



CITY COMMISSION

SPECIAL MEETING AGENDA

THURSDAY, DECEMBER 18, 2025 - 9:00 AM
CITY HALL - COMMISSION CHAMBERS
1126 EAST STATE ROAD 434, WINTER SPRINGS, FLORIDA

CALL TO ORDER

Roll Call

Invocation

Pledge of Allegiance

Agenda Changes

PUBLIC INPUT

Anyone who wishes to speak during Public Input on any Agenda Item or subject matter will need to fill out a "Public Input" form. Individuals will limit their comments to three (3) minutes, and representatives of groups or homeowners' associations shall limit their comments to five (5) minutes, unless otherwise determined by the City Commission.

REGULAR AGENDA

500. Stormwater Master Plan and Capital Improvement Plan

[20251212 Winter Springs Final Draft Stormwater Master Plan](#)

PUBLIC INPUT

Anyone who wishes to speak during Public Input on any Agenda Item or subject matter will need to fill out a "Public Input" form. Individuals will limit their comments to three (3) minutes, and representatives of groups or homeowners' associations shall limit their comments to five (5) minutes, unless otherwise determined by the City Commission.

ADJOURNMENT

PUBLIC NOTICE

This is a Public Meeting, and the public is invited to attend and this Agenda is subject to change. Please be advised that one (1) or more Members of any of the City's Advisory Boards and Committees may be in attendance at this Meeting, and may participate in discussions.

Persons with disabilities needing assistance to participate in any of these proceedings should contact the City of Winter Springs at (407) 327-1800 "at least 48 hours prior to meeting, a written request by a physically handicapped person to attend the meeting, directed to the chairperson or director of such board, commission, agency, or authority" - per Section 286.26 Florida Statutes.

"If a person decides to appeal any decision made by the board, agency, or commission with respect to any matter considered at such meeting or hearing, he or she will need a record of the proceedings, and that, for such purpose, he or she may need 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" - per Section 286.0105 Florida Statutes.

REGULAR AGENDA ITEM 500

CITY COMMISSION AGENDA | DECEMBER 18, 2025 SPECIAL MEETING

TITLE

Stormwater Master Plan and Capital Improvement Plan

SUMMARY

This Stormwater Master Plan is the compilation of historical knowledge from City staff and residents, historical flood records, and recent studies, including five recently approved Seminole County Basin Studies, to guide the assessment of current flood hazards. Flood-prone areas were identified through FEMA floodplain maps, past City reports, and basin models, ensuring a thorough and consistent evaluation across the City's five major watersheds: Gee Creek, Howell Creek, Little Lake Howell, Lake Jesup, and Soldiers Creek.

The outcome of the review effort was the identification of 46 Areas of Interest (AOIs), which were refined into 12 Capital Improvement Projects. Proposed project alternatives for each improvement area were developed, and their efficacy was measured against the Level of Service Criteria established by the Comprehensive Plan and the City Code of Ordinances. This performance alongside additional criteria were utilized to develop a project prioritization framework and the City's Prioritized List of Proposed Capital Improvement Projects.

FUNDING SOURCE

Not applicable.

RECOMMENDATION

Staff recommends the City Commission adopt the Stormwater Master Plan including the Prioritized List of Proposed Capital Improvement Projects that are included in the Master Plan



City of Winter Springs



Stormwater

Master Plan



Prepared by:
Kimley-Horn and Associates, Inc.
Orlando, Florida

Kimley»Horn

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Executive Summary

The City of Winter Springs (City) is a community incorporated in 1959 as North Orlando and re-chartered as the City of Winter Springs in 1962. The City is approximately 15 square miles in area and is located along the south side of Lake Jesup.

The City of Winter Springs Comprehensive Plan serves as the foundation for the City's stormwater management efforts through its Infrastructure Element. Goal 4 of Chapter IV of the 2030 Comprehensive Plan prioritizes a stormwater system that protects the life and property of the citizens of the City while minimizing environmental impacts. Efforts to mitigate flooding have been ongoing since the original adoption of the first Stormwater Master Plan (SWMP) in October 1993, which was then supplemented in 2005. As a continuation and revitalization of previous efforts, the document presented hereinafter serves as the new SWMP and provides a comprehensive summary of the Stormwater Improvement Program of the City of Winter Springs, to date. This SWMP provides context for previous and current stormwater planning initiatives, identifies and prioritizes stormwater improvement projects, recommends future asset management and maintenance programs, and ultimately supports the future implementation of a revised Stormwater Utility Rate via the creation of a stormwater Capital Improvement Plan (CIP).

The City of Winter Springs authorized the creation of this Stormwater Master Plan within Phase 4 of the RFQ #01-23-07 PH Stormwater Improvements Contract. The RFQ presents the development of the Stormwater Improvement Program and is phased in the following manner:

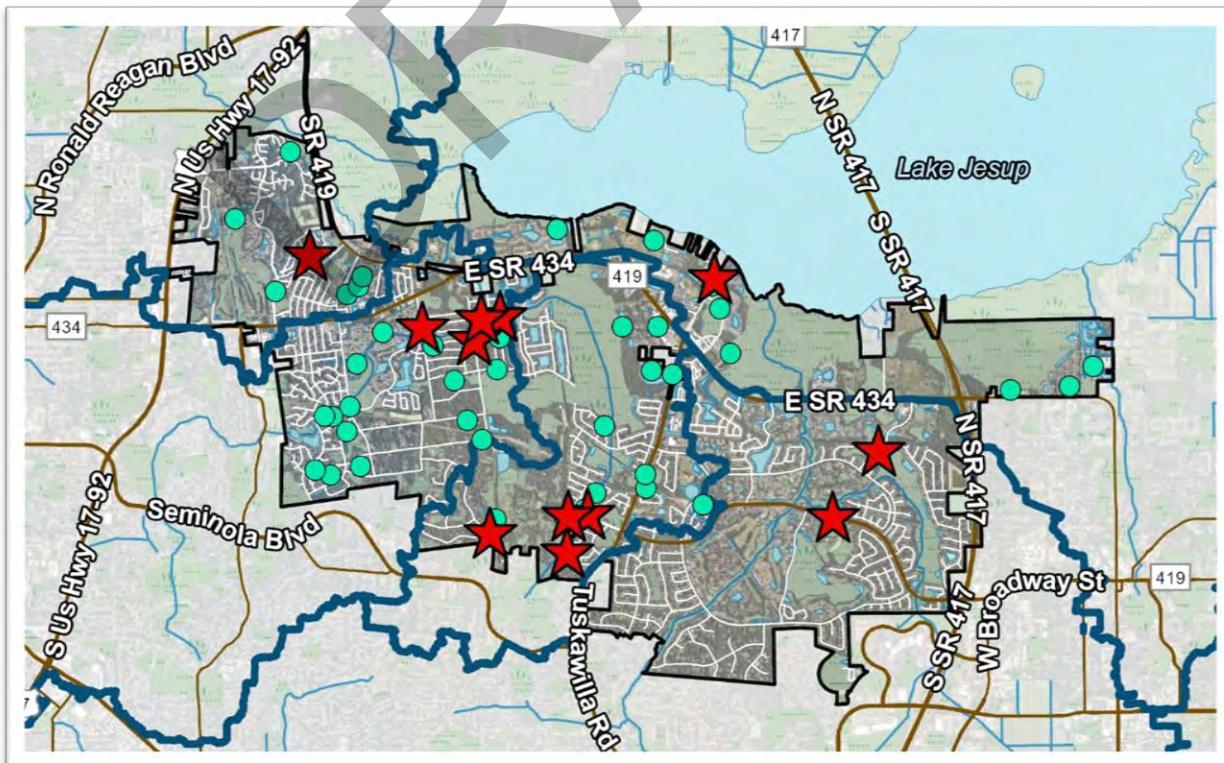
- Phase 1 – Drainage System Inventory
- Phase 2 – Identification of Maintenance Programs and Drainage Improvement Projects
- Phase 3 – Analysis of Current Maintenance, Equipment, and Manpower Demands
- Phase 4 – Stormwater Capital Improvement Program (CIP) and Stormwater Master Plan
- Phase 5 – Stormwater Capital Improvement Program (CIP) Funding Strategies

Phase 1 of the Stormwater Improvements contract sought to field-verify the condition of existing stormwater assets within the City. Phase 2 identified the existing and necessary maintenance and retrofit programs for the City to improve the level of service of their stormwater system. Phase 3 sought to identify the necessary equipment and staffing to execute the maintenance and retrofit programs identified in Phase 2. Phase 4 identifies

opportunities for capital improvements through a CIP and includes this report as a deliverable. Phase 5 will develop the funding strategy to implement the CIP and Maintenance Programs identified through the overall Stormwater Improvement Program.

This SWMP examines flood-prone regions across the City, as noted by both City staff and residents, and assesses the latest studies to provide a consistent analysis of all City watersheds and other areas of interest. Analysis of existing flood-prone areas was accomplished by reviewing effective FEMA floodplain mapping, previous City studies, and five recently completed Seminole County Basin Studies. The Seminole County Basin models were further explored to refine the analysis within City limits and identify additional local flood-prone areas. The evaluation was completed across five major watersheds within the City: Gee Creek, Howell Creek, Little Lake Howell, Lake Jesup, and Soldiers Creek.

This SWMP draws on the knowledge of City staff and residents, historical flood records, and recent studies, including five recently approved Seminole County Basin Studies, to guide the assessment of current flood hazards. Flood-prone areas were identified through FEMA floodplain maps, past City reports, and basin models, ensuring a thorough and consistent evaluation across the City's five major watersheds: Gee Creek, Howell Creek, Little Lake Howell, Lake Jesup, and Soldiers Creek. The outcome of the review effort was the identification of 46 Areas of Interest (AOIs), which were refined into 12 areas for future capital improvement projects.



Proposed project alternatives for each improvement area were developed, and their efficacy was measured against the Level of Service Criteria established by the Comprehensive Plan and the City Code of Ordinances. This performance alongside additional criteria were utilized to develop a project prioritization framework and the City's Stormwater CIP.

Prioritized List of Proposed Capital Improvement Projects

Rank	Project Number and Description		Project Total Cost
1	GC-01	Alton Road Culvert & Reach Improvements	\$995,000
2	HC-02	Vistawilla Drive Near Seneca Boulevard Improvements	\$600,000
3	GC-03	No-Name Creek Conveyance Improvements Near Sailfish Road	\$645,000
4	LLH-04	Dunmar Estates Flow Path Re-Establishment	\$845,000
5	HC-01	Winter Springs Boulevard near Davenport Way Improvements	\$900,000
6	LLH-01	Fisher Road Near Morton Lane Improvements	\$225,000
7	GC-02	Shore Road Culvert & Reach Improvements	\$1,160,000
8	SC-01	Highland Village Storage & Conveyance Improvements – Proposed Control Structure	\$550,000
9	LLH-02	Chokecherry Drive Near Sapling Drive Improvements	\$260,000
10	LJ-01	North Tuskawilla Road Outfall Improvements – Proposed Pipe Replacement	\$1,310,000
11	GC-04	No-Name Creek Conveyance Improvements Near Alton Road	\$690,000
12	LLH-03	Winter Springs Boulevard Near Chokecherry Drive Improvements	\$645,000

The resultant SWMP and associated Stormwater CIP documentation, including conceptual layouts and costs, is to be used in support of the City's Stormwater CIP funding strategy developed as part of Phase 5 and in parallel to this SWMP. These documents will support Goal 4 of the City's Comprehensive Plan and the City's continued commitment to maintaining and improving stormwater infrastructure.

List of Abbreviations

AOI	Area of Interest
BFE	Base Flood Elevation
BMP	Best Management Practice
CIP	Capital Improvement Plan
CMP	Corrugated Metal Pipe
CRS	Community Rating System
DCA	Department of Community Affairs
DEM	Digital Elevation Model
ECFRRC	East Central Florida Regional Resiliency Collaborative
EOPC	Engineer's Opinion of Probable Cost
EPA	Environmental Protection Agency
ERP	Environmental Resource Permitting
ERU	Equivalent Residential Unit
FDEP	Florida Department of Environmental Protection
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FFE	Finished Floor Elevation
GIS	Geographic Information System
HDPE	High Density Polyethylene
ICPR	Interconnected Channel and Pond Routing Model
LMS	Local Mitigation Strategy
LOS	Level of Service
MS4	Municipal Separate Storm Sewer System
NFIP	National Flood Insurance Program
NOAA	National Oceanic and Atmospheric Administration

NPDES	National Pollutant Discharge Elimination System
O&M	Operation and Maintenance
RCP	Reinforced Concrete Pipe
SBM	Storage Basin Maintenance
SCI	Schedule of Capital Improvements
SFHA	Special Flood Hazard Area
SJRWMD	St. Johns Water Management District
SWMP	Stormwater Master Plan
TMDL	Total Maximum Daily Load
USACE	U.S. Army Corps of Engineers
VA	Vulnerability Assessment
WMP	Watershed Management Plan
WTP	Water Treatment Plant

DRAFT

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1. Introduction to Winter Springs Stormwater Management Program

1.1. City Overview

The City of Winter Springs, Florida is a city located in northeastern Seminole County, within the Orlando–Kissimmee–Sanford metropolitan area. The city covers approximately 15 square miles of land and has a population of 38,342 as of the 2020 U.S. Census, with recent municipal estimates reporting 39,394. Winter Springs is bordered by the incorporated cities of Oviedo, Casselberry, and Longwood, as well as unincorporated areas of Seminole County.

The City's terrain is generally flat, with a mix of natural wetlands, upland areas, and small lakes. Vegetation includes pine flatwoods, hardwoods, and landscaped suburban green spaces. From a regional perspective, Winter Springs lies within the St. Johns River Water Management District (SJRWMD) and is situated in the Middle Basin of the SJRWMD's namesake. The St. Johns River flows north from Melbourne and forms various lakes as it enters Seminole County. One of those lakes is Lake Jesup, which is the City's largest northern boundary. Stormwater runoff within Winter Springs is therefore generally conveyed from south to north towards the lake.

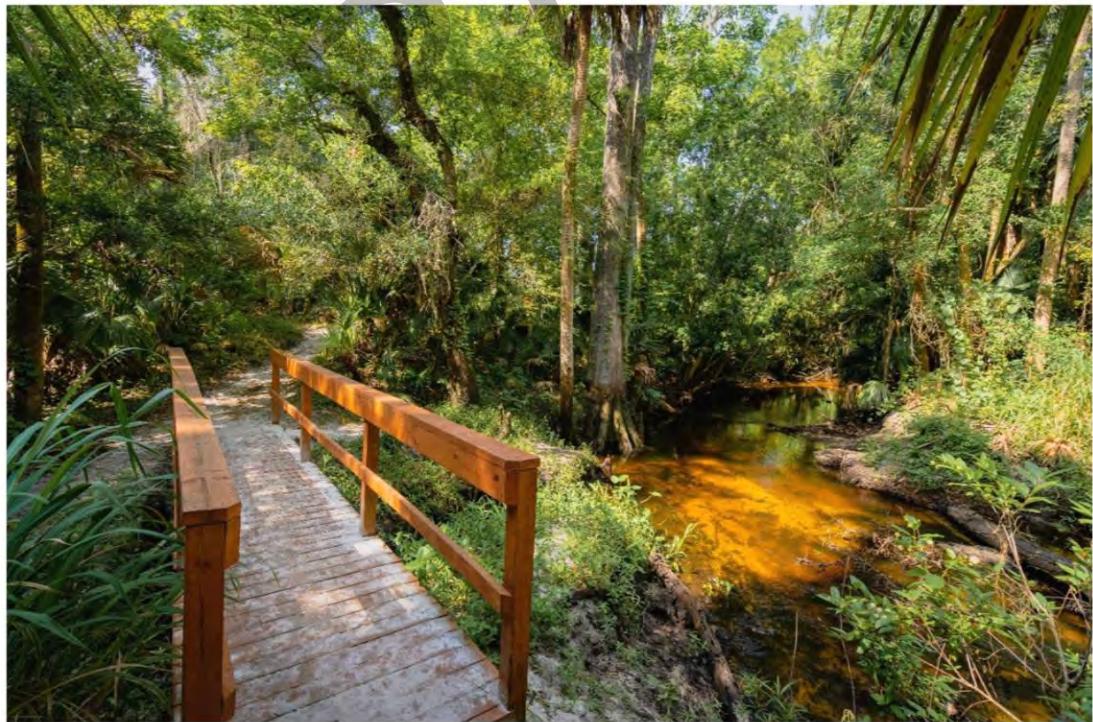


Figure 1. View from a City of Winter Springs Stream Crossing

These features shape drainage patterns and influence flood risk. The residents and businesses of Winter Springs have experienced the devastating extremes of this flood risk in recent years, particularly following Hurricane Ian and Hurricane Nicole in 2022.

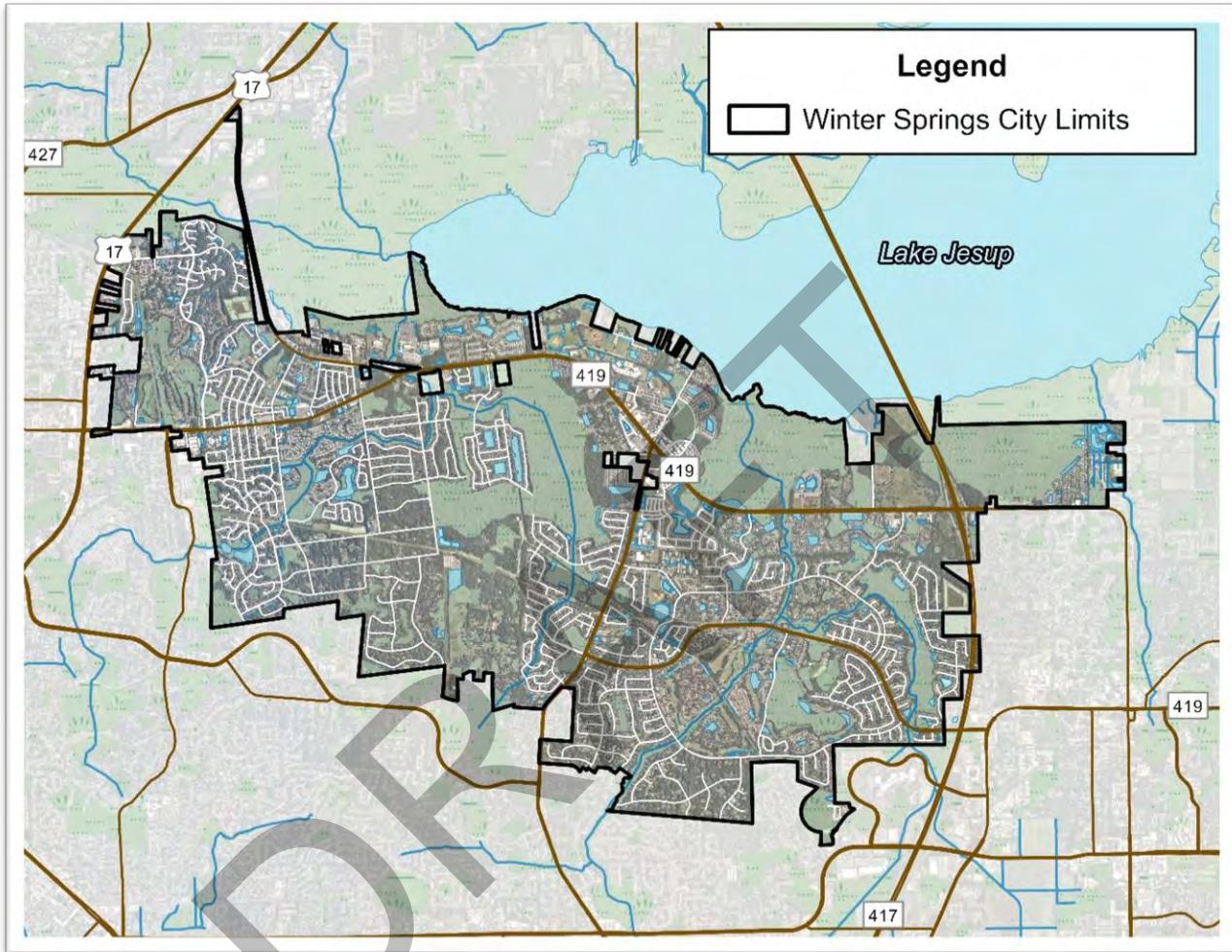


Figure 2: City of Winter Springs Limits

In late September 2022, Hurricane Ian made landfall in Southwest Florida and caused heavy rainfall across Central Florida. Over the course of the storm, nearly 20 inches of rainfall was experienced in isolated areas within the City. The contributing watershed also experienced upwards of 12 inches of water, resulting in significant flooding within the watershed and City. As stormwater ponds reached capacity and creeks and wetlands became overwhelmingly inundated, erosion and failure of portions of the stormwater system occurred. Historic radar imagery showing peak rainfall amounts is shown in **Figure 3** below.

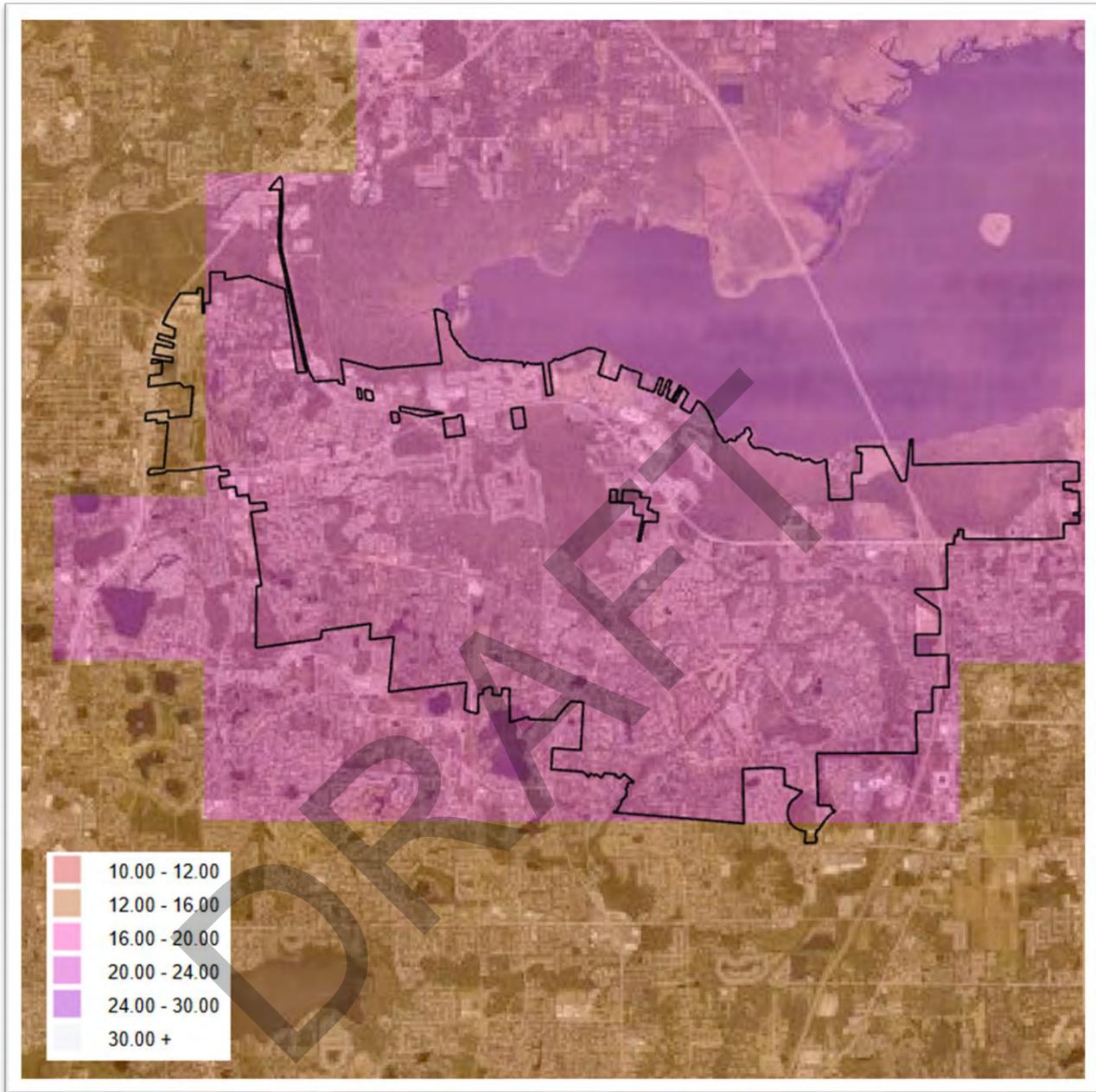


Figure 3: NEXRAD Radar Imagery of Hurricane Ian

Six weeks later, Hurricane Nicole exacerbated the situation by introducing an additional 4 to 6 inches of rainfall to the City, with some areas exceeding 6 inches, with soils already fully saturated in the watershed. This increased both the volume and rate of stormwater runoff, contributing to further flooding and erosion beyond what would typically be experienced under normal antecedent moisture conditions. Historic radar imagery showing peak rainfall amounts is shown in **Figure 4** below.

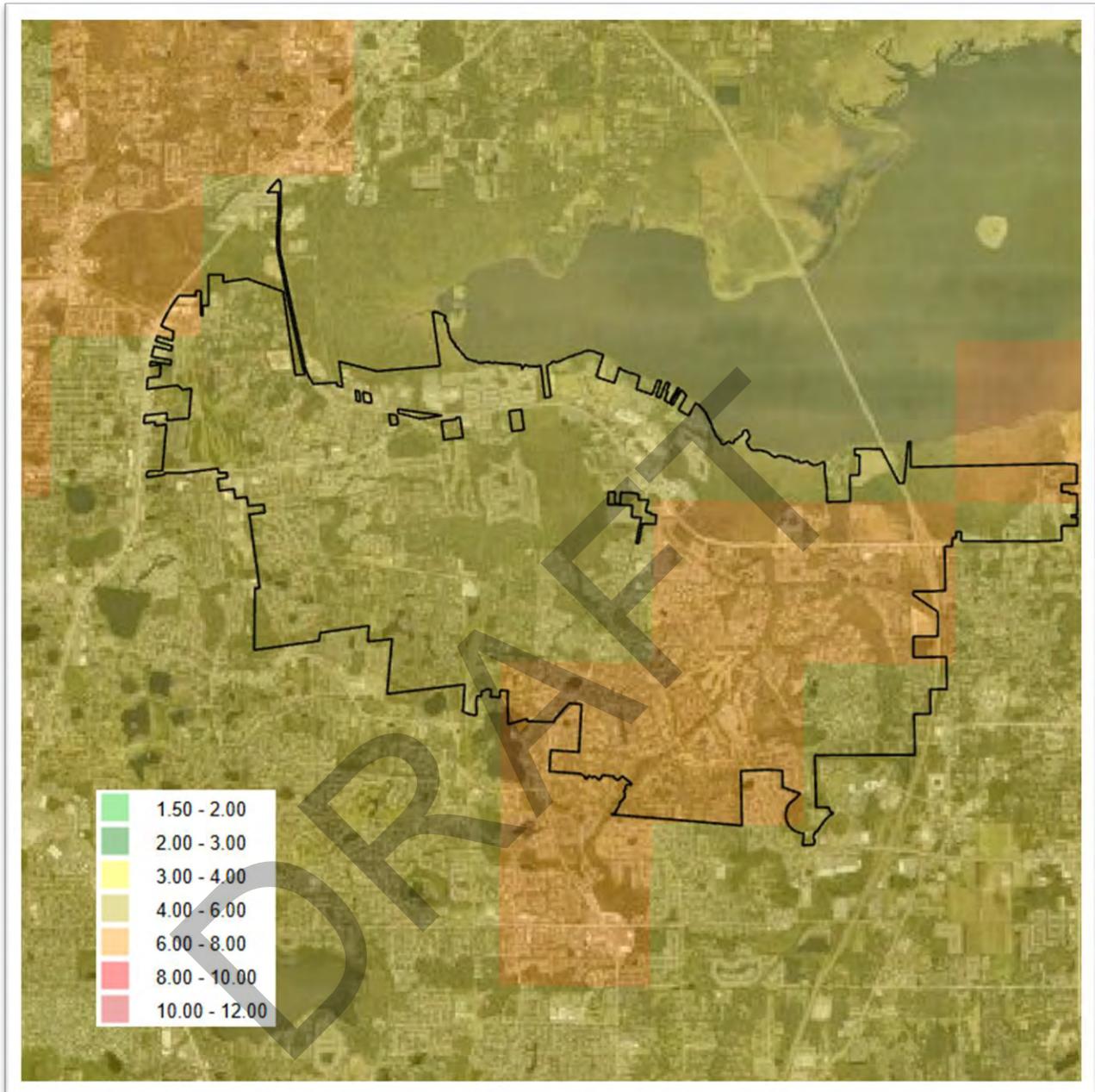


Figure 4: NEXRAD Radar Imagery of Hurricane Nicole

1.2. Stormwater Management Program Overview

The City of Winter Springs authorized the creation of this Stormwater Master Plan within Phase 4 of the RFQ #01-23-07 PH Stormwater Improvements Contract. The RFQ presents the development of the Stormwater Improvement Program and is phased in the following manner:

- Phase 1 – Drainage System Inventory

- Phase 2 – Identification of Maintenance Programs and Drainage Improvement Projects
- Phase 3 – Analysis of Current Maintenance, Equipment, and Manpower Demands
- Phase 4 – Stormwater Capital Improvement Program (CIP) and Stormwater Master Plan (SWMP)
- Phase 5 – Stormwater Capital Improvement Program (CIP) Funding Strategies

Phase 1 of the Stormwater Improvements contract sought to field-verify the condition of existing stormwater assets within the City. Phase 2 identified the existing and necessary maintenance and retrofit programs for the City to improve the level of service of their stormwater system. Phase 3 sought to identify the necessary equipment and staffing to execute the maintenance and retrofit programs identified in Phase 2. Phase 4 identifies opportunities for capital improvements through a CIP and includes this SWMP as a deliverable. Phase 5 will develop the funding strategy to implement the CIP and Maintenance Programs identified through the overall Stormwater Improvement Program.

1.3. Stormwater Management Program Goals

This SWMP and the Stormwater Improvement Program reflect the City's commitment to protecting residents, infrastructure, and the environment. The program guides the assessment and improvement of stormwater systems in alignment with the City's Comprehensive Plan. **Goal 4** within the Infrastructure Element of the City's Comprehensive Plan is to *“provide a stormwater system of appropriate capacity to protect the life and property of the citizens of the City, as well as decreasing adverse environmental impacts attributable to stormwater runoff.”*

To support Goal 4, the City's Stormwater Management Program endeavors to collect and organize an inventory of existing stormwater infrastructure, identify and develop facility maintenance programs and staffing needs, collect public input, analyze stormwater needs within the City's basins, and ultimately develop solutions and a framework through which to implement them. Phase 4 and, by extension, this SWMP are derived more specifically from Objective 4.2 within Goal 4 as described below:

Objective 4.2 – Stormwater Master Plan states that *“the City shall maintain and utilize the Stormwater Master Plan and its updates which establish high water elevations, addresses existing deficiencies, and coordinates the construction of new and replacement facilities.”*

Eight policy goals fall under this objective:

- **Policy 4.2.1** – *Maintain a detailed inventory and analysis of the existing drainage facilities within the City’s municipal boundaries in the City’s Stormwater Master Plan.*
- **Policy 4.2.2** – *Maintain a digital map of the drainage facilities within the City and require new developments to provide copies of their stormwater design for incorporation into the City’s database.*
- **Policy 4.2.3** – *Utilize the expertise of a professional engineer to run models of the City’s stormwater system based upon critical design storm events periodically on an as-needed basis and when necessary, update the Stormwater Master Plan.*
- **Policy 4.2.4** – *Include review of stormwater quality discharged into surface water bodies and recommendations for needed improvements in the Stormwater Master Plan.*
- **Policy 4.2.5** – *Establish priorities for stormwater system replacements, ensuring correction of existing drainage facility deficiencies, and providing for future facility needs in the Stormwater Master Plan.*
- **Policy 4.2.6** – *Include in the Stormwater Master Plan, a funding mechanism, or mechanisms, and schedules for completing the needed improvements.*
- **Policy 4.2.7** – *Rely on the Stormwater Master Plan to prepare the City’s annual budget for funding of stormwater facility replacement and deficiency upgrades.*
- **Policy 4.2.8** – *Utilize the Stormwater Master Plan and other sources to annually update the five (5) year Schedule of Capital Improvements (SCI) to correct existing deficiencies and prepare for future stormwater demands. Other sources for the identification of 5-year SCI projects may include items such as damage reports from severe storm events and projects receiving special grant funding.*

Note that this SWMP is primarily dedicated to identifying and addressing deficiencies related to flood hazard mitigation and stormwater conveyance within the City. The plan assesses the current stormwater infrastructure to identify areas requiring enhanced flood control and offers recommendations for improvement.

Matters concerning stormwater quality, including evaluations of existing conditions and recommendations for enhancements, are outside the scope of this plan. Such water quality issues and their corresponding solutions are comprehensively addressed in the City’s Total Maximum Daily Load (TMDL) Master Plan. All future implementation efforts resulting from recommendations in this plan’s capital improvement or maintenance programs will adhere to applicable water quality requirements at the local, state, and federal levels, including compliance with the Statewide Stormwater Rule adopted by the Florida Department of Environmental Protection in 2025, as codified in Chapter 62-330, Florida Administrative Code (F.A.C.).

2. City of Winter Springs Watersheds

The City is drained by five major watersheds, which serve as the basis of organization of technical analysis and recommendations presented in this SWMP. The watersheds are Gee Creek, Howell Creek, Lake Jesup, Little Lake Howell, and Soldiers Creek.

Figure 5 below identifies the existing topographic patterns within the City using a Digital Elevation Model (DEM).

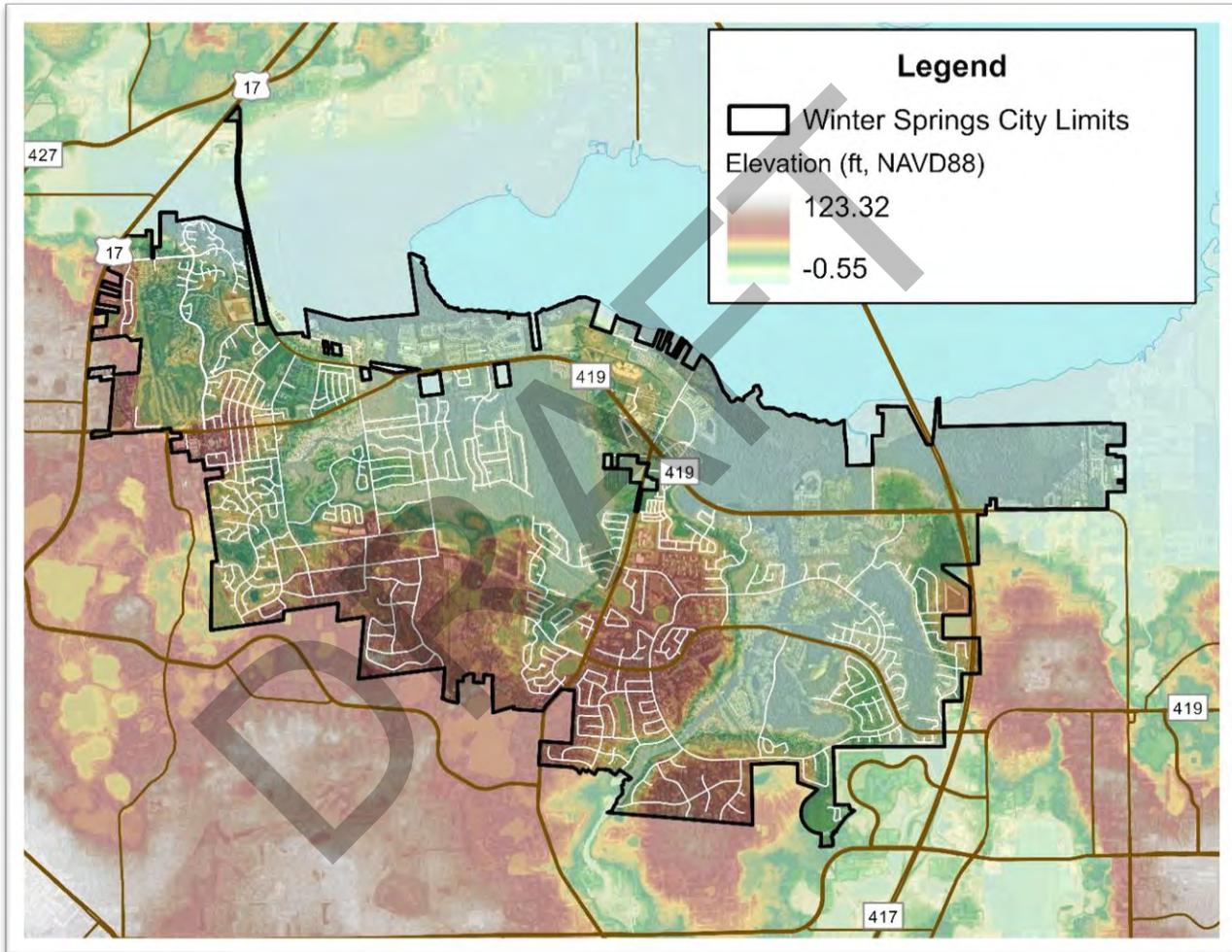


Figure 5: DEM within Winter Springs

Figure 6 shows the extent of the study area and each major watershed evaluated in this project.

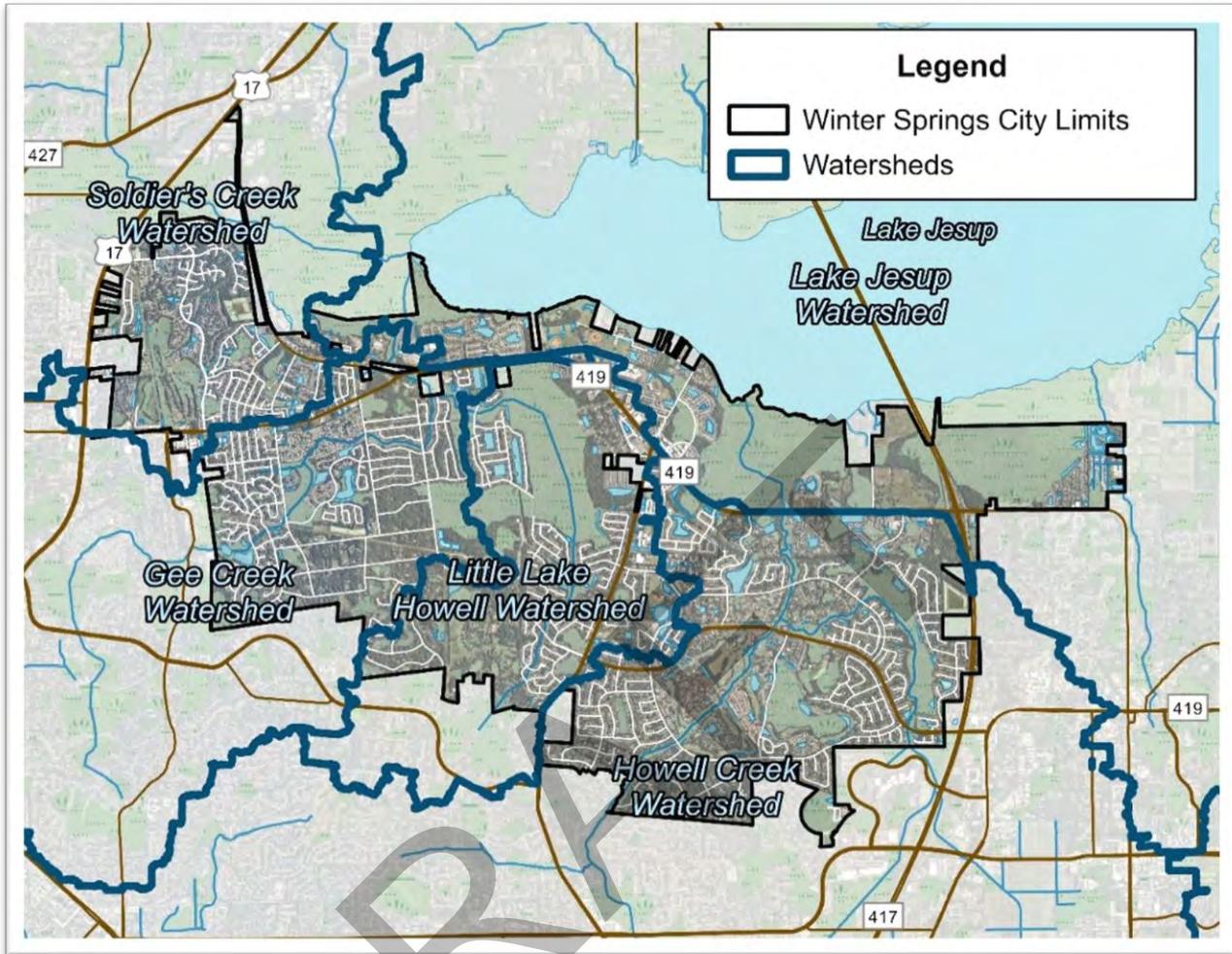


Figure 6: Watersheds within City Limits, Overall View

2.1. Gee Creek Watershed

Gee Creek Watershed encompasses the southwestern portion of Winter Springs and is situated between the Soldier's Creek and Howell Creek watersheds. The watershed is approximately 11.3 square miles, encompassing areas of Altamonte Springs, Fern Park, Casselberry, and the City of Longwood. 2.9 square miles are located within Winter Springs. The watershed is characterized by Gee Creek which flows southwest to northeast from Lake Kathryn to Lake Jesup. The headwaters of Gee Creek include a series of ponds and marshes that drain into Lake Kathryn.

Within the City of Winter Springs, land cover consists primarily of low to high density residential areas, with commercial areas along E State Road 434. Between the developed areas are patches of woody wetlands.

See **Figure 7** below for extents of this watershed study overlain on the City limits:

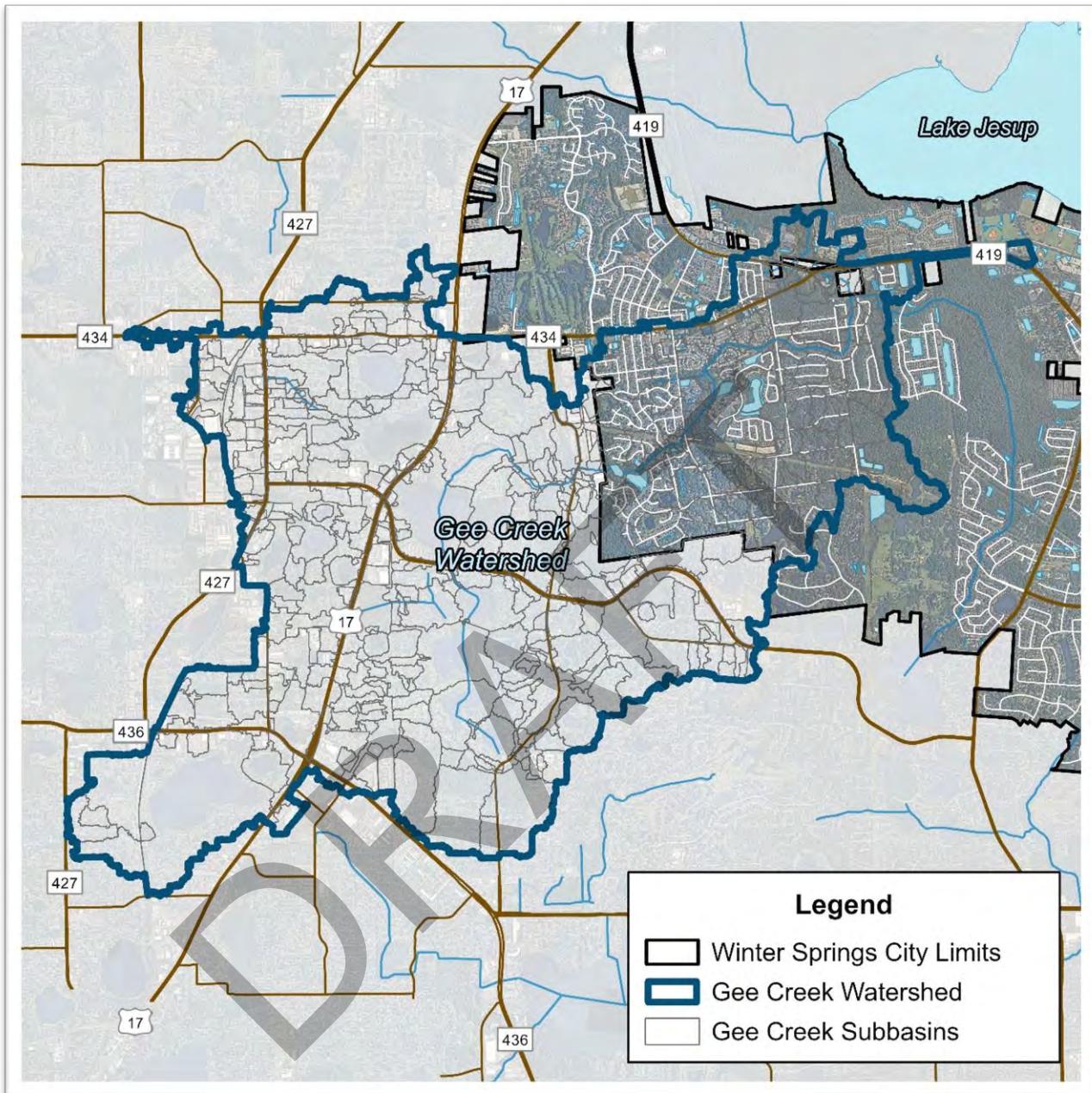


Figure 7: Gee Creek Watershed

2.2. Lake Jesup Watershed

The Lake Jesup watershed is located on the northern edge of the City of Winter Springs. The watershed is approximately 67.5 square miles, encompassing areas in Sunland Estates, Orlando Sanford International Airport, and Black Hammock. The portion within the City of Winter Springs is 2.5 square miles. The basin consists of areas that are drained directly to Lake Jesup by streams and tributaries adjacent to the Lake. Lake Jesup receives stormwater from all five City watersheds, and ultimately outfalls to the north into Lake Monroe.

Within the City boundaries, the Lake Jesup watershed includes the Town Center District and Winter Springs High School. The land cover is categorized by medium to high density residential development, woody wetlands, and evergreen forests. See **Figure 8** below for extents of this watershed study overlain on the City limits:

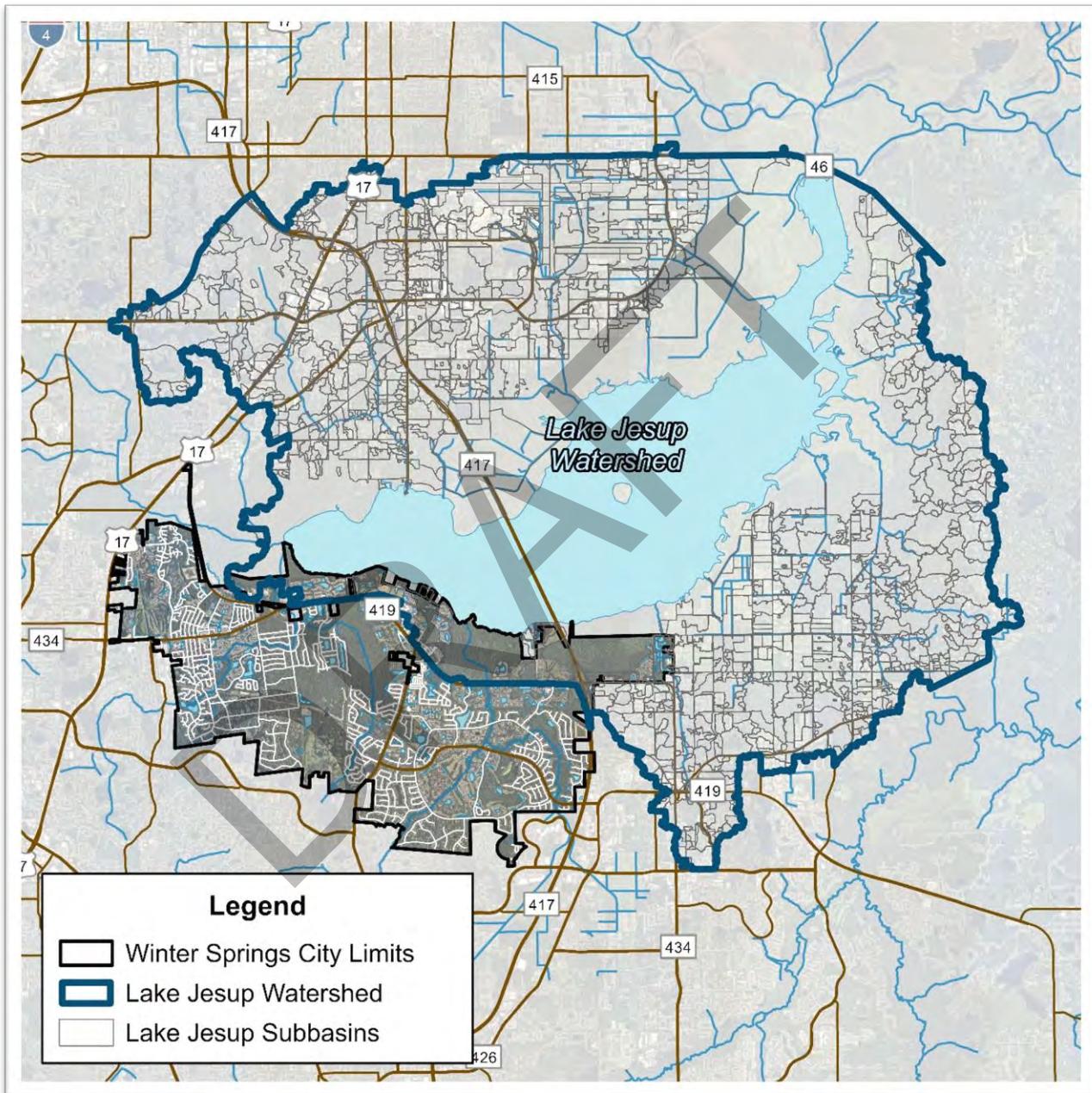


Figure 8: Lake Jesup Watershed

2.3. Little Lake Howell Watershed

The Little Lake Howell watershed is located in the center of Winter Springs, between the Gee Creek and Howell Creek watersheds. The watershed is approximately 4.2 square miles, encompassing a small area south of the City limits, in Casselberry, and 3.1 square miles within Winter Springs. It features No-Name Creek, a tributary of Gee Creek, originating from Little Tuskawilla Lake at the southern boundary of the watershed.

Within the City boundaries, the Little Lake Howell watershed is categorized primarily by low to high density residential development, a large, wooded wetland surrounding No-Name Creek, and areas of evergreen forest.

See **Figure 9** below for extents of this watershed study overlain on the City limits:

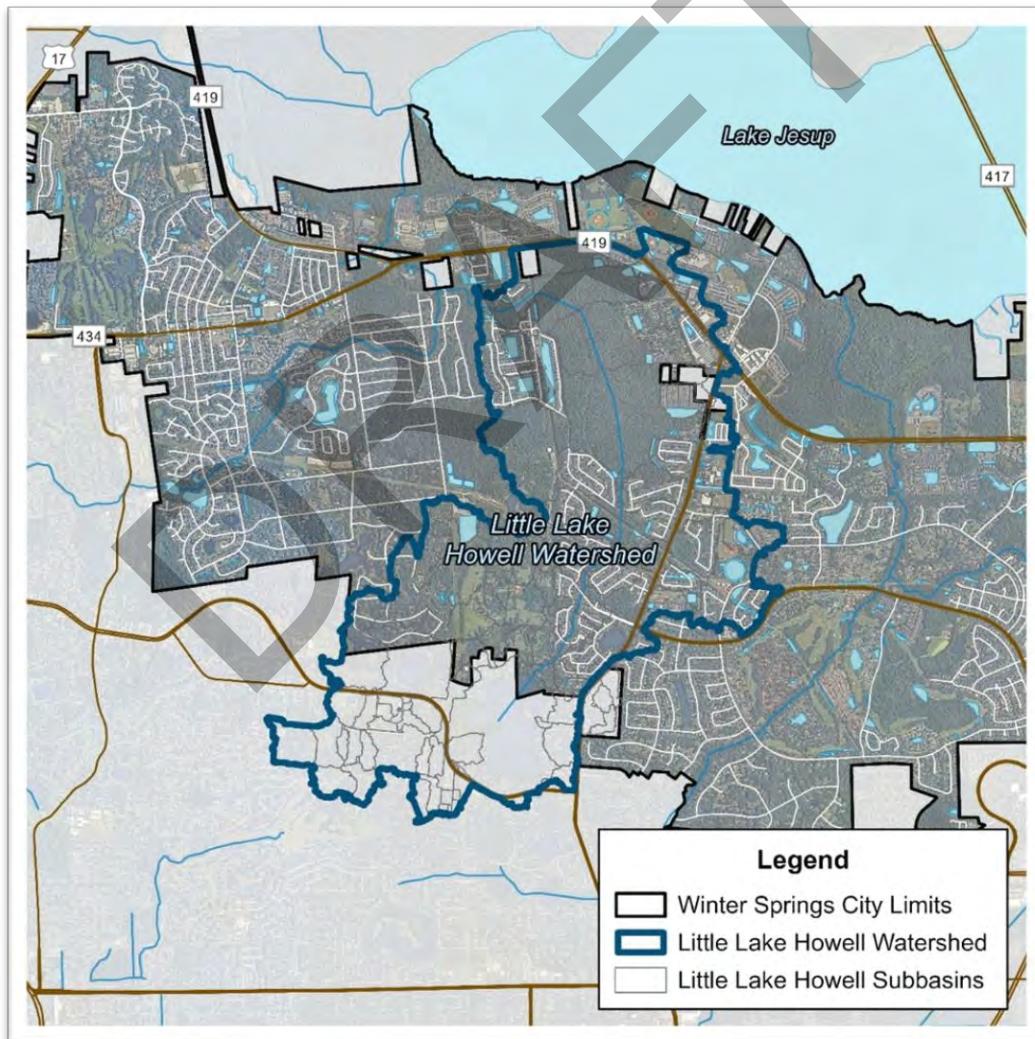


Figure 9: Little Lake Howell Watershed

2.4. Howell Creek Watershed

The Howell Creek Basin is located within the eastern portion of the City of Winter Springs, to the east of Little Lake Howell basin. The basin is approximately 50.2 square miles, encompassing areas of Orlando, Winter Park, Maitland, Fern Park, Casselberry, and Oviedo, with 5.0 square miles located within Winter Springs. The watershed is defined by two creeks, Howell Creek and Bear Creek. Howell Creek runs south to north into Lake Jesup. Bear Creek is a tributary to Howell Creek, flowing from the east and draining the southeast corner of the City.

Within the City boundaries, the Howell Creek watershed land cover consists primarily of low to high density residential development, and areas of woody wetlands. See **Figure 10** below for extents of this watershed study overlain on the City limits:

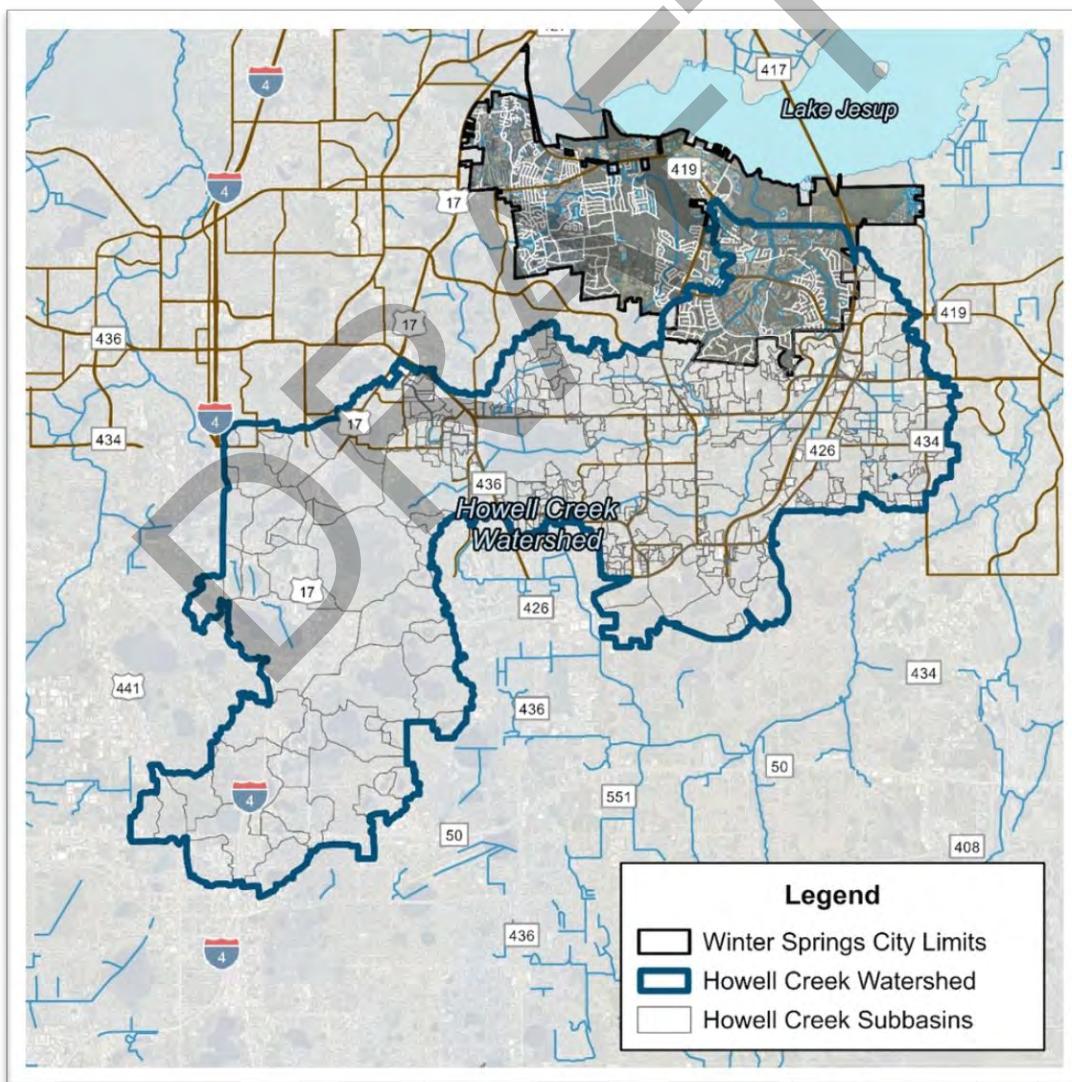


Figure 10: Howell Creek Watershed

2.5. Soldier's Creek Watershed

The Soldier's Creek watershed is located to the northwest of the City of Winter Springs, west of Gee Creek and east of I-4 Express Way. The basin is approximately 19.8 square miles, encompassing areas of Longwood, Lake Mary, and Sanford. Of those 19.8 square miles, approximately 1.7 square miles of the watershed fall within Winter Springs. The basin is characterized by Soldier's Creek which flows northwest to southeast into Lake Jesup. The City's portion of the watershed is drained northward into Soldier's Creek although the main branch is not located within City boundaries.

Within Winter Springs, Soldier's Creek watershed consists primarily of low to high density residential areas, and commercial areas along E State Road 434 and US Highway 17.

See **Figure 11** below for extents of this watershed study overlain on the City limits:

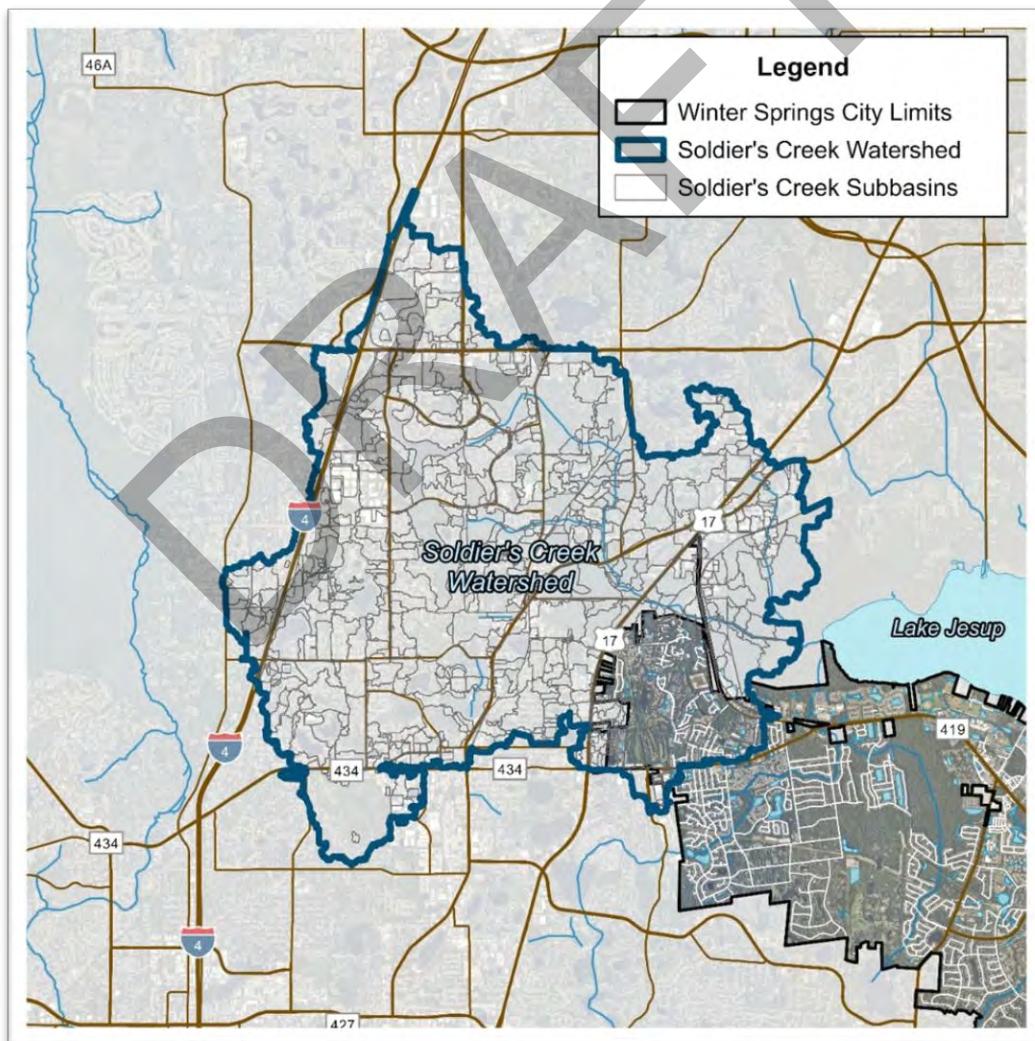


Figure 11: Soldier's Creek Watershed

3. Local and Regional Planning Efforts

Local and regional planning for this SWMP included reviewing flood risk areas already identified in the City. The studies provide an extensive history of flood risk within the City, but their regional focus renders them inadequate as planning guides for the City, with the exception of the *Basin Studies for East Seminole County Basins* which provide detailed watershed models that served as the basis of the analysis of the City's flood risk in this SWMP. The *Modeling Methodology* section of this report outlines the modifications made to *Basin Studies for East Seminole County Basins* as part of this SWMP. These regional level studies show the necessity for a local level study of the City's flood risk and potential solutions provided in this SWMP.

3.1. East Central Florida Regional Resiliency Collaborative (ECF RCC) Risk Assessment

The ECF RCC completed a regional risk assessment (RA) in 2023. Part 4 of the RA assessed several threats including 100-year Flooding and Flash Flooding. Approximately 38% of the County was identified as a medium or high threat zone for the 100-year flood zone hazard based on a review of existing FEMA data. The County was also determined to be at elevated risk for flash flooding, with 58% of the County categorized as medium or high threat zones.

3.2. Seminole County Stormwater Master Plan

Seminole County completed a SWMP in April 2018 to identify County-Wide floodplain level of service and potential CIP projects for County owned infrastructure. No-Name creek, a tributary of Gee Creek, was identified as an area with flooding as well as the larger Gee Creek drainage basin. The SWMP also identified potential projects involving partnership with municipalities within the County. Solary Canal and No-Name Creek were identified as areas for potential partnering efforts within the City.

3.3. Seminole County Comprehensive Vulnerability Assessment

The Seminole County Comprehensive Vulnerability Assessment (VA), Agreement No. 23PLN29, was revised by an amendment and executed April 2025. The VA will include Altamonte Springs, Casselberry, Lake Mary, Longwood, Oviedo, and Winter Springs. The goal of the VA is to determine critical assets within the County and their vulnerability to various flood events and planning horizons. The VA is currently underway and has an estimated completion date of June 2026.

3.4. Seminole County Local Mitigation Strategy (LMS)

The Seminole County LMS is a multi-jurisdictional hazard mitigation plan in cooperation with multiple municipalities including the Cities of Winter Springs, Altamonte Springs, Casselberry, Lake Mary, Longwood, Oviedo, Sanford, and Seminole County.

The LMS identified 3 repetitive loss properties within the City. All three properties were classified as residential. Repetitive loss properties are defined as properties meeting either of the following criteria:

- Insured property with at least 2 flood claims where the repairs equaled or exceeded 25% of the market value of the structure at the time of the flood event.
- Insured property with flood history of 4 or more separate claims of \$5,000 each with cumulative total exceeding \$20,000 or at least 2 claim payments where the cumulative amount of 2 claims exceeds the market value of the structure.

Integrating the improvements in the *Proposed Stormwater Strategies* section of this report into the next iteration of the Seminole County LMS would further coordinate flood protection efforts between the City and Seminole County.

3.5. Seminole County Floodplain Management Program

The Seminole County Floodplain Management Program (FMP) was developed in 2020 for the years 2020-2025. An updated FMP for 2025-2030 is in development. The plan seeks to develop a coordinated approach to flood mitigation within the County and its municipalities, including the City, to prioritize minimizing risk at the following critical facilities within the City:

- Winter Springs Water Treatment Plant (WTP) # 2 West at 700 Sheoah Boulevard
- Winter Springs Wastewater Treatment Plant (WWTP) West at 1000 West State Road 434
- Winter Springs Civic Center at 400 North Edgemon Avenue –
- Winter Springs Senior Center at 400 North Edgemon Avenue – Soldier’s
- Winter Springs Fire Department Station # 24 at 102 North Moss Road
- Winter Springs Public Safety Complex at 300 North Moss Road
- Winter Springs Water Treatment Plant (WTP) # 3 at 110 West Bahama Road
- Seminole County Public Schools Transportation Service Station at 810 East State Road 434
- Keeth Elementary School at 425 Tuskawilla Road
- Winter Springs Fire Department Station # 26 at 850 Northern Way
- Winter Springs Water Treatment Plant (WTP) # 1 East at 851 Northern Way

- Winter Springs Wastewater Treatment Plant (WWTP) East at 1560 Winter Springs Boulevard- Howell
- Winter Springs City Hall at 1126 East State Road 434
- Highlands Elementary School at 1600 Shepard Road
- Layer Elementary School at 4201 East State Road 419
- Winter Springs Elementary School at 701 West State Road 434
- Winter Springs High School at 130 Tuskawilla Road
- Indian Trails Middle School at 415 Tuskawilla Road

The Winter Springs Civic and Senior Centers, and Wastewater Treatment Plant East are located in the Soldier's Creek and Howell Creek watersheds, respectively, within subbasins impacted by the proposed projects in this SWMP. Additional detail can be found in the *Proposed Improvements* section.

3.6. Basin Studies for East Seminole County Basins

Hydrologic and hydraulic studies were performed by various engineering consultants to evaluate existing conditions within the watersheds of eastern Seminole County. These studies encompass each of the five watersheds that drain through the City of Winter Springs.

Seminole County provided five stormwater models that served as the basis for assessing and planning improvements in Winter Springs for this SWMP. These models supported preliminary inundation maps for 10-, 25-, and 100-year, 24-hour storms. Each model's detail was reviewed to identify potential for further refinement; only the Howell Creek Model was updated. All models were revised with proposed scenarios to measure improvement impacts. The process for adopting these studies is summarized below and explained fully in the *Modeling Methodology* section of this SWMP.

- The Gee Creek Watershed Basin Engineering Study was developed by Seminole County in conjunction with Singhofen & Associates, Inc. and completed in July 2025. The Interconnected Channel and Pond Routing Model (ICPR4) model and Basin Engineering Study report were obtained for review and incorporation into this SWMP. The existing condition Gee Creek Watershed model was adopted with no changes.
- The Howell Creek Watershed Management Plan Update was developed by Seminole County in conjunction with the Ardurra Group. The study was completed in August 2025. The StormWise model and Watershed Management Plan report were obtained for review and incorporation into this SWMP. The Howell Creek Watershed model required extensive modifications to increase the level of detail within the City of Winter Springs. Notable revisions included reconfiguration of subbasins within the watershed, adjustment of connectivity between subbasins, channel geometry

refinement, pipe size and invert adjustment, bridge overtopping elevation adjustment, and modification of Manning's "n" values within channels. The modifications are discussed in detail in the *Modeling Methodology* section of this report and **Appendix C**.

- The Lake Jesup Watershed Basin Engineering Study was developed by Seminole County in conjunction with Geosyntec Consultants, Inc. and completed in July 2025. The ICPR4 model and Basin Engineering Study report were obtained for review and incorporation into this SWMP. The existing condition Lake Jesup Watershed model was adopted with no changes.
- The Little Lake Howell Watershed Basin Engineering Study was developed by Seminole County in conjunction with Inwood Consulting Engineers, Inc., and completed in July 2025. The ICPR4 model and Basin Engineering Study report were obtained for review and incorporation into this SWMP. The existing condition Little Lake Howell Watershed model was adopted with no changes.
- The Soldier's Creek Watershed Basin Engineering Study was developed by Seminole County in conjunction with Geosyntec Consultants, Inc. and completed in July 2025. The ICPR4 model and Basin Engineering Study report were obtained for review and incorporation into this SWMP. The existing condition Soldier's Creek Watershed model was adopted with no changes.

4. Stormwater Regulations

4.1. National Pollution Discharge Elimination System (NPDES)

The NPDES is managed by the U.S. Environmental Protection Agency (EPA) and the Florida Department of Environmental Protection (FDEP). FDEP issues NPDES permits for discharge from point sources, including municipal separate storm sewer systems (MS4s) outfall points. The City is a co-permittee of Seminole County's MS4 permit, along with other municipalities in the County, and is required to report annually on the following actions:

- Contribution to MS4 SWMP including implementation, inspection, and maintenance of structural controls and roadways
- Control and management of stormwater pollutants from areas of new development and significant redevelopment
- Control and management of stormwater pollutants from roadways
- Assurance that flood management projects and retrofitting of existing structural flood control devices consider water quality treatment
- Control and management of stormwater pollutants from municipal waste treatment

- Control and management of stormwater pollutants from application and storage of pesticides, herbicides, and fertilizers
- Control and detection of illicit discharges and improper disposal into MS4
- Control and management of stormwater pollutants from industrial and high-risk runoff areas
- Control and management of stormwater pollutants from construction site runoff

The 2024 annual report from the City details the maintenance, inspections, public outreach, and other actions taken by the City during the year. Included in the report is a summary of water quality monitoring conducted in conjunction with the County per an inter-local Agreement since 1998. Monitoring tests the waters of Gee Creek, Howell Creek, and Soldiers Creek against numeric criterion for stormwater pollutants including Total Nitrogen, Total Phosphorous, and Chlorophyll-A based on FDEP standards for the Lake Jesup Basin Management Action Plan.

NPDES permits remain a separate federal process, not connected to state ERP or delegated to WMDs. Applicants should secure both NPDES and ERP permits before construction.

4.2. National Flood Insurance Program (NFIP)

The National Flood Insurance Program (NFIP) is jointly administered by the Federal Emergency Management Agency (FEMA) and the Florida Department of Community Affairs (DCA). Floodplain management and stormwater planning are interrelated, as both are focused on mitigating flood risk and enhancing community resilience. The City's participation in the NFIP and the Community Rating System (CRS) establishes a framework that allows this SWMP to align with national and state standards, while also providing opportunities for financial savings through improved CRS scores. Although participation in these programs is voluntary, communities identified as being at risk of flooding that elect not to participate may face sanctions. Winter Springs joined the NFIP in October 1993.

Participating communities may choose to exceed the minimum floodplain management requirements established by the NFIP, thus becoming eligible for reduced flood insurance premiums under the CRS. Communities participating in the CRS receive ratings from Class 10 (lowest) to Class 1 (highest), with each improvement in rating resulting in greater premium discounts for NFIP policies. The City currently maintains a Class 6 rating in the CRS, which affords a 20% discount on full-risk premiums for all NFIP policies within the City, including those located outside the Special Flood Hazard Area (SFHA). A histogram illustrating the distribution of Nationwide CRS Class ratings can be found in **Figure 12**. The City's current CRS scores are presented in **Table 1** below.

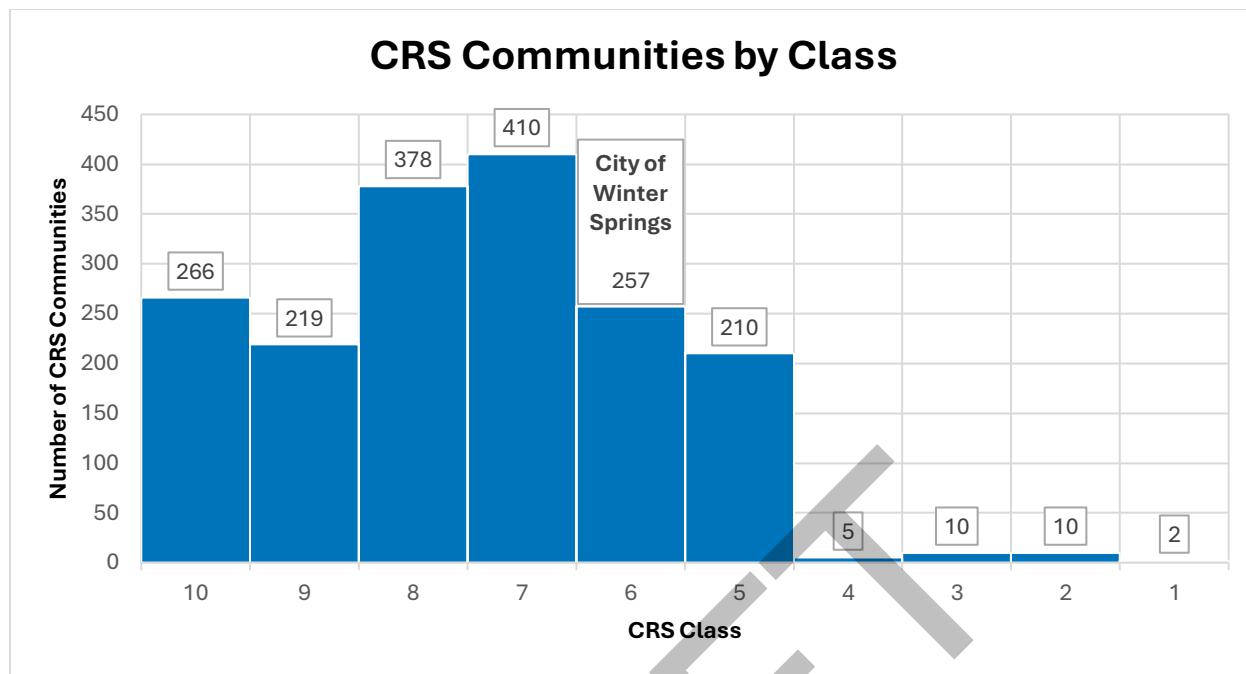


Figure 12: CRS Communities by Class

Table 1. City of Winter Springs CRS Scores

Activity	Description	City Score	National Average
310	Elevation Certificates	38	39
320	Map Information Service	90	79
330	Outreach Projects	160	128
350	Flood Protection Information	52	52
360	Flood Protection Assistance	55	62
410	Flood Hazard Mapping	18	84
420	Open Space Preservation	479	488
430	Higher Regulatory Standards	307	279
440	Flood Data Maintenance	146	133
450	Stormwater Management	126	114
510	Floodplain Management Planning	189	220
540	Drainage System Maintenance	200	196
610	Flood Warning and Response	235	256

This SWMP addresses elements of Activity 450 and Activity 540. The City's adoption of this SWMP may qualify the City for additional points in the Watershed Master Plan (WMP)

Element of Activity 450. This SWMP also recommends the creation of several maintenance programs and a CIP in the *Proposed* section of this report. These programs, if implemented, will qualify the City for additional points under the channel debris removal (CDR), CIP, and storage basin maintenance (SBM) Elements of Activity 540.

4.3. Environmental Resource Permit (ERP) Program

The Environmental Resource Permit (ERP) Program is administered by the Florida Department of Environmental Protection (FDEP) and the five Water Management Districts within the state of Florida. The City of Winter Springs lies within the St. Johns River Water Management District (SJRWMD). SJRWMD evaluates ERPs for residential and commercial developments, roadway construction, and agricultural projects, while FDEP manages ERPs for power plants, ports, wastewater treatment facilities, and single-family residential projects.

The ERP review process ensures that proposed projects do not adversely affect water quality, public health, safety, welfare, navigation, or surface water flow, nor do they impair fishing, recreational uses, increase flooding risks, or harm wetlands, fish, or wildlife. Active ERPs undergo periodic compliance inspections to confirm ongoing adherence to permit conditions.

Activities that alter surface water flows or impact wetlands and other surface waters, such as construction or modification of stormwater systems, roadway and infrastructure projects, and SWMP implementation projects, generally require ERP under Florida law. These activities change drainage patterns, increase impervious surfaces, or affect wetlands, triggering regulatory oversight. Routine maintenance activities like cleaning culverts, mowing, or repairing existing structures without changing design or capacity are typically exempt. Other municipal exemptions include projects below threshold limits such as less than one acre of disturbance, emergency repairs, and work confined to previously permitted systems without expansion or alteration. Detailed definitions for each permit type and exemptions are provided in the *Environmental Resource Permit Applicant's Handbook Volume I*.

To support compliance with the new stormwater rule (known as Florida's Clean Waterways Act/SB 712 and ratified by the Florida Legislature under SB 7040 in June 2024), the City may collaborate with SJRWMD to enhance enforcement and inspection capabilities for permitted systems, including private and hybrid ownership ponds. Depending on the City's pond maintenance policy moving forward, this partnership could involve leveraging City staff to conduct routine inspections using SJRWMD-approved protocols and sharing inspection data through coordinated reporting systems. The City's existing code enforcement authority may also be utilized to address maintenance deficiencies identified during inspections,

providing a local mechanism for enforcement in concert with SJRWMD permitting oversight and ERP inspection and operating permit renewal requirements. Additionally, joint outreach and education efforts can inform property owners and Homeowners Association about maintenance responsibilities and inspection requirements, ensuring consistent application of ERP standards across the community.

4.4. City Ordinances and Regulations

City Ordinances reflect the formal implementation and adoption of Comprehensive Plan objectives and policies. The City established stormwater management regulations in 1974, which provided the initial basis for regulating stormwater discharge from proposed development within the City. That regulation has been updated periodically to reflect improved knowledge on effective stormwater management. The latest update was in 2023, which established updated discharge limitations, design storms, and modeling requirements. The establishment of a stormwater management utility fee in 1992 marked a significant step, providing the basis of funding for the City to manage its stormwater assets. The utility fee is intended to be dynamic to meet the needs of the City, it is periodically analyzed and updated to fund projects necessary for the City's stormwater operations.

Ord. No. 721, § 3, 7-27-92 – Stormwater Management Utility Fee Created creates and imposes a stormwater management utility fee on all developed property within the City.

Code 1974, § 14-122; Ord. No. 2023-07, §§ 3, 4, 12-11-23 – Stormwater Management establishes the required improvements for proposed stormwater management systems. The performance standards consist of maintaining the rate, volume, quality, and timing of stormwater runoff equivalent to or below existing conditions. The ordinance establishes design rainfall duration, frequency, and distribution requirements. Modeling requirements are also established, including the requirement that tailwater conditions must be considered. Stormwater systems must also meet water quality standards set forth in the SJRWMD ERP Applicants Handbook Volume I.

Ord. No. 521, § 4, 7-27-92; Ord. No. 2025-11, § 2, 5-12-25 – Schedule of Rates revises the City's stormwater management utility fee to \$10.00 per Equivalent Residential Unit (ERU).

5. Existing Data Review

5.1. Stormwater Infrastructure Field Inventory

Prior to Phase 1, the City maintained a Geographic Information System (GIS) dashboard which provided a foundational inventory of stormwater infrastructure. The last update to the dashboard was completed in 2012. While this resource captured a substantial portion of the City's system, some data had become outdated or did not reflect subsequent new construction, and it had not been fully leveraged for ongoing maintenance purposes. The field data collection effort was therefore developed to provide an updated assessment of system conditions and to incorporate additional structures not previously recorded.

Kimley-Horn led the ArcGIS Field Maps data collection initiative, systematically preparing a data point for each accessible stormwater structure and applying a standardized rating scale based on physical condition, safety, and environmental impact. Photographic documentation was included for each structure to enhance the accuracy and utility of the assessment. Given that many stormwater structures are located on private property, Kimley-Horn coordinated with property owners to secure access release forms where necessary, ensuring comprehensive coverage and compliance with access requirements.

Historic record drawings, primarily for single-family residential neighborhoods, were provided by the City to supplement the field data collection. These as-built drawings were compared against the existing GIS dashboard and missing or previously undocumented structures were added to the City's digital inventory. A rigorous quality control process followed the initial data collection and integration phase, involving detailed review of all historic record drawings, verification of newly added structures, and re-examination of locations where data gaps or insufficient information persisted. This approach ensured a more accurate and complete representation of the City's stormwater system and provided a reliable basis for subsequent hydrologic and hydraulic modeling, as described in Section 6.2 Modeling Methodology.

5.2. Stormwater Related Work Orders

City staff provided work orders from January 2019 to August 2024 for stormwater maintenance and repairs. This data highlighted recurring problem areas and helped pinpoint sites needing further analysis and design upgrades. The locations of City stormwater work orders are shown in **Figure 13**.

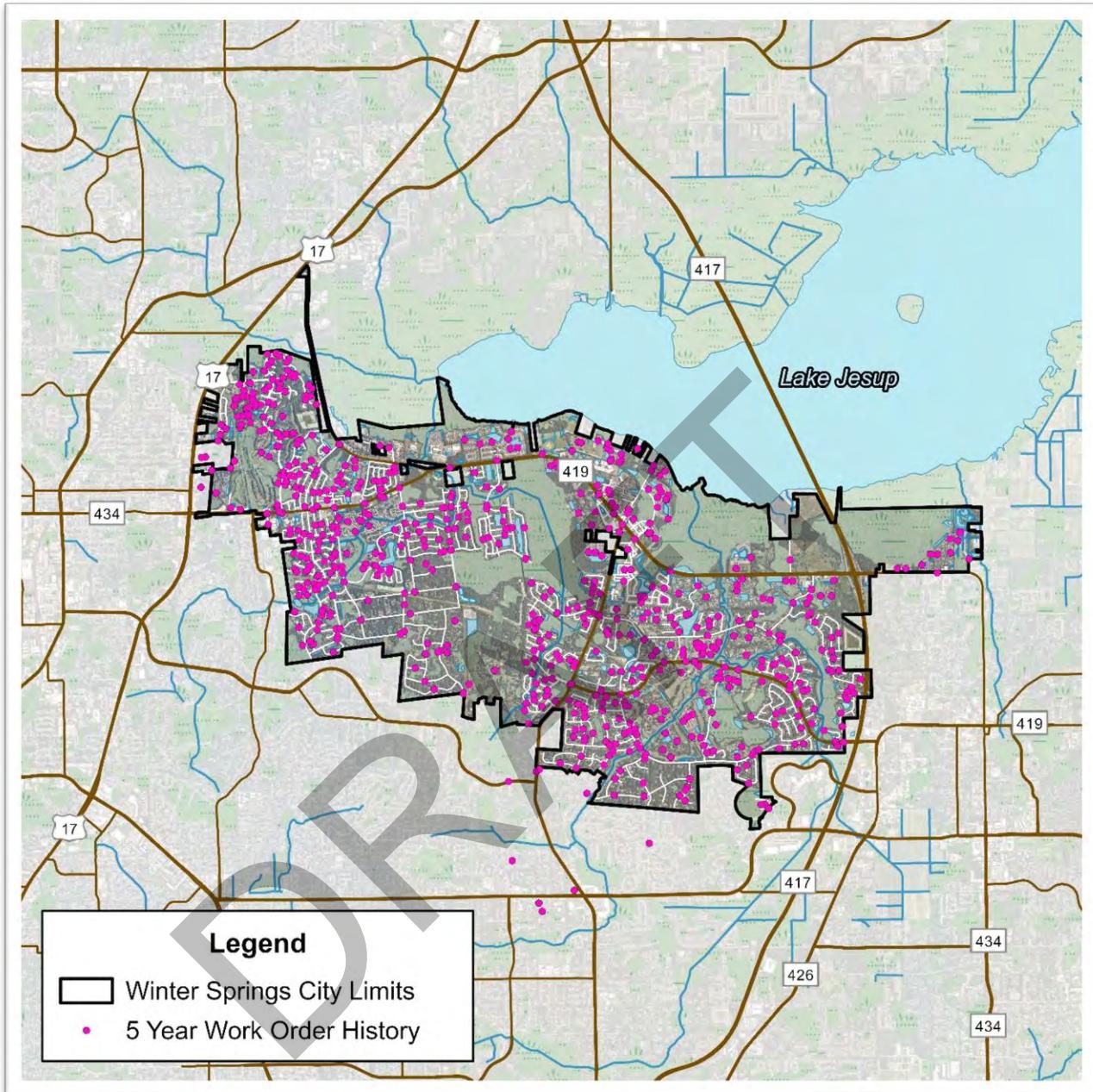


Figure 13: Stormwater Work Order History

Winter Springs Boulevard had the highest number of work orders in the City over five years, totaling 58; 18 were for drainage issues in the creek or roadway system.

5.3. Hurricane Ian Damage Inventory

A damage inventory was conducted by the City following Hurricane Ian, the location of areas with damage are shown in **Figure 14**.

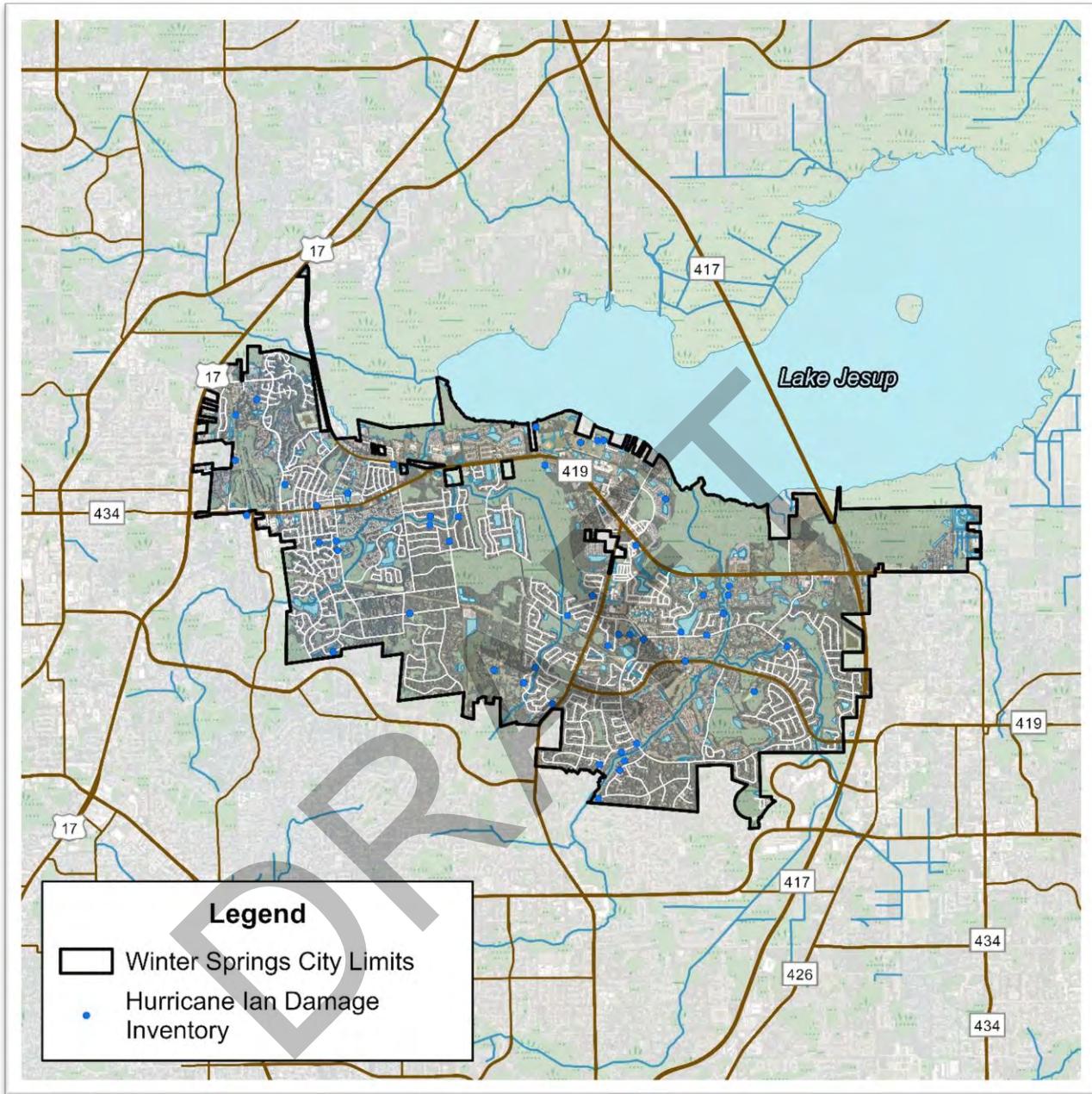


Figure 14: Hurricane Ian Damage Inventory

The City cataloged 71 damaged areas due to flooding and wind. Damaged areas are generally located along the City's major roads and riverine waterbodies, consistent with the existing conditions findings in the *Proposed* section of this SWMP. Damage in the vicinity of Lake Jesup was limited to the City's fishing pier and storm sewer pipe failure due to a perched water table near Orange Avenue. Floods greater than designed flows were reported throughout the City, resulting in damage to cross-drains and roadways. Damaged roadways due to saturation were also reported, indicating that floodwaters rose above design stages

in roadways throughout the City as well. Northern Way Bridge was overtopped resulting in damage to guardrails, sidewalks, and asphalt at the bridge approaches. Northern Way Bridge's approach slab was also undermined by stream flows. The pattern of damage reported from Hurricane Ian is consistent with the findings of the existing conditions watershed models within the City. Hurricane Ian resulted in 82 complaints filed with the City, as shown in **Figure 15**.

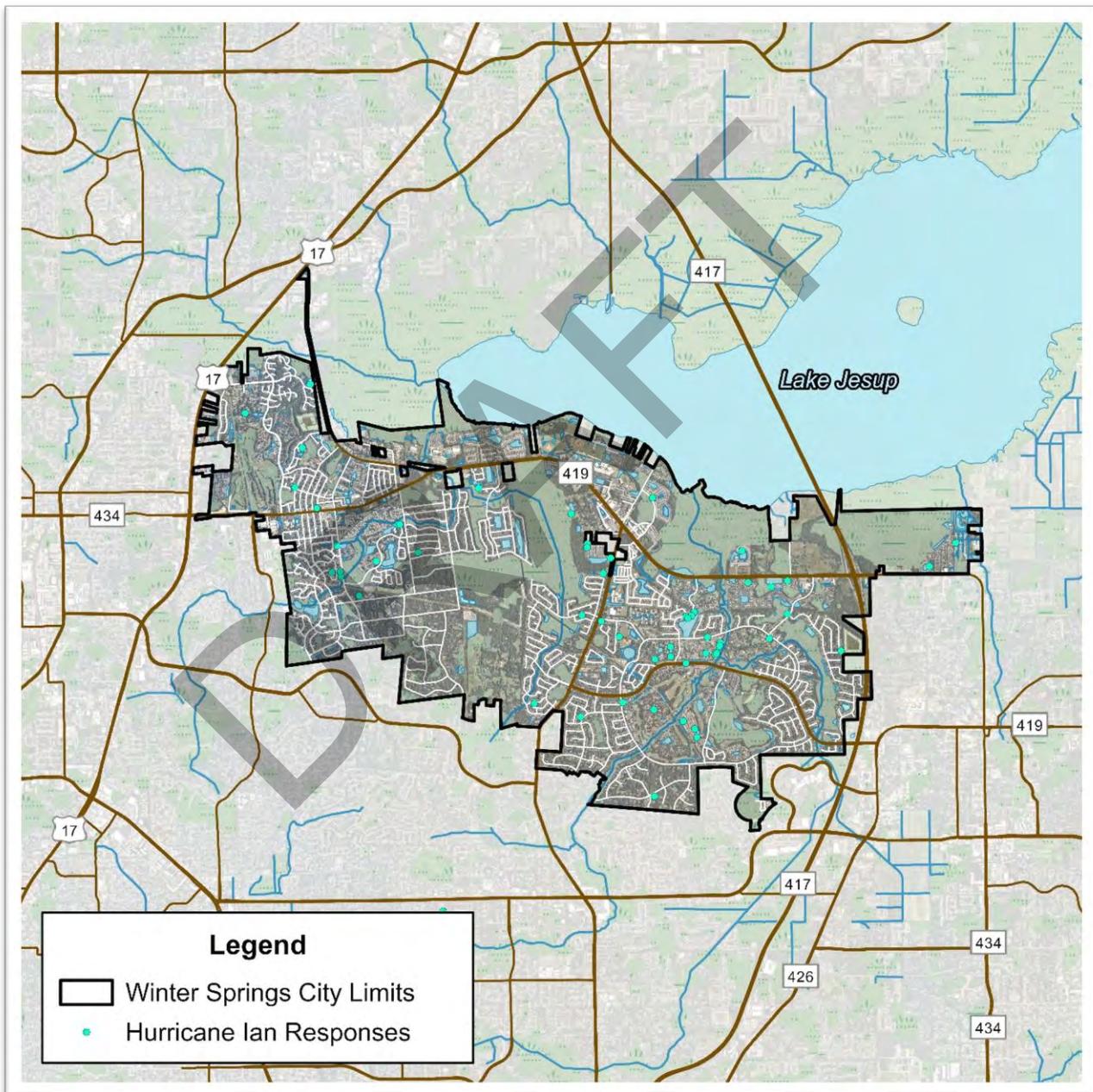


Figure 15: Hurricane Ian Drainage Complaints

These complaints focused primarily on sewer backup issues, ranging from backyards receiving sewer flow to homes being flooded by sewer flow. One complaint was related to ponds, a reclamation pond overflowed near 641 Saranac Drive. These responses occur in a similar pattern to the damage inventory, primarily occurring around major roads and riverine waterbodies.

5.4. FEMA Flood Hazards

The City is susceptible to riverine flooding from multiple sources and to lacustrine flooding from Lake Jesup. One resource used to assess flood risk is the FEMA Flood Insurance Rate Maps (FIRM), which show areas at risk of riverine and lacustrine flooding. The City is mapped in the following FIRM Panels, all effective September 28th, 2007: 12117C0155F, 12117C0160F, 12117C0165F, 12117C0170F, 12117C0180F, and 12117C0190F. Flooding is primarily concentrated around the following waterbodies, studied as part of the Flood Insurance Study (FIS) for Seminole County:

- Bear Creek
- No-Name Creek
- Gee Creek
- Howell Creek
- Soldiers Creek
- Lake Jesup

The FEMA flood hazard zones within the City are described in further detail **Table 2** and **Figure 16** for the FEMA floodplains within the City's extent.

Table 2: Flood Zone Definitions

Flood Zone	Description
AE	Areas subject to inundation by the 1% ACE flood event with established Base Flood Elevations (BFE).
A	Areas subject to inundation by the 1% ACE flood event without established BFEs.
Floodway	The channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height.
X Shaded	Areas subject to inundation by the 0.2% ACE flood event.
X Unshaded	Areas of minimal flood hazard.

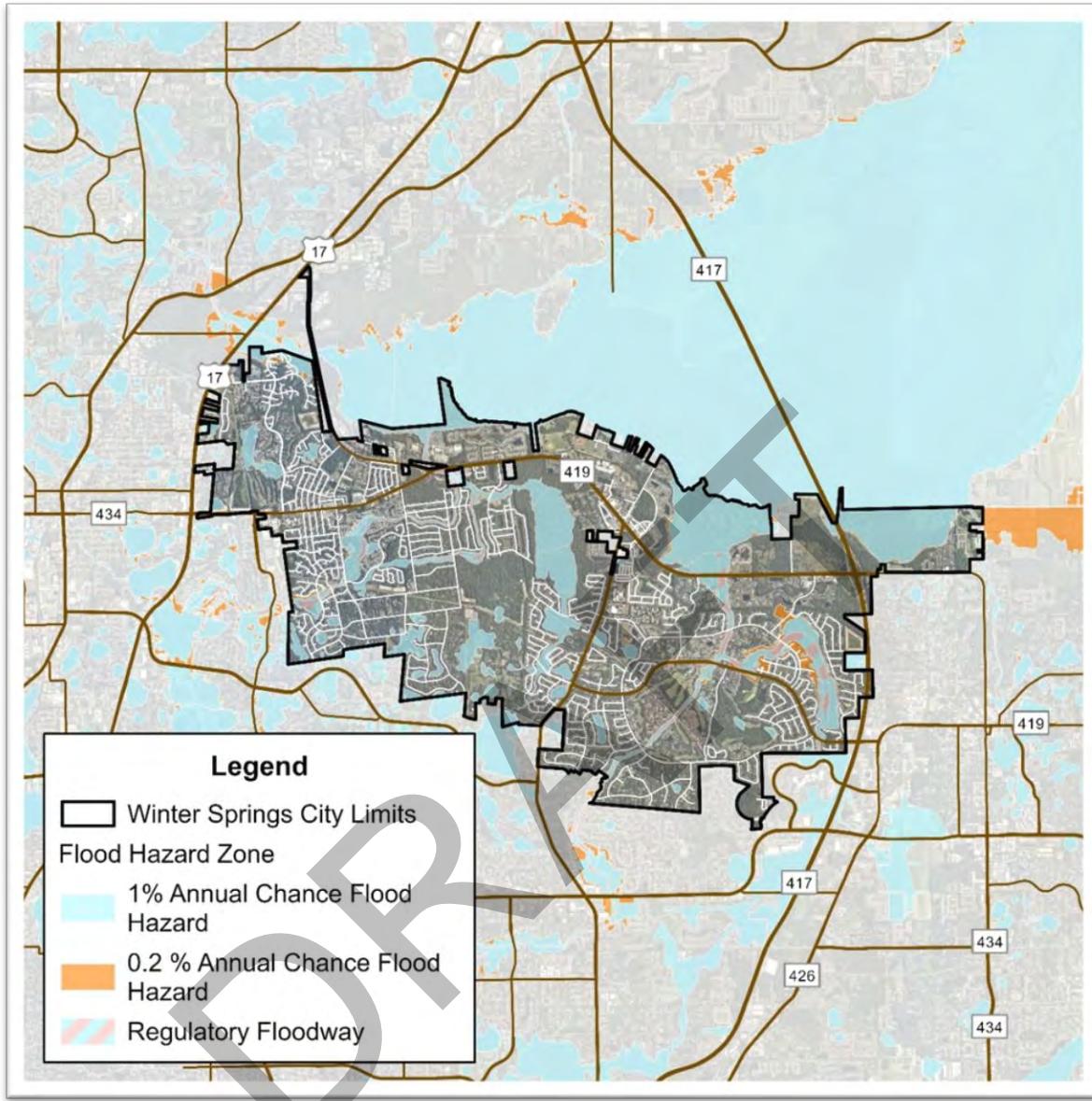


Figure 16: FEMA Special Flood Hazard Areas

6. Proposed Stormwater Strategies

The data collection efforts in the *Existing Data Review* section of this SWMP informed the identification of Areas of Interest (AOIs). Forty-six AOIs were identified based on observed and reported flooding, evaluation of existing infrastructure, stormwater damage and work order reports, and mapped FEMA and Seminole County Basin Study flood hazards. Through criteria discussed in the *Areas of Interest* section, twelve areas were identified for future capital improvement projects.

Utilizing the five Seminole County Basins models discussed in the *Basin Studies for East Seminole County Basins* section, proposed conditions modeling was prepared to evaluate project alternatives for the twelve project areas. Project alternatives were selected based upon their competitiveness within the *Project Scoring Criteria* established by this SWMP.

6.1. Level of Service Criteria

Level of Service (LOS) Criteria for this SWMP are defined in the Infrastructure Element of the City's Comprehensive Plan under **Goal 4 Objective 4.1 – Flood Control** and **Section 9-241(e)** of the City Code of Ordinances. **Policy 4.1.1** recommends that the City adopt the following LOS standards for roadways:

- Local Roadway – No water above the roadway in the 25-year, 24-hour design storm event (8.6 inches of rainfall)
- Collector Roadway – No water above the roadway in the 25-year, 24-hour design storm event (8.6 inches of rainfall)
- Arterial Roadway – No water above the roadway in the 100-year, 24-hour design storm event (11.6 inches of rainfall)

Section 9-241(e) of the City Code of Ordinances outlines lot grading and finished floor elevations requirements within the City. Finished floor elevations in the City must be elevated to a minimum of 18 inches above the 100-year base flood elevation. This SWMP established the 100-year, 24-hour storm as the LOS standard for residential and non-residential buildings.

The studies outlined in the *Basin Studies for East Seminole County Basins* section of this report were used to identify areas within the City where the LOS Criteria were not met. Areas not meeting LOS Criteria were further reviewed and considered for inclusion as Areas of Interest.

6.2. Modeling Methodology

The five hydrologic and hydraulic models utilized in this SWMP were based off the Seminole County Basin study models. Four of the County Basin study models (Soldier's Creek, Gee Creek, Little Lake Howell, and Lake Jesup) were deemed sufficient for the purpose of the SWMP to be used as the baseline for analysis of proposed capital improvements without significant modifications.

The Howell Creek Basin study model was revised to correct areas that conflicted with the City's stormwater atlas (developed under this Stormwater Improvement Program) and add additional detail as necessary within the City. The model revisions included updating

subbasin configuration, refining channel geometry, adjusting pipe and culvert sizes and elevations, and modifying Manning's "n" values based on available data and resources. These changes ensured that hydrologic data applied more accurately to current conditions, improved the representation of channel lengths and cross sections, and aligned roadway overtopping elevations with available elevation data. The revised Howell Creek Basin study was then used as the baseline for analysis of proposed capital improvements within the watershed.

Supplemental analysis of the Howell Creek watershed will be prepared at a future time, to further verify hydrologic conditions in the watershed, add additional detail within the City outside of proposed project areas, and fully adopt the model as an analysis tool by the City as the other Basin study models have been. Additional information regarding changes to the Howell Creek model can be found in the memorandum attached in **Appendix C**.

The integration of proposed revisions in the stormwater model consisted of targeted modifications to nodes, links, and other modeled hydraulic elements. This included updates such as adding new pipe links, changing the size and inverts of existing pipe links, widening established channels or ditches, expanding storage areas, and re-establishing channel pathways. These improvements were implemented through parameter changes, manual adjustments to cross-section widths, and updates to stage-area tables, ensuring the hydraulic model accurately reflected planned enhancements and increases in system capacity.

Each project assessed the 25- and 100-year, 1-day storm events in accordance with the City's LOS objectives. For every proposed project area, level pool floodplains were delineated under both existing and proposed conditions, utilizing the maximum stage of the node nearest to the project site. A comparison of these floodplains was conducted to illustrate the overall reduction in flooding attributed to the proposed improvements. Detailed analyses at road crossings and adjacent residential properties were performed to evaluate enhancements in LOS.

For the 25-year, 1-day storm event, proposed and existing floodplain extents were compared to the elevation of the road crown within the project area, quantifying the linear feet of roadway removed from the modeled floodplain and the corresponding decrease in flood depth. For the 100-year, 1-day storm, comparisons focused on affected structures to determine the number of buildings eliminated from the floodplain. In instances where an existing or proposed level pool floodplain bordered a basin edge along a roadway but did not cross it, a transitional zone was incorporated to more accurately measure LOS improvements along that corridor.

Based on preliminary findings, up to two iterations of each project were carried out to further optimize the modeled LOS benefits.

6.3. Areas of Interest

Forty-six AOIs, as shown in **Figure 17**, were identified based on observed and reported flooding, evaluation of existing infrastructure, stormwater damage and work order reports, and mapped FEMA and Seminole County Basin Study flood hazards. These areas were evaluated based upon the existing Level of Service criteria described in the *Level of Service Criteria* section and as outlined in the City's Comprehensive Plan.

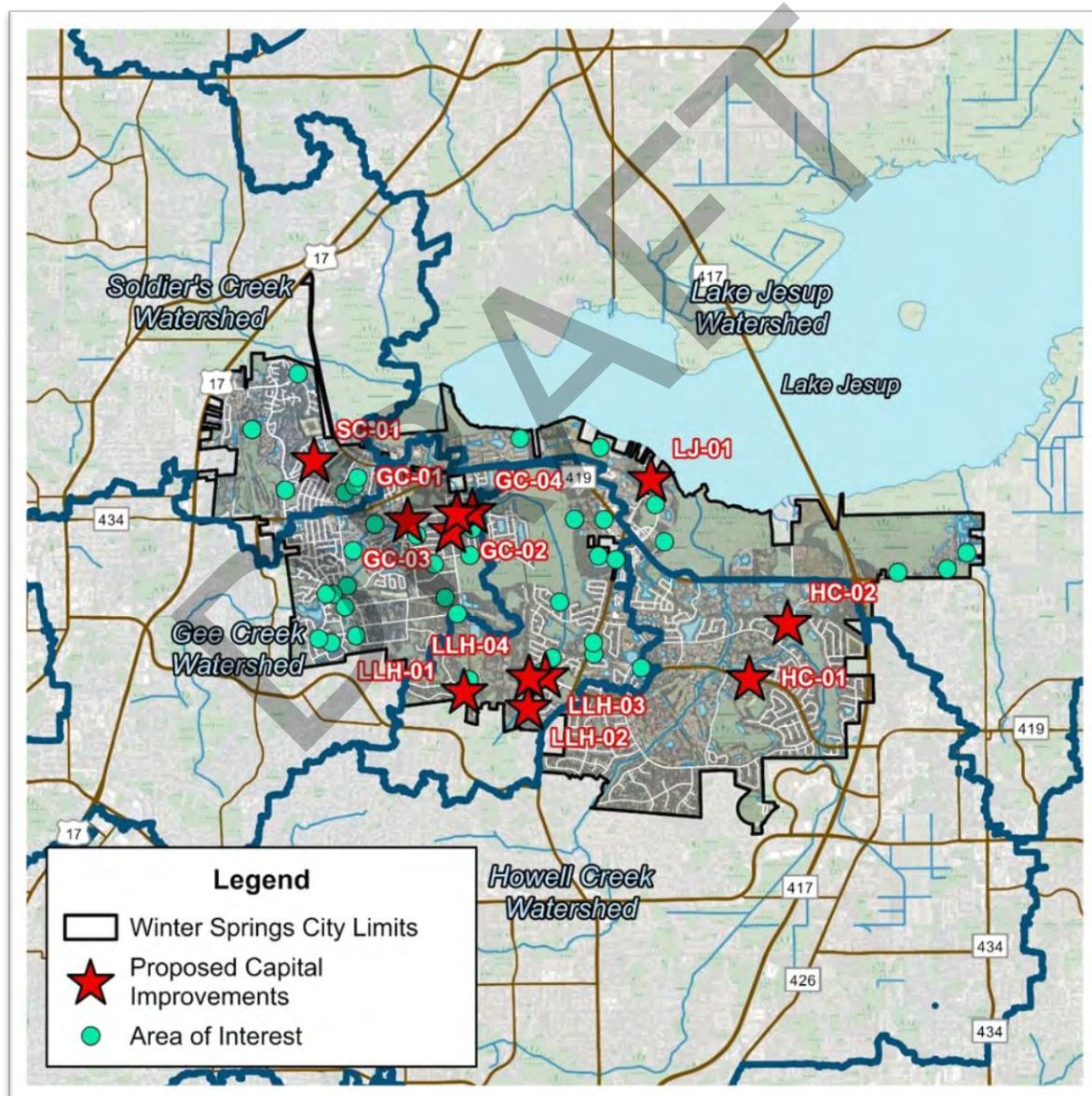


Figure 17: Prioritized Areas of Interest (AOIs)

Proposed capital improvement projects in the SWMP do not include Areas of Interest within private property. Based on City staff discussions and Level of Service criteria, the SWMP focuses on public infrastructure improvements, while private entities remain responsible for maintaining their own infrastructure. These areas are:

- 265 E Bahama Road Area
- Avery Park
- Cheyenne Trail
- Cory Lane
- Deer Song Drive and San Gabriel Street
- Hacienda Village
- Michael Blake Boulevard
- Mosswood Apartments
- Oviedo City Church Parking Lot
- Private Parking Lot Backflow South of Excelsior Parkway
- Sandringham Court, Seneca Meadows Rd, and Stone Harbour Rd
- Solaris Wharf Street, McLeod's Way, and Roberts Family Lane
- Southern Oaks Subdivision Streets
- SR 434 Northern Oaks Area
- Trail East of Seminole Crossing Townhomes

Areas where Level of Service could be improved due to larger nearby projects were not proposed as separate capital improvements. Instead, these locations may qualify for local “spot drainage” projects to repair or upgrade failing stormwater infrastructure. Such efforts are part of ongoing stormwater maintenance described in the *Proposed Maintenance Programs* section of this report. These areas include:

- Anhinga Road
- Arbor Glen at Tuskawilla
- Big Buck Circle
- E. Panama Road
- East and West Power Easement Ditches
- Edgemont Drive Wetlands between Panama W. Tradewinds and Jackson Circle
- Fruitwood Park and Fruitland Lake
- Hayes Road, Sailfish Road, and Shore Road
- Mimosa Court
- Mockingbird Lane near Oak Road
- Mockingbird Lane, Holiday Lane, and Sailfish Road

- North Tuskawilla Road
- O'Day Drive and Trotwood Boulevard
- Orange Avenue near Central Winds Park
- Sheoah Boulevard
- Sheoah Circle and Surrounding Neighborhoods
- South Tuskawilla Road
- S. Edgemon Avenue Creek Crossing
- S. Moss Road, Moss Park, and Dolphin Road
- Sweetgum Court
- Tributary South of Silver Creek Drive
- Tusca Oaks at Tuskawilla
- W. Bahama Road

Remaining Areas of Interest were deemed suitable areas for proposed capital improvement projects. These areas include:

- Alton Road and Lido Road and 202 Holiday Lane (GC-01)
- Shore Road (GC-02)
- Hayes Road, Alton Road, and Pearl Road Creek Crossing (GC-03)
- Mockingbird Lane North of Alton Road (GC-04)
- Winter Springs Boulevard near Davenport Way (HC-01)
- Vistawilla Drive near Seneca Boulevard (HC-02)
- North Tuskawilla Road South of St. Johns Landing (LJ-01)
- Fisher Road and Morton Lane Intersection (LLH-01)
- Sequoia and Chokecherry Area (LLH-02)
- Winter Springs Boulevard near Chokecherry Drive (LLH-03)
- Dunmar Estates (LLH-04)
- Highland Village (SC-01)

6.4. Proposed Capital Improvement Projects

Proposed capital improvement projects within the City include the replacement and improvement of existing culvert crossings, addition of pipe barrels to existing crossings, incorporation of outfalls and new crossings to provide conveyance in areas lacking drainage, addition or expansion of stormwater detention areas, and modification of channels to alleviate erosion and resultant flooding. Model parameters were updated to reflect these proposed improvements in each area. The final list of projects, along with descriptions, is presented in **Table 3**.

Table 3: Proposed Capital Improvement Projects

	Project ID	Name	Proposed Improvement
Gee Creek	GC-01	Alton Road Culvert & Reach Improvements	Widen the existing channel to a consistent 20-foot bottom width and replacing the existing pipes with a single 6-foot arch pipe.
	GC-02	Shore Road Culvert & Reach Improvements	Widen the existing channel to a consistent 15-foot bottom width and replacing the existing pipes with a single 6-foot arch pipe.
	GC-03	Hayes Road Culvert & Reach Improvements	Widen the existing channel to a consistent 15-foot bottom width in this section of the channel.
	GC-04	No-Name Creek Conveyance Improvements Near Alton Road	Widen the existing channel to a consistent 15-foot bottom width in this section of the channel as well as altering or replacing the existing pipe.
Lake Jesup	LJ-01	North Tuskawilla Road Outfall Improvements	Add a secondary 24-inch pipe along Tuskawilla Road and option for a depressional area north of the Cross Seminole Trail.
Little Lake Howell	LLH-01	Fisher Road Near Morton Lane Improvements	Add two (2) additional 24-inch pipes at the crossing beneath Fisher Road.
	LLH-02	Chokecherry Drive Near Sapling Drive Improvements	Install of two (2) additional 24-inch pipes beneath Chokecherry Drive.
	LLH-03	Winter Springs Boulevard Near Chokecherry Drive Improvements	Install two (2) additional 36-inch pipes beneath Winter Springs Boulevard.
	LLH-04	Dunmar Estates Flow Path Re-Establishment	Extend the existing outfall ditch as a channel to the south behind Dunmar Estates on Sequoia Drive
Soldiers Creek	SC-01	Highland Village Storage & Conveyance Improvements	Reroute stormwater to two wet detention ponds within Highlands Village before outfalling to a pond adjacent to Sheoah Boulevard.
Howell Creek	HC-01	Winter Springs Boulevard near Davenport Way Improvements	Remove existing pipes and install three (3) 38-inch elliptical pipes beneath Winter Springs Boulevard.
	HC-02	Vistawilla Drive Near Seneca Boulevard Improvements	Remove existing pipes and install three (3) 38-inch elliptical pipes beneath Vistawilla Drive.

Note: Schematics for the proposed improvements are shown in **Appendix A**.

All projects and the associated model updates (pipe parameters, channel widening extents, storage area locations, etc.) are conceptual and do not reflect permitting-level or design-level projects. It is recommended that all future design projects include additional site-specific project evaluation (including additional survey, geotechnical assessment,

environmental assessments, etc.) and necessary design refinement based on that evaluation.

In addition to proposed stormwater infrastructure improvements, proposed maintenance programs, derived from findings in Phases 1 through 3, were developed. The purpose is to complete the evaluation of visibly damaged pipes found in Phase 1, routinely perform infrastructure condition assessments, and produce a continuous and dynamic maintenance plan to mitigate malfunctioning during storm events of any intensity. **Table 4** summarizes the recommended maintenance activities.

Table 4: Proposed Maintenance Programs

Program ID	Name	Description
MNT-001	Pond Inspection & Maintenance	Enforce pond maintenance requirements within the City.
MNT-002	CMP Program	Monitor and repair the City's stormwater pipes as necessary.
MNT-003	CCTV Pipe Inspection Program	Utilize CCTV to aid in pipe inventory and condition assessment.
MNT-004	Creek Dredging and Erosion Program	Maintain condition of channels within the City and identify areas of erosion for mitigation.
MNT-005	Bridge Inspection Program	Maintain and expand on bridge inspection schedule per FDOT requirements.
MNT-006	GIS Maintenance Tracking	Track the maintenance status of all City assets in GIS using previously completed stormwater atlas.

7. Proposed Improvements

At each project site, existing drainage conditions and LOS were thoroughly documented, and proposed improvements were identified utilizing hydrologic and hydraulic modeling. The following sections provide a detailed discussion of the recommended projects for each of the 12 locations identified for proposed capital improvement projects.

Construction feasibility was evaluated for all proposed initiatives; however, as the SWMP remains at the conceptual planning stage, design efforts do not progress beyond this phase. The City recognizes the considerable challenges inherent in implementing these projects and anticipates substantial staff involvement that exceeds the requirements typical of standard projects.

7.1. Gee Creek Watershed

A key consideration for the Gee Creek recommendations is the proposed widening of stream bottoms in areas that are currently privately owned in some areas. In these sections, private parcels often form uninterrupted stretches, and City easements over the stream or its banks are not consistently established. As a result, the design team will need to thoughtfully identify the most appropriate locations for easement acquisition. This process will involve engaging with landowners and City officials to clearly communicate the project's benefits and address any additional considerations.

During construction, the selective removal of vegetation may increase visibility between neighboring properties, so the City may explore strategies to maintain privacy and foster positive neighborhood relations. Ensuring future maintenance access remains important, though obtaining such access may require proactive planning and collaboration. With proper maintenance, the project's advantages can be fully realized and the risk of blockages or debris accumulation during major storm events can be minimized. Exploring stream bank stabilization methods that allow for reduced easement widths may provide an effective alternative, and these options should be carefully assessed for their influence on water conveyance and downstream velocities.

Furthermore, the project will consider potential wetland impacts and the need for mitigation. Many stream segments within the studied watersheds are designated as wetlands by the Fish and Wildlife Service. As such, any activities involving the discharge of dredged or fill material into these areas will require securing a Section 404 permit from the U.S. Army Corps of Engineers (USACE).

GC-01 – Alton Road Culvert & Reach Improvements

Location

Project GC-01 begins at Alton Road and encompasses the road crossing and the stream segment downstream (northward) to approximately 250 feet north of Temple Way. In this area, Gee Creek flows between Lido Road and Holiday Lane. See **Figure 18** below for an existing conditions image of the location.



Figure 18: GC-01 Existing Conditions Photo

Existing Drainage Conditions

The existing crossing in this project area consists of three 54-inch pipes that discharge northward under Alton Road. Existing flooding conditions and overtopping of Alton Road are attributed to insufficient conveyance capacity through the pipes. In addition, Gee Creek has observed vegetation overgrowth and a narrowing of the channel, both north and south of the crossing. Erosion of the embankment and subsequent sediment accumulation currently obstruct flow through one of the pipes.

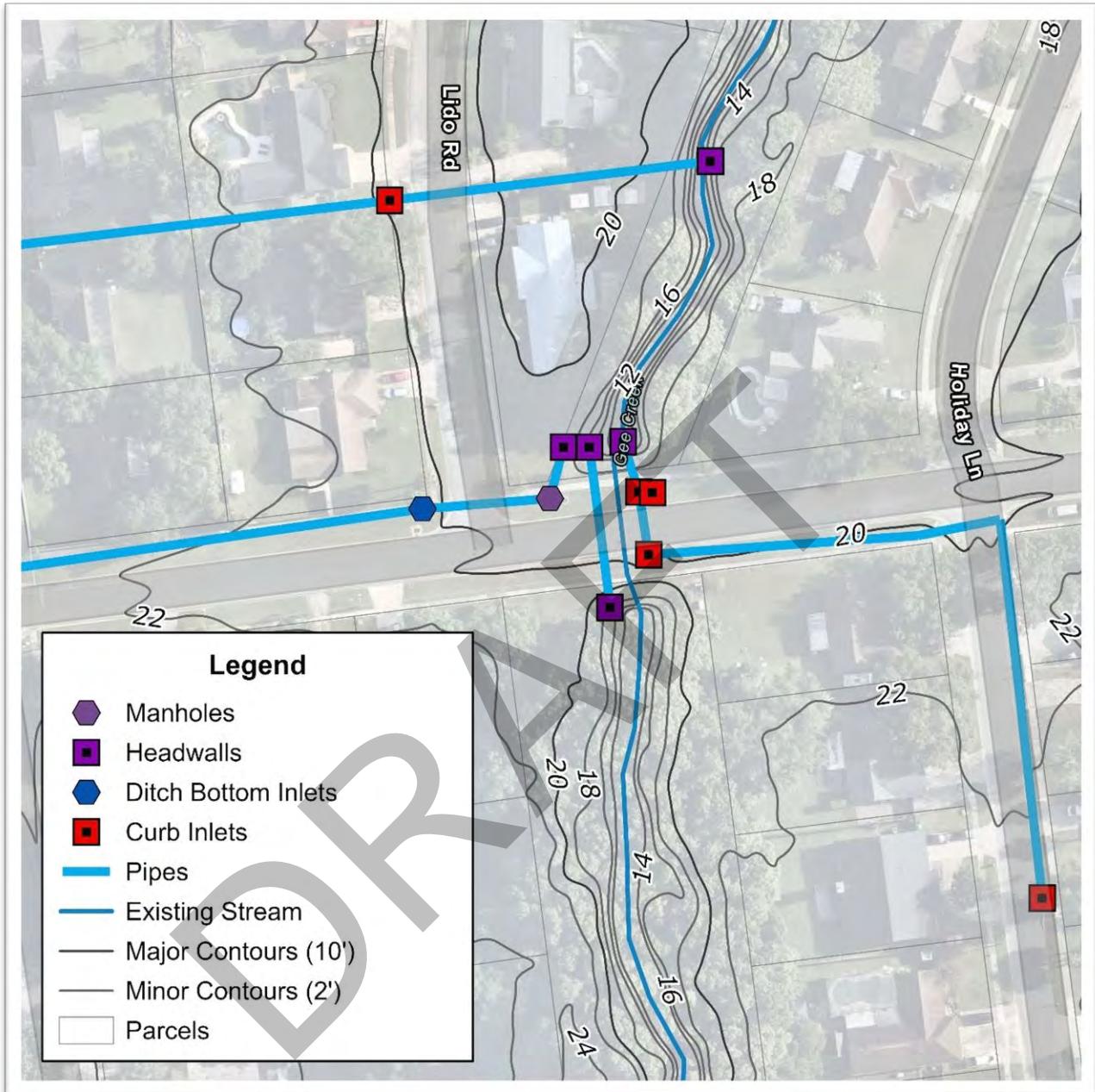


Figure 19: GC-01 Existing Conditions

Existing Level of Service Analysis

The floodplain mapping generated from the Gee Creek Watershed Model depicts flooding at this crossing in the 25-year and 100-year storm events. This crossing does not meet the 25-year LOS due to overtopping of the road. This crossing does not meet the 100-year LOS in existing conditions due to inundation of structures.

Proposed Improvement

This project proposes widening the existing channel north of Alton Road from an 8-foot bottom width to a consistent 20-foot bottom width and replacing the existing pipes with a single 116" x 72" RCP arch pipe. See **Figure 20** for the proposed improvements.

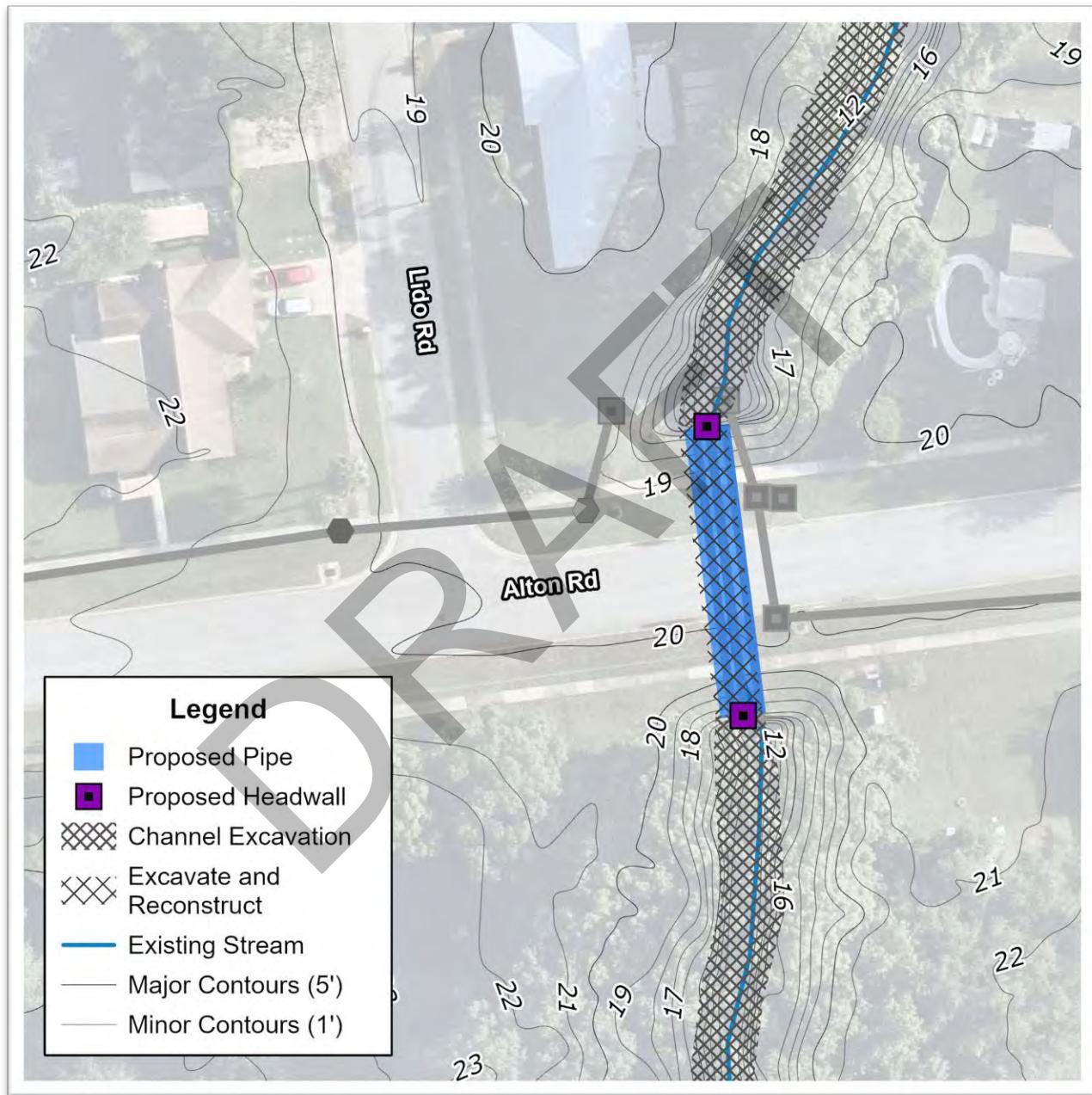


Figure 20: GC-01 Proposed Conditions

Proposed Level of Service Analysis

The proposed channel widening and pipe replacement resulted in a decrease in maximum stage upstream and downstream of the crossing in the modeled storm events. The maximum stage for the upstream node south of Alton Road was lowered to below the crown of road elevation, which eliminates modeled flooding in the 25-year storm event, and therefore shows a 25-year LOS improvement. The proposed maximum stages for the 100-year storm event also decreased to below existing maximum stages. Maximum stage results for locations impacted by the proposed improvement are included in **Table 5**. This results in some structures being removed from the modeled floodplain and a 100-year LOS improvement. A detailed figure showing pre- and post-improvement floodplains and LOS improvements is provided in **Appendix A**.

Table 5: GC-01 Maximum Stage Results

Location	Pre-Project 25-Year Max Stage (feet)	Post-Project 25-Year Max Stage (feet)	Pre-Project 100-Year Max Stage (feet)	Post-Project 100-Year Max Stage (feet)
GC10040N	17.03	16.86	18.42	18.35
GC10045N	18.37	17.16	19.17	18.54
GC10050N	21.17	20.86	21.58	21.46

GC-02 – Shore Road Culvert & Reach Improvements

Location

Project GC-02 begins at Gee Creek just below Hayes Road and includes the stream segment downstream to Shore Road, the crossing beneath Shore Road, and continues along the stream downstream to Alton Road. It is located upstream of GC-01. At Shore Road crossing, Gee Creek flows west to east between Coral Way and Silver Creek Drive. See **Figure 21** below for an existing conditions image of the location.

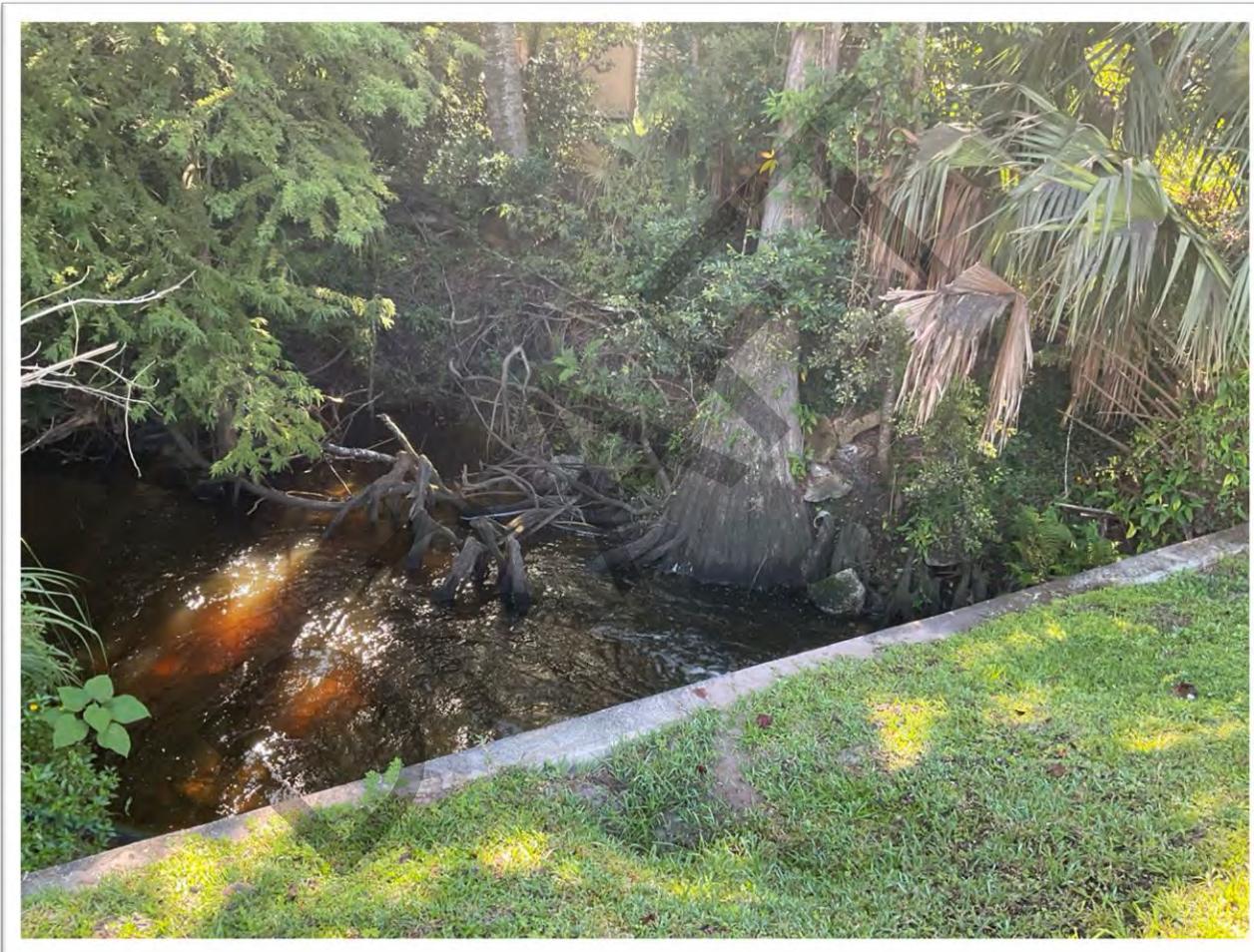


Figure 21: GC-02 Existing Conditions Photo

Existing Drainage Conditions

The existing crossing at this project area contains three 54-inch pipes, discharging east under Shore Road. Existing flooding conditions and overtopping of Shore Road are attributed to insufficient conveyance capacity through the pipes. Erosion of the stream embankment and subsequent sediment accumulation currently obstruct flow through one of the pipes.

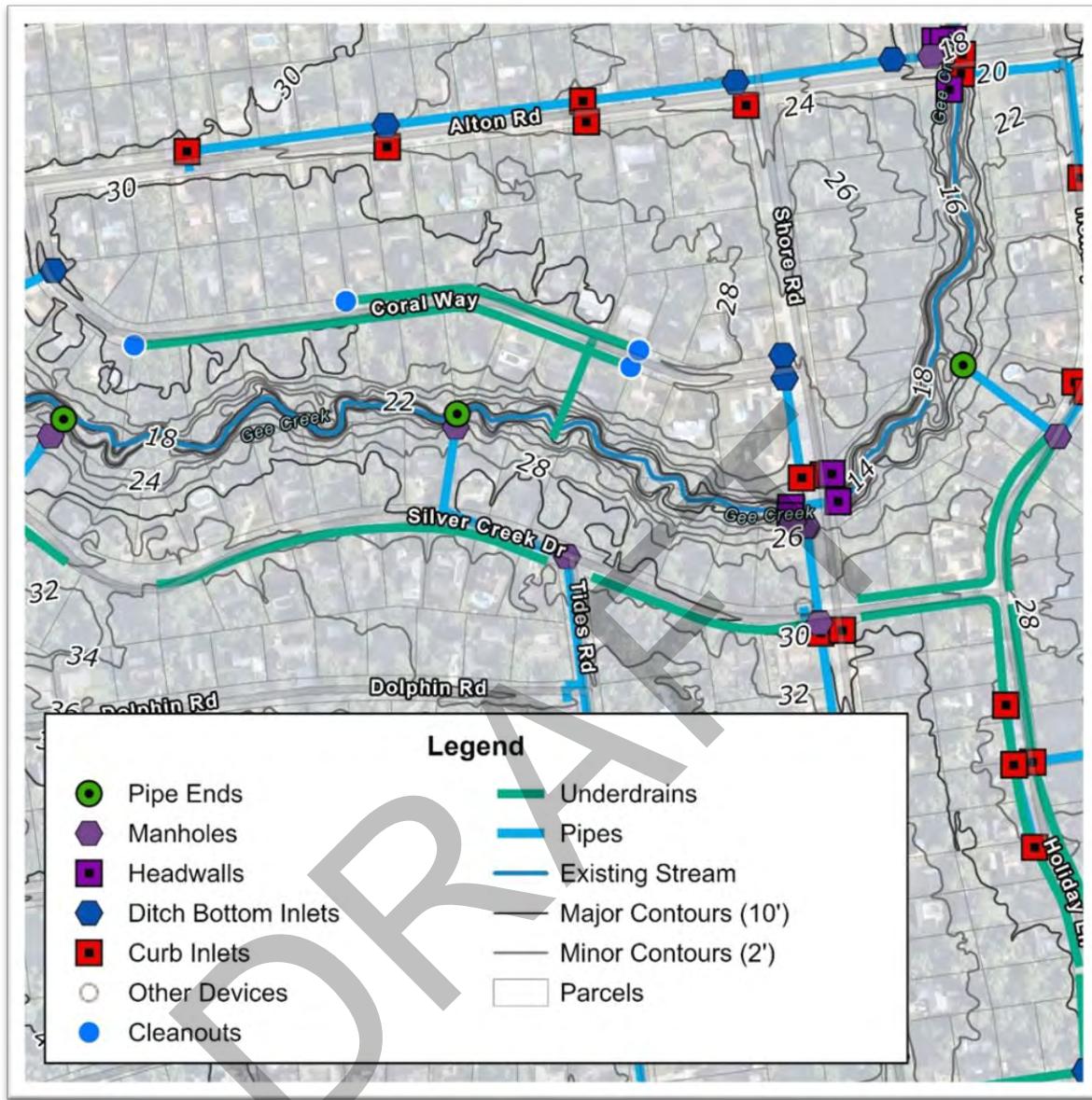


Figure 22. GC-02 Existing Conditions

Existing Level of Service Analysis

The floodplain mapping generated from the Gee Creek Watershed Model does not show flooding above the crown of Shore Road in the 25-year storm event or flooding of structures along the channel section in the 100-year storm event. Therefore, this crossing meets the 25- and 100-year LOS in existing conditions. However, roadway flooding is shown to occur along Shore Road during the 100-year storm event.

Proposed Improvement

This project proposes widening of the existing channel upstream and downstream of Shore Road from an 8-foot bottom width to a consistent 15-foot bottom width and mitigation of erosion along existing bank slopes. It also proposes replacement of existing culverts with a single 116" x 72" RCP arch pipe. See **Figure 23** for the proposed improvements.

Gee Creek, west of Shore Road, traverses private property as there is currently no established drainage easement. To facilitate maintenance activities and implement improvements for flood mitigation, this proposed project would require easement acquisition.

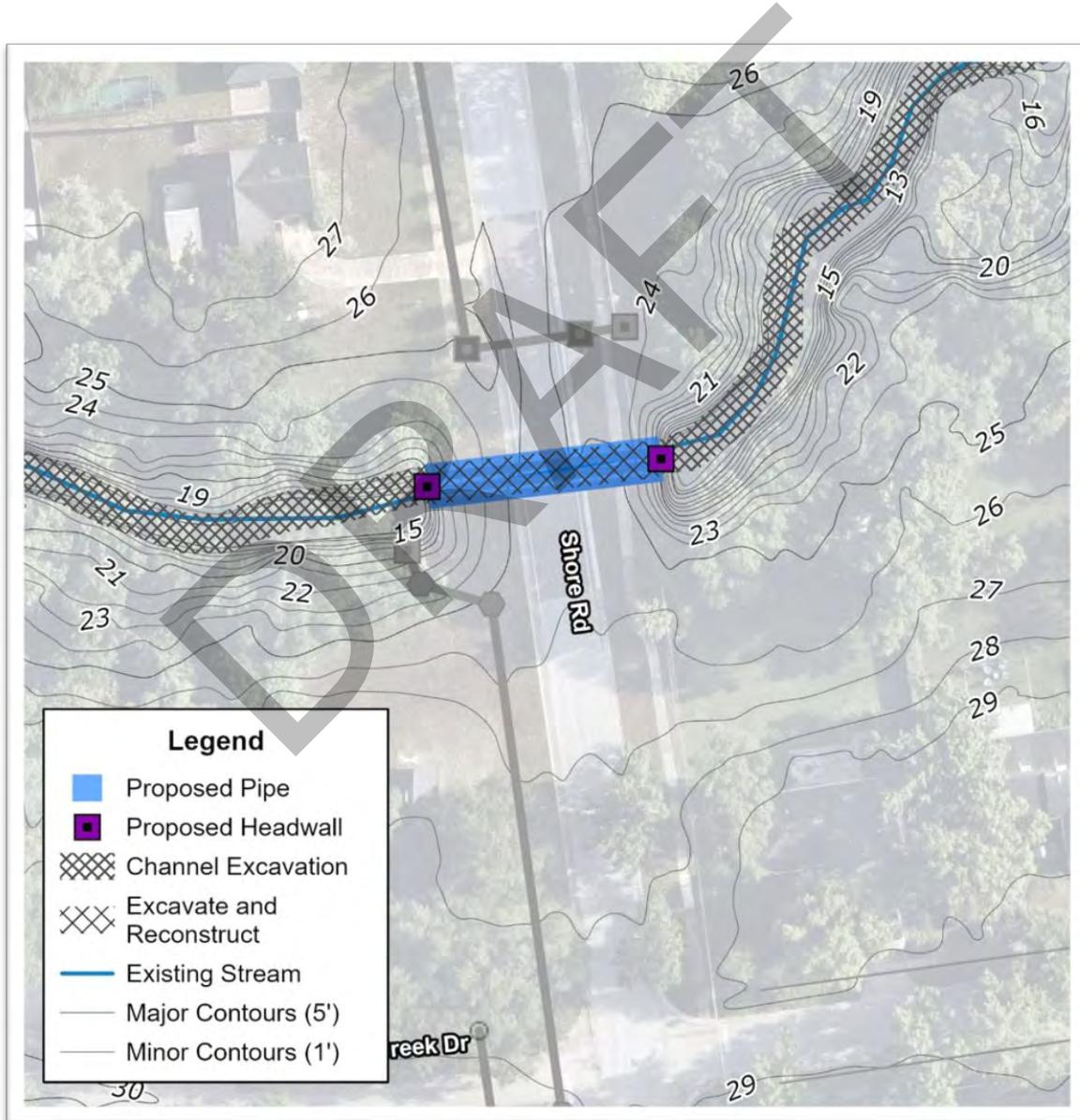


Figure 23: GC-02 Proposed Conditions

Proposed Level of Service Analysis

The proposed channel widening and pipe replacement result in a decrease in maximum stage upstream and downstream of the crossing in the LOS storm events. Maximum stage results for locations impacted by the proposed improvement are included in **Table 6**. The maximum stage for the upstream node is reduced below the crown of road during the 100-year storm event. A detailed figure showing pre- and post-improvement floodplains and channel improvement is provided in **Appendix A**.

Table 6: GC-02 Maximum Stage Results

Location	Pre-Project 25-Year Max Stage (feet)	Post-Project 25-Year Max Stage (feet)	Pre-Project 100-Year Max Stage (feet)	Post-Project 100-Year Max Stage (feet)
GC10050N	21.17	21.18	21.58	21.58
GC10055N	21.75	21.42	22.39	21.93
GC10060N	24.55	22.63	25.56	24.05
GC10065N	24.80	22.75	25.85	24.17
GC10070N	25.22	23.16	26.30	24.49

GC-03 – Hayes Road Culvert & Reach Improvements

Location

Project GC-03 begins at Gee Creek approximately 800 feet downstream of the Costa Rica Drive crossing and includes the stream segment eastward to Hayes Road, the crossing beneath Hayes Road, and approximately 700 additional feet downstream. At Hayes Road, Gee Creek flows between Silver Creek Drive and Alton Road. It is located upstream of GC-01 and GC-02. See **Figure 24** below for an existing conditions image of the location.



Figure 24: GC-03 Existing Conditions Photo

Existing Drainage Conditions

The existing crossing at this project area consists of a bridge, modeled as a rating curve in the Seminole County model, discharging to a downstream channel with a bottom width of 10 feet and lower. Observed flooding in this area has resulted in overtopping of Hayes Road.

Erosion of the stream embankment and subsequent sediment accumulation has also been observed.

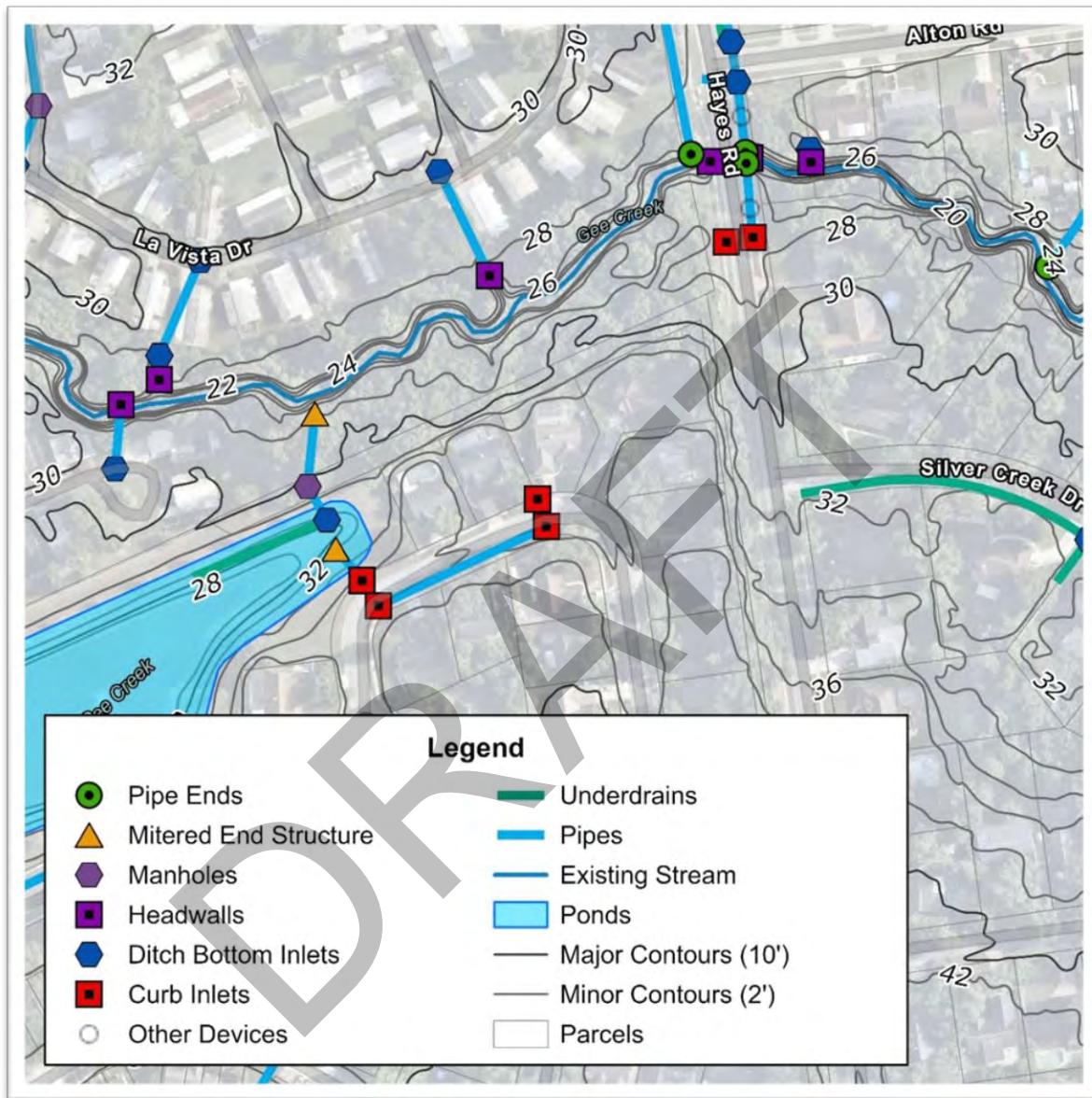


Figure 25. GC-03 Existing Conditions

Existing Level of Service Analysis

The floodplain mapping generated from the Gee Creek Watershed Model depicts flooding at the Hayes Road crossing in the 25-year storm event and extended flooding at the Hayes Road-Alton Road intersection in the 100-year storm event. This crossing does not meet the 25-year LOS in existing conditions. However, this crossing does meet the 100-year LOS in existing conditions since no structures lie within the modeled floodplain.

Proposed Improvement

This project proposes widening the existing channel from an average 8-foot bottom width to a consistent 15-foot bottom width upstream and downstream of the Hayes Road crossing. Bridge improvements were not studied as part of this project. See **Figure 26** for the proposed improvements.

Gee Creek, west of Hayes Road, traverses private property as there is currently no established drainage easement. To facilitate maintenance activities and implement improvements for flood mitigation, this proposed project would require the acquisition of easements within this area.

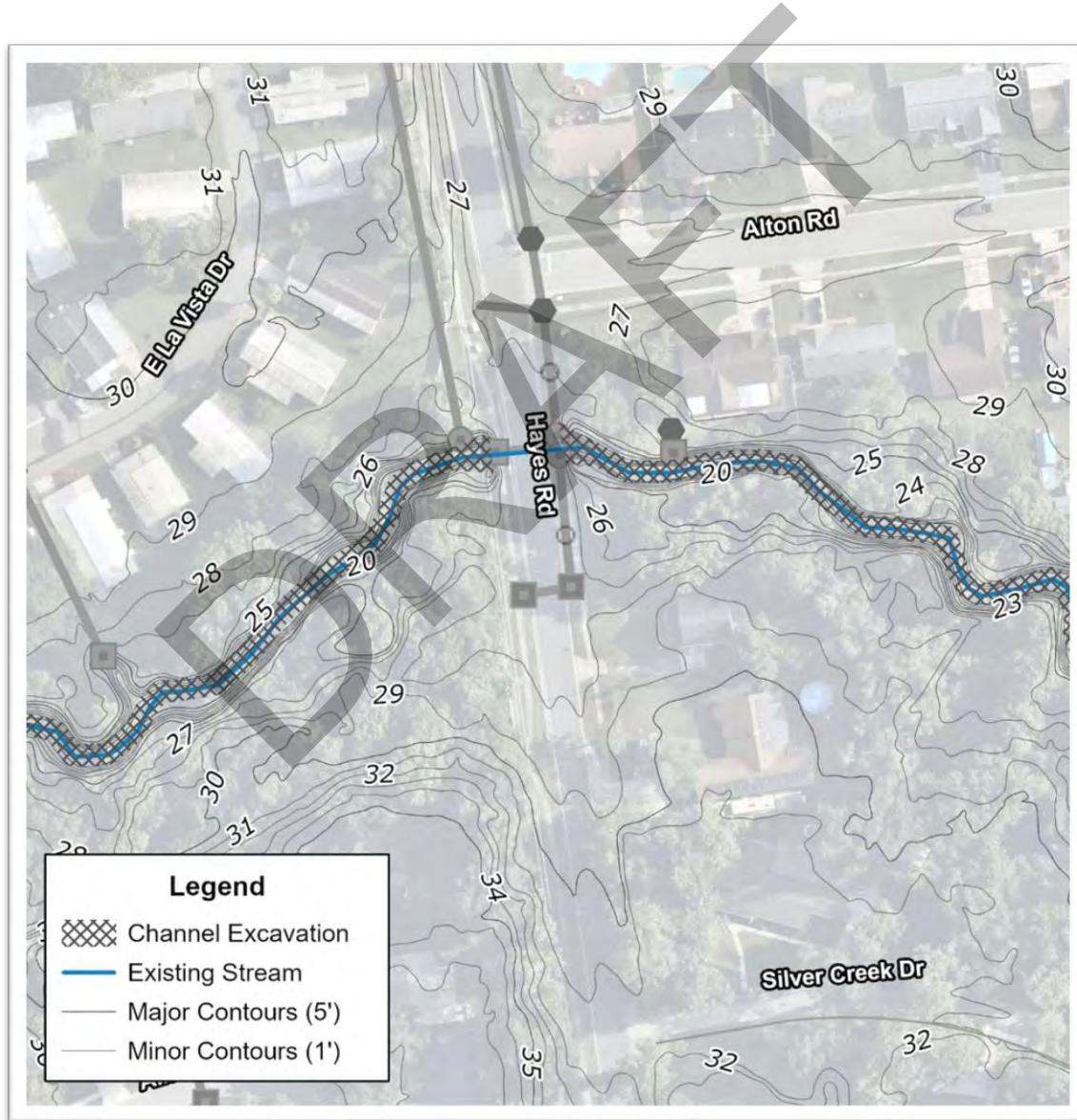


Figure 26: GC-03 Proposed Conditions

Proposed Level of Service Analysis

The proposed channel widening resulted in minimal to no decrease in maximum stage upstream and downstream for the LOS storm events. Maximum stage results for locations impacted by the proposed improvement are included in **Table 7**. The flooding at the crossing was not eliminated in either the 25- or 100-year storm. However, the project proposes channel modifications necessary to address sedimentation issues within this section of Gee Creek. A detailed figure showing pre- and post-improvement floodplains and channel improvement is provided in **Appendix A**.

Table 7: GC-03 Maximum Stage Results

Location	Pre-Project 25-Year Max Stage (feet)	Post-Project 25-Year Max Stage (feet)	Pre-Project 100-Year Max Stage (feet)	Post-Project 100-Year Max Stage (feet)
GC10070N	25.22	25.17	26.30	26.24
GC10075N	25.96	25.46	29.96	26.53
GC10080N	28.13	28.13	28.49	28.46
GC10085N	28.38	28.15	28.83	28.5
GC10090N	28.97	28.38	29.64	28.83
GC10245N	29.07	28.52	29.82	29.09
GC80010N	32.01	32.01	32.08	32.08
GC90085N	32.23	32.23	32.57	32.57

GC-04 – No-Name Creek Conveyance Improvements Near Alton Road

Location

Project GC-04 begins at the crossing of No-Name Creek with Alton Road and includes the stream segment approximately 936 feet downstream. At Alton Road, the creek flows south to north between Mockingbird Lane and Winding Hollow Boulevard. See **Figure 27** below for an existing conditions schematic of the project area.

Existing Drainage Conditions

The existing crossing at this project area consists of one 60-inch corrugated metal pipe (CMP). Observed flooding at this crossing is attributed to the adverse slope (downstream invert is higher than upstream invert) of the existing pipe, which also results in increased erosion.

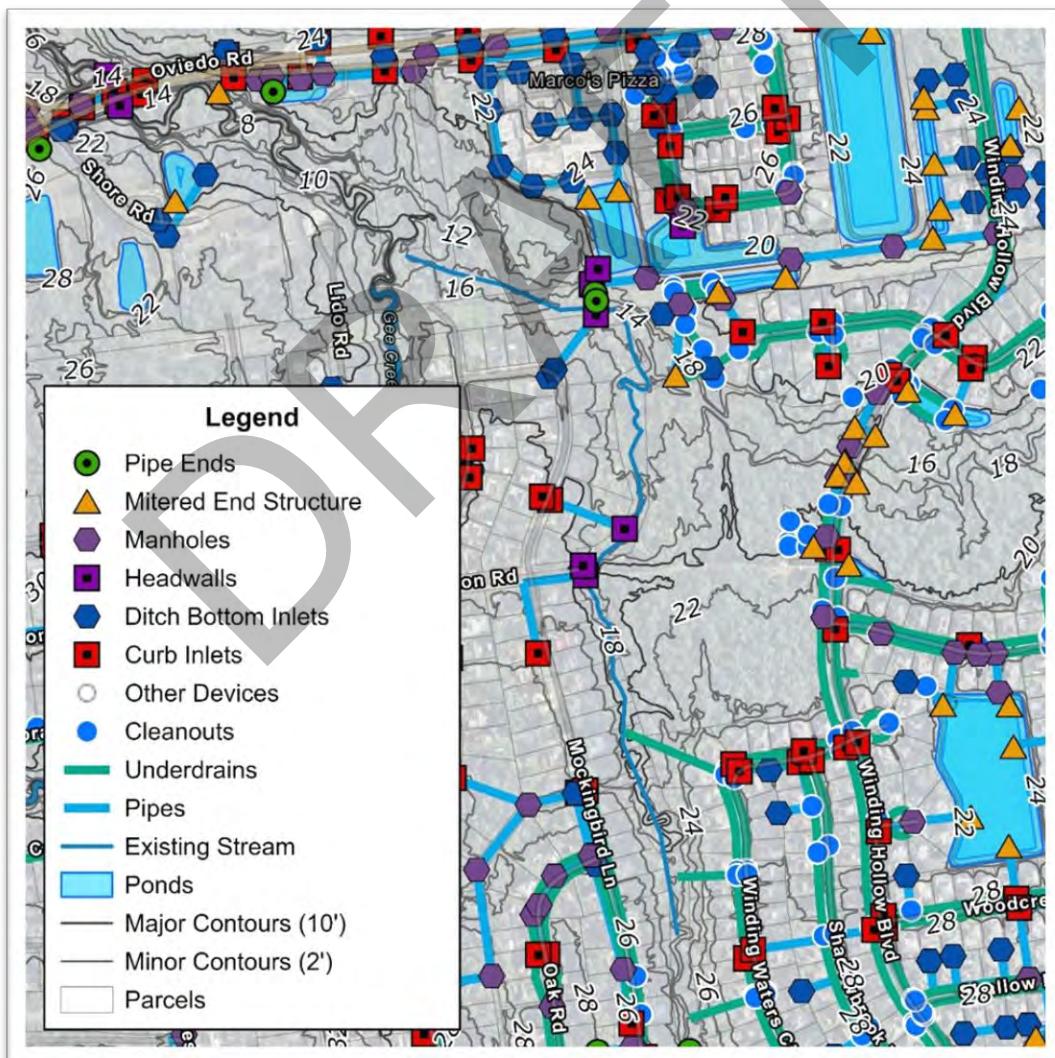


Figure 27. GC-04 Existing Conditions

Existing Level of Service Analysis

The 25- and 100-year storm event floodplains generated from the Gee Creek Watershed Model do not show flooding on Alton Road or within the footprint of any major structures. The LOS is therefore met in existing conditions. However, the erosion resulting from the pipe's adverse slope has highlighted this area as a concern.

Proposed Improvement

This project proposes widening of the existing channel north of the Alton Road crossing from an average 8-foot bottom width to a consistent 15-foot bottom width, and correction of the adverse slope by replacing the existing pipe and adjusting the downstream invert. See **Figure 28** for the proposed improvements.

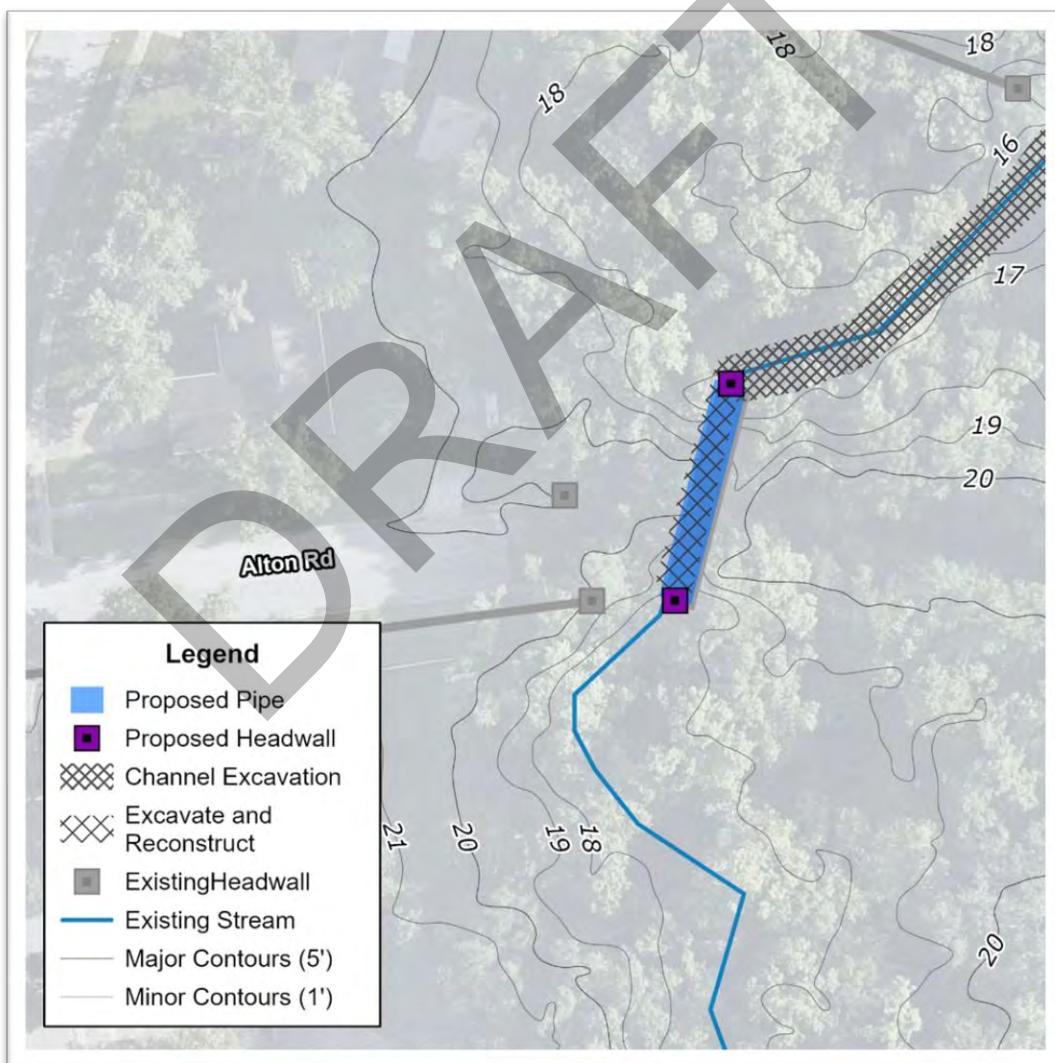


Figure 28: GC-04 Proposed Conditions

Proposed Level of Service Analysis

The proposed creek widening and pipe update resulted in a negligible decrease in maximum stage upstream and downstream of the crossing during the LOS storm events. Maximum stage results for locations impacted by the proposed improvement are included in **Table 8**. It is understood that the intent of this project is to address the adverse slope of the pipe, and not to show a significant improvement in modeled flooding. A detailed figure showing pre- and post-improvement floodplains and channel improvement is provided in **Appendix A**.

Table 8: GC-04 Maximum Stage Results

Location	Pre-Project 25-Year Max Stage (feet)	Post-Project 25-Year Max Stage (feet)	Pre-Project 100-Year Max Stage (feet)	Post-Project 100-Year Max Stage (feet)
GC20025N	17.56	17.53	18.78	18.76
GC20030N	17.57	17.54	18.79	18.76
GC20035N	19.42	19.04	19.93	19.77

7.2. Howell Creek Watershed

HC-01 – Winter Springs Boulevard near Davenport Way Improvements

Location

Project HC-01 consists of the Howell Creek crossing under Winter Springs, located approximately 600 feet northwest of the intersection with Davenport Way. See **Figure 29** below for an existing conditions schematic of the project area.

Existing Drainage Conditions

The existing crossing at this project area consists of two 36-inch circular reinforced concrete pipes (RCP) and drains an area of approximately 55 acres south of Winter Springs Boulevard. Flooding has been observed in low-lying sections of Winter Springs Boulevard.

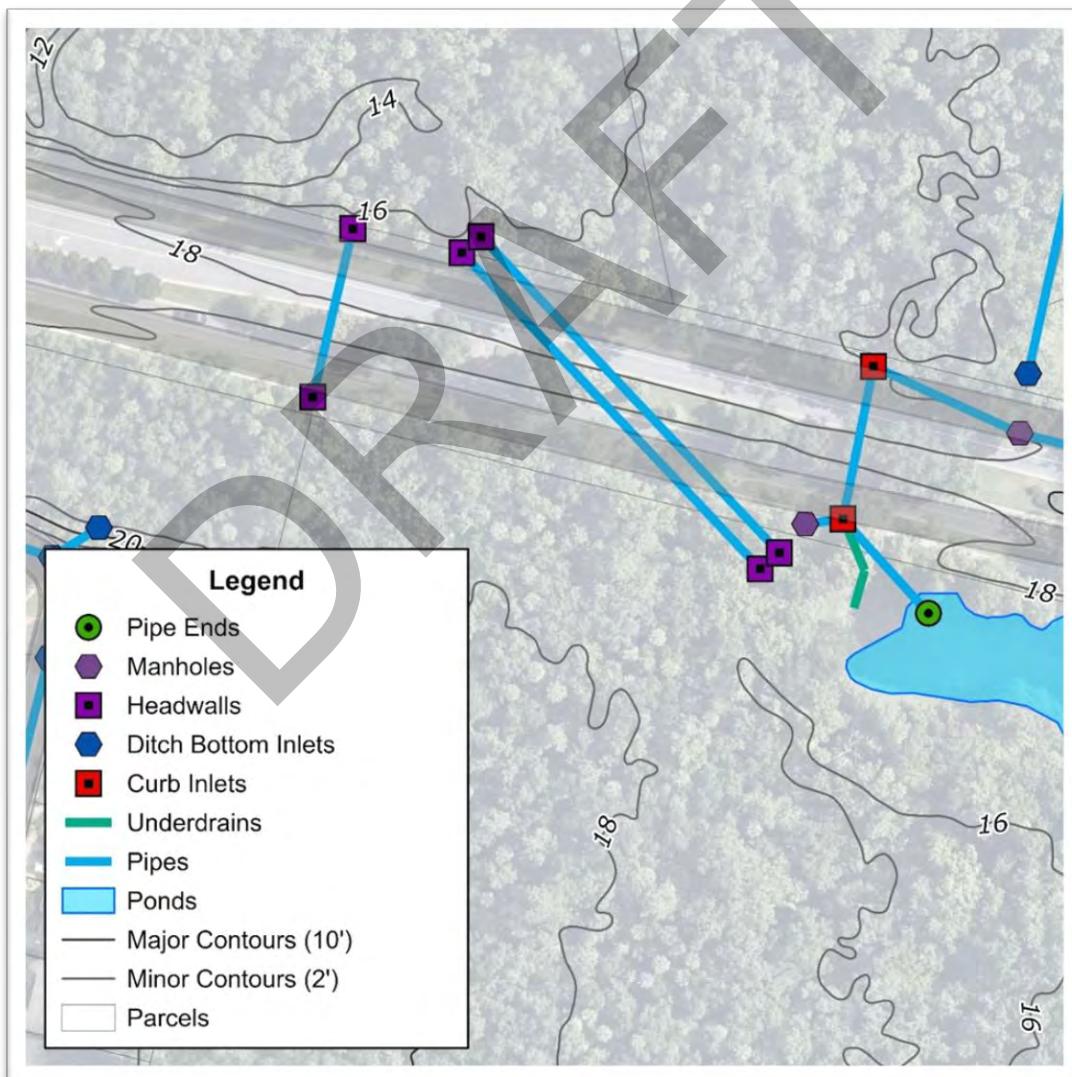


Figure 29. HC-01 Existing Conditions

Existing Level of Service Analysis

The floodplains generated from the Howell Creek Watershed Model show that the 25- and 100-year LOS are met. However, flooding does occur on Winter Springs Boulevard in the 25-year storm. It is not overtopped, but the east bound lane is completely inundated, rendering it impassable.

Proposed Improvement

This project proposes removing the existing 36-inch RCPs and replacing them with two 60-inch x 38-inch elliptical RCPs. Note that this project does not propose any improvements to the channel upstream or downstream of the Winter Springs Boulevard crossing. See **Figure 30** for the proposed improvements.



Figure 30: HC-01 Proposed Conditions

Proposed Level of Service Analysis

The proposed pipe replacements resulted in a decrease in maximum stage upstream of Winter Springs Boulevard for both LOS storm events. Maximum stage results for locations impacted by the proposed improvement are included in **Table 9**. The maximum stage for the upstream node is lower than the roadside elevation, which removes 634 feet of Winter Springs Boulevard from the 25-year modeled floodplain and eliminates flooding at the crossing, keeping the east bound lane accessible during the 25-year storm event. No structures were removed in the 100-year storm event. A detailed figure showing pre- and post-improvement floodplains and LOS improvements is provided in **Appendix A**.

Table 9: HC-01 Maximum Stage Results

Location	Pre-Project 25-Year Max Stage (feet)	Post-Project 25-Year Max Stage (feet)	Pre-Project 100-Year Max Stage (feet)	Post-Project 100-Year Max Stage (feet)
BGC-0290	17.85	17.04	18.23	18.23
BCG-0300	17.03	17.03	18.42	18.24

HC-02 – Vistawilla Drive Near Seneca Boulevard Improvements

Location

Project HC-02 consists of the Howell Creek crossing under Vistawilla Drive, located approximately 240 feet southwest of Seneca Boulevard. In this area, Howell Creek flows northwest to southeast. See **Figure 31** below for an existing conditions schematic of the project area.

Existing Drainage Conditions

The existing crossing at this project area consists of two 24-inch pipes (verified through field observation) and discharges to the southeast. Existing flooding conditions and overtopping of Vistawilla Drive are attributed to insufficient conveyance capacity through the pipes.

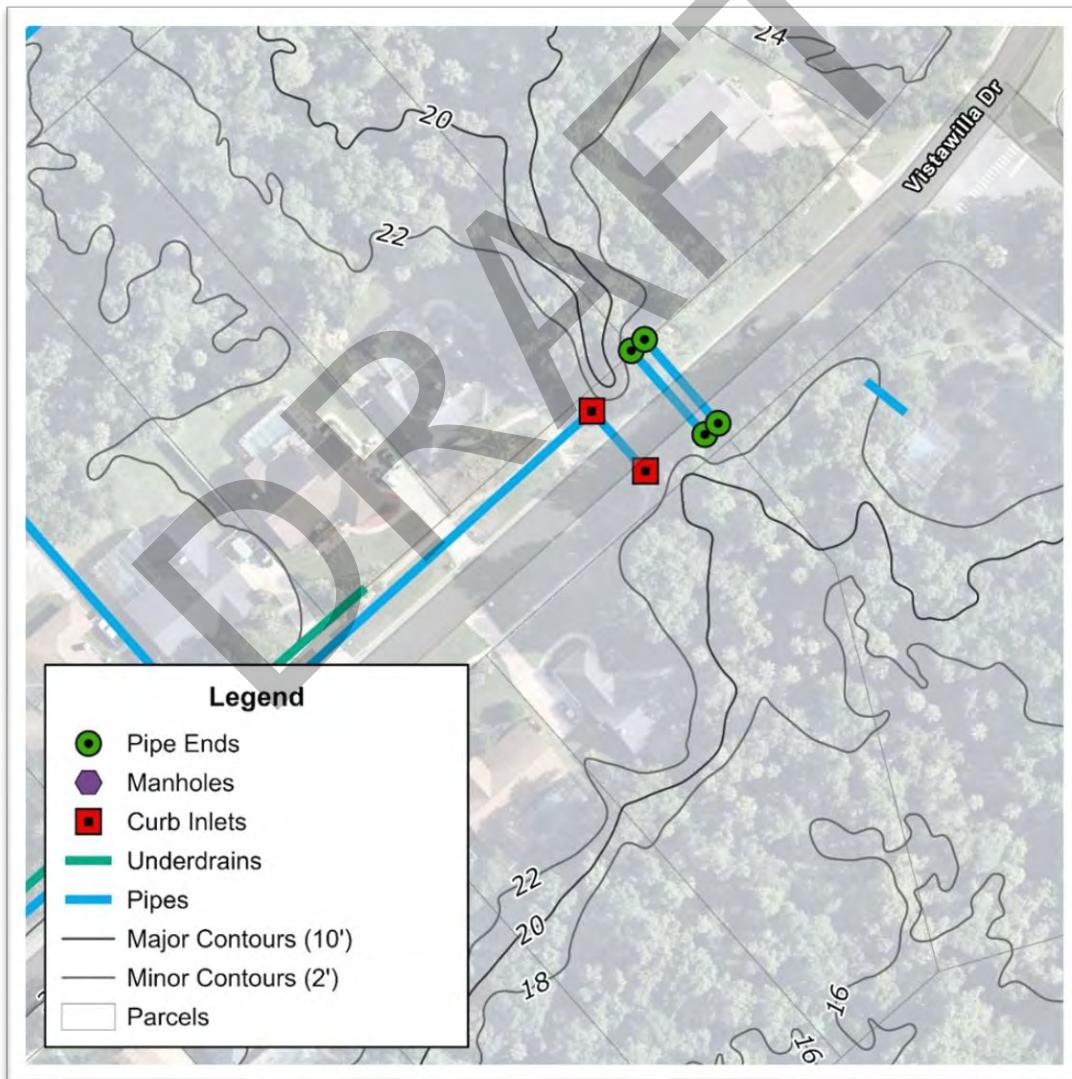


Figure 31. HC-02 Existing Conditions

Existing Level of Services Analysis

The floodplains generated from the Howell Creek Watershed Model depict flooding of Vistawilla Drive in the 25-year and 100-year storms. This crossing does not meet the 25-year LOS in existing conditions due to overtopping of the road. This crossing also fails to meet the 100-year LOS in existing conditions due to inundation of several structures.

Proposed Improvement

This project proposes removing the existing 24-inch RCPs and replacing them with three 60-inch x 38-inch elliptical RCPs. This improvement does not propose any improvements to the channel upstream or downstream of the Vistawilla Drive crossing. See **Figure 32** for a diagram of the proposed improvements.



Figure 32: HC-02 Proposed Conditions

Proposed Level of Service Analysis

The proposed pipe replacements resulted in a sufficient decrease in maximum stage upstream of Vistawilla Drive to meet both LOS thresholds. Maximum stage results for locations impacted by the proposed improvement are included in **Table 10**. The maximum stage for the upstream node is lower than the minimum elevation of the road, which removes 685 feet of Vistawilla Drive from the 25-year modeled floodplain. The decrease in stage also removes three structures from the 100-year floodplain. A detailed figure showing pre- and post-improvement floodplains and LOS improvements is provided in **Appendix A**.

Table 10: HC-02 Maximum Stage Results

Location	Pre-Project 25-Year Max Stage (feet)	Post-Project 25-Year Max Stage (feet)	Pre-Project 100-Year Max Stage (feet)	Post-Project 100-Year Max Stage (feet)
BGC-0310	19.10	19.11	20.02	20.05
BGC-0320	23.17	21.85	23.30	22.72

Areas of Concern

High Stream Velocities at Bridge Crossings

Near bridge crossings, Howell Creek shows high water velocities, especially at the Northern Way crossing located between Mount Laurel Drive and Brown Bear Court. Other crossings with high velocities include an upstream Northern Way crossing, found between Howell Creek Drive and Arabian Avenue, followed further upstream by the Dyson Drive crossing, situated between Howell Creek Drive and Arabian Avenue. Measures such as slope stabilization, rip rap installation, or channel realignment should be evaluated. The maintenance program also specifies ongoing monitoring and upkeep at these locations.

Jetta Point Park

Jetta Point Park, located in the northeast Howell Creek Watershed, was identified by Ardurra as impacted by Hurricane Milton in 2024. During the storm, runoff overflowed from neighboring subdivisions, causing the pond level to rise and local drainage to backflow into streets and yards. Proposed solutions include berm restoration and an interceptor swale, designed to discharge through a drop structure upstream of Vistawilla.

Greenbriar Lane

Greenbriar Lane has been identified as necessary for further study. A 48-inch RCP pipe runs beneath the road, discharging into an existing ditch upstream of the confluence with Howell Creek. The City is collecting data and will update the stormwater model when more information is available.

7.3. Lake Jesup Watershed

LJ-01 – North Tuskawilla Road Outfall Improvements

Location

Project LJ-01 consists of the crossing under Tuskawilla Road, approximately 200 feet southwest of Saint Johns Landing Drive. The culvert receives flow from the drainage network running along the west side of Tuskawilla Road which drains Winter Springs High School's detention pond. See **Figure 33** below for an existing conditions schematic of the project area.

Existing Drainage Conditions

The crossing at Tuskawilla Road between St. Johns Landing Drive and Fanning Drive consists of single 24-inch circular RCP. The pipe is undersized, causing LOS to not be met in the area.

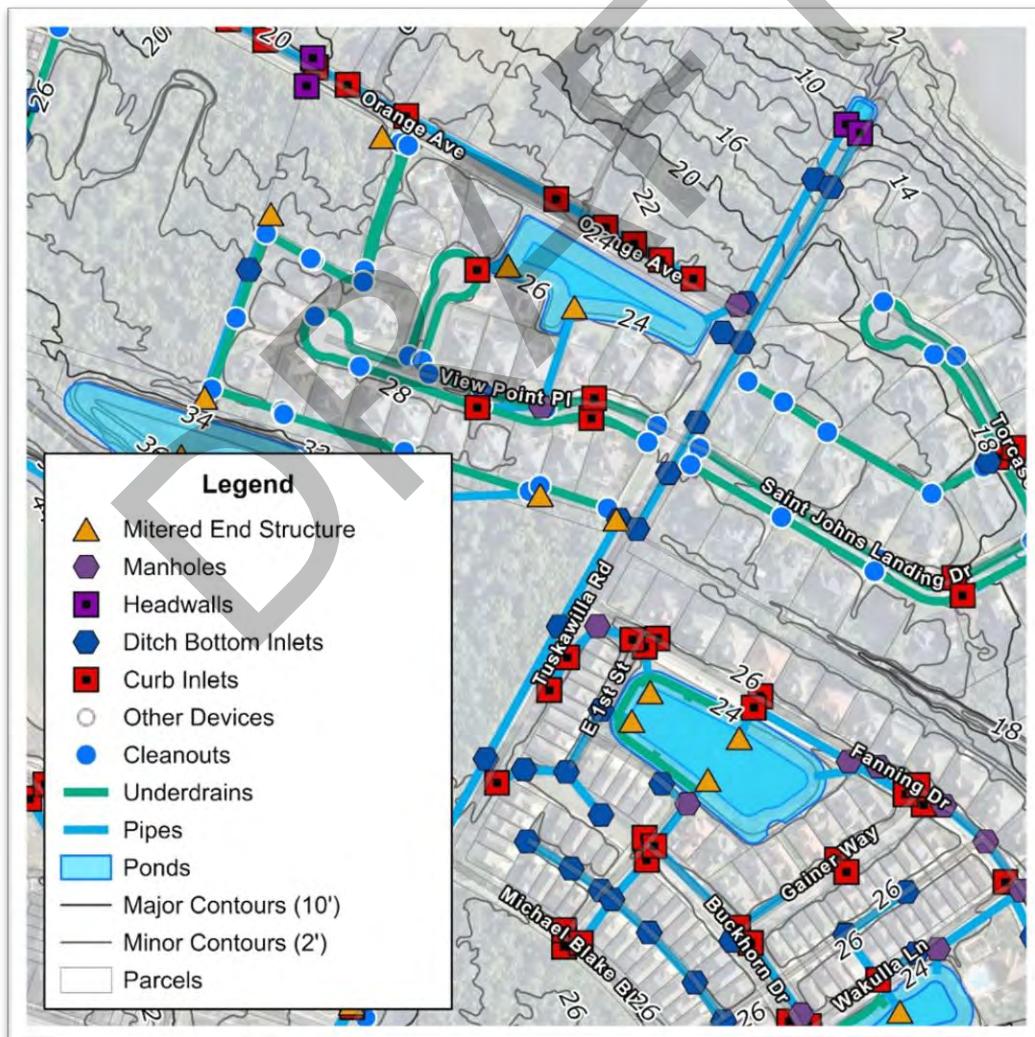


Figure 33. LJ-01 Existing Conditions

Existing Level of Service Analysis

The floodplains generated from the Lake Jesup Watershed Model depict flooding of Tuskawilla Road during both the 25- and 100-year storm events. During these events, the southbound lane is completely inundated. However, because the crown of road is not overtopped, the crossing meets the 25-year LOS. The 100-year LOS is also met as no structures are inundated.

Proposed Improvements

The project involves replacing the current 24-inch pipe with a larger 48-inch pipe, starting at the crossing and continuing all the way to where it discharges into Lake Jesup. See **Figure 34** for the proposed improvement.



Figure 34: LJ-01 Proposed Conditions

Proposed Level of Service Analysis

The proposed improvement reduced the upstream maximum stage during both LOS storm events, removing inundation along the roadway. Maximum stage results for locations impacted by the proposed improvement are included in **Table 11**. A detailed figure showing pre- and post-improvement floodplains and LOS improvements is provided in **Appendix A**.

Table 11: LJ-01 Maximum Stage Results

Location	Pre-Project 25-Year Max Stage (feet)	Post-Project 25-Year Max Stage (feet)	Pre-Project 100-Year Max Stage (feet)	Post-Project 100-Year Max Stage (feet)
LJ100240N	24.15	24.15	24.44	24.44
LJ100250N	26.60	24.19	26.65	25.09

Areas of Concern

Orange Avenue near Central Winds Park

Flooding has been observed on Orange Avenue, primarily due to runoff received from Central Winds Park. Water from the park drains southeast through a control structure and flows into a 30-inch reinforced concrete pipe along Orange Avenue. Previously, a roadside swale helped intercept this water. However, the swale was replaced with sidewalk during the latest improvements on Orange Avenue, which changed historical drainage patterns and may be the cause of current flooding issues.

The County's Lake Jesup model does not capture this localized flooding. It is advised that the City carry out a more focused study to identify potential solutions. One potential solution is to restore the depressional area between Orange Avenue and Central Winds Park, as outlined in earlier Park plans, to help collect water from the park and reduce flooding along Orange Avenue.

7.4. Little Lake Howell Watershed

LLH-01 – Fisher Road Near Morton Lane Improvements

Location

Project LLH-01 consists of the Little Lake Howell Creek crossing under Fisher Road, approximately 180 feet south of Seville Chase Drive. In this area, the creek flows west to east. See **Figure 35** below for an existing conditions schematic of the project area.

Existing Drainage Conditions

The existing crossing at this project area consists of one 24-inch circular reinforced concrete pipe (RCP) under Fisher Road. Flooding at this crossing causes overtopping of Fisher Road.

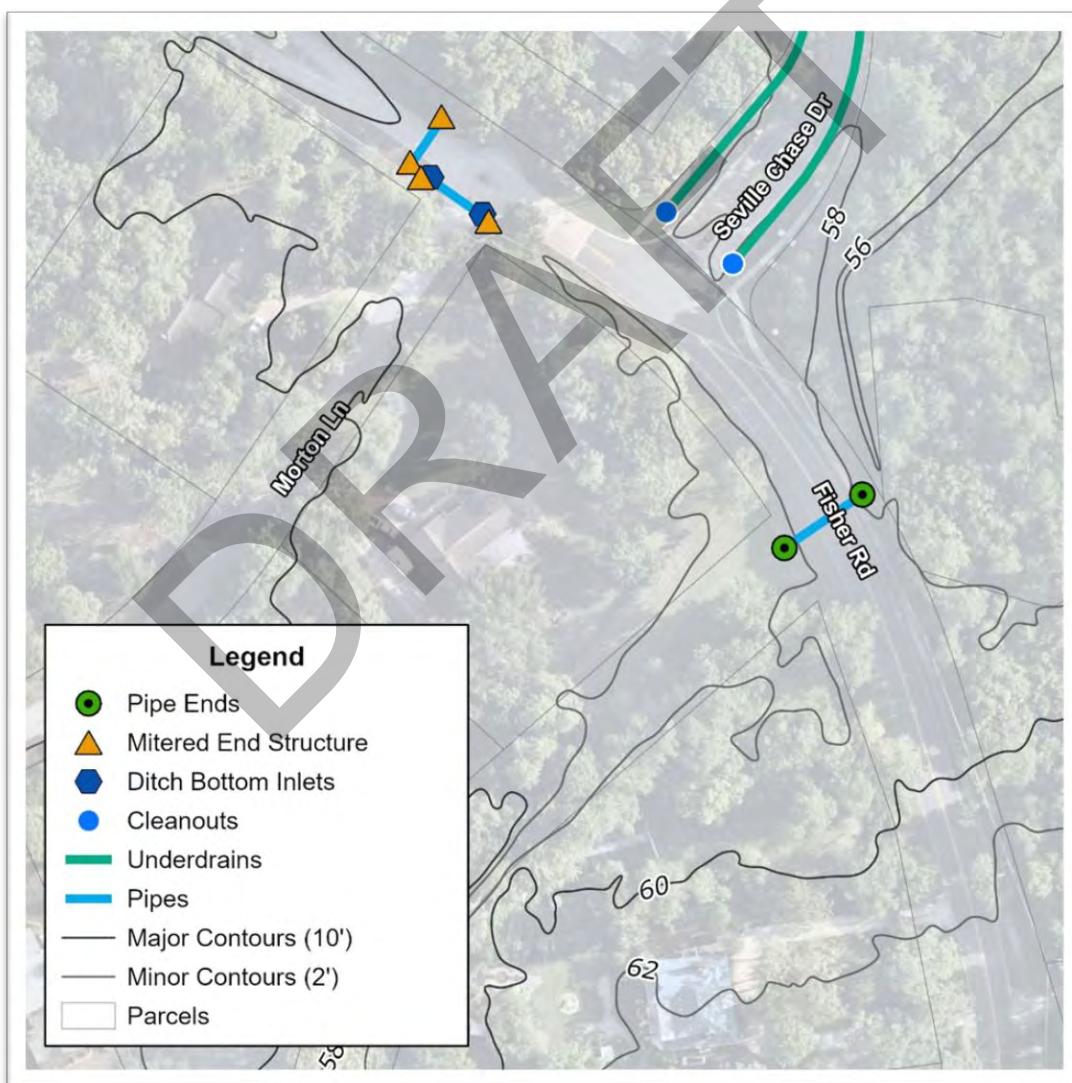


Figure 35. LLH-01 Existing Conditions

Existing Level of Service Analysis

The floodplain mapping generated from the Little Lake Howell Watershed Model depicts flooding in the 25-year and 100-year storms. This crossing does not meet the 25-year LOS in existing conditions due to the modeled overtopping of Fisher Road. The 100-year LOS is met as the model does not show structures within the floodplain.

Proposed Improvement

This project proposes adding two 24-inch RCP pipes adjacent to the existing pipe. There are no proposed improvements for the channel upstream or downstream. Additional storage was not modeled but is recommended to attenuate the increase in flow due to improved conveyance through the crossing. See **Figure 36** for the proposed improvements.



Figure 36: LLH-01 Proposed Conditions

Proposed Level of Service Analysis

The proposed additional pipes result in a decrease in maximum stage upstream of the crossing for both LOS modeled storm events. Maximum stage results for locations impacted by the proposed improvement are included in **Table 12**. The maximum stage for the upstream node is lower than the road elevation and therefore shows a 25-year improvement and achievement of the LOS. A detailed figure showing pre-and post-improvement floodplains and improved road access is provided in **Appendix A**.

Table 12: LLH-01 Maximum Stage Results

Location	Pre-Project 25-Year Max Stage (feet)	Post-Project 25-Year Max Stage (feet)	Pre-Project 100-Year Max Stage (feet)	Post-Project 100-Year Max Stage (feet)
LL300130N	57.17	57.20	57.22	57.26
LL300135N	58.75	57.76	58.79	58.05

LLH-02 – Chokecherry Drive Near Sapling Drive Improvements

Location

Project LLH-02 consists of the crossing under Chokecherry Drive, approximately 100 feet north of Sapling Drive. See **Figure 37** below for an existing conditions schematic of the project area.

Existing Drainage Conditions

The existing crossing under Chokecherry Drive is a single RCP pipe, consisting of three different segments with a 24-, 30-, and 36-inch diameter, respectively. Flooding at this crossing causes overtopping of Chokecherry Drive. The pipe inlet and outlet are obstructed due to heavy overgrowth.

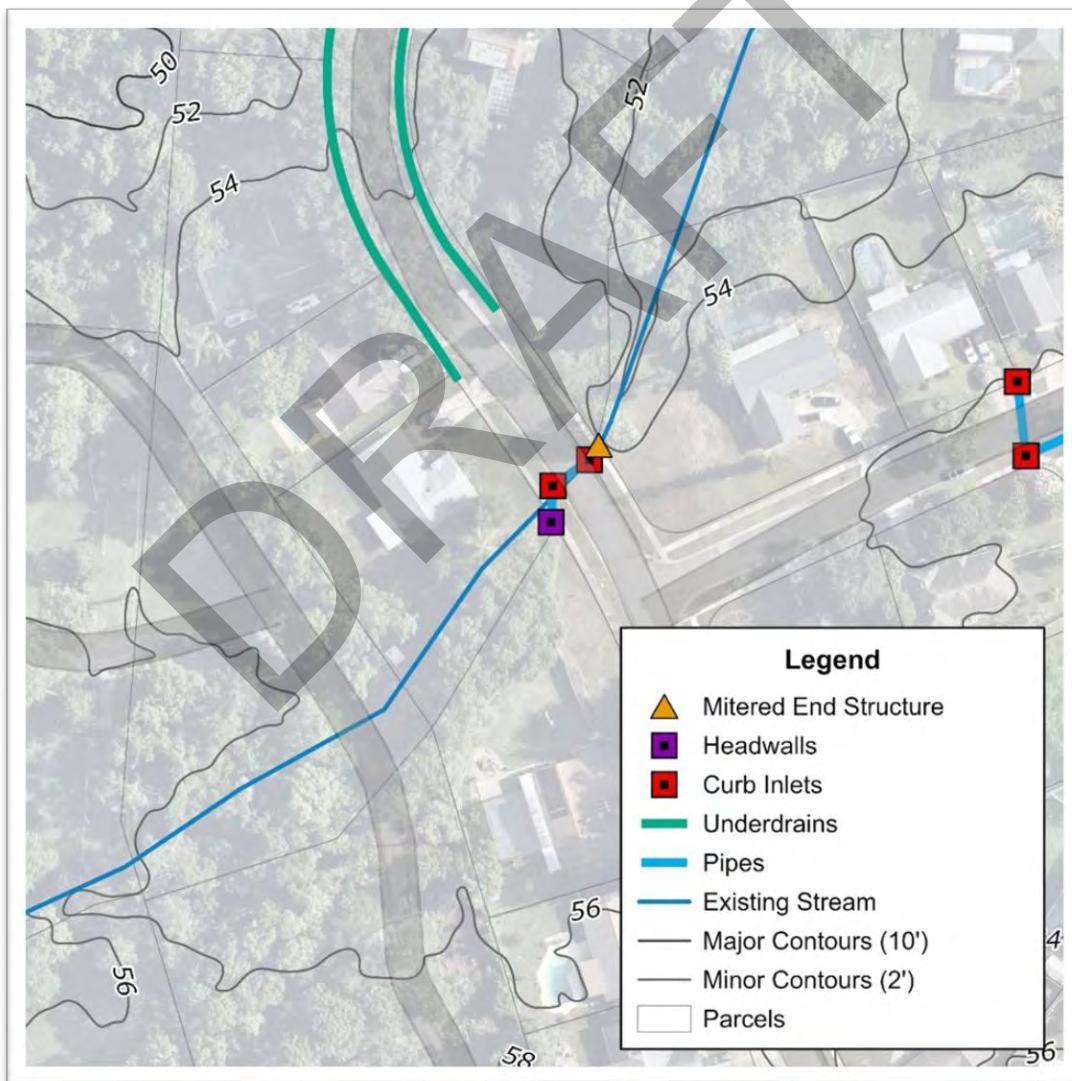


Figure 37. LLH-02 Existing Conditions

Existing Level of Service Analysis

The floodplain mapping generated from the Little Lake Howell Watershed Model depicts flooding at this crossing in the 25-year and 100-year storms. This crossing does not meet the 25-year LOS in existing conditions due to the modeled overtopping of Chokecherry Drive. The 100-year LOS is met as the model does not show structures within the floodplain.

Proposed Improvement

This project proposes adding two 24-inch RCP pipes adjacent to the existing. See **Figure 38** for the proposed improvements. There are no proposed improvements for the channel upstream or downstream, but additional storage is recommended to attenuate the increase in flow due to the improved conveyance through the structure.

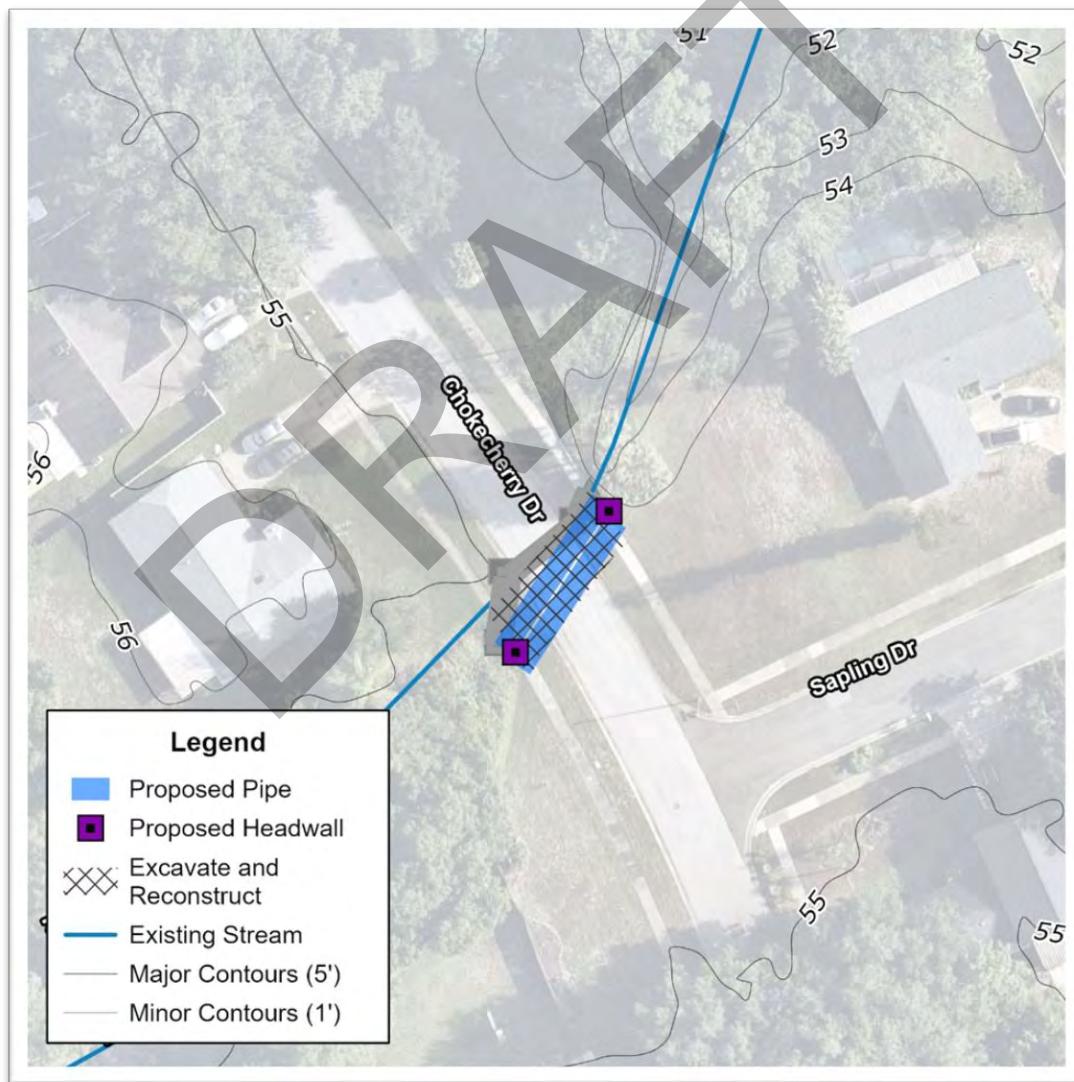


Figure 38: LLH-02 Proposed Conditions

Proposed Level of Service Analysis

The proposed additional pipes result in a decrease in maximum stage upstream of this project, therefore showing a 25-year LOS improvement and achievement of the LOS. Maximum stage results for locations impacted by the proposed improvement are included in **Table 13**. The maximum stage for the upstream node is still higher than the road elevation in the 100-year storm, maintaining Chokecherry Drive under flood risk during the 100-year storm. However, no structures are modeled as inundated during the 100-year storm. A detailed figure showing pre-and post-improvement floodplains and improved road access is provided in **Appendix A**.

Table 13: LLH-02 Maximum Stage Results

Location	Pre-Project 25-Year Max Stage (feet)	Post-Project 25-Year Max Stage (feet)	Pre-Project 100-Year Max Stage (feet)	Post-Project 100-Year Max Stage (feet)
LL400020N	53.08	53.10	53.36	53.38
LL400021N	53.79	53.48	53.86	53.64
LL400046N	54.68	54.19	54.80	54.44
LL400048N	54.78	54.26	54.91	54.53
LL400050N	54.85	54.76	54.97	54.90

LLH-03 – Winter Springs Boulevard Near Chokecherry Drive Improvements

Location

Project LLH-03 consists of the crossing under Winter Springs Boulevard, located between the intersections with Chokecherry Drive and Benchwood Drive. See **Figure 39** below for an existing conditions image of the location.



Figure 39: LLH-03 Existing Conditions Photo

Existing Drainage Conditions

The existing crossing at this project area consists of two 36-inch RCPs and discharges north under Winter Springs Boulevard. Flooding at this crossing results in overtopping of Chokecherry Drive. Erosion and dense vegetation are also present within the channel and adjacent to the existing pipes.

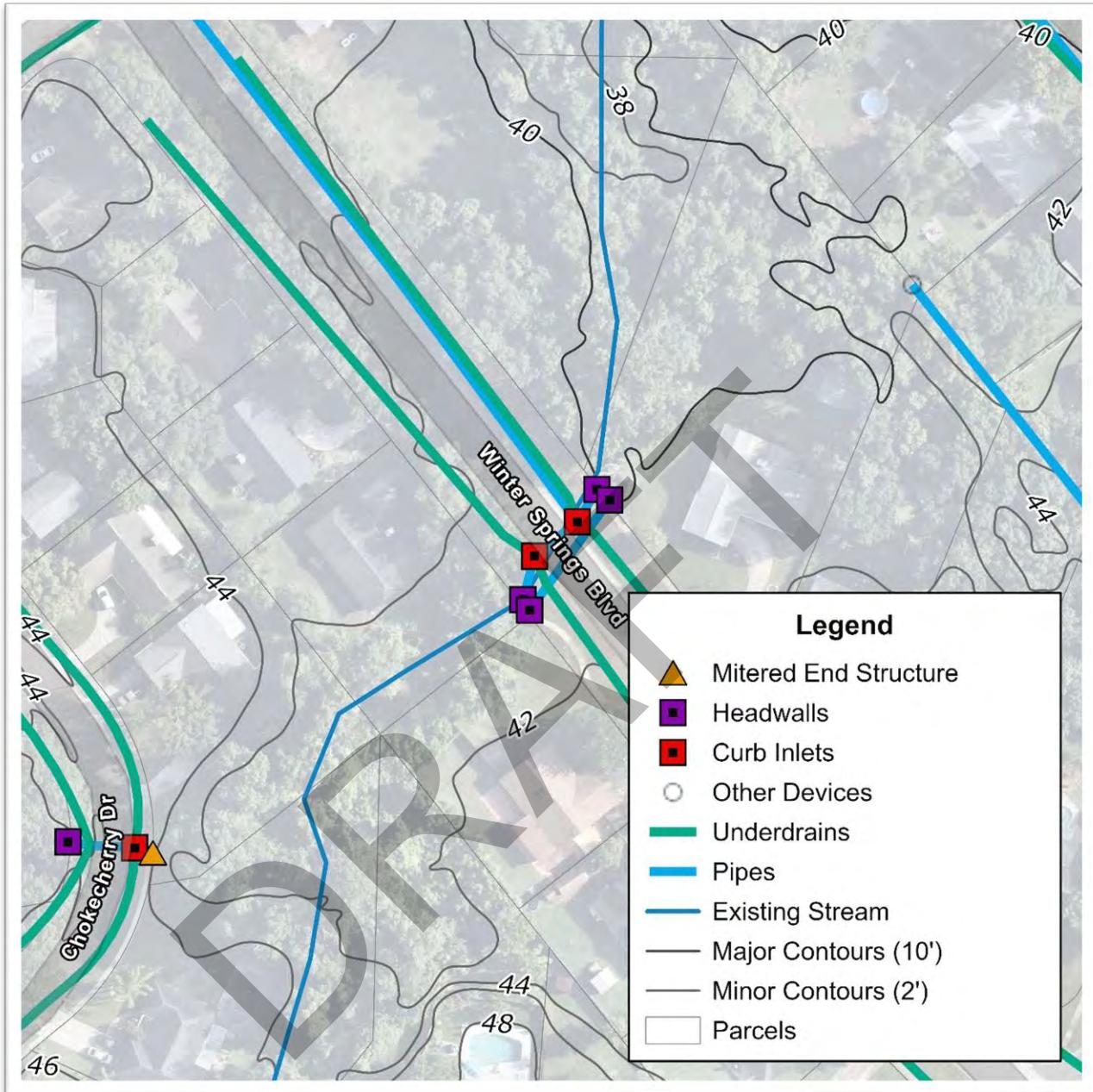


Figure 40. LLH-03 Existing Conditions

Existing Level of Service Analysis

The floodplains generated from the Little Lake Howell Watershed Model depict flooding at this crossing on Winter Springs Boulevard in the 25-year and 100-year storms. This crossing does not meet the 25-year LOS in existing conditions due to the modeled overtopping of Winter Springs Boulevard. The 100-year LOS is satisfied as the model does not show structures within the floodplain.

Proposed Improvement

The project proposes adding two 48-inch RCPs adjacent to the existing pipes. See **Figure 41** for the proposed improvements.

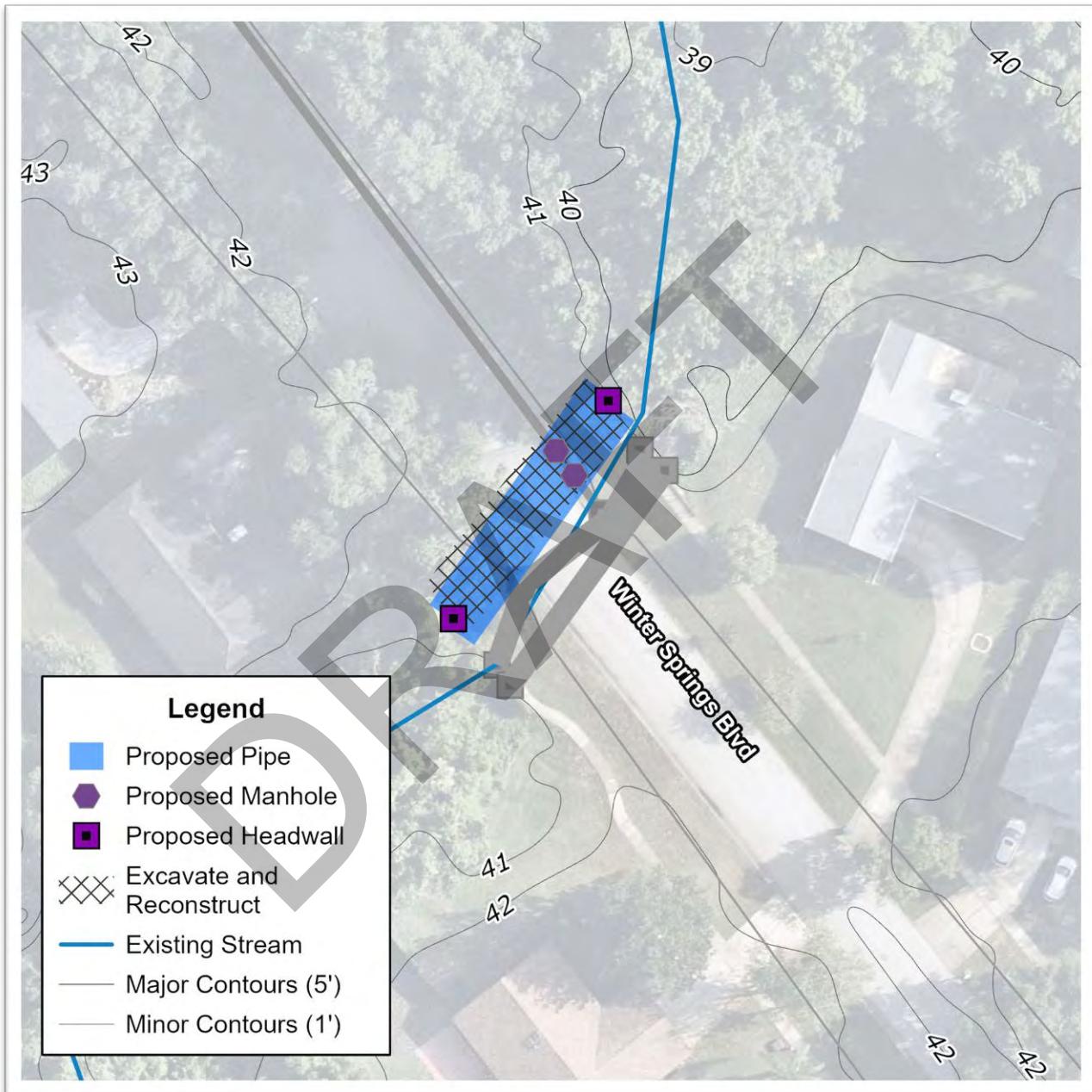


Figure 41: LLH-03 Proposed Conditions

Proposed Level of Service Analysis

The proposed additional pipes result in a decrease in maximum stage. The maximum stage for the upstream node is lower than the road elevation in the 25-year storm event therefore

showing a 25-year LOS improvement and achievement of the LOS. Maximum stage results for locations impacted by the proposed improvement are included in **Table 14**. The maximum stage for the upstream node is still higher than the road elevation in the 100-year storm, maintaining Winter Springs Boulevard under flood risk during the 100-year storm. However, no structures are modeled to flood during the 100-year storm event. A detailed figure showing pre-and post-improvement floodplains and improved road access is provided in **Appendix A**.

Table 14: LLH-03 Maximum Stage Results

Location	Pre-Project 25-Year Max Stage (feet)	Post-Project 25-Year Max Stage (feet)	Pre-Project 100-Year Max Stage (feet)	Post-Project 100-Year Max Stage (feet)
LL200130N	39.39	39.39	39.72	39.72
LL200150N	41.83	41.05	41.98	41.65

LLH-04 – Dunmar Estates Flow Path Re-Establishment

Location

Project LLH-04 consists of evaluation of the subbasin behind Dunmar Estates on Sequoia Drive and the corresponding drainage patterns that convey runoff from that subbasin towards the Chokecherry Drive crossing, located 300 feet to the northeast of Sequoia Drive. See **Figure 42** below for an existing conditions schematic of the project area.

Existing Drainage Conditions

An existing ditch runs west to east through a wooded area, outfalling at the crossing under Chokeberry Drive. However, there is no established channel or means of conveyance for the low-lying area behind Dunmar Estates to drain towards this existing channel or the crossing. In addition, the ditch reaches its maximum capacity during the modeled storms.

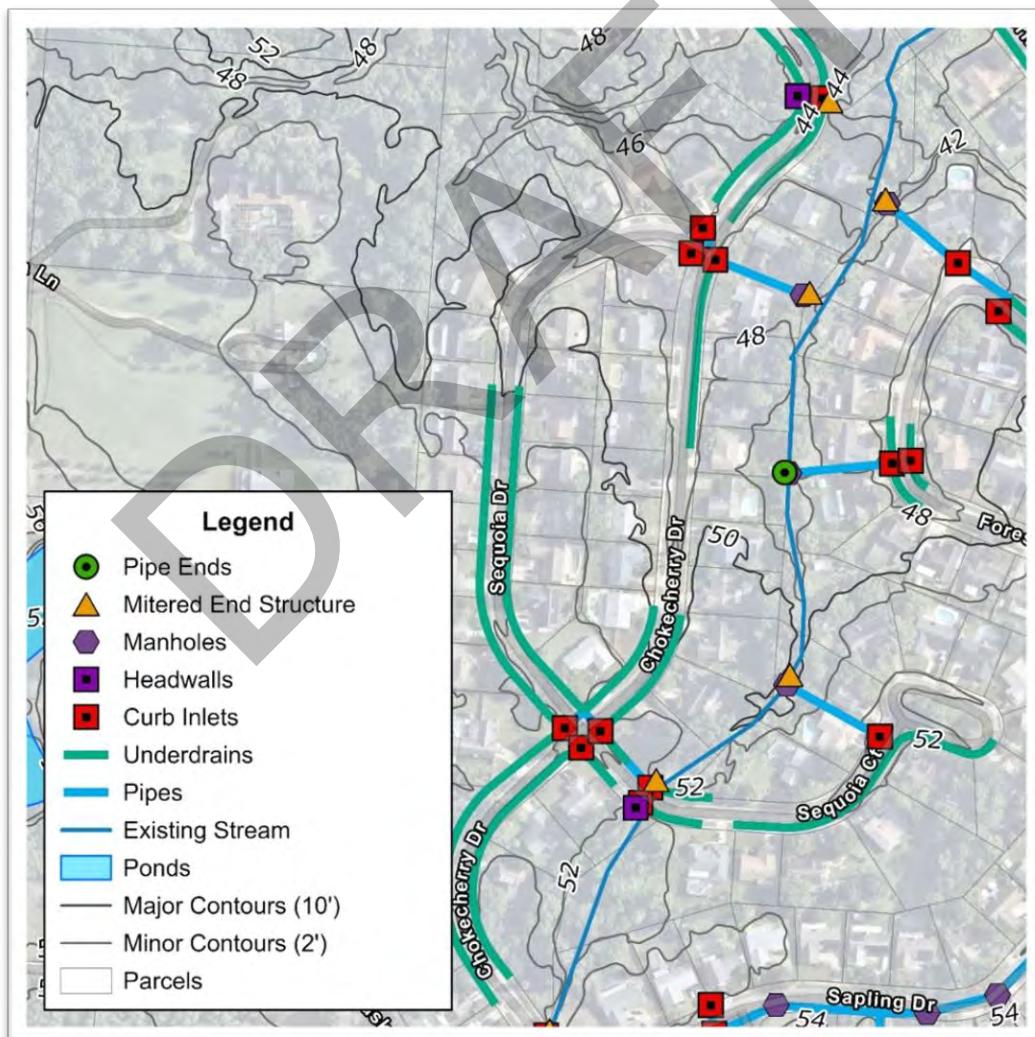


Figure 42. LLH-04 Existing Conditions

Existing Level of Service Analysis

The 25-year LOS is not evaluated at this location. Flooding occurs within the project subbasin, south of the existing outfall ditch, overtopping a major structure during the 25- and 100-year storm events. Therefore, this area does not meet the LOS requirement for the 100-year event.

Proposed Improvement

Initially, the project proposed replacing the existing outfall ditch near Chokecherry Drive with an established channel. This proposal yielded only minor improvements. After further evaluation, the project area requires creating a ditch that would flow south to north, parallel to Sequoia Drive, and outfall at the existing ditch upstream of the crossing on Chokeberry Drive. Additional stormwater detention is also recommended. See **Figure 43** for the proposed improvements.

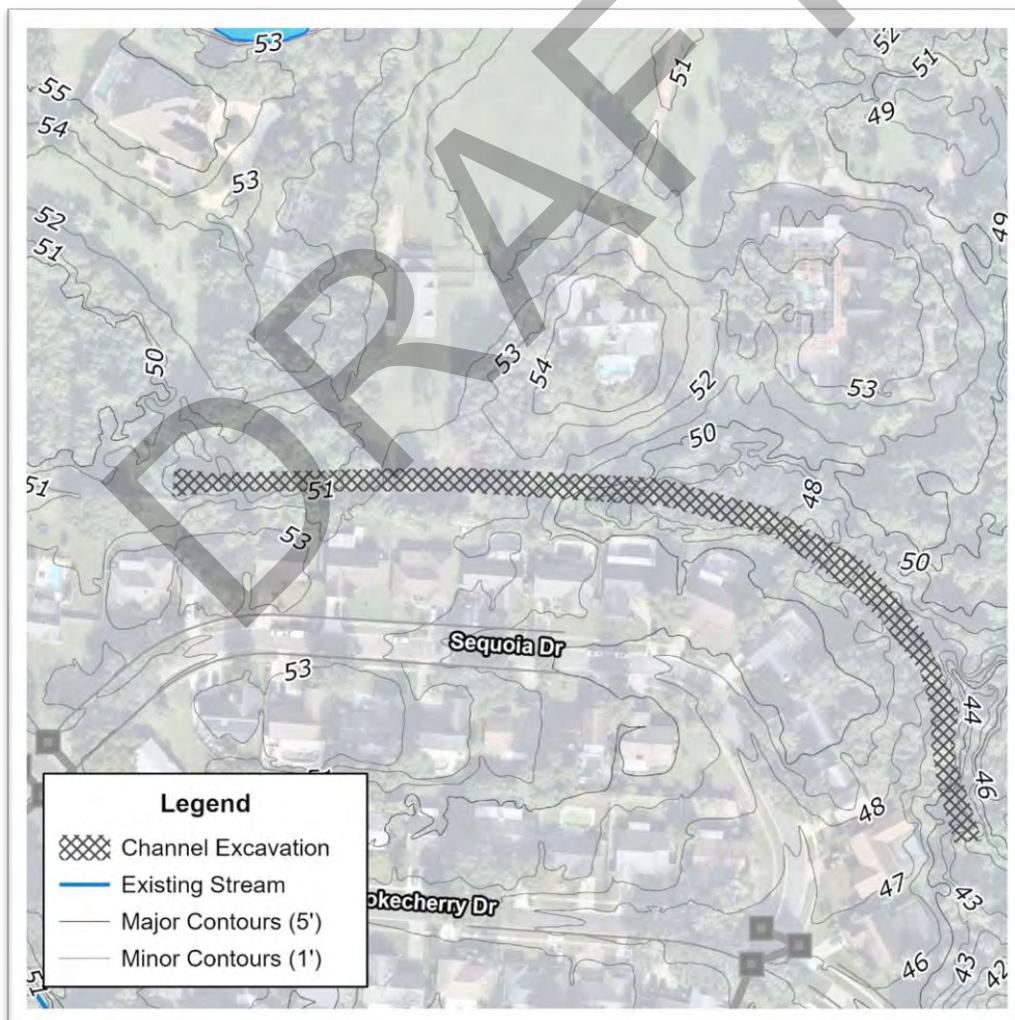


Figure 43: LLH-04 Proposed Conditions

Proposed Level of Service Analysis

The proposed ditch results in a decrease in maximum stage for the basin behind Dunmar Estates on Sequoia Drive in the LOS storm events. Maximum stage results for locations impacted by the proposed improvement are included in **Table 15**. The maximum stage for the basin is lower than the elevation of the existing structure, removing the structure from the 100-year modeled floodplain and satisfying the 100-year LOS. A detailed figure showing pre-and post-improvement floodplains and improved road access is provided in **Appendix A**.

Table 15: LLH-04 Maximum Stage Results

Location	Pre-Project 25-Year Max Stage (feet)	Post-Project 25-Year Max Stage (feet)	Pre-Project 100-Year Max Stage (feet)	Post-Project 100-Year Max Stage (feet)
LL300005N	44.29	44.32	44.40	44.41
LL300010N	44.30	44.33	44.40	44.41
LL400005N	42.86	42.92	43.16	43.19
LL400010N	50.60	50.60	50.66	50.66
LL400030N	51.71	49.83	51.80	49.97

7.5. Soldier's Creek Watershed

SC-01 – Highland Village Storage & Conveyance Improvements

Location

Project SC-01 consists of the Highlands Village neighborhood basin and the Sheoah Boulevard-3rd Street intersection. See **Figure 44** below for an existing conditions image of the location.



Figure 44: SC-01 Existing Conditions Photo of Receiving Channel

Existing Drainage Conditions

The stormwater within Highlands Village is routed to two wet detention ponds within the development, then conveyed southwest to a pond on the east side of Sheoah Boulevard,

ultimately outfalling to the large pond southwest of Sheoah Boulevard. The final pond in the sequence lacks adequate capacity to retain the stormwater, resulting in flooding.

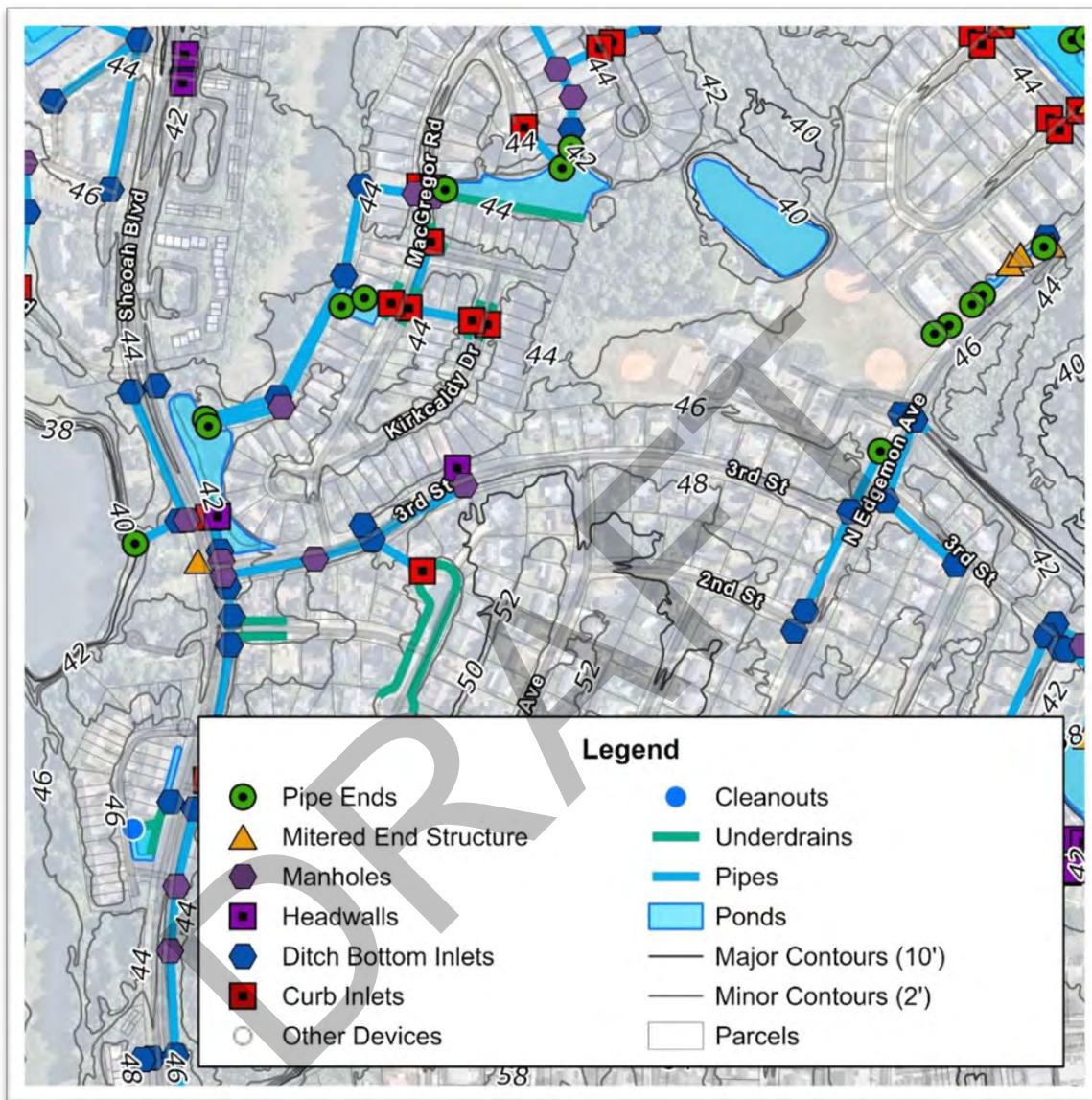


Figure 45. SC-01 Existing Conditions

Existing Level of Service Analysis

The floodplain mapping generated from the Soldiers Creek Watershed Model depicts flooding within Highlands Village. This area does not meet the 25-year LOS in existing conditions due to overtopping of 100 feet of roadway along MacGregor Road and Kirkcaldy Drive. This area also does not meet the 100-year LOS due to overtopping of 1,900 feet of roadway and flooding of three residential buildings. The LOS for both storm events is met along Sheoah Boulevard. However, modeling shows flooding during the 100-year storm

event and the Boulevard is overtopped for a segment of approximately 200 feet northbound and 300 feet southbound, with extended inundation within the road shoulders.

Proposed Improvements

The proposed project reduces the inflow into the chain of ponds by adding a control structure (42-inch circular RCP, type 'H' Inlet) that diverts a portion of inflow to the neighboring basin. A second alternative of creating a stormwater storage area west of Highland Village was modeled but later eliminated, due to a lower score within the project scoring criteria framework. See **Figure 46** for the proposed conditions schematic of the project.

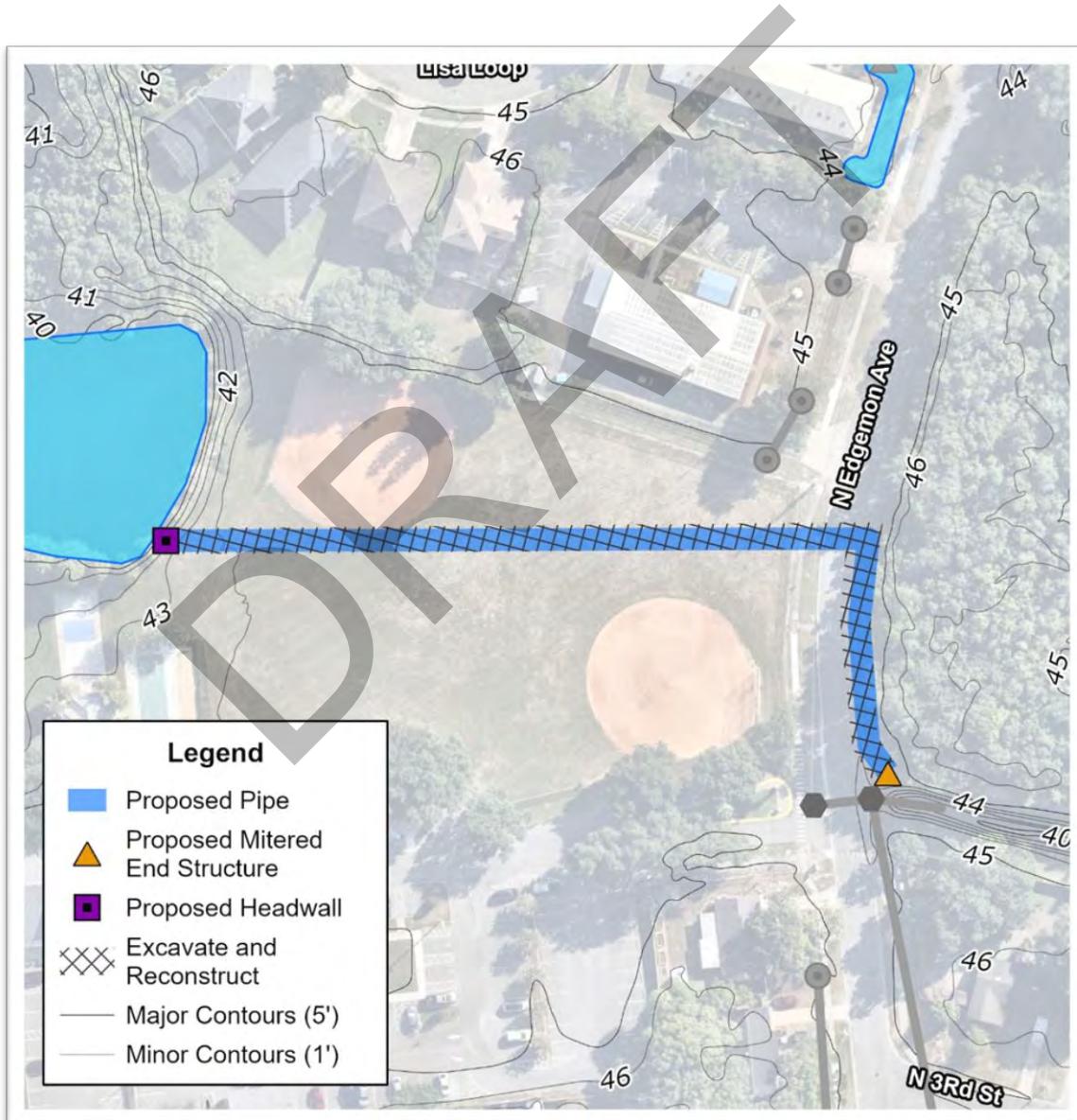


Figure 46: SC-01 Proposed Conditions

Proposed Level of Service Analysis

The proposed improvements decrease peak stages in the project area during the 25-year storm event. During the 100-year event, the improvements eliminate flooding along Sheoah Boulevard and resolve a large area of flooding within Highlands Village, including the three residential buildings previously identified as inundated. However, approximately 160 feet of roadway within Highlands Village remains subject to overtopping. As a result, the 25-year level of service is not met, while the 100-year level of service is achieved. Maximum stage results for locations impacted by the proposed improvement are included in **Table 16**. A comprehensive figure illustrating pre- and post-improvement floodplains and LOS enhancements is available in **Appendix A**.

Table 16: SC-01 Maximum Stage Results

Location	Pre-Project 25-Year Max Stage (feet)	Post-Project 25-Year Max Stage (feet)	Pre-Project 100-Year Max Stage (feet)	Post-Project 100-Year Max Stage (feet)
SC300315N	42.28	41.97	43.29	42.56
SC300320N	42.28	41.96	43.30	42.32
SC300325N	42.29	40.74	43.29	41.34
SC300330N	42.28	41.89	43.29	42.02
SC300340N	43.22	43.22	43.26	43.26
SC900039N	39.31	39.31	39.99	39.99
SC900040N	39.36	39.36	40.05	40.05
SC900045N	39.91	39.91	40.08	40.08
SC900075N	34.23	34.35	34.19	34.26
SC900085N	39.46	39.70	39.73	39.92
SC900095N	42.25	42.25	42.57	42.57
SC900110N	38.62	38.62	38.75	38.75
SC900115N	40.74	40.74	41.04	41.04
SC900120N	35.96	35.97	36.66	36.67
SC900125N	39.39	39.39	39.81	39.81
SC900130N	40.90	40.90	41.06	41.06

7.6. Proposed Maintenance Programs

The City currently performs maintenance on an as needed basis through work orders as described in *Stormwater Related Work Orders*. The City also performs maintenance necessary to remain in compliance with their MS4 permit and FDOT requirements. The City does not currently perform maintenance on a proactive basis through a comprehensive plan.

The City desires to create a proactive maintenance program for stormwater assets that the City owns and operates. These assets include public and private ponds, stormwater pipes, channels and ditches, and bridges. The establishment of a maintenance program will enable the City to track the status of its assets and preemptively identify assets in need of maintenance before they fail, resulting in better stormwater management and reduced costs. The creation of a proactive maintenance program requires the addition of staff dedicated to performing prescribed inspection and maintenance activities in addition to existing City maintenance staff.

MNT-001 – Pond Inspection & Maintenance

Numerous stormwater ponds, both publicly and privately owned, existing within the City and help manage stormwater runoff and improve water quality. Regular maintenance is required, including mowing, removing sediment and vegetation, and inspecting or repairing berms to keep these ponds operating effectively.

To improve the management of these ponds, the City is encouraged to create a formal inspection and maintenance program. This program should ensure that all ponds are inspected and maintained regularly by the responsible entity. Inspections are recommended at least twice per year and after major storm events. A GIS database would be used to track each pond within City limits, recording details such as ownership, current condition, relevant permits, and the maintenance schedule.

For public ponds, the City should develop and follow its own maintenance schedule. For private ponds, as well as hybrid ponds where both public and private interests are involved, the maintenance policy is still to be determined as of the time of this report. If inspections show that maintenance standards are not met, corrective actions such as sediment removal or restoring vegetation may be needed. The City may impose fines on owners who are noncompliant with maintenance requirements.

MNT-002 – CMP Program

The City of Winter Springs has an estimated 3,405-LF of CMP throughout its limits. CMP has a relatively limited lifespan compared to alternate materials and require additional O&M considerations. It is therefore recommended that the City develop a program to identify intervention requirements for the City's CMP system. Intervention requirements will be based on pipe age and condition, which can be implemented into a GIS-based database that the City can manage internally. Intervention methods will include additional condition assessment, investigation for condition, replacing positions of pipe, slip lining, and additional monitoring. The program will begin with the City's older CMP pipes and work into more recently installed CMP in later years.

MNT-003 – CCTV Pipe Inspection Program

To assist the larger CMP Program and inspect other City assets, the City can establish a CCTV Pipe Inspection Program. This program will identify stormwater structures and pipes requiring inspection and establish a schedule to inspect these areas in conjunction with the CMP program. Inspections should also be scheduled following major storm events or response to public complaints. The combination of inspection data and CCTV footage will assist in determining when maintenance is sufficient compared to replacement.

MNT-004 – Creek Dredging and Erosion Program

The City currently performs canal maintenance based on reported issues through work orders. Damage to the City's creeks during Hurricane Ian highlighted the need for a regular inspection and maintenance program. The program should establish routine inspection intervals to identify areas in need of maintenance. Neighborhoods adjacent to creeks that have seen stormwater flooding issues as outlined in the City of Winter Springs Comprehensive Plan will be monitored more frequently to determine if creek dredging is appropriate. Under this program, creek dredging within the City will be performed on a "as-needed" basis to remove accumulated sediment, debris, and vegetation that reduce conveyance efficiency, restrict flow, and contribute to localized flooding. All dredging activities will comply with applicable state and federal regulations, including coordination with the St. Johns River Water Management District and the Florida Department of Environmental Protection.

In conjunction with the creek dredging program, an erosion program will be established to monitor channel banks in need of maintenance. Routine channel inspections performed as part of the creek dredging program will also identify areas needing erosion control measures to preserve conveyance and prevent flooding. Where maintenance is needed, stabilization measures such as native vegetation or rock protection will be used. Inspections should be scheduled in tandem with creek dredging inspections when possible and as response to public complaints.

MNT-005 – Bridge Inspection Program Expansion

There are 28 bridges within the City according to the National Bridge Inventory (NBI) GIS dataset. The City currently monitors and evaluates pedestrian and vehicular bridges every two years based on FDOT requirements to ensure all bridge and large culvert crossings within the municipal stormwater system are routinely assessed for structural integrity, scour, and debris accumulation. Inspections currently follow a report to determine if repairs or replacements are needed. Bridges such as the Winter Springs Boulevard Bridge over Bear Creek, the Northern Way Bridge over Howell Creek, and the bridges crossing Gee Creek, were identified in the City of Winter Springs Comprehensive Plan as vulnerable to potential stormwater flooding concerns. Bridges identified as part of the Comprehensive Plan will

require monitoring beyond the two-year FDOT requirement to ensure their continued O&M under the revised Bridge Inspection Program. These structures should be monitored yearly and inspected following major storm events regardless of the last date of inspection to ensure their hydraulic and structural performance.

MNT-006 – GIS Maintenance Tracking

A critical component of the proposed comprehensive maintenance program is the ability to track maintenance needs throughout the City in a central database. Using the GIS atlas created in Phase 1, the City can create a map showing the maintenance status of all assets within the City. The maintenance tracker should incorporate information collected as part of other areas of the overall maintenance program. Data incorporated into the GIS layer in addition to existing asset data should include at a minimum:

- Date of last inspection
- Required inspection frequency of the asset
- Date of next required inspection
- Photos/videos collected during the latest inspection
- Condition assessment based on the latest inspection

Assets should be symbolized based on their condition and date of next required inspection. Assets conditions symbology should be based on three potential rankings: no maintenance necessary, future maintenance needed, immediate maintenance needed. Inspection date symbology should be based on three date ranges, for example: greater than 2 months until next inspection date, less than 2 months until next inspection date, past next inspection date. Exact date ranges should vary based on the recommended inspection interval for each asset. This tracking system will enable the City to organize and track the status of the maintenance programs outlined above.

8. Project Prioritization and Recommendations

8.1. Opinion of Probable Cost

An Engineer's Opinion of Probable Cost (EOPC) was prepared for each project based on the estimated construction, easement acquisition, survey, design, permitting, and wetland mitigation costs, and of the conceptual projects. **Table 17** summarizes the EOPC per project.

Construction costs for each project were estimated using values from RS Means. Item costs that were not included in RS Means were based upon the FDOT Historical Cost Index, which provides 6-month and 12-month moving averages for construction costs of items in projects across Florida. When available, 6-month averages were used; otherwise, 12-month average costs were applied. Item costs that were not included in the FDOT Historical Cost Indices

were based upon engineering judgement and cost estimates for similar projects in the area. A 30 percent contingency was added to the total construction cost.

Land acquisition costs were estimated based on a cost per square foot of the Just Market Value of the parcel, obtained from the Seminole County Property Appraiser. Drainage easement extents for each proposed detention area and proposed pipe installation segment were manually estimated to determine the total area. The easement areas were then multiplied by the average of the calculated cost per square foot. For existing pipes that are proposed to be increased in size, drainage easements were assumed to be in place. In addition to the total area costs, a 50% contingency was applied.

Survey, engineering design and permitting costs were estimated to be 10, 25, and 25 percent of the total construction cost, respectively. Environmental mitigation costs were not included as they are assumed to be lump sum values and will vary based on the impact of each project.

Table 17: Proposed Project Costs

Project Number	Project Name	Total Cost
GC-01	Alton Road Culvert & Reach Improvements	\$995,000
GC-02	Shore Road Culvert & Reach Improvements	\$1,160,000
GC-03	No-Name Creek Conveyance Improvements Near Sailfish Road	\$645,000
GC-04	No-Name Creek Conveyance Improvements Near Alton Road	\$690,000
LJ-01	North Tuskawilla Road Outfall Improvements	\$1,310,000
LLH-01	Fisher Road Near Morton Lane Improvements	\$225,000
LLH-02	Chokecherry Drive Near Sapling Drive Improvements	\$260,000
LLH-03	Winter Springs Boulevard Near Chokecherry Drive Improvements	\$645,000
LLH-04	Dunmar Estates Flow Path Re-Establishment	\$845,000
SC-01	Highland Village Storage & Conveyance Improvements	\$550,000
HC-01	Winter Springs Boulevard near Davenport Way Improvements	\$900,000
HC-02	Vistawilla Drive Near Seneca Boulevard Improvements	\$600,000

8.2. Project Scoring Criteria

Following identification of the proposed project concepts and development of Opinion of Probable Construction Cost, a project scoring criteria framework was developed to evaluate project priorities. Each project was scored within this framework to develop a prioritized list

of proposed capital improvement projects. Factors evaluated for this scoring criteria were as follows:

- Downstream Impacts
- 100-year LOS – Structures
- 25-year LOS – Roads
- Number of AOIs in Watershed
- Maintenance and Acquisition Considerations
- Benefit per Dollar Spent

Projects were scored in each criterion out of a maximum of 10 points. Each criterion was then weighed as shown below in **Table 18**.

Table 18: Project Scoring Criteria

Scoring Criteria	Description	Weight of Total Project Score
Downstream Impacts	Highest modeled stage increases in the 25-year, 24-hour storm or 100-year, 24-hour storm in feet. A score of 10 will be assigned to any projects with no adverse downstream impacts and a score of 0 will be assigned to the project with the largest downstream impact, with all other projects being given a score in between depending on the downstream impacts with respect to the highest and lowest values.	10%
100-year LOS – Structures	Number of structures removed from the modeled 100-year, 24-hour floodplain. The number of structures removed from the model was calculated based on a spatial review of existing structure locations based on recent aerial imagery vs the location of level-pool floodplains from the existing and proposed model results. A review of existing building elevations was not performed. A score of 10 will be assigned to the project with the greatest number of structures removed from the modeled floodplain and a score of 0 will be assigned to projects with no structures removed from the modeled floodplain, with all other projects being given a score in between depending on the number of structures removed with respect to the highest and lowest values.	25%
25-year LOS – Roads	Improvement to roadway flooding during the modeled 25-year, 24-hour storm. This weighting criteria evaluates the length and depth of floodwaters in pre- and post-project conditions. For each project, the product of roadway removed from modeled 25-year, 24-hour floodplain in linear	25%

Scoring Criteria	Description	Weight of Total Project Score																		
	feet and the maximum depth of roadway removed from modeled 25-year, 24-hour floodplain was computed to develop a roadway improvement factor A score of 10 will be assigned to the project with the highest roadway improvement factor and a score of 0 will be assigned to projects with the lowest roadway improvement factor, with all other projects being given a score in between depending on the roadway improvement factor with respect to the highest and lowest values.																			
Number of AOIs in Watershed	<p>Applied based on the number of AOIs within each watershed. Below is a breakdown of watersheds, number of AOIs, and associated scores for projects within the watershed.</p> <table border="1" data-bbox="486 783 1122 998"> <thead> <tr> <th data-bbox="523 783 670 815">Watershed</th> <th data-bbox="768 783 975 815">Number of AOIs</th> <th data-bbox="1029 783 1122 815">Score</th> </tr> </thead> <tbody> <tr> <td data-bbox="523 815 670 846">Gee Creek</td><td data-bbox="845 815 869 846">18</td><td data-bbox="1029 815 1070 846">10</td></tr> <tr> <td data-bbox="523 846 670 878">Little Lake Howell</td><td data-bbox="845 846 869 878">13</td><td data-bbox="1029 846 1070 878">8</td></tr> <tr> <td data-bbox="523 878 670 910">Lake Jesup</td><td data-bbox="845 878 869 910">10</td><td data-bbox="1029 878 1070 910">6</td></tr> <tr> <td data-bbox="523 910 670 941">Soldier's Creek</td><td data-bbox="845 910 869 941">7</td><td data-bbox="1029 910 1070 941">4</td></tr> <tr> <td data-bbox="523 941 670 973">Howell Creek</td><td data-bbox="845 941 869 973">2</td><td data-bbox="1029 941 1070 973">2</td></tr> </tbody> </table>	Watershed	Number of AOIs	Score	Gee Creek	18	10	Little Lake Howell	13	8	Lake Jesup	10	6	Soldier's Creek	7	4	Howell Creek	2	2	10%
Watershed	Number of AOIs	Score																		
Gee Creek	18	10																		
Little Lake Howell	13	8																		
Lake Jesup	10	6																		
Soldier's Creek	7	4																		
Howell Creek	2	2																		
Maintenance and Acquisition Considerations	City consideration for any projects with considerations for additional maintenance (due to channel clearing or additional storage areas) or property acquisition for easements. Any projects that did not have additional maintenance or acquisition considerations were given a score of 10. Any projects with either an additional maintenance or acquisition consideration were given a score of 5. Projects with both an additional maintenance and acquisition consideration were given a score of 0.	5%																		
Benefit per Dollar Spent	Calculated average land value removed from floodplain per project. The total square footage of floodplain removed was calculated for the 25-year storm. This area was multiplied by the average land value per square foot to get a total land value. Average land value was calculated for parcels within the basins that experienced a decrease in peak stage due to modeled improvements. Land value and parcel area information was obtained from the Seminole County Property Appraiser. The total land value was divided by the EOPC of each project to obtain a Benefit/Cost ratio of each project. A project score of 10 will be assigned to the project with the greatest Benefit/Cost ratio and a score of 0 will be assigned to the project with the lowest Benefit/Cost ratio, with all other projects being given a score in between depending on the ratio with respect to the highest and lowest values.	25%																		

8.3. Prioritized List of Proposed Capital Improvements

Proposed capital improvement projects were scored and ranked based on the criteria discussed in the *Project Scoring Criteria* section. The prioritized list of proposed capital improvements is shown in Table 19.

Table 19: Prioritized List of Proposed Capital Improvement Projects

Rank	Project Number and Description		Project Total Cost
1	GC-01	Alton Road Culvert & Reach Improvements	\$995,000
2	HC-02	Vistawilla Drive Near Seneca Boulevard Improvements	\$600,000
3	GC-03	No-Name Creek Conveyance Improvements Near Sailfish Road	\$645,000
4	LLH-04	Dunmar Estates Flow Path Re-Establishment	\$845,000
5	HC-01	Winter Springs Boulevard near Davenport Way Improvements	\$900,000
6	LLH-01	Fisher Road Near Morton Lane Improvements	\$225,000
7	GC-02	Shore Road Culvert & Reach Improvements	\$1,160,000
8	SC-01	Highland Village Storage & Conveyance Improvements – Proposed Control Structure	\$550,000
9	LLH-02	Chokecherry Drive Near Sapling Drive Improvements	\$260,000
10	LJ-01	North Tuskawilla Road Outfall Improvements – Proposed Pipe Replacement	\$1,310,000
11	GC-04	No-Name Creek Conveyance Improvements Near Alton Road	\$690,000
12	LLH-03	Winter Springs Boulevard Near Chokecherry Drive Improvements	\$645,000

8.4. Capital Improvement Program Funding Recommendation

The primary source of funding for the City's stormwater program is its Stormwater Utility. Previous phases, and particularly Phase 5, focus on developing the CIP, identifying a total program cost, and deriving year-to-year budgets, based on the project priority rankings outlined in the preceding section. The objective is to establish a sustainable budget that supports staffing needs, maintenance activities, and proposed projects while maintaining a reasonable utility fee without significant fluctuations.

Alternative funding can be procured through the Seminole County 3rd 4th generation Penny Sales Tax. This is an interlocal agreement between Seminole County approved by voters and

allocated to municipalities, including the City of Winter Springs, to support eligible capital improvements. Leveraging these surtax funds can help offset the need for increases to the Stormwater Utility fee while enabling the City to prioritize capital improvement projects.

8.5. Grant Funding Opportunities

Certain public funding programs that support stormwater and flood mitigation construction projects require the municipality to have developed master plans that provide a roadmap for managing stormwater in a sustainable and cost-effective manner, reducing flood risks, and protecting water quality while supporting the quality of life of its community and economic development activities.

This Stormwater Master Plan (“the Plan”) can be utilized as supporting documentation when applying for construction funds for priority projects listed in the Plan. Additionally, the FEMA grant programs require that priority projects be listed in the Local Mitigation Strategy Plan of Seminole County, where the City is located. The Seminole County Local Mitigation Strategy Plan will expire in 2030. Therefore, it is recommended that the City review the priority projects listed in the 2025 Mitigation Strategy Plan and reprioritize the projects to include all or a few of the ones listed in this Master Plan based on urgency. The reprioritization has to be coordinated with Seminole County’s Local Mitigation Strategy Working Group.

Following is a list of grant programs suitable for the identified projects. While the list of grant and loan programs may be suited to fund the priority projects, additional analysis regarding the specific eligibility requirements and priorities of the programs must be assessed before recommending that the City develop full grant applications. Furthermore, it is suggested that the City have initial discussions with the funding agencies to make sure that all aspects of a project are fully reimbursable by a grant program.

8.5.1. Hazard Mitigation Grant

This FEMA program is focused on providing funding support to projects which reduce expected losses caused by disaster. To qualify for eligibility, projects under this program must be listed on the Local Mitigation Strategy Plan. Some examples of projects that have historically been funded through this program are drainage system upgrades, flood proofing, structural elevation, flood wall installation or improvement, and roadway elevation, among others. Typically, this program requires a 25% local match. The application cycle for this program is tied to Presidential disaster declarations rather than a fixed annual schedule.

8.5.2. Flood Mitigation Assistance Grant

This program supports projects that reduce or eliminate the risk of repetitive flood damage to buildings insured by the National Flood Insurance Program. Recipients of funding awards are assessed based on the applicant’s ranking of the project, eligibility, and cost-

effectiveness. This program requires a 25% non-federal cost share from the municipality and has both an annual and a disaster-triggered funding cycle. Additionally, it is recommended that the PIs in this Plan be included in the Local Mitigation Strategy Plan.

8.5.3. Resilient Florida Implementation Grant

Administered by FDEP, this grant is available to cities and counties to fund construction of infrastructure projects that address risks identified in a local government vulnerability assessment. Implementation grants under this program typically require a 50% cost share. Because this program prioritizes projects that are part of a formal vulnerability assessment, it is worth noting that other master plans that have been developed by the City, such as the Stormwater Master Plan, which may support the City's need for infrastructure improvements. It is recommended the City discusses this possibility with the funding agency.

8.5.4. Community Development Block Grant

The City has an established Consolidated Plan where the City identified three high priority needs in which to invest this program's funding through September 30, 2026. The priority needs include public Improvements and Infrastructure, which includes improvements to stormwater drainage and stormwater runoff improvements. While the funds the City receives under the allocation may not fund the project fully, this funding can partially subsidize a project's cost. Additionally, the City can also consider applying to the competitive Community Development Block Grant program. The competitive grant program is undergoing amendments at the time of this report.

8.5.5. Nonpoint Source Management Program

This program provides funding for the planning, design and construction of critical stormwater infrastructure projects in communities with the goal of reducing decentralized pollution. Eligible projects include evaluation of Best Management Program's (BMP), nonpoint source pollution reduction in priority watersheds (e.g. areas with water quality restoration plans), low impact development for stormwater, and more. Matching requirements vary based on the project and municipality.

8.5.6. Clean Water State Revolving Fund

This program funds design and construction of stormwater improvements. It has a rolling application process which FDEP reviews on a quarterly basis. Loans are typically 2.5–3 percentage points lower than the current rate of the 20-year general obligation bond index (less than half the market rate). Interest rates vary based on market rate, affordability index, and population size to be served by the improvement. Additional rate reductions may be assessed if the project meets the amended Davis-Bacon Act, the American Iron and Steel

Act and the implementation of an asset management plan. Additional discounts are available for “green” projects. Most recently, stormwater improvement loans have been awarded at 1.75-2.0% interest rates. This program provides funding for the planning, design and construction of critical stormwater infrastructure projects in communities with the goal of reducing decentralized pollution. Eligible projects include evaluation of BMP’s, nonpoint source pollution reduction in priority watersheds (e.g. areas with water quality restoration plans), low impact development for stormwater, and more. Matching requirements vary based on the project and municipality.

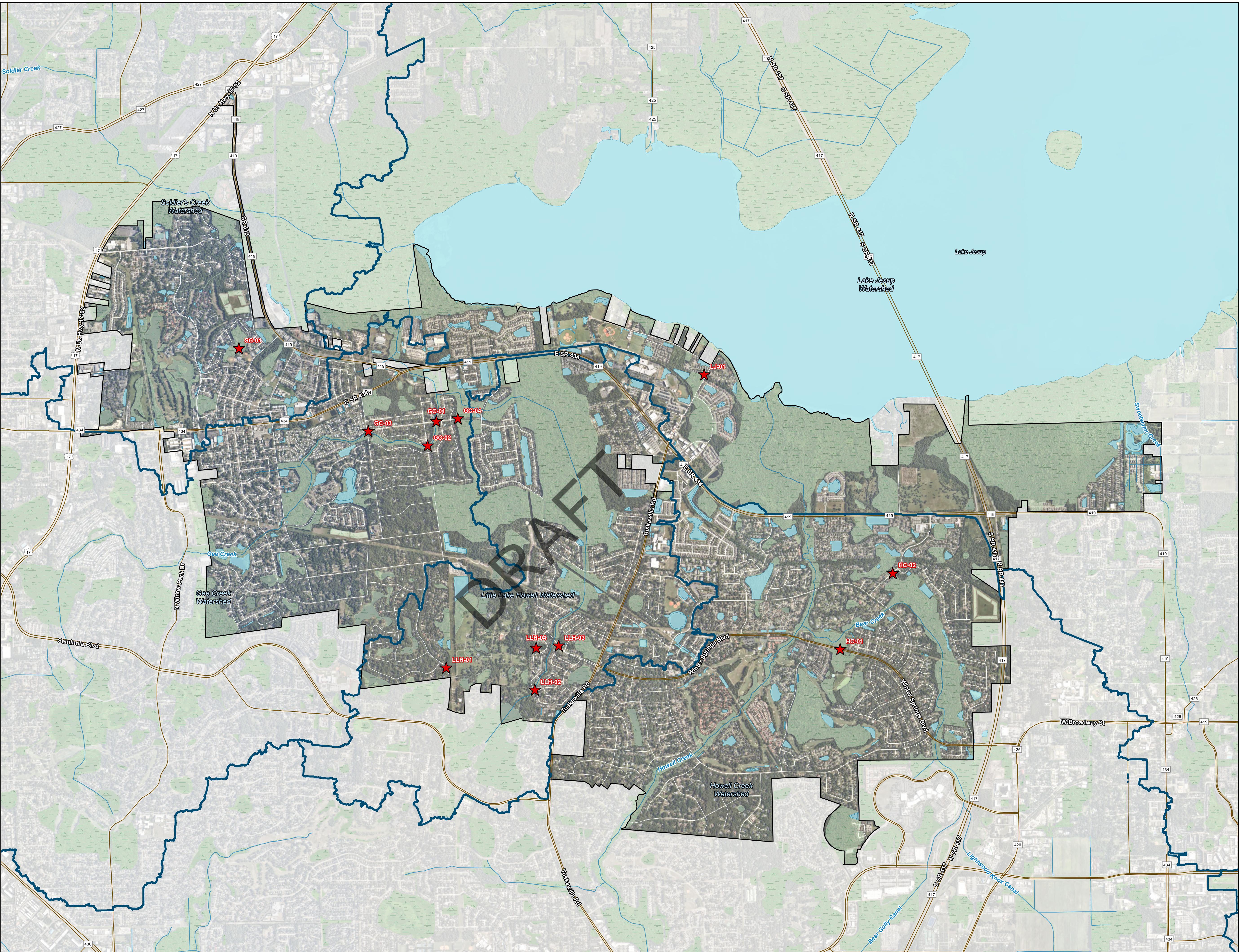
DRAFT

APPENDIX A – AREA OF INTEREST (AOI) EXHIBITS

DRAFT

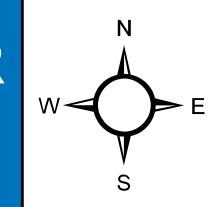
Legend

- Winter Springs City Limits
- Watersheds
- Proposed Capital Improvements
- Streams
- Ponds
- National Wetland Inventory
- Arterials



CITY MASTER MAP

STORMWATER IMPROVEMENTS PREPARED FOR CITY OF WINTER SPRINGS



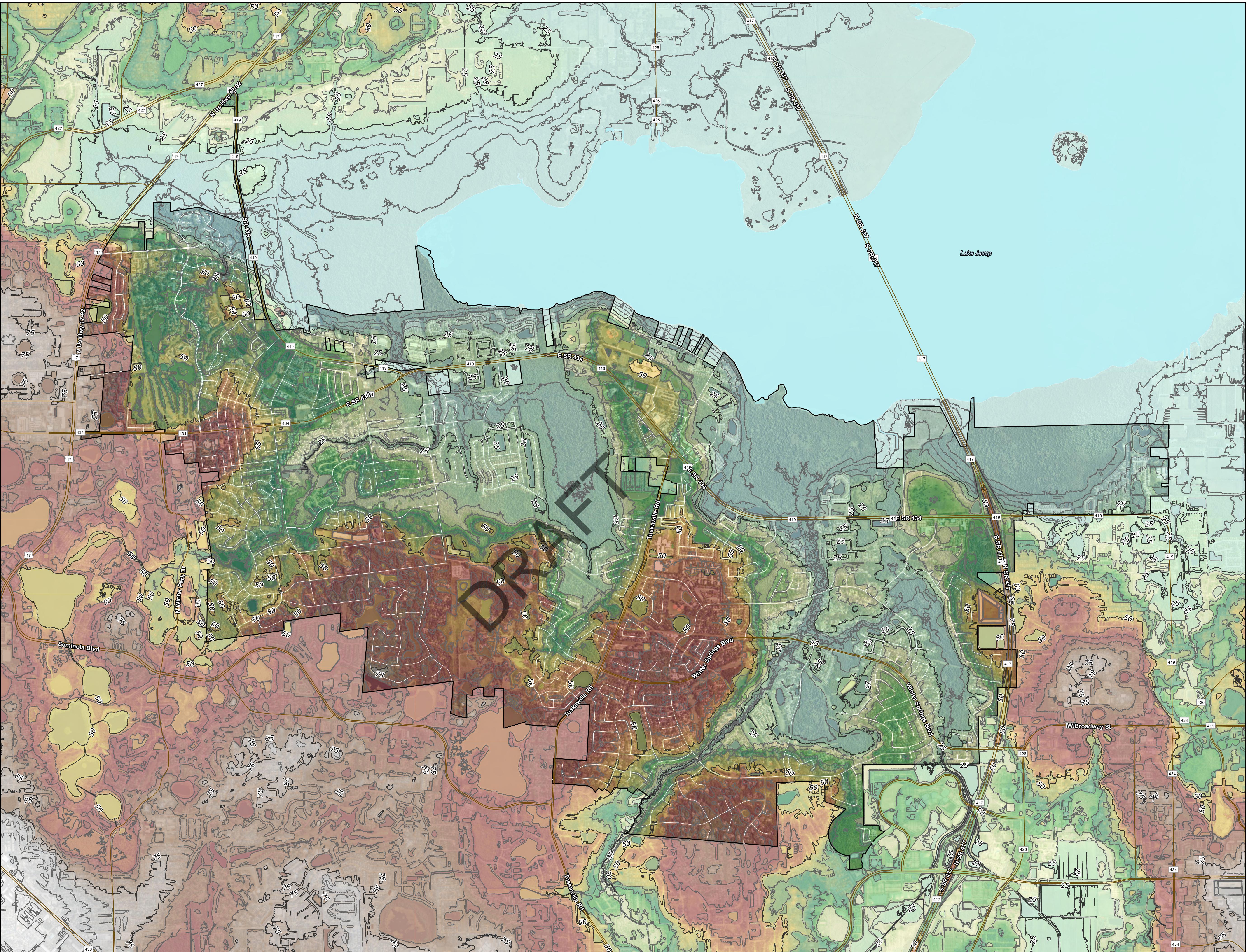
1 INCH = 1,500 FEET

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EXHIBIT
1

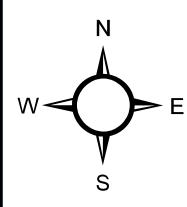
Legend

- Winter Springs City Limits
- Elevation (ft, NAVD88)
 - 123.32
 - 0.55
- Arterials
- Major Contours (25')
- Major Contours (5')



**DIGITAL ELEVATION MODEL
AND TOPOGRAPHIC INFORMATION**

**STORMWATER IMPROVEMENTS PREPARED FOR
CITY OF WINTER SPRINGS**



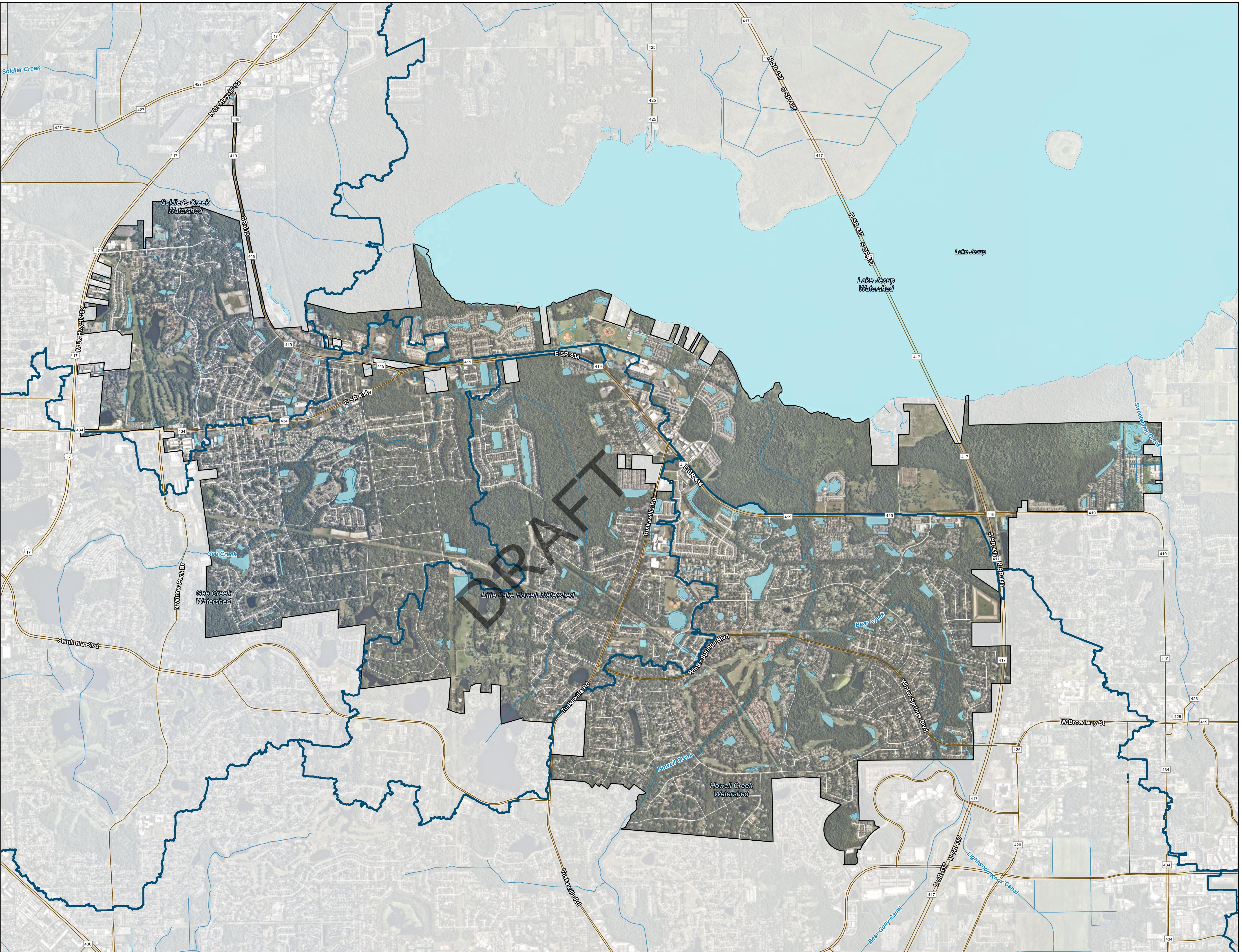
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**EXHIBIT
2**

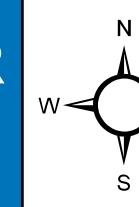
Legend

- Winter Springs City Limits
- Watersheds
- Streams
- Ponds
- Arterials



**CITY OF WINTER
SPRINGS WATERSHEDS**

STORMWATER IMPROVEMENTS PREPARED FOR
CITY OF WINTER SPRINGS



1 INCH = 1,500 FEET

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**EXHIBIT
3**

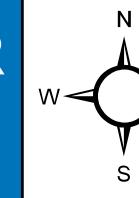
Legend

- Winter Springs City Limits
- Gee Creek Watershed
- Gee Creek Subbasins
- Streams
- Ponds
- Arterials



GEE CREEK WATERSHED

STORMWATER IMPROVEMENTS PREPARED FOR CITY OF WINTER SPRINGS



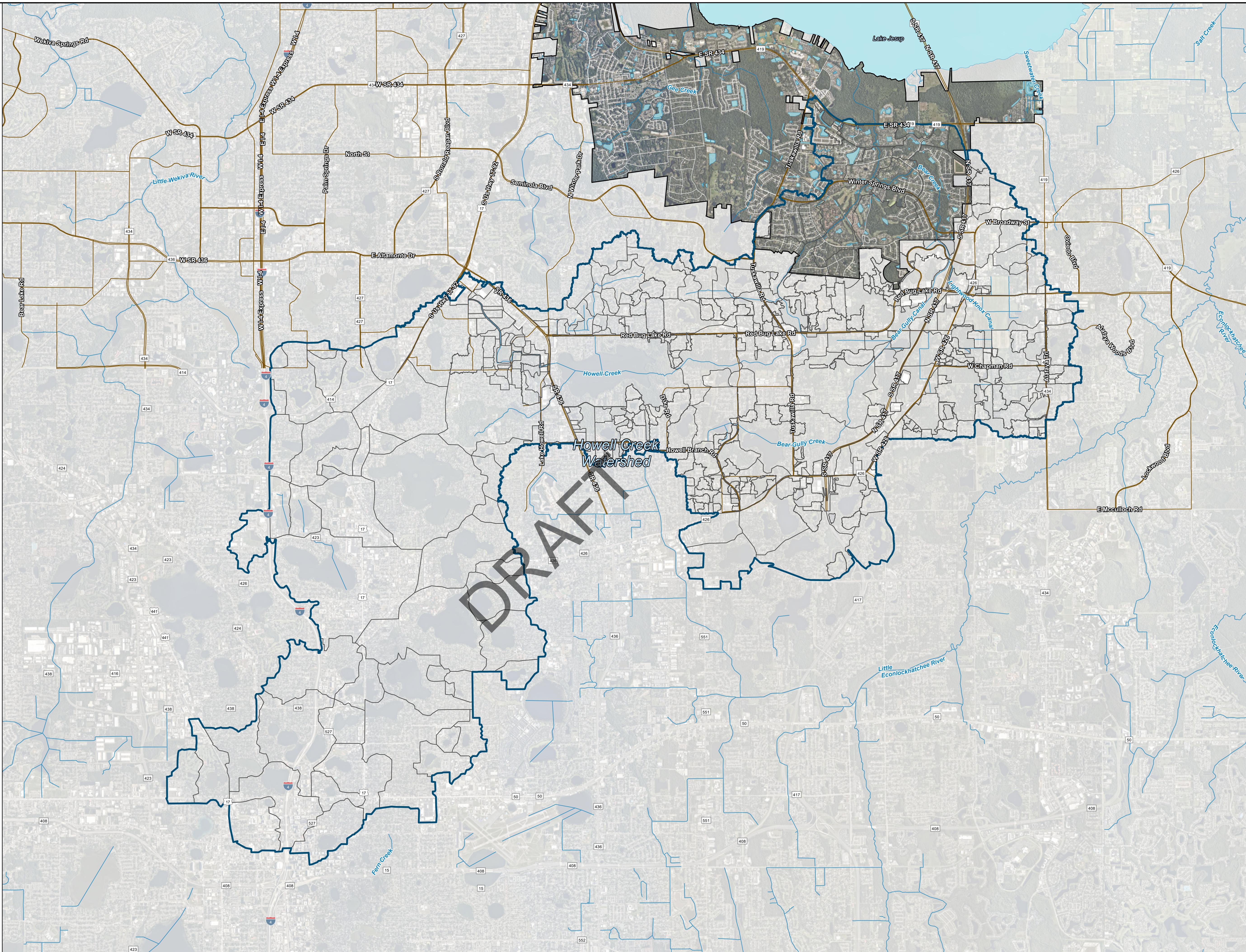
1 INCH = 1,200 FEET

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EXHIBIT 4

Legend

- Winter Springs City Limits
- Howell Creek Watershed
- Howell Creek Subbasins
- Streams
- Ponds
- Arterials



HOWELL CREEK WATERSHED

STORMWATER IMPROVEMENTS PREPARED FOR CITY OF WINTER SPRINGS



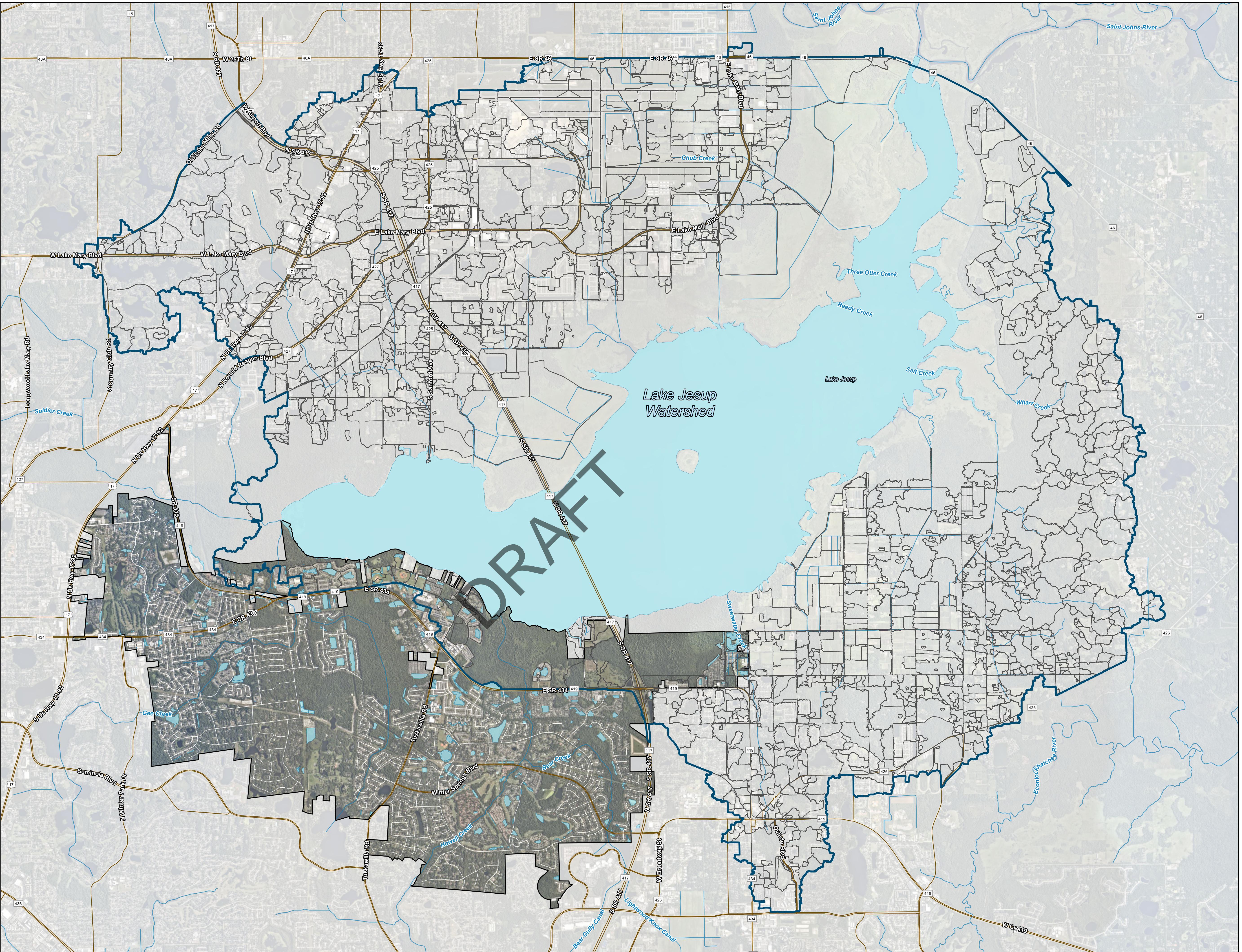
1 INCH = 800 FEET

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EXHIBIT
5

Legend

- Winter Springs City Limits
- Lake Jesup Watershed
- Lake Jesup Subbasins
- Streams
- Ponds
- Arterials



LAKE JESUP WATERSHED

STORMWATER IMPROVEMENTS PREPARED FOR CITY OF WINTER SPRINGS



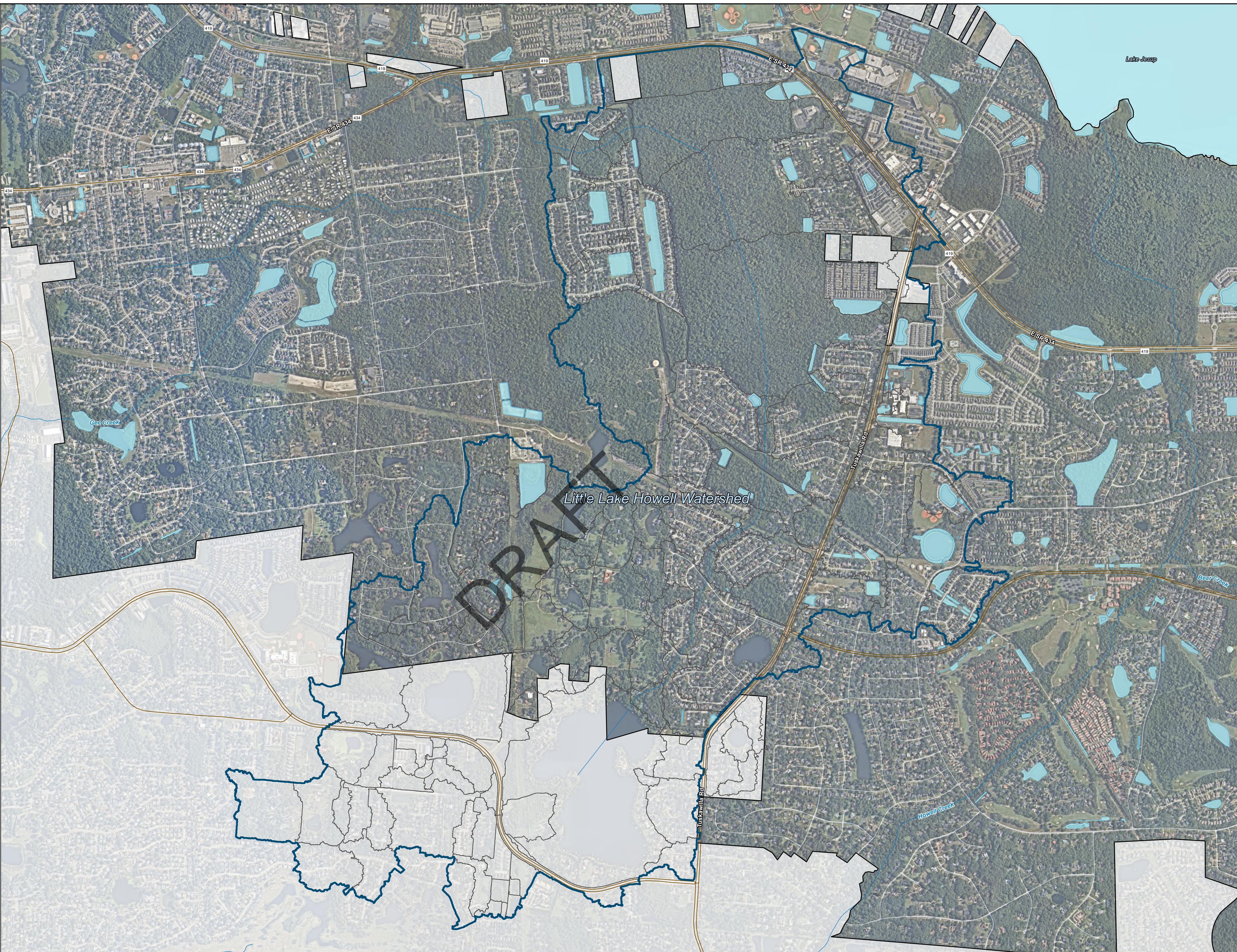
1 INCH = 2,400 FEET

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EXHIBIT
6

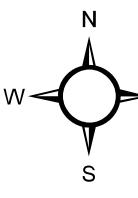
Legend

- Winter Springs City Limits
- Little Lake Howell Watershed
- Little Lake Howell Subbasins
- Streams
- Ponds
- Arterials



LITTLE LAKE HOWELL WATERSHED

STORMWATER IMPROVEMENTS PREPARED FOR **CITY OF WINTER SPRINGS**



1 INCH = 800 FEET

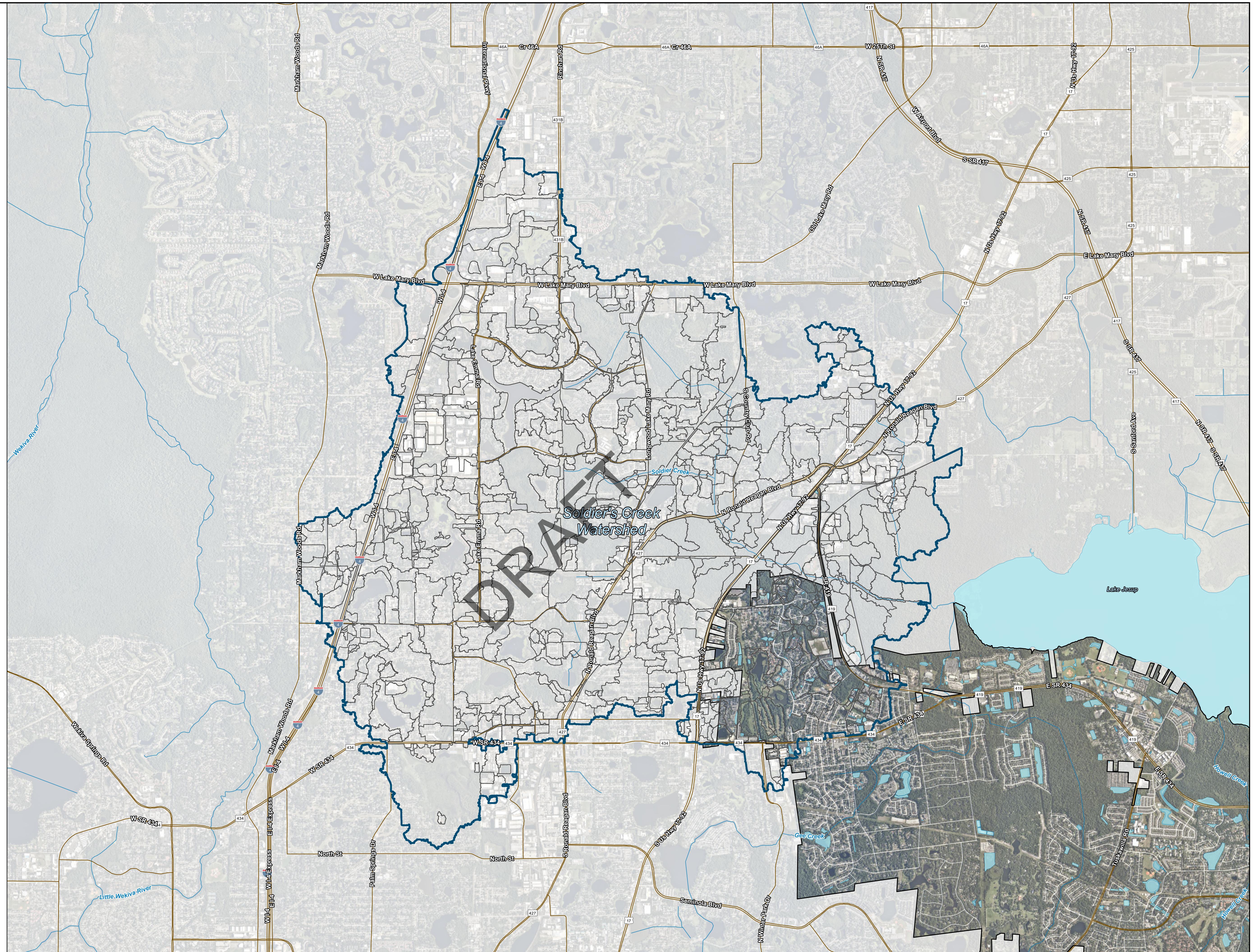
Kimley»Horn

EXHIBIT

7

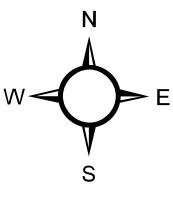
Legend

- Winter Springs City Limits
- Soldier's Creek Watershed
- Soldier's Creek Subbasins
- Streams
- Ponds
- Arterials



SOLDIER'S CREEK WATERSHED

STORMWATER IMPROVEMENTS PREPARED FOR
CITY OF WINTER SPRINGS



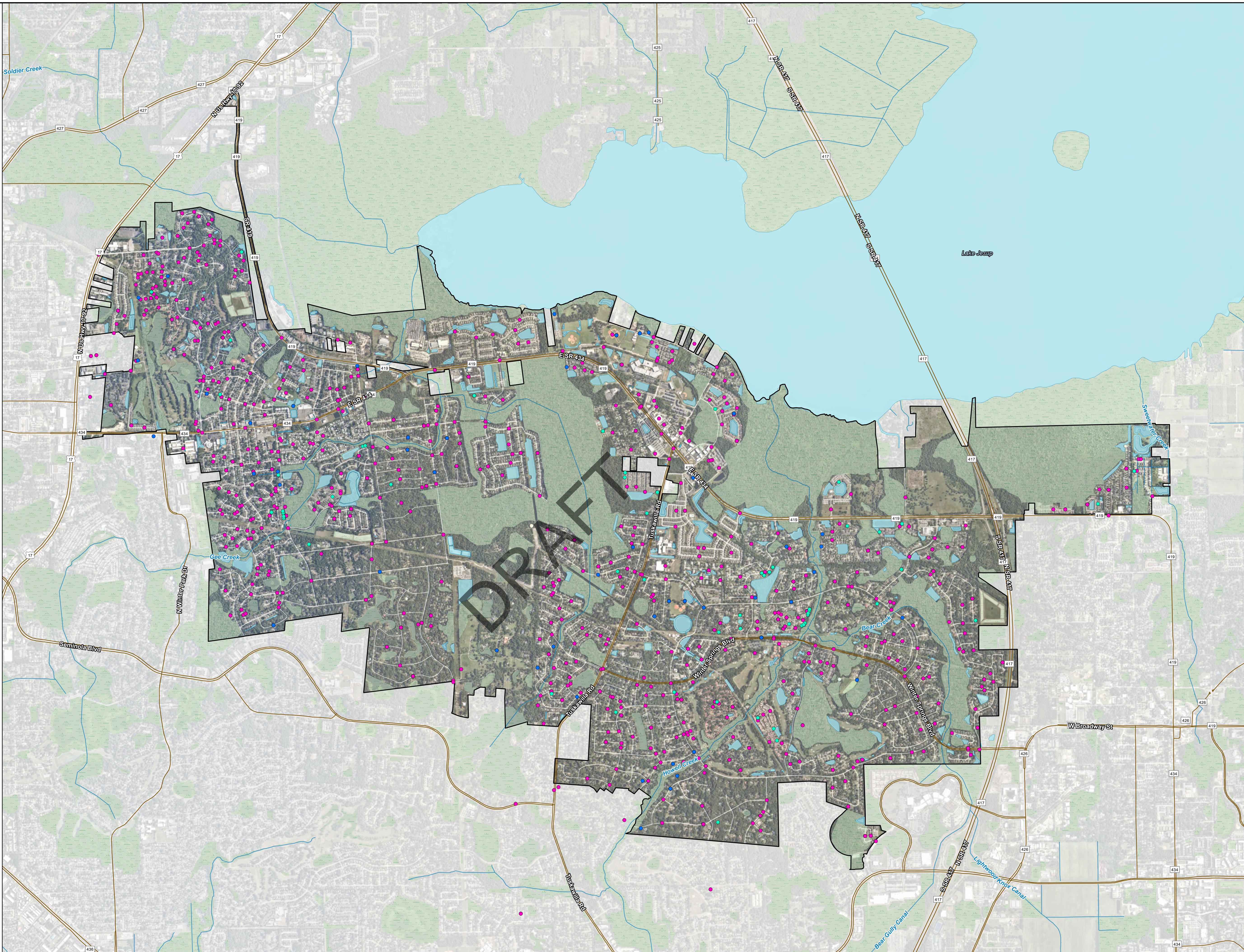
1 INCH = 2,000 FEET

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EXHIBIT
8

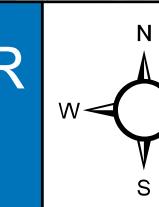
Legend

- Winter Springs City Limits
- Hurricane Ian Damage Inventory
- Hurricane Ian Responses
- 5 Year Work Order History
- Streams
- Ponds
- National Wetland Inventory
- Arterials



STORMWATER WORK ORDER HISTORY

STORMWATER IMPROVEMENTS PREPARED FOR CITY OF WINTER SPRINGS



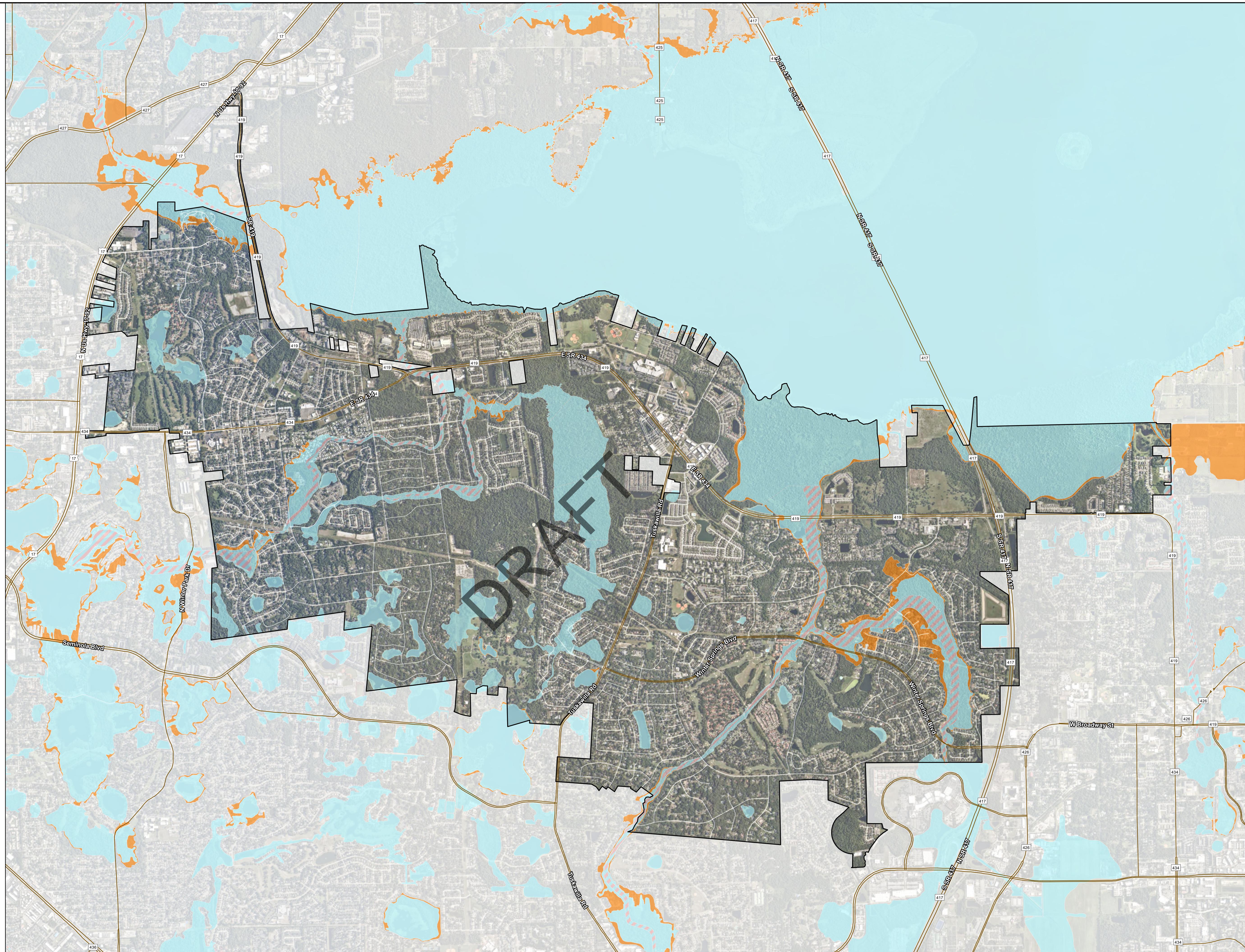
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EXHIBIT
9

Legend

- Winter Springs City Limits
- Flood Hazard Zone
 - 1% Annual Chance Flood Hazard
 - 0.2 % Annual Chance Flood Hazard
- Regulatory Floodway
- Arterials

**FEMA SPECIAL
FLOOD HAZARD AREAS****STORMWATER IMPROVEMENTS PREPARED FOR
CITY OF WINTER SPRINGS**

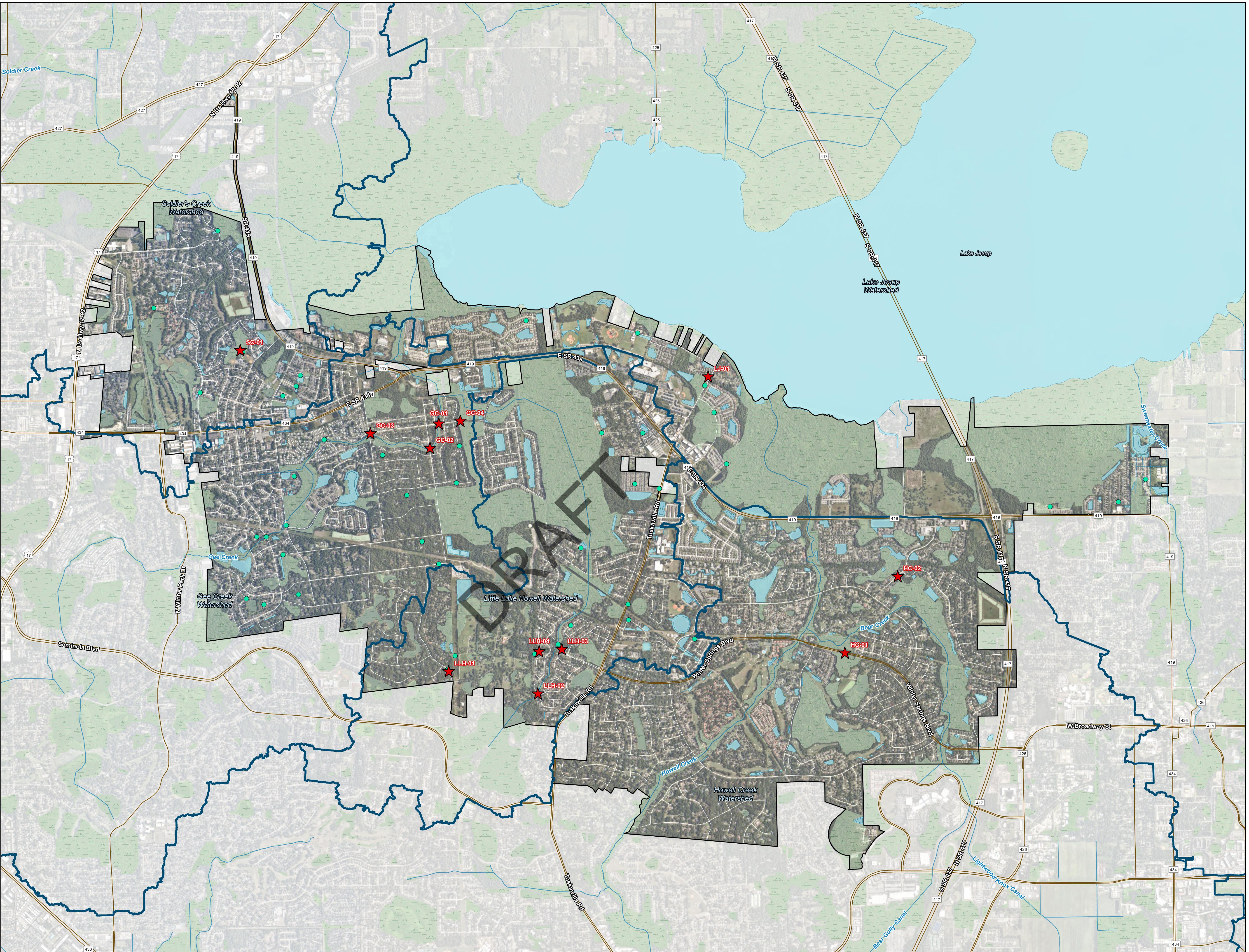
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**EXHIBIT
10**

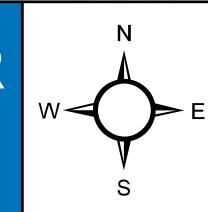
Legend

- Winter Springs City Limits
- Watersheds
- Proposed Capital Improvements
- Area of Interest
- Streams
- Ponds
- National Wetland Inventory
- Arterials



AREAS OF INTEREST

STORMWATER IMPROVEMENTS PREPARED FOR CITY OF WINTER SPRINGS



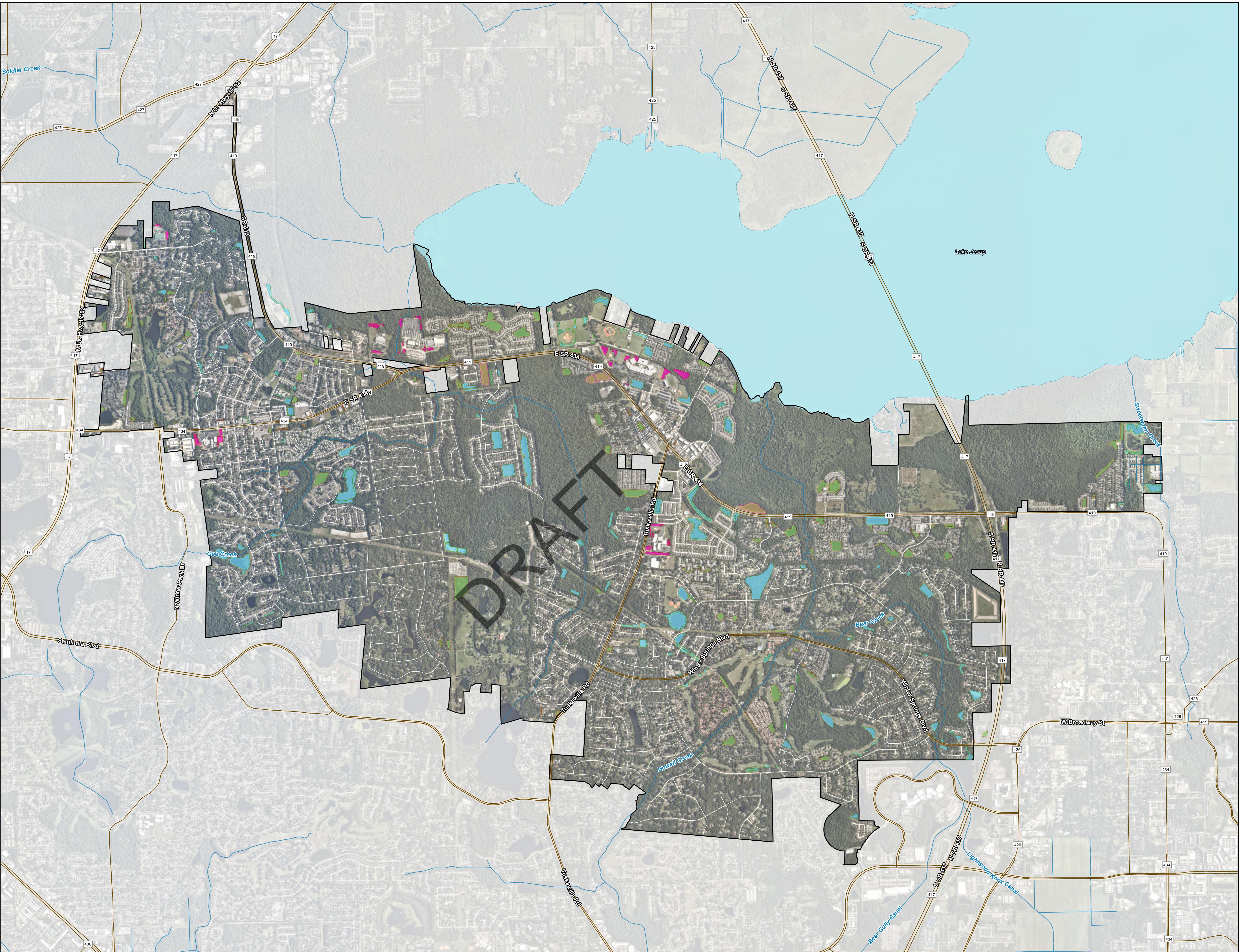
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EXHIBIT
11

Legend

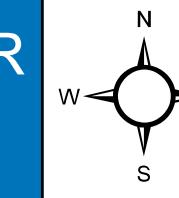
- Winter Springs City Limits
- Pond Maintenance Entity
- City of Winter Springs
- Private
- Seminole County
- FDOT
- Streams
- Arterials



POND MAP SERIES

STORMWATER IMPROVEMENTS PREPARED FOR
CITY OF WINTER SPRINGS

1 INCH = 1,500 FEET



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EXHIBIT
12 - 1



Legend

- Winter Springs City Limits
- Pond Maintenance Entity
- City of Winter Springs
- Private
- Seminole County
- FDOT
- Streams
- Arterials



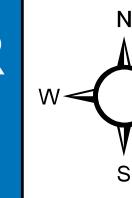
Legend

- Winter Springs City Limits
- Pond Maintenance Entity
- City of Winter Springs
- Private
- Seminole County
- FDOT
- Streams
- Arterials



POND MAP SERIES

STORMWATER IMPROVEMENTS PREPARED FOR **CITY OF WINTER SPRINGS**



1 INCH = 400 FEET

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EXHIBIT

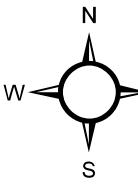
12 - 3

Legend

- Winter Springs City Limits
- Pond Maintenance Entity
- City of Winter Springs
- Private
- Seminole County
- FDOT
- Streams
- Arterials

**POND MAP SERIES**

STORMWATER IMPROVEMENTS PREPARED FOR
CITY OF WINTER SPRINGS



1 INCH = 400 FEET

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EXHIBIT
12 - 4



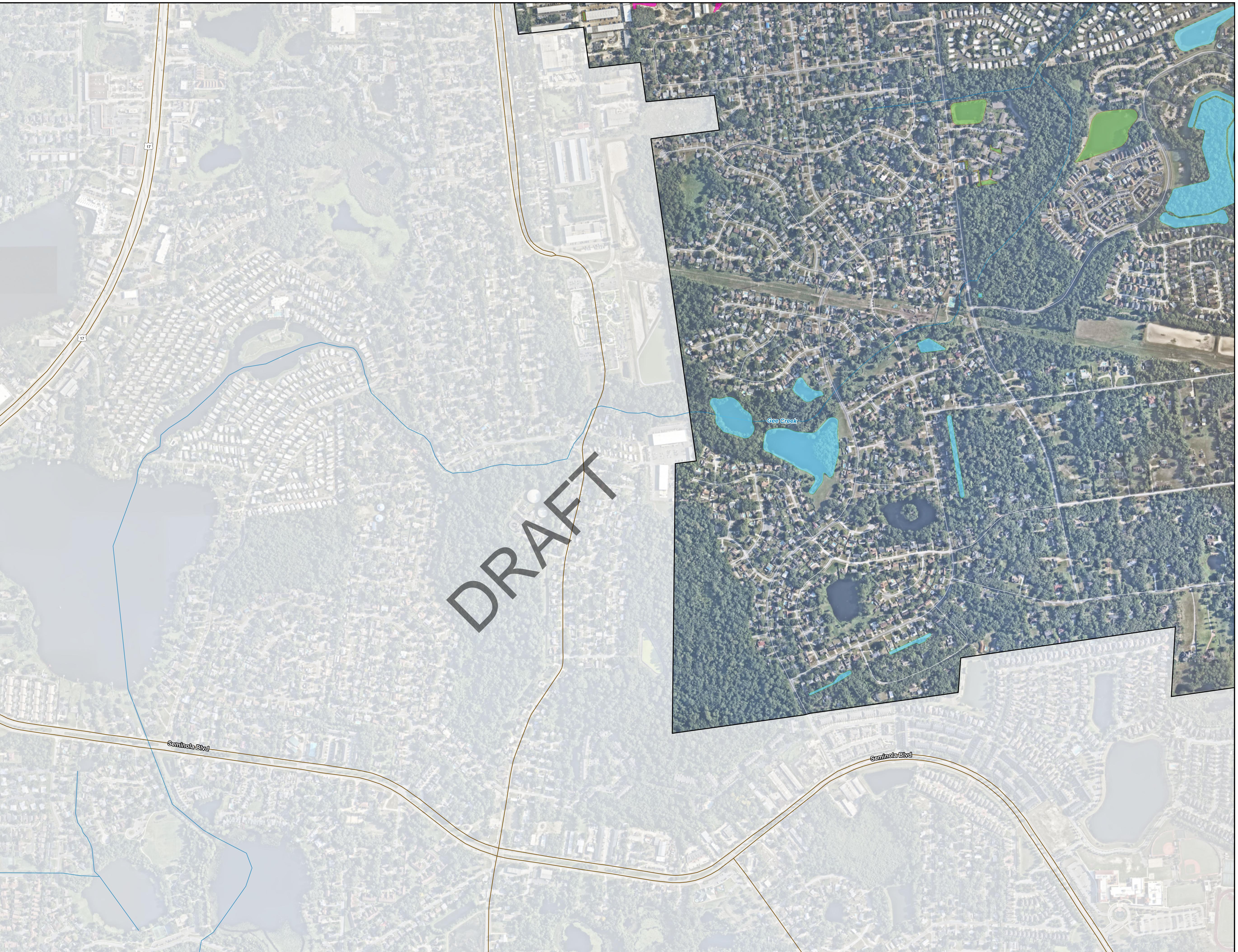
Legend

- Winter Springs City Limits
- Pond Maintenance Entity
- City of Winter Springs
- Private
- Seminole County
- FDOT
- Streams
- Arterials



Legend

- Winter Springs City Limits
- Pond Maintenance Entity
- City of Winter Springs
- Private
- Seminole County
- FDOT
- Streams
- Arterials

**POND MAP SERIES**

STORMWATER IMPROVEMENTS PREPARED FOR
CITY OF WINTER SPRINGS



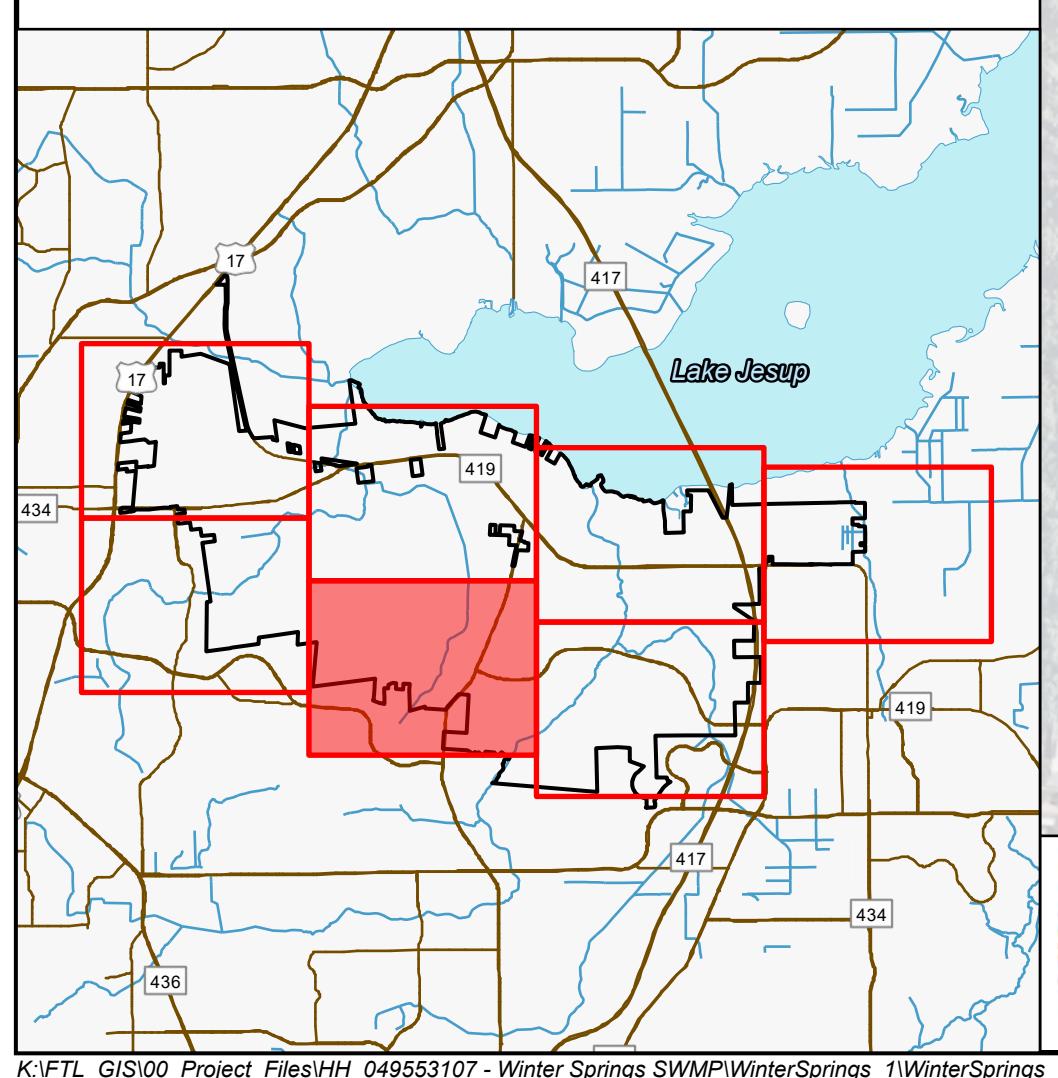
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EXHIBIT
12 - 6

Legend

- Winter Springs City Limits
- Pond Maintenance Entity
- City of Winter Springs
- Private
- Seminole County
- FDOT
- Streams
- Arterials



Legend

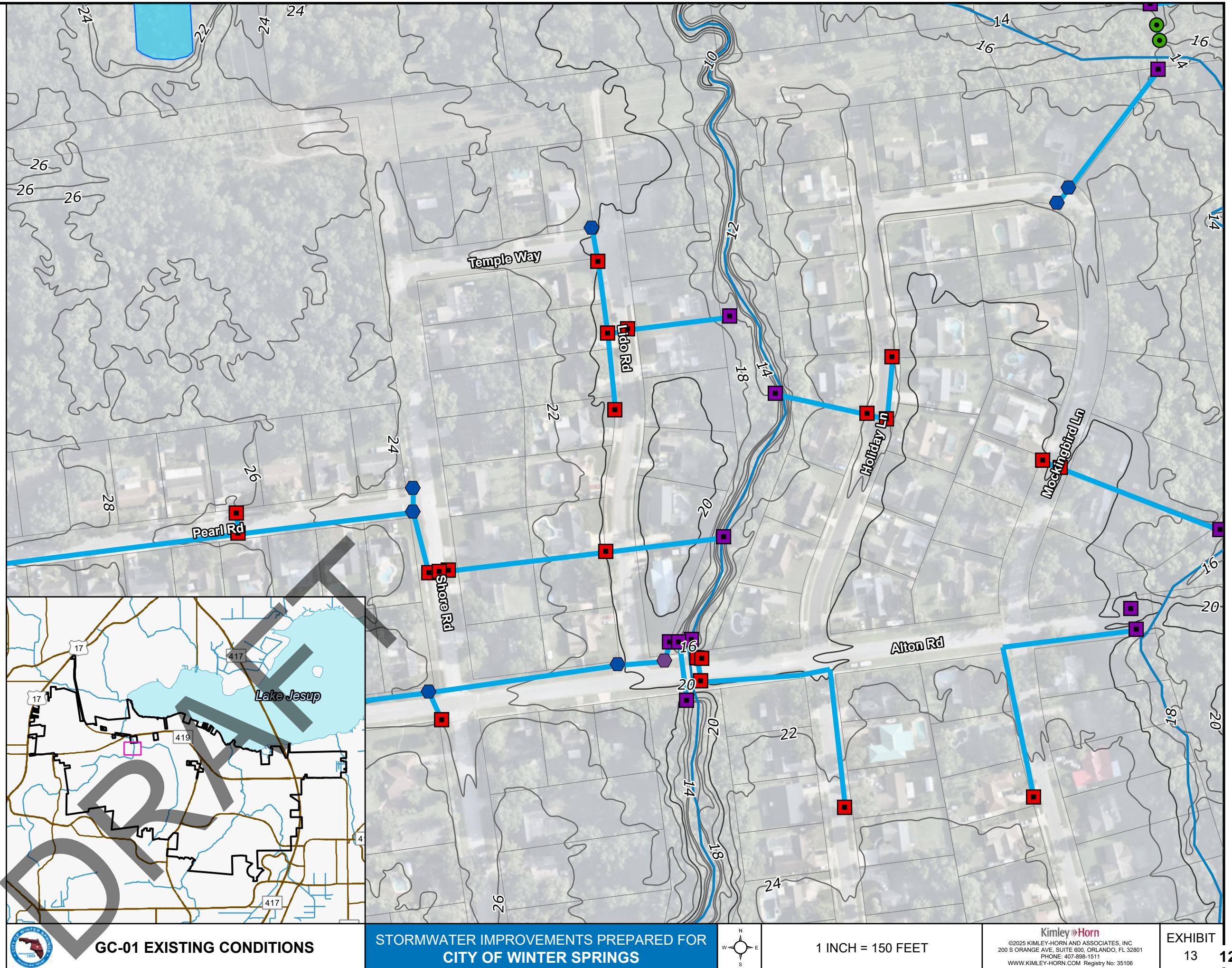
- Winter Springs City Limits
- Pond Maintenance Entity
- City of Winter Springs
- Private
- Seminole County
- FDOT
- Streams
- Arterials



Legend

Existing Stormwater Infrastructure

- Pipe Ends (Green Circle)
- Manholes (Purple Hexagon)
- Headwalls (Purple Square)
- Ditch Bottom Inlets (Blue Hexagon)
- Curb Inlets (Red Square)
- Pipes (Blue Line)
- Existing Stream (Blue Line)
- Ponds (Light Blue Area)
- Parcels (White Area)
- Major Contours (10')
- Minor Contours (2')



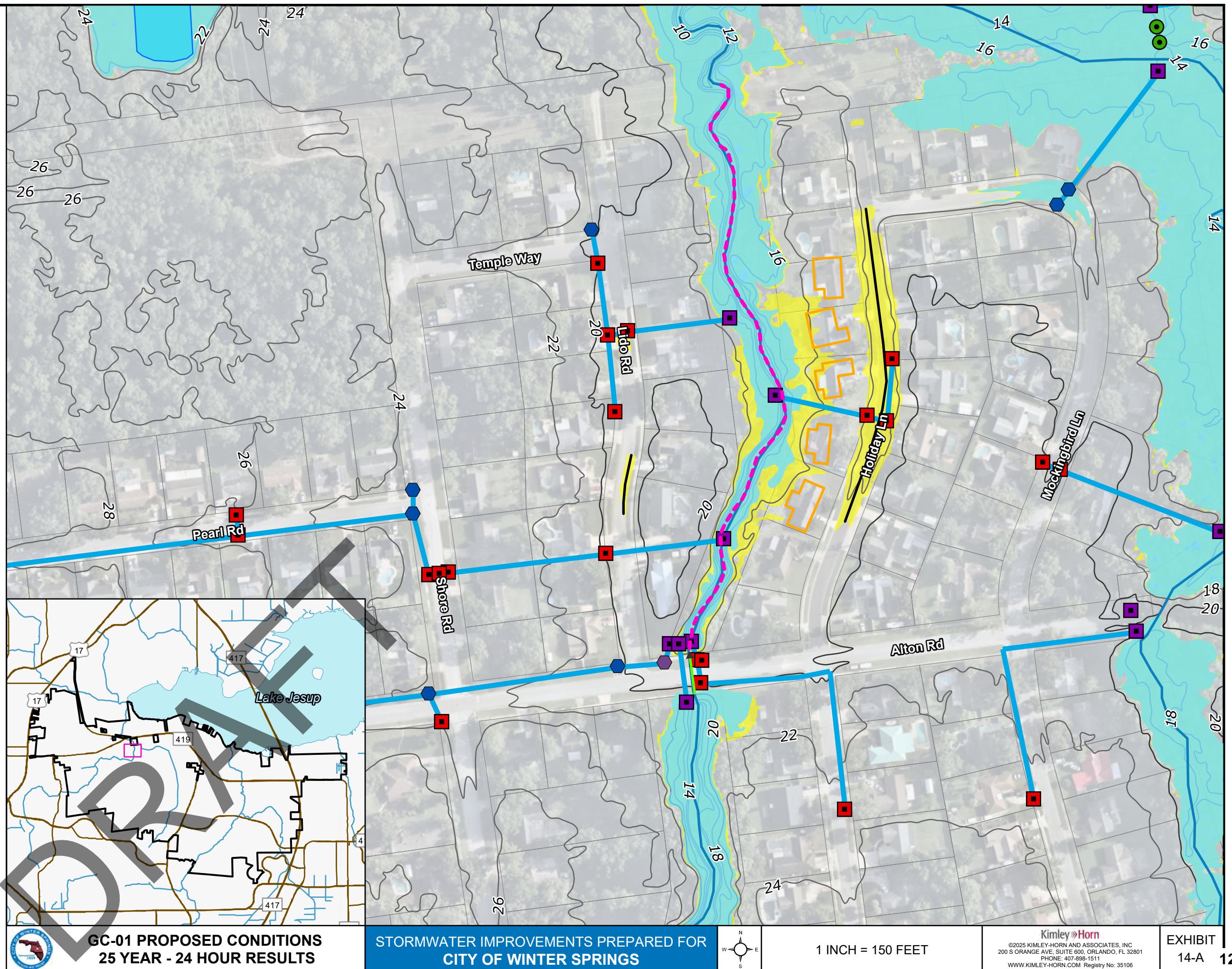
Legend

- Replace Existing Pipe
- Expand Existing Channel
- Crown of Road Removed from Modeled Floodplain
- Structure Removed from Modeled Floodplain
- Proposed Conditions 25
- Year 24 Hour Floodplain
- Existing Condition 25 Year 24 Hour Floodplain

Existing Stormwater Infrastructure

- Pipe Ends
- Manholes
- Headwalls
- Ditch Bottom Inlets
- Curb Inlets
- Pipes
- Existing Stream
- Ponds
- Parcels
- Major Contours (10')
- Minor Contours (2')

ALL EXISTING MODEL INFORMATION (BASINS, NODES, EXISTING LINKS) FROM SEMINOLE COUNTY WATERSHED MODELS DEVELOPED BY OTHERS AND REVIEWED BY KIMLEY-HORN WITH ADDED CHANGES.



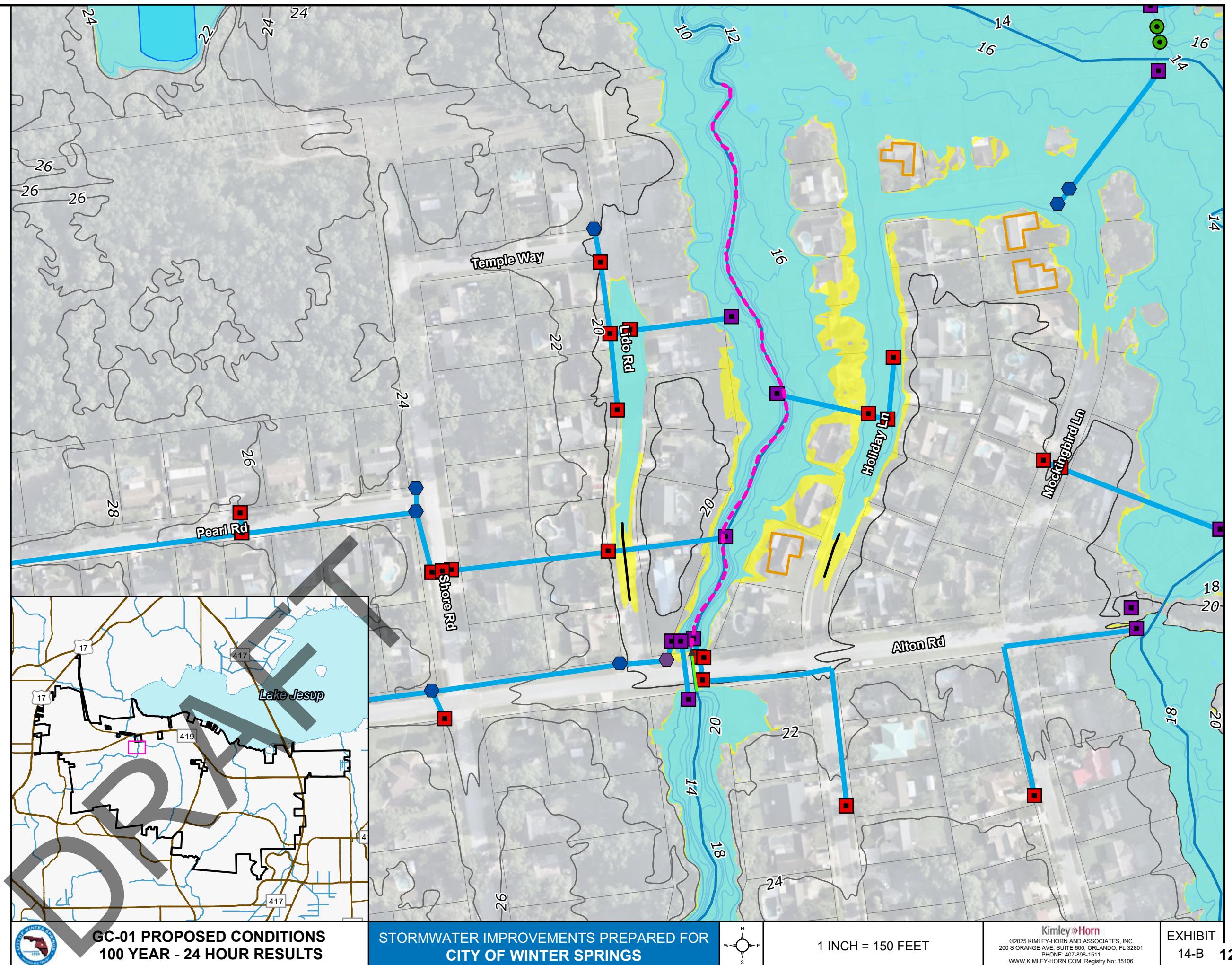
Legend

- Replace Existing Pipe
- Expand Existing Channel
- Crown of Road Removed from Modeled Floodplain
- Structure Removed from Modeled Floodplain
- Proposed Conditions 100 Year 24 Hour Floodplain
- Existing Condition 100 Year 24 Hour Floodplain

Existing Stormwater Infrastructure

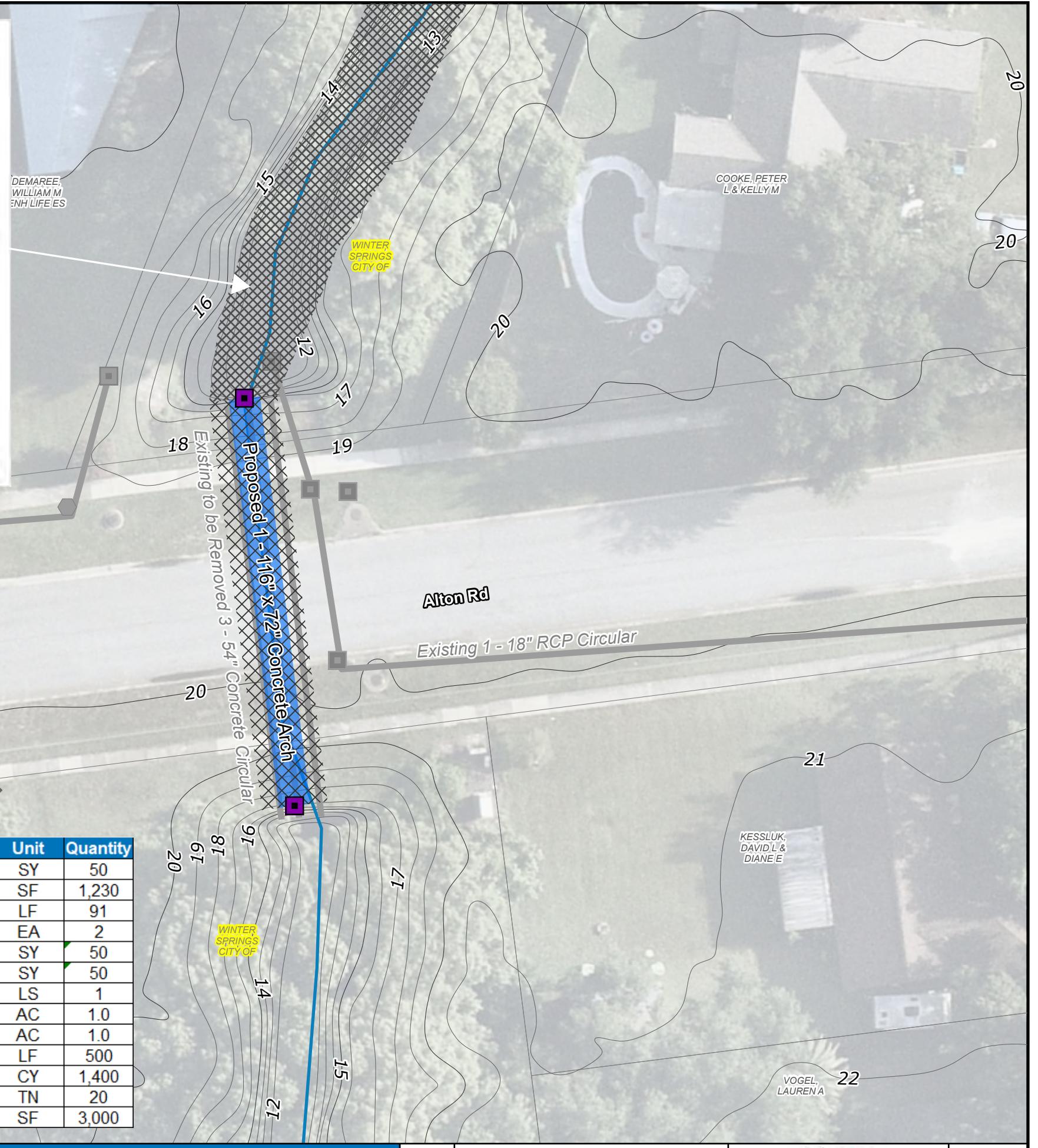
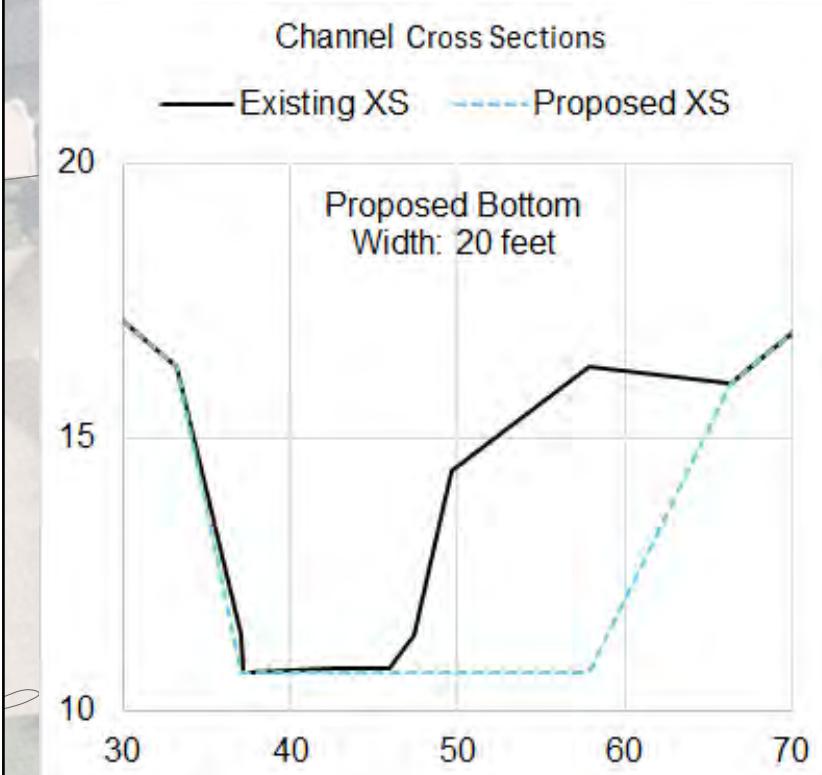
- Pipe Ends
- Manholes
- Headwalls
- Ditch Bottom Inlets
- Curb Inlets
- Pipes
- Existing Stream
- Ponds
- Parcels
- Major Contours (10')
- Minor Contours (2')

ALL EXISTING MODEL INFORMATION (BASINS, NODES, EXISTING LINKS) FROM SEMINOLE COUNTY WATERSHED MODELS DEVELOPED BY OTHERS AND REVIEWED BY KIMLEY-HORN WITH ADDED CHANGES.



Legend

- Proposed Pipe
- Proposed Headwall
- Channel Excavation
- Excavate and Reconstruct
- Existing Stormwater Infrastructure
- Manholes
- Existing Headwall
- Ditch Bottom Inlets
- Curb Inlets
- Pipes
- Existing Stream
- Parcels
- Major Contours (5')
- Minor Contours (1')



ALL EXISTING MODEL
INFORMATION (BASINS,
NODES, EXISTING LINKS)
FROM SEMINOLE
COUNTY WATERSHED
MODELS DEVELOPED BY
OTHERS AND REVIEWED
BY KIMLEY-HORN WITH
ADDED CHANGES.

Item Description	Unit	Quantity
Asphalt/Concrete Demolition and Removal	SY	50
Removal of Existing Drainage Structure (3 - 54")	SF	1,230
116" x 72" RCP Arch Pipe	LF	91
116" x 72" Concrete Headwall	EA	2
Optional Base, Base Group 04 (Limerock)	SY	50
Asphalt Concrete Friction Course	SY	50
Concrete Sidewalk, 4" Thick	LS	1
Clearing and Grubbing, Areas with Trees to Remain	AC	1.0
Wetland Mitigation	AC	1.0
Floating Turbidity Barrier	LF	500
Regular Excavation	CY	1,400
Rip-rap and Rock Lining Broken Stone, 18" Thick	TN	20
Sodding on Sloped Ground	SF	3,000

GC-01 PROPOSED CONDITIONS DETAIL

STORMWATER IMPROVEMENTS PREPARED FOR **CITY OF WINTER SPRINGS**

1 INCH = 25 FEET

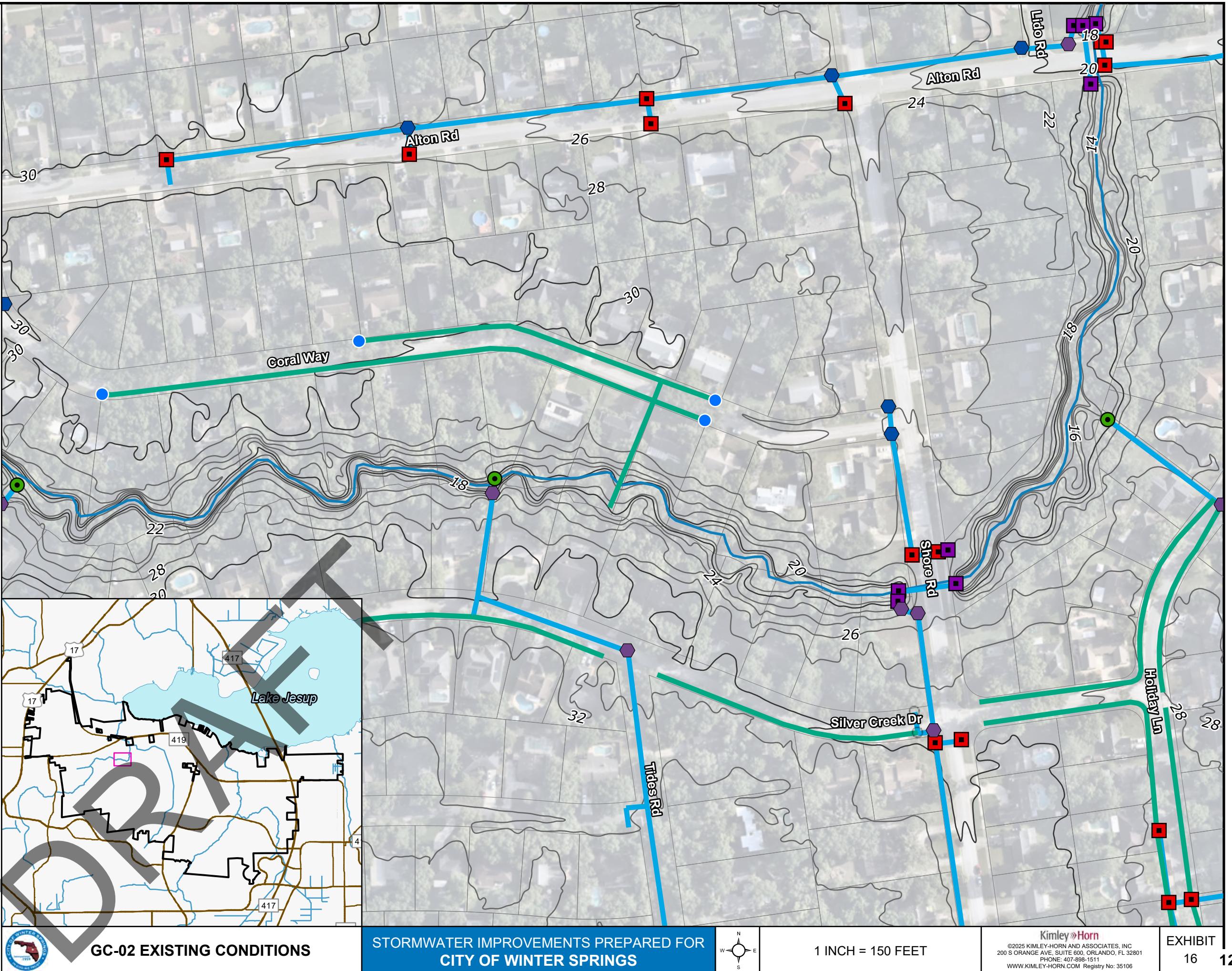
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EXHIBIT |
15 12

Legend

Existing Stormwater Infrastructure

- Pipe Ends
- Manholes
- Headwalls
- Ditch Bottom Inlets
- Curb Inlets
- Other Devices
- Cleanouts
- Underdrains
- Pipes
- Existing Stream
- Parcels
- Major Contours (10')
- Minor Contours (2')

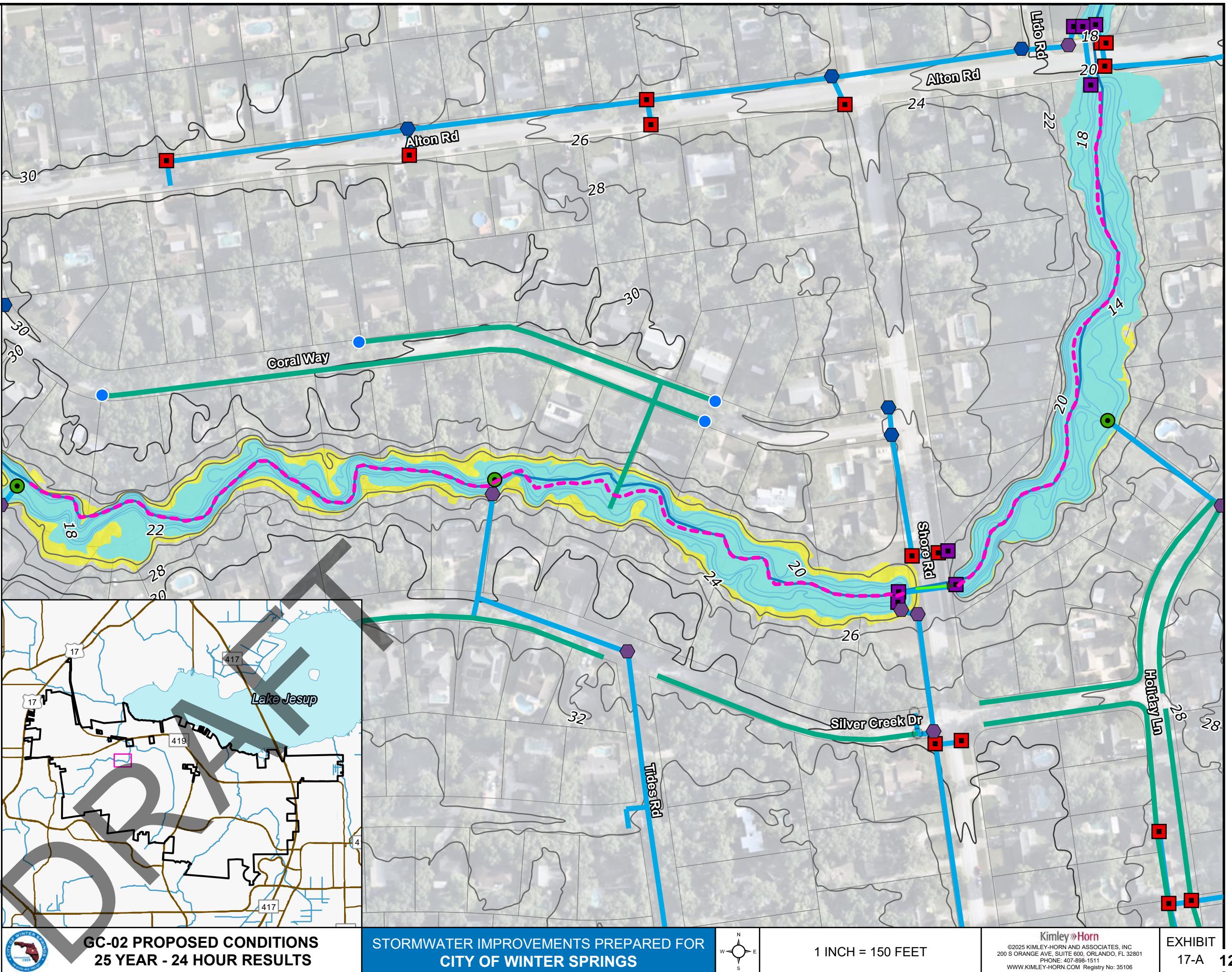


Legend

- Replace Existing Pipe
- Expand Existing Channel
- Proposed Conditions 25
- Year 24 Hour Floodplain
- Existing Condition 25 Year 24 Hour Floodplain

Existing Stormwater Infrastructure

- Pipe Ends
- Manholes
- Headwalls
- Ditch Bottom Inlets
- Curb Inlets
- Other Devices
- Cleanouts
- Underdrains
- Pipes
- Existing Stream
- Parcels
- Major Contours (10')
- Minor Contours (2')

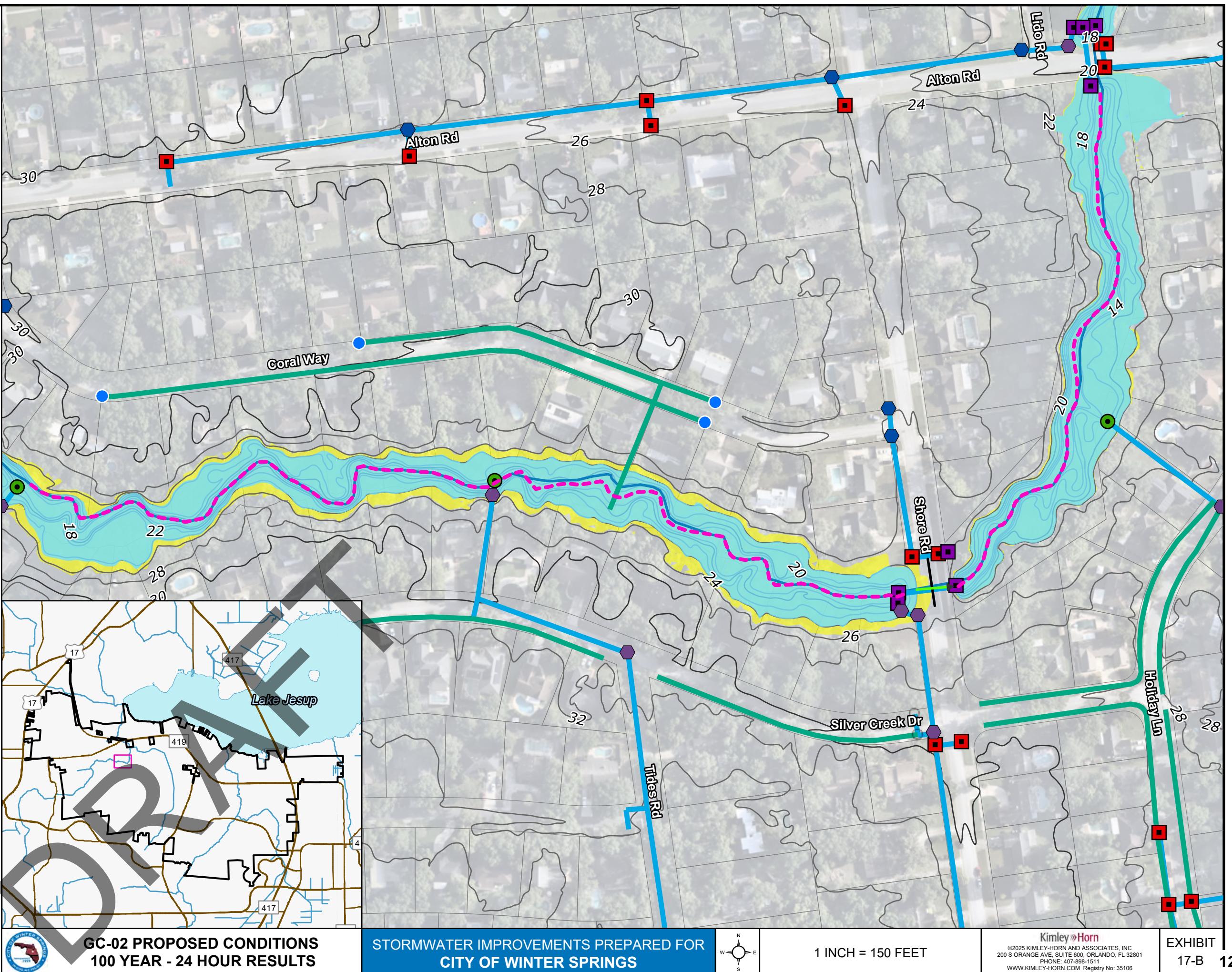


Legend

- Replace Existing Pipe
- Expand Existing Channel
- Crown of Road Removed from Modeled Floodplain
- Proposed Conditions 100
- Year 24 Hour Floodplain
- Existing Condition 100
- Year 24 Hour Floodplain

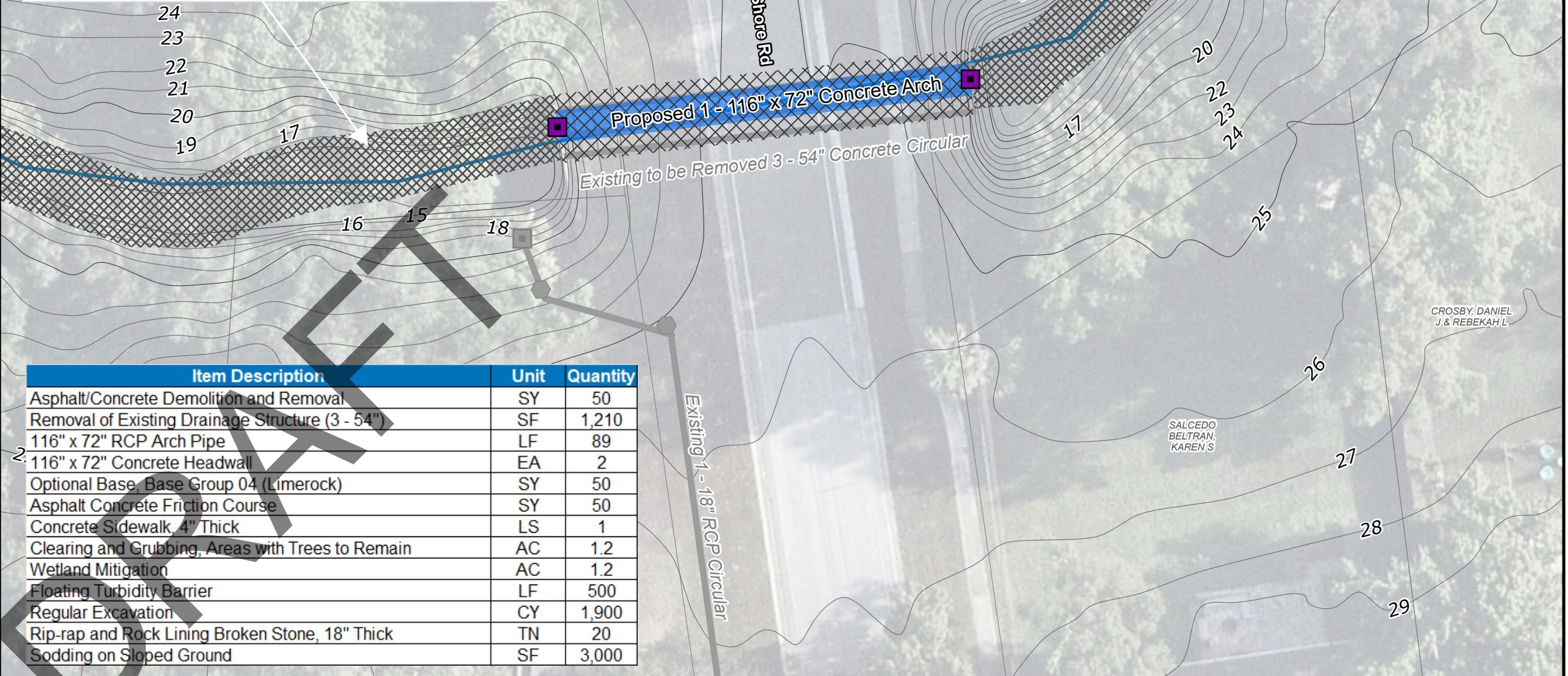
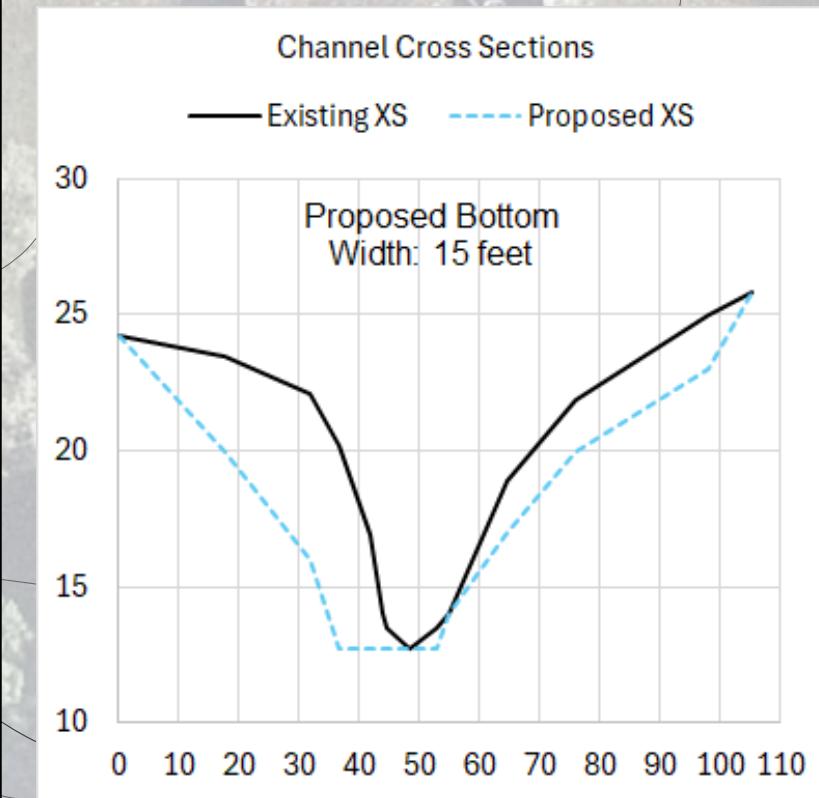
Existing Stormwater Infrastructure

- Pipe Ends
- Manholes
- Headwalls
- Ditch Bottom Inlets
- Curb Inlets
- Other Devices
- Cleanouts
- Underdrains
- Pipes
- Existing Stream
- Parcels
- Major Contours (10')
- Minor Contours (2')



Legend

- Proposed Pipe
- Proposed Headwall
- Channel Excavation
- Excavate and Reconstruct
- Existing Stormwater Infrastructure
- Manholes
- Existing Headwall
- Curb Inlets
- Pipes
- Existing Stream
- Parcels
- Major Contours (5')
- Minor Contours (1')



ALL EXISTING MODEL INFORMATION (BASINS, NODES, EXISTING LINKS) FROM SEMINOLE COUNTY WATERSHED MODELS DEVELOPED BY OTHERS AND REVIEWED BY KIMLEY-HORN WITH ADDED CHANGES.



**GC-02
PROPOSED CONDITIONS DETAIL**

STORMWATER IMPROVEMENTS PREPARED FOR
CITY OF WINTER SPRINGS



1 INCH = 25 FEET

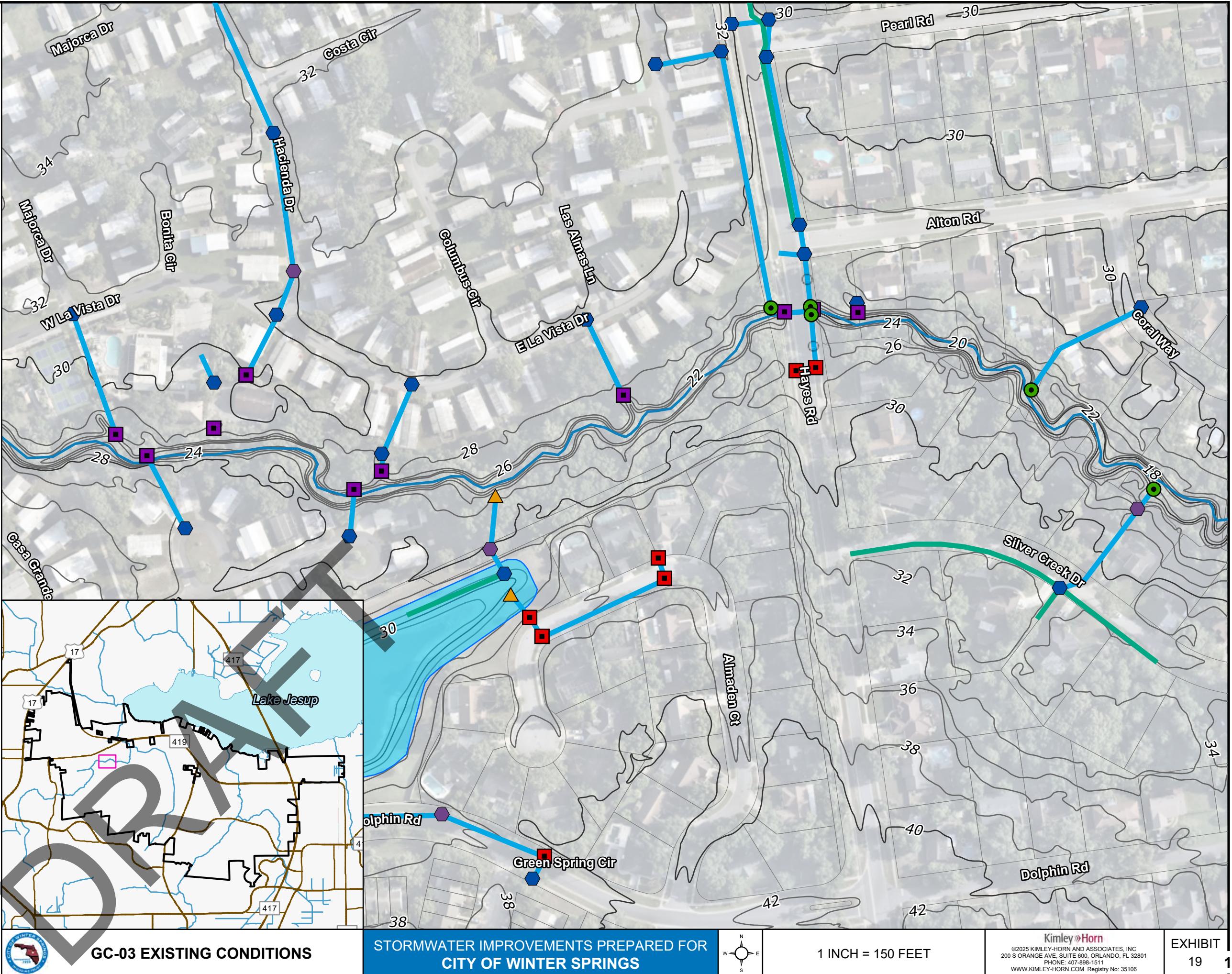
Kimley-Horn
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200 S ORANGE AVE, SUITE 600, ORLANDO, FL 32801
PHONE: 407-998-1511
WWW.KIMLEY-HORN.COM Registry No. 35106

EXHIBIT
18 130

Legend

Existing Stormwater Infrastructure

- Pipe Ends
- ▲ Mitered End Structure
- Manholes
- Headwalls
- Ditch Bottom Inlets
- Curb Inlets
- Other Devices
- Underdrains
- Pipes
- Existing Stream
- Ponds
- Parcels
- Major Contours (10')
- Minor Contours (2')



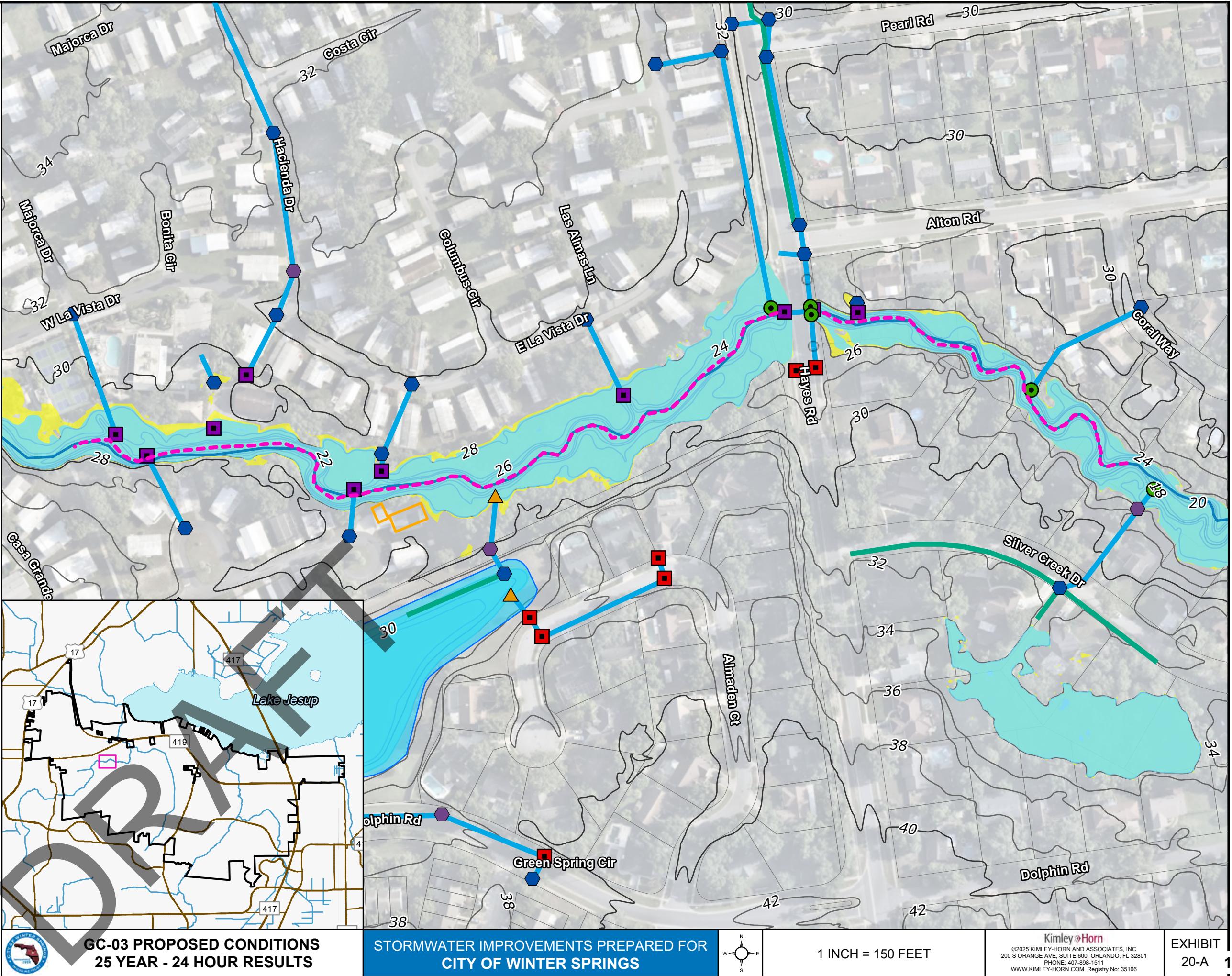
Legend

- Expand Existing Channel
- Structure Removed from Modeled Floodplain
- Proposed Conditions 25 Year 24 Hour Floodplain
- Existing Condition 25 Year 24 Hour Floodplain

Existing Stormwater Infrastructure

- Pipe Ends
- Mitered End Structure
- Manholes
- Headwalls
- Ditch Bottom Inlets
- Curb Inlets
- Other Devices
- Underdrains
- Pipes
- Existing Stream
- Ponds
- Parcels
- Major Contours (10')
- Minor Contours (2')

ALL EXISTING MODEL INFORMATION (BASINS, NODES, EXISTING LINKS) FROM SEMINOLE COUNTY WATERSHED MODELS DEVELOPED BY OTHERS AND REVIEWED BY KIMLEY-HORN WITH ADDED CHANGES.



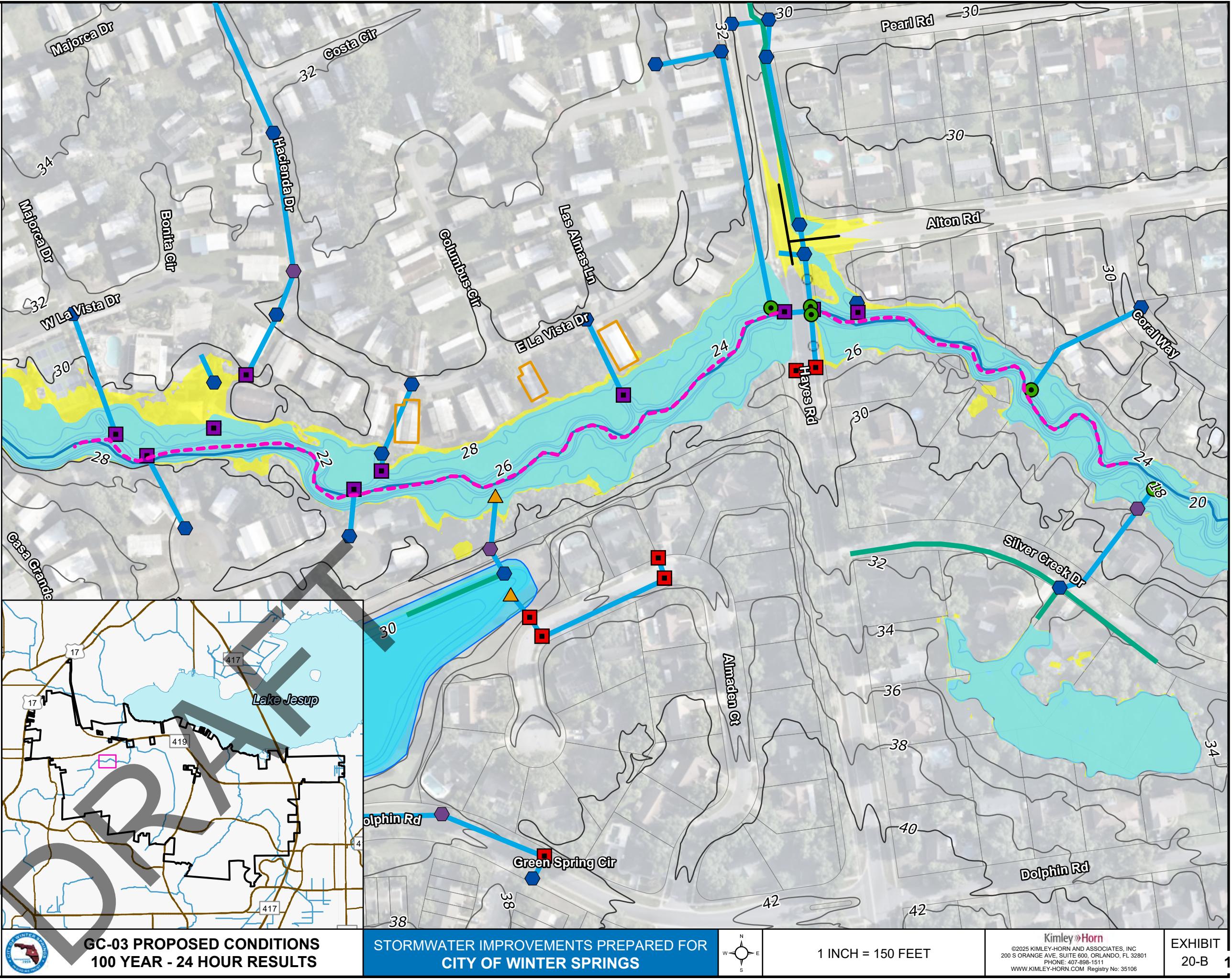
Legend

- Expand Existing Channel
- Crown of Road Removed from Modeled Floodplain
- Structure Removed from Modeled Floodplain
- Proposed Conditions 100 Year 24 Hour Floodplain
- Existing Condition 100 Year 24 Hour Floodplain

Existing Stormwater Infrastructure

- Pipe Ends
- Mitered End Structure
- Manholes
- Headwalls
- Ditch Bottom Inlets
- Curb Inlets
- Other Devices
- Underdrains
- Pipes
- Existing Stream
- Ponds
- Parcels
- Major Contours (10')
- Minor Contours (2')

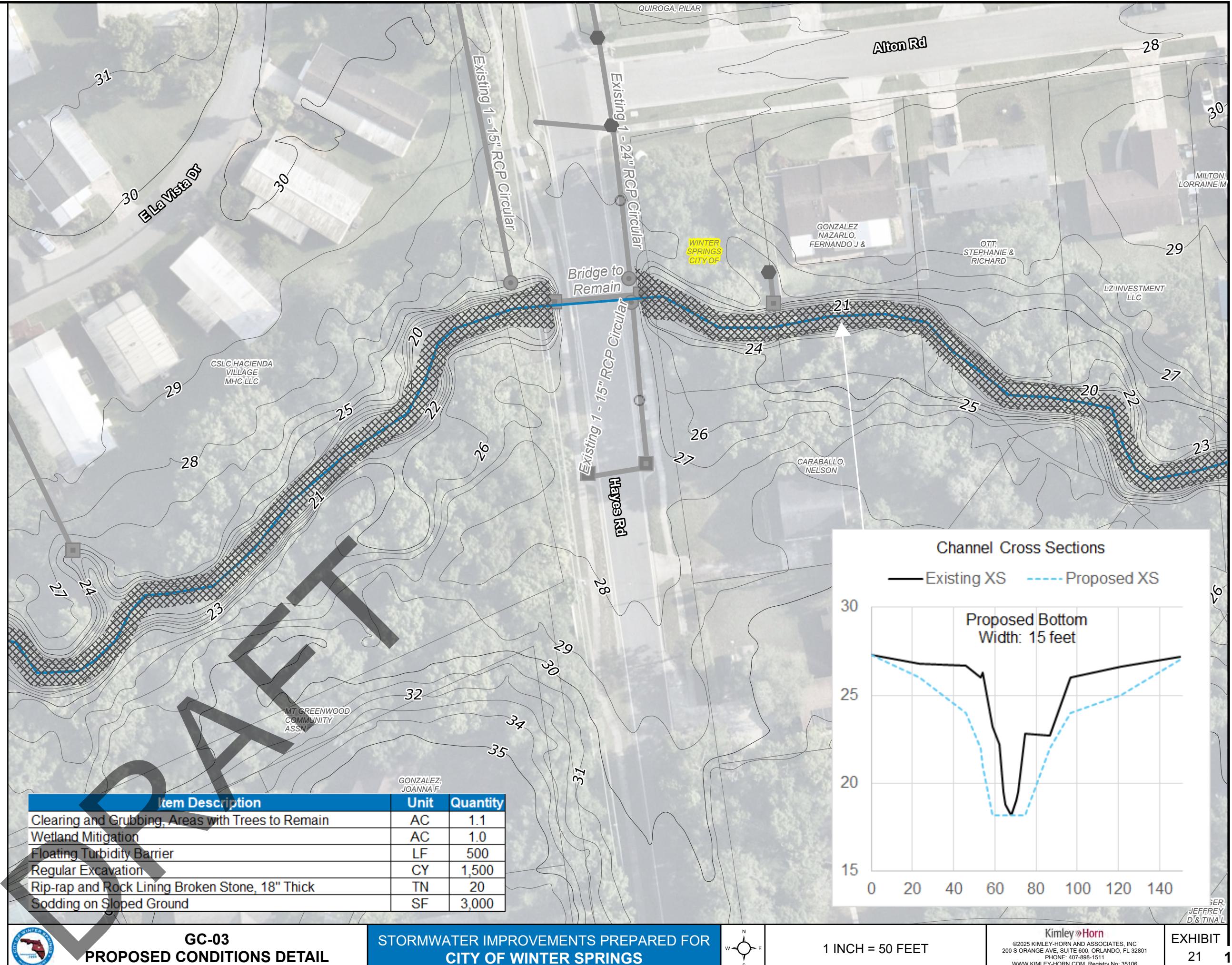
ALL EXISTING MODEL INFORMATION (BASINS, NODES, EXISTING LINKS) FROM SEMINOLE COUNTY WATERSHED MODELS DEVELOPED BY OTHERS AND REVIEWED BY KIMLEY-HORN WITH ADDED CHANGES.



Legend

- Channel Excavation
- Existing Stormwater Infrastructure
- Pipe Ends
- Existing Headwall
- Ditch Bottom Inlets
- Curb Inlets
- Other Devices
- Pipes
- Existing Stream
- Underdrains
- Parcels
- Major Contours (5')
- Minor Contours (1')

ALL EXISTING MODEL INFORMATION (BASINS, NODES, EXISTING LINKS) FROM SEMINOLE COUNTY WATERSHED MODELS DEVELOPED BY OTHERS AND REVIEWED BY KIMLEY-HORN WITH ADDED CHANGES.



Legend

Existing Stormwater Infrastructure

- Pipe Ends
- Mitered End Structure
- Manholes
- Headwalls
- Ditch Bottom Inlets
- Curb Inlets
- Other Devices
- Cleanouts
- Underdrains
- Pipes

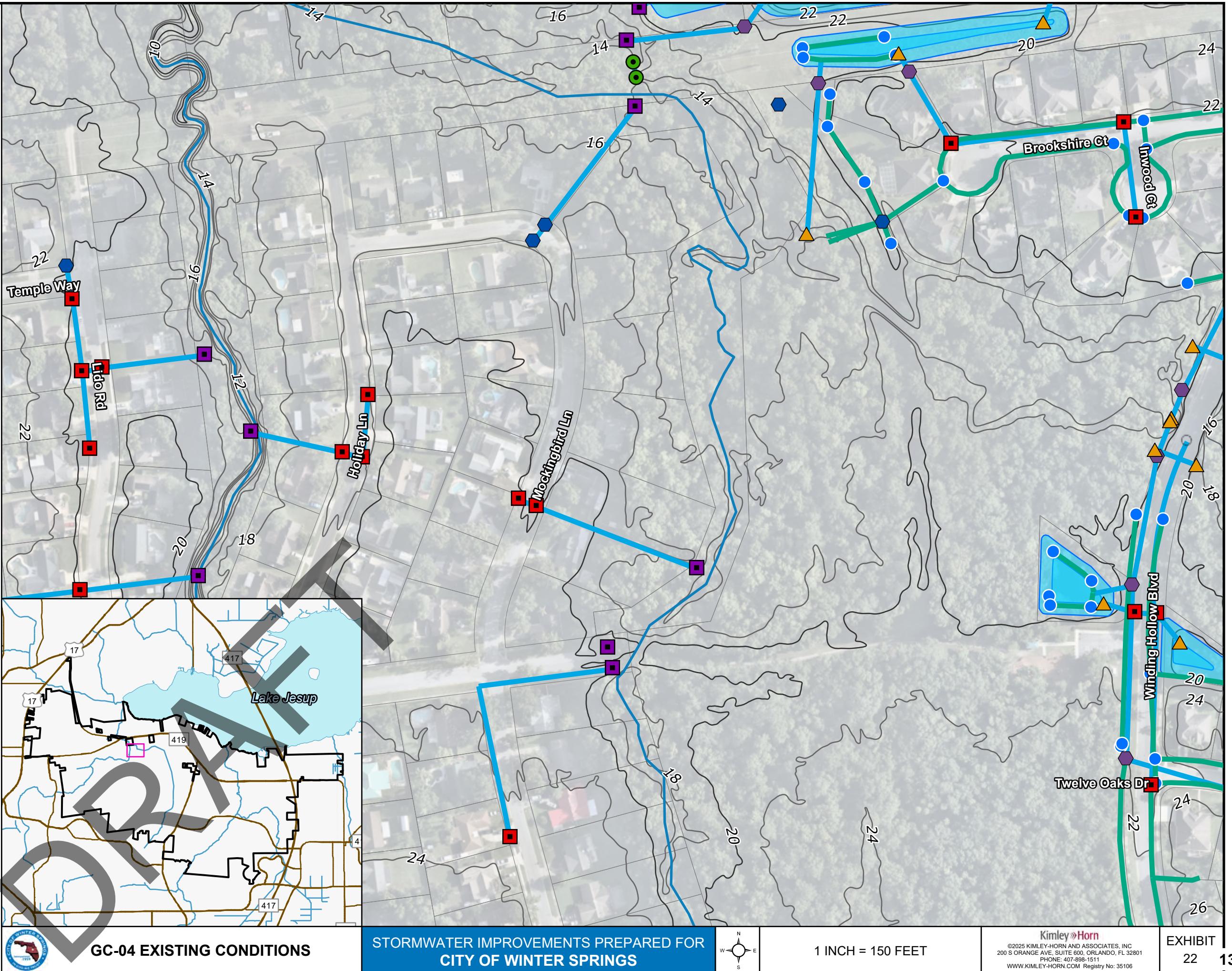
Existing Stream

Ponds

Parcels

Major Contours (10')

Minor Contours (2')



EXISTING STORMWATER
INFRASTRUCTURE
SOURCED FROM CITY OF
WINTER SPRINGS
STORMWATER ATLAS



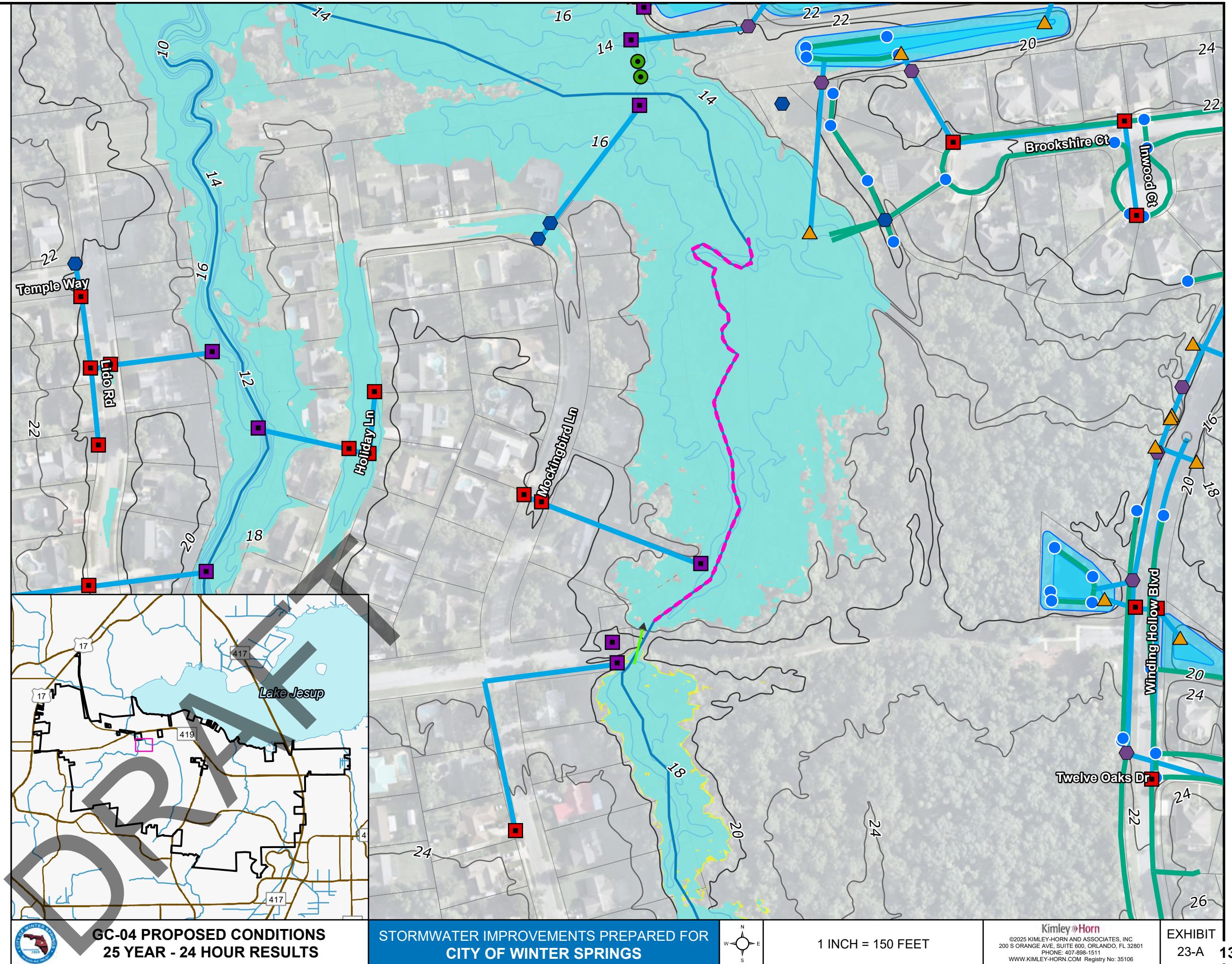
Legend

- Replace Existing Pipe
- Expand Existing Channel
- Proposed Conditions 25
- Year 24 Hour Floodplain
- Existing Condition 25 Year 24 Hour Floodplain

Existing Stormwater Infrastructure

- Pipe Ends
- Mitered End Structure
- Manholes
- Headwalls
- Ditch Bottom Inlets
- Curb Inlets
- Other Devices
- Cleanouts
- Underdrains
- Pipes
- Existing Stream
- Ponds
- Parcels
- Major Contours (10')
- Minor Contours (2')

ALL EXISTING MODEL INFORMATION (BASINS, NODES, EXISTING LINKS) FROM SEMINOLE COUNTY WATERSHED MODELS DEVELOPED BY OTHERS AND REVIEWED BY KIMLEY-HORN WITH ADDED CHANGES.



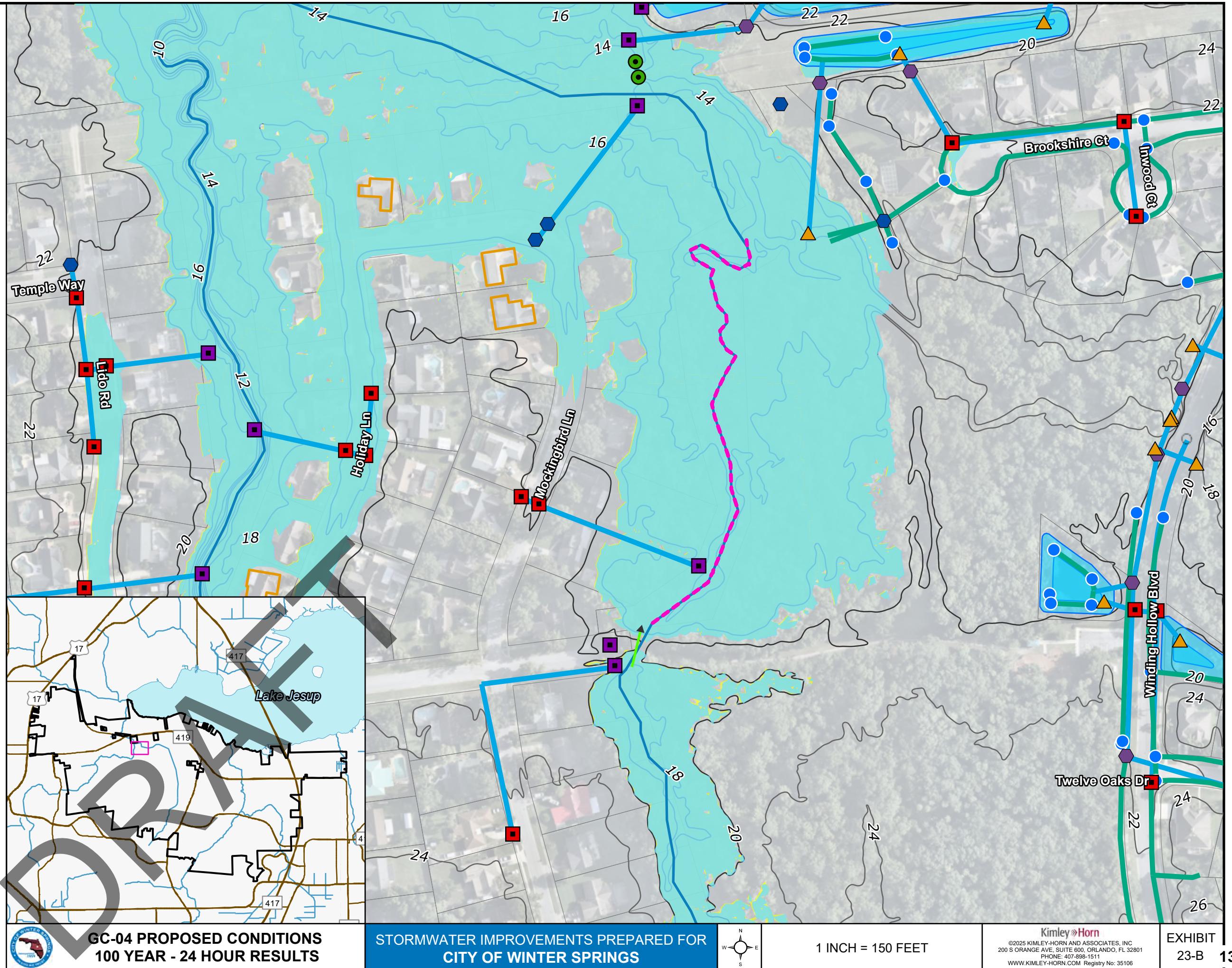
Legend

- Replace Existing Pipe
- Expand Existing Channel
- Structure Removed from Modeled Floodplain
- Proposed Conditions 100
- Year 24 Hour Floodplain
- Existing Condition 100
- Year 24 Hour Floodplain

Existing Stormwater Infrastructure

- Pipe Ends
- Mitered End Structure
- Manholes
- Headwalls
- Ditch Bottom Inlets
- Curb Inlets
- Other Devices
- Cleanouts
- Underdrains
- Pipes
- Existing Stream
- Ponds
- Parcels
- Major Contours (10')
- Minor Contours (2')

ALL EXISTING MODEL INFORMATION (BASINS, NODES, EXISTING LINKS) FROM SEMINOLE COUNTY WATERSHED MODELS DEVELOPED BY OTHERS AND REVIEWED BY KIMLEY-HORN WITH ADDED CHANGES.

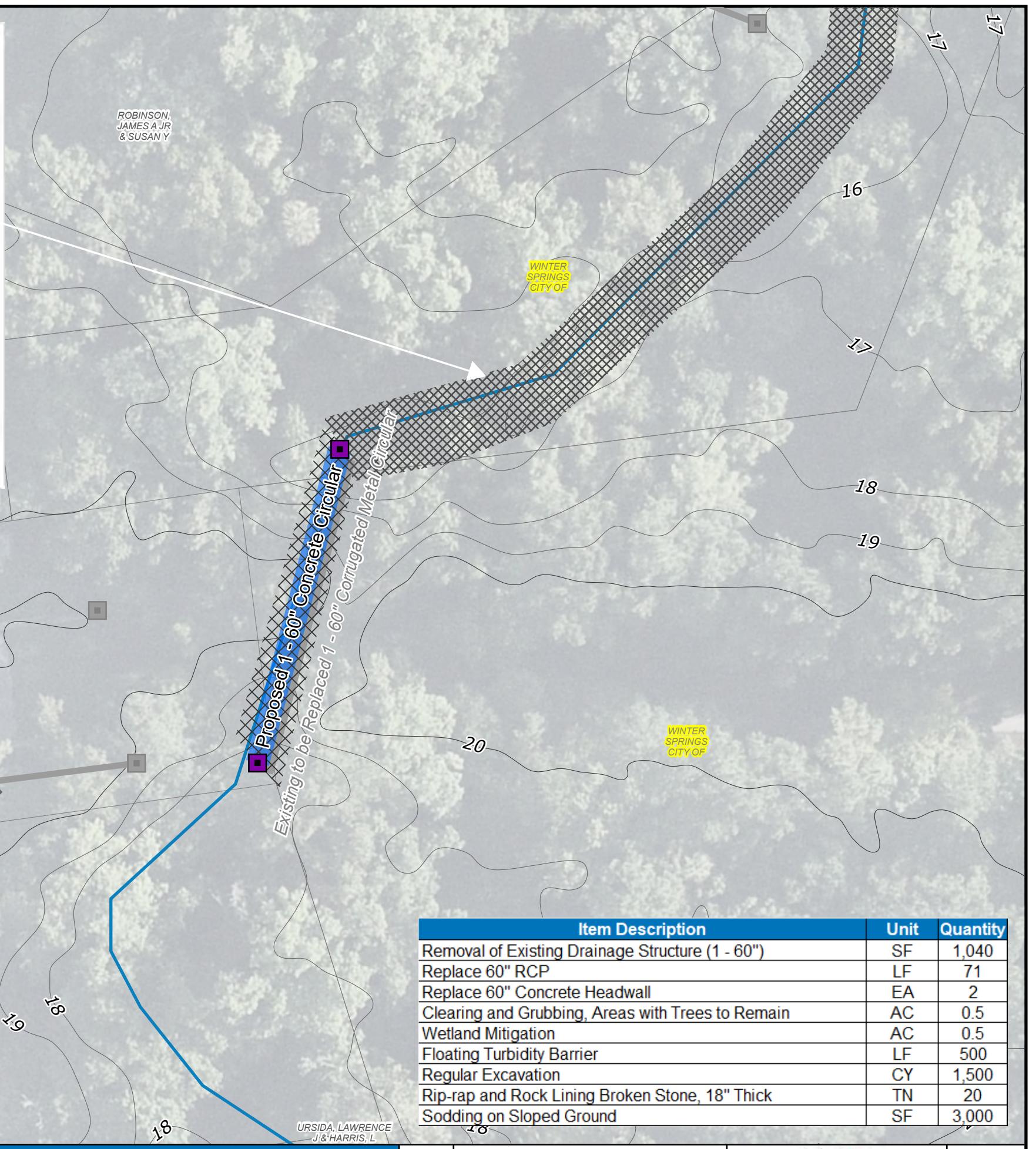
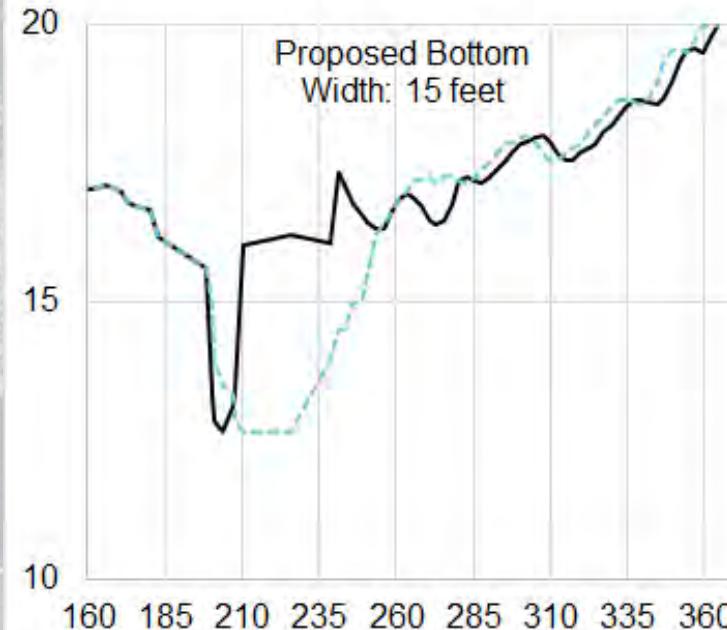


Legend

- Proposed Pipe
- Proposed Headwall
- Channel Excavation
- Excavate and Reconstruct
- Existing Stormwater Infrastructure
- Existing Headwall
- Pipes
- Existing Stream
- Parcels
- Major Contours (5')
- Minor Contours (1')

Channel Cross Sections

— Existing XS - - - Proposed XS

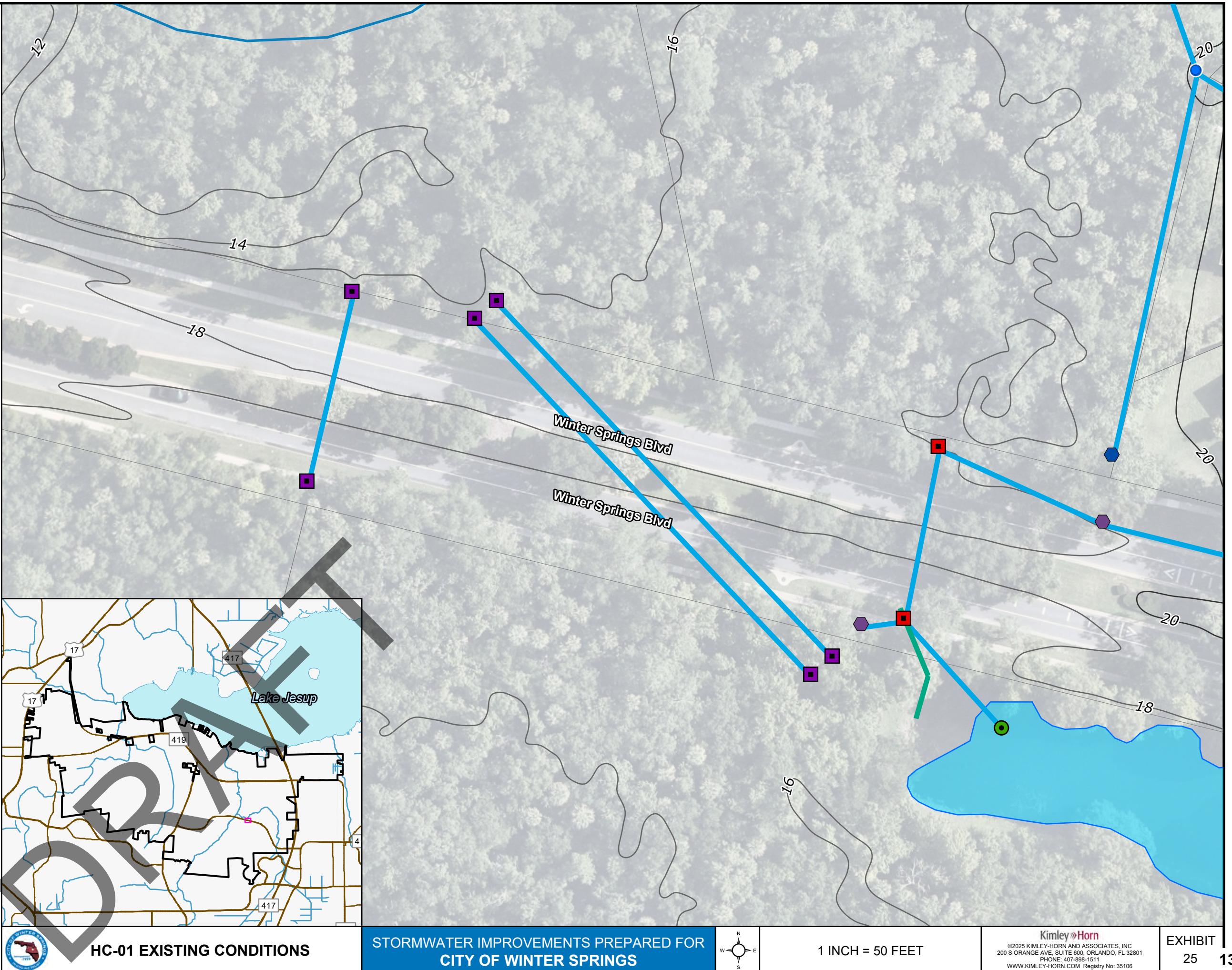


Item Description	Unit	Quantity
Removal of Existing Drainage Structure (1 - 60")	SF	1,040
Replace 60" RCP	LF	71
Replace 60" Concrete Headwall	EA	2
Clearing and Grubbing, Areas with Trees to Remain	AC	0.5
Wetland Mitigation	AC	0.5
Floating Turbidity Barrier	LF	500
Regular Excavation	CY	1,500
Rip-rap and Rock Lining Broken Stone, 18" Thick	TN	20
Sodding on Sloped Ground	SF	3,000

Legend

Existing Stormwater Infrastructure

- Pipe Ends
- Manholes
- Headwalls
- Ditch Bottom Inlets
- Curb Inlets
- Other Devices
- Cleanouts
- Underdrains
- Pipes
- Existing Stream
- Ponds
- Parcels
- Major Contours (10')
- Minor Contours (2')



EXISTING STORMWATER INFRASTRUCTURE SOURCED FROM CITY OF WINTER SPRINGS STORMWATER ATLAS

CITY OF
TAMPA
FLORIDA

STORMWATER IMPROVEMENTS PREPARED FOR **CITY OF WINTER SPRINGS**



1 INCH = 50 FEET

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PHONE: 407-898-1511
WWW.KIMLEY-HORN.COM Registry No: 35106

EXHIBIT |
25 13

Legend

- Replace Existing Pipe
- Crown of Road Removed from Modeled Floodplain
- Proposed Conditions 25 Year 24 Hour Floodplain
- Existing Condition 25 Year 24 Hour Floodplain

Existing Stormwater Infrastructure

- Pipe Ends
- Manholes
- Headwalls
- Ditch Bottom Inlets
- Curb Inlets
- Other Devices
- Cleanouts
- Underdrains
- Pipes
- Existing Stream
- Ponds
- Parcels
- Major Contours (10')
- Minor Contours (2')

ALL EXISTING MODEL
INFORMATION (BASINS,
NODES, EXISTING LINKS)
FROM SEMINOLE
COUNTY WATERSHED
MODELS DEVELOPED BY
OTHERS AND REVIEWED
BY KIMLEY-HORN WITH
ADDED CHANGES.

HC-01 PROPOSED CONDITIONS 25 YEAR - 24 HOUR RESULTS

STORMWATER IMPROVEMENTS PREPARED FOR **CITY OF WINTER SPRINGS**



1 INCH = 50 FEET

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PHONE: 407-898-1511
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**EXHIBIT |
26-A 140**

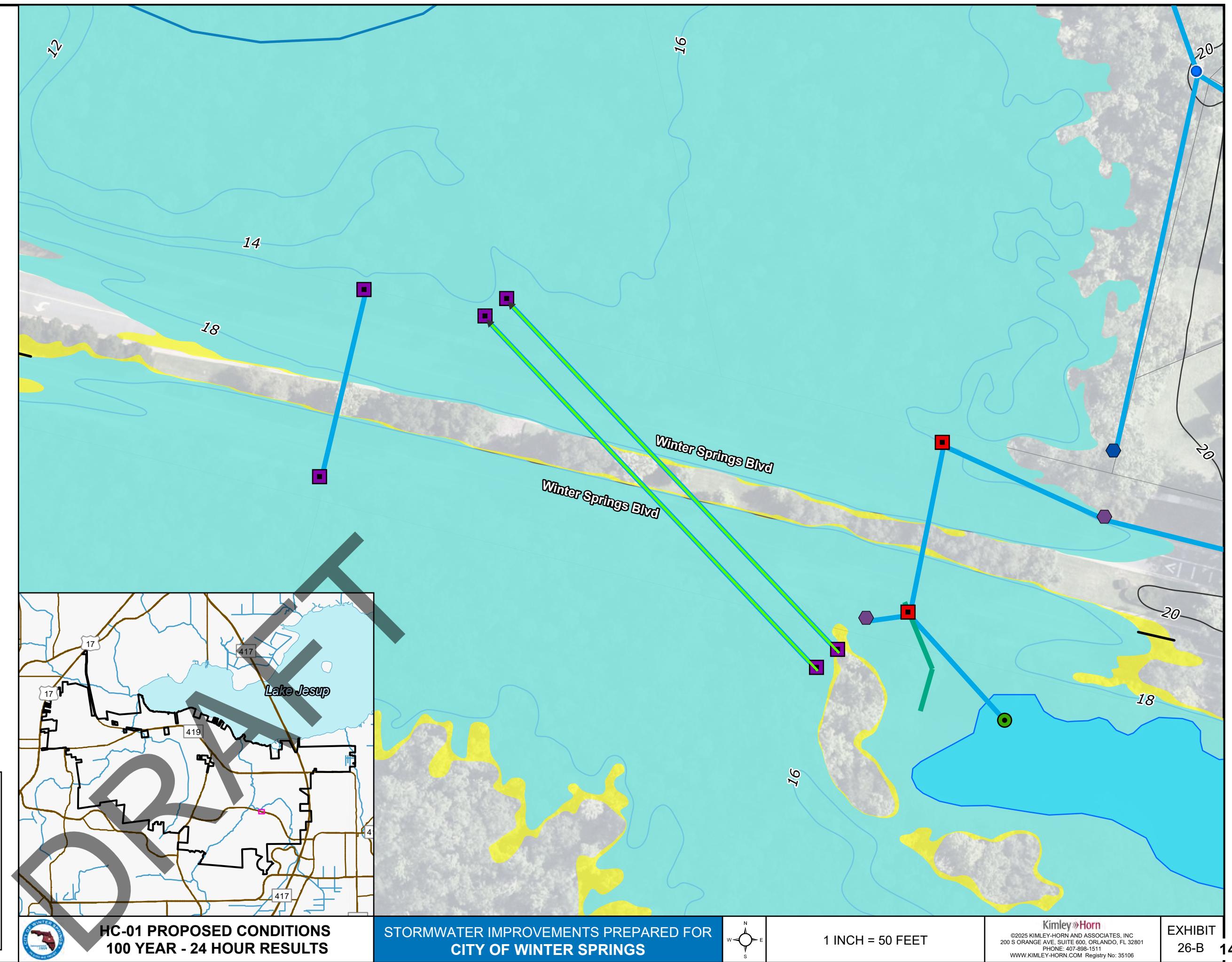
Legend

- Replace Existing Pipe
- Crown of Road Removed from Modeled Floodplain
- Proposed Conditions 100 Year 24 Hour Floodplain
- Existing Condition 100 Year 24 Hour Floodplain

Existing Stormwater Infrastructure

- Pipe Ends
- Manholes
- Headwalls
- Ditch Bottom Inlets
- Curb Inlets
- Other Devices
- Cleanouts
- Underdrains
- Pipes
- Existing Stream
- Ponds
- Parcels
- Major Contours (10')
- Minor Contours (2')

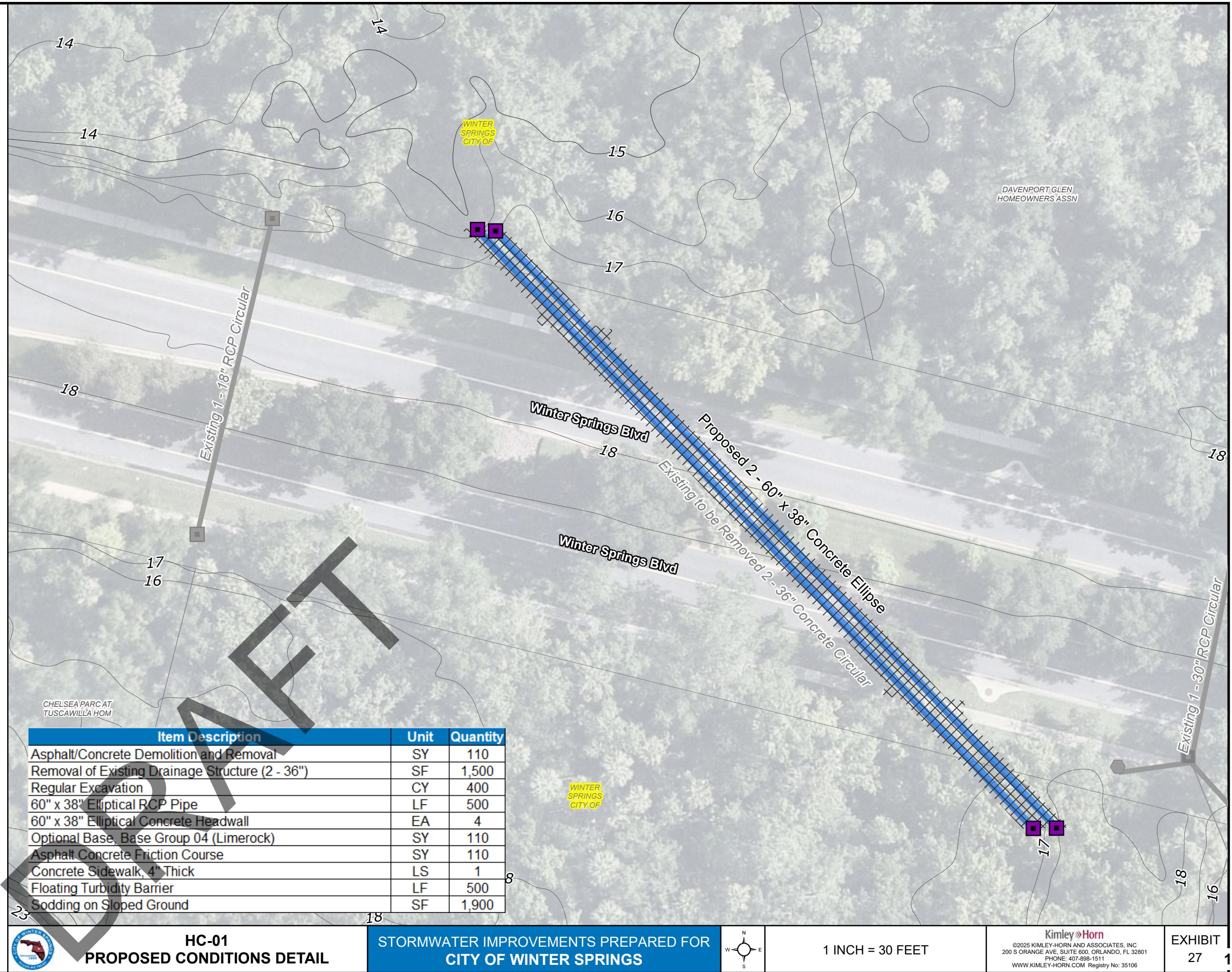
ALL EXISTING MODEL INFORMATION (BASINS, NODES, EXISTING LINKS) FROM SEMINOLE COUNTY WATERSHED MODELS DEVELOPED BY OTHERS AND REVIEWED BY KIMLEY-HORN WITH ADDED CHANGES.



Legend

- Proposed Pipe
- Proposed Headwall
- Excavate and Reconstruct
- Existing Stormwater Infrastructure
- Manholes
- Existing Headwall
- Curb Inlets
- Pipes
- Underdrains
- Parcels
- Major Contours (5')
- Minor Contours (1')

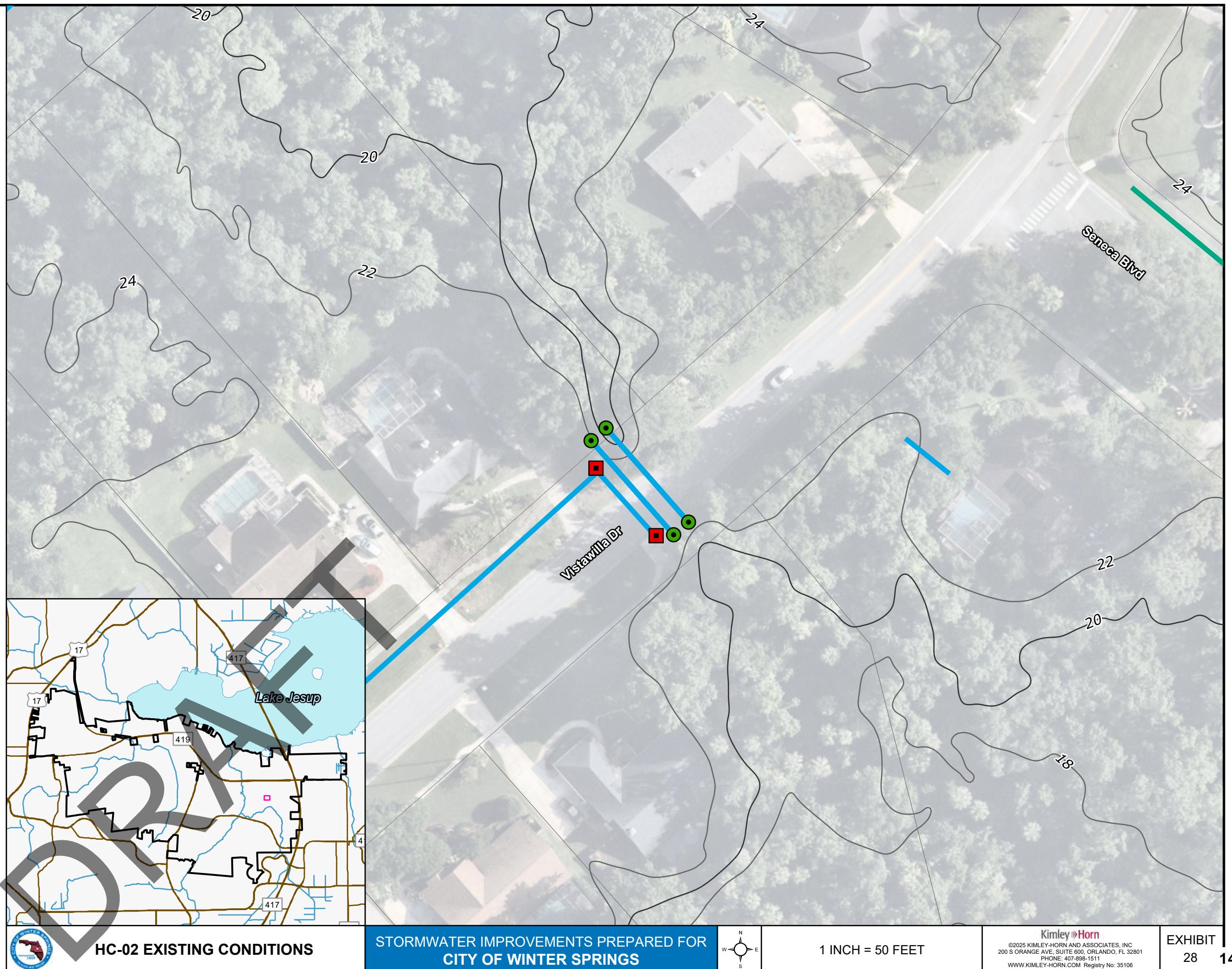
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Legend

Existing Stormwater Infrastructure

- Pipe Ends
- Manholes
- Curb Inlets
- Underdrains
- Pipes
- Existing Stream
- Parcels
- Major Contours (10')
- Minor Contours (2')



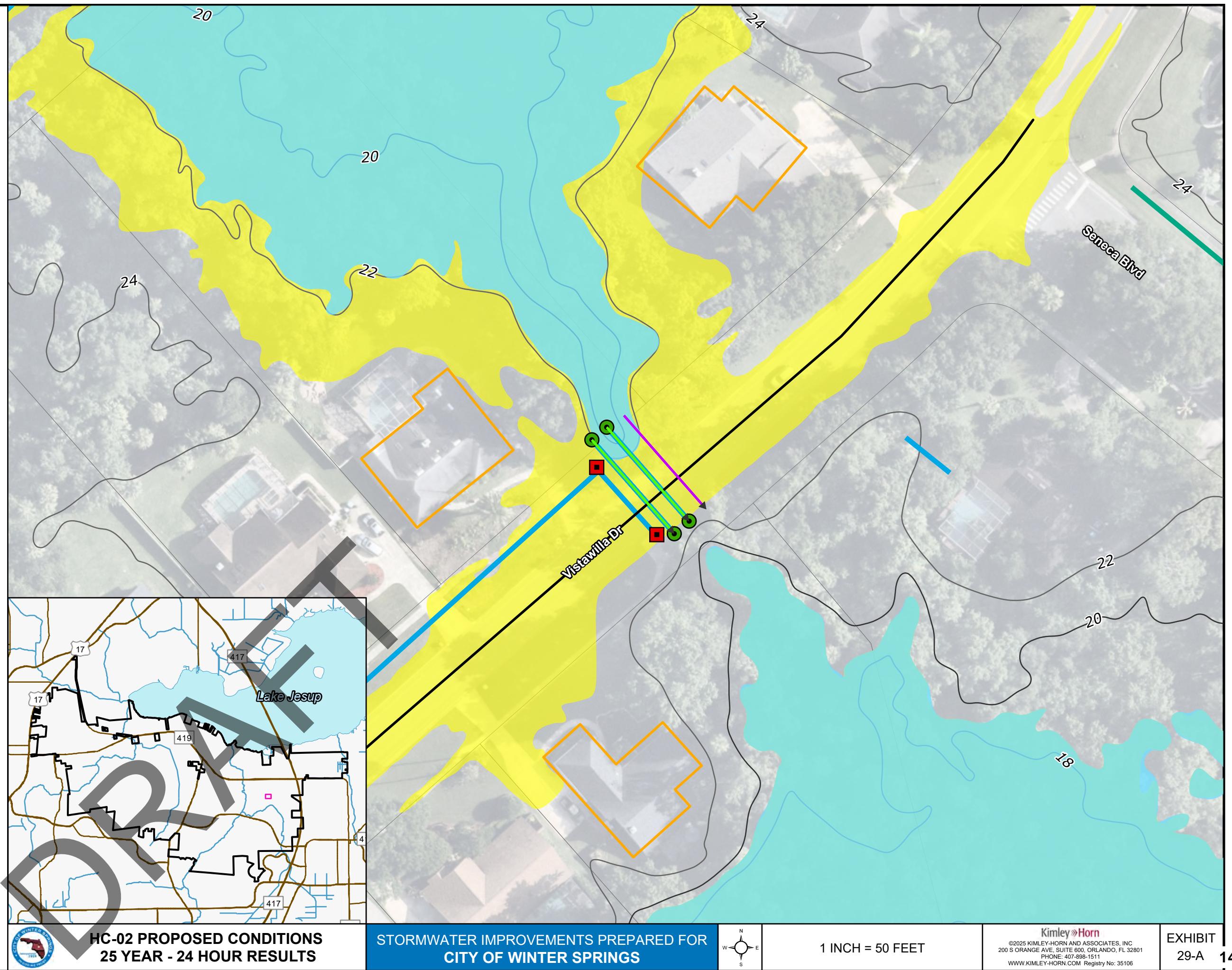
Legend

- Proposed Pipe
- Replace Existing Pipe
- Crown of Road Removed from Modeled Floodplain
- Structure Removed from Modeled Floodplain
- Proposed Conditions 25 Year 24 Hour Floodplain
- Existing Condition 25 Year 24 Hour Floodplain

Existing Stormwater Infrastructure

- Pipe Ends
- Manholes
- Curb Inlets
- Underdrains
- Pipes
- Parcels
- Major Contours (10')
- Minor Contours (2')

ALL EXISTING MODEL INFORMATION (BASINS, NODES, EXISTING LINKS) FROM SEMINOLE COUNTY WATERSHED MODELS DEVELOPED BY OTHERS AND REVIEWED BY KIMLEY-HORN WITH ADDED CHANGES.

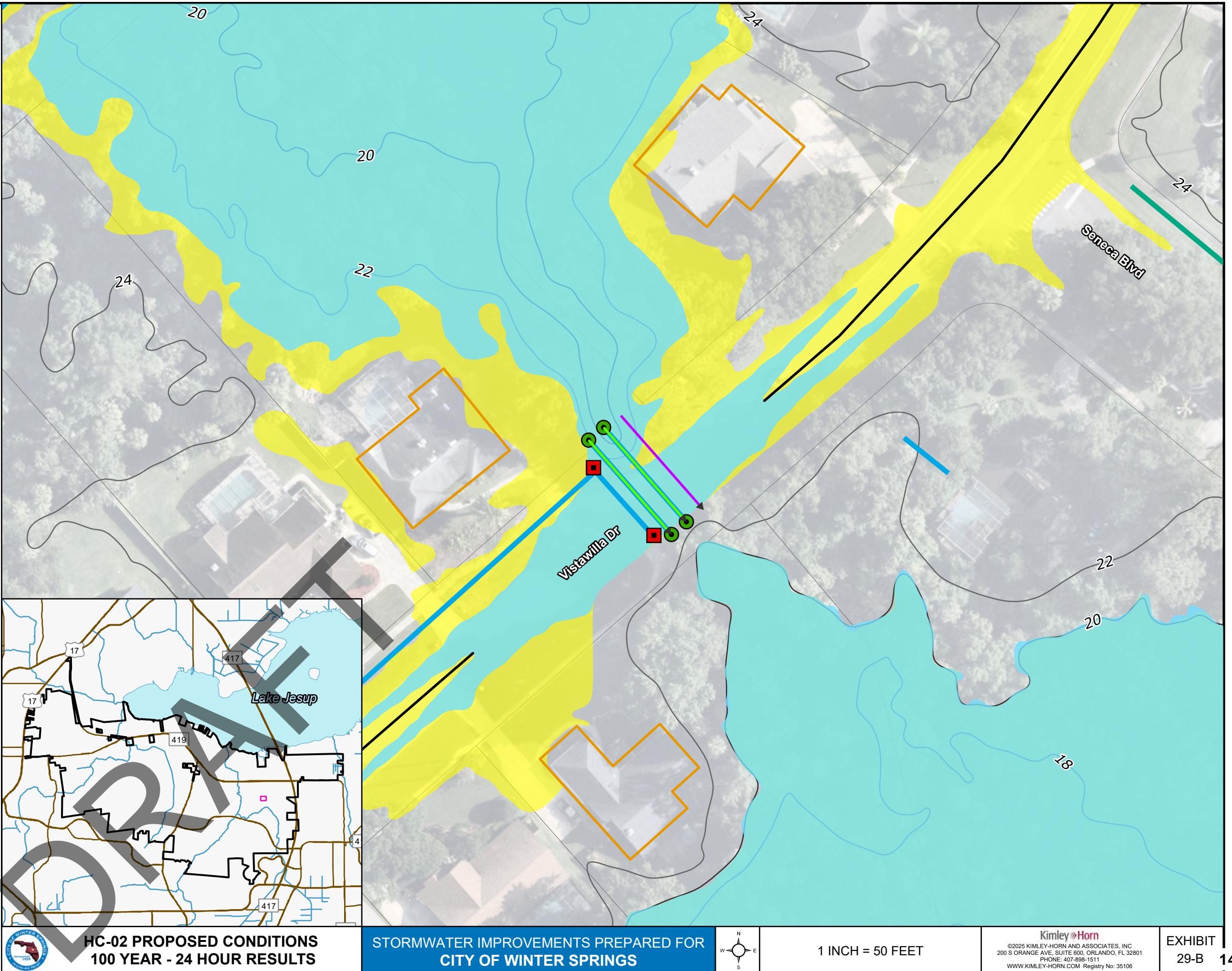
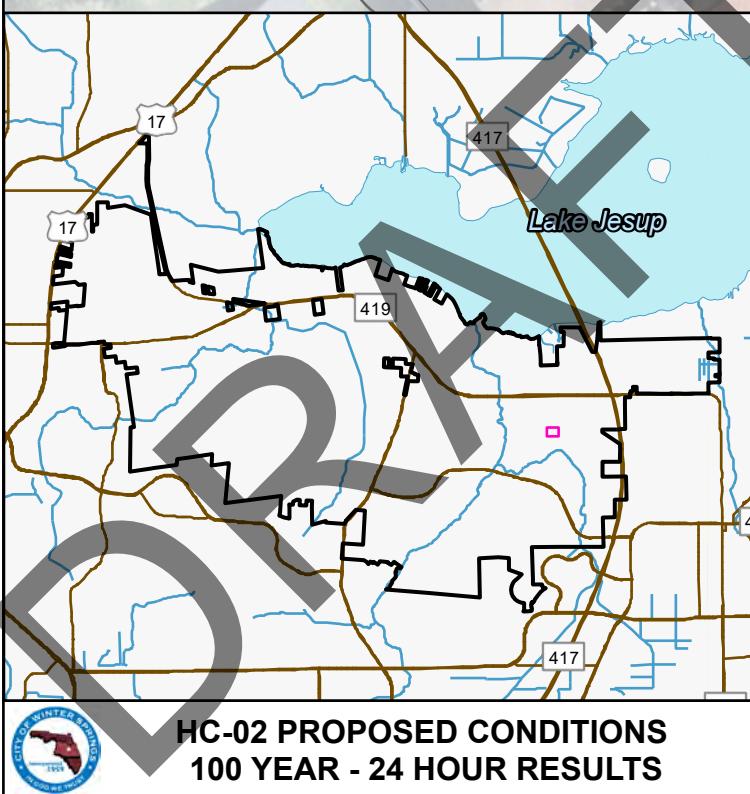


Legend

- Proposed Pipe
- Replace Existing Pipe
- Crown of Road Removed from Modeled Floodplain
- Structure Removed from Modeled Floodplain
- Proposed Conditions 100 Year 24 Hour Floodplain
- Existing Condition 100 Year 24 Hour Floodplain

Existing Stormwater Infrastructure

- Pipe Ends
- Manholes
- Curb Inlets
- Underdrains
- Pipes
- Parcels
- Major Contours (10')
- Minor Contours (2')



Legend

- ▲ Proposed Mitered End Structure
- Proposed Pipe
- ☒ Excavate and Reconstruct Existing Stormwater Infrastructure
- Pipe Ends
- Curb Inlets
- Pipes
- Underdrains
- Parcels
- Major Contours (5')
- Minor Contours (1')

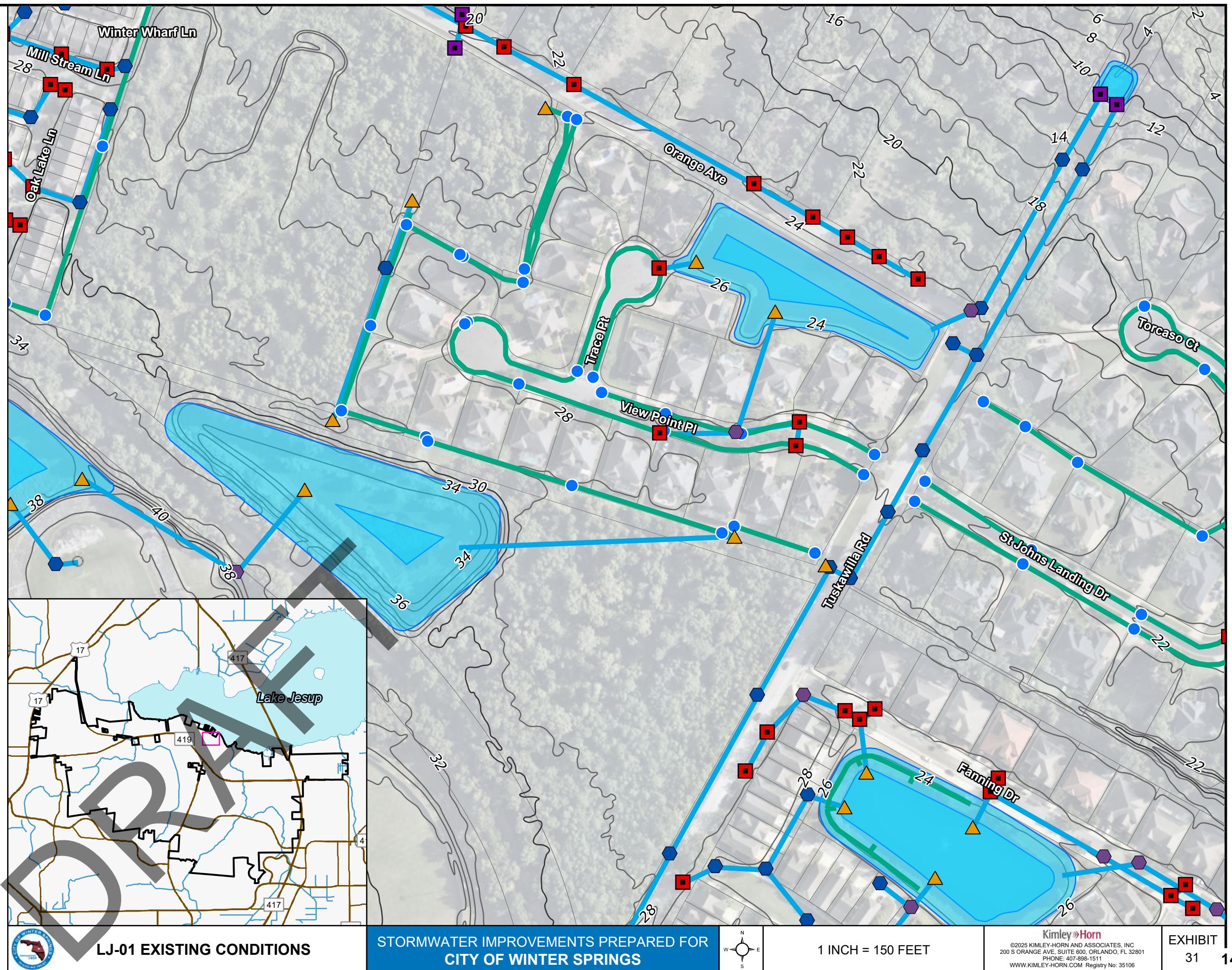
ALL EXISTING MODEL INFORMATION (BASINS, NODES, EXISTING LINKS) FROM SEMINOLE COUNTY WATERSHED MODELS DEVELOPED BY OTHERS AND REVIEWED BY KIMLEY-HORN WITH ADDED CHANGES.



Legend

Existing Stormwater Infrastructure

- ▲ Mitered End Structure
- Manholes
- Headwalls
- Ditch Bottom Inlets
- Curb Inlets
- Other Devices
- Cleanouts
- Underdrains
- Pipes
- Existing Stream
- Ponds
- Parcels
- Major Contours (10')
- Minor Contours (2')



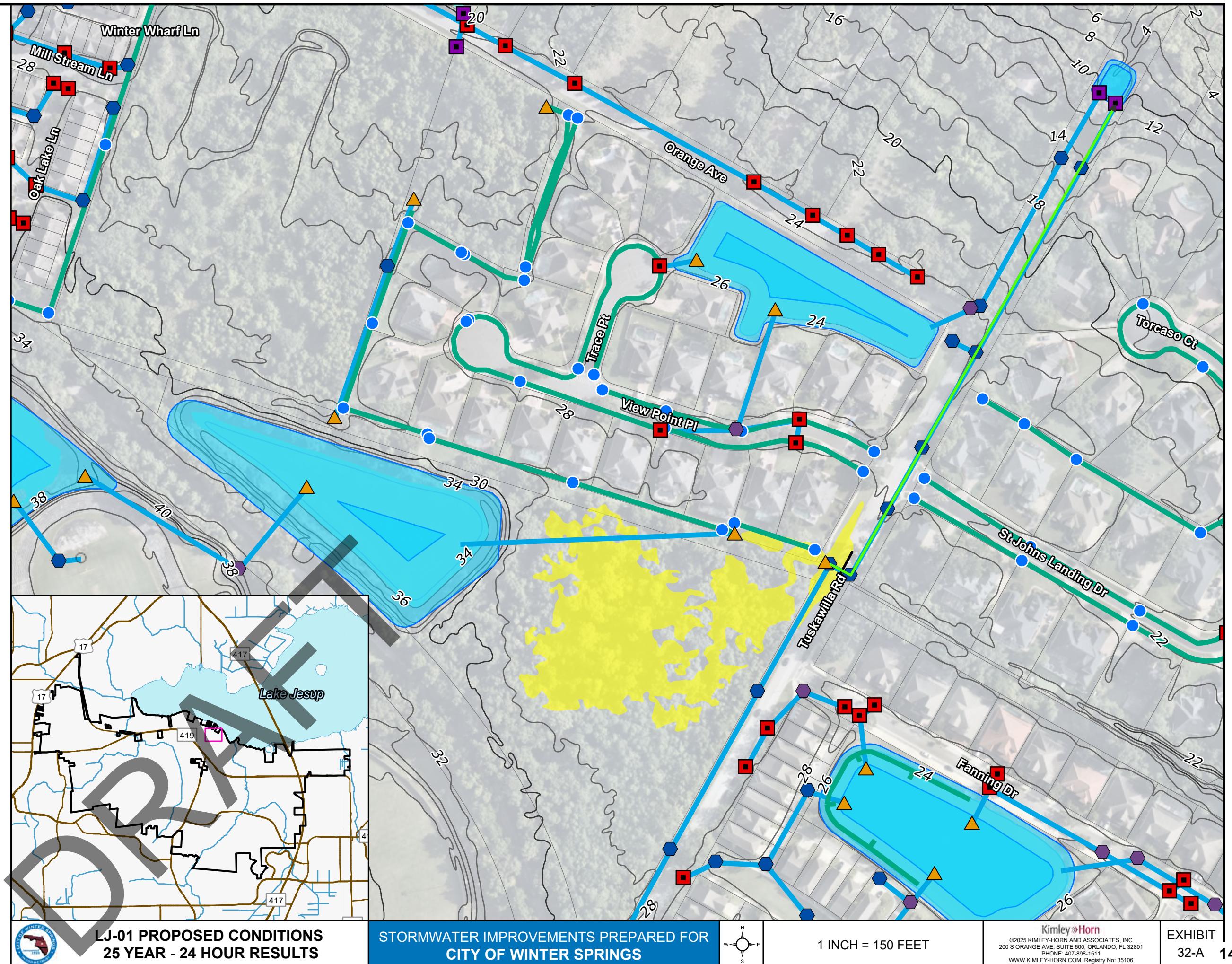
Legend

- Replace Existing Pipe
- Crown of Road Removed from Modeled Floodplain
- Proposed Conditions 25 Year 24 Hour Floodplain
- Existing Condition 25 Year 24 Hour Floodplain

Existing Stormwater Infrastructure

- Mitered End Structure
- Manholes
- Headwalls
- Ditch Bottom Inlets
- Curb Inlets
- Other Devices
- Cleanouts
- Underdrains
- Pipes
- Ponds
- Parcels
- Major Contours (10')
- Minor Contours (2')

ALL EXISTING MODEL INFORMATION (BASINS, NODES, EXISTING LINKS) FROM SEMINOLE COUNTY WATERSHED MODELS DEVELOPED BY OTHERS AND REVIEWED BY KIMLEY-HORN WITH ADDED CHANGES.



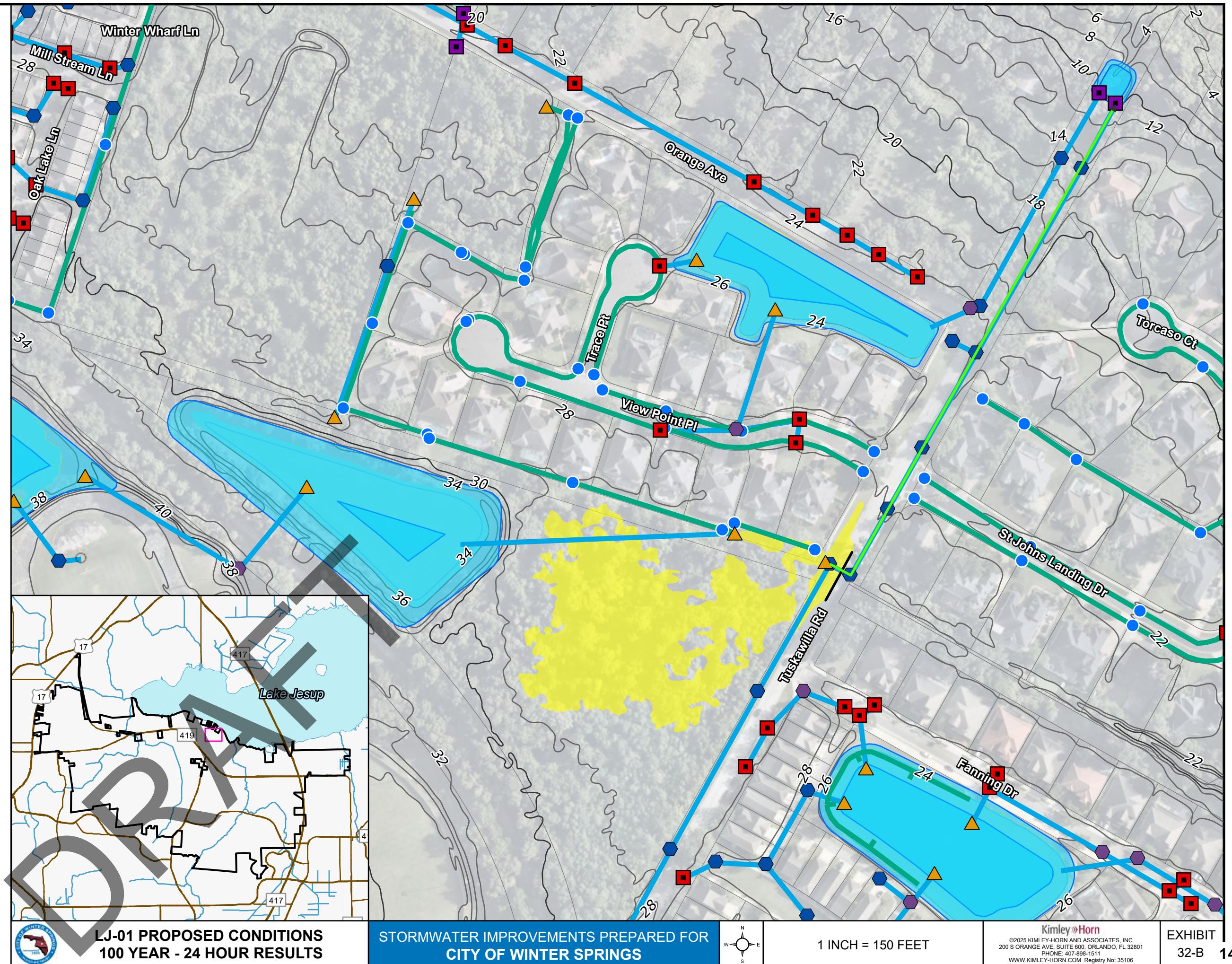
Legend

- Replace Existing Pipe
- Crown of Road Removed from Modeled Floodplain
- Proposed Conditions 100 Year 24 Hour Floodplain
- Existing Condition 100 Year 24 Hour Floodplain

Existing Stormwater Infrastructure

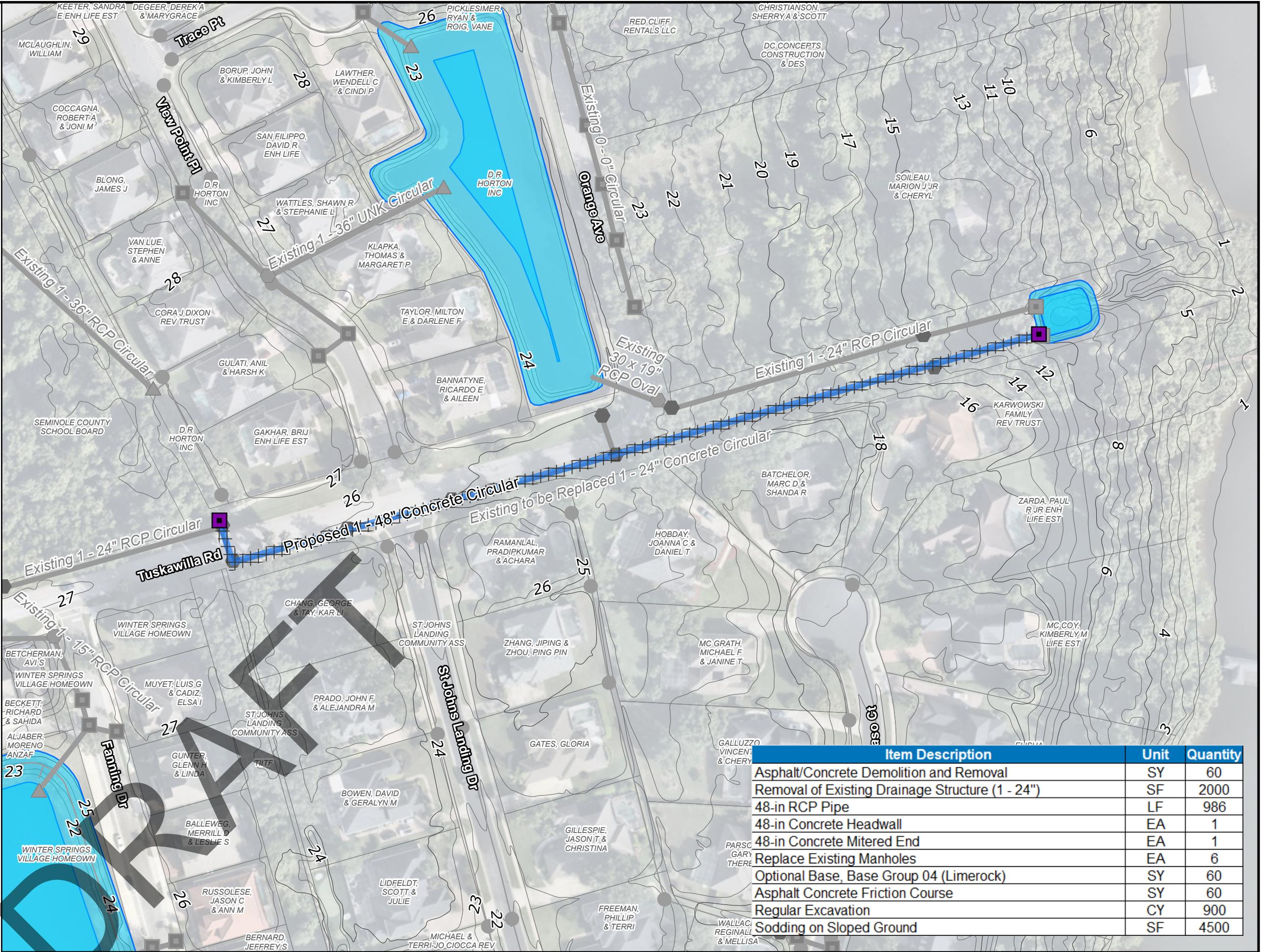
- Mitered End Structure
- Manholes
- Headwalls
- Ditch Bottom Inlets
- Curb Inlets
- Other Devices
- Cleanouts
- Underdrains
- Pipes
- Ponds
- Parcels
- Major Contours (10')
- Minor Contours (2')

ALL EXISTING MODEL INFORMATION (BASINS, NODES, EXISTING LINKS) FROM SEMINOLE COUNTY WATERSHED MODELS DEVELOPED BY OTHERS AND REVIEWED BY KIMLEY-HORN WITH ADDED CHANGES.



Legend

- Proposed Pipe
- Proposed Headwall
- Excavate and Reconstruct
- Existing Stormwater Infrastructure
- Mitered End Structure
- Manholes
- Existing Headwall
- Ditch Bottom Inlets
- Curb Inlets
- Pipes
- Cleanouts
- Underdrains
- Ponds
- Parcels
- Major Contours (5')
- Minor Contours (1')



ALL EXISTING MODEL INFORMATION (BASINS, NODES, EXISTING LINKS) FROM SEMINOLE COUNTY WATERSHED MODELS DEVELOPED BY OTHERS AND REVIEWED BY KIMLEY-HORN WITH ADDED CHANGES.



LJ-01
PROPOSED CONDITIONS DETAIL

STORMWATER IMPROVEMENTS PREPARED FOR
CITY OF WINTER SPRINGS



1 INCH = 100 FEET

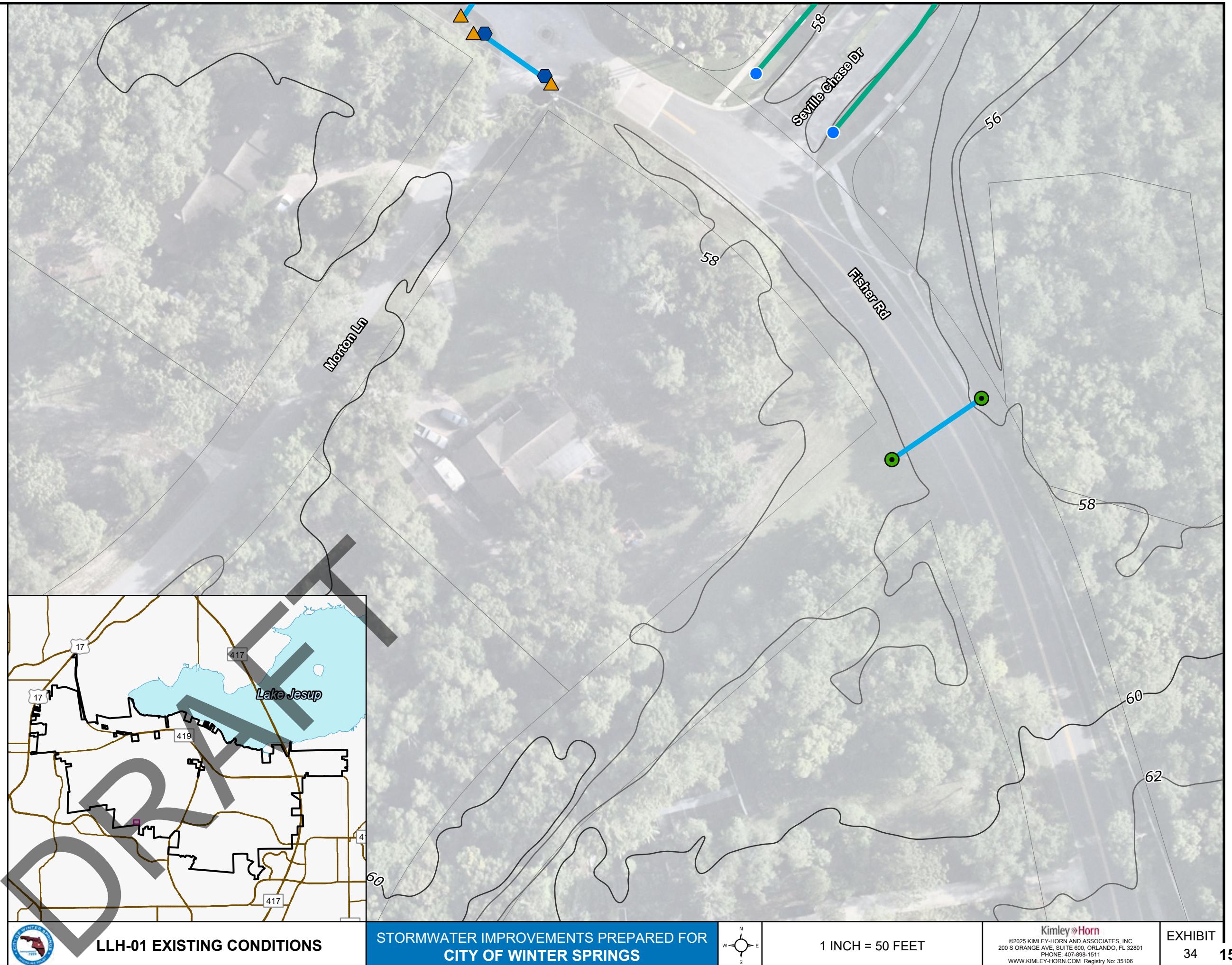
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PHONE: 407-998-1511
WWW.KIMLEY-HORN.COM Registry No: 35106

EXHIBIT
33 150

Legend

Existing Stormwater Infrastructure

- Pipe Ends
- ▲ Mitered End Structure
- Ditch Bottom Inlets
- Cleanouts
- Underdrains
- Pipes
- Existing Stream
- Parcels
- Major Contours (10')
- Minor Contours (2')

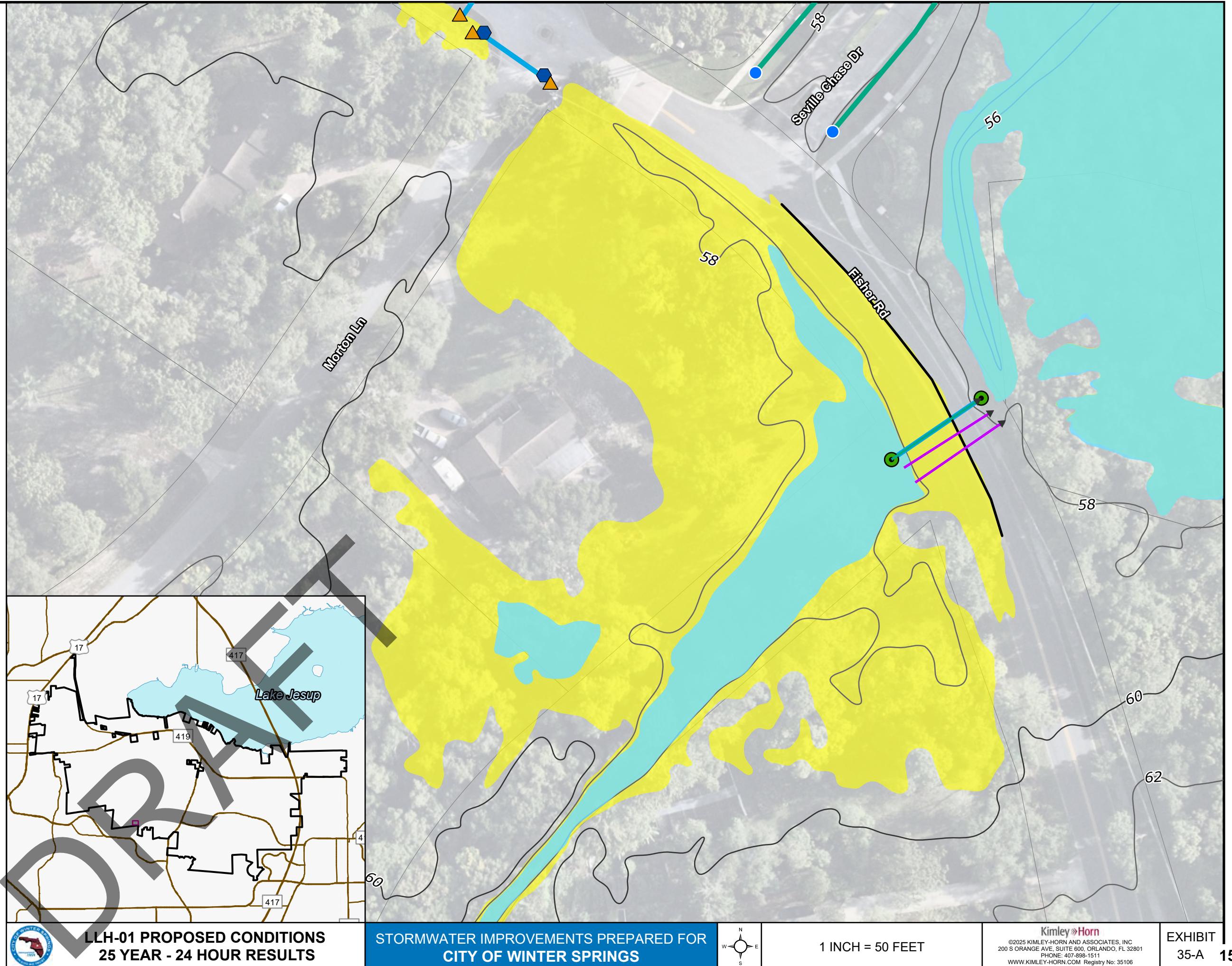


Legend

- Proposed Pipe
- Existing Pipe to Remain
- Crown of Road Removed from Modeled Floodplain
- Proposed Conditions 25
- Year 24 Hour Floodplain
- Existing Condition 25 Year 24 Hour Floodplain

Existing Stormwater Infrastructure

- Pipe Ends
- Mitered End Structure
- Ditch Bottom Inlets
- Cleanouts
- Underdrains
- Pipes
- Parcels
- Major Contours (10')
- Minor Contours (2')



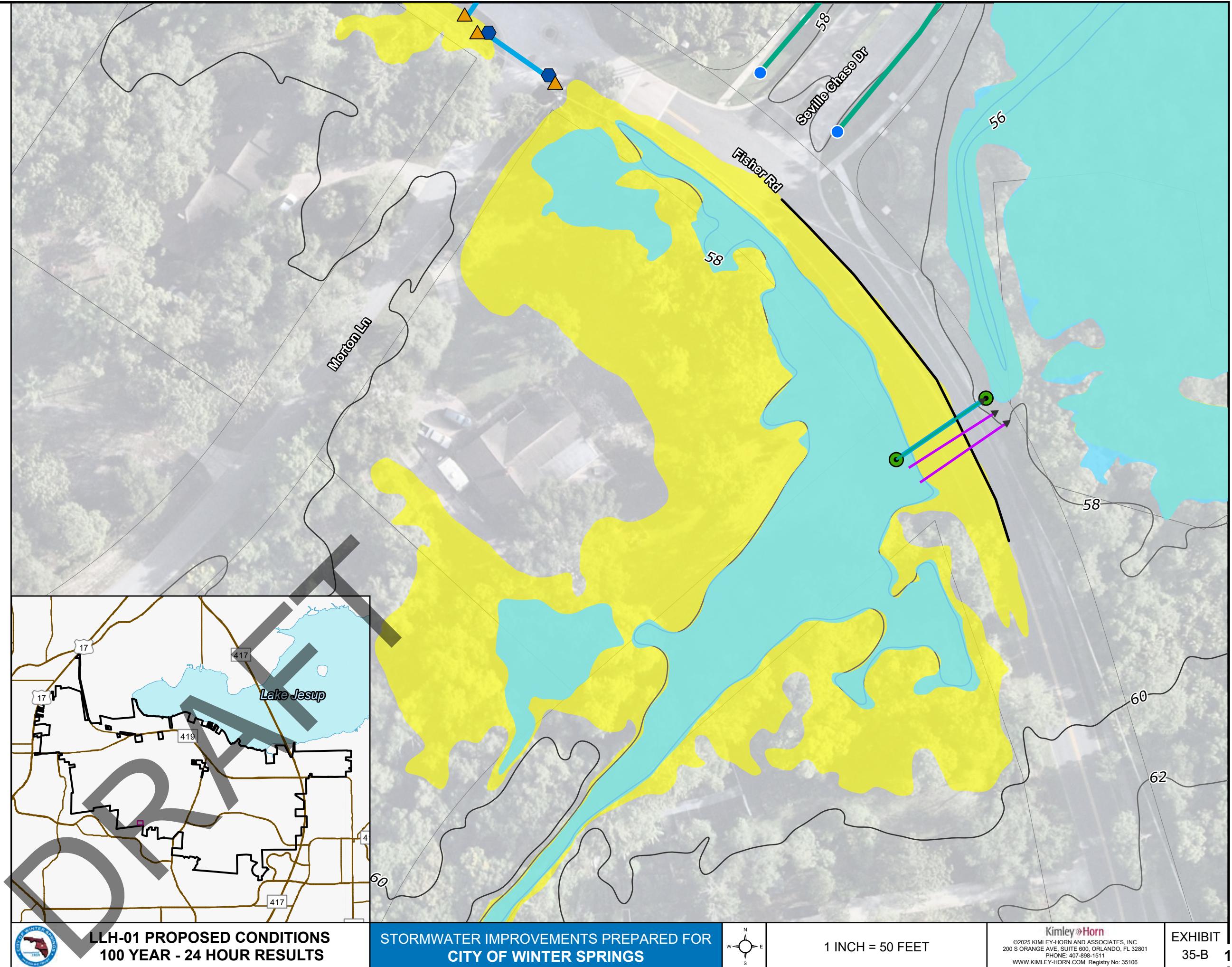
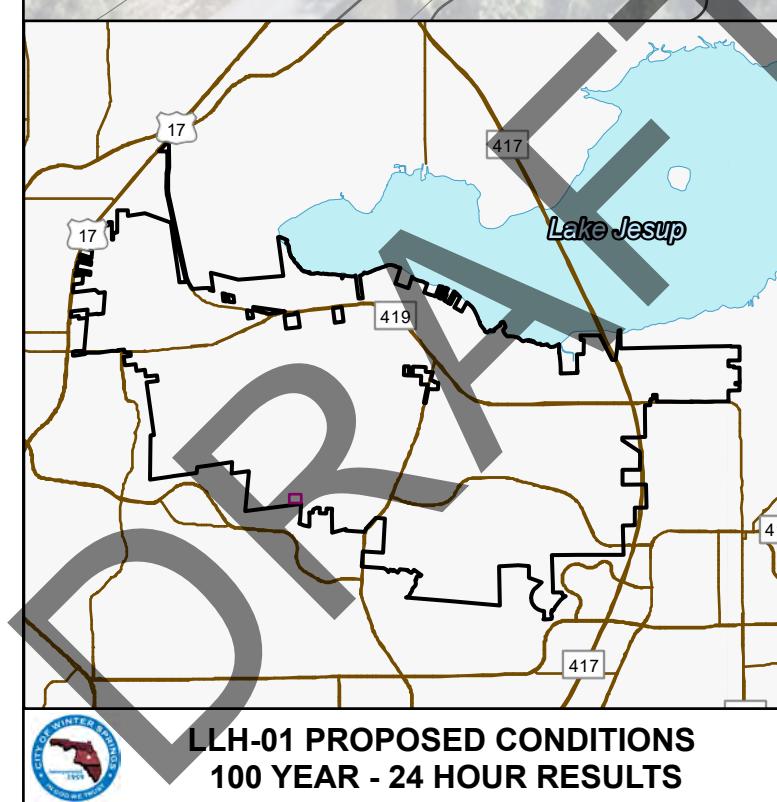
Legend

- Proposed Pipe
- Existing Pipe to Remain
- Crown of Road Removed from Modeled Floodplain
- Proposed Conditions 100 Year 24 Hour Floodplain
- Existing Condition 100 Year 24 Hour Floodplain

Existing Stormwater Infrastructure

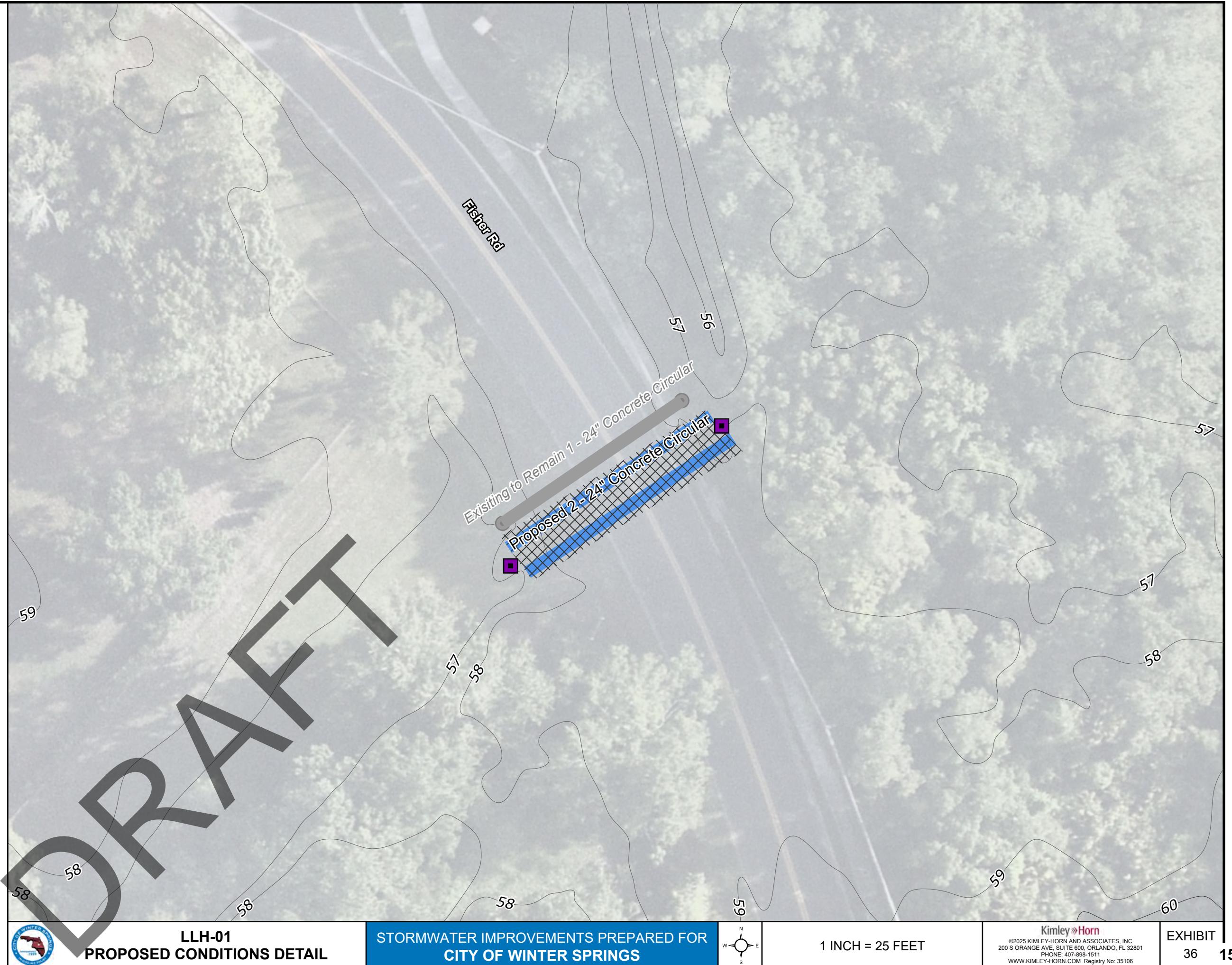
- Pipe Ends
- Mitered End Structure
- Ditch Bottom Inlets
- Cleanouts
- Underdrains
- Pipes
- Parcels
- Major Contours (10')
- Minor Contours (2')

ALL EXISTING MODEL INFORMATION (BASINS, NODES, EXISTING LINKS) FROM SEMINOLE COUNTY WATERSHED MODELS DEVELOPED BY OTHERS AND REVIEWED BY KIMLEY-HORN WITH ADDED CHANGES.



Legend

- Proposed Pipe
- Proposed Headwall
- Excavate and Reconstruct
- Existing Stormwater Infrastructure
- Pipe Ends
- Pipes
- Major Contours (5')
- Minor Contours (1')



Legend

Existing Stormwater Infrastructure

- ▲ Mitered End Structure
- Headwalls
- Curb Inlets
- Underdrains
- Pipes
- Existing Stream
- Parcels
- Major Contours (10')
- Minor Contours (2')



EXISTING STORMWATER
INFRASTRUCTURE
SOURCED FROM CITY OF
WINTER SPRINGS
STORMWATER ATLAS



LLH-02 EXISTING CONDITIONS

STORMWATER IMPROVEMENTS PREPARED FOR
CITY OF WINTER SPRINGS



1 INCH = 50 FEET

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37 155

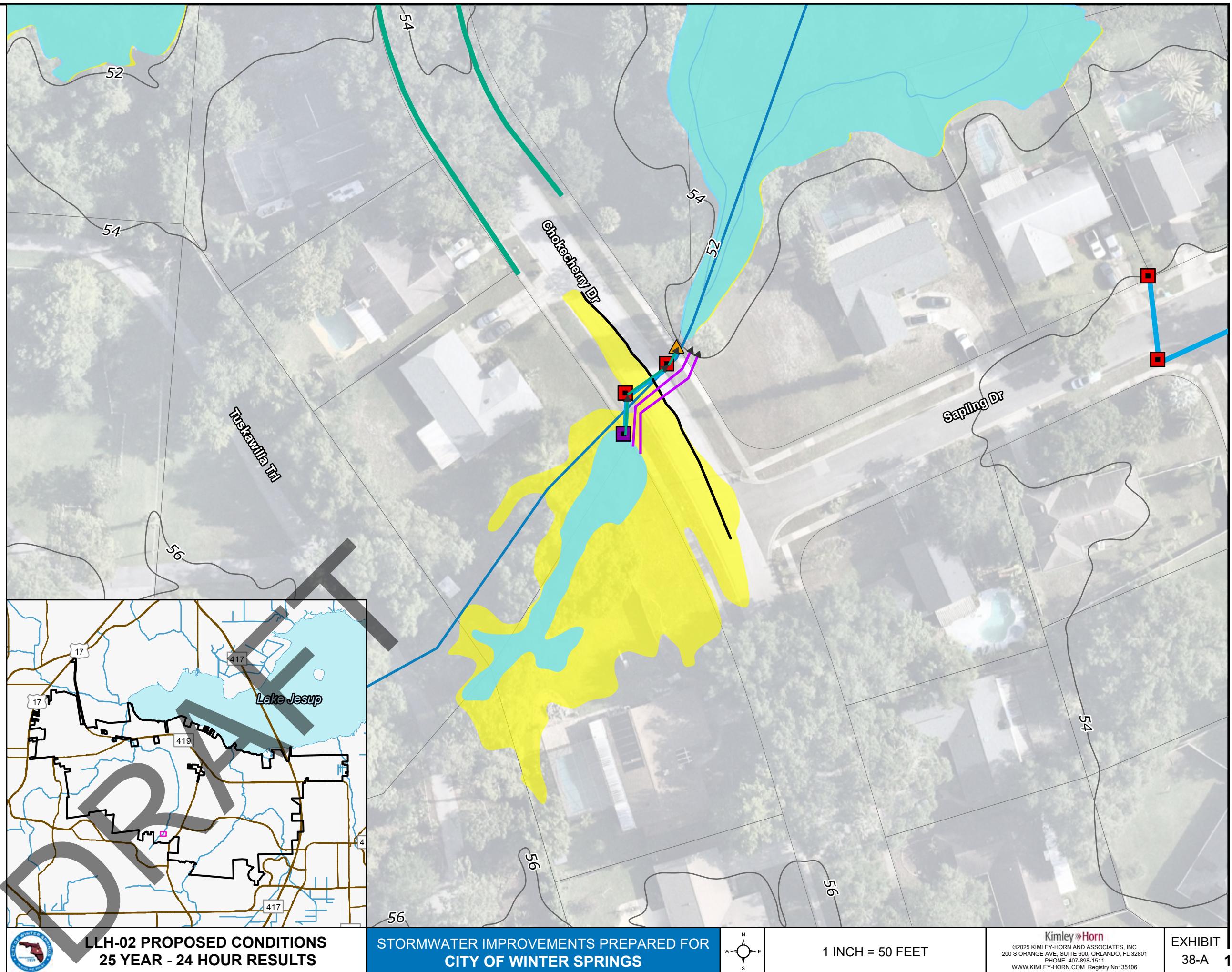
Legend

- Proposed Pipe
- Existing Pipe to Remain
- Crown of Road Removed from Modeled Floodplain
- Proposed Conditions 25
- Year 24 Hour Floodplain
- Existing Condition 25 Year
- 24 Hour Floodplain

Existing Stormwater Infrastructure

- Mitered End Structure
- Headwalls
- Curb Inlets
- Underdrains
- Pipes
- Existing Stream
- Parcels
- Major Contours (10')
- Minor Contours (2')

ALL EXISTING MODEL INFORMATION (BASINS, NODES, EXISTING LINKS) FROM SEMINOLE COUNTY WATERSHED MODELS DEVELOPED BY OTHERS AND REVIEWED BY KIMLEY-HORN WITH ADDED CHANGES.



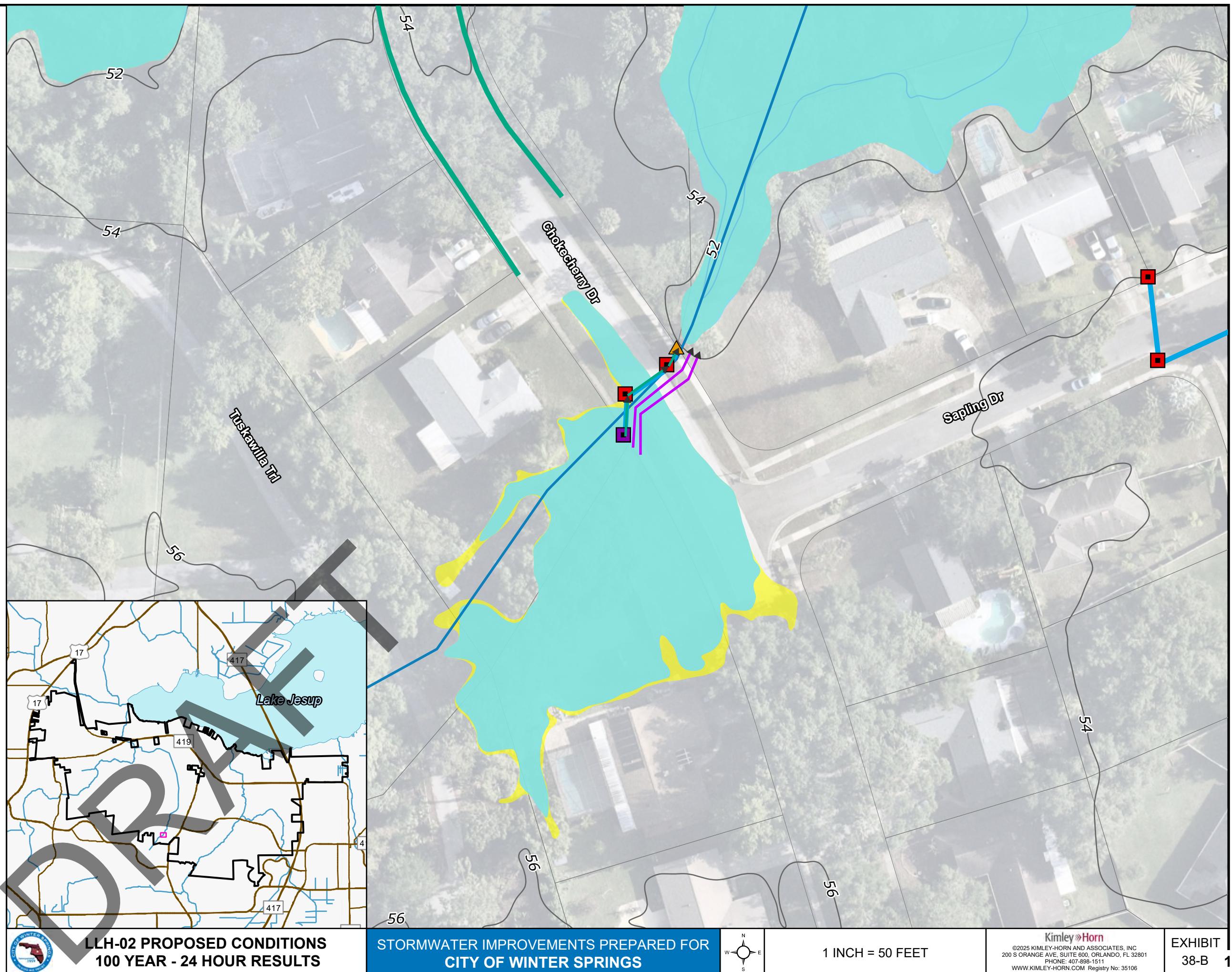
Legend

- Proposed Pipe
- Existing Pipe to Remain
- Proposed Conditions 100 Year 24 Hour Floodplain
- Existing Condition 100 Year 24 Hour Floodplain

Existing Stormwater Infrastructure

- Mitered End Structure
- Headwalls
- Curb Inlets
- Underdrains
- Pipes
- Existing Stream
- Parcels
- Major Contours (10')
- Minor Contours (2')

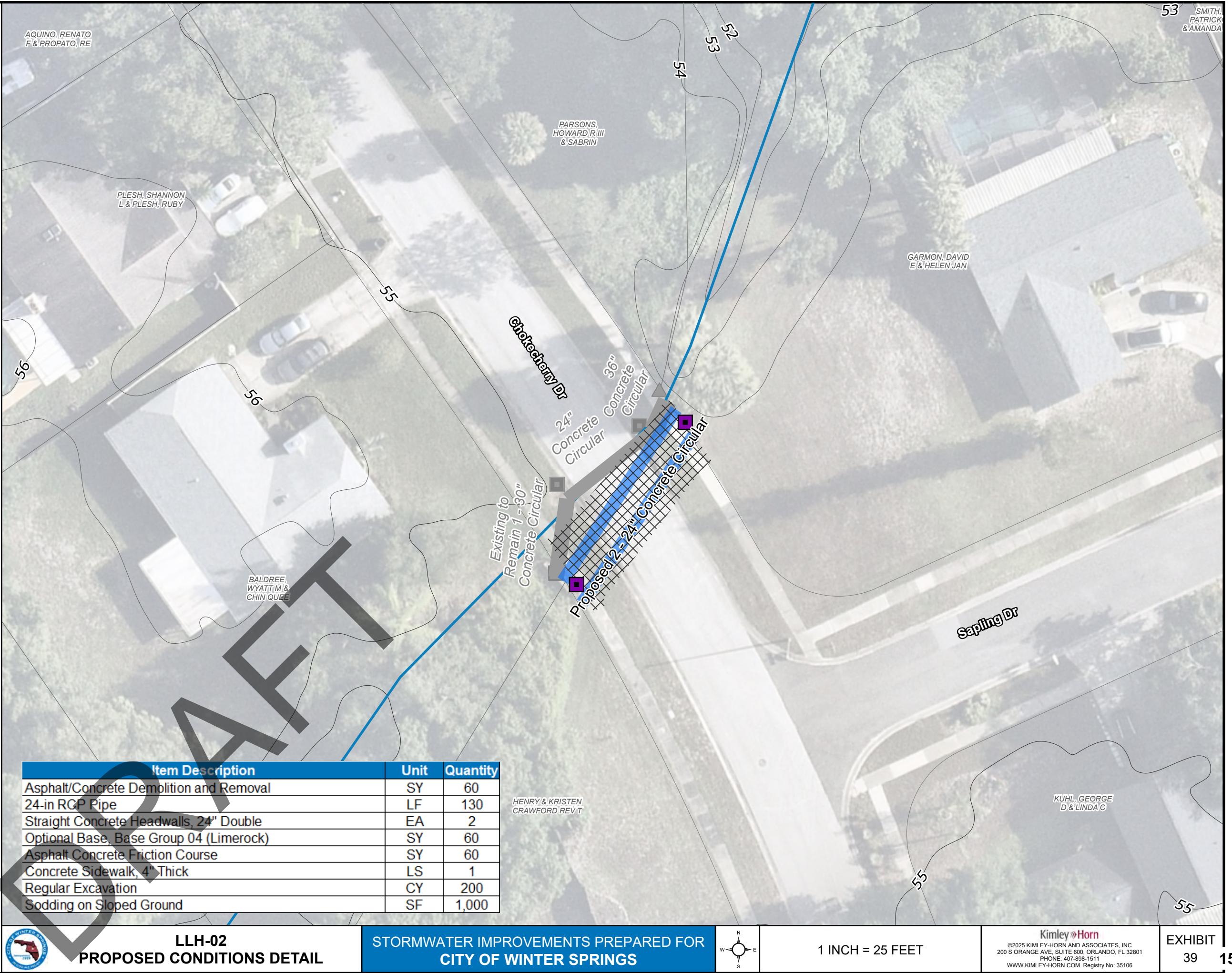
ALL EXISTING MODEL INFORMATION (BASINS, NODES, EXISTING LINKS) FROM SEMINOLE COUNTY WATERSHED MODELS DEVELOPED BY OTHERS AND REVIEWED BY KIMLEY-HORN WITH ADDED CHANGES.



Legend

- Proposed Pipe
- Proposed Headwall
- Excavate and Reconstruct
- Existing Stormwater Infrastructure
- Mitered End Structure
- Existing Headwall
- Curb Inlets
- Existing Stream
- Underdrains
- Parcels
- Major Contours (5')
- Minor Contours (1')

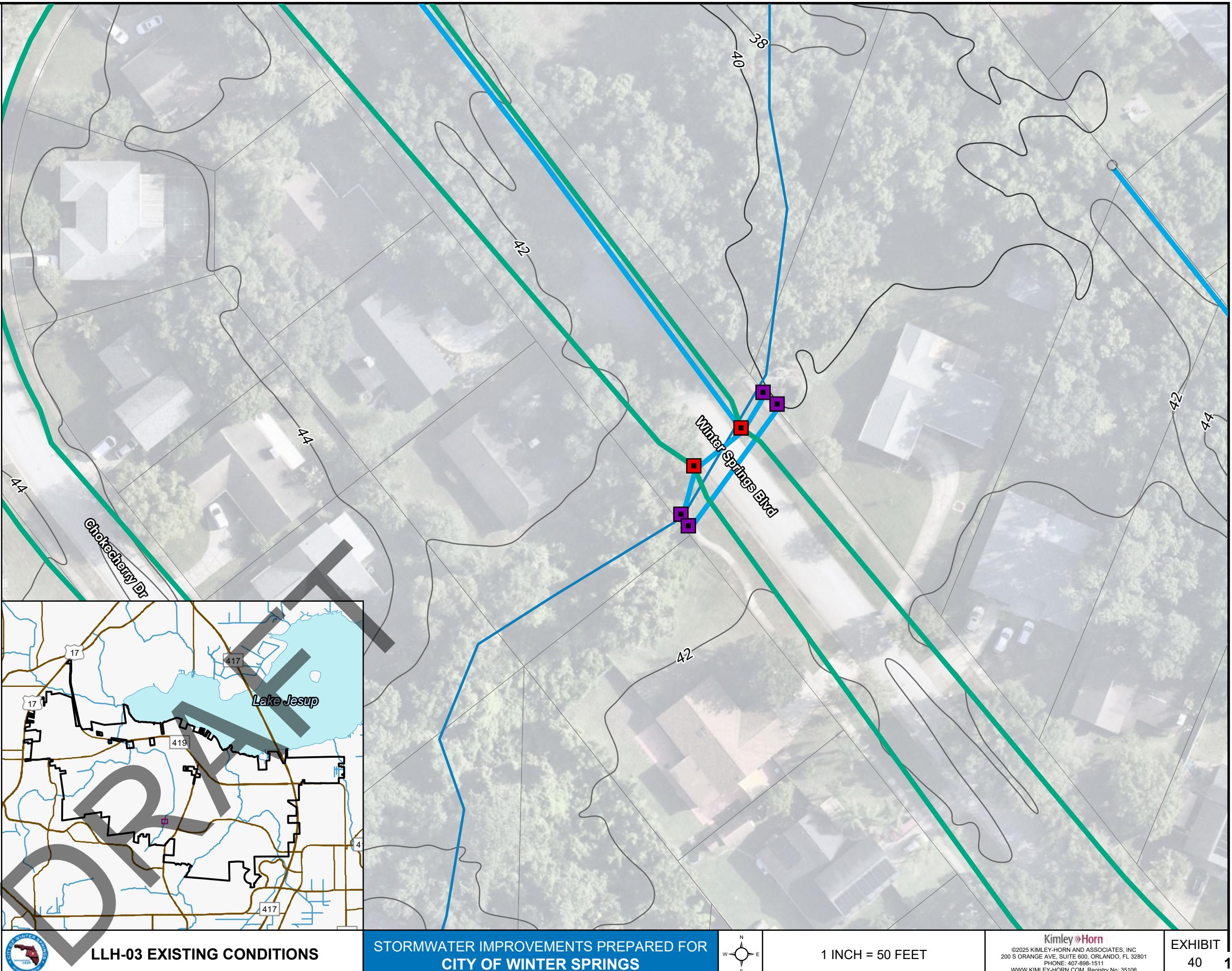
ALL EXISTING MODEL INFORMATION (BASINS, NODES, EXISTING LINKS) FROM SEMINOLE COUNTY WATERSHED MODELS DEVELOPED BY OTHERS AND REVIEWED BY KIMLEY-HORN WITH ADDED CHANGES.



Legend

Existing Stormwater Infrastructure

- ▲ Mitered End Structure
- Headwalls
- Curb Inlets
- Other Devices
- Underdrains
- Pipes
- Existing Stream
- Parcels
- Major Contours (10')
- Minor Contours (2')



EXISTING STORMWATER
INFRASTRUCTURE
SOURCED FROM CITY OF
WINTER SPRINGS
STORMWATER ATLAS



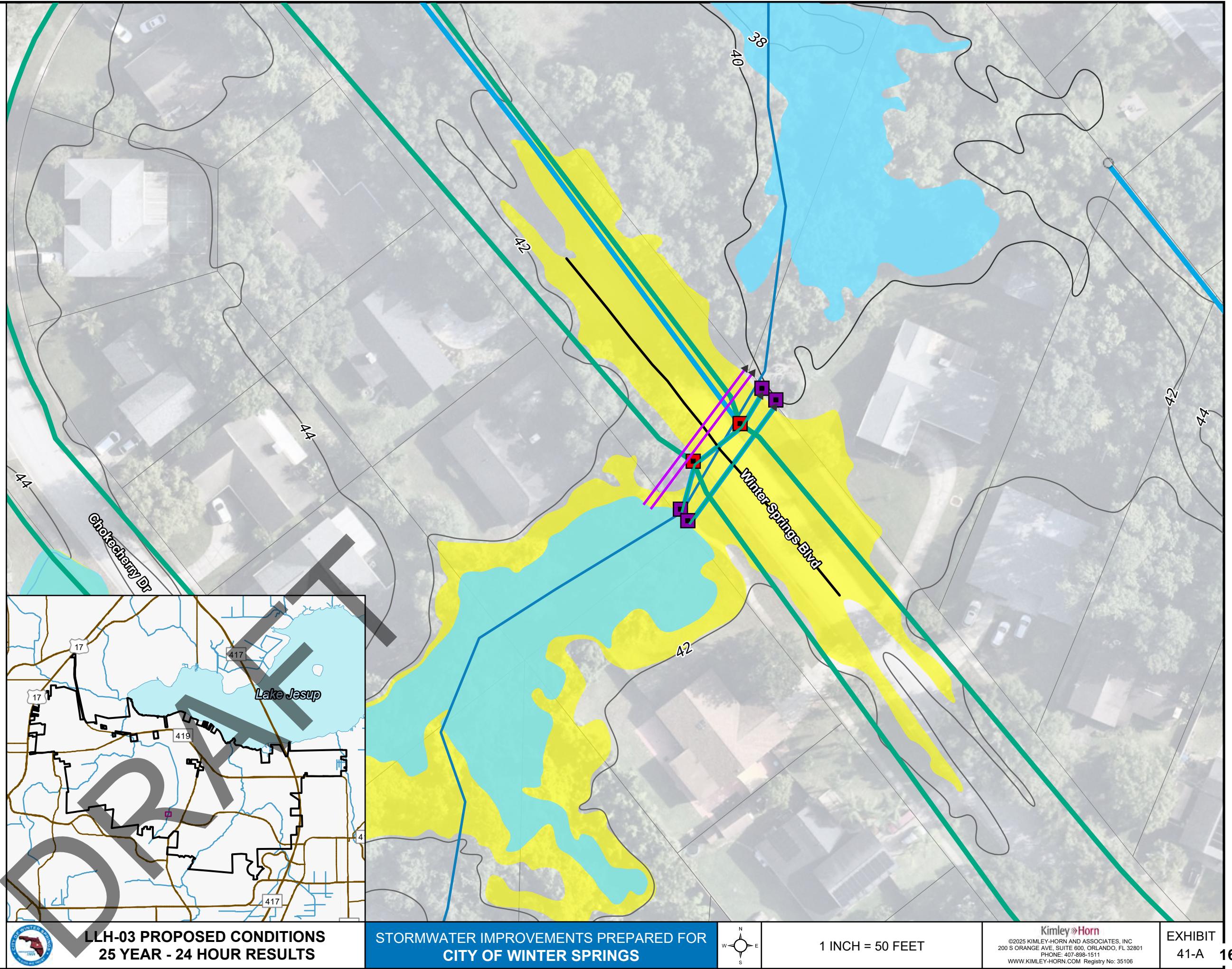
Legend

- Proposed Pipe
- Existing Pipe to Remain
- Crown of Road Removed from Modeled Floodplain
- Proposed Conditions 25 Year 24 Hour Floodplain
- Existing Condition 25 Year 24 Hour Floodplain

Existing Stormwater Infrastructure

- Mitered End Structure
- Headwalls
- Curb Inlets
- Other Devices
- Underdrains
- Pipes
- Existing Stream
- Parcels
- Major Contours (10')
- Minor Contours (2')

ALL EXISTING MODEL INFORMATION (BASINS, NODES, EXISTING LINKS) FROM SEMINOLE COUNTY WATERSHED MODELS DEVELOPED BY OTHERS AND REVIEWED BY KIMLEY-HORN WITH ADDED CHANGES.

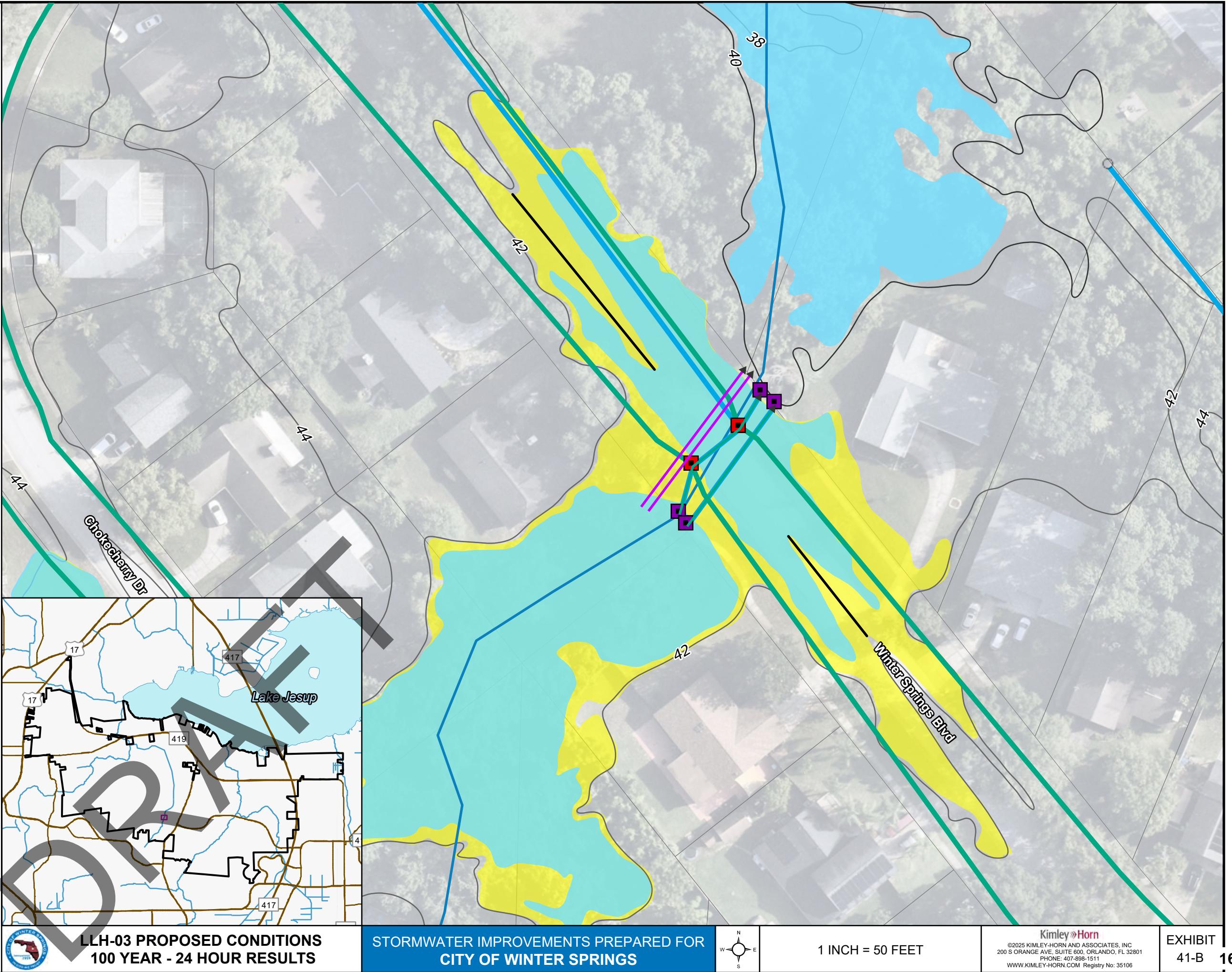


Legend

- Proposed Pipe
- Existing Pipe to Remain
- Crown of Road Removed from Modeled Floodplain
- Proposed Conditions 100
- Year 24 Hour Floodplain
- Existing Condition 100
- Year 24 Hour Floodplain

Existing Stormwater Infrastructure

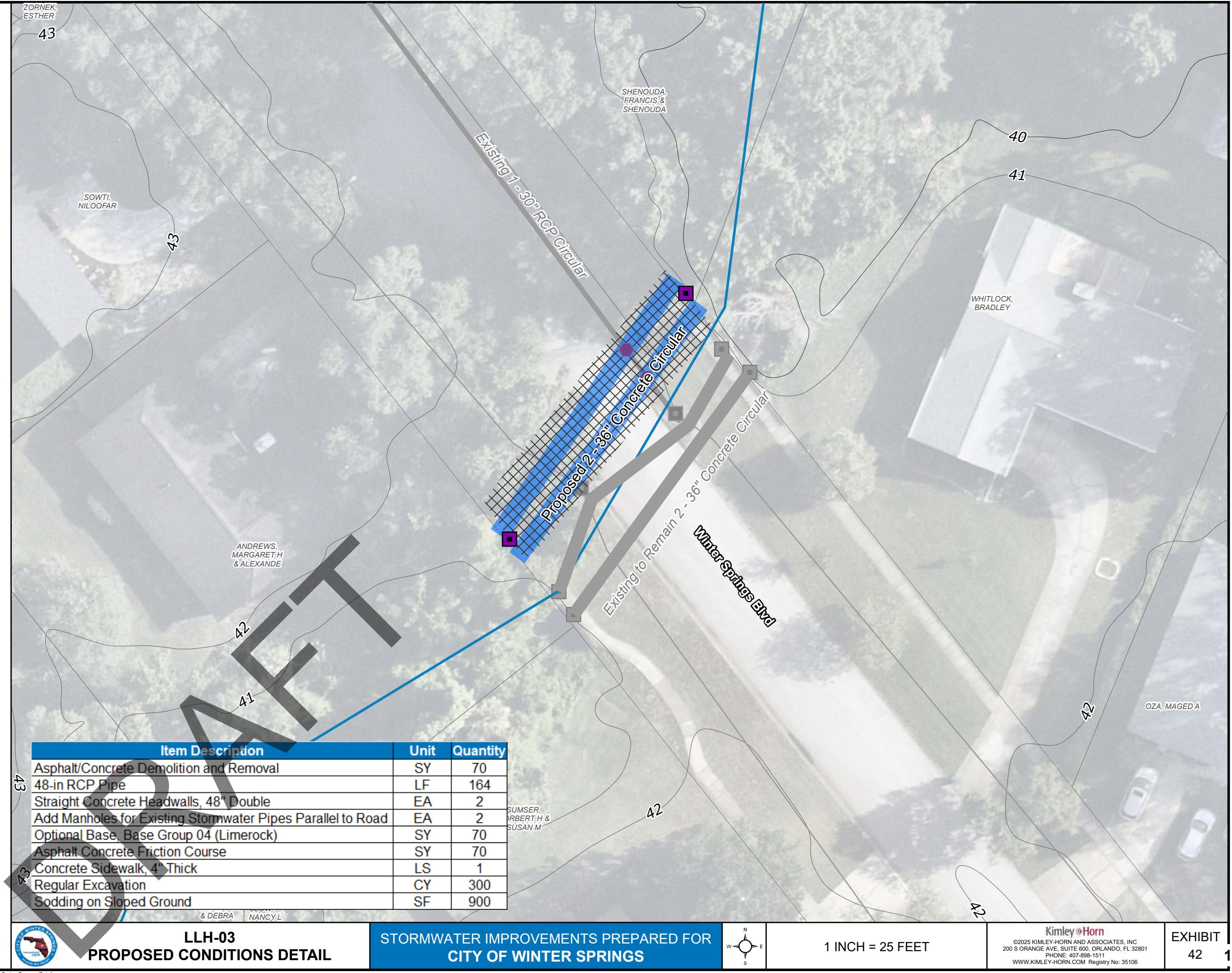
- Mitered End Structure
- Headwalls
- Curb Inlets
- Other Devices
- Underdrains
- Pipes
- Existing Stream
- Parcels
- Major Contours (10')
- Minor Contours (2')



Legend

- Proposed Pipe
- Proposed Headwall
- Proposed Manhole
- Excavate and Reconstruct
- Existing Stormwater Infrastructure
 - Existing Headwall
 - Curb Inlets
 - Pipes
 - Existing Stream
 - Underdrains
 - Parcels
- Major Contours (5')
- Minor Contours (1')

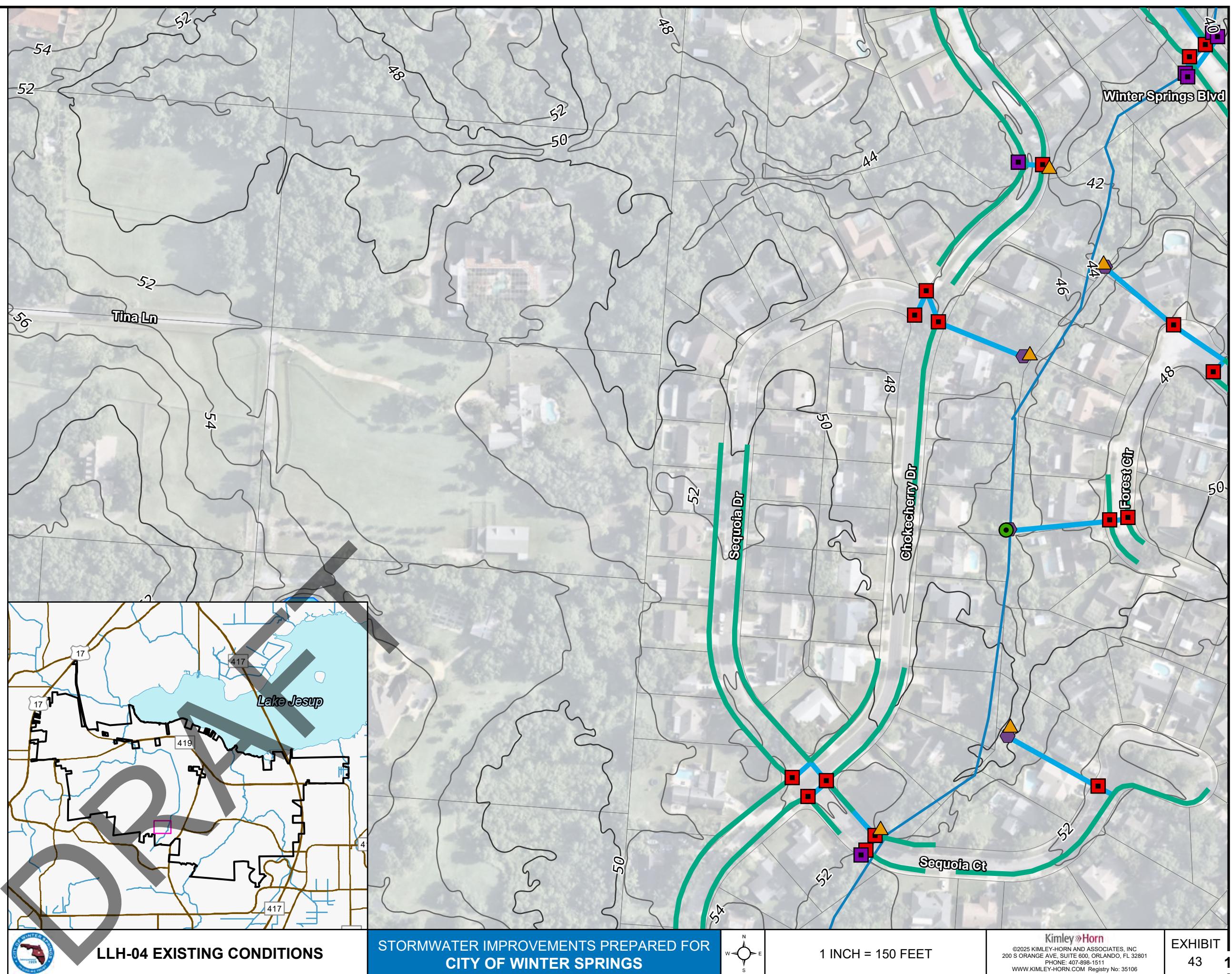
ALL EXISTING MODEL INFORMATION (BASINS, NODES, EXISTING LINKS) FROM SEMINOLE COUNTY WATERSHED MODELS DEVELOPED BY OTHERS AND REVIEWED BY KIMLEY-HORN WITH ADDED CHANGES.



Legend

Existing Stormwater Infrastructure

- Pipe Ends
- ▲ Mitered End Structure
- Manholes
- Headwalls
- Curb Inlets
- Underdrains
- Pipes
- Existing Stream
- Ponds
- Parcels
- Major Contours (10')
- Minor Contours (2')



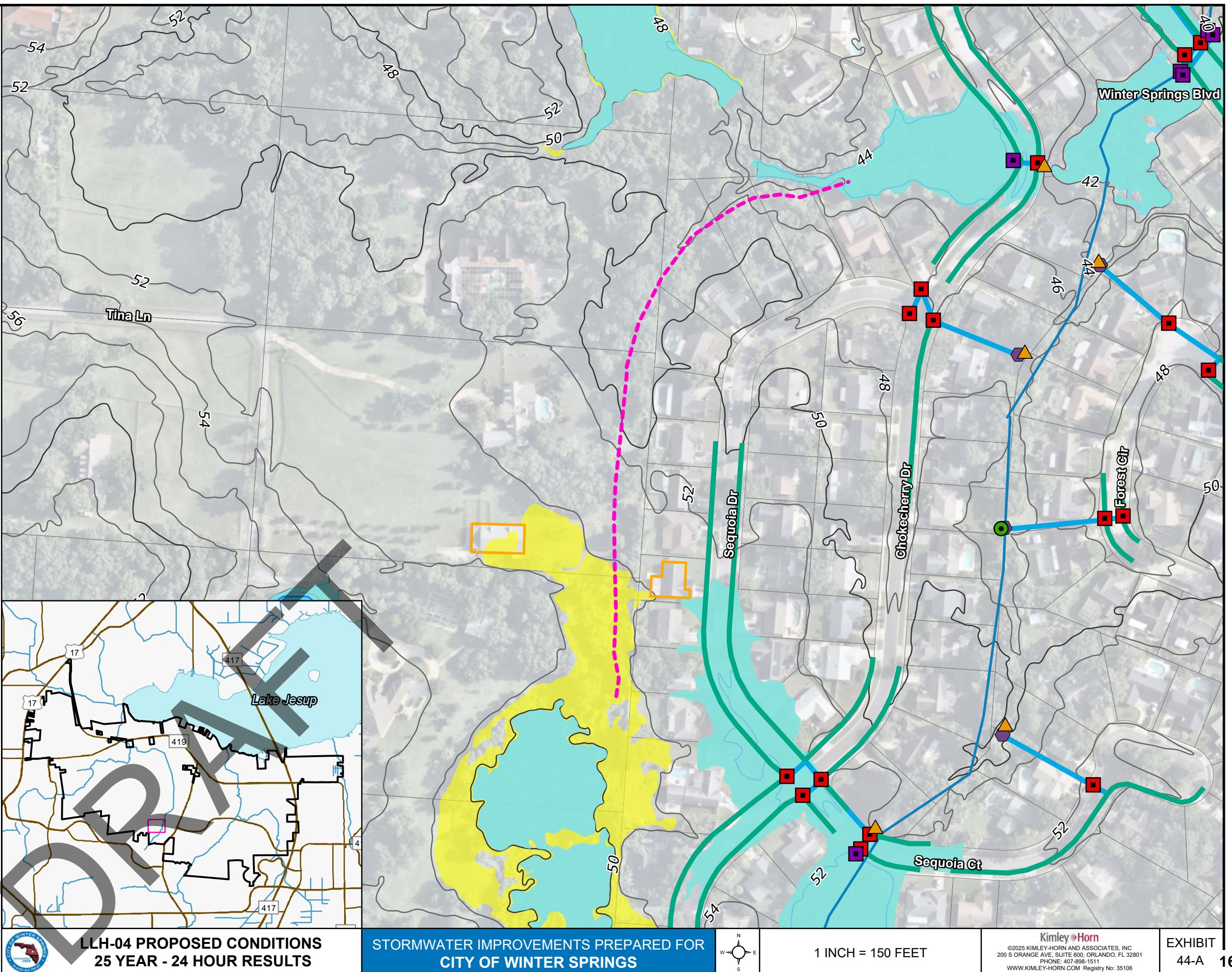
Legend

- Proposed Ditch
- Structure Removed from Modeled Floodplain
- Proposed Conditions 25 Year 24 Hour Floodplain
- Existing Condition 25 Year 24 Hour Floodplain

Existing Stormwater Infrastructure

- Pipe Ends
- Mitered End Structure
- Manholes
- Headwalls
- Curb Inlets
- Underdrains
- Pipes
- Existing Stream
- Ponds
- Parcels
- Major Contours (10')
- Minor Contours (2')

ALL EXISTING MODEL INFORMATION (BASINS, NODES, EXISTING LINKS) FROM SEMINOLE COUNTY WATERSHED MODELS DEVELOPED BY OTHERS AND REVIEWED BY KIMLEY-HORN WITH ADDED CHANGES.



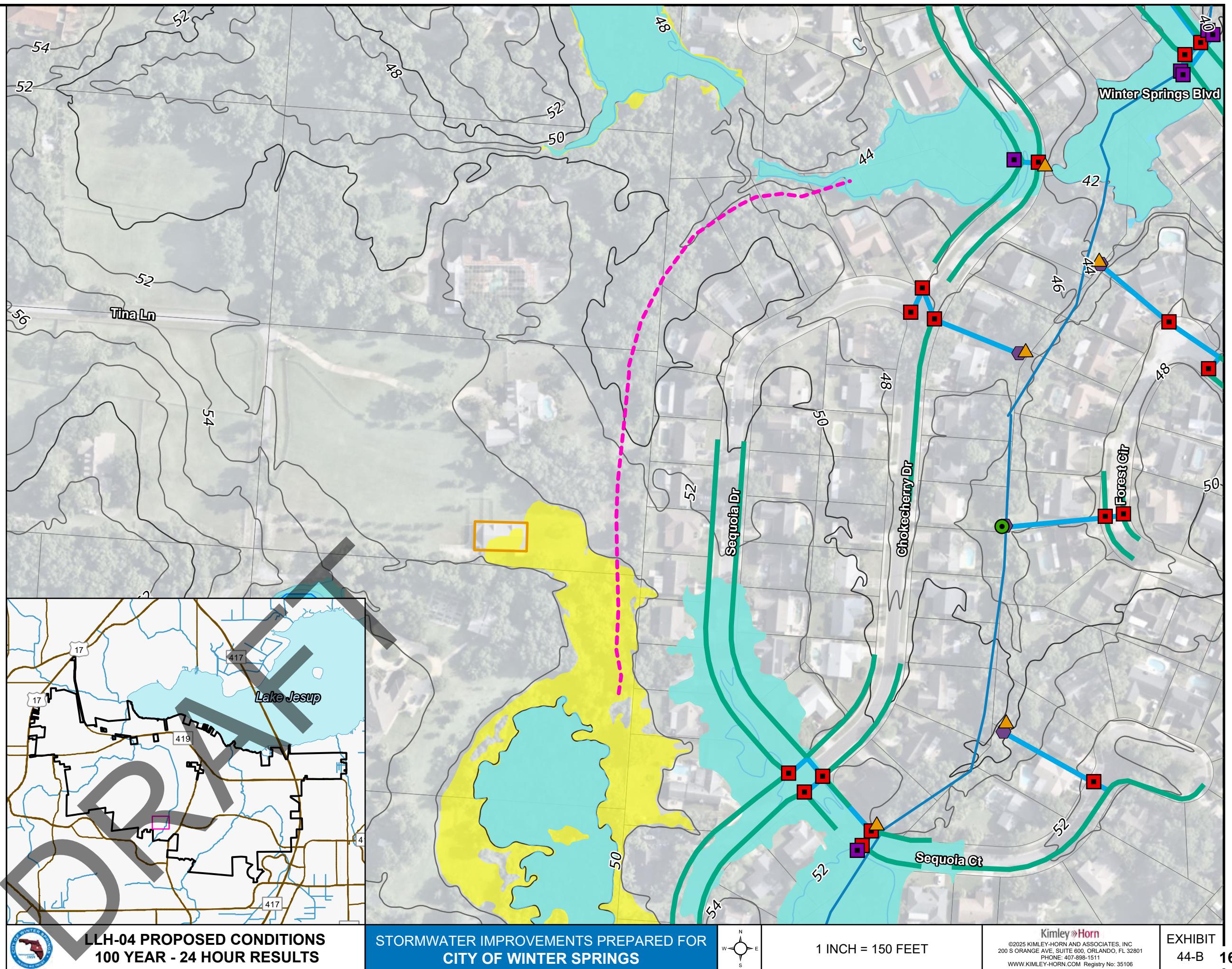
Legend

- Proposed Ditch
- Structure Removed from Modeled Floodplain
- Proposed Conditions 100 Year 24 Hour Floodplain
- Existing Condition 100 Year 24 Hour Floodplain

Existing Stormwater Infrastructure

- Pipe Ends
- Mitered End Structure
- Manholes
- Headwalls
- Curb Inlets
- Underdrains
- Pipes
- Existing Stream
- Ponds
- Parcels
- Major Contours (10')
- Minor Contours (2')

ALL EXISTING MODEL INFORMATION (BASINS, NODES, EXISTING LINKS) FROM SEMINOLE COUNTY WATERSHED MODELS DEVELOPED BY OTHERS AND REVIEWED BY KIMLEY-HORN WITH ADDED CHANGES.



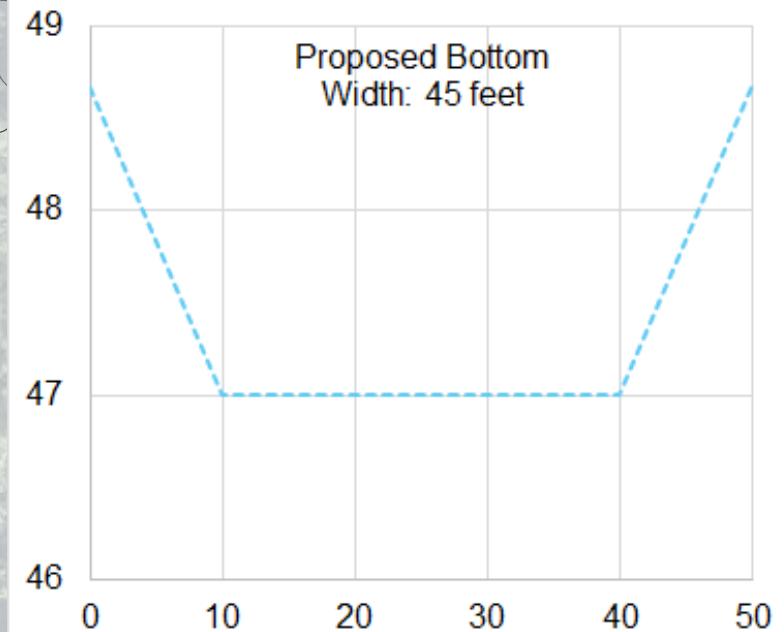
Legend

- Channel Excavation
- Existing Stormwater Infrastructure
- Curb Inlets
- Pipes
- Underdrains
- Parcels
- Major Contours (5')
- Minor Contours (1')

Ditch Cross Section

Proposed XS

Proposed Bottom Width: 45 feet



ALL EXISTING MODEL INFORMATION (BASINS, NODES, EXISTING LINKS) FROM SEMINOLE COUNTY WATERSHED MODELS DEVELOPED BY OTHERS AND REVIEWED BY KIMLEY-HORN WITH ADDED CHANGES.



LLH-04
PROPOSED CONDITIONS DETAIL

STORMWATER IMPROVEMENTS PREPARED FOR
CITY OF WINTER SPRINGS



1 INCH = 80 FEET

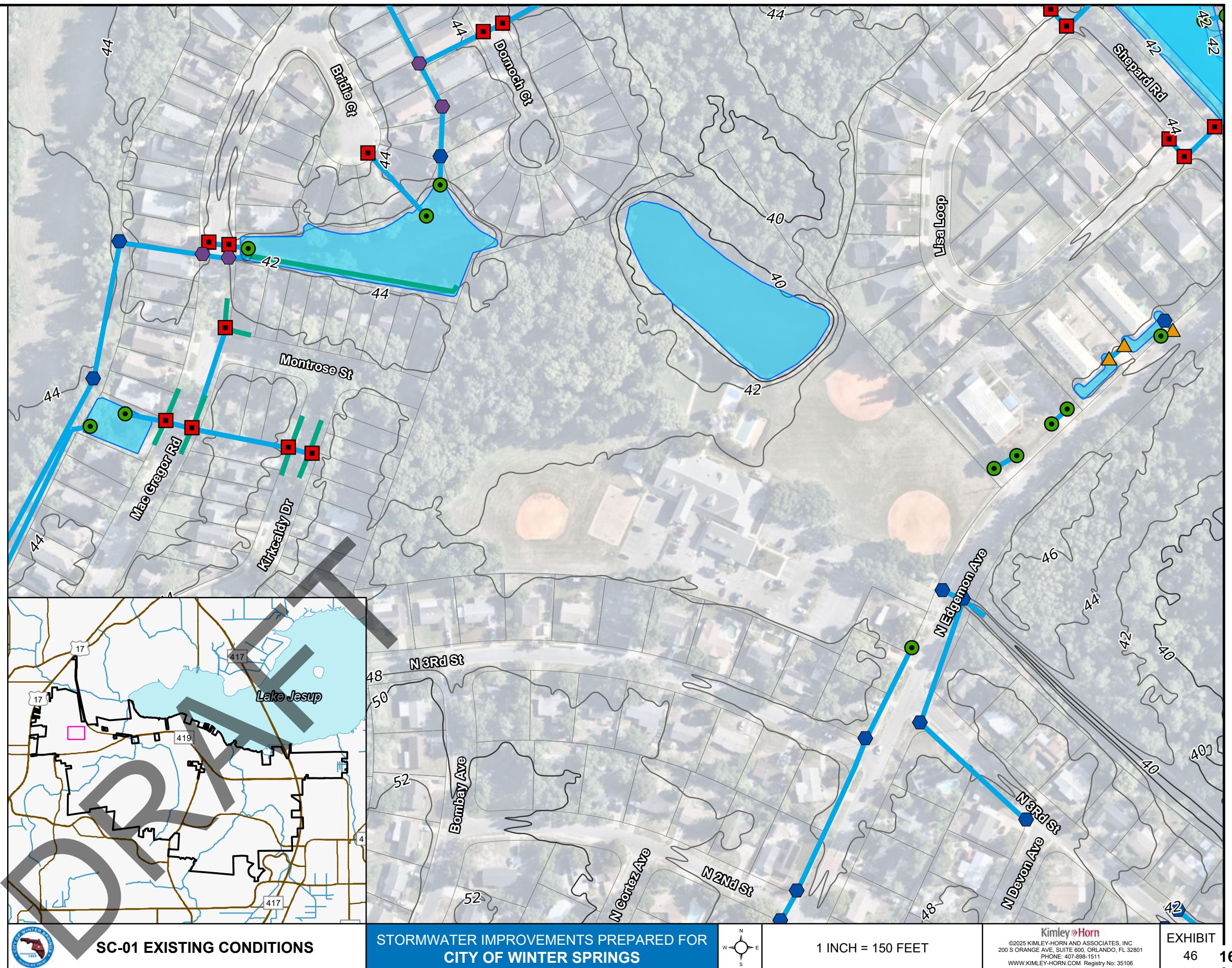
Kimley Horn
©2025 KIMLEY-HORN AND ASSOCIATES, INC
200 S ORANGE AVE, SUITE 600, ORLANDO, FL 32801
PHONE: 407-898-1511
WWW.KIMLEY-HORN.COM Registry No. 35106

EXHIBIT
45 166

Legend

Existing Stormwater Infrastructure

- Pipe Ends
- ▲ Mitered End Structure
- Manholes
- Headwalls
- Ditch Bottom Inlets
- Curb Inlets
- Other Devices
- Underdrains
- Pipes
- Existing Stream
- Ponds
- Parcels
- Major Contours (10')
- Minor Contours (2')



EXISTING STORMWATER INFRASTRUCTURE SOURCED FROM CITY OF WINTER SPRINGS STORMWATER ATLAS



SC-01 EXISTING CONDITIONS

STORMWATER IMPROVEMENTS PREPARED FOR
CITY OF WINTER SPRINGS



1 INCH = 150 FEET

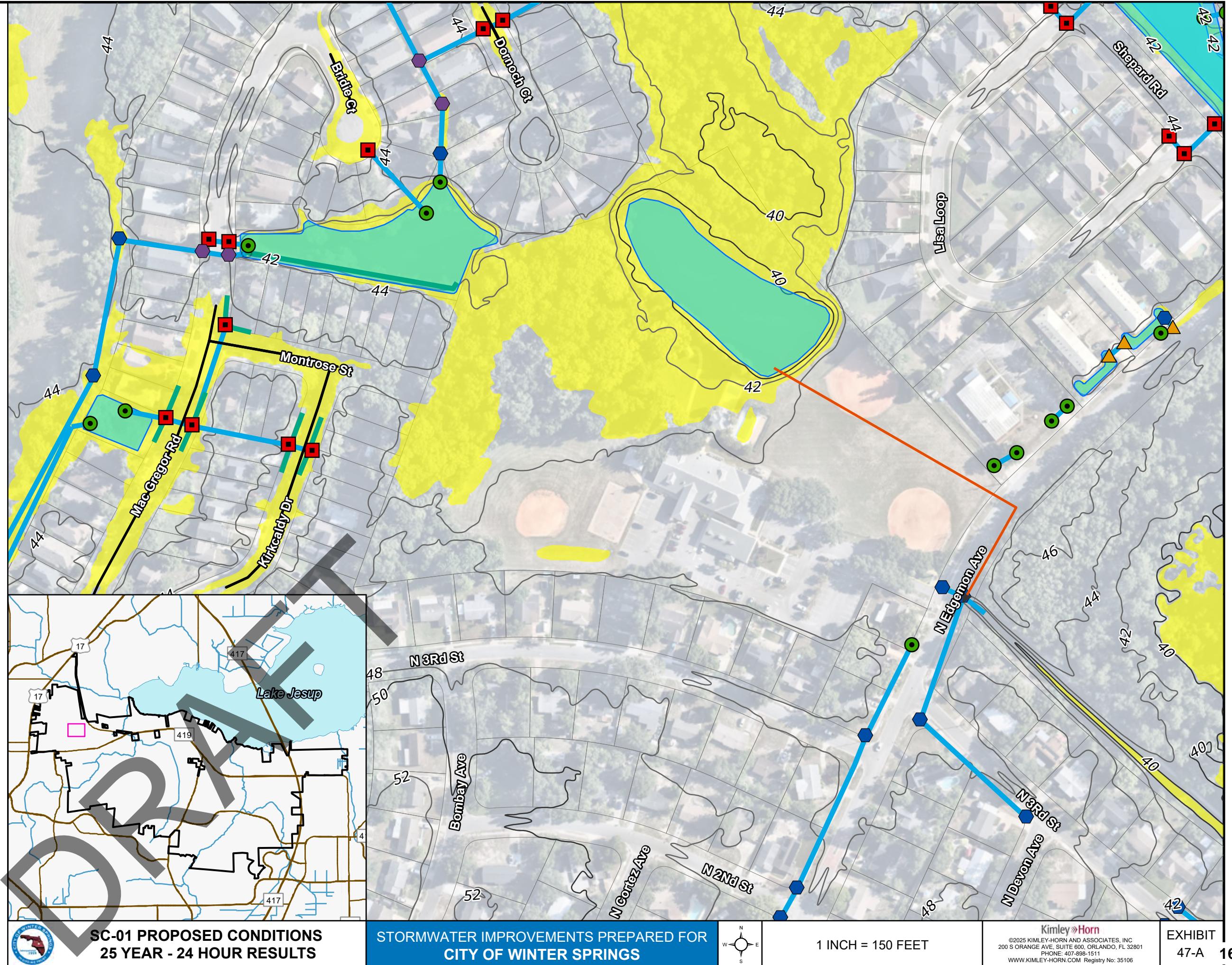
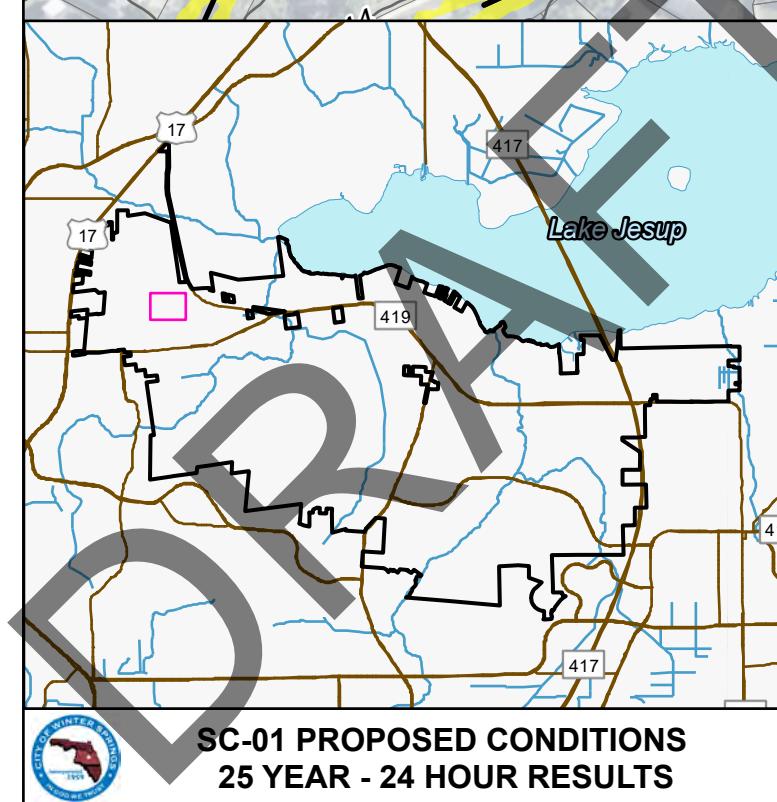
Legend

- Add New Control Structure
- Crown of Road Removed from Modeled Floodplain
- Proposed Conditions 25 Year 24 Hour Floodplain
- Existing Condition 25 Year 24 Hour Floodplain

Existing Stormwater Infrastructure

- Pipe Ends
- ▲ Mitered End Structure
- Manholes
- Headwalls
- Ditch Bottom Inlets
- Curb Inlets
- Other Devices
- Underdrains
- Pipes
- Ponds
- Parcels
- Major Contours (10')
- Minor Contours (2')

ALL EXISTING MODEL INFORMATION (BASINS, NODES, EXISTING LINKS) FROM SEMINOLE COUNTY WATERSHED MODELS DEVELOPED BY OTHERS AND REVIEWED BY KIMLEY-HORN WITH ADDED CHANGES.



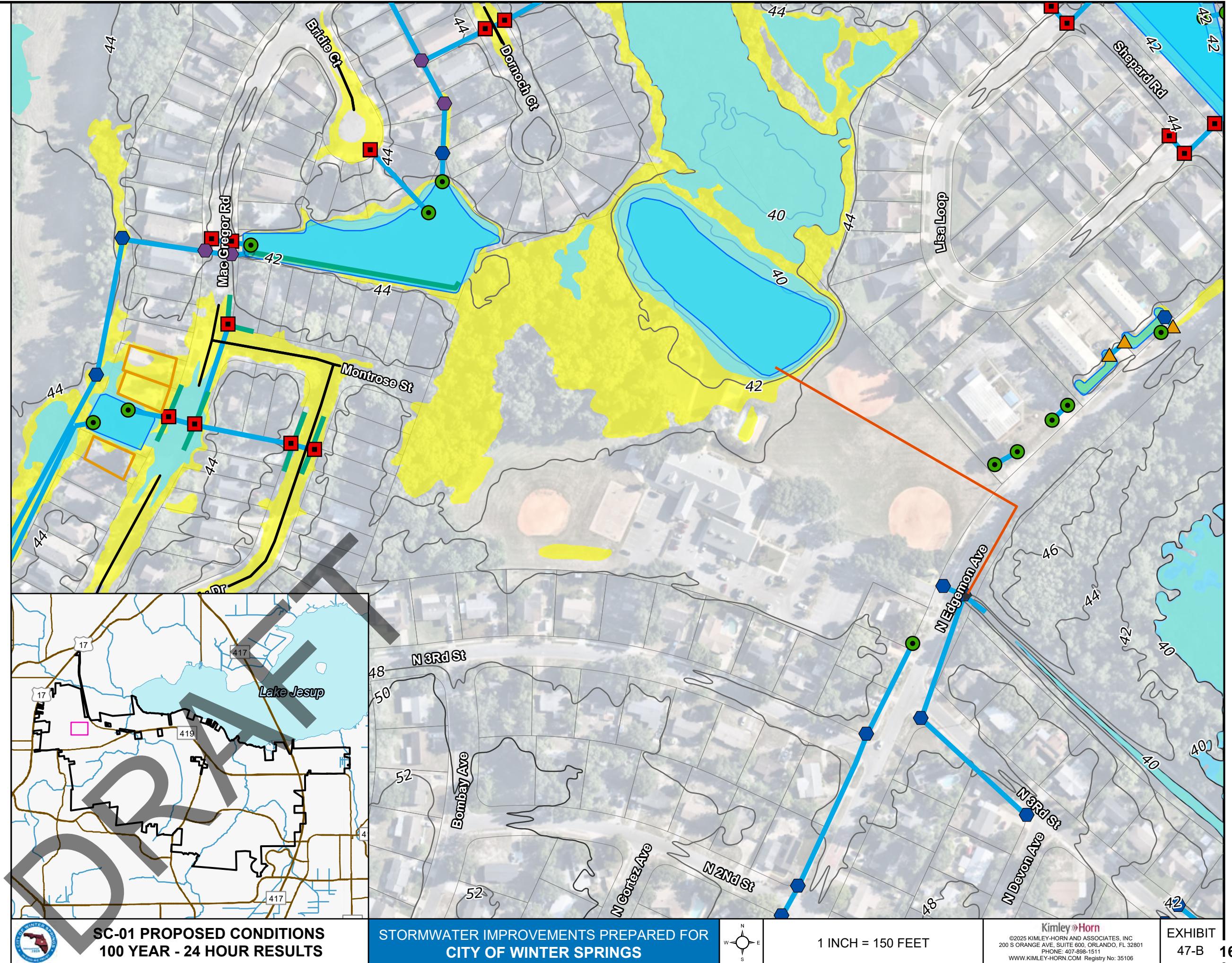
Legend

- Add New Control Structure
- Crown of Road Removed from Modeled Floodplain
- Structure Removed from Modeled Floodplain
- Proposed Conditions 100 Year 24 Hour Floodplain
- Existing Condition 100 Year 24 Hour Floodplain

Existing Stormwater Infrastructure

- Pipe Ends
- ▲ Mitered End Structure
- Manholes
- Headwalls
- Ditch Bottom Inlets
- Curb Inlets
- Other Devices
- Underdrains
- Pipes
- Ponds
- Parcels
- Major Contours (10')
- Minor Contours (2')

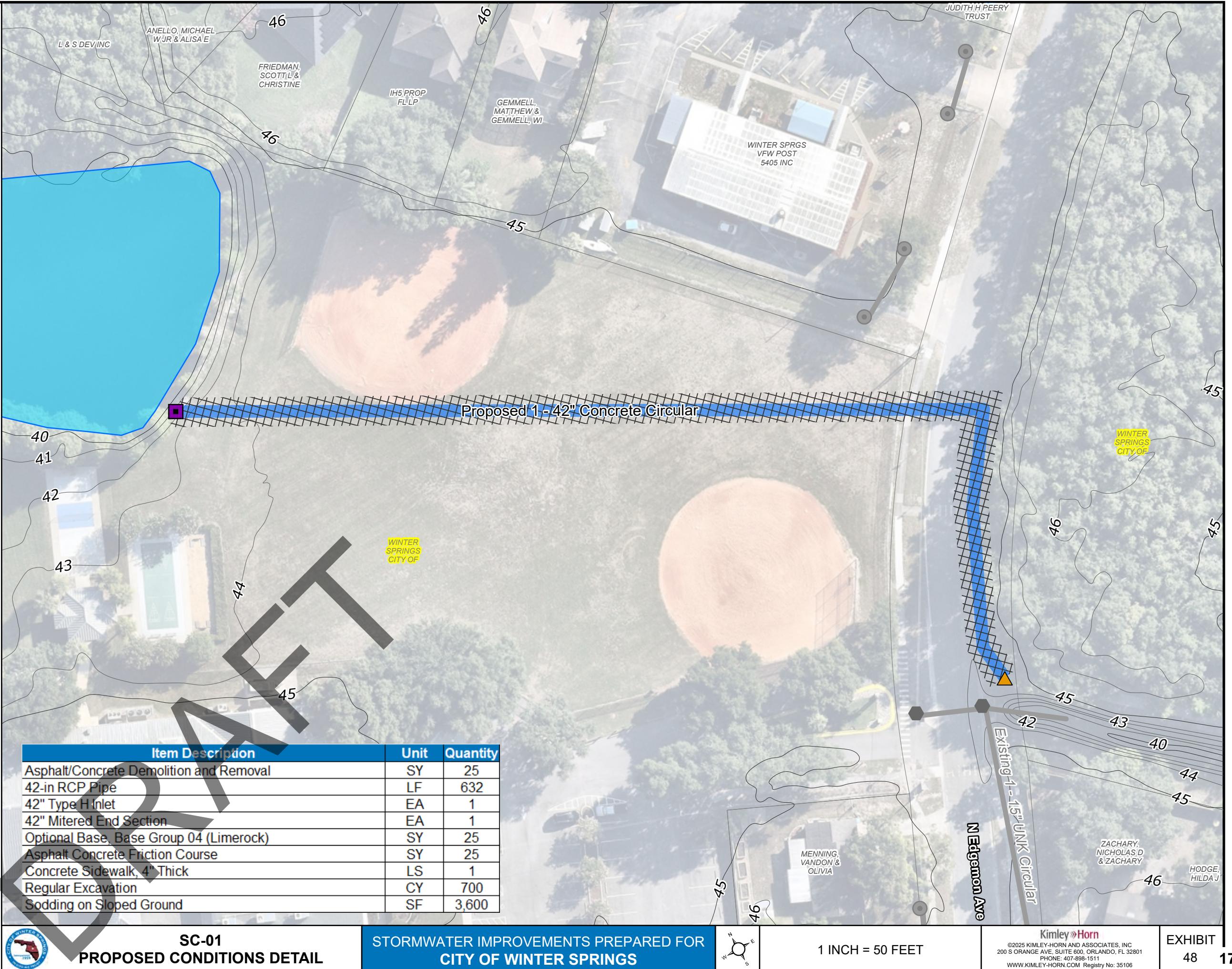
ALL EXISTING MODEL INFORMATION (BASINS, NODES, EXISTING LINKS) FROM SEMINOLE COUNTY WATERSHED MODELS DEVELOPED BY OTHERS AND REVIEWED BY KIMLEY-HORN WITH ADDED CHANGES.



Legend

- ▲ Proposed Mitered End Structure
- Proposed Pipe
- Proposed Headwall
- ☒ Excavate and Reconstruct Existing Stormwater Infrastructure
- Pipe Ends
- Ditch Bottom Inlets
- Pipes
- Ponds
- Parcels
- Major Contours (5')
- Minor Contours (1')

ALL EXISTING MODEL INFORMATION (BASINS, NODES, EXISTING LINKS) FROM SEMINOLE COUNTY WATERSHED MODELS DEVELOPED BY OTHERS AND REVIEWED BY KIMLEY-HORN WITH ADDED CHANGES.



APPENDIX B – ENGINEER’S OPINION OF PROBABLE COSTS

DRAFT

Table 1-1: Opinion of Conceptual Capital Cost
Project No. GC-01 - Alton Road Culvert & Reach Improvements

Item No.	Item Description	Unit	Quantity	Unit Cost	Capital Cost
1	Mobilization/ MOT (approx. 10%)	LS	1	\$45,000.00	\$45,000.00
2	Asphalt/Concrete Demolition and Removal	SY	50	\$45.00	\$2,250.00
3	Removal of Existing Drainage Structure (3 - 54")	SF	1,230	\$45.00	\$55,350.00
4	116" x 72" RCP Arch Pipe	LF	91	\$1,300.00	\$118,300.00
5	116" x 72" Concrete Headwall	EA	2	\$50,000.00	\$100,000.00
6	Optional Base, Base Group 04 (Limerock)	SY	50	\$44.00	\$2,200.00
7	Asphalt Concrete Friction Course	SY	50	\$230.00	\$11,500.00
8	Concrete Sidewalk, 4" Thick	LS	1	\$1,500.00	\$1,500.00
9	Clearing and Grubbing, Areas with Trees to Remain	AC	1.0	\$31,000.00	\$31,000.00
10	Wetland Mitigation	AC	1.0	\$91,000.00	\$91,000.00
11	Floating Turbidity Barrier	LF	500	\$15.00	\$7,500.00
12	Regular Excavation	CY	1,400	\$8.00	\$11,200.00
13	Rip-rap and Rock Lining Broken Stone, 18" Thick	TN	20	\$150.00	\$3,000.00
14	Sodding on Sloped Ground	SF	3,000	\$5.00	\$15,000.00
15	Utility Relocation	LS	1	\$50,000.00	\$50,000.00
					SUBTOTAL \$544,800.00
					Contingency: 30% \$163,400.00
					Survey 10% \$54,500.00
					Design/Consulting 25% \$136,200.00
					Permitting Lump Sum \$100,000.00
					OPINION OF CONCEPTUAL CAPITAL COST \$995,000.00

Rounded to the Nearest \$5,000

Opinions of Conceptual Capital Cost Notes:

1. Wetland mitigation cost = 0.7 UMAM * \$130,000 (state/federal credit) * acreage of wetland impacted.
2. This OPC does not include land acquisition, potential hazardous material or groundwater remediation, or any item not shown above.
3. The Consultant has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or overcompetitive bidding or market conditions. Opinions of probable costs provided herein are based on the information known to Consultant at this time and represent only the Consultant's judgment as a design professional familiar with the construction industry. The Consultant cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

Table 1-2: Opinion of Conceptual Capital Cost
Project No. GC-02 - Shore Road Culvert & Reach Improvements

Item No.	Item Description	Unit	Quantity	Unit Cost	Capital Cost
1	Mobilization/ MOT (approx. 10%)	LS	1	\$47,500.00	\$47,500.00
2	Asphalt/Concrete Demolition and Removal	SY	50	\$45.00	\$2,250.00
3	Removal of Existing Drainage Structure (3 - 54")	SF	1,210	\$45.00	\$54,450.00
4	116" x 72" RCP Arch Pipe	LF	89	\$1,300.00	\$115,700.00
5	116" x 72" Concrete Headwall	EA	2	\$50,000.00	\$100,000.00
6	Optional Base, Base Group 04 (Limerock)	SY	50	\$44.00	\$2,200.00
7	Asphalt Concrete Friction Course	SY	50	\$230.00	\$11,500.00
8	Concrete Sidewalk, 4" Thick	LS	1	\$1,500.00	\$1,500.00
9	Clearing and Grubbing, Areas with Trees to Remain	AC	1.2	\$31,000.00	\$37,200.00
10	Wetland Mitigation	AC	1.2	\$109,200.00	\$109,200.00
11	Floating Turbidity Barrier	LF	500	\$15.00	\$7,500.00
12	Regular Excavation	CY	1,900	\$8.00	\$15,200.00
13	Rip-rap and Rock Lining Broken Stone, 18" Thick	TN	20	\$150.00	\$3,000.00
14	Sodding on Sloped Ground	SF	3,000	\$5.00	\$15,000.00
14	Utility Relocation	LS	1	\$50,000.00	\$50,000.00
					SUBTOTAL \$572,200.00
					Contingency: 30% \$171,700.00
					Survey 10% \$57,200.00
					Design/Consulting 25% \$143,100.00
					Permitting Lump Sum \$100,000.00
					Land Acquisition See Notes \$116,000.00
					OPINION OF CONCEPTUAL CAPITAL COST \$1,160,000.00

Rounded to the Nearest \$5,000

Opinions of Conceptual Capital Cost Notes:

1. Wetland mitigation cost = 0.7 UMAM * \$130,000 (state/federal credit) * acreage of wetland impacted.
2. Land acquisition cost = Total land value of parcels in project area * 0.1. Land acquisition cost are an estimate and subject to market pricing and coordination with landowners for access.
3. This OPC does not include potential hazardous material or groundwater remediation, or any item not shown above.
4. The Consultant has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or overcompetitive bidding or market conditions. Opinions of probable costs provided herein are based on the information known to Consultant at this time and represent only the Consultant's judgment as a design professional familiar with the construction industry. The Consultant cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

**Table 1-3: Opinion of Conceptual Capital Cost
Project No. GC-03 - Hayes Road Culvert & Reach Improvements**

Item No.	Item Description	Unit	Quantity	Unit Cost	Capital Cost
1	Mobilization (approx. 10%)	LS	1	\$17,200.00	\$17,200.00
2	Clearing and Grubbing, Areas with Trees to Remain	AC	1.1	\$31,000.00	\$34,100.00
3	Wetland Mitigation	AC	1.0	\$100,100.00	\$100,100.00
4	Floating Turbidity Barrier	LF	500	\$15.00	\$7,500.00
5	Regular Excavation	CY	1,500	\$8.00	\$12,000.00
6	Rip-rap and Rock Lining Broken Stone, 18" Thick	TN	20	\$150.00	\$3,000.00
7	Sodding on Sloped Ground	SF	3,000	\$5.00	\$15,000.00
8	Utility Relocation	LS	1	\$50,000.00	\$50,000.00
SUBTOTAL					\$238,900.00
Contingency:					
30%					
Survey					
Lump Sum					
\$50,000.00					
Design/Consulting					
Lump Sum					
\$100,000.00					
Permitting					
Lump Sum					
\$100,000.00					
Land Acquisition					
See Notes					
\$88,000.00					

Rounded to the Nearest \$5,000

Opinions of Conceptual Capital Cost Notes:

1. Wetland mitigation cost = $0.7 \text{ UMAM} * \$130,000$ (state/federal credit) * acreage of wetland impacted.
2. Land acquisition cost = Total land value of parcels in project area * 0.1. Land acquisition cost are an estimate and subject to market pricing and coordination with landowners for access.
3. This OPC does not include potential hazardous material or groundwater remediation, or any item not shown above.
4. The Consultant has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or overcompetitive bidding or market conditions. Opinions of probable costs provided herein are based on the information known to Consultant at this time and represent only the Consultant's judgment as a design professional familiar with the construction industry. The Consultant cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

**Table 1-4: Opinion of Conceptual Capital Cost
Project No. GC-04 - Noname Creek Conveyance Improvements Near Alton Road**

Rounded to the Nearest \$5,000

Opinions of Conceptual Capital Cost Notes:

1. Wetland mitigation cost = $0.7 \text{ UMAM} * \$130,000 \text{ (state/federal credit)} * \text{acreage of wetland impacted.}$
2. Land acquisition cost = Total land value of parcels in project area * 0.1. Land acquisition cost are an estimate and subject to market pricing and coordination with landowners for access.
3. This OPC does not include potential hazardous material or groundwater remediation, or any item not shown above.
4. The Consultant has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or overcompetitive bidding or market conditions. Opinions of probable costs provided herein are based on the information known to Consultant at this time and represent only the Consultant's judgment as a design professional familiar with the construction industry. The Consultant cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

**Table 2-1: Opinion of Conceptual Capital Cost
Project No. HC-01 - Winter Springs Boulevard near Davenport Way Improvements**

Item No.	Item Description	Unit	Quantity	Unit Cost	Capital Cost
1	Mobilization/ MOT (approx. 10%)	LS	1	\$42,600.00	\$42,600.00
2	Asphalt/Concrete Demolition and Removal	SY	110	\$45.00	\$4,950.00
3	Removal of Existing Drainage Structure (2 - 36")	SF	1,500	\$45.00	\$67,500.00
4	Regular Excavation	CY	400	\$8.00	\$3,200.00
5	60" x 38" Elliptical RCP Pipe	LF	500	\$490.00	\$245,000.00
6	60" x 38" Elliptical Concrete Headwall	EA	4	\$14,000.00	\$56,000.00
7	Optional Base, Base Group 04 (Limerock)	SY	110	\$44.00	\$4,840.00
8	Asphalt Concrete Friction Course	SY	110	\$230.00	\$25,300.00
9	Concrete Sidewalk, 4" Thick	LS	1	\$2,000.00	\$2,000.00
10	Floating Turbidity Barrier	LF	500	\$15.00	\$7,500.00
11	Sodding on Sloped Ground	SF	1,900	\$5.00	\$9,500.00
12	Utility Relocation	LS	1	\$50,000.00	\$50,000.00
SUBTOTAL					\$518,390.00
Contingency: 30% \$155,500.00					
Survey Lump Sum \$50,000.00					
Design/Consulting 25% \$129,600.00					
Permitting Lump Sum \$50,000.00					
OPINION OF CONCEPTUAL CAPITAL COST \$900,000.00					
Rounded to the Nearest \$5,000					

Opinions of Conceptual Capital Cost Notes:

Options or Conceptual Capital Cost Notes:

1. This OPC does not include land acquisition, wetland mitigation, potential hazardous material or groundwater remediation, or any item not shown above.

above.

2. The Consultant has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or overcompetitive bidding or market conditions. Opinions of probable costs provided herein are based on the information known to Consultant at this time and represent only the Consultant's judgment as a design professional familiar with the construction industry. The Consultant cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

Table 2-2: Opinion of Conceptual Capital Cost
Project No. HC-02 - Vistawilla Drive Near Seneca Boulevard Improvements

Item No.	Item Description	Unit	Quantity	Unit Cost	Capital Cost
1	Mobilization/ MOT (approx. 10%)	LS	1	\$23,000.00	\$23,000.00
2	Asphalt/Concrete Demolition and Removal	SY	70	\$45.00	\$3,150.00
3	Removal of Existing Drainage Structure (2 - 24")	SF	320	\$45.00	\$14,400.00
4	Regular Excavation	CY	300	\$8.00	\$2,400.00
5	60" x 38" Elliptical RCP Pipe	LF	240	\$490.00	\$117,600.00
6	60" x 38" Elliptical Concrete Mitered End	EA	6	\$9,300.00	\$55,800.00
7	Optional Base, Base Group 04 (Limerock)	SY	70	\$44.00	\$3,080.00
8	Asphalt Concrete Friction Course	SY	70	\$230.00	\$16,100.00
9	Concrete Sidewalk, 4" Thick	LS	1	\$3,500.00	\$3,500.00
10	Floating Turbidity Barrier	LF	500	\$15.00	\$7,500.00
11	Sodding on Sloped Ground	SF	1,200	\$5.00	\$6,000.00
12	Utility Relocation	LS	1	\$50,000.00	\$50,000.00
SUBTOTAL					\$302,530.00
					Contingency: 30% \$90,800.00
					Survey 10% \$30,300.00
					Design/Consulting Lump Sum \$100,000.00
					Permitting Lump Sum \$50,000.00
					Land Acquisition See Notes \$28,000.00
					OPINION OF CONCEPTUAL CAPITAL COST \$600,000.00

Rounded to the Nearest \$5,000

Opinions of Conceptual Capital Cost Notes:

1. Land acquisition cost = Total land value of parcels in project area * 0.1. Land acquisition cost are an estimate and subject to market pricing and coordination with landowners for access.
2. This OPC does not include wetland mitigation, potential hazardous material or groundwater remediation, or any item not shown above.
3. The Consultant has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or overcompetitive bidding or market conditions. Opinions of probable costs provided herein are based on the information known to Consultant at this time and represent only the Consultant's judgment as a design professional familiar with the construction industry. The Consultant cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

**Table 3-1: Opinion of Conceptual Capital Cost
Project No. LJ-01 - North Tuskailla Road Outfall Improvements**

Opinions of Conceptual Capital Cost Notes: www.conceptualcapitalnotes.com

1. This OPC does not include land acquisition, wetland mitigation, potential hazardous material or groundwater remediation, or any item not shown above.
2. The Consultant has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or overcompetitive bidding or market conditions. Opinions of probable costs provided herein are based on the information known to Consultant at this time and represent only the Consultant's judgment as a design professional familiar with the construction industry. The Consultant cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

Table 4-1: Opinion of Conceptual Capital Cost
Project No. LLH-01 - Fisher Road Near Morton Lane Improvements

Item No.	Item Description	Unit	Quantity	Unit Cost	Capital Cost
1	Mobilization/ MOT (approx. 10%)	LS	1	\$5,200.00	\$5,200.00
2	Asphalt/Concrete Demolition and Removal	SY	60	\$45.00	\$2,700.00
3	24-in RCP Pipe	LF	120	\$125.00	\$15,000.00
4	Straight Concrete Endwalls, 24" Double	EA	2	\$6,000.00	\$12,000.00
5	Optional Base, Base Group 04 (Limerock)	SY	60	\$44.00	\$2,640.00
6	Asphalt Concrete Friction Course	SY	60	\$230.00	\$13,800.00
7	Concrete Sidewalk, 4" Thick	LS	1	\$1,500.00	\$1,500.00
8	Regular Excavation	CY	200	\$8.00	\$1,600.00
9	Sodding on Sloped Ground	SF	500	\$5.00	\$2,500.00
10	Utility Relocation	LS	1	\$50,000.00	\$50,000.00
				SUBTOTAL	\$106,940.00
				Contingency:	\$32,100.00
				Survey	\$10,700.00
				Design/Consulting	\$26,700.00
				Permitting	\$50,000.00
					OPINION OF CONCEPTUAL CAPITAL COST
					\$225,000.00

Rounded to the Nearest \$5,000

Opinions of Conceptual Capital Cost Notes:

1. This OPC does not include land acquisition, wetland mitigation, potential hazardous material or groundwater remediation, or any item not shown above.
2. The Consultant has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or overcompetitive bidding or market conditions. Opinions of probable costs provided herein are based on the information known to Consultant at this time and represent only the Consultant's judgment as a design professional familiar with the construction industry. The Consultant cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

Table 4-2: Opinion of Conceptual Capital Cost
Project No. LLH-02 - Chokecherry Drive Near Sapling Drive Improvements

Item No.	Item Description	Unit	Quantity	Unit Cost	Capital Cost
1	Mobilization/ MOT (approx. 10%)	LS	1	\$5,500.00	\$5,500.00
2	Asphalt/Concrete Demolition and Removal	SY	60	\$45.00	\$2,700.00
3	24-in RCP Pipe	LF	130	\$125.00	\$16,250.00
4	Straight Concrete Headwalls, 24" Double	EA	2	\$6,000.00	\$12,000.00
5	Optional Base, Base Group 04 (Limerock)	SY	60	\$44.00	\$2,640.00
6	Asphalt Concrete Friction Course	SY	60	\$230.00	\$13,800.00
7	Concrete Sidewalk, 4" Thick	LS	1	\$1,500.00	\$1,500.00
8	Regular Excavation	CY	200	\$8.00	\$1,600.00
9	Sodding on Sloped Ground	SF	1,000	\$5.00	\$5,000.00
10	Utility Relocation	LS	1	\$50,000.00	\$50,000.00
				SUBTOTAL	\$110,990.00
				Contingency:	30% \$33,300.00
				Survey	Lump Sum \$25,000.00
				Design/Consulting	25% \$27,700.00
				Permitting	Lump Sum \$50,000.00
				Land Acquisition	See Notes \$18,000.00
				OPINION OF CONCEPTUAL CAPITAL COST	
				\$260,000.00	

Rounded to the Nearest \$5,000

Opinions of Conceptual Capital Cost Notes:

1. Land acquisition cost = Total land value of parcels in project area * 0.1. Land acquisition cost are an estimate and subject to market pricing and coordination with landowners for access.
2. This OPC does not include wetland mitigation, potential hazardous material or groundwater remediation, or any item not shown above.
3. The Consultant has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or overcompetitive bidding or market conditions. Opinions of probable costs provided herein are based on the information known to Consultant at this time and represent only the Consultant's judgment as a design professional familiar with the construction industry. The Consultant cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

**Table 4-3: Opinion of Conceptual Capital Cost
Project No. LLH-03 - Winter Springs Boulevard Near Chokecherry Drive Improvements**

Item No.	Item Description	Unit	Quantity	Unit Cost	Capital Cost
1	Mobilization/ MOT (approx. 10%)	LS	1	\$17,900.00	\$17,900.00
2	Asphalt/Concrete Demolition and Removal	SY	70	\$45.00	\$3,150.00
3	48-in RCP Pipe	LF	164	\$490.00	\$80,360.00
4	Straight Concrete Headwalls, 48" Double	EA	2	\$25,000.00	\$50,000.00
5	Add Manholes for Existing Stormwater Pipes Parallel to Road	EA	2	\$9,000.00	\$18,000.00
6	Optional Base, Base Group 04 (Limerock)	SY	70	\$44.00	\$3,080.00
7	Asphalt Concrete Friction Course	SY	70	\$230.00	\$16,100.00
8	Concrete Sidewalk, 4" Thick	LS	1	\$1,500.00	\$1,500.00
9	Regular Excavation	CY	300	\$8.00	\$2,400.00
10	Sodding on Sloped Ground	SF	900	\$5.00	\$4,500.00
11	Utility Relocation	LS	1	\$150,000.00	\$150,000.00
					SUBTOTAL \$346,990.00
					Contingency: 30% \$104,100.00
					Survey 10% \$34,700.00
					Design/Consulting 25% \$86,700.00
					Permitting Lump Sum \$50,000.00
					Land Acquisition See Notes \$27,000.00
					OPINION OF CONCEPTUAL CAPITAL COST \$645,000.00

Rounded to the Nearest \$5,000

Opinions of Conceptual Capital Cost Notes:

1. Land acquisition cost = Total land value of parcels in project area * 0.1. Land acquisition cost are an estimate and subject to market pricing and coordination with landowners for access.
2. This OPC does not include wetland mitigation, potential hazardous material or groundwater remediation, or any item not shown above.
3. The Consultant has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or overcompetitive bidding or market conditions. Opinions of probable costs provided herein are based on the information known to Consultant at this time and represent only the Consultant's judgment as a design professional familiar with the construction industry. The Consultant cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

Table 4-4: Opinion of Conceptual Capital Cost
Project No. LLH-04 - Dunmar Estates Flow Path Re-Establishment

Item No.	Item Description	Unit	Quantity	Unit Cost	Capital Cost
1	Mobilization (approx. 10%)	LS	1	\$24,400.00	\$24,400.00
2	Clearing and Grubbing, Areas with Trees to Remain	AC	1.0	\$31,000.00	\$31,000.00
3	Wetland Mitigation	AC	1.0	\$91,000.00	\$91,000.00
4	Removal Trees	EA	30	\$1,800.00	\$54,000.00
5	Floating Turbidity Barrier	LF	500	\$15.00	\$7,500.00
6	Regular Excavation	CY	4,000	\$8.00	\$32,000.00
7	Rip-rap and Rock Lining Broken Stone, 18" Thick	TN	20	\$150.00	\$3,000.00
8	Sodding on Sloped Ground	SF	5,000	\$5.00	\$25,000.00
9	Utility Relocation	LS	1	\$50,000.00	\$50,000.00
SUBTOTAL					\$317,900.00
					Contingency: 30% \$95,400.00
					Survey 10% \$31,800.00
					Design/Consulting 25% \$79,500.00
					Permitting Lump Sum \$100,000.00
					Land Acquisition See Notes \$222,000.00
					OPINION OF CONCEPTUAL CAPITAL COST \$845,000.00

Rounded to the Nearest \$5,000

Opinions of Conceptual Capital Cost Notes:

1. Wetland mitigation cost = 0.7 UMAM * \$130,000 (state/federal credit) * acreage of wetland impacted.
2. Land acquisition cost = Total land value of parcels in project area * 0.1. Land acquisition cost are an estimate and subject to market pricing and coordination with landowners for access.
3. This OPC does not include potential hazardous material or groundwater remediation, or any item not shown above.
4. The Consultant has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or overcompetitive bidding or market conditions. Opinions of probable costs provided herein are based on the information known to Consultant at this time and represent only the Consultant's judgment as a design professional familiar with the construction industry. The Consultant cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

Table 5-1: Opinion of Conceptual Capital Cost
Project No. SC-01 - Highland Village Storage & Conveyance Improvements

Item No.	Item Description	Unit	Quantity	Unit Cost	Capital Cost
1	Mobilization/ MOT (approx. 10%)	LS	1	\$23,100.00	\$23,100.00
2	Asphalt/Concrete Demolition and Removal	SY	25	\$45.00	\$1,125.00
3	42-in RCP Pipe	LF	632	\$280.00	\$176,960.00
4	42" Type H Inlet	EA	1	\$12,200.00	\$12,200.00
5	42" Mitered End Section	EA	1	\$8,400.00	\$8,400.00
6	Optional Base, Base Group 04 (Limerock)	SY	25	\$44.00	\$1,100.00
7	Asphalt Concrete Friction Course	SY	25	\$230.00	\$5,750.00
8	Concrete Sidewalk, 4" Thick	LS	1	\$1,500.00	\$1,500.00
9	Regular Excavation	CY	700	\$8.00	\$5,600.00
10	Sodding on Sloped Ground	SF	3,600	\$5.00	\$18,000.00
11	Utility Relocation	LS	1	\$50,000.00	\$50,000.00
SUBTOTAL					\$303,700.00
					Contingency: 30% \$91,100.00
					Survey 10% \$30,400.00
					Design/Consulting 25% \$75,900.00
					Permitting Lump Sum \$50,000.00
					OPINION OF CONCEPTUAL CAPITAL COST \$550,000.00

Rounded to the Nearest \$5,000

Opinions of Conceptual Capital Cost Notes:

1. This OPC does not include land acquisition, wetland mitigation, potential hazardous material or groundwater remediation, or any item not shown above.
2. The Consultant has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or overcompetitive bidding or market conditions. Opinions of probable costs provided herein are based on the information known to Consultant at this time and represent only the Consultant's judgment as a design professional familiar with the construction industry. The Consultant cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

APPENDIX C – HOWELL CREEK WATERSHED MODEL TECHNICAL MEMORANDUM

DRAFT

Howell Creek Watershed Model Technical Memorandum

Howell Creek Model Revisions

The Howell Creek Watershed model (ECM, developed by others) received was prepared using Stormwise v4.08.03. Unlike the other four models, it was determined that additional detail was required to update this model within the City limits based on the scale of the effective model. An extensive review of the model was done to ensure the model portrayed existing drainage conditions within the City. This review resulted in the creation of a revised existing conditions model (RECM) with significant changes from the ECM.

Notable revisions were made to the ECM to improve the accuracy of the hydrologic input within the City of Winter Springs. Updates included basin configuration updates, refinement of channel geometry, and modification of Manning's n values to better reflect on-site conditions observed through LiDAR data, GIS data atlas, and aerial imagery. See the below paragraphs for a list of changes made. Note the ECM refers to what was developed by others, and the RECM are the changes made as part of this report.

Hydrologic Inputs and Channel Geometry Modifications Overview

Simple Basin Adjustments

The model received defined hydrologic inputs by simple basins. Each simple basin was connected to a node within the basin. Six simple basins within the City of Winter Springs were moved in the RECM to connect to the most upstream node within a basin to establish a more representative flow at the upstream side of creek crossings.

Channel Length Revisions

Channel alignments along Howell Creek and Bear Creek Gulley were redrawn to capture all meanders. This refinement resulted in approximately 10,000 additional feet of channel length in the RECM within the City of Winter Springs boundary.

Weir Invert Updates

Weir invert elevations were adjusted including at road and bridge crossings based on FGIO LiDAR (NAVD88) data within the City of Winter Springs Boundary.

Cross Section Modifications

Cross sections at bridge and road crossings were revised to include a lid at the top of the berm. Channels lacking a full floodway extent in the ECM were redrawn based on FGIO Lidar (NAVD88) data.

Manning's n Value Revisions

Manning's "n" values were reviewed for channel links within the City. Values in the Seminole County model were generally higher than typical Manning's "n" values for comparable channel conditions. Channel conditions were established based on aerial photos, on-ground photos collected as part of the GIS atlas, and the FEMA FIS for Seminole County. Manning's "n" values were determined in accordance with the methodology established by Chow (1959). **Table 1** below shows Manning's n conditions in the ECM and RECM

Table 1: Manning's n Revisions

Reach/Location	Channel Manning's n		Bridge Overbank Manning's n		Channel Overbank Manning's n	
	ECM	RECM	ECM	RECM	ECM	RECM
Outfall to Lake Jesup, downstream of SR 434 – Howell Creek	0.10 – 0.20	0.075 – 0.081 (medium to dense brush)	N/a	N/a	0.30	0.20 (dense forest)
Between SR 434 and Tuscarilla Country Club – Howell Creek	0.08 – 0.10	0.04 – 0.046 (light brush and trees)	0.12	0.12 (dense forest)	0.30	0.20 (dense forest)
Tuscarilla Country Club – Howell Creek	0.08 – 0.10	0.04 – 0.046 (light brush and trees)	0.12	0.06 – 0.12 (short grass to dense forest)	0.30	0.20 (dense forest)
South of Tuscarilla Country Club – Howell Creek	0.08 – 0.10	0.04 (light brush and trees)	0.12	0.20 (dense forest)	0.30	0.20 (dense forest)
Bear Creek Gully	0.05 – 0.10	0.04 – 0.046 (light brush and trees)	0.12	0.20 (dense forest)	0.10 – 0.30	0.15 – 0.20 (dense vegetation to dense forest)

Hydraulic Structure and Basin Configuration Revisions

State Road 434 Crossing:

- The ECM represented the crossing with a 40-foot-wide open cross section. Field verification and GIS data confirmed this structure as four (8 feet \times 10 feet) concrete box culverts, which were added to the revised model.
- A bridge crossing under SR 434 that was omitted in the ECM was incorporated as a weir link in the RECM.

Basin BGC-009a – Vistawilla Drive Crossing:

- Basin redrawn to align with Vistawilla Drive for improved hydrologic accuracy. Curve number and storage were recalculated based on new area in RECM.

Basin BGC-009b – Eagles Watch Neighborhood:

- The ECM lacked a connection to Basin BGC-009a. The revised conditions model added a weir to accurately measure flow within Basin BGC-009a.

Basin BGC-008 – Tuscarilla Country Club:

- The ECM routed flow to the Winter Springs Boulevard crossing, which outfalls to Bear Creek. The ECM ignored the outfall to Howell Creek under Greenbriar Lane by a 48-inch RCP. The RECM incorporated these changes.
- The existing conditions basin was divided into two in the RECM. Storage volumes were updated for these areas.

Basin HC-007 – West of Howell Creek and in between the Winter Springs Blvd and Wolverine Trl:

- The pond between Antelope Trail and Ermine Avenue in the existing conditions model ignored a 30-inch RCP to 36-inch RCP into Howell Creek per GIS Atlas data. This change was included in the RECM.

Basin HC-010 – West of Howell Creek in between the Howell Creek Trestle Trail and Winter Springs Blvd:

- The wetland between Tuscora Drive and Benitawood Court in the ECM included a weir outfall to Northern Way. The weir cross section span was expanded and lowered the weir invert based on the FGIO LiDAR (NAVD 88) data.
- An undrain system consisting of a 42-inch RCP leading to a 48-inch RCP discharging into Howell Creek was located through the GIS atlas and included in the RECM.
- An additional weir was included to allow discharge through the Howell Creek Trestle Trail into Howell Creek in the RECM.

Conclusion

The Howell Creek Watershed model required extensive modifications in existing conditions to accurately represent existing drainage conditions within the City for the purpose of analyzing proposed Pls. A RECM was developed to add the details necessary to accurately model Pls. A future project will address remaining areas of the Howell Creek Watershed model needing further refinement within the City.

DRAFT

APPENDIX D – FEMA FIRMS

DRAFT

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The community map repository should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where Base Flood Elevations (BFEs) and/or floodways have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The projection used in the preparation of this map was State Plane Florida East FIPS Zone 0901. The horizontal datum was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referred to the same vertical datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at <http://www.ngs.noaa.gov/> or contact the National Geodetic Survey at the following address:

Spatial Reference System Division
National Geodetic Survey, NOAA
Silver Spring Metro Center
1315 East-West Highway
Silver Spring, Maryland 20910
(301) 733-3191

To obtain current elevation, description, and/or location information for bench marks shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242 or visit its website at <http://www.ngs.noaa.gov/>.

Base map information shown on this FIRM was provided in digital format by Seminole County, Florida. This information was photographically compiled at a scale of 1:12,000 from aerial photography dated March 2004.

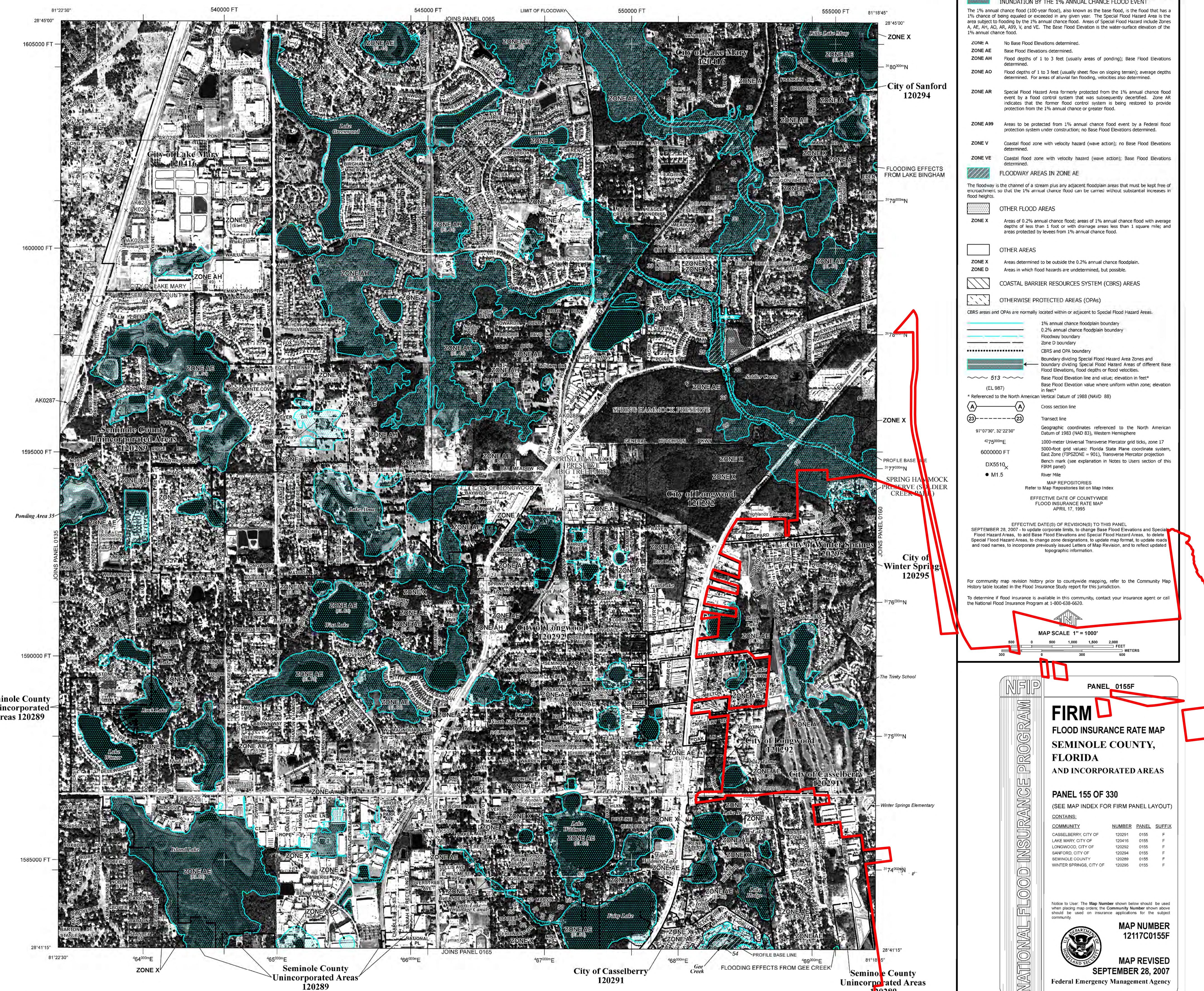
This map reflects more detailed and up-to-date stream channel configurations than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed Map Index for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the FEMA Map Service Center at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at <http://www.msfc.fema.gov/>.

If you have questions about this map or questions concerning the National Flood Insurance Program in general, please call 1-877-FEMA MAP (1-877-336-2627) or visit the FEMA website at <http://www.fema.gov/>.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD EVENT

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A No Base Flood Elevations determined.
ZONE AE Base Flood Elevations determined.
ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of interval fan flooding, velocities determined.

ZONE AR Special Flood Hazard Area formerly protected from the 1% annual chance flood event by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.

ZONE A99 Areas to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no Base Flood Elevations determined.

ZONE V Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODING EFFECTS FROM LAKE BINGHAM
FLOODING AREAS IN ZONE AE
The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS
ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS
ZONE X Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCE SYSTEM (CBRS) AREAS
OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% annual chance floodplain boundary
0.2% annual chance floodplain boundary
Floodway boundary
Zone D boundary

***** CBRS and OPA boundary
Boundary dividing Special Flood Hazard Area Zones and bounding specific Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.

513 (EL 987)
Base Flood Elevation line and value; elevation in feet*
Base Flood Elevation value where uniform within zone; elevation in feet**

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)
** Referenced to the North American Vertical Datum of 1929 (NAVD 29)

(A) Cross section line
(23) Transect line
Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere

1000-meter Universal Transverse Mercator grid ticks, zone 17
5000-foot grid values; Florida State Plane coordinate system, East Zone (FTPSZONE = 901), Transverse Mercator projection

Bench mark (see explanation in Notes to Users section of this FIRM panel)

DX5510 River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

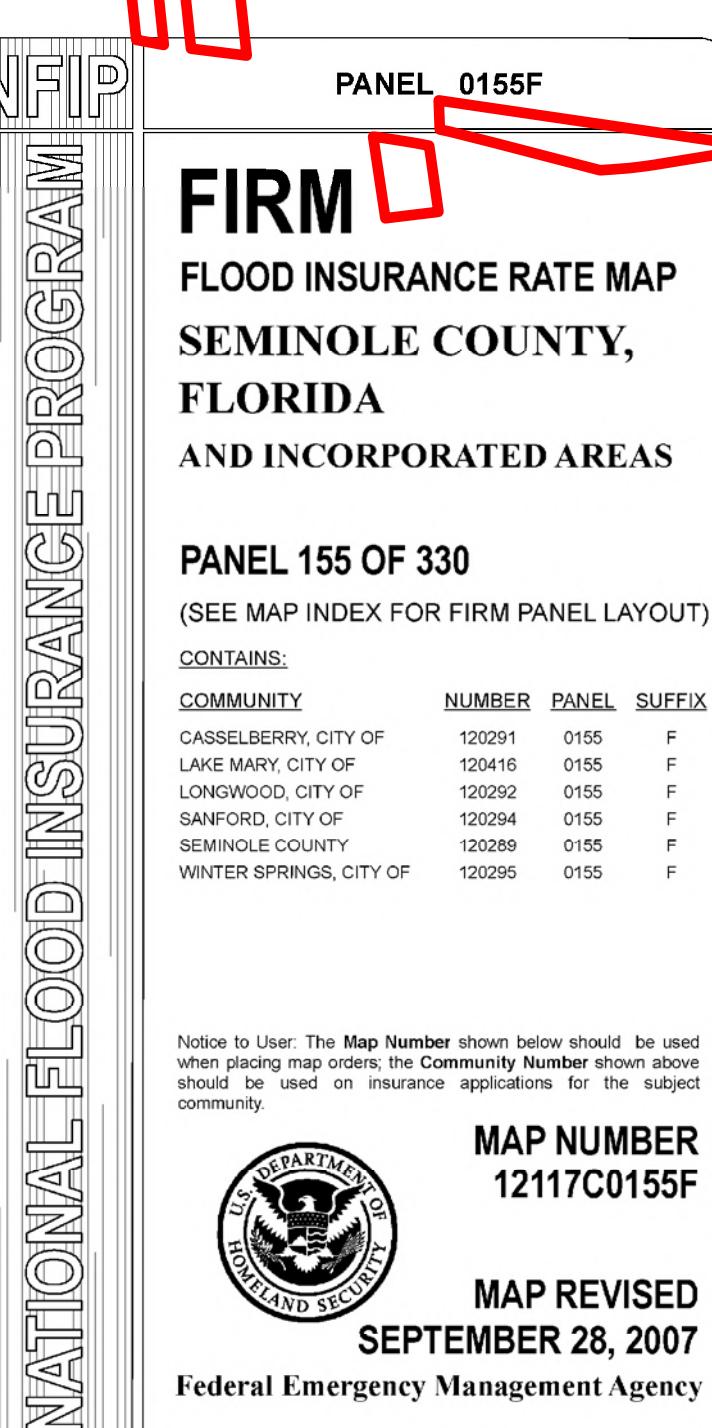
EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP APRIL 17, 1994

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
SEPTEMBER 28, 2007, to update the 1% annual chance Base Flood Elevations and Special Flood Hazard Areas, to add Base Flood Elevations and Special Flood Hazard Areas, to delete Special Flood Hazard Areas, to change zone designations, to update map format, to update roads and road names, to incorporate previously issued Letters of Map Revision, and to reflect updated topographic information.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

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

MAP SCALE 1" = 1000'
500 0 500 1,000 1,500 2,000 FEET
300 0 300 METERS



NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The community map repository should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where Base Flood Elevations (BFEs) and/or floodways have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that the BFEs in this FIRM are rounded to the nearest foot elevation. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydrologic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The projection used in the preparation of this map was State Plane Florida East FIPS Zone 0901. The horizontal datum was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection and UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be converted to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at <http://www.ngs.noaa.gov/> or contact the National Geodetic Survey at the following address:

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National Geodetic Survey, NOAA
Silver Spring Metro Center
1315 East-West Highway
Silver Spring, Maryland 20910
(301) 713-3191

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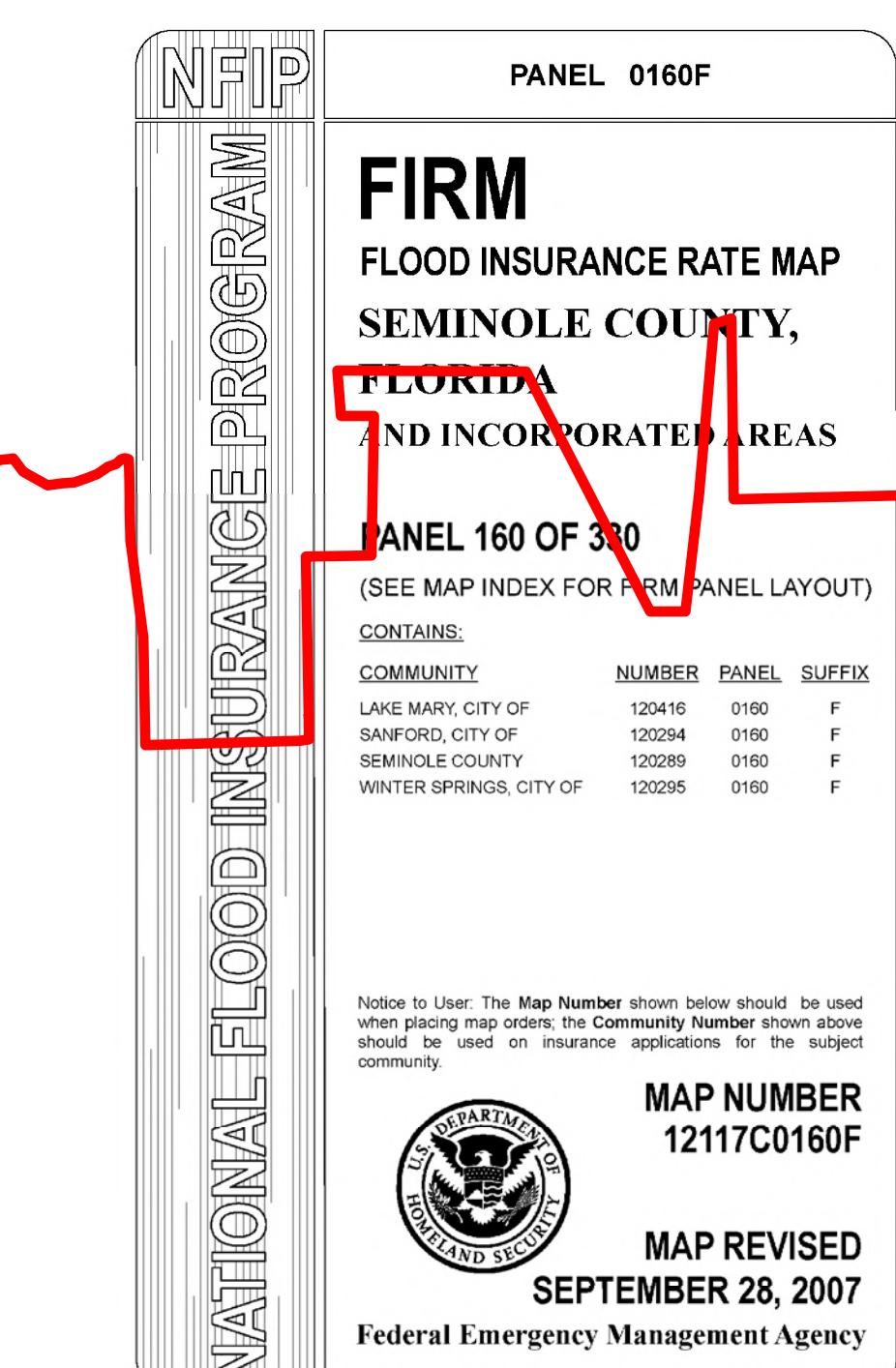
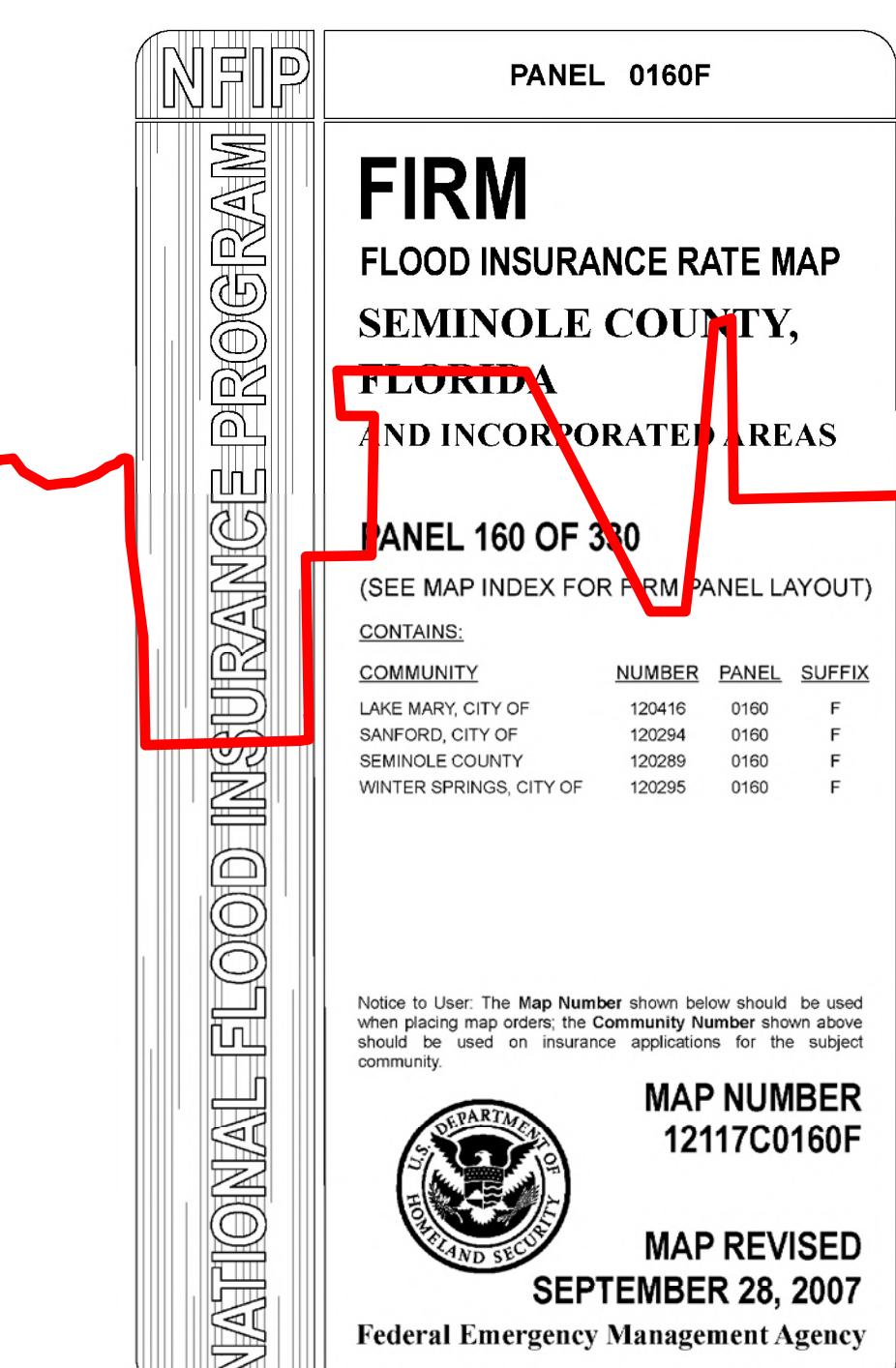
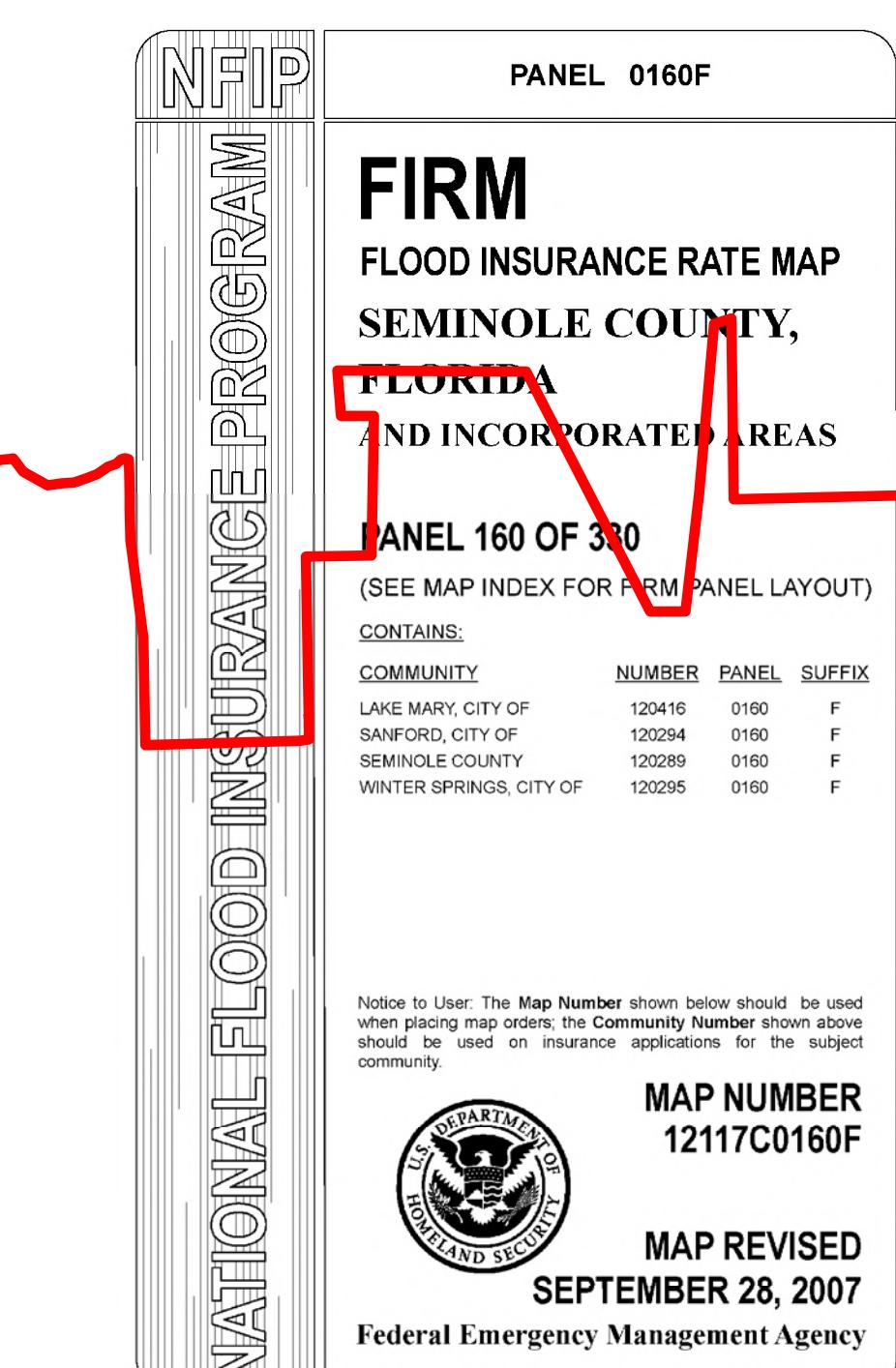
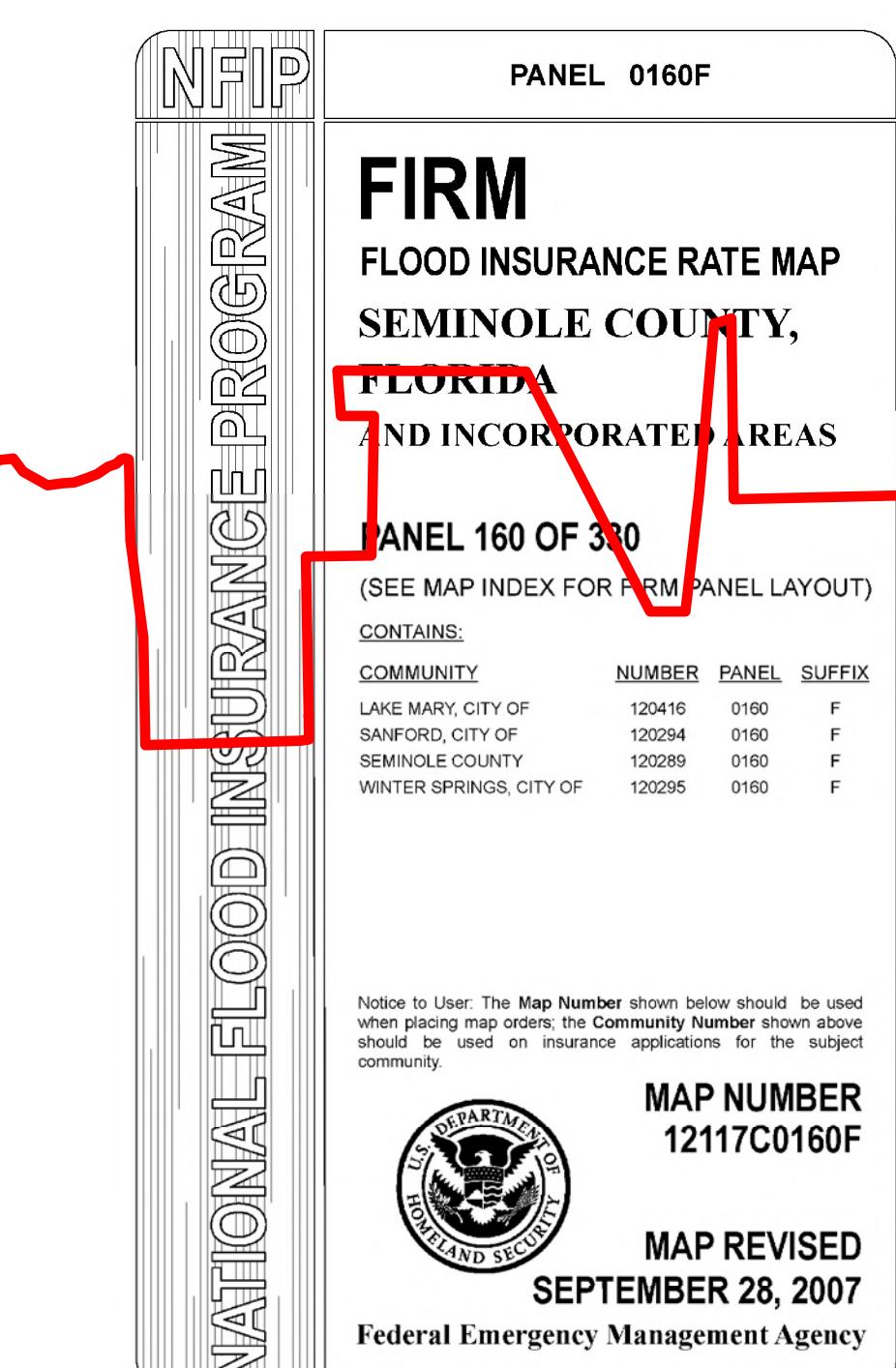
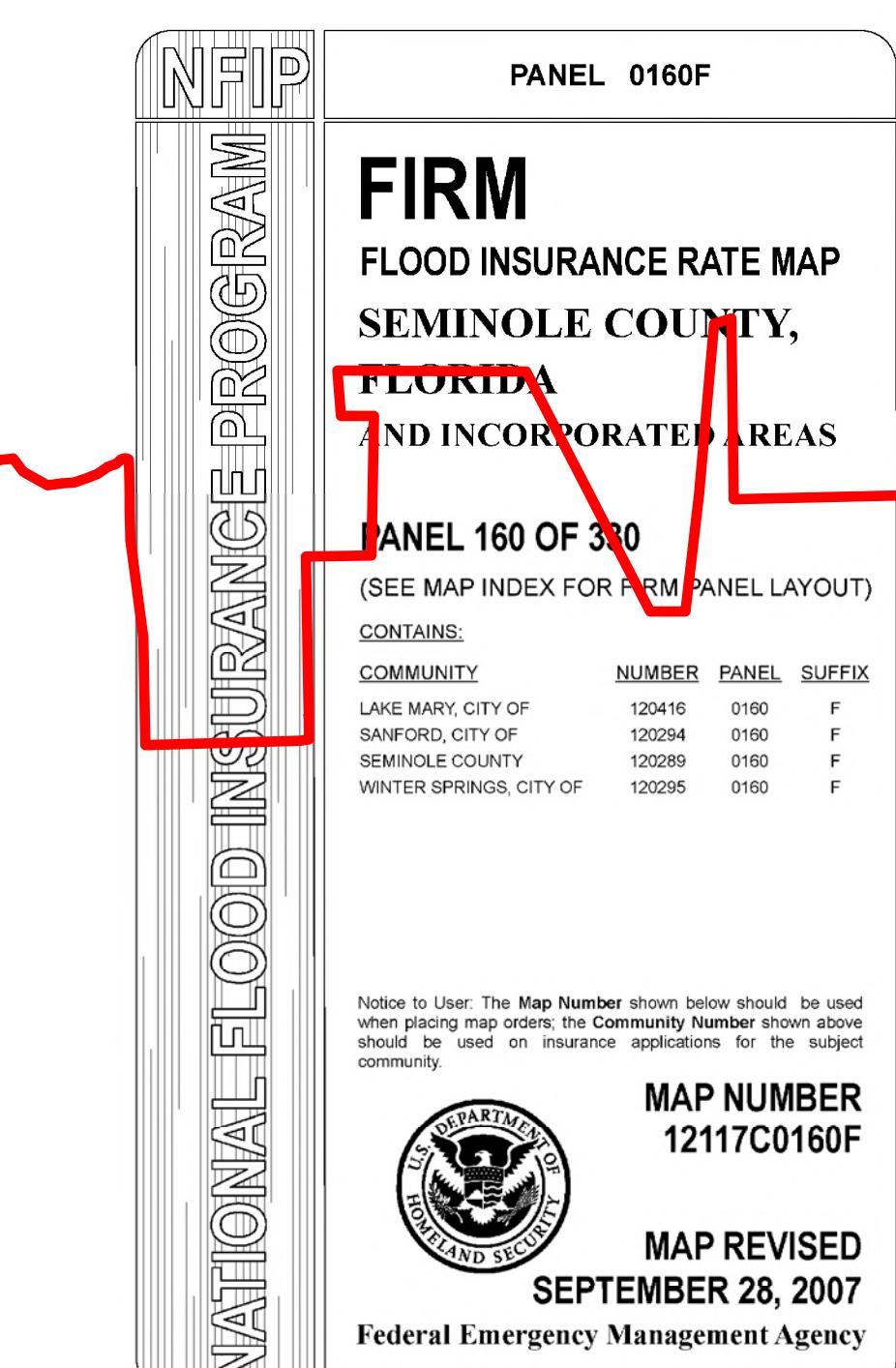
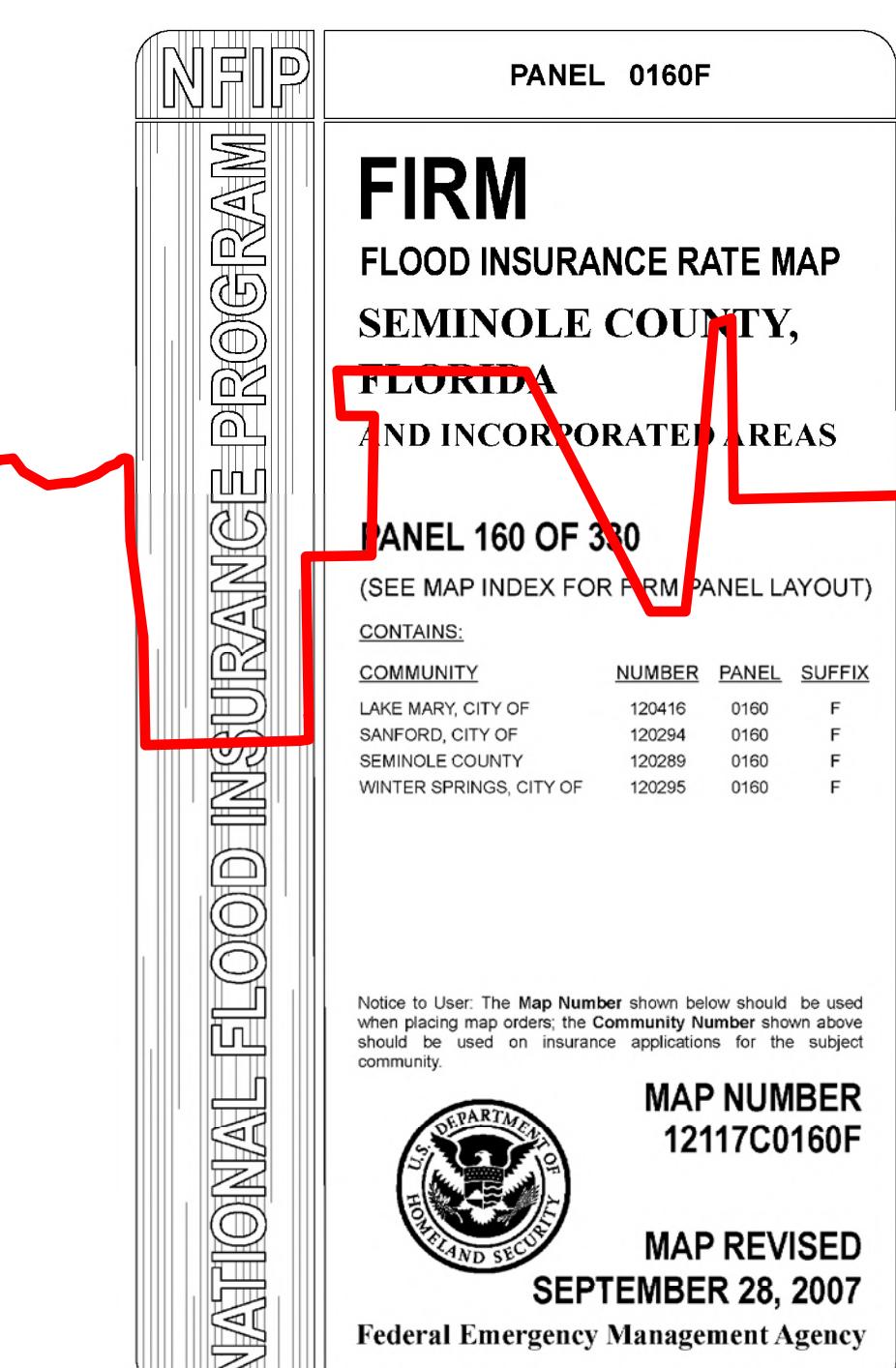
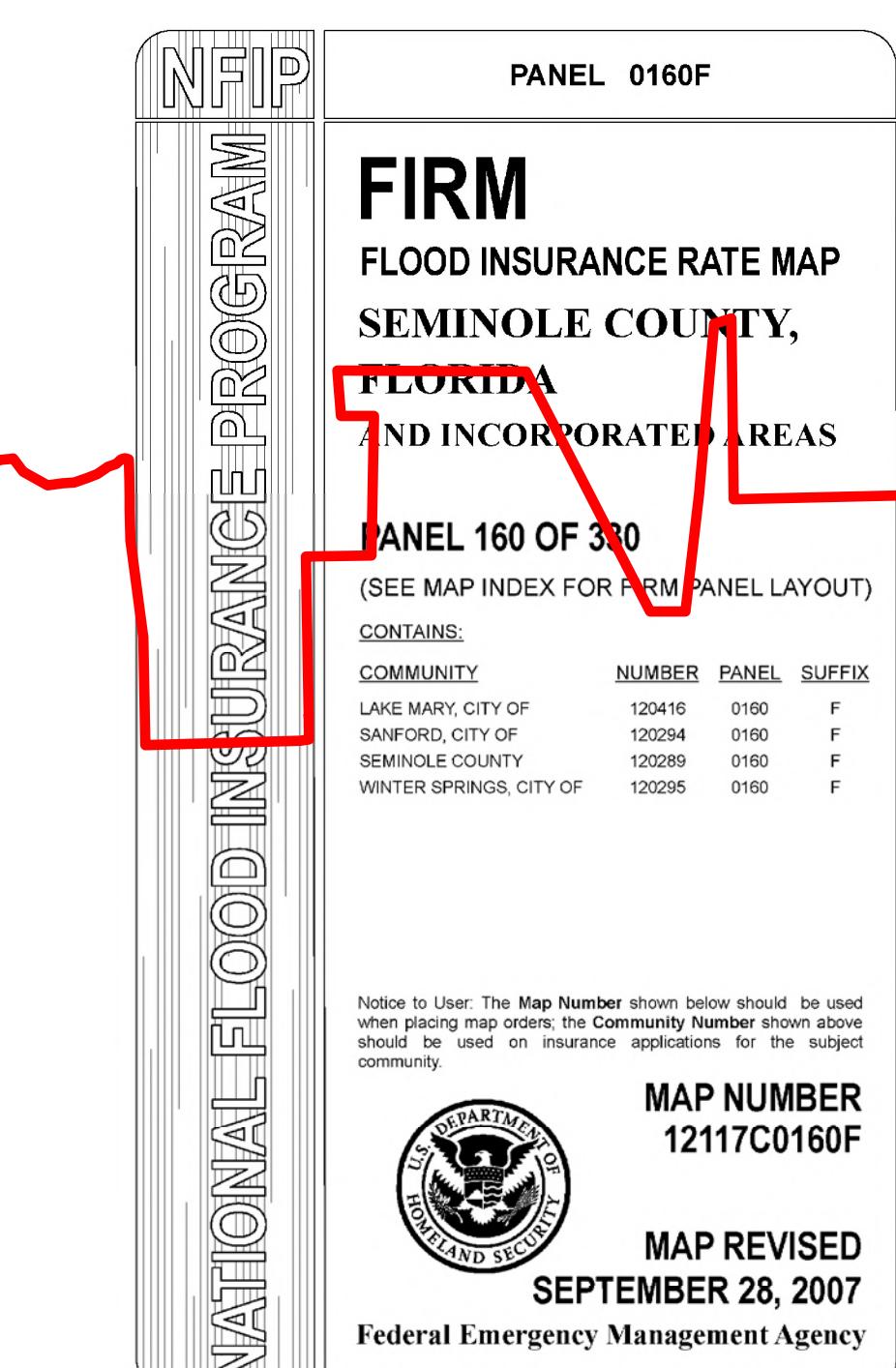
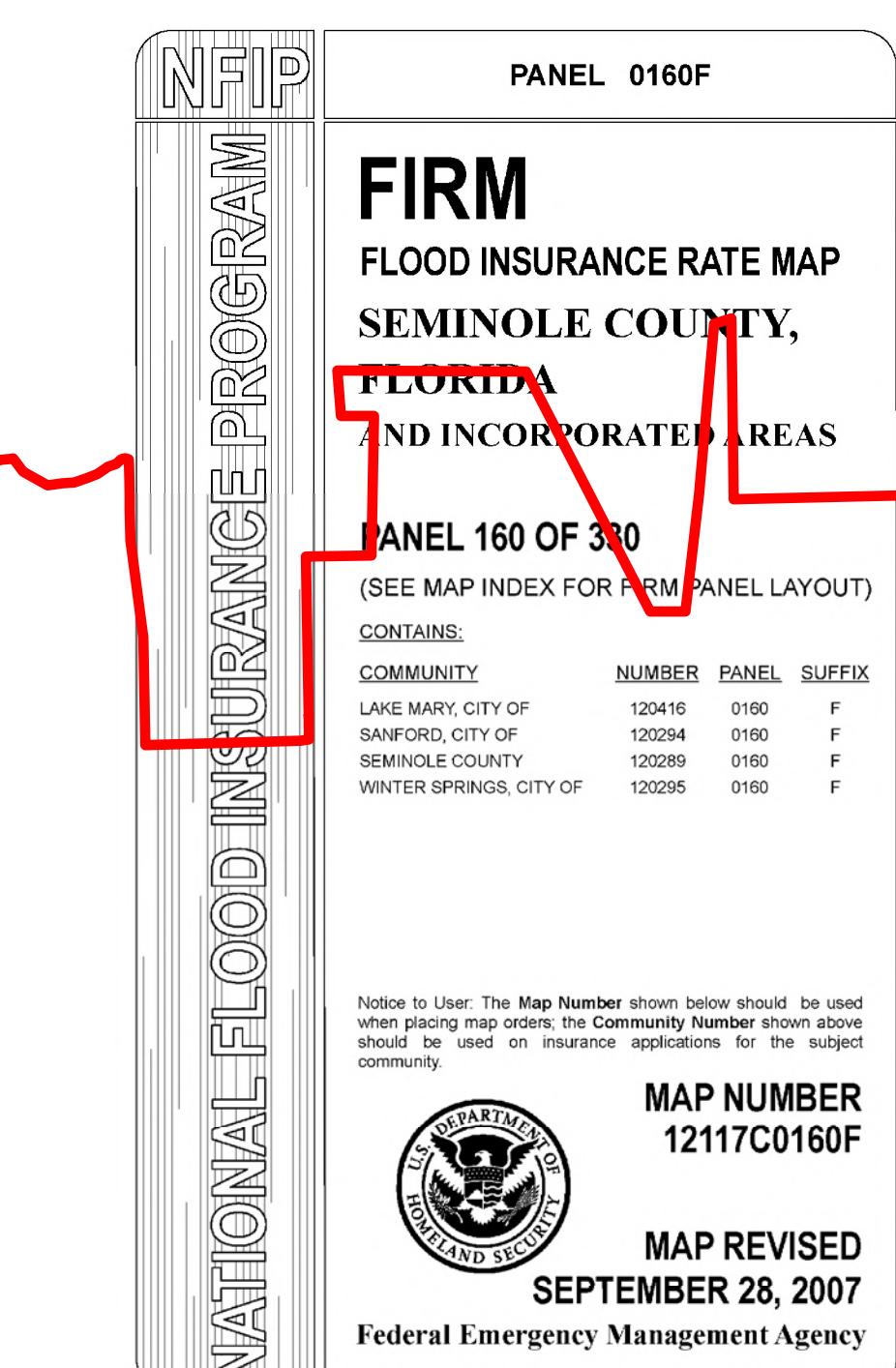
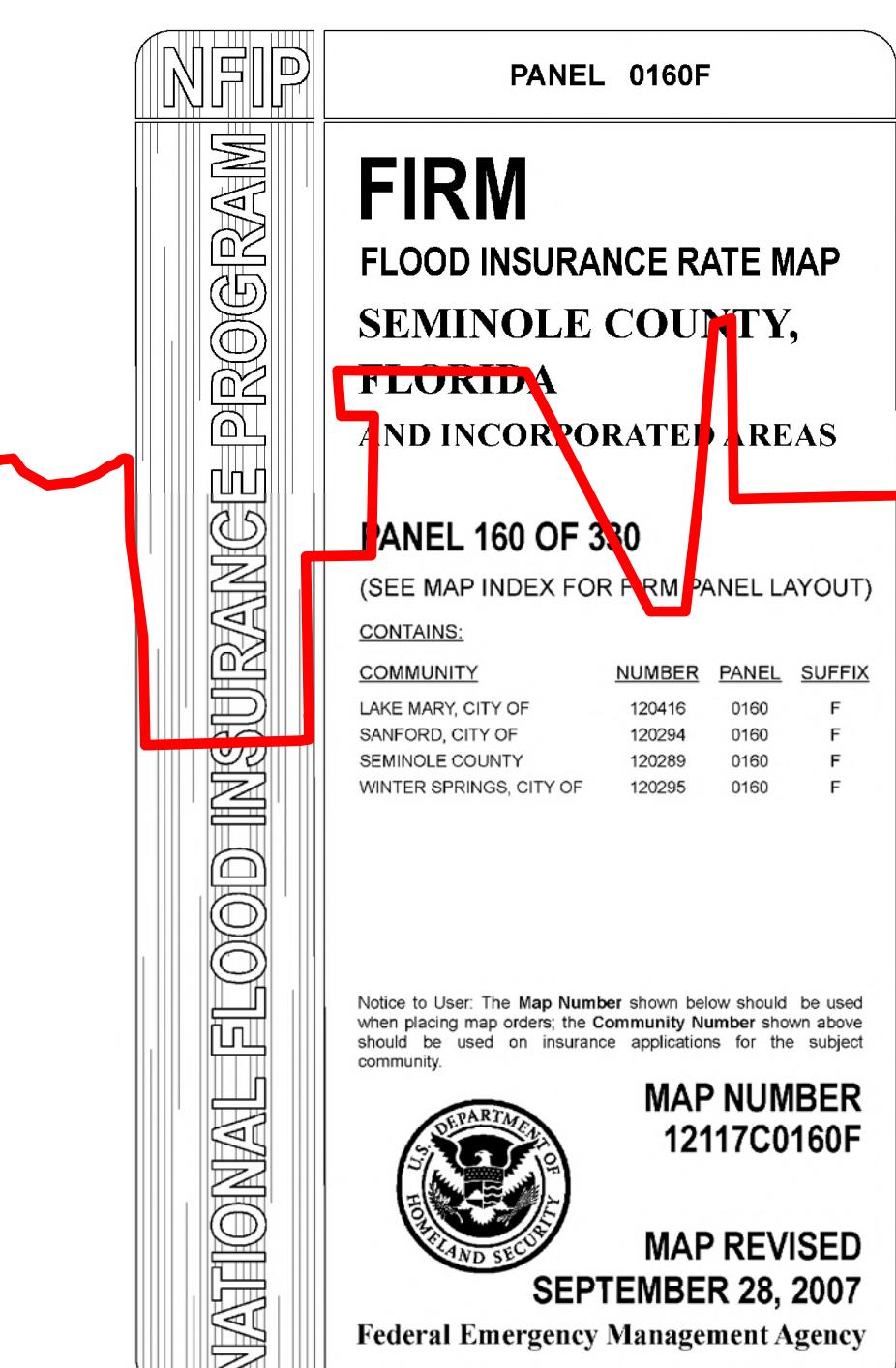
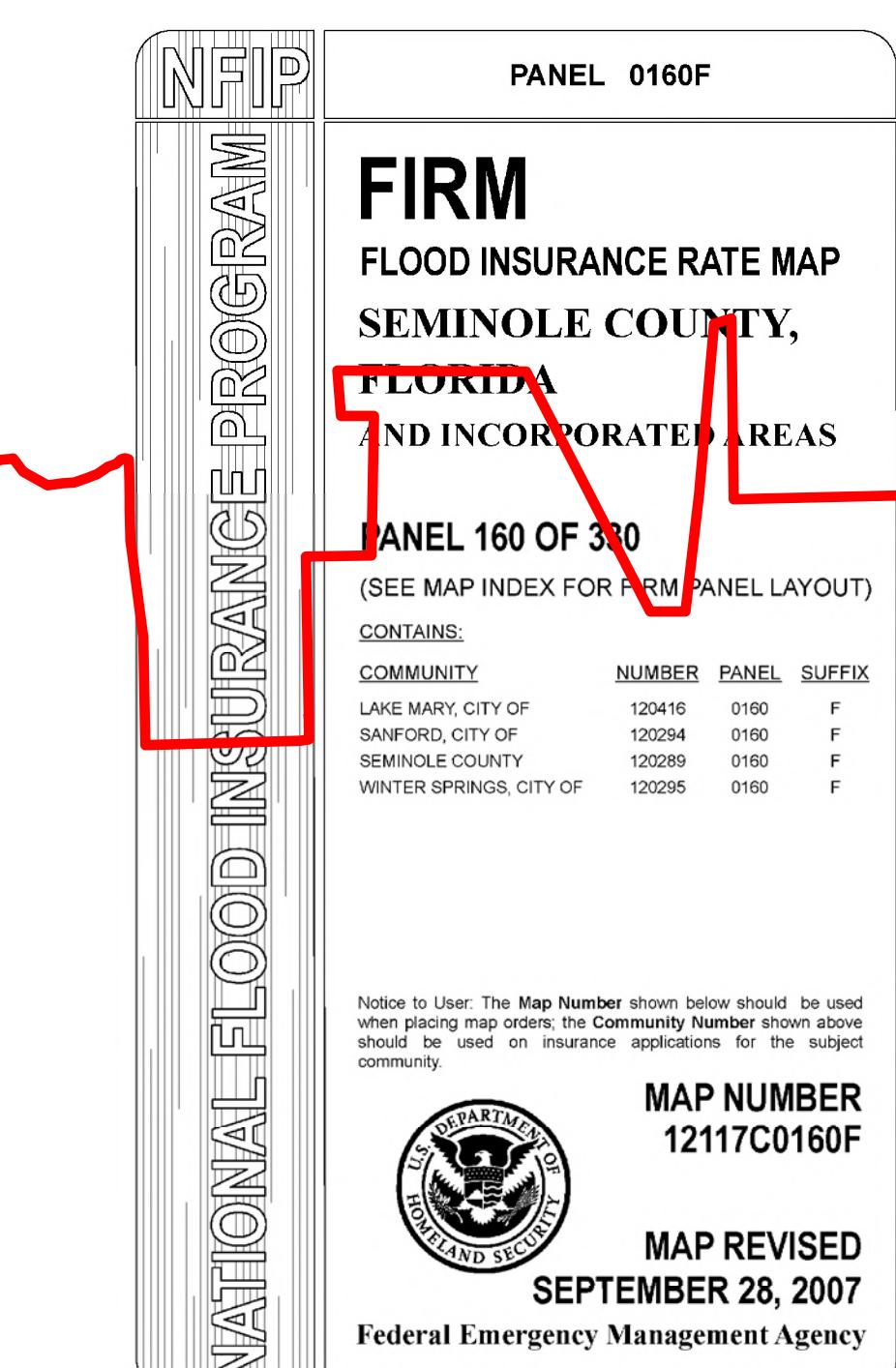
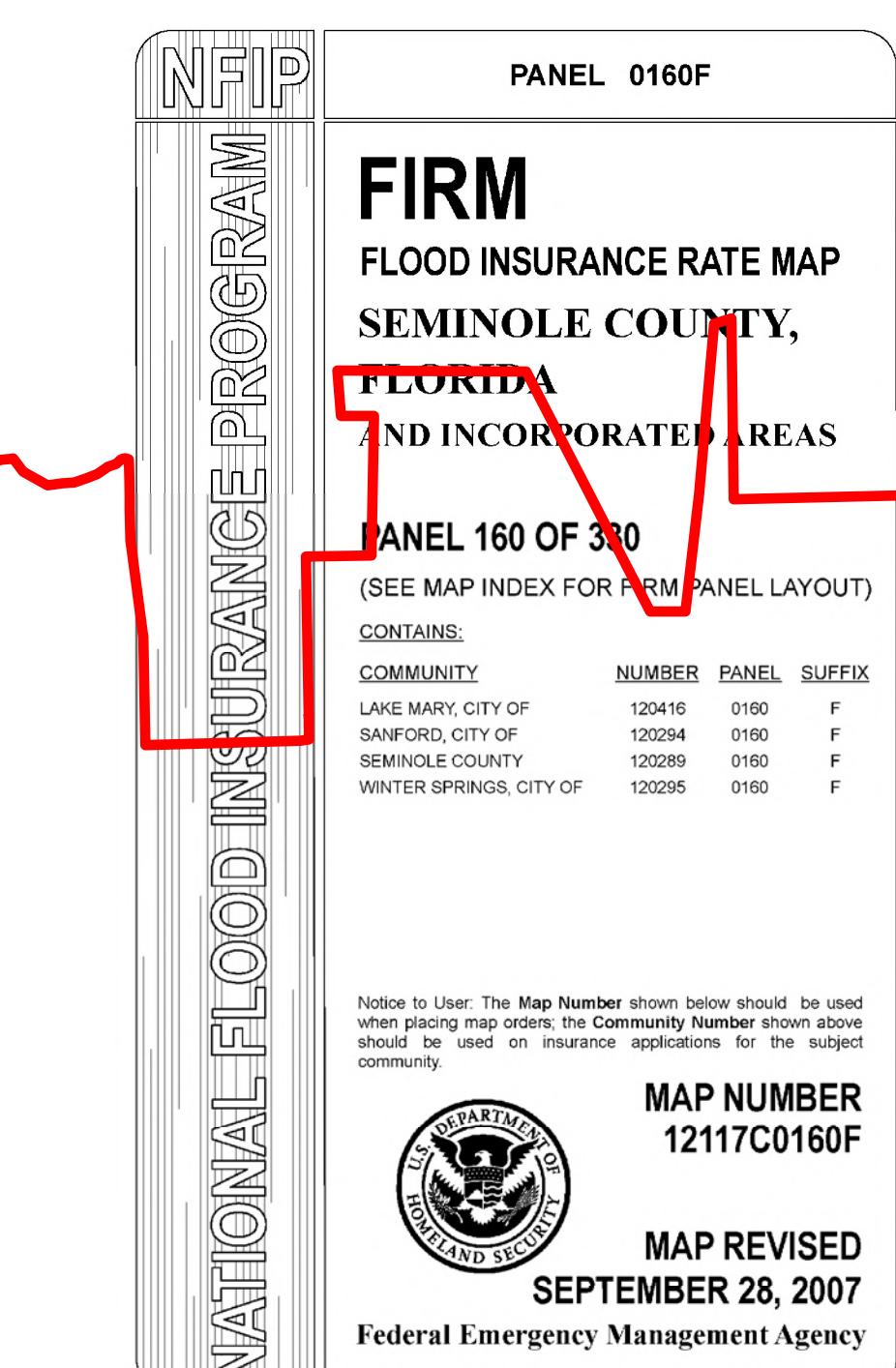
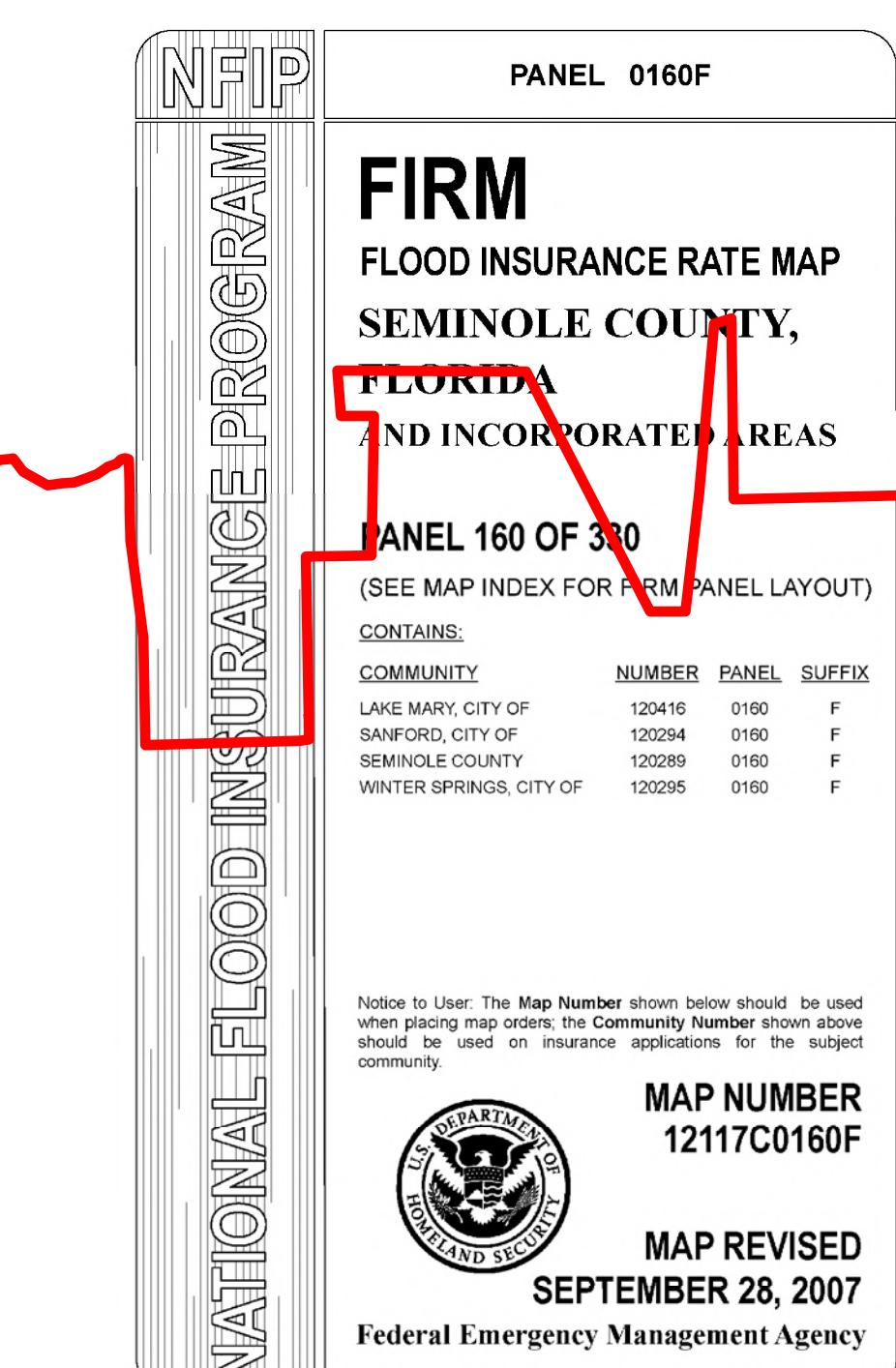
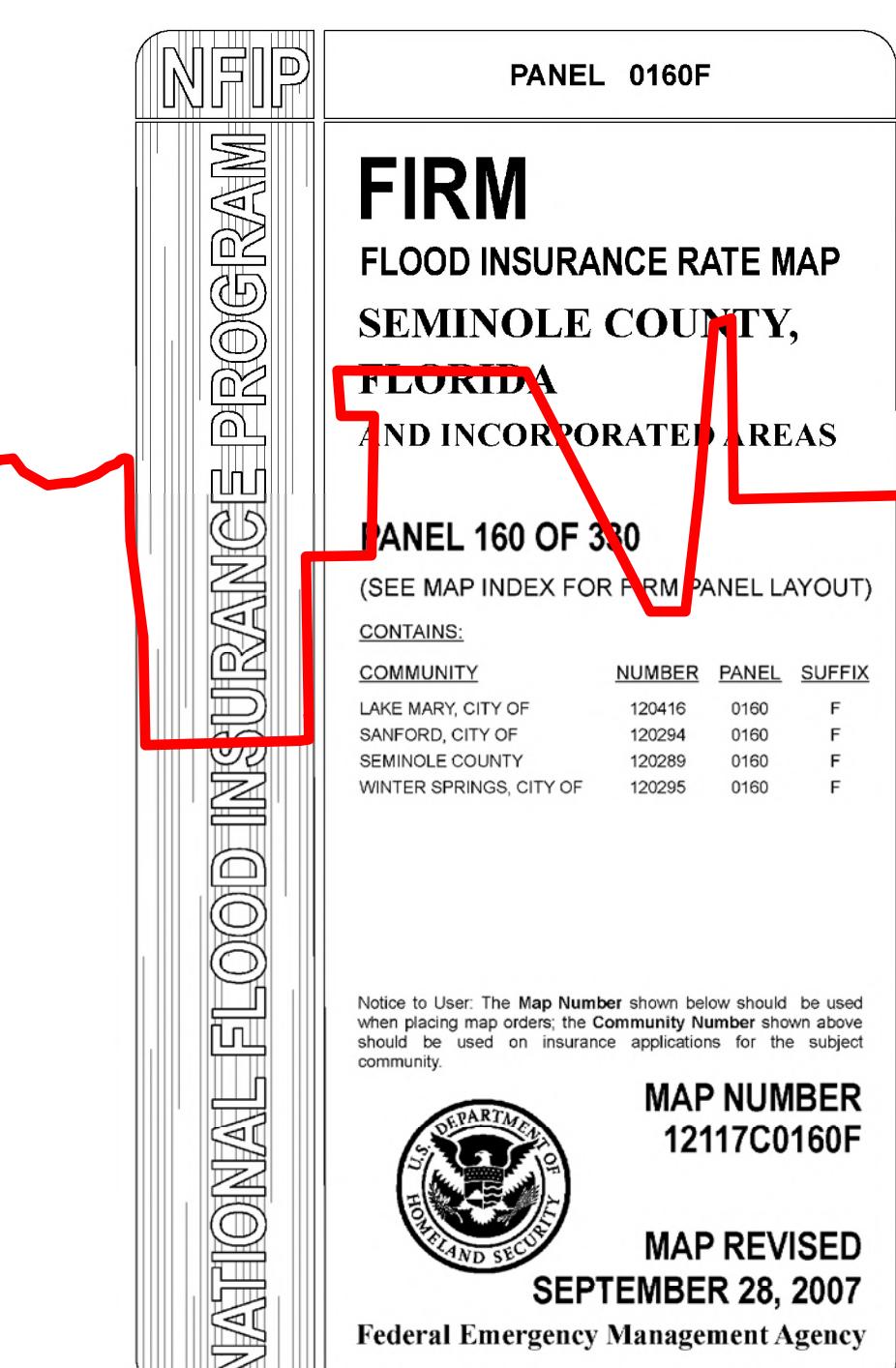
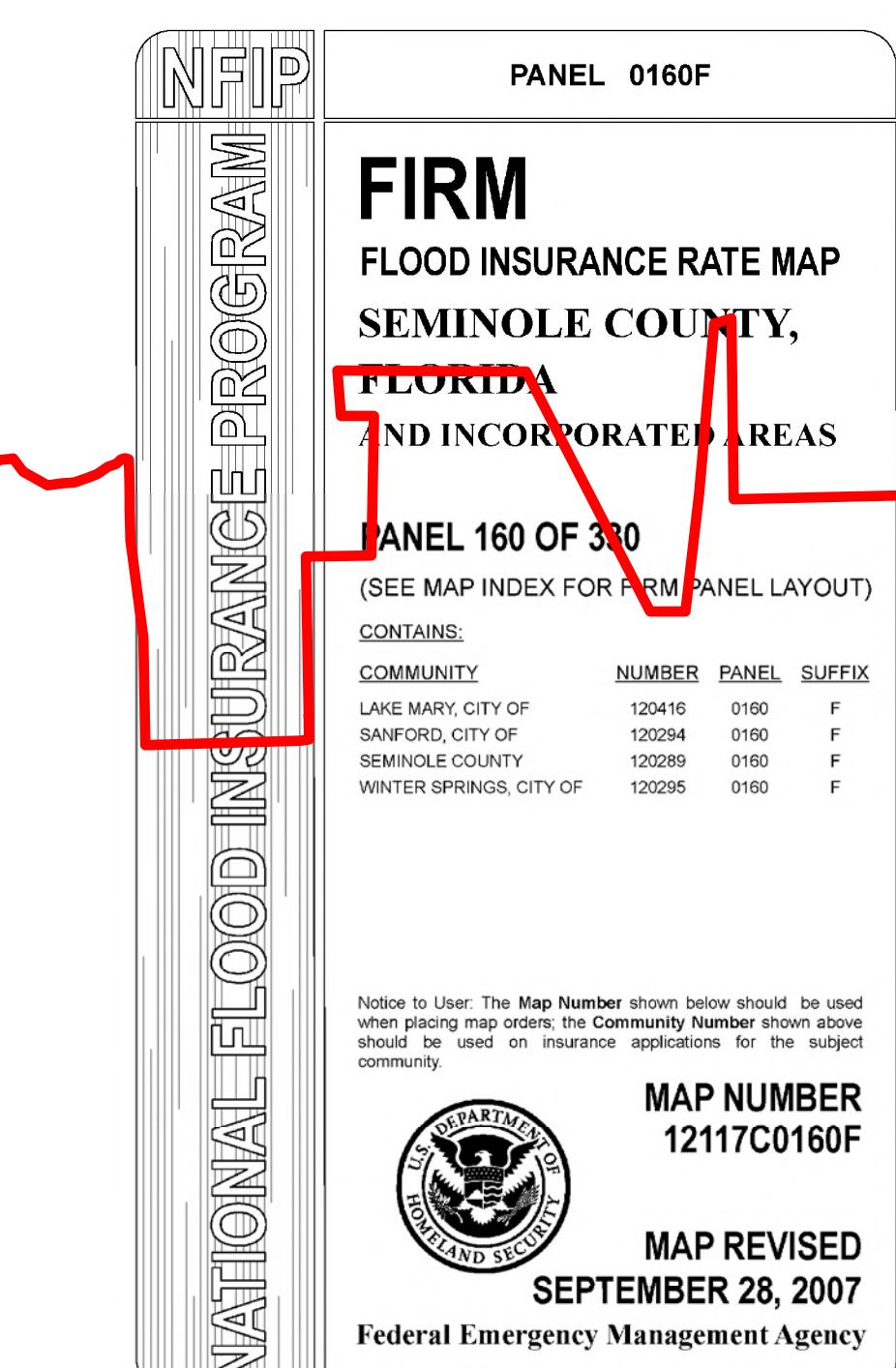
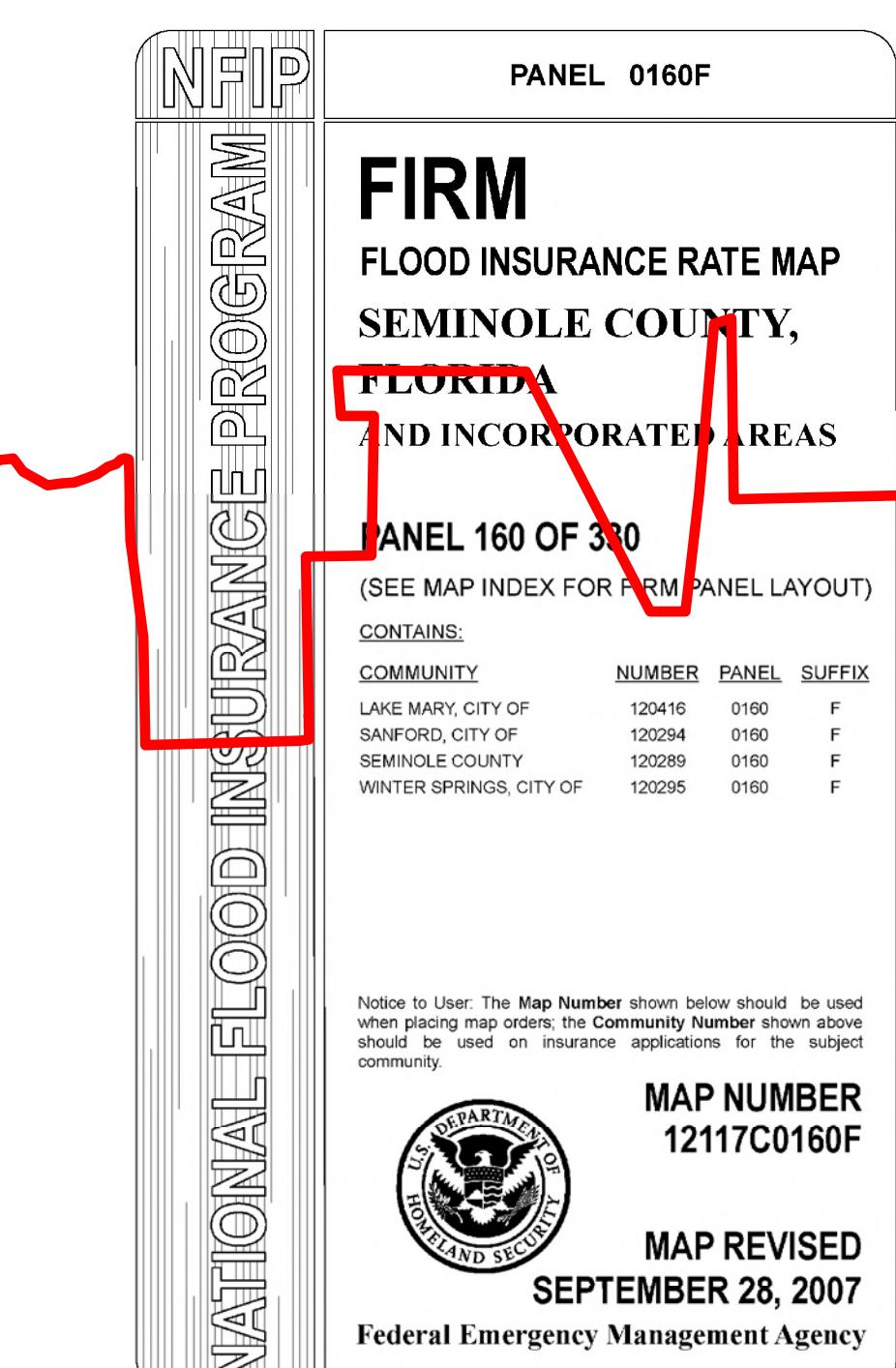
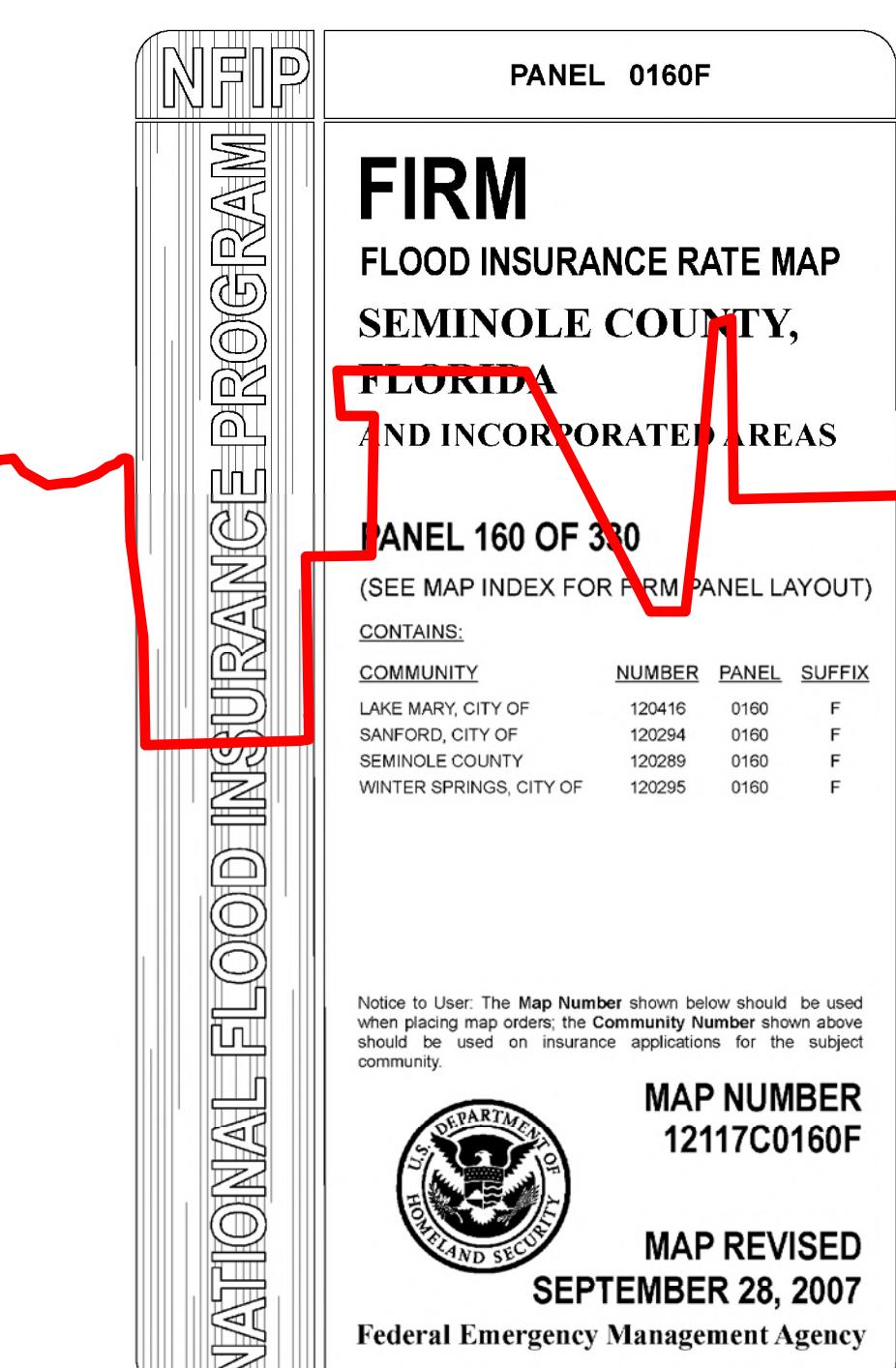
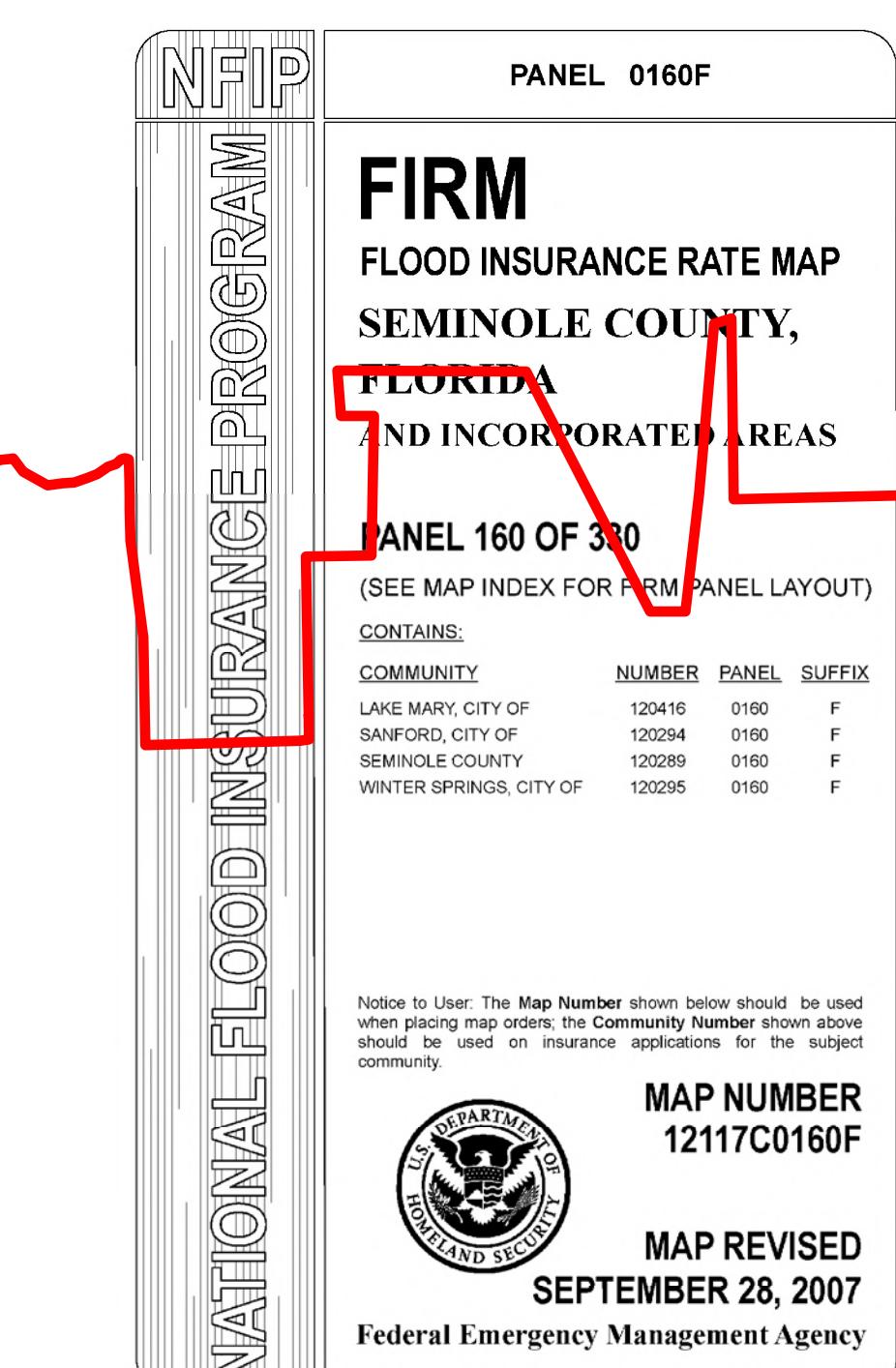
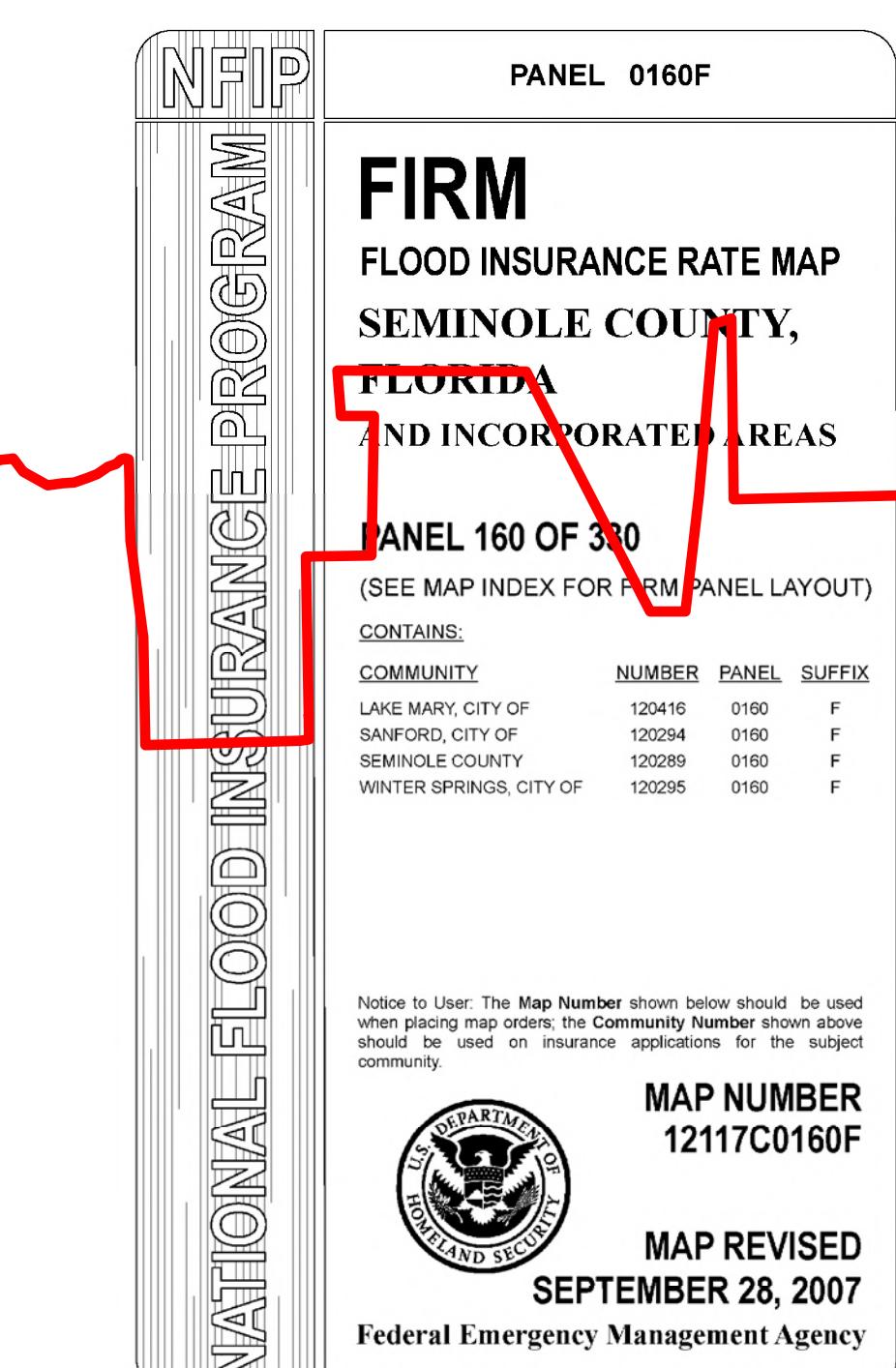
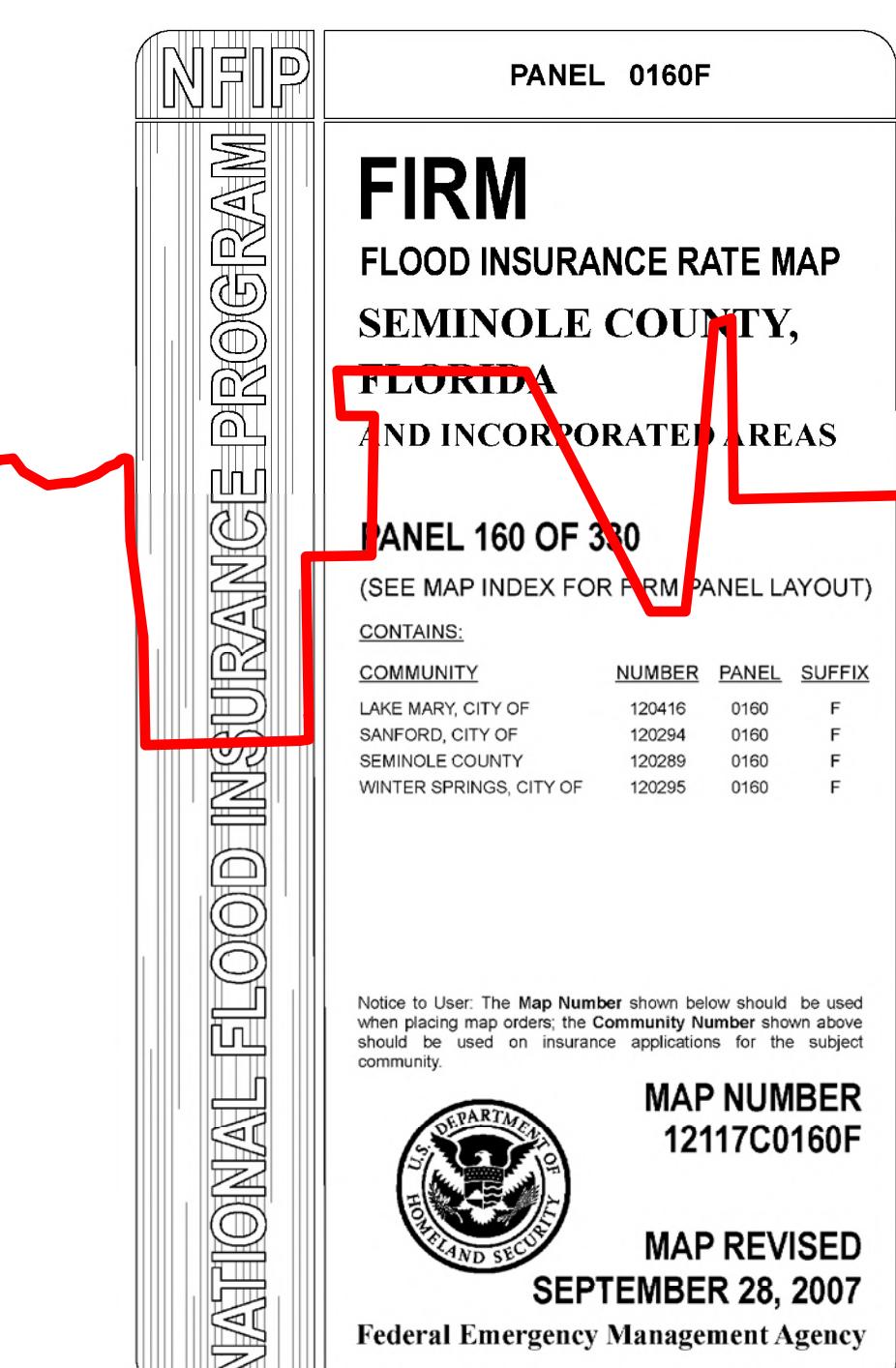
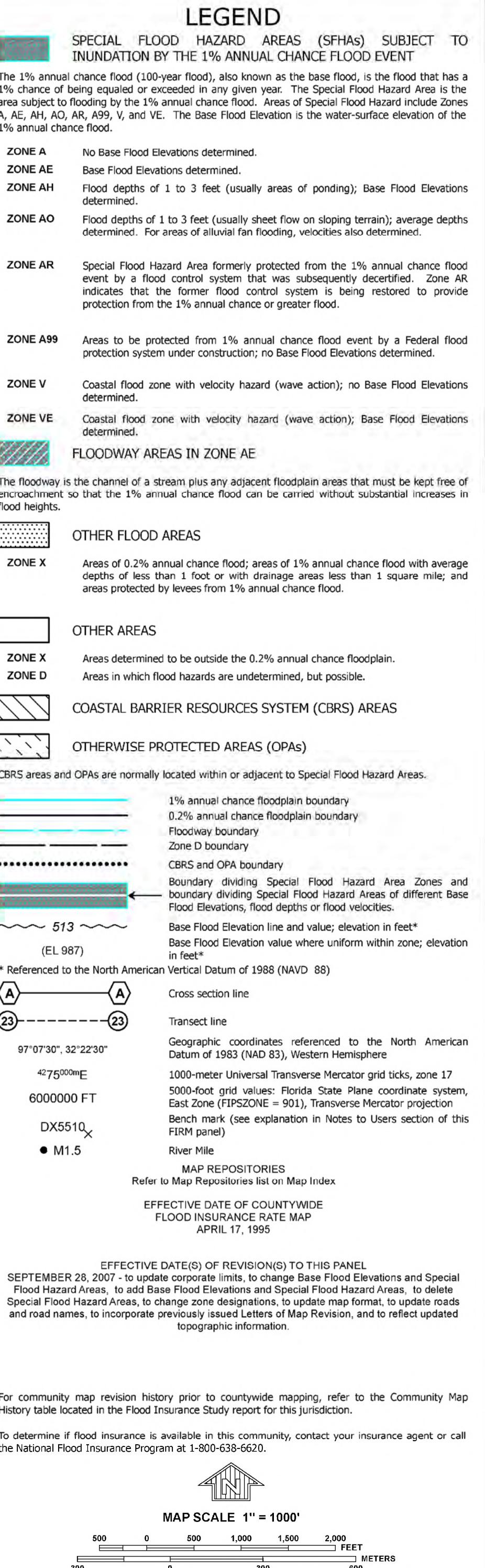
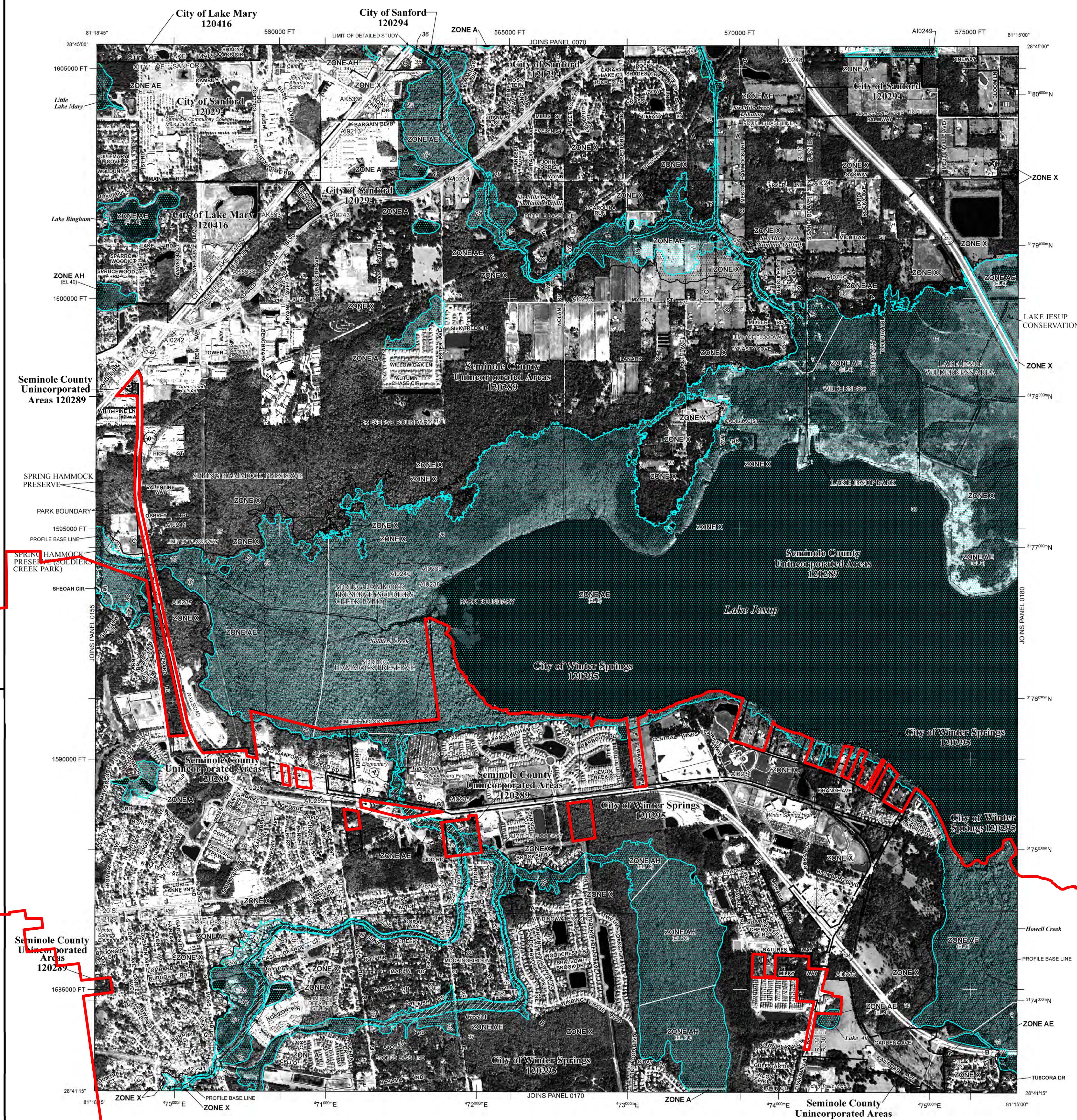
This map reflects more detailed and up-to-date stream channel configurations than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed Map Index for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the FEMA Map Service Center at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at <http://www.msfc.fema.gov>.

If you have questions about this map or questions concerning the National Flood Insurance Program in general, please call 1-877-FEMA MAP (1-877-336-6267) or visit the FEMA website at <http://www.fema.gov>.



NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The community map repository should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where Base Flood Elevations (BFEs) and/or floodways have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on this map represent rounded whole-foot elevations. These BFEs are used for flood insurance premium purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Cochlear Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of the FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The projection used in the preparation of this map was State Plane Florida East FIPS Zone 0901. The horizontal datum was NAD83 GRS1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations relative to the 1% annual chance flood. For more information on the difference between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at <http://www.ngs.noaa.gov/> or contact the National Geodetic Survey at the following address:

Spatial Reference System Division
National Geodetic Survey, NOAA
Silver Spring Metro Center
1315 East-West Highway
Silver Spring, Maryland 20910
(301) 713-3191

To obtain current elevation, description, and/or location information for bench marks shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242 or visit its website at <http://www.ngs.noaa.gov/>.

Base map information shown on this FIRM was provided in digital format by Seminole County, Florida. This information was photographically compiled at a scale of 1:2000 from aerial photography dated March 2004.

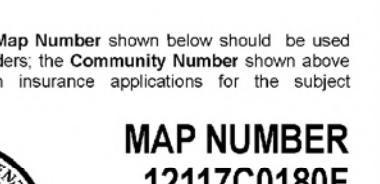
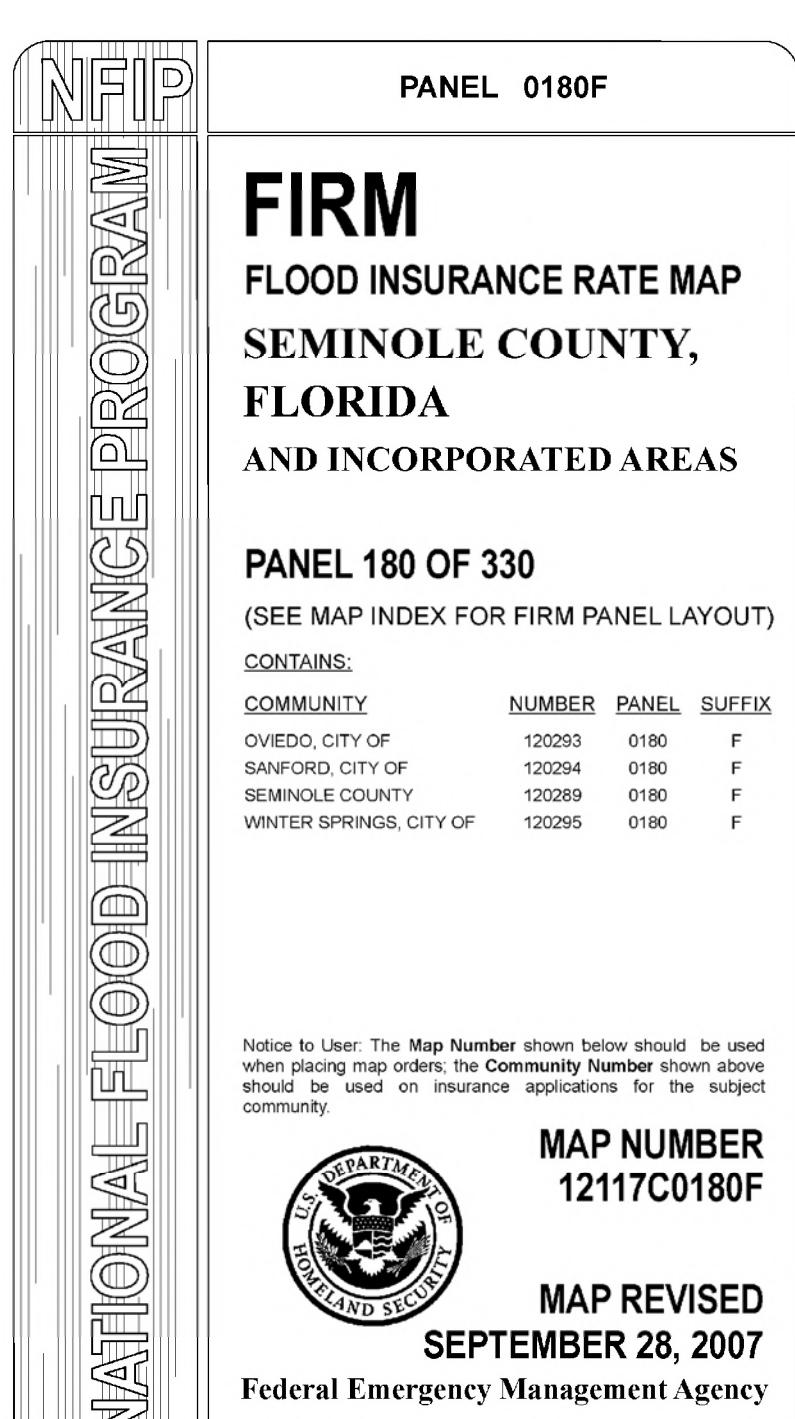
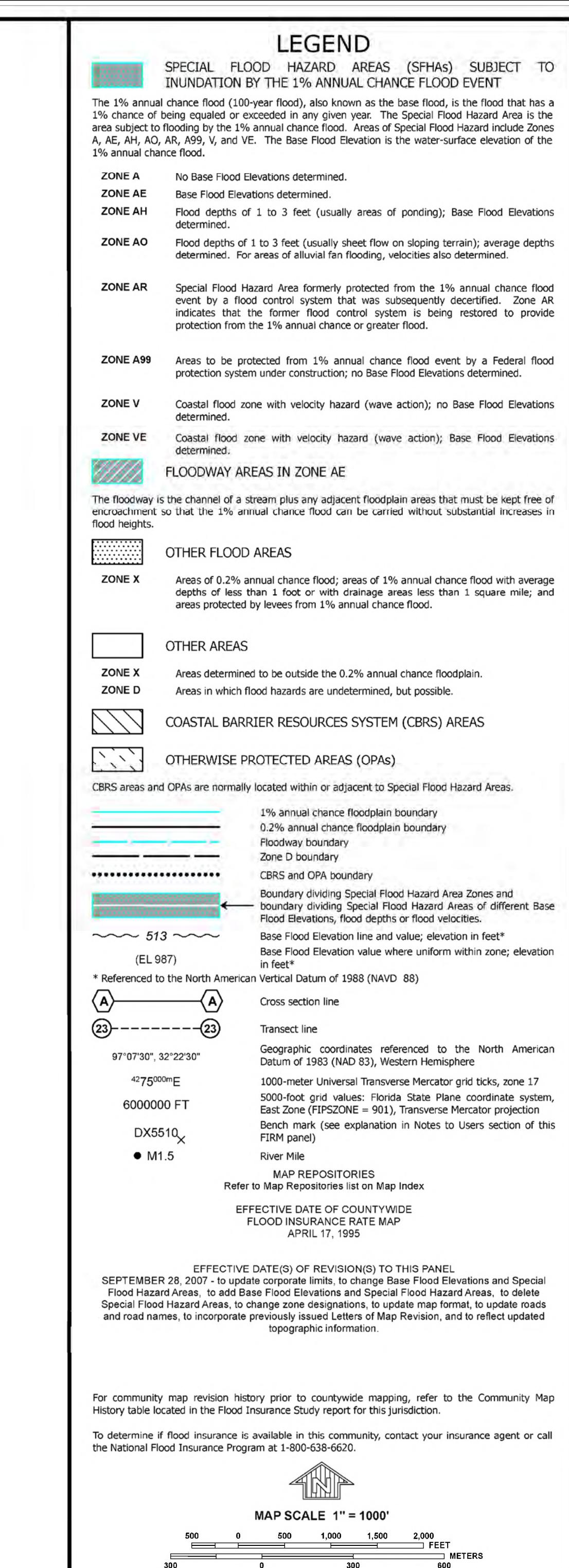
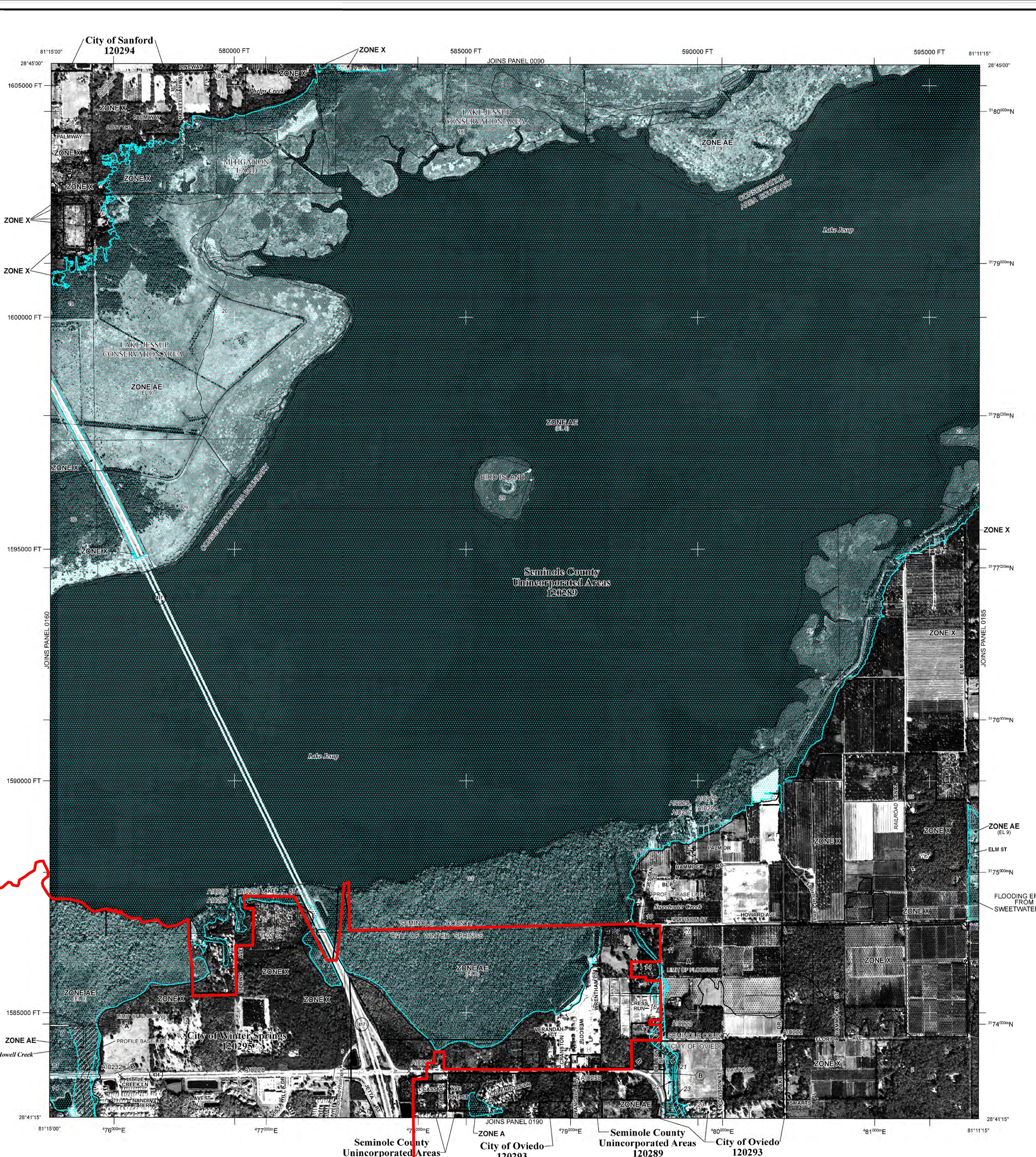
This map reflects more detailed and up-to-date stream channel configurations than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

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If you have questions about this map or questions concerning the National Flood Insurance Program in general, please call 1-877-FEMA MAP (1-877-336-2627) or visit the FEMA website at <http://www.fema.gov/>.



DEPARTMENT OF
HOMELAND SECURITY

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOTES TO USERS

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To obtain more detailed information in areas where Base Flood Elevations (BFEs) and/or floodways have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown in the FIRM are rounded whole-foot elevations. The BFEs shown in the flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0' North American Vertical Datum of 1988 (NAVD 88). Users of the FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

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Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations and to the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988; visit the National Geodetic Survey website at <http://www.ngs.noaa.gov> or contact the National Geodetic Survey at the following address:

Special Reference System Division
National Geodetic Survey, NOAA
Silver Spring Metro Center
1311 East-West Highway
Silver Spring, Maryland 20910
(301) 713-3191

To obtain current elevation, description, and/or location information for bench marks shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242 or visit its website at <http://www.ngs.noaa.gov>.

Base map information shown on this FIRM was provided in digital format by Seminole County, Florida. The information was photogrammetrically compiled at a scale of 1:250,000. The original base map was photogrammetrically dated March 2004.

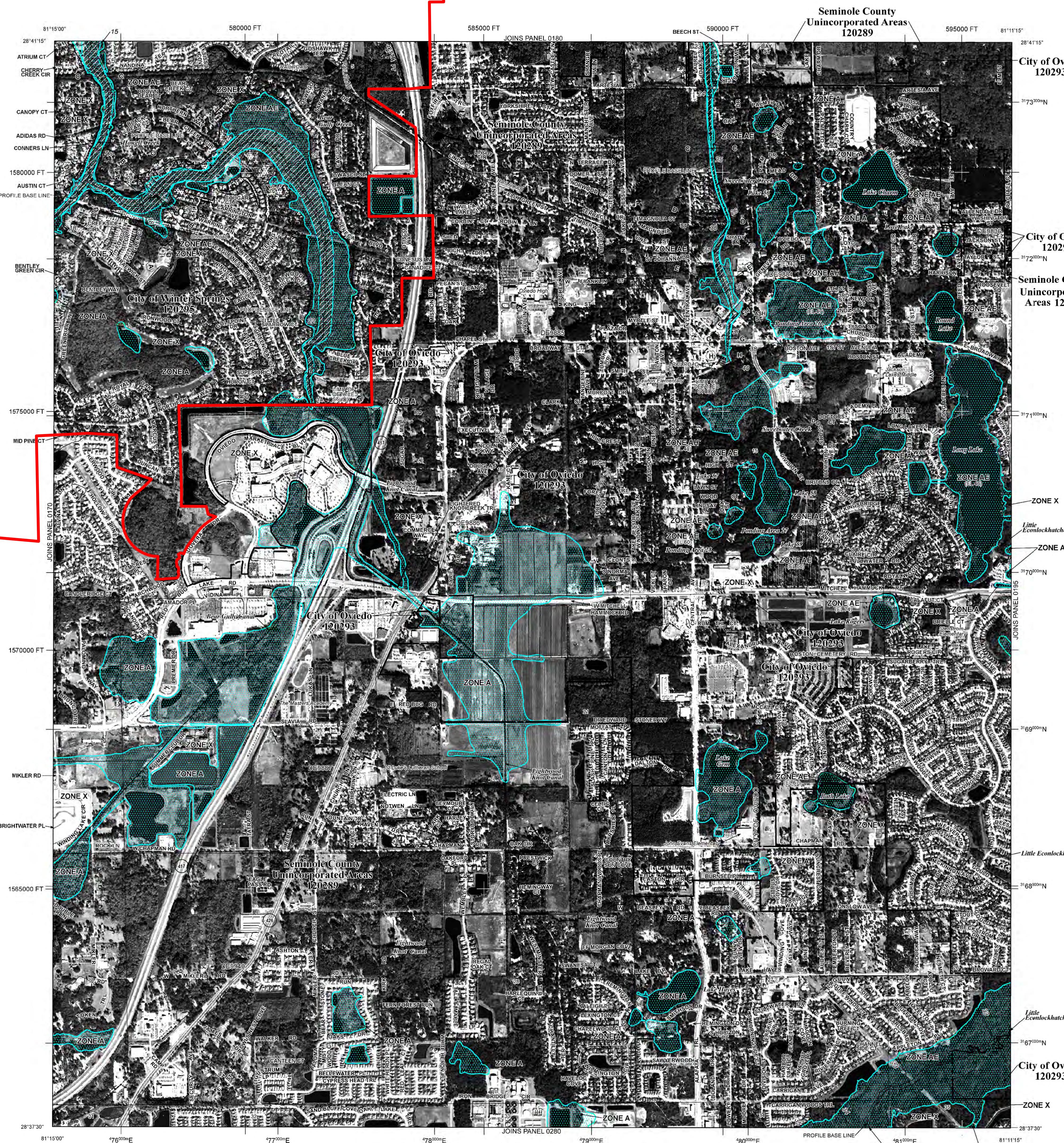
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LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO FLOODING BY THE 1% ANNUAL CHANCE FLOOD EVENT
The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A: No Base Flood Elevations determined.
 ZONE AE: Base Flood Elevations determined.
 ZONE AH: Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
 ZONE AO: Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE AR: Special Flood Hazard Area formerly protected from the 1% annual chance flood event by a flood control system that was subsequently de-certified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.

ZONE A99: Areas to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no Base Flood Elevations determined.

ZONE V: Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

ZONE VE: Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X: Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X: Areas determined to be outside the 0.2% annual chance floodplain.
 ZONE D: Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% annual chance floodplain boundary
 0.2% annual chance floodplain boundary
 Floodway boundary
 Zone D boundary

CBRS and OPA boundary

Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.

Base Flood Elevation line and value; elevation in feet*

Base Flood Elevation value where uniform within zone; elevation in feet*

Vertical Datum of 1988 (NAVD 88)

Cross section line

Transect line

Geographic coordinates referred to the North American Datum of 1983 (NAD 83), Western Hemisphere

100-meter Universal Transverse Mercator grid ticks, zone 17

5000-foot grid values: Florida State Plane coordinate system, East Zone (FIPSZONE = 901), Transverse Mercator projection

Benchmark (see explanation in Notes to Users section of this FIRM panel)

River Mile

MAP REPOSITORIES

Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP

APRIL 17, 1995

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

SEPTEMBER 28, 2007 - to update corporate limits, to change Base Flood Elevations and Special Flood Hazard Areas, to add Base Flood Elevations and Special Flood Hazard Areas, to delete Special Flood Hazard Areas, to change zone designations, to update map format, to update roads and road names, to incorporate previously issued Letters of Map Revision, and to reflect updated topographic information.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

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

MAP SCALE 1" = 1000'
500 0 500 1,000 1,500 2,000 FEET
300 0 300 600 METERS

FIRM FLOOD INSURANCE RATE MAP SEMINOLE COUNTY, FLORIDA AND INCORPORATED AREAS		
PANEL 0190F		
FIRM FLOOD INSURANCE RATE MAP SEMINOLE COUNTY, FLORIDA AND INCORPORATED AREAS		
PANEL 190 OF 330		
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)		
CONTAINS:		
COMMUNITY	NUMBER	PANEL SUFFIX
OVIDE, CITY OF	120293	0190 F
SEMINOLE COUNTY	120289	0190 F
WINTER SPRINGS, CITY OF	120295	0190 F
MAP NUMBER 12117C0190F		
MAP REVISED SEPTEMBER 28, 2007		
Federal Emergency Management Agency		

Notice to User: The Map Number shown below should be used when placing map orders. The Community Number shown above should be used on insurance applications for the subject community.



MAP REVISED

SEPTEMBER 28, 2007

Federal Emergency Management Agency