

City of Raleigh  
Engineering  
Services  
Department

The seal of the City of Raleigh, North Carolina, is a circular emblem. It features a central oak tree with a thick trunk and a full canopy of leaves. The tree is surrounded by a wreath of oak leaves. The words "CITY OF RALEIGH" are inscribed in a circle around the top, and "NORTH CAROLINA" around the bottom. Below the tree, the words "ESTABLISHED 1792" are visible.

## Stormwater Management



Millbrook Exchange Park  
Innovative Stream Restoration  
Public Meeting

February 8, 2018

# Introductions



## City of Raleigh Staff

- Lory Willard, EI, Engineering Services
- Kevin Boyer, PE, Engineering Services
- Kristin Freeman, Engineering Services

## NCSU Stream Restoration Program Staff

- Jonathan Page, PE
- Dr. Barbara Doll, PE

## NC Clean Water Management Trust Fund Staff

- Steve Bevington
- Terri Murray

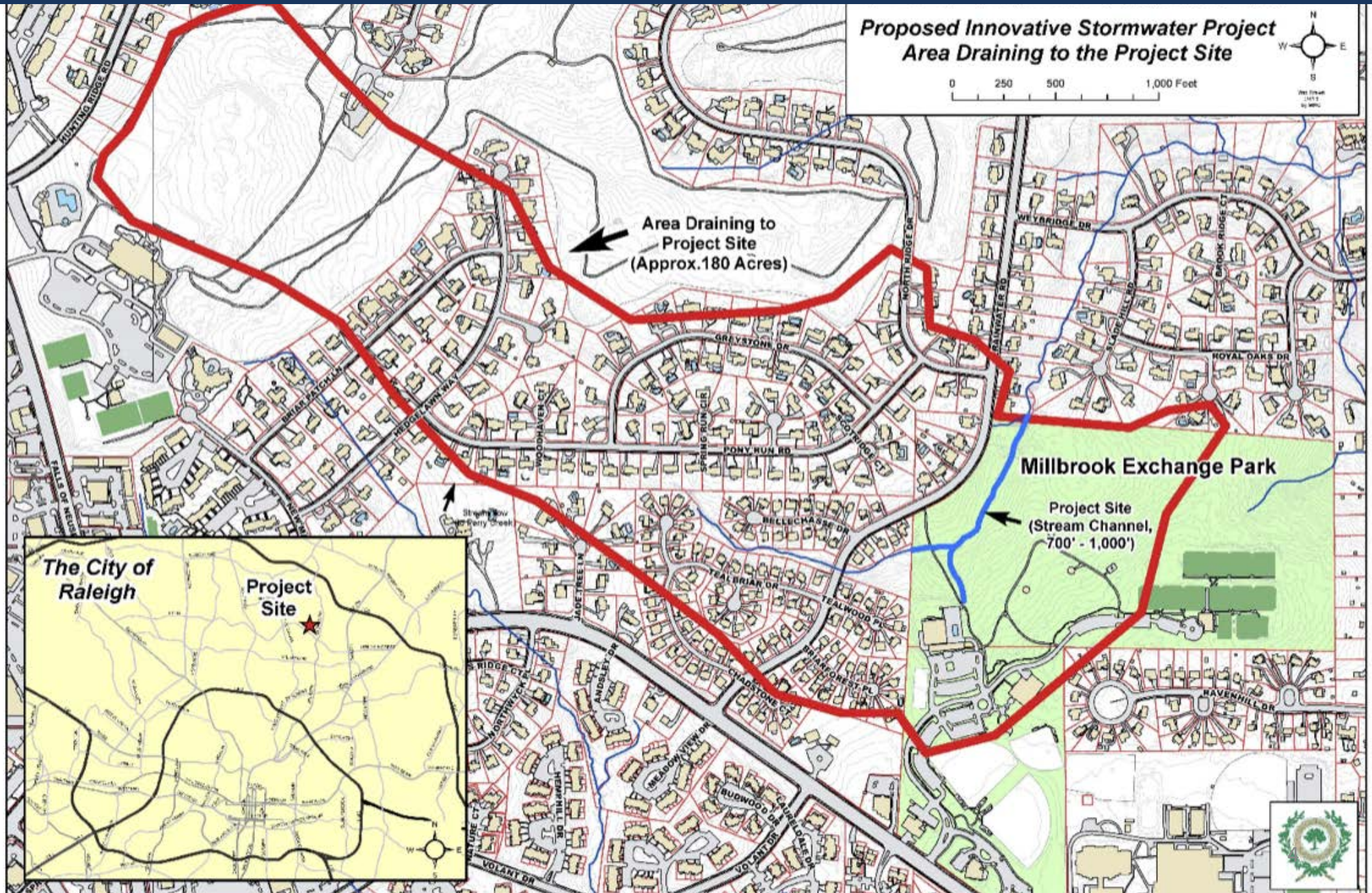
# Overview



- ✓ Site History
- ✓ Project Goals
- ✓ Project Design
- ✓ Construction Expectations and Challenges
- ✓ Proposed Schedule
- ✓ Questions & Answers



# Site History





# Project Location





# Project Goals



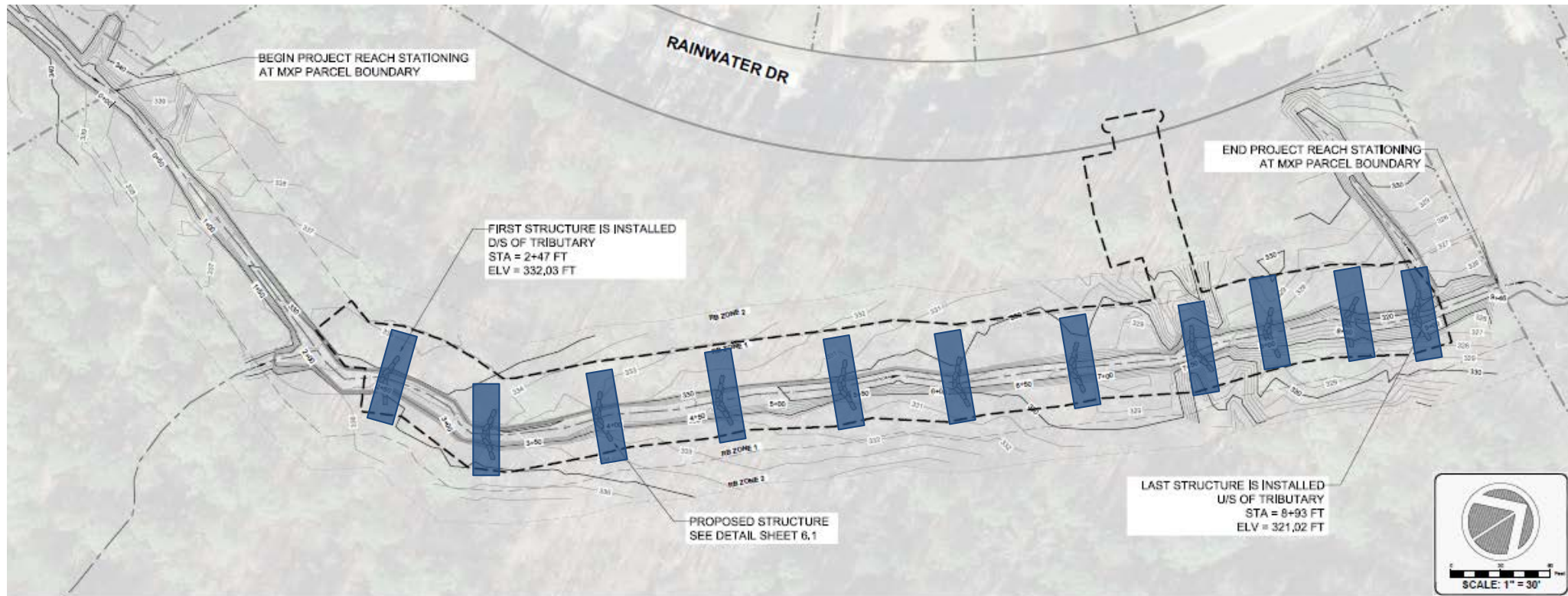
Stabilize and rehabilitate stream

Improve water quality

Provide floodplain connection  
on park property

Evaluate low-cost, low-impact  
stream restoration

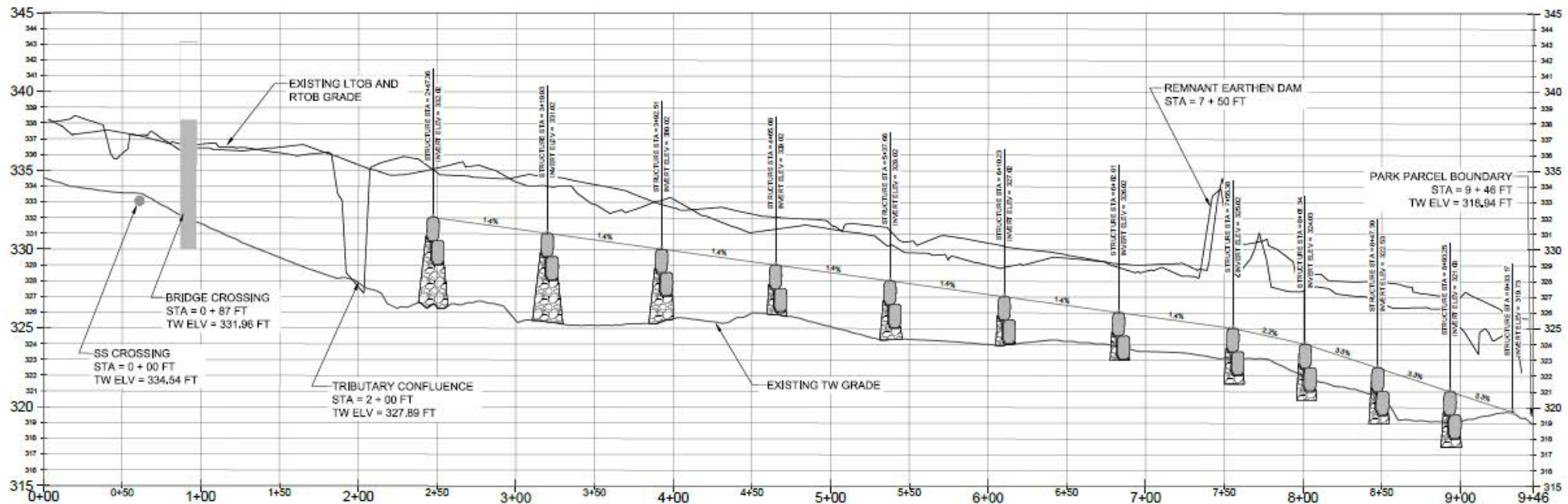
# Project Design



Installing 11 small dams that will fill in with sand and gravel over time



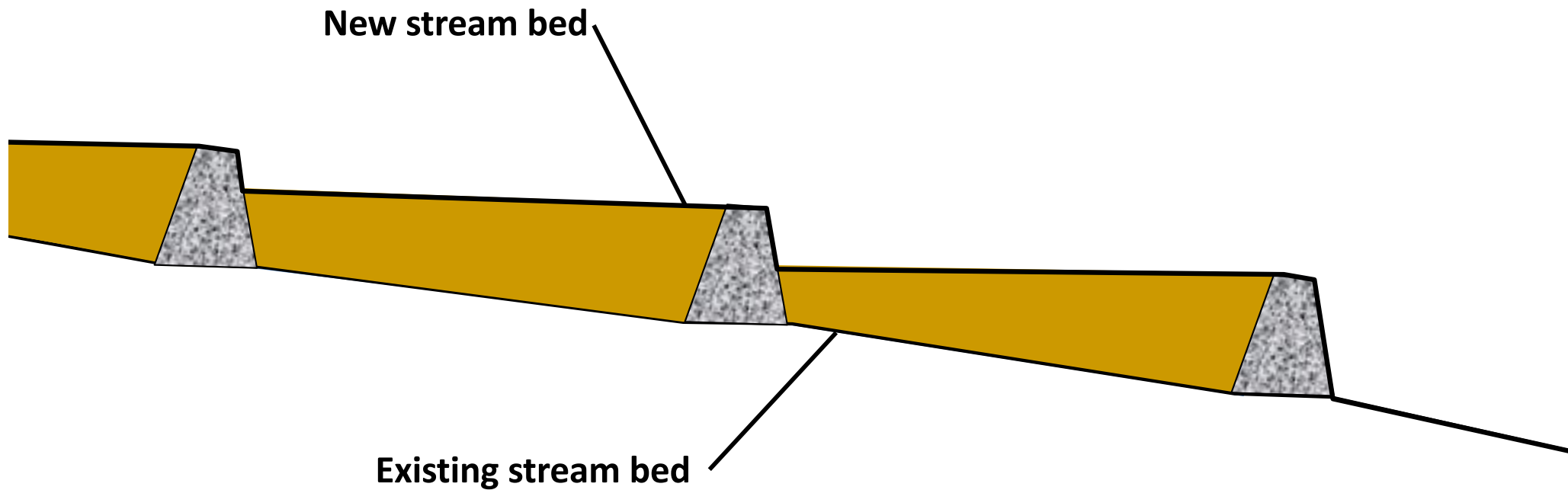
# Project Design



Structures range in height from 2-6 feet and are spaced 40-60 feet apart

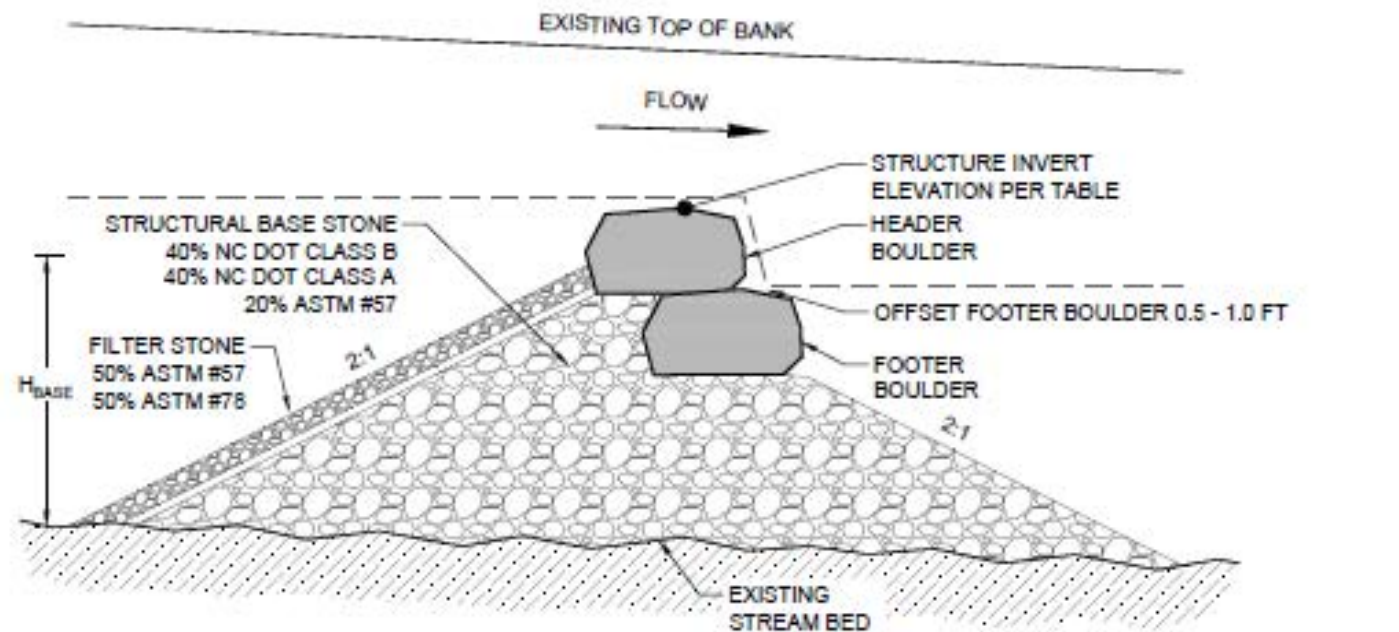


# Project Design



Sand and gravel will fill in behind structures to create a new stream bed

# Project Design



GRADE CONTROL STRUCTURE

NOT TO SCALE



# Project Design



Redirects stream flow to protect stream banks

Slows down the energy of the stream to reduce erosion

Traps sand and gravel to improve water quality

[Photo from [WattsBranchDC.blogspot.com](http://WattsBranchDC.blogspot.com)]



# Floodplain Reconnection



## Floodplain

- Flat land surrounding stream banks where water flows during heavy rainfall.

## Floodplain Reconnection

- Providing the stream with easier access to the floodplain by decreasing stream bank height. This will allow water to spread out over an area, which helps to reduce the energy of the stream and remove pollution from the stream.

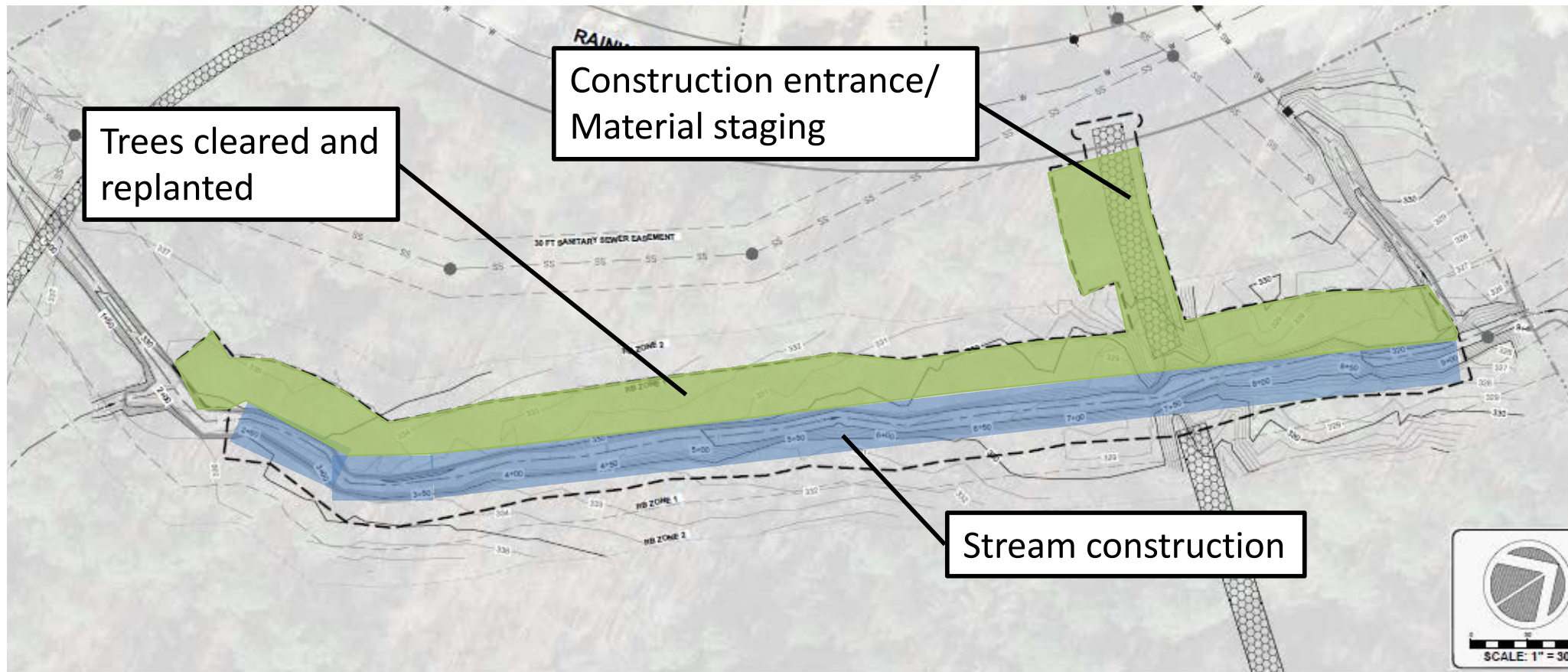
## Benefits of Floodplain Reconnection

- Reduced erosion
- Improved water quality
- Better habitat for aquatic life



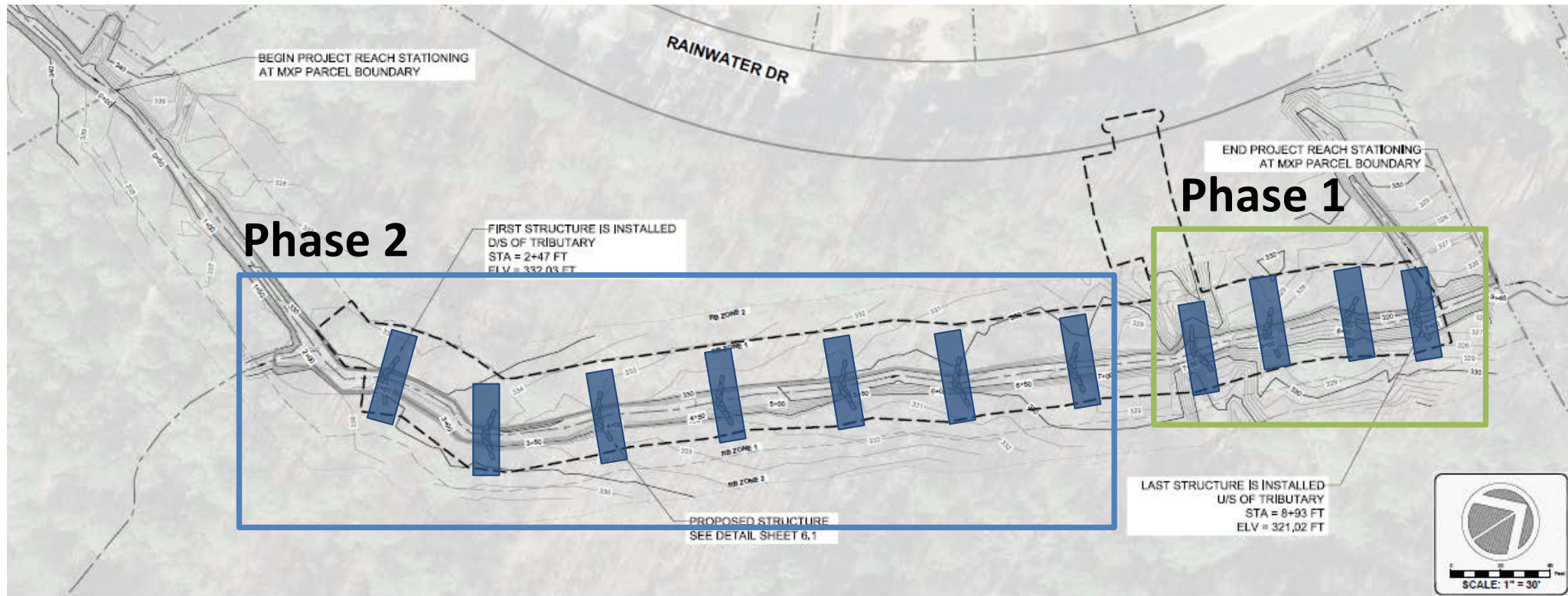


# Low-impact Construction



- No road closures during construction
- Construction signs will be in placed at the nearby road and sidewalk
- Small construction vehicles will be used

# Construction Phases



**Construction will be done in two phases:**

Phase 1 – Build four downstream dams and monitor over several rain events

Phase 2 – Make necessary design adjustments and construct seven upstream dams



# Construction Examples



Check Dam Installation

Photo from VAWaters.com



# Construction - Planting



**The following will be planted in the project area:**

- Tulip Poplar
- White Oak
- Spice Bush
- Beauty Berry
- Yellow Root
- Tag Alder
- Black-Eyed Susan
- Lanceleaf Coreopsis
- Native Grasses





# Post-Construction Efforts



NCSU will continue monitoring

Plants and trees will be  
monitored for successful growth





# Schedule



Task	Date
Complete 90% Design Plans	February 2018
Secure Environmental Permits*	February 2018
Finalize Design Plans	March 2018
Begin Construction	March 2018
Complete Construction	May 2018
Monitoring	Ongoing to 2020

\*Permit applications have been submitted to North Carolina Department of Environmental Quality (NCDEQ).



# Drainage Assistance Program



Provides help to citizens who experience drainage issues that result from stormwater coming from streets

Staff will assess structural flooding, severe erosion, and failing infrastructure for qualifying projects

Potential project downstream of Millbrook Exchange Park.

For more information, call Dale Hyatt, PE, 919-996-4071 or [Dale.Hyatt@raleighnc.gov](mailto:Dale.Hyatt@raleighnc.gov)

# Questions?



**Lory Willard, EI**

City of Raleigh Stormwater Management Division

Main Phone: 919-996-3940

Direct Line: 919-996-4012

E-mail: [Lory.Willard@raleighnc.gov](mailto:Lory.Willard@raleighnc.gov)

[raleighnc.gov](http://raleighnc.gov)

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