



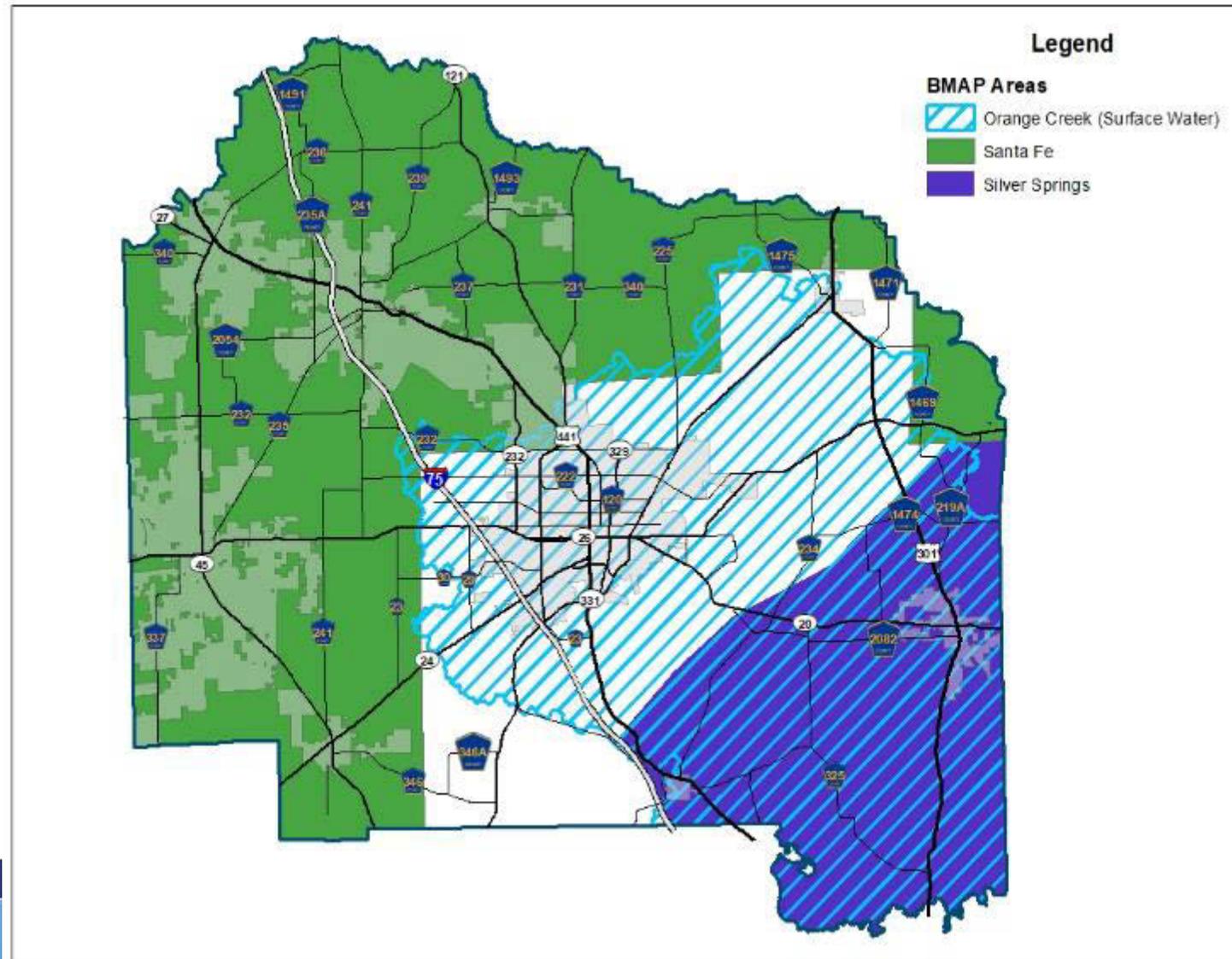
# Alachua County's Stormwater Treatment Code and Manual

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# Goals of the Stormwater Treatment Manual & Code

- The purpose is to prevent the worsening of existing water quality impairments and to prevent new ones.
  - Take into account the differing hydrology across the County in regard to stormwater treatment.
  - Encourage, and in some cases require, the use of Low Impact Design (LID).
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# Basin Management Action Plans (BMAPs) in Alachua County

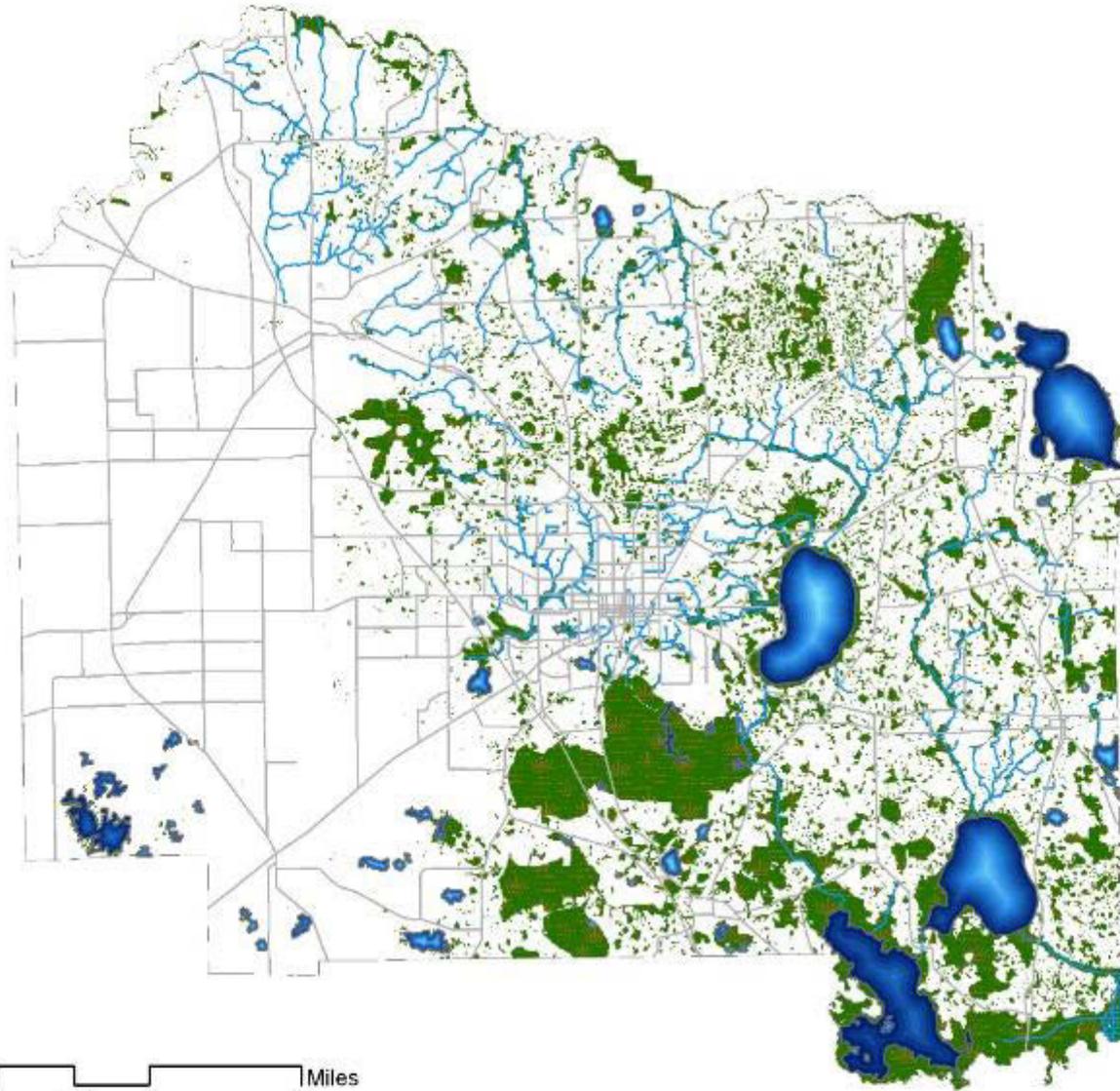




## Alachua County Water Bodies and Wetlands

### Legend

- Major Roads
- Lakes
- Creeks
- Wetlands



0 2.5 5 10 Miles

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- The hydrology of Alachua County varies from east to west with different approaches to stormwater management.
  - Open surface drainage in the east
  - Closed basin karst area in the west

# Three Lakes Impaired for Nutrients



# Santa Fe River and Hornsby Spring Impaired



Poe Spring



Hornsby Spring



Santa Fe River

# Stormwater Management in Eastern Alachua County

- Typically wet detention is used for stormwater management.
- Wet detention design eventually reaches a point of diminishing returns for nutrient removal.
- In some areas water table/soil will allow dry retention for at least the water quality treatment volume.



# Unique Stormwater Issues in the Karst Areas

- The sandy soils in the karst areas have low nitrogen removal potential and rapidly infiltrate runoff to the aquifer.
- Dry retention is the conventional practice. Assimilation of nitrogen in retention ponds is low.
- After large storms, sinkhole formation in retention ponds is not unusual.



# Milestones

- 2016 – Board directs staff to begin work on Stormwater Treatment Code
  - November 2017 – First draft of code presented to Commission with karst measures.
  - January 2018 – Shane starts working for Alachua County
  - August 2018 – Final set of case studies presented to Board
  - October 2018 – Code adopted by Board of County Commissioners
  - January 2019 – Code effective date
  - April 2019 – Updates to definitions and exemptions
- 

# Countywide Application

- Alachua County is one of 20 Charter Counties in Florida. Charter was adopted in 1987.
  - In November 2000, a majority of voters approved Amendment 1 which gave the County authority to establish countywide regulations for air and water pollution.
  - Projects within incorporated municipalities self-certify compliance rather than go through a project review.
- 

- Stormwater Treatment Standards are in the County Water Quality Code (Chapter 77, Article 3).
- The manual was adopted with the code as the design aid for meeting the requirements of the Code.
- Meeting the stormwater treatment standards and following the design guidelines in the Stormwater Treatment Manual = Presumed Compliance.

# ALACHUA COUNTY STORMWATER TREATMENT MANUAL



# Manual Structure

- The manual is structured into three parts.
- Appendices provide additional information and design aids.
- Since the manual was adopted with the code, changes cannot easily be made.
- Some information becomes out dated so other sources can be referenced.
  - Example: List of impaired waters

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ALACHUA COUNTY STORMWATER TREATMENT MANUAL

## ALACHUA COUNTY STORMWATER TREATMENT MANUAL



# Manual Structure: Part A

- Consists for the first two chapters.
- First chapter covers introductory material like definitions, water quality issues in the County, and the hydrology of the County.
- Chapter 2 discusses the site evaluation site planning aspects of LID.

October 2018

ALACHUA COUNTY STORMWATER TREATMENT MANUAL

**ALACHUA  
COUNTY  
STORMWATER  
TREATMENT  
MANUAL**



PART A



# Manual Structure: Part B

- Chapters 3 and 4.
- Chapter 3 covers general regulatory requirements.
- Chapter 4 covers the Stormwater Treatment Code requirements with supporting discussion.
  - Sensitive karst area is defined
  - Methods of load calculation

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ALACHUA COUNTY STORMWATER TREATMENT MANUAL

## ALACHUA COUNTY STORMWATER MANAGEMENT MANUAL

PART B



# Manual Structure: Part C

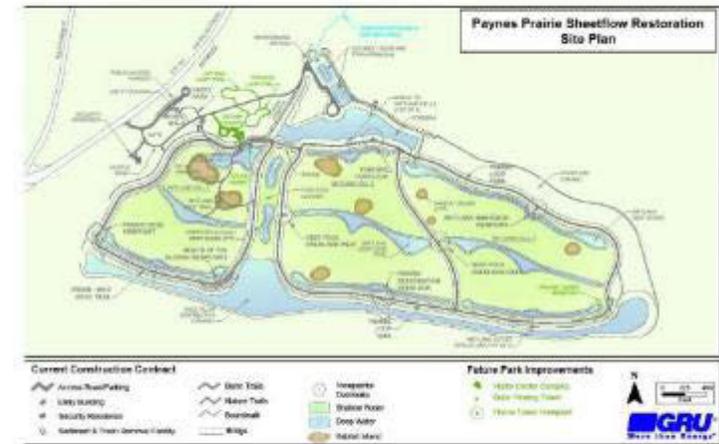
- Consists of one chapter but is the longest part of the manual.
- Chapter 5 discusses individual site planning, source control and structural Best Management Practices (BMPs).
- For structural BMPs, a description is provided along with construction and maintenance requirements.

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## ALACHUA COUNTY STORMWATER MANAGEMENT MANUAL

PART C

ALACHUA COUNTY STORMWATER TREATMENT MANUAL

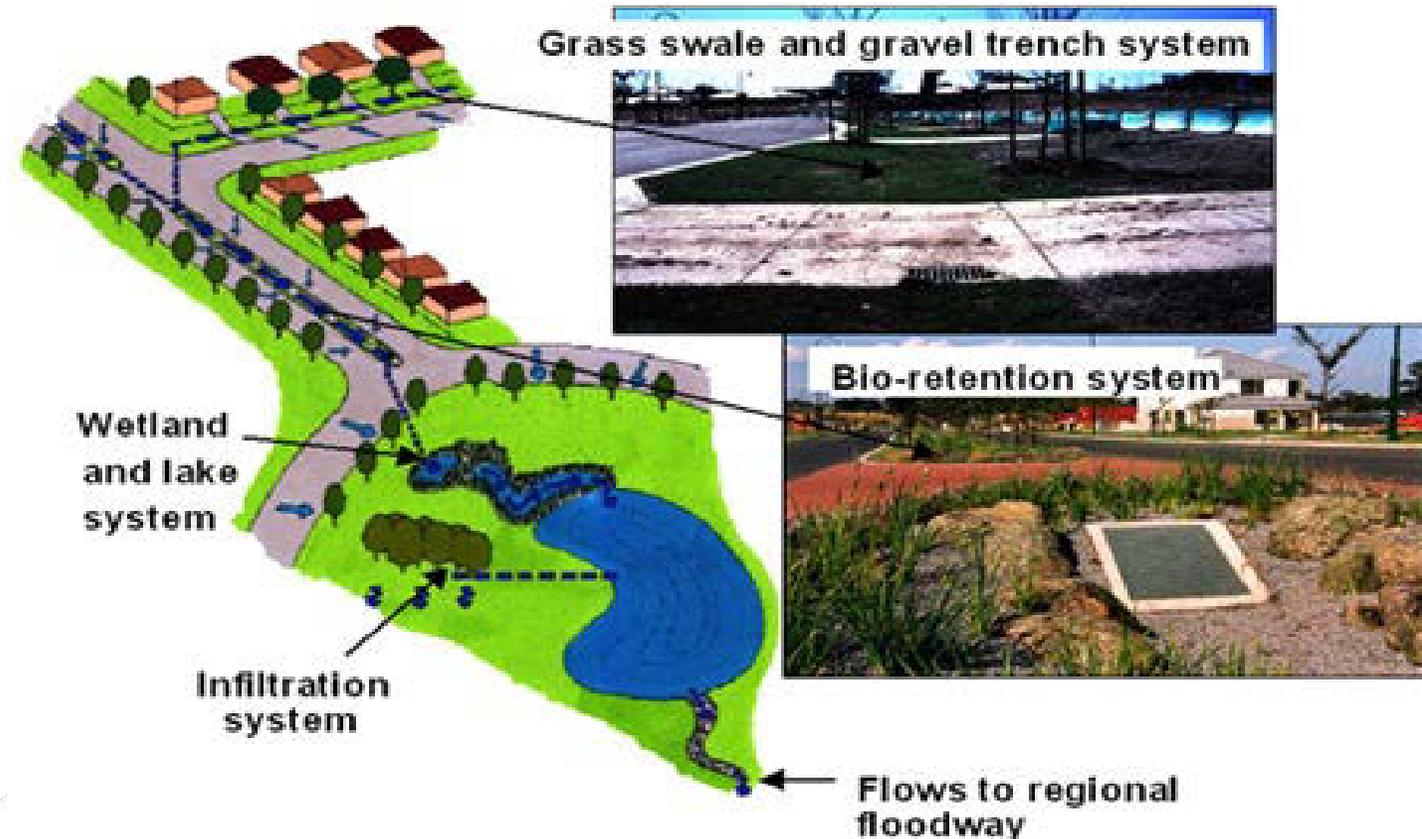


# Treatment Standards

- Standards for surface waters based on condition of the receiving water.
  - Special requirement for groundwater protection in the sensitive karst area when dry retention is used.
  - A special requirement for certain dry retention designs that enhance infiltration rate.
- 

# Code Requirements for Discharges to Surface Waters

- 70%/80% Total Nitrogen (TN) and Total Phosphorus (TP) reduction of post-development load prior to discharge from the site.
- For direct discharges to Outstanding Florida Waters 95% reduction of post-development load is required.
- When wet detention is used, meeting reductions typically require a treatment train incorporating Low Impact Design (LID) techniques or outflow filter.



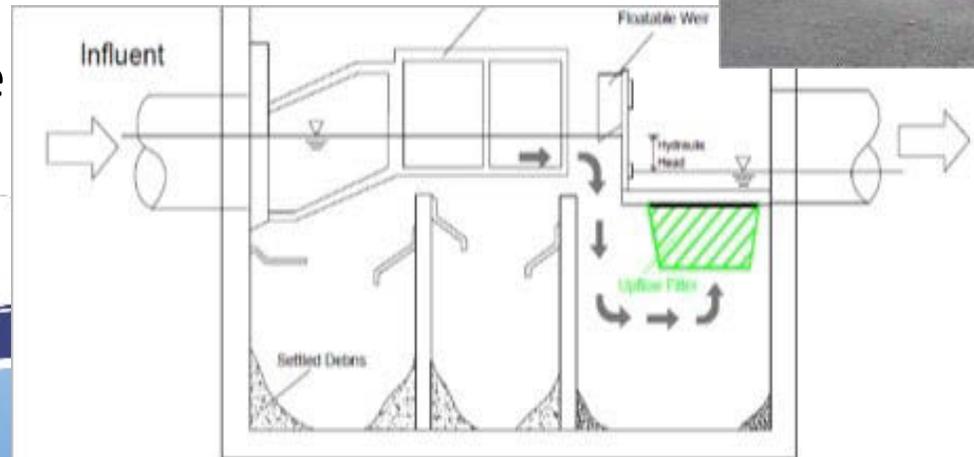
# Requirement for Impaired Surface Waters

- For projects in watersheds of surfaces waters designated by State as impaired for nutrients.
- **Reduce the post- development average annual TN and TN load to at least 10 percent less than the pre-development.**
  - Unless the basic 70/80% (or 95% OFW requirement) would provide a greater reduction.



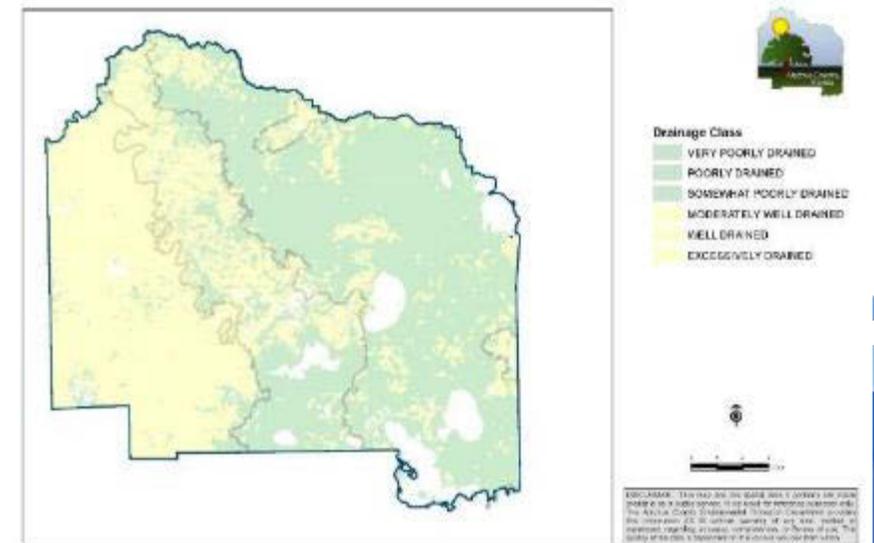
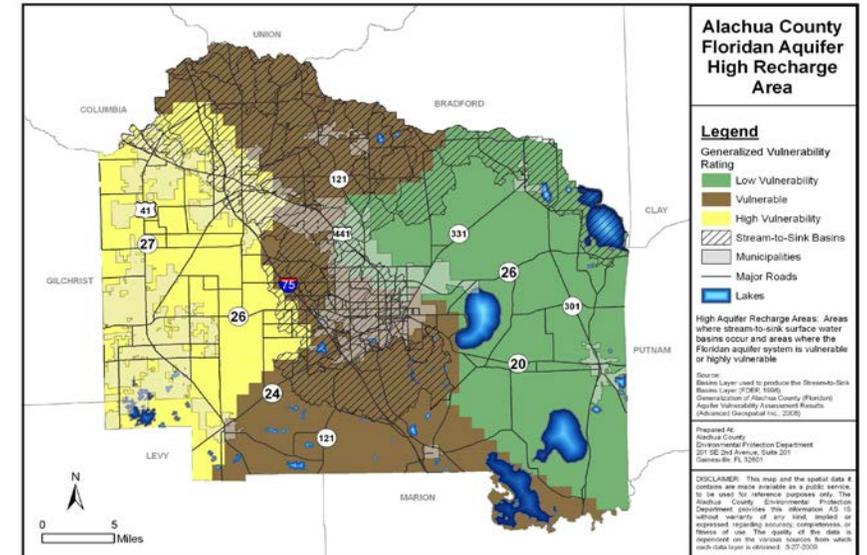
# Sensitive Karst Area Criteria

- Meet the applicable surface water requirement AND
- Treat 1" of runoff from the project area using LID techniques in addition to the retention basin(s).
- The LID techniques can be storage (retention) or filtration (detention) practices.



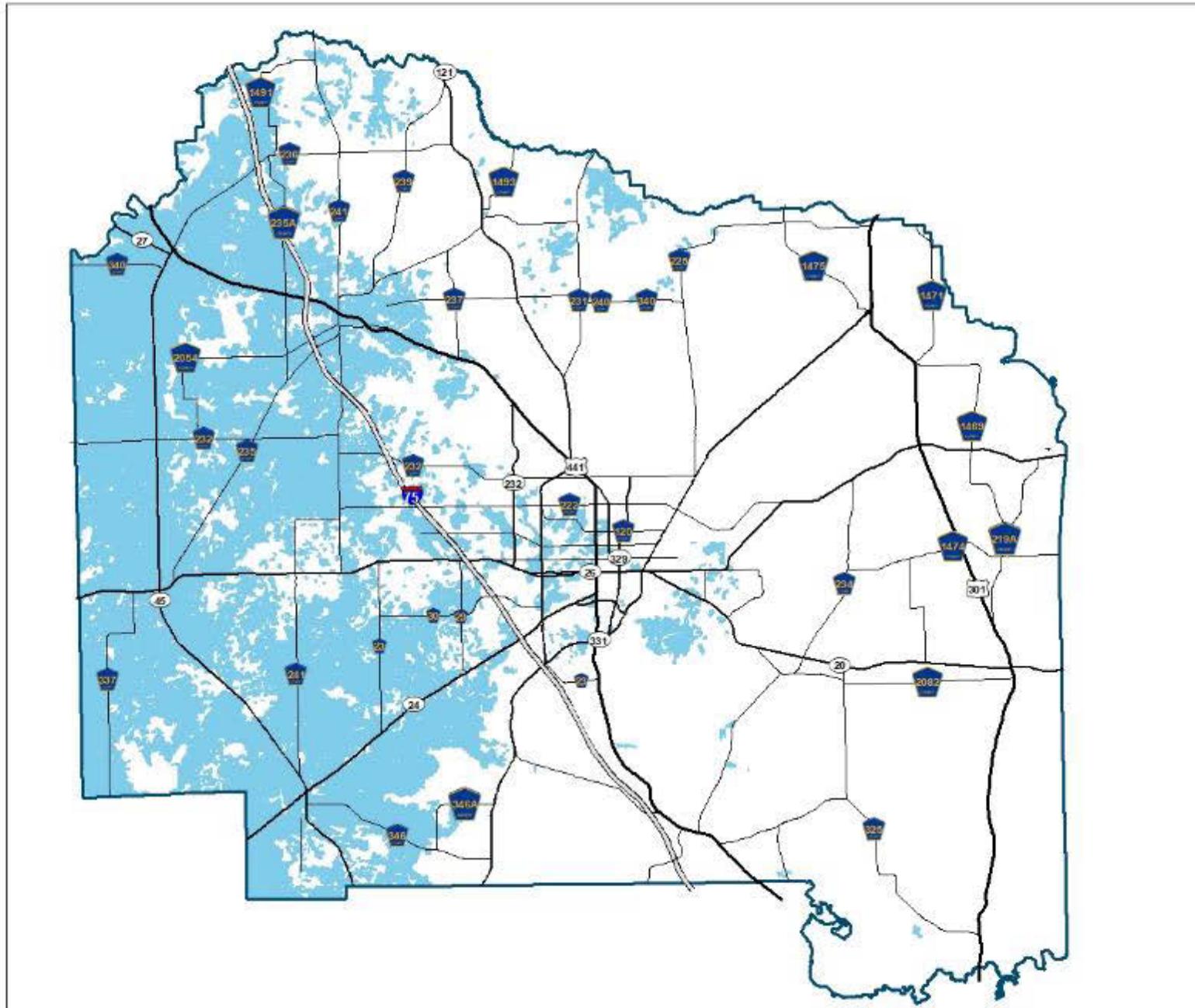
# Sensitive Karst Area

- Two requirements to be considered Sensitive Karst Area (SKA)
  - Vulnerable and Highly Vulnerable Areas of the County identified on the Alachua County Aquifer Vulnerability Map
  - NRCS Soil Drainage Classes: Excessively Drained, Somewhat Excessively Drained, or Well Drained.
- These soils are very aerobic and sandy and have low cation exchange capacity and moisture content.





## Sensitive Karst Area



### Legend

 Sensitive Karst Area



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# What Issues Arouse After Adoption?

- In the first few months the code was in effect several issues arose, requiring a code update in April.
  - Which projects are exempt?
  - Definition of “project area”
- Issues were raised related to the karst area LID criteria because of perceived potential impact on development space and layout.



# Some of the Issues Raised About LID

- Perception of increased cost of development.
  - Possible loss of developable land.
  - Maintenance and compliance (especially on private property).
  - How to model LIDs in stormwater calculations.
  - Runoff and pollution from development isn't a problem.  
Current stormwater management approaches are enough.
  - Florida is just...different.
- 

# Some Things that Weren't Raised, but are Potential Issues

- How to model LIDs in stormwater calculations.
  - Acceptance by regulators.
  - Conflicts with existing land development codes, comp plans, etc.
  - Lack of Statewide design specifications and details.
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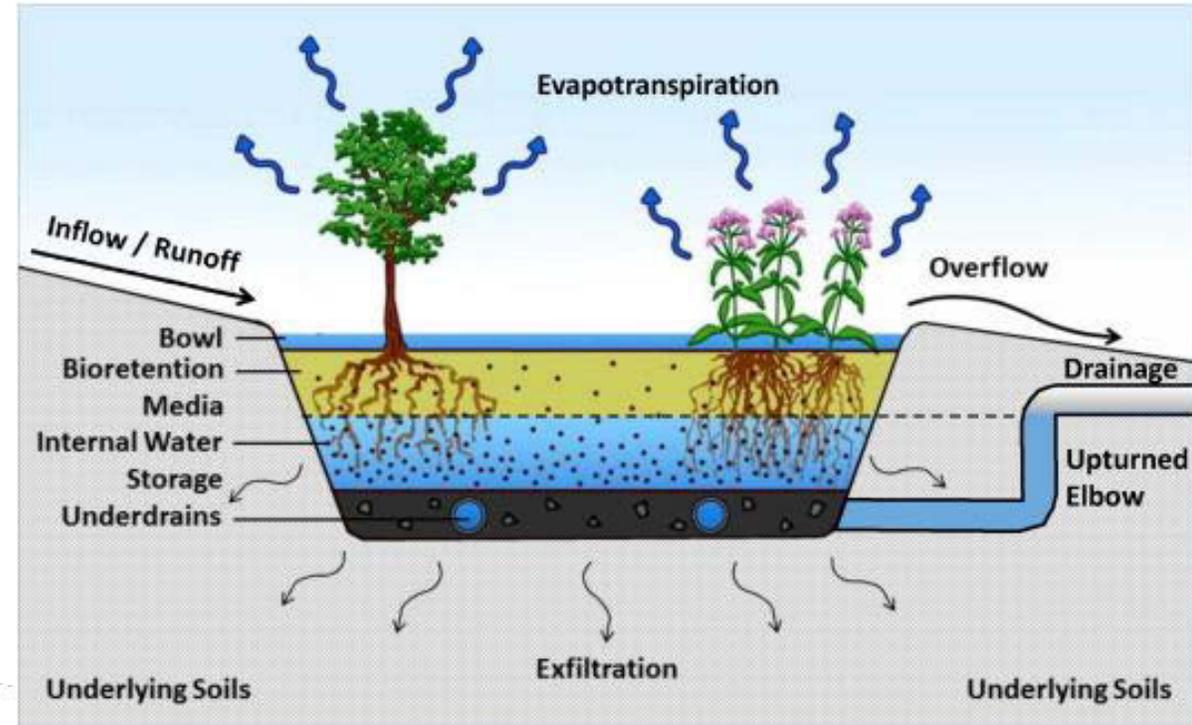
# Real or Perceived Issues?

- Yes, LID can require more space depending on how you implement.
- Consistency with Comprehensive Plan.
- Conflict with Land Development Regulations or Water Management District Rules.
  - How do LIDs count for water quality credit?
  - **How do LIDs count for runoff quantity calculations?**
- Statewide or Water Management District design standards?



# Future Trend? Enhancing LID For Nutrient Removal

- Nitrogen removal by encouraging microbial denitrification.
- Pollutant removal media:
  - Some proprietary, some not.
  - Some mineral based, some not (mulch, wood chips, etc.).
  - Often good at phosphorus removal too!
- Internal water storage to create saturated zone.

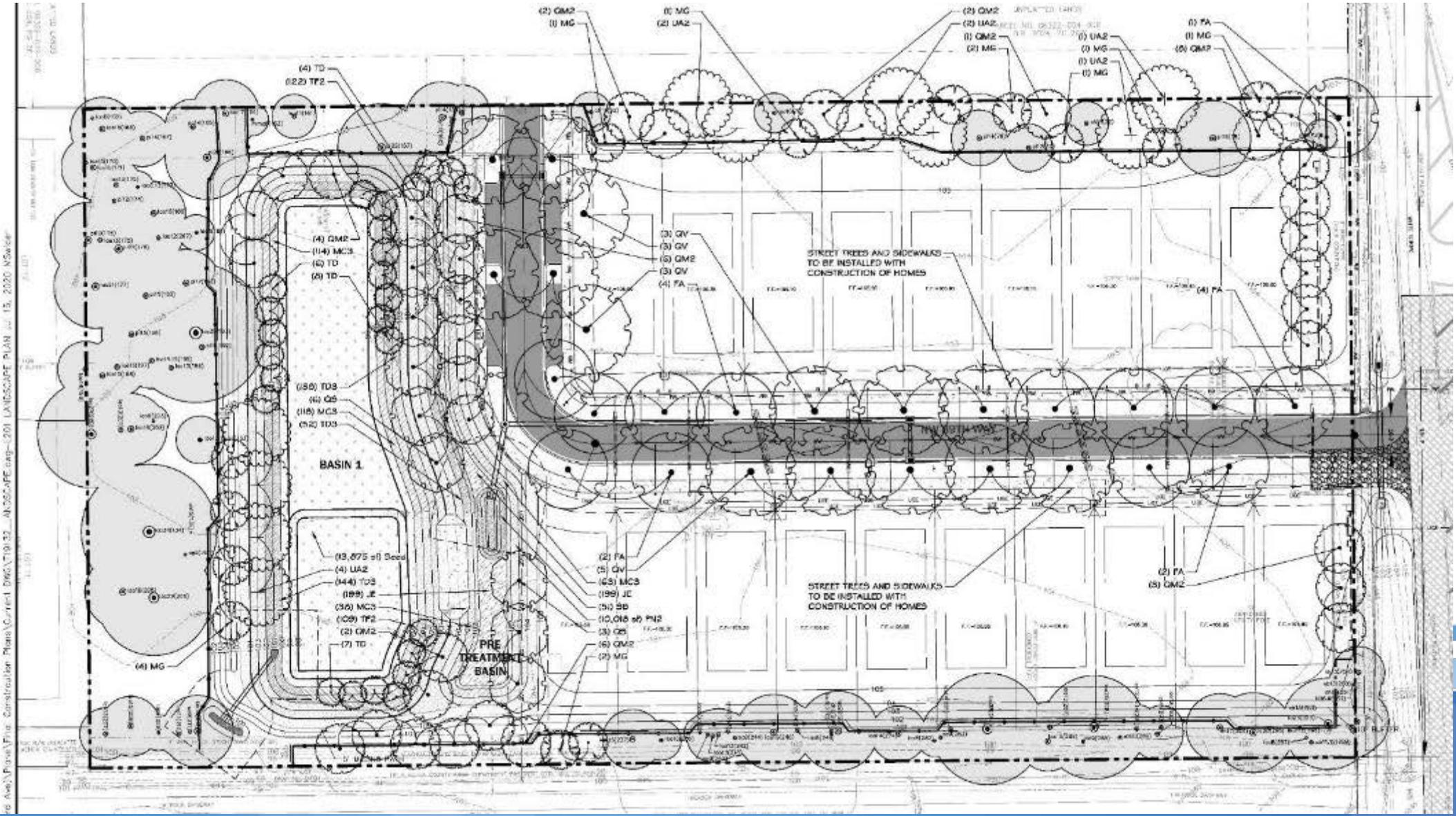


# Some Examples of Projects that Meet Code

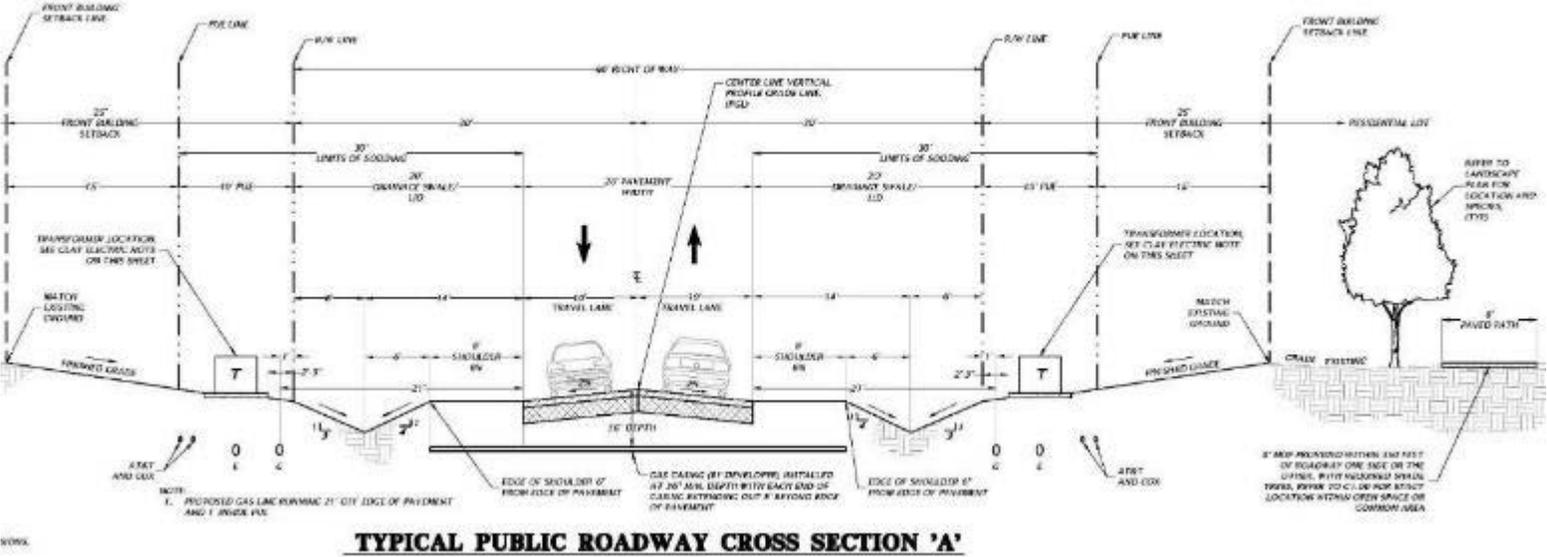
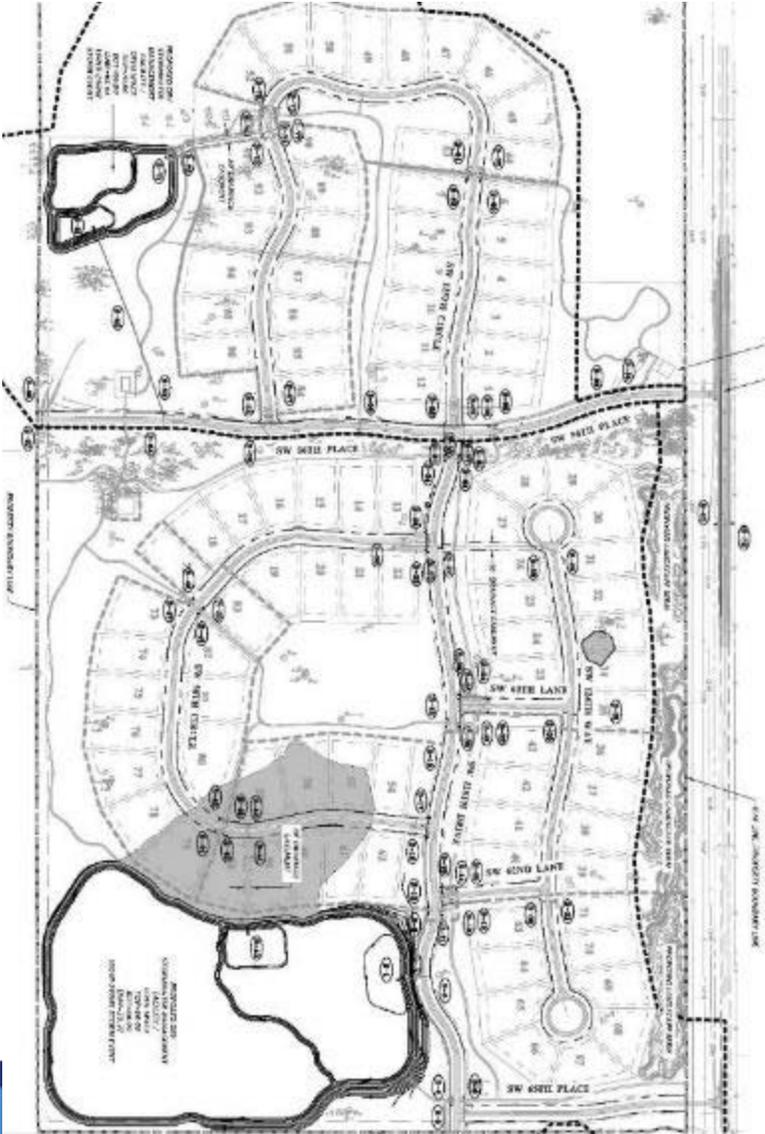




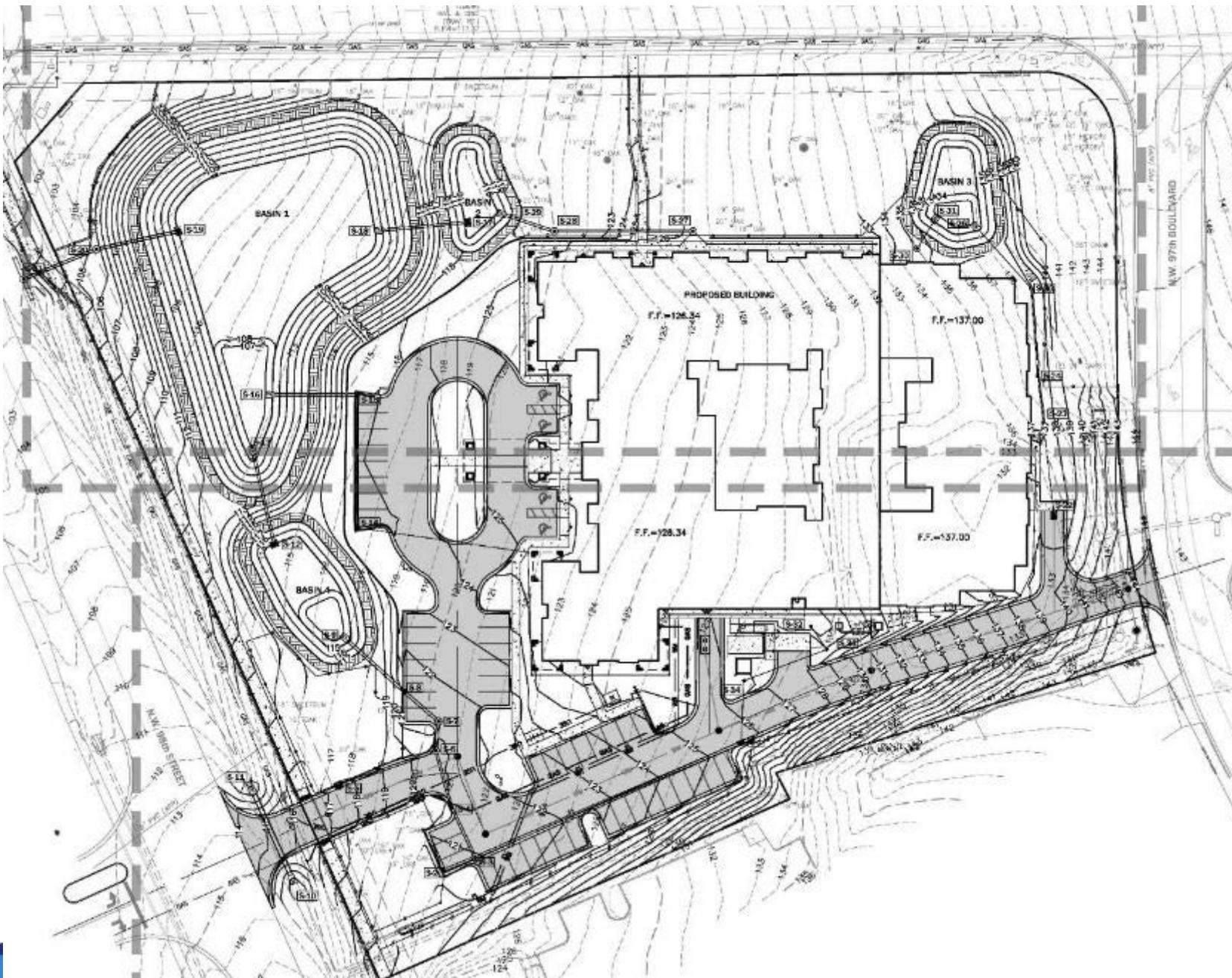
# Implementation: Residential (Karst)



# Implementation: Rural Subdivision (Karst)



# Implementation: Non-Residential (Karst)



# Questions?

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