

Rain Garden

HISTORY

Rain gardens, also called bioretention basins, are shallow depressions that catch and hold stormwater runoff to promote water infiltration into the ground and evaporation to the atmosphere. They mimic and restore natural drainage patterns and are classified as a Low Impact Development or “green infrastructure” strategy. They were first developed in the 1990’s in milder climates, and research at ESF has shown they can handle winter snow and road salt.

FUNCTION

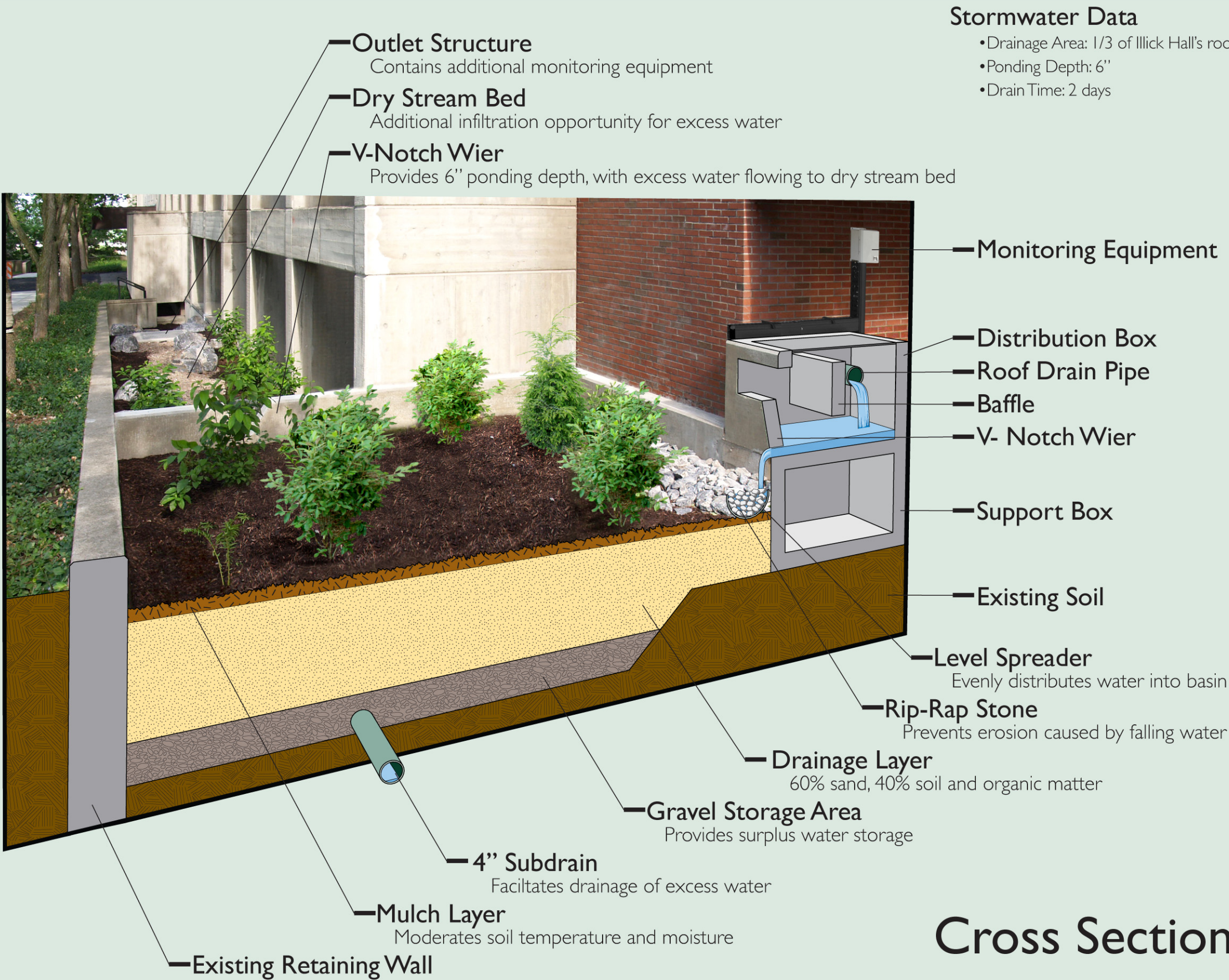
In many urban areas, “grey infrastructure,” comprised of inlets and pipes, was originally built to move rainfall as quickly as possible to a local receiving body, which for us is Onondaga Lake. Due to increasing development, this practice typically results in flooding and pollution, including raw sewage from combined sewer overflows dumping into water bodies. This practice also lowers the watertable, which during dry weather causes rivers to run dry or too low and are too hot for fish.

Rain gardens provide urban areas with stormwater protection while improving ecological functions by restoring the natural water cycle and improving water quality to meet the Clean Water Act goals of fishable and swimmable waters. Most of the water falling on rain gardens moves, or infiltrates, into the soil. This sustains plants, providing aesthetic benefits, wildlife habitat, shading to cool buildings and sidewalks, and improves air quality. A portion of the water percolates further into the soil, recharging groundwater which keeps streams healthy. Infiltration also removes common urban pollutants from water, improving water quality.

This rain garden provides important teaching and research functions at ESF. Students monitor flow rates using the V-notch weirs and level sensors, while soil temperature and moisture probes combined with climate data provide feedback to researchers and designers seeking to optimize the performance of these systems.

FUTURE

Rain gardens are an important part of green infrastructure, and are recommended by New York and federal stormwater guidelines. They are highly adaptable, with a variety of landscaping options, are easy to establish, and work equally well for residential homes, industrial parking lots, or commercial shopping districts. They are a critical part of improving the local environment while reducing costly and long-term problems at the downstream portions of the urban watershed.



Rain Garden Plantings

Plants used in rain gardens must be able to live in both wet, saturated soils and dry conditions, as the amount of water fluctuates widely over the course of a year. The plants used in this garden are:

Trees

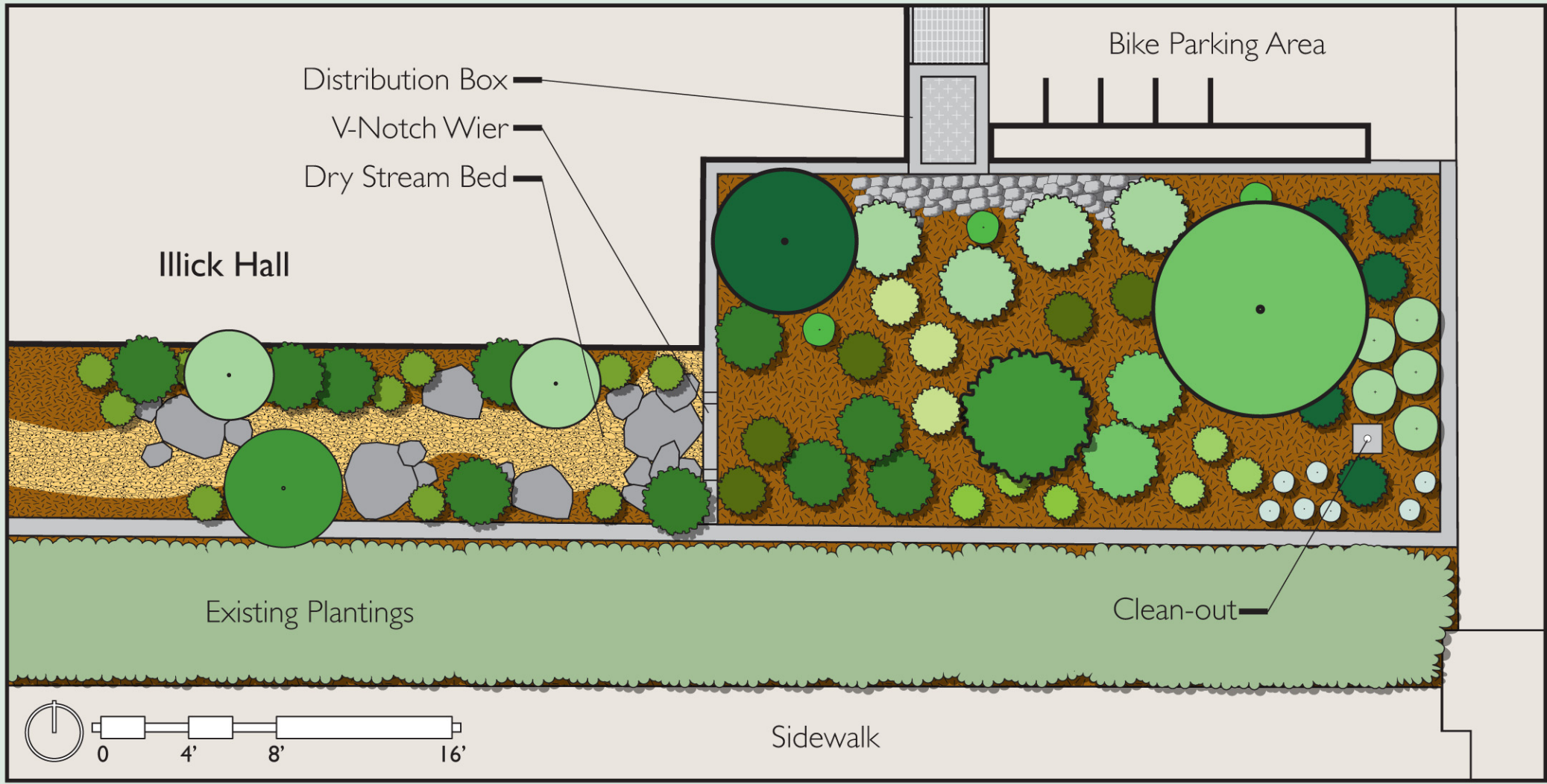
- Mountain Maple
Acer spicatum
- Striped Maple
Acer pensylvanicum
- Sweetbay Magnolia
Magnolia virginiana
- Hemlock
Tsuga canadensis

Shrubs

- Brilliant Red Chokeberry
Aronia arbutifolia 'Brilliantissima'
- Vernal Witchhazel
Hamamelis vernalis
- Virginia Sweetspire
Itea virginica
- Spicebush
Lindera benzoin
- Hardhack
Spiraea tomentosa

Perennials and Ferns

- Purple Dome Aster
Aster novae-angliae 'Purple Dome'
- Tussock Sedge
Carex stricta
- Cranesbill
Geranium maculatum
- Evergreen Wood Fern
Dryopteris intermedia
- Ostrich Fern
Matteucia struthiopteris
- Cinnamon Fern
Osumunda cinnamomea
- Royal Fern
Osumunda regalis
- Japanese Beech Fern
Thelypteris decursive-pinnata



Note: This rain garden was funded by SUNY and a grant from USDA McIntire Stennis. Preliminary design work was completed by students in FEG 489 Engineering Planning and Design