

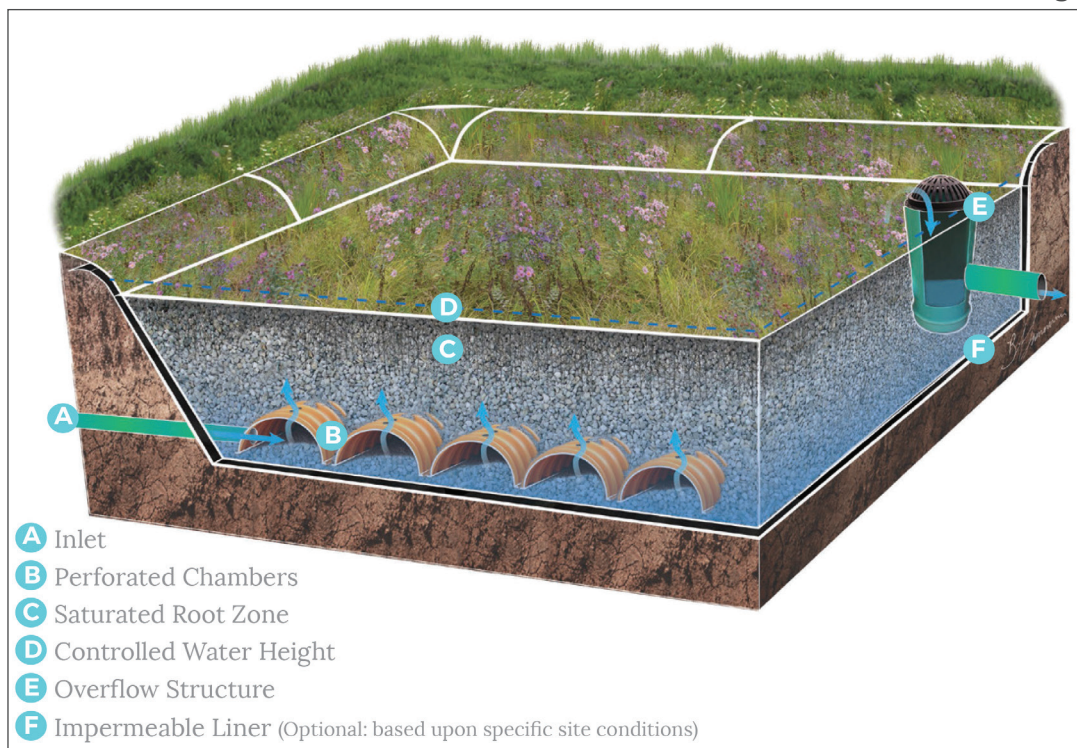
# GREEN STORMWATER INFRASTRUCTURE

ASSESS | PLAN | DESIGN | CONSTRUCT | EDUCATE

**What's in a name?** Green Stormwater Infrastructure (GSI) has been known by many names and acronyms over the years – Smart Growth Practices, Better Site Design, Low Impact Design (LID), Green Infrastructure (GI), and Nature-based Design to name a few. Regardless of what it is called, the design intent is the same. GSI mimics natural processes to manage stormwater runoff while also providing healthier spaces for people, plants, and animals. GSI includes a variety of stormwater practices that reduce and/or treat stormwater, such as rain barrels and cisterns, rain gardens, bioretentions, green streets, underground infiltration, porous pavements, and constructed wetlands.

**Horsley Witten Group** has been on the forefront of GSI planning and design from its very inception. We work with state and federal agencies, nonprofits, towns, and cities to provide all aspects of GSI services. Our staff is experienced in adapting GSI design for a range of site conditions and contexts, from parks to urban centers. We have developed state and local design manuals that incorporate GSI and have performed code audits to identify GSI opportunities and barriers within local regulations. We have developed GSI curriculums for school systems and conducted hands-on workshops building and maintaining GSI practices. Our staff love getting out into the field for watershed assessments and identifying the best locations for GSI retrofits. We are always following the latest research and data for ways to tweak GSI design to enhance pollutant removals and climate resiliency. We are passionate not only about implementing GSI as we know it today, but pushing it into the future when, who knows, it might be known by another name!

## Gravel Wetland Design



Green Stormwater Infrastructure Services include:

- GSI Planning, Sizing, & Design
- Stormwater Master Plans & Watershed Plans
- Permitting Assistance
- Soil Evaluations
- Field Investigations
- Vulnerability Assessments
- GIS Mapping/Modeling
- Municipal and Public Training
- Native Plant Selection and Restoration
- MS4 and TMDL Assistance
- Phosphorus Control Plans
- ORM Plans and Workshops
- Grant Funding Assistance
- Public Outreach and Engagement
- Construction Oversight

**“Green infrastructure is a cost-effective, resilient approach to managing wet weather impacts that provides many community benefits.” - US EPA**



## GSI for Park Improvement

*Roger Williams Park, Providence, RI*

We assisted the City of Providence and the Narragansett Bay Estuary Program with the development of a water quality management plan for Roger Williams Park. The goal was to improve the water quality and biodiversity conditions of the Park's ponds. The project included the identification and prioritization of dozens of GI practices, several of which we have designed and constructed. Our projects will be highlighted as part of a new regional GSI Center at the Park!



## Watershed-wide GSI

*Three Bays Watershed, Barnstable, MA*

HW is working with the Association to Preserve Cape Cod, the Barnstable Clean Water Coalition, and the Town of Barnstable to reduce stormwater pollution in the Three Bays Watershed. We have completed extensive field assessments, identifying and prioritizing over 70 GSI retrofit opportunities! We designed and permitted eight of the top priority sites and have overseen construction on three of them. We will be constructing three more in 2020! We also led numerous outreach activities including hands-on workshops to teach homeowners how to build rain gardens and to train municipal staff, on how to perform GSI maintenance.



## GSI at Boston Public Schools

*Boston Water and Sewer Commission, Boston, MA*

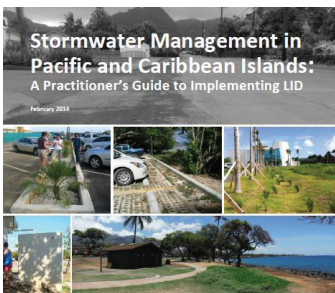
We designed GSI to manage stormwater runoff and engage students at five Boston Public Schools. The schools plan to incorporate green infrastructure into their strategic plan for educational programming and capital investments. With help from several partners, HW provided site investigations, GSI feasibility assessments, soil evaluations, GSI siting and design, and assistance with the stakeholder input process. Integration of stormwater into the science curriculum for fifth and seventh graders was one of the most exciting components of this project.



## Implementing GSI for CSO Abatement

*New York, NY*

New York City is implementing GSI as a cost-effective and green alternative to big tanks/tunnel storage typically used for combined sewer overflow (CSO) abatement. We have helped the City evaluate numerous BMPs including permeable pavements, underground recharge chambers, bioretentions, and blue roofs; providing siting, design, and construction oversight services for a variety of projects. We also collaborated with the City's Office of Green Infrastructure to initiate wide-scale implementation of GSI "bioswales" within City street ROWs and "on-site" practices at several public school sites.



## GSI Guidance for Pacific and Caribbean Islands

We developed this guide to help on-island stormwater managers to implement better stormwater management using island examples. It showcases successes from a variety of Pacific and Caribbean islands and provides island-specific information ranging from how to adapt designs using local materials to sizing criteria and rainfall data. This guide is not regulatory but is intended to inspire our island stormwater champions to embrace and implement GSI.