### **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



### **One Step Back**

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://greenvalues.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 lots, 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.

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These attractive and simple systems also provide food and habitat for butterflies, birds, and other wildlife. Rain gardens contain native plants and flowers that need little maintenance. As a result, they are a natural solution to storn water pollution.

Here are three simple ways:

Anyone can easily help reduce storm water pollution.

3. Neep your car well-maintained and leak free 2. Properly dispose of trash and per waste 3. Never dump soything down a storm drain Only rain belongs in the drain!

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

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### **ALBERTSON PARKWAY'S BIORETENTION SYSTEM: PROTECTING WATER QUALITY**

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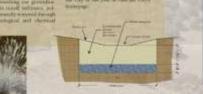
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### **Garden Form**

- 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

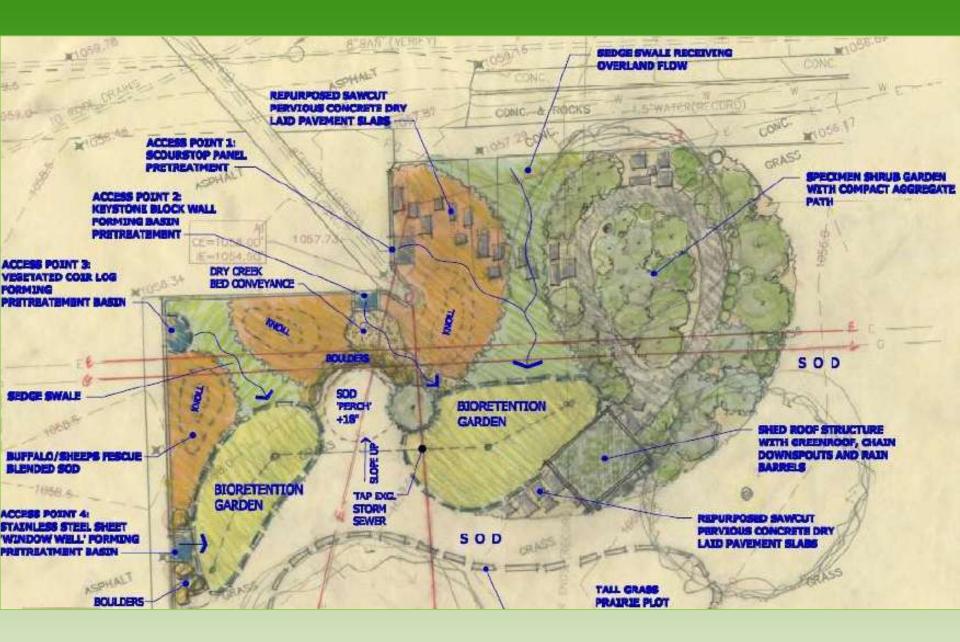


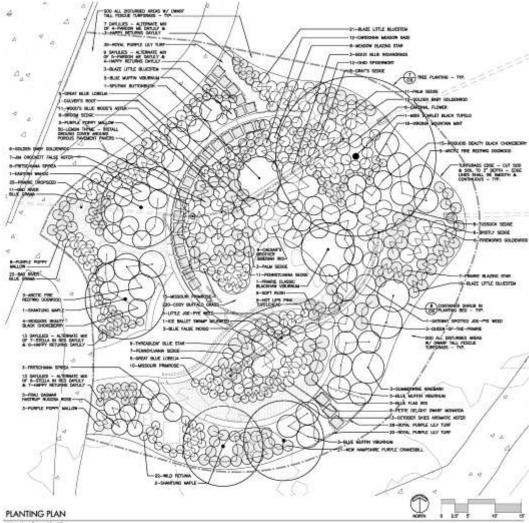












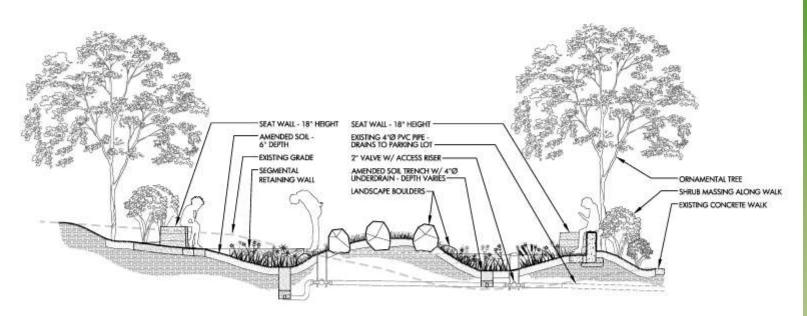
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### PLANTING LEGEND





### UNO WELCOME CENTER BIORETENTION GARDEN - SECTION 'A-A'

HORIZONTAL SCALE: 1"= 5'-0" VERTICAL SCALE: 1" = 2'-6"

# **Plant Arrangement - Aesthetics**

- Massing
- Plant heights
- Repetition
- Defined edges
- Plant types







# **Plant Heights**



# Repetition



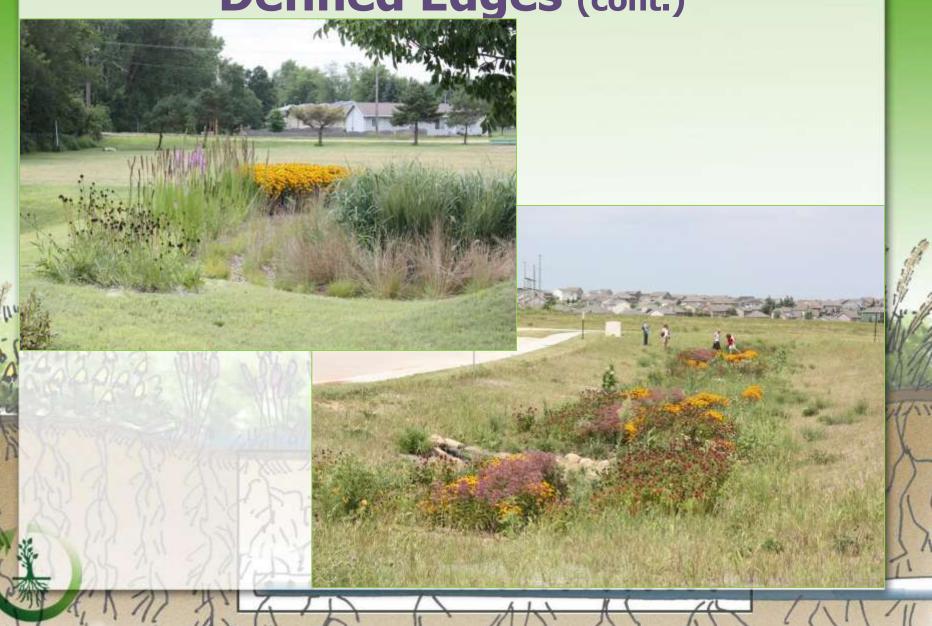
## **Repetition (Less is More)**



### **Defined Edges**



### Defined Edges (cont.)



# **Design (Dominance) Elements**

- Color
  F
- Texture

- Form
- Line

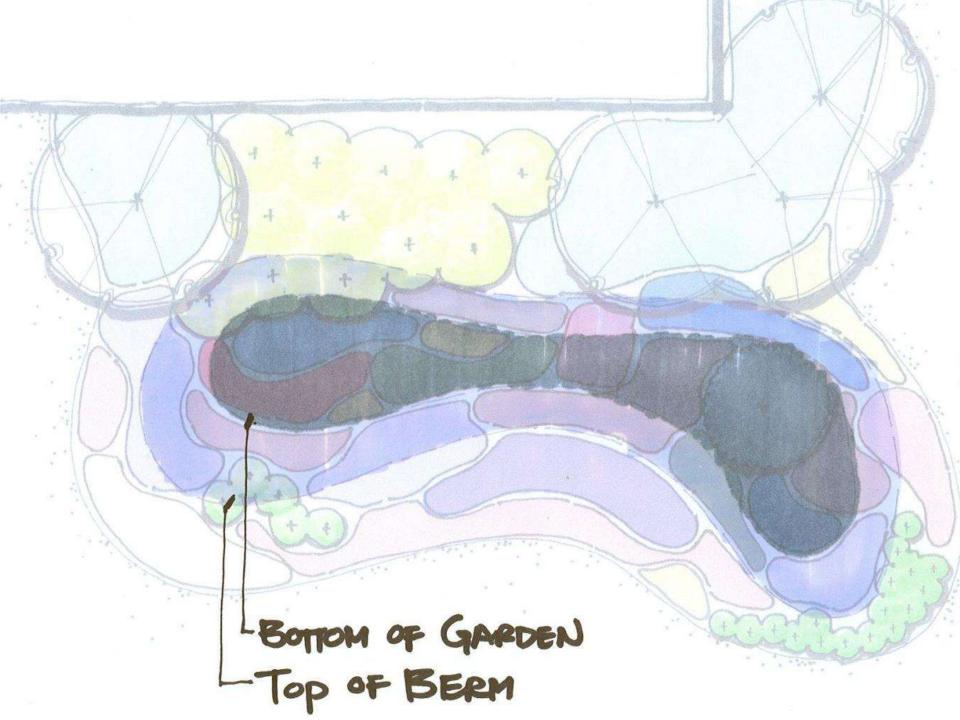


# **Plant Arrangement - Function**

- 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



## 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