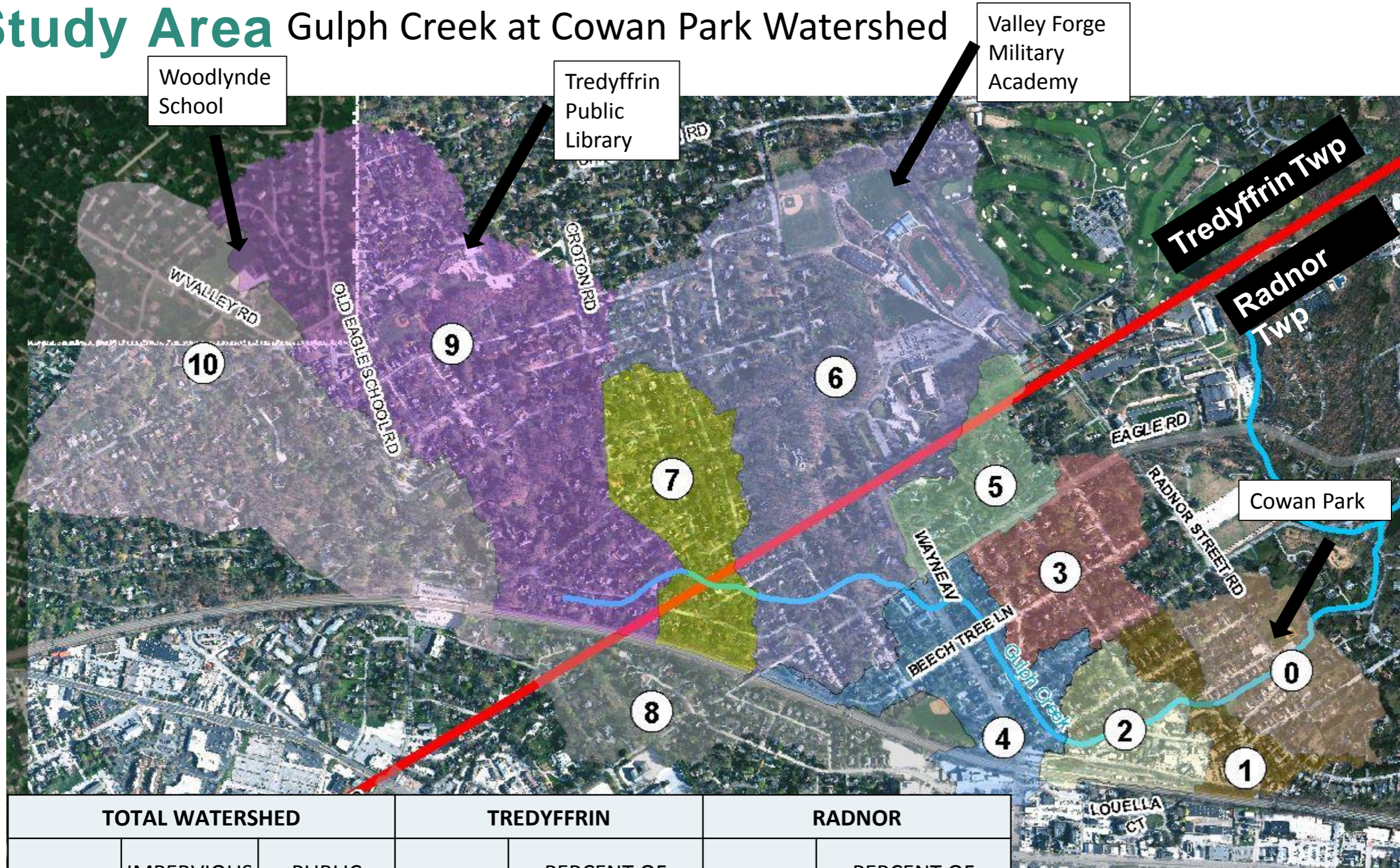


Study Area Gulph Creek at Cowan Park Watershed



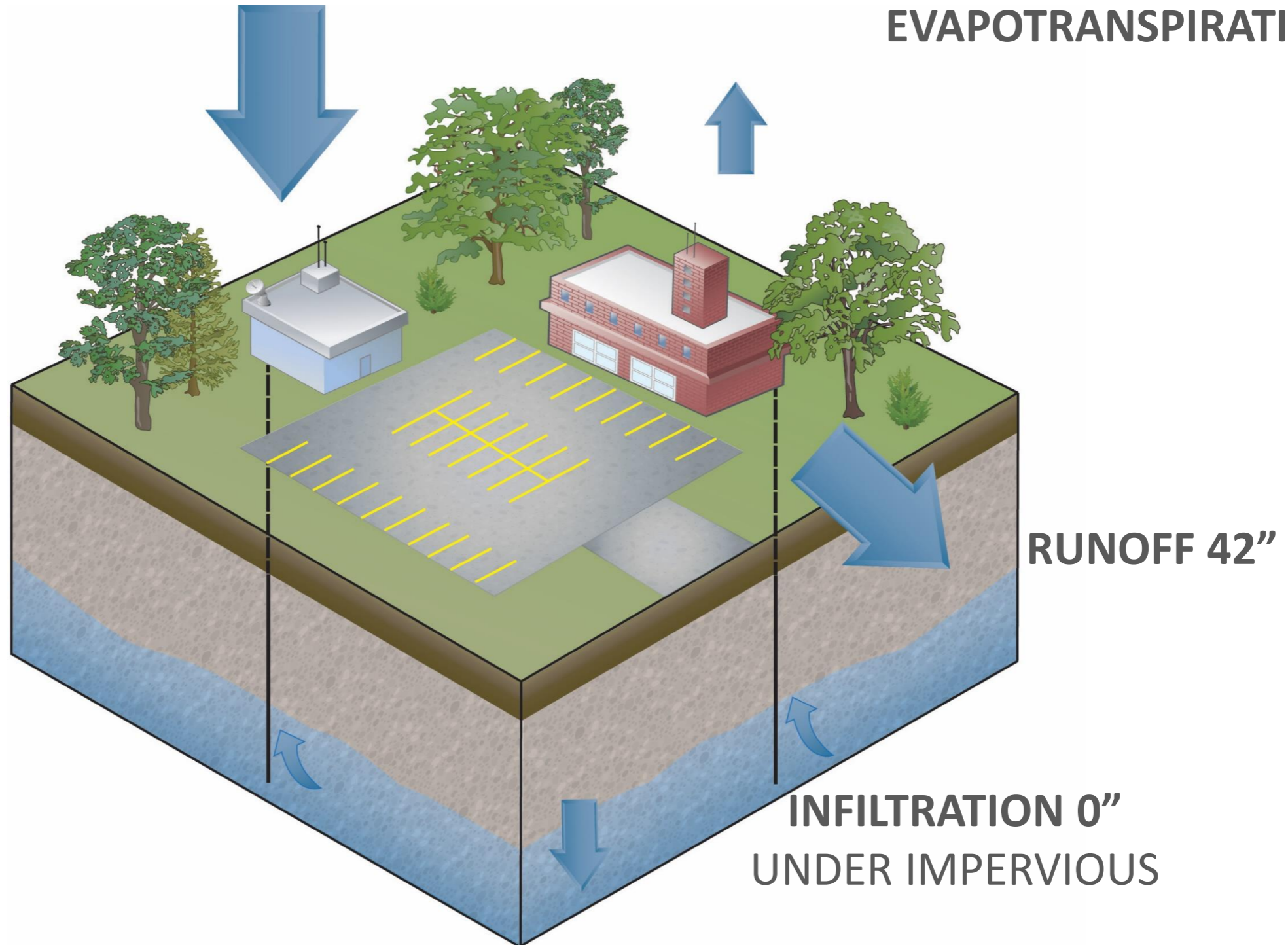
TOTAL WATERSHED			TREDYFFRIN		RADNOR	
AREA (AC)	IMPERVIOUS AREA (AC)	PUBLIC ROADS (AC)	AREA (AC)	PERCENT OF DRAINAGE AREA	AREA (AC)	PERCENT OF DRAINAGE AREA
910	276	41	615	68%	295	32%

Project Update – June 4, 2019

316 acres of impervious area increase runoff volume

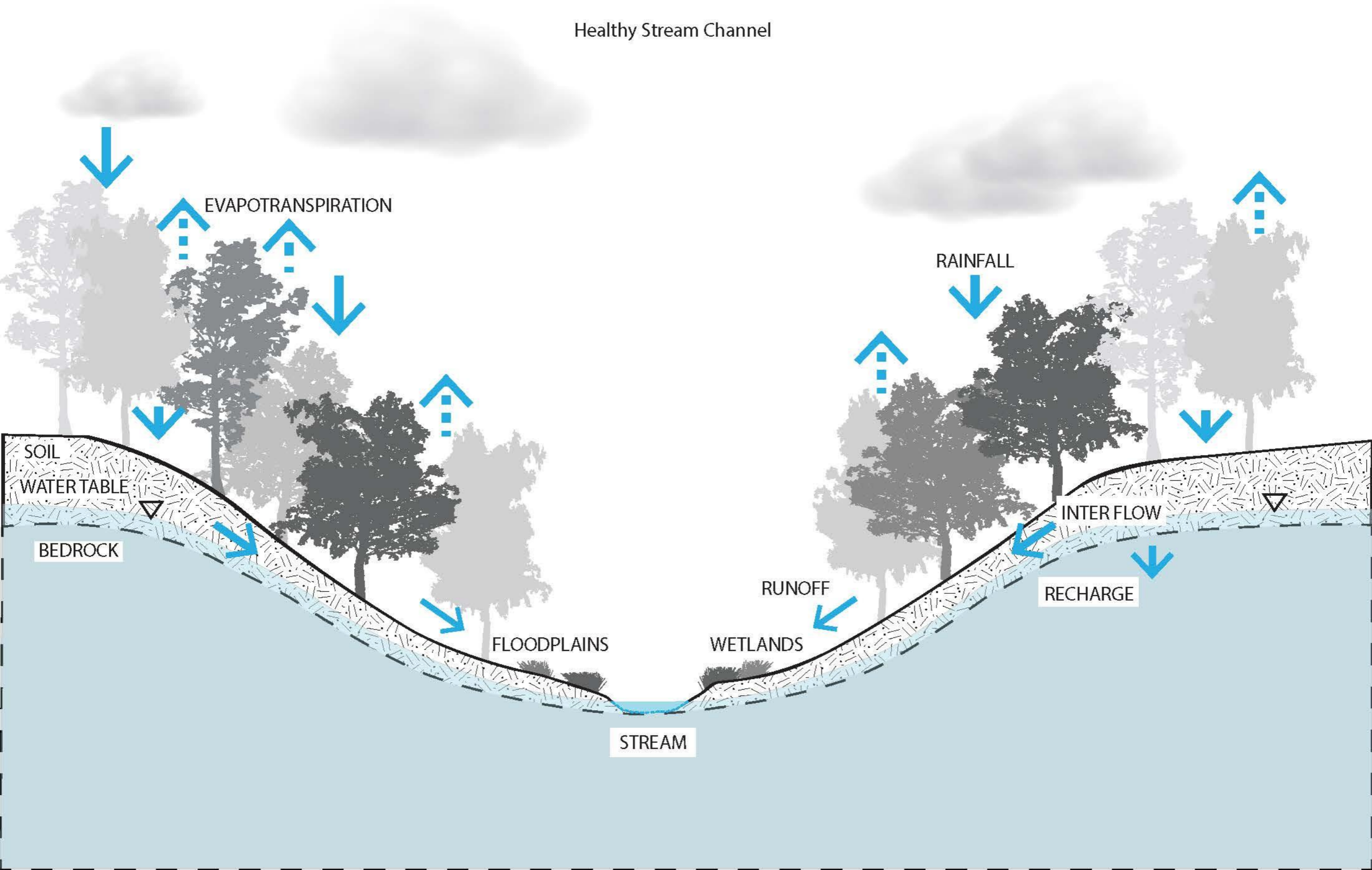
RAINFALL 45"

EVAPOTRANSPIRATION 3"

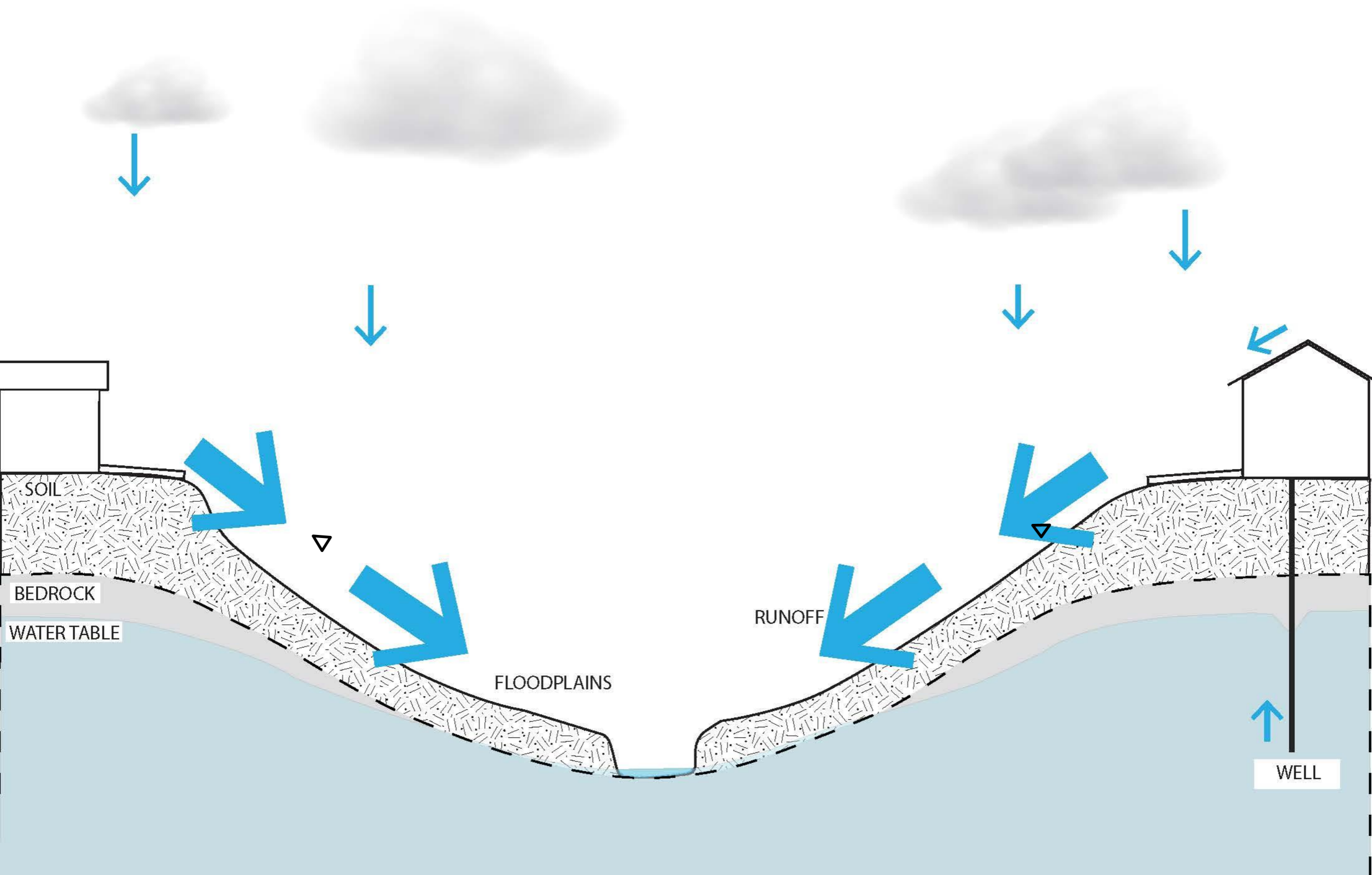


Healthy Stream Channel

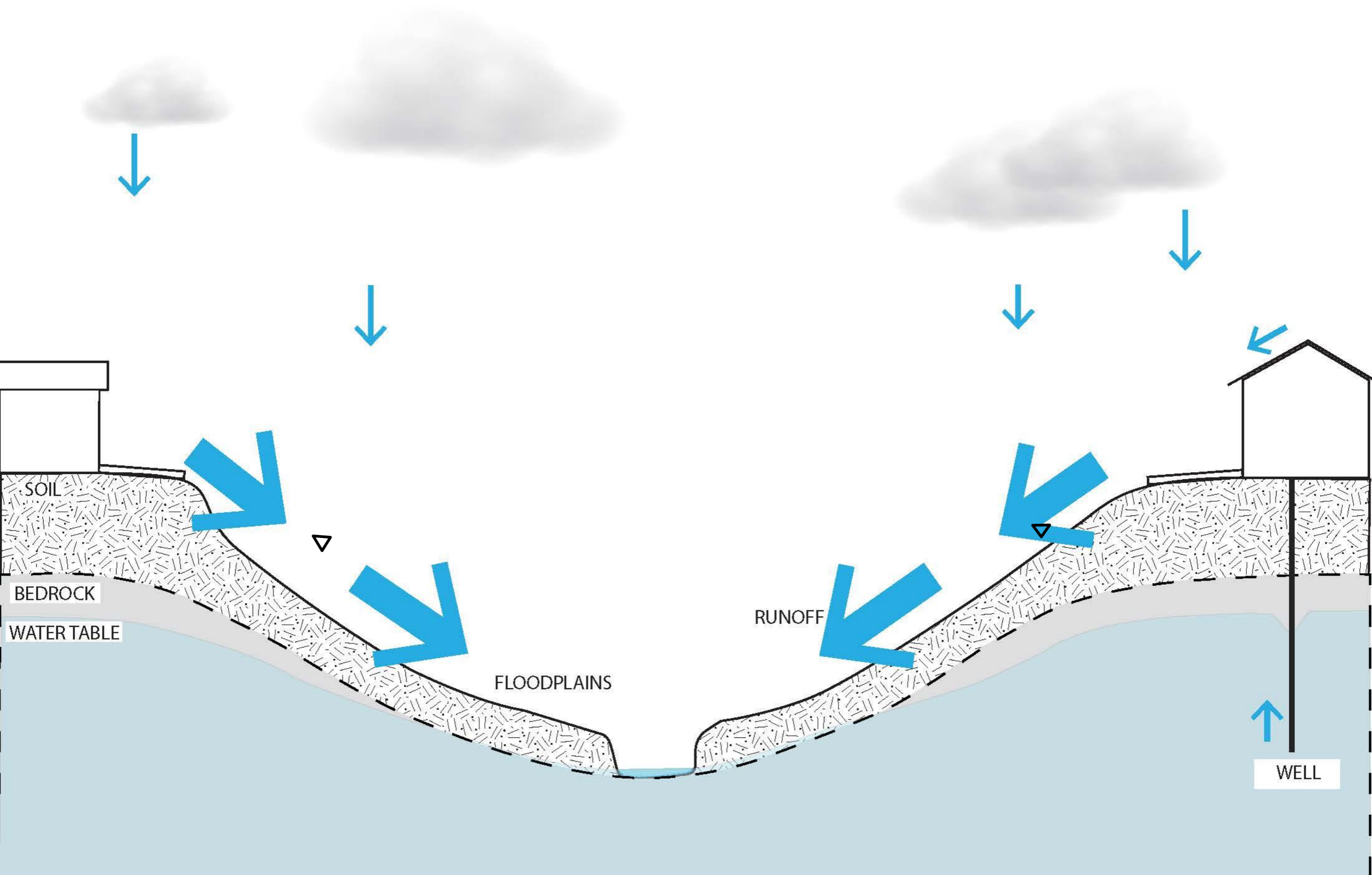
Healthy Stream Channel



Altered Stream Channel

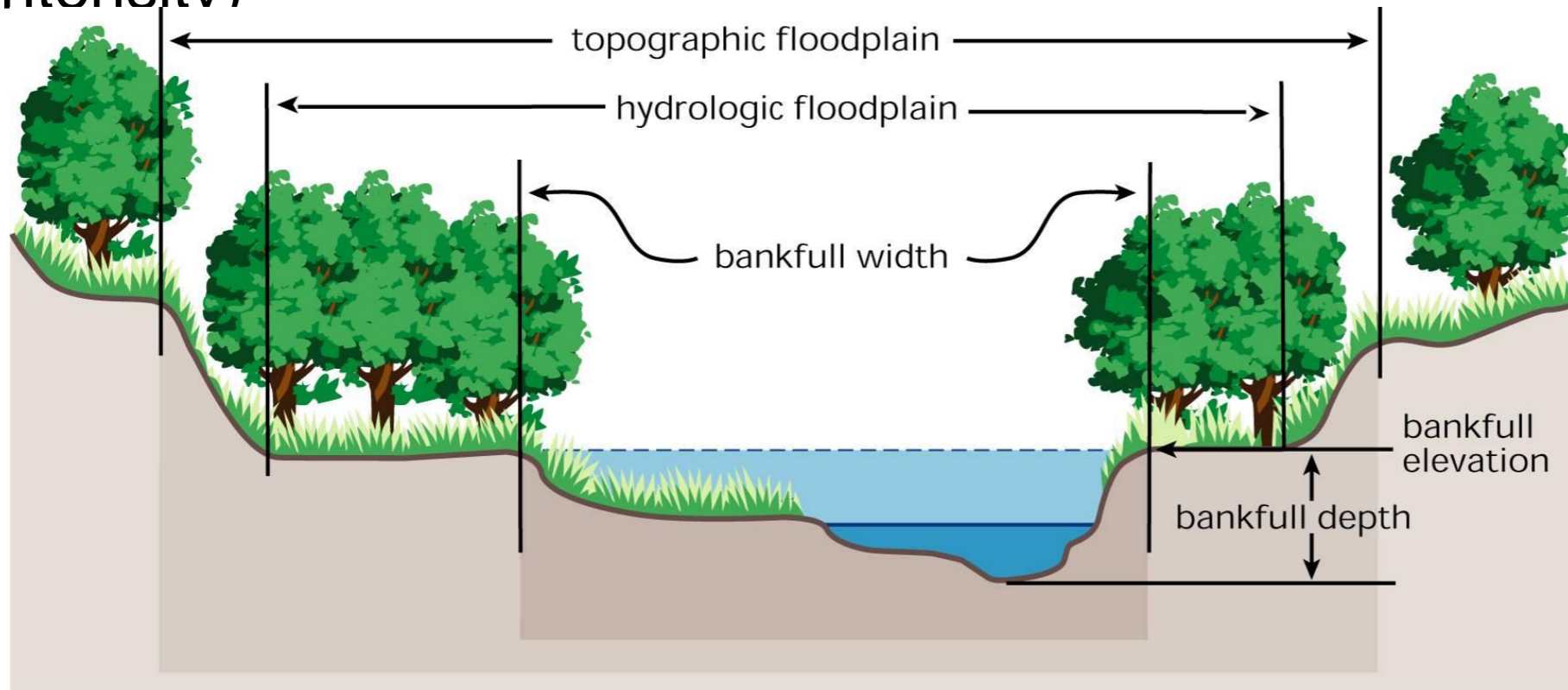


Altered Stream Channel



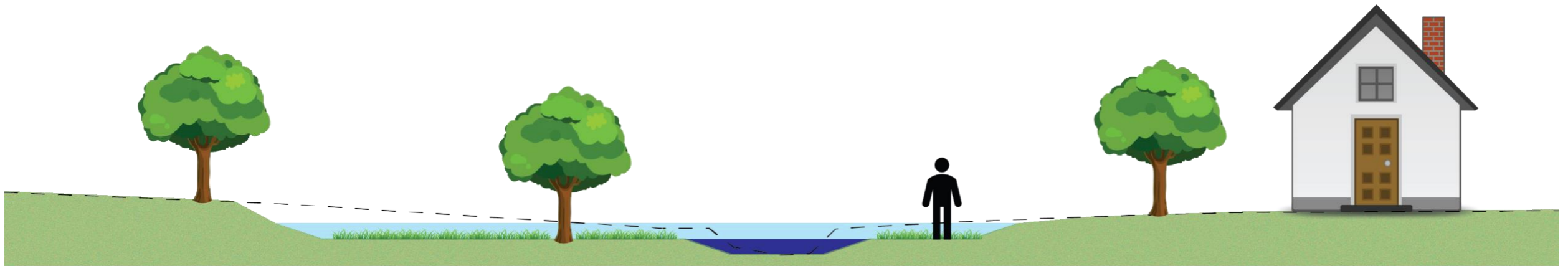
North Wayne Flood Reduction Update

- Existing stream surveyed from March and April 2019
 - 5,840 linear feet of Gulph Creek surveyed
- Boundary survey April 2019 to June 2019
 - Documents property boundaries and owners of all surveyed areas for our project.
- Newly surveyed stream channel and structures used to update existing channel geometry for modeling purposes: 10-year, 1- hour storm (high intensity)



Concept

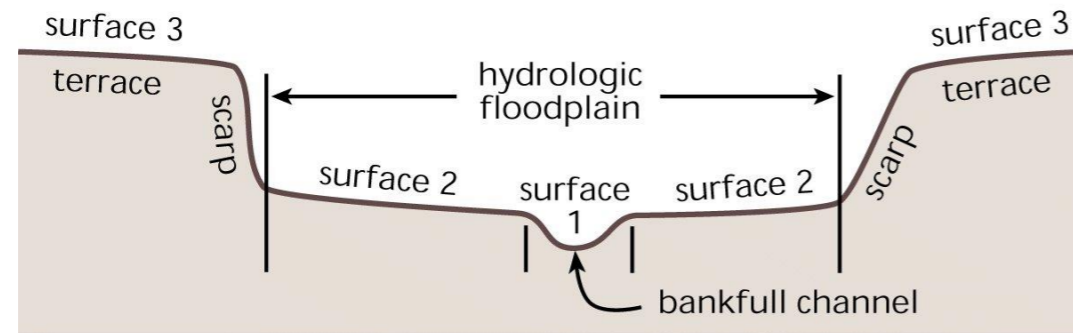
- Regrade floodplain in upper reaches of Gulph Creek (upstream of Poplar)
- Limit floodplain depth +/- 1'
- Wider, shallower channel



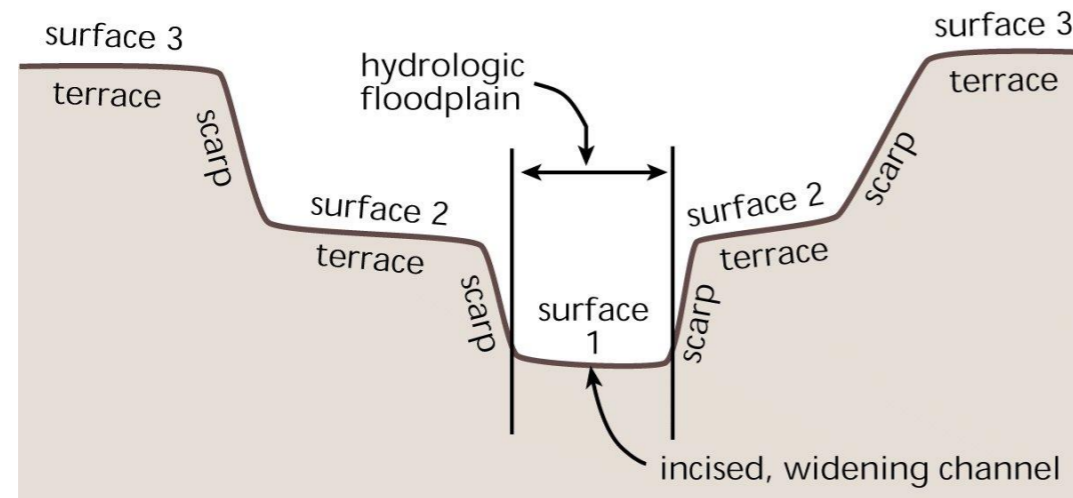
The Township is not contemplating taking property by eminent domain. Instead, homeowners can participate in this project voluntarily and on a property-by-property basis, negotiating with the Township for the best outcome for themselves and the community.

Stream Channel Design Parameters

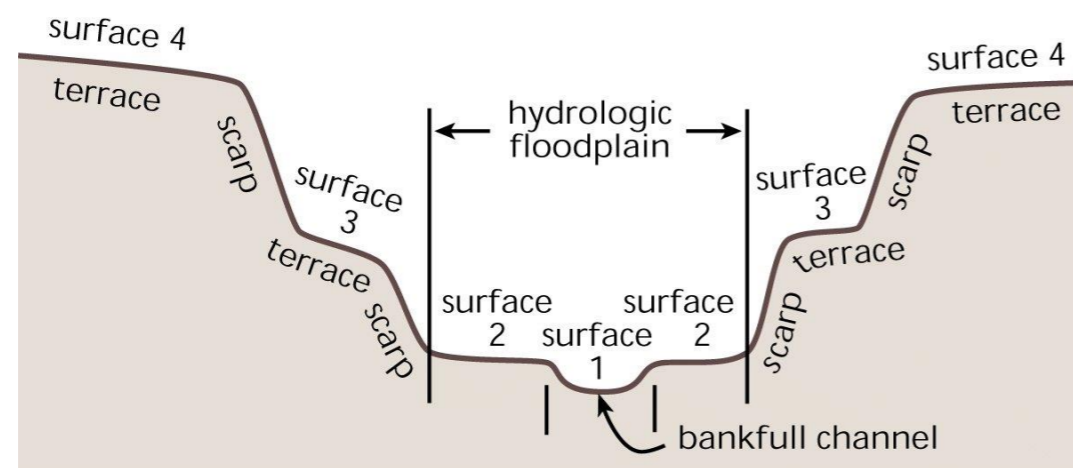
A. Nonincised Stream



B. Incised Stream (early widening phase)



C. Incised Stream (widening phase complete)



- Channel sections will vary along stream reach
- Restoring floodplain upstream of Poplar (not below)
- Cannot increase flooding downstream of project
- We cannot impact houses and critical structures
- Sheds and non-critical structures may be relocated

Fig. 1.24 – Terraces in (A) nonincised and (B and C) incised streams. Terraces are abandoned floodplains, formed through the interplay of incising and floodplain widening. In *Stream Corridor Restoration: Principles, Processes, and Practices* (10/98). Interagency Stream Restoration Working Group (15 federal agencies)(FISRWG).

Stream Corridor Restoration: Principles, Processes, and Practices. 1998. Federal Interagency Stream Restoration Working Group

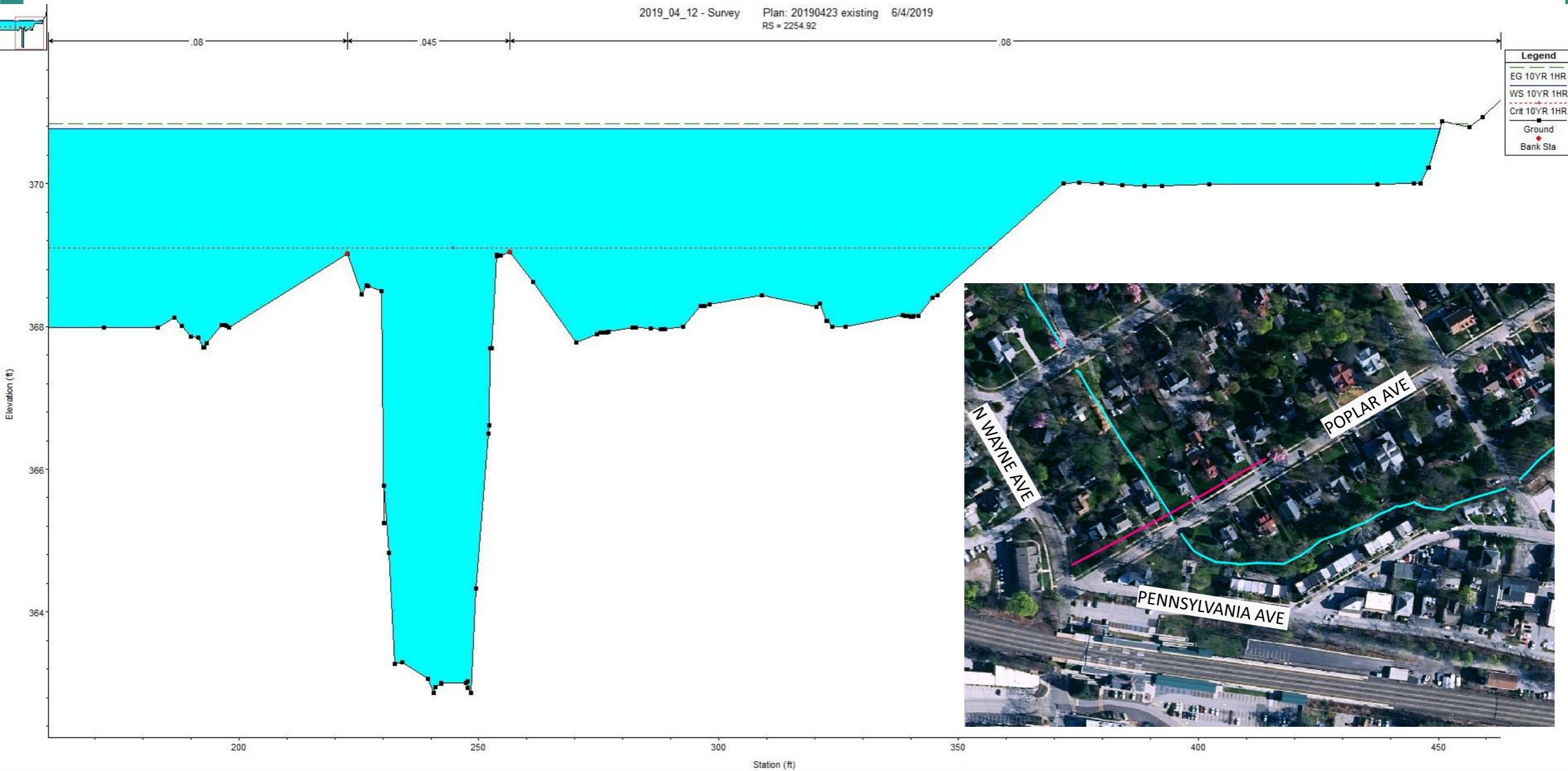
Findings:

- For a 10-year, 1-hour storm, creating a floodplain approximately 30' wide (average, as sections will vary), will lower the water level at Poplar Avenue approximately 0.75 feet
- Along Willow the water level is approximately 0.5 feet lower

Flood Depth Reduction at Poplar Avenue		
Storm Event	Total Rainfall (in)	Flood Depth Reduction (ft)
10-year 1-hour	2.03	0.73
5-year 1-hour	1.79	0.62
2-year 1-hour	1.44	0.70

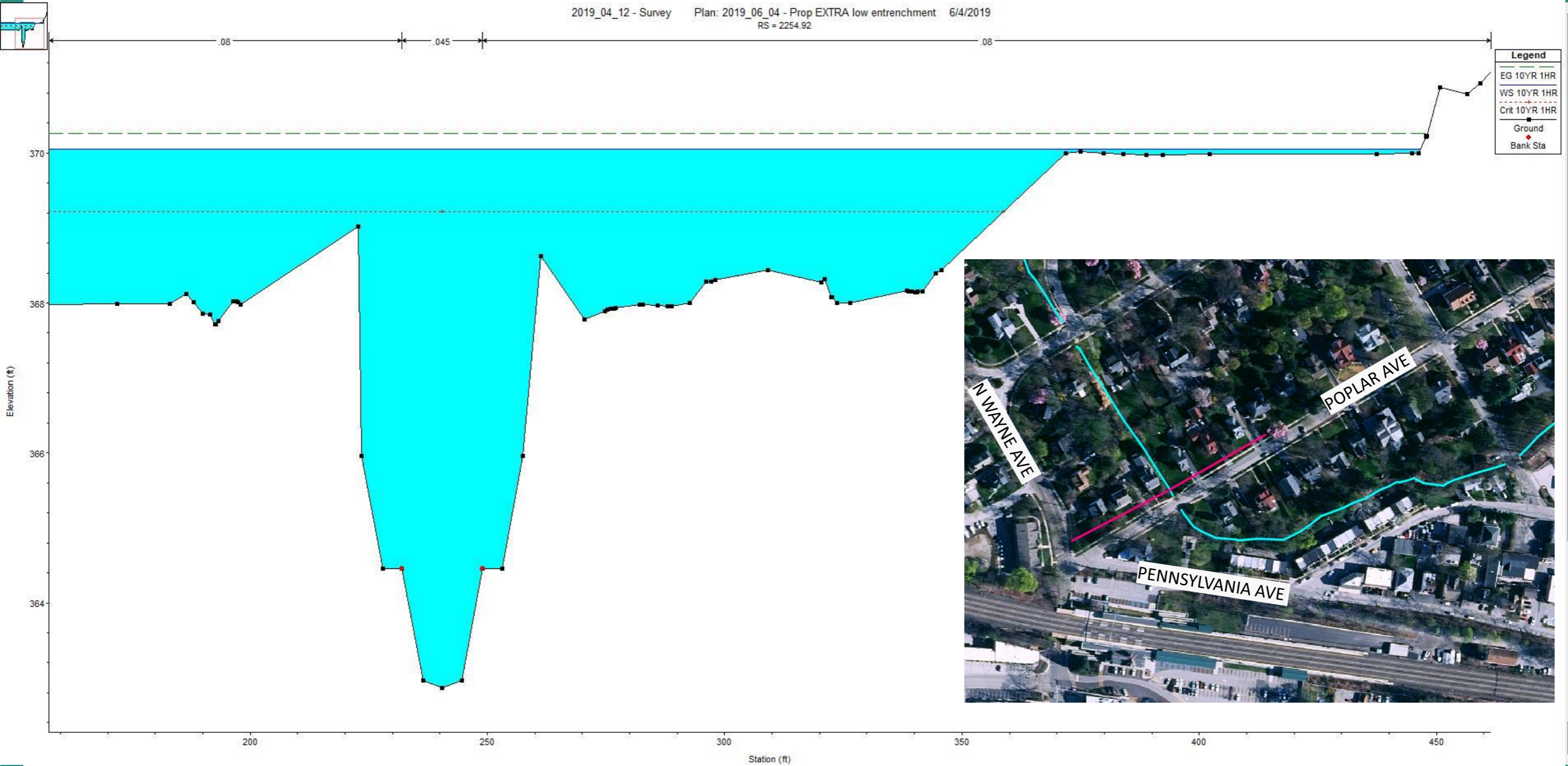
North Wayne Flood Reduction Update

Existing conditions – Gulph Creek cross section, just upstream of the Poplar Ave culvert (looking downstream)



North Wayne Flood Reduction Update

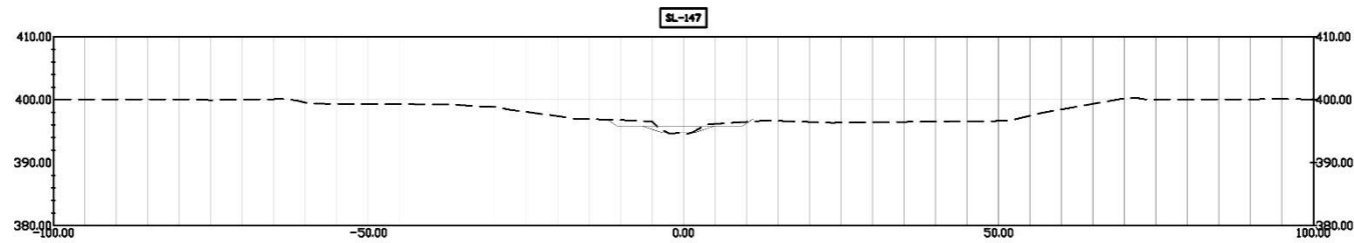
Proposed conditions – Gulph Creek cross section, just upstream of the Poplar Ave culvert (looking downstream)



Water surface elevation drops by 0.72 ft

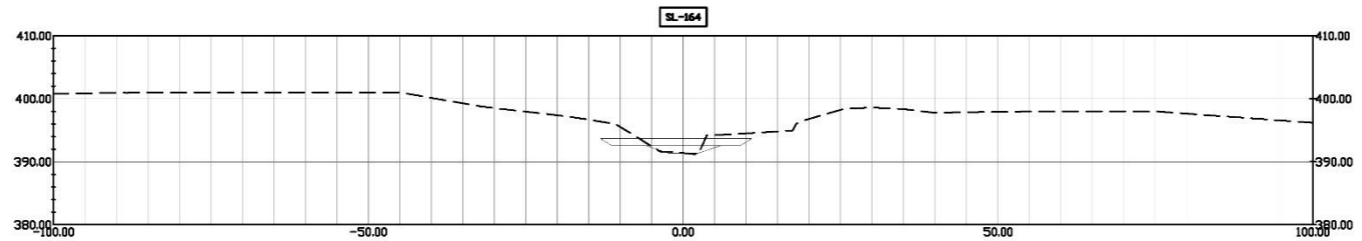


CHANNEL WIDTH: 11.6 FT.
 FLOODPLAIN WIDTH: 23.2 FT.



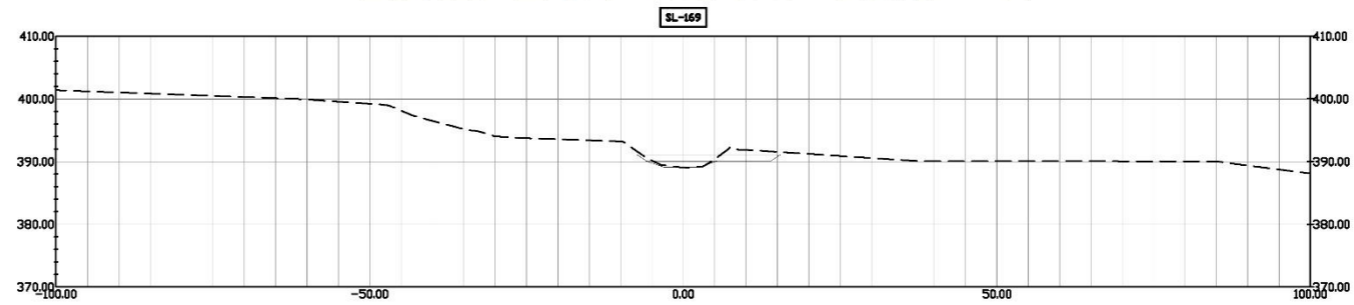


CHANNEL WIDTH: 12.0 FT.
 FLOODPLAIN WIDTH: 24.0 FT.





CHANNEL WIDTH: 11.4 FT.
 FLOODPLAIN WIDTH: 22.8 FT.

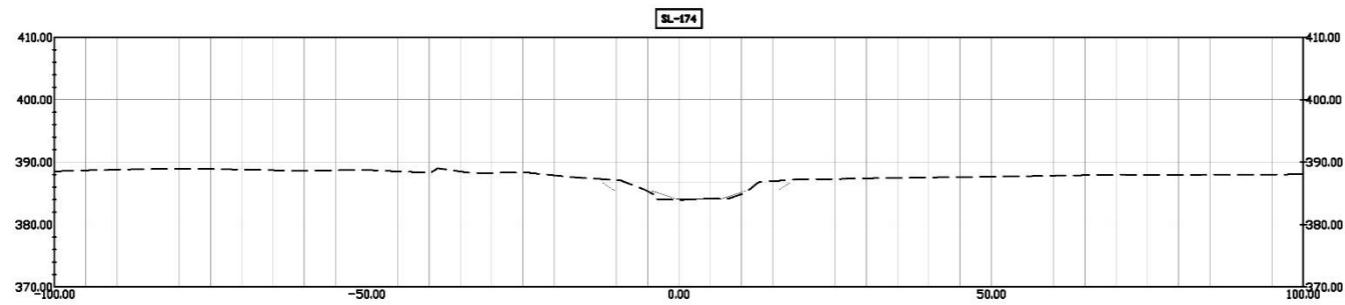


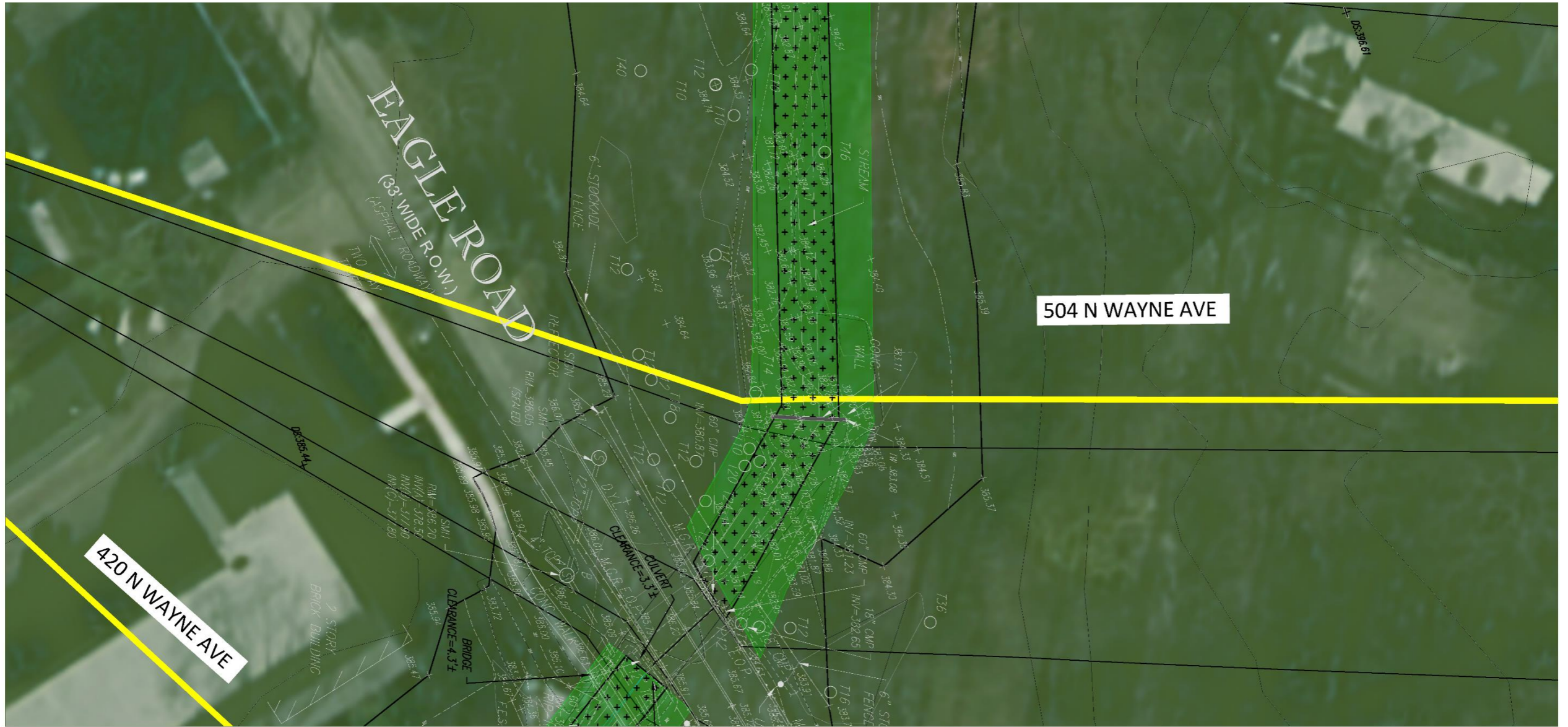


1 FOREST RD

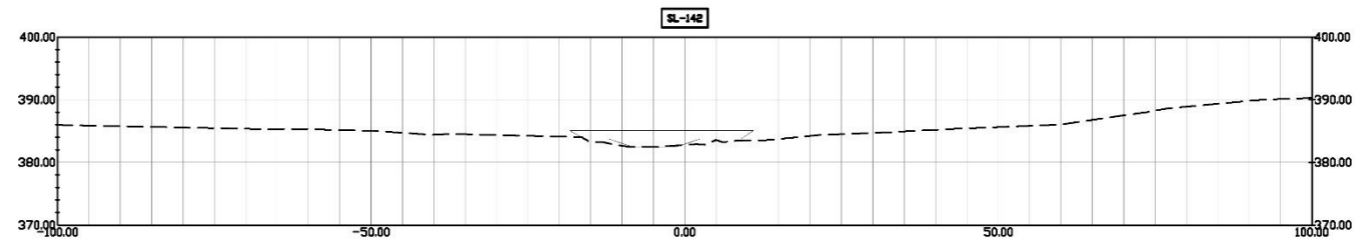
3 FOREST RD

CHANNEL WIDTH: 15.0 FT.
 FLOODPLAIN WIDTH: 30.0 FT.



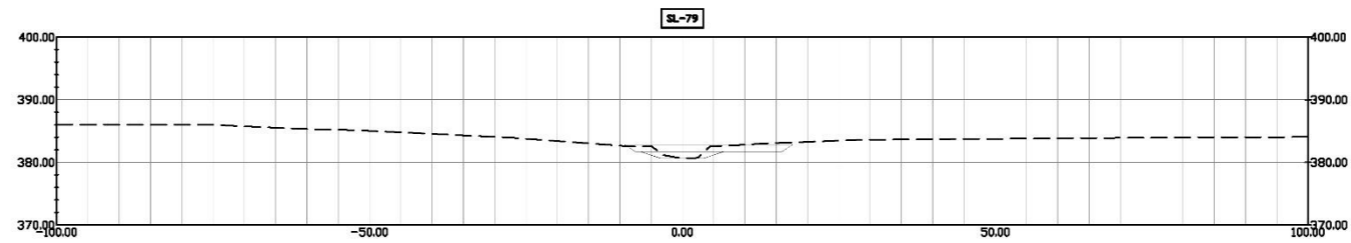


CHANNEL WIDTH: 14.6 FT.
 FLOODPLAIN WIDTH: 29.2 FT.



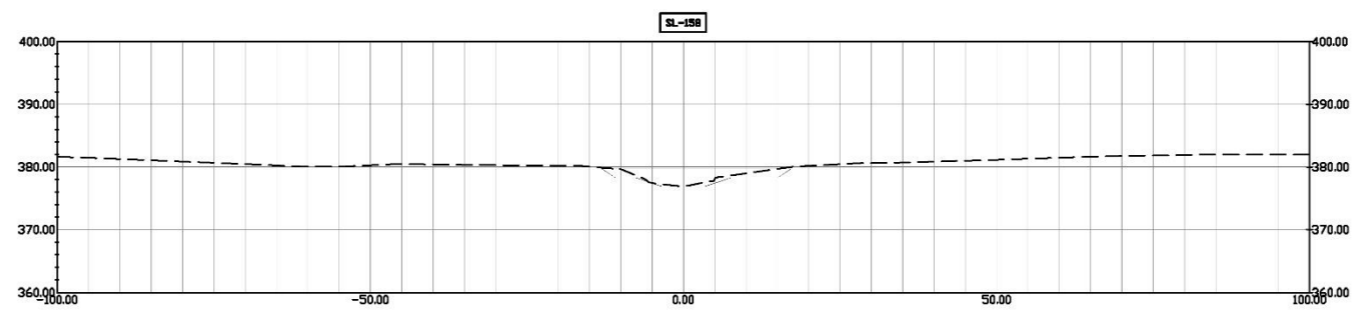


CHANNEL WIDTH: 13.4 FT.
 FLOODPLAIN WIDTH: 26.8 FT.



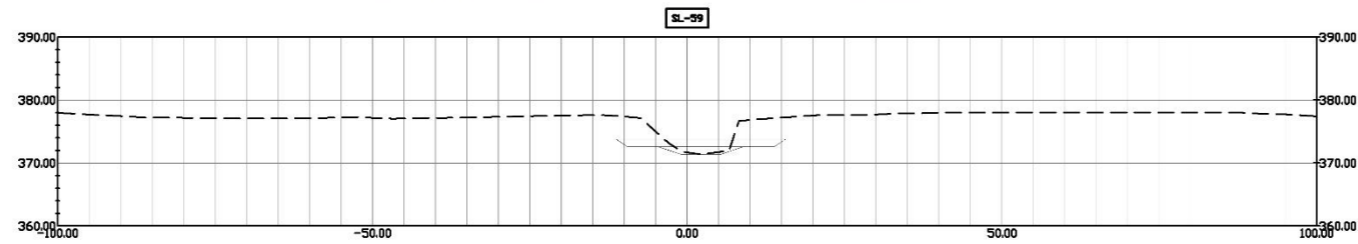


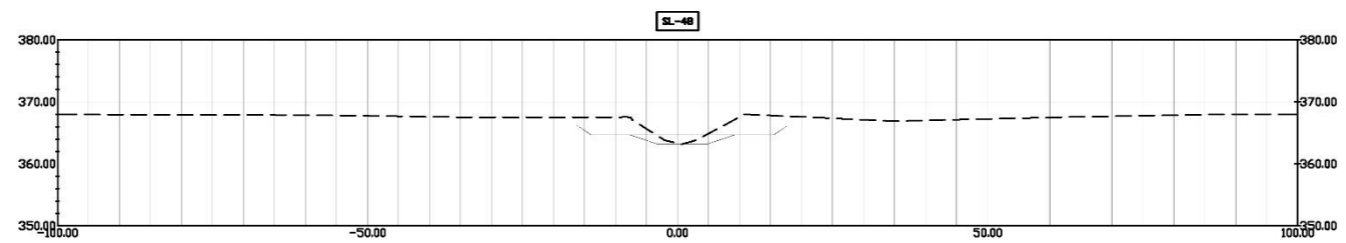
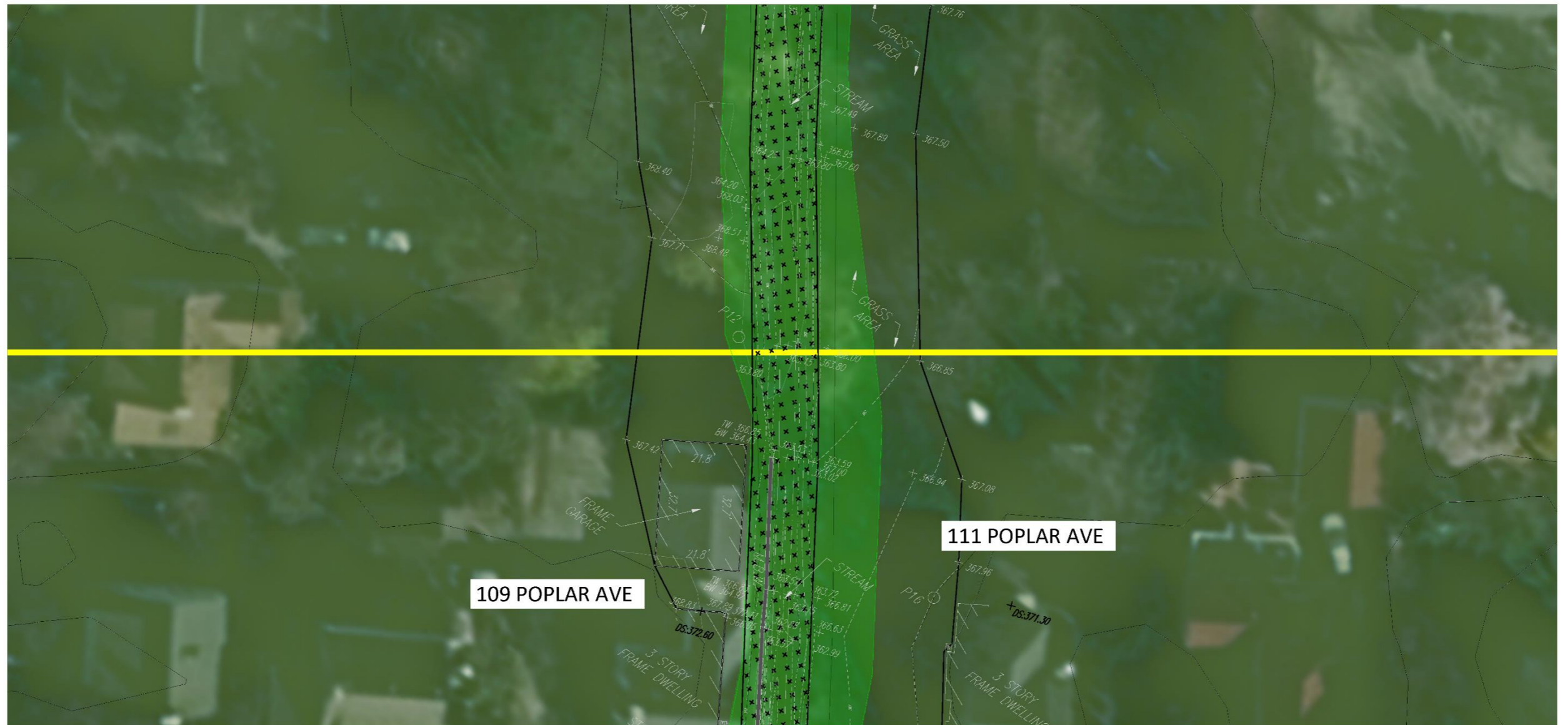
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 FLOODPLAIN WIDTH: 30.0 FT.

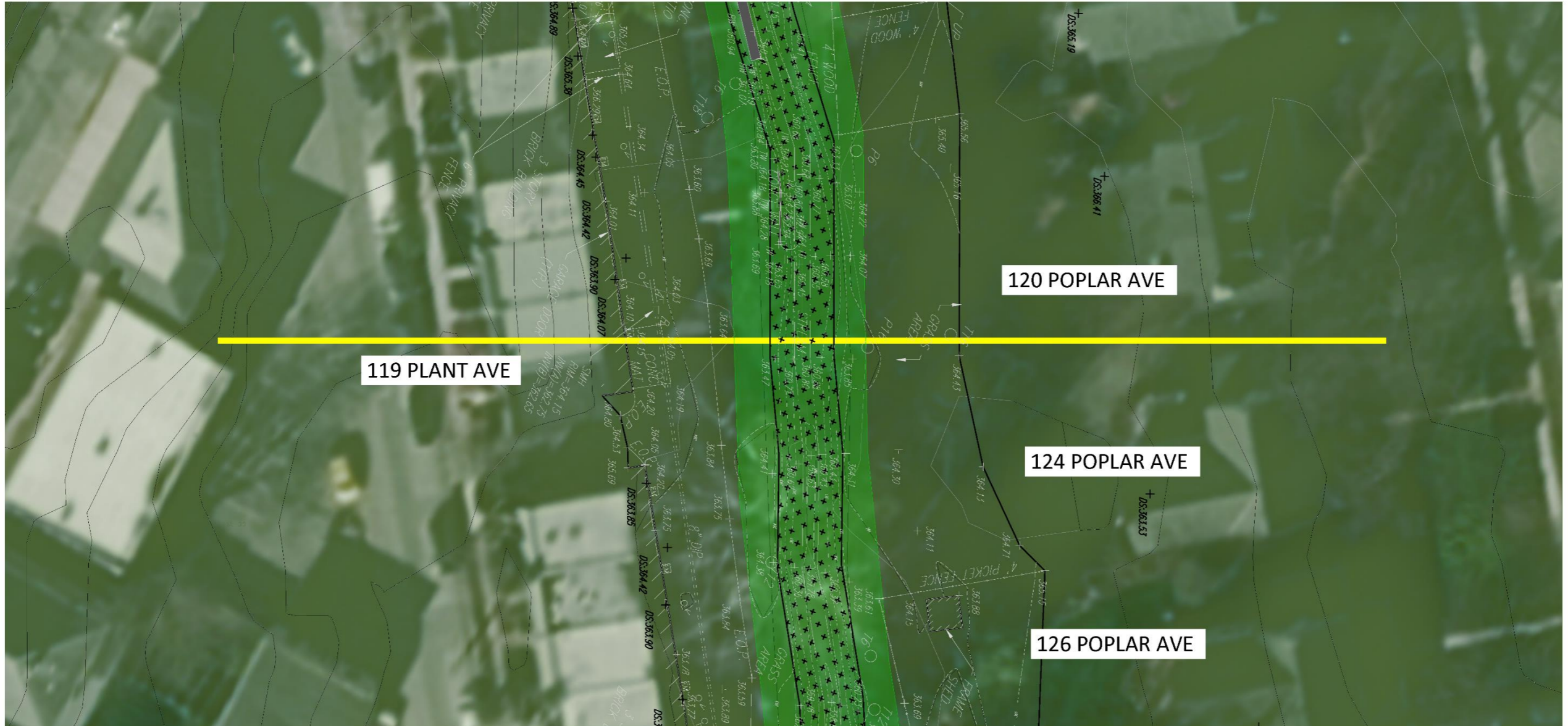




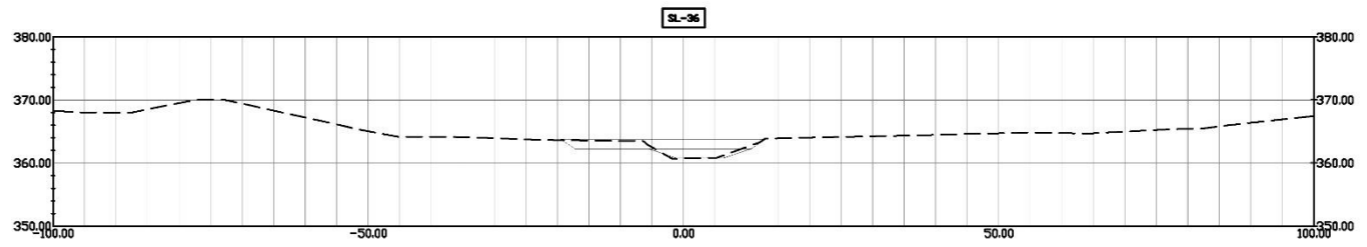
CHANNEL WIDTH: 13.4 FT.
 FLOODPLAIN WIDTH: 26.8 FT.





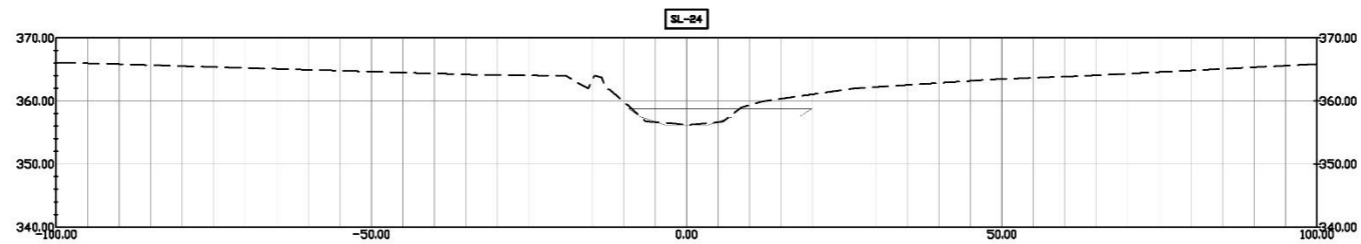


CHANNEL WIDTH: 17.0 FT.
 FLOODPLAIN WIDTH: 34.0 FT.



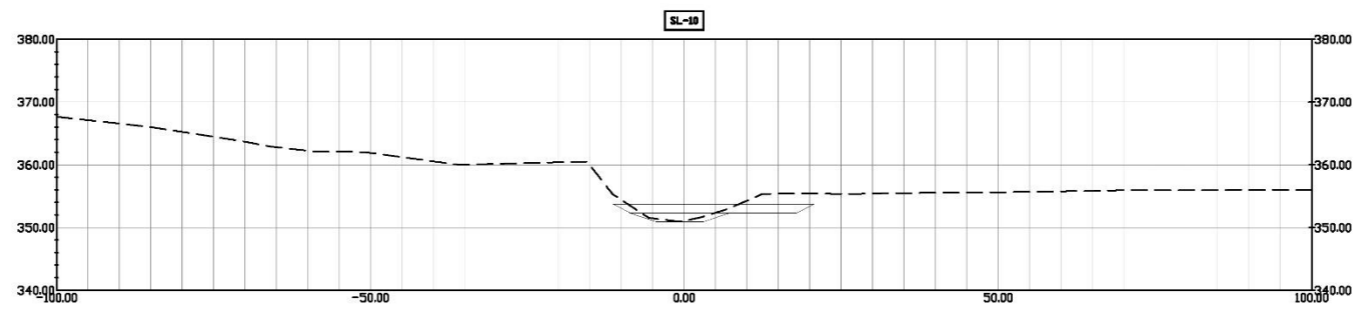


CHANNEL WIDTH: 14.5 FT.
 FLOODPLAIN WIDTH: 29.0 FT.





CHANNEL WIDTH: 16.0 FT.
 FLOODPLAIN WIDTH: 32.0 FT.









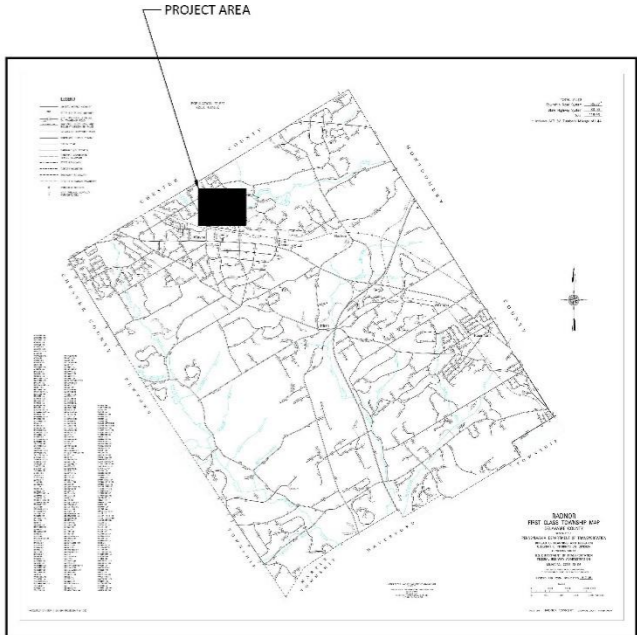
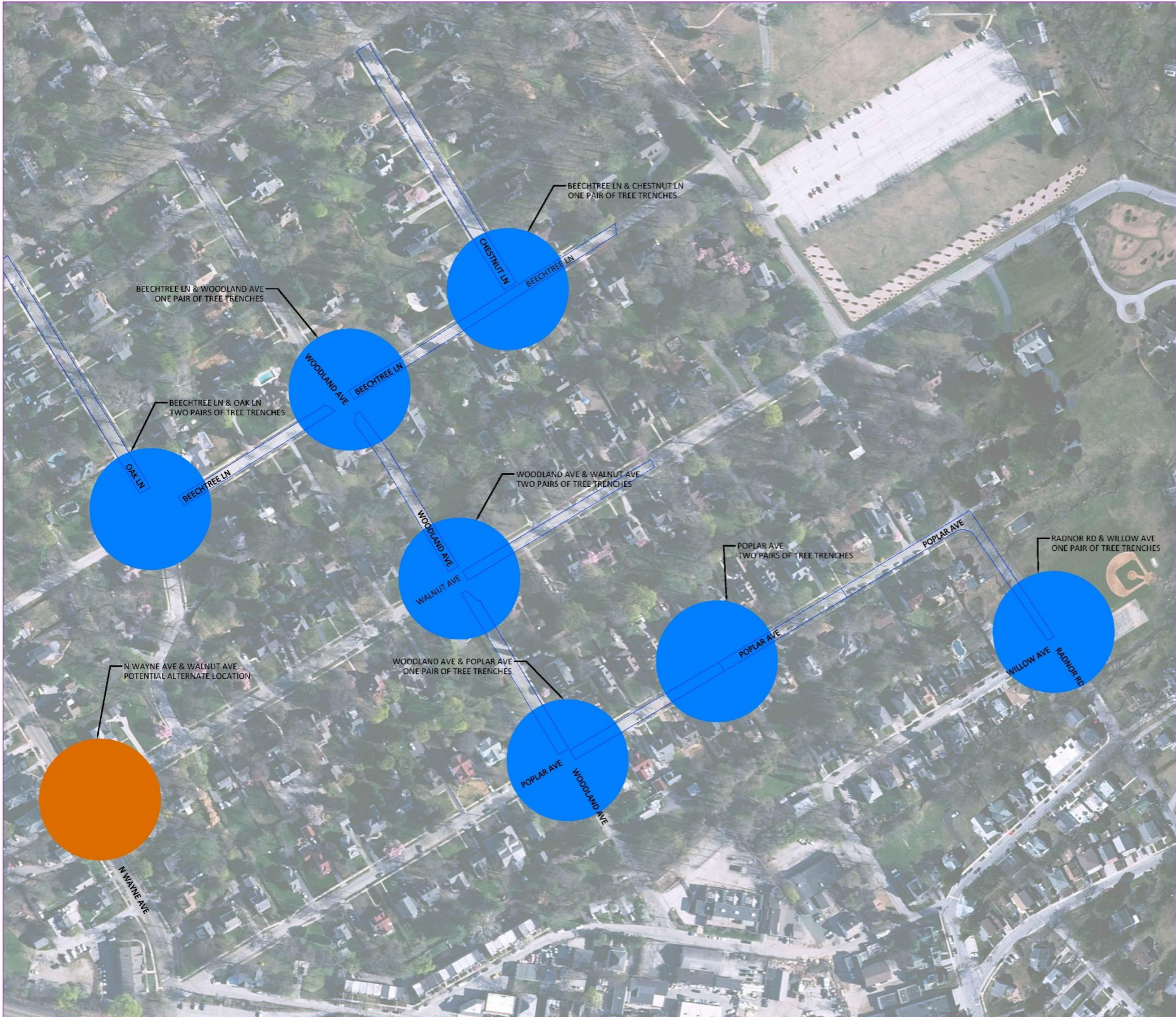
RACP Grant Application

- Redevelopment Assistance Capital Project
 - \$550,000 in assistance funds available
 - State-funded projects that cannot obtain primary funding under other state programs
 - 50% of project cost must be match participation
 - Eligible Reimbursable costs include:
 - Construction, Permits, Land, Interest during Construction
 - A/E, O&M, Admin., Legal Fees are non-reimbursable but eligible match costs.

RACP Grant Submission

- Construction of stormwater tree trenches at ten (10) locations within the North Wayne residential community.
- The stormwater tree trenches will be constructed by the Township in the public right-of-way of Township roads, below existing sidewalks.
- Provide both flood reduction and water quality benefits, as well as replacement of existing sidewalks and additional tree planting.
- The tree trenches will receive runoff from approximately 5000 feet of public street, as well as homes and driveways that discharge to the streets.
- The tree trenches were sized to store and infiltrate the runoff from approximately 1.5 inches of rainfall, or 90% of the rainfall events that occur in Radnor Township.

RACP Grant Plans – Overall Layout



NORTH WAYNE FLOOD REDUCTION PROJECT

TREE TRENCH OPPORTUNITIES OVERALL PLAN

PREPARED BY:

meliora

Civil, Water Resources, and Structural Engineering
 259 Morgan St., Phoenixville, PA 19460
 P: 610.933.0123 | www.melioradesign.com



RACP Grant Plans – Location Plans



BEACHTREE LN & OAK LN
TYPICAL 1"=1'-0"



BEACHTREE LN & WOODLAND AVE
TYPICAL 1"=1'-0"



BEACHTREE LN & CHESTNUT LN
TYPICAL 1"=1'-0"



WOODLAND AVE & WALNUT AVE
TYPICAL 1"=1'-0"



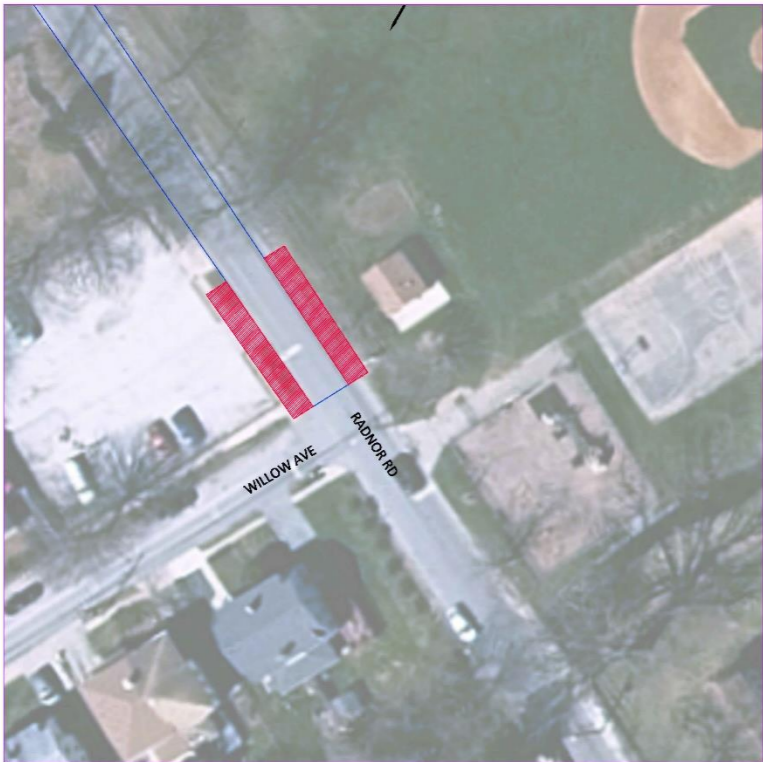
RACP Grant Plans – Location Plans



WOODLAND AVE & POPLAR AVE
TYPICAL 1"=1'-0"



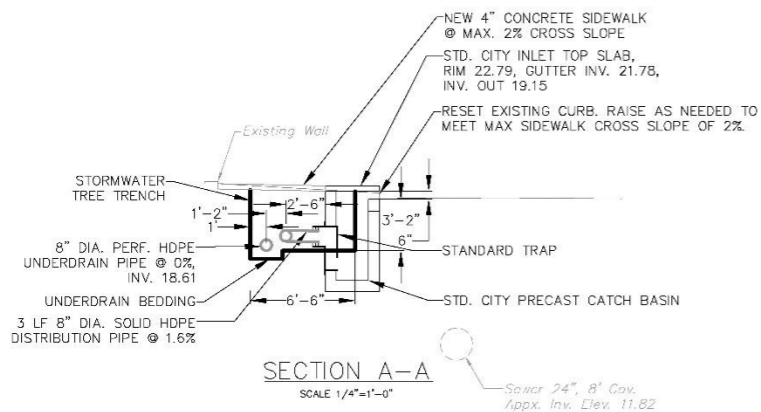
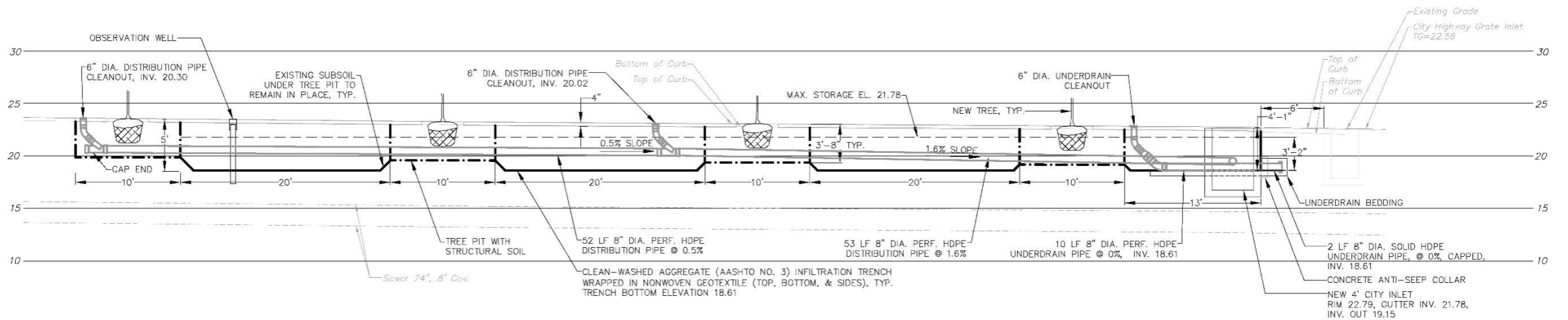
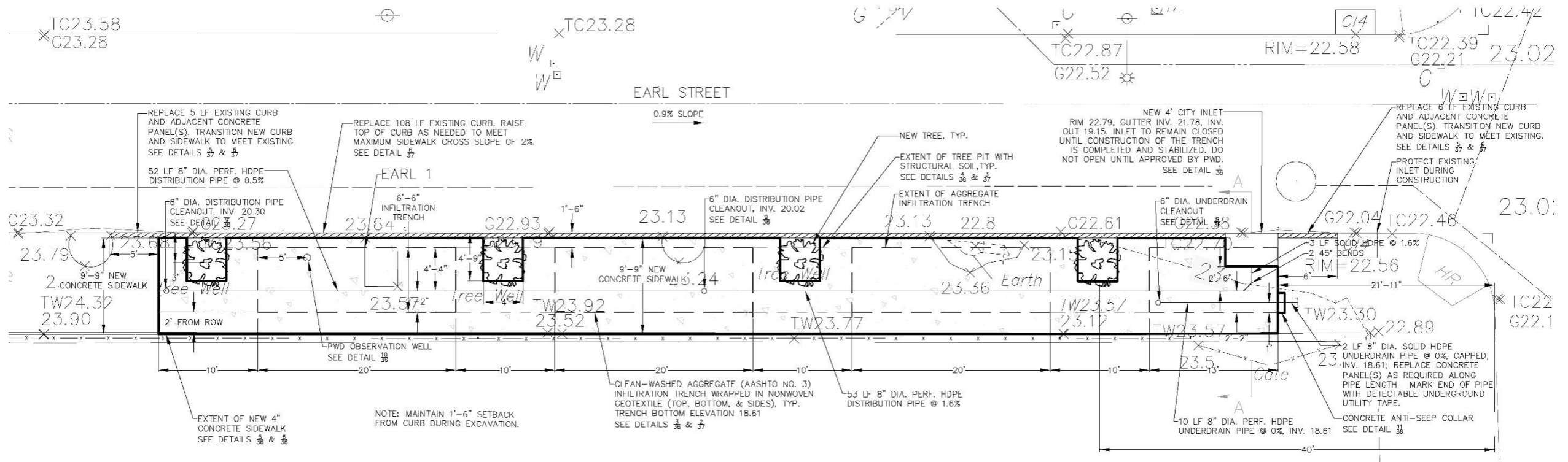
POPLAR AVE
TYPICAL 1"=1'-0"



RADNOR RD & WILLOW AVE
TYPICAL 1"=1'-0"



RACP Grant Plans – Typical Plan and Profile

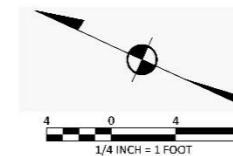


NOTE:
AS-BUILTS BASED ON FILED NOTES, PLANS, ELEVATIONS, AND DIMENSIONS PROVIDED BY CONTRACTOR.

SURFACE GRADING NOTE:
MEET EXISTING GRADES AT PROJECT EXTENTS. PROVIDE SMOOTH TRANSITIONS BETWEEN NEW AND EXISTING PAVEMENTS. GRADE SURFACE TO PROVIDE POSITIVE DRAINAGE TOWARD THE STREET WITH A MINIMUM SLOPE OF 1%. IF SURFACE CONDITIONS EXIST THAT INTERFERE WITH PROPER GRADING AND DRAINAGE, NOTIFY PROJECT MANAGER FOR DIRECTION. RIMS OF ALL CLEANOUTS AND OBSERVATION WELLS SHALL BE FLUSH WITH THE FINAL SURFACE GRADE.

NOTE:
SHEETING AND SHORING MUST BE USED FOR TRENCH DEPTHS GREATER THAN 4 FEET. ALL EXCAVATIONS, TRENCHING, AND SHORING OPERATIONS SHALL COMPLY WITH THE REQUIREMENTS OF ALL U.S. DEPARTMENT OF LABOR OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) PUBLICATIONS OF THE LATEST REVISION.

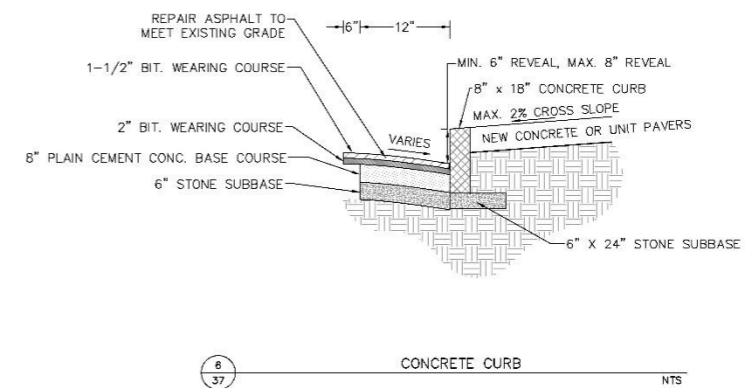
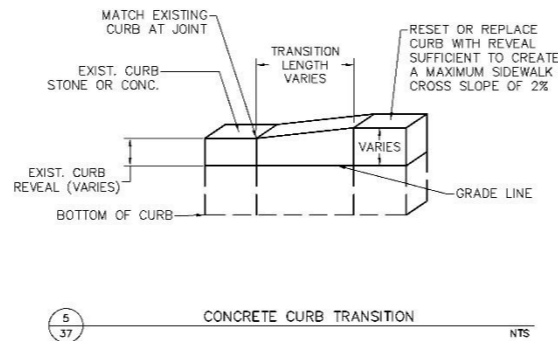
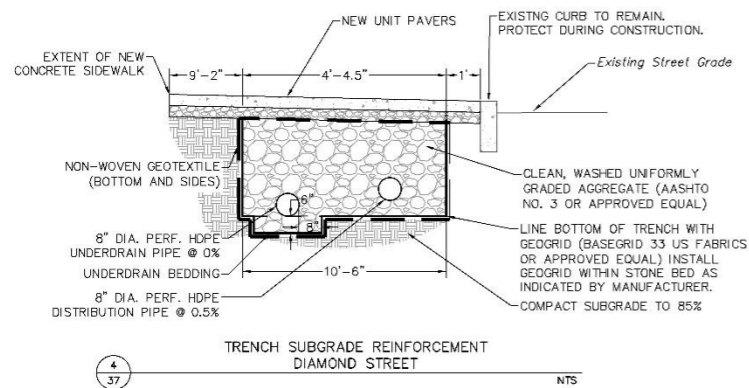
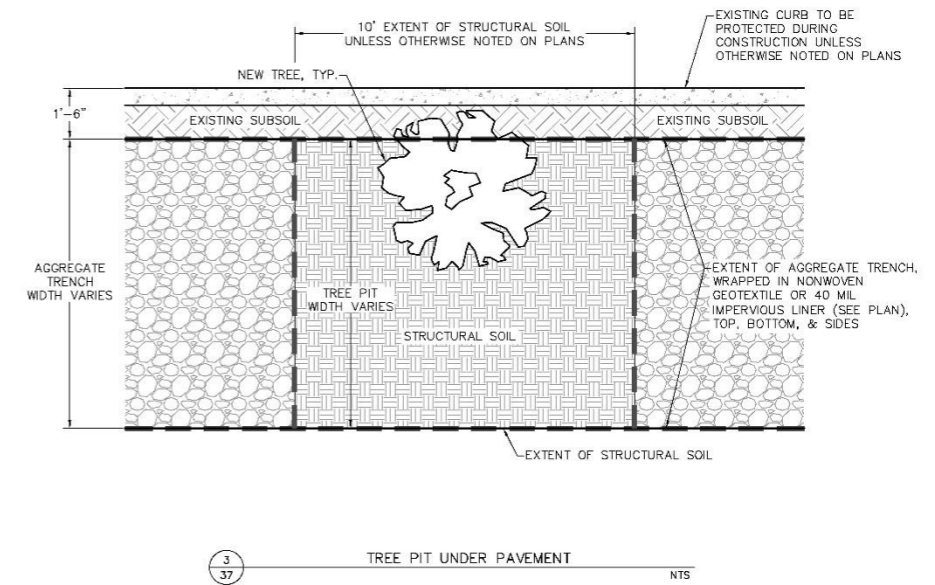
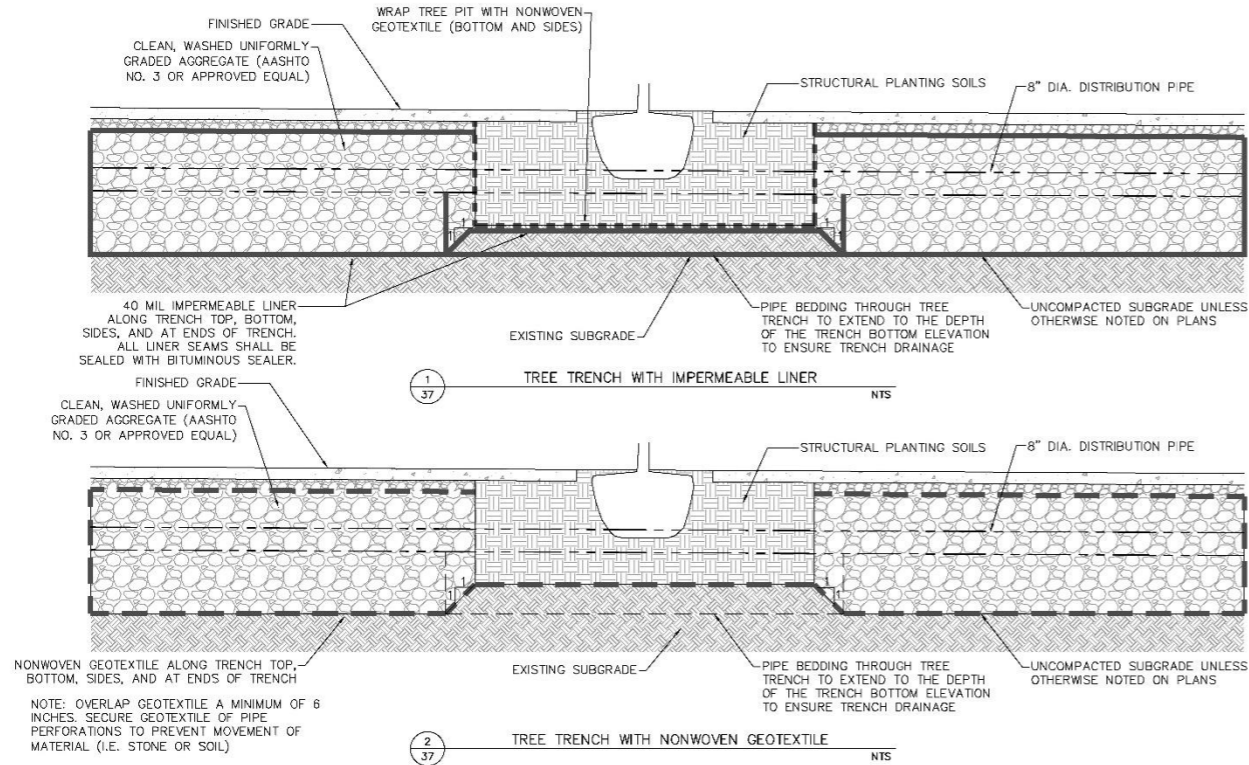
EXISTING UTILITIES NOTE:
THE CONTRACTOR IS RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING UTILITIES. ALL UTILITY LOCATIONS SHOULD BE FIELD VERIFIED PRIOR TO EXCAVATION. THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE OCCURRING TO EXISTING UTILITIES AS A RESULT OF CONSTRUCTION.



PREPARED BY:

TREE TRENCH PLAN & PROFILE

RACP Grant Plans – Details



Questions?