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Stormwater Basin Retrofit Project P-6
St. Peters, MO

30% Design Meeting
Willott Square / Pegasus Farms

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CFM, CPESC, D.WRE

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Meeting Agenda

- Stormwater Management & Water Quality Overview – Goals and benefits of retrofits
- Overview of Project Site – Existing condition
- Design Approach
  - Target Improvements
  - Design Features
- Restoration and Planting Plan
  - Restoration Plan Overview
  - Representative Pictures
- Questions and Discussion

Goals and Benefits

- Supports 2012 City of St. Peters Comprehensive City-wide Storm Water Master Plan (SWMP).
  - Improve water quality
  - Continued compliance with Missouri Department of Natural Resources Municipal Separate Storm Sewer Systems (MDNR MS4) regulations.
- Green Infrastructure Auxiliary Benefits
  - Enhanced aesthetics
  - Resilient infrastructure
  - Community & neighborhood asset

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Project Retrofit Goals

- Improve water quality
  - Provide alternative storage regime (e.g., extended dry detention)
  - Use native plantings
  - Design sediment removal forebays
  - Modify or replace basin outlet works
- Enhance riparian habitat along corridors
- Provide stable channel corridors

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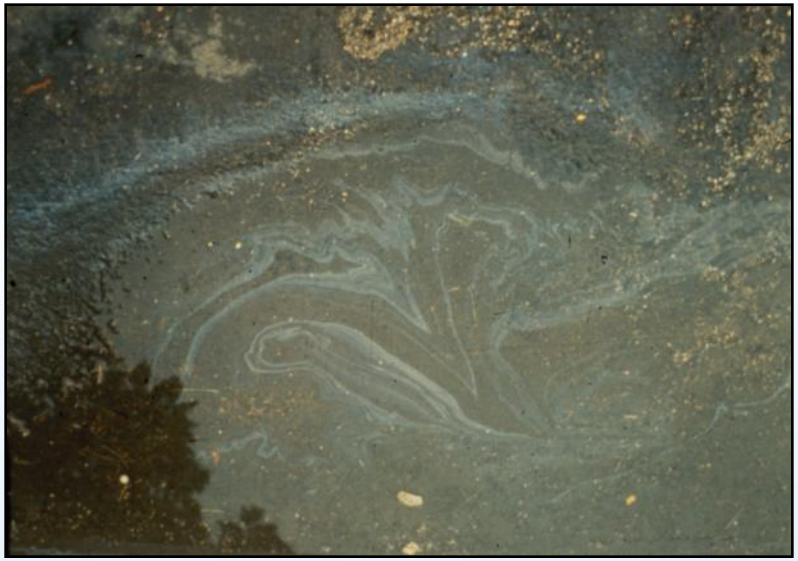
Resource Threats

- Increased runoff and flooding
- Erosion
- Water pollution
- Groundwater impairment
- Loss of habitat



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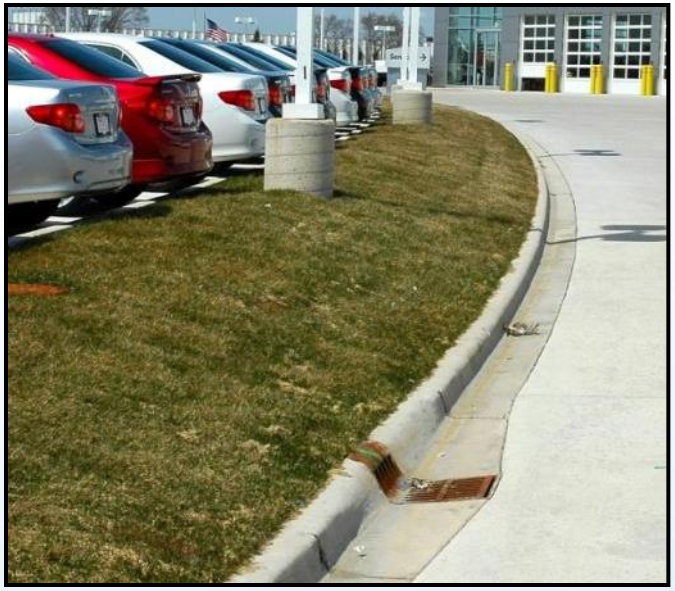
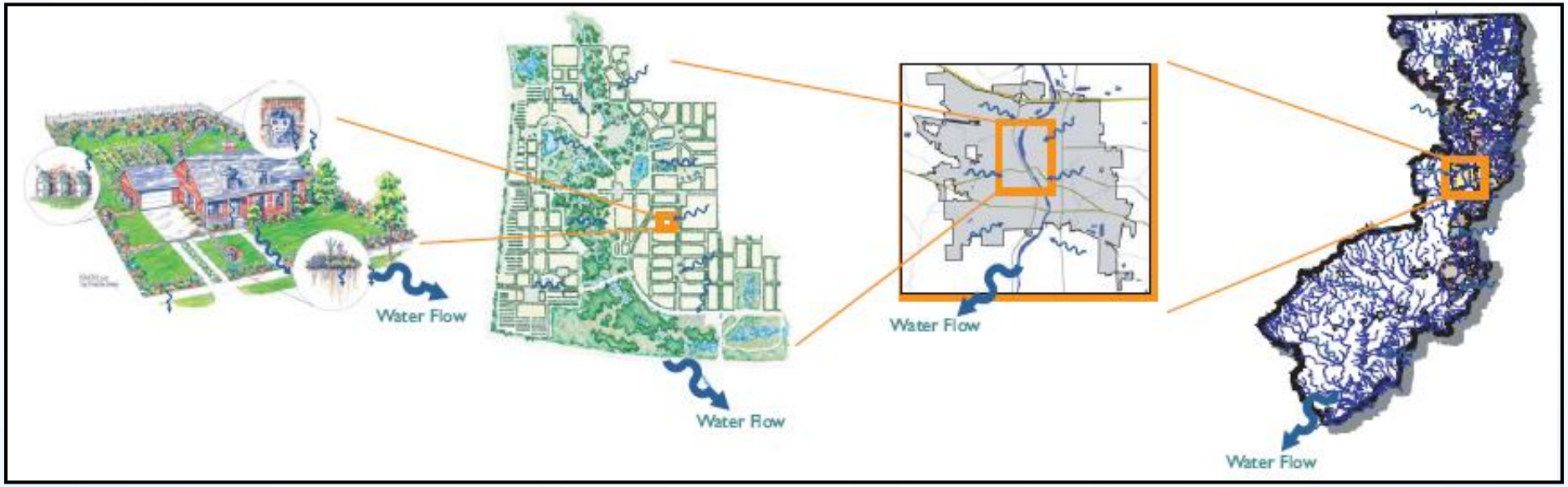
Green Infrastructure – A Technology Focus

- Products, technologies, and practices that use natural systems involving ***soil, water, and vegetation*** – or engineered systems that mimic natural processes – to enhance overall environmental quality and provide utility services
  - Green vs. grey infrastructure



Implementing Green Infrastructure at Varying Spatial Scales



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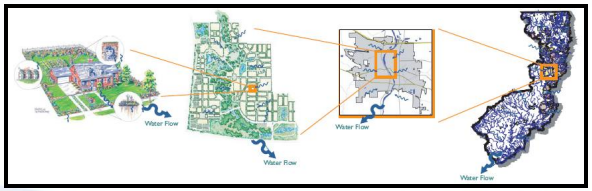
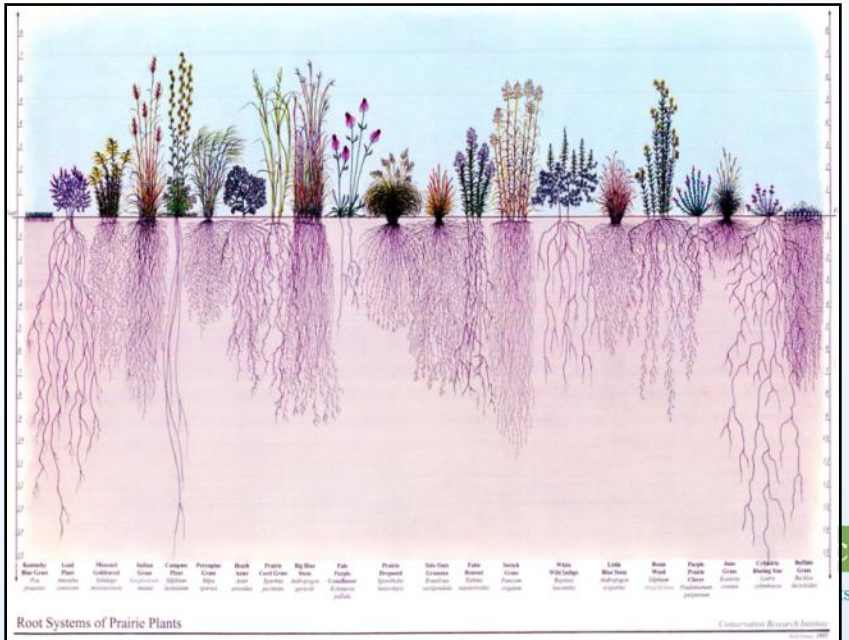


At the site/lot scale…

- Incorporate natural landscaping and stormwater best management practices in parks, school grounds, residences
  - Applicable to both new projects and retrofits
- Protect, restore, and manage natural areas

Natural Landscaping



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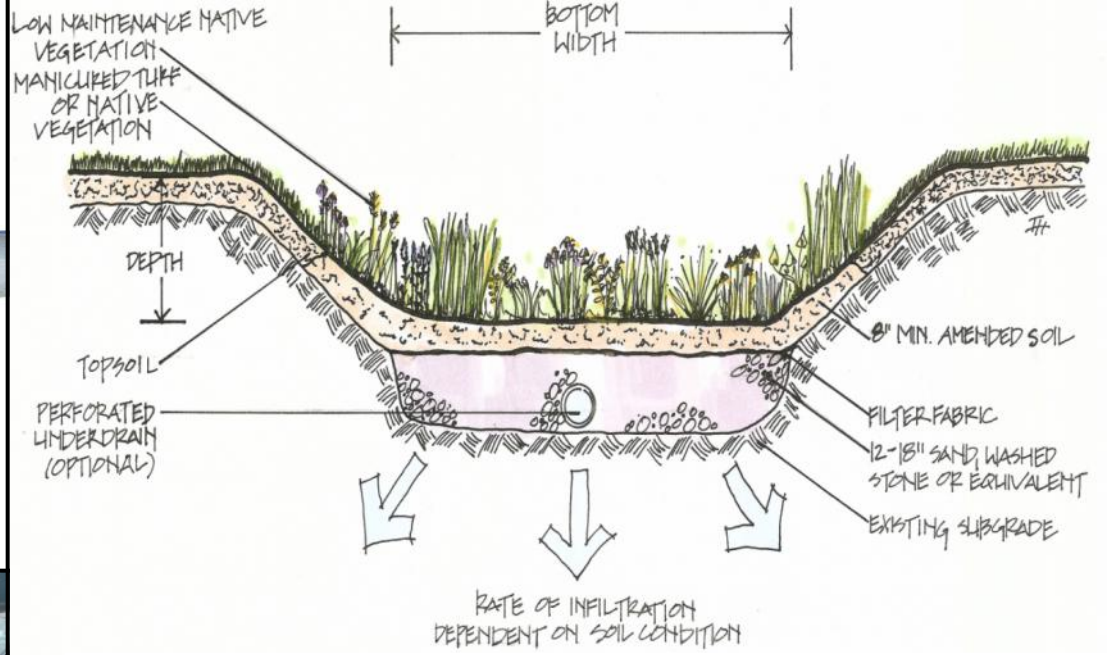
Bio-swales and Rain Gardens



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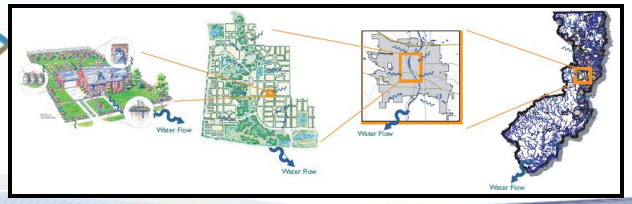
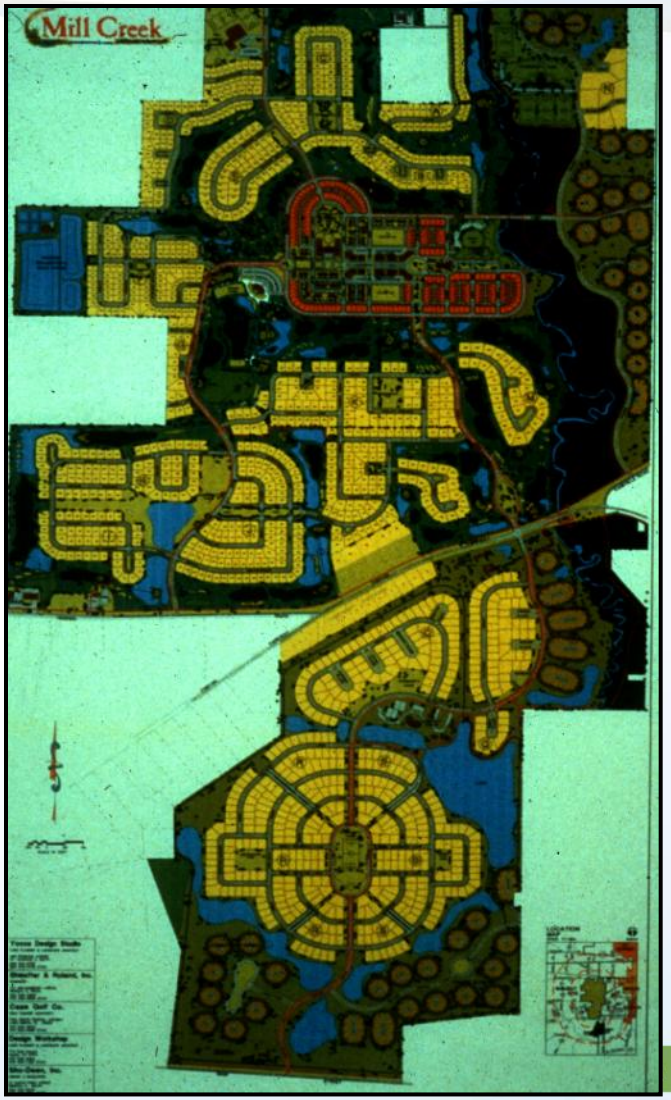


At the neighborhood scale…

- Incorporate "conservation design" into new developments
- Find creative ways to:
  - infiltrate runoff
  - protect natural areas
  - create greenway & trail connections



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Naturalized Detention Basins

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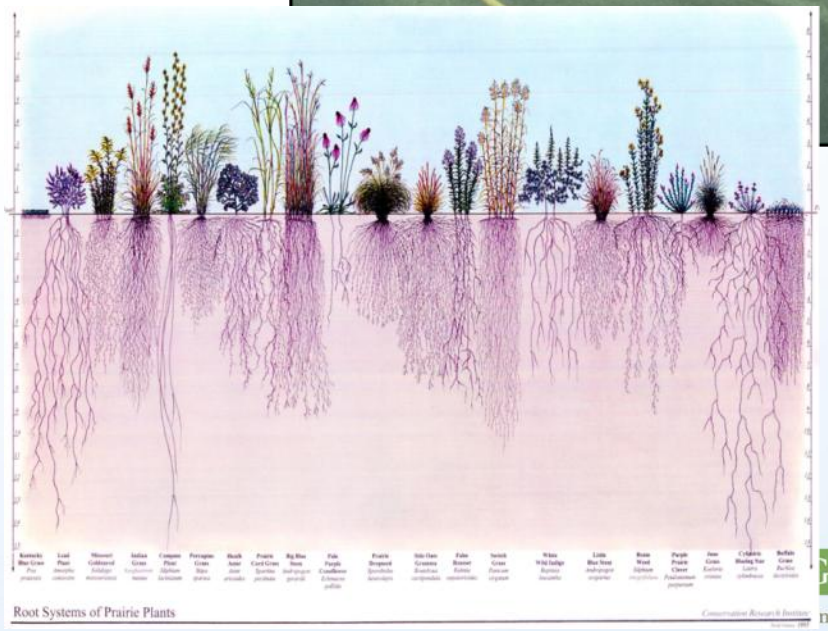
Use Natural Landscaping in Common Areas

Water Resource Benefits of Natural Landscaping

- Conventional landscaping requires:
  - Irrigation
  - Fertilizer
  - Pesticides and herbicides

- Native landscapes:

  Established natural landscapes do not



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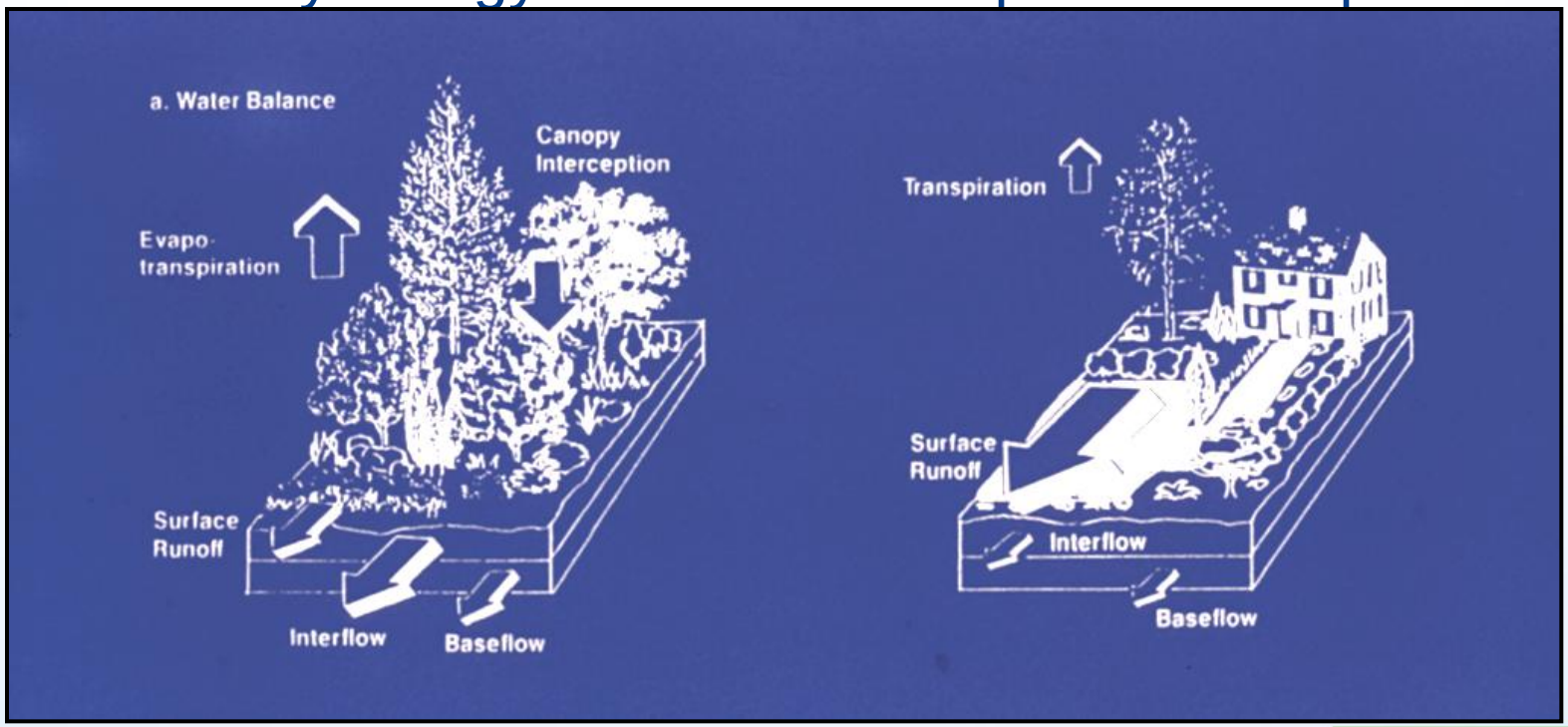
Community Benefits of Conservation Design

- Saves natural areas and open space
- Preserves groundwater recharge and water quality
- Prevents increased flooding
- Connects children and families to nature
- Enhances property values

Conservation Design Using "Green Infrastructure"

- Treat water as a resource
- Treat water where it falls
- Mirror the hydrology of the undeveloped landscape



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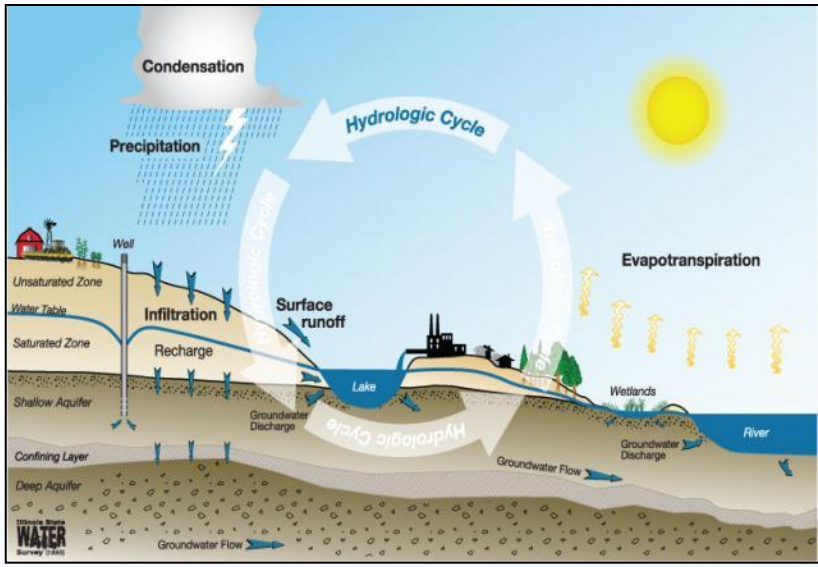
How do we do this?
The "Runoff Reduction Hierarchy"

- ***Reduce*** the amount of water to deal with
  - Preserve natural landscaping, swales, and drainageways
  - Reduce land disturbance and grading
  - Minimize impervious surfaces
- ***Infiltrate*** as much rainfall and runoff as possible
  - Treat runoff at the source
- ***Treat*** the rest
  - Filter, transform and settle runoff pollutants
- Finally, use storm sewers, if necessary, to convey excess runoff

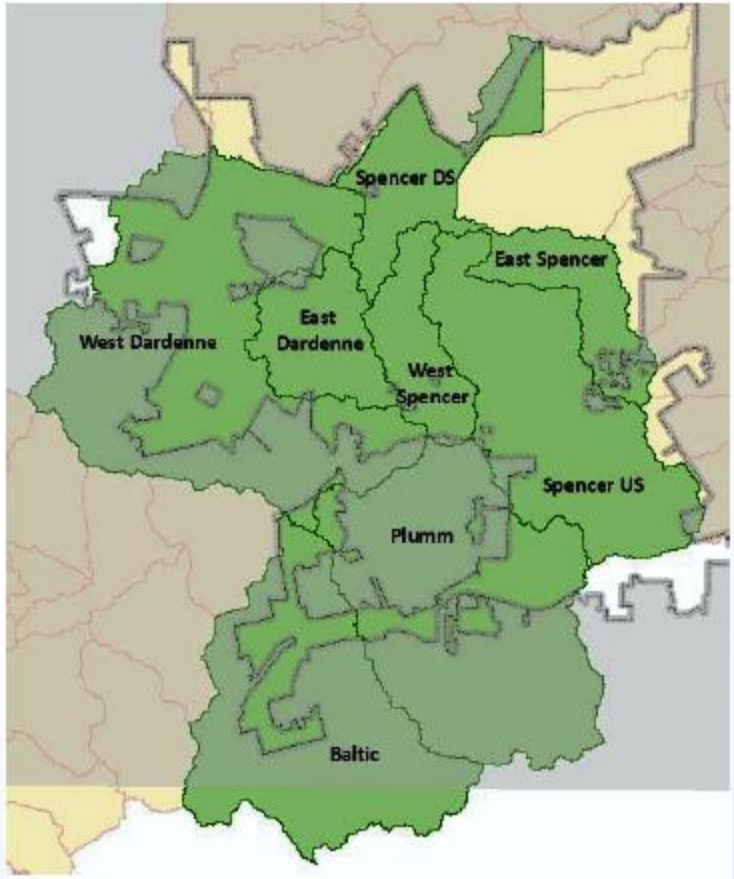
Holistic Menu of Stormwater BMPs

- Impervious area reduction
- Green roofs
- Permeable paving
- Natural landscaping
- Bio-infiltration
  - Rain gardens
  - Bioswales
- Filter strips/level spreaders
- Naturalized detention

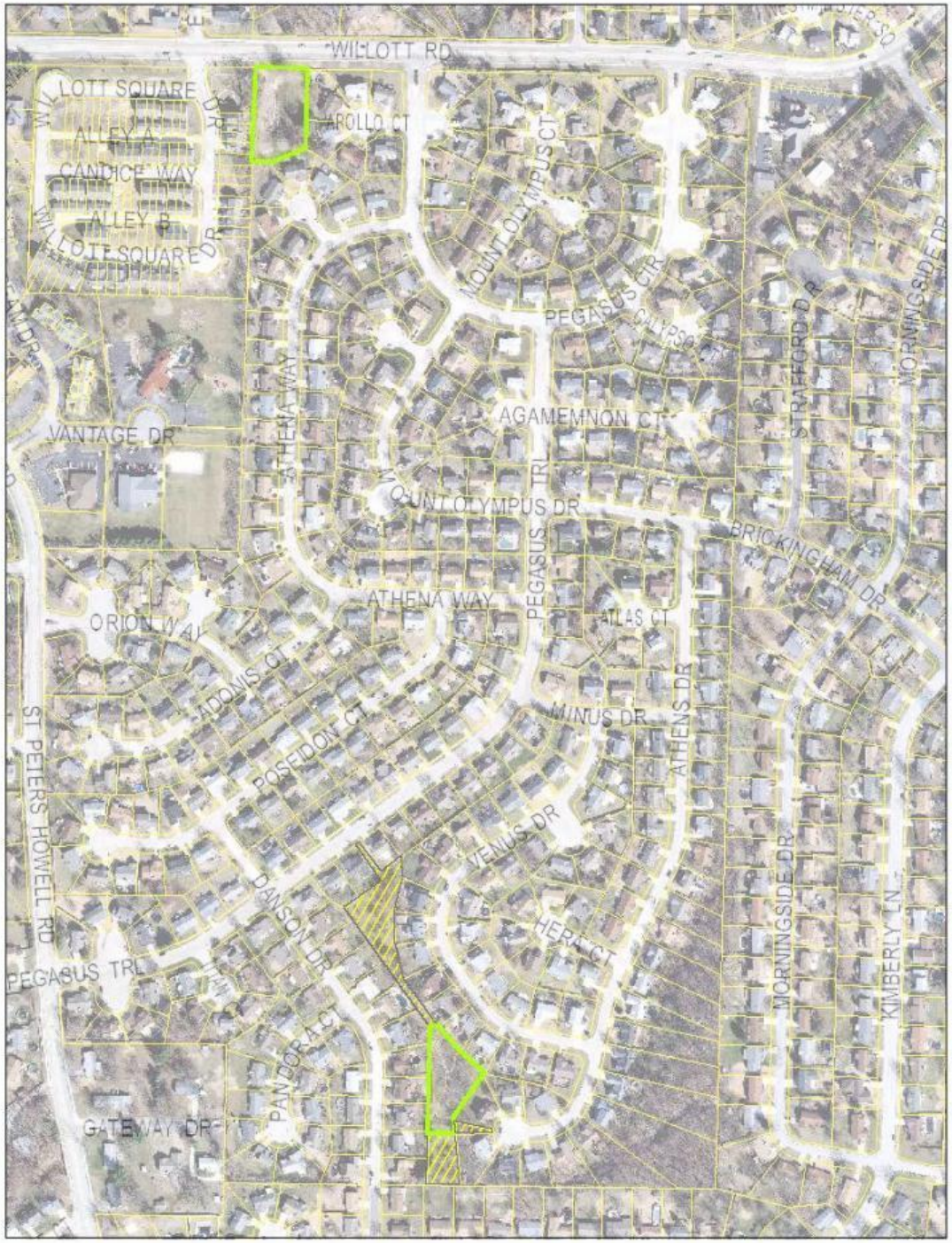


At the regional scale…

- City of St. Peters – 2012 Comprehensive City-wide Storm Water Master Plan (SWMP).
  - Improve water quality
  - Regulatory compliance



Overview of Project Sites



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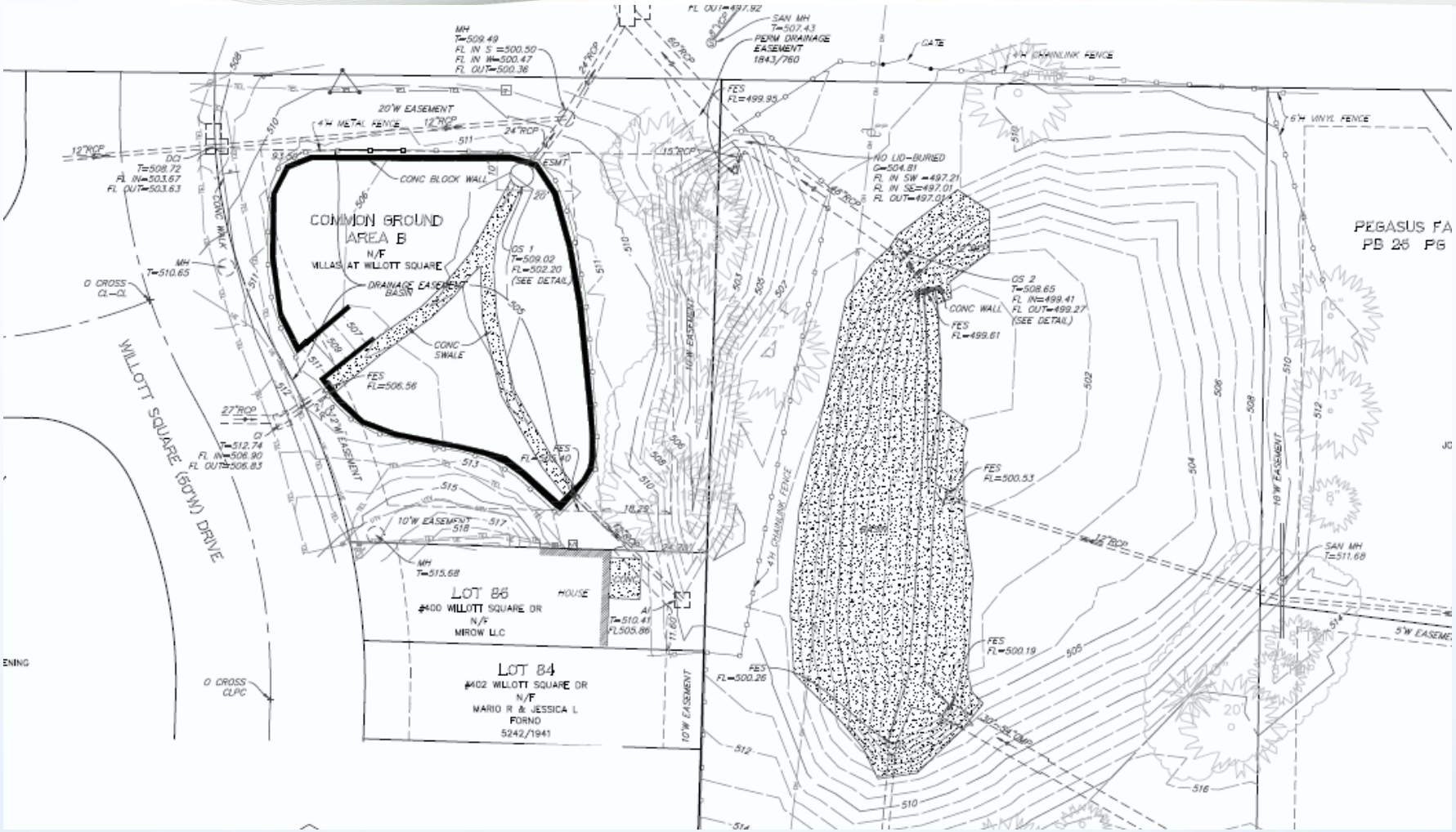
Overview of Project Site
Willott Square/Pegasus Farms (North)



Overview of Project Site Pegasus (North)

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Overview of Project Site
Willott Square

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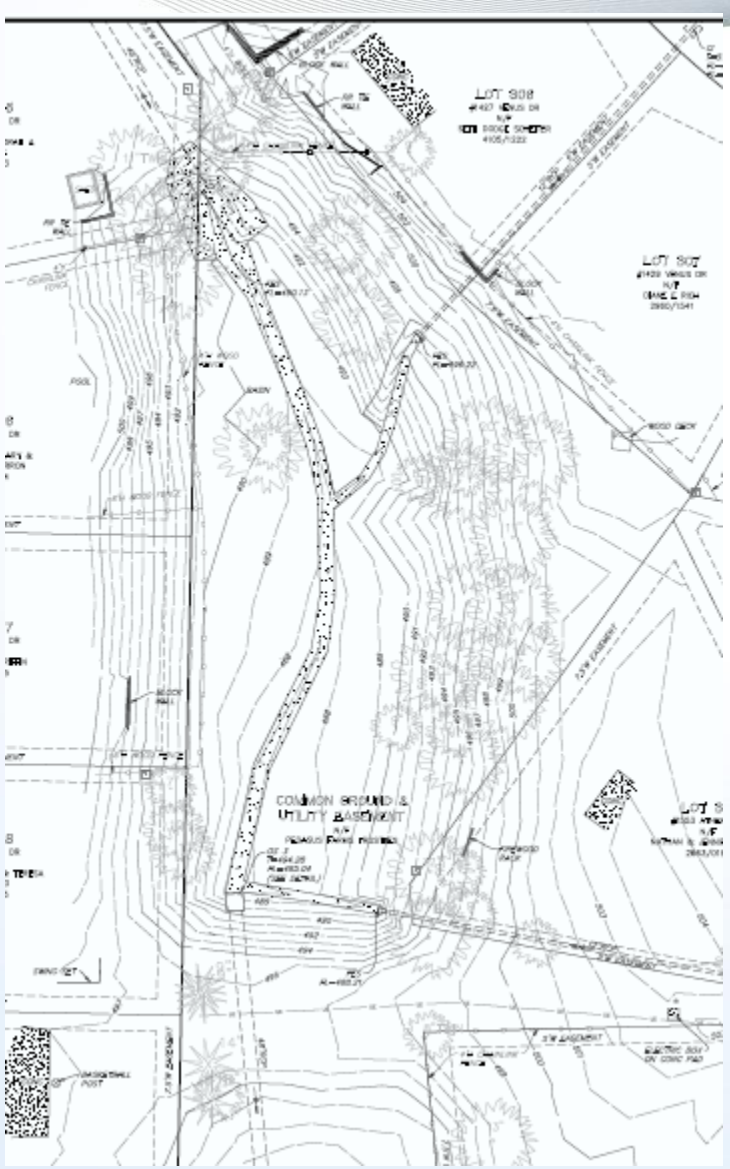
Overview of Project Site Pegasus (South)



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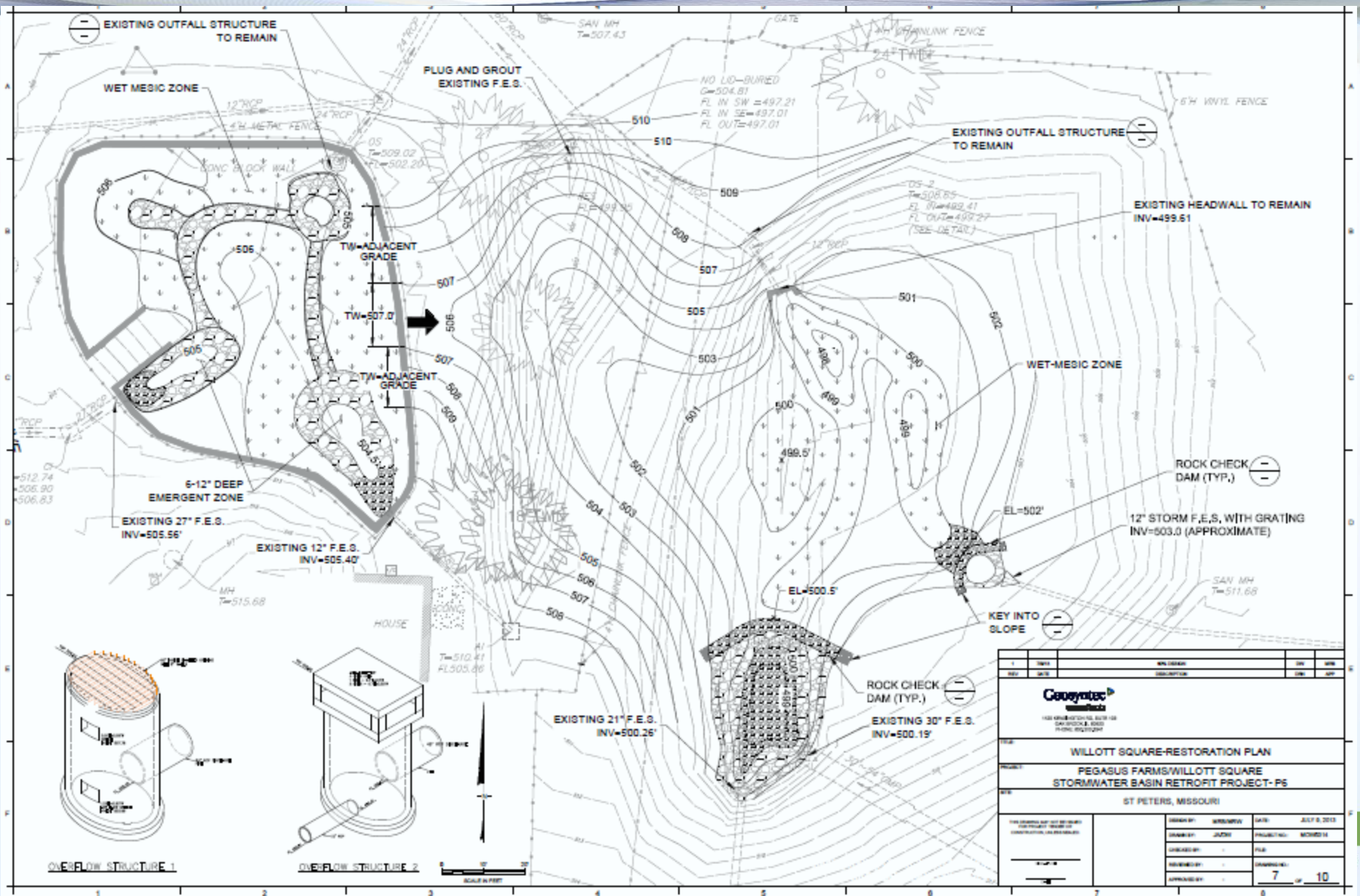
Design Approach
Willott Square / Pegasus (North)



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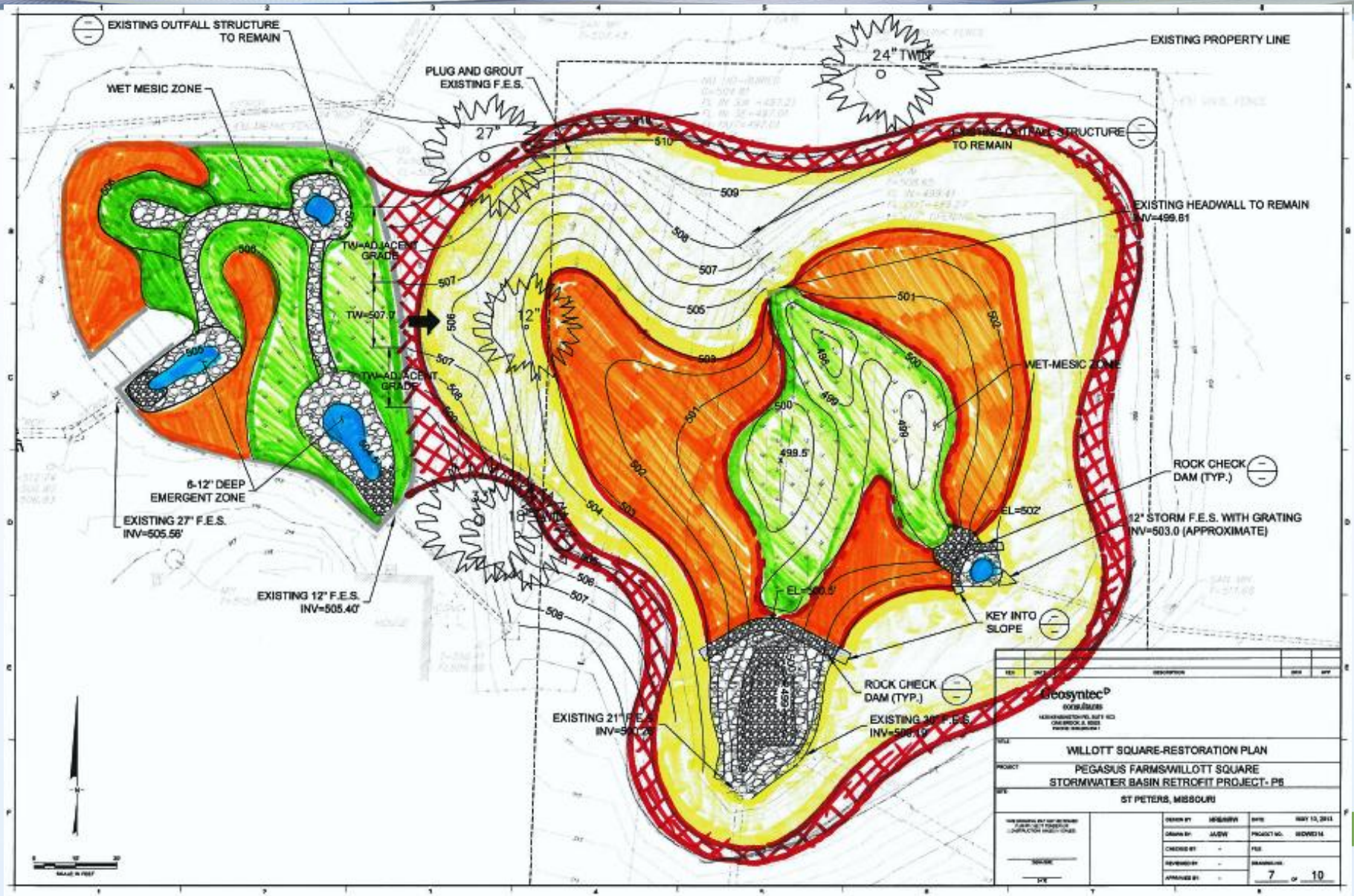
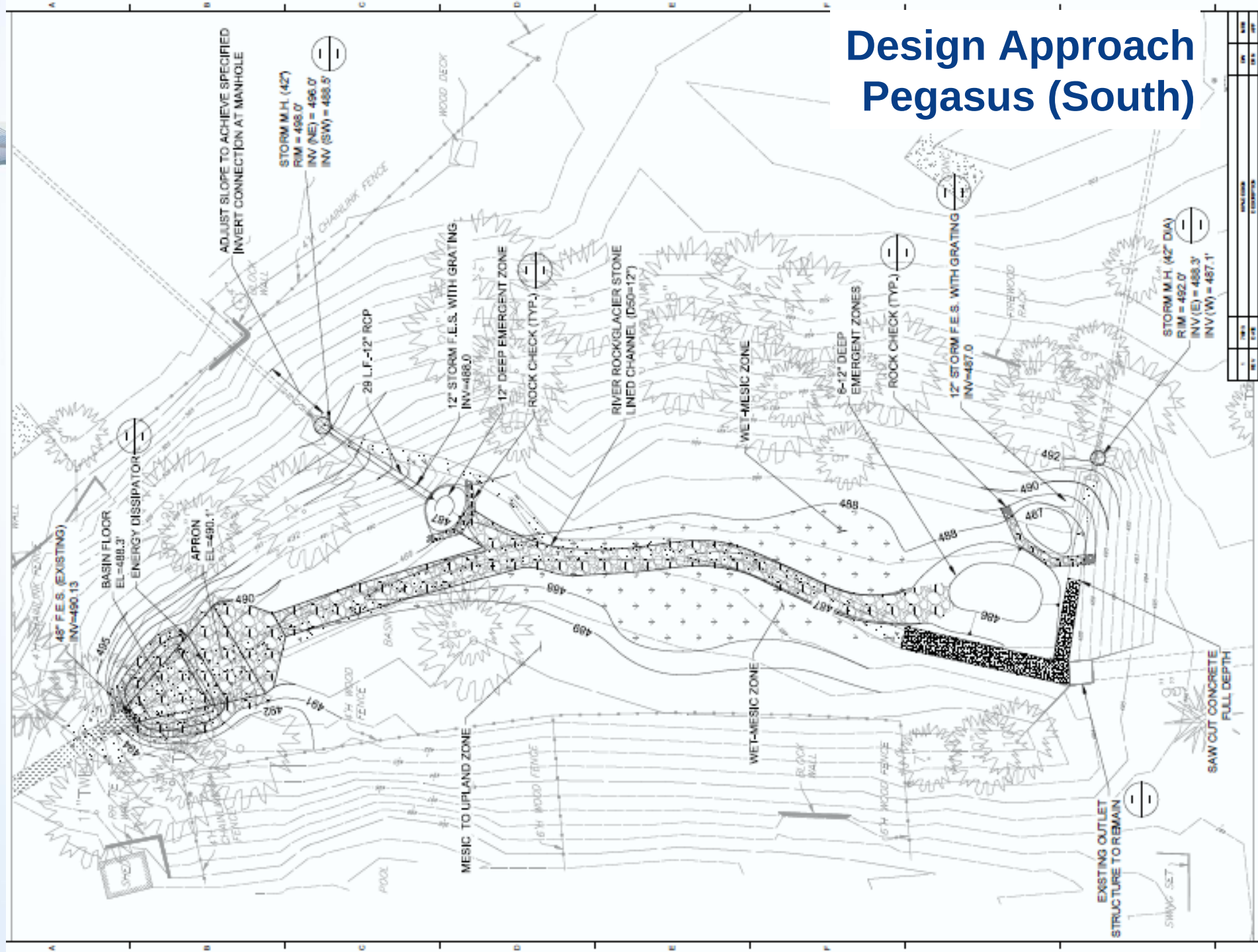
Restoration Plan
Willott Square / Pegasus (North)



Design Approach Pegasus (South)



Restoration Plan
Pegasus (South)

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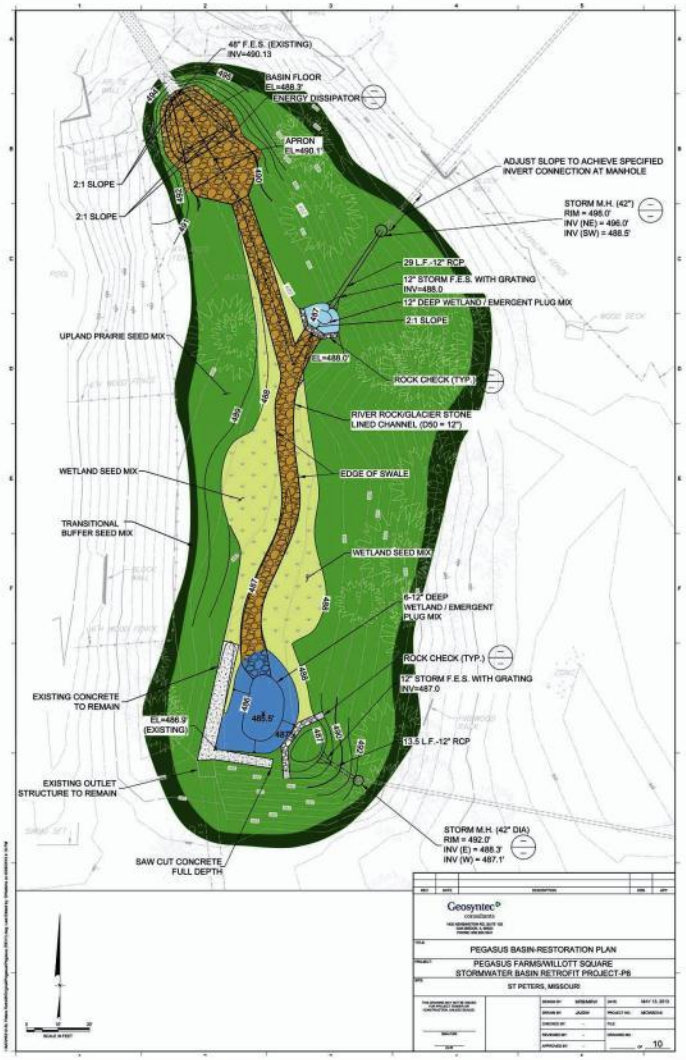
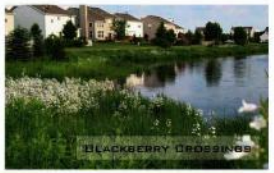
Restoration Plan – Pegasus (South)

Pegasus Farms Basin Retrofit Plan



Pegasus Farms Basin Retrofit Vision

Mature Planting



Prairie Phasing

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Restoration Plan
Pegasus (South)

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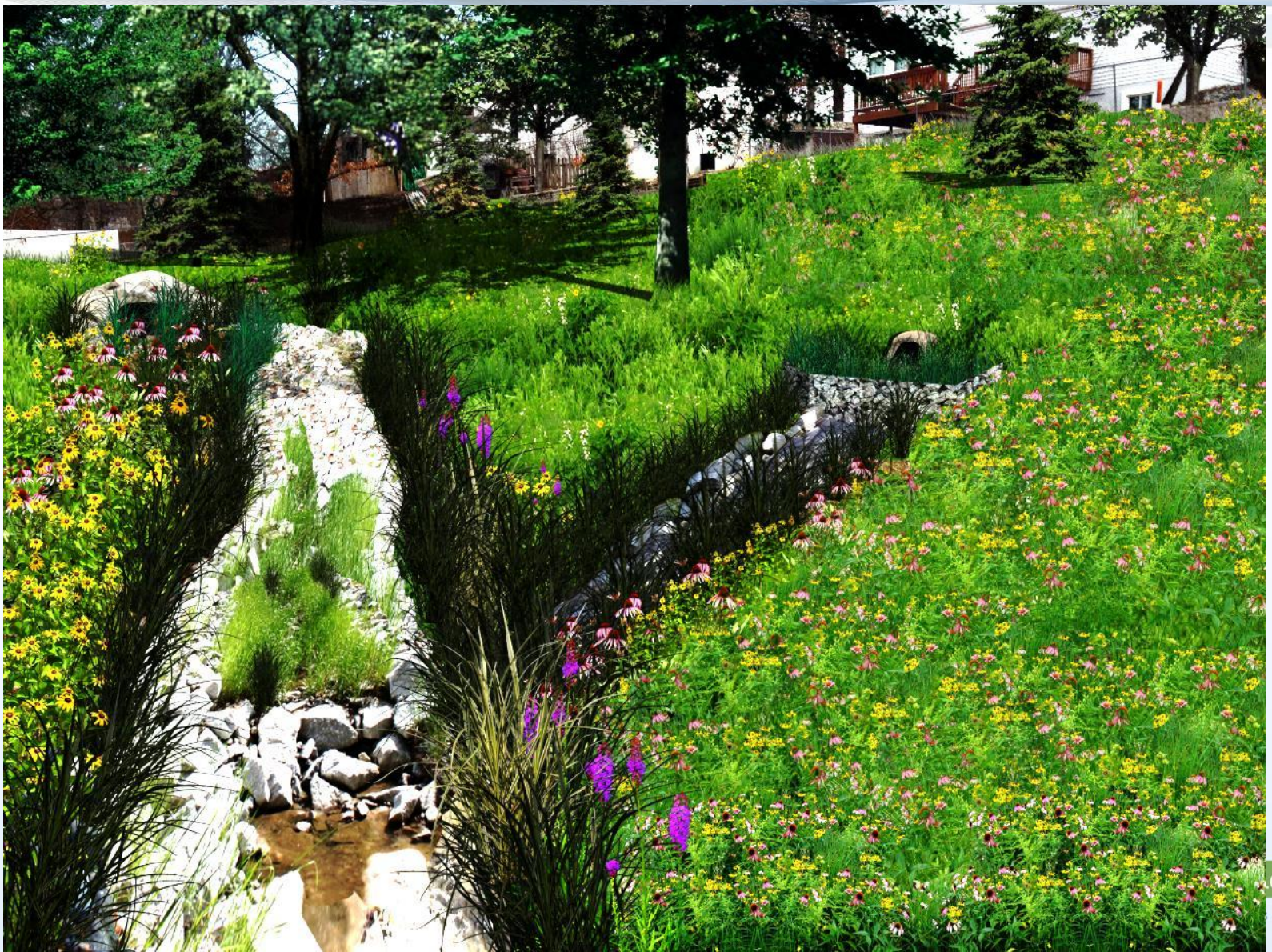
Restoration Plan
Pegasus (South)



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Bambrick Park Dry Bottom Detention Basin
Lemont, IL

Municipal Project – Village of Lemont

After the initial herbicide treatment of existing turf grass and showing first signs of nurse crop germination (May 2010)

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Bambrick Park Dry Bottom Detention Basin

Lemont, IL

Municipal Project – Village of Lemont

1-year after installation of seed
(July 2011)

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Bambrick Park Dry Bottom Detention Basin

Lemont, IL

Municipal Project – Village of Lemont

1-year after installation of seed
(July 2011)

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Bambrick Park Dry Bottom Detention Basin
Lemont, IL

Municipal Project – Village of Lemont

1-year after installation of seed, some of the more conservative species are present, but small in stature the first year (July 2011)

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Bambrick Park Dry Bottom Detention Basin
Lemont, IL

Municipal Project – Village of Lemont

2-years after installation of seed, the black-eyed susan's dominance has subsided and a permanent natural look has taken root (September 2012)

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Champaign DOT Wildflower Planting
Champaign, IL

Prairie in Early Summer (June/July)

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Wolf Road Prairie
Westchester, IL

Prairie in Late Summer (July/August)

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Private Residence
Clare, IL

Prairie in Late Fall (September/October)

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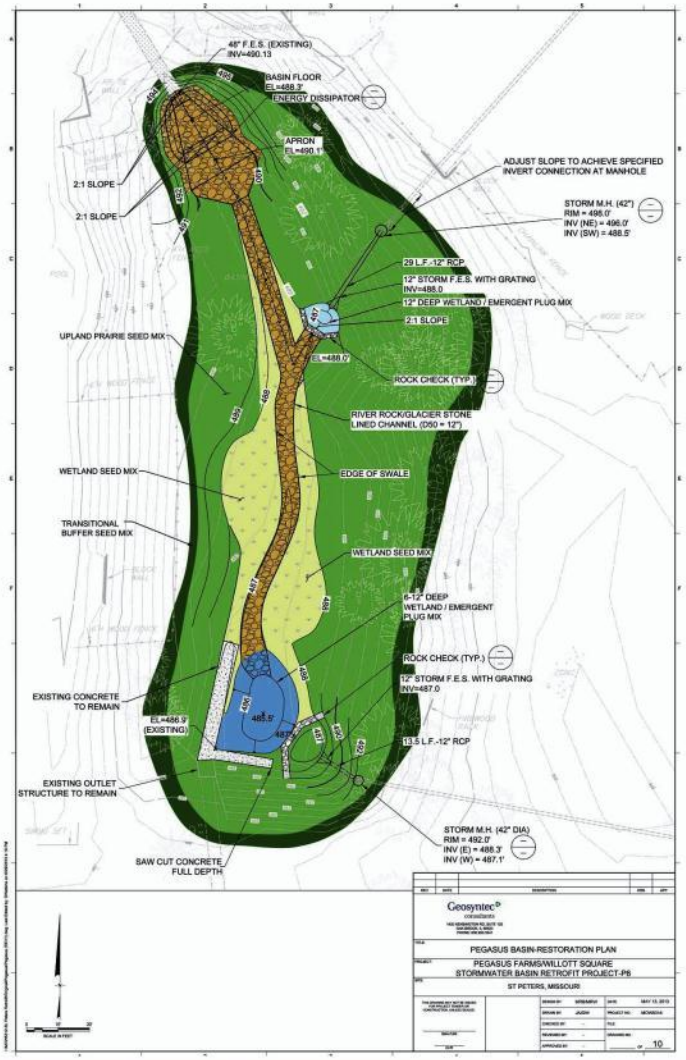
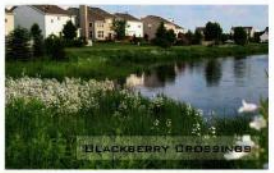
Restoration Plan – Pegasus (South)

Pegasus Farms Basin Retrofit Plan



Pegasus Farms Basin Retrofit Vision

Mature Planting



Prairie Phasing

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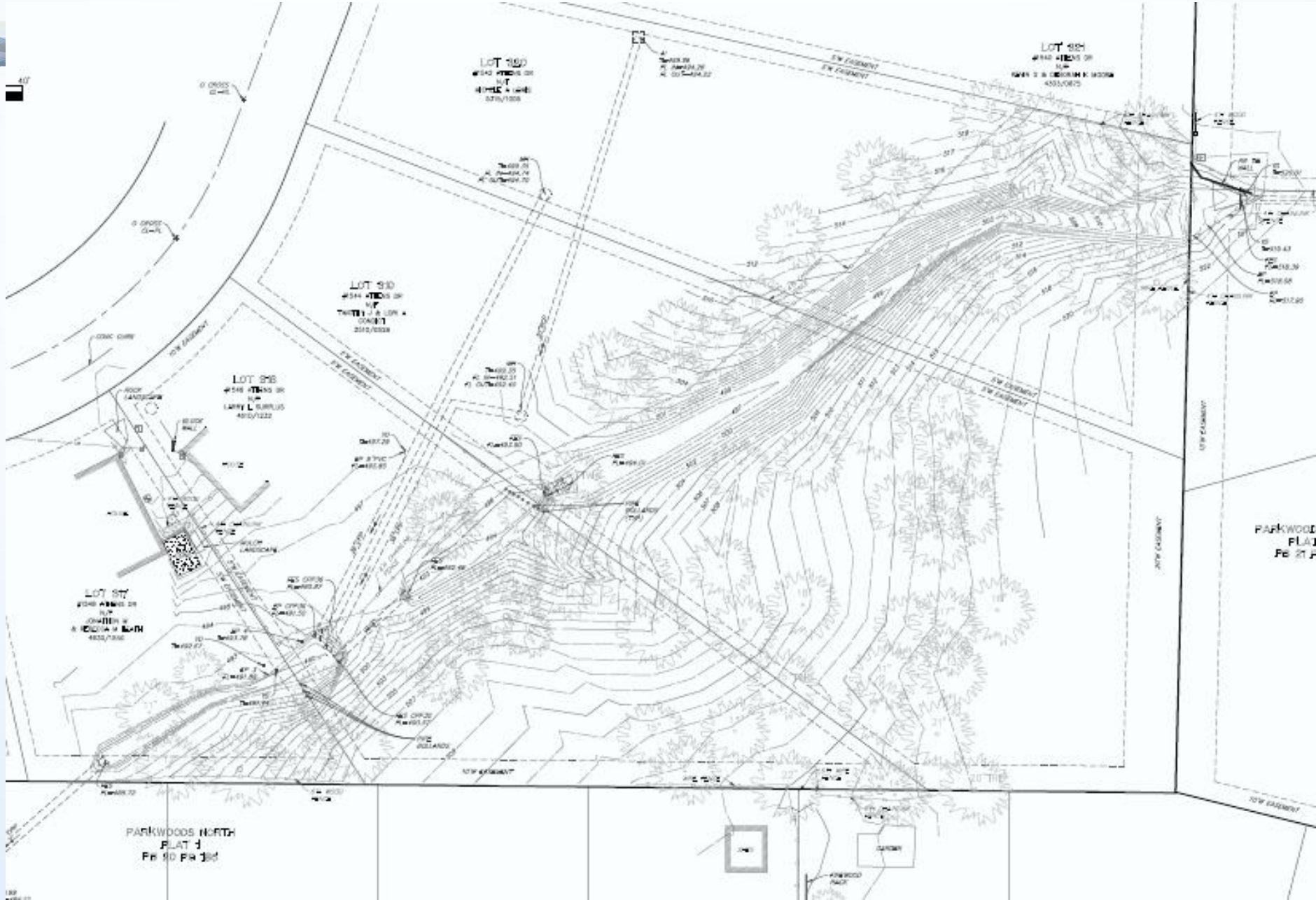
Overview of Project Site



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Overview of Project Site
Athens Channel

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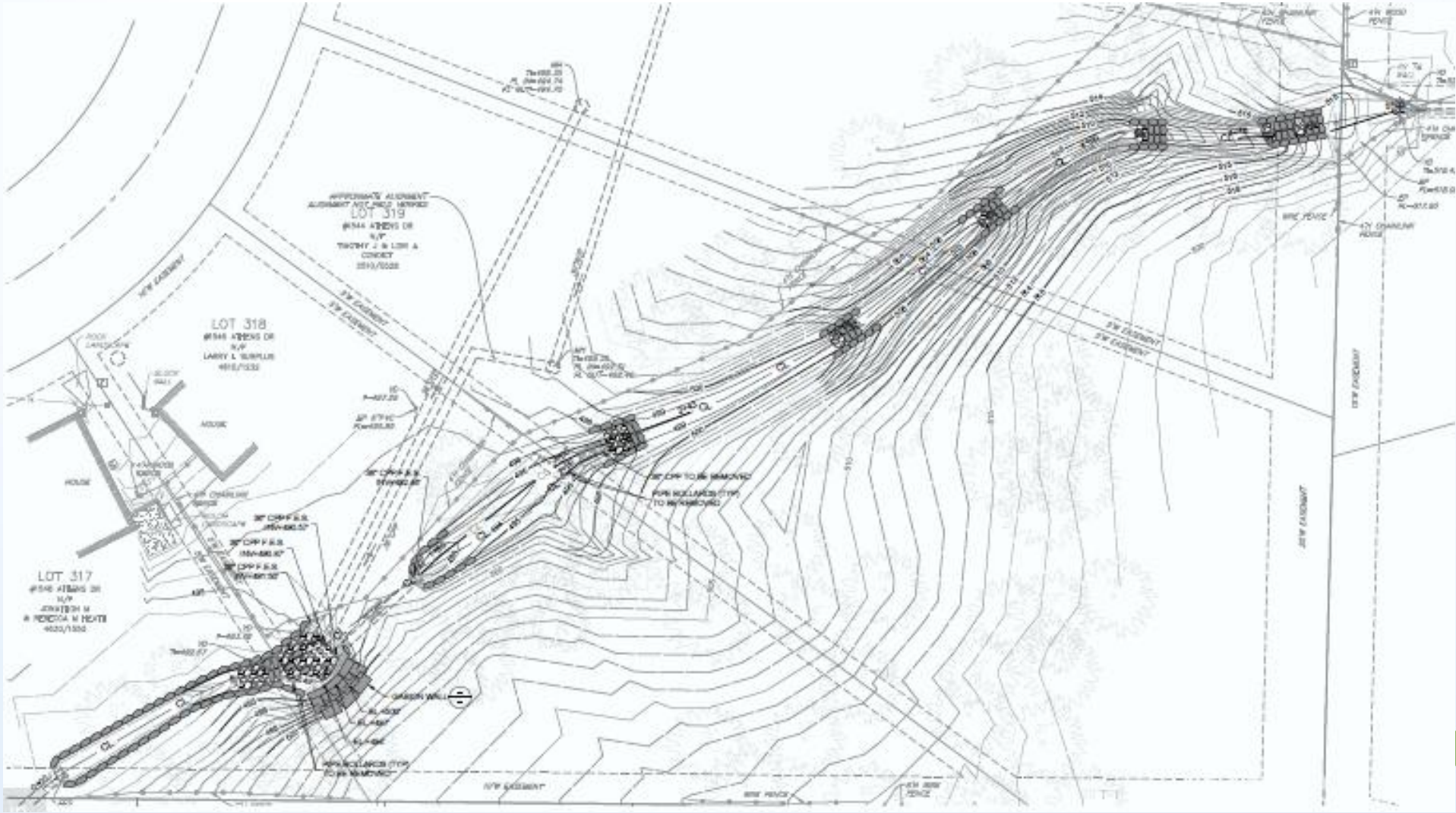
Design Approach
Athens Channel



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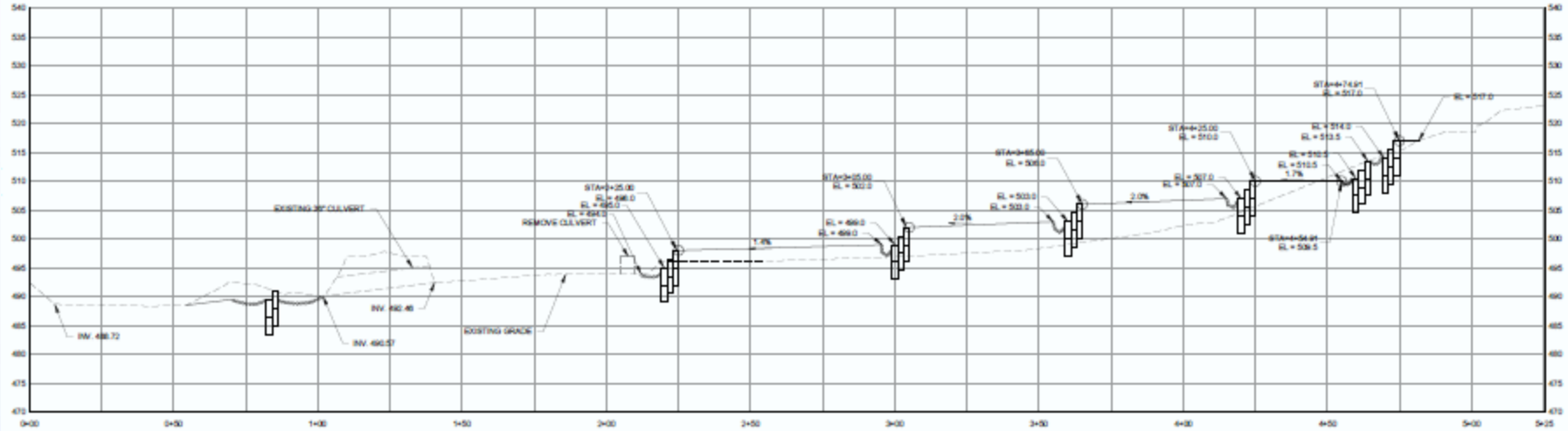
Design Approach
Athens Channel



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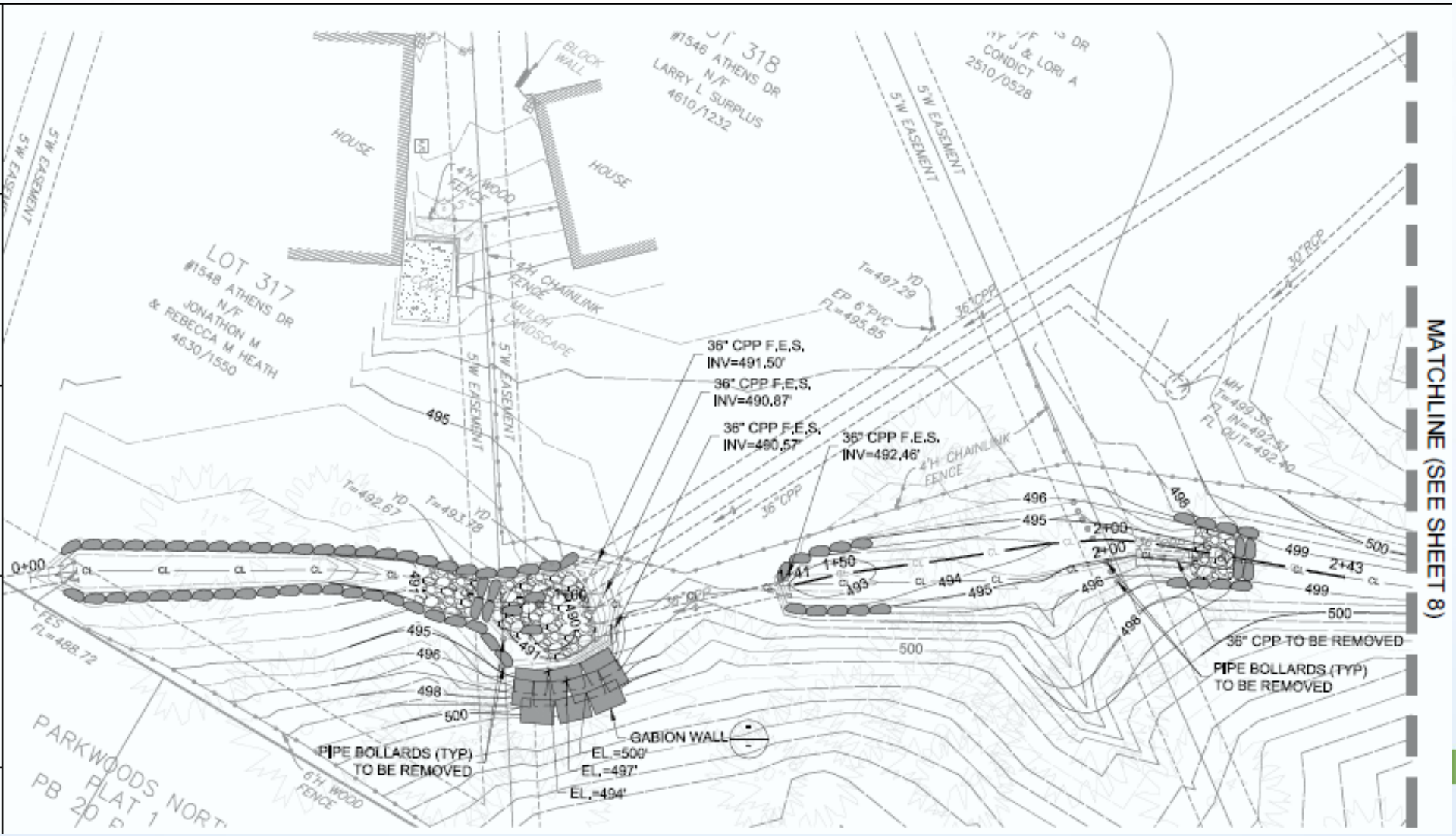
Design Approach
Athens Channel



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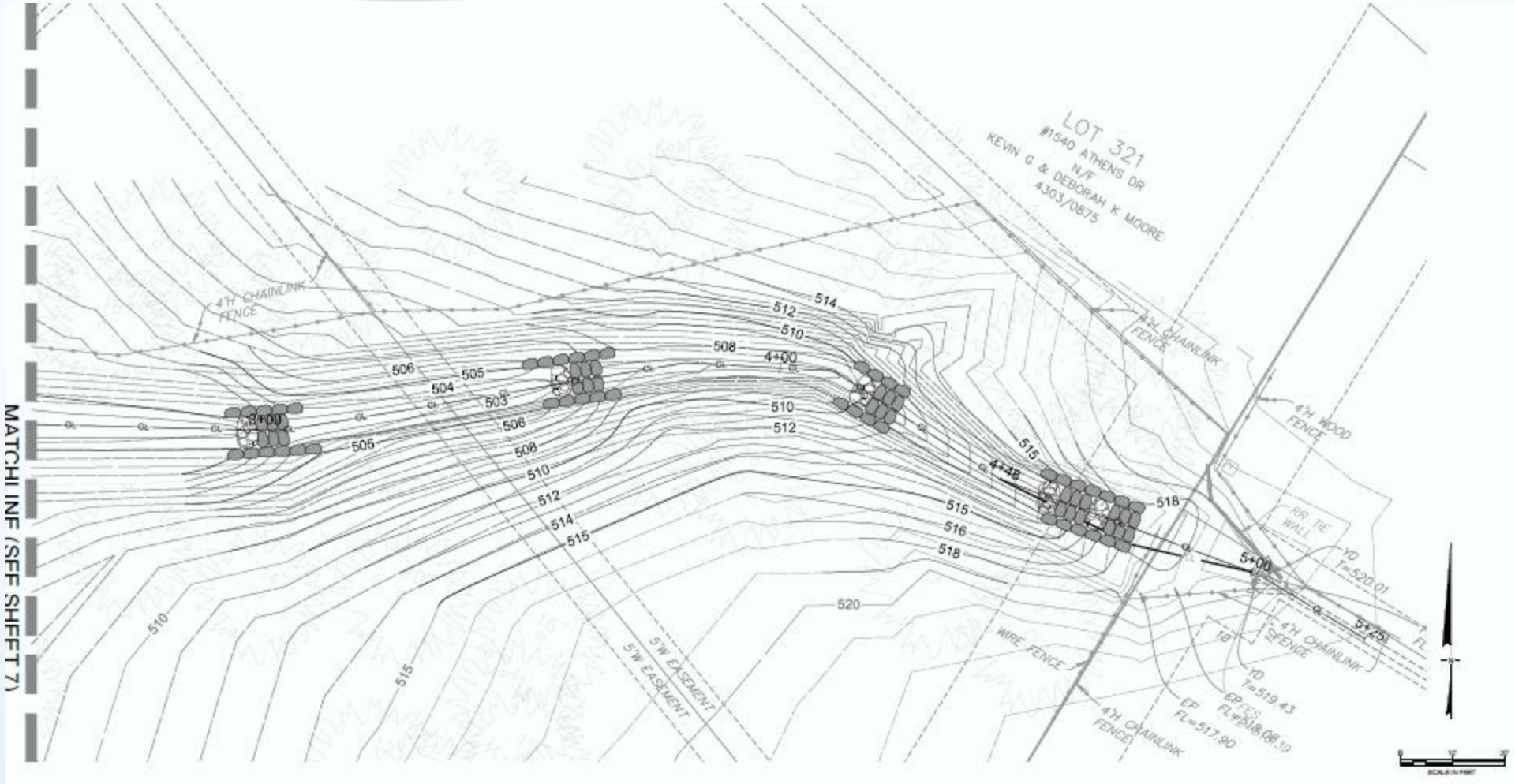
Design Approach
Athens Channel



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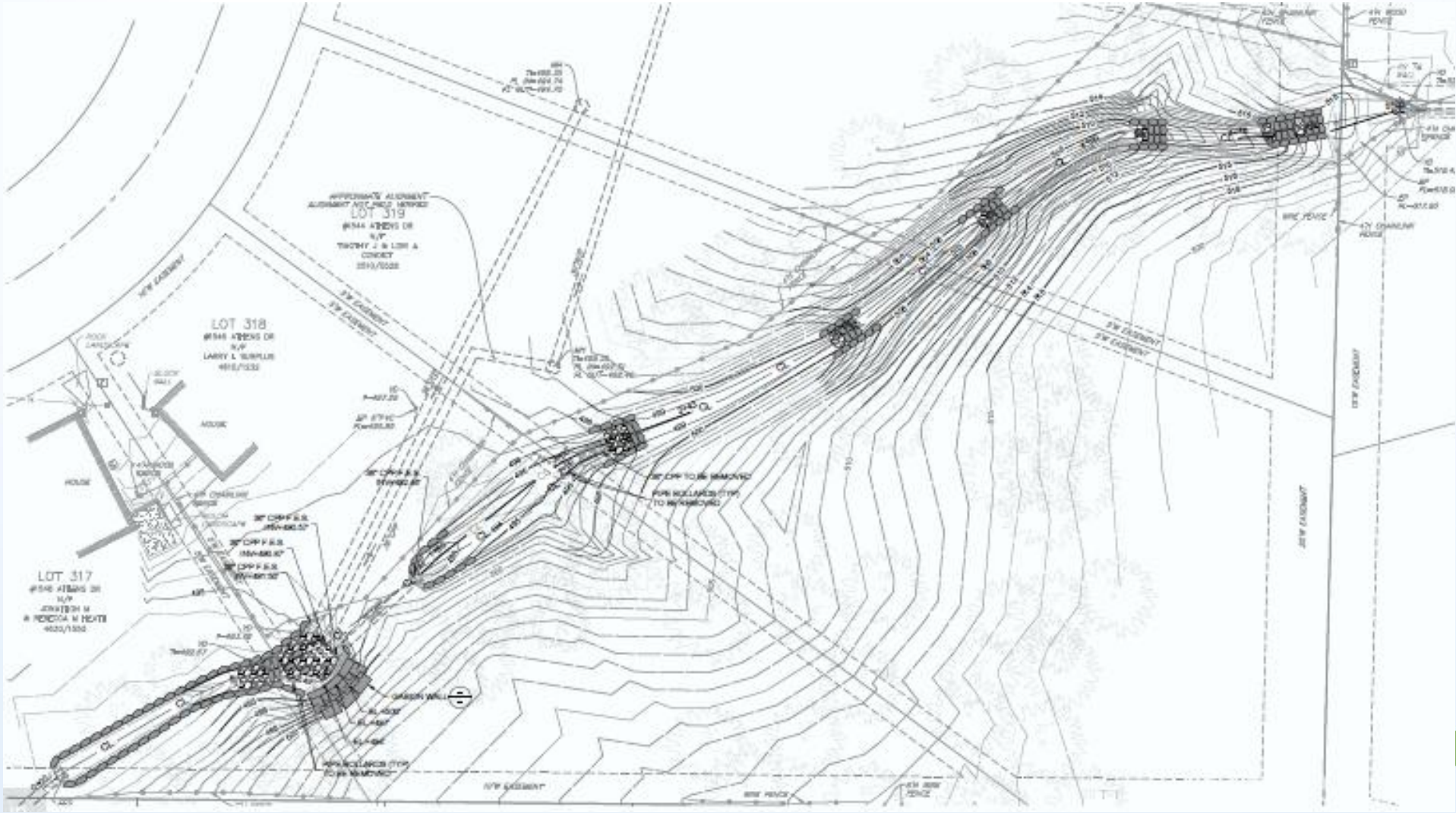
Design Approach
Athens Channel



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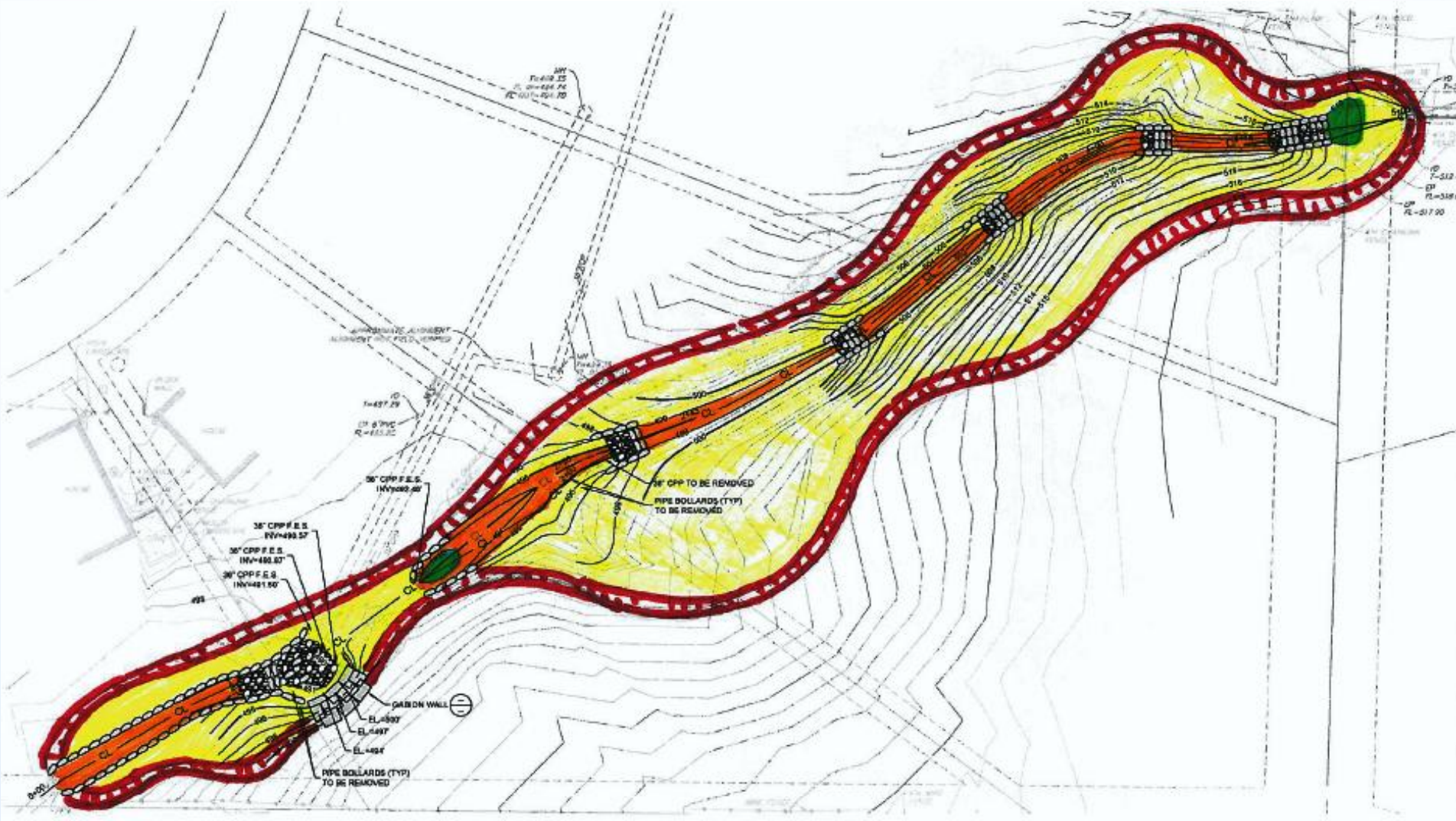
Restoration Plan
Athens Channel



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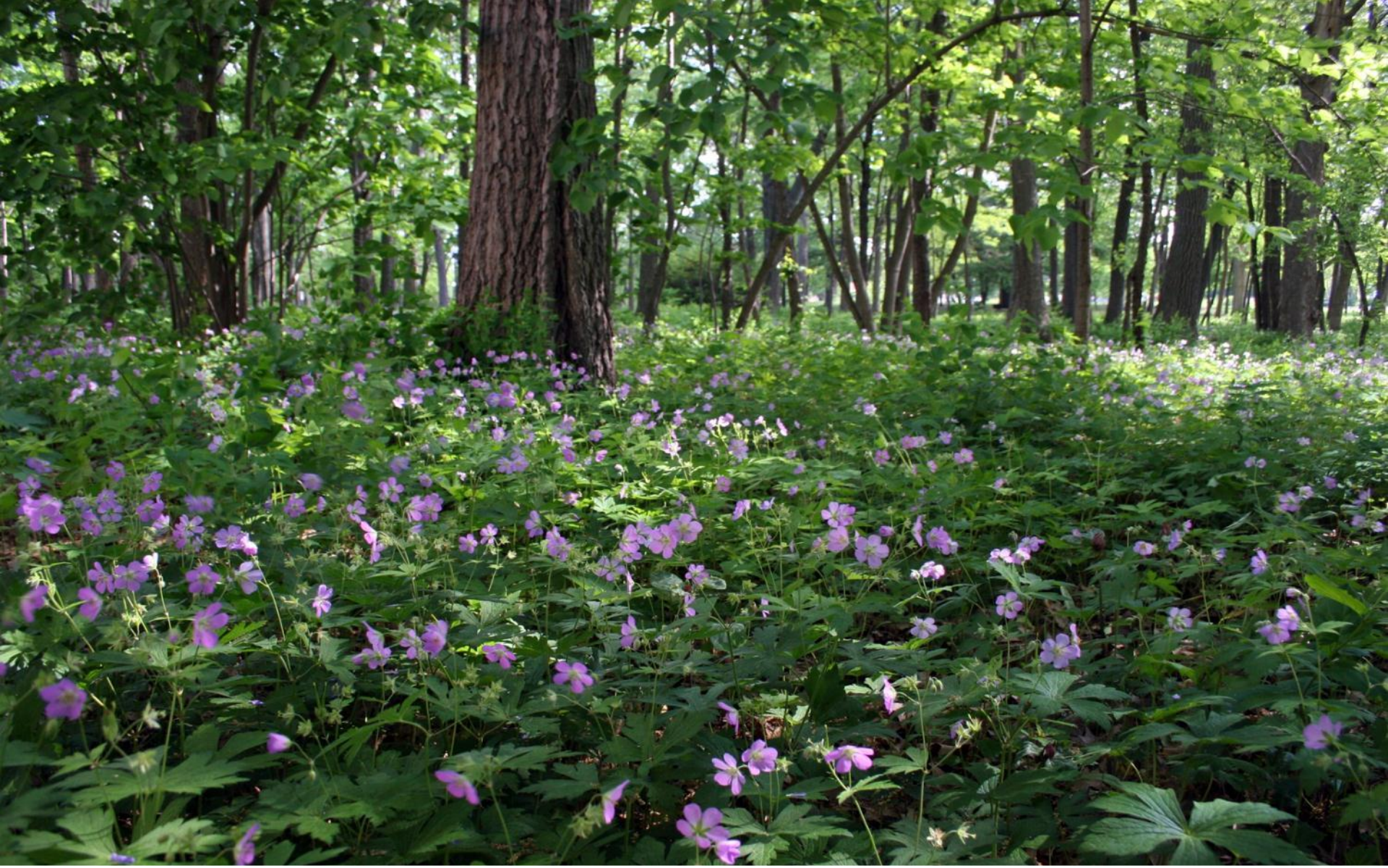
Humphrey Woods
Orland Park, IL

Woodland in Spring (May)



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NIU Arboretum Woods
DeKalb, IL

Woodland in Late Spring/Early Summer
(May/June)

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Ball Horticultural Company
West Chicago, IL

Woodland in Summer (June/July)

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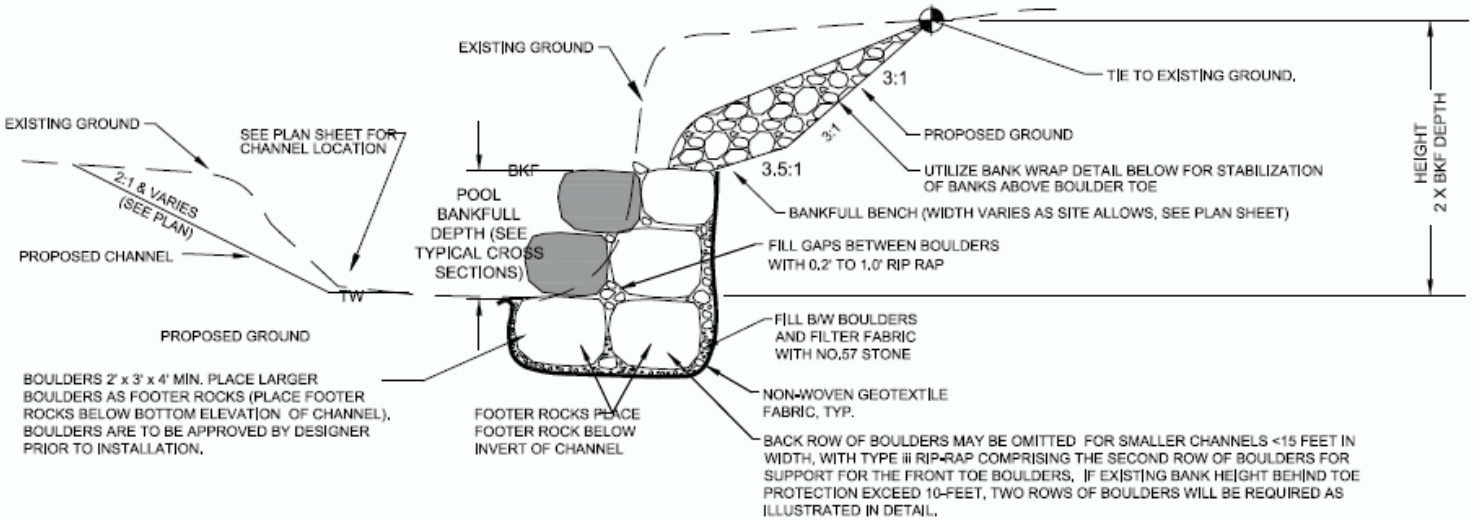
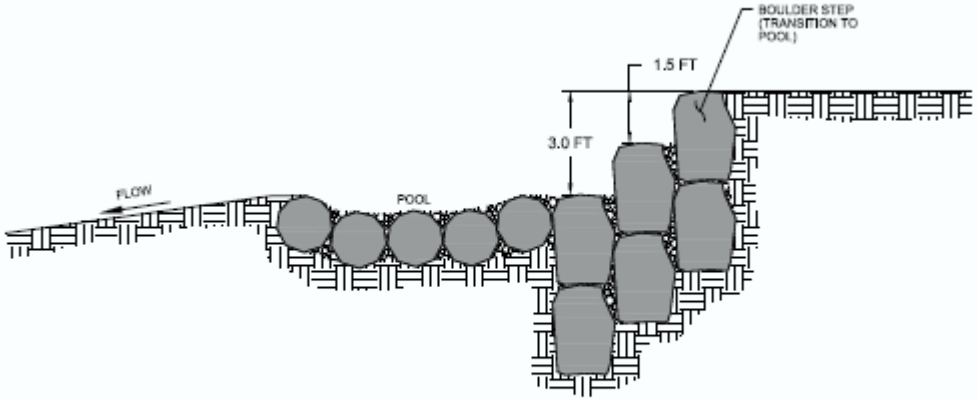
Ball Horticultural Company
West Chicago, IL

Woodland in Summer (July/August)

Restoration Plan
Athens Channel



BOULDER TOE PROTECTION
TYPICAL
N.T.S.



BOULDER STEP AND CONSTRUCTED POOL
TYPICAL
N.T.S.

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Representative Pictures

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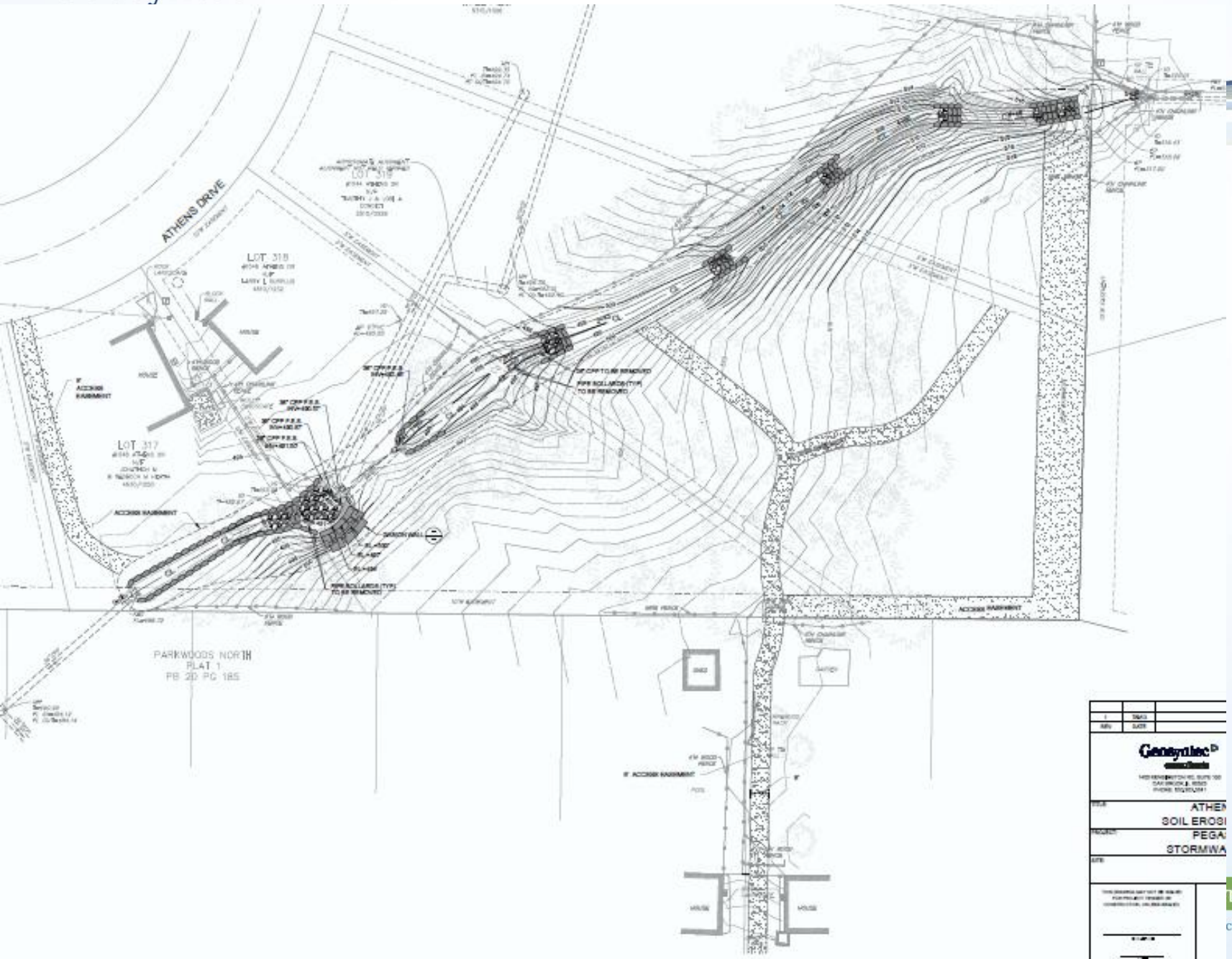
Proposed Easements



Questions?