Green Infrastructure – A Critical Review of Design Construction and Maintenance Methods

One Water
Ohio WEA-AWWA 2014 Technical Conference & Expo

August 27, 2014

Vinnie Tremante

Imagine the result
GI – A Critical Review

Agenda

Introduction
Soils
Design
Construction
Maintenance
GI – A Critical Review

Introduction

Ohio’s First Raingarden
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Soils

Typical Mix – Loamy Sand
50-60% Sand (70%–90%)
20-30% Soil
20-30% Compost
½” – 2” per hour minimum drawdown
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Soils

Issues:
- Actual infiltration rates between 5”-12”/hr
- Soil media/porosity acts as control orifice
- Soil “manufacturing” is inconsistent
- Drain rate too high – short circuits system
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Soils

Dry upland annuals and perennials
No vegetation
Downstream of inlet

Results:
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Options: Control drawdown

Outlet Weir / Orifice Plate / Control orifice

Design detail American Addition Phase 1 courtesy of the City of Columbus
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Design

Options: Control drawdown

Maintain sub-surface water level
- Upturned Underdrain
- Agridrain

Greensboro Science Center – Greensboro, NC
Design

- 70% topsoil
- 15% leaf compost
- 15% pine bark fines (≤ 5/8”)

No Sand!!!

Options: Alternate soil mix using compost

Soil mix proposed by: Vivian Llambi & Associates, Inc.
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Options: Drier Planting Palate:

<table>
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<th>TREES</th>
<th>Scientific Name</th>
<th>Common Name</th>
<th>Size</th>
<th>Quantity</th>
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<tbody>
<tr>
<td>ANGL</td>
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<td>Winterberry Holly</td>
<td>5 gallon</td>
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<td>IVE</td>
<td>Ilex verticillata 'Red Sprite'</td>
<td>Winterberry Holly</td>
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<td>Little Blue Stem</td>
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<td>SPHE</td>
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<td>Prairie Dropseed</td>
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</tbody>
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Planting Schedule: American Addition Phase 1 courtesy of the City of Columbus
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Construction

Stabilize D/A

Use sod/plants rather than seed

Gasket seal for sub-surface storage

Keep GI offline until stabilized

Lessons Learned:

Greensboro Science Center – Greensboro, NC
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Construction

Avoid compaction
Qualified oversight!

Lessons Learned:

Photo Courtesy of the City of Columbus
GI – A Critical Review

Yes, you have to do it!
Design Aesthetics
Warranty periods
Success Criteria
Plant Materials

Maintenance

Wild and Wooly

Planting Masses
Imagine the result