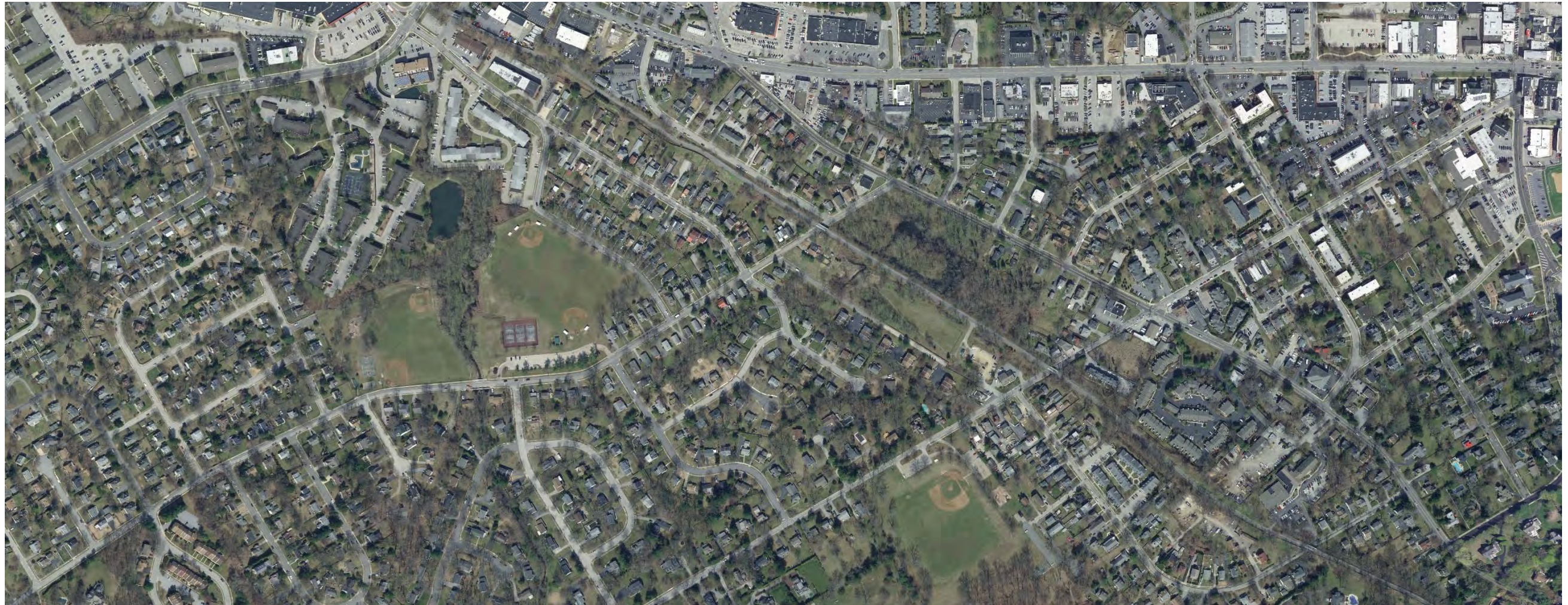


West Wayne Flood Reduction Study Update

Marc Henderson, P.E., Senior Water Resources Engineer, Meliora Design



Design Team Members

meliora 

viridian
landscape studio



West Wayne Flood Reduction Study Update

Wayne, PA

West Wayne Preserve – 6.4 acres

Friends of Radnor Trail Park – 3 acres

Currently stormwater is routed to both areas via Township stormwater pipes

Drainage

- WWP – 44 acres, 40% Impervious
- FRT Park – 20 acres, 18 % Impervious



General Existing Site Conditions



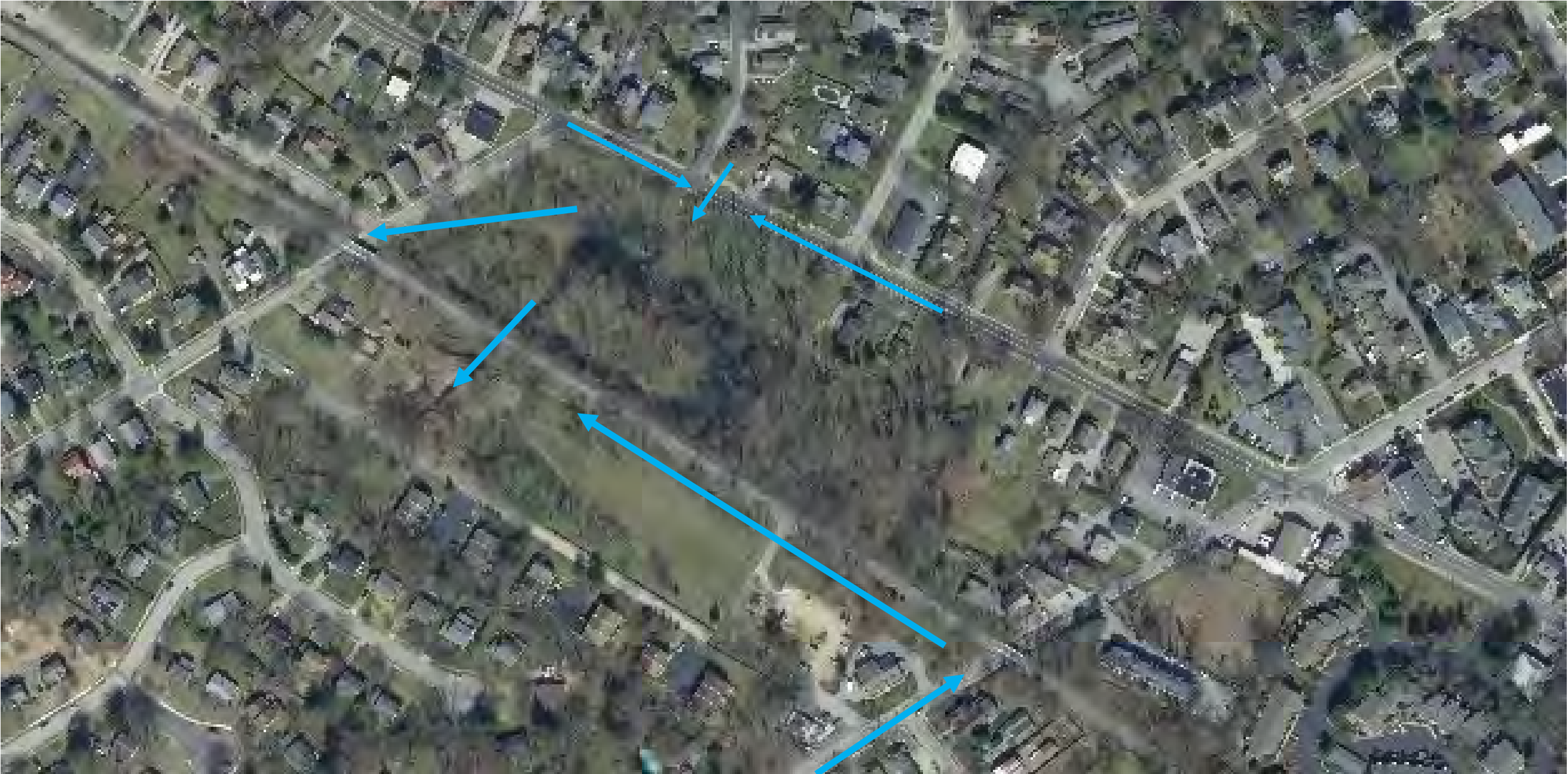
- 1. Buried outlet pipe
- 2. Wetlands
- 3. Flooding
- 4. Legacy fill from dumping
- 5. Undesirable tree species

Project Objectives

1. **Improve SWM**
2. **Increase habitat value**
3. **Provide passive recreational opportunities**
4. **Reduce downstream flooding**
5. **Improve existing Township amenities**

Existing Drainage Pattern

- Unmanaged flows out of WWP
- Flooding on W. Wayne and S. Devon



Existing Drainage Pattern



Existing Trees and Wetlands



Photo By: C. Hausman

Ash – Susceptible to Emerald Ash Borer



Norway Maple – Invasive Species



Stormwater Approach



- 1. Modify WW Preserve Outlet Structure**
- 2. Improve storm conveyance**
- 3. Improve WW Preserve grading to manage overflows to South Devon**
- 4. Add stormwater management and storage**

Current SWM Plan

EXISTING CONDITIONS LEGEND

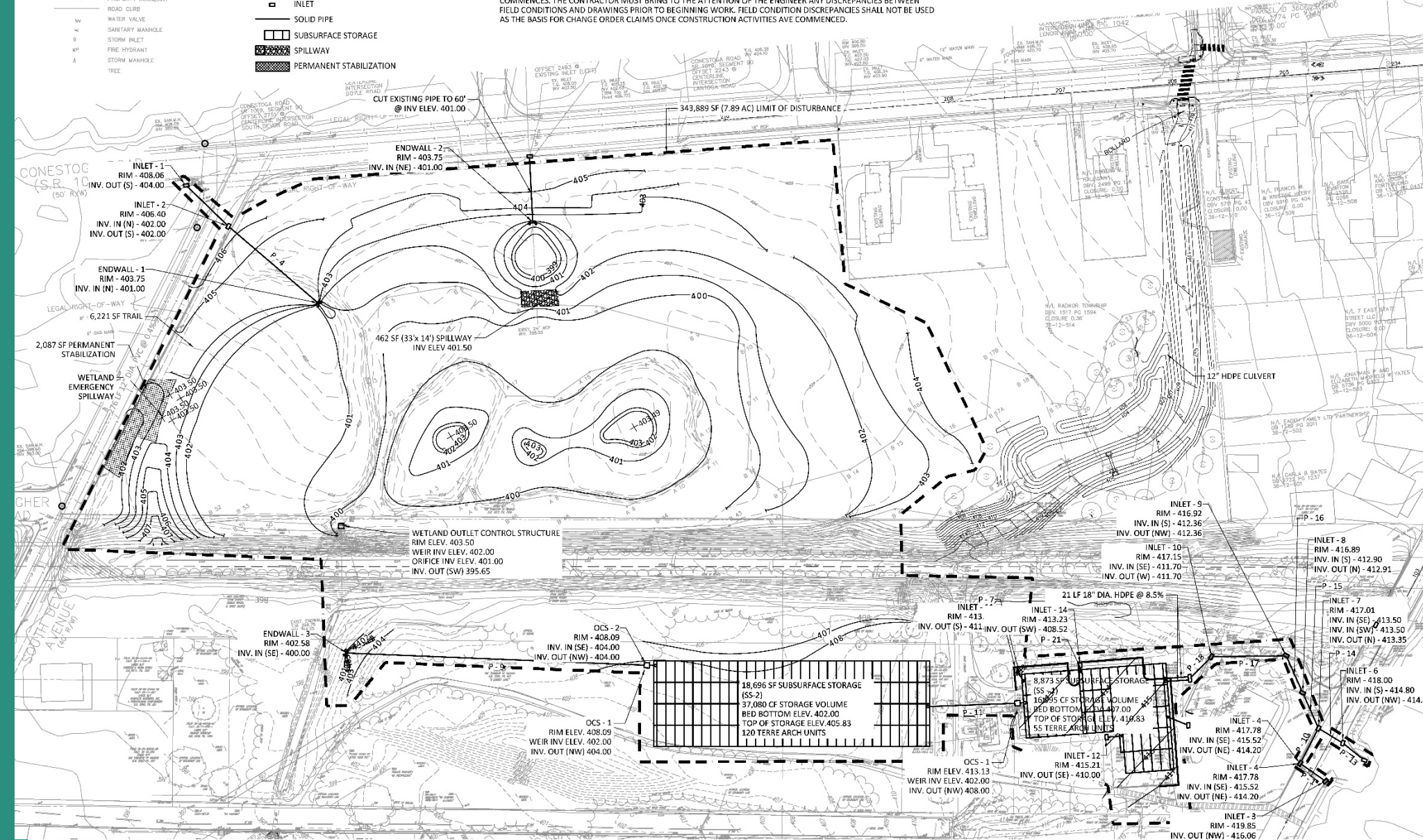
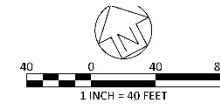
- ELEVATION CONTOUR
- SANITARY SEWER
- WATER LINE
- STORM SEWER
- PROPERTY BOUNDARY
- ROAD CURB
- W WATER VALVE
- M SANITARY MANHOLE
- S STORM INLET
- H FIRE HYDRANT
- A STORM MANHOLE
- T TREE

LEGEND

- - - - - LIMIT OF DISTURBANCE/ PROJECT BOUNDARY
- JUNCTION STRUCTURE
- ENDWALL
- OUTLET CONTROL STRUCTURE
- INLET
- SOLID PIPE
- SUBSURFACE STORAGE
- SPILLWAY
- PERMANENT STABILIZATION

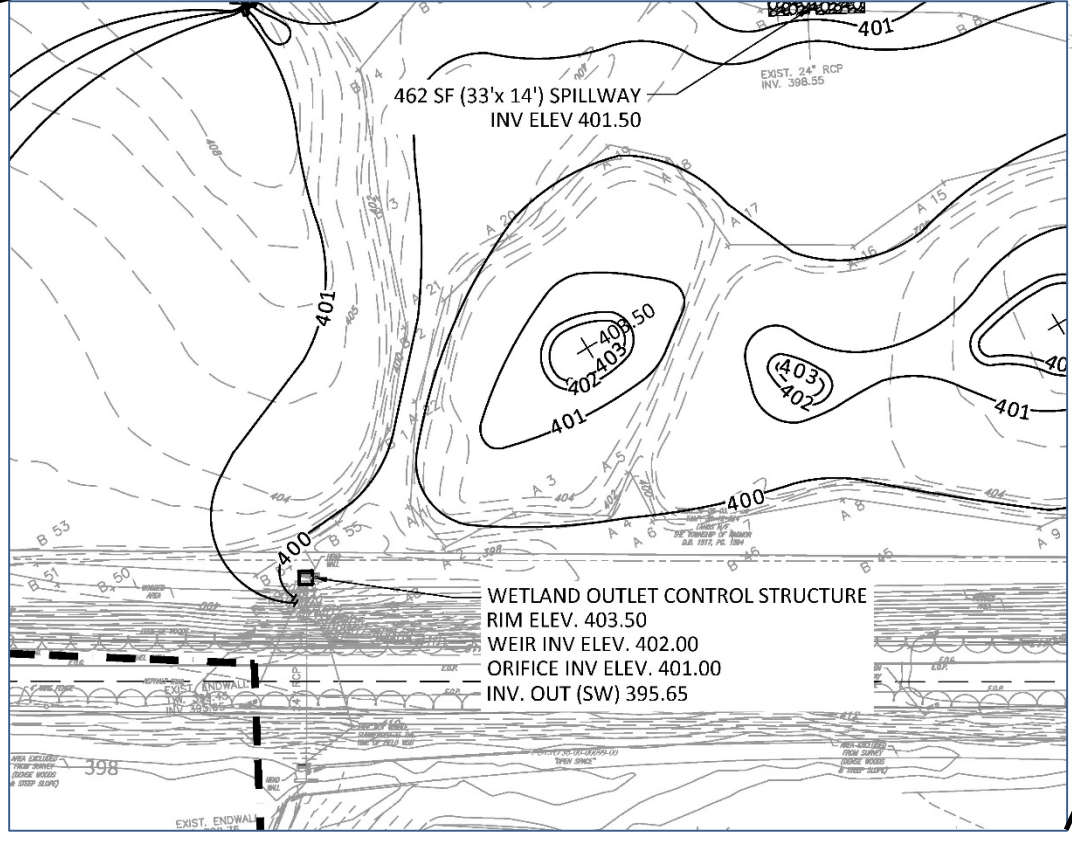
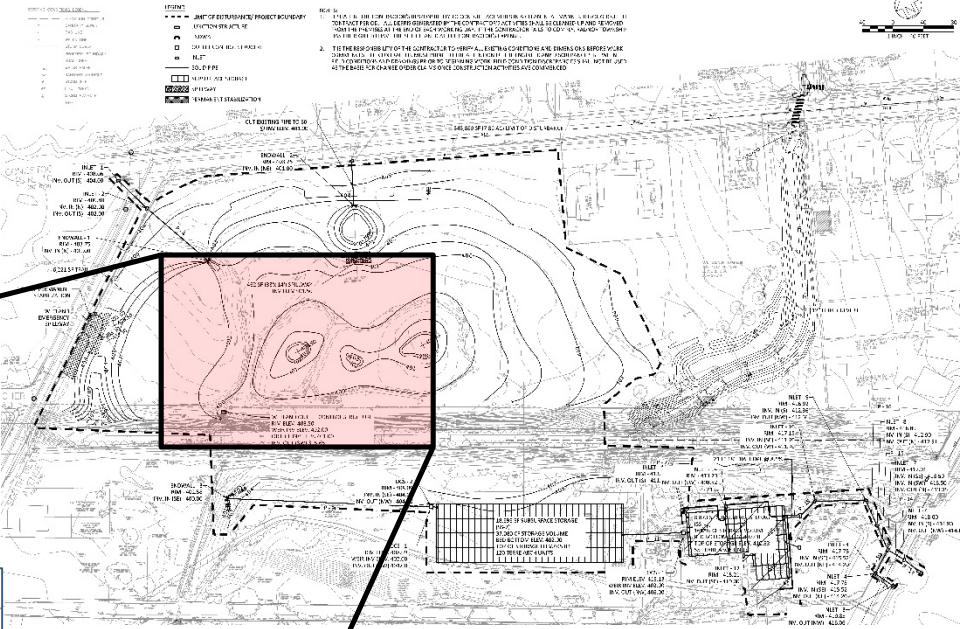
NOTES:

- IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO CONDUCT ACTIVITIES IN A CLEAN, NEAT MANNER THROUGHOUT THE CONTRACT PERIOD. ALL DEBRIS GENERATED BY THE CONTRACTOR'S ACTIVITIES SHALL BE CLEANED UP AND REMOVED FROM THE PREMISES AT THE END OF EACH WORKING DAY. IF THE CONTRACTOR FAILS TO COMPLY, RADNOR TOWNSHIP HAS THE RIGHT TO HAVE THE SITE CLEANED AT THE CONTRACTOR'S EXPENSE.
- IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS BEFORE WORK COMMENCES. THE CONTRACTOR MUST BRING TO THE ATTENTION OF THE ENGINEER ANY DISCREPANCIES BETWEEN FIELD CONDITIONS AND DRAWINGS PRIOR TO BEGINNING WORK. FIELD CONDITION DISCREPANCIES SHALL NOT BE USED AS THE BASIS FOR CHANGE ORDER CLAIMS ONCE CONSTRUCTION ACTIVITIES AVE COMMENCED.

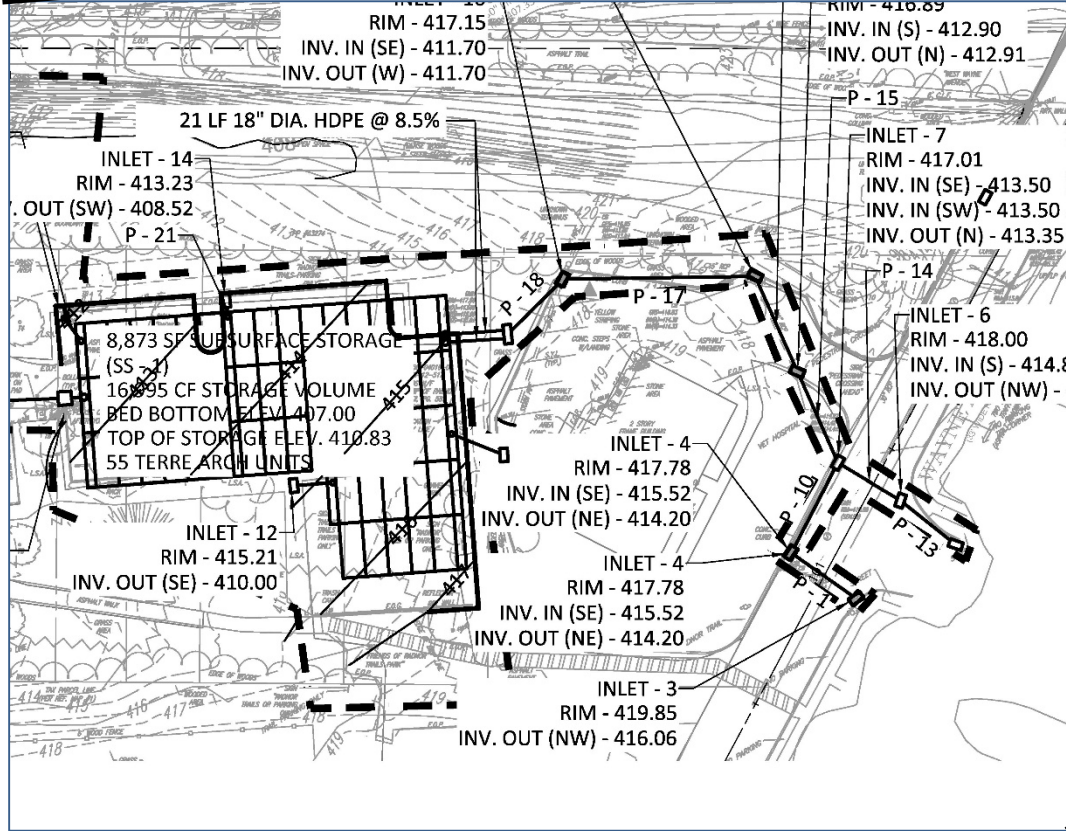
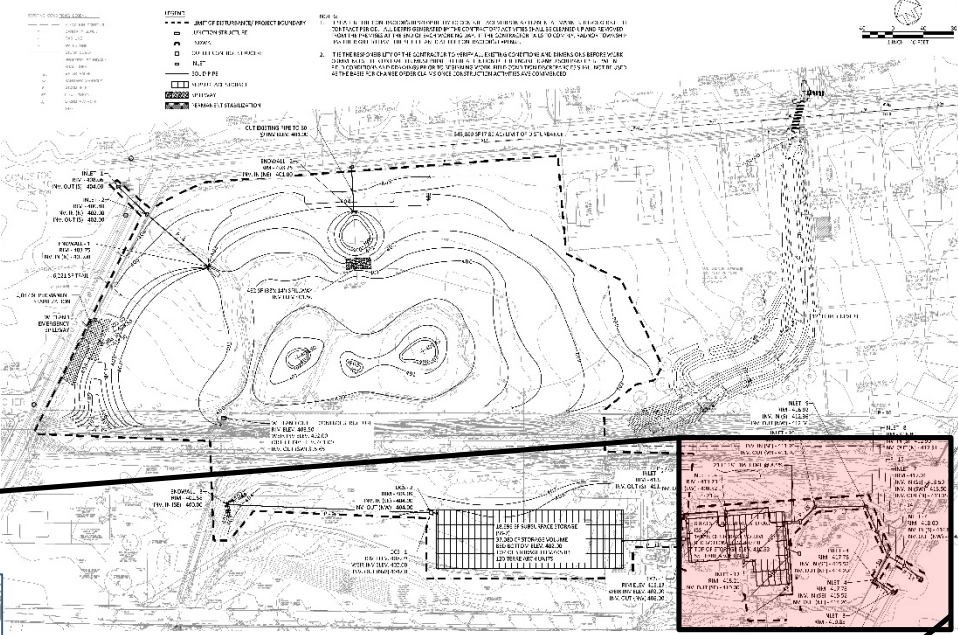


1. Modify WW Preserve Outlet Structure
2. Improve storm conveyance
3. Improve WW Preserve grading to manage overflows to South Devon
4. Add stormwater management and storage

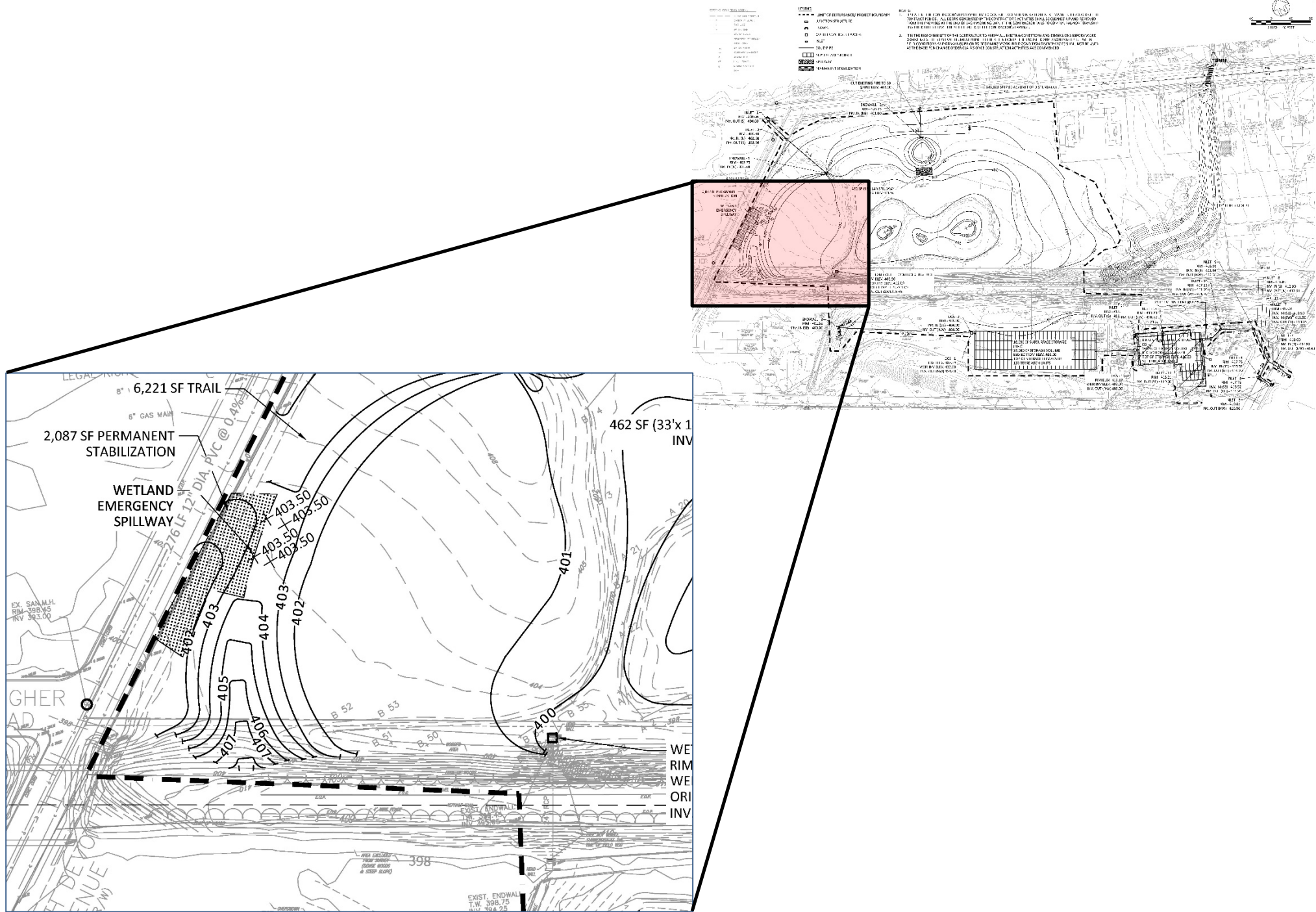
Modify WW Preserve Outlet Structure



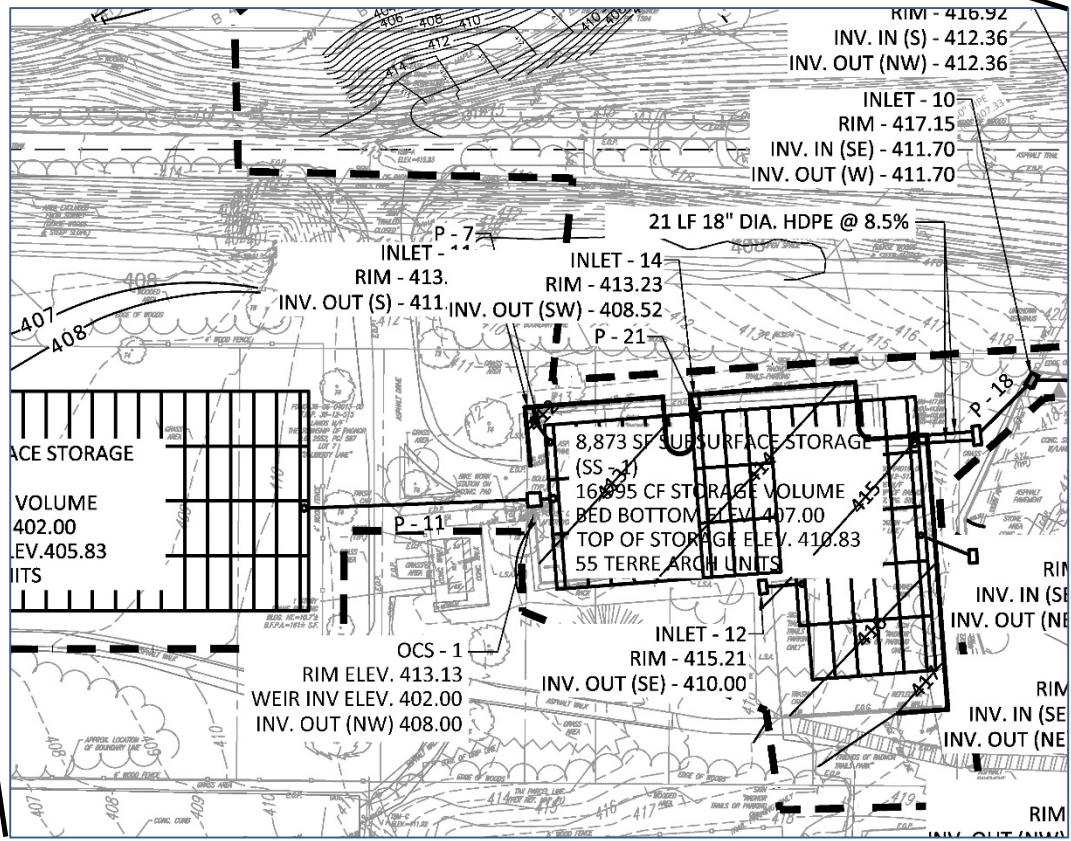
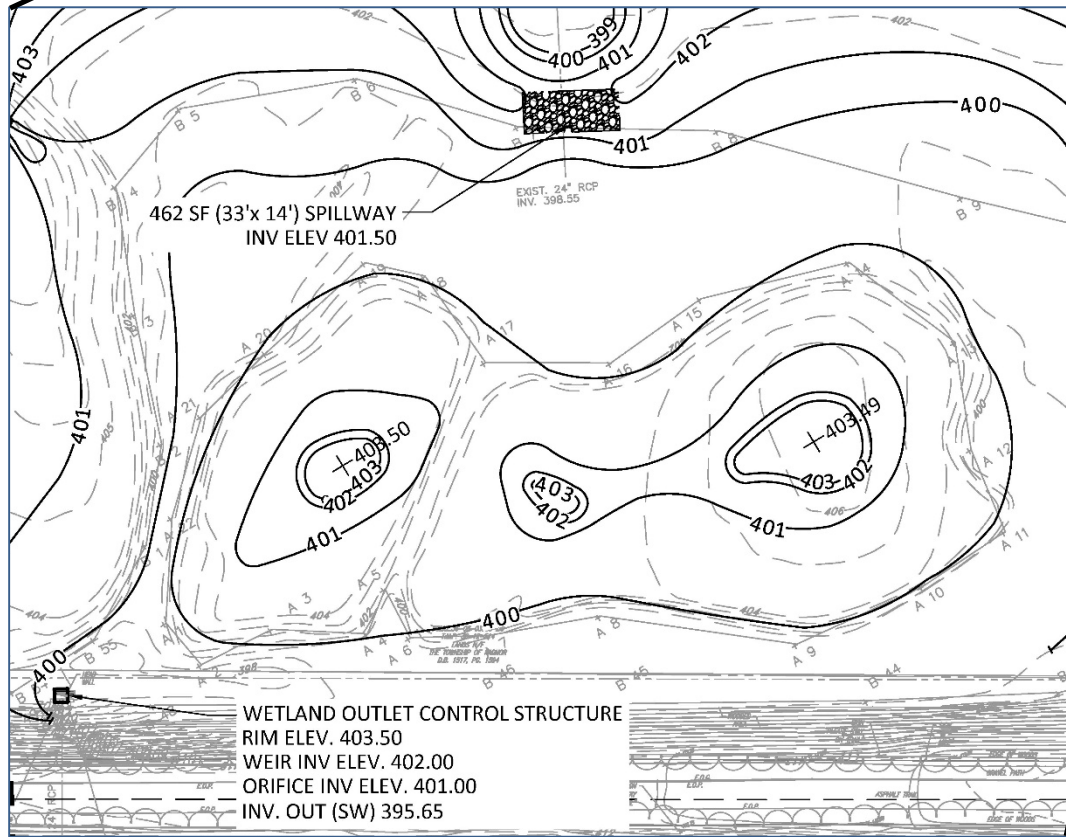
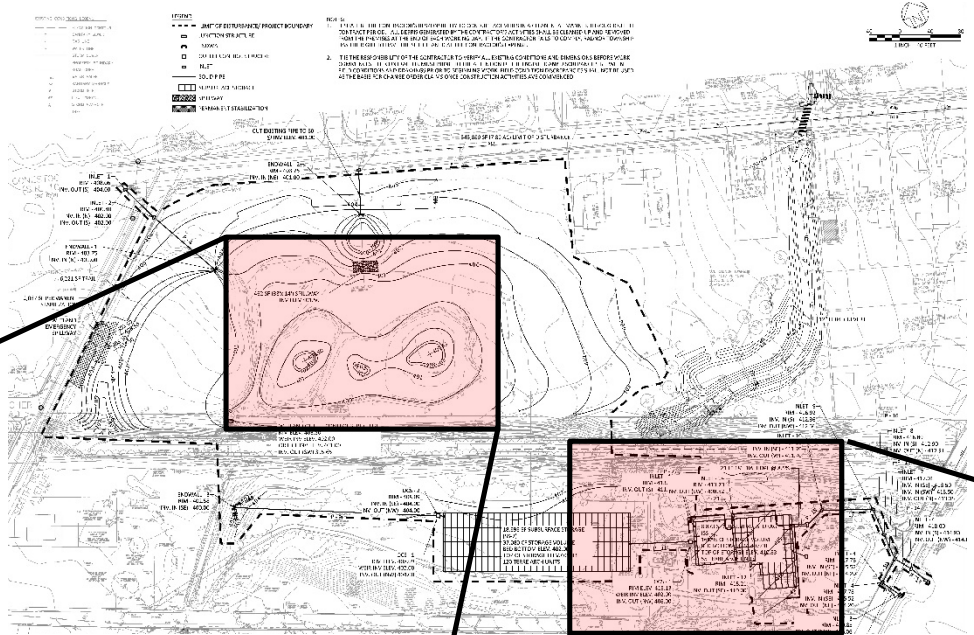
Improved storm conveyance



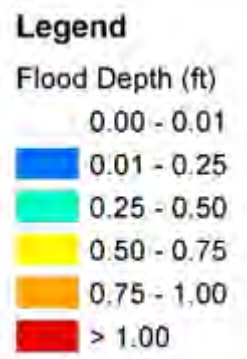
Limit overflows to South Devon



Add SWM and storage



Modeled Flood Reduction: 1-year 1-hour storm

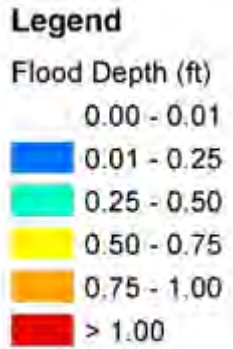


EXISTING CONDITIONS

PROPOSED CONDITIONS



Modeled Flood Reduction: 2-year 1-hour storm

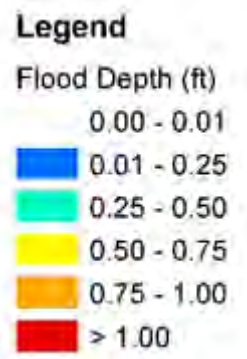


EXISTING CONDITIONS

PROPOSED CONDITIONS

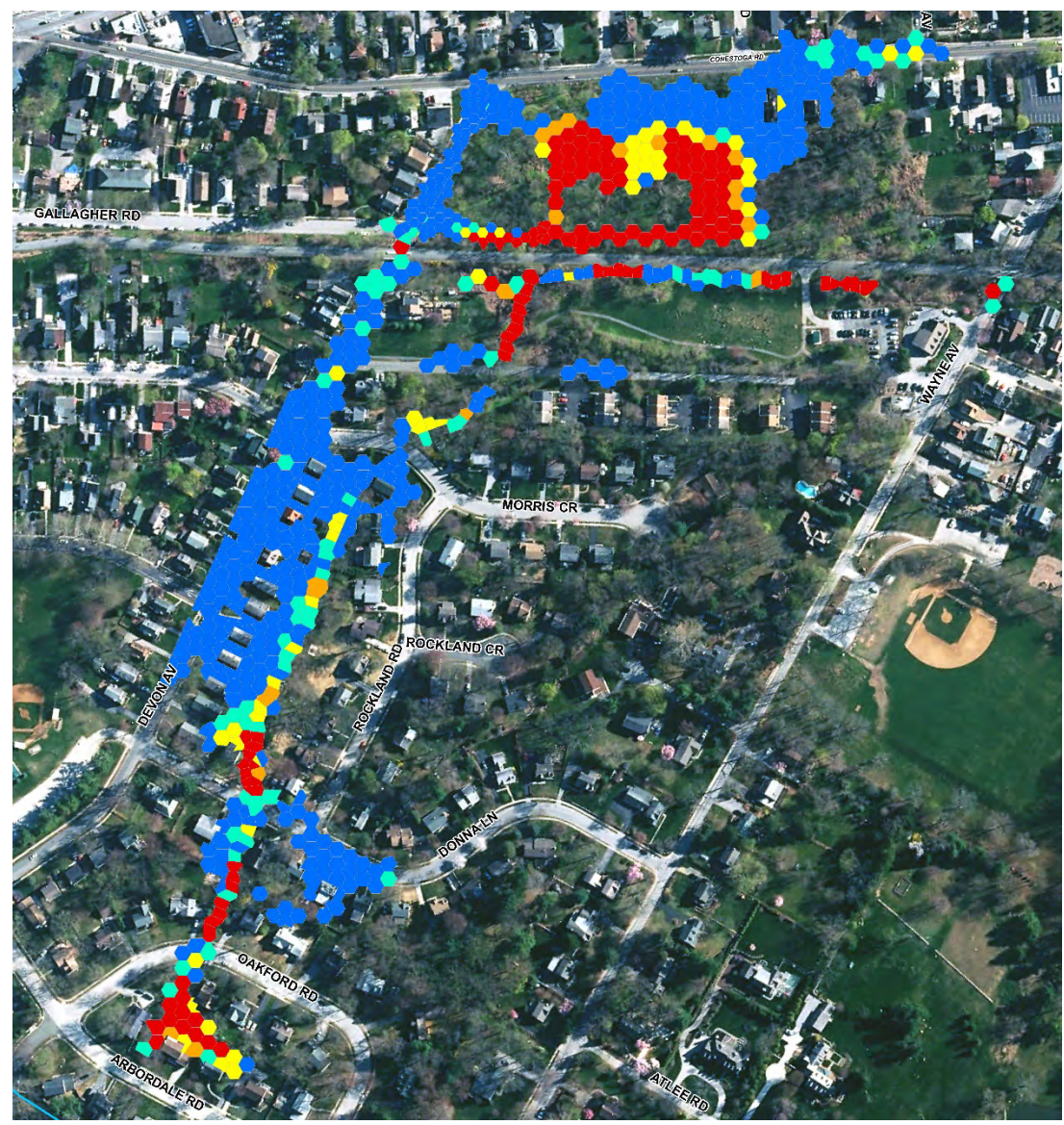


Modeled Flood Reduction: 5-year 1-hour storm

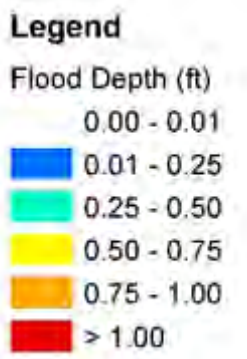


EXISTING CONDITIONS

PROPOSED CONDITIONS

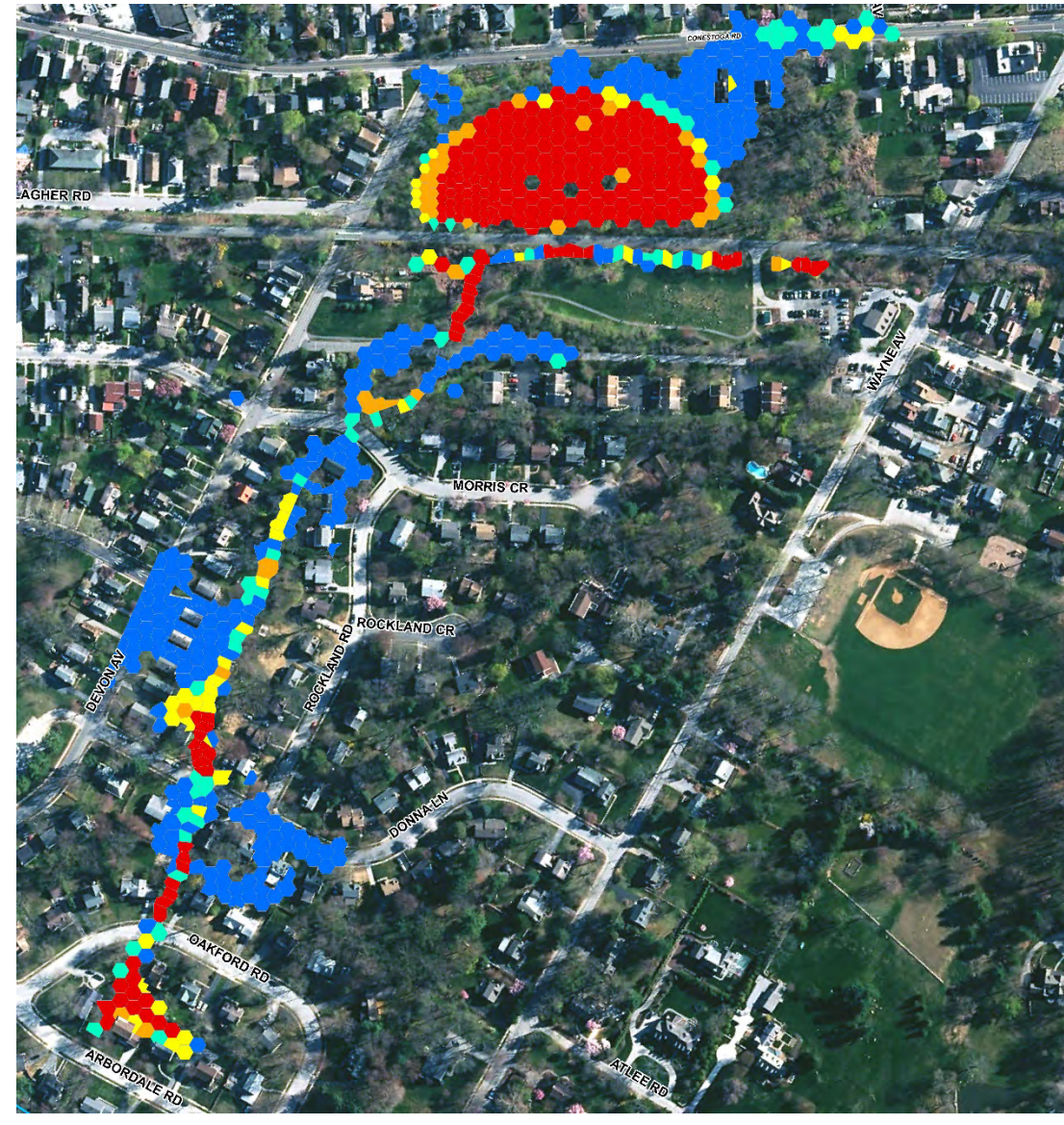
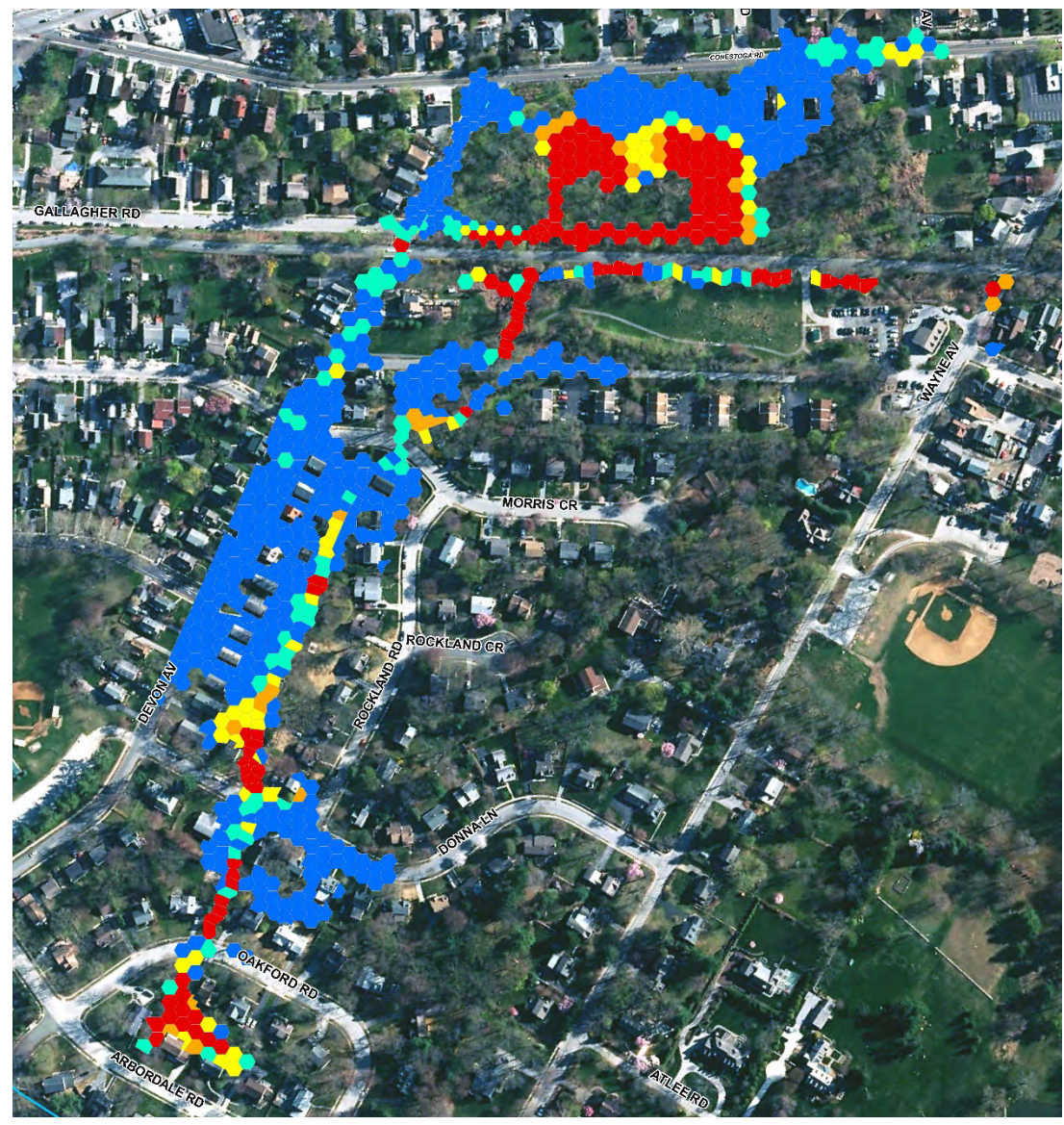


Modeled Flood Reduction: 10-year 1-hour storm



EXISTING CONDITIONS

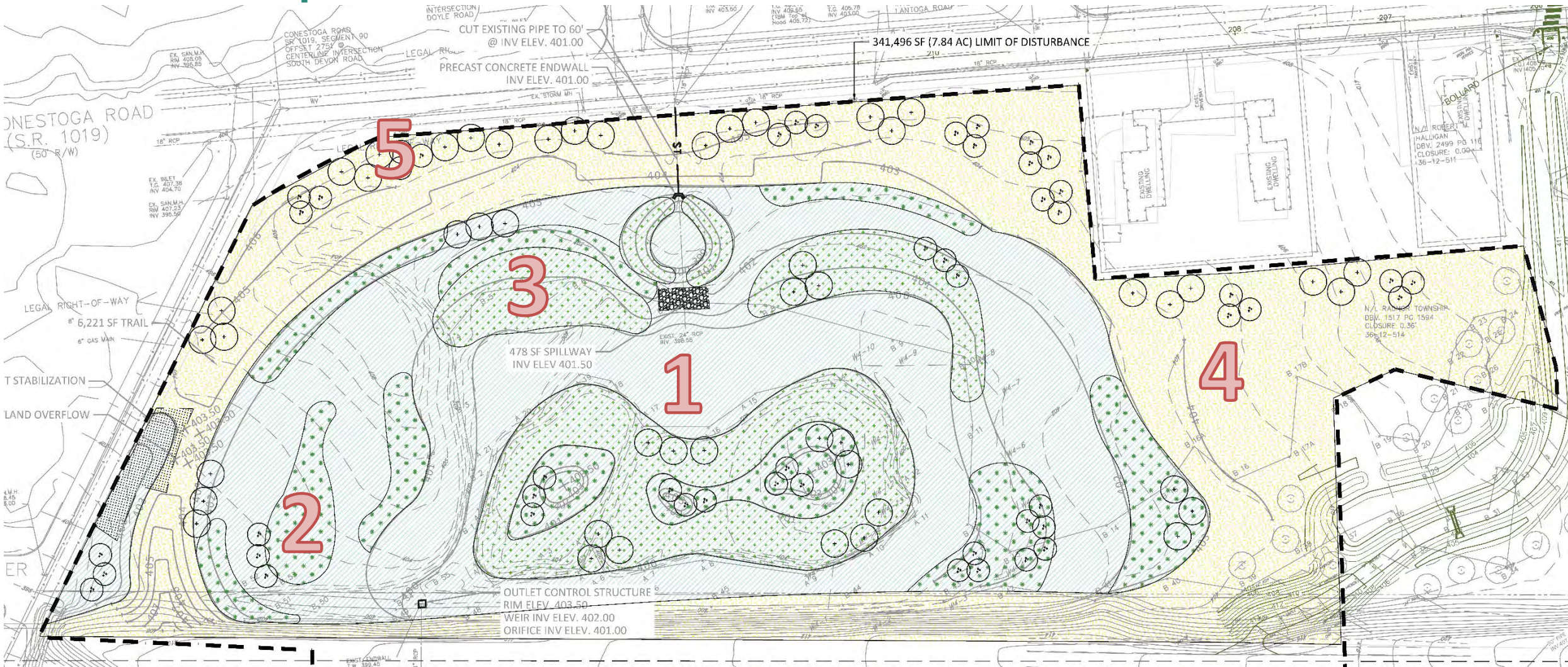
PROPOSED CONDITIONS



The Planting Plan

- 1. Forested Wetland Seeding
- 2. Live Stakes
- 3. Woody trees and shrubs (container/bare root)
- 4. Upland Seeding
- 5. Trees 2-3" caliper B&B

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The Planting Plan

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The Planting Plan

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Habitat Value

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Educational Opportunities



CONSTRUCTED WETLAND habitat

A WETLAND is land saturated or covered with water for part or all of the growing season. It has a rich environment and animal community.

Wetlands are part of the natural landscape in the United States. They have been reduced in number due to housing, farming and development. Constructed wetlands are built by humans to replace natural wetlands that have been destroyed or degraded.

Constructed wetlands are man-made wetlands. They are built to mimic natural wetlands and provide habitat for many types of wildlife. They also help clean water and filter out pollutants.

Who lives here?

Wetlands are home to many kinds of wildlife. They are home to birds, fish, amphibians, reptiles, and mammals. They are also home to many types of plants and animals.

Why are wetlands important?

- Wetlands are important for water quality and quantity.
- Wetlands are important for wildlife habitat.
- Wetlands are important for flood control.
- Wetlands are important for carbon sequestration.
- Wetlands are important for recreation and aesthetics.

WOODLAND RIPARIAN ZONE habitat

A Riparian Zone is a corridor of land running along the edge of a stream, creek, river, lake, or other body of water.

Riparian zones are important for water quality and quantity. They help filter pollutants and sediments from runoff. They also provide habitat for many types of wildlife.

Who lives here?

Riparian zones are home to many kinds of wildlife. They are home to birds, fish, amphibians, reptiles, and mammals. They are also home to many types of plants and animals.

Why is vegetation in a riparian zone so important?

- Vegetation in a riparian zone helps filter pollutants and sediments from runoff.
- Vegetation in a riparian zone provides habitat for many types of wildlife.
- Vegetation in a riparian zone helps stabilize the soil and prevent erosion.
- Vegetation in a riparian zone helps cool the water and improve oxygen levels.
- Vegetation in a riparian zone helps provide shade and shelter for many types of wildlife.

Rain Garden LINCOLN DRIVE PARK

KEEPING POLLUTION OUT OF SPA CREEK

This large rain garden filters polluted water created by rain running over more than an acre of parking lots, roofs and roads. Before the garden was created, oil, grease, toxic metals, bacteria, nutrients and sediment ran directly into Spa Creek and the Chesapeake Bay. Now the rain garden, with its mixture of sand and organic matter planted with native plants, absorbs the first flush of rainwater that contains the greatest amount of pollutants. The pollutants go into the ground and into the plants instead of Spa Creek.

At the same time, this garden, or bio-retention area, treats over a million gallons of stormwater each year and provides a beautiful street-end park garden that the neighborhood residents and businesses can enjoy. Native plants such as Sweet Bay Magnolia, Sweet Pepper Bush, and Switchgrass are used because they require very little care and maintenance once established.

Look at the "before" picture to see what a difference this project has made to the neighborhood. It is a source of pride to the community and has set an example for other such projects.

Example Planting Photos

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- Live Stakes
- Container grown trees



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Example Planting Photos

Perennial Plugs



Shrug Tubelings



Tree Whips



Planting Establishment –13 Months



Planting Establishment – 2 years



Planting Establishment -4 years



Planting Establishment -4 years



Planting Establishment –5 years



Planting Establishment –11 years



Any Questions?