

# Park Hills Drainageway Improvements

**Citizen Input Meeting  
January 9, 2019**



# Project Goals

- 1) Maintain stormwater on Township property or within easements
- 2) Eliminate erosion and sediment deposits in the drainageway
- 3) Coordinate improvements with utilities in the drainageway



# Project Limits





# Meeting Goals

- 1) Introduce project to residents
- 2) Solicit input from residents – particularly as related to flooding history
- 3) Establish dialogue for project issues



# Project Team

- 1) NTM Engineering – Prime Consultant and Project Lead
  - Waterway Analysis (H&H)
  - Permitting
  - Construction Plans, Details, and Specifications
  - Public Plans Meetings
- 2) Pennoni Associates
  - Topographic and Boundary Survey
  - Easement Plats
- 3) Biohabitats
  - Concept and Final Drainageway Design (RSC Approach)
  - Public plans meetings graphics
- 4) Aquatic Resource Restoration Company
  - Constructability
  - Cost Estimating

# Key Project Challenges

## 1) Site Physical Characteristics

- Steepness
- Tree protection



## 2) Utilities

- Sanitary Sewer
- Power
- Cable
- Phone

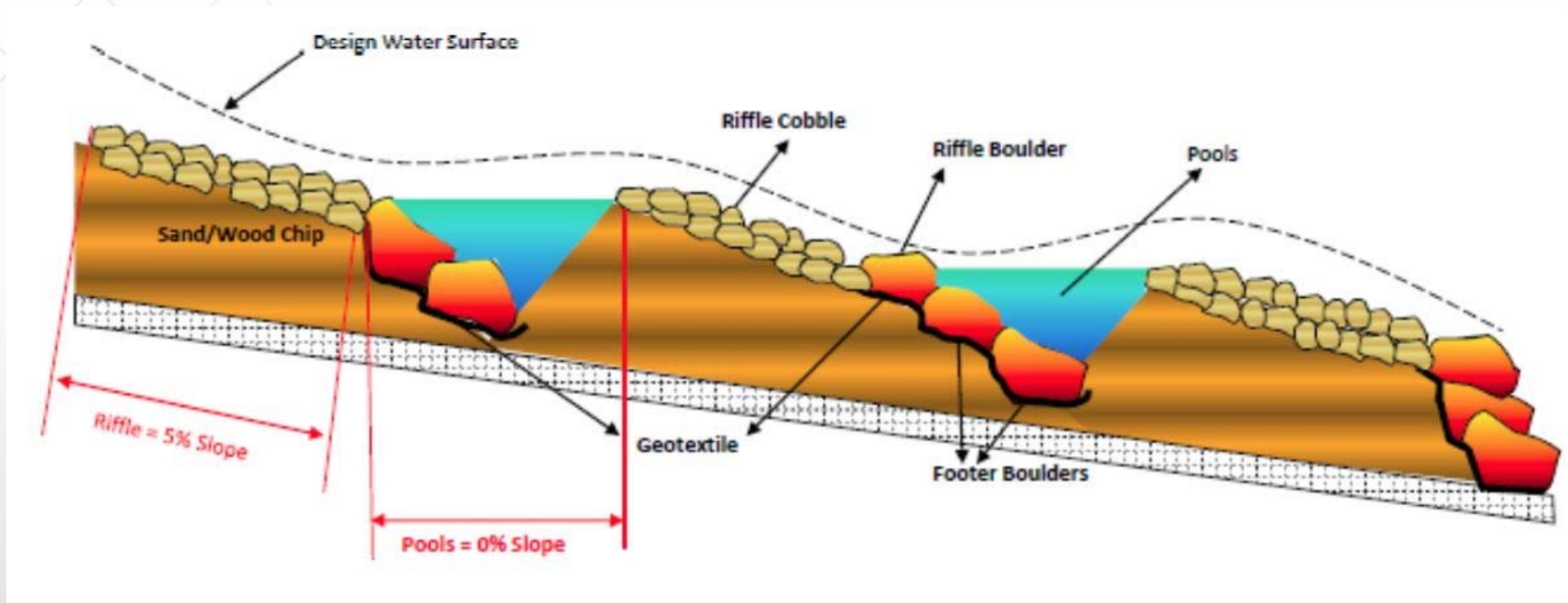






# Design Approach

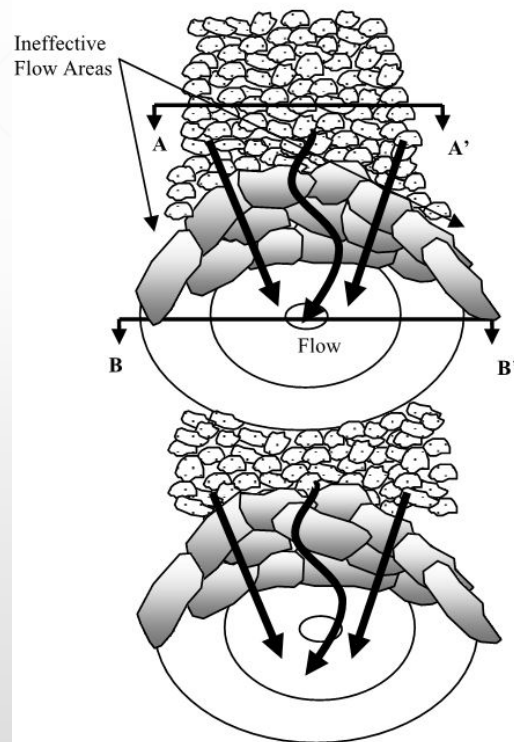
## Regenerative Stormwater Conveyance (Step Pool Sequence)



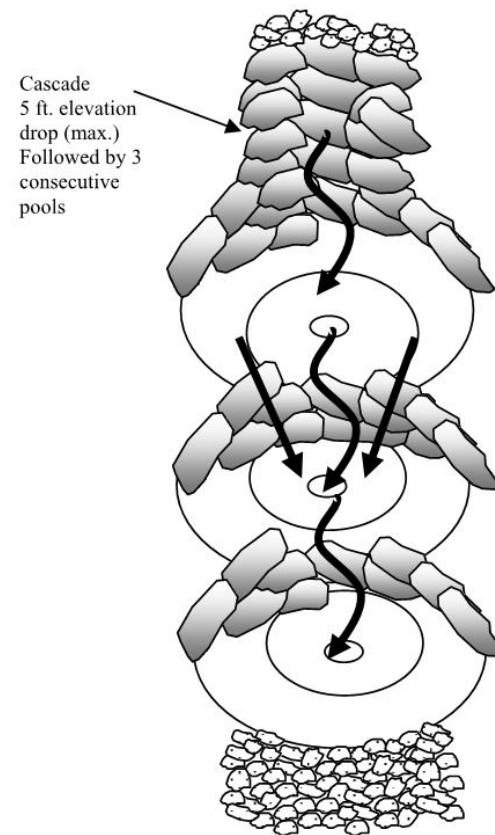


# Design Approach

## Regenerative Stormwater Conveyance (Step Pool Sequence)



Riffle - Pool Sequence (Typical)



Cascade Sequence

# Design Approach

## Regenerative Stormwater Conveyance Examples

Breewood  
Tributary RSC  
- Before



Ephemeral  
Upper  
Reaches





# Design Approach

## Regenerative Stormwater Conveyance Examples



Breewood  
Tributary RSC – After (½ Year Later)



# Design Approach

## Regenerative Stormwater Conveyance Examples



Original Outfall

Carriage Hills RSC  
- Before





# Design Approach

## Regenerative Stormwater Conveyance Examples



Carriage Hills RSC - After

# Design Approach

## Regenerative Stormwater Conveyance Examples



Crofton Tributary RSC  
– Before & After





# Design Approach

## Regenerative Stormwater Conveyance Examples



Crofton Tributary RSC - After



# Design Approach

## Regenerative Stormwater Conveyance Examples

### Linnean Avenue Gully RSC - Before





# Design Approach

## Regenerative Stormwater Conveyance Examples

Linnean Avenue Gully RSC - After





# Design Approach

## Regenerative Stormwater Conveyance Examples



Linnean Park RSC - Before





# Design Approach

## Regenerative Stormwater Conveyance Examples



Linnean Park  
RSC - After





# Design Approach

## Regenerative Stormwater Conveyance Examples



Milkhouse Ford RSC  
– Before & After





# Design Approach

## Regenerative Stormwater Conveyance Examples



Milkhouse Ford RSC – 4 yrs later





# Design Approach

## Regenerative Stormwater Conveyance Examples



Park Drive RSC - Before





# Design Approach

## Regenerative Stormwater Conveyance Examples

Park Drive RSC  
- After

Series of  
Cascades



# Schedule

Proposed Schedule

Task	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
Notice to Proceed	X																
Kick-off Meeting	X																
Boundary and Topographic Survey																	
H&H Analysis and Concept Plans																	
Residents Meeting			X														
Concept Design Presentation to Township						X											
Consultant Team Response to Comments																	
Public Meeting							X										
PADEP Pre-application Meeting							X										
Final Design/Construction Plans/Permitting																	
Final Analysis																	
Plans, Details, Specifications																	
ROW Map																	
Township Review																	
Easement/ROW Exhibits																	
Permit Document Preparation																	
Submit Permit Documents																	
PADEP Review																	
Permit Comment Response																	
Receive Permit																	X
Plans Display Meeting																	



# Flood History

