



Designing with Land and Water

Integrating Ecology, Green Infrastructure and Stormwater Management in Landscape Architecture



Who are we?



Professionally trained and licensed ecologists and landscape architects.



Our unique combination of training allows us to design spaces that are both **beautiful and functional**.



We collaborate with our clients to create **one-of-a-kind designs** to meet their unique needs.





GI Design Goals

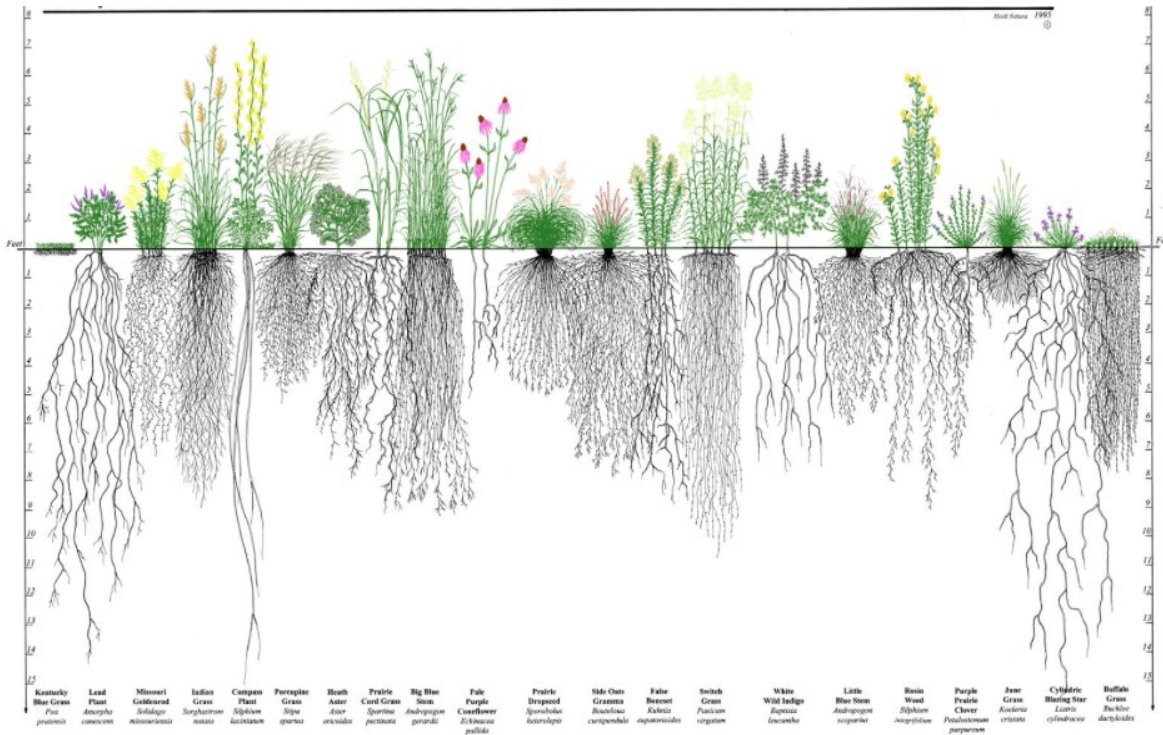
To analyze the optimal ways to use the land in a regenerative manner to:

- Increase carbon storage through nature-based solutions (Green Infrastructure)
- Integrate human health benefits of nature
- Improve water quality and flood storage
- Maximize biodiversity and wildlife habitat

Nature-Based Solutions!

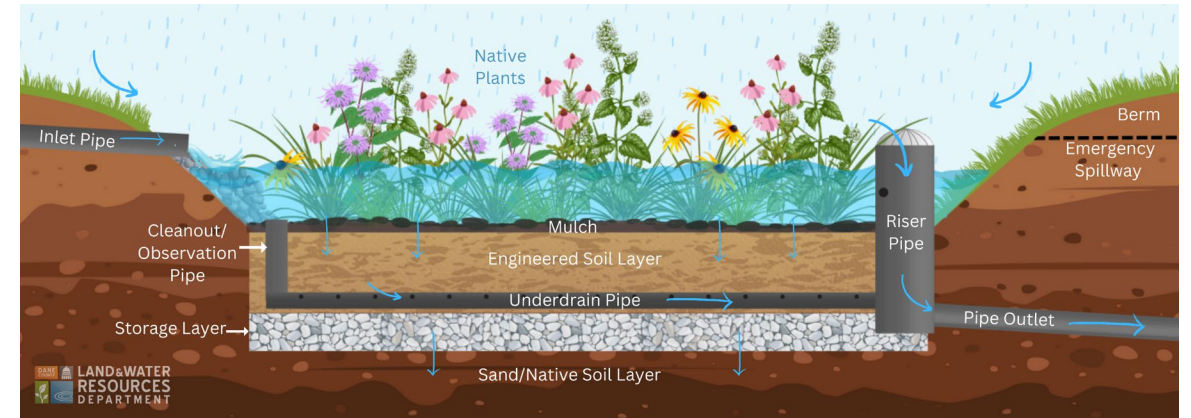
Reasons for Choosing Native Plants:

Native plants are drought tolerant



www.conservationresearchinstitute.com

They filter stormwater

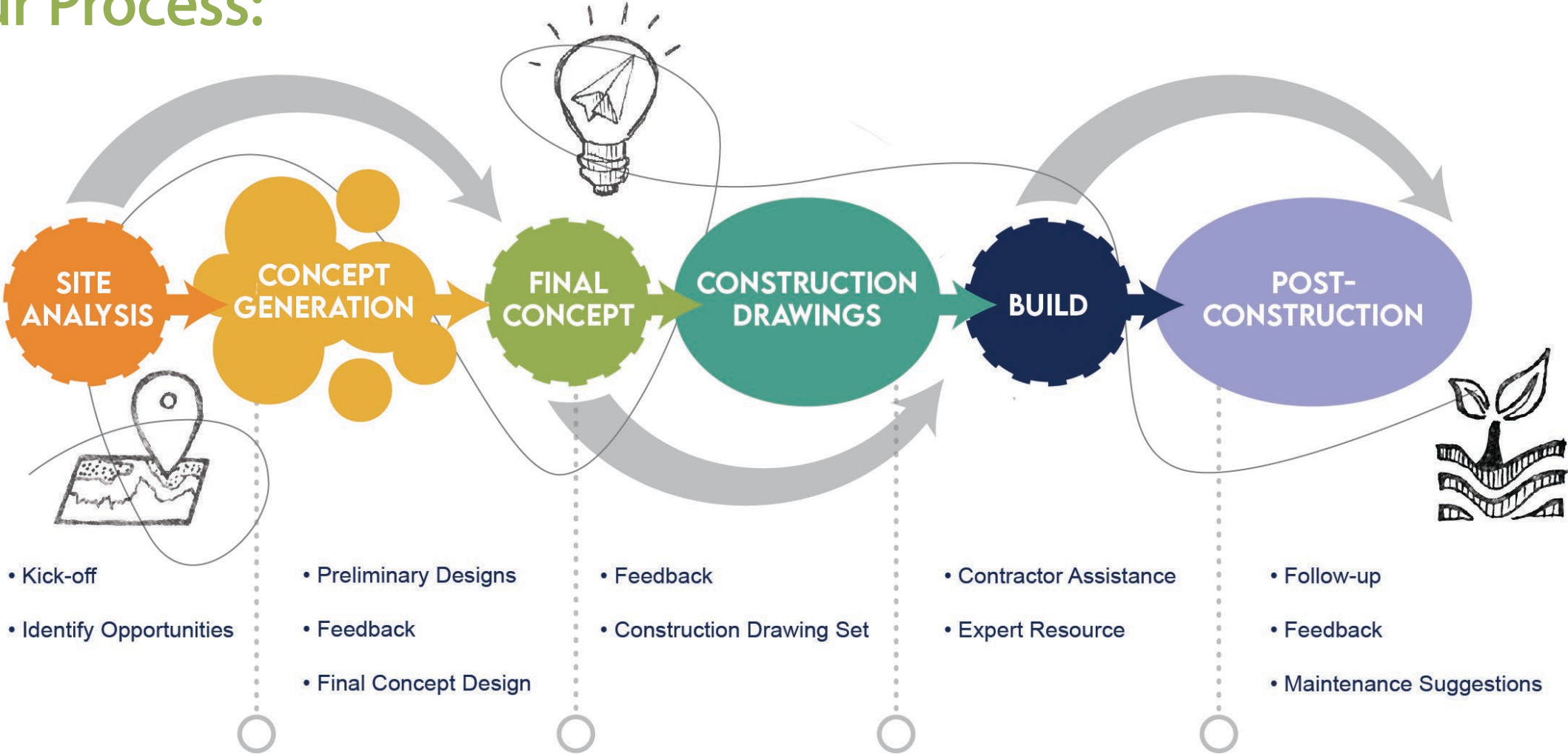


Dane County Stormwater Manual

They are better for wildlife

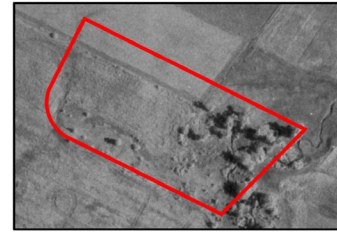
1. Insects are disappearing at an alarming rate
2. Native oaks support 400 species of insects on one tree vs. non-native supports only 2
3. Insects feed songbirds & small mammals
4. Birds and mammals feed hawks and other predators

Our Process:



Site Analysis

- ✓ **ANALYZE:** Existing site features and vegetation
- ✓ **WHAT:** Do you want to keep or preserve?
- ✓ **WHAT:** Do you want to change or enhance?
- ✓ **WHERE:** Are the best entrance points, views?
- ✓ **DETERMINE:** Zones, wind, sun, shade soils
- ✓ **DIAGRAM:** Circulation flow through site



1978 Aerial: Prior to development, the creek meandered through the site with large canopy trees

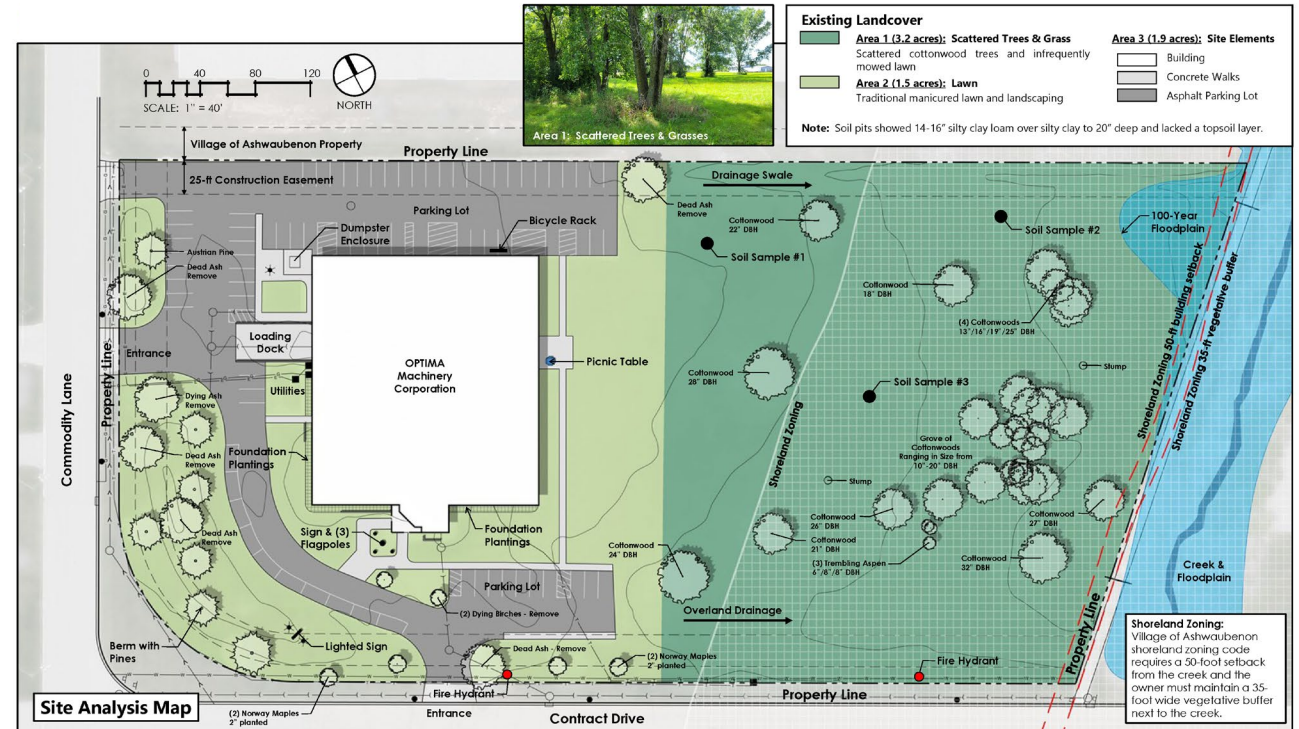
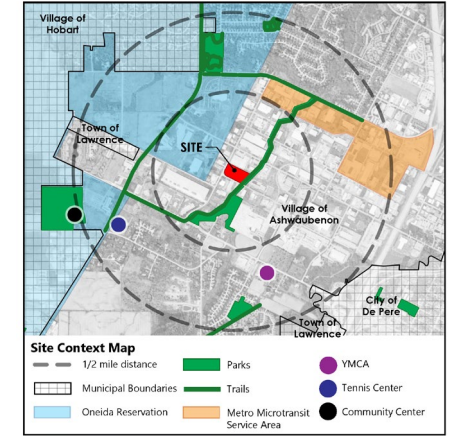


1992 Aerial: The creek bed was straightened and all large trees were removed from the site

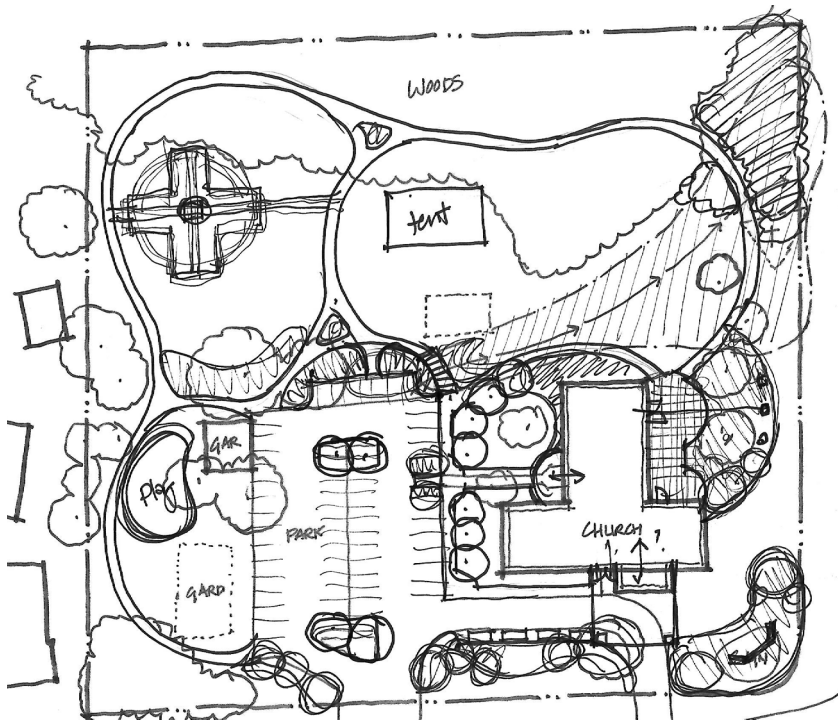


Species Richness: 60 plant species were recorded on site with 30 being native species. Dominant species included Eastern cottonwood, tall fescue, and yellow foxtail. Aggressive invasive species observed were common buckthorn shrubs and some garlic mustard.

The FQI (Floristic Quality) biodiversity for plants. The (over 35.0 is a very high lots of diversity).



Concept Generation

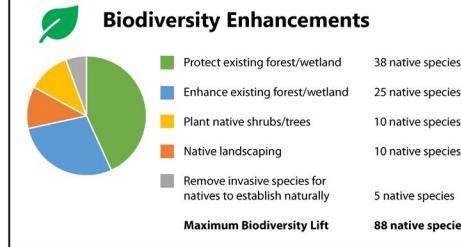


Concept Sketch (above) shows initial design process thinking



Concept Plan

Concept Plan (above) shows client a scaled plan of all proposed elements but not as detailed as a construction drawing.



- ### Human Health Enhancements
- Expanded parking lot with 66 spaces
 - Fenced community garden
 - New playground
 - Canopy to help identify as church
 - Concrete paths for circulation, ADA
 - Looped walking paths for exercise
 - Meditation garden for quiet reflection
 - Tent space for events
 - Outdoor pavilion
 - Deck next to church
 - Increased ADA access
 - Educational signage
 - Orchard trees
 - Seating areas



Site Amenity Examples

Right Plant, Right Place

It's important to **study plant requirements** to make sure they are adapted to various site conditions such as **DRY vs. MOIST; SHADY vs. SUNNY; SANDY SOILS vs. CLAY SOILS**

Wet Conditions



Perfoliate Boneset



Cardinal Flower

Dry Conditions



Purple Prairie Clover



Grey Headed Coneflower

Aesthetic and Maintenance Considerations

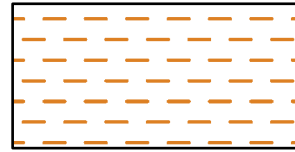
- Choose plants that will complement each other across the season and also provide nectar for pollinators all season
- Choose a reduced plant palette so maintenance becomes simplified

Bioswale Plugs:

SPRING/EARLY SUMMER

SUMMER/FALL

Mix 1

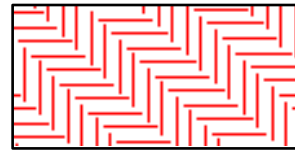


Spiderwort
Tradescantia ohioensis



Orange Coneflower
Rudbeckia fulgida

Mix 2



Obedient Plant
Physostegia virginiana



Riddell's Goldenrod
Solidago riddellii

Mix 3



Golden Alexander
Zizia aurea



New England Aster
Symphyotrichum novae-angliae

Construction Administration

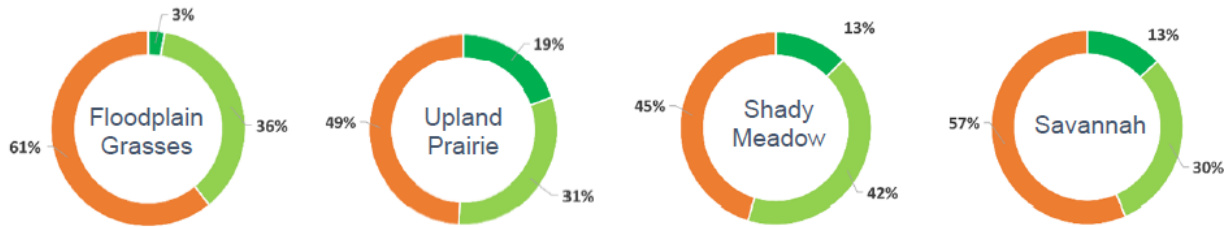
Why Is It Important?

- Prevent plant substitutions of plants that will not work at the site or with the design
- Make sure the contractor understands how to install the plants and the design intent
- Prevent plant shortages or poor-quality material from being installed or installed incorrectly
- Prevents costly mistakes and saves money!



Post-Construction Monitoring

Zone	Date	Species Richness (Total N)	# of Native Species	FQI	Mean C	# From Seed Mix	% Established From Seed Mix
A - Floodplain Grasses (Seed Mix 1)	2021	90	43	13.8	1.5	8	9%
	2022	111	58	14.8	1.4	9	8%
	2023	74	29	9.1	1.1	2	3%
B/C - Upland Prairie (Seed Mixes 3/4)	2021	74	38	16.6	1.9	22	30%
	2022	87	47	19.3	2.1	24	28%
	2023	67	34	13.4	1.6	13	19%
D - Shady Meadow (Seed Mix 2)	2021	99	52	14.3	1.4	4	4%
	2022	94	54	17.3	1.8	8	9%
	2023	64	35	14.3	1.8	8	13%
F - Savannah (MKE CO Seed Mix)	2021	68	30	12.6	1.5	11	16%
	2022	62	34	13.1	1.7	11	18%
	2023	46	20	11.8	1.7	6	13%



The charts above show the percent number of plant types (plants established from seed mix, native volunteers, invasive volunteers) relative to the total number of species.

Is the planting meeting performance standards?



MAINTENANCE: KNOW YOUR WEEDS

There are several other weeds that are invasive, if you control at least these three and all woody plants, you should be in good shape.



Phragmites – very tall / recognizable
invasive wetland grass

Reed Canary Grass – common invasive
wetland grass

Thistle – invasive with distinct prickly
leaves and purple flowers



A Case Study Project

MPS Green & Healthy Schools Cohort 6

Morse Middle School Milwaukee, WI

Before

Images by Reflo.



After

MPS Green & Healthy Schools Cohort 6 Morse Middle School

Milwaukee, WI



Green Infrastructure



Open Space Design



Public Projects



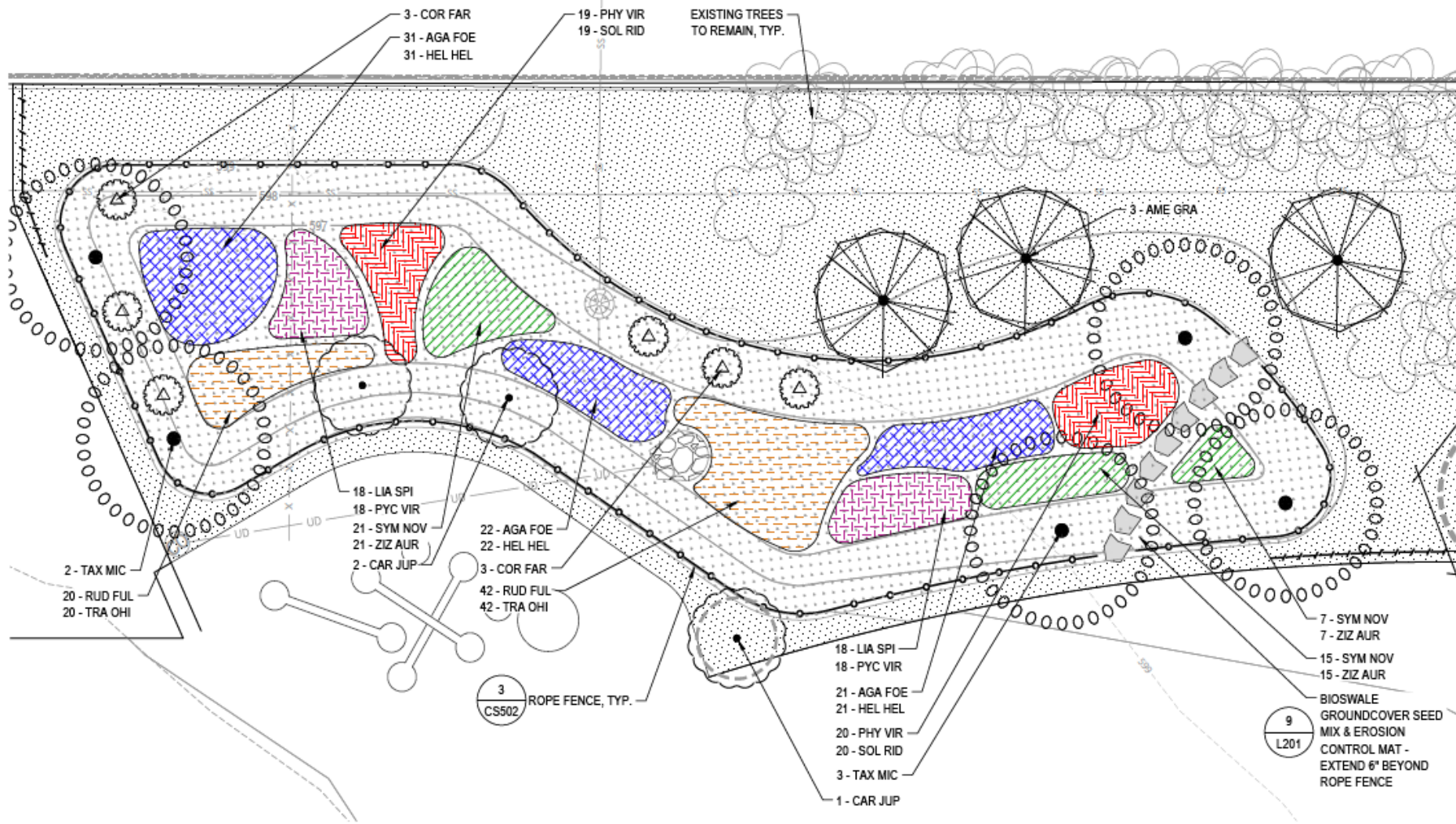
Neighborhood Redevelopment

Image by Smithgroup.

- Each year, five schools are selected to be part of the Green and Healthy Schools program
- Transforms bleak asphalt play yards into lush, active recreational zones
- Programmatic elements include bioswales that collect stormwater runoff, outdoor classrooms, stormwater trees, a micro forest, and a variety of recreational play zones.
- Organized and run through Reflo, a not-for-profit organization that focuses on integrating green infrastructure and education on the importance of ecology in urban areas.

Concept Design

Bioswale Planting Design



1 BIOSWALE 1 ENLARGEMENT

SCALE: 1" = 10'-0"



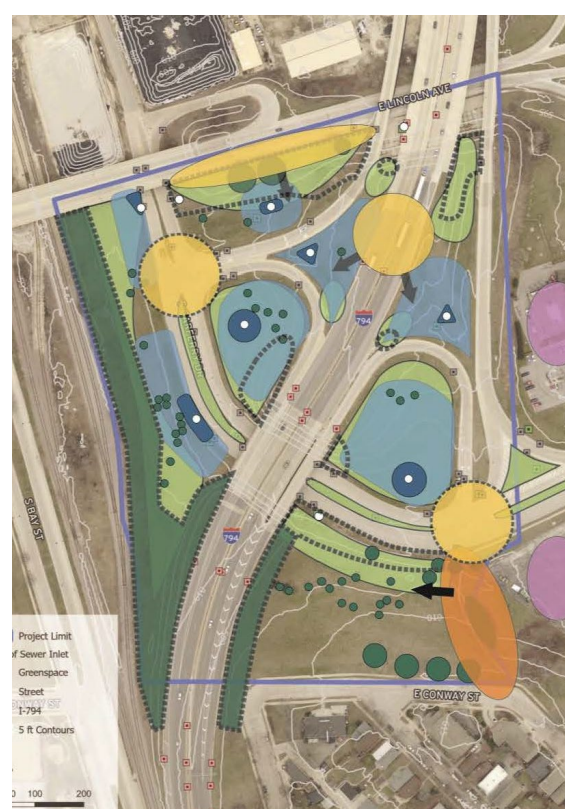
Construction Administration





The Completed Design in Use





Green Infrastructure Projects Port of Milwaukee Overpass Milwaukee, WI



- Collaboration with MMSD, City of Milwaukee, WisDOT, HNTB
- Community engagement
- Enhances underused open space that brings natural elements into an urban environment
- Implements successful stormwater collection strategies including bioswales and native buffer strips
- Attracts pollinators and diversity
- Adds stormwater trees for shade and ecological health

Green Infrastructure Projects

Holt Overpass Milwaukee, WI



1



2

Existing Vegetation Site Inventory



3



4



5

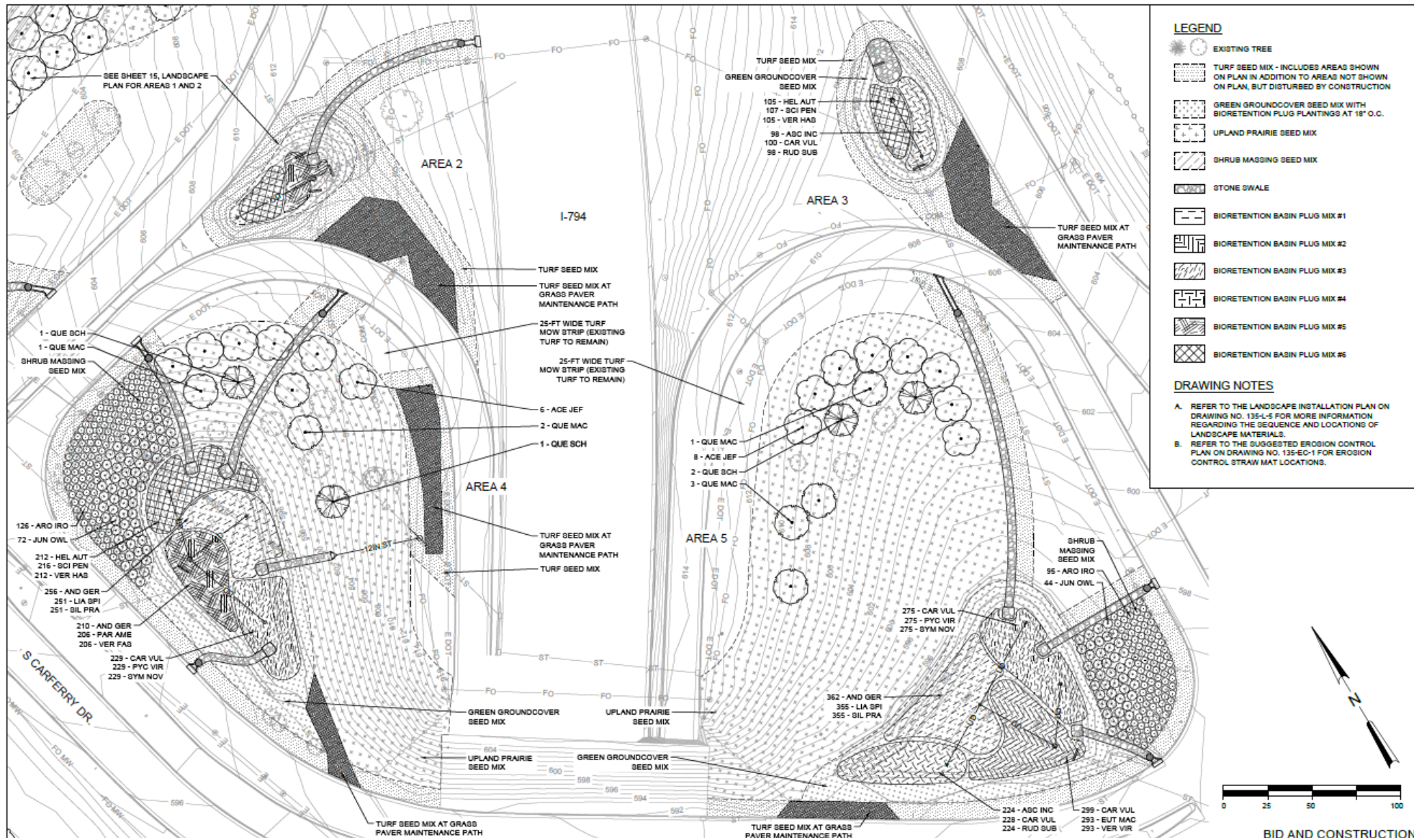
Green Infrastructure Projects Holt Overpass Milwaukee, WI

Concept Design

Selected Alternative

- Manages over 485,000 gallons during a major rain event
- De-Pave the entire Park and Ride and replace with green infrastructure
- Maintenance / walking path
- Bioretention areas united by a common plant palette
- Stormwater trees manage stormwater and create bold shapes. Trees are spaced to maintain sightlines for safety
- Native plantings filter stormwater along steep slopes draining to a low point







Construction Administration



Post-Construction Monitoring to Begin in 2026



New Testament Church Wetlands Milwaukee, WI



Green Infrastructure

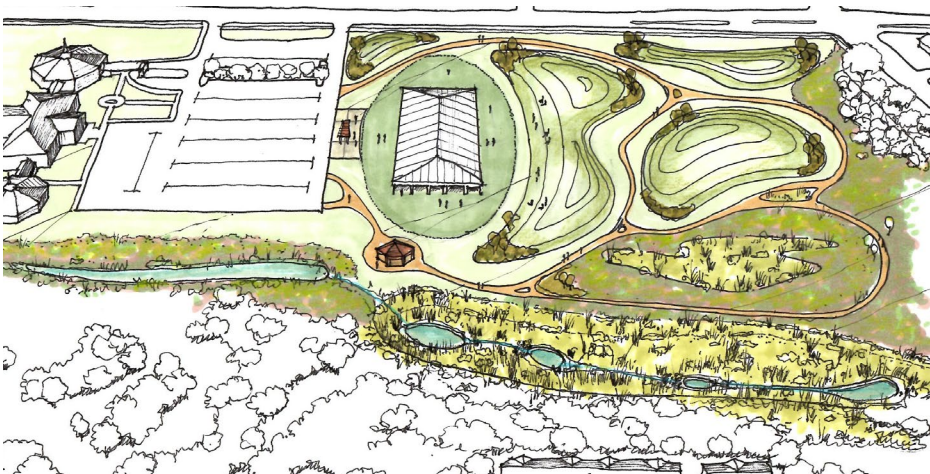


Open Space Design



Ecological Design

- Collaboration with MMSD, Corvias Infrastructure Solutions, LLC, Aqualis
- Public Private Partnership with Church
- Captures and Treats 1.86 Million Gallons of Stormwater Using a Constructed Wetland
- Restored Ecological Health with Diverse Plant Communities
- Plan for Surrounding Areas including Picnic Areas and Amphitheater for the Church



30th Street Stormwater West Basin Milwaukee, WI



Green Infrastructure



Open Space Design



Public Projects

- Collaboration with MMSD, City of MKE, Smithgroup, and HNTB
- Focus on Capturing Stormwater during Flood Events
- Creates a Variety of Places to People to Use in a Densely Populated Urban Area
- Incorporates Themed Educational Signage, Recreation, Activity Nodes
- Establishes Plant Communities such as Prairie, Oak Savannah, Wetland Plants



