

Improving a Stormwater Runoff Treatment Method

Technical Brief

February 2015

Report Title

Design and Maintenance of Subsurface Gravel Wetlands



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Report Link

<http://www.nh.gov/dot/org/projectdevelopment/materials/research/projects/documents/15680W-FINALREPORT.pdf>

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Why was it studied?

Roadways and other impervious surfaces increase runoff volume when it rains because the impervious cover does not allow precipitation to infiltrate. The stormwater runoff carries sediment and pollutants that impact lakes, rivers, and wetlands. Stormwater Gravel Wetlands (SGW) and other construction techniques are used to handle rainfall events in order to reduce peak discharge and improve water quality.



What was done?

Stormwater Gravel Wetlands may look like detention ponds but they work differently. The water flows through a subsurface anaerobic layer of gravel under the vegetation. This gravel layer has microbes that thrive and break down the nutrients in the stormwater. The UNH Stormwater Center reviewed and inspected SGWs that were constructed for Department projects and compared the design used to recent science in order to determine appropriate changes to the current design guidelines and specifications.

What did we learn?

NHDOT often includes an underground drainage system to intercept groundwater, but this can be eliminated except in cases where high groundwater flows prevent anaerobic bacteria from thriving. The Department's current



Subsurface Gravel Wetland Outlet

guidelines use a length to width ratio that is difficult to apply to linear roadways. The study recommended configuring the system to treat the desired rainfall depth. The study also suggested modifications to the inlets and outlets of the initial treatment area in order to pass low flows. Maintenance is important, especially the periodic removal of vegetation, which removes nutrients from the system.

How can we use it?

NHDOT will update design standards and continue to use Stormwater Gravel Wetlands for effective treatment of roadway runoff. Benefits include reduced construction and maintenance costs and less pollutants and sediment flowing into lakes and streams. Maintenance schedules should include periodic vegetation removal.