Maintenance and GI Design

Coastal Green & Resilient Infrastructure Project (RI GRIP)

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Maintenance Trainings and Site Visits

RI GRIP organized two maintenance training sessions with municipal maintenance staff. Participants learned how different GI works and provided feedback about maintenance challenges. The primary takeaway was that including maintenance staff in the design process helps avoid maintenance headaches and ensure long-term success. This presentation illustrates issues that arose during the trainings.

Key Takeaways

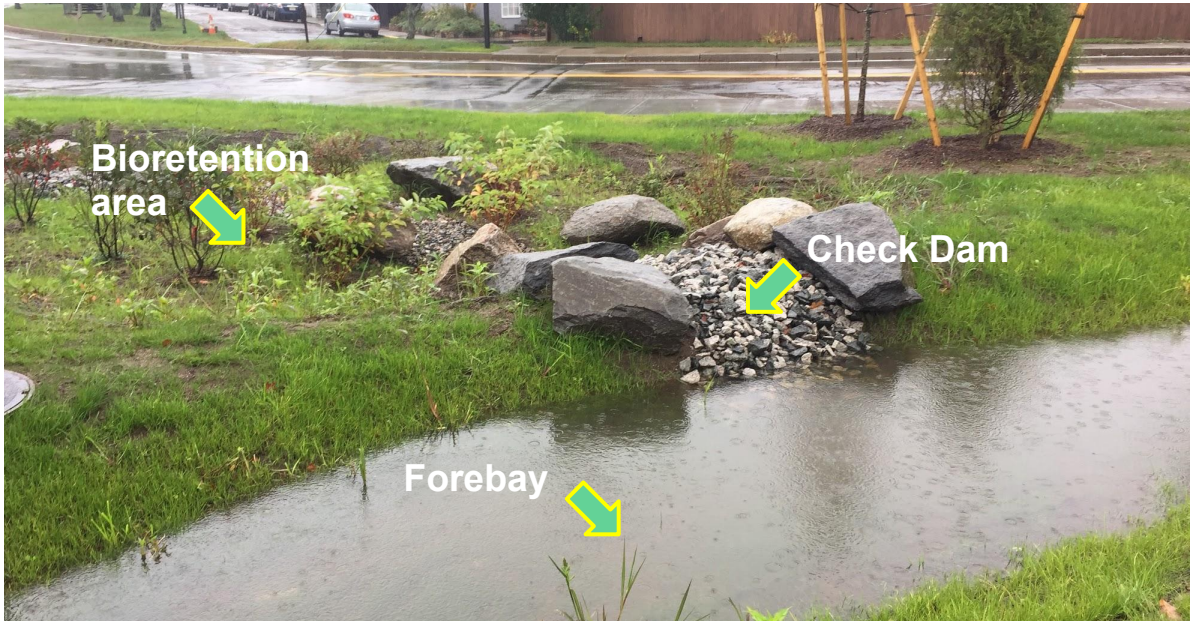
- Design systems with maintenance in mind and included maintenance staff in the design phase
- Maintenance staff must understand how the system is supposed to work to maintain it
- Grass and soil filters can be as effective as shrubs or perennials, and are easier to maintain
- In coastal areas, use salt- & sand-tolerant plants
- Plantings will evolve over time; plan for change
- Use basic O&M checklists, *developed by municipal staff,* for inspection and maintenance

Physical Obstacles

Riprap, gravel, rocks, and woody shrubs create mowing obstacles. Opting for wildflower and meadow grass mixes that can be easily cut a few times per year reduces the maintenance burden.

Flow-Through Issues

High check dams or deep forebays may prevent stormwater from moving through a multi-bay GI system. Here, stormwater is ponding in the forebay, while the bioretention area designed to filter the water remains dry.



Inlet Issues

Inlet pipes with obstructed outfalls or with low slopes may collect sediment and reduce flow into the system. They should be cleared regularly.

Steep or sparsely vegetated grass scuppers may erode. Anchor such features with deep rooted vegetation and avoid over-mowing.

Grass may die due to contact with runoff contaminated with winter road treatments. Monitored vegetation health and adjust systems to accommodate site conditions

Scuppers with too much rip rap may prevent water from entering the system. Keep inlets clear and remove observed obstacles.

Mounded riprap inhibits water entry

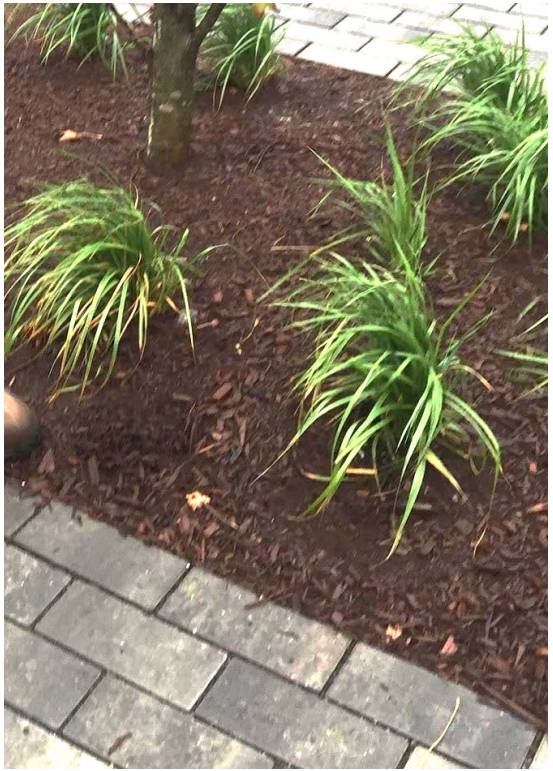
A clear outfall (1) & steep forebay wall (2)

Permeable Paver Issues

Cigarette butts can become lodged between pavers. The gap should be set smaller than a butt width to prevent this.

Mulch from mounded plantings can also clog gaps.

Sand from roads will fill gaps over time and require removal. Heavy equipment often removes the system's gravel along with the sand. Smaller equipment can restore system functionality, but can be labor intensive.



Testing Permeability

The approved way to test whether permeable pavers is pictured here. A less-scientific but still effective method involves simply dumping a 5-gallon bucket of water onto the pavers and observing whether it soaks in and, if so, how quickly.

Signage

Signage can introduce the public to GI and teach them what it looks like. This can reduce complaints about “unmaintained” GI installations.

Signage can also help maintenance staff understand how a particular system is supposed to work resulting in better maintenance outcomes.

Adopt-a-Spot Programs

An adopt-a-spot program may be an effective tool for achieving basic maintenance of GI such as weeding and debris removal. This can be especially effective for projects with more burdensome maintenance needs such as those with woody vegetation and perennial flowers.

Aesthetics vs. Function

It is important to balance aesthetics and function. Too much rip rap may be viewed as unattractive by the public, while too much woody and ornamental vegetation may be viewed as burdensome by maintenance people.

Ponding Issues

Infiltration basins are typically designed to store stormwater for up to 24-48 hours. Water that lingers may be a symptom of a poorly functioning system (e.g. excessive silting, poor soil filtration, outlets are clogged) and may act as mosquito habitat. Remedies include raising the basin to reduce steep slopes and using a sandy bioretention mix for better drainage. 60% sand, 20% woodchip, 20% loam is effective.