

Town Branch Stream Channel Improvements

May 15, 2024

Town of Leesburg

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WSP

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Aaron Jordan, PE

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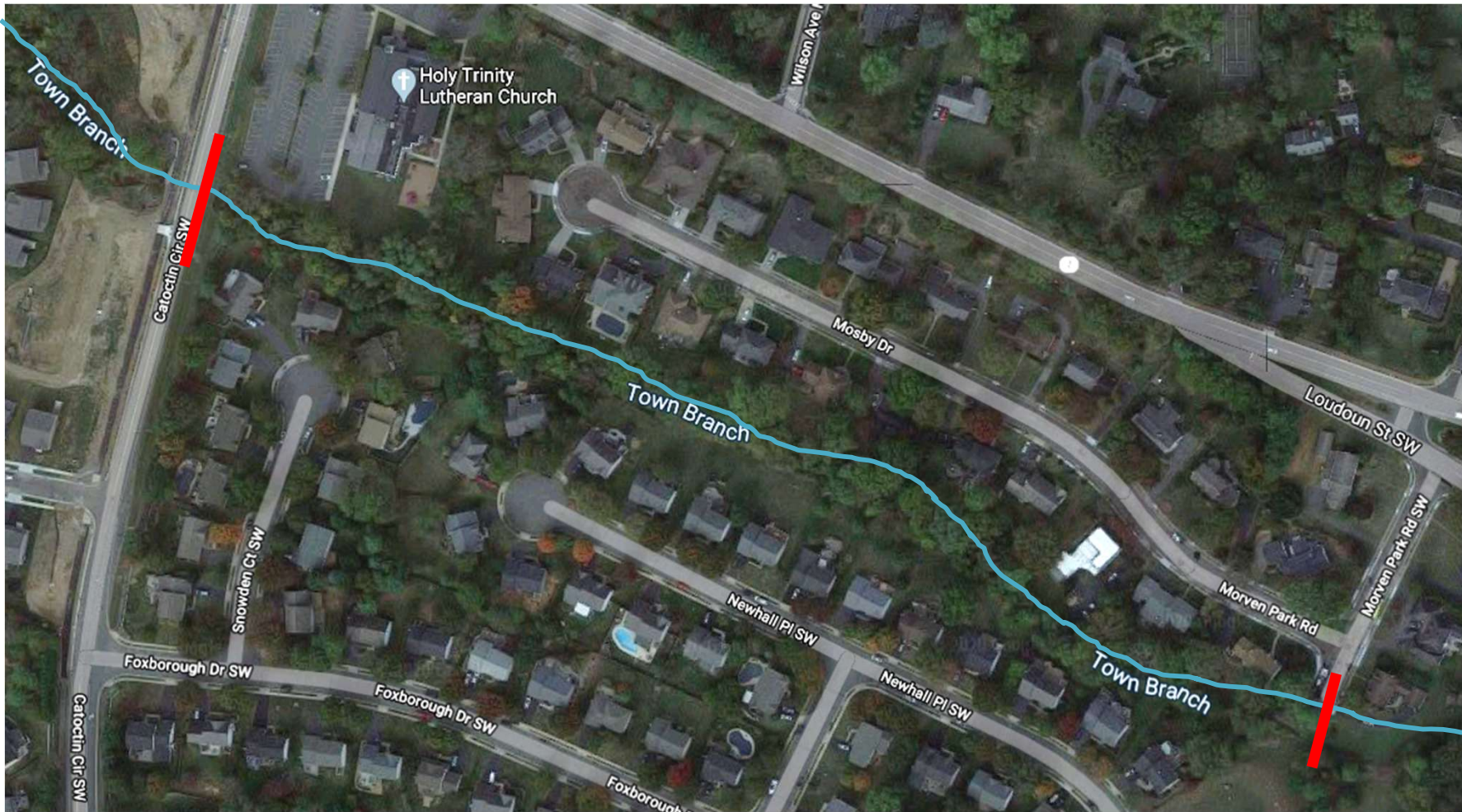
Administrative Items

- ▶ Note about Council Participation
- ▶ Bathrooms in hallway
- ▶ Presentation is being Recorded
 - ◆ Audio in room is on
 - ◆ Camera for room is off
- ▶ Group Q&A will also be Recorded
- ▶ Individual Q&A will NOT be Recorded

Agenda

- ▶ Location & History of Stream
- ▶ Existing Conditions
- ▶ What Will Happen if we don't Restore Town Branch?
- ▶ Project Goals & Benefits
- ▶ Project Challenges & Milestones to Date
- ▶ Concept Design Elements
- ▶ Overall Project Questions
- ▶ Breakout to Stations - View Concept Details and ask Property Specific Questions

Project Location

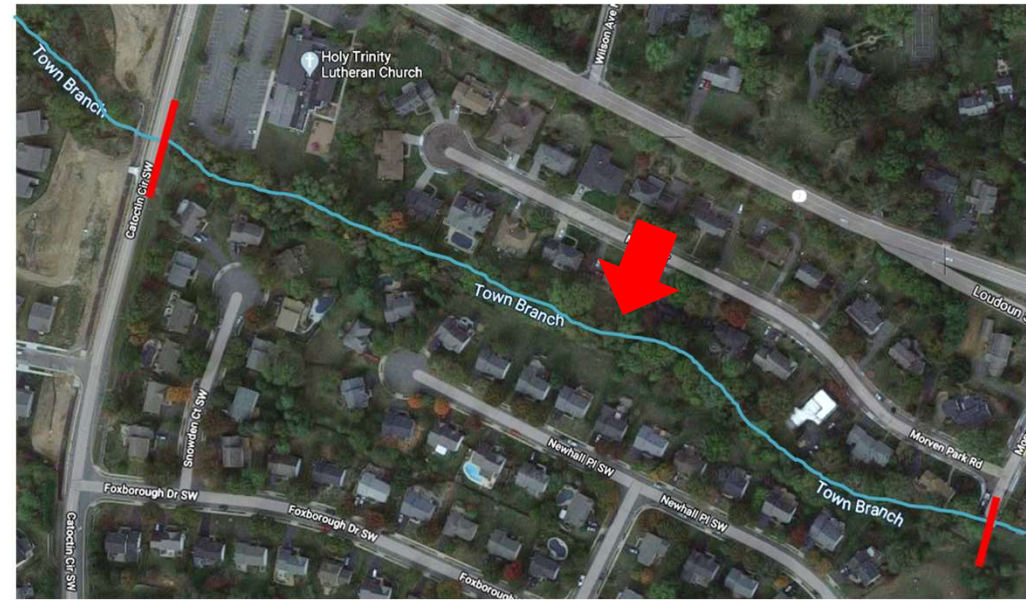


History and Background

1937



Recent



- Mosby Drive developed late 1960's/early 1970's
- Newhall Place developed in the mid-1990's
- Around 2020, Residents identified property risks
- July 2021, the Town completed study and applied for \$1M from Department of Environmental Quality Stormwater Local Assistance Funds

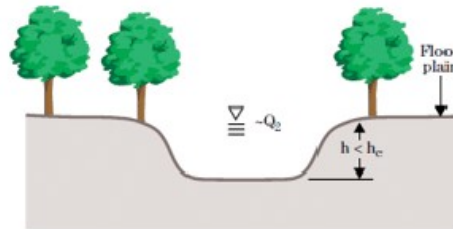
Existing Conditions



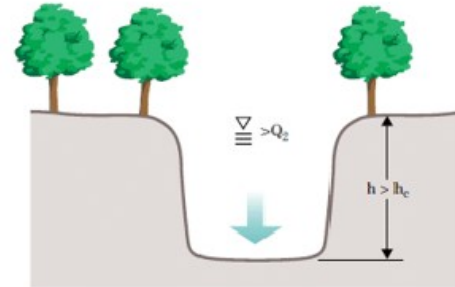
- ▶ Significant bank erosion
- ▶ Stream bank instability
- ▶ Threat of property loss, tree damage, and safety issues
- ▶ Urban Stream Corridor

Urban Stream Channel Evolution

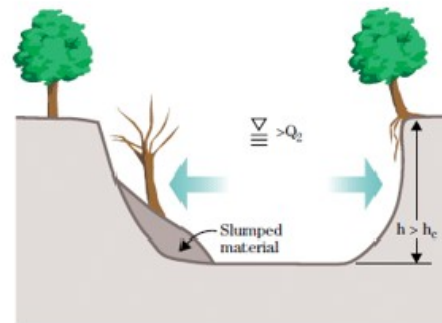
Stage 1: Stable



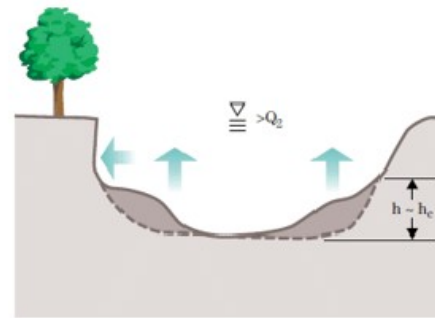
Stage 2: Incision



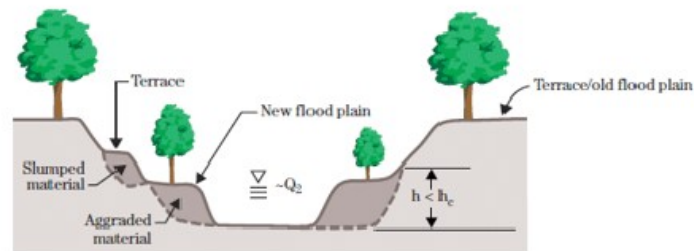
Stage 3: Widening



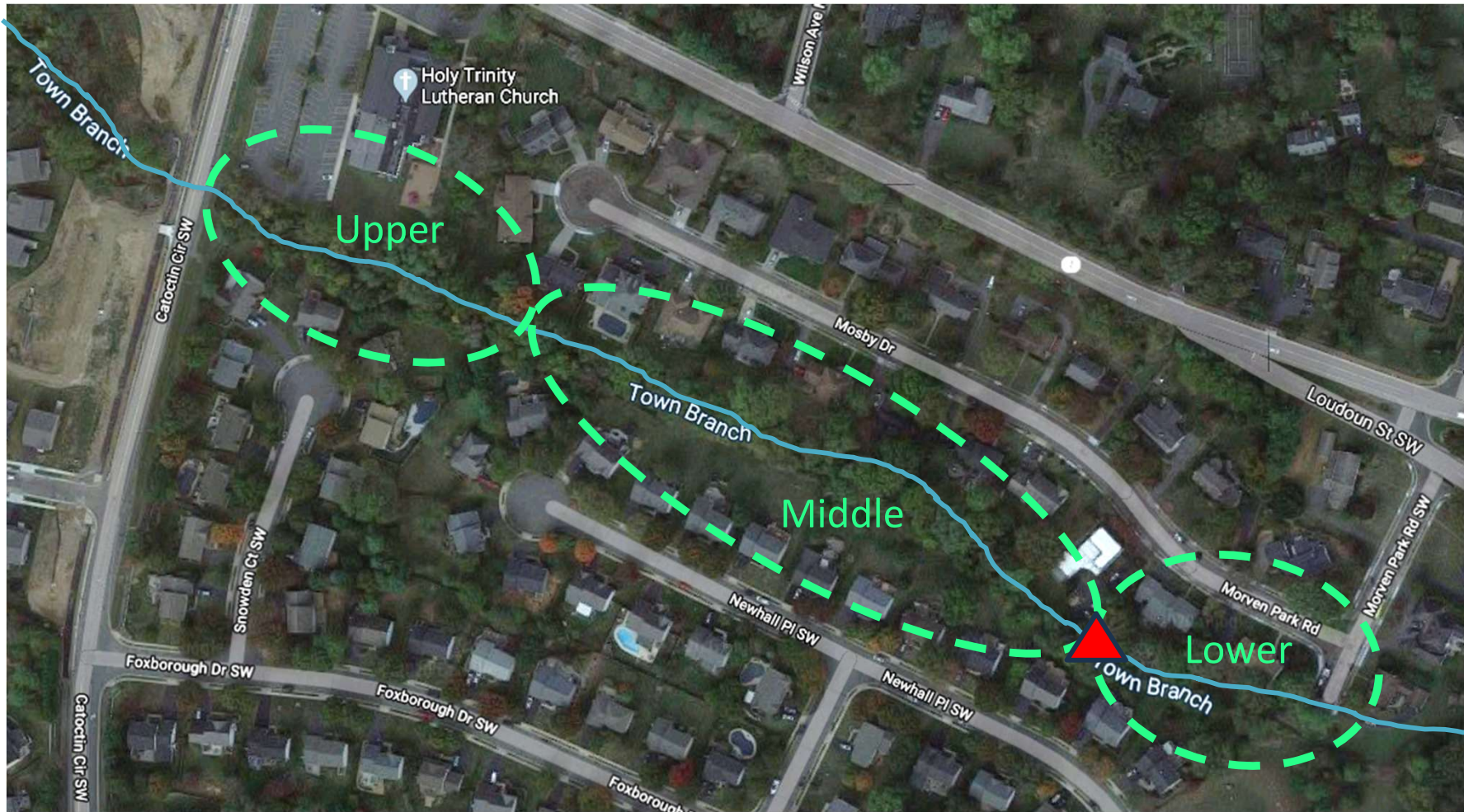
Stage 4: Deposition and Stabilization



Stage 5: Quasi-Equilibrium Stable



Project Location



Existing Conditions



Berms and Gabions restrict and splits flow KFO

Existing Easements

- ▶ Mosby Drive Side: 25 to 30-foot Storm Drainage Easement
- ▶ Newhall Place Side: Variable width 25-year and 100-year Floodplain Easements
- ▶ Both storm and floodplain easements permit stream restoration work
- ▶ Access Easements present near Catoctin Circle and Morven Park Road
- ▶ Dominion/Verizon easements are present across back of some properties on Mosby Dr

KFO

Existing Easements, cont

LEGEND



**100-YR FLOODPLAIN
EASEMENT**



**DRAINAGE
EASEMENT**



UTILITY EASEMENT



ELECTRICAL UTILITY

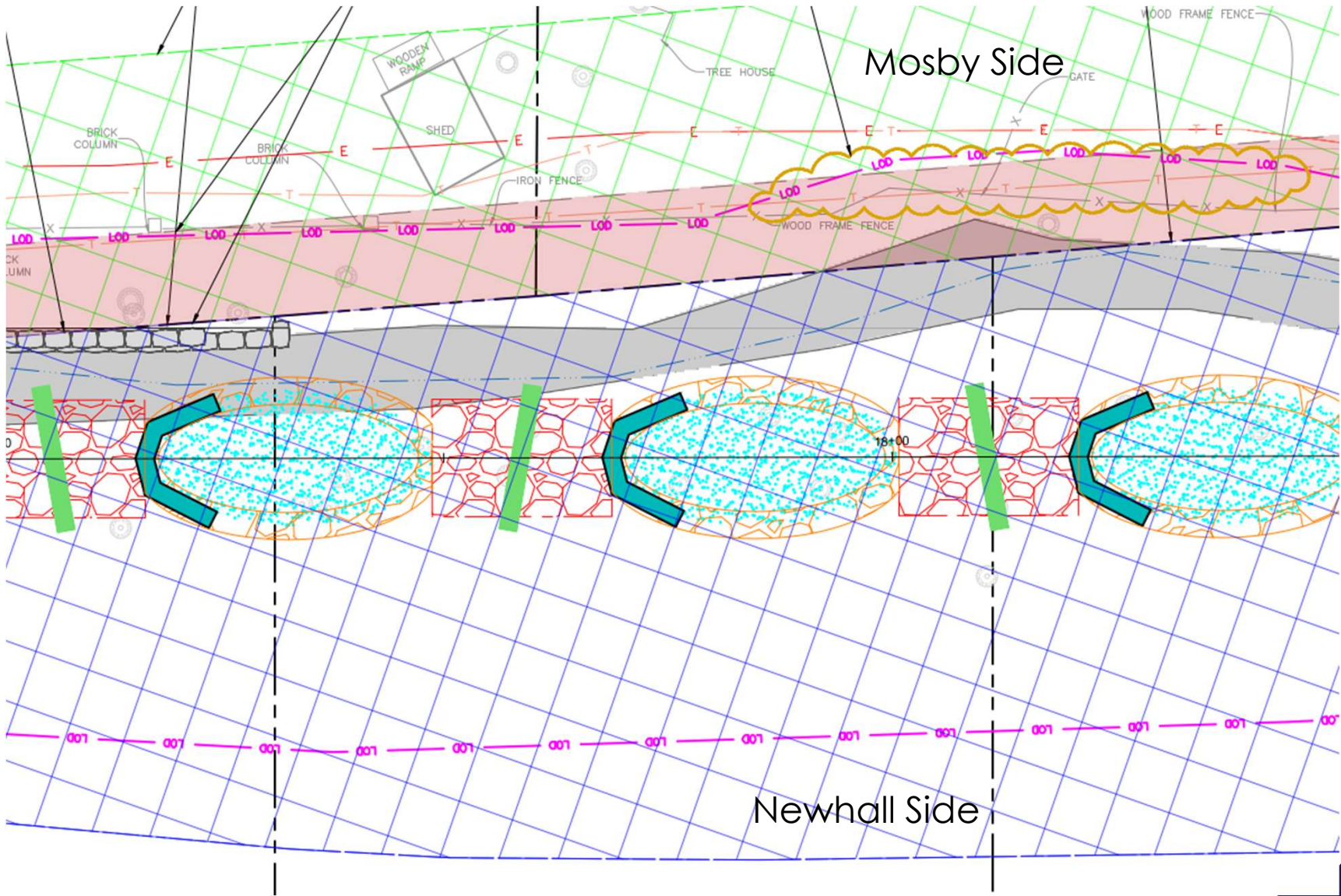


TELECOM UTILITY

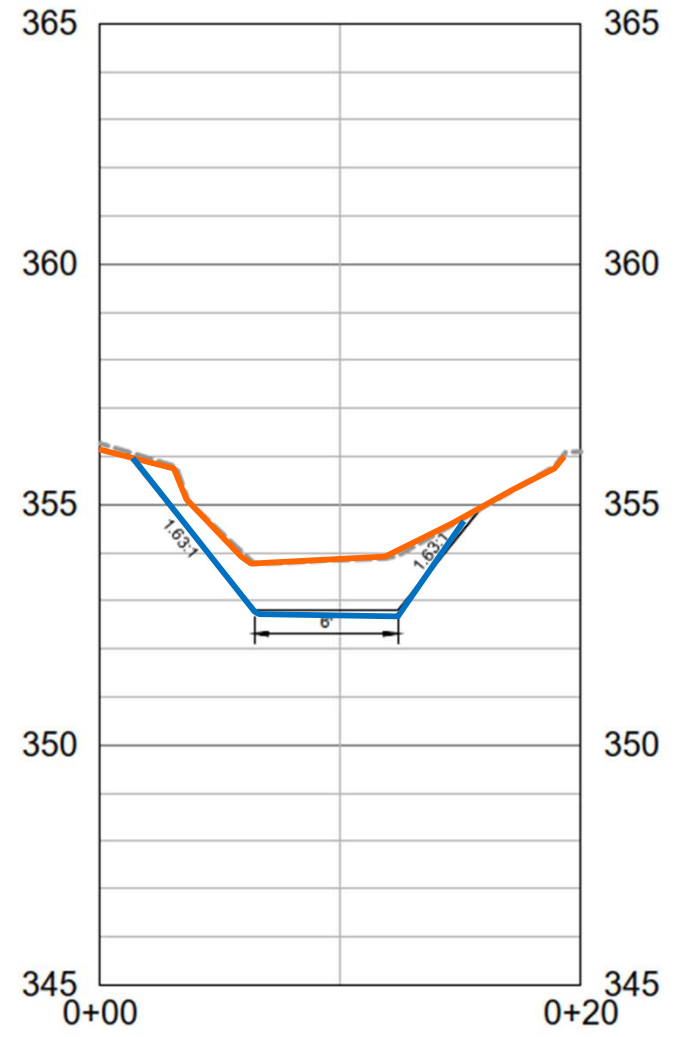
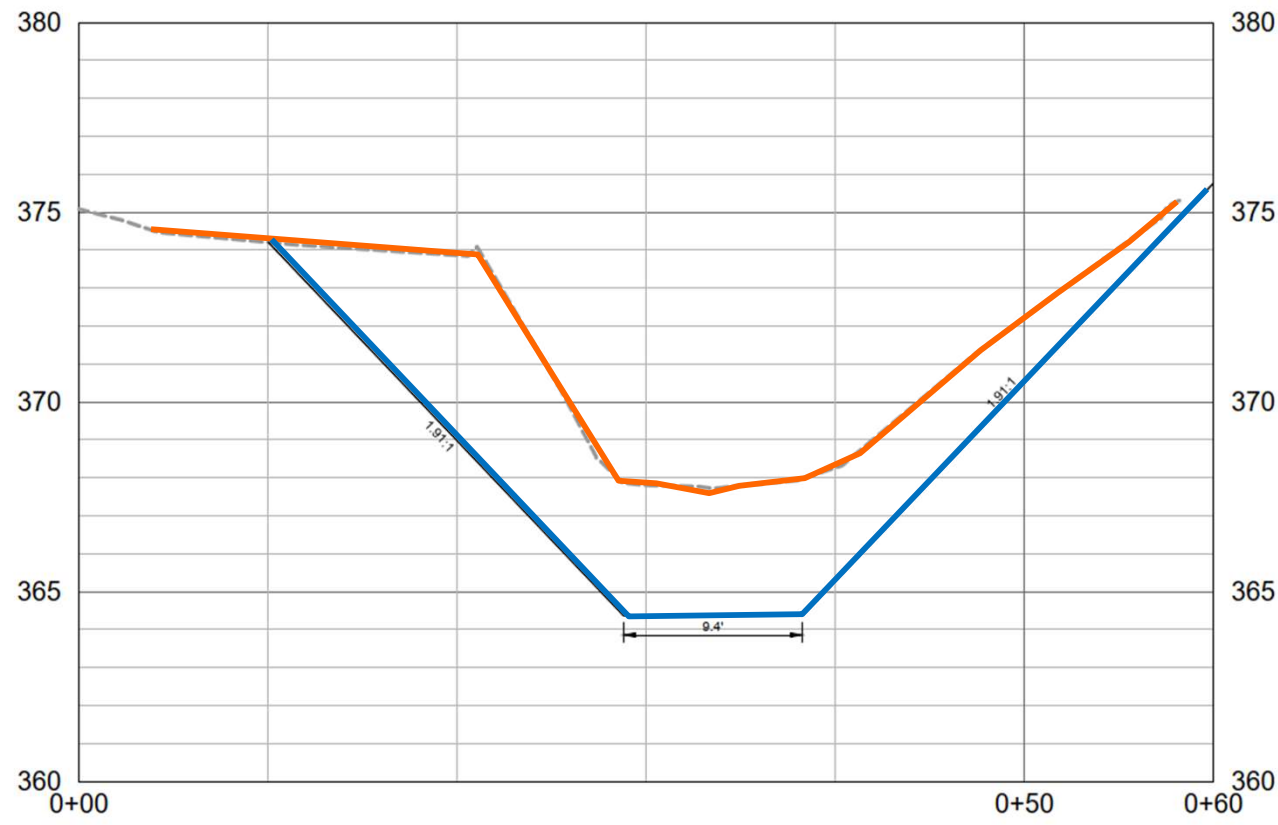


ACCESS EASEMENTS

Existing Easements, cont



What will happen without this project? (Modelling based over 30-year period)

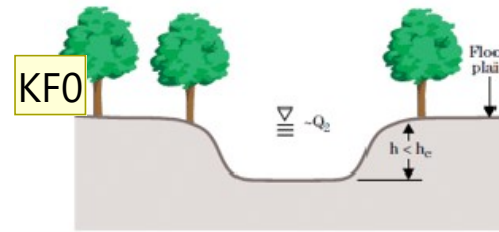


 EXISTING GROUND
 FUTURE PROJECTED CHANNEL CONDITION

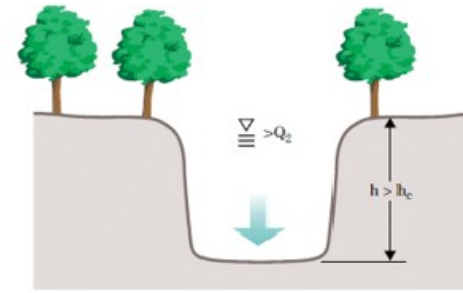
Project Goals

- ▶ Restore stream to a more natural condition (Stream Restoration instead of Stream Stabilization)
 - ◆ Minimize bank erosion
 - ◆ Improve wildlife habitat
 - ◆ Reestablish native plants
- ▶ Reduce property loss, downed trees and debris jams
- ▶ Bonus: Reduce nutrient loading downstream and to the Chesapeake Bay (eligibility for grant funds)

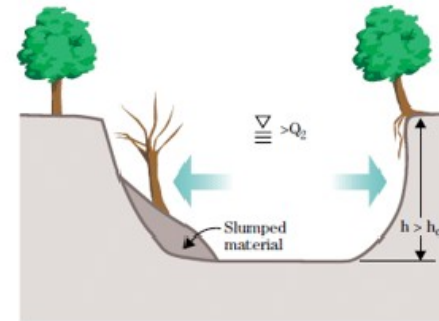
Stage 1: Stable



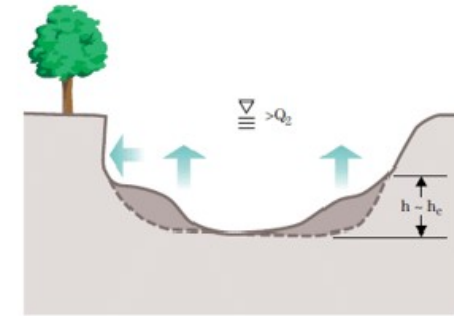
Stage 2: Incision



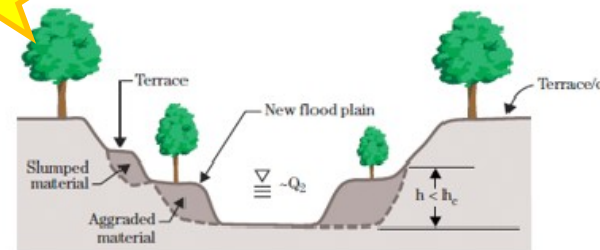
Stage 3: Widening



Stage 4: Deposition and Stabilization



★ Stage 5: Quasi-Equilibrium Stable



Channel Evolution

Project Benefits

- ▶ Reduce Erosion – protect property loss & reduce downed trees and debris dams

Before



After

Piney Branch in Vienna, VA

Project Benefits, cont.

- ▶ More gradual slopes



Before

Loftridge in Fairfax County, VA

After



Project Benefits, cont.

- ▶ Improved Habitat using native plant species



Before

Town Branch
(Confluence of Tuscarora
Creek) in Leesburg VA

After



Project Benefits, cont.

- ▶ All disturbed areas will be replanted

Tuscarora Creek in
Leesburg, 2023



Tuscarora Creek in
Leesburg, 2020



Plant Growth Happens Quickly!



Post Construction



Just 3 years later!

Piney Branch in Vienna, VA

Project Challenges

- ▶ Many stakeholders are involved – the project attempts to balance the at-risk property needs while minimizing grading & property impacts
- ▶ Existing private property and trees that are located within storm easements and project area will require removal
- ▶ More time was needed:
 - ◆ Meeting w/ DEQ postponed due to injury
 - ◆ Additional review to develop a concept design with the least impacts
- ▶ Project cost is higher than originally estimated

Project Challenges, cont.

- ▶ Underground electric & phone within project area may require relocation – new easements may be needed
- ▶ During Construction –
 - ◆ Working around existing storm and sanitary facilities
 - ◆ Challenging construction access - Stream is a confined narrow corridor
 - ◆ Construction timing and tree removal may be impacted by Endangered Species Act

Milestones Accomplished

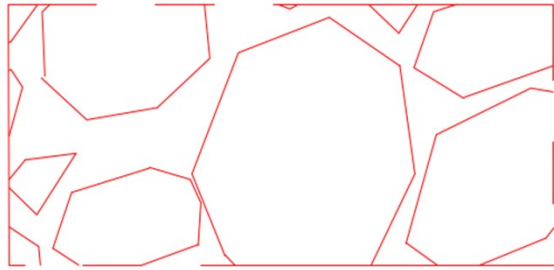
Date	Milestone
July 2021	Completed Study and Applied for Grant Funds
December 2021	Received Notice of \$1M DEQ Grant
Spring 2022	Project added to FY23 CIP
Summer/Fall 2022	Initiated Design and completed Fieldwork
Spring 2023	Initial Preliminary Concept Plan Submitted
Summer 2023	Reworking Concept Plan, meeting w/ DEQ
October 2023	Initial Prelim Floodplain Analysis Submitted
Winter 2023	Completed Additional Utility Surveying
May 2024	Revise Concept Plan for Presenting to Public

Concept Design

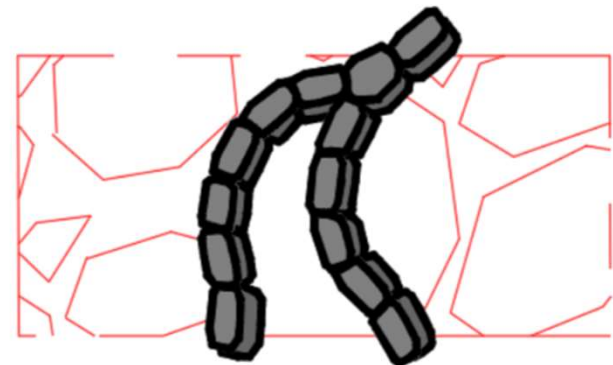
- ▶ Regrade stream banks within existing storm easements – this will require removal of vegetation and structures within project area
- ▶ Remove Berms and Gabion walls
- ▶ Remove failing walls and incorporate new walls where appropriate
- ▶ Add elements to reduce stream bed erosion
- ▶ Replant with vegetation to stabilize stream banks
- ▶ Use onsite materials where possible
- ▶ Maintain water levels currently experienced during rain events as much as possible

Stream Restoration Elements

▶ Riffles

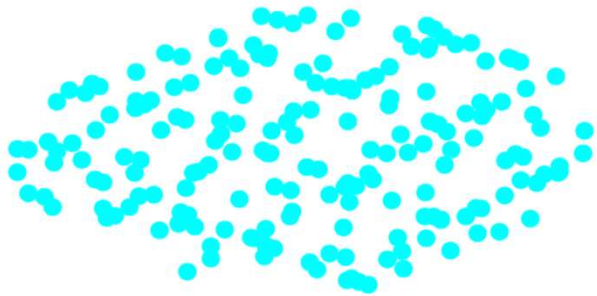


▶ Cascades



Stream Restoration Elements, cont.

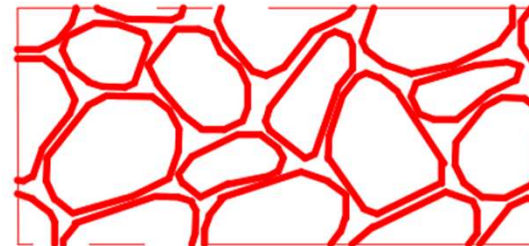
► Pools



Plunge Pool

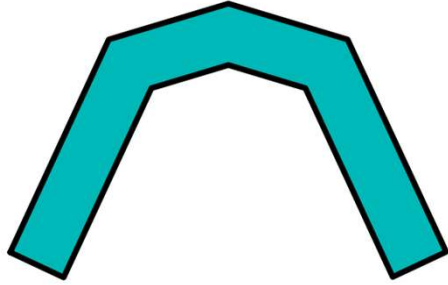


Step Pools



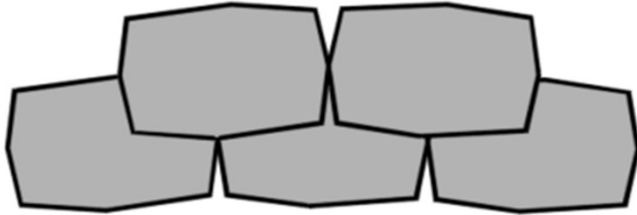
Stream Restoration Elements, cont.

► Cross-vanes



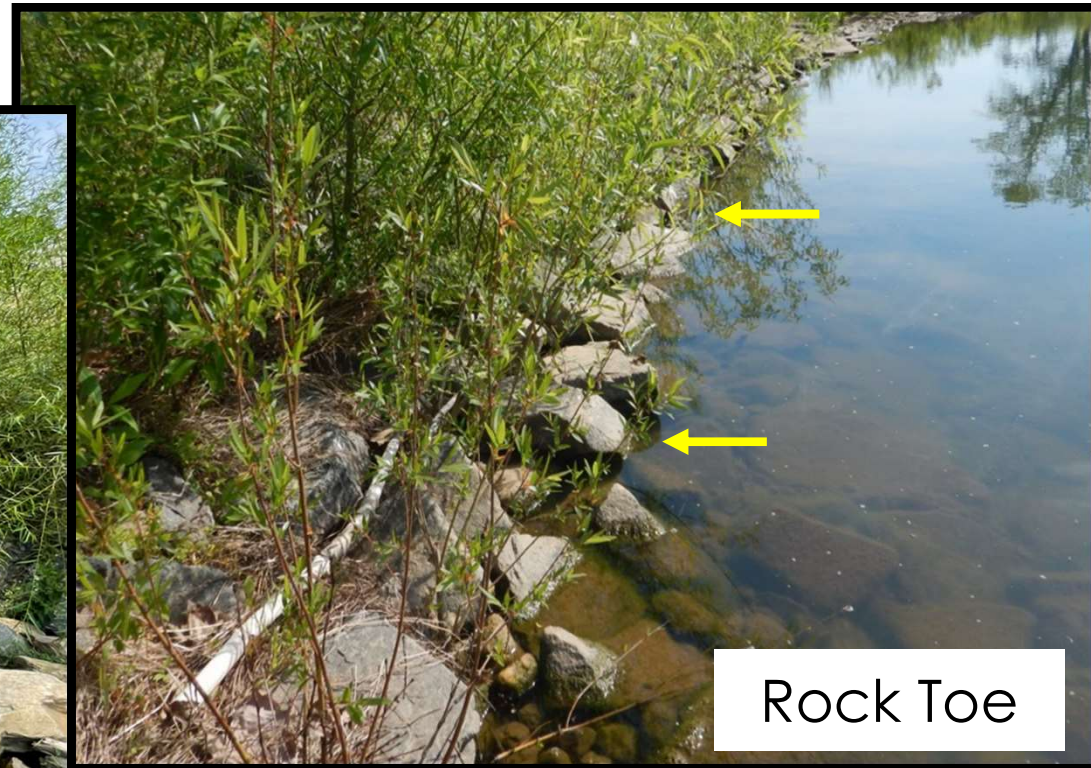
Stream Restoration Elements

► Imbricated Walls

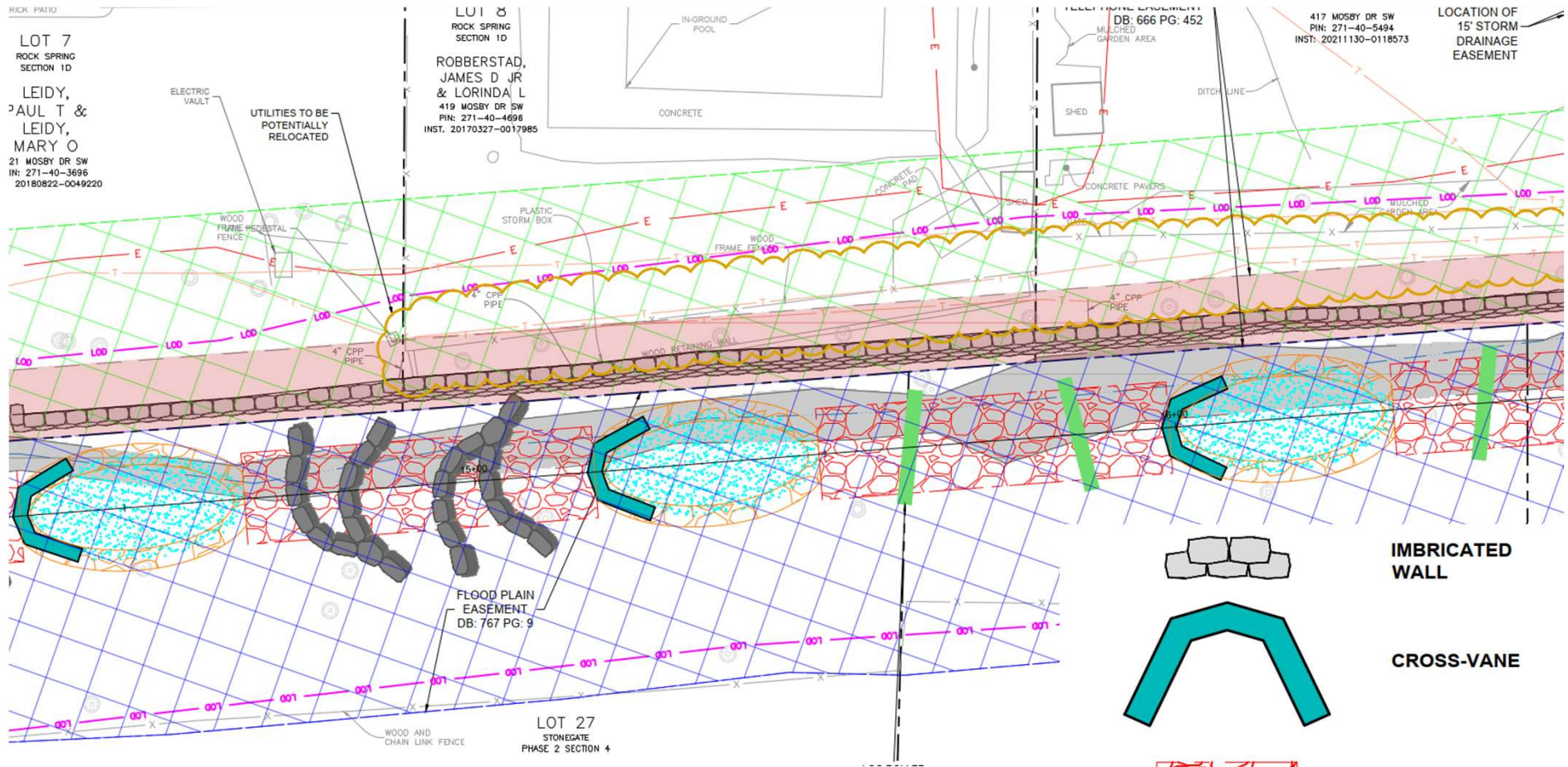


Stream Restoration Elements

- ▶ Natural onsite Materials will be used whenever possible (rocks and trees)



Concept Design



- Dissipate the velocity and “energy” of the water

Milestones – Design Phase

Date	Design Milestones
July 2024	Receive Input and Finalize Concept Design
February 2025	Submit Plans at 90% Design Level for Review
Spring 2025	Hold Additional Public Meeting
Summer 2025	Submit Final Plans for Review
Summer 2025	Initiate Land Acquisition
Spring 2026	Initiate Utility Relocation
Fall 2026*	Award Construction Contract

*Land acquisition and utility relocation may affect project timing.

Stream Restoration Works!

Restores the stream to a more stable state



- ▶ Gradual banks
- ▶ Reduced erosion
- ▶ Improved wildlife
- ▶ Bonus - Improved water quality to the Chesapeake Bay

Sugarland Run in Herndon, VA

Plant Growth Happens Quickly!



Spring 2023



Summer 2023



Fall 2023

Sugarland Run in Herndon, VA

A New Look in just 3 Years!



2020



2023

Tuscarora Creek – Upstream
from Harrison Bridge

Questions?

Hold your property specific impact questions for individual discussion at the stations

End Formal Presentation

Feel Free to View the Stations and
Talk to Engineers One on One

*Please provide any feedback and
input to Karin Franklin via*

Kfranklin@LeesburgVA.gov