City Commission
Work Session

Agenda
October 10, 2024 @ 1:00 PM
City Hall Commission Chambers
401 S. Park Avenue

welcome
Agendas and all backup material supporting each agenda item are accessible via the city's website at cityofwinterpark.org/meetings/ and include virtual meeting instructions.

assistance & appeals
Persons with disabilities needing assistance to participate in any of these proceedings should contact the City Clerk's Office (407-599-3277) at least 48 hours in advance of the meeting.

"If a person decides to appeal any decision made by the Board with respect to any matter considered at this hearing, a record of the proceedings is needed to ensure that a verbatim record of the proceedings is made, which record includes the testimony and evidence upon which the appeal is to be based." (F.S. 286.0105).

please note
Times are projected and subject to change.

agenda	estimated time

1. **Meeting Called to Order**
2. **Discussion Item (s)**
   a. Preliminary Stormwater Basin Studies Overview — 1 hour
3. **Adjournment**

City Commission

agenda item 2.a

item type
Discussion Item (s)

meeting date
October 10, 2024

prepared by
Charles Ramdatt, Director of Public Works

approved by

subject
Preliminary Stormwater Basin Studies Overview

motion | recommendation

background

alternatives | other considerations

fiscal impact

attachments
1. Basin Studies Work Session 10.10.24
2. Geosyntec_Lake_Killarney_CRA_Update_DRAFT_2024-09-18
3. CB_DraftSummaryReport_24-0918_NoApp (2)
4. Winter Park Pines Basin Study - Drainage Report 20240917

Stormwater Basin Studies
Commission Work Session

Prepared by:

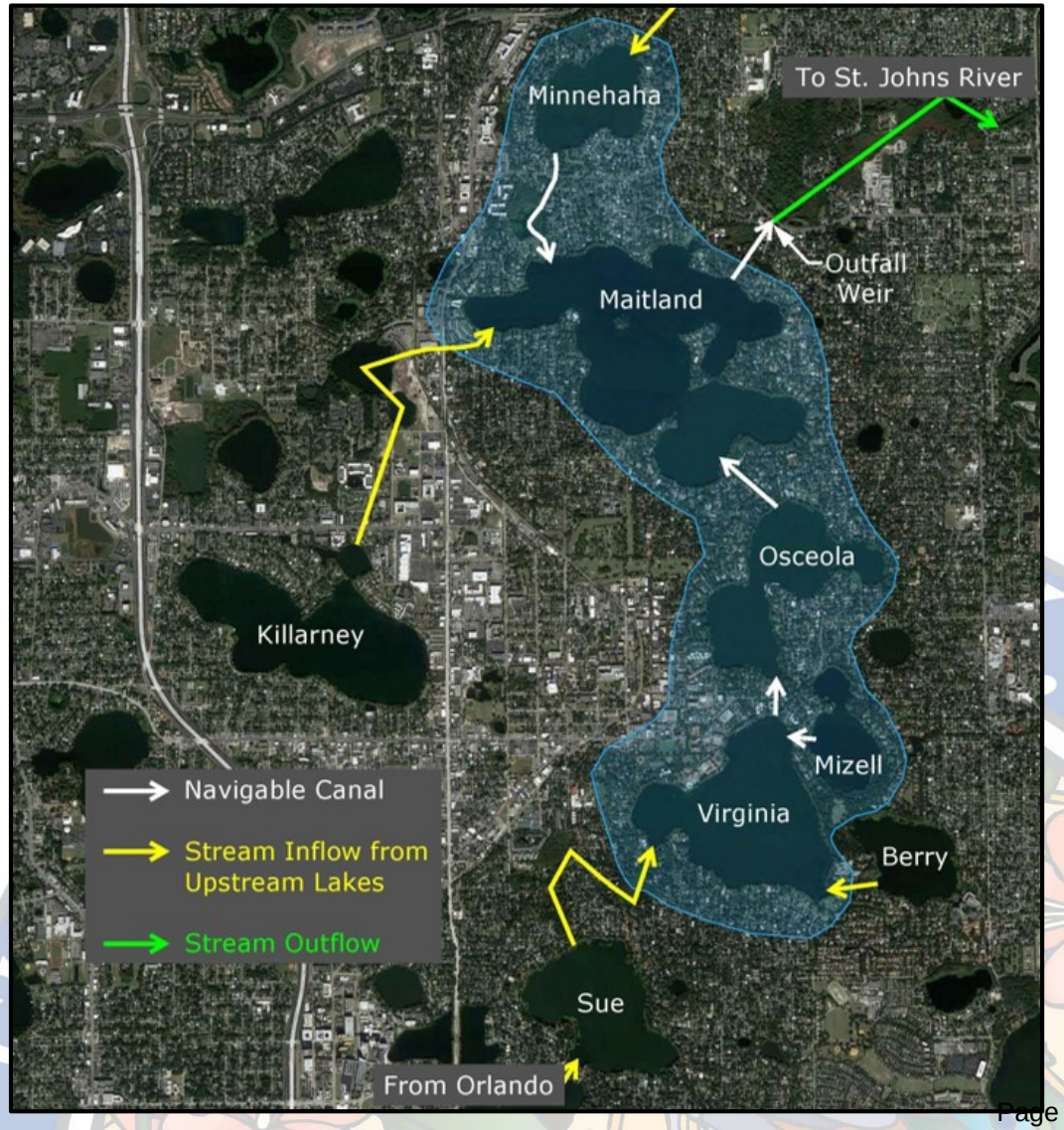
Public Works and Transportation
Stormwater Management Division

September 26, 2024

Team Introductions

City Team

- Charles Ramdatt, PE
  Director of Public Works & Transportation
- Don Marcotte, PE
  Assistant Director, City Engineer
- Shannon Monahan, EI
  Project Manager
- Gloria Eby, MS
  Director of Natural Resources and Sustainability

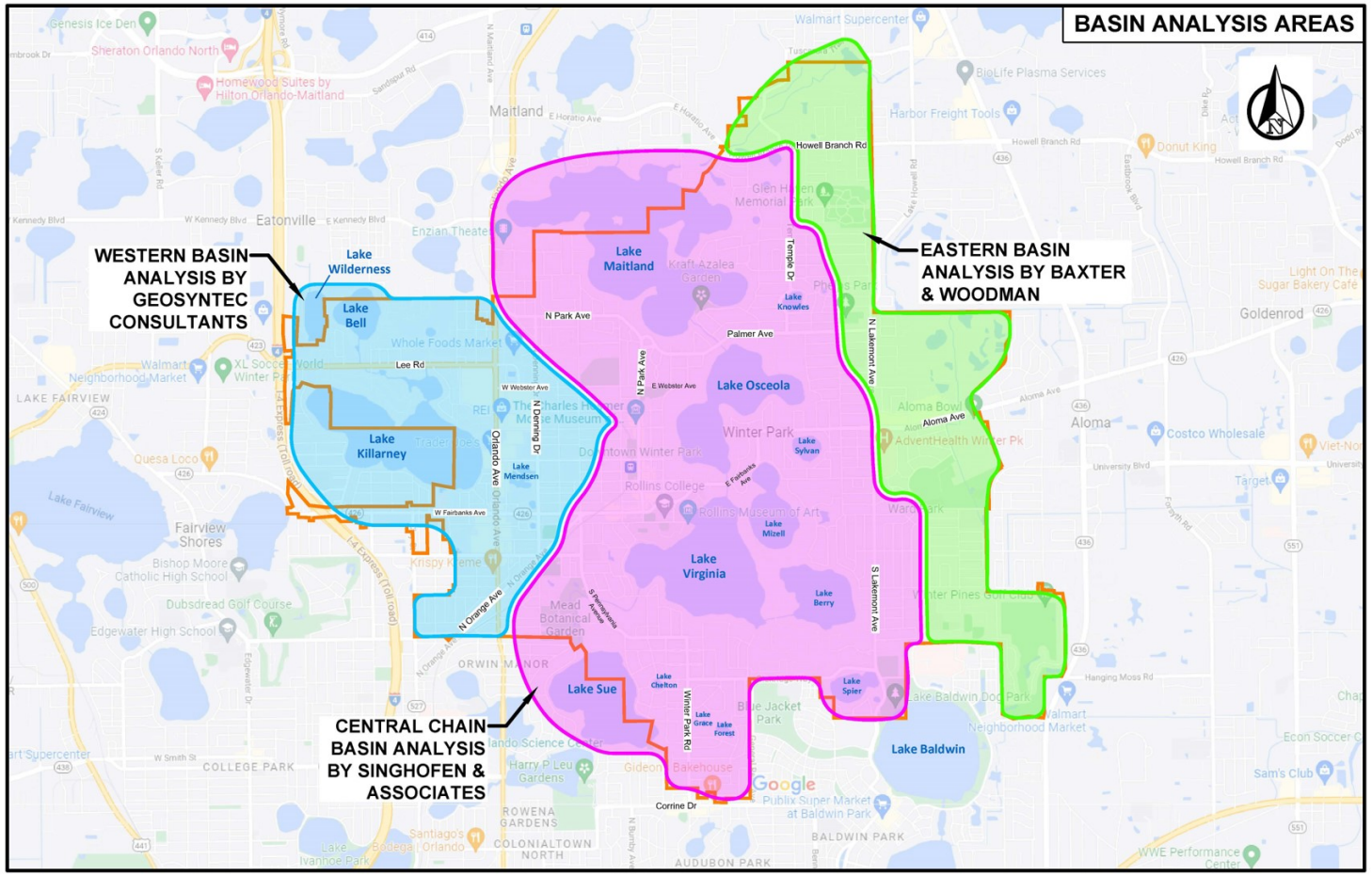


Team Introductions

Western Basin

Geosyntec Consultants, Inc.

- Tom Amstadt, PE, CFM
  Principal, Project Director
- Gloria Teague, PE, CFM
  Senior Engineer, Project Manager

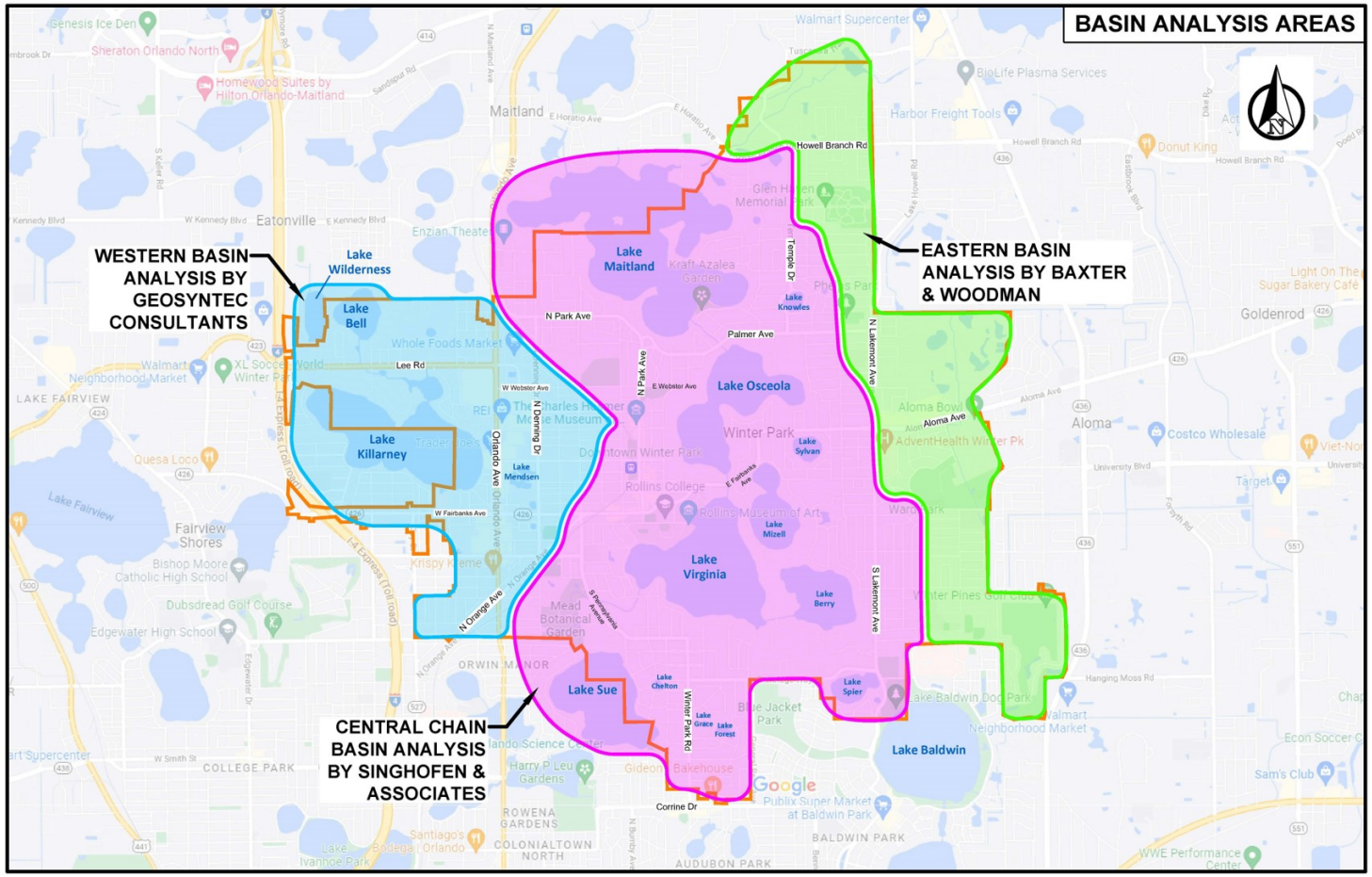


Team Introductions

Central Basin

Singhofen-Halff

- Kent Boulicault, PE
  VP, Deputy Practice Leader
- Chris Spargo
  GIS Analyst, Lead Modeler
- Mark Troilo, PE, CFM
  VP, Technical Leader

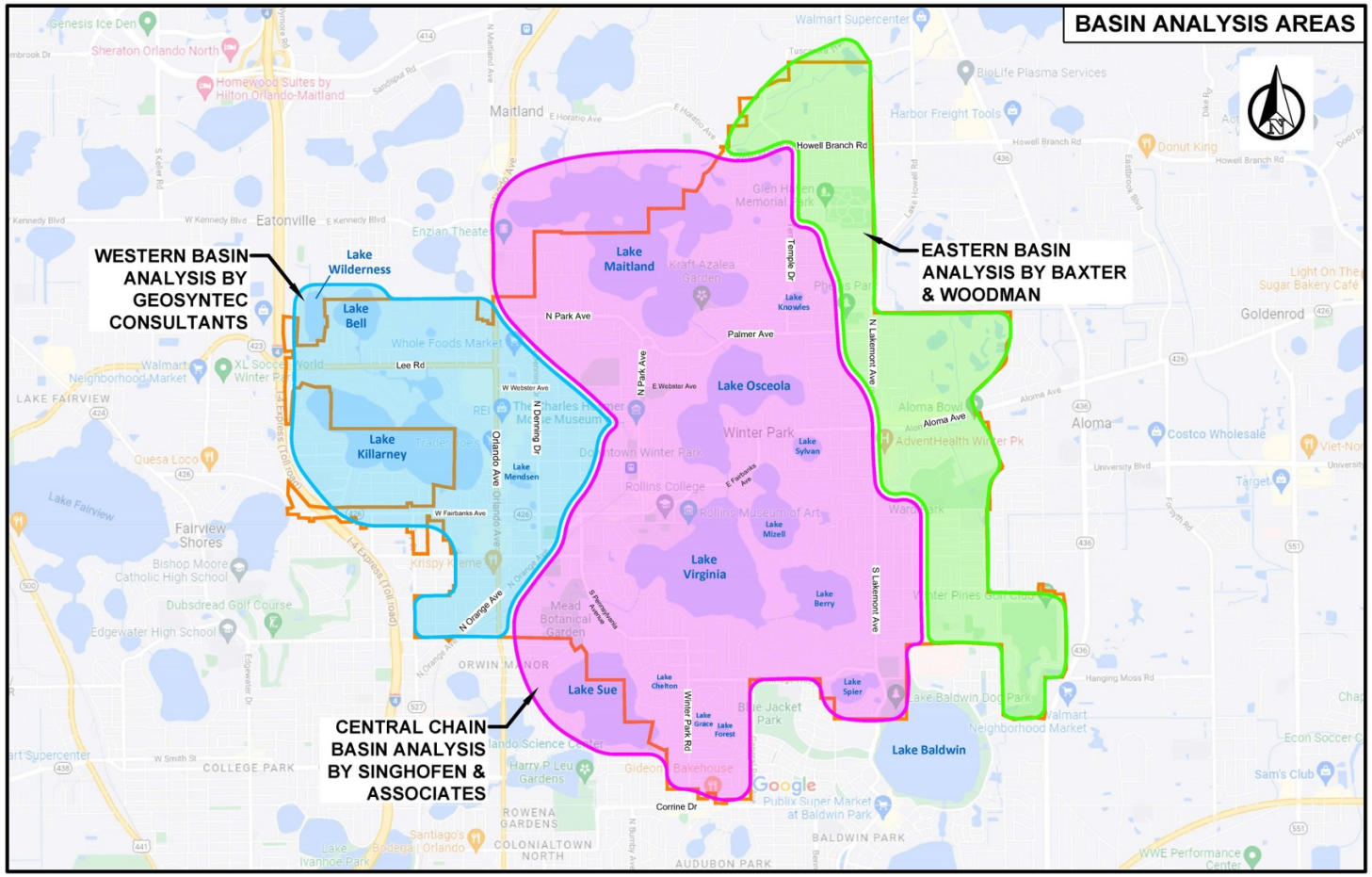


Team Introductions

Eastern Basin

Baxter and Woodman, Inc

- Claude Cassagnol, PE
  VP, Orlando Regional Manager
- Cindy Young, PE
  Engineer IV



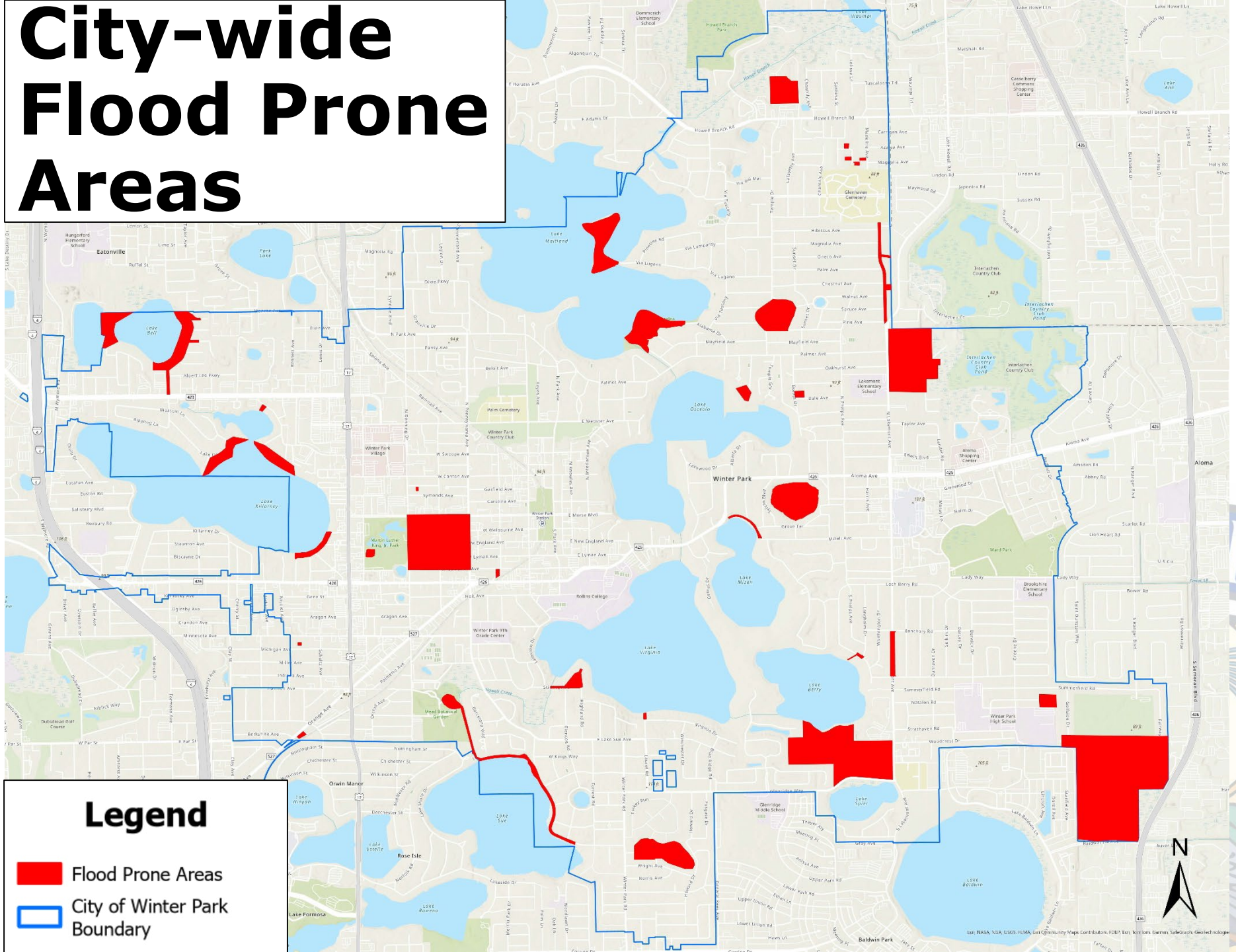
Study Motivation

- Frequent, intense storm events
- Major storm events such as Hurricane Ian
- Situational awareness for managers
- Enhanced flood management guide activities
- Improved base information for new development
- Opportunities to collaborate with neighboring municipalities

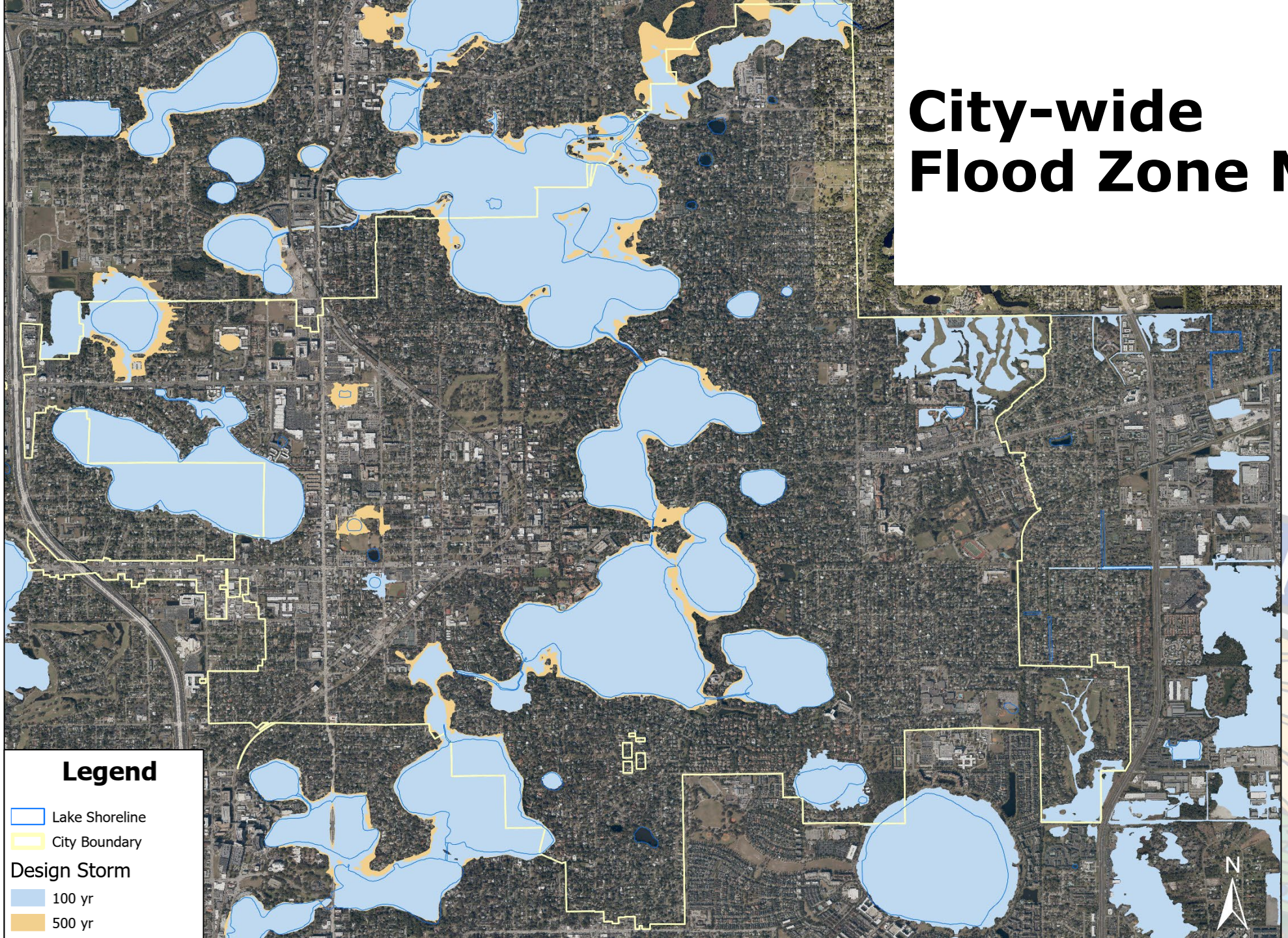




City-wide Flood Prone Areas



City-wide Flood Zone Map



Modeling Overview

- Design Storms
  - 2 yr, 24 hr
  - 10 yr, 6 hr
  - 10 yr, 24 hr
  - 25 yr, 6 hr
  - 25 yr, 24 hr
  - 100 yr, 24 hr
  - 500 yr, 24 hr (Hurricane Ian)
    - Used for model calibration



Mitigation Plan

Project Categories

- Upgrade and repair existing collection and conveyance facilities
- New collection and conveyance systems
- Upgraded and new water quality treatment and storage facilities
- Regional facilities for multi-jurisdictional benefits
- Flood zone validation
- Living stormwater model

Study Generated Alternatives

Western Basin

- Lake Mendsen:
  - Connection to Lake Rose
  - Pump station and lake expansion
- Canton Ave: Improved conveyance
- Lake Bell:
  - Connection to Park Lake
  - Reduced inflows from FDOT pond
- Lake Killarney: Improved conveyance to Lake Gem

- Combination of Lake Bell connection to Park Lake and improved conveyance from Lake Killarney to Lake Gem

Study Generated Alternatives

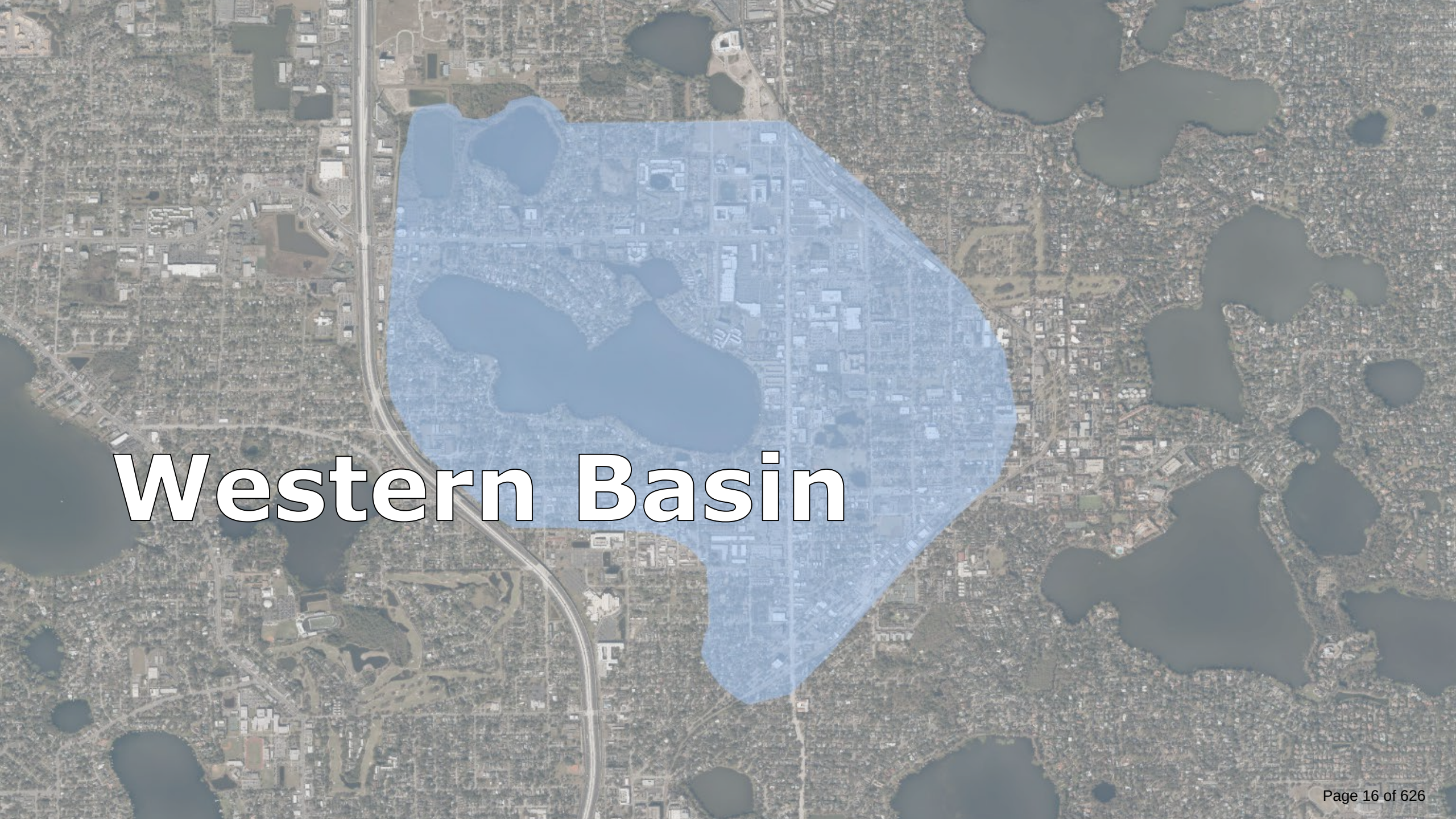
Central Basin

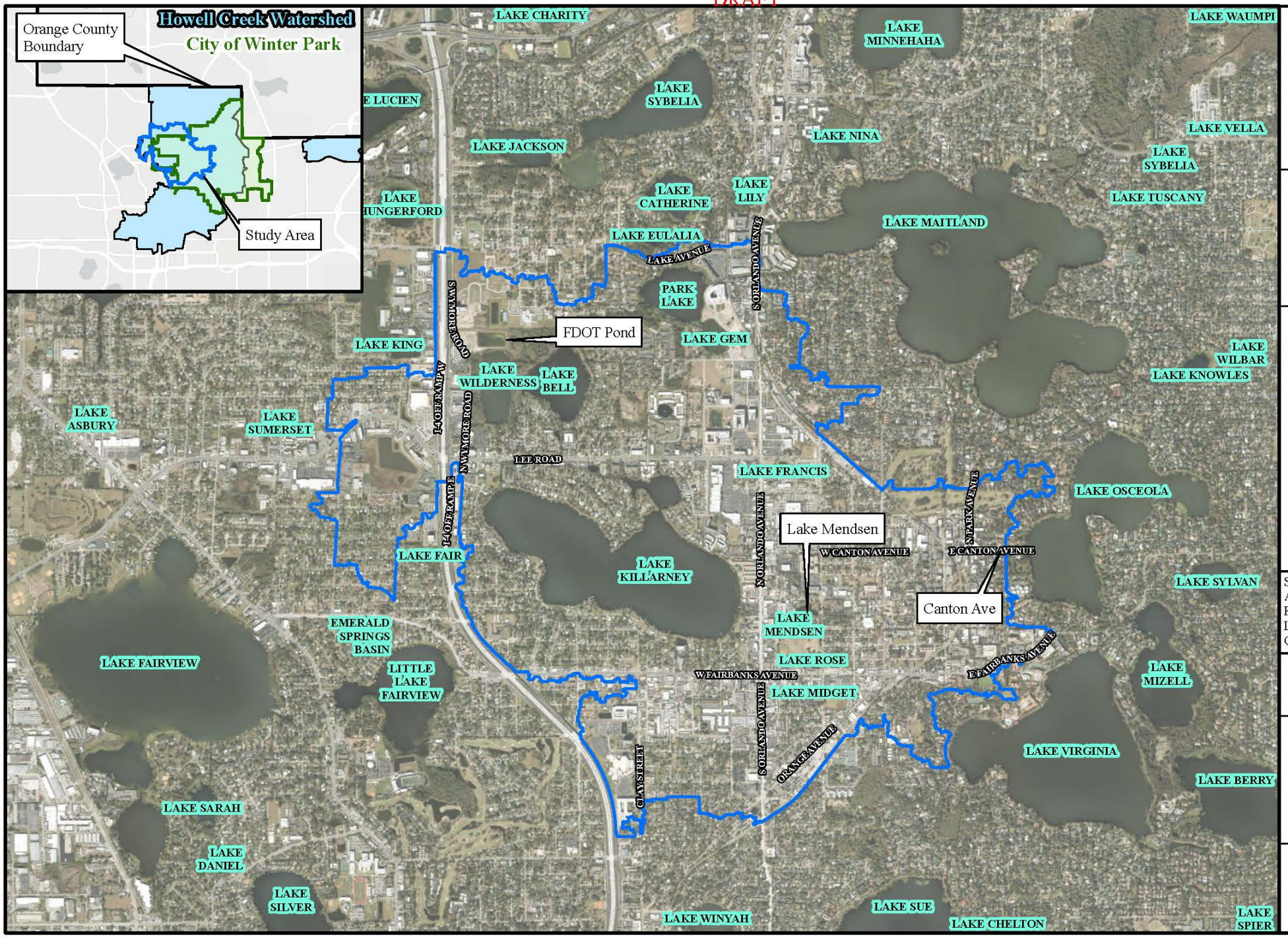
- Lake Interconnects:
  - Lake Knowles to Lake Maitland
  - Lake Sylvan to Lake Mizell
  - Lake Chelton to Lake Sue
  - Lake Grace to Lake Forest, and to Lake Sue
- Emergency Pumping Alternatives
- Chain of Lakes Control Structure

Eastern Basin

Winter Park Pines Sub basin

- Golfside Dr culvert replacement
- Lake Corrine Outfall Canal Regrading


Western Basin



CITY OF WINTER PARK, FLORIDA
ESTABLISHED 1882
CITY OF CULTURE AND HERITAGE

N

0 1,000 2,000
Feet

Legend

Study Area

Sources:
Aerial: ESRI, 2023
Roads: Orange County, 2020
Lakes: Orange County, 2020
City Boundary: Orange County, 2023

Exhibit
2

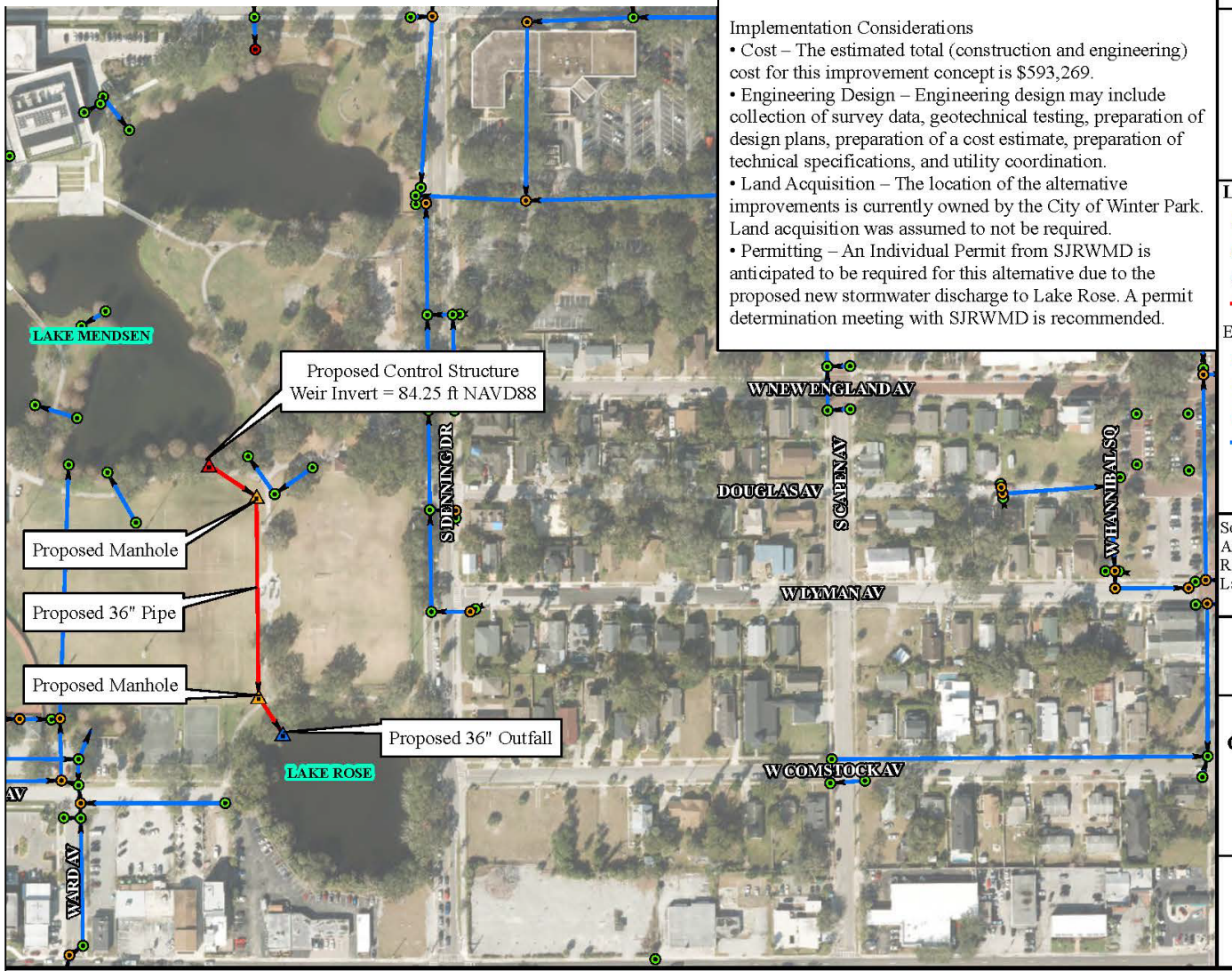
Site Map

Winter Park CRA Study Update and Lake Killarney Expansion Report

Geosyntec consultants

Lake Mendsen: Connection to Lake Rose

- New hydraulic connection between Lake Mendsen and Lake Rose.
- Includes new control structure
- Results in additional storage capacity and lowered flood stage of Lake Mendsen
- Estimated cost: $593,269



Problem
- Peak stages at Lake Mendsen result in potential roadway flooding along Denning Drive starting at the 2-year, 24-hour design storm event.

Benefit
- Decrease in peak stage mitigating roadway flooding on Denning Drive during storm events.

Implementation Considerations
- Cost – The estimated total (construction and engineering) cost for this improvement concept is $593,269.
- Engineering Design – Engineering design may include collection of survey data, geotechnical testing, preparation of design plans, preparation of a cost estimate, preparation of technical specifications, and utility coordination.
- Land Acquisition – The location of the alternative improvements is currently owned by the City of Winter Park. Land acquisition was assumed to not be required.
- Permitting – An Individual Permit from SJRWMD is anticipated to be required for this alternative due to the proposed new stormwater discharge to Lake Rose. A permit determination meeting with SJRWMD is recommended.

CITY OF WINTER PARK, FLORIDA
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N

0 100 200 Feet

Legend
- Proposed Manhole
- Proposed Structure
- Proposed Control Structure
- Proposed Pipe

Existing Stormwater Structures
- Inlet/Outlet
- Manhole
- Control Structure
- Existing Pipe

Sources:
Aerial: ESRI, 2023
Roads: Orange County, 2020
Lakes: Orange County, 2020

Exhibit 15

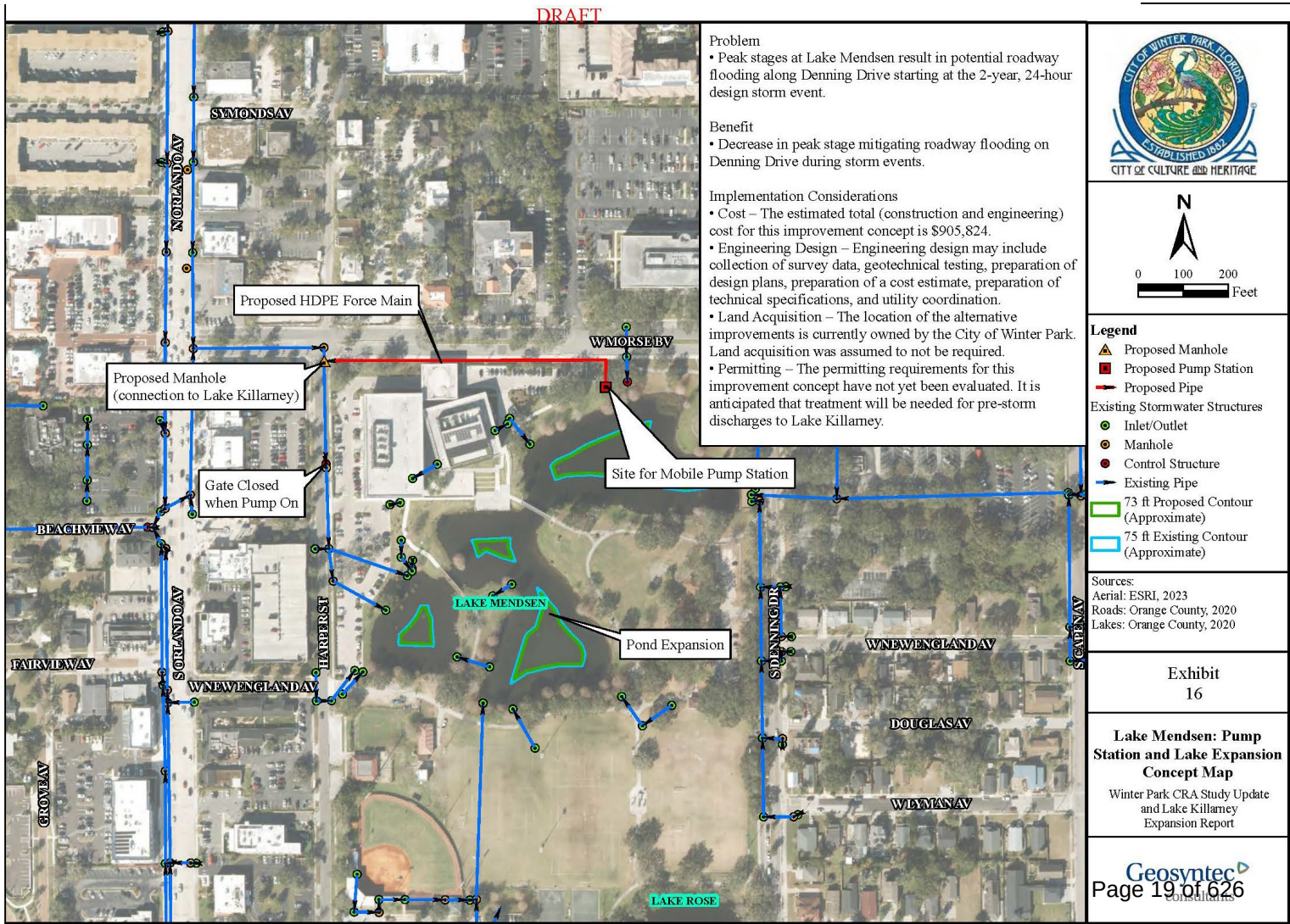
Lake Mendsen: Connection to Lake Rose Concept Map

Winter Park CRA Study Update and Lake Killarney Expansion Report

Geosyntec

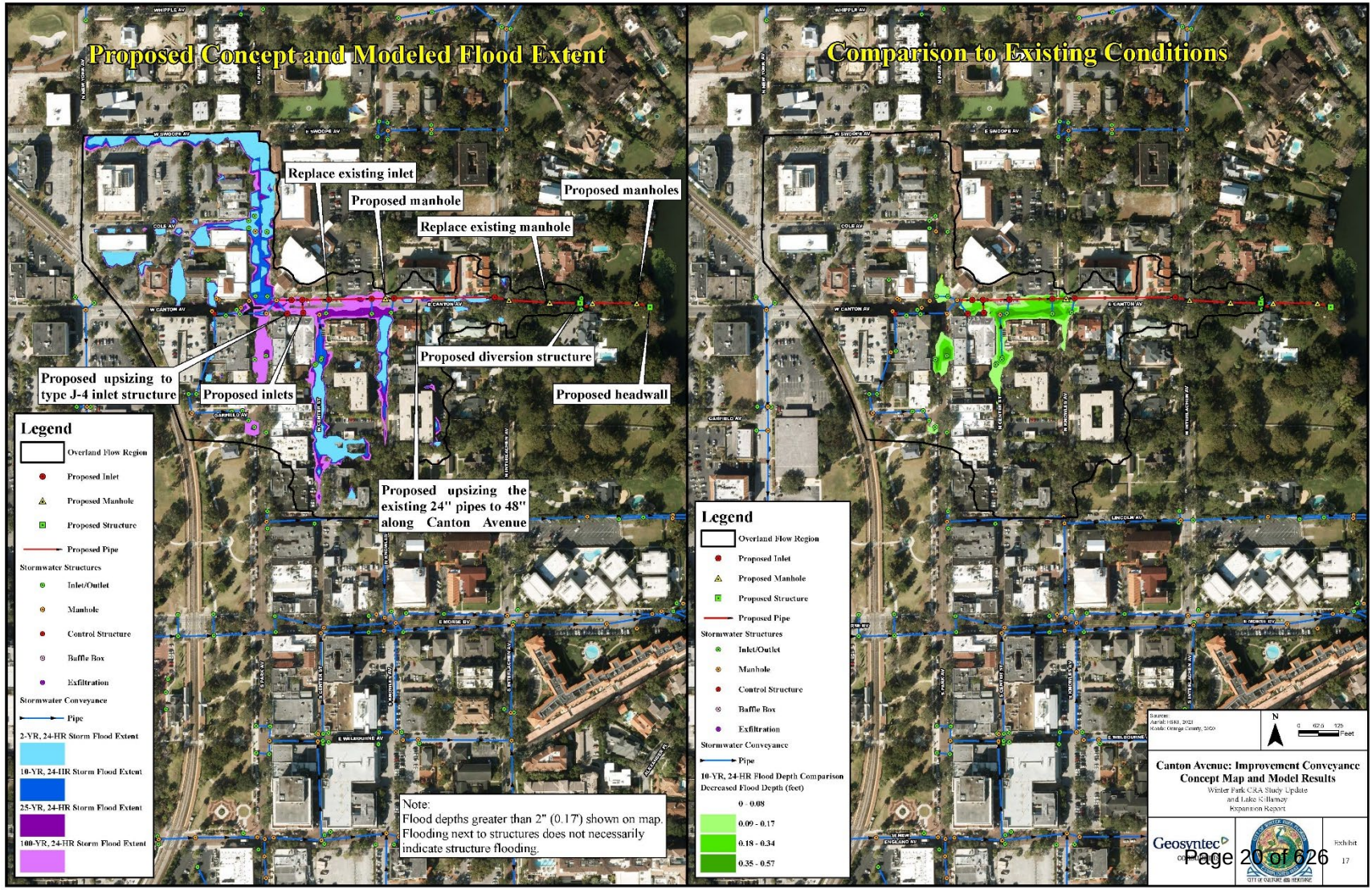
Lake Mendsen: Pump station and lake expansion

- Increase depth of Lake Mendsen by 2 feet
  - Provides 1.8 ac-ft of additional storage
- New infrastructure to allow for additional pre-storm drawdown using the City's mobile pump
- Estimated cost: $905,824



Canton Ave: Improved conveyance

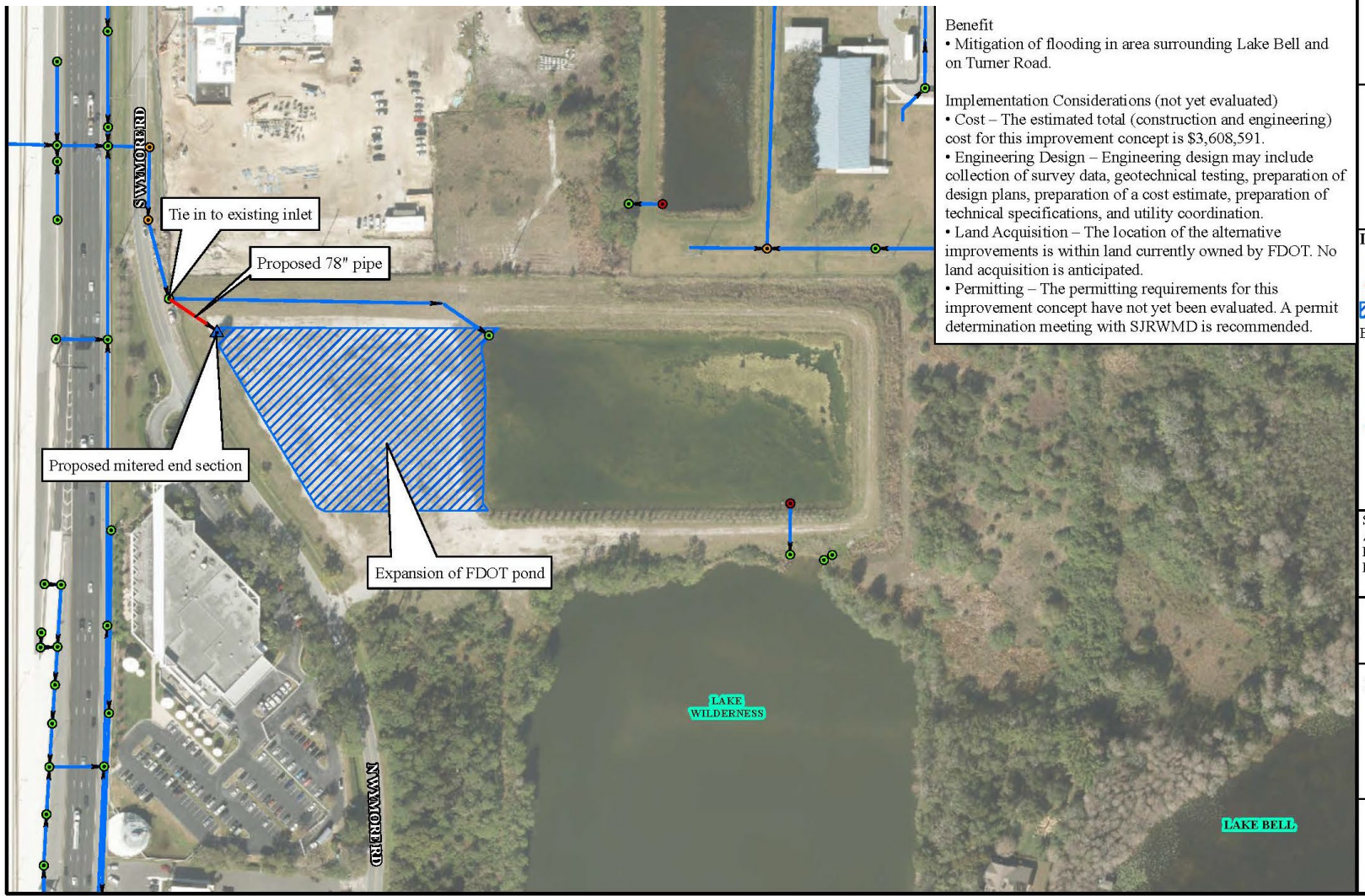
- Upsize main trunk line serving Canton Ave
- Additional and upsized inlets
- Results in increased capture and conveyance capabilities, reducing roadway flooding
- Estimated cost: $2,936,419



Lake Bell: Reduced inflows from FDOT pond

- Expansion of existing FDOT-owned pond north of Lake Wilderness
- Results in additional 23 ac-ft of storage
- Cost estimate: $3,608,591
  - Does not include land cost

*Multi-jurisdictional Project



Benefit
• Mitigation of flooding in area surrounding Lake Bell and on Turner Road.

Implementation Considerations (not yet evaluated)
• Cost – The estimated total (construction and engineering) cost for this improvement concept is $3,608,591.
• Engineering Design – Engineering design may include collection of survey data, geotechnical testing, preparation of design plans, preparation of a cost estimate, preparation of technical specifications, and utility coordination.
• Land Acquisition – The location of the alternative improvements is within land currently owned by FDOT. No land acquisition is anticipated.
• Permitting – The permitting requirements for this improvement concept have not yet been evaluated. A permit determination meeting with SJRWMD is recommended.

CITY OF WINTER PARK, FLORIDA
ESTABLISHED 1882
CITY OF CULTURE AND HERITAGE

N
0 80 160
Feet

Legend
- Proposed Structure
- Proposed Pipe
- Proposed Pond

Existing Stormwater Structures
- Inlet/Outlet
- Manhole
- Control Structure
- Existing Pipe

Sources:
Aerial: ESRI, 2023
Roads: Orange County, 2020
Lakes: Orange County, 2020

Exhibit
19

Lake Bell: Reduced Inflows from FDOT Pond Concept Map

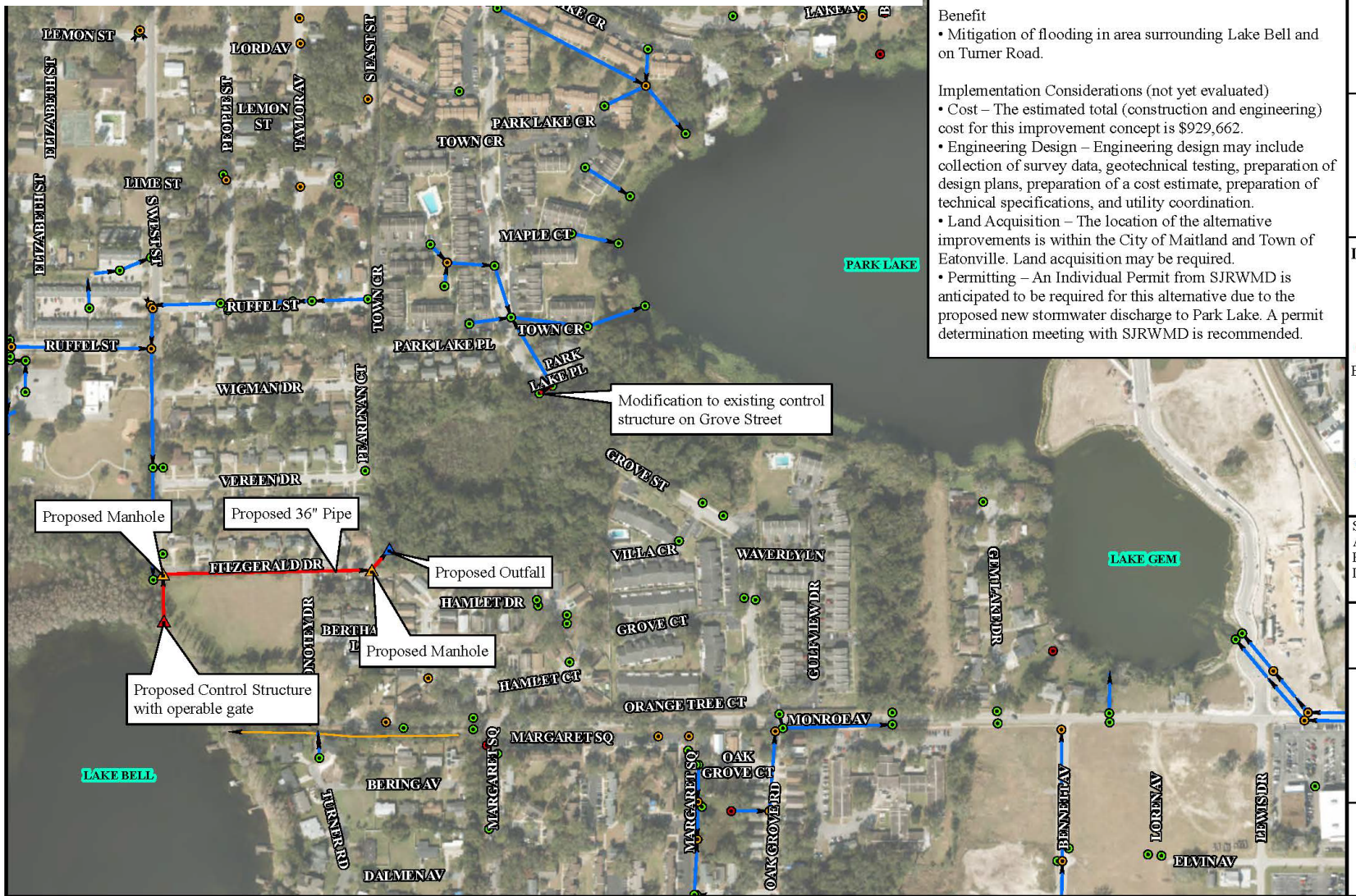
Winter Park CRA Study Update and Lake Killarney Expansion Report

Geosyntec

Lake Bell: Connection to Park Lake

- New hydraulic connection between Lake Bell and Park Lake
- Includes new control structure with an operable gate
- Estimated cost: $929,662

*Multi-jurisdictional Project



Problem
- Reported flooding in area surrounding Lake Bell and on Turner Road.

Benefit
- Mitigation of flooding in area surrounding Lake Bell and on Turner Road.

Implementation Considerations (not yet evaluated)
- Cost – The estimated total (construction and engineering) cost for this improvement concept is $929,662.
- Engineering Design – Engineering design may include collection of survey data, geotechnical testing, preparation of design plans, preparation of a cost estimate, preparation of technical specifications, and utility coordination.
- Land Acquisition – The location of the alternative improvements is within the City of Maitland and Town of Eatonville. Land acquisition may be required.
- Permitting – An Individual Permit from SJRWMD is anticipated to be required for this alternative due to the proposed new stormwater discharge to Park Lake. A permit determination meeting with SJRWMD is recommended.

CITY OF WINTER PARK, FLORIDA
ESTABLISHED 1882
CITY OF CULTURE AND HERITAGE

N

0 150 300 Feet

Legend
- Proposed Manhole
- Proposed Structure
- Proposed Control Structure
- Proposed Pipe

Existing Stormwater Structures
- Inlet/Outlet
- Manhole
- Control Structure
- Existing Pipe

Sources:
Aerial: ESRI, 2023
Roads: Orange County, 2020
Lakes: Orange County, 2020

Exhibit 18

Lake Bell: Connection to Park Lake Concept Map

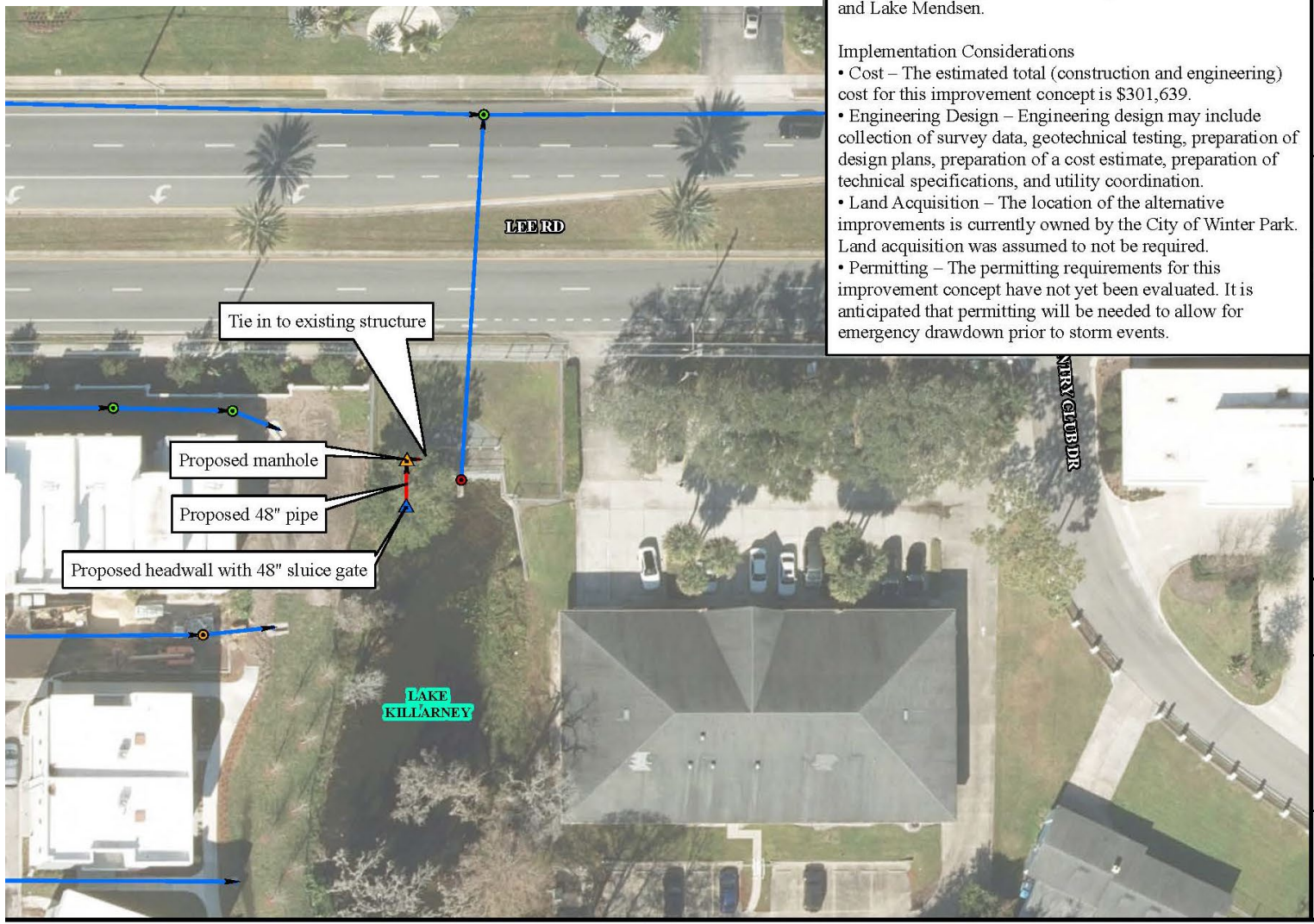
Winter Park CRA Study Update and Lake Killarney Expansion Report

Geosyntec consultants

Lake Killarney: Improved conveyance to Lake Gem

- New 48-inch bypass to the existing outfall structure on Lake Killarney
- Includes operable gate
- Intended for increased rate of pre-storm drawdown
- Estimated cost: $301,639

*Multi-jurisdictional Project



Problem
• Reported flooding in multiple areas surrounding Lake Killarney. Drawdown via drainwells requires 8 days which is not effective for pre-storm drawdown.

Benefit
• Mitigation of flooding in area surrounding Lake Killarney. Lowered lake level/increased storage availability prior to storm events to prepare for incoming flows from Lake Bell and Lake Mendsen.

Implementation Considerations
• Cost – The estimated total (construction and engineering) cost for this improvement concept is $301,639.
• Engineering Design – Engineering design may include collection of survey data, geotechnical testing, preparation of design plans, preparation of a cost estimate, preparation of technical specifications, and utility coordination.
• Land Acquisition – The location of the alternative improvements is currently owned by the City of Winter Park. Land acquisition was assumed to not be required.
• Permitting – The permitting requirements for this improvement concept have not yet been evaluated. It is anticipated that permitting will be needed to allow for emergency drawdown prior to storm events.

CITY OF WINTER PARK, FLORIDA
ESTABLISHED 1882
CITY OF CULTURE AND HERITAGE

N

0 20 40 Feet

Legend
- Proposed Manhole
- Proposed Structure
- Proposed Pipe

Existing Stormwater Structures
- Inlet/Outlet
- Manhole
- Control Structure
- Existing Pipe

Sources:
Aerial: ESRI, 2023
Roads: Orange County, 2020
Lakes: Orange County, 2020

Exhibit 20

Lake Killarney: Improved Conveyance to Lake Gem Concept Map

Winter Park CRA Study Update and Lake Killarney Expansion Report

Geosyntec consultants

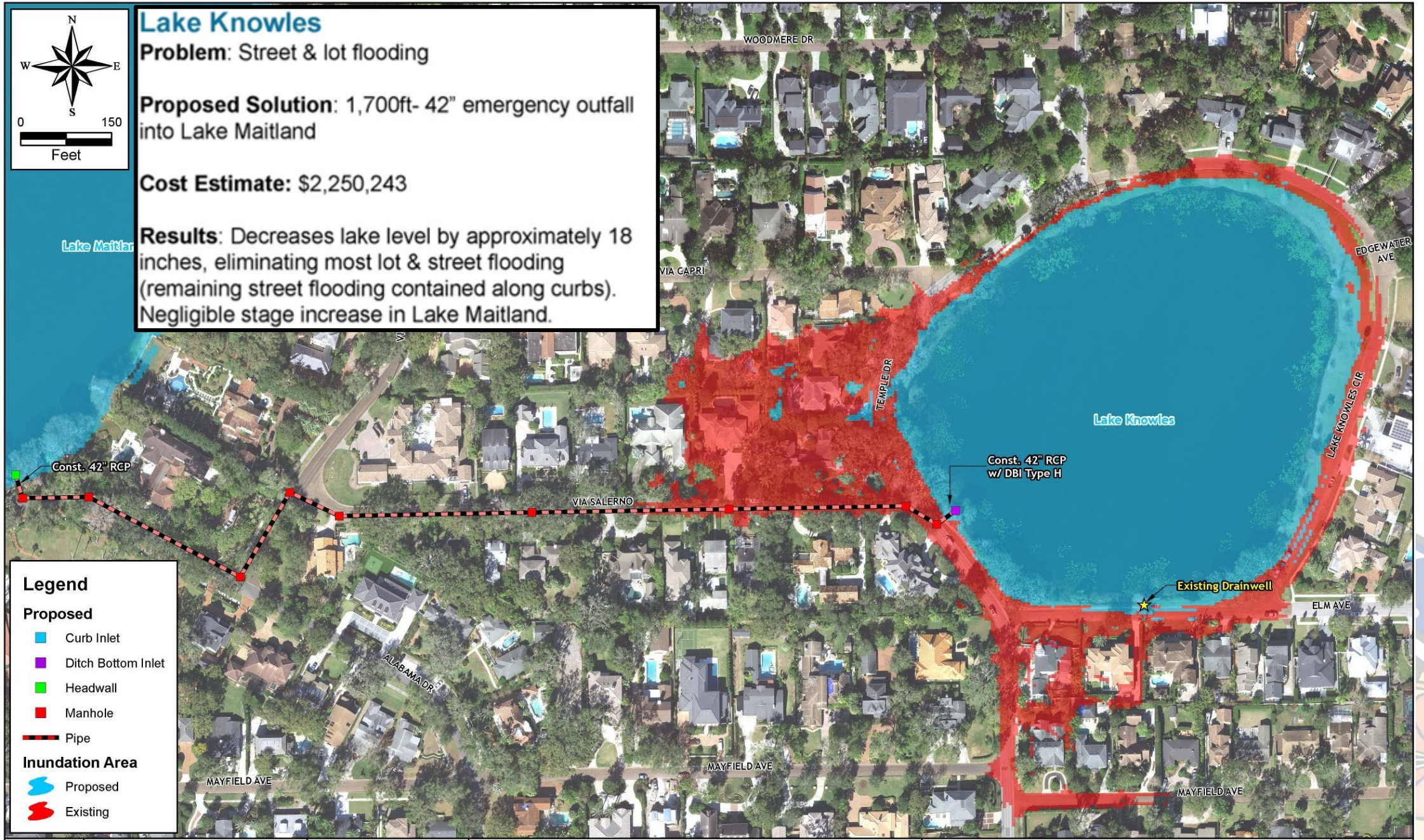
Combined Improvement
Lake Bell & Lake Killarney

- Includes the following previously mentioned alternatives
  - Lake Bell connection to Park Lake
  - Improved conveyance from Lake Killarney to Lake Gem
- Intended for larger, less frequent storm events
- Estimated cost: $1,231,301



*Multi-jurisdictional Project


Central Basin

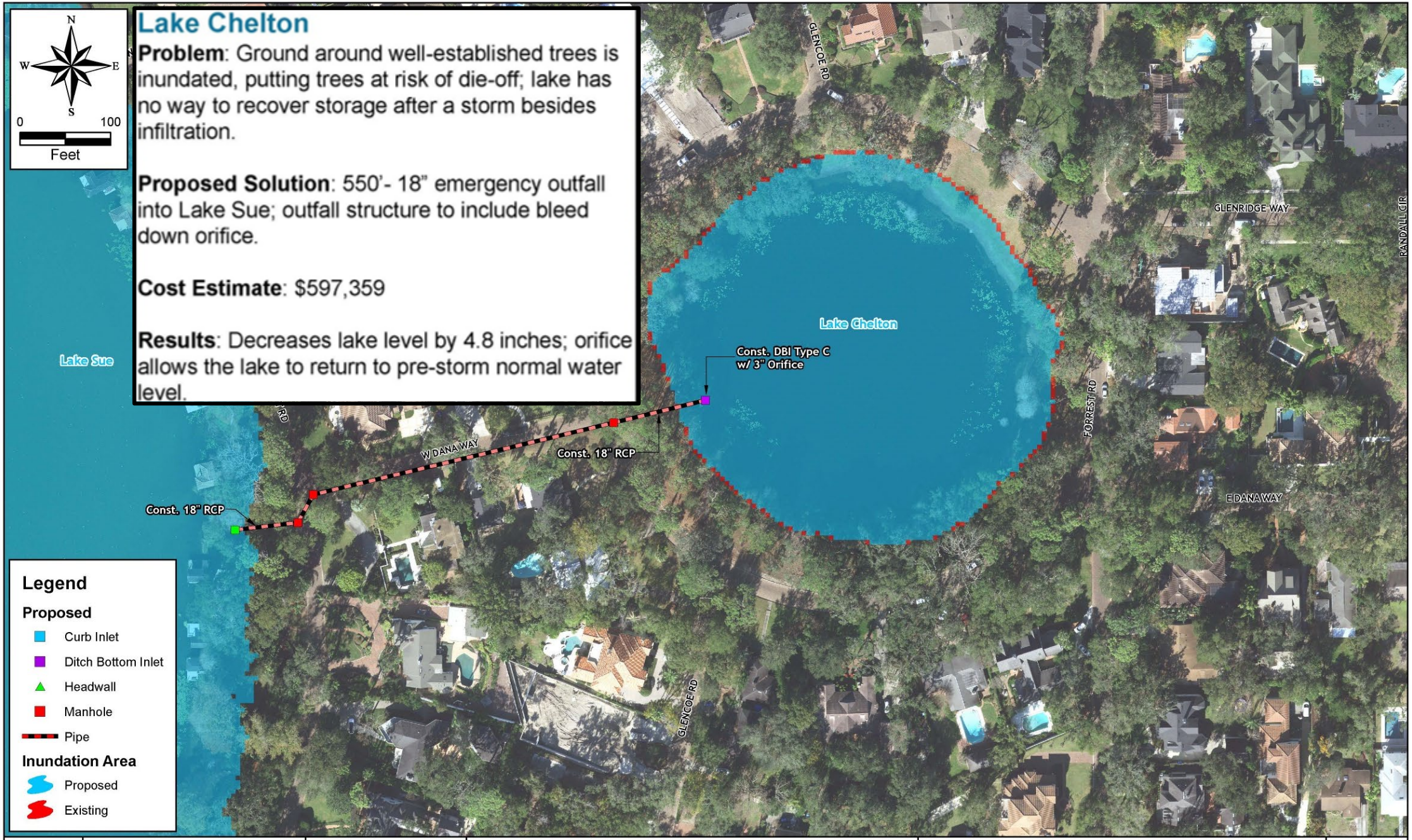


SAI		Sources: Aerials: 2018 Orange County	WINTER PARK CENTRAL BASIN STORMWATER MASTER PLAN	LAKE KNOWLES DESIGN ALTERNATIVE 1 500-YEAR 24-HOUR INUNDATION MAP

FIGURE:



SAI		Sources: Aerials: 2018 Orange County	WINTER PARK CENTRAL BASIN STORMWATER MASTER PLAN	LAKE SYLVAN DESIGN ALTERNATIVE 1 500-YEAR 24-HOUR INUNDATION MAP	FIGURE: 2



Sources:
Aerials: 2018 Orange County

WINTER PARK CENTRAL BASIN STORMWATER MASTER PLAN

LAKE CHELTON DESIGN ALTERNATIVE 1 500-YEAR 24-HOUR INUNDATION MAP

FIGURE: 3

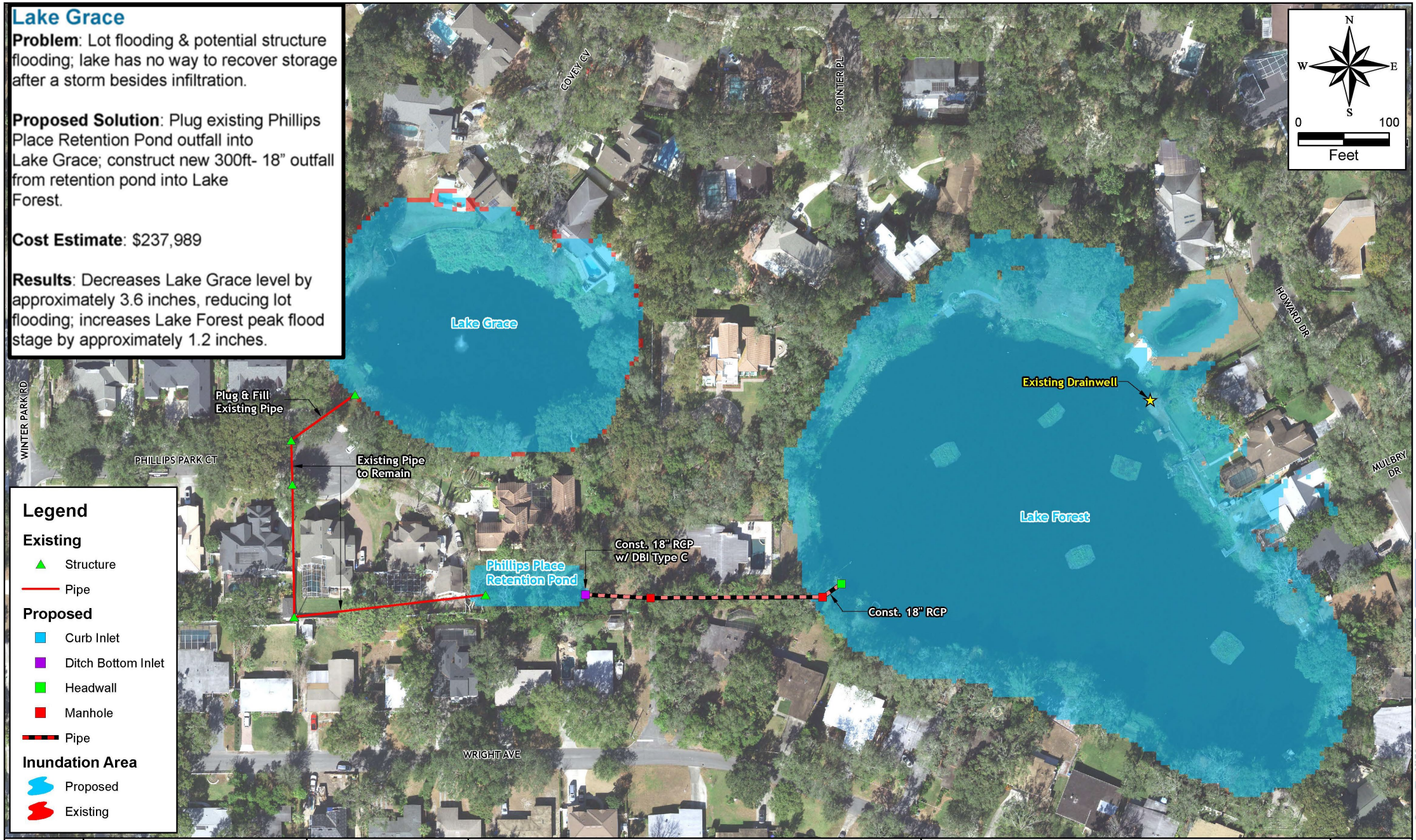
Lake Grace

Problem: Lot flooding & potential structure flooding; lake has no way to recover storage after a storm besides infiltration.

Proposed Solution: Plug existing Phillips Place Retention Pond outfall into Lake Grace; construct new 300ft- 18" outfall from retention pond into Lake Forest.

Cost Estimate: $237,989

Results: Decreases Lake Grace level by approximately 3.6 inches, reducing lot flooding; increases Lake Forest peak flood stage by approximately 1.2 inches.



SAI		Sources: Aerials: 2018 Orange County	WINTER PARK CENTRAL BASIN STORMWATER MASTER PLAN	LAKE GRACE DESIGN ALTERNATIVE 1 500-YEAR 24-HOUR INUNDATION MAP	FIGURE: 4.1

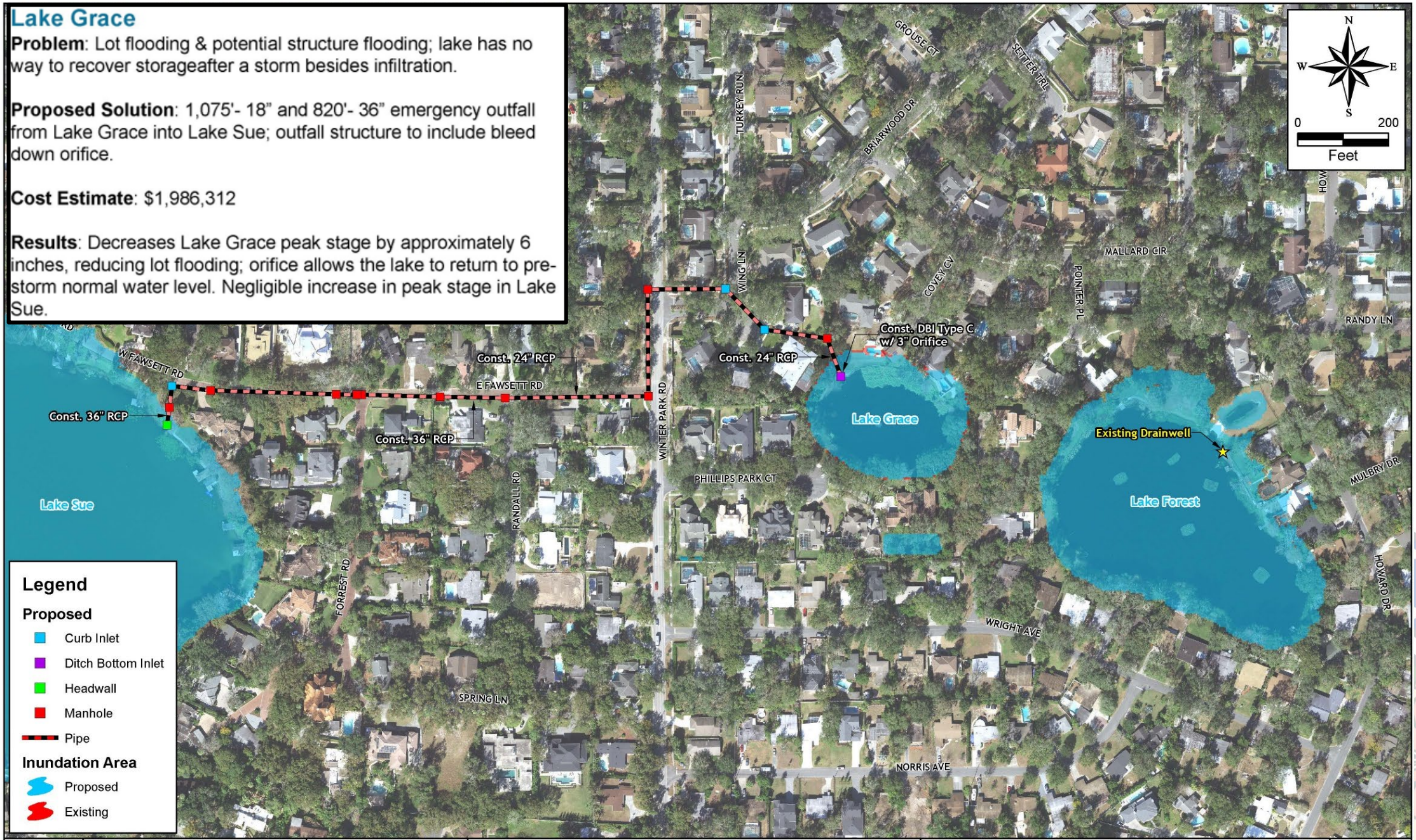
Lake Grace

Problem: Lot flooding & potential structure flooding; lake has no way to recover storageafter a storm besides infiltration.

Proposed Solution: 1,075'- 18" and 820'- 36" emergency outfall from Lake Grace into Lake Sue; outfall structure to include bleed down orifice.

Cost Estimate: $1,986,312

Results: Decreases Lake Grace peak stage by approximately 6 inches, reducing lot flooding; orifice allows the lake to return to pre-storm normal water level. Negligible increase in peak stage in Lake Sue.



SAI		Sources: Aerials: 2018 Orange County	WINTER PARK CENTRAL BASIN STORMWATER MASTER PLAN	LAKE GRACE DESIGN ALTERNATIVE 2 500-YEAR 24-HOUR INUNDATION MAP	FIGURE: 4.2

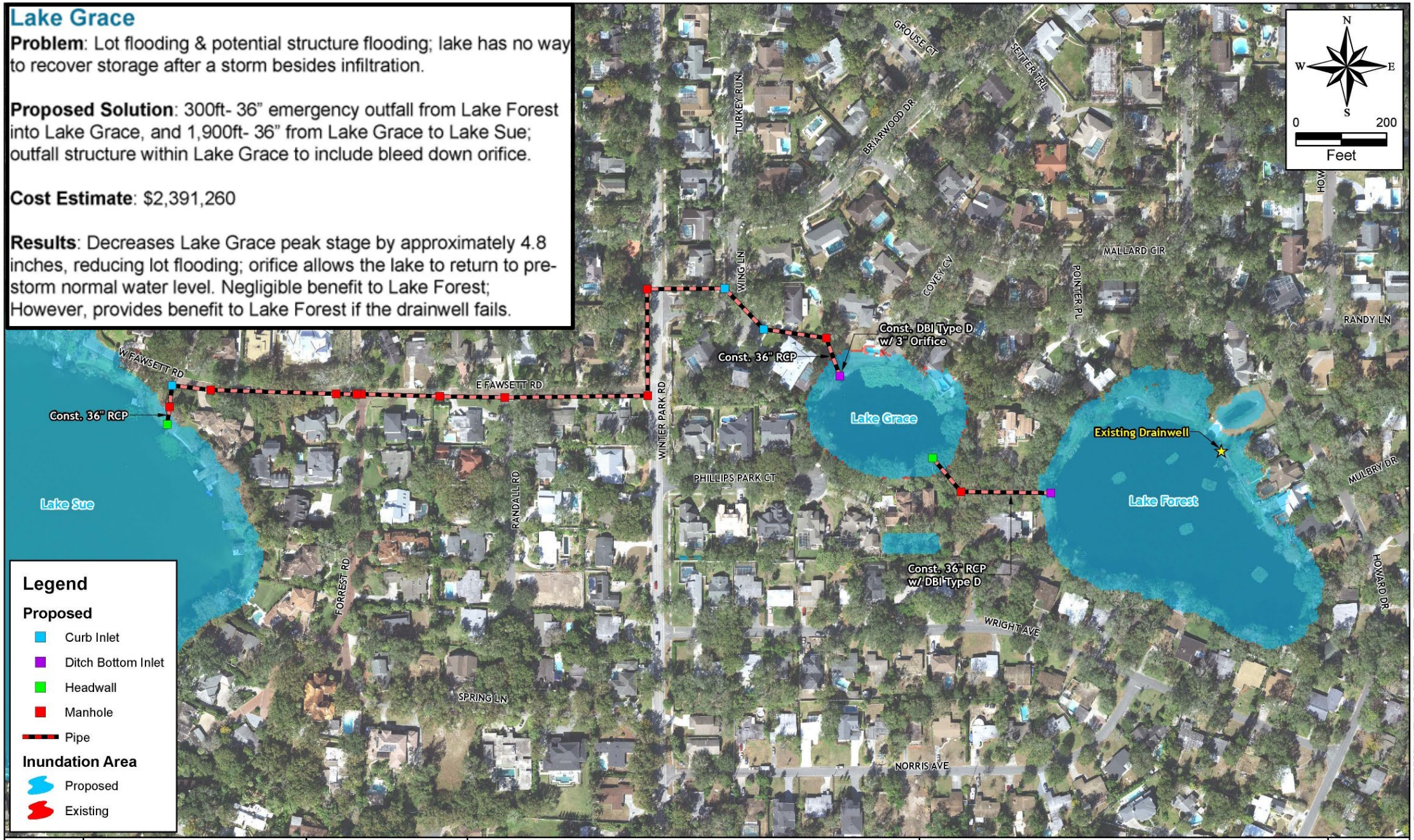
Lake Grace

Problem: Lot flooding & potential structure flooding; lake has no way to recover storage after a storm besides infiltration.

Proposed Solution: 300ft- 36" emergency outfall from Lake Forest into Lake Grace, and 1,900ft- 36" from Lake Grace to Lake Sue; outfall structure within Lake Grace to include bleed down orifice.

Cost Estimate: $2,391,260

Results: Decreases Lake Grace peak stage by approximately 4.8 inches, reducing lot flooding; orifice allows the lake to return to pre-storm normal water level. Negligible benefit to Lake Forest; However, provides benefit to Lake Forest if the drainwell fails.

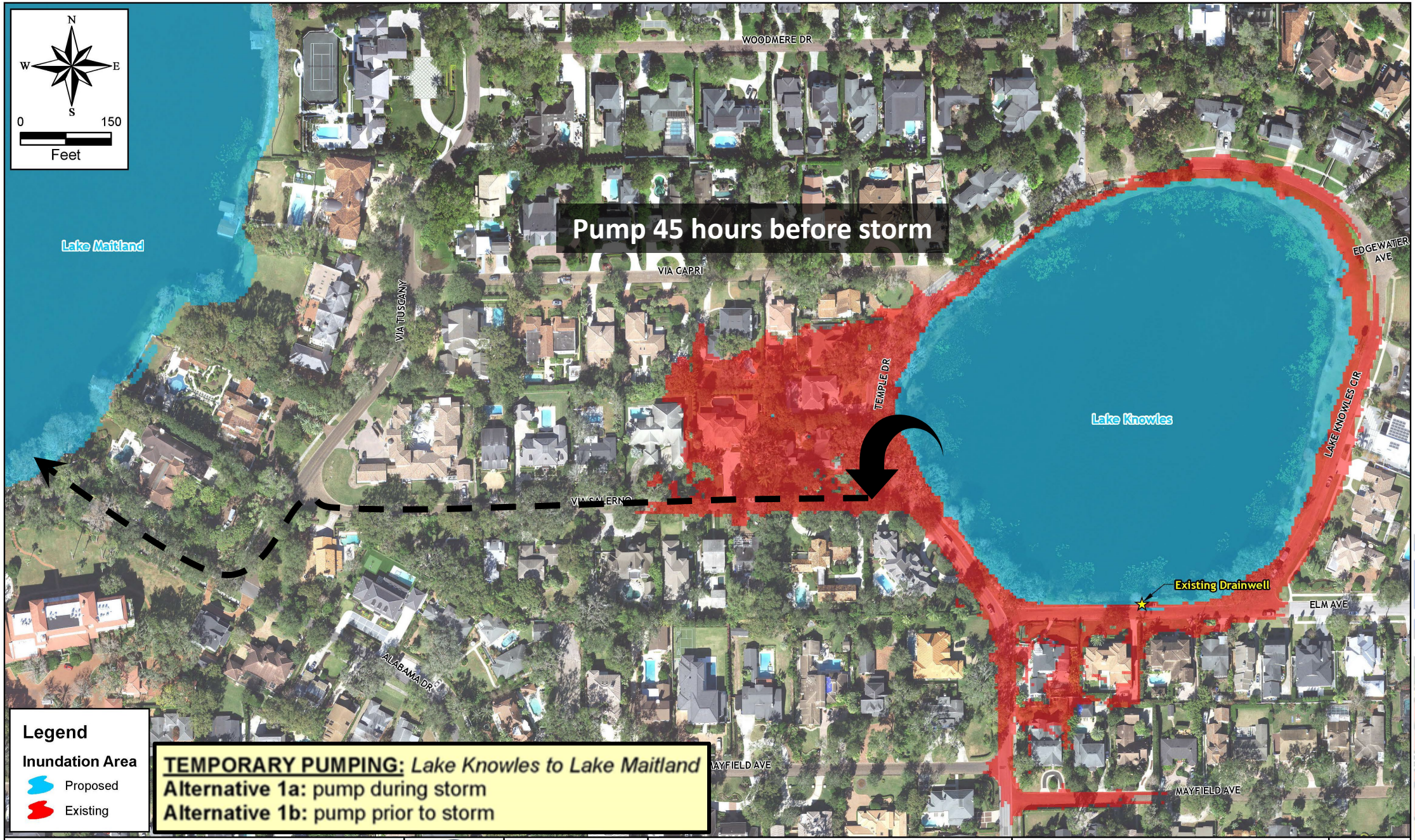


SAI		Sources: Aerials: 2018 Orange County	WINTER PARK CENTRAL BASIN STORMWATER MASTER PLAN	LAKE GRACE DESIGN ALTERNATIVE 3 500-YEAR 24-HOUR INUNDATION MAP	FIGURE: 4.9

Emergency Pumping Alternatives

- Provides similar level of service as permanent lake interconnects
- Pump costs (does not include infrastructure costs)
  - $272,000 - $362,000





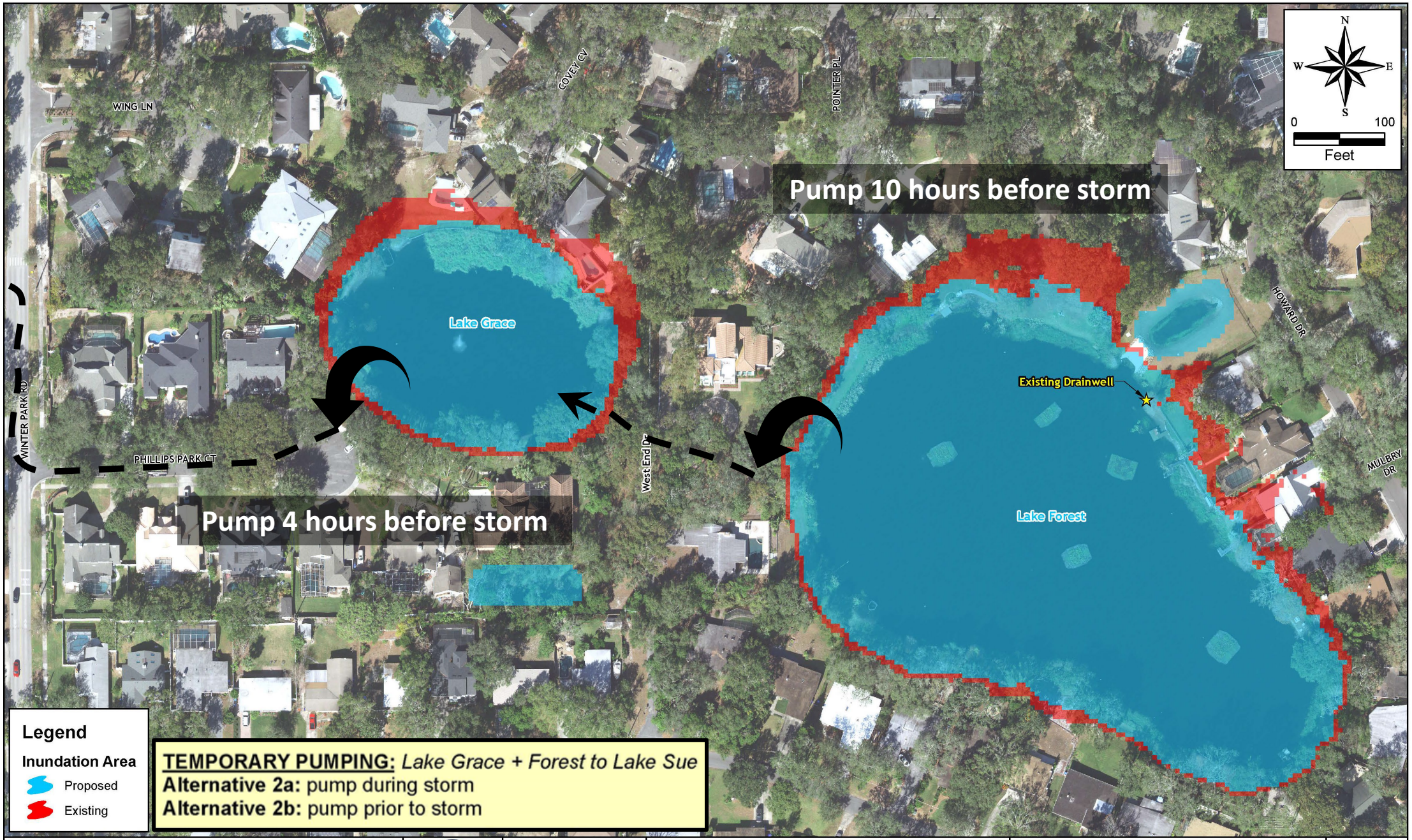
SINGHOFEN & ASSOCIATES INCORPORATED | halff

Sources:
Aerials: 2018 Orange County

WINTER PARK CENTRAL BASIN
STORMWATER MASTER PLAN

LAKE KNOWLES
DESIGN ALTERNATIVE 1a & b
500-YEAR 24-HOUR INUNDATION MAP

FIGURE:
4.1



SINGHOFEN & ASSOCIATES INCORPORATED | halff

Sources:
Aerials: 2018 Orange County

WINTER PARK CENTRAL BASIN STORMWATER MASTER PLAN

LAKES GRACE & FOREST
DESIGN ALTERNATIVE 2a & b
500-YEAR 24-HOUR INUNDATION MAP

FIGURE:
4.2

Additional Design Alternatives

- Lake Maitland Control Structure




Eastern Basin
Winter Park Pines Basin

Golfside Dr Culvert Replacement

- Replacement to existing pipe under Golfside Dr
- Relieves upstream drainage area
- Provides additional conveyance
- Estimated cost: $583,578





Lake Corrine Outfall Canal Regrading

- Increase cross-sectional area of outfall canal
- Provides additional conveyance
- Estimated cost: $5,848,937

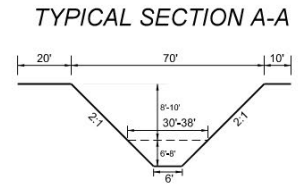
*Multi-jurisdictional Project

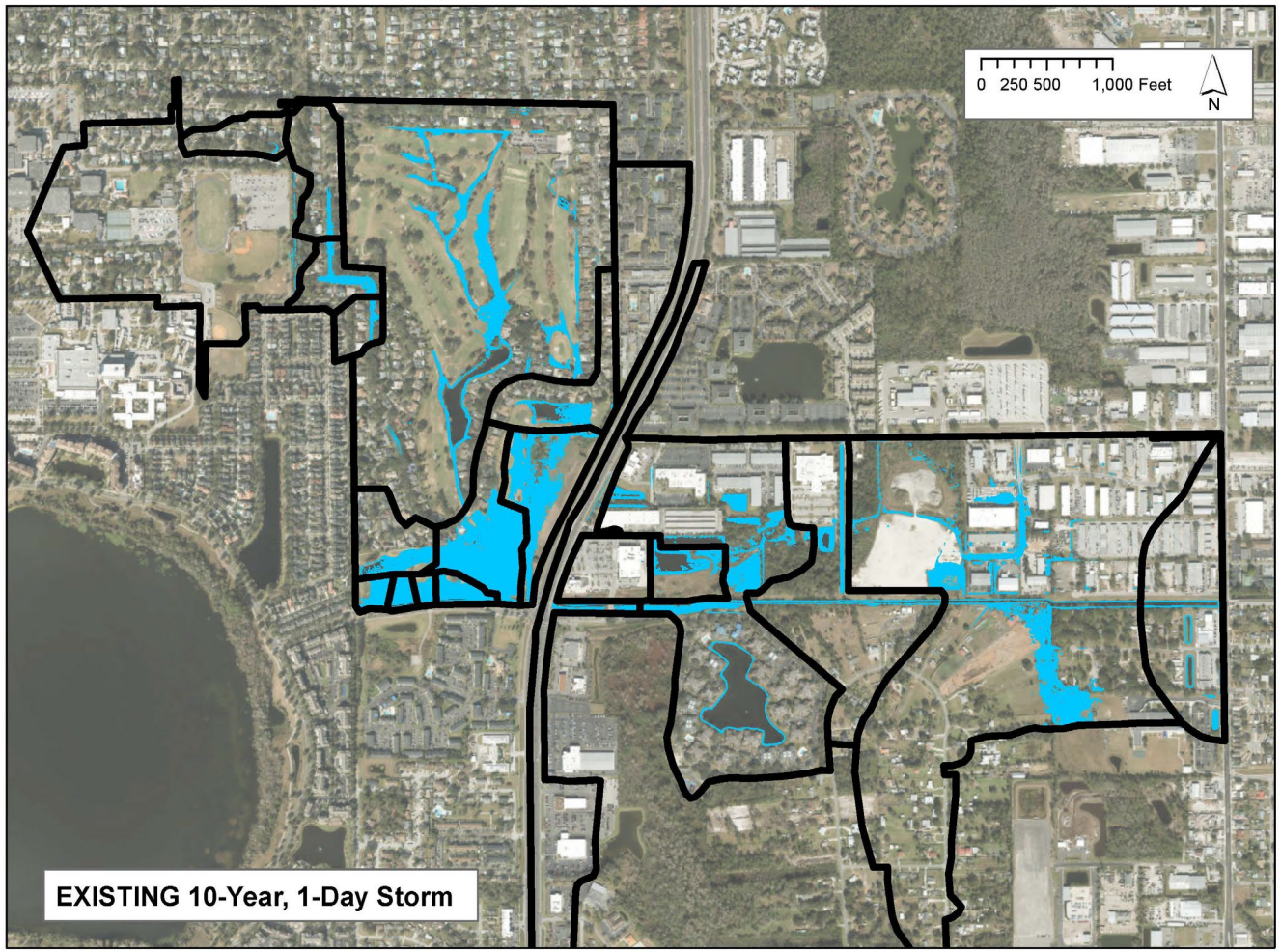


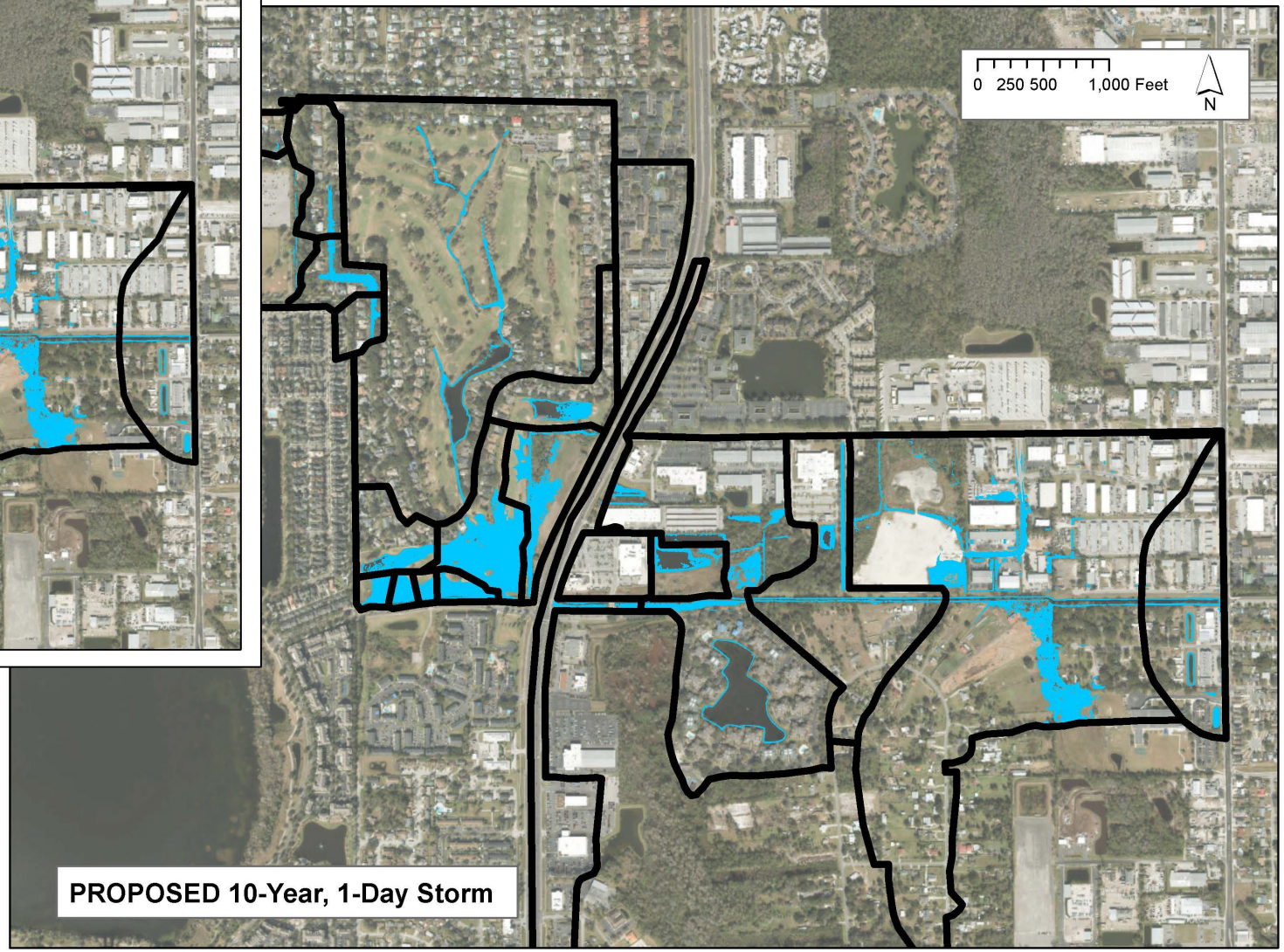

Existing Lake Corrine Outfall Canal (Looking West)

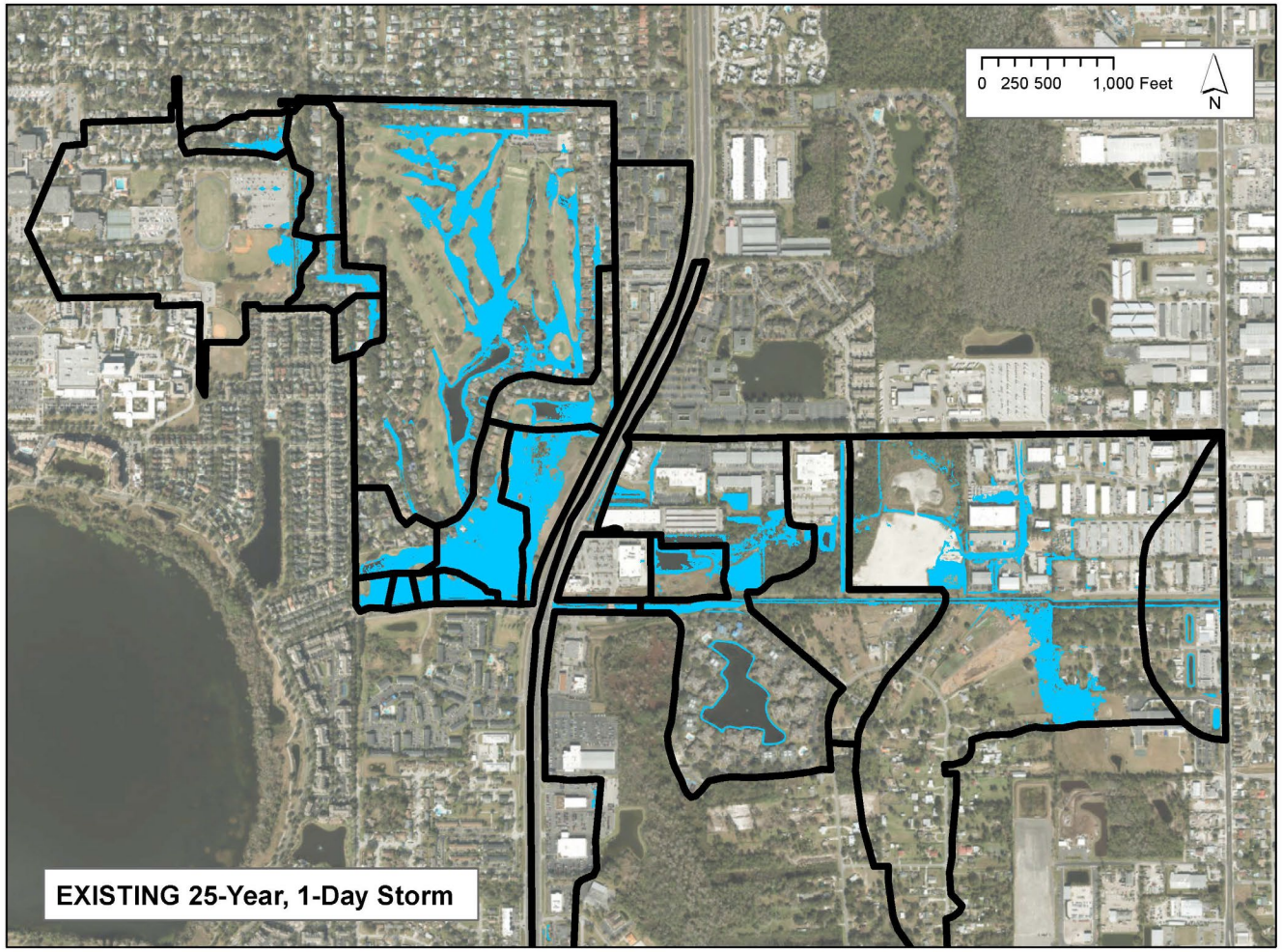

Existing Lake Corrine Outfall Canal (Looking East)

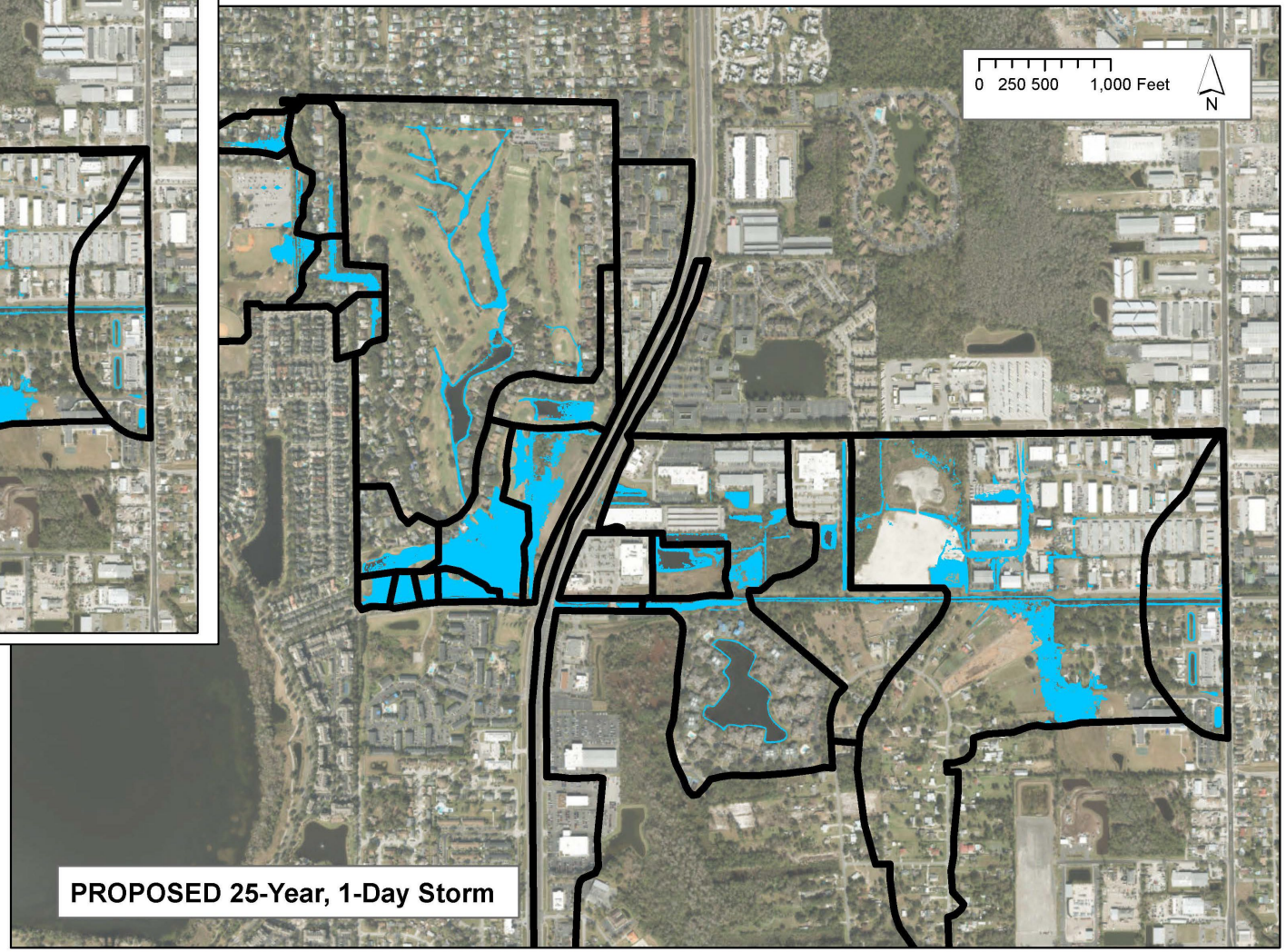

Existing Lake Corrine Outfall Canal (at Forsyth Rd)

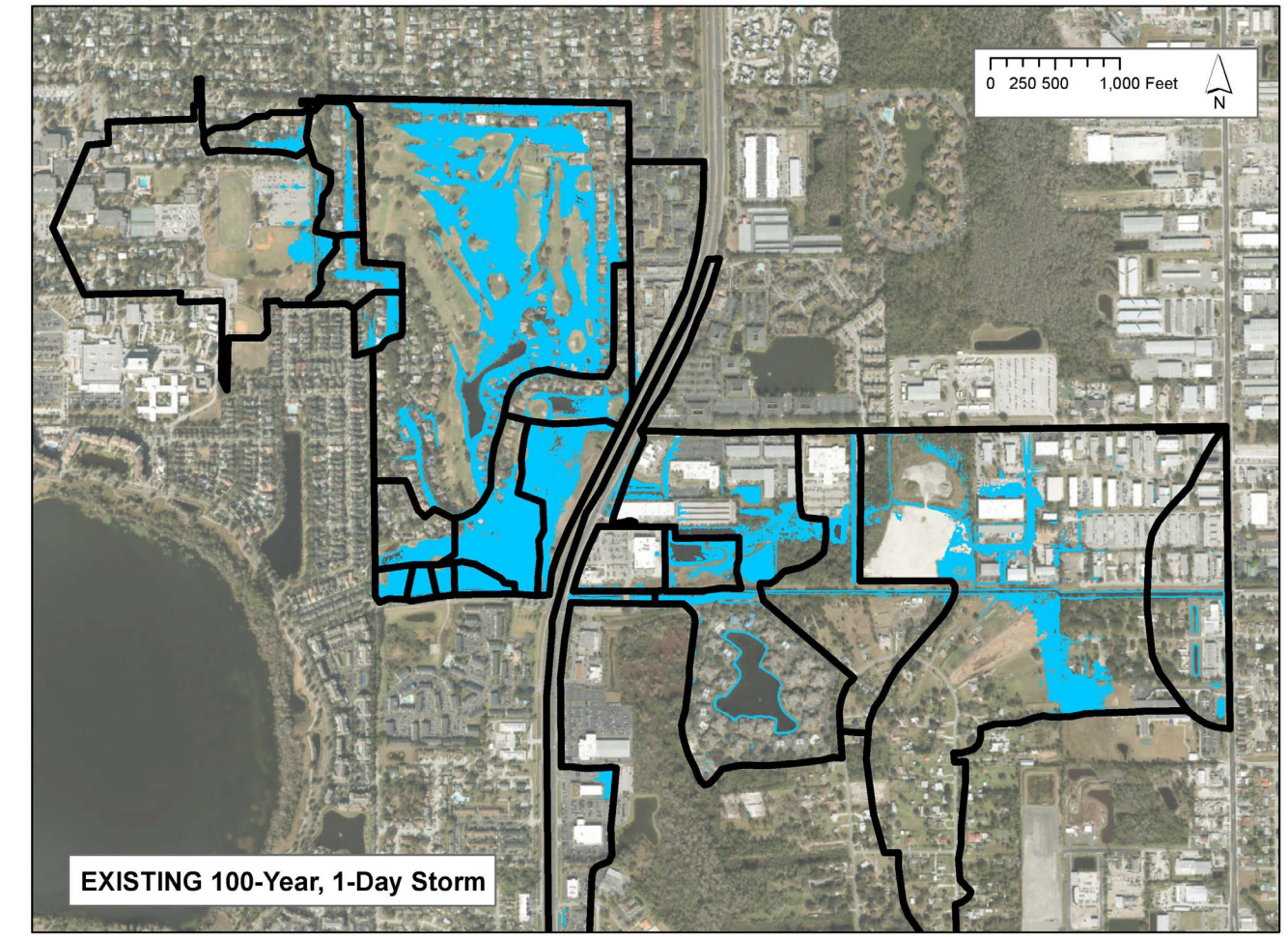


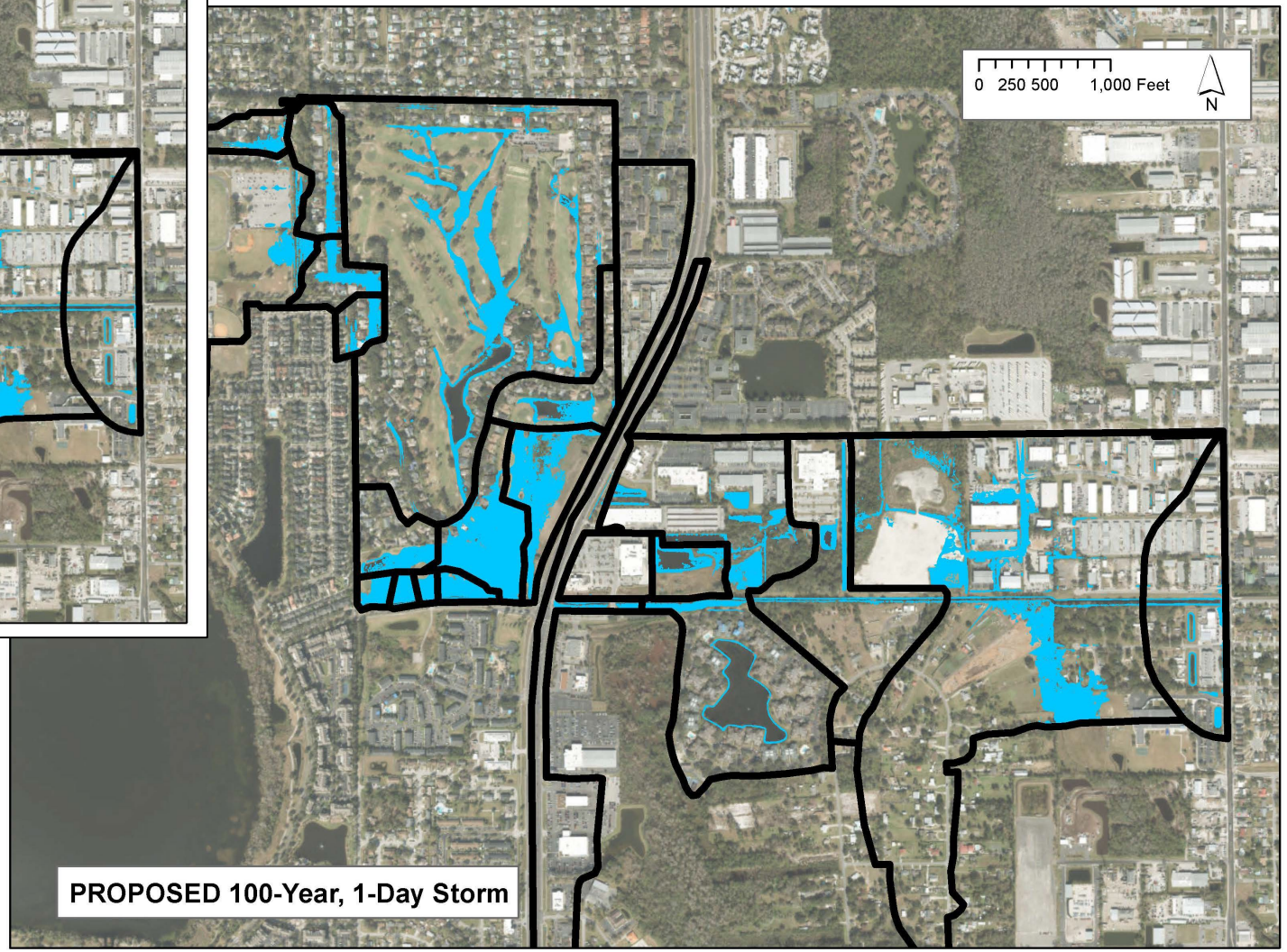

0 250 500 1,000 Feet
N
EXISTING 10-Year, 1-Day Storm


0 250 500 1,000 Feet
N
PROPOSED 10-Year, 1-Day Storm


0 250 500 1,000 Feet
N
EXISTING 25-Year, 1-Day Storm

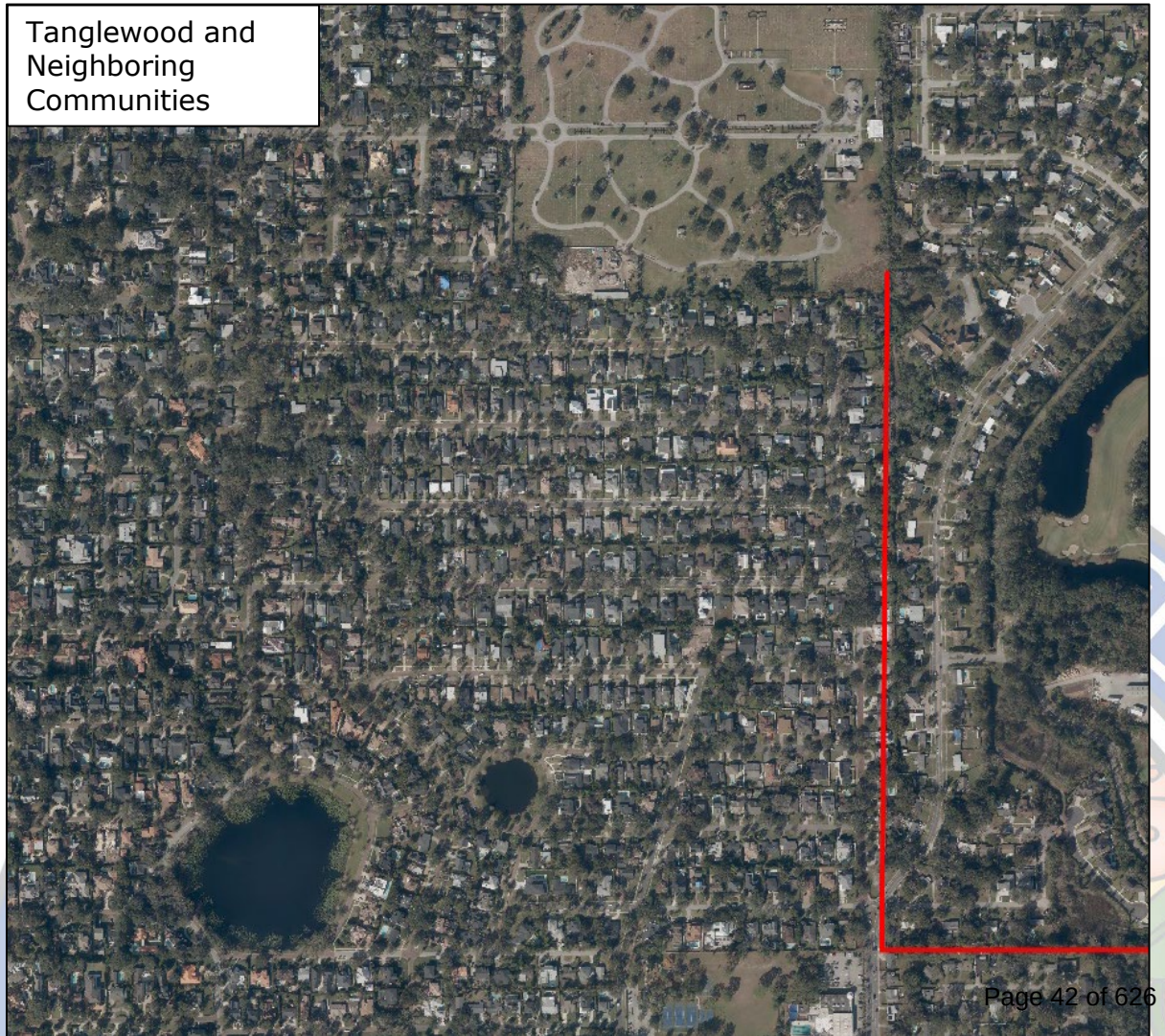

0 250 500 1,000 Feet
N
PROPOSED 25-Year, 1-Day Storm


0 250 500 1,000 Feet
N
EXISTING 100-Year, 1-Day Storm


0 250 500 1,000 Feet
N
PROPOSED 100-Year, 1-Day Storm

Interlachen and Tanglewood Drainage Areas





Estimated Project Cost Overview

Western Basin	
Project	Cost
Killarney Drive - Drainage & Street Improvements - Phase 1	$ 280,000
Lake Mendsen: Connection to Lake Rose	$ 593,269
Lake Bell: Connection to Park Lake	$ 929,662
Lake Mendsen: Pump Station and Lake Expansion	$ 4,604,678
Canton Avenue: Improved Conveyance	$ 2,936,419
Lake Bell: Reduced Inflows from FDOT Pond	$ 3,608,591
Lake Killarney: Improved Conveyance to Lake Gem	$ 301,639
Lake Bell Connection to Park Lake and Killarney Bypass	$ 1,231,301
Central Basin	
Project	Cost
Palmer Ave at Old England - Drainage Improvement	$ 500,000
Lake Grace: Temporary Pumping Operation	$ 150,000
Lake Knowles Connection to Lake Maitland	$ 2,250,243
Lake Sylvan Connection to Lake Mizell	$ 1,114,714

Central Basin	
Project	Cost
Lake Chelton Connection to Lake Sue	$ 597,359
Lake Grace Connection to Lake Sue	$ 1,983,055
Lake Grace Connection to Lake Forest and Sue	$ 2,391,260
Lake Knowles Emergency Pumping	$ 272,000
Lake Grace Emergency Pumping	$ 180,000
Stirling Bridge Replacement	$ 1,400,000
Lake Forest Emergency Pumping	$ 180,000
Eastern Basin	
Project	Cost
Mayflower - Drainage Ditches Dredging	$ 170,000
N Lakemont Seminole County Ditch Piping- Phase 1	$ 1,000,000
Golfside Dr Culvert Replacement	$ 583,579
Lake Corrine Outfall Canal Regrading	$ 5,848,937
Winter Park Outfall Canal Regrading	$ 3,800,000
City Wide Projects	
Project	Cost
Storm Sewer Conveyance Improvements	$ 5,000,000

TOTAL
$ 27,734,000 - $ 41,906,000

Upcoming FY 25 CIP

Basin Color Guide

Western	Central	Eastern

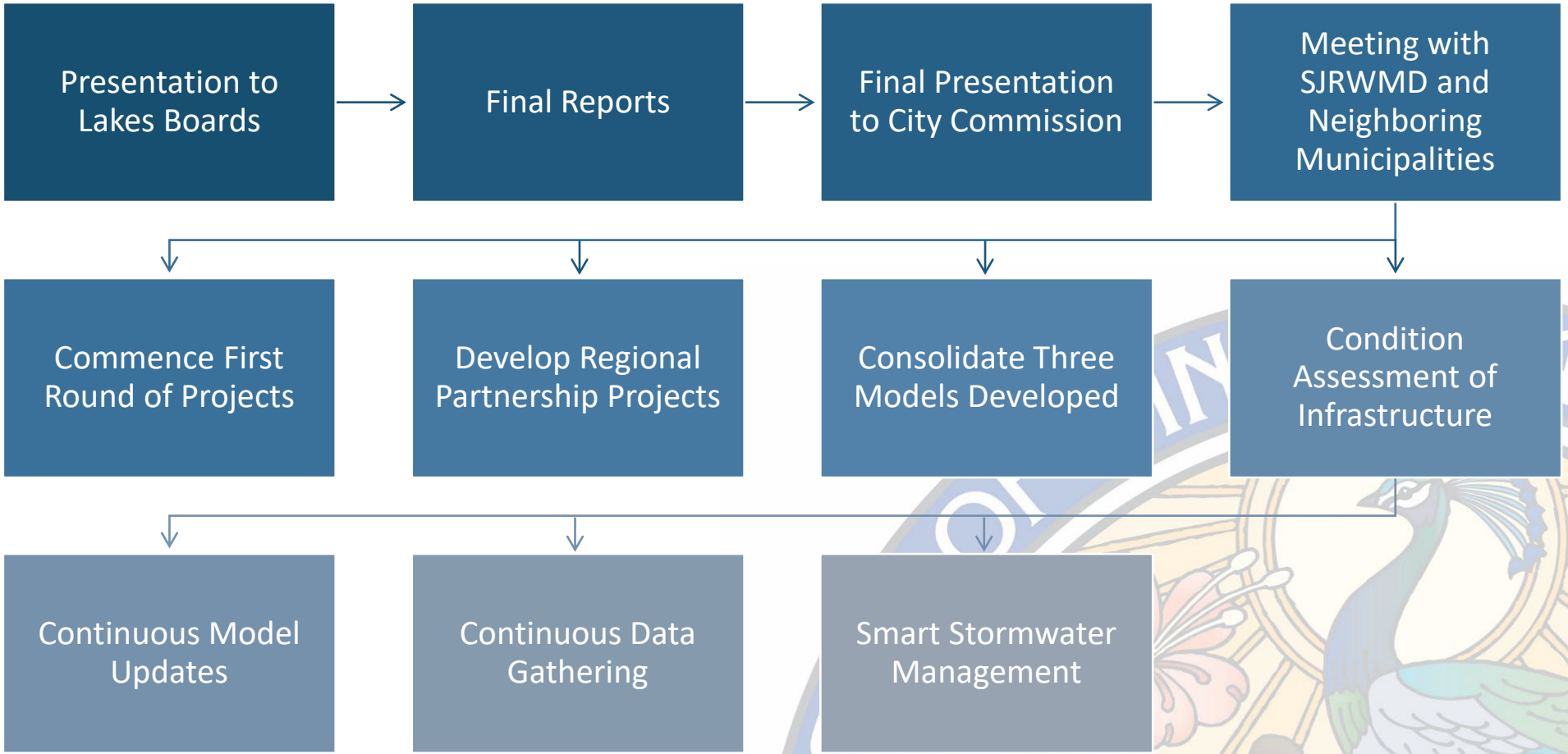
Continued from FY24			Proposed FY25			Study Generated Projects FY25		
Project	**Description**	**Existing Funds**	**Project**	**Description**	**Cost**	**Project**	**Description**	**Cost**
CDS Unit on Fawsett Road*	Hydrodynamic separator to reduce nutrient load to Lake Sue.	$ 200,000.00	Killarney Drive - Drainage & Street Improvements - Phase 1*	New, upsized outfall with nutrient removal to replace two existing, failing outfalls. Also includes new inlets for improved capture.	$ 280,000.00	Lake Mendsen: Connection to Lake Rose	Installation of hydraulic connection from Lake Mendsen to Lake Rose for Lake Rose to provide supplemental storage during storm events. Decreases peak stage of 2-yr 24-hr storm event by 0.8 ft, below Denning Dr.	$ 593,269.00
Stirling Bridge Replacement*	Design for the replacement of the existing Stirling Bridge.	$ 224,575.00	Palmer Ave at Old England - Drainage Improvements - Phase 1*	New, upsized outfall with nutrient removal to replace existing, undersized outfall. Also includes inlet replacements with additional capacity at intersection of Palmer and Old England.	$ 250,000.00	Golfside Dr Culvert Replacement	Increase to the size of the pipe that connects the drainage ditches on either side of Golfside Dr. Reduces upstream peak stage by 0.5 ft for 100-yr 24-hr event.	$ 583,579.00
N Lakemont Seminole County Ditch Piping - Phase 1*	Phase one of a partner project with Seminole County to construct an additional outfall to relieve the ditch that serves the Arbor Park Neighborhood.	$ 533,806.00	Mayflower - Drainage Ditches Dredging	Debris and sediment removal to restore flow capacity in ditch system that serves the Mayflower property and Pineview Cir neighborhood.	$ 170,000.00	Lake Grace: Temporary Pumping Operation	3,000 gpm pump and quick connection to discharge to Lake Sue. Decreases Peak Stage of Lake Grace by 14-27 inches for 500-yr 24-hr event, depending on time of deployment.	$ 150,000.00
				TOTAL	$ 700,000.00	Lake Bell: Connection to Park Lake	Installation of control structure with operable gate on Lake Bell and modification to control structure on Grove Street to allow for pre-storm drawdown via emergency releases to Park Lake. Meets level-of-service for 100-yr 24-hr event.	$ 929,662.00
						Storm Sewer Conveyance Improvements*	City-wide investigation and repair of storm sewer conveyance system city using stormwater inspection camera.	$ 700,000.00
							Central	$ 400,000.00
							Western	$ 150,000.00
							Eastern	$ 150,000.00
							TOTAL	$ 2,956,510.00

* Considered prior to Basin Studies

Project Sequence: Completed to Date

- First Draft of Improvement Alternatives
- St Johns River Water Management District (SJRWMD) Regional Discussions
- Review of First Draft Improvements with SJRWMD
- Updates to Draft Improvements
- City Commission Work Session

Anticipated Project Sequence



Questions/Comments?

DRAFT

Geosyntec consultants

engineers | scientists | innovators

CRA STORMWATER MASTER PLAN UPDATE AND EXPANSION

REPORT

Prepared for

City of Winter Park Public Works Department
401 City of Winter Park, Florida
Winter Park, 32789-4386

Prepared by

Geosyntec Consultants, Inc.
3504 Lake Lynda Drive, Suite 155
Orlando, Florida 32817

Project FW10069

September 2024

CRA Study Update and Lake Killarney Expansion

Report

Prepared for
City of Winter Park Public Works Department
401 Park Avenue South
Winter Park, Florida 32789-4386

Prepared by
Geosyntec Consultants, Inc.
3504 Lake Lynda Drive, Suite 155
Orlando, Florida 32817

The engineering material and data contained within the enclosed report was prepared by Geosyntec Consultants, Inc. for sole use by the City of Winter Park Public Works Department. This report was prepared under the supervision and direction of the respective undersigned, whose seal as a registered professional engineer is affixed below.

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Project Number: FW10069

September 2024

Geosyntec consultants

TABLE OF CONTENTS

1. INTRODUCTION AND BACKGROUND 1-1
1.1 Introduction 1-1
1.2 Background and Location 1-1
1.3 Purpose and Goals 1-1
2. DATA COLLECTION AND REVIEW 2-1
2.1 Previous Studies 2-1
2.2 Review of Available Construction Plans, Surveys, and As-Builts 2-2
2.3 Vertical Datum Conversion 2-6
2.4 Soils 2-6
2.5 Land Use 2-7
2.6 Topography 2-7
2.7 Drainage Infrastructure and Stormwater BMPs 2-7
2.8 Field Investigation and Survey Needs 2-11
2.9 FEMA Floodplains and Flooding Problem Areas 2-16
2.10 Capital Improvement Projects 2-17
2.10.1 Completed 2-17
2.10.2 Planned 2-18
3. EXISTING CONDITIONS ASSESSMENT 3-1
3.1 Potential Water Quality Treatment Deficiencies 3-1
3.2 Hydrologic and Hydraulic Model Development 3-5
3.3 Hydrologic Model Development 3-6
3.3.1 Subbasin Delineation 3-6
3.3.2 Time of Concentration 3-6
3.3.3 Peaking Factor 3-6
3.3.4 Curve Number (CN) Development 3-6
3.3.5 Rainfall Distribution, Depth, Duration, and Frequency 3-8
3.4 1D Hydraulic Model Development 3-8
3.4.1 1D Nodes 3-8
3.4.2 Links 3-10
3.5 2D Hydraulic Model Development 3-12
3.5.1 Overland Flow Region 3-12
3.5.2 2D Overland Flow Model Development 3-12
3.6 Model Validation 3-14
3.7 Model Results 3-15
3.7.1 LOS Assessment 3-15
3.7.2 Existing Conditions Assessment Results for Focus Areas 3-15
3.7.3 Potential Flood Prone Locations 3-19
3.8 Existing Conditions Conclusions 3-22
4. IMPROVEMENT ALTERNATIVES ANALYSIS 4-1
4.1 CRA Alternative Analysis Re-Evaluation 4-2

4.1.1 FIC #1 – Lake Mendsen: Connection to Lake Rose 4-3
4.1.2 FIC #2 – Lake Mendsen: Pump Station and Lake Expansion 4-6
4.1.3 FIC #3 – Canton Avenue: Improved Conveyance 4-8
4.2 Lake Bell and Lake Killarney Alternatives Analysis 4-11
4.2.1 FIC #4 – Lake Bell: Connection to Park Lake 4-11
4.2.2 FIC #5 – Lake Bell: Reduced Inflows from FDOT Pond Expansion 4-14
4.2.3 FIC #6 – Lake Killarney: Improved Conveyance to Lake Gem 4-16
4.2.4 FIC #7 – Combination of FIC #4 and 6 4-18
4.3 Interim Project Recommendations 4-21
4.3.1 CRA Alternatives Analysis Re-Evaluation 4-21
4.3.2 Lake Bell and Lake Killarney Alternatives Analysis 4-22
5. CONCLUSIONS AND RECOMMENDATIONS 5-1

LIST OF FIGURES

Figure 3-1: Modeled Hydrographs Representative of Canton Avenue for the a) 100-year, 24-hour design storm and b) Hurricane Ian 3-19
Figure 4-1: Modeled Time/Stage Data for Lake Mendsen and Lake Rose for 2-Year, 24-Hour Design Storm 4-5

LIST OF TABLES

Table 2-1: Summary of Reference Data 2-2
Table 2-2: Summary of Base Flood Elevations for Lakes in Study Area 2-16
Table 3-1: Summary of Curve Number (CN) Values 3-7
Table 3-2: Summary of Land Use Imperviousness and Percent DCIA 3-7
Table 3-3: Rainfall Frequency, Duration, Depth, and Distribution 3-8
Table 3-4: Summary of Observed Flooding Stages during Hurricane Ian 3-14
Table 3-5: Criteria for Study LOS Assessment Modeling 3-15
Table 3-6: Existing Conditions Peak Stages at Lake Killarney 3-16
Table 3-7: Existing Conditions Peak Stages at Lake Bell 3-16
Table 3-8: Existing Conditions Peak Stages at Lake Mendsen 3-17
Table 3-9: Existing Conditions Peak Overland Flow Rates on Canton Avenue 3-18
Table 4-1: Modeled Peak Stage of Pre-Storm Operations 4-1
Table 4-2: FIC #1 Modeled Peak Stages 4-3
Table 4-3: FIC #2 Modeled Peak Stages 4-7
Table 4-4: FIC #3 Modeled Peak Flow Rates 4-9
Table 4-5: FIC #4 Modeled Peak Stages 4-12

Table 4-6: FIC #5 Modeled Peak Stages 4-14
Table 4-7: FIC #6 Modeled Peak Stages 4-17
Table 4-8: FIC #7 Modeled Peak Stages 4-19

LIST OF EXHIBITS

Exhibit 1: Project Vicinity Map
Exhibit 2: Project Site Map
Exhibit 3: Soils Map
Exhibit 4: Land Use Map
Exhibit 5: DEM Map
Exhibit 6: Drainage Infrastructure Map
Exhibit 7: Survey Needs Map
Exhibit 8: FEMA Floodplains and Flooding Problem Areas Map
Exhibit 9: Capital Improvement Projects Map
Exhibit 10: Water Quality Treatment Deficiencies Map
Exhibit 11: Existing Conditions 1D Model Map
Exhibit 12: Existing Conditions 2D Model Map
Exhibit 13: Flood Prone Locations
Exhibit 14: Canton Avenue Model Results
Exhibit 15: Lake Mendsen: Connection to Lake Rose Concept Map
Exhibit 16: Lake Mendsen: Pump Station and Lake Expansion Concept Map
Exhibit 17: Canton Avenue: Improvement Conveyance Concept and Model Results
Exhibit 18: Lake Bell: Connection to Park Lake Concept Map
Exhibit 19: Lake Bell: Reduced Inflows from FDOT Pond Concept Map
Exhibit 20: Lake Killarney: Improved Conveyance to Lake Gem Concept Map

LIST OF APPENDICES

Appendix A: Existing Conditions Model Results
Appendix B: SJRWMD Preliminary Meeting Summary
Appendix C: FIC #1 – Lake Mendsen: Connection to Lake Rose Model Results
Appendix D: FIC #2 – Lake Mendsen: Pump Station and Lake Expansion Model Results
Appendix E: FIC #4 – Lake Bell: Connection to Park Lake Model Results
Appendix F: FIC #5 – Lake Bell: Reduced Inflows from FDOT Pond Model Results
Appendix G: FIC #6 – Lake Killarney: Improved Conveyance to Lake Gem Model Results
Appendix H: FIC #7 – Combination of FICs #4 and 6 Model Results
Appendix I: Cost Estimates

1. INTRODUCTION AND BACKGROUND

1.1 Introduction

This report presents the results of the study to update and expand the 2020 Community Redevelopment Agency (CRA) Stormwater Master Plan (SMP) to include the contributing areas to Lake Killarney, Lake Bell, Lake Wilderness, and Lake Gem. This study evaluated existing conditions and drainage improvement alternatives for the expanded study area in the City of Winter Park. Geosyntec Consultants (Geosyntec) was tasked by the City of Winter Park's (City) Public Works Department to perform this assessment. The work was performed under Geosyntec's Continuing Contract for Professional, Architectural & Engineering Services – Stormwater Management & Design with the City.

1.2 Background and Location

The study area is located in Winter Park, Florida and is bounded by Kennedy Boulevard to the north, Lakes Maitland and Osceola to the east, Harmon Avenue to the south, and Adanson Street to the west. The study area is within the Howell Creek Watershed in Orange County (County) and under St. John's River Water Management District (SJRWMD) jurisdiction. Refer to **Exhibit 1** and **Exhibit 2** for the Vicinity Map and Site Map, respectively.

The City has reported localized, nuisance flooding and experienced significant flooding during Hurricane Ian in 2022 in the areas around Lake Killarney, Lake Bell, and Lake Mendsen (MLK Park). Specific areas of concern are Lake Killarney, Lake Bell, Lake Mendsen, and Canton Avenue. Lake Killarney and Lake Bell are of concern primarily due to structure flooding during Hurricane Ian, while Canton Avenue is of concern primarily due to nuisance flooding. Lake Mendsen is of concern due to both nuisance flooding and structure flooding during Hurricane Ian. In addition to these specific areas of concern, a general assessment of flooding and water quality deficiencies throughout the expanded CRA area was performed during this study. Lake Killarney, Lake Bell, Lake Mendsen, and Canton Avenue were determined to be the focus areas for this study. Refer to **Exhibit 1** and **Exhibit 2** for the locations of these focus areas.

1.3 Purpose and Goals

The purpose of this study was to develop cost effective and feasible engineering alternatives to mitigate flooding during large storm events around Lake Killarney, Lake Mendsen, and Lake Bell and revisit previous alternatives to reduce nuisance flooding around Lake Mendsen and Canton Avenue. These improvements are aimed at addressing water quantity issues that the City has reported to Geosyntec.

An additional goal of this study was to develop an expanded existing conditions model to include the contributing areas to Lake Killarney, Lake Bell, Lake Wilderness, and Lake Gem. This will provide a means for the City to identify and evaluate other potential flooding and water quality deficiencies within the expanded study area.

2. DATA COLLECTION AND REVIEW

2.1 Previous Studies

The *CRA Stormwater Master Plan* performed by Geosyntec in December 2020 served as the primary reference for this study. In addition, the following additional studies relevant to the study area were compiled, reviewed, and are included with the Electronic Deliverables:

- **2022. *Killarney Drive Drainage Improvements Technical Memorandum.* Geosyntec Consultants.** This County technical memorandum summarizes the flooding assessment of the outfall to Lake Killarney on Euston Road and Lake Killarney Drive and includes drainage improvement alternatives.
- **2022. *Control Structure Inventory Update Report.* CDM Smith.** This report was developed as an update to the County's 2008 Overview of An Integrated Control Structure Report. 2009 survey data on the Lake Killarney outfall as well as structural information on the Lake Bell weir are included in this report.
- **2018. *Evaluation of the Effectiveness of the Alum Sediment Inactivation Treatment to Lake Killarney*. Environmental Research and Design, Inc. (ERD).** This report summarizes the County Environmental Protection Division's study to conduct sediment nutrient inactivation of available phosphorus in Lake Killarney to improve water quality.
- **2015. *Drainwell Model Methodology Technical Memorandum*. Geosyntec Consultants.** This technical memorandum summarizes the development of a methodology to accurately simulate drainwell stage-inflow capacity relationship for hydrologic and hydraulic (H&H) modeling.
- **2014. *Well Completion Report for the Replacement of Ohio Street and Cambridge Avenue (DW-034/DW-035) Drainage Wells*. DEVO Engineering.** This report summarizes well construction and development, geophysical and video logging, load testing, and provides as-built drawing for the six drainwells located on the southwest side of Lake Killarney and the abandonment of existing wells on Ohio Street and Cambridge Avenue.
- **2013. *Well Completion Report for the Construction of Minnesota Ave. Drainage Well (DW-036)*. DEVO Engineering.** This report summarizes well construction and development, geophysical and video logging, and provides as-built drawing for the drainwell on Nicolet pond (located at the intersection of Minnesota Avenue and Nicolet Avenue), and the abandonment of the existing well.
- **2013. *Lake Killarney Hydrologic/Nutrient Budget Evaluation*. ERD.** This report summarizes the joint project between the City and County to quantify and rank hydrologic and pollutant loadings to Lake Killarney. As part of this study a bathymetric survey was performed, contributing drainage basins to Lake Killarney were delineated, and stormwater treatment systems, permitted and natural systems as well as retrofit projects, were inventoried.

- **2011.** ***DRAFT Howell Creek Basin Watershed Management Plan*****. CDM.** This report summarizes the comprehensive drainage and flood level-of-service (LOS) evaluation of the Howell Creek watershed, including floodplain delineation and a water quality improvement summary. The existing conditions Interconnected Channel and Pond Routing computer model (ICPR) model was referenced for this study.
- **2010.** ***Minnesota Avenue Drainage Evaluation Report*****. Inwood Consulting Engineers.** This report summarizes the joint study between the City, County, and City of Orlando to evaluate drainage within the vicinity of Minnesota Ave to address flooding problems. As part of this study an existing conditions ICPR model was developed and proposed improvement concepts were evaluated.
- **2008.** ***Well Completion Report for the Replacement of the Clay Street (DW-037) Drainage Well*****. DEVO Engineering.** This report summarizes well construction and development, geophysical and video logging, and provides as-built drawing for the drainwell located on Miller Avenue near its intersection with Clay Street and the abandonment of the existing well. Load testing was not performed due to the lack of a suitable water source.
- **2004.** ***Town of Eatonville Stormwater Master Plan*****. Spectra Engineering & Research, Inc.** This report summarizes the existing conditions of the stormwater system for the Town of Eatonville and included surveying, inventory and assessment of structures, identification of flooding issues, mapping of the stormwater system, preliminary modeling using ICPR. At this time it is unknown if final modeling and assessment were ever completed as no subsequent report could be found.

2.2 Review of Available Construction Plans, Surveys, and As-Builts

Several plans and documents that contained key information about drainage infrastructure in the study area were provided by the City. Geosyntec also downloaded Environmental Resource Permit (ERP) documents from SJRWMD's permitting website for projects in and around the expanded study area including the Interstate 4 (I-4) drainage plans to delineate accurate basins and determine connectivity to Lake Wilderness. Data from several of these documents were used to parameterize the existing conditions model developed for this study. Relevant documents collected from the City, County, and downloaded from SJRWMD are listed below.

Table 2-1: Summary of Reference Data

Summary of Reference Data		
Environmental Resource Permits		
ERP Number	**Project Name**	**Available Data**
45892	Winter Park Oaks	Drainage infrastructure
46152	Raffertys Doctor Office	Drainage infrastructure
46178	Corporate Square	Drainage infrastructure
46428	NAPA Auto Parts	Drainage infrastructure
105632	Wymore Repump Facility	Drainage infrastructure
128968	4 Rivers Winter Park	Drainage infrastructure

Summary of Reference Data		
ERP Number	**Project Name**	**Available Data**
145693	Hungerford Elementary	Drainage infrastructure
145976	Winter Park Center	Drainage infrastructure
148961	Monroe Ave Drainage Outfall	Drainage infrastructure
150569	Office 436 Wymore	Drainage infrastructure
159496	Raindancer Car Wash	Drainage infrastructure
180095	Lifetime Winter Park	Drainage infrastructure
106953-2	Village Park Senior Housing	Drainage infrastructure
113255-1	BankAtlantic at Winter Park	Drainage infrastructure
114454-1	Central Florida Commuter Rail Transit – Phase 1	Drainage infrastructure
114562-2	Wawa Winter Park	Drainage infrastructure
119071-1	Winter Park 9th Grade Center	Drainage infrastructure
123462-1	Winter Park Community Center	Drainage infrastructure
128708-1	Ravaudage Phase 1	Drainage infrastructure
130498-1	Swoope Condos I	Drainage infrastructure
131899-1	Family Life Center	Drainage infrastructure
142864-1	Lakeside Crossing	Drainage infrastructure
143262-1	OCPS Winter Park Tech	Drainage infrastructure
145751 - 1	1800 Lee Road Townhomes	Drainage infrastructure
148266-1	Maitland Shores Apartment	Drainage infrastructure
149720-1	Lake Killarney	Drainage infrastructure and Lake Killarney data
162228-1	Starbucks Lee Road	Drainage infrastructure
20116-1	Alexan North End	Drainage infrastructure
20624-1	Kennedy Blvd Lake Ave	Drainage infrastructure
20833-3	Winter Park Village Redevelopment REI	Drainage infrastructure
20947-1	Lake Island Park	Drainage infrastructure and Lake Mendsen data
20947-2	Lake Island Killarney Interconnect	Drainage infrastructure and Lake Mendsen data
20947-5	Winter Park Library	Drainage infrastructure and Lake Mendsen data
27882-1	Town Eatonville Community Park	Drainage infrastructure
27929-1	Fields BMW	Drainage infrastructure
28033-1	Winter Park Village	Drainage infrastructure
28033-2	Winter Park Village Redevelopment Chase Bank	Drainage infrastructure

Summary of Reference Data		
ERP Number	**Project Name**	**Available Data**
44453-3	Rollins College Crummer Building Expansion	Drainage infrastructure
46105-3	Valencia Community College – Winter Park Campus	Drainage infrastructure
46178-3	Lee Road Extension	Drainage infrastructure
46178-6	Winter Park Whole Foods	Drainage infrastructure
62355-21	I-4 Ultimate Mainline from Lee Rd W to Kennedy Blvd E	Drainage infrastructure and FDOT Pond data
64811-1	Oak Haven Villas	Drainage infrastructure
67272-1	Speedway #9862	Drainage infrastructure
67631-1	DePugh Nursing Home	Drainage infrastructure
71640-1	Winter Park Vet	Drainage infrastructure
76616-1	Versailles Condominiums	Drainage infrastructure
80136-1	BP Amoco RF #15293	Drainage infrastructure
80136-3	TD Bank Winter Park	Drainage infrastructure
80878-1	Winter Park Home Depot	Drainage infrastructure
80878-2	Winter Park Race Track Home Depot	Drainage infrastructure
80943-1	Medallion Convenience Store - Lee Road	Drainage infrastructure
81655-1	City of Winter Park Public Safety Building	Drainage infrastructure
81655-2	Swoope Water Treatment Plant Improvement	Drainage infrastructure
85633-1	Lee Road Retail Center	Drainage infrastructure
CAD Drawings		
CAD File Name		**Available Data**
CRA DRAINAGE COMPILATION GEO RECTIFIED PARTIAL.dwg		A compilation of CAD files containing drainage infrastructure
designbase-orange av wp.dwg		Drainage infrastructure
Lake Osceola Alum Treatment Project		A compilation of CAD files containing design information for an alum injection facility
Lake Virginia North Alum Stormwater Treatment System		A compilation of CAD files containing design information for an alum injection facility
Webster Avenue Alum Stormwater Treatment System		A compilation of CAD files containing design information for an alum injection facility

Summary of Reference Data	
GIS Data	
GIS Data Name	**Available Data**
WP Stormwater.gdb	Compilation of City drainage infrastructure data including discharge points, inlets, manholes, retrofit locations, control structures, treatment structures, gravity lines, pressurized lines, underdrains, open drains, and retention/detention systems
OC_GIS-SDE_20231218.gdb	Compilation of County GIS's drainage infrastructure including drainwells, inlets, major control structures, pollution control devices, structures, ditches, pipes, and ponds.
OC_PW-SW_20240119.gdb	Compilation of County Public Works Department's drainage infrastructure including drainwells, pond structures, pump stations structures, culverts, ponds, primary canals, and secondary canals.
CDS_and_Baffle_Boxes.shp	Inventory of County Environmental Protection Division (EPD) data including CDS, baffle boxes, and modular wetlands.
CIB_Locations.shp	Inventory of County EPD's curb inlet baskets.
Other City Provided Data	
File Name	**Available Data**
Storm_Atlas_02B.tif	Drainage infrastructure
Storm_Atlas_03B.tif	Drainage infrastructure
Storm_Atlas_06A.tif	Drainage infrastructure
Storm_Atlas_06B.tif	Drainage infrastructure
Storm_Atlas_07A.tif	Drainage infrastructure
Storm_Atlas_07B.tif	Drainage infrastructure
Storm_Atlas_08A.tif	Drainage infrastructure
Storm_Atlas_08B.tif	Drainage infrastructure
Storm_Atlas_09A.tif	Drainage infrastructure
Storm_Atlas_09B.tif	Drainage infrastructure

Summary of Reference Data	
Other City Provided Data	
File Name	**Available Data**
HIGH WATER MARKS POST HURRICAN IAN COMPILATION LAKE BERRY LAKE KILLARNEY AND LAKE VIRGINIA.pdf	High water marks from Hurricane Ian for north and west banks of Lake Killarney
Ian Damage Assessment (Includes Updates from Resident Reports).xlsx	Flooded areas from Hurricane Ian
FLOOD MGMT 3.00.pdf	City's interim adaptive flood management guide (developed in October 2023)
KILLARNEY-DRAIN-WELLS- Exhibit.pdf	Drawing and details of risers on Lake Killarney drainwells
Hurricane Ian Photos	Photos of flooding elevation from Hurricane Ian around Lake Bell, Lake Killarney, MLK, and US 17-92
Global Pump 6GST Cut Sheet.pdf	Specifications for the City's mobile pump

2.3 Vertical Datum Conversion

The vertical datum referenced for all elevations in this study is the North American Vertical Datum of 1988 (NAVD). Data sources referencing the National Geodetic Vertical Datum of 1929 (NGVD) were converted to NAVD using the conversion factor -0.98 for the Howell Branch Watershed from the 2021 Flood Insurance Study (FIS) for the County. It is noted that drainage infrastructure data obtained from the City's Storm Atlas were converted from NGVD to NAVD. Additionally, a majority of the City's GIS data were determined to reference NGVD and were converted to NAVD.

2.4 Soils

A GIS polygon feature class of soils data was obtained from the United States Department of Agriculture Natural Resources Conservation Service (NRCS) Web Soil Survey. The hydrologic soil group (HSG) classification data were used in calculating the runoff curve numbers (CNs) in the model. The soils are designated with various HSG classifications, 'A' through 'D', which indicate relative drainage characteristics. An 'A' soil is more freely draining (generally deeper water tables and less runoff potential), and a 'D' soil is more restrictive of drainage (generally higher water tables and more runoff potential). Dual classification soils ('A/D', B/D', and 'C/D') can have varying characteristics during the dry and wet seasons and are often conservatively categorized as HSG 'D' for design-storm based runoff estimations.

Approximately 43% of the soils in the study area are classified as HSG A and approximately 15% are classified as A/D. Approximately 29% of the study area is classified as 'Urban Land' which is typically not assigned an HSG. Urban Land was conservatively estimated as HSG D for the purposes of this study. The remaining study area (13%) is classified as 'Water' and is not typically assigned an HSG.

The soils classifications were used to calculate CNs for hydrologic model runoff calculations. Refer to **Exhibit 3** for a map of the soils in the study area.

2.5 Land Use

Land use polygons for the study area were downloaded from SJRWMD and were dated 2014. The land use polygons were reviewed by Geosyntec and Florida Land Use Cover and Classification System (FLUCCS) code assignments were updated as necessary to reflect current conditions based on a review of 2024 aerials. Land use within the study area is primarily medium density residential (FLUCCS code: 1200) and commercial and services (FLUCCS code: 1400). Refer to **Exhibit 4** for a map of the land use classifications and table summarizing land use percentages in the study area.

2.6 Topography

Topographic data of land surface elevations throughout the study area are based on a Digital Elevation Model (DEM) shown on **Exhibit 5**. The DEM was developed with a resolution of 2.5 ft cells using the 2018-2020 Florida Peninsular LiDAR data collected by the United States Geological Survey. The data was used to establish the overall study area drainage boundary and for development of the H&H model.

2.7 Drainage Infrastructure and Stormwater BMPs

The drainage infrastructure in the expanded study area consists primarily of curb and gutter draining to inlets connected to stormsewer systems typical of urban/suburban land use types. Drainage infrastructure data was compiled and digitized in ArcGIS from the sources summarized in **Section 2.2** and is shown on **Exhibit 6**.

There are various drainwells, exfiltration structures, and stormwater best management practices (BMPs) throughout the expanded study area. As these are given special consideration during model development, a summary of these features is provided below.

- **Drainwells** - The various drainwells in the expanded study area are summarized below.
    - **Center Street Drainwell** – Based on the drainwell video logging, inspection, and evaluation performed by Devo Engineering in June 2015 for the City of Winter Park, this drainwell appears to be almost totally plugged and only achieves a flow rate of approximately 6.4 gallons per minute. The City is not aware of any chronic flooding issues in the drainage network that this drainwell is connected to and therefore, proposed capping this drainwell. This drainwell was not modeled for this study.
    - **Lake Mendsen 20-inch Drainwell** – There is an existing 20-inch drainwell in the center area of Lake Mendsen. The 20-inch drainwell currently has a 6-inch well pump installed within it for irrigation purposes. This drainwell receives water from Lake Mendsen via a control structure.
    - **Lake Mendsen 8-inch Drainwell** – There is an existing 8-inch drainwell on the north side of Lake Mendsen within an existing drainage structure. This drainwell receives water from Lake Mendsen via a control structure.

- **Lake Midget 15-inch Drainwell** – There is an existing 15-inch drainwell on the west side of Lake Midget that serves as the lake's control structure.
- **Lake Killarney Drainwells** – There are 6 existing drainwells on the southwest bank of Lake Killarney that serve as replacements to the Ohio Street and Cambridge Avenue drainage wells:
  - **DW-34**
    - **A** – Existing 10-inch drainwell receiving water from Lake Killarney via an intake pipe.
    - **B** – Existing 12-inch drainwell receiving water from Lake Killarney via a pipe connection with DW-34A.
    - **C** – Existing 12-inch drainwell receiving water from Lake Killarney via a pipe connection with DW-34A.
  - **DW-35**
    - **A** – Existing 10-inch drainwell receiving water from Lake Killarney via an intake pipe with an inline weir.
    - **B** – Existing 12-inch drainwell receiving water from Lake Killarney via a pipe connection with DW-35A.
    - **C** – Existing 12-inch drainwell receiving water from Lake Killarney via a pipe connection with DW-35A.
- **Nicolet Pond 12-inch Drainwell** – There is an existing 12-inch drainwell on the southeast side of Nicolet Pond (at the intersection of Minnesota Avenue and Nicolet Avenue) that serves as a replacement to the previous drainwell in the center of the pond. This drainwell receives water from Nicolet pond via a control structure.
- **Miller Avenue 12-inch Drainwell** – There is an existing 12-inch drainwell on Miller Avenue (east of its intersection with Clay Street) that serves as a replacement to the previous drainwell at the southeast intersection of Miller Avenue and Clay Street. This drainwell receives water from Miller Avenue and Clay Street via a control structure and CDS stormwater treatment unit connected to a curb inlet on the north side of Miler Street.

- **Exfiltration** – The various underground exfiltration structures in the expanded study area are summarized below. Note that not every exfiltration system was included in the model. The exfiltration systems listed below were deemed by Geosyntec to be sufficient enough in size to impact runoff volumes and thus were included in the model.
  - **Winter Park Village** – Nine exfiltration systems were designed to treat 1-inch of runoff and five custom manufactured sedimentation and oil separator baffle boxes provide water quality benefits. The exfiltration systems were designed to provide a combined 3.29 acre-feet (ac-ft) of volumetric storage.
  - **Alfond Stadium at Harper Shepherd Field** – Synthetic turf with an underlying storage layer and underground chambers provide a combined 0.25 ac-ft of volumetric storage. The synthetic turf infield and parking lot stormwater chambers

were designed to increase groundwater recharge and reduce stormwater peak runoff rates.

- **Lakeside Crossing** – Stormwater runoff from the site is managed by an underground offline exfiltration trench, designed to provide water treatment and attenuation. The exfiltration trench was designed to provide 0.524 ac-ft of treatment volume. It is noted that the Lakeside Crossing development is located directly west of Lake Mendsen and any bypass flows from the development are discharged to Lake Mendsen.
- **TD Bank Winter Park** – An underground chamber system provides treatment for the entire site and discharges to an existing curb inlet. The chamber system provides approximately 0.1 ac-ft of volumetric storage and a treatment volume of approximately 0.08 ac-ft.

- **Stormwater BMPs** – The various stormwater BMPs in the expanded study area are summarized below. The exfiltration systems described above are also typically considered a BMP since they reduce the quantity of stormwater discharged from a site and provide treatment via straining during infiltration. It is noted that other BMPs exist throughout the expanded study area, but they are primarily confined to private developments and were not assessed as part of this study.
  - **Canton Avenue Baffle Box** – There is a baffle box located at the east end of Canton Avenue that treats stormwater prior to being discharged to Lake Osceola.
  - **Morse Boulevard Baffle Boxes** – There are two baffle boxes located at the east end of Morse Boulevard that treat stormwater prior to being discharged to Lake Osceola.
  - **Webster Avenue Baffle Box** – There is a baffle box located at the east end of Webster Avenue that treats stormwater prior to being discharged to Lake Osceola.
  - **Lee Road Stormwater Pond** – There is a stormwater wet detention pond located southwest of Lee Road adjacent to Lake Francis that receives stormwater runoff from Lee Road and the private properties on the northeast corner of Lee Road and Orlando Avenue (US 17-92).
  - **Lake Mendsen** – Lake Mendsen is a stormwater park that provides attenuation and treatment of stormwater from the surrounding area. As part of the Lake Island (i.e., "Lake Mendsen")/Killarney Interconnect project, a diversion box was installed near the intersection of Beachview Avenue and Orlando Avenue (US 17-92). The intent of this project was to provide flood control for Lake Mendsen (i.e., provide a hydraulic connection to Lake Killarney) and water quality improvement for Lake Killarney (i.e., treat stormwater runoff from Orlando Avenue prior to being discharged to Lake Killarney).
  - **Swoope Water Treatment Plant Stormwater Pond** – There is a 0.7-acre stormwater dry detention pond that receives runoff from the public safety facility to the southeast, the water treatment plant to the south, and the multi-family housing project to the northwest.

- **9th Grade Center Pond** – There is a stormwater wet detention pond located east of the Winter Park 9th Grade Center. Based on discussions with the City, the stormwater wet detention pond currently operated primarily as a sedimentation pond to remove solids prior to stormwater being discharged to Lake Virginia. Due to the large contributing area and relatively small size of the stormwater pond, the City does not believe the pond currently functions to reduce nutrient loads.
- **Winter Park 9th Grade Center Dry Retention Pond** – There is an existing stormwater dry retention pond located west of the 9th Grade Center Pond that receives runoff from the 9th Grade Center and discharges to the 9th Grade Center Pond.
- **Webster Avenue Alum Facility** – There is an alum injection facility at the east end of Webster Avenue that pumps alum into an upstream drainage structure that discharges to Lake Osceola via a 42-inch pipe.
- **Lake Osceola Alum Facility** – There is an alum injection facility at the east end of Morse Boulevard that pumps alum to drainage structures along Canton Avenue, Lincoln Avenue, Morse Boulevard, and New England Avenue. All alum feed locations are upstream of outfalls that discharge to Lake Osceola.
- **Lake Virginia Alum Facility** – There is an alum injection facility east of the Rollins College field house that pumps alum to two upstream drainage structures that discharge to Lake Virginia via two separate outfalls.
- **Lake Killarney leaf/debris traps** – There are leaf/debris traps on 10 of the 32 stormwater outfalls to Lake Killarney within the City's jurisdiction on the north and east sides of the lake.
- **Lake Killarney curb/grate inlet baskets** – There are 37 curb or grate inlet baskets on stormwater systems with outfalls to Lake Killarney within the County's jurisdiction on the west and south sides of the lake.
- **Lee Road Baffle Box** – There is a baffle box located on the south side of Lee Road east of Turner Road that treats stormwater prior to being discharged to Lake Killarney.
- **Stormwater Management and Reuse Technology (SMART) system** – There is a reuse pipe network provides treatment through on-site irrigation of stormwater runoff for the properties within the City between Wynmore Road and I-4 in the area north of Lee Road.
- **FDOT Pond –** There is a stormwater wet detention pond located north of Lake Wilderness adjacent to Wymore Road that receives stormwater runoff from I-4.

Although not a permanent BMP offering continuous treatment, the 2015-2017 sediment inactivation project on Lake Killarney, discussed in detail in the 2013 ERD report, applied alum treatments to inactive available phosphorus and reduce sediment phosphorus release. Substantial improvements in Lake Killarney were noted as a result of these applications.

2.8 Field Investigation and Survey Needs

A detailed field investigation of the expanded study area to confirm key drainage infrastructure data from plans and previous studies and drainage patterns was conducted by Geosyntec personnel on April 3, 2024. Representative photos from the field investigation are presented below.



Photograph 1: Existing Lake Killarney Outfall



Photograph 2: Weir downstream of Lake Bell



Photograph 3: Commercial Properties downstream of Lake Bell



Photograph 4: View of Lake Bell from northeast (looking southwest)



Photograph 5: South bank of Lake Wilderness



Photograph 6: East bank of Lake Mendsen (looking northwest)



Photograph 7: North bank of Lake Mendsen (looking south)



Photograph 8: Northwest bank of Lake Rose (looking southeast)



Photograph 9: Canal from Park Lake to Lake Maitland (looking downstream)



Photograph 10: Control Structure at Grove Street

Geosyntec identified sites needing field reconnaissance in support of the existing conditions H&H model development. A review of the City stormwater system was performed to determine likely areas that may need to be modeled in greater detail and any sites with missing or incomplete data. Field reconnaissance was performed to verify data needs of these sites and a search of ERPs was performed to see if supplemental drainage information was available. As professional survey was not performed as part of this study, candidate channels and structures were identified that would benefit from future professional survey to support modeling efforts. A map of the survey needs sites are shown on **Exhibit 7**.

To develop an accurate existing conditions model in lieu of survey, data gaps such as features that were inaccessible or required elevation measurements were populated using engineering judgement and available data such as the DEM and adjacent stormwater infrastructure. For example, if a pipe invert elevation was unknown the rim elevation was determined from the DEM and the top of the pipe was assumed to be under 3-ft of cover which would make a 24-inch pipe invert 5-ft below the rim elevation.

2.9 FEMA Floodplains and Flooding Problem Areas

Federal Emergency Management Agency (FEMA) floodplain data from the 2021 Flood Insurance Study (FIS) for the County was used to identify areas in the expanded study area that are within a FEMA designated Special Flood Hazard Area (SFHA). Lake Killarney, Lake Bell, Lake Wilderness, Lake Gem/Park Lake, Lake Midget, Lake Maitland, Lake Osceola, and Lake Virginia are designated as "Zone AE," with base flood elevations (BFEs) summarized in **Table 2-2**. "Zone AE" is a SFHA subject to inundation by the 1% annual chance flood event. The FDOT pond located southwest of the I-4 and Lee Road intersection is designated as "Zone A" with no established BFE. Lake Mendsen and Lake Francis are designated as "Zone X" and are subject to the 0.2% annual chance flood event. The remainder of the study area is classified as "Zone X" and are areas of minimal flood hazard. The FEMA designated floodplains around the vicinity of the study area are shown on **Exhibit 8**. Note that Lake Gem and Park Lake are distinguished by name but are hydrologically connected and will be grouped as Lake Gem/Park Lake throughout this report.

Table 2-2: Summary of Base Flood Elevations for Lakes in Study Area

Waterbody	Base Flood Elevation (ft NAVD)
Lake Killarney	84.4
Lake Bell	91.4
Lake Wilderness	91.4
Lake Gem/Park Lake	73.6
Lake Midget	91.0
Lake Maitland	68.0
Lake Osceola	68.8
Lake Virginia	68.9

The City-provided records of flooding from Hurricane Ian (see Table 2-1) were georeferenced and digitized to develop a flooding problem areas map illustrating the extent of flooding on structures

and roadways during Hurricane Ian (**Exhibit 8)**. This map illustrates that the overtopping of Lake Bell during Hurricane Ian impacted residential structures on the east side of the lake along Turner Road, commercial properties south of Kindel Avenue, and caused roadway flooding on Lee Road. Residential properties on the southeast side of Lake Killarney were also impacted by flooding during Hurricane Ian as well as the residences within the neighborhood directly east of Lake Mendsen bordered by Morse Boulevard on the north, Pennsylvania Avenue on the east, and Comstock Avenue on the South.

2.10 Capital Improvement Projects

The City has several completed and planned capital improvement projects (CIPs) within the study that are targeted at flood improvements. These projects and their status (i.e., completed or planned) are summarized below and their locations are shown on **Exhibit 9**. For planned projects, the timeline of completion was categorized as follows: short-term refers to within the next 2 fiscal years and mid-term refers to within the 5-year Capital Improvement Program cycle. In addition to these projects, the City's Public Works department is investigating options to purchase stormsewer camera equipment to effectively investigate stormwater infrastructure to prioritize, schedule, and perform repairs.

2.10.1 Completed

- ***Lake Killarney Outfall Dredging.*** Project consisted of dredging to remove accumulated sediment for various outfalls into Lake Killarney which receive stormwater runoff from upstream roadway stormsewer networks.
- ***Lake Killarney Canal Dredging***. Project consisted of dredging to remove accumulated material from storm erosion and sedimentation in the canal east of the intersection of Turner Road and Blossom Lane. The accumulation had caused the canal to become very shallow resulting in resident complaints regarding boat navigation during dry season. Dredging deepened the canal allowing for boat navigation and improved conveyance.
- ***Capen Avenue at Symonds Avenue Drainage Improvements.*** Project consisted of replacing 27 feet (ft) of pipe on Capen Avenue at the intersection with Symonds Avenue. This repair was identified and carried out as part of the City's routine maintenance.
- ***Stormsewer Pipe Lining and Repairs***. Projects consist of lining of stormsewer pipe and repairs to maintain conveyance of stormwater system. Sites were identified from depressions in the roadway by the City as part of its routine maintenance or from resident complaints. Repairs were carried out as part of the City's routine maintenance.
    - West Hannibal Square
    - Douglas Avenue
    - Denning Drive at Symonds Avenue
    - Canton Avenue at Capen Avenue
    - 1051 Lake Bell Drive
    - 490 North Orlando Drive
    - Canton Avenue at Pennsylvania Avenue

2.10.2 Planned

- ***Lake Bell Weir Repair.*** Repairs are ongoing to the wing walls of this weir to address erosion and seepage which was exacerbated as a result of Hurricane Ian. Pressure grouting behind each wingwall has been performed, backfill and sodding remains to complete repairs. Project estimated to be completed in the short-term.
- ***Nicolet Avenue Dry Retention Pond.*** Ongoing development of new dry retention pond on Nicolet Avenue north of Minnesota Avenue to provide flood storage and pollution abatement for contributing drainage area along Nicolet Avenue and Minnesota Avenue. Project estimated to be completed in the short-term.
- ***Killarney Drive Drainage Improvements***. Planned project will improve conveyance of stormwater to address flooding along Killarney Drive from Lakeview Avenue to Shoreview Avenue. Improvements will include consolidation of two existing, failing outfalls into one with an internal screen for solids capture, installation of a new high-capacity inlet, as well as repaving and regrading along Killarney Drive to remediate erosion due to failed outfalls. Project estimated to be completed in the short-term.
- ***Turner Road at Blossom Lane Drainage Improvements***. Planned project will improve conveyance of stormwater to address localized flooding near the intersection of Turner Road and Blossom Lane. Improvements will include repaving and regrading to address conveyance issues during intense rain events identified by City staff and resident complaints. Project estimated to be completed in the mid-term.
- ***1311 Minnesota Avenue Repairs.*** Planned project will investigate depression in roadway which indicates stormwater infrastructure failure likely related to existing manhole. No reduction in conveyance or localized flooding has been identified by City staff or reported by residents. Project estimated to be completed in the short-term.
- ***Schultz Avenue Repairs***. Planned project will replace an 80-100 ft section of pipe along Schultz Avenue. The needed repair was identified by City staff during regular inspection. No reduction in conveyance or localized flooding has been identified by City staff or reported by residents. Project estimated to be completed in the short-term.

3. EXISTING CONDITIONS ASSESSMENT

3.1 Potential Water Quality Treatment Deficiencies

An evaluation of existing data was performed to identify stormwater outfalls in the study area that lack water quality treatment or have BMPs that provide substandard water quality treatment. BMPs that are limited to only sediment or trash collection (e.g., baffle boxes, curb inlet baskets) generally do not provide substantial reduction of nutrient loads. A summary of the findings is provided below and shown on **Exhibit 10**.

- **East Webster Avenue Outfall to Lake Osceola** – An alum injection facility and baffle box provide treatment for the stormsewer system that drains Webster Avenue, North New York Avenue, North Park Avenue, and North Interlachen Avenue before discharging to Lake Osceola. Per design plans prepared by ERD, dated September 1997, the alum injection facility utilizes a 3,000-gallon alum tank, pump, and alum feed line to dose an upstream drainage structure. The design also includes an alum floc barrier to trap the floc for easier collection and maintenance at the point of discharge to Lake Osceola.
- **Morse Boulevard Outfall to Lake Osceola** – An alum injection facility and two baffle boxes located at the east end of Morse Boulevard provide treatment for the stormsewer system that drains East Morse Boulevard, South Knowles Avenue, South Center Street, and parts of Interlachen Avenue before discharging to Lake Osceola. Per design plans prepared by ERD, dated March 1992, the alum injection facility utilizes a 6,000-gallon alum tank, pumps, and alum feed lines to dose upstream drainage structures.
- **Lincoln Avenue Outfall to Lake Osceola** – The alum injection facility located at the east end of Morse Boulevard doses an upstream drainage structure that is part of the stormsewer system that drains Lincoln Avenue and discharges to Lake Osceola. It is noted that Lincoln Avenue is hydraulically connected to East Morse Boulevard which has two existing baffle boxes.
- **Alexander Place Outfall to Lake Osceola** – The alum injection facility located at the east end of Morse Boulevard doses an upstream drainage structure that is part of the stormsewer system that drains parts of Interlachen Avenue, New England Avenue, and Alexander Place and discharges to Lake Osceola.
- **Canton Avenue Outfall to Lake Osceola** – The alum injection facility located at the east end of Morse Boulevard and a baffle box provide treatment for the stormsewer system that drains Canton Avenue before discharging to Lake Osceola. Per design plans prepared by ERD, dated January 1995, an alum feed line was extended from the alum injection facility at the east end of Morse Boulevard to dose a drainage structure at the intersection of Canton Avenue and Interlachen Avenue.
- **East Fairbank Avenue/Rollins College Outfall to Lake Virginia** – An alum injection facility located east of the Rollins College field house provides treatment for two stormsewer systems that drain East Fairbanks Avenue, South Interlachen Avenue, South Park Avenue, and parts of Rollins College before discharging to Lake Virginia. Per design plans prepared by ERD, dated April 1995, the alum injection facility utilizes an alum storage tank, pumps, and alum feed lines to dose upstream drainage structures.

- **Lakeview Drive Outfall to Lake Virginia** – Stormsewer system that drains approximately 114.2 acres discharges directly to Lake Virginia after minimal treatment in the 9th Grade Center Pond.
- **Beachview Avenue Outfall to Lake Killarney** – Stormsewer system that drains Beachview Avenue and South Orlando Avenue between North Kentucky Avenue and West Webster Avenue. A portion of runoff is diverted to Lake Mendsen for water quality treatment as part of the Lake Island (i.e., "Lake Mendsen")/Killarney Interconnect project. The remaining runoff is discharged directly to Lake Killarney. There is a leaf/debris trap, which consists of a fenced area outside of the stormsewer outfall which uses a filter fabric to filter solids and other debris from the stormwater inflows and retain them within the leaf/debris trap.
- **Ololu Drive Outfall to Lake Killarney –** Stormsewer system that drains Ololu Drive between Audrey Avenue and Beverly Avenue. There are curb and grate baskets providing trash/debris collection prior to discharging to Lake Killarney.
- **Euston Road Outfalls to Lake Killarney –** Stormsewer system that drains the entirety of Euston Road, and Pelham Road between Salisbury Boulevard and Euston Road. There are curb and grate baskets at each of the two (2) outfalls providing trash/debris collection prior to discharging to Lake Killarney.
- **Salisbury Boulevard Outfalls to Lake Killarney –** Stormsewer system that drains Salisbury Boulevard and Pelham Road between Roxbury Road and Salisbury Boulevard. There are curb and grate baskets providing trash/debris collection prior to discharging to Lake Killarney.
- **Clay Street Outfall to Lake Killarney –** Stormsewer system that drains Clay Street and Killarney Drive between Ohio Street and Starling Road. There is a curb and grate basket providing trash/debris collection prior to discharging to Lake Killarney.
- **West Fairbanks Avenue Outfall to Lake Killarney –** Stormsewer system that drains the medical office building plaza and West Fairbanks Avenue between Kilshore Lane and Cambridge Boulevard. There is a leaf/debris trap, which consists of a fenced area outside of the stormsewer outfall which uses a filter fabric to filter solids and other debris from the stormwater inflows and retain them within the leaf/debris trap.
- **Winter Park Medical Center Outfall to Lake Killarney –** Stormsewer system that drains the Winter Park Medical Center. Stormwater runoff is collected by a stormwater retention pond prior to discharging to Lake Killarney.
- **Kilshore Lane Outfall to Lake Killarney –** Stormsewer system that drains Kilshore Lane discharges directly to Lake Killarney after no water quality treatment.
- **Lakeview Avenue Outfall to Lake Killarney –** Stormsewer system that drains Lakeview Avenue discharges directly to Lake Killarney after no water quality treatment.
- **Shoreview Avenue Outfall to Lake Killarney –** Stormsewer system that drains Shoreview Avenue, the channel downstream from Nicolet Pond, and both West Fairbanks Avenue and Gene Street between Nicolet Avenue and South Orlando Avenue discharges directly to Lake Killarney via two (2) outfalls after no water quality treatment.

- **Broadview Avenue Outfall to Lake Killarney –** Stormsewer system that drains Broadview Avenue includes three (3) outfalls in total. There is a leaf/debris trap at each of the three outfalls, which consists of a fenced area outside of the stormsewer outfall site which uses a filter fabric to filter solids and other debris from the stormwater inflows and retain them within the leaf/debris trap.
- **Fairview Avenue Outfalls to Lake Killarney –** Stormsewer system that drains Fairview Avenue, Grove Avenue, and Killarney Drive between Broadview Avenue and Beachview Avenue discharges directly to Lake Killarney via two (2) outfalls after no water quality treatment.
- **Hillstone Restaurant Outfall to Lake Killarney –** Stormsewer system that drains the Hillstone Restaurant Plaza discharges directly to Lake Killarney after no water quality treatment.
- **Killarney Bay Court Outfall to Lake Killarney –** Stormsewer system that drains Trovillion Avenue and Killarney Bay Court. There is a leaf/debris trap, which consists of a fenced area outside of the stormsewer outfall which uses a filter fabric to filter solids and other debris from the stormwater inflows and retain them within the leaf/debris trap.
- **Gay Road Outfall to Lake Killarney –** Stormsewer system that drains Center of Winter Park Plaza discharges directly to Lake Killarney after no water quality treatment.
- **Lake Front Boulevard Outfalls to Lake Killarney –** The stormsewer system that drains Lake Front Boulevard and Country Club Drive between Executive Drive and Lake Front Boulevard includes four (4) outfalls in total. Among these outfalls, there are three (3) outfalls that discharges directly to Lake Killarney after no water quality treatment, and one (1) outfall, on the northern end of the road, which has a leaf/debris trap, providing debris treatment.
- **Country Club Drive Outfalls to Lake Killarney** – The stormsewer system that drains Ellen Drive and Country Club Drive between Lake Front Boulevard and Lee Road includes two (2) outfalls in total. At this site, there are leaf/debris traps at each of the two outfalls, which consists of a fenced area outside of the stormsewer outfall which uses a filter fabric to filter solids and other debris from the stormwater inflows and retain them within the leaf/debris trap.
- **Lake Killarney Townhomes Outfalls to Lake Killarney –** Stormsewer system that drains Lake Killarney townhomes includes two (2) outfalls in total. Stormwater runoff is collected by a stormwater retention pond prior to discharging to Lake Killarney at the two outfalls.
- **Lee Road Outfall to Lake Killarney –** Stormsewer system that drains the plaza located at the address 2001 Lee Road and Lee Road between Beard Avenue and Hanover Avenue and conveys water from Lake Bell. There is a baffle box to remove sediments and debris prior to discharging to Lake Killarney.
- **Blossom Lane Outfall to Lake Killarney –** Stormsewer system that drains the northwestern portion of Blossom Lane and Turner Road between Lee Road and Lake Drive discharges directly to Lake Killarney after no water quality treatment.

- **Lake Drive Outfalls to Lake Killarney –** The stormsewer system that drains Lake Drive, and the southeastern portion of Blossom Lane, includes four (4) outfalls in total. Among these outfalls, all four outfalls discharge directly to Lake Killarney after no water quality treatment.
- **Rippling Lane Outfalls to Lake Killarney –** The stormsewer system that drains Fountain Lane and Rippling Lane includes three (3) outfalls in total. Among these outfalls, all three outfalls discharge directly to Lake Killarney after no water quality treatment.
- **Grove Street Outfalls to Park Lake –** Stormsewer system that drains Town Circle, Park Lake Circle, and Grove Street between Villa Circle and Lake Avenue discharges directly to Park Lake after no water quality treatment.
- **The Adeline Apartment Complex Outfall to Park Lake –** Stormsewer system that drains the Adeline Apartment Complex discharges directly to Park Lake after no water quality treatment.
- **Monroe Avenue Outfall to Lake Gem –** The stormsewer system that drains and Monroe Avenue between Williamson Street and South Orlando Avenue discharges directly to Lake Gem after no water quality treatment.
- **Monroe Avenue/South Orlando Avenue Outfalls to Lake Gem –** The stormsewer system that drains South Orlando Avenue between North Park Avenue and Lee Road includes two (2) outfalls in total. There are nutrient boxes at the two outfalls to remove sediments and debris prior to discharging to Lake Gem.
- **South West Street to Lake Bell –** Stormsewer system that drains Ruffel Street between the eastern end of the road and Moseley Avenue, as well as South West Street between Ruffel Street and Fitzerald Drive, discharges directly to Lake Bell after no water quality treatment.
- **Lake Bell Drive Outfall to Lake Bell –** Stormsewer system that drains Dupont Avenue, Early Avenue, Atomic Court, and Lake Bell Drive between Early Avenue and Dupont Avenue discharges directly to Lake Bell after no water quality treatment.
- **Turner Road Outfall to Lake Bell –** Stormsewer system that drains Turner Road between Kindel Avenue and Durham Drive, as well as Galen Avenue, Eland Avenue, and Durham Avenue, discharges directly to Lake Bell after no water quality treatment.
- **Monroe Avenue Ditch Outfall to Lake Bell –** The channel that drains Jonotey Drive between Berthann Lane and Monroe Avenue, Monroe Avenue between Williamson Street and Jonotey Drive, and Turner Road between Durham Avenue and the northern end of the road, discharges directly to Lake Bell after no water quality treatment.
- **FDOT Pond Outfall to Lake Wilderness –** Stormsewer system that drains I-4 between Lee Road and West Kennedy Boulevard. Stormwater runoff is collected by the stormwater retention pond (i.e., FDOT Pond), prior to discharging to Lake Killarney.
- **Hungerford Elementary School Outfall to Lake Wilderness –** Stormsewer system that drains Hungerford Elementary School. Stormwater runoff is collected by the stormwater retention pond prior to discharging to Lake Wilderness.

- **Wymore Repump Facility Outfall to Lake Wilderness –** Stormsewer system that drains Wymore Repump Facility. Stormwater runoff is collected by the stormwater retention pond prior to discharging to Lake Wilderness.

Based on the review of lake stormwater outfalls, several outfalls to Lake Killarney, Lake Bell, Lake Wilderness, and Lake Gem/Park Lake are potential water quality deficiency locations (**Exhibit 10**). The remaining outfalls have either alum treatment or a combination of both alum treatment and baffle box treatment. It is noted that baffle boxes that do not contain a media filtration component generally function primarily to capture sediment and trash and not necessarily the reduction of nutrient loads. However, in conjunction with alum treatment, both removal of sediment/trash and reduction of nutrient loads can be achieved.

Based on review of the Lake Jesup Basin Management Action Plan (BMAP) Amendment, June 2019, the City's completed and planned projects are sufficient to achieve the required nutrient load reduction over the next five years. The City has currently achieved 79.7% of their required TN reduction and 187.7% of their required TP reduction. Also, the City currently receives a TN reduction credit of 743 lb/yr and a TP reduction credit of 321 lb/yr. The City's TN and TP required reduction for the next five years is 466 lb/yr and 86 lb/yr, respectively.

Although the City has met the BMAP nutrient reduction requirement through 2024, implementation of additional stormwater BMPs (e.g., upflow media filters, pervious pavement, tree box filters, etc.) may help improve the general water quality of the City's lakes from both a nutrient and aesthetics perspective. Geosyntec recommends the following steps for the stormwater outfall locations identified and on **Exhibit 10** that do not currently have a BMP or may have a BMP that provides substandard nutrient load reduction:

- **Existing Conditions Assessment** – Utilizing a pollutant loading model (e.g., BMPTrains), determine the estimated nutrient loading currently discharged from the water quality treatment deficiency location(s).
- **Improvement Alternatives Analysis** – Develop and evaluate improvement alternatives for the identified water quality treatment deficiency location(s).

3.2 Hydrologic and Hydraulic Model Development

The ICPR model (version 4.07.08) was the H&H model used to analyze the drainage systems for this study. The model uses a one-dimensional (1D) node-link representation of real world drainage features such as lakes, ponds, flow junctions (inlets, manholes, etc.), pipes, channels, etc. The model also calculates infiltration and runoff rates for either defined hydrologic units (subbasins) or a two dimensional (2D) overland flow mesh. The runoff is hydraulically routed though the 1D links or on the 2D overland flow surface.

ICPR is also capable of modeling the interaction of surface water with groundwater. This is done either through the incorporation of a 2D groundwater region or incorporation of 1D percolation links that model the flow of water from surface water nodes to a representative groundwater node. 1D percolation links connected to a representative groundwater node were used in this study's model.

The model domain for this study included the previous CRA model developed by Geosyntec in 2020 and the contributing areas to Lake Killarney, Lake Bell, Lake Wilderness, and Lake

Gem/Park Lake. The model network outside of the previous CRA study area was focused on the lakes, lake interconnections, and significant flood storage in the contributing areas.

For this study, 1D modeling techniques were primarily used throughout the study area; however, the 2D model developed for the contributing area to Canton Avenue in the 2020 study was retained and updated to better assess City reports of roadway nuisance flooding. Model input files are included with the Electronic Deliverables.

3.3 Hydrologic Model Development

3.3.1 Subbasin Delineation

Delineation of individual subbasins allows for a more detailed analysis and the opportunity to pinpoint specific areas with drainage deficiencies. Subbasins were developed to determine the extent of individual drainage areas within the expanded study area that concentrate runoff to a single point of interest (node). The expanded study area was discretized into 231 subbasins for use in the hydrologic model. The subbasin boundaries were determined using the project DEM, drainage infrastructure, and field observations. Due to the improved DEM, the subbasins from the previous CRA study were revised as part of this effort. Refer to **Exhibit 11** for a map of the subbasin delineations.

3.3.2 Time of Concentration

The Soil Conservation Service (SCS) Unit Hydrograph method requires a time of concentration (Tc) be specified for each subbasin. The Tc represents the amount of time it takes a particle of water to travel from the hydraulically most distant point in the drainage basin to its outlet. The Tc is computed by summing all travel times for consecutive flow components (i.e., sheet flow, shallow concentrated flow, and channel flow) of the subbasin conveyance system in accordance with the NRCS TR-55 methodology.

Sheet flow is flow over plane surfaces with a flow length of less than 100 ft. After 100 ft, sheet flow is assumed to become shallow concentrated flow. Shallow concentrated flow is also used for flow in very small channels such as water flowing along a street curb. Channel flow is used for flow in ditches or pipes. A minimum Tc of 10 minutes was used in the calculations. Tc flow paths and calculations are included with the Electronic Deliverables.

3.3.3 Peaking Factor

The SCS Unit Hydrograph method requires a unit hydrograph peak rate factor (K') be specified. The selection of a K' depends on the geographical area and local conditions. Selection of K' was based on the procedures outlined in the document titled *Procedure for Selection of SCS Peak Rate Factors for Use in MSSW Permit Application* (SJRWMD, April 1990). Specifically, the K' value of 256 was used in the watershed, which based on the SJRWMD 1990 report, is "an average of peak rate factors determined for several measured runoff hydrographs from several basins in central and southern Florida by the U.S. Army Corps of Engineers." In addition, from the SJRWMD 1990 report, the K' of 256 is appropriate for "watersheds with very mild slopes, significant storage throughout the watershed, and limited on-site drainage ditches."

3.3.4 Curve Number (CN) Development

The CN approach was used as the rainfall excess and runoff method. CN values were assigned to each land use and soil combination in a CN Set table in the model. For the 2D component of the

model, ICPR divides each honeycomb polygon into sub-polygons for each combination of underlying land use and soil type. The CN for each sub-polygon is determined by the model by looking up the matching land use and soil combination in the CN Set table.

Approximate impervious area percentages were estimated by Geosyntec by performing takeoff calculations at representative locations for each land use type. Approximate directly connected impervious area (DCIA) percentages were also estimated by Geosyntec by takeoff calculations. Lakes, ponds, and other waterbodies were given a CN of 100. The CN representative of open space was used for pervious areas instead of their land use specific CN to avoid double counting the DCIA in the model. CN values for pervious areas are summarized in **Table 3-1**.

Table 3-1: Summary of Curve Number (CN) Values

Open Space HSG Classification	Curve Number
HSG A	39
HSG A/D	80
HSG B/D	80
"Urban" Soil Classification	80
Water	100

A summary of imperviousness and percent DCIA for the different land use types is provided in **Table 3-2**.

Table 3-2: Summary of Land Use Imperviousness and Percent DCIA

Land Use Classification	Percent Impervious	Percent DCIA
1100: Residential, low density - less than 2 dwelling units/acre	39	16
1200: Residential, medium density - 2-5 dwelling units/acre	50	35
1300: Residential, high density - 6 or more dwelling units/acre	60	40
1400: Commercial and services	81.6	54
1480: Cemeteries	11	0
1490: Commercial & services under construction	88	88
1700: Institutional	67	53
1820: Golf courses	0	0
1850: Parks and zoos	44	22
1860: Community recreational facilities	44	22
1890: Other Recreational	10.9	0
1900: Open Land	0	0
1920: Inactive Land with Street Pattern but without Structures	0	0
3100: Herbaceous Upland Nonforested	0	0
4200: Upland Hardwood Forest	0	0
4340: Upland Mixed Coniferous/Hardwood	0	0

Land Use Classification	Percent Impervious	Percent DCIA
5200: Lakes	100	100
5300: Reservoirs - pits, retention ponds, dams	100	100
6210: Cypress	100	100
6300: Wetland Forested Mixed	100	100
6410: Freshwater marshes	100	100
6460: Mixed Scrub-Shrub Wetland	100	100
8120: Railroads	100	100
8140: Roads and highways (divided 4-lanes with medians)	100	100
8330: Water supply plants	68	54
8370: Surface Water Collection Basins	100	100

3.3.5 Rainfall Distribution, Depth, Duration, and Frequency

The rainfall events simulated for this study are presented in **Table 3-3**. All design storm event rainfall depths were referenced from the National Oceanic and Atmospheric Administration (NOAA) Atlas 14 Point Precipitation Frequency Estimates (https://hdsc.nws.noaa.gov).

Table 3-3: Rainfall Frequency, Duration, Depth, and Distribution

Frequency (years)	Event Duration (hours)	Depth (in)	Distribution
2	24	4.28	SCSII – FLMOD
10	6	4.65	ORANGE
10	24	6.11	SCSII – FLMOD
25	6	5.49	ORANGE
25	24	7.54	SCSII – FLMOD
100	24	10.20	SCSII – FLMOD

3.4 1D Hydraulic Model Development

3.4.1 1D Nodes

1D Nodes in the model are typically defined as Stage/Area, Stage/Volume, or Time/Stage nodes and are used to model storage areas like waterbodies/depressions and can also be used to model manholes in pipe networks or to represent underground exfiltration chambers. A total of 320 Stage/Area, 10 Stage/Volume, and 21 Time/Stage nodes were used in the existing conditions model. The model nodes are shown on **Exhibit 11**.

Initial Stages of nodes were set such that the model simulation would begin in static equilibrium. For nodes connected to a waterbody, the initial stage was set at the greater of the waterbody's Normal High Water Elevation (NHWE) or pipe/weir invert elevations. For waterbodies without a NHWE but with historical water level data available, this data was evaluated and used in place of the NHWE to determine the initial stage. The initial stages of nodes representing waterbodies were set based on the following information:

- **Lake Mendsen (Node: LAKE_MENDSEN)** – Initial stage was set to the weir invert elevation (81.14 ft NAVD) of the control structure upstream of the 20-inch drainwell. This invert functions as the lakes "control elevation" or lowest invert of a control structure weir/orifice.
- **Lake Rose (Node: LAKE_ROSE)** – The City provided Lake Rose stage data dating from January 1998 to April 2018. Based on a review of these data, the time period from December 2013 to August 2017 was used to estimate an initial stage for Lake Rose, as there were consistent monthly measurements taken during this time period. The average stage during this time period was approximately 83.3 ft NAVD and this value was used as the initial stage of Lake Rose for the purposes of this study. Elevations provided by the City were assumed to reference NAVD. Lake Rose is landlocked and does not have an existing control structure.
- **Lake Midget (Node: NA1180)** – Initial stage was set to the drainwell control elevation (83.62 ft NAVD).
- **Lake Killarney (Node: LAKE_KILLARNEY)**– Initial stage was set to the NHWE (82.04 ft NAVD) per the County's Water Atlas (https://orange.wateratlas.usf.edu/).
- **Lake Bell (Node: NB0005)** – Initial stage was set to the NHWE (89.4 ft NAVD) per the County's Water Atlas (https://orange.wateratlas.usf.edu/).
- **Lake Wilderness (Node: NC0005)** – Initial stage was set to the pipe invert elevation (88.76 ft NAVD) of the downstream pipe connected to Lake Bell.
- **Lake Gem/Park Lake (Node: NE0005)** – Initial stage was set to the pipe invert elevation (68.03 ft NAVD) of the downstream pipe connected to Lake Maitland.
- **FDOT Pond (Node: NC0090)** – Initial stage was set to the seasonal high water level (91.15 ft NAVD) per the FDOT construction plans. This elevation matches the invert elevation of the orifice on the pond's control structure.

Warning Stages were set at the elevation at which flooding of concern is expected to occur. Typically, this would be the elevation at which pond berm overtopping, roadway flooding, or structure flooding is likely to occur.

Stage/Area for the Stage/Area type nodes representing storage areas was defined at or below the node initial stage and above the peak node stage from the model results for each node. This was done to accurately define the available storage in each node and prevent any extrapolation or performance issues in the model. The stage/area information for storage nodes was extracted from the study DEM using ArcHydro tools in GIS. For storage ponds representing waterbodies, if construction plans or bathymetric data was available these were used to determine storage below the water surface.

Stage/Volume for the Stage/Volume type nodes representing underground exfiltration systems was defined to account for storage associated with modeled exfiltration systems. This information was referenced from ERP documents downloaded from SJRWMD.

Boundary Conditions – Time/Stage nodes were used to represent the tailwater boundary conditions in the model based on the following information:

- **Lake Maitland (Node: LAKE_MAITLAND)** – Boundary stage sets were developed for all design storm events using time series output from the City's Central Basin ICPR model.
- **Lake Osceola (Node: LAKE_OSCEOLA)** – Boundary stage was set at a constant elevation (67.2 ft NAVD) equal to the peak stage during the mean annual design storm event per the *Draft Howell Creek Basin Watershed Management Plan*, prepared by CDM in 2011.
- **Lake Virginia (Node: LAKE_VIRGINIA)**– Boundary stage was set at a constant elevation (67.2 ft NAVD) equal to the peak stage during the mean annual design storm event per the *Draft Howell Creek Basin Watershed Management Plan*, prepared by CDM in 2011.
- **Lake King (Node: NC0100)** – Boundary stage sets were developed for all design storm events using time series output from the Little Wekiva River ICPR model currently under development for the County.

3.4.2 Links

The model analyzed flow in 1D links, allowing the evaluation of conveyance effectiveness between nodes. The model 1D links are shown in **Exhibit 11**. The link types used in this model include the following:

Pipes – These links were used to represent the various pipe and culvert sections included in the model. A total of 292 pipe links were used in the existing conditions model. Pipe inverts, dimensions, geometry, and material data were referenced from a combination of documents provided by the City or downloaded by Geosyntec. Parameter values used for pipe links are detailed below:

- Manning's Roughness Coefficient – Values were varied based on material as follows:
  - Corrugated Metal Pipe (CMP) – 0.022
  - Reinforced Concrete Pipe (RCP) – 0.012
  - Plastic Pipe (e.g., PVC) – 0.009
  - Ductile Iron Pipe (DIP) – 0.012
  - High Density Polyethylene (HDPE) – 0.012
- Entrance Losses – A representative average value of 0.5 was assigned to all pipes in the model.
- Exit Losses – A value of 1.0 was assigned to pipes that discharge to a static water body. Otherwise a value of 0 was assigned.
- Bend Losses – A bend loss coefficient was assigned to applicable pipes based on the pipe diameter, angle of bend(s), and number of bends. Bend losses were summed if there were multiple bends.

Weirs – These links are used to represent overland flow (outside of the 2D model), inlet characteristics (i.e., linking the 1D interface nodes to the stormsewer network within the 2D model), and some outfall structures. A total of 392 weir links were used in the existing conditions model. The specific geometry of each weir was input into the model. Horizontal weirs were used

to model flat inlet structures. Vertical weirs were used to model control structure slots and bleeders along with true weir structures (sharp or broad crested). Parameter values used for weir links are detailed below:

- Weir Coefficient – A value of 2.8 was assigned for broad-crested weirs and 3.2 was assigned for sharp-crested weirs.
- Orifice Coefficient – A value of 0.6 was assigned.

Drop Structures – These links are used to simulate control structure-to-pipe or inlet-to-pipe in series combinations. The weir and pipe data associated with these links is identical to the weir and pipe data discussed above. A total of 40 drop structure links were used in the existing conditions model.

Channels – These links are used to represent open drainage ways like ditches, swales, creeks etc. in the model. Channel geometry was represented by irregular cross-sections extracted from survey data from previous studies. A total of two (2) channel links were used in the existing conditions model.

Rating Curves – Twelve (12) rating curve links were used to represent drainwells or pond infiltration in the existing conditions model. Unless otherwise described, drainwell flow rates were referenced from the *Drainwell Model Methodology Technical Memorandum*, prepared by Geosyntec in March 2015, which is included in the Electronic Deliverables. The parameter development for each rating curve link is described below:

- **Lake Mendsen 20-inch Drainwell (Link: L-2130RC)** – A rating curve link was utilized to model stormwater entering the groundwater via the 20-inch drainwell located in the center of Lake Mendsen. Drainwell flow rates were based on a 19-inch drainwell to account for the decrease in surface area due to the presence of the 6-inch well pump.
- **Lake Mendsen 8-inch Drainwell (Link: L-2150RC)** – A rating curve link was utilized to model stormwater entering the groundwater via the 8-inch drainwell located on the north side of Lake Mendsen.
- **Lake Midget 15-inch Drainwell (Link: L-2140RC)** – A rating curve link was utilized to model stormwater entering the groundwater via the 15-inch drainwell located on the west side of Lake Midget.
- **Swoope Water Treatment Plant Stormwater Pond (Link: PONDSOIL)** – A rating curve link was utilized to model stormwater percolation at the dry detention pond, north of the Swoope water treatment plant. Typically, a percolation link would be utilized for this; however, a rating curve link was utilized by Geosyntec for consistency with the project permit (ERP #81655-2).
- **Lake Killarney Drainwells (Links: RB0350, RB0370, RB0380, RB0390, RB0400, and RB0410)** – Six rating curve links were utilized to model stormwater entering the groundwater via the six drainwells located on the southwest side of Lake Killarney. Each drainwell's maximum flow rate was calculated using the transmissivity determined during the drainwell's load testing.
- **Nicolet Pond 12-inch Drainwell (Link: RB0280)** – A rating curve link was utilized to model stormwater entering the groundwater via the 12-inch drainwell located on the

southeast side of Nicolet Pond. The drainwell's maximum flow rate was calculated using the transmissivity determined during the drainwell's load testing.

- **Miller Avenue 12-inch Drainwell (Link: RB0450)** – A rating curve link was utilized to model stormwater entering the groundwater via the 12-inch drainwell located on the north side of Miller Avenue.

Percolation – These links are used to model percolation to the groundwater for dry ponds, natural depressions, or exfiltration chambers. Percolation links can be used to model both vertical (unsaturated) and horizontal (saturated) percolation. A total of 10 percolation links were used in the existing conditions model. Data required for percolation links includes Aquifer Base Elevation, Water Table Elevation, Annual Recharge Rate, Horizontal Conductivity, Vertical Conductivity, Fillable Porosity, and Layer Thickness. This information was referenced from ERP documents downloaded from SJRWMD.

3.5 2D Hydraulic Model Development

3.5.1 Overland Flow Region

An overland flow region defines the limits of the area to be modeled and is similar to a watershed area. Unlike traditional 1D modeling, basins are not delineated within the 2D overland flow model domain. Instead, ICPR generates a mesh of polygons called honeycombs (**Section 3.5.2**) within the overland flow region based on user defined parameters and features such as breaklines, breakpoints, etc. Each individual honeycomb polygon is treated as a basin for runoff generation purposes within the model. Since the 2D modeling approach does not rely on a unit hydrograph method, time of concentration and peaking factor are not specified. Refer to **Exhibit 12** for the overland flow region boundary 2D mesh including the honeycombs.

The overland flow region boundary for Canton Avenue developed for the previous CRA study was updated in ArcGIS using the project DEM. The extent of the model domain developed is described below:

- The overland flow region boundary was developed to model overland flow along Canton Avenue, east of the railroad.
- The overland flow region boundary is bounded by the railroad on the west side, Swoope Avenue on the north side, Interlachen Avenue on the east side, and Lincoln Avenue on the south side.
- The overland flow region boundary generally follows the topographic divide of the watershed.

3.5.2 2D Overland Flow Model Development

ICPR uses a flexible triangular computational mesh to model 2D overland flow. ICPR automatically generates the triangular mesh from user defined input parameters and features. Elevations in the triangular mesh are extracted from the raster DEM. From this triangular mesh, ICPR derives two additional layers: one of honeycomb-shaped polygons and another made up of diamond-shaped polygons (the honeycomb and diamond mesh, respectively). These elements are best understood using their analogues from 1D modeling. Each triangle vertex is a node, the triangle sides connecting the vertices to each other are the links, the individual honeycomb polygons are the basins, and the diamonds are similar to cross sections. These elements are only

generated within the overland flow region. The features described in the following sections and shown on **Exhibit 12** were added to improve depiction of the terrain and interface the 2D model components with the 1D model components (e.g., when overland flow enters the stormsewer network through an inlet).

3.5.2.1 Breakpoints and Breaklines

Breakpoints can be added to refine the triangular mesh. Triangle vertices are placed at each breakpoint. They can be automatically placed using spacing criteria (e.g., triangle sides must be at least 50 ft long and no breakpoints within 50 ft of the overland flow region boundary) or manually placed to refine the triangular mesh in areas where additional detail is needed.

Breaklines are also used to refine the triangular mesh. Triangle vertices are placed along each vertex (coordinate point) of a breakline, and a triangle side is placed along each breakline. Breaklines are typically used along collection paths and ridgelines. Overland flow links are formed along the triangle sides with the inverts determined at each vertex from the DEM.

The 2D component of the existing conditions model uses 149 breakpoints and 35 breaklines.

3.5.2.2 Impervious and Pervious Manning's n

The diamond mesh is intersected with a roughness zone layer to determine the area weighted Manning's n for each overland flow link (triangle side). A Roughness Set lookup table is used to vary the Manning's n by roughness zone and over a user specified depth range. Thus, shallow and deep Manning's n values and depth ranges are specified in the lookup table. The 2D component of the existing conditions model uses shallow and deep Manning's n values based on corresponding land use type and typical overland flow values per *Gridded Surface Subsurface Hydrologic Analysis*, September 2006. The Manning's n values for pervious and impervious areas decrease from the shallow to deep values over a depth range of three (3) ft.

3.5.2.3 1D Node Interfaces

The 2D mesh is connected to the 1D hydraulic model using 1D node interfaces. Typically, these are where the overland flow collects on the surface and enters a drainage inlet. A 1D interface node is connected to a 1D node (representing a manhole or catch basin) using one or more 1D links. The existing conditions model uses 29 1D node interfaces to represent where surface (overland) flow enters the stormsewer system along Canton Avenue.

3.5.2.4 Extrusion Areas

Extrusion features are formed by closed polygons and no overland flow is permitted to cross the polygon. Extrusion areas generate stormwater runoff and are assumed to be 100% impervious with no initial abstraction. Extrusions are useful for representing impediments to overland flow such as buildings. The 2D component of the existing conditions model uses 36 extrusion areas to represent buildings along Canton Avenue and within the overland flow region.

3.5.2.5 Boundary Stage Lines

Boundary stage lines force stage elevations as a function of time with all vertices along the boundary stage line operating as a time/stage node that is specified with a boundary stage table. The 2D component of the existing conditions model uses three boundary stage lines to prevent water entering the overland flow region from the 1D area during model start up. To account for flow from the 2D area to the 1D area during storm events, overland weirs were added to cross these boundary stage lines.

3.6 Model Validation

In order to provide independent validation of the model's ability to provide reasonable results, a historical storm event (Hurricane Ian) was simulated and compared to observed flooding. Hurricane Ian (9/27/2022 – 9/29/2022) resulted in approximately 14 inches of rainfall in the City, surpassing the 10.2 inches of rainfall simulated during the 100-year, 24-hour design storm (**Table 3-3**)

Rainfall data for this event was obtained from the Southwest Florida Water Management District which provides 15-minute NEXRAD precipitation data. A representative grid cell overlying Lake Killarney (Grid ID #115079) was selected to represent the study area.

Table 3-4 summarizes modeled peak stage and observed flood stage for sites with available data for comparison. Observed flood stage was estimated from photographs of flooding provided by the City which were referenced to the DEM using aerials to derive the flood stage elevation.

Table 3-4: Summary of Observed Flooding Stages during Hurricane Ian

Node ID	Representative Area	Modeled Peak Stage (ft NAVD)	Observed Flood Stage (ft NAVD)	Difference from Observed (ft)
LAKE_KILLARNEY	Lake Killarney	85.61	85.20	0.41
LAKE_MENDSEN	Lake Mendsen	88.35	87.68	0.67
NA0890	Along N Denning Dr, north of W Morse Blvd	88.38	87.65	0.73
NA0960	Along NW New England Ave, east of S Capen Ave	88.29	86.72	1.57
NA1540	Along Ward Ave, north of W Fairbanks Ave	88.39	87.60	0.79
NA1630	Residences in Hannibal Square, along W New England Ave, west of W Hannibal Sq	88.25	86.70	1.55
NB0005	Swale connected to Lake Bell, at corner of Jonotey Dr and Monroe Ave[1]	92.28	92.18	0.10
NC0005	Driveway to 1032 Early Avenue[2]	93.09	93.00[3]	0.09
NE0005	Intersection of S Orlando Ave and Monroe Ave	75.27	74.32	0.95

[1]Reflective of conditions at Lake Bell
[2]Reflective of conditions at Lake Wilderness
[3]Based on City reports of overtopping of driveway which is at approximately 92.5 ft NAVD

The photographs taken for observed flood stage were likely taken after the peak stage when conditions were safe therefore it is expected that the modeled peak stage would be higher than observed. Overall, based on review of the validation model results these results appear reasonable, and no adjustment of model parameters was performed.

3.7 Model Results

3.7.1 LOS Assessment

The flooding level of service (LOS) criteria listed in **Table 3-5** below were used to evaluate the performance of drainage infrastructure in the study area. Alternatives for flood control improvements were evaluated using the same criteria to assess the LOS benefit provided by the flood improvement concept.

Table 3-5: Criteria for Study LOS Assessment Modeling

Flooding Level of Service (LOS) Standards/Design Criteria			
Facility	**Storm Frequency and Duration**	**Physical Elevation Reference**	**Example in Study Area**
Stormsewer	10 year/Critical Duration[1]	Road Edge of Pavement or Manhole Top Elevation	Curb Inlet along Canton Avenue
Detention Ponds	25 Year/24 Hour	Pond Top of Bank	FDOT Pond
Lake/Pond	100 Year/24 Hour	Habitable Structure Finished Floor	Lake Killarney

[1]For the purposes of this study the 24-hour storm duration used however the 6-hour storm duration was simulated and is included in the model package in the Electronic Deliverables.

A complete summary of node peak stages for the existing conditions model is provided in **Appendix A**. Note that the existing conditions and all other scenarios assume the Lake Mendsen/Lake Killarney interconnect is open. This assumption was confirmed via e-mail correspondence with the City.

3.7.2 Existing Conditions Assessment Results for Focus Areas

The City experienced significant flooding during Hurricane Ian in 2022 and has reported localized, nuisance flooding at certain locations within the expanded study area. Lake Killarney, Lake Bell, Lake Mendsen, and Canton Avenue were determined to be the focus areas for this study. Lake Killarney and Lake Bell are of concern primarily due to flooding during Hurricane Ian, while Canton Avenue is of concern primarily due to nuisance flooding. Lake Mendsen is of concern due to both nuisance flooding and flooding during Hurricane Ian.

Critical flood stage elevations were approximated for yard, roadway, and structure flooding for all focus areas. Yard and roadway elevations were derived from the DEM. To estimate finished floor elevations (FFEs) for structural flooding one foot was added to the yard elevation.

Results from the existing conditions model highlighted drainage deficiencies throughout the study area and supported statements and observations made by the City regarding flooding during

Hurricane Ian and nuisance flooding. Specific examples and a discussion of the focus areas is provided below.

3.7.2.1 Lake Killarney

Based on the results of the existing conditions model, Lake Killarney resulted in potential structure flooding starting at the 100-year, 24-hour design storm event. Node peak stages for Lake Killarney are summarized below in **Table 3-6**.

Table 3-6: Existing Conditions Peak Stages at Lake Killarney

Lake Killarney Modeled Peak Stages					
Design Storm Event	2-year, 24-hour	10-year, 24-hour	25-year, 24-hour	100-year, 24-hour	Hurricane Ian
Peak Stage (ft NAVD)	83.01	83.42	83.72	84.34	85.61

Notes: Lake Killarney warning stage is equal to 84.40 ft NAVD for structural flooding, which is the approximate FFE of 2118 Lake Drive. Roadway flooding is anticipated at 85.20 ft NAVD, which is the approximate overtopping elevation to Lakefront Boulevard at the south end of Lakefront Boulevard near the boat ramp. Yard flooding is anticipated at 83.40 ft NAVD.

Currently, Lake Killarney is able to drain via the six drainwells located on the southwest bank of the lake and to Lake Gem via the Lake Killarney outfall on the north bank (**Photograph 1**).

Based on the study area DEM, the finished floor elevation of 2118 Lake Drive is approximately 84.4 ft NAVD and the overtopping elevation to Lakefront Boulevard is approximately 85.2 ft NAVD (at the south end of Lakefront Boulevard near the boat ramp). This suggests that elevated stages in Lake Killarney is resulting in potential structure flooding on Lake Drive starting at the 100-year, 24-hour design storm event. Modeled peak stages for Hurricane Ian support the City's observations of structure flooding on Lake Drive and roadway flooding on Lakefront Boulevard (**Exhibit 8**).

3.7.2.2 Lake Bell

Based on the results of the existing conditions model, Lake Bell resulted in potential roadway flooding starting at the 100-year, 24-hour design storm event. Node peak stages for Lake Bell are summarized below in **Table 3-7**.

Table 3-7: Existing Conditions Peak Stages at Lake Bell

Lake Bell Modeled Peak Stages					
Design Storm Event	2-year, 24-hour	10-year, 24-hour	25-year, 24-hour	100-year, 24-hour	Hurricane Ian
Peak Stage (ft NAVD)	89.43	89.88	90.63	91.62	92.28

Note: Lake Bell warning stage is equal to 91.62 ft NAVD for roadway flooding, which is the approximate overtopping elevation to Turner Road. Structural flooding is anticipated at 91.80 ft NAVD, which is the approximate FFE of 1100 Turner Road. Yard flooding is anticipated at 90.80 ft NAVD.

Currently, Lake Bell is able to drain via a weir to Lake Killarney located on the south bank (**Photograph 2**).

Based on the study area DEM, the overtopping elevation to Turner Road is approximately 91.6 ft NAVD (between 1208 and 1214 Turner Road) and the finished floor elevation of 1100 Turner Road is approximately 91.8 ft NAVD. This suggests that elevated stages in Lake Bell result in potential roadway flooding starting at the 100-year, 24-hour design storm event but does not result in structure flooding during any design storm event. Modeled peak stages for Hurricane Ian support the City's observations of structure and roadway flooding to the east of Lake Bell (**Exhibit 8**).

3.7.2.3 Lake Mendsen

Based on the results of the existing conditions model, Lake Mendsen resulted in potential roadway flooding starting at the 2-year, 24-hour design storm event. Node peak stages for Lake Mendsen are summarized below in **Table 3-8**.

Table 3-8: Existing Conditions Peak Stages at Lake Mendsen

Lake Mendsen Modeled Peak Stages					
Design Storm Event	2-year, 24-hour	10-year, 24-hour	25-year, 24-hour	100-year, 24-hour	Hurricane Ian
Peak Stage (ft NAVD)	85.58	86.79	87.29	87.94	88.35

Note: Lake Mendsen warning stage is equal to 84.82 ft NAVD for roadway flooding, which is the approximate Denning Drive edge of pavement elevation. Structural flooding is anticipated at 86.60 ft NAVD, which is the approximate FFE of 880 West New England Avenue. Yard flooding is anticipated at 85.60 ft NAVD.

Currently, Lake Mendsen is able to drain via the 20-inch drainwell located in the center of the lake, the 8-inch drainwell located within the control structure on the north side of the lake (**Photograph 7**), and to Lake Killarney via the Lake Mendsen/Killarney interconnect.

Based on the study area DEM, the road surface minimum elevation of Denning Drive is approximately 84.8 ft NAVD, and the road surface minimum elevation of Harper Street is approximately 85.7 ft NAVD. This suggests that Lake Mendsen is resulting in potential roadway flooding along Denning Drive starting at the 2-year, 24-hour design storm event and Harper Street starting at the 10-year, 24-hour design storm event. This supports the City's statement that Lake Mendsen occasionally stages up and floods upstream roads during intense rain events.

Per as-builts for the Winter Park Library (ERP #20947-5), the library and events center buildings have a finished floor elevation of 91.0 ft. Therefore, these structures would not be a risk of flooding during any design storm event. However, some of the older residential structures to the east of Lake Mendsen, particularly those on West New England Avenue, have an approximate finished floor elevation of 86.6 ft NAVD (estimated as 1 foot above the study DEM), which indicates potential structure flooding starting at the 10-year, 24-hour design storm event.

Modeled peak stages for Hurricane Ian support the City's observations of structure and roadway flooding to the south and east of Lake Mendsen (**Exhibit 8**).

3.7.2.4 Canton Avenue

Currently, Canton Avenue drains east to Lake Osceola via a 24-inch pipe. Based on modeling results, roadway flooding along Canton Avenue primarily occurs near the intersections with Park Avenue, Center Street, and Knowles Avenue. Based on the 2D overland flow model, roadway flooding is approximately 1-6 inches along Canton Avenue between Center Street and Knowles

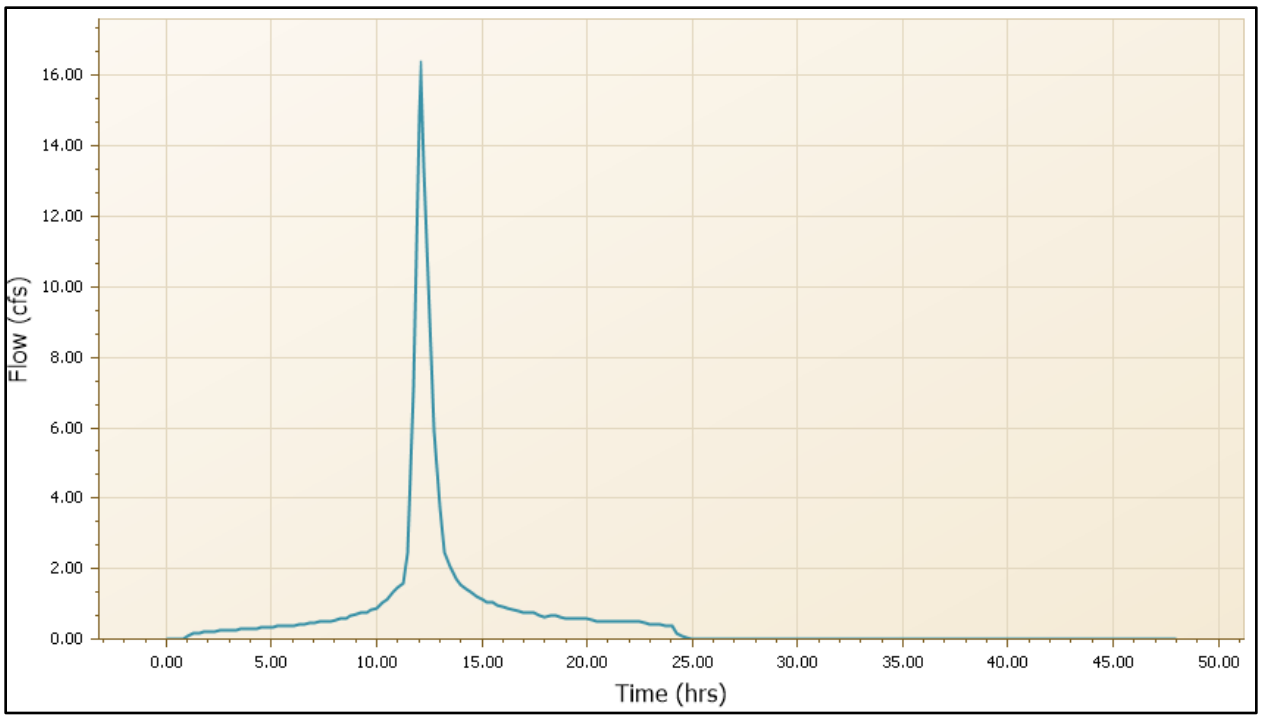
Avenue during the 2-year, 24-hour design storm event. As the return period of the design storm increases, so does the extent and severity of roadway flooding along Canton Avenue. During the 100-year, 24-hour design storm event there is approximately 13-inches of roadway flooding at the Canton Avenue and Knowles Avenue intersection. A map of the roadway flooding extent along Canton Avenue is presented as **Exhibit 14**.

Two overland flow weir links were incorporated into the model to represent the overland flow of stormwater from Canton Avenue north along Knowles Avenue and south along Park Avenue (i.e., water leaving the overland flow region). Model results are summarized in **Table 3-9.** Based on model results, the peak overland flow from Canton Avenue to Knowles Avenue ranged from 11.8 cubic feet per second (cfs) during the 2-year, 24-hour design storm to 44.4 cfs during the 100-year, 24-hour design storm. Since the intersection of Canton Avenue and Knowles Avenue is a low spot along Canton Avenue, roadway flooding along Canton Avenue likely results in the overland discharge of stormwater and potential roadway flooding along Knowles Avenue. These results support the City's observations of flooding at the intersection of Canton Avenue and Knowles Avenue.

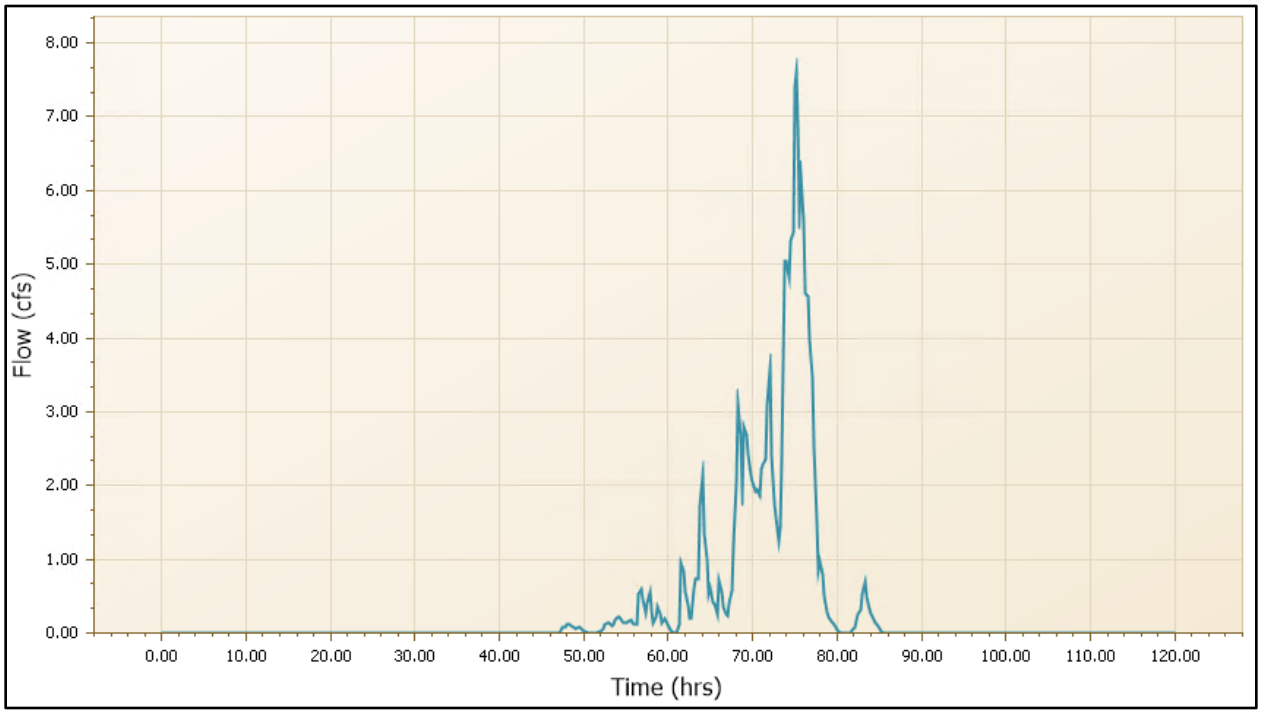
Table 3-9: Existing Conditions Peak Overland Flow Rates on Canton Avenue

Canton Avenue Modeled Peak Overland Flow Rates (cfs)					
Design Storm Event	2-year, 24-hour	10-year, 24-hour	25-year, 24-hour	100-year, 24-hour	Hurricane Ian
North along Knowles Avenue	11.79	21.81	29.75	44.38	12.91
South along Park Avenue	0.00	0.34	3.78	7.44	0.88

Overland flow rates during Hurricane Ian were lower than most of the design storm scenarios due to the Canton Avenue area being sensitive to the intensity of the rainfall, rather than the volume. **Figure 3-1** below shows hydrographs for the 100-year, 24-hour design storm and Hurricane Ian for basin (CRA 2020) adjacent to the overland flow region. Due the greater intensity of rainfall during the 100-year, 24-hour event, flows in this basin exceeded 16 cfs whereas they stayed below 8 cfs during Hurricane Ian.



a)



b)

Figure 3-1: Modeled Hydrographs Representative of Canton Avenue for the a) 100-year, 24-hour design storm and b) Hurricane Ian

3.7.3 Potential Flood Prone Locations

An assessment of the entire study area was performed to identify potential drainage deficiencies that may warrant corrective action and are unrelated to focus areas for this study (Lake Killarney, Lake Bell, Lake Mendsen, and Canton Avenue) which were discussed in **Section 3.7.2**. A

summary of the findings is provided below. Identified locations are shown in **Exhibit 13**. Note that peak flood depths are relative to approximate edge of pavement elevations.

- **Nicolet Pond** – Stormwater pond and connected channel near the intersection of Minnesota Avenue and Nicolet Avenue, including Nodes NB0250, NB0260, NB0270, NB0275, NB0280, and NB0300. Based on model results, there was a peak flood depth of approximately 1.08-ft during the 10-year, 24-hour design storm at this location.
- **West End of Miller Avenue** – Stormsewer system at the west end of Miller Avenue, including Nodes NB0420, NB0430, NB0440, NB0450. Based on model results, there was a peak flood depth of approximately 1.50-ft during the 10-year, 24-hour design storm at this location.
- **Intersection of Bennett Avenue and Kindel Avenue** – Stormsewer system at the intersection of Bennett Avenue and Kindel Avenue, including Node NE0079. Based on model results, there was a peak flood depth of approximately 0.2-ft during the 10-year, 24-hour design storm at this location.
- **Lake Francis** – Stormsewer system upstream of Lake Francis along Lee Road, including Nodes NA1900, NA1910, and NA2120. Based on model results, there was a peak flood depth of approximately 2.22-ft during the 10-year, 24-hour design storm at this location.
- Lake Francis does not have an established NHWE and therefore, the initial stage of the lake was set to its control elevation (86.29 ft NAVD). It is noted that if the NHWE of Lake Francis is less than this value, the model may have over-predicted potential flooding upstream of Lake Francis.
- **Lake Midget** – Lake Midget and the upstream stormsewer system along South Denning Drive, including Nodes NA1170 and NA1230. Based on model results, there was a peak flood depth of approximately 1.08-ft during the 10-year, 24-hour design storm at Lake Midget.
- Lake Midget does not have an established NHWE and therefore, the initial stage of the lake was set to its control elevation, which is equal to the drainwell invert (83.62 ft NAVD). It is noted that if the NHWE of Lake Midget is less than this value, the model may have over-predicted potential flooding at Lake Midget and the associated upstream stormsewer system.
- **Intersection of West Lyman Avenue and South Pennsylvania Avenue** – Stormsewer system at the intersection of West Lyman Avenue and South Pennsylvania Avenue, including Nodes NA1010, NA1020 and NA1650. Based on model results, there was a peak flood depth of approximately 0.61-ft during the 10-year, 24-hour design storm at this location.
- Based on correspondence with the City, extensive flooding during Hurricane Ian was reported in this area, which is directly east of Lake Mendsen.
- **East Welbourne Avenue** – Stormsewer system at East Welbourne Avenue between the intersections with South Park Avenue and South Interlachen Avenue, including Nodes NA0140, NA0200, NA0330, and NA0340. Based on model results, there was a peak flood depth of approximately 0.89-ft during the 10-year, 24-hour design storm at this location.

- **East Fairbanks Avenue** – Stormsewer system at East Fairbanks Avenue between the intersections with Chapman Avenue and South Interlachen Avenue, including Nodes NA0500, NA0510, and NA0520. Based on model results, there was a peak flood depth of approximately 0.50-ft during the 10-year, 24-hour design storm at this location.
- **South Orlando Avenue** – Stormsewer system at South Orlando Avenue between the intersections with West Fairbanks Avenue and West Comstock Avenue, including Nodes NA1690 and NA1700. Based on model results, there was a peak flood depth of approximately 0.77-ft during the 10-year, 24-hour design storm at this location.
- **Orange Avenue** – Stormsewer system at Orange Avenue between the intersections with South Pennsylvania Avenue and South Capen Avenue, including Nodes NA1290 and NA1300. Based on model results, there was a peak flood depth of approximately 0.71-ft during the 10-year, 24-hour design storm at this location.
- **East End of East Swoop Avenue** – Stormsewer system at the east end of East Swoop Avenue, including Nodes NA0100 and NA0110. Based on model results, there was a peak flood depth of approximately 1.52-ft during the 10-year, 24-hour design storm at this location.
- **North Interlachen Avenue** – Stormsewer system along North Interlachen Avenue between the intersections of East Webster Avenue and East Swoope Avenue, including Nodes NA0010, NA0080, and NA2010. Based on model results, there was a peak flood depth of approximately 0.71-ft during the 10-year, 24-hour design storm at this location.
- **East Lyman Avenue** – Stormsewer system along Lyman Avenue between the intersections of South New York Avenue and South Interlachen Avenue, including Nodes NA0410, NA0470, and NA0490. Based on model results, there was a peak flood depth of approximately 1.25-ft during the 10-year, 24-hour design storm at this location.
- **East End of Huntington Avenue** – Stormsewer system at the east end of Huntington Avenue, including Nodes NA1090 and NA1120. Based on model results, there was a peak flood depth of approximately 1.95-ft during the 10-year, 24-hour design storm at this location.
- **Douglas Avenue** – Stormsewer system at Douglas Avenue, including Node NA1630. Based on model results, there was a peak flood depth of approximately 1.98-ft during the 10-year, 24-hour design storm at this location.
- Based on correspondence with the City, extensive flooding during Hurricane Ian was reported in this area, which is directly east of Lake Mendsen.
- **Orange Avenue** – Stormsewer system at Orange Avenue between the intersections with South Denning Drive and Aragon Avenue, including Node NA1270. Based on model results, there was a peak flood depth of approximately 0.39-ft during the 10-year, 24-hour design storm at this location.
- **Intersection of Carolina Avenue and North New York Avenue** – Stormsewer system at the intersection of Carolina Avenue and North New York Avenue, including Node NA0250. Based on model results, there was a peak flood depth of approximately 0.51-ft during the 10-year, 24-hour design storm at this location.

- **Intersection of South Orlando Avenue and Gene Street** – Stormsewer system at the intersection of S Orlando Avenue and Gene Street, including Node NB0220. Based on model results, there was a peak flood depth of approximately 0.42-ft during the 10-year, 24-hour design storm at this location.
- **North Orlando Avenue –** Stormsewer system along North Orlando Avenue at the intersections with Gay Road and West Webster Avenue including NA1330, NA1340, NA1350, NA1410, and NA1420. Based on model results, there was a peak flood depth of approximately 1.4 -ft during the 10-year, 24-hour design storm at this location.
- **FDOT Stormwater Pond (southwest of Lee Rd and I-4)** – FDOT pond and the upstream stormsewer system, including Node NC0080. Based on model results, there was a peak flood depth of approximately 0.87-ft during the 10-year, 24-hour design storm at this location.
- **Intersection of Schultz Avenue and Miller Avenue** – Stormsewer system at the intersection of Schultz Avenue and Miller Avenue, including Node NB0320. Based on model results, there was a peak flood depth of approximately 0.94-ft during the 10-year, 24-hour design storm at this location.
- **Intersection of Minnesota Avenue and Shultz Avenue** – Stormsewer system at the intersection of Minnesota Avenue and Shultz Avenue, including Node NB0310. Based on model results, there was a peak flood depth of approximately 0.28-ft during the 10-year, 24-hour design storm at this location.
- **Intersection of West Fairbanks Avenue and Ward Avenue** – Stormsewer system at the intersection of West Fairbanks Avenue and Ward Avenue, including Node NA1490. Based on model results, there was a peak flood depth of approximately 0.47-ft during the 10-year, 24-hour design storm at this location.

Geosyntec recommends that the City review these potential flood prone locations to determine if flooding has been observed or reported in the past and if drainage improvements are warranted.

3.8 Existing Conditions Conclusions

An existing conditions evaluation was performed for the study area. Deficiencies identified throughout the expanded study during this evaluation are summarized below and a complete summary of the LOS assessment is provided in **Appendix A**.

- **Potential Water Quality Treatment Deficiencie**s – Water quality deficiencies resulting from lack of water quality treatment or substandard treatment were documented at multiple locations throughout the expanded study area (**Section 3.1**, **Exhibit 10**).
- **Potential Flood Prone Locations** – Potential flooding during the 10-year, 24-hour design storm event was documented at multiple locations throughout the expanded study area (**Section 3.7.2**, **Exhibit 13**).

Based on the results of the existing conditions analysis, City statements regarding deficiencies associated with the focus areas of this study were validated and corrective actions are warranted for Lake Killarney, Lake Bell, Lake Mendsen, or Canton Avenue as summarized below.

- **Lake Killarney** – Based on modeling results, the existing drainwells and control structure that service Lake Mendsen may be insufficient during extreme rain events to effectively manage the peak stage in the lake without resulting in potential flooding adjacent to the lake. Model results suggest that peak stages in Lake Killarney result in potential structure flooding on Lake Drive starting at the 100-year, 24-hour design storm event.
- **Lake Bell** – Based on modeling results, the existing outfall to Lake Killarney may be insufficient during extreme rain events to effectively manage the peak stage in the lake without resulting in potential roadway flooding adjacent to the lake. Model results suggest that peak stages in Lake Bell result in potential roadway flooding on Turner Road starting at the 100-year, 24-hour design storm event.
- **Lake Mendsen** – Based on modeling results, the existing drainwells that service Lake Mendsen are insufficient to effectively manage the peak stage in the lake without resulting in potential flooding adjacent to the lake. Model results suggest that peak stages in Lake Mendsen result in potential roadway flooding starting at the 2-year, 24-hour design storm event and potential structure flooding starting at the 10-year, 24-hour design storm event.
- **Canton Avenue** – As seen in **Exhibit 14**, roadway nuisance flooding starts during the 2-year, 24-hour design storm event along Canton Avenue, primarily between the intersections with Center Street and Knowles Avenue. Based on modeling results, the existing drainage infrastructure is inadequate to capture and effectively convey stormwater runoff from Canton Avenue and the adjacent contributing areas. The existing drainage infrastructure along Canton Avenue is not currently achieving a 10-year LOS, which is typically the design criteria for roadway drainage infrastructure.

Improvement concept alternatives were developed for the study focus areas to address these drainage/water quality deficiencies and are discussed in **Section 4**.

4. IMPROVEMENT ALTERNATIVES ANALYSIS

Flood improvement concepts (FICs) were developed for each focus area to address deficiencies that have been noted by the City and that were validated during the Existing Conditions Assessment, as discussed in **Section 3**. Due to the built-out nature of the study area, open space for traditional stormwater management techniques (e.g., stormwater ponds) is generally not available and therefore, techniques such as pre-storm drawdowns, expansion of existing storage, etc. were the focus during the development of improvement concepts.

For all FICs in the Lake Mendsen, Lake Bell, and Lake Killarney focus areas, a hot start simulation was run to set initial conditions based on pre-storm operations outlined in the City's Interim Adaptive Flood Management Plan released in October 2023. The following operational procedures were simulated, and a no-rain simulation was run for 7 days (168 hours). A comparison of modeled peak stages for the focus areas and downstream waterbodies under existing conditions and pre-storm conditions are presented in **Table 4-1**.

- 7 days prior to storm (hours 1-120):
    - Lake Killarney's six drainwell risers were removed to adjust the elevation from approximately 81.66 ft NAVD (normal operation) to approximately 80.00 ft NAVD (emergency operation)
    - Lake Bell's top weir board was removed to adjust the weir invert elevation from 88.70 ft NAVD (normal operation) to 87.95 ft NAVD (emergency operation)
- 2 days prior to storm (hours 121-168):
    - Continued implementation of operations from hours 1-120
    - Lake Mendsen's 20-inch drainwell weir was adjusted from 81.14 ft NAVD (normal operation) to 77.02 ft NAVD (emergency operation)

Table 4-1: Modeled Peak Stage of Pre-Storm Operations

Modeled Peak Stages (ft NAVD)						
Design Storm Event		**2-year, 24-hour**	**10-year, 24-hour**	**25-year, 24-hour**	**100-year, 24-hour**	**Ian**
Lake Mendsen	Existing Conditions	85.58	86.79	87.29	87.94	88.35
	Pre-Storm Conditions	84.06	86.16	86.97	87.70	88.31
	Change in Peak Stage (ft)	-1.52	-0.63	-0.32	-0.24	-0.04
Lake Bell	Existing Conditions	89.43	89.88	90.63	91.62	92.28
	Pre-Storm Conditions	88.92	89.42	90.14	91.43	92.18
	Change in Peak Stage (ft)	-0.51	-0.46	-0.49	-0.19	-0.10

Modeled Peak Stages (ft NAVD)						
Design Storm Event		2-year, 24-hour	10-year, 24-hour	25-year, 24-hour	100-year, 24-hour	Ian
Lake Killarney	Existing Conditions	83.01	83.42	83.72	84.34	85.61
	Pre-Storm Conditions	82.54	83.09	83.41	83.95	85.28
	Change in Peak Stage (ft)	-0.47	-0.33	-0.31	-0.39	-0.33
Lake Rose	Existing Conditions	83.89	84.16	84.37	84.91	88.36
	Pre-Storm Conditions	83.89	84.16	84.37	84.76	88.33
	Change in Peak Stage (ft)	0.00	0.00	0.00	-0.15	-0.03
Grove Street Wetland	Existing Conditions	80.89	81.03	81.12	81.27	81.18
	Pre-Storm Conditions	80.89	81.03	81.12	81.27	81.18
	Change in Peak Stage (ft)	0.00	0.00	0.00	0.00	0.00
Lake Gem/ Park Lake	Existing Conditions	69.80	71.17	72.26	74.35	75.27
	Pre-Storm Conditions	69.65	70.52	71.48	73.66	75.16
	Change in Peak Stage (ft)	-0.15	-0.65	-0.78	-0.69	-0.11

To distinguish flood benefits of the improvement alternatives from the City's existing pre-storm operations, peak stages were compared to pre-storm conditions.

A preliminary meeting was held with SJRWMD regulatory staff on July 18, 2024, to review the proposed FICs and request feedback on permitting feasibility and any concerns regarding water quality, wetland, and/or downstream impacts (**Appendix B**). Where applicable, feedback from this meeting was included in the FIC discussion.

4.1 CRA Alternative Analysis Re-Evaluation

Improvement alternatives investigated in the 2020 study were reviewed and re-evaluated for Lake Mendsen and Canton Avenue. Based on feedback from the City the underground storage alternative evaluated previously for Lake Mendsen is not considered cost effective and was not re-evaluated as part of this study. Rather, use of additional park land to increase flood storage and a mobile pump for pre-storm drawdowns was considered for Lake Mendsen. The recommended Canton Avenue improvement alternative was reevaluated and adjusted as needed.

4.1.1 FIC #1 – Lake Mendsen: Connection to Lake Rose

The following FIC is a re-evaluation of Lake Mendsen Improvement Alternative 2 from Geosyntec's 2020 study.

4.1.1.1 Improvement Concept

This FIC consists of hydraulically connecting Lake Mendsen to Lake Rose. A new control structure is proposed to convey water from Lake Mendsen to Lake Rose when the stage in Lake Mendsen rises above 83.3 ft NAVD (Lake Rose's assumed normal water elevation). Since Lake Rose currently has no manmade outfalls and only receives water from direct rainfall, it represents an opportunity to supplement the storage provided by Lake Mendsen and mitigate elevated peak stages. A map of the improvement concept is presented as **Exhibit 15**.

4.1.1.2 Proposed Conditions Stormwater Model

The model developed for the existing conditions analysis was modified to include the hydraulic connection to Lake Rose. The Lake Mendsen/Killarney interconnect remained open, and a drop structure link was utilized to model overtopping of a proposed weir at Lake Mendsen and the subsequent pipe flow to Lake Rose. The proposed control structure at Lake Mendsen was modeled as having a 6-ft wide rectangular weir with an invert of 83.3 ft NAVD (Lake Rose's assumed normal water elevation). Water that overtopped this weir was conveyed to Lake Rose via a 36-inch diameter pipe and discharged at the northwest side of Lake Rose.

4.1.1.3 Proposed Conditions Model Results

Modeled peak stages at Lake Mendsen and a comparison to existing conditions and pre-storm conditions is presented in **Table 4-2**. A complete summary of node peak stages for FIC #1 is provided as **Appendix C**.

Table 4-2: FIC #1 Modeled Peak Stages

Modeled Peak Stages (ft NAVD)						
Design Storm Event		**2-year, 24-hour**	**10-year, 24-hour**	**25-year, 24-hour**	**100-year, 24-hour**	**Ian**
Lake Mendsen[1]	Existing Conditions	85.58	86.79	87.29	87.94	88.35
	Pre-Storm Conditions	84.06	86.16	86.97	87.70	88.31
	FIC #1	84.03	85.98	86.87	87.62	88.36
	Change in Peak Stage (ft) from FIC	-0.03	-0.18	-0.10	-0.08	+0.05
Downstream Waterbodies						
Lake Rose	Existing Conditions	83.89	84.16	84.37	84.91	88.36
	Pre-Storm Conditions	83.89	84.16	84.37	84.76	88.33
	FIC #1	84.01	85.97	86.81	87.46	88.38
	Change in Peak Stage (ft) from FIC	+0.12	+1.81	+2.44	+2.70	+0.05

Modeled Peak Stages (ft NAVD)						
Design Storm Event		2-year, 24-hour	10-year, 24-hour	25-year, 24-hour	100-year, 24-hour	Ian
Lake Killarney	Existing Conditions	83.01	83.42	83.72	84.34	85.61
	Pre-Storm Conditions	82.54	83.09	83.41	83.95	85.28
	FIC #1	82.54	83.09	83.41	83.95	85.28
	Change in Peak Stage (ft) from FIC	0.00	0.00	0.00	0.00	0.00
Lake Gem/ Park Lake	Existing Conditions	69.80	71.17	72.26	74.35	75.27
	Pre-Storm Conditions	69.65	70.52	71.48	73.66	75.16
	FIC #1	69.65	70.52	71.48	73.66	75.16
	Change in Peak Stage (ft) from FIC	0.00	0.00	0.00	0.00	0.00

[1]Lake Mendsen warning stage is equal to 84.82 ft NAVD for roadway flooding, which is the approximate Denning Drive edge of pavement elevation. Structural flooding is anticipated at 86.60 ft NAVD, which is the approximate FFE of 880 West New England Avenue. Yard flooding is anticipated at 85.60 ft NAVD.

As seen in **Table 4-2**, Lake Mendsen peak stages are slightly lower in this improvement concept, when compared to pre-storm conditions. A peak stage less than 84.82 ft NAVD during the 2-year, 24-hour design storm event was targeted to address roadway flooding. The modeled peak stage for pre-storm operations during the 2-year, 24-hour design storm event achieved this LOS, and the FIC did not provide any additional benefit. For all other design storms, the peak stage exceeded 84.82 ft NAVD although the FIC provided additional slight reductions in peak stage as compared to pre-storm operations alone. Downstream impacts (i.e., increased peak stage) to Lake Rose begin in the 25-year, 24-hour storm when the peak stage reached the top of bank elevation for Lake Rose (86.8 ft NAVD). No increase in peak stage to downstream waterbodies, Lake Killarney and Lake Gem/Park Lake, are anticipated from this FIC.

Time/Stage data for Lake Mendsen and Lake Rose during the 2-year, 24-hour design storm event are presented in **Figure 4-1**.

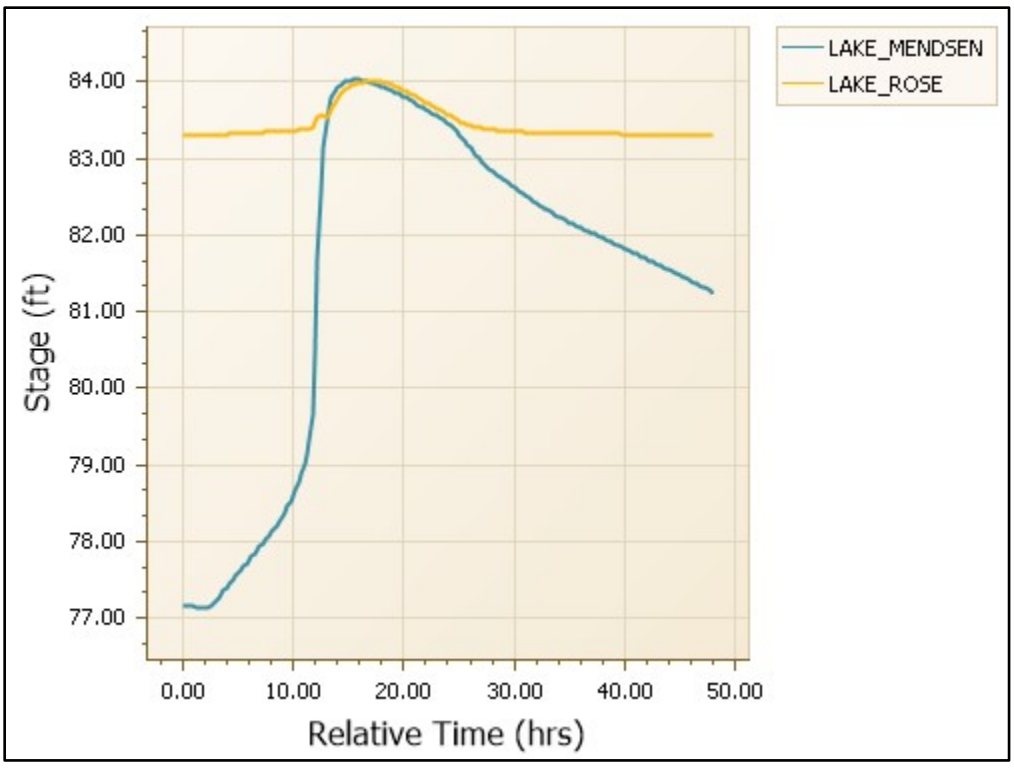


Figure 4-1: Modeled Time/Stage Data for Lake Mendsen and Lake Rose for 2-Year, 24-Hour Design Storm

As seen in **Figure 4-1**, when the stage in Lake Mendsen rises above 83.3 ft NAVD (which occurs at approximately hour 12), water begins moving from Lake Mendsen to Lake Rose. From approximately hour 12 to hour 16, water is conveyed to Lake Rose, resulting in a peak stage at Lake Rose of approximately 84.01 ft NAVD, which is approximately 2.8 ft below the top of bank for Lake Rose. After hour 16, both Lake Mendsen and Lake Rose drain simultaneously via the two existing drainwells and the interconnect to Lake Killarney, until the stage at Lake Rose reaches 83.3 ft NAVD, the elevation of the proposed weir and the lake's assumed normal water elevation. Since Lake Rose was originally formed from a sink hole, conditions may favor relatively quick infiltration; however, this would need to be confirmed by a more detailed hydrogeologic investigation. Further investigation would be necessary to establish a normal and normal high water elevation for Lake Rose prior to pursuing this improvement alternative.

4.1.1.4 Proposed Water Quality Impacts

This FIC may have water quality impacts on Lake Rose. If pursued, pollutant load impacts to Lake Rose would have to be calculated using a 10-year continuous simulation to obtain the annual average loading and a permit obtained through SJRWMD.

4.1.1.5 Implementation Considerations

The following implementation considerations are provided for this FIC:

- Cost – The estimated total (construction and engineering) cost for this improvement concept is $593,269. A detailed cost estimate is provided in **Appendix I**.

- Cost/Benefit – Relative to the other FIC (#2) for Lake Mendsen, this concept was less expensive and more effective at mitigating potential roadway flooding during the 2-year, 24- hour design storm event.
- Engineering Design – Engineering design may include collection of survey data, geotechnical testing, preparation of design plans, preparation of a cost estimate, preparation of technical specifications, and utility coordination.
- Land Acquisition – The location of the FIC is currently owned by the City of Winter Park. Land acquisition was assumed to not be required.
- Permitting – A permit from SJRWMD is anticipated to be required for this FIC due to the proposed new stormwater discharge to Lake Rose. The preliminary meeting held with SJRWMD on July 18, 2024, confirmed the need for a permit.

4.1.2 FIC #2 – Lake Mendsen: Pump Station and Lake Expansion

The following FIC is not a re-evaluation of one presented in Geosyntec's 2020 study but rather one developed as a result of the model expansion and improved topographical information.

4.1.2.1 Improvement Concept

This FIC consists of increasing the depth of Lake Mendsen and installing infrastructure to allow for pre-storm drawdown using the City's mobile pump. The expanded storage in Lake Mendsen assumed increasing the depth to 73 ft NAVD (current lake bottom is 75 ft NAVD) with 2:1 sideslopes providing approximately 1.8 ac-ft of additional storage. A concrete pad on the north side of the lake near the existing 8-inch drainwell would be constructed to station the mobile pump and a 6-inch HDPE force main would be installed along the south side West Morse Boulevard and tie into the existing stormsewer network at Harper Street with a new manhole. A flange and valve would be installed at the concrete pad to quickly connect the mobile pump to the force main prior to a storm event. Pump specifications provided by the City and communication with the vendor determined a pumping rate of 2.67 cfs. Use of a mobile pump for pre-storm drawdown of Lake Mendsen would occur in conjunction with the drainwells on Lake Mendsen to reduce the lake stage as much as possible. Currently, according to the City, the drainwells drain the lake to 77.02 ft NAVD in approximately 24 hours. Since Lake Mendsen is only able to drain via the 20-inch drainwell located in the center of the lake, the 8-inch drainwell located within the control structure on the north side of the lake, and to Lake Killarney via the Lake Mendsen/Killarney interconnect, this FIC represents an opportunity to create supplemental storage and mitigate elevated peak stages. A map of the improvement concept is presented as **Exhibit 16**.

4.1.2.2 Proposed Conditions Stormwater Model

The model developed for the existing conditions analysis was modified to increase the depth of Lake Mendsen and include the hydraulic connection to Lake Killarney. The expanded storage in Lake Mendsen was incorporated into the node's stage/area table, the Lake Mendsen/Killarney interconnect was closed, a rating curve link was added to model the mobile pump operation using the vendor-suggested pump rate of 2.67 cfs, and a 6-inch pipe link was added to convey water from the mobile pump to the existing stormsewer network at Harper Street. The mobile pump was simulated to be turned off when the new lake bottom elevation (73 ft NAVD) was reached.

The hot start simulation for this alternative included the increased depth of Lake Mendsen for the entire duration (7 days) of pre-storm operations. The mobile pump was turned on and interconnect

closed for the last 2 days, when the 20-inch drainwell would begin operating under emergency conditions.

For the design storm event simulations the mobile pump was turned off and the interconnect was opened. This reflects typical operating conditions as the mobile pump would be turned off prior to the storm to prevent damage to equipment and ensure the safety of City staff.

4.1.2.3 Proposed Conditions Model Results

Modeled peak stages at Lake Mendsen and a comparison to existing conditions and pre-storm conditions is presented in **Table 4-3**. A complete summary of node peak stages for FIC #2 is provided as **Appendix D**.

Table 4-3: FIC #2 Modeled Peak Stages

Modeled Peak Stages (ft NAVD)						
Design Storm Event		**2-year, 24-hour**	**10-year, 24-hour**	**25-year, 24-hour**	**100-year, 24-hour**	**Ian**
Lake Mendsen[1]	Existing Conditions	85.58	86.79	87.29	87.94	88.35
	Pre-Storm Conditions	84.06	86.16	86.97	87.70	88.31
	FIC #2	83.86	86.03	86.92	87.65	88.31
	Change in Peak Stage (ft) from FIC	-0.20	-0.13	-0.05	-0.05	0.00
Downstream Waterbodies						
Lake Killarney	Existing Conditions	83.01	83.42	83.72	84.34	85.61
	Pre-Storm Conditions	82.54	83.09	83.41	83.95	85.28
	FIC #2	82.57	83.11	83.44	83.97	85.30
	Change in Peak Stage (ft) from FIC	+0.03	+0.02	+0.03	+0.02	+0.02
Lake Gem/ Park Lake	Existing Conditions	69.80	71.17	72.26	74.35	75.27
	Pre-Storm Conditions	69.65	70.52	71.48	73.66	75.16
	FIC #2	69.65	70.55	71.52	73.72	75.16
	Change in Peak Stage (ft) from FIC	0.00	+0.03	+0.04	+0.06	0.00

[1]Lake Mendsen warning stage is equal to 84.82 ft NAVD for roadway flooding, which is the approximate Denning Drive edge of pavement elevation. Structural flooding is anticipated at 86.60 ft NAVD, which is the approximate FFE of 880 West New England Avenue. Yard flooding is anticipated at 85.60 ft NAVD.

As seen in **Table 4-3**, Lake Mendsen peak stages are slightly lower in this improvement concept, when compared to pre-storm conditions. A peak stage less than 84.82 ft NAVD during the 2-year, 24-hour design storm event was targeted to address roadway flooding. The modeled peak stage for pre-storm operations during the 2-year, 24-hour design storm event achieved this LOS, and the

FIC provided an additional benefit of approximately 2-inches. For all other design storms, the peak stage exceeded 84.82 ft NAVD although the FIC provided additional slight reductions in peak stage as compared to pre-storm operations alone. Increased peak inflows from Orlando Avenue via the interconnect were observed as result of this FIC which likely contributed to the lack of improvement in peak stages in Lake Mendsen. Marginal increases in peak stage to downstream waterbodies, Lake Killarney and Lake Gem/Park Lake, are anticipated from this FIC.

As compared to FIC #1, an additional peak stage reduction of approximately 0.17-ft (2-inches) was observed for the 2-year, 24-hour design storm.

4.1.2.4 Proposed Water Quality Impacts

This FIC may have water quality impacts on Lake Killarney and a treatment train may be required prior to pre-storm releases to Lake Killarney. SJRWMD communicated that there may be potential water quality credit if the expansion increases the residence time of Lake Mendsen, and that the expansion may already be included in existing permit. If pursued, pollutant load impacts to Lake Killarney would have to be calculated using a 10-year continuous simulation to obtain the annual average loading and a permit obtained through SJRWMD. Due to the fact that pre-storm releases are of treated stormwater rather than the non-treated releases from storm events it is plausible that pollutant loading during flood events would be reduced by this FIC as compared to existing conditions.

4.1.2.5 Implementation Considerations

The following implementation considerations are provided for this FIC:

- Cost – The estimated total (construction and engineering) cost for this improvement concept is $905,824. A detailed cost estimate is provided in **Appendix I**.
- Cost/Benefit – Relative to the other FIC (#1) for Lake Mendsen, this concept is more expensive and less effective to mitigate potential roadway flooding during the 2-year, 24-hour design storm event.
- Engineering Design – Engineering design may include collection of survey data, geotechnical testing, preparation of design plans, preparation of a cost estimate, preparation of technical specifications, and utility coordination.
- Land Acquisition – The location of the FIC is currently owned by the City of Winter Park. Land acquisition was assumed to not be required.
- Permitting – A permit from SJRWMD is anticipated to be required for this FIC due to the potential water quality impacts and increased peak flows to Lake Killarney. The existing permit may already include increasing the depth of Lake Mendsen. The preliminary meeting held with SJRWMD on July 18, 2024, confirmed the need for a permit.

4.1.3 FIC #3 – Canton Avenue: Improved Conveyance

The following FIC is a re-evaluation of the Canton Avenue Improvement Alternative 1 from Geosyntec's 2020 study.

4.1.3.1 Improvement Concept

This FIC consists of upsizing the main trunkline that flows west to east along Canton Avenue to 48-inches, additional inlet structures, and upsizing an existing inlet structure near the intersection with Park Avenue. Since drainage of Canton Avenue is limited by the existing 24-inch trunkline,

this FIC represents an opportunity to increase conveyance and mitigate roadway flooding. A map of the improvement concept is presented as **Exhibit 17**. Note that existing inlet and manhole structures downstream of the FIC would likely also have to be replaced due to their age and to accommodate the larger pipe.

As the goal of this improvement concept is to capture and convey more water from Canton Avenue to Lake Osceola, there is the possibility that the existing baffle box is undersized to accommodate this additional flow. To accommodate for this, a diversion structure was incorporated in the improvement concept to divert excess flow around the existing baffle box at the east end of Canton Avenue. The diversion structure consists of a 24-inch pipe to the existing baffle box and an overflow weir that would allow flow to bypass the baffle box and be discharged to Lake Osceola via the proposed 48-inch pipe. As a result of the increased conveyance capacity of the upsized trunkline, more water would likely bypass the baffles during large storm events than under existing conditions and may result in increased pollutant loads to Lake Osceola.

4.1.3.2 Proposed Conditions Stormwater Model

The model developed for the existing conditions analysis was modified to upsize the existing main trunkline along Canton Avenue was from 24-inches to 48-inches. Proposed curb inlet structures near the intersection with Park Avenue were modeled by 1-D interface points connected to a Stage/Area node via a weir link. The geometry of the weir links was input into the model as vertical, sharp crested with a maximum depth and width of 6-inches and 8-ft, respectively. These dimensions represent the opening of a typical FDOT Type 4 curb inlet. A weir coefficient of 3.2 and orifice coefficient of 0.6 was assigned to the weirs. In addition, an existing inlet structure near the Park Avenue intersection was upsized to a FDOT Type 4 curb inlet.

4.1.3.3 Proposed Conditions Model Results

Modeled peak overland flow rates from Canton Avenue and a comparison to existing conditions and pre-storm conditions is presented in **Table 4-4** and shown in **Exhibit 17**.

Table 4-4: FIC #3 Modeled Peak Flow Rates

Canton Avenue Modeled Peak Overland Flow Rates (cfs)						
Design Storm Event		**2-year, 24-hour**	**10-year, 24-hour**	**25-year, 24-hour**	**100-year, 24-hour**	**Ian**
North along Knowles Avenue	Existing Conditions	11.79	21.81	29.75	44.38	12.91
	FIC #3	0.00	0.00	0.00	15.96	0.00
	Change in Peak Flow (cfs) from FIC[1]	-11.79	-21.81	-29.75	-28.42	-12.91
South along Park Avenue	Existing Conditions	0.00	0.34	3.78	7.44	0.88
	FIC #3	0.00	0.00	1.11	6.85	0.00
	Change in Peak Flow (cfs) from FIC[1]	0.00	-0.34	-2.67	-0.59	-0.88

[1]Pre-storm operations do not impact Canton Avenue and were therefore not included for comparison

Model results for this FIC indicate a significant decrease in the extent and depth of flooding along Canton Avenue. See **Exhibit 17** for the flood extent and depth for each of the 24-hour design storms. Note that flood depths greater than 2-inches (0.17-ft) are shown on the map. A comparison of the peak flood depths to the existing conditions for the 10-year, 24-hour storm event is presented

in **Exhibit 17** as well. This comparison was performed using spatial analyst tools in ArcGIS. As seen in **Exhibit 17**, decreased flood depths of 7-inches (0.58-ft) or greater are observed primarily at the intersections with Center Street and Knowles Avenue (i.e., where roadway flooding was determined to be more severe in the existing conditions).

As discussed in the existing conditions analysis, the intersection of Canton Avenue and Knowles Avenue is a low spot along Canton Avenue and therefore, much of the surface runoff is conveyed to this location. When Canton Avenue becomes inundated, a portion of the stormwater is discharged north along Knowles Avenue via overland flow resulting in roadway flooding of Knowles Avenue which has been observed by the City. As seen in **Table 4-4**, based on model results, overland flow from Canton Avenue to Knowles Avenue is eliminated for all design storm events except the 100-year, 24-hour event where it is significantly reduced.

4.1.3.4 Proposed Water Quality Impacts

This FIC may have additional water quality impacts on Lake Osceola due to more water bypassing the baffle box during large storm events, when compared to existing conditions. The diversion structure incorporated in the FIC, a 24-inch pipe to the existing baffle box and an overflow weir that would allow flow to bypass the baffle box and be discharged to Lake Osceola via the proposed 48-inch pipe, would not alter the volume of water passing through the existing baffle box. However, since more water is being conveyed through the 48-inch pipe in comparison to the existing 24-inch pipe and the existing baffle box is undersized to accommodate additional flow associated with the 48-inch pipe, there is the potential for additional pollutant loading to Lake Osceola, a concern which was confirmed by SJRWMD during the meeting on July 18, 2024. If FIC #3 is pursued, pollutant load impacts to Lake Killarney would have to be calculated using a 10-year continuous simulation to ensure the annual average loading does not exceed existing conditions.

4.1.3.5 Implementation Considerations

The following implementation considerations are provided for this for this FIC:

- Cost – The estimated construction cost for this improvement concept is $2,936,419. A detailed cost estimate is provided in **Appendix I**.
- Cost/Benefit – This concept resulted in a substantial decrease in the extent and severity of potential roadway flooding along Canton Avenue. Based on model results, overland flow from Canton Avenue to Knowles Avenue and Park Avenue was eliminated in 2-year, 24-hour and 10-year, 24-hour design storm events.
- Engineering Design – Engineering design may include collection of survey data, geotechnical testing, preparation of design plans, preparation of a cost estimate, preparation of technical specifications, and utility coordination.
- Land Acquisition – The location of the FIC is within the East Canton Avenue right-of-way. Land acquisition was assumed to not be required.
- Permitting – A permit from SJRWMD is anticipated to be required for this alternative due to the increased peak flow to Lake Osceola. The preliminary meeting held with SJRWMD on July 18, 2024, confirmed the need for a permit.

4.2 Lake Bell and Lake Killarney Alternatives Analysis

Flood improvement alternative concepts were evaluated for the Lake Bell, Lake Wilderness and Lake Killarney interconnections. The City requested that the following potential alternatives be evaluated – a direct connection from Lake Bell to Park Lake, improvements to the existing connection from Lake Killarney to Lake Gem, and adjustments to the risers on the Lake Killarney drainwells.

Following conversations with SJRWMD on July 18, 2024, adjustments to the risers on the Lake Killarney drainwells was not investigated due to the unlikelihood of obtaining the required permit modification from the Florida Department of Environmental Protection (FDEP).

Four FICs were developed to evaluate a direct connection from Lake Bell to Park Lake (FIC #4), reduced inflows from the FDOT pond north of Lake Wilderness (FIC #5), improved conveyance to from Lake Killarney to Lake Gem (FIC #6), and a combination of FICs #4 and 6 (FIC #7).

4.2.1 FIC #4 – Lake Bell: Connection to Park Lake

The following FIC was requested by the City.

4.2.1.1 Improvement Concept

This FIC consists of hydraulically connecting Lake Bell to Park Lake. A new control structure with an operable gate is proposed to convey water from Lake Bell to the wetland upstream of Park Lake when the stage in Lake Bell is above 86.0 ft NAVD prior to a storm event. The control structure would be located at the northeast side of Lake Bell and have a 6-ft wide rectangular weir with an invert of 86.0 ft NAVD and operable gate. Water overtopping this weir would be conveyed via a 36-inch pipe north to a new manhole at the intersection of West Street and Fitzgerald Drive and then run east along the south side of Fitzgerald Drive past Jonotey Drive until the road terminates. The pipe would then cross Fitzgerald Drive and discharge northeast to the wetland upstream Park Lake (Grove Street wetland). This will allow for pre-storm drawdown via emergency releases to Park Lake. Since Lake Bell's only outfall is to Lake Killarney, it represents an opportunity to mitigate peak stages at both Lake Bell and Lake Killarney during storm events. A map of the improvement concept is presented as **Exhibit 18**.

4.2.1.2 Proposed Conditions Stormwater Model

The model developed for the existing conditions analysis was modified to include the hydraulic connection to Park Lake. A drop structure link was added to model overtopping of a proposed weir at Lake Bell and the subsequent pipe flow to the Grove Street wetland. The drop structure link had a 6-ft wide rectangular weir with an invert of 86.0 ft NAVD and a 36-inch diameter pipe. Water that overtopped this weir entered the 36-inch pipe and was conveyed along Fitzgerald Drive and discharged into the Grove Street wetland. No modifications were necessary to the control structure at Grove Street for modeling efforts (**Photograph 10**). However, to be conservative, this consideration is shown in **Exhibit 18** and included in the cost estimate (**Appendix I**).

The hot start simulation for this alternative included opening the control structure's operable gate for the entire duration (7 days) of pre-storm operations.

For the design storm event simulations the operable gate was closed to mitigate increases in peak stages downstream during design storm events.

4.2.1.3 Proposed Conditions Model Results

Modeled peak stages at Lake Bell and a comparison to existing conditions and pre-storm conditions is presented in **Table 4-5**. A complete summary of node peak stages for FIC #4 is provided as **Appendix E**.

Table 4-5: FIC #4 Modeled Peak Stages

Modeled Peak Stages (ft NAVD)						
Design Storm Event		**2-year, 24-hour**	**10-year, 24-hour**	**25-year, 24-hour**	**100-year, 24-hour**	**Ian**
Lake Bell[1]	Existing Conditions	89.43	89.88	90.63	91.62	92.28
	Pre-Storm Conditions	88.92	89.42	90.14	91.43	92.18
	FIC #4	88.60	88.94	89.42	90.72	91.97
	Change in Peak Stage (ft) from FIC	-0.32	-0.48	-0.72	-0.71	-0.21
Downstream Waterbodies & Wetlands						
Grove Street Wetland	Existing Conditions	80.89	81.03	81.12	81.27	81.18
	Pre-Storm Conditions	80.89	81.03	81.12	81.27	81.18
	FIC #4	80.90	81.03	81.12	81.27	81.18
	Change in Peak Stage (ft) from FIC	+0.01	0.00	0.00	0.00	0.00
Lake Killarney	Existing Conditions	83.01	83.42	83.72	84.34	85.61
	Pre-Storm Conditions	82.54	83.09	83.41	83.95	85.28
	FIC #4	82.44	82.98	83.34	83.90	85.08
	Change in Peak Stage (ft) from FIC	-0.10	-0.11	-0.07	-0.05	-0.20
Lake Gem/ Park Lake	Existing Conditions	69.80	71.17	72.26	74.35	75.27
	Pre-Storm Conditions	69.65	70.52	71.48	73.66	75.16
	FIC #4	70.03	70.78	71.65	73.74	75.22
	Change in Peak Stage (ft) from FIC	+0.38	+0.26	+0.17	+0.08	+0.06

[1]Lake Bell warning stage is equal to 91.62 ft NAVD for roadway flooding, which is the approximate overtopping elevation to Turner Road. Structural flooding is anticipated at 91.80 ft NAVD, which is the approximate FFE of 1100 Turner Road. Yard flooding is anticipated at 90.80 ft NAVD.

As seen in **Table 4-5**, Lake Bell peak stages are significantly lower in this improvement concept, when compared to pre-storm conditions. A peak stage less than 91.6 ft NAVD during the 100-year, 24-hour design storm event was targeted to address roadway flooding on Turner Road. This

target was achieved for all design storm events using pre-storm operations alone with the FIC providing additional flood benefit of preventing yard flooding during the 100-year, 24-hour design storm event. For Hurricane Ian, the peak stage exceeded 91.6 ft NAVD with yard, roadway, and structural flooding having the potential to occur. The FIC provided a marginal additional benefit of approximately 2-inches as compared to pre-storm operations for the Hurricane Ian storm event. Downstream impacts (i.e., increased peak stage) to Lake Gem/Park Lake begin in the 2-year, 24-hour storm event. No increase in peak stage to the Grove Street Wetland is anticipated and marginal flood benefit (decreased peak stage) is anticipated for Lake Killarney from this FIC.

4.2.1.4 Proposed Water Quality Impacts

This FIC may have water quality impacts on Lake Gem/Park Lake. If pursued, pollutant load impacts to Lake Gem/Park Lake would have to be calculated using a 10-year continuous simulation to obtain the annual average loading and a permit obtained through SJRWMD. Due to the fact that pre-storm releases are of treated stormwater rather than the non-treated releases from storm events it is plausible that pollutant loading during flood events would be reduced by this FIC as compared to existing conditions. At the preliminary meeting held with SJRWMD on July 18, 2024, SJRWMD included the following suggestions to identify and address potential water quality impacts:

- Avoidance of using the wetland for water quality treatment to prevent the need for mitigation of wetland impacts.
- Model pollutant loading from this FIC as well as the Lake Killarney outfall to ensure no net increase in loading to Lake Gem/Park Lake.
- Baffle box installation in route from Lake Killarney to Lake Gem/Park Lake may be a good option to offset additional loading from this FIC to Park Lake.

4.2.1.5 Implementation Considerations

The following implementation considerations are provided for this FIC:

- Cost – The estimated construction cost for this improvement concept is $929,662. A detailed cost estimate is provided in **Appendix I**.
- Cost/Benefit – Relative to the other FIC (#5) for Lake Bell, this concept was less expensive and more effective at mitigating potential roadway flooding along Tuner Road during design storm events. This improvement concept achieved a substantial peak stage reduction at Lake Bell as compared to FIC #5.
- Engineering Design – Engineering design may include collection of survey data, geotechnical testing, preparation of design plans, preparation of a cost estimate, preparation of technical specifications, and utility coordination.
- Land Acquisition – The location of the FIC is within the City of Maitland and Town of Eatonville. Land acquisition is likely to be required.
- Permitting – A permit from SJRWMD is anticipated to be required for this alternative due to the increased peak flow to and stages in Lake Gem/Park Lake. The preliminary meeting held with SJRWMD on July 18, 2024, confirmed the need for a permit.

4.2.2 FIC #5 – Lake Bell: Reduced Inflows from FDOT Pond Expansion

The following FIC was identified to reduce inflows to Lake Bell via Lake Wilderness.

4.2.2.1 Improvement Concept

This FIC consists of expanding the existing FDOT pond north of Lake Wilderness to reduce peak flow rates during storm events into Lake Wilderness which connects downstream to Lake Bell and ultimately Lake Killarney. Overtopping of Lake Wilderness into Lake Gem was observed during Hurricane Ian. The expansion assumed the footprint of the existing FDOT Pond would expand to the vacant area west of the existing pond while retaining the existing pond's bottom elevation of 85 ft NAVD and 4:1 sideslopes. This expansion would add approximately 2.5 acres of area and 23.1 ac-ft of storage. In addition to the pond expansion, modifications to the existing outfall pipe network to the FDOT pond are proposed to utilize the water quality benefits of the expanded pond. A map of the improvement concept is presented as **Exhibit 19**.

4.2.2.2 Proposed Conditions Stormwater Model

The model developed for the existing conditions analysis was modified to expand the storage of the FDOT pond. The expansion was incorporated into the stage/area table of Lake Wilderness, adding approximately 2.5 acres of area and 23.1 ac-ft of storage.

The expanded pond storage was simulated for the entire duration (7 days) of the hot start simulation and the design storm event simulations.

4.2.2.3 Proposed Conditions Model Results

Modeled peak stages at Lake Bell and a comparison to existing conditions and pre-storm conditions is presented in **Table 4-6**. A complete summary of node peak stages for FIC #5 is provided as **Appendix F**.

Table 4-6: FIC #5 Modeled Peak Stages

Modeled Peak Stages (ft NAVD)						
Design Storm Event		**2-year, 24-hour**	**10-year, 24-hour**	**25-year, 24-hour**	**100-year, 24-hour**	**Ian**
Lake Bell[1]	Existing Conditions	89.43	89.88	90.63	91.62	92.28
	Pre-Storm Conditions	88.92	89.42	90.14	91.43	92.18
	FIC #5	88.92	89.41	90.13	91.43	92.17
	Change in Peak Stage (ft) from FIC	0.00	-0.01	-0.01	0.00	-0.01
Downstream Waterbodies & Wetlands						
Grove Street Wetland	Existing Conditions	80.89	81.03	81.12	81.27	81.18
	Pre-Storm Conditions	80.89	81.03	81.12	81.27	81.18
	FIC #5	80.89	81.03	81.12	81.27	81.18
	Change in Peak Stage (ft) from FIC	0.00	0.00	0.00	0.00	0.00

Modeled Peak Stages (ft NAVD)						
Design Storm Event		2-year, 24-hour	10-year, 24-hour	25-year, 24-hour	100-year, 24-hour	Ian
Lake Killarney	Existing Conditions	83.01	83.42	83.72	84.34	85.61
	Pre-Storm Conditions	82.54	83.09	83.41	83.95	85.28
	FIC #5	82.54	83.09	83.41	83.95	85.28
	Change in Peak Stage (ft) from FIC	0.00	0.00	0.00	0.00	0.00
Lake Gem/ Park Lake	Existing Conditions	69.80	71.17	72.26	74.35	75.27
	Pre-Storm Conditions	69.65	70.52	71.48	73.66	75.16
	FIC #5	69.65	70.52	71.48	73.66	75.16
	Change in Peak Stage (ft) from FIC	0.00	0.00	0.00	0.00	0.00

[1]Lake Bell warning stage is equal to 91.62 ft NAVD for roadway flooding, which is the approximate overtopping elevation to Turner Road. Structural flooding is anticipated at 91.80 ft NAVD, which is the approximate FFE of 1100 Turner Road. Yard flooding is anticipated at 90.80 ft NAVD.

As seen in **Table 4-6**, Lake Bell peak stages were not lowered significantly for any design storm event or Hurricane Ian in this improvement concept, when compared to the pre-storm conditions. A peak stage less than 91.6 ft NAVD during the 100-year, 24-hour design storm event was targeted to address roadway flooding on Turner Road for all design storm events. This target was achieved for all design storm events using pre-storm operations alone with the FIC providing no additional peak stage reductions. For Hurricane Ian, the peak stage exceeded 91.6 ft NAVD, and the FIC did not provide additional peak stage reduction. No increase in peak stage to downstream wetlands and waterbodies, Grove Street Wetland, Lake Killarney, and Lake Gem/Park Lake, are anticipated from this FIC.

As compared to FIC #4, FIC #5 does not provide any flood benefit and is more expensive.

4.2.2.4 Proposed Water Quality Impacts

This FIC will have positive water quality impacts on Lake Wilderness or Lake Bell as the expanded FDOT pond would provide a larger permanent pool, which would result in a longer residence time for water quality treatment. SJRWMD had no concerns regarding this alternative during the July 18, 2024, meeting.

4.2.2.5 Implementation Considerations

The following implementation considerations are provided for this FIC:

- Cost – The estimated construction cost for this improvement concept is $3,608,591. A detailed cost estimate is provided in **Appendix I**.
- Cost/Benefit – Relative to the other FIC (#4) for Lake Bell, this concept is more expensive and ineffective at mitigating potential roadway flooding along Tuner Road during design

storm events. This improvement concept did not achieve a substantial peak stage reduction at Lake Bell.

- Engineering Design – Engineering design may include collection of survey data, geotechnical testing, preparation of design plans, preparation of a cost estimate, preparation of technical specifications, and utility coordination.
- Land Acquisition – The location of the FIC is owned by FDOT. Land acquisition may be required.
- Permitting – A general permit for retrofit from SJRWMD is anticipated to be required for this alternative to account for pond excavation/expansion.

4.2.3 FIC #6 – Lake Killarney: Improved Conveyance to Lake Gem

4.2.3.1 Improvement Concept

This FIC consists of installing a 48-inch bypass to the existing outfall structure on Lake Killarney to allow for pre-storm drawdown via emergency releases to Lake Gem prior to a storm event. The bypass consists of a 6-ft wide rectangular weir with an invert of 78.0 ft NAVD and operable gate. Water overtopping this weir would enter a 48-inch pipe that bypasses the existing control on the Lake Killarney outfall structure and ties back into the Lake Killarney outfall structure to be discharged to Lake Gem via the existing 8-ft outfall pipe. Since Lake Killarney's drainwells take 8 days to draw down Lake Killarney to approximately 80 ft NAVD once the risers are removed (drop of 1.6 ft at a rate of 0.1-0.2 ft/day), an alternative is needed to reduce the stage in Lake Killarney prior to a storm event to mitigate peak stages. A map of the improvement concept is presented as **Exhibit 20**.

4.2.3.2 Proposed Conditions Stormwater Model

The model developed for the existing conditions analysis was modified to add the bypass to the Lake Killarney outfall structure. A drop structure link was added to model overtopping of a proposed weir at Lake Killarney with subsequent pipe flow tying into the existing Lake Killarney outfall structure. The drop structure link had a 6-ft wide rectangular weir with an invert of 78.0 ft NAVD and a 48-inch diameter pipe. Water that overtopped this weir entered the 48-inch pipe, bypassed around the existing control on the Lake Killarney outfall structure, and tied back into the Lake Killarney outfall structure to be discharged to Lake Gem via the existing 8-ft outfall pipe.

The hot start simulation for this alternative included opening the control structure's operable gate for the entire duration (7 days) of pre-storm operations.

For the design storm event simulations the operable gate was closed to mitigate increases in peak stages downstream during design storm events.

4.2.3.3 Proposed Conditions Model Results

Modeled peak stages at Lake Killarney and a comparison to existing conditions and pre-storm conditions is presented in **Table 4-7**. A complete summary of node peak stages for FIC #6 is provided as **Appendix G**.

Table 4-7: FIC #6 Modeled Peak Stages

Modeled Peak Stages (ft NAVD)						
Design Storm Event		**2-year, 24-hour**	**10-year, 24-hour**	**25-year, 24-hour**	**100-year, 24-hour**	**Ian**
Lake Killarney[1]	Existing Conditions	83.01	83.42	83.72	84.34	85.61
	Pre-Storm Conditions	82.54	83.09	83.41	83.95	85.28
	FIC #6	80.98[2]	81.67[2]	82.03	82.85	83.71
	Change in Peak Stage (ft) from FIC	-1.56	-1.42	-1.38	-1.10	-1.57
Downstream Waterbodies						
Lake Gem/ Park Lake	Existing Conditions	69.80	71.17	72.26	74.35	75.27
	Pre-Storm Conditions	69.65	70.52	71.48	73.66	75.16
	FIC #6	70.70	71.39	71.98	73.13	74.67
	Change in Peak Stage (ft) from FIC	+1.05	+0.87	+0.50	-0.53	-0.49

[1]Lake Killarney warning stage is equal to 84.40 ft NAVD for structural flooding, which is the approximate FFE of 2118 Lake Drive. Roadway flooding is anticipated at 85.20 ft NAVD, which is the approximate overtopping elevation to Lakefront Boulevard at the south end of Lakefront Boulevard near the boat ramp. Yard flooding is anticipated at 83.40 ft NAVD.
[2]The 24-hour design storm ran for 140 hours but as stage in Lake Killarney remained below its NHWE (82.04 ft NAVD) it was still rising to this water level at the end of the simulation.

As seen in **Table 4-7**, Lake Killarney peak stages are significantly lower in this improvement concept, when compared to pre-storm conditions. A peak stage less than 84.4 ft NAVD during the 100-year, 24-hour design storm event was targeted to address structure flooding on Lake Drive. This target as well as elimination of roadway flooding was achieved for all design storm events using pre-storm operations alone and for Hurricane Ian using the FIC. Yard flooding was anticipated starting at the 100-year, 24-hour design storm event under pre-storm conditions and starting at Hurricane Ian event with the FIC. Increases in peak stage to the downstream waterbody, Lake Gem/Park Lake, was anticipated from this FIC for the 2-year, 24-hour, 10-year, 24-hour, and 25-year, 24-hour design storms. Decreases in peak stage to Lake Gem/Park Lake during the 100-year, 24-hour design storm event and Hurricane Ian storm event are anticipated from this FIC.

4.2.3.4 Proposed Water Quality Impacts

This FIC may have water quality impacts on Lake Gem/Park Lake. If pursued, pollutant load impacts to Lake Gem/Park Lake would have to be calculated using a 10-year continuous simulation to obtain the annual average loading and a permit obtained through SJRWMD. Due to the fact that pre-storm releases are of treated stormwater rather than the non-treated releases from storm events it is plausible that pollutant loading during flood events would be reduced by this FIC as compared to existing conditions. At the July 18, 2024, meeting, SJRWMD suggested a baffle box installation in route from Lake Killarney to Lake Gem to offset additional loading from this FIC.

4.2.3.5 Implementation Considerations

The following implementation considerations are provided for this FIC:

- Cost – The estimated construction cost for this improvement concept is $301,639. A detailed cost estimate is provided in **Appendix I**.
- Cost/Benefit – This FIC resulted in a decrease in the extent and severity of potential structure flooding around Lake Killarney. Based on model results, structure and roadway flooding was eliminated in all design storms.
- Engineering Design – Engineering design may include collection of survey data, geotechnical testing, preparation of design plans, preparation of a cost estimate, preparation of technical specifications, and utility coordination.
- Land Acquisition – The location of the FIC is currently owned by the City of Winter Park. Land acquisition was assumed to not be required.
- Permitting – A permit from SJRWMD is anticipated to be required for this alternative due to the increased peak flow to and stages in Lake Gem/Park Lake. The preliminary meeting held with SJRWMD on July 18, 2024, confirmed the need for a permit.

4.2.4 FIC #7 – Combination of FIC #4 and 6

The following FIC was developed to examine the combined impact of implementing FICs #4 and 6.

4.2.4.1 Improvement Concept

This FIC consists of hydraulically connecting Lake Bell to Park Lake and installing 48-inch bypass to the existing outfall structure on Lake Killarney to allow for pre-storm drawdowns via emergency releases of both Lake Bell and Lake Killarney. This combination represents an opportunity to mitigate peak stages at Lake Bell and Lake Killarney and decrease inflows to Lake Killarney from Lake Bell during storm events. A map of each individual improvement concept is presented in **Exhibits 17** and **19**.

4.2.4.2 Proposed Conditions Stormwater Model

The model developed for the existing conditions analysis was modified to include the hydraulic connection to Park Lake and the bypass to Lake Killarney using a drop structure links. Details on model modifications are included in their respective sections (**Sections 4.2.1.2** and **4.2.3.2**).

4.2.4.3 Proposed Conditions Model Results

Modeled peak stages at Lake Bell and Lake Killarney and a comparison to existing conditions and pre-storm conditions is presented in **Table 4-8**. A complete summary of node peak stages for FIC #7 is provided as **Appendix H**.

Table 4-8: FIC #7 Modeled Peak Stages

Modeled Peak Stages (ft NAVD)						
Design Storm Event		**2-year, 24-hour**	**10-year, 24-hour**	**25-year, 24-hour**	**100-year, 24-hour**	**Ian**
Lake Bell[1]	Existing Conditions	89.43	89.88	90.63	91.62	92.28
	Pre-Storm Conditions	88.92	89.42	90.14	91.43	92.18
	FIC #7	88.60	88.94	89.42	90.69	91.97
	Change in Peak Stage (ft) from FIC	-0.32	-0.48	-0.72	-0.74	-0.21
Lake Killarney[2]	Existing Conditions	83.01	83.42	83.72	84.34	85.61
	Pre-Storm Conditions	82.54	83.09	83.41	83.95	85.28
	FIC #7	80.71[3]	81.50[3]	81.90	82.73	83.54
	Change in Peak Stage (ft) from FIC	-1.83	-1.59	-1.51	-1.22	-1.74
Downstream Waterbodies & Wetlands						
Grove Street Wetland	Existing Conditions	80.89	81.03	81.12	81.27	81.18
	Pre-Storm Conditions	80.89	81.03	81.12	81.27	81.18
	FIC #7	80.90	81.03	81.12	81.27	81.18
	Change in Peak Stage (ft) from FIC	+0.01	0.00	0.00	0.00	0.00
Lake Gem/ Park Lake	Existing Conditions	69.80	71.17	72.26	74.35	75.27
	Pre-Storm Conditions	69.65	70.52	71.48	73.66	75.16
	FIC #7	70.72	71.40	71.99	73.14	74.64
	Change in Peak Stage (ft) from FIC	+1.07	+0.88	+0.51	-0.52	-0.52

[1]Lake Bell warning stage is equal to 91.62 ft NAVD for roadway flooding, which is the approximate overtopping elevation to Turner Road. Structural flooding is anticipated at 91.80 ft NAVD, which is the approximate FFE of 1100 Turner Road. Yard flooding is anticipated at 90.80 ft NAVD.

[2]Lake Killarney warning stage is equal to 84.40 ft NAVD for structural flooding, which is the approximate FFE of 2118 Lake Drive. Roadway flooding is anticipated at 85.20 ft NAVD, which is the approximate overtopping elevation to Lakefront Boulevard at the south end of Lakefront Boulevard near the boat ramp. Yard flooding is anticipated at 83.40 ft NAVD.

[3]The 24-hour design storm ran for 140 hours but as stage in Lake Killarney remained below its NHWE (82.04 ft NAVD) it was still rising to this water level at the end of the simulation.

As seen in **Table 4-7**, Lake Bell and Lake Killarney peak stages are significantly lower in this improvement concept, when compared to pre-storm conditions.

For Lake Bell, a peak stage less than 91.6 ft NAVD was targeted during the 100-year, 24-hour design storm event to address roadway flooding on Turner Road for all design storm events. This target was achieved for all design storm events using pre-storm operations alone with the FIC providing additional flood benefit of preventing yard flooding during the 100-year, 24-hour design storm events. For Hurricane Ian, the peak stage exceeded 91.6 ft NAVD with yard, roadway, and structural flooding having the potential to occur. The FIC provided a marginal additional benefit of approximately 2-inches as compared to pre-storm operations for the Hurricane Ian storm event.

For Lake Killarney, a peak stage less than 84.4 ft NAVD was targeted during the 100-year, 24-hour design storm event to address structure flooding on Lake Drive. This target as well as elimination of roadway flooding was achieved for all design storm events using pre-storm operations alone and for Hurricane Ian using the FIC. Yard flooding was anticipated starting at the 100-year, 24-hour design storm event under pre-storm conditions and starting at Hurricane Ian event with the FIC.

Increases in peak stage to the downstream waterbody, Lake Gem/Park Lake, was anticipated from this FIC for the 2-year, 24-hour, 10-year, 24-hour, and 25-year, 24-hour design storms. Decreases in peak stage to Lake Gem/Park Lake during the 100-year, 24-hour design storm event and Hurricane Ian storm event are anticipated from this FIC. No increase in peak stage to downstream wetland, Grove Street Wetland, is anticipated from this FIC.

4.2.4.4 Proposed Water Quality Impacts

This FIC will have water quality impacts on Lake Gem/Park Lake. If pursued, pollutant load impacts to Lake Gem/Park Lake would have to be calculated using a 10-year continuous simulation to obtain the annual average loading and a permit obtained through SJRWMD. Due to the fact that pre-storm releases are of treated stormwater rather than the non-treated releases from storm events it is plausible that pollutant loading during flood events would be reduced by this FIC as compared to existing conditions. At the preliminary meeting held with SJRWMD on July 18, 2024, SJRWMD included the following suggestions to identify and address water quality impacts:

- Avoidance of using the wetland for water quality treatment to prevent the need for mitigation of wetland impacts.
- Model pollutant loading from this FIC to ensure no net increase in loading to Lake Gem/Park Lake.
- Baffle box installation in route from Lake Killarney to Lake Gem may be a good option to offset additional loading from this FIC.

4.2.4.5 Implementation Considerations

The following implementation considerations are provided for this FIC:.

- Cost – The estimated construction cost for this improvement concept is $1,231,301. A detailed cost estimate for each individual FIC (#4 and 6) is provided in **Appendix I**.
- Cost/Benefit – This FIC resulted in a substantial decrease in the extent and severity of potential structure flooding around Lake Killarney and roadway flooding along Tuner Road during design storm events. Relative to the other FIC (#5) for Lake Bell, this concept was less expensive and more effective at mitigating potential roadway flooding and achieved a substantial peak stage reduction. Relative to the other FIC (#6) for Lake

Killarney, this concept achieved a substantial peak stage reduction for the 100-year, 24-hour design storm event.

- Engineering Design – Engineering design may include collection of survey data, geotechnical testing, preparation of design plans, preparation of a cost estimate, preparation of technical specifications, and utility coordination.
- Land Acquisition – The location of FIC #4 is within the City of Maitland and Town of Eatonville. The location of the FIC #6 is currently owned by the City of Winter Park. Land acquisition is likely to be required.
- Permitting – A permit from SJRWMD is anticipated to be required for this alternative due to the increased peak flow to and stages in Lake Gem/Park Lake. The preliminary meeting held with SJRWMD on July 18, 2024, confirmed the need for a permit.

4.3 Interim Project Recommendations

FICs were developed for each of the four identified focus areas (Lake Killarney, Lake Bell, Lake Mendsen, and Canton Avenue) to address deficiencies that have been noted by the City and that were validated during the existing conditions analysis. A summary of the FICs is provided below.

4.3.1 CRA Alternatives Analysis Re-Evaluation

Three FICs were investigated as part of the re-evaluation of the CRA study area. Two improvement alternative concepts developed in the 2020 study were re-evaluated for Lake Mendsen and Canton Avenue. A new FIC was developed for Lake Mendsen to address elevated stages which contributed to occasional roadway nuisance flooding upstream of the lake and significant flooding during Hurricane Ian. The improvement alternatives are summarized below.

- **FIC #1** – This improvement concept consists of hydraulically connecting Lake Mendsen to Lake Rose. A new control structure is proposed to convey water from Lake Mendsen to Lake Rose when the stage in Lake Mendsen rises above 83.3 ft NAVD.
    - FIC #1 resulted in a peak stage approximately 0.03-ft lower than pre-storm conditions during the 2-year, 24-hour design storm event. Based on modeling results, potential roadway flooding may still occur starting at the 10-year, 24-hour design storm. The estimated construction cost for this improvement concept is $593,269.
- **FIC #2** – This improvement concept consists of increasing the depth of Lake Mendsen and installing infrastructure to allow for pre-storm drawdowns of Lake Mendsen using a mobile pump. A new force main is proposed to convey emergency releases of water from Lake Mendsen to Lake Killarney during pre-storm drawdowns.
    - FIC #2 resulted in a peak stage approximately 0.20-ft lower than pre-storm conditions during the 2-year, 24-hour design storm event. Based on modeling results, potential roadway flooding may still occur starting at the 10-year, 24-hour design storm. The estimated construction cost for this improvement concept is $905,678.

- **FIC #3** – This improvement concept consists of upsizing the main trunkline that flows west to east along Canton Avenue, adding additional inlet structures, and upsizing an existing inlet structure near the intersection with Park Avenue.
    - FIC #3 resulted a significant decrease in the extent and depth of flooding along Canton Avenue. Based on modeling results, overland flow from Canton Avenue to Knowles Avenue was eliminated for all design storm events except the 100-year, 24-hour event. The estimated construction cost for this improvement concept is $768,245.

Geosyntec recommends proceeding with FIC #2 for Lake Mendsen with additional investigation into improvements in the watershed upstream and downstream of Lake Mendsen. Investigation should include options to divert flows away from Lake Mendsen, including that from Orlando Avenue, and options for supplemental storage. FIC #2 provides slightly greater peak stage reduction as FIC #1 for the 2-year, 24-hour design storm event without causing flooding in Lake Rose however it is not providing substantial flood benefit to an area subject to frequent flooding. In conjunction with further investigation into watershed improvements, implementation of the pond expansion under FIC #2 may provide the additional runoff attenuation needed to alleviate the chronic flooding in this area.

Geosyntec recommends proceeding with FIC #3 for Canton Avenue to address roadway flooding along Canton Avenue. It is noted that potential upsizing of the existing baffle box at the east end of Canton Avenue, which could be necessary from capturing and conveying more runoff, was not assessed as part of this study. A more detailed analysis of the baffle box's capacity and bypass mechanisms is recommended prior to proceeding with retrofit improvements. Based on survey data provided to Geosyntec by the City, the upstream invert of the baffle box is 76.24 ft NAVD, the downstream invert is 76.05 ft NAVD, and the structure bottom is 72.64 ft NAVD. Based on this and assuming that the baffles are located beneath the pipe inverts, it is not expected that conveying more water to the existing baffle box would cause potential upstream flooding. More water would likely bypass the baffles during large storm events, when compared to existing conditions with potential water quality impacts on Lake Osceola.

4.3.2 Lake Bell and Lake Killarney Alternatives Analysis

Four FICs were investigated for the Lake Bell, Lake Wilderness and Lake Killarney interconnections. Two of the FICs – a direct connection from Lake Bell to Park Lake (FIC #4) and improved conveyance to from Lake Killarney to Lake Gem (FIC #6) were requested by the City. The remaining two FICs investigated reduced inflows from the FDOT pond north of Lake Wilderness (FIC #5) and a combination of FIC #4 and 6 (FIC #7).

- **FIC #4** – This improvement concept consists of hydraulically connecting Lake Bell to Park Lake to allow for pre-storm drawdown via emergency releases. A new control structure is proposed to convey water from Lake Bell to Park Lake when the stage in Lake Bell rises above 86.0 ft NAVD prior to a storm event.
    - FIC #4 resulted in a peak stage approximately 0.71-ft lower than pre-storm conditions during the 100-year, 24-hour design storm event and 0.21-ft lower than pre-storm conditions during the Hurricane Ian storm event. Based on modeling results, roadway flooding on Turner Road was eliminated for all design storm

events but not the Hurricane Ian storm event. The estimated construction cost for this improvement concept is $929,662.

- **FIC #5** – This improvement concept consists of expanding the existing FDOT pond north of Lake Wilderness to reduce inflows into Lake Wilderness which connects downstream to Lake Bell and ultimately Lake Killarney.
    - FIC #5 resulted in the same peak stage as pre-storm conditions during the 100-year, 24-hour design storm event and Hurricane Ian storm event. Based on modeling results, roadway flooding on Turner Road was eliminated for all design storm events but not Hurricane Ian due to pre-storm operations. The estimated construction cost for this improvement concept is $3,608,591.
- **FIC #6** – This improvement concept consists of installing a 48-inch bypass to the existing outfall structure on Lake Killarney to allow for pre-storm drawdown via emergency releases to Lake Gem. A new control structure is proposed to convey water from Lake Killarney to Lake Gem when the stage in Lake Killarney is above 78.0 ft NAVD prior to a storm event.
    - FIC #6 resulted in a peak stage approximately 1.10-ft lower than pre-storm conditions during the 100-year, 24-hour design storm event and 1.57-ft lower than pre-storm conditions during the Hurricane Ian storm event. Based on modeling results, structural flooding on Lake Drive would be eliminated for all design storm events and the Hurricane Ian storm event. The estimated construction cost for this improvement concept is $301,639.
- **FIC #7** – This improvement concept consists of hydraulically connecting Lake Bell to Park Lake (FIC #4) and installing 48-inch bypass to the existing outfall structure on Lake Killarney (FIC #6) to allow for pre-storm drawdowns of both Lake Bell and Lake Killarney via emergency releases to Lake Gem/Park Lake.
    - FIC #7 resulted in a peak stage approximately 0.74-ft and 0.21-ft lower than pre-storm conditions for Lake Bell during the 100-year, 24-hour design storm event and Hurricane Ian storm event, respectively. This FIC resulted in peak stage reductions of approximately 1.22-ft and 1.74-ft from pre-storm conditions for Lake Killarney during the 100-year, 24-hour design storm event and Hurricane Ian storm event, respectively. Based on modeling results for Lake Bell, roadway flooding on Turner Road was eliminated for all design storm events but not the Hurricane Ian storm event. Based on modeling results for Lake Killarney, structural flooding on Lake Drive would be eliminated for all design storm events and the Hurricane Ian storm event. The estimated construction cost for this improvement concept is $1,231,301

Geosyntec recommends proceeding with FIC #7 for Lake Bell and Lake Killarney as it provides the greatest peak stage reduction for Lake Bell and Lake Killarney. In order to mitigate increased peak stages at Lake Gem/Park Lake during the smaller design storm events (2-year, 24-hour, 10-year, 24-hour, and 25-year, 24-hour), operational strategies for the operable gates should be investigated to evaluate timing of opening the gate and optimal pre-storm stages depending on storm severity. Due to the cost of implementation and complexity of collaborating with City of Maitland and Town of Eatonville to implement the hydraulic connection between Lake Bell and Park Lake (FIC #4), a phased approach may be taken to implement FIC #6 prior to FIC #4.

Modeling the pollutant loading from both of these projects jointly is recommended to ensure there is no net increase in loading to Lake Gem/Park Lake.

5. CONCLUSIONS AND RECOMMENDATIONS

The purpose of this study was to perform a holistic existing conditions analysis for the expanded study area and to develop cost effective and feasible engineering improvement alternatives for the focus areas: Lake Killarney, Lake Bell, Lake Mendsen, and Canton Avenue.

An existing conditions evaluation was performed for the study area. Deficiencies identified throughout the CRA area during this evaluation are summarized below.

Potential Water Quality Treatment Deficiencies – Water quality deficiencies resulting from lack of water quality treatment or substandard treatment were documented at the locations listed below.

- **Lakeview Drive Outfall to Lake Virginia** – Stormsewer system discharges directly to Lake Virginia after minimal treatment in the 9th Grade Center Pond.
- **Beachview Avenue Outfall to Lake Killarney** – Stormsewer system discharges portion of runoff not treated by Lake Mendsen directly to Lake Killarney after trash/debris collection.
- **Ololu Drive Outfall to Lake Killarney –** Stormsewer system discharges directly to Lake Killarney after trash/debris collection.
- **Euston Road Outfalls to Lake Killarney –** Stormsewer system discharges directly to Lake Killarney after trash/debris collection.
- **Salisbury Boulevard Outfalls to Lake Killarney –** Stormsewer system discharges directly to Lake Killarney after trash/debris collection.
- **Clay Street Outfall to Lake Killarney –** Stormsewer system discharges directly to Lake Killarney after trash/debris collection.
- **West Fairbanks Avenue Outfall to Lake Killarney –** Stormsewer system discharges directly to Lake Killarney after trash/debris collection.
- **Kilshore Lane Outfall to Lake Killarney –** Stormsewer system discharges directly to Lake Killarney without water quality treatment.
- **Lakeview Avenue Outfall to Lake Killarney –** Stormsewer system discharges directly to Lake Killarney without water quality treatment.
- **Shoreview Avenue Outfall to Lake Killarney –** Stormsewer system discharges directly to Lake Killarney without water quality treatment.
- **Broadview Avenue Outfall to Lake Killarney –** Stormsewer system discharges directly to Lake Killarney after trash/debris collection.
- **Fairview Avenue Outfalls to Lake Killarney –** Stormsewer system discharges directly to Lake Killarney without water quality treatment.
- **Hillstone Restaurant Outfall to Lake Killarney –** Stormsewer system discharges directly to Lake Killarney without water quality treatment.

- **Killarney Bay Court Outfall to Lake Killarney –** Stormsewer system discharges directly to Lake Killarney after trash/debris collection.
- **Gay Road Outfall to Lake Killarney –** Stormsewer system discharges directly to Lake Killarney without water quality treatment.
- **Lake Front Boulevard Outfalls to Lake Killarney –** Stormsewer system discharges directly to Lake Killarney after trash/debris collection treatment on one of its four outfalls. The remaining three outfalls discharge directly to Lake Killarney without water quality treatment.
- **Country Club Drive Outfalls to Lake Killarney** – Stormsewer system discharges directly to Lake Killarney after trash/debris collection.
- **Lee Road Outfall to Lake Killarney –** Stormsewer system discharges directly to Lake Killarney after sediment/debris collection.
- **Blossom Lane Outfall to Lake Killarney –** Stormsewer system discharges directly to Lake Killarney without water quality treatment.
- **Lake Drive Outfalls to Lake Killarney –** Stormsewer system discharges directly to Lake Killarney without water quality treatment.
- **Rippling Lane Outfalls to Lake Killarney –** Stormsewer system discharges directly to Lake Killarney without water quality treatment.
- **Grove Street Outfalls to Park Lake –** Stormsewer system discharges directly to Park Lake without water quality treatment.
- **The Adeline Apartment Complex Outfall to Park Lake –** Stormsewer system discharges directly to Park Lake without water quality treatment.
- **Monroe Avenue Outfall to Lake Gem –** Stormsewer system discharges directly to Lake Gem without water quality treatment.
- **Monroe Avenue/South Orlando Avenue Outfalls to Lake Gem –** Stormsewer system discharges directly to Lake Gem after sediment/debris collection.
- **South West Street to Lake Bell –** Stormsewer system discharges directly to Lake Bell without water quality treatment.
- **Lake Bell Drive Outfall to Lake Bell –** Stormsewer system discharges directly to Lake Bell without water quality treatment.
- **Turner Road Outfall to Lake Bell –** Stormsewer system discharges directly to Lake Bell without water quality treatment.
- **Monroe Avenue Ditch Outfall to Lake Bell –** Ditch system discharges directly to Lake Bell without water quality treatment.

Potential Flood Prone Locations – Potential roadway flooding during the 10-year, 24-hour design storm event was documented at the locations listed below.

- **Nicolet Pond** – Stormwater system upstream of Nicolet Pond.

- **West End of Miller Avenue** – Stormsewer system at the west end of Miller Avenue.
- **Intersection of Bennett Avenue and Kindel Avenue** – Stormsewer system at the intersection of Bennett Avenue and Kindel Avenue.
- **Lake Francis** – Stormsewer system upstream of Lake Francis.
- **Lake Midget** – Lake Midget and the upstream stormsewer system.
- **Intersection of West Lyman Avenue and South Pennsylvania Avenue** – Stormsewer system at the intersection of West Lyman Avenue and South Pennsylvania Avenue.
- **East Welbourne Avenue** – Stormsewer system at East Welbourne Avenue between the intersections with South Park Avenue and South Interlachen Avenue.
- **East Fairbanks Avenue** – Stormsewer system at East Fairbanks Avenue between the intersections with Chapman Avenue and South Interlachen Avenue.
- **South Orlando Avenue** – Stormsewer system at South Orlando Avenue between the intersections with West Fairbanks Avenue and West Comstock Avenue.
- **Orange Avenue** – Stormsewer system at Orange Avenue between the intersections with South Pennsylvania Avenue and South Capen Avenue.
- **East End of East Swoop Avenue** – Stormsewer system at the east end of East Swoop Avenue.
- **North Interlachen Avenue** – Stormsewer system along North Interlachen Avenue between the intersections of East Webster Avenue and East Swoope Avenue.
- **East Lyman Avenue** – Stormsewer system along Lyman Avenue between the intersections of South New York Avenue and South Interlachen Avenue.
- **East End of Huntington Avenue** – Stormsewer system at the east end of Huntington Avenue.
- **Douglas Avenue** – Stormsewer system at Douglas Avenue.
- **Orange Avenue** – Stormsewer system at Orange Avenue between the intersections with South Denning Drive and Aragon Avenue.
- **Intersection of Carolina Avenue and North New York Avenue** – Stormsewer system at the intersection of Carolina Avenue and North New York Avenue.
- **Intersection of South Orlando Avenue and Gene Street** – Stormsewer system at the intersection of S Orlando Avenue and Gene Street.
- **North Orlando Avenue –** Stormsewer system along North Orlando Avenue at the intersections with Gay Road and West Webster Avenue.
- FDOT Stormwater Pond (southwest of Lee Rd and I-4) – FDOT pond and the upstream stormsewer system.
- **Intersection of Schultz Avenue and Miller Avenue** – Stormsewer system at the intersection of Schultz Avenue and Miller Avenue.

- **Intersection of Minnesota Avenue and Shultz Avenue** – Stormsewer system at the intersection of Minnesota Avenue and Shultz Avenue.
- **Intersection of West Fairbanks Avenue and Ward Avenue** – Stormsewer system at the intersection of West Fairbanks Avenue and Ward Avenue.

Geosyntec recommends that the City review these identified deficiencies and if warranted, proceed with improvement alternative concepts to correct the deficiencies.

Findings from the existing conditions evaluation for the focus areas are summarized below.

- **Lake Killarney** – Model results indicated potential structure flooding along Lake Drive resulting from elevated stages in Lake Killarney beginning at the 100-year, 24-hour design storm event, potential roadway flooding during the Hurricane Ian storm event, and potential yard flooding along Lake Drive beginning at the 25-year, 24-hour design storm event. These finding suggests that the existing drainwells that service Lake Killarney and existing outfall to Lake Gem Mendsen are insufficient to effectively manage the peak stage in the lake. These findings are consistent with observations reported by City staff.
- **Lake Bell** – Model results indicated potential yard and street flooding along Tuner Road resulting from elevated stages in Lake Bell beginning at the 100-year, 24-hour design storm event and potential structure flooding during the Hurricane Ian storm event. These findings suggests that the existing outfall to Lake Killarney is insufficient to effectively manage the peak stage in the lake. These findings are consistent with observations reported by City staff.
- **Lake Mendsen** – Model results indicated potential street flooding along Denning Drive resulting from elevated stages in Lake Mendsen beginning at the 2-year, 24-hour design storm event and potential yard and structure flooding beginning at the 10-year, 24-hour design storm event. These findings suggests that the existing drainwells that service Lake Mendsen and the Lake Mendsen/Killarney interconnect are insufficient to effectively manage the peak stage in the lake. These findings are consistent with observations reported by City staff.
- **Canton Avenue** – Model results indicated potential roadway flooding for Canton Avenue beginning at the 2-year, 24-hour design storm event. Roadway flooding was most severe between the intersections with Center Street and Knowles Avenue. These findings suggest the existing drainage infrastructure along Canton Avenue is inadequate to capture and convey stormwater runoff from Canton Avenue and the adjacent contributing area. These findings are consistent with observations reported by City staff.

Based on these findings, improvement alternative concepts were developed for each focus area to address the deficiencies above. Improvement alternative recommendations are summarized below.

- **Lake Killarney and Lake Bell** – Geosyntec recommends proceeding with FIC #7, creating a hydraulic connection between Lake Bell and Park Lake and installing a 48-inch bypass to the existing outfall structure on Lake Killarney, as the combination of these alternatives provides the greatest peak stage reduction to lake Killarney. In order to mitigate increased peak stages at Lake Gem/Park Lake during the smaller design storm events (2-year, 24-hour, 10-year, 24-hour, and 25-year, 24-hour), operational strategies for the operable gates should be investigated to evaluate timing of opening the gate and

optimal pre-storm stages depending on storm severity. Due to the cost of implementation and complexity of collaborating with City of Maitland and Town of Eatonville to implement the hydraulic connection between Lake Bell and Park Lake, a phased approach may be taken to implement FIC #6 prior to FIC #4.

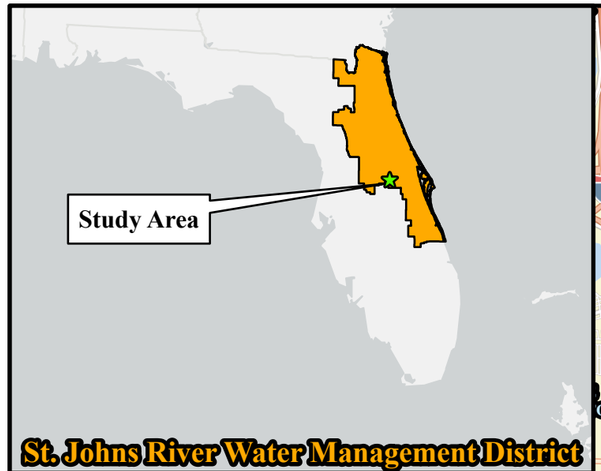
- **Lake Mendsen** – Geosyntec recommends proceeding with FIC #2, mobile pump and Lake Mendsen expansion, with additional investigation into improvements in the watershed upstream and downstream of Lake Mendsen. Investigation should include options to divert flows away from Lake Mendsen, including that from Orlando Avenue, and options for supplemental storage. FIC #2 provides slightly greater peak stage reduction as FIC #1 for the 2-year, 24-hour design storm event without causing flooding in Lake Rose however it is not providing substantial flood benefit to an area subject to frequent flooding. In conjunction with further investigation into watershed improvements, implementation of the pond expansion under FIC #2 may provide the additional runoff attenuation needed to alleviate the chronic flooding in this area.
- **Canton Avenue** – Geosyntec recommends proceeding with FIC #3, upsizing the main trunkline that flows west to east along Canton Avenue, due to the decrease in the extent and depth of roadway flooding along Canton Avenue and overland flow from Canton Avenue along Knowles Avenue and Park Avenue.

Once the City has selected their desired FIC(s), the following steps are recommended to design the project(s) for bidding and construction.

- Permitting – A permit determination meeting is recommended with all relevant permitting agencies.
- Topographic Survey – Collect topographic survey for design and construction plans development along project alignment. Survey should include existing drainage structure details, above and below ground utilities, property lines, and ancillary features (mailboxes, signs, poles, etc.). Topographic survey should be design level sufficient to generate a 3D tin file of the surface along the project alignment.
- Geotechnical Evaluation – Drill borings, test, and evaluate soils and groundwater characteristics in the project footprint to support design and construction. The geotechnical evaluation should include an assessment of suitability of soils related to proposed drainage infrastructure and provide recommendations for construction (excavation, backfill, compaction, removal of any unsuitable soils).
- Design – Develop final design of proposed drainage improvements, construction plans, engineer's cost estimate, and technical specifications to support bidding and construction of the project.
- Utility Coordination – Forward copies of draft plans to identified utilities to solicit input on possible conflicts and conflict resolutions.

EXHIBITS

DRAFT



CITY OF WINTER PARK, FLORIDA
ESTABLISHED 1882
CITY OF CULTURE AND HERITAGE

N

0 1,250 2,500
Feet

Legend

- Study Area
- City of Winter Park
- CRA Study Area

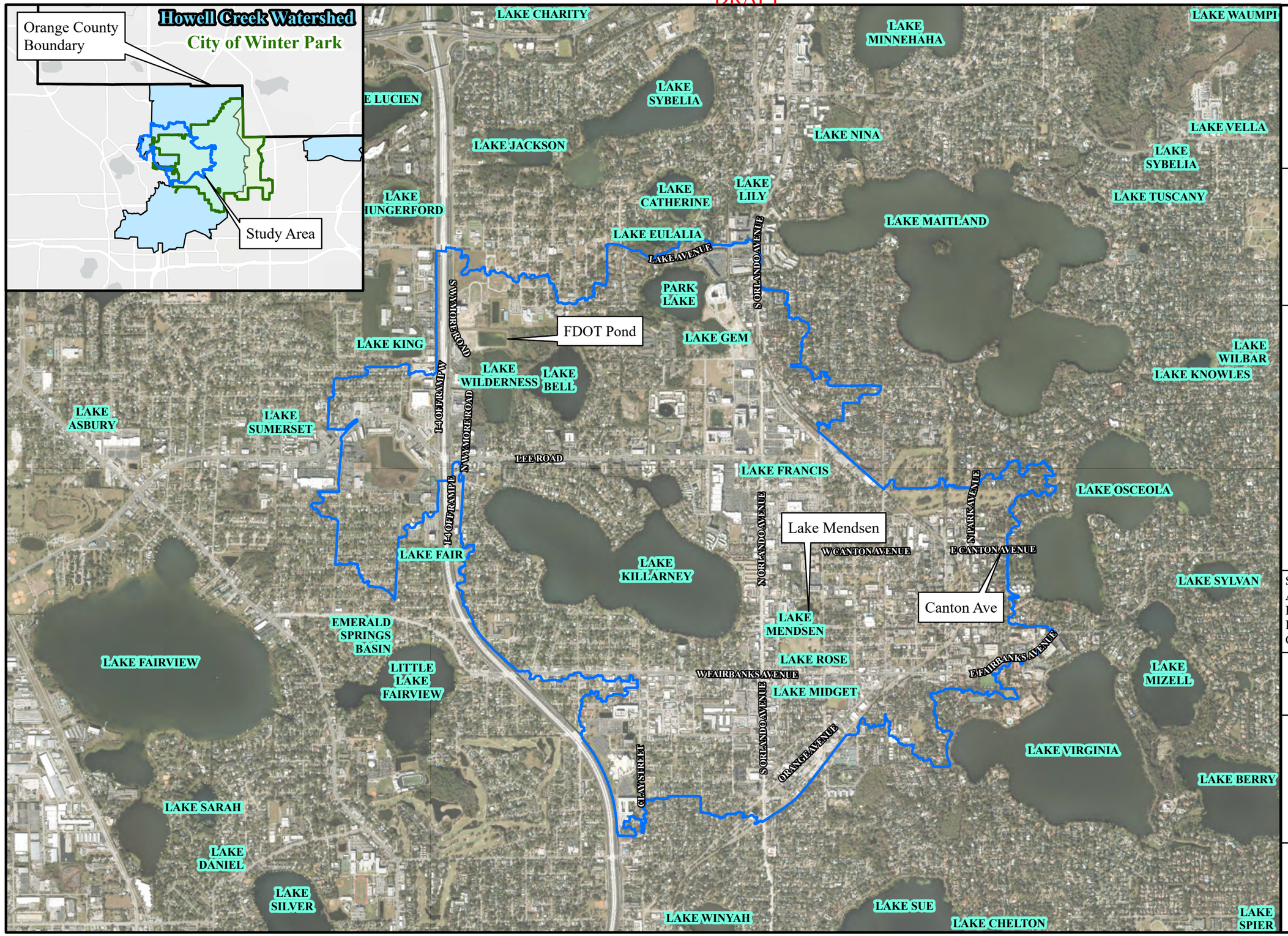
Sources:
Basemap: ESRI, 2024
Lakes: Orange County, 2020
City Boundary: Orange County, 2023

Exhibit
1

Vicinity Map

Winter Park CRA Study Update
and Lake Killarney
Expansion Report

Geosyntec consultants



CITY OF WINTER PARK, FLORIDA
ESTABLISHED 1882
CITY OF CULTURE AND HERITAGE

N

0 1,000 2,000
Feet

Legend

Study Area

Sources:
Aerial: ESRI, 2023
Roads: Orange County, 2020
Lakes: Orange County, 2020
City Boundary: Orange County, 2023

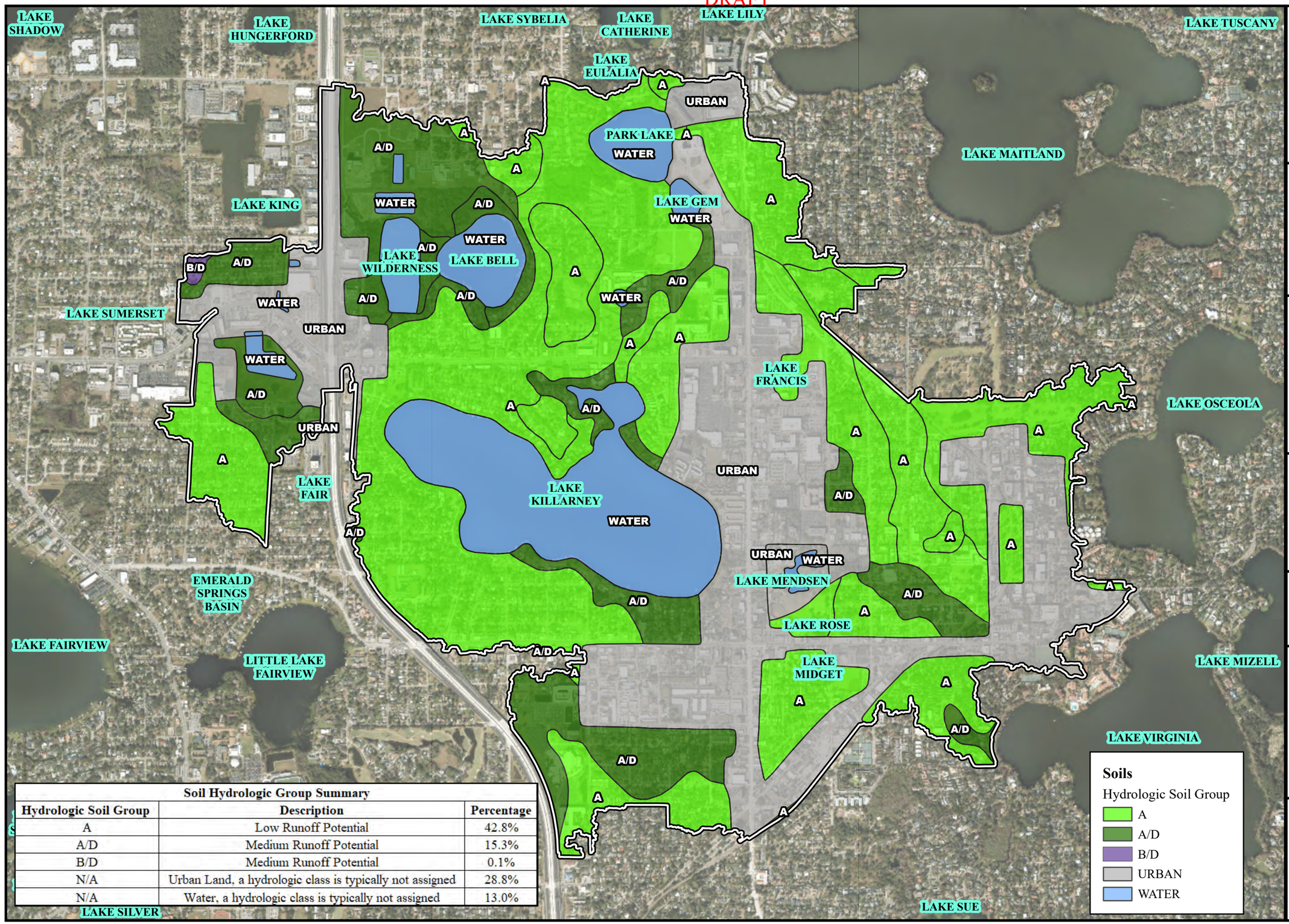
Exhibit
2

Site Map

Winter Park CRA Study Update and Lake Killarney Expansion Report

Geosyntec consultants

DRAFT



Soil Hydrologic Group Summary		
Hydrologic Soil Group	**Description**	**Percentage**
A	Low Runoff Potential	42.8%
A/D	Medium Runoff Potential	15.3%
B/D	Medium Runoff Potential	0.1%
N/A	Urban Land, a hydrologic class is typically not assigned	28.8%
N/A	Water, a hydrologic class is typically not assigned	13.0%

CITY OF WINTER PARK, FLORIDA
ESTABLISHED 1882
CITY OF CULTURE AND HERITAGE

N

0 750 1,500
Feet

Legend

Study Area

Sources:
Aerial: ESRI, 2023
Soils: NRCS, 2023
Lakes: Orange County, 2020

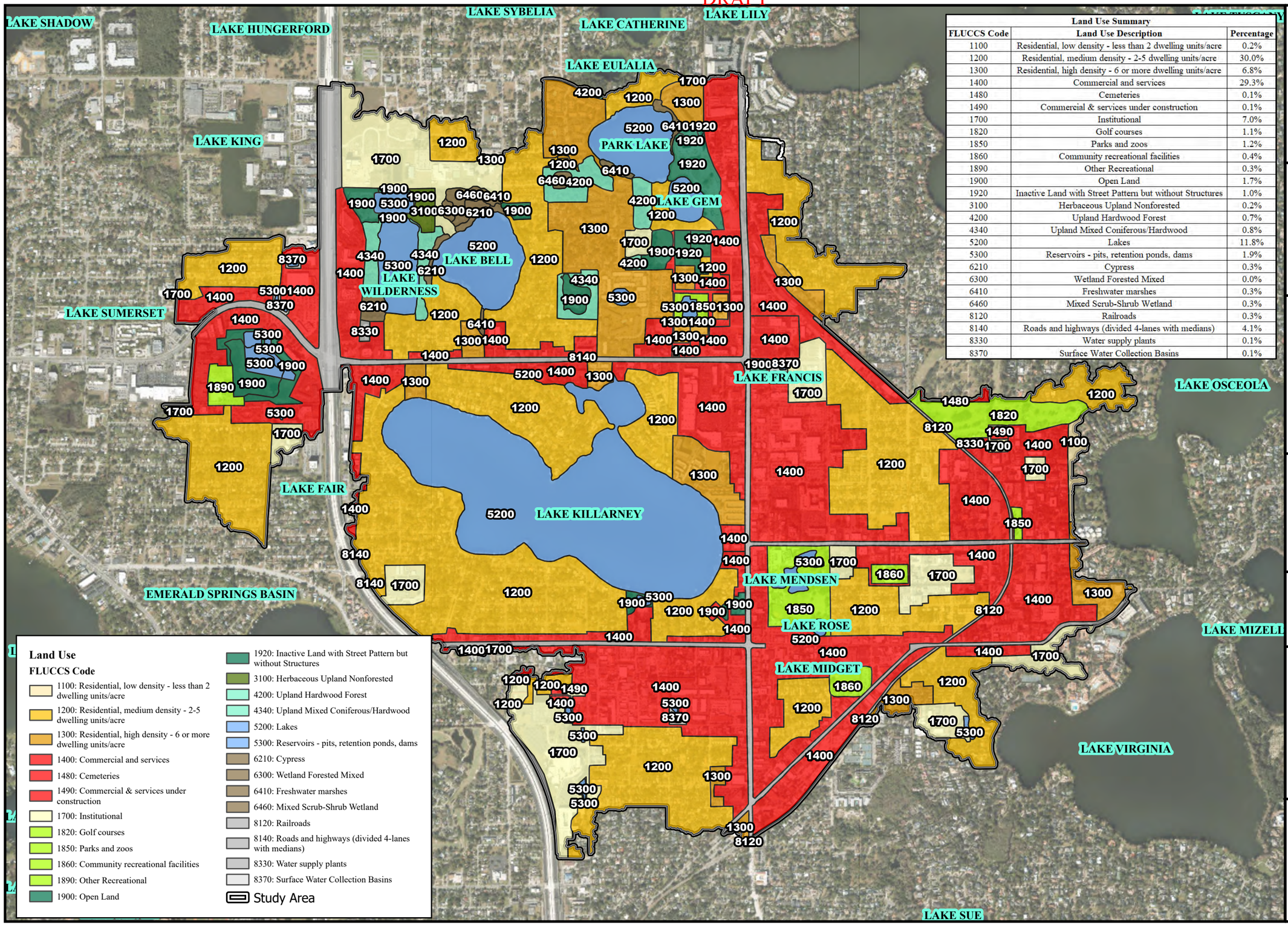
Exhibit
3

Soils Map

Winter Park CRA Study Update
and Lake Killarney
Expansion Report

Geosyntec consultants

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Land Use Summary		
FLUCCS Code	Land Use Description	Percentage
1100	Residential, low density - less than 2 dwelling units/acre	0.2%
1200	Residential, medium density - 2-5 dwelling units/acre	30.0%
1300	Residential, high density - 6 or more dwelling units/acre	6.8%
1400	Commercial and services	29.3%
1480	Cemeteries	0.1%
1490	Commercial & services under construction	0.1%
1700	Institutional	7.0%
1820	Golf courses	1.1%
1850	Parks and zoos	1.2%
1860	Community recreational facilities	0.4%
1890	Other Recreational	0.3%
1900	Open Land	1.7%
1920	Inactive Land with Street Pattern but without Structures	1.0%
3100	Herbaceous Upland Nonforested	0.2%
4200	Upland Hardwood Forest	0.7%
4340	Upland Mixed Coniferous/Hardwood	0.8%
5200	Lakes	11.8%
5300	Reservoirs - pits, retention ponds, dams	1.9%
6210	Cypress	0.3%
6300	Wetland Forested Mixed	0.0%
6410	Freshwater marshes	0.3%
6460	Mixed Scrub-Shrub Wetland	0.3%
8120	Railroads	0.3%
8140	Roads and highways (divided 4-lanes with medians)	4.1%
8330	Water supply plants	0.1%
8370	Surface Water Collection Basins	0.1%

Land Use

FLUCCS Code

- 1100: Residential, low density - less than 2 dwelling units/acre
- 1200: Residential, medium density - 2-5 dwelling units/acre
- 1300: Residential, high density - 6 or more dwelling units/acre
- 1400: Commercial and services
- 1480: Cemeteries
- 1490: Commercial & services under construction
- 1700: Institutional
- 1820: Golf courses
- 1850: Parks and zoos
- 1860: Community recreational facilities
- 1890: Other Recreational
- 1900: Open Land
- 1920: Inactive Land with Street Pattern but without Structures
- 3100: Herbaceous Upland Nonforested
- 4200: Upland Hardwood Forest
- 4340: Upland Mixed Coniferous/Hardwood
- 5200: Lakes
- 5300: Reservoirs - pits, retention ponds, dams
- 6210: Cypress
- 6300: Wetland Forested Mixed
- 6410: Freshwater marshes
- 6460: Mixed Scrub-Shrub Wetland
- 8120: Railroads
- 8140: Roads and highways (divided 4-lanes with medians)
- 8330: Water supply plants
- 8370: Surface Water Collection Basins
- Study Area

CITY OF WINTER PARK, FLORIDA
ESTABLISHED 1882
CITY OF CULTURE AND HERITAGE

N

0 750 1,500
Feet

Legend

Study Area

Sources:
Aerial: ESRI, 2023
Land Use: SJRWMD, 2014
Lakes: Orange County, 2020

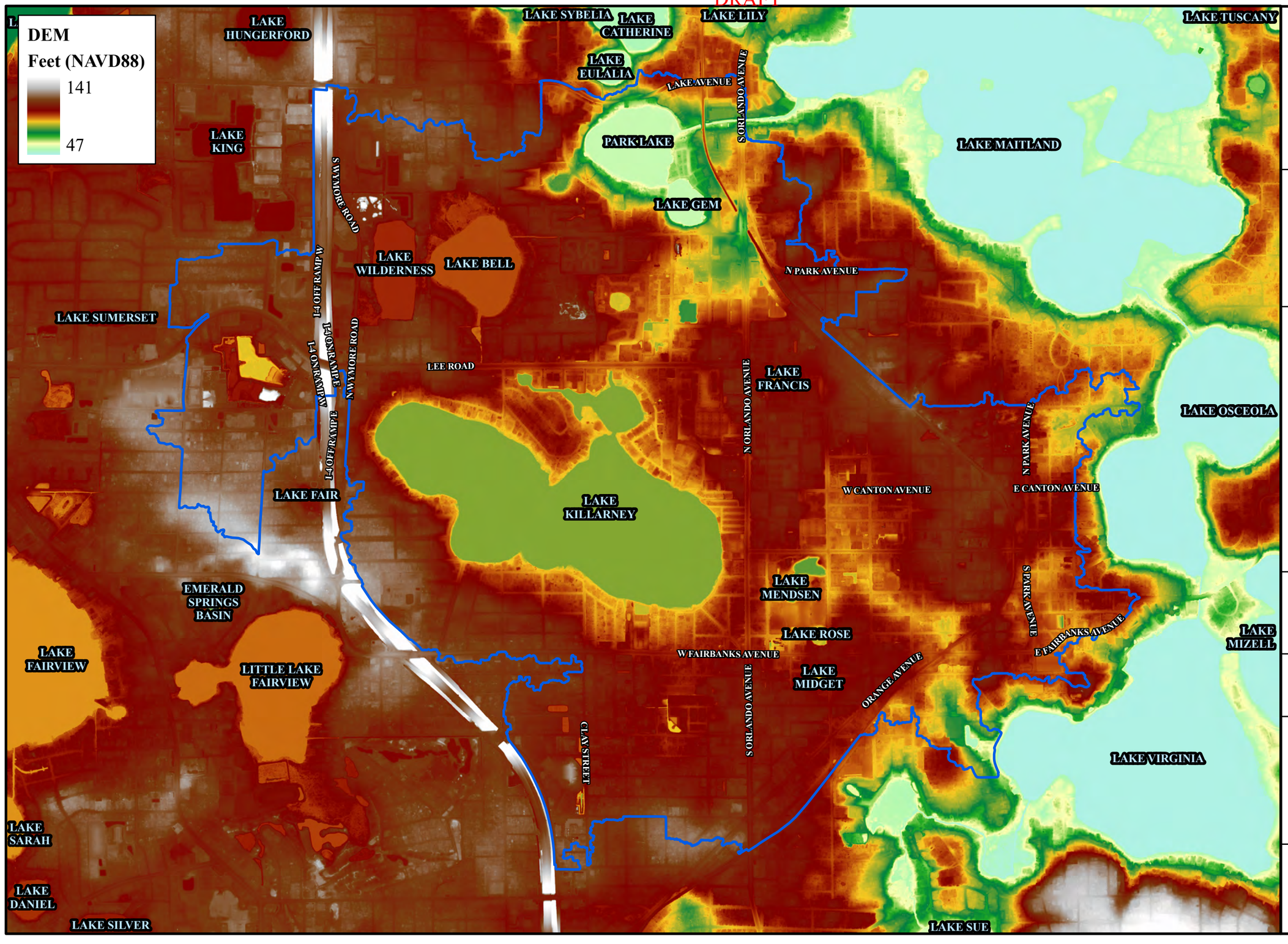
Exhibit
4

Land Use Map

Winter Park CRA Study Update and Lake Killarney Expansion Report

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CITY OF CULTURE AND HERITAGE

N

0 750 1,500
Feet

Legend

Study Area

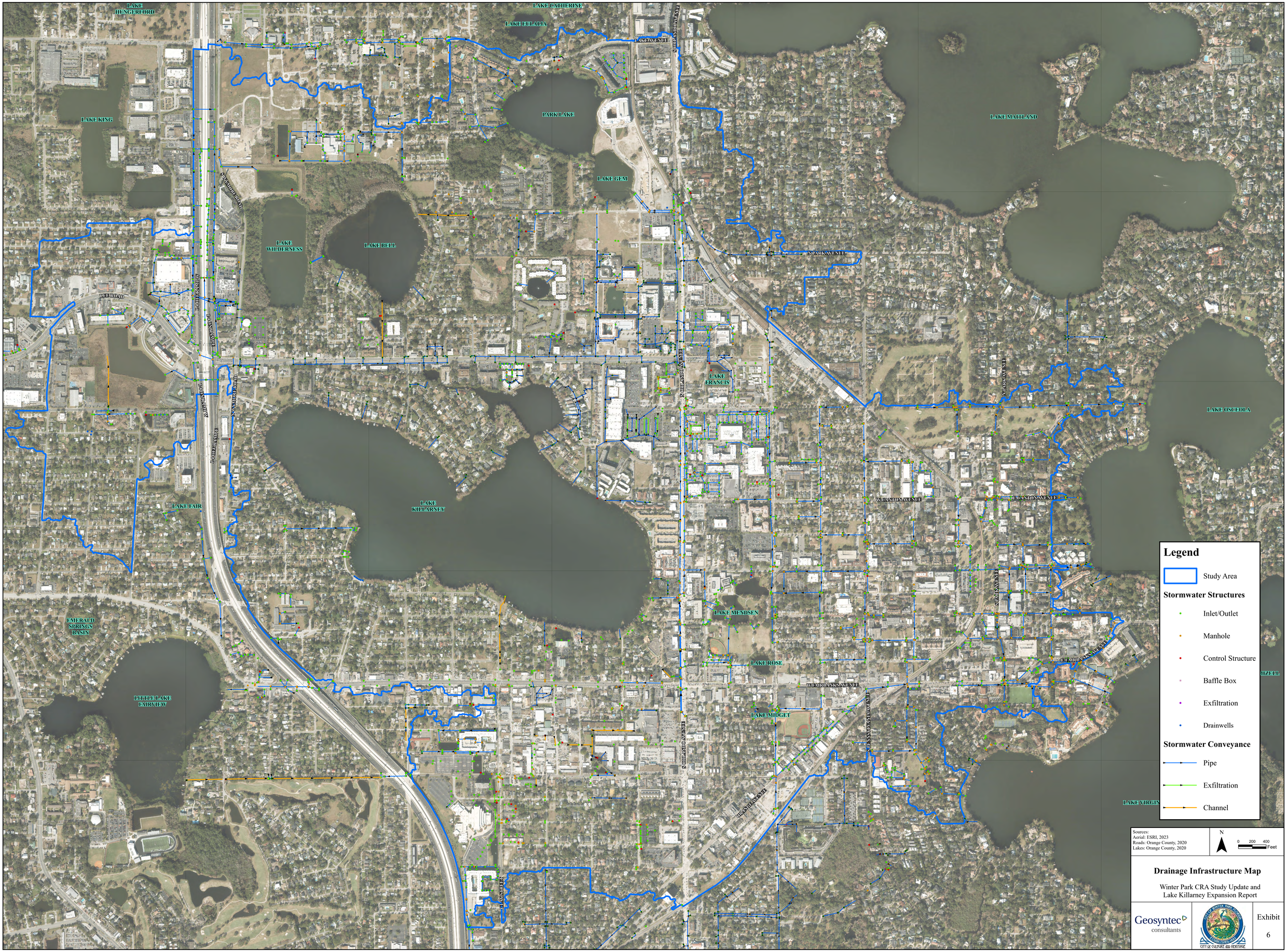
Sources:
Aerial: ESRI, 2023
Lakes: Orange County, 2020
Roads: Orange County, 2020

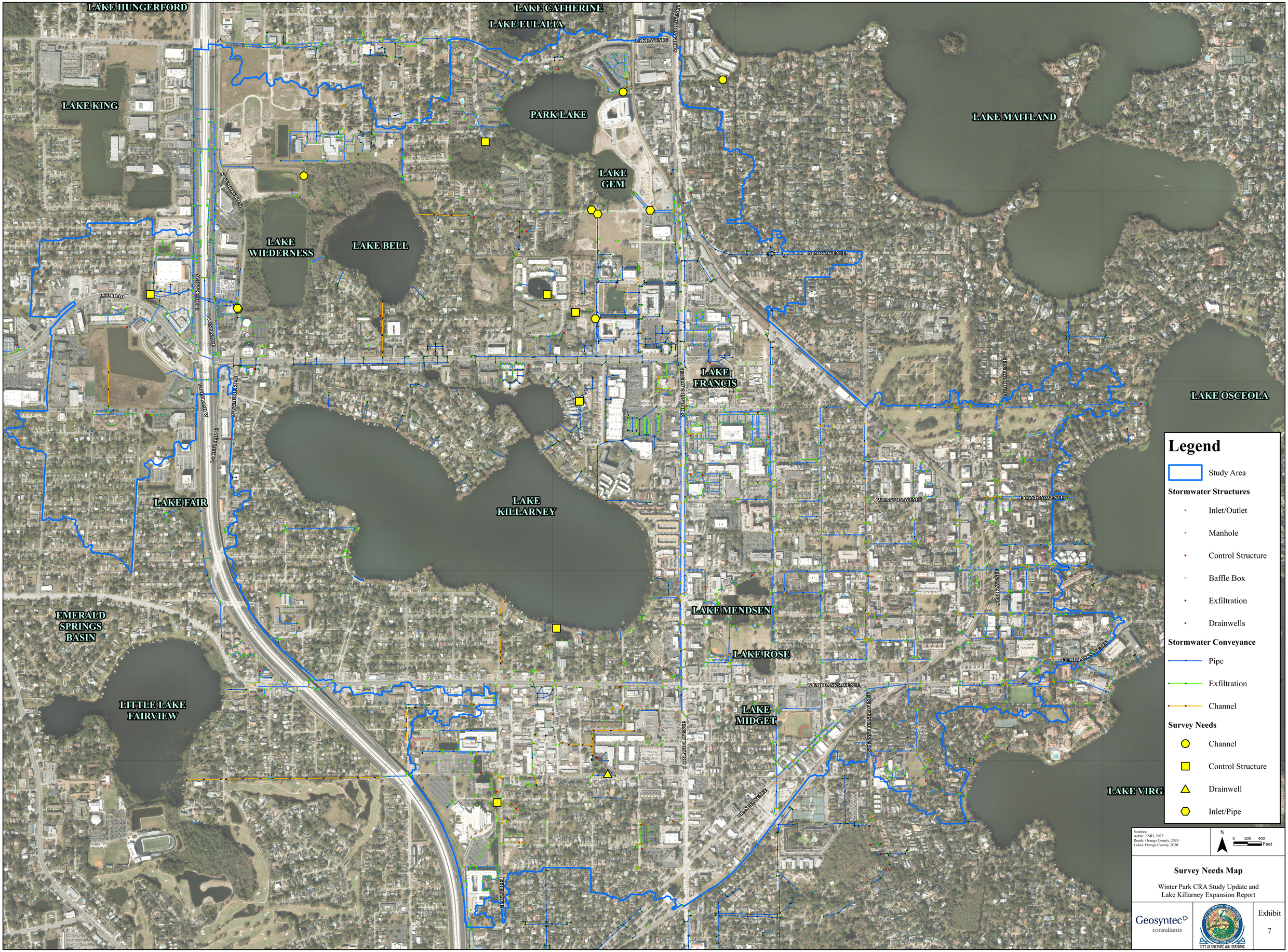
Exhibit
5

DEM Map

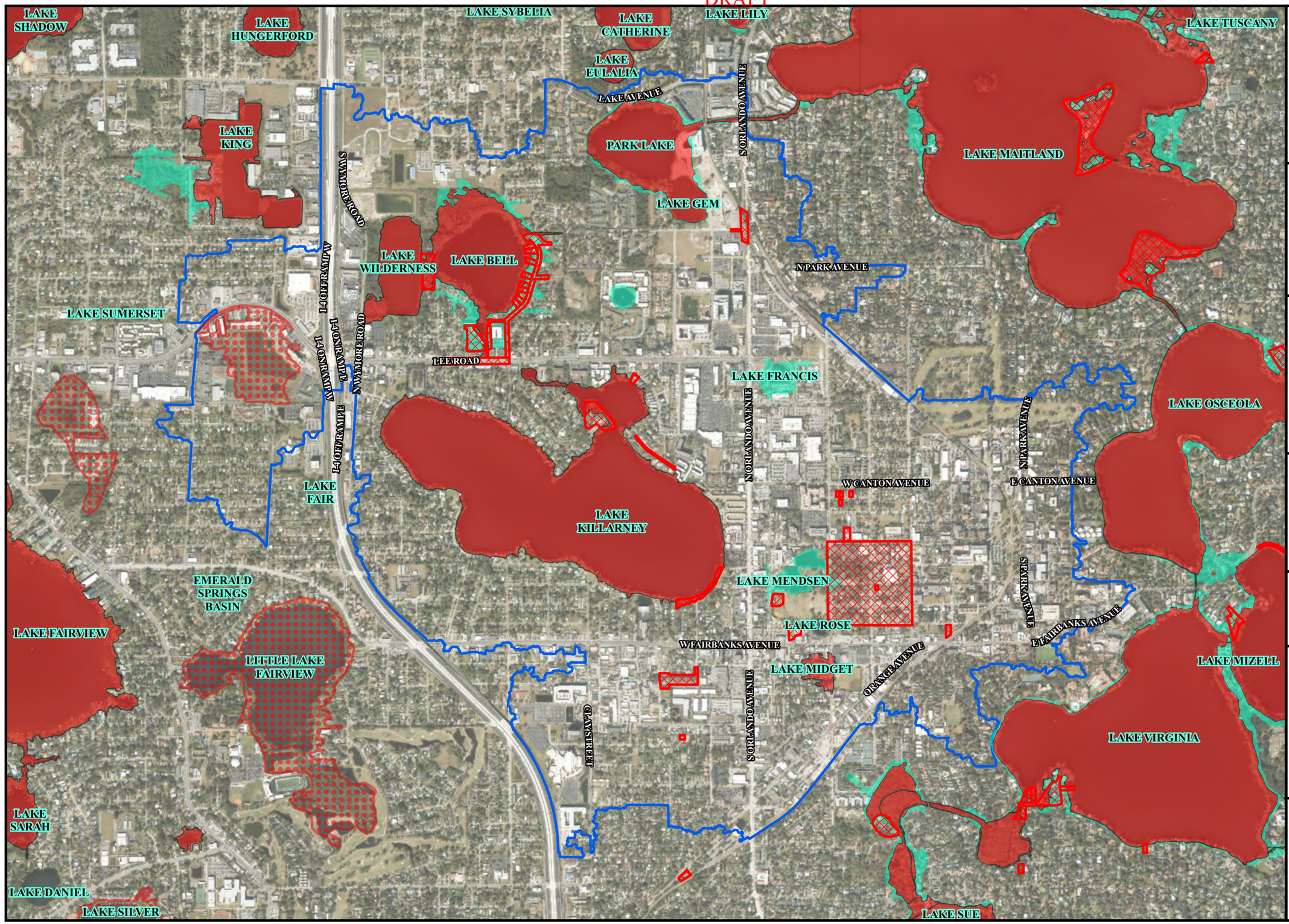
Winter Park CRA Study Update
and Lake Killarney
Expansion Report

Geosyntec consultants


LAKE HUNGERFORD
LAKE CATHERINE
LAKE ETTA
LAKE AVENUE
S ORLANDO AVENUE
LAKE KING
PARK LAKE
LAKE MALLELAND
LAKE GEM
SYMMES ROAD
LAKE WILDERNESS
LAKE BELL
N PARK AVENUE
FEE ROAD
DENNING DRIVE
FROST STREET
LAKE FRANCIS
LAKE OSCEOLA
LAKE FAIR
LAKE KILLARNEY
W CANTON AVENUE
E CANTON AVENUE
LAKE MENDSEN
EMERALD SPRINGS BASIN
LAKE ROSE
W FAIRBANKS AVENUE
E FAIRBANKS AVENUE
FLETCHER LAKE FAIRVIEW
LAKE MIDGET
S ORANGE AVENUE
ORANGE AVE
LAKE VIRGIN
HZELL
Legend
Study Area
Stormwater Structures
Inlet/Outlet
Manhole
Control Structure
Baffle Box
Exfiltration
Drainwells
Stormwater Conveyance
Pipe
Exfiltration
Channel
Sources:
Aerial: ESRI, 2023
Roads: Orange County, 2020
Lakes: Orange County, 2020
N
0 200 400
Feet
Drainage Infrastructure Map
Winter Park CRA Study Update and
Lake Killarney Expansion Report
Geosyntec consultants
CITY OF CULTURE AND HERITAGE
Exhibit
6


LAKE HUNGERFORD
LAKE CATHERINE
LAKE EULALIA
LAKE KING
PARK LAKE
LAKE MAITLAND
LAKE GEM
LAKE WILDERNESS
LAKE BELL
LAKE FRANCIS
LAKE OSCEOLA
LAKE FAIR
LAKE KILLARNEY
EMERALD SPRINGS BASIN
LAKE MENDSEN
LAKE ROSE
LITTLE LAKE FAIRVIEW
LAKE MIDGET
LAKE VIRG
LAKE AVENUE
NORTH PARK AVENUE
N PARK AVENUE
SUNRISE ROAD
FAIRBANKS AVENUE
PEE ROAD
ORANGE AVENUE
ORLANDO AVENUE
W CANTON AVENUE
E CANTON AVENUE
SPRING AVENUE
E FAIRBANKS AVENUE
W FAIRBANKS AVENUE
DENNIS AVENUE
Legend
Study Area
Stormwater Structures
Inlet/Outlet
Manhole
Control Structure
Baffle Box
Exfiltration
Drainwells
Stormwater Conveyance
Pipe
Exfiltration
Channel
Survey Needs
Channel
Control Structure
Drainwell
Inlet/Pipe
Sources:
Aerial: ESRI, 2023
Roads: Orange County, 2020
Lakes: Orange County, 2020
N
0 200 400
Feet
Survey Needs Map
Winter Park CRA Study Update and
Lake Killarney Expansion Report
Geosyntec consultants
CITY OF CULTURE AND HERITAGE
Exhibit
7

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ESTABLISHED 1882
CITY OF CULTURE AND HERITAGE

N

0 750 1,500
Feet

Legend

- Flood Complaints (Hurricane Ian)

Flood Zone

- AE (BFE Determined)
- A (No BFE Determined)
- X (0.2% Annual Chance Flood)
- Study Area

Sources:
Aerial: ESRI, 2023
Lakes: Orange County, 2020
SFHA: FEMA, 2021

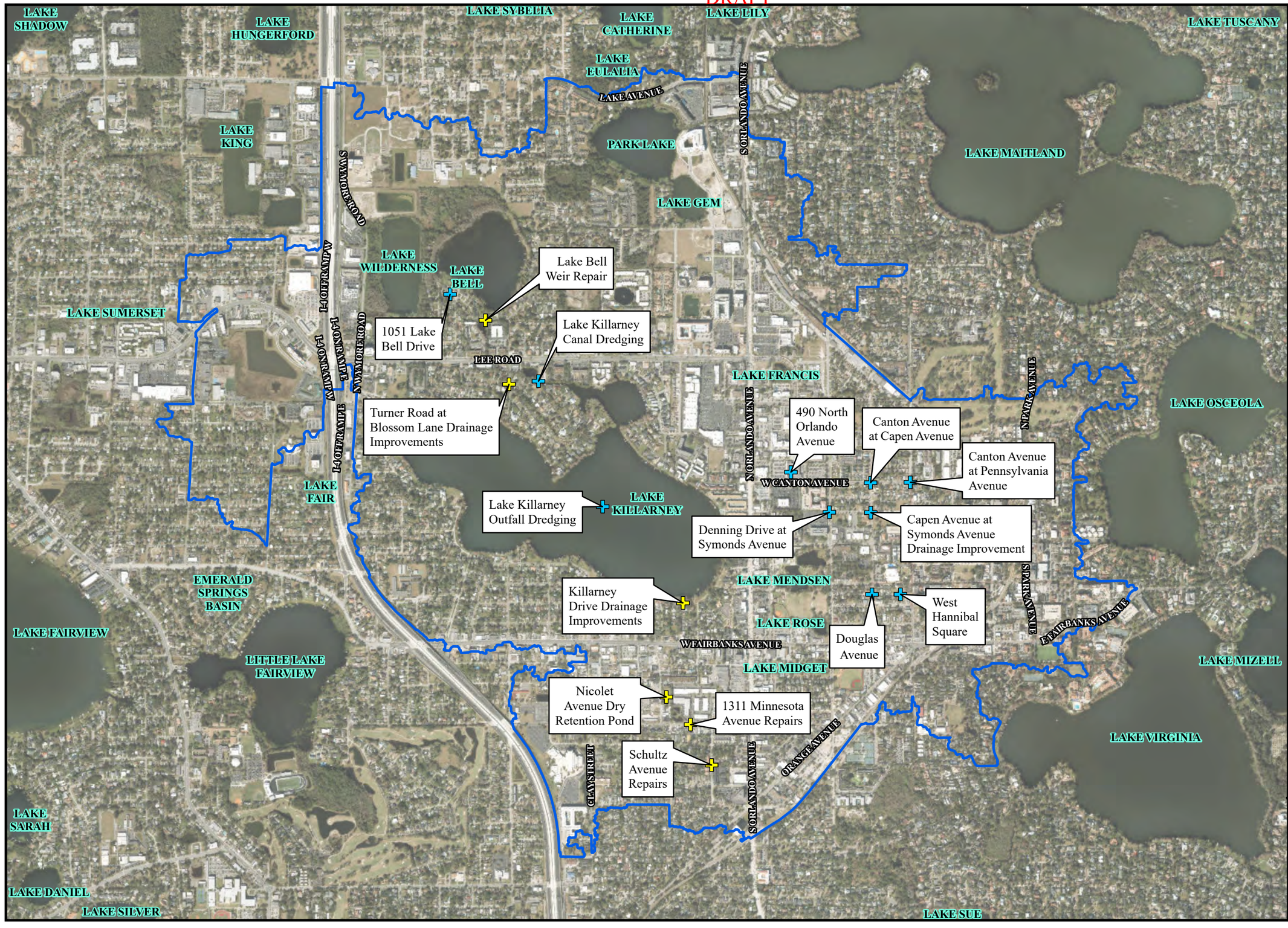
Exhibit
8

FEMA Floodplains and Problem Areas Map

Winter Park CRA Study Update and Lake Killarney Expansion Report

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ESTABLISHED 1882
CITY OF CULTURE AND HERITAGE

N

0 750 1,500
Feet

Legend

Capital Improvement Projects
- Completed
- Planned
- Study Area

Sources:
Aerial: ESRI, 2023
Lakes: Orange County, 2020
SFHA: FEMA, 2021

Exhibit
9

Capital Improvement Projects Map

Winter Park CRA Study Update and Lake Killarney Expansion Report

Geosyntec consultants

Summary of Lake Outfalls			
ID	**Outfall Location**	**Presence of Upstream BMP or End of Pipe Treatment**	**Treatment Type(s)**
Lake Osceola			
1	East Webster Avenue	Yes	Alum, baffle box
2, 3	Morse Boulevard	Yes	Alum, Baffle Box
4	Lincoln Avenue	Yes	Alum
5, 6	Alexander Place	Yes	Alum, baffle box
7	Canton Avenue	Yes	Alum, Baffle Box
Lake Virginia			
8, 9	East Fairbank Avenue/Rollins College	Yes	Alum
10	Lakeview Drive	Yes	Stormwater Pond
Lake Killarney			
11	Ololu Drive	Yes	Curb Inlet Basket
12, 13	Euston Road	Yes	Curb Inlet Basket
14, 15	Salisbury Boulevard	Yes	Curb Inlet Basket
16	Clay Street	Yes	Curb Inlet Basket
17	West Fairbanks Avenue	Yes	Fenced Area
18	Winter Park Medical Center	Yes	Stormwater Pond
19	Kilshore Lane	No	-
20	Lakeview Avenue	No	-
21, 22	Shoreview Avenue	No	-
23, 24, 25	Broadview Avenue	Yes	Fenced Area
26, 27	Fairview Avenue	No	-
28	Beachview Avenue	Yes	Fenced Area
29	Killarney Bay Court	Yes	Fenced Area
30	Gay Road	No	-
31, 32, 33, 34	Lake Front Boulevard	Yes	Fenced Area *(only ID 34)*
35, 36	Country Club Drive	Yes	Fenced Area
37, 38	Lake Killarney Townhomes	Yes	Stormwater Pond
39	Lee Road	Yes	Pollution Control System
40	Blossom Lane	No	-
41, 42, 43, 44	Lake Drive	No	-
45, 46, 47	Rippling Lane	No	-
48	Hillstone Restaurant	No	-
Park Lake			
49, 50, 51, 52	Grove Street	No	-
53	The Adeline Apartment Complex	No	-
Lake Gem			
54	Monroe Avenue	No	-
55, 56	Monroe Avenue/South Orlando Avenue	Yes	Nutrient box
Lake Bell			
57	South West Street	No	-
58	Lake Bell Drive	No	-
59	Turner Road	No	-
60	Monroe Avenue Ditch	No	-
Lake Wilderness			
61	FDOT Pond	Yes	Stormwater Pond
62	Hungerford Elementary School	Yes	Stormwater Pond
63	Wymore Repump Facility	Yes	Stormwater Pond

Legend

- Study Area
- Outfall with Nutrient treatment
- Outfall with Trash/ Debris Capture
- Outfall with No Treatment

Stormwater Structures

- Inlet/Outlet
- Manhole
- Control Structure
- Baffle Box
- Exfiltration

Stormwater Conveyance

- Pipe
- Exfiltration
- Channel

Sources:
Aerial: ESRI, 2023
Roads: Orange County, 2020
Lakes: Orange County, 2020

N
0 200 400 Feet

Water Quality Treatment Deficiencies Identification Map

Winter Park CRA Study Update and Lake Killarney Expansion Report

Geosyntec consultants

Exhibit 10

Park Lake

FDOT Pond

Lake Gem

Lake Wilderness

Lake Bell

See Exhibit 11 for Canton Avenue 2D Model Features

Canton Avenue

Lake Killarney

Lake Mendsen

Legend

- Subbasins
- Stage/Area Node
- Stage/Volume Node
- Time/Stage Node
- Pipe
- Weir
- Drop Structure
- Percolation
- Rating Curve
- Channel

Sources:
Aerial: ESRI, 2023
Roads: Orange County, 2020
Lakes: Orange County, 2020

N

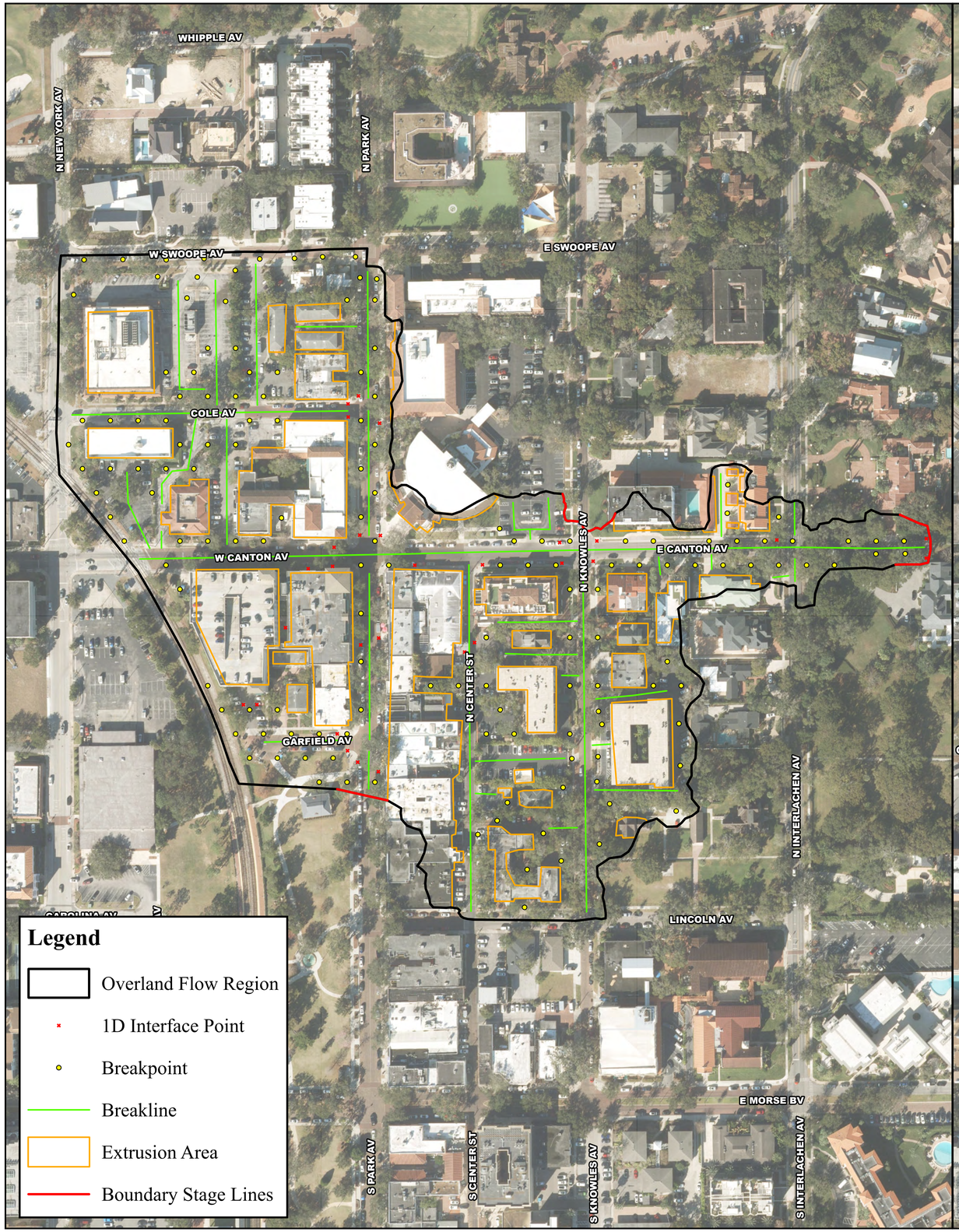
0 200 400 Feet

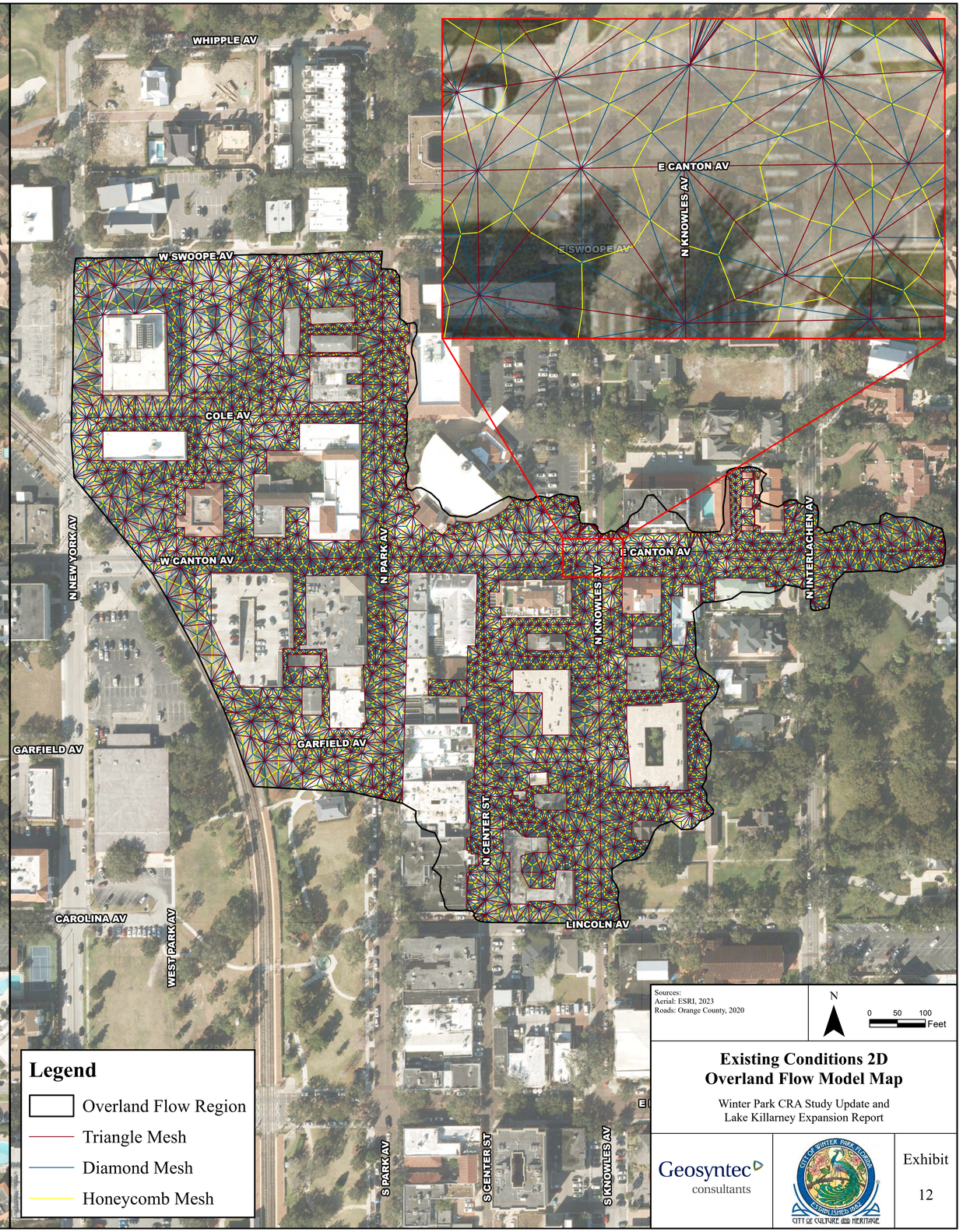
Existing Conditions 1D Node-Link Model Map

Winter Park CRA Study Update and Lake Killarney Expansion Report

Geosyntec consultants

Exhibit 11





Sources:
Aerial: ESRI, 2023
Roads: Orange County, 2020

N

0 50 100 Feet

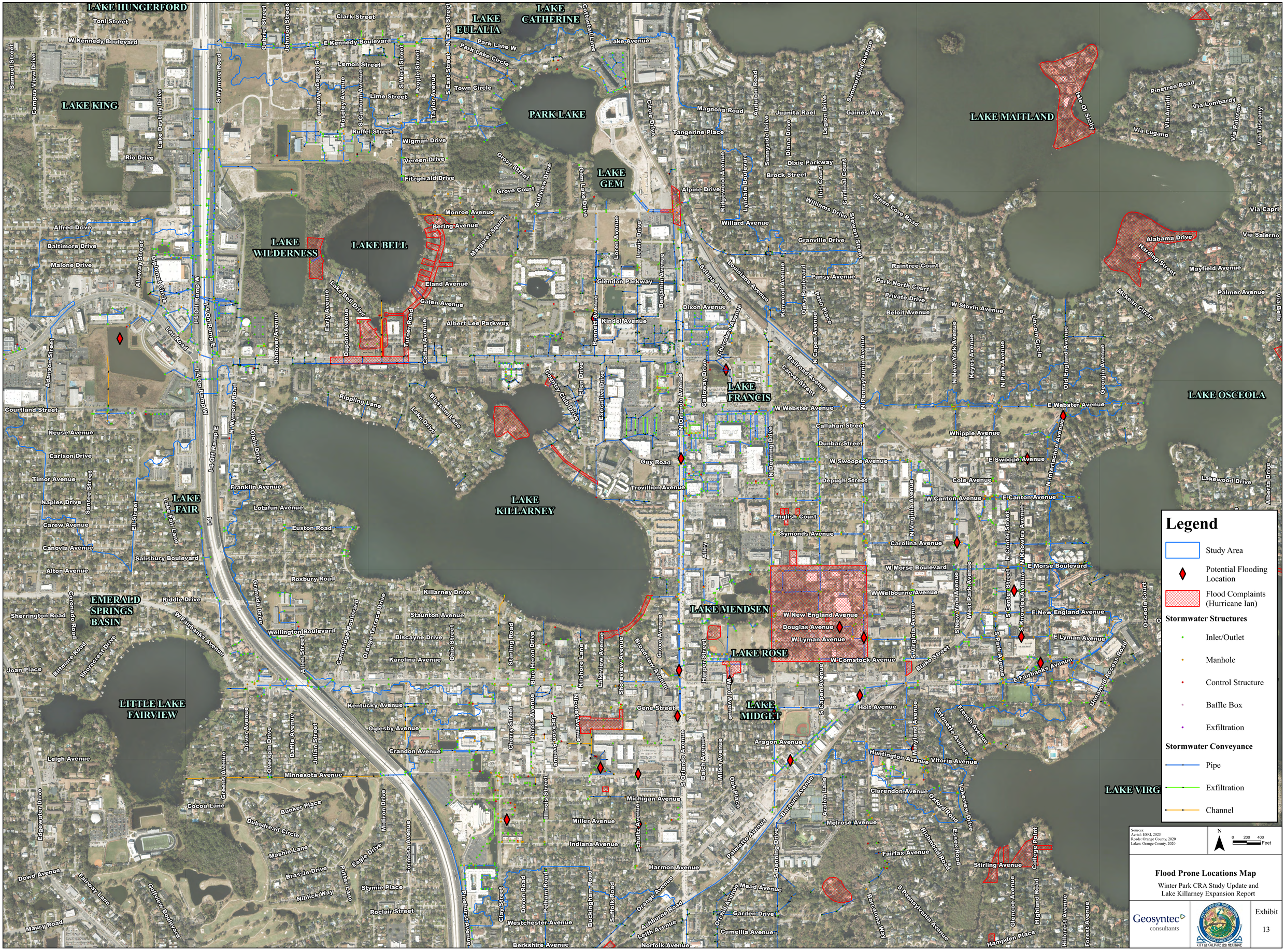
Existing Conditions 2D Overland Flow Model Map

Winter Park CRA Study Update and
Lake Killarney Expansion Report

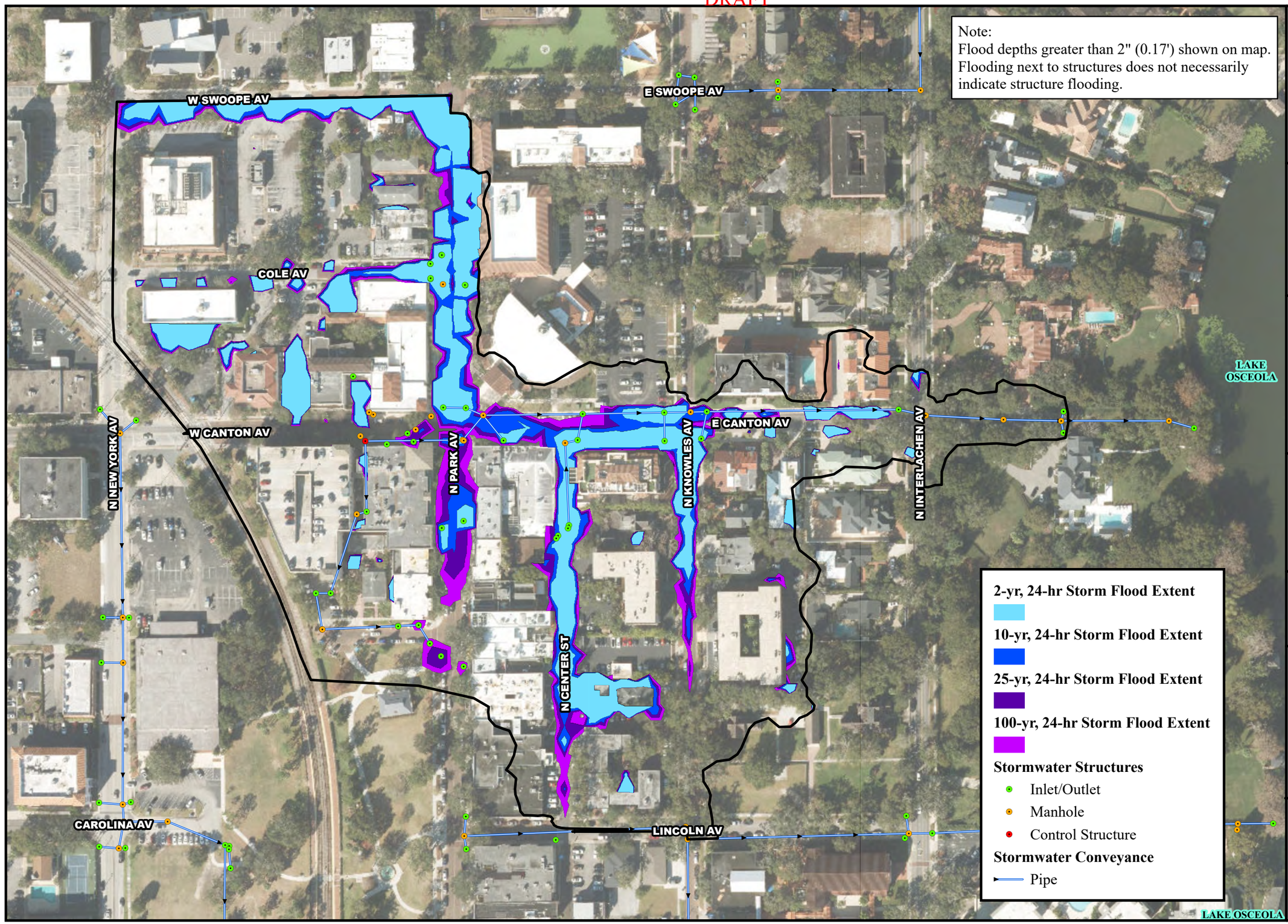
Geosyntec consultants

CITY OF WINTER PARK, FLORIDA
INCORPORATED 1887
CITY OF CULTURE AND HERITAGE

Exhibit
12


LAKE HUNGERFORD
LAKE EULALIA
LAKE CATHERINE
LAKE KING
PARK LAKE
LAKE MAITLAND
LAKE GEM
LAKE WILDERNESS
LAKE BELL
LAKE FRANCIS
LAKE OSCEOLA
LAKE FAIR
LAKE KILLARNEY
LAKE MENDSEN
LAKE ROSE
LAKE MIDGET
EMERALD SPRINGS BASIN
LITTLE LAKE FAIRVIEW
LAKE VIRG
Toni Street
W Kennedy Boulevard
Clark Street
E Kennedy Boulevard
Park Lane W
Park Lake Circle
Lake Avenue
Cottontail Lane
Town Circle
Lemon Street
Lime Street
Ruffel Street
Wigman Drive
Vereen Drive
Fitzgerald Drive
Grove Street
Grove Court
Gulfview Drive
Gem Lake Drive
Monroe Avenue
Bering Avenue
Margaret Square
Eland Avenue
Galen Avenue
Albert Lee Parkway
Kindel Avenue
Glendon Parkway
Dixon Avenue
Alpine Drive
Willard Avenue
Granville Drive
Magnolia Road
Tangerine Place
Dixie Parkway
Brock Street
Williams Drive
Green Cove Road
Raintree Court
Park North Court
Private Drive
Beloit Avenue
Pansy Avenue
W Stovin Avenue
Pinetree Road
Via Amalfi
Via Lombardy
Via Lugano
Via Palermo
Via Tuscany
Via Capri
Via Salerno
Alabama Drive
Harding Street
Mayfield Avenue
Palmer Avenue
Mckean Circle
Via Bella
Alfred Drive
Baltimore Drive
Malone Drive
Lake Destiny Drive
Rio Drive
Campus View Drive
Samuel Street
Gabriel Street
Johnson Street
S Wymore Road
S College Avenue
Mosley Avenue
S Calhoun Avenue
S West Street
People Street
Taylor Avenue
S East Street
N East Street
Alloway Street
Diplomat Circle
I-4 Off Ramp W
I-4 On Ramp E
Loo Road
Adamson Street
Courtland Street
Neuse Avenue
Carlson Drive
Timor Avenue
Naples Drive
Carew Avenue
Canovia Avenue
Alton Avenue
Sherrington Road
Joan Place
Colonial Drive
Biltmore Road
Shorecrest Drive
W Fairbanks Avenue
Riddle Drive
Salisbury Boulevard
Roxbury Road
Granada Drive
Wellington Boulevard
Cambridge Boulevard
Orange Terrace Drive
Allen Street
Biscayne Drive
Karolina Avenue
Staunton Avenue
Killarney Drive
Ohio Street
Starling Road
Blue Heron Drive
Kilshore Lane
Lakeview Avenue
Shoreview Avenue
Broadview Avenue
Grove Avenue
Harper Street
Hall Avenue
Kentucky Avenue
Oglesby Avenue
Crandon Avenue
Minnesota Avenue
Leigh Avenue
Cherry Street
Harold Avenue
Jackson Avenue
Nicholas Avenue
Illinois Street
Gene Street
Aragon Avenue
Michigan Avenue
Miller Avenue
Indiana Avenue
Harmon Avenue
Trovillion Avenue
Gay Road
Westchester Avenue
Berkshire Avenue
Norfolk Avenue
Camellia Avenue
Garden Drive
Mead Avenue
Orange Avenue
Ashburne Road
Leith Avenue
Clay Street
Devon Road
Pelham Road
Buckingham Road
Suffolk Road
Stymie Place
Roclair Street
Niblick Way
Brassie Drive
Porter Lane
Eagle Drive
Formosa Avenue
Midron Drive
Mashie Lane
Dubsdread Circle
Bunker Place
Cocoa Lane
Greens Avenue
Overspin Drive
Driver Avenue
Baffle Avenue
Julian Street
Hanover Avenue
Early Avenue
Dupont Avenue
Turner Road
Colfax Avenue
Lake Bell Drive
Rippling Lane
Blossom Lane
Lake Drive
Country Club Drive
Executive Drive
Ellen Drive
Benmatt Avenue
Benjamin Avenue
Lewis Drive
Loren Avenue
Sotana Avenue
Louisiana Avenue
Kenwood Avenue
Oaks Boulevard
Fern Place
N Capen Avenue
Cisco Road
Galloway Drive
N Orlando Avenue
N Denning Drive
Railroad Avenue
Carver Street
N Pennsylvania Avenue
Lincoln Circle
N New York Avenue
Keyes Avenue
N Park Avenue
Old England Avenue
Georgia Avenue
W Webster Avenue
E Webster Avenue
Callahan Street
Dunbar Street
Whipple Avenue
W Swoope Avenue
E Swoope Avenue
Depugh Street
Cole Avenue
W Canton Avenue
E Canton Avenue
N Interlachen Avenue
Lakewood Drive
Alberta Drive
English Court
Symonds Avenue
Carolina Avenue
N Virginia Avenue
N Center Street
N Knowles Avenue
W Morse Boulevard
E Morse Boulevard
W Welbourne Avenue
W New England Avenue
E New England Avenue
Douglas Avenue
W Lyman Avenue
E Lyman Avenue
W Comstock Avenue
S New York Avenue
West Park Avenue
S Virginia Avenue
S Park Avenue
S Center Street
S Knowles Avenue
Blake Street
E Fairbanks Avenue
Unnamed Access Road
Osceola Court
Holt Avenue
S Capen Avenue
Maryland Avenue
Antoinette Avenue
French Avenue
Huntington Avenue
Vitoria Avenue
Clarendon Avenue
Oxford Road
Lakeview Drive
Melrose Avenue
Azalea Lane
Fairfax Avenue
Richmond Road
Essex Road
Stirling Avenue
College Point
Hampden Place
Hillcrest Avenue
Forest Avenue
Highland Road
Glencoe Avenue
Barcelona Way
S Pennsylvania Avenue
S Denning Drive
Palmetto Avenue
Bemrose Avenue
Oxford Place
S Orlando Avenue
Belch Avenue
Miles Avenue
Schultz Avenue
Isle Of Sicily
Summerland Avenue
Audubon Road
Juanita Rael
Legion Drive
Sunnyside Drive
Diana Drive
Lyndale Boulevard
Ridgewood Avenue
Ibis Court
Cardinal Court
Stewart Street
Circle Drive
Lake Fair Lane
Eli Street
Santee Street
Franklin Avenue
Lotafun Avenue
Euston Road
Dowd Avenue
Fairway Lane
Golfview Boulevard
Maury Road
Edgewater Drive
Lake Destiny Drive
Legend
Study Area
Potential Flooding Location
Flood Complaints (Hurricane Ian)
Stormwater Structures
Inlet/Outlet
Manhole
Control Structure
Baffle Box
Exfiltration
Stormwater Conveyance
Pipe
Exfiltration
Channel
Sources:
Aerial: ESRI, 2023
Roads: Orange County, 2020
Lakes: Orange County, 2020
N
0 200 400
Feet
Flood Prone Locations Map
Winter Park CRA Study Update and
Lake Killarney Expansion Report
Geosyntec consultants
CITY OF CULTURE AND HERITAGE
Exhibit
13

DRAFT



Note:
Flood depths greater than 2" (0.17') shown on map. Flooding next to structures does not necessarily indicate structure flooding.

2-yr, 24-hr Storm Flood Extent

10-yr, 24-hr Storm Flood Extent

25-yr, 24-hr Storm Flood Extent

100-yr, 24-hr Storm Flood Extent

Stormwater Structures

- Inlet/Outlet
- Manhole
- Control Structure

Stormwater Conveyance

- Pipe

CITY OF WINTER PARK, FLORIDA
ESTABLISHED 1882
CITY OF CULTURE AND HERITAGE

N

0 75 150
Feet

Legend

- Overland Flow Region

Sources:
Aerial: ESRI, 2023
Roads: Orange County, 2020
Lakes: Orange County, 2020

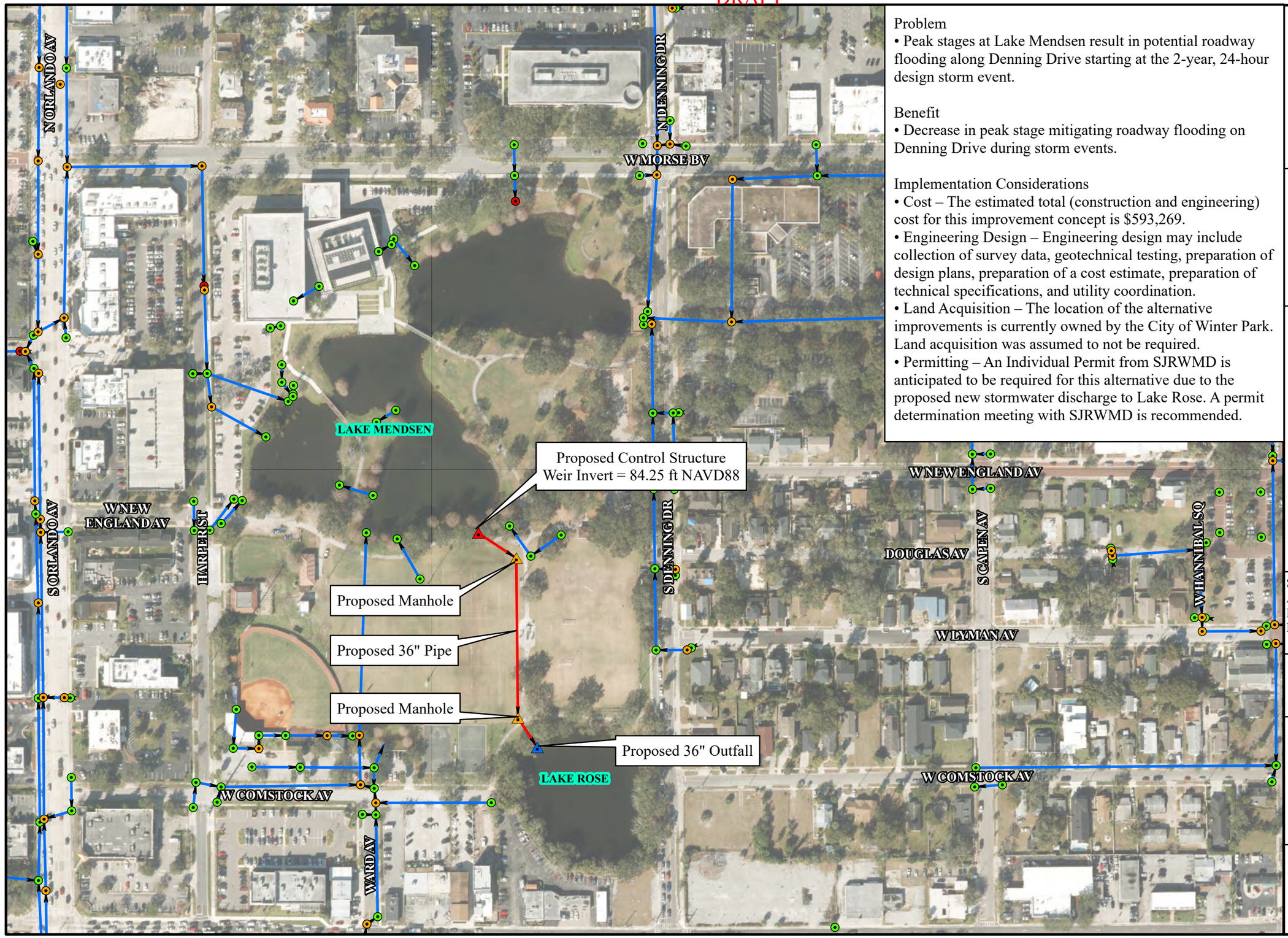
Exhibit
14

Canton Avenue Model Results

Winter Park CRA Study Update and Lake Killarney Expansion Report

Geosyntec consultants

DRAFT



Problem
- Peak stages at Lake Mendsen result in potential roadway flooding along Denning Drive starting at the 2-year, 24-hour design storm event.

Benefit
- Decrease in peak stage mitigating roadway flooding on Denning Drive during storm events.

Implementation Considerations
- Cost – The estimated total (construction and engineering) cost for this improvement concept is $593,269.
- Engineering Design – Engineering design may include collection of survey data, geotechnical testing, preparation of design plans, preparation of a cost estimate, preparation of technical specifications, and utility coordination.
- Land Acquisition – The location of the alternative improvements is currently owned by the City of Winter Park. Land acquisition was assumed to not be required.
- Permitting – An Individual Permit from SJRWMD is anticipated to be required for this alternative due to the proposed new stormwater discharge to Lake Rose. A permit determination meeting with SJRWMD is recommended.

CITY OF WINTER PARK, FLORIDA
ESTABLISHED 1882
CITY OF CULTURE AND HERITAGE

N

0 100 200
Feet

Legend
- Proposed Manhole
- Proposed Structure
- Proposed Control Structure
- Proposed Pipe

Existing Stormwater Structures
- Inlet/Outlet
- Manhole
- Control Structure
- Existing Pipe

Sources:
Aerial: ESRI, 2023
Roads: Orange County, 2020
Lakes: Orange County, 2020

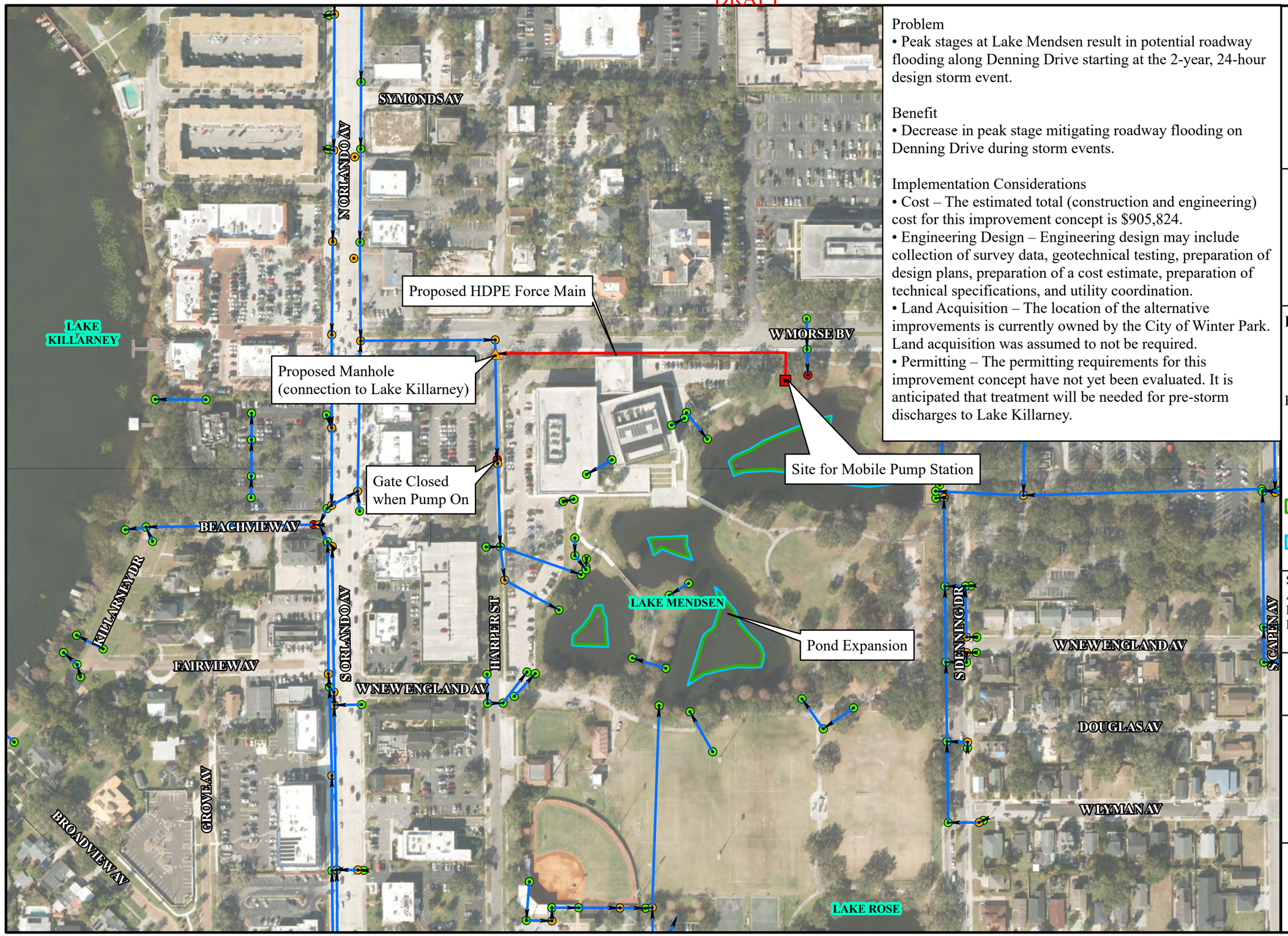
Exhibit
15

Lake Mendsen: Connection to Lake Rose Concept Map

Winter Park CRA Study Update and Lake Killarney Expansion Report

Geosyntec consultants

DRAFT



Problem
- Peak stages at Lake Mendsen result in potential roadway flooding along Denning Drive starting at the 2-year, 24-hour design storm event.

Benefit
- Decrease in peak stage mitigating roadway flooding on Denning Drive during storm events.

Implementation Considerations
- Cost – The estimated total (construction and engineering) cost for this improvement concept is $905,824.
- Engineering Design – Engineering design may include collection of survey data, geotechnical testing, preparation of design plans, preparation of a cost estimate, preparation of technical specifications, and utility coordination.
- Land Acquisition – The location of the alternative improvements is currently owned by the City of Winter Park. Land acquisition was assumed to not be required.
- Permitting – The permitting requirements for this improvement concept have not yet been evaluated. It is anticipated that treatment will be needed for pre-storm discharges to Lake Killarney.

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N

0 100 200
Feet

Legend
- Proposed Manhole
- Proposed Pump Station
- Proposed Pipe

Existing Stormwater Structures
- Inlet/Outlet
- Manhole
- Control Structure
- Existing Pipe
- 73 ft Proposed Contour (Approximate)
- 75 ft Existing Contour (Approximate)

Sources:
Aerial: ESRI, 2023
Roads: Orange County, 2020
Lakes: Orange County, 2020

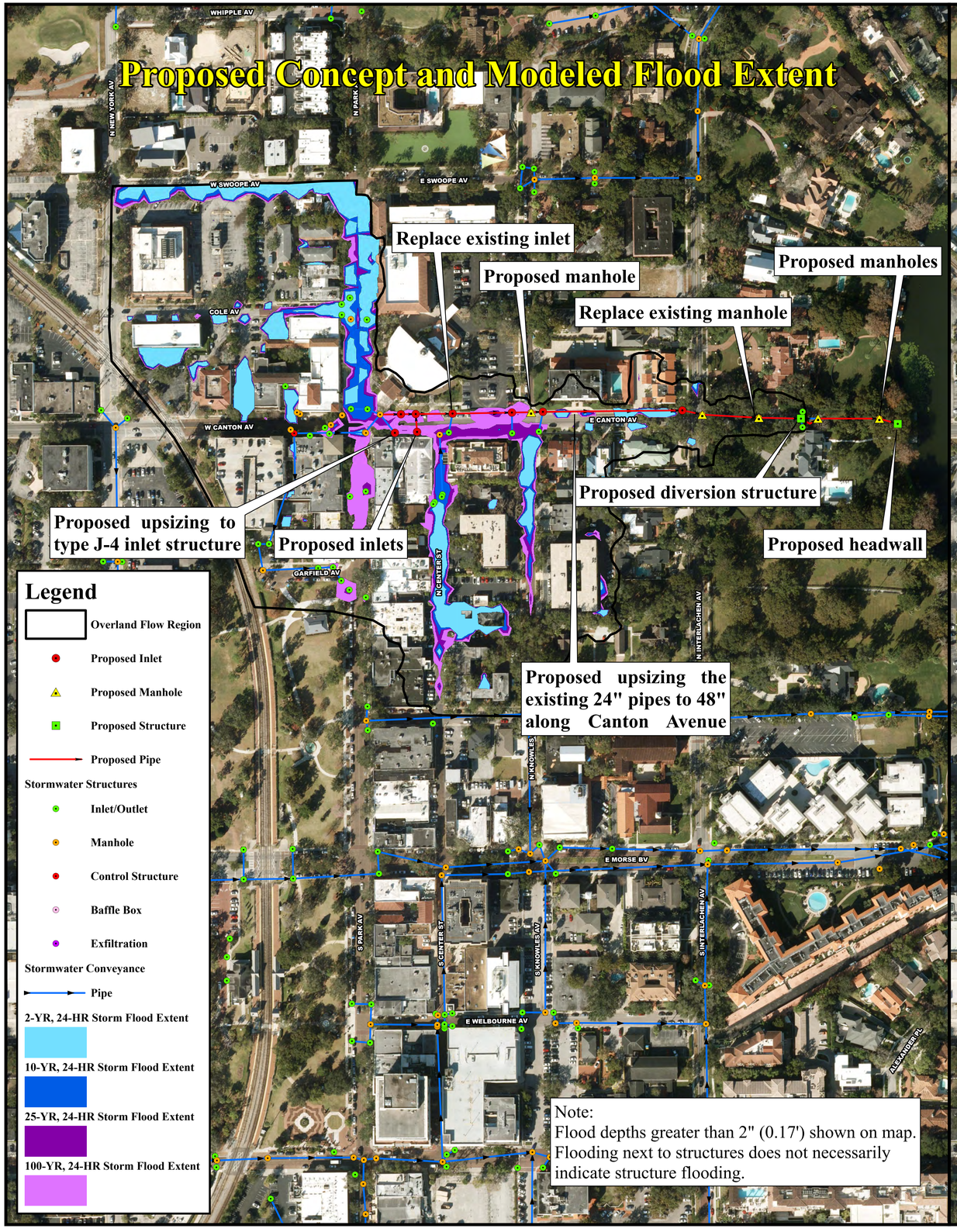
Exhibit
16

Lake Mendsen: Pump Station and Lake Expansion Concept Map

Winter Park CRA Study Update and Lake Killarney Expansion Report

Geosyntec consultants

Proposed Concept and Modeled Flood Extent



Legend

- Overland Flow Region
- Proposed Inlet
- Proposed Manhole
- Proposed Structure
- Proposed Pipe

Stormwater Structures

- Inlet/Outlet
- Manhole
- Control Structure
- Baffle Box
- Exfiltration

Stormwater Conveyance

- Pipe

2-YR, 24-HR Storm Flood Extent

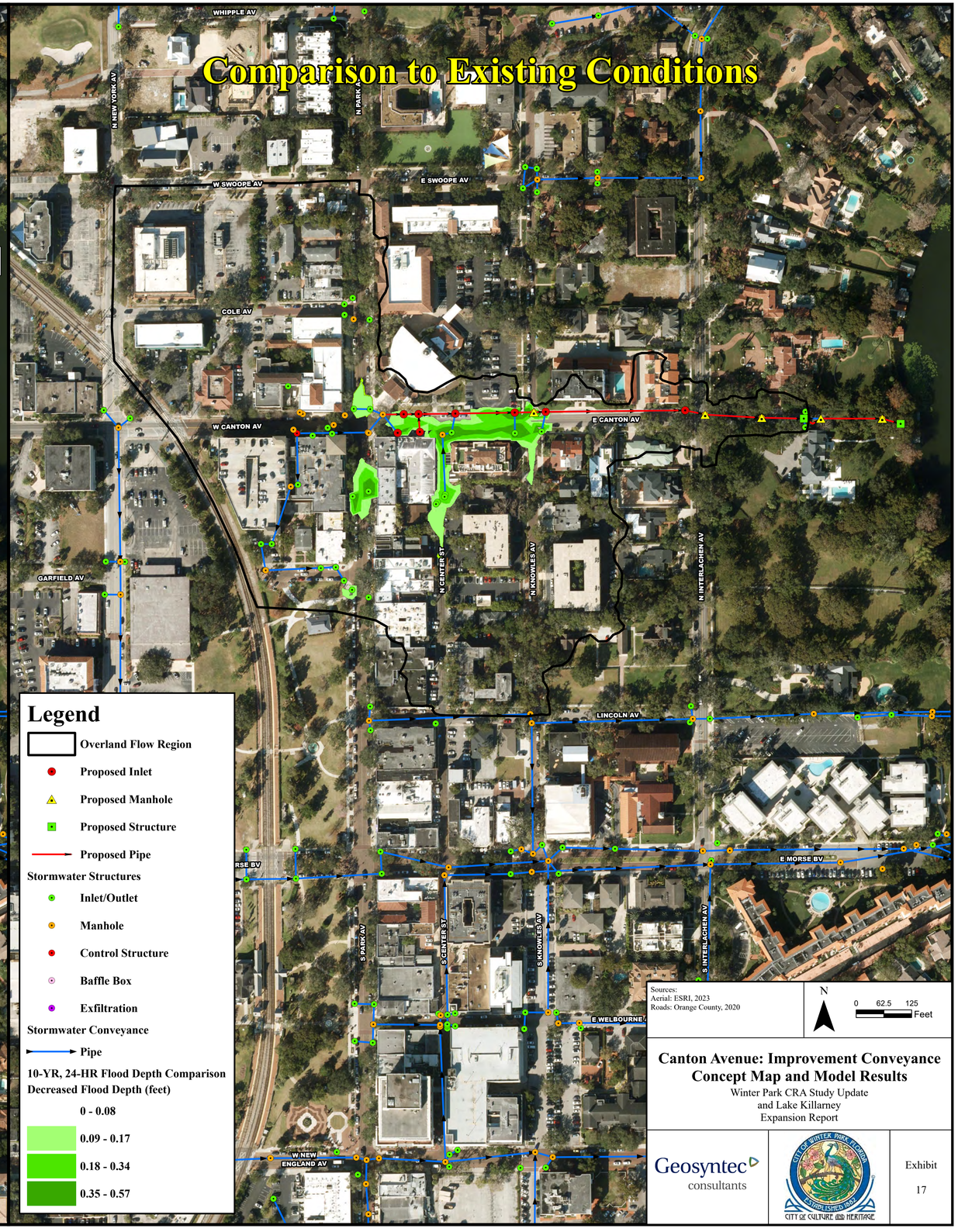
10-YR, 24-HR Storm Flood Extent

25-YR, 24-HR Storm Flood Extent

100-YR, 24-HR Storm Flood Extent

Note:
Flood depths greater than 2" (0.17') shown on map. Flooding next to structures does not necessarily indicate structure flooding.

Comparison to Existing Conditions



Legend

- Overland Flow Region
- Proposed Inlet
- Proposed Manhole
- Proposed Structure
- Proposed Pipe

Stormwater Structures

- Inlet/Outlet
- Manhole
- Control Structure
- Baffle Box
- Exfiltration

Stormwater Conveyance

- Pipe

10-YR, 24-HR Flood Depth Comparison
Decreased Flood Depth (feet)

- 0 - 0.08
- 0.09 - 0.17
- 0.18 - 0.34
- 0.35 - 0.57

Sources:
Aerial: ESRI, 2023
Roads: Orange County, 2020

N

0 62.5 125 Feet

Canton Avenue: Improvement Conveyance Concept Map and Model Results

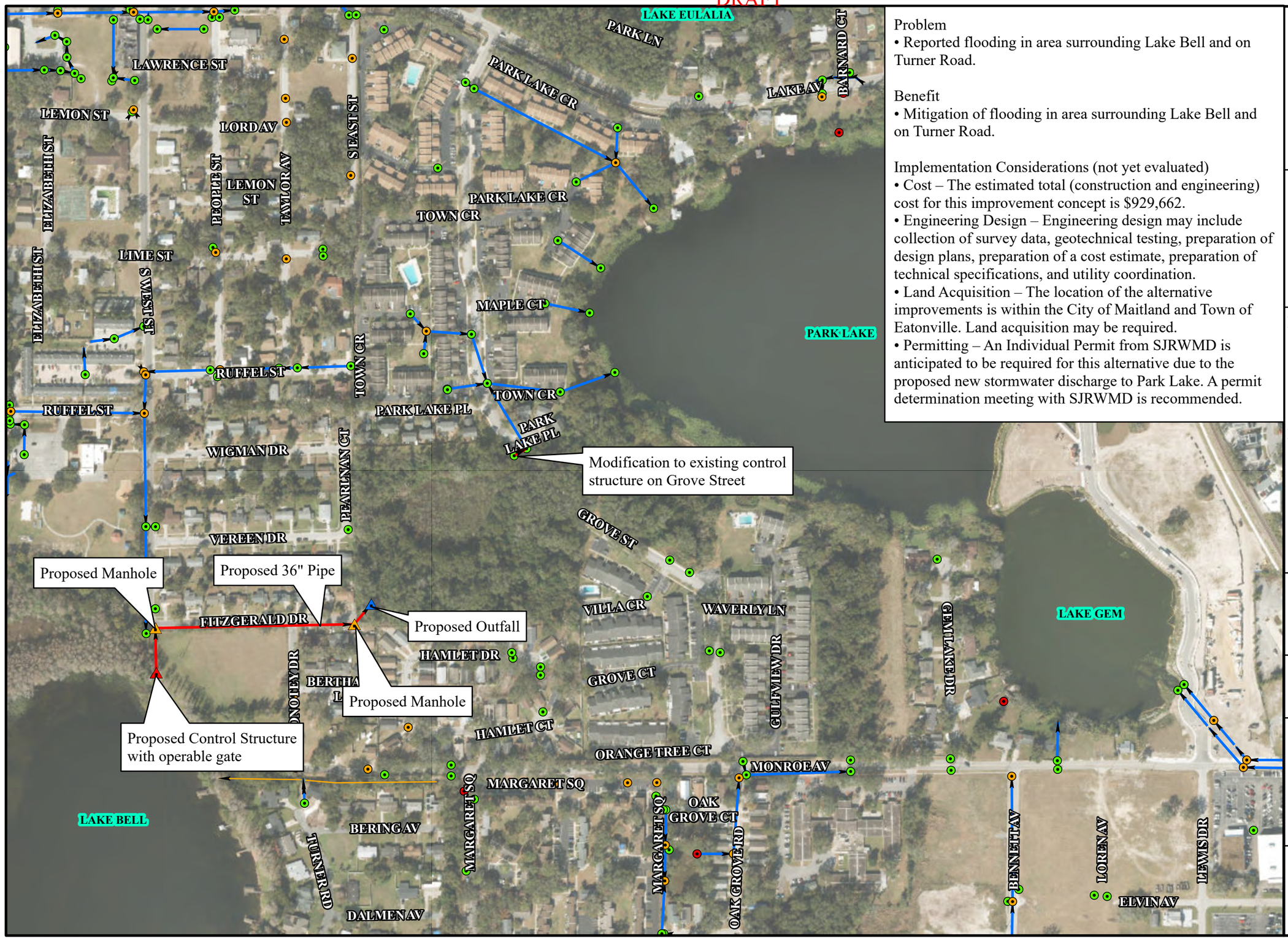
Winter Park CRA Study Update
and Lake Killarney
Expansion Report

Geosyntec consultants

CITY OF WINTER PARK, FLORIDA — EXPERIENCE MORE — CITY OF CULTURE AND HERITAGE

Exhibit 17

DRAFT



Problem
- Reported flooding in area surrounding Lake Bell and on Turner Road.

Benefit
- Mitigation of flooding in area surrounding Lake Bell and on Turner Road.

Implementation Considerations (not yet evaluated)
- Cost – The estimated total (construction and engineering) cost for this improvement concept is $929,662.
- Engineering Design – Engineering design may include collection of survey data, geotechnical testing, preparation of design plans, preparation of a cost estimate, preparation of technical specifications, and utility coordination.
- Land Acquisition – The location of the alternative improvements is within the City of Maitland and Town of Eatonville. Land acquisition may be required.
- Permitting – An Individual Permit from SJRWMD is anticipated to be required for this alternative due to the proposed new stormwater discharge to Park Lake. A permit determination meeting with SJRWMD is recommended.

CITY OF WINTER PARK, FLORIDA
ESTABLISHED 1882
CITY OF CULTURE AND HERITAGE

N

0 150 300
Feet

Legend
- Proposed Manhole
- Proposed Structure
- Proposed Control Structure
- Proposed Pipe

Existing Stormwater Structures
- Inlet/Outlet
- Manhole
- Control Structure
- Existing Pipe

Sources:
Aerial: ESRI, 2023
Roads: Orange County, 2020
Lakes: Orange County, 2020

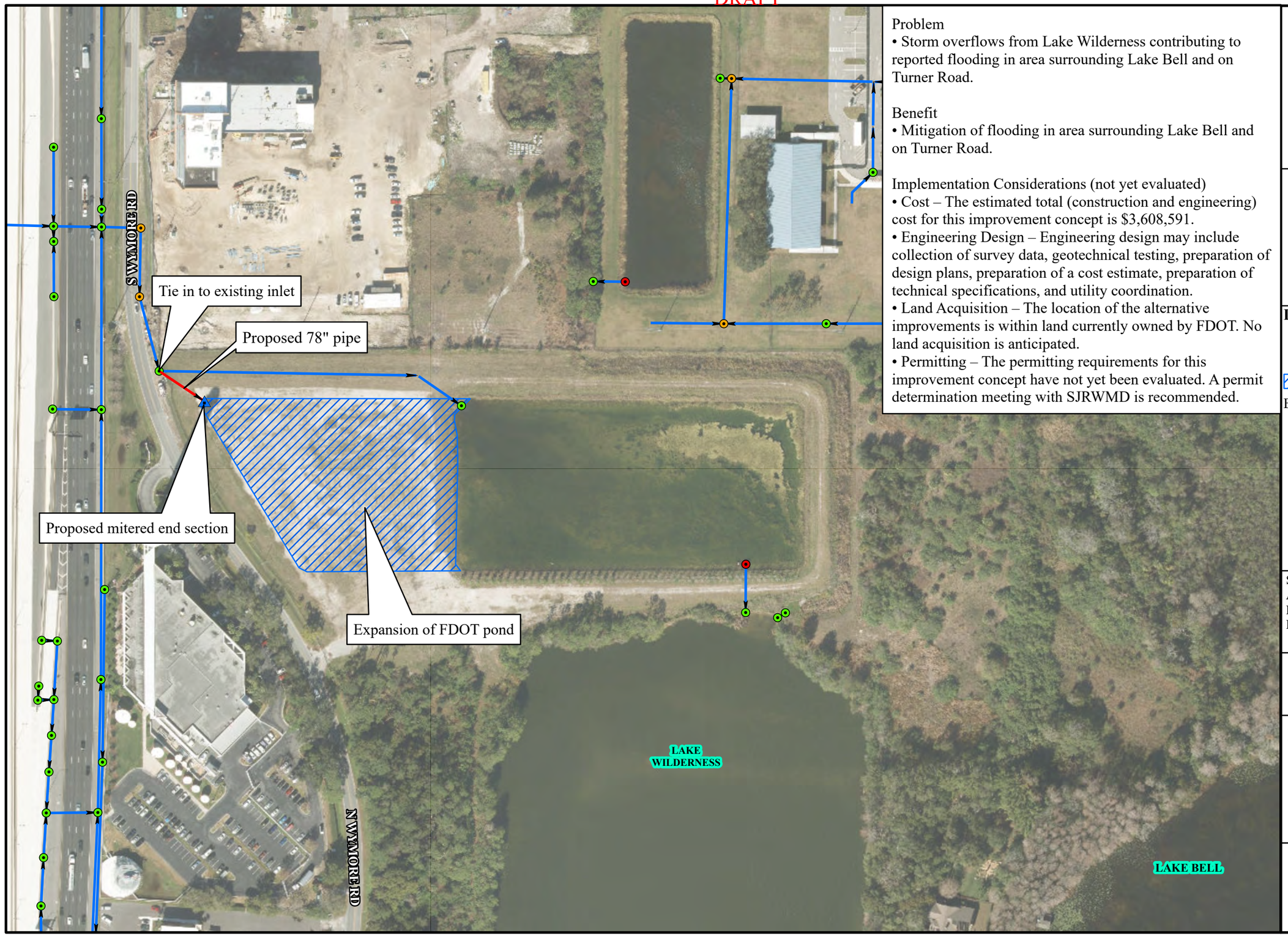
Exhibit
18

Lake Bell: Connection to Park Lake Concept Map

Winter Park CRA Study Update and Lake Killarney Expansion Report

Geosyntec consultants

DRAFT



Problem
• Storm overflows from Lake Wilderness contributing to reported flooding in area surrounding Lake Bell and on Turner Road.

Benefit
• Mitigation of flooding in area surrounding Lake Bell and on Turner Road.

Implementation Considerations (not yet evaluated)
• Cost – The estimated total (construction and engineering) cost for this improvement concept is $3,608,591.
• Engineering Design – Engineering design may include collection of survey data, geotechnical testing, preparation of design plans, preparation of a cost estimate, preparation of technical specifications, and utility coordination.
• Land Acquisition – The location of the alternative improvements is within land currently owned by FDOT. No land acquisition is anticipated.
• Permitting – The permitting requirements for this improvement concept have not yet been evaluated. A permit determination meeting with SJRWMD is recommended.

CITY OF WINTER PARK, FLORIDA
ESTABLISHED 1882
CITY OF CULTURE AND HERITAGE

N

0 80 160
Feet

Legend
- Proposed Structure
- Proposed Pipe
- Proposed Pond

Existing Stormwater Structures
- Inlet/Outlet
- Manhole
- Control Structure
- Existing Pipe

Sources:
Aerial: ESRI, 2023
Roads: Orange County, 2020
Lakes: Orange County, 2020

Exhibit
19

Lake Bell: Reduced Inflows from FDOT Pond Concept Map

Winter Park CRA Study Update and Lake Killarney Expansion Report

Geosyntec consultants



Problem
• Reported flooding in multiple areas surrounding Lake Killarney. Drawdown via drainwells requires 8 days which is not effective for pre-storm drawdown.

Benefit
• Mitigation of flooding in area surrounding Lake Killarney. Lowered lake level/increased storage availability prior to storm events to prepare for incoming flows from Lake Bell and Lake Mendsen.

Implementation Considerations
• Cost – The estimated total (construction and engineering) cost for this improvement concept is $301,639.
• Engineering Design – Engineering design may include collection of survey data, geotechnical testing, preparation of design plans, preparation of a cost estimate, preparation of technical specifications, and utility coordination.
• Land Acquisition – The location of the alternative improvements is currently owned by the City of Winter Park. Land acquisition was assumed to not be required.
• Permitting – The permitting requirements for this improvement concept have not yet been evaluated. It is anticipated that permitting will be needed to allow for emergency drawdown prior to storm events.

CITY OF WINTER PARK, FLORIDA
ESTABLISHED 1882
CITY OF CULTURE AND HERITAGE

N

0 20 40
Feet

Legend
- Proposed Manhole
- Proposed Structure
- Proposed Pipe

Existing Stormwater Structures
- Inlet/Outlet
- Manhole
- Control Structure
- Existing Pipe

Sources:
Aerial: ESRI, 2023
Roads: Orange County, 2020
Lakes: Orange County, 2020

Exhibit
20

Lake Killarney: Improved Conveyance to Lake Gem Concept Map

Winter Park CRA Study Update and Lake Killarney Expansion Report

Geosyntec consultants

APPENDIX A

Existing Conditions Model Results

Geosyntec consultants

Appendix A - Existing Conditions Model Results

NODE NAME	INITIAL STAGE		WARNING STAGE		2 YEAR / 24 HOUR		10 YEAR / 24 HOUR		25 YEAR / 24 HOUR		100 YEAR / 24 HOUR	
	ELEVATION	DESCRIPTION	ELEVATION	DESCRIPTION	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)
LAKE_KILLARNEY	82.04	Control Elevation	84.40	Finished floor elevation	83.07	-	83.53	-	83.83	-	**84.41**	0.01
LAKE_MENDSEN	81.14	Normal high water elevation	84.82	Approximate edge of pavement	**85.58**	0.76	**86.79**	1.97	**87.29**	2.47	**87.94**	3.12
LAKE_ROSE	83.30	Approximate water surface elevation	91.01	Bank overtopping	83.89	-	84.16	-	84.37	-	84.91	-
NA0010	72.14	Bottom of structure	78.79	Approximate edge of pavement	77.96	-	**79.49**	0.70	**79.77**	0.98	**80.07**	1.28
NA0020	72.87	Bottom of structure	83.54	Approximate edge of pavement	79.41	-	82.1	-	82.5	-	82.82	-
NA0030	76.82	Bottom of structure	86.32	Approximate edge of pavement	79.79	-	83.07	-	84.42	-	**86.38**	0.06
NA0040	82.00	Bottom of structure	89.63	Approximate edge of pavement	83.88	-	84.48	-	86.22	-	**89.8**	0.17
NA0050	85.66	Bottom of structure	91.51	Approximate edge of pavement	87.82	-	88.23	-	88.67	-	91.19	-
NA0060	88.12	Bottom of structure	92.97	Approximate edge of pavement	88.6	-	88.82	-	89.26	-	92.9	-
NA0070	85.52	Bottom of structure	90.82	Approximate edge of pavement	85.93	-	86.02	-	86.29	-	89.85	-
NA0080	76.22	Bottom of structure	82.01	Approximate edge of pavement	79.68	-	**82.39**	0.38	**82.57**	0.56	**82.74**	0.73
NA0090	78.51	Bottom of structure	85.83	Approximate edge of pavement	84.4	-	85.22	-	85.33	-	85.44	-
NA0100	80.27	Bottom of structure	83.79	Approximate edge of pavement	**84.84**	1.05	**85.3**	1.51	**85.39**	1.60	**85.48**	1.69
NA0110	81.13	Bottom of structure	84.29	Approximate edge of pavement	**85.17**	0.88	**85.36**	1.07	**85.44**	1.15	**85.52**	1.23
NA0120	82.90	Bottom of structure	91.22	Approximate edge of pavement	84.16	-	84.39	-	85.54	-	86.98	-
NA0130	77.12	Bottom of structure	88.40	Approximate edge of pavement	80.94	-	83.94	-	85.61	-	87.16	-
NA0140	81.42	Bottom of structure	85.91	Approximate edge of pavement	82.89	-	**86.3**	0.39	**86.72**	0.81	**87.34**	1.43
NA0150	76.23	Bottom of structure	86.30	Approximate edge of pavement	79.77	-	81.53	-	82.41	-	83.23	-
NA0160	80.32	Bottom of structure	88.35	Approximate edge of pavement	84.78	-	85.2	-	85.5	-	85.93	-
NA0170	79.47	Bottom of structure	90.12	Approximate edge of pavement	83.99	-	84.43	-	84.63	-	84.95	-
NA0180	71.31	Bottom of structure	87.26	Approximate edge of pavement	74.6	-	75.03	-	75.23	-	75.56	-
NA0190	80.82	Bottom of structure	89.89	Approximate edge of pavement	85.22	-	85.64	-	85.98	-	86.48	-
NA0200	81.52	Bottom of structure	85.45	Approximate edge of pavement	**85.93**	0.48	**86.34**	0.89	**86.75**	1.30	**87.36**	1.91
NA0210	80.80	Bottom of structure	88.76	Approximate edge of pavement	83.19	-	84.03	-	85.04	-	86.61	-
NA0220	86.72	Bottom of structure	90.75	Approximate edge of pavement	89	-	90.52	-	**90.86**	0.11	**91.12**	0.37
NA0230	91.44	Bottom of structure	96.15	Approximate edge of pavement	92.44	-	92.99	-	93.29	-	93.82	-
NA0240	88.61	Bottom of structure	93.98	Approximate edge of pavement	92.4	-	92.95	-	93.24	-	93.77	-
NA0250	87.54	Bottom of structure	92.19	Approximate edge of pavement	**92.31**	0.12	**92.7**	0.51	**92.81**	0.62	**92.92**	0.73
NA0260	86.29	Bottom of structure	91.93	Approximate edge of pavement	89.35	-	90.32	-	91.78	-	**92.07**	0.14
NA0270	85.32	Bottom of structure	90.61	Approximate edge of pavement	87.95	-	88.92	-	89.96	-	**91.79**	1.18
NA0280	82.32	Bottom of structure	91.56	Approximate edge of pavement	85.28	-	86.42	-	88	-	90.95	-
NA0290	75.96	Bottom of structure	89.24	Approximate edge of pavement	85.82	-	86.81	-	87.05	-	87.28	-
NA0300	81.61	Bottom of structure	88.92	Approximate edge of pavement	85.82	-	86.54	-	86.76	-	87.21	-
NA0310	83.67	Bottom of structure	86.50	Approximate edge of pavement	86.06	-	**86.5**	0.00	**86.76**	0.26	**87.35**	0.85
NA0320	83.58	Bottom of structure	88.77	Approximate edge of pavement	85.64	-	86.38	-	86.59	-	87.08	-
NA0330	83.24	Bottom of structure	86.37	Approximate edge of pavement	**86.37**	0.00	**86.64**	0.27	**86.84**	0.47	**87.41**	1.04
NA0340	81.46	Bottom of structure	85.60	Approximate edge of pavement	**85.96**	0.36	**86.37**	0.77	**86.77**	1.17	**87.38**	1.78
NA0350	78.17	Bottom of structure	87.25	Approximate edge of pavement	85.93	-	86.93	-	87.18	-	**87.4**	0.15
NA0360	88.33	Bottom of structure	94.12	Approximate edge of pavement	89.3	-	91.29	-	91.38	-	91.59	-
NA0370	86.22	Bottom of structure	91.16	Approximate edge of pavement	89.22	-	**91.21**	0.05	**91.26**	0.10	**91.32**	0.16
NA0380	84.62	Bottom of structure	88.11	Approximate edge of pavement	86.01	-	87.19	-	87.58	-	88.02	-
NA0390	77.48	Bottom of structure	87.47	Approximate edge of pavement	85.87	-	86.86	-	87.1	-	87.32	-
NA0400	87.42	Bottom of structure	91.46	Approximate edge of pavement	88.36	-	89	-	89.59	-	90.82	-
NA0410	85.24	Bottom of structure	87.80	Approximate edge of pavement	**88.28**	0.48	**88.78**	0.98	**89.04**	1.24	**89.19**	1.39
NA0420	82.03	Bottom of structure	89.00	Approximate edge of pavement	85.99	-	87.34	-	87.93	-	88.69	-
NA0430	82.26	Bottom of structure	88.32	Approximate edge of pavement	86.01	-	87.29	-	87.86	-	**88.62**	0.30
NA0440	81.27	Bottom of structure	89.46	Approximate edge of pavement	85.89	-	87.31	-	87.98	-	88.75	-

Geosyntec consultants

Appendix A - Existing Conditions Model Results

NODE NAME	INITIAL STAGE		WARNING STAGE		2 YEAR / 24 HOUR		10 YEAR / 24 HOUR		25 YEAR / 24 HOUR		100 YEAR / 24 HOUR	
	ELEVATION	DESCRIPTION	ELEVATION	DESCRIPTION	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)
NA0450	80.02	Bottom of structure	88.29	Approximate edge of pavement	84.37	-	85.92	-	86.94	-	87.91	-
NA0460	82.60	Bottom of structure	88.09	Approximate edge of pavement	86.06	-	86.64	-	86.81	-	87.14	-
NA0470	79.57	Bottom of structure	85.32	Approximate edge of pavement	**86.01**	0.69	**86.57**	1.25	**86.7**	1.38	**86.81**	1.49
NA0480	80.26	Bottom of structure	86.75	Approximate edge of pavement	85.91	-	86.67	-	**86.8**	0.05	**86.88**	0.13
NA0490	81.66	Bottom of structure	86.12	Approximate edge of pavement	85.05	-	**86.5**	0.38	**86.65**	0.53	**86.75**	0.63
NA0500	78.02	Bottom of structure	84.24	Approximate edge of pavement	82.93	-	**84.61**	0.37	**84.94**	0.70	**85.14**	0.90
NA0510	79.52	Bottom of structure	84.82	Approximate edge of pavement	83.55	-	**85.32**	0.50	**85.51**	0.69	**85.72**	0.90
NA0520	81.44	Bottom of structure	85.49	Approximate edge of pavement	84.03	-	**85.97**	0.48	**86.14**	0.65	**86.27**	0.78
NA0530	83.62	Bottom of structure	88.82	Approximate edge of pavement	86.07	-	86.99	-	87.67	-	**88.92**	0.10
NA0540	85.97	Bottom of structure	90.45	Approximate edge of pavement	87.62	-	88.5	-	89.9	-	**90.84**	0.39
NA0550	87.66	Bottom of structure	91.28	Approximate edge of pavement	89.07	-	90.15	-	**91.5**	0.22	**91.68**	0.40
NA0560	87.18	Bottom of structure	91.56	Approximate edge of pavement	88.69	-	89.32	-	90.46	-	**92.02**	0.46
NA0570	85.65	Bottom of structure	91.06	Approximate edge of pavement	87.92	-	88.45	-	89.02	-	**91.35**	0.29
NA0580	92.68	Bottom of structure	96.76	Approximate edge of pavement	93	-	93.1	-	93.18	-	93.34	-
NA0590	89.02	Bottom of structure	93.58	Approximate edge of pavement	90.15	-	90.76	-	91.08	-	92.77	-
NA0600	85.05	Bottom of structure	90.93	Approximate edge of pavement	87.01	-	88.38	-	89.83	-	**91.37**	0.44
NA0610	83.91	Bottom of structure	89.93	Approximate edge of pavement	86.14	-	87.99	-	89.18	-	**90.72**	0.79
NA0620	83.12	Bottom of structure	90.59	Approximate edge of pavement	85.96	-	87.77	-	88.81	-	90.19	-
NA0630	85.42	Bottom of structure	90.77	Approximate edge of pavement	86.51	-	87.84	-	88.92	-	90.43	-
NA0640	91.02	Bottom of structure	95.50	Approximate edge of pavement	91.37	-	91.47	-	91.63	-	94.85	-
NA0650	90.02	Bottom of structure	94.83	Approximate edge of pavement	90.92	-	91.23	-	91.5	-	94.76	-
NA0660	90.23	Bottom of structure	94.85	Approximate edge of pavement	91.46	-	92.21	-	93.05	-	94.48	-
NA0670	92.30	Bottom of structure	97.97	Approximate edge of pavement	93.54	-	96.44	-	**98.52**	0.55	**98.61**	0.64
NA0680	90.33	Bottom of structure	96.79	Approximate edge of pavement	91.66	-	94.21	-	96.57	-	**97.22**	0.43
NA0690	88.62	Bottom of structure	94.25	Approximate edge of pavement	90.38	-	93	-	**94.5**	0.25	**94.6**	0.35
NA0700	86.32	Bottom of structure	91.79	Approximate edge of pavement	87.87	-	89.57	-	90.83	-	**91.96**	0.17
NA0710	84.94	Bottom of structure	90.28	Approximate edge of pavement	87.23	-	89.2	-	90.21	-	**90.6**	0.32
NA0720	83.55	Bottom of structure	89.40	Approximate edge of pavement	85.94	-	87.49	-	88.26	-	88.91	-
NA0730	82.98	Bottom of structure	88.88	Approximate edge of pavement	85.87	-	87.3	-	88.02	-	88.53	-
NA0740	81.14	Lake Mendsen NHWE	88.51	Approximate edge of pavement	85.82	-	87.21	-	87.85	-	88.36	-
NA0750	81.14	Lake Mendsen NHWE	89.42	Approximate edge of pavement	85.87	-	87.5	-	88.36	-	**89.48**	0.06
NA0760	81.14	Lake Mendsen NHWE	87.92	Approximate edge of pavement	85.79	-	87.09	-	87.67	-	**88.22**	0.30
NA0770	81.14	Lake Mendsen NHWE	87.19	Approximate edge of pavement	85.75	-	86.88	-	**87.34**	0.15	**87.99**	0.80
NA0780	81.14	Lake Mendsen NHWE	84.82	Approximate edge of pavement	**85.71**	0.89	**86.82**	2.00	**87.24**	2.42	**87.9**	3.08
NA0790	85.72	Bottom of structure	89.36	Approximate edge of pavement	87.3	-	89.29	-	**90.26**	0.90	**90.49**	1.13
NA0800	82.98	Bottom of structure	87.39	Approximate edge of pavement	85.91	-	87.35	-	**88.18**	0.79	**88.51**	1.12
NA0810	81.14	Bottom of structure	87.43	Approximate edge of pavement	85.86	-	87.27	-	**87.77**	0.34	**88.07**	0.64
NA0820	84.16	Bottom of structure	92.65	Approximate edge of pavement	86.61	-	90.19	-	90.89	-	92	-
NA0830	84.16	Bottom of structure	91.73	Approximate edge of pavement	86.53	-	90.04	-	90.71	-	91.54	-
NA0840	82.97	Bottom of structure	89.94	Approximate edge of pavement	85.99	-	88.72	-	89.27	-	**90.1**	0.16
NA0850	81.14	Lake Mendsen NHWE	86.88	Approximate edge of pavement	85.81	-	**87.95**	1.07	**88.26**	1.38	**88.56**	1.68
NA0860	81.14	Lake Mendsen NHWE	87.59	Approximate edge of pavement	85.77	-	**87.68**	0.09	**88.11**	0.52	**88.46**	0.87
NA0870	81.14	Lake Mendsen NHWE	86.66	Approximate edge of pavement	85.74	-	**87.38**	0.72	**87.72**	1.06	**88.04**	1.38
NA0880	81.14	Lake Mendsen NHWE	87.14	Approximate edge of pavement	85.7	-	87.07	-	**87.44**	0.30	**88**	0.86
NA0890	81.14	Lake Mendsen NHWE	86.19	Approximate edge of pavement	85.66	-	**86.88**	0.69	**87.35**	1.16	**87.97**	1.78
NA0900	81.14	Lake Mendsen NHWE	85.06	Approximate edge of pavement	**85.62**	0.56	**86.84**	1.78	**87.32**	2.26	**87.95**	2.89
NA0910	85.88	Bottom of structure	91.89	Approximate edge of pavement	87.49	-	87.89	-	88.28	-	88.88	-

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Appendix A - Existing Conditions Model Results

NODE NAME	INITIAL STAGE		WARNING STAGE		2 YEAR / 24 HOUR		10 YEAR / 24 HOUR		25 YEAR / 24 HOUR		100 YEAR / 24 HOUR	
	ELEVATION	DESCRIPTION	ELEVATION	DESCRIPTION	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)
NA0920	81.29	Bottom of structure	87.69	Approximate edge of pavement	85.67	-	86.91	-	87.46	-	**88**	0.31
NA0930	81.14	Lake Mendsen NHWE	86.09	Approximate edge of pavement	85.63	-	**86.84**	0.75	**87.3**	1.21	**87.95**	1.86
NA0940	81.14	Lake Mendsen NHWE	84.77	Approximate edge of pavement	**85.6**	0.83	**86.82**	2.05	**87.28**	2.51	**87.93**	3.16
NA0950	81.14	Lake Mendsen NHWE	84.84	Approximate edge of pavement	**85.59**	0.75	**86.81**	1.97	**87.28**	2.44	**87.93**	3.09
NA0960	81.14	Lake Mendsen NHWE	85.58	Approximate edge of pavement	**85.73**	0.15	**86.78**	1.20	**87.18**	1.60	**87.85**	2.27
NA0970	81.14	Lake Mendsen NHWE	85.66	Approximate edge of pavement	**85.67**	0.01	**86.82**	1.16	**87.26**	1.60	**87.92**	2.26
NA0980	81.14	Lake Mendsen NHWE	84.95	Approximate edge of pavement	**85.62**	0.67	**86.81**	1.86	**87.27**	2.32	**87.93**	2.98
NA0990	87.41	Bottom of structure	90.80	Approximate edge of pavement	88.27	-	88.54	-	88.76	-	89.54	-
NA1000	82.94	Bottom of structure	87.49	Approximate edge of pavement	84.5	-	86.17	-	87.3	-	**88.21**	0.72
NA1010	78.97	Bottom of structure	85.37	Approximate edge of pavement	81.88	-	**85.62**	0.25	**86.55**	1.18	**87.7**	2.33
NA1020	80.47	Bottom of structure	85.47	Approximate edge of pavement	83.12	-	**85.89**	0.42	**86.59**	1.12	**87.72**	2.25
NA1030	77.85	Bottom of structure	85.55	Approximate edge of pavement	81.34	-	84.94	-	**85.61**	0.06	**87.68**	2.13
NA1040	77.76	Bottom of structure	85.24	Approximate edge of pavement	81.19	-	84.75	-	**85.43**	0.19	**87.69**	2.45
NA1050	77.44	Bottom of structure	84.28	Approximate edge of pavement	80.85	-	84.28	-	**84.93**	0.65	**87.67**	3.39
NA1060	76.61	Bottom of structure	83.43	Approximate edge of pavement	80.7	-	**84**	0.57	**84.79**	1.36	**87.66**	4.23
NA1070	75.87	Bottom of structure	89.34	Approximate edge of pavement	80.4	-	83.4	-	84.1	-	85.96	-
NA1080	74.25	Bottom of structure	85.11	Approximate edge of pavement	78.97	-	81.02	-	81.48	-	82.46	-
NA1090	73.79	Bottom of structure	76.62	Approximate edge of pavement	**77.73**	1.11	**78.57**	1.95	**78.77**	2.15	**79.19**	2.57
NA1100	77.15	Bottom of structure	83.03	Approximate edge of pavement	78.07	-	79.42	-	83	-	**83.28**	0.25
NA1110	74.23	Bottom of structure	80.07	Approximate edge of pavement	77.24	-	77.67	-	78.77	-	79.23	-
NA1120	73.79	Bottom of structure	76.34	Approximate edge of pavement	**77.17**	0.83	**77.28**	0.94	**77.51**	1.17	**77.81**	1.47
NA1130	78.93	Bottom of structure	83.69	Approximate edge of pavement	81.87	-	**84.34**	0.65	**84.73**	1.04	**85.15**	1.46
NA1140	79.43	Bottom of structure	86.76	Approximate edge of pavement	84.16	-	**87.26**	0.50	**87.53**	0.77	**87.85**	1.09
NA1150	80.96	Bottom of structure	83.93	Approximate edge of pavement	**87.31**	3.38	**88.47**	4.54	**88.67**	4.74	**88.91**	4.98
NA1160	87.02	Bottom of structure	91.63	Approximate edge of pavement	90.04	-	91.59	-	**91.98**	0.35	**92.17**	0.54
NA1170	83.62	Bottom of structure	89.26	Approximate edge of pavement	**89.99**	0.73	**90.34**	1.08	**90.52**	1.26	**90.71**	1.45
NA1180	83.62	Lake Midget control elevation	90.40	Bank overtopping	89.96	-	90.31	-	**90.48**	0.08	**90.67**	0.27
NA1190	83.89	Bottom of structure	88.91	Approximate edge of pavement	**89.94**	1.03	**90.04**	1.13	**90.09**	1.18	**90.16**	1.25
NA1200	83.89	Bottom of structure	91.04	Approximate edge of pavement	89.89	-	89.99	-	90.04	-	90.11	-
NA1210	83.62	Bottom of structure	90.46	Approximate edge of pavement	89.92	-	90.11	-	90.26	-	90.46	-
NA1220	83.62	Bottom of structure	91.71	Approximate edge of pavement	89.96	-	90.23	-	90.43	-	90.68	-
NA1230	83.62	Bottom of structure	90.28	Approximate edge of pavement	89.97	-	**90.3**	0.02	**90.49**	0.21	**90.69**	0.41
NA1240	87.78	Bottom of structure	91.07	Approximate edge of pavement	90.07	-	90.61	-	91.02	-	**91.13**	0.06
NA1250	87.42	Bottom of structure	90.70	Approximate edge of pavement	89.97	-	90.04	-	90.08	-	90.13	-
NA1260	86.18	Bottom of structure	90.64	Approximate edge of pavement	89.87	-	89.97	-	90.01	-	90.08	-
NA1270	85.80	Bottom of structure	89.67	Approximate edge of pavement	**89.94**	0.27	**90.06**	0.39	**90.14**	0.47	**90.22**	0.55
NA1280	85.60	Bottom of structure	90.74	Approximate edge of pavement	89.93	-	90.04	-	90.1	-	90.17	-
NA1290	88.32	Bottom of structure	90.86	Approximate edge of pavement	**91.06**	0.20	**91.19**	0.33	**91.24**	0.38	**91.3**	0.44
NA1300	86.73	Bottom of structure	90.10	Approximate edge of pavement	**90.44**	0.34	**90.81**	0.71	**90.91**	0.81	**90.99**	0.89
NA1310	83.30	Bottom of structure	87.94	Approximate edge of pavement	86.04	-	87.53	-	**88.56**	0.62	**88.72**	0.78
NA1320	88.52	Bottom of structure	92.53	Approximate edge of pavement	89.8	-	91.01	-	91.34	-	91.73	-
NA1330	84.72	Bottom of structure	90.29	Approximate edge of pavement	89.75	-	**90.96**	0.67	**91.3**	1.01	**91.67**	1.38
NA1340	85.32	Bottom of structure	89.55	Approximate edge of pavement	**89.58**	0.03	**90.92**	1.37	**91.26**	1.71	**91.62**	2.07
NA1350	84.62	Bottom of structure	90.45	Approximate edge of pavement	88.81	-	**90.68**	0.23	**91.2**	0.75	**91.56**	1.11
NA1360	82.50	Bottom of structure	89.84	Approximate edge of pavement	87.62	-	89.1	-	**90.23**	0.39	**90.74**	0.90
NA1370	82.50	Bottom of structure	88.96	Approximate edge of pavement	86.44	-	87.58	-	88.67	-	**90.05**	1.09
NA1380	82.50	Bottom of structure	89.60	Approximate edge of pavement	85.59	-	86.49	-	87.04	-	87.95	-

Geosyntec consultants

Appendix A - Existing Conditions Model Results

NODE NAME	INITIAL STAGE		WARNING STAGE		2 YEAR / 24 HOUR		10 YEAR / 24 HOUR		25 YEAR / 24 HOUR		100 YEAR / 24 HOUR	
	ELEVATION	DESCRIPTION	ELEVATION	DESCRIPTION	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)
NA1390	82.04	Bottom of structure	89.38	Approximate edge of pavement	85.15	-	85.92	-	86.21	-	86.88	-
NA1400	86.52	Bottom of structure	92.24	Approximate edge of pavement	89.91	-	91.29	-	91.74	-	**92.36**	0.12
NA1410	84.72	Bottom of structure	90.35	Approximate edge of pavement	89.76	-	**90.96**	0.61	**91.3**	0.95	**91.68**	1.33
NA1420	81.52	Bottom of structure	89.36	Approximate edge of pavement	87.97	-	**90.51**	1.15	**91.24**	1.88	**91.63**	2.27
NA1430	81.13	Bottom of structure	90.79	Approximate edge of pavement	87.04	-	89.06	-	89.79	-	**91.38**	0.59
NA1440	81.13	Bottom of structure	90.11	Approximate edge of pavement	86.53	-	88.36	-	89.08	-	**90.67**	0.56
NA1450	81.13	Bottom of structure	88.88	Approximate edge of pavement	86.19	-	87.92	-	88.66	-	**90.14**	1.26
NA1460	81.13	Bottom of structure	89.61	Approximate edge of pavement	85.8	-	87.28	-	87.93	-	89.52	-
NA1470	81.13	Bottom of structure	90.19	Approximate edge of pavement	85.37	-	86.59	-	87.15	-	88.42	-
NA1480	81.13	Bottom of structure	89.23	Approximate edge of pavement	85.28	-	86.33	-	86.78	-	87.76	-
NA1490	82.72	Bottom of structure	87.50	Approximate edge of pavement	87.31	-	**87.97**	0.47	**88.22**	0.72	**88.54**	1.04
NA1500	83.44	Bottom of structure	87.27	Approximate edge of pavement	85.72	-	86.95	-	**87.6**	0.33	**88.17**	0.90
NA1510	81.14	Lake Mendsen NHWE	85.25	Approximate edge of pavement	**85.66**	0.41	**86.9**	1.65	**87.55**	2.30	**88.13**	2.88
NA1520	82.42	Bottom of structure	86.11	Approximate edge of pavement	85.69	-	**86.92**	0.81	**87.52**	1.41	**88.1**	1.99
NA1530	81.14	Lake Mendsen NHWE	86.90	Approximate edge of pavement	85.62	-	86.84	-	**87.33**	0.43	**87.97**	1.07
NA1540	81.14	Lake Mendsen NHWE	85.15	Approximate edge of pavement	**85.69**	0.54	**86.91**	1.76	**87.56**	2.41	**88.15**	3.00
NA1550	90.36	Bottom of structure	94.47	Approximate edge of pavement	92	-	93.68	-	**94.5**	0.03	**94.87**	0.40
NA1560	89.67	Bottom of structure	94.46	Approximate edge of pavement	90.89	-	91.33	-	91.52	-	91.64	-
NA1570	87.27	Bottom of structure	91.49	Approximate edge of pavement	88.41	-	88.82	-	89.61	-	**91.61**	0.12
NA1580	84.57	Bottom of structure	89.81	Approximate edge of pavement	86.39	-	87	-	87.84	-	89.37	-
NA1590	82.97	Bottom of structure	91.69	Approximate edge of pavement	88.51	-	88.8	-	89.02	-	89.46	-
NA1600	82.97	Bottom of structure	87.71	Approximate edge of pavement	85.74	-	86.88	-	87.35	-	**87.96**	0.25
NA1610	81.80	Bottom of structure	85.34	Approximate edge of pavement	**85.71**	0.37	**86.85**	1.51	**87.31**	1.97	**87.96**	2.62
NA1620	90.03	Bottom of structure	92.24	Approximate edge of pavement	90.03	-	90.03	-	90.03	-	91.6	-
NA1630	81.92	Bottom of structure	84.78	Approximate edge of pavement	**85.05**	0.27	**86.73**	1.95	**87.13**	2.35	**87.81**	3.03
NA1640	81.54	Bottom of structure	87.01	Approximate edge of pavement	84.53	-	86.46	-	86.91	-	**87.78**	0.77
NA1650	80.90	Bottom of structure	85.58	Approximate edge of pavement	83.75	-	**86.16**	0.58	**86.65**	1.07	**87.76**	2.18
NA1660	82.04	Lake Killarney tailwater	85.25	Approximate edge of pavement	83.14	-	83.81	-	84.17	-	84.8	-
NA1670	84.22	Bottom of structure	92.63	Approximate edge of pavement	89.19	-	91.53	-	92.15	-	**92.8**	0.17
NA1680	83.52	Bottom of structure	90.33	Approximate edge of pavement	88.62	-	90.29	-	**90.47**	0.14	**90.58**	0.25
NA1690	82.52	Bottom of structure	89.14	Approximate edge of pavement	88.16	-	**89.35**	0.21	**89.44**	0.30	**89.55**	0.41
NA1700	82.04	Bottom of structure	88.40	Approximate edge of pavement	87.75	-	**89.17**	0.77	**89.28**	0.88	**89.41**	1.01
NA1710	82.04	Bottom of structure	89.18	Approximate edge of pavement	86.92	-	88.14	-	88.35	-	88.7	-
NA1720	82.04	Bottom of structure	89.94	Approximate edge of pavement	85.69	-	86.58	-	86.87	-	87.43	-
NA1730	82.04	Bottom of structure	89.12	Approximate edge of pavement	85.23	-	86.02	-	86.31	-	86.96	-
NA1740	81.14	Bottom of structure	90.16	Approximate edge of pavement	85.02	-	86.42	-	87.12	-	88.11	-
NA1750	81.14	Lake Mendsen NHWE	85.66	Approximate edge of pavement	85.2	-	**86.73**	1.07	**87.25**	1.59	**87.91**	2.25
NA1760	81.13	Lake Mendsen NHWE	85.45	Approximate edge of pavement	**85.6**	0.15	**86.78**	1.33	**87.29**	1.84	**87.95**	2.50
NA1790	82.93	Bottom of structure	88.04	Approximate edge of pavement	85.81	-	87.65	-	**88.47**	0.43	**88.72**	0.68
NA1800	76.40	Bottom of structure	88.11	Approximate edge of pavement	78.24	-	78.39	-	78.48	-	78.68	-
NA1810	77.43	Bottom of structure	86.98	Approximate edge of pavement	79.6	-	79.79	-	79.94	-	80.24	-
NA1820	70.50	Bottom of dry pond	78.99	Bank overtopping	78.19	-	78.32	-	78.41	-	78.54	-
NA1830	67.20	9th Grade Pond Control Elevation	77.76	Bank overtopping	71.35	-	72.05	-	72.27	-	72.61	-
NA1840	67.20	Bottom of structure	77.60	Approximate edge of pavement	71.97	-	73.16	-	73.53	-	74.25	-
NA1850	67.20	Lake Virginia tailwater	70.48	Approximate edge of pavement	69.13	-	**70.63**	0.15	**70.95**	0.47	**71.29**	0.81
NA1860	77.47	Bottom of structure	86.40	Approximate edge of pavement	82.44	-	84.09	-	84.52	-	84.79	-
NA1870	87.63	Bottom of structure	92.36	Approximate edge of pavement	89.54	-	91.95	-	92.34	-	**92.59**	0.23

Geosyntec consultants

Appendix A - Existing Conditions Model Results

NODE NAME	INITIAL STAGE		WARNING STAGE		2 YEAR / 24 HOUR		10 YEAR / 24 HOUR		25 YEAR / 24 HOUR		100 YEAR / 24 HOUR	
	ELEVATION	DESCRIPTION	ELEVATION	DESCRIPTION	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)
NA1880	85.16	Bottom of structure	92.62	Approximate edge of pavement	86.67	-	90.27	-	90.97	-	92.06	-
NA1890	92.07	Bottom of structure	94.36	Approximate edge of pavement	92.38	-	92.47	-	92.53	-	92.75	-
NA1900	86.29	Lake Francis Control Elevation	89.99	Bank overtopping	**91.82**	1.83	**92.21**	2.22	**92.38**	2.39	**92.6**	2.61
NA1910	87.03	Lee Road pond control elevation	90.58	Bank overtopping	**91.8**	1.22	**92.2**	1.62	**92.37**	1.79	**92.61**	2.03
NA1970	86.00	Bottom of dry pond	94.89	Bank overtopping	92.32	-	92.79	-	93.25	-	94.58	-
NA1980	89.70	Bottom of structure	95.10	Approximate edge of pavement	92.37	-	92.86	-	93.31	-	94.65	-
NA1990	86.66	Bottom of structure	90.12	Approximate edge of pavement	87.9	-	88.29	-	88.62	-	**90.29**	0.17
NA2000	87.47	Bottom of structure	92.54	Approximate edge of pavement	90.11	-	90.88	-	91.52	-	**93.02**	0.48
NA2010	77.85	Bottom of structure	82.90	Approximate edge of pavement	82.83	-	**83.36**	0.46	**83.44**	0.54	**83.55**	0.65
NA2020	79.52	Bottom of structure	88.37	Approximate edge of pavement	82.5	-	84.15	-	84.59	-	84.93	-
NA2030	87.08	Bottom of structure	92.37	Approximate edge of pavement	90.15	-	90.84	-	91.42	-	91.5	-
NA2100	80.70	Bottom of structure	85.92	Approximate edge of pavement	85.5	-	**86.71**	0.79	**87.21**	1.29	**87.86**	1.94
NA2110	82.19	Bottom of structure	81.74	Approximate edge of pavement	**85.38**	3.64	**86.59**	4.85	**87.09**	5.35	**87.74**	6.00
NA2120	90.41	Bottom of structure	90.89	Approximate edge of pavement	**91.86**	0.97	**92.27**	1.38	**92.44**	1.55	**92.66**	1.77
NB0005	88.75	Approximate water surface elevation	91.82	Finished Floor Elevation	89.43	-	89.88	-	90.63	-	91.62	-
NB0010	81.87	Botom of structure	89.15	Approximate edge of pavement	85.14	-	86.62	-	87.39	-	**89.31**	0.16
NB0020	82.31	Botom of structure	90.36	Approximate edge of pavement	86.93	-	89.03	-	89.62	-	**91.27**	0.91
NB0030	86.97	Approximate water surface elevation	92.39	Finished floor elevation	89.19	-	89.78	-	90.57	-	91.56	-
NB0040	82.50	Pond control structure	89.07	Bank overtopping	85.19	-	85.23	-	85.26	-	85.32	-
NB0050	83.14	Pond control structure	85.33	Bank overtopping	84.62	-	85.02	-	85.21	-	**85.42**	0.09
NB0060	82.04	Bottom of structure	90.41	Approximate edge of pavement	83.35	-	84.75	-	85.82	-	87.73	-
NB0070	86.01	Pond control structure	88.50	Bank overtopping	88.45	-	**88.52**	0.02	**88.57**	0.07	**88.61**	0.11
NB0080	82.04	Bottom of structure	91.31	Approximate edge of pavement	83.58	-	85.05	-	86.27	-	88.58	-

APPENDIX B

SJRWMD Preliminary Meeting Summary

WINTER PARK CRA STUDY UPDATE

Meeting Summary

1:00 pm / July 18, 2024
In-person Meeting

Meeting Attendees

- City of Winter Park (City) – Shannon Monahan (PM; Engineer, Public Works Department), Don Marcotte (Assistant Director, Public Works Department), Charles Ramdatt (Director, Public Works Department)
- St. Johns River Water Management District (SJRWMD) – Cammie Dewey
- Geosyntec – Gloria Teague (PM), Thomas Amstadt (PD)
- SAI/Halff – Mark Troilo, Chris Spargo
- Baxter & Woodman – Claude Cassagnol

Purpose

- A preliminary meeting was held with SJRWMD regulatory staff to review proposed flood mitigation strategies for the City's three study regions (west, central, and east) and request feedback on each strategy's permitting feasibility.

Western Study Region (Geosyntec)

- Flood Improvement Concept #1 – Lake Mendsen: Connection to Lake Rose
    - SJRWMD Comments
        - Water quality – permit would need to address water quality into Lake Rose and not create a local flooding issue.
        - Wetland impacts – no wetland impacts expected due to nature of Lake Rose (steep sides, lack of vegetation)
- Flood Improvement Concept #2 – Lake Mendsen: Pump Station and Lake Expansion
    - SJRWMD Comments
        - Pond expansion
            - Check existing permit, excavation/expansion may already be permitted
            - Potential credit for larger residence time
        - Pump station
            - Permit would need to address water quality into Lake Killarney, design may require treatment train.
            - Pre-storm lake drawdowns undesirable as it is preferred to keep water in basin and avoid perception of causing downstream flooding issues. Downstream residents commonly complain that pre-storm releases worsened their flooding issues.
        - Examples of projects that are preferable to SJRWMD and favorable for FDEP cost-share include daily skimming, chlorine treatment, and discharging into the reclaimed water system. These

projects are recommended for FDEP cost-share as they have a water quality benefit, water supply benefit, and occasionally natural system benefit. Examples include:

- City of Altamonte Springs – A-First
- City of Debary
- City of Orange City – Mill Lake

- Flood Improvement Concept #3 – Canton Avenue: Improved Conveyance
  - SJRWMD Comments
    - Water quality – may need to upsize baffle box at outlet
- Flood Improvement Concept #4 – Lake Bell: Connection to Lake Park
  - SJRWMD Comments
    - Pre-storm lake drawdowns undesirable as it is preferred to keep water in basin and avoid perception of causing downstream flooding issues.
    - Water quality
      - Avoid using wetland for water quality treatment or will need to mitigate for wetland impacts.
      - Concern whether volume/load of releases to Lake Gem/Park Lake will increase from wetland.
        - Investigate total load into Lake Gem/Park Lake from Lake Killarney and compare to load from Killarney and this project to ensure no net increase in loading to Lake Gem/Park Lake.
      - Retrofit to add baffle box in route from Lake Killarney to Lake Gem/Park Lake may be a good option to offset additional loading from this project.
      - To determine annual average loading for design standard would need to run 10-year simulation.
      - Possible argument to offset nutrient loading by converting septic to sewer around Lake Bell.
- Flood Improvement Concept #5 – Lake Bell: Reduced Inflows from FDOT Pond
  - SJRWMD Comments
    - None
- Flood Improvement Concept #6 – Lake Killarney: Conveyance to Lake Gem
  - SJRWMD Comments
    - Pre-storm lake drawdowns undesirable as it is preferred to keep water in basin and avoid perception of causing downstream flooding issues.
    - Ensure drainwells would not lose recharge to aquifer as a result of this project. FDEP is not receptive to additional drainwells or modifications to the intake pipe elevation on existing drainwells but does recognize that drainwells on lakes serve as an important recharge source and are preferred to drainwells on inlets due to better water quality.

APPENDIX C

FIC# 1 – Lake Mendsen: Connection to Lake Rose Model Results

Geosyntec consultants

APPENDIX C - FIC #1 – Lake Mendsen: Connection to Lake Rose Model Results

NODE NAME	INITIAL STAGE		WARNING STAGE		2 YEAR / 24 HOUR		10 YEAR / 24 HOUR		25 YEAR / 24 HOUR		100 YEAR / 24 HOUR	
	ELEVATION	DESCRIPTION	ELEVATION	DESCRIPTION	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)
LAKE_KILLARNEY	82.04	Control Elevation	84.40	Finished floor elevation	82.54	-	83.08	-	83.41	-	83.95	-
LAKE_MENDSEN	81.14	Normal high water elevation	84.82	Approximate edge of pavement	84.06	-	**85.98**	1.16	**86.87**	2.05	**87.62**	2.80
LAKE_ROSE	83.30	Approximate water surface elevation	91.01	Bank overtopping	83.89	-	85.97	-	86.8	-	87.45	-
NA0010	72.14	Bottom of structure	78.79	Approximate edge of pavement	77.96	-	**79.49**	0.70	**79.77**	0.98	**80.07**	1.28
NA0020	72.87	Bottom of structure	83.54	Approximate edge of pavement	79.41	-	82.1	-	82.5	-	82.82	-
NA0030	76.82	Bottom of structure	86.32	Approximate edge of pavement	79.79	-	83.07	-	84.42	-	**86.38**	0.06
NA0040	82.00	Bottom of structure	89.63	Approximate edge of pavement	83.88	-	84.48	-	86.22	-	**89.8**	0.17
NA0050	85.66	Bottom of structure	91.51	Approximate edge of pavement	87.82	-	88.23	-	88.67	-	91.19	-
NA0060	88.12	Bottom of structure	92.97	Approximate edge of pavement	88.6	-	88.82	-	89.26	-	92.9	-
NA0070	85.52	Bottom of structure	90.82	Approximate edge of pavement	85.93	-	86.02	-	86.29	-	89.85	-
NA0080	76.22	Bottom of structure	82.01	Approximate edge of pavement	79.68	-	**82.39**	0.38	**82.57**	0.56	**82.74**	0.73
NA0090	78.51	Bottom of structure	85.83	Approximate edge of pavement	84.4	-	85.22	-	85.33	-	85.44	-
NA0100	80.27	Bottom of structure	83.79	Approximate edge of pavement	**84.84**	1.05	**85.3**	1.51	**85.39**	1.60	**85.48**	1.69
NA0110	81.13	Bottom of structure	84.29	Approximate edge of pavement	**85.17**	0.88	**85.36**	1.07	**85.44**	1.15	**85.52**	1.23
NA0120	82.90	Bottom of structure	91.22	Approximate edge of pavement	84.16	-	84.39	-	85.54	-	86.98	-
NA0130	77.12	Bottom of structure	88.40	Approximate edge of pavement	80.94	-	83.94	-	85.61	-	87.16	-
NA0140	81.42	Bottom of structure	85.91	Approximate edge of pavement	82.89	-	**86.3**	0.39	**86.72**	0.81	**87.34**	1.43
NA0150	76.23	Bottom of structure	86.30	Approximate edge of pavement	79.77	-	81.53	-	82.41	-	83.23	-
NA0160	80.32	Bottom of structure	88.35	Approximate edge of pavement	84.78	-	85.2	-	85.5	-	85.93	-
NA0170	79.47	Bottom of structure	90.12	Approximate edge of pavement	83.99	-	84.43	-	84.63	-	84.95	-
NA0180	71.31	Bottom of structure	87.26	Approximate edge of pavement	74.6	-	75.03	-	75.23	-	75.56	-
NA0190	80.82	Bottom of structure	89.89	Approximate edge of pavement	85.22	-	85.64	-	85.98	-	86.48	-
NA0200	81.52	Bottom of structure	85.45	Approximate edge of pavement	**85.93**	0.48	**86.34**	0.89	**86.75**	1.30	**87.36**	1.91
NA0210	80.80	Bottom of structure	88.76	Approximate edge of pavement	83.19	-	84.03	-	85.04	-	86.61	-
NA0220	86.72	Bottom of structure	90.75	Approximate edge of pavement	89	-	90.52	-	**90.86**	0.11	**91.12**	0.37
NA0230	91.44	Bottom of structure	96.15	Approximate edge of pavement	92.44	-	92.99	-	93.29	-	93.82	-
NA0240	88.61	Bottom of structure	93.98	Approximate edge of pavement	92.4	-	92.95	-	93.24	-	93.77	-
NA0250	87.54	Bottom of structure	92.19	Approximate edge of pavement	**92.31**	0.12	**92.7**	0.51	**92.81**	0.62	**92.92**	0.73
NA0260	86.29	Bottom of structure	91.93	Approximate edge of pavement	89.35	-	90.32	-	91.78	-	**92.07**	0.14
NA0270	85.32	Bottom of structure	90.61	Approximate edge of pavement	87.95	-	88.92	-	89.96	-	**91.79**	1.18
NA0280	82.32	Bottom of structure	91.56	Approximate edge of pavement	85.28	-	86.42	-	88	-	90.95	-
NA0290	75.96	Bottom of structure	89.24	Approximate edge of pavement	85.82	-	86.81	-	87.05	-	87.28	-
NA0300	81.61	Bottom of structure	88.92	Approximate edge of pavement	85.82	-	86.54	-	86.76	-	87.21	-
NA0310	83.67	Bottom of structure	86.50	Approximate edge of pavement	86.06	-	**86.5**	0.00	**86.76**	0.26	**87.35**	0.85
NA0320	83.58	Bottom of structure	88.77	Approximate edge of pavement	85.64	-	86.38	-	86.59	-	87.08	-
NA0330	83.24	Bottom of structure	86.37	Approximate edge of pavement	**86.37**	0.00	**86.64**	0.27	**86.84**	0.47	**87.41**	1.04
NA0340	81.46	Bottom of structure	85.60	Approximate edge of pavement	**85.96**	0.36	**86.37**	0.77	**86.77**	1.17	**87.38**	1.78
NA0350	78.17	Bottom of structure	87.25	Approximate edge of pavement	85.93	-	86.93	-	87.18	-	**87.4**	0.15
NA0360	88.33	Bottom of structure	94.12	Approximate edge of pavement	89.3	-	91.29	-	91.38	-	91.59	-
NA0370	86.22	Bottom of structure	91.16	Approximate edge of pavement	89.22	-	**91.21**	0.05	**91.26**	0.10	**91.32**	0.16
NA0380	84.62	Bottom of structure	88.11	Approximate edge of pavement	86.01	-	87.19	-	87.58	-	88.02	-
NA0390	77.48	Bottom of structure	87.47	Approximate edge of pavement	85.87	-	86.86	-	87.1	-	87.32	-
NA0400	87.42	Bottom of structure	91.46	Approximate edge of pavement	88.36	-	89	-	89.59	-	90.82	-
NA0410	85.24	Bottom of structure	87.80	Approximate edge of pavement	**88.28**	0.48	**88.78**	0.98	**89.04**	1.24	**89.19**	1.39
NA0420	82.03	Bottom of structure	89.00	Approximate edge of pavement	85.99	-	87.34	-	87.93	-	88.69	-
NA0430	82.26	Bottom of structure	88.32	Approximate edge of pavement	86.01	-	87.29	-	87.86	-	**88.62**	0.30
NA0440	81.27	Bottom of structure	89.46	Approximate edge of pavement	85.89	-	87.31	-	87.98	-	88.75	-

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APPENDIX C - FIC #1 – Lake Mendsen: Connection to Lake Rose Model Results

NODE NAME	INITIAL STAGE		WARNING STAGE		2 YEAR / 24 HOUR		10 YEAR / 24 HOUR		25 YEAR / 24 HOUR		100 YEAR / 24 HOUR	
	ELEVATION	DESCRIPTION	ELEVATION	DESCRIPTION	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)
NA0450	80.02	Bottom of structure	88.29	Approximate edge of pavement	84.37	-	85.92	-	86.94	-	87.91	-
NA0460	82.60	Bottom of structure	88.09	Approximate edge of pavement	86.06	-	86.64	-	86.81	-	87.14	-
NA0470	79.57	Bottom of structure	85.32	Approximate edge of pavement	**86.01**	0.69	**86.57**	1.25	**86.7**	1.38	**86.81**	1.49
NA0480	80.26	Bottom of structure	86.75	Approximate edge of pavement	85.91	-	86.67	-	**86.8**	0.05	**86.88**	0.13
NA0490	81.66	Bottom of structure	86.12	Approximate edge of pavement	85.05	-	**86.5**	0.38	**86.65**	0.53	**86.75**	0.63
NA0500	78.02	Bottom of structure	84.24	Approximate edge of pavement	82.93	-	**84.61**	0.37	**84.94**	0.70	**85.14**	0.90
NA0510	79.52	Bottom of structure	84.82	Approximate edge of pavement	83.55	-	**85.32**	0.50	**85.51**	0.69	**85.72**	0.90
NA0520	81.44	Bottom of structure	85.49	Approximate edge of pavement	84.03	-	**85.97**	0.48	**86.14**	0.65	**86.27**	0.78
NA0530	83.62	Bottom of structure	88.82	Approximate edge of pavement	86.07	-	86.99	-	87.67	-	**88.92**	0.10
NA0540	85.97	Bottom of structure	90.45	Approximate edge of pavement	87.62	-	88.5	-	89.9	-	**90.84**	0.39
NA0550	87.66	Bottom of structure	91.28	Approximate edge of pavement	89.07	-	90.15	-	**91.5**	0.22	**91.68**	0.40
NA0560	87.18	Bottom of structure	91.56	Approximate edge of pavement	88.69	-	89.32	-	90.46	-	**92.02**	0.46
NA0570	85.65	Bottom of structure	91.06	Approximate edge of pavement	87.92	-	88.45	-	89.02	-	**91.35**	0.29
NA0580	92.68	Bottom of structure	96.76	Approximate edge of pavement	93	-	93.1	-	93.18	-	93.34	-
NA0590	89.02	Bottom of structure	93.58	Approximate edge of pavement	90.15	-	90.76	-	91.02	-	92.76	-
NA0600	85.05	Bottom of structure	90.93	Approximate edge of pavement	87.01	-	87.89	-	89.69	-	**91.37**	0.44
NA0610	83.91	Bottom of structure	89.93	Approximate edge of pavement	85.99	-	87.5	-	89.02	-	**90.7**	0.77
NA0620	83.12	Bottom of structure	90.59	Approximate edge of pavement	85.32	-	87.3	-	88.65	-	90.15	-
NA0630	85.42	Bottom of structure	90.77	Approximate edge of pavement	86.51	-	87.37	-	88.75	-	90.39	-
NA0640	91.02	Bottom of structure	95.50	Approximate edge of pavement	91.37	-	91.47	-	91.63	-	94.82	-
NA0650	90.02	Bottom of structure	94.83	Approximate edge of pavement	90.92	-	91.23	-	91.5	-	94.73	-
NA0660	90.23	Bottom of structure	94.85	Approximate edge of pavement	91.46	-	92.21	-	93.03	-	94.47	-
NA0670	92.30	Bottom of structure	97.97	Approximate edge of pavement	93.54	-	96.36	-	**98.52**	0.55	**98.61**	0.64
NA0680	90.33	Bottom of structure	96.79	Approximate edge of pavement	91.66	-	93.81	-	96.54	-	**97.22**	0.43
NA0690	88.62	Bottom of structure	94.25	Approximate edge of pavement	90.38	-	92.57	-	**94.5**	0.25	**94.6**	0.35
NA0700	86.32	Bottom of structure	91.79	Approximate edge of pavement	87.87	-	89.09	-	90.75	-	**91.96**	0.17
NA0710	84.94	Bottom of structure	90.28	Approximate edge of pavement	87.23	-	88.71	-	90.15	-	**90.59**	0.31
NA0720	83.55	Bottom of structure	89.40	Approximate edge of pavement	85.2	-	87.04	-	88.06	-	88.86	-
NA0730	82.98	Bottom of structure	88.88	Approximate edge of pavement	85.02	-	86.86	-	87.82	-	88.47	-
NA0740	81.14	Lake Mendsen NHWE	88.51	Approximate edge of pavement	84.26	-	86.78	-	87.67	-	88.29	-
NA0750	81.14	Lake Mendsen NHWE	89.42	Approximate edge of pavement	84.27	-	87.06	-	88.2	-	89.4	-
NA0760	81.14	Lake Mendsen NHWE	87.92	Approximate edge of pavement	84.23	-	86.68	-	87.51	-	**88.12**	0.20
NA0770	81.14	Lake Mendsen NHWE	87.19	Approximate edge of pavement	84.2	-	86.42	-	87.05	-	**87.69**	0.50
NA0780	81.14	Lake Mendsen NHWE	84.82	Approximate edge of pavement	84.17	-	**86.18**	1.36	**86.89**	2.07	**87.59**	2.77
NA0790	85.72	Bottom of structure	89.36	Approximate edge of pavement	87.3	-	88.81	-	**90.22**	0.86	**90.49**	1.13
NA0800	82.98	Bottom of structure	87.39	Approximate edge of pavement	85.06	-	86.91	-	**87.9**	0.51	**88.5**	1.11
NA0810	81.14	Bottom of structure	87.43	Approximate edge of pavement	84.28	-	86.84	-	**87.62**	0.19	**88**	0.57
NA0820	84.16	Bottom of structure	92.65	Approximate edge of pavement	86.61	-	89.77	-	90.81	-	91.98	-
NA0830	84.16	Bottom of structure	91.73	Approximate edge of pavement	86.53	-	89.6	-	90.63	-	91.53	-
NA0840	82.97	Bottom of structure	89.94	Approximate edge of pavement	85.35	-	88.12	-	89.13	-	**90.09**	0.15
NA0850	81.14	Lake Mendsen NHWE	86.88	Approximate edge of pavement	84.26	-	**87.24**	0.36	**88.15**	1.27	**88.55**	1.67
NA0860	81.14	Lake Mendsen NHWE	87.59	Approximate edge of pavement	84.23	-	86.86	-	**87.9**	0.31	**88.44**	0.85
NA0870	81.14	Lake Mendsen NHWE	86.66	Approximate edge of pavement	84.2	-	86.42	-	**87.53**	0.87	**87.95**	1.29
NA0880	81.14	Lake Mendsen NHWE	87.14	Approximate edge of pavement	84.16	-	86.11	-	**87.16**	0.02	**87.72**	0.58
NA0890	81.14	Lake Mendsen NHWE	86.19	Approximate edge of pavement	84.13	-	86.06	-	**86.97**	0.78	**87.67**	1.48
NA0900	81.14	Lake Mendsen NHWE	85.06	Approximate edge of pavement	84.09	-	**86.02**	0.96	**86.92**	1.86	**87.64**	2.58
NA0910	85.88	Bottom of structure	91.89	Approximate edge of pavement	87.49	-	87.89	-	88.17	-	88.82	-

Geosyntec consultants

APPENDIX C - FIC #1 – Lake Mendsen: Connection to Lake Rose Model Results

NODE NAME	INITIAL STAGE		WARNING STAGE		2 YEAR / 24 HOUR		10 YEAR / 24 HOUR		25 YEAR / 24 HOUR		100 YEAR / 24 HOUR	
	ELEVATION	DESCRIPTION	ELEVATION	DESCRIPTION	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)
NA0920	81.29	Bottom of structure	87.69	Approximate edge of pavement	84.19	-	86.07	-	87	-	**87.86**	0.17
NA0930	81.14	Lake Mendsen NHWE	86.09	Approximate edge of pavement	84.15	-	86.03	-	**86.92**	0.83	**87.64**	1.55
NA0940	81.14	Lake Mendsen NHWE	84.77	Approximate edge of pavement	84.13	-	**86**	1.23	**86.9**	2.13	**87.62**	2.85
NA0950	81.14	Lake Mendsen NHWE	84.84	Approximate edge of pavement	84.09	-	**85.99**	1.15	**86.88**	2.04	**87.62**	2.78
NA0960	81.14	Lake Mendsen NHWE	85.58	Approximate edge of pavement	84.19	-	**86.21**	0.63	**86.85**	1.27	**87.53**	1.95
NA0970	81.14	Lake Mendsen NHWE	85.66	Approximate edge of pavement	84.14	-	**86.07**	0.41	**86.89**	1.23	**87.61**	1.95
NA0980	81.14	Lake Mendsen NHWE	84.95	Approximate edge of pavement	84.09	-	**86.02**	1.07	**86.88**	1.93	**87.61**	2.66
NA0990	87.41	Bottom of structure	90.80	Approximate edge of pavement	88.27	-	88.54	-	88.76	-	89.54	-
NA1000	82.94	Bottom of structure	87.49	Approximate edge of pavement	84.5	-	86.17	-	87.3	-	**88.21**	0.72
NA1010	78.97	Bottom of structure	85.37	Approximate edge of pavement	81.88	-	**85.62**	0.25	**86.28**	0.91	**87.36**	1.99
NA1020	80.47	Bottom of structure	85.47	Approximate edge of pavement	83.12	-	**85.89**	0.42	**86.31**	0.84	**87.38**	1.91
NA1030	77.85	Bottom of structure	85.55	Approximate edge of pavement	81.34	-	84.94	-	**85.61**	0.06	**87.34**	1.79
NA1040	77.76	Bottom of structure	85.24	Approximate edge of pavement	81.19	-	84.75	-	**85.43**	0.19	**87.34**	2.10
NA1050	77.44	Bottom of structure	84.28	Approximate edge of pavement	80.85	-	84.28	-	**84.93**	0.65	**87.32**	3.04
NA1060	76.61	Bottom of structure	83.43	Approximate edge of pavement	80.7	-	**84**	0.57	**84.78**	1.35	**87.31**	3.88
NA1070	75.87	Bottom of structure	89.34	Approximate edge of pavement	80.4	-	83.4	-	84.1	-	85.62	-
NA1080	74.25	Bottom of structure	85.11	Approximate edge of pavement	78.97	-	81.02	-	81.47	-	82.24	-
NA1090	73.79	Bottom of structure	76.62	Approximate edge of pavement	**77.73**	1.11	**78.57**	1.95	**78.77**	2.15	**79.1**	2.48
NA1100	77.15	Bottom of structure	83.03	Approximate edge of pavement	78.07	-	79.42	-	83	-	**83.28**	0.25
NA1110	74.23	Bottom of structure	80.07	Approximate edge of pavement	77.24	-	77.6	-	78.76	-	79.23	-
NA1120	73.79	Bottom of structure	76.34	Approximate edge of pavement	**77.17**	0.83	**77.28**	0.94	**77.47**	1.13	**77.81**	1.47
NA1130	78.93	Bottom of structure	83.69	Approximate edge of pavement	81.87	-	**84.34**	0.65	**84.73**	1.04	**85.15**	1.46
NA1140	79.43	Bottom of structure	86.76	Approximate edge of pavement	84.17	-	**87.26**	0.50	**87.53**	0.77	**87.85**	1.09
NA1150	80.96	Bottom of structure	83.93	Approximate edge of pavement	**87.31**	3.38	**88.47**	4.54	**88.67**	4.74	**88.91**	4.98
NA1160	87.02	Bottom of structure	91.63	Approximate edge of pavement	90.04	-	91.59	-	**91.98**	0.35	**92.17**	0.54
NA1170	83.62	Bottom of structure	89.26	Approximate edge of pavement	**89.99**	0.73	**90.34**	1.08	**90.52**	1.26	**90.71**	1.45
NA1180	83.62	Lake Midget control elevation	90.40	Bank overtopping	89.96	-	90.31	-	**90.48**	0.08	**90.67**	0.27
NA1190	83.89	Bottom of structure	88.91	Approximate edge of pavement	**89.94**	1.03	**90.04**	1.13	**90.09**	1.18	**90.16**	1.25
NA1200	83.89	Bottom of structure	91.04	Approximate edge of pavement	89.89	-	89.99	-	90.04	-	90.11	-
NA1210	83.62	Bottom of structure	90.46	Approximate edge of pavement	89.92	-	90.11	-	90.26	-	90.46	-
NA1220	83.62	Bottom of structure	91.71	Approximate edge of pavement	89.96	-	90.23	-	90.43	-	90.68	-
NA1230	83.62	Bottom of structure	90.28	Approximate edge of pavement	89.97	-	**90.3**	0.02	**90.49**	0.21	**90.69**	0.41
NA1240	87.78	Bottom of structure	91.07	Approximate edge of pavement	90.07	-	90.61	-	91.02	-	**91.13**	0.06
NA1250	87.42	Bottom of structure	90.70	Approximate edge of pavement	89.97	-	90.04	-	90.08	-	90.13	-
NA1260	86.18	Bottom of structure	90.64	Approximate edge of pavement	89.87	-	89.97	-	90.01	-	90.08	-
NA1270	85.80	Bottom of structure	89.67	Approximate edge of pavement	**89.94**	0.27	**90.06**	0.39	**90.14**	0.47	**90.22**	0.55
NA1280	85.60	Bottom of structure	90.74	Approximate edge of pavement	89.93	-	90.04	-	90.1	-	90.17	-
NA1290	88.32	Bottom of structure	90.86	Approximate edge of pavement	**91.06**	0.20	**91.19**	0.33	**91.24**	0.38	**91.3**	0.44
NA1300	86.73	Bottom of structure	90.10	Approximate edge of pavement	**90.44**	0.34	**90.81**	0.71	**90.91**	0.81	**90.99**	0.89
NA1310	83.30	Bottom of structure	87.94	Approximate edge of pavement	86.04	-	87.53	-	**88.56**	0.62	**88.72**	0.78
NA1320	88.52	Bottom of structure	92.53	Approximate edge of pavement	89.46	-	90.98	-	91.3	-	91.72	-
NA1330	84.72	Bottom of structure	90.29	Approximate edge of pavement	89.4	-	**90.93**	0.64	**91.25**	0.96	**91.66**	1.37
NA1340	85.32	Bottom of structure	89.55	Approximate edge of pavement	89.27	-	**90.9**	1.35	**91.22**	1.67	**91.62**	2.07
NA1350	84.62	Bottom of structure	90.45	Approximate edge of pavement	88.51	-	**90.56**	0.11	**91.16**	0.71	**91.56**	1.11
NA1360	82.50	Bottom of structure	89.84	Approximate edge of pavement	87.3	-	88.95	-	**90.1**	0.26	**90.73**	0.89
NA1370	82.50	Bottom of structure	88.96	Approximate edge of pavement	86.1	-	87.4	-	88.24	-	**90.04**	1.08
NA1380	82.50	Bottom of structure	89.60	Approximate edge of pavement	85.24	-	86.28	-	86.75	-	87.77	-

Geosyntec consultants

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NODE NAME	INITIAL STAGE		WARNING STAGE		2 YEAR / 24 HOUR		10 YEAR / 24 HOUR		25 YEAR / 24 HOUR		100 YEAR / 24 HOUR	
	ELEVATION	DESCRIPTION	ELEVATION	DESCRIPTION	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)
NA1390	82.04	Bottom of structure	89.38	Approximate edge of pavement	84.79	-	85.69	-	85.99	-	86.62	-
NA1400	86.52	Bottom of structure	92.24	Approximate edge of pavement	89.56	-	91.28	-	91.74	-	**92.35**	0.11
NA1410	84.72	Bottom of structure	90.35	Approximate edge of pavement	89.41	-	**90.94**	0.59	**91.26**	0.91	**91.68**	1.33
NA1420	81.52	Bottom of structure	89.36	Approximate edge of pavement	87.49	-	**90.34**	0.98	**91.19**	1.83	**91.62**	2.26
NA1430	81.13	Bottom of structure	90.79	Approximate edge of pavement	86.53	-	88.78	-	89.59	-	**91.35**	0.56
NA1440	81.13	Bottom of structure	90.11	Approximate edge of pavement	86.01	-	88.02	-	88.8	-	**90.59**	0.48
NA1450	81.13	Bottom of structure	88.88	Approximate edge of pavement	85.67	-	87.53	-	88.33	-	**89.96**	1.08
NA1460	81.13	Bottom of structure	89.61	Approximate edge of pavement	85.28	-	86.84	-	87.55	-	89.15	-
NA1470	81.13	Bottom of structure	90.19	Approximate edge of pavement	84.88	-	86.1	-	86.7	-	88.07	-
NA1480	81.13	Bottom of structure	89.23	Approximate edge of pavement	84.85	-	85.95	-	86.44	-	87.45	-
NA1490	82.72	Bottom of structure	87.50	Approximate edge of pavement	85.98	-	**87.94**	0.44	**88.2**	0.70	**88.53**	1.03
NA1500	83.44	Bottom of structure	87.27	Approximate edge of pavement	84.2	-	86.23	-	**87.41**	0.14	**88.12**	0.85
NA1510	81.14	Lake Mendsen NHWE	85.25	Approximate edge of pavement	84.13	-	**86.13**	0.88	**87.33**	2.08	**88.08**	2.83
NA1520	82.42	Bottom of structure	86.11	Approximate edge of pavement	84.16	-	**86.45**	0.34	**87.32**	1.21	**88.05**	1.94
NA1530	81.14	Lake Mendsen NHWE	86.90	Approximate edge of pavement	84.09	-	86.02	-	**86.94**	0.04	**87.7**	0.80
NA1540	81.14	Lake Mendsen NHWE	85.15	Approximate edge of pavement	84.17	-	**86.16**	1.01	**87.36**	2.21	**88.1**	2.95
NA1550	90.36	Bottom of structure	94.47	Approximate edge of pavement	92	-	93.68	-	**94.5**	0.03	**94.87**	0.40
NA1560	89.67	Bottom of structure	94.46	Approximate edge of pavement	90.89	-	91.33	-	91.52	-	91.64	-
NA1570	87.27	Bottom of structure	91.49	Approximate edge of pavement	88.41	-	88.82	-	89.61	-	**91.61**	0.12
NA1580	84.57	Bottom of structure	89.81	Approximate edge of pavement	86.39	-	87	-	87.84	-	89.36	-
NA1590	82.97	Bottom of structure	91.69	Approximate edge of pavement	88.51	-	88.79	-	89.02	-	89.46	-
NA1600	82.97	Bottom of structure	87.71	Approximate edge of pavement	84.2	-	86.27	-	86.97	-	87.7	-
NA1610	81.80	Bottom of structure	85.34	Approximate edge of pavement	84.17	-	**86.19**	0.85	**86.93**	1.59	**87.65**	2.31
NA1620	90.03	Bottom of structure	92.24	Approximate edge of pavement	90.03	-	90.03	-	90.03	-	91.6	-
NA1630	81.92	Bottom of structure	84.78	Approximate edge of pavement	**85.05**	0.27	**85.98**	1.20	**86.8**	2.02	**87.49**	2.71
NA1640	81.54	Bottom of structure	87.01	Approximate edge of pavement	84.53	-	85.96	-	86.53	-	**87.45**	0.44
NA1650	80.90	Bottom of structure	85.58	Approximate edge of pavement	83.75	-	**85.94**	0.36	**86.32**	0.74	**87.42**	1.84
NA1660	82.04	Lake Killarney tailwater	85.25	Approximate edge of pavement	82.67	-	83.41	-	83.71	-	84.4	-
NA1670	84.22	Bottom of structure	92.63	Approximate edge of pavement	88.97	-	91.52	-	92.15	-	**92.8**	0.17
NA1680	83.52	Bottom of structure	90.33	Approximate edge of pavement	88.39	-	90.28	-	**90.47**	0.14	**90.57**	0.24
NA1690	82.52	Bottom of structure	89.14	Approximate edge of pavement	87.94	-	**89.33**	0.19	**89.43**	0.29	**89.54**	0.40
NA1700	82.04	Bottom of structure	88.40	Approximate edge of pavement	87.53	-	**89.15**	0.75	**89.26**	0.86	**89.39**	0.99
NA1710	82.04	Bottom of structure	89.18	Approximate edge of pavement	86.69	-	88.05	-	88.26	-	88.62	-
NA1720	82.04	Bottom of structure	89.94	Approximate edge of pavement	85.46	-	86.4	-	86.69	-	87.21	-
NA1730	82.04	Bottom of structure	89.12	Approximate edge of pavement	84.88	-	85.8	-	86.1	-	86.71	-
NA1740	81.14	Bottom of structure	90.16	Approximate edge of pavement	83.92	-	85.55	-	86.57	-	87.76	-
NA1750	81.14	Lake Mendsen NHWE	85.66	Approximate edge of pavement	83.92	-	85.65	-	**86.81**	1.15	**87.63**	1.97
NA1760	81.13	Lake Mendsen NHWE	85.45	Approximate edge of pavement	84.1	-	**85.96**	0.51	**86.85**	1.40	**87.65**	2.20
NA1790	82.93	Bottom of structure	88.04	Approximate edge of pavement	85.81	-	87.59	-	**88.41**	0.37	**88.66**	0.62
NA1800	76.40	Bottom of structure	88.11	Approximate edge of pavement	78.24	-	78.39	-	78.48	-	78.68	-
NA1810	77.43	Bottom of structure	86.98	Approximate edge of pavement	79.6	-	79.79	-	79.94	-	80.24	-
NA1820	70.50	Bottom of dry pond	78.99	Bank overtopping	78.19	-	78.32	-	78.41	-	78.54	-
NA1830	67.20	9th Grade Pond Control Elevation	77.76	Bank overtopping	71.35	-	72.05	-	72.25	-	72.6	-
NA1840	67.20	Bottom of structure	77.60	Approximate edge of pavement	71.97	-	73.16	-	73.53	-	74.15	-
NA1850	67.20	Lake Virginia tailwater	70.48	Approximate edge of pavement	69.13	-	**70.63**	0.15	**70.92**	0.44	**71.28**	0.80
NA1860	77.47	Bottom of structure	86.40	Approximate edge of pavement	82.44	-	84.09	-	84.52	-	84.79	-
NA1870	87.63	Bottom of structure	92.36	Approximate edge of pavement	89.54	-	91.81	-	92.33	-	**92.59**	0.23

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APPENDIX C - FIC #1 – Lake Mendsen: Connection to Lake Rose Model Results

NODE NAME	INITIAL STAGE		WARNING STAGE		2 YEAR / 24 HOUR		10 YEAR / 24 HOUR		25 YEAR / 24 HOUR		100 YEAR / 24 HOUR	
	ELEVATION	DESCRIPTION	ELEVATION	DESCRIPTION	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)
NA1880	85.16	Bottom of structure	92.62	Approximate edge of pavement	86.67	-	89.85	-	90.88	-	92.04	-
NA1890	92.07	Bottom of structure	94.36	Approximate edge of pavement	92.38	-	92.47	-	92.53	-	92.75	-
NA1900	86.29	Lake Francis Control Elevation	89.99	Bank overtopping	**91.82**	1.83	**92.21**	2.22	**92.38**	2.39	**92.6**	2.61
NA1910	87.03	Lee Road pond control elevation	90.58	Bank overtopping	**91.8**	1.22	**92.2**	1.62	**92.37**	1.79	**92.61**	2.03
NA1970	86.00	Bottom of dry pond	94.89	Bank overtopping	92.32	-	92.79	-	93.24	-	94.58	-
NA1980	89.70	Bottom of structure	95.10	Approximate edge of pavement	92.37	-	92.86	-	93.31	-	94.64	-
NA1990	86.66	Bottom of structure	90.12	Approximate edge of pavement	87.9	-	88.29	-	88.62	-	**90.29**	0.17
NA2000	87.47	Bottom of structure	92.54	Approximate edge of pavement	90.11	-	90.88	-	91.52	-	**93.02**	0.48
NA2010	77.85	Bottom of structure	82.90	Approximate edge of pavement	82.83	-	**83.36**	0.46	**83.44**	0.54	**83.55**	0.65
NA2020	79.52	Bottom of structure	88.37	Approximate edge of pavement	82.5	-	84.15	-	84.59	-	84.93	-
NA2030	87.08	Bottom of structure	92.37	Approximate edge of pavement	90.15	-	90.84	-	91.42	-	91.5	-
NA2100	80.70	Bottom of structure	85.92	Approximate edge of pavement	83.97	-	85.9	-	**86.79**	0.87	**87.54**	1.62
NA2110	82.19	Bottom of structure	81.74	Approximate edge of pavement	**83.86**	2.12	**85.78**	4.04	**86.67**	4.93	**87.42**	5.68
NA2120	90.41	Bottom of structure	90.89	Approximate edge of pavement	**91.86**	0.97	**92.27**	1.38	**92.44**	1.55	**92.66**	1.77
NB0005	88.75	Approximate water surface elevation	91.82	Finished Floor Elevation	88.92	-	89.42	-	90.14	-	91.43	-
NB0010	81.87	Botom of structure	89.15	Approximate edge of pavement	85	-	86.38	-	87.15	-	88.65	-
NB0020	82.31	Botom of structure	90.36	Approximate edge of pavement	86.59	-	88.48	-	88.89	-	**91.05**	0.69
NB0030	86.97	Approximate water surface elevation	92.39	Finished floor elevation	88.7	-	89.31	-	90.07	-	91.38	-
NB0040	82.50	Pond control structure	89.07	Bank overtopping	85.19	-	85.23	-	85.26	-	85.32	-
NB0050	83.14	Pond control structure	85.33	Bank overtopping	84.62	-	85.02	-	85.21	-	**85.42**	0.09
NB0060	82.04	Bottom of structure	90.41	Approximate edge of pavement	82.97	-	84.24	-	85.42	-	87.35	-
NB0070	86.01	Pond control structure	88.50	Bank overtopping	88.45	-	**88.52**	0.02	**88.57**	0.07	**88.61**	0.11
NB0080	82.04	Bottom of structure	91.31	Approximate edge of pavement	83.3	-	84.54	-	85.87	-	88.21	-

APPENDIX D

FIC #2 – Lake Mendsen: Pump Station and Lake Expansion Model Results

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APPENDIX D - FIC #2 – Lake Mendsen: Pump Station and Lake Expansion Model Results

NODE NAME	INITIAL STAGE		WARNING STAGE		2 YEAR / 24 HOUR		10 YEAR / 24 HOUR		25 YEAR / 24 HOUR		100 YEAR / 24 HOUR	
	ELEVATION	DESCRIPTION	ELEVATION	DESCRIPTION	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)
LAKE_KILLARNEY	82.04	Control Elevation	84.40	Finished floor elevation	82.54	-	83.08	-	83.41	-	83.97	-
LAKE_MENDSEN	81.14	Normal high water elevation	84.82	Approximate edge of pavement	84.06	-	**85.98**	1.16	**86.87**	2.05	**87.65**	2.83
LAKE_ROSE	83.30	Approximate water surface elevation	91.01	Bank overtopping	83.89	-	85.97	-	86.8	-	84.76	-
NA0010	72.14	Bottom of structure	78.79	Approximate edge of pavement	77.96	-	**79.49**	0.70	**79.77**	0.98	**80.07**	1.28
NA0020	72.87	Bottom of structure	83.54	Approximate edge of pavement	79.41	-	82.1	-	82.5	-	82.82	-
NA0030	76.82	Bottom of structure	86.32	Approximate edge of pavement	79.79	-	83.07	-	84.42	-	**86.38**	0.06
NA0040	82.00	Bottom of structure	89.63	Approximate edge of pavement	83.88	-	84.48	-	86.22	-	**89.8**	0.17
NA0050	85.66	Bottom of structure	91.51	Approximate edge of pavement	87.82	-	88.23	-	88.67	-	91.19	-
NA0060	88.12	Bottom of structure	92.97	Approximate edge of pavement	88.6	-	88.82	-	89.26	-	92.9	-
NA0070	85.52	Bottom of structure	90.82	Approximate edge of pavement	85.93	-	86.02	-	86.29	-	89.85	-
NA0080	76.22	Bottom of structure	82.01	Approximate edge of pavement	79.68	-	**82.39**	0.38	**82.57**	0.56	**82.74**	0.73
NA0090	78.51	Bottom of structure	85.83	Approximate edge of pavement	84.4	-	85.22	-	85.33	-	85.44	-
NA0100	80.27	Bottom of structure	83.79	Approximate edge of pavement	**84.84**	1.05	**85.3**	1.51	**85.39**	1.60	**85.48**	1.69
NA0110	81.13	Bottom of structure	84.29	Approximate edge of pavement	**85.17**	0.88	**85.36**	1.07	**85.44**	1.15	**85.52**	1.23
NA0120	82.90	Bottom of structure	91.22	Approximate edge of pavement	84.16	-	84.39	-	85.54	-	86.98	-
NA0130	77.12	Bottom of structure	88.40	Approximate edge of pavement	80.94	-	83.94	-	85.61	-	87.16	-
NA0140	81.42	Bottom of structure	85.91	Approximate edge of pavement	82.89	-	**86.3**	0.39	**86.72**	0.81	**87.34**	1.43
NA0150	76.23	Bottom of structure	86.30	Approximate edge of pavement	79.77	-	81.53	-	82.41	-	83.23	-
NA0160	80.32	Bottom of structure	88.35	Approximate edge of pavement	84.78	-	85.2	-	85.5	-	85.93	-
NA0170	79.47	Bottom of structure	90.12	Approximate edge of pavement	83.99	-	84.43	-	84.63	-	84.95	-
NA0180	71.31	Bottom of structure	87.26	Approximate edge of pavement	74.6	-	75.03	-	75.23	-	75.56	-
NA0190	80.82	Bottom of structure	89.89	Approximate edge of pavement	85.22	-	85.64	-	85.98	-	86.48	-
NA0200	81.52	Bottom of structure	85.45	Approximate edge of pavement	**85.93**	0.48	**86.34**	0.89	**86.75**	1.30	**87.36**	1.91
NA0210	80.80	Bottom of structure	88.76	Approximate edge of pavement	83.19	-	84.03	-	85.04	-	86.61	-
NA0220	86.72	Bottom of structure	90.75	Approximate edge of pavement	89	-	90.52	-	**90.86**	0.11	**91.12**	0.37
NA0230	91.44	Bottom of structure	96.15	Approximate edge of pavement	92.44	-	92.99	-	93.29	-	93.82	-
NA0240	88.61	Bottom of structure	93.98	Approximate edge of pavement	92.4	-	92.95	-	93.24	-	93.77	-
NA0250	87.54	Bottom of structure	92.19	Approximate edge of pavement	**92.31**	0.12	**92.7**	0.51	**92.81**	0.62	**92.92**	0.73
NA0260	86.29	Bottom of structure	91.93	Approximate edge of pavement	89.35	-	90.32	-	91.78	-	**92.07**	0.14
NA0270	85.32	Bottom of structure	90.61	Approximate edge of pavement	87.95	-	88.92	-	89.96	-	**91.79**	1.18
NA0280	82.32	Bottom of structure	91.56	Approximate edge of pavement	85.28	-	86.42	-	88	-	90.95	-
NA0290	75.96	Bottom of structure	89.24	Approximate edge of pavement	85.82	-	86.81	-	87.05	-	87.28	-
NA0300	81.61	Bottom of structure	88.92	Approximate edge of pavement	85.82	-	86.54	-	86.76	-	87.21	-
NA0310	83.67	Bottom of structure	86.50	Approximate edge of pavement	86.06	-	**86.5**	0.00	**86.76**	0.26	**87.35**	0.85
NA0320	83.58	Bottom of structure	88.77	Approximate edge of pavement	85.64	-	86.38	-	86.59	-	87.08	-
NA0330	83.24	Bottom of structure	86.37	Approximate edge of pavement	**86.37**	0.00	**86.64**	0.27	**86.84**	0.47	**87.41**	1.04
NA0340	81.46	Bottom of structure	85.60	Approximate edge of pavement	**85.96**	0.36	**86.37**	0.77	**86.77**	1.17	**87.38**	1.78
NA0350	78.17	Bottom of structure	87.25	Approximate edge of pavement	85.93	-	86.93	-	87.18	-	**87.4**	0.15
NA0360	88.33	Bottom of structure	94.12	Approximate edge of pavement	89.3	-	91.29	-	91.38	-	91.59	-
NA0370	86.22	Bottom of structure	91.16	Approximate edge of pavement	89.22	-	**91.21**	0.05	**91.26**	0.10	**91.32**	0.16
NA0380	84.62	Bottom of structure	88.11	Approximate edge of pavement	86.01	-	87.19	-	87.58	-	88.02	-
NA0390	77.48	Bottom of structure	87.47	Approximate edge of pavement	85.87	-	86.86	-	87.1	-	87.32	-
NA0400	87.42	Bottom of structure	91.46	Approximate edge of pavement	88.36	-	89	-	89.59	-	90.82	-
NA0410	85.24	Bottom of structure	87.80	Approximate edge of pavement	**88.28**	0.48	**88.78**	0.98	**89.04**	1.24	**89.19**	1.39
NA0420	82.03	Bottom of structure	89.00	Approximate edge of pavement	85.99	-	87.34	-	87.93	-	88.69	-
NA0430	82.26	Bottom of structure	88.32	Approximate edge of pavement	86.01	-	87.29	-	87.86	-	**88.62**	0.30
NA0440	81.27	Bottom of structure	89.46	Approximate edge of pavement	85.89	-	87.31	-	87.98	-	88.75	-

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APPENDIX D - FIC #2 – Lake Mendsen: Pump Station and Lake Expansion Model Results

NODE NAME	INITIAL STAGE		WARNING STAGE		2 YEAR / 24 HOUR		10 YEAR / 24 HOUR		25 YEAR / 24 HOUR		100 YEAR / 24 HOUR	
	ELEVATION	DESCRIPTION	ELEVATION	DESCRIPTION	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)
NA0450	80.02	Bottom of structure	88.29	Approximate edge of pavement	84.37	-	85.92	-	86.94	-	87.91	-
NA0460	82.60	Bottom of structure	88.09	Approximate edge of pavement	86.06	-	86.64	-	86.81	-	87.14	-
NA0470	79.57	Bottom of structure	85.32	Approximate edge of pavement	**86.01**	0.69	**86.57**	1.25	**86.7**	1.38	**86.81**	1.49
NA0480	80.26	Bottom of structure	86.75	Approximate edge of pavement	85.91	-	86.67	-	**86.8**	0.05	**86.88**	0.13
NA0490	81.66	Bottom of structure	86.12	Approximate edge of pavement	85.05	-	**86.5**	0.38	**86.65**	0.53	**86.75**	0.63
NA0500	78.02	Bottom of structure	84.24	Approximate edge of pavement	82.93	-	**84.61**	0.37	**84.94**	0.70	**85.14**	0.90
NA0510	79.52	Bottom of structure	84.82	Approximate edge of pavement	83.55	-	**85.32**	0.50	**85.51**	0.69	**85.72**	0.90
NA0520	81.44	Bottom of structure	85.49	Approximate edge of pavement	84.03	-	**85.97**	0.48	**86.14**	0.65	**86.27**	0.78
NA0530	83.62	Bottom of structure	88.82	Approximate edge of pavement	86.07	-	86.99	-	87.67	-	**88.92**	0.10
NA0540	85.97	Bottom of structure	90.45	Approximate edge of pavement	87.62	-	88.5	-	89.9	-	**90.84**	0.39
NA0550	87.66	Bottom of structure	91.28	Approximate edge of pavement	89.07	-	90.15	-	**91.5**	0.22	**91.68**	0.40
NA0560	87.18	Bottom of structure	91.56	Approximate edge of pavement	88.69	-	89.32	-	90.46	-	**92.02**	0.46
NA0570	85.65	Bottom of structure	91.06	Approximate edge of pavement	87.92	-	88.45	-	89.02	-	**91.35**	0.29
NA0580	92.68	Bottom of structure	96.76	Approximate edge of pavement	93	-	93.1	-	93.18	-	93.34	-
NA0590	89.02	Bottom of structure	93.58	Approximate edge of pavement	90.15	-	90.76	-	91.02	-	92.76	-
NA0600	85.05	Bottom of structure	90.93	Approximate edge of pavement	87.01	-	87.89	-	89.69	-	**91.37**	0.44
NA0610	83.91	Bottom of structure	89.93	Approximate edge of pavement	85.99	-	87.5	-	89.02	-	**90.7**	0.77
NA0620	83.12	Bottom of structure	90.59	Approximate edge of pavement	85.32	-	87.3	-	88.65	-	90.14	-
NA0630	85.42	Bottom of structure	90.77	Approximate edge of pavement	86.51	-	87.37	-	88.75	-	90.38	-
NA0640	91.02	Bottom of structure	95.50	Approximate edge of pavement	91.37	-	91.47	-	91.63	-	94.82	-
NA0650	90.02	Bottom of structure	94.83	Approximate edge of pavement	90.92	-	91.23	-	91.5	-	94.72	-
NA0660	90.23	Bottom of structure	94.85	Approximate edge of pavement	91.46	-	92.21	-	93.03	-	94.47	-
NA0670	92.30	Bottom of structure	97.97	Approximate edge of pavement	93.54	-	96.36	-	**98.52**	0.55	**98.61**	0.64
NA0680	90.33	Bottom of structure	96.79	Approximate edge of pavement	91.66	-	93.81	-	96.54	-	**97.22**	0.43
NA0690	88.62	Bottom of structure	94.25	Approximate edge of pavement	90.38	-	92.57	-	**94.5**	0.25	**94.6**	0.35
NA0700	86.32	Bottom of structure	91.79	Approximate edge of pavement	87.87	-	89.09	-	90.75	-	**91.96**	0.17
NA0710	84.94	Bottom of structure	90.28	Approximate edge of pavement	87.23	-	88.71	-	90.15	-	**90.59**	0.31
NA0720	83.55	Bottom of structure	89.40	Approximate edge of pavement	85.2	-	87.04	-	88.06	-	88.85	-
NA0730	82.98	Bottom of structure	88.88	Approximate edge of pavement	85.02	-	86.86	-	87.82	-	88.47	-
NA0740	81.14	Lake Mendsen NHWE	88.51	Approximate edge of pavement	84.26	-	86.78	-	87.67	-	88.28	-
NA0750	81.14	Lake Mendsen NHWE	89.42	Approximate edge of pavement	84.27	-	87.06	-	88.2	-	89.4	-
NA0760	81.14	Lake Mendsen NHWE	87.92	Approximate edge of pavement	84.23	-	86.68	-	87.51	-	**88.11**	0.19
NA0770	81.14	Lake Mendsen NHWE	87.19	Approximate edge of pavement	84.2	-	86.42	-	87.05	-	**87.7**	0.51
NA0780	81.14	Lake Mendsen NHWE	84.82	Approximate edge of pavement	84.17	-	**86.18**	1.36	**86.89**	2.07	**87.6**	2.78
NA0790	85.72	Bottom of structure	89.36	Approximate edge of pavement	87.3	-	88.81	-	**90.22**	0.86	**90.49**	1.13
NA0800	82.98	Bottom of structure	87.39	Approximate edge of pavement	85.06	-	86.91	-	**87.9**	0.51	**88.5**	1.11
NA0810	81.14	Bottom of structure	87.43	Approximate edge of pavement	84.28	-	86.84	-	**87.62**	0.19	**88**	0.57
NA0820	84.16	Bottom of structure	92.65	Approximate edge of pavement	86.61	-	89.77	-	90.81	-	91.97	-
NA0830	84.16	Bottom of structure	91.73	Approximate edge of pavement	86.53	-	89.6	-	90.63	-	91.53	-
NA0840	82.97	Bottom of structure	89.94	Approximate edge of pavement	85.35	-	88.12	-	89.13	-	**90.09**	0.15
NA0850	81.14	Lake Mendsen NHWE	86.88	Approximate edge of pavement	84.26	-	**87.24**	0.36	**88.15**	1.27	**88.55**	1.67
NA0860	81.14	Lake Mendsen NHWE	87.59	Approximate edge of pavement	84.23	-	86.86	-	**87.9**	0.31	**88.44**	0.85
NA0870	81.14	Lake Mendsen NHWE	86.66	Approximate edge of pavement	84.2	-	86.42	-	**87.53**	0.87	**87.94**	1.28
NA0880	81.14	Lake Mendsen NHWE	87.14	Approximate edge of pavement	84.16	-	86.11	-	**87.16**	0.02	**87.73**	0.59
NA0890	81.14	Lake Mendsen NHWE	86.19	Approximate edge of pavement	84.13	-	86.06	-	**86.97**	0.78	**87.69**	1.50
NA0900	81.14	Lake Mendsen NHWE	85.06	Approximate edge of pavement	84.09	-	**86.02**	0.96	**86.92**	1.86	**87.67**	2.61
NA0910	85.88	Bottom of structure	91.89	Approximate edge of pavement	87.49	-	87.89	-	88.17	-	88.8	-

Geosyntec consultants

APPENDIX D - FIC #2 – Lake Mendsen: Pump Station and Lake Expansion Model Results

NODE NAME	INITIAL STAGE		WARNING STAGE		2 YEAR / 24 HOUR		10 YEAR / 24 HOUR		25 YEAR / 24 HOUR		100 YEAR / 24 HOUR	
	ELEVATION	DESCRIPTION	ELEVATION	DESCRIPTION	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)
NA0920	81.29	Bottom of structure	87.69	Approximate edge of pavement	84.19	-	86.07	-	87	-	**87.86**	0.17
NA0930	81.14	Lake Mendsen NHWE	86.09	Approximate edge of pavement	84.15	-	86.03	-	**86.92**	0.83	**87.66**	1.57
NA0940	81.14	Lake Mendsen NHWE	84.77	Approximate edge of pavement	84.13	-	**86**	1.23	**86.9**	2.13	**87.64**	2.87
NA0950	81.14	Lake Mendsen NHWE	84.84	Approximate edge of pavement	84.09	-	**85.99**	1.15	**86.88**	2.04	**87.65**	2.81
NA0960	81.14	Lake Mendsen NHWE	85.58	Approximate edge of pavement	84.19	-	**86.21**	0.63	**86.85**	1.27	**87.55**	1.97
NA0970	81.14	Lake Mendsen NHWE	85.66	Approximate edge of pavement	84.14	-	**86.07**	0.41	**86.89**	1.23	**87.63**	1.97
NA0980	81.14	Lake Mendsen NHWE	84.95	Approximate edge of pavement	84.09	-	**86.02**	1.07	**86.88**	1.93	**87.64**	2.69
NA0990	87.41	Bottom of structure	90.80	Approximate edge of pavement	88.27	-	88.54	-	88.76	-	89.54	-
NA1000	82.94	Bottom of structure	87.49	Approximate edge of pavement	84.5	-	86.17	-	87.3	-	**88.21**	0.72
NA1010	78.97	Bottom of structure	85.37	Approximate edge of pavement	81.88	-	**85.62**	0.25	**86.28**	0.91	**87.38**	2.01
NA1020	80.47	Bottom of structure	85.47	Approximate edge of pavement	83.12	-	**85.89**	0.42	**86.31**	0.84	**87.4**	1.93
NA1030	77.85	Bottom of structure	85.55	Approximate edge of pavement	81.34	-	84.94	-	**85.61**	0.06	**87.36**	1.81
NA1040	77.76	Bottom of structure	85.24	Approximate edge of pavement	81.19	-	84.75	-	**85.43**	0.19	**87.36**	2.12
NA1050	77.44	Bottom of structure	84.28	Approximate edge of pavement	80.85	-	84.28	-	**84.93**	0.65	**87.35**	3.07
NA1060	76.61	Bottom of structure	83.43	Approximate edge of pavement	80.7	-	**84**	0.57	**84.78**	1.35	**87.33**	3.90
NA1070	75.87	Bottom of structure	89.34	Approximate edge of pavement	80.4	-	83.4	-	84.1	-	85.63	-
NA1080	74.25	Bottom of structure	85.11	Approximate edge of pavement	78.97	-	81.02	-	81.47	-	82.24	-
NA1090	73.79	Bottom of structure	76.62	Approximate edge of pavement	**77.73**	1.11	**78.57**	1.95	**78.77**	2.15	**79.1**	2.48
NA1100	77.15	Bottom of structure	83.03	Approximate edge of pavement	78.07	-	79.42	-	83	-	**83.28**	0.25
NA1110	74.23	Bottom of structure	80.07	Approximate edge of pavement	77.24	-	77.6	-	78.76	-	79.23	-
NA1120	73.79	Bottom of structure	76.34	Approximate edge of pavement	**77.17**	0.83	**77.28**	0.94	**77.47**	1.13	**77.81**	1.47
NA1130	78.93	Bottom of structure	83.69	Approximate edge of pavement	81.87	-	**84.34**	0.65	**84.73**	1.04	**85.15**	1.46
NA1140	79.43	Bottom of structure	86.76	Approximate edge of pavement	84.17	-	**87.26**	0.50	**87.53**	0.77	**87.85**	1.09
NA1150	80.96	Bottom of structure	83.93	Approximate edge of pavement	**87.31**	3.38	**88.47**	4.54	**88.67**	4.74	**88.91**	4.98
NA1160	87.02	Bottom of structure	91.63	Approximate edge of pavement	90.04	-	91.59	-	**91.98**	0.35	**92.17**	0.54
NA1170	83.62	Bottom of structure	89.26	Approximate edge of pavement	**89.99**	0.73	**90.34**	1.08	**90.52**	1.26	**90.71**	1.45
NA1180	83.62	Lake Midget control elevation	90.40	Bank overtopping	89.96	-	90.31	-	**90.48**	0.08	**90.67**	0.27
NA1190	83.89	Bottom of structure	88.91	Approximate edge of pavement	**89.94**	1.03	**90.04**	1.13	**90.09**	1.18	**90.16**	1.25
NA1200	83.89	Bottom of structure	91.04	Approximate edge of pavement	89.89	-	89.99	-	90.04	-	90.11	-
NA1210	83.62	Bottom of structure	90.46	Approximate edge of pavement	89.92	-	90.11	-	90.26	-	90.46	-
NA1220	83.62	Bottom of structure	91.71	Approximate edge of pavement	89.96	-	90.23	-	90.43	-	90.68	-
NA1230	83.62	Bottom of structure	90.28	Approximate edge of pavement	89.97	-	**90.3**	0.02	**90.49**	0.21	**90.69**	0.41
NA1240	87.78	Bottom of structure	91.07	Approximate edge of pavement	90.07	-	90.61	-	91.02	-	**91.13**	0.06
NA1250	87.42	Bottom of structure	90.70	Approximate edge of pavement	89.97	-	90.04	-	90.08	-	90.13	-
NA1260	86.18	Bottom of structure	90.64	Approximate edge of pavement	89.87	-	89.97	-	90.01	-	90.08	-
NA1270	85.80	Bottom of structure	89.67	Approximate edge of pavement	**89.94**	0.27	**90.06**	0.39	**90.14**	0.47	**90.22**	0.55
NA1280	85.60	Bottom of structure	90.74	Approximate edge of pavement	89.93	-	90.04	-	90.1	-	90.17	-
NA1290	88.32	Bottom of structure	90.86	Approximate edge of pavement	**91.06**	0.20	**91.19**	0.33	**91.24**	0.38	**91.3**	0.44
NA1300	86.73	Bottom of structure	90.10	Approximate edge of pavement	**90.44**	0.34	**90.81**	0.71	**90.91**	0.81	**90.99**	0.89
NA1310	83.30	Bottom of structure	87.94	Approximate edge of pavement	86.04	-	87.53	-	**88.56**	0.62	**88.72**	0.78
NA1320	88.52	Bottom of structure	92.53	Approximate edge of pavement	89.46	-	90.98	-	91.3	-	91.72	-
NA1330	84.72	Bottom of structure	90.29	Approximate edge of pavement	89.4	-	**90.93**	0.64	**91.25**	0.96	**91.66**	1.37
NA1340	85.32	Bottom of structure	89.55	Approximate edge of pavement	89.27	-	**90.9**	1.35	**91.22**	1.67	**91.62**	2.07
NA1350	84.62	Bottom of structure	90.45	Approximate edge of pavement	88.51	-	**90.56**	0.11	**91.16**	0.71	**91.56**	1.11
NA1360	82.50	Bottom of structure	89.84	Approximate edge of pavement	87.3	-	88.95	-	**90.1**	0.26	**90.73**	0.89
NA1370	82.50	Bottom of structure	88.96	Approximate edge of pavement	86.1	-	87.4	-	88.24	-	**90.03**	1.07
NA1380	82.50	Bottom of structure	89.60	Approximate edge of pavement	85.24	-	86.28	-	86.75	-	87.77	-

Geosyntec consultants

APPENDIX D - FIC #2 – Lake Mendsen: Pump Station and Lake Expansion Model Results

NODE NAME	INITIAL STAGE		WARNING STAGE		2 YEAR / 24 HOUR		10 YEAR / 24 HOUR		25 YEAR / 24 HOUR		100 YEAR / 24 HOUR	
	ELEVATION	DESCRIPTION	ELEVATION	DESCRIPTION	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)
NA1390	82.04	Bottom of structure	89.38	Approximate edge of pavement	84.79	-	85.69	-	85.99	-	86.62	-
NA1400	86.52	Bottom of structure	92.24	Approximate edge of pavement	89.56	-	91.28	-	91.74	-	**92.35**	0.11
NA1410	84.72	Bottom of structure	90.35	Approximate edge of pavement	89.41	-	**90.94**	0.59	**91.26**	0.91	**91.68**	1.33
NA1420	81.52	Bottom of structure	89.36	Approximate edge of pavement	87.49	-	**90.34**	0.98	**91.19**	1.83	**91.62**	2.26
NA1430	81.13	Bottom of structure	90.79	Approximate edge of pavement	86.53	-	88.78	-	89.59	-	**91.35**	0.56
NA1440	81.13	Bottom of structure	90.11	Approximate edge of pavement	86.01	-	88.02	-	88.8	-	**90.58**	0.47
NA1450	81.13	Bottom of structure	88.88	Approximate edge of pavement	85.67	-	87.53	-	88.33	-	**89.94**	1.06
NA1460	81.13	Bottom of structure	89.61	Approximate edge of pavement	85.28	-	86.84	-	87.55	-	89.12	-
NA1470	81.13	Bottom of structure	90.19	Approximate edge of pavement	84.88	-	86.1	-	86.7	-	88.04	-
NA1480	81.13	Bottom of structure	89.23	Approximate edge of pavement	84.85	-	85.95	-	86.44	-	87.43	-
NA1490	82.72	Bottom of structure	87.50	Approximate edge of pavement	85.98	-	**87.94**	0.44	**88.2**	0.70	**88.53**	1.03
NA1500	83.44	Bottom of structure	87.27	Approximate edge of pavement	84.2	-	86.23	-	**87.41**	0.14	**88.11**	0.84
NA1510	81.14	Lake Mendsen NHWE	85.25	Approximate edge of pavement	84.13	-	**86.13**	0.88	**87.33**	2.08	**88.07**	2.82
NA1520	82.42	Bottom of structure	86.11	Approximate edge of pavement	84.16	-	**86.45**	0.34	**87.32**	1.21	**88.04**	1.93
NA1530	81.14	Lake Mendsen NHWE	86.90	Approximate edge of pavement	84.09	-	86.02	-	**86.94**	0.04	**87.7**	0.80
NA1540	81.14	Lake Mendsen NHWE	85.15	Approximate edge of pavement	84.17	-	**86.16**	1.01	**87.36**	2.21	**88.09**	2.94
NA1550	90.36	Bottom of structure	94.47	Approximate edge of pavement	92	-	93.68	-	**94.5**	0.03	**94.87**	0.40
NA1560	89.67	Bottom of structure	94.46	Approximate edge of pavement	90.89	-	91.33	-	91.52	-	91.64	-
NA1570	87.27	Bottom of structure	91.49	Approximate edge of pavement	88.41	-	88.82	-	89.61	-	**91.61**	0.12
NA1580	84.57	Bottom of structure	89.81	Approximate edge of pavement	86.39	-	87	-	87.84	-	89.36	-
NA1590	82.97	Bottom of structure	91.69	Approximate edge of pavement	88.51	-	88.79	-	89.02	-	89.46	-
NA1600	82.97	Bottom of structure	87.71	Approximate edge of pavement	84.2	-	86.27	-	86.97	-	**87.72**	0.01
NA1610	81.80	Bottom of structure	85.34	Approximate edge of pavement	84.17	-	**86.19**	0.85	**86.93**	1.59	**87.67**	2.33
NA1620	90.03	Bottom of structure	92.24	Approximate edge of pavement	90.03	-	90.03	-	90.03	-	91.6	-
NA1630	81.92	Bottom of structure	84.78	Approximate edge of pavement	**85.05**	0.27	**85.98**	1.20	**86.8**	2.02	**87.51**	2.73
NA1640	81.54	Bottom of structure	87.01	Approximate edge of pavement	84.53	-	85.96	-	86.53	-	**87.47**	0.46
NA1650	80.90	Bottom of structure	85.58	Approximate edge of pavement	83.75	-	**85.94**	0.36	**86.32**	0.74	**87.44**	1.86
NA1660	82.04	Lake Killarney tailwater	85.25	Approximate edge of pavement	82.67	-	83.41	-	83.71	-	84.42	-
NA1670	84.22	Bottom of structure	92.63	Approximate edge of pavement	88.97	-	91.52	-	92.15	-	**92.8**	0.17
NA1680	83.52	Bottom of structure	90.33	Approximate edge of pavement	88.39	-	90.28	-	**90.47**	0.14	**90.57**	0.24
NA1690	82.52	Bottom of structure	89.14	Approximate edge of pavement	87.94	-	**89.33**	0.19	**89.43**	0.29	**89.54**	0.40
NA1700	82.04	Bottom of structure	88.40	Approximate edge of pavement	87.53	-	**89.15**	0.75	**89.26**	0.86	**89.39**	0.99
NA1710	82.04	Bottom of structure	89.18	Approximate edge of pavement	86.69	-	88.05	-	88.26	-	88.62	-
NA1720	82.04	Bottom of structure	89.94	Approximate edge of pavement	85.46	-	86.4	-	86.69	-	87.21	-
NA1730	82.04	Bottom of structure	89.12	Approximate edge of pavement	84.88	-	85.8	-	86.1	-	86.71	-
NA1740	81.14	Bottom of structure	90.16	Approximate edge of pavement	83.92	-	85.55	-	86.57	-	87.75	-
NA1750	81.14	Lake Mendsen NHWE	85.66	Approximate edge of pavement	83.92	-	85.65	-	**86.81**	1.15	**87.64**	1.98
NA1760	81.13	Lake Mendsen NHWE	85.45	Approximate edge of pavement	84.1	-	**85.96**	0.51	**86.85**	1.40	**87.66**	2.21
NA1790	82.93	Bottom of structure	88.04	Approximate edge of pavement	85.81	-	87.59	-	**88.41**	0.37	**88.65**	0.61
NA1800	76.40	Bottom of structure	88.11	Approximate edge of pavement	78.24	-	78.39	-	78.48	-	78.68	-
NA1810	77.43	Bottom of structure	86.98	Approximate edge of pavement	79.6	-	79.79	-	79.94	-	80.24	-
NA1820	70.50	Bottom of dry pond	78.99	Bank overtopping	78.19	-	78.32	-	78.41	-	78.54	-
NA1830	67.20	9th Grade Pond Control Elevation	77.76	Bank overtopping	71.35	-	72.05	-	72.25	-	72.6	-
NA1840	67.20	Bottom of structure	77.60	Approximate edge of pavement	71.97	-	73.16	-	73.53	-	74.15	-
NA1850	67.20	Lake Virginia tailwater	70.48	Approximate edge of pavement	69.13	-	**70.63**	0.15	**70.92**	0.44	**71.28**	0.80
NA1860	77.47	Bottom of structure	86.40	Approximate edge of pavement	82.44	-	84.09	-	84.52	-	84.79	-
NA1870	87.63	Bottom of structure	92.36	Approximate edge of pavement	89.54	-	91.81	-	92.33	-	**92.59**	0.23

Geosyntec consultants

APPENDIX D - FIC #2 – Lake Mendsen: Pump Station and Lake Expansion Model Results

NODE NAME	INITIAL STAGE		WARNING STAGE		2 YEAR / 24 HOUR		10 YEAR / 24 HOUR		25 YEAR / 24 HOUR		100 YEAR / 24 HOUR	
	ELEVATION	DESCRIPTION	ELEVATION	DESCRIPTION	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)
NA1880	85.16	Bottom of structure	92.62	Approximate edge of pavement	86.67	-	89.85	-	90.88	-	92.04	-
NA1890	92.07	Bottom of structure	94.36	Approximate edge of pavement	92.38	-	92.47	-	92.53	-	92.75	-
NA1900	86.29	Lake Francis Control Elevation	89.99	Bank overtopping	**91.82**	1.83	**92.21**	2.22	**92.38**	2.39	**92.6**	2.61
NA1910	87.03	Lee Road pond control elevation	90.58	Bank overtopping	**91.8**	1.22	**92.2**	1.62	**92.37**	1.79	**92.61**	2.03
NA1970	86.00	Bottom of dry pond	94.89	Bank overtopping	92.32	-	92.79	-	93.24	-	94.57	-
NA1980	89.70	Bottom of structure	95.10	Approximate edge of pavement	92.37	-	92.86	-	93.31	-	94.64	-
NA1990	86.66	Bottom of structure	90.12	Approximate edge of pavement	87.9	-	88.29	-	88.62	-	**90.29**	0.17
NA2000	87.47	Bottom of structure	92.54	Approximate edge of pavement	90.11	-	90.88	-	91.52	-	**93.02**	0.48
NA2010	77.85	Bottom of structure	82.90	Approximate edge of pavement	82.83	-	**83.36**	0.46	**83.44**	0.54	**83.55**	0.65
NA2020	79.52	Bottom of structure	88.37	Approximate edge of pavement	82.5	-	84.15	-	84.59	-	84.93	-
NA2030	87.08	Bottom of structure	92.37	Approximate edge of pavement	90.15	-	90.84	-	91.42	-	91.5	-
NA2100	80.70	Bottom of structure	85.92	Approximate edge of pavement	83.97	-	85.9	-	**86.79**	0.87	**87.58**	1.66
NA2110	82.19	Bottom of structure	81.74	Approximate edge of pavement	**83.86**	2.12	**85.78**	4.04	**86.67**	4.93	**87.46**	5.72
NA2120	90.41	Bottom of structure	90.89	Approximate edge of pavement	**91.86**	0.97	**92.27**	1.38	**92.44**	1.55	**92.66**	1.77
NB0005	88.75	Approximate water surface elevation	91.82	Finished Floor Elevation	88.92	-	89.42	-	90.14	-	91.43	-
NB0010	81.87	Botom of structure	89.15	Approximate edge of pavement	85	-	86.38	-	87.15	-	88.65	-
NB0020	82.31	Botom of structure	90.36	Approximate edge of pavement	86.59	-	88.48	-	88.89	-	**91.05**	0.69
NB0030	86.97	Approximate water surface elevation	92.39	Finished floor elevation	88.7	-	89.31	-	90.07	-	91.38	-
NB0040	82.50	Pond control structure	89.07	Bank overtopping	85.19	-	85.23	-	85.26	-	85.32	-
NB0050	83.14	Pond control structure	85.33	Bank overtopping	84.62	-	85.02	-	85.21	-	**85.42**	0.09
NB0060	82.04	Bottom of structure	90.41	Approximate edge of pavement	82.97	-	84.24	-	85.42	-	87.38	-
NB0070	86.01	Pond control structure	88.50	Bank overtopping	88.45	-	**88.52**	0.02	**88.57**	0.07	**88.61**	0.11
NB0080	82.04	Bottom of structure	91.31	Approximate edge of pavement	83.3	-	84.54	-	85.87	-	88.24	-

APPENDIX E

FIC #4 – Lake Bell: Connection to Park Lake Model Results

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APPENDIX E - FIC #4 – Lake Bell: Connection to Park Lake Model Results

NODE NAME	INITIAL STAGE		WARNING STAGE		2 YEAR / 24 HOUR		10 YEAR / 24 HOUR		25 YEAR / 24 HOUR		100 YEAR / 24 HOUR	
	ELEVATION	DESCRIPTION	ELEVATION	DESCRIPTION	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)
LAKE_KILLARNEY	82.04	Control Elevation	84.40	Finished floor elevation	82.54	-	83.08	-	83.41	-	83.9	-
LAKE_MENDSEN	81.14	Normal high water elevation	84.82	Approximate edge of pavement	84.06	-	**85.98**	1.16	**86.87**	2.05	**87.7**	2.88
LAKE_ROSE	83.30	Approximate water surface elevation	91.01	Bank overtopping	83.89	-	85.97	-	86.8	-	84.76	-
NA0010	72.14	Bottom of structure	78.79	Approximate edge of pavement	77.96	-	**79.49**	0.70	**79.77**	0.98	**80.07**	1.28
NA0020	72.87	Bottom of structure	83.54	Approximate edge of pavement	79.41	-	82.1	-	82.5	-	82.82	-
NA0030	76.82	Bottom of structure	86.32	Approximate edge of pavement	79.79	-	83.07	-	84.42	-	**86.38**	0.06
NA0040	82.00	Bottom of structure	89.63	Approximate edge of pavement	83.88	-	84.48	-	86.22	-	**89.8**	0.17
NA0050	85.66	Bottom of structure	91.51	Approximate edge of pavement	87.82	-	88.23	-	88.67	-	91.19	-
NA0060	88.12	Bottom of structure	92.97	Approximate edge of pavement	88.6	-	88.82	-	89.26	-	92.9	-
NA0070	85.52	Bottom of structure	90.82	Approximate edge of pavement	85.93	-	86.02	-	86.29	-	89.85	-
NA0080	76.22	Bottom of structure	82.01	Approximate edge of pavement	79.68	-	**82.39**	0.38	**82.57**	0.56	**82.74**	0.73
NA0090	78.51	Bottom of structure	85.83	Approximate edge of pavement	84.4	-	85.22	-	85.33	-	85.44	-
NA0100	80.27	Bottom of structure	83.79	Approximate edge of pavement	**84.84**	1.05	**85.3**	1.51	**85.39**	1.60	**85.48**	1.69
NA0110	81.13	Bottom of structure	84.29	Approximate edge of pavement	**85.17**	0.88	**85.36**	1.07	**85.44**	1.15	**85.52**	1.23
NA0120	82.90	Bottom of structure	91.22	Approximate edge of pavement	84.16	-	84.39	-	85.54	-	86.98	-
NA0130	77.12	Bottom of structure	88.40	Approximate edge of pavement	80.94	-	83.94	-	85.61	-	87.16	-
NA0140	81.42	Bottom of structure	85.91	Approximate edge of pavement	82.89	-	**86.3**	0.39	**86.72**	0.81	**87.34**	1.43
NA0150	76.23	Bottom of structure	86.30	Approximate edge of pavement	79.77	-	81.53	-	82.41	-	83.23	-
NA0160	80.32	Bottom of structure	88.35	Approximate edge of pavement	84.78	-	85.2	-	85.5	-	85.93	-
NA0170	79.47	Bottom of structure	90.12	Approximate edge of pavement	83.99	-	84.43	-	84.63	-	84.95	-
NA0180	71.31	Bottom of structure	87.26	Approximate edge of pavement	74.6	-	75.03	-	75.23	-	75.56	-
NA0190	80.82	Bottom of structure	89.89	Approximate edge of pavement	85.22	-	85.64	-	85.98	-	86.48	-
NA0200	81.52	Bottom of structure	85.45	Approximate edge of pavement	**85.93**	0.48	**86.34**	0.89	**86.75**	1.30	**87.36**	1.91
NA0210	80.80	Bottom of structure	88.76	Approximate edge of pavement	83.19	-	84.03	-	85.04	-	86.61	-
NA0220	86.72	Bottom of structure	90.75	Approximate edge of pavement	89	-	90.52	-	**90.86**	0.11	**91.12**	0.37
NA0230	91.44	Bottom of structure	96.15	Approximate edge of pavement	92.44	-	92.99	-	93.29	-	93.82	-
NA0240	88.61	Bottom of structure	93.98	Approximate edge of pavement	92.4	-	92.95	-	93.24	-	93.77	-
NA0250	87.54	Bottom of structure	92.19	Approximate edge of pavement	**92.31**	0.12	**92.7**	0.51	**92.81**	0.62	**92.92**	0.73
NA0260	86.29	Bottom of structure	91.93	Approximate edge of pavement	89.35	-	90.32	-	91.78	-	**92.07**	0.14
NA0270	85.32	Bottom of structure	90.61	Approximate edge of pavement	87.95	-	88.92	-	89.96	-	**91.79**	1.18
NA0280	82.32	Bottom of structure	91.56	Approximate edge of pavement	85.28	-	86.42	-	88	-	90.95	-
NA0290	75.96	Bottom of structure	89.24	Approximate edge of pavement	85.82	-	86.81	-	87.05	-	87.28	-
NA0300	81.61	Bottom of structure	88.92	Approximate edge of pavement	85.82	-	86.54	-	86.76	-	87.21	-
NA0310	83.67	Bottom of structure	86.50	Approximate edge of pavement	86.06	-	**86.5**	0.00	**86.76**	0.26	**87.35**	0.85
NA0320	83.58	Bottom of structure	88.77	Approximate edge of pavement	85.64	-	86.38	-	86.59	-	87.08	-
NA0330	83.24	Bottom of structure	86.37	Approximate edge of pavement	**86.37**	0.00	**86.64**	0.27	**86.84**	0.47	**87.41**	1.04
NA0340	81.46	Bottom of structure	85.60	Approximate edge of pavement	**85.96**	0.36	**86.37**	0.77	**86.77**	1.17	**87.38**	1.78
NA0350	78.17	Bottom of structure	87.25	Approximate edge of pavement	85.93	-	86.93	-	87.18	-	**87.4**	0.15
NA0360	88.33	Bottom of structure	94.12	Approximate edge of pavement	89.3	-	91.29	-	91.38	-	91.59	-
NA0370	86.22	Bottom of structure	91.16	Approximate edge of pavement	89.22	-	**91.21**	0.05	**91.26**	0.10	**91.32**	0.16
NA0380	84.62	Bottom of structure	88.11	Approximate edge of pavement	86.01	-	87.19	-	87.58	-	88.02	-
NA0390	77.48	Bottom of structure	87.47	Approximate edge of pavement	85.87	-	86.86	-	87.1	-	87.32	-
NA0400	87.42	Bottom of structure	91.46	Approximate edge of pavement	88.36	-	89	-	89.59	-	90.82	-
NA0410	85.24	Bottom of structure	87.80	Approximate edge of pavement	**88.28**	0.48	**88.78**	0.98	**89.04**	1.24	**89.19**	1.39
NA0420	82.03	Bottom of structure	89.00	Approximate edge of pavement	85.99	-	87.34	-	87.93	-	88.69	-
NA0430	82.26	Bottom of structure	88.32	Approximate edge of pavement	86.01	-	87.29	-	87.86	-	**88.62**	0.30
NA0440	81.27	Bottom of structure	89.46	Approximate edge of pavement	85.89	-	87.31	-	87.98	-	88.75	-

Geosyntec consultants

APPENDIX E - FIC #4 – Lake Bell: Connection to Park Lake Model Results

NODE NAME	INITIAL STAGE		WARNING STAGE		2 YEAR / 24 HOUR		10 YEAR / 24 HOUR		25 YEAR / 24 HOUR		100 YEAR / 24 HOUR	
	ELEVATION	DESCRIPTION	ELEVATION	DESCRIPTION	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)
NA0450	80.02	Bottom of structure	88.29	Approximate edge of pavement	84.37	-	85.92	-	86.94	-	87.91	-
NA0460	82.60	Bottom of structure	88.09	Approximate edge of pavement	86.06	-	86.64	-	86.81	-	87.14	-
NA0470	79.57	Bottom of structure	85.32	Approximate edge of pavement	**86.01**	0.69	**86.57**	1.25	**86.7**	1.38	**86.81**	1.49
NA0480	80.26	Bottom of structure	86.75	Approximate edge of pavement	85.91	-	86.67	-	**86.8**	0.05	**86.88**	0.13
NA0490	81.66	Bottom of structure	86.12	Approximate edge of pavement	85.05	-	**86.5**	0.38	**86.65**	0.53	**86.75**	0.63
NA0500	78.02	Bottom of structure	84.24	Approximate edge of pavement	82.93	-	**84.61**	0.37	**84.94**	0.70	**85.14**	0.90
NA0510	79.52	Bottom of structure	84.82	Approximate edge of pavement	83.55	-	**85.32**	0.50	**85.51**	0.69	**85.72**	0.90
NA0520	81.44	Bottom of structure	85.49	Approximate edge of pavement	84.03	-	**85.97**	0.48	**86.14**	0.65	**86.27**	0.78
NA0530	83.62	Bottom of structure	88.82	Approximate edge of pavement	86.07	-	86.99	-	87.67	-	**88.92**	0.10
NA0540	85.97	Bottom of structure	90.45	Approximate edge of pavement	87.62	-	88.5	-	89.9	-	**90.84**	0.39
NA0550	87.66	Bottom of structure	91.28	Approximate edge of pavement	89.07	-	90.15	-	**91.5**	0.22	**91.68**	0.40
NA0560	87.18	Bottom of structure	91.56	Approximate edge of pavement	88.69	-	89.32	-	90.46	-	**92.02**	0.46
NA0570	85.65	Bottom of structure	91.06	Approximate edge of pavement	87.92	-	88.45	-	89.02	-	**91.35**	0.29
NA0580	92.68	Bottom of structure	96.76	Approximate edge of pavement	93	-	93.1	-	93.18	-	93.34	-
NA0590	89.02	Bottom of structure	93.58	Approximate edge of pavement	90.15	-	90.76	-	91.02	-	92.76	-
NA0600	85.05	Bottom of structure	90.93	Approximate edge of pavement	87.01	-	87.89	-	89.69	-	**91.37**	0.44
NA0610	83.91	Bottom of structure	89.93	Approximate edge of pavement	85.99	-	87.5	-	89.02	-	**90.7**	0.77
NA0620	83.12	Bottom of structure	90.59	Approximate edge of pavement	85.32	-	87.3	-	88.65	-	90.15	-
NA0630	85.42	Bottom of structure	90.77	Approximate edge of pavement	86.51	-	87.37	-	88.75	-	90.39	-
NA0640	91.02	Bottom of structure	95.50	Approximate edge of pavement	91.37	-	91.47	-	91.63	-	94.82	-
NA0650	90.02	Bottom of structure	94.83	Approximate edge of pavement	90.92	-	91.23	-	91.5	-	94.73	-
NA0660	90.23	Bottom of structure	94.85	Approximate edge of pavement	91.46	-	92.21	-	93.03	-	94.47	-
NA0670	92.30	Bottom of structure	97.97	Approximate edge of pavement	93.54	-	96.36	-	**98.52**	0.55	**98.61**	0.64
NA0680	90.33	Bottom of structure	96.79	Approximate edge of pavement	91.66	-	93.81	-	96.54	-	**97.22**	0.43
NA0690	88.62	Bottom of structure	94.25	Approximate edge of pavement	90.38	-	92.57	-	**94.5**	0.25	**94.6**	0.35
NA0700	86.32	Bottom of structure	91.79	Approximate edge of pavement	87.87	-	89.09	-	90.75	-	**91.96**	0.17
NA0710	84.94	Bottom of structure	90.28	Approximate edge of pavement	87.23	-	88.71	-	90.15	-	**90.59**	0.31
NA0720	83.55	Bottom of structure	89.40	Approximate edge of pavement	85.2	-	87.04	-	88.06	-	88.86	-
NA0730	82.98	Bottom of structure	88.88	Approximate edge of pavement	85.02	-	86.86	-	87.82	-	88.47	-
NA0740	81.14	Lake Mendsen NHWE	88.51	Approximate edge of pavement	84.26	-	86.78	-	87.67	-	88.29	-
NA0750	81.14	Lake Mendsen NHWE	89.42	Approximate edge of pavement	84.27	-	87.06	-	88.2	-	89.41	-
NA0760	81.14	Lake Mendsen NHWE	87.92	Approximate edge of pavement	84.23	-	86.68	-	87.51	-	**88.13**	0.21
NA0770	81.14	Lake Mendsen NHWE	87.19	Approximate edge of pavement	84.2	-	86.42	-	87.05	-	**87.75**	0.56
NA0780	81.14	Lake Mendsen NHWE	84.82	Approximate edge of pavement	84.17	-	**86.18**	1.36	**86.89**	2.07	**87.65**	2.83
NA0790	85.72	Bottom of structure	89.36	Approximate edge of pavement	87.3	-	88.81	-	**90.22**	0.86	**90.49**	1.13
NA0800	82.98	Bottom of structure	87.39	Approximate edge of pavement	85.06	-	86.91	-	**87.9**	0.51	**88.5**	1.11
NA0810	81.14	Bottom of structure	87.43	Approximate edge of pavement	84.28	-	86.84	-	**87.62**	0.19	**88**	0.57
NA0820	84.16	Bottom of structure	92.65	Approximate edge of pavement	86.61	-	89.77	-	90.81	-	91.98	-
NA0830	84.16	Bottom of structure	91.73	Approximate edge of pavement	86.53	-	89.6	-	90.63	-	91.53	-
NA0840	82.97	Bottom of structure	89.94	Approximate edge of pavement	85.35	-	88.12	-	89.13	-	**90.09**	0.15
NA0850	81.14	Lake Mendsen NHWE	86.88	Approximate edge of pavement	84.26	-	**87.24**	0.36	**88.15**	1.27	**88.55**	1.67
NA0860	81.14	Lake Mendsen NHWE	87.59	Approximate edge of pavement	84.23	-	86.86	-	**87.9**	0.31	**88.44**	0.85
NA0870	81.14	Lake Mendsen NHWE	86.66	Approximate edge of pavement	84.2	-	86.42	-	**87.53**	0.87	**87.95**	1.29
NA0880	81.14	Lake Mendsen NHWE	87.14	Approximate edge of pavement	84.16	-	86.11	-	**87.16**	0.02	**87.77**	0.63
NA0890	81.14	Lake Mendsen NHWE	86.19	Approximate edge of pavement	84.13	-	86.06	-	**86.97**	0.78	**87.74**	1.55
NA0900	81.14	Lake Mendsen NHWE	85.06	Approximate edge of pavement	84.09	-	**86.02**	0.96	**86.92**	1.86	**87.72**	2.66
NA0910	85.88	Bottom of structure	91.89	Approximate edge of pavement	87.49	-	87.89	-	88.17	-	88.82	-

Geosyntec consultants

APPENDIX E - FIC #4 – Lake Bell: Connection to Park Lake Model Results

NODE NAME	INITIAL STAGE		WARNING STAGE		2 YEAR / 24 HOUR		10 YEAR / 24 HOUR		25 YEAR / 24 HOUR		100 YEAR / 24 HOUR	
	ELEVATION	DESCRIPTION	ELEVATION	DESCRIPTION	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)
NA0920	81.29	Bottom of structure	87.69	Approximate edge of pavement	84.19	-	86.07	-	87	-	**87.87**	0.18
NA0930	81.14	Lake Mendsen NHWE	86.09	Approximate edge of pavement	84.15	-	86.03	-	**86.92**	0.83	**87.71**	1.62
NA0940	81.14	Lake Mendsen NHWE	84.77	Approximate edge of pavement	84.13	-	**86**	1.23	**86.9**	2.13	**87.69**	2.92
NA0950	81.14	Lake Mendsen NHWE	84.84	Approximate edge of pavement	84.09	-	**85.99**	1.15	**86.88**	2.04	**87.7**	2.86
NA0960	81.14	Lake Mendsen NHWE	85.58	Approximate edge of pavement	84.19	-	**86.21**	0.63	**86.85**	1.27	**87.6**	2.02
NA0970	81.14	Lake Mendsen NHWE	85.66	Approximate edge of pavement	84.14	-	**86.07**	0.41	**86.89**	1.23	**87.68**	2.02
NA0980	81.14	Lake Mendsen NHWE	84.95	Approximate edge of pavement	84.09	-	**86.02**	1.07	**86.88**	1.93	**87.69**	2.74
NA0990	87.41	Bottom of structure	90.80	Approximate edge of pavement	88.27	-	88.54	-	88.76	-	89.54	-
NA1000	82.94	Bottom of structure	87.49	Approximate edge of pavement	84.5	-	86.17	-	87.3	-	**88.21**	0.72
NA1010	78.97	Bottom of structure	85.37	Approximate edge of pavement	81.88	-	**85.62**	0.25	**86.28**	0.91	**87.44**	2.07
NA1020	80.47	Bottom of structure	85.47	Approximate edge of pavement	83.12	-	**85.89**	0.42	**86.31**	0.84	**87.46**	1.99
NA1030	77.85	Bottom of structure	85.55	Approximate edge of pavement	81.34	-	84.94	-	**85.61**	0.06	**87.41**	1.86
NA1040	77.76	Bottom of structure	85.24	Approximate edge of pavement	81.19	-	84.75	-	**85.43**	0.19	**87.42**	2.18
NA1050	77.44	Bottom of structure	84.28	Approximate edge of pavement	80.85	-	84.28	-	**84.93**	0.65	**87.4**	3.12
NA1060	76.61	Bottom of structure	83.43	Approximate edge of pavement	80.7	-	**84**	0.57	**84.78**	1.35	**87.39**	3.96
NA1070	75.87	Bottom of structure	89.34	Approximate edge of pavement	80.4	-	83.4	-	84.1	-	85.68	-
NA1080	74.25	Bottom of structure	85.11	Approximate edge of pavement	78.97	-	81.02	-	81.47	-	82.24	-
NA1090	73.79	Bottom of structure	76.62	Approximate edge of pavement	**77.73**	1.11	**78.57**	1.95	**78.77**	2.15	**79.1**	2.48
NA1100	77.15	Bottom of structure	83.03	Approximate edge of pavement	78.07	-	79.42	-	83	-	**83.28**	0.25
NA1110	74.23	Bottom of structure	80.07	Approximate edge of pavement	77.24	-	77.6	-	78.76	-	79.23	-
NA1120	73.79	Bottom of structure	76.34	Approximate edge of pavement	**77.17**	0.83	**77.28**	0.94	**77.47**	1.13	**77.81**	1.47
NA1130	78.93	Bottom of structure	83.69	Approximate edge of pavement	81.87	-	**84.34**	0.65	**84.73**	1.04	**85.15**	1.46
NA1140	79.43	Bottom of structure	86.76	Approximate edge of pavement	84.17	-	**87.26**	0.50	**87.53**	0.77	**87.85**	1.09
NA1150	80.96	Bottom of structure	83.93	Approximate edge of pavement	**87.31**	3.38	**88.47**	4.54	**88.67**	4.74	**88.91**	4.98
NA1160	87.02	Bottom of structure	91.63	Approximate edge of pavement	90.04	-	91.59	-	**91.98**	0.35	**92.17**	0.54
NA1170	83.62	Bottom of structure	89.26	Approximate edge of pavement	**89.99**	0.73	**90.34**	1.08	**90.52**	1.26	**90.71**	1.45
NA1180	83.62	Lake Midget control elevation	90.40	Bank overtopping	89.96	-	90.31	-	**90.48**	0.08	**90.67**	0.27
NA1190	83.89	Bottom of structure	88.91	Approximate edge of pavement	**89.94**	1.03	**90.04**	1.13	**90.09**	1.18	**90.16**	1.25
NA1200	83.89	Bottom of structure	91.04	Approximate edge of pavement	89.89	-	89.99	-	90.04	-	90.11	-
NA1210	83.62	Bottom of structure	90.46	Approximate edge of pavement	89.92	-	90.11	-	90.26	-	90.46	-
NA1220	83.62	Bottom of structure	91.71	Approximate edge of pavement	89.96	-	90.23	-	90.43	-	90.68	-
NA1230	83.62	Bottom of structure	90.28	Approximate edge of pavement	89.97	-	**90.3**	0.02	**90.49**	0.21	**90.69**	0.41
NA1240	87.78	Bottom of structure	91.07	Approximate edge of pavement	90.07	-	90.61	-	91.02	-	**91.13**	0.06
NA1250	87.42	Bottom of structure	90.70	Approximate edge of pavement	89.97	-	90.04	-	90.08	-	90.13	-
NA1260	86.18	Bottom of structure	90.64	Approximate edge of pavement	89.87	-	89.97	-	90.01	-	90.08	-
NA1270	85.80	Bottom of structure	89.67	Approximate edge of pavement	**89.94**	0.27	**90.06**	0.39	**90.14**	0.47	**90.22**	0.55
NA1280	85.60	Bottom of structure	90.74	Approximate edge of pavement	89.93	-	90.04	-	90.1	-	90.17	-
NA1290	88.32	Bottom of structure	90.86	Approximate edge of pavement	**91.06**	0.20	**91.19**	0.33	**91.24**	0.38	**91.3**	0.44
NA1300	86.73	Bottom of structure	90.10	Approximate edge of pavement	**90.44**	0.34	**90.81**	0.71	**90.91**	0.81	**90.99**	0.89
NA1310	83.30	Bottom of structure	87.94	Approximate edge of pavement	86.04	-	87.53	-	**88.56**	0.62	**88.72**	0.78
NA1320	88.52	Bottom of structure	92.53	Approximate edge of pavement	89.46	-	90.98	-	91.3	-	91.72	-
NA1330	84.72	Bottom of structure	90.29	Approximate edge of pavement	89.4	-	**90.93**	0.64	**91.25**	0.96	**91.66**	1.37
NA1340	85.32	Bottom of structure	89.55	Approximate edge of pavement	89.27	-	**90.9**	1.35	**91.22**	1.67	**91.62**	2.07
NA1350	84.62	Bottom of structure	90.45	Approximate edge of pavement	88.51	-	**90.56**	0.11	**91.16**	0.71	**91.56**	1.11
NA1360	82.50	Bottom of structure	89.84	Approximate edge of pavement	87.3	-	88.95	-	**90.1**	0.26	**90.73**	0.89
NA1370	82.50	Bottom of structure	88.96	Approximate edge of pavement	86.1	-	87.4	-	88.24	-	**90.04**	1.08
NA1380	82.50	Bottom of structure	89.60	Approximate edge of pavement	85.24	-	86.28	-	86.75	-	87.77	-

Geosyntec consultants

APPENDIX E - FIC #4 – Lake Bell: Connection to Park Lake Model Results

NODE NAME	INITIAL STAGE		WARNING STAGE		2 YEAR / 24 HOUR		10 YEAR / 24 HOUR		25 YEAR / 24 HOUR		100 YEAR / 24 HOUR	
	ELEVATION	DESCRIPTION	ELEVATION	DESCRIPTION	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)
NA1390	82.04	Bottom of structure	89.38	Approximate edge of pavement	84.79	-	85.69	-	85.99	-	86.61	-
NA1400	86.52	Bottom of structure	92.24	Approximate edge of pavement	89.56	-	91.28	-	91.74	-	**92.35**	0.11
NA1410	84.72	Bottom of structure	90.35	Approximate edge of pavement	89.41	-	**90.94**	0.59	**91.26**	0.91	**91.68**	1.33
NA1420	81.52	Bottom of structure	89.36	Approximate edge of pavement	87.49	-	**90.34**	0.98	**91.19**	1.83	**91.62**	2.26
NA1430	81.13	Bottom of structure	90.79	Approximate edge of pavement	86.53	-	88.78	-	89.59	-	**91.35**	0.56
NA1440	81.13	Bottom of structure	90.11	Approximate edge of pavement	86.01	-	88.02	-	88.8	-	**90.59**	0.48
NA1450	81.13	Bottom of structure	88.88	Approximate edge of pavement	85.67	-	87.53	-	88.33	-	**89.97**	1.09
NA1460	81.13	Bottom of structure	89.61	Approximate edge of pavement	85.28	-	86.84	-	87.55	-	89.16	-
NA1470	81.13	Bottom of structure	90.19	Approximate edge of pavement	84.88	-	86.1	-	86.7	-	88.08	-
NA1480	81.13	Bottom of structure	89.23	Approximate edge of pavement	84.85	-	85.95	-	86.44	-	87.45	-
NA1490	82.72	Bottom of structure	87.50	Approximate edge of pavement	85.98	-	**87.94**	0.44	**88.2**	0.70	**88.53**	1.03
NA1500	83.44	Bottom of structure	87.27	Approximate edge of pavement	84.2	-	86.23	-	**87.41**	0.14	**88.12**	0.85
NA1510	81.14	Lake Mendsen NHWE	85.25	Approximate edge of pavement	84.13	-	**86.13**	0.88	**87.33**	2.08	**88.08**	2.83
NA1520	82.42	Bottom of structure	86.11	Approximate edge of pavement	84.16	-	**86.45**	0.34	**87.32**	1.21	**88.05**	1.94
NA1530	81.14	Lake Mendsen NHWE	86.90	Approximate edge of pavement	84.09	-	86.02	-	**86.94**	0.04	**87.74**	0.84
NA1540	81.14	Lake Mendsen NHWE	85.15	Approximate edge of pavement	84.17	-	**86.16**	1.01	**87.36**	2.21	**88.1**	2.95
NA1550	90.36	Bottom of structure	94.47	Approximate edge of pavement	92	-	93.68	-	**94.5**	0.03	**94.87**	0.40
NA1560	89.67	Bottom of structure	94.46	Approximate edge of pavement	90.89	-	91.33	-	91.52	-	91.64	-
NA1570	87.27	Bottom of structure	91.49	Approximate edge of pavement	88.41	-	88.82	-	89.61	-	**91.61**	0.12
NA1580	84.57	Bottom of structure	89.81	Approximate edge of pavement	86.39	-	87	-	87.84	-	89.36	-
NA1590	82.97	Bottom of structure	91.69	Approximate edge of pavement	88.51	-	88.79	-	89.02	-	89.46	-
NA1600	82.97	Bottom of structure	87.71	Approximate edge of pavement	84.2	-	86.27	-	86.97	-	**87.76**	0.05
NA1610	81.80	Bottom of structure	85.34	Approximate edge of pavement	84.17	-	**86.19**	0.85	**86.93**	1.59	**87.72**	2.38
NA1620	90.03	Bottom of structure	92.24	Approximate edge of pavement	90.03	-	90.03	-	90.03	-	91.6	-
NA1630	81.92	Bottom of structure	84.78	Approximate edge of pavement	**85.05**	0.27	**85.98**	1.20	**86.8**	2.02	**87.56**	2.78
NA1640	81.54	Bottom of structure	87.01	Approximate edge of pavement	84.53	-	85.96	-	86.53	-	**87.52**	0.51
NA1650	80.90	Bottom of structure	85.58	Approximate edge of pavement	83.75	-	**85.94**	0.36	**86.32**	0.74	**87.49**	1.91
NA1660	82.04	Lake Killarney tailwater	85.25	Approximate edge of pavement	82.67	-	83.41	-	83.71	-	84.37	-
NA1670	84.22	Bottom of structure	92.63	Approximate edge of pavement	88.97	-	91.52	-	92.15	-	**92.8**	0.17
NA1680	83.52	Bottom of structure	90.33	Approximate edge of pavement	88.39	-	90.28	-	**90.47**	0.14	**90.57**	0.24
NA1690	82.52	Bottom of structure	89.14	Approximate edge of pavement	87.94	-	**89.33**	0.19	**89.43**	0.29	**89.54**	0.40
NA1700	82.04	Bottom of structure	88.40	Approximate edge of pavement	87.53	-	**89.15**	0.75	**89.26**	0.86	**89.39**	0.99
NA1710	82.04	Bottom of structure	89.18	Approximate edge of pavement	86.69	-	88.05	-	88.26	-	88.61	-
NA1720	82.04	Bottom of structure	89.94	Approximate edge of pavement	85.46	-	86.4	-	86.69	-	87.2	-
NA1730	82.04	Bottom of structure	89.12	Approximate edge of pavement	84.88	-	85.8	-	86.1	-	86.7	-
NA1740	81.14	Bottom of structure	90.16	Approximate edge of pavement	83.92	-	85.55	-	86.57	-	87.8	-
NA1750	81.14	Lake Mendsen NHWE	85.66	Approximate edge of pavement	83.92	-	85.65	-	**86.81**	1.15	**87.68**	2.02
NA1760	81.13	Lake Mendsen NHWE	85.45	Approximate edge of pavement	84.1	-	**85.96**	0.51	**86.85**	1.40	**87.71**	2.26
NA1790	82.93	Bottom of structure	88.04	Approximate edge of pavement	85.81	-	87.59	-	**88.41**	0.37	**88.66**	0.62
NA1800	76.40	Bottom of structure	88.11	Approximate edge of pavement	78.24	-	78.39	-	78.48	-	78.68	-
NA1810	77.43	Bottom of structure	86.98	Approximate edge of pavement	79.6	-	79.79	-	79.94	-	80.24	-
NA1820	70.50	Bottom of dry pond	78.99	Bank overtopping	78.19	-	78.32	-	78.41	-	78.54	-
NA1830	67.20	9th Grade Pond Control Elevation	77.76	Bank overtopping	71.35	-	72.05	-	72.25	-	72.6	-
NA1840	67.20	Bottom of structure	77.60	Approximate edge of pavement	71.97	-	73.16	-	73.53	-	74.16	-
NA1850	67.20	Lake Virginia tailwater	70.48	Approximate edge of pavement	69.13	-	**70.63**	0.15	**70.92**	0.44	**71.28**	0.80
NA1860	77.47	Bottom of structure	86.40	Approximate edge of pavement	82.44	-	84.09	-	84.52	-	84.79	-
NA1870	87.63	Bottom of structure	92.36	Approximate edge of pavement	89.54	-	91.81	-	92.33	-	**92.59**	0.23

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APPENDIX E - FIC #4 – Lake Bell: Connection to Park Lake Model Results

NODE NAME	INITIAL STAGE		WARNING STAGE		2 YEAR / 24 HOUR		10 YEAR / 24 HOUR		25 YEAR / 24 HOUR		100 YEAR / 24 HOUR	
	ELEVATION	DESCRIPTION	ELEVATION	DESCRIPTION	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)
NA1880	85.16	Bottom of structure	92.62	Approximate edge of pavement	86.67	-	89.85	-	90.88	-	92.04	-
NA1890	92.07	Bottom of structure	94.36	Approximate edge of pavement	92.38	-	92.47	-	92.53	-	92.75	-
NA1900	86.29	Lake Francis Control Elevation	89.99	Bank overtopping	**91.82**	1.83	**92.21**	2.22	**92.38**	2.39	**92.6**	2.61
NA1910	87.03	Lee Road pond control elevation	90.58	Bank overtopping	**91.8**	1.22	**92.2**	1.62	**92.37**	1.79	**92.61**	2.03
NA1970	86.00	Bottom of dry pond	94.89	Bank overtopping	92.32	-	92.79	-	93.24	-	94.58	-
NA1980	89.70	Bottom of structure	95.10	Approximate edge of pavement	92.37	-	92.86	-	93.31	-	94.64	-
NA1990	86.66	Bottom of structure	90.12	Approximate edge of pavement	87.9	-	88.29	-	88.62	-	**90.29**	0.17
NA2000	87.47	Bottom of structure	92.54	Approximate edge of pavement	90.11	-	90.88	-	91.52	-	**93.02**	0.48
NA2010	77.85	Bottom of structure	82.90	Approximate edge of pavement	82.83	-	**83.36**	0.46	**83.44**	0.54	**83.55**	0.65
NA2020	79.52	Bottom of structure	88.37	Approximate edge of pavement	82.5	-	84.15	-	84.59	-	84.93	-
NA2030	87.08	Bottom of structure	92.37	Approximate edge of pavement	90.15	-	90.84	-	91.42	-	91.5	-
NA2100	80.70	Bottom of structure	85.92	Approximate edge of pavement	83.97	-	85.9	-	**86.79**	0.87	**87.62**	1.70
NA2110	82.19	Bottom of structure	81.74	Approximate edge of pavement	**83.86**	2.12	**85.78**	4.04	**86.67**	4.93	**87.5**	5.76
NA2120	90.41	Bottom of structure	90.89	Approximate edge of pavement	**91.86**	0.97	**92.27**	1.38	**92.44**	1.55	**92.66**	1.77
NB0005	88.75	Approximate water surface elevation	91.82	Finished Floor Elevation	88.92	-	89.42	-	90.14	-	90.72	-
NB0010	81.87	Botom of structure	89.15	Approximate edge of pavement	85	-	86.38	-	87.15	-	88.57	-
NB0020	82.31	Botom of structure	90.36	Approximate edge of pavement	86.59	-	88.48	-	88.89	-	89.7	-
NB0030	86.97	Approximate water surface elevation	92.39	Finished floor elevation	88.7	-	89.31	-	90.07	-	90.66	-
NB0040	82.50	Pond control structure	89.07	Bank overtopping	85.19	-	85.23	-	85.26	-	85.32	-
NB0050	83.14	Pond control structure	85.33	Bank overtopping	84.62	-	85.02	-	85.21	-	**85.42**	0.09
NB0060	82.04	Bottom of structure	90.41	Approximate edge of pavement	82.97	-	84.24	-	85.42	-	87.32	-
NB0070	86.01	Pond control structure	88.50	Bank overtopping	88.45	-	**88.52**	0.02	**88.57**	0.07	**88.61**	0.11
NB0080	82.04	Bottom of structure	91.31	Approximate edge of pavement	83.3	-	84.54	-	85.87	-	88.18	-

APPENDIX F

FIC #5 – Lake Bell: Reduced Inflows from FDOT Pond Model Results

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APPENDIX F - FIC #5 – Lake Bell: Reduced Inflows from FDOT Pond Model Results

NODE NAME	INITIAL STAGE		WARNING STAGE		2 YEAR / 24 HOUR		10 YEAR / 24 HOUR		25 YEAR / 24 HOUR		100 YEAR / 24 HOUR	
	ELEVATION	DESCRIPTION	ELEVATION	DESCRIPTION	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)
LAKE_KILLARNEY	82.04	Control Elevation	84.40	Finished floor elevation	82.54	-	83.08	-	83.41	-	83.95	-
LAKE_MENDSEN	81.14	Normal high water elevation	84.82	Approximate edge of pavement	84.06	-	**85.98**	1.16	**86.87**	2.05	**87.7**	2.88
LAKE_ROSE	83.30	Approximate water surface elevation	91.01	Bank overtopping	83.89	-	85.97	-	86.8	-	84.76	-
NA0010	72.14	Bottom of structure	78.79	Approximate edge of pavement	77.96	-	**79.49**	0.70	**79.77**	0.98	**80.07**	1.28
NA0020	72.87	Bottom of structure	83.54	Approximate edge of pavement	79.41	-	82.1	-	82.5	-	82.82	-
NA0030	76.82	Bottom of structure	86.32	Approximate edge of pavement	79.79	-	83.07	-	84.42	-	**86.38**	0.06
NA0040	82.00	Bottom of structure	89.63	Approximate edge of pavement	83.88	-	84.48	-	86.22	-	**89.8**	0.17
NA0050	85.66	Bottom of structure	91.51	Approximate edge of pavement	87.82	-	88.23	-	88.67	-	91.19	-
NA0060	88.12	Bottom of structure	92.97	Approximate edge of pavement	88.6	-	88.82	-	89.26	-	92.9	-
NA0070	85.52	Bottom of structure	90.82	Approximate edge of pavement	85.93	-	86.02	-	86.29	-	89.85	-
NA0080	76.22	Bottom of structure	82.01	Approximate edge of pavement	79.68	-	**82.39**	0.38	**82.57**	0.56	**82.74**	0.73
NA0090	78.51	Bottom of structure	85.83	Approximate edge of pavement	84.4	-	85.22	-	85.33	-	85.44	-
NA0100	80.27	Bottom of structure	83.79	Approximate edge of pavement	**84.84**	1.05	**85.3**	1.51	**85.39**	1.60	**85.48**	1.69
NA0110	81.13	Bottom of structure	84.29	Approximate edge of pavement	**85.17**	0.88	**85.36**	1.07	**85.44**	1.15	**85.52**	1.23
NA0120	82.90	Bottom of structure	91.22	Approximate edge of pavement	84.16	-	84.39	-	85.54	-	86.98	-
NA0130	77.12	Bottom of structure	88.40	Approximate edge of pavement	80.94	-	83.94	-	85.61	-	87.16	-
NA0140	81.42	Bottom of structure	85.91	Approximate edge of pavement	82.89	-	**86.3**	0.39	**86.72**	0.81	**87.34**	1.43
NA0150	76.23	Bottom of structure	86.30	Approximate edge of pavement	79.77	-	81.53	-	82.41	-	83.23	-
NA0160	80.32	Bottom of structure	88.35	Approximate edge of pavement	84.78	-	85.2	-	85.5	-	85.93	-
NA0170	79.47	Bottom of structure	90.12	Approximate edge of pavement	83.99	-	84.43	-	84.63	-	84.95	-
NA0180	71.31	Bottom of structure	87.26	Approximate edge of pavement	74.6	-	75.03	-	75.23	-	75.56	-
NA0190	80.82	Bottom of structure	89.89	Approximate edge of pavement	85.22	-	85.64	-	85.98	-	86.48	-
NA0200	81.52	Bottom of structure	85.45	Approximate edge of pavement	**85.93**	0.48	**86.34**	0.89	**86.75**	1.30	**87.36**	1.91
NA0210	80.80	Bottom of structure	88.76	Approximate edge of pavement	83.19	-	84.03	-	85.04	-	86.61	-
NA0220	86.72	Bottom of structure	90.75	Approximate edge of pavement	89	-	90.52	-	**90.86**	0.11	**91.12**	0.37
NA0230	91.44	Bottom of structure	96.15	Approximate edge of pavement	92.44	-	92.99	-	93.29	-	93.82	-
NA0240	88.61	Bottom of structure	93.98	Approximate edge of pavement	92.4	-	92.95	-	93.24	-	93.77	-
NA0250	87.54	Bottom of structure	92.19	Approximate edge of pavement	**92.31**	0.12	**92.7**	0.51	**92.81**	0.62	**92.92**	0.73
NA0260	86.29	Bottom of structure	91.93	Approximate edge of pavement	89.35	-	90.32	-	91.78	-	**92.07**	0.14
NA0270	85.32	Bottom of structure	90.61	Approximate edge of pavement	87.95	-	88.92	-	89.96	-	**91.79**	1.18
NA0280	82.32	Bottom of structure	91.56	Approximate edge of pavement	85.28	-	86.42	-	88	-	90.95	-
NA0290	75.96	Bottom of structure	89.24	Approximate edge of pavement	85.82	-	86.81	-	87.05	-	87.28	-
NA0300	81.61	Bottom of structure	88.92	Approximate edge of pavement	85.82	-	86.54	-	86.76	-	87.21	-
NA0310	83.67	Bottom of structure	86.50	Approximate edge of pavement	86.06	-	**86.5**	0.00	**86.76**	0.26	**87.35**	0.85
NA0320	83.58	Bottom of structure	88.77	Approximate edge of pavement	85.64	-	86.38	-	86.59	-	87.08	-
NA0330	83.24	Bottom of structure	86.37	Approximate edge of pavement	**86.37**	0.00	**86.64**	0.27	**86.84**	0.47	**87.41**	1.04
NA0340	81.46	Bottom of structure	85.60	Approximate edge of pavement	**85.96**	0.36	**86.37**	0.77	**86.77**	1.17	**87.38**	1.78
NA0350	78.17	Bottom of structure	87.25	Approximate edge of pavement	85.93	-	86.93	-	87.18	-	**87.4**	0.15
NA0360	88.33	Bottom of structure	94.12	Approximate edge of pavement	89.3	-	91.29	-	91.38	-	91.59	-
NA0370	86.22	Bottom of structure	91.16	Approximate edge of pavement	89.22	-	**91.21**	0.05	**91.26**	0.10	**91.32**	0.16
NA0380	84.62	Bottom of structure	88.11	Approximate edge of pavement	86.01	-	87.19	-	87.58	-	88.02	-
NA0390	77.48	Bottom of structure	87.47	Approximate edge of pavement	85.87	-	86.86	-	87.1	-	87.32	-
NA0400	87.42	Bottom of structure	91.46	Approximate edge of pavement	88.36	-	89	-	89.59	-	90.82	-
NA0410	85.24	Bottom of structure	87.80	Approximate edge of pavement	**88.28**	0.48	**88.78**	0.98	**89.04**	1.24	**89.19**	1.39
NA0420	82.03	Bottom of structure	89.00	Approximate edge of pavement	85.99	-	87.34	-	87.93	-	88.69	-
NA0430	82.26	Bottom of structure	88.32	Approximate edge of pavement	86.01	-	87.29	-	87.86	-	**88.62**	0.30
NA0440	81.27	Bottom of structure	89.46	Approximate edge of pavement	85.89	-	87.31	-	87.98	-	88.75	-

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APPENDIX F - FIC #5 – Lake Bell: Reduced Inflows from FDOT Pond Model Results

NODE NAME	INITIAL STAGE		WARNING STAGE		2 YEAR / 24 HOUR		10 YEAR / 24 HOUR		25 YEAR / 24 HOUR		100 YEAR / 24 HOUR	
	ELEVATION	DESCRIPTION	ELEVATION	DESCRIPTION	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)
NA0450	80.02	Bottom of structure	88.29	Approximate edge of pavement	84.37	-	85.92	-	86.94	-	87.91	-
NA0460	82.60	Bottom of structure	88.09	Approximate edge of pavement	86.06	-	86.64	-	86.81	-	87.14	-
NA0470	79.57	Bottom of structure	85.32	Approximate edge of pavement	**86.01**	0.69	**86.57**	1.25	**86.7**	1.38	**86.81**	1.49
NA0480	80.26	Bottom of structure	86.75	Approximate edge of pavement	85.91	-	86.67	-	**86.8**	0.05	**86.88**	0.13
NA0490	81.66	Bottom of structure	86.12	Approximate edge of pavement	85.05	-	**86.5**	0.38	**86.65**	0.53	**86.75**	0.63
NA0500	78.02	Bottom of structure	84.24	Approximate edge of pavement	82.93	-	**84.61**	0.37	**84.94**	0.70	**85.14**	0.90
NA0510	79.52	Bottom of structure	84.82	Approximate edge of pavement	83.55	-	**85.32**	0.50	**85.51**	0.69	**85.72**	0.90
NA0520	81.44	Bottom of structure	85.49	Approximate edge of pavement	84.03	-	**85.97**	0.48	**86.14**	0.65	**86.27**	0.78
NA0530	83.62	Bottom of structure	88.82	Approximate edge of pavement	86.07	-	86.99	-	87.67	-	**88.92**	0.10
NA0540	85.97	Bottom of structure	90.45	Approximate edge of pavement	87.62	-	88.5	-	89.9	-	**90.84**	0.39
NA0550	87.66	Bottom of structure	91.28	Approximate edge of pavement	89.07	-	90.15	-	**91.5**	0.22	**91.68**	0.40
NA0560	87.18	Bottom of structure	91.56	Approximate edge of pavement	88.69	-	89.32	-	90.46	-	**92.02**	0.46
NA0570	85.65	Bottom of structure	91.06	Approximate edge of pavement	87.92	-	88.45	-	89.02	-	**91.35**	0.29
NA0580	92.68	Bottom of structure	96.76	Approximate edge of pavement	93	-	93.1	-	93.18	-	93.34	-
NA0590	89.02	Bottom of structure	93.58	Approximate edge of pavement	90.15	-	90.76	-	91.02	-	92.76	-
NA0600	85.05	Bottom of structure	90.93	Approximate edge of pavement	87.01	-	87.89	-	89.69	-	**91.37**	0.44
NA0610	83.91	Bottom of structure	89.93	Approximate edge of pavement	85.99	-	87.5	-	89.02	-	**90.7**	0.77
NA0620	83.12	Bottom of structure	90.59	Approximate edge of pavement	85.32	-	87.3	-	88.65	-	90.15	-
NA0630	85.42	Bottom of structure	90.77	Approximate edge of pavement	86.51	-	87.37	-	88.75	-	90.39	-
NA0640	91.02	Bottom of structure	95.50	Approximate edge of pavement	91.37	-	91.47	-	91.63	-	94.82	-
NA0650	90.02	Bottom of structure	94.83	Approximate edge of pavement	90.92	-	91.23	-	91.5	-	94.73	-
NA0660	90.23	Bottom of structure	94.85	Approximate edge of pavement	91.46	-	92.21	-	93.03	-	94.47	-
NA0670	92.30	Bottom of structure	97.97	Approximate edge of pavement	93.54	-	96.36	-	**98.52**	0.55	**98.61**	0.64
NA0680	90.33	Bottom of structure	96.79	Approximate edge of pavement	91.66	-	93.81	-	96.54	-	**97.22**	0.43
NA0690	88.62	Bottom of structure	94.25	Approximate edge of pavement	90.38	-	92.57	-	**94.5**	0.25	**94.6**	0.35
NA0700	86.32	Bottom of structure	91.79	Approximate edge of pavement	87.87	-	89.09	-	90.75	-	**91.96**	0.17
NA0710	84.94	Bottom of structure	90.28	Approximate edge of pavement	87.23	-	88.71	-	90.15	-	**90.59**	0.31
NA0720	83.55	Bottom of structure	89.40	Approximate edge of pavement	85.2	-	87.04	-	88.06	-	88.86	-
NA0730	82.98	Bottom of structure	88.88	Approximate edge of pavement	85.02	-	86.86	-	87.82	-	88.47	-
NA0740	81.14	Lake Mendsen NHWE	88.51	Approximate edge of pavement	84.26	-	86.78	-	87.67	-	88.29	-
NA0750	81.14	Lake Mendsen NHWE	89.42	Approximate edge of pavement	84.27	-	87.06	-	88.2	-	89.41	-
NA0760	81.14	Lake Mendsen NHWE	87.92	Approximate edge of pavement	84.23	-	86.68	-	87.51	-	**88.13**	0.21
NA0770	81.14	Lake Mendsen NHWE	87.19	Approximate edge of pavement	84.2	-	86.42	-	87.05	-	**87.75**	0.56
NA0780	81.14	Lake Mendsen NHWE	84.82	Approximate edge of pavement	84.17	-	**86.18**	1.36	**86.89**	2.07	**87.66**	2.84
NA0790	85.72	Bottom of structure	89.36	Approximate edge of pavement	87.3	-	88.81	-	**90.22**	0.86	**90.49**	1.13
NA0800	82.98	Bottom of structure	87.39	Approximate edge of pavement	85.06	-	86.91	-	**87.9**	0.51	**88.5**	1.11
NA0810	81.14	Bottom of structure	87.43	Approximate edge of pavement	84.28	-	86.84	-	**87.62**	0.19	**88**	0.57
NA0820	84.16	Bottom of structure	92.65	Approximate edge of pavement	86.61	-	89.77	-	90.81	-	91.98	-
NA0830	84.16	Bottom of structure	91.73	Approximate edge of pavement	86.53	-	89.6	-	90.63	-	91.53	-
NA0840	82.97	Bottom of structure	89.94	Approximate edge of pavement	85.35	-	88.12	-	89.13	-	**90.09**	0.15
NA0850	81.14	Lake Mendsen NHWE	86.88	Approximate edge of pavement	84.26	-	**87.24**	0.36	**88.15**	1.27	**88.55**	1.67
NA0860	81.14	Lake Mendsen NHWE	87.59	Approximate edge of pavement	84.23	-	86.86	-	**87.9**	0.31	**88.44**	0.85
NA0870	81.14	Lake Mendsen NHWE	86.66	Approximate edge of pavement	84.2	-	86.42	-	**87.53**	0.87	**87.95**	1.29
NA0880	81.14	Lake Mendsen NHWE	87.14	Approximate edge of pavement	84.16	-	86.11	-	**87.16**	0.02	**87.78**	0.64
NA0890	81.14	Lake Mendsen NHWE	86.19	Approximate edge of pavement	84.13	-	86.06	-	**86.97**	0.78	**87.74**	1.55
NA0900	81.14	Lake Mendsen NHWE	85.06	Approximate edge of pavement	84.09	-	**86.02**	0.96	**86.92**	1.86	**87.72**	2.66
NA0910	85.88	Bottom of structure	91.89	Approximate edge of pavement	87.49	-	87.89	-	88.17	-	88.82	-

Geosyntec consultants

APPENDIX F - FIC #5 – Lake Bell: Reduced Inflows from FDOT Pond Model Results

NODE NAME	INITIAL STAGE		WARNING STAGE		2 YEAR / 24 HOUR		10 YEAR / 24 HOUR		25 YEAR / 24 HOUR		100 YEAR / 24 HOUR	
	ELEVATION	DESCRIPTION	ELEVATION	DESCRIPTION	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)
NA0920	81.29	Bottom of structure	87.69	Approximate edge of pavement	84.19	-	86.07	-	87	-	**87.87**	0.18
NA0930	81.14	Lake Mendsen NHWE	86.09	Approximate edge of pavement	84.15	-	86.03	-	**86.92**	0.83	**87.71**	1.62
NA0940	81.14	Lake Mendsen NHWE	84.77	Approximate edge of pavement	84.13	-	**86**	1.23	**86.9**	2.13	**87.69**	2.92
NA0950	81.14	Lake Mendsen NHWE	84.84	Approximate edge of pavement	84.09	-	**85.99**	1.15	**86.88**	2.04	**87.7**	2.86
NA0960	81.14	Lake Mendsen NHWE	85.58	Approximate edge of pavement	84.19	-	**86.21**	0.63	**86.85**	1.27	**87.6**	2.02
NA0970	81.14	Lake Mendsen NHWE	85.66	Approximate edge of pavement	84.14	-	**86.07**	0.41	**86.89**	1.23	**87.68**	2.02
NA0980	81.14	Lake Mendsen NHWE	84.95	Approximate edge of pavement	84.09	-	**86.02**	1.07	**86.88**	1.93	**87.69**	2.74
NA0990	87.41	Bottom of structure	90.80	Approximate edge of pavement	88.27	-	88.54	-	88.76	-	89.54	-
NA1000	82.94	Bottom of structure	87.49	Approximate edge of pavement	84.5	-	86.17	-	87.3	-	**88.21**	0.72
NA1010	78.97	Bottom of structure	85.37	Approximate edge of pavement	81.88	-	**85.62**	0.25	**86.28**	0.91	**87.44**	2.07
NA1020	80.47	Bottom of structure	85.47	Approximate edge of pavement	83.12	-	**85.89**	0.42	**86.31**	0.84	**87.46**	1.99
NA1030	77.85	Bottom of structure	85.55	Approximate edge of pavement	81.34	-	84.94	-	**85.61**	0.06	**87.42**	1.87
NA1040	77.76	Bottom of structure	85.24	Approximate edge of pavement	81.19	-	84.75	-	**85.43**	0.19	**87.42**	2.18
NA1050	77.44	Bottom of structure	84.28	Approximate edge of pavement	80.85	-	84.28	-	**84.93**	0.65	**87.4**	3.12
NA1060	76.61	Bottom of structure	83.43	Approximate edge of pavement	80.7	-	**84**	0.57	**84.78**	1.35	**87.39**	3.96
NA1070	75.87	Bottom of structure	89.34	Approximate edge of pavement	80.4	-	83.4	-	84.1	-	85.68	-
NA1080	74.25	Bottom of structure	85.11	Approximate edge of pavement	78.97	-	81.02	-	81.47	-	82.24	-
NA1090	73.79	Bottom of structure	76.62	Approximate edge of pavement	**77.73**	1.11	**78.57**	1.95	**78.77**	2.15	**79.1**	2.48
NA1100	77.15	Bottom of structure	83.03	Approximate edge of pavement	78.07	-	79.42	-	83	-	**83.28**	0.25
NA1110	74.23	Bottom of structure	80.07	Approximate edge of pavement	77.24	-	77.6	-	78.76	-	79.23	-
NA1120	73.79	Bottom of structure	76.34	Approximate edge of pavement	**77.17**	0.83	**77.28**	0.94	**77.47**	1.13	**77.81**	1.47
NA1130	78.93	Bottom of structure	83.69	Approximate edge of pavement	81.87	-	**84.34**	0.65	**84.73**	1.04	**85.15**	1.46
NA1140	79.43	Bottom of structure	86.76	Approximate edge of pavement	84.17	-	**87.26**	0.50	**87.53**	0.77	**87.85**	1.09
NA1150	80.96	Bottom of structure	83.93	Approximate edge of pavement	**87.31**	3.38	**88.47**	4.54	**88.67**	4.74	**88.91**	4.98
NA1160	87.02	Bottom of structure	91.63	Approximate edge of pavement	90.04	-	91.59	-	**91.98**	0.35	**92.17**	0.54
NA1170	83.62	Bottom of structure	89.26	Approximate edge of pavement	**89.99**	0.73	**90.34**	1.08	**90.52**	1.26	**90.71**	1.45
NA1180	83.62	Lake Midget control elevation	90.40	Bank overtopping	89.96	-	90.31	-	**90.48**	0.08	**90.67**	0.27
NA1190	83.89	Bottom of structure	88.91	Approximate edge of pavement	**89.94**	1.03	**90.04**	1.13	**90.09**	1.18	**90.16**	1.25
NA1200	83.89	Bottom of structure	91.04	Approximate edge of pavement	89.89	-	89.99	-	90.04	-	90.11	-
NA1210	83.62	Bottom of structure	90.46	Approximate edge of pavement	89.92	-	90.11	-	90.26	-	90.46	-
NA1220	83.62	Bottom of structure	91.71	Approximate edge of pavement	89.96	-	90.23	-	90.43	-	90.68	-
NA1230	83.62	Bottom of structure	90.28	Approximate edge of pavement	89.97	-	**90.3**	0.02	**90.49**	0.21	**90.69**	0.41
NA1240	87.78	Bottom of structure	91.07	Approximate edge of pavement	90.07	-	90.61	-	91.02	-	**91.13**	0.06
NA1250	87.42	Bottom of structure	90.70	Approximate edge of pavement	89.97	-	90.04	-	90.08	-	90.13	-
NA1260	86.18	Bottom of structure	90.64	Approximate edge of pavement	89.87	-	89.97	-	90.01	-	90.08	-
NA1270	85.80	Bottom of structure	89.67	Approximate edge of pavement	**89.94**	0.27	**90.06**	0.39	**90.14**	0.47	**90.22**	0.55
NA1280	85.60	Bottom of structure	90.74	Approximate edge of pavement	89.93	-	90.04	-	90.1	-	90.17	-
NA1290	88.32	Bottom of structure	90.86	Approximate edge of pavement	**91.06**	0.20	**91.19**	0.33	**91.24**	0.38	**91.3**	0.44
NA1300	86.73	Bottom of structure	90.10	Approximate edge of pavement	**90.44**	0.34	**90.81**	0.71	**90.91**	0.81	**90.99**	0.89
NA1310	83.30	Bottom of structure	87.94	Approximate edge of pavement	86.04	-	87.53	-	**88.56**	0.62	**88.72**	0.78
NA1320	88.52	Bottom of structure	92.53	Approximate edge of pavement	89.46	-	90.98	-	91.3	-	91.72	-
NA1330	84.72	Bottom of structure	90.29	Approximate edge of pavement	89.4	-	**90.93**	0.64	**91.25**	0.96	**91.66**	1.37
NA1340	85.32	Bottom of structure	89.55	Approximate edge of pavement	89.27	-	**90.9**	1.35	**91.22**	1.67	**91.62**	2.07
NA1350	84.62	Bottom of structure	90.45	Approximate edge of pavement	88.51	-	**90.56**	0.11	**91.16**	0.71	**91.56**	1.11
NA1360	82.50	Bottom of structure	89.84	Approximate edge of pavement	87.3	-	88.95	-	**90.1**	0.26	**90.73**	0.89
NA1370	82.50	Bottom of structure	88.96	Approximate edge of pavement	86.1	-	87.4	-	88.24	-	**90.04**	1.08
NA1380	82.50	Bottom of structure	89.60	Approximate edge of pavement	85.24	-	86.28	-	86.75	-	87.78	-

Geosyntec consultants

APPENDIX F - FIC #5 – Lake Bell: Reduced Inflows from FDOT Pond Model Results

NODE NAME	INITIAL STAGE		WARNING STAGE		2 YEAR / 24 HOUR		10 YEAR / 24 HOUR		25 YEAR / 24 HOUR		100 YEAR / 24 HOUR	
	ELEVATION	DESCRIPTION	ELEVATION	DESCRIPTION	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)
NA1390	82.04	Bottom of structure	89.38	Approximate edge of pavement	84.79	-	85.69	-	85.99	-	86.63	-
NA1400	86.52	Bottom of structure	92.24	Approximate edge of pavement	89.56	-	91.28	-	91.74	-	**92.35**	0.11
NA1410	84.72	Bottom of structure	90.35	Approximate edge of pavement	89.41	-	**90.94**	0.59	**91.26**	0.91	**91.68**	1.33
NA1420	81.52	Bottom of structure	89.36	Approximate edge of pavement	87.49	-	**90.34**	0.98	**91.19**	1.83	**91.62**	2.26
NA1430	81.13	Bottom of structure	90.79	Approximate edge of pavement	86.53	-	88.78	-	89.59	-	**91.35**	0.56
NA1440	81.13	Bottom of structure	90.11	Approximate edge of pavement	86.01	-	88.02	-	88.8	-	**90.59**	0.48
NA1450	81.13	Bottom of structure	88.88	Approximate edge of pavement	85.67	-	87.53	-	88.33	-	**89.97**	1.09
NA1460	81.13	Bottom of structure	89.61	Approximate edge of pavement	85.28	-	86.84	-	87.55	-	89.17	-
NA1470	81.13	Bottom of structure	90.19	Approximate edge of pavement	84.88	-	86.1	-	86.7	-	88.09	-
NA1480	81.13	Bottom of structure	89.23	Approximate edge of pavement	84.85	-	85.95	-	86.44	-	87.46	-
NA1490	82.72	Bottom of structure	87.50	Approximate edge of pavement	85.98	-	**87.94**	0.44	**88.2**	0.70	**88.53**	1.03
NA1500	83.44	Bottom of structure	87.27	Approximate edge of pavement	84.2	-	86.23	-	**87.41**	0.14	**88.12**	0.85
NA1510	81.14	Lake Mendsen NHWE	85.25	Approximate edge of pavement	84.13	-	**86.13**	0.88	**87.33**	2.08	**88.08**	2.83
NA1520	82.42	Bottom of structure	86.11	Approximate edge of pavement	84.16	-	**86.45**	0.34	**87.32**	1.21	**88.05**	1.94
NA1530	81.14	Lake Mendsen NHWE	86.90	Approximate edge of pavement	84.09	-	86.02	-	**86.94**	0.04	**87.74**	0.84
NA1540	81.14	Lake Mendsen NHWE	85.15	Approximate edge of pavement	84.17	-	**86.16**	1.01	**87.36**	2.21	**88.1**	2.95
NA1550	90.36	Bottom of structure	94.47	Approximate edge of pavement	92	-	93.68	-	**94.5**	0.03	**94.87**	0.40
NA1560	89.67	Bottom of structure	94.46	Approximate edge of pavement	90.89	-	91.33	-	91.52	-	91.64	-
NA1570	87.27	Bottom of structure	91.49	Approximate edge of pavement	88.41	-	88.82	-	89.61	-	**91.61**	0.12
NA1580	84.57	Bottom of structure	89.81	Approximate edge of pavement	86.39	-	87	-	87.84	-	89.36	-
NA1590	82.97	Bottom of structure	91.69	Approximate edge of pavement	88.51	-	88.79	-	89.02	-	89.46	-
NA1600	82.97	Bottom of structure	87.71	Approximate edge of pavement	84.2	-	86.27	-	86.97	-	**87.76**	0.05
NA1610	81.80	Bottom of structure	85.34	Approximate edge of pavement	84.17	-	**86.19**	0.85	**86.93**	1.59	**87.72**	2.38
NA1620	90.03	Bottom of structure	92.24	Approximate edge of pavement	90.03	-	90.03	-	90.03	-	91.6	-
NA1630	81.92	Bottom of structure	84.78	Approximate edge of pavement	**85.05**	0.27	**85.98**	1.20	**86.8**	2.02	**87.56**	2.78
NA1640	81.54	Bottom of structure	87.01	Approximate edge of pavement	84.53	-	85.96	-	86.53	-	**87.52**	0.51
NA1650	80.90	Bottom of structure	85.58	Approximate edge of pavement	83.75	-	**85.94**	0.36	**86.32**	0.74	**87.49**	1.91
NA1660	82.04	Lake Killarney tailwater	85.25	Approximate edge of pavement	82.67	-	83.41	-	83.71	-	84.4	-
NA1670	84.22	Bottom of structure	92.63	Approximate edge of pavement	88.97	-	91.52	-	92.15	-	**92.8**	0.17
NA1680	83.52	Bottom of structure	90.33	Approximate edge of pavement	88.39	-	90.28	-	**90.47**	0.14	**90.57**	0.24
NA1690	82.52	Bottom of structure	89.14	Approximate edge of pavement	87.94	-	**89.33**	0.19	**89.43**	0.29	**89.54**	0.40
NA1700	82.04	Bottom of structure	88.40	Approximate edge of pavement	87.53	-	**89.15**	0.75	**89.26**	0.86	**89.39**	0.99
NA1710	82.04	Bottom of structure	89.18	Approximate edge of pavement	86.69	-	88.05	-	88.26	-	88.62	-
NA1720	82.04	Bottom of structure	89.94	Approximate edge of pavement	85.46	-	86.4	-	86.69	-	87.21	-
NA1730	82.04	Bottom of structure	89.12	Approximate edge of pavement	84.88	-	85.8	-	86.1	-	86.72	-
NA1740	81.14	Bottom of structure	90.16	Approximate edge of pavement	83.92	-	85.55	-	86.57	-	87.8	-
NA1750	81.14	Lake Mendsen NHWE	85.66	Approximate edge of pavement	83.92	-	85.65	-	**86.81**	1.15	**87.68**	2.02
NA1760	81.13	Lake Mendsen NHWE	85.45	Approximate edge of pavement	84.1	-	**85.96**	0.51	**86.85**	1.40	**87.71**	2.26
NA1790	82.93	Bottom of structure	88.04	Approximate edge of pavement	85.81	-	87.59	-	**88.41**	0.37	**88.66**	0.62
NA1800	76.40	Bottom of structure	88.11	Approximate edge of pavement	78.24	-	78.39	-	78.48	-	78.68	-
NA1810	77.43	Bottom of structure	86.98	Approximate edge of pavement	79.6	-	79.79	-	79.94	-	80.24	-
NA1820	70.50	Bottom of dry pond	78.99	Bank overtopping	78.19	-	78.32	-	78.41	-	78.54	-
NA1830	67.20	9th Grade Pond Control Elevation	77.76	Bank overtopping	71.35	-	72.05	-	72.25	-	72.6	-
NA1840	67.20	Bottom of structure	77.60	Approximate edge of pavement	71.97	-	73.16	-	73.53	-	74.16	-
NA1850	67.20	Lake Virginia tailwater	70.48	Approximate edge of pavement	69.13	-	**70.63**	0.15	**70.92**	0.44	**71.28**	0.80
NA1860	77.47	Bottom of structure	86.40	Approximate edge of pavement	82.44	-	84.09	-	84.52	-	84.79	-
NA1870	87.63	Bottom of structure	92.36	Approximate edge of pavement	89.54	-	91.81	-	92.33	-	**92.59**	0.23

Geosyntec consultants

APPENDIX F - FIC #5 – Lake Bell: Reduced Inflows from FDOT Pond Model Results

NODE NAME	INITIAL STAGE		WARNING STAGE		2 YEAR / 24 HOUR		10 YEAR / 24 HOUR		25 YEAR / 24 HOUR		100 YEAR / 24 HOUR	
	ELEVATION	DESCRIPTION	ELEVATION	DESCRIPTION	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)
NA1880	85.16	Bottom of structure	92.62	Approximate edge of pavement	86.67	-	89.85	-	90.88	-	92.04	-
NA1890	92.07	Bottom of structure	94.36	Approximate edge of pavement	92.38	-	92.47	-	92.53	-	92.75	-
NA1900	86.29	Lake Francis Control Elevation	89.99	Bank overtopping	**91.82**	1.83	**92.21**	2.22	**92.38**	2.39	**92.6**	2.61
NA1910	87.03	Lee Road pond control elevation	90.58	Bank overtopping	**91.8**	1.22	**92.2**	1.62	**92.37**	1.79	**92.61**	2.03
NA1970	86.00	Bottom of dry pond	94.89	Bank overtopping	92.32	-	92.79	-	93.24	-	94.58	-
NA1980	89.70	Bottom of structure	95.10	Approximate edge of pavement	92.37	-	92.86	-	93.31	-	94.64	-
NA1990	86.66	Bottom of structure	90.12	Approximate edge of pavement	87.9	-	88.29	-	88.62	-	**90.29**	0.17
NA2000	87.47	Bottom of structure	92.54	Approximate edge of pavement	90.11	-	90.88	-	91.52	-	**93.02**	0.48
NA2010	77.85	Bottom of structure	82.90	Approximate edge of pavement	82.83	-	**83.36**	0.46	**83.44**	0.54	**83.55**	0.65
NA2020	79.52	Bottom of structure	88.37	Approximate edge of pavement	82.5	-	84.15	-	84.59	-	84.93	-
NA2030	87.08	Bottom of structure	92.37	Approximate edge of pavement	90.15	-	90.84	-	91.42	-	91.5	-
NA2100	80.70	Bottom of structure	85.92	Approximate edge of pavement	83.97	-	85.9	-	**86.79**	0.87	**87.62**	1.70
NA2110	82.19	Bottom of structure	81.74	Approximate edge of pavement	**83.86**	2.12	**85.78**	4.04	**86.67**	4.93	**87.5**	5.76
NA2120	90.41	Bottom of structure	90.89	Approximate edge of pavement	**91.86**	0.97	**92.27**	1.38	**92.44**	1.55	**92.66**	1.77
NB0005	88.75	Approximate water surface elevation	91.82	Finished Floor Elevation	88.92	-	89.42	-	90.14	-	91.43	-
NB0010	81.87	Botom of structure	89.15	Approximate edge of pavement	85	-	86.38	-	87.15	-	88.65	-
NB0020	82.31	Botom of structure	90.36	Approximate edge of pavement	86.59	-	88.48	-	88.89	-	**91.04**	0.68
NB0030	86.97	Approximate water surface elevation	92.39	Finished floor elevation	88.7	-	89.31	-	90.07	-	91.38	-
NB0040	82.50	Pond control structure	89.07	Bank overtopping	85.19	-	85.23	-	85.26	-	85.32	-
NB0050	83.14	Pond control structure	85.33	Bank overtopping	84.62	-	85.02	-	85.21	-	**85.42**	0.09
NB0060	82.04	Bottom of structure	90.41	Approximate edge of pavement	82.97	-	84.24	-	85.42	-	87.35	-
NB0070	86.01	Pond control structure	88.50	Bank overtopping	88.45	-	**88.52**	0.02	**88.57**	0.07	**88.61**	0.11
NB0080	82.04	Bottom of structure	91.31	Approximate edge of pavement	83.3	-	84.54	-	85.87	-	88.21	-

APPENDIX G

FIC #6 – Lake Killarney: Improved Conveyance to Lake Gem Model Results

Geosyntec consultants

APPENDIX G - FIC #6 – Lake Killarney: Improved Conveyance to Lake Gem Model Results

NODE NAME	INITIAL STAGE		WARNING STAGE		2 YEAR / 24 HOUR		10 YEAR / 24 HOUR		25 YEAR / 24 HOUR		100 YEAR / 24 HOUR	
	ELEVATION	DESCRIPTION	ELEVATION	DESCRIPTION	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)
LAKE_KILLARNEY	82.04	Control Elevation	84.40	Finished floor elevation	80.98	-	81.67	-	82.03	-	82.85	-
LAKE_MENDSEN	81.14	Normal high water elevation	84.82	Approximate edge of pavement	84.05	-	**86.16**	1.34	**86.97**	2.15	**87.7**	2.88
LAKE_ROSE	83.30	Approximate water surface elevation	91.01	Bank overtopping	83.89	-	84.16	-	84.37	-	84.76	-
NA0010	72.14	Bottom of structure	78.79	Approximate edge of pavement	77.96	-	**79.49**	0.70	**79.77**	0.98	**80.07**	1.28
NA0020	72.87	Bottom of structure	83.54	Approximate edge of pavement	79.41	-	82.1	-	82.5	-	82.82	-
NA0030	76.82	Bottom of structure	86.32	Approximate edge of pavement	79.79	-	83.07	-	84.42	-	**86.38**	0.06
NA0040	82.00	Bottom of structure	89.63	Approximate edge of pavement	83.88	-	84.48	-	86.22	-	**89.8**	0.17
NA0050	85.66	Bottom of structure	91.51	Approximate edge of pavement	87.82	-	88.23	-	88.67	-	91.19	-
NA0060	88.12	Bottom of structure	92.97	Approximate edge of pavement	88.6	-	88.82	-	89.26	-	92.9	-
NA0070	85.52	Bottom of structure	90.82	Approximate edge of pavement	85.93	-	86.02	-	86.29	-	89.85	-
NA0080	76.22	Bottom of structure	82.01	Approximate edge of pavement	79.68	-	**82.39**	0.38	**82.57**	0.56	**82.74**	0.73
NA0090	78.51	Bottom of structure	85.83	Approximate edge of pavement	84.4	-	85.22	-	85.33	-	85.44	-
NA0100	80.27	Bottom of structure	83.79	Approximate edge of pavement	**84.84**	1.05	**85.3**	1.51	**85.39**	1.60	**85.48**	1.69
NA0110	81.13	Bottom of structure	84.29	Approximate edge of pavement	**85.17**	0.88	**85.36**	1.07	**85.44**	1.15	**85.52**	1.23
NA0120	82.90	Bottom of structure	91.22	Approximate edge of pavement	84.16	-	84.39	-	85.54	-	86.98	-
NA0130	77.12	Bottom of structure	88.40	Approximate edge of pavement	80.94	-	83.94	-	85.61	-	87.16	-
NA0140	81.42	Bottom of structure	85.91	Approximate edge of pavement	82.89	-	**86.3**	0.39	**86.72**	0.81	**87.34**	1.43
NA0150	76.23	Bottom of structure	86.30	Approximate edge of pavement	79.77	-	81.53	-	82.41	-	83.23	-
NA0160	80.32	Bottom of structure	88.35	Approximate edge of pavement	84.78	-	85.2	-	85.5	-	85.93	-
NA0170	79.47	Bottom of structure	90.12	Approximate edge of pavement	83.99	-	84.43	-	84.63	-	84.95	-
NA0180	71.31	Bottom of structure	87.26	Approximate edge of pavement	74.6	-	75.03	-	75.23	-	75.56	-
NA0190	80.82	Bottom of structure	89.89	Approximate edge of pavement	85.22	-	85.64	-	85.98	-	86.48	-
NA0200	81.52	Bottom of structure	85.45	Approximate edge of pavement	**85.93**	0.48	**86.34**	0.89	**86.75**	1.30	**87.36**	1.91
NA0210	80.80	Bottom of structure	88.76	Approximate edge of pavement	83.19	-	84.03	-	85.04	-	86.61	-
NA0220	86.72	Bottom of structure	90.75	Approximate edge of pavement	89	-	90.52	-	**90.86**	0.11	**91.12**	0.37
NA0230	91.44	Bottom of structure	96.15	Approximate edge of pavement	92.44	-	92.99	-	93.29	-	93.82	-
NA0240	88.61	Bottom of structure	93.98	Approximate edge of pavement	92.4	-	92.95	-	93.24	-	93.77	-
NA0250	87.54	Bottom of structure	92.19	Approximate edge of pavement	**92.31**	0.12	**92.7**	0.51	**92.81**	0.62	**92.92**	0.73
NA0260	86.29	Bottom of structure	91.93	Approximate edge of pavement	89.35	-	90.32	-	91.78	-	**92.07**	0.14
NA0270	85.32	Bottom of structure	90.61	Approximate edge of pavement	87.95	-	88.92	-	89.96	-	**91.79**	1.18
NA0280	82.32	Bottom of structure	91.56	Approximate edge of pavement	85.28	-	86.42	-	88	-	90.95	-
NA0290	75.96	Bottom of structure	89.24	Approximate edge of pavement	85.82	-	86.81	-	87.05	-	87.28	-
NA0300	81.61	Bottom of structure	88.92	Approximate edge of pavement	85.82	-	86.54	-	86.76	-	87.21	-
NA0310	83.67	Bottom of structure	86.50	Approximate edge of pavement	86.06	-	**86.5**	0.00	**86.76**	0.26	**87.35**	0.85
NA0320	83.58	Bottom of structure	88.77	Approximate edge of pavement	85.64	-	86.38	-	86.59	-	87.08	-
NA0330	83.24	Bottom of structure	86.37	Approximate edge of pavement	**86.37**	0.00	**86.64**	0.27	**86.84**	0.47	**87.41**	1.04
NA0340	81.46	Bottom of structure	85.60	Approximate edge of pavement	**85.96**	0.36	**86.37**	0.77	**86.77**	1.17	**87.38**	1.78
NA0350	78.17	Bottom of structure	87.25	Approximate edge of pavement	85.93	-	86.93	-	87.18	-	**87.4**	0.15
NA0360	88.33	Bottom of structure	94.12	Approximate edge of pavement	89.3	-	91.29	-	91.38	-	91.59	-
NA0370	86.22	Bottom of structure	91.16	Approximate edge of pavement	89.22	-	**91.21**	0.05	**91.26**	0.10	**91.32**	0.16
NA0380	84.62	Bottom of structure	88.11	Approximate edge of pavement	86.01	-	87.19	-	87.58	-	88.02	-
NA0390	77.48	Bottom of structure	87.47	Approximate edge of pavement	85.87	-	86.86	-	87.1	-	87.32	-
NA0400	87.42	Bottom of structure	91.46	Approximate edge of pavement	88.36	-	89	-	89.59	-	90.82	-
NA0410	85.24	Bottom of structure	87.80	Approximate edge of pavement	**88.28**	0.48	**88.78**	0.98	**89.04**	1.24	**89.19**	1.39
NA0420	82.03	Bottom of structure	89.00	Approximate edge of pavement	85.99	-	87.34	-	87.93	-	88.69	-
NA0430	82.26	Bottom of structure	88.32	Approximate edge of pavement	86.01	-	87.29	-	87.86	-	**88.62**	0.30
NA0440	81.27	Bottom of structure	89.46	Approximate edge of pavement	85.89	-	87.31	-	87.98	-	88.75	-

Geosyntec consultants

APPENDIX G - FIC #6 – Lake Killarney: Improved Conveyance to Lake Gem Model Results

NODE NAME	INITIAL STAGE		WARNING STAGE		2 YEAR / 24 HOUR		10 YEAR / 24 HOUR		25 YEAR / 24 HOUR		100 YEAR / 24 HOUR	
	ELEVATION	DESCRIPTION	ELEVATION	DESCRIPTION	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)
NA0450	80.02	Bottom of structure	88.29	Approximate edge of pavement	84.37	-	85.92	-	86.94	-	87.91	-
NA0460	82.60	Bottom of structure	88.09	Approximate edge of pavement	86.06	-	86.64	-	86.81	-	87.14	-
NA0470	79.57	Bottom of structure	85.32	Approximate edge of pavement	**86.01**	0.69	**86.57**	1.25	**86.7**	1.38	**86.81**	1.49
NA0480	80.26	Bottom of structure	86.75	Approximate edge of pavement	85.91	-	86.67	-	**86.8**	0.05	**86.88**	0.13
NA0490	81.66	Bottom of structure	86.12	Approximate edge of pavement	85.05	-	**86.5**	0.38	**86.65**	0.53	**86.75**	0.63
NA0500	78.02	Bottom of structure	84.24	Approximate edge of pavement	82.93	-	**84.61**	0.37	**84.94**	0.70	**85.14**	0.90
NA0510	79.52	Bottom of structure	84.82	Approximate edge of pavement	83.55	-	**85.32**	0.50	**85.51**	0.69	**85.72**	0.90
NA0520	81.44	Bottom of structure	85.49	Approximate edge of pavement	84.03	-	**85.97**	0.48	**86.14**	0.65	**86.27**	0.78
NA0530	83.62	Bottom of structure	88.82	Approximate edge of pavement	86.07	-	86.99	-	87.67	-	**88.92**	0.10
NA0540	85.97	Bottom of structure	90.45	Approximate edge of pavement	87.62	-	88.5	-	89.9	-	**90.84**	0.39
NA0550	87.66	Bottom of structure	91.28	Approximate edge of pavement	89.07	-	90.15	-	**91.5**	0.22	**91.68**	0.40
NA0560	87.18	Bottom of structure	91.56	Approximate edge of pavement	88.69	-	89.32	-	90.46	-	**92.02**	0.46
NA0570	85.65	Bottom of structure	91.06	Approximate edge of pavement	87.92	-	88.45	-	89.02	-	**91.35**	0.29
NA0580	92.68	Bottom of structure	96.76	Approximate edge of pavement	93	-	93.1	-	93.18	-	93.34	-
NA0590	89.02	Bottom of structure	93.58	Approximate edge of pavement	90.15	-	90.76	-	91.02	-	92.76	-
NA0600	85.05	Bottom of structure	90.93	Approximate edge of pavement	87.01	-	87.89	-	89.69	-	**91.37**	0.44
NA0610	83.91	Bottom of structure	89.93	Approximate edge of pavement	85.99	-	87.5	-	89.02	-	**90.7**	0.77
NA0620	83.12	Bottom of structure	90.59	Approximate edge of pavement	85.32	-	87.3	-	88.65	-	90.15	-
NA0630	85.42	Bottom of structure	90.77	Approximate edge of pavement	86.51	-	87.37	-	88.75	-	90.39	-
NA0640	91.02	Bottom of structure	95.50	Approximate edge of pavement	91.37	-	91.47	-	91.63	-	94.82	-
NA0650	90.02	Bottom of structure	94.83	Approximate edge of pavement	90.92	-	91.23	-	91.5	-	94.73	-
NA0660	90.23	Bottom of structure	94.85	Approximate edge of pavement	91.46	-	92.21	-	93.03	-	94.47	-
NA0670	92.30	Bottom of structure	97.97	Approximate edge of pavement	93.54	-	96.36	-	**98.52**	0.55	**98.61**	0.64
NA0680	90.33	Bottom of structure	96.79	Approximate edge of pavement	91.66	-	93.81	-	96.54	-	**97.22**	0.43
NA0690	88.62	Bottom of structure	94.25	Approximate edge of pavement	90.38	-	92.57	-	**94.5**	0.25	**94.6**	0.35
NA0700	86.32	Bottom of structure	91.79	Approximate edge of pavement	87.87	-	89.09	-	90.75	-	**91.96**	0.17
NA0710	84.94	Bottom of structure	90.28	Approximate edge of pavement	87.23	-	88.71	-	90.15	-	**90.59**	0.31
NA0720	83.55	Bottom of structure	89.40	Approximate edge of pavement	85.2	-	87.04	-	88.06	-	88.86	-
NA0730	82.98	Bottom of structure	88.88	Approximate edge of pavement	85.02	-	86.86	-	87.82	-	88.47	-
NA0740	81.14	Lake Mendsen NHWE	88.51	Approximate edge of pavement	84.25	-	86.78	-	87.67	-	88.29	-
NA0750	81.14	Lake Mendsen NHWE	89.42	Approximate edge of pavement	84.26	-	87.06	-	88.2	-	89.41	-
NA0760	81.14	Lake Mendsen NHWE	87.92	Approximate edge of pavement	84.23	-	86.68	-	87.51	-	**88.13**	0.21
NA0770	81.14	Lake Mendsen NHWE	87.19	Approximate edge of pavement	84.2	-	86.42	-	87.05	-	**87.75**	0.56
NA0780	81.14	Lake Mendsen NHWE	84.82	Approximate edge of pavement	84.17	-	**86.25**	1.43	**86.96**	2.14	**87.65**	2.83
NA0790	85.72	Bottom of structure	89.36	Approximate edge of pavement	87.3	-	88.81	-	**90.22**	0.86	**90.49**	1.13
NA0800	82.98	Bottom of structure	87.39	Approximate edge of pavement	85.06	-	86.91	-	**87.9**	0.51	**88.5**	1.11
NA0810	81.14	Bottom of structure	87.43	Approximate edge of pavement	84.27	-	86.84	-	**87.62**	0.19	**88**	0.57
NA0820	84.16	Bottom of structure	92.65	Approximate edge of pavement	86.61	-	89.77	-	90.81	-	91.98	-
NA0830	84.16	Bottom of structure	91.73	Approximate edge of pavement	86.53	-	89.6	-	90.63	-	91.53	-
NA0840	82.97	Bottom of structure	89.94	Approximate edge of pavement	85.35	-	88.12	-	89.13	-	**90.09**	0.15
NA0850	81.14	Lake Mendsen NHWE	86.88	Approximate edge of pavement	84.26	-	**87.24**	0.36	**88.15**	1.27	**88.55**	1.67
NA0860	81.14	Lake Mendsen NHWE	87.59	Approximate edge of pavement	84.22	-	86.86	-	**87.9**	0.31	**88.44**	0.85
NA0870	81.14	Lake Mendsen NHWE	86.66	Approximate edge of pavement	84.19	-	86.42	-	**87.53**	0.87	**87.95**	1.29
NA0880	81.14	Lake Mendsen NHWE	87.14	Approximate edge of pavement	84.16	-	86.29	-	**87.17**	0.03	**87.77**	0.63
NA0890	81.14	Lake Mendsen NHWE	86.19	Approximate edge of pavement	84.12	-	**86.24**	0.05	**87.06**	0.87	**87.73**	1.54
NA0900	81.14	Lake Mendsen NHWE	85.06	Approximate edge of pavement	84.09	-	**86.2**	1.14	**87.02**	1.96	**87.71**	2.65
NA0910	85.88	Bottom of structure	91.89	Approximate edge of pavement	87.49	-	87.89	-	88.17	-	88.82	-

Geosyntec consultants

APPENDIX G - FIC #6 – Lake Killarney: Improved Conveyance to Lake Gem Model Results

NODE NAME	INITIAL STAGE		WARNING STAGE		2 YEAR / 24 HOUR		10 YEAR / 24 HOUR		25 YEAR / 24 HOUR		100 YEAR / 24 HOUR	
	ELEVATION	DESCRIPTION	ELEVATION	DESCRIPTION	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)
NA0920	81.29	Bottom of structure	87.69	Approximate edge of pavement	84.18	-	86.26	-	87.1	-	**87.87**	0.18
NA0930	81.14	Lake Mendsen NHWE	86.09	Approximate edge of pavement	84.15	-	**86.22**	0.13	**87.02**	0.93	**87.71**	1.62
NA0940	81.14	Lake Mendsen NHWE	84.77	Approximate edge of pavement	84.13	-	**86.19**	1.42	**86.99**	2.22	**87.68**	2.91
NA0950	81.14	Lake Mendsen NHWE	84.84	Approximate edge of pavement	84.09	-	**86.17**	1.33	**86.98**	2.14	**87.69**	2.85
NA0960	81.14	Lake Mendsen NHWE	85.58	Approximate edge of pavement	84.19	-	**86.26**	0.68	**86.92**	1.34	**87.6**	2.02
NA0970	81.14	Lake Mendsen NHWE	85.66	Approximate edge of pavement	84.13	-	**86.22**	0.56	**86.98**	1.32	**87.67**	2.01
NA0980	81.14	Lake Mendsen NHWE	84.95	Approximate edge of pavement	84.09	-	**86.19**	1.24	**86.98**	2.03	**87.68**	2.73
NA0990	87.41	Bottom of structure	90.80	Approximate edge of pavement	88.27	-	88.54	-	88.76	-	89.54	-
NA1000	82.94	Bottom of structure	87.49	Approximate edge of pavement	84.5	-	86.17	-	87.3	-	**88.21**	0.72
NA1010	78.97	Bottom of structure	85.37	Approximate edge of pavement	81.88	-	**85.62**	0.25	**86.28**	0.91	**87.43**	2.06
NA1020	80.47	Bottom of structure	85.47	Approximate edge of pavement	83.12	-	**85.89**	0.42	**86.31**	0.84	**87.45**	1.98
NA1030	77.85	Bottom of structure	85.55	Approximate edge of pavement	81.34	-	84.94	-	**85.61**	0.06	**87.41**	1.86
NA1040	77.76	Bottom of structure	85.24	Approximate edge of pavement	81.19	-	84.75	-	**85.43**	0.19	**87.41**	2.17
NA1050	77.44	Bottom of structure	84.28	Approximate edge of pavement	80.85	-	84.28	-	**84.93**	0.65	**87.4**	3.12
NA1060	76.61	Bottom of structure	83.43	Approximate edge of pavement	80.7	-	**84**	0.57	**84.78**	1.35	**87.39**	3.96
NA1070	75.87	Bottom of structure	89.34	Approximate edge of pavement	80.4	-	83.4	-	84.1	-	85.67	-
NA1080	74.25	Bottom of structure	85.11	Approximate edge of pavement	78.97	-	81.02	-	81.47	-	82.24	-
NA1090	73.79	Bottom of structure	76.62	Approximate edge of pavement	**77.73**	1.11	**78.57**	1.95	**78.77**	2.15	**79.1**	2.48
NA1100	77.15	Bottom of structure	83.03	Approximate edge of pavement	78.07	-	79.42	-	83	-	**83.28**	0.25
NA1110	74.23	Bottom of structure	80.07	Approximate edge of pavement	77.24	-	77.6	-	78.76	-	79.23	-
NA1120	73.79	Bottom of structure	76.34	Approximate edge of pavement	**77.17**	0.83	**77.28**	0.94	**77.47**	1.13	**77.81**	1.47
NA1130	78.93	Bottom of structure	83.69	Approximate edge of pavement	81.87	-	**84.34**	0.65	**84.73**	1.04	**85.15**	1.46
NA1140	79.43	Bottom of structure	86.76	Approximate edge of pavement	84.17	-	**87.26**	0.50	**87.53**	0.77	**87.85**	1.09
NA1150	80.96	Bottom of structure	83.93	Approximate edge of pavement	**87.31**	3.38	**88.47**	4.54	**88.67**	4.74	**88.91**	4.98
NA1160	87.02	Bottom of structure	91.63	Approximate edge of pavement	90.04	-	91.59	-	**91.98**	0.35	**92.17**	0.54
NA1170	83.62	Bottom of structure	89.26	Approximate edge of pavement	**89.99**	0.73	**90.34**	1.08	**90.52**	1.26	**90.71**	1.45
NA1180	83.62	Lake Midget control elevation	90.40	Bank overtopping	89.96	-	90.31	-	**90.48**	0.08	**90.67**	0.27
NA1190	83.89	Bottom of structure	88.91	Approximate edge of pavement	**89.94**	1.03	**90.04**	1.13	**90.09**	1.18	**90.16**	1.25
NA1200	83.89	Bottom of structure	91.04	Approximate edge of pavement	89.89	-	89.99	-	90.04	-	90.11	-
NA1210	83.62	Bottom of structure	90.46	Approximate edge of pavement	89.92	-	90.11	-	90.26	-	90.46	-
NA1220	83.62	Bottom of structure	91.71	Approximate edge of pavement	89.96	-	90.23	-	90.43	-	90.68	-
NA1230	83.62	Bottom of structure	90.28	Approximate edge of pavement	89.97	-	**90.3**	0.02	**90.49**	0.21	**90.69**	0.41
NA1240	87.78	Bottom of structure	91.07	Approximate edge of pavement	90.07	-	90.61	-	91.02	-	**91.13**	0.06
NA1250	87.42	Bottom of structure	90.70	Approximate edge of pavement	89.97	-	90.04	-	90.08	-	90.13	-
NA1260	86.18	Bottom of structure	90.64	Approximate edge of pavement	89.87	-	89.97	-	90.01	-	90.08	-
NA1270	85.80	Bottom of structure	89.67	Approximate edge of pavement	**89.94**	0.27	**90.06**	0.39	**90.14**	0.47	**90.22**	0.55
NA1280	85.60	Bottom of structure	90.74	Approximate edge of pavement	89.93	-	90.04	-	90.1	-	90.17	-
NA1290	88.32	Bottom of structure	90.86	Approximate edge of pavement	**91.06**	0.20	**91.19**	0.33	**91.24**	0.38	**91.3**	0.44
NA1300	86.73	Bottom of structure	90.10	Approximate edge of pavement	**90.44**	0.34	**90.81**	0.71	**90.91**	0.81	**90.99**	0.89
NA1310	83.30	Bottom of structure	87.94	Approximate edge of pavement	86.04	-	87.53	-	**88.56**	0.62	**88.72**	0.78
NA1320	88.52	Bottom of structure	92.53	Approximate edge of pavement	89.44	-	90.98	-	91.3	-	91.72	-
NA1330	84.72	Bottom of structure	90.29	Approximate edge of pavement	89.39	-	**90.94**	0.65	**91.25**	0.96	**91.66**	1.37
NA1340	85.32	Bottom of structure	89.55	Approximate edge of pavement	89.25	-	**90.9**	1.35	**91.22**	1.67	**91.62**	2.07
NA1350	84.62	Bottom of structure	90.45	Approximate edge of pavement	88.49	-	**90.57**	0.12	**91.16**	0.71	**91.56**	1.11
NA1360	82.50	Bottom of structure	89.84	Approximate edge of pavement	87.28	-	88.96	-	**90.1**	0.26	**90.73**	0.89
NA1370	82.50	Bottom of structure	88.96	Approximate edge of pavement	86.09	-	87.42	-	88.26	-	**90.03**	1.07
NA1380	82.50	Bottom of structure	89.60	Approximate edge of pavement	85.22	-	86.31	-	86.77	-	87.73	-

Geosyntec consultants

APPENDIX G - FIC #6 – Lake Killarney: Improved Conveyance to Lake Gem Model Results

NODE NAME	INITIAL STAGE		WARNING STAGE		2 YEAR / 24 HOUR		10 YEAR / 24 HOUR		25 YEAR / 24 HOUR		100 YEAR / 24 HOUR	
	ELEVATION	DESCRIPTION	ELEVATION	DESCRIPTION	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)
NA1390	82.04	Bottom of structure	89.38	Approximate edge of pavement	84.78	-	85.72	-	86.04	-	86.57	-
NA1400	86.52	Bottom of structure	92.24	Approximate edge of pavement	89.54	-	91.28	-	91.74	-	**92.35**	0.11
NA1410	84.72	Bottom of structure	90.35	Approximate edge of pavement	89.39	-	**90.94**	0.59	**91.26**	0.91	**91.68**	1.33
NA1420	81.52	Bottom of structure	89.36	Approximate edge of pavement	87.47	-	**90.34**	0.98	**91.19**	1.83	**91.62**	2.26
NA1430	81.13	Bottom of structure	90.79	Approximate edge of pavement	86.51	-	88.79	-	89.6	-	**91.35**	0.56
NA1440	81.13	Bottom of structure	90.11	Approximate edge of pavement	85.99	-	88.04	-	88.82	-	**90.59**	0.48
NA1450	81.13	Bottom of structure	88.88	Approximate edge of pavement	85.65	-	87.55	-	88.35	-	**89.96**	1.08
NA1460	81.13	Bottom of structure	89.61	Approximate edge of pavement	85.27	-	86.86	-	87.58	-	89.13	-
NA1470	81.13	Bottom of structure	90.19	Approximate edge of pavement	84.87	-	86.11	-	86.71	-	88.03	-
NA1480	81.13	Bottom of structure	89.23	Approximate edge of pavement	84.83	-	85.97	-	86.47	-	87.38	-
NA1490	82.72	Bottom of structure	87.50	Approximate edge of pavement	85.98	-	**87.94**	0.44	**88.2**	0.70	**88.53**	1.03
NA1500	83.44	Bottom of structure	87.27	Approximate edge of pavement	84.19	-	86.29	-	**87.41**	0.14	**88.12**	0.85
NA1510	81.14	Lake Mendsen NHWE	85.25	Approximate edge of pavement	84.13	-	**86.25**	1.00	**87.34**	2.09	**88.08**	2.83
NA1520	82.42	Bottom of structure	86.11	Approximate edge of pavement	84.15	-	**86.46**	0.35	**87.32**	1.21	**88.05**	1.94
NA1530	81.14	Lake Mendsen NHWE	86.90	Approximate edge of pavement	84.09	-	86.2	-	**87.03**	0.13	**87.73**	0.83
NA1540	81.14	Lake Mendsen NHWE	85.15	Approximate edge of pavement	84.17	-	**86.26**	1.11	**87.36**	2.21	**88.1**	2.95
NA1550	90.36	Bottom of structure	94.47	Approximate edge of pavement	92	-	93.68	-	**94.5**	0.03	**94.87**	0.40
NA1560	89.67	Bottom of structure	94.46	Approximate edge of pavement	90.89	-	91.33	-	91.52	-	91.64	-
NA1570	87.27	Bottom of structure	91.49	Approximate edge of pavement	88.41	-	88.82	-	89.61	-	**91.61**	0.12
NA1580	84.57	Bottom of structure	89.81	Approximate edge of pavement	86.39	-	87	-	87.84	-	89.36	-
NA1590	82.97	Bottom of structure	91.69	Approximate edge of pavement	88.51	-	88.79	-	89.02	-	89.46	-
NA1600	82.97	Bottom of structure	87.71	Approximate edge of pavement	84.19	-	86.27	-	87.06	-	**87.76**	0.05
NA1610	81.80	Bottom of structure	85.34	Approximate edge of pavement	84.17	-	**86.24**	0.90	**87.02**	1.68	**87.72**	2.38
NA1620	90.03	Bottom of structure	92.24	Approximate edge of pavement	90.03	-	90.03	-	90.03	-	91.6	-
NA1630	81.92	Bottom of structure	84.78	Approximate edge of pavement	**85.05**	0.27	**85.98**	1.20	**86.87**	2.09	**87.55**	2.77
NA1640	81.54	Bottom of structure	87.01	Approximate edge of pavement	84.53	-	85.96	-	86.6	-	**87.52**	0.51
NA1650	80.90	Bottom of structure	85.58	Approximate edge of pavement	83.75	-	**85.94**	0.36	**86.32**	0.74	**87.49**	1.91
NA1660	82.04	Lake Killarney tailwater	85.25	Approximate edge of pavement	82.58	-	83.54	-	83.83	-	84.23	-
NA1670	84.22	Bottom of structure	92.63	Approximate edge of pavement	88.96	-	91.52	-	92.15	-	**92.8**	0.17
NA1680	83.52	Bottom of structure	90.33	Approximate edge of pavement	88.38	-	90.28	-	**90.47**	0.14	**90.57**	0.24
NA1690	82.52	Bottom of structure	89.14	Approximate edge of pavement	87.93	-	**89.33**	0.19	**89.43**	0.29	**89.54**	0.40
NA1700	82.04	Bottom of structure	88.40	Approximate edge of pavement	87.51	-	**89.15**	0.75	**89.26**	0.86	**89.39**	0.99
NA1710	82.04	Bottom of structure	89.18	Approximate edge of pavement	86.68	-	88.06	-	88.28	-	88.64	-
NA1720	82.04	Bottom of structure	89.94	Approximate edge of pavement	85.45	-	86.42	-	86.73	-	87.22	-
NA1730	82.04	Bottom of structure	89.12	Approximate edge of pavement	84.86	-	85.83	-	86.14	-	86.67	-
NA1740	81.14	Bottom of structure	90.16	Approximate edge of pavement	83.9	-	85.55	-	86.62	-	87.76	-
NA1750	81.14	Lake Mendsen NHWE	85.66	Approximate edge of pavement	83.91	-	**85.99**	0.33	**86.91**	1.25	**87.67**	2.01
NA1760	81.13	Lake Mendsen NHWE	85.45	Approximate edge of pavement	84.1	-	**86.13**	0.68	**86.96**	1.51	**87.71**	2.26
NA1790	82.93	Bottom of structure	88.04	Approximate edge of pavement	85.81	-	87.59	-	**88.41**	0.37	**88.66**	0.62
NA1800	76.40	Bottom of structure	88.11	Approximate edge of pavement	78.24	-	78.39	-	78.48	-	78.68	-
NA1810	77.43	Bottom of structure	86.98	Approximate edge of pavement	79.6	-	79.79	-	79.94	-	80.24	-
NA1820	70.50	Bottom of dry pond	78.99	Bank overtopping	78.19	-	78.32	-	78.41	-	78.54	-
NA1830	67.20	9th Grade Pond Control Elevation	77.76	Bank overtopping	71.35	-	72.05	-	72.25	-	72.6	-
NA1840	67.20	Bottom of structure	77.60	Approximate edge of pavement	71.97	-	73.16	-	73.53	-	74.16	-
NA1850	67.20	Lake Virginia tailwater	70.48	Approximate edge of pavement	69.13	-	**70.63**	0.15	**70.92**	0.44	**71.28**	0.80
NA1860	77.47	Bottom of structure	86.40	Approximate edge of pavement	82.44	-	84.09	-	84.52	-	84.79	-
NA1870	87.63	Bottom of structure	92.36	Approximate edge of pavement	89.54	-	91.81	-	92.33	-	**92.59**	0.23

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APPENDIX G - FIC #6 – Lake Killarney: Improved Conveyance to Lake Gem Model Results

NODE NAME	INITIAL STAGE		WARNING STAGE		2 YEAR / 24 HOUR		10 YEAR / 24 HOUR		25 YEAR / 24 HOUR		100 YEAR / 24 HOUR	
	ELEVATION	DESCRIPTION	ELEVATION	DESCRIPTION	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)
NA1880	85.16	Bottom of structure	92.62	Approximate edge of pavement	86.67	-	89.85	-	90.88	-	92.04	-
NA1890	92.07	Bottom of structure	94.36	Approximate edge of pavement	92.38	-	92.47	-	92.53	-	92.75	-
NA1900	86.29	Lake Francis Control Elevation	89.99	Bank overtopping	**91.82**	1.83	**92.21**	2.22	**92.38**	2.39	**92.6**	2.61
NA1910	87.03	Lee Road pond control elevation	90.58	Bank overtopping	**91.8**	1.22	**92.2**	1.62	**92.37**	1.79	**92.61**	2.03
NA1970	86.00	Bottom of dry pond	94.89	Bank overtopping	92.32	-	92.79	-	93.24	-	94.58	-
NA1980	89.70	Bottom of structure	95.10	Approximate edge of pavement	92.37	-	92.86	-	93.31	-	94.64	-
NA1990	86.66	Bottom of structure	90.12	Approximate edge of pavement	87.9	-	88.29	-	88.62	-	**90.29**	0.17
NA2000	87.47	Bottom of structure	92.54	Approximate edge of pavement	90.11	-	90.88	-	91.52	-	**93.02**	0.48
NA2010	77.85	Bottom of structure	82.90	Approximate edge of pavement	82.83	-	**83.36**	0.46	**83.44**	0.54	**83.55**	0.65
NA2020	79.52	Bottom of structure	88.37	Approximate edge of pavement	82.5	-	84.15	-	84.59	-	84.93	-
NA2030	87.08	Bottom of structure	92.37	Approximate edge of pavement	90.15	-	90.84	-	91.42	-	91.5	-
NA2100	80.70	Bottom of structure	85.92	Approximate edge of pavement	83.97	-	**86.08**	0.16	**86.89**	0.97	**87.62**	1.70
NA2110	82.19	Bottom of structure	81.74	Approximate edge of pavement	**83.85**	2.11	**85.96**	4.22	**86.77**	5.03	**87.5**	5.76
NA2120	90.41	Bottom of structure	90.89	Approximate edge of pavement	**91.86**	0.97	**92.27**	1.38	**92.44**	1.55	**92.66**	1.77
NB0005	88.75	Approximate water surface elevation	91.82	Finished Floor Elevation	88.92	-	89.42	-	90.14	-	91.42	-
NB0010	81.87	Botom of structure	89.15	Approximate edge of pavement	85	-	86.38	-	87.15	-	88.65	-
NB0020	82.31	Botom of structure	90.36	Approximate edge of pavement	86.59	-	88.48	-	88.89	-	**91.01**	0.65
NB0030	86.97	Approximate water surface elevation	92.39	Finished floor elevation	88.7	-	89.31	-	90.07	-	91.37	-
NB0040	82.50	Pond control structure	89.07	Bank overtopping	85.19	-	85.23	-	85.26	-	85.32	-
NB0050	83.14	Pond control structure	85.33	Bank overtopping	84.62	-	85.02	-	85.21	-	**85.42**	0.09
NB0060	82.04	Bottom of structure	90.41	Approximate edge of pavement	81.83	-	82.69	-	83.67	-	85.77	-
NB0070	86.01	Pond control structure	88.50	Bank overtopping	88.45	-	**88.52**	0.02	**88.57**	0.07	**88.61**	0.11
NB0080	82.04	Bottom of structure	91.31	Approximate edge of pavement	83.05	-	83.51	-	84.21	-	86.61	-

APPENDIX H

FIC #7 – Combination of FICs #4 and 6 Model Results

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APPENDIX H - FIC #7 – Combination of FICs #4 and 6 Model Results

NODE NAME	INITIAL STAGE		WARNING STAGE		2 YEAR / 24 HOUR		10 YEAR / 24 HOUR		25 YEAR / 24 HOUR		100 YEAR / 24 HOUR	
	ELEVATION	DESCRIPTION	ELEVATION	DESCRIPTION	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)
LAKE_KILLARNEY	82.04	Control Elevation	84.40	Finished floor elevation	80.71	-	81.5	-	81.9	-	82.73	-
LAKE_MENDSEN	81.14	Normal high water elevation	84.82	Approximate edge of pavement	84.05	-	**86.16**	1.34	**86.97**	2.15	**87.7**	2.88
LAKE_ROSE	83.30	Approximate water surface elevation	91.01	Bank overtopping	83.89	-	84.16	-	84.37	-	84.76	-
NA0010	72.14	Bottom of structure	78.79	Approximate edge of pavement	77.96	-	**79.49**	0.70	**79.77**	0.98	**80.07**	1.28
NA0020	72.87	Bottom of structure	83.54	Approximate edge of pavement	79.41	-	82.1	-	82.5	-	82.82	-
NA0030	76.82	Bottom of structure	86.32	Approximate edge of pavement	79.79	-	83.07	-	84.42	-	**86.38**	0.06
NA0040	82.00	Bottom of structure	89.63	Approximate edge of pavement	83.88	-	84.48	-	86.22	-	**89.8**	0.17
NA0050	85.66	Bottom of structure	91.51	Approximate edge of pavement	87.82	-	88.23	-	88.67	-	91.19	-
NA0060	88.12	Bottom of structure	92.97	Approximate edge of pavement	88.6	-	88.82	-	89.26	-	92.9	-
NA0070	85.52	Bottom of structure	90.82	Approximate edge of pavement	85.93	-	86.02	-	86.29	-	89.85	-
NA0080	76.22	Bottom of structure	82.01	Approximate edge of pavement	79.68	-	**82.39**	0.38	**82.57**	0.56	**82.74**	0.73
NA0090	78.51	Bottom of structure	85.83	Approximate edge of pavement	84.4	-	85.22	-	85.33	-	85.44	-
NA0100	80.27	Bottom of structure	83.79	Approximate edge of pavement	**84.84**	1.05	**85.3**	1.51	**85.39**	1.60	**85.48**	1.69
NA0110	81.13	Bottom of structure	84.29	Approximate edge of pavement	**85.17**	0.88	**85.36**	1.07	**85.44**	1.15	**85.52**	1.23
NA0120	82.90	Bottom of structure	91.22	Approximate edge of pavement	84.16	-	84.39	-	85.54	-	86.98	-
NA0130	77.12	Bottom of structure	88.40	Approximate edge of pavement	80.94	-	83.94	-	85.61	-	87.16	-
NA0140	81.42	Bottom of structure	85.91	Approximate edge of pavement	82.89	-	**86.3**	0.39	**86.72**	0.81	**87.34**	1.43
NA0150	76.23	Bottom of structure	86.30	Approximate edge of pavement	79.77	-	81.53	-	82.41	-	83.23	-
NA0160	80.32	Bottom of structure	88.35	Approximate edge of pavement	84.78	-	85.2	-	85.5	-	85.93	-
NA0170	79.47	Bottom of structure	90.12	Approximate edge of pavement	83.99	-	84.43	-	84.63	-	84.95	-
NA0180	71.31	Bottom of structure	87.26	Approximate edge of pavement	74.6	-	75.03	-	75.23	-	75.56	-
NA0190	80.82	Bottom of structure	89.89	Approximate edge of pavement	85.22	-	85.64	-	85.98	-	86.48	-
NA0200	81.52	Bottom of structure	85.45	Approximate edge of pavement	**85.93**	0.48	**86.34**	0.89	**86.75**	1.30	**87.36**	1.91
NA0210	80.80	Bottom of structure	88.76	Approximate edge of pavement	83.19	-	84.03	-	85.04	-	86.61	-
NA0220	86.72	Bottom of structure	90.75	Approximate edge of pavement	89	-	90.52	-	**90.86**	0.11	**91.12**	0.37
NA0230	91.44	Bottom of structure	96.15	Approximate edge of pavement	92.44	-	92.99	-	93.29	-	93.82	-
NA0240	88.61	Bottom of structure	93.98	Approximate edge of pavement	92.4	-	92.95	-	93.24	-	93.77	-
NA0250	87.54	Bottom of structure	92.19	Approximate edge of pavement	**92.31**	0.12	**92.7**	0.51	**92.81**	0.62	**92.92**	0.73
NA0260	86.29	Bottom of structure	91.93	Approximate edge of pavement	89.35	-	90.32	-	91.78	-	**92.07**	0.14
NA0270	85.32	Bottom of structure	90.61	Approximate edge of pavement	87.95	-	88.92	-	89.96	-	**91.79**	1.18
NA0280	82.32	Bottom of structure	91.56	Approximate edge of pavement	85.28	-	86.42	-	88	-	90.95	-
NA0290	75.96	Bottom of structure	89.24	Approximate edge of pavement	85.82	-	86.81	-	87.05	-	87.28	-
NA0300	81.61	Bottom of structure	88.92	Approximate edge of pavement	85.82	-	86.54	-	86.76	-	87.21	-
NA0310	83.67	Bottom of structure	86.50	Approximate edge of pavement	86.06	-	**86.5**	0.00	**86.76**	0.26	**87.35**	0.85
NA0320	83.58	Bottom of structure	88.77	Approximate edge of pavement	85.64	-	86.38	-	86.59	-	87.08	-
NA0330	83.24	Bottom of structure	86.37	Approximate edge of pavement	**86.37**	0.00	**86.64**	0.27	**86.84**	0.47	**87.41**	1.04
NA0340	81.46	Bottom of structure	85.60	Approximate edge of pavement	**85.96**	0.36	**86.37**	0.77	**86.77**	1.17	**87.38**	1.78
NA0350	78.17	Bottom of structure	87.25	Approximate edge of pavement	85.93	-	86.93	-	87.18	-	**87.4**	0.15
NA0360	88.33	Bottom of structure	94.12	Approximate edge of pavement	89.3	-	91.29	-	91.38	-	91.59	-
NA0370	86.22	Bottom of structure	91.16	Approximate edge of pavement	89.22	-	**91.21**	0.05	**91.26**	0.10	**91.32**	0.16
NA0380	84.62	Bottom of structure	88.11	Approximate edge of pavement	86.01	-	87.19	-	87.58	-	88.02	-
NA0390	77.48	Bottom of structure	87.47	Approximate edge of pavement	85.87	-	86.86	-	87.1	-	87.32	-
NA0400	87.42	Bottom of structure	91.46	Approximate edge of pavement	88.36	-	89	-	89.59	-	90.82	-
NA0410	85.24	Bottom of structure	87.80	Approximate edge of pavement	**88.28**	0.48	**88.78**	0.98	**89.04**	1.24	**89.19**	1.39
NA0420	82.03	Bottom of structure	89.00	Approximate edge of pavement	85.99	-	87.34	-	87.93	-	88.69	-
NA0430	82.26	Bottom of structure	88.32	Approximate edge of pavement	86.01	-	87.29	-	87.86	-	**88.62**	0.30
NA0440	81.27	Bottom of structure	89.46	Approximate edge of pavement	85.89	-	87.31	-	87.98	-	88.75	-

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APPENDIX H - FIC #7 – Combination of FICs #4 and 6 Model Results

NODE NAME	INITIAL STAGE		WARNING STAGE		2 YEAR / 24 HOUR		10 YEAR / 24 HOUR		25 YEAR / 24 HOUR		100 YEAR / 24 HOUR	
	ELEVATION	DESCRIPTION	ELEVATION	DESCRIPTION	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)
NA0450	80.02	Bottom of structure	88.29	Approximate edge of pavement	84.37	-	85.92	-	86.94	-	87.91	-
NA0460	82.60	Bottom of structure	88.09	Approximate edge of pavement	86.06	-	86.64	-	86.81	-	87.14	-
NA0470	79.57	Bottom of structure	85.32	Approximate edge of pavement	**86.01**	0.69	**86.57**	1.25	**86.7**	1.38	**86.81**	1.49
NA0480	80.26	Bottom of structure	86.75	Approximate edge of pavement	85.91	-	86.67	-	**86.8**	0.05	**86.88**	0.13
NA0490	81.66	Bottom of structure	86.12	Approximate edge of pavement	85.05	-	**86.5**	0.38	**86.65**	0.53	**86.75**	0.63
NA0500	78.02	Bottom of structure	84.24	Approximate edge of pavement	82.93	-	**84.61**	0.37	**84.94**	0.70	**85.14**	0.90
NA0510	79.52	Bottom of structure	84.82	Approximate edge of pavement	83.55	-	**85.32**	0.50	**85.51**	0.69	**85.72**	0.90
NA0520	81.44	Bottom of structure	85.49	Approximate edge of pavement	84.03	-	**85.97**	0.48	**86.14**	0.65	**86.27**	0.78
NA0530	83.62	Bottom of structure	88.82	Approximate edge of pavement	86.07	-	86.99	-	87.67	-	**88.92**	0.10
NA0540	85.97	Bottom of structure	90.45	Approximate edge of pavement	87.62	-	88.5	-	89.9	-	**90.84**	0.39
NA0550	87.66	Bottom of structure	91.28	Approximate edge of pavement	89.07	-	90.15	-	**91.5**	0.22	**91.68**	0.40
NA0560	87.18	Bottom of structure	91.56	Approximate edge of pavement	88.69	-	89.32	-	90.46	-	**92.02**	0.46
NA0570	85.65	Bottom of structure	91.06	Approximate edge of pavement	87.92	-	88.45	-	89.02	-	**91.35**	0.29
NA0580	92.68	Bottom of structure	96.76	Approximate edge of pavement	93	-	93.1	-	93.18	-	93.34	-
NA0590	89.02	Bottom of structure	93.58	Approximate edge of pavement	90.15	-	90.76	-	91.02	-	92.76	-
NA0600	85.05	Bottom of structure	90.93	Approximate edge of pavement	87.01	-	87.89	-	89.69	-	**91.37**	0.44
NA0610	83.91	Bottom of structure	89.93	Approximate edge of pavement	85.99	-	87.5	-	89.02	-	**90.7**	0.77
NA0620	83.12	Bottom of structure	90.59	Approximate edge of pavement	85.32	-	87.3	-	88.65	-	90.15	-
NA0630	85.42	Bottom of structure	90.77	Approximate edge of pavement	86.51	-	87.37	-	88.75	-	90.39	-
NA0640	91.02	Bottom of structure	95.50	Approximate edge of pavement	91.37	-	91.47	-	91.63	-	94.82	-
NA0650	90.02	Bottom of structure	94.83	Approximate edge of pavement	90.92	-	91.23	-	91.5	-	94.73	-
NA0660	90.23	Bottom of structure	94.85	Approximate edge of pavement	91.46	-	92.21	-	93.03	-	94.47	-
NA0670	92.30	Bottom of structure	97.97	Approximate edge of pavement	93.54	-	96.36	-	**98.52**	0.55	**98.61**	0.64
NA0680	90.33	Bottom of structure	96.79	Approximate edge of pavement	91.66	-	93.81	-	96.54	-	**97.22**	0.43
NA0690	88.62	Bottom of structure	94.25	Approximate edge of pavement	90.38	-	92.57	-	**94.5**	0.25	**94.6**	0.35
NA0700	86.32	Bottom of structure	91.79	Approximate edge of pavement	87.87	-	89.09	-	90.75	-	**91.96**	0.17
NA0710	84.94	Bottom of structure	90.28	Approximate edge of pavement	87.23	-	88.71	-	90.15	-	**90.59**	0.31
NA0720	83.55	Bottom of structure	89.40	Approximate edge of pavement	85.2	-	87.04	-	88.06	-	88.86	-
NA0730	82.98	Bottom of structure	88.88	Approximate edge of pavement	85.02	-	86.86	-	87.82	-	88.47	-
NA0740	81.14	Lake Mendsen NHWE	88.51	Approximate edge of pavement	84.25	-	86.78	-	87.67	-	88.29	-
NA0750	81.14	Lake Mendsen NHWE	89.42	Approximate edge of pavement	84.26	-	87.06	-	88.2	-	89.41	-
NA0760	81.14	Lake Mendsen NHWE	87.92	Approximate edge of pavement	84.23	-	86.68	-	87.51	-	**88.13**	0.21
NA0770	81.14	Lake Mendsen NHWE	87.19	Approximate edge of pavement	84.2	-	86.42	-	87.05	-	**87.75**	0.56
NA0780	81.14	Lake Mendsen NHWE	84.82	Approximate edge of pavement	84.17	-	**86.25**	1.43	**86.96**	2.14	**87.65**	2.83
NA0790	85.72	Bottom of structure	89.36	Approximate edge of pavement	87.3	-	88.81	-	**90.22**	0.86	**90.49**	1.13
NA0800	82.98	Bottom of structure	87.39	Approximate edge of pavement	85.06	-	86.91	-	**87.9**	0.51	**88.5**	1.11
NA0810	81.14	Bottom of structure	87.43	Approximate edge of pavement	84.27	-	86.84	-	**87.62**	0.19	**88**	0.57
NA0820	84.16	Bottom of structure	92.65	Approximate edge of pavement	86.61	-	89.77	-	90.81	-	91.98	-
NA0830	84.16	Bottom of structure	91.73	Approximate edge of pavement	86.53	-	89.6	-	90.63	-	91.53	-
NA0840	82.97	Bottom of structure	89.94	Approximate edge of pavement	85.35	-	88.12	-	89.13	-	**90.09**	0.15
NA0850	81.14	Lake Mendsen NHWE	86.88	Approximate edge of pavement	84.26	-	**87.24**	0.36	**88.15**	1.27	**88.55**	1.67
NA0860	81.14	Lake Mendsen NHWE	87.59	Approximate edge of pavement	84.22	-	86.86	-	**87.9**	0.31	**88.44**	0.85
NA0870	81.14	Lake Mendsen NHWE	86.66	Approximate edge of pavement	84.19	-	86.42	-	**87.53**	0.87	**87.95**	1.29
NA0880	81.14	Lake Mendsen NHWE	87.14	Approximate edge of pavement	84.16	-	86.29	-	**87.17**	0.03	**87.77**	0.63
NA0890	81.14	Lake Mendsen NHWE	86.19	Approximate edge of pavement	84.12	-	**86.25**	0.06	**87.06**	0.87	**87.73**	1.54
NA0900	81.14	Lake Mendsen NHWE	85.06	Approximate edge of pavement	84.09	-	**86.2**	1.14	**87.02**	1.96	**87.71**	2.65
NA0910	85.88	Bottom of structure	91.89	Approximate edge of pavement	87.49	-	87.89	-	88.17	-	88.82	-

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APPENDIX H - FIC #7 – Combination of FICs #4 and 6 Model Results

NODE NAME	INITIAL STAGE		WARNING STAGE		2 YEAR / 24 HOUR		10 YEAR / 24 HOUR		25 YEAR / 24 HOUR		100 YEAR / 24 HOUR	
	ELEVATION	DESCRIPTION	ELEVATION	DESCRIPTION	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)
NA0920	81.29	Bottom of structure	87.69	Approximate edge of pavement	84.18	-	86.26	-	87.1	-	**87.87**	0.18
NA0930	81.14	Lake Mendsen NHWE	86.09	Approximate edge of pavement	84.15	-	**86.22**	0.13	**87.02**	0.93	**87.71**	1.62
NA0940	81.14	Lake Mendsen NHWE	84.77	Approximate edge of pavement	84.13	-	**86.19**	1.42	**86.99**	2.22	**87.68**	2.91
NA0950	81.14	Lake Mendsen NHWE	84.84	Approximate edge of pavement	84.09	-	**86.17**	1.33	**86.98**	2.14	**87.69**	2.85
NA0960	81.14	Lake Mendsen NHWE	85.58	Approximate edge of pavement	84.19	-	**86.26**	0.68	**86.92**	1.34	**87.6**	2.02
NA0970	81.14	Lake Mendsen NHWE	85.66	Approximate edge of pavement	84.13	-	**86.22**	0.56	**86.98**	1.32	**87.67**	2.01
NA0980	81.14	Lake Mendsen NHWE	84.95	Approximate edge of pavement	84.09	-	**86.19**	1.24	**86.98**	2.03	**87.68**	2.73
NA0990	87.41	Bottom of structure	90.80	Approximate edge of pavement	88.27	-	88.54	-	88.76	-	89.54	-
NA1000	82.94	Bottom of structure	87.49	Approximate edge of pavement	84.5	-	86.17	-	87.3	-	**88.21**	0.72
NA1010	78.97	Bottom of structure	85.37	Approximate edge of pavement	81.88	-	**85.62**	0.25	**86.28**	0.91	**87.43**	2.06
NA1020	80.47	Bottom of structure	85.47	Approximate edge of pavement	83.12	-	**85.89**	0.42	**86.31**	0.84	**87.45**	1.98
NA1030	77.85	Bottom of structure	85.55	Approximate edge of pavement	81.34	-	84.94	-	**85.61**	0.06	**87.41**	1.86
NA1040	77.76	Bottom of structure	85.24	Approximate edge of pavement	81.19	-	84.75	-	**85.43**	0.19	**87.41**	2.17
NA1050	77.44	Bottom of structure	84.28	Approximate edge of pavement	80.85	-	84.28	-	**84.93**	0.65	**87.4**	3.12
NA1060	76.61	Bottom of structure	83.43	Approximate edge of pavement	80.7	-	**84**	0.57	**84.78**	1.35	**87.39**	3.96
NA1070	75.87	Bottom of structure	89.34	Approximate edge of pavement	80.4	-	83.4	-	84.1	-	85.67	-
NA1080	74.25	Bottom of structure	85.11	Approximate edge of pavement	78.97	-	81.02	-	81.47	-	82.24	-
NA1090	73.79	Bottom of structure	76.62	Approximate edge of pavement	**77.73**	1.11	**78.57**	1.95	**78.77**	2.15	**79.1**	2.48
NA1100	77.15	Bottom of structure	83.03	Approximate edge of pavement	78.07	-	79.42	-	83	-	**83.28**	0.25
NA1110	74.23	Bottom of structure	80.07	Approximate edge of pavement	77.24	-	77.6	-	78.76	-	79.23	-
NA1120	73.79	Bottom of structure	76.34	Approximate edge of pavement	**77.17**	0.83	**77.28**	0.94	**77.47**	1.13	**77.81**	1.47
NA1130	78.93	Bottom of structure	83.69	Approximate edge of pavement	81.87	-	**84.34**	0.65	**84.73**	1.04	**85.15**	1.46
NA1140	79.43	Bottom of structure	86.76	Approximate edge of pavement	84.17	-	**87.26**	0.50	**87.53**	0.77	**87.85**	1.09
NA1150	80.96	Bottom of structure	83.93	Approximate edge of pavement	**87.31**	3.38	**88.47**	4.54	**88.67**	4.74	**88.91**	4.98
NA1160	87.02	Bottom of structure	91.63	Approximate edge of pavement	90.04	-	91.59	-	**91.98**	0.35	**92.17**	0.54
NA1170	83.62	Bottom of structure	89.26	Approximate edge of pavement	**89.99**	0.73	**90.34**	1.08	**90.52**	1.26	**90.71**	1.45
NA1180	83.62	Lake Midget control elevation	90.40	Bank overtopping	89.96	-	90.31	-	**90.48**	0.08	**90.67**	0.27
NA1190	83.89	Bottom of structure	88.91	Approximate edge of pavement	**89.94**	1.03	**90.04**	1.13	**90.09**	1.18	**90.16**	1.25
NA1200	83.89	Bottom of structure	91.04	Approximate edge of pavement	89.89	-	89.99	-	90.04	-	90.11	-
NA1210	83.62	Bottom of structure	90.46	Approximate edge of pavement	89.92	-	90.11	-	90.26	-	90.46	-
NA1220	83.62	Bottom of structure	91.71	Approximate edge of pavement	89.96	-	90.23	-	90.43	-	90.68	-
NA1230	83.62	Bottom of structure	90.28	Approximate edge of pavement	89.97	-	**90.3**	0.02	**90.49**	0.21	**90.69**	0.41
NA1240	87.78	Bottom of structure	91.07	Approximate edge of pavement	90.07	-	90.61	-	91.02	-	**91.13**	0.06
NA1250	87.42	Bottom of structure	90.70	Approximate edge of pavement	89.97	-	90.04	-	90.08	-	90.13	-
NA1260	86.18	Bottom of structure	90.64	Approximate edge of pavement	89.87	-	89.97	-	90.01	-	90.08	-
NA1270	85.80	Bottom of structure	89.67	Approximate edge of pavement	**89.94**	0.27	**90.06**	0.39	**90.14**	0.47	**90.22**	0.55
NA1280	85.60	Bottom of structure	90.74	Approximate edge of pavement	89.93	-	90.04	-	90.1	-	90.17	-
NA1290	88.32	Bottom of structure	90.86	Approximate edge of pavement	**91.06**	0.20	**91.19**	0.33	**91.24**	0.38	**91.3**	0.44
NA1300	86.73	Bottom of structure	90.10	Approximate edge of pavement	**90.44**	0.34	**90.81**	0.71	**90.91**	0.81	**90.99**	0.89
NA1310	83.30	Bottom of structure	87.94	Approximate edge of pavement	86.04	-	87.53	-	**88.56**	0.62	**88.72**	0.78
NA1320	88.52	Bottom of structure	92.53	Approximate edge of pavement	89.44	-	90.98	-	91.3	-	91.72	-
NA1330	84.72	Bottom of structure	90.29	Approximate edge of pavement	89.39	-	**90.94**	0.65	**91.25**	0.96	**91.66**	1.37
NA1340	85.32	Bottom of structure	89.55	Approximate edge of pavement	89.25	-	**90.9**	1.35	**91.22**	1.67	**91.62**	2.07
NA1350	84.62	Bottom of structure	90.45	Approximate edge of pavement	88.49	-	**90.57**	0.12	**91.16**	0.71	**91.56**	1.11
NA1360	82.50	Bottom of structure	89.84	Approximate edge of pavement	87.28	-	88.96	-	**90.1**	0.26	**90.73**	0.89
NA1370	82.50	Bottom of structure	88.96	Approximate edge of pavement	86.09	-	87.42	-	88.26	-	**90.03**	1.07
NA1380	82.50	Bottom of structure	89.60	Approximate edge of pavement	85.22	-	86.31	-	86.77	-	87.73	-

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APPENDIX H - FIC #7 – Combination of FICs #4 and 6 Model Results

NODE NAME	INITIAL STAGE		WARNING STAGE		2 YEAR / 24 HOUR		10 YEAR / 24 HOUR		25 YEAR / 24 HOUR		100 YEAR / 24 HOUR	
	ELEVATION	DESCRIPTION	ELEVATION	DESCRIPTION	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)
NA1390	82.04	Bottom of structure	89.38	Approximate edge of pavement	84.78	-	85.72	-	86.04	-	86.57	-
NA1400	86.52	Bottom of structure	92.24	Approximate edge of pavement	89.54	-	91.28	-	91.74	-	**92.35**	0.11
NA1410	84.72	Bottom of structure	90.35	Approximate edge of pavement	89.39	-	**90.94**	0.59	**91.26**	0.91	**91.68**	1.33
NA1420	81.52	Bottom of structure	89.36	Approximate edge of pavement	87.47	-	**90.34**	0.98	**91.19**	1.83	**91.62**	2.26
NA1430	81.13	Bottom of structure	90.79	Approximate edge of pavement	86.51	-	88.79	-	89.6	-	**91.35**	0.56
NA1440	81.13	Bottom of structure	90.11	Approximate edge of pavement	85.99	-	88.04	-	88.82	-	**90.59**	0.48
NA1450	81.13	Bottom of structure	88.88	Approximate edge of pavement	85.65	-	87.55	-	88.35	-	**89.96**	1.08
NA1460	81.13	Bottom of structure	89.61	Approximate edge of pavement	85.27	-	86.86	-	87.58	-	89.13	-
NA1470	81.13	Bottom of structure	90.19	Approximate edge of pavement	84.87	-	86.11	-	86.71	-	88.03	-
NA1480	81.13	Bottom of structure	89.23	Approximate edge of pavement	84.83	-	85.97	-	86.47	-	87.38	-
NA1490	82.72	Bottom of structure	87.50	Approximate edge of pavement	85.98	-	**87.94**	0.44	**88.2**	0.70	**88.53**	1.03
NA1500	83.44	Bottom of structure	87.27	Approximate edge of pavement	84.19	-	86.29	-	**87.41**	0.14	**88.12**	0.85
NA1510	81.14	Lake Mendsen NHWE	85.25	Approximate edge of pavement	84.13	-	**86.25**	1.00	**87.34**	2.09	**88.08**	2.83
NA1520	82.42	Bottom of structure	86.11	Approximate edge of pavement	84.15	-	**86.46**	0.35	**87.32**	1.21	**88.05**	1.94
NA1530	81.14	Lake Mendsen NHWE	86.90	Approximate edge of pavement	84.09	-	86.2	-	**87.03**	0.13	**87.73**	0.83
NA1540	81.14	Lake Mendsen NHWE	85.15	Approximate edge of pavement	84.17	-	**86.26**	1.11	**87.36**	2.21	**88.1**	2.95
NA1550	90.36	Bottom of structure	94.47	Approximate edge of pavement	92	-	93.68	-	**94.5**	0.03	**94.87**	0.40
NA1560	89.67	Bottom of structure	94.46	Approximate edge of pavement	90.89	-	91.33	-	91.52	-	91.64	-
NA1570	87.27	Bottom of structure	91.49	Approximate edge of pavement	88.41	-	88.82	-	89.61	-	**91.61**	0.12
NA1580	84.57	Bottom of structure	89.81	Approximate edge of pavement	86.39	-	87	-	87.84	-	89.36	-
NA1590	82.97	Bottom of structure	91.69	Approximate edge of pavement	88.51	-	88.79	-	89.02	-	89.46	-
NA1600	82.97	Bottom of structure	87.71	Approximate edge of pavement	84.19	-	86.27	-	87.06	-	**87.76**	0.05
NA1610	81.80	Bottom of structure	85.34	Approximate edge of pavement	84.17	-	**86.24**	0.90	**87.02**	1.68	**87.72**	2.38
NA1620	90.03	Bottom of structure	92.24	Approximate edge of pavement	90.03	-	90.03	-	90.03	-	91.6	-
NA1630	81.92	Bottom of structure	84.78	Approximate edge of pavement	**85.05**	0.27	**85.98**	1.20	**86.87**	2.09	**87.55**	2.77
NA1640	81.54	Bottom of structure	87.01	Approximate edge of pavement	84.53	-	85.96	-	86.6	-	**87.52**	0.51
NA1650	80.90	Bottom of structure	85.58	Approximate edge of pavement	83.75	-	**85.94**	0.36	**86.32**	0.74	**87.49**	1.91
NA1660	82.04	Lake Killarney tailwater	85.25	Approximate edge of pavement	82.58	-	83.54	-	83.83	-	84.23	-
NA1670	84.22	Bottom of structure	92.63	Approximate edge of pavement	88.96	-	91.52	-	92.15	-	**92.8**	0.17
NA1680	83.52	Bottom of structure	90.33	Approximate edge of pavement	88.38	-	90.28	-	**90.47**	0.14	**90.57**	0.24
NA1690	82.52	Bottom of structure	89.14	Approximate edge of pavement	87.93	-	**89.33**	0.19	**89.43**	0.29	**89.54**	0.40
NA1700	82.04	Bottom of structure	88.40	Approximate edge of pavement	87.51	-	**89.15**	0.75	**89.26**	0.86	**89.39**	0.99
NA1710	82.04	Bottom of structure	89.18	Approximate edge of pavement	86.68	-	88.06	-	88.28	-	88.64	-
NA1720	82.04	Bottom of structure	89.94	Approximate edge of pavement	85.45	-	86.42	-	86.73	-	87.22	-
NA1730	82.04	Bottom of structure	89.12	Approximate edge of pavement	84.86	-	85.83	-	86.14	-	86.67	-
NA1740	81.14	Bottom of structure	90.16	Approximate edge of pavement	83.9	-	85.55	-	86.62	-	87.76	-
NA1750	81.14	Lake Mendsen NHWE	85.66	Approximate edge of pavement	83.91	-	**85.99**	0.33	**86.91**	1.25	**87.67**	2.01
NA1760	81.13	Lake Mendsen NHWE	85.45	Approximate edge of pavement	84.1	-	**86.13**	0.68	**86.96**	1.51	**87.71**	2.26
NA1790	82.93	Bottom of structure	88.04	Approximate edge of pavement	85.81	-	87.59	-	**88.41**	0.37	**88.66**	0.62
NA1800	76.40	Bottom of structure	88.11	Approximate edge of pavement	78.24	-	78.39	-	78.48	-	78.68	-
NA1810	77.43	Bottom of structure	86.98	Approximate edge of pavement	79.6	-	79.79	-	79.94	-	80.24	-
NA1820	70.50	Bottom of dry pond	78.99	Bank overtopping	78.19	-	78.32	-	78.41	-	78.54	-
NA1830	67.20	9th Grade Pond Control Elevation	77.76	Bank overtopping	71.35	-	72.05	-	72.25	-	72.6	-
NA1840	67.20	Bottom of structure	77.60	Approximate edge of pavement	71.97	-	73.16	-	73.53	-	74.16	-
NA1850	67.20	Lake Virginia tailwater	70.48	Approximate edge of pavement	69.13	-	**70.63**	0.15	**70.92**	0.44	**71.28**	0.80
NA1860	77.47	Bottom of structure	86.40	Approximate edge of pavement	82.44	-	84.09	-	84.52	-	84.79	-
NA1870	87.63	Bottom of structure	92.36	Approximate edge of pavement	89.54	-	91.81	-	92.33	-	**92.59**	0.23

Geosyntec consultants

APPENDIX H - FIC #7 – Combination of FICs #4 and 6 Model Results

NODE NAME	INITIAL STAGE		WARNING STAGE		2 YEAR / 24 HOUR		10 YEAR / 24 HOUR		25 YEAR / 24 HOUR		100 YEAR / 24 HOUR	
	ELEVATION	DESCRIPTION	ELEVATION	DESCRIPTION	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)	PEAK STAGE (FT)	FLOOD DEPTH (FT)
NA1880	85.16	Bottom of structure	92.62	Approximate edge of pavement	86.67	-	89.85	-	90.88	-	92.04	-
NA1890	92.07	Bottom of structure	94.36	Approximate edge of pavement	92.38	-	92.47	-	92.53	-	92.75	-
NA1900	86.29	Lake Francis Control Elevation	89.99	Bank overtopping	**91.82**	1.83	**92.21**	2.22	**92.38**	2.39	**92.6**	2.61
NA1910	87.03	Lee Road pond control elevation	90.58	Bank overtopping	**91.8**	1.22	**92.2**	1.62	**92.37**	1.79	**92.61**	2.03
NA1970	86.00	Bottom of dry pond	94.89	Bank overtopping	92.32	-	92.79	-	93.24	-	94.58	-
NA1980	89.70	Bottom of structure	95.10	Approximate edge of pavement	92.37	-	92.86	-	93.31	-	94.64	-
NA1990	86.66	Bottom of structure	90.12	Approximate edge of pavement	87.9	-	88.29	-	88.62	-	**90.29**	0.17
NA2000	87.47	Bottom of structure	92.54	Approximate edge of pavement	90.11	-	90.88	-	91.52	-	**93.02**	0.48
NA2010	77.85	Bottom of structure	82.90	Approximate edge of pavement	82.83	-	**83.36**	0.46	**83.44**	0.54	**83.55**	0.65
NA2020	79.52	Bottom of structure	88.37	Approximate edge of pavement	82.5	-	84.15	-	84.59	-	84.93	-
NA2030	87.08	Bottom of structure	92.37	Approximate edge of pavement	90.15	-	90.84	-	91.42	-	91.5	-
NA2100	80.70	Bottom of structure	85.92	Approximate edge of pavement	83.97	-	**86.08**	0.16	**86.89**	0.97	**87.62**	1.70
NA2110	82.19	Bottom of structure	81.74	Approximate edge of pavement	**83.85**	2.11	**85.96**	4.22	**86.77**	5.03	**87.5**	5.76
NA2120	90.41	Bottom of structure	90.89	Approximate edge of pavement	**91.86**	0.97	**92.27**	1.38	**92.44**	1.55	**92.66**	1.77
NB0005	88.75	Approximate water surface elevation	91.82	Finished Floor Elevation	88.6	-	88.94	-	89.42	-	90.69	-
NB0010	81.87	Botom of structure	89.15	Approximate edge of pavement	84.8	-	86.3	-	87.07	-	88.57	-
NB0020	82.31	Botom of structure	90.36	Approximate edge of pavement	86.14	-	88.32	-	88.74	-	89.57	-
NB0030	86.97	Approximate water surface elevation	92.39	Finished floor elevation	88.25	-	88.73	-	89.31	-	90.63	-
NB0040	82.50	Pond control structure	89.07	Bank overtopping	85.19	-	85.23	-	85.26	-	85.32	-
NB0050	83.14	Pond control structure	85.33	Bank overtopping	84.62	-	85.02	-	85.21	-	**85.42**	0.09
NB0060	82.04	Bottom of structure	90.41	Approximate edge of pavement	81.83	-	82.7	-	83.68	-	85.78	-
NB0070	86.01	Pond control structure	88.50	Bank overtopping	88.45	-	**88.52**	0.02	**88.57**	0.07	**88.61**	0.11
NB0080	82.04	Bottom of structure	91.31	Approximate edge of pavement	83.05	-	83.51	-	84.22	-	86.62	-

APPENDIX I

Cost Estimates

PRELIMINARY FLOOD IMPROVEMENT CONCEPT #1
LAKE MENDSEN: CONNECTION TO LAKE ROSE
PRELIMINARY ESTIMATE OF IMPROVEMENT COSTS

Item	Pay Item No.	Description	Units	Unit Cost	Quantity	Total
1	101-1	Mobilization (10% of Total)	LS	varies	1	$36,318
2	102-1	Maintenance of Traffic (5% of Total)	LS	varies	1	$18,159
3	104-1	Prevention, Control and Abatement of Erosion and Water Pollution (7% of Total)	LS	varies	1	$25,422
4	110-1-1	Clearing and Grubbing (10% of Total)	LS	varies	1	$36,318
5	425-1581	Inlets, Ditch Bottom, Type H, <10'	EA	$11,000.00	1	$11,000
6	425-2-71	Manhole, J-7, <10'	EA	$14,850.00	2	$29,700
7	430-175-136	Pipe Culvert, RCP, Round, 36", S/CD	LF	$305.00	525	$160,125
8	430-982-138	Mitered End Section, Round, 36", CD	EA	$8,850.00	1	$8,850
9	570-1-2	Performance Turf, Sod	SY	$11.00	3,500	$38,500
					CONSTRUCTION SUBTOTAL:	$364,391
10	999-1	Design & Permitting	LS	$50,000.00	1	$50,000
11	999-2	Survey	LS	$10,000.00	1	$10,000
12	999-3	Ecological Services	LS	$10,000.00	1	$10,000
13	999-4	Geotechnical Services	LS	$10,000.00	1	$10,000
14	999-5	Construction Administration	LS	$35,000.00	1	$35,000
15	999-6	Construction Inspection and Oversight	LS	$15,000.00	1	$15,000
					ENGINEERING SUBTOTAL:	$130,000
					CONTINGENCY (20%):	$98,878
					ESTIMATED TOTAL COST:	**$593,269**

Notes:

1) Unit costs based on current FDOT MPIL Statewide Unit Cost Averages along with Engineer's experience with recent projects.
2) Above estimate does not include cost for potential utility relocations.
3) Estimate does not include potential additional costs associated with removal of muck or unsuitable soils. The extent of onsite muck or unsuitable material would be delineated during the design phase of the project.
4) Pay Item 425-1-583 is the total installed cost for the proposed Lake Mendsen control structure.
5) Pay Item 570-1-2, the area in square-yards was determined by the pipe length in feet under sod, multiplied by 60, assuming they will dig 30 feet on either side per one foot of pipe to install under existing sod. The unit cost is based on recent experience with Orange County projects.
6) Pay Item 570-1-2, the unit cost is based on recent experience with Orange County projects.
7) The estimates for Engineering items are based on similar services on recent projects adjusting for project size and complexity.

PRELIMINARY FLOOD IMPROVEMENT CONCEPT #2
LAKE MENDSEN: PUMP STATION AND LAKE EXPANSION
PRELIMINARY ESTIMATE OF IMPROVEMENT COSTS

Item	Pay Item No.	Description	Units	Unit Cost	Quantity	Total
1	101-1	Mobilization (10% of Total)	LS	varies	1	$52,811
2	102-1	Maintenance of Traffic (5% of Total)	LS	varies	1	$36,968
3	104-1	Prevention, Control and Abatement of Erosion and Water Pollution (7% of Total)	LS	varies	1	$36,968
4	120-2-2	Borrow Excavation, Truck Measure	CY	$55.00	2,948	$162,116
5	160-4	Type B Stabilization (12")	SY	$11.00	149	$1,635
6	285-704	Optional Base, Base Group 04 (6")	SY	$32.00	149	$4,756
7	334-1-13	Superpave Asphaltic Concrete, Traffic C (2")	SY	$160.00	149	$23,778
8	350-3-1	Plain cement concrete pavement, 6"	SY	$125.00	5	$625
9	425-2-71	Manhole, J-7, <10'	EA	$14,850.00	1	$14,850
10	570-1-2	Performance Turf, Sod	SY	$11.00	1,768	$19,449
11	1050-31206	Utility Pipe - Polyvinylchloride, Furnish and Install, Water/Sewer - 6"	LF	$110.00	690	$75,900
					CONSTRUCTION SUBTOTAL:	$429,853
12	999-1	Design & Permitting	LS	$150,000.00	1	$150,000
13	999-2	Survey	LS	$30,000.00	1	$30,000
14	999-3	Ecological Services	LS	$10,000.00	1	$10,000
15	999-4	Geotechnical Services	LS	$20,000.00	1	$20,000
16	999-5	Construction Administration	LS	$15,000.00	1	$15,000
17	999-6	Construction Inspection and Oversight	LS	$100,000.00	1	$100,000
					ENGINEERING SUBTOTAL:	$325,000
					CONTINGENCY (20%):	$150,971
					ESTIMATED TOTAL COST:	**$905,824**

Notes:

1) Unit costs based on current FDOT MPIL Statewide Unit Cost Averages along with Engineer's experience with recent projects.
2) Above estimate does not include cost for potential utility relocations.
3) Estimate does not include potential additional costs associated with removal of muck or unsuitable soils. The extent of onsite muck or unsuitable material would be delineated during the design phase of the project.
4) Pay Item 120-2-2, the volume of the soil to be excavated from the pond was estimated by calulcating the existing area of pond at 75 feet NAVD88, and increasing the depth by 6 feet to 69 feet NAVD88 with 4:1 sideslopes. This includes a modification of the current pond side slopes from 78.9-76 feet NAVD88 from 2:1 to 4:1.
5) Pay Items 160-4, 285-704, and 334-1-13, the area in square-yards was determined by the pipe length in feet under concrete, multiplied by 25, assuming they will dig ~12 feet on either side per one foot of pipe to install under existing cement.
6) Pay Item 350-3-1, the area of cement concrete pavement was determined referencing the dimensions of the mobile pump station, 6GST SAE Mount Global Standard Trash.
7) Pay Item 570-1-2, the unit cost is based on recent experience with Orange County projects.
8) The estimates for Engineering items are based on similar services on recent projects adjusting for project size and complexity.

PRELIMINARY FLOOD IMPROVEMENT CONCEPT #3
CANTON AVENUE: IMPROVED CONVEYANCE
PRELIMINARY ESTIMATE OF IMPROVEMENT COSTS

Item	Pay Item No.	Description	Units	Unit Cost	Quantity	Total
1	101-1	Mobilization (10% of Total)	LS	varies	1	$175,705
2	102-1	Maintenance of Traffic (10% of Total)	LS	varies	1	$175,705
3	104-1	Prevention, Control and Abatement of Erosion and Water Pollution (5% of Total)	LS	varies	1	$87,852
4	110-1-1	Clearing and Grubbing (10% of Total)	LS	varies	1	$175,705
5	160-4	Type B Stabilization (12")	SY	$11.00	3,333	$36,663
6	285-704	Optional Base, Base Group 04 (6")	SY	$32.00	3,333	$106,656
7	334-1-13	Superpave Asphaltic Concrete, Traffic C (2")	SY	$160.00	3,333	$533,280
8	425-1441	Curb Inlet, Type J-4, <10'	EA	$19,500.00	8	$156,000
9	425-2-71	Manholes, J-7, <10'	EA	$14,850.00	5	$74,250
10	430-175-148	Pipe Culvert, RCP, Round, 48"	LF	$455.00	1,200	$546,000
11	430-548-100	Straight Concrete Endwall, 48", Single, 0 Degrees, Round	EA	$30,000.00	1	$30,000
12	520-1-10	Concrete Curb & Gutter, Type F	LF	$50.00	1,100	$55,000
13	522-1	Concrete Sidewalk and Driveways, 4" Thick	SY	$80.00	365	$29,200
					CONSTRUCTION SUBTOTAL:	$2,182,016
14	999-1	Design & Permitting	LS	$100,000.00	1	$100,000
15	999-2	Survey	LS	$30,000.00	1	$30,000
16	999-3	Ecological Services	LS	$10,000.00	1	$10,000
17	999-4	Geotechnical Services	LS	$15,000.00	1	$15,000
18	999-5	Construction Administration	LS	$35,000.00	1	$35,000
19	999-6	Construction Inspection and Oversight	LS	$75,000.00	1	$75,000
					ENGINEERING SUBTOTAL:	$265,000
					CONTINGENCY (20%):	$489,403
					ESTIMATED TOTAL COST:	**$2,936,419**

Notes:

1) Unit costs based on current FDOT MPIL Statewide Unit Cost Averages along with Engineer's experience with recent projects.
2) Above estimate does not include cost for potential utility relocations.
3) Estimate does not include potential additional costs associated with removal of muck or unsuitable soils. The extent of onsite muck or unsuitable material would be delineated during the design phase of the project.
4) Pay Items 160-4, 285-704, and 334-1-13, the area in square-yards was determined by the pipe length in feet under concrete, multiplied by 25, assuming they will dig ~12 feet on either side per one foot of pipe to install under existing cement.
5) Pay Item 425-2-71, one manhole will have a diversion structure within the manhole. The concerte for the diverson structure is assumed to be included in the structure cost.
6) The estimates for Engineering items are based on similar services on recent projects adjusting for project size and complexity.

PRELIMINARY FLOOD IMPROVEMENT CONCEPT #4
LAKE BELL: CONNECTION TO PARK LAKE
PRELIMINARY ESTIMATE OF IMPROVEMENT COSTS

Item	Pay Item No.	Description	Units	Unit Cost	Quantity	Total
1	101-1	Mobilization (10% of Total)	LS	varies	1	$57,554
2	102-1	Maintenance of Traffic (5% of Total)	LS	varies	1	$28,777
3	104-1	Prevention, Control and Abatement of Erosion and Water Pollution (7% of Total)	LS	varies	1	$40,288
4	110-1-1	Clearing and Grubbing (10% of Total)	LS	varies	1	$57,554
5	160-4	Type B Stabilization (12")	SY	$11.00	198	$2,176
6	285-704	Optional Base, Base Group 04 (6")	SY	$32.00	198	$6,329
7	334-1-13	Superpave Asphaltic Concrete, Traffic C (2")	SY	$160.00	198	$31,644
8	425-11	Modify Existing Drainage Structure	EA	$4,750.00	1	$4,750
9	425-1549	Inlet, Ditch Bottom, Type D	EA	$10,400.00	1	$10,400
10	425-2-71	Manhole, J-7, <10'	EA	$14,850.00	2	$29,700
11	430-175-136	Pipe Culvert, RCP, Round, 36", S/CD	LF	$305.00	875	$266,875
12	430-982-138	Mitered End Section, Round, 36", CD	EA	$8,850.00	1	$8,850
13	570-1-2	Performance Turf, Sod	SY	$11.00	2,620	$28,820
14	999-1	Sluice Gate	LS	$20,000.00	1	$20,000
15	999-2	Property acquisition/easements	LS	$21,000.00	1	$21,000
					CONSTRUCTION SUBTOTAL:	$614,718
16	999-3	Design & Permitting	LS	$75,000.00	1	$75,000
17	999-4	Survey	LS	$20,000.00	1	$20,000
18	999-5	Ecological Services	LS	$20,000.00	1	$20,000
19	999-6	Geotechnical Services	LS	$10,000.00	1	$10,000
20	999-7	Construction Administration	LS	$20,000.00	1	$20,000
21	999-8	Construction Inspection and Oversight	LS	$15,000.00	1	$15,000
					ENGINEERING SUBTOTAL:	$160,000
					CONTINGENCY (20%):	$154,944
					ESTIMATED TOTAL COST:	**$929,662**

Notes:

1) Unit costs based on current FDOT MPIL Statewide Unit Cost Averages along with Engineer's experience with recent projects.
2) Above estimate does not include cost for potential utility relocations.
3) Estimate does not include potential additional costs associated with removal of muck or unsuitable soils. The extent of onsite muck or unsuitable material would be delineated during the design phase of the project.
4) Pay Items 160-4, 285-704, and 334-1-13, the area in square-yards was determined by the pipe length in feet under concrete,
5) Pay item 425-11 is the cost of modification to the existing control structure on Grove Street.
6) Pay item 425-1549 is the cost of the proposed control structure for Lake Bell.
7) Pay Item 570-1-2, the area in square-yards was determined by the pipe length in feet under sod, multiplied by 60, assuming
8) Pay Item 570-1-2, the unit cost is based on recent experience with Orange County projects.
9) Pay Item 999-1 is the installed cost for sluice gate based on values given from the manufacturer.
10) Pay Item 999-2 is the easement acquisition cost, this was determined by using the property's 2023 market value multiplied by the percentage of the property that was estimated to be needed for the easement.
11) The estimates for Engineering items are based on similar services on recent projects adjusting for project size and complexity.

PRELIMINARY FLOOD IMPROVEMENT CONCEPT #5
LAKE KILLARNEY: REDUCED INFLOWS FROM FDOT POND
PRELIMINARY ESTIMATE OF IMPROVEMENT COSTS

Item	Pay Item No.	Description	Units	Unit Cost	Quantity	Total
1	101-1	Mobilization (10% of Total)	LS	varies	1	$244,439
2	102-1	Maintenance of Traffic (5% of Total)	LS	varies	1	$122,220
3	104-1	Prevention, Control and Abatement of Erosion and Water Pollution (7% of Total)	LS	varies	1	$171,107
4	120-2-2	Borrow excavation, truck measure	CY	$55.00	37,327	$2,052,996
5	145-71	Reinforcement Grid for Soil Stabilization	SY	$11.00	1,798	$19,780
6	430-175-172	Pipe Culvert, RCP, Round, 78", S/CD	LF	$1,600.00	95	$152,000
7	430-830	Plug and abandon existing 78" pipe	CY	$370.00	47	$17,541
8	430-982-143	Mitered End Section, Round, 78", CD	EA	$18,750.00	1	$18,750
9	570-1-2	Performance Turf, Sod	SY	$11.00	5,302	$58,326
10	999-1	Modify Existing Drainage Structure	EA	$30,000.00	1	$30,000
					CONSTRUCTION SUBTOTAL:	$2,887,159
11	999-2	Design & Permitting	LS	$50,000.00	1	$50,000
12	999-3	Survey	LS	$15,000.00	1	$15,000
13	999-4	Ecological Services	LS	$5,000.00	1	$5,000
14	999-5	Geotechnical Services	LS	$10,000.00	1	$10,000
15	999-6	Construction Administration	LS	$15,000.00	1	$15,000
16	999-7	Construction Inspection and Oversight	LS	$25,000.00	1	$25,000
					ENGINEERING SUBTOTAL:	$120,000
					CONTINGENCY (20%):	$601,432
					ESTIMATED TOTAL COST:	**$3,608,591**

Notes:

1) Unit costs based on current FDOT MPIL Statewide Unit Cost Averages along with Engineer's experience with recent projects.
2) Above estimate does not include cost for potential utility relocations.
3) Estimate does not include potential additional costs associated with removal of muck or unsuitable soils. The extent of onsite muck or unsuitable material would be delineated during the design phase of the project.
4) Pay Item 120-2-2, the volume of the soil to be excavated was estimated assuming a pond expansion into the adjacent parcel matching the existing pond bottom elevation of 85 feet NAVD88 with 4:1 sideslopes.
5) Pay Item 145-71 assumes a maintenance berm along all sides of the proposed pond except the boundary with the existing pond.
6) Pay Item 430-175-172 includes the cost for a 72" RCP pipe, the proposed pipe is 78" however this pay item was used as it is the closest pay item to the pipe size necessary for the proposed improvement. It is assumed that the 78" pipe will have similar cost.
7) Pay Item 430-480, the area in cubic-yards was determined by assuming a 10 feet x 10 feet area exposed to plug the pipe and multiplying by the depth from ground surface to the pipe invert.
8) Pay Item 430-982-143 includes the cost for a 60" MES, the proposed MES is 78" however this pay item was used as it is the closest pay item to the size necessary for the proposed improvement. It is assumed that the 78" MES will have similar cost.
9) Pay Item 570-1-2, the unit cost is based on recent experience with Orange County projects.
10) Pay Item 999-1 includes the cost for modifying the existing inlet that will be used as a tie in for the proposed pipe to the expanded pond.
11) The estimates for Engineering items are based on similar services on recent projects adjusting for project size and complexity.

PRELIMINARY FLOOD IMPROVEMENT CONCEPT #6
LAKE KILLARNEY: IMPROVED CONEVEYANCE TO LAKE GEM
PRELIMINARY ESTIMATE OF IMPROVEMENT COSTS

Item	Pay Item No.	Description	Units	Unit Cost	Quantity	Total
1	101-1	Mobilization (15% of Total)	LS	varies	1	$26,860
2	102-1	Maintenance of Traffic (10% of Total)	LS	varies	1	$17,907
3	104-1	Prevention, Control and Abatement of Erosion and Water Pollution (7% of Total)	LS	varies	1	$12,535
4	425-11	Modify existing drainage structure	EA	$4,750.00	1	$4,750
5	425-2-71	Manholes, J-7, <10'	EA	$19,305.00	1	$19,305
6	430-175-148	Pipe Culvert, RCP, Round, 48"	LF	$455.00	22	$10,010
7	430-548-100	Straight Concrete Endwall, 48", Single, 0 Degrees, Round	EA	$30,000.00	1	$30,000
8	999-1	Sluice Gate	EA	$20,000.00	1	$20,000
					CONSTRUCTION SUBTOTAL:	$141,366
9	999-2	Design & Permitting	LS	$50,000.00	1	$50,000
10	999-3	Survey	LS	$10,000.00	1	$10,000
11	999-4	Ecological Services	LS	$10,000.00	1	$10,000
12	999-5	Geotechnical Services	LS	$10,000.00	1	$10,000
13	999-6	Construction Administration	LS	$15,000.00	1	$15,000
14	999-7	Construction Inspection and Oversight	LS	$15,000.00	1	$15,000
					ENGINEERING SUBTOTAL:	$110,000
					CONTINGENCY (20%):	$50,273
					ESTIMATED TOTAL COST:	**$301,639**

Notes:

1) Unit costs based on current FDOT MPIL Statewide Unit Cost Averages along with Engineer's experience with recent projects.
2) Above estimate does not include cost for potential utility relocations.
3) Estimate does not include potential additional costs associated with removal of muck or unsuitable soils. The extent of onsite muck or unsuitable material would be delineated during the design phase of the project.
4) Pay Item 425-11 will serve as the modification associated with the tie in to the existing outfall structure for Lake Killarney
5) Pay Item 425-2-71 unit cost was increased by 30% as the box will be larger than average to accommodate the 90 degree turn for the 48" pipes.
6) Pay Item 999-1 is the installed cost for sluice gate based on values given from the manufacturer.
7) The estimates for Engineering items are based on similar services on recent projects adjusting for project size and complexity.

Winter Park Central Basin Stormwater Master Plan

Draft Summary Memorandum







September 2024

Executive Summary ES-1

Section 1 – Introduction and Project Background 1-1

Section 2 – Data Collection and Site Investigation 2-1
2.1 Data Collection 2-1
2.2 Field Reconnaissance and Site Observations 2-2

Section 3 – Existing Conditions Analysis 3-1
3.1 Vertical Datum 3-1
3.2 Base Models 3-1
3.3 Hydrologic Data Development 3-1
3.4 Hydraulic Data Development 3-2
3.5 Existing Conditions Model Results 3-3
3.6 Level of Service Analysis 3-5
3.7 Calibration and Verification 3-5
3.8 Ongoing Flood Control Projects 3-9

Section 4 – Design Development and Evaluation 4-1
4.1 Design Conditions Model Development & Analysis 4-1
4.2 Design Alternative 1a-b 4-5
4.3 Design Alternative 2a-b 4-7
4.4 Design Alternative 3 4-9
4.5 Design Alternative 4 4-12
4.6 Design Alternative 5 4-15
4.7 Design Alternative 6 4-18
4.8 Design Alternative 7 4-21
4.9 Design Alternative 8 4-24
4.10 Additional Design Alternatives 4-27
4.11 Design Recommendation 4-28

Appendices
Appendix C: CWP Adaptive Flood Management Guide
Appendix D: Data Collection
Appendix E: StormWise Input Data and Results: Existing Conditions
Appendix F: StormWise Input Data and Results: Proposed Conditions
F.1 – Design Alternatives 1a & 2a
F.2 – Design Alternatives 1b & 2b
F.3 – Design Alternatives 3 – 6
F.4 – Design Alternative 7
F.5 – Design Alternative 8

Exhibits
Exhibit 3.1 Hurricane Ian WSE Comparison at USGS Gage 3-6
Exhibit 3.2 Hurricane Ian Flooding: Fawsett Rd 3-7
Exhibit 3.3 Hurricane Ian Flooding: Stirling Ave at College Point 3-7
Exhibit 3.4 Hurricane Ian Flooding: Temple Dr at Via Salerno 3-8

Tables
Table 2.1 Reference Documents 2-1
Table 3.1 Maximum Stages/Flood Depths: Existing Conditions 3-16

Table 4.1 Maximum Stages: Proposed Design Conditions vs. Existing Conditions 4-3
Table 4.2 Flood Depths: Proposed Design Conditions vs. Existing Conditions 4-4
Table 4.3 Engineer's Opinion of Probable Cost – Design Alternative 3 4-11
Table 4.4 Engineer's Opinion of Probable Cost – Design Alternative 4 4-14
Table 4.5 Engineer's Opinion of Probable Cost – Design Alternative 5 4-17
Table 4.6 Engineer's Opinion of Probable Cost – Design Alternative 6 4-20
Table 4.7 Engineer's Opinion of Probable Cost – Design Alternative 7 4-23
Table 4.8 Engineer's Opinion of Probable Cost – Design Alternative 8 4-26
Table 4.9 Design Alternative Evaluation Matrix 4-29

Figures

Figure 1.1 Location Map 1-2
Figure 1.2 Existing Drainage Patterns 1-3
Figure 1.3 FEMA Flood Hazard Zones 1-4

Figure 3.1 Model Extents Map 3-11
Figure 3.2 Existing Conditions Model Network – Study Area 3-12
Figure 3.3 Existing Conditions Model Network – Focus Area 3-13
Figure 3.4 Landuse Map 3-14
Figure 3.5 Soils Map 3-15

Figure 3.6a Existing 2YR 24HR Inundation 3-16
Figure 3.6b Existing 10YR 24HR Inundation 3-17
Figure 3.6c Existing 25YR 24HR Inundation 3-18
Figure 3.6d Existing 100YR 24HR Inundation 3-19
Figure 3.6e Existing 500YR 24HR Inundation 3-20
Figure 3.6f Existing 10YR 6HR Inundation 3-21
Figure 3.6g Existing 25YR 6HR Inundation 3-22
Figure 3.6h Existing 25YR 96HR Inundation 3-23
Figure 3.6i Existing 100YR 96HR Inundation 3-24
Figure 3.6j Existing Hurricane Ian Inundation 3-25

Figure 3.7a Existing 2YR 24HR LOS Analysis 3-26
Figure 3.7b Existing 10YR 24HR LOS Analysis 3-27
Figure 3.7c Existing 25YR 24HR LOS Analysis 3-28
Figure 3.7d Existing 100YR 24HR LOS Analysis 3-29
Figure 3.7e Existing 500YR 24HR LOS Analysis 3-30
Figure 3.7f Existing 10YR 6HR LOS Analysis 3-31
Figure 3.7g Existing 25YR 6HR LOS Analysis 3-32
Figure 3.7h Existing 25YR 96HR LOS Analysis 3-33
Figure 3.7i Existing 100YR 96HR LOS Analysis 3-34

Figure 4.1 Design Alternative 1a-b 500YR 24HR Inundation 4-6
Figure 4.2 Design Alternative 2a-b 500YR 24HR Inundation 4-8
Figure 4.3 Design Alternative 3 500YR 24HR Inundation 4-10
Figure 4.4 Design Alternative 4 500YR 24HR Inundation 4-13
Figure 4.5 Design Alternative 5 500YR 24HR Inundation 4-16
Figure 4.6 Design Alternative 6 500YR 24HR Inundation 4-19
Figure 4.7 Design Alternative 7 500YR 24HR Inundation 4-22
Figure 4.8 Design Alternative 8 500YR 24HR Inundation 4-25

Executive Summary

Introduction and Project Background

The City of Winter Park (CWP) experienced significant flooding during Hurricane Ian in 2022; to prepare for future extreme storm events, the CWP subsequently initiated a series of flood control projects, one of which being this study. This study is intended to establish a modeling tool that can be used to identify potential future flood risks and evaluate potential alternatives to mitigate those risks.

The Central Basin covers approximately 9 square miles within the Howell Creek Watershed, part of the larger Lake Jesup Basin. The Central Basin is regulated by the St. Johns River Water Management District (SJRWMD) and resides primarily within Orange County, but discharges into Seminole County. The project location is presented in **Figure 1.1**, which shows the overall study area, Central Basin project area (i.e., Focus Area), and other key features in the vicinity. The defining feature of the Central Basin is the Winter Park Chain of Lakes, which consists of six (6) lakes connected by navigable canals: Lake Virginia, Lake Osceola, Lake Maitland, Lake Mizell, Lake Nina, and Lake Minnehaha.

The Chain of Lakes are part of a larger lake system, with numerous lakes upstream discharging into the Chain of Lakes (e.g., Lake Sue). The entire Chain of Lakes system discharges into Howell Creek through a control structure just downstream of Lake Maitland, at Howell Branch Rd (referred to as the Lake Maitland Control Structure). Flow is then conveyed through Howell Creek into Lake Howell before ultimately discharging into Lake Jesup. These drainage patterns are presented in **Figure 1.2**.

Data Collection and Site Investigation

As part of the data collection phase of the project, SAI-Halff obtained and reviewed a variety of data, including infrastructure information, GIS files, drainage models, environmental resource permit (ERP) documents from the SJRWMD, etc.

Additionally, field reconnaissance was conducted in December & January of 2023 & 2024. The purpose of the reconnaissance was to observe site conditions, as well as investigate areas with missing or suspect data.

Existing Conditions Analysis

Model Development

SAI-Halff developed a hydrologic and hydraulic (H&H) computer model (StormWise) to simulate the rainfall runoff process. Rates and volumes of stormwater runoff were determined for nine (9) synthetic storm events, which included five (5) 24-hour storms, two (2) 6-hour storms, and two (2) 96-hour storms. Hurricane Ian was also simulated, which was used to verify the model results.

The existing conditions model was created by reviewing and refining an area within the existing Howell Creek watershed model developed by CDM in 2011 (HC2011). In addition to the model updates made by SAI-Halff (CB2024), the Community Redevelopment Agency model developed by Geosyntec in 2020 (CRA2020) was also incorporated. The overall area updated by SAI-Halff is referred to as the Focus Area. A map depicting the extents of the HC2011, CRA2020, and CB2024 model areas is included as **Figure 3.1**.

Model results indicate structure flooding, as well as lot and street flooding throughout the CWP. The flood control design alternatives developed for this study are focused on the closed-basin lakes, consequently, they were evaluated separately from the rest of the Central Basin.

Model Results: Closed-Basin Lakes

- Lake Knowles: Results indicate several streets are inundated during extreme storm events, including Lake Knowles Cir, Temple Dr, and Via Salerno.
- Lake Sylvan: Results indicate lot flooding during extreme storm events, but no street or structure flooding.
- Lake Chelton: Results indicate no lot, street, or structure flooding during extreme storm events. However, several well-established trees (live oaks) around the lake are at risk when inundated for extended periods of time.
- Lake Grace: Results indicate lot and structure flooding during extreme storm events.
- Lake Forest: Results indicate lot flooding during extreme storm events, but no street or structure flooding.

Table 3.1 presents the maximum predicted stages and flood depths at key nodes within the Focus Area.

Level pool floodplains were developed for each modeled storm event to demonstrate the predicted flood extents under existing conditions and are provided as **Figures 3.6a-3.6k**.

Level of Service Analysis

An LOS analysis of buildings and roads was performed to evaluate flooding during the synthetic storm events throughout the rest of the Central Basin. Building polygons, road centerlines, and the project terrain information were used as the basis of the analysis.

The number of inundated structures, and combined roadways lengths during each storm event are listed below:

Storm Event	Number of Inundated Structures	Length of Inundated Road [ft]
2-Year 24-hour	0	7,425
10-Year 24-hour	2	23,950
25-Year 24-hour	15	37,375
100-Year 24-hour	64	51,300
500-Year 24-hour	125	86,675
10-Year 6-hour	2	31,275
25-Year 6-hour	16	42,500
25-Year 96-hour	36	44,600
100-Year 96-hour	89	70,650

The results of the LOS analysis, including the buildings and roads inundated during each storm event, are provided as **Figures 3.7a-3.7i**.

Model Calibration and Verification

NEXRAD rainfall data were used to simulate Hurricane Ian. The simulated Ian results along with documented flood data at several locations throughout the Central Basin were to facilitate calibration and verification of the model.

Comparing the simulated Hurricane Ian results to the available flood data suggests a general agreement between the model and Hurricane Ian. While discrepancies were noted in the higher simulated peak stages, the discrepancy is consistent, with higher stages at all locations. Ultimately, this means the model overstates flood stages, producing more conservative results.

Design Development and Evaluation

SAI-Halff developed and evaluated flood control design alternatives at five (5) closed-basin lakes, including Lake Knowles, Lake Sylvan, Lake Chelton, Lake Grace, and Lake Forest.

Two (2) types of designs were evaluated: one using temporary pumps, the other using permanent gravity culvert outfalls. Temporary pumping options were not evaluated for Lake Chelton or Lake Sylvan, as the existing peak stages within the lakes are more than 2 ft below the determined LOS elevations. Global Standard Trash (GST) pumps offered by Global Pump were used to determine the pump requirements at the remaining lakes, as the CWP already has one (1) GST pump within its fleet (model: 6GST, rated for 3,000gpm). Meanwhile, gravity culvert outfalls were evaluated at all five (5) closed-basin lakes.

Summary tables comparing the design peak stages and anticipated flood depths to the existing conditions are included as **Tables 4.1** and **4.2,** respectively. A brief description of each design alternative and the estimated cost is presented below. Note, the cost ranges for some alternatives based on if the CWP utilizes the 6GST pump currently within its fleet.

Design Alternative	Design Location	Design Description	Cost Estimate
Temporary Pumping Alternatives			
1a	Lake Knowles	Pump during storm	$182,000
1b	Lake Knowles	Pump prior to storm	$0 - $90,000
2a	Lakes Grace & Forest	Pump during storm	$90,000 - $180,000
2b	Lakes Grace & Forest	Pump prior to storm	$0 - $90,000
Gravity Culvert Outfall Alternatives			
3	Lake Knowles	Construct emergency outfall to Lake Maitland	$2,250,243
4	Lake Sylvan	Construct emergency outfall to Lake Mizell; outfall structure to include bleed down orifice	$1,117,971
5	Lake Chelton	Construct emergency outfall to Lake Sue; outfall structure to include bleed down orifice	$597,359
6	Lakes Grace & Forest	Construct emergency outfall from Lake Forest to Lake Grace, and from Lake Grace to Lake Sue; outfall structure within Lake Grace to include bleed down orifice	$2,394,517
7	Lake Grace	Construct emergency outfall from Lake Grace into Lake Sue; outfall structure to include bleed down orifice	$1,986,312
8	Lake Grace	Plug existing Phillips Place Retention Pond outfall into Lake Grace; construct new outfall from retention pond into Lake Forest	$237,989

Alternative 1a-b: Alternative 1 addresses street and lot flooding around Lake Knowles, which was observed during Hurricane Ian.

- Proposed Design: To achieve this, temporary pumps will be used to pump water from Lake Knowles into Lake Maitland, during or prior to the storm (1a and 1b, respectively), (**Figure 4.1**).

- Results: Both pump options meet the desired LOS (500-year, 24-hour) at Lake Knowles. Impacts to the maximum stages within Lake Maitland are negligible.
- Permitting and Construction Considerations: No permitting challenges are anticipated for this alternative, and no construction is proposed.

Alternative 2a-b: Alternative 2 addresses lot flooding and potential structure flooding around Lake Grace and Lake Forest, which was observed during Hurricane Ian.

- Proposed Design: To achieve this, temporary pumps will be used to pump water from Lake Grace and Lake Forest into Lake Sue, during or prior to the storm (2a and 2b, respectively), (**Figure 4.2**).
- Results: Both pump options meet the desired LOS (500-year, 24-hour) at Lake Grace and Lake Forest. Impacts to the maximum stages within Lake Sue are negligible.
- Permitting and Construction Considerations: No permitting challenges are anticipated for this alternative, and no construction is proposed.

Alternative 3: Alternative 3 addresses street and lot flooding around Lake Knowles, which was observed during Hurricane Ian.

- Proposed Design: To achieve this, an emergency gravity culvert outfall will be constructed to allow Lake Knowles to discharge into Lake Maitland during extreme storm events (**Figure 4.3**).
- Results: This alternative meets the desired LOS (500-year, 24-hour) at Lake Knowles and impacts to the maximum stages within Lake Maitland are negligible.
- Permitting and Construction Considerations: Permitting challenges are anticipated for this alternative, as providing an outfall to a previously closed-basin system may pose water quality concerns. Construction challenges are also anticipated, as a segment of the outfall culvert traverses privately-owned land.

Alternative 4: Alternative 4 addresses lot flooding around Lake Sylvan, which was observed during Hurricane Ian.

- Proposed Design: To achieve this, a gravity culvert emergency outfall will be constructed to allow Lake Sylvan to discharge into Lake Mizell during extreme storm events. In addition, the outfall structure will include an orifice to allow Lake Sylvan to recover its available storage after a storm (**Figure 4.4**).
- Results: This alternative meets the desired LOS (500-year, 24-hour) at Lake Sylvan, with the primary benefit of providing the lake with a bleed-down mechanism. Impacts to the maximum stages within Lake Mizell are negligible.
- Permitting and Construction Considerations: Permitting challenges are anticipated for this alternative, as providing an outfall to a previously closed-basin system may pose water quality concerns. Construction challenges are also anticipated, as a segment of the outfall culvert traverses privately-owned land.

Alternative 5: Alternative 5 inundation that threatens well-established tree (live oaks) around Lake Chelton, which was observed during Hurricane Ian.

- Proposed Design: To achieve this, a structural outfall will be constructed to allow Lake Chelton to discharge into Lake Sue during extreme storm events. In addition, the outfall structure will include an orifice to allow Lake Chelton to recover its available storage after a storm (**Figure 4.5**).
- Results: This alternative meets the desired LOS (500-year, 24-hour) at Lake Chelton, with the primary benefit of providing the lake with a bleed-down mechanism. Impacts to the maximum stages within Lake Sue are negligible.

- Permitting and Construction Considerations: Permitting challenges are anticipated for this alternative, as providing an outfall to a previously closed-basin system may pose water quality concerns. Construction of this alternative is contained within City right-of-way.

Alternative 6: Alternative 6 addresses lot flooding and potential structure flooding around Lake Grace, and lot flooding around Lake Forest, which was observed during Hurricane Ian.

- Proposed Design: To achieve this, an emergency gravity culvert outfall will be constructed to allow Lake Forest to discharge into Lake Grace, and for Lake Grace to discharge into Lake Sue during extreme storm events. In addition, the outfall structure within Lake Grace will include an orifice to allow the lake to recover its available storage after a storm (**Figure 4.6**).
- Results: This alternative meets the desired LOS (500-year, 24-hour) at Lake Grace, and achieves the benefit of providing the lake with a bleed-down mechanism. Impacts to maximum stages within Lake Forest are negligible; the outfall into Lake Grace only provides a benefit if the drainwell within Lake Forest fails. Impacts to the maximum stages within Lake Sue are negligible.
- Permitting and Construction Considerations: Permitting challenges are anticipated for this alternative, as providing an outfall to a previously closed-basin system may pose water quality concerns. Construction challenges are also anticipated, as a segment of the outfall culvert traverses privately-owned land.

Alternative 7: Alternative 7 addresses lot flooding and potential structure flooding around Lake Grace, which was observed during Hurricane Ian.

- Proposed Design: To achieve this, an emergency gravity culvert outfall will be constructed to allow Lake Grace to discharge into Lake Sue during extreme storm events. In addition, the outfall structure will include an orifice to allow Lake Grace to recover its available storage after a storm (**Figure 4.7**).
- Results: This alternative meets the desired LOS (500-year, 24-hour) at Lake Grace. Impacts to the maximum stages within Lake Sue are negligible.
- Permitting and Construction Considerations: Permitting challenges are anticipated for this alternative, as providing an outfall to a previously closed-basin system may pose water quality concerns. Construction challenges are also anticipated, as a segment of the outfall culvert traverses privately-owned land.

Alternative 8: Alternative 8 addresses lot flooding and potential structure flooding around Lake Grace, which was observed during Hurricane Ian.

- Proposed Design: To achieve this, the Phillips Place retention pond outfall will be moved from Lake Grace to Lake Forest (**Figure 4.8**).
- Results: This alternative meets the desired LOS (500-year, 24-hour) at Lake Knowles and impacts to the maximum stages within Lake Maitland are negligible.
- Permitting and Construction Considerations: Permitting challenges are anticipated for this alternative, as impervious area is being added to the Lake Forest basin, which may pose water quality concerns. Construction challenges are also anticipated, as a segment of the outfall culvert traverses privately-owned land.

Additional Design Alternatives: Additional alternatives were reviewed but were not fully developed due to feasibility concerns. Alternatives which modified the Lake Maitland control structure at Howell Branch Rd were reviewed. This included improving the conveyance of the control structure, as well as the use of an operable gate to lower the water levels in the Chain of Lakes prior to a storm.
No model or cost estimates were developed for these alternatives.

Design Recommendation: The design alternatives were evaluated to each other on a lake-by-lake basis, based on construction costs and considerations, maintenance considerations, longevity, permitting feasibility, and effectiveness of design, as described below. The design alternatives at Lakes Chelton and Sylvan were not included in the ranking as only one (1) alternative was developed for each lake. **Table 4.9** presents the scoring and ranking of each design alternative as well as a description of the evaluation criteria and scoring method.

SAI-Halff recommends Design Alternatives 1b & 2b (Pump Option 2): temporary pumping prior to a storm at Lake Knowles, Lake Grace, and Lake Forest. Pump Option 2 meets the desired LOS at all three lakes, has the lowest cost, and requires no construction.

While Pump Option 1 meets the desired LOS, it has a higher cost and requires the pumps to operate during a storm, which may pose safety concerns. The gravity outfall alternatives also meet the desired LOS, but cost significantly more than Pump Option 2, and construction of the outfalls will cause significant interruption to the neighborhood.

Section 1

Introduction and Project Background

1.1 Background

The City of Winter Park (CWP) has requested Singhofen-Halff (SAI-Halff) develop a stormwater management master plan for the Central Basin. The CWP experienced significant flooding during Hurricane Ian in 2022; to prepare for future extreme storm events, the CWP subsequently initiated a series of flood control projects, one of which being this study. This study is intended to establish a modeling tool that can be used to identify potential future flood risks and evaluate potential alternatives to mitigate those risks. Specifically, the objectives of this project, as defined by the CWP, include:

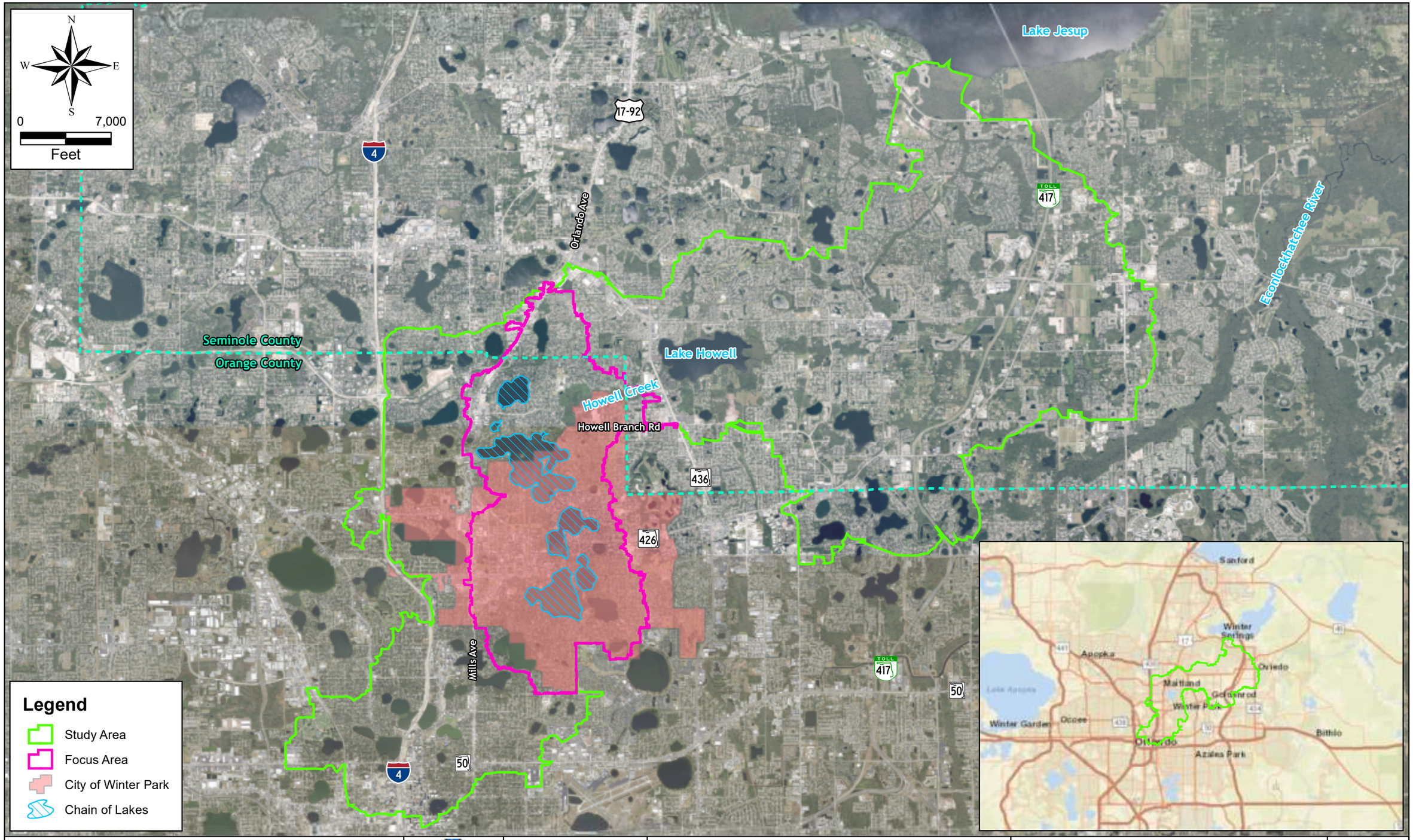
- Development of an existing conditions model for the Central Basin,
- Evaluation of current and future flood risks,
- Evaluation of the CWP's predicted level-of-service (LOS) for roadways and structures, and
- Development of conceptual design solutions to mitigate flooding. Specific conceptual design solutions will evaluate establishing interconnections between several closed-basin lakes, including Lake Knowles, Lake Sylvan, Lake Chelton, Lake Grace, and Lake Forest.

1.2 Location

The Central Basin covers approximately 9 square miles within the Howell Creek Watershed, part of the larger Lake Jesup Basin. The Central Basin is regulated by the St. Johns River Water Management District (SJRWMD) and resides primarily within Orange County, but discharges into Seminole County. The project location is presented in **Figure 1.1**, which shows the overall study area, Central Basin project area (i.e., Focus Area), and other key features in the vicinity. The defining feature of the Central Basin is the Winter Park Chain of Lakes, which consists of six (6) lakes connected by navigable canals: Lake Virginia, Lake Osceola, Lake Maitland, Lake Mizell, Lake Nina, and Lake Minnehaha.

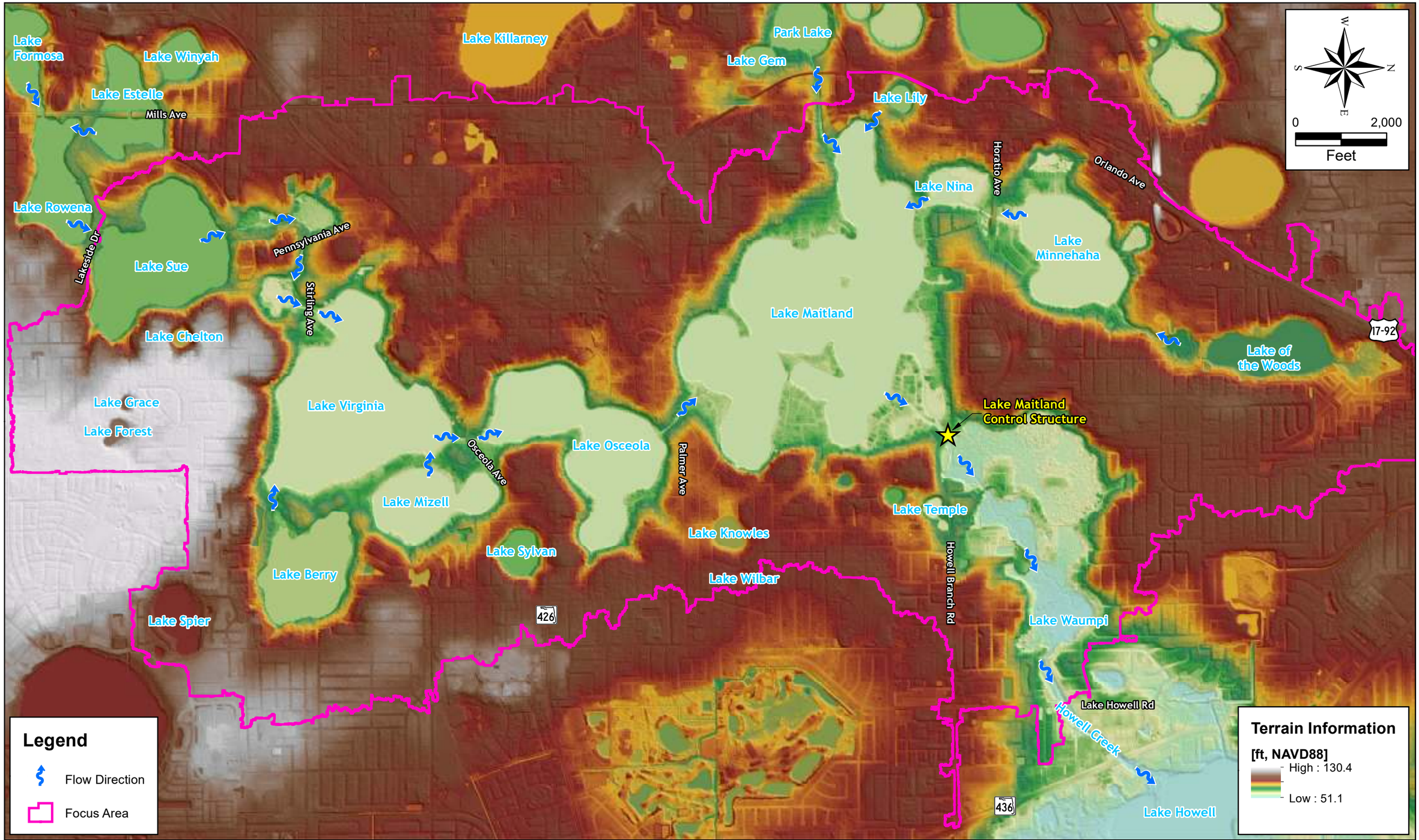
The Chain of Lakes are part of a larger lake system, with numerous lakes upstream discharging into the Chain of Lakes (e.g., Lake Sue). The entire Chain of Lakes system discharges into Howell Creek through a control structure just downstream of Lake Maitland, at Howell Branch Rd (referred to as the Lake Maitland Control Structure). Flow is then conveyed through Howell Creek into Lake Howell before ultimately discharging into Lake Jesup. These drainage patterns are presented in **Figure 1.2**.

The FEMA flood hazard zones within the Focus Area are mostly Zone AE and have corresponding base flood elevations (BFE). This includes the Chain of Lakes system and most of the closed-basin lakes. Two (2) designated regulatory floodways are located within the Focus Area: the channel between Lake Sue and Lake Viginia; and Howell Creek, beginning just upstream of the Lake Maitland Control Structure and extending downstream into Lake Jesup. Floodways prohibit encroachments (e.g., fill, new construction, substantial improvements) unless it is demonstrated that the proposed encroachment will not result in any increase in flood levels during the occurrence of the base flood discharge. The extents of the FEMA flood hazard zones within the Focus Area are shown in **Figure 1.3**.



SINGHOFEN & ASSOCIATES INCORPORATED | halff	*Sources:* *Aerials:* *2018 Orange County* *2018 Seminole County*	**WINTER PARK CENTRAL BASIN STORMWATER MASTER PLAN**	**LOCATION MAP**	**FIGURE: 1.1**

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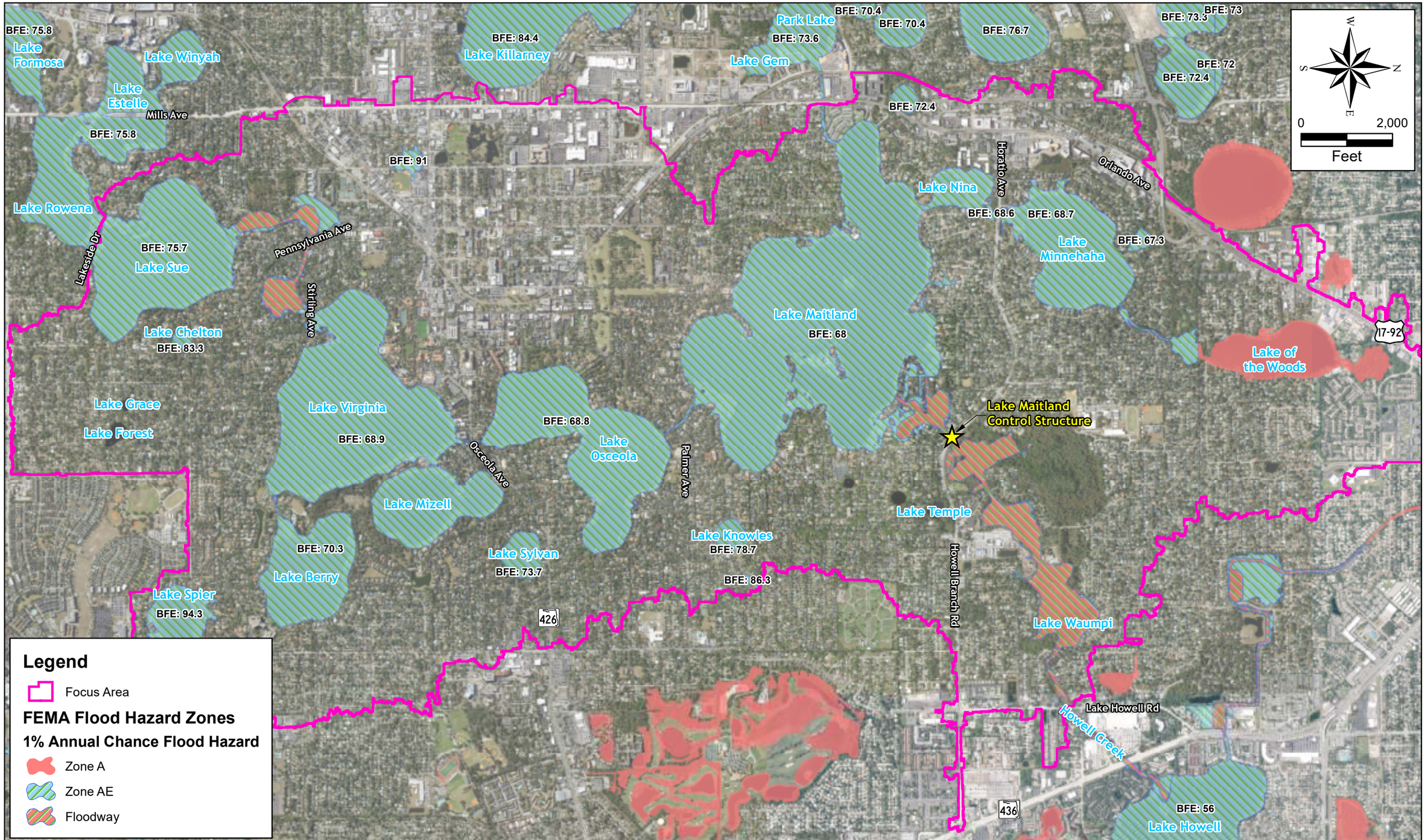
Sources:
Terrain: USGS 2018

WINTER PARK CENTRAL BASIN STORMWATER MASTER PLAN

EXISTING DRAINAGE PATTERNS

FIGURE: 1.2

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Sources:
Aerials:
2018 Orange County
2018 Seminole County
FEMA: 2021

WINTER PARK CENTRAL BASIN STORMWATER MASTER PLAN

FEMA FLOOD HAZARD ZONES

FIGURE: 1.3

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Section 2

Data Collection and Site Investigation

2.1 Data Collection

As part of the data collection phase of the project, SAI-Halff obtained and reviewed a variety of data (e.g., infrastructure information, GIS files, drainage models), listed below.

- Howell Creek Basin Watershed Management Plan: Report, ICPR3 Model (CDM, 2007)
- Howell Creek Basin Watershed Management Plan Update: Report, ICPR3 Model, GIS data (CDM 2011)
- Maitland Chain of Lakes LOMR: Report, GIS data (CDM, 2012)
- Community Redevelopment Agency (CRA) Stormwater Master Plan: Report, ICPR4 Model, GIS data (Geosyntec, 2020)
- Infrastructure geodatabase (Orange County)
- 2018 LIDAR information (USGS)
- 2018 Orange and Seminole County Aerial Imagery
- NRCS Soils information
- SJRWMD Landuse information
- Historic Water Surface Elevations (Water Atlas Program)

Additionally, environmental resource permit (ERP) documents were obtained from the SJRWMD. The ERP documents reviewed and cataloged by SAI-Halff and are presented in **Table 2.1**. Select information provided by the CWP is also listed in the table.

Table 2.1: Reference Documents

Document ID	Document Type	Document Date	Development	Permit Number	Source	Datum
WPCB_0002_CP	Construction Drawings	December 1998	The Preserve at Windsong Northeast	75939	SJRWMD	NGVD29
WPCB_0003_CP	Construction Drawings	December 1995	Phillips Place	46237	SJRWMD	NGVD29
WPCB_0005-01_CP	Construction Drawings	July 1995	Mead Garden Stormwater Retrofit & Pond Restoration	20716	SJRWMD	NGVD29
WPCB_0005_CP	Construction Drawings	July 1995	Mead Garden Stormwater Retrofit & Pond Restoration	20716	SJRWMD	NGVD29
WPCB_0010_CP	Construction Drawings	October 1999	Canal Wall Replacement	62696	SJRWMD	NGVD29
WPCB_0024_SD	Survey Data	November 2012	Maitland LOMR - Apx E Survey Data & Plans (CDM)	N/A	CWP	NGVD29
WPCB_0040_CP	Construction Drawings	March 2006	Knowles Place	103678	SJRWMD	NGVD29
WPCB_0041_CP	Construction Drawings	July 2000	Public Works Compound	65839	SJRWMD	NGVD29
WPCB_0042-01_CP	Construction Drawings	December 2007	Dommerich Elementary School	45392	SJRWMD	NGVD29
WPCB_0042-02_CP	Construction Drawings	December 2007	Dommerich Elementary School	45392	SJRWMD	NGVD29
WPCB_0044_RD	Survey Data	December 2009	Lake Howell Control Water Control Structure Replacement	119739	SJRWMD	NAVD88

WPCB_0045_RPT	Report	January 2009	Lake Howell Water Control Structure Replacement	119739	SJRWMD	NAVD88
WPCB_0046_CP	Construction Drawings	December 2009	Lake Howell Water Control Structure Replacement	119739	SJRWMD	NAVD88
WPCB_0050_CP	Construction Drawings	January 2011	Lake Howell Road Bridge Replacement	119739	SJRWMD	NAVD88
WPCB_0052_CP	Construction Drawings	November 1998	Lake Howell Road Townhomes	51668	SJRWMD	NGVD29
WPCB_0058-01_CP	Construction Drawings	September 2020	Lake of the Woods Retention Pond	162910	SJRWMD	NAVD88
WPCB_0059-01_SD	Survey Data	January 2017	Villa Tuscany; Formal Wetland Determination	148006	SJRWMD	NAVD88
WPCB_0061_RPT	Report	January 2021	Lake Forest Basin	N/A	CWP	NAVD88
WPCB_0057-01_CP	Construction Drawings	September 2005	Downtown Maitland Master Stormwater Facility	91505	SJRWMD	NGVD29

2.2 Field Reconnaissance and Site Observations

Field reconnaissance was conducted in December & January of 2023 & 2024. The purpose of the reconnaissance was to observe site conditions, as well as investigate areas with missing or suspect data.

Section 3

Existing Conditions Analysis

SAI-Halff developed a hydrologic and hydraulic (H&H) computer model to simulate the rainfall runoff process. Rates and volumes of stormwater runoff were determined for nine (9) synthetic storm events, which included five (5) 24-hour storms, two (2) 6-hour storms, and two (2) 96-hour storms. Hurricane Ian was also simulated, which was used to verify the model results. The specific storm events simulated are presented in **Section 3.3**. StormWise (Version 4.08.02), formerly known as ICPR4, was used for all H&H calculations. The existing conditions stormwater model developed was used to evaluate the current flooding locations and extents within the project area.

3.1 Vertical Datum

All deliverables for this project are based on the NAVD88 vertical datum. Any data utilized for this project which were referenced to NGVD29 were converted to NAVD88. The following conversion factor was used as necessary for this project:

Elevation in NAVD88 = Elevation in NGVD29 – 0.98 ft

This conversion factor is the average conversion factor for the Howell Creek Watershed determined by FEMA for the FIS conducted in 2009.

3.2 Base Models

An existing stormwater model for the Howell Creek watershed was available in ICPR Version 3.02. This model is the FEMA-effective Howell Creek model and was developed by CDM Smith in 2011 (referred to herein as the HC2011 model). This model was converted to StormWise and was used as the starting point for developing the existing conditions stormwater model.

Based on the CWP limits and known flooding concerns within the Central Basin, SAI-Halff defined an area within the overall HC2011 model to review and refine to better evaluate the drainage characteristics. Part of this refinement effort included incorporating the Community Redevelopment Agency (CRA) ICPR4 model, developed by Geosyntec in 2020 (referred to herein as the CRA2020 model). A small region within the CRA2020 model was modeled using two-dimensional surface flow (2D); SAI-Halff converted this 2D region to one-dimensional surface flow (1D). The 2D region was converted to 1D for consistency purposes. Beyond this conversion, the CRA2020 model was incorporated as-is, with limited exceptions.

The area of the HC2011 model updated by SAI-Halff is referred to as the CB2024 model, while the combined CB2024 and CRA2020 refinement area is referred to as the Focus Area. Meanwhile, the overall model area is referred to as the Study Area. H&H data outside of the Focus Area were left as-is from the HC2011 model, with limited exceptions. A map depicting the extents of the HC2011, CRA2020, and CB2024 model areas is included as **Figure 3.1**. To summarize:

- HC2011: Howell Creek model (CDM Smith 2011)
- CRA2020: Community Redevelopment Agency model (Geosyntec 2020)
- CB2024: Central Basin model (SAI-Halff 2024)
- Focus Area: Central Basin refinement area; includes CRA2020 and CB2024
- Study Area: Overall model area; includes CRA2020, CB2024, and as-is areas from HC2011

3.3 Hydrologic Data Development

The Focus Area is comprised of 325 basins, with 137 basins from SAI-Halff's refinement efforts and 188 basins from the CRA2020 model. A total of 224 basins outside of the Focus Area were taken as-is from the HC2011 model.

Basins within the Focus Area were delineated using infrastructure, construction plans, and USGS terrain data (LiDAR, 2018). **Figure 3.2** demonstrates the existing conditions nodal network within the overall study area, while **Figure 3.3** demonstrates the nodal network within the Focus Area.

StormWise manual basin features were used for hydrologic modeling in the Focus Area, including calculation of Green-Ampt parameters (GA) within the StormWise program. Basins taken from the HC2011 model were included as simple basins with weighted NRCS curve numbers (CN).

For consistency purposes, all manual basins within the model were recalculated using GA parameters. GA are dependent on the landuse and soil conditions within each basin. Landuse information was obtained from SJRWMD and updated as needed based on the 2018 aerials. Soils information was obtained from NRCS. Landuse and Soils maps are provided as **Figures 3.4** and **3.5**, respectively.

Rainfall volumes used for the synthetic storm events were based on NOAA Atlas-14 rainfall amounts; total rainfall volumes for each respective storm event are listed below:

Storm Event	Rainfall [in]
2-Year 24-hour	4.28
10-Year 24-hour	6.13
25-Year 24-hour	7.57
100-Year 24-hour	10.2
500-Year 24-hour	14.0
10-Year 6-hour	4.66
25-Year 6-hour	5.5
25-Year 96-hour	10.6
100-Year 96-hour	14.3

Hurricane Ian was simulated using hourly Next Generation Weather Radar (NEXRAD) rainfall data, obtained from the SJRWMD.

3.4 Hydraulic Data Development

Node and link data were developed based on field reconnaissance information, construction documents, and data provided by the CWP.

Stage/Area relationships were calculated at storage nodes representing low lying areas, wetlands, ponds, and lakes. Stage/Area relationships were derived from the delineated basins and LiDAR. Channel storage was excluded from these calculations as necessary to meet requirements of the StormWise program.

A total of 20 Time/Stage nodes were included in the model, which were used to represent the connection to external features, such as Lake Jesup and groundwater. Percolation and drainwells were modeled with these groundwater Time/Stage nodes; all data related to the percolation links, and most of the drainwells were taken as-is from their respective model. Several drainwells located within the CB2024 area were revised or added to the model.

Node initial conditions (i.e., initial stages) outside of the Focus Area were taken as-is from the HC2011 model, with limited exceptions. A similar approach was taken within the Focus Area, with initial stages from the CRA2020 model taken as-is, with limited exceptions. For the remaining nodes within the Focus Area, initial stages were reviewed and revised based on best available data, such as seasonal high-water elevations (SHWE) where available. Historic water surface elevations (WSE) obtained from the Orange and Seminole County Water Atlases were also used to set initial stages for numerous lakes throughout

the Central Basin, including the Chain of Lakes, and were based on the average WSE during the peak wet season (July to Sept.).

3.5 Existing Conditions Model Results

Model results indicate structure flooding, as well as lot and street flooding throughout the CWP. The flood control design alternatives developed for this study are focused on the closed-basin lakes, consequently, they were evaluated separately from the rest of the Central Basin. As such, model results at the closed-basin lakes and the rest of the Central Basin are discussed separately; the closed-basins results are presented below, while results for the rest of the Central Basin are discussed in **Section 3.6**.

Closed-Basin Lakes

- Lake Knowles: Results indicate several streets are inundated during extreme storm events, including Lake Knowles Cir, Temple Dr, and Via Salerno. The basis of flooding was the lowest road crown elevation in the Lake Knowles basin (81.2-feet), obtained via terrain data along Lake Knowles Cir. With a peak stage of 82.7-feet during the 500-year, 24-hour storm, the depth of flooding is 18.0-inches.
- Lake Sylvan: Results indicate lot flooding during extreme storm events, but no street or structure flooding. The basis of flooding was the lowest FFE in the Lake Sylvan basin (76.1-feet), obtained from the CWP. With a peak stage of 74.1-feet during the 500-year, 24-hour storm, the WSE within Lake Sylvan is 24.0-inches below the LOS elevation.
- Lake Chelton: Results indicate no lot, street, or structure flooding during extreme storm events. The basis of flooding was the lowest road crown elevation in the Lake Chelton basin (87.1-feet), obtained via terrain data along Chelton Cir. With a peak stage of 84.2-feet during the 500-year, 24-hour storm, the WSE within Lake Chelton is 34.8-inches below the LOS elevation.
- Lake Grace: Results indicate lot and structure flooding during extreme storm events. The basis of flooding was the lowest FFE in the Lake Grace basin (104.5-feet), obtained from the CWP. With a peak stage of 104.6-feet during the 500-year, 24-hour storm, the depth of flooding is 1.2-inches.
- Lake Forest: Results indicate lot flooding during extreme storm events, but no street or structure flooding. The basis of flooding was the lowest FFE in the Lake Forest basin (105.0-feet), estimated via terrain data. With a peak stage of 104.7-feet during the 500-year, 24-hour storm, the WSE within Lake Forest is 3.6-inches below the LOS elevation.

Table 3.1 presents the maximum predicted stages and flood depths at key nodes within the Focus Area.

Level pool floodplains were developed for each modeled storm event to demonstrate the predicted flood extents under existing conditions and are provided as **Figures 3.6a-3.6k**.

The StormWise input data and results for the existing conditions model can be found in **Appendix E.**

3.6 Level of Service Analysis

An LOS analysis of buildings and roads was performed to evaluate flooding during the synthetic storm events throughout the Central Basin. The Focus Area and the CWP limits were used to determine which features to include in the analysis, though some buildings and roads outside of the CWP limits were included to provide a buffer. The LOS analysis methodology and the findings of the evaluation are presented below.

Building LOS

Building footprint polygons were obtained from Microsoft and served as the basis of the LOS analysis. The buildings were reviewed at high-level and certain inappropriate buildings were excluded from the analysis

(e.g., boat houses). A total of 9,792 buildings were included in the analysis, which included a mix of residential, commercial, institutional, and recreational structures.

The FFEs were estimated through the building polygons and the project's terrain data. First, an average ground surface elevation (GSE) was calculated for the area within each building polygon. The FFE was then estimated based on an assumed distance (i.e., offset) above the average GSE. An offset of 1 ft was used, which is consistent with standard LOS methodology.

Estimated FFE = Building Average GSE + 1 ft

The estimated FFEs were compared to known FFEs from construction documents or provided by the CWP. The known FFEs were as much as ± 1 ft above/below the estimated FFEs, though the average difference was about + 0.1 ft. However, the + 1 ft offset was kept due to relatively small number of known FFEs, and the overstated peak stages from the model (discussed in **Section 3.7**).

The number of inundated structures during each storm event are listed below:

Storm Event	Number of Inundated Structures
2-Year 24-hour	0
10-Year 24-hour	2
25-Year 24-hour	15
100-Year 24-hour	64
500-Year 24-hour	125
10-Year 6-hour	2
25-Year 6-hour	16
25-Year 96-hour	36
100-Year 96-hour	89

The results of the LOS analysis, including the buildings and roads inundated during each storm event, are provided as **Figures 3.7a-3.7i**.

Building LOS Limitations: While considered to be a reasonable high-level LOS evaluation, there are several limitations to building LOS methodology to note.

- The building use type (e.g., residential, commercial), and the building size were not considered in the analysis; all buildings were evaluated using the same methodology.
- Due to the high-level nature of the LOS analysis, certain inappropriate buildings (e.g., unimproved detached garage, sheds) were likely included in analysis.

Roadway LOS

Road centerlines were obtained from the CWP and served as the basis of the LOS analysis. The centerlines in the vicinity of key project areas were revised as needed based on aerial imagery and terrain data. The road centerlines were split into 25 ft segments and intersected with the basins to associate a node with each segment. A total of 29,320 road segments were included in this analysis.

The GSE along each road segment was extracted to determine the minimum elevation for each segment. The minimum elevation of each segment was used to represent the entire 25 ft segment and served as the basis for road inundation. Roads were only considered to be inundated if the peak stage exceeded the road crown; inundation of only the curb/right-of-way did not flag the road segment as inundated.

The total length of inundated roads during each storm event are listed below:

Storm Event	Length of Inundated Road [ft]
2-Year 24-hour	7,425
10-Year 24-hour	23,950
25-Year 24-hour	37,375
100-Year 24-hour	51,300
500-Year 24-hour	86,675
10-Year 6-hour	31,275
25-Year 6-hour	42,500
25-Year 96-hour	44,600
100-Year 96-hour	70,650

The results of the LOS analysis, including the buildings and roads inundated during each storm event, are provided as **Figures 3.7a-3.7i**.

Road LOS Limitations: While considered to be a reasonable high-level LOS evaluation, there are several limitations to roadway LOS methodology to note.

- Inundation depths were not considered, meaning no differentiation was made between roads inundated by several feet vs. tenths of an inch. Similarly, inundation durations were not considered, with no differentiation between roads inundated for hours vs. minutes.
- Roadway types were not considered, with no differentiation made between minor dead-end residential roads vs. major arterial roads.
- Several factors contribute to overestimation of the total inundated road lengths, including double counting at intersections where more than one road centerline intersects; segments with a single point below the peak stage, flagging the entire 25 ft segment; and overstated model stages (discussed in **Section 3.7**).
- While most of the road centerlines generally align with the road crown, some centerlines are offset from the road crown, or even from the roadway itself. In other instances, the centerline aligns with a raised median, resulting in road segment minimum elevations set higher than they should be.

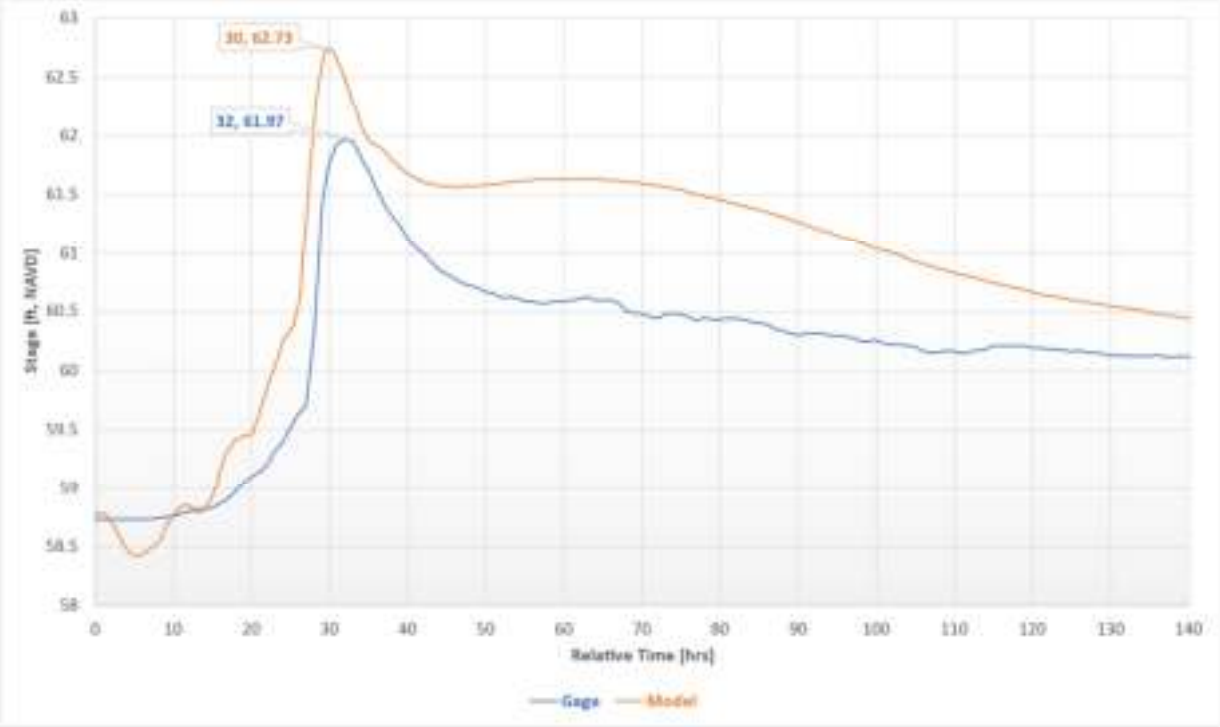
3.7 Model Calibration and Verification

NEXRAD rainfall data were used to simulate Hurricane Ian, serving as the basis for model calibration and verification. Hurricane Ian flood data were available at several locations throughout the Central Basin, including:

- A USGS gage within Howell Creek at Lake Howell Rd (gage: 02234308), downstream of the Chain of Lakes;
- Photographs of flooding during Ian at areas upstream of the Chain of Lakes and at a closed-basin lake, provided by the CWP; and
- Flood depth measurements taken during Ian, provided by a resident living adjacent to Lake Virginia.

The flood data at these locations were compared to Hurricane Ian simulation results to facilitate calibration and verification of the model. The comparisons at the various locations are presented below.

Exhibit 3.1: Hurricane Ian WSE Comparison – USGS Gage vs. Model



- Time is relative to the start of Hurricane Ian (9/28/2022 at 12:00am)

Location 1 – USGS Gage: A comparison between the gage WSEs and model stages (node: HC-0065) is presented in **Exhibit 3.1**. Model stages are shown to be higher than the gage throughout the simulation, with the modeled peak stage about 0.76 ft higher than the gage. However, the time to peak and drawdown characteristics generally align, suggesting decent correlation with the model.

Exhibit 3.2: Fawsett Rd Along Lake Sue (9/29/22)

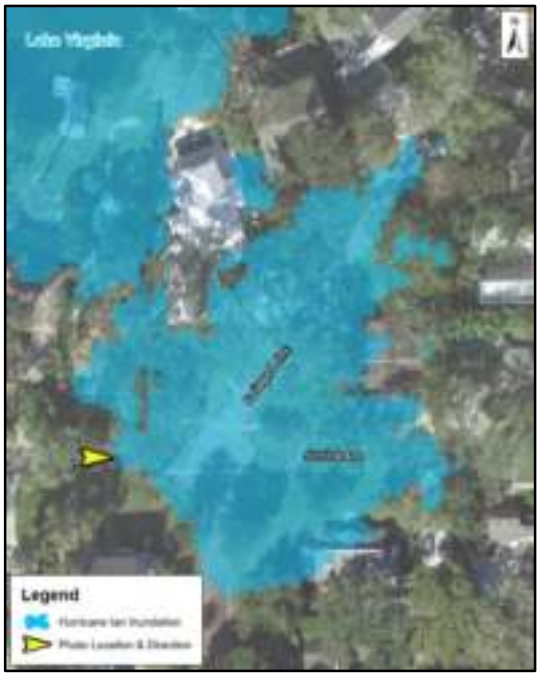




Location 2 – Fawsett Rd Flooding: **Exhibit 3.2** shows a comparison between photographed flooding along Fawsett Rd to the simulated Ian inundation area. While a peak stage is not clearly identifiable within the photo, the model shows inundation in the same area of the photo, suggesting good correlation with the model.

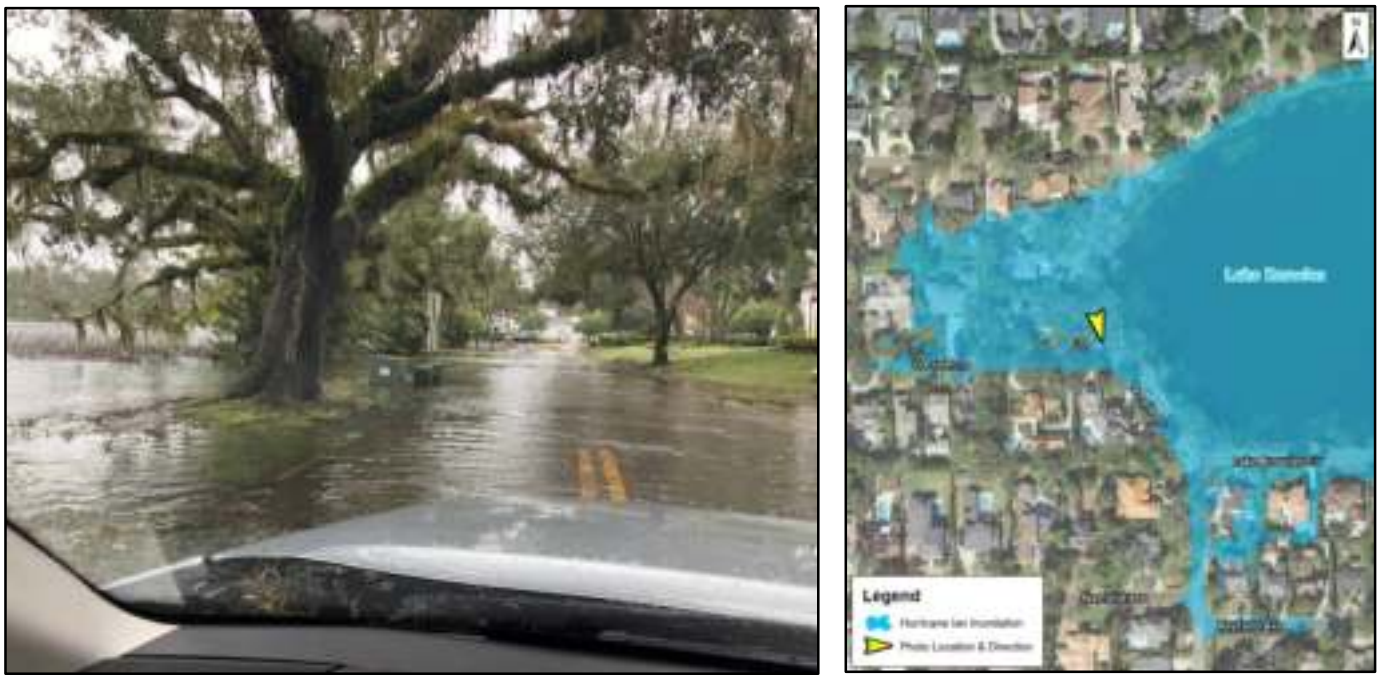
Exhibit 3.3: Stirling Ave at College Point (9/29/22)





Location 3 – Stirling Ave Flooding: **Exhibit 3.3** shows a comparison between photographed flooding along Stirling Ave at College Point to the simulated Ian inundation area. Based on the photo, the peak flood stage was estimated at 68.8 ft. The node at this location (LV-0160) had a simulated flood stage of 69.2 ft, about 0.4 ft above the photo-estimated flood stage. While the model shows a higher flood stage, it still suggests good correlation with the model, as the discrepancy is consistent with the higher flood stages documented throughout the model.

Exhibit 3.4: Temple Dr at Via Salerno Along Lake Knowles (9/29/22)



Location 4 – Temple Dr at Via Salerno: **Exhibit 3.3** shows a comparison between photographed flooding along Temple Dr to the simulated Ian inundation area. Based on the photo, as well as discussion with the CWP, the peak flood stage was estimated at 82.2 ft. The node at this location (L_Knowles) had a simulated flood stage of 82.7 ft, about 0.5 ft above the photo-estimated flood stage. While the model shows a higher flood stage, it still suggests good correlation with the model, as the discrepancy is consistent with the higher flood stages documented throughout the model.

Location 5 – Flood Depth Measurements: Several flood depth measurements taken at a residence adjacent to Lake Virginia at various times during Ian, with the depths relative to a surveyed elevation. This information was used by SAI-Halff to estimate the measured stages during Ian. The node at this location had a simulated flood stage of 69.2 ft, about 0.3 ft above the estimated flood stage. While the model shows a higher flood stage, it still suggests good correlation with the model, as the discrepancy is consistent with the higher flood stages documented throughout the model.

Comparing the simulated Hurricane Ian results to the available flood data suggests a general agreement between the model and Hurricane Ian. While discrepancies were noted in the higher simulated peak stages, the discrepancy is consistent, with higher stages at all locations. Ultimately, this means the model overstates flood stages, producing more conservative results.

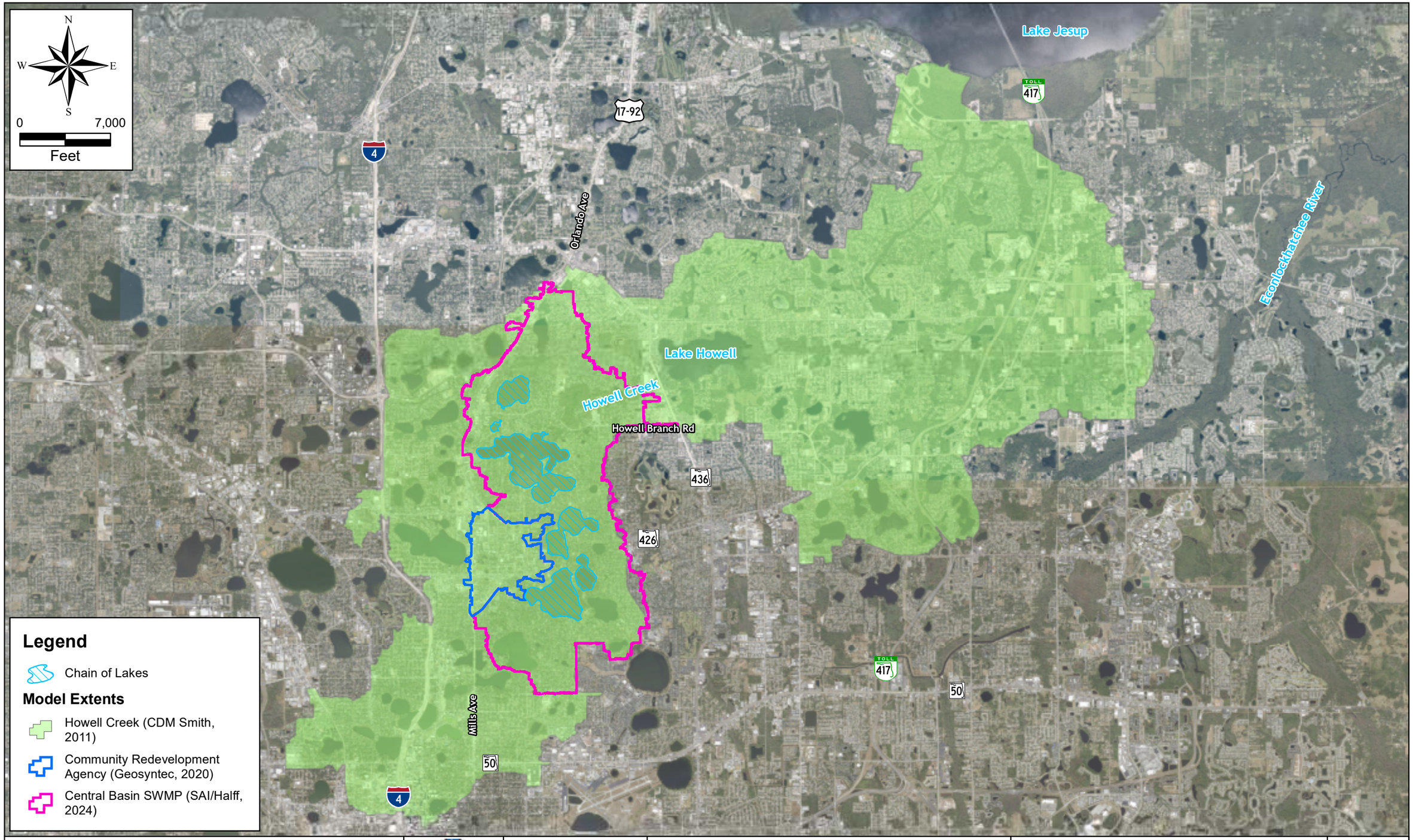
3.8 Ongoing Flood Control Projects

As discussed, the CWP experienced significant flooding during Hurricane Ian. To prepare for future storm events, the CWP subsequently initiated numerous flood control projects, one of which being this study. As of September 2024, several of these flood control projects have already been completed, with several others scheduled or in the planning phase. A brief description and status of these projects is presented in the table below. Meanwhile, the flood control design alternatives developed by SAI-Halff are presented in **Section 4**.

Project Status	Project Description
Completed	Outfall dredging in Lakes Maitland, Osceola, Berry, Knowles, Midget
	Dredging in the Venetian and Fern Canals
	Lake Knowles drainwell intake repair
	Dredging and stabilizing the 9th grade center pond
	Lake Sue Ave inlets
	Storm sewer pipe repair & lining - 456 Pointer Pl - Balmoral Rd - Pinetree Rd - 1129 Via Del Mar - 656 Interlachen Ave - Joeline Ct at Alexa Dr - 2631 Temple Dr
Planned or Scheduled	Howell Creek stabilization
	Palmer Ave at Old England Ave drainage improvements - Phase 1: Replace existing outfall pipe to Lake Maitland and retrofit with a new hydrodynamic separator for water quality improvements. Design complete, permit application in progress. - Phase 2: Three (3) new inlets and connecting pipes on Palmer Ave, between the intersections of Old England Ave and Lincoln Cir. - Phase 3: Seven (7) new inlets and connecting pipes on Palmer Ave, between the intersections of Old England Ave and Georgia Ave.
	Laurel Rd drainage improvements - Redesign of the existing conveyance and capture system to include new and additional inlets. A new outfall design is also being considered.
	Cherokee Ave inlet
	Storm sewer pipe repair & lining - Edgewater Ave from Sunset Dr to lake Knowles - Summerland Ave
	Stirling Bridge Replacement

Additionally, CWP Public Works is currently evaluating alternatives to purchase storm sewer camera equipment. This equipment would allow for improved infrastructure maintenance and repair through proper investigation of existing storm sewer systems.

The CWP has also adopted an Adaptive Flood Management Guide (October 2023), which outlines specific protocols and procedures for lake and flood management. This includes year-round procedures both during hurricane season and the off season. Procedures are also in place for activities before and after a major storm event, beginning seven (7) days prior to tropical activity impacting Central Florida. This document is included as **Appendix C.**



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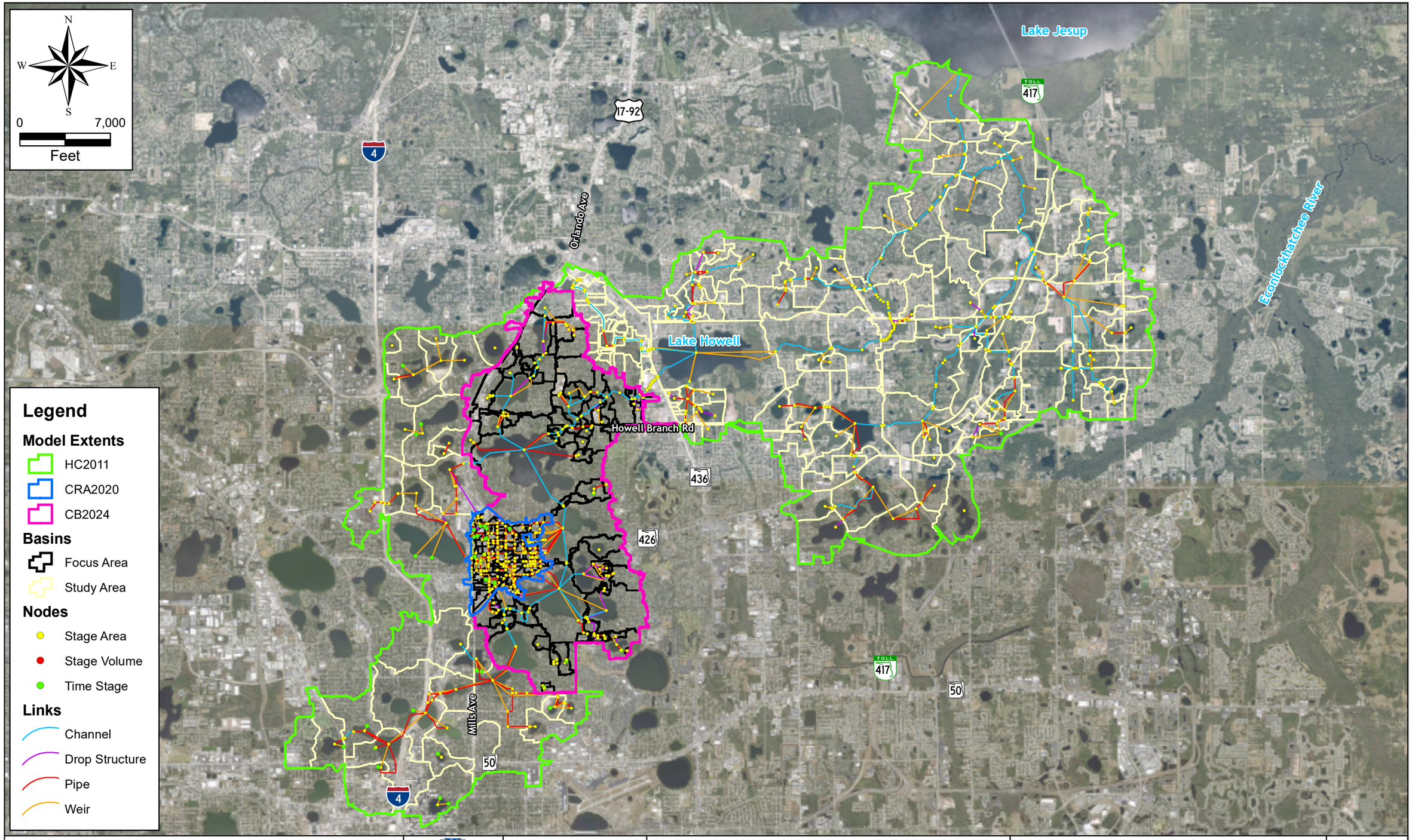
Sources:
Aerials:
2018 Orange County
2018 Seminole County

WINTER PARK CENTRAL BASIN STORMWATER MASTER PLAN

MODEL EXTENTS MAP

FIGURE: 3.1

Map Document: (K:\CITY\WinterPark\CtrlBasinWMP\GIS\Figures\05_DraftReport\3.1_ModelExtents.mxd)
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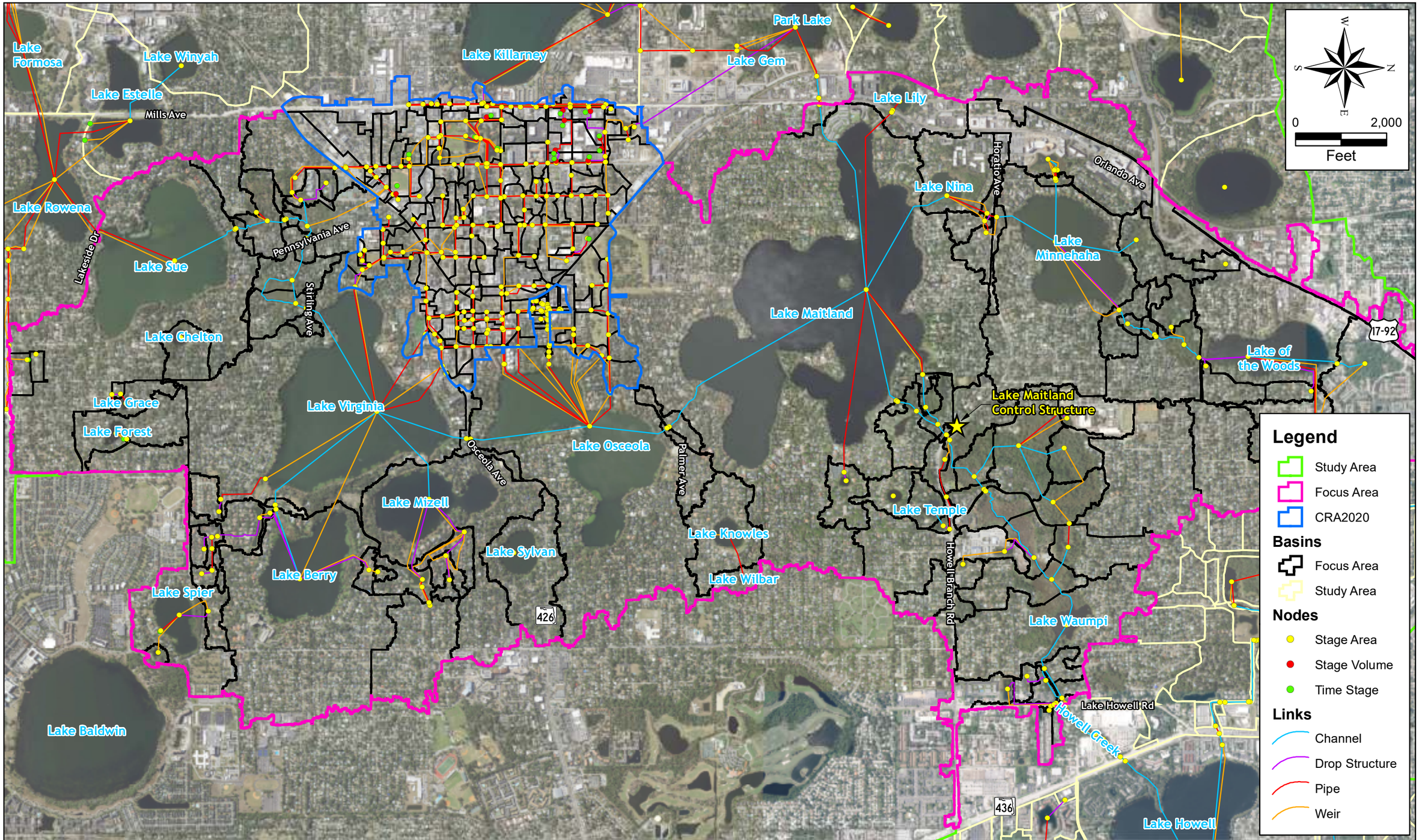
Sources:
Aerials:
2018 Orange County
2018 Seminole County

WINTER PARK CENTRAL BASIN STORMWATER MASTER PLAN

MODEL NETWORK STUDY AREA

FIGURE: 3.2

Map Document: (K:\CITY\WinterPark\CtrlBasinWMP\GIS\Figures\05_DraftReport\3.2_ModelNetwork_StudyArea.mxd)
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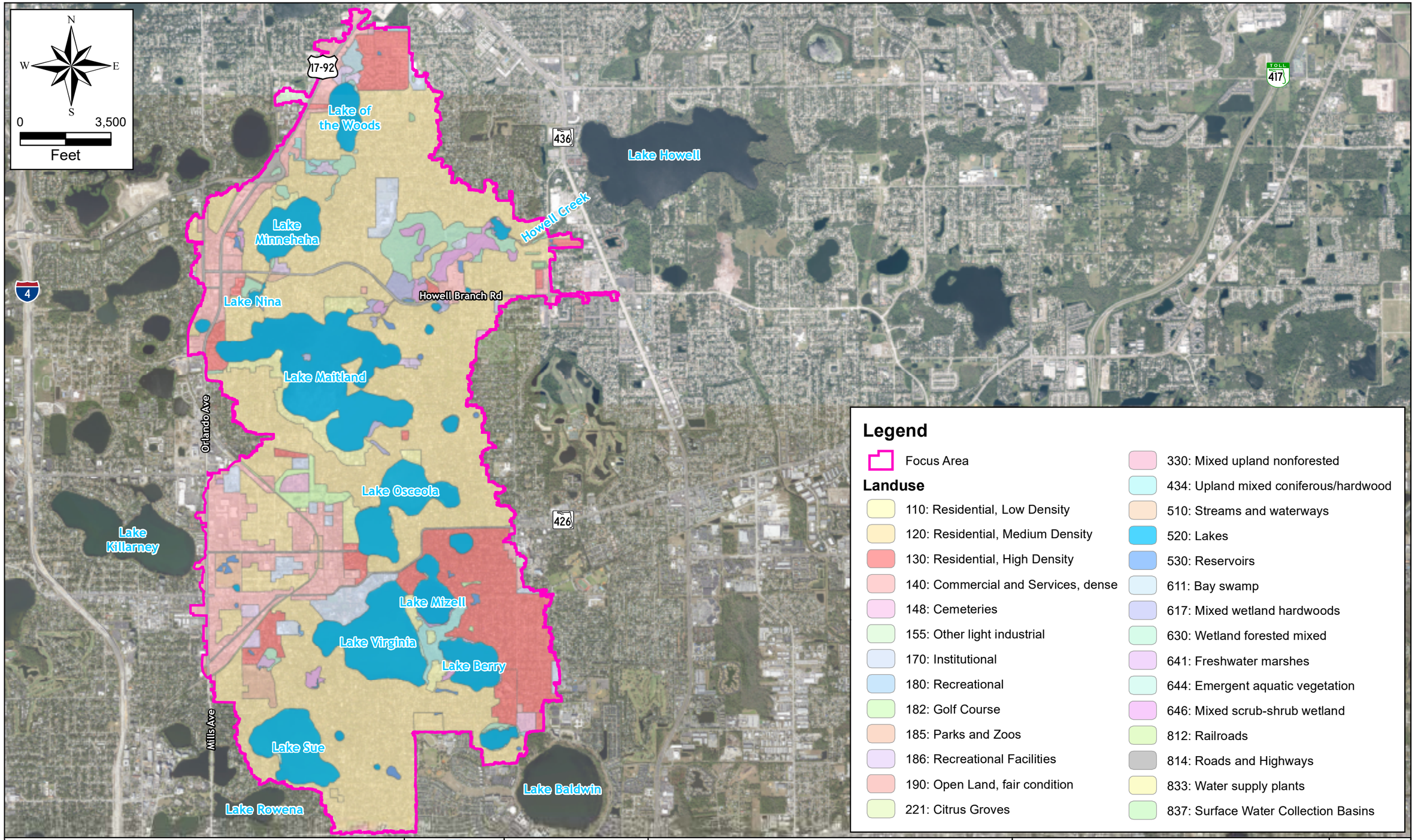
Sources:
Aerials:
2018 Orange County
2018 Seminole County

WINTER PARK CENTRAL BASIN STORMWATER MASTER PLAN

MODEL NETWORK FOCUS AREA

FIGURE: 3.3

Map Document: (K:\CITY\WinterPark\CtrlBasinWMP\GIS\Figures\05_DraftReport\3.3_ModelNetwork_FocusArea.mxd)
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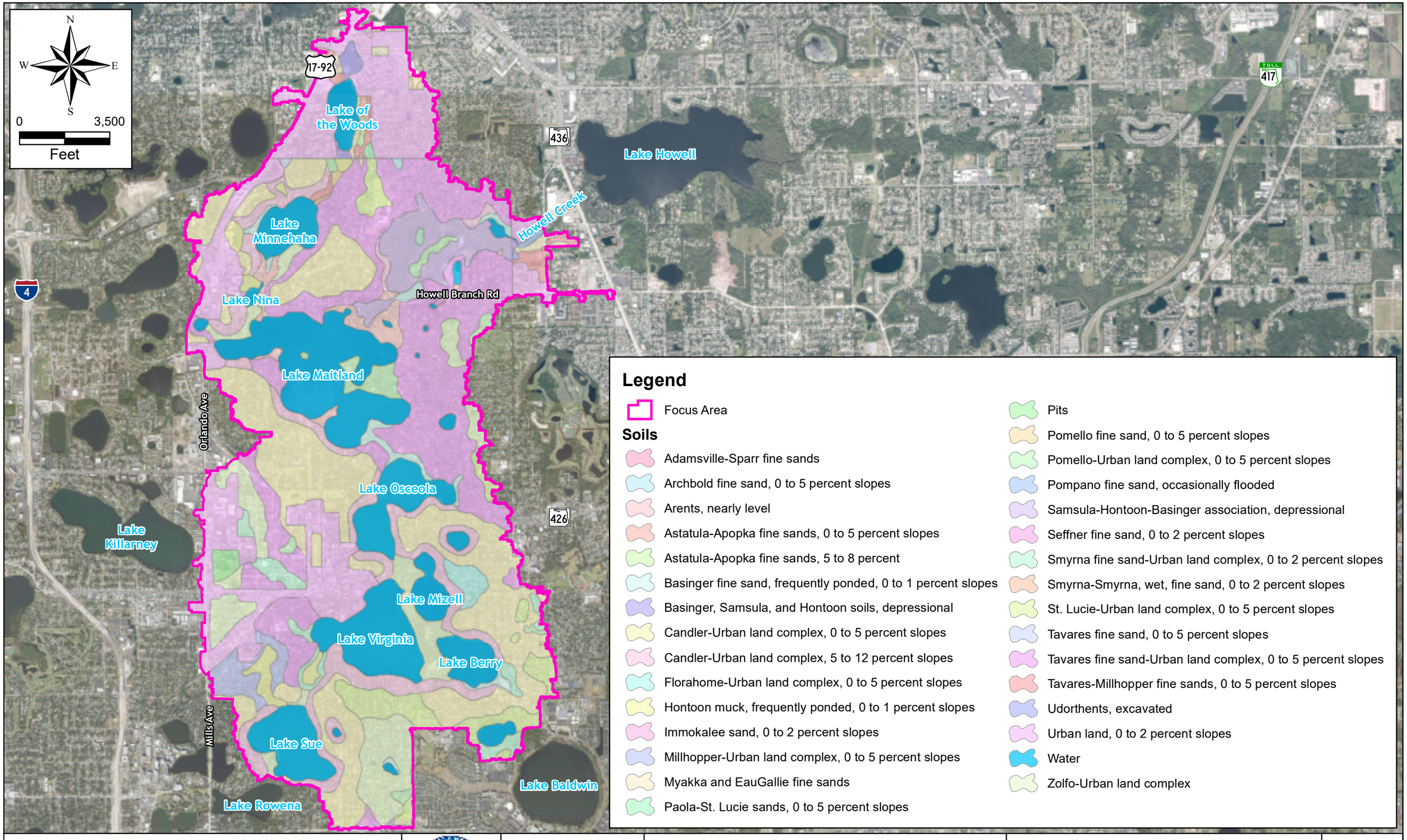
Sources:
Aerials:
2018 Orange County
2018 Seminole County
Landuse: 2009 SJRWMD

WINTER PARK CENTRAL BASIN STORMWATER MASTER PLAN

LANDUSE MAP

FIGURE: 3.4

Map Document: (K:\CITY\WinterPark\CtrlBasinWMP\GIS\Figures\05_DraftReport\3.4_Landuse.mxd)
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Legend

Focus Area

Soils

- Adamsville-Sparr fine sands
- Archbold fine sand, 0 to 5 percent slopes
- Arents, nearly level
- Astatula-Apopka fine sands, 0 to 5 percent slopes
- Astatula-Apopka fine sands, 5 to 8 percent
- Basinger fine sand, frequently ponded, 0 to 1 percent slopes
- Basinger, Samsula, and Hontoon soils, depressional
- Candler-Urban land complex, 0 to 5 percent slopes
- Candler-Urban land complex, 5 to 12 percent slopes
- Florahome-Urban land complex, 0 to 5 percent slopes
- Hontoon muck, frequently ponded, 0 to 1 percent slopes
- Immokalee sand, 0 to 2 percent slopes
- Millhopper-Urban land complex, 0 to 5 percent slopes
- Myakka and EauGallie fine sands
- Paola-St. Lucie sands, 0 to 5 percent slopes
- Pits
- Pomello fine sand, 0 to 5 percent slopes
- Pomello-Urban land complex, 0 to 5 percent slopes
- Pompano fine sand, occasionally flooded
- Samsula-Hontoon-Basinger association, depressional
- Seffner fine sand, 0 to 2 percent slopes
- Smyrna fine sand-Urban land complex, 0 to 2 percent slopes
- Smyrna-Smyrna, wet, fine sand, 0 to 2 percent slopes
- St. Lucie-Urban land complex, 0 to 5 percent slopes
- Tavares fine sand, 0 to 5 percent slopes
- Tavares fine sand-Urban land complex, 0 to 5 percent slopes
- Tavares-Millhopper fine sands, 0 to 5 percent slopes
- Udorthents, excavated
- Urban land, 0 to 2 percent slopes
- Water
- Zolfo-Urban land complex

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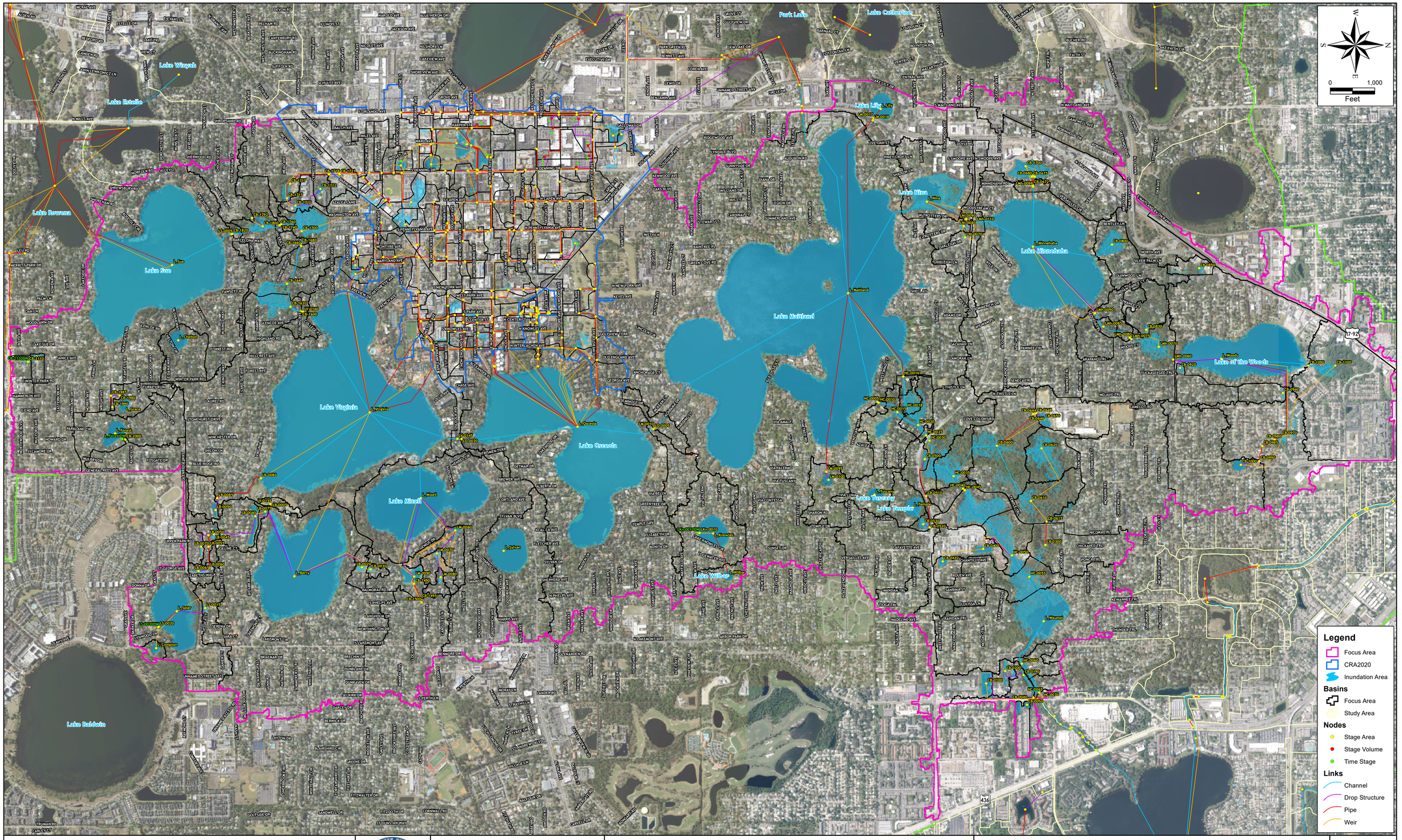
Sources:
Aerials:
2018 Orange County
2018 Seminole County
Soils: 2023 NRCS

WINTER PARK CENTRAL BASIN STORMWATER MASTER PLAN

SOILS MAP

FIGURE: 3.5

Map Document: (K:\CITY\WinterPark\CtrlBasinWMP\GIS\Figures\05_DraftReport\3.5_Soils.mxd)
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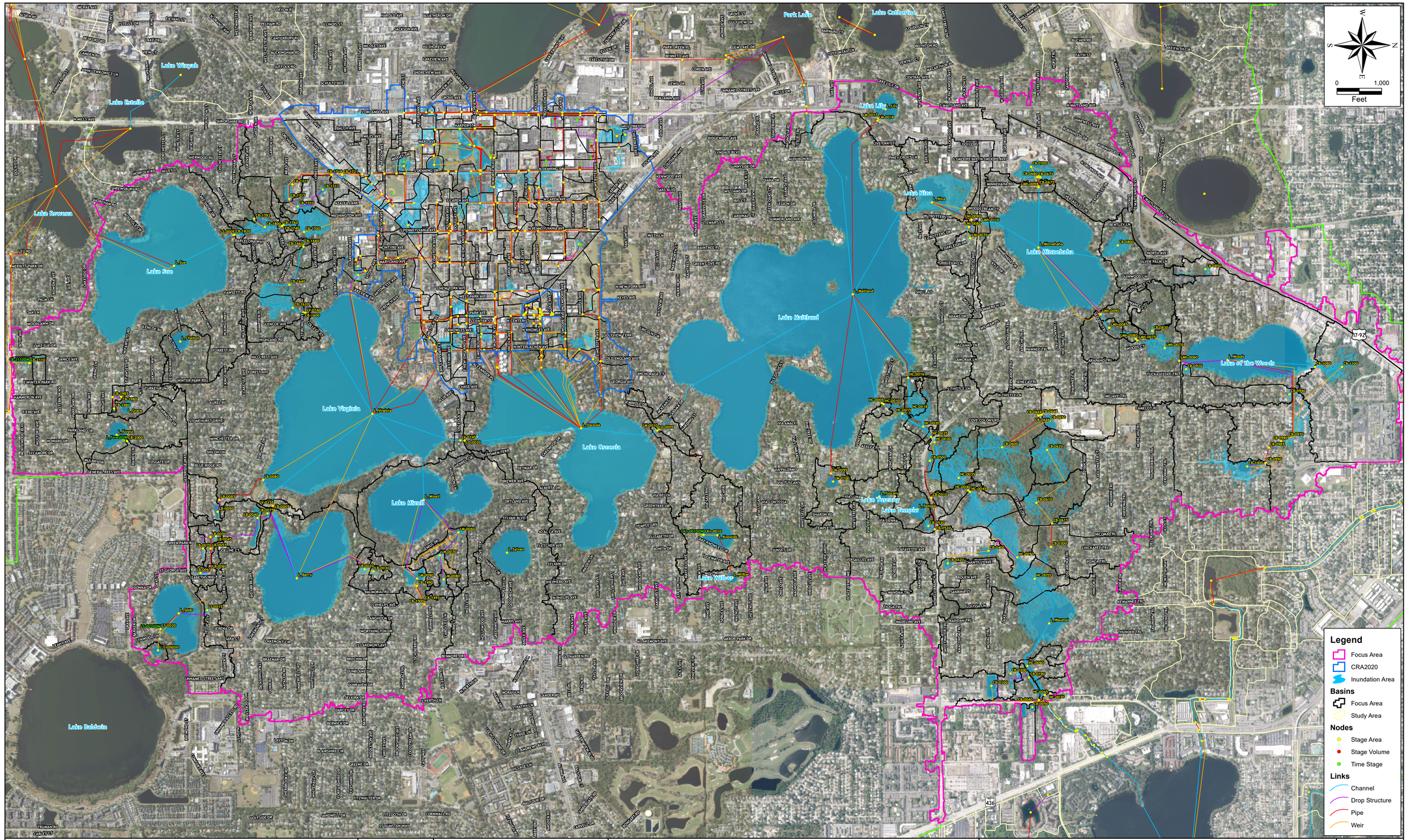
Sources:
Aerials:
2018 Orange County
2018 Seminole County

WINTER PARK CENTRAL BASIN STORMWATER MASTER PLAN

EXISTING CONDITIONS 2-YEAR 24-HOUR INUNDATION MAP

FIGURE 3.6a

Map Document: (K:\CITY\WinterPark\Ctrl\Basin\WMP\GIS\Figures\05_Draft\Report\GIS\3.6_InundationMap.mxd)
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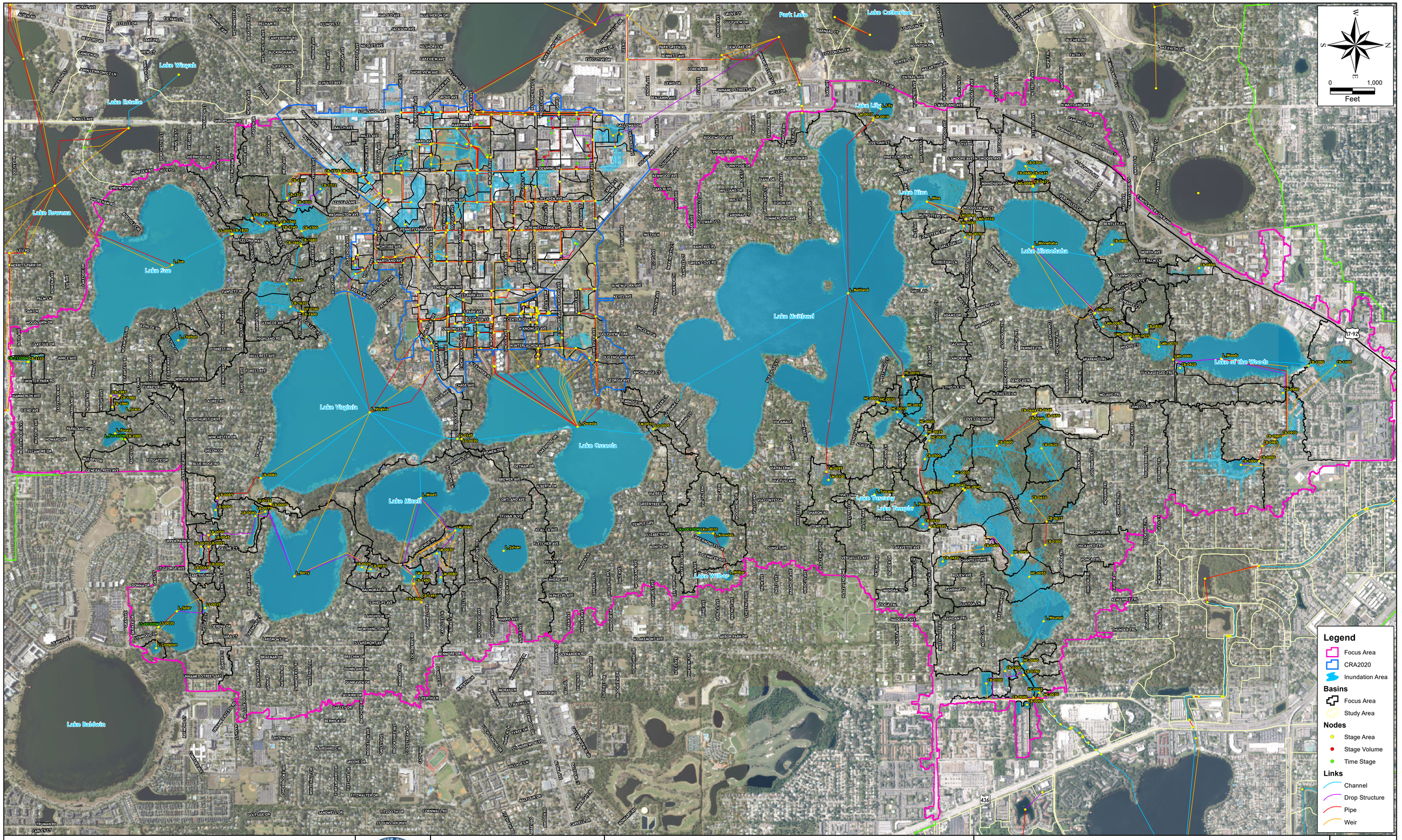
Sources:
Aerials:
2018 Orange County
2018 Seminole County

WINTER PARK CENTRAL BASIN STORMWATER MASTER PLAN

EXISTING CONDITIONS 10-YEAR 24-HOUR INUNDATION MAP

FIGURE 3.6b

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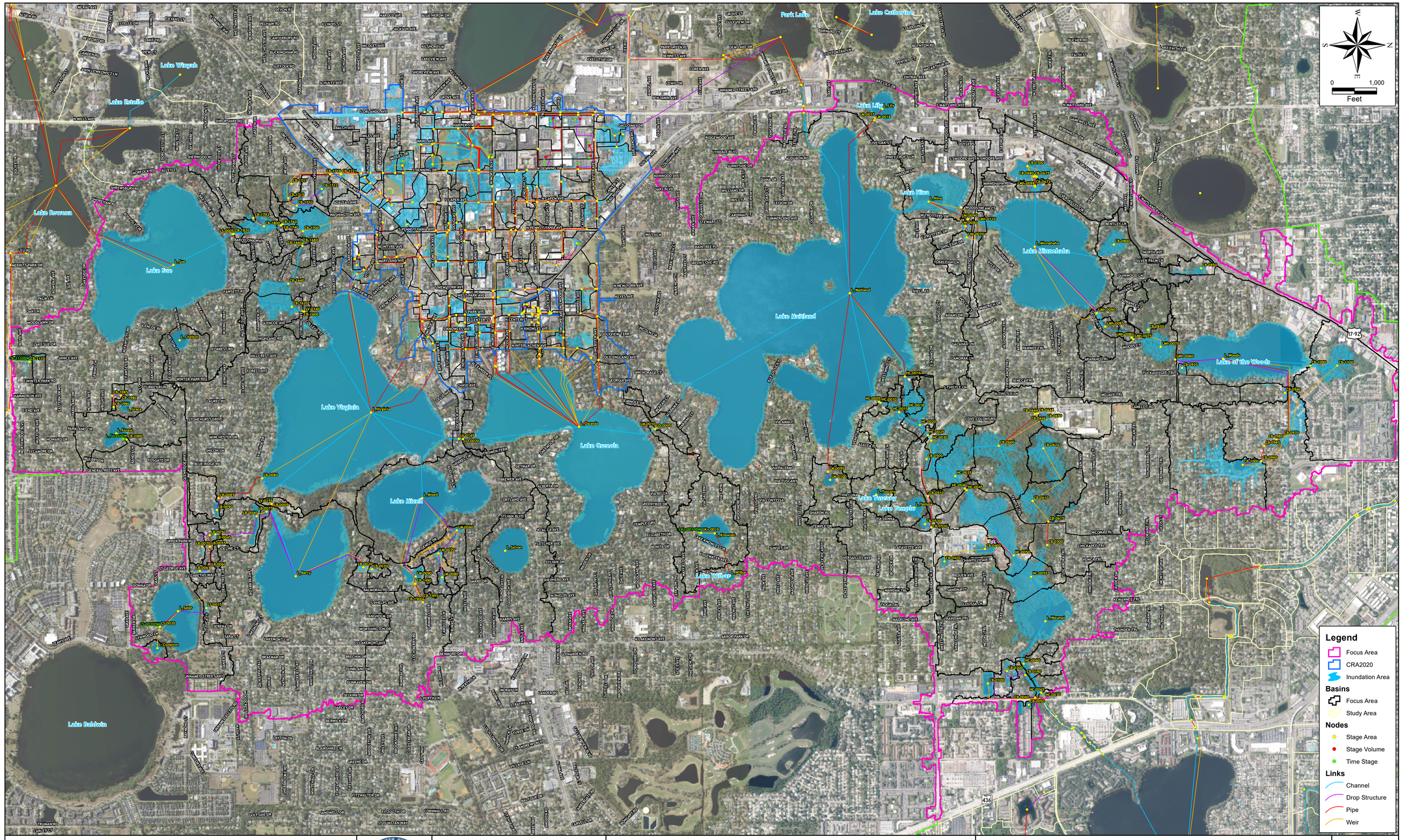
Sources:
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2018 Orange County
2018 Seminole County

WINTER PARK CENTRAL BASIN STORMWATER MASTER PLAN

EXISTING CONDITIONS 25-YEAR 24-HOUR INUNDATION MAP

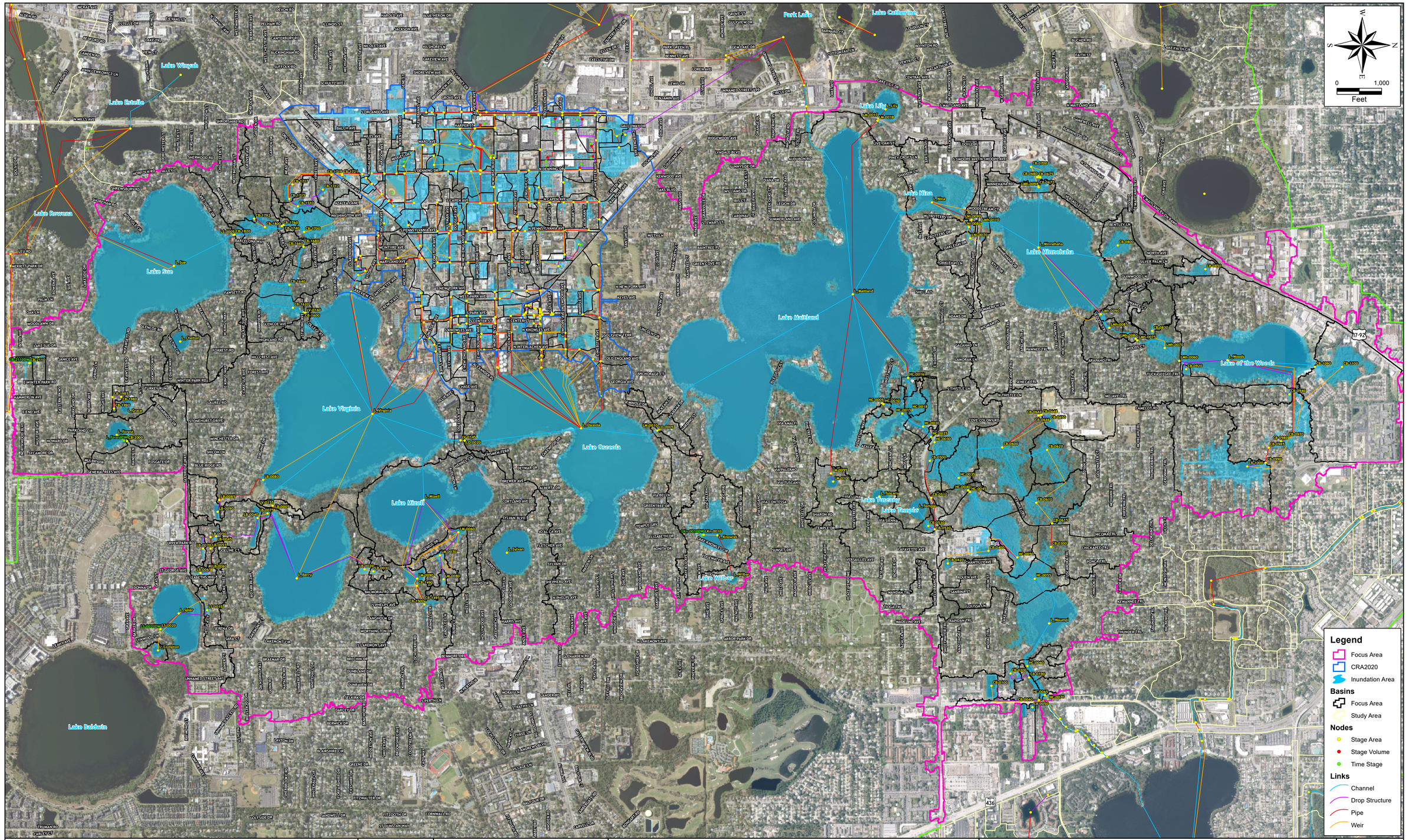
FIGURE 3.6c

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SINGHOFEN & ASSOCIATES INCORPORATED | halff	*Sources:* *Aerials:* *2018 Orange County* *2018 Seminole County*	**WINTER PARK CENTRAL BASIN STORMWATER MASTER PLAN**	**EXISTING CONDITIONS 100-YEAR 24-HOUR INUNDATION MAP**	**FIGURE 3.6d**

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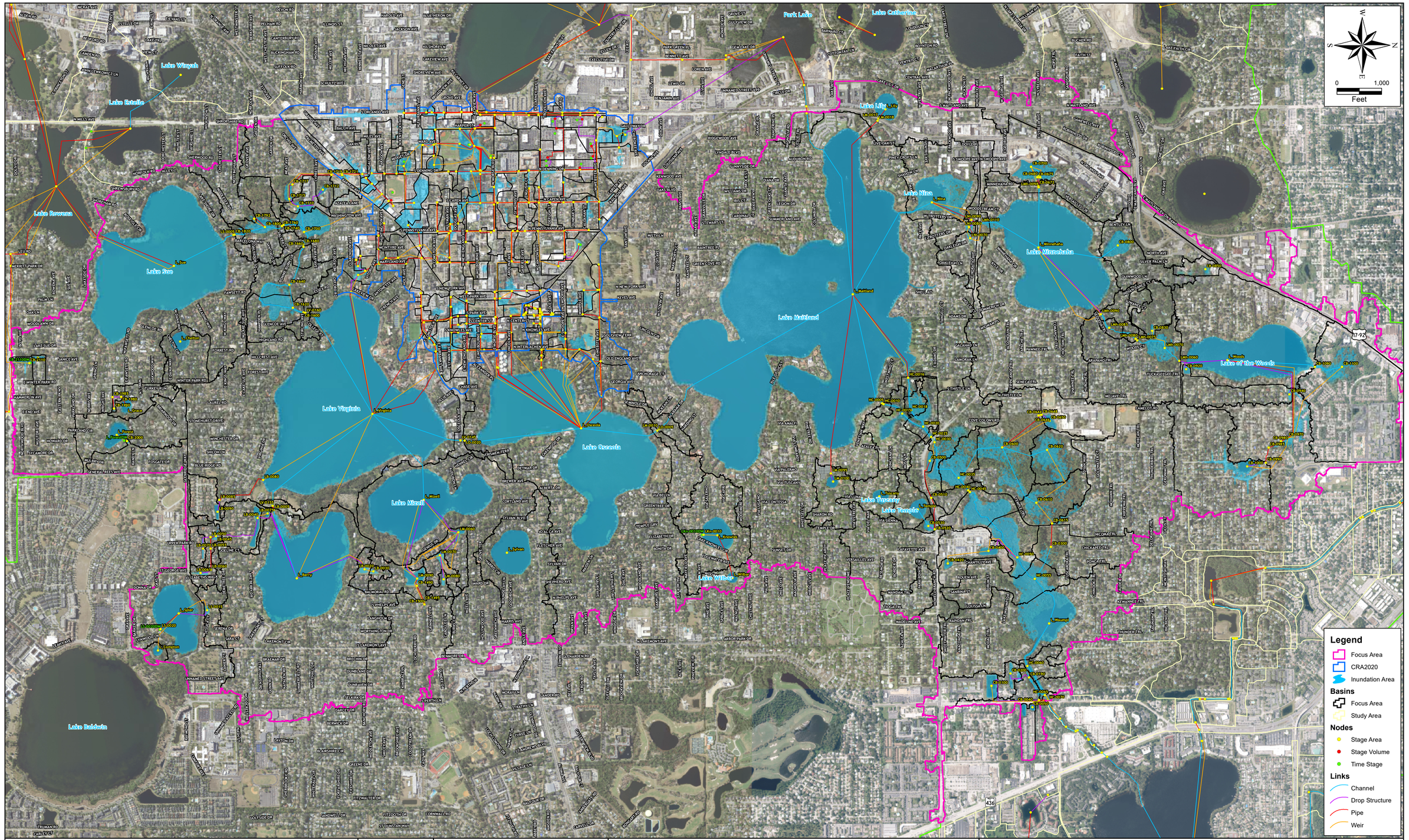
Sources:
Aerials:
2018 Orange County
2018 Seminole County

WINTER PARK CENTRAL BASIN STORMWATER MASTER PLAN

EXISTING CONDITIONS 500-YEAR 24-HOUR INUNDATION MAP

FIGURE 3.6e

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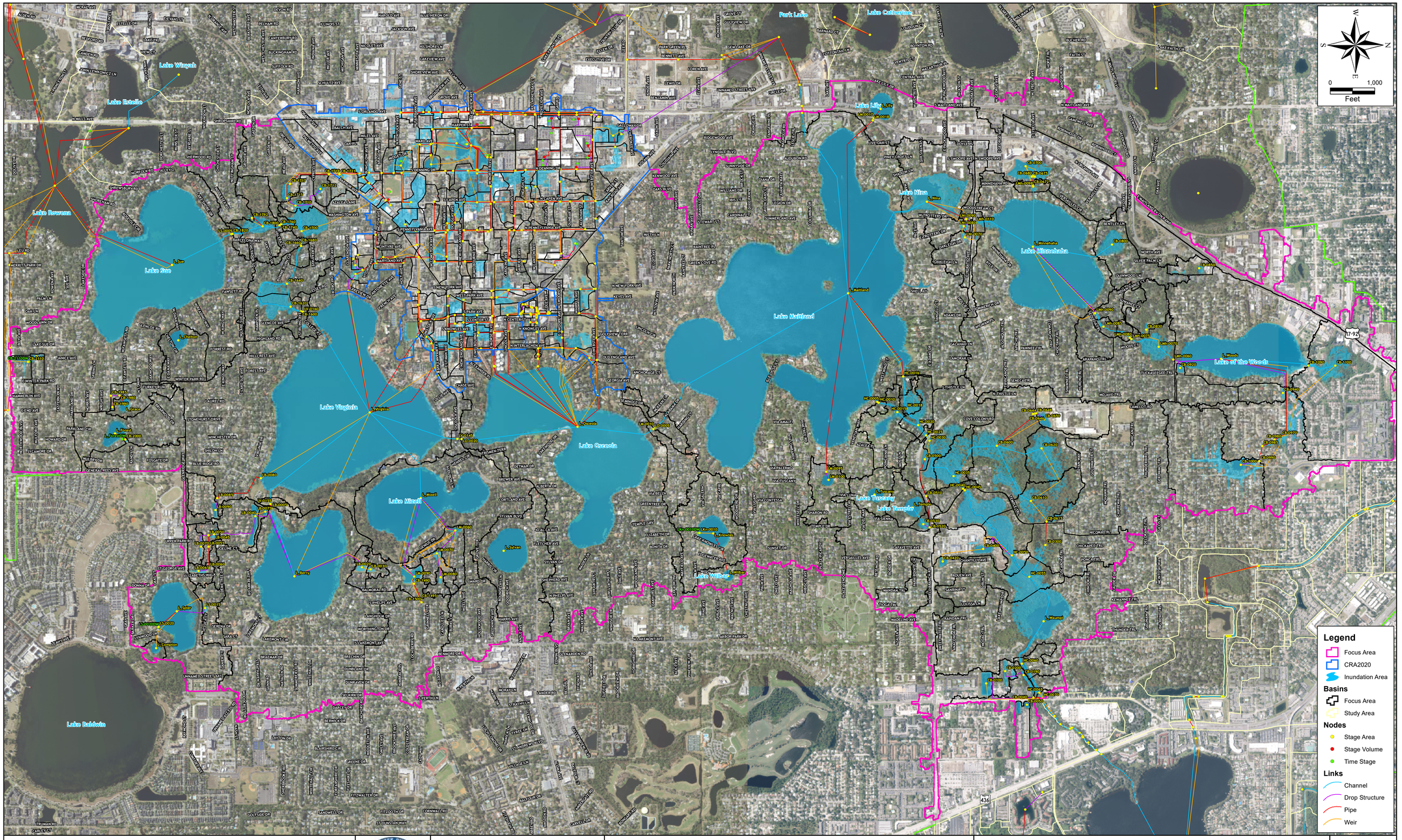
Sources:
Aerials:
2018 Orange County
2018 Seminole County

WINTER PARK CENTRAL BASIN STORMWATER MASTER PLAN

EXISTING CONDITIONS 10-YEAR 6-HOUR INUNDATION MAP

FIGURE 3.6f

Map Document: (K:\CITY\WinterPark\Civil\Basin\WMP\GIS\Figures\05_DraftReport\GIS\3.6_InundationMap.mxd)
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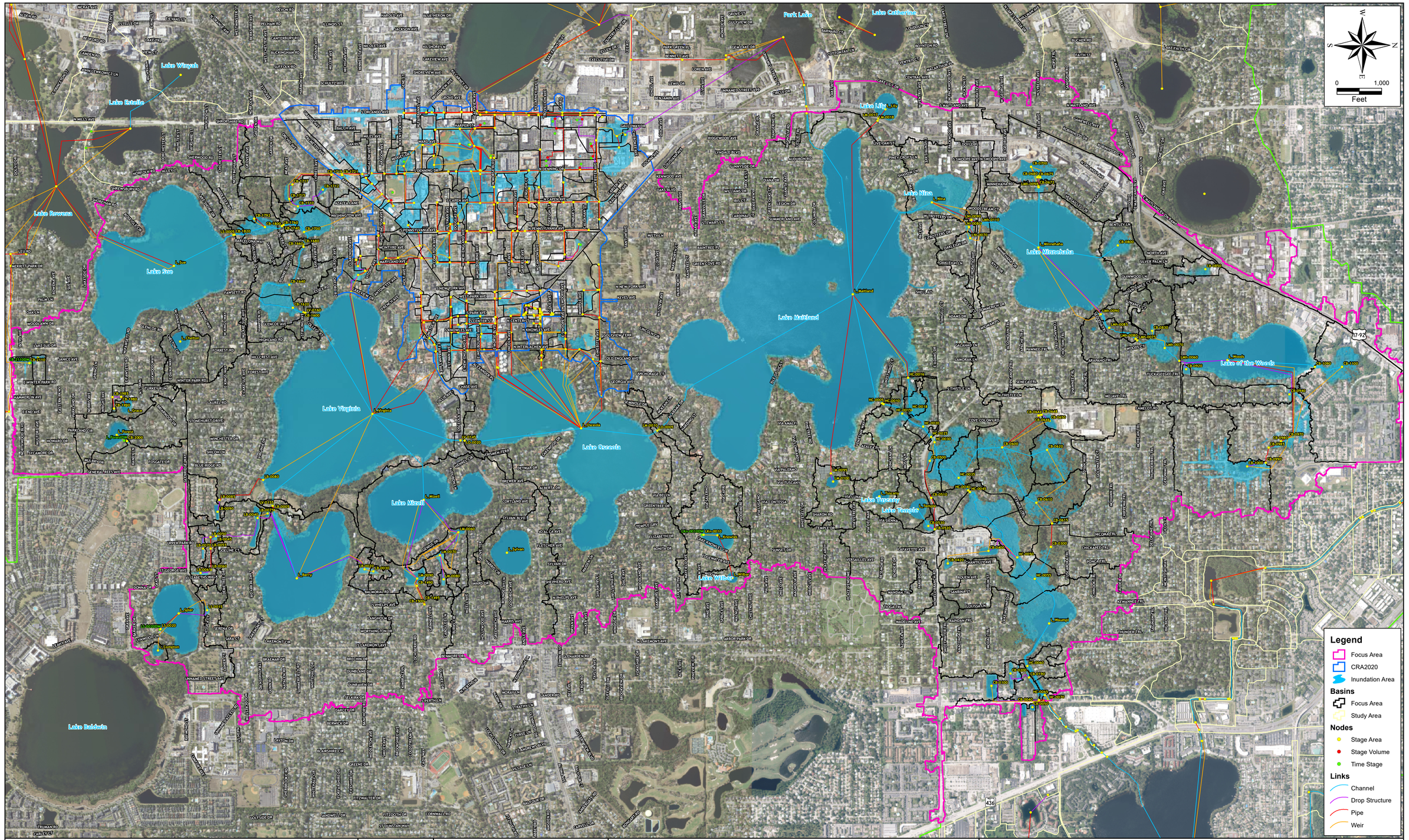
Sources:
Aerials:
2018 Orange County
2018 Seminole County

WINTER PARK CENTRAL BASIN STORMWATER MASTER PLAN

EXISTING CONDITIONS 25-YEAR 6-HOUR INUNDATION MAP

FIGURE 3.6g

Map Document: (K:\CITY\WinterPark\Civil\Basin\WMP\GIS\Figures\05_DraftReport\GIS\3.6_InundationMap.mxd)
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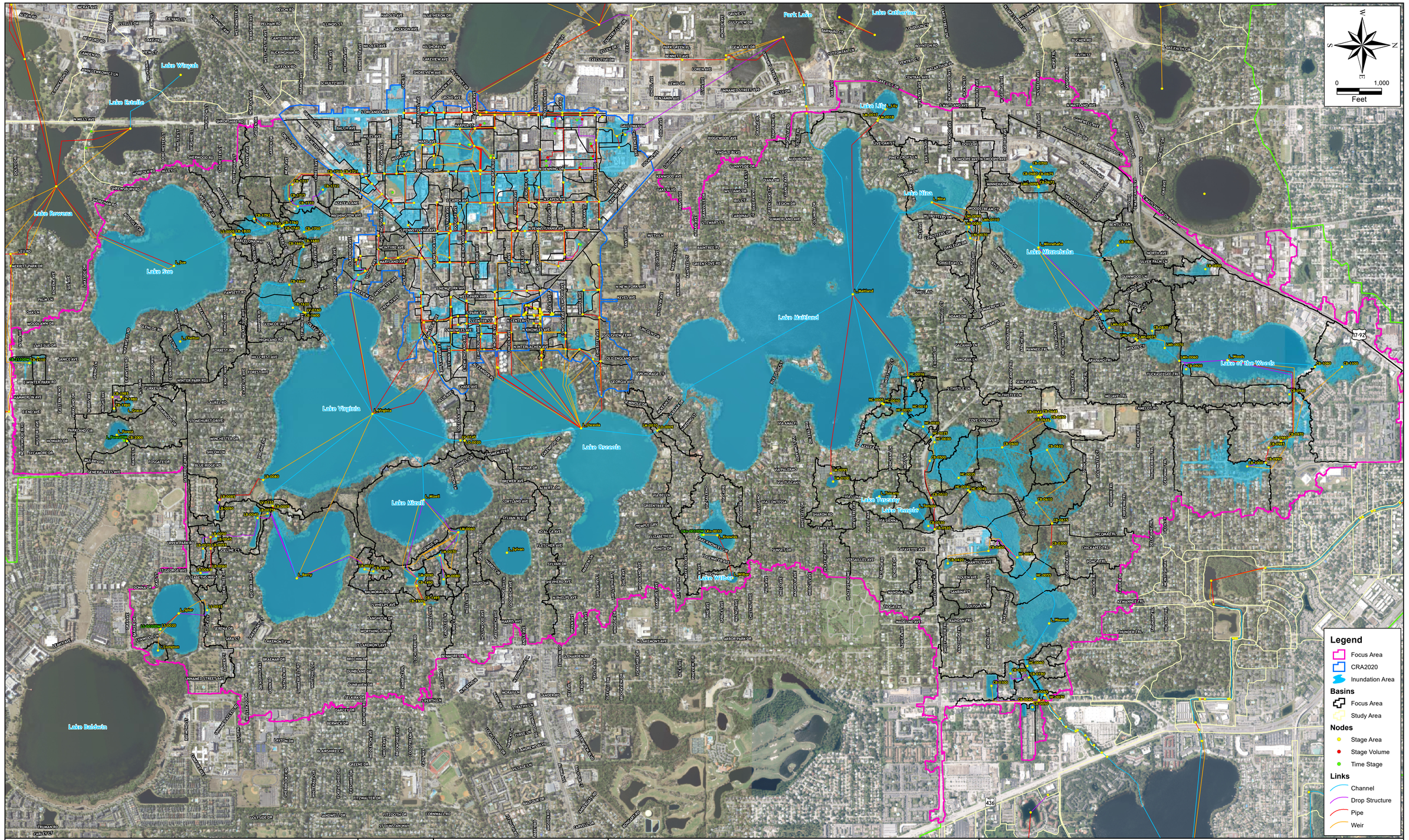
Sources:
Aerials:
2018 Orange County
2018 Seminole County

WINTER PARK CENTRAL BASIN STORMWATER MASTER PLAN

EXISTING CONDITIONS 25-YEAR 96-HOUR INUNDATION MAP

FIGURE 3.6h

Map Document: (K:\CITY\WinterPark\Civil\Basin\WMP\GIS\Figures\05_DraftReport\GIS\3.6_InundationMap.mxd)
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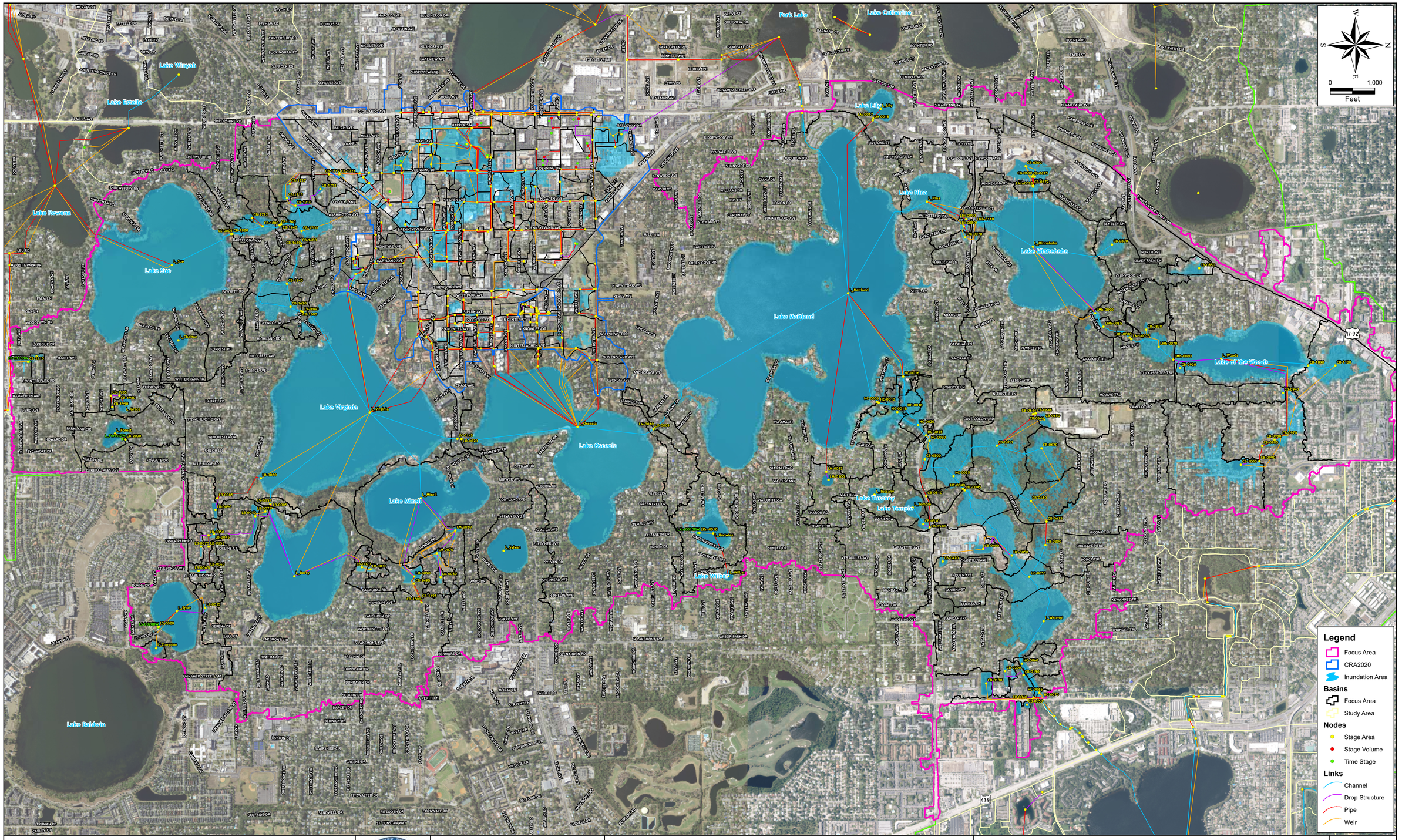
Sources:
Aerials:
2018 Orange County
2018 Seminole County

WINTER PARK CENTRAL BASIN STORMWATER MASTER PLAN

EXISTING CONDITIONS 100-YEAR 96-HOUR INUNDATION MAP

FIGURE 3.6i

Map Document: (K:\CITY\WinterPark\Civil\Basin\WMP\GIS\Figures\05_DraftReport\GIS\3.6_InundationMap.mxd)
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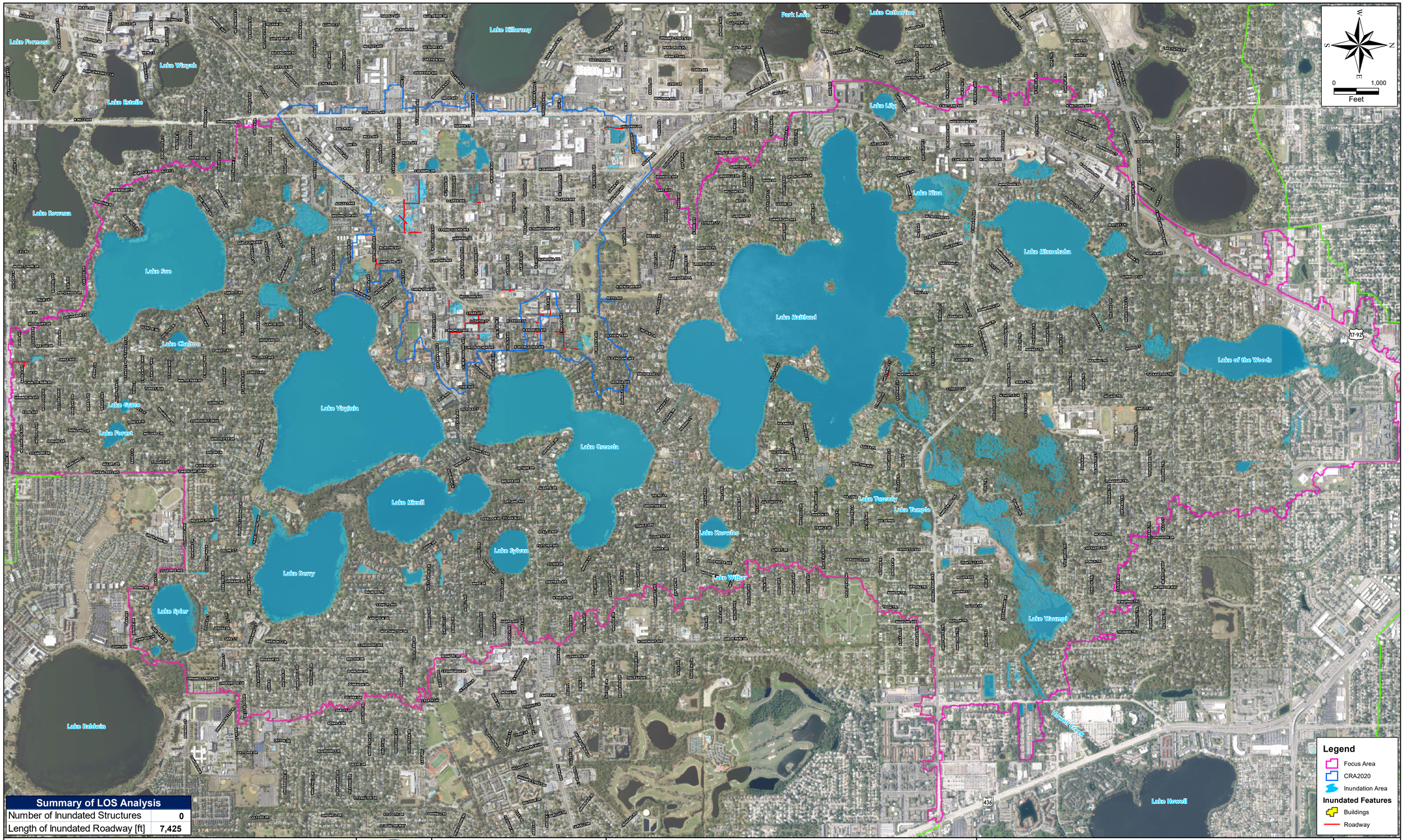
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2018 Orange County
2018 Seminole County

WINTER PARK CENTRAL BASIN STORMWATER MASTER PLAN

EXISTING CONDITIONS HURRICANE IAN INUNDATION MAP

FIGURE 3.6j

Map Document: (K:\CITY\WinterPark\Civil\Basin\WMP\GIS\Figures\05_DraftReport\GIS\3.6_InundationMap.mxd)
9/18/2024 -- 9:43:43 AM



Summary of LOS Analysis	
Number of Inundated Structures	0
Length of Inundated Roadway [ft]	7,425

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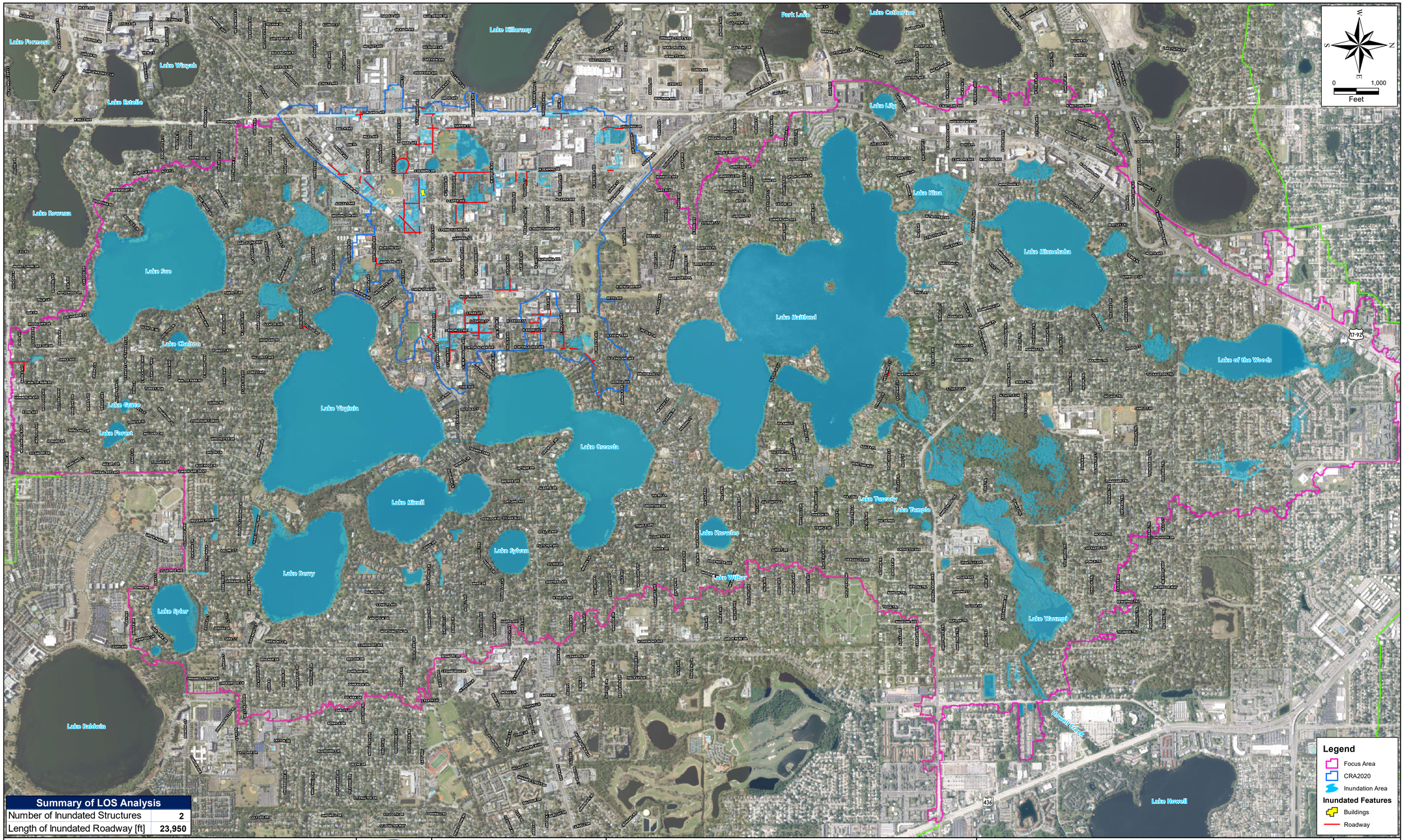
Sources:
Aerials:
2018 Orange County
2018 Seminole County

WINTER PARK CENTRAL BASIN STORMWATER MASTER PLAN

EXISTING CONDITIONS LEVEL OF SERVICE ANALYSIS 2-YEAR 24-HOUR

FIGURE 3.7a

Map Document: (K:\CITY\WinterPark\CWBasinWMP\GIS\Figures\05_Draft\Report\GIS\3.7_LOS.mxd)
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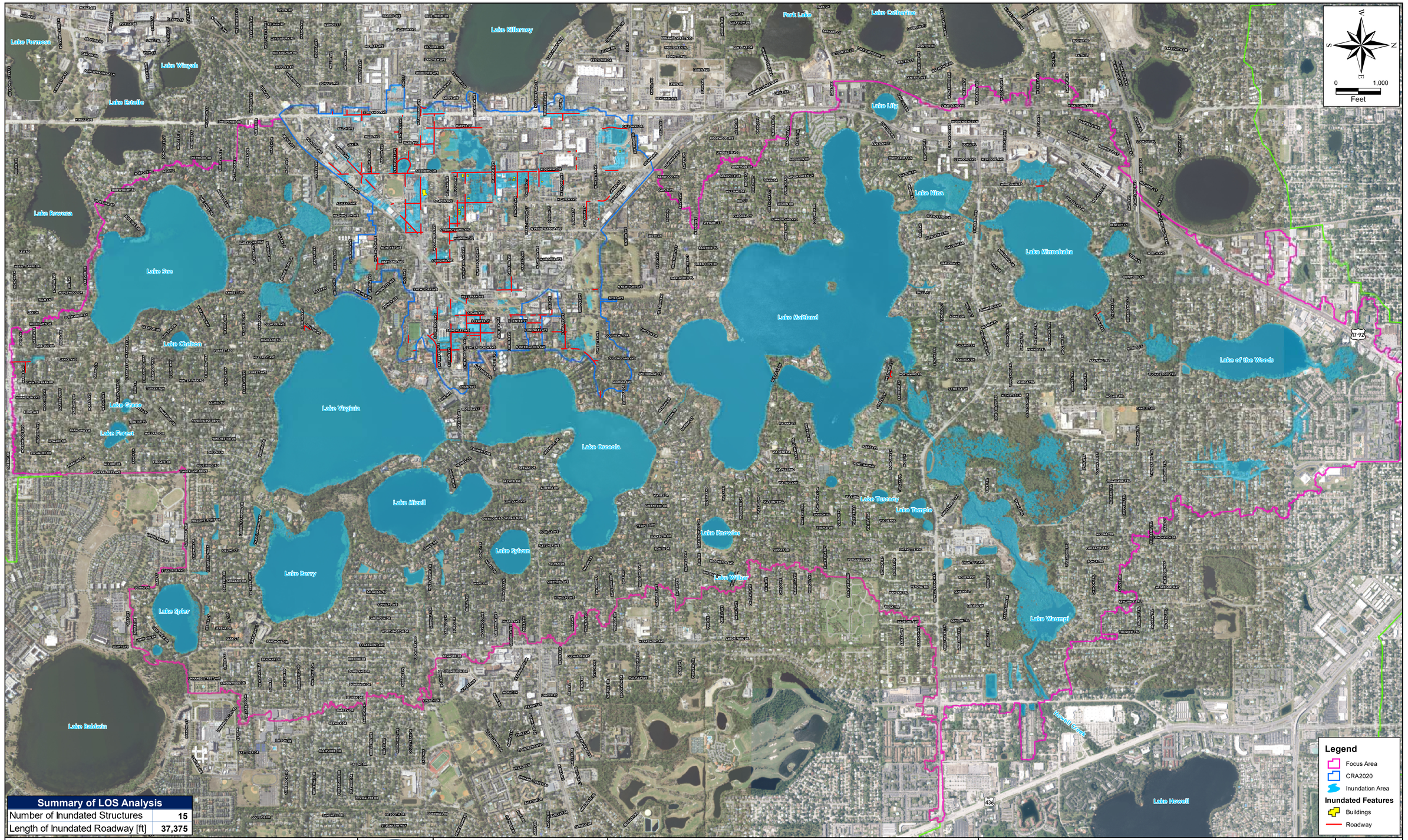
Sources:
Aerials:
2018 Orange County
2018 Seminole County

WINTER PARK CENTRAL BASIN STORMWATER MASTER PLAN

EXISTING CONDITIONS LEVEL OF SERVICE ANALYSIS 10-YEAR 24-HOUR

FIGURE 3.7b

Map Document: (K:\CITY\WinterPark\CIP\BasinWMP\GIS\Figures\05_Draft\Report\GIS\3.7_LOS.mxd)
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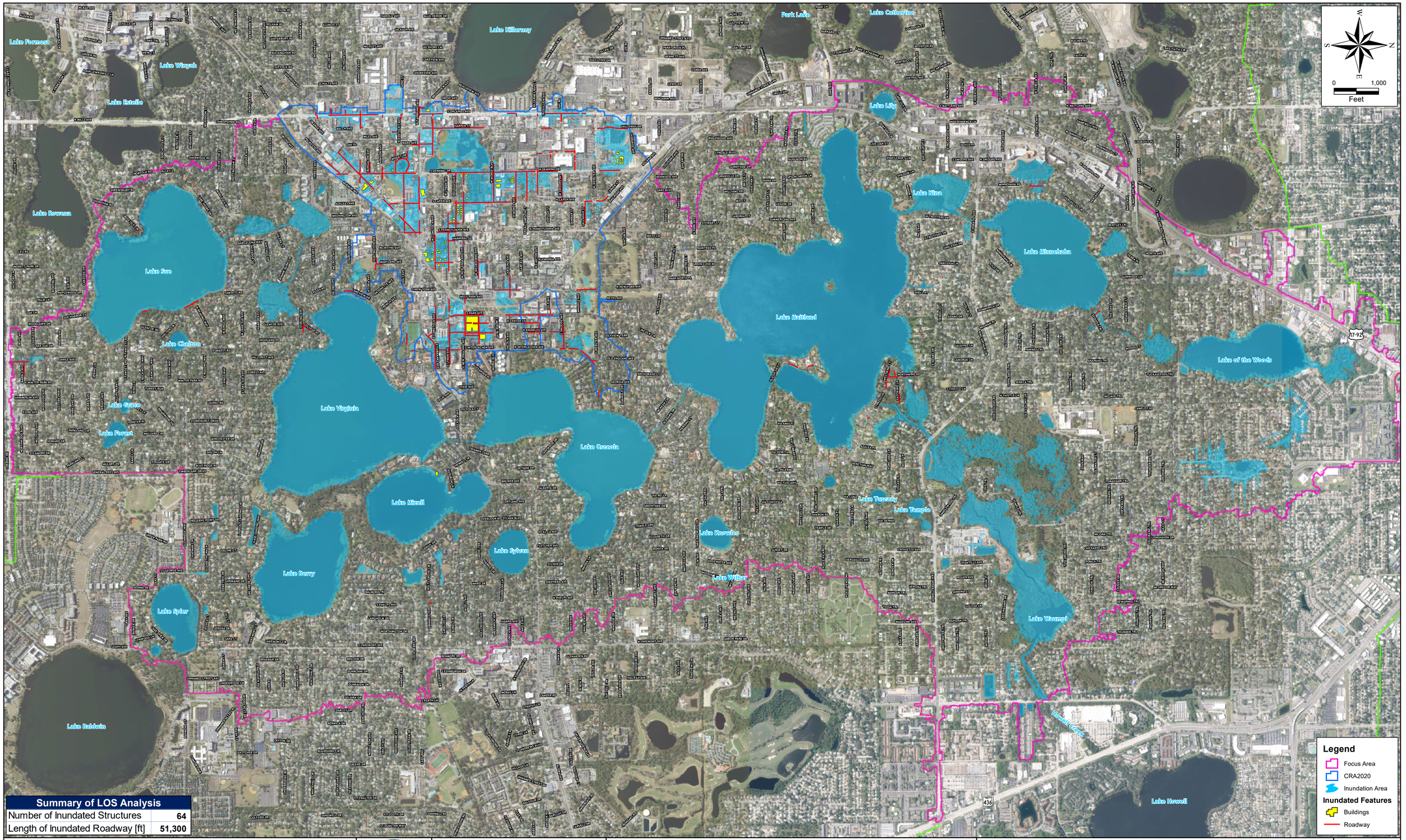
Sources:
Aerials:
2018 Orange County
2018 Seminole County

WINTER PARK CENTRAL BASIN STORMWATER MASTER PLAN

EXISTING CONDITIONS LEVEL OF SERVICE ANALYSIS 25-YEAR 24-HOUR

FIGURE 3.7c

Map Document: (K:\CITY\WinterPark\CWBasinWMP\GIS\Figures\05_Draft\Report\GIS\3.7_LOS.mxd)
9/11/2024 -- 12:43:08 PM



Summary of LOS Analysis	
Number of Inundated Structures	64
Length of Inundated Roadway [ft]	51,300

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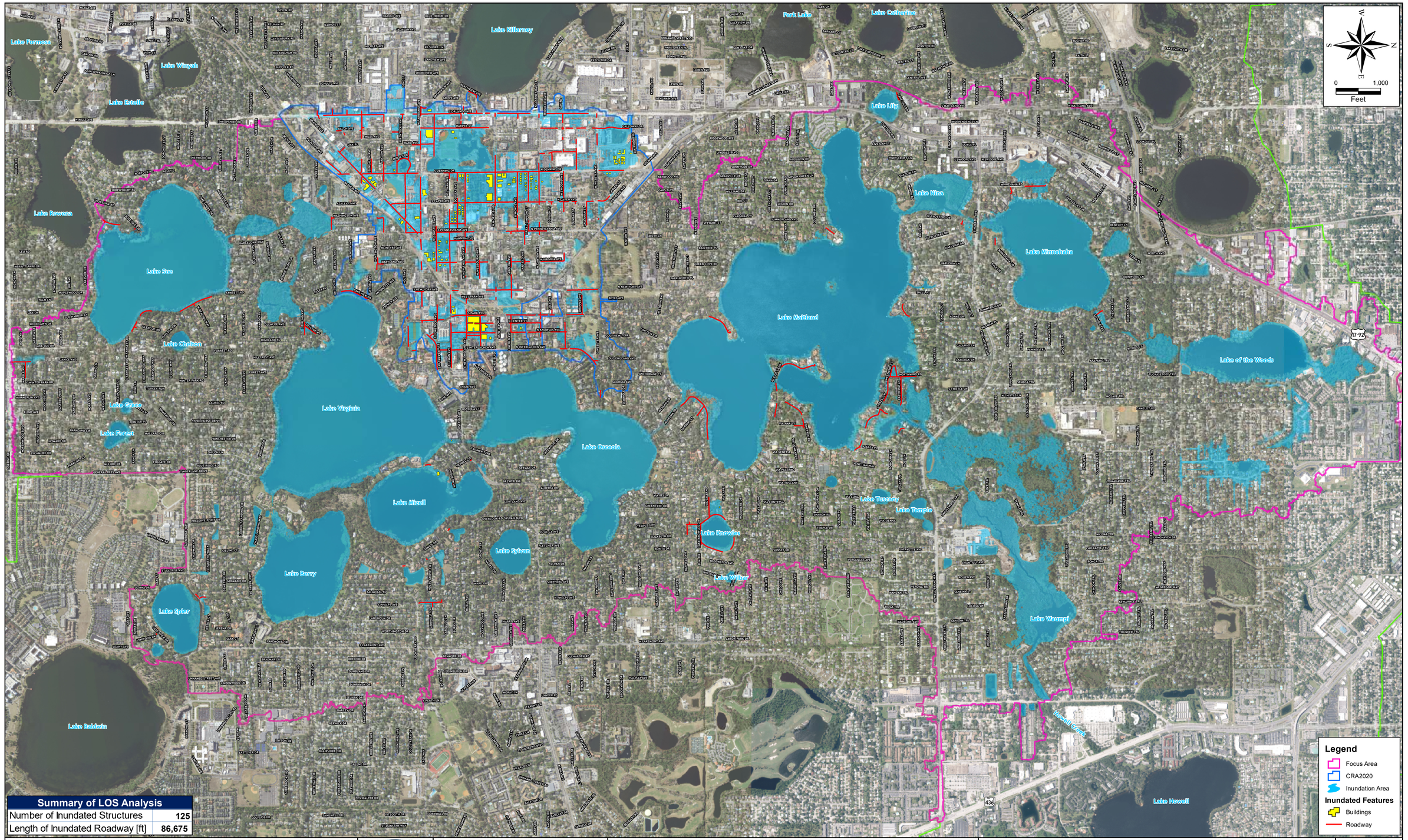
Sources:
Aerials:
2018 Orange County
2018 Seminole County

WINTER PARK CENTRAL BASIN STORMWATER MASTER PLAN

EXISTING CONDITIONS LEVEL OF SERVICE ANALYSIS 100-YEAR 24-HOUR

FIGURE 3.7d

Map Document: (K:\CITY\WinterPark\CWBasinWMP\GIS\Figures\05_Draft\Report\GIS\3.7_LOS.mxd)
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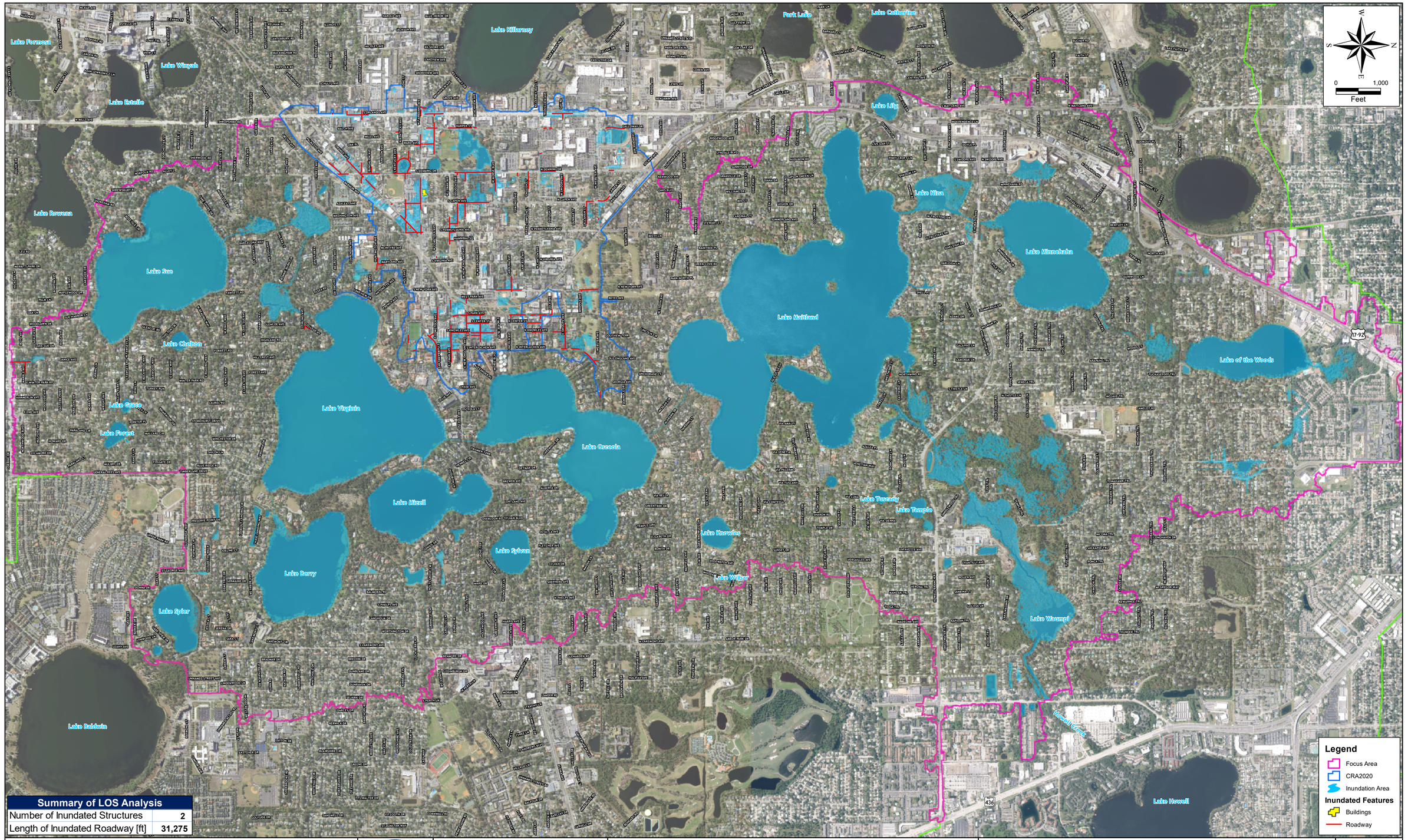
Sources:
Aerials:
2018 Orange County
2018 Seminole County

WINTER PARK CENTRAL BASIN STORMWATER MASTER PLAN

EXISTING CONDITIONS LEVEL OF SERVICE ANALYSIS 500-YEAR 24-HOUR

FIGURE 3.7e

Map Document: (K:\CITY\WinterPark\CWBasinWMP\GIS\Figures\05_Draft\Report\GIS\3.7_LOS.mxd)
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Summary of LOS Analysis	
Number of Inundated Structures	2
Length of Inundated Roadway [ft]	31,275

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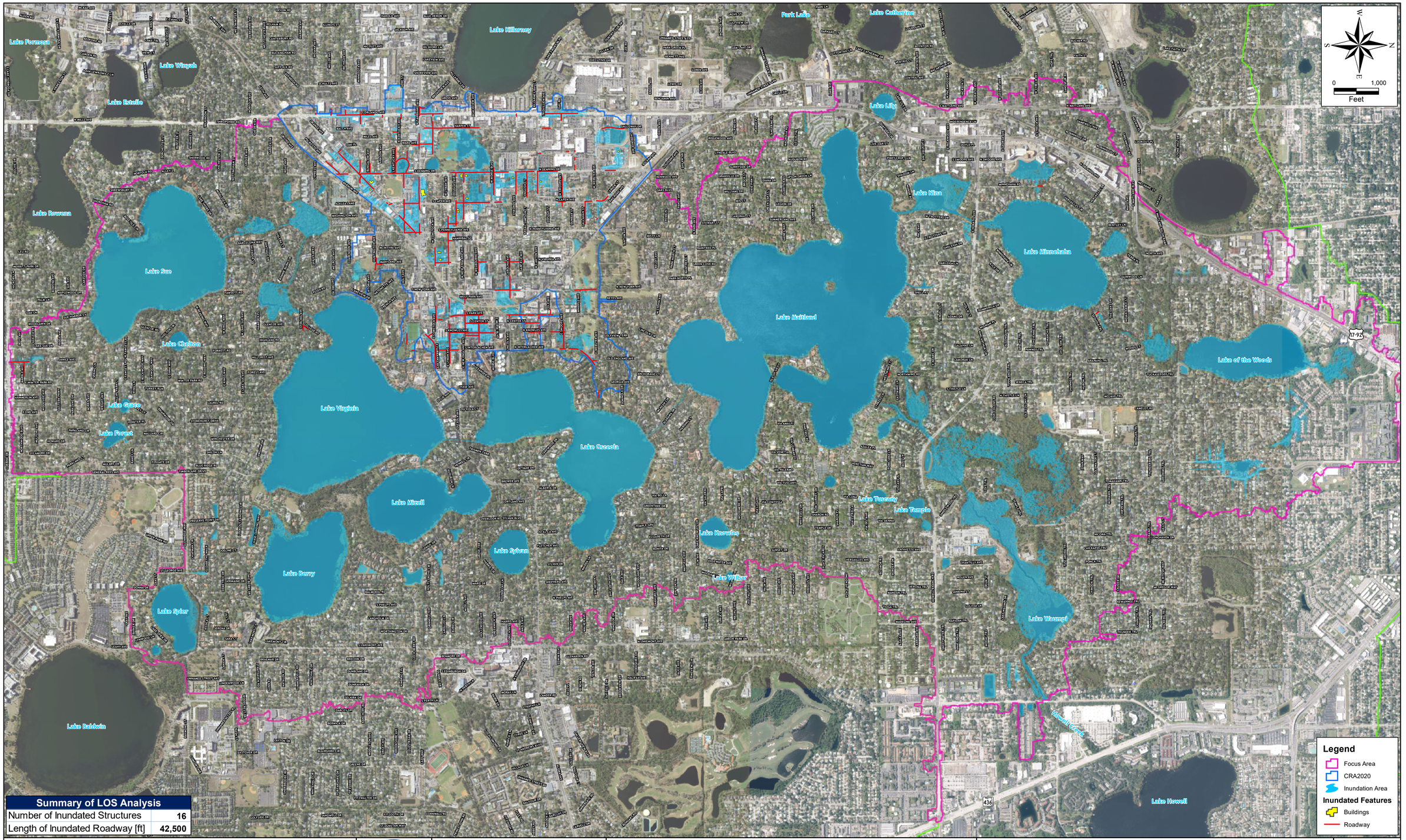
Sources:
Aerials:
2018 Orange County
2018 Seminole County

WINTER PARK CENTRAL BASIN STORMWATER MASTER PLAN

EXISTING CONDITIONS LEVEL OF SERVICE ANALYSIS 10-YEAR 6-HOUR

FIGURE 3.7f

Map Document: (K:\CITY\WinterPark\CWBasinWMP\GIS\Figures\05_Draft\Report\GIS\3.7_LOS.mxd)
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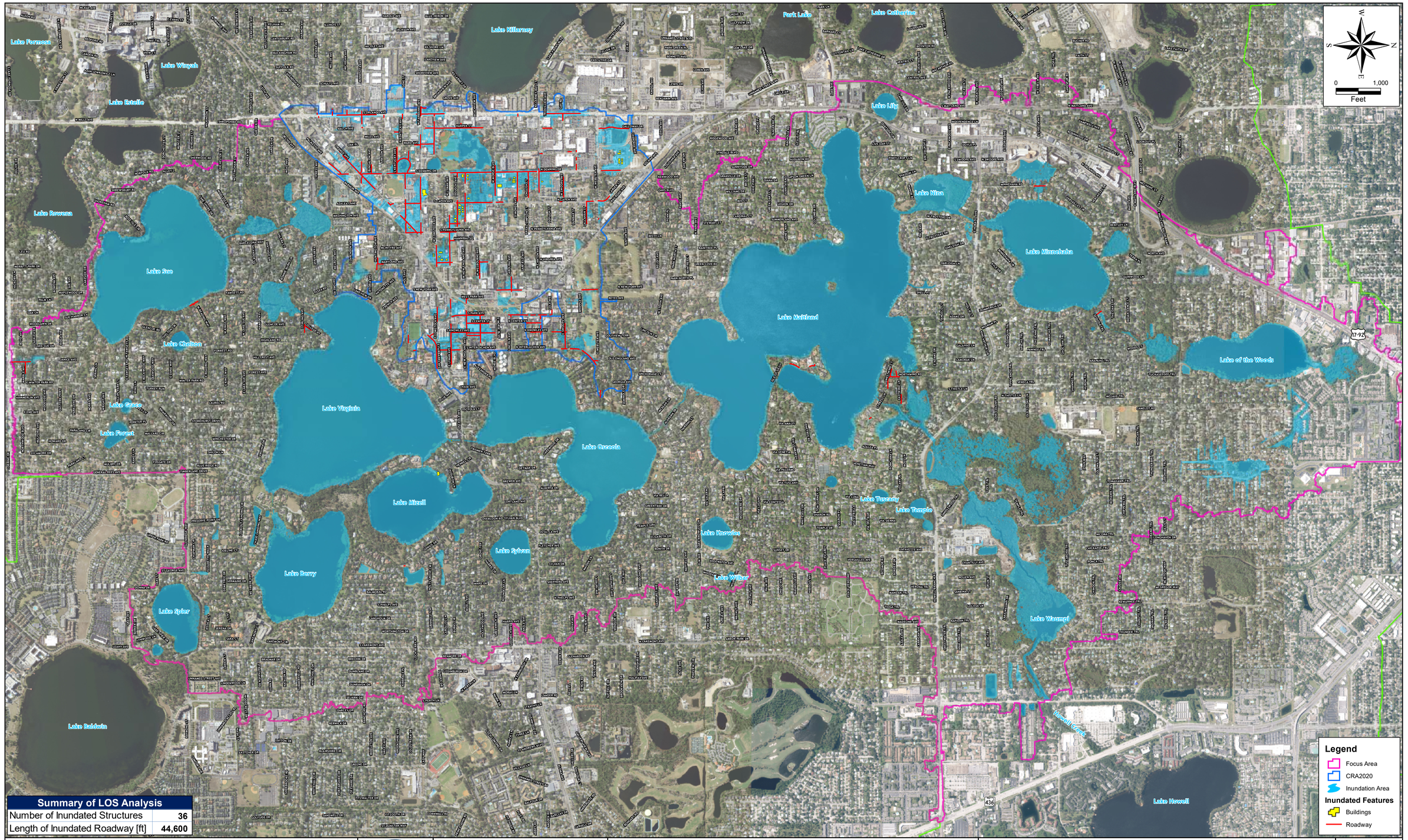
Sources:
Aerials:
2018 Orange County
2018 Seminole County

WINTER PARK CENTRAL BASIN STORMWATER MASTER PLAN

EXISTING CONDITIONS LEVEL OF SERVICE ANALYSIS 25-YEAR 6-HOUR

FIGURE 3.7g

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Summary of LOS Analysis	
Number of Inundated Structures	36
Length of Inundated Roadway [ft]	44,600

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CITY OF WINTER PARK, FLORIDA ESTABLISHED 1885

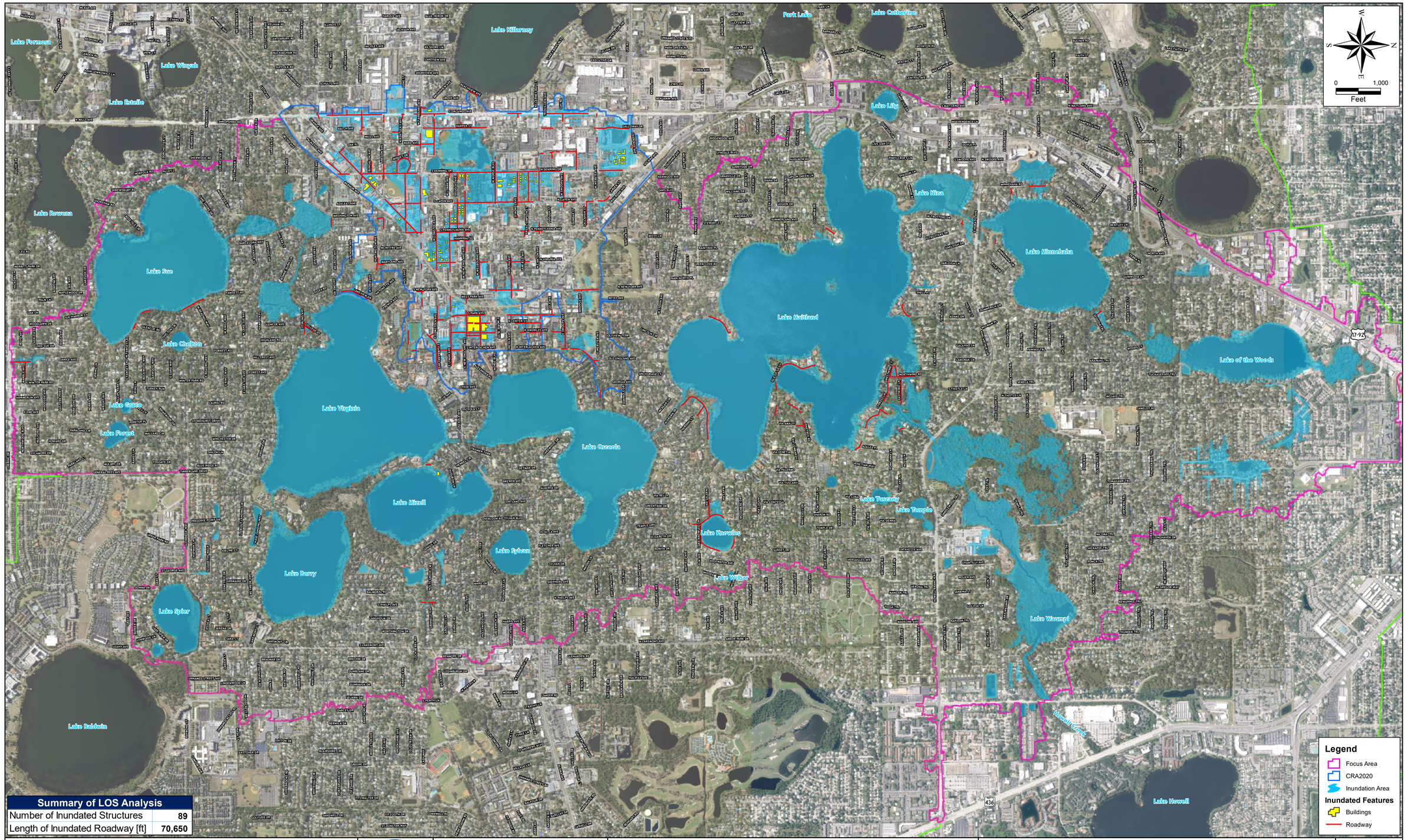
Sources:
Aerials:
2018 Orange County
2018 Seminole County

WINTER PARK CENTRAL BASIN STORMWATER MASTER PLAN

EXISTING CONDITIONS LEVEL OF SERVICE ANALYSIS 25-YEAR 96-HOUR

FIGURE 3.7h

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Summary of LOS Analysis	
Number of Inundated Structures	89
Length of Inundated Roadway [ft]	70,650

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CITY OF WINTER PARK, FLORIDA ESTABLISHED 1885

Sources:
Aerials:
2018 Orange County
2018 Seminole County

WINTER PARK CENTRAL BASIN STORMWATER MASTER PLAN

EXISTING CONDITIONS LEVEL OF SERVICE ANALYSIS 100-YEAR 96-HOUR

FIGURE 3.7i

Map Document: (K:\CITY\WinterPark\CtrlBasinWMP\GIS\Figures\05_Draft\Report\GIS\3.7_LOS.mxd)
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Table 3.1 - Maximum Stages/Flood Depths: Existing Conditions

				2-Year, 24-Hour Storm Event		10-Year, 24-Hour Storm Event		25-Year, 24-Hour Storm Event		100-Year, 24-Hour Storm Event		500-Year, 24-Hour Storm Event		10-Year, 6-Hour Storm Event		25-Year, 6-Hour Storm Event		25-Year, 96-Hour Storm Event		100-Year, 96-Hour Storm Event		Hurricane Ian	
Node ID	Location	Warn. Elev.	Warning Elevation Location	Stage [ft]	Flood Depth [in]	Stage [ft]	Flood Depth [in]	Stage [ft]	Flood Depth [in]	Stage [ft]	Flood Depth [in]	Stage [ft]	Flood Depth [in]	Stage [ft]	Flood Depth [in]	Stage [ft]	Flood Depth [in]	Stage [ft]	Flood Depth [in]	Stage [ft]	Flood Depth [in]	Stage [ft]	Flood Depth [in]
L_Wilbar	Lake Wilbar; US Lake Knowles	87.20	Road EOP (DEM); Wilbar Cir	86.0	0.0	86.2	0.0	86.3	0.0	86.7	0.0	**87.3**	**1.2**	86.5	0.0	86.8	0.0	86.3	0.0	86.7	0.0	86.6	0.0
L_Knowles	Lake Knowles	81.20	Road Crown (DEM); Lake Knowles Cir	79.4	0.0	79.8	0.0	80.1	0.0	81.0	0.0	**82.7**	**18.0**	79.6	0.0	79.8	0.0	80.7	0.0	**82.3**	**13.2**	**82.7**	**18.0**
L_Maitland	Lake Maitland	66.20	Lowest FFE (LOS)	65.9	0.0	66.2	0.0	**66.4**	**2.4**	**67.0**	**9.6**	**67.9**	**20.4**	65.9	0.0	66.1	0.0	**67.0**	**9.6**	**67.8**	**19.2**	**67.8**	**19.2**
L_Sue	Lake Sue	75.00	Lowest FFE (LOS)	71.5	0.0	72.3	0.0	72.8	0.0	73.7	0.0	**75.2**	**2.4**	71.8	0.0	72.2	0.0	73.4	0.0	74.5	0.0	**75.2**	**2.4**
L_Forest	Lake Forest	105.00	Lowest FFE (DEM)	101.4	0.0	102.0	0.0	102.5	0.0	103.3	0.0	104.7	0.0	102.1	0.0	102.6	0.0	103.0	0.0	103.8	0.0	104.6	0.0
L_Grace	Lake Grace	104.50	Lowest FFE (CWP)	101.9	0.0	102.4	0.0	102.8	0.0	103.5	0.0	**104.6**	**1.2**	102.2	0.0	102.6	0.0	103.6	0.0	104.5	0.0	104.4	0.0
CB-1990	Phillips Place Retention Pond; Lake Grace System	111.70	Road Crown (DEM); Phillips Park Cir	109.5	0.0	109.6	0.0	109.8	0.0	110.1	0.0	110.8	0.0	109.7	0.0	109.9	0.0	110.1	0.0	110.3	0.0	109.8	0.0
CB-2000	Pond; Lake Forest System	106.80	Pond TOB (DEM)	106.4	0.0	106.6	0.0	106.7	0.0	106.8	0.0	**107.0**	**2.4**	**106.9**	**1.2**	**107.0**	**2.4**	106.7	0.0	**106.9**	**1.2**	106.4	0.0
L_Mizell	Lake Mizell	66.90	Lowest FFE (LOS)	66.2	0.0	66.7	0.0	**67.1**	**2.4**	**68.0**	**13.2**	**69.2**	**27.6**	66.3	0.0	66.6	0.0	**67.9**	**12.0**	**69.0**	**25.2**	**69.2**	**27.6**
L_Sylvan	Lake Sylvan	76.07	Lowest FFE (CWP)	72.0	0.0	72.4	0.0	72.6	0.0	73.2	0.0	74.1	0.0	72.1	0.0	72.3	0.0	73.3	0.0	74.2	0.0	74.2	0.0
L_Chelton	Lake Chelton	87.05	Road Crown (LOS)	82.3	0.0	82.7	0.0	83.0	0.0	83.5	0.0	84.2	0.0	82.4	0.0	82.7	0.0	83.6	0.0	84.3	0.0	84.3	0.0
HC-0030	Howell Creek; DS Lake Maitland CS	68.84	Road Crown (LOS)	62.0	0.0	62.6	0.0	62.9	0.0	63.5	0.0	64.6	0.0	62.6	0.0	63.0	0.0	63.4	0.0	64.5	0.0	64.7	0.0
HC-0025	Howell Creek; US Lake Maitland CS	69.50	Lowest FFE (LOS)	65.8	0.0	66.1	0.0	66.3	0.0	66.8	0.0	67.7	0.0	65.9	0.0	66.0	0.0	66.8	0.0	67.7	0.0	67.7	0.0
L_Berry	Lake Berry	74.70	Lowest FFE (LOS)	69.8	0.0	70.1	0.0	70.4	0.0	70.8	0.0	71.2	0.0	69.9	0.0	70.1	0.0	70.7	0.0	71.0	0.0	71.4	0.0
L_Virginia	Lake Virginia	66.80	Lowest FFE (LOS)	66.2	0.0	66.7	0.0	**67.1**	**3.6**	**68.0**	**14.4**	**69.2**	**28.8**	66.3	0.0	66.6	0.0	**67.9**	**13.2**	**69.0**	**26.4**	**69.2**	**28.8**
L_Nina	Lake Nina	67.30	Lowest FFE (LOS)	65.9	0.0	66.2	0.0	66.4	0.0	67.0	0.0	**67.9**	**7.2**	65.9	0.0	66.1	0.0	67.0	0.0	**67.8**	**6.0**	**67.9**	**7.2**
L_Waumpi	Lake Waumpi	65.50	Lowest FFE (LOS)	59.9	0.0	60.4	0.0	60.8	0.0	61.6	0.0	62.8	0.0	60.5	0.0	60.8	0.0	61.2	0.0	62.3	0.0	63.1	0.0
L_Osceola	Lake Osceola	68.90	Lowest FFE (LOS)	66.0	0.0	66.5	0.0	66.8	0.0	67.5	0.0	68.6	0.0	66.1	0.0	66.3	0.0	67.5	0.0	68.4	0.0	68.5	0.0
L_Minnehaha	Lake Minnehaha	67.80	Lowest FFE (LOS)	65.9	0.0	66.2	0.0	66.5	0.0	67.0	0.0	**67.9**	**1.2**	66.0	0.0	66.2	0.0	67.0	0.0	67.8	0.0	**67.9**	**1.2**

Table 3.1 - Maximum Stages/Flood Depths: Existing Conditions

				2-Year, 24-Hour Storm Event		10-Year, 24-Hour Storm Event		25-Year, 24-Hour Storm Event		100-Year, 24-Hour Storm Event		500-Year, 24-Hour Storm Event		10-Year, 6-Hour Storm Event		25-Year, 6-Hour Storm Event		25-Year, 96-Hour Storm Event		100-Year, 96-Hour Storm Event		Hurricane Ian	
Node ID	Location	Warn. Elev.	Warning Elevation Location	Stage [ft]	Flood Depth [in]	Stage [ft]	Flood Depth [in]	Stage [ft]	Flood Depth [in]	Stage [ft]	Flood Depth [in]	Stage [ft]	Flood Depth [in]	Stage [ft]	Flood Depth [in]	Stage [ft]	Flood Depth [in]	Stage [ft]	Flood Depth [in]	Stage [ft]	Flood Depth [in]	Stage [ft]	Flood Depth [in]
HC-0016	Howell Creek	67.26	Road Crown (LOS)	65.9	0.0	66.1	0.0	66.4	0.0	66.9	0.0	**67.8**	**6.5**	65.9	0.0	66.1	0.0	66.9	0.0	**67.8**	**6.5**	**67.8**	**6.5**
L_Temple	Lake Temple	79.10	Lowest FFE (LOS)	67.5	0.0	67.8	0.0	68.1	0.0	68.7	0.0	69.8	0.0	67.5	0.0	67.7	0.0	68.8	0.0	69.6	0.0	70.0	0.0
L_Lily	Lake Lily	77.80	Lowest FFE (LOS)	70.2	0.0	71.1	0.0	71.9	0.0	73.3	0.0	75.2	0.0	71.0	0.0	71.6	0.0	72.3	0.0	73.9	0.0	75.0	0.0
L_Tuscany	Lake Tuscany	81.20	Lowest FFE (LOS)	71.5	0.0	71.9	0.0	72.2	0.0	73.4	0.0	75.9	0.0	71.6	0.0	71.9	0.0	73.7	0.0	76.1	0.0	75.9	0.0
LM-0010	Venetian Canal; DS Palmer Ave	71.18	Road Crown (LOS)	66.0	0.0	66.4	0.0	67.0	0.0	67.5	0.0	68.5	0.0	66.1	0.0	66.3	0.0	67.5	0.0	68.4	0.0	68.5	0.0
L_Compton	Lake Compton	94.40	Lowest FFE (LOS)	90.8	0.0	91.6	0.0	92.2	0.0	93.1	0.0	94.2	0.0	91.0	0.0	91.3	0.0	93.3	0.0	94.2	0.0	94.3	0.0
L_Spier	Lake Spier	94.10	Lowest FFE (LOS)	90.4	0.0	90.7	0.0	90.9	0.0	91.4	0.0	92.0	0.0	90.5	0.0	90.6	0.0	91.2	0.0	91.8	0.0	92.2	0.0
HC-0020	Howell Creek	68.10	Lowest FFE (LOS)	65.8	0.0	66.1	0.0	66.3	0.0	66.8	0.0	67.8	0.0	65.9	0.0	66.0	0.0	66.8	0.0	67.7	0.0	67.7	0.0
HC-0015	Howell Creek	67.60	Lowest FFE (LOS)	65.8	0.0	66.1	0.0	66.4	0.0	66.9	0.0	**67.8**	**2.4**	65.9	0.0	66.0	0.0	66.9	0.0	**67.7**	**1.2**	**67.8**	**2.4**
HC-0018	Howell Creek	69.00	Lowest FFE (LOS)	65.8	0.0	66.1	0.0	66.4	0.0	66.9	0.0	67.8	0.0	65.9	0.0	66.1	0.0	66.9	0.0	67.7	0.0	67.8	0.0
HC-0010	Howell Creek	67.09	Road Crown (LOS)	65.8	0.0	66.1	0.0	66.4	0.0	66.9	0.0	**67.8**	**8.5**	65.9	0.0	66.1	0.0	66.9	0.0	**67.7**	**7.3**	**67.8**	**8.5**
LV-0145	Fern Canal; US Osceola Ave	68.40	Lowest FFE (LOS)	66.1	0.0	66.6	0.0	67.0	0.0	67.7	0.0	**68.9**	**6.0**	66.2	0.0	66.5	0.0	67.7	0.0	**68.7**	**3.6**	**68.8**	**4.8**
LO-0005	Venetian Canal; US Palmer Ave	82.99	Road Crown (LOS)	66.0	0.0	66.4	0.0	68.8	0.0	68.8	0.0	68.5	0.0	66.1	0.0	66.3	0.0	68.8	0.0	68.4	0.0	68.5	0.0
LB-0040	Pond; residential	86.90	Lowest FFE (LOS)	76.2	0.0	76.5	0.0	76.7	0.0	77.2	0.0	77.7	0.0	76.5	0.0	76.7	0.0	77.1	0.0	77.6	0.0	77.5	0.0
LM-0100	Pond; residential	81.90	Lowest FFE (LOS)	74.2	0.0	74.3	0.0	74.4	0.0	74.5	0.0	74.9	0.0	74.4	0.0	74.5	0.0	74.4	0.0	74.7	0.0	74.8	0.0
LM-0090	Pond; residential	87.50	Lowest FFE (LOS)	83.6	0.0	83.9	0.0	84.1	0.0	84.3	0.0	84.5	0.0	83.9	0.0	84.1	0.0	84.1	0.0	84.3	0.0	84.1	0.0
LM-0070	Pond; residential	84.28	Road Crown (LOS)	83.1	0.0	83.4	0.0	83.7	0.0	84.1	0.0	**84.6**	**3.8**	83.4	0.0	83.6	0.0	83.8	0.0	84.2	0.0	83.7	0.0
LM-0060	Pond; residential	78.30	Lowest FFE (LOS)	73.2	0.0	73.6	0.0	73.9	0.0	74.4	0.0	75.8	0.0	73.7	0.0	73.9	0.0	74.1	0.0	74.4	0.0	74.0	0.0
LM-0080	Pond; residential	88.82	Road Crown (LOS)	86.5	0.0	86.8	0.0	86.9	0.0	87.1	0.0	87.2	0.0	86.7	0.0	86.9	0.0	87.0	0.0	87.1	0.0	86.9	0.0
CB-1600	Channel; US Stirling Ave	70.05	Road Crown (DEM)	67.0	0.0	67.5	0.0	68.1	0.0	68.9	0.0	**70.5**	**5.4**	67.6	0.0	67.9	0.0	68.8	0.0	69.9	0.0	**70.5**	**5.4**
LV-0160	Channel; DS Stirling Ave	66.82	Road Crown (LOS)	66.8	0.0	**67.2**	**4.6**	**67.8**	**11.8**	**68.3**	**17.8**	**69.2**	**28.6**	**67.3**	**5.8**	**67.5**	**8.2**	**68.2**	**16.6**	**69.0**	**26.2**	**69.2**	**28.6**

Table 3.1 - Maximum Stages/Flood Depths: Existing Conditions

				2-Year, 24-Hour Storm Event		10-Year, 24-Hour Storm Event		25-Year, 24-Hour Storm Event		100-Year, 24-Hour Storm Event		500-Year, 24-Hour Storm Event		10-Year, 6-Hour Storm Event		25-Year, 6-Hour Storm Event		25-Year, 96-Hour Storm Event		100-Year, 96-Hour Storm Event		Hurricane Ian	
Node ID	Location	Warn. Elev.	Warning Elevation Location	Stage [ft]	Flood Depth [in]	Stage [ft]	Flood Depth [in]	Stage [ft]	Flood Depth [in]	Stage [ft]	Flood Depth [in]	Stage [ft]	Flood Depth [in]	Stage [ft]	Flood Depth [in]	Stage [ft]	Flood Depth [in]	Stage [ft]	Flood Depth [in]	Stage [ft]	Flood Depth [in]	Stage [ft]	Flood Depth [in]
LB-0020	Pond; residential	81.19	Road Crown (LOS)	77.1	0.0	77.3	0.0	77.5	0.0	77.8	0.0	78.4	0.0	77.3	0.0	77.5	0.0	77.8	0.0	78.0	0.0	77.6	0.0
LB-0030	Pond; residential	86.80	Lowest FFE (LOS)	83.0	0.0	83.1	0.0	83.2	0.0	83.2	0.0	83.3	0.0	83.1	0.0	83.2	0.0	83.2	0.0	83.3	0.0	83.1	0.0
LB-0090	Pond; residential	105.60	Lowest FFE (LOS)	98.8	0.0	99.5	0.0	100.0	0.0	100.6	0.0	101.0	0.0	99.4	0.0	99.8	0.0	100.1	0.0	100.7	0.0	100.9	0.0
LB-0070	Pond; residential	100.61	Road Crown (LOS)	99.0	0.0	99.6	0.0	99.8	0.0	99.9	0.0	100.1	0.0	99.2	0.0	99.6	0.0	99.9	0.0	100.1	0.0	100.0	0.0
LB-0075	Pond; residential	73.74	Road Crown (LOS)	71.7	0.0	71.9	0.0	72.1	0.0	72.2	0.0	72.3	0.0	72.1	0.0	72.1	0.0	72.1	0.0	72.2	0.0	72.1	0.0
LS-0015	Pond; residential	95.60	Lowest FFE (LOS)	93.8	0.0	94.0	0.0	94.2	0.0	94.6	0.0	95.1	0.0	94.3	0.0	94.6	0.0	94.3	0.0	94.7	0.0	93.8	0.0
LB-0065	Pond; residential	99.63	Road Crown (LOS)	96.4	0.0	96.8	0.0	96.8	0.0	96.9	0.0	97.3	0.0	96.6	0.0	96.8	0.0	96.9	0.0	97.3	0.0	96.9	0.0
LB-0045	Pond; residential	100.40	Lowest FFE (LOS)	95.8	0.0	95.8	0.0	96.0	0.0	96.2	0.0	96.7	0.0	95.8	0.0	96.0	0.0	96.2	0.0	96.6	0.0	96.4	0.0
CB-0610	Wetland	68.14	Road Crown (LOS)	64.0	0.0	64.2	0.0	64.3	0.0	64.4	0.0	64.6	0.0	64.3	0.0	64.4	0.0	64.3	0.0	64.5	0.0	64.6	0.0
CB-0400	Pond; residential	66.70	Lowest FFE (LOS)	64.0	0.0	64.6	0.0	65.1	0.0	66.1	0.0	**66.8**	**1.2**	65.0	0.0	65.5	0.0	65.6	0.0	66.6	0.0	66.0	0.0
CB-0300	Wetland	66.13	Road Crown (LOS)	62.0	0.0	62.1	0.0	62.2	0.0	62.3	0.0	62.8	0.0	62.3	0.0	62.4	0.0	62.2	0.0	62.3	0.0	63.1	0.0
CB-0615	Wetland	70.90	Lowest FFE (LOS)	66.0	0.0	66.1	0.0	66.2	0.0	66.2	0.0	66.4	0.0	66.2	0.0	66.2	0.0	66.2	0.0	66.4	0.0	66.4	0.0
CB-0620	Wetland	72.90	Lowest FFE (LOS)	64.7	0.0	64.9	0.0	64.9	0.0	65.1	0.0	65.2	0.0	64.8	0.0	64.9	0.0	65.0	0.0	65.1	0.0	65.0	0.0
CB-0600	Wetland	67.00	Lowest FFE (LOS)	63.1	0.0	63.3	0.0	63.4	0.0	63.6	0.0	64.2	0.0	63.4	0.0	63.5	0.0	63.5	0.0	64.0	0.0	64.5	0.0
CB-1000	Pond; residential	93.10	Lowest FFE (LOS)	89.3	0.0	91.4	0.0	91.8	0.0	92.3	0.0	92.6	0.0	91.1	0.0	91.6	0.0	92.2	0.0	92.5	0.0	92.5	0.0

All elevations are based on the NAVD88 vertical datum.

Stages above the warning elevation are highlighted in **red**.

Anticipated flood depths are shown in **red**.

Stages are shown rounded to the nearest tenth.

Section 4

Design Development and Evaluation

4.1 Design Conditions Model Development & Analysis

The existing conditions stormwater model was used as the basis for the design conditions models. SAI-Halff developed and evaluated flood control design alternatives at five (5) closed-basin lakes, including Lake Knowles, Lake Sylvan, Lake Chelton, Lake Grace, and Lake Forest. The objective of the design alternatives is to reduce or eliminate lot, street, and structure flooding around the closed-basin lakes, with a desired LOS of a 500-year 24-hour storm event (approximation of Hurricane Ian). An LOS elevation was determined for each lake and was set either 0.5 ft below the lowest road crown or 1 ft below the lowest FFE, whichever was lower.

Two (2) types of designs were evaluated: one using temporary pumps, the other using permanent gravity culvert outfalls. Temporary pumping options were not evaluated for Lake Chelton or Lake Sylvan, as the existing peak stages within the lakes are more than 2 ft below the determined LOS elevations. Global Standard Trash (GST) pumps offered by Global Pump were used to determine the pump requirements at the remaining lakes, as the CWP already has one (1) GST pump within its fleet (model: 6GST, rated for 3,000gpm). Meanwhile, gravity culvert outfalls were evaluated at all five (5) closed-basin lakes.

Each design alternative includes a conceptual layout of the design solution, along with a construction cost estimate. Summary tables comparing the design peak stages and anticipated flood depths to the existing conditions are included as **Tables 4.1** and **4.2,** respectively. A brief description of each design alternative is presented below.

Design Alternative	Design Location	Design Description
Temporary Pumping Alternatives		
1a	Lake Knowles	Pump during storm
1b	Lake Knowles	Pump prior to storm
2a	Lakes Grace & Forest	Pump during storm
2b	Lakes Grace & Forest	Pump prior to storm
Gravity Culvert Outfall Alternatives		
3	Lake Knowles	Construct emergency outfall to Lake Maitland
4	Lake Sylvan	Construct emergency outfall to Lake Mizell; outfall structure to include bleed down orifice
5	Lake Chelton	Construct emergency outfall to Lake Sue; outfall structure to include bleed down orifice
6	Lakes Grace & Forest	Construct emergency outfall from Lake Forest to Lake Grace, and from Lake Grace to Lake Sue; outfall structure within Lake Grace to include bleed down orifice
7	Lake Grace	Construct emergency outfall from Lake Grace into Lake Sue; outfall structure to include bleed down orifice
8	Lake Grace	Plug existing Phillips Place Retention Pond outfall into Lake Grace; construct new outfall from retention pond into Lake Forest

It should be noted that various design alternatives were grouped together and simulated within combined models to evaluate the cumulative impacts of implementing multiple alternatives. In total, five (5) design condition models were developed to evaluate the design alternatives. Specifically, Alternatives 1a & 2a, and 1b & 2b were each modeled together to represent the pumping during and prior to the storm, respectively. Alternatives 3, 4, 5, and 6 were simulated together to demonstrate that even if all designs

are implemented, the impacts to the overall Chain of Lakes system are negligible. Alternatives 7 and 8 were each simulated independently. These groupings are reflected in the presentation of model results, and within the StormWise input reports.

Table 4.1 - Maximum Stages: Proposed Design Conditions vs. Existing Conditions

Temporary Pumping Alternatives

Alt 1a & 2a: Pump during storm at Lakes Knowles, Grace, and Forest

Alt 1b & 2b: Pump prior to storm at Lakes Knowles, Grace, and Forest

Gravity Culvert Outfall Alternatives

Alt 3-6: Construct outfalls at Lakes Knowles, Sylvan, Chelton, Grace, and Forest

Alt 7: Construct outfall at Lake Grace

Alt 8: Philips Place Retention Pond outfall redirected from Lake Grace to Lake Forest

				500-Year, 24-Hour Storm Event											
				Exist	Alt 1a & 2a		Alt 1b & 2b		Alt 3-6		Alt 7		Alt 8	
Node ID	Location	Warning Elevation	Warning Elevation Location	Stage [ft]	Stage [ft]	Diff (Alt - Ex) [in]	Stage [ft]	Diff (Alt - Ex) [in]	Stage [ft]	Diff (Alt - Ex) [in]	Stage [ft]	Diff (Alt - Ex) [in]	Stage [ft]	Diff (Alt - Ex) [in]
L_Wilbar	Lake Wilbar; US Lake Knowles	87.20	Road EOP (DEM); Wilbar Cir	**87.3**	**87.3**	0.0	**87.3**	0.0	**87.3**	0.0	**87.3**	0.0	**87.3**	0.0
L_Knowles	Lake Knowles	81.20	Road Crown (DEM); Lake Knowles Cir	**82.7**	80.5	-26.4	80.7	-24.0	81.2	-18.0	**82.7**	0.0	**82.7**	0.0
L_Maitland	Lake Maitland	66.20	Lowest FFE (LOS)	**67.9**	**67.9**	0.0	**67.9**	0.0	**67.9**	0.0	**67.9**	0.0	**67.9**	0.0
L_Sue	Lake Sue	75.00	Lowest FFE (LOS)	**75.2**	**75.3**	1.2	**75.2**	0.0	**75.3**	1.2	**75.3**	1.2	**75.2**	0.0
L_Forest	Lake Forest	105.00	Lowest FFE (DEM)	104.7	103.6	-13.2	103.9	-9.6	104.7	0.0	104.7	0.0	104.8	1.2
L_Grace	Lake Grace	104.50	Lowest FFE (CWP)	**104.6**	102.3	-27.6	103.3	-15.6	104.2	-4.8	104.1	-6.0	104.3	-3.6
CB-1990	Phillips Place Retention Pond; Lake Grace System	111.70	Road Crown (DEM); Phillips Park Cir	110.8	110.8	0.0	110.8	0.0	110.8	0.0	110.8	0.0	109.9	-10.8
CB-2000	Pond; Lake Forest System	106.80	Pond TOB (DEM)	**107.0**	**107.0**	0.0	**107.0**	0.0	**107.0**	0.0	**107.0**	0.0	**107.0**	0.0
L_Sylvan	Lake Sylvan	76.07	Lowest FFE (CWP)	74.1	74.1	0.0	74.1	0.0	74.0	-1.2	74.1	0.0	74.1	0.0
L_Chelton	Lake Chelton	87.05	Road Crown (LOS)	84.2	84.2	0.0	84.2	0.0	83.8	-4.8	84.2	0.0	84.2	0.0
L_Mizell	Lake Mizell	66.90	Lowest FFE (LOS)	**69.2**	**69.2**	0.0	**69.2**	0.0	**69.2**	0.0	**69.2**	0.0	**69.2**	0.0
HC-0030	Howell Creek; DS Lake Maitland CS	68.84	Road Crown (LOS)	64.6	64.6	0.0	64.6	0.0	64.6	0.0	64.6	0.0	64.6	0.0
HC-0025	Howell Creek; US Lake Maitland CS	69.50	Lowest FFE (LOS)	67.7	67.8	1.2	67.7	0.0	67.7	0.0	67.7	0.0	67.7	0.0
L_Virginia	Lake Virginia	66.80	Lowest FFE (LOS)	**69.2**	**69.2**	0.0	**69.2**	0.0	**69.2**	0.0	**69.2**	0.0	**69.2**	0.0
L_Osceola	Lake Osceola	68.90	Lowest FFE (LOS)	68.6	68.6	0.0	68.6	0.0	68.6	0.0	68.6	0.0	68.6	0.0

All elevations are based on the NAVD88 vertical datum.

Stages above the warning elevation are highlighted in **red**.

Differences shown in **red** indicate anticipated stage increases.

Stages are shown rounded to the nearest tenth.

Table 4.2 - Flood Depths: Proposed Design Conditions vs. Existing Conditions

Temporary Pumping Alternatives

Alt 1a & 2a: Pump during storm at Lakes Knowles, Grace, and Forest

Alt 1b & 2b: Pump prior to storm at Lakes Knowles, Grace, and Forest

Gravity Culvert Outfall Alternatives

Alt 3-6: Construct outfalls at Lakes Knowles, Sylvan, Chelton, Grace, and Forest

Alt 7: Construct outfall at Lake Grace

Alt 8: Philips Place Retention Pond outfall redirected from Lake Grace to Lake Forest

				500-Year, 24-Hour Storm Event					
				Exist	Alt 1a & 2a	Alt 1b & 2b	Alt 3-6	Alt 7	Alt 8
Node ID	Location	Warning Elevation	Warning Elevation Location	Flood Depth [in]	Flood Depth [in]	Flood Depth [in]	Flood Depth [in]	Flood Depth [in]	Flood Depth [in]
L_Wilbar	Lake Wilbar; US Lake Knowles	87.20	Road EOP (DEM); Wilbar Cir	1.2	1.2	1.2	1.2	1.2	1.2
L_Knowles	Lake Knowles	81.20	Road Crown (DEM); Lake Knowles Cir	18.0	0.0	0.0	0.0	18.0	18.0
L_Maitland	Lake Maitland	66.20	Lowest FFE (LOS)	20.4	20.4	20.4	20.4	20.4	20.4
L_Sue	Lake Sue	75.00	Lowest FFE (LOS)	2.4	3.6	2.4	3.6	3.6	2.4
L_Forest	Lake Forest	105.00	Lowest FFE (DEM)	0.0	0.0	0.0	0.0	0.0	0.0
L_Grace	Lake Grace	104.50	Lowest FFE (CWP)	1.2	0.0	0.0	0.0	0.0	0.0
CB-1990	Phillips Place Retention Pond; Lake Grace System	111.70	Road Crown (DEM); Phillips Park Cir	0.0	0.0	0.0	0.0	0.0	0.0
CB-2000	Pond; Lake Forest System	106.80	Pond TOB (DEM)	2.4	2.4	2.4	2.4	2.4	2.4
L_Sylvan	Lake Sylvan	76.07	Lowest FFE (CWP)	0.0	0.0	0.0	0.0	0.0	0.0
L_Chelton	Lake Chelton	87.05	Road Crown (LOS)	0.0	0.0	0.0	0.0	0.0	0.0
L_Mizell	Lake Mizell	66.90	Lowest FFE (LOS)	27.6	27.6	27.6	27.6	27.6	27.6
HC-0030	Howell Creek; DS Lake Maitland CS	68.84	Road Crown (LOS)	0.0	0.0	0.0	0.0	0.0	0.0
HC-0025	Howell Creek; US Lake Maitland CS	69.50	Lowest FFE (LOS)	0.0	0.0	0.0	0.0	0.0	0.0
L_Virginia	Lake Virginia	66.80	Lowest FFE (LOS)	28.8	28.8	28.8	28.8	28.8	28.8
L_Osceola	Lake Osceola	68.90	Lowest FFE (LOS)	0.0	0.0	0.0	0.0	0.0	0.0

All elevations are based on the NAVD88 vertical datum.

Values shown in **red** indicate anticipated flood depths.

4.2 Design Alternative 1a-b

Alternative 1 addresses street and lot flooding around Lake Knowles, which was observed during Hurricane Ian.

To achieve this, temporary pumps will be used to pump water from Lake Knowles into Lake Maitland. Two (2) temporary pumping options were evaluated and are presented below as Alterative 1a and 1b.

Alternative 1a (*Pump Option 1*): Pumping occurs during storm and continues operating thru the peak of the storm.

- Pump Requirements: This option requires an 8,800gpm pump (model: 12GST) to operate for the duration of the storm.
- Results: Maximum stages during the 500-year, 24-hour storm event are reduced by 25-inches within Lake Knowles.
- Permitting Considerations: Permitting challenges are not anticipated for this alternative, as pumping down lake levels is authorized during state of emergency declarations (Florida Statute 252.363).
- Cost: This option requires one (1) 12GST pump, with a quoted price of $182,000.

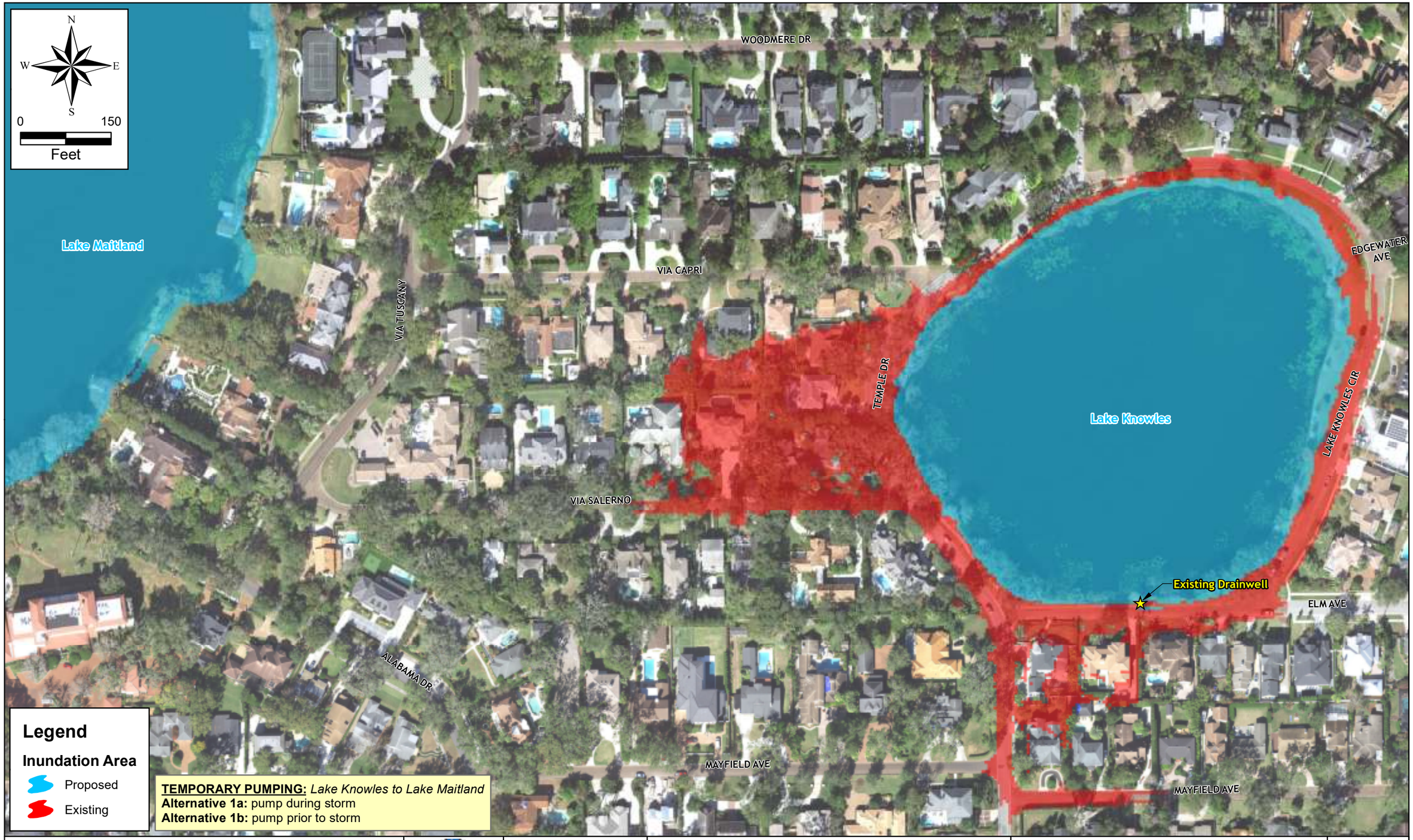
Alternative 1b (*Pump Option 2*): Pumping occurs prior to storm to lower the initial lake levels, increasing the available storage within the lake. No pumping occurs during storm.

- Pump Requirements: This option requires a 3,000gpm pump (model: 6GST) to operate for 45 hours prior to the storm to lower the lake level by 3.2 ft.
- Results: Maximum stages during the 500-year, 24-hour storm event are reduced by 24.2-inches within Lake Knowles.
- Permitting Considerations: Permitting challenges are not anticipated for this alternative, as pumping down lake levels is authorized during state of emergency declarations. However, lowering the lake level prior to a storm may pose environmental or water-use concerns.
- Cost: This option requires one (1) 6GST pump, with a quoted price of $90,000. If the City utilizes the 6GST pump already within its fleet, there is no cost to implement this option.

Both pump options meet the desired LOS (500-year, 24-hour) at Lake Knowles. Impacts to the maximum stages within Lake Maitland are negligible.

Maximum stages and flood depths for this alternative are presented in **Table 4.1** and **4.2**, respectively. An inundation comparison map for this alternative is provided as **Figure 4.1**. Note, only one inundation map was provided, as the visual difference between Options 1 and 2 is negligible. The StormWise input data and results for Alternatives 1a and 1b can be found in **Appendix F.1** and **F.2**, respectively.

Pump specifications and pricing were obtained from Global Pump in July 2024. The pricing assumes the pumps are trailer mounted and include sound attenuation enclosures (SoundGuard). The costs per pump should be considered preliminary, as certain optional costs were not included (e.g., fuel tanks extensions, hoses).



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Sources:
Aerials: 2018 Orange County

WINTER PARK CENTRAL BASIN STORMWATER MASTER PLAN

LAKE KNOWLES
DESIGN ALTERNATIVE 1a & b
500-YEAR 24-HOUR INUNDATION MAP

FIGURE:
4.1

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4.3 Design Alternative 2a-b

Alternative 2 addresses lot flooding and potential structure flooding around Lake Grace and Lake Forest, which was observed during Hurricane Ian.

To achieve this, temporary pumps will be used to pump water from Lake Grace and Lake Forest into Lake Sue. Two (2) temporary pumping options were evaluated and are presented below as Alterative 2a and 2b.

Alternative 2a (*Pump Option 1*): Pumping occurs during storm and continues operating thru the peak of the storm.

- Pump Requirements: This option requires a 3,000gpm pump (model: 6GST) to operate within both lakes for the duration of the storm.
- Results: Maximum stages during the 500-year, 24-hour storm event are reduced by 27.6- and 13.9-inches within Lake Grace and Forest, respectively.
- Permitting Considerations: Permitting challenges are not anticipated for this alternative, as pumping down lake levels is authorized during state of emergency declarations (Florida Statute 252.363).
- Cost: This option requires two (2) 6GST pumps, with a total quoted price of $180,000. If the City utilizes the 6GST pump already within its fleet, the cost to implement this option is reduced to $90,000.

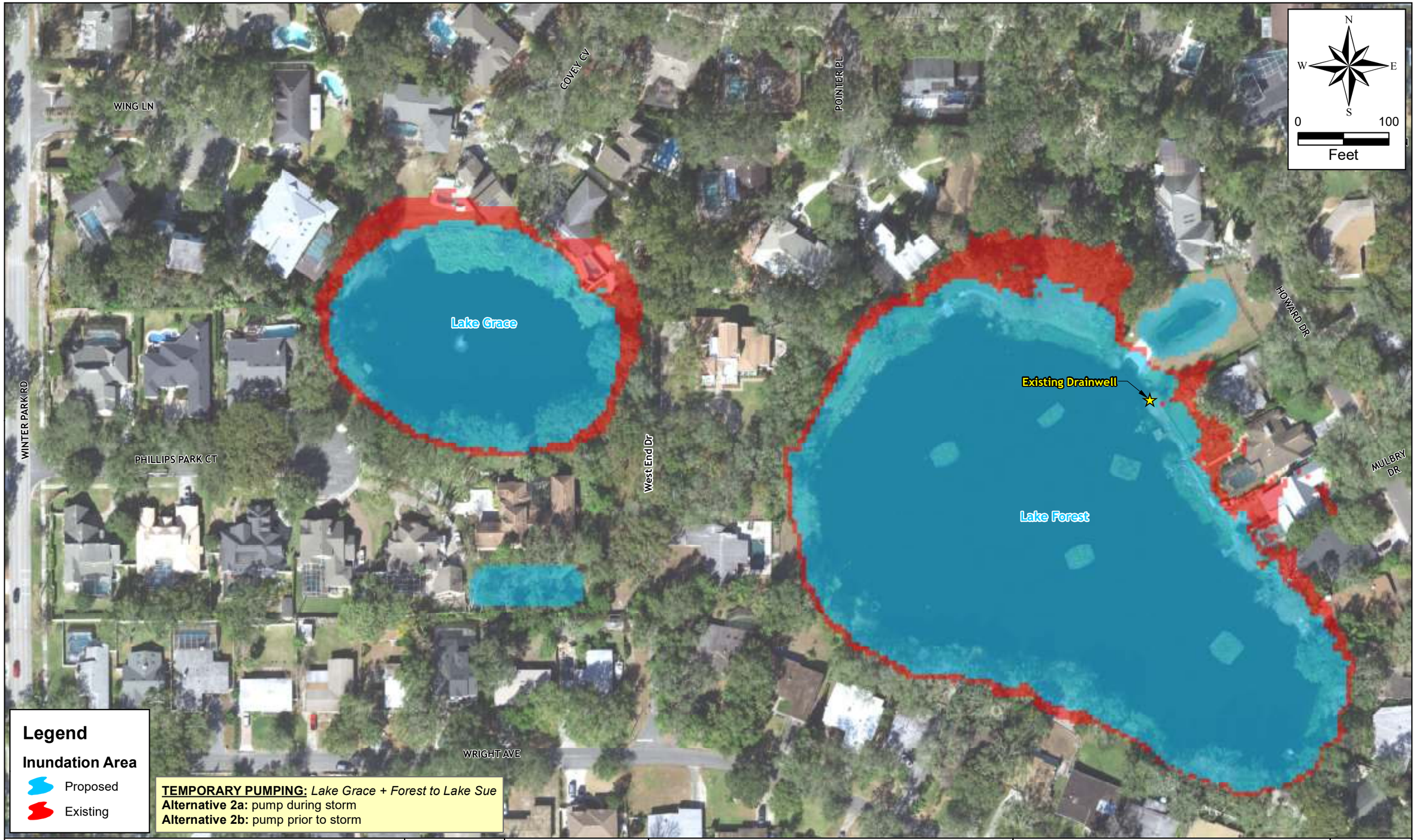
Alternative 2b (*Pump Option 2*): Pumping occurs prior to storm to lower the initial lake levels, increasing the available storage within the lakes. No pumping occurs during storm.

- Pump Requirements: This option requires a 3,000gpm pump (model: 6GST) within both lakes. The pump in Lake Grace would need to operate for four (4) hours prior to the storm to lower the lake level by 1.8 ft, while the pump in Lake Forest would need to operate for 10 hours to lower the lake level by 1.5 ft.
- Results: Maximum stages during the 500-year, 24-hour storm event are reduced by 14.5- and 9.5-inches within Lake Grace and Forest, respectively.
- Permitting Considerations: Permitting challenges are not anticipated for this alternative, as pumping down lake levels is authorized during state of emergency declarations. However, lowering the lake level prior to a storm may pose environmental or water-use concerns.
- Cost: This option requires one (1) 6GST pump, with a quoted price of $90,000. If the City utilizes the 6GST pump already within its fleet, there is no cost to implement this option. While both lakes require a 6GST pump, the pumping in each lake can occur sequentially, thus requiring one (1) pump instead of two (2).

Both pump options meet the desired LOS (500-year, 24-hour) at Lake Grace and Lake Forest. Impacts to the maximum stages within Lake Sue are negligible.

Maximum stages and flood depths for this alternative are presented in **Table 4.1** and **4.2**, respectively. An inundation comparison map for this alternative is provided as **Figure 4.2**. Note, only one inundation map is provided, as the visual difference between Options 1 and 2 is negligible. The StormWise input data and results for Alternatives 2a and 2b can be found in **Appendix F.1** and **F.2**, respectively.

Pump specifications and pricing were obtained from Global Pump in July 2024. The pricing assumes the pumps are trailer mounted and include sound attenuation enclosures (SoundGuard). The costs per pump should be considered preliminary, as certain optional costs were not included (e.g., fuel tanks extensions, hoses).



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Sources:
Aerials: 2018 Orange County

WINTER PARK CENTRAL BASIN STORMWATER MASTER PLAN

LAKES GRACE & FOREST DESIGN ALTERNATIVE 2a & b 500-YEAR 24-HOUR INUNDATION MAP

FIGURE: 4.2

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4.4 Design Alternative 3

Alternative 3 addresses street and lot flooding around Lake Knowles, which was observed during Hurricane Ian.

To achieve this, an emergency gravity culvert outfall will be constructed to allow Lake Knowles to discharge into Lake Maitland during extreme storm events. This includes installing an overflow structure within Lake Knowles, and 1,718-feet of 42" RCP along Temple Dr, Via Salerno, Via Tuscany, and Alabama Dr. Eight (8) manholes are included along the culvert, with a headwall at the outfall within Lake Maitland. The outfall structure is designed to function only during extreme storm events. The components of this design can be seen in **Figure 4.3**.

- Results: This alternative meets the desired LOS (500-year, 24-hour) at Lake Knowles. Model results indicate maximum stages during the 500-year, 24-hour storm event are reduced by 18.0-inches within Lake Knowles. Impacts to the maximum stages within Lake Maitland are negligible.

  Maximum stages and flood depths for this alternative are presented in **Table 4.1** and **4.2**, respectively. An inundation comparison for this alternative is provided within **Figure 4.3**.

- Permitting Considerations: Permitting challenges are anticipated for this alternative, as providing an outfall to a previously closed-basin system may pose water quality concerns. As such, installing a treatment system may be required.

- Construction Considerations: Construction of this alternative is mostly contained within City right-of-way; however, a segment of the outfall culvert traverses privately-owned land. As such, a drainage easement will need to be acquired. If this alternative is chosen, utilities will be located as part of the construction level survey and impacts to existing utilities will be minimized in the final design.

- Cost: The total cost of construction for this alternative is estimated to be $2,250,243. A detailed construction cost estimate is provided in **Table 4.3**. Note, the costs of installing a treatment system and acquiring a drainage easement are not included.

The StormWise input data and results for this alternative can be found in **Appendix F.1**.



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Sources:
Aerials: 2018 Orange County

WINTER PARK CENTRAL BASIN STORMWATER MASTER PLAN

LAKE KNOWLES
DESIGN ALTERNATIVE 3
500-YEAR 24-HOUR INUNDATION MAP

FIGURE:
4.3

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Table 4.3 Engineer's Opinion of Probable Cost

Design Alternative 3 - Lake Knowles

ITEM NO.	FDOT NO.	DESCRIPTION	EST. QTY.	UNIT	UNIT PRICE	CONTRACT PRICE
1	101-1	MOBILIZATION (10% OF ITEMS 2 THRU 16)	1	LS	$ 205,000.00	$ 205,000.00
2	102-1	MAINTENANCE OF TRAFFIC	1	LS	$ 120,000.00	$ 120,000.00
3	104	PREVENTION, CONTROL, AND ABATEMENT OF EROSION AND WATER POLLUTION	1	LS	$ 48,000.00	$ 48,000.00
4	110-1-1	CLEARING & GRUBBING	1.1	AC	$ 66,799.76	$ 73,853.92
5	160-4	TYPE B STABILIZATION	3,736	SY	$ 8.77	$ 32,768.29
6	285-709	OPTIONAL BASE, BASE GROUP 09	3,827	SY	$ 50.14	$ 191,853.76
7	334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	1,000	SY	$ 19.77	$ 19,770.00
8	425-1-581	INLETS, DT BOT, TYPE H, <10'	2	EA	$ 14,898.60	$ 29,797.20
9	425-2-71	MANHOLES, J-7, <10'	6	EA	$ 18,215.33	$ 109,291.97
10	425-2-72	MANHOLES, J-7, >10'	2	EA	$ 26,823.00	$ 53,646.00
11	430-175-142	PIPE CULVERT, OPT MATERIAL, ROUND, 42"S/CD	1,720	LF	$ 470.28	$ 808,881.60
12	430-542-100	STRAIGHT CONCRETE ENDWALLS, 42", SINGLE, 0 DEGREES, ROUND	1	EA	$ 17,448.00	$ 17,448.00
13	520-1-10	CONCRETE CURB & GUTTER, TYPE F	1,640	LF	$ 55.78	$ 91,472.64
14	522-2	CONCRETE SIDEWALK AND DRIVEWAYS, 6" THICK	400	SY	$ 116.84	$ 46,737.60
15	526-1-101	PAVERS, ARCHITECTURAL, REMOVE EXISTING AND REINSTALL	2,644	SY	$ 130.44	$ 344,941.33
16	570-1-2	PERFORMANCE TURF (SOD, MATCH EXISTING)	5,221	SY	$ 10.88	$ 56,780.55
				Total Estimated Construction Cost =		**$ 2,250,243.00**

General Notes:

1. Costs do not include construction administration.
2. Unit costs are from Florida Department of Transportation - From 2023/02/01 to 2024/01/31 (Statewide)
3. Lump Sum costs are engineer's estimate.

4.5 Design Alternative 4

Alternative 4 addresses lot flooding around Lake Sylvan, which was observed during Hurricane Ian.

To achieve this, a gravity culvert emergency outfall will be constructed to allow Lake Sylvan to discharge into Lake Mizell during extreme storm events. This includes installing a control structure within Lake Sylvan, and 1,050-feet of 18" RCP along Overlook Rd, Grove Terrace, and Osceola Ave. Six (6) manholes are included along the culvert, with a headwall at the outfall within Lake Mizell. The control structure will include an orifice to allow Lake Sylvan to recover its available storage after a storm. The weir component of the structure is designed to function only during extreme storm events. The components of this design can be seen in **Figure 4.4**.

- Results: This alternative meets the desired LOS (500-year, 24-hour) at Lake Sylvan, with the primary benefit of providing the lake with a bleed-down mechanism. Model results indicate maximum stages during the 500-year, 24-hour storm event are reduced by 1.2-inches within Lake Sylvan. Impacts to the maximum stages within Lake Mizell are negligible.

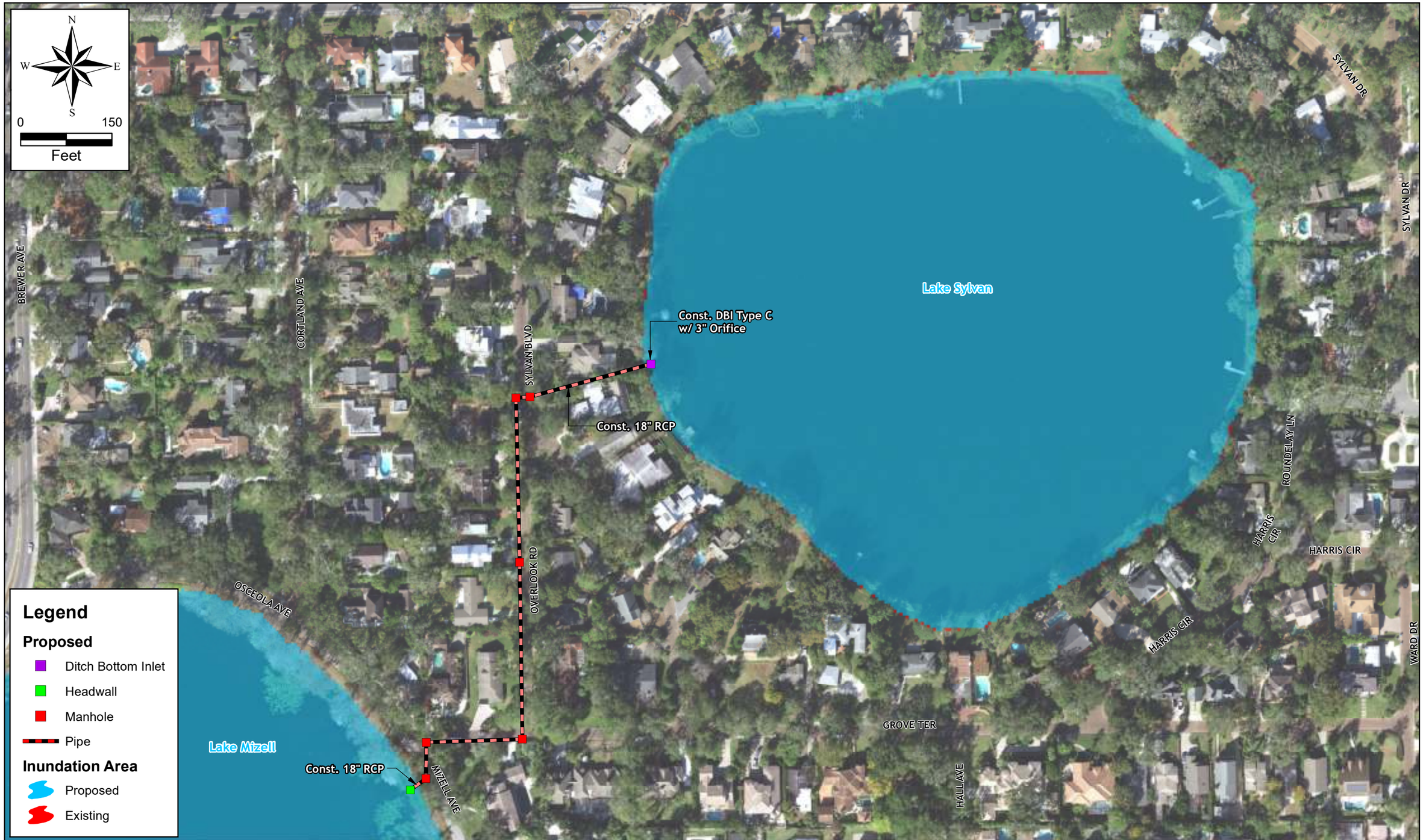
  Maximum stages and flood depths for this alternative are presented in **Table 4.1** and **4.2**, respectively. An inundation comparison for this alternative is provided within **Figure 4.4**.

- Permitting Considerations: Permitting challenges are anticipated for this alternative, as providing an outfall to a previously closed-basin system may pose water quality concerns. As such, installing a treatment system may be required.

- Construction Considerations: Construction of this alternative is mostly contained within City right-of-way, though a segment of the outfall culvert traverses thru privately-owned land. If this alternative is chosen, utilities will be located as part of the construction level survey and impacts to existing utilities will be minimized in the final design.

- Cost: The total cost of construction for this alternative is estimated to be $1,117,971. A detailed construction cost estimate is provided in **Table 4.4**. Note, the costs of installing a treatment system and acquiring a drainage easement are not included.

The StormWise input data and results for this alternative can be found in **Appendix F.3**.



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Sources:
Aerials: 2018 Orange County

WINTER PARK CENTRAL BASIN STORMWATER MASTER PLAN

LAKE SYLVAN
DESIGN ALTERNATIVE 4
500-YEAR 24-HOUR INUNDATION MAP

FIGURE:
4.4

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Table 4.4 Engineer's Opinion of Probable Cost

Design Alternative 4 - Lake Sylvan

ITEM NO.	FDOT NO.	DESCRIPTION	EST. QTY.	UNIT	UNIT PRICE	CONTRACT PRICE
1	101-1	MOBILIZATION (10% OF ITEMS 2 THRU 16)	1	LS	$ 102,000.00	$ 102,000.00
2	102-1	MAINTENANCE OF TRAFFIC	1	LS	$ 120,000.00	$ 120,000.00
3	104	PREVENTION, CONTROL, AND ABATEMENT OF EROSION AND WATER POLLUTION	1	LS	$ 48,000.00	$ 48,000.00
4	110-1-1	CLEARING & GRUBBING	0.6	AC	$ 66,799.76	$ 41,466.15
5	160-4	TYPE B STABILIZATION	1,777	SY	$ 8.77	$ 15,584.92
6	285-709	OPTIONAL BASE, BASE GROUP 09	1,820	SY	$ 50.14	$ 91,247.52
7	334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	133	SY	$ 19.77	$ 2,636.00
8	425-1-521	INLETS, DT BOT, TYPE C,<10'	1	EA	$ 8,142.29	$ 8,142.29
9	425-2-71	MANHOLES, J-7, <10'	4	EA	$ 18,215.33	$ 72,861.31
10	425-2-72	MANHOLES, J-7, >10'	4	EA	$ 26,823.00	$ 107,292.00
11	430-175-118	PIPE CULVERT,OPTIONAL MATERIAL,ROUND, 18"S/CD	1,040	LF	$ 171.40	$ 178,251.84
12	430-518-100	STRAIGHT CONCRETE ENDWALLS, 18", SINGLE, 0 DEGREES, ROUND	1	EA	$ 5,759.88	$ 5,759.88
13	520-1-10	CONCRETE CURB & GUTTER, TYPE F	780	LF	$ 55.78	$ 43,505.28
14	522-2	CONCRETE SIDEWALK AND DRIVEWAYS, 6" THICK	300	SY	$ 116.84	$ 35,053.20
15	526-1-101	PAVERS, ARCHITECTURAL, REMOVE EXISTING AND REINSTALL	1,600	SY	$ 130.44	$ 208,704.00
16	570-1-2	PERFORMANCE TURF (SOD, MATCH EXISTING)	3,445	SY	$ 10.88	$ 37,466.55
				Total Estimated Construction Cost =		**$ 1,117,971.00**

General Notes:

1. Costs do not include construction administration.
2. Unit costs are from Florida Department of Transportation - From 2023/02/01 to 2024/01/31 (Statewide)
3. Lump Sum costs are engineer's estimate.

4.6 Design Alternative 5

Alternative 5 addresses inundation that threatens well-established tree (live oaks) around Lake Chelton, which was observed during Hurricane Ian.

To achieve this, a structural outfall will be constructed to allow Lake Chelton to discharge into Lake Sue during extreme storm events. This includes installing a control structure within Lake Chelton, and 550-feet of 18" RCP along Chelton Cir, Dana Way, and Fawsett Rd. Three (3) manholes are included along the culvert, with a headwall at the outfall within Lake Sue. The control structure will include an orifice to allow Lake Chelton to recover its available storage after a storm. The weir component of the structure is designed to function only during extreme storm events. The components of this design can be seen in **Figure 4.5**.

- Results: This alternative meets the desired LOS (500-year, 24-hour) at Lake Chelton, with the primary benefit of providing the lake with a bleed-down mechanism. Model results indicate maximum stages during the 500-year, 24-hour storm event are reduced by 4.8-inches within Lake Chelton. Impacts to the maximum stages within Lake Sue are negligible.

  Maximum stages and flood depths for this alternative are presented in **Table 4.1** and **4.2**, respectively. An inundation comparison for this alternative is provided within **Figure 4.5**.

- Permitting Considerations: Permitting challenges are anticipated for this alternative, as providing an outfall to a previously closed-basin system may pose water quality concerns. As such, installing a treatment system may be required.

- Construction Considerations: Construction of this alternative is contained within City right-of-way. If this alternative is chosen, utilities will be located as part of the construction level survey and impacts to existing utilities will be minimized in the final design.

- Cost: The total cost of construction for this alternative is estimated to be $597,359. A detailed construction cost estimate is provided in **Table 4.5**. Note, the cost of installing a treatment is not included.

The StormWise input data and results for this alternative can be found in **Appendix F.3**.



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Sources:
Aerials: 2018 Orange County

WINTER PARK CENTRAL BASIN STORMWATER MASTER PLAN

LAKE CHELTON
DESIGN ALTERNATIVE 5
500-YEAR 24-HOUR INUNDATION MAP

FIGURE:
4.5

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Table 4.5 Engineer's Opinion of Probable Cost

Design Alternative 5 - Lake Chelton

ITEM NO.	FDOT NO.	DESCRIPTION	EST. QTY.	UNIT	UNIT PRICE	CONTRACT PRICE
1	101-1	MOBILIZATION (10% OF ITEMS 2 THRU 14)	1	LS	$ 55,000.00	$ 55,000.00
2	102-1	MAINTENANCE OF TRAFFIC	1	LS	$ 90,000.00	$ 90,000.00
3	104	PREVENTION, CONTROL, AND ABATEMENT OF EROSION AND WATER POLLUTION	1	LS	$ 36,000.00	$ 36,000.00
4	110-1-1	CLEARING & GRUBBING	0.3	AC	$ 66,799.76	$ 21,929.22
5	160-4	TYPE B STABILIZATION	854	SY	$ 8.77	$ 7,492.75
6	285-709	OPTIONAL BASE, BASE GROUP 09	875	SY	$ 50.14	$ 43,869.00
7	425-1-521	INLETS, DT BOT, TYPE C,<10'	1	EA	$ 8,142.29	$ 8,142.29
8	425-2-71	MANHOLES, J-7, <10'	4	EA	$ 18,215.33	$ 72,861.31
9	430-175-118	PIPE CULVERT,OPTIONAL MATERIAL,ROUND, 18"S/CD	550	LF	$ 171.40	$ 94,267.80
10	430-518-100	STRAIGHT CONCRETE ENDWALLS, 18", SINGLE, 0 DEGREES, ROUND	1	EA	$ 5,759.88	$ 5,759.88
11	520-1-10	CONCRETE CURB & GUTTER, TYPE F	375	LF	$ 55.78	$ 20,916.00
12	522-2	CONCRETE SIDEWALK AND DRIVEWAYS, 6" THICK	100	SY	$ 116.84	$ 11,684.40
13	526-1-101	PAVERS, ARCHITECTURAL, REMOVE EXISTING AND REINSTALL	833	SY	$ 130.44	$ 108,700.00
14	570-1-2	PERFORMANCE TURF (SOD, MATCH EXISTING)	1,907	SY	$ 10.88	$ 20,736.45
		Total Estimated Construction Cost =				**$ 597,359.00**

General Notes:

1. Costs do not include construction administration.
2. Unit costs are from Florida Department of Transportation - From 2023/02/01 to 2024/01/31 (Statewide)
3. Lump Sum costs are engineer's estimate.

4.7 Design Alternative 6

Alternative 6 addresses lot flooding and potential structure flooding around Lake Grace, and lot flooding around Lake Forest, which was observed during Hurricane Ian.

To achieve this, an emergency gravity culvert outfall will be constructed to allow Lake Forest to discharge into Lake Grace, and for Lake Grace to discharge into Lake Sue during extreme storm events. Listed in a general upstream to downstream direction, the specific components of the improvements include:

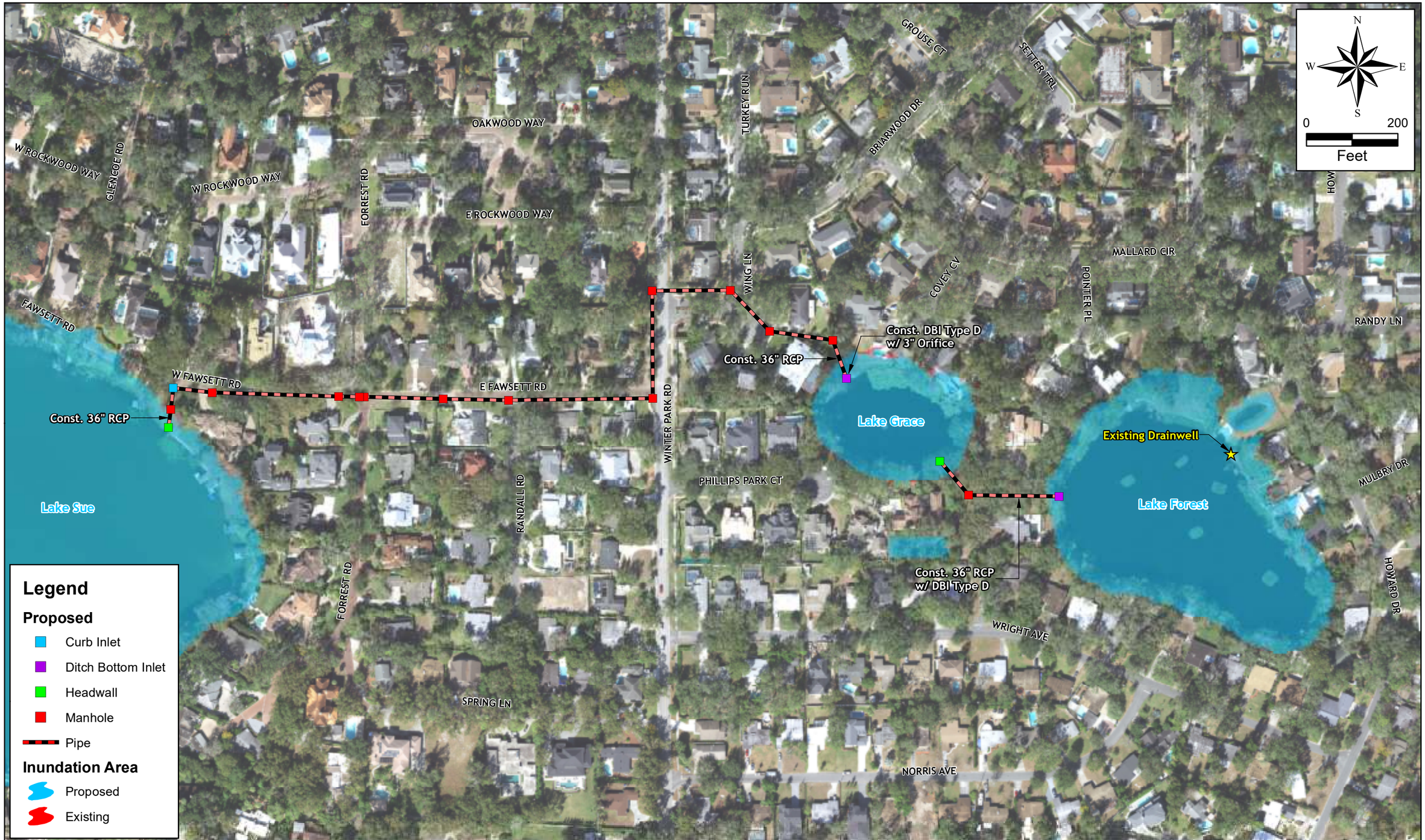
1. Installing a control structure within Lake Forest. The weir component of the structure is designed to function only during storm events greater than or equivalent to the 500-year 24-hour.
2. Installing 300-feet of 36" RCP from Lake Forest to Lake Grace. One (1) manhole is included along this segment.
3. Installing a control structure within Lake Grace. The control structure will include an orifice to allow Lake Grace to recover its available storage after a storm. The weir component of the structure is designed to function only during storm events greater than or equivalent to the 500-year 24-hour.
4. Installing 1,075-feet of 36" RCP from the lake to an existing storm sewer system at the intersection of Fawsett Rd and Randall Rd. This segment traverses Phillips Park Ct, Winter Park Rd, and Fawsett Rd. Five (5) manholes are included along this segment.
5. Installing 820-feet of 36" RCP to upsize the pipe from the intersection of Fawsett Rd and Randall Rd to the outfall in Lake Sue. This segment traverses Fawsett Rd and the intersection with Forrest Rd. Seven (7) manholes and one (1) curb inlet are included along this segment.

The components of this design can be seen in **Figure 4.6**.

- Results: This alternative meets the desired LOS (500-year, 24-hour) at Lake Grace, and achieves the benefit of providing the lake with a bleed-down mechanism. Model results indicate maximum stages during the 500-year, 24-hour storm event are reduced by 4.8-inches within Lake Grace. Impacts to maximum stages within Lake Forest are negligible; the outfall into Lake Grace only provides a benefit if the drainwell within Lake Forest fails. Impacts to the maximum stages within Lake Sue are negligible.

  Maximum stages and flood depths for this alternative are presented in **Table 4.1** and **4.2**, respectively. An inundation comparison for this alternative is provided within **Figure 4.6**.
- Permitting Considerations: Permitting challenges are anticipated for this alternative, as providing an outfall to a previously closed-basin system may pose water quality concerns. As such, installing a treatment system may be required.
- Construction Considerations: Construction of this alternative is mostly contained within City right-of-way; however, portions of the proposed outfalls traverse privately-owned land. As such, a drainage easement will need to be acquired. If this alternative is chosen, utilities will be located as part of the construction level survey and impacts to existing utilities will be minimized in the final design.
- Cost: The total cost of construction for this alternative is estimated to be $2,394,517. A detailed construction cost estimate is provided in **Table 4.6**. Note, the costs of installing a treatment system and acquiring a drainage easement are not included.

The StormWise input data and results for this alternative can be found in **Appendix F.3**.



SAI SINGHOFEN & ASSOCIATES INCORPORATED | halff		*Sources:* *Aerials: 2018 Orange County*	**WINTER PARK CENTRAL BASIN STORMWATER MASTER PLAN**	**LAKES GRACE & FOREST** **DESIGN ALTERNATIVE 6** **500-YEAR 24-HOUR INUNDATION MAP**	**FIGURE:** **4.6**

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Table 4.6 Engineer's Opinion of Probable Cost

Design Alternative 6 - Lakes Grace & Forest

ITEM NO.	FDOT NO.	DESCRIPTION	EST. QTY.	UNIT	UNIT PRICE	CONTRACT PRICE
1	101-1	MOBILIZATION (10% OF ITEMS 2 THRU 17)	1	LS	$ 218,000.00	$ 218,000.00
2	102-1	MAINTENANCE OF TRAFFIC	1	LS	$ 135,000.00	$ 135,000.00
3	104	PREVENTION, CONTROL, AND ABATEMENT OF EROSION AND WATER POLLUTION	1	LS	$ 54,000.00	$ 54,000.00
4	110-1-1	CLEARING & GRUBBING	1.2	AC	$ 66,799.76	$ 78,462.12
5	160-4	TYPE B STABILIZATION	3,594	SY	$ 8.77	$ 31,529.49
6	285-709	OPTIONAL BASE, BASE GROUP 09	3,682	SY	$ 50.14	$ 184,600.75
7	334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	1,178	SY	$ 19.77	$ 23,284.67
8	425-1-421	INLETS, CURB, TYPE J-2, <10'	1	EA	$ 17,532.04	$ 17,532.04
9	425-1-543	INLETS, DITCH BOTTOM, TYPE D, J BOT, <10'	2	EA	$ 17,863.63	$ 35,727.26
10	425-2-71	MANHOLES, J-7, <10'	8	EA	$ 18,215.33	$ 145,722.62
11	425-2-72	MANHOLES, J-7, >10'	6	EA	$ 26,823.00	$ 160,938.00
12	430-175-136	PIPE CULVERT, OPT MATERIAL, ROUND, 36"S/CD	2,195	LF	$ 359.72	$ 789,594.18
13	430-536-100	STRAIGHT CONCRETE ENDWALLS, 36", SINGLE, 0 DEGREES, ROUND	2	EA	$ 13,046.18	$ 26,092.37
14	520-1-10	CONCRETE CURB & GUTTER, TYPE F	1,578	LF	$ 55.78	$ 88,014.53
15	522-2	CONCRETE SIDEWALK AND DRIVEWAYS, 6" THICK	367	SY	$ 116.84	$ 42,842.80
16	526-1-101	PAVERS, ARCHITECTURAL, REMOVE EXISTING AND REINSTALL	2,333	SY	$ 130.44	$ 304,360.00
17	570-1-2	PERFORMANCE TURF (SOD, MATCH EXISTING)	5,408	SY	$ 10.88	$ 58,816.35
					Total Estimated Construction Cost =	**$ 2,394,517.00**

General Notes:

1. Costs do not include construction administration.
2. Unit costs are from Florida Department of Transportation - From 2023/02/01 to 2024/01/31 (Statewide)
3. Lump Sum costs are engineer's estimate.

4.8 Design Alternative 7

Alternative 7 addresses lot flooding and potential structure flooding around Lake Grace, which was observed during Hurricane Ian.

To achieve this, an emergency gravity culvert outfall will be constructed to allow Lake Grace to discharge into Lake Sue during extreme storm events. Listed in a general upstream to downstream direction, the specific components of the improvements include:

1. Installing a control structure within Lake Grace. The control structure will include an orifice to allow Lake Grace to recover its available storage after a storm. The weir component of the structure is designed to function only during storm events greater than or equivalent to the 500-year 24-hour.
2. Installing 1,075-feet of 18" RCP from the lake to an existing storm sewer system at the intersection of Fawsett Rd and Randall Rd. This segment traverses Phillips Park Ct, Winter Park Rd, and Fawsett Rd. Five (5) manholes are included along this segment.
3. Installing 820-feet of 36" RCP to upsize the pipe from the intersection of Fawsett Rd and Randall Rd to the outfall in Lake Sue. This segment traverses Fawsett Rd and the intersection with Forrest Rd. Seven (7) manholes and one (1) curb inlet are included along this segment.

The components of this design can be seen in **Figure 4.7**.

- Results: This alternative meets the desired LOS (500-year, 24-hour) at Lake Grace. Model results indicate maximum stages during the 500-year, 24-hour storm event are reduced by 6.0-inches within Lake Grace. Impacts to the maximum stages within Lake Sue are negligible.

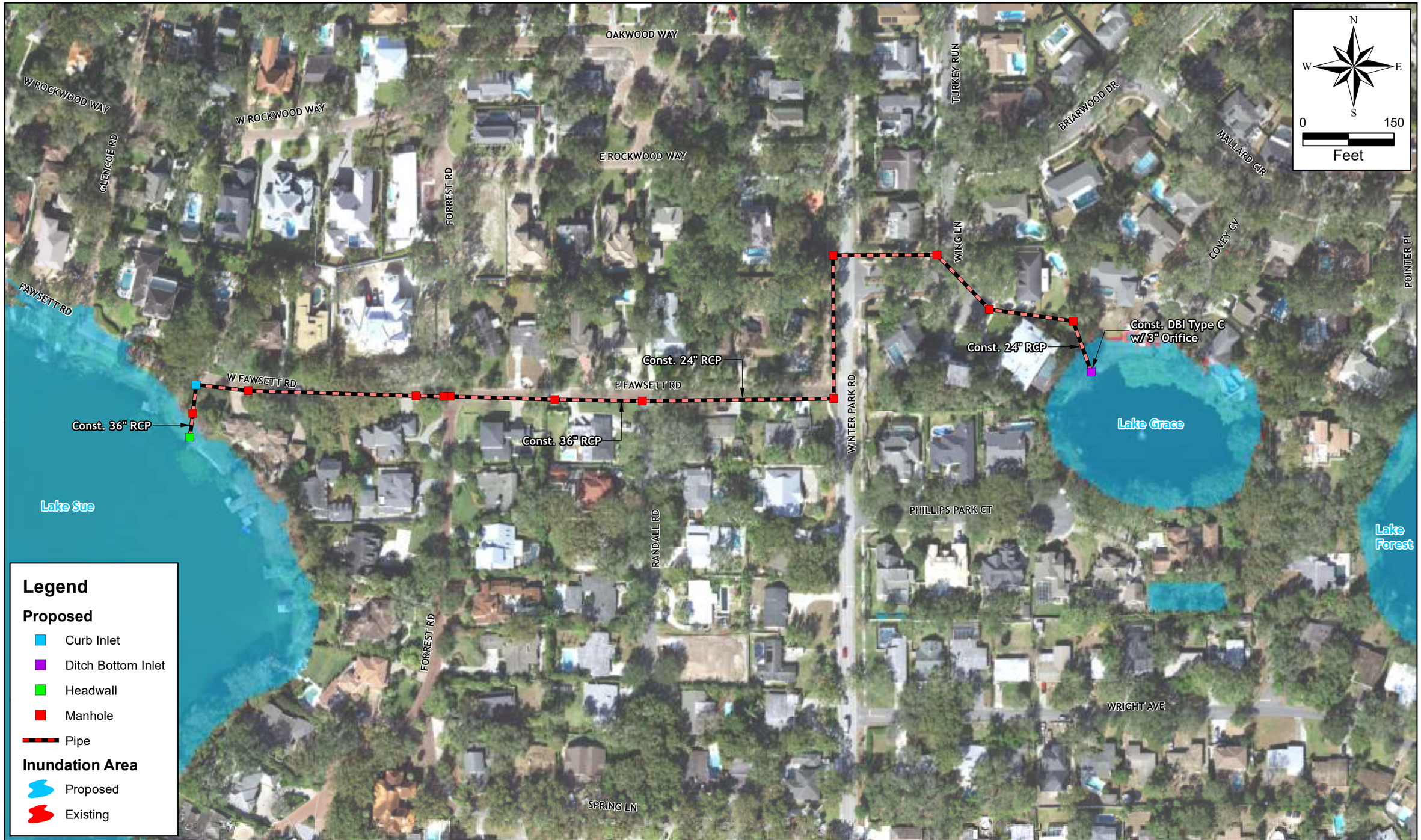
  Maximum stages and flood depths for this alternative are presented in **Table 4.1** and **4.2**, respectively. An inundation comparison for this alternative is provided within **Figure 4.7**.

- Permitting Considerations: Permitting challenges are anticipated for this alternative, as providing an outfall to a previously closed-basin system may pose water quality concerns. As such, installing a treatment system may be required.

- Construction Considerations: Construction of this alternative is mostly contained within City right-of-way. However, a portion of the proposed outfall passes through privately-owned land. As such, a drainage easement will need to be acquired. If this alternative is chosen, utilities will be located as part of the construction level survey and impacts to existing utilities will be minimized in the final design.

- Cost: The total cost of construction for this alternative is estimated to be $1,986,312. A detailed construction cost estimate is provided in **Table 4.7**. Note, the costs of installing a treatment system and acquiring a drainage easement are not included.

The StormWise input data and results for this alternative can be found in **Appendix F.4**.



SAI SINGHOFEN & ASSOCIATES INCORPORATED | halff	*Sources:* *Aerials: 2018 Orange County*	**WINTER PARK CENTRAL BASIN STORMWATER MASTER PLAN**	**LAKE GRACE** **DESIGN ALTERNATIVE 7** **500-YEAR 24-HOUR INUNDATION MAP**	**FIGURE:** **4.7**

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Table 4.7 Engineer's Opinion of Probable Cost

Design Alternative 7 - Lake Grace

ITEM NO.	FDOT NO.	DESCRIPTION	EST. QTY.	UNIT	UNIT PRICE	CONTRACT PRICE
1	101-1	MOBILIZATION (10% OF ITEMS 2 THRU 18)	1	LS	$ 181,000.00	$ 181,000.00
2	102-1	MAINTENANCE OF TRAFFIC	1	LS	$ 120,000.00	$ 120,000.00
3	104	PREVENTION, CONTROL, AND ABATEMENT OF EROSION AND WATER POLLUTION	1	LS	$ 48,000.00	$ 48,000.00
4	110-1-1	CLEARING & GRUBBING	1.2	AC	$ 66,799.76	$ 78,462.12
5	160-4	TYPE B STABILIZATION	3,594	SY	$ 8.77	$ 31,529.49
6	285-709	OPTIONAL BASE, BASE GROUP 09	3,682	SY	$ 50.14	$ 184,600.75
7	334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	1,178	SY	$ 19.77	$ 23,284.67
8	425-1-421	INLETS, CURB, TYPE J-2, <10'	1	EA	$ 17,532.04	$ 17,532.04
9	425-1-521	INLETS, DT BOT, TYPE C,<10'	1	EA	$ 8,142.29	$ 8,142.29
10	425-2-71	MANHOLES, J-7, <10'	8	EA	$ 18,215.33	$ 145,722.62
11	425-2-72	MANHOLES, J-7, >10'	5	EA	$ 26,823.00	$ 134,115.00
12	430-175-124	PIPE CULVERT,OPTIONAL MATERIAL,ROUND, 24"S/CD	1,075	LF	$ 197.09	$ 211,869.60
13	430-175-136	PIPE CULVERT, OPT MATERIAL, ROUND, 36"S/CD	820	LF	$ 359.72	$ 294,973.68
14	430-536-100	STRAIGHT CONCRETE ENDWALLS, 36", SINGLE, 0 DEGREES, ROUND	1	EA	$ 13,046.18	$ 13,046.18
15	520-1-10	CONCRETE CURB & GUTTER, TYPE F	1,578	LF	$ 55.78	$ 88,014.53
16	522-2	CONCRETE SIDEWALK AND DRIVEWAYS, 6" THICK	367	SY	$ 116.84	$ 42,842.80
17	526-1-101	PAVERS, ARCHITECTURAL, REMOVE EXISTING AND REINSTALL	2,333	SY	$ 130.44	$ 304,360.00
18	570-1-2	PERFORMANCE TURF (SOD, MATCH EXISTING)	5,408	SY	$ 10.88	$ 58,816.35
					Total Estimated Construction Cost =	**$ 1,986,312.00**

General Notes:

1. Costs do not include construction administration.
2. Unit costs are from Florida Department of Transportation - From 2023/02/01 to 2024/01/31 (Statewide)
3. Lump Sum costs are engineer's estimate.

4.9 Design Alternative 8

Alternative 8 addresses lot flooding and potential structure flooding around Lake Grace, which was observed during Hurricane Ian.

To achieve this, the Phillips Place retention pond outfall will be moved from Lake Grace to Lake Forest. This includes installing a control structure within the retention pond, and 295-feet of 18" RCP to Lake Forest, crossing West End Dr. Two (2) manholes are included along the culvert, with a headwall at the outfall within Lake Forest. The new control structure will include a weir to maintain the same control elevation as the existing outfall.

The components of this design can be seen in **Figure 4.8**.

- Results: This alternative meets the desired LOS (500-year, 24-hour) at Lake Grace. Model results indicate maximum stages during the 500-year, 24-hour storm event are reduced by 3.6-inches within Lake Grace. Maximum stages within Lake Forest are increased by 1.2-inches.

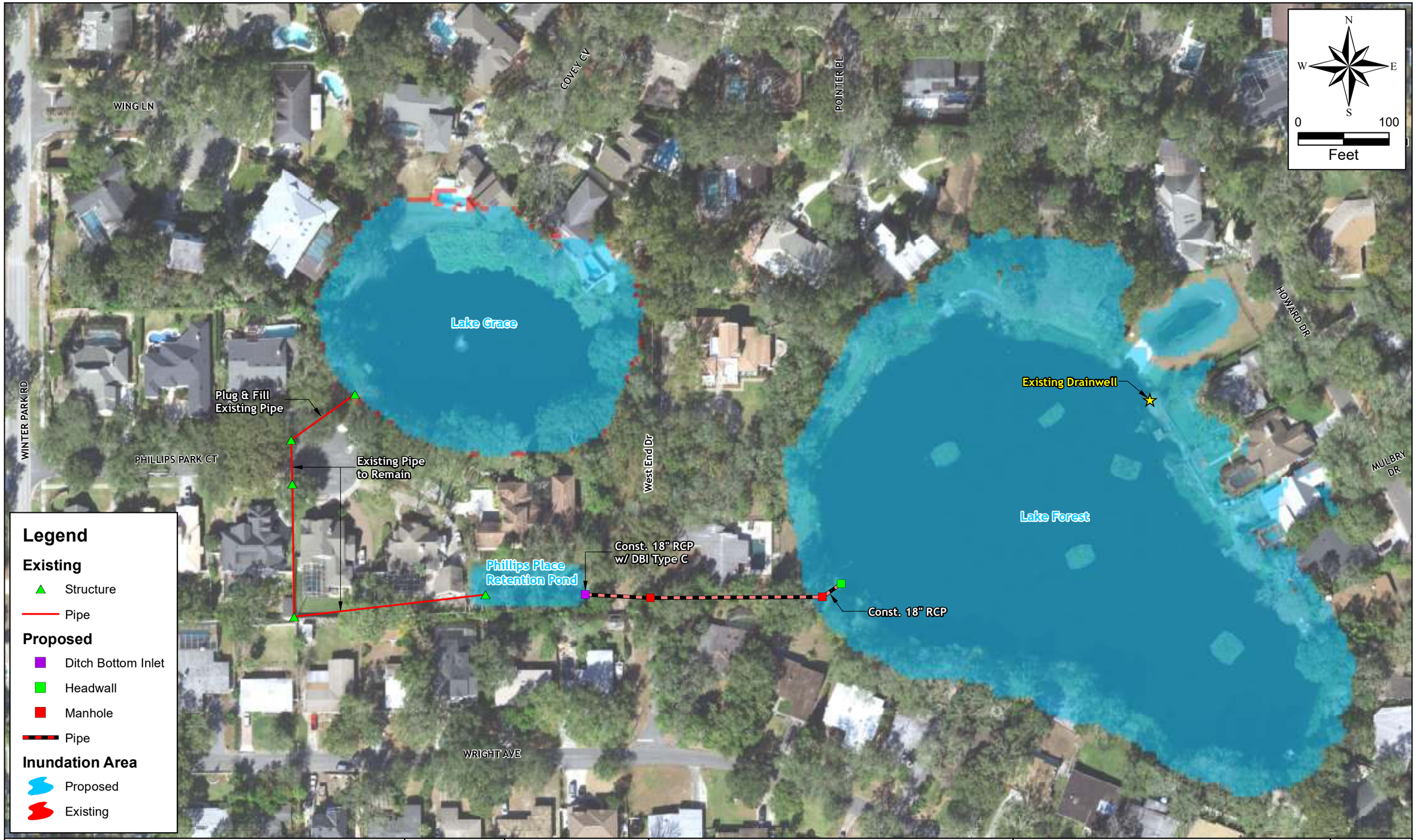
  Maximum stages and flood depths for this alternative are presented in **Table 4.1** and **4.2**, respectively. An inundation comparison for this alternative is provided within **Figure 4.8**.

- Permitting Considerations: Permitting challenges are anticipated for this alternative, as impervious area is being added to the Lake Forest basin, which may pose water quality concerns.

- Construction Considerations: Construction of this alternative is mostly on privately-owned land. As such, a drainage easement will need to be acquired. If this alternative is chosen, utilities will be located as part of the construction level survey and impacts to existing utilities will be minimized in the final design.

- Cost: The total cost of construction for this alternative is estimated to be $237,989. A detailed construction cost estimate is provided in **Table 4.8**. Note, the cost of acquiring a drainage easement is not included.

The StormWise input data and results for this alternative can be found in **Appendix F.5**.



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Sources:
Aerials: 2018 Orange County

WINTER PARK CENTRAL BASIN STORMWATER MASTER PLAN

LAKE GRACE
DESIGN ALTERNATIVE 8
500-YEAR 24-HOUR INUNDATION MAP

FIGURE:
4.8

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Table 4.8 Engineer's Opinion of Probable Cost

Design Alternative 8 - Lake Grace

ITEM NO.	FDOT NO.	DESCRIPTION	EST. QTY.	UNIT	UNIT PRICE	CONTRACT PRICE
1	101-1	MOBILIZATION (10% OF ITEMS 2 THRU 13)	1	LS	$ 22,000.00	$ 22,000.00
2	102-1	MAINTENANCE OF TRAFFIC	1	LS	$ 75,000.00	$ 75,000.00
3	104	PREVENTION, CONTROL, AND ABATEMENT OF EROSION AND WATER POLLUTION	1	LS	$ 30,000.00	$ 30,000.00
4	110-1-1	CLEARING & GRUBBING	0.2	AC	$ 66,799.76	$ 10,121.18
5	160-4	TYPE B STABILIZATION	34	SY	$ 8.77	$ 299.71
6	285-709	OPTIONAL BASE, BASE GROUP 09	35	SY	$ 50.14	$ 1,754.76
7	334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	33	SY	$ 19.77	$ 659.00
8	425-1-521	INLETS, DT BOT, TYPE C,<10'	1	EA	$ 8,142.29	$ 8,142.29
9	425-2-61	MANHOLES, P-8, <10'	2	EA	$ 10,171.58	$ 20,343.17
10	430-175-118	PIPE CULVERT,OPTIONAL MATERIAL,ROUND, 18"S/CD	300	LF	$ 171.40	$ 51,418.80
11	430-518-100	STRAIGHT CONCRETE ENDWALLS, 18", SINGLE, 0 DEGREES, ROUND	1	EA	$ 5,759.88	$ 5,759.88
12	430-830	PIPE FILLING AND PLUGGING- PLACE OUT OF SERVICE	7	CY	$ 479.38	$ 3,355.63
13	570-1-2	PERFORMANCE TURF (SOD, MATCH EXISTING)	840	SY	$ 10.88	$ 9,135.00
			Total Estimated Construction Cost =			**$ 237,989.00**

General Notes:

1. Costs do not include construction administration.
2. Unit costs are from Florida Department of Transportation - From 2023/02/01 to 2024/01/31 (Statewide)
3. Lump Sum costs are engineer's estimate.

4.10 Additional Design Alternatives

Additional alternatives were reviewed but were not fully developed due to feasibility concerns. Alternatives which modified the Lake Maitland control structure at Howell Branch Rd were reviewed. This included improving the conveyance of the control structure, as well as the use of an operable gate to lower the water levels in the Chain of Lakes prior to a storm.

Improvements made to the outfall conveyance would reduce stages throughout the Chain of Lakes upstream of the control structure. However, these improvements did not eliminate flooding, and caused adverse impacts in the regulatory floodway downstream of the structure.

Installing an operable gate has the potential to reduce peak stages and flows during extreme storm events, both upstream and downstream of the structure. However, lowering the lake levels in advance of a storm would require a detailed study of a variety of factors to determine any adverse impacts, including hydroperiod impacts, water quality considerations, recreational impacts, and lead and recovery time. Furthermore, with the control structure located at the downstream end of the Chain of Lakes system, and upstream of Howell Creek, numerous communities throughout the region would be impacted by any design which modifies the control structure. Per the SJRWMD's feedback during a meeting between SAI-Halff, CWP, and SJRWMD staff (July 18, 2024), an operable structure would create a perception of adverse impacts downstream, even if modeling indicates no adverse impacts.

No model or cost estimates were developed for these alternatives.

4.11 Design Recommendation

The design alternatives were evaluated to each other on a lake-by-lake basis, based on construction costs and considerations, maintenance considerations, longevity, permitting feasibility, and effectiveness of design, as described below. The design alternatives at Lakes Chelton and Sylvan were not included in the ranking as only one (1) alternative was developed for each lake.

Table 4.9 presents the scoring and ranking of each design alternative as well as a description of the evaluation criteria and scoring method.

- **Construction Costs**

  The design alternatives were evaluated and ranked based on total estimated construction costs, excluding land acquisition, design engineering, and permitting.

- **Construction Considerations**

  The design alternatives were evaluated and ranked based on any potential difficulties in constructing the project.

- **Maintenance Considerations**

  Maintenance criteria for the design alternatives were evaluated according to their need for continuing maintenance of the proposed system.

- **Longevity**

  Expected project useful life for each of the design alternatives evaluated.

- **Permitting**

  The design alternatives were evaluated and compared to each other in terms of anticipated ease of permitting the project through SJRWMD.

- **Effectiveness of Design**
  The design alternatives were evaluated and ranked based on the effectiveness of the design in reducing flooding.

SAI-Halff recommends Design Alternatives 1b & 2b (Pump Option 2): temporary pumping prior to a storm at Lake Knowles, Lake Grace, and Lake Forest. Pump Option 2 meets the desired LOS at all three lakes, has the lowest cost, and requires no construction.

While Pump Option 1 meets the desired LOS, it has a higher cost and requires the pumps to operate during a storm, which may pose safety concerns. The gravity outfall alternatives also meet the desired LOS, but cost significantly more than Pump Option 2, and construction of the outfalls will cause significant interruption to the neighborhood.

Table 4.9: Design Alternative Evaluation Matrix

	Design Alternative							
	Lake Knowles			Lakes Grace & Forest				
	1a	1b	3	2a	2b	6	7	8
Description	Pump Option 1: pump during storm	Pump Option 2: pump prior to storm	Construct emergency outfall to Lake Maitland	Pump Option 1: pump during storm	Pump Option 2: pump prior to storm	Construct emergency outfall from Lake Forest to Lake Grace, and from Lake Grace to Lake Sue	Construct emergency outfall from Lake Grace into Lake Sue	Plug existing Phillips Place Retention Pond outfall into Lake Grace; Construct new outfall from retention pond into Lake Forest
Estimated Cost	$182,000	$0 - $90,000	$2,250,243	$90,000 - $180,000	$0 - $90,000	$2,394,517	$1,986,312	$237,989
Cost	4	5	1	4	5	1	2	3
Construction Considerations	5	5	1	5	5	1	2	3
Maintenance Consideration	4	5	3	4	5	3	3	2
Longevity	4	4	5	4	4	5	5	2
Permitting Feasibility	5	4	4	5	4	3	3	3
Effectiveness of Design	5	5	5	5	5	4	4	3
Total Score	27	28	19	27	28	17	19	16
Rank	**2**	**1**	**3**	**2**	**1**	**4**	**3**	**5**

Evaluation Criteria:

Criteria	Description	Score = 1	Score = 5
Construction Cost	Comparison of total estimated construction costs excluding land acquisition, design engineering, and permitting	Highest Cost	Lowest Cost
Construction Considerations	Difficulty in constructing the project	Most Difficult	Least Difficult
Maintenance Considerations	Difficulty in maintatining the constructed project	Most Difficult	Least Difficult
Longevity	Expected lifetime of the constructed project	Shortest Lifespan	Longest Lifespan
Permitting Feasibility	Ease of permitting the project for construction	Most Difficult	Least Difficult
Effectiveness of Design	Effectiveness in addressing flooding issues	Least Effective	Most Effective

Winter Park Pines Basin Study
Lake Corrine Outfall

Prepared for:

City of Winter Park

Submitted by:

Baxter and Woodman, Inc.

200 E. Robinson Street, Suite 555
Orlando, FL 32801
Phone 407-386-2249

September 2024

Table of Contents

Executive Summary 2

Section 1 Introduction
1.1 Introduction 6
1.2 Study Area Description 6
1.2.1 Data Collection 6
1.2.2 Project Location 7
1.2.3 Land Use 7
1.2.4 Watershed 7
1.2.5 Topography and Soils 7
1.2.6 Floodplain 8
1.2.7 Wetland Impacts 8

Section 2 Existing Condition Analysis
2.1 Methodology 9
2.2 Existing Conditions 9
2.3 Existing Condition ICPR Modeling 9
2.4 Results 9

Section 3 Proposed Alternatives Analysis
3.1 Proposed Condition ICPR Modeling 11
3.2 Proposed Alternatives 11
3.3 Results 14

Section 4 Summary and Recommendation 16

Figures
Figure 1: Location Map
Figure 2: USGS Quadrangle Map
Figure 3: SCS Soils Map
Figure 4: FEMA Flood Insurance Rate Map

Appendices
Appendix A: Existing Condition ICPR Data and Results
Appendix B: Proposed Alternative ICPR Data and Results
Appendix C: Backup Data from SJRWMD, Winter Park, and Orange County

Executive Summary

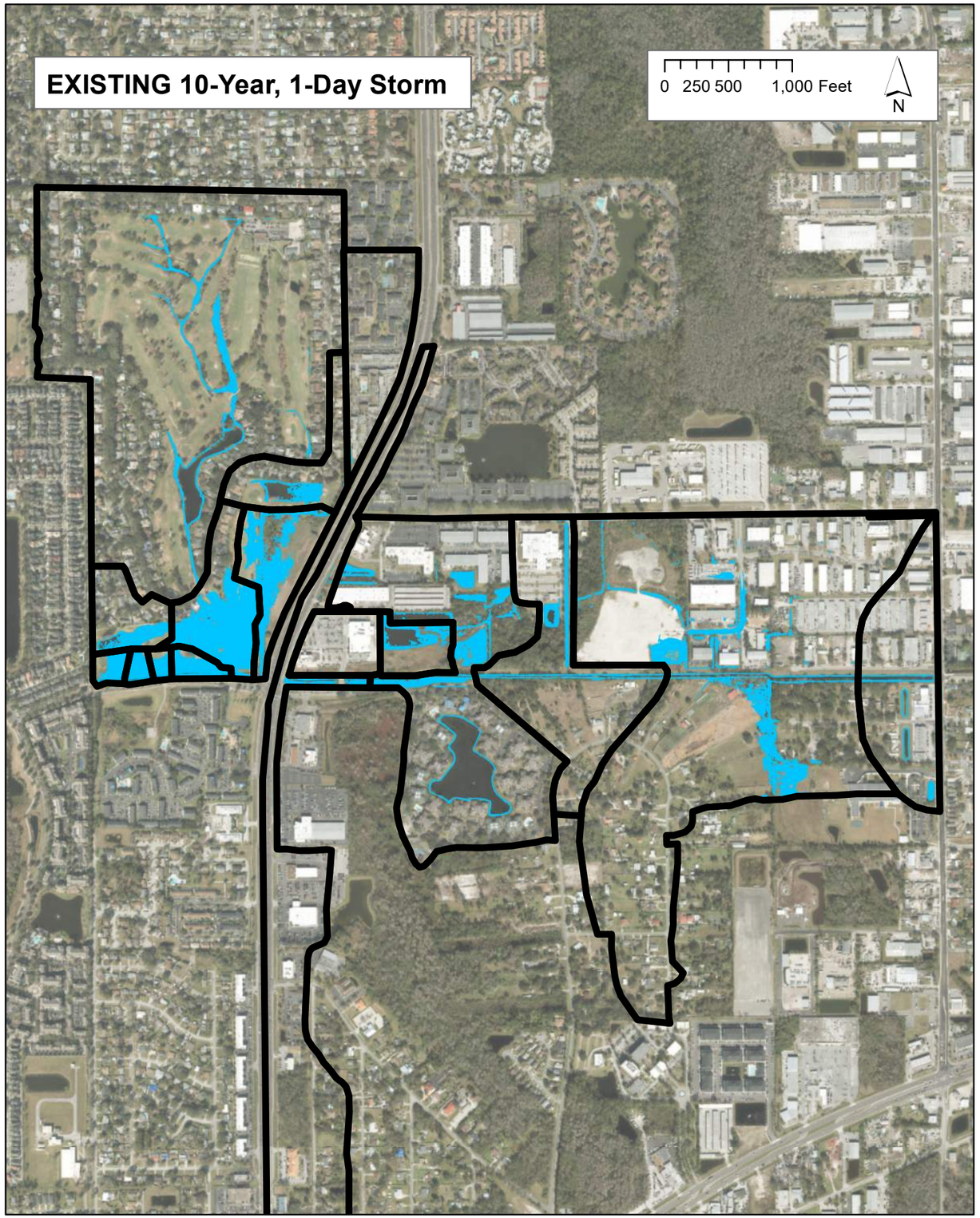
During Hurricane Ian (September 2022) Winter Park experienced flooding in various areas of the City. Areas of flooding included the Winter Park Pines golf course and surrounding neighborhoods, and the Mayflower Retirement Village in the northern area of the Winter Park Eastern Basin. The golf course and surrounding areas discharge to the Lake Corrine Outfall Canal which drains to Goldenrod Canal. The Mayflower Retirement Village drain to the Eastbrook canal, which discharges to the Crane Strand Canal and then to the Goldenrod Canal, which discharges to the Little Econlockhachee River.

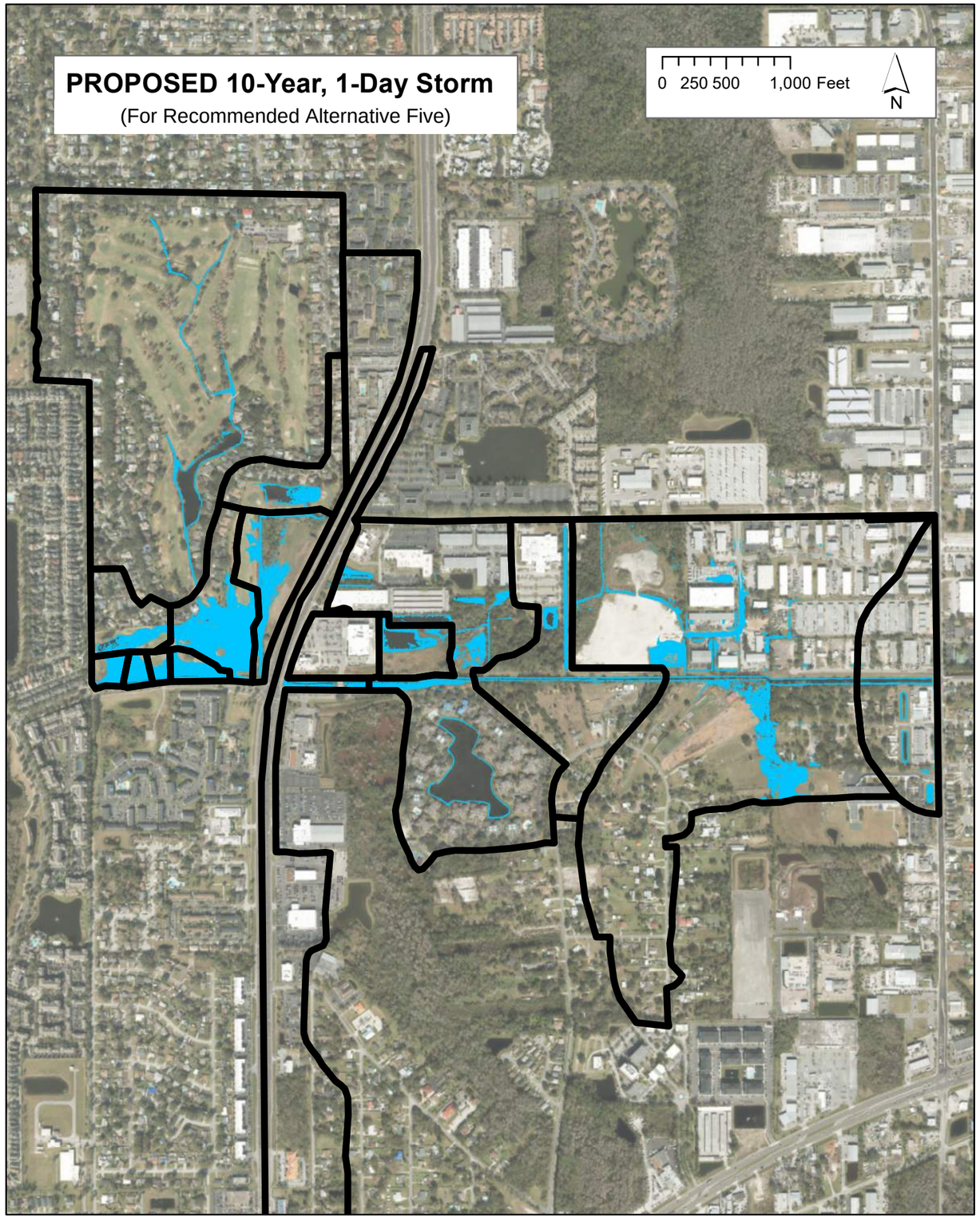
In 2023, the City of Winter Park contracted Baxter and Woodman, Inc. to provide engineering services to perform a drainage study of the eastern basins of the City. The study investigates the causes of flooding that occurred during Hurricane Ian and looks at drainage improvement alternatives to eliminate/reduce the flooding and ponding that occurs within the area. This report concentrates on the Lake Corrine Outfall Canal.

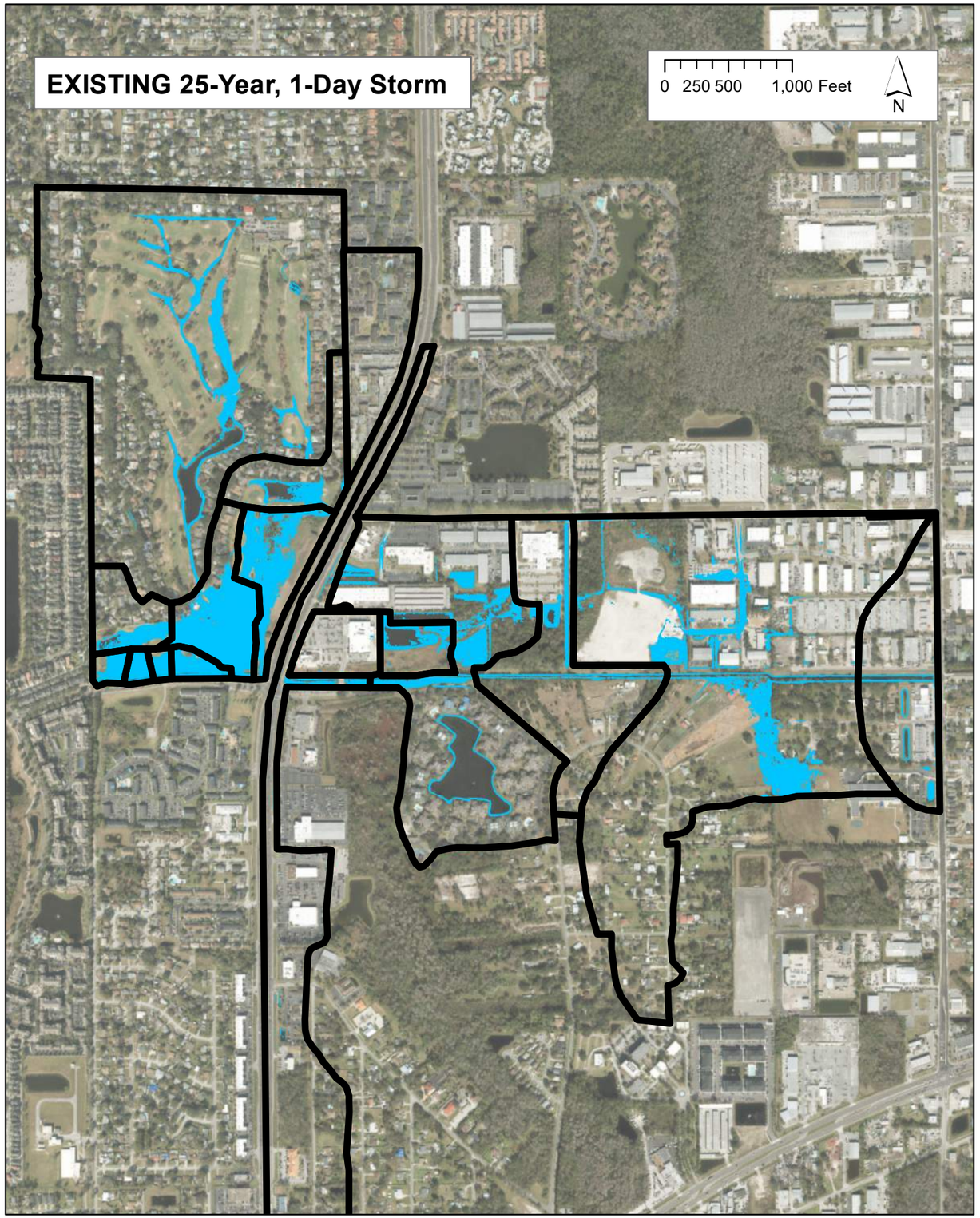
The study evaluated five alternatives within the Lake Corrine Outfall basin, to determine the effects on the peak stages within the Winter Park Pines golf course, the feasibility of the alternatives, and provide recommendations. The recommended alternative includes the regrading of the Lake Corrine Outfall Canal between S.R. 436 and Forsyth Road, and upgrading the existing 60” CMP pipe under Golfside Drive within the Winter Park Pines golf course to an equivalent 72” Elliptical RCP. The following pages illustrate the floodplain impacts for the 10-year, 25-year, and 100-year 1-day storms. The results show a substantial improvement between the existing and proposed for the 100-year 1-day storm.

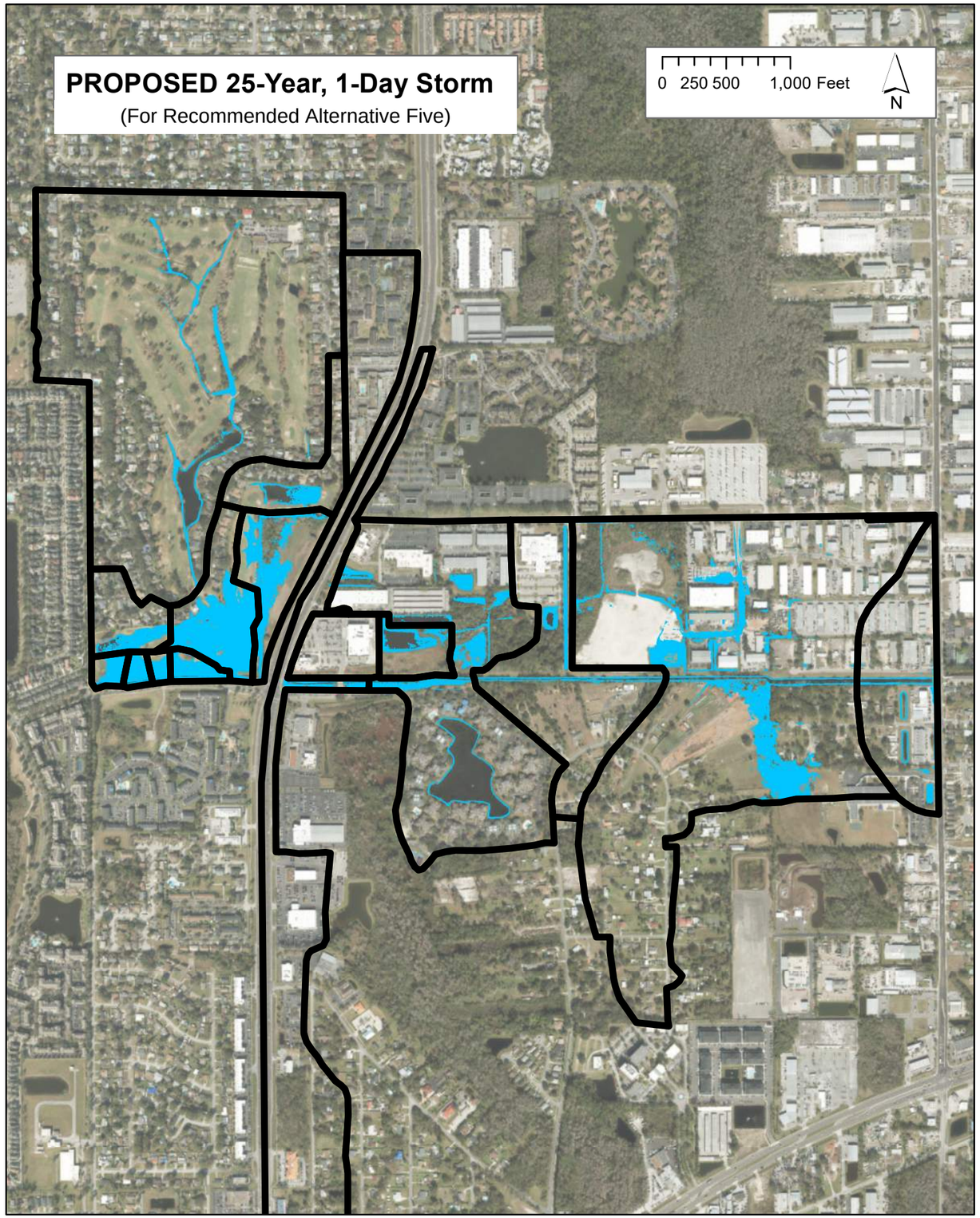
The City of Winter Park has implemented a flood management guide for procedures to follow in advance of a hurricane in the Winter Park basin. For example, the Winter Park Pines golf course contains check valves that, if not functioning, can cause a backup of stormwater at Hole 8. Part of the flood management guide for this area includes confirmation of the proper functioning of these check valves.

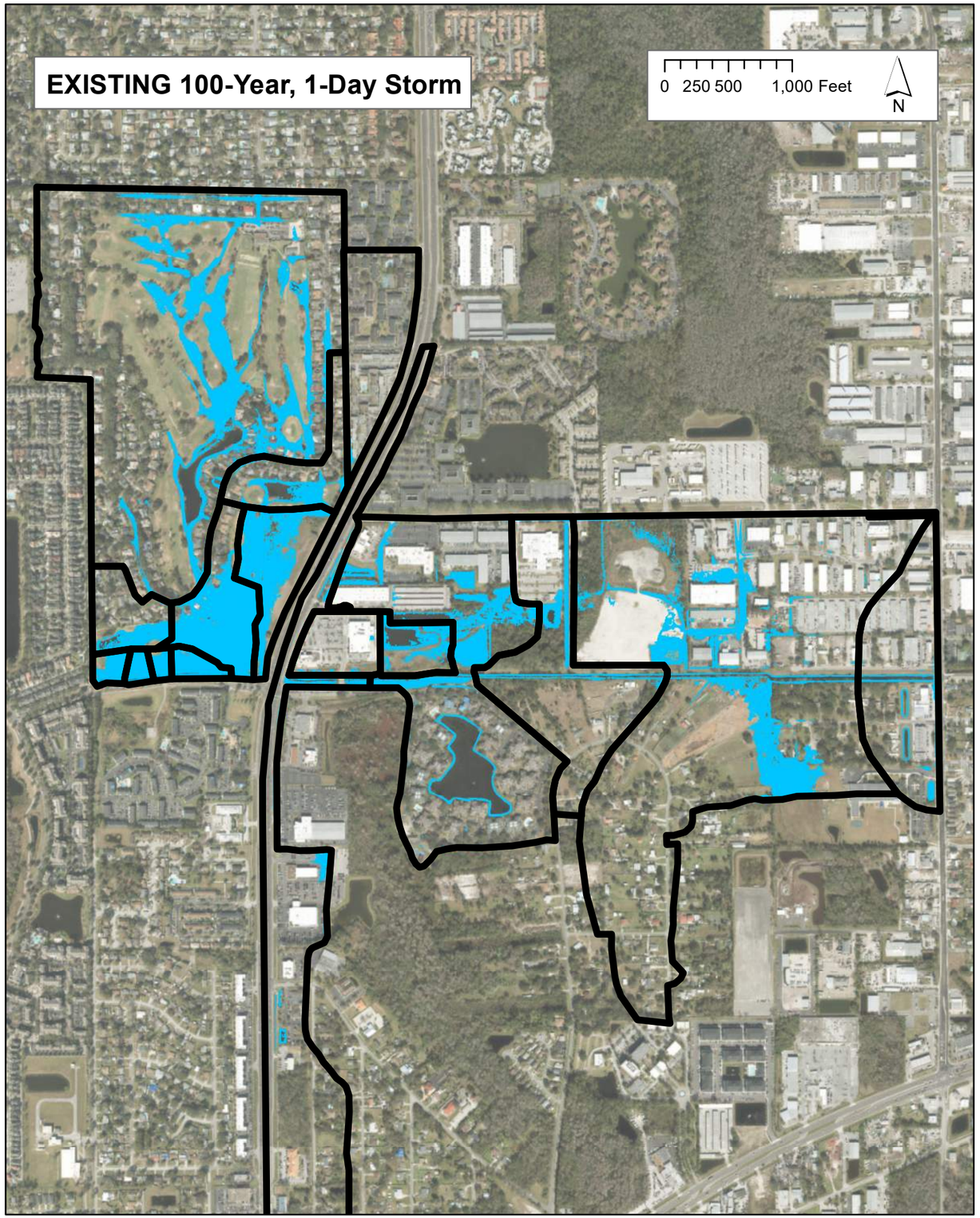
The Mayflower area will be discussed in a later report. There are several CIP projects that are planned to the Mayflower area, the first including $170,000 over the next five to six years. for heavy clearing of two ditches that drain to the north through the Interlachen Country Club. The second CIP project will include a new pipe replacement of an old, corrugated pipe at the cart path northeast of the Mayflower. The third CIP is a longer-term project and will include the use of articulated concrete block to line to the existing two ditches, which would greatly decrease long term maintenance of the ditches. A fourth CIP project will include the Tanglewood ditch piping project. The Tanglewood project will involve the piping of an existing large ditch at the rear of a row of existing lots, located between Arbor Park Road and Lake Howell Road. The estimated cost of the Tanglewood improvements is $2,000,000 for all phases of work.

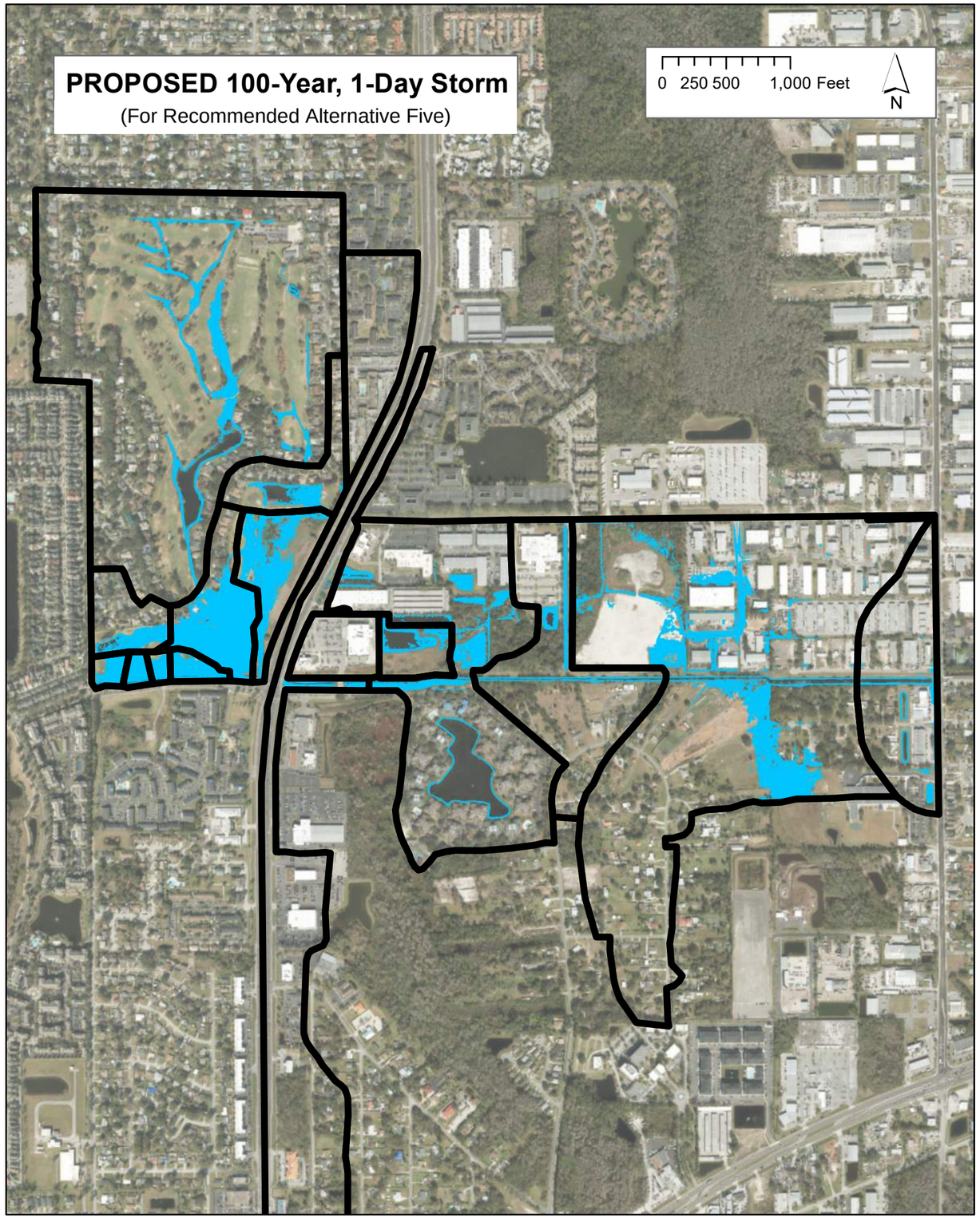

EXISTING 10-Year, 1-Day Storm
0 250 500 1,000 Feet
N


PROPOSED 10-Year, 1-Day Storm
(For Recommended Alternative Five)
0 250 500 1,000 Feet
N


EXISTING 25-Year, 1-Day Storm
0 250 500 1,000 Feet
N


PROPOSED 25-Year, 1-Day Storm
(For Recommended Alternative Five)
0 250 500 1,000 Feet
N


EXISTING 100-Year, 1-Day Storm
0 250 500 1,000 Feet
N


PROPOSED 100-Year, 1-Day Storm
(For Recommended Alternative Five)
0 250 500 1,000 Feet
N

Section 1 – Introduction

1.1 Introduction

During Hurricane Ian (September 2022) Winter Park experienced flooding in various areas of the City. Areas of flooding included the Winter Park Pines golf course and surrounding neighborhoods, and the Tanglewood Subdivision and Mayflower Retirement Village in the northern area of the Winter Park Eastern Basin. The golf course and surrounding areas discharge to the Lake Corrine Outfall Canal which drains to Goldenrod Canal. The Tanglewood Subdivision and Mayflower Retirement Village drain to the Eastbrook canal, which discharges to the Crane Strand Canal and then to the Goldenrod Canal, which discharges to the Little Econlockhachee River.

In 2023, the City of Winter Park contracted Baxter and Woodman, Inc. to provide engineering services to perform a drainage study of the eastern basins of the City. The study investigates the causes of flooding that occurred during Hurricane Ian and looks at drainage improvement alternatives to eliminate/reduce the flooding and ponding that occurs within the area.

This report concentrates on the Lake Corrine Outfall Canal basin and its proposed alternatives. An analysis was conducted of the basin to determine flood stages within the existing system and to provide alternatives to reduce peak stages for the 100-year storm event within the Winter Park Pines golf course.

1.2 Study Area Description

1.2.1 Data Collection

Existing reports, field reviews and other pertinent data were collected and reviewed to form a solid understanding of the project. Information used for the assessment included the following:

- Orange County one-foot aerial contours dated May 2002
- Orange County Lidar data dated 2018
- Orange County color aerial photography dated September 2023
- USGS topographic map
- SCS soils survey maps from the USGS for Orange County
- FEMA Flood Insurance Rate Map
- Little Econlockhatchee Basin Study and Model by Singhofen and Associates (2001)
- Drainage Report/Model for Lake Corrine Outfall ICPR Update (Singhofen and Associates, February 2013)
- Plans and Drainage Report for Forsyth Road Improvements (Professional Engineering Consultants, Inc., 2002)
- FDOT plans for State Road 436
- Plans and Drainage Reports for Wal-Mart Neighborhood Market, (CPH, 2012)

- Updated survey information from Winter Park by DRMP (2024)
- Structure data along the Lake Corrine Outfall Canal from Orange County Public Works

1.2.2 Project Location

The Lake Corrine Outfall Canal basin study area covers approximately 2900 acres within the Little Econlockhatchee River Basin and includes the Baldwin Park (formerly Lake Corrine) model updates by Singhofen and Associates from 2013, the Winter Park Pines golf course, and the Lake Corrine Outfall Canal from S.R. 436 to the confluence at Goldenrod Canal. The study is within Orange County in Sections 14, 15, 16, 17, 20, 21, 22 and 23, Township 22 South, and Range 30 East.

The proposed project area is in the City of Winter Park and includes the Winter Park Pines golf course on the west side of S.R. 436 (Semoran Boulevard), and along the Lake Corrine Outfall Canal from the golf course to Forsyth Road. The project area is Sections 15 and 16, Township 22 South, and Range 30 East. The limits of the basin study for this report along with the project limits are shown on Figure 1, Project Location Map.

1.2.3 Land Use

The existing land use within the project basin consists of single-family homes, apartments, townhomes, commercial properties, industrial parcels, schools, wetlands, and a golf course, and includes Lake Baldwin (Corrine) and Lake Susannah to the southwest.

1.2.4 Watershed

The project study is located within the limits of the Little Econlockhatchee River Basin and is under the jurisdiction of the St. Johns River Water Management District. Lake Susannah drains north to Lake Corrine which drains via a control structure to the north to the existing Lake Corrine Outfall Canal which travels along the north side of Baldwin Park Lane, crosses under S.R. 436 via a 9'x11.5' box culvert to the east side of S.R. 436.

The canal continues east along the north side of Auvers Boulevard and Partridge Road west of Forsyth Road, to a weir structure which discharges via two 54" pipes under Forsyth Road. The canal then continues east along the north side of Partridge Road to Dorris where it discharges via two 54" CMP pipes under Partridge Road to the east side of Dorris. The canal then continues east on the south side of Partridge Road to the confluence at Goldenrod Canal, which discharges to the Little Econlockhatchee River.

1.2.5 Topography and Soils

Basin topography ranges in elevation from about 85 feet to 95 feet NAVD88 within the project area. Based on the Soil Resource Report for Orange County obtained from the USDA Natural Resources Conservation Service Soil Survey, existing soils within the study limits

consist of Smyrna and Tavares sands with some Felda, Ona, Pomello, St. Lucie, Zolfo and Basinger sands and Samsula-Hontoon-Basinger association sand and Sanibel muck (see Figure 3 – SCS Soils Map). Soils present within the project limits consist of Basinger, Pomello, Samsula-Hontoon-Basinger, and Smyrna sands, along with small amounts of Basinger fine sand, Sanibel muck, and Zolfo sands. Tavares, Pomello, St. Lucie, and Zolfo sands are classified as Type A, Smyrna, and Ona sands are classified as Type B/D, and Felda and Basinger sands are classified as Type D, according to the Orange County Soil Survey. Basinger sands can sometimes be an indicator of the presence of muck.

1.2.6 Floodplain

The project area is shown as Zone AE according to the Flood Insurance Rate Maps (FIRM) 12095C0255F and 12095C0260F (see Figure 4, Flood Insurance Rate Map). According to the FIRM the 100-year floodplain for the Lake Corrine Outfall canal varies from 86 ft NAVD88 at Forsyth Road to 91 ft NAVD88 at the Winter Park Pines golf course.

1.2.7 Wetland Impacts

There are several wetlands and surface waters located within the study area, including Lake Corrine and its shoreline, the Lake Corrine Outfall Canal, several golf course ponds, and various detention ponds. Impacts to wetlands/surface waters will be limited to proposed Lake Corrine Outfall Canal bank regrading and temporary surface water impacts for pipe replacement.

Section 2 – Existing Conditions Basin Analysis

2.1 Methodology

The existing and proposed conditions were analyzed by stormwater routings of various design storms. Storm routings were performed using standard SCS methods and the Interconnected Pond Routing (ICPR) program (version 4) by Streamline Technologies. ICPR accounts for storage within a system (e.g., ponds, ditches, storage in streets, etc.) and can be used to model complex interconnected networks using a variable tailwater from a receiving water system. ICPR was used to calculate stages during the 10, 25 and 100-year/24-hour duration storms (rainfalls of 7.5, 8.6 and 10.6 inches respectively).

2.2 Historical Modeling for Little Econlockhatchee Basin

Singhofen and Associates, Inc. (SAI) prepared an ICPR stormwater model of the Little Econlockhatchee River Basin in Orange County, Florida in 2001, which covers approximately 93 square miles, extending from State Road 528/Orlando International Airport northward to County Road 419 in Oviedo. This model was developed as part of the Little Econ River Basin SWMMP for Orange County.

In 2006, the model was updated by SAI for Orange County to revise the SWMMP for the Little Econ basin to incorporate the Lake George basin into the study area and is known as the Little Econ Restudy. The restudy model converted the original master plan model to ICPR Version 3.0 and added hydrologic data for the newly added basins.

The restudy model was updated for Orange County by SAI in 2011 to incorporate more recent topography and established base flood elevations on a parcel in the Lake Corrine Outfall sub-basin near Muskogee Street.

In 2013, SAI updated the restudy model for Excel Engineering, Inc. to account for the more recent topography and development of the Baldwin Park subdivision which occurred since the 2006 update. The update was used to support a Letter of Map Revision (LOMR) request. The Baldwin Park model was incorporated into the 2011 Little Econ model and converted to ICPR Version 3.1.

This latest SAI model update was converted in 2023 by Baxter and Woodman to ICPR4, and updated the datum used from NGVD29 to NAVD88 (-1.0 foot). The converted model was used as a baseline for further updates to the basin by Baxter and Woodman.

2.3 Existing Condition ICPR Modeling

As discussed in Section 2.2, the existing conditions ICPR model used for this project is based on the latest SAI model from 2013, converted to ICPR4 and updated the datum from NGVD29 to NAVD88. Baxter and Woodman revised the converted model to incorporate additional updates to the basin.

The first update incorporated the Forsyth Road Widening Improvements from 2002 which included the design of a wet detention pond north of Partridge Road and east of Forsyth Road, to treat the additional impervious area from the widening of Forsyth Road between Hanging Moss Road and Partridge Road.

The second update incorporated the construction of the Walmart Neighborhood Market plaza, located at the corner of Semoran Boulevard (S.R. 436) and Auvers Boulevard. The update included adding the wet detention pond used for treatment of the impervious area from the building and parking areas, and a double cell box culvert within the Lake Corrine Outfall canal under the entrance drive from Auvers Boulevard.

Also included in the revisions to the model is updated survey by DRMP for the City of Winter Park for various structures within the project limits. See Appendix A for the existing condition ICPR input and output.

2.4 Results

The existing peak stages for the nodes along the Lake Corrine Outfall Canal for the 100-year storm event are shown in Table 1 below. Please note that nodes upstream of the golf course and beginning of the outfall canal are not included in the table.

Table 1 -Summary of Existing Peak Stages for 100yr/24hr Storm (ft NAVD88)

Node	Existing	Node Location
B-11	89.01	Headwall of existing 54” RCP connected to 9’x11.5’ Box Culvert under SR 436
BP207	89.58	Beginning node in canal along Baldwin Park St
BP218	89.53	US Invert of 96” RCP connected to 9’x11.5’ Box Culvert under SR 436
BP220	89.00	US Invert of 9’x11.5’ Box Culvert under SR 436
LC00050	88.75	DS invert of 9’x11.5’ Box Culvert under SR 436
LC00050A	88.70	US invert of Double (8’H x 6.9’W) Box Culvert under Entrance to Wal-Mart Market
LC00050B	88.54	DS invert of Double (8’H x 6.9’W) Box Culvert under Entrance to Wal-Mart Market
LC00055	88.51	Discharge point from WalMart pond to canal
LC00060	88.10	Outfall point of N/S ditch from Hanging Moss Road
LC00065	86.89	Jog in canal
LC00070	86.53	End of canal before Forsyth Weir structure
LC00070A	86.32	Weir structure at Forsyth Road
LC00070B_N	83.47	North Manhole on W side of Forsyth Road
LC00070B_S	83.45	South Manhole on W side of Forsyth Road
LC00075	79.04	Beginning of canal on East side of Forsyth Road

LC00080	78.51	Midpoint Node in canal between Forsyth Road and Cross Drain System at Dorris Drive
LC00084	78.34	Forsyth Pond at Partridge/Dorris (Pond 4)
LC00085	78.16	US Node of Cross Drain System at Dorris Drive
LC00087A	68.75	Eastern MH at SE intersection of Partridge/Dorris
LC00087B	68.78	Western MH at SE intersection of Partridge/Dorris
LC00090	67.78	Beginning of Canal east of Dorris Drive
LC00095	67.75	90° Bend in Canal
LC00100	67.73	US end of pipe under parking lot near Rising Stars at Conrad Academy
LC00105	61.48	DS end of pipe under parking lot near Rising Stars at Conrad Academy
LC00110	64.79	US end of pipe under Goldenrod Road
LC00115	60.80	DS end of pipe under Goldenrod Road
LC00117	67.72	Node in Canal
LC00120	60.01	Node in Canal
LC00123	59.35	Node in Canal
LC00125	59.04	Node in Canal
LC00130	57.79	Node Upstream of Confluence with Goldenrod Canal
WMPond-1	88.54	Wal-Mart Neighborhood Mkt Pond
WPP1	90.22	Central Golf Course Pond
WPP2	89.02	Eastern Golf Course Pond
WPP3	89.01	Beginning of Ditch around Triangular Parcel on East side of Golf Course
WPP4	89.54	DS end of Pipe Crossing at Golfside Drive
WPP9	89.55	Western Golf Course Pond

Section 3 – Proposed Alternatives Analysis

3.1 Proposed Condition ICPR Modeling

The proposed conditions ICPR model used for the project is based on the updated existing conditions model with changes which reflect the proposed alternatives. Various scenarios were modeled to determine the best solution to the existing flooding issues within the Winter Park Pines golf course and are discussed below in Section 3.2.

Any alternatives that include changes to basin areas and proposed new node/link information are based on CN and stage/storage calculations developed using Orange County aerials and one-foot contours.

3.2 Proposed Alternatives

Alternative One investigated designing a pond located within the triangular parcel on the west side of S.R. 436 next to the Winter Park Pines golf course. The pond would discharge via a control structure to the adjacent ditch located along the north and west sides of the parcel.

Alternative Two revised the existing weir structure system in the Lake Corrine Outfall canal on the west side of Forsyth Road. Three sub-alternatives were investigated. The first sub-alternate enlarged the two 54" RCP pipes from the weir structure to the first set of manholes to 60" RCP. The second sub-alternate enlarged the 54" RCP pipes to 60" RCP, from the weir structure to the east side of Forsyth Road, keeping the same inverts as the existing condition. The third sub-alternate used the proposed 60" RCP in the second sub-alternate above and revised the inverts from the weir structure and manholes to be the same as the outfall pipe invert in the canal on the east side of Forsyth Road, providing a flat slope from the west side of Forsyth Road to the east side.

Alternative Three involved enlarging and deepening the existing Forsyth Road pond located north of Partridge Road at Dorris (aka Pond 4 in the construction plans and drainage report for the Forsyth Widening Improvements project for Orange County – see Appendix C). This was investigated to provide extra storage within the basin during larger storms. The existing control structure was redesigned to lower the initial stage in the pond by five feet and provide an outfall that would connect directly to the cross-drain system that crosses under Partridge Road at Dorris Road. The pond would also be enlarged to encompass the existing wetland located directly north of the existing pond. The wetland currently discharges to the existing storm sewer system along Gresham Drive which outfalls to a wetland to the north, so an outfall structure for the enlarged pond was also designed to provide a secondary outfall to the north.

Alternative Four involved adding wet detention ponds along the south side of the Lake Corrine Outfall canal between the Walmart Neighborhood Market property and the weir structure at Forsyth Road. These ponds were intended to provide additional storage in the canal for larger storms. The initial stages in these proposed ponds were the same as within the canal, and the

ponds were designed with overflow weirs set one foot below the normal water level in the canal to allow the water to flow back and forth between the ponds and the canal.

Alternative Five increased the cross-sectional area of the Lake Corrine Outfall canal, using a 30' wide bottom with 2:1 side slopes between SR 436 (Semoran Boulevard) and Forsyth Road. The alternative also included the replacement of the existing 60" CMP at Golfside Drive with an equivalent 72" ERCP.

Baldwin Park St – Outfall Structure



Baldwin Park St – Outfall Structure



Golfside Dr – 72" CMP, Downstream



Golfside Dr – 72" CMP, Upstream



Results

Alternative One showed little impact to the peak stages within the golf course, due to the high initial stage in the proposed pond and topographic constraints which did not allow for much storage. The alternative would require purchasing the parcel and permitting through SJRWMD.

For Alternative Two, the results for all three sub-alternatives also showed little impact to the peak stages within the golf course. There was some improvement with the replacement of the existing 54" RCPs with 60" RCPs, however discharge rates increased substantially, and downstream peak stages increased by approximately 3 to 4 inches. This alternative would require approval from Orange County to modify the existing structure at Forsyth Road/Partridge Road and permitting through SJRWMD.

Alternative Three showed little impact to the peak stages within the golf course. This alternative would require an agreement with Orange County and surrounding business owners along with a permit from SJRWMD for the pond to be approved as a joint-use pond.

Alternative Four showed little impact to the peak stages within the golf course. This alternative involves purchasing the parcels to construct the proposed ponds and permitting through SJRWMD.

Alternative Five showed a significant decrease in peak stages within the golf course upstream of the 9'x11.5' box culvert. The regrading and widening of the Lake Corrine Outfall Canal from S.R 436 to Forsyth Road decreases the friction loss through the canal, lowering peak stages on the golf course by approximately 6 to 11 inches. The pipe replacement at Golfside Drive also provides higher flows through the larger cross-sectional area. Stages downstream of the weir structure at Forsyth Road did increase, particularly after the cross-drain system at Dorris Drive and Partridge Lane. However, the water levels are still well within the canal banks. Alternative Five would require approval from Orange County and permitting through SJRWMD to modify the existing canal, as well as approval from Winter Park Pines golf course to replace the 60" CMP with the 72" equivalent ERCP at the crossing at Golfside Drive. Alternative Five would also require a submittal to FEMA.

Table 2 shows the 100-year peak stage comparison between existing and proposed conditions for the fifth alternative for the nodes shown in Table 1. See Appendix B for the proposed condition ICPR input and output for this alternative.

Table 2 – Peak Stage Comparison between Existing and Proposed for 100yr/24hr Storm (ft NAVD88)

Node	Existing	Proposed	Difference
B-11	89.01	88.28	-0.73
BP207	89.58	89.06	-0.52
BP218	89.53	89.01	-0.52
BP220	89.00	88.26	-0.74
LC00050	88.75	87.88	-0.87
LC00050A	88.70	87.83	-0.87
LC00050B	88.54	87.53	-1.01
LC00055	88.51	87.48	-1.03
LC00060	88.10	87.20	-0.9
LC00065	86.89	86.87	-0.02
LC00070	86.53	86.70	0.17
LC00070A	86.32	86.50	0.18
LC00070B_N	83.47	83.79	0.32
LC00070B_S	83.45	83.77	0.32
LC00075	79.04	79.58	0.54
LC00080	78.51	78.96	0.45
LC00084	78.34	78.75	0.41
LC00085	78.16	78.51	0.35
LC00087A	68.75	71.91	3.16
LC00087B	68.78	71.95	3.17
LC00090	67.78	70.85	3.07
LC00095	67.75	70.84	3.09
LC00100	67.73	70.83	3.10
LC00105	61.48	62.17	0.69
LC00110	64.79	64.81	0.02
LC00115	60.80	61.03	0.23
LC00117	67.72	67.72	0.00
LC00120	60.01	60.08	0.07
LC00123	59.35	59.43	0.08
LC00125	59.04	59.12	0.08
LC00130	57.79	57.96	0.17
WMPond-1	88.54	87.58	-0.96
WPP1	90.22	89.29	-0.93
WPP2	89.02	88.29	-0.73
WPP3	89.01	88.28	-0.73
WPP4	89.54	89.01	-0.53
WPP9	89.55	89.03	-0.52

Section 4 – Summary and Recommendations

4.1 Recommended Alternative

As discussed in Section 3.3, Alternative Five provides the most improvement in the peak stages within the Winter Park Pines golf course basin and upstream of Golfside Drive and is the recommended alternative. Alternative Five showed a significant decrease in peak stages within the golf course upstream of the 9'x11.5' box culvert. The regrading and widening of the Lake Corrine Outfall Canal from S.R 436 to Forsyth Road decreases the friction loss through the canal, lowering peak stages on the golf course by approximately 6 to 11 inches. The pipe replacement at Golfside Drive also provides higher flows through the larger cross-sectional area.

The preliminary cost of widening the Lake Corrine Outfall Canal from S.R 436 to Forsyth Road is approximately $5,265,000, and the preliminary cost of the culvert replacement at Golfside Drive is $584,000.

4.2 Water Quality Considerations During Construction

The Contractor will be required to provide effective and continuous control of erosion and water pollution throughout the life of the contract. Areas adjacent to construction activities will be protected from sedimentation by a continuous silt fence. The exact locations of the erosion protection are shown on the construction drawings along with installation details. The Contractor will be required to inspect the erosion protection after each rainfall and correct all observed deficiencies.

4.3 Operation and Maintenance

The overall maintenance and operation schedule will be the responsibility of the City of Winter Park and Orange County and will include regular mowing of the canal side banks and monthly inspections of the pipe replacement at Golfside Drive.

Engineer's Preliminary Estimate of Probable Cost

Alternative Five

PROJECT NAME: **Lake Corrine Outfall Canal - Revise Canal Cross Section from SR436 to Forsyth Rd**

July 9, 2024

ITEMS

REF. NO.	PAY ITEM NO.	DESCRIPTION	QTY.	UNIT	UNIT PRICE	AMOUNT
1	101-1	MOBILIZATION	10%	LS	$272,406.53	$272,406.53
2	102-1	MAINTENANCE OF TRAFFIC	3%	LS	$81,721.96	$81,721.96
3	104-14	PREVENTION, CONTROL AND ABATEMENT OF EROSION AND WATER POLLUTION	10%	LS	$272,406.53	$272,406.53
4	110-1-1	CLEARING & GRUBBING	11.9	AC	$79,680.90	$948,202.71
5	120-1	REGULAR EXCAVATION	60,779	CY	$16.39	$996,167.81
6	120-6	EMBANKMENT	9,109	CY	$29.05	$264,616.45
7	570-1-2	PERFORMANCE TURF (SOD)	39,449	SY	$6.21	$244,978.29
8	900-1	AS-BUILT PLANS	1	LS	$30,000.00	$30,000.00
9	900-2	INDEMNIFICATION	1	LS	$100.00	$100.00
10	900-3	GROUNDWATER TREATMENT & DISPOSAL	120	DA	$2,000.00	$240,000.00
11		LAND COST, 9 PARCELS (ESTIMATED USING ORANGE COUNTY APPRAISALS AND APPLYING ADJUSTMENTS)	1	LS	$1,914,759.00	$ 1,914,759.00
		570-1-2				
		TOTAL				**$5,265,359.27**

Lake Corrine Outfall Canal - Revise Canal Cross Section from SR436 to Forsyth Rd	**$5,265,359.27**
Lake Corrine Outfall Canal - Golfside Drive	**583,578.08**
TOTAL	**$5,848,937.35**

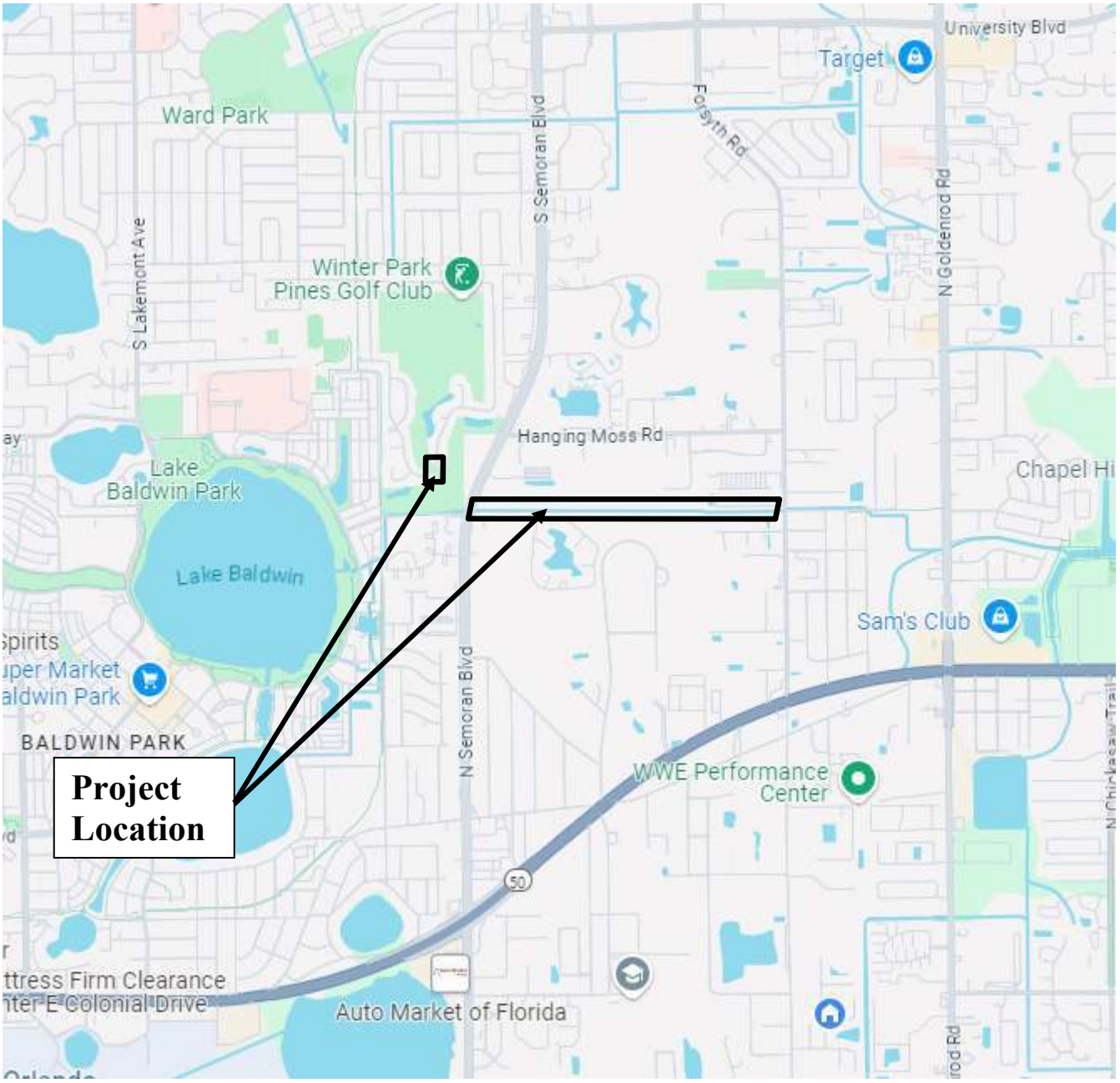
Engineer's Preliminary Estimate of Probable Cost
Alternative Five

PROJECT NAME: **Lake Corrine Outfall Canal - Golfside Drive**
July 10, 2024

ITEMS

REF. NO.	PAY ITEM NO.	DESCRIPTION	QTY.	UNIT	UNIT PRICE	AMOUNT
1	101-1	MOBILIZATION	10%	LS	$50,728.28	$50,728.28
2	102-1	MAINTENANCE OF TRAFFIC	5%	LS	$25,364.14	$25,364.14
3	104-14	PREVENTION, CONTROL AND ABATEMENT OF EROSION AND WATER POLLUTION	2%	LS	$10,145.66	$202.91
4	110-1-1	CLEARING & GRUBBING	0.3	AC	$79,680.90	$19,920.23
5	160-4	TYPE B STABILIZATION (LBR 40) (12")	218	SY	$40.14	$8,741.60
6	285-70-8	BASE, GRADED CRUSHED CONCRETE AGGREGATE, (8")	218	SY	$44.16	$9,617.07
7	334-1-13	TYPE SP 12.5 ASPHALTIC CONCRETE (2.0") (TRAFFIC LEVEL C)	26.4	TN	$199.00	$5,253.60
8	425-1-462	INLETS, CURB, TYPE J-6, >10'	2	EA	$21,536.78	$43,073.56
9	430-175-272	PIPE CULVERT, STEEL REINFORCED CONCRETE, CLASS IV, ELLIPTICAL, 58"x91"	73	LF	$4,000.00	$292,000.00
10	430-572-130	STRAIGHT CONCRETE ENDWALLS, 72", SINGLE, 45 DEGREES, ROUND	2	EA	$50,000.00	$100,000.00
11	522-1	SIDEWALK CONCRETE, 4" THICK, SIDEWALK AND CART PATH	150	SY	$87.61	$13,141.50
12	570-1-2	PERFORMANCE TURF (SOD)	231	SY	$6.21	$1,435.20
13		WOOD RAILING	80	LF	$100.00	$8,000.00
14	900-1	AS-BUILT PLANS	1	LS	$6,000.00	$6,000.00
15	900-2	INDEMNIFICATION	1	LS	$100.00	$100.00
		TOTAL				**$583,578.08**

$583,578.08



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407-386-2249

Winter Park Pines Basin Study

City of Winter Park, Florida

Figure 1 - Location Map

Florida

City of Winter Park

Figure 2
USGS Quadrangle Map
Orlando East, FL - 2023

Winter Park Pines Basin Study

BY	DATE	JOB NUMBER	SHEET
CMY	09-11-24	230330	1 of 1

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Cindy M Young, P.E.
P.E. Number 60936

SCALE: 1"=2000'

STUDY LIMITS

PROJECT LIMITS

STUDY LIMITS

STUDY LIMITS

T22S R30E

AZALEA PARK

P:\WINPA\0230330 - Task 1 Eastern Basin\DGN\230330WPEasternBasin\Drainage\Figure 2 - USGS Map.dgn

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SCALE: 1"=2000'

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City of Winter Park — Florida

Figure 3

SCS Soil Survey Map

Orange County

Winter Park Pines Basin Study

BY	DATE	JOB NUMBER	SHEET
CMY	09-11-24	230330	1 of 1

P:\WP\WP\A\230330 - Task 1 Eastern Basin\DGN\230330WPEasternBasinDrainage\Figure 3 - SCS Soils Map.dgn

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City of Winter Park

Florida

Figure 4
FEMA Flood Map
Orange County

Winter Park Pines Basin Study

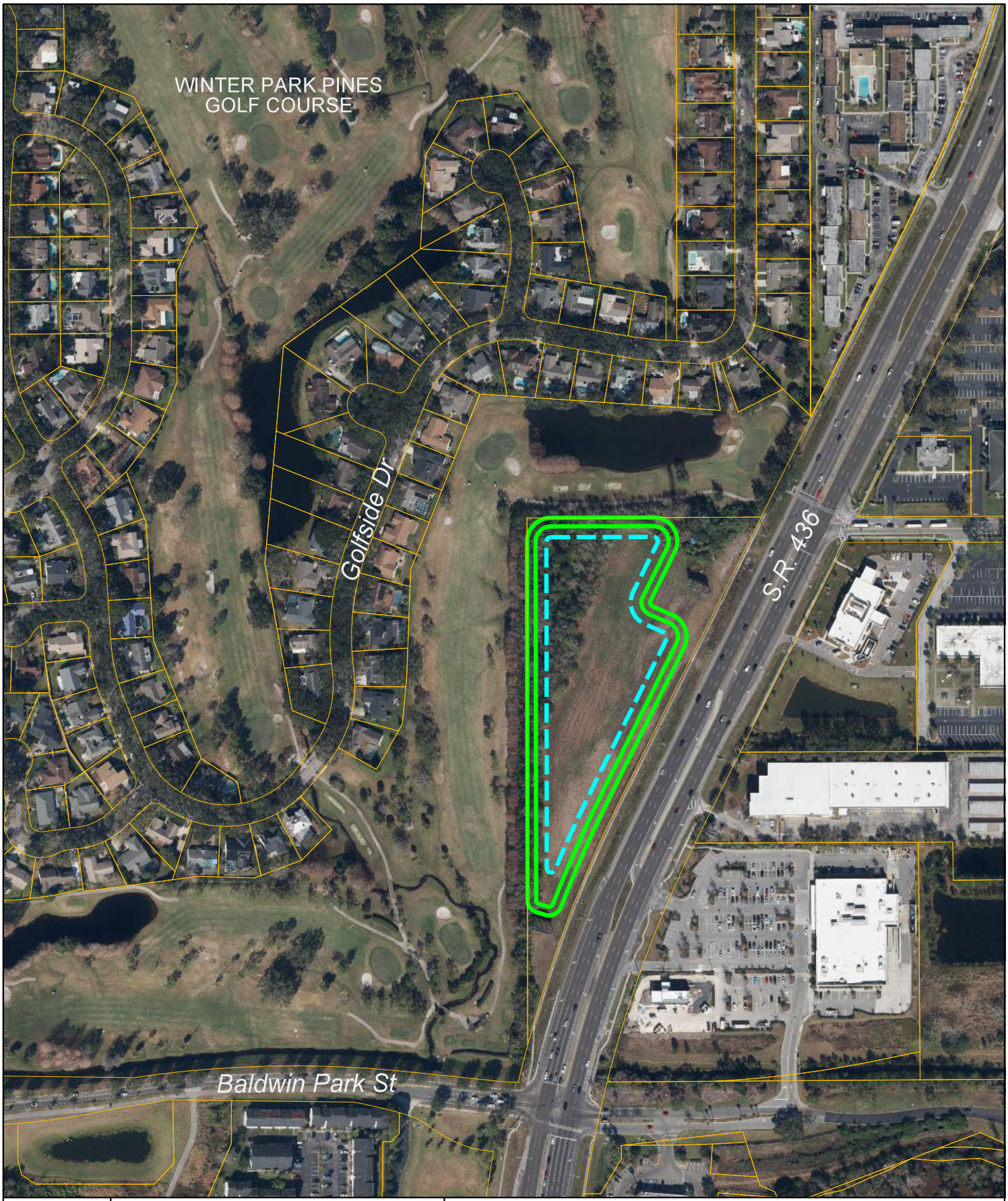
BY	DATE	JOB NUMBER	SHEET
CMY	09-11-24	230330	1 of 1

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P.E. Number 60936

SCALE: 1"=2000'

NOTE: Flood map information obtained from FEMA Flood Map Service Center Orange County, FL and Incorporated Areas, Map Numbers 12095C0255F, 12095C0260F, 12095C0265F, and 12095C0270F,Effective Date 9/25/2009

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SCALE:
1"=300'

N

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City of Winter Park — Florida

Alternative #1

PROPOSED POND BY GOLF COURSE

Winter Park Basin Study

BY	DATE	JOB NUMBER	SHEET
CMY	07-09-24	230330	1 of 1

9/12/2024

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Existing Structure at Forsyth Road (Upstream)



Existing Structure at Forsyth Road (Downstream)



SCALE:
1"=100'

N

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P.E. Number 60936

City of Winter Park — Florida

Alternative #2

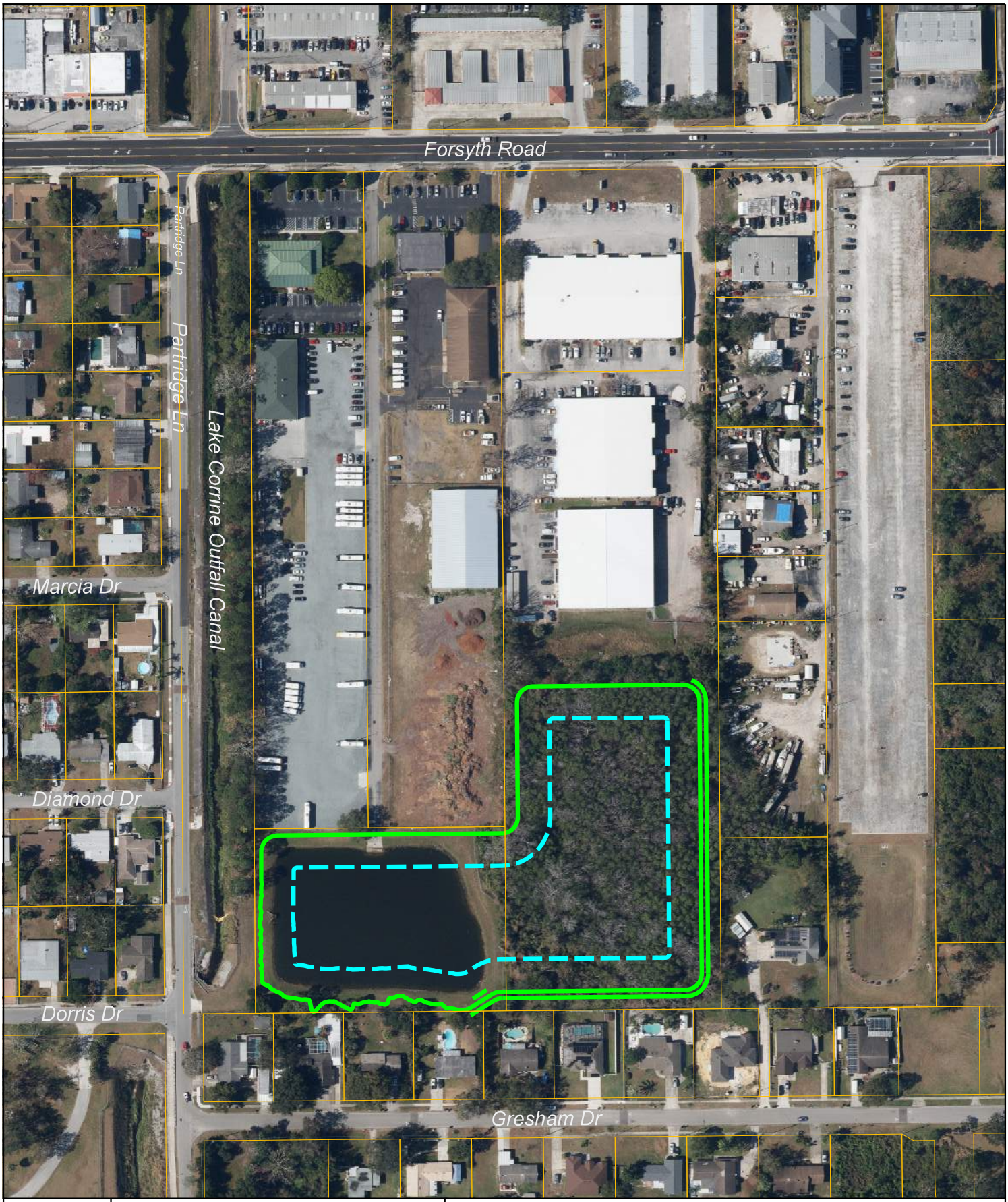
FORSYTH ROAD STRUCTURE REVISIONS

Winter Park Basin Study

BY	DATE	JOB NUMBER	SHEET
CMY	09-09-24	230330	1 of 1

9/17/2024

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SCALE: 1"=200'

N

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P.E. Number 60936

City of Winter Park — Florida

Alternative #3

FORSYTH ROAD POND MODIFICATION

Winter Park Basin Study

BY CMY	DATE 09-09-24	JOB NUMBER 230330	SHEET 1 of 1

9/12/2024

P:\WINPA\0230330 - Task 1 Eastern Basin\DGN\230330WPEasternBasin\Roadway\Alternative 3 - Forsyth Road Pond Modification.dgn



SCALE: 1"=400'

N

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407-380-0402

Claude L. Cassagnol, P.E.
P.E. Number 35490

City of Winter Park — Florida

Alternative #4

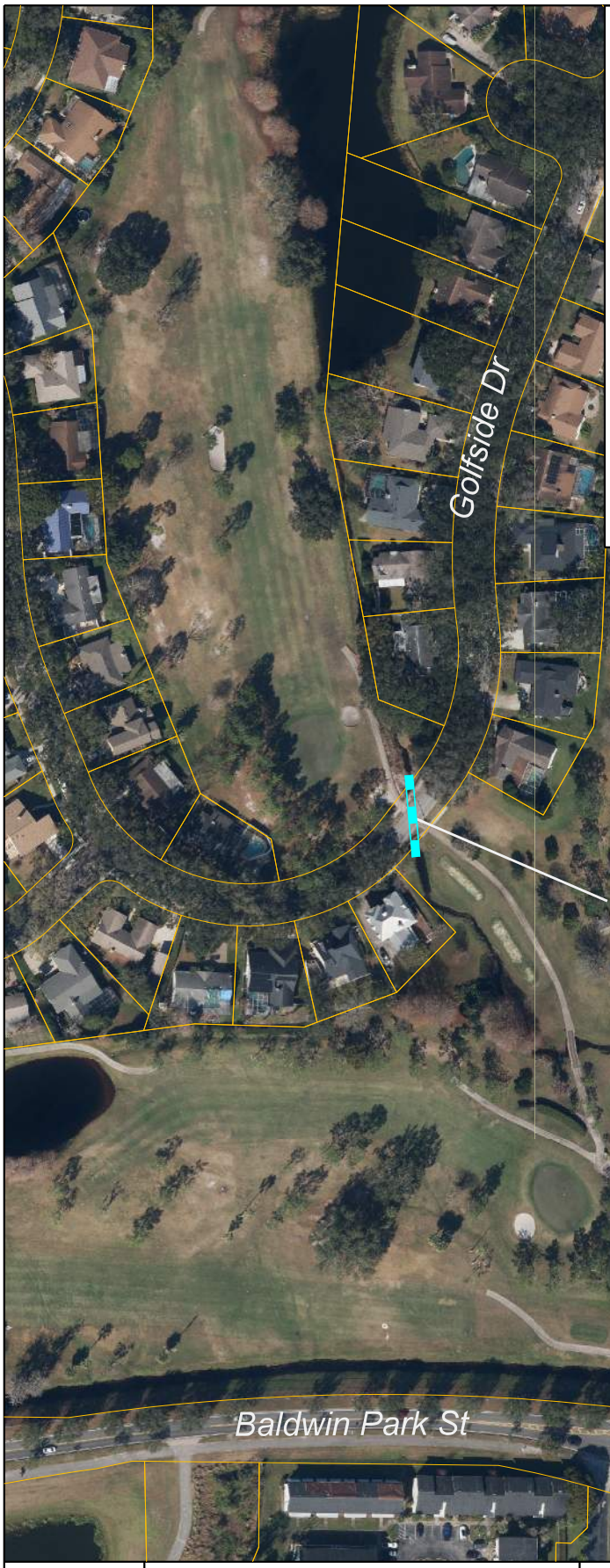
PROPOSED PONDS ALONG CANAL

Winter Park Basin Study

BY	DATE	JOB NUMBER	SHEET
CMY	07-09-24	230330	1 of 1

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Existing 60" CMP

SCALE:
1"=200'

N

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P.E. Number 60936

City of Winter Park — Florida

Alternative #5

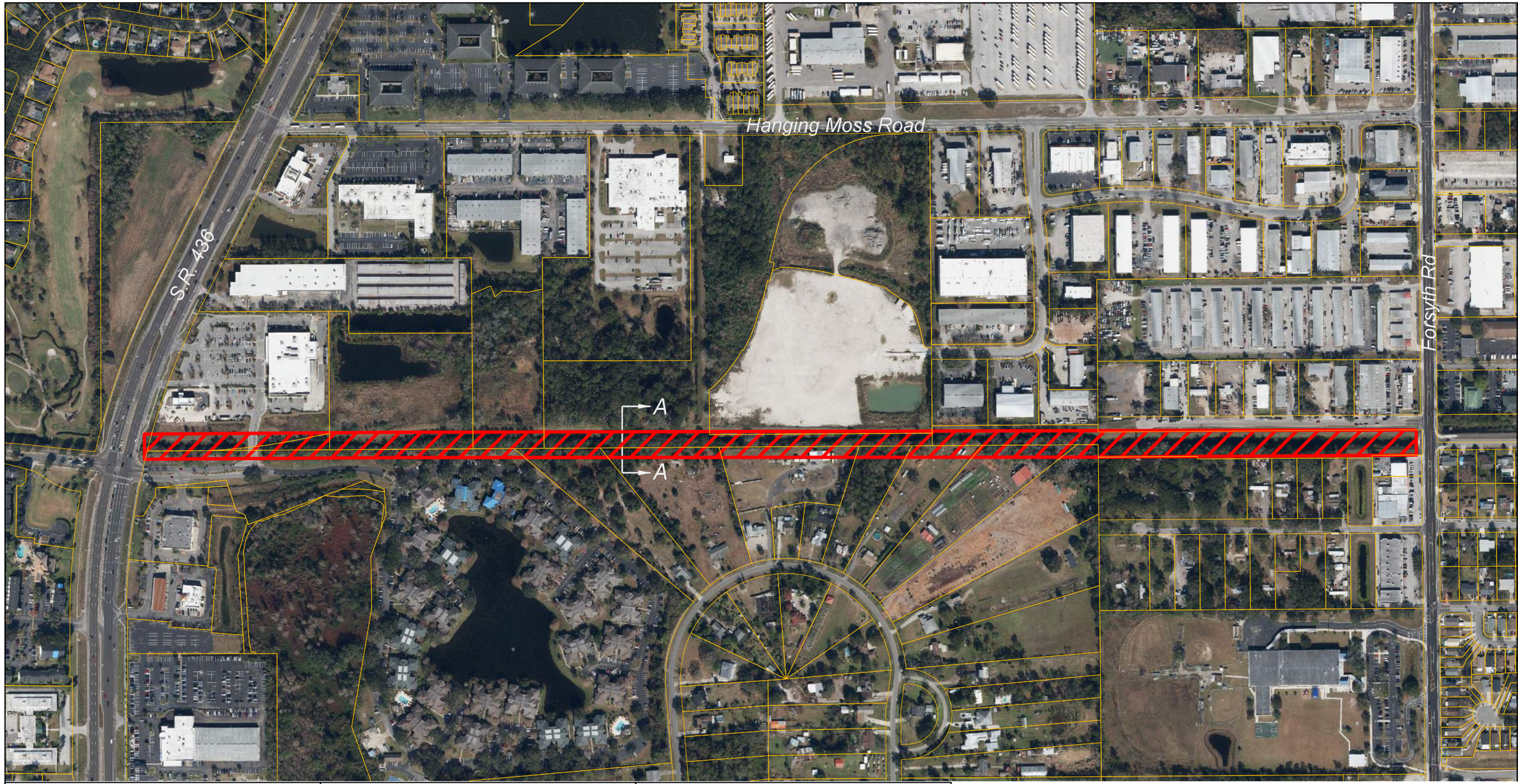
GOLFSIDE DR CULVERT REPLACEMENT

Winter Park Basin Study

BY	DATE	JOB NUMBER	SHEET
CMY	07-09-24	230330	1 of 1

9/17/2024

P:\WINPA\0230330 - Task 1 Eastern Basin\DGN\230330WPEasternBasin\Roadway\Alternative 5 - Golfside Drive Culvert Replacement.dgn



LAKE CORRINE OUTFALL CANAL REGRADING

Winter Park Basin Study

Alternative #5

City of Winter Park, Florida

Baxter & Woodman, Inc.

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407-380-0402

Claude L. Cassagnol, P.E.
P.E. Number 35490

BY CMY | DATE 07-09-24 | JOB NUMBER 230330 | SHEET 1 of 1

SCALE: 1"=400'



Existing Lake Corrine Outfall Canal (Looking West)

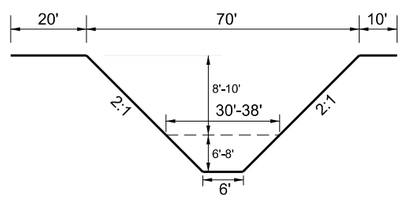


Existing Lake Corrine Outfall Canal (Looking East)



Existing Lake Corrine Outfall Canal (at Forsyth Rd)

TYPICAL SECTION A-A



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Appendix A

Existing Condition ICPR Data and Results

Input Data

Winter Park Pines Study, Lake Corrine Outfall Canal - Existing Condition
Input Data
9/17/2024

Simple Basin: LC00030

Scenario:	Existing Updated
Node:	LC00030
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	20.0000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH323
Peaking Factor:	323.0
Area:	7.6200 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	FLMOD

Comment: OFFSITE - SEMORAN CLUB DISCHARGE TO OFFSITE DITCH

Simple Basin: LC00040

Scenario:	Existing Updated
Node:	BP212
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	15.0000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH323
Peaking Factor:	323.0
Area:	5.8800 ac
Curve Number:	74.6
% Impervious:	6.39
% DCIA:	6.39
% Direct:	0.00
Rainfall Name:	FLMOD

Comment: OFFSITE - DISCHARGE TO OFFSITE DITCH

Simple Basin: LC00045

Scenario:	Existing Updated
Node:	BP220
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	309.0000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH323
Peaking Factor:	323.0
Area:	125.1100 ac
Curve Number:	72.3
% Impervious:	23.25

% DCIA:	23.25
% Direct:	0.00
Rainfall Name:	FLMOD

Comment: GREEN VIEW,GOLF COURSE,SEMORAN CLUB,CORRIE TERRACE

Simple Basin: LC00050

Scenario:	Existing Updated
Node:	LC00050
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	162.5000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH323
Peaking Factor:	323.0
Area:	68.9000 ac
Curve Number:	75.0
% Impervious:	37.88
% DCIA:	37.88
% Direct:	0.00
Rainfall Name:	GORDECON

Comment:

Simple Basin: LC00055

Scenario:	Existing Updated
Node:	LC00055
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	66.9000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH323
Peaking Factor:	323.0
Area:	55.0200 ac
Curve Number:	78.0
% Impervious:	37.53
% DCIA:	37.53
% Direct:	0.00
Rainfall Name:	GORDECON

Comment:

Simple Basin: LC00060

Scenario:	Existing Updated
Node:	LC00060
Hydrograph Method:	NRCS Unit Hydrograph

Infiltration Method:	Curve Number
Time of Concentration:	17.4000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH323
Peaking Factor:	323.0
Area:	30.9300 ac
Curve Number:	75.8
% Impervious:	20.45
% DCIA:	20.45
% Direct:	0.00
Rainfall Name:	GORDECON

Comment:

Simple Basin: LC00065

Scenario:	Existing Updated
Node:	LC00065
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	111.8000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH323
Peaking Factor:	323.0
Area:	135.7200 ac
Curve Number:	72.6
% Impervious:	23.87
% DCIA:	23.87
% Direct:	0.00
Rainfall Name:	GORDECON

Comment: Area reduced to account for Forsyth Road Improvements (widening), CN assumed unchanged

Simple Basin: LC00070

Scenario:	Existing Updated
Node:	LC00070
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	15.0000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH323
Peaking Factor:	323.0
Area:	23.6400 ac
Curve Number:	72.1
% Impervious:	39.84
% DCIA:	39.84
% Direct:	0.00
Rainfall Name:	GORDECON

Comment: Area reduced to account for Forsyth Road Improvements (widening), CN assumed unchanged

Simple Basin: LC00075

Scenario:	Existing Updated
Node:	LC00075
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	15.0000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH323
Peaking Factor:	323.0
Area:	1.0600 ac
Curve Number:	82.7
% Impervious:	22.29
% DCIA:	22.29
% Direct:	0.00
Rainfall Name:	GORDECON

Comment: Area reduced to account for Forsyth Road Improvements (widening), CN assumed unchanged

Simple Basin: LC00080

Scenario:	Existing Updated
Node:	LC00080
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	15.0000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH323
Peaking Factor:	323.0
Area:	1.6100 ac
Curve Number:	80.7
% Impervious:	17.72
% DCIA:	17.72
% Direct:	0.00
Rainfall Name:	GORDECON

Comment: Area reduced to account for Forsyth Road Improvements (widening), CN assumed unchanged

Simple Basin: LC00084A

Scenario:	Existing Updated
Node:	LC00084
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	43.0000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr

Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	7.3400 ac
Curve Number:	94.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	Flmod

Comment: Forsyth Road draining to Pond north of Partridge Lane at Dorris Ave (Pond 4)
From SJRWMD Permit #20839-3, Drainage Report dated March 2002

Simple Basin: LC00084B

Scenario:	Existing Updated
Node:	LC00084
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	10.0000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	8.7400 ac
Curve Number:	93.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	Flmod

Comment: Heddron/Ground Control Property draining to Pond north of Partridge Lane at Dorris Ave (Pond4), from SJRWMD Permit #20839-3, Drainage Report dated March 2002

Simple Basin: LC00084C

Scenario:	Existing Updated
Node:	LC00084
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	10.0000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	2.3900 ac
Curve Number:	90.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	Flmod

Comment: Pond tract area draining to Pond north of Partridge Lane at Dorris Ave (Pond 4), from SJRWMD Permit #20839-3, Drainage Report dated March 2002

Simple Basin: LC00085

Scenario:	Existing Updated
Node:	LC00085
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	15.0000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH323
Peaking Factor:	323.0
Area:	1.8100 ac
Curve Number:	82.5
% Impervious:	11.82
% DCIA:	11.82
% Direct:	0.00
Rainfall Name:	GORDECON

Comment: Area reduced to account for Forsyth Road Improvements (widening), CN assumed unchanged

Simple Basin: LC00090

Scenario:	Existing Updated
Node:	LC00090
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	15.0000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH323
Peaking Factor:	323.0
Area:	19.9500 ac
Curve Number:	74.3
% Impervious:	21.36
% DCIA:	21.36
% Direct:	0.00
Rainfall Name:	GORDECON

Comment:

Simple Basin: LC00095

Scenario:	Existing Updated
Node:	LC00095
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	15.0000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH323
Peaking Factor:	323.0
Area:	10.6000 ac
Curve Number:	73.4
% Impervious:	32.26

% DCIA:	32.26
% Direct:	0.00
Rainfall Name:	GORDECON

Comment:

Simple Basin: WMPost-1

Scenario:	Existing Updated
Node:	WMPond-1
Hydrograph Method:	Santa Barbara Urban Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	12.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Area:	7.2000 ac
Curve Number:	96.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: WMPost-2

Scenario:	Existing Updated
Node:	WMPond-1
Hydrograph Method:	Santa Barbara Urban Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	10.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Area:	5.5500 ac
Curve Number:	84.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: WPP1

Scenario:	Existing Updated
Node:	WPP1
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	77.0000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr

Unit Hydrograph:	UH323
Peaking Factor:	323.0
Area:	161.6000 ac
Curve Number:	79.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	FLMOD

Comment: WINTER PINES GOLF COURSE

Simple Basin: WPP12

Scenario:	Existing Updated
Node:	WPP3
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	16.0000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH323
Peaking Factor:	323.0
Area:	16.3000 ac
Curve Number:	94.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	FLMOD

Comment:

Simple Basin: WPP2

Scenario:	Existing Updated
Node:	WPP2
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	63.0000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH323
Peaking Factor:	323.0
Area:	10.4000 ac
Curve Number:	82.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	FLMOD

Comment:

Simple Basin: WPP3

Scenario:	Existing Updated
Node:	WPP3
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	69.0000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH323
Peaking Factor:	323.0
Area:	11.2000 ac
Curve Number:	74.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	FLMOD

Comment:

Simple Basin: WPP4

Scenario:	Existing Updated
Node:	WPP4
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	67.0000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH323
Peaking Factor:	323.0
Area:	12.1000 ac
Curve Number:	76.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	FLMOD

Comment:

Simple Basin: WPP5

Scenario:	Existing Updated
Node:	BP214
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	46.0000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH323
Peaking Factor:	323.0
Area:	1.7000 ac
Curve Number:	74.0
% Impervious:	0.00

% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	FLMOD

Comment:

Simple Basin: WPP6

Scenario:	Existing Updated
Node:	BP212
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	44.0000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH323
Peaking Factor:	323.0
Area:	0.9000 ac
Curve Number:	74.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	FLMOD

Comment:

Simple Basin: WPP7

Scenario:	Existing Updated
Node:	BP209
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	44.0000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH323
Peaking Factor:	323.0
Area:	0.9000 ac
Curve Number:	74.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	FLMOD

Comment:

Simple Basin: WPP8

Scenario:	Existing Updated
Node:	BP207
Hydrograph Method:	NRCS Unit Hydrograph

Infiltration Method:	Curve Number
Time of Concentration:	44.0000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH323
Peaking Factor:	323.0
Area:	1.5000 ac
Curve Number:	74.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	FLMOD

Comment:

Simple Basin: WPP9

Scenario:	Existing Updated
Node:	WPP9
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	58.0000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH323
Peaking Factor:	323.0
Area:	7.8000 ac
Curve Number:	83.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	FLMOD

Comment:

Node: B-11

Scenario:	Existing Updated
Type:	Stage/Area
Base Flow:	0.00 cfs
Initial Stage:	79.53 ft
Warning Stage:	82.30 ft

Stage [ft]	Area [ac]	Area [ft2]
79.53	0.0010	44
82.50	0.0020	87

Comment: HEADWALL

Node: BP207

Winter Park Pines Study, Lake Corrine Outfall Canal - Existing Condition
Input Data
9/17/2024

Scenario: Existing Updated
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 83.00 ft
Warning Stage: 88.98 ft

Stage [ft]	Area [ac]	Area [ft2]
82.00	0.0030	131
82.60	0.0040	174
83.00	0.0040	174
83.20	0.0050	218
83.40	0.0060	261
84.40	0.0070	305
84.80	0.0080	348
85.00	0.4160	18121
85.20	0.4380	19079
85.40	0.4670	20343
85.60	0.4920	21432
85.80	0.5140	22390
86.00	0.6130	26702
86.20	0.6340	27617
86.40	0.6430	28009
86.60	0.6570	28619
86.80	0.6680	29098
87.00	0.7050	30710
87.20	0.7170	31233
87.40	0.7290	31755
87.60	0.7400	32234
87.80	0.7540	32844
88.00	0.7650	33323
88.20	0.7810	34020
88.40	0.7960	34674
88.60	0.8080	35196
88.80	0.8230	35850
89.00	0.8870	38638
89.20	0.9080	39552
89.40	0.9320	40598
89.60	0.9490	41338
89.80	0.9720	42340
90.00	1.0200	44431
90.20	1.0520	45825
90.40	1.0740	46783
90.60	1.1000	47916
90.80	1.1190	48744
91.00	1.2110	52751
91.20	1.2290	53535
91.40	1.2390	53971
91.60	1.2500	54450
91.80	1.2530	54581
92.00	1.2560	54711
92.20	1.2590	54842
92.40	1.2610	54929
92.60	1.2640	55060
92.80	1.2660	55147
93.00	1.2680	55234
93.20	1.2710	55365

Stage [ft]	Area [ac]	Area [ft2]
93.40	1.2740	55495
93.60	1.2760	55583
93.80	1.2790	55713
94.00	1.2810	55800
94.20	1.2820	55844
94.40	1.2820	55844
94.80	1.2820	55844

Comment: BP 436 CONN. RD STATION 207+00 (OLD LC00035/MHB-2)

Stage/Area updated by SAI 1/30/13

Node: BP208

Scenario: Existing Updated
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 82.72 ft
Warning Stage: 86.18 ft

Stage [ft]	Area [ac]	Area [ft2]
82.72	0.1000	4356
86.18	0.2000	8712

Comment: BP 436 CONN. RD STATION 208+00

Node: BP209

Scenario: Existing Updated
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 82.44 ft
Warning Stage: 85.68 ft

Stage [ft]	Area [ac]	Area [ft2]
82.44	0.0010	44
85.00	0.1250	5445
85.20	0.1560	6795
85.40	0.1930	8407
85.60	0.2340	10193
85.80	0.2790	12153
86.00	0.4290	18687
86.20	0.4650	20255
86.40	0.5070	22085
86.60	0.5440	23697
86.80	0.5820	25352
87.00	0.6210	27051
87.20	0.6340	27617
87.40	0.6490	28270
87.60	0.6610	28793
87.80	0.6700	29185
88.00	0.6830	29751

Stage [ft]	Area [ac]	Area [ft2]
88.20	0.6910	30100
88.40	0.6980	30405
88.60	0.7070	30797
88.80	0.7130	31058
89.00	0.7220	31450
89.20	0.7290	31755
89.40	0.7370	32104
89.60	0.7440	32409
89.80	0.7520	32757
90.00	0.7570	32975
90.20	0.7610	33149
90.40	0.7640	33280
90.60	0.7650	33323
90.80	0.7660	33367
91.00	0.7680	33454

Comment: BP 436 CONN. RD STATION 209+00 (OLD MHB-4)

Stage/Area updated by SAI 1/30/13

Node: BP210

Scenario: Existing Updated
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 82.16 ft
Warning Stage: 85.63 ft

Stage [ft]	Area [ac]	Area [ft2]
82.16	0.1000	4356
85.63	0.2000	8712

Comment: BP 436 CONN. RD STATION 210+00

Node: BP211

Scenario: Existing Updated
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 81.88 ft
Warning Stage: 85.81 ft

Stage [ft]	Area [ac]	Area [ft2]
81.88	0.1000	4356
85.81	0.2000	8712

Comment: BP 436 CONN. RD STATION 211+00

Node: BP212

Winter Park Pines Study, Lake Corrine Outfall Canal - Existing Condition
Input Data
9/17/2024

Scenario: Existing Updated
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 81.60 ft
Warning Stage: 86.62 ft

Stage [ft]	Area [ac]	Area [ft2]
81.60	0.0010	44
86.00	0.0550	2396
86.20	0.0650	2831
86.40	0.0850	3703
86.60	0.1112	4844
86.80	0.1360	5924
87.00	0.2560	11151
87.20	0.3000	13068
87.40	0.3540	15420
87.60	0.4000	17424
87.80	0.4410	19210
88.00	0.5050	21998
88.20	0.5200	22651
88.40	0.5375	23414
88.60	0.5580	24306
88.80	0.5750	25047
89.00	0.5990	26092
89.20	0.6170	26877
89.40	0.6340	27617
89.60	0.6541	28494
89.80	0.6731	29322
90.00	1.0954	47716
90.20	1.1280	49136
90.40	1.1680	50878
90.60	1.2040	52446
90.80	1.2433	54158
91.00	1.4631	63735
91.20	1.4912	64957
91.40	1.5260	66473
91.60	1.5590	67910
91.80	1.6084	70061
92.00	1.7101	74492
92.20	1.7260	75185
92.40	1.7430	75925
92.60	1.7612	76719
92.80	1.7750	77319
93.00	1.8393	80120
93.20	1.8540	80760
93.40	1.8700	81457
93.60	1.8880	82241
93.80	1.9090	83156
94.00	1.9530	85073
94.20	1.9740	85987
94.40	2.0030	87251
94.60	2.0260	88253
94.80	2.0500	89298
95.00	2.2060	96093
95.20	2.2260	96965
95.40	2.2500	98010

Stage [ft]	Area [ac]	Area [ft2]
95.60	2.2710	98925
95.80	2.2900	99752
96.00	2.3360	101756
96.20	2.3650	103019
96.40	2.3950	104326
96.60	2.4240	105589
96.80	2.4530	106853
97.00	2.4990	108856
97.20	2.5300	110207
97.40	2.5580	111426
97.60	2.5900	112820
97.80	2.6220	114214
98.00	2.9920	130332

Comment: BP 436 CONN. RD STATION 212+00 (OLD MHB-5)

Stage/Area updated by SAI 1/30/13

Node: BP213

Scenario: Existing Updated
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 81.32 ft
Warning Stage: 86.59 ft

Stage [ft]	Area [ac]	Area [ft2]
89.00	10.6800	465221
90.00	64.8200	2823559
91.00	114.3900	4982828

Comment: BP 436 CONN. RD STATION 213+00 (OLD LCOOO40)

Node: BP214

Scenario: Existing Updated
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 81.04 ft
Warning Stage: 85.50 ft

Stage [ft]	Area [ac]	Area [ft2]
82.00	0.0000	0
82.40	0.0000	0
83.20	0.0000	0
83.60	0.0000	0
84.60	0.0000	0
85.00	0.0670	2919
85.20	0.0960	4182
85.40	0.1360	5924
85.60	0.1830	7971
85.80	0.2310	10062

Stage [ft]	Area [ac]	Area [ft2]
86.00	0.5350	23305
86.20	0.5970	26005
86.40	0.6490	28270
86.60	0.7000	30492
86.80	0.7440	32409
87.00	0.8440	36765
87.20	0.8740	38071
87.40	0.9050	39422
87.60	0.9340	40685
87.80	0.9630	41948
88.00	1.0600	46174
88.20	1.0750	46827
88.40	1.0900	47480
88.60	1.1020	48003
88.80	1.1110	48395
89.00	1.1250	49005
89.20	1.1320	49310
89.40	1.1390	49615
89.60	1.1440	49833
89.80	1.1550	50312
90.00	1.2360	53840
90.20	1.2400	54014
90.40	1.2400	54014

Comment: BP 436 CONN. RD STATION 214+00 (OLD MHB-8)

Stage/Area updated by SAI 1/30/13

Node: BP215

Scenario: Existing Updated
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 80.76 ft
Warning Stage: 85.80 ft

Stage [ft]	Area [ac]	Area [ft2]
80.76	0.1000	4356
85.80	0.2000	8712

Comment: BP 436 CONN. RD STATION 215+00

Node: BP216

Scenario: Existing Updated
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 80.48 ft
Warning Stage: 86.43 ft

Stage [ft]	Area [ac]	Area [ft2]
80.48	0.1000	4356

Stage [ft]	Area [ac]	Area [ft2]
86.43	0.2000	8712

Comment: BP 436 CONN. RD STATION 216+00

Node: BP217

Scenario: Existing Updated
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 80.20 ft
Warning Stage: 85.46 ft

Stage [ft]	Area [ac]	Area [ft2]
80.20	0.1000	4356
85.46	0.2000	8712

Comment: BP 436 CONN. RD STATION 217+00 (OLD MHB-10)

Node: BP218

Scenario: Existing Updated
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 79.31 ft
Warning Stage: 85.46 ft

Stage [ft]	Area [ac]	Area [ft2]
79.31	0.1000	4356
85.46	0.2000	8712

Comment: BP 436 CONN. RD STATION 218+00

Node: BP220

Scenario: Existing Updated
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 79.50 ft
Warning Stage: 94.00 ft

Stage [ft]	Area [ac]	Area [ft2]
79.50	0.1000	4356
94.00	0.2000	8712

Comment: BP 436 CONN. RD STATION 220+00 (OLD LC00045)

Node: LC00030

Scenario: Existing Updated
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 84.75 ft
Warning Stage: 91.30 ft

Stage [ft]	Area [ac]	Area [ft2]
84.75	0.1000	4356
94.00	0.2000	8712

Comment: WARN=RD CRN

Node: LC00030A

Scenario: Existing Updated
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 83.11 ft
Warning Stage: 86.00 ft

Stage [ft]	Area [ac]	Area [ft2]
83.11	0.0010	44
86.11	0.0020	87

Comment: PROPOSED HEADWALL STATION 207

Node: LC00050

Scenario: Existing Updated
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 82.35 ft
Warning Stage: 90.70 ft

Comment: WARN=NTOB
DRMP survey (4/8/24) shows stain mark at 83.6'+/-

Node: LC00050A

Scenario: Existing Updated
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 82.35 ft
Warning Stage: 90.70 ft

Comment: Upstream node of double cell box culvert under driveway entrance to WalMart Neighborhood Mkt off Auvers Blvd

Node: LC00050B

Scenario: Existing Updated
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 82.35 ft
Warning Stage: 90.70 ft

Comment: Downstream node of double cell box culvert under driveway entrance to WalMart Neighborhood Mkt off Auvers Blvd

Node: LC00055

Scenario: Existing Updated
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 82.31 ft
Warning Stage: 90.10 ft

Comment: WARN=S BOC

Node: LC00060

Scenario: Existing Updated
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 82.27 ft
Warning Stage: 89.50 ft

Comment: WARN=APPROX ELEV OF BLDG TO THE SOUTH

Node: LC00065

Scenario: Existing Updated
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 82.21 ft
Warning Stage: 86.60 ft

Comment: WARN=STOB; STAGE AREA

Node: LC00070

Scenario: Existing Updated
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 82.20 ft

Warning Stage: 86.80 ft

Comment: WARN=RD CRN

Node: LC00070A

Scenario: Existing Updated
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 77.20 ft
Warning Stage: 86.80 ft

Stage [ft]	Area [ac]	Area [ft2]
77.20	0.0010	44
78.13	0.0060	261
81.88	0.0060	261

Comment: Structure stage area information obtained from OCPW field notes dated 2014
Bottom of structure slopes to pipes on east starting at 78.13 on west side to 77.2 on the east side. Area is based on length x width of structure.

Node: LC00070B_N

Scenario: Existing Updated
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 77.20 ft
Warning Stage: 86.80 ft

Comment: N Manhole on W side of Forsyth, drop in invert

Node: LC00070B_S

Scenario: Existing Updated
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 77.20 ft
Warning Stage: 86.80 ft

Comment: S Manhole on W side of Forsyth, drop in invert

Node: LC00075

Scenario: Existing Updated
Type: Stage/Area
Base Flow: 0.00 cfs

Initial Stage: 73.50 ft
Warning Stage: 85.50 ft

Comment: WARN=APPROX CURB ELEV TO SOUTH

Node: LC00080

Scenario: Existing Updated
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 72.10 ft
Warning Stage: 83.00 ft

Comment: WARN~TOB PER TOPO

Node: LC00084

Scenario: Existing Updated
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 73.00 ft
Warning Stage: 78.00 ft

Stage [ft]	Area [ac]	Area [ft2]
73.00	1.6100	70132
74.00	1.7300	75359
75.00	1.8600	81022
76.00	1.9800	86249
77.00	2.2100	96268
78.00	2.2500	98010

Comment: Pond 4 from Forsyth Road Improvements, SJRWMD Permit #20839-3, Drainage Report dated March 2002, elevations converted to NAVD88 (-1 ft)

Node: LC00085

Scenario: Existing Updated
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 71.69 ft
Warning Stage: 78.00 ft

Comment: WARN=RD CRN

Node: LC00087A

Scenario: Existing Updated
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 59.25 ft
Warning Stage: 78.24 ft

Comment: (converted from manhole to stage/area node)

WARN=N MH RIM ELEV

Node: LC00087B

Scenario: Existing Updated
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 59.25 ft
Warning Stage: 78.24 ft

Comment: (converted from manhole to stage/area node)

WARN=N MH RIM ELEV

Node: LC00090

Scenario: Existing Updated
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 57.24 ft
Warning Stage: 77.00 ft

Comment: WARN=TOB

Node: LC00095

Scenario: Existing Updated
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 56.13 ft
Warning Stage: 73.50 ft

Comment: WARN=NTOB

Node: WMPond-1

Scenario: Existing Updated

Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 83.70 ft
Warning Stage: 90.00 ft

Stage [ft]	Area [ac]	Area [ft2]
83.70	1.6660	72571
84.00	1.7150	74705
85.00	1.8800	81893
86.00	2.0490	89254
87.00	2.2210	96747
88.00	2.3980	104457
89.00	2.5790	112341
89.14	2.6030	113387
90.00	2.7610	120269

Comment: Wet Detention Pond for Walmart Neighborhood Market at Auvers and 436

Node: WPP1

Scenario: Existing Updated
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 82.35 ft
Warning Stage: 86.70 ft

Stage [ft]	Area [ac]	Area [ft2]
82.05	0.0010	44
86.00	2.7500	119790
86.20	2.8130	122534
86.40	2.8980	126237
86.60	2.9650	129155
86.80	3.0320	132074
87.00	3.2910	143356
87.20	3.4330	149541
87.40	3.5740	155683
87.60	3.7250	162261
87.80	3.8630	168272
88.00	4.5520	198285
88.20	4.8930	213139
88.40	5.2640	229300
88.60	5.6220	244894
88.80	5.9970	261229
89.00	7.6570	333539
89.20	8.5350	371785
89.40	9.4190	410292
89.60	10.3040	448842
89.80	11.2030	488003
90.00	22.9260	998657
90.20	25.7830	1123107
90.40	28.6680	1248778
90.60	31.6230	1377498
90.80	34.5840	1506479
91.00	57.6150	2509709

Winter Park Pines Study, Lake Corrine Outfall Canal - Existing Condition
Input Data
9/17/2024

Stage [ft]	Area [ac]	Area [ft2]
91.20	60.2590	2624882
91.40	62.7560	2733651
91.60	65.1500	2837934
91.80	67.4920	2939952
92.00	79.8610	3478745
92.20	81.4120	3546307
92.40	82.9580	3613650
92.60	84.4920	3680472
92.80	85.9710	3744897
93.00	94.1310	4100346
93.20	95.0070	4138505
93.40	95.8180	4173832
93.60	96.6360	4209464
93.80	97.3910	4242352
94.00	104.0410	4532026
94.20	105.5250	4596669
94.40	106.9110	4657043
94.60	108.2240	4714237
94.80	109.4310	4766814
95.00	117.0550	5098916
95.20	117.7260	5128145
95.40	118.4120	5158027
95.60	118.9700	5182333
95.80	119.5100	5205856
96.00	122.6250	5341545
96.20	123.2110	5367071
96.40	123.8450	5394688
96.60	124.5190	5424048
96.80	125.2250	5454801
97.00	128.8290	5611791
97.20	129.1300	5624903
97.40	129.3820	5635880
97.60	129.5870	5644810
97.80	129.7480	5651823
98.00	130.1820	5670728
98.20	130.2370	5673124
98.40	130.2900	5675432
98.60	130.3250	5676957
98.80	130.3590	5678438
99.00	130.3870	5679658
99.20	130.3970	5680093
99.40	130.4020	5680311
99.60	130.4100	5680660
99.80	130.4130	5680790
100.00	130.4200	5681095

Comment: WINTER PINES GOLF COURSE

Stage/Area updated by SAI 1/30/13

Node: WPP2

Scenario: Existing Updated

Winter Park Pines Study, Lake Corrine Outfall Canal - Existing Condition
Input Data
9/17/2024

Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 82.35 ft
Warning Stage: 86.00 ft

Stage [ft]	Area [ac]	Area [ft2]
81.30	0.0010	44
86.00	1.3420	58458
86.20	1.3650	59459
86.40	1.3910	60592
86.60	1.4110	61463
86.80	1.4310	62334
87.00	1.4760	64295
87.20	1.5400	67082
87.40	1.5900	69260
87.60	1.6510	71918
87.80	1.7090	74444
88.00	1.9160	83461
88.20	2.0120	87643
88.40	2.1180	92260
88.60	2.2000	95832
88.80	2.2960	100014
89.00	2.7880	121445
89.20	2.9620	129025
89.40	3.1350	136561
89.60	3.3210	144663
89.80	3.5170	153201
90.00	7.5440	328617
90.20	7.9710	347217
90.40	8.3540	363900
90.60	8.7120	379495
90.80	9.0610	394697
91.00	9.8850	430591
91.20	9.9420	433074
91.40	9.9900	435164
91.60	10.0480	437691
91.80	10.0970	439825
92.00	10.3330	450105
92.20	10.3430	450541
92.40	10.3470	450715
92.60	10.3550	451064
92.80	10.3600	451282
93.00	10.4280	454244

Comment: WINTER PINES GOLF COURSE

Stage/Area updated by SAI 1/30/13

Node: WPP3

Scenario: Existing Updated
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 82.35 ft

Winter Park Pines Study, Lake Corrine Outfall Canal - Existing Condition
Input Data
9/17/2024

Warning Stage: 86.00 ft

Stage [ft]	Area [ac]	Area [ft2]
80.80	0.0010	44
84.00	0.0730	3180
84.20	0.1090	4748
84.40	0.1450	6316
84.60	0.1570	6839
84.80	0.2010	8756
85.00	0.4560	19863
85.20	0.5400	23522
85.40	0.6370	27748
85.60	0.7290	31755
85.80	0.8270	36024
86.00	1.1470	49963
86.20	1.3800	60113
86.40	1.6370	71308
86.60	1.8870	82198
86.80	2.1550	93872
87.00	3.1720	138172
87.20	3.6130	157382
87.40	4.0460	176244
87.60	4.4930	195715
87.80	4.9530	215753
88.00	6.5300	284447
88.20	6.7270	293028
88.40	6.9310	301914
88.60	7.1210	310191
88.80	7.3050	318206
89.00	8.4730	369084
89.20	8.7750	382239
89.40	9.0530	394349
89.60	9.3010	405152
89.80	9.5250	414909
90.00	10.7640	468880
90.20	10.9990	479116
90.40	11.2400	489614
90.60	11.4810	500112
90.80	11.7330	511089
91.00	14.4110	627743
91.20	14.8920	648696
91.40	15.3660	669343
91.60	15.8130	688814
91.80	16.2310	707022
92.00	18.0310	785430
92.20	18.2200	793663
92.40	18.4490	803638
92.60	18.7120	815095
92.80	19.0450	829600
93.00	27.4530	1195853
93.20	27.4550	1195940
93.40	27.4560	1195983
93.60	27.4570	1196027
93.80	27.4580	1196070
94.00	27.4580	1196070

Comment: WINTER PINES GOLF COURSE

Stage/Area updated by SAI 1/30/13

Node: WPP4

Scenario: Existing Updated
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 81.40 ft
Warning Stage: 81.60 ft

Stage [ft]	Area [ac]	Area [ft2]
82.00	0.0310	1350
82.20	0.0320	1394
82.40	0.0330	1437
82.60	0.0340	1481
82.80	0.0360	1568
83.00	0.0500	2178
83.20	0.0590	2570
83.40	0.0680	2962
83.60	0.0740	3223
83.80	0.0830	3615
84.00	0.1020	4443
84.20	0.1130	4922
84.40	0.1400	6098
84.60	0.1680	7318
84.80	0.2120	9235
85.00	1.4830	64599
85.20	1.7900	77972
85.40	2.1200	92347
85.60	2.4610	107201
85.80	2.8160	122665
86.00	4.0640	177028
86.20	4.2740	186175
86.40	4.4870	195454
86.60	4.6890	204253
86.80	4.8830	212703
87.00	5.9290	258267
87.20	6.1300	267023
87.40	6.3140	275038
87.60	6.4860	282530
87.80	6.6600	290110
88.00	7.2370	315244
88.20	7.3630	320732
88.40	7.4890	326221
88.60	7.6220	332014
88.80	7.7600	338026
89.00	8.4310	367254
89.20	8.5700	373309
89.40	8.6990	378928
89.60	8.8340	384809
89.80	8.9640	390472
90.00	9.6740	421399

Winter Park Pines Study, Lake Corrine Outfall Canal - Existing Condition
Input Data
9/17/2024

Stage [ft]	Area [ac]	Area [ft2]
90.20	9.8770	430242
90.40	10.1130	440522
90.60	10.3560	451107
90.80	10.5950	461518
91.00	11.5370	502552
91.20	11.5400	502682
91.40	11.5420	502770
91.60	11.5430	502813
91.80	11.5440	502857
92.00	11.5440	502857
92.20	11.5450	502900
92.40	11.5450	502900
93.00	11.5450	502900

Comment: WINTER PINES GOLF COURSE

Stage/Area updated by SAI 1/30/13

Node: WPP9

Scenario: Existing Updated
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 82.35 ft
Warning Stage: 86.00 ft

Stage [ft]	Area [ac]	Area [ft2]
81.70	0.0010	44
84.00	0.7120	31015
84.20	0.7370	32104
84.40	0.7620	33193
84.60	0.7860	34238
84.80	0.8100	35284
85.00	0.8320	36242
85.20	0.8540	37200
85.40	0.8800	38333
85.60	0.8960	39030
85.80	0.9130	39770
86.00	1.1100	48352
86.20	1.1370	49528
86.40	1.1680	50878
86.60	1.1920	51924
86.80	1.2170	53013
87.00	1.3910	60592
87.20	1.4370	62596
87.40	1.4850	64687
87.60	1.5270	66516
87.80	1.5740	68563
88.00	1.6330	71133
88.20	1.6980	73965
88.40	1.7530	76361
88.60	1.8040	78582
88.80	1.8560	80847

Stage [ft]	Area [ac]	Area [ft2]
89.00	1.9060	83025
89.20	1.9480	84855
89.40	1.9940	86859
89.60	2.0390	88819
89.80	2.0780	90518
90.00	2.2830	99447
90.20	2.3730	103368
90.40	2.4560	106983
90.60	2.5320	110294
90.80	2.6060	113517
91.00	3.1470	137083
91.20	3.2550	141788
91.40	3.3540	146100
91.60	3.4540	150456
91.80	3.5430	154333
92.00	4.2250	184041
92.20	4.3370	188920
92.40	4.4390	193363
92.60	4.5450	197980
92.80	4.6430	202249
93.00	6.1910	269680
93.20	6.3700	277477
93.40	6.5300	284447
93.60	6.6720	290632
93.80	6.8040	296382
94.00	7.3130	318554
94.20	7.3180	318772
94.40	7.3230	318990
94.60	7.3270	319164
94.80	7.3300	319295
95.00	7.3710	321081

Comment: WINTER PINES GOLF COURSE

Stage/Area updated by SAI 1/30/13

Simulation: OC100y24

Scenario: Existing Updated
Run Date/Time: 8/31/2024 1:44:47 PM
Program Version: ICPR4 4.07.08

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	96.0000

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

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000
0	0	0	6.0000	5.0000
0	0	0	15.0000	15.0000
0	0	0	24.0000	30.0000
0	0	0	36.0000	60.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000
0	0	0	36.0000	30.0000
0	0	0	72.0000	60.0000

Groundwater

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	360.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: ICPR3
Reference ET Folder:
Unit Hydrograph Folder: ICPR3

Lookup Tables

Boundary Stage Set: OC100-EXZ
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:
Roughness Set:
Crop Coef Set:
Fillable Porosity Set:
Conductivity Set:
Leakage Set:

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft
Max dZ: 1.0000 ft
Link Optimizer Tol: 0.0001 ft
Edge Length Option: Automatic

IA Recovery Time: 24.0000 hr
ET for Manual Basins: False
Smp/Man Basin Rain Opt: Global
OF Region Rain Opt: Global
Rainfall Name: ORANGE
Rainfall Amount: 10.60 in
Storm Duration: 24.0000 hr

Dflt Damping (2D):	0.0050 ft	Dflt Damping (1D):	0.0050 ft
Min Node Srf Area (2D):	1 ft2	Min Node Srf Area (1D):	113 ft2
Energy Switch (2D):	Energy	Energy Switch (1D):	Energy

Comment: Little Econlockhatchee River Basin - Econ-Baldwin
100YR-24HR EXISTING COND STORM (ORANGE)
Nov 2023 Conversion to NAVD88
**Elevations are referenced to NAVD88

Little Econlockhatchee River Basin - Supplemental Model Revisions
100YR-24HR EXISTING COND STORM (ORANGE)
Nov 2023 Conversion to NAVD88

Simulation: OC10y24

Scenario: Existing Updated
Run Date/Time: 8/31/2024 3:57:24 PM
Program Version: ICPR4 4.07.08

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	96.0000

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

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000
0	0	0	6.0000	5.0000
0	0	0	15.0000	15.0000
0	0	0	24.0000	30.0000
0	0	0	36.0000	60.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000
0	0	0	36.0000	30.0000
0	0	0	72.0000	60.0000

Groundwater

Year	Month	Day	Hour [hr]	Time Increment [min]

Winter Park Pines Study, Lake Corrine Outfall Canal - Existing Condition
Input Data
9/17/2024

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	360.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: ICPR3
Reference ET Folder:
Unit Hydrograph Folder: ICPR3

Lookup Tables

Boundary Stage Set: OC10-EXZ
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:
Roughness Set:
Crop Coef Set:
Fillable Porosity Set:
Conductivity Set:
Leakage Set:

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft
Max dZ: 1.0000 ft
Link Optimizer Tol: 0.0001 ft
Edge Length Option: Automatic
Dflt Damping (2D): 0.0050 ft
Min Node Srf Area (2D): 1 ft2
Energy Switch (2D): Energy

IA Recovery Time: 24.0000 hr
ET for Manual Basins: False
Smp/Man Basin Rain Opt: Global
OF Region Rain Opt: Global
Rainfall Name: ORANGE
Rainfall Amount: 7.50 in
Storm Duration: 24.0000 hr
Dflt Damping (1D): 0.0050 ft
Min Node Srf Area (1D): 113 ft2
Energy Switch (1D): Energy

Comment: Little Econlockhatchee River Basin - Econ-Baldwin
10YR-24HR EXISTING COND STORM (ORANGE)
Nov 2023 Conversion to NAVD88
**Elevations are referenced to NAVD88

Little Econlockhatchee River Basin - Supplemental Model Revisions
10YR-24HR EXISTING COND STORM (ORANGE)
Nov 2023 Conversion to NAVD88

Simulation: OC25y24

Scenario: Existing Updated
Run Date/Time: 8/31/2024 5:44:46 PM
Program Version: ICPR4 4.07.08

Winter Park Pines Study, Lake Corrine Outfall Canal - Existing Condition
Input Data
9/17/2024

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	96.0000

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

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000
0	0	0	6.0000	5.0000
0	0	0	15.0000	15.0000
0	0	0	24.0000	30.0000
0	0	0	36.0000	60.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000
0	0	0	36.0000	30.0000
0	0	0	72.0000	60.0000

Groundwater

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	360.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: ICPR3
Reference ET Folder:
Unit Hydrograph Folder: ICPR3

Lookup Tables

Boundary Stage Set: OC25-EXZ
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:
Roughness Set:
Crop Coef Set:
Fillable Porosity Set:
Conductivity Set:
Leakage Set:

Tolerances & Options

Time Marching:	SAOR	IA Recovery Time:	24.0000 hr
Max Iterations:	6	ET for Manual Basins:	False
Over-Relax Weight Fact:	0.5 dec		
dZ Tolerance:	0.0010 ft	Smp/Man Basin Rain Opt:	Global
Max dZ:	1.0000 ft	OF Region Rain Opt:	Global
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	ORANGE
		Rainfall Amount:	8.60 in
Edge Length Option:	Automatic	Storm Duration:	24.0000 hr
Dflt Damping (2D):	0.0050 ft	Dflt Damping (1D):	0.0050 ft
Min Node Srf Area (2D):	1 ft2	Min Node Srf Area (1D):	113 ft2
Energy Switch (2D):	Energy	Energy Switch (1D):	Energy

Comment: Little Econlockhatchee River Basin - Econ-Baldwin
25YR-24HR EXISTING COND STORM (ORANGE)
Nov 2023 Conversion to NAVD88
**Elevations are referenced to NAVD88

Little Econlockhatchee River Basin - Supplemental Model Revisions
25YR-24HR EXISTING COND STORM (ORANGE)
Nov 2023 Conversion to NAVD88

Channel Cross Section: 207

Scenario: Existing Updated
Lid: No
Conveyance Method: ICPRv3

Bottom Point Table

Order	Station [ft]	Elevation [ft]	Manning's N
0	-102.08	88.98	0.0350
1	-84.14	83.00	0.0350
2	-78.14	83.00	0.0350
3	-45.00	94.05	0.0350
4	-30.00	95.55	0.0350

Comment: Station 207 Cross-Section - Proposed

Channel Cross Section: 208

Scenario: Existing Updated
Lid: No
Conveyance Method: ICPRv3

Bottom Point Table

Order	Station [ft]	Elevation [ft]	Manning's N
0	-88.13	86.18	0.0350
1	-77.78	82.72	0.0350
2	-71.78	82.72	0.0350

Order	Station [ft]	Elevation [ft]	Manning's N
3	-43.69	92.08	0.0350
4	-28.69	93.58	0.0350

Comment: Station 208 Cross-Section - Proposed

Channel Cross Section: 209

Scenario: Existing Updated
Lid: No
Conveyance Method: ICPRv3

Bottom Point Table

Order	Station [ft]	Elevation [ft]	Manning's N
0	-73.90	85.68	0.0350
1	-64.19	82.44	0.0350
2	-58.19	82.44	0.0350
3	-35.13	90.13	0.0350
4	-20.13	91.63	0.0350

Comment: Station 209 Cross-Section - Proposed

Channel Cross Section: 210

Scenario: Existing Updated
Lid: No
Conveyance Method: ICPRv3

Bottom Point Table

Order	Station [ft]	Elevation [ft]	Manning's N
0	-66.67	85.63	0.0350
1	-56.26	82.16	0.0350
2	-50.26	82.16	0.0350
3	-29.70	89.01	0.0350
4	-14.70	90.51	0.0350

Comment: Station 210 Cross-Section - Proposed

Channel Cross Section: 211

Scenario: Existing Updated
Lid: No
Conveyance Method: ICPRv3

Bottom Point Table

Order	Station [ft]	Elevation [ft]	Manning's N
0	-68.41	85.81	0.0350
1	-56.62	81.88	0.0350
2	-50.62	81.88	0.0350
3	-28.00	89.42	0.0350
4	-13.00	90.92	0.0350

Comment: Station 211 Cross-Section - Proposed

Channel Cross Section: 212

Scenario: Existing Updated
Lid: No
Conveyance Method: ICPRv3

Bottom Point Table

Order	Station [ft]	Elevation [ft]	Manning's N
0	-73.71	86.62	0.0350
1	-58.66	81.60	0.0350
2	-52.66	81.60	0.0350
3	-28.00	89.82	0.0350
4	-13.00	91.32	0.0350

Comment: Station 212 Cross-Section - Proposed

Channel Cross Section: 213

Scenario: Existing Updated
Lid: No
Conveyance Method: ICPRv3

Bottom Point Table

Order	Station [ft]	Elevation [ft]	Manning's N
0	-76.51	86.59	0.0350
1	-60.70	81.32	0.0350
2	-54.70	81.32	0.0350
3	-28.00	90.22	0.0350
4	-13.00	91.72	0.0350

Comment: Station 213 Cross-Section - Proposed

Channel Cross Section: 214

Scenario: Existing Updated
Lid: No
Conveyance Method: ICPRv3

Bottom Point Table

Order	Station [ft]	Elevation [ft]	Manning's N
0	-74.43	85.50	0.0350
1	-61.06	81.04	0.0350
2	-55.06	81.04	0.0350
3	-28.00	90.06	0.0350
4	-13.00	91.56	0.0350

Comment: Station 214 Cross-Section - Proposed

Channel Cross Section: 215

Scenario: Existing Updated
Lid: No
Conveyance Method: ICPRv3

Bottom Point Table

Order	Station [ft]	Elevation [ft]	Manning's N
0	-76.10	85.81	0.0350
1	-61.00	80.76	0.0350
2	-55.00	80.76	0.0350
3	-28.00	89.76	0.0350
4	-13.00	91.26	0.0350

Comment: Station 215 Cross-Section - Proposed

Channel Cross Section: 216

Scenario: Existing Updated
Lid: No
Conveyance Method: ICPRv3

Bottom Point Table

Order	Station [ft]	Elevation [ft]	Manning's N
0	-78.77	86.43	0.0350
1	-60.94	80.48	0.0350
2	-54.94	80.48	0.0350
3	-28.00	89.46	0.0350
4	-13.00	90.96	0.0350

Comment: Station 216 Cross-Section - Proposed

Channel Cross Section: 217

Scenario: Existing Updated
Lid: No
Conveyance Method: ICPRv3

Bottom Point Table

Order	Station [ft]	Elevation [ft]	Manning's N
0	-78.44	85.46	0.0350
1	-62.68	80.20	0.0350
2	-56.68	80.20	0.0350
3	-28.00	89.76	0.0350
4	-13.00	91.26	0.0350

Comment: Station 217 Cross-Section - Proposed

Channel Cross Section: C4-1X

Scenario: Existing Updated
Lid: No

Conveyance Method: ICPRv3

Bottom Point Table

Order	Station [ft]	Elevation [ft]	Manning's N
0	-255.00	87.46	0.0450
1	-244.00	81.70	0.0450
2	-240.00	71.20	0.0450
3	-234.00	69.80	0.0450
4	-226.00	68.40	0.0450
5	-220.00	67.90	0.0450
6	-213.00	76.30	0.0450
7	-208.00	80.10	0.0450
8	-200.00	86.10	0.0450

Comment: pg 2124001-49

Channel Cross Section: C4-1XM

Scenario: Existing Updated
Lid: No
Conveyance Method: ICPRv3

Bottom Point Table

Order	Station [ft]	Elevation [ft]	Manning's N
0	-255.00	87.46	0.0450
1	-244.00	81.70	0.0450
2	-240.88	73.50	0.0450
3	-215.33	73.50	0.0450
4	-213.00	76.30	0.0450
5	-208.00	80.10	0.0450
6	-200.00	86.10	0.0450

Comment: pg 2124001-49 (PLUNGE POOL REMOVED)

Channel Cross Section: C4-2X

Scenario: Existing Updated
Lid: No
Conveyance Method: ICPRv3

Bottom Point Table

Order	Station [ft]	Elevation [ft]	Manning's N
0	-327.00	87.66	0.0450
1	-322.00	87.65	0.0450
2	-312.00	87.31	0.0450
3	-301.00	87.18	0.0450
4	-290.00	86.86	0.0450
5	-270.00	87.00	0.0450
6	-251.00	87.60	0.0450
7	-250.00	86.34	0.0450
8	-244.00	83.80	0.0450
9	-238.00	78.60	0.0450
10	-225.00	78.00	0.0450

Order	Station [ft]	Elevation [ft]	Manning's N
11	-216.00	78.50	0.0450
12	-213.00	81.40	0.0450
13	-207.00	83.20	0.0450
14	-200.00	86.40	0.0450

Comment: PG 2124001-48

Channel Cross Section: C4-3X

Scenario: Existing Updated
Lid: No
Conveyance Method: ICPRv3

Bottom Point Table

Order	Station [ft]	Elevation [ft]	Manning's N
0	200.00	88.90	0.0450
1	209.00	84.20	0.0450
2	213.00	80.50	0.0450
3	219.00	78.00	0.0450
4	222.00	76.70	0.0450
5	234.00	79.30	0.0450
6	238.00	80.10	0.0450
7	244.00	80.90	0.0450
8	254.00	86.60	0.0450

Comment: 2124001-47

Channel Cross Section: C4-4X

Scenario: Existing Updated
Lid: No
Conveyance Method: ICPRv3

Bottom Point Table

Order	Station [ft]	Elevation [ft]	Manning's N
0	200.00	94.00	0.0450
1	208.00	88.80	0.0450
2	214.00	82.50	0.0450
3	216.00	79.70	0.0450
4	222.00	78.60	0.0450
5	226.00	78.90	0.0450
6	229.00	82.00	0.0450
7	236.00	84.30	0.0450
8	247.00	89.10	0.0450
9	258.00	89.70	0.0450
10	297.00	90.60	0.0450
11	347.00	90.80	0.0450

Comment: pg 2124001-46

Channel Cross Section: C4-5X

Scenario: Existing Updated
Lid: No
Conveyance Method: ICPRv3

Bottom Point Table

Order	Station [ft]	Elevation [ft]	Manning's N
0	200.00	90.90	0.0450
1	207.00	86.40	0.0450
2	213.00	80.80	0.0450
3	225.00	80.60	0.0450
4	233.00	79.90	0.0450
5	236.00	80.10	0.0450
6	240.00	82.00	0.0450
7	246.00	84.40	0.0450
8	287.00	85.50	0.0450
9	309.00	89.90	0.0450
10	330.00	90.10	0.0450

Comment: PG 2124001-45

Channel Cross Section: C4-6X

Scenario: Existing Updated
Lid: No
Conveyance Method: ICPRv3

Bottom Point Table

Order	Station [ft]	Elevation [ft]	Manning's N
0	-338.00	90.70	0.0450
1	-288.00	90.50	0.0450
2	-248.00	90.50	0.0450
3	-238.00	88.80	0.0450
4	-222.00	82.40	0.0450
5	-217.00	80.50	0.0450
6	-211.00	80.10	0.0450
7	-204.00	80.50	0.0450
8	-202.00	82.20	0.0450
9	-193.00	83.50	0.0450
10	-175.00	86.40	0.0450
11	-130.00	90.90	0.0450
12	-125.50	91.15	0.0450

Comment: PG 2124001-44

Weir Cross Section: LC00065W-W

Scenario: Existing Updated
Lid: No

Bottom Point Table

Order	Station [ft]	Elevation [ft]
0	0.00	89.10

Winter Park Pines Study, Lake Corrine Outfall Canal - Existing Condition
Input Data
9/17/2024

Order	Station [ft]	Elevation [ft]
1	23.00	89.00
2	398.00	88.00
3	425.00	87.00
4	489.00	86.00
5	577.00	85.30
6	754.00	86.00
7	910.00	86.00
8	1084.00	86.00
9	1176.00	87.00
10	1306.00	88.00
11	1452.00	89.00
12	1487.00	90.00
13	1511.00	90.20

Comment: CROSS SECTION TAKEN FROM CONTOURS (NAVD88)

Channel Link: 207		Upstream		Downstream	
Scenario:	Existing Updated	Invert:	83.00 ft	Invert:	82.72 ft
From Node:	BP207	Manning's N:	0.0000	Manning's N:	0.0000
To Node:	BP208	Geometry:	Irregular	Geometry:	Irregular
Link Count:	1	Cross Section:	207	Cross Section:	208
Flow Direction:	Both				
Damping:	0.0000 ft				
Length:	100.00 ft				
Contraction Coef:	0.10				
Expansion Coef:	0.30				
Entr Loss Coef:	0.00				
Exit Loss Coef:	0.00				
Bend Loss Coef:	0.00				
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Comment: LAKE CORRINE OUTFALL CANAL

Channel Link: 208		Upstream		Downstream	
Scenario:	Existing Updated	Invert:	82.72 ft	Invert:	82.44 ft
From Node:	BP208	Manning's N:	0.0000	Manning's N:	0.0000
To Node:	BP209	Geometry:	Irregular	Geometry:	Irregular
Link Count:	1	Cross Section:	208	Cross Section:	209
Flow Direction:	Both				
Damping:	0.0000 ft				
Length:	100.00 ft				
Contraction Coef:	0.10				
Expansion Coef:	0.30				
Entr Loss Coef:	0.00				
Exit Loss Coef:	0.00				
Bend Loss Coef:	0.00				
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Comment: LAKE CORRINE OUTFALL CANAL

Channel Link: 209		Upstream		Downstream	
Scenario:	Existing Updated	Invert:	82.44 ft	Invert:	82.16 ft
From Node:	BP209	Manning's N:	0.0000	Manning's N:	0.0000
To Node:	BP210	Geometry:	Irregular	Geometry:	Irregular
Link Count:	1	Cross Section:	209	Cross Section:	210
Flow Direction:	Both				
Damping:	0.0000 ft				
Length:	100.00 ft				
Contraction Coef:	0.10				
Expansion Coef:	0.30				
Entr Loss Coef:	0.00				
Exit Loss Coef:	0.00				
Bend Loss Coef:	0.00				
Bend Location:	0.00 dec				
Energy Switch:	Energy				
Comment:	LAKE CORRINE OUTFALL CANAL				

Channel Link: 210		Upstream		Downstream	
Scenario:	Existing Updated	Invert:	82.16 ft	Invert:	81.88 ft
From Node:	BP210	Manning's N:	0.0000	Manning's N:	0.0000
To Node:	BP211	Geometry:	Irregular	Geometry:	Irregular
Link Count:	1	Cross Section:	210	Cross Section:	211
Flow Direction:	Both				
Damping:	0.0000 ft				
Length:	100.00 ft				
Contraction Coef:	0.10				
Expansion Coef:	0.30				
Entr Loss Coef:	0.00				
Exit Loss Coef:	0.00				
Bend Loss Coef:	0.00				
Bend Location:	0.00 dec				
Energy Switch:	Energy				
Comment:	LAKE CORRINE OUTFALL CANAL				

Channel Link: 211		Upstream		Downstream	
Scenario:	Existing Updated	Invert:	81.88 ft	Invert:	81.60 ft
From Node:	BP211	Manning's N:	0.0000	Manning's N:	0.0000
To Node:	BP212	Geometry:	Irregular	Geometry:	Irregular
Link Count:	1	Cross Section:	211	Cross Section:	212
Flow Direction:	Both				
Damping:	0.0000 ft				
Length:	100.00 ft				
Contraction Coef:	0.10				
Expansion Coef:	0.30				
Entr Loss Coef:	0.00				
Exit Loss Coef:	0.00				
Bend Loss Coef:	0.00				
Bend Location:	0.00 dec				
Energy Switch:	Energy				
Comment:	LAKE CORRINE OUTFALL CANAL				

Channel Link: 212		Upstream		Downstream	
Scenario:	Existing Updated	Invert:	81.60 ft	Invert:	81.32 ft
From Node:	BP212	Manning's N:	0.0000	Manning's N:	0.0000
To Node:	BP213	Geometry:	Irregular	Geometry:	Irregular
Link Count:	1	Cross Section:	212	Cross Section:	213
Flow Direction:	Both				
Damping:	0.0000 ft				
Length:	100.00 ft				
Contraction Coef:	0.10				
Expansion Coef:	0.30				
Entr Loss Coef:	0.00				
Exit Loss Coef:	0.00				
Bend Loss Coef:	0.00				
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Comment: LAKE CORRINE OUTFALL CANAL

Channel Link: 213		Upstream		Downstream	
Scenario:	Existing Updated	Invert:	81.32 ft	Invert:	81.04 ft
From Node:	BP213	Manning's N:	0.0000	Manning's N:	0.0000
To Node:	BP214	Geometry:	Irregular	Geometry:	Irregular
Link Count:	1	Cross Section:	213	Cross Section:	214
Flow Direction:	Both				
Damping:	0.0000 ft				
Length:	100.00 ft				
Contraction Coef:	0.10				
Expansion Coef:	0.30				
Entr Loss Coef:	0.00				
Exit Loss Coef:	0.00				
Bend Loss Coef:	0.00				
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Comment: LAKE CORRINE OUTFALL CANAL

Channel Link: 214		Upstream		Downstream	
Scenario:	Existing Updated	Invert:	81.04 ft	Invert:	80.76 ft
From Node:	BP214	Manning's N:	0.0000	Manning's N:	0.0000
To Node:	BP215	Geometry:	Irregular	Geometry:	Irregular
Link Count:	1	Cross Section:	214	Cross Section:	215
Flow Direction:	Both				
Damping:	0.0000 ft				
Length:	100.00 ft				
Contraction Coef:	0.10				
Expansion Coef:	0.30				
Entr Loss Coef:	0.00				
Exit Loss Coef:	0.00				
Bend Loss Coef:	0.00				
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Comment: LAKE CORRINE OUTFALL CANAL

Channel Link: 215		Upstream		Downstream	
Scenario:	Existing Updated	Invert:	80.76 ft	Invert:	80.48 ft
From Node:	BP215	Manning's N:	0.0000	Manning's N:	0.0000
To Node:	BP216	Geometry:	Irregular	Geometry:	Irregular
Link Count:	1	Cross Section:	215	Cross Section:	216
Flow Direction:	Both				
Damping:	0.0000 ft				
Length:	100.00 ft				
Contraction Coef:	0.10				
Expansion Coef:	0.30				
Entr Loss Coef:	0.00				
Exit Loss Coef:	0.00				
Bend Loss Coef:	0.00				
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Comment: LAKE CORRINE OUTFALL CANAL

Channel Link: 216		Upstream		Downstream	
Scenario:	Existing Updated	Invert:	80.48 ft	Invert:	80.20 ft
From Node:	BP216	Manning's N:	0.0000	Manning's N:	0.0000
To Node:	BP217	Geometry:	Irregular	Geometry:	Irregular
Link Count:	1	Cross Section:	216	Cross Section:	217
Flow Direction:	Both				
Damping:	0.0000 ft				
Length:	100.00 ft				
Contraction Coef:	0.10				
Expansion Coef:	0.30				
Entr Loss Coef:	0.00				
Exit Loss Coef:	0.00				
Bend Loss Coef:	0.00				
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Comment: LAKE CORRINE OUTFALL CANAL

Channel Link: 217		Upstream		Downstream	
Scenario:	Existing Updated	Invert:	80.20 ft	Invert:	79.31 ft
From Node:	BP217	Manning's N:	0.0000	Manning's N:	0.0000
To Node:	BP218	Geometry:	Irregular	Geometry:	Irregular
Link Count:	1	Cross Section:	217	Cross Section:	217
Flow Direction:	Both				
Damping:	0.0000 ft				
Length:	100.00 ft				
Contraction Coef:	0.10				
Expansion Coef:	0.30				
Entr Loss Coef:	0.00				
Exit Loss Coef:	0.00				
Bend Loss Coef:	0.00				
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Comment: LAKE CORRINE OUTFALL CANAL

Channel Link: LC00030		Upstream		Downstream	
Scenario:	Existing Updated	Invert:	83.60 ft	Invert:	83.11 ft
From Node:	LC00030	Manning's N:	0.0450	Manning's N:	0.0450
To Node:	LC00030A	Geometry:	Irregular	Geometry:	Irregular
Link Count:	1	Cross Section:	C3-1X	Cross Section:	C3-1X
Flow Direction:	Both				
Damping:	0.0000 ft				
Length:	603.73 ft				
Contraction Coef:	0.10				
Expansion Coef:	0.30				
Entr Loss Coef:	0.00				
Exit Loss Coef:	0.00				
Bend Loss Coef:	0.00				
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Comment: OFFSITE OUTFALL DITCH FROM PROPERY LINE NORTH

Channel Link: LC00050		Upstream		Downstream	
Scenario:	Existing Updated	Invert:	80.10 ft	Invert:	80.00 ft
From Node:	LC00050	Manning's N:	0.0450	Manning's N:	0.0450
To Node:	LC00050A	Geometry:	Irregular	Geometry:	Irregular
Link Count:	1	Cross Section:	C4-6X	Cross Section:	C4-6X
Flow Direction:	Both				
Damping:	0.0000 ft				
Length:	402.00 ft				
Contraction Coef:	0.10				
Expansion Coef:	0.30				
Entr Loss Coef:	0.00				
Exit Loss Coef:	0.00				
Bend Loss Coef:	0.00				
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Comment:

Channel Link: LC00050B		Upstream		Downstream	
Scenario:	Existing Updated	Invert:	79.20 ft	Invert:	79.20 ft
From Node:	LC00050B	Manning's N:	0.0450	Manning's N:	0.0450
To Node:	LC00055	Geometry:	Irregular	Geometry:	Irregular
Link Count:	1	Cross Section:	C4-6X	Cross Section:	C4-5X
Flow Direction:	Both				
Damping:	0.0000 ft				
Length:	542.00 ft				
Contraction Coef:	0.10				
Expansion Coef:	0.30				
Entr Loss Coef:	0.00				
Exit Loss Coef:	0.00				
Bend Loss Coef:	0.00				
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Comment:

Channel Link: LC00055		Upstream		Downstream	
Scenario:	Existing Updated	Invert:	79.90 ft	Invert:	78.90 ft
From Node:	LC00055	Manning's N:	0.0450	Manning's N:	0.0450
To Node:	LC00060	Geometry:	Irregular	Geometry:	Irregular
Link Count:	1	Cross Section:	C4-5X	Cross Section:	C4-4X
Flow Direction:	Both				
Damping:	0.0000 ft				
Length:	1201.06 ft				
Contraction Coef:	0.10				
Expansion Coef:	0.30				
Entr Loss Coef:	0.00				
Exit Loss Coef:	0.00				
Bend Loss Coef:	0.00				
Bend Location:	0.00 dec				
Energy Switch:	Energy				
Comment:					

Channel Link: LC00060		Upstream		Downstream	
Scenario:	Existing Updated	Invert:	78.90 ft	Invert:	78.60 ft
From Node:	LC00060	Manning's N:	0.0450	Manning's N:	0.0450
To Node:	LC00065	Geometry:	Irregular	Geometry:	Irregular
Link Count:	1	Cross Section:	C4-4X	Cross Section:	C4-3X
Flow Direction:	Both				
Damping:	0.0000 ft				
Length:	1599.59 ft				
Contraction Coef:	0.10				
Expansion Coef:	0.30				
Entr Loss Coef:	0.00				
Exit Loss Coef:	0.00				
Bend Loss Coef:	0.00				
Bend Location:	0.00 dec				
Energy Switch:	Energy				
Comment:					

Channel Link: LC00065		Upstream		Downstream	
Scenario:	Existing Updated	Invert:	77.50 ft	Invert:	77.65 ft
From Node:	LC00065	Manning's N:	0.0450	Manning's N:	0.0450
To Node:	LC00070	Geometry:	Irregular	Geometry:	Irregular
Link Count:	1	Cross Section:	C4-3X	Cross Section:	C4-2X
Flow Direction:	Both				
Damping:	0.0000 ft				
Length:	1272.04 ft				
Contraction Coef:	0.10				
Expansion Coef:	0.30				
Entr Loss Coef:	0.00				
Exit Loss Coef:	0.00				
Bend Loss Coef:	0.00				
Bend Location:	0.00 dec				
Energy Switch:	Energy				
Comment:					

Channel Link: LC00075		Upstream		Downstream	
Scenario:	Existing Updated	Invert:	73.50 ft	Invert:	72.10 ft
From Node:	LC00075	Manning's N:	0.0450	Manning's N:	0.0450
To Node:	LC00080	Geometry:	Irregular	Geometry:	Irregular
Link Count:	1	Cross Section:	C4-1XM	Cross Section:	C4-1XM
Flow Direction:	Both				
Damping:	0.0000 ft				
Length:	570.73 ft				
Contraction Coef:	0.10				
Expansion Coef:	0.30				
Entr Loss Coef:	0.00				
Exit Loss Coef:	0.00				
Bend Loss Coef:	0.00				
Bend Location:	0.00 dec				
Energy Switch:	Energy				
Comment:					

Channel Link: LC00080		Upstream		Downstream	
Scenario:	Existing Updated	Invert:	72.10 ft	Invert:	70.50 ft
From Node:	LC00080	Manning's N:	0.0450	Manning's N:	0.0450
To Node:	LC00085	Geometry:	Irregular	Geometry:	Irregular
Link Count:	1	Cross Section:	C4-1XM	Cross Section:	C4-1XM
Flow Direction:	Both				
Damping:	0.0000 ft				
Length:	653.57 ft				
Contraction Coef:	0.10				
Expansion Coef:	0.30				
Entr Loss Coef:	0.00				
Exit Loss Coef:	0.00				
Bend Loss Coef:	0.00				
Bend Location:	0.00 dec				
Energy Switch:	Energy				
Comment:					

Channel Link: LC00090		Upstream		Downstream	
Scenario:	Existing Updated	Invert:	56.90 ft	Invert:	53.11 ft
From Node:	LC00090	Manning's N:	0.0450	Manning's N:	0.0450
To Node:	LC00095	Geometry:	Trapezoidal	Geometry:	Trapezoidal
Link Count:	1	Max Depth:	941.10 ft	Max Depth:	944.89 ft
Flow Direction:	Both	Extrapolation:	Normal	Extrapolation:	Normal
Damping:	0.0000 ft	Bottom Width:	20.00 ft	Bottom Width:	20.00 ft
Length:	582.00 ft	Left Slope:	2.000 (h:v)	Left Slope:	2.000 (h:v)
Contraction Coef:	0.10	Right Slope:	1.500 (h:v)	Right Slope:	1.500 (h:v)
Expansion Coef:	0.30	Bottom Clip			
Entr Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Exit Loss Coef:	0.00	Op Table:		Op Table:	
Bend Loss Coef:	0.00	Ref Node:		Ref Node:	
Bend Location:	0.00 dec	Manning's N:	0.0450	Manning's N:	0.0450
Energy Switch:	Energy	Top Clip			
		Default:	0.00 ft	Default:	0.00 ft
		Op Table:		Op Table:	

		Ref Node:		Ref Node:	
		Manning's N:	0.0450	Manning's N:	0.0450

Comment: ASSUMED XSEC FROM TOPO

Channel Link: LC00095		Upstream		Downstream	
Scenario:	Existing Updated	Invert:	53.11 ft	Invert:	53.70 ft
From Node:	LC00095	Manning's N:	0.0450	Manning's N:	0.0450
To Node:	LC00100	Geometry: Trapezoidal		Geometry: Trapezoidal	
Link Count:	1	Max Depth:	944.89 ft	Max Depth:	944.30 ft
Flow Direction:	Both	Extrapolation:	Normal	Extrapolation:	Normal
Damping:	0.0000 ft	Bottom Width:	20.00 ft	Bottom Width:	20.00 ft
Length:	360.66 ft	Left Slope:	1.500 (h:v)	Left Slope:	1.500 (h:v)
Contraction Coef:	0.10	Right Slope:	1.500 (h:v)	Right Slope:	1.500 (h:v)
Expansion Coef:	0.30	Bottom Clip			
Entr Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Exit Loss Coef:	0.00	Op Table:		Op Table:	
Bend Loss Coef:	0.00	Ref Node:		Ref Node:	
Bend Location:	0.00 dec	Manning's N:	0.0450	Manning's N:	0.0450
Energy Switch:	Energy	Top Clip			
		Default:	0.00 ft	Default:	0.00 ft
		Op Table:		Op Table:	
		Ref Node:		Ref Node:	
		Manning's N:	0.0450	Manning's N:	0.0450

Comment: ASSUMED XSEC FROM TOPO

Channel Link: WPP3		Upstream		Downstream	
Scenario:	Existing Updated	Invert:	80.80 ft	Invert:	79.68 ft
From Node:	WPP3	Manning's N:	0.0450	Manning's N:	0.0450
To Node:	B-11	Geometry: Trapezoidal		Geometry: Trapezoidal	
Link Count:	1	Max Depth:	999.00 ft	Max Depth:	999.00 ft
Flow Direction:	Both	Extrapolation:	Normal	Extrapolation:	Normal
Damping:	0.0000 ft	Bottom Width:	6.00 ft	Bottom Width:	6.00 ft
Length:	95.00 ft	Left Slope:	2.000 (h:v)	Left Slope:	2.000 (h:v)
Contraction Coef:	0.10	Right Slope:	2.000 (h:v)	Right Slope:	2.000 (h:v)
Expansion Coef:	0.30	Bottom Clip			
Entr Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Exit Loss Coef:	0.00	Op Table:		Op Table:	
Bend Loss Coef:	0.00	Ref Node:		Ref Node:	
Bend Location:	0.00 dec	Manning's N:	0.0450	Manning's N:	0.0450
Energy Switch:	Energy	Top Clip			
		Default:	0.00 ft	Default:	0.00 ft
		Op Table:		Op Table:	
		Ref Node:		Ref Node:	
		Manning's N:	0.0450	Manning's N:	0.0450

Comment: WINTER PINES GOLF COURSE CANAL

Channel Link: WPP4		Upstream		Downstream	
Scenario:	Existing Updated	Invert:	81.40 ft	Invert:	79.97 ft

From Node:	WPP4	Manning's N:	0.0450	Manning's N:	0.0450
To Node:	BP217	Geometry: Trapezoidal		Geometry: Trapezoidal	
Link Count:	1	Max Depth:	916.60 ft	Max Depth:	918.03 ft
Flow Direction:	Both	Extrapolation:	Normal	Extrapolation:	Normal
Damping:	0.0000 ft	Bottom Width:	6.00 ft	Bottom Width:	6.00 ft
Length:	115.00 ft	Left Slope:	2.000 (h:v)	Left Slope:	2.000 (h:v)
Contraction Coef:	0.10	Right Slope:	2.000 (h:v)	Right Slope:	2.000 (h:v)
Expansion Coef:	0.30	Bottom Clip			
Entr Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Exit Loss Coef:	0.00	Op Table:		Op Table:	
Bend Loss Coef:	0.00	Ref Node:		Ref Node:	
Bend Location:	0.00 dec	Manning's N:	0.0450	Manning's N:	0.0450
Energy Switch:	Energy	Top Clip			
		Default:	0.00 ft	Default:	0.00 ft
		Op Table:		Op Table:	
		Ref Node:		Ref Node:	
		Manning's N:	0.0450	Manning's N:	0.0450

Comment: WINTER PINES GOLF COURSE CANAL

Pipe Link: 218		Upstream		Downstream	
Scenario:	Existing Updated	Invert:	79.31 ft	Invert:	79.13 ft
From Node:	BP218	Manning's N:	0.0110	Manning's N:	0.0110
To Node:	BP220	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	8.00 ft	Max Depth:	8.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	171.00 ft	Op Table:		Op Table:	
FHWA Code:	1	Ref Node:		Ref Node:	
Entr Loss Coef:	0.50	Manning's N:	0.0110	Manning's N:	0.0110
Exit Loss Coef:	1.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0110	Manning's N:	0.0110

Comment: Existing 96" RCP from Baldwin Park Lane Improvements, updated info from DRMP Survey (4/8/24), deleted Node 219 and Pipe BP219 from model

Pipe Link: B-11		Upstream		Downstream	
Scenario:	Existing Updated	Invert:	80.94 ft	Invert:	80.76 ft
From Node:	B-11	Manning's N:	0.0110	Manning's N:	0.0110
To Node:	BP220	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	4.50 ft	Max Depth:	4.50 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	20.00 ft	Op Table:		Op Table:	
FHWA Code:	1	Ref Node:		Ref Node:	
Entr Loss Coef:	0.50	Manning's N:	0.0110	Manning's N:	0.0110
Exit Loss Coef:	1.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	

		Manning's N:	0.0110	Manning's N:	0.0110

Comment: WINTER PINES GOLF COURSE HEADWALL 54" RCP, updated info from DRMP Survey (4/8/24)

Pipe Link: LC00030A		Upstream		Downstream	
Scenario:	Existing Updated	Invert:	83.11 ft	Invert:	83.00 ft
From Node:	LC00030A	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	BP207	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	3.00 ft	Max Depth:	3.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	114.00 ft	Op Table:		Op Table:	
FHWA Code:	1	Ref Node:		Ref Node:	
Entr Loss Coef:	0.50	Manning's N:	0.0120	Manning's N:	0.0120
Exit Loss Coef:	1.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0120	Manning's N:	0.0120

Comment: PROPOSED 36" RCP

Pipe Link: LC00031		Upstream		Downstream	
Scenario:	Existing Updated	Invert:	86.50 ft	Invert:	87.00 ft
From Node:	BALDWIN	Manning's N:	0.0130	Manning's N:	0.0130
To Node:	CS-BALD	Geometry: Circular		Geometry: Circular	
Link Count:	3	Max Depth:	3.50 ft	Max Depth:	3.50 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	140.00 ft	Op Table:		Op Table:	
FHWA Code:	1	Ref Node:		Ref Node:	
Entr Loss Coef:	0.50	Manning's N:	0.0130	Manning's N:	0.0130
Exit Loss Coef:	1.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0130	Manning's N:	0.0130

Comment:

Pipe Link: LC00045		Upstream		Downstream	
Scenario:	Existing Updated	Invert:	79.31 ft	Invert:	79.00 ft
From Node:	BP220	Manning's N:	0.0130	Manning's N:	0.0130
To Node:	LC00050	Geometry: Rectangular		Geometry: Rectangular	
Link Count:	1	Max Depth:	9.00 ft	Max Depth:	9.00 ft
Flow Direction:	Both	Max Width:	11.50 ft	Max Width:	11.50 ft
Damping:	0.0000 ft	Fillet:	0.00 ft	Fillet:	0.00 ft
Length:	186.00 ft	Bottom Clip			
FHWA Code:	11	Default:	0.00 ft	Default:	0.00 ft
Entr Loss Coef:	0.70	Op Table:		Op Table:	
Exit Loss Coef:	1.00	Ref Node:		Ref Node:	

Bend Loss Coef:	0.00	Manning's N:	0.0130	Manning's N:	0.0130
Bend Location:	0.00 dec	Top Clip			
Energy Switch:	Energy	Default:	0.00 ft	Default:	0.00 ft
		Op Table:		Op Table:	
		Ref Node:		Ref Node:	
		Manning's N:	0.0130	Manning's N:	0.0130

Comment: BOX CULVERT AT SR 436 - EXTENDED 34', updated survey from DRMP (4/08/24)

Pipe Link: LC00050A1		Upstream		Downstream	
Scenario:	Existing Updated	Invert:	80.98 ft	Invert:	80.40 ft
From Node:	LC00050A	Manning's N:	0.0130	Manning's N:	0.0130
To Node:	LC00050B	Geometry: Rectangular		Geometry: Rectangular	
Link Count:	1	Max Depth:	8.00 ft	Max Depth:	8.00 ft
Flow Direction:	Both	Max Width:	6.90 ft	Max Width:	6.90 ft
Damping:	0.0000 ft	Fillet:	0.00 ft	Fillet:	0.00 ft
Length:	55.00 ft	Bottom Clip			
FHWA Code:	0	Default:	0.00 ft	Default:	0.00 ft
Entr Loss Coef:	0.00	Op Table:		Op Table:	
Exit Loss Coef:	1.00	Ref Node:		Ref Node:	
Bend Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Bend Location:	0.00 dec	Top Clip			
Energy Switch:	Energy	Default:	0.00 ft	Default:	0.00 ft
		Op Table:		Op Table:	
		Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment: North Cell of Double Cell Box Culvert under entrance to Walmart Neighborhood Market from Auvers Blvd, updated survey from DRMP (04/08/24)

Pipe Link: LC00050A2		Upstream		Downstream	
Scenario:	Existing Updated	Invert:	80.87 ft	Invert:	80.41 ft
From Node:	LC00050A	Manning's N:	0.0130	Manning's N:	0.0130
To Node:	LC00050B	Geometry: Rectangular		Geometry: Rectangular	
Link Count:	1	Max Depth:	8.00 ft	Max Depth:	8.00 ft
Flow Direction:	Both	Max Width:	6.90 ft	Max Width:	6.90 ft
Damping:	0.0000 ft	Fillet:	0.00 ft	Fillet:	0.00 ft
Length:	55.00 ft	Bottom Clip			
FHWA Code:	0	Default:	0.00 ft	Default:	0.00 ft
Entr Loss Coef:	0.00	Op Table:		Op Table:	
Exit Loss Coef:	1.00	Ref Node:		Ref Node:	
Bend Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Bend Location:	0.00 dec	Top Clip			
Energy Switch:	Energy	Default:	0.00 ft	Default:	0.00 ft
		Op Table:		Op Table:	
		Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment: South Cell of Double Cell Box Culvert under entrance to Walmart Neighborhood Market from Auvers Blvd, updated survey from DRMP (04/08/24)

Pipe Link: LC00070A_N		Upstream		Downstream	
Scenario:	Existing Updated	Invert:	77.25 ft	Invert:	76.67 ft
From Node:	LC00070A	Manning's N:	0.0130	Manning's N:	0.0130
To Node:	LC00070B_N	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	4.50 ft	Max Depth:	4.50 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	17.00 ft	Op Table:		Op Table:	
FHWA Code:	1	Ref Node:		Ref Node:	
Entr Loss Coef:	0.50	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	1.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment: Update using GIS info from OCPW (1/2024)

Pipe Link: LC00070A_S		Upstream		Downstream	
Scenario:	Existing Updated	Invert:	77.20 ft	Invert:	76.84 ft
From Node:	LC00070A	Manning's N:	0.0130	Manning's N:	0.0130
To Node:	LC00070B_S	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	4.50 ft	Max Depth:	4.50 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	20.00 ft	Op Table:		Op Table:	
FHWA Code:	1	Ref Node:		Ref Node:	
Entr Loss Coef:	0.50	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	1.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment: Update using GIS info from OCPW (1/2024)

Pipe Link: LC00070B_N		Upstream		Downstream	
Scenario:	Existing Updated	Invert:	73.76 ft	Invert:	73.38 ft
From Node:	LC00070B_N	Manning's N:	0.0130	Manning's N:	0.0130
To Node:	LC00075	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	4.50 ft	Max Depth:	4.50 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	106.00 ft	Op Table:		Op Table:	
FHWA Code:	1	Ref Node:		Ref Node:	
Entr Loss Coef:	0.50	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	1.00	Top Clip			
Bend Loss Coef:	0.50	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment: Update using GIS info from OCPW (1/2024)

Pipe Link: LC00070B_S		Upstream		Downstream	
Scenario:	Existing Updated	Invert:	73.78 ft	Invert:	73.48 ft
From Node:	LC00070B_S	Manning's N:	0.0130	Manning's N:	0.0130
To Node:	LC00075	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	4.50 ft	Max Depth:	4.50 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	103.00 ft	Op Table:		Op Table:	
FHWA Code:	1	Ref Node:		Ref Node:	
Entr Loss Coef:	0.50	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	1.00	Top Clip			
Bend Loss Coef:	0.50	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment: Update using GIS info from OCPW (1/2024)

Pipe Link: LC00085A_N		Upstream		Downstream	
Scenario:	Existing Updated	Invert:	70.66 ft	Invert:	68.88 ft
From Node:	LC00085	Manning's N:	0.0130	Manning's N:	0.0130
To Node:	LC00087A	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	5.00 ft	Max Depth:	5.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	102.00 ft	Op Table:		Op Table:	
FHWA Code:	2	Ref Node:		Ref Node:	
Entr Loss Coef:	0.50	Manning's N:	0.0240	Manning's N:	0.0240
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0240	Manning's N:	0.0240

Comment: Update using GIS info from OCPW (1/2024)

Pipe Link: LC00085A_S		Upstream		Downstream	
Scenario:	Existing Updated	Invert:	70.74 ft	Invert:	69.14 ft
From Node:	LC00085	Manning's N:	0.0130	Manning's N:	0.0130
To Node:	LC00087B	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	5.00 ft	Max Depth:	5.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	104.00 ft	Op Table:		Op Table:	
FHWA Code:	2	Ref Node:		Ref Node:	
Entr Loss Coef:	0.50	Manning's N:	0.0240	Manning's N:	0.0240
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0240	Manning's N:	0.0240

Comment: Update using GIS info from OCPW (1/2024)

Pipe Link: LC00087_N		Upstream		Downstream	
Scenario:	Existing Updated	Invert:	58.03 ft	Invert:	57.76 ft
From Node:	LC00087A	Manning's N:	0.0130	Manning's N:	0.0130
To Node:	LC00090	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	5.00 ft	Max Depth:	5.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	75.00 ft	Op Table:		Op Table:	
FHWA Code:	7	Ref Node:		Ref Node:	
Entr Loss Coef:	0.20	Manning's N:	0.0240	Manning's N:	0.0240
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0240	Manning's N:	0.0240

Comment: Update using GIS info from OCPW (1/2024)

Pipe Link: LC00087_S		Upstream		Downstream	
Scenario:	Existing Updated	Invert:	58.28 ft	Invert:	57.48 ft
From Node:	LC00087B	Manning's N:	0.0130	Manning's N:	0.0130
To Node:	LC00090	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	5.00 ft	Max Depth:	5.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	82.00 ft	Op Table:		Op Table:	
FHWA Code:	7	Ref Node:		Ref Node:	
Entr Loss Coef:	0.20	Manning's N:	0.0240	Manning's N:	0.0240
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0240	Manning's N:	0.0240

Comment: Update using GIS info from OCPW (1/2024)

Pipe Link: WPP1		Upstream		Downstream	
Scenario:	Existing Updated	Invert:	82.05 ft	Invert:	81.40 ft
From Node:	WPP1	Manning's N:	0.0250	Manning's N:	0.0250
To Node:	WPP4	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	5.00 ft	Max Depth:	5.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	65.00 ft	Op Table:		Op Table:	
FHWA Code:	1	Ref Node:		Ref Node:	
Entr Loss Coef:	0.50	Manning's N:	0.0250	Manning's N:	0.0250
Exit Loss Coef:	1.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0250	Manning's N:	0.0250

Comment: WINTER PINES GOLF COURSE EXISTING 60" CMP

Pipe Link: WPP9		Upstream		Downstream	
Scenario:	Existing Updated	Invert:	79.73 ft	Invert:	79.27 ft
From Node:	WPP9	Manning's N:	0.0250	Manning's N:	0.0250
To Node:	WPP4	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	1.50 ft	Max Depth:	1.50 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	30.00 ft	Op Table:		Op Table:	
FHWA Code:	1	Ref Node:		Ref Node:	
Entr Loss Coef:	0.50	Manning's N:	0.0250	Manning's N:	0.0250
Exit Loss Coef:	1.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0250	Manning's N:	0.0250

Comment: WINTER PINES GOLF COURSE EXISTING 18" CMP

Weir Link: LC00065W			
Scenario:	Existing Updated	Bottom Clip	
From Node:	LC00065	Default:	0.00 ft
To Node:	LC12200	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Broad Crested Vertical	Op Table:	
Geometry Type:	Irregular	Ref Node:	
Invert:	86.30 ft	Discharge Coefficients	
Control Elevation:	86.30 ft	Weir Default:	2.800
Cross Section:	LC00065W-W	Weir Table:	
		Orifice Default:	0.600
		Orifice Table:	

Comment: WEIR INVERT TAKEN FROM CONTOURS

Weir Link: LC00070B			
Scenario:	Existing Updated	Bottom Clip	
From Node:	LC00070	Default:	0.00 ft
To Node:	LC00075	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Broad Crested Vertical	Op Table:	
Geometry Type:	Trapezoidal	Ref Node:	
Invert:	86.00 ft	Discharge Coefficients	
Control Elevation:	86.00 ft	Weir Default:	2.800
Max Depth:	99.00 ft	Weir Table:	
Extrapolation Method:	Normal Projection	Orifice Default:	0.600
Bottom Width:	0.00 ft	Orifice Table:	
Left Slope:	217.400 (h:v)		
Right Slope:	333.300 (h:v)		

Comment: OVERFLOW FORSYTH 180'+/- SOUTH OF XING

Weir Link: LC00070_W

Scenario:	Existing Updated	**Bottom Clip**	
From Node:	LC00070	Default:	0.00 ft
To Node:	LC00070A	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	**Top Clip**	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Sharp Crested Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	81.88 ft	**Discharge Coefficients**	
Control Elevation:	81.88 ft	Weir Default:	3.000
Max Depth:	999.00 ft	Weir Table:	
Max Width:	47.50 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Weir Link: LC00085B

Scenario:	Existing Updated	**Bottom Clip**	
From Node:	LC00085	Default:	0.00 ft
To Node:	LC00090	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	**Top Clip**	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Broad Crested Vertical	Op Table:	
Geometry Type:	Parabolic	Ref Node:	
Invert:	77.80 ft	**Discharge Coefficients**	
Control Elevation:	77.80 ft	Weir Default:	2.800
Max Depth:	99.00 ft	Weir Table:	
Max Width:	1557.40 ft	Orifice Default:	0.600
Extrapolation Method:	Normal Projection	Orifice Table:	

Comment: OVERFLOW DORIS/PARTRIDGE (SEE C5-4S)

Weir Link: WMW-1

Scenario:	Existing Updated	**Bottom Clip**	
From Node:	WMPond-1	Default:	0.00 ft
To Node:	LC00055	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	**Top Clip**	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Broad Crested Vertical	Op Table:	
Geometry Type:	Trapezoidal	Ref Node:	
Invert:	88.50 ft	**Discharge Coefficients**	
Control Elevation:	88.50 ft	Weir Default:	2.800
Max Depth:	1.50 ft	Weir Table:	
Extrapolation Method:	Normal Projection	Orifice Default:	0.600
Bottom Width:	20.00 ft	Orifice Table:	
Left Slope:	4.000 (h:v)		
Right Slope:	4.000 (h:v)		

Comment:

Weir Link: WPP2

Scenario:	Existing Updated	**Bottom Clip**	
From Node:	WPP2	Default:	0.00 ft
To Node:	WPP3	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	**Top Clip**	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Sharp Crested Vertical	Op Table:	
Geometry Type:	Trapezoidal	Ref Node:	
Invert:	82.00 ft	**Discharge Coefficients**	
Control Elevation:	82.00 ft	Weir Default:	3.200
Max Depth:	999.00 ft	Weir Table:	
Extrapolation Method:	Normal Projection	Orifice Default:	0.600
Bottom Width:	6.00 ft	Orifice Table:	
Left Slope:	2.000 (h:v)		
Right Slope:	2.000 (h:v)		

Comment: WINTER PINES GOLF COURSE EXISTING WEIR

2013_0107 - Weir Type revised to reflect Vertical: Mavis Equation

Weir Link: WPP2A

Scenario:	Existing Updated	**Bottom Clip**	
From Node:	WPP2	Default:	0.00 ft
To Node:	WPP3	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	**Top Clip**	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Sharp Crested Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	81.80 ft	**Discharge Coefficients**	
Control Elevation:	81.80 ft	Weir Default:	3.200
Max Depth:	0.20 ft	Weir Table:	
Max Width:	3.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment: WINTER PINES GOLF COURSE EXISTING WEIR

Weir Link: WPP9_W

Scenario:	Existing Updated	**Bottom Clip**	
From Node:	WPP9	Default:	0.00 ft
To Node:	BP217	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	**Top Clip**	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Broad Crested Vertical	Op Table:	
Geometry Type:	Trapezoidal	Ref Node:	
Invert:	87.00 ft	**Discharge Coefficients**	
Control Elevation:	87.00 ft	Weir Default:	2.600
Max Depth:	9999.00 ft	Weir Table:	
Extrapolation Method:	Normal Projection	Orifice Default:	0.600
Bottom Width:	50.00 ft	Orifice Table:	
Left Slope:	0.000 (h:v)		

Right Slope: 0.000 (h:v)

Comment:

Weir Link: WPP9_W2			
Scenario:	Existing Updated	Bottom Clip	
From Node:	WPP9	Default:	0.00 ft
To Node:	BP208	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Broad Crested Vertical	Op Table:	
Geometry Type:	Trapezoidal	Ref Node:	
Invert:	86.00 ft	Discharge Coefficients	
Control Elevation:	86.00 ft	Weir Default:	2.600
Max Depth:	9999.00 ft	Weir Table:	
Extrapolation Method:	Normal Projection	Orifice Default:	0.600
Bottom Width:	50.00 ft	Orifice Table:	
Left Slope:	0.000 (h:v)		
Right Slope:	0.000 (h:v)		

Comment:

Weir Link: WPP9_W3			
Scenario:	Existing Updated	Bottom Clip	
From Node:	WPP9	Default:	0.00 ft
To Node:	BP210	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Broad Crested Vertical	Op Table:	
Geometry Type:	Trapezoidal	Ref Node:	
Invert:	86.50 ft	Discharge Coefficients	
Control Elevation:	86.50 ft	Weir Default:	2.600
Max Depth:	9999.00 ft	Weir Table:	
Extrapolation Method:	Normal Projection	Orifice Default:	0.600
Bottom Width:	50.00 ft	Orifice Table:	
Left Slope:	0.000 (h:v)		
Right Slope:	0.000 (h:v)		

Comment:

Drop Structure Link: LC00084DS		Upstream Pipe		Downstream Pipe	
Scenario:	Existing Updated	Invert:	72.50 ft	Invert:	72.00 ft
From Node:	LC00084	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	LC00085	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	2.00 ft	Max Depth:	2.00 ft
Flow Direction:	Both	Bottom Clip			
Solution:	Combine	Default:	0.00 ft	Default:	0.00 ft
Increments:	0	Op Table:		Op Table:	
Pipe Count:	1	Ref Node:		Ref Node:	

Damping:	0.0000 ft	Manning's N:	0.0000	Manning's N:	0.0000
Length:	80.00 ft	Top Clip			
FHWA Code:	0	Default:	0.00 ft	Default:	0.00 ft
Entr Loss Coef:	0.50	Op Table:		Op Table:	
Exit Loss Coef:	1.00	Ref Node:		Ref Node:	
Bend Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Pipe Comment:

Weir Component

Weir:	1	Bottom Clip	
Weir Count:	1	Default:	0.00 ft
Weir Flow Direction:	Both	Op Table:	
Damping:	0.0000 ft	Ref Node:	
Weir Type:	Sharp Crested Vertical	Top Clip	
Geometry Type:	Circular	Default:	0.00 ft
Invert:	73.00 ft	Op Table:	
Control Elevation:	73.00 ft	Ref Node:	
Max Depth:	0.40 ft	Discharge Coefficients	
		Weir Default:	3.000
		Weir Table:	
		Orifice Default:	0.600
		Orifice Table:	

Weir Comment:

Weir Component

Weir:	2	Bottom Clip	
Weir Count:	1	Default:	0.00 ft
Weir Flow Direction:	Both	Op Table:	
Damping:	0.0000 ft	Ref Node:	
Weir Type:	Sharp Crested Vertical	Top Clip	
Geometry Type:	Rectangular	Default:	0.00 ft
Invert:	74.57 ft	Op Table:	
Control Elevation:	74.57 ft	Ref Node:	
Max Depth:	2.43 ft	Discharge Coefficients	
Max Width:	1.00 ft	Weir Default:	3.200
Fillet:	0.00 ft	Weir Table:	
		Orifice Default:	0.600
		Orifice Table:	

Weir Comment:

Weir Component

Weir:	3	Bottom Clip	
Weir Count:	1	Default:	0.00 ft
Weir Flow Direction:	Both	Op Table:	
Damping:	0.0000 ft	Ref Node:	
Weir Type:	Horizontal	Top Clip	
Geometry Type:	Rectangular	Default:	0.00 ft
Invert:	77.00 ft	Op Table:	
Control Elevation:	77.00 ft	Ref Node:	
Max Depth:	3.08 ft	Discharge Coefficients	
Max Width:	4.08 ft	Weir Default:	3.200
Fillet:	0.00 ft	Weir Table:	
		Orifice Default:	0.600
		Orifice Table:	

Weir Comment:

Drop Structure Comment: Pond 4 Outfall Structure from Forsyth Road Improvements, SJRWMD Permit #20839-3, Drainage Report dated March 2002, elevations converted to NAVD88 (-1 ft)

Drop Structure Link: WMCS-1		Upstream Pipe		Downstream Pipe	
Scenario:	Existing Updated	Invert:	83.50 ft	Invert:	81.00 ft
From Node:	WMPond-1	Manning's N:	0.0130	Manning's N:	0.0130
To Node:	LC00055	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	2.00 ft	Max Depth:	2.00 ft
Flow Direction:	Both	Bottom Clip			
Solution:	Combine	Default:	0.00 ft	Default:	0.00 ft
Increments:	0	Op Table:		Op Table:	
Pipe Count:	1	Ref Node:		Ref Node:	
Damping:	0.0000 ft	Manning's N:	0.0000	Manning's N:	0.0000
Length:	203.00 ft	Top Clip			
FHWA Code:	0	Default:	0.00 ft	Default:	0.00 ft
Entr Loss Coef:	0.00	Op Table:		Op Table:	
Exit Loss Coef:	1.00	Ref Node:		Ref Node:	
Bend Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Pipe Comment:

Weir Component		Bottom Clip	
Weir:	1	Default:	0.00 ft
Weir Count:	1	Op Table:	
Weir Flow Direction:	Both	Ref Node:	
Damping:	0.0000 ft	Top Clip	
Weir Type:	Sharp Crested Vertical	Default:	0.00 ft
Geometry Type:	Rectangular	Op Table:	
Invert:	84.65 ft	Ref Node:	
Control Elevation:	84.65 ft	Discharge Coefficients	
Max Depth:	3.78 ft	Weir Default:	3.200
Max Width:	0.58 ft	Weir Table:	
Fillet:	0.00 ft	Orifice Default:	0.600
		Orifice Table:	

Weir Comment:

Weir Component		Bottom Clip	
Weir:	2	Default:	0.00 ft
Weir Count:	1	Op Table:	
Weir Flow Direction:	Both	Ref Node:	
Damping:	0.0000 ft	Top Clip	
Weir Type:	Horizontal	Default:	0.00 ft
Geometry Type:	Circular	Op Table:	
Invert:	83.70 ft	Ref Node:	
Control Elevation:	83.70 ft	Discharge Coefficients	
Max Depth:	0.29 ft	Weir Default:	3.200
		Weir Table:	
		Orifice Default:	0.600

Orifice Table:

Weir Comment:

Weir Component		Bottom Clip	
Weir:	3	Default:	0.00 ft
Weir Count:	1	Op Table:	
Weir Flow Direction:	Both	Ref Node:	
Damping:	0.0000 ft	**Top Clip**	
Weir Type:	Horizontal	Default:	0.00 ft
Geometry Type:	Rectangular	Op Table:	
Invert:	88.43 ft	Ref Node:	
Control Elevation:	88.46 ft	**Discharge Coefficients**	
Max Depth:	4.08 ft	Weir Default:	3.200
Max Width:	3.08 ft	Weir Table:	
Fillet:	0.00 ft	Orifice Default:	0.600
		Orifice Table:	

Weir Comment:

Weir Component		Bottom Clip	
Weir:	4	Default:	0.00 ft
Weir Count:	2	Op Table:	
Weir Flow Direction:	Both	Ref Node:	
Damping:	0.0000 ft	**Top Clip**	
Weir Type:	Sharp Crested Vertical	Default:	0.00 ft
Geometry Type:	Rectangular	Op Table:	
Invert:	86.03 ft	Ref Node:	
Control Elevation:	86.03 ft	**Discharge Coefficients**	
Max Depth:	2.40 ft	Weir Default:	3.200
Max Width:	3.00 ft	Weir Table:	
Fillet:	0.00 ft	Orifice Default:	0.600
		Orifice Table:	

Weir Comment:

Drop Structure Comment:

Node Maximum Conditions

25 Year/24 Hour Storm

Winter Park Pines Study, Lake Corrine Outfall Canal - Existing Condition
Node Maximum Conditions - 25 Year/24 Hour Storm
9/17/2024
Node Max Conditions w/ Times [Existing Updated]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]	Time to Max Stage [hr]	Time to Min/Max Delta Stage [hr]	Time to Max Total Inflow [hr]	Time to Max Total Outflow [hr]
B-11	OC25y24	82.30	88.41	0.0406	45.96	52.26	1979	14.7906	0.0001	0.0000	7.9080
BALDWIN	OC25y24	95.00	92.40	-0.0150	1091.58	322.43	8999916	20.3990	0.0005	9.0667	0.0000
BP207	OC25y24	88.98	88.91	0.0002	147.50	148.91	39349	15.0194	0.4247	20.1008	20.0988
BP208	OC25y24	86.18	88.90	0.0007	148.91	149.42	12286	15.0247	0.5222	20.0988	20.0975
BP209	OC25y24	85.68	88.89	0.0006	133.56	134.19	34760	15.0238	0.5243	32.7332	32.7296
BP210	OC25y24	85.63	88.89	0.0003	145.74	146.81	12380	14.9852	15.0057	28.5190	14.9341
BP211	OC25y24	85.81	88.88	-0.0004	146.30	146.87	12615	15.0205	15.0057	28.5178	28.5171
BP212	OC25y24	86.62	88.88	0.0005	146.87	170.90	29725	14.9591	9.0414	28.5171	15.7786
BP213	OC25y24	86.59	88.88	0.0014	170.90	170.69	4407	14.9034	15.3329	15.7786	15.4052
BP214	OC25y24	85.50	88.87	0.0005	171.18	199.27	52961	14.9795	0.0001	15.4052	15.2319
BP215	OC25y24	85.80	88.87	0.0012	199.27	235.85	13266	14.9852	15.2580	15.2319	15.2320
BP216	OC25y24	86.43	88.87	-0.0012	235.85	216.35	13550	14.9554	15.2580	15.2320	14.0131
BP217	OC25y24	85.46	88.87	0.0010	350.77	379.09	15847	14.9454	13.1226	14.2309	15.1003
BP218	OC25y24	85.46	88.86	0.0010	379.09	208.70	11278	14.8921	11.1357	15.1003	15.7791
BP220	OC25y24	94.00	88.41	0.0021	276.15	275.53	8070	14.7302	0.0001	15.1355	15.3531
CS-BALD	OC25y24	89.00	91.47	0.0640	146.03	146.03	864	20.2343	0.0001	20.2579	20.2343
LC00030	OC25y24	91.30	88.91	0.0002	12.16	9.02	15946	14.9626	8.7460	9.0334	9.0870
LC00030A	OC25y24	86.00	88.91	0.0003	9.02	7.25	9875	14.9955	0.5178	9.0870	9.1266
LC00050	OC25y24	90.70	88.19	-0.0022	308.58	308.54	16575	14.6376	0.0001	14.4255	14.5487
LC00050A	OC25y24	90.70	88.13	-0.0004	308.54	308.50	16420	14.6478	0.0014	14.5487	14.5706
LC00050B	OC25y24	90.70	88.00	-0.0003	308.50	308.58	25115	14.7081	0.0001	14.5706	14.6146
LC00055	OC25y24	90.10	87.97	0.0002	388.25	388.04	74074	14.6650	8.7460	14.6178	14.7284
LC00060	OC25y24	89.50	87.61	0.0002	391.69	391.69	58172	14.6501	8.7460	14.5374	14.7564
LC00065	OC25y24	86.60	86.68	0.0002	453.19	445.79	1328497	14.5975	8.7476	13.6891	14.5975
LC00070	OC25y24	86.80	86.39	0.0002	411.34	411.30	34188	14.5592	8.7628	14.4664	14.4970
LC00070A	OC25y24	86.80	86.16	0.0228	358.67	358.68	343	14.5624	0.0001	20.3070	20.3121
LC00070B_N	OC25y24	86.80	83.17	-0.0224	179.25	179.25	271	14.7456	0.0005	12.1925	20.1777
LC00070B_S	OC25y24	86.80	83.14	-0.0210	179.46	179.46	271	14.7272	0.0001	20.4115	20.4096
LC00075	OC25y24	85.50	78.50	0.0027	411.43	411.36	9435	14.7911	0.0001	14.4931	14.5610
LC00080	OC25y24	83.00	77.95	-0.0003	411.55	411.37	20951	14.8551	0.5243	14.4996	14.5894
LC00084	OC25y24	78.00	77.62	0.0002	29.82	8.60	97348	15.1440	8.7476	9.0167	11.5504
LC00085	OC25y24	78.00	77.60	-0.0038	413.45	413.42	11676	14.8703	0.0001	14.8685	14.8726
LC00087A	OC25y24	78.24	66.50	0.0030	208.07	208.08	426	15.0537	8.9480	14.8726	14.9120
LC00087B	OC25y24	78.24	66.52	0.0029	205.35	205.36	448	15.0313	27.9565	14.8721	14.9042
LC00090	OC25y24	77.00	65.67	0.0008	415.64	415.85	15717	15.0832	8.8405	14.8744	14.9010
LC00095	OC25y24	73.50	65.63	0.0008	417.03	418.21	27911	15.0797	8.8405	14.9010	14.8998

Winter Park Pines Study, Lake Corrine Outfall Canal - Existing Condition
Node Maximum Conditions - 25 Year/24 Hour Storm
9/17/2024

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]	Time to Max Stage [hr]	Time to Min/Max Delta Stage [hr]	Time to Max Total Inflow [hr]	Time to Max Total Outflow [hr]
LC00100	OC25y24	70.47	65.61	0.0010	419.04	417.40	10138	15.0573	8.8273	14.8998	15.0925
LC00105	OC25y24	70.47	61.04	-0.0010	417.52	417.61	10549	10.2570	8.8291	15.0647	15.0732
LC00110	OC25y24	69.00	64.37	0.0001	319.48	318.07	69323	10.0503	8.9410	9.6738	9.7833
LC00115	OC25y24	68.47	60.24	-0.0004	688.71	688.57	20766	10.2126	8.8410	10.1896	10.2054
LC00117	OC25y24	68.50	67.14	0.0004	34.83	24.40	29185	10.0604	8.7460	9.0167	10.0600
LC00120	OC25y24	68.00	59.62	-0.0002	716.09	716.02	7585	10.2137	8.8413	10.1832	10.1898
LC00123	OC25y24	62.40	58.94	0.0024	716.02	715.87	9275	10.2469	8.0085	10.1898	10.1969
LC00125	OC25y24	59.10	58.63	-0.0006	723.44	721.95	78217	10.2648	26.2930	10.1585	10.2345
LC00130	OC25y24	57.75	57.17	0.0002	843.94	839.89	69839	10.3524	8.7118	10.1597	10.2188
WMPond-1	OC25y24	90.00	87.98	0.0002	23.01	4.76	104321	15.0396	8.7476	9.0000	26.5671
WPP1	OC25y24	86.70	89.35	0.0003	178.73	112.33	400549	12.4547	8.7476	9.8333	10.5789
WPP2	OC25y24	86.00	88.42	0.0002	19.85	6.06	92547	14.7960	8.7460	8.7032	0.0075
WPP3	OC25y24	86.00	88.41	-0.0021	38.24	45.96	304242	14.7934	0.0002	9.0499	0.0000
WPP4	OC25y24	81.60	88.87	0.0019	125.44	109.10	350097	14.9721	0.0001	10.4979	13.6259
WPP9	OC25y24	86.00	88.88	-0.0010	43.92	35.05	81768	14.9864	0.1928	9.1809	25.5139

100 Year/24 Hour Storm

Winter Park Pines Study, Lake Corrine Outfall Canal - Existing Condition
Node Maximum Conditions - 100 Year/24 Hour Storm
9/17/2024
Node Max Conditions w/ Times [Existing Updated]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]	Time to Max Stage [hr]	Time to Min/Max Delta Stage [hr]	Time to Max Total Inflow [hr]	Time to Max Total Outflow [hr]
B-11	OC100y24	82.30	89.01	0.0406	45.96	52.11	2093	14.5550	0.0001	0.0000	7.4918
BALDWIN	OC100y24	95.00	93.14	-0.0150	1473.60	322.43	9618945	21.0275	0.0005	9.0561	0.0000
BP207	OC100y24	88.98	89.58	0.0003	172.90	175.65	43352	16.4038	0.4160	22.7584	22.7401
BP208	OC100y24	86.18	89.57	0.0006	175.65	176.51	12487	16.3775	0.5217	22.7401	22.7413
BP209	OC100y24	85.68	89.56	0.0006	146.63	156.98	36109	16.3653	0.5265	22.7414	15.3855
BP210	OC100y24	85.63	89.56	-0.0006	161.53	190.46	12865	16.3651	15.0102	34.6562	15.0101
BP211	OC100y24	85.81	89.55	0.0009	181.97	191.92	12944	16.4032	15.0102	15.0101	15.3850
BP212	OC100y24	86.62	89.55	0.0005	192.63	162.86	32760	16.3658	8.6723	15.3850	34.6175
BP213	OC100y24	86.59	89.55	0.0012	162.86	179.00	1761305	16.3429	9.8395	34.6175	20.6855
BP214	OC100y24	85.50	89.54	0.0005	179.31	214.17	54314	16.3503	0.0001	20.6855	15.4733
BP215	OC100y24	85.80	89.54	0.0013	214.17	248.70	13467	16.3725	15.0735	15.4733	15.3826
BP216	OC100y24	86.43	89.54	-0.0012	248.70	247.76	13796	16.2848	15.0735	15.3826	17.2255
BP217	OC100y24	85.46	89.54	-0.0013	402.31	430.13	16258	16.1591	13.7605	15.7762	15.4699
BP218	OC100y24	85.46	89.53	-0.0010	430.13	257.34	11466	16.1838	15.7168	15.4699	19.9052
BP220	OC100y24	94.00	89.00	0.0021	319.70	319.67	8075	14.5020	0.0001	17.3360	17.2119
CS-BALD	OC100y24	89.00	91.88	0.0640	171.01	171.01	864	17.8772	0.0001	20.9997	21.0012
LC00030	OC100y24	91.30	89.58	0.0002	15.42	11.41	16681	16.3713	9.8117	9.0333	8.7450
LC00030A	OC100y24	86.00	89.58	0.0003	11.41	9.33	10295	16.3773	0.5172	8.7450	8.7394
LC00050	OC100y24	90.70	88.75	-0.0022	347.40	347.67	17405	14.2275	0.0001	15.3567	15.4033
LC00050A	OC100y24	90.70	88.70	-0.0004	347.67	347.97	17824	14.1966	0.0014	15.4033	15.4888
LC00050B	OC100y24	90.70	88.54	-0.0003	347.97	348.43	26800	14.1704	0.0001	15.4888	15.5103
LC00055	OC100y24	90.10	88.51	0.0002	485.04	485.21	77176	14.1543	8.2675	14.3647	14.4524
LC00060	OC100y24	89.50	88.10	0.0002	492.19	492.19	60509	14.0991	8.2675	14.0806	14.1241
LC00065	OC100y24	86.60	86.89	0.0002	580.10	577.58	1499905	13.5916	9.8117	13.1094	13.6790
LC00070	OC100y24	86.80	86.53	0.0002	472.30	472.25	38300	13.1852	9.8122	13.1665	13.1851
LC00070A	OC100y24	86.80	86.32	0.0228	358.80	358.81	343	13.1852	0.0001	25.4985	25.4982
LC00070B_N	OC100y24	86.80	83.47	-0.0224	179.33	179.33	271	13.1823	0.0005	25.2394	25.2415
LC00070B_S	OC100y24	86.80	83.45	-0.0210	179.52	179.53	271	13.1749	0.0001	25.5770	25.5761
LC00075	OC100y24	85.50	79.04	0.0027	472.71	472.69	9697	13.1808	0.0001	13.1291	13.1808
LC00080	OC100y24	83.00	78.51	0.0003	473.37	473.32	21531	13.2002	8.2670	13.1346	13.1978
LC00084	OC100y24	78.00	78.34	0.0002	37.07	12.50	98010	13.7303	8.2675	9.0166	10.4769
LC00085	OC100y24	78.00	78.16	-0.0038	480.51	480.50	11991	13.2291	0.0001	13.2289	13.2291
LC00087A	OC100y24	78.24	68.75	-0.0030	225.26	225.25	426	13.6489	33.7391	13.2290	13.5731
LC00087B	OC100y24	78.24	68.78	0.0029	222.75	222.74	448	13.6438	33.0218	13.2290	13.7368
LC00090	OC100y24	77.00	67.78	0.0009	488.78	487.36	17864	13.6577	8.3632	13.0953	13.6578
LC00095	OC100y24	73.50	67.75	0.0010	491.40	492.16	31217	13.6526	8.3632	13.1167	13.5842

Winter Park Pines Study, Lake Corrine Outfall Canal - Existing Condition
Node Maximum Conditions - 100 Year/24 Hour Storm
9/17/2024

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]	Time to Max Stage [hr]	Time to Min/Max Delta Stage [hr]	Time to Max Total Inflow [hr]	Time to Max Total Outflow [hr]
LC00100	OC100y24	70.47	67.73	0.0010	494.53	492.25	11289	13.6262	8.3632	13.5842	13.6401
LC00105	OC100y24	70.47	61.48	-0.0010	492.59	492.75	10967	10.1463	8.3472	13.6264	13.6351
LC00110	OC100y24	69.00	64.79	0.0002	397.63	394.60	77488	9.5452	8.7105	9.3167	9.4795
LC00115	OC100y24	68.47	60.80	-0.0003	795.15	795.10	21796	10.0884	8.3632	10.0640	10.1024
LC00117	OC100y24	68.50	67.72	0.0005	44.02	40.23	29185	9.1811	8.2670	9.0166	9.1810
LC00120	OC100y24	68.00	60.01	-0.0002	832.33	832.28	7881	10.0865	8.3632	9.8050	9.8250
LC00123	OC100y24	62.40	59.35	0.0025	832.28	832.16	9751	10.1280	31.0861	9.8250	9.8293
LC00125	OC100y24	59.10	59.04	-0.0006	843.69	842.35	88660	10.1575	31.0861	9.7643	9.8470
LC00130	OC100y24	57.75	57.79	0.0002	1011.50	1005.62	81987	11.4916	8.2640	9.6008	9.6683
WMPond-1	OC100y24	90.00	88.54	0.0002	30.22	4.62	108701	14.1295	9.8117	8.9999	31.2979
WPP1	OC100y24	86.70	90.22	0.0003	233.87	121.91	1137247	13.3149	9.5664	9.7500	10.4636
WPP2	OC100y24	86.00	89.02	0.0002	21.58	6.06	122021	14.5968	8.2670	8.2736	0.0075
WPP3	OC100y24	86.00	89.01	-0.0021	57.23	45.96	371767	14.5988	0.0002	10.5958	0.0000
WPP4	OC100y24	81.60	89.54	0.0019	139.47	138.11	385307	16.3508	0.0001	10.2117	13.8255
WPP9	OC100y24	86.00	89.55	-0.0010	49.12	41.62	88372	16.3662	0.1929	8.7317	30.7306

10 Year/24 Hour Storm

Winter Park Pines Study, Lake Corrine Outfall Canal - Existing Condition
Node Maximum Conditions - 10 Year/24 Hour Storm
9/17/2024
Node Max Conditions w/ Times [Existing Updated]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]	Time to Max Stage [hr]	Time to Min/Max Delta Stage [hr]	Time to Max Total Inflow [hr]	Time to Max Total Outflow [hr]
B-11	OC10y24	82.30	87.88	0.0406	45.96	52.15	1878	14.7004	0.0001	0.0000	8.1852
BALDWIN	OC10y24	95.00	91.98	-0.0150	893.14	322.43	8613516	20.2129	0.0005	10.0333	0.0000
BP207	OC10y24	88.98	88.28	0.0002	131.46	132.80	36124	14.7142	0.4245	20.0765	20.1287
BP208	OC10y24	86.18	88.27	0.0007	132.80	133.28	12076	14.7191	0.5174	20.1287	20.1274
BP209	OC10y24	85.68	88.26	0.0006	124.74	125.57	33529	14.6919	0.5195	28.0966	28.0771
BP210	OC10y24	85.63	88.26	0.0002	134.39	134.95	12190	14.6918	0.5195	24.5205	24.5198
BP211	OC10y24	85.81	88.25	-0.0003	134.95	135.53	12425	14.6902	14.7358	24.5198	24.5185
BP212	OC10y24	86.62	88.25	0.0004	135.56	144.00	26913	14.6901	9.5016	24.5185	15.2640
BP213	OC10y24	86.59	88.25	0.0013	144.00	145.76	4218	14.6885	14.6191	15.2640	15.4430
BP214	OC10y24	85.50	88.24	0.0005	146.18	162.16	51122	14.6941	0.0001	15.4430	14.7180
BP215	OC10y24	85.80	88.24	0.0010	162.16	186.94	13077	14.7237	14.3712	14.7180	14.7181
BP216	OC10y24	86.43	88.24	0.0010	186.94	185.35	13361	14.7182	14.7238	14.7181	14.7195
BP217	OC10y24	85.46	88.24	0.0010	297.91	326.01	15513	14.6941	12.6605	13.9651	13.9650
BP218	OC10y24	85.46	88.23	-0.0010	326.01	182.98	11278	14.6819	13.8043	13.9650	14.7273
BP220	OC10y24	94.00	87.87	0.0021	242.26	241.55	7956	14.6171	0.0001	14.4595	14.5284
CS-BALD	OC10y24	89.00	91.25	0.0640	130.12	130.13	864	20.1381	0.0001	20.1372	20.1381
LC00030	OC10y24	91.30	88.29	-0.0002	10.36	7.18	15033	14.6871	0.0001	9.0500	0.0000
LC00030A	OC10y24	86.00	88.29	0.0003	7.18	5.36	9483	14.7486	0.5174	0.0000	9.2045
LC00050	OC10y24	90.70	87.71	-0.0022	274.92	274.51	15831	14.6559	0.0001	13.4321	13.4648
LC00050A	OC10y24	90.70	87.64	-0.0004	274.51	274.11	15190	14.6887	0.0014	13.4648	13.4990
LC00050B	OC10y24	90.70	87.53	-0.0003	274.11	273.49	23639	14.7801	0.0001	13.4990	13.5358
LC00055	OC10y24	90.10	87.49	0.0002	329.41	328.73	71408	14.8193	8.6480	14.0864	14.3389
LC00060	OC10y24	89.50	87.16	0.0001	334.40	333.21	55889	15.0632	8.6486	14.0169	14.0755
LC00065	OC10y24	86.60	86.33	0.0002	396.54	357.58	1048943	15.5383	9.5547	11.6943	15.5010
LC00070	OC10y24	86.80	86.07	0.0002	359.09	359.03	31051	15.5611	9.5563	15.3506	15.5705
LC00070A	OC10y24	86.80	85.82	0.0228	358.28	358.28	343	15.5611	0.0001	15.6092	15.6046
LC00070B_N	OC10y24	86.80	82.72	-0.0224	179.07	179.07	271	15.5200	0.0005	15.6046	15.5996
LC00070B_S	OC10y24	86.80	82.69	-0.0210	179.21	179.21	271	15.5627	0.0001	15.5702	15.6070
LC00075	OC10y24	85.50	77.90	0.0027	359.10	359.11	9304	15.3653	0.0001	15.6070	15.6182
LC00080	OC10y24	83.00	77.26	-0.0003	359.21	359.24	20234	15.4218	0.5195	15.6387	15.6483
LC00084	OC10y24	78.00	77.08	0.0002	25.82	5.26	96399	13.7903	9.5547	9.0166	24.6812
LC00085	OC10y24	78.00	76.85	-0.0038	362.64	362.62	11318	15.3216	0.0001	15.2999	15.3249
LC00087A	OC10y24	78.24	65.14	0.0030	182.86	182.86	426	14.0992	9.3206	15.3239	15.3211
LC00087B	OC10y24	78.24	65.15	0.0029	179.76	179.77	448	14.1014	24.4084	15.3249	15.2797
LC00090	OC10y24	77.00	64.50	0.0006	365.46	365.59	14517	14.0972	9.2327	14.0501	14.0823
LC00095	OC10y24	73.50	64.44	0.0007	367.64	368.65	26059	14.0904	9.2324	14.0823	13.7889

Winter Park Pines Study, Lake Corrine Outfall Canal - Existing Condition
Node Maximum Conditions - 10 Year/24 Hour Storm
9/17/2024

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]	Time to Max Stage [hr]	Time to Min/Max Delta Stage [hr]	Time to Max Total Inflow [hr]	Time to Max Total Outflow [hr]
LC00100	OC10y24	70.47	64.41	0.0009	370.21	368.85	9493	14.0892	9.2230	13.7889	14.0879
LC00105	OC10y24	70.47	60.74	-0.0010	369.07	369.22	10268	10.4226	9.2264	13.2613	13.3025
LC00110	OC10y24	69.00	64.10	0.0001	272.49	271.36	63517	10.1621	8.6480	10.0243	10.1096
LC00115	OC10y24	68.47	59.87	-0.0003	613.70	613.53	20072	10.3059	9.2327	10.2843	10.3025
LC00117	OC10y24	68.50	66.58	0.0004	29.75	19.50	29185	10.1354	8.5016	9.0167	10.1352
LC00120	OC10y24	68.00	59.31	-0.0002	635.17	635.10	7361	10.3167	9.2420	10.2819	10.2899
LC00123	OC10y24	62.40	58.63	0.0024	635.10	634.95	8915	10.3386	8.2863	10.2899	10.2981
LC00125	OC10y24	59.10	58.32	-0.0006	640.40	639.46	70474	10.3561	23.0255	10.2743	10.3517
LC00130	OC10y24	57.75	56.75	0.0002	738.84	736.92	61266	10.3785	8.5016	10.2666	10.3154
WMPond-1	OC10y24	90.00	87.51	0.0001	19.60	4.84	100656	15.0756	9.5563	8.9999	22.8023
WPP1	OC10y24	86.70	88.64	0.0003	148.77	101.20	247827	12.1881	9.5547	9.9167	10.6654
WPP2	OC10y24	86.00	87.88	0.0002	18.19	6.06	78193	14.6474	8.6479	9.0111	0.0075
WPP3	OC10y24	86.00	87.88	-0.0021	32.56	45.96	244970	14.6496	0.0002	9.0500	0.0000
WPP4	OC10y24	81.60	88.24	0.0019	112.24	94.26	323767	14.6707	0.0001	10.5250	12.6639
WPP9	OC10y24	86.00	88.26	-0.0010	37.49	30.54	74637	14.6967	0.1927	9.5094	21.6189

Appendix B

Proposed Condition ICPR Data and Results

Input Data

Simple Basin: LC00030

Scenario:	ProposedFinal
Node:	LC00030
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	20.0000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH323
Peaking Factor:	323.0
Area:	7.6200 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	FLMOD

Comment: OFFSITE - SEMORAN CLUB DISCHARGE TO OFFSITE DITCH

Simple Basin: LC00040

Scenario:	ProposedFinal
Node:	BP212
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	15.0000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH323
Peaking Factor:	323.0
Area:	5.8800 ac
Curve Number:	74.6
% Impervious:	6.39
% DCIA:	6.39
% Direct:	0.00
Rainfall Name:	FLMOD

Comment: OFFSITE - DISCHARGE TO OFFSITE DITCH

Simple Basin: LC00045

Scenario:	ProposedFinal
Node:	BP220
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	309.0000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH323
Peaking Factor:	323.0
Area:	125.1100 ac
Curve Number:	72.3
% Impervious:	23.25

% DCIA:	23.25
% Direct:	0.00
Rainfall Name:	FLMOD

Comment: GREEN VIEW,GOLF COURSE,SEMORAN CLUB,CORRIE TERRACE

Simple Basin: LC00050

Scenario:	ProposedFinal
Node:	LC00050
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	162.5000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH323
Peaking Factor:	323.0
Area:	68.9000 ac
Curve Number:	75.0
% Impervious:	37.88
% DCIA:	37.88
% Direct:	0.00
Rainfall Name:	GORDECON

Comment:

Simple Basin: LC00055

Scenario:	ProposedFinal
Node:	LC00055
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	66.9000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH323
Peaking Factor:	323.0
Area:	55.0200 ac
Curve Number:	78.0
% Impervious:	37.53
% DCIA:	37.53
% Direct:	0.00
Rainfall Name:	GORDECON

Comment:

Simple Basin: LC00060

Scenario:	ProposedFinal
Node:	LC00060
Hydrograph Method:	NRCS Unit Hydrograph

Infiltration Method:	Curve Number
Time of Concentration:	17.4000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH323
Peaking Factor:	323.0
Area:	30.9300 ac
Curve Number:	75.8
% Impervious:	20.45
% DCIA:	20.45
% Direct:	0.00
Rainfall Name:	GORDECON

Comment:

Simple Basin: LC00065

Scenario:	ProposedFinal
Node:	LC00065
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	111.8000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH323
Peaking Factor:	323.0
Area:	135.7200 ac
Curve Number:	72.6
% Impervious:	23.87
% DCIA:	23.87
% Direct:	0.00
Rainfall Name:	GORDECON

Comment: Area reduced to account for Forsyth Road Improvements (widening), CN assumed unchanged

Simple Basin: LC00070

Scenario:	ProposedFinal
Node:	LC00070
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	15.0000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH323
Peaking Factor:	323.0
Area:	23.6400 ac
Curve Number:	72.1
% Impervious:	39.84
% DCIA:	39.84
% Direct:	0.00
Rainfall Name:	GORDECON

Comment: Area reduced to account for Forsyth Road Improvements (widening), CN assumed unchanged

Simple Basin: LC00075

Scenario:	ProposedFinal
Node:	LC00075
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	15.0000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH323
Peaking Factor:	323.0
Area:	1.0600 ac
Curve Number:	82.7
% Impervious:	22.29
% DCIA:	22.29
% Direct:	0.00
Rainfall Name:	GORDECON

Comment: Area reduced to account for Forsyth Road Improvements (widening), CN assumed unchanged

Simple Basin: LC00080

Scenario:	ProposedFinal
Node:	LC00080
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	15.0000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH323
Peaking Factor:	323.0
Area:	1.6100 ac
Curve Number:	80.7
% Impervious:	17.72
% DCIA:	17.72
% Direct:	0.00
Rainfall Name:	GORDECON

Comment: Area reduced to account for Forsyth Road Improvements (widening), CN assumed unchanged

Simple Basin: LC00084A

Scenario:	ProposedFinal
Node:	LC00084
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	43.0000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr

Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	7.3400 ac
Curve Number:	94.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	FImod

Comment: Forsyth Road draining to Pond north of Partridge Lane at Dorris Ave (Pond 4)
From SJRWMD Permit #20839-3, Drainage Report dated March 2002

Simple Basin: LC00084B

Scenario:	ProposedFinal
Node:	LC00084
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	10.0000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	8.7400 ac
Curve Number:	93.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	FImod

Comment: Heddron/Ground Control Property draining to Pond north of Partridge Lane at Dorris Ave (Pond4), from SJRWMD Permit #20839-3, Drainage Report dated March 2002

Simple Basin: LC00084C

Scenario:	ProposedFinal
Node:	LC00084
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	10.0000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	2.3900 ac
Curve Number:	90.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	FImod

Comment: Pond tract area draining to Pond north of Partridge Lane at Dorris Ave (Pond 4), from SJRWMD Permit #20839-3, Drainage Report dated March 2002

Simple Basin: LC00085

Scenario:	ProposedFinal
Node:	LC00085
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	15.0000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH323
Peaking Factor:	323.0
Area:	1.8100 ac
Curve Number:	82.5
% Impervious:	11.82
% DCIA:	11.82
% Direct:	0.00
Rainfall Name:	GORDECON

Comment: Area reduced to account for Forsyth Road Improvements (widening), CN assumed unchanged

Simple Basin: LC00090

Scenario:	ProposedFinal
Node:	LC00090
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	15.0000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH323
Peaking Factor:	323.0
Area:	19.9500 ac
Curve Number:	74.3
% Impervious:	21.36
% DCIA:	21.36
% Direct:	0.00
Rainfall Name:	GORDECON

Comment:

Simple Basin: LC00095

Scenario:	ProposedFinal
Node:	LC00095
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	15.0000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH323
Peaking Factor:	323.0
Area:	10.6000 ac
Curve Number:	73.4
% Impervious:	32.26

% DCIA:	32.26
% Direct:	0.00
Rainfall Name:	GORDECON

Comment:

Simple Basin: WMPost-1

Scenario:	ProposedFinal
Node:	WMPond-1
Hydrograph Method:	Santa Barbara Urban Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	12.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Area:	7.2000 ac
Curve Number:	96.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: WMPost-2

Scenario:	ProposedFinal
Node:	WMPond-1
Hydrograph Method:	Santa Barbara Urban Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	10.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Area:	5.5500 ac
Curve Number:	84.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: WPP1

Scenario:	ProposedFinal
Node:	WPP1
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	77.0000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr

Unit Hydrograph:	UH323
Peaking Factor:	323.0
Area:	161.6000 ac
Curve Number:	79.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	FLMOD

Comment: WINTER PINES GOLF COURSE

Simple Basin: WPP12

Scenario:	ProposedFinal
Node:	WPP3
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	16.0000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH323
Peaking Factor:	323.0
Area:	16.3000 ac
Curve Number:	94.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	FLMOD

Comment:

Simple Basin: WPP2

Scenario:	ProposedFinal
Node:	WPP2
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	63.0000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH323
Peaking Factor:	323.0
Area:	10.4000 ac
Curve Number:	82.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	FLMOD

Comment:

Simple Basin: WPP3

Scenario:	ProposedFinal
Node:	WPP3
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	69.0000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH323
Peaking Factor:	323.0
Area:	11.2000 ac
Curve Number:	74.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	FLMOD

Comment:

Simple Basin: WPP4

Scenario:	ProposedFinal
Node:	WPP4
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	67.0000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH323
Peaking Factor:	323.0
Area:	12.1000 ac
Curve Number:	76.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	FLMOD

Comment:

Simple Basin: WPP5

Scenario:	ProposedFinal
Node:	BP214
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	46.0000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH323
Peaking Factor:	323.0
Area:	1.7000 ac
Curve Number:	74.0
% Impervious:	0.00

% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	FLMOD

Comment:

Simple Basin: WPP6

Scenario:	ProposedFinal
Node:	BP212
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	44.0000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH323
Peaking Factor:	323.0
Area:	0.9000 ac
Curve Number:	74.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	FLMOD

Comment:

Simple Basin: WPP7

Scenario:	ProposedFinal
Node:	BP209
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	44.0000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH323
Peaking Factor:	323.0
Area:	0.9000 ac
Curve Number:	74.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	FLMOD

Comment:

Simple Basin: WPP8

Scenario:	ProposedFinal
Node:	BP207
Hydrograph Method:	NRCS Unit Hydrograph

Infiltration Method:	Curve Number
Time of Concentration:	44.0000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH323
Peaking Factor:	323.0
Area:	1.5000 ac
Curve Number:	74.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	FLMOD

Comment:

Simple Basin: WPP9

Scenario:	ProposedFinal
Node:	WPP9
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	58.0000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH323
Peaking Factor:	323.0
Area:	7.8000 ac
Curve Number:	83.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	FLMOD

Comment:

Node: B-11

Scenario:	ProposedFinal
Type:	Stage/Area
Base Flow:	0.00 cfs
Initial Stage:	79.53 ft
Warning Stage:	82.30 ft

Stage [ft]	Area [ac]	Area [ft2]
79.53	0.0010	44
82.50	0.0020	87

Comment: HEADWALL

Node: BP207

Winter Park Pines Study, Lake Corrine Outfall Canal - Proposed Final Condition
Input Data
9/17/2024

Scenario: ProposedFinal
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 83.00 ft
Warning Stage: 88.98 ft

Stage [ft]	Area [ac]	Area [ft2]
82.00	0.0030	131
82.60	0.0040	174
83.00	0.0040	174
83.20	0.0050	218
83.40	0.0060	261
84.40	0.0070	305
84.80	0.0080	348
85.00	0.4160	18121
85.20	0.4380	19079
85.40	0.4670	20343
85.60	0.4920	21432
85.80	0.5140	22390
86.00	0.6130	26702
86.20	0.6340	27617
86.40	0.6430	28009
86.60	0.6570	28619
86.80	0.6680	29098
87.00	0.7050	30710
87.20	0.7170	31233
87.40	0.7290	31755
87.60	0.7400	32234
87.80	0.7540	32844
88.00	0.7650	33323
88.20	0.7810	34020
88.40	0.7960	34674
88.60	0.8080	35196
88.80	0.8230	35850
89.00	0.8870	38638
89.20	0.9080	39552
89.40	0.9320	40598
89.60	0.9490	41338
89.80	0.9720	42340
90.00	1.0200	44431
90.20	1.0520	45825
90.40	1.0740	46783
90.60	1.1000	47916
90.80	1.1190	48744
91.00	1.2110	52751
91.20	1.2290	53535
91.40	1.2390	53971
91.60	1.2500	54450
91.80	1.2530	54581
92.00	1.2560	54711
92.20	1.2590	54842
92.40	1.2610	54929
92.60	1.2640	55060
92.80	1.2660	55147
93.00	1.2680	55234
93.20	1.2710	55365

Stage [ft]	Area [ac]	Area [ft2]
93.40	1.2740	55495
93.60	1.2760	55583
93.80	1.2790	55713
94.00	1.2810	55800
94.20	1.2820	55844
94.40	1.2820	55844
94.80	1.2820	55844

Comment: BP 436 CONN. RD STATION 207+00 (OLD LC00035/MHB-2)

Stage/Area updated by SAI 1/30/13

Node: BP208

Scenario: ProposedFinal
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 82.72 ft
Warning Stage: 86.18 ft

Stage [ft]	Area [ac]	Area [ft2]
82.72	0.1000	4356
86.18	0.2000	8712

Comment: BP 436 CONN. RD STATION 208+00

Node: BP209

Scenario: ProposedFinal
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 82.44 ft
Warning Stage: 85.68 ft

Stage [ft]	Area [ac]	Area [ft2]
82.44	0.0010	44
85.00	0.1250	5445
85.20	0.1560	6795
85.40	0.1930	8407
85.60	0.2340	10193
85.80	0.2790	12153
86.00	0.4290	18687
86.20	0.4650	20255
86.40	0.5070	22085
86.60	0.5440	23697
86.80	0.5820	25352
87.00	0.6210	27051
87.20	0.6340	27617
87.40	0.6490	28270
87.60	0.6610	28793
87.80	0.6700	29185
88.00	0.6830	29751

Stage [ft]	Area [ac]	Area [ft2]
88.20	0.6910	30100
88.40	0.6980	30405
88.60	0.7070	30797
88.80	0.7130	31058
89.00	0.7220	31450
89.20	0.7290	31755
89.40	0.7370	32104
89.60	0.7440	32409
89.80	0.7520	32757
90.00	0.7570	32975
90.20	0.7610	33149
90.40	0.7640	33280
90.60	0.7650	33323
90.80	0.7660	33367
91.00	0.7680	33454

Comment: BP 436 CONN. RD STATION 209+00 (OLD MHB-4)

Stage/Area updated by SAI 1/30/13

Node: BP210

Scenario: ProposedFinal
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 82.16 ft
Warning Stage: 85.63 ft

Stage [ft]	Area [ac]	Area [ft2]
82.16	0.1000	4356
85.63	0.2000	8712

Comment: BP 436 CONN. RD STATION 210+00

Node: BP211

Scenario: ProposedFinal
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 81.88 ft
Warning Stage: 85.81 ft

Stage [ft]	Area [ac]	Area [ft2]
81.88	0.1000	4356
85.81	0.2000	8712

Comment: BP 436 CONN. RD STATION 211+00

Node: BP212

Winter Park Pines Study, Lake Corrine Outfall Canal - Proposed Final Condition
Input Data
9/17/2024

Scenario: ProposedFinal
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 81.60 ft
Warning Stage: 86.62 ft

Stage [ft]	Area [ac]	Area [ft2]
81.60	0.0010	44
86.00	0.0550	2396
86.20	0.0650	2831
86.40	0.0850	3703
86.60	0.1112	4844
86.80	0.1360	5924
87.00	0.2560	11151
87.20	0.3000	13068
87.40	0.3540	15420
87.60	0.4000	17424
87.80	0.4410	19210
88.00	0.5050	21998
88.20	0.5200	22651
88.40	0.5375	23414
88.60	0.5580	24306
88.80	0.5750	25047
89.00	0.5990	26092
89.20	0.6170	26877
89.40	0.6340	27617
89.60	0.6541	28494
89.80	0.6731	29322
90.00	1.0954	47716
90.20	1.1280	49136
90.40	1.1680	50878
90.60	1.2040	52446
90.80	1.2433	54158
91.00	1.4631	63735
91.20	1.4912	64957
91.40	1.5260	66473
91.60	1.5590	67910
91.80	1.6084	70061
92.00	1.7101	74492
92.20	1.7260	75185
92.40	1.7430	75925
92.60	1.7612	76719
92.80	1.7750	77319
93.00	1.8393	80120
93.20	1.8540	80760
93.40	1.8700	81457
93.60	1.8880	82241
93.80	1.9090	83156
94.00	1.9530	85073
94.20	1.9740	85987
94.40	2.0030	87251
94.60	2.0260	88253
94.80	2.0500	89298
95.00	2.2060	96093
95.20	2.2260	96965
95.40	2.2500	98010

Stage [ft]	Area [ac]	Area [ft2]
95.60	2.2710	98925
95.80	2.2900	99752
96.00	2.3360	101756
96.20	2.3650	103019
96.40	2.3950	104326
96.60	2.4240	105589
96.80	2.4530	106853
97.00	2.4990	108856
97.20	2.5300	110207
97.40	2.5580	111426
97.60	2.5900	112820
97.80	2.6220	114214
98.00	2.9920	130332

Comment: BP 436 CONN. RD STATION 212+00 (OLD MHB-5)

Stage/Area updated by SAI 1/30/13

Node: BP213

Scenario: ProposedFinal
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 81.32 ft
Warning Stage: 86.59 ft

Stage [ft]	Area [ac]	Area [ft2]
89.00	10.6800	465221
90.00	64.8200	2823559
91.00	114.3900	4982828

Comment: BP 436 CONN. RD STATION 213+00 (OLD LCOOO40)

Node: BP214

Scenario: ProposedFinal
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 81.04 ft
Warning Stage: 85.50 ft

Stage [ft]	Area [ac]	Area [ft2]
82.00	0.0000	0
82.40	0.0000	0
83.20	0.0000	0
83.60	0.0000	0
84.60	0.0000	0
85.00	0.0670	2919
85.20	0.0960	4182
85.40	0.1360	5924
85.60	0.1830	7971
85.80	0.2310	10062

Stage [ft]	Area [ac]	Area [ft2]
86.00	0.5350	23305
86.20	0.5970	26005
86.40	0.6490	28270
86.60	0.7000	30492
86.80	0.7440	32409
87.00	0.8440	36765
87.20	0.8740	38071
87.40	0.9050	39422
87.60	0.9340	40685
87.80	0.9630	41948
88.00	1.0600	46174
88.20	1.0750	46827
88.40	1.0900	47480
88.60	1.1020	48003
88.80	1.1110	48395
89.00	1.1250	49005
89.20	1.1320	49310
89.40	1.1390	49615
89.60	1.1440	49833
89.80	1.1550	50312
90.00	1.2360	53840
90.20	1.2400	54014
90.40	1.2400	54014

Comment: BP 436 CONN. RD STATION 214+00 (OLD MHB-8)

Stage/Area updated by SAI 1/30/13

Node: BP215

Scenario: ProposedFinal
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 80.76 ft
Warning Stage: 85.80 ft

Stage [ft]	Area [ac]	Area [ft2]
80.76	0.1000	4356
85.80	0.2000	8712

Comment: BP 436 CONN. RD STATION 215+00

Node: BP216

Scenario: ProposedFinal
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 80.48 ft
Warning Stage: 86.43 ft

Stage [ft]	Area [ac]	Area [ft2]
80.48	0.1000	4356

Stage [ft]	Area [ac]	Area [ft2]
86.43	0.2000	8712

Comment: BP 436 CONN. RD STATION 216+00

Node: BP217

Scenario: ProposedFinal
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 80.20 ft
Warning Stage: 85.46 ft

Stage [ft]	Area [ac]	Area [ft2]
80.20	0.1000	4356
85.46	0.2000	8712

Comment: BP 436 CONN. RD STATION 217+00 (OLD MHB-10)

Node: BP218

Scenario: ProposedFinal
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 79.31 ft
Warning Stage: 85.46 ft

Stage [ft]	Area [ac]	Area [ft2]
79.31	0.1000	4356
85.46	0.2000	8712

Comment: BP 436 CONN. RD STATION 218+00

Node: BP220

Scenario: ProposedFinal
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 79.50 ft
Warning Stage: 94.00 ft

Stage [ft]	Area [ac]	Area [ft2]
79.50	0.1000	4356
94.00	0.2000	8712

Comment: BP 436 CONN. RD STATION 220+00 (OLD LC00045)

Node: LC00030

Scenario: ProposedFinal
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 84.75 ft
Warning Stage: 91.30 ft

Stage [ft]	Area [ac]	Area [ft2]
84.75	0.1000	4356
94.00	0.2000	8712

Comment: WARN=RD CRN

Node: LC00030A

Scenario: ProposedFinal
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 83.11 ft
Warning Stage: 86.00 ft

Stage [ft]	Area [ac]	Area [ft2]
83.11	0.0010	44
86.11	0.0020	87

Comment: PROPOSED HEADWALL STATION 207

Node: LC00050

Scenario: ProposedFinal
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 82.35 ft
Warning Stage: 90.70 ft

Comment: WARN=NTOB
DRMP survey (4/8/24) shows stain mark at 83.6'+/-

Node: LC00050A

Scenario: ProposedFinal
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 82.35 ft
Warning Stage: 90.70 ft

Comment: Upstream node of double cell box culvert under driveway entrance to WalMart Neighborhood Mkt off Auvers Blvd

Node: LC00050B

Scenario: ProposedFinal
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 82.35 ft
Warning Stage: 90.70 ft

Comment: Downstream node of double cell box culvert under driveway entrance to WalMart Neighborhood Mkt off Auvers Blvd

Node: LC00055

Scenario: ProposedFinal
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 82.31 ft
Warning Stage: 90.10 ft

Comment: WARN=S BOC

Node: LC00060

Scenario: ProposedFinal
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 82.27 ft
Warning Stage: 89.50 ft

Comment: WARN=APPROX ELEV OF BLDG TO THE SOUTH

Node: LC00065

Scenario: ProposedFinal
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 82.21 ft
Warning Stage: 86.60 ft

Stage [ft]	Area [ac]	Area [ft2]
82.00	1.2950	56410
83.00	1.6960	73878
84.00	2.2760	99143
85.00	4.2680	185914
86.00	16.5550	721136
87.00	34.8770	1519242
88.00	69.3300	3020015
89.00	96.2150	4191125
90.00	105.3050	4587086
91.00	108.9720	4746820

Stage [ft]	Area [ac]	Area [ft2]
92.00	118.7810	5174100
93.00	132.6710	5779149
94.00	135.8710	5918541
95.00	136.0780	5927558

Comment: WARN=STOB; STAGE AREA

Node: LC00070

Scenario: ProposedFinal
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 82.20 ft
Warning Stage: 86.80 ft

Comment: WARN=RD CRN

Node: LC00070A

Scenario: ProposedFinal
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 77.20 ft
Warning Stage: 86.80 ft

Stage [ft]	Area [ac]	Area [ft2]
77.20	0.0010	44
78.13	0.0060	261
81.88	0.0060	261

Comment: Structure stage area information obtained from OCPW field notes dated 2014
Bottom of structure slopes to pipes on east starting at 78.13 on west side to 77.2 on the east side. Area is based on length x width of structure.

Node: LC00070B_N

Scenario: ProposedFinal
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 77.20 ft
Warning Stage: 86.80 ft

Comment: N Manhole on W side of Forsyth, drop in invert

Node: LC00070B_S

Scenario: ProposedFinal
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 77.20 ft
Warning Stage: 86.80 ft

Comment: S Manhole on W side of Forsyth, drop in invert

Node: LC00075

Scenario: ProposedFinal
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 73.50 ft
Warning Stage: 85.50 ft

Comment: WARN=APPROX CURB ELEV TO SOUTH

Node: LC00080

Scenario: ProposedFinal
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 72.10 ft
Warning Stage: 83.00 ft

Comment: WARN~TOB PER TOPO

Node: LC00084

Scenario: ProposedFinal
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 73.00 ft
Warning Stage: 78.00 ft

Stage [ft]	Area [ac]	Area [ft2]
73.00	1.6100	70132
74.00	1.7300	75359
75.00	1.8600	81022
76.00	1.9800	86249
77.00	2.2100	96268
78.00	2.2500	98010

Comment: Pond 4 from Forsyth Road Improvements, SJRWMD Permit #20839-3, Drainage Report dated March 2002, elevations converted to NAVD88 (-1 ft)

Node: LC00085

Scenario: ProposedFinal
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 71.69 ft
Warning Stage: 78.00 ft

Comment: WARN=RD CRN

Node: LC00087A

Scenario: ProposedFinal
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 59.25 ft
Warning Stage: 78.24 ft

Comment: (converted from manhole to stage/area node)

WARN=N MH RIM ELEV

Node: LC00087B

Scenario: ProposedFinal
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 59.25 ft
Warning Stage: 78.24 ft

Comment: (converted from manhole to stage/area node)

WARN=N MH RIM ELEV

Node: LC00090

Scenario: ProposedFinal
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 57.24 ft
Warning Stage: 77.00 ft

Comment: WARN=TOB

Node: LC00095

Scenario: ProposedFinal
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 56.13 ft
Warning Stage: 73.50 ft

Comment: WARN=NTOB

Node: LC00100

Scenario: ProposedFinal
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 56.13 ft
Warning Stage: 70.47 ft

Comment:

Node: LC00105

Scenario: ProposedFinal
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 55.17 ft
Warning Stage: 70.47 ft

Comment: WARN=US RD CRN

Node: LC00110

Scenario: ProposedFinal
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 61.00 ft
Warning Stage: 69.00 ft

Stage [ft]	Area [ac]	Area [ft2]
55.00	0.0000	0
57.00	0.0010	44
60.00	0.3670	15987
61.00	0.4020	17511
62.00	0.4370	19036
63.00	0.4960	21606
64.00	0.5750	25047
65.00	0.8930	38899
66.00	1.0470	45607
67.00	1.3180	57412
68.00	2.4010	104588

Stage [ft]	Area [ac]	Area [ft2]
69.00	3.9220	170842
70.00	5.9380	258659
71.00	7.7290	336675
72.00	9.1160	397093
73.00	10.8970	474673
74.00	13.7100	597208
75.00	17.0260	741653
76.00	22.0150	958973
77.00	29.0950	1267378
78.00	33.4460	1456908
79.00	38.4620	1675405
80.00	41.3190	1799856
81.00	45.0100	1960636
82.00	49.5000	2156220
83.00	53.3960	2325930
84.00	59.5820	2595392
85.00	67.0290	2919783
86.00	72.5530	3160409
87.00	77.6240	3381301
88.00	79.4420	3460494
89.00	79.7770	3475086

Comment: WARN=TOP OF ZA;

Node: LC00115

Scenario: ProposedFinal
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 54.84 ft
Warning Stage: 68.47 ft

Comment: WARN=RD CRWN

Node: LC00117

Scenario: ProposedFinal
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 59.50 ft
Warning Stage: 68.50 ft

Stage [ft]	Area [ac]	Area [ft2]
59.50	0.6700	29185
68.50	0.6700	29185

Comment: WARN=TOB

Node: LC00120

Scenario:	ProposedFinal
Type:	Stage/Area
Base Flow:	0.00 cfs
Initial Stage:	54.83 ft
Warning Stage:	68.00 ft

Comment: WARN=FLOODING ON NORTH

Node: LC00123

Scenario:	ProposedFinal
Type:	Stage/Area
Base Flow:	0.00 cfs
Initial Stage:	54.40 ft
Warning Stage:	62.40 ft

Comment: WARN = HP IN XSEC

Node: LC00125

Scenario:	ProposedFinal
Type:	Stage/Area
Base Flow:	0.00 cfs
Initial Stage:	53.48 ft
Warning Stage:	59.10 ft

Comment: ZW=HP IN XSEC

Node: LC00130

Scenario:	ProposedFinal
Type:	Stage/Area
Base Flow:	0.00 cfs
Initial Stage:	53.46 ft
Warning Stage:	57.75 ft

Comment: WARN=TOP OF WEIR

Node: WMPond-1

Scenario:	ProposedFinal
Type:	Stage/Area
Base Flow:	0.00 cfs
Initial Stage:	83.70 ft

Winter Park Pines Study, Lake Corrine Outfall Canal - Proposed Final Condition
Input Data
9/17/2024

Warning Stage: 90.00 ft

Stage [ft]	Area [ac]	Area [ft2]
83.70	1.6660	72571
84.00	1.7150	74705
85.00	1.8800	81893
86.00	2.0490	89254
87.00	2.2210	96747
88.00	2.3980	104457
89.00	2.5790	112341
89.14	2.6030	113387
90.00	2.7610	120269

Comment: Wet Detention Pond for Walmart Neighborhood Market at Auvers and 436

Node: WPP1

Scenario: ProposedFinal
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 82.35 ft
Warning Stage: 86.70 ft

Stage [ft]	Area [ac]	Area [ft2]
82.05	0.0010	44
86.00	2.7500	119790
86.20	2.8130	122534
86.40	2.8980	126237
86.60	2.9650	129155
86.80	3.0320	132074
87.00	3.2910	143356
87.20	3.4330	149541
87.40	3.5740	155683
87.60	3.7250	162261
87.80	3.8630	168272
88.00	4.5520	198285
88.20	4.8930	213139
88.40	5.2640	229300
88.60	5.6220	244894
88.80	5.9970	261229
89.00	7.6570	333539
89.20	8.5350	371785
89.40	9.4190	410292
89.60	10.3040	448842
89.80	11.2030	488003
90.00	22.9260	998657
90.20	25.7830	1123107
90.40	28.6680	1248778
90.60	31.6230	1377498
90.80	34.5840	1506479
91.00	57.6150	2509709
91.20	60.2590	2624882
91.40	62.7560	2733651
91.60	65.1500	2837934

Winter Park Pines Study, Lake Corrine Outfall Canal - Proposed Final Condition
Input Data
9/17/2024

Stage [ft]	Area [ac]	Area [ft2]
91.80	67.4920	2939952
92.00	79.8610	3478745
92.20	81.4120	3546307
92.40	82.9580	3613650
92.60	84.4920	3680472
92.80	85.9710	3744897
93.00	94.1310	4100346
93.20	95.0070	4138505
93.40	95.8180	4173832
93.60	96.6360	4209464
93.80	97.3910	4242352
94.00	104.0410	4532026
94.20	105.5250	4596669
94.40	106.9110	4657043
94.60	108.2240	4714237
94.80	109.4310	4766814
95.00	117.0550	5098916
95.20	117.7260	5128145
95.40	118.4120	5158027
95.60	118.9700	5182333
95.80	119.5100	5205856
96.00	122.6250	5341545
96.20	123.2110	5367071
96.40	123.8450	5394688
96.60	124.5190	5424048
96.80	125.2250	5454801
97.00	128.8290	5611791
97.20	129.1300	5624903
97.40	129.3820	5635880
97.60	129.5870	5644810
97.80	129.7480	5651823
98.00	130.1820	5670728
98.20	130.2370	5673124
98.40	130.2900	5675432
98.60	130.3250	5676957
98.80	130.3590	5678438
99.00	130.3870	5679658
99.20	130.3970	5680093
99.40	130.4020	5680311
99.60	130.4100	5680660
99.80	130.4130	5680790
100.00	130.4200	5681095

Comment: WINTER PINES GOLF COURSE

Stage/Area updated by SAI 1/30/13

Node: WPP2

Scenario: ProposedFinal
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 82.35 ft

Warning Stage: 86.00 ft

Stage [ft]	Area [ac]	Area [ft2]
81.30	0.0010	44
86.00	1.3420	58458
86.20	1.3650	59459
86.40	1.3910	60592
86.60	1.4110	61463
86.80	1.4310	62334
87.00	1.4760	64295
87.20	1.5400	67082
87.40	1.5900	69260
87.60	1.6510	71918
87.80	1.7090	74444
88.00	1.9160	83461
88.20	2.0120	87643
88.40	2.1180	92260
88.60	2.2000	95832
88.80	2.2960	100014
89.00	2.7880	121445
89.20	2.9620	129025
89.40	3.1350	136561
89.60	3.3210	144663
89.80	3.5170	153201
90.00	7.5440	328617
90.20	7.9710	347217
90.40	8.3540	363900
90.60	8.7120	379495
90.80	9.0610	394697
91.00	9.8850	430591
91.20	9.9420	433074
91.40	9.9900	435164
91.60	10.0480	437691
91.80	10.0970	439825
92.00	10.3330	450105
92.20	10.3430	450541
92.40	10.3470	450715
92.60	10.3550	451064
92.80	10.3600	451282
93.00	10.4280	454244

Comment: WINTER PINES GOLF COURSE

Stage/Area updated by SAI 1/30/13

Node: WPP3

Scenario: ProposedFinal
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 82.35 ft
Warning Stage: 86.00 ft

Winter Park Pines Study, Lake Corrine Outfall Canal - Proposed Final Condition
Input Data
9/17/2024

Stage [ft]	Area [ac]	Area [ft2]
80.80	0.0010	44
84.00	0.0730	3180
84.20	0.1090	4748
84.40	0.1450	6316
84.60	0.1570	6839
84.80	0.2010	8756
85.00	0.4560	19863
85.20	0.5400	23522
85.40	0.6370	27748
85.60	0.7290	31755
85.80	0.8270	36024
86.00	1.1470	49963
86.20	1.3800	60113
86.40	1.6370	71308
86.60	1.8870	82198
86.80	2.1550	93872
87.00	3.1720	138172
87.20	3.6130	157382
87.40	4.0460	176244
87.60	4.4930	195715
87.80	4.9530	215753
88.00	6.5300	284447
88.20	6.7270	293028
88.40	6.9310	301914
88.60	7.1210	310191
88.80	7.3050	318206
89.00	8.4730	369084
89.20	8.7750	382239
89.40	9.0530	394349
89.60	9.3010	405152
89.80	9.5250	414909
90.00	10.7640	468880
90.20	10.9990	479116
90.40	11.2400	489614
90.60	11.4810	500112
90.80	11.7330	511089
91.00	14.4110	627743
91.20	14.8920	648696
91.40	15.3660	669343
91.60	15.8130	688814
91.80	16.2310	707022
92.00	18.0310	785430
92.20	18.2200	793663
92.40	18.4490	803638
92.60	18.7120	815095
92.80	19.0450	829600
93.00	27.4530	1195853
93.20	27.4550	1195940
93.40	27.4560	1195983
93.60	27.4570	1196027
93.80	27.4580	1196070
94.00	27.4580	1196070

Comment: WINTER PINES GOLF COURSE

Stage/Area updated by SAI 1/30/13

Node: WPP4

Scenario: ProposedFinal
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 81.40 ft
Warning Stage: 81.60 ft

Stage [ft]	Area [ac]	Area [ft2]
82.00	0.0310	1350
82.20	0.0320	1394
82.40	0.0330	1437
82.60	0.0340	1481
82.80	0.0360	1568
83.00	0.0500	2178
83.20	0.0590	2570
83.40	0.0680	2962
83.60	0.0740	3223
83.80	0.0830	3615
84.00	0.1020	4443
84.20	0.1130	4922
84.40	0.1400	6098
84.60	0.1680	7318
84.80	0.2120	9235
85.00	1.4830	64599
85.20	1.7900	77972
85.40	2.1200	92347
85.60	2.4610	107201
85.80	2.8160	122665
86.00	4.0640	177028
86.20	4.2740	186175
86.40	4.4870	195454
86.60	4.6890	204253
86.80	4.8830	212703
87.00	5.9290	258267
87.20	6.1300	267023
87.40	6.3140	275038
87.60	6.4860	282530
87.80	6.6600	290110
88.00	7.2370	315244
88.20	7.3630	320732
88.40	7.4890	326221
88.60	7.6220	332014
88.80	7.7600	338026
89.00	8.4310	367254
89.20	8.5700	373309
89.40	8.6990	378928
89.60	8.8340	384809
89.80	8.9640	390472
90.00	9.6740	421399
90.20	9.8770	430242
90.40	10.1130	440522

Winter Park Pines Study, Lake Corrine Outfall Canal - Proposed Final Condition
Input Data
9/17/2024

Stage [ft]	Area [ac]	Area [ft2]
90.60	10.3560	451107
90.80	10.5950	461518
91.00	11.5370	502552
91.20	11.5400	502682
91.40	11.5420	502770
91.60	11.5430	502813
91.80	11.5440	502857
92.00	11.5440	502857
92.20	11.5450	502900
92.40	11.5450	502900
93.00	11.5450	502900

Comment: WINTER PINES GOLF COURSE

Stage/Area updated by SAI 1/30/13

Node: WPP9

Scenario: ProposedFinal
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 82.35 ft
Warning Stage: 86.00 ft

Stage [ft]	Area [ac]	Area [ft2]
81.70	0.0010	44
84.00	0.7120	31015
84.20	0.7370	32104
84.40	0.7620	33193
84.60	0.7860	34238
84.80	0.8100	35284
85.00	0.8320	36242
85.20	0.8540	37200
85.40	0.8800	38333
85.60	0.8960	39030
85.80	0.9130	39770
86.00	1.1100	48352
86.20	1.1370	49528
86.40	1.1680	50878
86.60	1.1920	51924
86.80	1.2170	53013
87.00	1.3910	60592
87.20	1.4370	62596
87.40	1.4850	64687
87.60	1.5270	66516
87.80	1.5740	68563
88.00	1.6330	71133
88.20	1.6980	73965
88.40	1.7530	76361
88.60	1.8040	78582
88.80	1.8560	80847
89.00	1.9060	83025
89.20	1.9480	84855

Stage [ft]	Area [ac]	Area [ft2]
89.40	1.9940	86859
89.60	2.0390	88819
89.80	2.0780	90518
90.00	2.2830	99447
90.20	2.3730	103368
90.40	2.4560	106983
90.60	2.5320	110294
90.80	2.6060	113517
91.00	3.1470	137083
91.20	3.2550	141788
91.40	3.3540	146100
91.60	3.4540	150456
91.80	3.5430	154333
92.00	4.2250	184041
92.20	4.3370	188920
92.40	4.4390	193363
92.60	4.5450	197980
92.80	4.6430	202249
93.00	6.1910	269680
93.20	6.3700	277477
93.40	6.5300	284447
93.60	6.6720	290632
93.80	6.8040	296382
94.00	7.3130	318554
94.20	7.3180	318772
94.40	7.3230	318990
94.60	7.3270	319164
94.80	7.3300	319295
95.00	7.3710	321081

Comment: WINTER PINES GOLF COURSE

Stage/Area updated by SAI 1/30/13

Simulation: OC100y24

Scenario: ProposedFinal
Run Date/Time: 9/1/2024 2:20:41 PM
Program Version: ICPR4 4.07.08

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	96.0000

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

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000
0	0	0	6.0000	5.0000
0	0	0	15.0000	15.0000
0	0	0	24.0000	30.0000
0	0	0	36.0000	60.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000
0	0	0	36.0000	30.0000
0	0	0	72.0000	60.0000

Groundwater

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	360.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: ICPR3
Reference ET Folder:
Unit Hydrograph Folder: ICPR3

Lookup Tables

Boundary Stage Set: OC100-EXZ
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:
Roughness Set:
Crop Coef Set:
Fillable Porosity Set:
Conductivity Set:
Leakage Set:

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft
Max dZ: 1.0000 ft
Link Optimizer Tol: 0.0001 ft
Edge Length Option: Automatic
Dflt Damping (2D): 0.0050 ft
Min Node Srf Area 1 ft2

IA Recovery Time: 24.0000 hr
ET for Manual Basins: False
Smp/Man Basin Rain Opt: Global
OF Region Rain Opt: Global
Rainfall Name: ORANGE
Rainfall Amount: 10.60 in
Storm Duration: 24.0000 hr
Dflt Damping (1D): 0.0050 ft
Min Node Srf Area 113 ft2

Winter Park Pines Study, Lake Corrine Outfall Canal - Proposed Final Condition
Input Data
9/17/2024

(2D):
Energy Switch (2D): Energy

(1D):
Energy Switch (1D): Energy

Comment: Little Econlockhatchee River Basin - Econ-Baldwin
100YR-24HR EXISTING COND STORM (ORANGE)
Nov 2023 Conversion to NAVD88
**Elevations are referenced to NAVD88

Little Econlockhatchee River Basin - Supplemental Model Revisions
100YR-24HR EXISTING COND STORM (ORANGE)
Nov 2023 Conversion to NAVD88

Simulation: OC10y24

Scenario: ProposedFinal
Run Date/Time: 9/1/2024 4:40:14 PM
Program Version: ICPR4 4.07.08

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	96.0000

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

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000
0	0	0	6.0000	5.0000
0	0	0	15.0000	15.0000
0	0	0	24.0000	30.0000
0	0	0	36.0000	60.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000
0	0	0	36.0000	30.0000
0	0	0	72.0000	60.0000

Groundwater

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	360.0000

Restart File

Save Restart:	False

Resources & Lookup Tables

Resources

Rainfall Folder:	ICPR3
Reference ET Folder:	
Unit Hydrograph Folder:	ICPR3

Lookup Tables

Boundary Stage Set:	OC10-EXZ
Extern Hydrograph Set:	
Curve Number Set:	
Green-Ampt Set:	
Vertical Layers Set:	
Impervious Set:	
Roughness Set:	
Crop Coef Set:	
Fillable Porosity Set:	
Conductivity Set:	
Leakage Set:	

Tolerances & Options

Time Marching:	SAOR	IA Recovery Time:	24.0000 hr
Max Iterations:	6	ET for Manual Basins:	False
Over-Relax Weight Fact:	0.5 dec		
dZ Tolerance:	0.0010 ft	Smp/Man Basin Rain Opt:	Global
Max dZ:	1.0000 ft	OF Region Rain Opt:	Global
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	ORANGE
		Rainfall Amount:	7.50 in
Edge Length Option:	Automatic	Storm Duration:	24.0000 hr
Dflt Damping (2D):	0.0050 ft	Dflt Damping (1D):	0.0050 ft
Min Node Srf Area (2D):	1 ft2	Min Node Srf Area (1D):	113 ft2
Energy Switch (2D):	Energy	Energy Switch (1D):	Energy

Comment: Little Econlockhatchee River Basin - Econ-Baldwin
10YR-24HR EXISTING COND STORM (ORANGE)
Nov 2023 Conversion to NAVD88
**Elevations are referenced to NAVD88

Little Econlockhatchee River Basin - Supplemental Model Revisions
10YR-24HR EXISTING COND STORM (ORANGE)
Nov 2023 Conversion to NAVD88

Simulation: OC25y24

Scenario:	ProposedFinal
Run Date/Time:	9/1/2024 6:25:45 PM
Program Version:	ICPR4 4.07.08

General

Run Mode:	Normal

Winter Park Pines Study, Lake Corrine Outfall Canal - Proposed Final Condition
Input Data
9/17/2024

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	96.0000

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

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000
0	0	0	6.0000	5.0000
0	0	0	15.0000	15.0000
0	0	0	24.0000	30.0000
0	0	0	36.0000	60.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000
0	0	0	36.0000	30.0000
0	0	0	72.0000	60.0000

Groundwater

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	360.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: ICPR3
Reference ET Folder:
Unit Hydrograph Folder: ICPR3

Lookup Tables

Boundary Stage Set: OC25-EXZ
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:
Roughness Set:
Crop Coef Set:
Fillable Porosity Set:
Conductivity Set:
Leakage Set:

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
IA Recovery Time: 24.0000 hr
ET for Manual Basins: False

Over-Relax Weight Fact:	0.5 dec		
dZ Tolerance:	0.0010 ft	Smp/Man Basin Rain Opt:	Global
Max dZ:	1.0000 ft	OF Region Rain Opt:	Global
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	ORANGE
		Rainfall Amount:	8.60 in
Edge Length Option:	Automatic	Storm Duration:	24.0000 hr
Dflt Damping (2D):	0.0050 ft	Dflt Damping (1D):	0.0050 ft
Min Node Srf Area (2D):	1 ft2	Min Node Srf Area (1D):	113 ft2
Energy Switch (2D):	Energy	Energy Switch (1D):	Energy

Comment: Little Econlockhatchee River Basin - Econ-Baldwin
25YR-24HR EXISTING COND STORM (ORANGE)
Nov 2023 Conversion to NAVD88
**Elevations are referenced to NAVD88

Little Econlockhatchee River Basin - Supplemental Model Revisions
25YR-24HR EXISTING COND STORM (ORANGE)
Nov 2023 Conversion to NAVD88

Channel Cross Section: 207

Scenario: ProposedFinal
Lid: No
Conveyance Method: ICPRv3

Bottom Point Table

Order	Station [ft]	Elevation [ft]	Manning's N
0	-102.08	88.98	0.0350
1	-84.14	83.00	0.0350
2	-78.14	83.00	0.0350
3	-45.00	94.05	0.0350
4	-30.00	95.55	0.0350

Comment: Station 207 Cross-Section - Proposed

Channel Cross Section: 208

Scenario: ProposedFinal
Lid: No
Conveyance Method: ICPRv3

Bottom Point Table

Order	Station [ft]	Elevation [ft]	Manning's N
0	-88.13	86.18	0.0350
1	-77.78	82.72	0.0350
2	-71.78	82.72	0.0350
3	-43.69	92.08	0.0350
4	-28.69	93.58	0.0350

Comment: Station 208 Cross-Section - Proposed

Channel Cross Section: 209

Scenario: ProposedFinal
Lid: No
Conveyance Method: ICPRv3

Bottom Point Table

Order	Station [ft]	Elevation [ft]	Manning's N
0	-73.90	85.68	0.0350
1	-64.19	82.44	0.0350
2	-58.19	82.44	0.0350
3	-35.13	90.13	0.0350
4	-20.13	91.63	0.0350

Comment: Station 209 Cross-Section - Proposed

Channel Cross Section: 210

Scenario: ProposedFinal
Lid: No
Conveyance Method: ICPRv3

Bottom Point Table

Order	Station [ft]	Elevation [ft]	Manning's N
0	-66.67	85.63	0.0350
1	-56.26	82.16	0.0350
2	-50.26	82.16	0.0350
3	-29.70	89.01	0.0350
4	-14.70	90.51	0.0350

Comment: Station 210 Cross-Section - Proposed

Channel Cross Section: 211

Scenario: ProposedFinal
Lid: No
Conveyance Method: ICPRv3

Bottom Point Table

Order	Station [ft]	Elevation [ft]	Manning's N
0	-68.41	85.81	0.0350
1	-56.62	81.88	0.0350
2	-50.62	81.88	0.0350
3	-28.00	89.42	0.0350
4	-13.00	90.92	0.0350

Comment: Station 211 Cross-Section - Proposed

Channel Cross Section: 212

Scenario: ProposedFinal
Lid: No
Conveyance Method: ICPRv3

Bottom Point Table

Order	Station [ft]	Elevation [ft]	Manning's N
0	-73.71	86.62	0.0350
1	-58.66	81.60	0.0350
2	-52.66	81.60	0.0350
3	-28.00	89.82	0.0350
4	-13.00	91.32	0.0350

Comment: Station 212 Cross-Section - Proposed

Channel Cross Section: 213

Scenario: ProposedFinal
Lid: No
Conveyance Method: ICPRv3

Bottom Point Table

Order	Station [ft]	Elevation [ft]	Manning's N
0	-76.51	86.59	0.0350
1	-60.70	81.32	0.0350
2	-54.70	81.32	0.0350
3	-28.00	90.22	0.0350
4	-13.00	91.72	0.0350

Comment: Station 213 Cross-Section - Proposed

Channel Cross Section: 214

Scenario: ProposedFinal
Lid: No
Conveyance Method: ICPRv3

Bottom Point Table

Order	Station [ft]	Elevation [ft]	Manning's N
0	-74.43	85.50	0.0350
1	-61.06	81.04	0.0350
2	-55.06	81.04	0.0350
3	-28.00	90.06	0.0350
4	-13.00	91.56	0.0350

Comment: Station 214 Cross-Section - Proposed

Channel Cross Section: 215

Scenario: ProposedFinal
Lid: No

Conveyance Method: ICPRv3

Bottom Point Table

Order	Station [ft]	Elevation [ft]	Manning's N
0	-76.10	85.81	0.0350
1	-61.00	80.76	0.0350
2	-55.00	80.76	0.0350
3	-28.00	89.76	0.0350
4	-13.00	91.26	0.0350

Comment: Station 215 Cross-Section - Proposed

Channel Cross Section: 216

Scenario: ProposedFinal
Lid: No
Conveyance Method: ICPRv3

Bottom Point Table

Order	Station [ft]	Elevation [ft]	Manning's N
0	-78.77	86.43	0.0350
1	-60.94	80.48	0.0350
2	-54.94	80.48	0.0350
3	-28.00	89.46	0.0350
4	-13.00	90.96	0.0350

Comment: Station 216 Cross-Section - Proposed

Channel Cross Section: 217

Scenario: ProposedFinal
Lid: No
Conveyance Method: ICPRv3

Bottom Point Table

Order	Station [ft]	Elevation [ft]	Manning's N
0	-78.44	85.46	0.0350
1	-62.68	80.20	0.0350
2	-56.68	80.20	0.0350
3	-28.00	89.76	0.0350
4	-13.00	91.26	0.0350

Comment: Station 217 Cross-Section - Proposed

Channel Cross Section: C4-1X

Scenario: ProposedFinal
Lid: No
Conveyance Method: ICPRv3

Bottom Point Table

Order	Station [ft]	Elevation [ft]	Manning's N
0	-255.00	87.46	0.0450
1	-244.00	81.70	0.0450
2	-240.00	71.20	0.0450
3	-234.00	69.80	0.0450
4	-226.00	68.40	0.0450
5	-220.00	67.90	0.0450
6	-213.00	76.30	0.0450
7	-208.00	80.10	0.0450
8	-200.00	86.10	0.0450

Comment: pg 2124001-49

Channel Cross Section: C4-1XM

Scenario: ProposedFinal
Lid: No
Conveyance Method: ICPRv3

Bottom Point Table

Order	Station [ft]	Elevation [ft]	Manning's N
0	-255.00	87.46	0.0450
1	-244.00	81.70	0.0450
2	-240.88	73.50	0.0450
3	-215.33	73.50	0.0450
4	-213.00	76.30	0.0450
5	-208.00	80.10	0.0450
6	-200.00	86.10	0.0450

Comment: pg 2124001-49 (PLUNGE POOL REMOVED)

Channel Cross Section: C4-2X

Scenario: ProposedFinal
Lid: No
Conveyance Method: ICPRv3

Bottom Point Table

Order	Station [ft]	Elevation [ft]	Manning's N
0	-327.00	87.66	0.0450
1	-322.00	87.65	0.0450
2	-312.00	87.31	0.0450
3	-301.00	87.18	0.0450
4	-290.00	86.86	0.0450
5	-270.00	87.00	0.0450
6	-251.00	87.60	0.0450
7	-250.00	86.34	0.0450
8	-244.00	83.80	0.0450
9	-238.00	78.60	0.0450
10	-225.00	78.00	0.0450
11	-216.00	78.50	0.0450
12	-213.00	81.40	0.0450
13	-207.00	83.20	0.0450

Order	Station [ft]	Elevation [ft]	Manning's N
14	-200.00	86.40	0.0450

Comment: PG 2124001-48

Channel Cross Section: C4-3X

Scenario: ProposedFinal
Lid: No
Conveyance Method: ICPRv3

Bottom Point Table

Order	Station [ft]	Elevation [ft]	Manning's N
0	200.00	88.90	0.0450
1	209.00	84.20	0.0450
2	213.00	80.50	0.0450
3	219.00	78.00	0.0450
4	222.00	76.70	0.0450
5	234.00	79.30	0.0450
6	238.00	80.10	0.0450
7	244.00	80.90	0.0450
8	254.00	86.60	0.0450

Comment: 2124001-47

Channel Cross Section: C4-4X

Scenario: ProposedFinal
Lid: No
Conveyance Method: ICPRv3

Bottom Point Table

Order	Station [ft]	Elevation [ft]	Manning's N
0	200.00	94.00	0.0450
1	208.00	88.80	0.0450
2	214.00	82.50	0.0450
3	216.00	79.70	0.0450
4	222.00	78.60	0.0450
5	226.00	78.90	0.0450
6	229.00	82.00	0.0450
7	236.00	84.30	0.0450
8	247.00	89.10	0.0450
9	258.00	89.70	0.0450
10	297.00	90.60	0.0450
11	347.00	90.80	0.0450

Comment: pg 2124001-46

Channel Cross Section: C4-5X

Scenario: ProposedFinal

Lid: No
Conveyance Method: ICPRv3

Bottom Point Table

Order	Station [ft]	Elevation [ft]	Manning's N
0	200.00	90.90	0.0450
1	207.00	86.40	0.0450
2	213.00	80.80	0.0450
3	225.00	80.60	0.0450
4	233.00	79.90	0.0450
5	236.00	80.10	0.0450
6	240.00	82.00	0.0450
7	246.00	84.40	0.0450
8	287.00	85.50	0.0450
9	309.00	89.90	0.0450
10	330.00	90.10	0.0450

Comment: PG 2124001-45

Channel Cross Section: C4-6X

Scenario: ProposedFinal
Lid: No
Conveyance Method: ICPRv3

Bottom Point Table

Order	Station [ft]	Elevation [ft]	Manning's N
0	-338.00	90.70	0.0450
1	-288.00	90.50	0.0450
2	-248.00	90.50	0.0450
3	-238.00	88.80	0.0450
4	-222.00	82.40	0.0450
5	-217.00	80.50	0.0450
6	-211.00	80.10	0.0450
7	-204.00	80.50	0.0450
8	-202.00	82.20	0.0450
9	-193.00	83.50	0.0450
10	-175.00	86.40	0.0450
11	-130.00	90.90	0.0450
12	-125.50	91.15	0.0450

Comment: PG 2124001-44

Channel Cross Section: C4-NEW

Scenario: ProposedFinal
Lid: No
Conveyance Method: ICPRv3

Bottom Point Table

Order	Station [ft]	Elevation [ft]	Manning's N
0	0.00	88.00	0.0450
1	20.00	78.00	0.0450

Order	Station [ft]	Elevation [ft]	Manning's N
2	50.00	78.00	0.0450
3	70.00	88.00	0.0450

Comment:

Weir Cross Section: LC00065W-W

Scenario: ProposedFinal
Lid: No

Bottom Point Table

Order	Station [ft]	Elevation [ft]
0	0.00	89.10
1	23.00	89.00
2	398.00	88.00
3	425.00	87.00
4	489.00	86.00
5	577.00	85.30
6	754.00	86.00
7	910.00	86.00
8	1084.00	86.00
9	1176.00	87.00
10	1306.00	88.00
11	1452.00	89.00
12	1487.00	90.00
13	1511.00	90.20

Comment: CROSS SECTION TAKEN FROM CONTOURS (NAVD88)

Channel Link: 207

Scenario: ProposedFinal
From Node: BP207
To Node: BP208
Link Count: 1
Flow Direction: Both
Damping: 0.0000 ft
Length: 100.00 ft
Contraction Coef: 0.10
Expansion Coef: 0.30
Entr Loss Coef: 0.00
Exit Loss Coef: 0.00
Bend Loss Coef: 0.00
Bend Location: 0.00 dec
Energy Switch: Energy

Upstream		Downstream	
Invert:	83.00 ft	Invert:	82.72 ft
Manning's N:	0.0000	Manning's N:	0.0000
Geometry:	Irregular	Geometry:	Irregular
Cross Section:	207	Cross Section:	208

Comment: LAKE CORRINE OUTFALL CANAL

Channel Link: 208

Scenario: ProposedFinal

Upstream		Downstream	
Invert:	82.72 ft	Invert:	82.44 ft

		Upstream		Downstream	
From Node:	BP208	Manning's N:	0.0000	Manning's N:	0.0000
To Node:	BP209	Geometry:	Irregular	Geometry:	Irregular
Link Count:	1	Cross Section:	208	Cross Section:	209
Flow Direction:	Both				
Damping:	0.0000 ft				
Length:	100.00 ft				
Contraction Coef:	0.10				
Expansion Coef:	0.30				
Entr Loss Coef:	0.00				
Exit Loss Coef:	0.00				
Bend Loss Coef:	0.00				
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Comment: LAKE CORRINE OUTFALL CANAL

Channel Link: 209		Upstream		Downstream	
Scenario:	ProposedFinal	Invert:	82.44 ft	Invert:	82.16 ft
From Node:	BP209	Manning's N:	0.0000	Manning's N:	0.0000
To Node:	BP210	Geometry:	Irregular	Geometry:	Irregular
Link Count:	1	Cross Section:	209	Cross Section:	210
Flow Direction:	Both				
Damping:	0.0000 ft				
Length:	100.00 ft				
Contraction Coef:	0.10				
Expansion Coef:	0.30				
Entr Loss Coef:	0.00				
Exit Loss Coef:	0.00				
Bend Loss Coef:	0.00				
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Comment: LAKE CORRINE OUTFALL CANAL

Channel Link: 210		Upstream		Downstream	
Scenario:	ProposedFinal	Invert:	82.16 ft	Invert:	81.88 ft
From Node:	BP210	Manning's N:	0.0000	Manning's N:	0.0000
To Node:	BP211	Geometry:	Irregular	Geometry:	Irregular
Link Count:	1	Cross Section:	210	Cross Section:	211
Flow Direction:	Both				
Damping:	0.0000 ft				
Length:	100.00 ft				
Contraction Coef:	0.10				
Expansion Coef:	0.30				
Entr Loss Coef:	0.00				
Exit Loss Coef:	0.00				
Bend Loss Coef:	0.00				
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Comment: LAKE CORRINE OUTFALL CANAL

Channel Link: 211		Upstream		Downstream	
Scenario:	ProposedFinal	Invert:	81.88 ft	Invert:	81.60 ft
From Node:	BP211	Manning's N:	0.0000	Manning's N:	0.0000
To Node:	BP212	Geometry:	Irregular	Geometry:	Irregular
Link Count:	1	Cross Section:	211	Cross Section:	212
Flow Direction:	Both				
Damping:	0.0000 ft				
Length:	100.00 ft				
Contraction Coef:	0.10				
Expansion Coef:	0.30				
Entr Loss Coef:	0.00				
Exit Loss Coef:	0.00				
Bend Loss Coef:	0.00				
Bend Location:	0.00 dec				
Energy Switch:	Energy				
Comment:	LAKE CORRINE OUTFALL CANAL				

Channel Link: 212		Upstream		Downstream	
Scenario:	ProposedFinal	Invert:	81.60 ft	Invert:	81.32 ft
From Node:	BP212	Manning's N:	0.0000	Manning's N:	0.0000
To Node:	BP213	Geometry:	Irregular	Geometry:	Irregular
Link Count:	1	Cross Section:	212	Cross Section:	213
Flow Direction:	Both				
Damping:	0.0000 ft				
Length:	100.00 ft				
Contraction Coef:	0.10				
Expansion Coef:	0.30				
Entr Loss Coef:	0.00				
Exit Loss Coef:	0.00				
Bend Loss Coef:	0.00				
Bend Location:	0.00 dec				
Energy Switch:	Energy				
Comment:	LAKE CORRINE OUTFALL CANAL				

Channel Link: 213		Upstream		Downstream	
Scenario:	ProposedFinal	Invert:	81.32 ft	Invert:	81.04 ft
From Node:	BP213	Manning's N:	0.0000	Manning's N:	0.0000
To Node:	BP214	Geometry:	Irregular	Geometry:	Irregular
Link Count:	1	Cross Section:	213	Cross Section:	214
Flow Direction:	Both				
Damping:	0.0000 ft				
Length:	100.00 ft				
Contraction Coef:	0.10				
Expansion Coef:	0.30				
Entr Loss Coef:	0.00				
Exit Loss Coef:	0.00				
Bend Loss Coef:	0.00				
Bend Location:	0.00 dec				
Energy Switch:	Energy				
Comment:	LAKE CORRINE OUTFALL CANAL				

Channel Link: 214		Upstream		Downstream	
Scenario:	ProposedFinal	Invert:	81.04 ft	Invert:	80.76 ft
From Node:	BP214	Manning's N:	0.0000	Manning's N:	0.0000
To Node:	BP215	Geometry:	Irregular	Geometry:	Irregular
Link Count:	1	Cross Section:	214	Cross Section:	215
Flow Direction:	Both				
Damping:	0.0000 ft				
Length:	100.00 ft				
Contraction Coef:	0.10				
Expansion Coef:	0.30				
Entr Loss Coef:	0.00				
Exit Loss Coef:	0.00				
Bend Loss Coef:	0.00				
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Comment: LAKE CORRINE OUTFALL CANAL

Channel Link: 215		Upstream		Downstream	
Scenario:	ProposedFinal	Invert:	80.76 ft	Invert:	80.48 ft
From Node:	BP215	Manning's N:	0.0000	Manning's N:	0.0000
To Node:	BP216	Geometry:	Irregular	Geometry:	Irregular
Link Count:	1	Cross Section:	215	Cross Section:	216
Flow Direction:	Both				
Damping:	0.0000 ft				
Length:	100.00 ft				
Contraction Coef:	0.10				
Expansion Coef:	0.30				
Entr Loss Coef:	0.00				
Exit Loss Coef:	0.00				
Bend Loss Coef:	0.00				
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Comment: LAKE CORRINE OUTFALL CANAL

Channel Link: 216		Upstream		Downstream	
Scenario:	ProposedFinal	Invert:	80.48 ft	Invert:	80.20 ft
From Node:	BP216	Manning's N:	0.0000	Manning's N:	0.0000
To Node:	BP217	Geometry:	Irregular	Geometry:	Irregular
Link Count:	1	Cross Section:	216	Cross Section:	217
Flow Direction:	Both				
Damping:	0.0000 ft				
Length:	100.00 ft				
Contraction Coef:	0.10				
Expansion Coef:	0.30				
Entr Loss Coef:	0.00				
Exit Loss Coef:	0.00				
Bend Loss Coef:	0.00				
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Comment: LAKE CORRINE OUTFALL CANAL

Channel Link: 217		Upstream		Downstream	
Scenario:	ProposedFinal	Invert:	80.20 ft	Invert:	79.31 ft
From Node:	BP217	Manning's N:	0.0000	Manning's N:	0.0000
To Node:	BP218	Geometry:	Irregular	Geometry:	Irregular
Link Count:	1	Cross Section:	217	Cross Section:	217
Flow Direction:	Both				
Damping:	0.0000 ft				
Length:	100.00 ft				
Contraction Coef:	0.10				
Expansion Coef:	0.30				
Entr Loss Coef:	0.00				
Exit Loss Coef:	0.00				
Bend Loss Coef:	0.00				
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Comment: LAKE CORRINE OUTFALL CANAL

Channel Link: LC00030		Upstream		Downstream	
Scenario:	ProposedFinal	Invert:	83.60 ft	Invert:	83.11 ft
From Node:	LC00030	Manning's N:	0.0450	Manning's N:	0.0450
To Node:	LC00030A	Geometry:	Irregular	Geometry:	Irregular
Link Count:	1	Cross Section:	C3-1X	Cross Section:	C3-1X
Flow Direction:	Both				
Damping:	0.0000 ft				
Length:	603.73 ft				
Contraction Coef:	0.10				
Expansion Coef:	0.30				
Entr Loss Coef:	0.00				
Exit Loss Coef:	0.00				
Bend Loss Coef:	0.00				
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Comment: OFFSITE OUTFALL DITCH FROM PROPERY LINE NORTH

Channel Link: LC00050		Upstream		Downstream	
Scenario:	ProposedFinal	Invert:	80.10 ft	Invert:	80.00 ft
From Node:	LC00050	Manning's N:	0.0450	Manning's N:	0.0450
To Node:	LC00050A	Geometry:	Irregular	Geometry:	Irregular
Link Count:	1	Cross Section:	C4-NEW	Cross Section:	C4-NEW
Flow Direction:	Both				
Damping:	0.0000 ft				
Length:	402.00 ft				
Contraction Coef:	0.10				
Expansion Coef:	0.30				
Entr Loss Coef:	0.00				
Exit Loss Coef:	0.00				
Bend Loss Coef:	0.00				
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Comment: Regrading of existing Lake Corrine Outfall Canal between SR 436 and Forsyth Road

Channel Link: LC00050B		Upstream		Downstream	
Scenario:	ProposedFinal	Invert:	79.20 ft	Invert:	79.20 ft
From Node:	LC00050B	Manning's N:	0.0450	Manning's N:	0.0450
To Node:	LC00055	Geometry:	Irregular	Geometry:	Irregular
Link Count:	1	Cross Section:	C4-NEW	Cross Section:	C4-NEW
Flow Direction:	Both				
Damping:	0.0000 ft				
Length:	542.00 ft				
Contraction Coef:	0.10				
Expansion Coef:	0.30				
Entr Loss Coef:	0.00				
Exit Loss Coef:	0.00				
Bend Loss Coef:	0.00				
Bend Location:	0.00 dec				
Energy Switch:	Diff Wave				

Comment: Regrading of existing Lake Corrine Outfall Canal between SR 436 and Forsyth Road

Channel Link: LC00055		Upstream		Downstream	
Scenario:	ProposedFinal	Invert:	79.90 ft	Invert:	78.90 ft
From Node:	LC00055	Manning's N:	0.0450	Manning's N:	0.0450
To Node:	LC00060	Geometry:	Irregular	Geometry:	Irregular
Link Count:	1	Cross Section:	C4-NEW	Cross Section:	C4-NEW
Flow Direction:	Both				
Damping:	0.0000 ft				
Length:	1201.06 ft				
Contraction Coef:	0.10				
Expansion Coef:	0.30				
Entr Loss Coef:	0.00				
Exit Loss Coef:	0.00				
Bend Loss Coef:	0.00				
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Comment: Regrading of existing Lake Corrine Outfall Canal between SR 436 and Forsyth Road

Channel Link: LC00060		Upstream		Downstream	
Scenario:	ProposedFinal	Invert:	78.90 ft	Invert:	78.60 ft
From Node:	LC00060	Manning's N:	0.0450	Manning's N:	0.0450
To Node:	LC00065	Geometry:	Irregular	Geometry:	Irregular
Link Count:	1	Cross Section:	C4-NEW	Cross Section:	C4-NEW
Flow Direction:	Both				
Damping:	0.0000 ft				
Length:	1599.59 ft				
Contraction Coef:	0.10				
Expansion Coef:	0.30				
Entr Loss Coef:	0.00				
Exit Loss Coef:	0.00				
Bend Loss Coef:	0.00				
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Comment: Regrading of existing Lake Corrine Outfall Canal between SR 436 and Forsyth Road

Channel Link: LC00065		Upstream		Downstream	
Scenario:	ProposedFinal	Invert:	77.50 ft	Invert:	77.65 ft
From Node:	LC00065	Manning's N:	0.0450	Manning's N:	0.0450
To Node:	LC00070	Geometry:	Irregular	Geometry:	Irregular
Link Count:	1	Cross Section:	C4-NEW	Cross Section:	C4-NEW
Flow Direction:	Both				
Damping:	0.0000 ft				
Length:	1272.04 ft				
Contraction Coef:	0.10				
Expansion Coef:	0.30				
Entr Loss Coef:	0.00				
Exit Loss Coef:	0.00				
Bend Loss Coef:	0.00				
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Comment: Regrading of existing Lake Corrine Outfall Canal between SR 436 and Forsyth Road

Channel Link: LC00075		Upstream		Downstream	
Scenario:	ProposedFinal	Invert:	73.50 ft	Invert:	72.10 ft
From Node:	LC00075	Manning's N:	0.0450	Manning's N:	0.0450
To Node:	LC00080	Geometry:	Irregular	Geometry:	Irregular
Link Count:	1	Cross Section:	C4-1XM	Cross Section:	C4-1XM
Flow Direction:	Both				
Damping:	0.0000 ft				
Length:	570.73 ft				
Contraction Coef:	0.10				
Expansion Coef:	0.30				
Entr Loss Coef:	0.00				
Exit Loss Coef:	0.00				
Bend Loss Coef:	0.00				
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Comment:

Channel Link: LC00080		Upstream		Downstream	
Scenario:	ProposedFinal	Invert:	72.10 ft	Invert:	70.50 ft
From Node:	LC00080	Manning's N:	0.0450	Manning's N:	0.0450
To Node:	LC00085	Geometry:	Irregular	Geometry:	Irregular
Link Count:	1	Cross Section:	C4-1XM	Cross Section:	C4-1XM
Flow Direction:	Both				
Damping:	0.0000 ft				
Length:	653.57 ft				
Contraction Coef:	0.10				
Expansion Coef:	0.30				
Entr Loss Coef:	0.00				
Exit Loss Coef:	0.00				
Bend Loss Coef:	0.00				
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Comment:

Channel Link: LC00090		Upstream		Downstream	
Scenario:	ProposedFinal	Invert:	56.90 ft	Invert:	53.11 ft
From Node:	LC00090	Manning's N:	0.0450	Manning's N:	0.0450
To Node:	LC00095	Geometry: Trapezoidal		Geometry: Trapezoidal	
Link Count:	1	Max Depth:	941.10 ft	Max Depth:	944.89 ft
Flow Direction:	Both	Extrapolation:	Normal	Extrapolation:	Normal
Damping:	0.0000 ft	Bottom Width:	20.00 ft	Bottom Width:	20.00 ft
Length:	582.00 ft	Left Slope:	2.000 (h:v)	Left Slope:	2.000 (h:v)
Contraction Coef:	0.10	Right Slope:	1.500 (h:v)	Right Slope:	1.500 (h:v)
Expansion Coef:	0.30	Bottom Clip			
Entr Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Exit Loss Coef:	0.00	Op Table:		Op Table:	
Bend Loss Coef:	0.00	Ref Node:		Ref Node:	
Bend Location:	0.00 dec	Manning's N:	0.0450	Manning's N:	0.0450
Energy Switch:	Energy	Top Clip			
		Default:	0.00 ft	Default:	0.00 ft
		Op Table:		Op Table:	
		Ref Node:		Ref Node:	
		Manning's N:	0.0450	Manning's N:	0.0450

Comment: ASSUMED XSEC FROM TOPO

Channel Link: LC00095		Upstream		Downstream	
Scenario:	ProposedFinal	Invert:	53.11 ft	Invert:	53.70 ft
From Node:	LC00095	Manning's N:	0.0450	Manning's N:	0.0450
To Node:	LC00100	Geometry: Trapezoidal		Geometry: Trapezoidal	
Link Count:	1	Max Depth:	944.89 ft	Max Depth:	944.30 ft
Flow Direction:	Both	Extrapolation:	Normal	Extrapolation:	Normal
Damping:	0.0000 ft	Bottom Width:	20.00 ft	Bottom Width:	20.00 ft
Length:	360.66 ft	Left Slope:	1.500 (h:v)	Left Slope:	1.500 (h:v)
Contraction Coef:	0.10	Right Slope:	1.500 (h:v)	Right Slope:	1.500 (h:v)
Expansion Coef:	0.30	Bottom Clip			
Entr Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Exit Loss Coef:	0.00	Op Table:		Op Table:	
Bend Loss Coef:	0.00	Ref Node:		Ref Node:	
Bend Location:	0.00 dec	Manning's N:	0.0450	Manning's N:	0.0450
Energy Switch:	Energy	Top Clip			
		Default:	0.00 ft	Default:	0.00 ft
		Op Table:		Op Table:	
		Ref Node:		Ref Node:	
		Manning's N:	0.0450	Manning's N:	0.0450

Comment: ASSUMED XSEC FROM TOPO

Channel Link: WPP3		Upstream		Downstream	
Scenario:	ProposedFinal	Invert:	80.80 ft	Invert:	79.68 ft
From Node:	WPP3	Manning's N:	0.0450	Manning's N:	0.0450
To Node:	B-11	Geometry: Trapezoidal		Geometry: Trapezoidal	
Link Count:	1	Max Depth:	999.00 ft	Max Depth:	999.00 ft
Flow Direction:	Both	Extrapolation:	Normal	Extrapolation:	Normal
Damping:	0.0000 ft	Bottom Width:	6.00 ft	Bottom Width:	6.00 ft
Length:	95.00 ft	Left Slope:	2.000 (h:v)	Left Slope:	2.000 (h:v)
Contraction Coef:	0.10	Right Slope:	2.000 (h:v)	Right Slope:	2.000 (h:v)

Expansion Coef:	0.30	Bottom Clip			
Entr Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Exit Loss Coef:	0.00	Op Table:		Op Table:	
Bend Loss Coef:	0.00	Ref Node:		Ref Node:	
Bend Location:	0.00 dec	Manning's N:	0.0450	Manning's N:	0.0450
Energy Switch:	Energy	Top Clip			
		Default:	0.00 ft	Default:	0.00 ft
		Op Table:		Op Table:	
		Ref Node:		Ref Node:	
		Manning's N:	0.0450	Manning's N:	0.0450

Comment: WINTER PINES GOLF COURSE CANAL

Channel Link: WPP4		Upstream		Downstream	
Scenario:	ProposedFinal	Invert:	81.40 ft	Invert:	79.97 ft
From Node:	WPP4	Manning's N:	0.0450	Manning's N:	0.0450
To Node:	BP217	Geometry: Trapezoidal		Geometry: Trapezoidal	
Link Count:	1	Max Depth:	916.60 ft	Max Depth:	918.03 ft
Flow Direction:	Both	Extrapolation:	Normal	Extrapolation:	Normal
Damping:	0.0000 ft	Bottom Width:	6.00 ft	Bottom Width:	6.00 ft
Length:	115.00 ft	Left Slope:	2.000 (h:v)	Left Slope:	2.000 (h:v)
Contraction Coef:	0.10	Right Slope:	2.000 (h:v)	Right Slope:	2.000 (h:v)
Expansion Coef:	0.30	Bottom Clip			
Entr Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Exit Loss Coef:	0.00	Op Table:		Op Table:	
Bend Loss Coef:	0.00	Ref Node:		Ref Node:	
Bend Location:	0.00 dec	Manning's N:	0.0450	Manning's N:	0.0450
Energy Switch:	Energy	Top Clip			
		Default:	0.00 ft	Default:	0.00 ft
		Op Table:		Op Table:	
		Ref Node:		Ref Node:	
		Manning's N:	0.0450	Manning's N:	0.0450

Comment: WINTER PINES GOLF COURSE CANAL

Pipe Link: 218		Upstream		Downstream	
Scenario:	ProposedFinal	Invert:	79.31 ft	Invert:	79.13 ft
From Node:	BP218	Manning's N:	0.0110	Manning's N:	0.0110
To Node:	BP220	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	8.00 ft	Max Depth:	8.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	171.00 ft	Op Table:		Op Table:	
FHWA Code:	1	Ref Node:		Ref Node:	
Entr Loss Coef:	0.50	Manning's N:	0.0110	Manning's N:	0.0110
Exit Loss Coef:	1.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0110	Manning's N:	0.0110

Comment: Existing 96" RCP from Baldwin Park Lane Improvements, updated info from DRMP Survey (4/8/24), deleted Node 219 and Pipe BP219 from model

Pipe Link: B-11		Upstream		Downstream	
Scenario:	ProposedFinal	Invert:	80.94 ft	Invert:	80.76 ft
From Node:	B-11	Manning's N:	0.0110	Manning's N:	0.0110
To Node:	BP220	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	4.50 ft	Max Depth:	4.50 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	20.00 ft	Op Table:		Op Table:	
FHWA Code:	1	Ref Node:		Ref Node:	
Entr Loss Coef:	0.50	Manning's N:	0.0110	Manning's N:	0.0110
Exit Loss Coef:	1.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0110	Manning's N:	0.0110

Comment: WINTER PINES GOLF COURSE HEADWALL 54" RCP, updated info from DRMP Survey (4/8/24)

Pipe Link: LC00030A		Upstream		Downstream	
Scenario:	ProposedFinal	Invert:	83.11 ft	Invert:	83.00 ft
From Node:	LC00030A	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	BP207	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	3.00 ft	Max Depth:	3.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	114.00 ft	Op Table:		Op Table:	
FHWA Code:	1	Ref Node:		Ref Node:	
Entr Loss Coef:	0.50	Manning's N:	0.0120	Manning's N:	0.0120
Exit Loss Coef:	1.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0120	Manning's N:	0.0120

Comment: PROPOSED 36" RCP

Pipe Link: LC00031		Upstream		Downstream	
Scenario:	ProposedFinal	Invert:	86.50 ft	Invert:	87.00 ft
From Node:	BALDWIN	Manning's N:	0.0130	Manning's N:	0.0130
To Node:	CS-BALD	Geometry: Circular		Geometry: Circular	
Link Count:	3	Max Depth:	3.50 ft	Max Depth:	3.50 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	140.00 ft	Op Table:		Op Table:	
FHWA Code:	1	Ref Node:		Ref Node:	
Entr Loss Coef:	0.50	Manning's N:	0.0130	Manning's N:	0.0130
Exit Loss Coef:	1.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0130	Manning's N:	0.0130

Comment:

Pipe Link: LC00045		Upstream		Downstream	
Scenario:	ProposedFinal	Invert:	79.31 ft	Invert:	79.00 ft
From Node:	BP220	Manning's N:	0.0130	Manning's N:	0.0130
To Node:	LC00050	Geometry: Rectangular		Geometry: Rectangular	
Link Count:	1	Max Depth:	9.00 ft	Max Depth:	9.00 ft
Flow Direction:	Both	Max Width:	11.50 ft	Max Width:	11.50 ft
Damping:	0.0000 ft	Fillet:	0.00 ft	Fillet:	0.00 ft
Length:	186.00 ft	Bottom Clip			
FHWA Code:	11	Default:	0.00 ft	Default:	0.00 ft
Entr Loss Coef:	0.70	Op Table:		Op Table:	
Exit Loss Coef:	1.00	Ref Node:		Ref Node:	
Bend Loss Coef:	0.00	Manning's N:	0.0130	Manning's N:	0.0130
Bend Location:	0.00 dec	Top Clip			
Energy Switch:	Energy	Default:	0.00 ft	Default:	0.00 ft
		Op Table:		Op Table:	
		Ref Node:		Ref Node:	
		Manning's N:	0.0130	Manning's N:	0.0130

Comment: BOX CULVERT AT SR 436 - EXTENDED 34', updated survey from DRMP (4/08/24)

Pipe Link: LC00050A1		Upstream		Downstream	
Scenario:	ProposedFinal	Invert:	80.98 ft	Invert:	80.40 ft
From Node:	LC00050A	Manning's N:	0.0130	Manning's N:	0.0130
To Node:	LC00050B	Geometry: Rectangular		Geometry: Rectangular	
Link Count:	1	Max Depth:	8.00 ft	Max Depth:	8.00 ft
Flow Direction:	Both	Max Width:	6.90 ft	Max Width:	6.90 ft
Damping:	0.0000 ft	Fillet:	0.00 ft	Fillet:	0.00 ft
Length:	55.00 ft	Bottom Clip			
FHWA Code:	0	Default:	0.00 ft	Default:	0.00 ft
Entr Loss Coef:	0.00	Op Table:		Op Table:	
Exit Loss Coef:	1.00	Ref Node:		Ref Node:	
Bend Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Bend Location:	0.00 dec	Top Clip			
Energy Switch:	Energy	Default:	0.00 ft	Default:	0.00 ft
		Op Table:		Op Table:	
		Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment: North Cell of Double Cell Box Culvert under entrance to Walmart Neighborhood Market from Auvers Blvd, updated survey from DRMP (04/08/24)

Pipe Link: LC00050A2		Upstream		Downstream	
Scenario:	ProposedFinal	Invert:	80.87 ft	Invert:	80.41 ft
From Node:	LC00050A	Manning's N:	0.0130	Manning's N:	0.0130
To Node:	LC00050B	Geometry: Rectangular		Geometry: Rectangular	
Link Count:	1	Max Depth:	8.00 ft	Max Depth:	8.00 ft
Flow Direction:	Both	Max Width:	6.90 ft	Max Width:	6.90 ft
Damping:	0.0000 ft	Fillet:	0.00 ft	Fillet:	0.00 ft
Length:	55.00 ft	Bottom Clip			
FHWA Code:	0	Default:	0.00 ft	Default:	0.00 ft
Entr Loss Coef:	0.00	Op Table:		Op Table:	
Exit Loss Coef:	1.00	Ref Node:		Ref Node:	
Bend Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000

Bend Location:	0.00 dec	Top Clip			
Energy Switch:	Energy	Default:	0.00 ft	Default:	0.00 ft
		Op Table:		Op Table:	
		Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment: South Cell of Double Cell Box Culvert under entrance to Walmart Neighborhood Market from Auvers Blvd, updated survey from DRMP (04/08/24)

Pipe Link: LC00070A_N		Upstream		Downstream	
Scenario:	ProposedFinal	Invert:	77.25 ft	Invert:	76.67 ft
From Node:	LC00070A	Manning's N:	0.0130	Manning's N:	0.0130
To Node:	LC00070B_N	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	4.50 ft	Max Depth:	4.50 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	17.00 ft	Op Table:		Op Table:	
FHWA Code:	1	Ref Node:		Ref Node:	
Entr Loss Coef:	0.50	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	1.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment: Update using GIS info from OCPW (1/2024)

Pipe Link: LC00070A_S		Upstream		Downstream	
Scenario:	ProposedFinal	Invert:	77.20 ft	Invert:	76.84 ft
From Node:	LC00070A	Manning's N:	0.0130	Manning's N:	0.0130
To Node:	LC00070B_S	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	4.50 ft	Max Depth:	4.50 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	20.00 ft	Op Table:		Op Table:	
FHWA Code:	1	Ref Node:		Ref Node:	
Entr Loss Coef:	0.50	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	1.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment: Update using GIS info from OCPW (1/2024)

Pipe Link: LC00070B_N		Upstream		Downstream	
Scenario:	ProposedFinal	Invert:	73.76 ft	Invert:	73.38 ft
From Node:	LC00070B_N	Manning's N:	0.0130	Manning's N:	0.0130
To Node:	LC00075	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	4.50 ft	Max Depth:	4.50 ft
Flow Direction:	Both	Bottom Clip			

Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	106.00 ft	Op Table:		Op Table:	
FHWA Code:	1	Ref Node:		Ref Node:	
Entr Loss Coef:	0.50	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	1.00	Top Clip			
Bend Loss Coef:	0.50	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment: Update using GIS info from OCPW (1/2024)

Pipe Link: LC00070B_S		Upstream		Downstream	
Scenario:	ProposedFinal	Invert:	73.78 ft	Invert:	73.48 ft
From Node:	LC00070B_S	Manning's N:	0.0130	Manning's N:	0.0130
To Node:	LC00075	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	4.50 ft	Max Depth:	4.50 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	103.00 ft	Op Table:		Op Table:	
FHWA Code:	1	Ref Node:		Ref Node:	
Entr Loss Coef:	0.50	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	1.00	Top Clip			
Bend Loss Coef:	0.50	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment: Update using GIS info from OCPW (1/2024)

Pipe Link: LC00085A_N		Upstream		Downstream	
Scenario:	ProposedFinal	Invert:	70.66 ft	Invert:	68.88 ft
From Node:	LC00085	Manning's N:	0.0130	Manning's N:	0.0130
To Node:	LC00087A	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	5.00 ft	Max Depth:	5.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	102.00 ft	Op Table:		Op Table:	
FHWA Code:	2	Ref Node:		Ref Node:	
Entr Loss Coef:	0.50	Manning's N:	0.0240	Manning's N:	0.0240
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0240	Manning's N:	0.0240

Comment: Update using GIS info from OCPW (1/2024)

Pipe Link: LC00085A_S		Upstream		Downstream	
Scenario:	ProposedFinal	Invert:	70.74 ft	Invert:	69.14 ft
From Node:	LC00085	Manning's N:	0.0130	Manning's N:	0.0130

To Node:	LC00087B	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	5.00 ft	Max Depth:	5.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	104.00 ft	Op Table:		Op Table:	
FHWA Code:	2	Ref Node:		Ref Node:	
Entr Loss Coef:	0.50	Manning's N:	0.0240	Manning's N:	0.0240
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0240	Manning's N:	0.0240

Comment: Update using GIS info from OCPW (1/2024)

Pipe Link: LC00087_N		Upstream		Downstream	
Scenario:	ProposedFinal	Invert:	58.03 ft	Invert:	57.76 ft
From Node:	LC00087A	Manning's N:	0.0130	Manning's N:	0.0130
To Node:	LC00090	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	5.00 ft	Max Depth:	5.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	75.00 ft	Op Table:		Op Table:	
FHWA Code:	7	Ref Node:		Ref Node:	
Entr Loss Coef:	0.20	Manning's N:	0.0240	Manning's N:	0.0240
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0240	Manning's N:	0.0240

Comment: Update using GIS info from OCPW (1/2024)

Pipe Link: LC00087_S		Upstream		Downstream	
Scenario:	ProposedFinal	Invert:	58.28 ft	Invert:	57.48 ft
From Node:	LC00087B	Manning's N:	0.0130	Manning's N:	0.0130
To Node:	LC00090	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	5.00 ft	Max Depth:	5.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	82.00 ft	Op Table:		Op Table:	
FHWA Code:	7	Ref Node:		Ref Node:	
Entr Loss Coef:	0.20	Manning's N:	0.0240	Manning's N:	0.0240
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0240	Manning's N:	0.0240

Comment: Update using GIS info from OCPW (1/2024)

Pipe Link: WPP1		Upstream		Downstream	
Scenario:	ProposedFinal	Invert:	82.05 ft	Invert:	81.40 ft
From Node:	WPP1	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	WPP4	Geometry: Horizontal Ellipse		Geometry: Horizontal Ellipse	
Link Count:	1	Max Depth:	4.83 ft	Max Depth:	4.83 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	65.00 ft	Op Table:		Op Table:	
FHWA Code:	1	Ref Node:		Ref Node:	
Entr Loss Coef:	0.50	Manning's N:	0.0250	Manning's N:	0.0250
Exit Loss Coef:	1.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0250	Manning's N:	0.0250

Comment: WINTER PINES GOLF COURSE EXISTING 60" CMP Revised to 72" elliptical equivalent RCP

Pipe Link: WPP9		Upstream		Downstream	
Scenario:	ProposedFinal	Invert:	79.73 ft	Invert:	79.27 ft
From Node:	WPP9	Manning's N:	0.0250	Manning's N:	0.0250
To Node:	WPP4	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	1.50 ft	Max Depth:	1.50 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	30.00 ft	Op Table:		Op Table:	
FHWA Code:	1	Ref Node:		Ref Node:	
Entr Loss Coef:	0.50	Manning's N:	0.0250	Manning's N:	0.0250
Exit Loss Coef:	1.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0250	Manning's N:	0.0250

Comment: WINTER PINES GOLF COURSE EXISTING 18" CMP

Weir Link: LC00065W			
Scenario:	ProposedFinal	Bottom Clip	
From Node:	LC00065	Default:	0.00 ft
To Node:	LC12200	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Broad Crested Vertical	Op Table:	
Geometry Type:	Irregular	Ref Node:	
Invert:	86.30 ft	Discharge Coefficients	
Control Elevation:	86.30 ft	Weir Default:	2.800
Cross Section:	LC00065W-W	Weir Table:	
		Orifice Default:	0.600
		Orifice Table:	

Comment: WEIR INVERT TAKEN FROM CONTOURS

Weir Link: LC00070B

Scenario:	ProposedFinal	**Bottom Clip**	
From Node:	LC00070	Default:	0.00 ft
To Node:	LC00075	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	**Top Clip**	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Broad Crested Vertical	Op Table:	
Geometry Type:	Trapezoidal	Ref Node:	
Invert:	86.00 ft	**Discharge Coefficients**	
Control Elevation:	86.00 ft	Weir Default:	2.800
Max Depth:	99.00 ft	Weir Table:	
Extrapolation Method:	Normal Projection	Orifice Default:	0.600
Bottom Width:	0.00 ft	Orifice Table:	
Left Slope:	217.400 (h:v)		
Right Slope:	333.300 (h:v)		

Comment: OVERFLOW FORSYTH 180'+/- SOUTH OF XING

Weir Link: LC00070_W

Scenario:	ProposedFinal	**Bottom Clip**	
From Node:	LC00070	Default:	0.00 ft
To Node:	LC00070A	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	**Top Clip**	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Sharp Crested Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	81.88 ft	**Discharge Coefficients**	
Control Elevation:	81.88 ft	Weir Default:	3.000
Max Depth:	999.00 ft	Weir Table:	
Max Width:	47.50 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Weir Link: LC00085B

Scenario:	ProposedFinal	**Bottom Clip**	
From Node:	LC00085	Default:	0.00 ft
To Node:	LC00090	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	**Top Clip**	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Broad Crested Vertical	Op Table:	
Geometry Type:	Parabolic	Ref Node:	
Invert:	77.80 ft	**Discharge Coefficients**	
Control Elevation:	77.80 ft	Weir Default:	2.800
Max Depth:	99.00 ft	Weir Table:	
Max Width:	1557.40 ft	Orifice Default:	0.600
Extrapolation Method:	Normal Projection	Orifice Table:	

Comment: OVERFLOW DORIS/PARTRIDGE (SEE C5-4S)

Weir Link: WMW-1

Scenario:	ProposedFinal	**Bottom Clip**	
From Node:	WMPond-1	Default:	0.00 ft
To Node:	LC00055	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	**Top Clip**	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Broad Crested Vertical	Op Table:	
Geometry Type:	Trapezoidal	Ref Node:	
Invert:	88.50 ft	**Discharge Coefficients**	
Control Elevation:	88.50 ft	Weir Default:	2.800
Max Depth:	1.50 ft	Weir Table:	
Extrapolation Method:	Normal Projection	Orifice Default:	0.600
Bottom Width:	20.00 ft	Orifice Table:	
Left Slope:	4.000 (h:v)		
Right Slope:	4.000 (h:v)		

Comment:

Weir Link: WPP2

Scenario:	ProposedFinal	**Bottom Clip**	
From Node:	WPP2	Default:	0.00 ft
To Node:	WPP3	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	**Top Clip**	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Sharp Crested Vertical	Op Table:	
Geometry Type:	Trapezoidal	Ref Node:	
Invert:	82.00 ft	**Discharge Coefficients**	
Control Elevation:	82.00 ft	Weir Default:	3.200
Max Depth:	999.00 ft	Weir Table:	
Extrapolation Method:	Normal Projection	Orifice Default:	0.600
Bottom Width:	6.00 ft	Orifice Table:	
Left Slope:	2.000 (h:v)		
Right Slope:	2.000 (h:v)		

Comment: WINTER PINES GOLF COURSE EXISTING WEIR

2013_0107 - Weir Type revised to reflect Vertical: Mavis Equation

Weir Link: WPP2A

Scenario:	ProposedFinal	**Bottom Clip**	
From Node:	WPP2	Default:	0.00 ft
To Node:	WPP3	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	**Top Clip**	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Sharp Crested Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	81.80 ft	**Discharge Coefficients**	
Control Elevation:	81.80 ft	Weir Default:	3.200
Max Depth:	0.20 ft	Weir Table:	
Max Width:	3.00 ft	Orifice Default:	0.600

Fillet:	0.00 ft		
		Orifice Table:	

Comment: WINTER PINES GOLF COURSE EXISTING WEIR

Weir Link: WPP9_W

Scenario:	ProposedFinal	**Bottom Clip**	
From Node:	WPP9	Default:	0.00 ft
To Node:	BP217	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	**Top Clip**	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Broad Crested Vertical	Op Table:	
Geometry Type:	Trapezoidal	Ref Node:	
Invert:	87.00 ft	**Discharge Coefficients**	
Control Elevation:	87.00 ft	Weir Default:	2.600
Max Depth:	9999.00 ft	Weir Table:	
Extrapolation Method:	Normal Projection	Orifice Default:	0.600
Bottom Width:	50.00 ft	Orifice Table:	
Left Slope:	0.000 (h:v)		
Right Slope:	0.000 (h:v)		

Comment:

Weir Link: WPP9_W2

Scenario:	ProposedFinal	**Bottom Clip**	
From Node:	WPP9	Default:	0.00 ft
To Node:	BP208	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	**Top Clip**	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Broad Crested Vertical	Op Table:	
Geometry Type:	Trapezoidal	Ref Node:	
Invert:	86.00 ft	**Discharge Coefficients**	
Control Elevation:	86.00 ft	Weir Default:	2.600
Max Depth:	9999.00 ft	Weir Table:	
Extrapolation Method:	Normal Projection	Orifice Default:	0.600
Bottom Width:	50.00 ft	Orifice Table:	
Left Slope:	0.000 (h:v)		
Right Slope:	0.000 (h:v)		

Comment:

Weir Link: WPP9_W3

Scenario:	ProposedFinal	**Bottom Clip**	
From Node:	WPP9	Default:	0.00 ft
To Node:	BP210	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	**Top Clip**	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Broad Crested Vertical	Op Table:	

Geometry Type:	Trapezoidal
Invert:	86.50 ft
Control Elevation:	86.50 ft
Max Depth:	9999.00 ft
Extrapolation Method:	Normal Projection
Bottom Width:	50.00 ft
Left Slope:	0.000 (h:v)
Right Slope:	0.000 (h:v)

Ref Node:

Discharge Coefficients

Weir Default:	2.600
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Comment:

Drop Structure Link: LC00084DS

Scenario:	ProposedFinal
From Node:	LC00084
To Node:	LC00085
Link Count:	1
Flow Direction:	Both
Solution:	Combine
Increments:	0
Pipe Count:	1
Damping:	0.0000 ft
Length:	80.00 ft
FHWA Code:	0
Entr Loss Coef:	0.50
Exit Loss Coef:	1.00
Bend Loss Coef:	0.00
Bend Location:	0.00 dec
Energy Switch:	Energy

Upstream Pipe

Invert:	72.50 ft
Manning's N:	0.0120

Geometry: Circular

Max Depth:	2.00 ft

Bottom Clip

Default:	0.00 ft
Op Table:	
Ref Node:	
Manning's N:	0.0000

Top Clip

Default:	0.00 ft
Op Table:	
Ref Node:	
Manning's N:	0.0000

Downstream Pipe

Invert:	72.00 ft
Manning's N:	0.0120

Geometry: Circular

Max Depth:	2.00 ft

Bottom Clip

Default:	0.00 ft
Op Table:	
Ref Node:	
Manning's N:	0.0000

Top Clip

Default:	0.00 ft
Op Table:	
Ref Node:	
Manning's N:	0.0000

Pipe Comment:

Weir Component

Weir:	1
Weir Count:	1
Weir Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Sharp Crested Vertical
Geometry Type:	Circular
Invert:	73.00 ft
Control Elevation:	73.00 ft
Max Depth:	0.40 ft

Bottom Clip

Default:	0.00 ft
Op Table:	
Ref Node:	

Top Clip

Default:	0.00 ft
Op Table:	
Ref Node:	

Discharge Coefficients

Weir Default:	3.000
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Weir Comment:

Weir Component

Weir:	2
Weir Count:	1
Weir Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Sharp Crested Vertical
Geometry Type:	Rectangular
Invert:	74.57 ft

Bottom Clip

Default:	0.00 ft
Op Table:	
Ref Node:	

Top Clip

Default:	0.00 ft
Op Table:	

Control Elevation:	74.57 ft
Max Depth:	2.43 ft
Max Width:	1.00 ft
Fillet:	0.00 ft

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

Weir Comment:

Weir Component

Weir:	3
Weir Count:	1
Weir Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Horizontal
Geometry Type:	Rectangular
Invert:	77.00 ft
Control Elevation:	77.00 ft
Max Depth:	3.08 ft
Max Width:	4.08 ft
Fillet:	0.00 ft

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

Weir Comment:

Drop Structure Comment: Pond 4 Outfall Structure from Forsyth Road Improvements, SJRWMD Permit #20839-3, Drainage Report dated March 2002, elevations converted to NAVD88 (-1 ft)

Drop Structure Link: WMCS-1

Scenario:	ProposedFinal
From Node:	WMPond-1
To Node:	LC00055
Link Count:	1
Flow Direction:	Both
Solution:	Combine
Increments:	0
Pipe Count:	1
Damping:	0.0000 ft
Length:	203.00 ft
FHWA Code:	0
Entr Loss Coef:	0.00
Exit Loss Coef:	1.00
Bend Loss Coef:	0.00
Bend Location:	0.00 dec
Energy Switch:	Energy

Upstream Pipe		Downstream Pipe	
Invert:	83.50 ft	Invert:	81.00 ft
Manning's N:	0.0130	Manning's N:	0.0130
Geometry: Circular		**Geometry: Circular**	
Max Depth:	2.00 ft	Max Depth:	2.00 ft
Bottom Clip			
Default:	0.00 ft	Default:	0.00 ft
Op Table:		Op Table:	
Ref Node:		Ref Node:	
Manning's N:	0.0000	Manning's N:	0.0000
Top Clip			
Default:	0.00 ft	Default:	0.00 ft
Op Table:		Op Table:	
Ref Node:		Ref Node:	
Manning's N:	0.0000	Manning's N:	0.0000

Pipe Comment:

Weir Component

Weir:	1
Weir Count:	1
Weir Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Sharp Crested Vertical

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

Geometry Type:	Rectangular
Invert:	84.65 ft
Control Elevation:	84.65 ft
Max Depth:	3.78 ft
Max Width:	0.58 ft
Fillet:	0.00 ft

Default:	0.00 ft
Op Table:	
Ref Node:	

Discharge Coefficients

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

Weir Comment:

Weir Component

Weir:	2
Weir Count:	1
Weir Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Horizontal
Geometry Type:	Circular
Invert:	83.70 ft
Control Elevation:	83.70 ft
Max Depth:	0.29 ft

Bottom Clip

Default:	0.00 ft
Op Table:	
Ref Node:	

Top Clip

Default:	0.00 ft
Op Table:	
Ref Node:	

Discharge Coefficients

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

Weir Comment:

Weir Component

Weir:	3
Weir Count:	1
Weir Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Horizontal
Geometry Type:	Rectangular
Invert:	88.43 ft
Control Elevation:	88.46 ft
Max Depth:	4.08 ft
Max Width:	3.08 ft
Fillet:	0.00 ft

Bottom Clip

Default:	0.00 ft
Op Table:	
Ref Node:	

Top Clip

Default:	0.00 ft
Op Table:	
Ref Node:	

Discharge Coefficients

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

Weir Comment:

Weir Component

Weir:	4
Weir Count:	2
Weir Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Sharp Crested Vertical
Geometry Type:	Rectangular
Invert:	86.03 ft
Control Elevation:	86.03 ft
Max Depth:	2.40 ft
Max Width:	3.00 ft
Fillet:	0.00 ft

Bottom Clip

Default:	0.00 ft
Op Table:	
Ref Node:	

Top Clip

Default:	0.00 ft
Op Table:	
Ref Node:	

Discharge Coefficients

Weir Default:	3.200
Weir Table:	
Orifice Default:	0.600

Orifice Table:

Weir Comment:

Drop Structure Comment:

Node Maximum Conditions

25 Year/24 Hour Storm

Winter Park Pines Study, Lake Corrine Outfall Canal - Proposed Final Condition
Node Maximum Conditions - 25 Year/24 Hour Storm
9/17/2024
Node Max Conditions w/ Times [ProposedFinal]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]	Time to Max Stage [hr]	Time to Min/Max Delta Stage [hr]	Time to Max Total Inflow [hr]	Time to Max Total Outflow [hr]
B-11	OC25y24	82.30	87.64	0.0406	45.96	70.29	1831	13.7938	0.0001	0.0000	8.5877
BALDWIN	OC25y24	95.00	92.40	-0.0150	1091.58	322.43	8999913	20.3990	0.0005	9.0668	0.0000
BP207	OC25y24	88.98	88.19	0.0003	147.31	148.52	35783	14.0249	0.4161	20.0720	18.6603
BP208	OC25y24	86.18	88.17	0.0007	148.52	149.02	12042	14.0290	0.5196	18.6603	18.6694
BP209	OC25y24	85.68	88.16	0.0006	146.44	148.04	33335	14.0218	0.5218	25.3703	25.3716
BP210	OC25y24	85.63	88.16	0.0002	151.54	152.09	12159	14.0077	0.5305	22.5047	22.5030
BP211	OC25y24	85.81	88.15	0.0002	152.09	152.66	12394	14.0074	8.7689	22.5030	22.5621
BP212	OC25y24	86.62	88.15	0.0002	152.90	153.52	26512	14.0077	8.7689	22.7616	22.5011
BP213	OC25y24	86.59	88.14	0.0010	153.52	153.71	4186	13.9877	12.2231	22.5011	22.4847
BP214	OC25y24	85.50	88.14	0.0007	153.92	161.23	50745	14.0221	0.3177	22.7486	14.4220
BP215	OC25y24	85.80	88.13	-0.0009	161.23	190.78	13045	14.0223	14.3479	14.4220	14.5029
BP216	OC25y24	86.43	88.13	0.0009	190.78	189.08	13329	14.0091	12.0898	14.5029	14.2109
BP217	OC25y24	85.46	88.13	0.0010	317.08	339.05	15456	14.0223	12.3244	13.6055	14.3519
BP218	OC25y24	85.46	88.12	-0.0009	339.05	219.47	11288	14.0446	14.3479	14.3519	14.7611
BP220	OC25y24	94.00	87.62	0.0021	297.23	296.52	7892	13.7453	0.0001	14.3306	14.2228
CS-BALD	OC25y24	89.00	91.47	0.0640	146.03	146.03	864	20.6242	0.0001	20.2433	20.2454
LC00030	OC25y24	91.30	88.19	-0.0002	12.16	9.10	14762	14.0530	0.0001	9.0333	8.8187
LC00030A	OC25y24	86.00	88.19	0.0003	9.10	7.48	9356	14.0268	0.5196	8.8187	8.4092
LC00050	OC25y24	90.70	87.34	-0.0013	336.56	336.84	12931	13.6315	0.0001	13.4225	13.5202
LC00050A	OC25y24	90.70	87.30	-0.0005	336.84	336.51	12264	13.6346	0.0018	13.5202	13.5149
LC00050B	OC25y24	90.70	87.10	-0.0005	336.51	336.59	17050	13.6932	0.0001	13.5149	13.4584
LC00055	OC25y24	90.10	87.05	0.0002	426.17	426.07	52697	13.6901	8.7689	13.8101	13.7516
LC00060	OC25y24	89.50	86.87	0.0002	433.92	433.93	86190	13.6480	8.7674	13.5861	13.7095
LC00065	OC25y24	86.60	86.66	0.0002	507.78	502.66	1341711	13.6104	8.7674	13.0614	13.6367
LC00070	OC25y24	86.80	86.54	0.0002	475.41	475.33	41858	13.5776	8.7689	13.5548	13.5776
LC00070A	OC25y24	86.80	86.32	0.0228	358.62	358.58	343	13.5783	0.0001	10.9858	10.9864
LC00070B_N	OC25y24	86.80	83.48	-0.0224	179.29	179.28	271	13.6730	0.0005	10.9864	10.9858
LC00070B_S	OC25y24	86.80	83.45	-0.0210	179.29	179.28	271	13.6615	0.0001	10.9864	10.9858
LC00075	OC25y24	85.50	79.04	0.0027	475.61	475.58	9700	13.6813	0.0001	13.5777	13.5817
LC00080	OC25y24	83.00	78.51	0.0003	476.01	475.92	21534	13.7059	8.7548	13.5817	13.6152
LC00084	OC25y24	78.00	78.24	0.0002	32.68	8.30	98010	14.1472	8.7689	9.0000	10.8576
LC00085	OC25y24	78.00	78.16	-0.0038	480.18	480.16	11991	13.7632	0.0001	13.7259	13.7632
LC00087A	OC25y24	78.24	68.58	0.0030	225.21	225.20	426	14.1317	8.6257	13.7631	13.7638
LC00087B	OC25y24	78.24	68.61	0.0029	222.70	222.69	448	14.1376	27.5519	13.7631	13.7638
LC00090	OC25y24	77.00	67.61	0.0005	484.98	483.73	17691	14.1433	8.7674	13.7263	14.0692
LC00095	OC25y24	73.50	67.58	0.0005	486.25	488.78	30950	14.1412	8.7689	13.9059	14.0690

Winter Park Pines Study, Lake Corrine Outfall Canal - Proposed Final Condition
Node Maximum Conditions - 25 Year/24 Hour Storm
9/17/2024

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]	Time to Max Stage [hr]	Time to Min/Max Delta Stage [hr]	Time to Max Total Inflow [hr]	Time to Max Total Outflow [hr]
LC00100	OC25y24	70.47	67.56	0.0007	490.48	486.63	11196	14.1419	8.5416	14.0690	14.1408
LC00105	OC25y24	70.47	61.26	0.0008	486.86	486.96	10621	13.7967	29.0545	14.1288	14.1574
LC00110	OC25y24	69.00	64.39	0.0001	319.51	318.32	69533	9.8963	8.9326	9.6736	9.7759
LC00115	OC25y24	68.47	60.31	0.0002	703.88	703.75	20891	10.1822	8.3555	10.1513	10.1724
LC00117	OC25y24	68.50	67.14	0.0004	34.83	24.40	29185	10.0604	8.3545	9.0167	10.0603
LC00120	OC25y24	68.00	59.67	0.0002	731.55	731.49	7624	10.1800	8.3548	10.1517	10.1573
LC00123	OC25y24	62.40	58.99	0.0024	731.49	731.37	9335	10.2124	25.7985	10.1573	10.1655
LC00125	OC25y24	59.10	58.68	-0.0006	739.33	737.96	79330	10.2256	25.7985	10.1311	10.1893
LC00130	OC25y24	57.75	57.21	0.0002	860.74	856.64	70838	10.3347	8.2062	10.1221	10.1780
WMPond-1	OC25y24	90.00	87.11	0.0001	21.60	4.27	97596	14.0455	8.7674	9.0000	10.0089
WPP1	OC25y24	86.70	88.27	0.0003	178.73	136.21	218942	13.5029	8.7674	9.8333	10.4540
WPP2	OC25y24	86.00	87.64	0.0003	20.01	6.06	72433	13.7963	8.7674	8.7590	0.0075
WPP3	OC25y24	86.00	87.64	-0.0021	38.24	45.96	201044	13.7939	0.0002	9.0500	0.0000
WPP4	OC25y24	81.60	88.13	0.0018	150.02	101.08	320835	14.0014	0.0001	10.3884	12.0495
WPP9	OC25y24	86.00	88.15	-0.0003	35.32	35.91	73304	14.0292	0.2061	9.6223	18.6587

100 Year/24 Hour Storm

Winter Park Pines Study, Lake Corrine Outfall Canal - Proposed Final Condition

Node Maximum Conditions - 100 Year/24 Hour Storm

9/17/2024

Node Max Conditions w/ Times [ProposedFinal]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]	Time to Max Stage [hr]	Time to Min/Max Delta Stage [hr]	Time to Max Total Inflow [hr]	Time to Max Total Outflow [hr]
B-11	OC100y24	82.30	88.28	0.0406	45.96	71.51	1954	13.6578	0.0001	0.0000	8.1534
BALDWIN	OC100y24	95.00	93.13	-0.0150	1473.60	322.43	9617508	21.0305	0.0005	9.0543	0.0000
BP207	OC100y24	88.98	89.06	0.0003	172.62	174.33	40922	14.0718	9.1827	20.0947	18.6462
BP208	OC100y24	86.18	89.04	0.0006	174.33	175.00	12330	14.0608	0.5235	18.6462	18.6452
BP209	OC100y24	85.68	89.04	0.0005	165.13	166.47	35074	14.0743	0.5282	29.8822	29.8751
BP210	OC100y24	85.63	89.03	0.0003	172.62	173.22	12443	14.0733	10.5194	26.9828	26.9916
BP211	OC100y24	85.81	89.03	0.0004	173.22	173.87	12672	14.0635	9.9997	26.9916	27.0058
BP212	OC100y24	86.62	89.03	0.0004	173.87	189.31	30493	14.0727	9.1833	27.0058	15.0939
BP213	OC100y24	86.59	89.02	0.0012	189.31	188.93	521255	14.0183	15.0754	15.0939	15.1300
BP214	OC100y24	85.50	89.02	0.0007	189.69	214.46	53417	14.0196	0.3176	15.1300	15.4820
BP215	OC100y24	85.80	89.02	0.0010	214.46	249.50	13310	14.0328	14.2233	15.4820	15.5604
BP216	OC100y24	86.43	89.01	0.0011	249.50	245.31	13593	14.0083	15.0422	15.5604	14.3968
BP217	OC100y24	85.46	89.01	-0.0014	412.29	433.24	15923	13.9998	15.0422	14.3968	14.3967
BP218	OC100y24	85.46	89.01	0.0010	433.24	270.63	11291	14.0288	10.4814	14.3967	14.7528
BP220	OC100y24	94.00	88.26	0.0021	370.86	370.47	8071	13.4841	0.0001	14.4016	14.3471
CS-BALD	OC100y24	89.00	91.87	0.0640	170.89	170.89	864	20.8820	0.0001	20.8932	20.8821
LC00030	OC100y24	91.30	89.06	0.0003	15.42	11.95	16113	14.0944	9.6107	9.0333	9.0764
LC00030A	OC100y24	86.00	89.06	0.0003	11.95	9.95	9970	14.0807	0.5148	9.0764	9.1036
LC00050	OC100y24	90.70	87.88	-0.0013	422.23	438.47	13359	13.2685	0.0001	13.5518	13.5508
LC00050A	OC100y24	90.70	87.83	-0.0005	438.47	421.94	12688	13.2712	0.0018	13.5508	13.3165
LC00050B	OC100y24	90.70	87.53	-0.0005	421.94	422.15	17521	13.2679	0.0001	13.3165	13.3115
LC00055	OC100y24	90.10	87.48	0.0002	573.85	573.74	53753	13.2320	9.1827	13.4441	13.5318
LC00060	OC100y24	89.50	87.20	0.0002	585.04	585.13	88012	13.1930	9.1827	13.1764	13.2290
LC00065	OC100y24	86.60	86.87	0.0002	683.60	682.24	1509970	13.1144	9.1827	12.5897	13.2243
LC00070	OC100y24	86.80	86.70	0.0002	587.35	587.31	42296	13.0334	9.1827	13.0678	13.0334
LC00070A	OC100y24	86.80	86.50	0.0228	358.23	358.24	343	13.0353	0.0001	23.7567	23.7566
LC00070B_N	OC100y24	86.80	83.79	-0.0224	179.08	179.07	271	13.0351	0.0005	9.9730	23.5706
LC00070B_S	OC100y24	86.80	83.77	-0.0210	179.23	179.23	271	12.8717	0.0001	23.9203	23.9195
LC00075	OC100y24	85.50	79.58	0.0027	587.80	587.79	9947	13.0370	0.0001	13.0328	13.0366
LC00080	OC100y24	83.00	78.96	0.0004	588.52	588.50	21995	13.0530	10.4662	13.0366	13.0496
LC00084	OC100y24	78.00	78.75	0.0002	37.94	10.77	98010	13.3061	8.3389	8.6588	9.9460
LC00085	OC100y24	78.00	78.51	-0.0038	597.03	597.02	12201	13.0755	0.0001	13.0752	13.0755
LC00087A	OC100y24	78.24	71.91	0.0030	235.30	235.33	426	13.0615	8.1936	13.0733	13.0617
LC00087B	OC100y24	78.24	71.95	0.0029	232.90	232.91	448	13.0715	31.4651	13.0756	13.0686
LC00090	OC100y24	77.00	70.85	0.0005	605.75	614.70	21000	13.0677	11.2544	13.0617	12.9146
LC00095	OC100y24	73.50	70.84	0.0005	619.41	614.59	36030	13.0845	11.2544	12.9146	12.9711

Winter Park Pines Study, Lake Corrine Outfall Canal - Proposed Final Condition
Node Maximum Conditions - 100 Year/24 Hour Storm
9/17/2024

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]	Time to Max Stage [hr]	Time to Min/Max Delta Stage [hr]	Time to Max Total Inflow [hr]	Time to Max Total Outflow [hr]
LC00100	OC100y24	70.47	70.83	-0.0008	617.88	613.49	12961	13.0947	33.3831	12.9711	13.0948
LC00105	OC100y24	70.47	62.17	0.0009	613.95	614.00	11477	12.8664	33.3832	13.0948	13.1010
LC00110	OC100y24	69.00	64.81	0.0002	397.65	394.78	77736	9.5308	8.4427	9.3172	9.4825
LC00115	OC100y24	68.47	61.03	0.0003	835.11	835.04	22096	12.7210	33.4082	12.6895	12.7379
LC00117	OC100y24	68.50	67.72	0.0005	44.02	40.23	29185	9.1811	8.3175	9.0166	9.1810
LC00120	OC100y24	68.00	60.08	0.0002	849.42	849.42	7934	12.6874	33.4082	12.6858	12.6874
LC00123	OC100y24	62.40	59.43	0.0024	849.42	849.44	9843	12.6996	7.4674	12.6874	12.6997
LC00125	OC100y24	59.10	59.12	-0.0005	857.64	856.19	90922	12.7072	29.2506	9.6468	9.7352
LC00130	OC100y24	57.75	57.96	0.0002	1026.98	1020.91	85498	11.8130	9.1123	9.5537	9.6125
WMPond-1	OC100y24	90.00	87.58	0.0002	26.97	6.30	101183	13.8839	8.3389	9.0000	9.2803
WPP1	OC100y24	86.70	89.29	0.0004	233.87	164.65	389990	12.5728	9.6107	9.7501	10.1904
WPP2	OC100y24	86.00	88.29	0.0003	23.00	6.06	89614	13.6603	8.3175	8.8159	0.0075
WPP3	OC100y24	86.00	88.28	-0.0021	48.64	47.44	298389	13.6576	0.0002	9.0500	8.7119
WPP4	OC100y24	81.60	89.01	0.0018	182.52	135.35	369816	14.0098	0.0001	10.0862	12.1920
WPP9	OC100y24	86.00	89.03	0.0006	45.44	43.86	83303	14.0644	9.1123	9.1110	22.3728

10 Year/24 Hour Storm

Winter Park Pines Study, Lake Corrine Outfall Canal - Proposed Final Condition

Node Maximum Conditions - 10 Year/24 Hour Storm

9/17/2024

Node Max Conditions w/ Times [ProposedFinal]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]	Time to Max Stage [hr]	Time to Min/Max Delta Stage [hr]	Time to Max Total Inflow [hr]	Time to Max Total Outflow [hr]
B-11	OC10y24	82.30	87.17	0.0406	45.96	75.40	1744	14.1850	0.0001	0.0000	8.9051
BALDWIN	OC10y24	95.00	91.98	-0.0150	893.14	322.43	8613515	20.2120	0.0005	10.0333	0.0000
BP207	OC10y24	88.98	87.61	0.0003	131.49	132.94	33914	14.3063	0.4161	20.0963	20.1242
BP208	OC10y24	86.18	87.58	0.0006	132.94	133.50	11845	14.2770	0.5219	20.1242	20.1220
BP209	OC10y24	85.68	87.57	0.0006	133.52	135.09	31851	14.2920	0.5226	22.1180	22.1399
BP210	OC10y24	85.63	87.57	0.0002	136.81	137.41	11982	14.2841	0.5226	19.7288	19.7878
BP211	OC10y24	85.81	87.56	0.0002	137.41	138.04	12217	14.2359	9.1483	19.7878	19.8232
BP212	OC10y24	86.62	87.55	0.0002	138.38	138.97	20822	14.2830	9.1483	19.8237	19.5469
BP213	OC10y24	86.59	87.55	-0.0005	138.97	139.18	4008	14.2839	14.2328	19.5469	19.5474
BP214	OC10y24	85.50	87.55	0.0007	139.44	141.52	44281	14.2832	0.3192	19.8637	19.8751
BP215	OC10y24	85.80	87.54	0.0006	141.52	150.19	12867	14.2830	14.2830	19.8751	14.3987
BP216	OC10y24	86.43	87.54	-0.0008	150.19	161.03	13151	14.1995	14.2830	14.3987	14.3986
BP217	OC10y24	85.46	87.54	-0.0010	264.39	282.04	15142	14.2830	14.3313	14.4012	14.3706
BP218	OC10y24	85.46	87.53	0.0009	282.04	185.99	11286	14.2416	13.9133	14.3706	14.7368
BP220	OC10y24	94.00	87.17	0.0021	249.03	248.44	7890	14.1479	0.0001	14.4213	14.1752
CS-BALD	OC10y24	89.00	91.25	0.0640	130.13	130.13	864	20.0959	0.0001	20.0970	20.0959
LC00030	OC10y24	91.30	87.61	-0.0002	10.36	8.20	13051	14.2493	0.0001	9.0500	8.6832
LC00030A	OC10y24	86.00	87.61	0.0003	8.20	7.06	7949	14.2444	0.5176	8.6832	8.6522
LC00050	OC10y24	90.70	86.95	-0.0013	285.09	284.53	12615	14.1553	0.0001	12.5359	12.5369
LC00050A	OC10y24	90.70	86.91	-0.0005	284.53	284.01	11950	14.1756	0.0018	12.5369	12.6120
LC00050B	OC10y24	90.70	86.76	-0.0005	284.01	283.27	16686	14.1936	0.0001	12.6120	12.6714
LC00055	OC10y24	90.10	86.72	0.0002	345.37	344.60	51570	14.1889	9.1469	13.5734	13.7191
LC00060	OC10y24	89.50	86.58	0.0002	352.62	350.07	84605	14.2452	9.1469	13.1094	13.8499
LC00065	OC10y24	86.60	86.43	0.0002	438.59	395.93	1156678	14.3672	9.1469	11.0904	14.3893
LC00070	OC10y24	86.80	86.34	0.0002	396.21	396.13	41326	14.3476	9.1469	14.2752	14.3172
LC00070A	OC10y24	86.80	86.10	0.0228	358.71	358.69	343	14.3501	0.0001	12.3455	12.3477
LC00070B_N	OC10y24	86.80	83.05	-0.0224	179.33	179.33	271	14.4285	0.0005	12.4806	12.4784
LC00070B_S	OC10y24	86.80	83.03	-0.0210	179.42	179.41	271	14.4399	0.0001	12.2606	12.2601
LC00075	OC10y24	85.50	78.31	0.0027	396.27	396.18	9339	14.5035	0.0001	14.3138	14.3486
LC00080	OC10y24	83.00	77.73	-0.0002	396.39	396.15	20722	14.5489	0.5226	14.3211	14.4167
LC00084	OC10y24	78.00	77.38	0.0002	28.18	6.39	96924	14.8914	9.1469	9.0645	11.9812
LC00085	OC10y24	78.00	77.36	-0.0038	397.82	397.78	11545	14.5728	0.0001	14.5713	14.5918
LC00087A	OC10y24	78.24	66.04	0.0030	200.31	200.31	426	14.6052	8.9373	14.5918	14.5958
LC00087B	OC10y24	78.24	66.06	0.0029	197.48	197.49	448	14.6017	24.7444	14.5606	14.6085
LC00090	OC10y24	77.00	65.27	0.0006	399.80	400.04	15307	14.6052	8.9229	14.4456	14.6052
LC00095	OC10y24	73.50	65.22	0.0006	401.07	401.73	27277	14.5975	8.9229	14.6052	14.6690

Winter Park Pines Study, Lake Corrine Outfall Canal - Proposed Final Condition
Node Maximum Conditions - 10 Year/24 Hour Storm
9/17/2024

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]	Time to Max Stage [hr]	Time to Min/Max Delta Stage [hr]	Time to Max Total Inflow [hr]	Time to Max Total Outflow [hr]
LC00100	OC10y24	70.47	65.20	-0.0007	402.46	401.46	9918	14.6369	26.1583	14.6690	14.6187
LC00105	OC10y24	70.47	60.86	0.0007	401.57	401.72	10373	10.3196	26.1583	14.6187	14.5941
LC00110	OC10y24	69.00	64.11	0.0001	272.57	271.65	63800	10.1462	8.3257	10.0190	10.1054
LC00115	OC10y24	68.47	59.97	0.0002	635.07	634.92	20258	10.2589	8.3251	10.2313	10.2576
LC00117	OC10y24	68.50	66.58	0.0004	29.75	19.50	29185	10.1354	8.3251	9.0167	10.1353
LC00120	OC10y24	68.00	59.39	0.0002	656.86	656.80	7420	10.2668	8.3251	10.2375	10.2432
LC00123	OC10y24	62.40	58.71	0.0024	656.80	656.68	9007	10.2860	8.1638	10.2432	10.2523
LC00125	OC10y24	59.10	58.40	-0.0005	662.49	661.58	72202	10.3047	23.3921	10.2261	10.2976
LC00130	OC10y24	57.75	56.82	0.0002	762.27	760.30	62814	10.3432	8.3258	10.2208	10.2723
WMPond-1	OC10y24	90.00	86.74	0.0001	18.64	4.06	94830	14.2987	8.6062	9.0000	19.1429
WPP1	OC10y24	86.70	87.62	0.0002	148.77	117.32	162861	13.8079	9.1469	9.9167	10.1129
WPP2	OC10y24	86.00	87.18	0.0002	17.91	6.06	66771	14.1795	9.1469	9.0801	0.0075
WPP3	OC10y24	86.00	87.17	-0.0021	32.56	45.96	156446	14.1747	0.0002	9.0500	0.0000
WPP4	OC10y24	81.60	87.54	0.0018	129.55	87.97	282049	14.2464	0.0001	10.1481	10.7920
WPP9	OC10y24	86.00	87.57	-0.0003	27.41	29.84	66220	14.2768	0.2060	16.0884	16.2486

Appendix C

Backup Information from SJRWMD, Orange County, Winter Park

Forsyth Road Widening Improvements
SJRWMD Permit #4-095-20839-3

CONSTRUCTION PLANS FOR

FORSYTH ROAD
COLONIAL DR. TO ALOMA AVE.

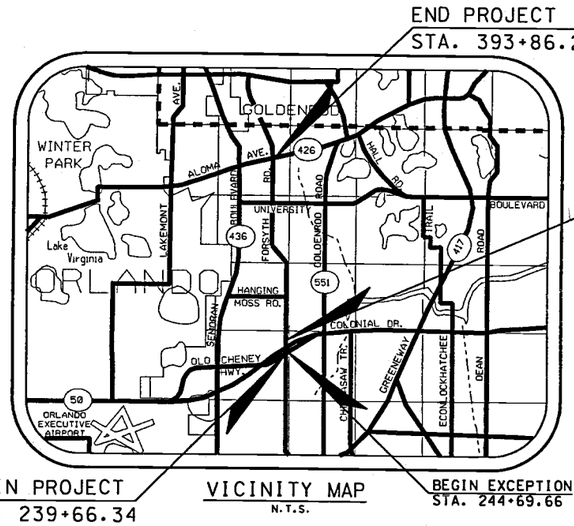
DISTRICT Nos. 3 AND 5
ORANGE COUNTY, FLORIDA

UTILITIES ENCOUNTERED	
FLORIDA POWER CORP	(813)866-5329 (407)938-6628
ORLANDO UTILITIES COMMISSION (ELECTRICAL) (WATER)	(407)384-4100 (407)423-9100
ORANGE CO. PUBLIC UTILITIES	(407)836-7211
WINTER PARK PUBLIC UTILITIES	(407)599-3219
BELL SOUTH TELEPHONE CO.	(407)237-5084
SPRINT	(407)830-3458
TIME WARNER COMMUNICATIONS	(407)291-2500
GAS & PETROLEUM TECO/PEOPLES GAS SYSTEM, INC.	(407)425-4661
SOUTH SEMINOLE AND NORTH ORANGE WASTEWATER TRANSMISSION AUTHORITY	(407)628-3419

THESE PLANS HAVE BEEN PREPARED IN ACCORDANCE WITH THE FLORIDA DEPARTMENT OF TRANSPORTATION ROADWAY & TRAFFIC DESIGN STANDARDS. (BOOKLETS DATED JANUARY 1992 & JANUARY 1994, WHERE APPLICABLE)

NOTE

PLANS WERE PREPARED ACCORDING TO AVAILABLE INFORMATION TO ADEQUATELY ADDRESS CONDITIONS AS THEY EXISTED AT THE TIME OF PLANS PREPARATION. NEEDS, CONDITIONS AND OWNERSHIP OF PROPERTIES MAY HAVE CHANGED SINCE PROJECT DESIGN. THE COUNTY'S REPRESENTATIVE WILL ADDRESS CHANGES AND NEEDS WITH THE PROPERTY OWNER OR THEIR REPRESENTATIVES. CONTRACTOR SHALL WORK WITH THE COUNTY'S REPRESENTATIVE IN ADDRESSING AND MEETING NEEDS AND CONDITIONS THAT MAY HAVE CHANGED SINCE PLANS PREPARATION.



VICINITY MAP
N.T.S.

TYPE OF CONSTRUCTION: RECONSTRUCTION

PROJECT LENGTH: 15419.92 FT. 2.92 MI.

ERP SUBMITTAL
JANUARY 15, 2002

ATTENTION IS DIRECTED TO THE FACT THAT THESE PLANS MAY HAVE BEEN ALTERED IN SIZE BY REPRODUCTION. THIS MUST BE CONSIDERED WHEN OBTAINING SCALED DATA.

SOURCE OF BENCH MARK DATUM
B-34-001 RAILROAD SPIKE IN ASPHALT CUT IN ℄ OF FORSYTH ROAD. 450' +/- NORTH OF ℄ SR 50. EL. 85.74 B-34-013 RAILROAD SPIKE IN EAST FACE OF POWER POLE. 20' ± WEST OF ℄ OF FORSYTH RD. AND 10' +/- SOUTHEAST OF SOUTHEAST FENCE CORNER OF ORANGE COUNTY MAINTENANCE BARN. STA. 99+58, 23' LT, EL. 90.32

LEGEND

SECTION LINE	HEDGE
CITY LINE	TREES
BASE OR SURVEY LINE	EDGE OF WOODED AREA
RIGHT OF WAY	CONCRETE
LIMITED ACCESS LINE	RATE OF SUPERELEVATION
FENCE LINE	POWER POLE
BOX CULVERT	OVERHEAD POWER CABLE
BRIDGE	TELEPHONE POLE
STORM SEWER INLET	OVERHEAD TELEPHONE POLE
MANHOLE	GUY WIRE AND ANCHOR PIN
SURVEY REFERENCE POINT	BURIED POWER CABLE
BENCH MARK	ELECTRIC DUCT
POINT OF INTERSECTION	BURIED TELEPHONE CABLE
NORTH POINT	TELEPHONE DUCT
BASE LINE	LIGHT POLE
CENTERLINE	GAS MAIN
PROPERTY LINE	WATER MAIN
DELTA ANGLE	SANITARY SEWER
APPROXIMATE	MANHOLE
ROUND	VALVE
CURB	FIRE HYDRANT
CURB AND GUTTER	UNDERGROUND CABLE TELEVISION
SOIL BORING	OVERHEAD CABLE TELEVISION
GUARDRAIL	MONITORING WELL
	POTENTIAL CONTAMINATION SITE
	TEMPORARY CONST. EASEMENT T.C.E.
	PERMANENT DRAINAGE EASEMENT P.D.E.
	PERMANENT MAINTENANCE EASEMENT P.M.E.

BOARD OF COUNTY COMMISSIONERS

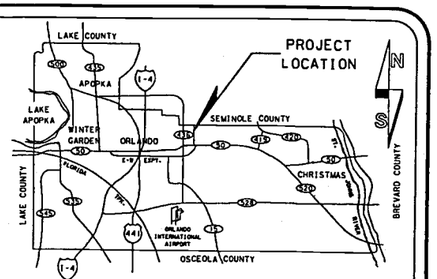
RICHARD T. CROTTY	COUNTY CHAIRMAN
TERESA JACOBS	DISTRICT 1
ROBERT B. "BOB" SINDLER	DISTRICT 2
MARY I. JOHNSON	DISTRICT 3
CLARENCE W. HOENSTINE	DISTRICT 4
TED EDWARDS	DISTRICT 5
HOMER L. HARTAGE	DISTRICT 6
WILLIAM P. BAXTER, P.E.	DIRECTOR OF PUBLIC WORKS

Mark B. Sch
2/8/02

CERTIFICATION TO PLANS

THIS IS TO CERTIFY THAT THE ROADWAY CONSTRUCTION PLANS AND SPECIFICATIONS AS CONTAINED HEREIN WERE DESIGNED TO APPLICABLE STANDARDS AS SET FORTH IN THE 'MANUAL OF UNIFORM MINIMUM STANDARDS FOR DESIGN, CONSTRUCTION AND MAINTENANCE FOR STREETS AND HIGHWAYS', STATE OF FLORIDA, AS PREPARED BY THE FLORIDA DEPARTMENT OF TRANSPORTATION TALLAHASSEE, FLORIDA. DATED SEPTEMBER 12, 1989

DATE:_____ ENGINEER: MICHAEL L. MOHLER REG. NO. 52034



SEC. 3,10,14,15,23 TWP. 22S RGE. 30E

LOCATION MAP

INDEX OF SHEETS

SHEET	DESCRIPTION
1	KEY SHEET
2	SUMMARY OF PAY ITEMS
3	PAY ITEM NOTES
4	GENERAL NOTES AND DETAILS
5-7	TYPICAL SECTIONS
8-13	DRAINAGE MAPS
14	DRAINAGE AREA SUMMARY
15-16	EXISTING DRAINAGE STRUCTURES
17-29A	SUMMARY OF DRAINAGE STRUCTURES
30-68	ROADWAY PLAN AND PROFILE
69-70	SPECIAL PROFILES
71-80	INTERSECTION DETAILS
81-91	DRIVEWAY HALF SECTIONS
92-94A, 95-114A	DRAINAGE STRUCTURE CROSS SECTIONS
115-120A,121-138A	DRAINAGE STRUCTURE CROSS SECTIONS
92-94A, 95-120A	DRAINAGE STRUCTURE CROSS SECTIONS
139-172	DRAINAGE STRUCTURE CROSS SECTIONS
173-177A,178-180	POND PLANS
181-186	POND DETAILS
187-195	CSX RAILROAD LATERAL DITCH
196-198	BOX CULVERT DETAILS
199-200	GARDNER LATERAL DITCH
201-256	ROADWAY CROSS SECTIONS
257-301A,B,C	POND CROSS SECTIONS
302-316	POND CROSS SECTIONS
317-349	TRAFFIC CONTROL PLANS
350-358	PAVEMENT MARKING PLANS
359-365	SIGNALIZATION PLANS

PREPARED BY:
PEC
PROFESSIONAL ENGINEERING CONSULTANTS, INC.
200 E. ROBINSON STREET, SUITE 1560
ORLANDO, FL 32801
engineers planners surveyors

20839-3

RECEIVED
MAR 0 8 2002
PDS
ALTAMONTE SPG. OFC.

REVISIONS	DATE	BY

DESIGNED BY: LJM DATE: 1/13/95
CHECKED BY: LJM DATE: 1/13/95
DRAWN BY: LHS DATE: 1/13/95
APPROVED BY: MLM DATE: 1/13/95
PROJECT NO: DC-64/73

SHEET 1 OF 365

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POND R/W
TYPE B FENCE
TYPE B FENCE
LIMITS OF CLEARING & GRUBBING
SOD
SOD
15' 30' 10' 30' 15'
1' 1'
90.0
EXIST. GROUND 90.0
CWL EL. 83.00
2:1 2:1
BOTTOM EL. 75.0
FROM POND 3A
AB-4
S-361
POND 3B
SECTION B-B

+00.33
100.00' (LT.)
℄ CONST. POND R/W
546
100.00'
S89°36'08"W
CONST. 89 L.F. OF 36" PIPE
20'R
5
3
1
5'R
5'R
POND 3B
10'
4'
22.83'
30'
2:1
2:1
2:1
2:1
2:1
4'
CWL EL. 83.00
25-YEAR DHW EL. 85.57
SEE DETAILS (SHEET 191)
8
20'R
20'R
7
CONST. 40 MIL LINER IMPERMEABLE PVC (SEE SHEET 194 FOR DETAILS)
N00°43'27"W
270.19'
15'
15'
N89°36'58"E
100.01'
+70.52
100.00' (LT.)
A
A
B
B
CONST. 70 L.F. OF 30" PIPE
S-362
S-363
AB-5
EXIST. TOE OF SLOPE
EXIST. TOP OF BANK
EXIST. TOP OF BANK
20'
567
568
569
PARTRIDGE LN.
N 89°36'30" E
S 00°43'27" E
450
451
452
453
CONST. 20 L.F. CANTILEVER SLIDE GATE INDEX No. 453
S 00°43'27" E 270.17'
CONST. 20 L.F. CANTILEVER SLIDE GATE INDEX No. 453
℄ CONST. POND 3B
CONST. 703 L.F. OF TYPE B INDEX No. 452
+69.93
0.00'
S 00°43'27" E

STA. 547+30.00
℄ SURVEY
TURQUOISE W. LN.
STA. 450+00.00
℄ CONST.
POND 3B
90°24'58"
POND R/W
LIMITS OF CLEARING & GRUBBING
TYPE B FENCE
SOD
TYPE B FENCE
SOD
POND R/W
547
20'
30'
175'
30'
15'
1'
12" TYPE B STABILIZATION MIN LBR 40 (TYP.)
90.0
90.0
EXIST. GROUND
36" PIPE
FL. 80.00
25-YEAR DHW EL. 85.57
CWL EL. 83.00
2:1
2:1
BOTTOM EL. 75.0
CONC. CURB & GUTTER
POND 3B
SECTION A-A
12" TYPE B STABILIZATION MIN LBR 40 (TYP.)
CONST. 283 L.F. OF TYPE B INDEX No. 452

273
274
275
276
277
548
STA. 273+10.70
℄ SURVEY
FORSYTH ROAD
STA. 500+00.00
℄ SURVEY
TURQUOISE W. LN.
℄ SURVEY TURQUOISE W. LN.
N 89°41'31" E
PI STA. 76+40.88
℄ SURVEY
Δ=0°09'43" RT.
NO CURVE
STA. 560+00.00
℄ SURVEY
PARTRIDGE LN. E.
560
570
N 0° 43' 27" W
N 0° 43' 27" W
N 0° 33' 44" W
POT STA. 560+00.00
N 0° 33' 44" W
54" PIPE
LAKE CORRINE OUTFALL CANAL

S-77
S-85
S-88
S-92
S-81
S-79
S-86
S-89
S-90
S-95
S-98
S-99A
S-94A
S-100
S-101
S-102
S-109A
S-110
S-93
S-94
S-95A
S-103
S-109
S-104
TCE
B-72
B-74
B-76

POND NO. 3B RADII STATIONING

REFERENCE POINT	STATION	OFFSET	RADIUS
1	450+55.23	50.00' LT.	5'
2	452+20.22	50.03' LT.	5'
3	450+40.12	35.00' LT.	20'
4	452+35.13	35.00' LT.	20'
5	450+40.21	65.00' LT.	20'
6	452+35.31	65.00' LT.	20'

ALL RADII POINTS ARE REFERENCED TO ℄ CONST. POND 3B

RECEIVED
MAR 08 2002
PDS
ALTAMONTE SPRINGS, FLA.

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

ORANGE COUNTY FLORIDA
2000-3
PEC PROFESSIONAL ENGINEERING CONSULTANTS, INC. engineers planners surveyors
PLAN
Pond 3B

2/8/02

N:\projects\oc-073\drdrd18.dgn 05:22:26 PM 03/07/2002

STABILIZE BEHIND O/W

5' 5' R- 5' R/W LINE

ROADWAY PAVEMENT

℄ CONST

O/W CONNECTION DETAIL

463+11.31 LT
463+18.95 RT
464+57.95 RT
469+24.63 LT
469+31.73 RT

+35.15 11.01 RT

+71.13 11.00 RT

R = 4.5'

R = 4.5'

+35.09 20.95 RT

+71.06 20.94 RT

O/W DETAIL STA. 462+52.38

POND NO. 4 RADII STATIONING

REFERENCE POINT	STATION	OFFSET	RADIUS
1	471+07.01	98.78' LT.	6'
2	471+19.79	209.82' LT.	55'
3	472+02.23	137.00' LT.	6'
4	472+71.25	137.00' LT.	6'
5	472+72.11	128.00' RT.	6'
6	471+07.25	127.90' RT.	6'

ALL RADII POINTS ARE REFERENCED TO ℄ CONST. POND 4

MATCHLINE STA. 462+00.00

S-105 ℄ CONST. POND 4

CONST. 267 L.F. OF 36" PIPE

BEGIN TYPE O CURB

STA. 460+00.00 ℄ CONST. POND 4

STA. 279+40.00 ℄ CONST. FORSYTH ROAD

S-104

CONST. 62 LF TURBIDITY BARRIER

LAKE CORRINE OUTFALL CANAL

CONST. 36" PIPE

S-106

CONST. 16 L.F. OF 24" PIPE STUB OUT AND PLUG (INOEX 280)

12" PVC (TO BE REMOVED)

EDGE DIRT RD

12" PVC (TO REMAIN)

EXIST. INLET (TO REMAIN)

15" CMP (TO REMAIN)

CONST. 222 L.F. OF 36" PIPE

END TYPE D CURB STA. 462+96.00

SEE DETAIL THIS SHEET

S-107

CONST. 16 L.F. OF 24" PIPE STUB OUT AND PLUG (INOEX 280)

℄ CONST. POND 4

S-107A

EXIST. MES (TO BE REMOVED, 15" CMP PIPE AND 12" PVC TO TIE INTO S-107A)

EXIST. 12" PVC PIPE (TO REMAIN)

P.O.E.

CONST. 15 L.F. OF 15" RCP

CONST. 400 L.F. OF 36" PIPE

EXISTING FENCE TO BE RELOCATED, SEE NOTE 3 SHEET 177A

S-108

10" PVC (TO BE REMOVED)

12" PVC (TO BE REMOVED)

15" RCP (TO BE REMOVED)

EXIST. RDWY (TO BE RECONSTRUCTED)

15" RCP (TO BE REMOVED)

CONST. 1143 L.F. OF FENCE TYPE B AROUND POND & REMOVE EXISTING FENCE

CONST. 16 L.F. OF 24" PIPE STUB OUT AND PLUG (INOEX 200)

CONST. 16 L.F. OF 24" PIPE STUB OUT AND PLUG (INOEX 200)

CONST. 185 L.F. OF 36" PIPE

S-108B

CONST. 92 L.F. OF 36" PIPE

S-108A

CONST. 100 L.F. OF 36" PIPE

S-108D

CONST. 40 L.F. OF 36" PIPE

S-108C

CONST. 40 MIL LINER IMPERMEABLE PVC (SEE SHEET 194 FOR DETAILS)

+86.00 153.20 LT

+73.60 195.92 LT

+45.44 164.95 LT

+46.19 153.71 LT

+29.81 195.50 LT

R/W LINE

WETLAND LIMITS

EXIST. FENCE

55' R

EXIST. CONC. FLUME (TO BE REMOVED)

EXISTING POND

EXIST. FENCE (TO BE REMOVED)

EXIST. CONTROL STRUCTURE (TO BE REMOVED)

+40.05 13.88 RT

POND 4

CWL EL. 74.00
100 YEAR OHW EL. 79.10
25-YEAR OHW EL. 77.76
10-YEAR OHW EL. 77.42

EL. 79.0 EL. 72.0 EL. 65.0

AB-6 EL. 65.0 EL. 72.0 EL. 79.0

EXIST. 24" CMP (TO BE REMOVED)

S-364

EXIST. 24" CMP (TO REMAIN)

EXIST. FENCE (TO BE REMOVED)

+48.11 186.74 RT

EXIST. FENCE (TO REMAIN)

CONNECT TO EXIST. FENCE

CONST. 50 LF TURBIDITY BARRIER

+31.23 186.77 RT

WETLAND LIMITS

LAKE CORRINE OUTFALL CANAL

462 463 464 465 466 467 468 469 470 471 472 473

562 563 564 565 566 567 568 569 570 572 573

N 89° 37' 16" E

℄ PARTRIDGE LN. E.

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ORANGE COUNTY FLORIDA

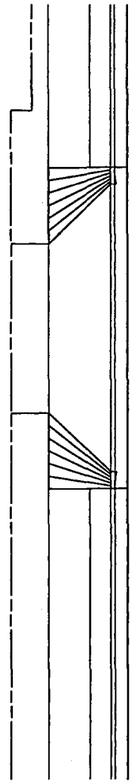
PEC PROFESSIONAL ENGINEERING CONSULTANTS, INC. engineers planners surveyors

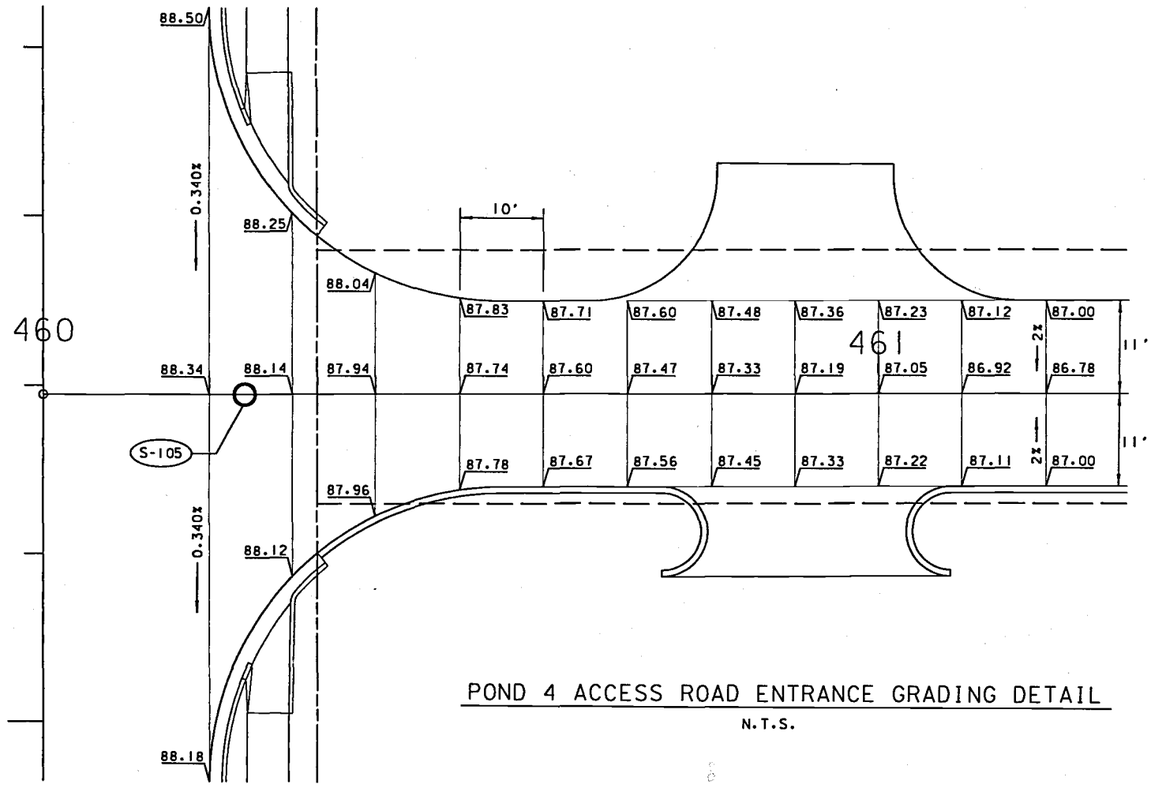
PLAN Pond 4

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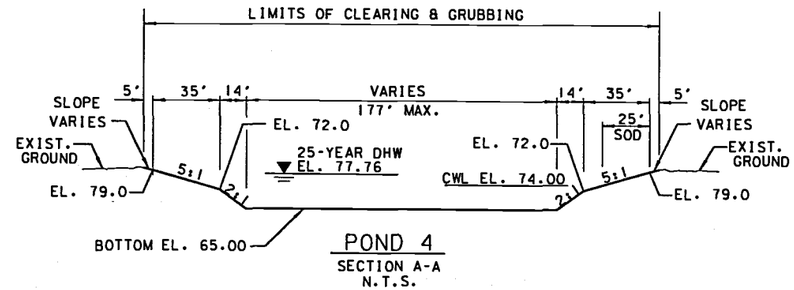
NOTES:

1. SEE POND 4 CROSS SECTIONS SHEET NOS. 276 - 283C FOR POND 4 ACCESS ROAD PGL ELEVATIONS.
2. SEE SHEET NO. 177 FOR LOCATION OF CROSS SECTION LINES A-A, B-B AND C-C.
3. THE EXISTING FENCE AND GATES ALONG THE POND 4 ACCESS ROAD (STA. 463+00.00 - STA. 470+47.00) IS TO BE REMOVED DURING CONSTRUCTION AND THEN RE-INSTALLED IN THE SAME LOCATION. COORDINATION WITH THE PROPERTY OWNER IS REQUIRED IN ORDER TO MAINTAIN ON-SITE SECURITY.

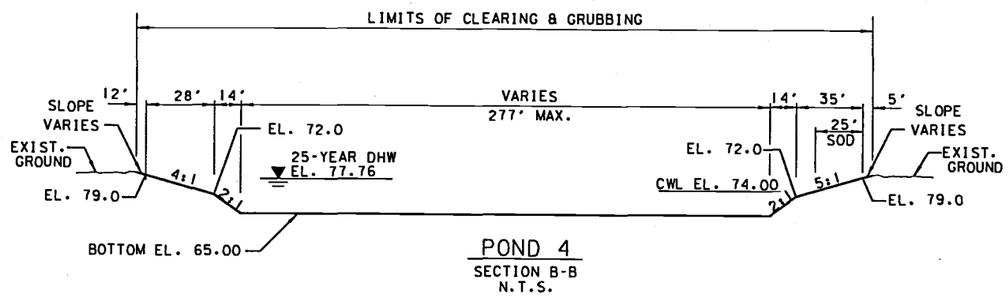




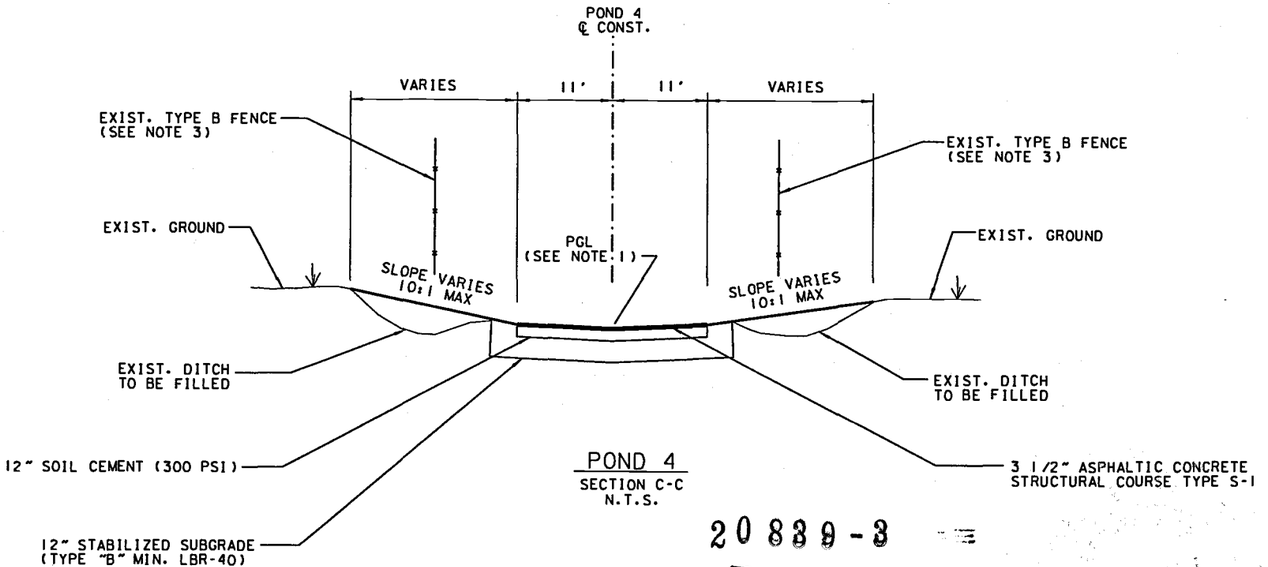
POND 4 ACCESS ROAD ENTRANCE GRADING DETAIL
N.T.S.



POND 4
SECTION A-A
N.T.S.



POND 4
SECTION B-B
N.T.S.



POND 4
SECTION C-C
N.T.S.

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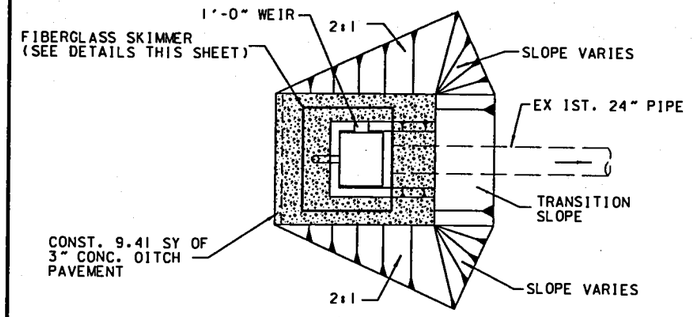
ORANGE COUNTY
FLORIDA

ALTAMONTE SVC. CTR.

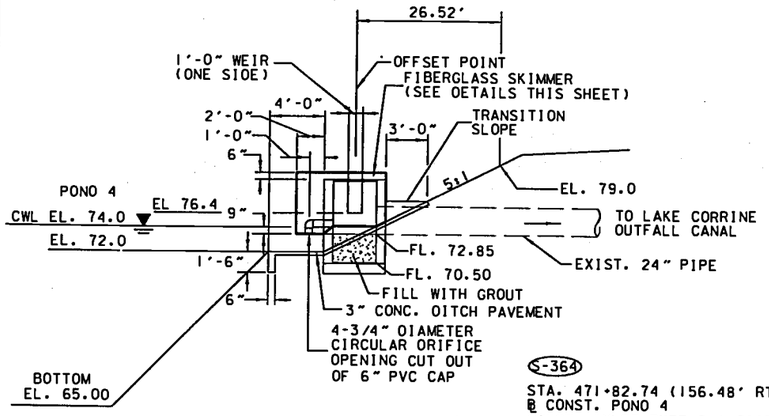
PDS
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engineers planners surveyors

PLAN
Pond 4

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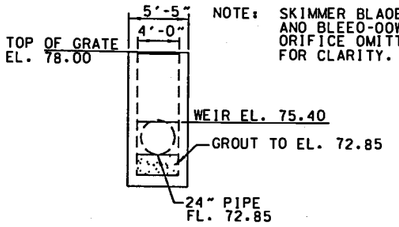
STRUCTURE S-364
PLAN
(POND 4)
N.T.S



S-364

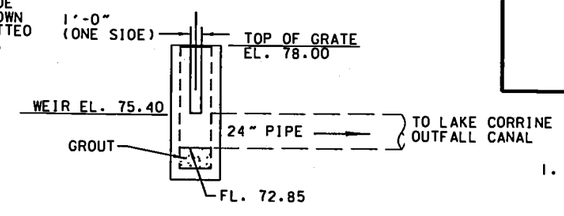
STA. 471+82.74 (156.48' RT)
℄ CONST. PONO 4
CONST. INLET TYPE O (MOOIFIEO)
GRATE EL. 78.00
WEIR EL. 75.40
ORIFICE EL. 74.00
FL. 72.85
INOEX NO. 232

STRUCTURE S-364
SIDE ELEVATION
(POND 4)
N.T.S

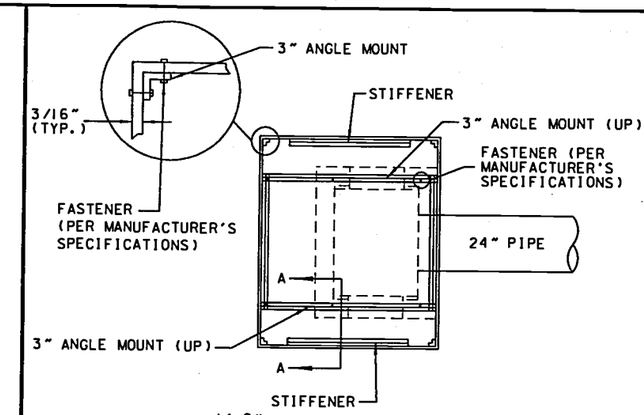


NOTE: SKIMMER BLAOE ANO BLEEO-OOWN ORIFICE OMITTEO FOR CLARITY.

STRUCTURE S-364
FRONT ELEVATION
(POND 4)
N.T.S

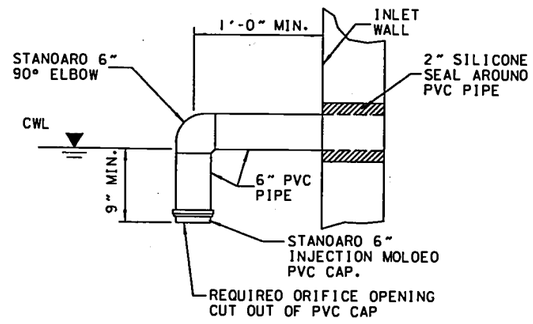


STRUCTURE S-364
SIDE ELEVATION
N.T.S



SECTION A-A

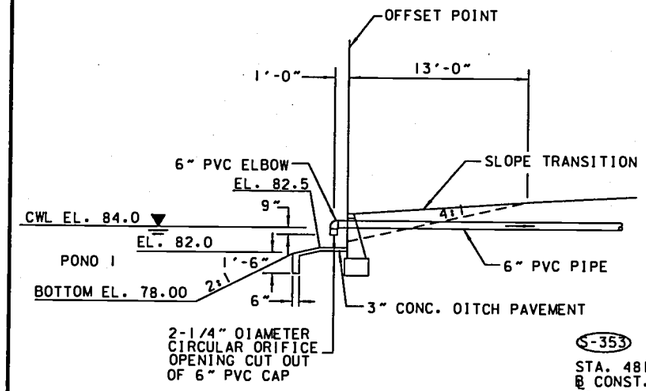
SKIMMER DETAIL
PLAN
N.T.S



TYPICAL PVC BLEED-DOWN
DEVICE DETAIL

NOTES

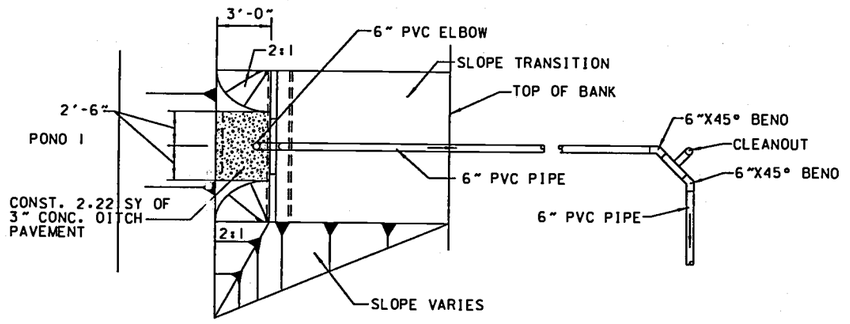
1. ALL EXPOSEO PVC PIPES ANO FITTINGS SHALL BE PAINTEO WITH TWO (2) COATS OF WHITE ENAMEL BASE PAINT. PAINT SHALL MEET ALL APPLICABLE STATE ANO FEOERAL STANOAROS ANO SPECIFICATIONS.
2. ALL NECESSARY GRAOING AROUNO THE CONTROL STRUCTURE SHALL BE CONSIOEREO INCIOENTAL ANO SHALL BE INCLUOEO IN THE UNIT PRICE BIO FOR "INLET" OR "ENOWALL".
3. THE COST OF THE BLEEO OOWN ORIFICE, SKIMMER ANO THE 3" CONC. OITCH PAVEMENT SHALL BE INCLUOEO IN THE COST OF THE TYPE "O" OITCH BOTTOM INLET (PONO 4) OR STRAIGHT ENOWALL (PONO 1).



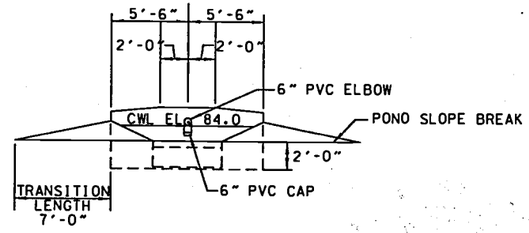
S-353

STA. 481+92.00 (66.9' LT)
℄ CONST. OLO CHENEY HIGHWAY
CONST. STRAIGHT ENOWALL (24")
INOEX NO. 250
ORIFICE EL. 84.00

STRUCTURE S-353
SIDE ELEVATION
(POND 1)
N.T.S



STRUCTURE S-353
PLAN
(POND 1)
N.T.S



STRUCTURE S-353
FRONT ELEVATION
N.T.S

20839-3

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Matt B. Gale 2/8/02

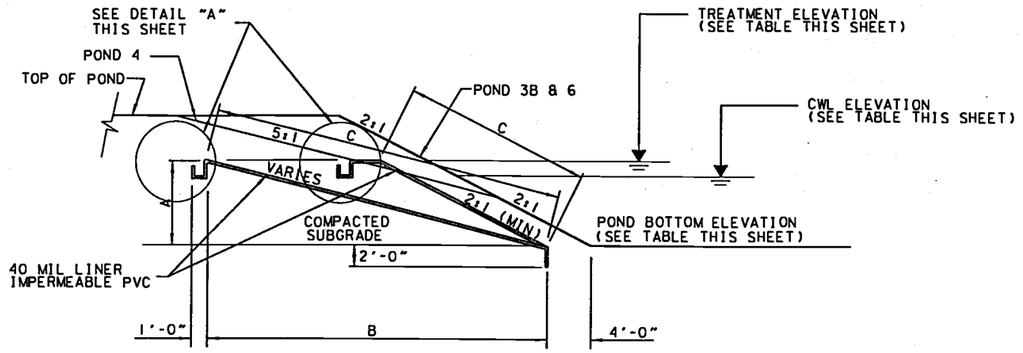
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ORANGE COUNTY
FLORIDA

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ALTAMONTE SVC CTR.

POND 1 & 4
DETAILS

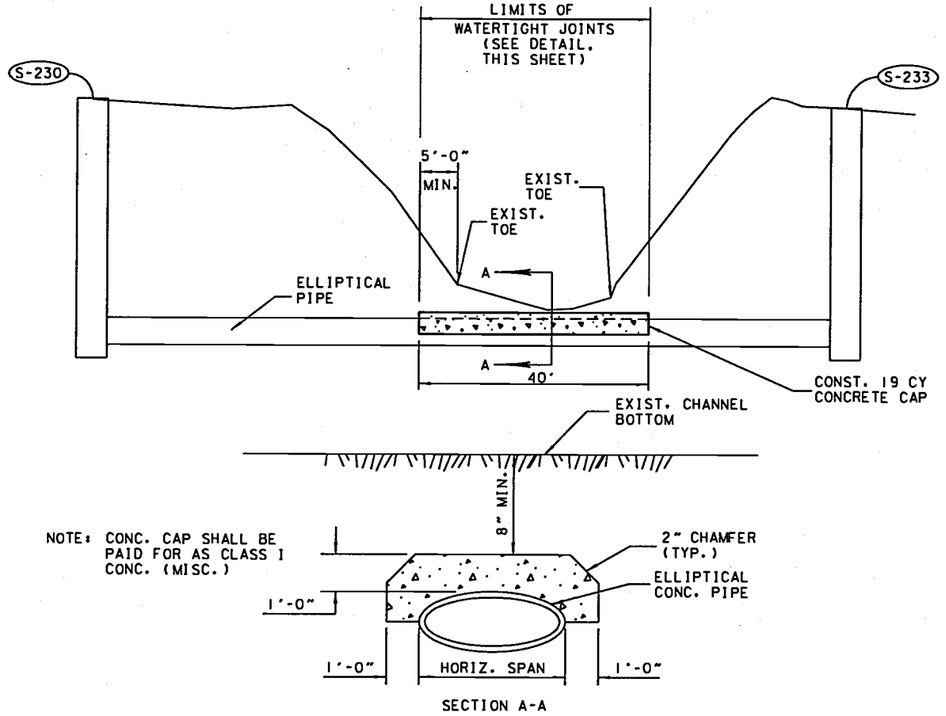
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POND	TREATMENT EL. (NGVD)	CWL EL (NGVD)	POND BOTTOM EL. (NGVD)	DIMENSION A	DIMENSION B	DIMENSION C	LINER IMPERMEABLE PVC (40 MIL)
3B	84.40	83.00	75.00	9'-5"	18'-10"	21'-1"	1,564 SY
4	75.60	74.00	65.00	10'-6"	53'-0"	54'-0"	7,184 SY
6	85.00	82.00	71.00	13'-11"	27'-10"	31'-1"	2,265 SY

NOTE: LINER SHOWN ABOVE IS FOR 2:1 AND 5:1 SIDE SLOPED CONDITIONS.

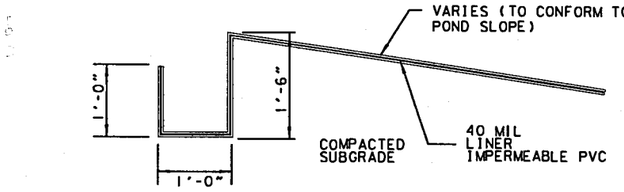
POND LINING DETAILS POND '3B', '4' & '6'
N.T.S



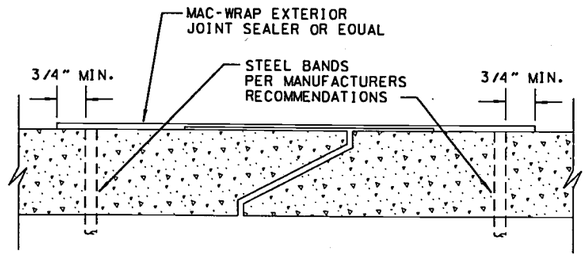
NOTE: CONC. CAP SHALL BE PAID FOR AS CLASS I CONC. (MISC.)

SECTION A-A

TYPICAL PIPE CONC. CAP FOR CHANNEL CROSSING
N.T.S



DETAIL "A"
N.T.S

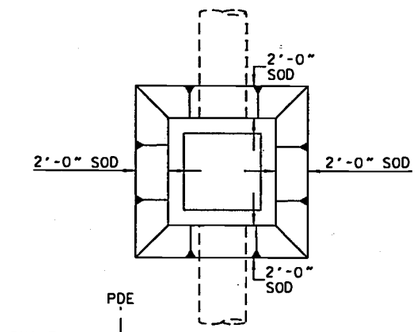


TYPICAL WATERTIGHT JOINT DETAIL
N.T.S

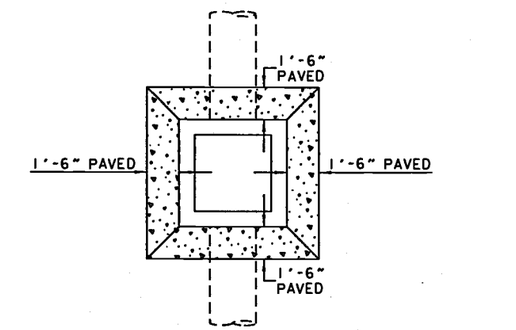
POND LINING NOTES

1. PRIOR TO LINER INSTALLATION, THE EXPOSED SUBGRADE SHALL BE SCORED TO A DEPTH OF AT LEAST SIX (6) INCHES AND COMPACTED TO 95% OF STANDARD PROCTOR (ASTM D 698), MAXIMUM LABORATORY DRY DENSITY. WEAK OR COMPRESSIBLE AREAS WHICH CANNOT BE SATISFACTORILY COMPACTED SHALL BE REMOVED AND REPLACED WITH PROPERLY COMPACTED FILL.
2. ALL SURFACES TO BE LINED SHALL BE SMOOTH AND FREE OF ALL FOREIGN AND ORGANIC MATERIAL, SHARP OBJECTS OR DEBRIS OF ANY KIND.
3. THE ANCHOR TRENCH SHALL BE EXCAVATED TO THE LINE, GRADE AND WIDTH SHOWN ON THE CONSTRUCTION DRAWINGS. THE FIELD ENGINEER SHALL VERIFY THAT THE ANCHOR TRENCH HAS BEEN CONSTRUCTED ACCORDING TO THE CONSTRUCTION DRAWINGS.
4. THE ANCHOR TRENCH SHALL BE BACKFILLED AND COMPACTED BY THE CONTRACTOR AS APPROVED BY THE FIELD ENGINEER. TRENCH BACKFILL SHALL BE PLACED IN 6-INCH THICK LOOSE LIFTS AND COMPACTED BY WHEEL ROLLING WITH LIGHT, RUBBER-TIRED OR OTHER LIGHT COMPACTION EQUIPMENT.
5. ALL EARTHWORK ASSOCIATED WITH LINER INSTALLATION BELOW FINISH POND TEMPLATE GRADE SHALL BE INCLUDED IN THE BID UNIT PRICE FOR ITEM No. 514-72 IMPERMEABLE PVC LINER (40 MIL).

2/8/02



DITCH BOTTOM INLET SODDED CONDITION
N.T.S



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DITCH BOTTOM INLET PAVED CONDITION
N.T.S

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ORANGE COUNTY FLORIDA

PEC PROFESSIONAL ENGINEERING CONSULTANTS, INC. engineers planners surveyors

MISCELLANEOUS DRAINAGE DETAILS

Page 41 of 626

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SHEET NO. 9

105 / 95 / 85 / 75 / 65

89.94 89.68 89.94

24" PIPE S-66 80.54 80.54

24" PIPE

EXIST 30" PIPE GROUND LINE

PGL

30" PIPE S-68 80.26 80.26 S-69 80.15 80.15

AMETHYST LN.

S-71 80.40 S-72 80.10

24" PIPE S-79 81.00 81.00

TUROUOISE LN. W.

24" PIPE S-81 81.07 81.07 S-82 81.32 81.32

24" PIPE S-86 81.45 81.45 S-89 81.55 81.55

PARTRIDGE LN. E.

24" PIPE S-90 81.75

PARTRIDGE LN. W.

18" PIPE S-95 S-96 100-YR. DHW EL. 85.2

25-YR. DHW EL. 84.5

S-104 10-YR. DHW EL. 84.00

S-98 80.93

DBL. 54" PIPE

EXIST. DBL 54" RCP

18" PIPE S-105 79.08 77.58

36" PIPE S-113 77.80 77.80

36" PIPE S-116 78.05 78.05

36" PIPE S-119 78.25 78.25

36" PIPE S-121 78.37 78.37

36" PIPE S-123 78.41 78.41

36" PIPE S-125 78.46 78.46

HANGING MOSS RD.

36" PIPE S-126 78.55 78.55

30" PIPE PGL

EXIST GROUND LINE

30" PIPE S-136 78.79 78.79

30" PIPE S-139 78.92 78.92

30" PIPE S-141 S-144 79.03

30" PIPE 89.27

265 270 275 280 285 290 295

Scale : 1 Inch : 10 feet Vert.
1 Inch : 100 feet Horiz.

POND 3B DHW 25 EL = 85.58

JURISDICTIONAL WETLAND

WETLAND AREA NO. 5

LAKE CORRINE OUTFALL CANAL

PARTRIDGE LN. W.

POND 3A DHW 25 EL = 85.58

S-76 S-361 S-362 S-363 S-73

TUROUOISE LN. W.

S-100 S-94A S-95A S-101 S-102 S-103 S-109A S-109 S-110 S-111A S-111 S-112 S-114A S-114 S-117A S-117 S-115 S-118 S-120 S-122 S-124

FORSYTH RD.

S-127 S-128 S-129 S-130 S-131 S-132 S-133 S-134 S-135 S-136A S-137 S-137A S-138 S-140 S-142 S-142A S-143

HANGING MOSS RD.

S-65 S-67 S-70 S-74 S-85 S-88 S-93 S-94 S-66 S-68 S-69 S-71 S-72 S-75 S-75A S-77 S-79 S-81 S-82 S-83 S-86 S-89 S-90 S-95 S-96 S-97 S-99 S-98 S-99A S-104 S-105 S-106 S-107A S-107 S-113 S-116 S-119 S-121 S-123 S-125 S-126 S-136 S-139 S-141 S-144

JURISDICTIONAL WETLAND

WETLAND AREA NO. 5

TO POND 4

SEE SHEET 177

REVISIONS

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ORANGE COUNTY FLORIDA

PEC PROFESSIONAL ENGINEERING CONSULTANTS, INC. engineers planners surveyors

DRAINAGE MAP

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TO POND 3B SEE SHEET NO. 176

272

EXIST. INLET (TO REMAIN)

CONST. 13 L.F. OF 18" PIPE CONNECT TO EXISTING INLET

TURQUOISE LN. W.

R/W LINE

5' CONC. SIDEWALK

CURB AND GUTTER TYPE F

CONST. 44 L.F. OF 18" PIPE

CONST. 24" PIPE

CONST. 31 L.F. OF 24" PIPE

CONST. 54 L.F. OF 18" PIPE

STA. 73+10.65 ℄ SURVEY FORSYTH RD. STA. 549+00.00 ℄ SURVEY TURQUOISE LN. W.

STA. 73+11.11 ℄ CONST. FORSYTH RD. STA. 549+97.00 ℄ SURVEY TURQUOISE LN. E.

STA. 73+11.06 ℄ SURVEY FORSYTH RD. STA. 550+00.00 ℄ SURVEY TURQUOISE LN. E.

CONST. 62 L.F. OF 18" PIPE

CONST. 53 L.F. OF 18" PIPE

CONST. 119 L.F. OF 24" PIPE

CONST. 61 L.F. OF 24" PIPE

CONST. 36 L.F. OF 24" PIPE

CONST. 99 L.F. OF 24" PIPE

CONST. 54 L.F. OF 24" PIPE

CONST. 100 L.F. OF TYPE B FENCE

CONST. 31 L.F. OF 24" PIPE

CONST. 116.3 TN OF RUBBLE RIP-RAP (DITCH LINING)

JURISDICTIONAL WETLAND

PI STA. 276+40.91 ℄ CONST. Δ = 0°09'43" RT. NO CURVE

STA. 76+40.89, 3' LT., ℄ SURVEY PI STA. 76+40.88 ℄ SURVEY Δ=0°09'43" RT. NO CURVE

STA. 560+00.00 ℄ SURVEY PARTRIDGE LN. E.

CONST. 98 L.F. OF TYPE B FENCE

CONST. 25 L.F. OF 24" PIPE

CONST. 13 L.F. OF 54" PIPE

CONST. 77 L.F. OF 54" PIPE

CONST. 20 L.F. OF 54" PIPE

STA. 276+40.88 ℄ CONST. FORSYTH RD. STA. 559+97.00 ℄ SURVEY PARTRIDGE LN. E.

STA. 277+21.01 ℄ CONST. FORSYTH RD. STA. 570+03.00 ℄ SURVEY PARTRIDGE LN. W.

CONST. 42 L.F. OF 24" PIPE

CONST. 31 L.F. OF 18" PIPE

CONST. 83 L.F. OF 24" PIPE

CONST. 33 L.F. OF 18" PIPE

CONST. 41 L.F. OF 18" PIPE

CONST. 7 L.F. OF 18" PIPE

CONST. 18" PIPE

CONST. 48 L.F. OF 18" PIPE

CONST. 24" PIPE

CONST. 54" PIPE

CONST. 18" PIPE

CONST. 24" PIPE

CONST. 18" PIPE

CONST. 24" PIPE

CONST. 24" PIPE

CONST. 24" PIPE

CONST. 24" PIPE

CONST. 24" PIPE

CONST. 18" PIPE

CONST. 18" PIPE

CONST. 24" PIPE

CONST. 24" PIPE

CONST. 54" PIPE

CONST. 18" PIPE

CONST. 18" PIPE

CONST. 18" PIPE

CONST. 24" PIPE

CONST. 24" PIPE

CONST. 24" PIPE

CONST. 24" PIPE

CONST. 24

278 279 280 281 282 283 284

℄ PARTRIDGE LN. WEST
STA. 77+20.98 FORSYTH RD.
STA. 570+00 PARTRIDGE LN. WEST
N8D FND
LB+3556
1 STY METAL BUSINESS
T.C.E.
R/W LINE
CONST. 290 L.F. OF 18" PIPE
5' CONC. SIDEWALK
CURB AND GUTTER TYPE "F"
6" FM
WATER VALVE
WATER METER
STA. 279+38.92
℄ CONST. FORSYTH ROAD
STA. 460+00.00
℄ CONST. POND 4
℄ CONST. 79
℄ SURVEY
88.50
+91.64 20.00' RT
89° 48' 49"
88.19
CURB AND GUTTER TYPE F
5' CONC. SIDEWALK
25'R
35'R
+31.88 20.00' RT
R/W LINE WOOD SIGN
STA. 79+38.88
℄ SURVEY FORSYTH ROAD
STA. 460+03.00
℄ CONST. POND 4
+55.15 11.00'RT
TYPE B CURB
+74.14 21.71'RT
+74.20 Ln.00'RT
CONST. 188 LF OF 18" PIPE
℄ CONST. POND 4
4.5'R
+08.69 21.94'RT
+08.76 11.00'RT
TYPE B CURB
TO POND 4 (SEE SHEET 177)
℄ 20' D/W +47
℄ 30' D/W +15
℄ 25' D/W +97
℄ 20' D/W +17
℄ 27' D/W +62
℄ 24' D/W +96
ASPHALT DRIVE
6' C.L. FENCE
6" PVC WM
P.D.E.
CONST. 7 L.F. OF 18" PIPE
S-111A
S-111
S-112
S-113
S-114A
S-114
S-115
S-116
S-105
METAL SIGN BASE
ELECT J BOX
CONST. 246 L.F. OF 18" PIPE
CONST. 18" PIPE
88.50 CONST. 44 L.F. OF 18" PIPE
+83.64 20.00'RT
CONST. 108 L.F. OF 36" PIPE
BRICK PLANTER
CB VALVE BOX
+65.61 11.00'LT
+54.85 11.00'LT
+80.62 27.25'LT
CONST. 267 L.F. OF 36" PIPE
15'R
+01.80 27.12'LT
+16.79 11.00'LT
N 89° 37' 27" E
N 0° 33' 44" W
CONST. 244 L.F. OF 36" PIPE
CONST. 44 L.F. OF 18" PIPE
CURB AND GUITER TYPE F
CONST. 222 L.F. OF 36" PIPE
CONC. SLAB
SEPTIC MOUND
METAL SIGN
ASPHALT PARKING LOT
B-78 B-80 B-82
HA-9/TW-3 HA-10 HA-P2
BM NO. 82
BOX CUT IN SOUTH CURB
STA. 82+47, 95' LT.
EL. 90.07
EXIST. GROUND LINE
P.G.L.
(+)0.340%
0.00%
END SPECIAL DITCH LT.
STA. 279+10
FL. EL. 86.20
18" PIPE
FL.EL. 84.45
FL.EL. 85.30
36" PIPE
CONST. 18" PIPE
FL.EL. 79.08
FL.EL. 77.58
CONST. 36" PIPE
FL.EL. 77.80
FL.EL. 77.80
CONST. 36" PIPE
FL.EL. 78.05
FL.EL. 78.05
CONST. 36" PIPE
FROM S-104
FROM S-119
88.28
88.18
90.32
90.30
90 88 86 84 82 80 78 76

Scale : 1 inch = 2 feet Vert.
1 inch = 20 feet Horiz.

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

ORANGE COUNTY FLORIDA

PEC
PROFESSIONAL ENGINEERING CONSULTANTS, INC.
engineers planners surveyors

PLAN / PROFILE
278+00 to 284+00

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284 285 286 287 288 289 290

N80°-125.0'-I.R. 33°18'55" 125.0'-I.R. 132°43'15" 140.0'-140.0'-N80° I.R.

℄ HANGING MOSS RD.

STA. 89+41.88 FORSYTH RD.
STA. 580+00 HANGING MOSS RD.
N80 FND ⌀B=3556

N 00°33'44" W ℄ SURVEY

I.R. 150.00' I.R. 214°31'20" N80° 56°19'00" 140.00' I.R.

P.O.T. STA. 90+00.00

20'

+26.90
15.00' (RT.)

CONST. 125 L.F. OF 18" PIPE

STA. 284+41.89 ℄ CONST. FORSYTH RD. • STA. 580+03.00 ℄ SURVEY HANGING MOSS RD.

15' 21'

MATCHLINE , SEE SHEET NO. 39

HANGING MOSS RD. 580

88.80 ℄ SURVEY 89.18 50'R 89.06 50'R

8" PVC F.M. 8" PVC W.M. UPS BOX MAIL BOX SEWER VALVE

1 STY METAL BUS

6' CL FENCE

CONST. 7 L.F. OF 18" PIPE (S-117A)

1 STY CB BUS

CONST. 213 L.F. OF 18" PIPE

P.D.E. (S-117)

CONC. PARKING LOT

℄ 30' D/W +59

R/W LINE

5' CONC. SIDEWALK

CURB AND GUTTER TYPE F

6" FM (S-118) HA-14 HA-15 TW-4 2" DH

12" AC WM BT (406PR) (S-120) (S-122) (S-124)

CONST. 39 L.F. OF 18" PIPE

℄ 24' D/W +69

T.C.E.

ASPHALT DRIVE

MAILBOX PAD MAILBOX

R/W LINE

5' CONC. SIDEWALK

BRICK SIGN

CONST. 68 L.F. OF 18" PIPE

+76.48
20.00' (LT.)

89.32

90°20'28"

℄ CONST.

℄ SURVEY

N 0° 33' 44" W

CONST. 44 L.F. OF 18" PIPE

CONST. 44 L.F. OF 18" PIPE

CONST. 62 L.F. OF 36" PIPE

CONST. 114 L.F. OF 36" PIPE

CURB AND GUTTER TYPE F (S-119) (S-121) (S-123) (S-125) (S-126)

5' CONC. SIDEWALK

CONC. SLAB ELEC. J-BOX

℄ 30' D/W +31

CONC. DRIVE

R/W LINE

CONST. 36" PIPE

WOOD SIGN

MAILBOX

CONC. SPILLWAY

CONC. PARKING LOT

1 STY CB BUS

MEMORY LN.

℄ 25' D/W +39

CONC. DRIVE

CONST. 156 L.F. OF 36" PIPE

CONST. 44 L.F. OF 36" PIPE

WOOD SIGN

CONC. POST

CONC. APRON

℄ 12' D/W +51

1 STY CB BUS

WOOD SIGN

℄ 12' D/W +86

DIRT DRIVE

R/W LINE

DIRT PARKING AREA

8" PVC W.M.

8" PVC F.M.

4' CL FENCE

DIRT DRIVE

CONST. 302 L.F. OF 30" PIPE

MATCHLINE, SEE SHEET NO. 40

1 STY CB BUS

STA. 89+41.89 ℄ SURVEY FORSYTH RD. • STA. 580+00.00 ℄ SURVEY HANGING MOSS RD.

BM NO. 86
4X4 CM WITH DISK
2' +/- S. OF POWER POLE
STA. 86+24.5, 131.4' RT.
EL. 90.11

BM NO. 90
BOX CUT IN S.E. CORNER OF WALK
STA 90+73, 96.5' LT.
EL 90.87

90.32 PVI(+50.00) EL 90.49 (+)0.340% (-)0.407% EXIST. GROUND LINE (-)0.407% (-)0.407% (+)0.300% (+)0.300% PVI(+40.00) EL 89.31 EXIST. GROUND LINE 90.09

P.G.L. 18" PIPE FL.EL. 85.50 P.G.L. 18" PIPE FL.EL. 84.60 18" PIPE FL.EL. 83.00

TO S-116 FROM S-136

CONST. 36" PIPE CONST. 36" PIPE CONST. 36" PIPE CONST. 36" PIPE CONST. 36" PIPE CONST. 30" PIPE

FL.EL. 78.25 FL.EL. 78.25 FL.EL. 78.37 FL.EL. 78.37 FL.EL. 78.41 FL.EL. 78.41 FL.EL. 78.46 FL.EL. 78.46 FL.EL. 78.55 FL.EL. 78.55

90.30 90.01

Scale : 1 Inch = 2 feet Vert.
1 Inch = 20 feet Horiz.

92 90 88 86 84 82 80 78

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

ORANGE COUNTY FLORIDA

PEC PROFESSIONAL ENGINEERING CONSULTANTS, INC. engineers planners surveyors

PLAN / PROFILE
284+00 to 290+00

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BEGIN CONSTRUCTION
CONNECT TO EXIST. PAVT.
STA. 574+80.00
℄ SURVEY
HANGING MOSS ROAD

STA. 574+00.00
HANGING MOSS RD.
PK NAIL FND

℄ HANGING MOSS RD.
N 89°05'48" E

281°03'05" / 81°50'10" / N80 / 50.0' / I.R.

R/W LINE

ASPHALT DRIVE

WATER VALVE

ASPHALT ROAD

12'

15'

℄ 33' D/W

+80.00
12.35' (LT)

+08

CONST. 30 L.F. OF 18" PIPE

S-128

S-129

8" PVC FM

8" PVC WM

5' CONC. SIDEWALK

CURB AND GUTTER TYPE F

℄ 26' D/W

+22

+00.00
21.00' (LT)

WATER METER

℄ 34' D/W

+82

EXIST. TREES (TO REMAIN)

20'

N

CONST. 61 L.F. OF 18" PIPE

+15.43
21.00' (LT.)

88.98

S-132

S-134

574 575 576 577 578 579

CONST. 39 L.F. OF 18" PIPE

CONST. 44 L.F. OF 18" PIPE

℄ SURVEY

PGL

℄ SURVEY N 89° 05' 48" E

CURB AND GUTTER TYPE F

S-127

S-130

88.93 CONST. 236 L.F. OF 18" PIPE

89.26

89.08 CURB AND GUTTER TYPE F

CONST. 61 L.F. OF 18" PIPE

S-133

S-131

ASPHALT DRIVE

CONC. S/W (TO REMAIN)

+40.91
15.00' (RT)

WATER VALVE

TYPE D CURB

89.25

+99.68
53.25' (RT)

35' R

12" AC WM

5' CONC. SIDEWALK

+58.70
15.00' (RT)

+70
31.00' (RT)

+00
24.50' (RT)

12" RCP

+80.00
15.00' (RT)

R/W LINE

CONST. 33 L.F. OF 18" PIPE

CONC. SIDEWALK

89.62

89.60

5' R

VENTURE CIRCLE

+23.70
48.80' (RT)

CONST. 18" PIPE

CONC. PARKING LOT

+75.70
50.21' (RT)

+75.58
71.21' (RT)

ASPHALT DRIVE

+23.58
71.49' (RT)

1- STY METAL BLDG

CONC. SPILLWAY

END CONSTRUCTION CONNECT TO EXIST. PAVT.

MATCHLINE SEE SHEET NO. 38

21'

15'

N80 / 125.0' I.R. / 125.0' / 33°18'55" / 132°43'15" / 140.0' / 140.0' / N80 / I.R.

℄ HANGING MOSS RD.
N 89°05'48" E

STA. 89+41.88
FORSYTH RD.
STA. 580+00
HANGING MOSS RD.
N80 FND
L8-3556

BM NO. 1874
TOP OF NAIL
STA. 574+00, 0.00 FT.
EL. 88.72

BM NO. 1877
TOP OF NAIL
STA. 577+00, 0.00 FT.
EL. 89.77

BM NO. 90
BOX CUT IN S.E. CORNER OF WALK
STA. 90+73, 96.5 LT. ℄ SURVEY FORSYTH.
EL. 90.87

94 92 90 88 86 84 82 80

40' V.C.

PVC 75+40 88.84

88.82

PVT 75+80 88.89

PVI(+00.00) EL 89.56

60' V.C.

PVC 78+80 89.02

89.00

89.06

PVT 79+40 89.19

60' V.C.

PVC 76+70 89.39

89.44

89.50

89.49

PVT 77+30 89.47

EXIST. GROUND LINE

S-127

S-130

S-131

S-133

(-)0.300%

(+)0.557%

(+)0.557%

(-)0.300%

(-)0.300%

(+)0.881%

PVI(-60.00) EL 88.78

PVI(+10.00) EL 88.95

89.06

18" PIPE

CONST. 18" PIPE

FL.EL. 84.35

FL.EL. 84.35

FL.EL. 84.25

FL.EL. 84.25

CONST. 18" PIPE

FL.EL. 83.75

FL.EL. 83.75

18" PIPE

FL.EL. 84.60

CONST. 18" PIPE

CONST. 18" PIPE

TO S-126

FL.EL. 83.60

FL.EL. 83.60

88.99

88.96

90.26

575 576 577 578 579

Scale : 1 Inch = 2 feet Vert.
1 Inch = 20 feet Horiz.

HANGING MOSS RD.

PLAN / PROFILE
574+00 to 579+20

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

ORANGE COUNTY
FLORIDA

PEC
PROFESSIONAL ENGINEERING CONSULTANTS, INC.
engineers planners surveyors

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290 291 292 293 294 295 296

EXIST. TREES (TO REMAIN)
3 MAIL BOXES
P.O.T. STA. 90+00.00
ASPHALT PARKING LOT
R/W LINE
5' CONC. SIDEWALK
CURB AND GUTTER TYPE F
32.00' (LT)
12.41' OF (OH/CATV)
T2" AC WM
CONST. 76 L.F. OF 18" PIPE
CONST. 56 L.F. OF 18" PIPE
CONST. 30" PIPE
CONST. 167 L.F. OF 30" PIPE
CONST. 182 L.F. OF 24" PIPE
CONST. 7 L.F. OF 18" PIPE
CONST. 44 L.F. OF 18" PIPE
CONST. 147 L.F. OF 30" PIPE
CONST. 47 L.F. OF 18" PIPE
CONST. 44 L.F. OF 18" PIPE
CONST. 47 L.F. OF 30" PIPE
P.D.E.
CONC. SPILL WAY
ELECT TRANSFORMER
WOOD SIGN
METAL SIGN
WATER METER
WATER VALVE
SEPTIC MH
CB/WOOD SIGN
WATER BACK FLOW PREVENTER
2 MAILBOXES ON CONC. PADS
3 MAIL BOXES
MAILBOXES ON PAD
CONC. DRIVE
ASPHALT DRIVE
METAL POSTS
W/ CABLE
CABLE POWER SUPPLY UNIT
B-92
B-94
B-96
S-135 S-136 S-136A S-137 S-137A S-138 S-139 S-140 S-141 S-142 S-142A S-143 S-144
℄ CONST.
℄ SURVEY
N 0° 33' 44" W
MATCHLINE, SEE SHEET NO. 38

BM NO. 90
BOX CUT IN S.E. CORNER OF WALK
STA. 90+73, 96.5' LT.
EL 90.87

BM NO. 96
4X4 CM WITH DISK
STA. 96+33, 123' RT.
EL. 88.12

PVI (-40.00)
EL 90.21
P.G.L.
(+)0.300%
(-)0.300%
EXIST. GROUND LINE
0.00%
0.200%
BEGIN SPECIAL DITCH LT. STA. 293+30 FL. EL. 87.50
END SPECIAL DITCH LT. STA. 294+20 FL. EL. 87.50
BEGIN SPECIAL DITCH LT. STA. 294+90 FL. EL. 87.22
END SPECIAL DITCH LT. STA. 296+00 FL. EL. 87.00
18" PIPE
FL.EL. 82.25
FL.EL. 82.45
FL.EL. 82.10
FROM S-145
TO S-126
CONST. 30" PIPE
FL.EL. 78.79
FL.EL. 78.92
FL.EL. 79.03
FL.EL. 79.07
88.53
89.27
90.09
90.01
Scale : 1 Inch = 2 feet Vert.
1 Inch = 20 feet Horiz.

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

ORANGE COUNTY
FLORIDA

PEC
PROFESSIONAL ENGINEERING CONSULTANTS, INC.
engineers planners surveyors

PLAN / PROFILE
290+00 to 296+00

05/6/01 PM
12/21/2001
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SHEET NO. 41

296 297 298 299 300 301 302

CONST. 68 L.F. OF 24" PIPE
CONST. 7 L.F. OF 18" PIPE
ASPHALT DRIVE
METAL POLE FOR BILLBOARD
FENCE
℄ 24' D/W +43
CONST. 7 L.F. OF 18" PIPE
S-142A
P.D.E.
S-142
S-146A
S-146
BT-1400RR
R/W LINE
5' CONC. SIDEWALK
S-143
WATER METER
AC WP
S-147
CONST. 77 L.F. OF 18" PIPE
CURB AND GUTTER TYPE F
CONST. 276 L.F. OF 24" PIPE
℄ 24' D/W +23
S-149A
S-149
HHH
TELE
CONST. 7 L.F. OF 18" PIPE
END P.D.E., BEGIN T.C.E.
℄ 30' D/W +09
CONST. 187 L.F. OF 24" PIPE
SIGN
P.I. STA. 102+93.54
T.C.E.
CONST. 6" RDADWAY UNDERDRAIN
P.D.E.
S-150A
S-150
℄ 34' D/W +62
CONST. 107 L.F. OF 30" PIPE
S-151
CONST. 44 L.F. OF 18" PIPE
℄ CONST.
B SURVEY
N 0° 33' 44" W
CURB AND GUTTER TYPE F
CONST. 18" PIPE
S-145
B-96
S-144
5' CONC. SIDEWALK
CONST. 61 L.F. OF 30" PIPE
R/W LINE
S-148
B-98
B-100
CONST. 232 L.F. OF 30" PIPE
CONST. 217 L.F. OF 30" PIPE
S-152
CONST. 6" ROADWAY UNDERDRAIN
CONST. 197 L.F. OF 30" PIPE
METAL SIGN
℄ 50' D/W +68
ELECT J BOX
SEPTIC MH
ASPHALT DRIVE
WOOD/STONE SIGN
CONC. PAD
℄ 40' D/W +63
WOOD MAILBOX ENCLOSURE
WATER METER
MAILBOX ON CONC. PAD
ASPHALT PARKING AREA
℄ 26' D/W +64
CBI SIGN
METAL POSTS W/ CABLE
ASPHALT PARKING LOT

BM NO. 96
4X4 CM WITH DISK
STA. 96+33, 123' RT.
EL. 88.12

BM NO. 101
PK NAIL SET IN POWER POLE NO. 814947
STA. 101+28, 64' RT.
EL 88.23

EXIST. GROUND LINE
P.G.L.
(+)0.300%
(+)0.100%
(-)0.463%
(-)0.500%
(-)0.60%
PVI(+00.00) EL 89.43
PVI(+DD.00) EL 88.53
BEGIN SPECIAL DITCH LT. STA. 296+71 FL. EL. 87.42
END SPECIAL DITCH LT. STA. 299+00 FL. EL. 87.65
BEGIN SPECIAL DITCH LT. STA. 300+36 FL. EL. 87.42
BEGIN SPECIAL DITCH LT. STA. 301+90 FL. EL. 86.76
END SPECIAL DITCH LT. STA. 301+40 FL. EL. 86.90
18" PIPE
FL.EL. 82.10
CONST. 30" PIPE
FL.EL. 79.07
FL.EL. 79.12
FL.EL. 79.12
FL.EL. 79.30
FL.EL. 79.30
FL.EL. 81.55
FL.EL. 79.47
FL.EL. 79.47
FROM S-155
TO S-141
88.53
89.27
88.20
88.04

Scale : 1 Inch = 2 feet Vert.
1 Inch = 20 feet Horiz.

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

ORANGE COUNTY FLORIDA

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PROFESSIONAL ENGINEERING CONSULTANTS, INC.
engineers planners surveyors

PLAN / PROFILE
296+00 to 302+00

05/6/09 PM
12/21/2001
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SHEET NO. 42

302 303 304 305 306 307 308

20'

FOUND R.R. SPIKE

N 00°33'44" W ℄ SURVEY

N 00°44'30" W ℄ SURVEY

PK NAIL SET STA. 108+00

P.I. STA. 102+93.54

Δ = 0°10'46"

P.I. STA. 302+93.57

Δ = 0°10'46"

3' LT. ℄ SURVEY

CONST. 7 L.F. OF 18" PIPE

CONST. 30" PIPE

P.D.E.

T.C.E.

S-153A

S-153

R/W LINE

5' CONC. SIDEWALK

℄ PROPOSED

℄ 102

BT +408PR

CURB AND GUTTER TYPE F

102 3 N 0° 33' 44" W 103 ℄ CONST. 104 N 0° 44' 30" W 105 106 107 3 108

N 0° 33' 44" W ℄ SURVEY

20'

S-154

TYPE D CURB

CONST. 127 L.F. OF 30" PIPE

SEPTIC MOUTH

WOOD SIGN

6' CONC. SIDEWALK

WATER METER

S-155A

S-155B

CONST. 44 L.F. OF 18" PIPE

SANITARY SEWER LINE

12" PVC FM

S-155

CONST. 30" PIPE

R/W LINE

SIGN

ASPHALT DRIVE

FENCE

CONST. 186 L.F. OF 30" PIPE

SEWER VALVE

CONST. 36 L.F. OF 30" PIPE

S-158

S-160

WATER VALVE

WATER METER

ELECT J BOX

WATER VALVE

CONC./METAL SIGN

FH

CONST. 6" ROADWAY UNDERDRAIN

CONST. 67 L.F. OF 30" PIPE

S-162

CONST. 227 L.F. OF 24" PIPE

T.C.E.

SIGN

BULLOCK POSTS

ASPHALT DRIVE

CONC. PARKING LOT

6' CL FENCE

ELECT BOX & LIGHT

CONC. DRIVE

CONST. 24 L.F. OF 30" PIPE

ASPHALT DRIVE

CONST. 99 L.F. OF 30" PIPE

CONST. 6" ROADWAY UNDERDRAIN

METER VAULT

WET WELL

METER CABINET

SAN MH

6'-0" FENCE

CONTROL BOX

CONC. DRIVE

SAN MH

WOOD SIGN

WATER METER

S-156A

S-156

P.D.E.

CONST. 7 L.F. OF 18" PIPE

CONST. 37 L.F. OF 18" PIPE

CONST. 55 L.F. OF 18" PIPE

S-159

JURISDICTIONAL WETLAND

CONST. 44 L.F. OF 18" PIPE

S-161

CONST. 187 L.F. OF 30" PIPE

CONST. 7 L.F. OF 18" PIPE

S-163A

S-163

P.D.E.

ASPHALT DRIVE

CB/METAL SIGN

CONST. 160 L.F. OF 30" PIPE

CONST. 6" UNDERDRAIN CLEANOUT +00, 23.00'LT

R/W LINE

5' CONC. SIDEWALK

℄ PROPOSED

CURB AND GUTTER TYPE F

JURISDICTIONAL WETLAND

℄ CONST.

℄ SURVEY

12" PVC FM

MARKER POST

CONST. 6" UNDERDRAIN CLEANOUT +00, 25.00'RT

℄ 24' D/W +43

℄ 30' D/W +70

℄ 36' D/W +37

℄ 40' D/W +58

℄ 22' D/W +59

BM NO. 105
BOX CUT ON W. END OF WALL
STA. 105+94, 145' RT.
EL. 88.84

EXIST. GROUND LINE

(-)0.463%

(-)0.600%

(-)0.600%

P.G.L.

OPI LT. +50
FL. EL. 86.40

END SPECIAL DITCH LT.
STA. 302+85
FL. EL. 86.61

18" PIPE
FL.EL. 82.00

CONST. 30" PIPE

FL.EL. 79.57

FL.EL. 79.57

TO S-152

CONST. 30" PIPE

FL.EL. 79.72

FL.EL. 79.72

PVI (+50.00)
EL 86.42

(-)0.463%

(+)0.300%

18" PIPE
FL.EL. 81.75

CONST. 30" PIPE

FL.EL. 79.75

FL.EL. 79.75

CONST. 30" PIPE

FL.EL. 79.82

FL.EL. 79.82

(+)0.300%

EXIST. GROUND LINE

P.G.L.

CONST. 24" PIPE

FROM S-166

88.04

88.20

87.17

88
86
84
82
80
78
76

Scale : 1 inch = 2 feet Vert.
1 inch = 20 feet Horiz.

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

ORANGE COUNTY
FLORIDA

PEC
PROFESSIONAL ENGINEERING CONSULTANTS, INC.
engineers planners surveyors

PLAN / PROFILE
302+00 to 308+00

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308 309 310 311 312 313 314

STA. 108+00

P.O.T. STA. 113+00.00

2" DUCT W/COMM. CABLE, 2'-3' DEEP OWNED BY (WHEELED COACH)

ELECT J BOX

SEPTIC MH

CONST. 30" PIPE

P.D.E. S-164A S-164

ASPHALT PARKING LOT

℄ 32' D/W +63

T.C.E.

CONST. 7 L.F. OF 18" PIPE

R/W LINE

SIGN

WATER METER

6' CONC. SIDEWALK

CONST. 192 L.F. OF 30" PIPE

WATER CABLE POWER VALVE SUPPLY UNIT

P.D.E. S-167A S-167

CONST. 7 L.F. OF 18" PIPE

ASPHALT DRIVE

℄ 24' D/W +89

CONST. 139 L.F. OF 36" PIPE

P.D.E. S-170A S-170

CONST. 7 L.F. OF 18" PIPE

CONST. 16" UNDERDRAIN CLEANOUT +00, 23.00' LT

WOOD SIGN

BULLOCK POSTS

WATER VALVES

WATER METERS

ASPHALT DRIVE

℄ 64' D/W +77

6' CL FENCE

CONST. 4 L.F. OF 18" RCP

CONST. CONC. COLLAR INDEX NO. 280

CONST. 197 L.F. OF 36" PIPE

CONST. 6" ROADWAY UNDERDRAIN

CONST. 39 L.F. OF 18" PIPE

METAL SIGN

18" RCP (TO REMAIN)

S-175 S-174 S-172

CURB AND GUTTER TYPE F

20'

B-108

JURISDICTIONAL WETLAND

108 109 110 111 112 113 114

℄ CONST.

N 0° 44' 30" W

℄ SURVEY

CONST. 47 L.F. OF 18" PIPE

S-168

S-166 CURB AND GUTTER TYPE F

S-169

B-110

B-112

S-171

CONST. 44 L.F. OF 18" PIPE

S-173

S-176

5' CONC. SIDEWALK

WATER METER

WATER VALVE

12" PVC FM

2" H.P. GM

CONST. 24" PIPE

R/W LINE

BULLOCK POSTS

CONST. 204 L.F. OF 24" PIPE

CONST. 199 L.F. OF 24" PIPE

CONST. 6" UNDERDRAIN CLEANOUT +00, 25.00' RT

CONST. 6" ROADWAY UNDERDRAIN

CONST. 88 L.F. OF 24" PIPE

CONST. 46 L.F. OF 18" PIPE

℄ 30' D/W +16

ASPHALT PARKING LOT

CONC. FILLED POSTS W/ CABLE

℄ 36' D/W +83

ASPHALT DRIVE

METAL SIGN

WATER METER

BULLOCK POSTS

WATER VALVE

℄ 36' D/W +10

ASPHALT DRIVE

℄ 24' D/W +06

ASPHALT PARKING AREA

6' CL FENCE

1 STY CB RES

BM NO. 109
PK NAIL IN POWER POLE
STA. 109+54, 79' RT.
EL. 88.98

BEGIN SPECIAL DITCH LT. STA. 309+30 FL. EL. 85.84

END SPECIAL DITCH LT. STA. 310+58 FL. EL. 85.20

BEGIN SPECIAL DITCH LT. STA. 311+10 FL. EL. 85.34

DPI LT +00 FL. EL. 84.80

END SPECIAL DITCH LT. STA. 312+35 FL. EL. 85.01

87.17

PVI (+50.00) EL 87.32

(+)0.300% (-)0.340% (-)0.500% (-)0.600% (+)0.600% (-)0.340%

EXIST. GROUND LINE

P.G.L.

S-166 S-169 S-171 S-173 S-176

18" PIPE

EXIST. 18" CMP

FL. EL. W. 83.87
FL. EL. E. 83.71

TO S-162

CONST. 24" PIPE

FL.EL. 80.05 FL.EL. 80.05

CONST. 24" PIPE

FL.EL. 81.95

FL.EL. 80.26 FL.EL. 80.26

CONST. 24" PIPE

FL.EL. 80.46 FL.EL. 80.46

CONST. 24" PIPE

CONST. 18" PIPE

FL.EL. 80.55 FL.EL. 80.75

FL.EL. 80.75 FL.EL. 81.00

FROM S-177

87.51

86.28

85.45

90 88 86 84 82 80 78 76

Scale : 1 inch = 2 feet Vert.
1 inch = 20 feet Horiz.

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

ORANGE COUNTY FLORIDA

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PLAN / PROFILE
308+00 to 314+00

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314 315 316 317 318 319 320

CONST. 64 L.F. OF 36" PIPE
CONST. 144 L.F. OF 36" PIPE
CONST. 7 L.F. OF 18" PIPE
CONST. 7 L.F. OF 18" PIPE
CONST. 6" ROADWAY UNDERDRAIN
CONST. 218 L.F. OF 24" PIPE
CONST. 7 L.F. OF 18" PIPE
CONST. 94 L.F. OF 18" PIPE
CONST. 59 L.F. OF 36" PIPE
CONST. 44 L.F. OF 18" PIPE
CONST. 196 L.F. OF 18" PIPE
CONST. 47 L.F. OF 18" PIPE
CONST. 61 L.F. OF 18" PIPE
CONST. 6" ROADWAY UNDERDRAIN
CONST. 116 L.F. OF 36" PIPE
CONST. 31 L.F. OF 18" PIPE
CONST. 44 L.F. OF 36" PIPE
CONST. 241 L.F. OF 36" PIPE

JURISDICTIONAL WETLAND
JURISDICTIONAL WETLAND
JURISDICTIONAL WETLAND
JURISDICTIONAL WETLAND

STA. 316+13.19 ℄ CONST. FORSYTH RD. STA 0+00.00 ℬ SURVEY & ℄ CONST. LATERAL DITCH

STA. 119+42.96 FORSYTH RD. STA. 590+00 GARDNER AVE. N&D FND LB-3556

STA. 319+42.96 ℄ CONST. FORSYTH RD. • STA. 589+97.00 ℬ SURVEY GARDNER ST.

BEGIN GRAVITY WALL STA. 318+20.00 29.50' (LT).

END GRAVITY WALL STA. 319+43.00 29.50' (LT.)

S-175 S-176 S-177 S-178 S-178A S-179 S-180 S-180A S-181 S-182 S-183 S-184 S-184A S-185 S-186 S-187 S-190

R/W LINE
5' CONC. SIDEWALK
CURB AND GUTTER TYPE F
℄ SURVEY
℄ CONST.
N 0° 44' 30" W
N 89° 21' 52" E
N 00°44'30" W ℄ SURVEY
P.O.B. STA. 113+00.00
P.O.E. STA. 120+98.38
N 89°21'12" E ℄ GARDNER ST.
BACK FLOW PREVENTER
WATER METER
WATER VALVE
FH
P.D.E.
WOOD SIGN
WOOD BULLOCK POSTS
FLAG POLE
GRAVEL DRIVE
ASPHALT DRIVE
MAILBOXES CONC. PAD
BILLBOARD
ASPHALT SPILLWAY
WOOD PLANTER
METAL SIGN
ELECT J BOX
SEPTIC MOUND
1 STY CB BUSINESS
1 STY WF BUSINESS
CONC. PARKING AREA
CONC. DRIVE
GARDNER ST.
B-116 B-118
12" PVC FM
24" RCP
18" RCP
15" RCP
24" CMP
12" AC WL
4" FM
6" FM
8" PVC FM
12" PVC FM
20' D/W +38
36' D/W +34
15' D/W +31
37' D/W +31
24' D/W +78
21' D/W +56
12' D/W +98
90°46'40"
90°05'42"
35' R
7.5'
20'
+95.89 20.00' (RT)
+89.89 20.00' (RT)
86.54
86.82

FOR SIDE STREET, SEE SHEET NO.67

TO POND 5 (SEE SHEET No. 178)

BM NO. 114
BOX CUT IN NORTH CURB
STA 114+51, 75.6' LT.
EL 86.53

BM NO. 119
BOX CUT IN FLAT CURB
STA. 119+31.5, 130' RT.
EL. 85.90

EXIST. GROUND LINE
P.G.L.
PVI(+00.00) EL 85.45
(+)0.300%
CONST. 18" PIPE
FL.EL. 81.00
FL.EL. 81.15
TO S-173
EXIST. 24" CMP
FL. EL. W. 82.88
FL. EL. E. UNKNOWN
EXIST. 18" RCP
FL. EL. W. 82.78
FL. EL. E. 82.41
36" PIPE
FL.EL. 79.75
18" PIPE
FL.EL. 81.75
FL.EL. 81.75
FL.EL. 81.35
CONST. 36" PIPE
FROM S-191
FL.EL. 78.76
FL.EL. 78.76
85.45
86.28
87.25
87.83

Scale : 1 inch = 2 feet Vert.
1 inch = 20 feet Horiz.

90 88 86 84 82 80 78 76

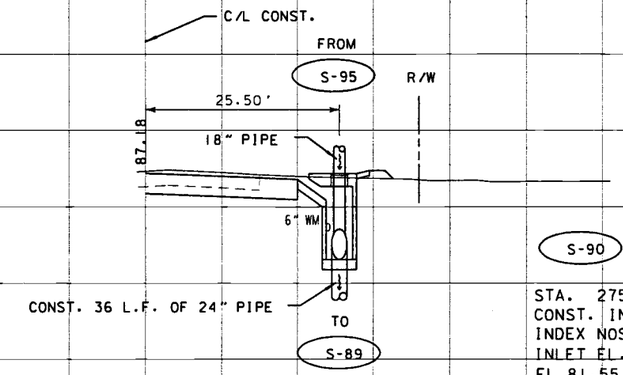
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ORANGE COUNTY FLORIDA

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PLAN / PROFILE 314+00 to 320+00

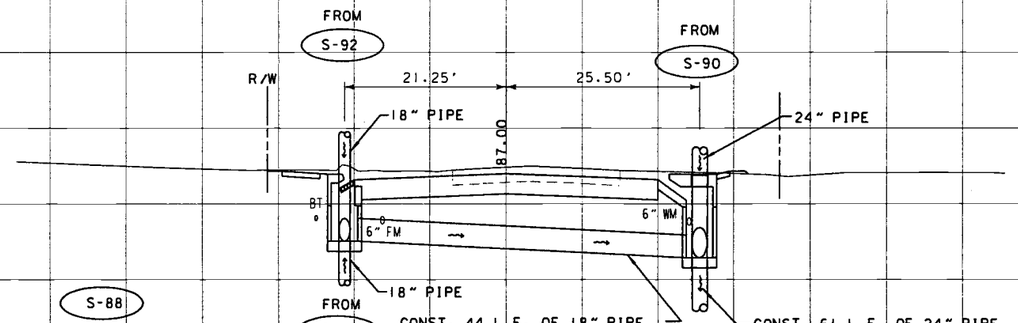
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S-90

STA. 275+20.00
CONST. INLET TYPE P-1
INDEX NOS. 200, 201, 210
INLET EL. 86.78
FL 81.55 AHD. & BK.

S-90
STA. 275+20.00



S-88

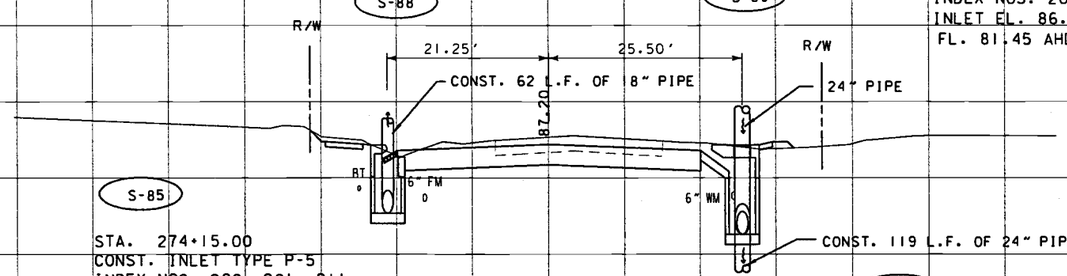
STA. 274+80.00
CONST. INLET TYPE P-6
INDEX NOS. 200, 201, 211
INLET EL. 86.80
FL 82.55 BK., AHD. & RT

S-89

STA. 274+80.00
CONST. INLET TYPE P-2
INDEX NOS. 200, 201, 210
INLET EL. 86.80
FL. 81.45 AHD. & BK., 81.45 LT.

S-89
STA. 274+80.00

S-88
STA. 274+80.00



S-85

STA. 274+15.00
CONST. INLET TYPE P-5
INDEX NOS. 200, 201, 211
INLET EL. 86.80
FL 82.70 AHD.

S-86

STA. 274+15.00
CONST. INLET TYPE P-1
INDEX NOS. 200, 201, 210
INLET EL. 86.80
FL 81.32 AHD. & BK.

S-87
OMITTED

S-86
STA. 274+15.00

S-85
STA. 274+15.00

Scale : 1 Inch = 5 feet Vert.
1 Inch = 10 feet Horiz.

C/L CONST.

S-84
OMITTED

REVISIONS

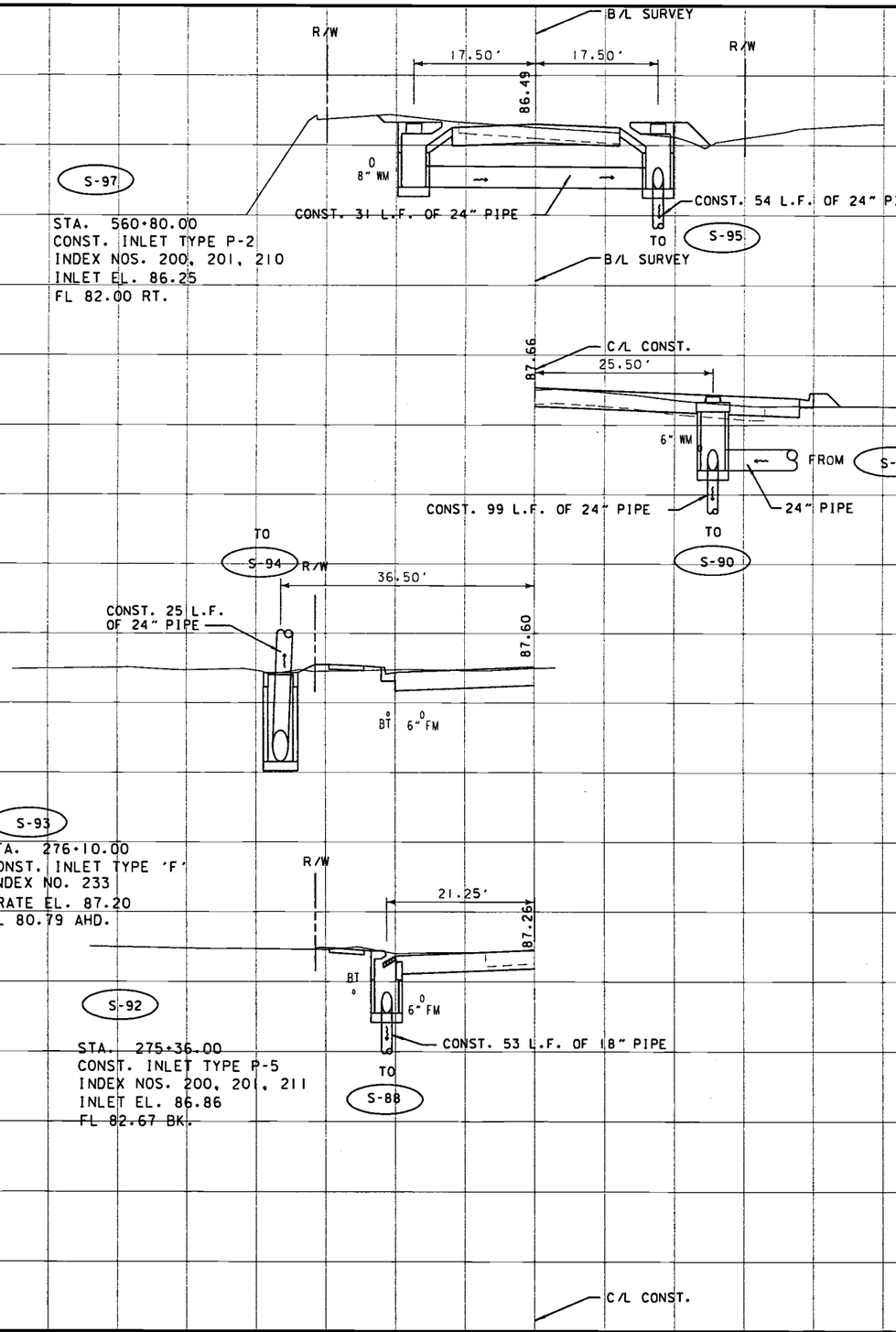
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ORANGE COUNTY
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DRAINAGE STRUCTURES

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S-97
STA. 560+80.00
CONST. INLET TYPE P-2
INDEX NOS. 200, 201, 210
INLET EL. 86.25
FL 82.00 RT.

S-96
STA. 560+80.00
CONST. INLET TYPE P-2
INDEX NOS. 200, 201, 210
INLET EL. 86.25
FL 81.90 BK. & LT.

S-95
STA. 276+23.00
CONST. MANHOLE TYPE P-7
INDEX NOS. 200, 201
RIM EL. 87.15
FL 81.75 BK. & RT.

S-93
STA. 276+10.00
CONST. INLET TYPE 'F'
INDEX NO. 233
GRATE EL. 87.20
FL 80.79 AHD.

S-92
STA. 275+36.00
CONST. INLET TYPE P-5
INDEX NOS. 200, 201, 211
INLET EL. 86.86
FL 82.67 BK.

S-97
STA. 560+80.00
PARTRIDGE LN. E

S-96
STA. 560+80.00
PARTRIDGE LN. E

S-95
STA. 276+23.00

S-93
STA. 276+10.00

S-92
STA. 275+36.00

S-91
OMITTED

Scale : 1 Inch = 5 feet Vert.
1 Inch = 10 feet Horiz.

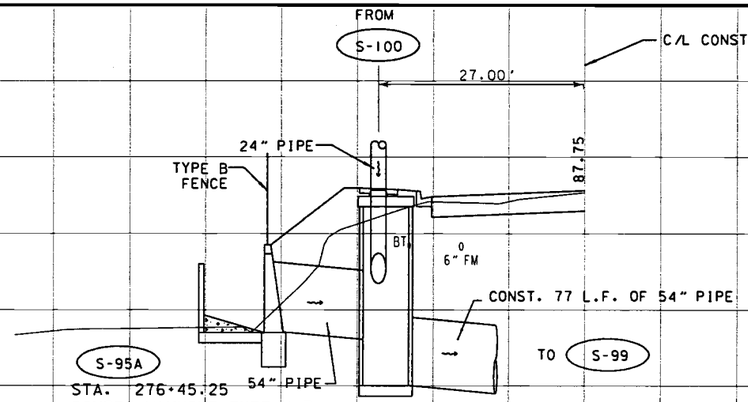
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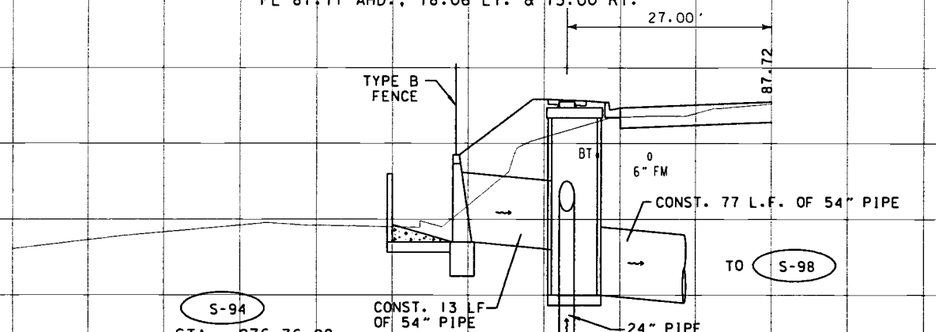
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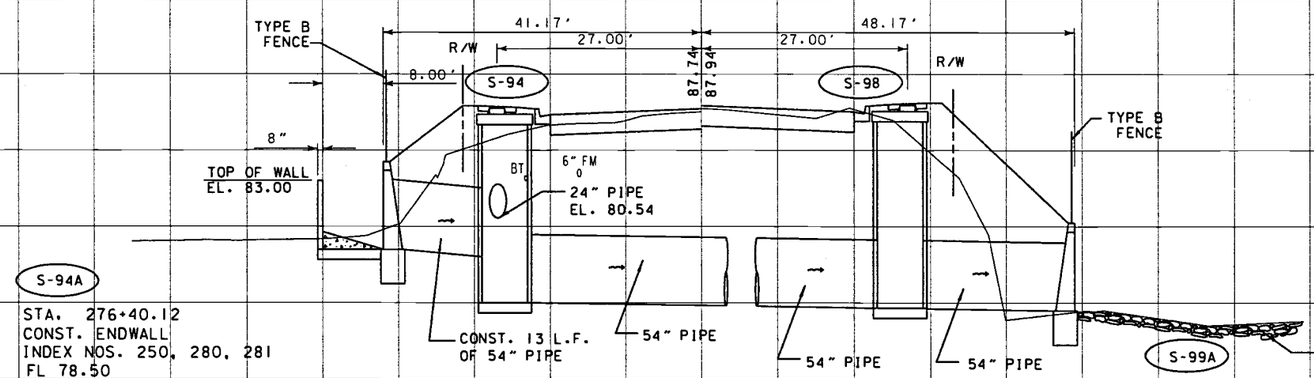
S-95A
STA. 276+45.25
CONST. MANHOLE TYPE J-7
INDEX NOS. 200, 201
RIM EL. 87.88
FL 81.71 AHD., 78.06 LT. & 75.00 RT.

S-95A
STA. 276+45.25



S-94
STA. 276+36.08
CONST. MANHOLE TYPE J-7
INDEX NOS. 200, 201
RIM EL. 87.85
FL 80.54 BK., 78.03 LT. & 75.00 RT.

S-94
STA. 276+36.08



S-94A
STA. 276+40.12
CONST. ENDWALL
INDEX NOS. 250, 280, 281
FL 78.50

S-99A
STA. 277+00.00
S-94A
STA. 276+40.12

S-99A
STA. 277+00.00
CONST. ENDWALL
INDEX NOS. 250, 280, 281
FL 74.50

Scale : 1 inch = 5 feet Vert.
1 inch = 10 feet Horiz.

C/L CONST.

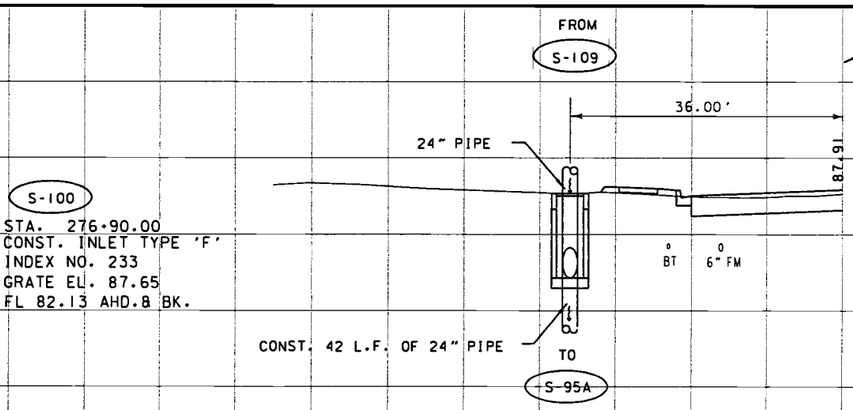
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ORANGE COUNTY
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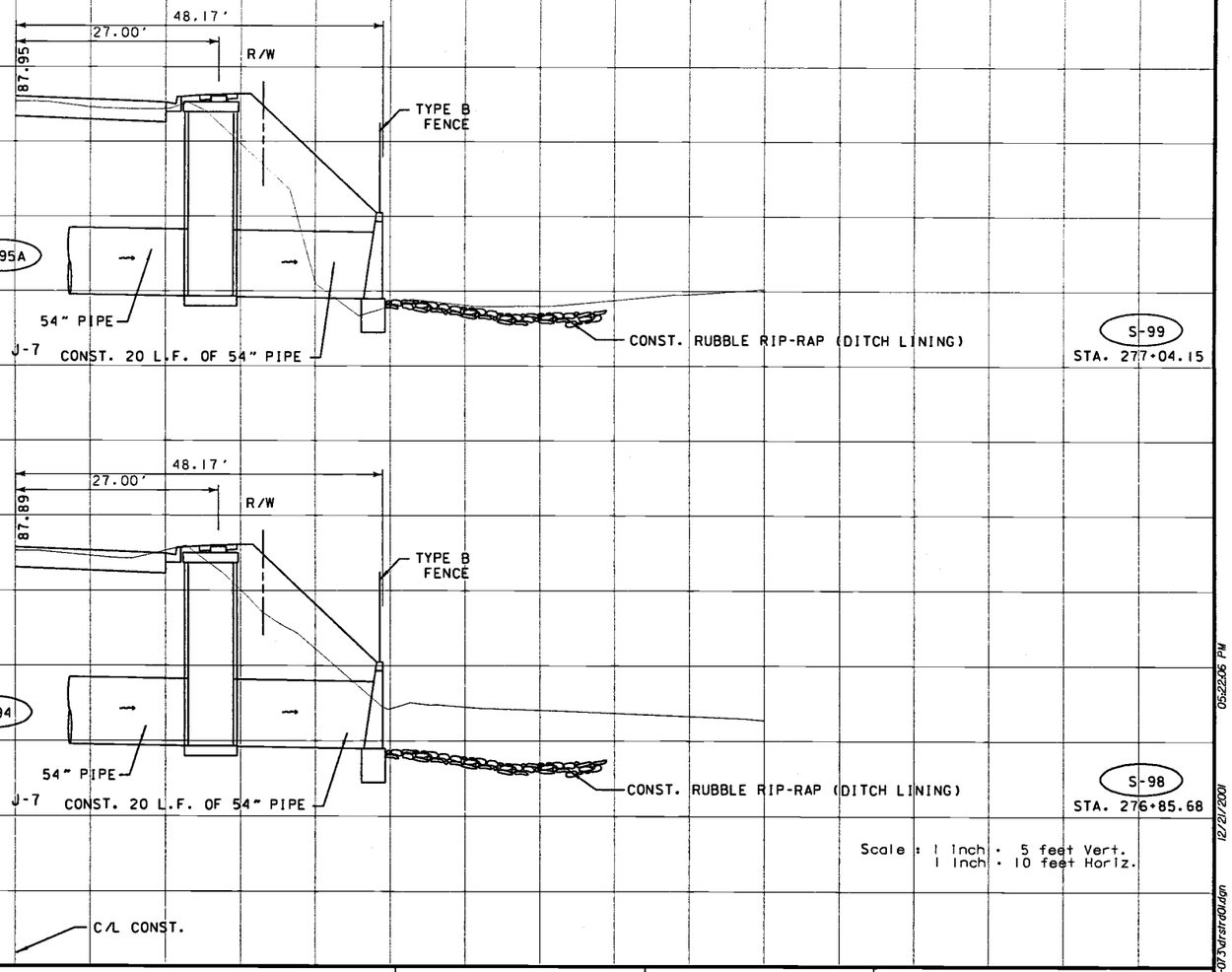
DRAINAGE STRUCTURES

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S-100
STA. 276+90.00
CONST. INLET TYPE 'F'
INDEX NO. 233
GRATE EL. 87.65
FL 82.13 AHD.8 BK.

S-100
STA. 276+90.00



S-99
STA. 277+04.15
CONST. MANHOLE TYPE J-7
INDEX NOS. 200, 201
RIM EL. 88.08
FL 74.70 LT. & RT.

S-99
STA. 277+04.15

S-98
STA. 276+85.68
CONST. MANHOLE TYPE J-7
INDEX NOS. 200, 201
RIM EL. 88.02
FL 74.70 LT. & RT.

S-98
STA. 276+85.68

Scale : 1 Inch = 5 feet Vert.
1 Inch = 10 feet Horiz.

REVISIONS

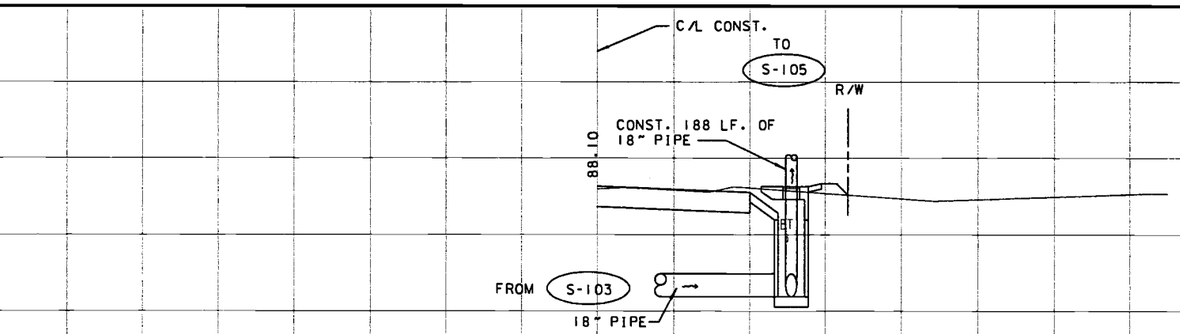
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ORANGE COUNTY
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DRAINAGE STRUCTURES

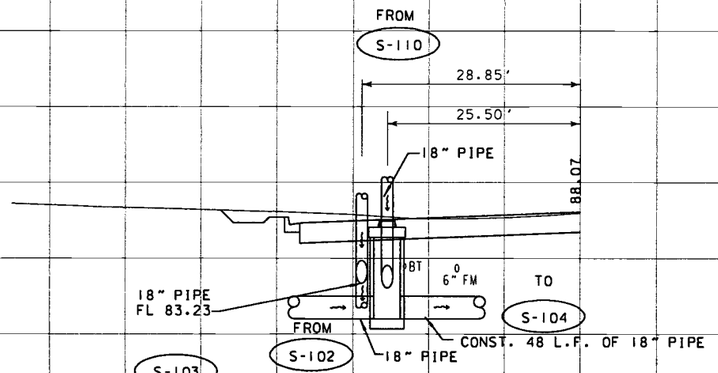
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S-104

STA. 277+47.27
CONST. INLET TYPE P-1
INDEX NOS. 200, 201, 211
INLET EL. 87.70
FL 80.93 AHD. & LT.

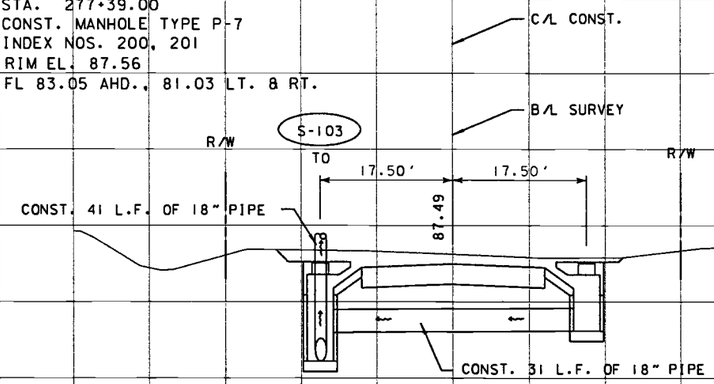
S-104
STA. 277+47.27



S-103

STA. 277+39.00
CONST. MANHOLE TYPE P-7
INDEX NOS. 200, 201
RIM EL. 87.56
FL 83.05 AHD., 81.03 LT. & RT.

S-103
STA. 277+39.00



S-102

STA. 569+26.70
CONST. INLET TYPE P-2
INDEX NOS. 200, 201, 210
INLET EL. 87.25
FL 81.11 AHD. & 83.00 RT

S-102
STA. 569+26.70
PARTRIDGE LN W

S-101

STA. 569+26.70
CONST. INLET TYPE P-2
INDEX NOS. 200, 201, 210
INLET EL. 87.25
FL 83.10 LT.

S-101
STA. 569+26.70
PARTRIDGE LN W

Scale : 1 Inch = 5 feet Vert.
1 Inch = 10 feet Horiz.

B/L SURVEY

REVISIONS

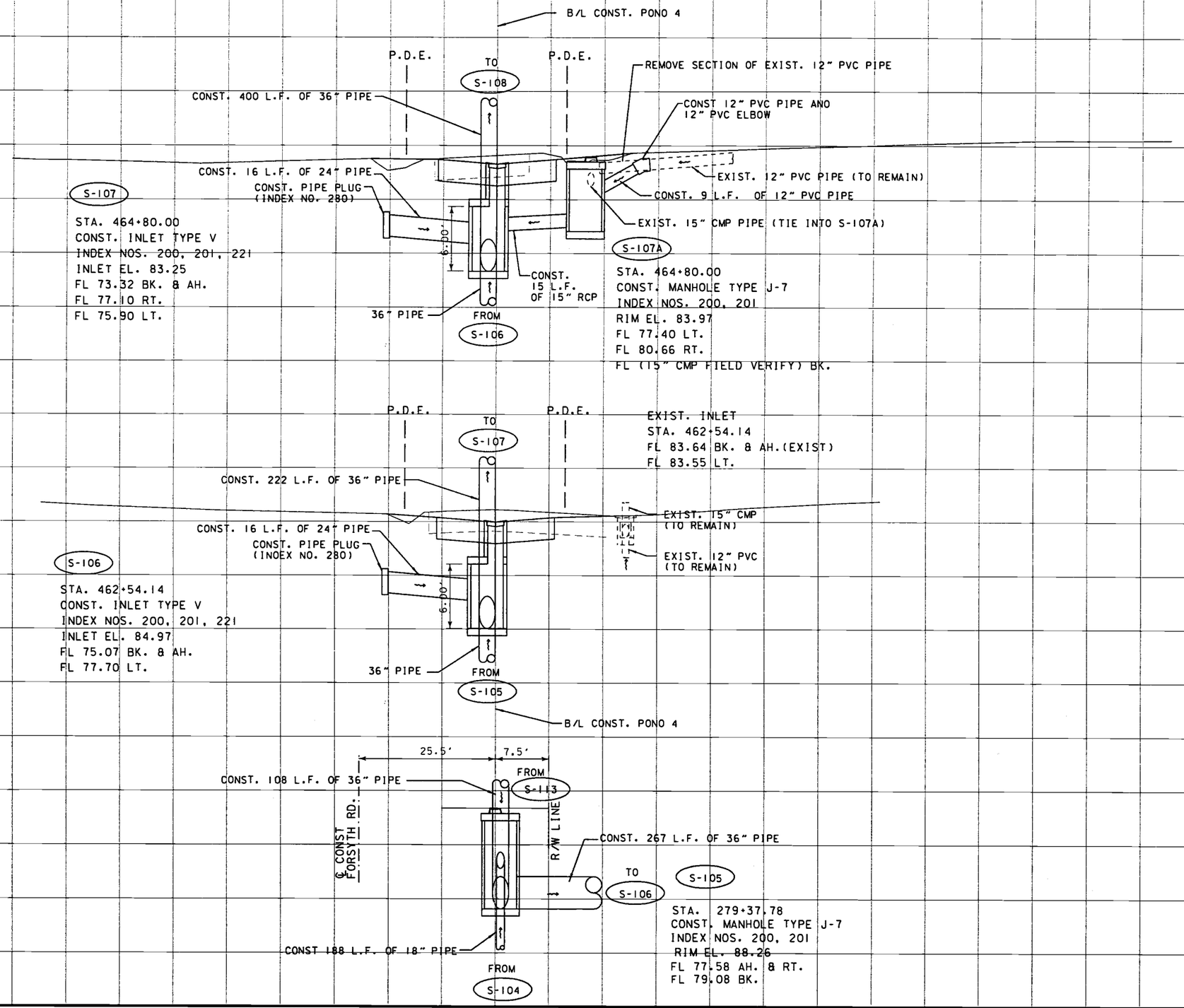
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ORANGE COUNTY
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DRAINAGE STRUCTURES

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Scale : 1 Inch = 5 feet Vert.
1 Inch = 10 feet Horiz.

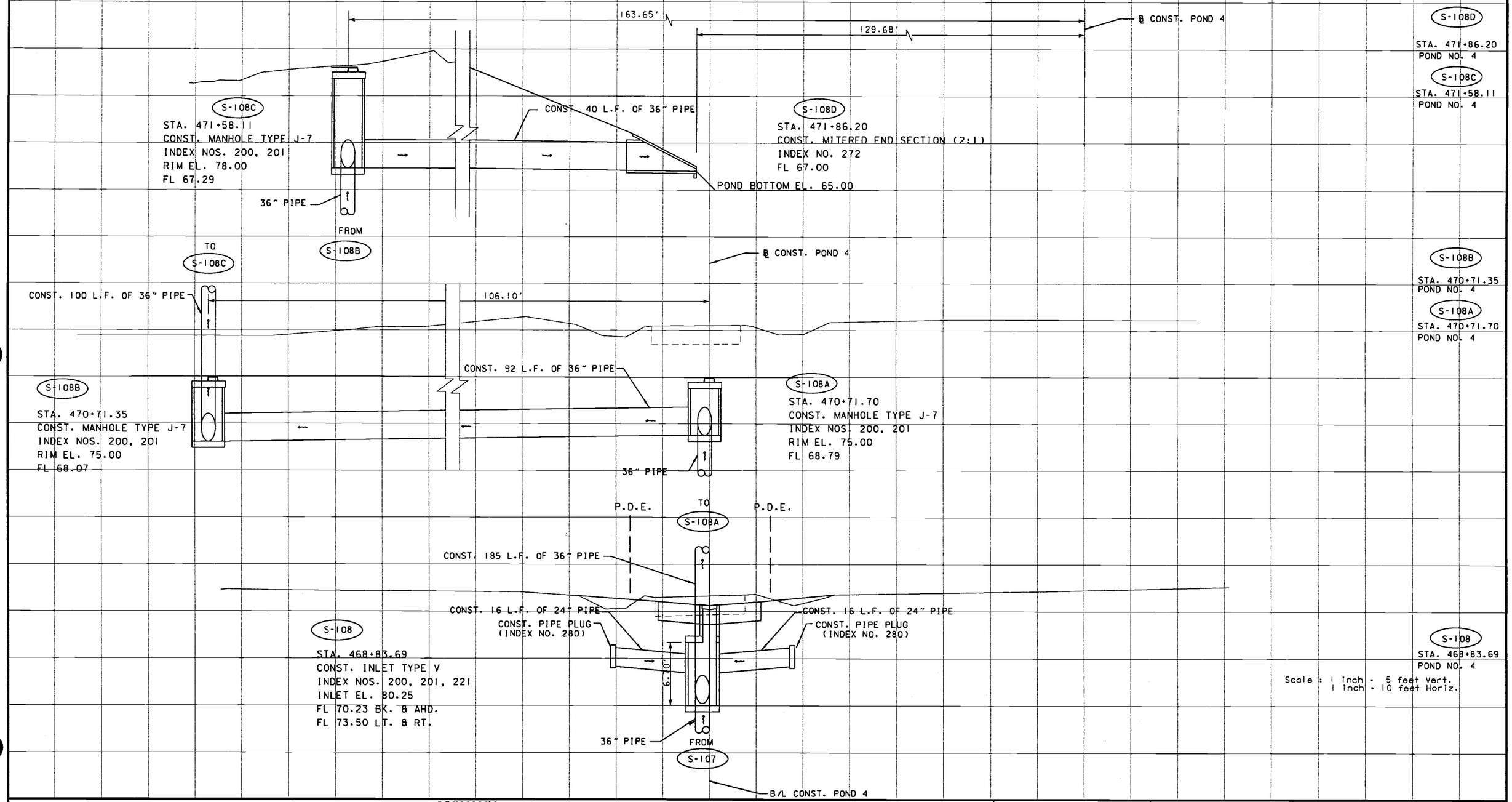
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DRAINAGE STRUCTURES

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Scale : 1 Inch = 5 feet Vert.
1 Inch = 10 feet Horiz.

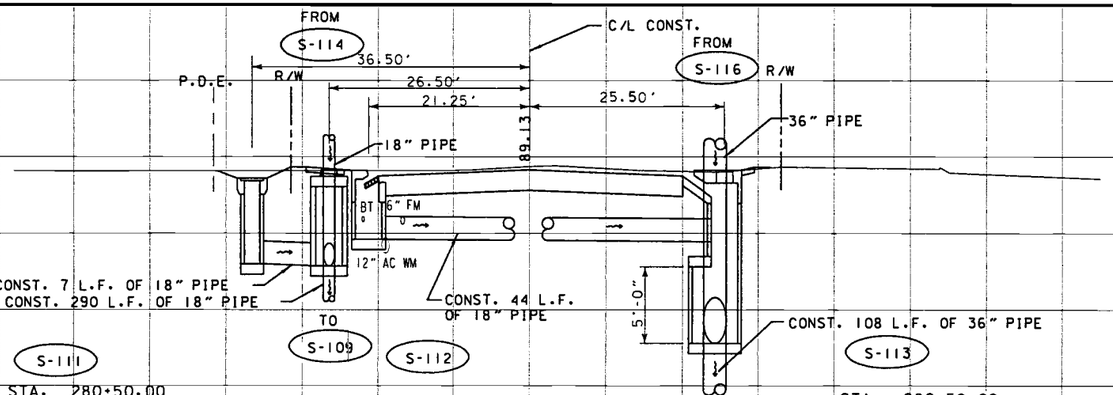
REVISIONS

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ORANGE COUNTY
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DRAINAGE STRUCTURES



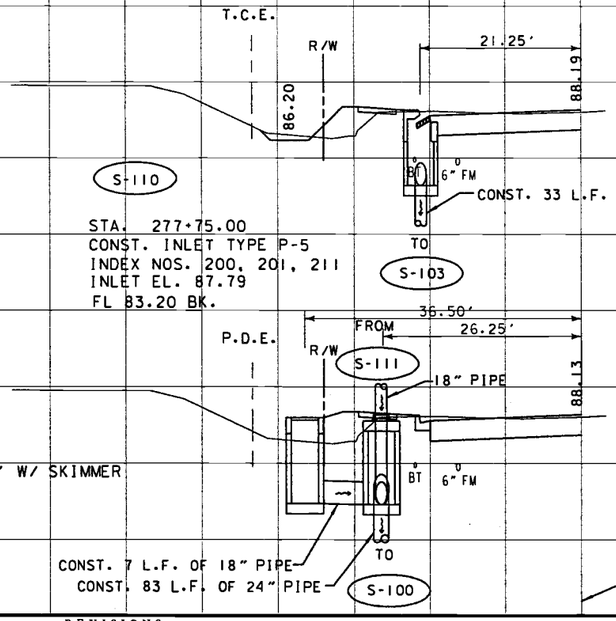
S-111A
STA. 280+50.00
CONST. INLET TYPE 'F'
INDEX NO. 233
GRATE EL. 88.57
FL 82.92

S-111
STA. 280+50.00
CONST. MANHOLE TYPE P-7
INDEX NO. 200, 201
RIM EL. 89.20
FL 82.85 LT., AHD. & BK.

S-112
STA. 280+60.00
CONST. INLET TYPE P-5
INDEX NOS. 200, 201, 211
INLET EL. 88.73
FL 84.60 RT.

S-113
STA. 280+50.00
CONST. INLET TYPE J-1
INDEX NOS. 200, 201, 210
INLET EL. 88.73
FL 77.80 AHD. & BK., 84.45 LT.

S-113
STA. 280+50.00
S-112
STA. 280+60.00
S-111A
STA. 280+50.00
S-111
STA. 280+50.00



S-110
STA. 277+75.00
CONST. INLET TYPE P-5
INDEX NOS. 200, 201, 211
INLET EL. 87.79
FL 83.20 BK.

S-109A
STA. 277+56.10
CONST. INLET TYPE 'F' W/ SKIMMER
INDEX NO. 233
GRATE EL. 88.00
FL 82.37

S-109
STA. 277+56.10
CONST. MANHOLE TYPE P-7
INDEX NOS. 200, 201
RIM EL. 88.28
FL 82.30 LT., BK. & AHD.

S-110
STA. 277+75.00
S-109
STA. 277+56.10
S-109A
STA. 277+56.10

Scale : 1 Inch = 5 feet Vert.
1 Inch = 10 feet Horiz.

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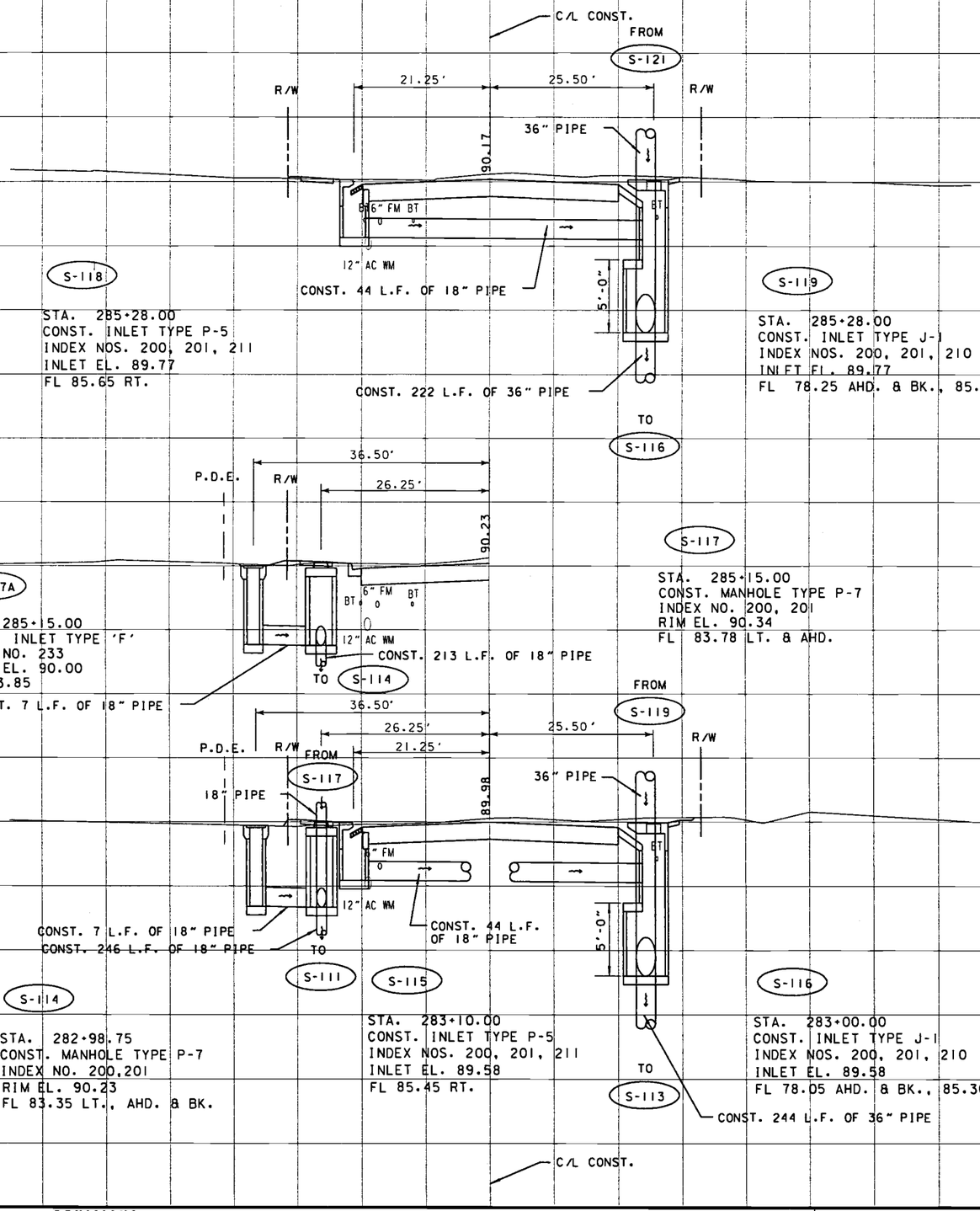
REVISIONS

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DRAINAGE STRUCTURES



S-118
STA. 285+28.00
CONST. INLET TYPE P-5
INDEX NOS. 200, 201, 211
INLET EL. 89.77
FL 85.65 RT.

S-119
STA. 285+28.00
CONST. INLET TYPE J-1
INDEX NOS. 200, 201, 210
INLET EL. 89.77
FL 78.25 AHD. & BK., 85.50 LT.

S-117
STA. 285+15.00
CONST. MANHOLE TYPE P-7
INDEX NO. 200, 201
RIM EL. 90.34
FL 83.78 LT. & AHD.

S-117A
STA. 285+15.00
CONST. INLET TYPE 'F'
INDEX NO. 233
GRATE EL. 90.00
FL 83.85

S-114A
STA. 282+98.75
CONST. INLET TYPE 'F'
INDEX NO. 233
GRATE EL. 89.71
FL 83.42

S-114
STA. 282+98.75
CONST. MANHOLE TYPE P-7
INDEX NO. 200,201
RIM EL. 90.23
FL 83.35 LT., AHD. & BK.

S-115
STA. 283+10.00
CONST. INLET TYPE P-5
INDEX NOS. 200, 201, 211
INLET EL. 89.58
FL 85.45 RT.

S-116
STA. 283+00.00
CONST. INLET TYPE J-1
INDEX NOS. 200, 201, 210
INLET EL. 89.58
FL 78.05 AHD. & BK., 85.30 LT.

S-119 STA. 285+28.00
S-118 STA. 285+28.00
S-117A STA. 285+15.00
S-117 STA. 285+15.00
S-116 STA. 283+00.00
S-115 STA. 283+10.00
S-114A STA. 282+98.75
S-114 STA. 282+98.75

Scale : 1 Inch = 5 feet Vert.
1 Inch = 10 feet Horiz.

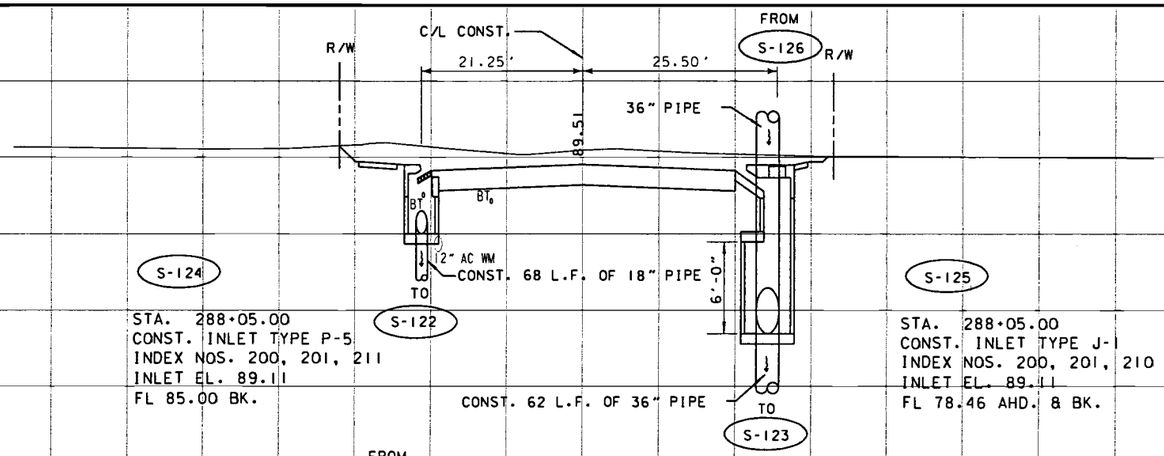
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DRAINAGE STRUCTURES

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S-124

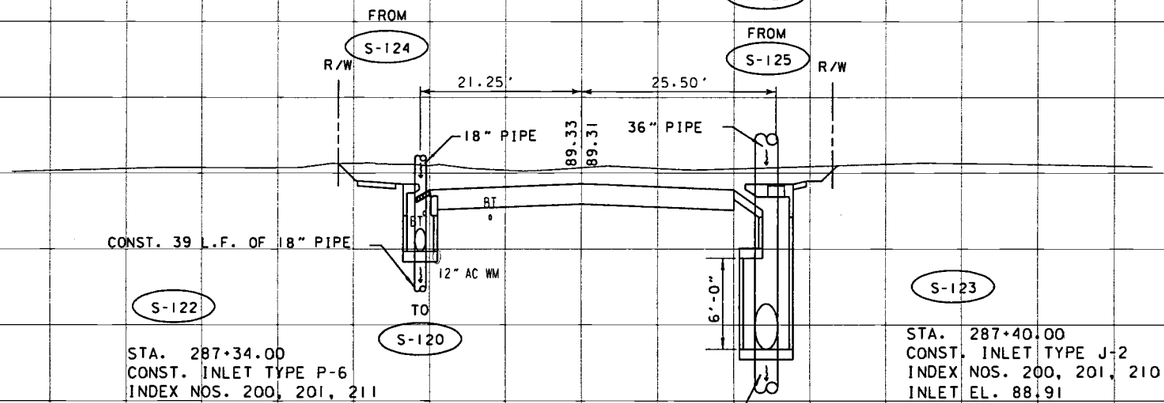
STA. 288+05.00
CONST. INLET TYPE P-5
INDEX NOS. 200, 201, 211
INLET EL. 89.11
FL 85.00 BK.

S-125

STA. 288+05.00
CONST. INLET TYPE J-1
INDEX NOS. 200, 201, 210
INLET EL. 89.11
FL 78.46 AHD. & BK.

S-125
STA. 288+05.00

S-124
STA. 288+05.00



S-122

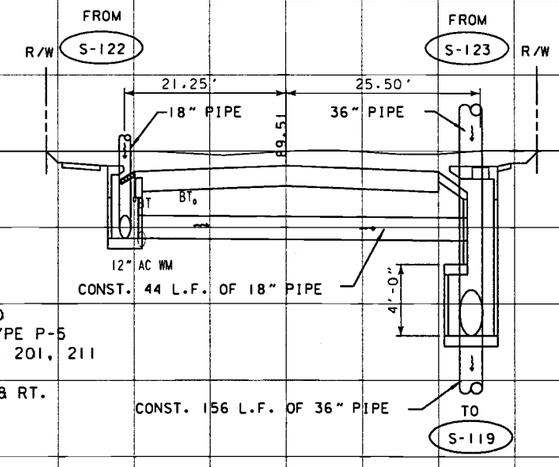
STA. 287+34.00
CONST. INLET TYPE P-6
INDEX NOS. 200, 201, 211
INLET EL. 88.91
FL 84.85 AHD. & BK.

S-123

STA. 287+40.00
CONST. INLET TYPE J-2
INDEX NOS. 200, 201, 210
INLET EL. 88.91
FL 78.41 AHD. & BK.

S-123
STA. 287+40.00

S-122
STA. 287+34.00



S-120

STA. 286+90.00
CONST. INLET TYPE P-5
INDEX NOS. 200, 201, 211
INLET EL. 89.11
FL 84.75 AHD. & RT.

S-121

STA. 286+90.00
CONST. INLET TYPE J-1
INDEX NOS. 200, 201, 210
INLET EL. 89.11
FL 78.37 AHD. & BK., 84.60 LT.

S-121
STA. 286+90.00

S-120
STA. 286+90.00

Scale : 1 Inch = 5 feet Vert.
1 Inch = 10 feet Horiz.

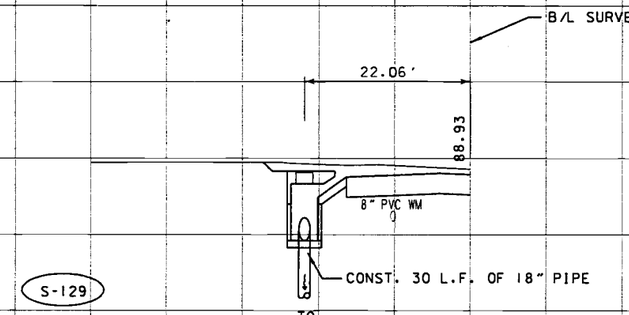
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DRAINAGE STRUCTURES

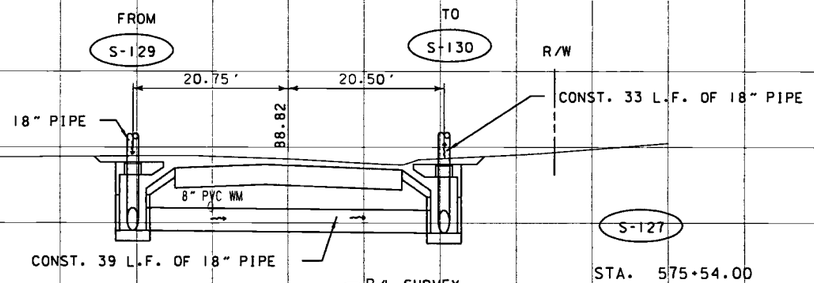
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S-129

STA. 575+87.00
CONST. INLET TYPE P-1
INDEX NOS. 200, 201, 210
INLET EL. 88.77
FL 84.60 BK.

S-129
STA. 575+87.00
HANGING MOSS RD



S-128

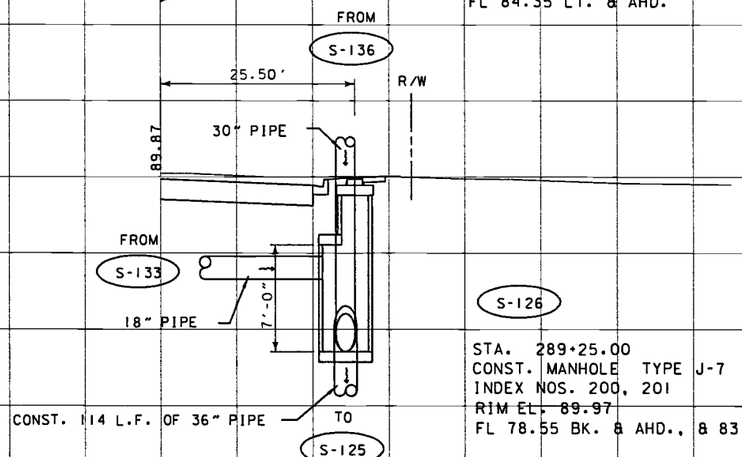
STA. 575+54.00
CONST. INLET TYPE P-2
INDEX NOS. 200, 201, 210
INLET EL. 88.64
FL 84.50 AHD. & RT.

S-127

STA. 575+54.00
CONST. INLET TYPE P-2
INDEX NOS. 200, 201, 210
INLET EL. 88.52
FL 84.35 LT. & AHD.

S-128
STA. 575+54.00
HANGING MOSS RD

S-127
STA. 575+54.00
HANGING MOSS RD



S-126

STA. 289+25.00
CONST. MANHOLE TYPE J-7
INDEX NOS. 200, 201
~~RIM EL. 89.97~~
FL 78.55 BK. & AHD., & 83.30 LT.

S-126
STA. 289+25.00

Scale : 1 Inch = 5 feet Vert.
1 Inch = 10 feet Horiz.

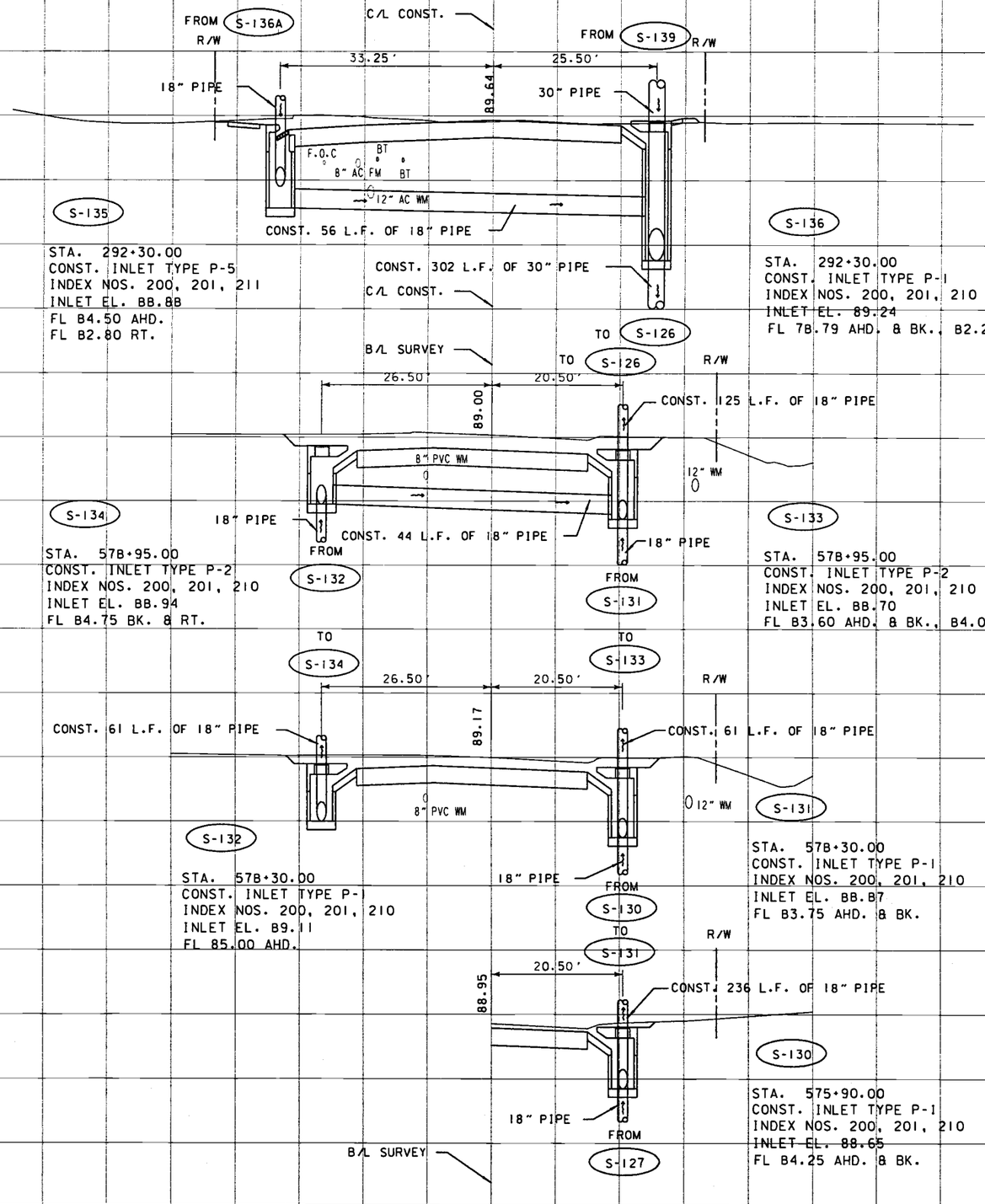
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DRAINAGE STRUCTURES

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S-135

STA. 292+30.00
CONST. INLET TYPE P-5
INDEX NOS. 200, 201, 211
INLET EL. 88.88
FL 84.50 AHD.
FL 82.80 RT.

S-136

STA. 292+30.00
CONST. INLET TYPE P-1
INDEX NOS. 200, 201, 210
INLET EL. 89.24
FL 78.79 AHD. & BK., 82.25 LT.

S-134

STA. 578+95.00
CONST. INLET TYPE P-2
INDEX NOS. 200, 201, 210
INLET EL. 88.94
FL 84.75 BK. & RT.

S-133

STA. 578+95.00
CONST. INLET TYPE P-2
INDEX NOS. 200, 201, 210
INLET EL. 88.70
FL 83.60 AHD. & BK., 84.00 LT.

S-132

STA. 578+30.00
CONST. INLET TYPE P-1
INDEX NOS. 200, 201, 210
INLET EL. 89.11
FL 85.00 AHD.

S-131

STA. 578+30.00
CONST. INLET TYPE P-1
INDEX NOS. 200, 201, 210
INLET EL. 88.87
FL 83.75 AHD. & BK.

S-130

STA. 575+90.00
CONST. INLET TYPE P-1
INDEX NOS. 200, 201, 210
INLET EL. 88.65
FL 84.25 AHD. & BK.

S-136
STA. 292+30.00

S-135
STA. 292+30.00

S-134
STA. 578+95.00
HANGING MOSS RD

S-133
STA. 578+95.00
HANGING MOSS RD

S-132
STA. 578+30.00
HANGING MOSS RD

S-131
STA. 578+30.00
HANGING MOSS RD

S-130
STA. 575+90.00
HANGING MOSS RD

Scale : 1 Inch = 5 feet Vert.
1 Inch = 10 feet Horiz.

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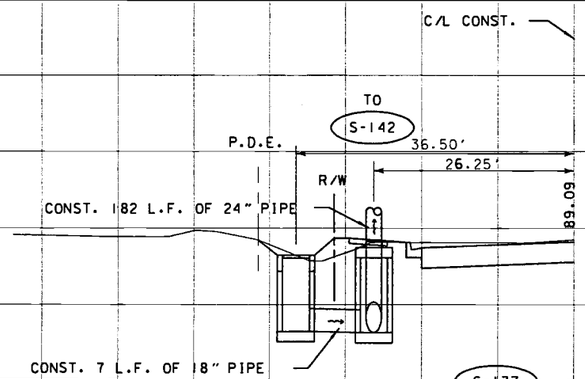
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ORANGE COUNTY
FLORIDA

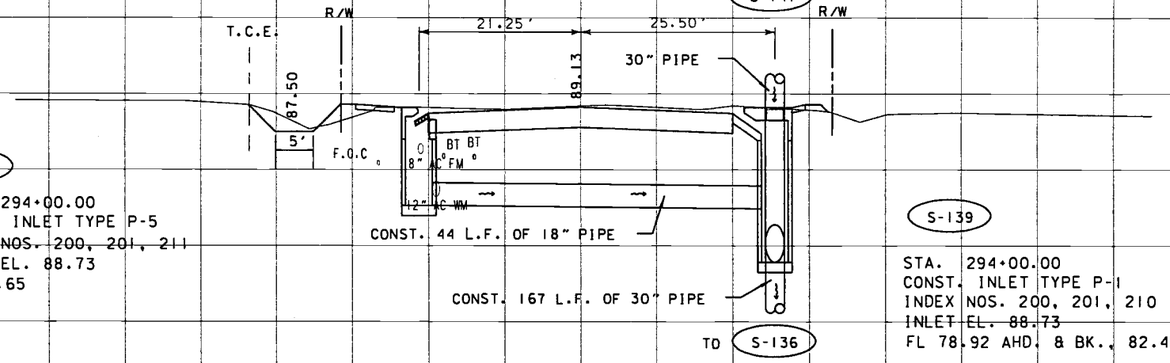
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DRAINAGE STRUCTURES



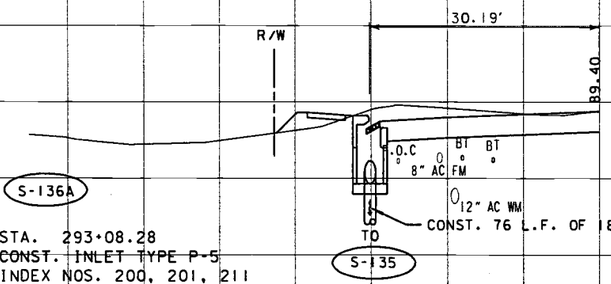
S-137A
STA. 294+15.00
CONST. INLET TYPE 'F'
INDEX NO. 233
GRATE EL. 88.20
FL 83.22

S-137
STA. 294+15.00
CONST. MANHOLE TYPE P-7
INDEX NOS. 200, 201
RIM EL. 89.21
FL 83.15 LT.& AHD.



S-138
STA. 294+00.00
CONST. INLET TYPE P-5
INDEX NOS. 200, 201, 211
INLET EL. 88.73
FL 82.65

S-139
STA. 294+00.00
CONST. INLET TYPE P-1
INDEX NOS. 200, 201, 210
INLET EL. 88.73
FL 78.92 AHD. & BK., 82.45 LT.



S-136A
STA. 293+08.28
CONST. INLET TYPE P-5
INDEX NOS. 200, 201, 211
INLET EL. 88.74
FL 84.65 BK.

C/L CONST.

S-137A
STA. 294+15.00

S-137
STA. 294+15.00

S-139
STA. 294+00.00

S-138
STA. 294+00.00

S-136A
STA. 293+08.28

Scale : 1 Inch = 5 feet Vert.
1 Inch = 10 feet Horiz.

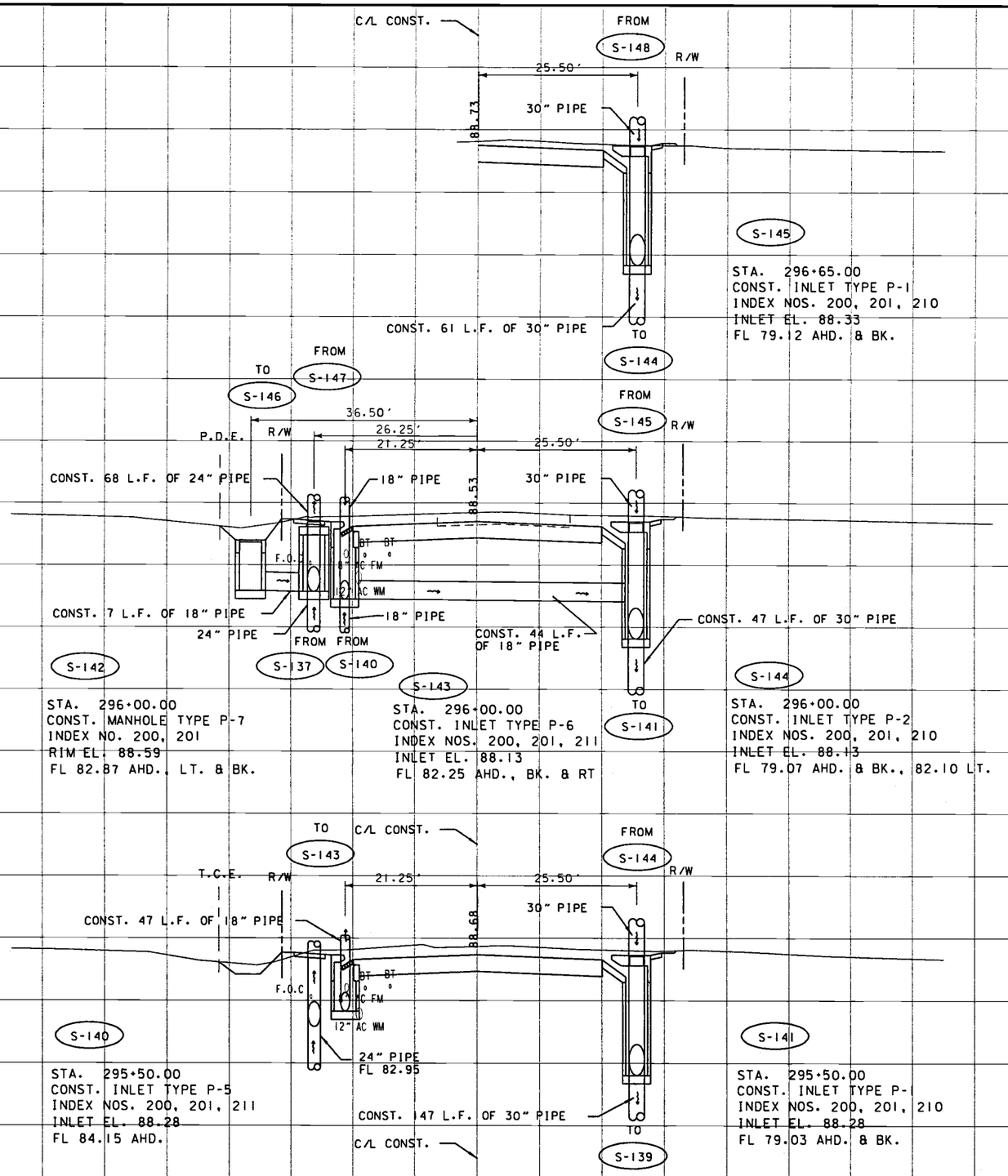
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S-142A

STA. 296+00.00
CONST. INLET TYPE 'F'
INDEX NO. 233
GRATE EL. 87.00
FL 82.94

S-142

STA. 296+00.00
CONST. MANHOLE TYPE P-7
INDEX NO. 200, 201
RIM EL. 88.59
FL 82.87 AHD., LT. & BK.

S-143

STA. 296+00.00
CONST. INLET TYPE P-6
INDEX NOS. 200, 201, 211
INLET EL. 88.13
FL 82.25 AHD., BK. & RT

S-144

STA. 296+00.00
CONST. INLET TYPE P-2
INDEX NOS. 200, 201, 210
INLET EL. 88.13
FL 79.07 AHD. & BK., 82.10 LT.

S-140

STA. 295+50.00
CONST. INLET TYPE P-5
INDEX NOS. 200, 201, 211
INLET EL. 88.28
FL 84.15 AHD.

S-141

STA. 295+50.00
CONST. INLET TYPE P-1
INDEX NOS. 200, 201, 210
INLET EL. 88.28
FL 79.03 AHD. & BK.

S-145

STA. 296+65.00
CONST. INLET TYPE P-1
INDEX NOS. 200, 201, 210
INLET EL. 88.33
FL 79.12 AHD. & BK.

S-145 STA. 296+65.00
S-144 STA. 296+00.00
S-143 STA. 296+00.00
S-142A STA. 296+00.00
S-142 STA. 296+00.00
S-141 STA. 295+50.00
S-140 STA. 295+50.00

Scale: 1 Inch = 5 feet Vert.
1 Inch = 10 feet Horiz.

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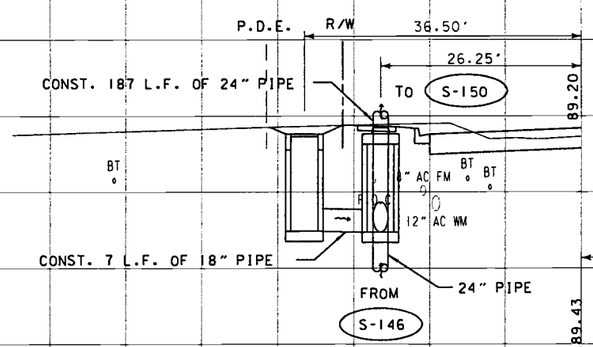
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C/L CONST.

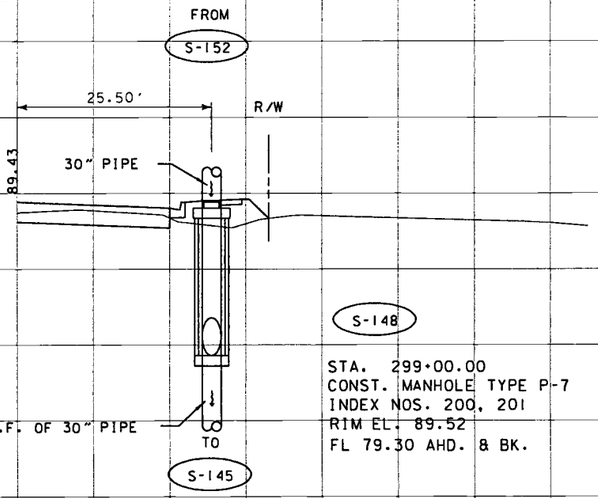


S-149A

STA. 299+50.00
CONST. INLET TYPE 'F'
INDEX NO. 233
GRATE EL. 88.81
FL 82.42

S-149

STA. 299+50.00
CONST. MANHOLE TYPE P-7
INDEX NO. 200, 201
RIM EL. 89.31
FL 82.35 AHD., LT. & BK.



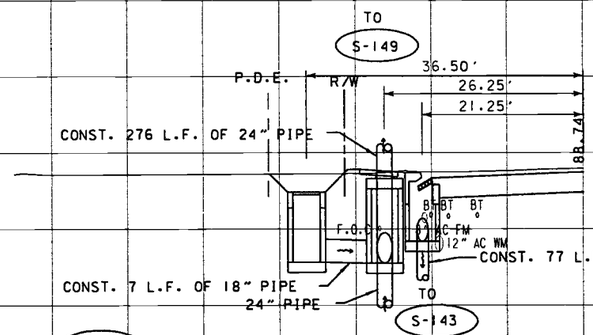
S-148

STA. 299+00.00
CONST. MANHOLE TYPE P-7
INDEX NOS. 200, 201
RIM EL. 89.52
FL 79.30 AHD. & BK.

S-149A
STA. 299+50.00

S-149
STA. 299+50.00

S-148
STA. 299+00.00



S-146A

STA. 296+71.00
CONST. INLET TYPE 'F'
INDEX NO. 233
GRATE EL. 87.42
FL 82.83

S-146

STA. 296+71.00
CONST. MANHOLE TYPE P-7
INDEX NOS. 200, 201,
RIM EL. 88.81
FL 82.76 AHD., LT. & BK.

S-147

STA. 296+80.00
CONST. INLET TYPE P-5
INDEX NOS. 200, 201, 211
INLET EL. 88.34
FL 84.20 BK.

S-147
STA. 296+80.00

S-146A
STA. 296+71.00

S-146
STA. 296+71.00

C/L CONST.

Scale : 1 inch = 5 feet Vert.
1 inch = 10 feet Horiz.

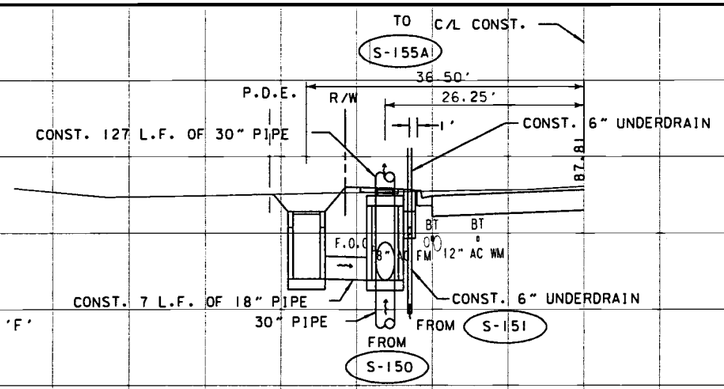
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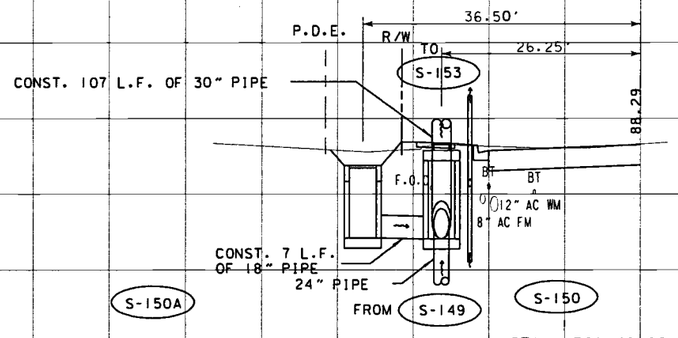
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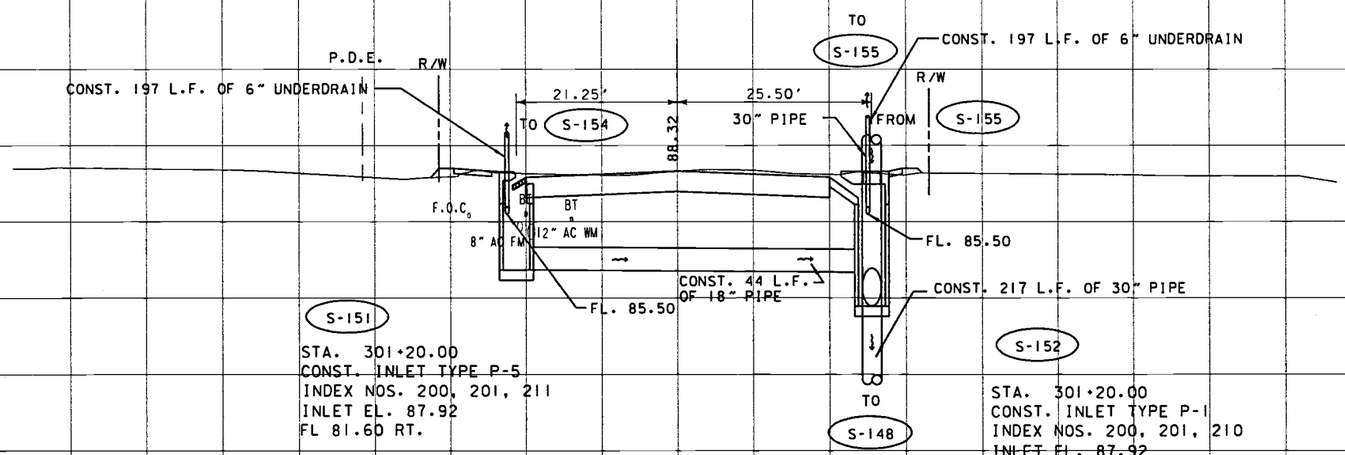
S-153A
STA. 302+50.00
CONST. INLET TYPE 'F'
INDEX NO. 233
GRATE EL. 86.40
FL 81.97

S-153
STA. 302+50.00
CONST. MANHOLE TYPE P-7
INDEX NO. 200, 201
RIM EL. 87.92
FL 81.90 AHD., LT. & BK



S-150A
STA. 301+40.00
CONST. INLET TYPE 'F'
INDEX NO. 233
GRATE EL. 86.90
FL 82.13

S-150
STA. 301+40.00
CONST. MANHOLE TYPE P-7
INDEX NO. 200, 201
RIM EL. 88.38
FL 82.06 AHD., LT. & BK.



S-151
STA. 301+20.00
CONST. INLET TYPE P-5
INDEX NOS. 200, 201, 211
INLET EL. 87.92
FL 81.60 RT.

S-152
STA. 301+20.00
CONST. INLET TYPE P-1
INDEX NOS. 200, 201, 210
INLET EL. 87.92
FL 79.47 AHD. & BK., 81.55 LT.

C/L CONST.

S-153A
STA. 302+50.00

S-153
STA. 302+50.00

S-150A
STA. 301+40.00

S-150
STA. 301+40.00

S-152
STA. 301+20.00

S-151
STA. 301+20.00

Scale : 1 inch = 5 feet Vert.
1 inch = 10 feet Horiz.

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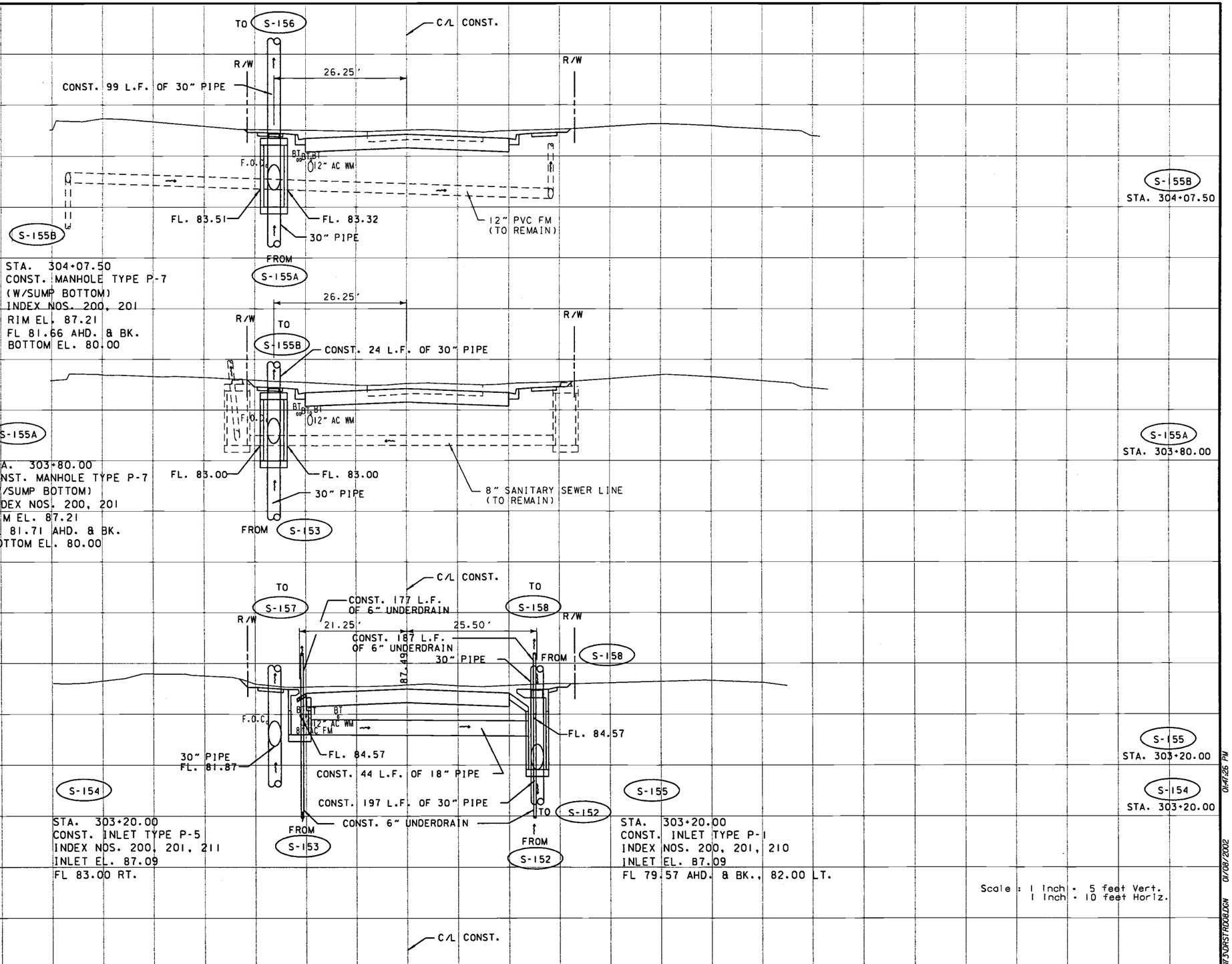
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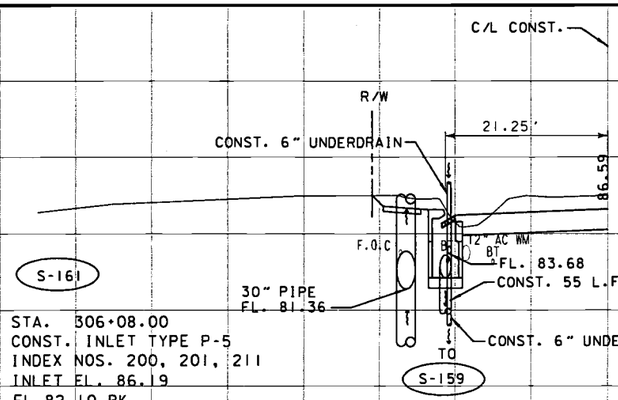
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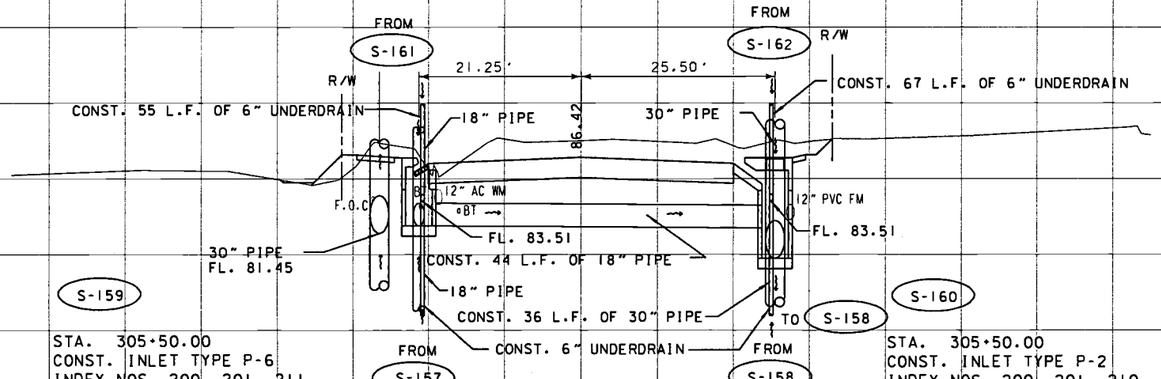
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S-161

STA. 306+08.00
CONST. INLET TYPE P-5
INDEX NOS. 200, 201, 211
INLET EL. 86.19
FL 82.10 BK.

S-161
STA. 306+08.00



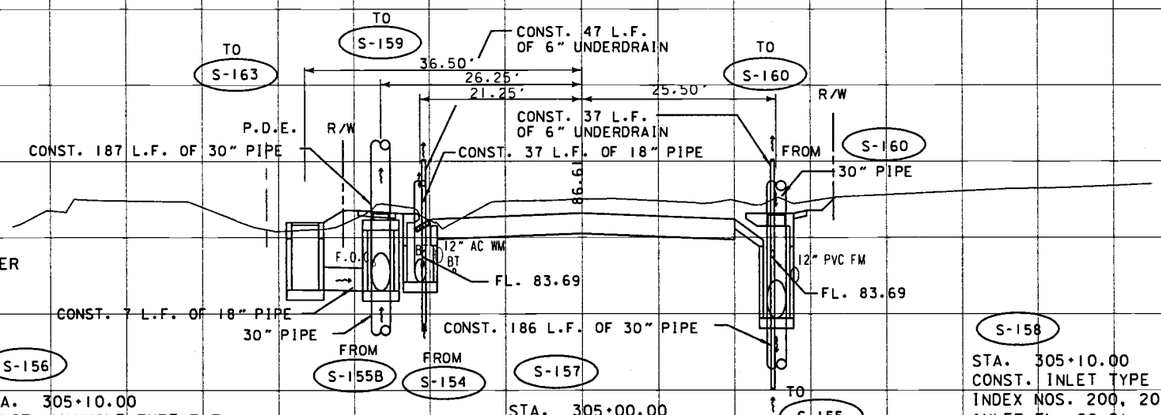
S-159

STA. 305+50.00
CONST. INLET TYPE P-6
INDEX NOS. 200, 201, 211
INLET EL. 86.02
FL 81.90 AHD., BK. & RT.

S-160

STA. 305+50.00
CONST. INLET TYPE P-2
INDEX NOS. 200, 201, 210
INLET EL. 86.02
FL 79.75 AHD. & BK., 81.75 LT.

S-160
STA. 305+50.00
S-159
STA. 305+50.00



S-156A

STA. 305+10.00
CONST. INLET TYPE 'F' W/ SKIMMER
INDEX NO. 233
GRATE EL. 86.00
FL 81.58

S-156

STA. 305+10.00
CONST. MANHOLE TYPE P-7
INDEX NO. 200, 201
RIM EL. 86.67
FL 81.51

S-157

STA. 305+00.00
CONST. INLET TYPE P-5
INDEX NOS. 200, 201, 211
INLET EL. 86.21
FL 82.10 AHD.
C/L CONST.

S-158

STA. 305+10.00
CONST. INLET TYPE P-1
INDEX NOS. 200, 201, 210
INLET EL. 86.21
FL 79.72 AHD. & BK.

S-158
STA. 305+10.00
S-157
STA. 305+00.00
S-156A
STA. 305+10.00
S-156
STA. 305+10.00

Scale : 1 Inch = 5 feet Vert.
1 Inch = 10 feet Horiz.

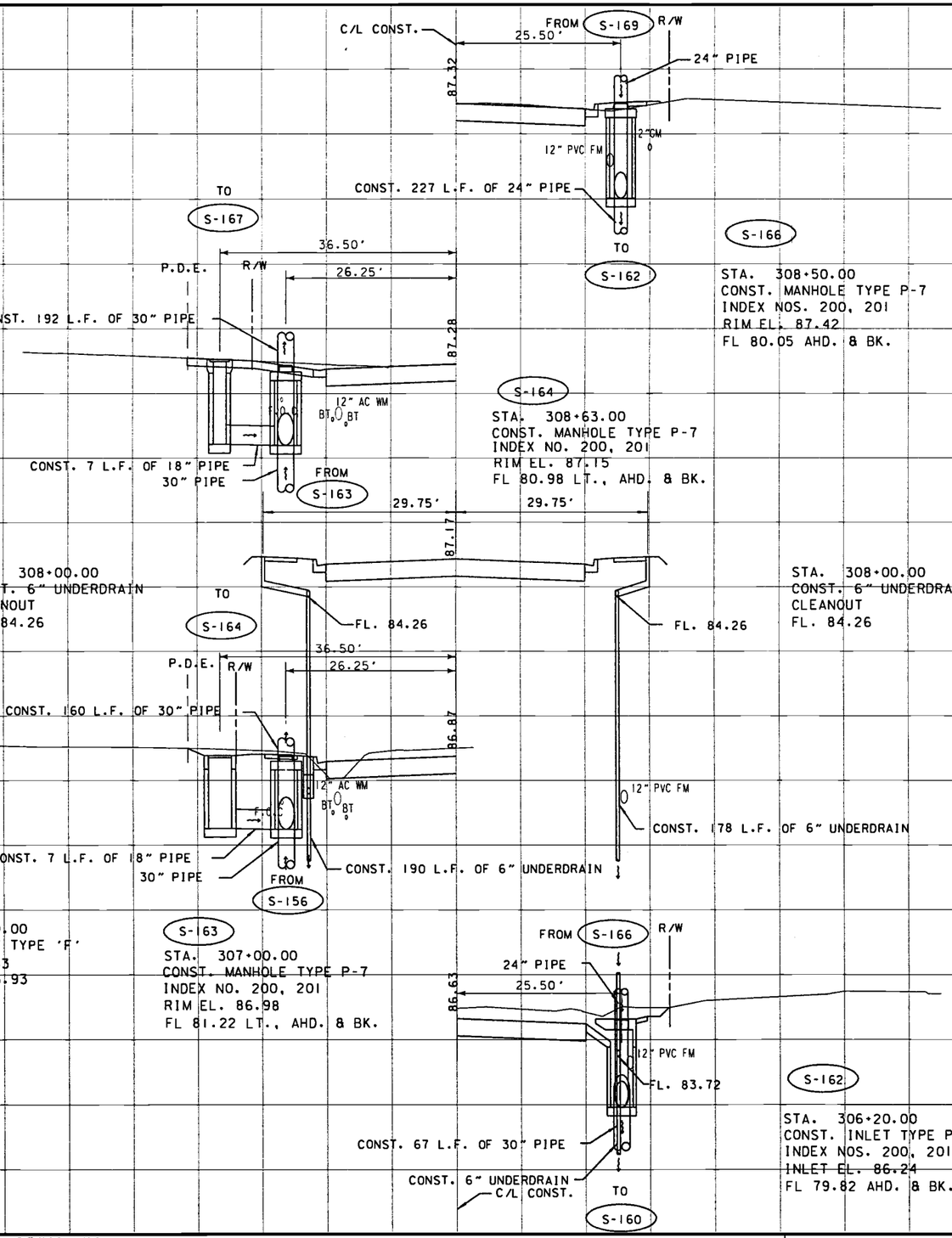
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S-164A

STA. 308+63.00
CONST. INLET TYPE 'F'
INDEX NO. 233
GRATE EL. 87.62
FL 81.05

S-166

STA. 308+50.00
CONST. MANHOLE TYPE P-7
INDEX NOS. 200, 201
RIM EL. 87.42
FL 80.05 AHD. & BK.

S-164

STA. 308+63.00
CONST. MANHOLE TYPE P-7
INDEX NO. 200, 201
RIM EL. 87.15
FL 80.98 LT., AHD. & BK.

STA. 308+00.00
CONST. 6" UNDERDRAIN
CLEANOUT
FL. 84.26

STA. 308+00.00
CONST. 6" UNDERDRAIN
CLEANOUT
FL. 84.26

S-163A

STA. 307+00.00
CONST. INLET TYPE 'F'
INDEX NO. 233
GRATE EL. 86.93
FL 81.29

S-163

STA. 307+00.00
CONST. MANHOLE TYPE P-7
INDEX NO. 200, 201
RIM EL. 86.98
FL 81.22 LT., AHD. & BK.

S-162

STA. 306+20.00
CONST. INLET TYPE P-1
INDEX NOS. 200, 201, 210
INLET EL. 86.24
FL 79.82 AHD. & BK.

S-166
STA. 308+50.00

S-165
OMITTED

S-164A
STA. 308+63.00

S-164
STA. 308+63.00

S-163A
STA. 307+00.00

S-163
STA. 307+00.00

S-162
STA. 306+20.00

Scale : 1 Inch = 5 feet Vert.
1 Inch = 10 feet Horiz.

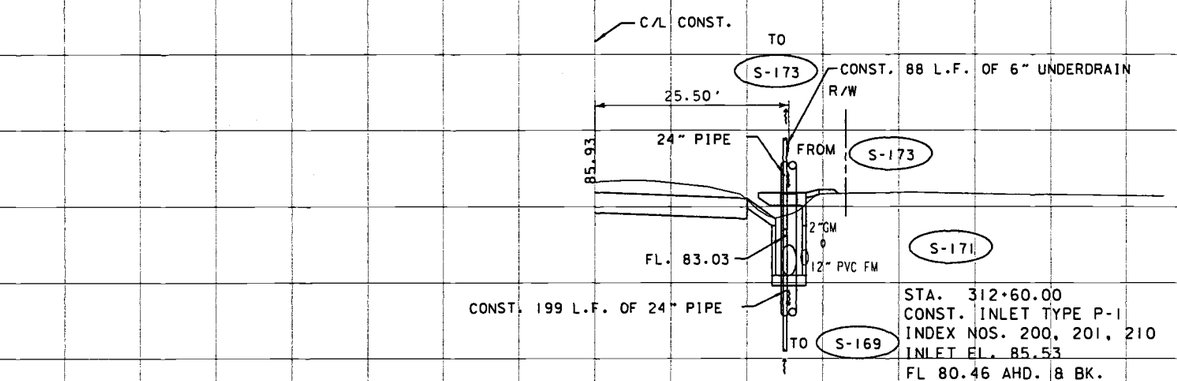
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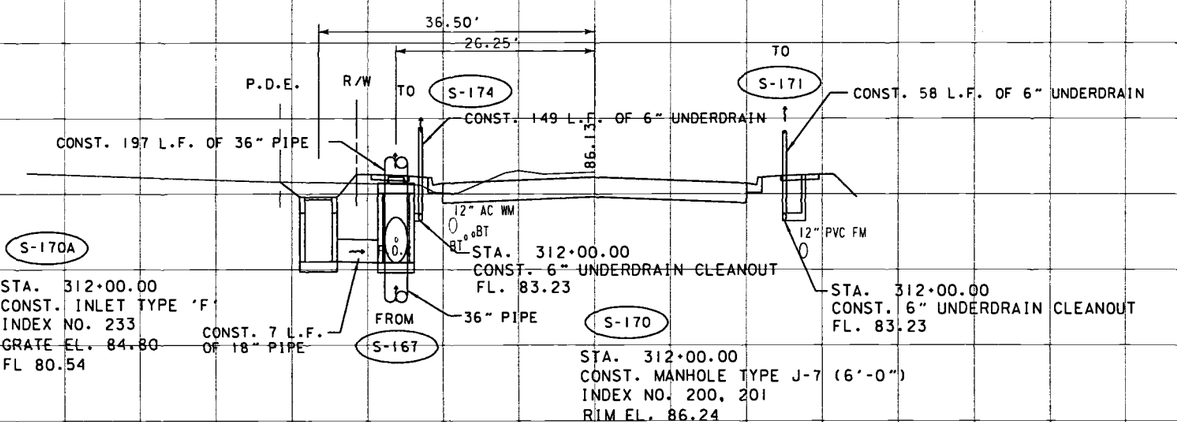
ORANGE COUNTY
FLORIDA

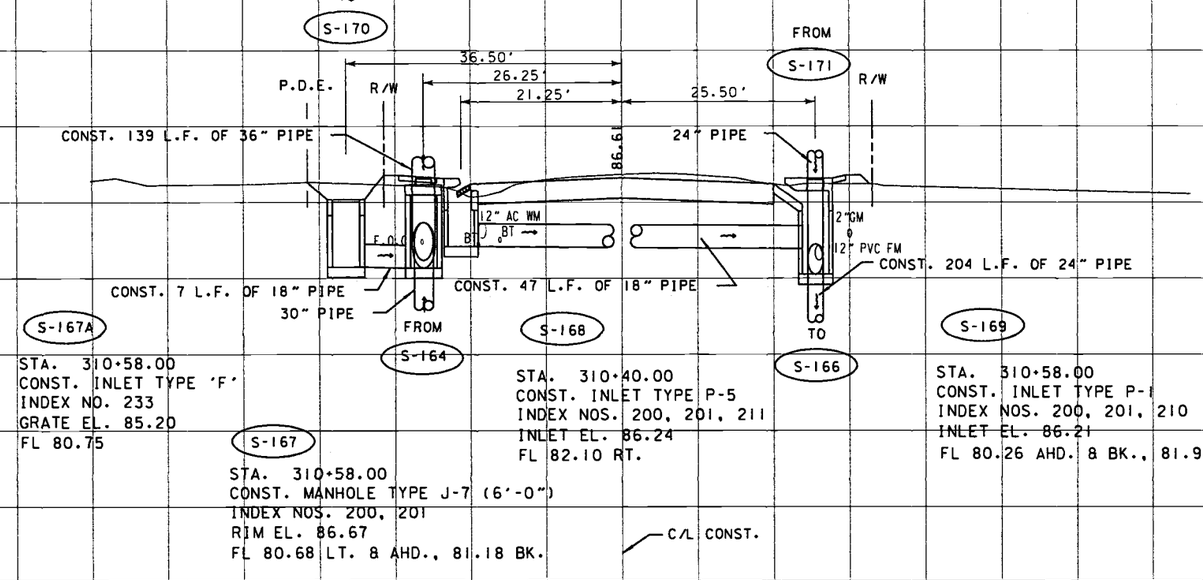
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DRAINAGE STRUCTURES

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S-171
STA. 312+60.00

S-170A
STA. 312+00.00

S-170
STA. 312+00.00

S-169
STA. 310+58.00

S-168
STA. 310+40.00

S-167A
STA. 310+58.00

S-167
STA. 310+58.00

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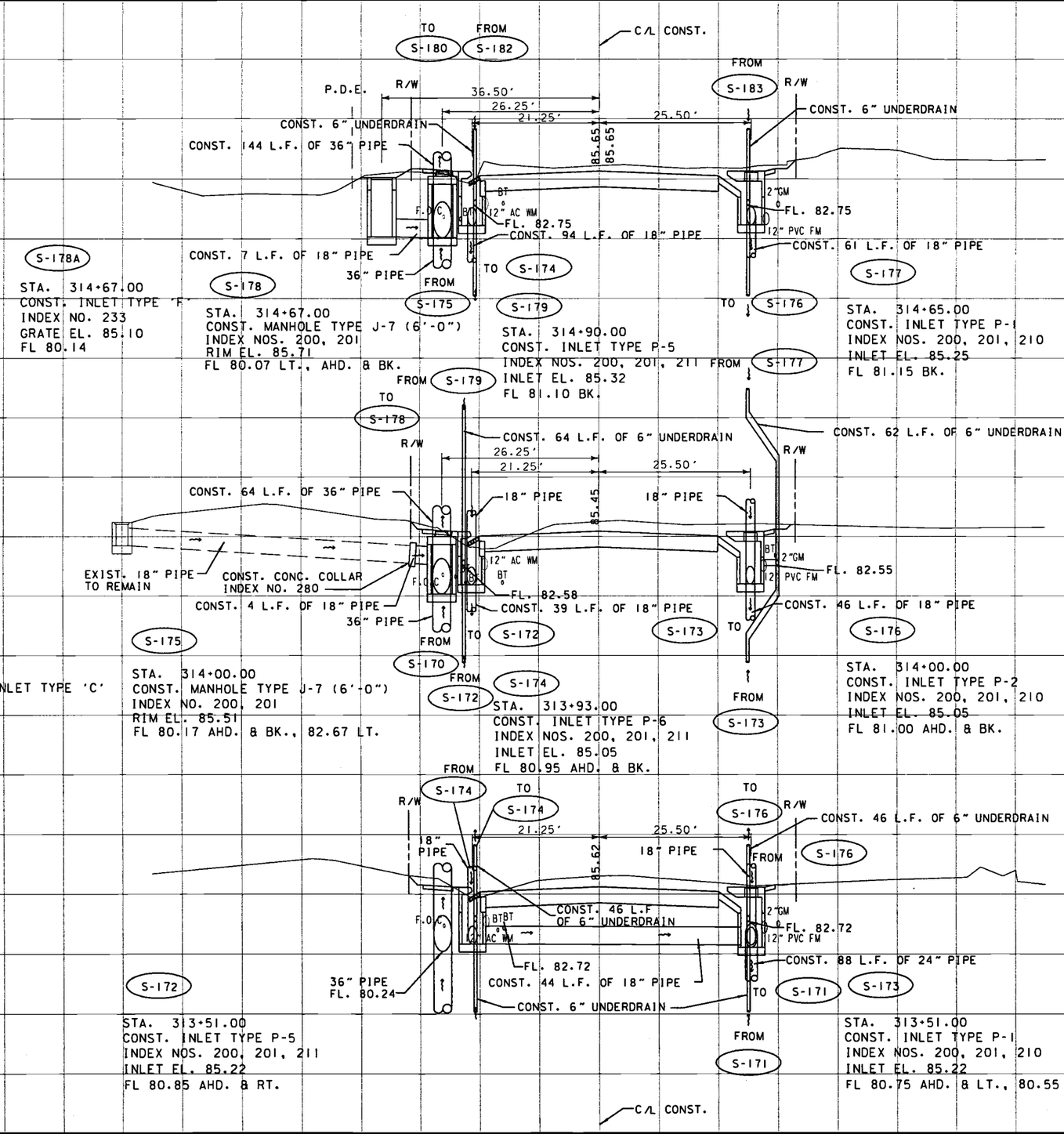
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ORANGE COUNTY
FLORIDA

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DRAINAGE STRUCTURES

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1 Inch = 10 feet Horiz.

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ORANGE COUNTY
FLORIDA

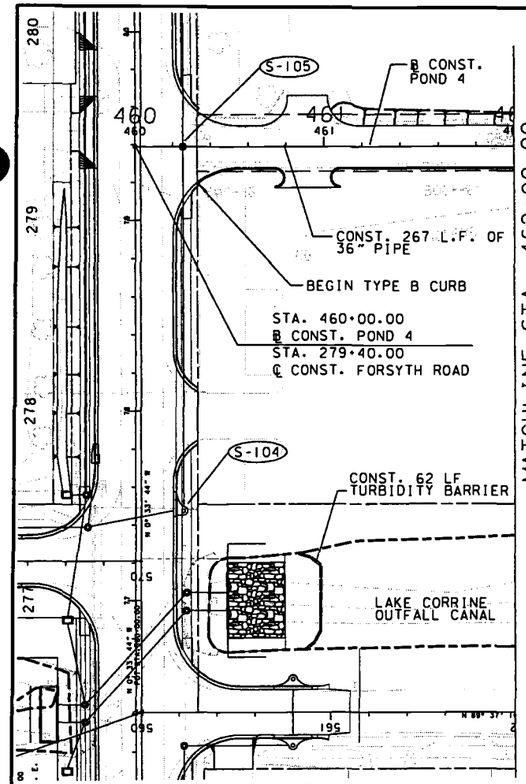
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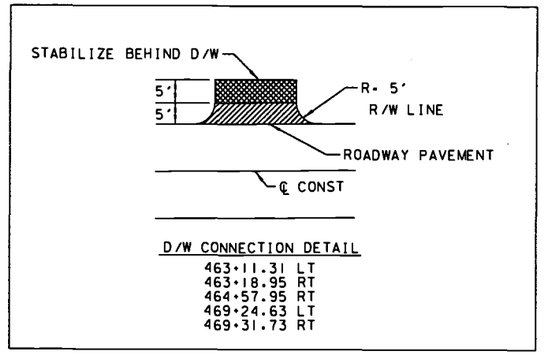
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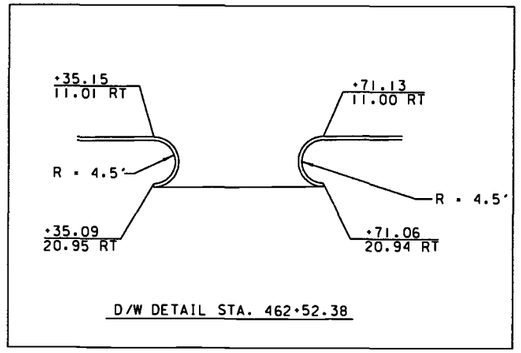
POND NO. 4 RADII STATIONING

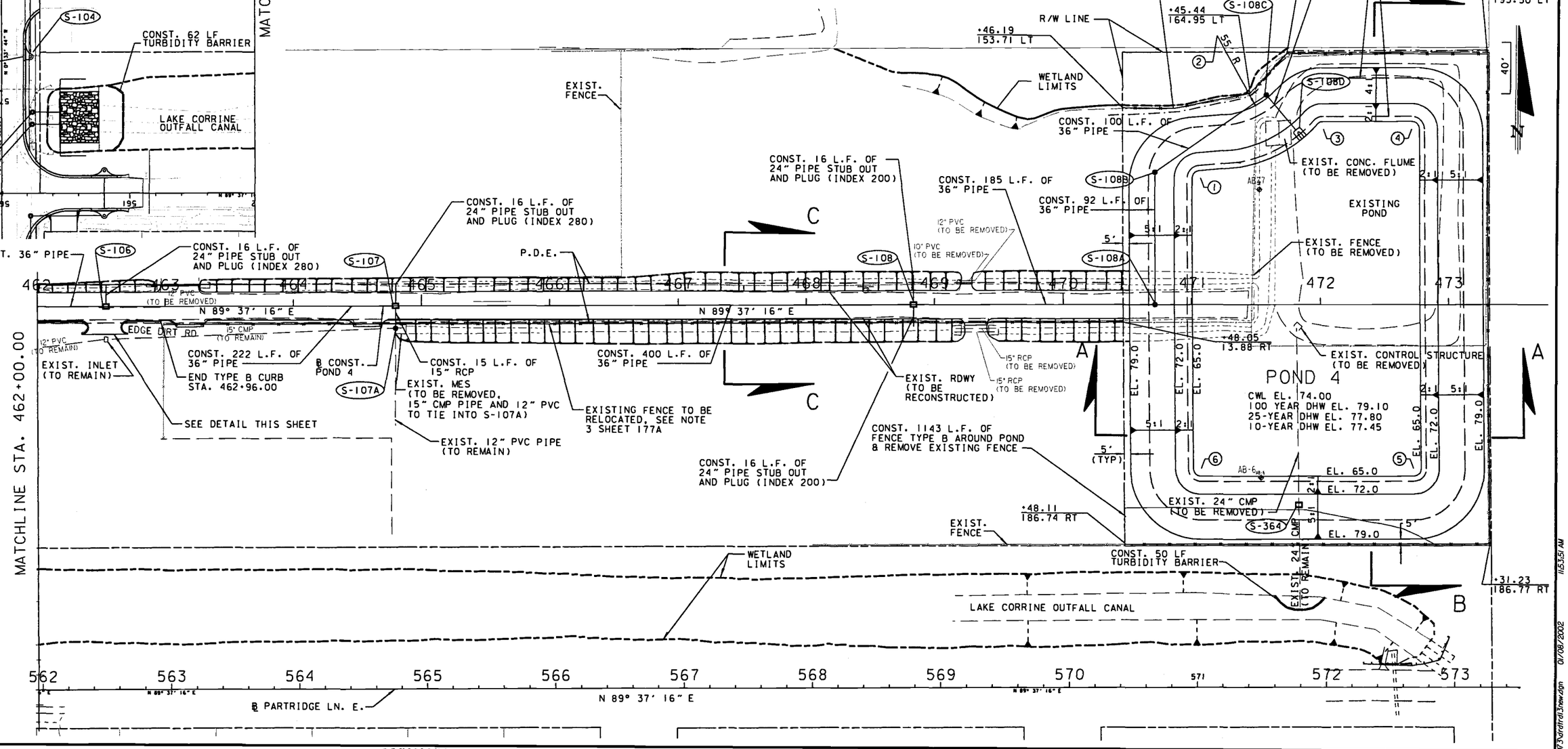
REFERENCE POINT	STATION	OFFSET	RADIUS
1	471+07.01	98.78' LT.	6'
2	471+19.79	209.82' LT.	55'
3	472+02.23	137.00' LT.	6'
4	472+71.25	137.00' LT.	6'
5	472+72.11	128.00' RT.	6'
6	471+07.25	127.90' RT.	6'

ALL RADII POINTS ARE REFERENCED TO ℄ CONST. POND 4









REVISIONS													
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ORANGE COUNTY
FLORIDA

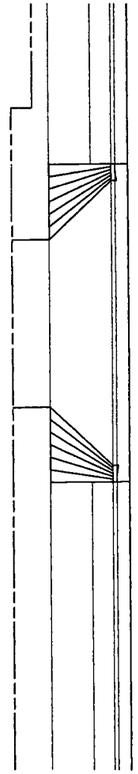
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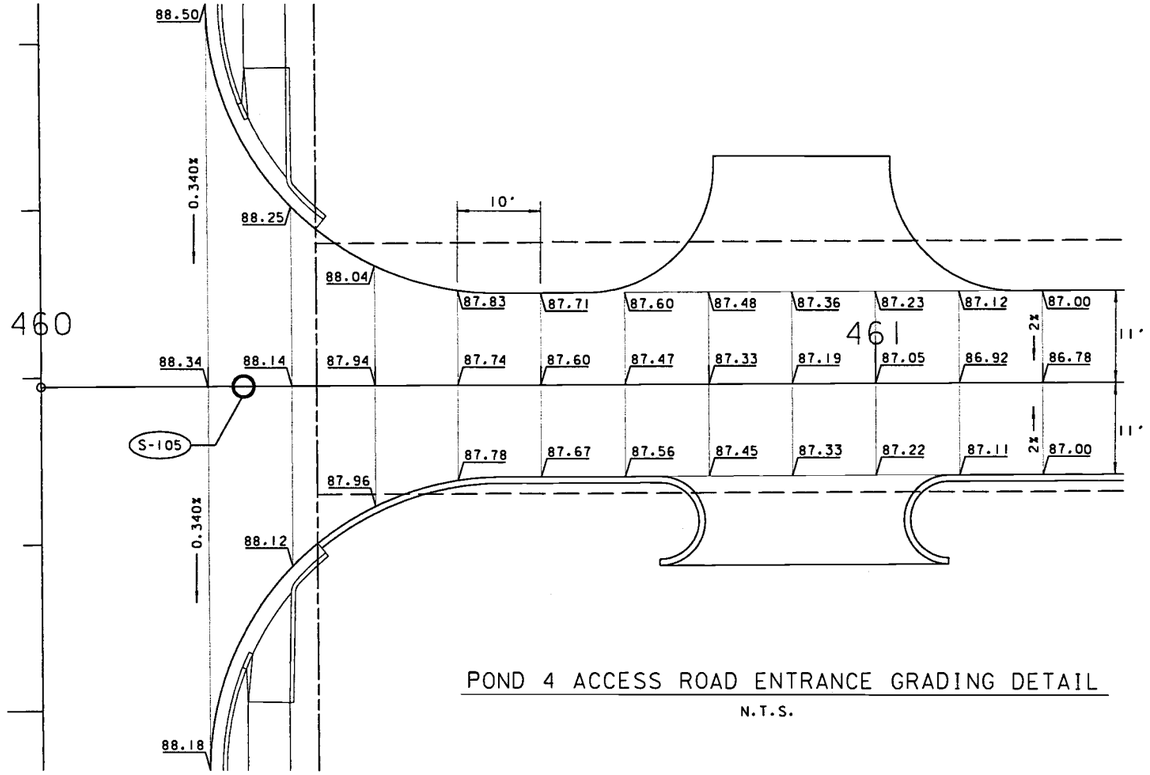
PLAN
Pond 4

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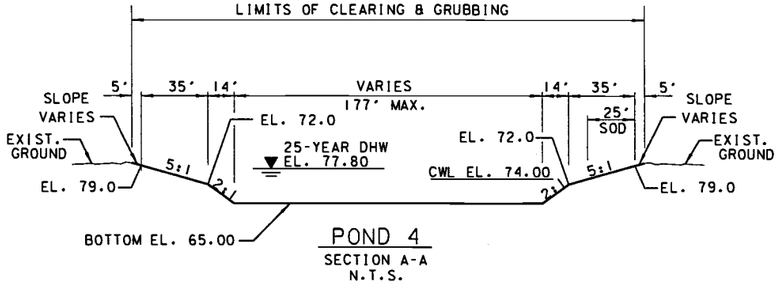
1. SEE POND 4 CROSS SECTIONS SHEET NOS. 276 - 283C FOR POND 4 ACCESS ROAD PGL ELEVATIONS.
2. SEE SHEET NO. 177 FOR LOCATION OF CROSS SECTION LINES A-A, B-B AND C-C.
3. THE EXISTING FENCE AND GATES ALONG THE POND 4 ACCESS ROAD (STA. 463+00.00 - STA. 470+47.00) IS TO BE REMOVED DURING CONSTRUCTION AND THEN RE-INSTALLED IN THE SAME LOCATION. COORDINATION WITH THE PROPERTY OWNER IS REQUIRED IN ORDER TO MAINTAIN ON-SITE SECURITY.



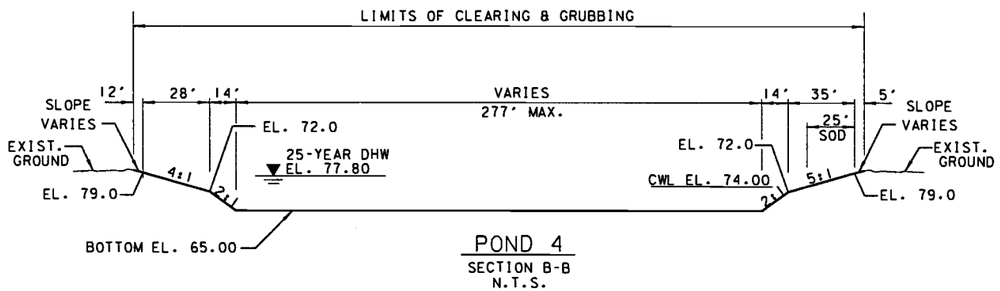


POND 4 ACCESS ROAD ENTRANCE GRADING DETAIL

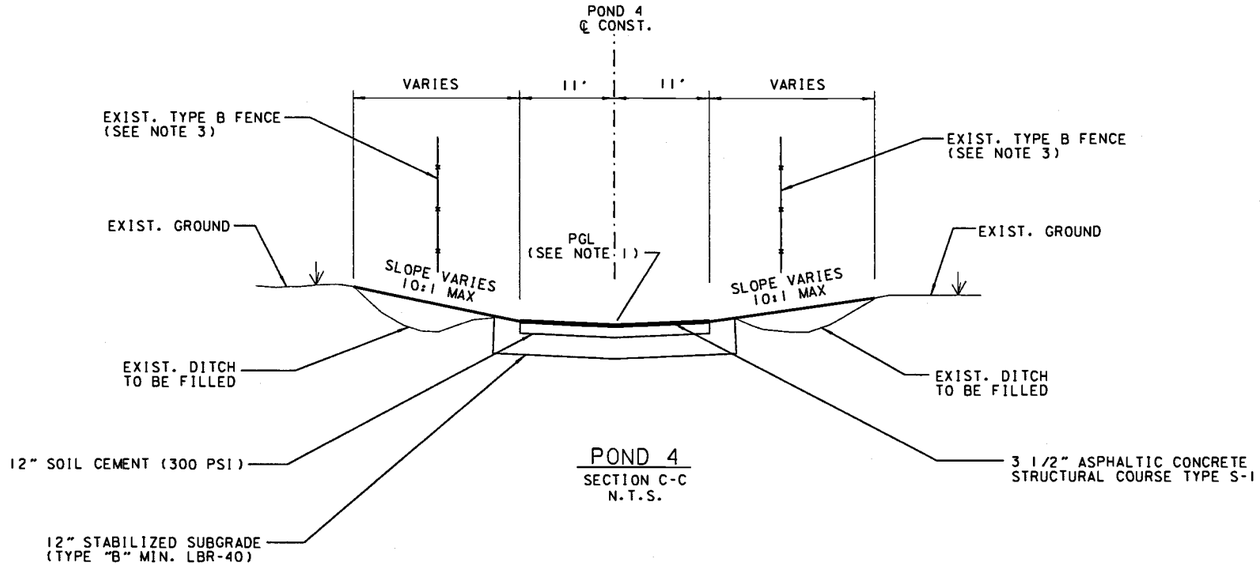
N.T.S.



POND 4
SECTION A-A
N.T.S.



POND 4
SECTION B-B
N.T.S.



POND 4
SECTION C-C
N.T.S.

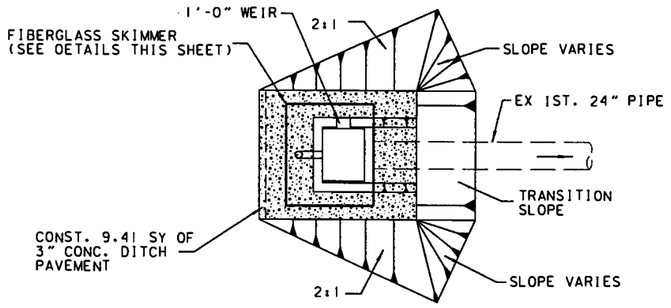
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FLORIDA

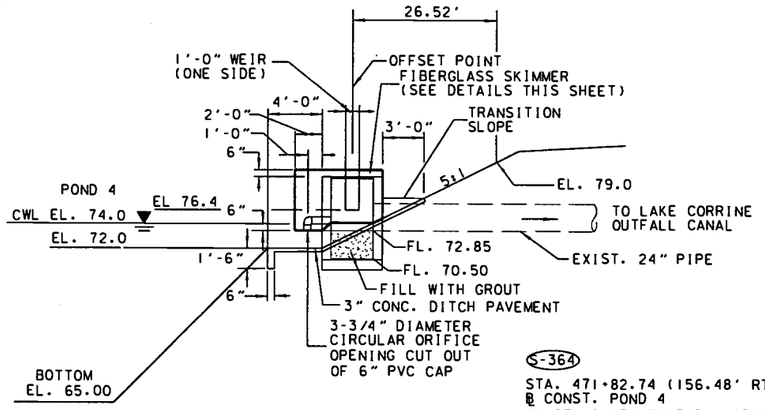
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PLAN
Pond 4

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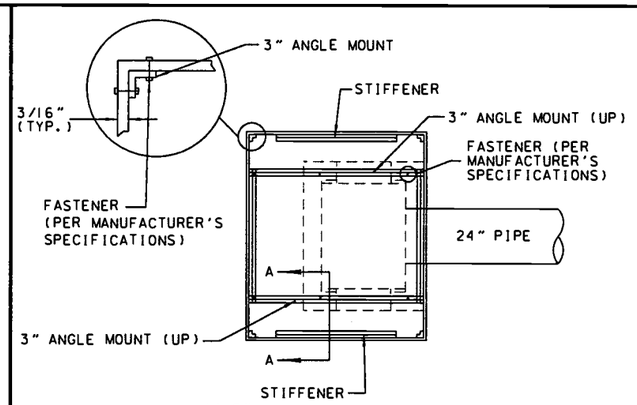


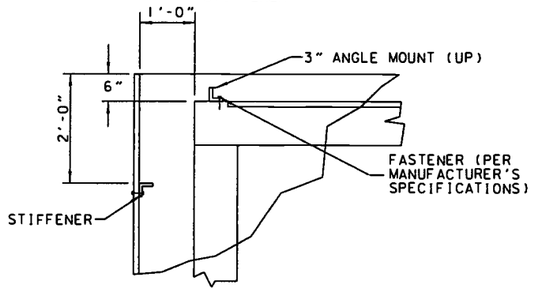
STRUCTURE S-364
PLAN
(POND 4)
N.T.S



STRUCTURE S-364
SIDE ELEVATION
(POND 4)
N.T.S

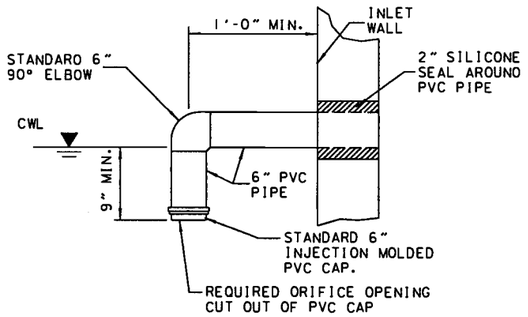
(S-364)
STA. 471+82.74 (156.48' RT)
℄ CONST. POND 4
CONST. INLET TYPE D (MODIFIED)
GRATE EL. 78.00
WEIR EL. 75.40
ORIFICE EL. 74.00
FL. 72.85
INDEX NO. 232



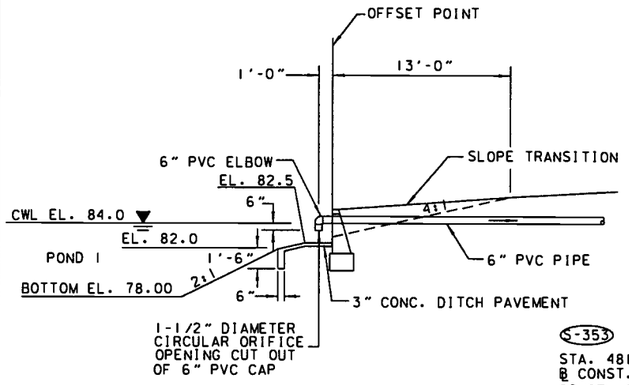


SECTION A-A

SKIMMER DETAIL
PLAN
N.T.S

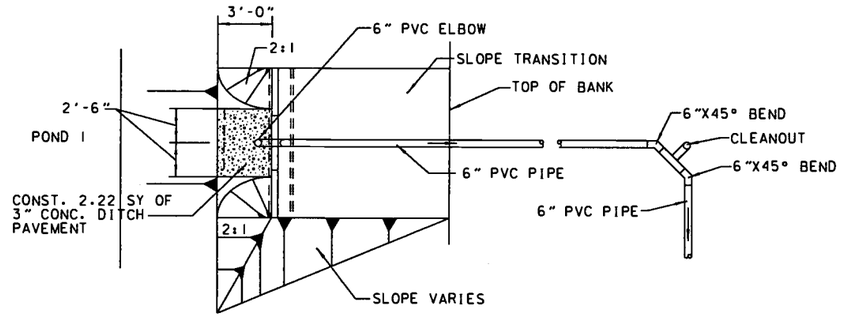


TYPICAL PVC BLEED-DOWN
DEVICE DETAIL

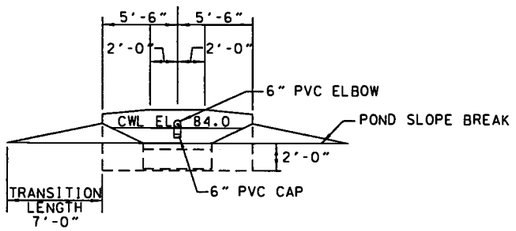


(S-353)
STA. 481+92.00 (66.9' LT)
℄ CONST. OLD CHENEY HIGHWAY
CONST. STRAIGHT ENDWALL (24")
INDEX NO. 250
ORIFICE EL. 84.00

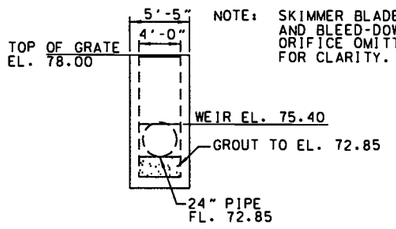
STRUCTURE S-353
SIDE ELEVATION
(POND 1)
N.T.S



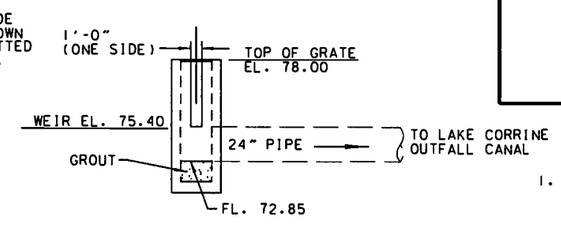
STRUCTURE S-353
PLAN
(POND 1)
N.T.S



STRUCTURE S-353
FRONT ELEVATION
(POND 1)
N.T.S



STRUCTURE S-364
FRONT ELEVATION
(POND 4)
N.T.S



STRUCTURE S-364
SIDE ELEVATION
N.T.S

NOTES

1. ALL EXPOSED PVC PIPES AND FITTINGS SHALL BE PAINTED WITH TWO (2) COATS OF WHITE ENAMEL BASE PAINT. PAINT SHALL MEET ALL APPLICABLE STATE AND FEDERAL STANDARDS AND SPECIFICATIONS.
2. ALL NECESSARY GRADING AROUND THE CONTROL STRUCTURE SHALL BE CONSIDERED INCIDENTAL AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR "INLET" OR "ENDWALL".
3. THE COST OF THE BLEED DOWN ORIFICE, SKIMMER AND THE 3" CONC. DITCH PAVEMENT SHALL BE INCLUDED IN THE COST OF THE TYPE "D" DITCH BOTTOM INLET (POND 4) OR STRAIGHT ENDWALL (POND 1).

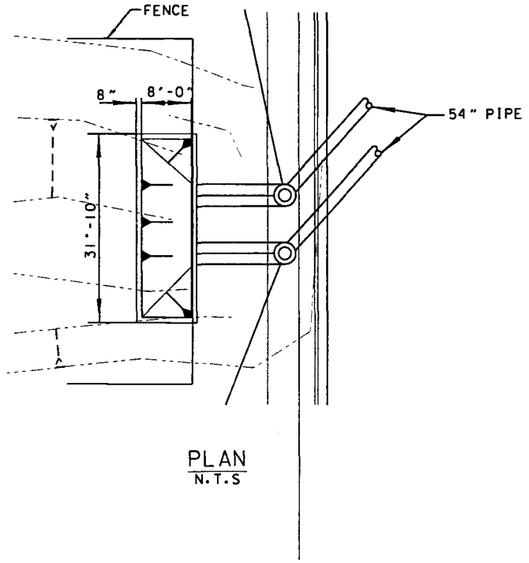
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POND 1 & 4 DETAILS

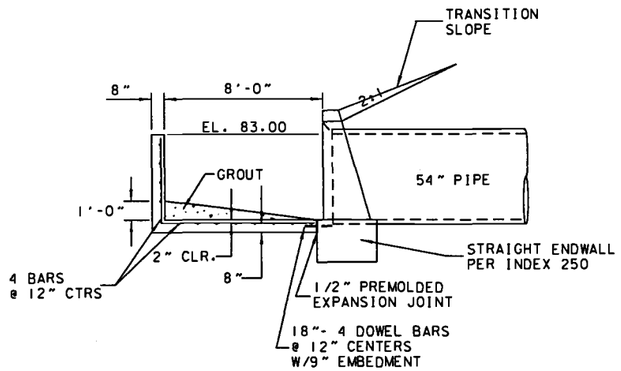
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PLAN
N.T.S

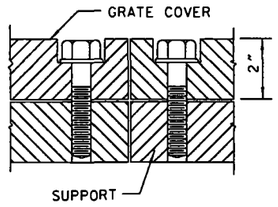
STRUCTURE	CONC CY	STEEL LBS
S-94A (ENDWALL)	15.23	*
WEIR STR.	12.13	489
TOTAL	27.36	489

* INCLUDED IN THE COST OF S-94A (ENDWALL)

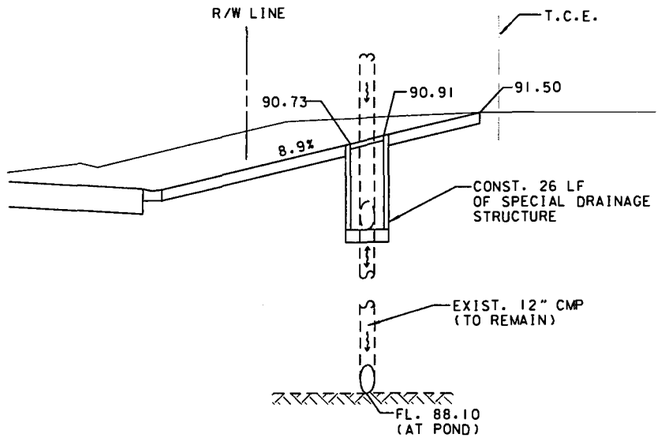


S-94A

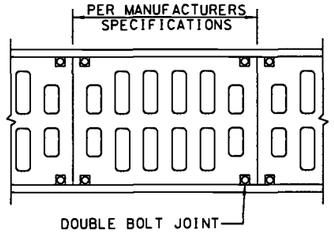
WEIR STRUCTURE DETAILS
REINFORCING
N.T.S



CONNECTION DETAIL
N.T.S

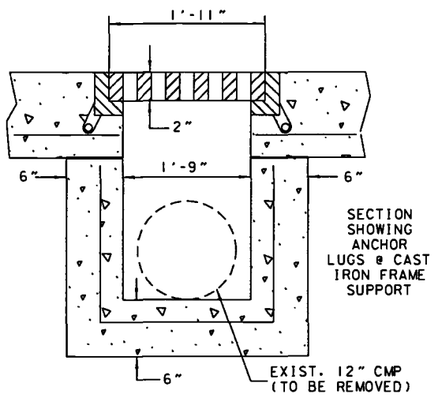


ELEVATION
N.T.S

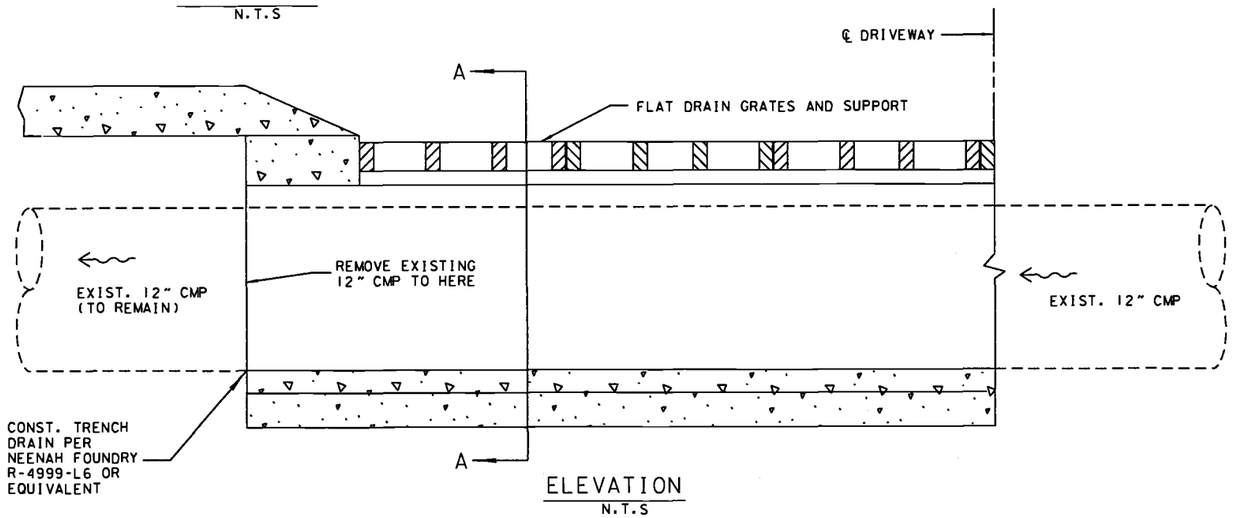


ILLUSTRATING TYPICAL GRATE WITH FRAME
N.T.S

NOTE: ALL CONNECTIONS, SUPPORT APPURTENANCES, AND CONCRETE SHALL BE INCLUDED IN THE UNIT COST FOR "SPECIAL DRAINAGE STRUCTURE", EACH.



ELEVATION
SECTION A-A
N.T.S



ELEVATION
N.T.S

SPECIAL DRAINAGE STRUCTURE DETAILS

SEE PLAN & PROFILE SHEET NO. 52
(DRIVEWAY STA. 359+90 RT)

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MISCELLANEOUS DRAINAGE DETAILS

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RESPONSE TO COMMENTS
SJRWMD ERP
APPLICATION No. 4-095-20839-3

FORSYTH ROAD
Between Old Cheney Highway and Aloma Avenue

PREPARED FOR
THE ORANGE COUNTY
BOARD OF COUNTY COMMISSIONERS

ORANGE COUNTY GOVERNMENT
FLORIDA

#1 of 2

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MARCH 2002

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Suite 1560 Eola Park Centre 200 East Robinson Street Orlando, Florida 32801 407/422-8062

TABLE OF CONTENTS

SECTION NO.	DESCRIPTION
1.0	RESPONSE TO COMMENTS
2.0	REVISED EXECUTIVE SUMMARY
3.0	CULVERT ANALYSIS

APPENDIX NO.	DESCRIPTION
1.0	POND NO. 1
2.0	POND NO. 2
3.0	POND NO. 3
4.0	POND NO. 4
5.0	POND NO. 5
6.0	POND NO. 6
7.0	POND NO. 7
8.0	WATER SURFACE PROFILES
	Lake Corrine Outfall Canal Winter Park Pines Canal
9.0	CULVERT ANALYSIS CALCULATIONS

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RESPONSE TO COMMENTS
Application No. 4-095-20839-3
Forsyth Road
Between Old Cheney Highway and Aloma Avenue (S.R. 426)
Orange County, Florida

1. **The proposed project is located within the Econlockhatchee River Hydrologic Basin. Please be advised that a system must not cause a net reduction in flood storage within the 100-year floodplain of the Econlockhatchee River or any of its tributaries, at a location with an upstream drainage area of 1 square mile or greater, except for structures elevated on pilings or traversing works that comply with conveyance requirements in subsection 10.5.2. Please clarify and submit any revised plans and calculations {40C-4.301(1)(a)(b)(c); 40C-41.063(5)(b), F.A.C.]**

Please refer to **Section 3.0,** entitled *Culvert Analysis* of this *Response to Comments* document. This section describes each of the existing and proposed culvert improvements at these crossings. As described in the ERP application, Forsyth Road will traverse across the following waterways:

- Tiffany Manor Canal;
- Lake Corrine Outfall Canal;
- Gardner Street Ditch;
- Winter Park Pines Canal; and
- CSX Railroad (south of Aloma Avenue).

Of these five crossings, only the Lake Corrine Outfall Canal and the Winter Park Pines Canal have an upstream drainage area of one (1) square mile or greater and are considered "traversing works". The improvements for these two culvert crossings are described as follows:

Lake Corrine Outfall Canal. The culvert improvements entail the removal and replacement in-kind of the existing double 54-inch RCP. The culvert length will be extended to accommodate the proposed roadway widening for Forsyth Road. The current structural condition of the existing pipes is poor, with the County having to repair roadway and pipe sections on numerous occasions. The Lake Corrine Outfall Canal is a major tributary to the Little Econlockhatchee River, originating at Lake Baldwin within the old Orlando Naval Training Center (NTC) and terminating at the Arcadia Acres weir, just east of Goldenrod Road (S.R. 551). This canal is considered to be one of Orange County's "primary" canal systems and is maintained by the Orange County Roads and Drainage Division.

Winter Park Pines Canal. The culvert improvements entail the extension of the existing double 9-foot rise by 10-foot span reinforced concrete box (RCB). The extension of the existing box culvert is warranted due to the widening of Forsyth Road. This canal is a major tributary to the Crane Strand Canal that originates within [illegible] subdivision, west of Semoran Boulevard (S.R. 436) and terminates at its confluence with the

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Crane Strand Canal, located between Forsyth Road and Goldenrod Road (S.R. 551), south of University Boulevard. This canal is also considered to be a "primary" canal system and is maintained by the Orange County Roads and Drainage Division.

Section 3.0, entitled *Culvert Analysis*, further describes the approach, methodology, and results of the culvert analysis for Forsyth Road. Refer to **Appendix 8.0** for the Water Surface Profile (HEC-2) calculations for the Lake Corrine Outfall Canal and the Winter Park Pines Canal; and **Appendix 9.0** for culvert analysis calculations at the Tiffany Manor Canal and the CSX Railroad..

2. **Pursuant to staff's telephone conversation with you on February 12, 2002, please be advised that the proposed treatment methodology is a wet-detention pond. Please be advised that the wet-detention system must be designed as follows:**

   a. **The proposed wet detention system must be designed such that the outfall structure shall bleed down one-half the required treatment volume within 24 to 30 hours following a storm event, but no more than one-half of this volume should be discharged within the first 24-hours.**

   b. **The proposed system must be designed so that the mean depth of the permanent poll is between 2 and 8 feet, and the maximum depth does not exceed 12 feet below the invert of the bleed down device.**

   c. **Be designed so the flow path through the pond has an average length to width ratio of at least 2:1. The alignment and location of inlets and outlets should be designed to maximize flow paths in the pond. If short flow paths are unavoidable, the effective flow path should be increased by adding diversion barriers such as islands, peninsulas, or baffles to the pond. Inlet structures shall be designed to dissipate the energy of water entering the pond.**

   d. **Be designed so that bleed down devices shall incorporate minimum dimensions no smaller than six square inches of cross section area, two inches wide, and 20 degrees for "v" notches. Bleed down devices incorporating dimensions smaller than six inches minimum width or less than 45 degrees for 'v" notches shall include a device to minimize clogging. Examples include baffles, grates, and pipe elbows.**

   e. **Be designed so that the bleed down structure invert elevations are at or above the estimated post-development normal ground water table elevation. If the structure is proposed to be set below this elevation, ground water inflow must be considered in the drawdown calculations, calculation of average residence**

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20839-3
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time, estimated normal water level in the pond, and pollution removal efficiency of the system.

f. Provide for permanent maintenance easements or other acceptable legal instruments to allow for access to and maintenance of the system, including the pond, littoral zone, inlets and outlets. The easement or other acceptable instrument must cover the entire littoral zone.

g. Be designed so that the average pond side slope measured between the control elevation and two feet below the control elevation is no steeper than 3:1 (horizontal:vertical).

Please revise accordingly, and submit revised calculations and plans. {40C-42.023(a)(b); 40C-42.026(4)(b)(c)(e)(f)(g)(h)(i)(j), F.A.C.]

Section 2.0 of this *Response to Comments* document is a revised EXECUTIVE SUMMARY, which summarizes the revised orifice sizes for the seven (7) stormwater ponds, the revised drawdown time, and the revised peak discharge rate comparisons for the project.

Refer to **Appendix 1.0** through **Appendix 7.0** for the revised calculations for the seven (7) stormwater ponds proposed for Forsyth Road. These calculations reflect the revised bleed-down orifice size for each of the ponds to draw down ½ of the required pollution abatement volume within 24- to 30-hours, pursuant to Chapter 40C-42.026(4)(b), F.A.C. The calculations also include the results from the revised ICPR flood routing models for the drawdown analysis and the peak stages for the 2.33-, 10-, 25- and 100-year frequency, 24-hour duration storm events.

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The following table summarizes the water quality performance for the proposed stormwater ponds for Forsyth Road.

Water Quality Treatment Summary

Pond Name	Basin No.	Water Quality Treatment						
		Required Treatment Volume (af)	Provided Treatment Volume (af)	Required Permanent Pool Volume (af)	Provided Permanent Pool Volume (af)	Required Permanent Pool Volume to be bled down within 24- to 30-hours (af) *	Orifice Size (in)	Drawdown Time (hours)
POND-1	1	0.467	0.467	0.830	1.811	0.234	2.25	24.53
POND-2	2	0.470	0.470	0.740	0.740	0.235	2.50	25.09
POND-3	3	0.850	0.850	1.352	2.128	0.425	2.75	24.00
POND-4	4	2.700	2.700	4.650	10.660	1.350	4.75	28.34
POND-5	5	0.504	0.504	0.820	1.204	0.252	3.50	24.34
POND-6	6	1.508	1.508	2.387	2.467	0.754	3.00	24.75
POND-7	7	2.840	2.840	4.510	8.169	8.169	6.000	25.77

Note: * Reference: Chapter 40C-42.026(4)(b), F.A.C.
Required permanent pool volume is for 21-days (no littoral zone).

In addition, revised sheets of the construction plans reflecting the revised bleed-down orifice sizes are also included with this *Response to Comments* document.

The following table summarizes the revised peak discharge rates from the project based on the revised orifice sizes (for the water quality bleed-down).

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Comparison of Peak Discharges (Q)

Node Name	Basin No.	2.3-Year Storm Event			25-Year Storm Event		
		Pre-Dev.	Post-Dev.	Difference	Pre-Dev.	Post-Dev.	Difference
SR50DTCH	1	4.37	1.97	-2.40	9.14	4.00	-5.14
NODE-99	1	1.78	1.48	-0.30	3.73	5.16	1.43
TMCANAL	2	9.47	6.82	-2.65	20.07	16.42	-3.65
LCORRINE	3/4	17.97	8.35	-9.62	42.17	28.84	-13.33
GARDOUT	5	12.50	10.62	-1.88	26.40	24.76	-1.64
WPPINES	6	7.98	2.48	-5.50	16.36	13.40	-2.96
CSTRAND	7	52.96	38.00	-14.96	107.67	91.42	-16.25
	Totals	**107.03**	**69.72**	**-37.31**	**225.54**	**184.00**	**-41.54**

Notes: 1. Difference is Post-Development minus Pre-Development discharge.
2. Post-development discharge to the Lake Corrine Outfall Canal (Node LCORRINE) is the summed total from Basins 3 and 4 for Pre- and Post-development conditions (including Ponds 3A/3B and Pond 4).

Based on the results of the revised flood routing analysis (to incorporate the revised orifice sizes for the pond control structures), the post-development peak discharge rate for the 2.33- and 25-year frequency, 24-hour duration storm event will still be less than the pre-development discharge rate, conforming to the District's discharge rate criteria.

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SECTION 2.0

REVISED EXECUTIVE SUMMARY

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EXECUTIVE SUMMARY

INTRODUCTION

The purpose of this report is to describe the drainage concepts, design standards and recommendations for the drainage improvements associated with the proposed roadway improvements for Forsyth Road between Old Cheney Highway and Aloma Avenue (S.R. 426). This report also includes supporting drainage calculations and summary of results.

Project Location

The roadway improvement project is located wholly within the unincorporated boundaries of Orange County in Sections 3, 10, 11, 14, 15, 22 and 23, Township 22 South, Range 30 East, Orange County, Florida.

NEED FOR PROJECT

Functional Classification

The segment of Forsyth Road between Colonial Drive and Aloma Avenue is classified as an Urban Collector according to the Orange County Comprehensive Plan dated July 1, 1991. Forsyth Road is a north-south facility principally providing access to the numerous commercial and industrial businesses found along the study segment. In addition to the high concentration of these land uses, there are also a number of residential neighborhoods along, and adjacent to the Forsyth Road corridor.

The Comprehensive Plan has identified Forsyth Road as an element within Corridor F. These corridors include roadways which tend to function as parallel groups within the transportation network. The other roads which are included in this corridor are: Semoran Boulevard, Goldenrod Road, Chickasaw Trail, and a portion of the Eastern Beltway. This is important to note since these facilities will tend to operate as a system and affect each other more than individual, isolated facilities.

Forsyth Road currently carries approximately 16,000 vehicles a day and operates at a Level of Service E in the Peak Hour. The posted speed limit is 35 mph with the exception of the curved alignment where advisory speeds of 30 mph are posted. There is also a speed zone in the vicinity of Cheney Elementary School which has been provided for increased safety.

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Insert Location Map

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PERMITTING CONSIDERATIONS AND HISTORY

The project was previously issued an MSSW permit (Permit No. 4-095-0448GM) and an WRM permit (Permit No. 12-095-0097GM) on July 11, 1995. Subsequently, a two (2) year extension for each permit was requested and issued on July 11, 2000 by the District (Permit No. 4-095-0448GME and 12-095-0097GM2). These permit extensions are scheduled to expire in July 2002. Since the beginning of construction for the project is anticipated to be in mid-2002, the permit coverage for the project will expire prior to the project construction being completed. Therefore, Orange County has decided to pursue an Environmental Resource Permit (ERP) to provide permit coverage for the project. The securing of an ERP from the District will allow the County to complete construction of Forsyth Road within five (5) years of issuance of the ERP.

OVERVIEW OF EXISTING DRAINAGE CONDITIONS

Currently, the project is drained by a series of roadside ditches and inlet/pipe collection systems, which were observed to be in moderate to poor condition. Localized flooding has continued to persist along the corridor.

EXISTING BASIN CHARACTERISTICS

The Project Area extends from Old Cheney Highway to Aloma Avenue (SR 426) and lies within the Little Econlockhatchee River Basin. This basin encompasses approximately 90 square miles located in north central Orange County and south central Seminole County. The terrain of the basin has been classified as generally flat and poorly drained except in those areas where the natural drainage patterns have been altered by man.

The existing drainage features within the Project Area consists of drainage ditches parallel to the existing roadway and cross drains that flow into lateral ditches or canals. There are seven (7) primary drainage basins that have been identified within the Project Area. These drainage basins are identified on the drainage maps included in this report. Primary drainage basins along Forsyth Road are described as follows:

Drainage Basin No. 1

Drainage Basin No. 1 consists of roadway drainage area extending north from Old Cheney Highway to Colonial Boulevard (SR 50) along Forsyth Road. The existing drainage system consists of sheet flow within the right-of-way into either a vacant lot located in the northeast corner of Forsyth Road and Old Cheney Highway or a drainage ditch located on the west side of the roadway. The stormwater runoff is transported north into an open ditch at Colonial Drive (SR 50). The land use in the basin is comprised of service stations, commercial businesses, and vacant lots. The Orange County Engineering Department has completed the construction for the roadway and drainage improvements to Forsyth Road south of Old Cheney Highway. This included the construction of

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a stormwater management pond on the northeast quadrant of the intersection of Old Cheney Highway and Forsyth Road. The improvements to Forsyth Road under this project will modify and utilize this stormwater pond to provide water quality treatment of the section from Old Cheney Highway to State Road 50.

Drainage Basin No. 2

Drainage Basin No. 2 extends from the north side of Colonial Drive (SR 50) to the north side of Agate Lane (Sta. 255+50). The basin encompasses approximately 4.65 acres of contributing roadway drainage area. The existing drainage system consists of overland sheet flow within the right-of-way to drainage ditches on the west side of Forsyth Road and ditch bottom inlets on the east side. Offsite drainage from the west is conveyed by overland flow to a ditch on the west side, which combines with roadway runoff and flows underneath Forsyth Road via a double 48-inch diameter reinforced concrete pipe (RCP) cross drains. The current land use in the basin is comprised of small commercial businesses, vacant lots and single family residential housing.

Drainage Basin No. 3

Drainage Basin No. 3 extends from the north side of Agate Lane to the Lake Corrine (Baldwin) Outfall Canal. The basin encompasses of approximately 3.2 acres of contributing roadway drainage area. The existing drainage system consists of primarily sheet flow to existing ditches or inlets that convey runoff to roadside ditches which outfall into the canal. A small water quality detention pond serving the Cheney Elementary was observed to discharge to a ditch immediately adjacent to Forsyth Road. The current land use in the basin is comprised of small businesses, an elementary school, and single family residential homes. There is an existing commercial development located on the west side of Forsyth Road immediately south of Turquoise Lane that will also contribute to the drainage basin.

Drainage Basin No. 4

Drainage Basin No. 4 extends from the Lake Corrine (Baldwin) Outfall Canal to Sta. 299+00, north of Hanging Moss Road. The basin encompasses approximately 1.1 acres of contributing roadway drainage area and 5.6 acres of offsite area for a total drainage area of 6.7 acres. The existing drainage system flows south to the canal by way of overland flow from existing properties into roadside ditches. Some commercial businesses in the basin have dry retention ponds to treat runoff before discharging to roadside ditches. The current land use in the basin is comprised of commercial businesses, industrial parks, and vacant lots. This basin also includes the Ground Control, Inc. and Heddron Construction sites located on the east side of Forsyth Road, immediately north of the Lake Corrine Outfall Canal. The County has entered into an agreement with the owners to reconstruct their existing stormwater pond to accommodate both the Forsyth Road improvements and the "ultimate" development for these two parcels.

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Drainage Basin No. 5

Drainage Basin No. 5 extends from Sta. 299+00, north of Hanging Moss Road to Sta. 322+50, just south of Stapoint Court. The basin encompasses approximately 4.75 acres of contributing roadway drainage area and 17.00 acres of offsite area for a total drainage basin of 21.75 acres. The existing drainage system flows primarily by overland flow into drainage ditches located on the west side of Forsyth Road. Stormwater runoff is then conveyed from the roadside ditches to a lateral drainage ditch located on the north side of Discount Self Storage. This ditch extends to the east and then to the north and connects with the lake system of the Hidden Oaks condominium community. Several commercial businesses have retention swales located on their property which contain the "first flush" of stormwater and overflow into the roadside ditches when the swale berms are exceeded. The land use in the basin is highly urbanized and contains several industrial parks and commercial businesses.

Drainage Basin No. 6

Drainage Basin No. 6 extends from Sta. 322+50, south of Stapoint Court to the south side of University Boulevard. The drainage basin contains approximately 7.45 acres of contributing drainage area. The drainage system is primarily contained within the right-of-way which flows north to south. Two subdivisions, Bel-Aire Pines and Terra Woods, adjacent to the Study Area, contain separate stormwater management and drainage systems. These subdivisions discharge directly into the Winter Park Pines Canal. The basin encompasses the Winter Park Pines Canal at Forsyth Road, which consist of double 9'x10' box culverts at the crossing. The current land use in the basin north of the canal contains small commercial businesses, a church, an animal hospital and a vacant lot.

Drainage Basin No. 7

Drainage Basin No. 7 extends from the north side of University Boulevard to the CSX railroad tracks. The basin contains approximately 9.2 acres of contributing roadway drainage area and 5.0 acres of offsite area for a total drainage basin area of 14.2 acres. Stormwater runoff is conveyed by sheet flow from the south to north along drainage ditches on the west side and storm sewer pipes on the east side to the CSX railroad right-of-way. Runoff is then conveyed to a ditch within the CSX railroad right-of-way and running parallel with the railroad tracks. The ditch is connected to the Crane Strand Canal to the east. This ditch was heavily vegetated and did not appear to have been maintained within recent time. This basin has experienced localized flooding on numerous occasions due to the condition of the CSX railroad ditch. This ditch is the primary means of drainage relief for the adjacent areas. The land use within the basin consists of various industrial and commercial businesses.

Drainage Basin No. 7 also extends from the CSX railroad tracks to Aloma Avenue (SR 426). The basin encompasses approximately 1.5 acres of contributing roadway drainage area and 6.6 acres of offsite area for a total drainage area of 8.1 acres. Stormwater runoff from the west side of Forsyth Road is collected by inlets located in front of local businesses and conveyed via storm sewer pipes

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to the ditch paralleling the CSX railroad tracks. This basin, experiences localized flooding due to the condition of the existing ditch along the CSX railroad. The land use in the basin consist of various commercial businesses and light industry.

Drainage Basin No. 7 also accepts stormwater runoff from the existing COSTCO site located at the intersection of Forsyth Road and University Boulevard. This commercial development provides their own stormwater management system, and discharges to Forsyth Road only for certain storm events.

SOILS CONDITION

Soil types encountered in the project vicinity were determined from the *Soil Survey of Orange County, Florida*, prepared by the Soil Conservation Service (SCS) for the United States Department of Agriculture. The document provides specific information about the soil in the survey area. This information includes a description of the soils and their location and a discussion of suitability of the soils for specific uses.

According to the United Sates Agriculture Department, Soil Conservation Service (SCS), the project area lies within the general classification of Urban land-Smyrna-Pomello. These soils are sandy throughout with nearly level to gently sloping terrain and poorly to moderately well drained. Some have an organic-stained subsoil at a depth of less than 30 inches and others ranging between 30 to 50 inches. Most areas have been modified for urban use.

From a review of the SCS *Soil Survey for Orange County*, nine distinct soil associations have been identified as follows:

- Basinger Fine Sand - depressional
- Pomello Fine Sand - 0-5% slope
- Pomello - Urban land complex - 0-5% slope
- Samsula-Hontoon-Basinger association - depressional
- Smyrna Fine Sand
- Smyrna - Urban land complex
- Urban Land
- Zolfo Fine Sand
- Zolfo - Urban land complex

The following sections provide a brief description of each soil type encountered within the Project Study Area.

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flow attenuation to pre-development flow rates. The system then discharges to an existing ditch (known as the Tiffany Manor outfall canal), which flows east under Marcia Drive and into the Colonial Drive ditch system.

Pond 3A/3B

Pond 3A and 3B consist of an "online" wet detention system which utilizes the volume from both ponds to provide the necessary water quality treatment and peak flow attenuation. The ponds are located on two lots that are currently for sale (and subsequently purchased by Orange County). The two ponds are connected by a 36-inch diameter culvert under Turquoise Lane. A control structure in Pond 3B, consisting of a bleed-down orifice and overflow weir, controls the water level in the pond for the appropriate design storm events. The pond system outfalls to the Lake Corrine Outfall canal, located to the north of the ponds, west of Forsyth Road. The contributing drainage basin to this pond encompasses 4.84 acres, including offsite drainage along Amethyst Lane. This pond also accommodates the discharge from the future improvements for Cheney Elementary School (Permit No. 42-095-1120ANGM2-ERP) and the Forsyth Center development (Permit No. 40-095-0420AW). The flood routing calculations for Pond 3A/3B include the future improvements for the Cheney Elementary, and the connection from the existing Forsyth Center stormwater pond to Forsyth Road.

Pond 4

Pond 4 is an "on-line" wet detention system which provides water quality treatment and peak flow attenuation of runoff rates for the contributing drainage basin from Forsyth Road. This pond was originally to be located in a vacant lot, which consists of predominantly pine trees. This lot was subsequently developed (Ground Control Landscaping Office Building, by Heddron Construction - Permit No. 42-095-1745AN-ERP) and a stormwater pond serving only the development was constructed. **Due to the need for a stormwater pond with outfall access to the Lake Corrine Outfall Canal, Orange County entered into an agreement with both Ground Control Landscaping and Heddron Construction to construct a "joint use" stormwater pond. This pond would encompass the existing wet detention pond originally constructed for Ground Control/Heddron Construction and enlarged to accommodate the proposed Forsyth Road roadway improvements. It should be noted that this "joint use" pond is to also accommodate any future improvements for Ground Control Landscaping and Heddron Construction.**

This pond will utilize the 24-inch pipe from the existing Ground Control/Heddron Construction pond as the proposed Pond 4 outfall to the Lake Corrine Outfall Canal. This pond will have a control structure with a circular orifice to slowly release stormwater to the receiving water body. The Pond 4 drainage basin encompasses 7.35 acres of proposed Forsyth Road (including the pond area) and 4.84 acres of offsite area.

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SECTION 3.0

CULVERT ANALYSIS

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CULVERT IMPROVEMENTS

The Forsyth Road project included five (5) cross-drain culverts that were to be evaluated for hydraulic and structural adequacy. Of the five, only two are considered within the District's "traversing works" criteria. The following sections brief summarizes of each of these "traversing works" culvert crossings.

Tiffany Manor Outfall Ditch (S-35)

This structure consisted of double 48-inch diameter reinforced concrete pipes with sand cement bag headwalls for end treatments. The structure was observed to be in physically good condition. The evaluation of this structure resulted in maintaining the same pipe size but horizontally realigning the pipes to better line up with the existing ditch on the east and west side of Forsyth Road. The double 48-inch diameter pipe at Forsyth Road is consistent with those east (downstream) at Marcia Drive.

The tailwater condition for the culvert was determined using the FHWA program HY-8, Version 4.0 to develop a rating curve at Marcia Drive for various tailwater and discharge conditions. The existing double 48-inch pipes at this crossing controlled the amount of stormwater released to Colonial Drive, subsequently affecting the staging effect in the existing ditch downstream of S-35. The rating curves were then input into adICPR to dynamically model the culvert performance during a 10-year frequency, 24-hour duration storm event.

The tailwater solution was determined using "HW-TW-Discharge" rating curves, which are a family of curves specified for up to six (6) discharge curves. Each curve is dependent upon a specific tailwater condition. This methodology of determining the tailwater solution was selected because of the restricting nature of the double 48-inch culverts at Marcia Drive. The adICPR program will determine the tailwater solution in this HW-TW-Discharge rating curve matrix. The following table summarizes the HW-TW-Discharge rating curve matrix. The adICPR input and output data is included in **Appendix 9.0** of this document.

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The following table summarizes the flood routing results for the culvert crossing

Summary of Cross Drain Design High Water Elevations (DHW)
Structure S-35 (Tiffany Manor Canal)

Structure No.	Station	Q_{10} cfs	10-Year DHW Elevation feet, NGVD		Diff. feet	Overtopping Elevation
			Existing	Proposed		
S-35	253+60.00 (1)	36.4	81.98	82.03	0.05	85.74

Although the pipe size and number of pipe barrels remain the same (double 48-inch RCP), there is an increase of 0.05-feet in the DHW on the upstream side of Forsyth Road. The slight increase in stage can be attributed to the increase in pipe length (friction losses) for the crossing due to the widening of Forsyth Road. The existing pipe length for the double 48-inch pipes is 41-feet, whereas the proposed pipe length is 84-feet. No flooding upstream of the proposed culvert improvements is expected due to the widening of Forsyth Road.

Lake Corrine Outfall Canal (S-98)

The Lake Corrine Outfall Canal cross-drain currently consists of double 54-inch diameter concrete pipes aligned in parallel to connect the canal on both sides of Forsyth Road. The culverts are connected by a manholes to account for a slight offset in the canal. Conversations with the Orange County Maintenance staff at their Forsyth Road office indicated that the culverts have been in service for over 20-years and that they are approaching their structural life. Apparently, the County has previously experienced leaking at the pipe joints. In addition, the culvert crossing has a weir/drop structure on the west side of Forsyth Road, which controls the water level in the canal upstream (west of Forsyth Road). This was also confirmed with Tom Perrine, Foreman, of the Orange County Roads and Drainage Division.

The proposed culvert improvements is to straighten the culvert horizontal alignment, maintaining the same pipe sizes and vertical alignment at the existing invert elevations east and west of Forsyth Road. Junction manholes will need to be provided on the west side of the culvert to allow connections from proposed bypass storm sewer lines. Rubble rip-rap will also be provide on the east side to provide stability of the canal bottom and erosion protection for the canal side slopes. The existing concrete weir and drop structure on the west side of Forsyth Road will be removed and relocated at the same existing elevations, in association with the roadway widening. This culvert was previously modeled by Miller & Miller for the *Little Econlockhatchee River Restoration Study*, prepared for the Orange County Board of County Commissioners in 1984. The upstream

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contributing drainage basin for this culvert crossing exceeds one (1) square mile, therefore the design accounted for any loss of flood storage that may result from the culvert replacement.

SUMMARY OF 100-YEAR WATER SURFACE ELEVATION COMPARISON LAKE CORRINE (E-4) OUTFALL CANAL

Frequency	Q cfs	Stream Station	Description	WSP Elevation feet, NGVD		
				Exist.	Prop.	Diff.
10-Year	638	6020	D.S. of Forsyth Road	80.19	80.05	-0.14
10-Year	638	6120	U.S. of Forsyth Road	87.61	87.69	0.08
10-Year	606	7425	1,305-ft. U.S. of Forsyth Road	88.67	88.71	0.04
100-Year	946	6020	D.S. of Forsyth Road	81.11	81.07	-0.04
100-Year	946	6120	U.S. of Forsyth Road	88.64	88.64	0.00
100-Year	896	7425	1,305-ft. U.S. of Forsyth Road	89.63	89.63	0.00

Reference: *Little Econlockhatchee River Restoration Study*, Miller & Miller, 1984 (for the Orange County Board of County Commissioners)

Refer to **Appendix 8.0** for the water surface profile calculations (HEC-2) for the Lake Corrine Outfall Canal for Existing and Proposed conditions.

Gardner Street Outfall Ditch (S-181)

This cross-drain currently consists of a single 24-inch corrugated metal pipe (CMP) which discharges to a lateral ditch to the east of Forsyth Road. This ditch is encompassed in an existing 15-foot drainage easement. This ditch flows towards the Hidden Oaks Condominium development lake system and eventually to the Crane Strand Canal.

The proposed culvert improvements is to replace the existing 24-inch with a single 36-inch culvert and regrade the lateral ditch to match the pipe invert. The 36-inch culvert is connected to a bypass storm sewer line which collects stormwater from offsite areas between Hanging Moss Road and Stapoint Drive. The tailwater condition for the proposed culvert was estimated at the normal depth of the ditch for the 10-year frequency, 24-hour duration storm event. Forsyth Road is the headwaters of this culvert system, therefore the replacement of the single 24-inch CMP with a single 36-inch RCP is expected to result in a lowering of the DHW elevation at Forsyth Road. In addition, the downstream ditch is proposed to be improved as part of the project to allow conveyance of the stormwater runoff originating from Forsyth Road. No flooding of adjacent properties is expected as part of these improvements.

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Winter Park Pines Canal (S-232)

The existing cross-drain at the Winter Park Pines Canal consists of a double 9-foot rise by 10-foot span reinforced box culvert. This culvert was constructed by Orange County in 1982. The culvert horizontal alignment is slightly skewed with Forsyth Road, which is in a curvature at the culvert crossing. Fabric-formed rip-rap is provided on both the upstream and downstream side of the box culvert for erosion protection and canal bottom stability.

The proposed improvements to this box culvert will consist of an extension of the culvert barrels to accommodate the widening improvements. In addition, pedestrian handrails will be provided at the back of sidewalks for safety considerations. This culvert was previously modeled by Miller & Miller for the *Little Econlockhatchee River Restoration Study*, prepared for the Orange County Board of County Commissioners in 1984. Since the box culvert improvements entail only an extension of the culvert barrels, no further hydraulic analysis was warranted. **Appendix 8.0 - Water Surface Profile Calculations - Winter Park Pines Canal** contains the HEC-2 water surface profile analyses for the 10- and 100-year flood events (existing and proposed). The following table summarizes the results of the analyses.

10-YEAR WATER SURFACE ELEVATION							
Frequency	**Q cfs**	**Time hour**	**Stream Station**	**Description**	**WSP Elevation feet, NGVD**		
					Exist.	**Prop.**	**Diff.**
10-Year	215	10.0	3539	U.S. of Forsyth Road	82.76	82.76	0.00
10-Year	334	11.0	3539	U.S. of Forsyth Road	83.79	83.79	0.00
10-Year	457	12.0	3539	U.S. of Forsyth Road	84.60	84.60	0.00
10-Year	478	13.0	3539	U.S. of Forsyth Road	84.72	84.72	0.00
10-Year	454	14.0	3539	U.S. of Forsyth Road	84.58	84.58	0.00
10-Year	407	15.0	3539	U.S. of Forsyth Road	84.29	84.29	0.00
10-Year	337	16.0	3539	U.S. of Forsyth Road	83.81	83.81	0.00
10-Year	291	17.0	3539	U.S. of Forsyth Road	83.46	83.46	0.00

Reference: *Little Econlockhatchee River Restoration Study*, Miller & Miller, 1984 (for the Orange County Board of County Commissioners)

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100-YEAR WATER SURFACE ELEVATION							
Frequency	**Q cfs**	**Time hour**	**Stream Station**	**Description**	**WSP Elevation feet, NGVD**		
					Exist.	**Prop.**	**Diff.**
100-Year	429	10.0	3539	U.S. of Forsyth Road	84.42	84.42	0.00
100-Year	623	11.0	3539	U.S. of Forsyth Road	85.46	85.60	0.14
100-Year	752	12.0	3539	U.S. of Forsyth Road	86.23	86.26	0.03
100-Year	766	13.0	3539	U.S. of Forsyth Road	86.30	86.33	0.03
100-Year	715	14.0	3539	U.S. of Forsyth Road	86.05	86.08	0.03
100-Year	429	10.0	3612	91-ft. U.S. Forsyth Road	84.47	84.47	0.00
100-Year	623	11.0	3612	91-ft. U.S. Forsyth Road	85.55	85.69	0.14
100-Year	752	12.0	3612	91-ft. U.S. Forsyth Road	86.36	86.39	0.03
100-Year	766	13.0	3612	91-ft. U.S. Forsyth Road	86.43	86.46	0.03
100-Year	715	14.0	3612	91-ft. U.S. Forsyth Road	86.17	86.20	0.03
100-Year	429	10.0	4212	691-ft. U.S. Forsyth Road	84.92	84.92	0.00
100-Year	623	11.0	4212	691-ft. U.S. Forsyth Road	86.03	86.13	0.10
100-Year	752	12.0	4212	691-ft. U.S. Forsyth Road	86.80	86.82	0.02
100-Year	766	13.0	4212	691-ft. U.S. Forsyth Road	86.87	86.89	0.02
100-Year	715	14.0	4212	691-ft. U.S. Forsyth Road	86.61	86.63	0.02

Reference: *Little Econlockhatchee River Restoration Study*, Miller & Miller, 1984 (for the Orange County Board of County Commissioners)

From the analysis, it can be seen that the proposed culvert extension will not have any affect on the water surface profile in the Winter Park Pines Canal for the 10- and 100-year flood events. This also satisfies the SJRWMD 100-year frequency flood criteria of no more than a 1-foot rise immediately upstream of project and 0.1-foot rise 500-feet upstream of the project, pursuant to their traversing works criteria.

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CSX Railroad Ditch (S-301)

The cross-drain at the intersection of the CSX railroad ditch and Forsyth Road currently consists of a single 38-inch by 60-inch elliptical concrete pipe with sand-cement headwalls for end treatments. This culvert was observed to be partially full of water during field reviews. The railroad ditch on both sides of Forsyth Road were observed to be overgrown with vegetation, presumably retarding the flow capacity of the ditch. The culvert also appeared to be vertically aligned in a "sumped" condition, where the ditch inverts on either side of the culvert are higher than the culvert inverts. This is probably attributed to the existing low profile grade of Forsyth Road at the railroad crossing.

The proposed roadway profile grade line will maintain the "at-grade" crossing at the CSX railroad. This results in a potential conflict between an elliptical pipe of the same size as the existing and the bottom of the curb line. Rather than an "in-kind" replacement, an equivalent double pipe culvert is proposed. The equivalency is based on the cross-sectional area of the pipes in comparison. The selected pipe size is a double 29-inch by 45-inch elliptical pipe. The following table provides a hydraulic elements comparison of the existing to the proposed culvert.

Elliptical Pipe Comparison

Pipe Condition	Elliptical Pipe Dimensions				
	Nominal Dimensions		No. of Pipe	Equivalent Diameter (in.)	Area (Sq. Ft.)
	Horizontal				
	Rise (in.)	Span (in.)			
Existing	38	60	1	48	12.9
Proposed	29	45	2	36	14.8

The tailwater condition for the culvert was determined using a program entitled *Trapezoidal Channel Analysis*, Version 1.3, developed by Dodson & Associates, to create a rating curve at the existing railroad ditch east of Forsyth Road for various tailwater and discharge conditions. The rating curves were then input into adICPR to dynamically model the culvert performance during a 10-year frequency, 24-hour duration storm event.

The tailwater solution was determined using "HW-TW-Discharge" rating curves, which are a family of curves specified for up to six (6) discharge curves. Each curve is dependent upon a specific tailwater condition. This methodology of determining the tailwater solution was selected because of the absence of tailwater influence on the existing ditch from the Crane Strand Canal. The adICPR program will determine the tailwater solution in this HW-TW-Discharge rating curve matrix. The following table summarizes the HW-TW-Discharge rating curve ma

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Summary of CSX Railroad Ditch Rating Curve

Tailwater El. 82.50		Tailwater El. 83.00		Tailwater El. 83.50		Tailwater El. 84.00		Tailwater El. 84.50		Tailwater El. 85.00	
HW	Q	HW	Q	HW	Q	HW	Q	HW	Q	HW	Q
82.50	0	83.00	0	83.50	0	84.00	0	84.50	0	85.00	0
83.92	20	83.92	20	84.05	20	84.28	20	84.62	20	85.05	20
86.93	50	84.70	50	84.60	50	84.71	50	84.92	50	85.23	50
89.21	75	85.77	75	85.03	75	85.02	75	85.16	75	85.40	75
89.27	100	87.64	100	85.54	100	85.31	100	85.38	100	85.57	100
89.34	125	89.34	125	86.23	125	85.63	125	85.60	125	85.74	125
89.42	150	89.42	150	87.20	150	85.98	150	85.82	150	85.91	150
89.59	200	89.59	200	89.59	200	86.91	200	86.30	200	86.24	200

The headwater elevations were determined using a backwater profile routine in the program based on a given discharge rate and tailwater elevation at the boundary condition (existing ditch) of the hydrodynamic model. The adICPR input and output data for this culvert is included in this section of the drainage report/calculations. The following table summarizes the 10-year DHW for both existing and proposed conditions.

Summary of Cross Drain Design High Water Elevations (DHW)

Structure No.	Station	Q_{10} cfs	10-Year DHW Elevation feet, NGVD		Diff. feet	Overtopping Elevation
			Existing	Proposed		
S-301	383+14.00	23.6	83.60	83.60	0.00	84.45

From the table it can be seen that the proposed culvert improvements associated with the widening of Forsyth Road will not result in any adverse flooding conditions upstream of Forsyth Road. The calculations in **Appendix 9.0** summarize the results of the Existing and Proposed conditions culvert analysis.

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SUMMARY OF CROSS DRAIN DESIGN

Two (2) major cross drains were evaluated for the 10- and 100-year frequency storm events, pursuant to Section 10.5.2 of the *Applicant's Handbook - Management and Storage of Surface Waters* (SJRWMD) and the results summarized in the following table:

Summary of Cross Drain Design High Water Elevations (DHW)

Structure No.	Station	Q_{10} cfs	10-Year DHW Ele.	Q_{100} cfs	100-Year DHW Ele.	Overtopping Elevation
S-98	276+40.00 (1)	638 (3)	87.69	946 (3)	88.64	87.74
S-232	347+29.00 (2)	478 (3)	84.72	766 (3)	86.33	88.30

NOTES:

(1) Lake Corrine Outfall Canal

(2) Winter Park Pines Canal

(3) **Reference:** *Little Econlockhatchee River Restoration Study*, Orange County Board of County Commissioners, Miller & Miller, February 1984.

The results of the cross drain analyses indicate that the likelihood of the 10-year flood event overtopping the proposed roadway profile is at both locations negligible. The proposed roadway profiles and culvert capacities will not result in any significant increase in the 10-year flood elevation. Although roadway overtopping can be expected at the crossing at the Lake Corrine Outfall Canal, the proposed improvements will not result in a greater flood hazard than what already exists. The upsizing of pipes at the Lake Corrine Outfall crossing at Forsyth Road was not considered due largely to the restriction of the pipe sizes (double 72-inch CMP) at Dorris Drive, which is approximately 1,250-feet downstream. To reduce the 100-year flood stage for this reach of the Lake Corrine Outfall Canal, culvert improvements would have to be done at both locations concurrently.

In addition, the culvert improvements at the Lake Corrine Outfall Canal and the Winter Park Pines canal will not result in a decrease in the floodplain storage for a 100-year frequency flood event. The culvert improvements at the Lake Corrine Outfall Canal merely replace what currently exists (double 54-inch RCP), only lengthening the culvert crossing to accommodate the roadway widening improvements. The existing box culvert at the Winter Park Pines crossing will remain intact. The culvert improvements at this crossing will only entail the extension of the existing box culvert sections to accommodate the roadway widening improvements.

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APPENDIX 4.0
POND NO. 4

Post Development (Proposed) Conditions

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WATER QUALITY CALCULATIONS - POND NO. 4

Post-Development (Proposed) Conditions

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FORSYTH ROAD IMPROVEMENTS

WATER QUALITY CALCULATIONS
POND NO. 4

1. DETERMINE TOTAL AREA CONTRIBUTING TO FORSYTH ROAD POND NO. 4

FROM FORSYTH ROAD IMPROVEMENTS = 7.35 ACRES
FROM HEDDRON CONSTRUCTION SITE = 4.00 ACRES
FROM GROUND CONTROL SITE = 4.05 ACRES
FROM ACCESS ROAD EASEMENT = 0.69 ACRES
FROM POND 4 SITE (EXCLUDING POND AREA AT CONTROL WATER LEVEL) = 0.96 ACRES

TOTAL AREA TO POND 4 (EXCLUDING OPEN WATER) = 17.05 ACRES

2. DETERMINE PERCENT IMPERVIOUSNESS
TOTAL DRAINAGE AREA TO POND 4 = 17.05 ACRES
IMPERVIOUS AREA FROM FORSYTH ROAD IMPROVEMENTS = 6.03 ACRES
IMPERVIOUS AREA FROM HEDDRON CONSTRUCTION SITE (INCL. FUTURE) = 3.20 ACRES
IMPERVIOUS AREA FROM GROUND CONTROL SITE = 3.24 ACRES (FUTURE IMPROVE.)
IMPERVIOUS AREA FROM PROPOSED ACCESS ROAD = 0.51 ACRES
TOTAL IMPERVIOUS DRAINAGE AREA = 12.98 ACRES
TOTAL PERVIOUS DRAINAGE AREA = 4.07 ACRES

$$\text{PERCENTAGE IMPERVIOUSNESS} = \frac{\text{TOTAL IMPERVIOUS AREA}}{\text{TOTAL DRAINAGE AREA}}$$

$$\text{PERCENTAGE IMPERVIOUSNESS} = \frac{12.98 \text{ ACRES}}{17.05 \text{ ACRES}} = 76\ \%\ (0.76)$$

3. "WET DETENTION VOLUME SHALL BE PROVIDED FOR THE FIRST INCH OF RUNOFF FROM THE DEVELOPED PROJECT, OR THE TOTAL RUNOFF OF 2.5 INCHES TIMES THE PERCENTAGE OF IMPERVIOUSNESS, WHICHEVER IS GREATER."

(REFERENCE: 40C-42.026 - SPECIFIC DESIGN AND PERFORMANCE CRITERIA MANAGEMENT AND STORAGE OF SURFACE WATERS, PERMIT INFORMATION MANUAL, ST. JOHNS RIVER WATER MANAGEMENT DISTRICT)

ONE INCH CRITERIA: *(1")(1/12)(17.05) = 1.42 ACRE-FEET*
2.5 INCH TIMES % IMP. CRITERIA: *(2.5")(1/12)(0.76)(17.05) = 2.70 ACRE-FEET*

THE 2.5 INCHES TIMES % IMPERVIOUS AREA CRITERIA GOVERNS.
REQUIRED WET DETENTION VOLUME = 2.70 ACRE-FEET

4. STAGE STORAGE RELATIONSHIP FOR FORSYTH ROAD POND NO. 4

EFFECTIVE VOLUME / STAGE-STORAGE RELATIONSHIP

20839-3

ELEVATION	SURFACE AREA	AVG. VOL.	ACC. VOL.
74.00	1.6125	0.000	0.000
75.00	1.7324	1.672	1.672
76.00	1.8560	1.794	3.466
77.00	1.9832	1.920	5.386
78.00	2.1140	2.049	7.435
79.00	2.2484	2.181	9.616

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POLLUTION ABATEMENT VOLUME = ELE. 75.57 (INTERPOLATED)

4. STAGE STORAGE RELATIONSHIP FOR FORSYTH ROAD POND NO. 4 (Cont.)

PERMANENT POOL VOLUME / STAGE-STORAGE RELATIONSHIP

ELEVATION	SURFACE AREA	AVG. VOL.	ACC. VOL.
65.00	1.0598	0.000	0.000
66.00	1.1000	1.080	1.080
67.00	1.1408	1.120	2.200
68.00	1.1821	1.161	3.362
69.00	1.2241	1.203	4.565
70.00	1.2666	1.245	5.810
71.00	1.3097	1.288	7.098
72.00	1.3534	1.332	8.430
73.00	1.4651	1.409	9.839
74.00	1.5804	1.523	11.362
75.00	1.6993	0.000	11.362
76.00	1.8218	0.000	11.362
77.00	1.9479	0.000	11.362
78.00	2.0777	0.000	11.362
79.00	2.2110	0.000	11.362

5. DETERMINE RUNOFF COEFFICIENT

TOTAL AREA = 17.05 ACRES
IMPERVIOUS AREA = 12.98 ACRES PERVIOUS AREA = 4.07 ACRES

RUNOFF COEFFICIENTS

IMPERVIOUS AREA RUNOFF COEFFICIENT = 0.95
PERVIOUS AREA RUNOFF COEFFICIENT = 0.20

$$\text{COMPOSITE RUNOFF COEFFICIENT} = \frac{[(A1)(C1) + (A2)(C2)]}{A1 + A2}$$

WHERE: A1 = IMPERVIOUS AREA, ACRES
A2 = PERVIOUS AREA, ACRES
C1 = IMPERVIOUS AREA RUNOFF COEFFICIENT
C2 = PERVIOUS AREA RUNOFF COEFFICIENT

A1 = 12.98 ACRES C1 = 0.95
A2 = 4.07 ACRES C2 = 0.20

$$\text{COMPOSITE RUNOFF COEFFICIENT} = \frac{[(12.98)(0.95) + (4.07)(0.20)]}{12.98 + 4.07}$$

COMPOSITE RUNOFF COEFFICIENT = 0.77

6. CALCULATE PERMANENT POOL VOLUMES

THE PERMANENT POOL IS THAT PORTION OF A POND WHICH IS DESIGNED TO HOLD WATER AT ALL TIMES (i.e., BELOW THE CONTROL ELEVATION). TYPICALLY THE PERMANENT POOL IS SIZED TO PROVIDE AT LEAST A TWO-WEEK (14-DAY) RESIDENCE TIME DURING THE WET SEASON (JUNE THROUGH OCTOBER).

IMPORTANT POLLUTANT REMOVAL PROCESSES WHICH OCCUR WITHIN THE PERMANENT POOL INCLUDE: UPTAKE OF NUTRIENTS BY ALGAE, ADSORPTION OF NUTRIENTS AND HEAVY METALS INTO BOTTOM SEDIMENTS, BIOLOGICAL OXIDATION OF ORGANIC MATERIALS AND SEDIMENTATION. UPTAKE BY ALGAE IS PROBABLY THE MOST IMPORTANT PROCESS FOR THE REMOVAL OF NUTRIENTS. SEDIMENTATION AND ADSORPTION INTO BOTTOM SEDIMENTS IS LIKELY THE PRIMARY MEANS OF REMOVING HEAVY METALS.

SINCE ONE OF THE MAJOR BIOLOGICAL MECHANISMS FOR POLLUTANT REMOVAL IN A WET DETENTION BASIN IS PHYTOPLANKTON GROWTH, THE AVERAGE HYDRAULIC RESIDENCE TIME OF THE POND MUST BE LONG ENOUGH TO ENSURE ADEQUATE ALGAL GROWTH. A RESIDENCE TIME OF TWO WEEKS IS CONSIDERED TO BE THE MINIMUM DURATION THAT ENSURES ADEQUATE OPPORTUNITY FOR ALGAL GROWTH.

RESIDENCE TIME OF A POND IS DEFINED AS THE AVERAGE TIME REQUIRED TO RENEW THE WATER VOLUME (PERMANENT POOL VOLUME) IN THE POND AND CAN BE EXPRESSED AS:

$$RT = PPV/FR \qquad (29\text{-}1)$$

WHERE: *RT = RESIDENT TIME (DAYS)*
PPV = PERMANENT POOL VOLUME (ACRE-FEET)
FR = AVERAGE FLOW RATE (ACRE-FEET/DAY)

SOLVING EQUATION 29-1 FOR THE PERMANENT POOL VOLUME (PPV) GIVES:

$$PPV = (RT)(FR) \qquad (29\text{-}2)$$

THE AVERAGE FLOW RATE DURING THE WET SEASON (JUNE - OCTOBER) IS EXPRESSED AS FOLLOWS:

$$FR = \frac{DA\ C\ R}{WS} \qquad (29\text{-}3)$$

WHERE: *DA = DRAINAGE AREA TO POND (ACRES)*
C = RUNOFF COEFFICIENT
R = WET SEASON RAINFALL DEPTH (INCHES)
(SEE FIGURE 29-1 ON FOLLOWING PAGE)
WS = LENGTH OF WET SEASON (DAYS) (JUNE - OCTOBER = 153 DAYS)

SUBSTITUTING EQUATION 29-3 INTO EQUATION 29-2 GIVES:

$$PPV = \frac{DA\ C\ R\ RT}{WS\ CF} \qquad (29\text{-}4)$$

WHERE: *CF = CONVERSION FACTOR = 12 INCHES/FT*

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Reference: *Applicants Handbook - Regulation of Stormwater Management Systems, Chapter 40C-42, F.A.C.*
Page 29-1, St. Johns River Water Management District, Palatka, Florida

6. CALCULATE PERMANENT POOL VOLUMES (Cont.)

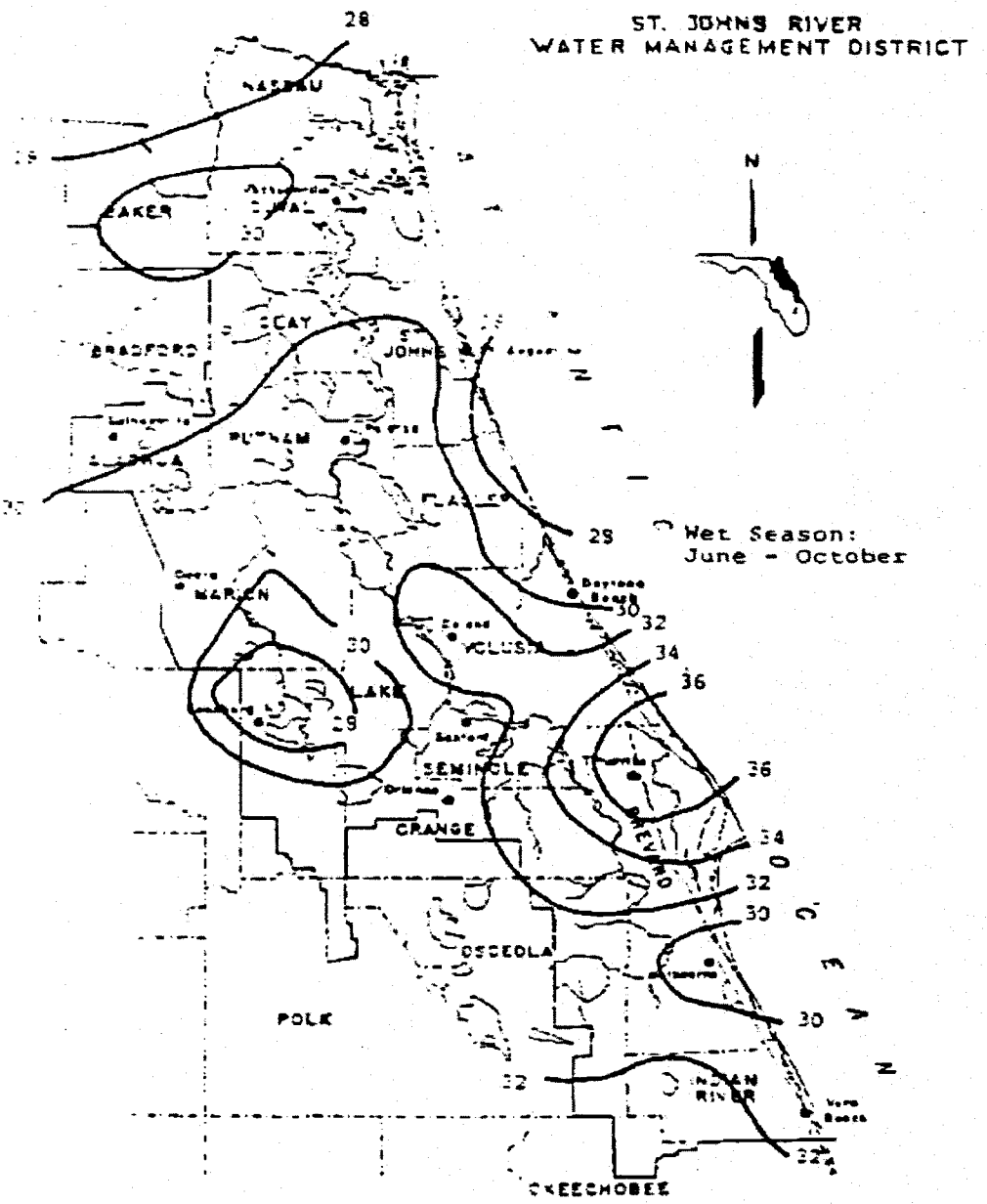


FIGURE 29-1 WET SEASON NORMAL RAINFALL, INCHES

Reference: *Applicants Handbook - Regulation of Stormwater Management Systems, Chapter 40C-42, F.A.C.*
St. Johns River Water Management District, Palatka, Florida

6. *CALCULATE PERMANENT POOL VOLUMES (Cont.)*

SOLVE FOR REQUIRED PERMANENT POOL VOLUME (PPV) ASSUMING A MINIMUM 14-DAY RESIDENCE TIME (LITTORAL ZONE OPTION).

FROM EQUATION 29-4, THE PERMANENT POOL VOLUME IS COMPUTED AS:

$$PPV = \frac{DA\ C\ R\ RT}{WS\ CF}$$

WHERE:
DA = 17.05 ACRES (SEE SECTION 1)
C = 0.77 (SEE SECTION 5)
R = 31-INCHES (SEE FIGURE 29-1, Applicant's Handbook, Regulation of Stormwater Management Systems, Chapter 30C-42, F.A.C., SJRWMD).
WS = 153 DAYS (JUNE - OCTOBER WET SEASON)
RT = 14 DAYS (Minimum required for wet ponds with littoral zones)

$$PPV = \frac{(17.05)(0.77)(31)(14)}{(153)(12)} = 3.10 \text{ ACRE-FEET}$$

PERMANENT POOL VOLUME AVAILABLE = 10.66 ACRE-FEET (SEE SECTION 4)

COMPUTE ACTUAL RESIDENCE TIME FOR POND NO. 4

REWRITING EQUATION 29-4

$$RT = \frac{PPV\ WS\ CF}{DA\ C\ R}$$

WHERE:
DA = 17.05 ACRES (SEE SECTION 1)
C = 0.77 (SEE SECTION 5)
R = 31-INCHES (SEE FIGURE 29-1, Applicant's Handbook, Regulation of Stormwater Management Systems, Chapter 30C-42, F.A.C., SJRWMD).
WS = 153 DAYS (JUNE - OCTOBER WET SEASON)
PPV = 11.362 ACRE-FEET (BELOW CWL ELE. 74.00)

$$RT = \frac{(11.362)(153)(12)}{(17.05)(0.77)(31)}$$

RT = 51.26 DAYS

CHECK MEAN DEPTH OF POND

THE MEAN DEPTH OF THE PERMANENT POOL MUST BE BETWEEN 2 AND 8 FEET

$$MD = \frac{PPV}{Ap}$$

WHERE: MD = Mean depth of pond (ft)
Ap = Area of the pond measured at the control elevation (sf)

$$MD = \frac{11.362}{1.5804}$$

PPV = 11.362 AF
Ap = 1.58[illegible] AC

MD = 7.19-FEET (2-FEET < MD < 8-FEET)

POND NO. 4 PPV AVAILABLE > MINIMUM REQUIRED - 14 DAY (SJRWMD)

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FORSYTH ROAD - POND NO. 4
WATER QUALITY CALCULATIONS

6. CALCULATE PERMANENT POOL VOLUMES (Cont.)

SOLVE FOR REQUIRED PERMANENT POOL VOLUME (PPV) ASSUMING A MINIMUM 21-DAY RESIDENCE TIME (NON-LITTORAL ZONE OPTION).

FROM EQUATION 29-4, THE PERMANENT POOL VOLUME IS COMPUTED AS:

$$PPV = \frac{DA\ C\ R\ RT}{WS\ CF}$$

WHERE:
DA = 17.05 ACRES (SEE SECTION 1)
C = 0.77 (SEE SECTION 5)
R = 31-INCHES (SEE FIGURE 29-1, Applicant's Handbook, Regulation of Stormwater Management Systems, Chapter 30C-42, F.A.C., SJRWMD).
WS = 153 DAYS (JUNE - OCTOBER WET SEASON)
RT = 14 DAYS (Minimum required for wet ponds with littoral zones)

$$PPV = \frac{(17.05)(0.77)(31)(21)}{(153)(12)} = 4.65 \text{ ACRE-FEET}$$

POND NO. 4 PERMANENT POOL VOLUME AVAILABLE = 10.660 ACRE-FEET

COMPUTE ACTUAL RESIDENCE TIME FOR POND NO. 4

REWRITING EQUATION 29-4

$$RT = \frac{PPV\ WS\ CF}{DA\ C\ R}$$

WHERE:
DA = 17.05 ACRES (SEE SECTION 1)
C = 0.77 (SEE SECTION 5)
R = 31-INCHES (SEE FIGURE 29-1, Applicant's Handbook, Regulation of Stormwater Management Systems, Chapter 30C-42, F.A.C., SJRWMD).
WS = 153 DAYS (JUNE - OCTOBER WET SEASON)
PPV = 11.362 ACRE-FEET (BELOW CWL ELE. 74.00)

$$RT = \frac{(11.362)(153)(12)}{(17.05)(0.77)(31)}$$

RT = 51.26 DAYS

CHECK MEAN DEPTH OF POND

THE MEAN DEPTH OF THE PERMANENT POOL MUST BE BETWEEN 2 AND 8 FEET

$$MD = \frac{PPV}{Ap}$$

$$MD = \frac{11.362}{1.5804}$$

MD = 7.19-FEET (2-FEET < MD < 8-FEET)

WHERE: MD = Mean depth of pond (ft)
Ap = Area of the pond measured at the control elevation (sf)

PPV = 11.362 AF
Ap = 1.5804 ACRES

POND NO. 4 PPV AVAILABLE > MINIMUM REQUIRED - 21 DAY (SJRWMD)
THEREFORE NO LITTORAL ZONE REQUIRED

FORSYTH ROAD - POND NO. 4
WATER QUALITY CALCULATIONS

7. DETERMINE CONTROL DEVICE BLEED-DOWN VOLUME

"GRAVITY CONTROL DEVICES SHALL NORMALLY BE SIZED BASED ON A DESIGN DISCHARGE OF ONE-HALF (1/2) OF THE TREATMENT VOLUME IN THE FIRST 24 TO 30 HOURS. THE DEVICES SHALL INCORPORATE DIMENSIONS NO SMALLER THAN SIX (6) INCHES OF CROSS-SECTIONAL AREA, TWO (2) INCHES MINIMUM DIMENSION, AND 20 DEGREES FOR V-NOTCH WEIRS."

(REFERENCE: 40C-42.026 - SPECIFIC DESIGN AND PERFORMANCE CRITERIA MANAGEMENT AND STORAGE OF SURFACE WATERS, PERMIT INFORMATION MANUAL, ST. JOHNS RIVER WATER MANAGEMENT DISTRICT)

ALLOW. VOLUME TO BE RELEASED = (0.5) (TREATMENT VOLUME)
ALLOW. VOLUME TO BE RELEASED = (0.5) (2.70 ACRE-FEET) = 1.35 AF

8. SIZE CONTROL WEIR (BLEED-DOWN DEVICE)
(ASSUME V-NOTCH AS INITIAL CONFIGURATION)

COMPUTE V-NOTCH ANGLE

V-NOTCH ANGLE = 2(ARCTAN(0.492V/H^2.5))

WHERE:
V = VOLUME TO BE RELEASED, 24-HOURS
H = HEAD ON VERTEX OF NOTCH, FEET
BLEED-DOWN CONTROL WATER LEVEL (CWL) = ELE. 74.00
POLLUTION ABATEMENT LEVEL = ELE. 75.57

H = POLLUTION ABATEMENT ELE. - CWL ELE.
H = 75.57 - 74.00 = 1.57 FEET
V = 1.35 ACRE-FEET

*V-NOTCH ANGLE = 2(ARCTAN[(0.492*1.35) / 1.57^2.5])*
V-NOTCH ANGLE = 2(ARCTAN[0.215])
V-NOTCH ANGLE = 2(12.134)
V-NOTCH ANGLE = 24.268 DEGREES > 20 DEGREES (Does Conform to SJRWMD Criteria)
TRY AN ALTERNATIVE BLEED-DOWN DEVICE (CIRCULAR ORIFICE)

9. SIZE CONTROL ORIFICE (BLEED-DOWN DEVICE)
(ASSUME CIRCULAR ORIFICE CONFIGURATION)

SIZE CONTROL ORIFICE OPENING DIMENSION USING FALLING HEAD EQUATION (EQ. 4-19 HANDBOOK OF HYDRAULICS, E.F. BRATER & H.W. KING, McGRAW-HILL BOOK COMPANY)

$$a = \frac{2A\left(\sqrt{h1} - \sqrt{h2}\right)}{Ct\sqrt{2g}}$$

WHERE:
a = AREA OF ORIFICE, SQUARE FEET
A = AVERAGE POND SURFACE AREA, SQUARE FEET
h1 = INITIAL HEAD ON ORIFICE, FEET
h2 = FINAL HEAD ON ORIFICE, FEET
C = DISCHARGE COEFFICIENT, (0.60 FOR ORIFICE)
g = GRAVITATIONAL CONSTANT, (32.2)
t = DRAWDOWN TIME, SECONDS

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9. SIZE CONTROL ORIFICE (BLEED-DOWN DEVICE) (Cont.)

EFFECTIVE TREATMENT VOLUME / STAGE-STORAGE

ELEVATION	SURFACE AREA	AVG. VOL.	ACC. VOL.
74.00	1.6125		0.000
		1.672	
75.00	1.7324		1.672
		1.794	
76.00	1.8560		3.467
		1.920	
77.00	1.9832		5.386
		2.049	
78.00	2.1140		7.435
		2.181	
79.00	2.2484		9.616

DESIGN PARAMETERS

CONTROL WATER LEVEL (CWL) = ELE. 74.00
TOP OF TREATMENT VOLUME = ELE. 75.57
VOLUME TO BE BLED DOWN = 1.35 ACRE-FEET (1/2 OF REQ'D TREATMENT VOLUME)
DRAWDOWN TIME = 24-HOURS = 86,400 SECONDS

AREA @ h1 = POND SURFACE AREA AT TOP OF TREATMENT VOLUME

$$\text{AREA @ h1} = \frac{[\text{ELE. RET. V - ELE. A}]}{\text{ELE. B - ELE. A}} (\text{AREA B - AREA A}) + \text{AREA A} \quad \text{(SEE SECTION 4)}$$

$$\text{AREA @ h1} = \frac{[75.57 - 75.00]}{76.00 - 75.00} (1.856 - 1.732) + 1.7324$$

AREA @ h1 = 1.803 ACRES

AREA @ h2 = POND SURFACE AREA AT ELEVATION WHERE BLEED-DOWN VOLUME IS RELEASED.

VOLUME @ h2 = TOTAL RETENTION VOLUME - ALLOWABLE VOLUME RELEASE
VOLUME @ h2 = 2.70 - 1.35 = 1.35 ACRE-FEET

$$\text{ELE. @ h2} = \frac{[\text{VOL. @ h2 - VOL. A}]}{[\text{VOL. B - VOL. A}]} (\text{ELE. B - ELE. A}) + \text{ELE. A}$$

VOLUME @ h2 = 1.35 ACRE-FEET
VOLUME AT A = 0.000 ACRE-FEET (ELE. 74.00)
VOLUME AT B = 1.672 ACRE-FEET (ELE. 75.00)

$$\text{ELE. @ h2} = \frac{[\,1.35 - 0.000\,]}{[\,1.672 - 0.000\,]} (75.00 - 74.00) + 74.00$$

ELE. @ h2 = 74.81

9. SIZE CONTROL ORIFICE (BLEED-DOWN DEVICE) (Cont.)

$$\text{AREA @ h2} = \frac{[\text{ELE. @ h2 - ELE. A}]}{[\text{ELE. B - ELE. A}]} (\text{AREA @ B - AREA @ A}) + \text{AREA @ A}$$

ELE. @ h2 = 74.81
ELE. @ A = 74.00 AREA @ A = 1.6125 ACRES
ELE. @ B = 75.00 AREA @ B = 1.7324 ACRES

$$\text{AREA @ h2} = \frac{[74.81 - 74.00]}{[75.00 - 74.00]} (1.7324 - 1.6125) + 1.6125$$

AREA @ h2 = 1.710 ACRES

10. DETERMINE ORIFICE SIZE

$$\text{AVERAGE AREA} = \frac{\text{AREA @ h1 + AREA @ h2}}{2}$$

AREA @ h1 = 1.803 ACRES
AREA @ h2 = 1.710 ACRES

$$\text{AVERAGE AREA} = \frac{(1.803 + 1.710)}{2}$$

AVERAGE AREA = 1.757 ACRES = 76,513 SQUARE FEET

h1 = (TOP OF TREATMENT VOLUME) - (BOTTOM OF POLLUTION ABATEMENT VOLUME)

WHERE: TOP OF TREATMENT VOLUME = ELE. 75.57
BOTTOM OF POLLUTION ABATEMENT VOLUME (CWL) = 74.00

h1 = 75.57 - 74.00 = 1.57 FEET

h2 = (ELEVATION WHERE BLEED-DOWN VOLUME HAS BEEN RELEASED) - (BOTTOM OF POLLUTION ABATEMENT VOLUME)

h2 = 74.81 - 74.00 = 0.81 FEET

SOLVE FOR ORIFICE AREA

$$a = \frac{2A(\sqrt{h1} - \sqrt{h2})}{Ct\sqrt{2g}}$$

A = 76,513 SQUARE FEET
h1 = 1.57 FEET
h2 = 0.81 FEET
C = 0.60 (DISCHARGE COEFFICIENT FOR CIRCULAR ORIFICE)
t = 86,400 SECONDS (24-HOURS)
g = 32.2 (GRAVITATIONAL CONSTANT)

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FORSYTH ROAD - POND NO. 4
WATER QUALITY CALCULATIONS

10. DETERMINE ORIFICE SIZE (Cont.)

$$a = \frac{2(76,513)(\sqrt{1.57} - \sqrt{0.81})}{(0.60)(86,400)(\sqrt{2(32.2)})}$$

$a = 0.1298$ SQUARE FEET

SOLVE FOR ORIFICE DIAMETER

$a = (PI*D^2)/4$ $D = \sqrt{(4a)/PI}$ $PI = 3.142$

WHERE: D = ORIFICE DIAMETER, FEET

$D = [4(0.1298)/3.142]^0.5$

$D = 0.4065$ FEET
$D = 4.878$ INCHES

USE ORIFICE DIAMETER EQUIVALENT TO 4-3/4 INCHES

11. DETERMINE ACTUAL DRAWDOWN TIME FOR 4-3/4 INCH DIAMETER ORIFICE

D = 4-3/4 INCHES = 4.75 INCHES
D = 4-3/4 INCHES = 0.3958 FEET

$a = (PI*D^2)/4$
$a = 0.1230$ SQUARE FEET

$$a = \frac{2A(\sqrt{h1} - \sqrt{h2})}{Ct\sqrt{2g}}$$

A = 76,513 SQUARE FEET
h1 = 1.57 FEET
h2 = 0.81 FEET
C = 0.60 (DISCHARGE COEFFICIENT FOR CIRCULAR ORIFICE)
t = DRAWDOWN TIME, SECONDS
g = 32.2 (GRAVITATIONAL CONSTANT)
a = CROSS-SECTIONAL AREA OF ORIFICE, SQUARE FEET

REWRITING FORMULA TO SOLVE FOR t

$$t = \frac{2A(\sqrt{h1} - \sqrt{h2})}{Ca\sqrt{2g}}$$

$$t = \frac{2(76,513)(\sqrt{1.57} - \sqrt{0.81})}{(0.6)(0.1230)[\sqrt{(2)(32.2)}]}$$

$t = 91,209$ SECONDS

$t = 25.33$ HOURS

THEREFORE THE ORIFICE SIZE OF 4-3/4" DIA. CONFORMS TO THE SJRWMD REQUIREMENTS OF BLEEDING DOWN ONE-HALF OF THE WATER QUALITY VOLUME WITHIN 24 TO 30 HOURS.

12. BACKGROUND SEEPAGE ANALYSIS SUMMARY

	ROADWAY
GROUNDWATER CONTROL ELE. (FT ABOVE DATUM)	83.00
BOTTOM OF AQUIFER ELEVATION (FT ABOVE DATUM)	65.00
AQUIFER GROUNDWATER ELEVATION	83.00
HORIZONTAL PERMEABILITYOF AQUIFER (FT/DAY)	5.00
FILLABLE POROSITY OF AQUIFER (FT/FT)	0.25
DURATION OF WET SEASON (DAYS)	120.00
CONTROL ELEVATION PERIMETER (FT)	1204.00
BACKGROUND SEEPAGE RATE [Q] (CF/DAY)	1169
BACKGROUND SEEPAGE RATE [Q] (CFS)	0.0135

THE BACKGROUND SEEPAGE RATE WILL ADD APPROXIMATELY 0.05 ACRE-FEET TO THE POLLUTION ABATEMENT VOLUME IN A 24-HOUR PERIOD (TIME REQUIRED TO DRAWDOWN 1/2 OF THE POLLUTION ABATEMENT VOLUME).

THE BLEED-DOWN ORIFICE WILL BE REQUIRED TO BE SIZED TO DISCHARGE THE BASE FLOW FROM THE ROADWAY UNDERDRAINS AS WELL AS THE POLLUTION ABATEMENT VOLUME.

13. DRAWDOWN ANALYSIS

A DRAWDOWN ANALYSIS WAS DONE USING ADVANCED INTERCONNECTED POND ROUTING (ADICPR) TO CHECK THE ORIFICE SIZE DETERMINED USING THE FALLING HEAD EQUATIONS USED IN SECTION 9 AND 10 (REFERENCE: HANDBOOK OF HYDRAULICS, Brater and King, McGraw-Hill Book Company) OF THIS WATER QUALITY CALCULATION DOCUMENT. THIS WAS ACCOMPLISHED BY DEACTIVATING THE INFLOW HYDROGRAPHS TO POND 4 AND SETTING THE INITIAL STAGE IN THE POND TO THE WATER QUALITY LEVEL. IN ADDITION, A CONSTANT GROUNDWATER RATE WAS INTRODUCED BY USING A TIME-DISCHARGE RATING CURVE REACH TO POND 4. THE FLOOD ROUTING WAS THEN PERFORMED TO ALLOW ONLY THE ORIFICE TO DRAWDOWN THE REQUIRED WATER QUALITY VOLUME.

THE FOLLOWING ATTACHMENT IS A NODE STAGE/VOLUME/FLOW REPORT WHICH SUMMARIZES THE DRAWDOWN CURVE FOR THE BLEED-DOWN ORIFICE OVER A 60-HOUR PERIOD.

THE REQUIRED VOLUME RELEASE WITHIN THE 24 TO 30-HOUR PERIOD IS 1.35 ACRE-FEET FOR POND 4. THE ELEVATION WHERE ONE-HALF THE TREATMENT VOLUME IS TO BE RECOVERED IS ELEVATION 74.81.

14. CONCLUSIONS

THE ADICPR DRAWDOWN ANALYSIS INDICATES THAT A 4-3/4" DIAMETER ORIFICE WILL EVACUATE ONE-HALF OF THE WATER QUALITY VOLUME WITHIN 24 TO 30 HOURS, (INCLUDING BACKGROUND SEEPAGE) PURSUANT TO SJRWMD STANDARDS.

THE FLOOD ROUTING RESULTS ARE SUMMARIZED IN THE FOLLOWING TABLE.

TIME (hrs)	STAGE (ft)	CUMULATIVE VOLUME OUT (af)	OUTFLOW (cfs)
28.339	74.80	1.3526	0.0135

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ADICPR INPUT DATA - POND NO. 4

Post-Development (Proposed) Conditions

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REVISED POND 4 - FORSYTH ROAD
INPUT DATA
PROJECT NO. OC-73 02/28/02

********** Input Report **********
--------Class: Node----------
Name: LCORRINE Base Flow(cfs): 0 Init Stage(ft): 73
Group: BASE Length(ft): 0 Warn Stage(ft): 76.6
Comment: TAILWATER BOUNDARY - LAKE CORRINE OUTFALL CANAL

Time(hrs)	Stage(ft)
0	73
10	74
13	76.6
18	74
30	73

--------Class: Node----------
Name: POND-4 Base Flow(cfs): 0.0135 Init Stage(ft): 74
Group: BASE Length(ft): 0 Warn Stage(ft): 79
Comment: REVISED POND 4 STAGE/AREA

Stage(ft)	Area(ac)
65	1.071
66	1.111
67	1.152
68	1.193
69	1.236
70	1.278
71	1.322
72	1.365
73	1.477
74	1.6125
75	1.7324
76	1.856
77	1.9832
78	2.2114
79	2.2484

--------Class: Basin----------
Basin: FORSYTH Node: POND-4 Status: On Site Type: SCS Unit Hydr
Group: BASE
Unit Hydrograph: UH256 Peak Factor: 256
Rainfall File: ORANGE Storm Duration(hrs): 24
Rainfall Amount(in): 7.5
Area(ac): 7.34 Concentration Time(min): 43
Curve #: 94 Lag Time(hrs): 0
DCIA(%): 0

DRAINAGE AREA FROM FORSYTH ROAD

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REVISED POND 4 - FORSYTH ROAD
INPUT DATA
PROJECT NO. OC-73   02/28/02

********** Input Report ************************************************************
--------Class: Basin-----------------------------------------------------------------
Basin: HEDDRON    Node: POND-4     Status: On Site    Type: SCS Unit Hydr
Group: BASE
    Unit Hydrograph: UH256                  Peak Factor: 256
      Rainfall File: ORANGE          Storm Duration(hrs): 24
Rainfall Amount(in): 7.5
           Area(ac): 8.74        Concentration Time(min): 10
            Curve #: 93                   Lag Time(hrs): 0
            DCIA(%): 0

          DRAINAGE AREA FROM HEDDRON AND GROUND CONTROL

--------Class: Basin-----------------------------------------------------------------
Basin: OFFSITE    Node: LCORRINE   Status: On Site    Type: SCS Unit Hydr
Group: BASE
    Unit Hydrograph: UH256                  Peak Factor: 256
      Rainfall File: ORANGE          Storm Duration(hrs): 24
Rainfall Amount(in): 7.5
           Area(ac): 4.84        Concentration Time(min): 44
            Curve #: 89                   Lag Time(hrs): 0
            DCIA(%): 0

          OFFSITE DRAINAGE AREA TO L. CORRINE OUTFALL CANAL

--------Class: Basin-----------------------------------------------------------------
Basin: POND4BAS   Node: POND-4     Status: On Site    Type: SCS Unit Hydr
Group: BASE
    Unit Hydrograph: UH256                  Peak Factor: 256
      Rainfall File: ORANGE          Storm Duration(hrs): 24
Rainfall Amount(in): 7.5
           Area(ac): 2.39        Concentration Time(min): 10
            Curve #: 90                   Lag Time(hrs): 0
            DCIA(%): 0

          DRAINAGE AREA FROM POND 4
```

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REVISED POND 4 - FORSYTH ROAD
INPUT DATA
PROJECT NO. OC-73 02/28/02

********** Input Report **
--------Class: Drop Structure--
Name: RDSPOND4 From Node: POND-4 Length(ft): 80
Group: BASE To Node: LCORRINE Count: 1

Outlet Cntrl Spec: Use dc or tw Inlet Cntrl Spec: Use dn
Upstream Geometry: Circular Downstream Geometry: Circular

	UPSTREAM	DOWNSTREAM
Span(in)	24	24
Rise(in)	24	24
Invert(ft)	73.5	73
Manning's N	0.013	0.013
Top Clip(in)	0	0
Bottom Clip(in)	0	0

Entrance Loss Coef: 0.5 Flow: Both
Exit Loss Coef: 1 Equation: Aver Conveyance

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall 1 1
Downstream FHWA Inlet Edge Description:
Circular CMP: Mitered to slope 2 2

PROPOSED POND 4 OUTFALL
*** Weir 1 of 3 for Drop Structure RDSPOND4 *** [TABLE]
Count: 1 Bottom Clip(in): 0
Type: Mavis Top Clip(in): 0
Flow: Both Weir Discharge Coef: 3
Geometry: Circular Orifice Discharge Coef: 0.6

Span(in): 4.75 Invert(ft): 74
Rise(in): 4.75 Control Elev(ft): 74

*** Weir 2 of 3 for Drop Structure RDSPOND4 *** [TABLE]
Count: 1 Bottom Clip(in): 0
Type: Mavis Top Clip(in): 0
Flow: Both Weir Discharge Coef: 3.2
Geometry: Rectangular Orifice Discharge Coef: 0.6

Span(in): 12 Invert(ft): 75.57
Rise(in): 29.16 Control Elev(ft): 75.57

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    REVISED POND 4 - FORSYTH ROAD
    INPUT DATA
    PROJECT NO. OC-73   02/28/02

    ********** Input Report ************************************************************
     *** Weir 3 of 3 for Drop Structure RDSPOND4 ***              [TABLE]
       Count: 1                    Bottom Clip(in): 0
        Type: Horiz                   Top Clip(in): 0
        Flow: Both             Weir Discharge Coef: 3.2
    Geometry: Rectangular  Orifice Discharge Coef: 0.6

             Span(in): 49                         Invert(ft): 78
             Rise(in): 37                    Control Elev(ft): 78


    --------Class: Simulation-------------------------------------------------------
 D:\WORKFILE\ICPR20\OC-73\CONVERT\POND-4\1
 Execution: Both
    Header: REVISED POND 4 - FORSYTH ROAD
            10-YEAR FREQUENCY, 24-HOUR DURATION STORM EVENT
            PROJECT NO. OC-73        $$DATE$$
---------HYDRAULICS-----------------------------HYDROLOGY--------------------
        Max Delta Z (ft): 1
          Delta Z Factor: 0.01          Override Defaults: No
     Time Step Optimizer: 10
Drop Structure Optimizer: 10
     Sim Start Time(hrs): 0
       Sim End Time(hrs): 30
      Min Calc Time(sec): 2
      Max Calc Time(sec): 5
        To Hour:   PInc(min):                To Hour:   PInc(min):
        10         15                        24         15
        16         2
        30         15
---------GROUP SELECTIONS-----------------------------------------------------
+ BASE     [02/28/02]
```

```
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    REVISED POND 4 - FORSYTH ROAD
    INPUT DATA
    PROJECT NO. OC-73   02/28/02

    ********** Input Report ************************************************************
    --------Class: Simulation-----------------------------------------------------------
 D:\WORKFILE\ICPR20\OC-73\CONVERT\POND-4\2
 Execution: Both
    Header: REVISED POND4 - FORSYTH ROAD
            25-YEAR FREQUENCY, 24-HOUR DURATION STORM EVENT
            PROJECT NO. OC-73        $$DATE$$
---------HYDRAULICS-----------------------------HYDROLOGY--------------------
        Max Delta Z (ft): 1
          Delta Z Factor: 0.01          Override Defaults: Yes
     Time Step Optimizer: 10               Storm Dur(hrs): 24
Drop Structure Optimizer: 10             Rain Amount(in): 8.6
     Sim Start Time(hrs): 0                Rainfall File: ORANGE
       Sim End Time(hrs): 30
      Min Calc Time(sec): 2
      Max Calc Time(sec): 5
        To Hour:   PInc(min):                To Hour:   PInc(min):
        10         15                        24         15
        16         2
        30         15
---------GROUP SELECTIONS-----------------------------------------------------------
+ BASE     [02/28/02]
    --------Class: Simulation-----------------------------------------------------------
 D:\WORKFILE\ICPR20\OC-73\CONVERT\POND-4\2
 Execution: Both
    Header: REVISED POND 4 - FORSYTH ROAD
            2.33-YEAR FREQUENCY, 24-HOUR DURATION STORM EVENT
            PROJECT NO. OC-73          $$DATE$$
---------HYDRAULICS-----------------------------HYDROLOGY--------------------
        Max Delta Z (ft): 1
          Delta Z Factor: 0.01          Override Defaults: Yes
     Time Step Optimizer: 10               Storm Dur(hrs): 24
Drop Structure Optimizer: 10             Rain Amount(in): 4.5
     Sim Start Time(hrs): 0                Rainfall File: ORANGE
       Sim End Time(hrs): 30
      Min Calc Time(sec): 2
      Max Calc Time(sec): 5
        To Hour:   PInc(min):                To Hour:   PInc(min):
        10         15                        24         15
        16         2
        30         15
---------GROUP SELECTIONS-----------------------------------------------------------
+ BASE     [02/28/02]
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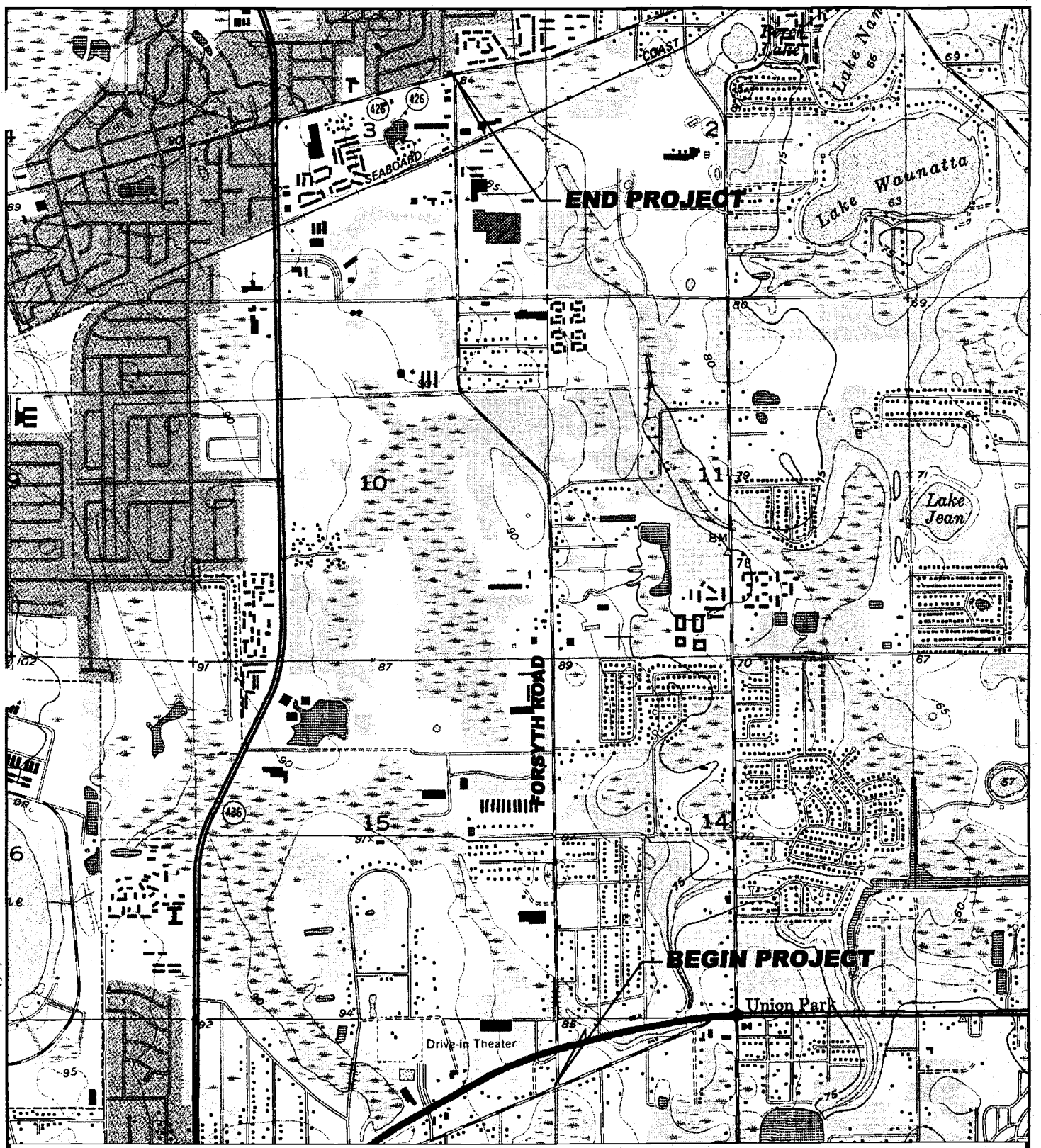
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    REVISED POND 4 - FORSYTH ROAD
    INPUT DATA
    PROJECT NO. OC-73   02/28/02

    ********** Input Report ************************************************************
    --------Class: Simulation-----------------------------------------------------------
 D:\WORKFILE\ICPR20\OC-73\CONVERT\POND-4\1
 Execution: Both
    Header: REVISED POND 4 - FORSYTH ROAD
            100-YEAR FREQUENCY, 24-HOUR DURATION STORM EVENT
            PROJECT NO. OC-73          $$DATE$$
---------HYDRAULICS-----------------------------HYDROLOGY--------------------
        Max Delta Z (ft): 1
          Delta Z Factor: 0.01           Override Defaults: Yes
     Time Step Optimizer: 10                Storm Dur(hrs): 24
Drop Structure Optimizer: 10              Rain Amount(in): 10.6
     Sim Start Time(hrs): 0                 Rainfall File: ORANGE
       Sim End Time(hrs): 30
      Min Calc Time(sec): 2
      Max Calc Time(sec): 5
        To Hour:   PInc(min):                To Hour:   PInc(min):
        10         15                        24         15
        16         2
        30         15
---------GROUP SELECTIONS-----------------------------------------------------------
+ BASE     [02/28/02]
```



REFERENCE: U.S.G.S. QUADRANGLE MAP
EAST ORLANDO, ORANGE COUNTY, FLORIDA
(PHOTOREVISED 1981)

1"=2000'

Figure 1.1
Location Map
Forsyth Road

D:\2\ACAD\EAST ORLANDO OUTFALL.DWG 03/01 (gat)

D:\2_PEC\WORK

Professional Engineering Consultants, Inc.
200 E. Robinson Street, Suite 1560, Orlando, FL 32801

SECTION 4.0 - PROPOSED CONDITIONS

4.1 PROPOSED ROADWAY IMPROVEMENTS

The traffic study indicates that the project can be divided into two distinct segments. There is a significant drop in traffic along Forsyth Road south of University Boulevard. The average daily traffic volumes (ADT) forecasted for the design year 2016 for Forsyth Road south of University will be 18,650 VPD. The ADT for Forsyth Road north of University will be 30,040 VPD.

4.1.1 Southern Segment

The traffic volumes for the southern segment of the project can be handled by a modified two-lane facility. Since the existing facility is a two-lane road and it is presently operating at unacceptable levels at times during the day, the recommended modification is the use of a continuous two-way left turn lane. Additionally, the existing road has substandard lane widths which reduce capacity.

The recommended typical section will increase the capacity beyond the existing two-lane road by providing 14-foot travel lanes and a 12-foot wide center turn lane. Providing the continuous center turn lane will also significantly improve the accessibility of the corridor to emergency vehicles. Congestion will be reduced by virtue of the dedicated left turn lanes which will allow for almost limitless storage lengths. Field observations support the value of this feature since traffic is often backed up behind vehicles attempting to make left turns against the flow of oncoming traffic. This section will therefore provide a safer facility by removing left turning vehicles from the thru lanes.

Additionally, the section will provide improved local access to the adjacent properties. While this will have an effect on the capacity of the road, the concept is consistent with the functional classification (urban collector) and the character of the land use along the corridor.

4.1.2 Northern Segment

The projected traffic volumes for the northern portion of the project are best handled by a four-lane facility providing two travel lanes in each direction. Both a four-lane divided typical and a five-lane typical using a continuous two-way left turn lane were evaluated.

Because of the existing and future land uses, the need for good local access to the adjacent properties is an important requisite. Additionally, R/W will be very expensive to acquire along this segment. This is due to the fact that the existing R/W is the same as the nominal R/W for the southern segment (60 ft) but the proposed roadway will include two additional travel lanes. This translates to a minimum of 24 additional feet of R/W alone just for the travel lanes. The northern segment also has more buildings that are closer to Forsyth Road. The wider typical section will have increased impacts on these existing businesses and potentially greater impacts on parking and internal traffic circulation. A four-lane undivided section is undesirable from a traffic operation and safety

4.3.4 Pond 4

Pond 4 is an "on-line" wet detention system which provides water quality treatment and peak flow attenuation of runoff rates for the contributing drainage basin from Forsyth Road. This pond was originally to be located in a vacant lot, which consists of predominantly pine trees. This lot was subsequently developed (Ground Control Landscaping Office Building, by Heddron Construction - Permit No. 42-095-1745AN-ERP) and a stormwater pond serving only the development was constructed. Due to the need for a stormwater pond with outfall access to the Lake Corrine Outfall Canal, Orange County entered into an agreement with both Ground Control Landscaping and Heddron Construction to construct a "joint use" stormwater pond. This pond would encompass the existing wet detention pond originally constructed for Ground Control/Heddron Construction and enlarged to accommodate the proposed Forsyth Road roadway improvements. It should be noted that this "joint use" pond is to also accommodate any future improvements for Ground Control Landscaping and Heddron Construction.

This pond will utilize the 24-inch pipe from the existing Ground Control/Heddron Construction pond as the proposed Pond 4 outfall to the Lake Corrine Outfall Canal. This pond will have a control structure with a circular orifice to slowly release stormwater to the receiving water body. The Pond 4 drainage basin encompasses 7.35 acres of proposed Forsyth Road (including the pond area) and 4.84 acres of offsite area.

4.3.5 Pond 5

Pond 5 is an "on-line" wet detention system which provides water quality treatment and peak flow attenuation of runoff rates for the contributing drainage basin from Forsyth Road. This pond is situated in a vacant lot south of Gardner Street, east of Forsyth Road. A portion of the lot is considered a wetland system (from a field review of the pond location with the SJRWMD and the U.S. Army Corps of Engineers). Pond 5 is to be located in only the upland portion of the lot. The existing wetland system will remain intact. The pond discharges to an existing lateral ditch on the south side of the lot. This ditch extends from the west side of Forsyth Road to the east, to the Hidden Oaks Condominium development. This ditch is encompassed by a 15-foot drainage easement and is currently maintained by Orange County. The contributing drainage area to Pond 5 encompasses 2.95 acres of the proposed Forsyth Road improvements.

4.3.6 Pond 6

Pond 6 is located west of Forsyth Road and south of the Winter Park Pines Canal, adjacent to the Bel-Air Pines development. This pond was originally rectangular in shape and aligned parallel to the canal, but has since been modified under this permit application. The modification was done in an effort to better coordinate vehicular access from Forsyth Road with a future development, located south of the Winter Park Pines Canal, west of Forsyth Road. The pond is situated in an area considered uplands by the regulatory agencies, and is mostly grassed. The pond provides water quality treatment and peak flow attenuation of runoff for the section of Forsyth Road between Astro

bottom inlets were proposed in these ponds, which collect and convey the excess runoff to the bypass line, rather than into Forsyth Road.

Perpetual drainage easements (PDE's) are proposed to encompass the proposed inlets, with the bypass system being located under the proposed sidewalk. In areas of existing fill, roadside ditches were constructed to compliment the bypass storm sewer system in providing runoff conveyance to appropriate receiving water bodies.

4.4.1.3 Winter Park Pines Canal Crossing

A pipeline crossing is proposed in the vicinity of the Winter Park Pines canal to convey stormwater collected north of the existing double 9-foot by 10-foot box culvert to Pond 6. A review of the structural plans for the existing culvert revealed that a pipe crossing underneath the box would be difficult and expensive, therefore other alternatives were reviewed. A pipe crossing of the canal was deemed more appropriate, with special provisions. Orange County inspectors were contacted to determine the method of construction at the canal crossing. The County has recently been utilizing tongue and groove elliptical pipes with O-rings with a large degree of success for special conditions such as the Winter Park Pines canal crossing. The joints of the elliptical pipe are to be tightly wrapped with a geotextile material to insure a water-tight seal. In addition, a concrete cap is to be poured over the elliptical pipe in the vicinity of the canal crossing. The function of the concrete cap is to protect the elliptical pipe in the event that maintenance dredging occurs in the canal. The cap will immediately warn the dredging operator and inspector of the conflict once encountered.

4.4.2 University Boulevard to Aloma Avenue

This segment of Forsyth Road consists wholly of a mainline system to collect and convey both onsite and offsite runoff to Pond 7. Ditch bottom inlets are located in appropriate locations to collect the offsite runoff prior to discharging onto Forsyth Road. This becomes an important element in that these ditch bottom inlets reduce the number of curb inlets required to control excessive spread of stormwater on the roadway.

4.5 CROSS DRAIN SYSTEMS

The Forsyth Road project consists of five (5) cross-drains which convey onsite and offsite stormwater runoff flow to the east into the Little Econlockhatchee River. The following section briefly describes the cross-drains.

4.5.1 Tiffany Manor Outfall Ditch

This cross-drain is located south of Agate Lane and currently consists of a double 48-inch diameter culvert with sand-cement bag headwalls. The culverts connect existing ditches on both sides of Forsyth Road. The proposed culvert improvements consist of replacement in-kind, extending the culvert ends to accommodate the proposed roadway improvements. The proposed pipe sizes are

identical to those downstream (to the east), underneath Marcia Drive. The existing culverts were observed to be in good condition, but because of the skew in relation to the roadway improvements, will be required to be removed and relocated to better align with the existing ditch on both sides of Forsyth Road.

4.5.2 Lake Corrine Outfall Canal

This cross-drain is located north of Partridge Lane (east) and consists of double 54-inch diameter pipes. The culvert also has a control weir on the west side of Forsyth Road. The weir functions to retain water in the canal. Discussions with the Orange County staff indicate that this structure is more than 20-years old and is probably at the end of its structural life. The County has previously encountered maintenance problems with this culvert crossing, particularly with leaking pipes. The proposed culvert improvements consist of replacement in-kind and the relocation of the existing concrete weir on the west side of Forsyth Road. In addition, handrails and guardrails will be provided at the back of the proposed sidewalk and endwall, respectively, for safety purposes.

4.5.3 Gardner Street Outfall

This cross-drain is located south of Gardner Street and discharges into an existing lateral ditch which runs in an easterly direction from Forsyth Road. This culvert currently consists of an 18-inch diameter concrete pipe with concrete endwalls on both sides. The County has previously experienced drainage problems in this vicinity, particularly with the Crummet Chemicals property on the west side of Forsyth Road, immediately north of the culvert. The proposed culvert improvements consist of constructing a "bypass" storm sewer system on the west side of Forsyth Road to collect offsite runoff which was previously discharging into adjacent roadside ditches. These roadside ditches will be eliminated by the proposed roadway improvements, therefore the bypass line will replace these ditches.

These bypass lines will converge at the Gardner Street Outfall culvert, which will be replaced by a single 36-inch diameter pipe. The existing ditch will also be required to be regraded to attain a positive gradient from the proposed culvert crossing to the existing ditch.

4.5.4 Winter Park Pines Canal

The culvert crossing for the Winter Park Pines Canal consists of a double 9-foot by 10-foot reinforced concrete box (RCB) culvert, which was constructed in 1982 by Orange County. Due to roadway horizontal alignment improvements for safety, this box culvert will be required to be extended on both sides of Forsyth Road to accommodate the proposed roadway improvements. The proposed box extensions will not have any effect on the established water surface elevations for the 10-, 25- and 100-year flood events.

DRAINAGE BASIN MAPS

Post-Development (Proposed) Conditions

BEGIN PROJECT
STA. 239+66.34

86.78 OLD CHENEY HWY

BEGIN EXCEPTION
CONNECT TO EXIST PAVT.
STA. 244+69.66
℄ CONST. FORSYTH RD.

COLONIAL DRIVE

END EXCEPTION
CONNECT TO EXIST PAVT.
STA. 245+48.25
℄ CONST. FORSYTH RD.

AGATE LN.

MUSKOGEE ST.

DOMINION AVE.

86.57

105
95
85
75
65

240 245 250 255 260

24" PIPE
18" PIPE
PGL
EXIST. GROUND LINE
S-6 S-4 S-9 S-10 S-17 S-18 S-20 S-25 S-26 S-29 S-33 S-35 S-37 S-45 S-52 S-56 S-61 S-62 S-63

78.10 80.75 81.25 81.35 80.50 81.62 81.35 81.35 81.05 80.55 80.35 81.05 78.70 81.20 81.20 81.56 82.19 10-YEAR DHW EL 81.98 81.80 81.80 81.33 81.33 81.08 81.08 80.85 80.85 80.80 80.80

EXIST. 48" RCP
DBL. 48" PIPE

Scale : 1 inch = 10 feet Vert.
1 inch = 100 feet Horiz.

100'

BEGIN PROJECT
STA. 239+66.34

235 240 245 250 255 260

BEGIN EXCEPTION
CONNECT TO EXIST PAVT.
STA. 244+69.66
℄ CONST. FORSYTH RD.

END EXCEPTION
CONNECT TO EXIST PAVT.
STA. 245+48.25
℄ CONST. FORSYTH RD.

COLONIAL DRIVE
S.R. 50

OLD CHENEY HWY.

JURISDICTIONAL WETLAND

WETLAND AREA NO. 6

POND 1
DHW 25
EL - 85.12

POND 2A
DHW 25
EL - 84.38

POND 2B
DHW 25
EL - 82.08

LEAVY MANOR OUTFALL CANAL

FORSYTH RD.

AGATE LN.

MUSKOGEE ST.

DOMINION AVE.

S-1 S-2 S-2A S-3 S-3A S-4 S-5 S-6 S-7 S-8 S-9 S-10 S-11 S-12 S-13 S-14 S-15 S-16 S-17 S-18 S-19 S-19A S-20 S-21 S-22 S-23 S-24 S-25 S-26 S-27 S-27A S-28 S-29 S-30 S-31 S-32 S-33 S-34 S-34A S-35 S-35A S-36 S-37 S-38 S-39 S-40 S-41 S-41A S-43 S-43A S-44 S-45 S-47 S-48 S-49 S-50 S-50A S-51 S-52 S-53 S-53A S-54 S-54A S-55 S-56 S-57 S-57A S-58 S-58A S-59 S-59A S-60 S-61 S-62 S-63 S-64 S-353 S-355 S-356 S-357 S-358 S-359 S-360

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40

431 435

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

ORANGE COUNTY
FLORIDA

PEC
PROFESSIONAL ENGINEERING CONSULTANTS, INC.
engineers planners surveyors

DRAINAGE MAP

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SHEET NO. 9

105 / 95 / 85 / 75 / 65

24" PIPE · 24" PIPE · EXIST 30" PIPE · 30" PIPE · AMETHYST LN. · TURQUOISE LN. W. · 24" PIPE · 24" PIPE · 24" PIPE · PARTRIDGE LN. E. · PARTRIDGE LN. W. · 18" PIPE · 18" PIPE · 36" PIPE · 36" PIPE · 36" PIPE · 36" PIPE · 36" PIPE · HANGING MOSS RD. · 36" PIPE · 30" PIPE · PGL · 30" PIPE · 30" PIPE

EXIST GROUND LINE

S-66 · S-68 · S-69 · S-71 · S-72 · S-79 · S-81 · S-82 · S-86 · S-89 · S-90 · S-95 · S-96 · S-104 · S-98 · S-105 · S-113 · S-116 · S-119 · S-121 · S-123 · S-125 · S-126 · S-136 · S-139 · S-141 · S-144

89.68 · 89.94 · 89.27

80.54 · 80.54 · 80.26 · 80.26 · 80.15 · 80.15 · 80.40 · 80.10 · 81.00 · 81.00 · 81.07 · 81.07 · 81.32 · 81.32 · 81.45 · 81.45 · 81.55 · 81.55 · 80.93 · 79.08 · 77.58 · 77.80 · 77.80 · 78.05 · 78.05 · 78.25 · 78.25 · 78.37 · 78.37 · 78.41 · 78.41 · 78.46 · 78.46 · 78.55 · 78.55 · 78.79 · 78.79 · 78.92 · 78.92 · 79.03

100-YR. DHW EL. 85.2 · 81.75 · 25-YR. DHW EL. 84.5 · DBL. 54" PIPE · EXIST. OBL 54" RCP · 10-YR. DHW EL. 84.00

265 · 270 · 275 · 280 · 285 · 290 · 295

Scale : 1 inch : 10 feet Vert.
1 inch : 100 feet Horiz.

POND 3B DHW 25 EL = 85.58 · JURISDICTIONAL WETLAND · LAKE CORRINE OUTFALL CANAL · POND 3A DHW 25 EL = 85.58 · WETLAND AREA NO. 5 · TURQUOISE LN. W. · PARTRIDGE LN. W. · HANGING MOSS RD.

S-76 · S-361 · S-362 · S-363 · S-73 · S-94A · S-95A · S-100 · S-101 · S-102 · S-103 · S-109A · S-109 · S-110 · S-111A · S-111 · S-112 · S-114A · S-114 · S-115 · S-117A · S-117 · S-118 · S-120 · S-122 · S-124 · S-127 · S-128 · S-129 · S-130 · S-131 · S-132 · S-133 · S-134 · S-135 · S-136A · S-137A · S-137 · S-138 · S-140 · S-142A · S-142 · S-143

JURISDICTIONAL WETLAND · WETLAND AREA NO. 5 · FORSYTH RD.

S-70 · S-74 · S-65 · S-67 · S-85 · S-88 · S-93 · S-92 · S-94 · S-66 · S-68 · S-69 · S-7 · S-72 · S-75A · S-75 · S-77 · S-79 · S-81 · S-82 · S-86 · S-83 · S-89 · S-90 · S-95 · S-96 · S-97 · S-104 · S-99 · S-98 · S-99A · S-106 · S-105 · S-113 · S-116 · S-119 · S-121 · S-123 · S-125 · S-126 · S-136 · S-139 · S-141 · S-144

AMETHYST LN. · TURQUOISE LN. E. · PARTRIDGE LN. E. · LAKE CORRINE OUTFALL CANAL · JURISDICTIONAL WETLAND · WETLAND AREA NO. 5 · S-107A · S-107 · TO POND 4

SEE SHEET 177

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

ORANGE COUNTY
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DRAINAGE MAP

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SHEET NO. 10

105 / 95 / 85 / 75 / 65

88.53 89.27 88.53

30" PIPE S-144 S-145 — 79.07 79.12 79.12

30" PIPE — EXIST GROUND LINE — PGL S-148 — 79.30 79.30

30" PIPE S-152 — 79.47 79.47

30" PIPE S-155 — 79.57 79.57

30" PIPE S-158 — 79.72 79.72 79.75 79.75

30" PIPE S-160

30" PIPE S-162 — 79.82 79.82

24" PIPE S-166 — 80.05 80.05

24" PIPE — EXIST. 18" CMP S-169 — 80.26 80.26

24" PIPE S-171 — 80.46 80.46

18" PIPE S-173 — 80.55 80.75 81.00 81.00

EXIST. 18" CMP S-176 S-177 — 81.15

18" PIPE

36" PIPE

S-181 — EXIST. 18" RCP

10-YEAR DHW EL 83.84

18" PIPE S-183 — 81.75

GARDNER ST.

36" PIPE S-186 — 81.35

S-187 — 78.76

30" PIPE S-191 — 79.01 79.01

S-193 — 79.20 79.20

EXIST GROUND LINE — PGL

24" PIPE S-195 — 80.00 80.06

S-196 — 86.57 87.33 86.57

296 300 305 310 315 320 325

Scale : 1 Inch = 10 feet Vert.
1 Inch = 100 feet Horiz.

100'

STAPOINT CT.

S-140 S-141 S-142A S-142 S-143 S-144 S-145 S-146A S-146 S-147 S-148 S-149A S-149 S-150 S-150A S-151 S-152 S-153A S-153 S-154 S-155 S-155A S-155B S-156 S-156A S-157 S-158 S-159 S-160 S-161 S-162 S-163 S-163A S-164 S-164A S-165 S-166 S-167 S-167A S-168 S-169 S-170 S-170A S-171 S-172 S-173 S-174 S-175 S-176 S-177 S-178 S-178A S-179 S-180 S-180A S-181 S-182 S-183 S-184 S-184A S-185 S-186 S-187 S-188 S-189 S-190 S-191 S-192 S-193 S-194 S-195 S-196 S-197 S-367 S-368

WETLAND AREA NO. 4

JURISDICTIONAL WETLAND

FORSYTH RD.

JURISDICTIONAL WETLAND

WETLAND AREA NO. 4

JURISDICTIONAL WETLAND

GARDNER ST.

POND 5
DHW 25
EL = 84.91

EXIST. DITCH

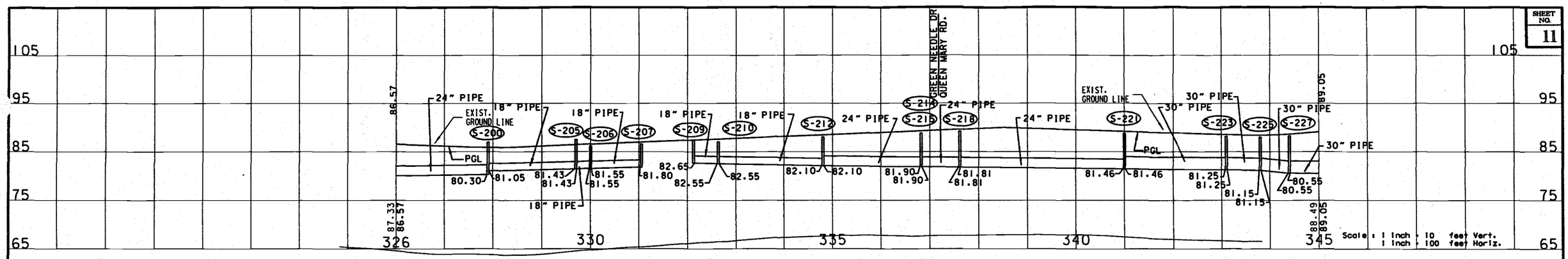
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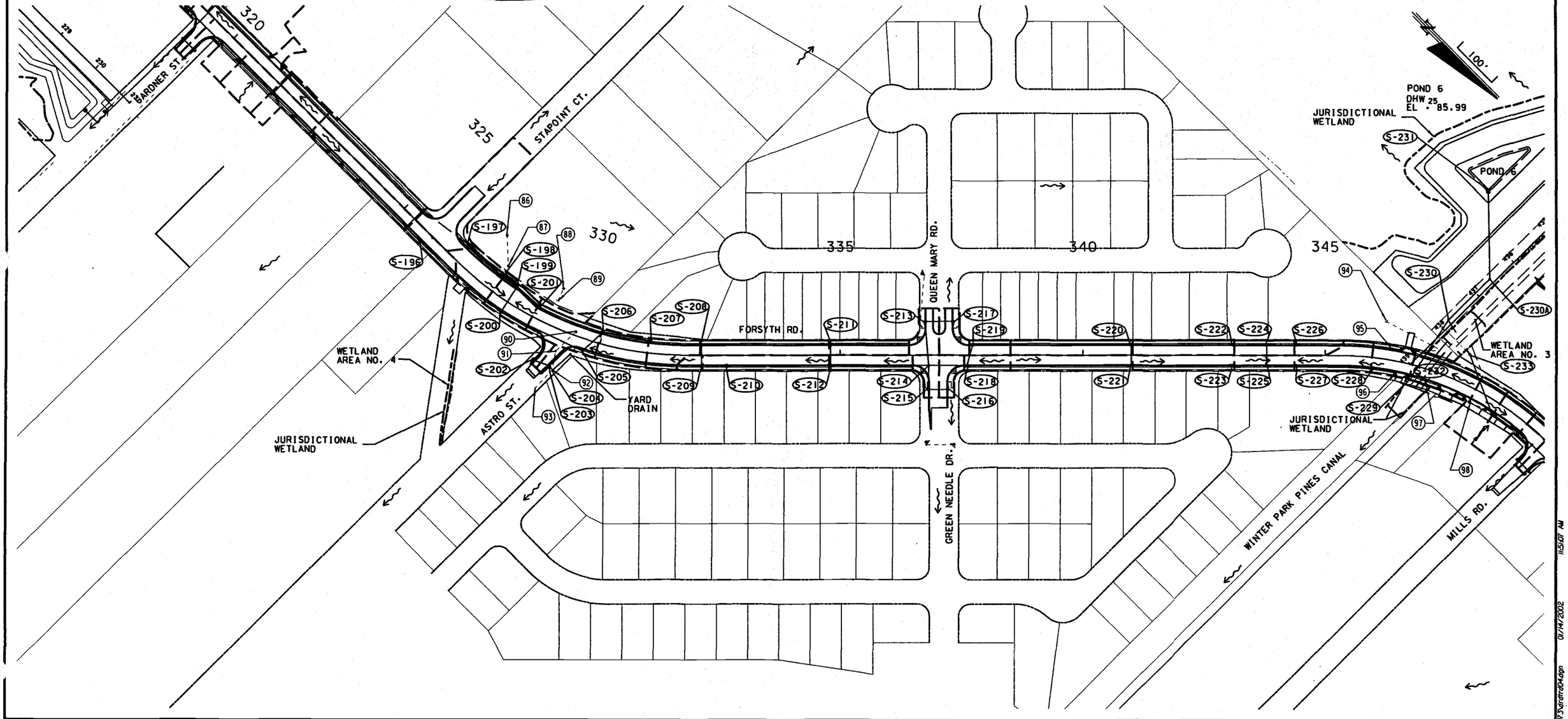
ORANGE COUNTY
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DRAINAGE MAP

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SHEET NO. 12

105 / 95 / 85 / 75 / 65

345 350 355 360 365 370

AMORY CT.

UNIVERSITY BLVD.

100-YR. DHW EL. 86.08

25-YR. DHW EL. 85.3

10-YR. DHW EL. 84.8

EXIST. GROUND LINE

EXIST. DBL 10'x9' RCB

34"X53" PIPE

30" PIPE

36" PIPE

24" PIPE

PGL

S-228 S-229 S-230 S-231 S-232 S-233 S-234 S-235 S-236 S-237 S-238 S-239 S-240 S-241 S-242 S-243 S-244 S-245 S-245A S-246 S-247 S-248 S-249 S-250 S-251 S-252 S-253 S-254 S-255 S-256 S-257 S-258 S-259 S-260 S-261 S-262 S-263 S-264 S-265 S-266 S-267 S-268 S-269 S-270 S-271 S-272 S-273 S-274

80.39 80.39 80.30 80.30 77.20 72.76 72.93 80.50 80.65 80.71 80.75 80.75 80.84 80.84 80.92 80.92 80.97 80.97 81.09 81.09 81.18 81.18 81.33 81.33 81.61 81.61 81.77 81.77 81.85 82.18 82.04 82.04 81.62 81.62 81.20 81.20 80.60 80.60 79.95 79.95

89.05 89.05 88.49 87.90 87.72

Scale: 1 inch = 10 feet Vert.
1 inch = 100 feet Horiz.

MATCHLINE (SEE THIS SHEET)

MATCHLINE (SEE THIS SHEET)

100'

TO POND 7 (SEE SHEET 180)

JURISDICTIONAL WETLAND

WETLAND AREA NO. 3

POND 6 DHW 25 EL. 86.02

JURISDICTIONAL WETLAND

JURISDICTIONAL WETLAND

WINTER PARK PINES CANAL

MILLS RD.

EASTER ST.

FORSYTH RD.

SPECIAL DRAINAGE STRUCTURE (SEE SHEET 185)

S-226 S-227 S-228 S-229 S-230 S-230A S-231 S-232 S-233 S-234 S-235 S-236 S-237 S-238 S-239 S-240 S-241 S-242 S-243 S-244 S-245 S-245A S-246 S-247 S-248 S-249 S-250 S-251 S-252 S-253 S-254 S-255 S-256 S-257 S-258 S-259 S-260 S-261 S-262 S-263 S-264 S-265 S-266 S-267 S-268 S-269 S-270 S-271 S-272 S-273 S-274 S-341 S-342 S-343 S-344 S-345 S-346 S-347 S-348 S-349 S-349A S-350 S-351 S-352 S-369 S-370

97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 119A 119B 119C

REVISIONS

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ORANGE COUNTY FLORIDA

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DRAINAGE MAP

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SHEET NO. 13

105 95 85 75 65 90 87.72 87.90

30" PIPE
36" PIPE PGL
36" PIPE
36" PIPE
42" PIPE
CSX RR
10-YEAR DHW EL 83.60
48" PIPE
S-300
S-301
S-304
S-305
PGL
S-313
S-317
36" PIPE PGL
18" PIPE
18" PIPE
24" PIPE
S-319
S-322
S-326
S-328
S-337
84.48
ALOMA AVE.
END PROJECT
STA. 393+86.26
S-278
S-281
S-284
S-286
S-289
S-291
EXIST. GROUND LINE
EXIST. 38"x60" ERCP
42" PIPE
EXIST. GROUND LINE
79.40 79.40
79.14 79.14
78.80 78.80
78.64 78.64
78.20 78.20
77.86 77.86
76.40 74.60
74.79
76.66
74.97
77.42
77.67
79.50
79.15
78.95 78.45
78.25
78.00
83.97 84.60
30" PIPE
48" PIPE
36" PIPE
DBL 24"X45" ELLIPTICAL PIPE
24" PIPE
375 380 385 390 393
Scale : 1 inch = 10 feet Vert.
1 inch = 100 feet Horiz.

100'

TO POND 7 (SEE SHEET 180)
WETLAND AREA NO. 1
S-298
S-376
JURISDICTIONAL WETLAND
JURISDICTIONAL WETLAND
WETLAND AREA NO. 2
JURISDICTIONAL WETLAND
JURISDICTIONAL WETLAND
C.S.X. R/R
WETLAND AREA NO. 1
TO CRANE STRAND CANAL
FORSYTH RD.
ALOMA AVE.
END PROJECT
STA. 393+86.26
S-275 S-276 S-277 S-278 S-279 S-280 S-281 S-282 S-283 S-284 S-285 S-286 S-287 S-288 S-289 S-290 S-291 S-292 S-300 S-301 S-303 S-303A S-304 S-305 S-306 S-307 S-308 S-309 S-310 S-311 S-313 S-315 S-316 S-317 S-317A S-318 S-319 S-320 S-321 S-322 S-323 S-325 S-326 S-327 S-328 S-329 S-330 S-331 S-332 S-333 S-334 S-335 S-336 S-337 S-337A S-338 S-339 S-340 S-340A S-340B S-376 S-377 S-378 S-379

REVISIONS

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ORANGE COUNTY
FLORIDA

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engineers planners surveyors

DRAINAGE MAP

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Baldwin Park – S.R.436 Connector Road
SJRWMD Permits #40-095-63752-29, #40-095-63752-38

BALDWIN PARK

CONSTRUCTION PACKAGE No. 4-6
S.R. 436 CONNECTOR ROAD

CONSULTANTS

OWNER
BALDWIN PARK DEVELOPMENT COMPANY
4776 NEW BROAD STREET - SUITE 110
ORLANDO, FLORIDA 32814
CONTACT: JOHN H. CLASSE JR., P.E.
PHONE (407) 206-7232
FAX (407) 208-7209

ENGINEER/SURVEYOR
PBS&J
482 SOUTH KELLER ROAD
ORLANDO, FLORIDA 32810
CONTACT: KATHY LEO, P.E.
PHONE (407) 647-7275
FAX (407) 647-0551

ECOLOGICAL SCIENCES
PBS&J
482 SOUTH KELLER ROAD
ORLANDO, FLORIDA 32810
CONTACT: LISA DURANT
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FAX (407) 647-0551

GEOTECHNICAL/ENVIRONMENTAL
PSI
1748 33RD STREET
ORLANDO, FLORIDA 32839
PHONE (407) 304-5560
FAX (407) 448-8486

UTILITIES

CITY OF ORLANDO
WASTEWATER ENVIRONMENTAL SERVICES DIVISION
5100 L.B. MCLEOD ROAD
ORLANDO, FLORIDA 32811
CONTACT: ALAN OYLER, P.E.
PHONE (407) 246-2213
FAX (407) 246-2886

ORLANDO UTILITIES COMMISSION
WATER DIVISION
3800 GARDENIA AVENUE
ORLANDO, FLORIDA 32839
CONTACT: MIKE MULLER
PHONE (407) 423-9100
FAX (407) 649-4420

ORLANDO UTILITIES COMMISSION
ELECTRICAL DIVISION
6003 PERSHING AVENUE - 2ND. FLOOR
ORLANDO, FLORIDA 32802
CONTACT: DAVE L. BRAMLETT
PHONE (407) 384-4111
FAX (407) 384-4126

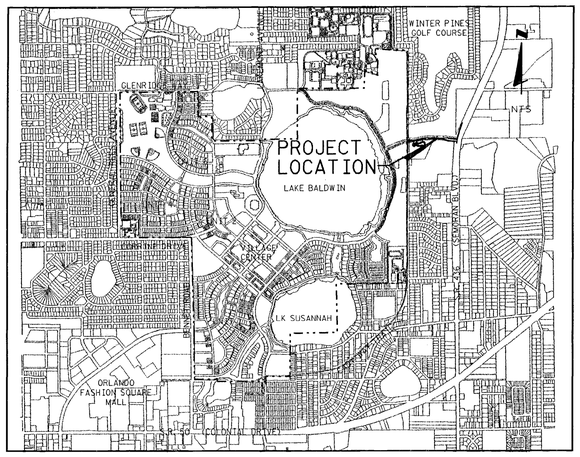
BELLSOUTH
5100 STOYR STREET
ORLANDO, FLORIDA 32819
CONTACT: PHIL RYAN
PHONE (407) 245-3068
FAX (407) 246-0269

SPRINT
952 FIRST STREET
ALTAMONTE SPRINGS, FLORIDA 32701
CONTACT: VICKY BROWN
PHONE (407) 830-3431
FAX (407) 206-2683

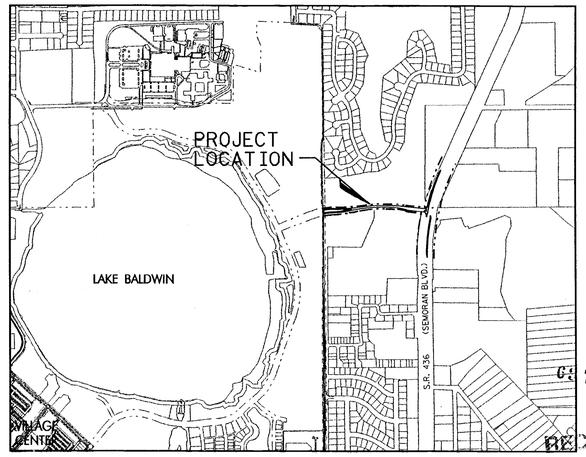
BRIGHT HOUSE NETWORKS
844 MAGUIRE ROAD
OCOEE, FLORIDA 32761-8508
CONTACT: P.J. KING
PHONE (407) 532-8508
FAX (407) 656-1162

TECO PEOPLES GAS
600 WEST ROBINSON STREET
ORLANDO, FL 32802
CONTACT: JIM ARNOLD
PHONE (407) 420-6658
FAX (407) 425-4673

VICINITY MAP



LOCATION MAP



PREPARED BY:

PBS&J

ENGINEERING * PLANNING * ARCHITECTURE
482 SOUTH KELLER ROAD
ORLANDO, FLORIDA 32810
(407) 647-7275

SJRWMD SUBMITTAL

RECEIVED
JUN 11 2004
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ALTAMONTE SPRINGS, FLORIDA

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GENERAL NOTES:

01. THESE GENERAL NOTES APPLY TO ALL WORK IN THIS SET OF DRAWINGS.

02. CONTRACTOR SHALL REVIEW ALL PERMITS PRIOR TO CONSTRUCTION FOR ANY CHANGES TO THE DESIGN INCLUDED THEREIN. NOTIFY ENGINEER/OWNER OF ANY REQUIRED CHANGES PRIOR TO CONSTRUCTION.

03. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR(S) TO ENSURE THAT ALL REQUIRED PERMITS ARE OBTAINED AND ARE IN HAND AT THE JOB SITE PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. CONTRACTOR SHALL ABIDE BY ALL CONDITIONS CONTAINED THEREIN. PERMITS INCLUDED (BUT NOT NECESSARILY LIMITED TO) ARE:

- WATER MANAGEMENT DISTRICT SURFACE WATER MANAGEMENT
- CITY OF ORLANDO ENGINEERING
- FLORIDA DEPARTMENT OF TRANSPORTATION

04. FLORIDA LAW (F.S. 553.851) PROTECTION OF UNDERGROUND GAS PIPELINES MANDATES THAT "NO EXCAVATOR SHALL COMMENCE OR PERFORM ANY EXCAVATION IN ANY PUBLIC OR PRIVATE STREET, ALLEY, RIGHT-OF-WAY DEDICATED TO THE PUBLIC USE, OR GAS UTILITY EASEMENT WITHOUT FIRST OBTAINING INFORMATION CONCERNING THE POSSIBLE LOCATION OF GAS PIPELINES IN THE AREA OF THE PROPOSED EXCAVATION." THIS INCLUDES ANY OPERATION UTILIZING HAND TOOLS OR POWER TOOLS WHICH MOVES OR REMOVES ANY STRUCTURE, EARTH, ROCK, OR OTHER MASS OF MATERIAL BY SUCH METHODS AS DIGGING, BACKFILLING, DEMOLITION, GRADING, DITCHING, DRILLING, BORING AND CABLE PLOWING. THE EXCAVATOR MUST NOTIFY THE GAS UTILITY A MINIMUM OF 48 HOURS AND A MAXIMUM OF 5 DAYS PRIOR TO EXCAVATING (EXCLUDING SATURDAYS, SUNDAYS, AND LEGAL HOLIDAYS).

05. CONTRACTOR SHALL NOTIFY ALL APPROPRIATE UTILITY COMPANIES OF PROPOSED START OF WORK IN ACCORDANCE WITH THEIR STANDARD REQUIREMENTS; INCLUDING BUT NOT LIMITED TO WATER, SEWER, POWER, TELEPHONE, GAS AND CABLE TV COMPANIES.

06. PRIOR TO COMMENCEMENT, CONTRACTOR SHALL PROVIDE THE OWNER AND PBS&J WITH CONSTRUCTION SCHEDULE FOR VARIOUS SITE WORK ELEMENTS SO THAT PERIODIC SITE VISITS MAY BE COORDINATED TO ENSURE TIMELY CERTIFICATION OF COMPLETION TO AGENCIES AND AVOID DELAYS IN ISSUANCE OF CERTIFICATES OF OCCUPANCY/COMPLETION.

07. CONTRACTOR SHALL FURNISH OWNER WITH ACCURATE RECORD DRAWINGS SURVEY SHOWING AS-CONSTRUCTED HORIZONTAL AND VERTICAL DIMENSIONING OF THE WORK. THE SUBMITTAL COPY OF THE RECORD DRAWINGS WILL NOT BE RETURNED. THE RECORD DRAWING OR A REPRODUCIBLE COPY PREPARED BY ENGINEER SHALL BE CERTIFIED BY THE CONTRACTOR AS CORRECT. ALL INFORMATION WHICH IS UNCHANGED AND CURRENT SHALL BE NOTED BY CHECKING OFF OR CLOUDING. ALL REVISED INFORMATION SHALL BE CROSSED THROUGH AND NEW DATA ADDED. ADDITIONAL REQUIREMENTS ARE NOTED IN PAVING, GRADING AND DRAINAGE, AND WATER AND SEWER NOTES.

08. THE LOCATIONS OF EXISTING UTILITIES AND STORM DRAINAGE SHOWN ON THE DRAWINGS HAVE BEEN DETERMINED FROM THE BEST INFORMATION AVAILABLE AND ARE GIVEN FOR THE CONVENIENCE OF THE CONTRACTOR. ENGINEER ASSUMES NO RESPONSIBILITY FOR INACCURACY. PRIOR TO THE START OF ANY CONSTRUCTION ACTIVITY, IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO MAKE ARRANGEMENTS FOR FIELD LOCATIONS AND FOR ANY RELOCATIONS OF THE VARIOUS EXISTING UTILITIES WITH THE UTILITY OWNERS, WHICH SHALL BE DONE IN A TIMELY FASHION TO MINIMIZE IMPACT ON THE CONSTRUCTION SCHEDULE. ANY DELAY OR INCONVENIENCE CAUSED THE CONTRACTOR BY THE RELOCATION OF THE VARIOUS UTILITIES SHALL BE INCIDENTAL TO THE CONTRACT AND NO EXTRA COMPENSATION WILL BE ALLOWED.

09. ANY DIFFERING SITE CONDITIONS FROM THAT WHICH IS REPRESENTED HEREIN, WHETHER ABOVE, ON OR BELOW THE SURFACE OF THE GROUND, SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE ENGINEER AND OWNER IN WRITING PRIOR TO CONSTRUCTION IN THE AREA IMPACTED BY THE CONFLICT. NO CLAIM FOR EXPENSES INCURRED BY THE CONTRACTOR DUE TO DIFFERING SITE CONDITIONS WILL BE ALLOWED IF CONTRACTOR FAILS TO PROVIDE THE REQUIRED WRITTEN NOTIFICATION OF SUCH CONDITIONS FOR REVIEW BY THE ENGINEER AND OWNER.

10. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE OWNER OF ANY DISCREPANCIES FOUND BETWEEN DRAWINGS AND THE FIELD CONDITIONS PRIOR TO CONSTRUCTION IN THE AREA IMPACTED BY THE CONFLICT.

11. ALL RECOMMENDATIONS AND REQUIREMENTS OF INSPECTION PERSONNEL OTHER THAN OWNER'S SHALL BE REPORTED TO ENGINEER/OWNER PRIOR TO IMPLEMENTATION. COMPENSATION WILL NOT BE ALLOWED FOR WORK WHICH IS NOT AUTHORIZED BY ENGINEER/OWNER.

12. CONTRACTOR SHALL PROTECT LAKE BALDWIN, LAKE GEAR, LAKE SUSANNAH, ADJACENT WETLANDS & ALL ADJACENT PROPERTIES FROM DAMAGE BY SEDIMENTATION OR OTHER POTENTIAL CONSTRUCTION RELATED CAUSES.

13. ALL WORK SHALL BE OPEN TO AND SUBJECT TO INSPECTION BY AUTHORIZED PERSONNEL OF THE CITY, OWNER, INVOLVED UTILITY COMPANIES, ENGINEER AND REGULATORY AGENCIES.

14. CONTRACTOR SHALL STAKE ALL IMPROVEMENTS USING THE INFORMATION PROVIDED IN THESE DRAWINGS. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO COMPLETELY STAKE AND CHECK ALL IMPROVEMENTS TO ENSURE ADEQUATE POSITIONING, BOTH HORIZONTAL AND VERTICAL PRIOR TO THE INSTALLATION OF ANY IMPROVEMENT.

15. CONTRACTOR SHALL CONFIRM COMPATIBILITY OF PIPE SLOPES AND INVERTS DURING SHOP DRAWING AND MATERIALS ORDERING PHASE OF PROJECT AND ADVISE ENGINEER OF ANY DISCREPANCIES.

16. NO EXISTING MATERIAL SHALL BE USED IN NEW CONSTRUCTION UNLESS APPROVED DURING THE SHOP DRAWING APPROVAL PROCESS.

17. CONTRACTOR TO REFERENCE CONSTRUCTION AND MATERIALS TECHNICAL SPECIFICATIONS CONTAINED WITHIN THE PROJECT MANUAL DISTRIBUTED BY THE OWNER.

18. CONTRACTOR TO PRESERVE ALL MONITORING WELLS IDENTIFIED ONSITE.

19. CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING PROPER TRAFFIC MAINTENANCE AND CONTROLS IN ACCORDANCE WITH REGULATORY STANDARDS. WHERE A TRAFFIC MAINTENANCE PLAN IS REQUIRED. IT SHALL BE PREPARED AND SUBMITTED BY CONTRACTOR FOR APPROVAL BY OWNER, ENGINEER AND CITY.

20. IT IS THE CONTRACTOR'S RESPONSIBILITY TO SECURE THE PROJECT SITE DURING CONSTRUCTION, TO PREVENT TRESPASSING OF UNAUTHORIZED PEDESTRIANS AND/OR VEHICLES IN ALL WORK AREAS. THE CONTRACTOR SHALL POST SIGNS, CONSTRUCT BARRIERS OR IMPLEMENT OTHER METHODS NECESSARY TO CONTROL ACCESS. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR TRESPASSING ON THE CONSTRUCTION SITE OR DAMAGES TO ANY WORK RELATED THERETO.

HORIZONTAL GEOMETRY NOTES:

01. THESE GENERAL NOTES APPLY TO ALL WORK IN THIS SET OF DRAWINGS.

02. BOUNDARY BASED ON THE FOLLOWING:
SURVEYOR: REGIONAL ENGINEERS, PLANNERS & SURVEYORS, INC. (REPS)
DRAWING NO.: 98-126
DATED: 8-18-98

03. ALL SIGNAGE, PAVEMENT MARKING, AND TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH FDOT "MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS" AND CITY OF ORLANDO ESM/LDC REQUIREMENTS.

04. BLUE REFLECTIVE PAVEMENT MARKERS SHALL BE PLACED OPPOSITE FIRE HYDRANTS IN THE CENTER OF THE NEAREST TRAVELED LANE TO MARK THEIR LOCATIONS.

GRADING & DRAINAGE NOTES:

01. THESE GENERAL NOTES APPLY TO ALL WORK IN THIS SET OF DRAWINGS.

02. EXISTING TOPOGRAPHY BASED ON DRAWING PROVIDED BY ENGINEER HAS BEEN FIELD VERIFIED.

03. SURVEYOR'S REFERENCE VERTICAL BENCHMARK: #5062 (CITY OF ORL. DATUM)
DESCRIPTION: 3" ALUMINUM DISK
ELEVATION: 100.028
LOCATION: C/L LAKEMONT AVE. ACROSS FROM LAKE BALDWIN PARK

04. BENCHMARK LOCATION AND ELEVATION ARE AS REPRESENTED BY SURVEYOR AT THE TIME OF THE SURVEY. CONTRACTOR SHALL VERIFY ITS CORRECTNESS AT TIME OF CONSTRUCTION.

05. SITE GRADING AND DRAINAGE MATERIALS AND CONSTRUCTION SHALL CONFORM TO FDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, 2000, AND THE CITY OF ORLANDO ENGINEERING STANDARDS MANUAL AND STORMWATER MANAGEMENT (OUSWMM) REGULATIONS AND SPECIFICATIONS.

06. CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING SURVEY MONUMENTATION. DISTURBED MONUMENTATION SHALL BE RESTORED BY A FLORIDA-LICENSED LAND SURVEYOR SELECTED BY THE OWNER AT CONTRACTOR'S EXPENSE.

07. DURING CONSTRUCTION, THE CONTRACTOR SHALL TAKE ALL REASONABLE MEASURES TO INSURE AGAINST POLLUTING, SILTING, OR DISTURBING TO SUCH AN EXTENT AS TO CAUSE AN INCREASE IN TURBIDITY TO THE EXISTING ONSITE AND OFFSITE DRAINAGE SYSTEM. CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLYING WITH ALL PERMIT REQUIREMENTS RELATED TO SUCH MEASURES. METHODS MAY INCLUDE, BUT ARE NOT LIMITED TO, CONSTRUCTION OF TEMPORARY EROSION CONTROL STRUCTURES SUCH AS SEDIMENT BASINS, SEDIMENT CHECKS, SILT BARRIERS, OR SILT SCREENS. ANY MEASURES SHOWN OR DETAILED IN THESE DRAWINGS SHALL BE CONSIDERED MINIMUMS AND SHALL NOT ALLEVIATE CONTRACTOR FROM THE RESPONSIBILITY TO IMPLEMENT ANY MEASURES NECESSARY TO PROVIDE PROTECTION.

08. CONTRACTOR IS ADVISED THAT THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY AND FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION AGENCY REQUIRES THAT OPERATORS FILE A NOTICE OF INTENT (NOI) FOR STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY UNDER THE NPDES GENERAL PERMIT PRIOR TO BEGINNING WORK. IT IS CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE WHETHER SAID PERMIT IS REQUIRED AND TO OBTAIN SAME. A COPY SHALL BE SENT TO THE ENGINEER AND OWNER.

09. CONTRACTOR SHALL INCLUDE ACCURATE AS-BUILT DIMENSIONS AND ELEVATIONS OF THE STORMWATER MANAGEMENT AREAS IMMEDIATELY AFTER FINAL GRADING AND PRIOR TO GRASSING THE SLOPES. AT A MINIMUM, CONTRACTOR MUST PROVIDE TWO TYPICAL AS-BUILT CROSS-SECTIONS IN DIFFERENT DIRECTIONS. CONTRACTOR MUST OBTAIN ENGINEER'S APPROVAL PRIOR TO GRASSING. IF ANY MODIFICATIONS ARE NEEDED, ADDITIONAL AS-BUILTS MUST BE FURNISHED.

10. GEOTECHNICAL SERVICES HAVE BEEN PROVIDED AS REFERENCED BELOW. GEOTECHNICAL RECOMMENDATIONS ARE NOT THE RESPONSIBILITY OF PBS&J. PBS&J HAS RELIED ON THE BELOW REFERENCED GEOTECHNICAL REPORT'S IN PREPARATION OF THESE DRAWINGS. ANY CONFLICT BETWEEN INFORMATION WITHIN THE REPORT AND THESE DRAWINGS SHALL BE REPORTED TO ENGINEER/OWNER. PBS&J ASSUMES NO RESPONSIBILITY FOR THE CORRECTNESS, COMPLETENESS OR ACCURACY OF GEOTECHNICAL INFORMATION.

GEOTECHNICAL ENGINEER: PSI
PROJECT NO.: 757-35175
DATE: SEPTEMBER 18, 2003

11. ELEVATIONS OF GRASSED AREAS ARE GIVEN AT FINISHED GRADE (TOP OF SOD OR SEEDED SURFACE).

12. PIPE LENGTHS SHOWN REPRESENT SCALED DISTANCES BETWEEN CENTERLINES OF DRAINAGE STRUCTURES AND FROM INVERTS OF ENDWALLS AND/OR MITERED END SECTIONS. BIDDERS SHALL ADJUST FOR PIPE LENGTHS WHEN BIDDING MITERED END SECTIONS.

13. ALL OFF-SITE DISTURBED AREAS SHALL BE RESTORED TO PRE-CONSTRUCTION CONDITION, OR BETTER.

14. CONTRACTOR IS RESPONSIBLE FOR IDENTIFYING AND DISPOSING OF ALL WASTE MATERIALS CONSISTENT WITH ALL RULES AND REGULATIONS APPLICABLE TO THE SPECIFIC MATERIAL FOUND.

15. DISTURBED RIGHTS OF WAY SHALL BE RESTORED. BAHIA SOD SHALL BE PLACED FROM EDGE OF PAVEMENT TO THE TOE OF BANK.

GRADING AND DRAINAGE MATERIAL SPECIFICATIONS:

01. STORM DRAINS SHALL BE REINFORCED CONCRETE PIPE, PER ASTM C-76 CLASS III, UNLESS OTHERWISE SPECIFIED. LIFTING HOLES ARE PROHIBITED. JOINTS SHALL BE BELL AND SPIGOT WITH COMPRESSION GASKETS CONFORMING TO ASTM C443-85 AND WRAPPED PER FDOT INDEX 280.

02. ALL STORM STRUCTURES SHALL CONFORM WITH FDOT STANDARD INDEX DRAWINGS AND SPECIFICATIONS EXCEPT THAT DITCH BOTTOM INLETS IN PAVED AREAS SHALL HAVE TRAVERSABLE, TRAFFIC BEARING, GRATES SUPPORTED BY STEEL ANGLE SEATS OR SUPPORTED ON FOUR SIDES. GRATES SHALL BE CAST IRON UNLESS OTHERWISE SPECIFIED OR APPROVED.

03. ALL TYPE "P" STRUCTURE BOTTOMS SHALL BE ROUND UNLESS OTHERWISE SPECIFIED AND SHALL HAVE 4 FT. MINIMUM DIAMETER.

04. ALL CONCRETE WORK SHALL BE 3000 PSI MINIMUM, UNLESS OTHERWISE SPECIFIED.

05. CONTRACTOR HAS THE OPTION TO USE HDPE PIPE IN LIEU OF THE SPECIFIED REINFORCED CONCRETE PIPE FOR PIPE SIZES 15" THROUGH 48". PIPES SHALL HAVE SOIL TIGHT JOINTS WRAPPED PER FDOT INDEX 280.

06. HDPE PIPE (WHERE SPECIFIED) SHALL BE INSTALLED BY A CERTIFIED HDPE CONTRACTOR.

07. STORM SEWERS WILL BE TESTED ACCORDING TO THE REQUIREMENTS OF SECTION 9.03.05 OF THE CITY OF ORLANDO ESM, INCLUDING HIGH PRESSURE CLEANING, VIEDOTAPING AND MANDREL TESTING OF PLASTIC AND METAL PIPE.

DEMOLITION NOTES:

01. THE LOCATIONS OF EXISTING UTILITIES AND STORM DRAINAGE SHOWN ON THE DRAWINGS HAVE BEEN DETERMINED FROM THE BEST INFORMATION AVAILABLE AND ARE GIVEN FOR THE CONVENIENCE OF THE CONTRACTOR. ENGINEER AND OWNER ASSUMES NO RESPONSIBILITY FOR INACCURACY. PRIOR TO THE START OF ANY CONSTRUCTION ACTIVITY, IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO MAKE ARRANGEMENTS FOR FIELD LOCATIONS AND FOR ANY RELOCATIONS OF THE VARIOUS EXISTING UTILITIES WITH THE UTILITY OWNERS, WHICH SHALL BE DONE IN A TIMELY FASHION TO MINIMIZE IMPACT ON THE CONSTRUCTION SCHEDULE. ANY DELAY OR INCONVENIENCE CAUSED THE CONTRACTOR BY THE RELOCATION OF THE VARIOUS UTILITIES SHALL BE INCIDENTAL TO THE CONTRACT AND NO EXTRA COMPENSATION WILL BE ALLOWED.

02. CONTRACTOR SHALL NOTIFY ALL APPROPRIATE UTILITY COMPANIES OF PROPOSED START OF WORK IN ACCORDANCE WITH THEIR STANDARD REQUIREMENTS; INCLUDING BUT NOT LIMITED TO WATER, SEWER, POWER, TELEPHONE, GAS AND CABLE TV COMPANIES.

03. ANY DIFFERING SITE CONDITIONS FROM THAT WHICH IS REPRESENTED HEREON, WHETHER ABOVE, ON OR BELOW THE SURFACE OF THE GROUND, SHOULD BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE OWNER IN WRITING. NO CLAIM FOR EXPENSES INCURRED BY THE CONTRACTOR DUE TO DIFFERING SITE CONDITIONS WILL BE ALLOWED.

04. CONTRACTOR SHALL PROTECT ADJACENT RIGHT-OF-WAYS AND ALL ADJACENT PROPERTIES FROM DAMAGE BY SEDIMENTATION OR OTHER POTENTIAL CONSTRUCTION RELATED CAUSES.

05. DURING CONSTRUCTION, THE CONTRACTOR SHALL TAKE ALL REASONABLE MEASURES TO INSURE AGAINST POLLUTING, SILTING, OR DISTURBING TO SUCH AN EXTENT AS TO CAUSE AN INCREASE IN TURBIDITY TO THE EXISTING DRAINAGE SYSTEM. CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLYING WITH ALL PERMIT REQUIREMENTS RELATED TO SUCH MEASURES. METHODS MAY INCLUDE, BUT ARE NOT LIMITED TO, FLOATING TURBIDITY BARRIERS, CONSTRUCTION OF TEMPORARY EROSION CONTROL STRUCTURES SUCH AS SEDIMENT BASINS, SEDIMENT CHECKS, SILT BARRIERS, OR SILT SCREENS. ANY MEASURES SHOWN OR DETAILED IN THESE DRAWINGS SHALL BE CONSIDERED MINIMUMS AND SHALL NOT ALLEVIATE CONTRACTOR FROM THE RESPONSIBILITY TO IMPLEMENT ANY MEASURES NECESSARY TO PROVIDE PROTECTION.

06. CONTRACTOR SHALL REMOVE ALL NON-REUSABLE WASTE MATERIAL, AT THE OWNERS DIRECTION, FOR DISPOSAL OFF-SITE. DISPOSAL SHALL CONFORM TO ALL APPLICABLE REGULATIONS.

07. CONTRACTOR SHALL ACQUAINT HIMSELF WITH THE CONSTRUCTION DOCUMENTS AND BE RESPONSIBLE FOR PROTECTING ANY EXISTING FACILITY SO DESIGNATED OR DESIGNATED TO BE UTILIZED IN THE WORK.

08. CONTRACTOR SHALL BE EXTREMELY CAUTIOUS WHEN WORKING NEAR TREES WHICH ARE TO BE SAVED, WHETHER SHOWN IN THE DRAWINGS OR DESIGNATED IN THE FIELD. CONTRACTOR SHALL COORDINATE WITH THE LANDSCAPE ARCHITECT AND LANDSCAPE DRAWINGS REGARDING TREES AND OTHER LANDSCAPING TO BE SALVAGED.

09. SITE CONTRACTOR TO MAINTAIN UTILITY SERVICE (WATER, SEWER, POWER, TELEPHONE, CABLE, GAS) TO EXISTING BUILDINGS TO REMAIN. ANY DISRUPTIONS ARE TO BE PREVIOUSLY COORDINATED WITH THE TENANTS.

10. TIMING OF DEMOLITION IS SUBJECT TO THE LOGISTIC PLAN FROM OWNER.

11. CONTRACTOR SHALL BE ADVISED THAT WHILE EXCAVATING AND WORKING WITHIN PROJECT LIMITS, PREVIOUSLY DEMOLISHED OR UNDEMOLISHED MATERIAL MAY BE ENCOUNTERED. CONTRACTOR SHALL COLLECT AND STOCKPILE ENCOUNTERED DEMOLISHED MATERIAL WITHIN AN AREA DESIGNATED ONSITE BY THE OWNER.

MAINTENANCE OF TRAFFIC:

1. MAINTENANCE OF TRAFFIC FOR S.R. 436 SHALL BE IN ACCORDANCE WITH FDOT STANDARD INDEX 613: MULTILANE, DIVIDED OR UNDIVIDED, RURAL NIGHT OPERATIONS OR OPERATIONS EXCEEDING ONE DAYLIGHT PERIOD.

Datum difference calculated to be -0.94 ft to convert to NAVD88 using information from City of Orlando.

APPLICABLE MOST CURRENT EDITION FDOT STANDARD DRAWINGS:

INDEX #	DESCRIPTION
102	BALED HAY OR STRAW BARRIERS AND SILT FENCES
103	TURBIDITY BARRIERS
200	STRUCTURE BOTTOMS TYPES J AND P
201	SUPPLEMENTARY DETAILS FOR MANHOLES AND INLETS
210	CURB INLET TOPS TYPES 1, 2, 3 & 4
211	CURB INLET TOPS TYPES 5 & 6
221	GUTTER INLET TYPE V
232	DITCH BOTTOM INLETS TYPES C, D, E AND H
233	DITCH BOTTOM INLETS TYPES F AND G
250	STRAIGHT CONCRETE ENDWALLS SINGLE & MULTIPLE PIPE
253	STRAIGHT CONCRETE ENDWALLS
264	U-TYPE CONCRETE ENDWALL ENERGY DISSIPATER; 30" TO 72" PIPE
266	WINGED CONCRETE ENDWALL SINGLE ROUND PIPE
272	CROSS DRAIN MITERED END SECTION
273	SIDE DRAIN MITERED END SECTION
280	MISCELLANEOUS DRAINAGE
281	DITCH PAVEMENT & SODDING
300	CURB & CURB AND GUTTER
304	CURB CUT RAMPS
380	CONCRETE SIDEWALK
500	REMOVAL OF ORGANIC & PLASTIC MATERIALS
515	TURNOUTS
600	GENERAL INFORMATION FOR TRAFFIC CONTROL THROUGH WORK ZONES
613	MULTILANE, DIVIDED AND UNDIVIDED RURAL NIGHT OPERATIONS OR OPERATIONS EXCEEDING ONE DAYLIGHT PERIOD
17346	SPECIAL MARKINGS
17349	TRAFFIC CONTROLS FOR STREET TERMINATION
17725	CONCRETE POLES

1 of 4

63752-29

RECEIVED
JUN 11 2004
PDS
ALTAMONTE SVC. CTR.

REV. BY	DESCRIPTION	DATE
	ISSUED FOR	DATE
JJM	60% SUBMITTAL	11/5/03
JJM	90% SUBMITTAL	5/19/04
JJM	100% SUBMITTAL	5/12/04
JJM	S.R.W.M.D.	6/09/04

WILLIAM H. TELFORD P.E.
FLORIDA REG. NO. 32667
DATE: 6/8/04

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CLIENT: BALDWIN PARK

PROJECT: CONSTRUCTION PACKAGE No. 4-6
S.R. 436 CONNECTOR ROAD

TITLE: GENERAL NOTES

PBS&J
2601 MAITLAND CENTER PARKWAY, SUITE 210
MAITLAND, FL 32751
TEL: (407) 647-7275
FAX: (407) 647-0051
FIRM CERTIFICATE OF AUTHORIZATION NO. 24

JOB NO.:	071325.03
DRAWN:	KKL
DESIGN:	JJM
CHECKED:	MZB
APPROVED:	WHT
SHEET NO.	G102
REV.	△

PLOT DATE: 08-JUN-2004 14:37
FILE NAME: M:\Baldwin Park\436\436gen01.dgn

LB-7
N 1,542,047.89
E 555,103.72
MANHOLE, 8' DIA.
RIM EL= 92.25
INV=82.90 W
INV=82.90 E

A-8
STA 211+90.82 (0.00' RT)
MANHOLE TYPE P-7, 3.5' DIA.
RIM EL=92.20
INV=85.48 E
INV=84.98 SW

A-9
N 1,541,908.48
E 555,476.49
24" MES
INV=81.83

LB-8
N 1,542,021.00
E 555,041.63
MANHOLE, 8' DIA.
RIM EL= 94.25
INV=83.82 W
INV=83.05 S
INV=83.05 E

B-4
N 1,542,040.25
E 555,295.98
24" MES
INV=82.45 S

DELETED
B-1
B-2
B-3
B-3A

E-1
STA 207+99.10 (16.79' LT)
TYPE P-5 INLET
TOP EL=94.80
INV=89.09 S

E-2
STA 207+99.10 (14.73' RT)
TYPE P-5 INLET
TOP EL=94.80
INV=88.92 N
INV=88.92 SE

E-3
N 1,541,873.01
E 555,236.99
18" MES
INV=82.41

CS-1
N 1,541,892.25
E 555,297.36
INV=84.72 NW
(SEE SHEET C451 FOR DETAILS)

F-1
STA 210+27.64 (12.25' LT)
TYPE P-6 INLET
TOP EL=91.88
INV=86.17 SE

F-2
STA 210+27.64 (12.25' RT)
TYPE P-6 INLET
TOP EL=91.85
INV=86.08 NW
INV=86.08 SE

F-3
N 1,541,910.44
E 555,421.20
18" MES
INV=82.41

BEGIN CONSTRUCTION
STA 206+31.18

CADY WAY TRAIL

E 555,000

E 555,500

N 1,542,000

HEADWALL (TYP)
PER FDOT
INDEX 253
INV=82.85

16 LF - 72" RCP

EXISTING DITCH

20'

RIP-RAP
SEE DETAIL 3
SHEET C451

APPROXIMATE LIMITS OF SURCHARGE
TEMPORARY EARTH FILL

14'

RIP-RAP
SEE DETAIL 4
SHEET C451

LIMITS OF CONSTRUCTION

50' EXISTING CITY OF WINTER PARK EASEMENT & RIGHT OF WAY (NOT IMPROVED) ORB 2682, PG 1551

50' EXISTING EASEMENT ORB 1008, PG 435

40' EXISTING STORM DRAIN EASEMENT O.R. 2500, PG 1996

436 CONNECTOR

249 LF - 18" RCP

14' ASPHALT TRAIL

60 LF - 72" RCP

68 LF - 72" RCP

295 LF - 72" RCP

36" RCP

13 LF

32 LF - 18" RCP

48 LF - 24" RCP

25 LF - 18" RCP

134 LF - 24" RCP

18" RCP

115 LF - 18" RCP

91 TOB

86 NWL

84

80

POND 40

NWL	86.0
25 YEAR	91.3
100 YEAR	91.9

BEGIN PAVEMENT
SECTION A
STA 206+31.18
SEE SHEET C460

HEADWALL (TYP)
PER FDOT
INDEX 250
INV=83.15

SEE SHEET C420
FOR ADDITIONAL
GRADING IN THIS AREA

EXCAVATE AND REPLACE ORGANIC SOILS
WITHIN LIMITS OF CONSTRUCTION FROM
STATION 206+31.18 TO STATION 207+00

EXISTING DITCH

FILL OVER AND SURCHARGE ORGANIC SOILS WITH TEMPORARY EARTH FILL PRIOR TO CONSTRUCTION WITHIN LIMITS OF CONSTRUCTION FROM STATION 207+00 TO STATION 212+00.

BEGIN PAVEMENT
SECTION B
STA 212+00
SEE SHEET C460

SEE SHEET C420
FOR ADDITIONAL
GRADING IN THIS AREA

EXISTING CHAIN
LINK FENCE

EXCAVATE AND REPLACE ORGANIC SOILS
WITHIN LIMITS OF CONSTRUCTION FROM
STATION 212+00 TO STATION 219+44.8

MATCH LINE - SEE SHEET C402

NORTH

0 20 40 80
GRAPHIC SCALE
SCALE: 1" = 40'
HALF SIZE: 1" = 80'

KEY MAP

NO.	DATE	DESCRIPTION	BY
5	7/20/05	96" P.P.E REMOVED	KKL
4	6/24/05	#RT BULLETIN 7	WHT
3	5/6/05	CONSTRUCTION BULLETIN 4	WHT
2	2/28/05	ISSUED FOR	WHT
1	10/04/04		WHT

DATE: 5/19/05

WILLIAM H. TELFORD, P.E.
FLORIDA REG. NO. 35067

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NOTE:
SEE PSI GEOTECH REPORT NO. 757-35175 DATED APRIL 30, 2004 FOR ADDITIONAL INFORMATION AND RECOMMENDATIONS ON EXCAVATION, REPLACEMENT FILLING, AND SURCHARGE PROGRAM FOR ORGANIC SOILS.

200.00 FT

+80 92.94 +00 92.61 +20 92.33 +40 92.10 +60 91.91 +80 91.77 +00 91.68 +20 91.64 +40 91.65

BEGIN CONSTRUCTION
STA 206+31.18
EL = 97.25

-1.06%

PVI 207+00.00
EL 96.52

-2.00%

PVC 208+60.98
EL 93.30

PVI 209+60.98
EL 91.30

PVT 210+60.98
EL 91.70

0.40%

PVI 213+20.07
EL 92.14

90.8

84.3

83.3

83.7

83.1

82.7

72" RCP

36" RCP

72" RCP

72" RCP

18" RCP

18" RCP

24" RCP

18" RCP

24" RCP

18" RCP

PROPOSED
CANAL BOTTOM

BORING AB-1
STA 206+99

BORING AB-3
STA 209+78

BORING AB-5
STA 212+38

MATCH LINE - SEE SHEET C402

205+00 206+00 207+00 208+00 209+00 210+00 211+00 212+00 213+00 214+00

106 102 98 94 90 86 82 78

FULL SIZE:
1" = 40' HORIZ.
1" = 4' VERT.
HALF SIZE:
1" = 80' HORIZ.
1" = 8' VERT.

CLIENT: BALDWIN PARK

PROJECT: CONSTRUCTION PACKAGE No. 4-6
S.R. 436 CONNECTOR ROAD

TITLE: PLAN AND PROFILE
S.R. 436 CONNECTOR ROAD

PBSJ
2601 S.L. ...
...

JOB NO.:	071325.03
DRAWN:	KKL
DESIGN:	JJM
CHECKED:	MZB
APPROVED:	WHT
SHEET NO.	C401
REV.	1

PLOT DATE: 13-MAY-2005 09:12
FILE NAME: m:\Baldwin Park\436\436ppr01.dgn

MATCH LINE - SEE SHEET C401

E 556,000

RIP-RAP SEE DETAIL 4 SHEET C451

LIMITS OF CONSTRUCTION

17'

B-8

ORB 1008, PG 435

50' EXISTING CITY OF WINTER PARK EASEMENT & RIGHT OF WAY (NOT IMPROVED) ORB 2682, PG 1551

HEADWALL - SEE DETAIL SHEET C457 INV = 80.55

HEADWALL - SEE DETAILS SHEET C458 INV = 82.55

50' EXISTING EASEMENT ORB 1008, PG 435

RIP-RAP SEE DETAIL 5 SHEET C451

CITY OF WINTER PARK 50' EXISTING DRAINAGE EASEMENT ORB 4879, PG 2413

225 LF GUARDRAIL PER FDOT INDEX 400

5' CONC. SIDEWALK

20 LF 54" RCP

170 LF - 96" RCP

297 LF W.S.E. W

182 LF - 18" RCP

40' RCP

213+00

204 LF - 18" RCP

A-7

A-6

A-4

A-5

S.R. 436 CONNECTOR ROAD

14' ASPHALT TRAIL

42" RCP

B-7

ORB 1008, PG 435

PG 514

SECTION 30

SE 1/4 OF SE 1/4

50' EXISTING EASEMENT ORB 1116, PG 514

103 LF - 36" RCP

184 LF - 18" RCP

S.R. 436 CONNECTOR ROAD 16 LF - 66" RCP 18 LF - 66" RCP

B-9

8' CONC. SIDEWALK

A-3

34 LF CONCRETE BOX CULVERT EXTENSION

END S.R. 436 CONNECTOR ROAD STA 220+74.28

S.R. 436 STA 447+60.91

BEGIN PAVEMENT SECTION STA 219+44.79 SEE SHEET C461

5' CONC. SIDEWALK

LEVEL 3 COMM.

R/W

S.R. 436 (SEMORAN BLVD.) SECTION No. 75003000

N 1,542,000

SPRINT

42" RCP

60" RCP

36" RCP

38" RCP

30" RCP

GAS LINE

PEOPLES

A-2

A-1

A-3

A-4

A-5

A-6

A-7

B-7

B-8

B-9

A-3
STA 447+61.86 (51.94' LT)
MANHOLE TYPE P-7, 3.5' DIA.
RIM EL= 96.50
INV=91.29 N
INV=91.29 W

A-4
STA 218+24.27 (5.50' LT)
MANHOLE TYPE P-7, 4' DIA.
RIM EL=94.49
INV=90.73 E
INV=90.73 W

A-5
STA 216+42.65 (19.66' RT)
TYPE P-6 INLET
TOP EL=91.91
INV=86.93 N

A-6
STA 216+42.65 (12.25' LT)
TYPE P-6 INLET
TOP EL=92.05
INV=86.84 E
INV=86.84 S
INV=86.84 W

A-7
STA 214+39.79 (0.00' LT)
MANHOLE TYPE P-7, 3.5' DIA.
RIM EL=92.38
INV=86.23 E
INV=86.23 W

B-7
N 1,541,987.94
E 555,845.32
TYPE B INLET W/ J-BOTTOM
GRATE EL= 89.50
INV=81.40 N

B-8
N 1,542,090.33
E 555,845.04
42" MES
INV=81.30 S

B-9
N 1,541,954.52
E 556,115.23
TYPE B INLET
GRATE EL= 89.50
INV=82.67 N

DELETED
B-6
B-10

EXCAVATE AND REPLACE ORGANIC SOILS WITHIN LIMITS OF CONSTRUCTION FROM STATION 212+00 TO STATION 219+44.8

NORTH

0 20 40 80
GRAPHIC SCALE
SCALE: 1" = 40'
HALF SIZE: 1" = 80'

KEY MAP

REV.	DESCRIPTION	DATE
1	ADDED CANAL & RIP-RAP	2/22/05
	BULLETIN 4	4/26/05
	BULLETIN 7	7/25/05
	CONSTRUCTION	10/10/05

ISSUED FOR

DATE: 3/1/05

DRAWING NO.

KKL

WHT

WHT

WHT

WHT

NOTE:
SEE PSI GEOTECH REPORT NO. 757-35175 DATED APRIL 30, 2004 FOR ADDITIONAL INFORMATION AND RECOMMENDATIONS ON EXCAVATION, REPLACEMENT FILLING, AND SURCHARGE PROGRAM FOR ORGANIC SOILS.

MATCH LINE - SEE SHEET C401

100.00 FT

+40	+60	+80	+00	+20
91.79	91.85	91.95	92.17	92.49

A-6
A-5

PVC 216+29.61
EL 91.81
LO 216+42.65
EL 91.79

PVI 216+79.61
EL 91.66

PVT 217+29.61
EL 92.66

A-7

A-4

-0.30%

2.00%

PVC 219+32.25
EL 96.71

HI 219+67.14
EL 97.06

PVI 219+82.25
EL 97.11

PVT 220+32.25
EL 95.85

-3.73%

END S.R. 436 CONNECTOR ROAD
PVI 220+74.28 =
S.R. 436
STA 447+60.91
EL 94.28

A-3

+40	+60	+80	+00	+20
96.85	97.05	97.01	96.75	96.26

91.0

86.9 18" RCP

18" RCP

PROPOSED CANAL BOTTOM

42" RCP

36" RCP

87.0

81.4

90.0

96" RCP

18" RCP

91.1

18" RCP

66" RCP

66" RCP

EXISTING 11.5'-X-9' CONC. BOX CULVERT

11.5' X 9' PRECAST CONC. BOX CULVERT EXTENSION

BORING AB-7
STA 215+35

BORING AB-9
STA 217+78

BORING AB-12
STA 218+53

BORING AB-11
STA 219+66

214+00 215+00 216+00 217+00 218+00 219+00 220+00 221+00

106 102 98 94 90 86 82 78

RECEIVED
MAY 17 2005
PDS
ALTAMONTE SVC. CTR.

6375 2-38

FULL SIZE:
1" = 40' HORIZ.
1" = 4' VERT.
HALF SIZE:
1" = 80' HORIZ.
1" = 8' VERT.

CLIENT: BALDWIN PARK

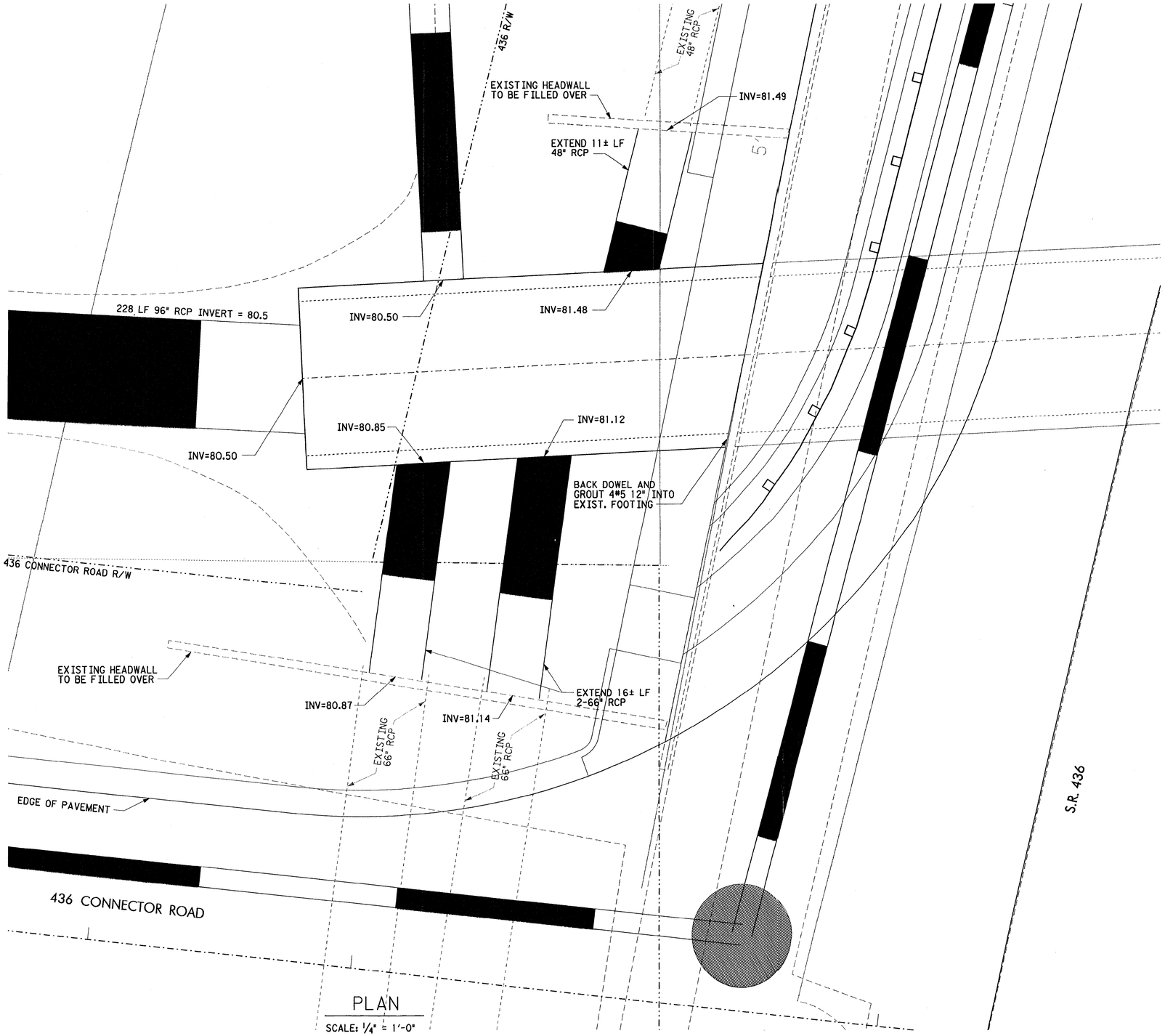
PROJECT: CONSTRUCTION PACKAGE No. 4-6
S.R. 436 CONNECTOR ROAD

TITLE: PLAN AND PROFILE
S.R. 436 CONNECTOR ROAD

PBSJ

JOB NO.: 071325.03
DRAWN: KKL
DESIGN: JJM
CHECKED: MZB
APPROVED: WHT
SHEET NO.: C402
REV.: 1

PLOT DATE: 13-MAY-2005 09:12
FILE NAME: m:\Baldwin Park\436\436por02.dgn



PLAN

SCALE: 1/4" = 1'-0"

NORTH

0 4'-0" 8'-0"

GRAPHIC SCALE

SCALE: 1/4" = 1'-0"

HALF SIZE: 1/8" = 1'-0"

NOTES:

1. FIELD VERIFY AND MATCH ALL EXISTING INVERTS.
2. SEE SHEET C455 FOR CULVERT ELEVATIONS.

4 of 4



KEY MAP

RECEIVED

JUN 11 2004

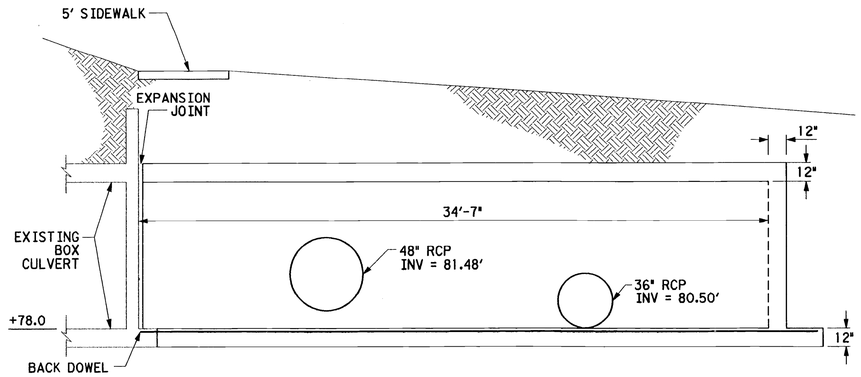
PDS

ALTAMONTE SVC. CTR.

REV. BY	DATE	DESCRIPTION
	6/09/04	JJM	SUBMITTAL
	5/12/04	JJM	100% SUBMITTAL
	3/19/04	JJM	90% SUBMITTAL
	11/5/03	JJM	60% SUBMITTAL
	DATE	ISSUED BY	ISSUED FOR

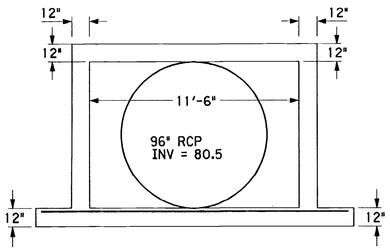
WILLIAM H. TELFORD, P.E.
FLORIDA REG. NO. 32067

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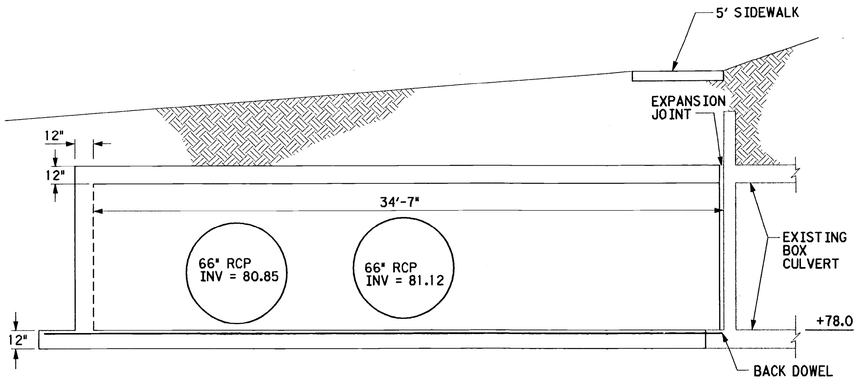
NORTH ELEVATION

SCALE: 1/4" = 1'-0"
HALF SIZE: 1/8" = 1'-0"



WEST ELEVATION

SCALE: 1/4" = 1'-0"
HALF SIZE: 1/8" = 1'-0"



SOUTH ELEVATION

SCALE: 1/4" = 1'-0"
HALF SIZE: 1/8" = 1'-0"

NO.	BY	DATE	DESCRIPTION
1	JJM	6/09/04	SJRWMD
2	JJM	5/12/04	100% SUBMITTAL
3	JJM	3/15/04	90% SUBMITTAL
4	JJM	11/5/03	60% SUBMITTAL

ISSUED FOR

WILLIAM H. TELFORD, P.E.
FLORIDA REG. NO. 32067
DATE: 6/8/04

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Semoran Crossroads Mass Grading
SJRWMD Permit #4-095-74860-5

Excel Engineering
CONSULTANTS, LLC
Land Development Consultants

122 Wilshire Boulevard
Casselberry, Fl 32707
Telephone: (407) 260-2292
www.Excelengineers.com

July 30, 2013

Ratna S. Lee
SJRWMD
Engineer III
601 South Lake Destiny Road, Suite 200
Maitland, FL 32751

Subject: Semoran Crossroads Stormwater Pond, Application No. 4-095-74860-5
Response to February 23, 2012 Request for Information.

"Dear Ratna:

Please find attached the revised Plans, AdICPR model (Appendix E) and Spreadsheet calculations (Appendix B, which has not changed) as per our meeting with you and Margie Cook in your offices on June 25, 2013 and also per you subsequent conversations with Mr. Tim Schutz on July 26, 2013. We have updated the model for Alternate 2 (Proposed FEMA elevation per Singhofen revision); Method 2 (Includes the Wal-Mart Property). Results indicate that 4.1 Acre-Ft. of water backflows into the pond from the Corrine Canal during the 100-year storm event, exceeding the required 3.85 Acre-Ft. of compensating storage volume. Below is a list of the revisions to the model. These revisions closely correlate to the model that you presented in our June 25, 2013 meeting.

1.) The rainfall depth for the 100-year storm was increased to 11.3 inches.

2.) We only provided the results for the 25-year, 24-Hour and 100-year, 24-Hour storm events per your conversation with Mr. Tim Schutz on July 26, 2013.

3.) The weir on the control structure was separated into three weirs on three faces of the control structure. The weir for the treatment volume (El. 84.65') was increased to 7" in width and now goes to the top of the structure (El. 88.43'). The 36" weir (El. 86.03') was made into two weirs (both also 36" in length) and placed on the 2 walls.

4.) The earthen weir connecting the pond directly to the canal was reduced to 20' in length (bottom width) and set at an elevation of 88.5'.

5.) The latest update to the Corrine Canal stage-Time elevation was applied to the pond per data received from Singhofen and Associates on Thursday, July 25, 2013 for their FEMA flood plain revision.

We trust that the response will allow for a final permit to be issued. Thank you for your help and diligence in resolving the issues for this project. Please call us if there are any questions regarding this submittal."

Sincerely,

Excel Engineering Consultants, LLC

Julian R. Coto, P.E.
President for the Firm

JRC/mls

JEN01-0109- Semoran Crossroads-Wal-Mart Pond-Response to SJRWMD-07.30.13.docx

PROJECT:	**Hanging Moss**
BASIN DESIGNATION:	**Post-1 (Langford)**

SUB-BASIN ANALYSIS & CURVE NUMBER DETERMINATION

TYPE of EVALUATION: **POST-** DEVELOPMENT
(PRE- or POST-)

BASIN SIZE: 7.20 acres.

Determine Basin Runoff Curve Number: CN

Land Use Description	Hydrologic Soil Group	CN	AREA (ac.)	Product
Open Space, Good Condition	B/D	80		
Open Space, Good Condition	D	80		
Open Space, Poor Condition	B/D	89	1.44	128.16
Open Space, Poor Condition	D	89		
Water Surface	N/A	100		
Impervious Areas - Asphalt, Sidewalks, roofs, etc..	N/A	98	5.76	564.48
Wetland	N/A			
			7.20	692.64

(PRODUCT SUM) 692.64

WEIGHTED CN = ---------- = ---------- = 96.20

(AREA) 7.20

USE CN = 96

PROJECT:	**Hanging Moss**
BASIN DESIGNATION:	**Post-2**

SUB-BASIN ANALYSIS & CURVE NUMBER DETERMINATION

TYPE of EVALUATION: **POST-** DEVELOPMENT
(PRE- or POST-)

BASIN SIZE: 5.55 acres.

Determine Basin Runoff Curve Number: CN

Land Use Description	Hydrologic Soil Group	CN	AREA (ac.)	Product
Open Space, Good Condition	B/D	80	4.37	349.56
Gravel over Open Space, Good Condition	B/D	80		
Open Space, Poor Condition	D	89		
Gravel Open Space, Poor Condition	D	89		
Water Surface	N/A	100	1.18	118.05
Impervious Areas - Asphalt, Sidewalks, roofs, etc..	N/A	98		
Wetland	N/A			
			5.55	467.61

(PRODUCT SUM) 467.61

WEIGHTED CN = ---------- = ---------- = 84.25

(AREA) 5.55

USE CN = 84

PROJECT: Hanging Moss
POND DESIGNATION: Pond 1

Water Quality Calculations:

Contributing Basins = Post-1 (Langford) & Post 2

Full Basin Area = 12.75 Ac.
Impervious Area = 5.76 Ac.

1.0" of Full Basin Area = 1.063 Ac.-Ft.
or
2.5" of Impervious Area = 1.200 Ac.-Ft.

Req. Water Quality Vol. = 1.200 Ac.-Ft.

Pond Stage-Storage:

Pond Type = Wet Detention
Control (Perm. Pool) Elevation 83.70

Water Quality (Weir) Elevation = 84.65

	Pond Stage (ft)	Increment (ft)	Area (sf)	Incremental Volume (cf)	Cumulative Volume (cf)	Cumulative Volume (Ac-ft)
Control Elevation:	83.70		51,422		-	-
		0.30		15,706		
	84.00		53,284		15,706	0.361
		1.00		56,439		
	85.00		59,593		72,144	1.656
		1.00		62,827		
	86.00		66,060		134,971	3.099
		1.00		69,372		
	87.00		72,683		204,342	4.691
		1.00		76,074		
	88.00		79,464		280,416	6.437
		1.00		82,925		
	89.00		86,386		363,341	8.341
		1.00		89,916		
	90.00		93,445		453,256	10.405

Permanent Pool:

Pond Bottom:	75.00		26,091		-	-
		1.00		26,995		
	76.00		27,899		26,995	0.620
		1.00		28,821		
	77.00		29,743		55,816	1.281
		1.00		30,683		
	78.00		31,623		86,499	1.986
		1.00		32,582		
	79.00		33,540		119,081	2.734
		1.00		34,518		
	80.00		35,495		153,598	3.526
		1.00		36,490		
	81.00		37,485		190,088	4.364
		1.00		39,311		
	82.00		41,137		229,399	5.266
		1.00		46,280		
	83.00		47,132		275,679	6.329
		0.70		34,494		
	83.70		51,422		310,172	7.121

PROJECT:	Hanging Moss
POND DESIGNATION:	Pond 1

Permanent Pool

$$\text{Required PPV} = \frac{(DA)*(C)*(R)*(RT)}{(WS)*(CF)}$$

Where:

DA =	Drainage Area (Acres)	=	12.75	
C =	Runoff Coefficient	=	0.59	
R =	Wet Season Rainfall Depth (Inches)	=	31.8	
RT =	Minimum Residence Time (Days)	=	14	
WS =	Length of Wet Season (Days)	=	153	
CF =	Conversion Factor (12 Inches/Ft.)	=	12	

	PPV	=	1.84	ac/ft
Additional 50% PPV (No Littoral Zone)	PPV_L	=	0.92	ac/ft
Additional PPV Due to Background Seepage	PPV_S	=		ac/ft

Required PPV =	**2.75**	**ac/ft**
Provided PPV =	**7.12**	**ac/ft**

Residence Time Calculation (21 Days Required - No littoral Zone)

$$\text{Residence Time} = \frac{(PPV)*(WS)*(CF)}{(DA)*(C)*(R)}$$

$$\text{Residence Time (Actual)} = \frac{13073}{240.7} = \textbf{54 Days}$$

Mean Depth (2-8 Feet required, 12 feet maximum)

$$\text{Mean Depth} = \frac{(PPV)}{(A_p)} = \frac{7.12}{1.18} = \textbf{6.03 Feet}$$

WHERE:

A_p = Area of Pond At Control Elevation (Acres)

ORIFICE CALCULATIONS

SIZING OF ORIFICE FOR WET POND:

ORIFICE EQUATION

Q = C x A x SQRT (2 x g x h)

Q = RATE OF DISCHARGE
C = ORIFICE COEFFICIENT
A = ORIFICE AREA
g = GRAVITATIONAL CONSTANT
h = DEPTH OF WATER ABOVE THE FLOW LINE (CENTER) OF ORIFICE

AVERAGE DISCHARGE RATE TO DRAW DOWN ONE HALF OF
THE TREATMENT VOLUME IN A DESIRED AMOUNT OF TIME (t) IS:

Q = TV / (2 x t x CF)

TV = TREATMENT VOLUME (Cubic Feet)

t = RECOVERY TIME (Hours)
CF = CONVERSION FACTOR = 3600 sec / hr

1/2TV =	26,136	$Ft.^3$
t_{30}=	30	hrs.
t_{24}=	24	hrs.
CF=	3600	sec/hr
Q_{30}=	0.242	cfs
Q_{24}=	0.303	cfs
$Q_{seepage}$=	0.000	cfs

DEPTH OF WATER (h):

WEIR EL.=	84.65
CONTROL EL.=	83.70
h_1=	0.95
h_2=	0.47
h=	0.71

AREA OF ORIFICE:

A = Q / (C x (SQRT (2 x g x h)))

C=	0.60						
g=	32.20						
A_{30}=	0.0596	sf	or	8.58	$in.^2$, or	3.31	in. diameter
A_{24}=	0.0745	sf	or	10.73	$in.^2$, or	3.70	in. diameter

USE : **3.50** -inch diameter orifice

==========
==== Basins
==========

Name: Post-1 Langford | Node: Pond-1 | Status: Onsite
Group: 25-Year 24 Hour | Type: Santa Barbara CN

Rainfall File: Flmod | Storm Duration(hrs): 24.00
Rainfall Amount(in): 8.600 | Time of Conc(min): 12.00
Area(ac): 7.200 | Time Shift(hrs): 0.00
Curve Number: 96.00 | Time Increment(min): 5.00
DCIA(%): 0.00 | Max Allowable Q(cfs): 999999.000

Name: Post-1 Langford | Node: Pond-1 | Status: Onsite
Group: 100-Year 24 Hou | Type: Santa Barbara CN

Rainfall File: Flmod | Storm Duration(hrs): 24.00
Rainfall Amount(in): 8.600 | Time of Conc(min): 12.00
Area(ac): 7.200 | Time Shift(hrs): 0.00
Curve Number: 96.00 | Time Increment(min): 5.00
DCIA(%): 0.00 | Max Allowable Q(cfs): 999999.000

Name: Post-2 | Node: Pond-1 | Status: Onsite
Group: 25-Year 24 Hour | Type: Santa Barbara CN

Rainfall File: Flmod | Storm Duration(hrs): 24.00
Rainfall Amount(in): 8.600 | Time of Conc(min): 10.00
Area(ac): 5.550 | Time Shift(hrs): 0.00
Curve Number: 86.00 | Time Increment(min): 5.00
DCIA(%): 0.00 | Max Allowable Q(cfs): 999999.000

Name: Post-2 | Node: Pond-1 | Status: Onsite
Group: 100-Year 24 Hou | Type: Santa Barbara CN

Rainfall File: Flmod | Storm Duration(hrs): 24.00
Rainfall Amount(in): 8.600 | Time of Conc(min): 10.00
Area(ac): 5.550 | Time Shift(hrs): 0.00
Curve Number: 86.00 | Time Increment(min): 5.00
DCIA(%): 0.00 | Max Allowable Q(cfs): 999999.000

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

Name: Lk Corr Canal | Base Flow(cfs): 0.000 | Init Stage(ft): 83.600
Group: 25-Year 24 Hour | Warn Stage(ft): 89.000
Type: Time/Stage

Time(hrs)	Stage(ft)
0.00	83.600
6.00	84.050
8.00	85.440
9.00	86.430
10.00	87.250
14.00	87.910
16.00	87.780
18.00	87.510
20.00	87.150
22.00	86.780
24.00	86.460

Name: Lk Corr Canal Base Flow(cfs): 0.000 Init Stage(ft): 83.600
Group: 100-Year 24 Hou Warn Stage(ft): 89.000
Type: Time/Stage

Time(hrs)	Stage(ft)
0.00	83.600
6.00	83.870
8.00	85.990
9.00	87.140
10.00	87.960
13.75	88.650
16.00	88.510
18.00	88.200
20.00	88.040
22.00	87.750
24.00	87.420

Name: Pond-1 Base Flow(cfs): 0.000 Init Stage(ft): 83.700
Group: 25-Year 24 Hour Warn Stage(ft): 90.000
Type: Stage/Area

Stage(ft)	Area(ac)
83.700	1.6660
84.000	1.7150
85.000	1.8800
86.000	2.0490
87.000	2.2210
88.000	2.3980
89.000	2.5790
89.140	2.6030
90.000	2.7610

Name: Pond-1 Base Flow(cfs): 0.000 Init Stage(ft): 83.700
Group: 100-Year 24 Hou Warn Stage(ft): 90.000
Type: Stage/Area

Stage(ft)	Area(ac)
83.700	1.6660
84.000	1.7150
85.000	1.8800
86.000	2.0490
87.000	2.2210
88.000	2.3980
89.000	2.5790
89.140	2.6030
90.000	2.7610

==========

==== Cross Sections

==========

Name: Group: 25-Year 24 Hour
Encroachment: No

Station(ft)	Elevation(ft)	Manning's N

Name: Group: 100-Year 24 Hou
Encroachment: No

Station(ft)	Elevation(ft)	Manning's N

==========

==== Operating Tables

==========

Name: Group: 25-Year 24 Hour
Type: Bottom Clip
Function: Time vs. Depth of Clip

Time(hrs)	Clip Depth(in)

Name: Group: 100-Year 24 Hou
Type: Bottom Clip
Function: Time vs. Depth of Clip

Time(hrs)	Clip Depth(in)

==========

==== Drop Structures
==

Name:	CS-1	From Node: Pond-1	Length(ft): 203.00
Group:	25-Year 24 Hour	To Node: Lk Corr Canal	Count: 1

	UPSTREAM	DOWNSTREAM		
			Friction Equation:	Automatic
Geometry:	Circular	Circular	Solution Algorithm:	Most Restrictive
Span(in):	24.00	24.00	Flow:	Both
Rise(in):	24.00	24.00	Entrance Loss Coef:	0.000
Invert(ft):	83.500	81.000	Exit Loss Coef:	1.000
Manning's N:	0.013000	0.013000	Outlet Ctrl Spec:	Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
Bot Clip(in):	0.000	0.000	Solution Incs:	10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

*** Weir 1 of 4 for Drop Structure CS-1 ***

TABLE

Count:	1	Bottom Clip(in):	0.000
Type:	Vertical: Mavis	Top Clip(in):	0.000
Flow:	Both	Weir Disc Coef:	3.200
Geometry:	Rectangular	Orifice Disc Coef:	0.600
Span(in):	7.00	Invert(ft):	84.650
Rise(in):	45.36	Control Elev(ft):	84.650

*** Weir 2 of 4 for Drop Structure CS-1 ***

TABLE

Count:	1	Bottom Clip(in):	0.000
Type:	Horizontal	Top Clip(in):	0.000
Flow:	Both	Weir Disc Coef:	3.200
Geometry:	Rectangular	Orifice Disc Coef:	0.600
Span(in):	37.00	Invert(ft):	88.430
Rise(in):	49.00	Control Elev(ft):	88.430

*** Weir 3 of 4 for Drop Structure CS-1 ***

TABLE

Count:	1	Bottom Clip(in):	0.000
Type:	Horizontal	Top Clip(in):	0.000
Flow:	Both	Weir Disc Coef:	3.200
Geometry:	Circular	Orifice Disc Coef:	0.600
Span(in):	3.50	Invert(ft):	83.700
Rise(in):	3.50	Control Elev(ft):	83.700

*** Weir 4 of 4 for Drop Structure CS-1 ***

TABLE

Count:	2	Bottom Clip(in):	0.000
Type:	Vertical: Mavis	Top Clip(in):	0.000
Flow:	Both	Weir Disc Coef:	3.200
Geometry:	Rectangular	Orifice Disc Coef:	0.600
Span(in):	36.00	Invert(ft):	86.030
Rise(in):	28.80	Control Elev(ft):	86.030

Name:	CS-1	From Node:	Pond-1	Length(ft):	203.00
Group:	100-Year 24 Hou	To Node:	Lk Corr Canal	Count:	1

	UPSTREAM	DOWNSTREAM		
Geometry:	Circular	Circular	Friction Equation:	Automatic
Span(in):	24.00	24.00	Solution Algorithm:	Most Restrictive
Rise(in):	24.00	24.00	Flow:	Both
Invert(ft):	83.500	81.000	Entrance Loss Coef:	0.000
Manning's N:	0.013000	0.013000	Exit Loss Coef:	1.000
Top Clip(in):	0.000	0.000	Outlet Ctrl Spec:	Use dc or tw
Bot Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
			Solution Incs:	10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

*** Weir 1 of 4 for Drop Structure CS-1 ***

TABLE

Count:	1	Bottom Clip(in):	0.000
Type:	Vertical: Mavis	Top Clip(in):	0.000
Flow:	Both	Weir Disc Coef:	3.200
Geometry:	Rectangular	Orifice Disc Coef:	0.600
Span(in):	7.00	Invert(ft):	84.650
Rise(in):	45.36	Control Elev(ft):	84.650

*** Weir 2 of 4 for Drop Structure CS-1 ***

TABLE

Count:	1	Bottom Clip(in):	0.000
Type:	Horizontal	Top Clip(in):	0.000
Flow:	Both	Weir Disc Coef:	3.200
Geometry:	Rectangular	Orifice Disc Coef:	0.600
Span(in):	37.00	Invert(ft):	88.430
Rise(in):	49.00	Control Elev(ft):	88.430

*** Weir 3 of 4 for Drop Structure CS-1 ***

TABLE

```
                Count: 1                        Bottom Clip(in): 0.000
                 Type: Horizontal                  Top Clip(in): 0.000
                 Flow: Both                     Weir Disc Coef: 3.200
             Geometry: Circular              Orifice Disc Coef: 0.600

             Span(in): 3.50                          Invert(ft): 83.700
             Rise(in): 3.50                   Control Elev(ft): 83.700

*** Weir 4 of 4 for Drop Structure CS-1 ***

TABLE
                Count: 2                        Bottom Clip(in): 0.000
                 Type: Vertical: Mavis             Top Clip(in): 0.000
                 Flow: Both                     Weir Disc Coef: 3.200
             Geometry: Rectangular           Orifice Disc Coef: 0.600

             Span(in): 36.00                         Invert(ft): 86.030
             Rise(in): 28.80                  Control Elev(ft): 86.030


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

         Name: W-1                  From Node: Pond-1
        Group: 100-Year 24 Hou        To Node: Lk Corr Canal
         Flow: Both                     Count: 1
         Type: Vertical: Mavis      Geometry: Trapezoidal

            Bottom Width(ft): 20.00
       Left Side Slope(h/v): 4.00
      Right Side Slope(h/v): 4.00
                 Invert(ft): 88.500
       Control Elevation(ft): 88.500
      Struct Opening Dim(ft): 1.50
                                          TABLE
             Bottom Clip(ft): 0.000
                Top Clip(ft): 0.000
         Weir Discharge Coef: 3.200
      Orifice Discharge Coef: 0.600



--------------------------------------------------------------------------------
         Name: W-1                  From Node: Pond-1
        Group: 25-Year 24 Hour        To Node: Lk Corr Canal
         Flow: Both                     Count: 1
         Type: Vertical: Mavis      Geometry: Trapezoidal

            Bottom Width(ft): 20.00
       Left Side Slope(h/v): 4.00
      Right Side Slope(h/v): 4.00
                 Invert(ft): 88.500
       Control Elevation(ft): 88.500
      Struct Opening Dim(ft): 1.50
                                          TABLE
             Bottom Clip(ft): 0.000
                Top Clip(ft): 0.000
         Weir Discharge Coef: 3.200
      Orifice Discharge Coef: 0.600
```

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

         Name: Post 100yr-24hr
     Filename: C:\Tim\Backup Files\Timothy Schutz PE\Projects\100903-10 (Jennings
SWM)\Calculations\3.04.13 New Calcs for SJRWMD With Singhoffen backup\3.05.13 Phase I
Proposed FEMA\Postdevelopment\AdICPR\SJRWMD Post\Post 100yr-24hr.R32

      Override Defaults: Yes
    Storm Duration(hrs): 24.00
          Rainfall File: Flmod
    Rainfall Amount(in): 11.30

Time(hrs)       Print Inc(min)
--------------- ---------------
2.500           5.00
19.000          2.00
24.000          5.00

--------------------------------------------------------------------------------
         Name: Post 25yr-24hr
     Filename: C:\Tim\Backup Files\Timothy Schutz PE\Projects\100903-10 (Jennings
SWM)\Calculations\3.04.13 New Calcs for SJRWMD With Singhoffen backup\3.05.13 Phase I
Proposed FEMA\Postdevelopment\AdICPR\SJRWMD Post\Post 25yr-24hr.R32

      Override Defaults: Yes
    Storm Duration(hrs): 24.00
          Rainfall File: Flmod
    Rainfall Amount(in): 8.60

Time(hrs)       Print Inc(min)
--------------- ---------------
8.000           30.00
12.000          5.00
24.000          30.00

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

         Name: Post 100yr-24hr     Hydrology Sim: Post 100yr-24hr
     Filename: C:\Tim\Backup Files\Timothy Schutz PE\Projects\100903-10 (Jennings
SWM)\Calculations\3.04.13 New Calcs for SJRWMD With Singhoffen backup\3.05.13 Phase I
Proposed FEMA\Postdevelopment\AdICPR\SJRWMD Post\Post 100yr-24hr.I32

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

        Max Delta Z(ft): 0.50                    Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                    End Time(hrs): 24.00
     Min Calc Time(sec): 0.5000               Max Calc Time(sec): 60.0000
        Boundary Stages:                         Boundary Flows:
```

Time(hrs)	Print Inc(min)
2.500	5.000
19.000	2.000
24.000	5.000

Group	Run
100-Year 24 Hou	Yes

Name: Post 25yr-24hr Hydrology Sim: Post 25yr-24hr
Filename: C:\Tim\Backup Files\Timothy Schutz PE\Projects\100903-10 (Jennings SWM)\Calculations\3.04.13 New Calcs for SJRWMD With Singhoffen backup\3.05.13 Phase I Proposed FEMA\Postdevelopment\AdICPR\SJRWMD Post\Post 25yr-24hr.I32

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

Max Delta Z(ft): 0.50 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 24.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
8.000	30.000
12.000	5.000
24.000	30.000

Group	Run
25-Year 24 Hour	Yes

```
            Basin Name: Post-1 Langford
            Group Name: 100-Year 24 Hou
             Node Name: Pond-1
            Basin Type: Santa Barbara

    Spec Time Inc (min): 5.00
    Comp Time Inc (min): 5.00
          Rainfall File: Flmod
   Rainfall Amount (in): 11.300
   Storm Duration (hrs): 24.00
                 Status: Onsite
     Time of Conc (min): 12.00
       Time Shift (hrs): 0.00
              Area (ac): 7.200
          Curve Number: 96.000
              DCIA (%): 0.000

         Time Max (hrs): 11.92
         Flow Max (cfs): 49.612
     Runoff Volume (in): 10.815
    Runoff Volume (ft3): 282658.838


--------------------------------------------------------------------------------

            Basin Name: Post-2
            Group Name: 100-Year 24 Hou
             Node Name: Pond-1
            Basin Type: Santa Barbara

    Spec Time Inc (min): 5.00
    Comp Time Inc (min): 5.00
          Rainfall File: Flmod
   Rainfall Amount (in): 11.300
   Storm Duration (hrs): 24.00
                 Status: Onsite
     Time of Conc (min): 10.00
       Time Shift (hrs): 0.00
              Area (ac): 5.550
          Curve Number: 86.000
              DCIA (%): 0.000

         Time Max (hrs): 11.92
         Flow Max (cfs): 38.138
     Runoff Volume (in): 9.557
    Runoff Volume (ft3): 192536.001


--------------------------------------------------------------------------------

            Basin Name: Post-1 Langford
            Group Name: 25-Year 24 Hour
             Node Name: Pond-1
            Basin Type: Santa Barbara

    Spec Time Inc (min): 5.00
    Comp Time Inc (min): 5.00
          Rainfall File: Flmod
   Rainfall Amount (in): 8.600
   Storm Duration (hrs): 24.00
```

```
                Status: Onsite
     Time of Conc (min): 12.00
       Time Shift (hrs): 0.00
              Area (ac): 7.200
          Curve Number: 96.000
              DCIA (%): 0.000

         Time Max (hrs): 11.92
         Flow Max (cfs): 37.617
     Runoff Volume (in): 8.119
    Runoff Volume (ft3): 212209.523


--------------------------------------------------------------------------------

             Basin Name: Post-2
             Group Name: 25-Year 24 Hour
              Node Name: Pond-1
             Basin Type: Santa Barbara

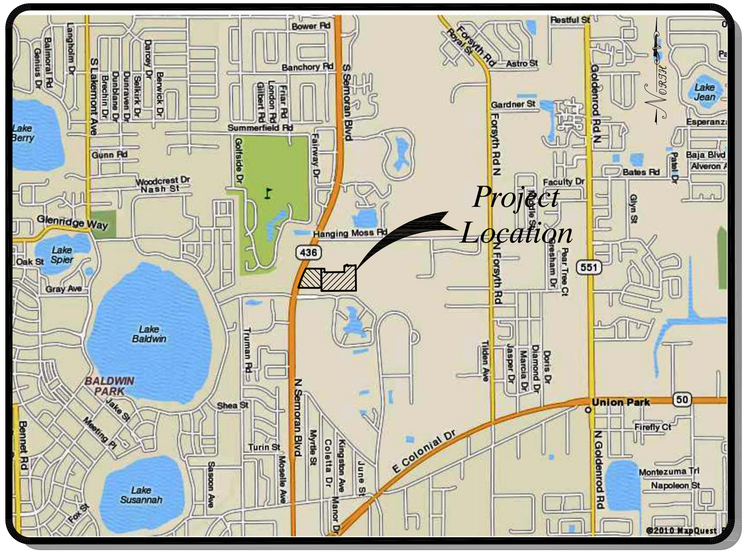
    Spec Time Inc (min): 5.00
    Comp Time Inc (min): 5.00
          Rainfall File: Flmod
   Rainfall Amount (in): 8.600
   Storm Duration (hrs): 24.00
                Status: Onsite
     Time of Conc (min): 10.00
       Time Shift (hrs): 0.00
              Area (ac): 5.550
          Curve Number: 86.000
              DCIA (%): 0.000

         Time Max (hrs): 11.92
         Flow Max (cfs): 28.055
     Runoff Volume (in): 6.914
    Runoff Volume (ft3): 139295.590
```

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
Lk Corr Canal	100-Year 24 Hou	Post 100yr-24hr	13.75	88.650	89.000	0.0177	0	12.54	22.642	0.00	0.000
Pond-1	100-Year 24 Hou	Post 100yr-24hr	12.56	88.852	90.000	0.0025	111171	11.93	86.803	12.54	22.642
Lk Corr Canal	25-Year 24 Hour	Post 25yr-24hr	14.01	87.910	89.000	0.0132	0	12.86	6.678	0.00	0.000
Pond-1	25-Year 24 Hour	Post 25yr-24hr	14.12	88.043	90.000	0.0025	104793	11.92	65.665	12.86	6.678

Construction Plans For Semoran Crossroads Stormwater Pond

Section 15, Township 22 South, Range 30 East
Orange County, Florida



LOCATION MAP
NOT TO SCALE



Vicinity Map
N.T.S.

Jennings Property Description

Parcel 15-22-30-0000-00-014

A parcel of land being a portion of the Northwest ¼ of Section 15, Township 22 South, Range 30 East in Orange County, Florida. Being more particularly described as follows:

COMMENCE at the Southwest corner of said Northwest ¼ of Section 15, Township 22 South, Range 30 East, thence North 89°36'56" East, along the South line of said Northwest ¼, for a distance of 910.26 feet to the POINT OF BEGINNING; thence North 00°23'32" West for a distance of 550.98 feet; thence North 89°47'21" East, for a distance of 79.79 feet; thence South 00°32'39" East for a distance of 88.84 feet; thence North 89°23'49" East for a distance of 490.35 feet to a point on the West line of a parcel of land described in Official Records Book 6787, Page 1726, public records of Orange County, Florida; thence along said West line, South 00°34'03" East for a distance of 463.77 feet to said South line; thence South 89°36'56" West, along said South line, a distance of 571.79 feet to the POINT OF BEGINNING.

Contains 6.229 acres, more or less.

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT SUBMITTAL

DRAWING INDEX

Drawing Number	Drawing Description
1	Cover Sheet and Drawing Index
2	General Notes & Engineering Notes
3	Pre-Development Drainage Basins
4	Post-Development Drainage Basins & Grading Plan
5	Critical Cross Sections
6	Miscellaneous Details
7	Miscellaneous Details
8	Miscellaneous Details
2 9	Stage/Storage of Pond And Canal

OWNER

Jennings Investments I, LLC
C/O Excel Engineering Consultants LLC

Excel Engineering CONSULTANTS, LLC
ENVIRONMENTAL & CIVIL ENGINEERS
CERTIFICATE OF AUTHORIZATION NO. 27541
122 WILSHIRE BOULEVARD
CASSELBERRY, FL 32707
TEL: (407) 260-2292
FAX: (407) 260-1193
WWW.EXCELENGINEERS.COM

CALL 48 HOURS BEFORE YOU DIG IN FLORIDA
IT'S THE LAW!
1-800-432-4770
SUNSHINE STATE ONE CALL OF FLORIDA, INC.

SURVEY PROVIDED BY:

Benchmark Surveying & Mapping Consultants, Inc.
Certificate of Authorization Number – LB-6796
Post Office Box 771065, Winter Garden, Florida 34777-1065
557 West Plant Street, Winter Garden, Florida 34787

NO.	REVISION	DATE
1	Revised Sheets 3,4,5,7 and 8 Due To Reshaping	12/13/11
	Stormwater Pond	
2	Revised Sheets 4 and 9 per SJRWMD Comments	3/29/12
3	Revised Sheets 4, 5, 8 and 9 per SJRWMD Comments	8/1/13

JULIAN R. COTO DATE
P.E. LICENSE #0033635

JEN01-0109 DATE: 8/1/13

GENERAL NOTES:

1.0 CONTRACTOR SHALL FIELD VERIFY THE EXACT LOCATION, NATURE AND CHARACTER OF ALL EXISTING UTILITIES, PRIOR TO BEGINNING CONSTRUCTION. LOCATIONS AND CHARACTER OF EXISTING UTILITIES SHOWN ON PLANS ARE BASED ON THE AVAILABLE INFORMATION.

2.0 CONTRACTOR SHALL VERIFY ALL DIMENSIONS WHERE STRUCTURES SHALL BE IMPACTED BY THE CONSTRUCTION PRIOR TO SUBMITTALS AND FABRICATION OF COMPONENTS AND MATERIALS.

3.0 CONTRACTOR SHALL BECOME THOROUGHLY FAMILIAR WITH THE PROJECT, THESE PLANS AND SPECIFICATIONS, GEOTECHNICAL INVESTIGATION, AND ALL LOCAL, STATE AND FEDERAL AGENCY REQUIREMENTS FOR CONSTRUCTION OF THE PROPOSED IMPROVEMENTS PRIOR TO BEGINNING THE CONSTRUCTION.

4.0 CONTRACTOR SHALL COMPLY WITH ALL OSHA REQUIREMENTS FOR TRENCH CONSTRUCTION.

5.0 CONTRACTOR SHALL PROVIDE SHORING AND DEWATERING AT ALL LOCATIONS WHERE NECESSARY TO ASSURE COMPLIANCE WITH OSHA, AND PROTECTION OF PROPERTY AND SAFETY OF RESIDENTS AND WORKERS.

6.0 THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION WHEN EXCAVATING IN PROXIMITY OF ANY UTILITIES, NOT LIMITED TO: WATER, SEWER, GAS, ELECTRIC, AND/OR COMMUNICATIONS. UTILITY LOCATIONS SHOWN ON PLANS ARE NOT EXACT OR GUARANTEED. CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING PRIOR TO CONSTRUCTION.

7.0 CONTRACTOR SHALL OBTAIN ALL REQUIRED PERMITS TO COMPLETE THE CONSTRUCTION OF THIS PROJECT, INCLUDING PERMITS FROM THE CITY, COUNTY, AND/OR STATE.

8.0 CONTRACTOR SHALL VERIFY THE PROPERTY BOUNDARIES AND LOCATE ALL PROPERTY CORNERS, ELEVATIONS, BUILDING CORNERS, PARKING LOT CORNERS, PONDS AND OTHER IMPROVEMENTS PRIOR TO INITIATING THE CONSTRUCTION. CONTRACTOR SHALL ALSO VERIFY EXISTING GRADES SHOWN IN THE PLANS. NOTIFY ENGINEER IMMEDIATELY OF ANY DISCREPANCIES WITH THE FIELD CONDITIONS AND THESE PLANS AND SPECIFICATIONS.

9.0 THE CONTRACTOR SHALL THOROUGHLY REVIEW AND APPROVE SHOP DRAWINGS, PRIOR TO SUBMITTING, TO EXCEL ENGINEERING CONSULTANTS (ENGINEER). CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR ALL ITEMS OF WORK FOR REVIEW PRIOR TO ORDERING OR FABRICATION OF COMPONENTS OR SYSTEMS. THE CONTRACTOR SHALL ALLOW TEN WORKING DAYS FOR REVIEW OF EACH SUBMITTAL OR REQUEST FOR CLARIFICATION AND SHALL NOT ORDER OR FABRICATE COMPONENTS OF SYSTEM UNTIL ALL QUESTIONS RAISED BY THE ENGINEER HAVE BEEN ADDRESSED IN WRITING AND ACCEPTED.

10.0 ALL SUBMITTALS AND REQUESTS FOR INFORMATION SHALL BE SUBMITTED TO ENGINEER:
MR. JULIAN R. COTO, P.E.
EXCEL ENGINEERING CONSULTANTS, LLC.
122 WILSHIRE BLVD.
CASSELBERRY, FLORIDA 32707

11.0 CONTRACTOR SHALL NOT TAKE ADVANTAGE OF ANY OMISSION OR CONFLICT. CONTRACTOR SHALL INFORM ENGINEER OF ANY OMISSION OR CONFLICT AS SOON AS IT IS DISCOVERED AND BEFORE ANY WORK IS DONE.

12.0 CONTRACTOR SHALL PAY FOR AND OBTAIN A CITY AND/OR STATE SITE CONSTRUCTION PERMIT; THE COUNTY SITE PERMIT AND/OR UNDERGROUND UTILITY PERMIT AND HOLD A PRE-CONSTRUCTION CONFERENCE WITH THE TOWN AND/OR THE COUNTY BEFORE STARTING WORK. CONTACT DEVELOPMENT REVIEW DIVISION, FOR INFORMATION ON SETTING THE PRE CONSTRUCTION MEETING, ISSUANCE OF COUNTY PERMITS AND OTHER REQUIREMENTS.

13.0 CONTRACTOR SHALL CONTACT THE COUNTY TRAFFIC OPERATIONS ENGINEER PRIOR TO INITIATING ANY CONSTRUCTION IN THE ROW.

14.0 CONTRACTOR SHALL MAINTAIN ALL SETBACK DISTANCES SHOWN IN THE PLANS.

15.0 WORK PERFORMED UNDER THIS PROJECT SHALL NOT BE CONSIDERED AS COMPLETE UNTIL FINAL ACCEPTANCE OF THE SYSTEM BY THE CITY, COUNTY, WATER MANAGEMENT DISTRICT, FDEP, AND OWNER AND UNTIL ALL OF THE FOLLOWING DOCUMENTS ARE RECEIVED BY THE OWNER:
A. THE CONTRACTOR'S WAIVERS AND RELEASES OF LIENS.
B. THE CONTRACTOR'S LETTER OF WARRANTY.
C. ONE SET OF PAPER AND ELECTRONIC (AUTOCAD) "AS-BUILT" DRAWINGS PREPARED BY AND CERTIFIED BY A FLORIDA REGISTERED LAND SURVEYOR.

16.0 ALL MATERIALS AND LABOR UNDER THIS PROJECT SHALL BE IN STRICT ACCORDANCE WITH THE REQUIREMENTS OF THE STANDARDS AND SPECIFICATIONS OF THE CITY, COUNTY, WATER MANAGEMENT DISTRICT, FDEP AND THESE PLANS AND SPECIFICATIONS.

17.0 NOTIFY SUNSHINE, THE COUNTY PUBLIC UTILITIES AND ALL UTILITY COMPANIES AT LEAST FORTY-EIGHT HOURS PRIOR TO COMMENCING THE CONSTRUCTION .

18.0 ALL RAMPS SHALL HAVE A MAXIMUM SLOPE OF 1:12 AND MAXIMUM CROSS SLOPE OF 1:50 AS PER FHAC CODE.

19.0 ALL MARKINGS TO COMPLY WITH THE FDOT ROADWAY AND TRAFFIC DESIGN STANDARDS, MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, OF THE TOWN AND THE COUNTY.

20.0 MINIMUM COVER OVER ALL UTILITIES SHALL BE 36 INCHES UNLESS NOTED OTHERWISE. CONTRACTOR SHALL INSTALL DUCTILE IRON PIPE WHERE DEPTH OF COVER IS LESS THAN 30 INCHES.

21.0 MINIMUM COVER OVER ALL DRAINAGE PIPES SHALL BE 24 INCHES UNLESS NOTED OTHERWISE.

22.0 UTILITY SEPARATION REQUIREMENTS:
THE MINIMUM HORIZONTAL AND VERTICAL SEPARATIONS REQUIRED FOR POTABLE WATER SHALL COMPLY WITH RULES 62-555.314(1), (2), (3), AND (4) F.A.C.

HORIZONTAL SEPARATION REQUIREMENTS:
NEW OR RELOCATED, UNDERGROUND WATER MAINS SHALL BE LAID TO PROVIDE A HORIZONTAL DISTANCE OF AT LEAST THREE FEET BETWEEN THE OUTSIDE OF THE WATER MAIN AND THE OUTSIDE OF ANY EXISTING OR PROPOSED STORM SEWER, STORMWATER FORCE MAIN, OR PIPELINE CONVEYING RECLAIMED WATER REGULATED UNDER PART III OF CHAPTER 62-610, F.A.C. NEW OR RELOCATED, UNDERGROUND WATER MAINS SHALL BE LAID TO PROVIDE A HORIZONTAL DISTANCE OF AT LEAST THREE FEET, AND PREFERABLY TEN FEET, BETWEEN THE OUTSIDE OF THE WATER MAIN AND THE OUTSIDE OF ANY EXISTING OR PROPOSED VACUUM-TYPE SANITARY SEWER. NEW OR RELOCATED, UNDERGROUND WATER MAINS SHALL BE LAID TO PROVIDE A HORIZONTAL DISTANCE OF AT LEAST SIX FEET, AND PREFERABLY TEN FEET, BETWEEN THE OUTSIDE OF THE WATER MAIN AND THE OUTSIDE OF ANY EXISTING OR PROPOSED GRAVITY- OR PRESSURE-TYPE SANITARY SEWER, WASTEWATER FORCE MAIN, OR PIPELINE CONVEYING RECLAIMED WATER NOT REGULATED UNDER PART III OF CHAPTER 62-610, F.A.C. THE MINIMUM HORIZONTAL SEPARATION DISTANCE BETWEEN WATER MAINS AND GRAVITY-TYPE SANITARY SEWERS SHALL BE REDUCED TO THREE FEET WHERE THE BOTTOM OF THE WATER MAIN IS LAID AT LEAST SIX INCHES ABOVE THE TOP OF THE SEWER. NEW OR RELOCATED, UNDERGROUND WATER MAINS SHALL BE LAID TO PROVIDE A HORIZONTAL DISTANCE OF AT LEAST TEN FEET BETWEEN THE OUTSIDE OF THE WATER MAIN AND ALL PARTS OF ANY EXISTING OR PROPOSED "ON-SITE SEWAGE TREATMENT AND DISPOSAL SYSTEM" AS DEFINED IN SECTION 381.0065(2), F.S., AND RULE 64E-6.002, F.A.C.

VERTICAL SEPARATION REQUIREMENTS:
NEW OR RELOCATED, UNDERGROUND WATER MAINS CROSSING ANY EXISTING OR PROPOSED GRAVITY- OR VACUUM-TYPE SANITARY SEWER OR STORM SEWER SHALL BE LAID SO THE OUTSIDE OF THE WATER MAIN IS AT LEAST SIX INCHES, AND PREFERABLY 12 INCHES, ABOVE OR AT LEAST 12 INCHES BELOW THE OUTSIDE OF THE OTHER PIPELINE. HOWEVER, IT IS PREFERABLE TO LAY THE WATER MAIN ABOVE THE OTHER PIPELINE. NEW OR RELOCATED, UNDERGROUND WATER MAINS CROSSING ANY EXISTING OR PROPOSED PRESSURE-TYPE SANITARY SEWER, WASTEWATER OR STORMWATER FORCE MAIN, OR PIPELINE CONVEYING RECLAIMED WATER SHALL BE LAID SO THE OUTSIDE OF THE WATER MAIN IS AT LEAST 12 INCHES ABOVE OR BELOW THE OUTSIDE OF THE OTHER PIPELINE. HOWEVER, IT IS PREFERABLE TO LAY THE WATER MAIN ABOVE THE OTHER PIPELINE. AT THE UTILITY CROSSINGS DESCRIBED ABOVE, ONE FULL LENGTH OF WATER MAIN PIPE SHALL BE CENTERED ABOVE OR BELOW THE OTHER PIPELINE SO THE WATER MAIN JOINTS WILL BE AS FAR AS POSSIBLE FROM THE OTHER PIPELINE. ALTERNATIVELY, AT SUCH CROSSINGS, THE PIPES SHALL BE ARRANGED SO THAT ALL WATER MAIN JOINTS ARE AT LEAST THREE FEET FROM ALL JOINTS IN VACUUM-TYPE SANITARY SEWERS, STORM SEWERS, STORMWATER FORCE MAINS, OR PIPELINES CONVEYING RECLAIMED WATER REGULATED UNDER PART III OF CHAPTER 62-610, F.A.C., AND AT LEAST SIX FEET FROM ALL JOINTS IN GRAVITY- OR PRESSURE-TYPE SANITARY SEWERS, WASTEWATER FORCE MAINS, OR PIPELINES CONVEYING RECLAIMED WATER NOT REGULATED UNDER PART III OF CHAPTER 62-610, F.A.C.

NO WATER MAIN SHALL PASS THROUGH, OR COME INTO CONTACT WITH, ANY PART OF A SANITARY SEWER MANHOLE.

NO VARIANCES OR EXCEPTIONS TO THE ABOVE REQUIREMENTS WILL BE PERMITTED UNLESS APPROVAL FOR THE EXCEPTION OR VARIANCE IS OBTAINED FROM THE FDEP.

23.0 CONTRACTOR SHALL PROVIDE ALL FITTINGS, APPURTENANCES AND INCIDENTALS FOR A COMPLETE AND FUNCTIONAL SYSTEM IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND LOCAL, STATE AND FEDERAL AGENCIES.

24.0 CONFORM TO THE RECOMMENDATIONS OF THE GEOTECHNICAL INVESTIGATION WHICH IS MADE PART OF THESE PLANS AND SPECIFICATIONS BY REFERENCE.

25.0 PRIOR TO CONSTRUCTION, CONTRACTOR SHALL OBTAIN NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT FROM THE FDEP. CONTRACTOR, AT ALL TIMES, SHALL KEEP AT THE PROJECT SITE, A COPY OF THE STORM WATER POLLUTION PREVENTION PLAN (SWPP). DURING CONSTRUCTION, THE CONTRACTOR SHALL BE IN FULL COMPLIANCE WITH THE REQUIREMENTS OF THE NPDES AS REQUIRED BY F.A.C. 62-620.305.

26.0 CONTRACTOR SHALL COORDINATE ELECTRICAL, TELEPHONE, CABLE, ETC. FOR PROVISION OF SERVICE REQUIRED FOR PROJECT.

ENGINEER'S NOTES

1.0 CLEARING AND GRUBBING
A. CLEAR AND GRUB SITE. REMOVE ALL EXISTING GRASS, TREES, STUMPS AND ORGANICS. SHRUB AND TREE STUMPS SHALL BE REMOVED TO A MINIMUM DEPTH OF 12 INCHES BELOW EXISTING GRADE. GRASS SHALL BE REMOVED TO A MINIMUM DEPTH OF 6 INCHES BELOW EXISTING GRADE.

2.0 SITE PREPARATION/EROSION CONTROL
A. ALL AREAS WHERE CONSTRUCTION IS TO OCCUR SHALL BE PROPERLY PROTECTED WITH EROSION CONTROL MEASURES TO PREVENT THE MIGRATION OF SOILS AND FINES OFF-SITE, OR INTO DRAINAGE DITCHES.
B. PROVIDE EROSION CONTROL MEASURES IN ACCORDANCE WITH WATER MANAGEMENT DISTRICT REQUIREMENTS. AT A MINIMUM, PROVIDE SILT CURTAINS TO PRECLUDE THE MIGRATION OF SOILS AND FINES INTO THE RIGHT OF WAY OR SURFACE WATERS.
C. ALL AREAS UNDER STRUCTURES AND PAVEMENTS SHALL BE PROOF ROLLED. ALL ORGANIC MATERIALS SHALL BE REMOVED FROM SOFT SPOTS AND BACKFILLED WITH SUITABLE MATERIALS AND COMPACTED IN ACCORDANCE WITH THESE PLANS AND SPECIFICATIONS.

3.0 SITE GRADING
A. SITE SHALL BE GRADED TO THE SLOPES AND GRADES SHOWN IN THE PLANS.
B. FILLING OF THE SITE SHALL BE ACCOMPLISHED WITH CLEAN NATURAL SANDS WHICH SHALL BE COMPOSED OF HARD, DURABLE PARTICLES. THE SANDS SHALL NOT CONTAIN ANY ROOTS, CANS, DEBRIS, ETC., SHALL NOT CONTAIN MORE THAN 5% ORGANICS AND SHALL CONTAIN A MAXIMUM AMOUNT OF FINES PASSING THE 200 SIEVE OF 5 %. THE MATERIAL SHALL COMPLY WITH THE GRADATION REQUIREMENTS OF FDOT 902-6. FILLING OF THE SITE SHALL PROCEED AFTER CLEARING AND GRUBBING OPERATIONS ARE COMPLETE.
C. FILL MATERIAL SHALL BE COMPACTED TO 98% OF ITS MAXIMUM DENSITY UNDER PAVED AREAS AND TO 90% OF ITS MAXIMUM DENSITY UNDER LANDSCAPED AREAS (AASHTO T-180). FILL MATERIAL SHALL BE COMPACTED IN MAXIMUM LIFTS OF 12 INCHES.

4.0 WATER PIPES AND FITTINGS
LEFT BLANK INTENTIONALLY

5.0 GRAVITY SANITARY SEWER PIPE AND MANHOLES
LEFT BLANK INTENTIONALLY

6.0 SANITARY SEWER FORCEMAINS
LEFT BLANK INTENTIONALLY

7.0 RECLAIMED WATER PIPE AND FITTINGS
LEFT BLANK INTENTIONALLY

8.0 DRAINAGE PIPES, MANHOLES AND CATCH BASINS
A. DRAINAGE PIPE WITHIN THE PROJECT SITE SHALL MEET ALL REQUIREMENTS BY THE TOWN, COUNTY AND/OR STATE, UNLESS NOTED OTHERWISE.
B. MANHOLES AND CATCH BASINS SHALL MEET THE MINIMUM REQUIREMENTS OF THE FLORIDA DEPARTMENT OF TRANSPORTATION. THE DRAINAGE STRUCTURES SHALL BE OF THE TYPES SPECIFIED IN THE PLANS.

9.0 PAVEMENT
A. ASPHALTIC CONCRETE SURFACE COURSE SHALL BE OF THE TYPES AND THICKNESSES SPECIFIED IN THE PLANS AND SHALL MEET THE REQUIREMENTS OF THE FDOT SPECIFICATIONS SECTION 331, LATEST EDITION. ASPHALTIC CONCRETE SHALL ATTAIN A MINIMUM DENSITY OF 98% OF ITS MAXIMUM DENSITY AS DETERMINED BY THE FDOT SPECIFICATIONS.
B. BASE COURSE SHALL BE LIMEROCK, OR SOIL CEMENT CONFORMING TO THE THICKNESSES SHOWN IN THE PLANS. LIMEROCK SHALL MEET THE REQUIREMENTS OF FDOT SPECIFICATIONS SECTION 200, LATEST EDITION. SOIL CEMENT SHALL MEET THE REQUIREMENTS OF FDOT SPECIFICATIONS SECTION 270, LATEST EDITION.
C. BASE COURSE SHALL BE COMPACTED TO 97% OF ITS MAXIMUM DENSITY (AASHTO T-180) AND IT SHALL ATTAIN A MINIMUM COMPRESSIVE STRENGTH OF 300 PSI, (SOIL CEMENT).
D. SUB-BASE SHALL BE STABILIZED TO THE THICKNESSES SHOWN IN THE PLANS. SUB-BASE STABILIZATION SHALL BE ACCOMPLISHED IN CONFORMANCE WITH FDOT SPECIFICATIONS SECTIONS 160 AND 914, LATEST EDITIONS. THE STABILIZED SUB-BASE SHALL BE COMPACTED TO 98% OF ITS MAXIMUM DENSITY (AASHTO T-180) AND IT SHALL HAVE A MINIMUM FBV OF 75 PSI.

10.0 PAVEMENT STRIPING AND SIGNAGE
LEFT BLANK INTENTIONALLY

11.0 CONCRETE
A. CONCRETE SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 3,000 PSI WITH A MAXIMUM SLUMP OF 5 INCHES, UNLESS NOTED OTHERWISE. CONCRETE FOR WALLS SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 4,000 PSI WITH A MAXIMUM SLUMP OF 5 INCHES.
B. CONCRETE FOR DRAINAGE AND SANITARY SEWER STRUCTURES SHALL BE TYPE II CONCRETE WITH A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 4,000 PSI.

12.0 QUALITY CONTROL
A. PROVIDE ONE DENSITY AND ONE FBV TEST ON THE SUB-BASE AT 300' INTERVALS FOR ROADWAYS AND DRIVEWAYS AND AT EVERY 10,000 S.F. FOR PARKING LOTS.
B. PROVIDE ONE DENSITY TEST FOR FILL MATERIAL FOR EVERY 12" LIFT INTERVALS FOR ROADWAYS AND DRIVEWAYS AND AT EVERY 10,000 S.F. FOR PARKING LOTS.
C. PROVIDE ONE ASPHALT CORE TEST AT 10,000 S.F. ASPHALT CORES SHALL BE TESTED FOR DENSITY, THICKNESS, GRADATION, ASPHALT CONTENT AND MARSHALL STABILITY AND SHALL BE COMPARED TO THAT OF THE FDOT SPECIFICATIONS AND THESE PLANS AND SPECIFICATIONS AND SHALL MEET OR EXCEED THE MINIMUM REQUIREMENTS.
D. A MINIMUM OF TWO(2) TESTS ARE REQUIRED FOR ANY SECTION SMALLER THAN NOTED.
E. PRESSURE TEST FIRE MAINS, WATERMAINS & FORCEMAINS

E.1 PRESSURE TEST FIRE MAINS, WATER MAINS AND FORCEMAINS BY PUMPING TO 200 PSI FOR FIRE MAINS, 150 PSI FOR WATER MAINS AND RECLAIM WATER MAINS, AND 100 PSI FOR SS FORCEMAINS, AND MAINTAINING THE PRESSURE FOR A MINIMUM PERIOD OF 2 HOURS. PRIOR TO PRESSURE TESTING, FLUSH OUT PIPES TO REMOVE ALL DEBRIS AND AIR POCKETS. ENGINEER MUST BE PRESENT FOR ALL PRESSURE TESTS. CONTRACTOR TO PROVIDE ENGINEER WITH A MINIMUM 48 HOURS OF NOTICE PRIOR TO COMMENCEMENT OF ANY PRESSURE TEST.

E.2 THE MAXIMUM ALLOWABLE LEAKAGE FOR PIPES AND WATER MAINS OVER THE 2 HOUR PERIOD IS AS FOLLOWS:

1.) PVC: $\frac{N_L D \sqrt{P}}{7,400}$

2.) DIP: $\frac{S D \sqrt{P}}{133,200}$

L = ALLOWABLE LEAKAGE IN GALLONS PER HOUR
N = NUMBER OF JOINTS
S = LENGTH OF PIPE TESTED, IN FEET
D = NOMINAL DIAMETER OF PIPE
P = AVERAGE TEST PRESSURE MAINTAINED DURING THE TEST, IN POUNDS PER IN^2 GAUGE

F. SANITARY SEWER GRAVITY LINES WILL BE TESTED BY LAMPING AND LOW PRESSURE AIR TEST. WHEN THE LAMPING PROCEDURE IS PERFORMED, EACH TEST SECTION OF PIPE (BETWEEN MANHOLES) WITH A FULL CIRCLE SHOWING SHALL BE CONSIDERED TO BE ACCEPTABLE. SANITARY SEWER LINES WILL BE LOW PRESSURE AIR TESTED USING THE LATEST UNI-BELL STANDARD. ENGINEER MUST BE PRESENT FOR ALL LAMPING AND LOW PRESSURE AIR TESTS. CONTRACTOR TO PROVIDE ENGINEER WITH A MINIMUM 48 HOURS OF NOTICE PRIOR TO COMMENCEMENT OF ANY LAMPING OR LOW PRESSURE AIR TEST.

G. WATER, SEWER, RECLAIMED AND DRAINAGE COMPACTION TEST OF BACKFILL AND PIPE BEDDING MATERIAL SHALL BE OBTAINED AT 300 FOOT INTERVALS ALONG THE CENTERLINE OF THE PIPE STARTING AT THE BOTTOM OF THE PIPE AND PROCEEDING AT 1 FOOT INTERVALS TO FINISHED GRADE. A MINIMUM OF 2 TESTS PER EXCAVATION SHALL BE REQUIRED.

H. ALL STORMWATER LINES WILL BE LAMP TESTED. WHEN THE LAMPING PROCEDURE IS PERFORMED, EACH TEST SECTION OF PIPE (BETWEEN MANHOLES OR CATCH BASINS) WITH A FULL CIRCLE SHOWING SHALL BE CONSIDERED TO BE ACCEPTABLE. ENGINEER MUST BE PRESENT FOR ALL LAMPING TESTS. CONTRACTOR TO PROVIDE ENGINEER WITH A MINIMUM 48 HOURS OF NOTICE PRIOR TO COMMENCEMENT OF ANY LAMPING TEST.

13.0 RESTORATION
A. ALL DISTURBED AREAS SHALL BE RESTORED IN LIKE KIND WITH NEW MATERIALS, UNLESS NOTED OTHERWISE. AT A MINIMUM ALL DISTURBED AREAS SHALL BE STABILIZED IN AN APPROVED MANNER. ALL SIDEWALKS AND PAVEMENTS THAT NEED TO BE DISTURBED SHALL BE SAW CUT TO ITS FULL DEPTH PRIOR TO CONSTRUCTION. SUBSEQUENTLY, PAVEMENTS SHALL BE RESTORED IN ACCORDANCE WITH THE PAVEMENT RESTORATION DETAILS EXCEPT THAT CONCRETE DRIVEWAYS SHALL BE RESTORED WITH CONCRETE WITH A MINIMUM THICKNESS OF 6 INCHES. SIDEWALKS SHALL BE RESTORED IN ACCORDANCE WITH THE SIDEWALK DETAILS.
C. RESTORATION OF GRASSED AREAS WITHIN RIGHTS OF WAY SHALL BE ACCOMPLISHED BY SOLID SODDING WITH BAHIA SOD UNLESS NOTED OTHERWISE.
D. CONTRACTOR SHALL WATER ALL GRASSED AREAS AND APPLY FERTILIZERS, ETC. AS NECESSARY TO MAINTAIN THE VIABILITY OF THE GRASS UNTIL IT BECOMES ESTABLISHED.
E. THE PLANS SHOW EXISTING FEATURES TO THE GREATEST EXTENT POSSIBLE. ALL DISTURBED FEATURES ALONG THE RIGHTS OF WAY SHALL BE RESTORED WHETHER SPECIFICALLY CALLED OUT ON THE PLANS OR NOT. CONTRACTOR SHALL WALK THE SITE TO FIELD VERIFY ALL SURFACE FEATURES AND INCLUDE ALL THOSE THAT WILL BE DISTURBED BY THE CONSTRUCTION IN ITS BID.

14.0 UNDERGROUND UTILITIES
A. ALL UTILITIES ARE TO BE INSTALLED UNDERGROUND INCLUDING ELECTRIC, PHONE, CABLE, NATURAL GAS, SANITARY SEWER, STORMWATER AND POTABLE WATER.

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General Notes & Engineering Notes

Semoran Crossroads Stormwater Pond

REVISIONS:

NUMBER	DESCRIPTION	DATE

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JULIAN R. COTO DATE
P.E. LICENSE #0033635

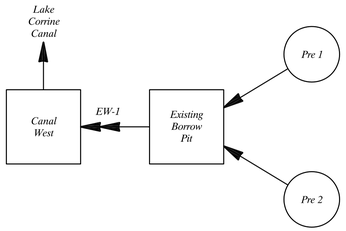
PROJECT NUMBER
JEN01-0109

SCALE: AS SHOWN
DRAWN: T.N.S.
CHECKED: M.R.
APPROVED: J.C.
DATE: 8/1/13

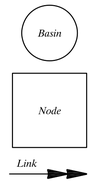
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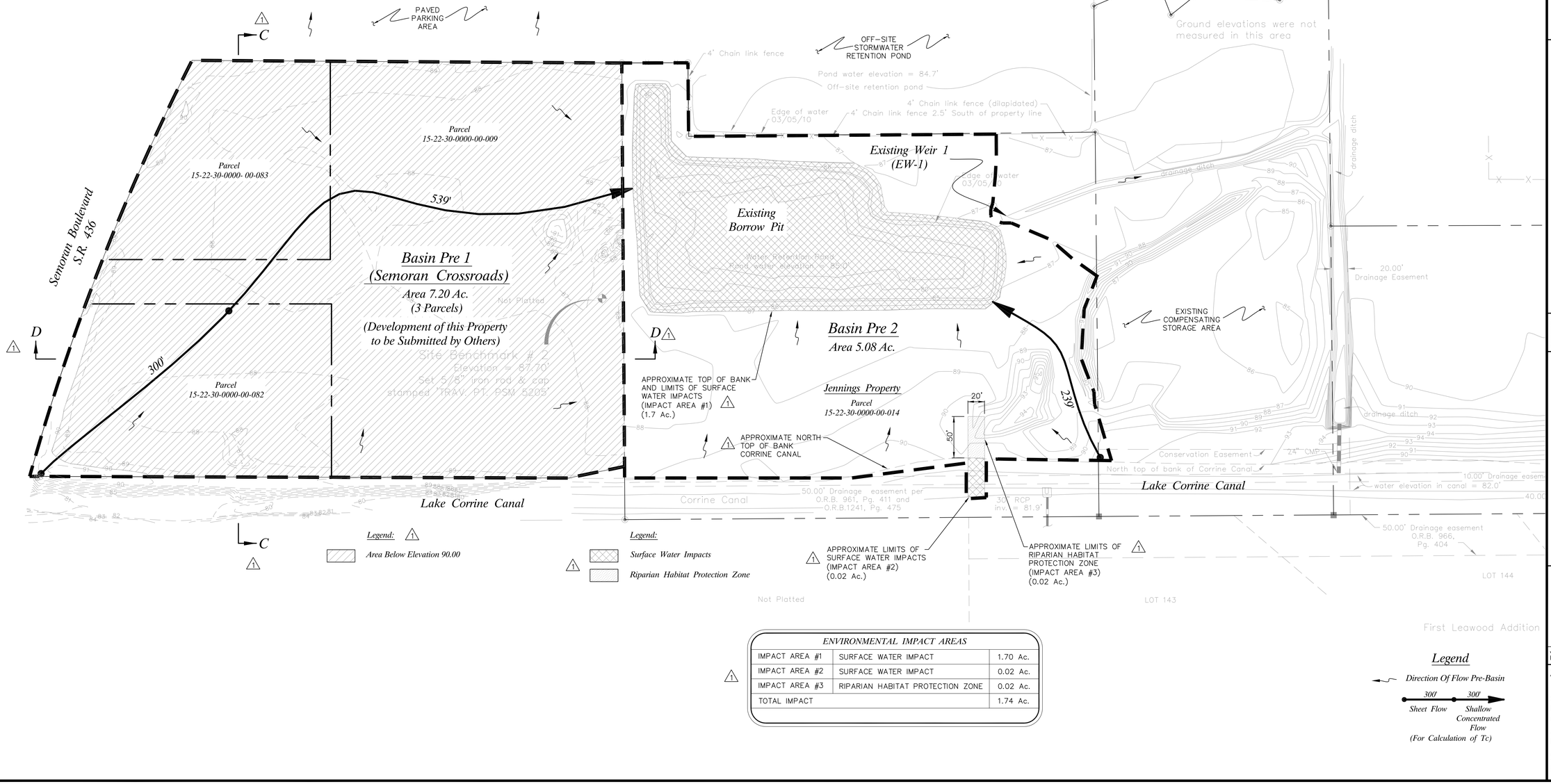
Pre-Development

Nodal Diagram

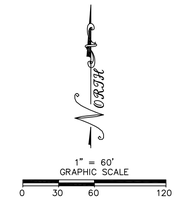


Nodal Legend





ENVIRONMENTAL IMPACT AREAS		
IMPACT AREA #1	SURFACE WATER IMPACT	1.70 Ac.
IMPACT AREA #2	SURFACE WATER IMPACT	0.02 Ac.
IMPACT AREA #3	RIPARIAN HABITAT PROTECTION ZONE	0.02 Ac.
TOTAL IMPACT		1.74 Ac.



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Pre-Development Drainage Basins

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REVISIONS:

NUMBER	DESCRIPTION	DATE
1	Added Area Under El. 90, Surface Water Impacts and RPZ, Added Sections.	12/13/11

JULIAN R. COTO DATE
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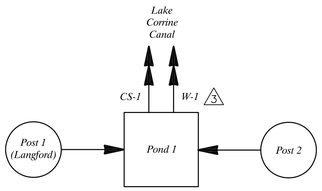
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JEN01-0109

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APPROVED: J.C.
DATE: 8/1/13

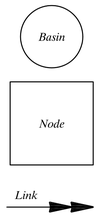
SHEET NO. 3 OF 9

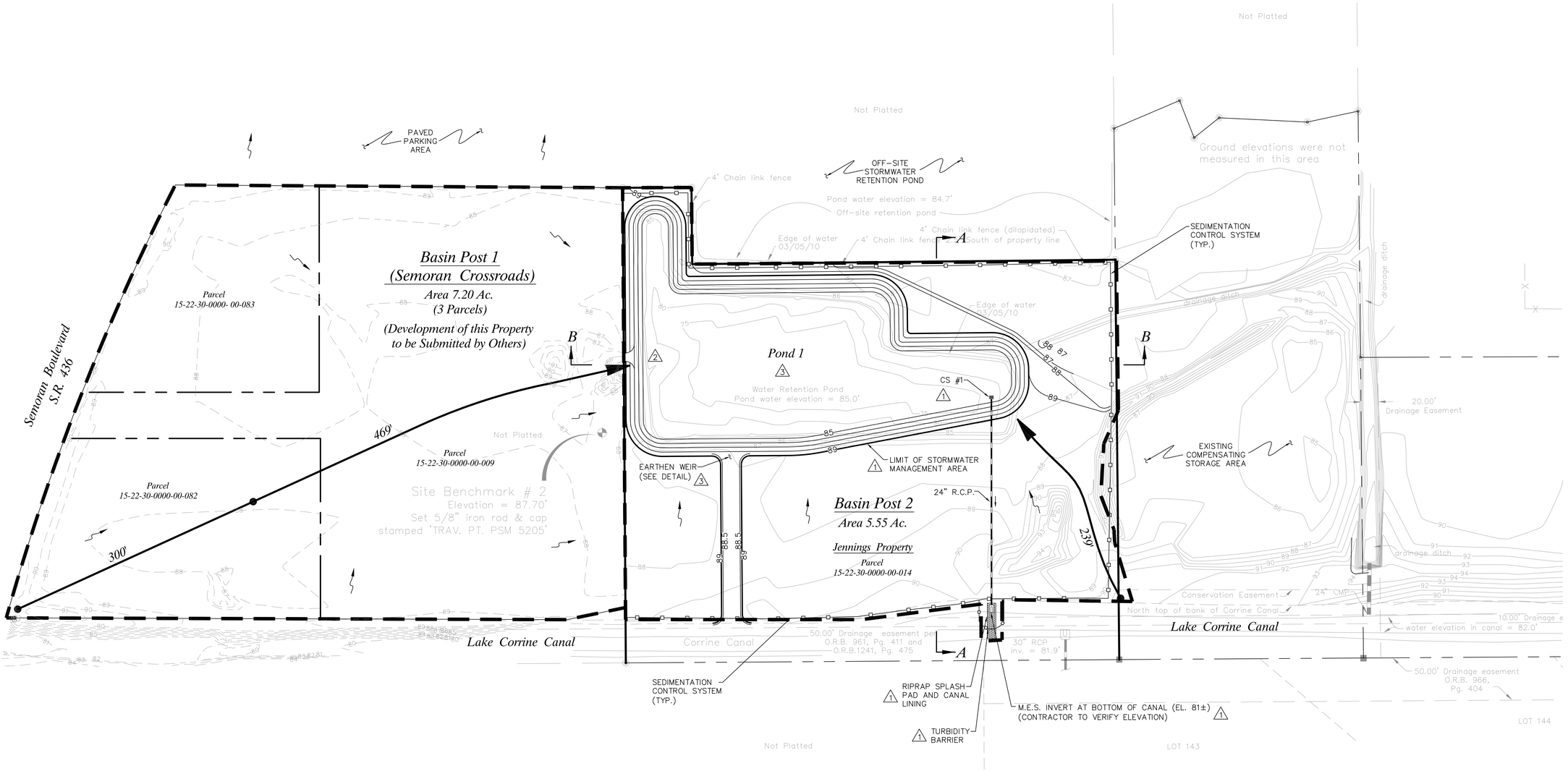
Post Development

Nodal Diagram



Nodal Legend:





NOTES:

1. LOCATION OF UNDERGROUND PIPING AND OTHER UTILITIES ASSUMED.
2. CONTRACTOR TO FIELD VERIFY THE LOCATION OF ALL UNDERGROUND UTILITIES PRIOR TO BEGINING CONSTRUCTION

LEGEND

Direction Of Flow Post-Basin

300' Sheet Flow — 300' Shallow Concentrated Flow

(For Calculation of Tc)

1" = 60'
GRAPHIC SCALE
0 30 60 120

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Post-Development Drainage Basins and Grading Plan

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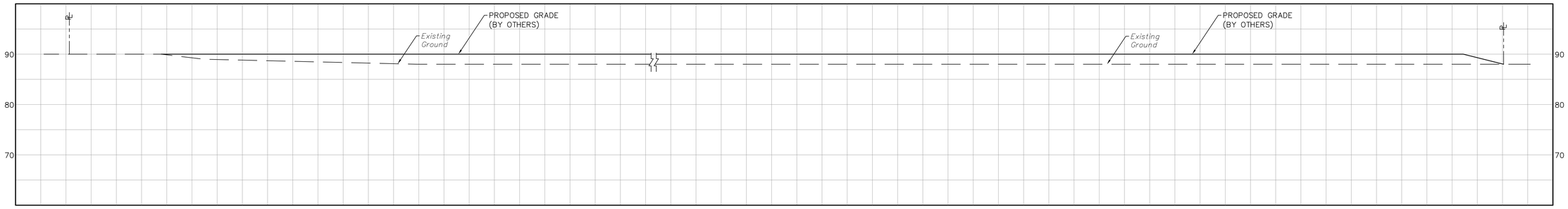
NUMBER	DESCRIPTION	DATE
1	Reshape Pond and Move Control Structure	12/13/11
2	Revised Pond Berm	3/29/12
3	Revised Pond and Added Earthrn Weir	8/1/13

JULIAN R. COTO DATE
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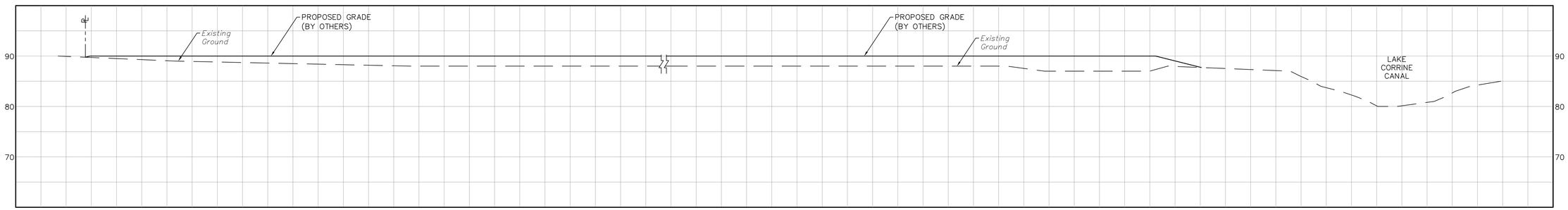
PROJECT NUMBER
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APPROVED: J.C.
DATE: 8/1/13

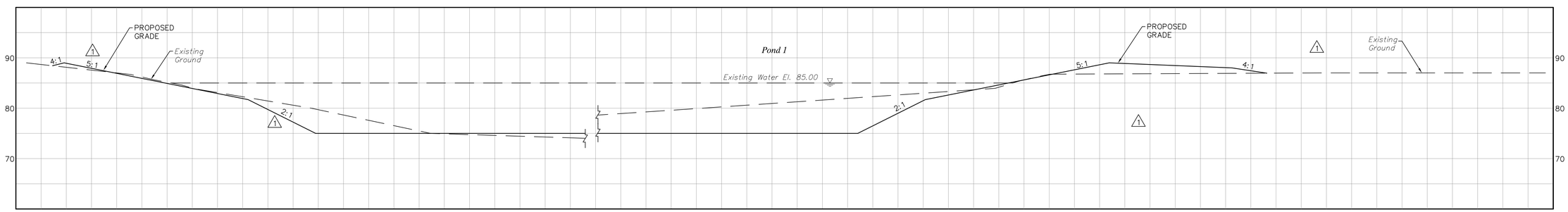
SHEET NO. 4
OF 9



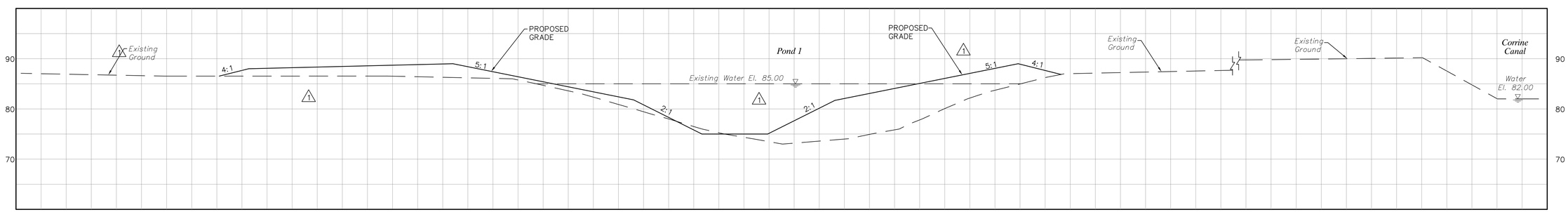
SECTION D-D
SCALE: 1"=10' 1



SECTION C-C
SCALE: 1"=10' 1



SECTION B-B
SCALE: 1"=10' 3



SECTION A-A
SCALE: 1"=10' 3

1 *Note:*
For Typical Pond Cross Section With Storm Stages and Construction Specifications, See Sheet 8 of 8.

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Critical Cross Sections

Semoran Crossroads Stormwater Pond

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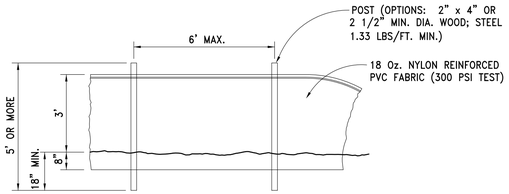
NUMBER	DESCRIPTION	DATE
1	Reshape Pond. Add Sections C-C & D-D.	12/13/11
3	Reshape Pond. Revise Sections A-A & B-B	8/1/13

JULIAN R. COTO DATE
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PROJECT NUMBER
JEN01-0109

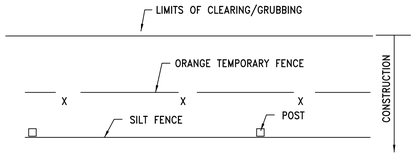
SCALE: AS SHOWN
DRAWN: T.N.S.
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APPROVED: J.C.
DATE: 8/1/13

SHEET NO. 5
OF 9



STAKED TURBIDITY BARRIER

N.T.S.



NOTES:

1. WHERE INDICATED ON THE PLANS, CONSTRUCT A 4FT HIGH ORANGE TEMPORARY FENCE ALONG THE LIMITS OF CLEARING/GRUBBING.
2. CONSTRUCT A STAKED SILT FENCE 1FT OFF THE ORANGE TEMPORARY FENCE, OR ALONG THE LIMITS OF CLEARING/GRUBBING WHERE APPLICABLE.

ORANGE TEMPORARY FENCE AND SILT FENCE LOCATION DETAIL

N.T.S.

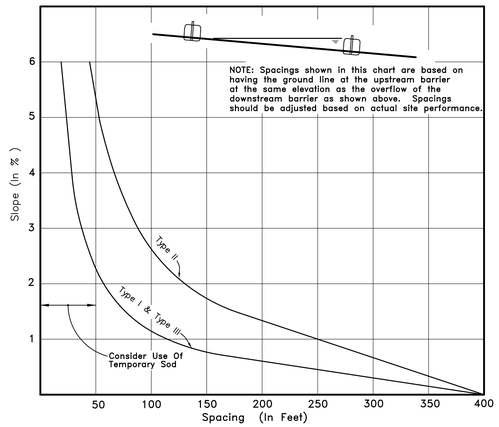
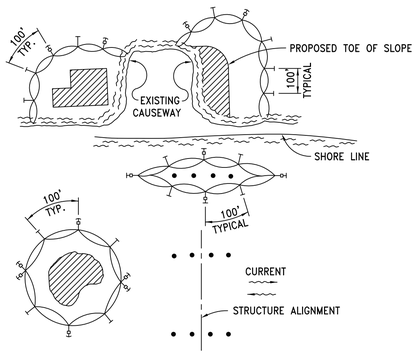
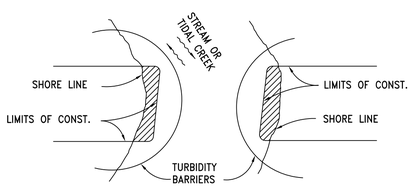


CHART 1
RECOMMENDED SPACING FOR TYPE III SILT FENCE





NOTE: TURBIDITY BARRIERS FOR FLOWING STREAMS AND TIDAL CREEKS MAY BE EITHER FLOATING, OR STAKED TYPES OR ANY COMBINATIONS OF TYPES THAT WILL SUIT SITE CONDITIONS AND MEET EROSION CONTROL AND WATER QUALITY REQUIREMENTS. THE BARRIER TYPE(S) WILL BE AT THE CONTRACTORS OPTION UNLESS OTHERWISE SPECIFIED IN THE PLANS. HOWEVER PAYMENT WILL BE UNDER THE PAY ITEM(S) ESTABLISHED IN THE PLANS FOR FLOATING TURBIDITY BARRIER AND/OR STAKED TURBIDITY BARRIER. POSTS IN STAKED TURBIDITY BARRIERS TO BE INSTALLED IN VERTICAL POSITION UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

LEGEND

- PILE LOCATIONS
- DREDGE OR FILL AREA
- MOORING BUOY W/ANCHOR
- ANCHOR
- BARRIER MOVEMENT DUE TO CURRENT ACTION

NOTES:

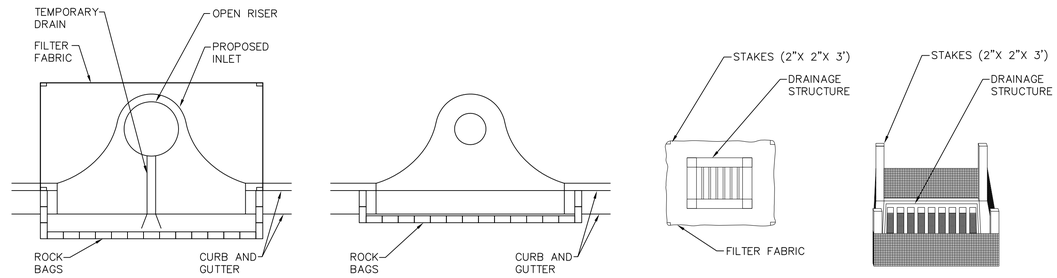
1. TURBIDITY BARRIERS ARE TO BE USED IN ALL PERMANENT BODIES OF WATER REGARDLESS OF WATER DEPTH.
2. NUMBER AND SPACING OF ANCHORS DEPENDENT ON CURRENT VELOCITIES.
3. DEPLOYMENT OF BARRIER AROUND PILE LOCATIONS MAY VARY TO ACCOMMODATE CONSTRUCTION OPERATIONS.
4. NAVIGATION MAY REQUIRE SEGMENTING BARRIER DURING CONSTRUCTION OPERATIONS.
5. FOR ADDITIONAL INFORMATION SEE SECTION 104 OF THE STANDARD SPECIFICATIONS.

GENERAL NOTES

1. FLOATING TURBIDITY BARRIERS ARE TO BE PAID FOR UNDER THE CONTRACT UNIT PRICE FOR FLOATING TURBIDITY BARRIERS, LF.
2. STAKED TURBIDITY BARRIERS ARE TO BE PAID FOR UNDER THE CONTRACT UNIT PRICE FOR STAKED TURBIDITY BARRIER, LF.

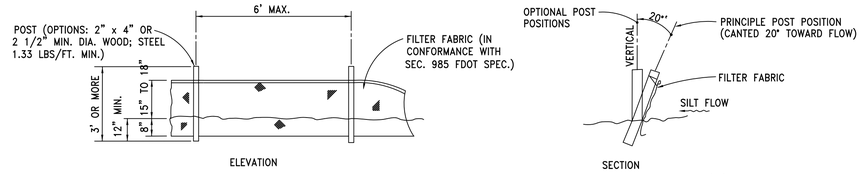
TURBIDITY BARRIER APPLICATIONS

N.T.S.



PROTECTION AROUND INLETS OR SIMILAR STRUCTURES

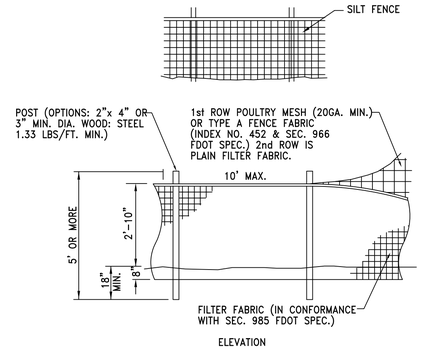
N.T.S.



NOTE: SILT FENCE TO BE PAID FOR UNDER THE CONTRACT UNIT PRICE FOR STAKED SILT FENCE (LF).

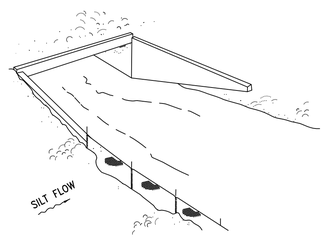
TYPE III SILT FENCE

N.T.S.

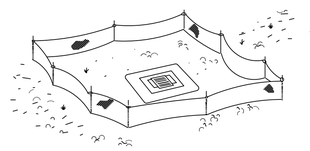


TYPE IV SILT FENCE

N.T.S.



TYPE III SILT FENCE



TYPE III SILT FENCE PROTECTION AROUND DITCH BOTTOM INLETS.



NOTE: SPACING FOR TYPE III FENCE TO BE IN ACCORDANCE WITH CHART I, SHEET 1 OF 3 AND DITCH INSTALLATIONS AT DRAINAGE STRUCTURES SHEET 2 OF 3.

TYPE III SILT FENCE

DO NOT DEPLOY IN A MANNER THAT SILT FENCES WILL ACT AS A DAM ACROSS PERMANENT FLOWING WATERCOURSES. SILT FENCES ARE TO BE USED AT UPLAND LOCATION AND TURBIDITY BARRIERS USED AT PERMANENT BODIES OF WATER.

SILT FENCE APPLICATIONS

N.T.S.

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Miscellaneous Details

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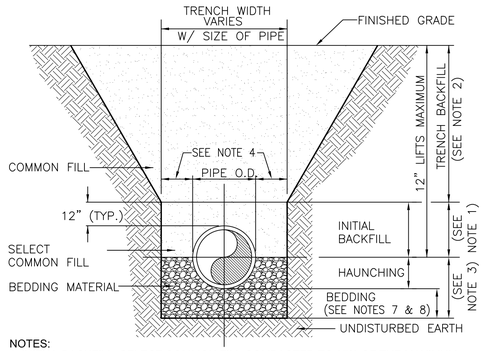
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P.E. LICENSE #0033635

PROJECT NUMBER JEN01-0109

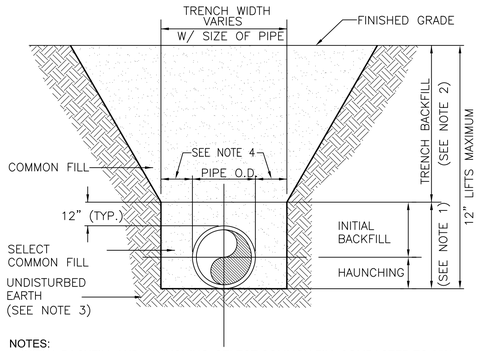
SCALE: AS SHOWN
DRAWN: T.N.S.
CHECKED: M.R.
APPROVED: J.C.
DATE: 8/1/13

SHEET NO. 6 OF 9



NOTES:
1. INITIAL BACKFILL: SELECT COMMON FILL COMPACTED TO 95% OF THE MAXIMUM DENSITY AS PER AASHTO T-180.
2. TRENCH BACKFILL: COMMON FILL COMPACTED TO 95% OF THE MAXIMUM DENSITY AS PER AASHTO T-180.
3. TYPE A BEDDING MATERIAL SHALL CONFORM TO FDOT NO. 57 AGGREGATE.
4. 15" MAX. (12" MIN.) FOR PIPE DIAMETER LESS THAN 24", AND 24" MAX (12" MIN.) FOR PIPE DIAMETER 24" AND LARGER.
5. WATER SHALL NOT BE PERMITTED IN THE TRENCH DURING CONSTRUCTION.
6. ALL PIPE TO BE INSTALLED WITH BELL FACING UPSTREAM TO THE DIRECTION OF THE FLOW.
7. BEDDING DEPTH SHALL BE 4" MINIMUM FOR PIPE DIAMETER UP TO 12", AND 6" MINIMUM FOR PIPE DIAMETER 16" AND LARGER.
8. DEPTH FOR REMOVAL OF UNSUITABLE MATERIAL SHALL GOVERN DEPTH OF BEDDING ROCK BELOW THE PIPE. TOWN SHALL DETERMINE IN THE FIELD REQUIRED REMOVAL OF UNSUITABLE MATERIAL TO REACH SUITABLE FOUNDATION.
9. FINAL RESTORATION IN IMPROVED AREAS SHALL BE IN COMPLIANCE WITH ALL APPLICABLE REGULATIONS OF GOVERNING AGENCIES. SURFACE RESTORATION WITHIN RIGHT-OF-WAY SHALL COMPLY WITH REQUIREMENTS OF RIGHT-OF-WAY UTILIZATION REGULATIONS AND ROAD CONSTRUCTION SPECIFICATIONS.

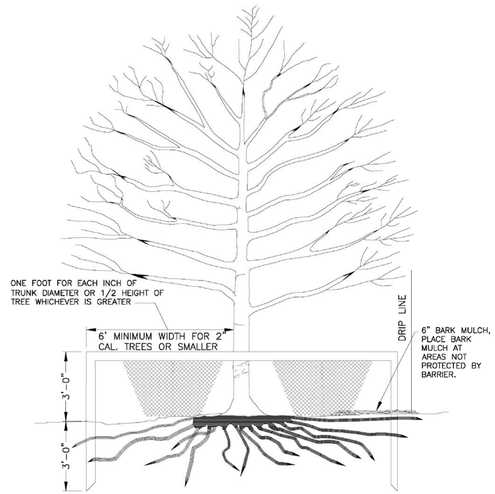
TYPE "A" BEDDING AND TRENCHING



NOTES:
1. INITIAL BACKFILL AND HAUNCHING: SELECT COMMON FILL COMPACTED TO 95% OF THE MAXIMUM DENSITY AS PER AASHTO T-180.
2. TRENCH BACKFILL: COMMON FILL COMPACTED TO 95% OF THE MAXIMUM DENSITY AS PER AASHTO T-180.
3. PIPE BEDDING UTILIZING SELECT COMMON FILL OR BEDDING ROCK IN ACCORDANCE WITH TYPE A BEDDING AND TRENCHING DETAIL MAY BE REQUIRED AS DIRECTED BY THE TOWN.
4. 15" MAX. (12" MIN.) FOR PIPE DIAMETER LESS THAN 24", AND 24" MAX (12" MIN.) FOR PIPE DIAMETER 24" AND LARGER.
5. WATER SHALL NOT BE PERMITTED IN THE TRENCH DURING CONSTRUCTION.
6. ALL PIPE TO BE INSTALLED WITH BELL FACING UPSTREAM TO THE DIRECTION OF THE FLOW.
7. FINAL RESTORATION IN IMPROVED AREAS SHALL BE IN COMPLIANCE WITH ALL APPLICABLE REGULATIONS OF GOVERNING AGENCIES. SURFACE RESTORATION WITHIN RIGHT-OF-WAY SHALL COMPLY WITH REQUIREMENTS OF RIGHT-OF-WAY UTILIZATION REGULATIONS AND ROAD CONSTRUCTION SPECIFICATIONS.

TYPE "B" BEDDING AND TRENCHING

PIPE BEDDING & TRENCHING DETAILS
N.T.S.



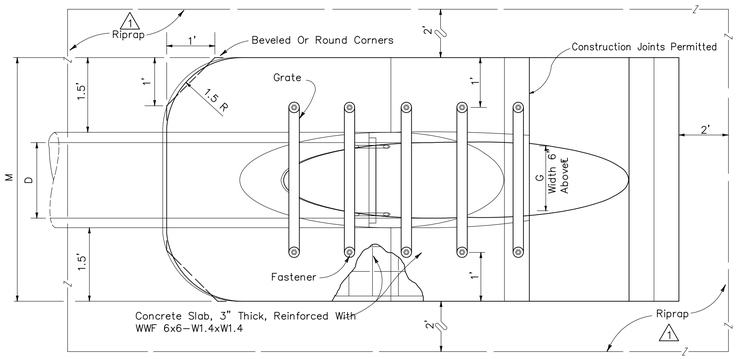
NOTE:
2"x4" STANDARDS + 1"x4" RAILS OR ORANGE SAFETY FENCING MAY BE USED.

TREE PROTECTION BARRIER DETAIL
N.T.S.

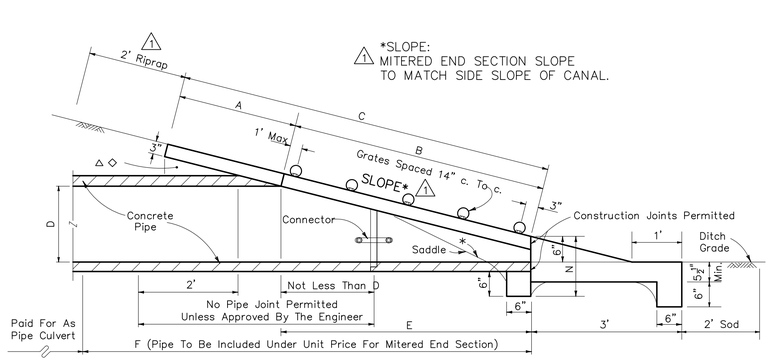
DIMENSIONS & QUANTITIES

D	X	A	B	C	E	F	G	M Single Pipe	M Double Pipe	M Triple Pipe	M Quad Pipe	N	GRATE SIZES Standard Weight Pipe	GRATE SIZES Extra Strong Pipe	CONCRETE (Cu. Yds.) Single Pipe	CONCRETE (Cu. Yds.) Double Pipe	CONCRETE (Cu. Yds.) Triple Pipe	CONCRETE (Cu. Yds.) Quad Pipe	SODDING (Sq. Yds.) Single Pipe	SODDING (Sq. Yds.) Double Pipe	SODDING (Sq. Yds.) Triple Pipe	SODDING (Sq. Yds.) Quad Pipe
15"	2'-7"	2.27'	4.09'	6.36'	4.03'	8'	1.22'	4.63'	7.21'	9.79'	12.37'	1.19'			0.76	1.16	1.54	1.94	8	10	11	12
18"	2'-10"	2.36'	5.12'	7.48'	5.03'	9'	1.41'	4.92'	7.75'	10.58'	13.42'	1.21'			0.85	1.28	1.71	2.17	9	10	12	13
24"	3'-5"	2.53'	7.18'△	9.71'	7.03'△	11'	1.73'	5.50'	8.92'	12.33'	15.75'	1.25'			1.02	1.58	2.15	2.75	10	12	13	15
30"	4'-3"	2.70'	9.25'	11.95'	9.03'	13'	2.00'	6.08'	10.33'	14.58'	18.83'	1.29'	2½"	3"	1.23	1.98	2.74	3.50	12	14	15	17
36"	5'-1"	2.87'	11.31◇	14.18'	11.03◇	15'	2.24'	6.67'	11.75'	16.83'	21.92'	1.33'	2½"	3"	1.40	2.38	3.33	4.24	13	15	17	20
42"	6'-0"	3.05'	13.37'	16.42'	13.03'	17'	2.45'	7.25'	13.25'	19.25'	25.25'	1.38'	2½"	3½"	1.60	2.83	4.04	5.26	14	17	19	22
48"	6'-9"	3.22'	15.43'	18.65'	15.03'	19'	2.65'	7.83'	14.58'	21.33'	28.08'	1.42'	2½"	3½"	1.81	3.26	4.70	6.14	15	18	21	24
54"	7'-8"	3.39'	17.49'	20.88'	17.03'	21'	2.83'	8.42'	16.08'	23.75'	31.42'	1.46'	3"	4"	2.03	3.78	5.54	7.28	17	20	23	27
60"	8'-6"	3.56'	19.55'	23.11'	19.03'	23'	3.00'	9.00'	17.50'	26.00'	34.50'	1.50'	3"	4"	2.28	4.36	6.43	8.50	18	22	25	29

△ 6.42' △ 6.25' Dimensions permitted to allow use of 8' standard pipe lengths.
◇ 10.40' ◇ 10.10' Dimensions permitted to allow use of 12' standard pipe lengths.
△ ◇ Concrete slab shall be deepened to form bridge across crown of pipe. See section below.

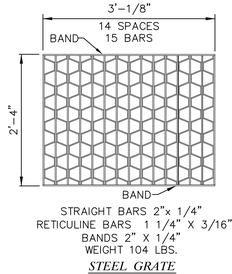


TOP VIEW-SINGLE PIPE



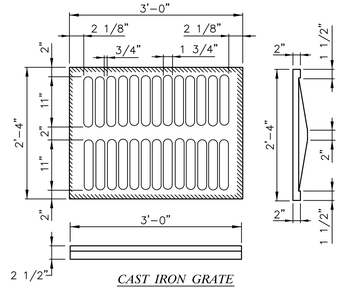
SECTION

MITERED END SECTION FDOT INDEX NO. 273
N.T.S.

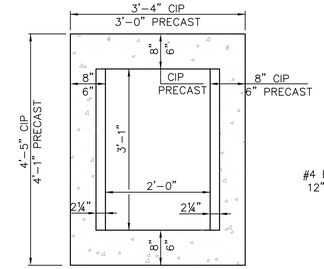


STRAIGHT BARS 2"x 1/4"
RETICULINE BARS 1 1/4" X 3/16"
BANDS 2" X 1/4"
WEIGHT 104 LBS.

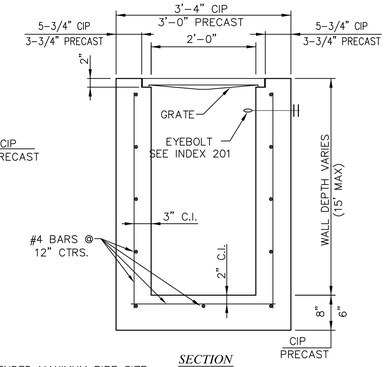
STEEL GRATE



CAST IRON GRATE
Approx. Weight 235 Lbs.



PLAN



SECTION

RECOMMENDED MAXIMUM PIPE SIZE:
2'-0" WALL – 18" PIPE
3'-1" WALL – 24" PIPE

TYPE "C" INLET FDOT INDEX NO. 232
N.T.S.

Excel Engineering CONSULTANTS, LLC.
ENVIRONMENTAL & CIVIL ENGINEERS
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2722 W. SHORE BOULEVARD
CASSELBERRY, FL. 32707
TEL. (407) 260-2292
FAX (407) 260-2293
WWW.EXCELENGINEERS.COM

Miscellaneous Details

Semoran Crossroads Stormwater Pond

ENGINEER HEREBY EXPRESSLY RESERVES HIS COMMON LAW COPYRIGHT AND OTHER PROPERTY RIGHTS IN THESE DRAWINGS. THESE DRAWINGS SHALL NOT BE REPRODUCED OR ASSIGNED TO ANOTHER PARTY WITHOUT THE WRITTEN PERMISSION AND CONSENT OF THE ENGINEER.

REVISIONS:

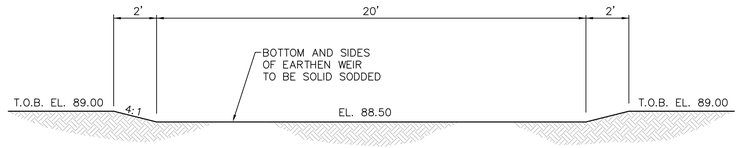
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1	Revised M.E.S. Detail	12/13/11

JULIAN R. COTO DATE
P.E. LICENSE #0033635

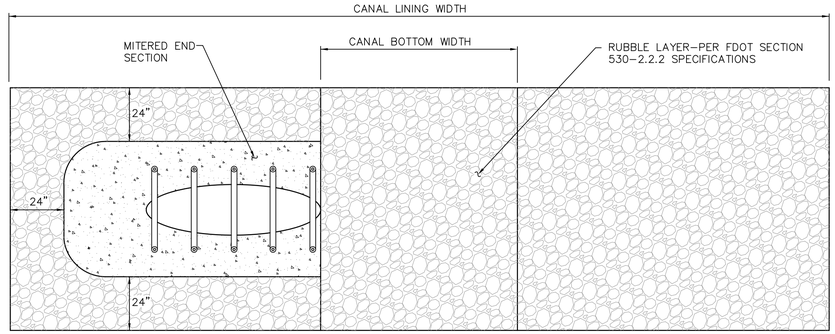
PROJECT NUMBER
JEN01-0109

SCALE: AS SHOWN
DRAWN: T.N.S.
CHECKED: M.R.
APPROVED: J.C.
DATE: 8/1/13

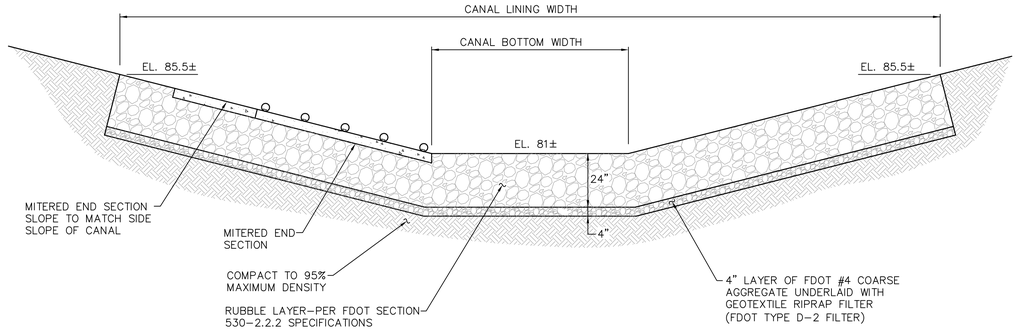
SHEET NO. 7 OF 9



EARTHEN WEIR DETAIL
N.T.S.
3

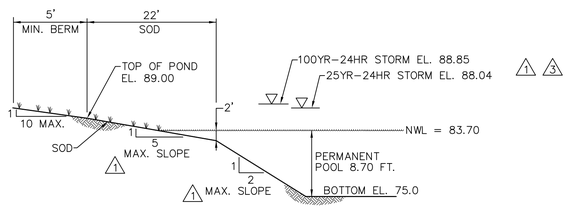


PLAN VIEW



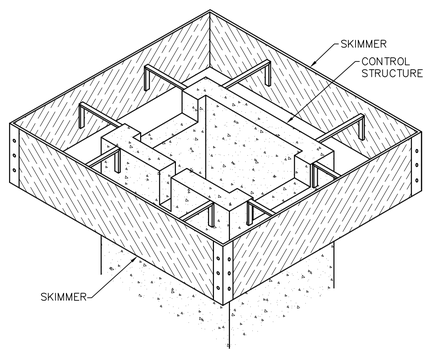
SECTION VIEW

RIPRAP SPLASH PAD AND CANAL LINING 1
N.T.S.

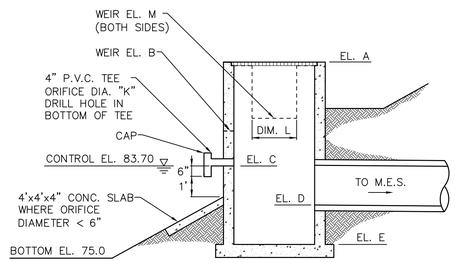


NOTES:
1. SOD IS TO BE PLACED TO EDGE OF WATER.
2. EXTEND LIMITS OF SODDING TO A MINIMUM OF TWO (2') BEYOND TOP OF BANK.
3. PERMANENT POOL VOLUME SHALL MEET THE REQUIREMENTS OF THE SJRWMD.

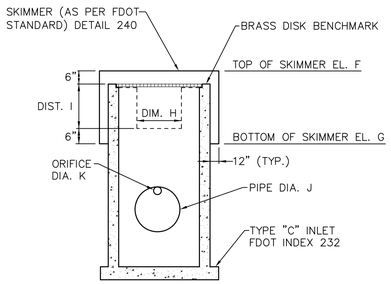
TYPICAL WET POND 1 SECTION 1 3
N.T.S.



SKIMMER ISOMETRIC VIEW
N.T.S.
3



SECTION VIEW
3



FRONT VIEW
3

CONTROL STRUCTURE DIMENSIONS AND ELEVATIONS 1 3

POND	STRUCTURE	EL. A	EL. B	EL. C	EL. D	EL. E	EL. F	EL. G	DIM. H	DIST. I	DIA. J	DIA. K	DIM. L	EL. M
POND 1	CS–1	88.43	84.65	83.70	83.50	80.50	88.93	84.15	7.00"	3.78'	24"	3.5"	36" (2 EACH)	86.03

CONTROL STRUCTURE (CS-1) 1
N.T.S.

Excel Engineering CONSULTANTS, LLC.
ENVIRONMENTAL & CIVIL ENGINEERS
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122 WILSHIRE BOULEVARD
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WWW.EXCELENGINEERS.COM

Miscellaneous Details

Semoran Crossroads Stormwater Pond

ENGINEER HEREBY EXPRESSLY RESERVES HIS COMMON LAW COPYRIGHT AND OTHER PROPERTY RIGHTS IN THESE DRAWINGS. THESE DRAWINGS SHALL NOT BE REPRODUCED OR ASSIGNED TO ANOTHER PARTY WITHOUT THE WRITTEN PERMISSION AND CONSENT OF THE ENGINEER.

REVISIONS:

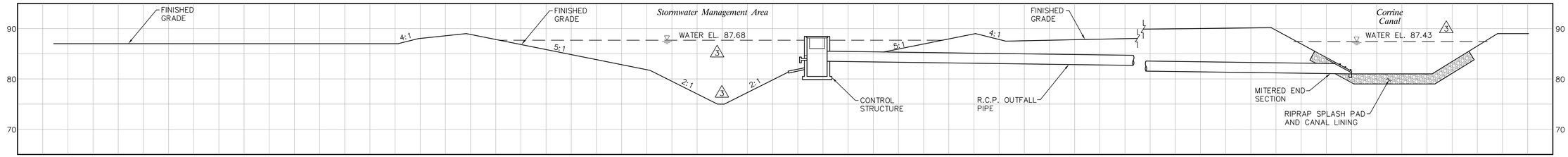
NUMBER	DESCRIPTION	DATE
1	Revised Control Structure Detail, Typical Wet Pond Section and Riprap Splash Pad and Channel Lining Detail	12/13/11
3	Revised Control Structure Detail, Typical Wet Pond Section and Added Earthen Weir Detail	8/1/13

JULIAN R. COTO DATE
P.E. LICENSE #0033635

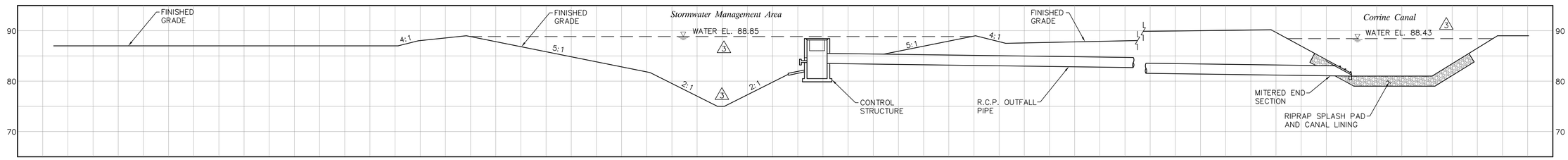
PROJECT NUMBER
JEN01-0109

SCALE: AS SHOWN
DRAWN: T.N.S.
CHECKED: M.R.
APPROVED: J.C.
DATE: 8/1/13

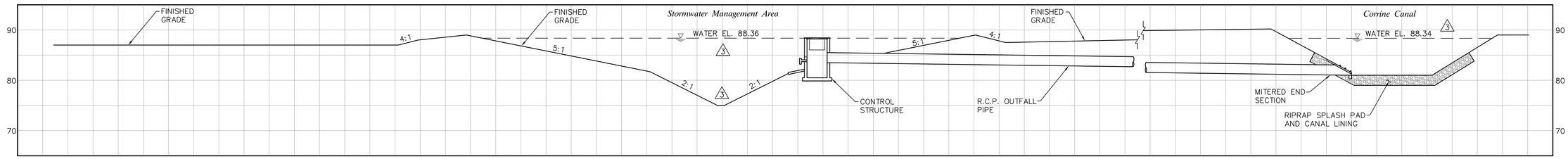
SHEET NO. 8
OF 9



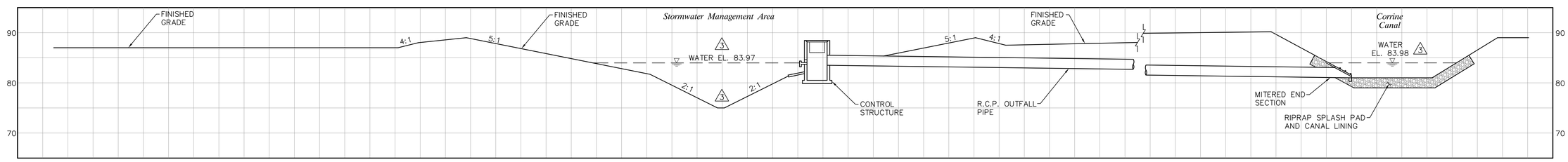
SECTION THROUGH CONTROL STRUCTURE
TIME: 24.00 HOURS
SCALE: 1"=10'



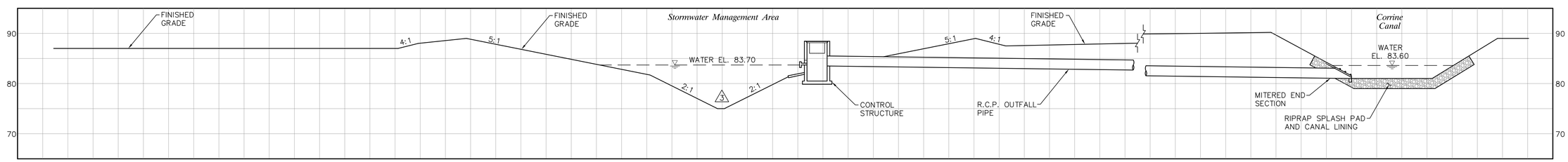
SECTION THROUGH CONTROL STRUCTURE
TIME: 12.56 HOURS - PEAK STAGE POND
SCALE: 1"=10'



SECTION THROUGH CONTROL STRUCTURE
TIME: 12.05 HOURS - END CANAL INFLOW TO POND
SCALE: 1"=10'



SECTION THROUGH CONTROL STRUCTURE
TIME: 6.10 HOURS - BEGIN CANAL INFLOW TO POND
SCALE: 1"=10'



SECTION THROUGH CONTROL STRUCTURE
TIME: 0.00 HOURS
SCALE: 1"=10'

Excel Engineering CONSULTANTS, LLC.
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Stage/Storage Of Pond And Canal

Semoran Crossroads Stormwater Pond

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REVISIONS:

NUMBER	DESCRIPTION	DATE
1	Revised Control Structure Detail, Typical Wet Pond Section and Riprap Splash Pad and Channel Lining Detail	12/13/11
2	Added New Sheet For Stage/Storage	3/29/12
3	Revised Pond, Revised Pond and Canal Time – Storage Information	8/1/13

JULIAN R. COTO DATE
P.E. LICENSE #0033635

PROJECT NUMBER
JEN01-0109

SCALE: AS SHOWN
DRAWN: T.N.S.
CHECKED: M.R.
APPROVED: J.C.
DATE: 8/1/13

SHEET NO. 9 (2)
OF 9

Wal-Mart Neighborhood Market (Semoran Crossings)
SJRWMD Permit #4-095-74860-6

STORMWATER DRAINAGE DESIGN REPORT

FOR

WAL-MART NEIGHBORHOOD MARKET STORE NO. 5988-01
N.E. QUADRANT OF NORTH SEMORAN BLVD. AND AUVERS BLVD.
CITY OF ORLANDO, ORANGE COUNTY, FLORIDA

cph

Engineers
Planners
Landscape Architects
Surveyors
Construction Management
Design/Build

Certificate of Authorization No. 00003215

500 WEST FULTON STREET
SANFORD, FLORIDA 32771
PHONE: 407-322-6841
FAX: 407-330-0639



TABLE OF CONTENTS

	Page No.
Executive Summary	1

APPENDICES

	Appendix
Location Map	A
USGS Quad Map	B
SCS Soils Map	C
FEMA Flood Map	D
Excerpts of Submitted "Semoran Crossings Stormwater Pond" Report and Calculations (SJRWMD Application #4-095-47860-5)	E
Proposed Grading and Storm Drainage Plan	F
Stormsewer Analysis	G

Executive Summary

Executive Summary

Introduction:

The proposed Wal-Mart Neighborhood Market is located on 7.74 acres of land at the northeast corner of N. Semoran Boulevard and Auvers Boulevard in Orlando, FL (unincorporated Orange County) in Section 15 Township 22S Range 30E. The site is bounded by North Semoran Blvd. to the west, Auvers Blvd. and Orange County's Corrine Canal to the south, a warehouse/storage facility to the north and vacant industrially zoned property and stormwater pond to the east. Please reference the Location map within Appendix A for further information. The proposed development will provide for the construction of a 43,011 +/- SF store, associated parking, utilities and a stormsewer conveyance system to connect to the stormwater pond to the east currently under review with SJRWMD (Application No. 4-095-74860-5).

Existing Stormwater Drainage Conditions:

The site is currently undeveloped and consists primarily of relatively flat open pasture grasslands that overland drain generally to the south and east to the Corrine Canal and the property containing the stormwater pond the site is to connect to. This stormwater pond ultimately discharges to the Corrine Canal. Please reference the USGS Quad map within Appendix B for further information.

According to the SCS Soil Survey for Orange County, the predominant soil type is identified as Samsula-Hontoon Basinger Association, Depressional (#41). Please reference Appendix C for the SCS Soil Survey figure for the site. For additional site specific soil details and boring/soil profile information please refer to the geotechnical soils report completed by ECS Florida, LLC.

The site is within the 100-year flood plain according to the US FEMA maps (FIRM Panel #12095C0260F) which is provided within Appendix D. The base flood elevation for the property is 90.0' and the minimum finished floor elevation for the site shall be 91.0'. The proposed finished floor of the Wal-Mart Neighborhood Market is 92.0'.

There are no wetlands located within the proposed development. However, a 0.10-acre impact is proposed to the Corrine Canal for construction of a 12' (w) x 9' (h) box culvert and associated headwalls. This impact is needed to construct an access driveway to Auvers Boulevard.

Stormwater Management System Design:

Runoff from the Wal-Mart Neighborhood Market site as well as the runoff from a potential future outparcel located at the southwest corner of the parcel will be conveyed through a series of storm pipes to the stormwater pond under review in the "Semoran Crossroads Stormwater Pond" project, (SJRWMD Application No. 4-095-74860-5) for treatment and attenuation.

Excerpts of this report are included within Appendix E including the pre and post-development drainage maps, the post development curve number determination and the water quality calculations for the Semoran Crossings stormwater pond. The proposed

development associated with this report and application is within the basins labeled "Basin Pre-1" and "Basin-Post 1" in the report shown in Appendix E.

Proposed Stormwater Management System:

Please reference the full stormwater report and calculations under review in the mentioned application for the complete design information including the flood zone compensating storage, complete water quality determination, peak design storm pond elevations and the flow rate attenuation values. This project will connect to the permitted stormwater pond as shown on the grading and storm drainage plan within Appendix F.

The table below depicts the amount of impervious area that the Semoran Crossings stormwater pond has been designed for and the amount of proposed impervious area associated with this development and the remaining amount of future impervious area that the Semoran Crossings stormwater pond has been designed to accommodate:

Proposed Impervious Area and Impact to Semoran Crossings Stormwater Pond	
Amount of Impervious Area Semoran Crossings Stormwater Pond Designed To Accommodate*	5.76 acres
Amount of Impervious Area Proposed with this Development to Discharge to Semoran Crossing Stormwater Pond	4.59 acres
Remaining Amount of Impervious Area Permitted to Discharge to Semoran Crossings Stormwater Pond	1.17 acres

*Please reference the post-development curve number determination and water quality calculations submitted for the Semoran Crossings stormwater pond within Appendix E.

The table below depicts the amount of compensating storage provided within the Semoran Crossings stormwater pond and the amount of storage required for the proposed Wal-Mart development:

Proposed Compensating Storage	
Amount of Compensating Storage Provided within the Semoran Crossings Stormwater Pond	11.56 ac-ft
Amount of Compensating Storage Required for the Proposed Wal-Mart Development*	11.27 ac-ft

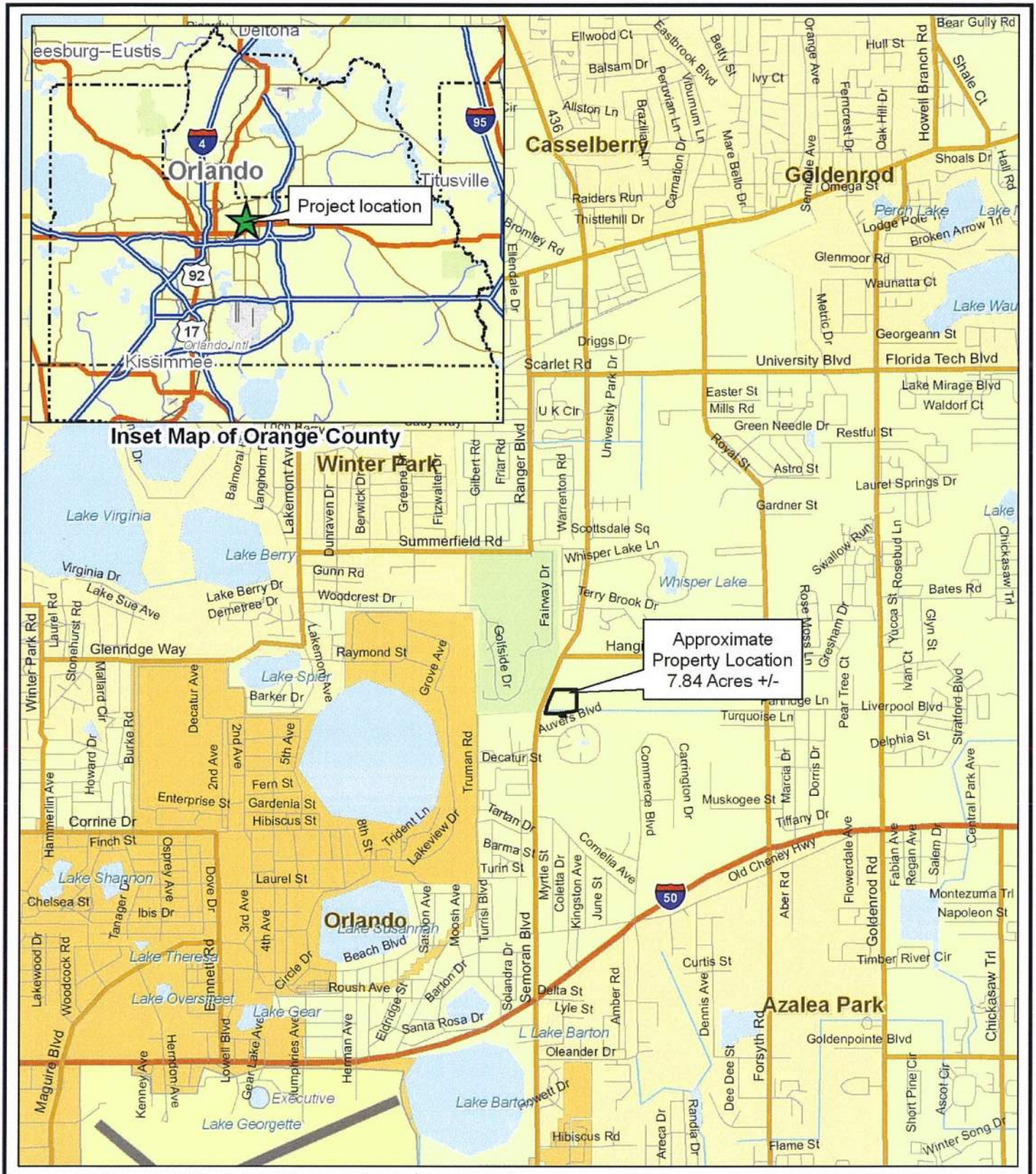
*The amount of required compensating storage was calculated as the volume between existing grade and a flood elevation of 90.00 using surface attributes within the AutoCAD program.

A stormsewer analysis has been completed to adequately size the stormsewer conveyance system that will be constructed to route both the Wal-Mart facility and parking lot as well as provide a future connection for an outparcel located at the southwest quadrant of the property. A copy of this analysis is included within Appendix

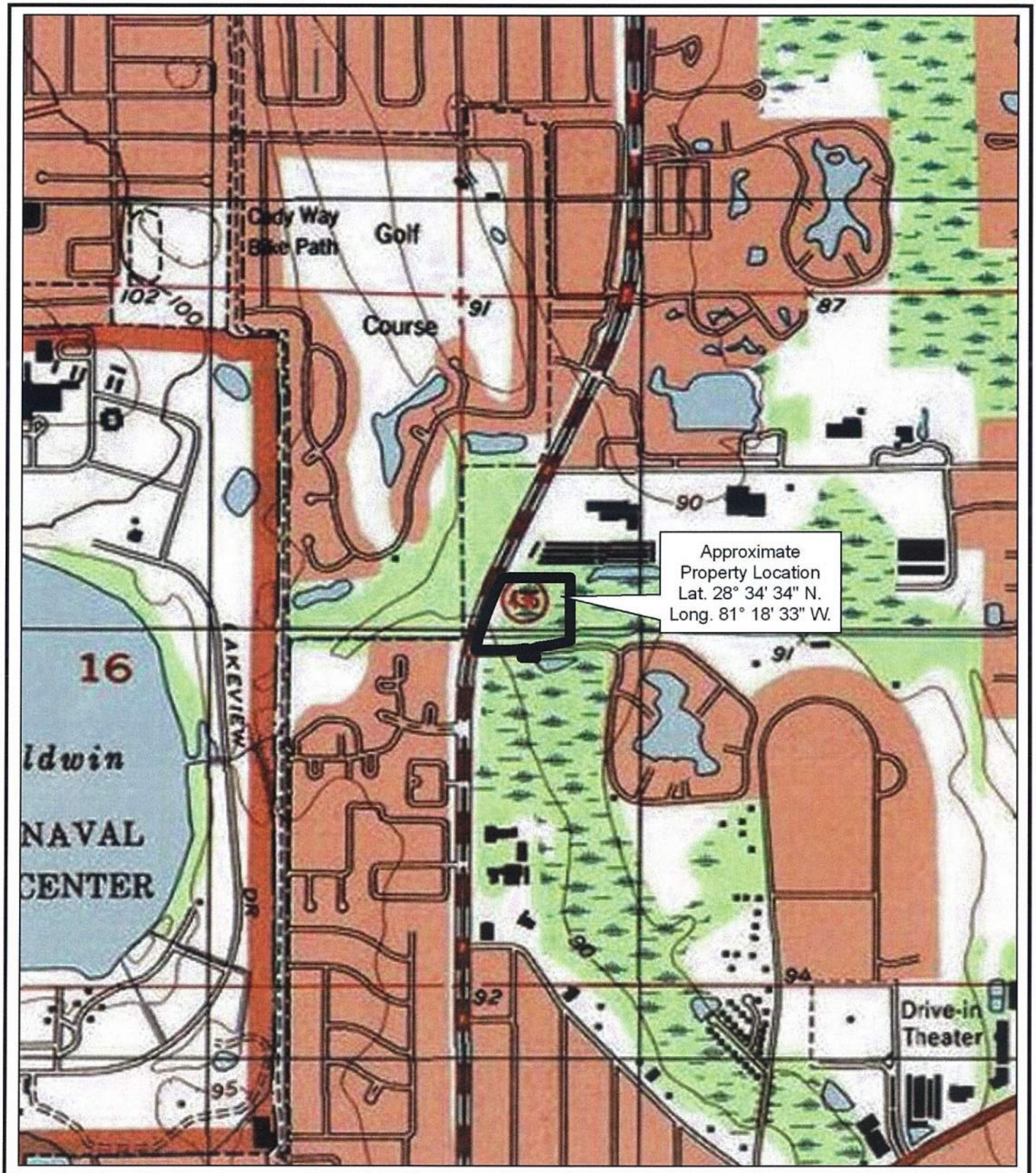
G for reference. A tailwater elevation of 88.06' was used based on the 10-year 24-hour peak stage for the Semoran Crossings stormwater pond.

The proposed 12'x9' Corrine Canal box culvert was sized to match the existing upstream culvert under SR436.

Appendix A
Location Map


Inset Map of Orange County
Project location
Orlando
Titusville
Kissimmee
Deltona
Approximate Property Location 7.84 Acres +/-
Winter Park
Casselberry
Goldenrod
Azalea Park
Orlando
Lake Virginia
Lake Berry
Lake Spier
Lake Shannon
Lake Susannah
Lake Theresa
Lake Overstreet
Lake Gear
L Lake Barton
Lake Georgette
Lake Whisper
Perch Lake
Lake Wau
Summerfield Rd
Scarlet Rd
University Blvd
Florida Tech Blvd
Old Cheney Hwy
Semoran Blvd
Maguire Blvd
Ranger Blvd
Goldenrod Rd
Howell Branch Rd
Bear Gully Rd
Shoals Dr
Hall Rd
Shale Ct
Glenridge Way
Raymond St
Decatur St
Fern St
Gardenia St
Hibiscus St
Laurel St
Corrine Dr
Finch St
Chelsea St
Ibis Dr
Beach Blvd
Roush Ave
Delta St
Lyle St
Santa Rosa Dr
Oleander Dr
Goldenpointe Blvd
Timber River Cir
Napoleon St
Montezuma Trl
Chickasaw Trl
Liverpool Blvd
Delphia St
Tiffany Dr
Muskogee St
Turquoise Ln
Auvers Blvd
Gunn Rd
Woodcrest Dr
Lake Berry Dr
Demetree Dr
Lake Sue Ave
Virginia Dr
Summerfield Rd
Whisper Lake Ln
Terry Brook Dr
Scottsdale Sq
Warrenton Rd
Fairway Dr
Goldside Dr
Truman Rd
Grove Ave
Lakemont Ave
Dunraven Dr
Berwick Dr
Greene Dr
Fitzwalter Dr
Gilbert Rd
Friar Rd
Balmoral Rd
Langholm Dr
University Park Dr
U K Cir
Easter St
Mills Rd
Green Needle Dr
Restful St
Royal St
Astro St
Gardner St
Laurel Springs Dr
Lake Mirage Blvd
Waldorf Ct
Georgeann St
Waunatta Ct
Glenmoor Rd
Broken Arrow Trl
Lodge Pole Trl
Omega St
Driggs Dr
Bromley Rd
Ellendale Dr
Raiders Run
Thistlehill Dr
Carnation Dr
Mare Bello Dr
Seminole Ave
Orange Ave
Oak Hill Dr
Forrest Dr
Ivy Ct
Betty St
Eastbrook Blvd
Peruvian Ln
Viburnum Ln
Brazilian Ln
Allston Ln
Balsam Dr
Ellwood Ct
Hull St
Swallow Run
Rosebud Ln
Rose Moss Ln
Gresham Dr
Yucca St
Glyn St
Ivan Ct
Bates Rd
Chickasaw Trl
Pear Tree Ct
Partridge Ln
Stratford Blvd
Central Park Ave
Salem Dr
Regan Ave
Fabian Ave
Flowerdale Ave
Aber Rd
Marcia Dr
Dorris Dr
Carrington Dr
Commerce Blvd
Cornelia Ave
Myrtle St
Coletta Dr
Kingston Ave
June St
Turrisi Blvd
Solandra Dr
Amber Rd
Dennis Ave
Forsyth Rd
Dee Dee St
Areca Dr
Randia Dr
Hibiscus Rd
Flame St
Winter Song Dr
Short Pine Cir
Ascot Cir
Curtis St
Lake Mirage Blvd
Tartan Dr
Barma St
Turin St
Trident Ln
Lakeview Dr
8th St
5th Ave
4th Ave
3rd Ave
2nd Ave
Decatur Ave
Howard Dr
Burke Rd
Hammerlin Ave
Enterprise St
Osprey Ave
Dove Dr
Tanager Dr
Lakewood Dr
Woodcock Rd
Bennett Rd
Circle Dr
Barlom Dr
Moosh Ave
Sarbon Ave
Eldridge St
Herman Ave
Lowell Blvd
Gear Lake Ave
Humphries Ave
Kenney Ave
Herndon Ave
Executive
Lake Barton Dr
Laurel Rd
Stonehurst Rd
Winter Park Rd
Howard Ct
Lake Spier Dr
Barker Dr
Lake Sue Ave
Lake Berry Dr
Demetree Dr
Gunn Rd
Woodcrest Dr
Lakemont Ave
Raymond St
Glenridge Way

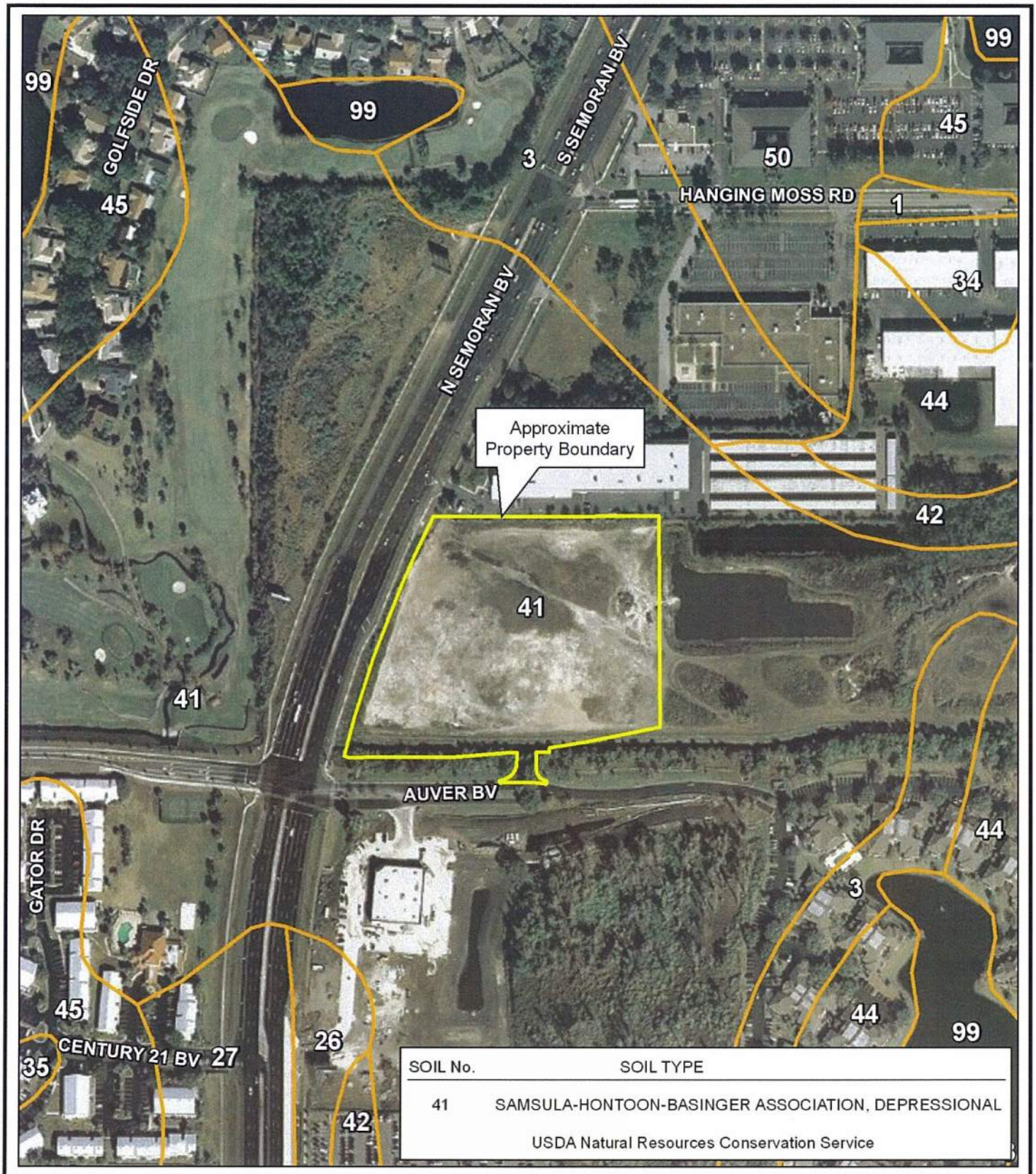
Appendix B
USGS Quad Map



cph	Scale: 1" = 1000' Date: March 2012 Photo Date: N/A Project No. W13405.2 Biologist: GIS: DEM	N	USGS QUAD SHEET - ORLANDO EAST WALMART NEIGHBORHOOD MARKET STORE #5988-00 SECTION 15, TOWNSHIP 22 SOUTH, RANGE 30 EAST ORANGE COUNTY, FLORIDA

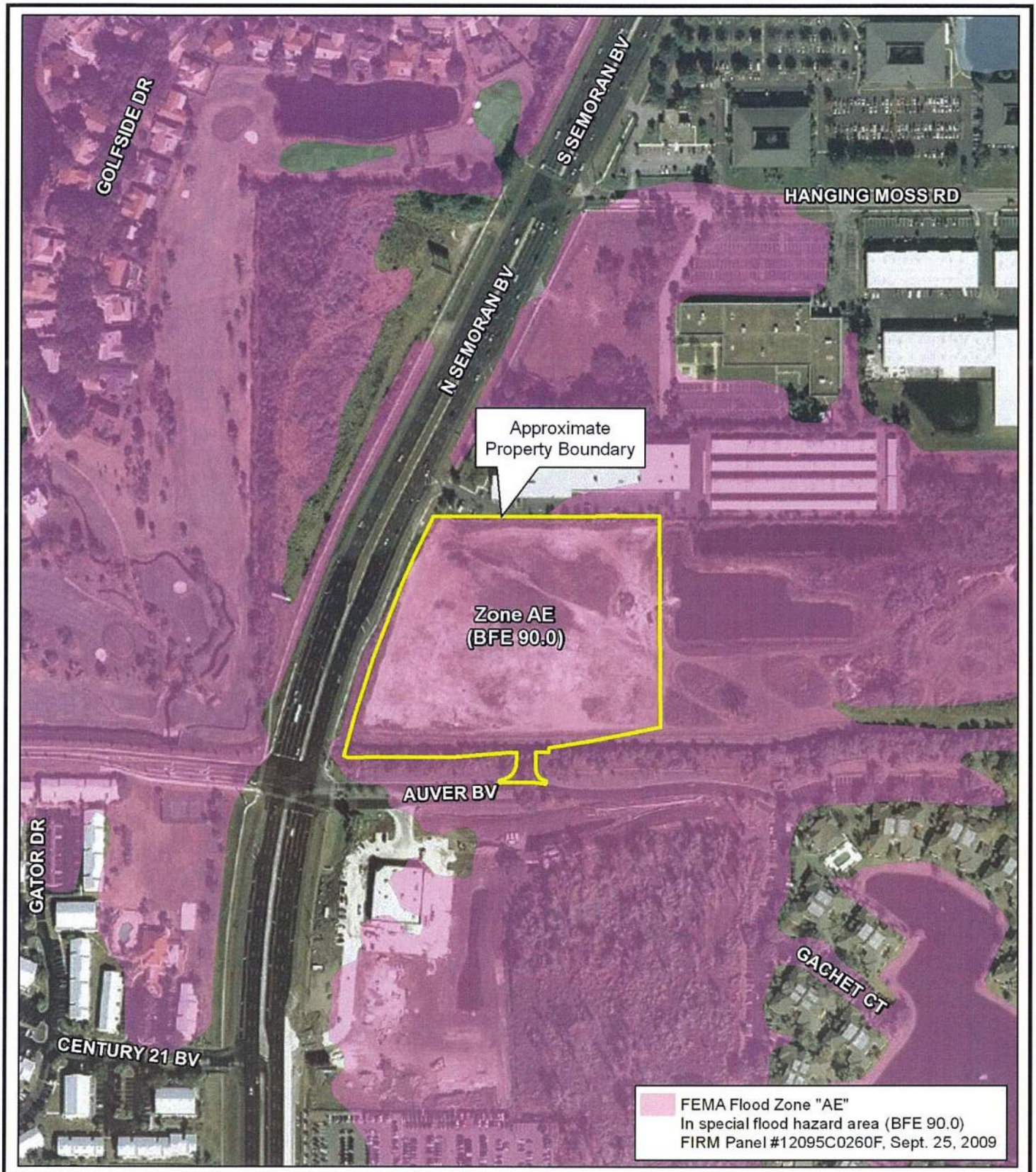
FIGURE 2

Appendix C
SCS Soils Map



cph	Scale: 1" = 300' Date: March 2012 Photo Date: 2009 Project No. W13405.2 Biologist: GIS: DEM	N	SOILS MAP WALMART NEIGHBORHOOD MARKET STORE #5988-00 SECTION 15, TOWNSHIP 22 SOUTH, RANGE 30 EAST ORANGE COUNTY, FLORIDA	FIGURE 3

Appendix D
FEMA Flood Map

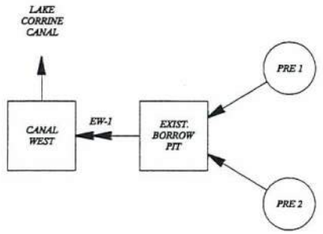


cph	Scale: 1" = 300' Date: March 2012 Photo Date: 2009 Project No. W13405.2 Biologist: GIS: DEM	N	FEMA FLOOD MAP WALMART NEIGHBORHOOD MARKET STORE #5988-00 SECTION 15, TOWNSHIP 22 SOUTH, RANGE 30 EAST ORANGE COUNTY, FLORIDA	FIGURE 4

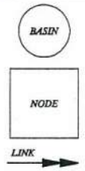
Appendix E
Excerpts of Submitted "Semoran Crossings Stormwater Pond" Report and Calculations (SJRWMD Application #4-095-47860-5)

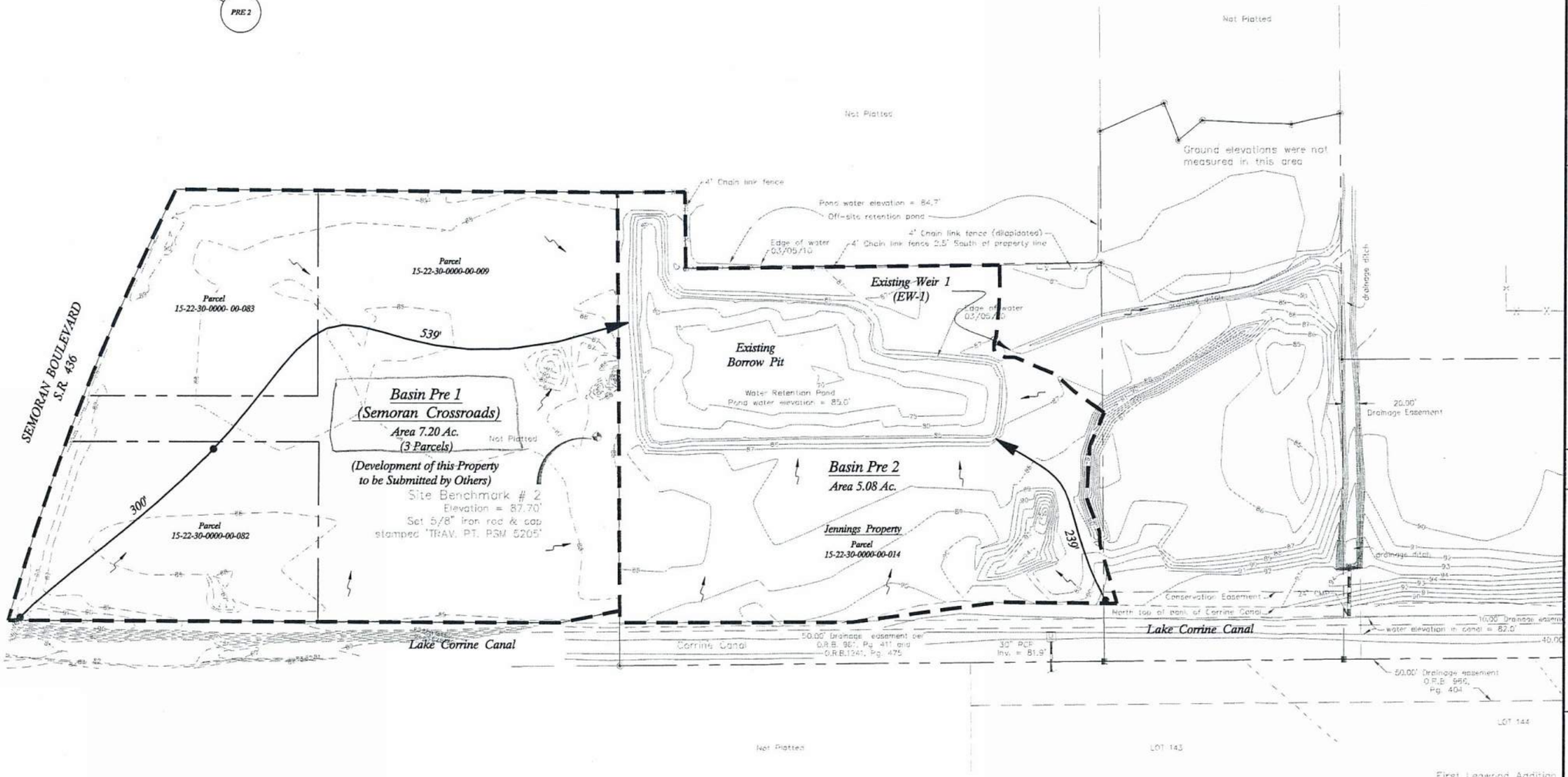
PRE-DEVELOPMENT

NODAL DIAGRAM



NODAL LEGEND





1" = 60'
GRAPHIC SCALE
0 30 60 120

LEGEND

Direction Of Flow Pre-Basin

300' Sheet Flow 300' Shallow Concentrated Flow (For Calculation of Tc)

Excel Engineering
ENVIRONMENTAL & CIVIL ENGINEERS
237 W. KONRE BRIDGE ROAD
CASSELBERRY, FL 32707
TEL: (407) 260-2292
FAX: (407) 260-1193
WWW.EXCELENGINEERS.COM

Pre-Development Drainage Basins

Semoran Crossings Stormwater Pond

ENGINEER HEREBY EXPRESSLY RESERVES HIS COMMON LAW COPYRIGHT AND OTHER PROPERTY RIGHTS IN THESE DRAWINGS. THESE DRAWINGS SHALL NOT BE REPRODUCED, CHANGED OR COPIED IN ANY FORM OR MANNER WHATSOEVER NOR ASSIGNED TO ANY THIRD PARTY WITHOUT FIRST OBTAINING THE EXPRESS WRITTEN PERMISSION AND CONSENT OF THE ENGINEER

REVISIONS:

DESCRIPTION	DATE

JULIAN R. COTO DATE
P.E. LICENSE #0033635

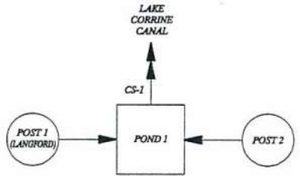
PROJECT NUMBER
JEN01-0109

SCALE: AS SHOWN
DRAWN: T.N.S.
CHECKED: M.R.
APPROVED: J.C.
DATE: 10/13/11

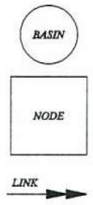
SHEET NO. 3 OF 8

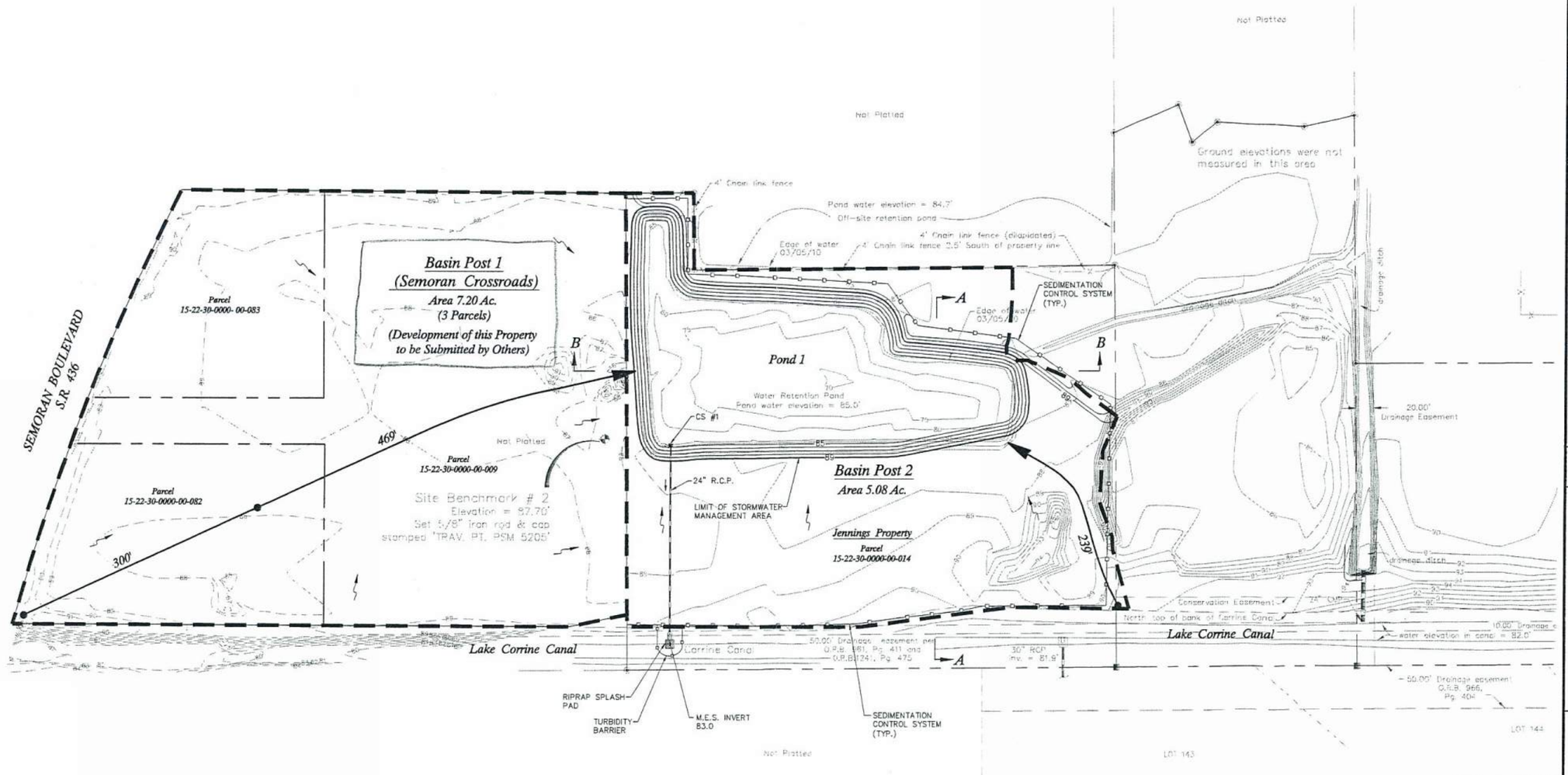
POST DEVELOPMENT

NODAL DIAGRAM



NODAL LEGEND:





NOTES:

1. LOCATION OF UNDERGROUND PIPING AND OTHER UTILITIES ASSUMED.
2. CONTRACTOR TO FIELD VERIFY THE LOCATION OF ALL UNDERGROUND UTILITIES PRIOR TO BEGINING CONSTRUCTION

LEGEND

Direction Of Flow Post-Basin

300' Sheet Flow — 300' Shallow Concentrated Flow (For Calculation of Tc)

1" = 60' GRAPHIC SCALE (0, 30, 60, 120)

Excel Engineering
ENVIRONMENTAL & CIVIL ENGINEERS
122 WILSHIRE BOULEVARD
CASSELBERRY, FL 32707
TEL: (407) 260-2292
FAX: (407) 260-1193
WWW.EXCELENGINEERS.COM

Post-Development Drainage Basins and Grading Plan

Semoran Crossings Stormwater Pond

ENGINEER HEREBY EXPRESSLY RESERVES HIS COMMON LAW COPYRIGHT AND OTHER PROPERTY RIGHTS IN THESE DRAWINGS. THESE DRAWINGS SHALL NOT BE REPRODUCED OR ASSIGNED TO ANOTHER PARTY WITHOUT THE WRITTEN PERMISSION AND CONSENT OF THE ENGINEER

REVISIONS: DESCRIPTION DATE

JULIAN R. COTO, P.E. LICENSE #0033635 DATE

PROJECT NUMBER JEN01-0109

SCALE: AS SHOWN
DRAWN: T.N.S.
CHECKED: M.R.
APPROVED: J.C.
DATE: 10/13/11

SHEET NO. 4 OF 8

PROJECT: Hanging Moss
BASIN DESIGNATION: Post-1 (Langford)

SUB-BASIN ANALYSIS & CURVE NUMBER DETERMINATION

TYPE of EVALUATION: POST- DEVELOPMENT
(PRE- or POST-)

BASIN SIZE: 7.20 acres.

Determine Basin Runoff Curve Number: CN

Land Use Description	Hydrologic Soil Group	CN	AREA (ac.)	Product
Open Space, Good Condition	B/D	80		
Open Space, Good Condition	D	80		
Open Space, Poor Condition	B/D	89	1.44	128.16
Open Space, Poor Condition	D	89		
Water Surface	N/A	100		
Impervious Areas - Asphalt, Sidewalks, roofs, etc..	N/A	98	5.76	564.48
Wetland	N/A			
			7.20	692.64

WEIGHTED CN = (PRODUCT SUM) / (AREA) = 692.64 / 7.20 = 96.20

USE CN = 96

PROJECT: Hanging Moss
BASIN DESIGNATION: Post-2

SUB-BASIN ANALYSIS & CURVE NUMBER DETERMINATION

TYPE of EVALUATION: POST- DEVELOPMENT
(PRE- or POST-)

BASIN SIZE: 5.08 acres.

Determine Basin Runoff Curve Number: CN

Land Use Description	Hydrologic Soil Group	CN	AREA (ac.)	Product
Open Space, Good Condition	B/D	80	3.89	310.90
Gravel over Open Space, Good Condition	B/D	80		
Open Space, Poor Condition	D	89		
Gravel Open Space, Poor Condition	D	89		
Water Surface	N/A	100	1.19	119.38
Impervious Areas - Asphalt, Sidewalks, roofs, etc..	N/A	98		
Wetland	N/A			
			5.08	430.28

$$\text{WEIGHTED CN} = \frac{\text{(PRODUCT SUM)}}{\text{(AREA)}} = \frac{430.28}{5.08} = 84.70$$

USE CN = 85

PROJECT: Hanging Moss
POND DESIGNATION: Pond 1

Water Quality Calculations:

Contributing Basins = Post-1 (Langford) & Post 2

Full Basin Area = 12.28 Ac
Impervious Area = 5.76 Ac.

1.0" of Full Basin Area = 1.023 Ac.-Ft
or
2.5" of Impervious Area = 1.200 Ac.-Ft.

Req. Water Quality Vol. = 1.200 Ac.-Ft.

Pond Stage-Storage:

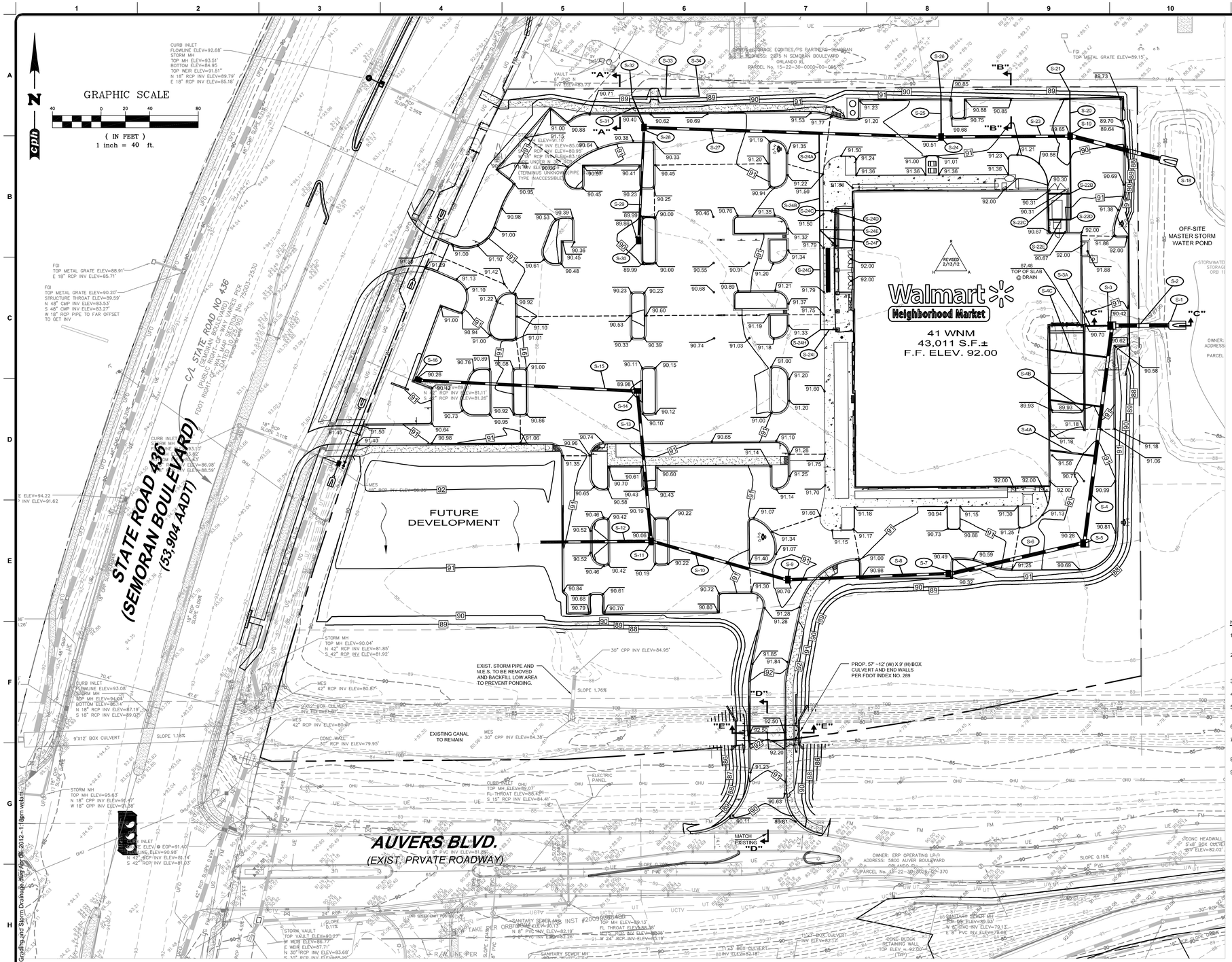
Pond Type = Wet Detention
Control (Perm. Pool) Elevation 83.50
Water Quality (Weir) Elevation = 84.50

	Pond Stage (ft)	Increment (ft)	Area (sf)	Incremental Volume (cf)	Cumulative Volume (cf)	Cumulative Volume (Ac-ft)
Control Elevation:	83.50		52,002		-	-
	84.00	0.50	53,766	26,442	26,442	0.607
	85.00	1.00	57,591	55,679	82,121	1.885
	86.00	1.00	61,659	59,625	141,746	3.254
	87.00	1.00	67,966	64,813	206,558	4.742
	88.00	1.00	143,881	105,924	312,482	7.174
	89.00	1.00	185,810	164,846	477,327	10.958

Permanent Pool:

Pond Bottom	70.00		446		-	-
	71.00	1.00	6,604	3,525	3,525	0.081
	72.00	1.00	12,582	9,593	13,118	0.301
	73.00	1.00	15,826	14,204	27,322	0.627
	74.00	1.00	19,559	17,693	45,015	1.033
	75.00	1.00	22,871	21,215	66,230	1.520
	76.00	1.00	26,284	24,578	90,807	2.085
	77.00	7.00	29,811	105,900	105,900	2.431
	78.00	1.00	33,325	31,568	137,468	3.156
	79.00	1.00	36,880	35,103	172,570	3.962
	80.00	1.00	40,484	38,682	211,252	4.850
	81.00	1.00	43,774	42,129	253,381	5.817
	82.00	1.00	47,069	45,422	298,803	6.860
	83.00	0.50	50,238	49,536	348,338	7.997
	83.50		52,002	12,560	348,338	7.997

Appendix F
Proposed Grading and Storm Drainage Plan


GRAPHIC SCALE
40 0 20 40 80
(IN FEET)
1 inch = 40 ft.
STATE ROAD 436
(SEMORAN BOULEVARD)
(53,904 AADT)
C/L STATE ROAD NO. 436
(PUBLIC SEMORAN BOULEVARD - WAY VARIES PER DEPARTMENT MAP RECORD No. 75030-2530 FOOT RIGHT-OF-WAY VARIES PER DEPARTMENT MAP RECORD No. 75030-2530)
FUTURE DEVELOPMENT
Walmart
Neighborhood Market
41 WNM
43,011 S.F.±
F.F. ELEV. 92.00
OFF-SITE MASTER STORM WATER POND
AUVERS BLVD.
(EXIST. PRVATE ROADWAY)
EXIST. STORM PIPE AND M.E.S. TO BE REMOVED AND BACKFILL LOW AREA TO PREVENT PONDING.
PROP. 57' -12' (W) X 9' (H) BOX CULVERT AND END WALLS PER FDOT INDEX NO. 289
EXISTING CANAL TO REMAIN
MATCH EXISTING "D"
REVISED 2/13/12
TOP OF SLAB @ DRAIN 87.48
"A"
"B"
"C"
"D"
"E"
CURB INLET
PLOWLINE ELEV=92.68'
STORM MH
TOP MH ELEV=93.51'
BOTTOM ELEV=84.95'
TOP WER ELEV=91.51'
N 18" RCP INV ELEV=89.79'
E 18" RCP INV ELEV=85.18'
FGI
TOP METAL GRATE ELEV=88.91'
E 18" RCP INV ELEV=85.71'
FGI
TOP METAL GRATE ELEV=90.20'
STRUCTURE THROAT ELEV=89.59'
N 48" CMP INV ELEV=83.53'
S 48" CMP INV ELEV=83.27'
W 18" RCP PIPE TO FAR OFFSET TO GET INV
CURB INLET
PLOWLINE ELEV=93.10'
STORM MH
TOP MH ELEV=93.40'
BOTTOM ELEV=86.42'
N 42" RCP INV ELEV=86.98'
S 42" RCP INV ELEV=88.59'
E ELEV=94.22
INV ELEV=91.62
STORM MH
TOP MH ELEV=90.04'
N 42" RCP INV ELEV=81.85'
S 42" RCP INV ELEV=81.92'
CURB INLET
PLOWLINE ELEV=93.08'
STORM MH
TOP MH ELEV=94.04'
BOTTOM ELEV=86.14'
N 18" RCP INV ELEV=87.19'
S 18" RCP INV ELEV=89.02'
9'X12' BOX CULVERT
SLOPE 1.18%
STORM MH
TOP MH ELEV=95.63'
N 18" CPP INV ELEV=91.47'
W 18" CPP INV ELEV=91.28'
CURB INLET
TOP MH ELEV=91.40'
PLOWLINE ELEV=90.98'
N 42" RCP INV ELEV=81.14'
S 42" RCP INV ELEV=81.03'
STORM VAULT
TOP VAULT ELEV=90.27'
W WER ELEV=86.77'
E WER ELEV=87.71'
N 30" RCP INV ELEV=83.68'
S 30" RCP INV ELEV=83.56'
SLOPE 0.11%
SANITARY SEWER MH
TOP MH ELEV=89.13'
FL THROAT ELEV=88.18'
W 8" PVC INV ELEV=82.19'
E 8" PVC INV ELEV=82.26'
SANITARY SEWER MH
TOP MH ELEV=89.23'
W 8" PVC INV ELEV=79.13'
E 8" PVC INV ELEV=79.08'
CONC. BLOCK RETAINING WALL TOP ELEV.=87.00' (TYP.)
SLOPE 0.15%
8" PVC
CONC HEADWALL 5'x6' BOX CULVERT INV ELEV=82.02'
OWNER: ERP OPERATING LP
ADDRESS: 5800 AUVER BOULEVARD
PARCEL No. 15-22-30-0000-00-370
OWNER: CHARTER SQUARE PARTNERS - SEMORAN
ADDRESS: 2375 N SEMORAN BOULEVARD ORLANDO, FL
PARCEL No. 15-22-30-0000-00-085
STORMWATER STORAGE ORB 10
PARCEL
ELECTRIC PANEL
CURB INLET
TOP MH ELEV=89.07'
FL THROAT ELEV=88.42'
S 15" RCP INV ELEV=84.41'
CONC. WALL
30" RCP INV ELEV=79.95'
MES
42" RCP INV ELEV=80.87'
2-9'X7' BOX CULVERT
INV ELEV=80.87'
MES
42" RCP INV ELEV=80.87'
MES
30" CPP INV ELEV=84.38'
SLOPE 1.76%
30" CPP INV ELEV=84.95'
SLOPE 1.18%
SLOPE 0.15%
8" PVC
24" RCP
SLOPE 3.11%
18" RCP
SLOPE 1.26%
UNDERDRAIN
TOP MH ELEV=89.13'
FL THROAT ELEV=88.18'
W 8" PVC INV ELEV=82.19'
E 8" PVC INV ELEV=82.26'
1-23' BOX CULVERT
INV ELEV=82.27'
1-23' BOX CULVERT
INV ELEV=82.18'
R/W LINE PER ORB 10 PG 370
R/W LINE PER ORB 10 PG 370
CONC HEADWALL
INV ELEV=82.02'
SANITARY SEWER MH
SANITARY SEWER MH
SANITARY SEWER MH

CONSTRUCTION PLANS FOR SEMORAN CROSS ROADS PD

Walmart Neighborhood Market

NORTH SEMORAN BOULEVARD
ORANGE COUNTY, FL 32807

TAX PARCEL ID NUMBERS:

15-22-30-0000-00-082
15-22-30-0000-00-083
15-22-30-0000-00-009



VICINITY MAP
N.T.S.

OWNER

WAL-MART STORES EAST, LP
2001 S.E. 10TH STREET
BENTONVILLE, AR 72716-0550
PHONE: (479) 273-4000
ATTN: DESIGN MANAGER-FLORIDA

DEVELOPER

WAL-MART STORES EAST, LP
2001 S.E. 10TH STREET
BENTONVILLE, AR 72716-0550
PHONE: (479) 273-4000
ATTN: DESIGN MANAGER-FLORIDA

ENGINEER

CPH ENGINEERS, INC.
500 WEST FULTON STREET
POST OFFICE BOX 2808
SANFORD, FLORIDA 32772-2808
PHONE: (407) 322-6841
ATTN: DENVER M. MARLOW, P.E.

ARCHITECTS

RAYMOND HARRIS AND ASSOCIATES
211 N. RECORD ST., SUITE 222
DALLAS, TX 75202
PHONE: (214) 749-0626
ATTN: BRIAN CRAWFORD

ENVIRONMENTAL CONSULTANT

CPH ENGINEERS, INC.
500 W. FULTON STREET
SANFORD, FLORIDA 32771
PHONE: (407) 322-6841
ATTN.: AMY E. WRIGHT

SURVEYOR

CPH ENGINEERS, INC.
500 W. FULTON STREET
SANFORD, FLORIDA 32771
PHONE: (407) 322-6841
ATTN.:

LANDSCAPE ARCHITECT

CPH ENGINEERS, INC.
500 W. FULTON STREET
POST OFFICE BOX 2808
SANFORD, FLORIDA 32771
PHONE: (407) 322-6841
ATTN: GALEN J. PUGH, RLA, AICP

SOILS CONSULTANT

ECS FLORIDA, LLC.
2815 DIRECTORS ROW, SUITE 500
POST OFFICE BOX 2808
ORLANDO, FLORIDA 32809
PHONE: (407) 859-8378
ATTN: SUNIL SUNDARAM

UTILITY RESPONSIBILITY MATRIX FOR THIS PROJECT

UTILITY/ GOVERNING AGENCIES CONTACTS		* CONTRACTOR RESPONSIBILITY–	* OTHERS RESPONSIBILITY–
GAS	TECO PEOPLES GAS – ORLANDO 600 W. ROBINSON ST. ORLANDO, FL 32801 PHONE: (407) 420–6609 ATTN: DEBORAH FRAZIER	–COORDINATE CONSTRUCTION ACTIVITIES WITH GAS COMPANY TO ENSURE THE EXISTING GAS LINES ARE PROTECTED PRIOR TO ASPHALT OR CURB PLACEMENT –MAY REQUIRE A CLEARANCE FROM ANY OTHER UTILITY	–ANY RELOCATION OF EXISTING WILL BE DONE BY GAS COMPANY.
CABLE	BRIGHT HOUSE NETWORKS 3767 ALL AMERICAN BLVD. ORLANDO, FLORIDA 32810 CONTACT: MARVIN USRY PHONE: (407) 532–8509	–COORDINATE CONSTRUCTION ACTIVITIES WITH CABLE COMPANY TO ENSURE THE EXISTING CABLE LINES ARE PROTECTED PRIOR TO ASPHALT OR CURB PLACEMENT	–ANY RELOCATION OF EXISTING WILL BE DONE BY CABLE COMPANY.
TELEPHONE	CENTURY LINK 5812 RED BUG LAKE RD. WINTER PARK, FL 32708 PHONE: (407) 814–5321 ATTN: DAVID ROY	–COORDINATE CONSTRUCTION ACTIVITIES WITH TELEPHONE COMPANY TO ENSURE INSTALLATION OF UNDERGROUND LINES ARE COMPLETED PRIOR TO ASPHALT OR CURB PLACEMENT –PROVIDE AND INSTALL (X)–4" SCHEDULE 40 PVC CONDUITS WITH PULL ROPES, INCLUDING ALL TRENCHING AND BACKFILLING, FROM THE RISER POLE UP TO THE BUILDING –PROVIDE AND INSTALL PULL BOXES AS PER TELEPHONE COMPANY REQUIREMENTS	–TELEPHONE COMPANY WILL PROVIDE AND INSTALL ALL TELEPHONE CABLES FROM THE POINT OF CONNECTION UP TO THE BUILDING –ANY RELOCATION OF EXISTING WILL BE DONE BY CENTURY LINK.
ELECTRIC	PROGRESS ENERGY 452 EAST CROWN POINT ROAD WINTER GARDEN, FLORIDA 34787 PHONE: (407) 905–3303 ATTN: JEFF ZAHARIS	–PRIOR TO ANY DEMOLITION OR CONSTRUCTION, CONTRACTOR TO CONTACT PROG. EN. TO DISCUSS THE SCOPE OF WORK RELATING TO THE RELOCATION OF OUC SERVICES INCLUDING BUT NOT LIMITED TO THE EXISTING UTILITY POLES, OVERHEAD LINES ETC. BOTH ONSITE AND OFFSITE. AN APPLICATION NEEDS TO BE FILED WITH PROG. EN., CONTRACTOR SHALL CONTACT JEFF ZAHARIS WITH OUC AT 407–905–3303 –COORDINATE CONSTRUCTION ACTIVITIES WITH ELECTRIC COMPANY TO ENSURE INSTALLATION OF UNDERGROUND LINES ARE COMPLETED PRIOR TO ASPHALT OR CURB PLACEMENT –PROVIDE AND INSTALL (X)–4" SCHEDULE 40 PVC CONDUITS WITH PULL ROPES, INCLUDING TRENCHING AND BACKFILLING, FOR THE UNDERGROUND PORTIONS OF THE PRIMARY SERVICE FROM THE RISER POLE UP TO THE TRANSFORMER. SCHEDULE 80 PVC CONDUITS SHALL BE USED ON THE RISER POLE AND RIGID METAL, LONG RADIUS, ELBOWS SHALL BE USED WHERE THE UNDERGROUND PORTION MEETS THE RISER POLE AND TRANSFORMER –CONSTRUCT TRANSFORMER PAD AS PER THE ELECTRIC COMPANY'S SPECIFICATIONS –PROVIDE AND INSTALL ALL SECONDARY SERVICE AND MATERIALS –ALL COSTS OF POLE RELOCATION WILL BE THE CONTRACTORS RESPONSIBILITY.	–ELECTRIC COMPANY WILL PROVIDE AND INSTALL PRIMARY CABLE FOR ALL UNDERGROUND LINES UP TO THE TRANSFORMER –ANY RELOCATION OF EXISTING LINES OR POLES WILL BE DONE BY PROGRESS ENERGY.
SANITARY SEWER	CITY OF WINTER PARK UTILITIES 401 PARK AVE. SOUTH WINTER PARK, FL 32789 PHONE: (407) 599–3399 ATTN: SUELLEN SANDERS	–PROVIDE AND INSTALL SANITARY SEWER LINES AND ASSOCIATED APPURTENANCES PER THE PLANS AND SPECIFICATIONS –ALL PUBLIC AND PRIVATE SANITARY SEWER LINES SHALL BE PVC AND RATED SDR 35	
WATER	CITY OF WINTER PARK UTILITIES 401 PARK AVE. SOUTH WINTER PARK, FL 32789 PHONE: (407) 599–3399 ATTN: SUELLEN SANDERS	–PROVIDE AND INSTALL ALL WATER MAINS AND ASSOCIATED APPURTENANCES PER THE PLANS AND SPECIFICATIONS –ALL PUBLIC WATER MAINS SHALL BE D.I.P. –ALL PRIVATE WATER MAINS SHALL BE C–900 PVC, DR18 CLASS 150 OR DR14 CLASS 200 FOR OTHER MAINS. –ALL COSTS OF UTILITY RELOCATIONS WILL BE THE CONTRACTORS RESPONSIBILITY	–INSPECT THE POINT OF CONNECTION AT WATER MAIN AND UP TO POINT OF SERVICE, METER/VALVES. WATER METER WILL BE PROVIDED BY THE WATER COMPANY AT A COST. METER WILL BE EITHER INSTALLED BY THE WATER COMPANY OR THE CONTRACTOR WILL INSTALL UNDER THE INSPECTION OF THE WATER COMPANY.
STORM SEWER	SJRWMD 975 KELLER ROAD ALTAMONTE SPRINGS, FLORIDA 32714 (407) 659–4837 ATTN: MARJORIE COOK	–PROVIDE AND INSTALL ALL STORM SEWER LINES AND ASSOCIATED APPURTENANCES PER THE PLANS AND SPECIFICATIONS –REFER TO GRADING PLAN FOR INFORMATION ON ALLOWABLE STORM SEWER MATERIALS	

THIS MATRIX HAS BEEN PROVIDED FOR INFORMATIONAL PURPOSES. THE CONTRACTOR SHALL PROVIDE ANY AND ALL APPURTENANCES, TRENCHING AND BACKFILL, AND OTHER INCIDENTALS TO MEET OR EXCEED THE SPECIFICATIONS OF THE ITEMS LISTED.

* RESPONSIBILITIES TO BE DETERMINED UPON COORDINATION WITH THE APPROPRIATE ENTITIES

INDEX OF SHEETS

C-1	COVER SHEET
C-2	GENERAL NOTES SHEET
C-2A	SITE SPECIFIC NOTES SHEET
C-3	BOUNDARY & TOPOGRAPHIC SURVEY ALSO BEING AN (ALTA/ACSM LAND TITLE SURVEY)
C-3A	BOUNDARY & TOPOGRAPHIC SURVEY ALSO BEING AN (ALTA/ACSM LAND TITLE SURVEY)
C-3B	BOUNDARY & TOPOGRAPHIC SURVEY ALSO BEING AN (ALTA/ACSM LAND TITLE SURVEY)
C-3C	BOUNDARY & TOPOGRAPHIC SURVEY ALSO BEING AN (ALTA/ACSM LAND TITLE SURVEY)
C-3D	BOUNDARY & TOPOGRAPHIC SURVEY ALSO BEING AN (ALTA/ACSM LAND TITLE SURVEY)
C-3E	BOUNDARY & TOPOGRAPHIC SURVEY ALSO BEING AN (ALTA/ACSM LAND TITLE SURVEY)
C-3F	BOUNDARY & TOPOGRAPHIC SURVEY ALSO BEING AN (ALTA/ACSM LAND TITLE SURVEY)
C-3G	BOUNDARY & TOPOGRAPHIC SURVEY ALSO BEING AN (ALTA/ACSM LAND TITLE SURVEY)
(X) C-4	PHASE 1 EROSION AND SEDIMENTATION CONTROL
(X) C-4A	PHASE 2 EROSION AND SEDIMENTATION CONTROL
(X) C-4B	EROSION AND SEDIMENTATION CONTROL DETAILS
C-5	OVERALL SITE PLAN
C-6	SITE DIMENSION PLAN
C-7	GRADING AND STORM DRAINAGE PLAN
C-8	COMPOSITE UTILITY PLAN
C-8A	LIFT STATION DETAILS
C-8B	LIFT STATION DETAILS
(X) C-9	OFFSITE IMPROVEMENTS
C-10	SECTIONS SHEET
C-11	PHOTOMETRIC SITE PLAN
C-11A	LIGHTING DETAILS
C-12	GENERAL DETAIL SHEET
C-12A	GENERAL DETAIL SHEET
C-12B	GENERAL DETAIL SHEET
C-13	PAVEMENT AND UTILITY DETAIL SHEET
C-14	WINTER PARK UTILITY DETAIL SHEET
C-14A	WINTER PARK UTILITY DETAIL SHEET
C-14B	WINTER PARK UTILITY DETAIL SHEET
C-14C	WINTER PARK UTILITY DETAIL SHEET
L-1	OVERALL LANDSCAPE PLAN
L-2	LANDSCAPE NOTES AND DETAILS
(X)	NOT INCLUDED IN THIS SUBMITTAL

NOTES:

1. THE SITEWORK FOR THIS PROJECT SHALL MEET OR EXCEED THE "WAL-MART STANDARD SITEWORK SPECIFICATIONS."

2. ALL NECESSARY INSPECTIONS AND/OR CERTIFICATIONS REQUIRED BY CODES AND/OR UTILITY SERVICE COMPANIES SHALL BE PERFORMED PRIOR TO ANNOUNCED BUILDING POSSESSION AND THE FINAL CONNECTION OF SERVICES.

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Engineers
Surveyors
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Planners
Landscape Architects
Environmental Scientists
Construction Management
Traffic / Transportation

Eng. C.O.A. No. 3215
Survey L.B. No. 7143
Arch. Lic. No. AA2600926
Landscp. Lic. No. LC0000298

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DENVER M. MARLOW, P.E. 60900

No.	Date	Revision	By

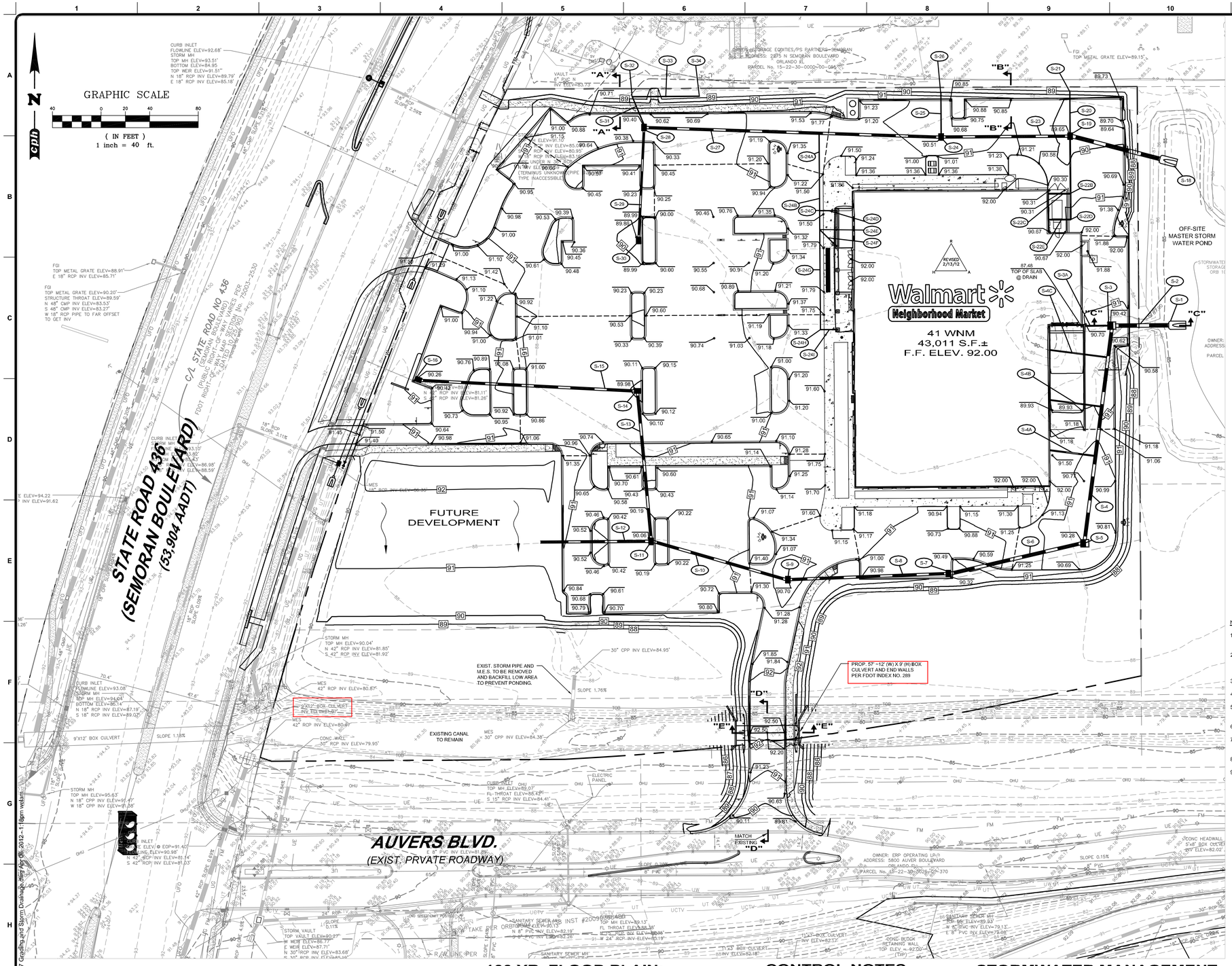
Designed by:	L.J.A.
Drawn by:	T.W.E.
Checked by:	L.J.A.
Approved by:	D.M.M.
Scale:	N.T.S.
Date:	4/6/12
Job No.:	W13405.2
File:	W13405.2 C-1 Cover Sheet.dwg

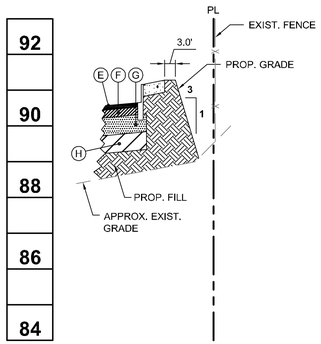
COVER SHEET

Walmart Neighborhood Market
STORE NO. 5988-01, ORANGE COUNTY

Sheet No.
C-1

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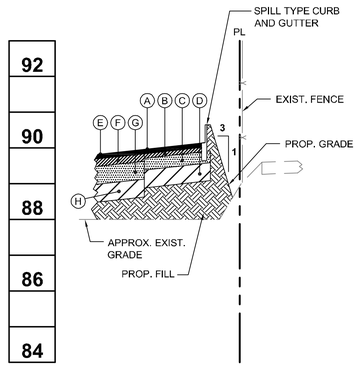

GRAPHIC SCALE
40 0 20 40 80
(IN FEET)
1 inch = 40 ft.
STATE ROAD 436
(SEMORAN BOULEVARD)
(53,904 AADT)
C/L STATE ROAD NO. 436
(PUBLIC SEMORAN BOULEVARD - VARIABLE WIDTH RIGHT-OF-WAY MARIES PER STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION RIGHT-OF-WAY MAP SECTION No. 75030-2530 DATED 10/30/2009)
FUTURE DEVELOPMENT
Walmart
Neighborhood Market
41 WNM
43,011 S.F.±
F.F. ELEV. 92.00
OFF-SITE MASTER STORM WATER POND
AUVERS BLVD.
(EXIST. PRVATE ROADWAY)
EXIST. STORM PIPE AND M.E.S. TO BE REMOVED AND BACKFILL LOW AREA TO PREVENT PONDING.
PROP. 57' -12' (W) X 9' (H) BOX CULVERT AND END WALLS PER FDOT INDEX NO. 289
EXISTING CANAL TO REMAIN
REVISED 2/13/12
TOP OF SLAB @ DRAIN 87.48
"A"
"B"
"C"
"D"
"E"
MATCH EXISTING "D"
SLOPE 1.76%
SLOPE 1.18%
SLOPE 0.11%
SLOPE 0.15%
SLOPE 2.58%
SLOPE 3.11%
SLOPE 2.84%
SLOPE 2.50%
SLOPE 2.50%
SLOPE 2.50



NOTE:
1. SOD ALL SIDE SLOPES AND ALL DISTURBED AREAS
2. SEE SHEET C-13 FOR PAVEMENT MATERIALS.

SECTION "A"-"A"

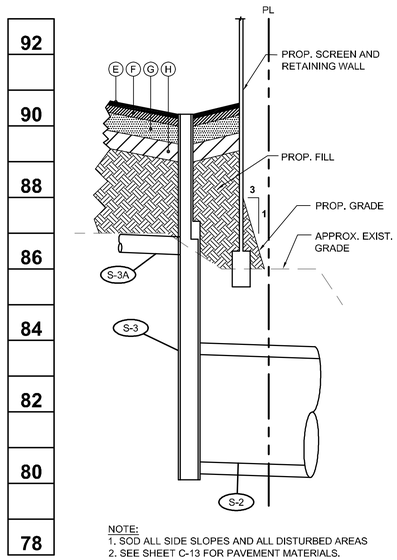
SCALE: H. 1" = 20', V. 1" = 2'



NOTE:
1. SOD ALL SIDE SLOPES AND ALL DISTURBED AREAS
2. SEE SHEET C-13 FOR PAVEMENT MATERIALS.

SECTION "B"-"B"

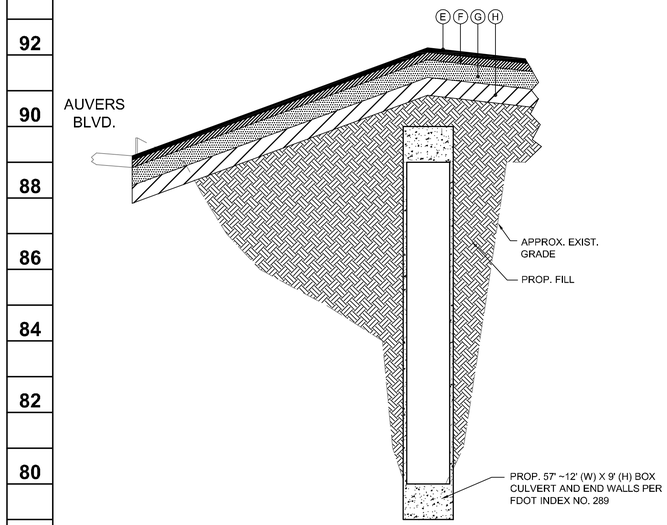
SCALE: H. 1" = 20', V. 1" = 2'



NOTE:
1, SOD ALL SIDE SLOPES AND ALL DISTURBED AREAS
2. SEE SHEET C-13 FOR PAVEMENT MATERIALS.

SECTION "C"-"C"

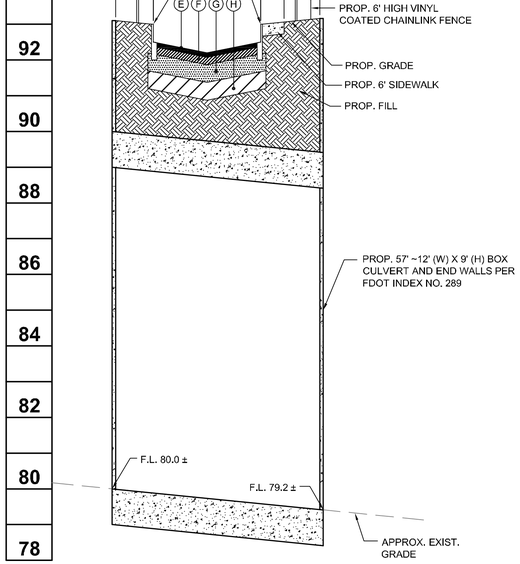
SCALE: H. 1" = 20', V. 1" = 2'



NOTE:
1. SOD ALL SIDE SLOPES AND ALL DISTURBED AREAS
2. SEE SHEET C-13 FOR PAVEMENT MATERIALS.

SECTION "D"-"D"

SCALE: H. 1" = 20', V. 1" = 2'



NOTE:
1. SOD ALL SIDE SLOPES AND ALL DISTURBED AREAS
2. SEE SHEET C-13 FOR PAVEMENT MATERIALS.

SECTION "E"-"E"

SCALE: H. 1" = 20', V. 1" = 2'

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No.	Date	Revision	By

Designed by:	L.J.A.
Drawn by:	T.W.E.
Checked by:	L.J.A.
Approved by:	D.M.M.
Scale:	AS SHOWN
Date:	4/6/12
Job No.:	W13405.2
File: W13405.2 - BASE_SECTIONS1.dwg	

SECTIONS SHEET

Walmart Neighborhood Market

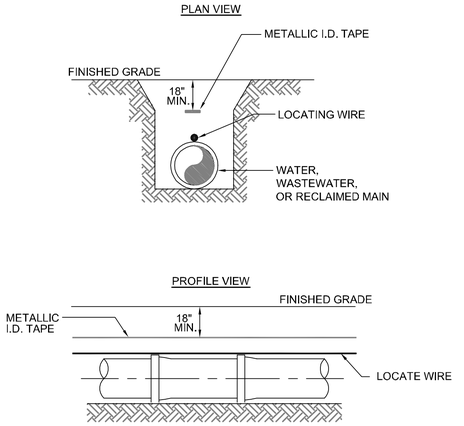
STORE NO. 5988-01, ORANGE COUNTY

Sheet No.

C-10

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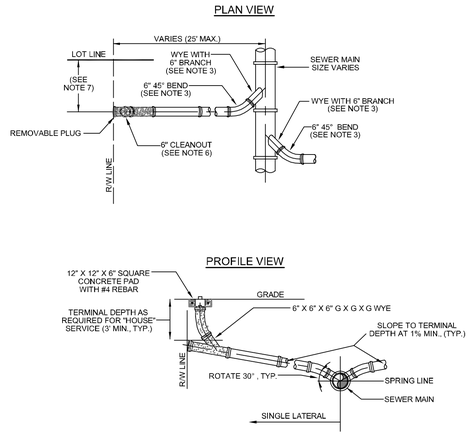
DATE: January 2, 2008 **PIPE LOCATING WIRE & METALLIC TAPE** SCALE: N.T.S



NOTES:
1. ALL PIPES REQUIRE INSULATED WIRE (10 GAUGE SOLID COPPER OR 12 GAUGE COPPERHEAD COPPER COAST STEEL) CAPABLE OF DETECTION BY A CABLE LOCATOR AND SHALL BE SECURED TO THE TOP CENTERLINE OF THE PIPE.
2. THE LOCATING WIRE SHALL TERMINATE INSIDE THE TEST BOX AND SHALL EXTEND 12" ABOVE FINISHED GRADE.
3. METALLIC I.D. TAPE SHALL BE INSTALLED AT THE CENTERLINE OF THE BURIED MAIN AND A MINIMUM OF 18" BELOW FINISHED GRADE.

FIGURE 3

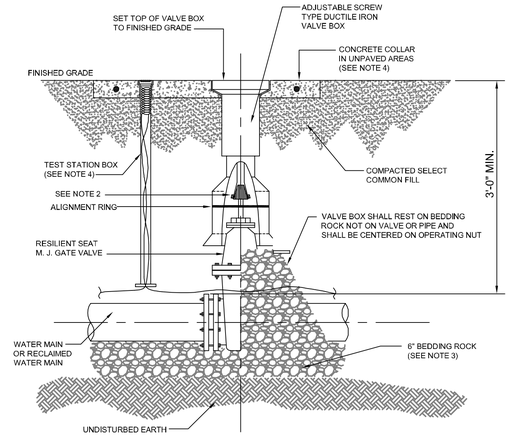
DATE: January 2, 2008 **SERVICE LATERAL** SCALE: N.T.S



NOTES:
1. INVERT OF SERVICE LATERAL SHALL NOT ENTER SEWER MAIN BELOW SPRING LINE.
2. SERVICE LATERAL SHALL BE CAPPED BY DEVELOPER'S CONTRACTOR.
3. ALL FITTINGS SHOWN ARE TO BE INSTALLED.
4. SERVICE CONNECTIONS SHALL BE PERMANENTLY MARKED BY CUTTING AN "S" INTO THE CURB DIRECTLY OVER THE LATERAL.
5. BUILDER'S PLUMBER WILL REMOVE PLUG, INSTALL CLEANOUT AND CONNECT LATERAL TO HOUSE.
6. 6" CLEANOUT (SHOWN SHADED) SHALL BE INSTALLED BY THE BUILDER AND/OR CONTRACTOR AT THE PROPERTY LINE IN ACCORDANCE WITH UTILITY STANDARDS.
7. SINGLE LATERALS ARE TO BE INSTALLED PER CITY UTILITY REQUIREMENTS.

FIGURE 4

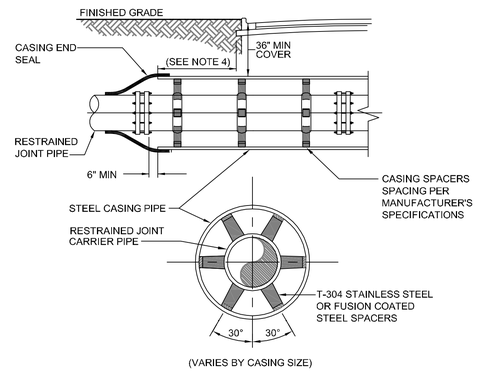
DATE: January 2, 2008 **GATE VALVE & BOX-WATER & RECLAIMED** SCALE: N.T.S



NOTES:
1. C900 PVC OR DUCTILE IRON PIPE SHALL BE USED ON VALVE BOX INSTALLATION.
2. THE VALVE ACTUATING NUT SHALL BE EXTENDED TO BE WITHIN 3' BELOW FINISHED GRADE.
3. BEDDING MATERIAL SHALL CONFORM TO FDOT NO. 57 AGGREGATE.
4. SEE FIGURE 10 AND 42 FOR DETAILED SPECIFICATIONS.
5. THE VALVE COVER BOX SHALL BE MARKED " WATER OR RECLAIMED".

FIGURE 6

DATE: January 2, 2008 **CASING SPACERS** SCALE: N.T.S

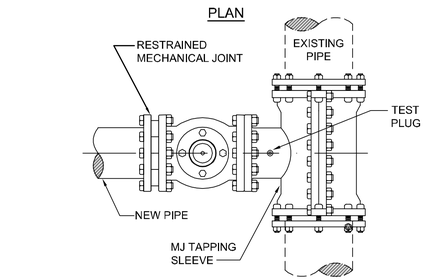


NOTES:
1. WHEN CONSTRUCTION IS WITHIN FDOT JURISDICTION, ADDITIONAL REQUIREMENTS OF THE UTILITY ACCOMMODATION GUIDE SHALL BE MET.
2. DISTANCE BETWEEN SPACERS TO BE PER MANUFACTURER'S SPECIFICATIONS.
3. NO FLOWABLE FILL IN THE ANNULAR SPACE BETWEEN THE CASING AND CARRIER PIPE.
4. CASING SHALL EXTEND A MINIMUM OF 5' FROM THE EDGE OF THE ROADWAY OR MEET FDOT REQUIREMENTS, WHICHEVER IS GREATER.

FIGURE 8

DATE: January 2, 2008 **MJ TAPPING SLEEVE & TAPPING VALVE** SCALE: N.T.S

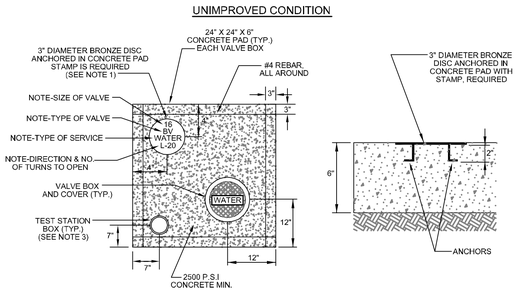
(APPROVED FOR UNIVERSAL CAST IRON PIPE)



NOTES:
1. AC PIPE REQUIRES SMITH BLAIR MODEL - 655 OR JCM MODEL - 432 TAPPING SLEEVE.

FIGURE 9

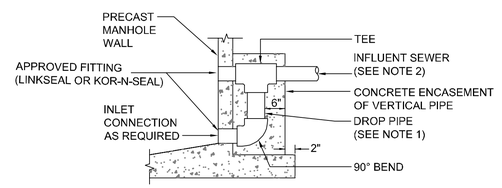
DATE: January 2, 2008 **VALVE COLLAR PAD** SCALE: N.T.S



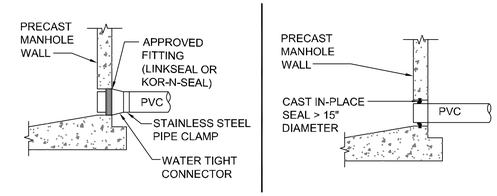
NOTES:
1. BRONZE IDENTIFICATION DISC SHALL BE REQUIRED FOR ALL VALVES GREATER THAN 2", OR AS REQUIRED BY THE CITY.
2. VALVE COLLAR DIMENSIONS MAY BE REDUCED TO 18" X 18" X 6" ON A 2" ARCH PATTERN CURB BOX.
3. SEE FIGURE 42 FOR DETAILED SPECIFICATIONS.

FIGURE 10

DATE: January 2, 2008 **MANHOLE CONNECTION** SCALE: N.T.S



MANHOLE STANDARD DROP DETAIL



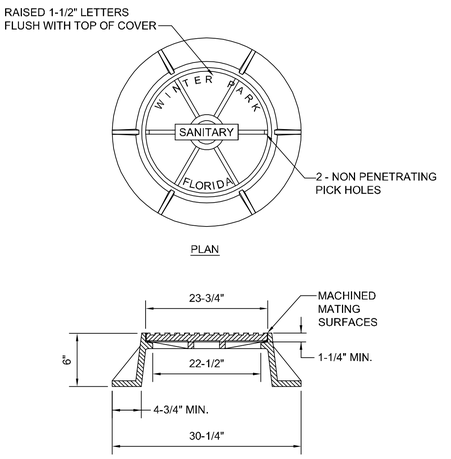
STANDARD PRECAST MANHOLE PIPE CONNECTION

RESILIENT CAST IN-PLACE SEAL

NOTES:
1. DROP PIPE AND FITTINGS SHALL BE OF EQUAL SIZE AND MATERIAL AS THE INFLUENT MAIN.
2. AN OUTSIDE DROP CONNECTION SHALL BE REQUIRED FOR ALL INFLUENT LINES WHICH HAVE AN INVERT 2' OR MORE ABOVE THE MANHOLE INVERT.
3. ALTERNATE WATER-TIGHT CONNECTION DETAILS FOR CONNECTION WITH 24" DIAMETER PIPES AND LARGER MUST BE APPROVED BY UTILITIES.
4. INSIDE SERVICE DROP CONNECTIONS ARE PERMITTED ON EXISTING MANHOLES, FOLLOWING REVIEW AND ACCEPTANCE BY THE UTILITY DEPARTMENT.

FIGURE 11

DATE: January 2, 2008 **USF 170E MANHOLE FRAME & COVER** SCALE: N.T.S



NOTES:
1. ONLY APPLIES TO THE CITY OF WINTER PARK UTILITIES OWNED AND MAINTAINED MANHOLES. "WINTER PARK" SHALL NOT APPEAR ON PRIVATE MANHOLES.
2. DEPENDENT UPON SITE LOCATION DECORATIVE LOGO MANHOLE COVERS MAY BE REQUIRED; USF 170 FRAME W/ EI. STANDARD MANHOLE COVER; USF 170 FRAME W/ CE.

FIGURE 12

cph
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No.	Revision	By	Date
1			

Designed by: --
Drawn by: --
Checked by: --
Approved by: --
Scale: NONE
Date: 4/6/12
Job No.: W13405.2
File: W13405.2 C-14 Winter Park Utility Details.dwg

WINTER PARK UTILITY DETAIL SHEET

Walmart Neighborhood Market

STORE NO. 5988-01, ORANGE COUNTY

Sheet No.

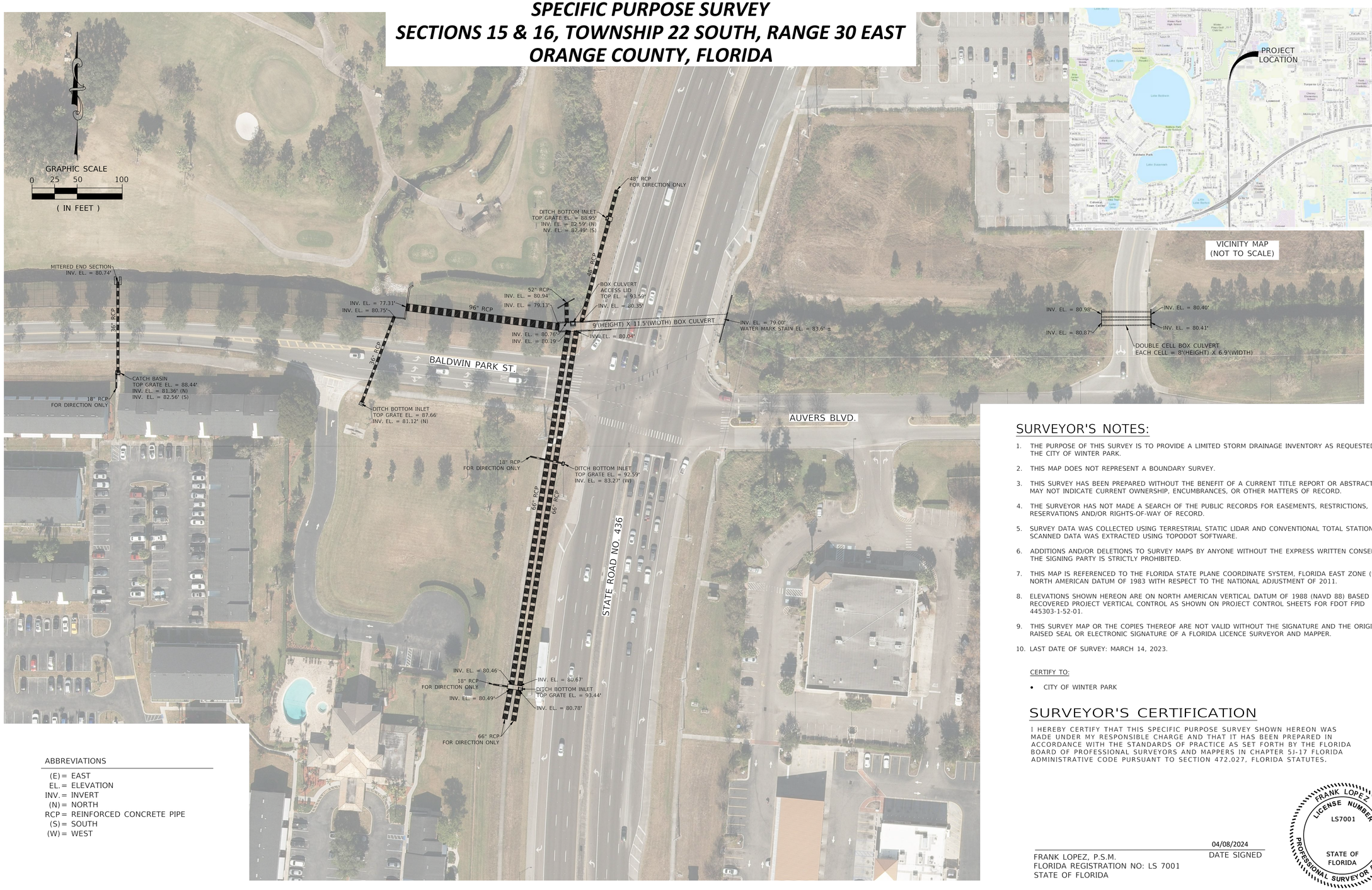
C-14

J:\W13405.2\dwg\design\W13405.2 C-14 Winter Park Utility Details.dwg Apr 06, 2012 - 1:37pm rcarpenter

Updated Survey from DRMP

CITY OF WINTER PARK - EASTERN BASIN STUDY

SPECIFIC PURPOSE SURVEY
SECTIONS 15 & 16, TOWNSHIP 22 SOUTH, RANGE 30 EAST
ORANGE COUNTY, FLORIDA



ABBREVIATIONS

(E)	= EAST
EL.	= ELEVATION
INV.	= INVERT
(N)	= NORTH
RCP	= REINFORCED CONCRETE PIPE
(S)	= SOUTH
(W)	= WEST

SURVEYOR'S NOTES:

1. THE PURPOSE OF THIS SURVEY IS TO PROVIDE A LIMITED STORM DRAINAGE INVENTORY AS REQUESTED BY THE CITY OF WINTER PARK.
2. THIS MAP DOES NOT REPRESENT A BOUNDARY SURVEY.
3. THIS SURVEY HAS BEEN PREPARED WITHOUT THE BENEFIT OF A CURRENT TITLE REPORT OR ABSTRACT AND MAY NOT INDICATE CURRENT OWNERSHIP, ENCUMBRANCES, OR OTHER MATTERS OF RECORD.
4. THE SURVEYOR HAS NOT MADE A SEARCH OF THE PUBLIC RECORDS FOR EASEMENTS, RESTRICTIONS, RESERVATIONS AND/OR RIGHTS-OF-WAY OF RECORD.
5. SURVEY DATA WAS COLLECTED USING TERRESTRIAL STATIC LIDAR AND CONVENTIONAL TOTAL STATION. SCANNED DATA WAS EXTRACTED USING TOPODOT SOFTWARE.
6. ADDITIONS AND/OR DELETIONS TO SURVEY MAPS BY ANYONE WITHOUT THE EXPRESS WRITTEN CONSENT OF THE SIGNING PARTY IS STRICTLY PROHIBITED.
7. THIS MAP IS REFERENCED TO THE FLORIDA STATE PLANE COORDINATE SYSTEM, FLORIDA EAST ZONE (901), NORTH AMERICAN DATUM OF 1983 WITH RESPECT TO THE NATIONAL ADJUSTMENT OF 2011.
8. ELEVATIONS SHOWN HEREON ARE ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88) BASED ON RECOVERED PROJECT VERTICAL CONTROL AS SHOWN ON PROJECT CONTROL SHEETS FOR FDOT FPID 445303-1-52-01.
9. THIS SURVEY MAP OR THE COPIES THEREOF ARE NOT VALID WITHOUT THE SIGNATURE AND THE ORIGINAL RAISED SEAL OR ELECTRONIC SIGNATURE OF A FLORIDA LICENCE SURVEYOR AND MAPPER.
10. LAST DATE OF SURVEY: MARCH 14, 2023.

CERTIFY TO:

- CITY OF WINTER PARK

SURVEYOR'S CERTIFICATION

I HEREBY CERTIFY THAT THIS SPECIFIC PURPOSE SURVEY SHOWN HEREON WAS MADE UNDER MY RESPONSIBLE CHARGE AND THAT IT HAS BEEN PREPARED IN ACCORDANCE WITH THE STANDARDS OF PRACTICE AS SET FORTH BY THE FLORIDA BOARD OF PROFESSIONAL SURVEYORS AND MAPPERS IN CHAPTER 5J-17 FLORIDA ADMINISTRATIVE CODE PURSUANT TO SECTION 472.027, FLORIDA STATUTES.

FRANK LOPEZ LICENSE NUMBER LS7001 STATE OF FLORIDA PROFESSIONAL SURVEYOR & MAPPER

04/08/2024
DATE SIGNED

FRANK LOPEZ, P.S.M.
FLORIDA REGISTRATION NO: LS 7001
STATE OF FLORIDA

DATE	REVISIONS	REVISED BY	CHECKED BY	DATE	REVISIONS	REVISED BY	CHECKED BY

SECTION	15,16
TOWNSHIP	22 S
RANGE	30 E
PAGE(S)	28 - 32

FIELD BY	LM	03/14
DRAWN BY	SP	04/24
CHECKED BY	FL	04/24
FIELD BOOK	22/19	

FILE: 0124.014_TWinter Park_Eastern_Basin_Study_Survey.dwg

DRMP
ENGINEERS • SURVEYORS • PLANNERS • SCIENTISTS
Certificate of Authorization No 2648
941 Lake Baldwin Lane - Orlando, Florida 32814
Telephone (407) 896-0594

TOPOGRAPHIC SURVEY
CITY OF WINTER PARK - EASTERN BASIN STUDY
STATE ROAD NO. 436 & BALDWIN PARK STREET
ORLANDO, FLORIDA

PROJECT NO.	301.1800124.014
DATE	04/08/2024
SCALE	1" = 50'
SHEET	1 OF 1