HRGreen

100+

Est. 1913

Neighborhood Drainage Infrastructure Improvements Using Green Initiatives

Village of Hinsdale, IL

Presentation Agenda

- Project Overview
- Goals and Objectives
- Design Approach
- Public Coordination
- Recap
- Questions

Project Location

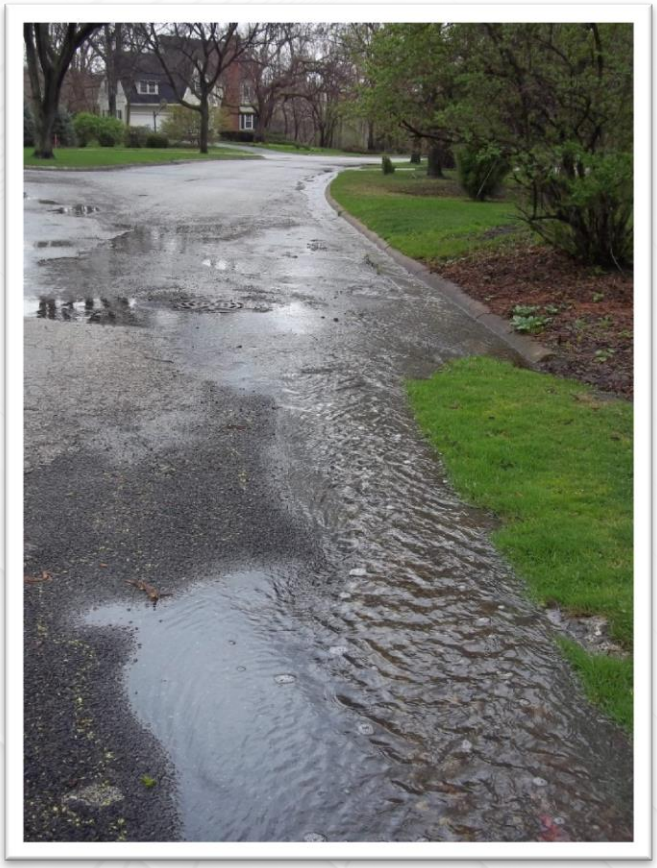
Project Location

Previous Studies

- September 2008 Drainage Study
  - Reconstruct roadways with curb and gutter
  - Traditional storm sewer conveyance
  - Large storm sewers with underground detention were required
  - Design provided collection and conveyance of 100-year, 24-hour duration storm
  - 2008 Cost estimate for drainage improvements - $24.4 Million
- December 2009 Feasibility Study
  - Focused on “green initiatives”
  - Combination of rain gardens, permeable pavers, and underground storage was utilized to model 100-year, 24-hour duration storm
  - Projected costs for drainage improvements - $15.0 Million

Existing Conditions

Existing Conditions



Existing Conditions

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Existing Conditions

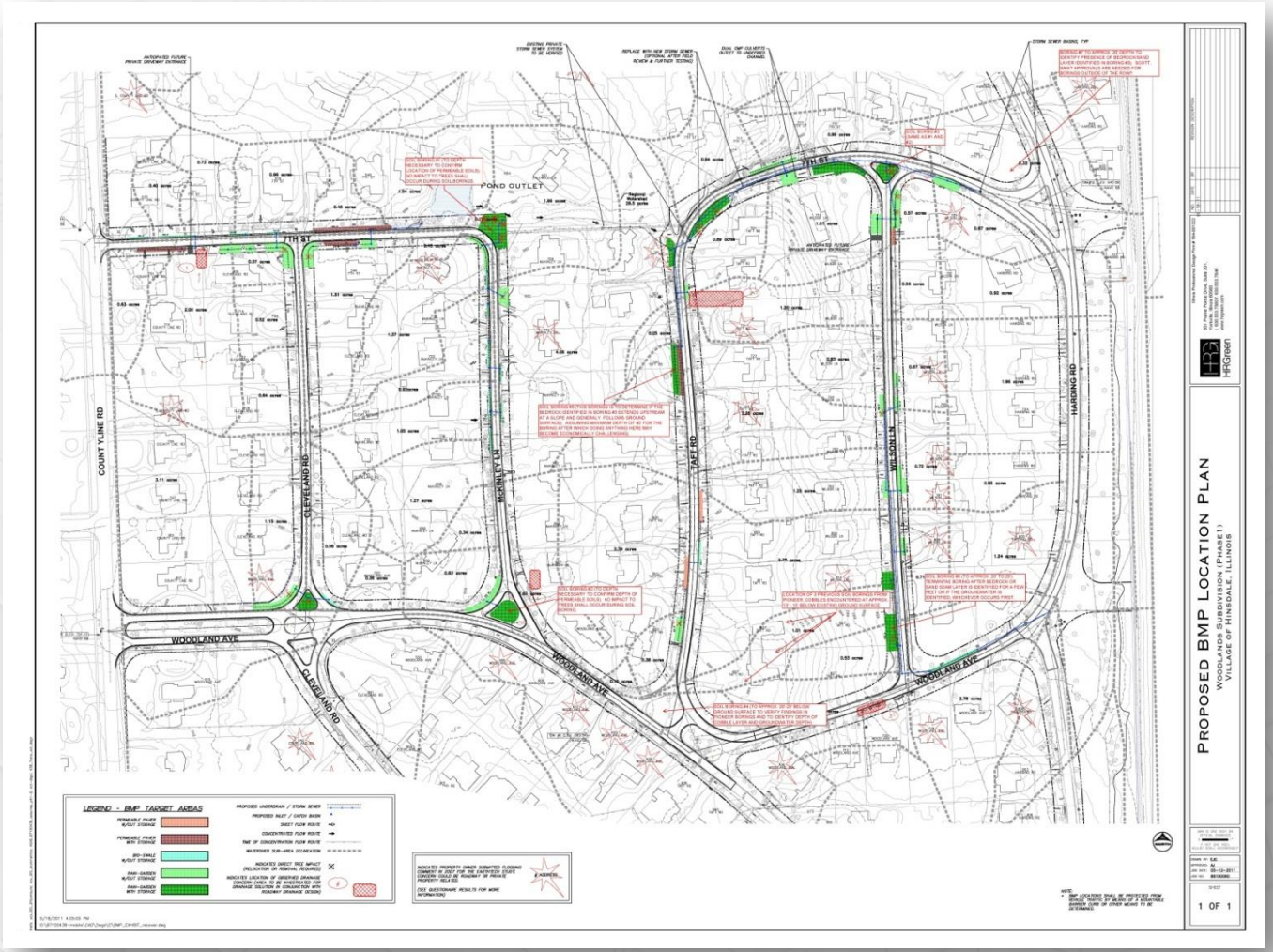
Goals and Objectives

- Maintain Subdivision Characteristics
- Minimize increase in impervious area
- Stay within ROW
- Minimize Storm Sewers
- Maximize BMP’s for infiltration and storage
- Minimize Tree impacts
- Minimum 10-year storm with no surcharge

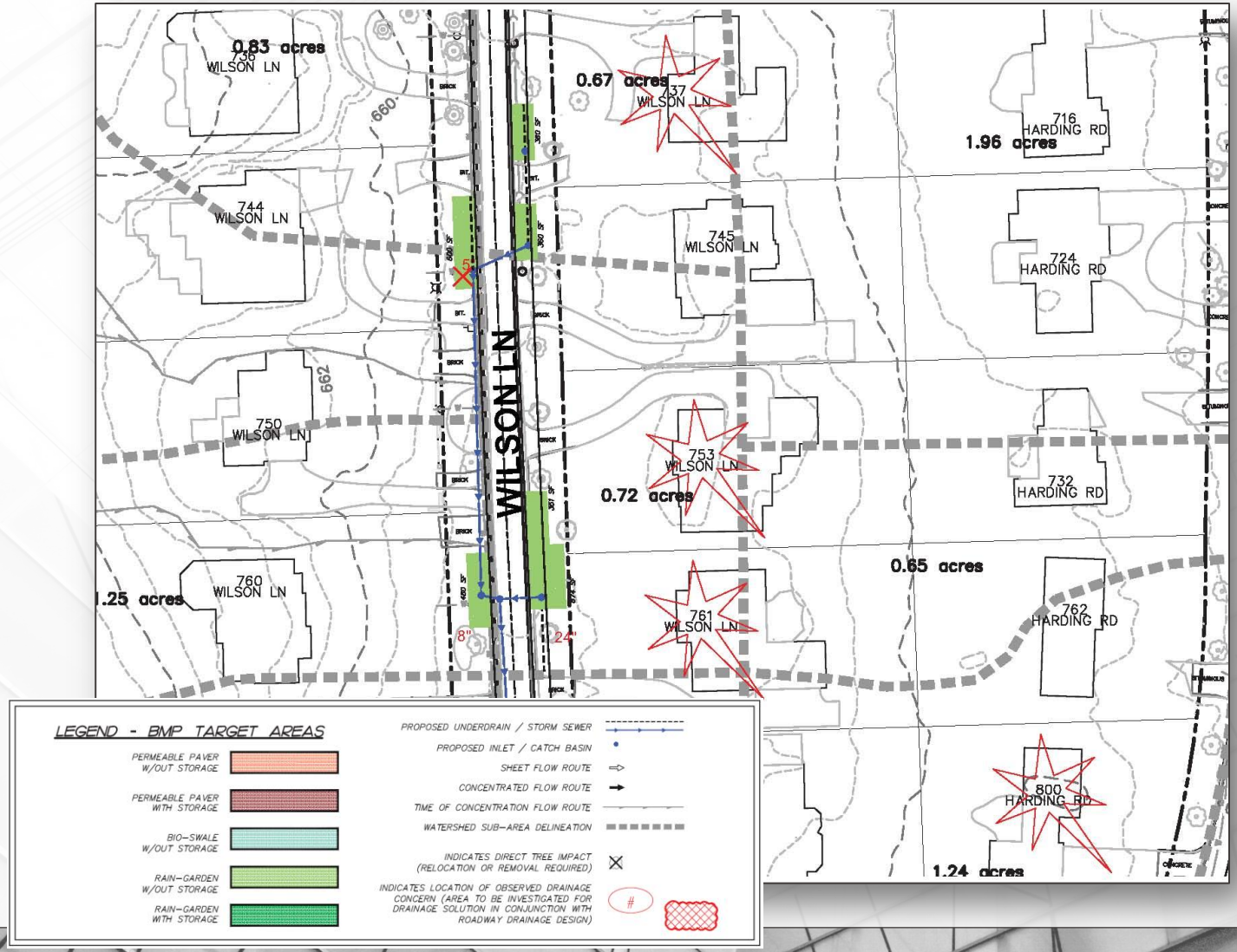
Design Approach

- Identify flooding locations
- Delineate sub-watershed areas (approx. 1 – 2 acres max.)
- Develop flow path and correlate to flooding locations
- Develop concept BMP's (type and location)
- Verify suitability for infiltration using soil borings
- Review conveyance path
- Series of staff meetings and public meetings
- Finalize concept BMP's
- Develop a XP-SWMM model
- Finalize stormwater management plan and design

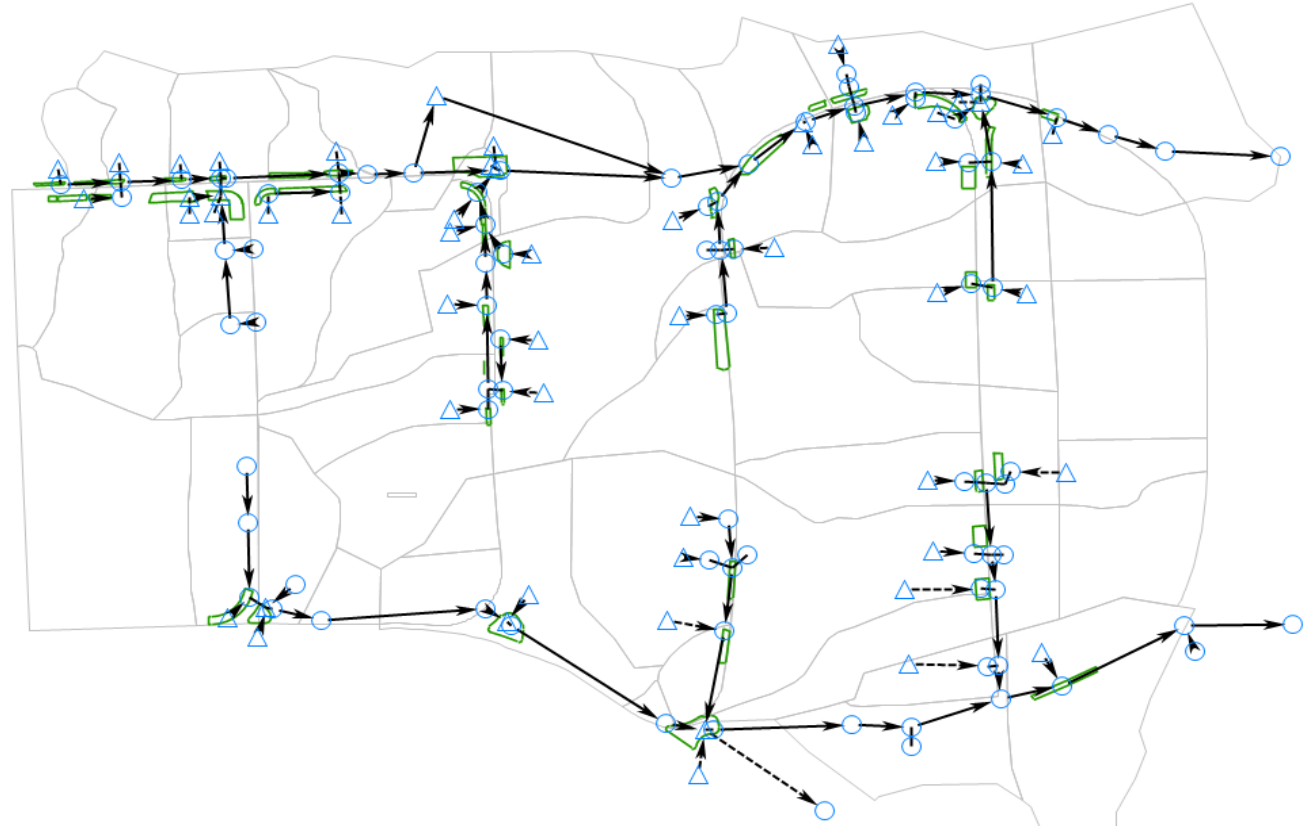
Concept Exhibit



Concept Exhibit

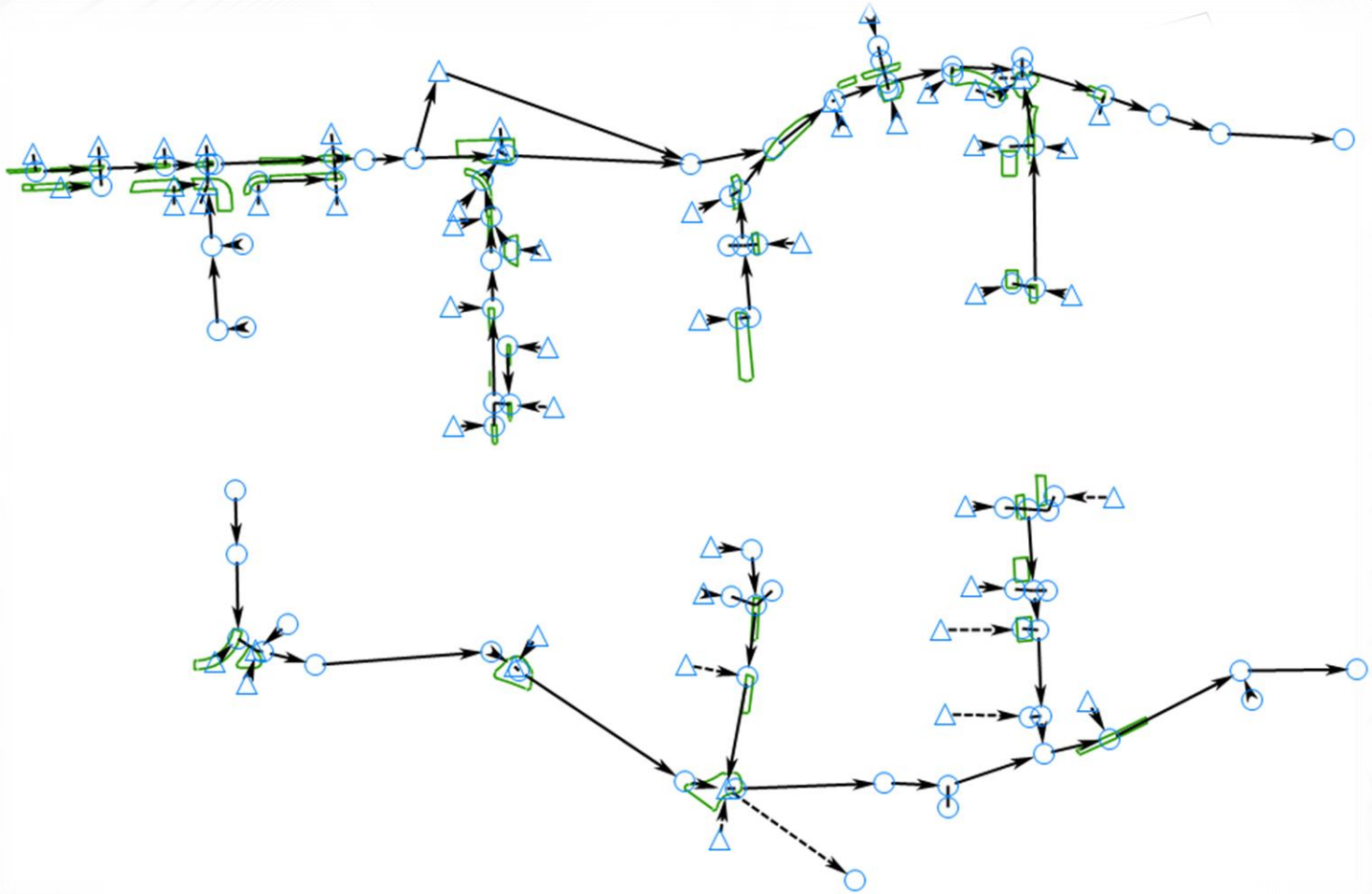


Model Set-up

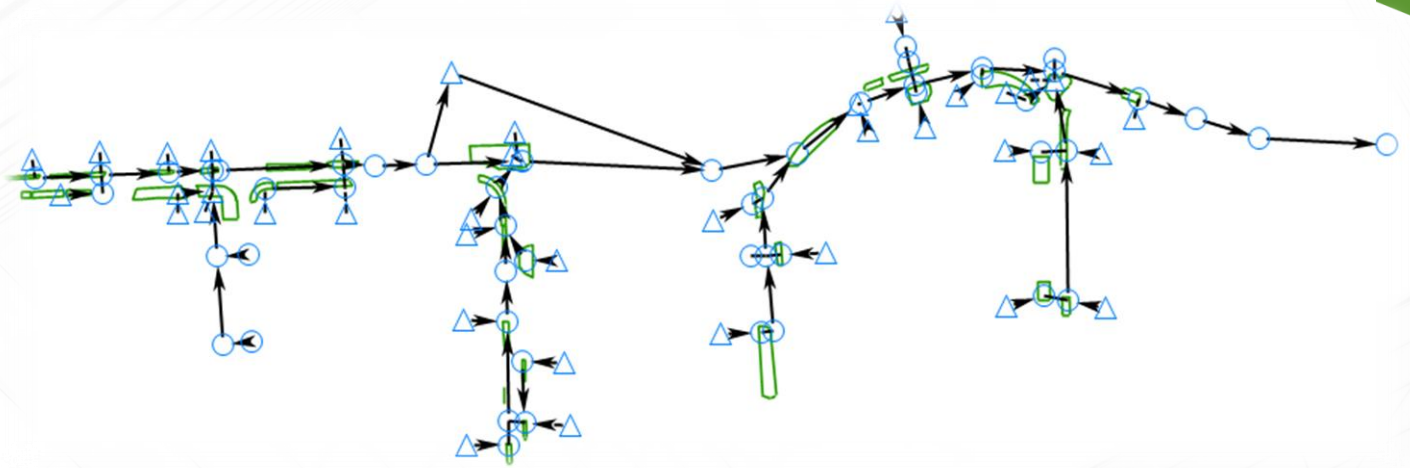


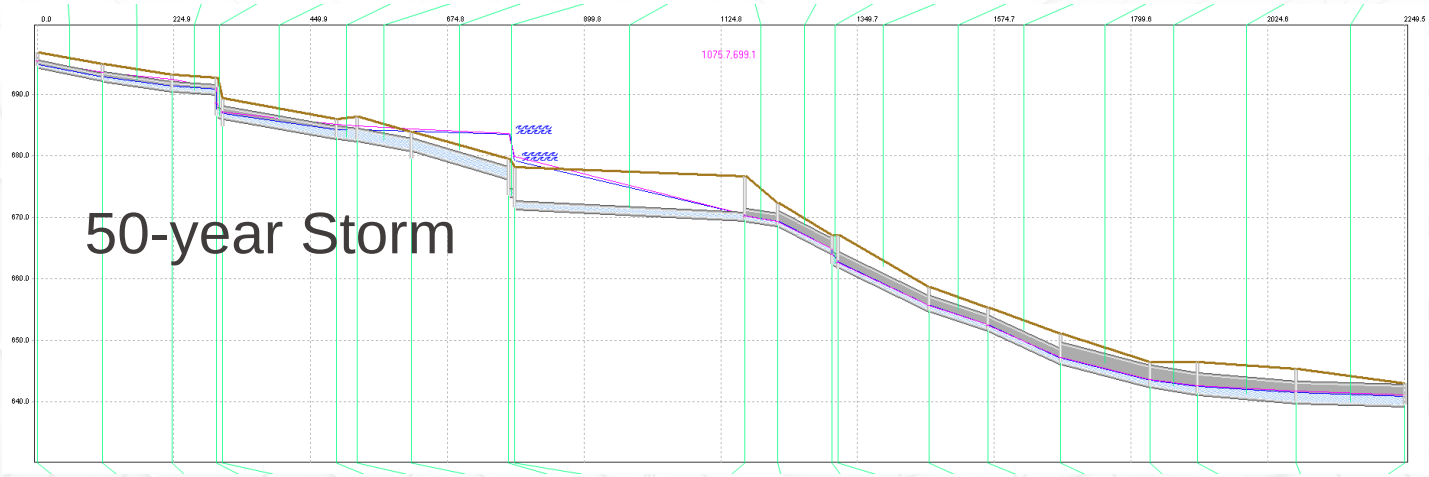
Build the Model

XP SWMM model of Phase 1



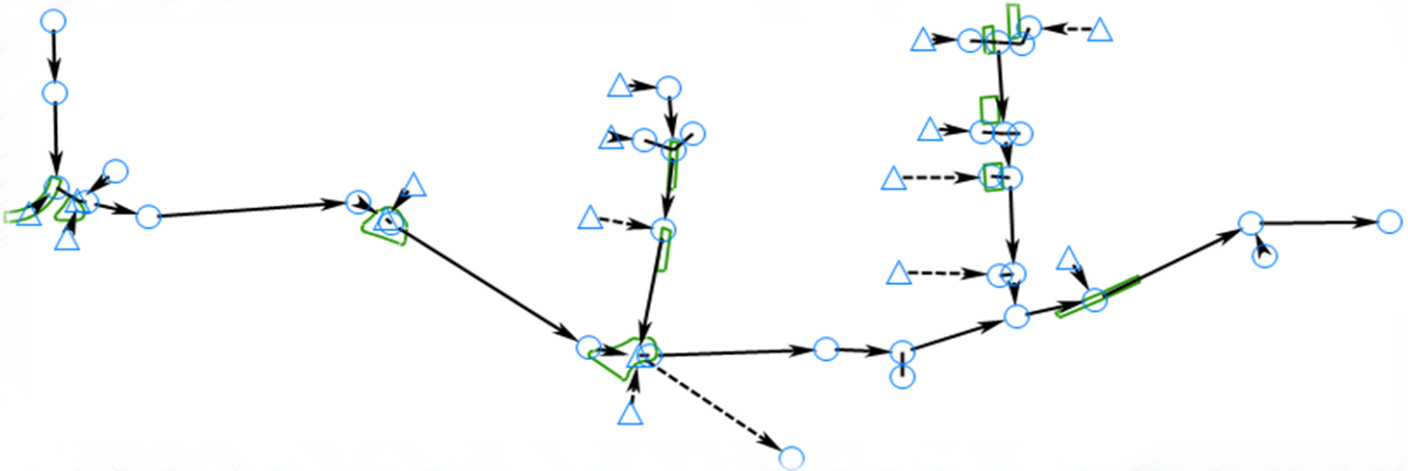
North System





50-year Storm

South System



50-year Storm

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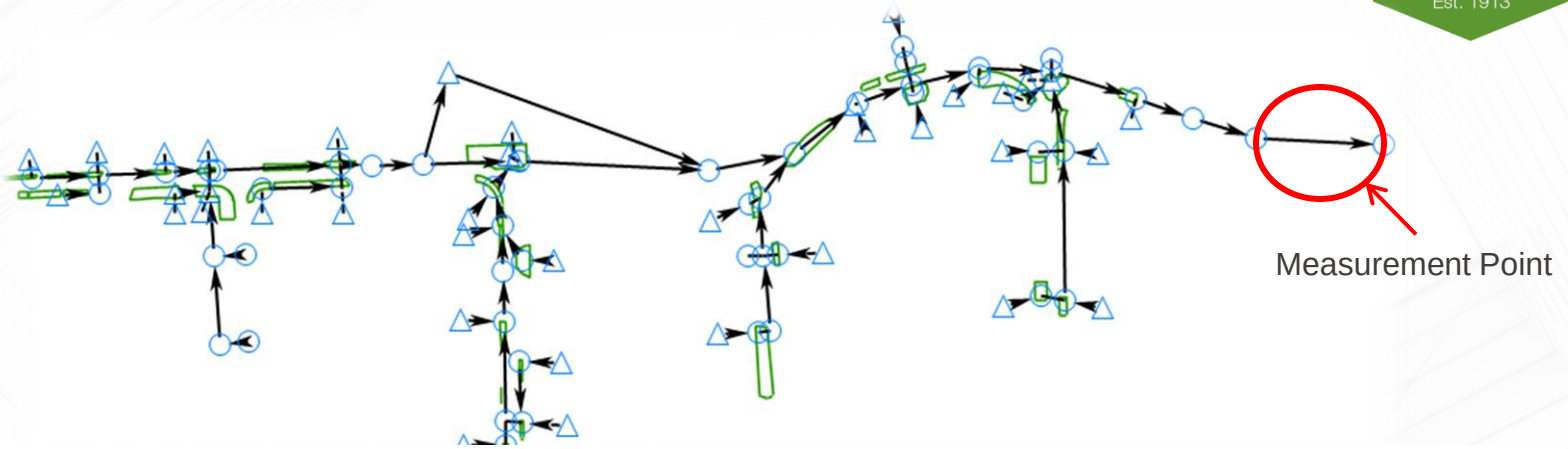
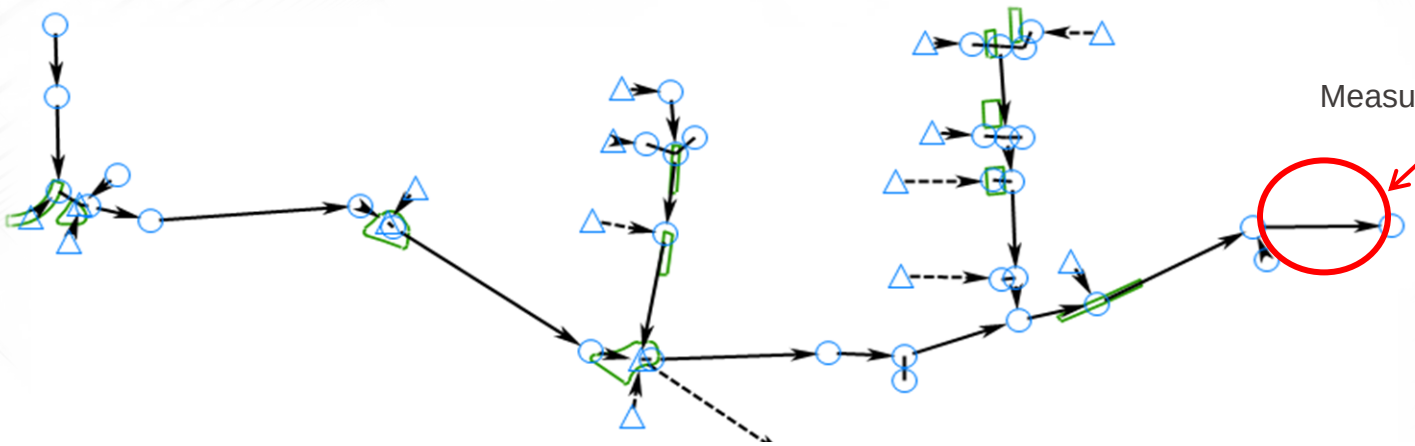


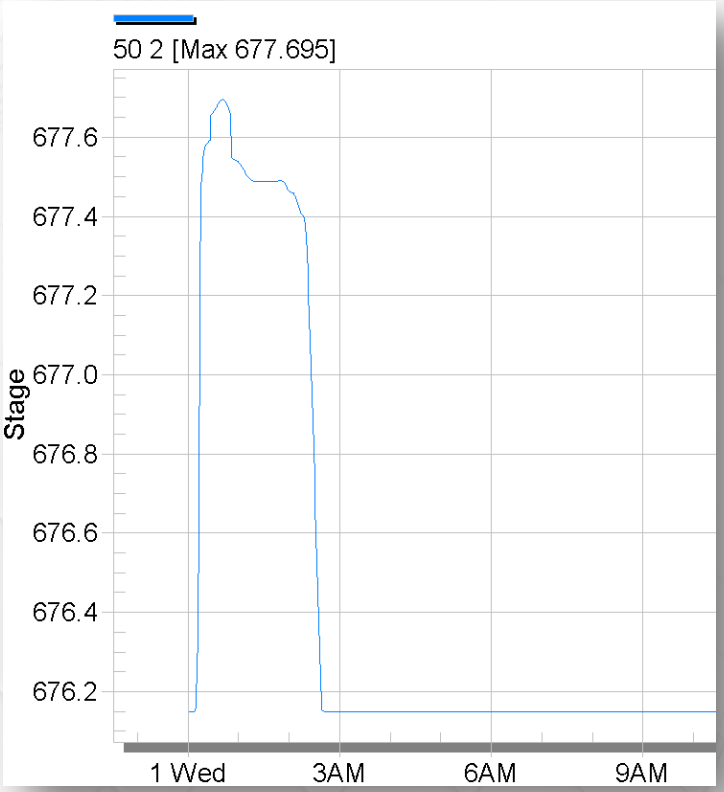
Event	Peak Flow Without BMPs	Peak Flow With BMPs	% Reduction
50-year 2-hour	69.85 cfs	23.45 cfs	66%
10-year 2-hour	35.25 cfs	15.87 cfs	55%

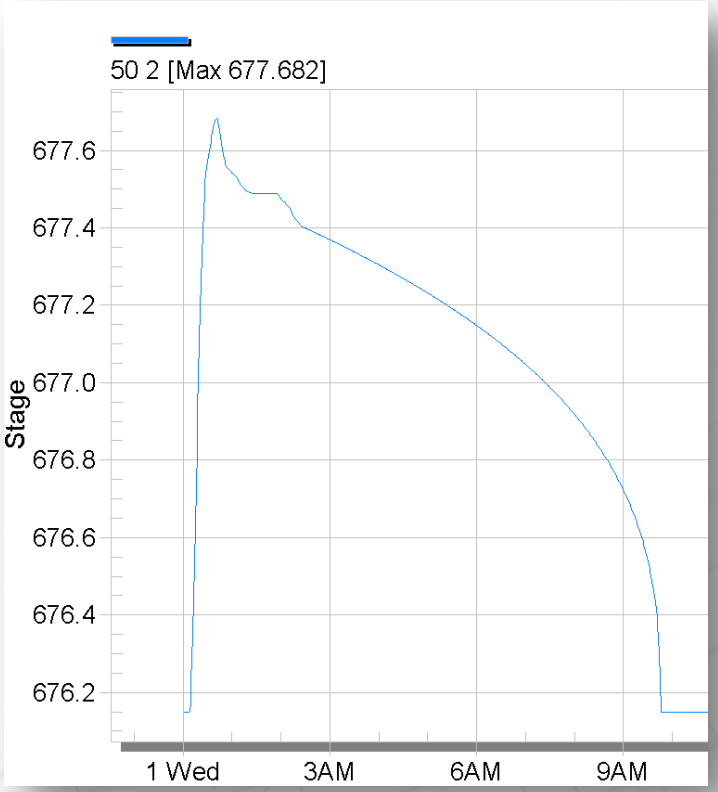
South System



Event	Peak Flow Without BMPs	Peak Flow With BMPs	% Reduction
50-year 2-hour	44.04 cfs	15.67 cfs	65%
10-year 2-hour	22.98 cfs	9.47 cfs	58%

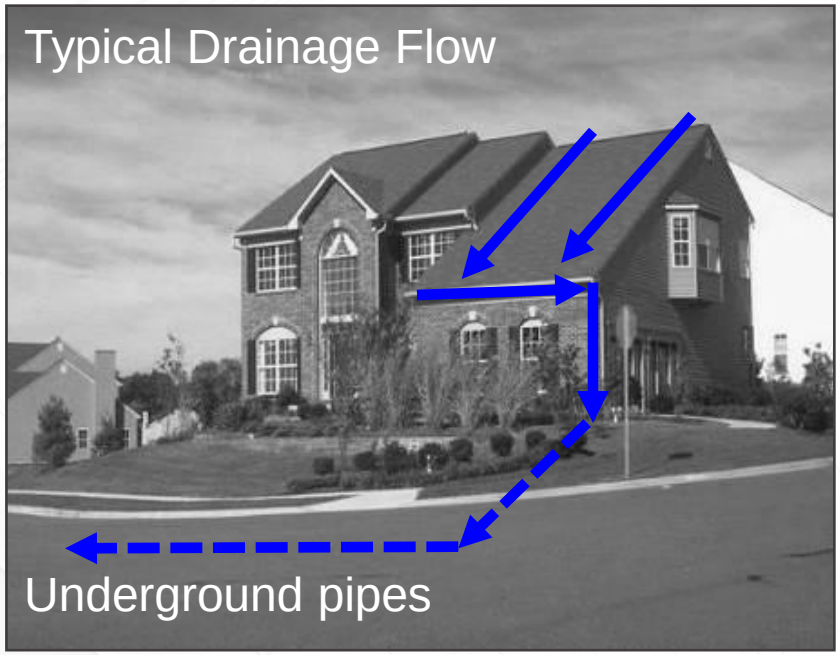
Hydrographs

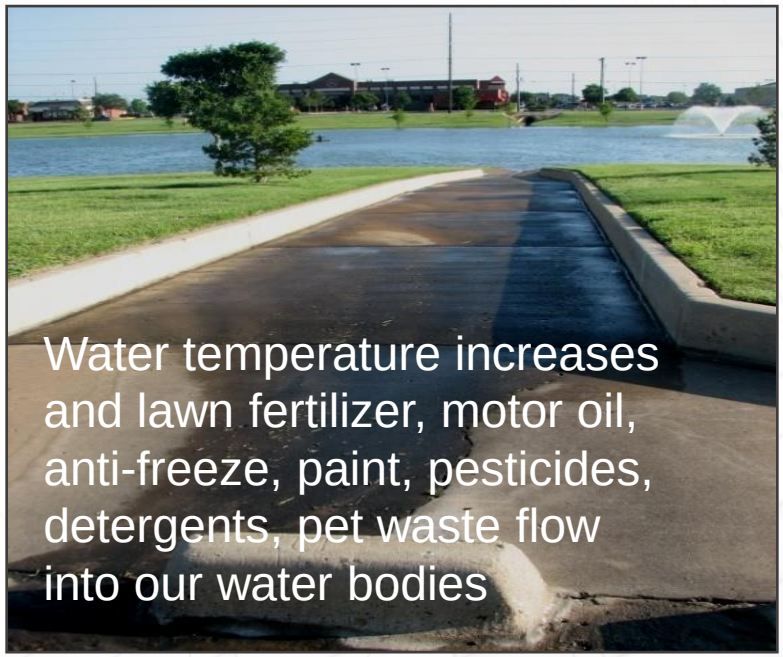




Landscape Approach and Concept

Conventional methods - Collect, concentrate and convey polluted runoff directly to our lakes, streams and groundwater.





NEW WAY – Rain gardens and bio-swales

- filter the pollutants
- cool the water down
- infiltrate into the sub-surface

Native landscape plants are often used in these stormwater features.

Landscape Approach and Concept

Mix of Non-Native Plants….

…and Illinois Native Plants

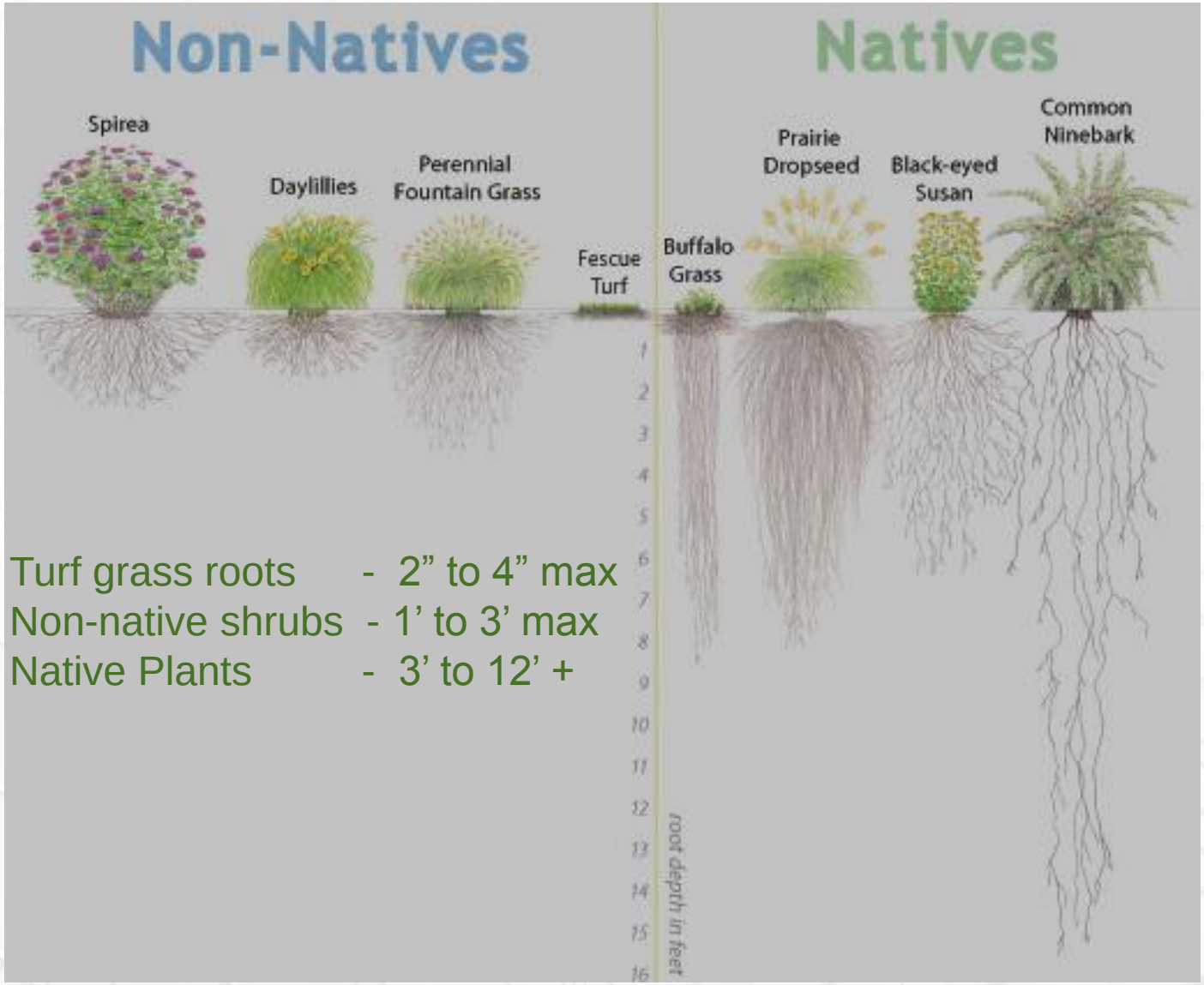
Landscape Approach and Concept

The landscape palette needed to blend in with this manicured neighborhood…

Landscape Approach and Concept

BE CAREFUL WITH THE LANDSCAPE!
Native landscape plants look like weeds to most people…

Landscape Approach and Concept



Turf grass roots - 2” to 4” max
Non-native shrubs - 1’ to 3’ max
Native Plants - 3’ to 12’ +

Landscape Approach and Concept

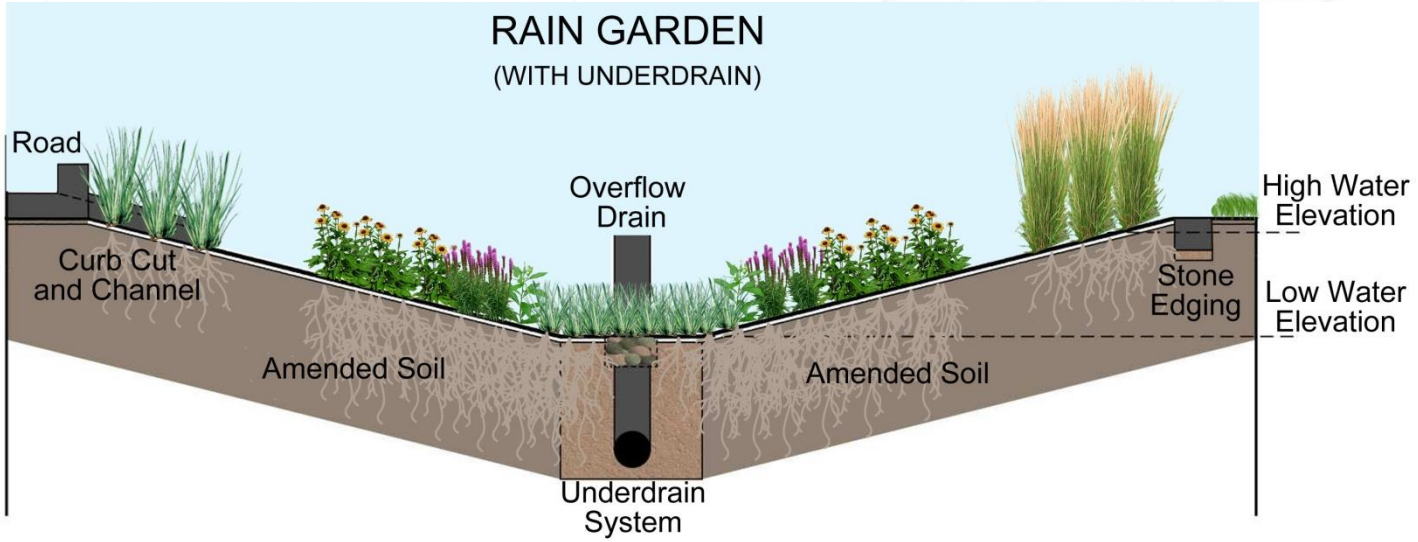
KEY ELEMENTS OF THE RAIN GARDENS AND BIO-SWALES

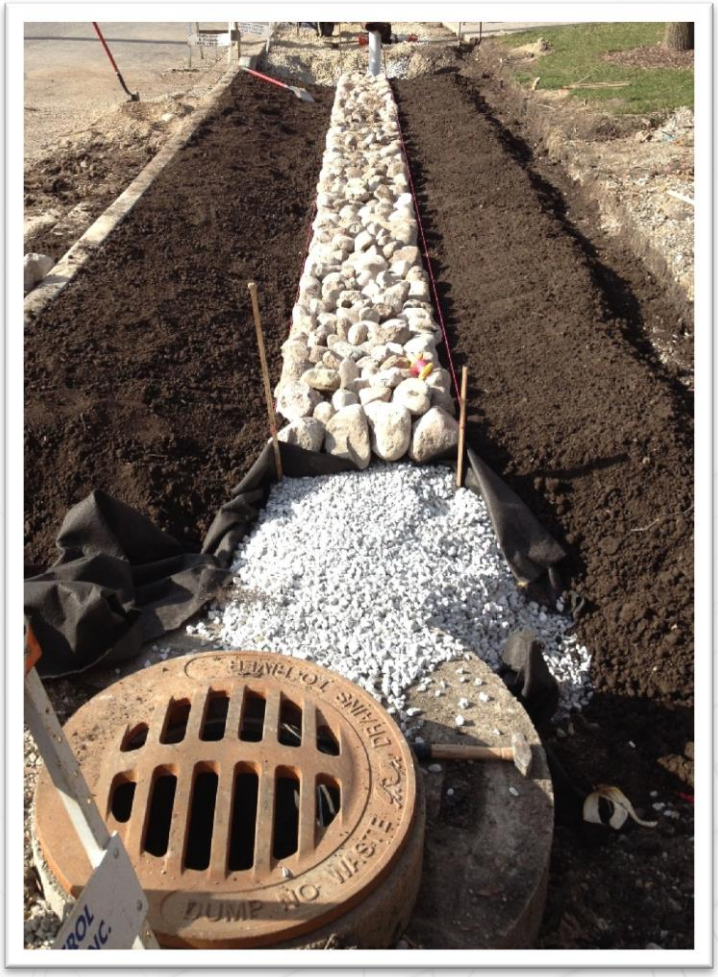
SOIL MIXTURE

30% sand, 30% compost and 40% topsoil

NATIVE PLANT MIX (low areas only)

COMMON NAME	BOTANICAL	PERCENTAGE
Nodding Wild Onion	(Allium cernum)	25%
Blue Flag Iris	(Iris virginica)	25%
Common Fox Sedge	(Carex stipata)	25%
Foxglove Beardtongue	(Penstemon digitalis)	25%



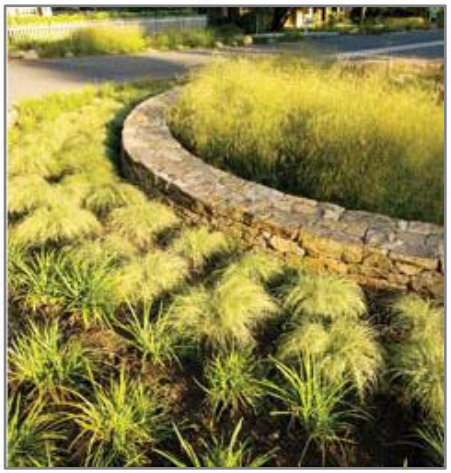


During construction – under drains are critical with poor sub-surface soils (i.e. clay).

Landscape plant palette was modified above large underground storage units.

Under construction.

Landscape Approach and Concept



-The goal was to have a more “clean look” than all native plants that may appear “weedy” in a more urban environment.
-Maintenance is key for long term success.

Public Coordination

- 2005 – Drainage and Woodlands Improvement Task Force (DWIT)
- 2007 –Woodlands-Highlands Drainage Study (Traditional Study)
  - Questionnaires – 217 residences (82 responses)
- 2009 – Woodlands Green Initiatives for Stormwater Management Study
  - Neighborhood Meeting (s) – support for Green Initiative

Public Coordination

- 2011 - The Woodlands Phase 1 Design -
  - May 2011 - Concept Plan Review w/ Arborist, Village Engineer, Village Manager, Public Works Director
  - June 2011 – Neighborhood Meeting
    - Improvements Concept Plan
    - Roadway Typical Section
    - Rain Garden/Bio-swale Details
    - Planting Species & Details
    - Special Service Area

Public Coordination

- Summer 2011 – Neighborhood Survey
  - Proposed Concept Improvements
  - Special Service Area (SSA)
- Winter 2011 - Project Concept/SSA Concurrence
- Feb. 2012 – Neighborhood Meeting
  - 60% Plans & Specifications
  - Planting Plans & Details
- Summer 2012 – Phase 1 Construction
  - Field Stake Rain Gardens/Bio-swales
  - Field Meetings - Individual Residences
  - Field Adjustment of Design Elements

Recap

- Green Initiatives, a viable cost effective tool for stormwater management
- Potential 20% to 40% cost savings over traditional stormwater management
- Start public coordination early and make it an ongoing process during the design and implementation of your project
- Make your BMP details and specifications as clear as possible including effective erosion control management during construction

QUESTIONS?