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Innovative Solutions, Outstanding Support.

Westmoreland Conservation District
Helping People Use Resources Wisely

Green Infrastructure on Brownfields

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Tysen O. Miller, PE, LEED AP, CPESC

Tysen Miller, PE, LEED AP, CPESC - Tysen Miller, PE is a Registered Professional Engineer in 3 states. He is an engineering professional with over 14 years of experience in civil engineering design and permitting. Mr. Miller specializes in civil engineering for commercial, institutional, and residential site design. Mr. Miller also has a focus in stormwater management design and sustainability, utilizing the latest best management practices (BMPs) and green infrastructure (GI) techniques to achieve water quantity and quality goals. Mr. Miller is a graduate of Drexel University, with a Bachelor's and Master's Degree in Civil Engineering as well as a Master's in Business Administration. Tysen is a member of professional organizations including ESWP, NAIOP, Construction Legislative Council and others.

KU Resources, Inc. was formed in 1997 to provide environmental management consulting services. The business focus of the firm is to bring the knowledge and experience of our Principals and staff to our clients with a significantly reduced overhead structure. Initially, we focused on providing our services to two core markets: brownfield redevelopment and wood preserving. We located our headquarters at a former steel manufacturing facility and brownfield redevelopment in Duquesne, Pennsylvania. This location has allowed us to participate in significant Monongahela River Valley brownfield initiatives and then utilize those experiences to serve an expanded geographic area.

James W. Pillsbury PE MS

Jim Pillsbury PE MS, has been the Hydraulic Engineer at the Westmoreland Conservation District for 30 years. An engineering graduate from Penn State in 1988, he received an MSCE from Villanova University in 2009 and has been a registered Professional Engineer in the state of Pennsylvania since 1997.

His work at the District includes Plan review for land development to verify compliance with PA DEP's Chapter 102 erosion and sediment control, Chapter 105 dam safety and waterway management, and NPDES Post Construction Stormwater Management for all of Westmoreland County. Jim also provides technical assistance in the field, and performs design work for various stormwater management retrofit and demonstration projects to address recurring stormwater issues. He participated in the statewide stormwater committee that developed the PA SW BMP Manual published in 2006, and more recently led the team that produced the Westmoreland County Integrated Water Resources Plan to meet the Commonwealth's Act 167 requirements. He is a member of the Villanova Urban Stormwater Partnership, a member of Pennsylvania's Statewide Stormwater Management Committee and a board member of the Sewickley Creek Watershed Association.

Permit Requirements

- Since at least 2012, Brownfield sites have still had to comply with Water Quality, Rate and Volume requirements
- Prior to 2012, many brownfield sites conveyed stormwater only. Some sites also had to monitor and treat discharges.
- Individual NPDES permit requirements vary by site, and may still require effluent testing

Challenges

- Concern on how to manage stormwater without causing additional damage via infiltration
- Disposal of additional contaminated material
- Sacrifice of valuable real estate
- Changing property owner and manager maintenance habits and expectactions

Opportunities

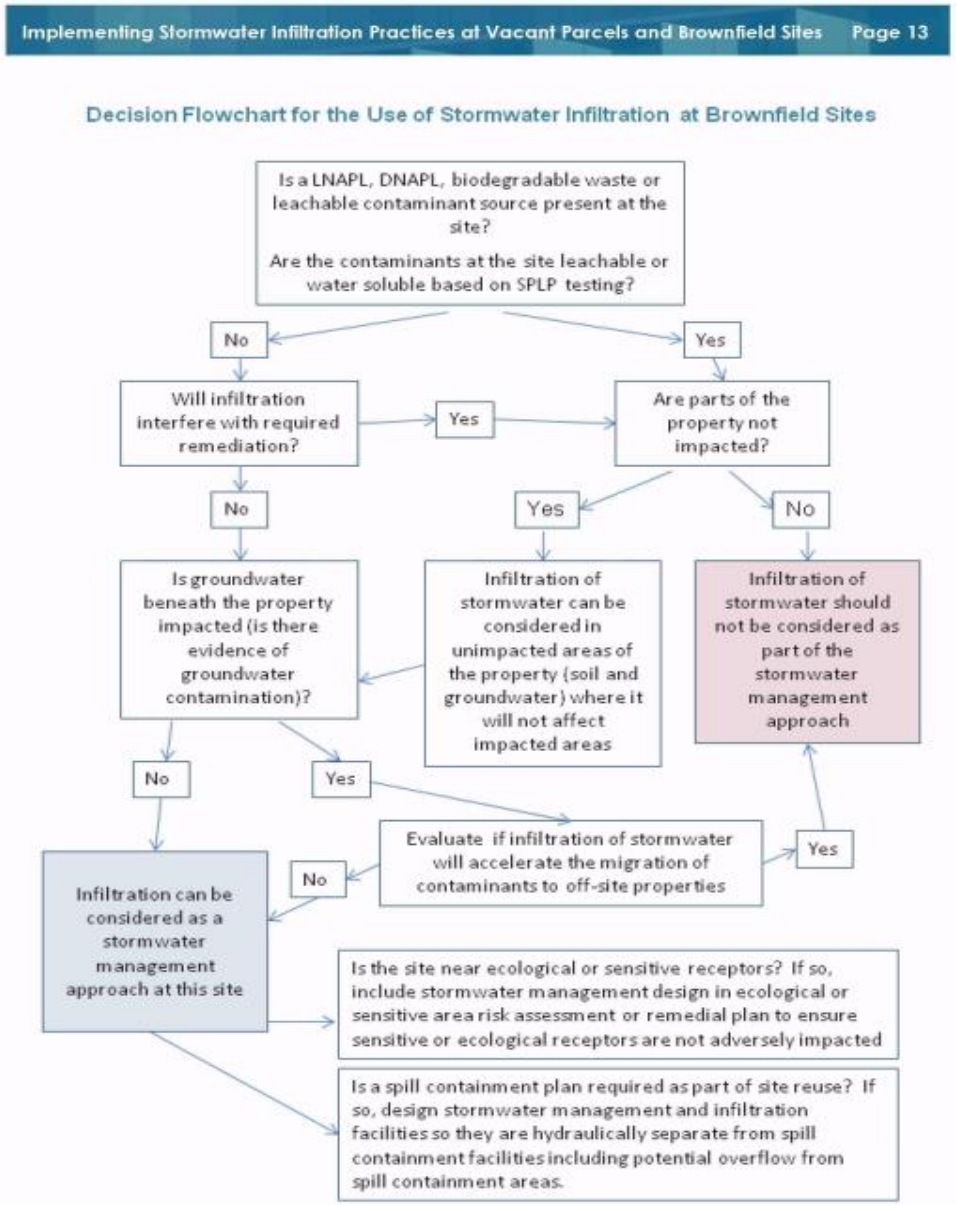
- Techniques to manage stormwater in a variety of manners, to avoid particular contaminants and promote the highest and best use for a property.
- Isolate contaminated soils, surface runoff, and groundwater from un-contaminated areas
- Provide dual-purpose or highly functioning stormwater management areas
- Expansion/ reconstruction of natural habitat
- Potential CSO pollutant and volume reduction

Land Recycling Coordination

- As part of Individual NPDES permit review, the Bureau of Waterways and Wetlands will confer with their peers in the Bureau of Environmental Cleanup and Brownfields Development.
- These two groups will review pertinent data, or request additional data, against the proposed stormwater management solution.

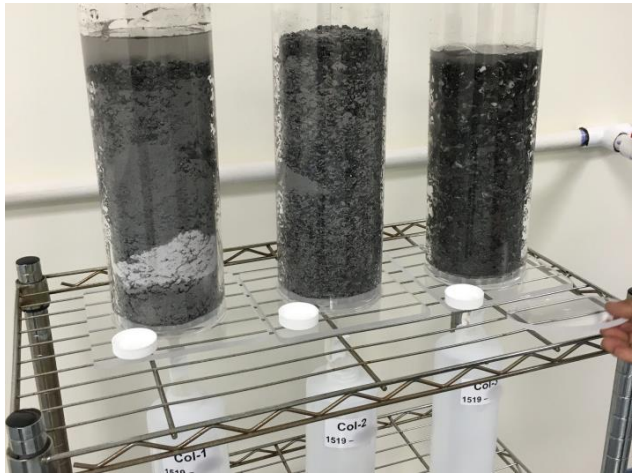
EPA Guidance

- Publication No. 905F13001



Background Research and Data

- Phase 1/ Phase 2
- Hotspot identification
  - Are there un-impacted locations on-site
  - Are there distinctions between site “Areas”
- Additional testing
  - SPLP (Synthetic Precipitation Leaching Procedure)



Green Stormwater Infrastructure (GSI)

- Bioretention
- Bioswales
- Curb extensions/ bumpouts and planters
- Tree Pits
- Daylighting
- Vegetated or Riparian Buffer
- Cisterns
- Green Roof
- Permeable Pavement

Bioretention

- Aesthetically pleasing
- Offer passive use possibilities

Bioretention

- May require HDPE or Geosynthetic Clay Liner

Bioswales

- Integrate with trails or parking areas
- Can be stepped to reflect elevation changes
- May be able to eliminate gray stormwater conveyances

Infiltration islands and bioswale reduce urban runoff to a combined sewer

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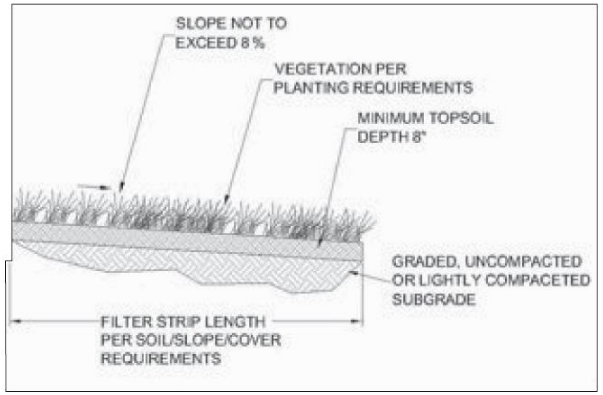
Bumpouts and Planters

Tree Pits

Vegetated and Riparian Buffer

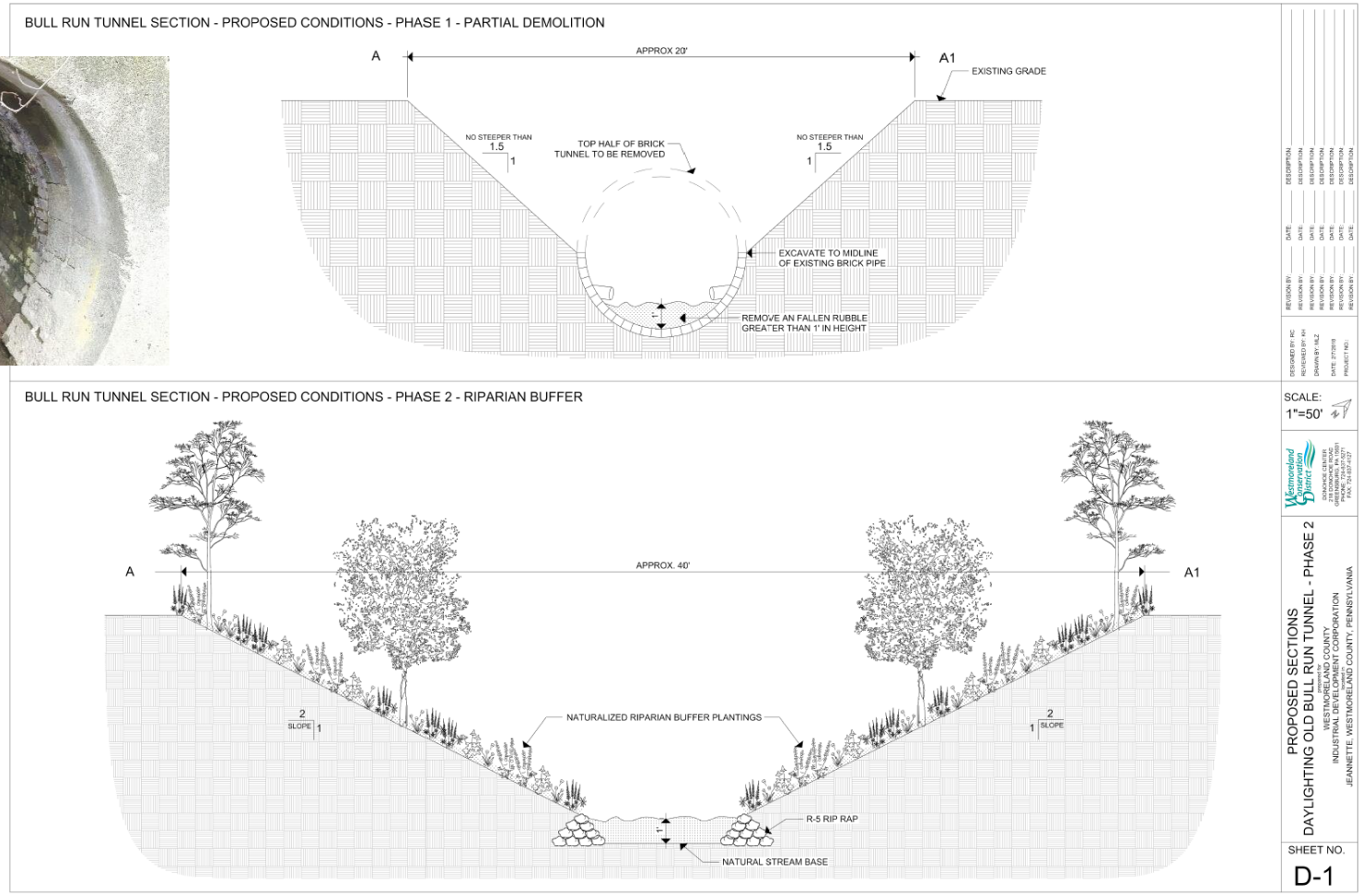
- Native plant growth directly adjacent to receiving watercourse
- Limited maintenance – by design



VEGETATIVE FILTER STRIP TO BE SEEDED WITH ERNST SEED MIX 149 OR EQUAL.

VEGETATED BUFFER DETAIL
N.T.S.

Daylighting Opportunities

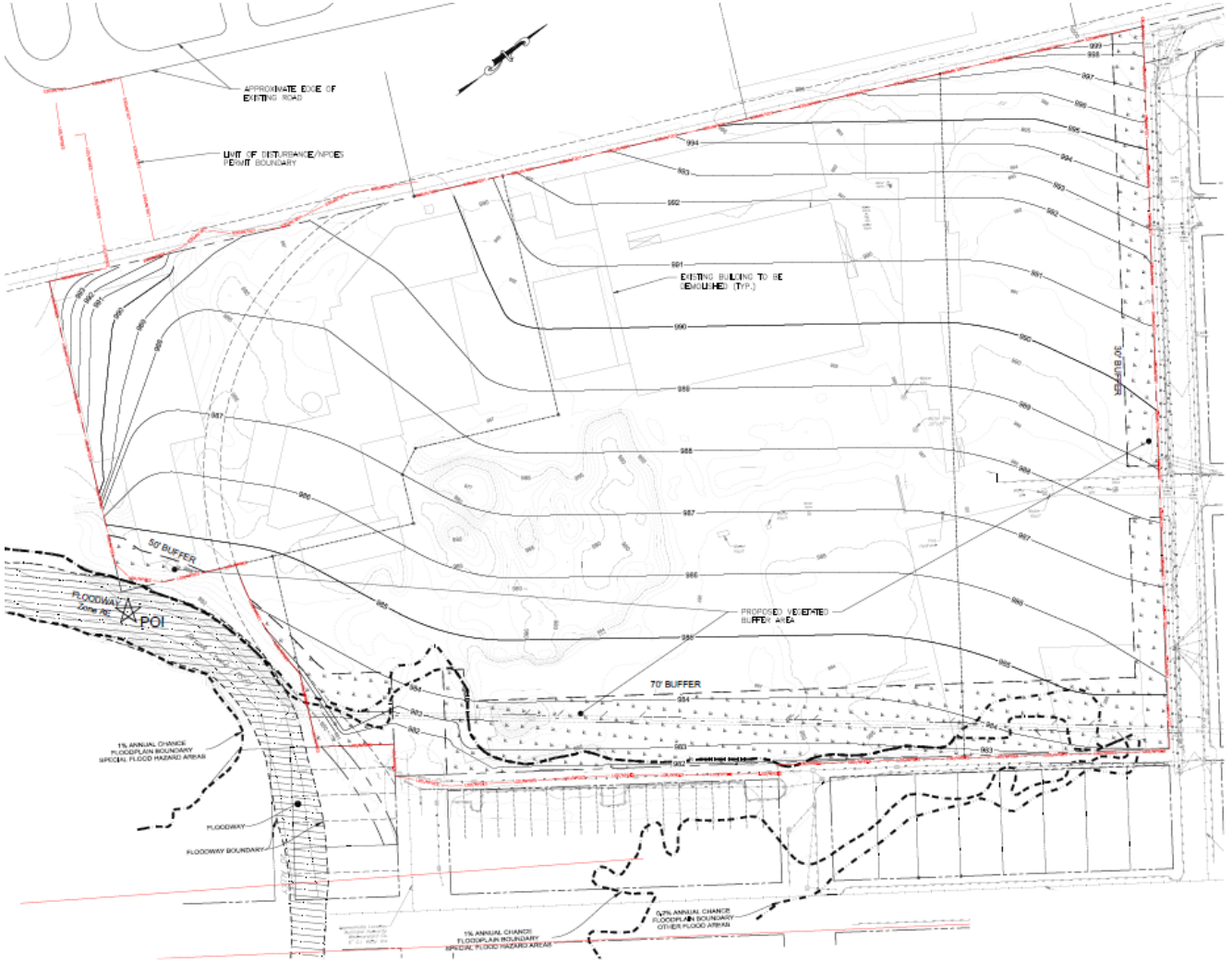


Case Study Discussion – Jeannette Glass Site

- Former glass making facility constructed circa 1888, idled the last 20 years
- Enclosed an existing stream, Bull Run
- 13 Acre Site. Entered into Act 2 via NIR in May, 2017
- Site demolition and preparation phases in April 2017 and October 2017, respectively

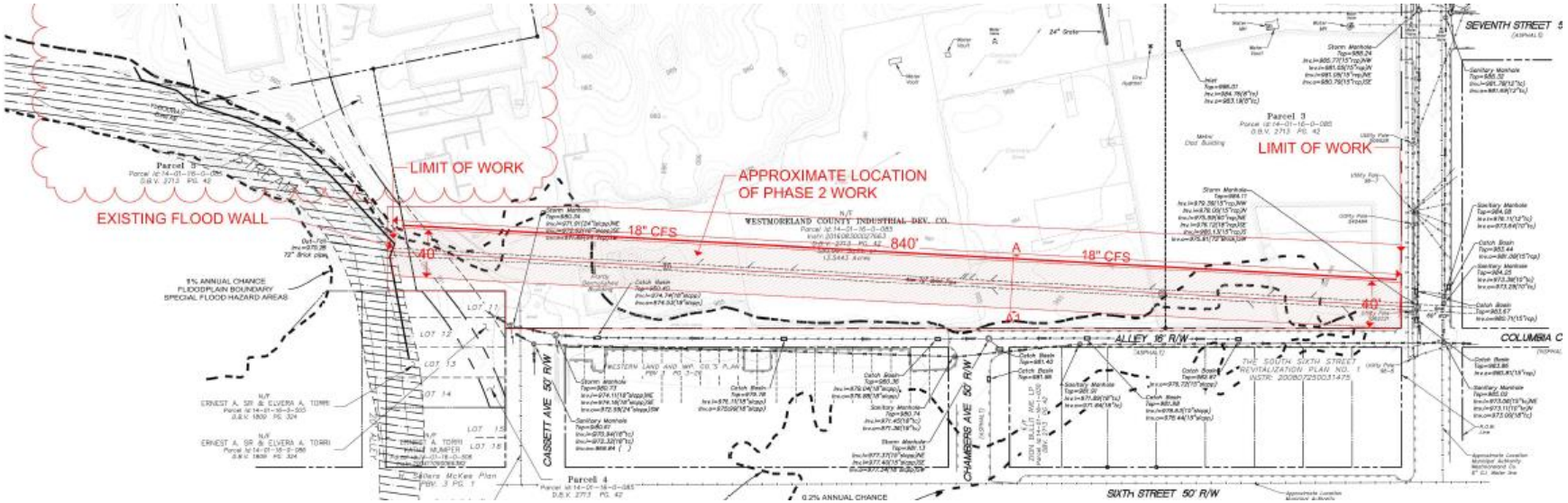
Case Study Discussion – Jeannette Glass Site

- Perimeter vegetate buffer for stormwater management and neighborhood transition



Case Study Discussion – Jeannette Glass Site

- Phase 2 Daylighting Bull Run



Case Study Discussion – Westmoreland County Community College

- Former Westinghouse Facility
- Objectives
  - Alleviate runoff from 4 AC parking
  - Promote infiltration
  - Improve the water quality of runoff
  - Provide a riparian buffer
  - Encourage native plant use
- Treatments
  - Pavement removal
  - Bio-infiltration swales
  - Rain garden
  - Porous paving
  - Landscaping

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Air Conditioned


TB145


SILVIS

Before

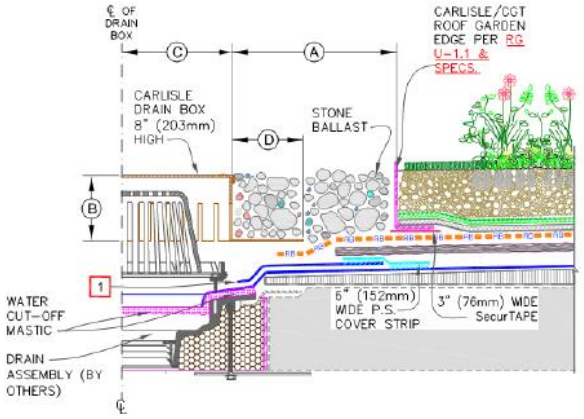
Before

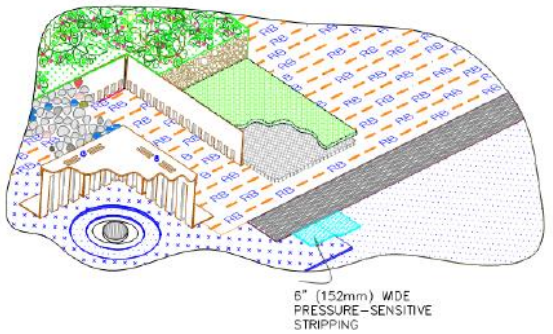
Phase 1

Phase 2

Cisterns

Green Roof





Permeable Pavement

- Many varieties available
- Some have maintenances concerns
- ADA accessibility varies

Permeable paving demonstration showing varied porosity

Rain disappears through gaps and pores

PERMEABLE PAVING SHOULD BE PLOWED

Snow melts off quickly, disappearing through the paving

SALT is a wasted effort on permeable paving, and may even harm certain types

Case Study: Scottdale Library

- Permeable Pavement and dual use bioretention area

Abandoned street

Demolition layers: 3” asphalt, 3” brick, 4” fly ash, 8” concrete

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Permeable paving

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Seat high wall landscape planter

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Rain disappears through pores in paving

Integrated dual purpose area

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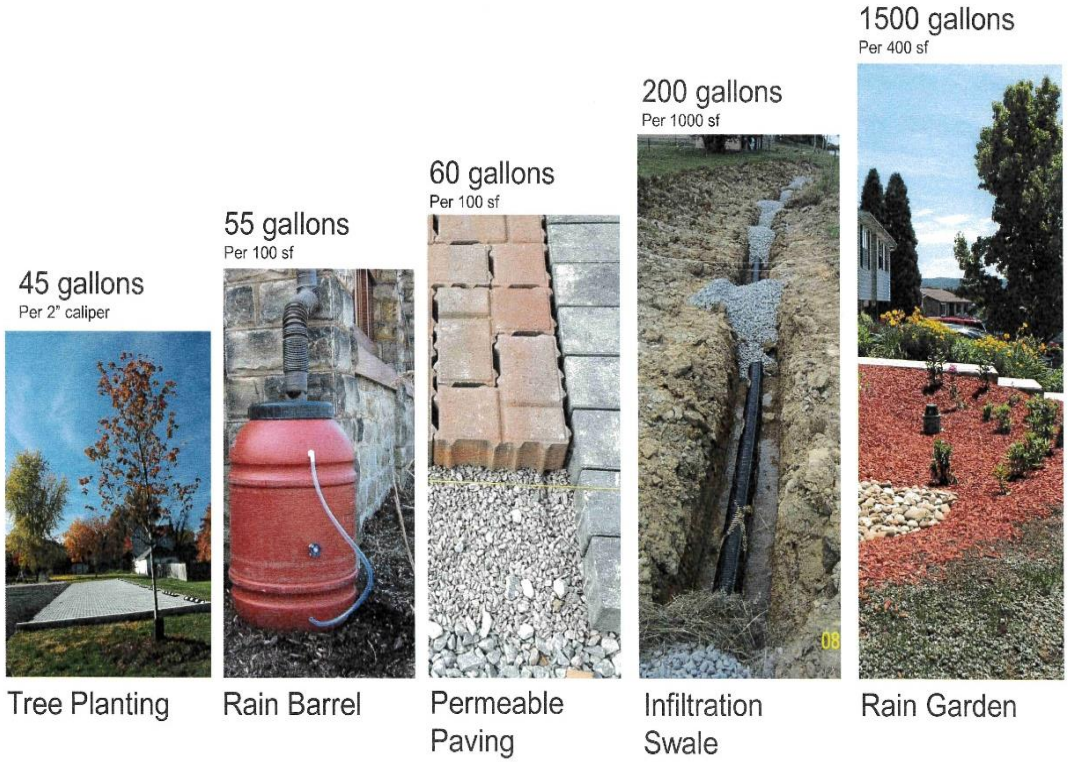
Reading Garden that manages stormwater!

POINTS TO REMEMBER:

- Sustainable stormwater facilities use layers to infiltrate rain runoff
- Separation geomembranes could be costly
- Underdrains help drain a system if it is overloaded in heavy rains
- Salt should not be used on permeable paving
- Permeable paving should be cleaned 1 or 2X per year
- Rain Gardens should be protected from sediment, cleaned of detritus, replanted as needed
- Manholes, Inlets, Cleanouts provide inspection ports to underground systems, and should be cleaned periodically

Green Infrastructure Volume Control

for a 1 inch storm



Green Infrastructure Costs

Thank You!

Any Questions?

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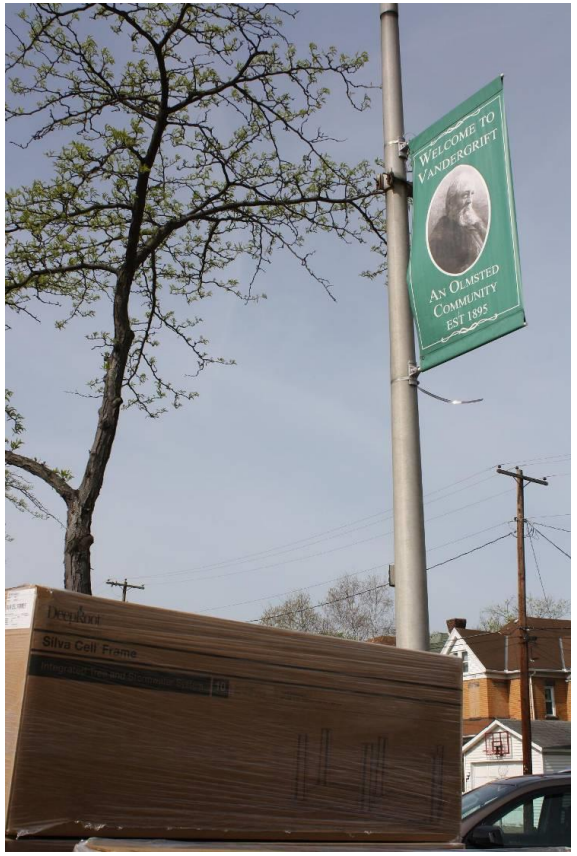
Case Study Discussion – Vandergrift Columbia Avenue Street Enhancement

- Historic Main Street 100+ years old
- Objectives
  - Enhance underutilized space
  - Provide stormwater management and limited conveyance
- Treatments
  - Permeable paving
  - Tree wells/ linear trench



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2012

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