BIORETENTION GARDEN DESIGN

Planting Design
Overview

• Sustainable design context
• Garden character and form
• Plant arrangement
  – Aesthetics
  – Function
• Ideal plants – aesthetically
• Ideal plants – functionally
• Plant types
• Plant selection basics
Sustainable Design – Context for Bioretention Gardens

- Enhances landscape aesthetic and functionality
- Maximizes environmental benefits and quality
- Minimizes resource inputs and maintenance requirements
Green infrastructure is the interconnected network of open spaces and natural areas, such as greenways, wetlands, parks, forest preserves and native plant vegetation, that naturally manages stormwater, reduces flooding risk and improves water quality. (http://greenvvalues.cnt.org/green-infrastructure)
Garden Character and Form

• CRITICAL TO UNDERSTAND CLIENT AND PUBLIC BIASES AND EXPECTATIONS FOR GARDEN CHARACTER

• Neat and tidy = high maintenance and inputs

• Fuzzy and informal = typically lower maintenance (unless managed to look neat and tidy)

Neat and tidy + fuzzy and informal = compatible (?)
Garden Character Acceptance

• Research (Joan Nassauer, Univ. Michigan) shows two approaches – both important:
  – Intelligent Care (education)
  – Vivid Care (obvious beauty)

• Thoroughly integrating “neat” and “fuzzy” will tone down contrasts and help unify garden appearance with surrounding landscape
Intelligent Care

Rain Gardens

The two planted depressions you see at this rest area are rain gardens. They were installed in 2006 as part of MDOT's overall storm water management program. These rain gardens help filter pollutants from storm water runoff from the parking lot, which can pollute downstream creeks and rivers. By collecting storm water runoff and allowing it to soak into the ground in the rain gardens, MDOT is reducing pollution to Michigan's waterways and improving water quality.

Native plants assist rain gardens by soaking up water in their roots, which grow as deep as 15 feet. Tunnels formed by decaying roots help water and oxygen filter through the ground.

Anyone can easily help reduce storm water pollution. Here are three simple ways:
1. Keep your car well maintained and leak-free
2. Properly dispose of trash and pet waste
3. Never dump anything down a storm drain

Only rain belongs in the drain!

Albertson Parkway's Bioretention System: Protecting Water Quality

What is a Bioretention System? How Does It Work?

Rainfall from paved areas and buildings has been designed to help manage the impacts of storm water runoff by intercepting a portion of the precipitation before it hits streets, sidewalks, and driveways. These specially designed systems of vegetation, soils, and structural elements are designed to slow and detain stormwater to enhance the landscape and support storm water management.

In the past, rainfall would flow directly to the nearest waterway, carrying pollutants into the stream. Alpine vegetation, such as the rain garden, uses a combination of soil, gravel, and rocks to absorb and filter pollutants from runoff water.

Did You Know...

- Rain gardens are one of the simplest ways to improve water quality.
- Rain gardens help to reduce the amount of pollution in our waterways.
- Rain gardens can be used as part of a larger storm water management plan.

Since 2002, the City of Troy and the Troy area have worked with state, regulatory, and non-profit organizations to restore and enhance storm gardens in Troy.
Vivid Care
Garden Form

• Dictated by location and designer/property owner
• Curving edges more natural, tend to be more popular
• Most landscapes have curving bed lines; appropriate to use as visual cue for bioretention garden bed lines
• Regardless, design theme ties landscape together; bioretention shouldn’t be visually separate
Garden Form (cont.)

- Straight edges and angled corners appear more formal, are possible but less common
- May require a mix depending on context
- Minimize “left-over” areas that will ultimately be difficult to maintain
- **In most landscapes, the bioretention garden should extend beyond the bioretention garden**
UNIVERSITY OF NEBRASKA - OMAHA WELCOME CENTER BIORETENTION GARDEN
UNO WELCOME CENTER BIORETENTION GARDEN - SECTION 'A-A'
Plant Arrangement - Aesthetics

- Massing
- Plant heights
- Repetition
- Defined edges
- Plant types
Plant Heights
Repetition
Repetition (Less is More)
Defined Edges
Defined Edges (cont.)
Design (Dominance) Elements

- Color
- Texture

- Form
- Line
Plant Arrangement - Function

- Soil Moisture
- Sun/Shade
- Soil Texture and structure
- Potential time for inundation
  - Days vs. hours
  - Garden maturity factor
- Chemicals and salt
- Preference vs tolerance
Soil Moisture

• Bioretention gardens tend to hold water by the hour vs by the day
• Plants lists may need to be adjusted “down” in garden depending on conditions
• Areas of garden not directly over drainage cell will retain more moisture
Bottom of Garden
Top of Berm
Sun/Shade

- Full sun = six hours of sun/day minimum
- Part shade = morning/afternoon; afternoon shade preferred; filtered or moving shade during the day
- Full shade = no direct sun, but few plants tolerate heavy dense full shade
Plant Arrangement - Summary

- Group/mass similar kinds of plants, fewer varieties overall, repeat plant masses
- Maximize flowering when practical **while ensuring** long/overlapped bloom times
- Create distinct patterns with plant masses, and distinct edges with bed edges
Plant Arrangement – Summary (cont.)

• Appropriate plant heights scaled to garden size and surroundings

• Use a low groundcover plant around garden edge to unify character regardless of wide species variety throughout garden