

Green Stormwater Infrastructure Planning and Design Guidelines

SELECTION OF GREEN STORMWATER INFRASTRUCTURE (GSI)

General Selection Principles for Green Stormwater Infrastructure Features

1. Surface features are preferred over sub-surface features.
2. Vegetated features are preferred over non-vegetated features.
3. Tree planting should be provided on all GSI.

Green Stormwater Infrastructure Hierarchy

Designers should maximize the benefits by careful selection of GSI system types. The following list shows the preferred GSI functions in descending order. The hierarchy presented is a generalized list and doesn't take into consideration site specific constraints that might otherwise preclude certain GSI types.

1. Surface Inflow into Vegetated Systems with Woody Vegetation: Maximizes surface features & vegetation
2. Surface Inflow into Vegetated Systems with Herbaceous Vegetation: Smaller surface features and vegetation footprint
3. Subsurface Inflow with Pretreatment and Vegetation: No surface feature or vegetation footprint, but includes tree planting
4. Systems with No Vegetation: No surface feature or vegetation footprint, additional tree planting recommended.

EVALUATING POTENTIAL GSI LOCATIONS

The following section lists the applicable design guidelines to be considered during the planning phase

GENERAL GUIDELINES APPLICABLE FOR PLANNING LEVEL ANALYSIS:

1. Meet the following criteria for stormwater management (with the assumption that infiltration is feasible):
 - Volume of runoff stored: 1.5"
 - Surface loading ratio of 16:1; subsurface loading ratio of 8:1.
 - Temporary surface storage of 4"-12"
2. Utilize existing low point, where possible, to locate green stormwater infrastructure (GSI) system.
3. For conveyance utilize existing grading, or minimal grading, to direct stormwater (sheet flow) to GSI system. In addition, other conveyance will need to be considered, especially if off-site (street runoff) or roof runoff is being directed into the GSI system. Examples include curb cuts, new inlets upstream of existing inlets and subsurface piping, trench drains, culverts, etc.
4. Ideally, systems should be located directly upstream of an existing inlet whenever possible in order to maximize drainage area and allow for a convenient underdrain connection.
 - a. Exception: Some locations may be acceptable for GSI systems where convenient underdrain connections are not available, such as areas with adequate infiltration rates or steep streets that require a tiered system approach.

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5. In order to protect off-street systems from future construction on adjacent parcels, a minimum of a 5 foot buffer must be maintained from the adjacent property lines, though 10 feet is preferred
6. Typically, at least 10 feet of separation between infiltrating GSI systems and buildings or structures should be maintained. Systems located less than 10 feet from a building may be designed as slow release systems with an impermeable liner.
7. Projects should evaluate the potential costs and stormwater management benefit when determining whether to impact existing utilities, poles, and lights. If a project is designed with the intention to not impact utilities, poles, and lights, the following guidance is suggested:
 - b. A 3 foot horizontal distance from existing utility lines should be maintained.
 - c. A minimum of 12-18 inches vertical distance from existing utility lines should be maintained, depending on the utility type, age, and condition.
 - d. A 5 foot distance from telephone poles or other comparable existing infrastructure should be maintained, where possible.
 - e. A 3-foot distance from traffic lights must be maintained.
 - f. Setbacks from existing retaining walls should be considered.
 - g. Locations where many utility service laterals would conflict with SMPs are generally categorized as low potential for GSI

For additional information on GSI Design requirements for potential green stormwater infrastructure projects that Philadelphia Water's Office of Watersheds could implement, please refer to the following resource:

http://phillywatersheds.org/doc/GSI/GSI_Design_Requirements_&_Guidelines_Packet_5-15-2015.pdf

IMPORTANT NOTE: The loading ratios outlined above are the ones to be followed for the competition.