LOCATION HYDRAULIC REPORT

SR 417 (Seminole Expressway) Sanford Airport Connector from SR 417 to Red Cleveland Boulevard

Project Development and Environment Study

Seminole County, FL

Project 417-246A

Prepared for:

CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Central Florida Expressway Authority

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Orlando, Florida, 32807

Prepared By:

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Winter Park, FL 32789

June 2025

PROFESSIONAL ENGINEER CERTIFICATION

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

PROJECT: SR 417 (Seminole Expressway) Sanford Airport Connector PD&E Study
from SR 417 to Red Cleveland Boulevard
Location Hydraulic Report
Project ID: 417-246A
Seminole County, Florida

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

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This report provides the results of a summary of data collection efforts, and limited calculation for the existing and the proposed cross drain and floodplain evaluations prepared for the conceptual analyses for the Location Hydraulic Report for the Project Development and Environment Study for the SR 417 (Seminole Expressway) Sanford Airport Connector improvements from SR 417 (Seminole Expressway) to the entrance of the Orlando Sanford International Airport at Red Cleveland Boulevard. I acknowledge that the procedures and references used to develop the results contained in this report are standard to the professional practice of hydrologic analysis and hydraulic engineering as applied through professional judgment and experience. This document is for planning purposes only and is not to replace any effort required for final design.

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

FLORIDA REGISTERED ENGINEER:

Jennifer A. Nunn, State of Florida, Professional Engineer, License No. 70709

This item has been electronically signed and sealed by:

Signature must be verified on any electronic copies.

EXECUTIVE SUMMARY

The Central Florida Expressway Authority (CFX) is conducting a Project Development and Environment (PD&E) Study to evaluate the proposed State Road (SR) 417 (Seminole Expressway) Sanford Airport Connector improvements from SR 417 (Seminole Expressway) to the entrance of the Orlando Sanford International Airport (SFB) at Red Cleveland Boulevard in Seminole County, FL.

The purpose of the Location Hydraulic Report (LHR) is to evaluate and identify floodplain impacts associated with the proposed improvements, discuss any potential encroachments, and describe measures for avoidance or minimization of these impacts. A preliminary cross drain analysis is included in order to demonstrate the minimization of impacts to flood elevations and limits as part of the proposed improvements.

The proposed roadway typical section consists of two 15-foot wide travel lanes, one in each direction, separated by a 32-foot grassed median. Initially, six potential alignments were considered as part of this PD&E study; however, Alignment 2A was determined to be the preferred alternative and is the only build alternative considered for this hydraulics analysis. Alignment 2A originates at a proposed interchange north of the existing toll plaza and continues in a northerly direction intersecting East Lake Mary Boulevard and terminating at Red Cleveland Boulevard. See **Figure 1, Project Location Map** in **Appendix A, Figures**.

The Federal Emergency Management Agency (FEMA) has determined the 100-year floodplain extents within the study area with an effective date of September 28, 2007. Alignment 2A does not encroach on any FEMA 100-year floodplain, and therefore, no floodplain impacts are anticipated. See **Figure 4, FEMA Floodplain Map** in **Appendix A, Figures**.

Alignment 2A is within the Navy Canal basin which discharges to Lake Jesup. The entire study area is within the Lake Jesup HUC12 030801011105 basin and is included in the Lake Jesup Basin Management Action Plan (BMAP). See **Figure 5, Waterbody ID (WBID) Map** in **Appendix A, Figures**.

In order to mimic existing drainage conditions, proposed cross drains are preliminarily located and sized based on the best available information to convey offsite flows through the Alternative 2A corridor and demonstrate no adverse impacts to offsite properties. Detailed investigations of the upstream and downstream condition were performed to assess existing cross drains, flows, and patterns in order to determine the best available information for estimation of proposed cross drain sizes. During the design phase, the analysis will be re-evaluated with site-specific design information to ensure hydraulic adequacy. Four (4) cross drains for Alternative 2A were located and sized and utilized the Rational Method for flow estimation and Federal Highway Administration (FHWA) HY-8 software for headwater stages.

The project is classified as having minimal encroachment. The proposed structures will perform hydraulically in a manner equal to or greater than the existing structures, and backwater surface elevations are not expected to increase. Thus, there will be no significant adverse impacts on natural and beneficial floodplain values. There will be no significant change in flood risk, and there will not be a

significant change in the potential for interruption or termination of emergency service or emergency evacuation routes. Therefore, it has been determined that this encroachment is not significant.

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1. Introduction

The CFX is conducting a PD&E Study to evaluate the proposed SR 417 (Seminole Expressway) Sanford Airport Connector improvements from SR 417 (Seminole Expressway) to the entrance of the Orlando Sanford International Airport (SFB) at Red Cleveland Boulevard.

Initially, six potential alignments were considered as part of this PD&E study within the study area shown in **Plate 1.** Alignment 2A was determined to be the preferred alternative and is the only build alternative considered for this hydraulics analysis. Alignment 2A originates at a proposed interchange north of the existing toll plaza and continues in a northerly direction intersecting East Lake Mary Boulevard and terminating at Red Cleveland Boulevard. See **Figure 1, Project Location Map** in **Appendix A, Figures**.

The proposed roadway typical section consists of two 15-foot wide travel lanes, one in each direction, separated by a 32-foot grassed median. Each travel direction includes a 4-foot outside paved shoulder with curb and gutter, 10-foot landscaped areas, and 27-foot sodded areas for a total width of 144 feet as shown in **Plate 2**. The proposed connector has a design speed of 45 miles per hour (mph) with the ramps to and from SR 417 having design speeds of 50 mph.

The project horizontal datum is Florida State Plane East Zone (NAD 1983), and the vertical datum is North American Vertical Datum of 1988 (NAVD). Conversion to NAVD elevation is accomplished by subtracting 1.04 feet from the National Geodetic Vertical Datum of 1929 (NGVD) elevation (i.e., 10.00 feet NGVD = 8.96 feet NAVD).

The project is located in Seminole County and within the St. Johns River Water Management District (SJRWMD) jurisdiction. The study area encompasses Township 20 South, Range 30 East, Sections 12 and 13, and within Township 20 South, Range 31 East, Sections 7-9, and 16-20. See **Figure 2, USGS Topographic Map** in **Appendix A, Figures**.

The Federal Emergency Management Agency (FEMA) has determined the 100-year floodplain extents within the study area with an effective date of September 28, 2007. Within the study area, flood zones classified as Zone X, Zone A, and Zone AE are present. Zone X is an area of minimal flood hazard and is determined to be outside the 100-year floodplain. Zones A and AE are areas which have a 1% chance of flooding annually (100-year event). There is one Zone A floodplain located east of SR 417 and north of Pine Way. The Zone AE flood zones have a determined base flood elevation (BFE) and are located in the vicinity of Lake Jesup with an established BFE of 9.00 feet NAVD. Alignment 2A does not encroach on any FEMA 100-year floodplain. See **Figure 4, FEMA Floodplain Map** in **Appendix A, Figures**.

The study area is located within the Middle St. Johns watershed and more specifically within the Lake Jesup Drain, Navy Canal, and Six Mile Creek basins. The study area drains primarily to two named waterways (Six Mile Creek and Phelps Creek/Navy Canal) and various channelized ditches which then

discharge to Lake Jesup. The entire project limits are located within the Lake Jesup BMAP. There are no Outstanding Florida Waters (OFW) within the study area.

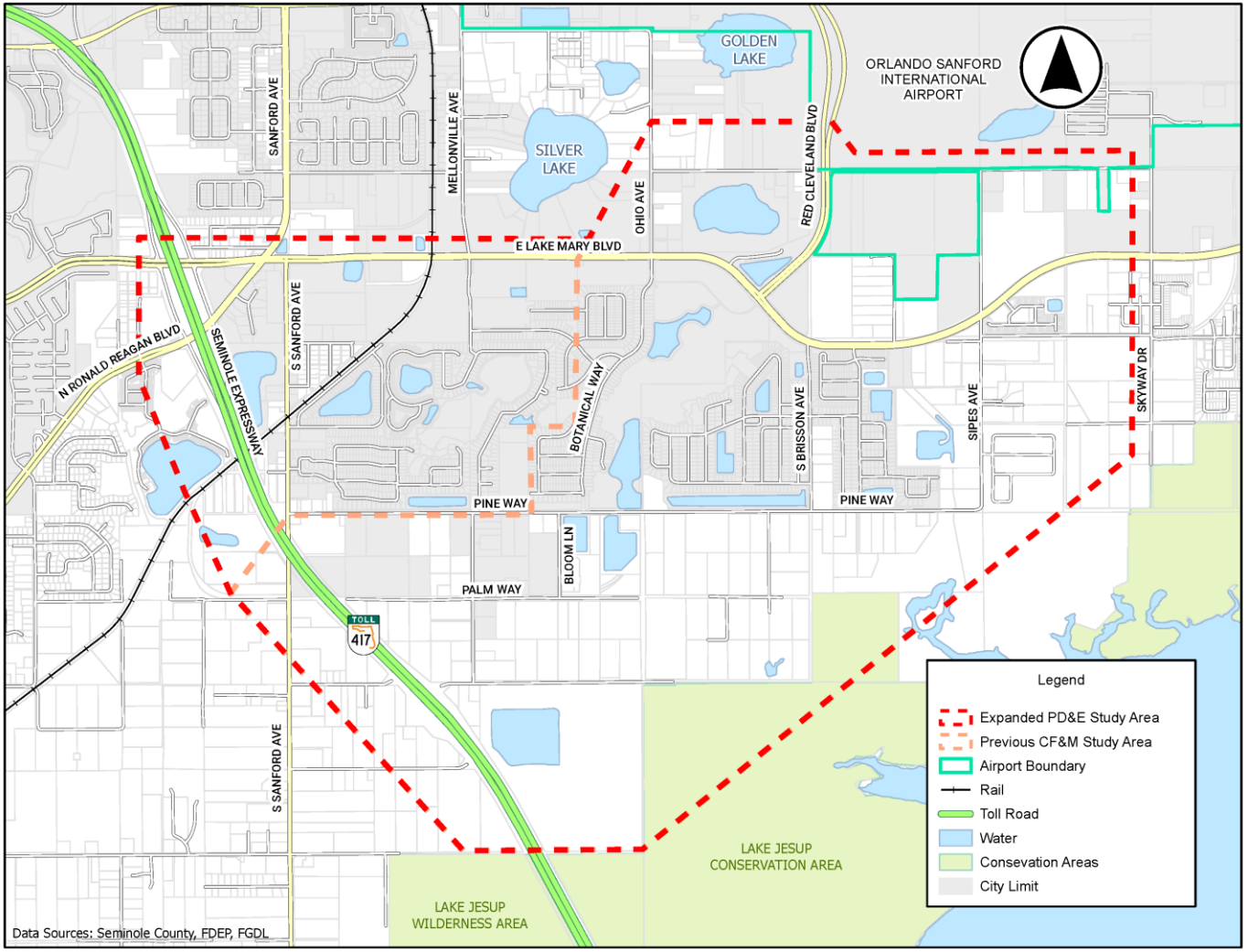


Plate 1 – SR 417 (Seminole Expressway) Sanford Airport Connector Study Area

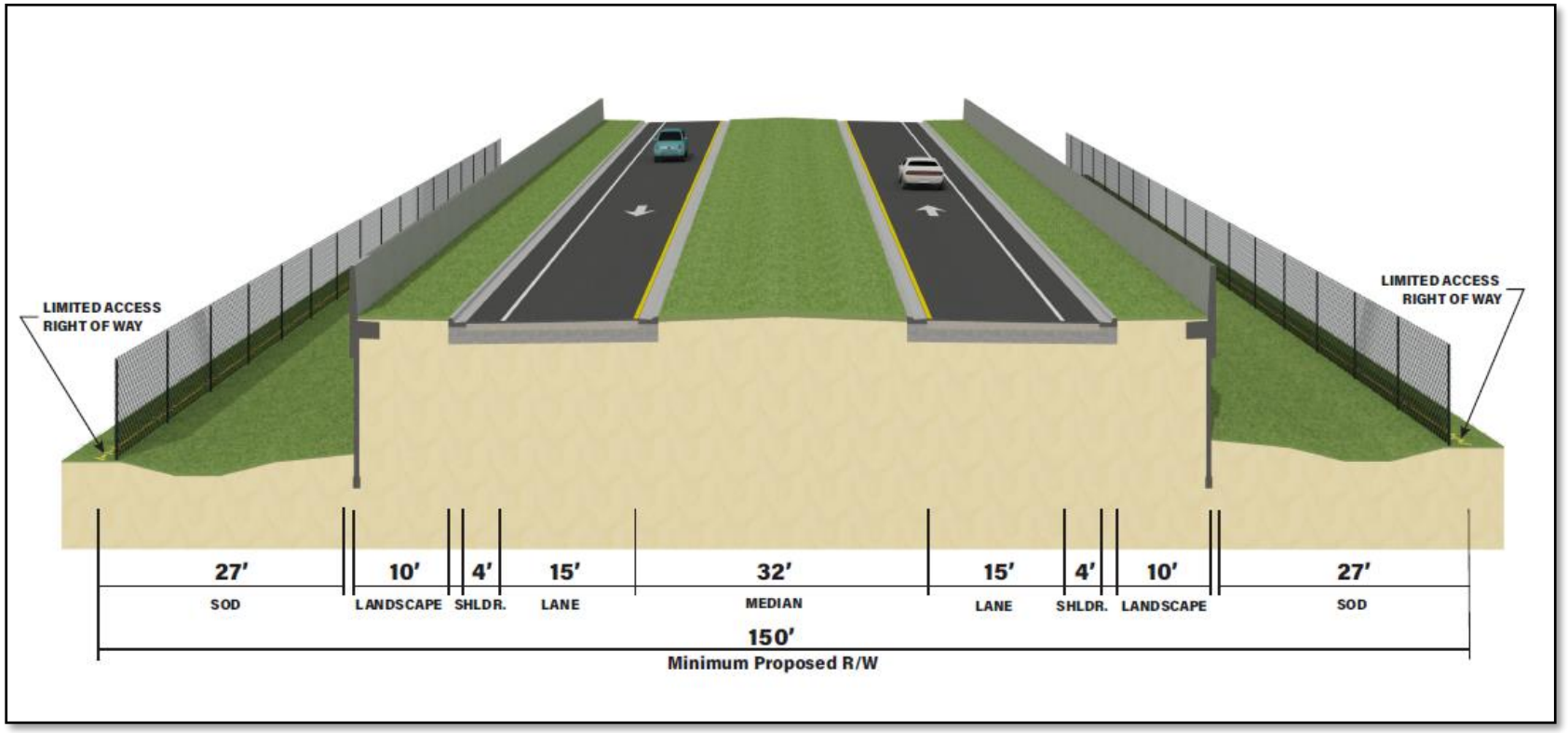


Plate 2 – SR 417 (Seminole Expressway) Sanford Airport Connector Proposed Typical Section

2. Purpose

The purpose of the proposed SR 417 (Seminole Expressway) Sanford Airport Connector is to provide a direct, limited access connection between SR 417 and SFB to provide better connectivity and accommodate future traffic growth in the area. The primary access to the airport is along East Lake Mary Boulevard via Red Cleveland Boulevard, which extends north from the airport entrance to the airport terminal. A proposed connector would provide a limited access connection directly to SFB from SR 417, thereby reducing the demand along East Lake Mary Boulevard and improving travel time for all users. The proposed improvements are to 1) enhance regional connectivity, 2) accommodate transportation demand, 3) provide needed capacity, 4) improve safety, 5) support modal connectivity, and 6) serve social and economic growth.

The purpose of this LHR is to evaluate and identify floodplain impacts associated with the proposed improvements, discuss any potential encroachments, and describe measures for avoidance or minimization of these impacts. The evaluation of cross drains is included in the hydraulic impacts associated with the proposed improvements in order to mimic existing drainage patterns. A preliminary cross drain analysis is included in order to demonstrate the minimization of impacts to flood elevations and limits as part of the proposed improvements.

3. Cross Drain Analysis Methodology

The existing land use within the study area consists mainly of roadways, residential (low density and rural), commercial and services, agriculture, and institutional. As this area is highly developed, runoff generally flows from north to south, and drains into existing ponds, roadside ditches, and swales before discharging into Lake Jesup. Existing stormwater management facilities (SMFs) include wet detention ponds, dry retention ponds, and linear swales.

The study area includes multiple Water Body Identification (WBID) basins that are part of the Middle St. Johns watershed that ultimately discharges to the St. Johns River. The study area is within the Lake Jesup HUC12 030801011105 basin and is included in the Lake Jesup BMAP with established Total Nitrogen and Total Phosphorous requirements. Alignment 2A is within the Navy Canal (WBID 2982), which is impaired for fecal coliform. See **Figure 5, Waterbody ID (WBID) Map** in **Appendix A, Figures**.

Offsite contributing areas draining to proposed Alternative 2A were delineated utilizing CatchmentSIM (CSIM) software, and refined utilizing existing permits, plans, and field reconnaissance of the project area. Relevant permit information is contained within **Appendix B, Existing Permitted Documents**. Proposed cross drain locations were determined from field review, LiDAR, and other available information including FEMA floodplains, USGS (United States Geological Survey) topographic information, and permits containing corridor-adjacent culverts. Generally, proposed cross drains were located where open channels or depressional areas exist. **Table 1** provides the storm events utilized for the preliminary cross drain analysis, (Florida Department of Transportation (FDOT) 2025 Drainage Manual (2025 DM) Section 4 and 2025 Drainage Design Guide (2024 DDG) Chapter 4). Proposed cross drains are sized for the 50-year design storm event. In addition, FDOT requires that the 100-year storm and either the 500-year storm (if greatest flood) or overtopping flood be analyzed for all cross drains.

Table 1 – Storm Frequency Criteria

Storm Event Frequency	Reason
10-year	Roadside Ditch Culverts; Pedestrian and Trail Bridges
25-year	Design Flood Event; (20-yr project of AADT < 1,500)
50-year*	Design Flood Event; (20-yr projection of AADT > 1,500)
100-year*	Base Flood Event
500-year	Greatest Flood Event

* Design storms for this project

The proposed cross drains along the proposed alignment will be designed to allow the offsite flow to mimic the existing conditions. The peak flood flows for the Design (50-year), Base (100-year), and Greatest Flood (500-year) were assessed for all proposed cross drains. The Rational Method was

employed and utilized rainfall intensities from the National Oceanographic Atmospheric Agency (NOAA) Atlas 14, Point Precipitation Frequency estimates for the study.

Federal Highway Administration (FHWA) HY-8 (Version 8.0) software was used to estimate headwater stages associated with the offsite flows and assist with the determination of proposed cross drain sizes. Proposed cross drain culvert sizes were determined by assuming a maximum velocity of three feet per second (fps) during the design storm to minimize risk given the surrounding relatively flat terrain and to demonstrate no adverse conditions at upstream properties resulting from the proposed roadway corridor. Utilizing the continuity equation ($Q = V \times A$), the maximum velocity and offsite flow resulted in a required cross sectional area for the proposed cross drain. Standard culvert dimensions were utilized to provide a cross sectional area greater than required. The tailwater elevation was assumed to be constant and utilized the more reasonable value from the following: the BFE within a FEMA Flood Zone AE, the crown of pipe at the downstream end, or a permitted tailwater elevation. The culvert location, length, and invert elevations for each cross drain were determined using LiDAR to approximate the existing ground elevation at the proposed right-of-way line.

In all cases, overtopping for the basin was assumed to be the proposed roadway and utilized a preliminary roadway profile developed for Alternative 2A. If the 500-year discharge did not result in roadway overtopping, then the 500-year discharge and stage was utilized as the Greatest Flood. The proposed cross drains were sized to result in no roadway overtopping; therefore, the 500-year discharge was recorded as the Greatest Flood for all cross drains. The Flood Data Box is included in **Table 7** of this report. During the design phase, the cross drain design will be re-evaluated with site-specific design information. This includes survey, geotechnical data, and any existing infrastructure (e.g. underground utilities), as well as the final proposed roadway profile. It is also assumed that the basin overtopping analysis and floodplain analysis will be further evaluated in the design phase.

4. Existing Conditions

4.1 Previously Permitted Information

Existing drainage basin locations and previously permitted cross drains located upstream of the project were used to support proposed cross drain sizing and peak flow estimation. A site visit was performed on October 4, 2024 to verify the location and sizes of previously permitted cross drains. **Table 2** provides a list of SJRWMD Environmental Resource Permits (ERPs) reviewed for cross drain information within the study area. Permit information that includes pertinent cross drain data within the project vicinity can be found in **Appendix B, Existing Permit Documents**.

Table 2 – Existing Permits within Study Area

ERP App.	Project	Date Issued	Shows Pertinent Cross Drain?
21757	Baker Farms	1/08/1985	No
21945-12	Lake Mary Boulevard	4/08/1996	No
22290-2	Silver Lakes Industrial Park	12/07/1992	No
22290-3	Silver Lakes Industrial Park	1/11/1993	No
22290-10	Sylvestri Estates	9/29/2016	No
22290-12	Sylvestri Lakes SD Sanford	6/21/2021	No
22290-14	Sylvestri Lakes Amenity Center Sanford	10/14/2021	No
22290-15	Safari Commercial Parcels	2/05/2023	No
22290-17	Sylvestri Lakes S/D (Transfer) Sanford	7/24/2023	No
22290-18	SFB Crossing	Pending	No
22339-1	FDOT Borrow Pit	9/08/1992	No
22339-3	White Construction Borrow Pits SR 427	9/08/1992	No
22339-5	FDOT Borrow Pit	7/13/1993	No
22367-1	Marquette Shores Borrow Pit	2/09/1993	No
22381-1	CR 427	2/08/1994	No
22496-3	East Lake Mary Boulevard Segment IIA	6/10/2002	Yes
22496-4	East Lake Mary Boulevard Segment IIB	4/08/2003	Yes
22496-5	East Lake Mary Boulevard Segment I	11/12/2002	Yes
70929 - 1	Pine Way @ Navy Canal Culvert Replacement	5/02/2001	No
71069-1	Magnolia Park, PD	8/14/2001	No
90051-1	Navy Canal Stormwater Facility	9/07/2004	No
96997-1	The Preserve at Eagle Lake	7/29/2005	No

ERP App.	Project	Date Issued	Shows Pertinent Cross Drain?
110906-3	Brisson East	8/31/2012	No
110906-7	Brisson West Residential Development	11/3/2017	No
110906-5	Brisson East Residential Development	4/30/2014	No
181400-1	Skylar Crest Townhomes Stormwater Manag. System	5/09/2022	No
182187-2	Palmetto Pointe	10/11/2023	No

4.2 Existing Cross Drains

Existing cross drains along East Lake Mary Boulevard and Red Cleveland Boulevard were field reviewed. Field review notes are located in **Appendix C, Field Review Documentation**. The direction of flow was determined from LiDAR, existing permit data, and field visit observations. See **Figure 6, Existing Cross Drain Location Map** in **Appendix A, Figures** for existing cross drain locations. **Table 3** provides pertinent information for existing cross drains along East Lake Mary Boulevard and Red Cleveland Boulevard.

Table 3 – Pertinent Existing Cross Drains within Study Area

Existing Cross Drain	Location	Size	Flow Direction	SJRWMD ERP Number	Applicable Proposed Cross Drain
CD-01_EX	Sta. 32+00	2 – 24” RCP	South	4-117-22496-5	N/A
CD-02_EX	Sta. 33+40	3 – 48” RCP	South	4-117-22496-5	N/A
CD-03A_EX	Sta. 56+18	30” RCP	South	4-117-22496-5	N/A
CD-03B_EX	Sta. 64+20	30” RCP	South	4-117-22496-5	N/A
CD-04_EX	Sta. 68+00	3 – 24” x 38” ERCP	South	4-117-22496-5	N/A
CD-05_EX*	Sta. 22+00	3 – 30” RCP	Southeast	4-117-22496-3	CD-04_PR
CD-06_EX	Sta. 93+00	3 – 30” RCP	South	4-117-22496-3	N/A
CD-07_EX	Sta. 96+20	2 – 36” RCP	South	4-117-22496-3	N/A
CD-08_EX	Sta. 111+90	3 – 10’ x 6’ CBC	South	4-117-22496-4	N/A

*Cross drain located on Red Cleveland Blvd. All other CDs located on E. Lake Mary Blvd.

The following discussion contains a brief description of each existing cross drain. The capacity of each existing cross drain to convey the 50-year storm event was assessed. For cross drains CD-01_EX, CD-02_EX, CD-3A_EX, and CD-3B_EX, peak flows were previously calculated for the 25-year/24-hour storm event; therefore, a statistical method was employed to estimate the 50-year peak flows. For cross drain CD-04_EX, peak flow data was not available in the permit documents; therefore, the 50-year peak flow was estimated using the Velocity Method and applying the Continuity equation ($Q = V \times A$) with an

assumed velocity of three fps. For cross drains CD-05_EX, CD-06_EX, CD-07_EX, and CD-08_EX, the 50-year peak flows were obtained directly from the permit documents. See **Appendix B, Existing Permit Documents** for existing permit documentation.

4.2.1 CD-01_EX

CD-01_EX is located at Station 32+00 on East Lake Mary Boulevard which is just west of the East Lake Mary Boulevard and the Seaboard Coastline Railroad Crossing (aka CSX Railroad) intersection. This cross drain is a double 24-inch reinforced concrete pipe (RCP) (per SJRWMD ERP 4-117-22496-5) as shown in **Table 3**. Within the permit documentation, CD-01_EX is referred to as "CULV_1" in the sub-basin B analysis.

CD-01_EX is located within FEMA Flood Zone X, which is an area having a moderate or minimal risk of flooding. CD-01_EX conveys the runoff from offsite areas north of East Lake Mary Boulevard to outfall into an existing ditch southwest of the railroad crossing intersection. The SJRWMD ERP 4-117-22496-5 indicates the CD-01_EX drainage basin to be 17.96 acres with a 25-year/24-hour event discharge of 23.57 cubic feet per second (cfs). The 50-yr flow rate was not provided in the permit documentation and was estimated to be 27.11 cfs using a statistical method.

During the field visit, the north (upstream) mitered endwall (ST-1) was observed to be in good condition and had no apparent scour or erosion. The water level at ST-1 was measured to be approximately 19-inches above the pipe invert. Heavy vegetation was noted along the inflow ditch to the cross drain. The south (downstream) endwall (ST-2) was not visually observed due to heavy vegetation; however, a low water level was observed near the structure location. See field photos and notes in **Appendix C**, **Field Review Documentation**.

4.2.2 CD-02_EX

CD-02_EX is located at Station 33+40 on East Lake Mary Boulevard, which is just east of the East Lake Mary Boulevard and CSX Railroad intersection. This cross drain is a triple 48-inch RCP (per SJRWMD ERP 4-117-22496-5) as shown in **Table 3**. Within the permit documentation, CD-02_EX is referred to as "RRPOND" in the sub-basin B analysis.

CD-02_EX is located in FEMA Flood Zone X, which is an area having a moderate or minimal risk of flooding. CD-02_EX conveys offsite runoff from north of East Lake Mary Boulevard. Runoff from the roadway is collected in a closed conveyance system and directed to wet detention Pond B, located northwest of the railroad crossing intersection. The Pond B outfall crosses the railroad north of East Lake Mary Boulevard and discharges into a canal that drains south into the upstream side of the existing cross drain. The existing cross drain discharges into a canal that flows into the triple 48-inch culvert to the south, which eventually discharges into a wetland area. The SJRWMD ERP 4-117-22496-5 indicates the CD-02_EX drainage basin to be 14.39 acres with a 25-year/24-hour event discharge of 35.56 cfs. The 50-year flow rate was not provided in the permit documentation and was estimated to be 40.89 cfs using a statistical method.

During the field visit, the north (upstream) endwall (ST-3) was not visually observed due to heavy vegetation; however, a low water level was observed near the structure location. The south (downstream) end (ST-4) is connected to a triple 48-inch side drain that conveys the runoff east to the roadside ditch. See field photos and notes in **Appendix C**, **Field Review Documentation**.

4.2.3 CD-03A_EX

CD-03A_EX is located at Station 56+18 on East Lake Mary Boulevard which is approximately 0.21 miles west of the East Lake Mary Boulevard and Ohio Avenue intersection. This cross drain is a 30-inch RCP (per SJRWMD ERP 4-117-22496-5) as shown in **Table 3**. Within the permit documentation, CD-03A_EX is referred to as "CULV_1" in the sub-basin C analysis.

CD-03A_EX is located in FEMA Flood Zone X, which is an area having a moderate or minimal risk of flooding. CD-03A_EX conveys the runoff from a portion of the extension of East Lake Mary Boulevard (per SJRWMD ERP 42-11 7-0943NG) from the CSX Railroad to Ohio Avenue including the west side of Ohio Avenue. The offsite areas consist of industrial, residential, and agricultural land uses located primarily to the north of East Lake Mary Boulevard. The roadway runoff discharges into wet detention Pond C, which discharges into an existing ditch that drains south to the upstream side of CD-03A_EX.

CD-03A_EX discharges southward where it joins with CD-03B_EX at an existing 38-inch x 60-inch elliptical reinforced concrete pipe (ERCP). The ERCP outfall conveys runoff within Sylvestri Lakes Community (under construction – Permit App. No. 22290-18) and outfall into a wetland area located east of the community. The wetland area discharges into a ditch/canal system that ultimately drains to Lake Jesup. The SJRWMD ERP 4-117-22496-5 indicates the CD-03A_EX drainage basin to be 32.50 acres with a 25-year/24-hour event discharge of 36.48 cfs. The 50-year flow rate was not provided in the permit documentation and was estimated to be 41.95 cfs using a statistical method.

During the field visit, the north (upstream) mitered endwall (ST-5) was observed to be in good condition and had no apparent scour or erosion. The water level and stain marks were measured at approximately 5-inches and 8-inches above the pipe invert, respectively. The south (downstream) end (ST-6) is a storm sewer manhole where CD-03A_EX joins with CD-03B_EX. The manhole was observed to be in good condition and had no apparent scour or erosion. See field photos and notes in **Appendix C**, **Field Review Documentation**.

4.2.4 CD-03B_EX

CD-03B_EX is located at Station 64+20 at East Lake Mary Boulevard, which is approximately 0.05 miles west of the East Lake Mary Boulevard and Ohio Avenue intersection. This cross drain is a 30-inch RCP (per SJRWMD ERP 4-117-22496-5) as shown in **Table 3**. Within the permit documentation, CD-03B_EX is referred to as "CULV_3" in the sub-basin C analysis.

CD-03B_EX is located in FEMA Flood Zone X, which is an area having a moderate or minimal risk of flooding. CD-03B_EX conveys the runoff from offsite areas of primarily agricultural land uses located north of East Lake Mary Boulevard. CD-03B_EX discharges southward where it joins with CD-03A_EX at

an existing 38-inch x 60-inch ERCP. This system ultimately discharges to Lake Jesup as described for CD-03A_EX. The SJRWMD ERP 4-117-22496-5 indicates the CD-03B_EX drainage basin to be 19.08 acres with a 25-year/24-hour event discharge of 24.68 cfs. The 50-year flow rate was not provided in the permit documentation and was estimated to be 28.38 cfs using a statistical method.

During the field visit, the north (upstream) ditch bottom inlet (ST-7) was observed to be in good condition and had no apparent scour or erosion. There was no standing water or flow on the day of the field review. The south (downstream) end (ST-6) is a storm sewer manhole where CD-03B_EX joins with CD-03A_EX. The manhole was observed to be in good condition and had no apparent scour or erosion. See field photos and notes in **Appendix C**, **Field Review Documentation**.

4.2.5 CD-04_EX

CD-04_EX is located at Station 68+00 on East Lake Mary Boulevard which is just east of the East Lake Mary Boulevard and Ohio Avenue intersection. This cross drain is a triple 24-inch by 38-inch ERCP (per SJRWMD ERP 4-117-22496-5) as shown in **Table 3**.

CD-04_EX is located in FEMA Flood Zone X, which is an area having a moderate or minimal risk of flooding. CD-04_EX conveys the runoff from offsite areas of primarily residential and agricultural land uses located north of East Lake Mary Boulevard. CD-04_EX discharges southward and runoff flows into an undeveloped area of the Sylvestri Lakes Community (under construction – Permit App. No. 22290-18) to outfall into a wetland area. The wetland area discharges into a ditch/canal system that ultimately outfalls to Lake Jesup.

Although the cross drain is included in the construction plans, it could not be found within the drainage report. It appears that it was not included since neither the drainage area nor the structure of the cross drain was altered for the permitted improvements. Therefore, no design flow was provided in the permit documentation. The 50-year flow rate was estimated to be 45.90 cfs using the Velocity Method.

During the field visit, the north (upstream) endwall (ST-8) was observed to be in good condition and had no apparent scour or erosion. There was no standing water or flow on the day of the field review. Some sedimentation (silt) and stain lines were observed inside the elliptical pipe. The south (downstream) endwall (ST-9) was observed to be in good condition and had no apparent scour or erosion. There was no standing water or flow on the day of the field review. The structure had no sedimentation (silt), nor any observed stain lines. See field photos and notes in **Appendix C**, **Field Review Documentation**.

4.2.6 CD-05_EX

CD-05_EX is located at Station 22+00 on Red Cleveland Boulevard which is approximately 0.21 miles northeast of the Red Cleveland Boulevard and East Lake Mary Boulevard intersection. This cross drain was originally designed as a quintuple 24” x 38” configuration according to the permit documentation (SJRWMD ERP 4-117-22496-3); however, it was subsequently constructed as a triple 30-inch configuration, as shown in the construction plans and confirmed during the field visit (See **Table 3**). Within the permit documentation, CD-05_EX is referred to as "X-1L".

CD-05_EX is located in FEMA Flood Zone X, which is an area having a moderate or minimal risk of flooding. CD-05_EX conveys the runoff from offsite areas of primarily industrial, residential, and agricultural land uses located west of Red Cleveland Boulevard to a wetland area upstream of CD-06_EX and CD-07_EX. Cross drains CD-06_EX and CD-07_EX drain into a ditch/canal system that ultimately drains to Lake Jesup. The SJRWMD ERP 4-117-22496-3 indicates the CD-05_EX drainage basin to be 21.95 acres with a 50-year design discharge of 60.31 cfs.

During the field visit, the northwest (upstream) mitered endwall (ST-10) was observed to be in good condition and had no apparent scour or erosion. The ST-10 had the water level approximately 8-inches above the pipe invert. The structure had no sedimentation (silt), nor any observed stain lines. The southeast (downstream) mitered endwall (ST-11) was observed to be in good condition and had no apparent scour or erosion. The structure had no sedimentation (silt), nor any observed stain lines. See field photos and notes in **Appendix C**, **Field Review Documentation**.

4.2.7 CD-06_EX

CD-06_EX is located at Station 93+00 on East Lake Mary Boulevard which is approximately 0.14 miles southeast of the East Lake Mary Boulevard and Red Cleveland Boulevard intersection. This cross drain is a triple 30-inch RCP (per SJRWMD ERP 4-117-22496-3) as shown in **Table 3**. Within the permit documentation, CD-06_EX is referred to as "X-2L".

CD-06_EX is located in FEMA Flood Zone X, which is an area having a moderate or minimal risk of flooding. CD-06_EX and CD-07_EX both convey the runoff discharged upstream from CD-05_EX and the runoff from an offsite area located east of Red Cleveland Boulevard to a ditch/canal system that ultimately drains to Lake Jesup. The SJRWMD ERP 4-117-22496-3 indicates the CD-06_EX has a drainage basin of 34.5 acres and the 50-year design discharge of 47 cfs.

During the field visit, the north (upstream) mitered endwall (ST-12) was observed to be in good condition and had no apparent scour or erosion. The ST-12 had the water level approximately 6-inches above the pipe invert. The structure had no sedimentation (silt), nor any observed stain lines. The south (downstream) mitered endwall (ST-13) was observed to be in good condition and had no apparent scour or erosion. The ST-13 had the water level approximately 6-inches above the pipe invert. The structure had no sedimentation (silt), nor any observed stain lines. See field photos and notes in **Appendix C**, **Field Review Documentation**.

4.2.8 CD-07_EX

CD-07_EX is located at Station 96+20 on East Lake Mary Boulevard which is approximately 0.19 miles southeast of the East Lake Mary Boulevard and Red Cleveland Boulevard intersection. This cross drain is a double 36-inch RCP (per SJRWMD ERP 4-117-22496-3) as shown in **Table 3**. Within the permit documentation, CD-07_EX is referred to as "S-213".

CD-07_EX is located in FEMA Flood Zone X, which is an area having a moderate or minimal risk of flooding. CD-07_EX and CD-06_EX both convey the runoff discharged from CD-05_EX and the runoff

from an offsite area located east of Red Cleveland Boulevard to a ditch/canal system that ultimately drains to Lake Jesup. The SJRWMD ERP 4-117-22496-3 indicates the 50-year design discharge of 60 cfs; no drainage basin information was available for this cross drain.

During the field visit, the north (upstream) endwall (ST-14) was observed, although it could not be accessed due to the high vegetation. Standing water was observed. The south (downstream) endwall (ST-15) was not visible due to heavy vegetation. Standing water was observed. See field photos and notes in **Appendix C**, **Field Review Documentation**.

4.2.9 CD-08_EX

CD-08_EX is located at Station 111+90 on East Lake Mary Boulevard, which is approximately 0.50 miles southeast of the East Lake Mary Boulevard and Red Cleveland Boulevard intersection. CD-08_EX conveys Navy Canal through a triple 10-ft by 6-ft Concrete Box Culvert (CBC) (per SJRWMD ERP 4-117-22496-4) as shown in **Table 3**. Within the permit documentation, CD-08_EX is referred to as "X-4".

CD-08_EX is located in FEMA Flood Zone X, which is an area having a moderate or minimal risk of flooding. CD-08_EX conveys runoff from the Navy Canal drainage basin, which includes areas of residential and agricultural land uses located north of East Lake Mary Boulevard. Navy Canal ultimately drains to Lake Jesup. The SJRWMD ERP 4-117-22496-4 indicates a 50-year design discharge of 307 cfs, although there are previous calculations dating back to 1994 that indicate that the 50-year design flow was 920 cfs.

During the field visit, Navy Canal was observed with no vegetation and obstructions within the canal. The canal was highly vegetated in the overbanks. See field photos and notes in **Appendix C**, **Field Review Documentation**.

4.3 Summary of Flow Estimation for Existing Cross Drains

Table 4 provides an overview of each existing cross drain including location, size, and estimated 50-year peak flow along East Lake Mary Boulevard.

Table 4 – Summary of Peak Flow Estimation for Existing Cross Drains

Existing Cross Drain ID	Location	Number of Barrels	Size	50-year Peak Flow (cfs)	Method
CD-01_EX	Sta. 32+00	2	24" RCP	27.11	Statistical Method
CD-02_EX	Sta. 33+40	3	48" RCP	40.89	Statistical Method
CD-03A_EX	Sta. 56+18	1	30" RCP	41.95	Statistical Method
CD-03B_EX	Sta. 64+20	1	30" RCP	28.38	Statistical Method
CD-04_EX	Sta. 68+00	3	24" x 38" ERCP	45.90	Velocity Method
CD-05_EX*	Sta. 22+00	3	30" RCP	60.31	ERP 4-117-22496-3
CD-06_EX	Sta. 93+00	3	30" RCP	47.00	ERP 4-117-22496-3
CD-07_EX	Sta. 96+20	2	36" RCP	60.00	ERP 4-117-22496-4
CD-08_EX	Sta. 111+90	3	10' x 6' CBC	307.00	ERP 4-117-22496-4

*Cross drain located on Red Cleveland Blvd. All other CDs located on E. Lake Mary Blvd.

5. Proposed Conditions

Potential floodplain impacts resulting from the SR 417 (Seminole Expressway) Sanford Airport Connector Alternative 2A were evaluated. As the proposed corridor does not encroach on any FEMA 100-year floodplains, no floodplain impacts are anticipated with the proposed improvements.

In order to mimic existing drainage conditions, proposed cross drains are preliminarily located and sized based on the best available information to convey offsite flows through the Alternative 2A corridor and demonstrate no adverse impacts to offsite properties. Detailed investigations of the upstream and downstream condition were performed to assess existing cross drains, flows, and patterns in order to determine the best available information for estimation of proposed cross drain sizes. It is recommended to reevaluate each proposed cross drain during the design phase to ensure hydraulic adequacy.

There are four (4) proposed cross drains for Alternative 2A. See **Figure 7A and 7B, Proposed Cross Drain and Basin Maps** in **Appendix A, Figures** for proposed cross drain locations and basin map exhibits. All proposed cross drains are located within Zone X, therefore there will be no encroachment into the FEMA 100-year floodplain. Refer to **Figure 4, FEMA Floodplain Map** in **Appendix A, Figures** for the FEMA Floodplain Map. The hydrologic soil groups for the proposed cross drain basins include Type A and Type A/D. Refer to **Figure 3, NRCS Soil Map** in **Appendix A, Figures** for the Natural Resources Conservation Service (NRCS) Soil Map.

5.1 Proposed Cross Drains

The cross drain analysis was conducted as described in **Section 3.** The following discussion contains a brief description of each proposed cross drain and their respective drainage basins.

5.1.1 CD-01_PR

The CD-01_PR drainage system receives runoff from a 13.43-acres drainage basin. The drainage basin draining to CD-01_PR encompasses a low-density residential area located south of Palm Way Street, east of Mellonville Avenue, and northwest of the SR 417 (Seminole Expressway) Sanford Airport Connector Alignment 2A. The hydrologic soil group within the basin is Type A/D.

CD-01_PR is proposed at Station 107+66 of the SR 417 (Seminole Expressway) Sanford Airport Connector. The proposed cross drain size is a 36-inch RCP draining to the southeast with discharge into an open area that drains into an existing ditch and ultimately drains to Lake Jesup. CD-01_PR will be located in FEMA Flood Zone X, which is an area having a moderate or minimal risk of flooding. The 50-year flow rate was estimated to be 19.63 cfs.

5.1.2 CD-02_PR

The CD-02_PR drainage system receives runoff from a total 69.15-acres drainage basin. This drainage basin includes 15.12 acres of offsite wetland area and 54.03 acres from the permitted Sylvestri Lake

Community basin. The drainage area encompasses a wetland area located southeast of Sylvestri Lakes Community and northwest of the SR 417 (Seminole Expressway) Sanford Airport Connector Alignment 2A. In addition, CD-02_PR will convey the entire northern drainage system of the Sylvestri Lakes Community. Currently, the drainage system is routed to an existing wet detention pond which outfalls via a control structure to the wetland area. The hydrologic soil group within the basin is Type A/D.

CD-02_PR is proposed at Station 158+76 of the SR 417 (Seminole Expressway) Sanford Airport Connector. The proposed cross drain size is a 9-foot x 5-foot CBC draining to the southeast with discharge into a wetland area that ultimately drains to Lake Jesup. CD-02_PR will be located in FEMA Flood Zone X, which is an area having a moderate or minimal risk of flooding. The 50-year flow rate was estimated to be 122.97 cfs. The peak flow rate from the 15.12 acre offsite basin was estimated using the Rational Method, and the peak flow rate from the Sylvestri Lakes Community basin was estimated using a statistical method, referencing the permit data.

5.1.3 CD-03_PR

The CD-03_PR drainage system receives runoff from a total 103.74-acre drainage basin. This drainage basin includes 23.85 acres of offsite wetland area, located south of East Lake Mary Boulevard, north and east of Sylvestri Lakes Community, and northwest of the SR 417 (Seminole Expressway) Sanford Airport Connector Alignment 2A. Additionally, it includes 28.27 acres from the CD-04_EX drainage basin and 51.62 acres from CD-03A_EX and CD-03B_EX drainage basins. The drainage basin for CD-03A_EX and CD-03B_EX was obtained from permit documentation, while the remaining drainage basin was delineated utilizing CSIM software. Runoff from CD-03A_EX and CD-03B_EX converges into an existing 38-inch x 60-inch ERCP located within the Sylvestri Lakes Community. This conduit conveys flows through the community and discharge into the adjacent wetland system. The hydrologic soil group within the basin is Type A/D.

CD-03_PR is located at Station 170+30 of the SR 417 (Seminole Expressway) Sanford Airport Connector. The proposed cross drain size is an 8-foot x 6-foot CBC draining to the south with discharge into the wetland area that ultimately drains to Lake Jesup. CD-03_PR is located in FEMA Flood Zone X, which is an area having a moderate or minimal risk of flooding. The 50-year flow rate is estimated to be 140.68 cfs. The peak flow rate for the offsite basin was estimated using the Rational Method. The flow rate from CD-03A_EX and CD-03B_EX was estimated using a statistical method, and the flow rate from CD-04_EX was estimated using the Velocity Method.

5.1.4 CD-04_PR

CD-04_PR is located at Station 188+59 of the SR 417 (Seminole Expressway) Sanford Airport Connector which is the same location of CD-05_EX (Station 22+00 on Red Cleveland Boulevard). The drainage system receives runoff from a total 21.95-acre drainage basin according to SJRWMD ERP 4-117-22496-3 permit documentation. The hydrologic soil groups within the basin are Type A and Type A/D.

The proposed cross drain configuration considers replacement of the existing triple 30-inch pipes with triple 36-inch pipes. During the design phase, it is recommended to determine whether the existing triple 30-inch pipes are in adequate condition and can be extended for the new alignment. To ensure no adverse conditions, an additional proposed pipe will be required in parallel for this option. Additionally, it should be noted that the proposed cross drain dimensions may require upsizing during the design phase, if it is determined that the existing Pond 4A needs to be modified to handle additional flow.

The proposed structure will drain to the southeast with discharge into a wetland area upstream of CD-06_EX and CD-07_EX. Cross drains CD-06_EX and CD-07_EX drain into a ditch/canal system that ultimately drains to Lake Jesup. CD-04_PR is located in FEMA Flood Zone X, which is an area having a moderate or minimal risk of flooding. The 50-year flow rate is estimated to be 60.31 cfs according to permit documentation.

The existing cross drain CD_05-EX was originally designed as a quintuple 24" x 38" configuration according to the permit documentation (SJRWMD ERP 4-117-22496-3); however, it was subsequently constructed as a triple 30-inch RCP configuration, as shown in the construction plans and confirmed during the field visit. Since the permit calculations were based on a configuration different from the one constructed, calculations were performed for the as-built structure, allowing the water surface elevation to be compared with the proposed conditions (See **Table 5**).

Table 5 – Comparison of Stages for CD-04_PR

Design Storm	Existing Condition Stages (ft NAVD)	Proposed Condition Stages (ft NAVD)	Difference (ft)
50-	31.95	31.94	-0.01
100-	32.20	32.08	-0.12
500-	32.85	32.24	-0.61

Table 6 provides a summary of the proposed cross drains for Alternative 2A. See **Table 7** for the Flood Data Box. See **Appendix D, Proposed Hydrologic and Hydraulic Calculations** for proposed calculations, assumptions, and HY-8 results.

Table 6 – Alternative 2A Proposed Cross Drains

Cross Drain	Culvert Size	Flow Direction	Total Basin Area (acres)	Peak Flow Methodology	Within Flood Zone?	Peak Design Storm Flow (cfs)
CD-01_PR	36" RCP	Southeast	13.43	Rational	No	**19.63**
CD-02_PR	9-ft x 5-ft	Southeast	69.15	Rational	No	**122.97**

CD-03_PR	8-ft x 6-ft	South	103.74	Rational	No	**140.68**
CD-04_PR	Triple 36” RCP	Southeast	21.95	SJRWMD ERP 4-117-22496-3	No	**60.31**

Table 7 – Alternative 2A Flood Data Box

STRUCTURE NO.	Cross Drain Size	DESIGN FLOOD		BASE FLOOD		OVERTOPPING FLOOD				GREATEST FLOOD			
		2% PROB	50 YR FREQ	1% PROB	100 YR FREQ								
		DISCHARGE	STAGE	DISCHARGE	STAGE	DISCHARGE	STAGE	PROB %	FREQ YR	DISCHARGE	STAGE	PROB %	FREQ YR
CD-01_PR	36-inch RCP	19.63	14.25	22.09	14.35	--	--	--	--	25.62	14.38	0.2%	500
CD-02_PR	9-ft x 5-ft CBC	122.97	34.02	206.67	34.42	--	--	--	--	217.75	34.48	0.2%	500
CD-03_PR	8-ft x 6-ft CBC	140.68	34.89	167.03	35.01	--	--	--	--	206.37	35.22	0.2%	500
CD-04_PR	Triple 36-inch RCP	60.31	31.94	69.32	32.08	--	--	--	--	88.20	32.24	0.2%	500

Note: The hydraulic data is shown for informational purposes only, to indicate the flood discharges and water surface elevations which may be anticipated in any given year. This data was generated using highly variable factors determined by a study of the watershed. Many judgements and assumptions are required to establish these factors. The resultant hydraulic data is sensitive to changes, particularly of antecedent conditions, urbanization, channelization, and land use. Users of this data are cautioned against the assumption of precision which cannot be attained. Discharges are in cubic feet per second (cfs) and stages are in feet, NAVD 88.

5.2 Floodplain Minimal Encroachment Evaluation

Per Section 13.2.2.5 of the FDOT PD&E Manual, the LHR has requirements for each level of significance of encroachment. This project qualifies as a Minimal Encroachments level due to minimal impacts to floodplain encroachments. The location of pertinent information and/or discussion of the following items to be contained within the LHR for a project with Minimal Encroachments are summarized below:

- General description of the project: See **Section 1 Introduction**, **Plate 1 – SR 417 (Seminole Expressway) Sanford Airport Connector Study Area**, **Plate 2 – SR 417 (Seminole Expressway) Sanford Airport Connector Proposed Typical Section**, and **Figures 1-5 in Appendix A**.

- Determination of whether the proposed action is in the base floodplain: See **Section 1 Introduction** and See **Figure 4, FEMA Floodplain Map** in **Appendix A, Figures**. Alignment 2A, the preferred Build Alternative, does not encroach within the FEMA 100-year floodplain.

- History of flooding of the existing facilities and/or measures to minimize any impacts due to the proposed improvements: Permit documentation (ERP 22290-12) indicates that the area south of Pine Way has had historic flooding issues, but the associated permitted improvements (Sylvestri Lakes Community) would assist in alleviating flooding in that area. Other documented comments from public input were received regarding reoccurring flooding issues. The proposed improvements will follow standard water quality and water quantity criteria and will not exacerbate any existing conditions.

- Determination of whether the encroachment is longitudinal or transverse, and if it is a longitudinal encroachment, an evaluation and discussion of practicable avoidance alternatives: See **Section 1 Introduction** and See **Figure 4, FEMA Floodplain Map** in **Appendix A, Figures**. Alignment 2A, the preferred Build Alternative, does not encroach within the FEMA 100-year floodplain.

- The practicability of avoidance alternatives and/or measures to minimize impacts: See **Section 1 Introduction** and see **Figure 4, FEMA Floodplain Map** in **Appendix A, Figures**. Alignment 2A, the preferred Build Alternative, does not encroach within the FEMA 100-year floodplain.

- Impact of the project on emergency services and evacuation: The project seeks to increase regional mobility and accommodate the future traffic needs. As travel lanes will be increased, the project is not anticipated to have any negative impacts on emergency services and evacuation.

- Impacts of the project on the base flood, likelihood of flood risk, overtopping, location of overtopping, backwater: Preliminary calculations have been prepared to provide preliminary cross drain sizes in order to convey offsite runoff and have no adverse impact to offsite properties. See **Section 5.1 Proposed Cross Drains**. During design, final hydrologic and hydraulic calculations will need to be performed.

- Determination of the impact of the project on regulatory floodways, if any, and documentation of coordination with FEMA and local agencies to determine the requirements for the project to be developed consistent with the regulatory floodway: There is no FEMA Regulatory floodway within the study area (see **Figure 4, FEMA Floodplain Map** in **Appendix A, Figures**).

- The impacts on natural and beneficial floodplain values and measures to restore and preserve these values: See **Section 1 Introduction** and See **Figure 4, FEMA Floodplain Map** in **Appendix A, Figures**. Alignment 2A, the preferred Build Alternative, does not encroach within the FEMA 100-year floodplain.

- Consistency of the project with the local floodplain development plan or the land use elements in the Local Government Comprehensive Plan (*LGCP*), and the potential of encouraging development in the base floodplain: See **Section 1 Introduction** and see **Figure 4, FEMA Floodplain Map** in **Appendix A, Figures**. Alignment 2A, the preferred Build Alternative, does not encroach within the FEMA 100-year floodplain. As part of the PD&E study, regular coordination meetings with Seminole County and the City of Sanford have been occurring.

- Measures to minimize floodplain impacts associated with the project and measures to restore and preserve the natural and beneficial floodplain values impacts by the project: See **Section 1 Introduction** and see **Figure 4, FEMA Floodplain Map** in **Appendix A, Figures**. Alignment 2A, the preferred Build Alternative, does not encroach within the FEMA 100-year floodplain.

- A map showing project location, and impacted floodplains: See **Figure 1, Project Location Map** and **Figure 4, FEMA Floodplain Map** in **Appendix A, Figures**.

- Results of any risk assessments performed: See **Table 6 – Alternative 2A Proposed Cross Drains** and **Table 7 – Alternative 2A Flood Data Box** for the results of the proposed cross drain analysis.

6. Conclusion

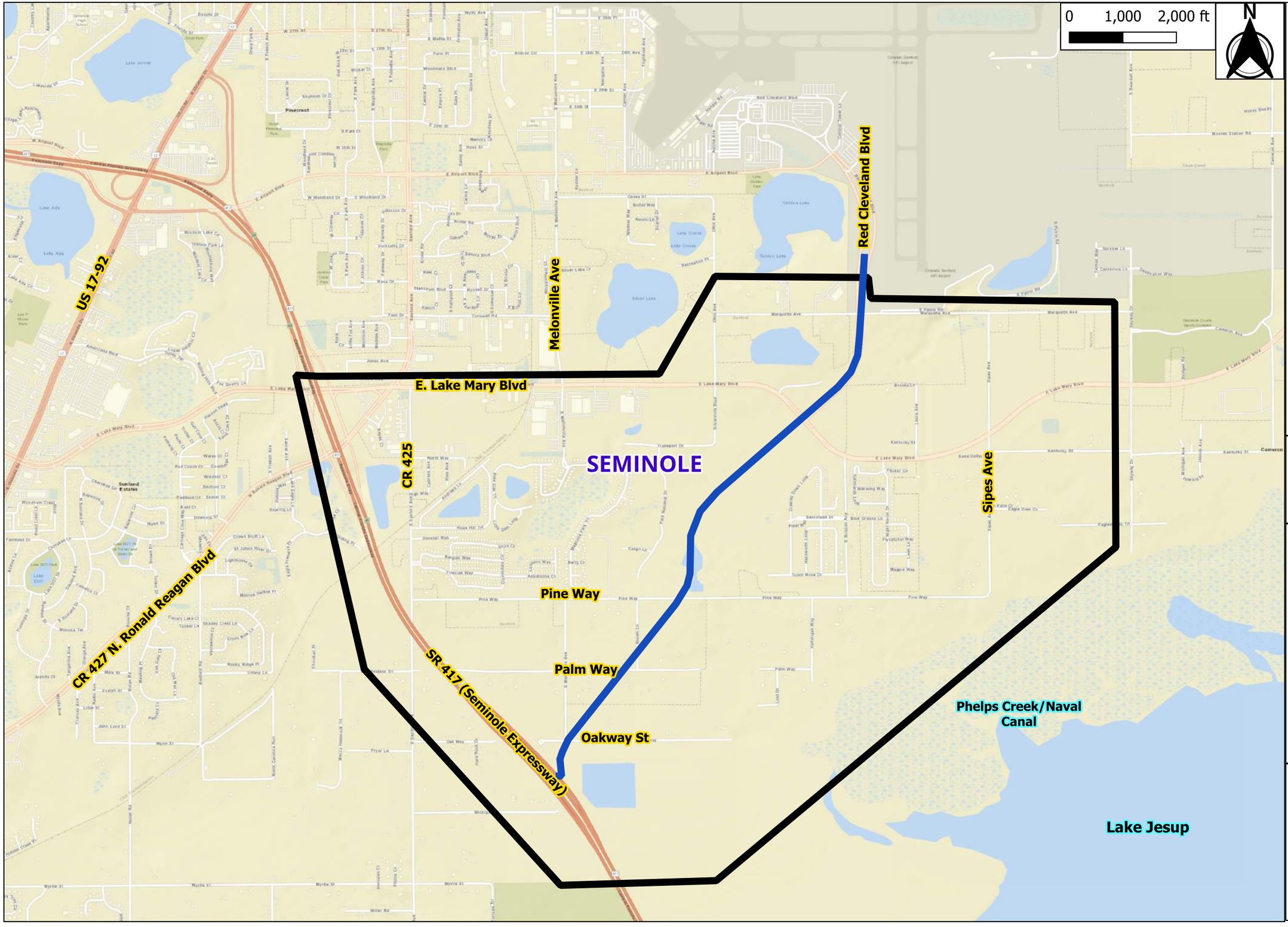
In summary, this report determined that there is anticipated to be no FEMA 100-year floodplain encroachment from the proposed Alignment 2A of the SR 417 (Seminole Expressway) Sanford Airport Connector. Additionally, in order to mimic existing drainage patterns, preliminary cross drain sizes and locations have been provided to demonstrate that there will not be any adverse impact to offsite flood stages and flood limits. The proposed roadway improvements are expected to have no adverse impact on the existing cross drains located at East Lake Mary Boulevard or Red Cleveland Boulevard. During final design, it is recommended to update the proposed cross drain analysis with project-specific survey, detailed tailwater information and the final roadway profile to demonstrate no adverse impacts.

The project is classified as having minimal encroachment. The proposed structures will perform hydraulically in a manner equal to or greater than the existing structures, and backwater surface elevations are not expected to increase. Thus, there will be no significant adverse impacts on natural and beneficial floodplain values. There will be no significant change in flood risk, and there will not be a significant change in the potential for interruption or termination of emergency service or emergency evacuation routes. Therefore, it has been determined that this encroachment is not significant.

7. References

1. Central Florida Expressway Authority (March 2025). 2025 Design Guidelines.
2. Federal Emergency Management Agency (Effective September 28, 2007). *Flood Insurance Rate Maps, Jackson County, Florida and incorporated Areas.* Community-Panel Numbers 12117C0070F, 12117C0090F, 12117C0160F and 12117C0180F.
3. Federal Emergency Management Agency (Effective September 28, 2007). *Flood Insurance Study, Seminole County, Florida and incorporated Areas.* Community-Panel Numbers 12117CV000A.
4. Federal Highway Administration (May 2024). *HY-8 Culvert Hydraulic Analysis Program User Manual*.
5. Florida Department of Transportation (January, 2025). *Design Manual*.
6. Florida Department of Transportation (January, 2025). *Drainage Manual.*
7. Florida Department of Transportation (January, 2025). *FDOT Standard Plans for Road Construction*.

Appendix A – Figures



Legend

- Alignment 2A
- County Boundary
- Study Area

Figure 1

Project Location Map

PD&E Study
SR 417 Sanford Airport Connector
CFX Project Number: 417-246A
Seminole County

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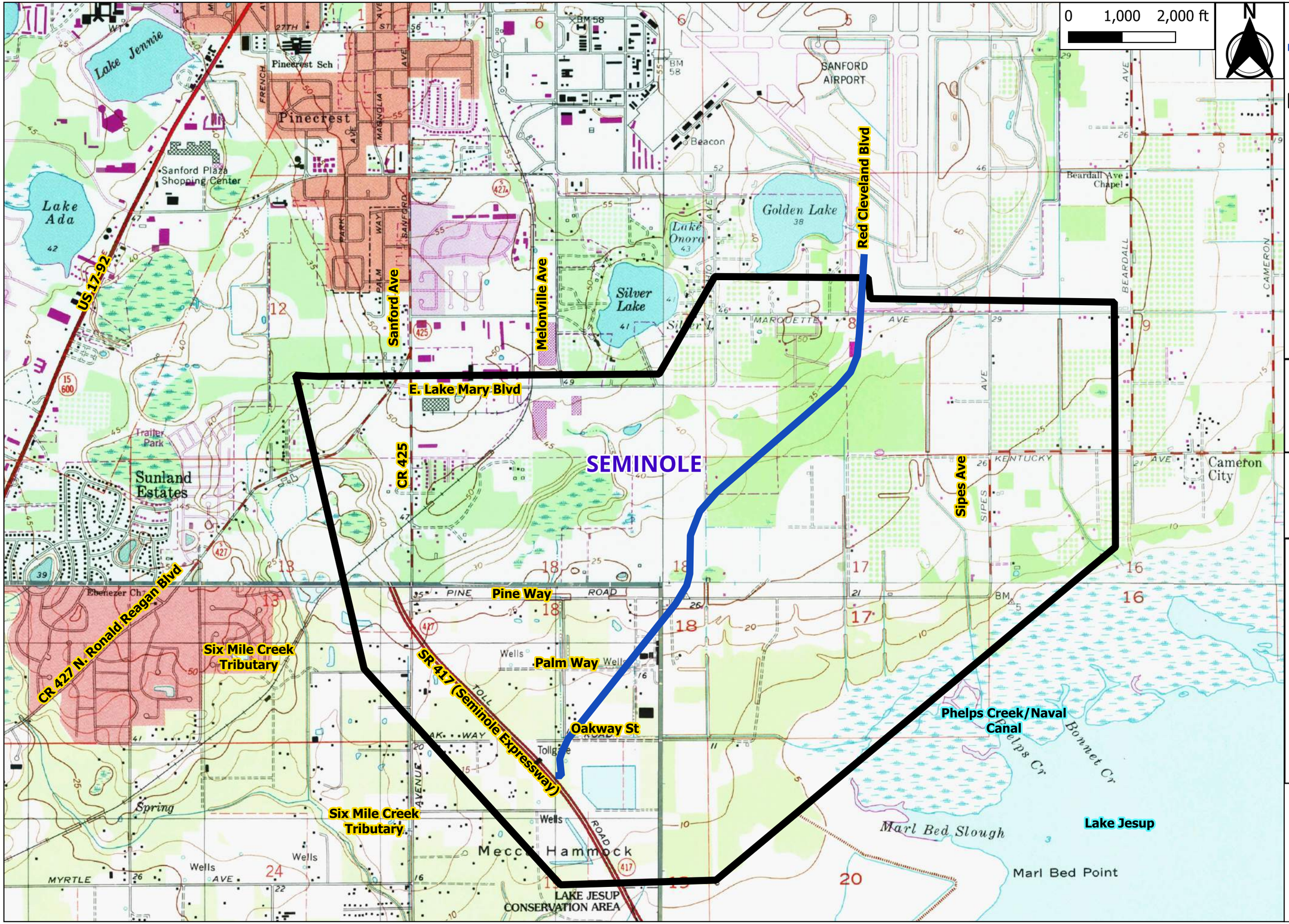

Sources:
Topographic Map
United States Geological Survey
February 12, 2021

Figure 2

USGS Topographic Map

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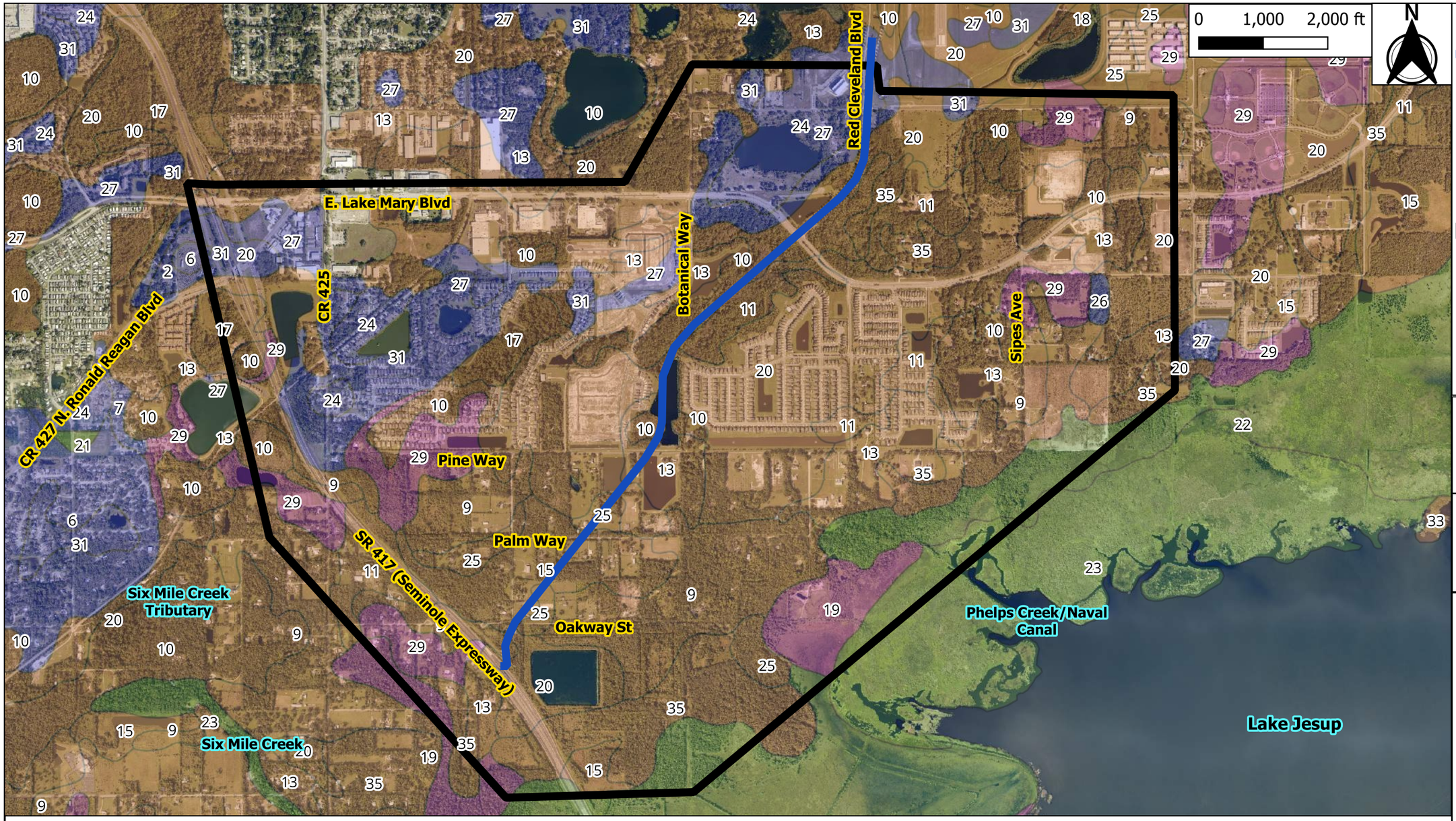

Legend

- Alignment 2A
- NRCS Soils
  - A
  - A/D
  - B/D
  - C/D
- Study Area

Sources:
Natural Resources Conservation Service
October, 2023

Figure 3

NRCS Soils Map

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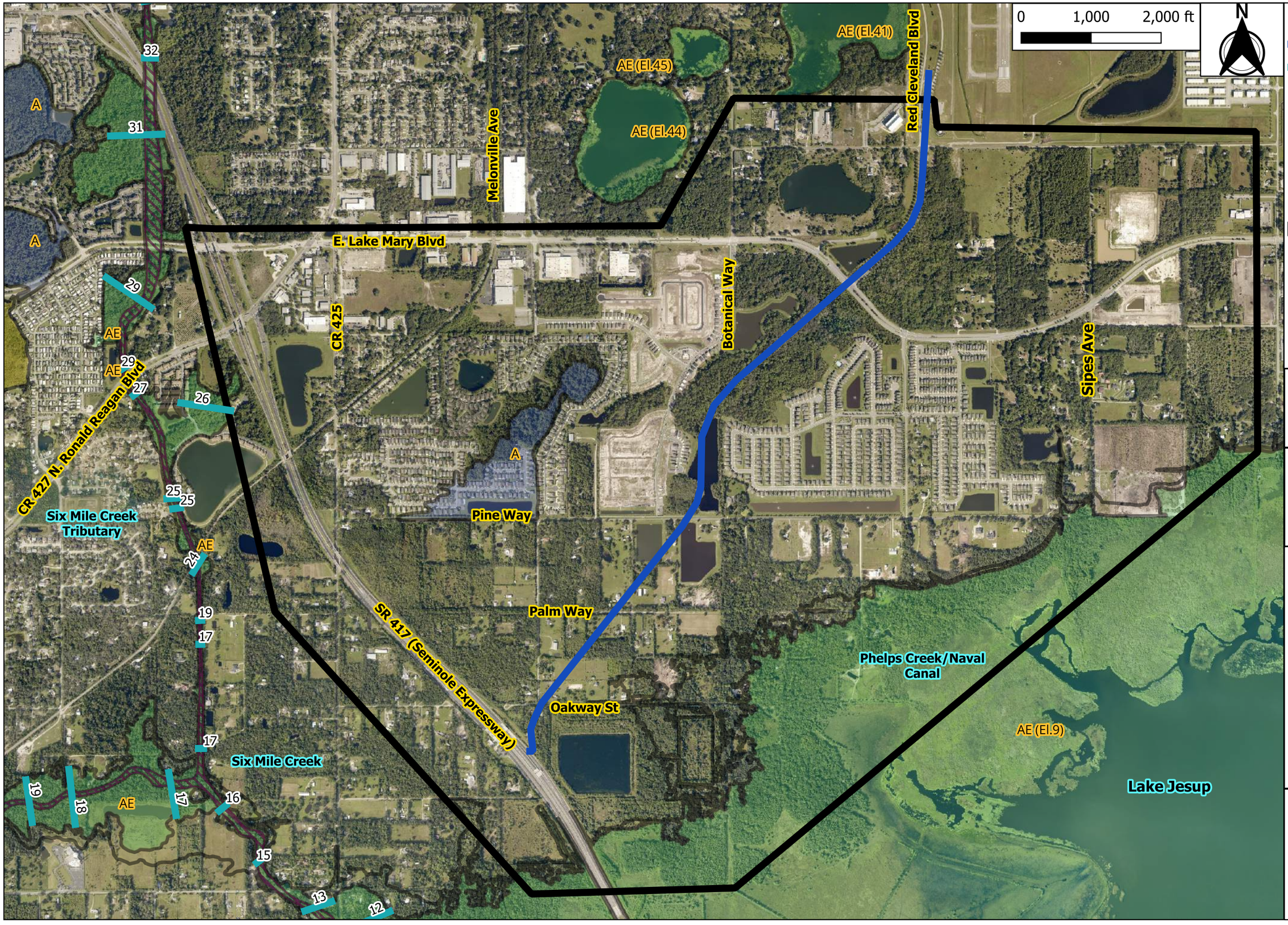
Seminole County Soils

- 10: BASINGER, SAMSULA, AND HONTOON SOILS, DEPRESSIONAL
- 11: BASINGER AND SMYRNA FINE SANDS, DEPRESSIONAL
- 13: EAUGALLIE AND IMMOKALEE FINE SANDS
- 15: FELDA AND MANATEE MUCKY FINE SANDS, DEPRESSIONAL
- 17: BRIGHTON, SAMSULA, AND SANIBEL MUCKS
- 18: MALABAR FINE SAND, 0 TO 2 PERCENT SLOPES
- 19: MANATEE, FLORIDANA, AND HOLOPAW SOILS, FREQUENTLY FLOODED
- 2: ADAMSVILLE-SPARR FINE SANDS
- 20: MYAKKA AND EAUGALLIE FINE SANDS
- 21: NITTAW MUCKY FINE SAND, DEPRESSIONAL
- 22: NITTAW MUCK, OCCASIONALLY FLOODED
- 23: NITTAW, OKEELANTA, AND BASINGER SOILS, FREQUENTLY FLOODED
- 24: PAOLA-ST. LUCIE SANDS, 0 TO 5 PERCENT SLOPES
- 25: PINEDA-PINEDA, WET, FINE SAND, 0 TO 2 PERCENT SLOPES
- 26: UDORTHENTS, EXCAVATED
- 27: POMELLO FINE SAND, 0 TO 5 PERCENT SLOPES
- 29: ST. JOHNS AND EAUGALLIE FINE SANDS
- 3: ARENTS, 0 TO 5 PERCENT SLOPES
- 31: TAVARES-MILLHOPPER COMPLEX, 0 TO 5 PERCENT SLOPES
- 33: TERRA CEIA MUCK, 0 TO 1 PERCENT SLOPES, FREQUENTLY FLOODED
- 34: URBAN LAND, 0 TO 2 PERCENT SLOPES
- 35: WABASSO FINE SAND, 0 TO 2 PERCENT SLOPES
- 6: ASTATULA-APOPKA FINE SANDS, 0 TO 5 PERCENT SLOPES
- 7: ASTATULA-APOPKA FINE SANDS, 5 TO 8 PERCENT
- 8: ASTATULA-APOPKA FINE SANDS, 8 TO 12 PERCENT SLOPES
- 9: BASINGER AND DELRAY FINE SANDS
- 99: WATER



Legend

- Alignment 2A
- BFE
- Regulatory Floodway

FEMA Floodplain

- A
- AE
- AH
- X
- Study Area

Source: FEMA FIS for Seminole County and Incorporated Areas Effective 9/28/2007

Figure 4

FEMA Floodplain Map

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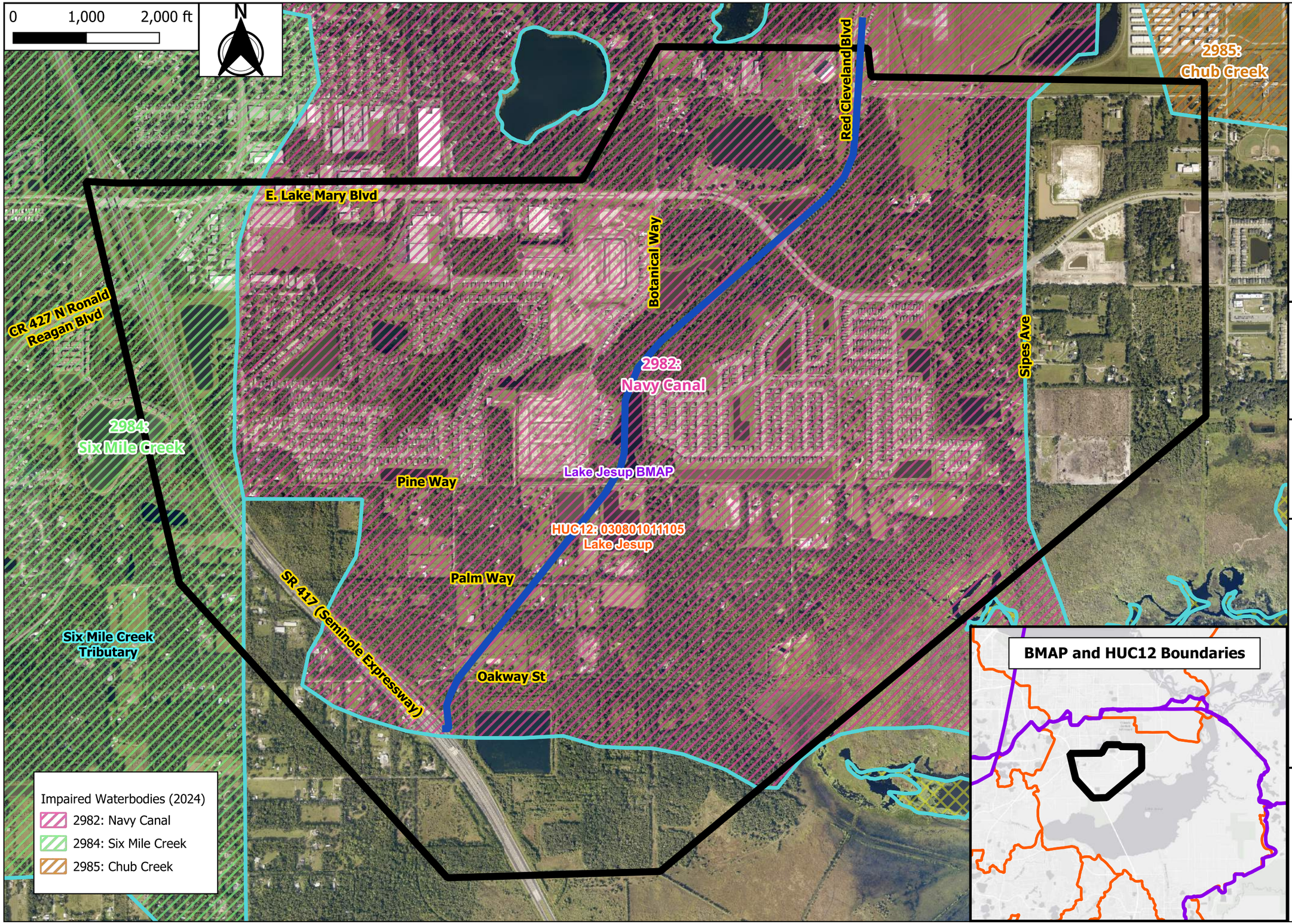

Legend

- Alignment 2A
- TMDL
- WBIDs
- BMAP Boundaries
- HUC12 Basin
- Study Area

Sources:
BMAP: FDEP, October 2024
HUC12: FDEP, January 2022
Impaired Waers: FDEP, November 2024
TMDL: U.S. Environmental Protection Agency, May 2020
WBIDs: FDEP, January 2025

Figure 5

Waterbody ID (WBID) Map

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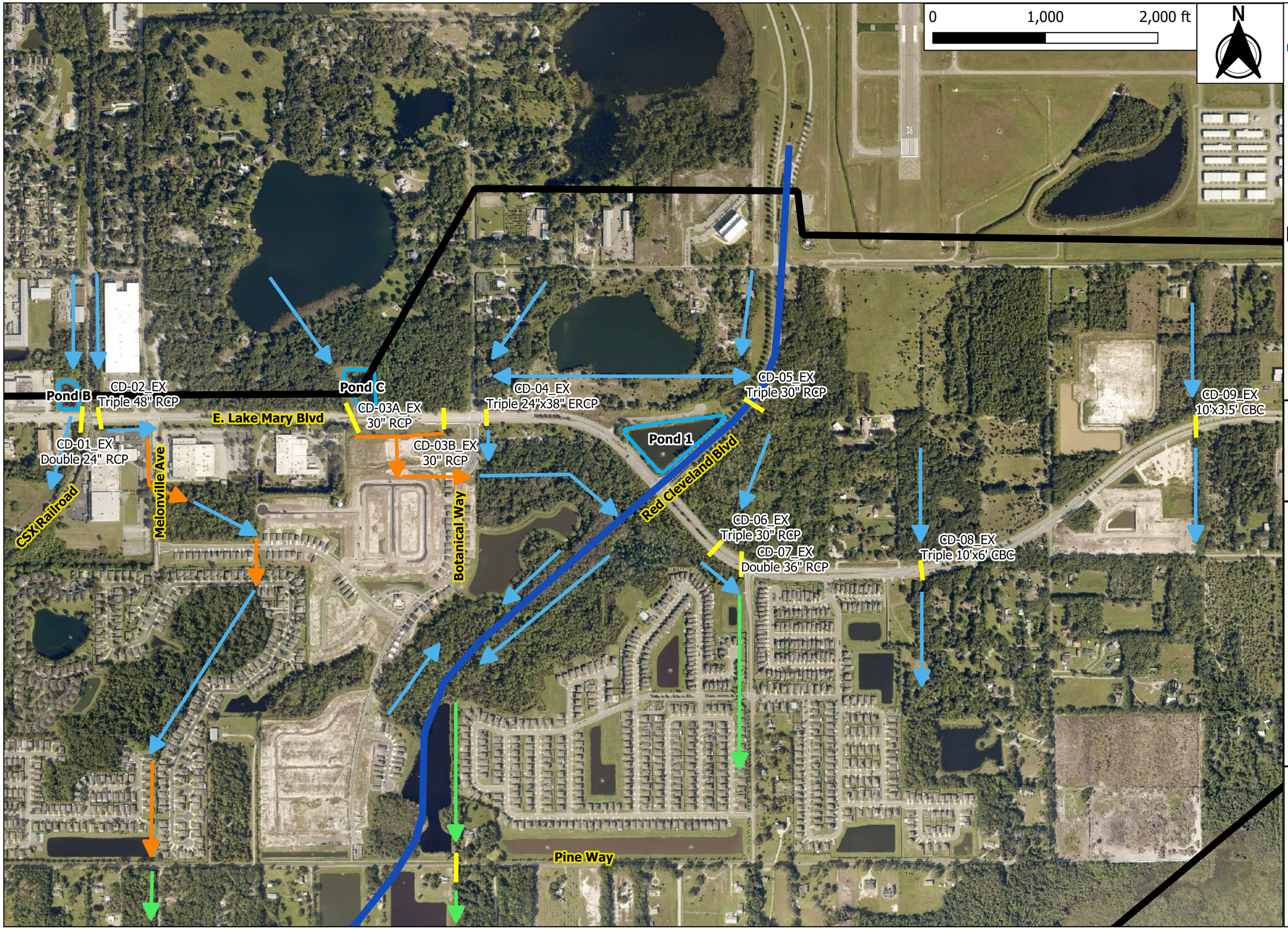

Legend

- Alignment 2A
- Flow Arrows
- Existing CD
- Overland Flow
- Existing Ditch
- Existing Storm Pipe
- Ponds
- Study Area

Figure 6

Existing Cross Drain Location Map

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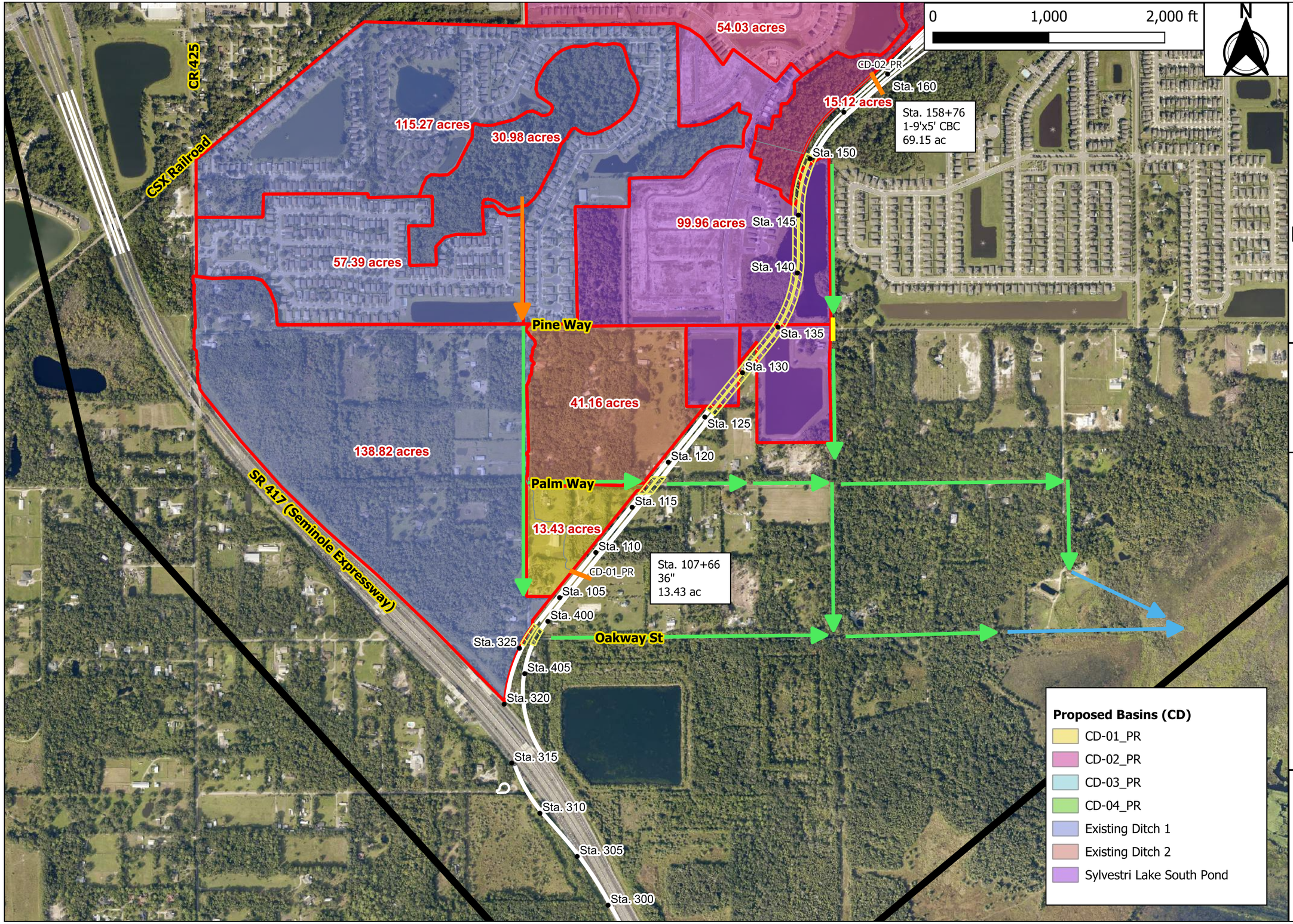

Figure 7A

Proposed Cross Drain Location and Basin Map

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www.balmoralgroup.us

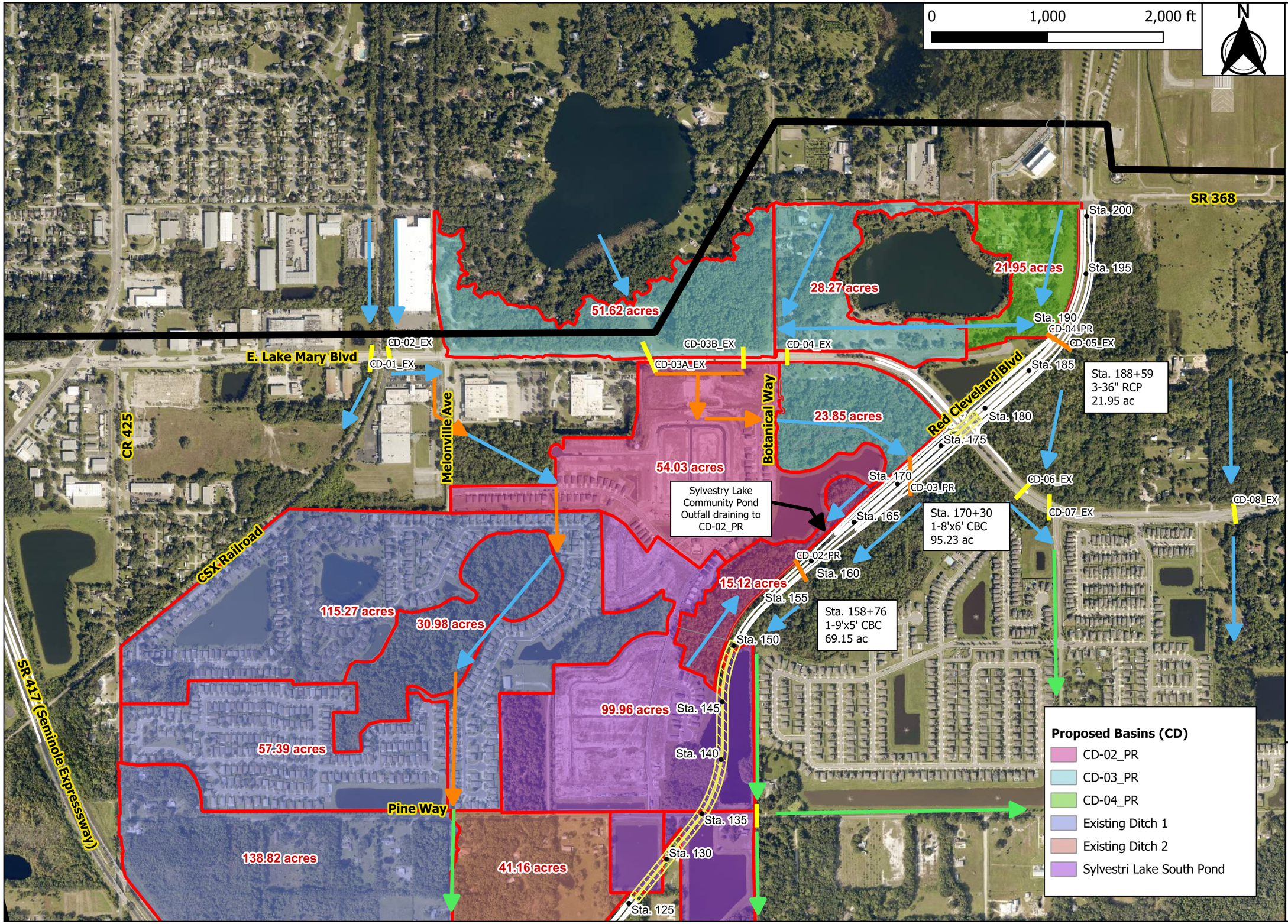


Figure 7B

Proposed Cross Drain Location and Basin Map

PD&E Study
SR 417 Sanford Airport Connector
CFX Project Number: 417-246A
Seminole County

CENTRAL FLORIDA EXPRESSWAY AUTHORITY

The Balmoral Group
165 Lincoln Avenue
Winter Park, FL 32789
Phone: (407) 629-2185
www.balmoralgroup.us

Appendix B – Existing Permitted Documents

CROSS DRAIN CD-01_EX

AND

CROSS DRAIN CD-02_EX

STORMWATER MANAGEMENT

CALCULATIONS

Volume I

East Lake Mary Boulevard

Segments I

From Sanford Avenue to Ohio Avenue

SEMINOLE COUNTY, FLORIDA

22496-5

PREPARED BY:

Gee & Jenson,
Division of CH2M HILL
225 E. Robinson Street, Suite 505
Orlando, FL 32801-4322
407-423-0030

SUBMITTED FOR:

SEMINOLE COUNTY
ENGINEERING DEPARTMENT

September 2002

9/27/02

Seaboard Coastline Railroad Crossing. At this point the runoff turns south and crosses ELMB where it must stage up to above elevation 48 NGVD where it then crosses the railroad bridge and is collected in the triple 48" culvert mentioned above. The flow continues east in a series of triple 48" culverts and ditches and then south into the Mellonville Road outfall.

The **third sub-basin** includes a portion of the extension of ELMB designed by Seminole County (42-117-0943NG sub-basin C and D) from approximately 550 feet east of Seaboard Coastline Railroad to approximately 850 feet west of Ohio Avenue including the west side of Ohio Avenue. The area drains in roadside ditches to a 30" RCP culvert located 1000 feet west of Ohio Avenue where it discharges to the south and into the SilverVista Storrnwater Management System (4-117-0317M2). This sub-basin includes a large offsite area to the north consisting of undeveloped or agricultural land use. The water quality volume from this portion of the roadway is collected and treated in roadside swales with ditch blocks and made to percolate into the surficial groundwater table.

2.2 PROPOSED SURFACE WATER MANAGEMENT SYSTEMS

The proposed stormwater management systems are not intended to significantly alter historical paths of conveyance for existing flows. The intent is to collect only the roadway runoff into the wet detention ponds while directing the offsite flows to their existing outfall points.

2.2.1 SEGMENT

Proposed drainage along the Segment I project corridor will consist of **three (3) drainage sub-basins.**

The first sub-basin, or sub-basin A, extends from Sanford Avenue to approximately 600 feet east along ELMB and consists of 1.46 acres roadway and 5.69 acres of Industrial type land use. The runoff from this basin drains toward a retention pond in the area bounded by ELMB on the south, Sanford Avenue on the east and CR 427 on the northwest. The Brindley Pieters design for the Sanford Avenue/ELMB/CR 427 intersection includes a new pond south of ELMB between Sanford Avenue and CR 427 that accepts runoff from ELMB west of Sanford Avenue. The pond to the north of ELMB will be designed to accept the runoff from the system east of Sanford Avenue. The outfall for the pond north of ELMB will tie into the outfall for the pond south of ELMB and then into the existing CR 427 Outfall.

The second sub-basin, or sub-basin B, includes ELMB from approximately 600 feet east of Sanford Avenue to the Seaboard Coastline Railroad and consists of 3.89 acres of roadway, 32.88 acres of undeveloped and 34.79 acres of Industrial type land use. This

SUB-BASIN B = SUBBASINS
FOR CD-01_EX AND CD-02_EX

sub-basin includes offsite area to the north and south including a portion of the Cardinal Homes Site that drains into an adjacent lake. The drop structure outfall for this lake will remain while the 24" RCP outfall will be eliminated. The proposed roadway runoff will be collected in an enclosed conveyance system and directed to Wet Detention Pond B located northwest of the Railroad and ELMB intersection. The proposed discharge structure for the existing RL Best Machine Shop Pond will tie into the roadway system while all other offsite runoff will be routed in a separate conveyance system and directed to its existing outfall at the Railroad crossing. The Pond B outfall will cross the Railroad north of ELMB and discharge into a canal that drains to the existing triple 48" culverts to the south. This system will ultimately discharge to the **Mellonville Road Outfall** to the east.

The third sub-basin, or sub-basin C, includes a portion of the extension of ELMB designed by Seminole County (42-117-0943NG sub-basin C and D) from the Seaboard Coastline Railroad Crossing to Ohio Avenue including the west side of Ohio Avenue and consists of 51.58 acres of primarily Industrial, Residential and Agricultural land uses located mostly to the north of ELMB. The proposed roadway runoff will discharge into Wet Detention Pond C and outfall into the silverVista stom1water Management System Outfall and eventually Lake Jesup.

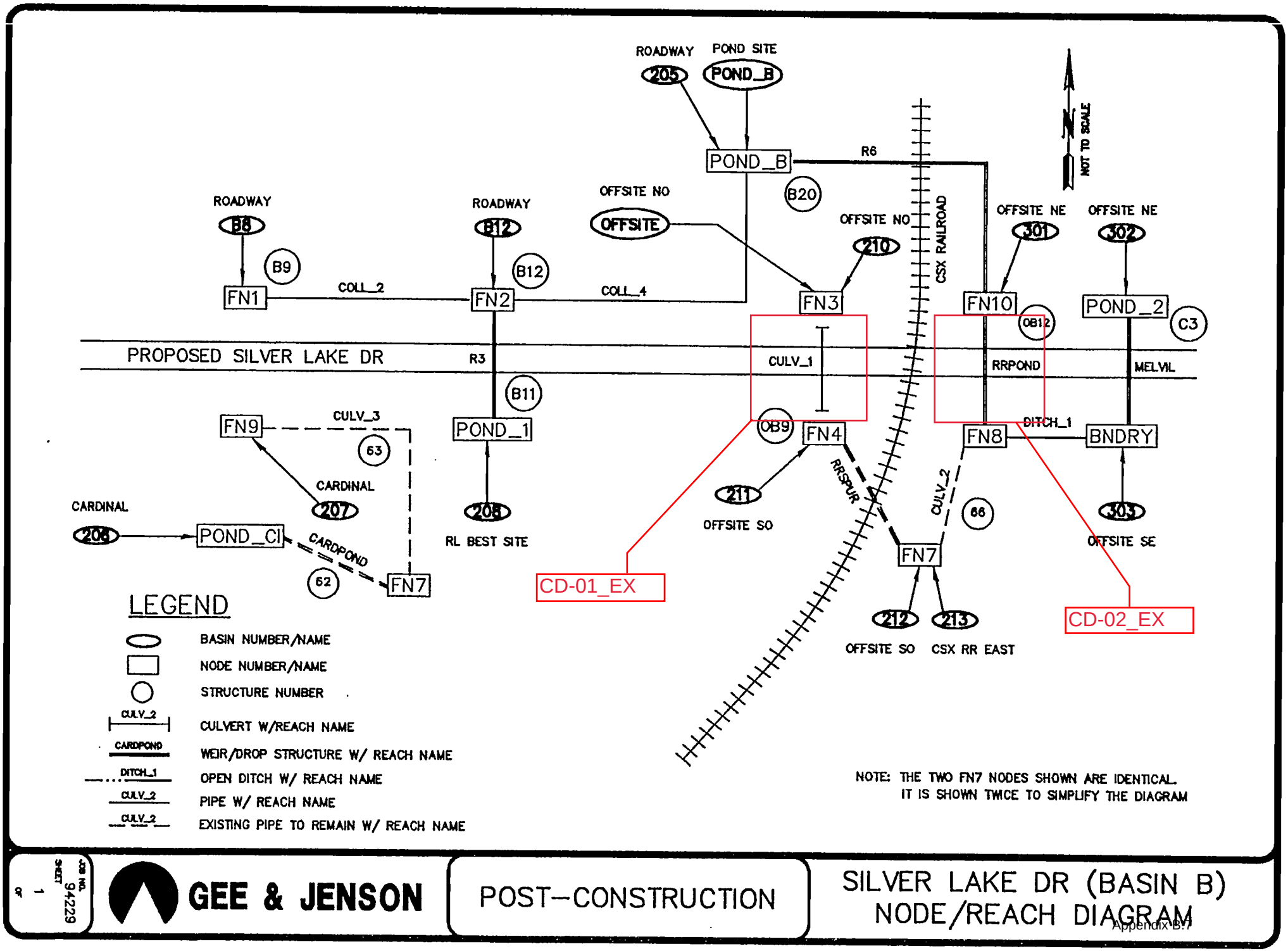
2.3 ENVIRONMENTAL IMPACT ASSESSMENT

2.3.1 JURISDICTIONAL WETLAND AREAS

A field delineation of all wetland areas within the original 1995 alignment for both Segments I and II was performed by Environmental Management Systems, Inc. (EMS) and a copy of this assessment is included as an attachment to this report. These jurisdictional areas consisted of primarily natural streams (Chub Creek) and manmade irrigation ditches. The most significant wetland along both the **original** Segment I and II alignments was the area near the Airport Entrance Road. Several cross culverts were to be placed in this area to maintain the hydrologic connection and therefore reduce the impacts to this wetland. Additionally, one of these culverts were sized (48") to act as a "critter crossing". With the **re-alignment of Segment IIA,** the encroachment into that wetland has been reduced. **Again,** application is for Segment I, only.

Only one **wetland** area, other than manmade ditches was considered jurisdictional in the Segment I corridor. This is a small wetland (0.13 acre total area with 0.02 acres of impact) known as Wetland #1 and located in the northwest quadrant of the Mellonville Road intersection. No additional mitigation, **other than that as provided AND PREVIOUSLY CONSTRUCTED** is proposed for this re-permitting project. There were eight (8) other soggy bottom roadside or railroad or road crossing manmade ditches that

POST-CONSTRUCTION



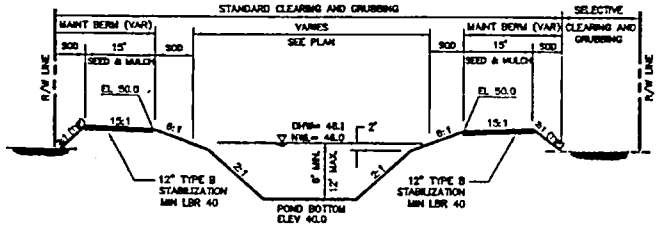
JOB NO. 94229
SHEET 1 OF

GEE & JENSON

POST-CONSTRUCTION

SILVER LAKE DR (BASIN B) NODE/REACH DIAGRAM

COUNTY PROJ. NO.	SHT. NO.
P94-0796	49



TYPICAL POND SECTION

NTS

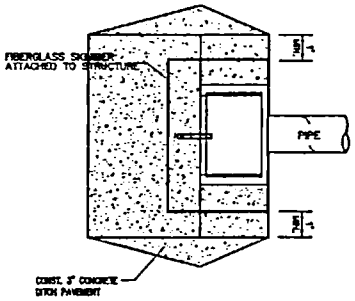
LEGEND

B8-2 — BORING LOCATION & NUMBER

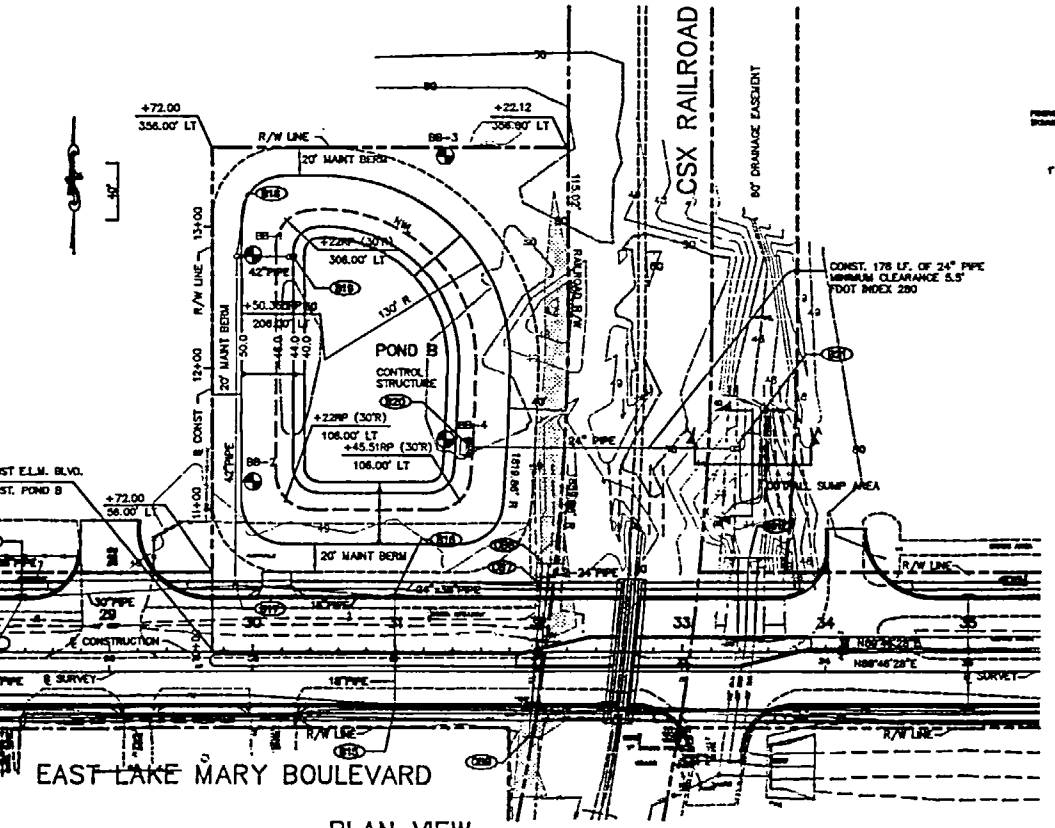
DITCH WETLAND AREAS

50 — EXISTING GROUND CONTOUR

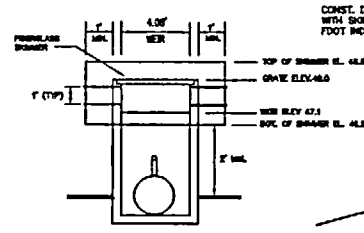
NOTE: STAKED SILT FENCE TO BE PLACED ALONG POND'S NORTH, EAST AND WEST PERIMETER. SILTATION AND EROSION CONTROL TO BE PLACED AT THE POND OUTFALL.



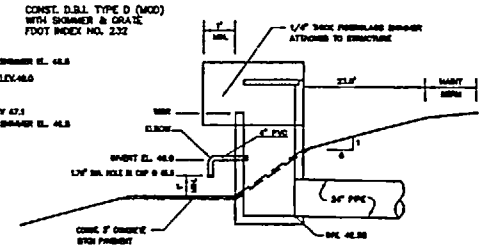
PLAN VIEW
N.T.S.



PLAN VIEW



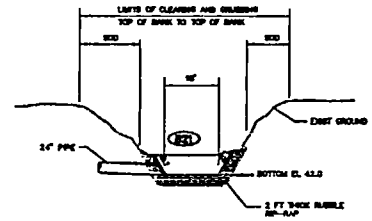
FRONT VIEW
N.T.S.



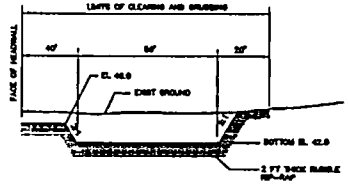
SIDE VIEW
N.T.S.

B-20 CONTROL STRUCTURE DETAILS

N.T.S.



SECTION A-A
N.T.S.



SECTION B-B
N.T.S.

POND OUTFALL SUMP AREA

N.T.S.

GEE & JENSON

WATER RETENTION AREA
POND B PLAN, SECTION & DETAILS

Advanced Interconnected Channel & Pond Routing (adICPR Ver 1.40)
Copyright 1989, Streamline Technologies, Inc.

SILVER LAKE DRIVE BASIN B POST-CONST 25YR/24HR EVENT
10/20/95

BASIN NAME	OFFSITE	B8	B12	205	206
NODE NAME	FN3	FN1	FN2	POND_B	POND_CI
UNIT HYDROGRAPH	UH256	UH484	UH484	UH484	UH484
PEAKING FACTOR	256.	484.	484.	484.	484.
RAINFALL FILE	FLMOD	FLMOD	FLMOD	FLMOD	FLMOD
RAIN AMOUNT (in)	8.50	8.50	8.50	8.50	8.50
STORM DURATION (hrs)	24.00	24.00	24.00	24.00	24.00
AREA (ac)	10.94	.76	1.38	1.75	5.47
CURVE NUMBER	90.00	73.00	73.00	73.00	93.50
DCIA (%)	.00	85.00	85.00	85.00	.00
TC (mins)	101.00	10.00	10.00	10.00	10.60
LAG TIME (hrs)	.00	.00	.00	.00	.00
BASIN STATUS	OFFSITE	ONSITE	ONSITE	ONSITE	OFFSITE

BASIN	QMX (cfs)	TMX (hrs)	VOL (in)	NOTES
OFFSITE	15.00	13.02	7.28	BASIN 203 & 204 MINUS ROADWAY
B8	4.55	12.02	7.92	PROPOSED ROADWAY
B12	8.26	12.02	7.92	PROPOSED ROADWAY
205	10.48	12.02	7.92	PROPOSED ROADWAY
206	33.16	12.01	7.71	CARDINAL SITE AND POND

BASIN NAME	207	208	210	211	212
NODE NAME	FN9	POND_1	FN3	FN4	FN7
UNIT HYDROGRAPH	UH256	UH256	UH256	UH256	UH256
PEAKING FACTOR	256.	256.	256.	256.	256.
RAINFALL FILE	FLMOD	FLMOD	FLMOD	FLMOD	FLMOD
RAIN AMOUNT (in)	8.50	8.50	8.50	8.50	8.50
STORM DURATION (hrs)	24.00	24.00	24.00	24.00	24.00
AREA (ac)	1.01	.40	7.02	6.29	16.58
CURVE NUMBER	75.20	93.00	73.00	75.20	73.00
DCIA (%)	.00	.00	.00	.00	.00
TC (mins)	21.20	23.20	71.20	75.00	45.00
LAG TIME (hrs)	.00	.00	.00	.00	.00
BASIN STATUS	OFFSITE	OFFSITE	OFFSITE	ONSITE	ONSITE

BASIN	QMX (cfs)	TMX (hrs)	VOL (in)	NOTES
207	2.80	12.15	5.52	CARDINAL INDUSTRIES POND SITE
208	1.38	12.17	7.65	RL BEST MACHINE SHOP
210	8.99	12.82	5.25	OFFSITE NORTH OF WAREHOUSES
211	8.19	12.83	5.52	OFFSITE AREA SOUTH
212	28.69	12.50	5.25	OFFSITE SOUTH ADJACENT TO RR

DRAINAGE BASINS FOR:

CD-01_EX: OFFSITE AND 210
TOTAL DRAINAGE AREA: 17.96 AC

CD-02_EX: B8, B12, 205, 208, 301, AND POND B
TOTAL DRAINAGE AREA: 14.39 AC

Advanced Interconnected Channel & Pond Routing (adICPR Ver 1.40)
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SILVER LAKE DRIVE BASIN B POST-CONST 25YR/24HR EVENT
10/20/95

BASIN NAME	213	PONDB	301	302	303
NODE NAME	FN7	POND_B	FN10	POND_2	BNDRY
UNIT HYDROGRAPH	UH256	UH256	UH484	UH484	UH484
PEAKING FACTOR	256.	256.	484.	484.	484.
RAINFALL FILE	FLMOD	FLMOD	FLMOD	FLMOD	FLMOD
RAIN AMOUNT (in)	8.50	8.50	8.50	8.50	8.50
STORM DURATION (hrs)	24.00	24.00	24.00	24.00	24.00
AREA (ac)	1.05	1.76	8.34	6.41	2.40
CURVE NUMBER	81.50	85.70	88.40	90.60	91.70
DCIA (%)	.00	.00	.00	.00	.00
TC (mins)	26.90	10.00	22.30	17.30	10.00
LAG TIME (hrs)	.00	.00	.00	.00	.00
BASIN STATUS	ONSITE	ONSITE	ONSITE	ONSITE	ONSITE

BASIN	QMX (cfs)	TMX (hrs)	VOL (in)	NOTES
213	2.89	12.25	6.27	EASTSIDE OF RR SOUTH OF SLD
PONDB	8.13	12.04	6.78	PROPOSED POND SITE AREA
301	40.89	12.09	7.09	NO OF SLD BETWEEN RR & MELLONVILLE
302	34.74	12.07	7.36	NO OF SLD BETWEEN RR & MELLONVILLE
303	14.47	12.02	7.49	SO OF SLD BETWEEN RR & MELLONVILLE

```
        Advanced Interconnected Channel & Pond Routing (adICPR Ver 1.40)
                Copyright 1989, Streamline Technologies, Inc.

        SILVER LAKE DRIVE BASIN B POST-CONST
        10/31/95

>>REACH NAME      : CULV_1
  FROM NODE       : FN3
  TO NODE         : FN4
  REACH TYPE      : CULVERT, CIRCULAR w/ ROADWAY
  FLOW DIRECTION  : POSITIVE AND NEGATIVE FLOWS ALLOWED
  TURBO SWITCH    : OFF

  CULVERT DATA    :
        SPAN (in):  24.000      RISE (in):  24.000     LENGTH (ft): 125.000
   U/S INVERT (ft):  46.350 D/S INVERT (ft):  46.050      MANNING N:    .012
       ENTRNC LOSS:    .500   # OF CULVERTS:   2.000

  POSITION A      : RECTANGULAR ROADWAY/BERM WEIR
    CREST EL. (ft):  49.800  CREST LN. (ft): 293.000      WEIR COEF.:   2.800
         RESERVED:********       RESERVED:********       RESERVED:********

  POSITION B      : RECTANGULAR ROADWAY/BERM WEIR
    CREST EL. (ft):********  CREST LN. (ft):********      WEIR COEF.:********
         RESERVED:********       RESERVED:********       RESERVED:********

             NOTE: CROSS CULVERT WEST OF RAILROAD

>>REACH NAME      : CULV_2
  FROM NODE       : FN7
  TO NODE         : FN8
  REACH TYPE      : CULVERT, CIRCULAR w/ ROADWAY
  FLOW DIRECTION  : POSITIVE AND NEGATIVE FLOWS ALLOWED
  TURBO SWITCH    : OFF

  CULVERT DATA    :
        SPAN (in):  36.000      RISE (in):  36.000     LENGTH (ft): 243.000
   U/S INVERT (ft):  45.800 D/S INVERT (ft):  43.100      MANNING N:    .012
       ENTRNC LOSS:    .500   # OF CULVERTS:   1.000

  POSITION A      : NOT USED

  POSITION B      : NOT USED

             NOTE: CULVERT FROM RR BRIDGE TO (3) 48"
```

CD-01_EX

Advanced Interconnected Channel & Pond Routing (adICPR Ver 1.40)
Copyright 1989, Streamline Technologies, Inc.

SILVER LAKE DRIVE 8ASIN 8 POST-CONST 25YR/24HR EVENT
10/31/95

REACH MAXIMUM FLOW REPORT

REACH ID	TIME (hrs)	FLOW (cfs)	FR NODE NAME	STAGE (ft)	TO NODE NAME	STAGE (ft)
RR3PUR	13.00	31.45	FN4	48.29	FN7	46.90
CO_L_2	12.00	4.33	FN1	48.41	FN2	48.34
CO_L_4	12.00	10.95	FN2	48.34	POND_8	47.77
CU_V_1	13.00	23.57	FN3	48.91	FN4	48.29
CU_V_2	16.50	16.57	FN7	47.84	FN8	43.43
CU_V_3	4.75	.64	FN9	45.80	FN7	45.80
R3	12.75	1.08	POND_1	48.29	FN2	48.07
MELVIL	12.25	25.09	POND_2	49.68	8NDRY	42.93
R6	12.50	12.14	POND_8	48.13	FN10	46.80
CARDPOND	12.25	16.83	POND_CI	48.45	FN7	46.22
RR?OND	12.50	35.56	FN10	46.80	FN8	43.69
DITCH_1	12.50	38.53	FN8	43.69	8NDRY	42.95

CD-01_EX

CD-02_EX

COUNTY PROJ. NO.	SHEET NO.
P94-0798	21

POND B

60' DRAINAGE EASEMENT

CONST. STRAIGHT CONC. ENDWALL, FDOT INDEX 250

CANAL

CONST 78 LF 6" UNDDR W/CLEANOUT

24"x38"PIPE

CONST. 5' CONC. SIDEWALK

CURB & GUTTER TYPE F

11CONC. SPILLWAY

24"PIPE

CURB TYPE A

HDW

8.5' CONC. TRAFFIC SEPARATOR TYPE I

18"PIPE

CONST. 5' CONC. SIDEWALK

R/W LINE

CONST 78 LF 6" UNDDR W/CLEANOUT

C/L CONST. STA. 32+60.46
R.R. CROSSING NO. 621378-X
R.R.M.P. 772.51
CSX TRANSPORTATION
TRAFFIC CONTROL DEVICE
TYPE IV CLASS III
FDOT INDEX NO. 17882

CSX RR

100' R.R. R/W

+12.08 56.00' LT.

+98.22 56.00'LT 49.80

ASPHALT DRIVE

+36.86 56.00'LT 49.75

+45.00 56.00'LT

+45.00 76.00'LT

+50.00 96.00'LT

+50.00 76.00'LT

+68.47 87.00'LT 49.89

+92.47 87.00'LT 49.96

20' TCE

40' PE

24'

50'R

35'R

49.44

GRASS AREA

CONST 218 LF 6" UNDDR W/CLEANOUT

CONST 258 LF 6" UNDDR W/CLEANOUTS

R/W LINE

ASPHALT PARKING

CONST. 5' CONC. SIDEWALK

+68.47 87.00'LT 49.77

24" RCP

49.87

0.786%

24"PIPE

CURB & GUTTER TYPE F

+76.09 37.00'LT 49.08

+33.47 37.00'LT 49.84

+87.09 37.00'LT 49.73

3-48"PIPES

+90.00 10.42'LT

+90.00 01.92'LT

CONNECT NEW 48" RCP TO EXIST. 48" RCP, FDOT INDEX 280 MATCH EXIST. INVERT

CURB & GUTTER TYPE F

GRASS AREA

8.5' CONC. TRAFFIC SEPARATOR TYPE I SPEED

CONSTRUCTION

RAIL ROAD

N89°46'28"E

N89°46'28"E

℄ SURVEY

18"PIPE

CONST. 5' CONC. SIDEWALK

R/W LINE

CONST 218 LF 6" UNDDR W/CLEANOUT

CONST 258 LF 6" UNDDR W/CLEANOUTS

+85.00 01.92'RT

+85.00 10.42'RT

+35.00 11.00'RT

+40.00 11.00'RT

+74.00 37.00'RT 49.91

+78.00 37.00'RT 49.46

48" RCP (TO REMAIN)

+97.22 54.00'RT

+97.99 54.00'RT

GRASS

35'R

CONC. WATER VALVE

7" GUARD POST

ASPHALT DRIVE

7"GUARD POST

F.H.

HEADWALL & DITCH PAVEMENT (TO REMAIN)

Note: Sawcut Existing Pavement Match Existing Elevations. Tie Proposed Curb & Gutter to Existing Match Existing Elevations

56.00'
37.00'
14.00'
54.00'

31 32 33 34 35 36 37

BM NO. 3D
STA. 30+29, 76' RT
SET PK NAIL & ALUMINUM DISC ON NE. CORNER OF CONC. LOADING DOCK @ BLDG. # 501
ELEV. 52.893

BM NO. 4D
STA. 39+92, 88' RT
SET PK NAIL & ALUMINUM DISC IN TOP CONC. CURB OF PARKING LOT E. OF W. ENTRANCE TO MOBILITE PROPERTY.
ELEV. 48.495

NOTE:
FOR PROFILE & ELEVATIONS
STA. 31+00 TO STA. 35+00
SEE RAILROAD INTERSECTION DETAIL SHEET

CD-01_EX

CD-02_EX

PVI STA. 31+00.00
PVI ELEV. 49.80
NO V.C.

CSX RAILROAD
PVI STA = 32+60.00
NO V.C.

PVI STA = 35+00.00
PVI ELEV = 49.60
NO V.C.

PROFILE GRADE LINE

Exist. Ground Line (B/L SURVEY)

(+) 0.3000%

6" UNDDR

6"FORCE MAIN

8"WATER MAIN

FL 46.99 (LT & RT)

FL 47.21 (LT & RT)

FL 46.55 (LT & RT)

FL 43.56

CONST. 24" PIPE TO C4

49.8 50.05 50.10 49.85 49.90 50.20

49.8 49.9 50.1 49.3 49.5 49.4 49.5

54 52 50 48 46 44 42 40

31 32 33 34 35 36 37

SCALE: 1" = 20' Horiz.
1" = 2' Vert.

22496-5

RECEIVED
SEP 27 2002
PDS
ALTAMONTE SVC. CTR

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
						7/29/99	JSM	Revised Drwy
						9-8-99	JSM	Revised 40'TCE to PE

	NAME	DATE		NAME	DATE
DESIGNED BY	SER	1-95	DRAWN BY	CADD	2-95
CHECKED BY	JJN	2-95	CHECKED BY	CND	2-95

SUPERVISED BY JOHN J. NEMETHY, PE

SEMINOLE COUNTY ENGINEERING DEPARTMENT
APPROVED BY
DATE

GEE & JENSON
ENGINEERS-ARCHITECTS-PLANNERS, INC.
ORLANDO FLORIDA

EAST LAKE MARY BLVD.
PLAN / PROFILE

PLPRR005

CROSS DRAIN CD-03A_EX

AND

CROSS DRAIN CD-03B_EX

STORMWATER MANAGEMENT

CALCULATIONS

Volume I

East Lake Mary Boulevard

Segments I

From Sanford Avenue to Ohio Avenue

SEMINOLE COUNTY, FLORIDA

22496-5

PREPARED BY:

Gee & Jenson,
Division of CH2M HILL
225 E. Robinson Street, Suite 505
Orlando, FL 32801-4322
407-423-0030

SUBMITTED FOR:

SEMINOLE COUNTY
ENGINEERING DEPARTMENT

September 2002

9/27/02

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2.2.1 SEGMENT

Proposed drainage along the Segment I project corridor will consist of **three (3) drainage sub-basins.**

The first sub-basin, or sub-basin A, extends from Sanford Avenue to approximately 600 feet east along ELMB and consists of 1.46 acres roadway and 5.69 acres of Industrial type land use. The runoff from this basin drains toward a retention pond in the area bounded by ELMB on the south, Sanford Avenue on the east and CR 427 on the northwest. The Brindley Pieters design for the Sanford Avenue/ELMB/CR 427 intersection includes a new pond south of ELMB between Sanford Avenue and CR 427 that accepts runoff from ELMB west of Sanford Avenue. The pond to the north of ELMB will be designed to accept the runoff from the system east of Sanford Avenue. The outfall for the pond north of ELMB will tie into the outfall for the pond south of ELMB and then into the existing CR 427 Outfall.

The second sub-basin, or sub-basin B, includes ELMB from approximately 600 feet east of Sanford Avenue to the Seaboard Coastline Railroad and consists of 3.89 acres of roadway, 32.88 acres of undeveloped and 34.79 acres of Industrial type land use. This

sub-basin includes offsite area to the north and south including a portion of the Cardinal Homes Site that drains into an adjacent lake. The drop structure outfall for this lake will remain while the 24" RCP outfall will be eliminated. The proposed roadway runoff will be collected in an enclosed conveyance system and directed to Wet Detention Pond B located northwest of the Railroad and ELMB intersection. The proposed discharge structure for the existing RL Best Machine Shop Pond will tie into the roadway system while all other offsite runoff will be routed in a separate conveyance system and directed to its existing outfall at the Railroad crossing. The Pond B outfall will cross the Railroad north of ELMB and discharge into a canal that drains to the existing triple 48" culverts to the south. This system will ultimately discharge to the **Mellonville Road Outfall** to the east.

SUB-BASIN C = SUBBASIN FOR CD-03A_EX AND CD-03B_EX

The third sub-basin, or sub-basin C, includes a portion of the extension of ELMB designed by Seminole County (42-117-0943NG sub-basin C and D) from the Seaboard Coastline Railroad Crossing to Ohio Avenue including the west side of Ohio Avenue and consists of 51.58 acres of primarily Industrial, Residential and Agricultural land uses located mostly to the north of ELMB. The proposed roadway runoff will discharge into Wet Detention Pond C and outfall into the silverVista stom1water Management System Outfall and eventually Lake Jesup.

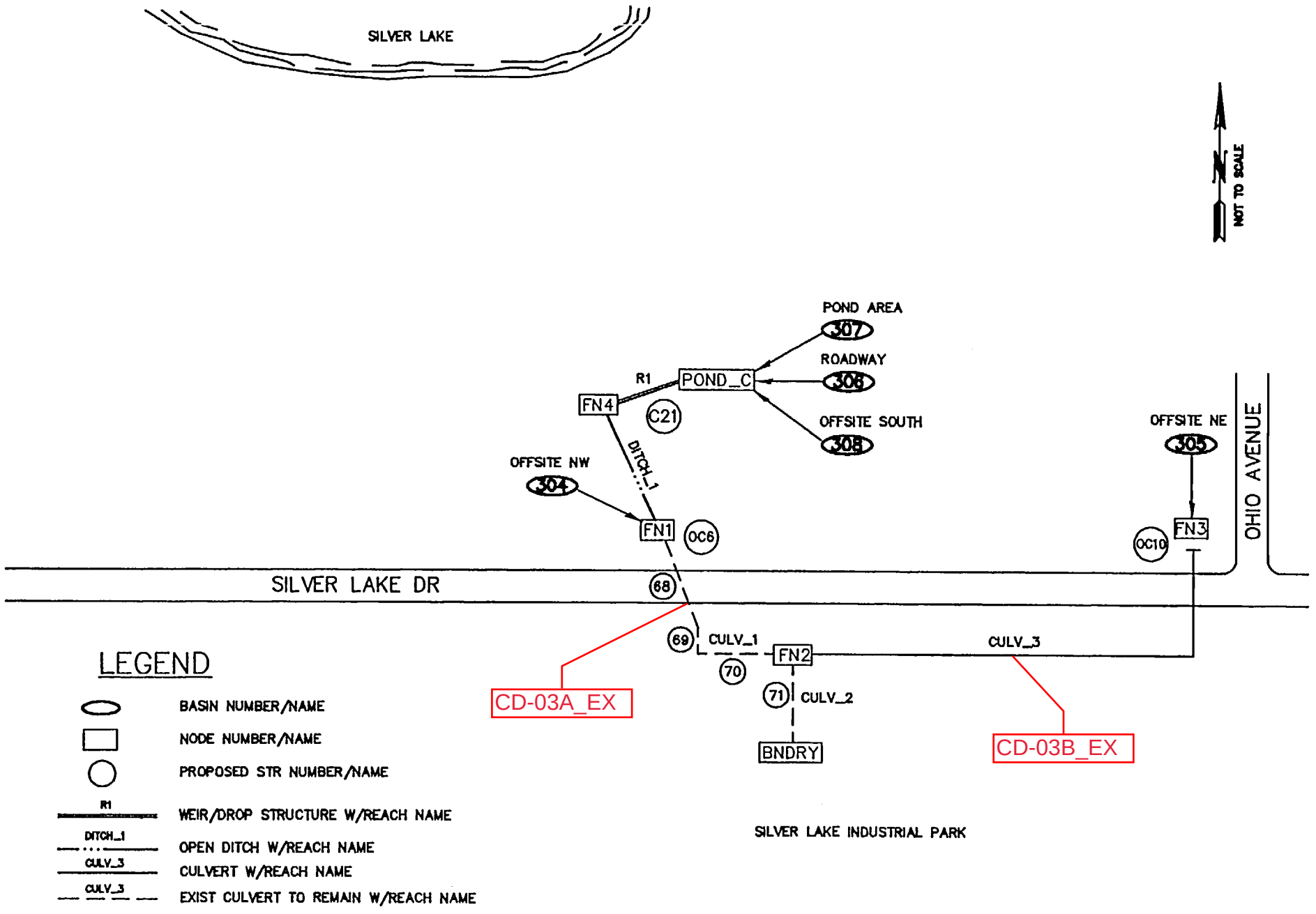
2.3 ENVIRONMENTAL IMPACT ASSESSMENT

2.3.1 JURISDICTIONAL WETLAND AREAS

A field delineation of all wetland areas within the original 1995 alignment for both Segments I and II was performed by Environmental Management Systems, Inc. (EMS) and a copy of this assessment is included as an attachment to this report. These jurisdictional areas consisted of primarily natural streams (Chub Creek) and manmade irrigation ditches. The most significant wetland along both the **original** Segment I and II alignments was the area near the Airport Entrance Road. Several cross culverts were to be placed in this area to maintain the hydrologic connection and therefore reduce the impacts to this wetland. Additionally, one of these culverts were sized (48") to act as a "critter crossing". With the **re-alignment of Segment IIA,** the encroachment into that wetland has been reduced. **Again,** application is for Segment I, only.

Only one **wetland** area, other than manmade ditches was considered jurisdictional in the Segment I corridor. This is a small wetland (0.13 acre total area with 0.02 acres of impact) known as Wetland #1 and located in the northwest quadrant of the Mellonville Road intersection. No additional mitigation, **other than that as provided AND PREVIOUSLY CONSTRUCTED** is proposed for this re-permitting project. There were eight (8) other soggy bottom roadside or railroad or road crossing manmade ditches that

POST-CONSTRUCTION



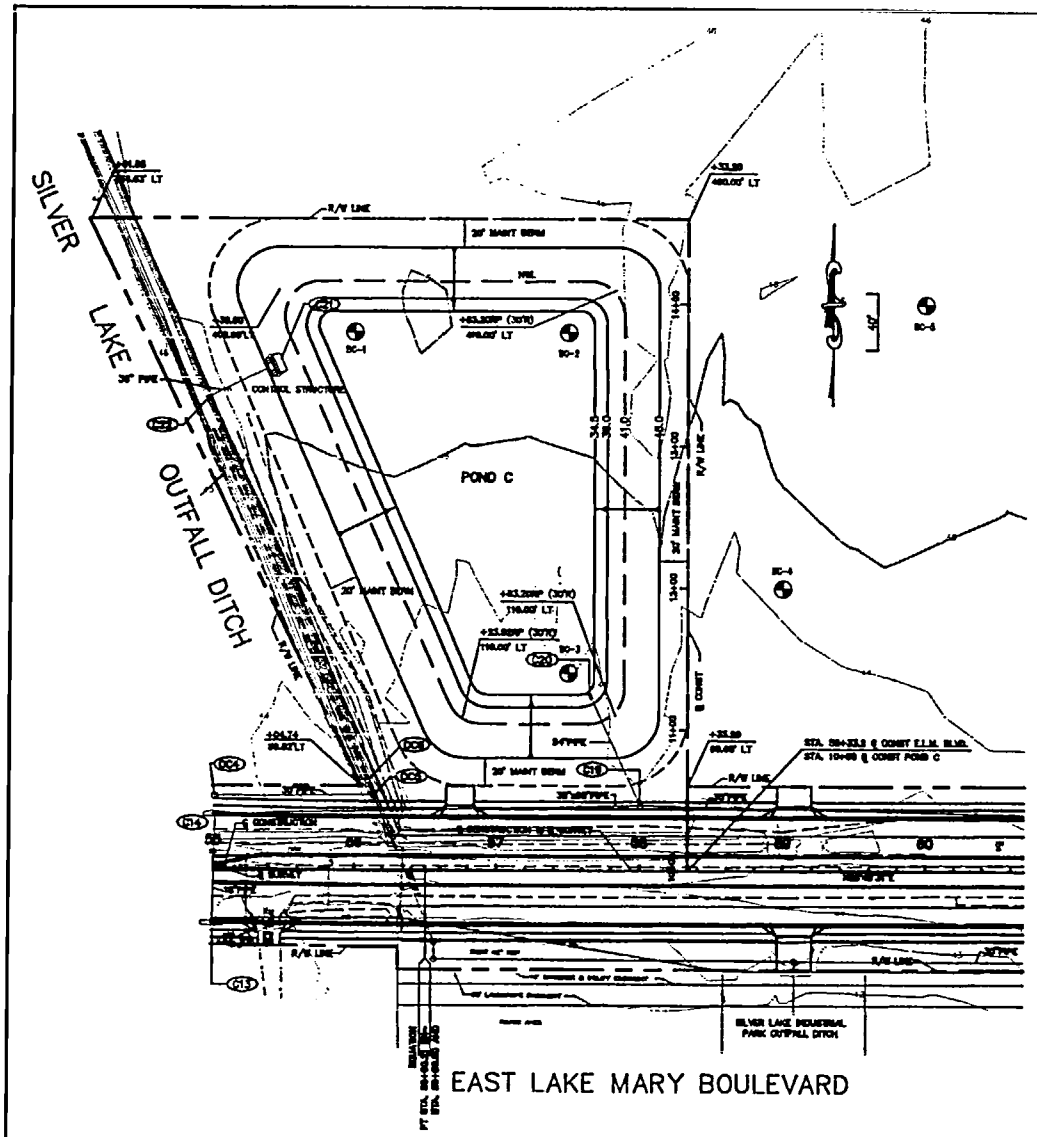
JOB NO. 94229
SHEET 1 OF

GEE & JENSON

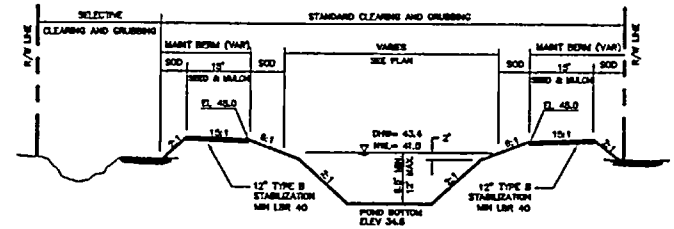
POST-CONSTRUCTION

SILVER LAKE DR (BASIN C) NODE/REACH DIAGRAM

COUNTY PROJ. NO.	SHEET NO.
P94-0798	53



PLAN VIEW



TYPICAL POND SECTION

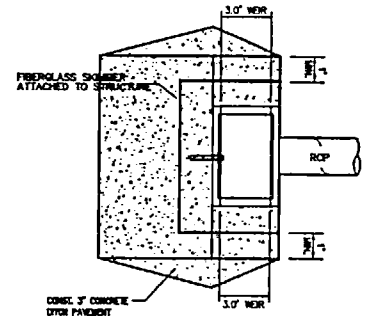
NTS

LEGEND

SC-4 — BORING LOCATION & NUMBER

EXISTING GROUND CONTOUR

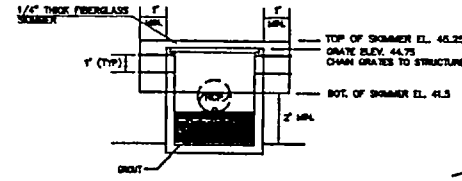
NOTE: STAKED SILT FENCE TO BE PLACED ALONG POND'S NORTH, EAST AND WEST PERIMETER. SILTATION AND EROSION CONTROL TO BE PLACED AT THE POND OUTFALL.



PLAN VIEW

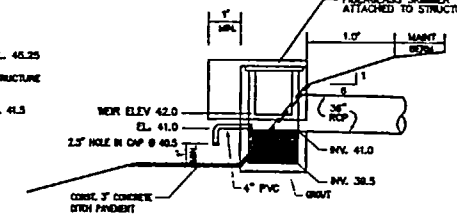
N.T.S.

CONST. D.B.I. TYPE E (9400) WITH SKIMMER AND GRATES INDEX NO. 232



FRONT VIEW

N.T.S.



SIDE VIEW

N.T.S.

C-21 CONTROL STRUCTURE DETAILS

N.T.S.

GEE & JENSON

WATER RETENTION AREA
POND C PLAN, SECTION & DETAILS

Advanced Interconnected Channel & Pond Routing (adICPR Ver 1.40)
Copyright 1989, Streamline Technologies, Inc.

SILVER LAKE DRIVE BASIN C POST-CONST 25YR/24HR EVENT
11/2/95

BASIN NAME	304	305	306	307	308
NODE NAME	FN1	FN3	POND_C	POND_C	POND_C
UNIT HYDROGRAPH	UH256	UH256	UH484	UH256	UH256
PEAKING FACTOR	256.	256.	484.	256.	256.
RAINFALL FILE	FLMOD	FLMOD	FLMOD	FLMOD	FLMOD
RAIN AMOUNT (in)	8.50	8.50	8.50	8.50	8.50
STORM DURATION (hrs)	24.00	24.00	24.00	24.00	24.00
AREA (ac)	20.10	19.08	8.02	2.40	1.98
CURVE NUMBER	74.90	78.00	77.00	89.40	77.00
DCIA (%)	.00	.00	65.00	.00	.00
TC (mins)	84.30	80.40	27.00	10.00	97.30
LAG TIME (hrs)	.00	.00	.00	.00	.00
BASIN STATUS	ONSITE	ONSITE	ONSITE	ONSITE	ONSITE

BASIN	QMX (cfs)	TMX (hrs)	VOL (in)	NOTES
304	23.90	12.93	5.48	OFFSITE NORTHWEST
305	25.15	12.86	5.85	OFFSITE NORTHEAST
306	36.32	12.18	7.46	PROPOSED BASIN C ROADWAY AREAS
307	11.57	12.04	7.22	PROPOSED POND SITE
308	2.22	12.97	5.72	OFFSITE SOUTHSIDE

DRAINAGE BASINS FOR:

CD-03A_EX: 304, 306, 307, AND 308
TOTAL DRAINAGE AREA: 32.50 AC

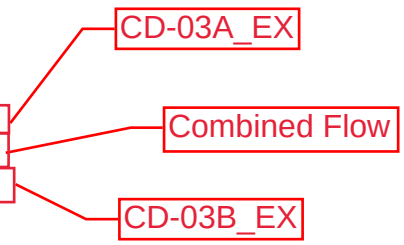
CD-03B_EX: 305
TOTAL DRAINAGE AREA: 19.08 AC

Advanced Interconnected Channel & Pond Routing (adICPR Ver 1.40)
Copyright 1989, Streamline Technologies, Inc.

SILVER LAKE DRIVE BASIN C POST-CONST 25YR/24HR EVENT
4/29/96

REACH MAXIMUM FLOW REPORT

REACH ID	TIME (hrs)	FLOW (cfs)	FR NODE NAME	STAGE (ft)	TO NODE NAME	STAGE (ft)
CULV_1	13.00	36.48	FN1	43.08	FN2	42.33
CULV_2	13.00	61.16	FN2	42.33	BNDRY	38.69
CULV_3	13.00	24.68	FN3	45.06	FN2	42.33
R1	12.50	15.37	POND_C	43.24	FN4	42.89
DITCH_1	12.50	14.73	FN4	42.89	FN1	42.84



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        Advanced Interconnected Channel & Pond Routing (adICPR Ver 1.40)
                Copyright 1989, Streamline Technologies, Inc.

        SILVER LAKE DRIVE BASIN C POST-CONST
        4/29/96

>>REACH NAME      : CULV_1   CD-03A_EX
  FROM NODE       : FN1
  TO NODE         : FN2
  REACH TYPE      : CULVERT, CIRCULAR w/ ROADWAY
  FLOW DIRECTION  : POSITIVE AND NEGATIVE FLOWS ALLOWED
  TURBO SWITCH    : OFF

  CULVERT DATA    :
        SPAN (in):  42.000       RISE (in):  42.000     LENGTH (ft): 335.000
   U/S INVERT (ft):  39.340 D/S INVERT (ft):  39.100       MANNING N:    .012
      ENTRNC LOSS:    .800  # OF CULVERTS:   1.000

  POSITION A      : TRIANGULAR ROADWAY/BERM WEIR
    CREST EL. (ft):  44.400 VERTEX ANG (dg): 179.620      WEIR COEF.:   2.800
         RESERVED:********       RESERVED:********        RESERVED:********

  POSITION B      : RECTANGULAR ROADWAY/BERM WEIR
    CREST EL. (ft):9999.000  CREST LN. (ft):    .000      WEIR COEF.:   2.800
         RESERVED:********       RESERVED:********        RESERVED:********

             NOTE: EXISTING CROSS CULVERT

>>REACH NAME      : CULV_2
  FROM NODE       : FN2
  TO NODE         : BNDRY
  REACH TYPE      : CULVERT, ELLIPTICAL w/ ROADWAY
  FLOW DIRECTION  : POSITIVE AND NEGATIVE FLOWS ALLOWED
  TURBO SWITCH    : OFF

  CULVERT DATA    :
        SPAN (in):  60.000       RISE (in):  38.000     LENGTH (ft): 104.000
   U/S INVERT (ft):  39.100 D/S INVERT (ft):  37.900       MANNING N:    .012
      ENTRNC LOSS:    .500  # OF CULVERTS:   1.000

  POSITION A      : RECTANGULAR ROADWAY/BERM WEIR
    CREST EL. (ft):9999.000  CREST LN. (ft):    .000      WEIR COEF.:   2.800
         RESERVED:********       RESERVED:********        RESERVED:********

  POSITION B      : RECTANGULAR ROADWAY/BERM WEIR
    CREST EL. (ft):********  CREST LN. (ft):********      WEIR COEF.:********
         RESERVED:********       RESERVED:********        RESERVED:********

             NOTE: OUTFALL INTO SL INDUSTRIAL PARK
```

CONSTRUCTION PLANS INDICATED 30" RCP

```
        Advanced Interconnected Channel & Pond Routing (adICPR Ver 1.40)
                Copyright 1989, Streamline Technologies, Inc.

        SILVER LAKE DRIVE BASIN C POST-CONST
        4/29/96

>>REACH NAME      : CULV_3    CD-03B_EX
  FROM NODE       : FN3
  TO NODE         : FN2
  REACH TYPE      : CULVERT, CIRCULAR w/ ROADWAY
  FLOW DIRECTION  : POSITIVE AND NEGATIVE FLOWS ALLOWED
  TURBO SWITCH    : OFF

  CULVERT DATA    :
        SPAN (in):  30.000      RISE (in):  30.000     LENGTH (ft): 566.000
   U/S INVERT (ft):  40.250 D/S INVERT (ft):  39.250       MANNING N:    .012
       ENTRNC LOSS:   1.500   # OF CULVERTS:   1.000

  POSITION A      : NOT USED

  POSITION B      : NOT USED

             NOTE: OFFSITE COLLECTOR FROM OHIO ST
```

COUNTY PROJ. NO.	SHEET NO.
P94-0798	25

CURVE NO. 4
C/L CONSTRUCTION
PI STA. 55+08.63
Δ = 02°49'57"(LT)
D = 01°00'00"
T = 141.65'
L = 283.25'
R = 5729.58'
e = NC
PRC STA. 53+66.98
PT STA. 56+50.23 BK=
EQUATION STA. 56+50.00 AHD

CONST 98 LF 6" UNDDR W/CLEANOUT
+04.75 59.82' LT.
R/W LINE
DITCH
OC6
OC5
OC4
30"PIPE
℄ CONST. PT STA. 56+50.23 BK= EQUATION STA. 56+50.00 AHD ℄ SURVEY
POND C
54"PIPE
C20
R/W LINE
CONST 158 LF 6" UNDDR W/CLEANOUT
PROPERTY LINE
20'
38"x60"PIPE
C19
30"PIPE
CONST. 5' CONC. SIDEWALK
+90.00 70.00' LT.
+90.00 60.00' LT.
+33.20 60.00' LT.
T.C.E. 24'
+26.00 70.00' LT.
+26.00 60.00' LT.
CONST 388 LF 6" UNDDR W/CLEANOUTS
R/W LINE
20'
58.0'
37.00'
1.97'
37.00'
56.00'
C14
℄ CONSTRUCTION
30"PIPE
55 56 57 58 59 60 61
+35.29 11.00' LT.
FH
CURB & GUTTER TYPE F
℄ CONSTRUCTION & ℄ SURVEY
CURB TYPE A
FH
CURVE NO. 4
℄ SURVEY
N89°45'31"E
EXIST. 30"RCP (TO REMAIN)
18"PIPE
REMOVE EXIST. ENDWALL
CONNECT PROPOSED 30" RCP TO EXIST. 30" RCP
4" & 10" PVC CONDUIT W/CAPS
CURB TYPE A
C13
TO ASPHALT DRIVE
DIRT DRIVE
CURB & GUTTER TYPE F
CURB & GUTTER TYPE F
END 4" STEEL GAS MAIN
CONST. 5' CONC. SIDEWALK
Exist. MANHOLE (TO REMAIN)
Exist. 34"x53" HERCP (TO REMAIN)
OC14
CONST 155 LF 6" UNDDR W/CLEANOUT
Exist. 42"RCP (TO REMAIN)
Exist. MH (TO REMAIN)
30"PIPE
16'
R/W LINE
+30.90 60.00' RT.
+30.90 70.00' RT.
R/W LINE
10' DRAINAGE & UTILITY EASEMENT
CONNECT TO EXIST. MANHOLE
R/W LINE
CONST 128 LF 6" UNDDR W/CLEANOUT
Exist. DBI (TO REMAIN)
25' LANDSCAPE EASEMENT
CONST 388 LF 6" UNDDR W/CLEANOUTS
EXIST. 38"x60" HERCP TO REMAIN
24'
60.00'
37.00'
37.00'
70.00'
CD-03A_EX
GRASS AREA

RECEIVED
SEP 27 2002
PDS
22496-5

BM NO. 3330901 (SEMINOLE COUNTY)
STA. 54+18, 32' RT.
RR SPIKE IN N. SIDE OF 13" OAK ON S. SIDE E. LAKE MARY BLVD.
ELEV. 45.002

BM NO. 59
STA. 58+62, 70' RT.
SET RR SPIKE IN N. FACE OFF PP
ELEV. 43.442

ALTAMONTE SVC. CTR.

PVI STA = 55+00
PVI ELEV = 44.70
NO V.C.
PT STA.56+50.21 BK.=
EQUATION:
STA.-56+50.00-AHD.
PVI STA = 58+50
PVI ELEV = 45.75
NO V.C.
PROFILE GRADE LINE
(+) 0.3000%
(-) 0.3000%
Exist. Ground Line (B/L SURVEY)
6"UNDDR
30" PIPE
6"UNDDR
6"UNDDR
FL 42.08 (RT)
FL 42.50 (RT)
FL 42.55 (LT & RT)
8"WATER MAIN
FL 41.95 (LT)
FL 39.30
FL 41.88 (LT)
FL 42.04 (RT)
FL 41.40 (LT)
4"GAS MAIN
CONST. 42"PIPE
CONST. 30" PIPE
FROM C18
FL 41.65 (LT & RT)
FL.36.06
CONST. 38"x60" PIPE
FL.37.11
FL.35.56
FL.34.66
44.4
43.9
43.7
43.7
43.9
44.2
48 46 44 42 40 38 36 34
55 56 57 58 59 60 61
C14
C19

SCALE: 1" = 20' Horiz.
1" = 2' Vert.

9/27/02

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

	NAME	DATE		NAME	DATE
DESIGNED BY	SER	1-95	DRAWN BY	CADD	2-95
CHECKED BY	JJN	2-96	CHECKED BY	CND	2-96

SUPERVISED BY JOHN J. NEMETHY, PE

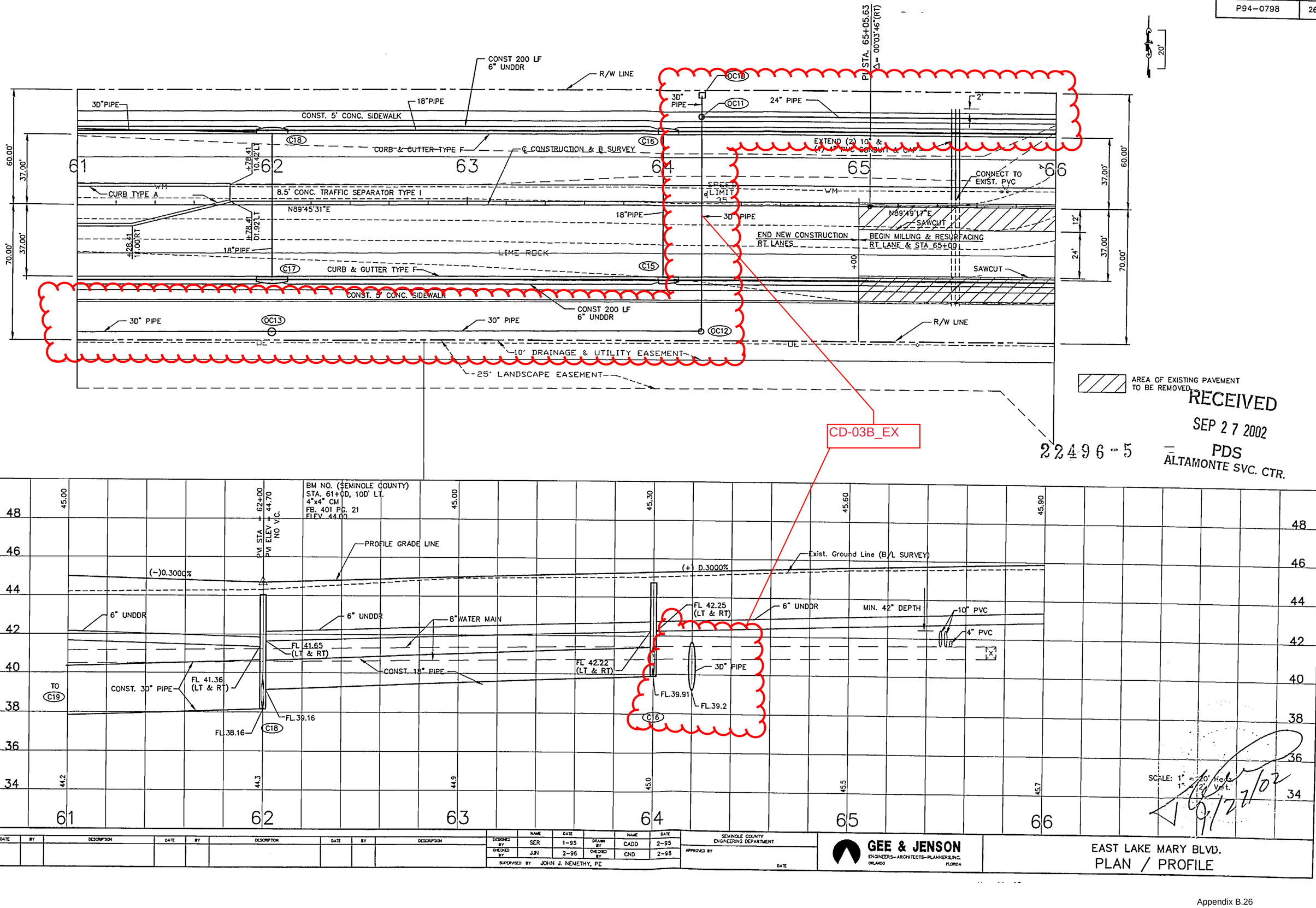
SEMINOLE COUNTY ENGINEERING DEPARTMENT
APPROVED BY
DATE

GEE & JENSON
ENGINEERS–ARCHITECTS–PLANNERS, INC.
ORLANDO FLORIDA

EAST LAKE MARY BLVD.
PLAN / PROFILE

PLPRR009

COUNTY PROJ. NO.	SHEET NO.
P94-0798	26



DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

	NAME	DATE		NAME	DATE
DESIGNED BY	SER	1-95	DRAWN BY	CADD	2-95
CHECKED BY	JJN	2-96	CHECKED BY	CND	2-98

SUPERVISED BY JOHN J. NEMETHY, PE

SEMINOLE COUNTY ENGINEERING DEPARTMENT
APPROVED BY
DATE

GEE & JENSON
ENGINEERS—ARCHITECTS—PLANNERS, INC.
ORLANDO FLORIDA

EAST LAKE MARY BLVD.
PLAN / PROFILE

PLPRR01D

CROSS DRAIN CD-04_EX

COUNTY PROJ. NO.	SHEET NO.
P94-0798	27

FOR DETAILS OF THIS AREA REFER TO OHIO AVE. @ EAST LAKE MARY BLVD. INTERSECTION DETAIL SHEET.

STA 69+60 SEGMENT I BK = SEGMENT IIA AH

SEGMENT IIA PLANS BY EARTH TECH PS-0137

STA. 11+00 MATCH AND CONNECT TO EXISTING PAVEMENT & TYPE F CURB

OPI 10+70 EL. 43.40

CONST 385 LF 6" UNOOR W/CLEANOUTS

CONST 173 LF 6" UNOOR W/CLEANOUT

CONST 393 LF 6" UNODR W/CLEANOUTS

FACE OF WALL 51' LT

WOOD PRIVACY FENCE

HOG WIRE FENCE

R/W LINE

CONST. 5' CONC. SIDEWALK

RIP RAP

CONST. GRAVITY WALL & ALUMINUM HANORAIL

EXTEND (2) 10" & (1) 4" PVC CONDUIT & CAP

Exist. 24"x38" Pipe (TO REMAIN)

CONNECT TO EXIST. PVC

℄ CONSTRUCTION & ℄ SURVEY

CONNECT TO EXIST PIPE

N89°49'17"E

18" PIPE EXTENSION

CURB & GUTTER TYPE F

EXTEND 18" RCP & PLUG

8.5' CONC. TRAFFIC SEPARATOR TYPE I

SAWCUT

EXIST 18" RCP (TO REMAIN)

MILL & RESURFACE

CURB & GUTTER TYPE F

24"PIPE

EXIST. 18" RCP (TO REMAIN)

CONST. 5' CONC. SIDEWALK

REMOVE 5.5' OF EXIST PIPE

CONST. GRAVITY WALL & ALUMINUM HANDRAIL

CONST. TYPE "F" CURB & GUTTER (TYP. 4 CORNERS)

EXIST. MIAMI GG

CONC. FLUME

CONC. CG

MES

STA. 68+20 (RT.) CONST. DITCH BLOCK 5' TOP WIDTH 4:1 SIDE SLOPES TOP ELEV. 43.50 SOD ALL DISTURBED AREAS

CONST 385 LF 6" UNODR W/CLEANOUTS

CONST 173 LF 6" UNDDR W/CLEANOUT

CONST 393 LF 6" UNOOR W/CLEANOUTS

25' LANDSCAPE EASEMENT

STA. 67+00.00 EAST LAKE MARY BLVD = STA. 10+00.00 OHIO AVE.

END CONST. SOUTH FUTURE CONST. BY OTHERS

SILVER VISTA BLVD.

AREA OF EXISTING PAVEMENT TO BE REMOVED.

NOTE : EXIST 18" RCP @ STA 72+00 TO BE ABANDONED IN PLACE

CD-04_EX

Exist. Ground Line (B/L SURVEY)

PROFILE GRADE LINE

(+)0.367%

(−) 0.300%

(+)0.3000%

(−)0.400%

(+)0.800%

6" UNDOR

6" UNOOR

SPECIAL DITCH PROFILE (LT.)

FL. S. 41.50

FL. N. 41.70

FL 43.44 (LT & RT)

FL 42.78 (LT & RT)

4" PVC

10" PVC

MIN. 42" DEPTH

Exist. 24"x38" ERCP

PVI STA = 66+90
PVI ELEV = 46.23

PVI STA = 70+00
PVI ELEV = 45.30
NO V.C.

FL 42.25 (LT & RT)

CONNECT Exist. 18" RCP

FL. 39.42

FL. 38.92

CONST. 24" PIPE

Exist. 18" RCP
FL. 40.02

TO 03

BM (SEMINOLE COUNTY)
STA. 71+62, 100' LT.
4"x4" CM
FB. 401 PG. 21
ELEV. 45.80

SCALE: 1" = 20' Horiz.
1" = 2' Vert.

22496-5

RECEIVED
SEP 27 2002
PDS
ALTAMONTE SVC. CTR.

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
9/02	TSW	1 ADDED CONST LIMIT NOTE						

	NAME	DATE		NAME	DATE
DESIGNED BY	SER	1-95	DRAWN BY	CADD	2-95
CHECKED BY	JJN	2-96	CHECKED BY	CND	2-95

SUPERVISED BY JOHN J. NEMETHY, PE

SEMINOLE COUNTY ENGINEERING DEPARTMENT

APPROVED BY

DATE

GEE & JENSON
ENGINEERS-ARCHITECTS-PLANNERS, INC.
ORLANDO FLORIDA

EAST LAKE MARY BLVD.
PLAN / PROFILE

PLPRR011

CROSS DRAIN CD-05_EX,

CROSS DRAIN CD-06_EX

AND

CROSS DRAIN CD-07_EX

DRAINAGE CALCULATIONS AND PERMITTING NARRATIVE FOR

EAST LAKE MARY BLVD.

SEGMENT IIA

Sta. 69+60.00 to Sta. 96+59.70

Prepared For:

Seminole County
Public Works Department
Engineering Division

Prepared By:

Earth Tech Consulting, Inc.
30 South Keller Road, Suite 500
Orlando, Florida 32810

January 2002
Revised: April 4, 2002

Robert C. Alderman
4-4-02
#47613

3. PROPOSED CONDITIONS

The proposed East Lake Mary Boulevard Segment 2A includes the reconstruction of East Lake Mary Boulevard from 280 feet east of Ohio Avenue to 1,000 feet east of the proposed intersection of East Lake Mary Boulevard and Airport Entrance Road. It also includes the reconstruction of Airport Entrance Road from the proposed East Lake Mary Boulevard to Marquette Avenue. A new Frontage Road will be provided to access the Marquette borrow pit. None of the proposed roadways lie in the 100-year flood zone according to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map, included in Appendix D-1.

The proposed East Lake Mary Boulevard and Airport Entrance Road will consist of a four-lane divided urban section with curb and gutter, a raised median, a 5-foot sidewalk on the left and an 8-foot sidewalk on the right side of the proposed roadways.

The proposed Frontage Road will consist of a two-lane rural section with onsite and offsite ditches along the proposed roadway with curb and gutter at the intersection of East Lake Mary Boulevard and the Frontage Road.

The drainage facilities for this project will include two stormwater management ponds, storm sewer systems, cross drains, and open ditches.

Runoff from East Lake Mary Boulevard and Airport Entrance Road will be collected by curb inlets and be conveyed by storm sewer to the proposed stormwater management pond 1. A portion of runoff from Frontage Road will drain into curb inlets or onsite open ditches then be conveyed by storm sewer to the proposed wet Pond 1. Runoff from a portion of Frontage Road covering an area of 0.133 acres will drain into Pond 1 directly. Runoff from the proposed East Lake Mary Boulevard between the airport entrance road and the eastern edge of segment IIA will drain into curb inlets then be conveyed by storm sewer to the proposed wet Pond 2.

CD-06_EX

Offsite runoff will be separated from the runoff of the proposed roadways. Offsite ditches will collect and convey runoff from an area of 22.0 acres to station 22+00 of Airport Entrance Road where three (3) proposed 30 inch in cross drains will convey runoff further southeasterly to a wetland area. Additionally, a triple 30-inch cross drain is proposed at Sta. 93+00 to continue the existing drainage patterns towards Lake Jessup. There is an existing ditch on the west side of Brisson Avenue that is maintained in the proposed condition. A double36-inch cross drain is proposed at Sta. 96+20 to maintain the existing drainage patterns.

CD-07_EX

The proposed stormwater management Pond 1 will be located in an area, consisting of an existing wet pond and a grassed area immediately east of the pond, encompassed by the proposed East Lake Mary Boulevard, Airport Entrance Road, and Frontage Road. The proposed Pond 1 will discharge southeasterly into a low area, and eventually discharge into Lake Jessup. The proposed stormwater management Pond 2 will be located approximately 300 feet south of the eastern end of the proposed East Lake Mary Boulevard. The proposed Pond 2 will discharge southeasterly into Lake Jessup.

CD-05_EX

A.25 PROPOSED CROSS DRAINS CALCULATIONS

PROJECT: _____ DESIGNER: MG

DATE: 12/26/01

HYDROLOGIC AND CHANNEL INFORMATION

SKETCH STATION: 22+00 Airport Entrance Rd

D = Diameter or Height
B = Span

$Q_1 = 60.31$ (50YR) $TW_1 = 32.0$
$Q_2 = 69.32$ (100YR) $TW_2 = 32.0$

(Q_1 = DESIGN DISCHARGE, SAY Q_{25}
Q_2 = CHECK DISCHARGE, SAY Q_{50} OR Q_{100})

EL. _____
AHW= 7.82
EL. 300.0
S_o= 0.16%
L= 196
TW 32.0
EL. 297.1

MEAN STREAM VELOCITY= _____
MAX. STREAM VELOCITY= _____
LS_o 0.3

CULVERT DESCRIPTION (ENTRANCE TYPE)	Q	SIZE D	SIZE B	HEADWATER COMPUTATION: INLET CONTROL Q/B	INLET CONTROL HW/D	INLET CONTROL HW	OUTLET CONTROL K_e	OUTLET CONTROL H	OUTLET CONTROL d_c	OUTLET CONTROL $\frac{d_c+D}{2}$	OUTLET CONTROL TW	OUTLET CONTROL DTW	OUTLET CONTROL LS_o	OUTLET CONTROL HW=H+DTW−LS_o	CONTROLLING HW	OUTLET VELOCITY	COST	COMMENTS
5-24"x38" MES	12.41	24"	38"	3.81	0.70	1.75	0.7	0.3	1.24	1.85	2.39	2.39	0.3	2.38	2.3	2.4		Outlet Control
	13.86	24"	38"	4.37	0.74	1.85	0.7	0.38	1.23	1.87	2.30	2.30	0.3	2.38	2.38	2.7		Outlet Control

32.30
32.38

Construction plans indicated 3-30" RCP

SUMMARY & RECOMMENDATIONS

Design by _____ Checked by _____ Approved by _____

RECEIVED
JAN 22 2002
PDS
ALTAMONTE SVC. CTR.

22496

FIGURE 8-2
Worksheet for Culvert Capacity Calculations

EARTH TECH

A tyco INTERNATIONAL LTD. COMPANY

CALCULATION SHEET — PAGE ___ OF ___

CLIENT Seminole County — SUBJECT Proposed Cross Drain Calculation — PROJECT NO. 46547

PROJECT East Lake Mary Boulevard, Segment 2A — Prepared By MG DATE 01/02/02

Reviewed By ____ DATE ____

Approved By ____ DATE ____

Drainage Area (A) = 21.953 AC

DRAINAGE AREA FOR CD_EX-05

T_c = 20 min

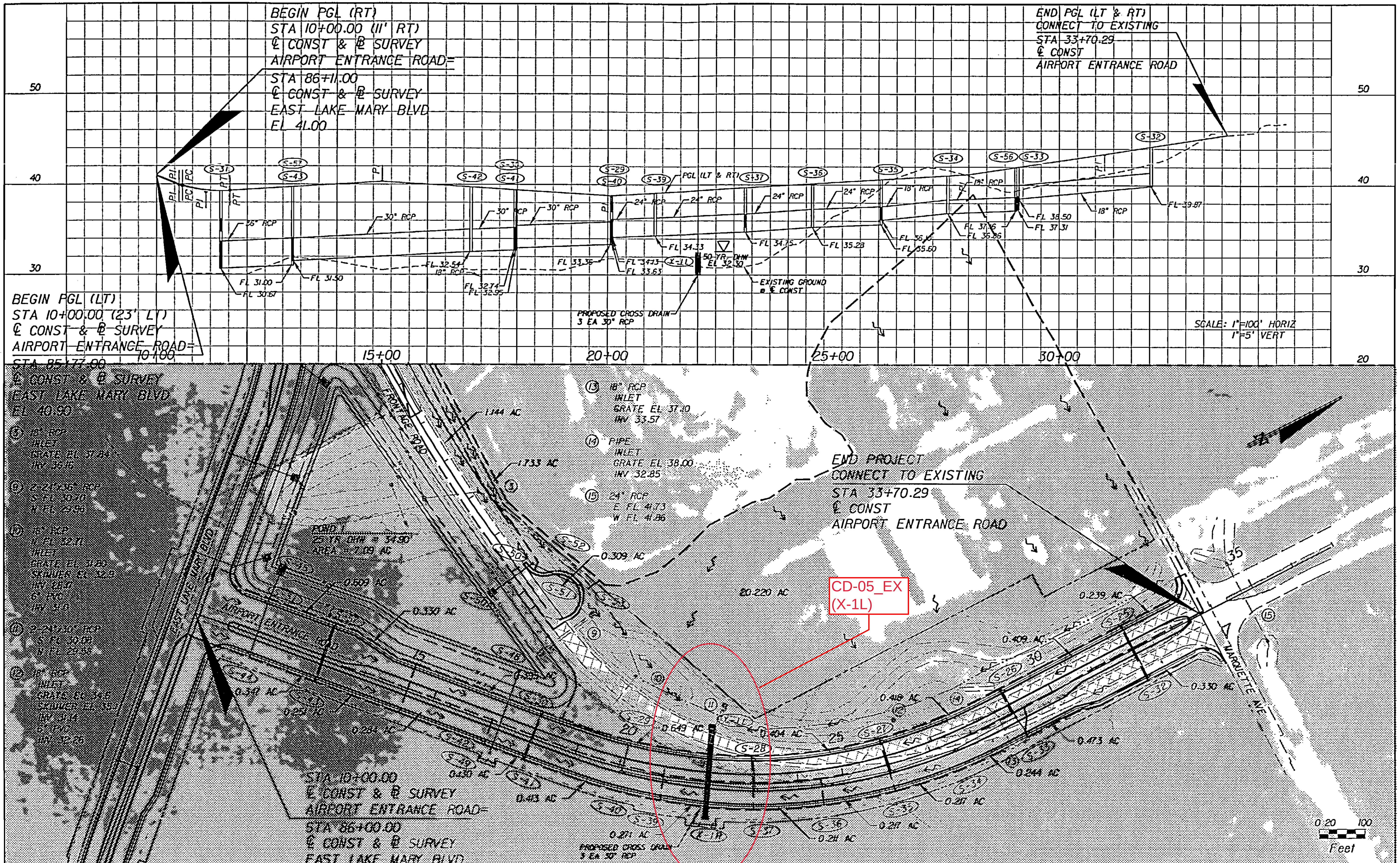
Intensity $\begin{cases} I_{50} = 7.0 \text{ in/hr} \left(C_{50} = 0.337 \times 1.2 = 0.404 \right) \\ I_{100} = 7.5 \text{ in/hr} \left(C_{100} = 0.337 \times 1.25 = 0.421 \right) \end{cases}$

$$Q_{50} = C_{50} I_{50} A$$

$$= 0.404 \times 7.0 \times 21.953 = 62.08 \text{ cfs}$$

$$Q_{100} = C_{100} I_{100} A$$

$$= 0.421 \times 7.5 \times 21.953 = 69.32 \text{ cfs}$$



REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

EARTH TECH
30 SOUTH KELLER ROAD, SUITE 590, ORLANDO, FL 32810
407.660.1719
CERTIFICATE OF AUTHORIZATION NO. 8115

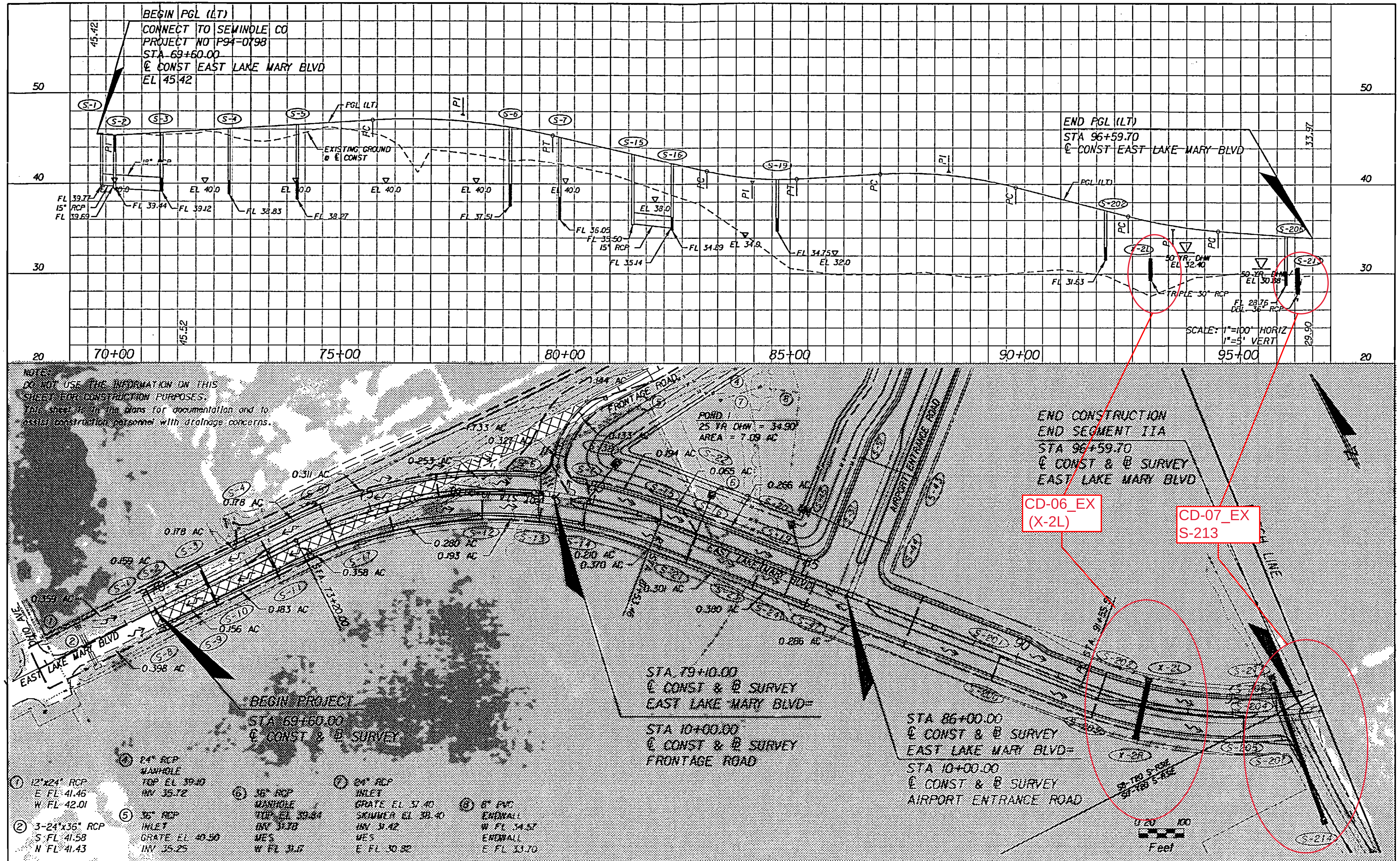
SEMINOLE COUNTY
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

ROAD NO.	COUNTY	PROJECT ID
	SEMINOLE	PS-0137

PROPOSED DRAINAGE MAP

SHEET NO. 4

03/23/2002 08:38:44 AM g:\46547\CADD\drainage\DRMPRO02.dgn


BEGIN PGL (LT)
CONNECT TO SEMINOLE CO
PROJECT NO P94-0798
STA 69+60.00
℄ CONST EAST LAKE MARY BLVD
EL 45.42
END PGL (LT)
STA 96+59.70
℄ CONST EAST LAKE MARY BLVD
EXISTING GROUND @ ℄ CONST
PGL (LT)
SCALE: 1"=100' HORIZ
1"=5' VERT
70+00
75+00
80+00
85+00
90+00
95+00
TRIPLE 30" RCP
DBL 36" RCP
NOTE:
DO NOT USE THE INFORMATION ON THIS SHEET FOR CONSTRUCTION PURPOSES.
This sheet is in the plans for documentation and to assist construction personnel with drainage concerns.
BEGIN PROJECT
STA 69+60.00
℄ CONST & Ⓑ SURVEY
STA 79+10.00
℄ CONST & Ⓑ SURVEY
EAST LAKE MARY BLVD=
STA 10+00.00
℄ CONST & Ⓑ SURVEY
FRONTAGE ROAD
STA 86+00.00
℄ CONST & Ⓑ SURVEY
EAST LAKE MARY BLVD=
STA 10+00.00
℄ CONST & Ⓑ SURVEY
AIRPORT ENTRANCE ROAD
END CONSTRUCTION
END SEGMENT IIA
STA 96+59.70
℄ CONST & Ⓑ SURVEY
EAST LAKE MARY BLVD
POND 1
25 YR DHW = 34.90
AREA = 7.09 AC
CD-06_EX
(X-2L)
CD-07_EX
S-213
① 12"x24" RCP
E FL 41.46
W FL 42.01
② 3-24"x36" RCP
S FL 41.58
N FL 41.43
④ 24" RCP
MANHOLE
TOP EL 39.40
INV 35.72
⑤ 36" RCP
INLET
GRATE EL 40.50
INV 35.25
⑥ 36" RCP
MANHOLE
TOP EL 39.84
INV 31.78
⑦ 24" RCP
INLET
GRATE EL 37.40
SKIMMER EL 38.40
INV 31.42
⑧ 6" PVC
ENDWALL
W FL 34.57
ENDWALL
E FL 33.70
Feet

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

EARTH TECH
30 SOUTH KELLER ROAD, SUITE 500, ORLANDO, FL 32810
407.660.1719
CERTIFICATE OF AUTHORIZATION NO. 8115

SEMINOLE COUNTY
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

ROAD NO.	COUNTY	PROJECT ID
	SEMINOLE	PS-0137

PROPOSED DRAINAGE MAP

SHEET NO. 3

03/23/2002 08:37:23 AM g:\46547\CADD\drainage\DRMPRD01.dgn

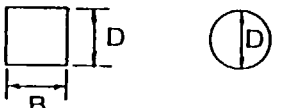
CD-06_EX

PROJECT: FIA Segment 2A
X-3L

DESIGNER: MG

DATE:

HYDROLOGIC AND CHANNEL INFORMATION



D = Diameter or Height
B = Span

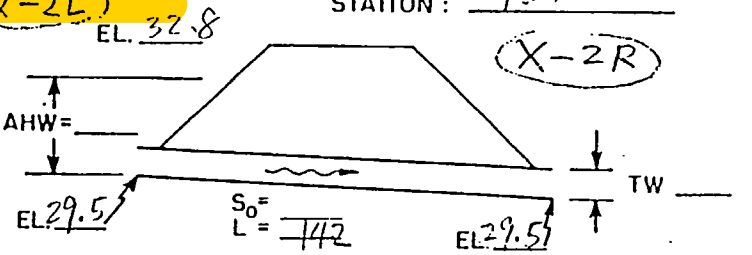
50-YR Q_1 = 46.6 cfs
100-YR Q_2 = 50.0 cfs

TW_1 = 32 ft
TW_2 = 32 ft

(Q_1 = DESIGN DISCHARGE, SAY Q_{25}
Q_2 = CHECK DISCHARGE, SAY Q_{50} OR Q_{100})

SKETCH

(X-2L)
STATION: 93+00
(X-2R)



MEAN STREAM VELOCITY =
MAX. STREAM VELOCITY =
LS_o 0

CULVERT DESCRIPTION (ENTRANCE TYPE)	Q	SIZE		HEADWATER COMPUTATION											CONTROLLING HW	OUTLET VELOCITY	COST	COMMENTS
				INLET CONTROL			OUTLET CONTROL HW=H+DTW-LS_o											
		D	B	$\frac{Q}{B}$	$\frac{HW}{D}$	HW	K_e	H	d_c	$\frac{d_c+D}{2}$	TW	DTW	LS_o	HW				
3-30" RCP	15.5	2.5			0.78	1.95	0.7	0.4	1.3	1.90	2.5	2.5	0	2.9	2.9	3.1		Out'el controls 32.4
3-30" RCP	16.7	2.5			0.84	2.10	0.7	0.5	1.4	1.95	2.5	2.5	0	3.0	3.0	3.4		Outlet Control, 32.5

SUMMARY & RECOMMENDATIONS:

Design by _____ Checked by _____ Approved by _____

FIGURE 8-2
Worksheet for Culvert Capacity Calculations

EARTH TECH

A tyco company

CD-06_EX

CLIENT Seminole County — Calculations for — MG

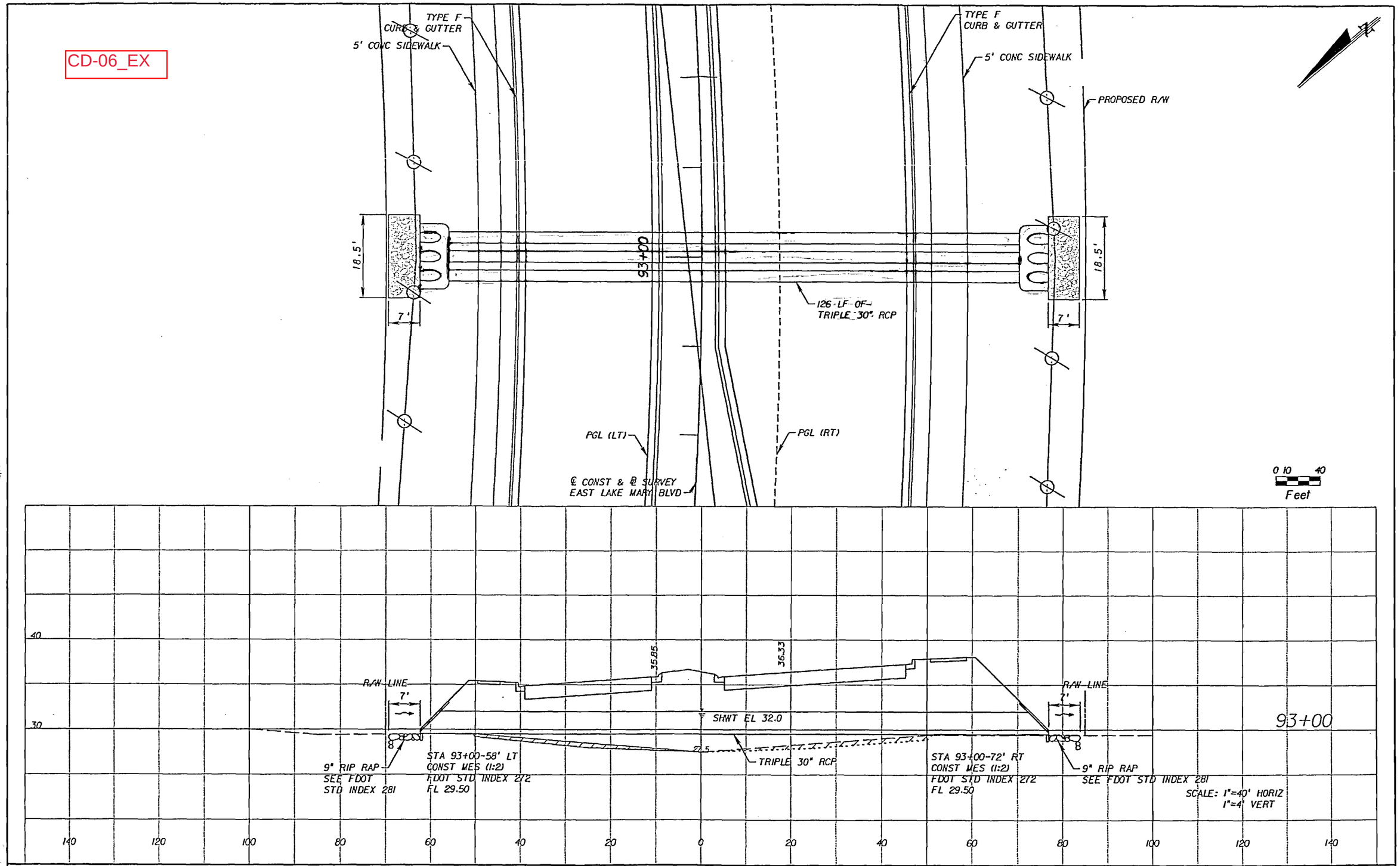
PROJECT East Lake Mary Blvd. Segment 2A — Cross Drain at Station 93 +00

Drainage Area to the proposed cross drain (A) = 34.5 Ac

Travel Time = 37 min

Frequency	C	I (in/hr)	Discharge (Q, cfs)
50-YEAR	0.24	5.4	46.6
100-YEAR	0.25	5.8	50.0

CD-06_EX



G:\1654T\CADD\ROADWAY\DSPPRDD1.DGN
G:\1654T\CADD\DRAINAGE\OFFSITEDITCHES.PLG
G:\1654T\CADD\ROADWAY\EXTRD2B.DGN
G:\1654T\CADD\DRAINAGE\DRDITD05.DGN

G:\1654T\CADD\ROADWAY\DSCWRD2A.DGN
G:\1654T\CADD\SURVEY\...\XTOPORD01.DGN
G:\1654T\CADD\DRAINA...\SSDRTS01.DGN
G:\1654T\CADD\DRAINA...\RDD01.DGN

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

EARTH TECH
30 SOUTH KELLER ROAD, SUITE 500, ORLANDO, FL 32810
407.660.1719
CERTIFICATE OF AUTHORIZATION NO. 8115

SEMINOLE COUNTY
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

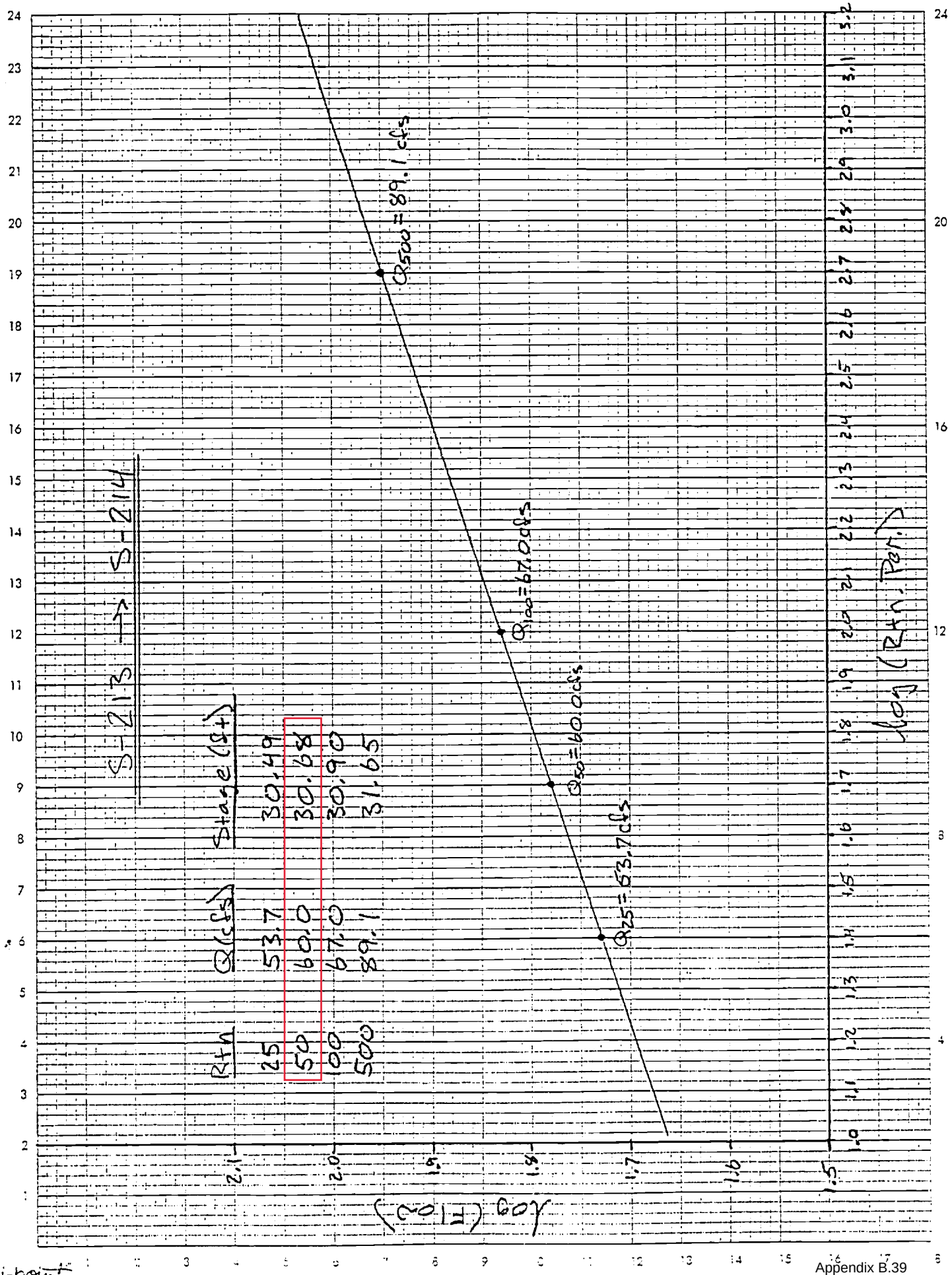
ROAD NO.	COUNTY	PROJECT NO
	SEMINOLE	PS-0137

CROSS DRAIN DETAIL

SHEET NO. 31

03/27/2002 02:26:25 AM G:\1654T\CADD\drainage\drd1rd04.dgn

CD-07_EX



dri-point

CURVE NO 43
PI STA 5+25.90, 9.19' LT
Δ = 10°46'20" (LT)
D = 5°43'46"
T = 94.28'
L = 188.01'
R = 1000.00'
PC STA 4+31.13, 12.02' LT
PT STA 6+20.13, 19.51' LT
e = NC

BRISSON AVENUE					
RETURN	PC STA	OFFSET	PT STA	OFFSET	RADIUS
NO 1	96+59.70	39.00' LT	96+68.71	40.04' LT	35.00'
NO 2	96+67.02	19.05' LT	9+81.16	15.26' RT	25.00'
NO 3	9+40.13	24.00' LT	95+96.86	42.49' RT	35.00'

CURVE NO 44
PI STA 7+10.23, 28.47' LT
Δ = 10°24'16" (RT)
D = 5°43'46"
T = 91.05'
L = 181.59'
R = 1000.00'
PC STA 6+20.13, 19.51' LT
PT STA 7+99.95, 24.43' LT
e = NC

POND 2
S-210
S-211 88 LF OF 30" RCP
76 LF OF 24" RCP
℄ SPECIAL LEFT DITCH
41 LF OF 18" RCP
294 LF OF 24" RCP
S-214
DBL 36" RCP
RETURN NO 3
CONST 20 LF OF STAKED TURBIDITY BARRIER
R/W LINE
S-212
S-209
CURVE NO 43
PC STA 4+32.64
PT STA 5+99.20
PRC
CURVE NO 44
CURVE NO 41
N 00° 19' 09" W
N 00° 17' 43" W DIRT ROAD
20.52'
CURVE NO 40
N 05° 17' 32" W
DIRT ROAD
PC
R/W LINE
CURVE NO 42
S-208
PC STA 6+74.23
PT STA 8+40.00
℄ CONST BRISSON AVE
TYPE F CURB & GUTTER
WETLAND BOUNDARY (TYP)
R/W LINE
S-213
RETURN NO 2
RETURN NO 1
R/W LINE
50'
26'

BEGIN CONSTRUCTION
CONNECT TO EXISTING
STA 4+31.14
℄ CONST
BRISSON AVE

CURVE NO 40
PI STA 5+15.97
Δ = 4°59'49" (LT)
D = 3°00'00"
T = 83.33'
L = 166.56'
R = 1909.86
PC STA 4+32.64
PT STA 5+99.20
e = NC

CURVE NO 41
PI STA 7+57.17
Δ = 4°58'23" (RT)
D = 3°00'00"
T = 82.94'
L = 165.77'
R = 1909.86'
PC STA 6+74.23
PT STA 8+40.00
e = NC

CURVE NO 42
PI STA 5+55.81, 12.50' RT
Δ = 4°59'49" (LT)
D = 3°00'00"
T = 83.33'
L = 166.56'
R = 1909.85'
PC STA 4+73.01, 8.93' RT
PT STA 6+38.86, 12.00' RT
e = NC

CD-07_EX

STA 10+00.00
℄ CONST
BRISSON AVE =
STA 96+28.52
℄ CONST & ℄ SURVEY
EAST LAKE MARY BLVD

0 10 40
Feet

BEGIN PROFILE
CONNECT TO EXISTING
STA 4+31.14
℄ CONST
BRISSON AVE

END PROFILE
STA 9+55.12
℄ CONST
BRISSON AVE
EL 35.90

100' V.C.
200' V.C.
PGL
S-209
(+) 1.000%
(+) 4.153%
(-) 1.160%
PI +55.12 EL. 37.06
+55.12 EL. 30.33
+55.12 EL. 32.91
+50.00 EL 27.0
EXISTING GROUND ℄ CONST
(+) 0.94%
+31.14 EL 24.0
SPECIAL LEFT DITCH
FL 24.24
FL 20.86
28.78 29.78 31.10 30.33 30.68 31.10 31.64 32.31 32.91 33.11 33.86 34.50 35.04 35.48 35.80 36.02 36.14 36.14 36.05 35.90 34.50 36.14

SCALE: 1"=40' HORIZ
1"=4' VERT

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

EARTH TECH
30 SOUTH KELLER ROAD, SUITE 500, ORLANDO, FL 32810
407.660.1719
CERTIFICATE OF AUTHORIZATION NO. 8115

SEMINOLE COUNTY
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

ROAD NO.	COUNTY	PROJECT NO
	SEMINOLE	PS-0137

BRISSON AVE
PLAN AND PROFILE

SHEET NO. 29

03/25/2002 04:30:35 PM G:\46547\CADD\roadway\sheet\PLPRRD27.dgn

	STRUCTURE NO.	STATION	DESIGN FLOOD		BASE FLOOD		OVERTOPPING FLOOD				GREATEST FLOOD			
			2% PROB.	50 YR.FREQ.	1% PROB.	100 YR.FREQ.								
			DISCHARGE	STAGE	DISCHARGE	STAGE	DISCHARGE	STAGE	PROB. %	FREQ. YR.	DISCHARGE	STAGE	PROB. %	FREQ. YR.
CD-05_EX	X-1L	22+00.00	60.31	32.30	69.32	32.38					88.20	32.60	0.2	500
CD-06_EX	X-2L	93+00.00	46.60	32.40	50.00	32.50					53.40	32.70	0.2	500
CD-07_EX	S-213	96+20.00	60.00	30.68	67.00	30.90					89.10	31.65	0.2	500

NOTE: THE HYDRAULIC DATA IS SHOWN FOR INFORMATIONAL PURPOSES ONLY, TO INDICATE THE FLOOD DISCHARGES AND WATER SURFACE ELEVATIONS WHICH MAY BE ANTICIPATED IN ANY GIVEN YEAR. THIS DATA WAS GENERATED USING HIGHLY VARIABLE FACTORS DETERMINED BY A STUDY OF THE WATERSHED. MANY JUDGEMENTS AND ASSUMPTIONS ARE REQUIRED TO ESTABLISH THESE FACTORS. THE RESULTANT HYDRAULIC DATA IS SENSITIVE TO CHANGES, PARTICULARLY OF ANTECEDENT CONDITIONS, URBANIZATION, CHANNELIZATION, AND LAND USE. USERS OF THIS DATA ARE CAUTIONED AGAINST THE ASSUMPTION OF PRECISION WHICH CAN NOT BE ATTAINED. DISCHARGES ARE IN CUBIC FEET PER SECOND AND STAGES ARE IN FEET, NGVD, 1929.

DEFINITIONS:

DESIGN FLOOD: THE FLOOD SELECTED BY F.D.O.T. TO BE UTILIZED TO ASSURE A STANDARD LEVEL OF HYDRAULIC PERFORMANCE.

BASE FLOOD: THE FLOOD HAVING A 1% CHANCE OF BEING EXCEEDED IN ANY YEAR. (100 YR. FREQUENCY)

OVERTOPPING FLOOD: THE FLOOD WHERE FLOW OCCURS (A) OVER THE HIGHWAY (B) OVER A WATERSHED DIVIDE OR (C) THRU EMERGENCY RELIEF STRUCTURES.

GREATEST FLOOD: THE MOST SEVERE FLOOD WHICH CAN BE PREDICTED WHERE OVERTOPPING IS NOT PRACTICABLE, NORMALLY ONE WITH A 0.2% CHANCE OF BEING EXCEEDED IN ANY YEAR. (500 YR. FREQUENCY)

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

EARTH TECH
30 SOUTH KELLER ROAD, SUITE 500, ORLANDO, FL 32810
407.660.1719
CERTIFICATE OF AUTHORIZATION NO. 8115

SEMINOLE COUNTY
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

ROAD NO.	COUNTY	PROJECT NO
	SEMINOLE	PS-0137

FLOOD DATA

SHEET NO. 5

CROSS DRAIN CD-08_EX

DRAINAGE CALCULATIONS
AND
PERMITTING NARRATIVE

FOR

EAST LAKE MARY BLVD. SEGMENT IIB

Prepared For:
Seminole County
Public Works Department
Engineering Division

SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

Prepared By:
Earth Tech Consulting, Inc.
30 South Keller Road, Suit 500
Orlando, Florida 32810

EARTH TECH
A tyco INTERNATIONAL LTD. COMPANY

Robert C. Alderman
#47613
8-29-02

August 23, 2002

X-4

Seminole County
East Lake Mary Blvd.

EARTH TECH

BOX CULVERT ANALYSIS
COMPUTATION OF CULVERT PERFORMANCE CURVE

July 30, 2002

X-4 50 yr

PROGRAM INPUT DATA

DESCRIPTION	VALUE
Culvert Span (ft)	10.0
Culvert Rise (ft)	6.0
FHWA Chart Number	8
FHWA Scale Number (Type of Culvert Entrance)	3
Manning's Roughness Coefficient (n-value)	0.012
Entrance Loss Coefficient of Culvert Opening	0.5
Culvert Length (ft)	130.0
Invert Elevation at Downstream end of Culvert (ft)	19.0
Invert Elevation at Upstream end of Culvert (ft)	19.01
Culvert Slope (ft/ft)	0.0001
Starting Flow Rate (cfs)	307.0
Incremental Flow Rate (cfs)	0.0
Ending Flow Rate (cfs)	307.0
Starting Tailwater Depth (ft)	2.3
Incremental Tailwater Depth (ft)	0.0
Ending Tailwater Depth (ft)	2.3

COMPUTATION RESULTS

Flow Rate (cfs)	Tailwater Depth (ft)	Headwater (ft) Inlet Control	Headwater (ft) Outlet Control	Normal Depth (ft)	Critical Depth (ft)	Depth at Outlet (ft)	Outlet Velocity (fps)
307.0	2.3	5.26	5.34	6.0	3.08	3.08	9.96

24,34

BOX CULVERT ANALYSIS
COMPUTATION OF CULVERT PERFORMANCE CURVE

July 30, 2002

X-4 100 yr

PROGRAM INPUT DATA

DESCRIPTION	VALUE
Culvert Span (ft)	10.0
Culvert Rise (ft)	6.0
FHWA Chart Number	8
FHWA Scale Number (Type of Culvert Entrance)	3
Manning's Roughness Coefficient (n-value)	0.012
Entrance Loss Coefficient of Culvert Opening	0.5
Culvert Length (ft)	130.0
Invert Elevation at Downstream end of Culvert (ft)	19.0
Invert Elevation at Upstream end of Culvert (ft)	19.01
Culvert Slope (ft/ft)	0.0001
Starting Flow Rate (cfs)	340.0
Incremental Flow Rate (cfs)	0.0
Ending Flow Rate (cfs)	340.0
Starting Tailwater Depth (ft)	2.5
Incremental Tailwater Depth (ft)	0.0
Ending Tailwater Depth (ft)	2.5

COMPUTATION RESULTS

Flow Rate (cfs)	Tailwater Depth (ft)	Headwater (ft) Inlet Control	Headwater (ft) Outlet Control	Normal Depth (ft)	Critical Depth (ft)	Depth at Outlet (ft)	Outlet Velocity (fps)
340.0	2.5	5.64	5.71	6.0	3.3	3.3	10.3

24.71

BOX CULVERT ANALYSIS
COMPUTATION OF CULVERT PERFORMANCE CURVE

July 30, 2002

X-4 500 yr

PROGRAM INPUT DATA

DESCRIPTION	VALUE
Culvert Span (ft)	10.0
Culvert Rise (ft)	6.0
FHWA Chart Number	8
FHWA Scale Number (Type of Culvert Entrance)	3
Manning's Roughness Coefficient (n-value)	0.012
Entrance Loss Coefficient of Culvert Opening	0.5
Culvert Length (ft)	130.0
Invert Elevation at Downstream end of Culvert (ft)	19.0
Invert Elevation at Upstream end of Culvert (ft)	19.01
Culvert Slope (ft/ft)	0.0001
Starting Flow Rate (cfs)	407.0
Incremental Flow Rate (cfs)	0.0
Ending Flow Rate (cfs)	407.0
Starting Tailwater Depth (ft)	3.5
Incremental Tailwater Depth (ft)	0.0
Ending Tailwater Depth (ft)	3.5

COMPUTATION RESULTS

Flow Rate (cfs)	Tailwater Depth (ft)	Headwater (ft) Inlet Control	Headwater (ft) Outlet Control	Normal Depth (ft)	Critical Depth (ft)	Depth at Outlet (ft)	Outlet Velocity (fps)
407.0	3.5	6.37	6.43	6.0	3.72	3.72	10.94

25.43

EARTH TECH

tyco

46547

CLIENT Seminole County — Calculations for — MS

PROJECT ELM Crossing — Proposed Cross Drain at Sta. (Navy Canal)

The proposed cross drain will be located at Kentucky Ave. at Navy Canal.

The following data was obtained from the Four Corners Flood Plain Management Study, performed in 1994

Frequency	Peak Elevation (ft)	Discharge (cfs)
25-YEAR	21.1	800
100-YEAR	21.5	1021
500-YEAR	22.5	1475

The Peak Elevation and discharge for 50-YEAR frequency were interpolated between 25-YEAR and 100-YEAR data

50-YEAR 21.3 ft 920 cfs

Calculations from 1994

CROSS DRAIN CD-09_EX

DRAINAGE CALCULATIONS
AND
PERMITTING NARRATIVE

FOR

EAST LAKE MARY BLVD. SEGMENT IIB

Prepared For:
Seminole County
Public Works Department
Engineering Division

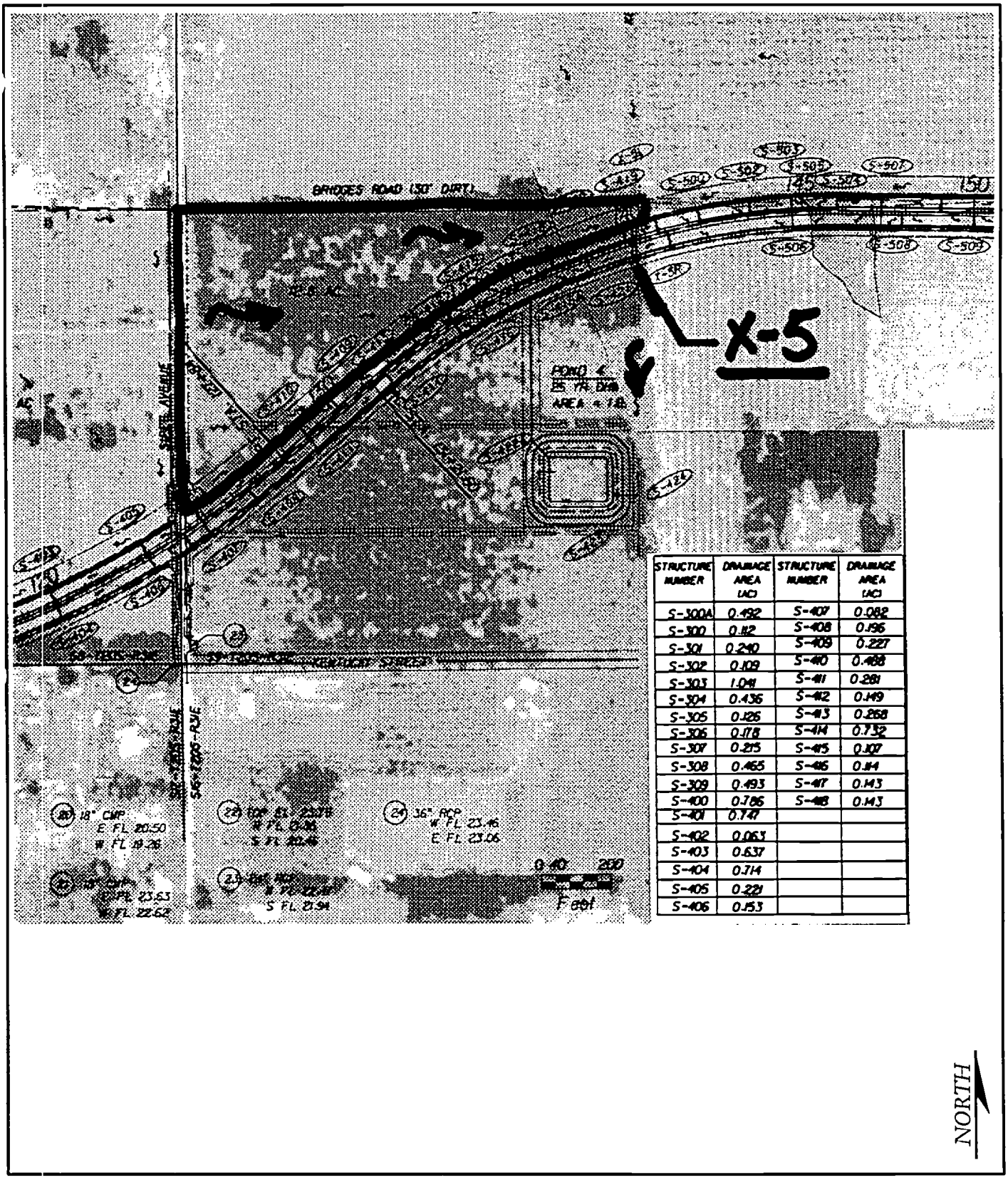
SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

Prepared By:
Earth Tech Consulting, Inc.
30 South Keller Road, Suit 500
Orlando, Florida 32810

EARTH TECH
A tyco INTERNATIONAL LTD. COMPANY

Robert C. Alderman
#47613
8-29-02

August 23, 2002



STRUCTURE NUMBER	DRAINAGE AREA (AC)	STRUCTURE NUMBER	DRAINAGE AREA (AC)
S-300A	0.492	S-407	0.082
S-300	0.112	S-408	0.196
S-301	0.240	S-409	0.227
S-302	0.109	S-410	0.488
S-303	1.041	S-411	0.281
S-304	0.436	S-412	0.149
S-305	0.126	S-413	0.268
S-306	0.178	S-414	0.732
S-307	0.215	S-415	0.107
S-308	0.465	S-416	0.114
S-309	0.493	S-417	0.143
S-400	0.786	S-418	0.143
S-401	0.747		
S-402	0.063		
S-403	0.637		
S-404	0.714		
S-405	0.221		
S-406	0.153		

X-5

Seminole County
East Lake Mary Blvd.

EARTH TECH

BOX CULVERT ANALYSIS
COMPUTATION OF CULVERT PERFORMANCE CURVE

July 30, 2002

X-5 50 yr

PROGRAM INPUT DATA

DESCRIPTION	VALUE
Culvert Span (ft)	10.0
Culvert Rise (ft)	3.5
FHWA Chart Number	8
FHWA Scale Number (Type of Culvert Entrance)	3
Manning's Roughness Coefficient (n-value)	0.012
Entrance Loss Coefficient of Culvert Opening	0.5
Culvert Length (ft)	133.0
Invert Elevation at Downstream end of Culvert (ft)	21.5
Invert Elevation at Upstream end of Culvert (ft)	21.6
Culvert Slope (ft/ft)	0.0008
Starting Flow Rate (cfs)	148.0
Incremental Flow Rate (cfs)	0.0
Ending Flow Rate (cfs)	148.0
Starting Tailwater Depth (ft)	2.9
Incremental Tailwater Depth (ft)	0.0
Ending Tailwater Depth (ft)	2.9

COMPUTATION RESULTS

Flow Rate (cfs)	Tailwater Depth (ft)	Headwater (ft) Inlet Control	Headwater (ft) Outlet Control	Normal Depth (ft)	Critical Depth (ft)	Depth at Outlet (ft)	Outlet Velocity (fps)
148.0	2.9	3.24	3.51	2.91	1.9	2.9	5.1

25.01

BOX CULVERT ANALYSIS
COMPUTATION OF CULVERT PERFORMANCE CURVE

July 30, 2002

X-5 100yr

PROGRAM INPUT DATA

DESCRIPTION	VALUE
Culvert Span (ft)	10.0
Culvert Rise (ft)	3.5
FHWA Chart Number	8
FHWA Scale Number (Type of Culvert Entrance)	3
Manning's Roughness Coefficient (n-value)	0.012
Entrance Loss Coefficient of Culvert Opening	0.5
Culvert Length (ft)	133.0
Invert Elevation at Downstream end of Culvert (ft)	21.5
Invert Elevation at Upstream end of Culvert (ft)	21.6
Culvert Slope (ft/ft)	0.0008
Starting Flow Rate (cfs)	164.0
Incremental Flow Rate (cfs)	0.0
Ending Flow Rate (cfs)	164.0
Starting Tailwater Depth (ft)	3.0
Incremental Tailwater Depth (ft)	0.0
Ending Tailwater Depth (ft)	3.0

COMPUTATION RESULTS

Flow Rate (cfs)	Tailwater Depth (ft)	Headwater (ft) Inlet Control	Headwater (ft) Outlet Control	Normal Depth (ft)	Critical Depth (ft)	Depth at Outlet (ft)	Outlet Velocity (fps)
164.0	3.0	3.47	3.71	3.12	2.03	3.0	5.47

25.21

BOX CULVERT ANALYSIS
COMPUTATION OF CULVERT PERFORMANCE CURVE

July 30, 2002

X-5 500 yr

PROGRAM INPUT DATA

DESCRIPTION	VALUE
Culvert Span (ft)	10.0
Culvert Rise (ft)	3.5
FHWA Chart Number	8
FHWA Scale Number (Type of Culvert Entrance)	3
Manning's Roughness Coefficient (n-value)	0.012
Entrance Loss Coefficient of Culvert Opening	0.5
Culvert Length (ft)	133.0
Invert Elevation at Downstream end of Culvert (ft)	21.5
Invert Elevation at Upstream end of Culvert (ft)	21.6
Culvert Slope (ft/ft)	0.0008
Starting Flow Rate (cfs)	196.0
Incremental Flow Rate (cfs)	0.0
Ending Flow Rate (cfs)	196.0
Starting Tailwater Depth (ft)	3.5
Incremental Tailwater Depth (ft)	0.0
Ending Tailwater Depth (ft)	3.5

COMPUTATION RESULTS

Flow Rate (cfs)	Tailwater Depth (ft)	Headwater (ft) Inlet Control	Headwater (ft) Outlet Control	Normal Depth (ft)	Critical Depth (ft)	Depth at Outlet (ft)	Outlet Velocity (fps)
196.0	3.5	3.91	4.32	3.5	2.29	3.5	5.6

25.82

EARTH TECH

tyco

CLIENT Seminole County — Calculations for
PROJECT East Lake Mary Blvd. Proposed Cross Drain
Engineer: EB — Sta. 15+19
(Kentucky Ditch)

Calculations from 1994

The proposed Cross Drain will be Located at 1419 ft downstream of Marguette Road at Kentucky Ditch.

The following data was obtained from Lake Jesup Basin Drainage Study, performed in 1994.

Frequency	Peak Elevation (ft)	Discharge (cfs)
25-YEAR	24.3	82
100-YEAR	24.5	104
500-YEAR	25.2	148

The Peak Elevation and discharge for 50-YEAR frequency was interpolated between 25-YEAR and 100-YEAR data.

50-YEAR	24.4 ft	94 cfs

Per Seminole Co. review and CDM model:

Q_{50} → 148 cfs (Per Ed Torres June 17, 2002)

ANOTHER PERMIT INFORMATION

CYCORP ENGINEERING INC.
1614 White Dove Dr. Winter Springs, FL 327708 Phone: 407-405-7819

Stormwater Calculations

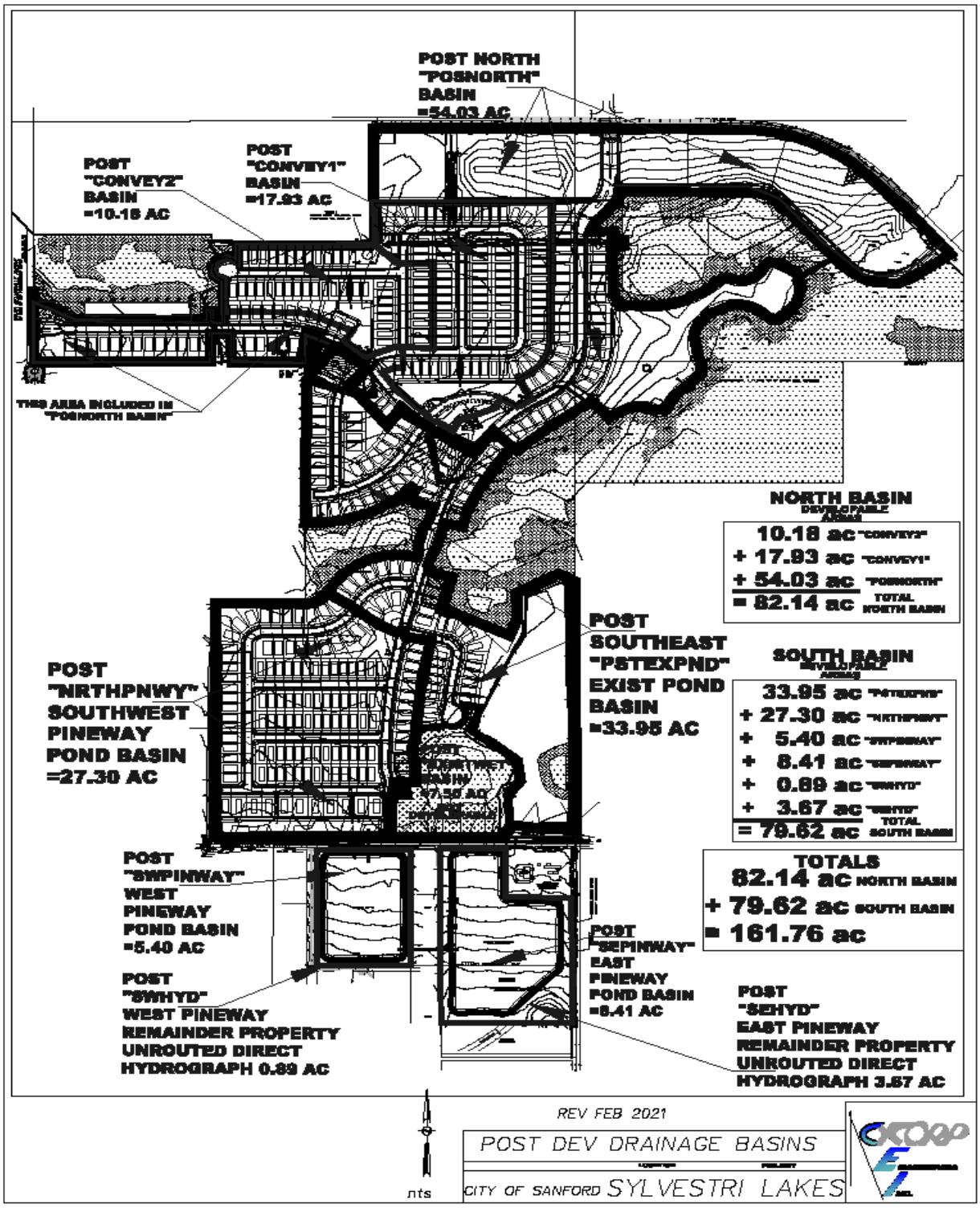
SYLVESTRI LAKES

City of Sanford

Prepared for:

Safari Investments, LLC **February 2021**

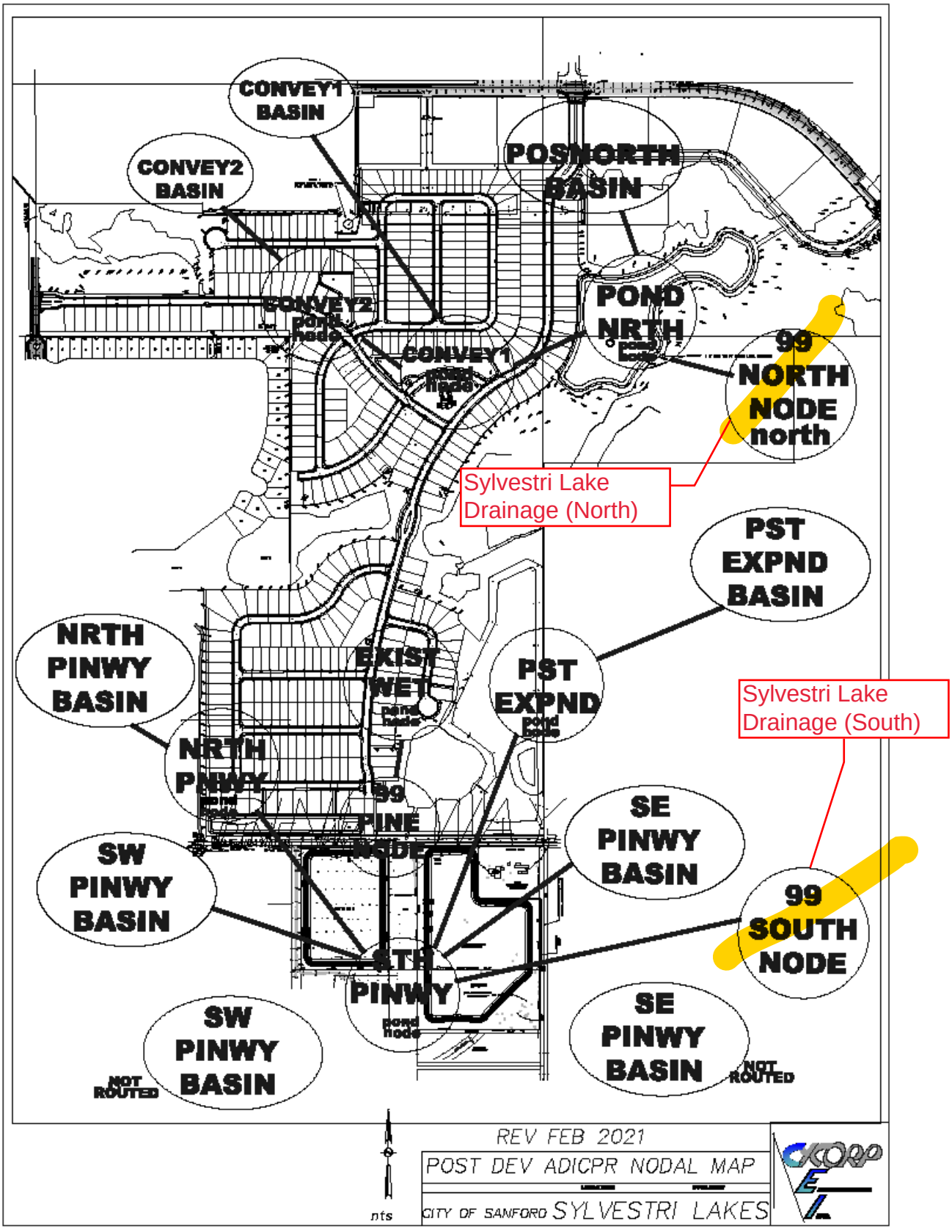
KIM ELBOHER
LICENSE
No. 68942
STATE OF FLORIDA
PROFESSIONAL ENGINEER

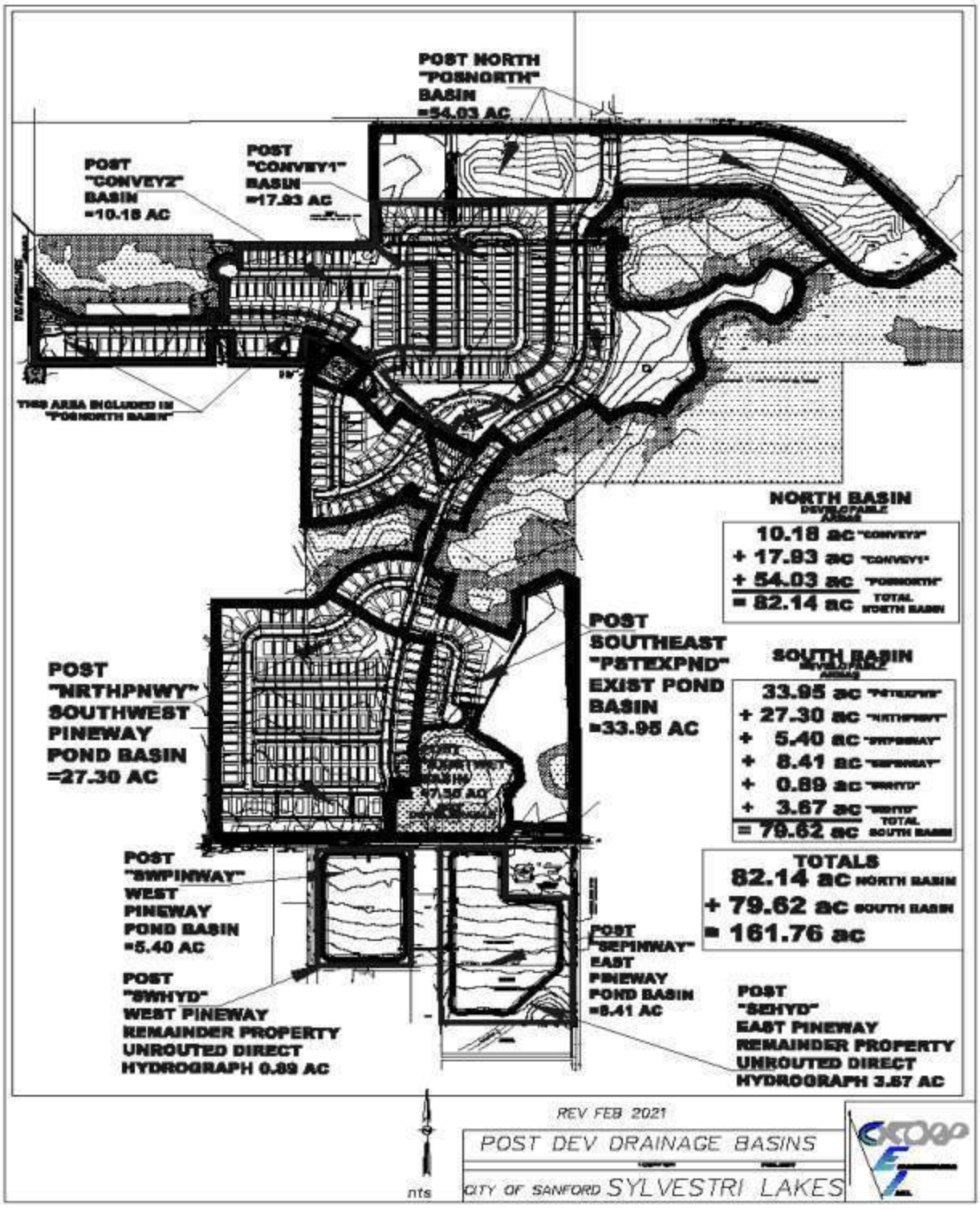


POST DEVELOPED MAP – also stand alone pdf

POST-DEVELOPMENT AdICPR

10 YEAR
25 YEAR
100 YEAR


CONVEY1 BASIN
CONVEY2 BASIN
POSNORTH BASIN
CONVEY2 pond node
CONVEY1 pond node
POND NRTH pond node
99 NORTH NODE north
Sylvestri Lake Drainage (North)
PST EXPND BASIN
NRTH PINWY BASIN
EXIST WET pond node
PST EXPND pond node
Sylvestri Lake Drainage (South)
NRTH PINWY pond node
99 PINE NODE
SE PINWY BASIN
SW PINWY BASIN
99 SOUTH NODE
STH PINWY pond node
SW PINWY BASIN NOT ROUTED
SE PINWY BASIN NOT ROUTED
nts
REV FEB 2021
POST DEV ADICPR NODAL MAP
CITY OF SANFORD SYLVESTRI LAKES


POST NORTH
"POSNORTH"
BASIN
=54.03 AC
POST
"CONVEY2"
BASIN
=10.18 AC
POST
"CONVEY1"
BASIN
=17.93 AC
THIS AREA INCLUDED IN
"POSNORTH BASIN"
NORTH BASIN
10.18 ac "CONVEY2"
+ 17.93 ac "CONVEY1"
+ 54.03 ac "POSNORTH"
= 82.14 ac TOTAL NORTH BASIN
POST
SOUTHEAST
"PSTEXPND"
EXIST POND
BASIN
=33.95 AC
SOUTH BASIN
33.95 ac "PSTEXPND"
+ 27.30 ac "NRTHPNWY"
+ 5.40 ac "SWPINWAY"
+ 8.41 ac "SEPINWAY"
+ 0.89 ac "SWHYD"
+ 3.67 ac "SEHYD"
= 79.62 ac TOTAL SOUTH BASIN
POST
"NRTHPNWY"
SOUTHWEST
PINEWAY
POND BASIN
=27.30 AC
POST
"SWPINWAY"
WEST
PINEWAY
POND BASIN
=5.40 AC
POST
"SWHYD"
WEST PINEWAY
REMAINDER PROPERTY
UNROUTED DIRECT
HYDROGRAPH 0.89 AC
TOTALS
82.14 ac NORTH BASIN
+ 79.62 ac SOUTH BASIN
= 161.76 ac
POST
"SEPINWAY"
EAST
PINEWAY
POND BASIN
=8.41 AC
POST
"SEHYD"
EAST PINEWAY
REMAINDER PROPERTY
UNROUTED DIRECT
HYDROGRAPH 3.67 AC
nts
REV FEB 2021
POST DEV DRAINAGE BASINS
CITY OF SANFORD SYLVESTRI LAKES

NORTH

Sylvestri Lake South Drainage

Advanced Interconnected Channel & Pond Routing (ICPR Ver 2.20) [1]
Copyright 1995, Streamline Technologies, Inc.

SYLVESTRI NORTH BASIN POST
FEB 20

********** Node Maximum Conditions - 25POS **********

(Time units - hours)

Node Name	Group Name	Max Time Conditions	Max Stage (ft)	Warning Stage (ft)	Max Delta Stage (ft)	Max Surface Area (sf)	Max Time Inflow	Max Inflow (cfs)	Max Time Outflow	Max Outflow (cfs)
99PINE	BASE	12.00	23.50	30.00	0.0000	0.00	13.75	2.89	0.00	0.00
99SOUTH	BASE	12.00	17.00	30.00	0.0001	0.00	16.92	18.79	0.00	0.00
EXISTWET	BASE	13.75	23.95	28.00	0.0004	142745.50	12.00	35.90	13.75	2.89
NRTHPNWY	BASE	12.44	22.85	28.00	0.0009	55721.95	12.08	102.54	12.31	62.85
PSTEXPND	BASE	12.74	24.78	29.00	0.0003	382548.48	12.08	127.52	12.74	40.59
STHPINWY	BASE	16.92	22.73	28.00	0.0003	534502.65	12.08	144.21	16.92	18.79

Advanced Interconnected Channel & Pond Routing (ICPR Ver 2.20) [1]
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SYLVESTRI NORTH BASIN POST
FEB 20

********** Node Maximum Conditions - MEANPOS **********

(Time units - hours)

Node Name	Group Name	Max Time Conditions	Max Stage (ft)	Warning Stage (ft)	Max Delta Stage (ft)	Max Surface Area (sf)	Max Time Inflow	Max Inflow (cfs)	Max Time Outflow	Max Outflow (cfs)
99PINE	BASE	12.00	23.50	30.00	0.0000	0.00	0.00	0.00	0.00	0.00
99SOUTH	BASE	12.00	17.00	30.00	0.0001	0.00	24.00	3.62	0.00	0.00
EXISTWET	BASE	24.00	23.59	28.00	0.0003	106869.83	12.00	14.97	0.00	0.00
NRTHPNWY	BASE	24.00	21.86	28.00	0.0003	48983.51	12.08	37.24	12.22	27.47
PSTEXPND	BASE	13.03	24.30	29.00	0.0001	375871.41	12.08	46.31	13.03	9.96
STHPINWY	BASE	24.00	21.86	28.00	0.0001	519357.51	12.08	61.29	24.00	3.62

Advanced Interconnected Channel & Pond Routing (ICPR Ver 2.20) [1]
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SYLVESTRI NORTH BASIN POST
FEB 20

********** Node Maximum Conditions - 10YRPOS **********

(Time units - hours)

Node Name	Group Name	Max Time Conditions	Max Stage (ft)	Warning Stage (ft)	Max Delta Stage (ft)	Max Surface Area (sf)	Max Time Inflow	Max Inflow (cfs)	Max Time Outflow	Max Outflow (cfs)
99PINE	BASE	12.00	23.50	30.00	0.0000	0.00	15.59	1.56	0.00	0.00
99SOUTH	BASE	12.00	17.00	30.00	0.0001	0.00	17.71	14.24	0.00	0.00
EXISTWET	BASE	15.59	23.90	28.00	0.0004	137646.75	12.00	30.77	15.59	1.56
NRTHPNWY	BASE	17.63	22.52	28.00	0.0008	53432.32	12.08	86.15	12.29	55.11
PSTEXPND	BASE	12.78	24.66	29.00	0.0002	380943.29	12.08	107.14	12.78	32.03
STHPINWY	BASE	17.71	22.51	28.00	0.0002	530674.41	12.08	123.94	17.71	14.24

Advanced Interconnected Channel & Pond Routing (ICPR Ver 2.20) [1]
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SYLVESTRI NORTH BASIN POST
FEB 20

********** Node Maximum Conditions - 100YRPOS **********

(Time units - hours)

Node Name	Group Name	Max Time Conditions	Max Stage (ft)	Warning Stage (ft)	Max Delta Stage (ft)	Max Surface Area (sf)	Max Time Inflow	Max Inflow (cfs)	Max Time Outflow	Max Outflow (cfs)
99PINE	BASE	12.00	23.50	30.00	0.0000	0.00	12.75	8.79	0.00	0.00
99SOUTH	BASE	12.00	17.00	30.00	0.0001	0.00	16.13	31.40	0.00	0.00
EXISTWET	BASE	12.75	24.12	28.00	0.0004	159399.04	12.00	48.17	12.75	8.79
NRTHPNWY	BASE	12.47	23.83	28.00	0.0013	62331.38	12.08	142.19	12.35	79.32
PSTEXPND	BASE	12.80	25.08	29.00	0.0004	386792.54	12.08	176.82	12.49	50.98
STHPINWY	BASE	16.13	23.27	28.00	0.0004	543734.40	12.08	192.49	16.13	31.40

South

Sylvestri Estates
Master Stormwater Management System
Calculations Report

January 13, 2016

SYLVESTRI LAKE NORTH DRAINAGE SYSTEM

Submitted To:
The City of Sanford
and
St. Johns River Water Management District

Prepared For

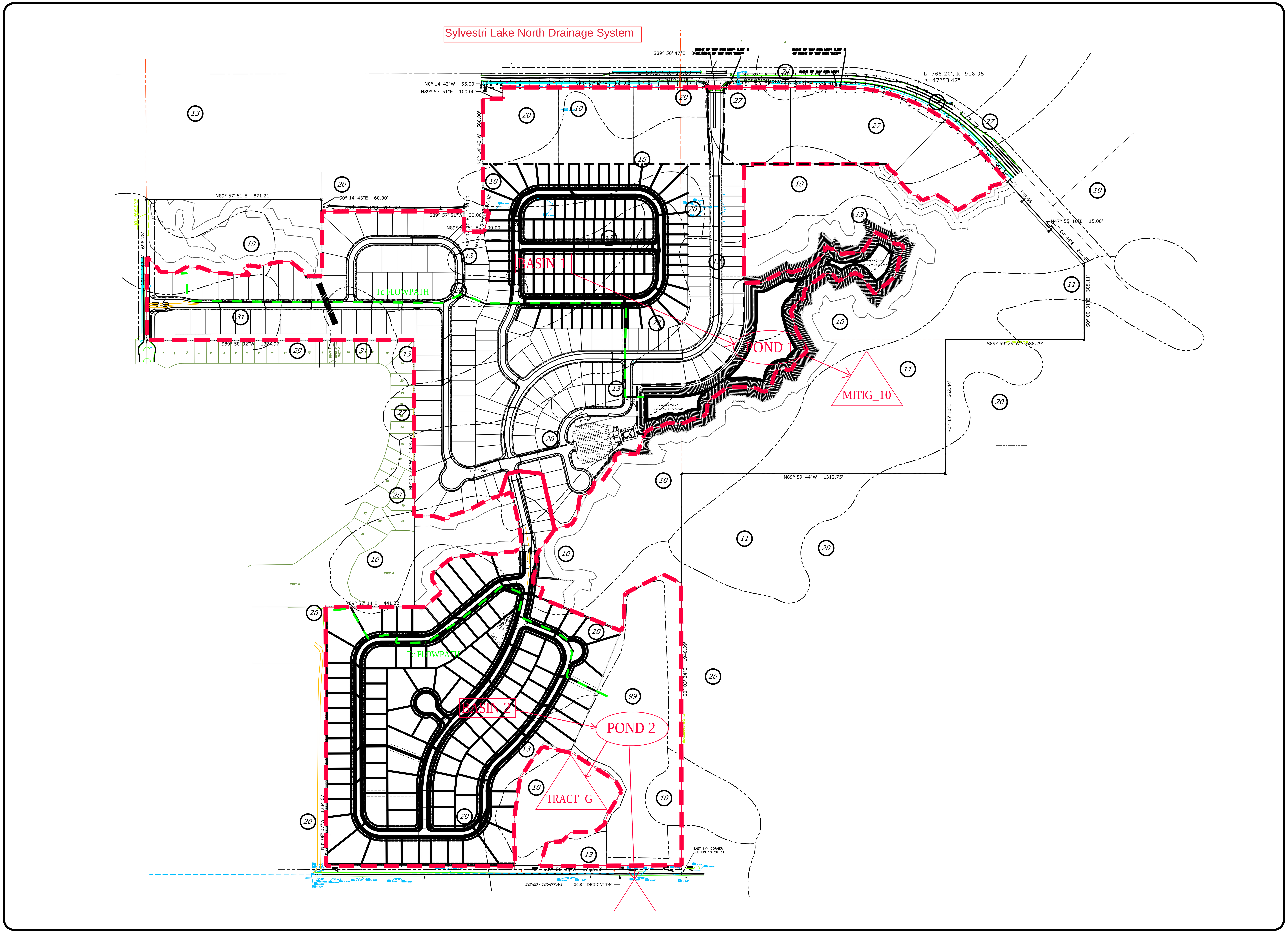
Safari Investments, LLC

By

EVANS ENGINEERING, INC.
CIVIL ENGINEERING LAND PLANNING PERMITTING SERVICES

Certificate of Authorization No. 6788

_____
David L. Evans, P.E.
Reg. # 46586
Date:_____



REVISIONS	DATE	BY

EVANS ENGINEERING, INC. CERTIFICATE OF AUTHORIZATION NO. 6788

DAVID M. KELLY
FLORIDA P.E. NO. 43325
DATE: Nov 20, 2015

EVANS ENGINEERING, INC.
CIVIL ENGINEERING · LAND PLANNING · PERMITTING SERVICES
719 IRMA AVENUE
ORLANDO, FLORIDA 32803
(407) 872-1515
www.evansengine.com
CERTIFICATE OF AUTHORIZATION NO. 00006788

SYLVESTRI ESTATES
FOR
SAFARI INVESTMENTS, LLC.
CITY OF SANFORD, FLORIDA

OVERALL DRAINAGE BASIN MAP

DRAWN: **DMK**
CHECKED: **DMK**
DATE: **OCTOBER 2015**
SCALE:
JOB #: **24801**
SHEET #:

Routing Analysis

ROUTING INPUT

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
Mitig_10	Post	Post 10 24	0.00	31.00	31.00	0.0000	0	14.36	49.36	0.00	0.00
Pineway	Post	Post 10 24	0.00	22.00	22.00	0.0000	0	0.00	0.00	0.00	0.00
Pond 1	Post	Post 10 24	14.36	37.64	40.00	0.0047	253368	12.33	205.33	14.36	49.36
Pond 2	Post	Post 10 24	20.20	26.48	27.50	0.0017	406553	12.17	133.62	20.20	6.38
Tract_G	Post	Post 10 24	0.00	24.00	24.00	0.0000	0	20.20	6.38	0.00	0.00
Mitig_10	Post	Post 100 24	0.00	31.00	31.00	0.0000	0	12.98	198.24	0.00	0.00
Pineway	Post	Post 100 24	0.00	22.00	22.00	0.0000	0	0.00	0.00	0.00	0.00
Pond 1	Post	Post 100 24	12.98	38.51	40.00	0.0050	267684	12.25	325.16	12.98	198.24
Pond 2	Post	Post 100 24	15.12	27.30	27.50	0.0021	417972	12.25	208.34	15.12	21.57
Tract_G	Post	Post 100 24	0.00	24.00	24.00	0.0000	0	15.12	21.57	0.00	0.00
Mitig_10	Post	Post 25 24	0.00	31.00	31.00	0.0000	0	14.15	66.99	0.00	0.00
Pineway	Post	Post 25 24	0.00	22.00	22.00	0.0000	0	0.00	0.00	0.00	0.00
Pond 1	Post	Post 25 24	14.15	38.20	40.00	0.0050	262489	12.33	242.86	14.15	66.99
Pond 2	Post	Post 25 24	17.34	26.72	27.50	0.0019	409869	12.17	156.12	17.34	10.33
Tract_G	Post	Post 25 24	0.00	24.00	24.00	0.0000	0	17.34	10.33	0.00	0.00
Mitig_10	Post	Post MA	0.00	31.00	31.00	0.0000	0	17.74	8.17	0.00	0.00
Pineway	Post	Post MA	0.00	22.00	22.00	0.0000	0	0.00	0.00	0.00	0.00
Pond 1	Post	Post MA	17.74	35.89	40.00	0.0026	225120	12.33	100.04	17.74	8.17
Pond 2	Post	Post MA	24.00	25.56	27.50	0.0009	393526	12.33	70.01	0.00	0.00
Tract_G	Post	Post MA	0.00	24.00	24.00	0.0000	0	0.00	0.00	0.00	0.00

FLOW CONVEYED FROM CD-03A_EX AND CD-03B_EX TO WETLAND EAST OF SYLVESTRI LAKE

4-117-0317 AM

ENVIRONMENTAL ANALYSIS
of
THE SILVER LAKES INDUSTRIAL PARK, INC.
SEMINOLE COUNTY, FLORIDA

MSSW PERMIT NO. 4-117-0137
MODIFICATION

ADDENDUM NO. 1

Submitted to:

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
618 East South Street
Orlando, Florida 32801

Prepared by:

THE LAND PLANNING GROUP, INC.
1755 U.S. New Highway 441, West
Mount Dora, Florida 32757

October, 1992

DONALD W. MCINTOSH ASSOCIATES, INC.
ENGINEERS PLANNERS SURVEYORS
2200 PARK AVENUE NORTH, WINTER PARK, FLORIDA 32789 (407) 644-4068

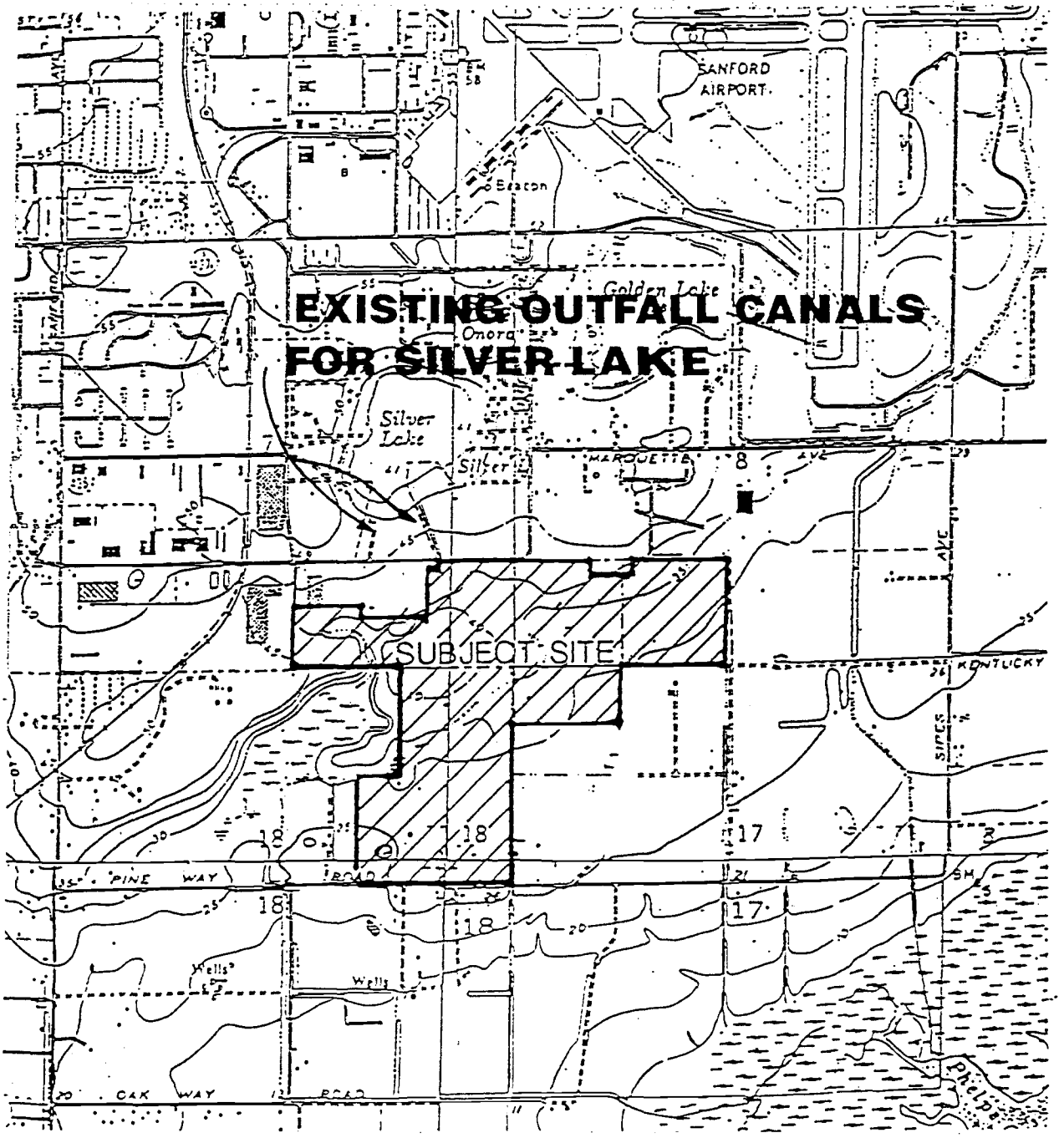
BY KW DATE 8/91
CK. _____ DATE _____
NO. _____
SHEET G-2 OF _____
MOD 10-92

PROJECT SILVER LAKES INDUSTRIAL PARK

SUBJECT _____

CASSELBERRY QUADRANGLE
OSTEEN QUADRANGLE
SANFORD QUADRANGLE
OVIEDO QUADRANGLE
FLORIDA—SEMINOLE CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)

LAT.28°45'20"
LONG.81°15'00"
S7,8,17 & 18,T20S,R31E



EXISTING OUTFALL CANALS FOR SILVER LAKE

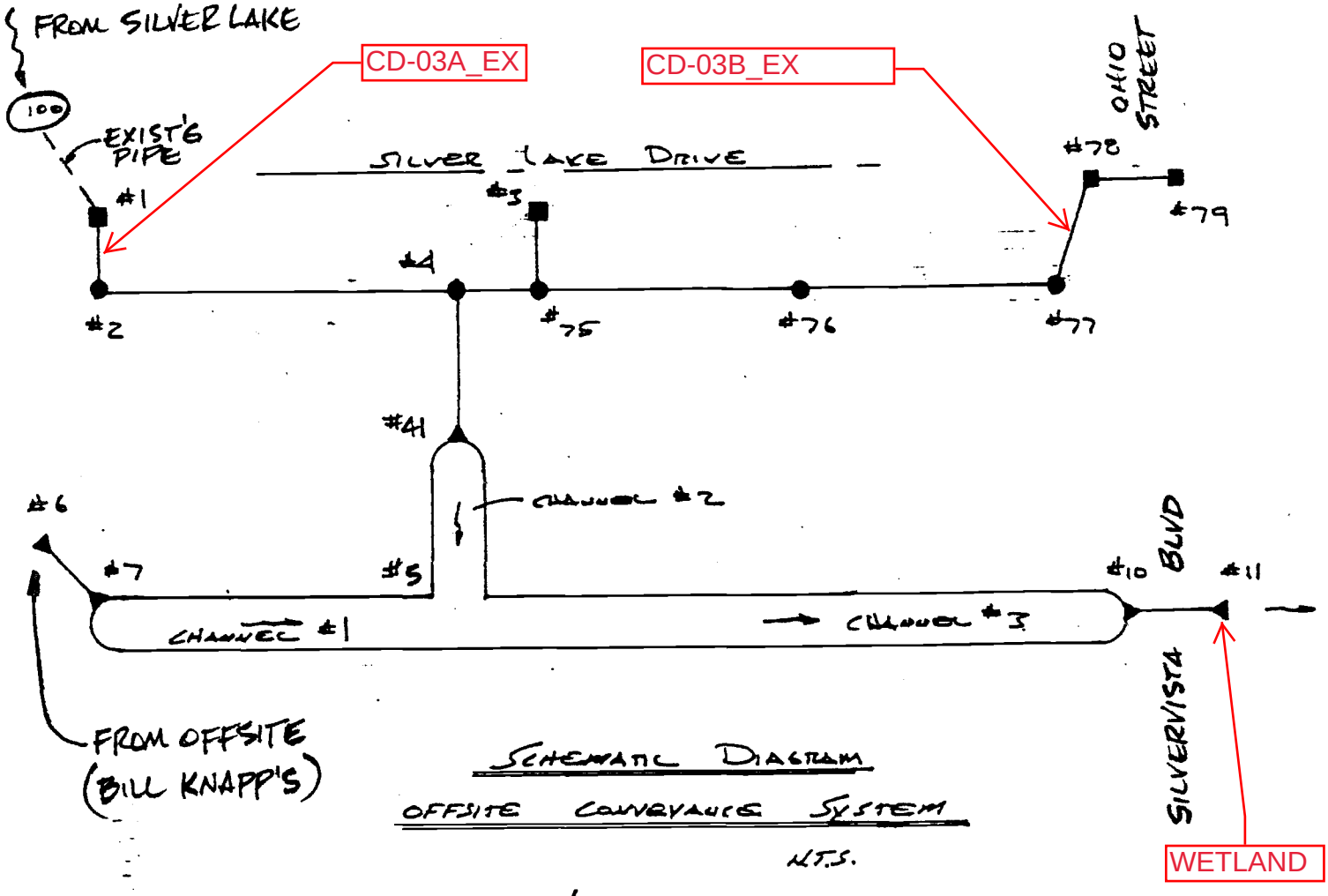
QUADRANGLE LOCATION

SCALE 1:24 000

1 0 1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 0 1 KILOMETER

DONALD W. McINTOSH ASSOCIATES, INC.
ENGINEERS PLANNERS SURVEYORS
2200 PARK AVENUE NORTH, WINTER PARK, FLORIDA 32789 (407) 644-4068

BY KW DATE 8/91
CK. _____ DATE _____
PROJECT _____
NO. 90197
SUBJECT COLLECTION SYSTEM - OFFSITE
SHEET G-3 OF 1
MOD 10/92



SCHEMATIC DIAGRAM
OFFSITE CONVEYANCE SYSTEM
N.T.S.

SEE SH'T G-11 FOR CHANNEL SECTIONS

G-12
MOD.
10/92

HYDRAULIC NETWORK ANALYSIS AND DESIGN
(C) Copyright 1983, Peter J. Singhofen, P.E.

= NODE DATA = **25-YEAR FLOWS**

NODE	X	Y	QTOT	GRND	TW
100	0.00	0.00	40.70	44.00	-999.00
1	0.00	0.00	42.70	43.00	-999.00
79	0.00	0.00	13.20	44.20	-999.00
2	0.00	0.00	42.70	42.50	-999.00
78	0.00	0.00	19.60	44.30	-999.00
77	0.00	0.00	19.60	43.00	-999.00
76	0.00	0.00	19.60	43.00	-999.00
3	0.00	0.00	3.50	43.70	-999.00
75	0.00	0.00	20.00	43.00	-999.00
4	0.00	0.00	61.40	43.00	-999.00
41	0.00	0.00	61.40	42.00	-999.00
5	0.00	0.00	82.50	40.00	-999.00
6	0.00	0.00	7.90	42.00	-999.00
7	0.00	0.00	13.20	42.00	-999.00
10	0.00	0.00	82.50	40.60	-999.00
11	0.00	0.00	82.50	40.60	37.20

= NODE DATA = **10-YEAR**

NODE	X	Y	QTOT	GRND	TW
100	0.00	0.00	40.70	44.00	-999.00
1	0.00	0.00	42.50	43.00	-999.00
79	0.00	0.00	10.80	44.20	-999.00
2	0.00	0.00	42.50	42.50	-999.00
78	0.00	0.00	16.80	44.30	-999.00
77	0.00	0.00	16.80	43.00	-999.00
76	0.00	0.00	16.80	43.00	-999.00
3	0.00	0.00	3.20	43.70	-999.00
75	0.00	0.00	17.40	43.00	-999.00
4	0.00	0.00	60.50	43.00	-999.00
41	0.00	0.00	60.50	42.00	-999.00
5	0.00	0.00	80.40	40.00	-999.00
6	0.00	0.00	7.90	42.00	-999.00
7	0.00	0.00	12.70	42.00	-999.00
10	0.00	0.00	80.40	40.60	-999.00
11	0.00	0.00	80.40	40.60	37.20

GENERAL CONSTRUCTION NOTES

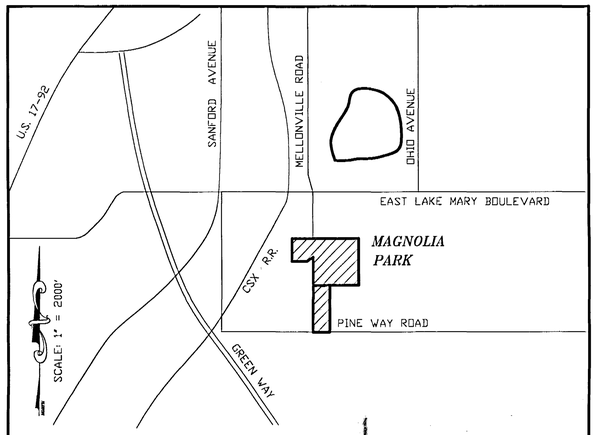
1. ALL SITE WORK CONSTRUCTION SHALL COMPLY WITH APPLICABLE CITY OF SANFORD AND FDOT SPECIFICATIONS
2. THE CONTRACTOR SHALL NOTIFY THE OWNERS OF ALL UTILITIES TO LOCATE AND MARK THE LOCATION OF THEIR UTILITIES. SUCH NOTIFICATION INCLUDES CITY OF SANFORD FOR EXACT LOCATION AND INVERT ELEVATION OF SANITARY SEWER MAINS, GAS MAINS, WATER MAINS AND FORCE MAINS, VALVES, ETC. ADJACENT TO THE CONSTRUCTION SITE.
3. EXISTING TOPOGRAPHY WAS FURNISHED BY OTHERS AND IS BELIEVED TO BE ACCURATE. HOWEVER THE CONTRACTOR SHALL VERIFY ALL PERTINENT FEATURES WHICH MAY AFFECT HIS BID PRIOR TO BIDDING THE PROJECT. DISCREPANCIES NOTED DURING CONSTRUCTION WILL NOT BE CONSIDERED CAUSE FOR EXTRA PAYMENT ON ANY OF THE PAY ITEMS IN THE CONTRACT.
4. CONTRACTOR SHALL IMMEDIATELY NOTIFY DESIGN ENGINERER OF ANY DISCREPANCIES FOUND ON THE PLANS.
5. ANY PUBLIC LAND CORNER WITHIN THE LIMITS OF CONSTRUCTION IS TO BE PROTECTED. IF A CORNER MONUMENT IS IN DANGER OF BEING DESTROYED AND HAS NOT BEEN PROPERLY REFERENCED, THE CONTRACTOR SHOULD NOTIFY THE COUNTY 'S LOCATION SURVEYOR SUREYOR WITHOUT DELAY BY TELEPHONE.
6. MAINTENANCE OF TRAFFIC WILL BE IN ACCORDANCE WITH THE "MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS" AND THE F.D.O.T. "ROADWAY AND YRAFFIC DESIGN STANDARDS" DATED JANUARY, 1992.
7. THERE SHALL BE ONE COMPACTION TEST PER 2500 S.F. (OR PORTION THEREOF) OF PAVEMENT. COMPACTION REQUIREMENTS FOR PIPE BEDS SHALL BE 95% OF MAXIMUM DRY DENSITY FOR UNPAVED AREAS AND 98% FOR PAVED AREAS.
8. UPON COMPLETION OF CONSTRUCTION, CITY OF SANFORD AND THE ENGINEER OF RECORD SHALL BE NOTIFIED IN WRITING FOR FINAL INSPECTION.
9. TEMPORARY DRAINAGE SHALL BE PROVIDED DURING CONSTRUCTION TO ELIMINATE ANY FLOODING OF PRIVATE PROPERTY.
10. UNSTABLE MATERIALS SHALL BE REMOVED FROM CONSTRUCTION AREAS AND BACK FILLED WITH SUITABLE MATERIALS.
11. CONSTRUCTION SHALL INCLUDE REPLACING WITH MATCHING MATERIALS. THE DRIVEWAYS, WALKS, CURBS AND LANDSCAPING THAT ARE DAMAGED OR REMOVED DUE TO CONSTRUCTION. THIS WORK SHALL BE COORDINATED WITH THE AFFECTED PROPERTY OWNERS.
12. ALL STORM SEWER LINES AND INLETS SHALL BE CLEANED OF DEBRIS AND ERODED MATERIALS AT LAST STAGES OF CONSTRUCTION.
13. ANY DRAINAGE PROBLEMS CREATED BY CONSTRUCTION, OR EXISTING BEFORE CONSTRUCTION AND NOT ALLEVIATED, SHOULD BE BROUGHT TO THE ATTENTION OF THE CITY, AND THE PROJECT ENGINEER.
14. THE CONTRACTOR SHALL TAKE PRECAUTIONS TO PROTECT EXISTING TREES SHOWN "TO REMAIN" ON THE PLANS.
15. PRIOR TO FINAL CERTIFICATION, THE CONTRACTOR SHALL PROVIDE THE PROJECT ENGINEER FIVE (5) COPIES OF "AS-BUILT" PRINTS OF THE RECORD DRAWINGS, CLEARLY INDICATING ANY AND ALL CHANGES MADE, AND SIGNED AND SEALED BY A FLORIDA REGISTERED LAND SURVEYOR, AND ONE MYLAR REPRODUCTBLE COPY OF THE "AS-BUILT" DRAWINGS.

MASTER PLAN FOR

MAGNOLIA PARK, P.D.

A PLANNED RESIDENTIAL DEVELOPMENT IN THE

CITY OF SANFORD, FLORIDA



LOCATION MAP

OWNER APPLICANT:
MICHAEL D. MURRAY, AGENT
MAGNOLIA PARK L.C.
C/O COLDEN FLORIDA MANAGEMENT
1399 WEST STATE ROAD 434
LONGWOOD, FLORIDA 32750
PHONE: (407) 331-4300

ENGINEER:
JOHN T. BRISKEY, P.E.
BRISKEY AND ASSOCIATES, ENGINEERS, INC.
P.O. BOX 7641 DAYTONA BEACH, FL 32116
PHONE: (904) 239-6999

SOILS:
MICHAEL D. SIMS, P.E.
POINT FOUR ENGINEERING & TECHNOLOGICAL SERVICES
193 WEST NEW YORK AVENUE
LAKE HELEN, FLORIDA 32744
PHONE: (407) 260-9449

ENVIRONMENTAL:
ROBERT G. EPPERSON, JR., M.S.
SHANNON SURVEYING, INC.
1035 SOUTH SEMORAN BOULEVARD
SUITE 1013
WINTER PARK FL 32792
PHONE: (407) 678-1881

SURVEYOR:
JAMES R. SHANNON, JR. P.L.S.
SHANNON SURVEYING, INC.
499 N. STATE ROAD 434-SUITE 2007,
ALTIMONTE SPRINGS, FL 32714
PHONE: (407) 775-8372

INDEX OF DRAWINGS

NO.	DATE	DESCRIPTION
		REVISIONS

MAGNOLIA PARK PD-@ SANFORD FLORIDA

COVER SHEET

BRISKEY & ASSOCIATES
ENGINEERS INC. Site And Civil Consultants
P.O. BOX 7641 DAYTONA BEACH, FL 32116 Phone/Fax (904) 239-6999

B & A

DESIGNED: DATE:
DRAWN: DATE:
CHECKED: DATE:
APPROVED: DATE:
PLANNED: DATE:
SCALE:

JOHN T. BRISKEY, P.E.
FL REG. NO. 39044
SEAL

DRAWING NUMBER 1 OF 6 SHEETS

INLET A-4
STA. 27+84.10, 17.5'L
TOP EL.44.18
INV. EL.40.11
INV. EL.37.20

101' of 24"RCP@0.43%

EXIST. RETENTION/DITCH

INLET A-1

STA.122+99 D.B.I.@43.00' LT.
GRATE EL.44.00
INV. EL.=41.92
6" SLOT EL.43.50
F.D.O.T. TYPE "E" INDEX #232

STA. 123+65.28, 42.7' LT.
C/L STRUCTURE# JB-2
TOP EL.47.35
INV. EL.41.66
F.D.O.T. TYPE G MOD.

TRIPLE 48-INCH TO CONVEY RUNOFF FROM CD-02_EX

RELOCATED SECURITY FENCE

EXIST. ENDWALL REPLACE W/NEW M.E.S. (SEE X-SECTS.)

EX. 6"CONCRETE CURB

EX. 2' CURB AND GUTTER (TYP)

SCREEN WALL (DEVELOPER'S OPTION)

NEW CONTROL STRUCTURE (SEE SHT. 10) SKIMMER TOP=45.15 REMOVE EX. CONTR. STR.

532LF-10" PVC WATERMAIN FROM CR055 TO GATE VALVE

RECOVERED 1"X1" CONCRETE MONUMENT

300' of 24" RCP @ 0.85%

MH# 1
STA. 116+50 20.7' R
TOP EL.=44.62

INLET A-2

500LF-10" PVC WATERMAIN GATE VALVE TO GATE VALVE

10" GATE VALVE

4305-19"X30" RCP@ 0.10%

3-48"RCP@ 0.10%

WETLAND AREA

CONST. 45'CONC. ENDWALL
STA. 122+14.27, 25.00' RT.
19"x30"ERCP. @ INV.41.80

CONST. 45'CONC. ENDWALL
STA. 122+71.41, 25.00' RT.
3-48"RCP. @ INV.41.56

EXIST. CONCRETE WEIR TOP:44.24

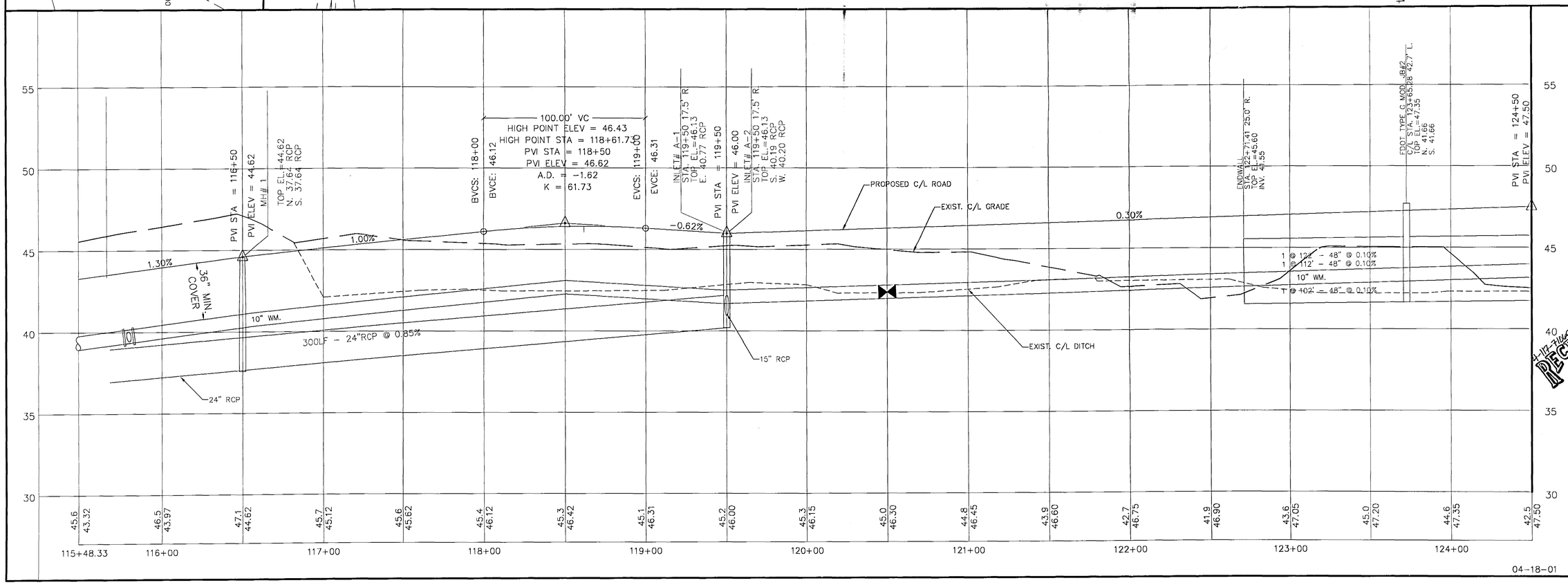
EXISTING POND TO REMAIN

N89°41'11"W

STA. 116+83.28 MELLENVILLE RD.
STA. 28+64.08 STREET "A",(E.&W.)
STA. 10+00.00 MELLONVILLE RD.,(S.)

CONSERVATION AREA
TRACT "C"
P.B. 46, PG.56

SCREEN WALL (DEVELOPER'S OPTION)



04-18-01

MELLONVILLE AVENUE
STA. 115+48.33 TO STA. 124+50.00
MAGNOLIA PARK

NO.	DATE	DESCRIPTION
REVISIONS		

BASKEY & ASSOCIATES
ENGINEERS INC. Site And Civil Consultants
P.O. BOX 2541 DAYTONA BEACH, FL 32116 Phone/Fax (904) 239-6999

JOHN T. BASKEY, P.E.
FL REG. NO. 39694
SEAL

DRAWING NUMBER 3
SHEETS OF 6

SCALE: H:1" = 30' V:1" = 3'
PLANNED: DATE:
DESIGNED: DATE:
DRAWN: DATE:
APPROVED: DATE:

EXISTING DITCH/ CANAL CONNECTING CD-02_EX_OUTLET AND TRIPLE 48-INCH PIPES

TRIPLE 48-INCH TO CONVEY RUNOFF FROM CD-02_EX

30' ACCESS, DRAINAGE AND UTILITY EASEMENT FOR THE EXTENSION OF EXISTING STORM WATER SYSTEM

PROPOSED MASONRY SCREEN WALL (DEVELOPER'S OPTION)

CONST. 10" GV & BOX

EXISTING POND TO REMAIN (CITY R/W USE PERMIT) TRANSITION GRADES TO EXISTING SLOPES. SOD ALL DISTURBED AREAS

CONST. 469LF-10" PVC WATERMAIN FROM GV TO WET TAP

CONST. 15 L.F. OF 24" RCP 24" M.E.S.(N) – EL. 43.80

DROP INLET TO REMAIN TOP: 46.95 INV: 44.65(24"RCP)

CONST. 55 L.F. OF 24"RCP 24" M.E.S.(N) – EL. 44.00 CONST. STM. M.H. TOP EL. 48.00 INV. EL. 43.90

C/L STA. 127+88.42 12.00' RT. PROPOSED NEW ACCESS TO INVACARE CORPORATION SITE TRANSITION PVM'T. TO EXIST. PAVEMENT CONSERUCTION TO BE PER CITY COMMERCIAL STANDARDS

C/L STA. 127+86.19 39.69' L PROPOSED NEW ACCESS TO I.C.E. SYSTEMS & ELECTRONICS TRANSITION PVM'T. TO EXISTING PAVEMENT CONSERUCTION TO BE PER CITY COMMERCIAL STANDARDS

EXIST. PAVED DRIVE (SEE NOTE-A)

EXIST. POND TO REMAIN

CULV. TO REMAIN MES INV 44.27

EXTEND EXIST. 24" RCP (INV:44.50)

EXTEND EXIST. DITCH

EXTEND CURB

TRANSITION TO EXIST. PAVEMENT

EXIST. FM

EXIST. WM

MELLONVILLE AVE.

C/L (FUTURE) CONSTRUCTION BY SEMINOLE COUNTY P.I. STA. 38+59.00 E.LK. MARY BLVD. SEMINOLE COUNTY B/L SURVEY = STA. 130+14.00 MELLONVILLE AVE.

E. LK. MARY BLVD. AND MELLONVILLE AVE. NORTH FUTURE CONSTRUCTION BY SEMINOLE COUNTY

STA 130+21.71 CONST. 10" WET TAP TAPPING SLEEVE & 10" TAPPING VALE

SIGN

FDOT TYPE G MOD. JB#1 8' X 5' (INSIDE) M.H. RISER AND COVER C/L STA. 129+25.17 39.0' L TOP EL.=48.50 INV. 42.22

DROP INLET TOP:45.93 INV:43.63(24"RCP)

DROP INLET TOP:46.03 W.INV: 42.90(15"RCP) S.INV: 42.81(24"RCP) N.INV: 42.96(24"RCP)

DROP INLET TOP:46.09 INV: 43.03(15"RCP)

DROP INLET TOP: 48.55 INV: 43.35(18"RCP)

EOP INV: 43.20(18"RCP)

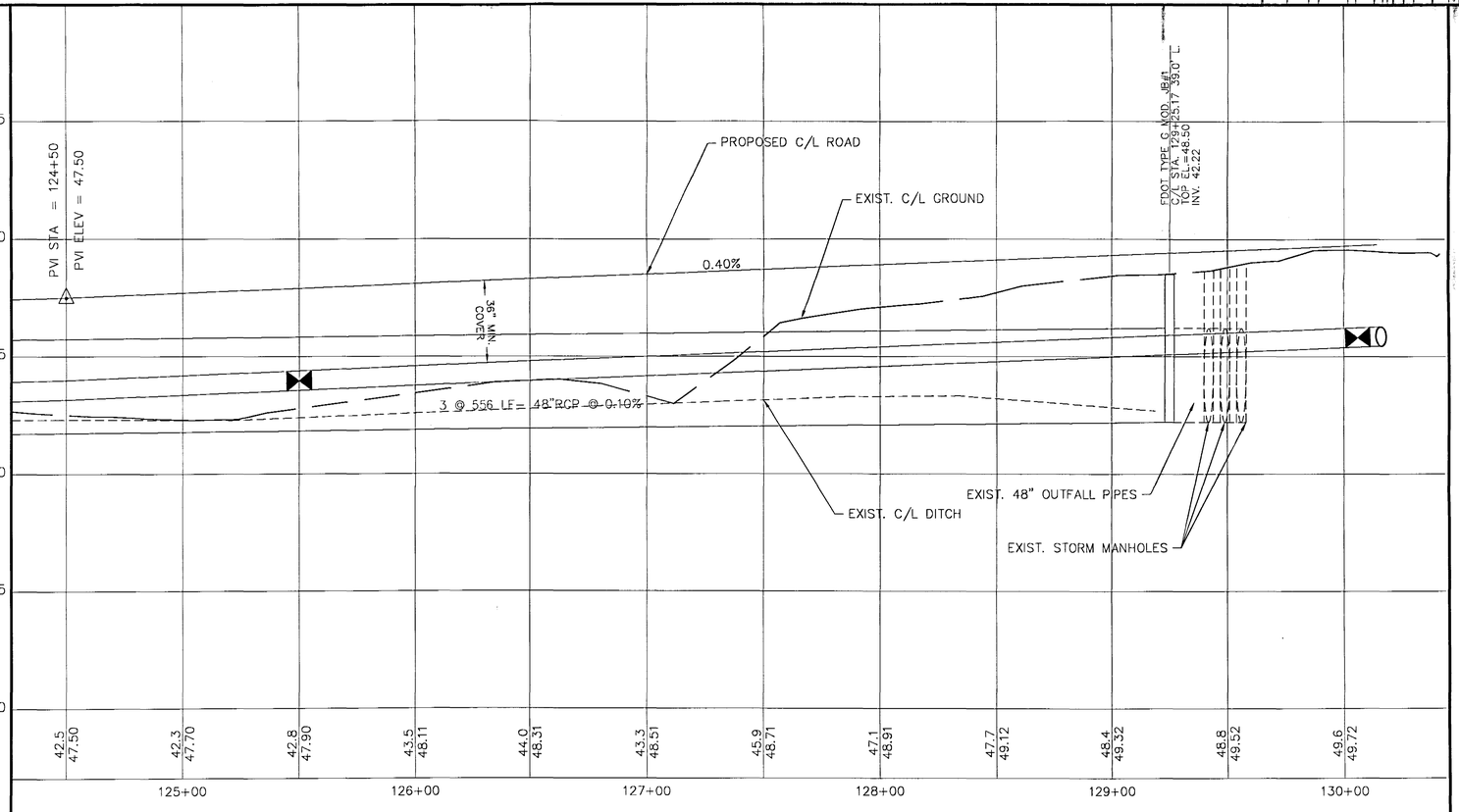
MANHOLES TO EL.48.46 INV. EL.42.22 (TO REMAIN)

TOMBSTONE

DROP INLET TOP EL. 7897

NOTE-A:

EXISTING ACCESS DRIVES INTO INVACARE CORP. AND SEI SYSTEMS & ELRCTRONICS TO BE ABANDONED AT SUCH TIME THAT MELLENVILLE AVENUE IS OPEN FOR TRAFFIC. PAVEMENT TO BE REMOVED AND DITCHES EXTENDED AND SODDED. CURBS TO BE EXTENDED AND EXISTING PAVEMENT RESTORED IN KIND.



4-117-71069-1
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MAR 24 2001
PDS ORLANDO SJR WMD

04-18-01

MELLONVILLE AVENUE
MAGNOLIA PARK PD

NO.	DATE	DESCRIPTION REVISIONS

BRISKEY & ASSOCIATES
ENGINEERS INC. Site And Civil Consultants
P.O. BOX 7641 DAYTONA BEACH, FL. 32116 Phone/Fax (904) 239-6999

SCALE: H:1" = 30' V:1" = 3'
PLANNED: DATE:
DESIGNED: DATE:
DRAWN: DATE:
APPROVED: DATE:

JOHN T. BRISKEY, P.E. FL REG. NO. 9694
SEAL

DRAWING NUMBER 4 OF 6 SHEETS

Stormwater Computations and Environmental Resource Permit Application (Addendum 1)

MAGNOLIA CLUB AND ROSE HILL DRAINAGE SYSTEMS

SCANNED 6/01/04

Magnolia Club

Sanford, Florida

Prepared for D.R. Horton
Orlando, Florida

Prepared by *VHB*/Vanasse Hangen Brustlin, Inc.
Orlando, Florida
EB# 3932

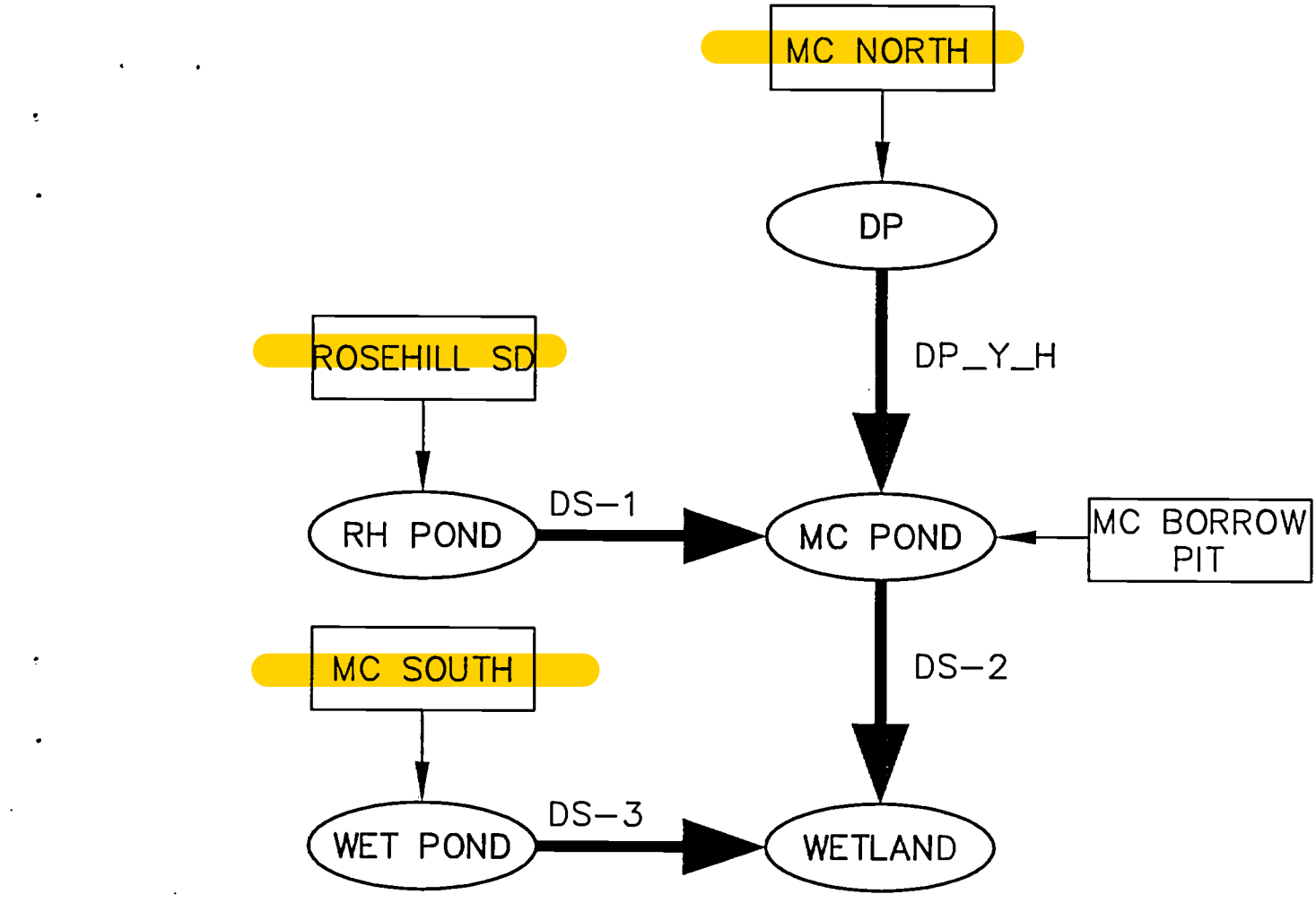
22328-1

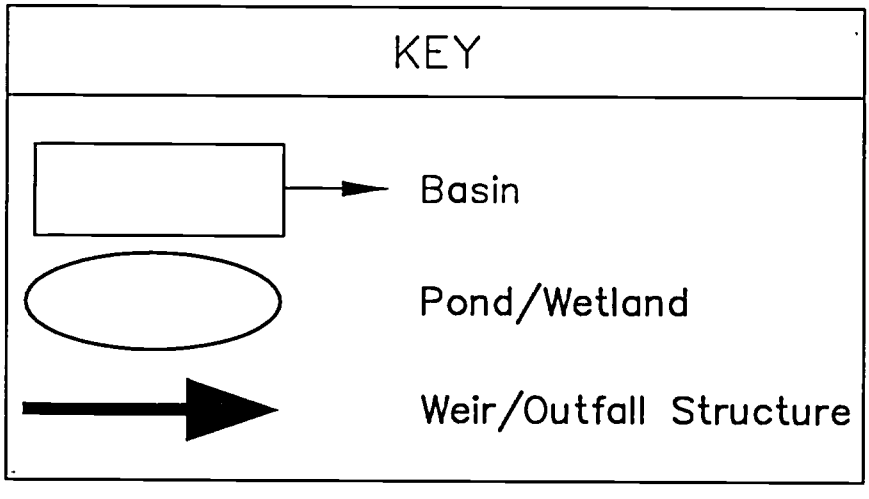
RECEIVED
MAY 2 5 2004
PDS
ALTAMONTE SVC. CTR.

April 19, 2004

David J Bromberg, P.E.
PE No. 50022
25 MAY 04

AdICPR Input

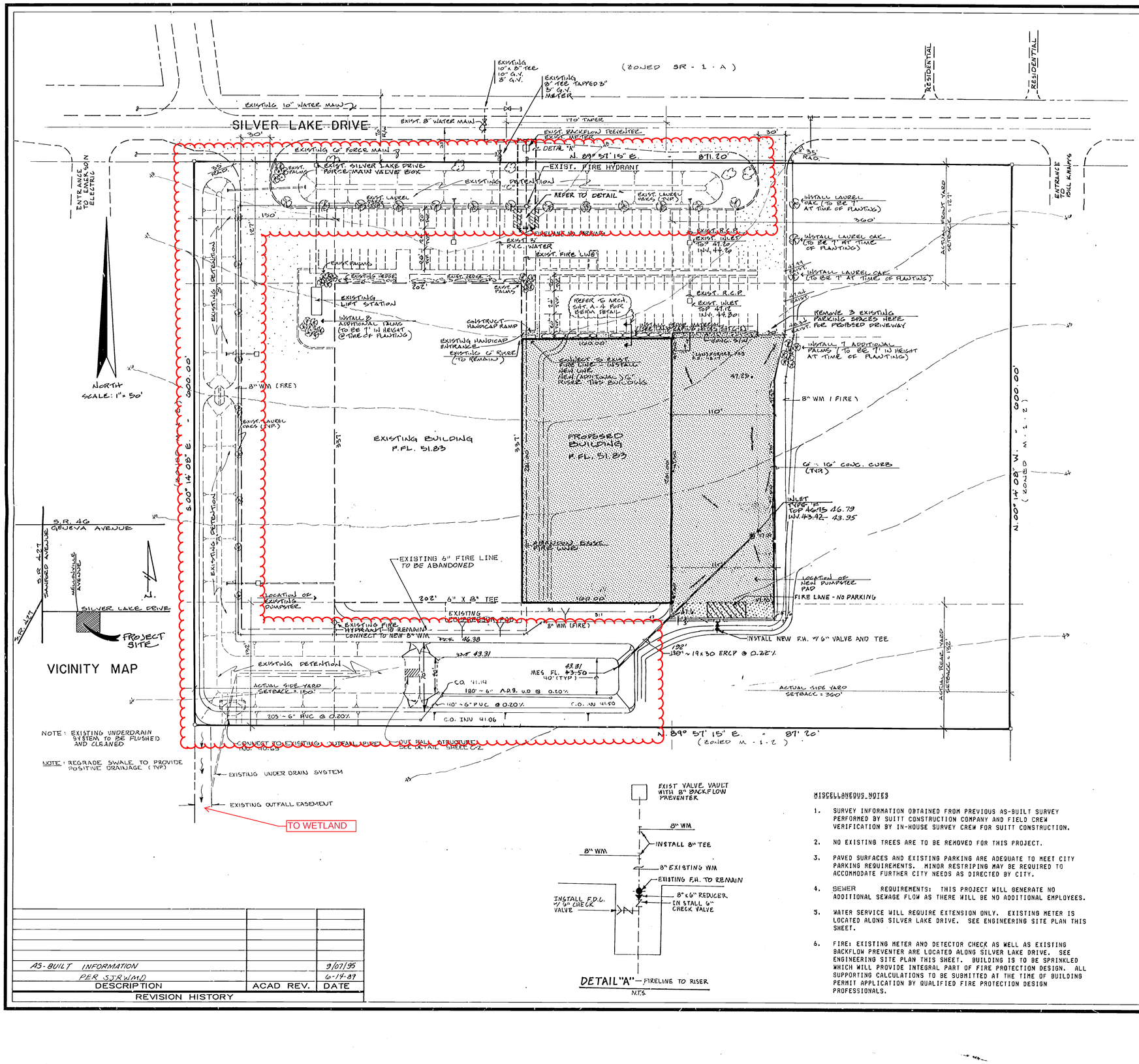




Vanasse Hangen Brustlin, Inc.

Magnolia Club
Post-Development Nodal Diagram

Figure 8 (Revised)
May 24, 2004



DESCRIPTION	ACAD REV.	DATE
AS-BUILT INFORMATION		9/07/95
PER SJRWMD		6-14-89

REVISION HISTORY

PROJECT DATA

OWNER: MOBILITE
HOWARD BENDER
1301 SILVER LAKE DRIVE
SANFORD, FL 32771
(407) 321-5630

ENGINEER: SITE ENGINEERING CONSULTANTS, INC.
MONTJE S. PLANK, P.E.
405 DOUGLAS AVENUE SUITE 2405
ALTAMONTE SPRINGS, FL 32714
(407) 682-3134

SITE USE: MANUFACTURING OF HOME HEALTH CARE UNITS (HOSPITAL BEDS, ETC.)

EXISTING ZONING: M-1-2
MEDIUM INDUSTRIAL DISTRICT

MINIMUM STANDARDS SET BY CITY OF SANFORD FOR ZONING M-1-2:

1.	MINIMUM LOT SIZE	=	10,000 S.F.
2.	FRONT YARD SETBACK	=	25 FT.
3.	BACK YARD SETBACK	=	20 FT.
4.	SIDE YARD SETBACK	=	15 FT.
5.	MAXIMUM LOT COVERAGE	=	50 PERCENT
6.	MAXIMUM BUILDING HEIGHT	=	50 FT.
	PROPOSED BUILDING HEIGHT	=	25 FT.

PARKING SUMMARY

THE NUMBER OF EMPLOYEES WILL REMAIN THE SAME BASED ON INFORMATION RECEIVED FOR MOBILITE. THE NUMBER OF PARKING SPACES WILL REMAIN THE SAME.

PROVIDED:

EXISTING	=	139	SPACES
REMOVE	=	3	SPACES
TOTAL	=	136	SPACES

W/INCLUDES 1 EXISTING HANDICAP SPACE

GENERAL NOTES:

1. ALL CONSTRUCTION TO BE IN ACCORDANCE WITH THE LATEST CITY OF SANFORD, FLORIDA STANDARDS AND SPECIFICATIONS.
2. CONTRACTOR TO INVESTIGATE SITE FULLY AND TO BASE HIS PRICE ACCORDINGLY.
3. POTABLE WATER IS CURRENTLY SUPPLIED BY THE CITY OF SANFORD.
4. SANITARY SEWER IS CURRENTLY SUPPLIED BY THE CITY OF SANFORD.
5. PRIOR TO COMMENCING CONSTRUCTION, CONTRACTOR IS TO VERIFY LOCATION AND INVERTS OF EXISTING UTILITIES/STRUCTURES WHICH ARE TO BE TIED TO BY PROPOSED SYSTEMS.
6. THE TOPOGRAPHY, BOUNDARY AND LOCATION INFORMATION SHOWN HEREON IS SUPPLIED BY OTHERS, AND NOT A RESULT OF ANY SURVEY PREPARED BY SITE ENGINEERING CONSULTANTS, INC.
7. ALL PAVING SURFACES SHALL BE GRADED TO DRAIN POSITIVELY IN THE DIRECTION SHOWN BY THE FLOW ARROWS OR TYPICAL PAVEMENT SECTIONS. PAVED SURFACES SHALL ALSO BE GRADED TO PROVIDE A SMOOTHLY TRANSITIONED DRIVING SURFACE FOR VEHICLES WITH NO SHARP BREAKS IN GRADE, AND NO UNUSUALLY STEEP OR REVERSE CROSS SLOPES.

LEGAL DESCRIPTION:

THE NORTH 625 FEET OF THE WEST 871.20 FEET OF THE SOUTHWEST 1/4 OF THE SOUTHEAST 1/4 OF SECTION 7, TOWNSHIP 20 SOUTH, RANGE 31 EAST, SEMINOLE COUNTY, FLORIDA, LESS THE NORTH 25 FEET FOR SILVER LAKE ROAD RIGHT OF WAY.

NOTE: THE ARCHITECTURAL ELEVATION OF THE PROPOSED BUILDING WILL BE A CONTINUATION ON THE EXISTING BUILDING

LANDSCAPE:

EXISTING LANDSCAPING WILL REMANIN UNCHANGED.

TREES:
EXISTING: 38 TREES ON SITE
PROPOSED: 10 ADDITIONAL TREES
TOTAL = 48 TREES

LANDSCAPING MAINTENANCE: THE OWNER IS RESPONSIBLE FOR THE MAINTENANCE OF ALL LANDSCAPING IN GOOD CONDITION. AN EXISTING IRRIGATION SYSTEM IS IN OPERATION TO SUPPLY WATER TO ALL PLANT MATERIAL.

ACREAGE BREAKDOWN:

TOTAL AREA:	12.0 ACRES
AREA OF NEW DEVELOPMENT:	2.25 ACRES
TOTAL BUILDING AREA:	113,000 S.F.
AREA OF EXISTING BUILDING:	68,000 S.F. +/-
AREA OF NEW BUILDING:	45,000 S.F. +/-
AREA OF PAVING/PARKING:	116,800 S.F. +/-

PERVIOUS = 5.7 ACRES (56%)
IMPERVIOUS = 5.3 ACRES (44%)

MISCELLANEOUS NOTES

1. SURVEY INFORMATION OBTAINED FROM PREVIOUS AS-BUILT SURVEY PERFORMED BY SUITT CONSTRUCTION COMPANY AND FIELD CREW VERIFICATION BY IN-HOUSE SURVEY CREW FOR SUITT CONSTRUCTION.
2. NO EXISTING TREES ARE TO BE REMOVED FOR THIS PROJECT.
3. PAVED SURFACES AND EXISTING PARKING ARE ADEQUATE TO MEET CITY PARKING REQUIREMENTS. MINOR RESTRIPING MAY BE REQUIRED TO ACCOMMODATE FURTHER CITY NEEDS AS DIRECTED BY CITY.
4. SEWER REQUIREMENTS: THIS PROJECT WILL GENERATE NO ADDITIONAL SEWAGE FLOW AS THERE WILL BE NO ADDITIONAL EMPLOYEES.
5. WATER SERVICE WILL REQUIRE EXTENSION ONLY. EXISTING METER IS LOCATED ALONG SILVER LAKE DRIVE. SEE ENGINEERING SITE PLAN THIS SHEET.
6. FIRE: EXISTING METER AND DETECTOR CHECK AS WELL AS EXISTING BACKFLOW PREVENTER ARE LOCATED ALONG SILVER LAKE DRIVE. SEE ENGINEERING SITE PLAN THIS SHEET. BUILDING IS TO BE SPRINKLED WHICH WILL PROVIDE INTEGRAL PART OF FIRE PROTECTION DESIGN. ALL SUPPORTING CALCULATIONS TO BE SUBMITTED AT THE TIME OF BUILDING PERMIT APPLICATION BY QUALIFIED FIRE PROTECTION DESIGN PROFESSIONALS.

RECEIVED
SEP 13 1994
RECORDS
ORLANDO

AS-BUILT DRAWINGS
DATED: September 7, 1994
CHANGES SHOWN ON DRAWINGS ARE BASED UPON INFORMATION SUPPLIED BY CONTRACTOR AND ARE NOT THE RESULTS OF FIELD MEASUREMENTS BY SITE ENGINEERING AND PLANNING.

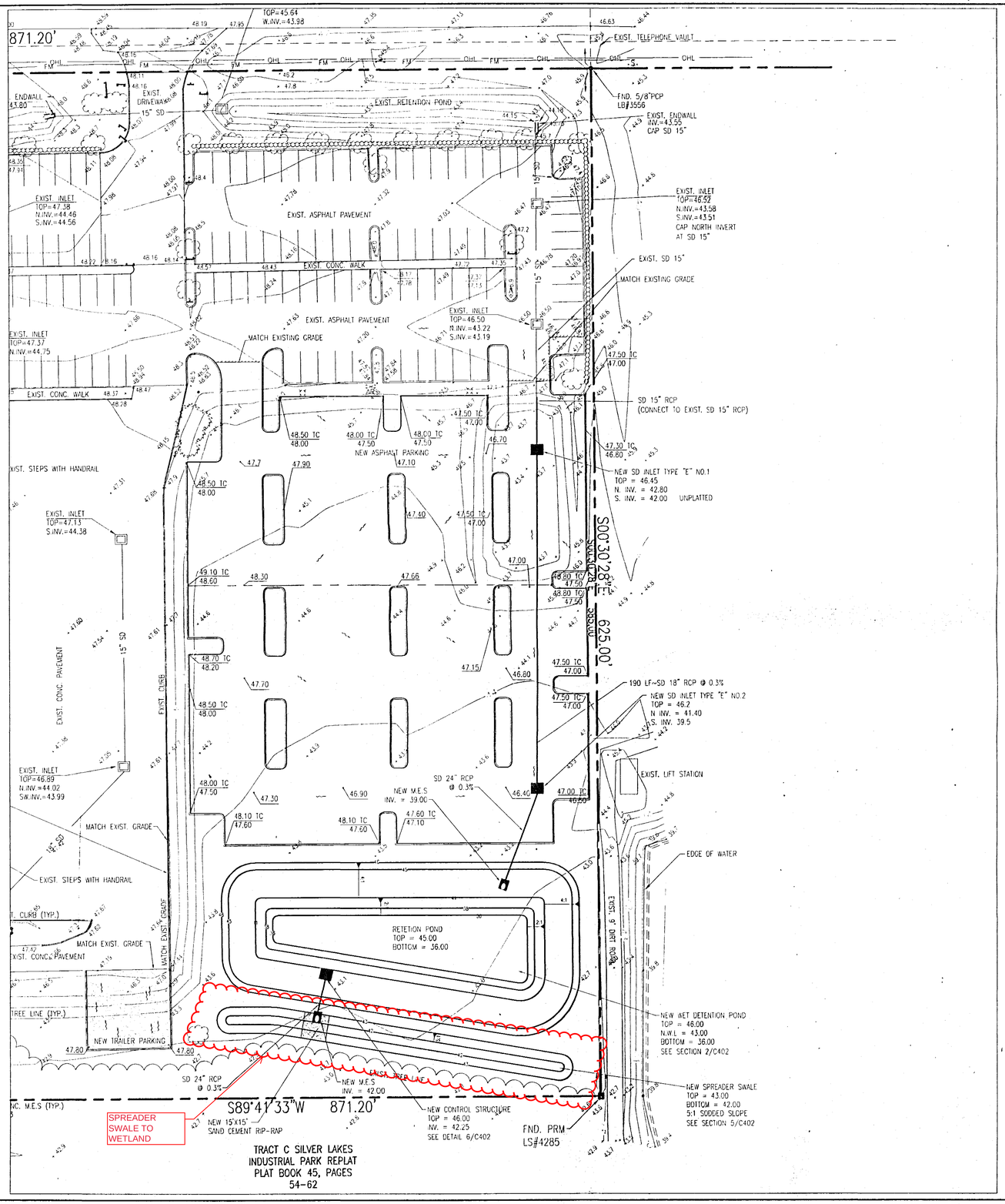
PLOT CONTROL # 19880428.1318

DRAWING TITLE: Site/ENGINEERING PLAN
Mobilite Additions

Site Engineering Consultants Inc.
405 Douglas Avenue Suite 2405
Altamonte Springs, Florida 32714
(305) 682-3134
After Hours by Modem: (305) 682-4430

DRAWN BY:	V.G.W.
DESIGNED BY:	V.G.W.
APPROVED BY:	M.S. PLANK
JOB NUMBER:	88-119
ACAD FILE:	TEMP
SCALE:	1"=50'
DATE:	05/28/88
SHEET NO.	C-1

9-13-94



GRADING AND DRAINAGE

SCALE: 1" =40'

N

0 15' 30' 60'

1 inch =30 ft.

GENERAL NOTES:

1. ALL DISTURBED AREAS SHALL BE SODDED.
2. COMPLY WITH FLORIDA DEPT. OF TRANSPORTATION ROADWAY & TRAFFIC DESIGN STANDARDS FOR THE FOLLOWING:

   TYPE "E" & "C" INLET = INDEX No. 232
   MITERED END SECTION = INDEX No. 273
   TYPE J MANHOLE = INDEX No. 200
   SD HEADWALL = INDEX No. 250
3. ALL STORM DRAIN INLETS LOCATED IN VEHICULAR TRAFFIC AREAS SHALL RECEIVE A STEEL ANGLE GRATE SEAT. ALL GRATES SHALL BE TRAFFIC RATED.
4. SEE SHEET C-002 FOR EROSION PROTECTION MEASURES DURING CONSTRUCTION.
5. PROJECT IS NOT LOCATED WITHIN A SPECIAL FLOOD AREA FEMA CLASSIFICATION ZONE "".

LEGEND

	EXIST.	NEW
FINISH GRADE	46.4	63.0
FLOW PATTERN		
CONTOUR	60	60
STORM DRAIN INLET		
STORM DRAIN LINE	50	50
STORM MANHOLE		
MITERED END SECTION		

SKConsortium, Inc.
URBAN DESIGN • PLANNING • ENGINEERING
1053 N. ORLANDO AVE. ■ SUITE 3 • MAITLAND ▲ FLORIDA 32751
TELEPHONE 407-629-4288 ■ FACSIMILE 407-629-1656 • EB# 7080

Seal

1/16/03

GRADING AND DRAINAGE PLAN EAST

INVACARE PARKING ADDITION

SUITT CONSTRUCTION

SANFORD, FLORIDA

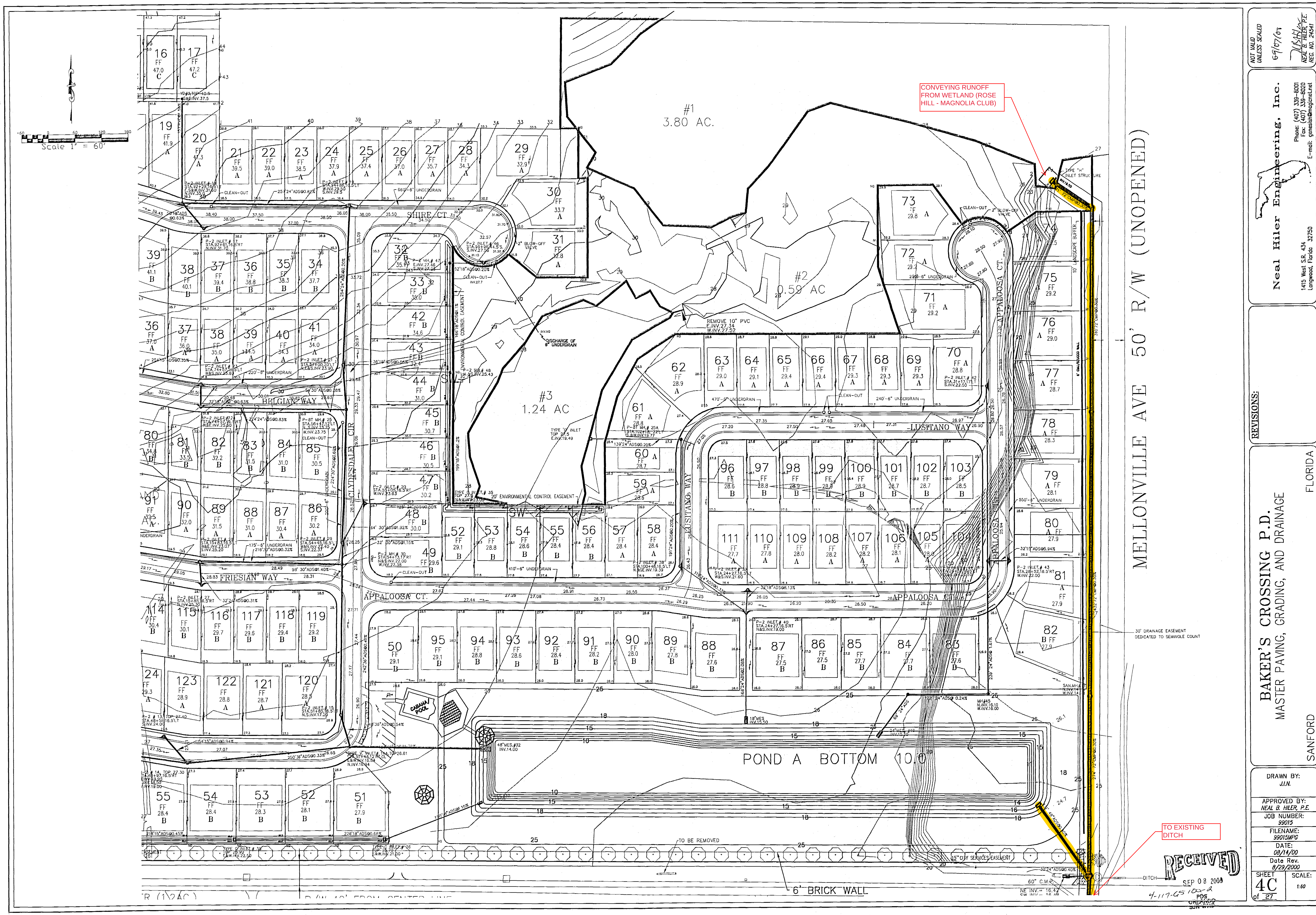
12/13/02 30% SUBMITTAL
12/26/02 90% PRICE SET
1/16/03 PERMIT SET

Issue Date and Purpose

Project: 253

Drawn by: T.OTTAWAY
Checked: M. KHACHICHI
File No: 253\DSK2018.DWG

C-201


CONVEYING RUNOFF FROM WETLAND (ROSE HILL - MAGNOLIA CLUB)
TO EXISTING DITCH
#1 3.80 AC.
#2 0.59 AC
#3 1.24 AC
POND A BOTTOM (10.0)
MELLONVILLE AVE 50' R/W (UNOPENED)
SHIRE CT.
BELGIAN WAY
FRIESIAN WAY
APPALOOSA CT.
LUSITANO WAY
CLYDESDALE CIR.
CABANA/POOL
6' BRICK WALL
30' DRAINAGE EASEMENT DEDICATED TO SEMINOLE COUNTY
20' ENVIRONMENTAL CONTROL EASEMENT
Scale 1" = 60'
BAKER'S CROSSING P.D.
MASTER PAVING, GRADING, AND DRAINAGE
SANFORD
FLORIDA
Neal Hiller Engineering, Inc.
1415 West S.R. 434
Longwood, Florida 32750
Phone: (407) 339-8001
Fax: (407) 339-8020
E-mail: genesis@magicnet.net
NOT VALID UNLESS SEALED
NEAL B. HILLER, P.E.
REG. NO. 24541
REVISIONS:
DRAWN BY: J.I.N.
APPROVED BY: NEAL B. HILLER, P.E.
JOB NUMBER: 99015
FILENAME: 99015MPG
DATE: 08/14/00
Date Rev. 8/29/2000
SHEET 4C of 27
SCALE: 1:60
RECEIVED
SEP 08 2000

Appendix C – Field Review Documentation

SR 417-246A – Photo Log: Field Review Photos

Photo 1: View of north (upstream) mitered endwall (ST-1) of CD-01_EX. Endwall was observed to be in good condition and had no apparent scour or erosion. Heavy vegetation was noted along the inflow ditch to the cross drain. The water level in ST-1 measured approximately 19-inches above the pipe invert.

Photo 2: View south and immediately downstream of endwall (ST-2) of CD-01_EX. Endwall not visible due to heavy vegetation. Standing water was observed.

Photo 3: View north and immediately upstream of endwall (ST-3) of CD-02_EX. Endwall not visible due to heavy vegetation. Standing water was observed.

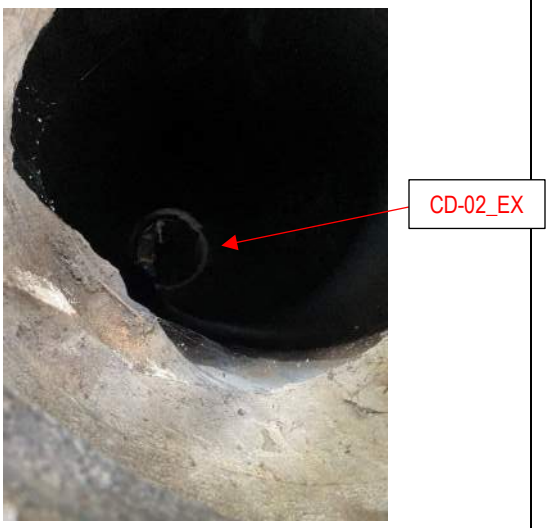


Photo 4: View south of the downstream CD-02_EX (ST-4) where it joins the 48-inch triple side drain.

SR 417-246A – Photo Log: Field Review Photos

Photo 5: View northwest of triple 48-inch side drain downstream of CD-02_EX which conveys the runoff to an roadside ditch.

Photo 6: View east of roadside ditch downstream of triple 48-inch side drain which conveys the runoff from CD-02_EX and other areas to triple 48-inch pipes.

Photo 7: View southeast of triple 48-inch pipes which receive the runoff from the roadside ditch and conveys the runoff to a downstream wetland. This structure is located at East Lake Mary Blvd approximately 100-ft west of Mellonville Avenue.

Photo 8: View of scour on the headwall structure of triple 48-inch pipes. This structure is located at East Lake Mary Blvd approximately 100-ft west of Mellonville Avenue.

SR 417-246A – Photo Log: Field Review Photos

Photo 9: View of manholes structures corresponding to a triple 48-inch pipes which conveys the runoff from the roadside ditch to a downstream wetland. These structures are located at Mellonville Avenue approximately 640-ft south of East Lake Mary Blvd, on the west side next to the sidewalk just before the beginning of a tall concrete wall.

Photo 10: View of quadruple pipes structure which receive the runoff from the triple 48-inch pipes and conveys the runoff to a downstream wetland. This structure is located at Hidden Palm Dr. approximately 860-ft east of Mellonville Avenue.

Photo 11: View of north (upstream) mitered endwall (ST-5) of CD-03A_EX. Endwall was observed to be in good condition and had no apparent scour or erosion. The water level and stain marks were measured at approximately 5-inches and 8-inches above the pipe invert, respectively.

Photo 12: View of storm manhole (ST-6) which joins CD_03A and CD_03B at the downstream side. From manhole, a 38" x 60" ERCP conveys runoff within Sylvestri Lakes Community and outfalls into a wetland area located east of the community.

SR 417-246A – Photo Log: Field Review Photos

Photo 13: View of north (upstream) ditch bottom inlet (ST-7) of CD-03B_EX. Ditch bottom inlet was observed to be in good condition and had no apparent scour or erosion. There was no standing water or flow on the day of the field review.

Photo 14: View of north (upstream) endwall (ST-8) of CD-04_EX. Endwall was observed to be in good condition and had no apparent scour or erosion. There was no standing water or flow on the day of the field review. The structure had no sedimentation (silt), nor any observed stain lines.

Photo 15: View of ditch with stone revetment upstream CD-04_EX looking east.

Photo 16: View inside of elliptical pipe of CD-04_EX looking south. Some sedimentation and stain lines were observed.

SR 417-246A – Photo Log: Field Review Photos

Photo 17: View of south (downstream) endwall (ST-9) of CD-04_EX. Endwall was observed to be in good condition and had no apparent scour or erosion. There was no standing water or flow on the day of the field review. The structure had no sedimentation (silt), nor any observed stain lines. A DBI structure was observed downstream the endwall, however, it could not be determined in the field how it is related to the drainage system.

Photo 18: View of northwest (upstream) mitered endwall (ST-10) of CD-05_EX. Endwall was observed to be in good condition and had no apparent scour or erosion. The water level was measured at approximately 8-inches above the pipe invert. The structure had vegetation, there was no sedimentation (silt), and no stain lines were observed.

Photo 19: View of southeast (downstream) mitered endwall (ST-11) of CD-05_EX. Endwall was observed to be in good condition and had no apparent scour or erosion. The structure had vegetation, there was no sedimentation (silt), and no stain lines were observed.

Photo 20: View of north (upstream) mitered endwall (ST-12) of CD-06_EX. Endwall was observed to be in good condition and had no apparent scour or erosion. The water level for ST-12 was approximately 6-inches above the pipe invert. The structure had no sedimentation (silt), nor any observed stain lines.

SR 417-246A – Photo Log: Field Review Photos

Photo 21: View of south (downstream) mitered endwall (ST-13) of CD-06_EX. Endwall was observed to be in good condition and had no apparent scour or erosion. The water level for ST-13 was approximately 6-inches above the pipe invert. The structure had no sedimentation (silt), nor any observed stain lines.

Photo 22: View north and immediately upstream of endwall (ST-14) of CD-07_EX. Endwall was observed, although it could not be accessed due to the high vegetation. Standing water was observed.

Photo 23: View south and immediately downstream of endwall (ST-15) of CD-07_EX. Endwall not visible due to heavy vegetation. Standing water was observed.

Photo 24: View north and immediately upstream of CD-07_EX at Navy Canal. Navy canal was observed with no vegetation and obstructions within the canal. The canal was highly vegetated along the overbanks.

Appendix D – Proposed Hydrologic and Hydraulic Calculations

NOAA RAINFALL (ATLAS 14)

NOAA Atlas 14, Volume 9, Version 2
Location name: Sanford, Florida, USA*
Latitude: 28.7511°, Longitude: -81.2546°
Elevation: m/ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Deborah Martin, Sandra Pavlovic, Ishani Roy, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Michael Yekta, Geoffery Bonnin

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	5.69 (4.62-6.98)	6.50 (5.27-7.99)	7.78 (6.29-9.60)	8.78 (7.07-10.9)	10.1 (7.80-12.9)	11.1 (8.36-14.4)	12.0 (8.75-16.0)	12.8 (8.99-17.8)	13.9 (9.37-19.9)	14.6 (9.65-21.5)
10-min	4.16 (3.38-5.12)	4.76 (3.86-5.86)	5.69 (4.60-7.03)	6.43 (5.17-7.99)	7.39 (5.71-9.43)	8.09 (6.12-10.5)	8.75 (6.40-11.7)	9.38 (6.58-13.0)	10.2 (6.86-14.6)	10.7 (7.07-15.8)
15-min	3.38 (2.75-4.16)	3.87 (3.14-4.76)	4.63 (3.74-5.72)	5.23 (4.20-6.49)	6.01 (4.64-7.67)	6.58 (4.98-8.56)	7.11 (5.20-9.54)	7.62 (5.35-10.6)	8.25 (5.58-11.9)	8.69 (5.74-12.8)
30-min	2.78 (2.26-3.42)	3.17 (2.58-3.91)	3.79 (3.06-4.68)	4.27 (3.43-5.30)	4.90 (3.79-6.25)	5.36 (4.06-6.97)	5.79 (4.24-7.77)	6.20 (4.35-8.61)	6.71 (4.53-9.64)	7.06 (4.67-10.4)
60-min	1.85 (1.50-2.27)	2.12 (1.72-2.61)	2.54 (2.06-3.14)	2.88 (2.32-3.58)	3.32 (2.57-4.25)	3.65 (2.76-4.75)	3.96 (2.89-5.31)	4.25 (2.98-5.90)	4.61 (3.12-6.63)	4.87 (3.22-7.19)
2-hr	1.15 (0.942-1.41)	1.32 (1.08-1.62)	1.60 (1.30-1.96)	1.82 (1.47-2.24)	2.10 (1.64-2.66)	2.31 (1.76-2.99)	2.51 (1.85-3.34)	2.70 (1.91-3.72)	2.94 (2.00-4.20)	3.11 (2.07-4.55)
3-hr	0.832 (0.684-1.01)	0.960 (0.788-1.17)	1.16 (0.953-1.42)	1.33 (1.08-1.64)	1.55 (1.22-1.97)	1.72 (1.32-2.22)	1.88 (1.40-2.51)	2.04 (1.45-2.82)	2.25 (1.54-3.21)	2.40 (1.60-3.51)
6-hr	0.477 (0.395-0.577)	0.548 (0.454-0.664)	0.669 (0.551-0.812)	0.773 (0.633-0.943)	0.921 (0.732-1.17)	1.04 (0.806-1.35)	1.16 (0.870-1.55)	1.29 (0.926-1.78)	1.46 (1.01-2.09)	1.60 (1.08-2.32)
12-hr	0.273 (0.228-0.328)	0.310 (0.258-0.372)	0.378 (0.314-0.456)	0.441 (0.364-0.535)	0.540 (0.436-0.693)	0.624 (0.491-0.812)	0.716 (0.543-0.959)	0.816 (0.594-1.13)	0.961 (0.671-1.37)	1.08 (0.730-1.56)
24-hr	0.157 (0.132-0.188)	0.178 (0.149-0.213)	0.219 (0.183-0.262)	0.259 (0.215-0.312)	0.324 (0.265-0.417)	0.381 (0.303-0.496)	0.445 (0.341-0.596)	0.516 (0.379-0.714)	0.621 (0.438-0.885)	0.708 (0.482-1.01)
2-day	0.090 (0.077-0.107)	0.104 (0.088-0.123)	0.129 (0.109-0.154)	0.155 (0.130-0.185)	0.195 (0.161-0.250)	0.231 (0.185-0.299)	0.271 (0.209-0.360)	0.315 (0.233-0.433)	0.380 (0.270-0.538)	0.434 (0.297-0.617)
3-day	0.067 (0.057-0.079)	0.077 (0.065-0.091)	0.096 (0.081-0.114)	0.114 (0.096-0.136)	0.144 (0.119-0.183)	0.170 (0.136-0.218)	0.198 (0.153-0.262)	0.230 (0.170-0.314)	0.276 (0.197-0.389)	0.315 (0.216-0.446)
4-day	0.054 (0.046-0.064)	0.062 (0.053-0.073)	0.077 (0.065-0.091)	0.092 (0.077-0.109)	0.114 (0.095-0.145)	0.134 (0.108-0.172)	0.156 (0.121-0.206)	0.181 (0.134-0.246)	0.217 (0.154-0.304)	0.246 (0.170-0.348)
7-day	0.037 (0.032-0.044)	0.042 (0.036-0.049)	0.051 (0.043-0.060)	0.059 (0.050-0.070)	0.072 (0.060-0.091)	0.084 (0.068-0.107)	0.097 (0.075-0.126)	0.111 (0.082-0.149)	0.131 (0.094-0.182)	0.147 (0.102-0.207)
10-day	0.030 (0.026-0.035)	0.033 (0.029-0.039)	0.040 (0.034-0.047)	0.046 (0.039-0.054)	0.055 (0.046-0.069)	0.063 (0.051-0.080)	0.072 (0.056-0.094)	0.081 (0.061-0.109)	0.095 (0.068-0.132)	0.106 (0.074-0.149)
20-day	0.020 (0.018-0.024)	0.023 (0.020-0.026)	0.027 (0.023-0.031)	0.030 (0.026-0.035)	0.035 (0.029-0.043)	0.039 (0.032-0.049)	0.044 (0.034-0.056)	0.048 (0.036-0.064)	0.055 (0.039-0.075)	0.060 (0.042-0.083)
30-day	0.017 (0.014-0.019)	0.019 (0.016-0.022)	0.022 (0.019-0.025)	0.024 (0.021-0.029)	0.028 (0.023-0.034)	0.031 (0.025-0.038)	0.034 (0.027-0.043)	0.037 (0.028-0.049)	0.041 (0.030-0.056)	0.044 (0.031-0.061)
45-day	0.014 (0.012-0.016)	0.015 (0.013-0.018)	0.018 (0.016-0.021)	0.020 (0.017-0.023)	0.023 (0.019-0.028)	0.025 (0.020-0.031)	0.027 (0.021-0.034)	0.029 (0.022-0.038)	0.032 (0.023-0.043)	0.033 (0.023-0.046)
60-day	0.012 (0.011-0.014)	0.014 (0.012-0.016)	0.016 (0.014-0.018)	0.018 (0.015-0.020)	0.020 (0.017-0.024)	0.022 (0.018-0.026)	0.023 (0.018-0.029)	0.025 (0.019-0.032)	0.027 (0.019-0.036)	0.028 (0.020-0.038)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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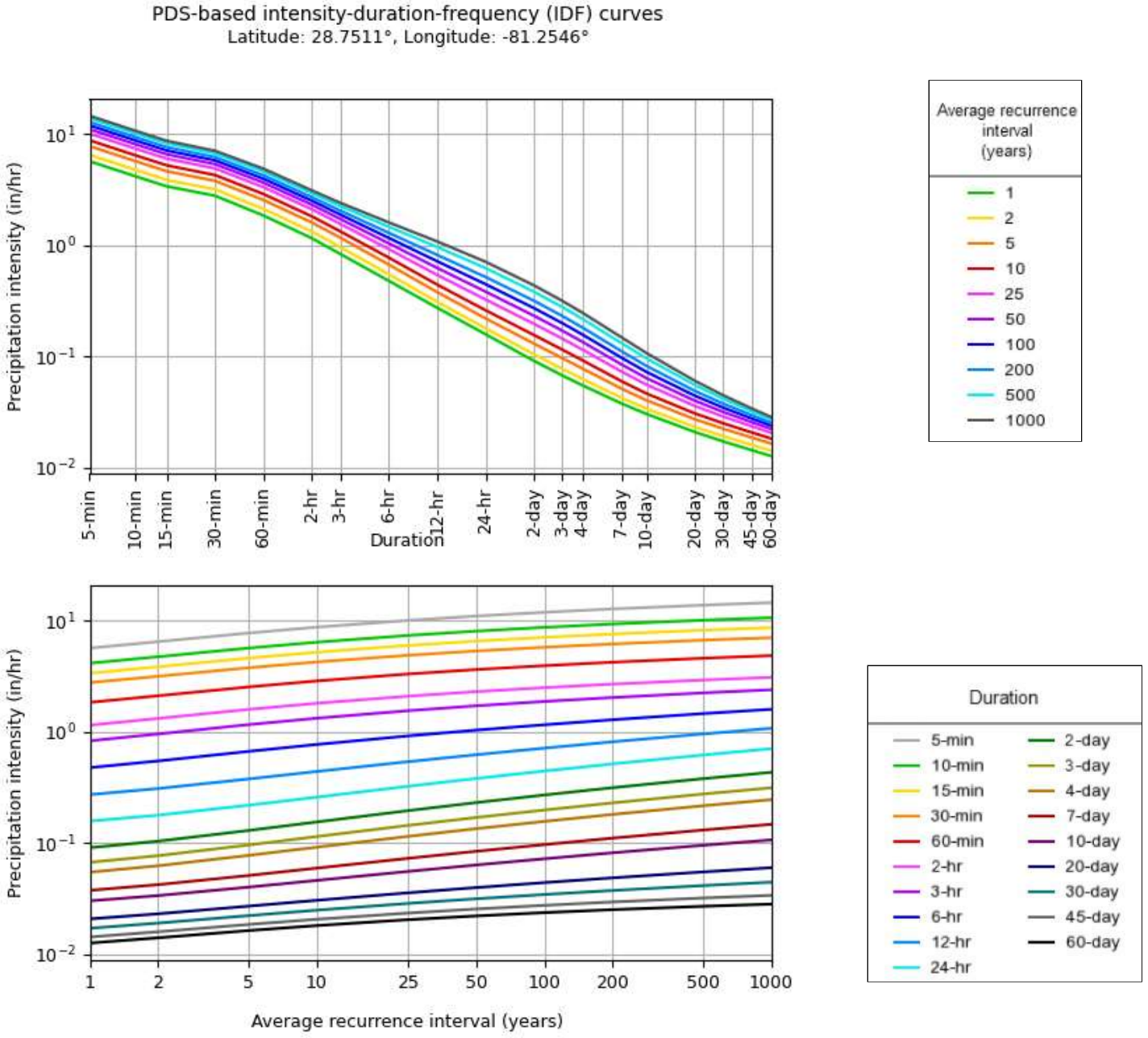
PF graphical



NOAA Atlas 14, Volume 9, Version 2

Created (GMT): Wed Jul 24 18:31:56 2024

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Maps & aerials

Small scale terrain

CROSS DRAIN CD-01_PR

PROJECT:	**Sanford Airport Connector**	**PREPARED:**	LCM	**DATE:**	04/28/25
LOCATION:	**Seminole County, Florida**	**CHECKED:**	LCS	**DATE:**	04/28/25

Proposed Offsite Conveyance Calculations

Proposed Cross Drain at Sanford Airport Connector

Cross Drain Name	**CD-01_PR**
Affected Corridor(s)	2a
Pervious C-Value	0.20
Impervious C-value	0.95
Time of Concentration (min)	21.0

Basin Runoff Calculations for Offsite CD-01_PR Basin

Total Contributing Area (acres)	13.43
Pervious Contributing Area (acres)	13.43
Impervious Contributing Area (acres)	0.00
Weighted Runoff Coefficient (C_{50})[1]	0.24
Weighted Runoff Coefficient ($C_{100-500}$)[1]	0.25
Design Event[2]	50-year
Rainfall Intensities[3]	
Design Event I_{50} (in/hr)	6.09
I_{100} (in/hr)	6.58
I_{500} (in/hr)	7.63
Peak Flows	
Design Q_{50} (cfs)	**19.63**
Q_{100} (cfs)	**22.09**
Q_{500} (cfs)	**25.62**

Cross Drain Sizing Calculations

Assumed Velocity (ft/s)	3
Cross-sectional Area Required (ft^2)	6.54
Recommended Culvert Conveyance Size	36 inch
Provided Cross Sectional Area (ft^2)	7.07
Upstream Est. SHWL Elev (ft-NAVD88)	11.14
Upstream Est. Ground Elev (ft-NAVD88)	11.14
Downstream Est. Ground Elev (ft-NAVD88)	10.90
Additional Culvert Height Required	0 ft
Recommended Culvert Size	36 inch
Tailwater (ft-NAVD88)[4]	13.9 ft
Length[5]	142 ft

Notes:

[1] Frequency Factor for Pervious Area Runoff Coefficients will be applied per Design Storm Event (Table B-5, FDOT Drainage Design Guide, January 2017).

[2] Per FDOT Drainage Manual, 50-year considered design event for mainline interstates and 100-year used if culvert proposed within regulated floodway.

[3] Design Intensity calculated from NOAA IDF Curve (NOAA Atlas 14 Website).

[4] Crown of culvert

[5] Approximate Length = R/W Length - 10-ft each side for riprap

Design Storm Frequency Factors for Pervious Area Runoff Coefficients

Table T-5 (FDOT Hydrology Handbook, Feb. 2012)

Return Period (years)	**Design Storm Frequency**
2 to 10	1.00
25	1.10
50	1.20
100	1.25

PROJECT:	Sanford Airport Connector	**PREPARED:**	LCM	**DATE:**	4/28/2025
LOCATION:	Seminole County, Florida	**CHECKED:**	LCS	**DATE:**	4/28/2025

Proposed Offsite Time of Concentration Calculations

EXISTING or DEVELOPED / UNDEVELOPED BASIN: Offsite CD-01_PR

Tc or Tt (through subarea)

L = 1,085 ft

Sheet flow (Applicable to Tc only)

Segment ID	AB
1. Surface description†	Pavement
2. Mannings roughness coeff., n †	0.012
3. Flow length, L (total L ≤ 100 ft.)	100
4. 2-year, 24-hour rainfall (in.) ††	4.27
5. Land slope, s (ft./ft.)	0.022
6. Compute Tt in hr, Tt = $[0.007(nL)^{0.8}] / [P_{24hr}^{0.5} s^{0.4}]$ †††	0.018
Subtotal	**0.02**

Shallow Concentrated Flow

Segment ID	BC
7. Surface description (Paved or Unpaved)	Unpaved
8. Flow length, L (ft)	985
9. Watercourse slope, s (ft/ft)	0.003
10. Average velocity†††, V = kS^0.5 (fps)	0.83
11. Compute Tt in hr, Tt = L/3600V	0.33
Subtotal	**0.33**

Channel & Pipe Flow

Segment ID	
12. Segment Type	
13. Pipe Diameter (in.)	
14. Cross sectional flow area, a (assumed d=0.5 ft for channel)	
15. Wetted perimeter, Pw	
16. Hydraulic radius (ft), r = a/Pw, Compute r	
17. Channel/Pipe slope, s (ft./ft.)	
18. Manning's roughness coeff., n	
19. V = 1.486(r^0.667)(s^0.50)/n, Compute V	
20. Flow length, L	
21. Compute Tt in hr, Tt = L/3600V	
22. Subtotal	

Time of Concentration, hr. (summation of subtotals)

Hours	0.35
Minutes	21.0
Total	**21.0**

Notes:

† Values from Table 3-1 of Urban Hydrology for Small Watersheds, Technical Release of TR-55

†† The 2-year, 24-hour rainfall was used based on TR-55 Figure B-3.

††† This equation is derived from TR-55

Crossing Input: CD-01_PR

Parameter	Value	Units
DISCHARGE DATA		
Discharge Method	User-Defined	
Discharge List	Define...	
TAILWATER DATA		
Channel Type	Enter Constant Tailwater Elevation	
Channel Invert Elevation	10.900	ft
Constant Tailwater Elevation	13.900	ft
Rating Curve	View...	
ROADWAY DATA		
Roadway Profile Shape	Constant Roadway Elevation	
First Roadway Station	0.000	ft
Crest Length	300.000	ft
Crest Elevation	37.000	ft
Roadway Surface	Paved	
Top Width	96.000	ft

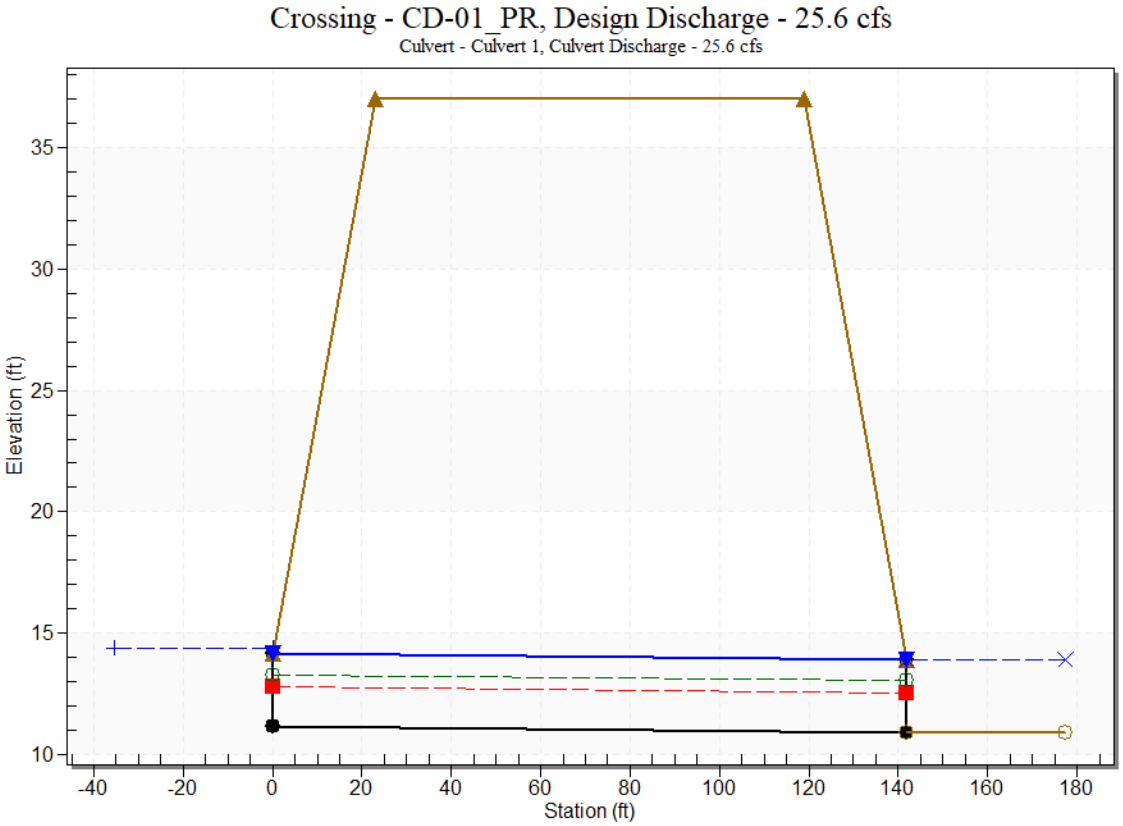
Culvert Input: CD-01_PR

Parameter	Value	Units
CULVERT DATA		
Name	Culvert 1	
Shape	Circular	
Material	Concrete	
Diameter	3.000	ft
Embedment Depth	0.000	in
Manning's n	0.012	
Culvert Type	Straight	
Inlet Configuration	Square Edge with Headwall (Ke=0.5)	
Inlet Depression?	No	
SITE DATA		
Site Data Input Option	Culvert Invert Data	
Inlet Station	0.000	ft
Inlet Elevation	11.140	ft
Outlet Station	142.000	ft
Outlet Elevation	10.900	ft
Number of Barrels	1	
Computed Culvert Slope	0.001690	ft/ft

Table 2 - Culvert Summary Table: Culvert 1

Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	HW / D (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
50-yr	19.63	19.63	14.25	2.08	3.107	1.04	3-M1f	1.78	1.42	3.00	3.00	2.78	0.00
100-yr	22.09	22.09	14.35	2.23	3.212	1.07	3-M1f	1.92	1.51	3.00	3.00	3.13	0.00
500-yr	25.62	25.62	14.38	2.44	3.244	1.08	4-FFf	2.15	1.63	3.00	3.00	3.62	0.00
Overtopping	170.80	169.08	37.02	25.88	23.817	8.63	4-FFf	3.00	3.00	3.00	3.00	23.92	0.00

Water Surface Profile Plot for Culvert: Culvert 1



CROSS DRAIN CD-02_PR

PROJECT:	**Sanford Airport Connector**	**PREPARED:**	LCM	**DATE:**	02/03/25
LOCATION:	**Seminole County, Florida**	**CHECKED:**	LCS	**DATE:**	02/03/25

Proposed Offsite Conveyance Calculations

**** Total Drainage Basin Area = Sylvestri Lakes North Drainage System + Offsite CD-02_PR**

Proposed Cross Drain at Sanford Airport Connector (Offsite CD-02_PR Basin)

Cross Drain Name	**CD-02_PR**
Affected Corridor(s)	2a
Pervious C-Value	0.20
Impervious C-value	0.95
Time of Concentration (min)	138.6

Basin Runoff Calculations for Offsite CD-04_PR Basin

Total Contributing Area (acres)	15.12
Pervious Contributing Area (acres)	15.12
Impervious Contributing Area (acres)	0.00
Weighted Runoff Coefficient (C_{50})[1]	0.24
Weighted Runoff Coefficient ($C_{100-500}$)[1]	0.25
Design Event[2]	50-year
Rainfall Intensities[3]	
Design Event I_{50} (in/hr)	2.13
I_{100} (in/hr)	2.31
I_{500} (in/hr)	2.73
Peak Flows	
Design Q_{50} (cfs)	**7.73**
Q_{100} (cfs)	**8.73**
Q_{500} (cfs)	**10.32**

Total Peak Flow Draining to CD_04_PR

Basin	**Q_{50}**	**Q_{100}**	**Q_{500}**
*Sylvestri Lake North Drainage System	115.24	198.24	207.43
Offsite CD-02_PR Basin	7.73	8.73	10.32
Total Peak Flow	**122.97**	**206.97**	**217.75**

Note: *100-yr peak flows from Sylvestri Lake Drainage System Permit Documentation, other flows was estimated.

Cross Drain Sizing Calculations

Assumed Velocity (ft/s)	3
Cross-sectional Area Required (ft^2)	40.99
Number of Cells	1
Recommended Culvert Conveyance Size	9 ft x 5 ft
Provided Cross Sectional Area (ft^2)	45.00
Upstream Est. SHWL Elev (ft-NAVD88)	29.28
Upstream Est. Ground Elev (ft-NAVD88)	29.28
Downstream Est. Ground Elev (ft-NAVD88)	28.81
Additional Culvert Height Required	0 ft
Recommended Culvert Size (SpanxRise)	1-cell 9 ft x 5 ft
Tailwater (ft-NAVD88)[4]	33.81
Length[5]	156 ft

Notes:

[1] Frequency Factor for Pervious Area Runoff Coefficients will be applied per Design Storm Event (Table B-5, FDOT Drainage Design Guide, January 2017).

[2] Per FDOT Drainage Manual, 50-year considered design event for mainline interstates and 100-year used if culvert proposed within regulated floodway.

[3] Design Intensity calculated from NOAA IDF Curve (NOAA Atlas 14 Website).

[4] Crown of culvert

[5] Approximate Length = R/W Length - 10-ft each side for riprap / Culvert in skew.

Design Storm Frequency Factors for Pervious Area Runoff Coefficients

Table T-5 (FDOT Hydrology Handbook, Feb. 2012)

Return Period (years)	Design Storm Frequency
2 to 10	1.00
25	1.10
50	1.20
100	1.25

General Notes:

Sylvestri Lake North Drainage System Basin

1- The oufall flows from Sylvestri Lake North Drainage System for 50-yr and 500-yr recurrence intervals were estimates using a log-log procedure (See Sheet for Additional Flow Estimate from Sylvestri Lake South Drainage System).

PROJECT:	Sanford Airport Connector	**PREPARED:**	LCM	**DATE:**	4/28/2025
LOCATION:	Seminole County, Florida	**CHECKED:**	LCS	**DATE:**	4/28/2025

Proposed Offsite Time of Concentration Calculations

EXISTING or DEVELOPED / UNDEVELOPED BASIN: Offsite CD-02_PR

Tc or Tt (through subarea)

L = 1,675 ft

Sheet flow (Applicable to Tc only)

Segment ID	AB
1. Surface description†	Wood
2. Mannings roughness coeff., n †	0.40
3. Flow length, L (total L ≤ 100 ft.)	100
4. 2-year, 24-hour rainfall (in.) ††	4.27
5. Land slope, s (ft./ft.)	0.002
6. Compute Tt in hr, Tt = $[0.007(nL)^{0.8}] / [P_{24hr}^{0.5} s^{0.4}]$ †††	0.831
Subtotal	**0.83**

Shallow Concentrated Flow

Segment ID	BC
7. Surface description (Paved or Unpaved)	Unpaved
8. Flow length, L (ft)	328
9. Watercourse slope, s (ft/ft)	0.0003
10. Average velocity†††, V = kS^0.5 (fps)	0.28
11. Compute Tt in hr, Tt = L/3600V	0.32
Subtotal	**0.32**

Channel & Pipe Flow

Segment ID	CD
12. Segment Type	Channel
13. Pipe Diameter (in.)	--
14. Cross sectional flow area, a (assumed d=0.5 ft for channel)	6
15. Wetted perimeter, Pw	14.12
16. Hydraulic radius (ft), r = a/Pw, Compute r	0.42
17. Channel/Pipe slope, s (ft./ft.)	0.0005
18. Manning's roughness coeff., n	0.06
19. V = 1.486(r^0.667)(s^0.50)/n, Compute V	0.30
20. Flow length, L	1,247
21. Compute Tt in hr, Tt = L/3600V	1.16
22. Subtotal	**1.16**

Time of Concentration, hr. (summation of subtotals)		
	Hours	2.31
	Minutes	138.6
	Total	**138.6**

Notes:

† Values from Table 3-1 of Urban Hydrology for Small Watersheds, Technical Release of TR-55

†† The 2-year, 24-hour rainfall was used based on TR-55 Figure B-3.

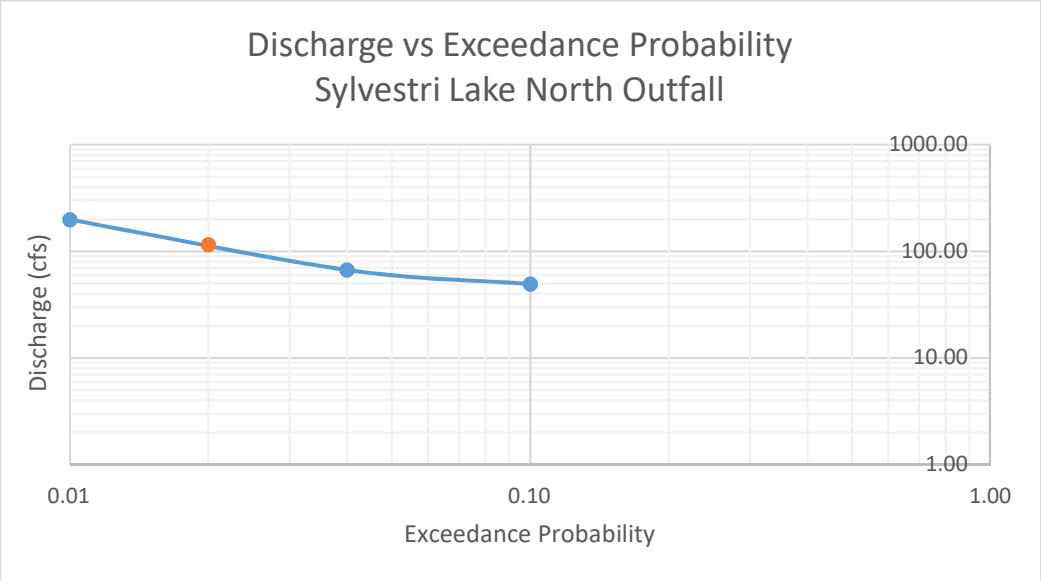
††† This equation is derived from TR-55

Additional Flow Estimate from Sylvestri Lake North Drainage System

RI (yr)	Prob	Discharge (cfs)	log Prob	Log Discharge
10	0.10	49.36	-1.000	1.693
25	0.04	66.99	-1.398	1.826
100	0.01	198.24	-2.000	2.297

Slope1 = -0.78262

RI (yr)	Prob	log Prob	Log Discharge	Estimated Discharge (cfs)
50	0.02	-1.699	2.062	115.24



To determine Peak Flow for 500-yr Storm Event:

Q_{500} = 207.43 cfs (Typical range Q_{500}/Q_{50} between 1.3 and 1.8, use 1.8)

Crossing Input: CD-02_PR

Parameter	Value	Units
DISCHARGE DATA		
Discharge Method	User-Defined	
Discharge List	Define...	
TAILWATER DATA		
Channel Type	Enter Constant Tailwater Elevation	
Channel Invert Elevation	28.810	ft
Constant Tailwater Elevation	33.810	ft
Rating Curve	View...	
ROADWAY DATA		
Roadway Profile Shape	Constant Roadway Elevation	
First Roadway Station	0.000	ft
Crest Length	300.000	ft
Crest Elevation	36.950	ft
Roadway Surface	Paved	
Top Width	96.000	ft

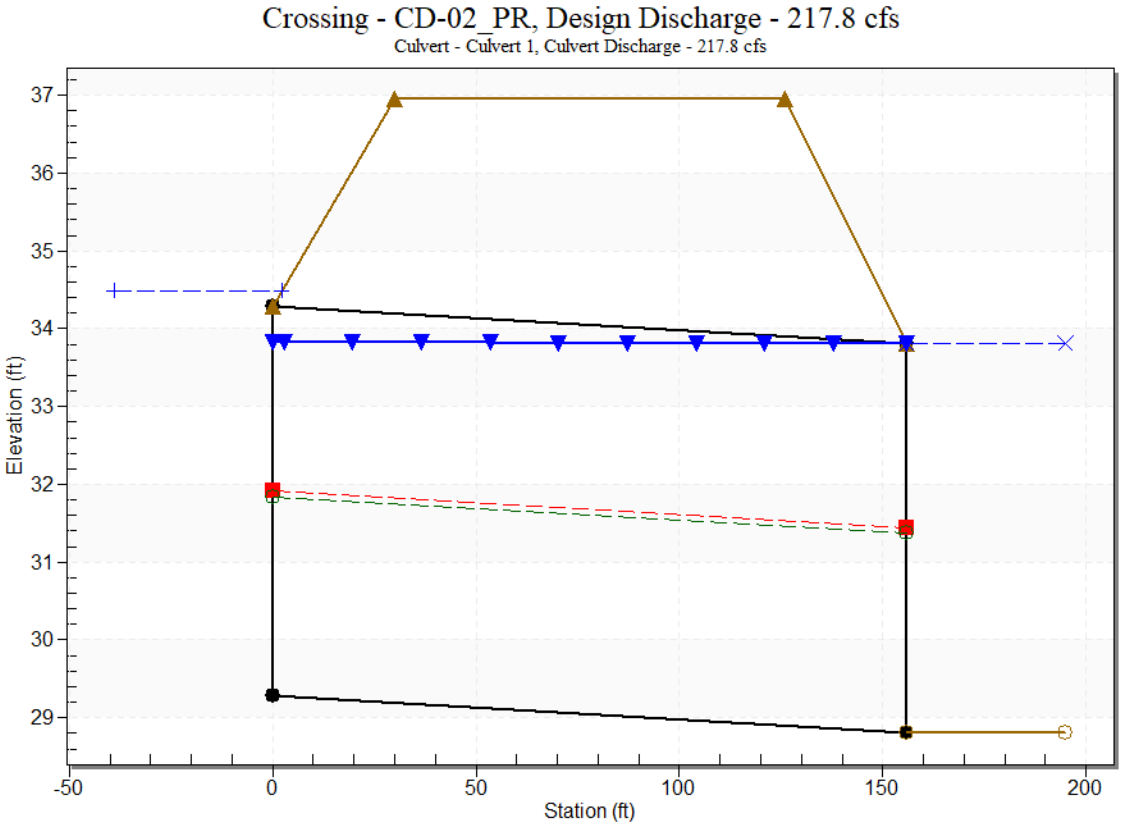
Culvert Input: CD-02_PR

Parameter	Value	Units
CULVERT DATA		
Name	Culvert 1	
Shape	Concrete Box	
Material	Concrete	
Span	9.000	ft
Rise	5.000	ft
Embedment Depth	0.000	in
Manning's n	0.012	
Culvert Type	Straight	
Inlet Configuration	Square Edge (90º) Headwall (Ke=0.5)	
Inlet Depression?	No	
SITE DATA		
Site Data Input Option	Culvert Invert Data	
Inlet Station	0.000	ft
Inlet Elevation	29.280	ft
Outlet Station	156.000	ft
Outlet Elevation	28.810	ft
Number of Barrels	1	
Computed Culvert Slope	0.003013	ft/ft

Table 2 - Culvert Summary Table: Culvert 1

Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	HW / D (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
50-yr	122.97	122.97	34.02	3.06	4.745	0.95	1-S1f	1.73	1.80	5.00	5.00	2.73	0.00
100-yr	206.97	206.97	34.42	4.29	5.138	1.03	1-S1f	2.47	2.54	5.00	5.00	4.60	0.00
500-yr	217.75	217.75	34.48	4.44	5.203	1.04	1-S1f	2.56	2.63	5.00	5.00	4.84	0.00
Overtopping	508.08	445.73	37.12	7.84	7.342	1.57	4-FFf	4.30	4.24	5.00	5.00	9.91	0.00

Water Surface Profile Plot for Culvert: Culvert 1



CROSS DRAIN CD-03_PR

PROJECT:	**Sanford Airport Connector**	**PREPARED:**	LCM	**DATE:**	05/02/25
LOCATION:	**Seminole County, Florida**	**CHECKED:**	LCS	**DATE:**	05/02/25

Proposed Offsite Conveyance Calculations

Proposed Cross Drain at Sanford Airport Connector

(Total Drainage Basin Area = Drainage Basin CD-03_EX + Drainage Basin CD-04_EX + Offsite CD-03_PR Basin)

Cross Drain Name	**CD-03_PR**
Affected Corridor(s)	2a
Pervious C-Value	0.20
Impervious C-value	0.95
Time of Concentration (min)	49.1

Basin Runoff Calculations for Offsite CD-03_PR Basin

Total Contributing Area (acres)	23.85
Pervious Contributing Area (acres)	23.85
Impervious Contributing Area (acres)	0.00
Weighted Runoff Coefficient (C_{50})[1]	0.24
Weighted Runoff Coefficient ($C_{100-500}$)[1]	0.25
Design Event[2]	50-year
Rainfall Intensities[3]	
Design Event I_{50} (in/hr)	4.27
I_{100} (in/hr)	4.62
I_{500} (in/hr)	5.37
Peak Flows	
Design Q_{50} (cfs)	**24.44**
Q_{100} (cfs)	**27.55**
Q_{500} (cfs)	**32.02**

Total Peak Flow Draining to CD_03_PR

Basin	**Q_{50}**	**Q_{100}**	**Q_{500}**
*Existing Cross Drains CD-3A_EX and CD-3B_EX	70.33	84.40	105.50
*Existing Cross Drain CD-4_EX	45.90	55.08	68.85
Offsite CD-03_PR Basin	24.44	27.55	32.02
Total Peak Flow	**140.68**	**167.03**	**206.37**

Notes:

**Estimated using the velocity method

Cross Drain Sizing Calculations

Assumed Velocity (ft/s)	3
Cross-sectional Area Required (ft^2)	46.89
Number of Cells	1
Recommended Culvert Conveyance Size	8 ft x 6 ft
Provided Cross Sectional Area (ft^2)	48.00
Upstream Est. SHWL Elev (ft-NAVD88)	29.46
Upstream Est. Ground Elev (ft-NAVD88)	29.46
Downstream Est. Ground Elev (ft-NAVD88)	28.61
Additional Culvert Height Required	0 ft
Recommended Culvert Size (SpanxRise)	1-cell 8 ft x 6 ft
Tailwater (ft-NAVD88)[4]	34.61
Length[5]	283 ft

Notes:

[1] Frequency Factor for Pervious Area Runoff Coefficients will be applied per Design Storm Event (Table B-5, FDOT Drainage Design Guide, January 2017).

[2] Per FDOT Drainage Manual, 50-year considered design event for mainline interstates and 100-year used if culvert proposed within regulated floodway.

[3] Design Intensity calculated from NOAA IDF Curve (NOAA Atlas 14 Website).

[4] Crown of culvert

[5] Approximate Length = R/W Length - 10-ft each side for riprap / Culvert in skew.

Design Storm Frequency Factors for Pervious Area Runoff Coefficients

Table T-5 (FDOT Hydrology Handbook, Feb. 2012)

Return Period (years)	Design Storm Frequency
2 to 10	1.00
25	1.10
50	1.20
100	1.25

General Notes:

Existing Cross Drains CD-3A_EX and CD-3B_EX Basin

1- Existing Cross Drains CD-3A_EX and CD-3B_EX are connected in an existing drainage system that runs within the North Sylvertri Lake Development and conveys the offsite basin runoff to a wetland area located on east of the community.

Existing Cross Drain CD-4 Basin

1- Although the cross drain is shown in the construction plans, it is not included in the drainage report of the permit document. Therefore, no design flow was provided in the permit documentation. The 50-yr flow rate was estimated using the velocity method.

PROJECT:	Sanford Airport Connector	**PREPARED:**	LCM	**DATE:**	4/28/2025
LOCATION:	Seminole County, Florida	**CHECKED:**	LCS	**DATE:**	04/28/25

Proposed Offsite Time of Concentration Calculations

EXISTING or DEVELOPED / UNDEVELOPED BASIN: Offsite CD-03_PR

Tc or Tt (through subarea)

L = 2,310 ft

Sheet flow (Applicable to Tc only)

Segment ID	AB
1. Surface description†	Woods
2. Mannings roughness coeff., n †	0.40
3. Flow length, L (total L ≤ 100 ft.)	100
4. 2-year, 24-hour rainfall (in.) ††	4.27
5. Land slope, s (ft./ft.)	0.019
6. Compute Tt in hr, Tt = $[0.007(nL)^{0.8}] / [P_{24hr}^{0.5} s^{0.4}]$ †††	0.318
Subtotal	**0.32**

Shallow Concentrated Flow

Segment ID	BC
7. Surface description (Paved or Unpaved)	Unpaved
8. Flow length, L (ft)	2,210
9. Watercourse slope, s (ft/ft)	0.006
10. Average velocity†††, V = kS^0.5 (fps)	1.23
11. Compute Tt in hr, Tt = L/3600V	0.50
Subtotal	**0.50**

Channel & Pipe Flow

Segment ID	
12. Segment Type	
13. Pipe Diameter (in.)	
14. Cross sectional flow area, a (assumed d=0.5 ft for channel)	
15. Wetted perimeter, Pw	
16. Hydraulic radius (ft), r = a/Pw, Compute r	
17. Channel/Pipe slope, s (ft./ft.)	
18. Manning's roughness coeff., n	
19. V = 1.486(r^0.667)(s^0.50)/n, Compute V	
20. Flow length, L	
21. Compute Tt in hr, Tt = L/3600V	
22. Subtotal	

Time of Concentration, hr. (summation of subtotals)

Hours	0.82
Minutes	49.1
Total	**49.1**

Notes:

† Values from Table 3-1 of Urban Hydrology for Small Watersheds, Technical Release of TR-55

†† The 2-year, 24-hour rainfall was used based on TR-55 Figure B-3.

††† This equation is derived from TR-55

Additional Flow Estimate from Existing Cross Drains (CD-03A_EX and CD-03B_EX)

Estimate Peak Flow (Alternative 1 - Using Q_{25} Calculated Peak Flow from Permit)

From Permit document, Q_{25} = 61.16 cfs

Calculated Q_{25}	61.16	cfs
Estimate Q_{50}	70.33	cfs (Typical range Q_{50}/Q_{25} between 1.1 and 1.2, use 1.15)
Estimate Q_{100}	84.40	cfs (Typical range Q_{100}/Q_{50} between 1.1 and 1.3, use 1.2)
Estimate Q_{500}	105.50	cfs (Typical range Q_{500}/Q_{50} between 1.3 and 1.8, use 1.5)

Additional Flow Estimate from Existing Cross Drain CD-04_EX

Existing Structure	Triple 24" x 38" ERCP	
Opening Area	15.30	sf
Assume Velocity	3	fps
Estimate Q_{50}	45.90	cfs
Estimate Q_{100}	55.08	cfs (Typical range Q_{100}/Q_{50} between 1.1 and 1.3, use 1.2)
Estimate Q_{500}	68.85	cfs (Typical range Q_{500}/Q_{50} between 1.3 and 1.8, use 1.5)

Crossing Input: CD-03_PR

Parameter	Value	Units
DISCHARGE DATA		
Discharge Method	User-Defined	
Discharge List	Define...	
TAILWATER DATA		
Channel Type	Enter Constant Tailwater Elevation	
Channel Invert Elevation	28.610	ft
Constant Tailwater Elevation	34.610	ft
Rating Curve	View...	
ROADWAY DATA		
Roadway Profile Shape	Constant Roadway Elevation	
First Roadway Station	0.000	ft
Crest Length	300.000	ft
Crest Elevation	52.650	ft
Roadway Surface	Paved	
Top Width	96.000	ft

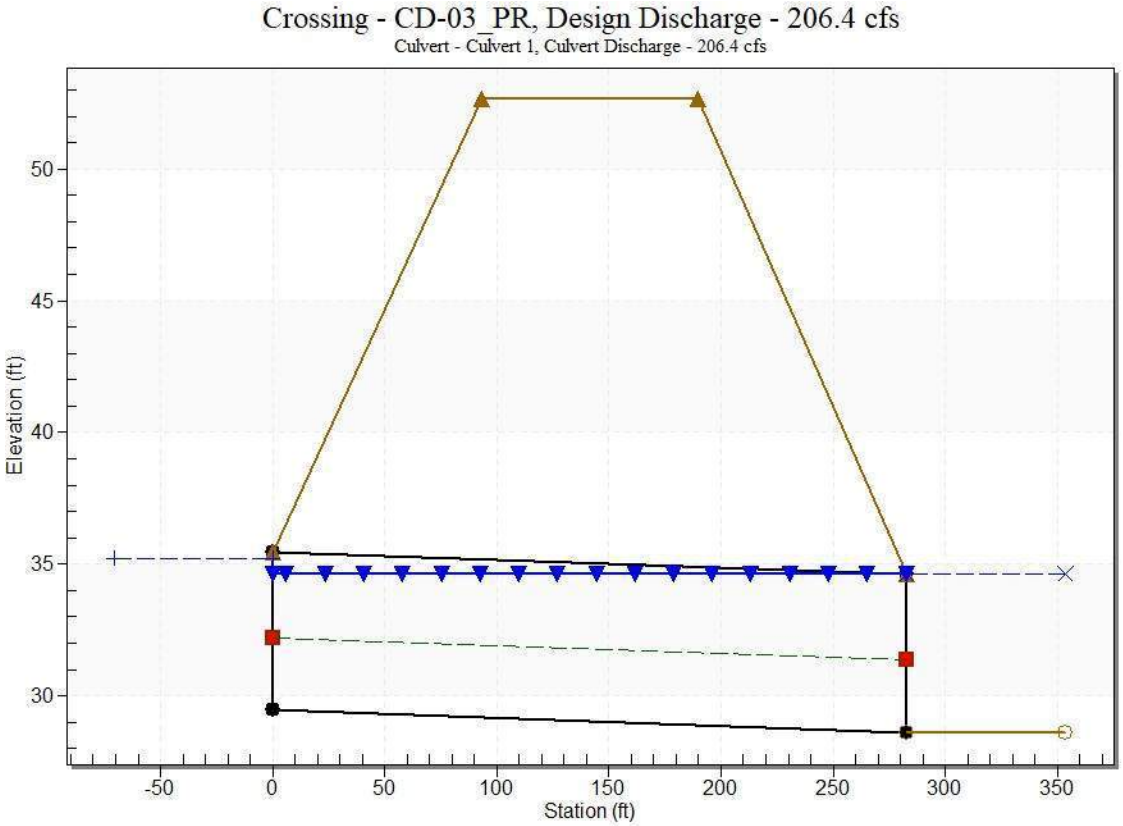
Culvert Input: CD-03_PR

Parameter	Value	Units
CULVERT DATA		
Name	Culvert 1	
Shape	Concrete Box	
Material	Concrete	
Span	8.000	ft
Rise	6.000	ft
Embedment Depth	0.000	in
Manning's n	0.012	
Culvert Type	Straight	
Inlet Configuration	Square Edge (90º) Headwall (Ke=0.5)	
Inlet Depression?	No	
SITE DATA		
Site Data Input Option	Culvert Invert Data	
Inlet Station	0.000	ft
Inlet Elevation	29.460	ft
Outlet Station	283.000	ft
Outlet Elevation	28.610	ft
Number of Barrels	1	
Computed Culvert Slope	0.003004	ft/ft

Table 2 - Culvert Summary Table: Culvert 1

Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	HW / D (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
50-yr	140.68	140.68	34.89	3.62	5.434	0.91	1-S1f	2.09	2.13	6.00	6.00	2.93	0.00
100-yr	167.03	167.03	35.01	4.04	5.550	0.93	1-S1f	2.36	2.38	6.00	6.00	3.48	0.00
500-yr	206.37	206.37	35.22	4.64	5.760	0.96	1-S1f	2.74	2.74	6.00	6.00	4.30	0.00
Overtopping	1031.85	1010.79	52.73	23.27	19.445	3.88	4-FFf	6.00	6.00	6.00	6.00	21.06	0.00

Water Surface Profile Plot for Culvert: Culvert 1



CROSS DRAIN CD-04_PR

HY-8 CALCULATION FOR PROPOSED CONDITION

(TRIPLE 36-INCH RCP)

PROJECT:	**Sanford Airport Connector**	**PREPARED:**	LCM	**DATE:**	06/20/25
LOCATION:	**Seminole County, Florida**	**CHECKED:**	LCS	**DATE:**	06/20/25

Proposed Offsite Conveyance Calculations

Proposed Cross Drain at Sanford Airport Connector

Cross Drain Name	**CD-04_PR**
Affected Corridor(s)	2a

Basin Runoff Calculations for Offsite CD-05_PR Basin

Total Contributing Area (acres)	21.95
Design Q_{50} (cfs)	**60.31**
Q_{100} (cfs)	**69.32**
Q_{500} (cfs)	**88.20**

$Q_{50,}$ Q_{100} and Q_{500} from Permit SJRWMD ERP 4-117-22496-3
(See Excerpts in Appendix B Page 40)

Cross Drain Sizing Calculations

Assumed Velocity (ft/s)	3
Cross-sectional Area Required (ft^2)	20.10
Number of Cell	3
Recommended Culvert Conveyance Size	36 inch
Provided Cross Sectional Area (ft^2)	21.21
Upstream Est. SHWL Elev (ft-NAVD88)	28.96
Upstream Est. Ground Elev (ft-NAVD88)	28.96
Downstream Est. Ground Elev (ft-NAVD88)	28.56
Additional Culvert Height Required	0 ft
Recommended Culvert Size	36 inch
Tailwater (ft-NAVD88)[4]	31.56
Length	220 ft

Notes:

[1] Frequency Factor for Pervious Area Runoff Coefficients will be applied per Design Storm Event (Table B-5, FDOT Drainage Design Guide, January 2017).

[2] Per FDOT Drainage Manual, 50-year considered design event for mainline interstates and 100-year used if culvert proposed within regulated floodway.

[3] Design Intensity calculated from NOAA IDF Curve (NOAA Atlas 14 Website).

[4] Crown of culvert

EARTH TECH

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CALCULATION SHEET — PAGE ___ OF ___

CLIENT Seminole County — SUBJECT Proposed Cross Drain Calculation — PROJECT NO. 46547

PROJECT East Lake Mary Boulevard, Segment 2A — Prepared By MG DATE 01/02/02

Reviewed By ____ DATE ____

Approved By ____ DATE ____

Drainage Area (A) = 21.953 AC

DRAINAGE AREA FOR CD_EX-05

T_c = 20 min

Intensity $\begin{cases} I_{50} = 7.0 \text{ in/hr} \left(C_{50} = 0.337 \times 1.2 = 0.404 \right) \\ I_{100} = 7.5 \text{ in/hr} \left(C_{100} = 0.337 \times 1.25 = 0.421 \right) \end{cases}$

$$Q_{50} = C_{50} I_{50} A$$

$$= 0.404 \times 7.0 \times 21.953 = 62.08 \text{ cfs}$$

$$Q_{100} = C_{100} I_{100} A$$

$$= 0.421 \times 7.5 \times 21.953 = 69.32 \text{ cfs}$$

Crossing Input: CD-04_PR (Triple)

Parameter	Value	Units
DISCHARGE DATA		
Discharge Method	User-Defined	
Discharge List	Define...	
TAILWATER DATA		
Channel Type	Enter Constant Tailwater Elevation	
Channel Invert Elevation	28.560	ft
Constant Tailwater Elevation	31.560	ft
Rating Curve	View...	
ROADWAY DATA		
Roadway Profile Shape	Constant Roadway Elevation	
First Roadway Station	0.000	ft
Crest Length	300.000	ft
Crest Elevation	38.200	ft
Roadway Surface	Paved	
Top Width	96.000	ft

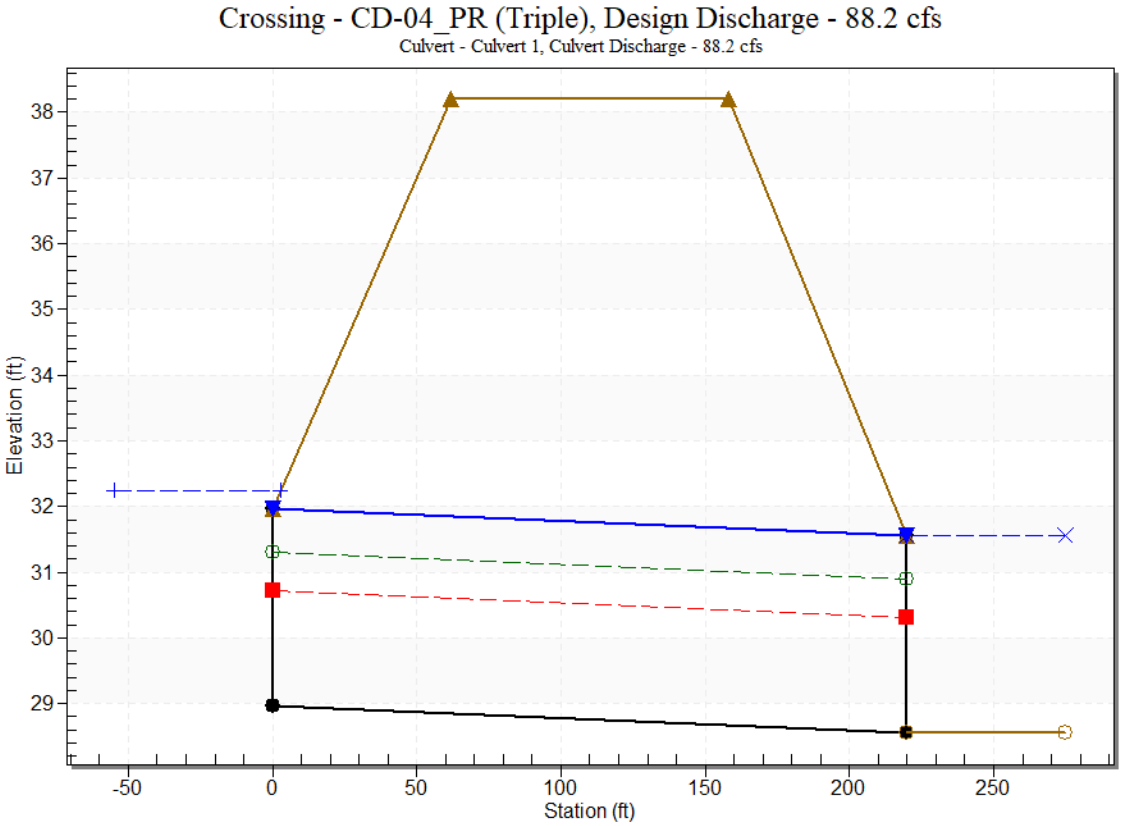
Culvert Input: CD-04_PR (Triple)

Parameter	Value	Units
CULVERT DATA		
Name	Culvert 1	
Shape	Circular	
Material	Concrete	
Diameter	3.000	ft
Embedment Depth	0.000	in
Manning's n	0.012	
Culvert Type	Straight	
Inlet Configuration	Beveled Edge (1:1) (Ke=0.2)	
Inlet Depression?	No	
SITE DATA		
Site Data Input Option	Culvert Invert Data	
Inlet Station	0.000	ft
Inlet Elevation	28.960	ft
Outlet Station	220.000	ft
Outlet Elevation	28.560	ft
Number of Barrels	3	
Computed Culvert Slope	0.001818	ft/ft

Table 2 - Culvert Summary Table: Culvert 1

Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	HW / D (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
50-	60.31	60.31	31.94	2.06	2.981	0.99	3-M1f	1.76	1.44	3.00	3.00	2.84	0.00
100-	69.32	69.32	32.08	2.24	3.122	1.04	3-M1f	1.94	1.55	3.00	3.00	3.27	0.00
500-	88.20	88.20	32.24	2.57	3.285	1.09	4-FFf	2.34	1.76	3.00	3.00	4.16	0.00
Overtopping	294.00	276.22	38.27	7.95	9.314	3.10	4-FFf	3.00	2.86	3.00	3.00	13.03	0.00

Water Surface Profile Plot for Culvert: Culvert 1



HY-8 CALCULATION FOR EXISTING CONDITION

(TRIPLE 30-INCH RCP)

Crossing Input: CD_05_EX (NAVD) (Triple)

Parameter	Value	Units
DISCHARGE DATA		
Discharge Method	User-Defined	
Discharge List	Define...	
TAILWATER DATA		
Channel Type	Enter Constant Tailwater Elevation	
Channel Invert Elevation	28.660	ft
Constant Tailwater Elevation	31.160	ft
Rating Curve	View...	
ROADWAY DATA		
Roadway Profile Shape	Constant Roadway Elevation	
First Roadway Station	0.000	ft
Crest Length	300.000	ft
Crest Elevation	39.240	ft
Roadway Surface	Paved	
Top Width	96.000	ft

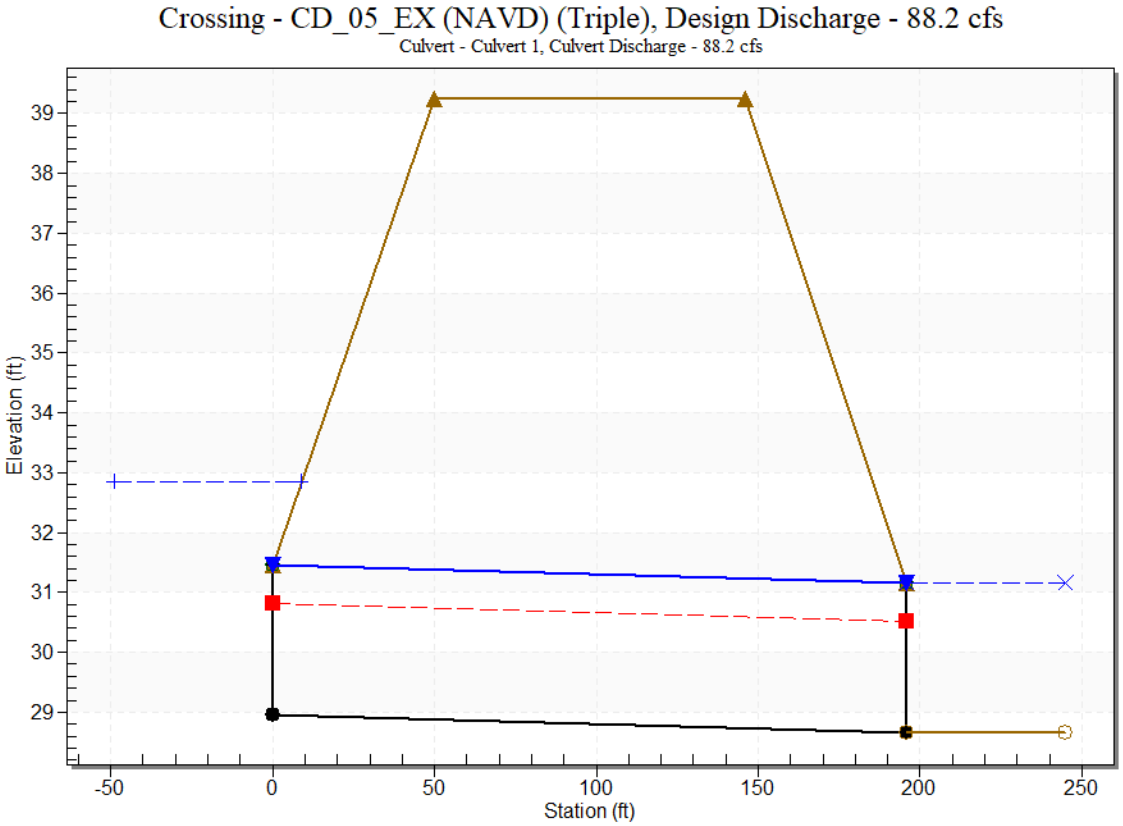
Culvert Input: CD_05_EX (NAVD) (Triple)

Parameter	Value	Units
CULVERT DATA		
Name	Culvert 1	
Shape	Circular	
Material	Concrete	
Diameter	2.500	ft
Embedment Depth	0.000	in
Manning's n	0.012	
Culvert Type	Straight	
Inlet Configuration	Square Edge with Headwall (Ke=0.5)	
Inlet Depression?	No	
SITE DATA		
Site Data Input Option	Culvert Invert Data	
Inlet Station	0.000	ft
Inlet Elevation	28.960	ft
Outlet Station	196.000	ft
Outlet Elevation	28.660	ft
Number of Barrels	3	
Computed Culvert Slope	0.001531	ft/ft

Table 2 - Culvert Summary Table: Culvert 1

Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	HW / D (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
50-yr	60.31	60.31	31.95	2.33	2.990	1.20	4-FFf	2.50	1.52	2.50	2.50	4.10	0.00
100-yr	69.32	69.32	32.20	2.57	3.243	1.30	4-FFf	2.50	1.64	2.50	2.50	4.71	0.00
500-yr	88.20	88.20	32.85	3.11	3.889	1.56	4-FFf	2.50	1.85	2.50	2.50	5.99	0.00
Overtopping	205.80	193.61	39.30	8.61	10.337	4.13	4-FFf	2.50	2.41	2.50	2.50	13.15	0.00

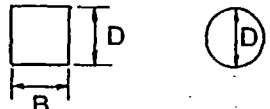
Water Surface Profile Plot for Culvert: Culvert 1



A.25 PROPOSED CROSS DRAINS CALCULATIONS

PROJECT: _____ CD--5_EX DESIGNER: MG DATE: 12/26/01

HYDROLOGIC AND CHANNEL INFORMATION



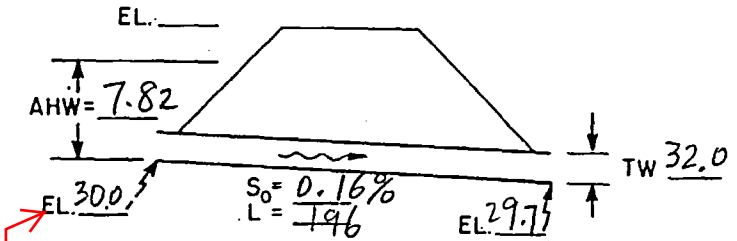
D = Diameter or Height
B = Span

Q_1 = 60.31 (50YR) TW_1 = 32.0
Q_2 = 69.32 (100YR) TW_2 = 32.0

(Q_1 = DESIGN DISCHARGE, SAY Q_{25}; Q_2 = CHECK DISCHARGE, SAY Q_{50} OR Q_{100})

SKETCH Airport Entrance Rd

STATION: 22+00



CULVERT DESCRIPTION (ENTRANCE TYPE)	Q	SIZE D	SIZE B	HEADWATER COMPUTATION: INLET CONTROL $\frac{Q}{B}$	INLET CONTROL $\frac{HW}{D}$	INLET CONTROL HW	OUTLET CONTROL HW=H+DTW−LS_o: K_e	H	d_c	$\frac{d_c+D}{2}$	TW	DTW	LS_o	HW	CONTROLLING H W	OUTLET VELOCITY	COST	COMMENTS	
5-24"x38"MES	12.41	24"	38"	3.81	0.70	1.75	0.7	0.3	1.20	1.85	2.30	2.30	0.3	2.3	2.3	2.4		Outlet Control	32.30
	13.86	24"	38"	4.37	0.74	1.85	0.7	0.38	1.23	1.87	2.30	2.30	0.3	2.38	2.38	2.7		Outlet Control	32.38

Construction plans indicated 3 - 30" RCP

SUMMARY & RECOMMENDATIONS:

Elevations in NGVD
10.0 NGVD = 8.96 NAVD

Design by _____ Checked by _____ Approved by _____

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JAN 22 2002
PDS
MONTE $VC. CTR.

2496

FIGURE 8-2
Worksheet for Culvert Capacity Calculations

625-040-208-a
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A-44

BEGIN PGL (RT)
STA 10+00.00 (11' RT)
℄ CONST & ℄ SURVEY
AIRPORT ENTRANCE ROAD=
STA 86+11.00
℄ CONST & ℄ SURVEY
EAST LAKE MARY BLVD
EL 41.00

END PGL (LT & RT)
CONNECT TO EXISTING
STA 33+70.29
℄ CONST
AIRPORT ENTRANCE ROAD

BEGIN PGL (LT)
STA 10+00.00 (23' LT)
℄ CONST & ℄ SURVEY
AIRPORT ENTRANCE ROAD=
STA 85+77.00
℄ CONST & ℄ SURVEY
EAST LAKE MARY BLVD
EL 40.90

PGL (LT & RT)

36" RCP
30" RCP
24" RCP
18" RCP
FL 31.00
FL 30.67
FL 31.50
FL 32.54
FL 32.74
FL 32.95
FL 37.36
FL 34.23
FL 33.73
FL 33.63
FL 34.15
FL 35.28
FL 36.10
FL 35.80
FL 37.16
FL 36.96
FL 38.50
FL 37.31
FL 39.87
EXISTING GROUND ℄ CONST
PROPOSED CROSS DRAIN
3 EA 30" RCP
X-1L
D/W EL 32.50

10+00 15+00 20+00 25+00 30+00
50 40 30 20

SCALE: 1"=100' HORIZ
1"=5' VERT

(3) 18" RCP INLET GRATE EL 37.89 INV 34.16
(9) 2-24"x38" RCP S FL 30.70 N FL 29.99
(10) 18" RCP N FL 32.71 INLET GRATE EL 37.83 SEWER EL 32.9 INV 29.01 6" PVC INV 31.0
(11) 2-24"x38" RCP S FL 30.08 N FL 29.38
(12) 18" RCP INLET GRATE EL 34.6 SEWER EL 30.1 INV 31.4 6" PVC INV 32.26
(13) 18" RCP INLET GRATE EL 37.40 INV 33.57
(14) PIPE INLET GRATE EL 38.00 INV 32.85
(15) 24" RCP E FL 41.73 W FL 41.86

1.344 AC
1.733 AC
0.309 AC
0.609 AC
0.330 AC
20.220 AC
0.239 AC
0.409 AC
0.330 AC
0.418 AC
0.649 AC
0.404 AC
0.473 AC
0.244 AC
0.217 AC
0.217 AC
0.214 AC
0.341 AC
0.251 AC
0.284 AC
0.430 AC
0.413 AC
0.271 AC
0.214 AC

FRONT AGE ROAD
EAST LAKE MARY BLVD
AIRPORT ENTRANCE RD
TARQUETTE AVE

CD-05_EX
(X-1L)

STA 10+00.00
℄ CONST & ℄ SURVEY
AIRPORT ENTRANCE ROAD=
STA 86+00.00
℄ CONST & ℄ SURVEY
EAST LAKE MARY BLVD

PROPOSED CROSS DRAIN
3 EA 30" RCP

0 20 100
Feet

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

EARTH TECH
30 SOUTH KELLER ROAD, SUITE 590, ORLANDO, FL 32810
407.660.1719
CERTIFICATE OF AUTHORIZATION NO. 8115

SEMINOLE COUNTY
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

ROAD NO.	COUNTY	PROJECT ID
	SEMINOLE	PS-0137

PROPOSED DRAINAGE MAP

SHEET NO. 4

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