

Research to Practice - What Can I Do To Improve My BMP

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Description

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 In this webinar we will review practical lessons learned from Villanova's research that can be applied to your property. Focus will be on the processes used in stormwater systems, and how you can apply them to retrofit or build new green infrastructure practices.



- 1 We will review the fundamental Processes of Green Infrastructure.
- We will review different types of green infrastructure 2. you should consider.
- We will review how to introduce stormwater control 3. measures to your existing property
- 4 At the end of this webinar, you will understand maintenance needs for BMPs



VILLANOVA UNIVERSITY college of engineering

CENTER FOR RESILIENT WATER SYSTEMS

Framework



Mission: To engage with society to create resilient

engineered solutions for alobal water challenges.

- Urban Water Systems refers to the application of the watershed processes within the built environment. Resilient Green Infrastructures, Water Supply, Urban Flooding, Combined Sewers (VUSP)
- Under Resourced Communities refers to using engineering knowledge to resolve fundamental water supply issues in vulnerable communities

https://engineering.villanova.edu/vcrws

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Water Resources - Robert Traver, Bridget Wadzuk, Virginia Smith. - Andrea Welker Kristin Sample-Lord, Environmental - John Komlos, Wenqing Xu, Garret Clayton (Cendec) Other Contributors Temple, Penn, Morgan State, University of Baltimore, VU A&S, "CBEST"



VU Research Facilities

Labs Water Resources (JBH), Geotechnical (JBH), Env. Chem Eng Bldg Campus - VUSP's Stormwater Control Measure (SCM) Research and Demonstration Park Campus and Philadelphia Landscape

Staff Support – Frin Malanowski

Laboratory Director - Amanda Garzio-Hadzick

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1/10/01



STORM ISAIAS PARAMETERS

9/4/2020 4-49

9/A/20200-36

- Retrofit constructed in 2006
- 1:1 ratio
- 4 in (10 cm) growing media
- depth
- Captures ~0.8 in (2 cm) - Primarily due to underdrain (waffle board) and rock
 - perimeter Modify drainage structure -> get more retention

PI - Dr. Bridget Wadzuk Students: Jerry Zaremba, Catherine Barr, Dominik Schneider, Meghan Feller

Green Roof

Bubble Chart with Measurable Overflow







8/3/202019:12

BRG Event Average Recession Rate Life-cycle Chart

1

0.9

8/3/20209:36

8/3/202014:24



Question

Proof of concept

Water Quality

Maintenance?

Climate Change?

8/4/202014:24

8/4/202019:12

Use of Design Storm?

Longevity

Back to Back Storms

Hydrologic Cycle Perspective

Importance of Infiltration and ET





8/5/2020 0:00



🔶 - 24 hour, 3.28" storm

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- Challenges
 - Long term construction projects need to look at drainage
 - Need to make sure flow gets to inlets
 - Design SMP's for variable capture
 - Need a new NJ barrier design that permits water passage



Two Underperforming SMP's

• Performed forensic investigation, analyzing range of variables to identify the issue(s) ٠

→ Observations & recommendations for inspection and restoration



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Results: Shear Stress Distribution







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