Innovative Water Management for Commercial Landscaping/ Site Plans

2/1/2012
“…take a solution and divide it neatly into two problems.”  Wendell Berry
Ordinance Goals

• Use rainwater wisely
• Conserve potable water
• Help improve water quality
Conventional

To Inlet

Potential
Pavement Stability

To Inlet

Heavy Traffic

Light Traffic

Heavy Traffic

Light Traffic

No Traffic

No Traffic

Light Traffic
Wal-Mart (Ben White)
Stormwater Requirements

• Direct stormwater runoff to at least **50 percent** of required landscaped area

• Can use non-required landscaping as long as area is equivalent to 50% of required area

• Show drainage areas to landscaping on site plan to demonstrate compliance and sufficient drainage

• Stormwater from “hot spot” land uses (e.g., gas stations) and parking lots over the Recharge Zone may not be used unless landscape doubles as a water quality control
Constructive Use of Stormwater

- Overland Flow
- Rainwater Harvesting
- Rain Garden
- Disconnected Downspout
Undisturbed Vegetation Credit

- Undisturbed natural areas or undisturbed existing trees can count toward the 50 percent requirement.

- No potable water irrigation is allowed in order to receive credit.
Supplemental Irrigation

• Irrigation systems (e.g., potable) required for all newly planted trees

• Irrigation systems are required for all other newly planted landscaping, unless certain conditions are met:
  – receiving stormwater runoff
  – drought tolerant plant palette
  – low foot-traffic areas

• Temporary irrigation required for two growing seasons if no permanent irrigation is provided
Ordinance Flexibility

• Administrative variance allowed for unique site conditions, such as topography, size, shape, and location of existing features

• Staff will report to City Council two years after adoption about the effectiveness of the ordinance, including recommendations for improvements or amendments
• City’s zoning jurisdiction only

• Development projects requiring a site plan
  – some exceptions e.g., central business district
Summary

• Conserve potable water and improve water quality by using rainwater wisely and preserving existing vegetation.

• Unique site challenges are addressed with flexible menu of options to achieve compliance.

• Other major US cities have successfully implemented similar requirements.

• Begin a new generation of sustainable sites now.
Case Studies
CVS Pharmacy
South 1st & Slaughter Lane

Total Site: 2.4 acres
Pervious: 0.9 acres
Pct. IC: 63%
Pct. Pervious: 37%
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CVS Pharmacy
South 1st & Slaughter Lane

14,046 sq ft of required landscaping

Detention Pct. of Site: 4%
WQ Pct. of Site: 2%
Landscaping Pct. of Site: 14%

Sand Filter
Potential for Rain Gardens

107% of Required Water Quality Volume

14,046 sq ft of required landscaping
## CVS Site: Conventional Sand-Filter vs. Rain Garden Cost Analysis

<table>
<thead>
<tr>
<th>Cost Component</th>
<th>$/Units</th>
<th>Rain Garden</th>
<th>Existing/Conventional</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Water Quality Control</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Excavation</td>
<td>$15/yd³</td>
<td>$ 5,863</td>
<td>$ 5,823</td>
</tr>
<tr>
<td>Embankment</td>
<td>$5/yd³</td>
<td>$ 358</td>
<td>$ -</td>
</tr>
<tr>
<td>Concrete</td>
<td>$500/yd³</td>
<td>$ -</td>
<td>$ 34,861</td>
</tr>
<tr>
<td>Rain Garden Soil</td>
<td>$36/yd³</td>
<td>$ 8,062</td>
<td>$ -</td>
</tr>
<tr>
<td>Sand</td>
<td>$8/yd³</td>
<td>$ -</td>
<td>$ 421</td>
</tr>
<tr>
<td>6&quot; perforated pipe</td>
<td>$23/ft</td>
<td>$ 4,674</td>
<td>$ 2,185</td>
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<tr>
<td>6&quot; solid pipe</td>
<td>$20/ft</td>
<td>$ 1,701</td>
<td>$ 1,900</td>
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<tr>
<td><strong>Subtotal Water Quality Control</strong></td>
<td>$ 20,658</td>
<td>$ 45,190</td>
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<tr>
<td><strong>Storm Drainage</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>18&quot; RCP</td>
<td>$90.30/ft</td>
<td>$ 30,702</td>
<td>$ 72,782</td>
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<tr>
<td><strong>Landscaping (Water Quality areas only)</strong></td>
<td></td>
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<td></td>
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<tr>
<td>Required Plants</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$/Plant</td>
<td>$16/each</td>
<td>$ 9,744</td>
<td>$ 2,100 *</td>
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<tr>
<td>Sod cost</td>
<td>$3.60/yd²</td>
<td>$ 1,719</td>
<td>$ 859 *</td>
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<tr>
<td><strong>Subtotal Landscaping</strong></td>
<td>$ 11,463</td>
<td>$ 2,959</td>
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<tr>
<td><strong>Totals</strong></td>
<td>$ 62,823</td>
<td>$ 120,931</td>
<td></td>
</tr>
</tbody>
</table>

* Pro-rated costs for landscaping in areas in common with rain garden
Three Points Retail Center

Code now requires 10-foot medians
Rain Garden #1
• 10:1 Ratio of Impervious Cover to Drainage Area
• 88% Imp. Cover
• 62% of Required Water Quality Volume

Rain Garden #2
• 5:1 Ratio of Impervious Cover to Drainage Area
• 82% Imp. Cover
• 134% of Required Water Quality Volume
Other Major US Jurisdictions

- Tucson
- Portland
- Seattle
- Philadelphia
- Minneapolis
- Los Angeles
- San Diego
- New York City
- State of Maryland
- State of Wisconsin