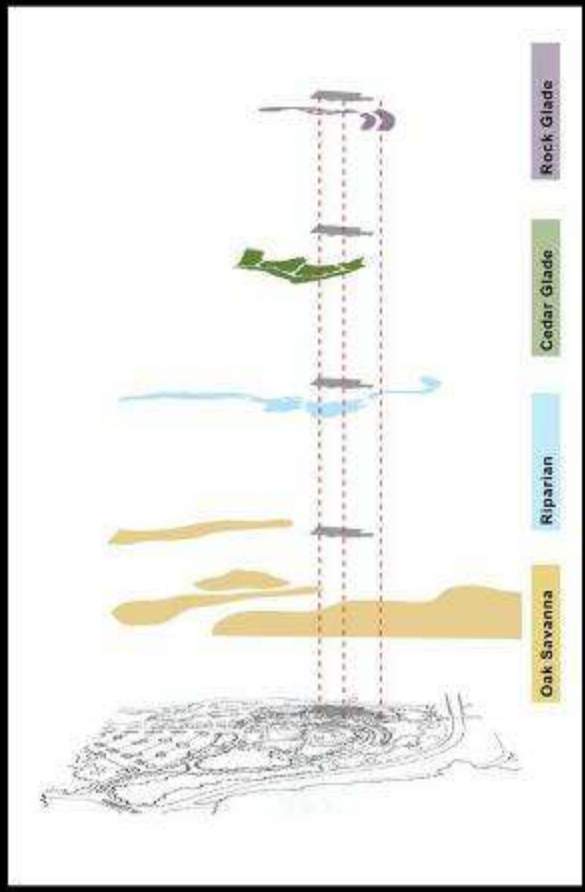
Design and Plant Selection for Bio Retention Facilities

SWT Design

Ted H. Spaid, ASLA

DESIGN PROCESS

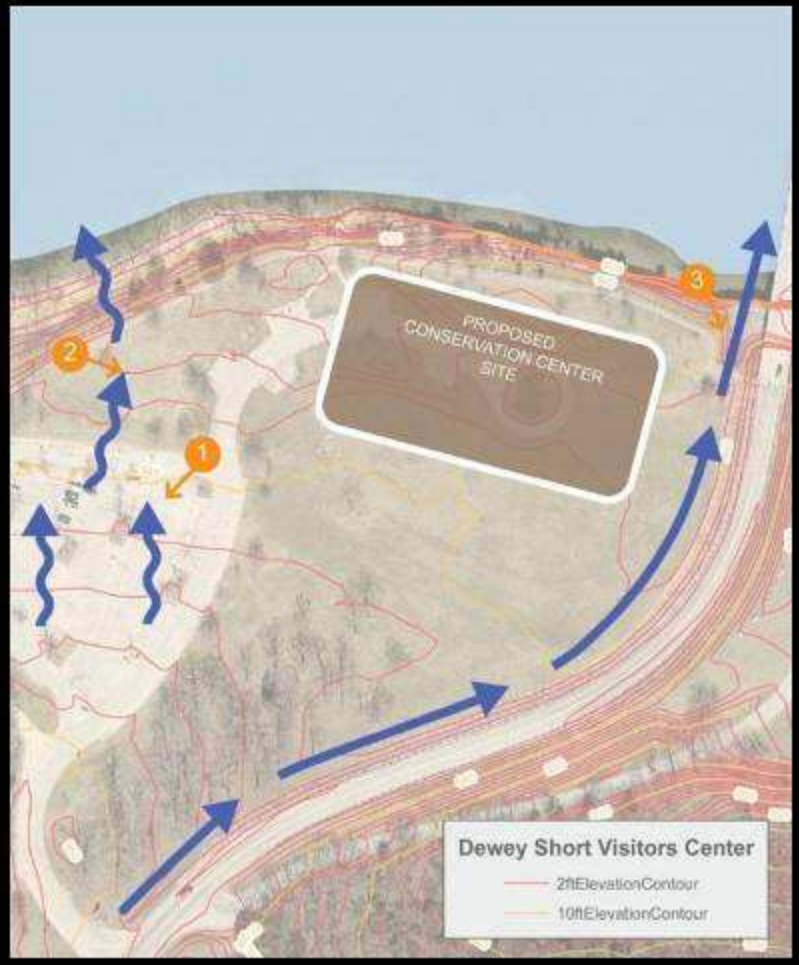
- Site Selection / Goal
- Analyze Site Conditions
- Determine Bioretention Needs and Methods
- Develop Design Solution(s) Based on Goals
- Refine Design
- Confirm That Design Meets Desired Goals
- Determine Maintenance Needs



DESIGN PROCESS

SITE SELECTION / GOAL

- How Does Site Selection Impact Plant Choice?
- Low Impact Development
- Regenerative Opportunities
- Site Performance / Multi-Use
- Partnership Opportunities
- Impact on Adjacent Land



SITE SELECTION / GOALS

SITE SELECTION / GOALS

Analyze Site Conditions

- "Boots on Ground"
- Tree Preservation
- Existing Soils
- Watershed Analysis
- Site Character
- Micro Climates

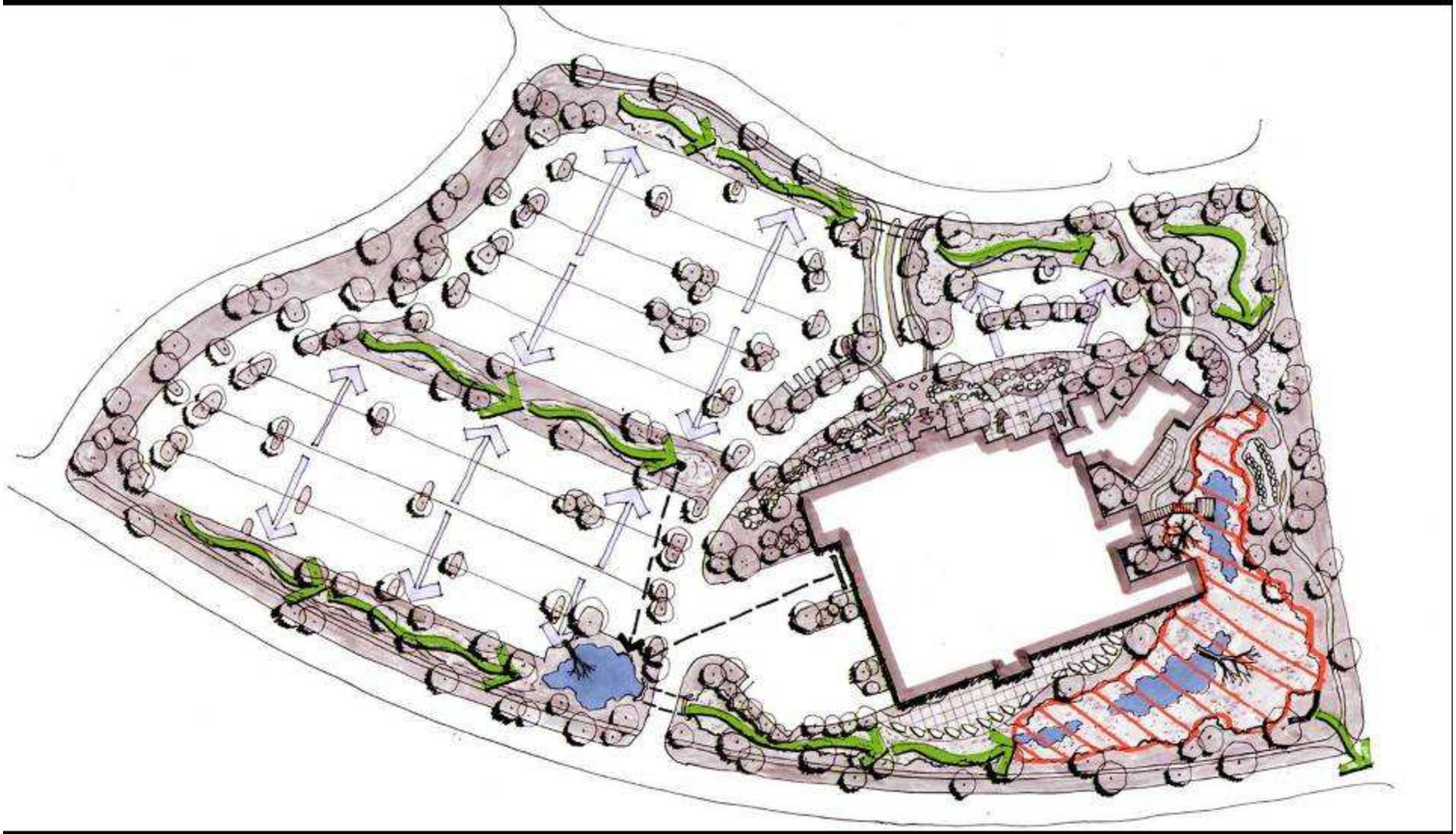
ANALYZE SITE CONDITIONS

DETERMINE BIORETENTION NEEDS / METHODS

- Sediment Control / Pretreatment
- Environmental Protection
- Use of Dry Swales “Bio Swales”
- Filtration Basin “Rain Gardens”
- Fore Bay
- Detention / Retention Basin
- Wet Pond

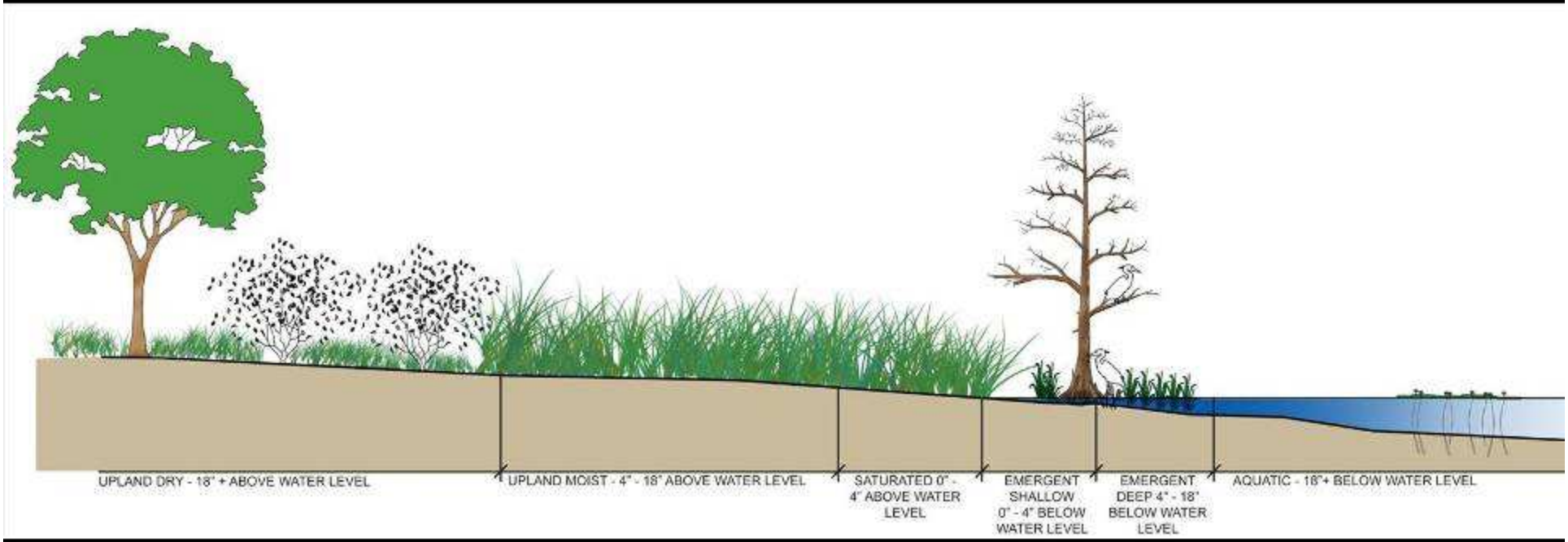
DETERMINE BIORETENTION NEEDS / METHODS

DES PERES LAKESIDE IMPROVEMENTS | DES PERES, MO



BASS PRO SHOPS OUTDOOR WORLD | COUNCIL BLUFFS, IA

UNDERSTAND LANDSCAPE ZONES AND SOIL PROFILE



Button Bush
Cephalanthus occidentalis

Swamp Milkweed
Asclepias incarnata

Cardinal Flower
Lobelia cardinalis

Broadleaf Arrowhead
Sagittaria latifolia

Pickerel Weed
Pontederia cordata

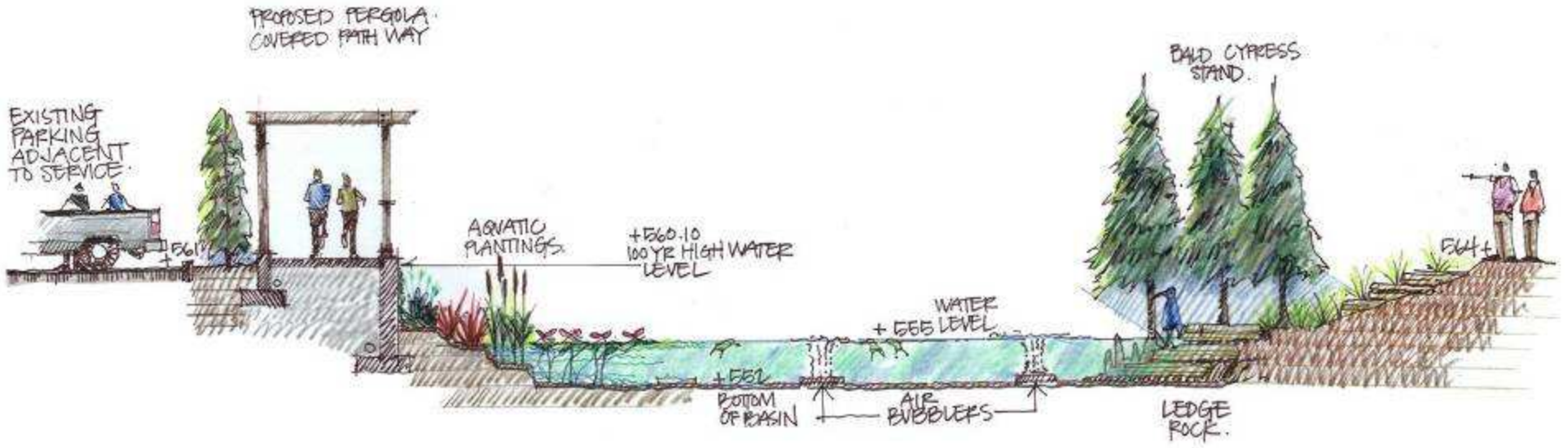
Marsh Marigold
Caltha palustris

Water Lily
Nymphaea pygmaea helvola

UNDERSTAND LANDSCAPE ZONES AND SOIL PROFILE

DEVELOP DESIGN SOLUTION(S)

- Study in Plan and Section
- Create Plant Palette
- Understand Water Flow
- Determine Normal vs. High Water Line
- Design Criteria Formal vs. Informal
- Visual Impact on Adjacent Land Users

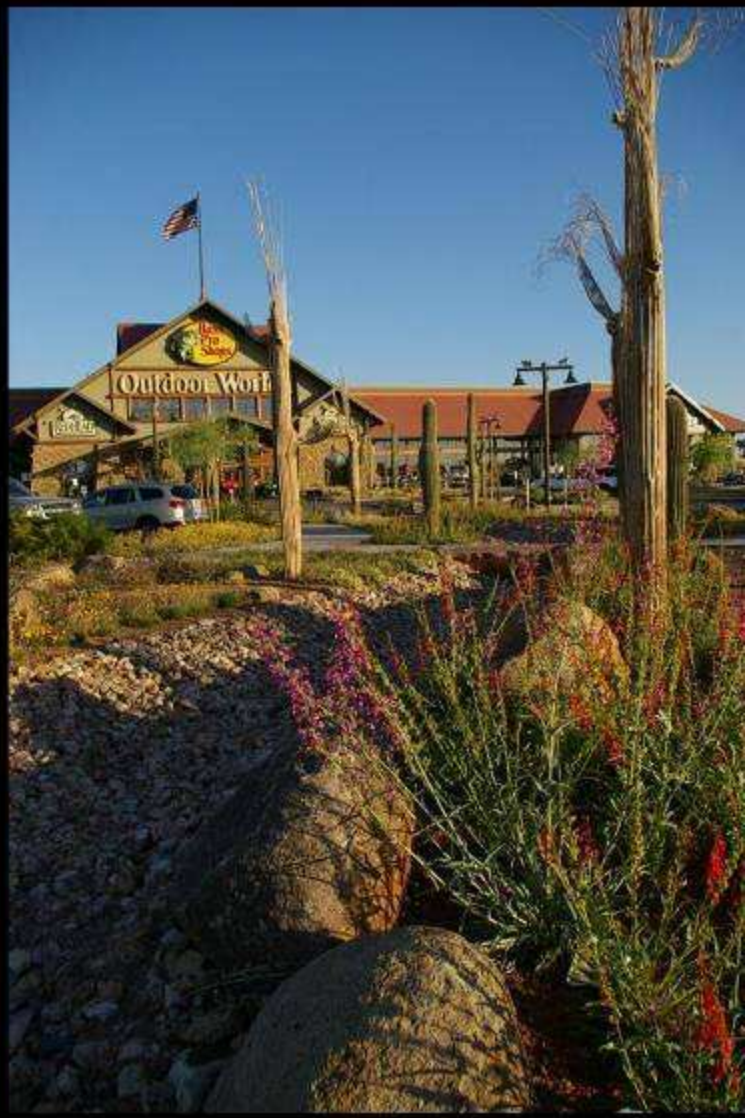


DEVELOP DESIGN SOLUTIONS(S)

BEFORE

AFTER

CITY GARDEN | ST. LOUIS, MO



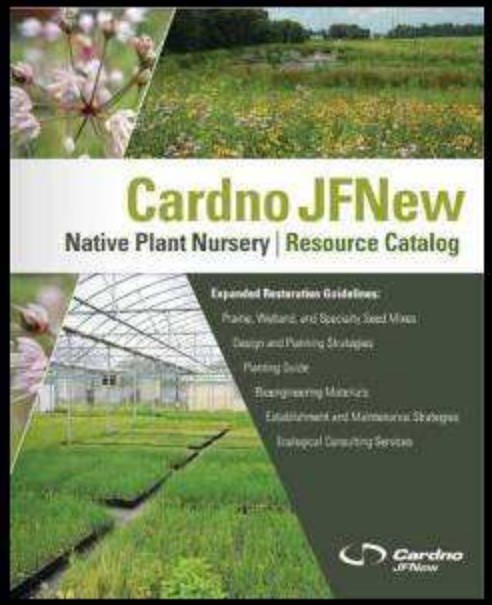
BASS PRO SHOPS OUTDOOR WORLD | MESA, AZ

RANKEN JORDAN PEDIATRIC SPECIALTY HOSPITAL | MARYLAND HEIGHTS, MO

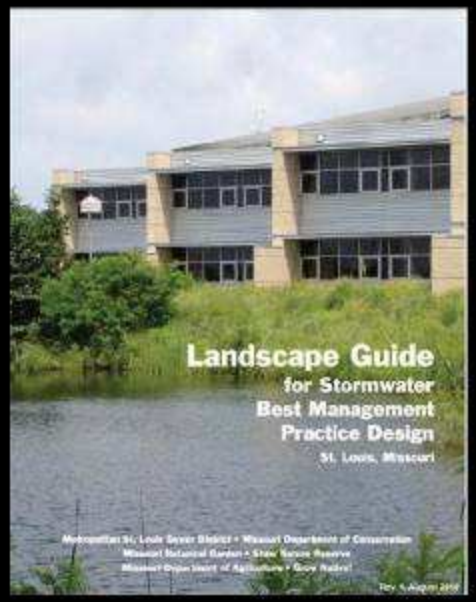
PLANT PALETTE

- Provide Seasonal Interest
- Understand Mature Height / Character
- Know Cultural Requirements / Communities
- Diversity of Selections
- Maintenance Requirements
- Long Term vs. Short Term
- Plant Availability

PLANT PALETTE



http://www.cardnojfnew.com/



http://www.stlmsd.com/home

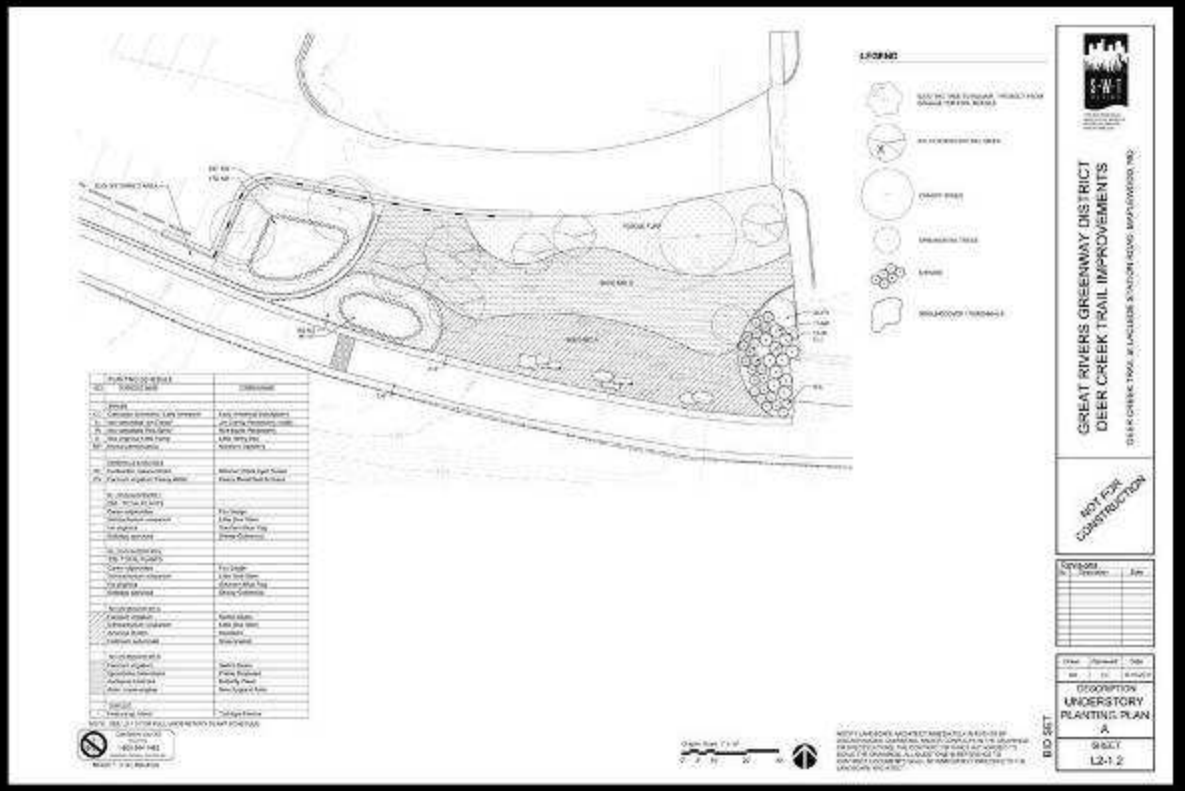
- Missouri Botanical Garden:
  http://www.missouribotanicalgarden.org/
- Bohn's Farm:
  http://www.bohnsfarm.com/

- Forrest Keeling Nursery
  http://www.fknursery.com/
- Pea Ridge Forest Tree Farm:
  http://www.pearidgeforest.com/

RESOURCES

Refine Design

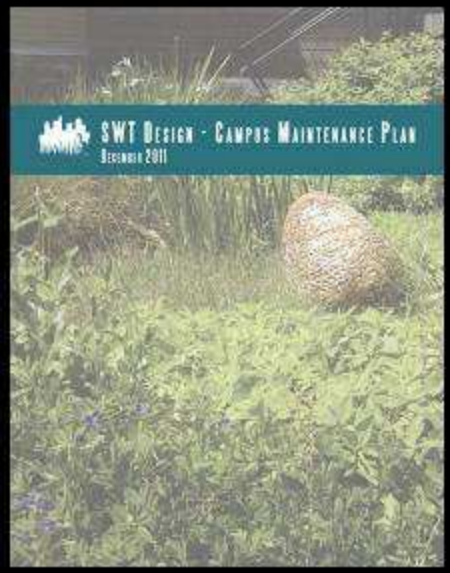
- Location of Plants / Layout
- Understand Both Horizontal and Vertical Relationship of Plants
- Ensure Limits of Plants to be Preserved
- Determining Grow-In Requirements
- Cost Analysis Impact of Plant Sizes



REDEFINE DESIGN

MAINTENANCE NEEDS

- Short Term vs. Long Term
- Develop Maintenance Plan
- Sustainable Practices
- High Visibility vs. Low
- Understand the Evolution of Design



REDEFINE DESIGN

TED'S TOP 10 PLANTS

Diospyros virginiana – Persimmon

Chionanthus virginicus – White Fringe Tree

Zizea aurea – Golden Alexander

TED'S TOP 10 PLANTS

Iris fulva – Copper Iris

TED'S TOP 10 PLANTS

Carex pensylvanica – Sedge

TED'S TOP 10 PLANTS

Juncus effusus – Rush

TED'S TOP 10 PLANTS

Eupatorium 'Little Joe' – Joe Pye Weed

TED'S TOP 10 PLANTS

Lobelia cardinalis, L. siphilitica – Cardinal Flower, Great Blue Lobelia

TED'S TOP 10 PLANTS

Baptisia australis, B. sphaerocarpa – False Blue Indigo, Yellow Wild Indigo

TED'S TOP 10 PLANTS

Amsonia hubrichtii – Thread Leaf Blue Star

A. tabernaemontana 'Short Stack'

A. tabernaemontana

A. illustris

Rain Garden

A rain garden is a planted depression that allows rainwater runoff from impervious surfaces, such as roofs, driveways, and walkways, to be absorbed. This reduces rain runoff by allowing stormwater to soak into the ground. Rain gardens can cut down on the amount of pollution reaching creeks and streams by up to 30%. The SWT Design rain garden collects water from the front parking area, funneling it through a rock stream bed under the building bridge to the garden's water feature. During storm events, water will flow into the garden permeate the ground. Excess water overflows through an underground pipe into the granular base of the adjacent permeable paving system.

Time 00h:00m

Time 00h:03m

Time 00h:08m

Time 00h:15m