Jacobs Challenging today. Reinventing tomorrow.

DC Water's Green Infrastructure Challenge Parks Project

2019 CWEA Stormwater Seminar

Proven Strategies for Stormwater Program Success: Challenges and Solutions from Design to Implementation

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Green Infrastructure Challenge – Background

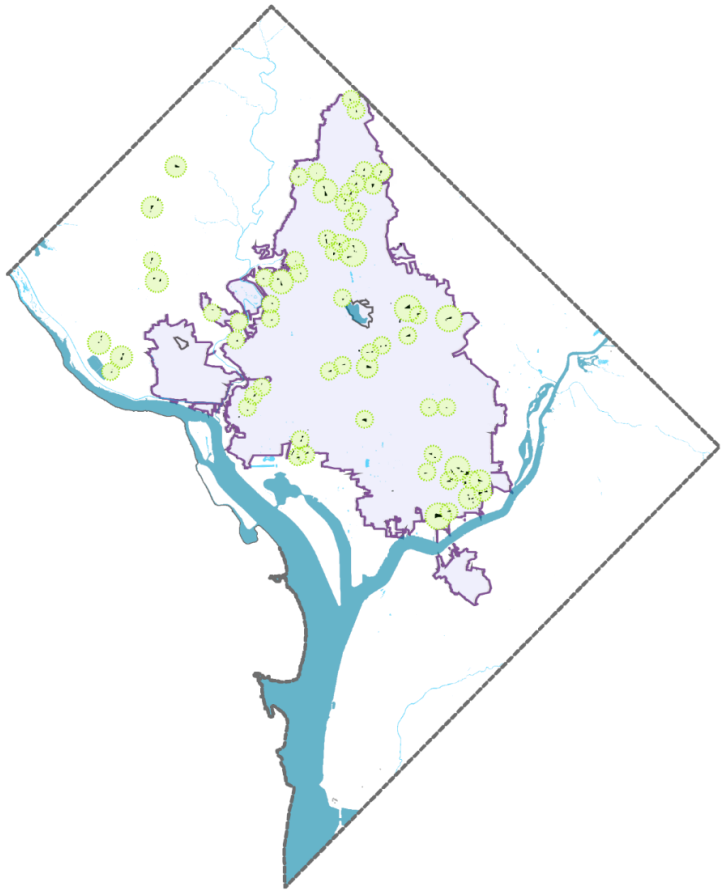
- April 2013 - DC Water launched the Green Infrastructure (GI) Challenge, engaging firms to design innovative green practices that capture stormwater runoff
- The Challenge: develop innovative and practical GI solutions for DC in either public spaces, commercial/private properties, or government/institutional properties
- Part of DC Water's Clean Rivers Project's pilot GI program and associated efforts to reduce combined sewer overflows (CSOs)

Green Infrastructure Challenge – Timeline

- April 2013: 1st Phase of Competition kicked off
- January 2014: 7 projects announced as winners of the Challenge's 1st phase
- May 2014: 2nd Phase of competition began
- March 2015: DC Water awarded additional funds for construction to two of the Phase 1 winning projects
- January 2017: DC Water seeks Commission of Fine Arts (CFA) approval and Project goes to Bid
- Spring 2019: Construction Complete

Jacobs' GI Challenge Phase 1 Submission

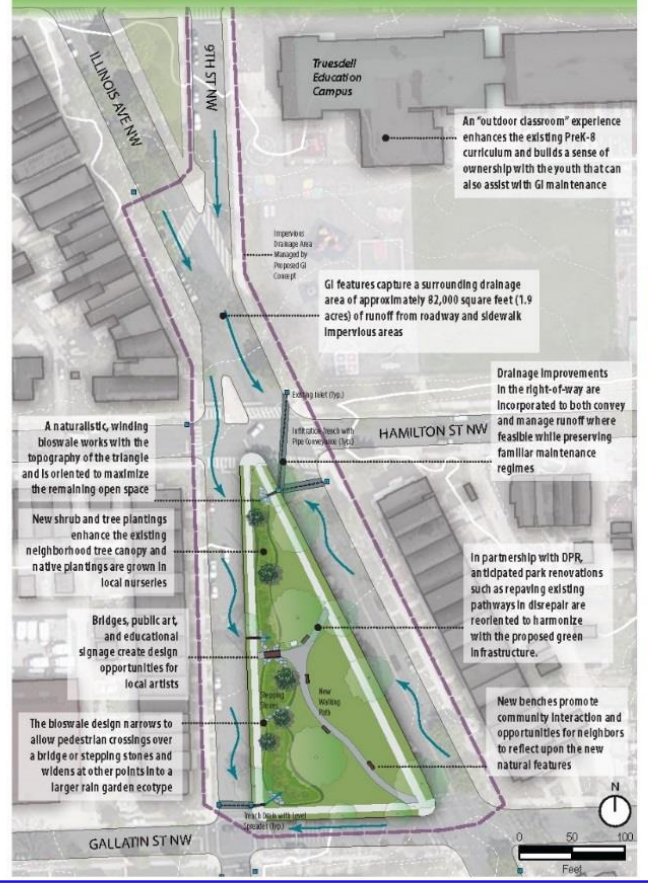
- "Greening the District's Geometry: Enhancing L'Enfant's Plan"
- JACOBS selected a triangular open space site ("choose your own site" option)
- Typology of underutilized existing green spaces that result from the combination of diagonal avenues and perpendicular street grid
- Overarching vision to re-purpose these triangles to provide more usable green spaces that enliven communities while simultaneously enhancing water quality in the District
- Create 2 typical designs that could be replicated throughout the City



GREENING THE DISTRICT'S GEOMETRY:
ENHANCING L'ENFANT'S PLAN
DC Water Green Infrastructure Challenge: Public Space Submission

"Greening the District's Geometry: Enhancing L'Enfant's Plan" proposes a creative, replicable, and cost-effective green infrastructure typology to manage right-of-way runoff throughout Washington, D.C.'s combined sewersheds, reducing combined sewer overflows while enhancing the city's neighborhoods. The multitude of triangular and circular spaces carved out by the city's distinctive street layout - created by L'Enfant's master plan of 1791 - provides a unique programmatic opportunity to improve water quality while providing community benefits. **CH2M HILL's proposal aims to re-purpose these underutilized triangles into a network of green infrastructure systems.** A detailed plan is presented here for the triangle at Illinois Avenue and 9th Street NW in the Brightwood Park neighborhood of the Rock Creek sewershed. While compelling on its own accord, **the concept is intended to be a typology that can be easily replicated on a much larger scale.** Over 200 years after L'Enfant's plan was developed, **now is the time to re-envision the City's urban green spaces as prime sites to accomplish more** – achieving multiple goals related to sustainability, education, community enhancement, the economy, and to stormwater management and CSO reduction, which are most critical to DC Water's water quality initiatives.

TRANSFORMING AN UNDERUTILIZED TRIANGLE INTO A GI PILOT PROJECT ADDS VALUE TO THE NEIGHBORHOOD



REPLICABLE DESIGN PROVIDES COST-EFFECTIVE STORMWATER MANAGEMENT AND CSO REDUCTION

The green triangle GI features are flexible and can easily be scaled in size depending on the amount of contributing impervious area. In general, concepts managing larger drainage areas exhibit a better cost-efficiency.

Based on a review of over 200 GI projects nationwide, **this project is extremely cost-effective at $0.19/gallon/year for implementation.**

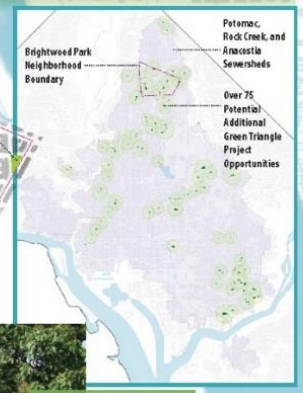
Drainage Area Managed:
82,000 ft

Annual Capture Volume:
1,563,000 gallons/year

Implementation Cost:
$0.19/gallon/year
$157,000/acre

INNOVATIVE CONCEPT CREATES THE OPPORTUNITY FOR A CITY-WIDE NETWORK OF GREEN INFRASTRUCTURE

A simple design typology that can be repeated at over 75 similar "green" triangles, circles, and right-of-way medians.



GREENING THE DISTRICT'S GEOMETRY DELIVERS A WIDE RANGE OF ENVIRONMENTAL, ECONOMIC, AND SOCIAL BENEFITS

The new green triangle at Illinois and 9th delivers a variety of benefits, **with significant cumulative benefits if the green triangle park typology is replicated throughout the combined sewersheds on a City scale.**

CH2MHILL

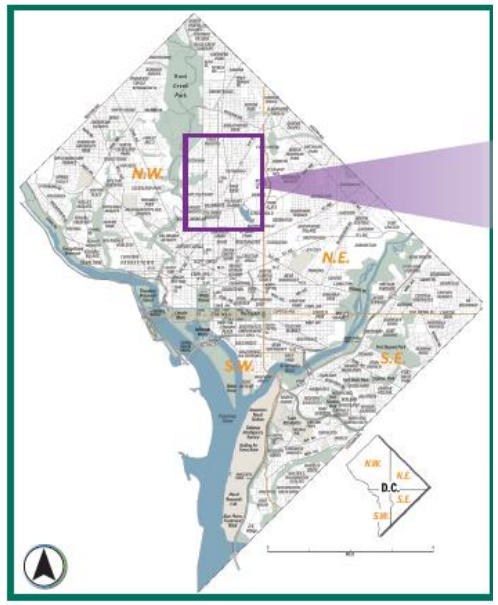
Prepared by CH2M HILL/10.01.13

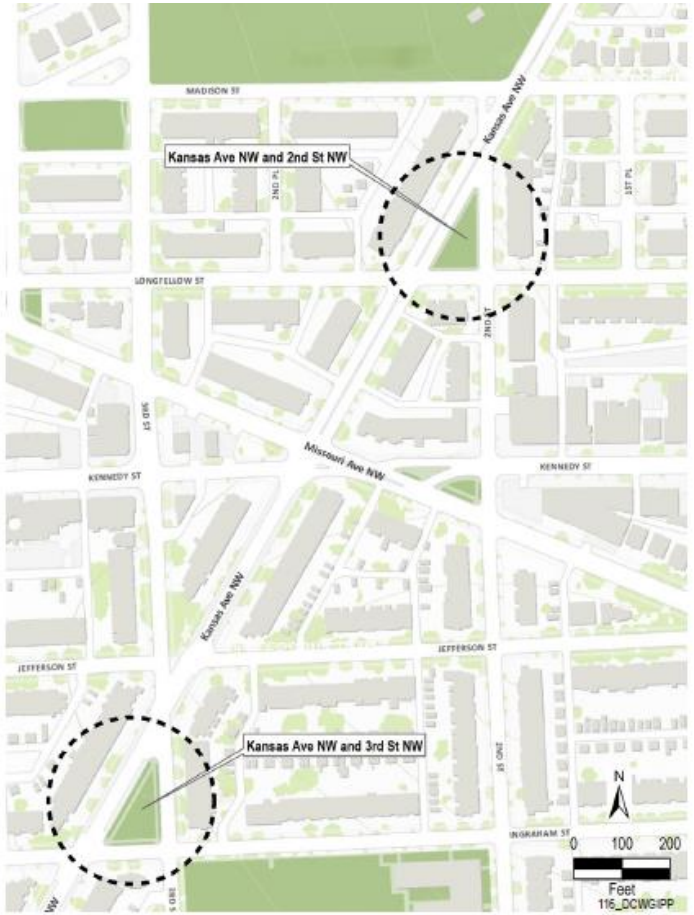
DC Water GI Challenge Phase 2

- Firms competing in 2 categories:
  - 2 firms for GI Streetscape
  - 2 firms for GI Parks
    - DC Water requested 15% conceptual plan packages for two specific existing triangular park sites
      - Site and Materials Plan
      - Demo Plan
      - Utility Plan

Final Design differed from winning conceptual design due to integration of CFA comments

Chosen Sites:
Kansas Ave NW and 2nd St NW & Kansas Ave NW and 3rd St NW

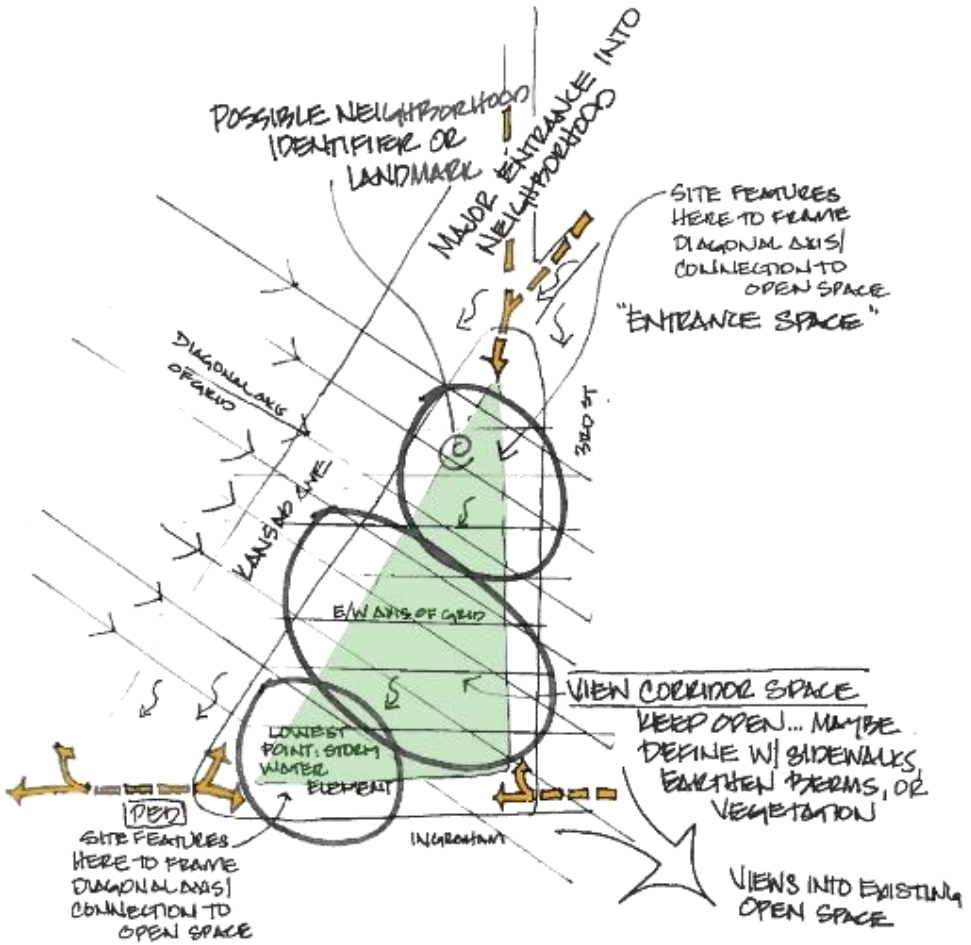




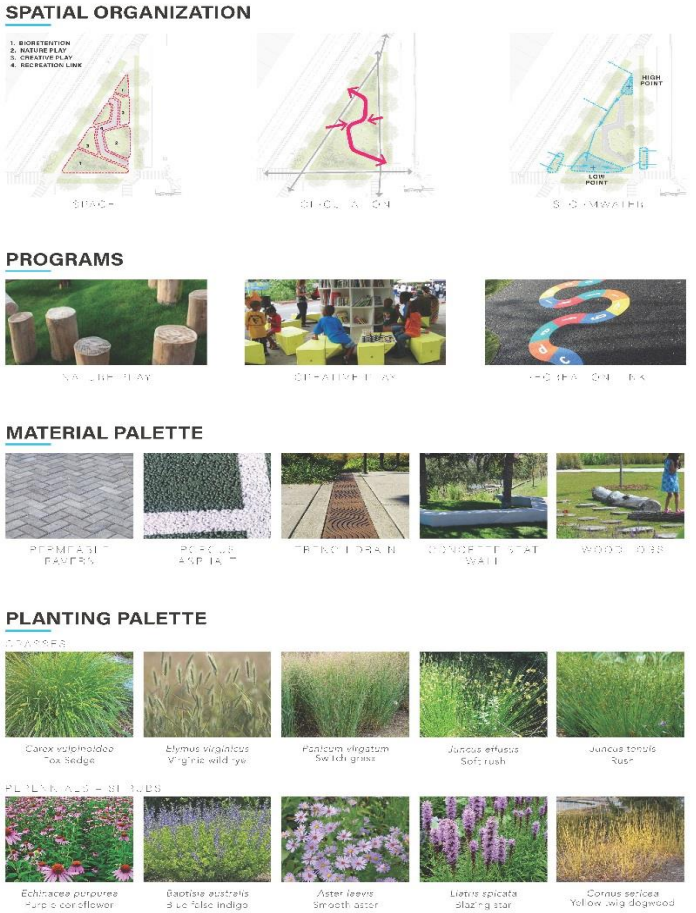
The two triangle parks are located less than 3 blocks from each other in the Brightwood Park neighborhood.

JACOBS' GI Challenge Phase 2 – Design Approach

- Landscape architectural focused design approach (balanced with engineering technical knowledge)
- Re-purpose the underutilized ‘triangles’ as community assets that achieve CSO reductions while emphasizing revealed stormwater processes.
- Considered site constraints, neighborhood character, and goals of other DC agencies (DDOT, DPR, DOEE, CFA, …).
- Integrated stormwater management features and aesthetically pleasing functionality.
- Intended to include typologies that can be replicated on a larger scale for a citywide “green triangle” program



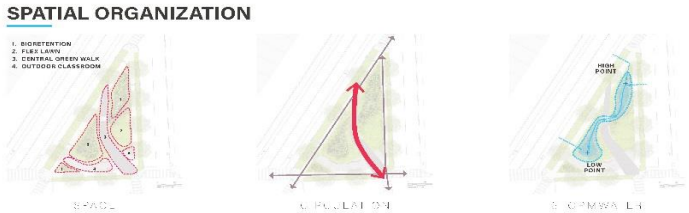
Site and Materials Plan: Kansas and 2nd



KANSAS AVENUE GI PARKS PROJECT

KANSAS & 2ND ST. NW

Site and Materials Plan: Kansas and 3rd



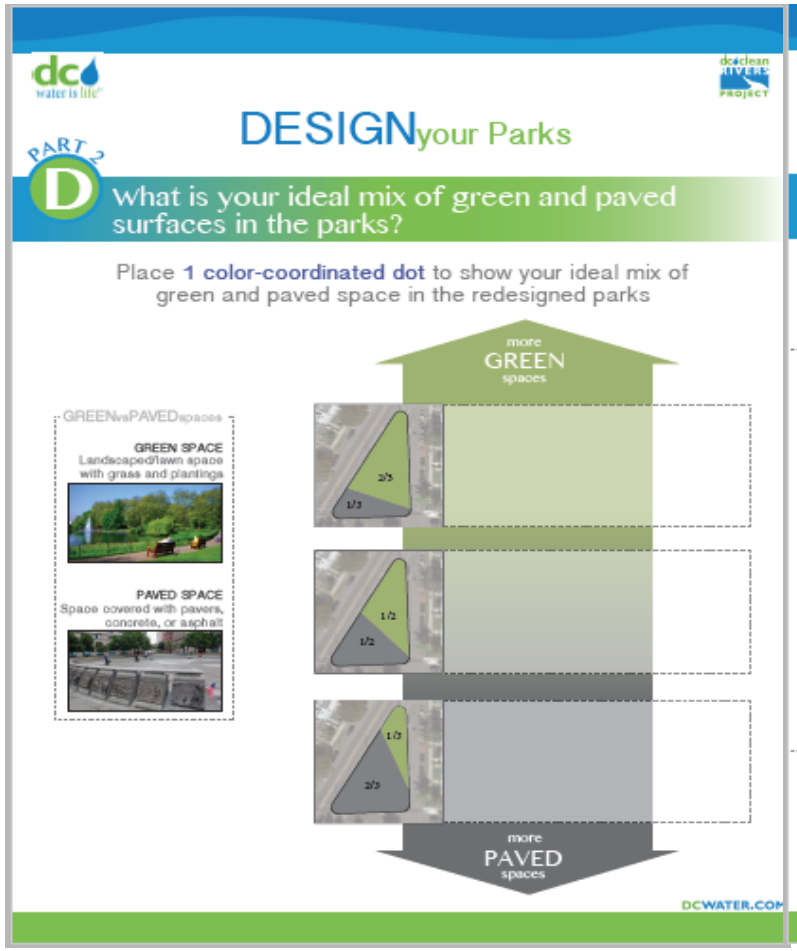
KANSAS AVENUE V PARKS PROJECT

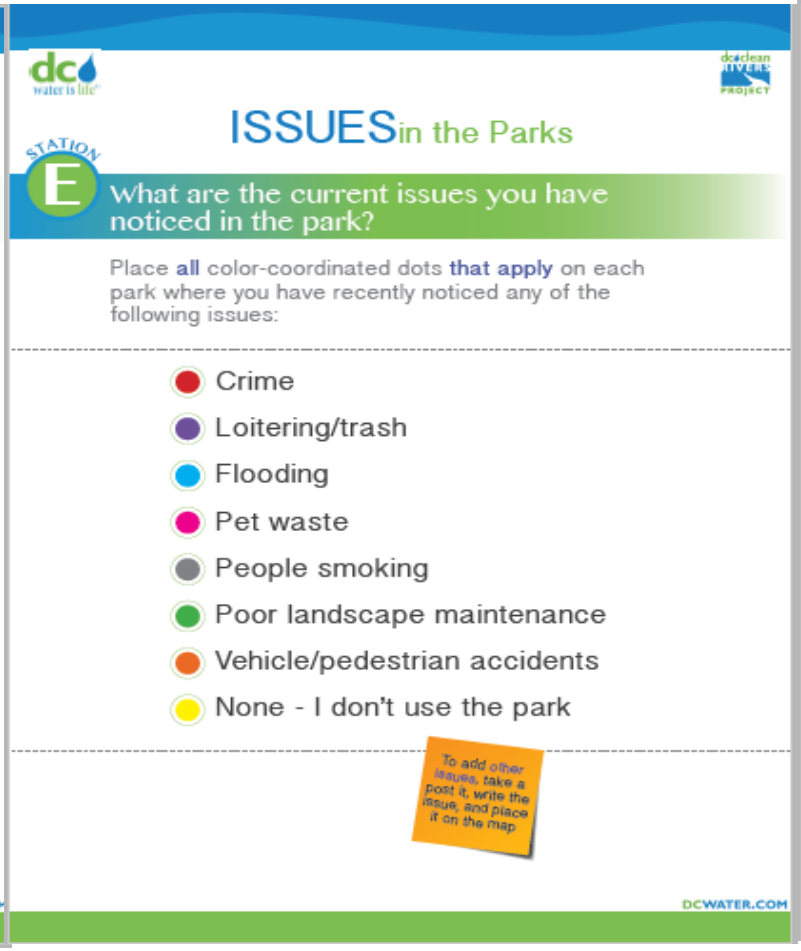
KANSAS & 3RD ST. NW

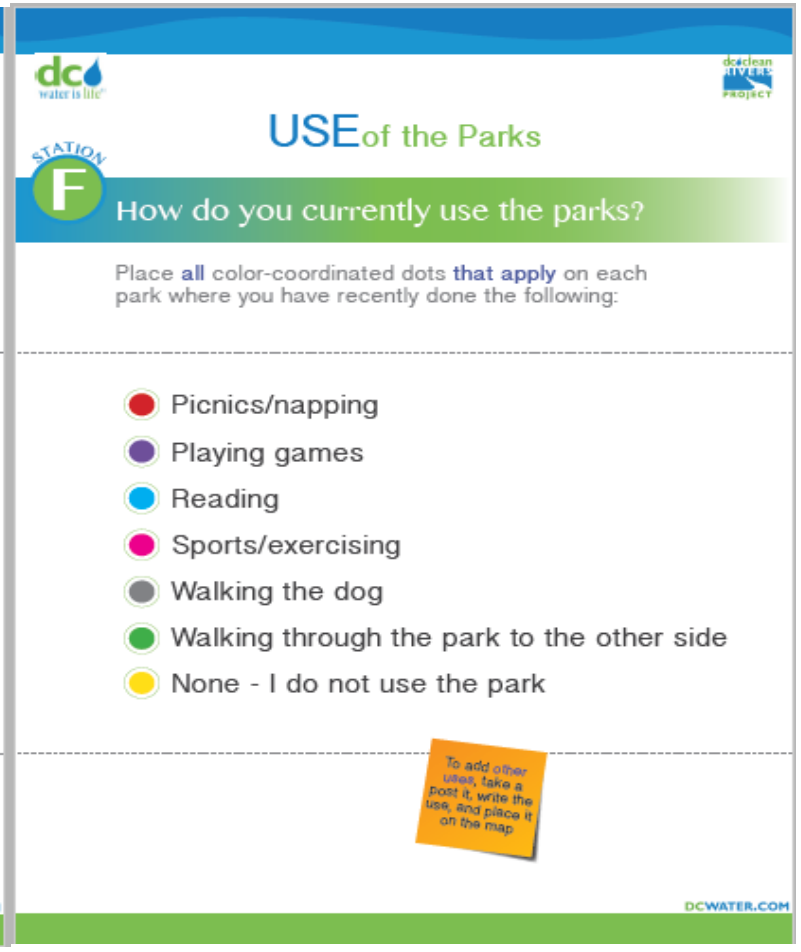
Phase 2: Design Development Phase

- 15% Conceptual Plan Package
- 50% Intermediate Design
- 90% Design
- 100% Design
- Public Outreach

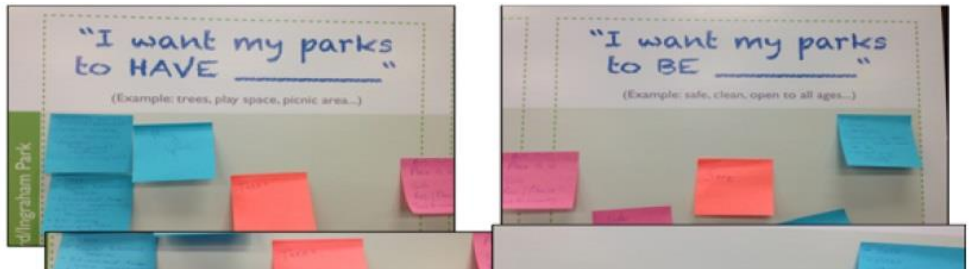
Public Outreach Process







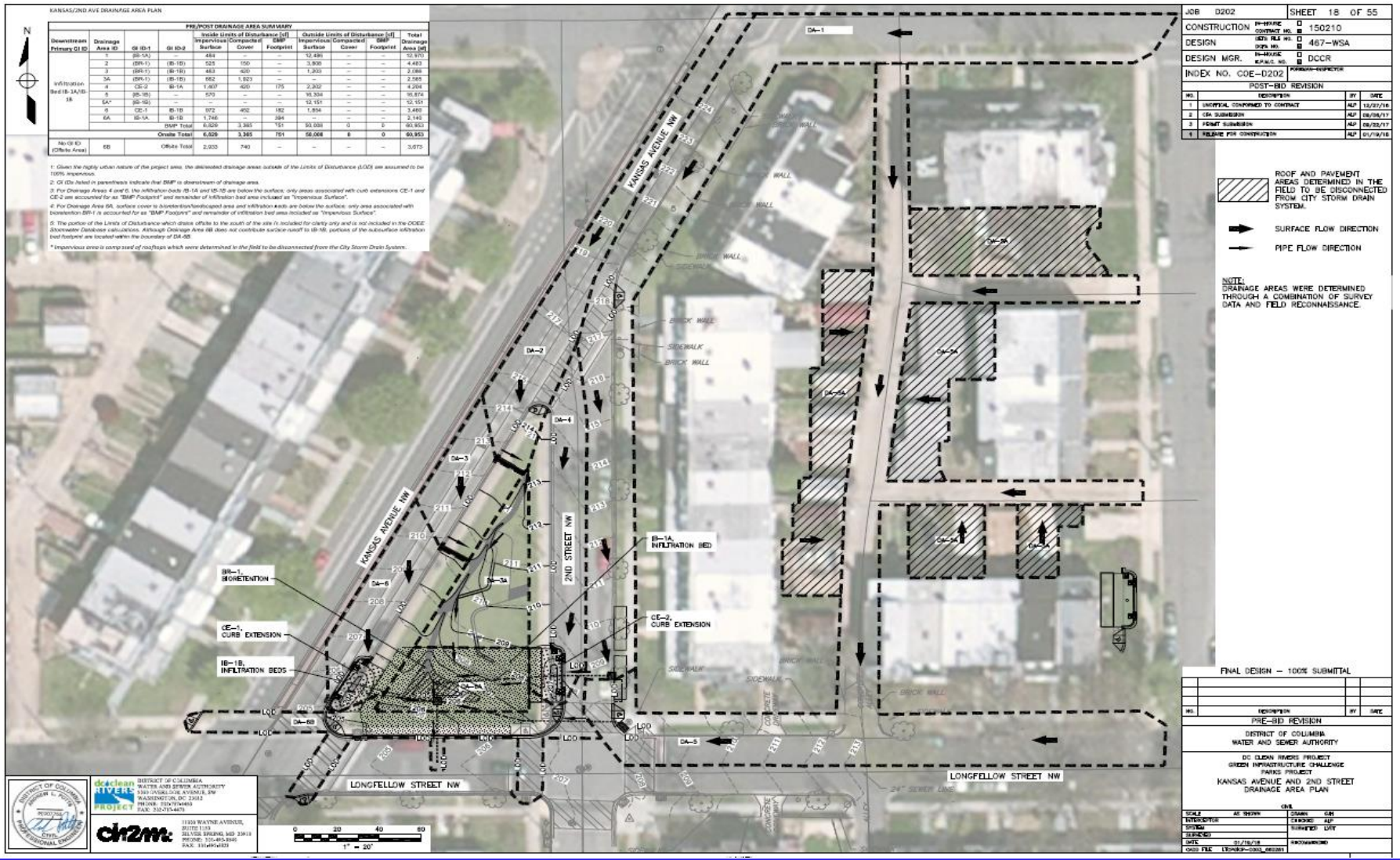
Community Visioning for the Parks



Station I. Vision for the Parks - Results

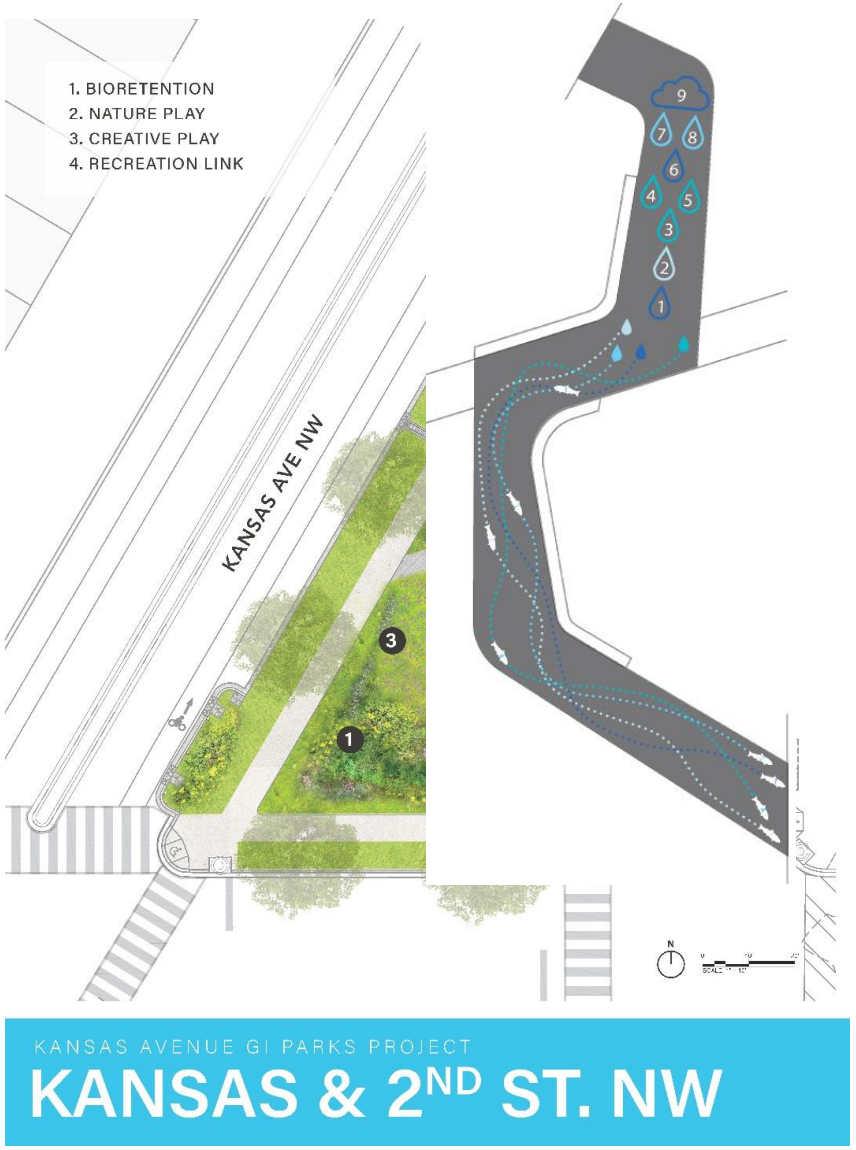
3rd & Ingraham		2nd & Longfellow	
… to HAVE	… to BE	… to HAVE	… to BE
Art (interactive, Musical)	Attractive	Art - interactive, Musical- (2 votes)	A place to gather with neighbors
Bike parking	Both areas to have similar feel or landscape	Benches or sitting place (5 votes)	A space that encourages cleanliness
Capital bikeshare station	Clean (3 votes)	Bike parking (1 vote)	Attractive
Do not want a picnic area	Clean	Capital bikeshare station (1 vote)	Beautiful
Educational stormwater opportunities	Community space where people want to be	Dog park (1 vote)	Both areas to have similar feel or landscape
Equipment for older youth (like with CarterBarron)	Educational (stormwater, history)	Educational Stormwater opportunities (1 vote)	Clean (4 votes)
Historic markers (if applicable)	Nothing here new	Do not want a picnic area (1 vote)	Colorful
Native plant rain gardens/Few flowers (2 votes)	Open to all ages	Few flowers (1 vote)	Community hub (2 votes)
Permeable pavers	Safe (5 votes)	Free grass (1 vote)	Community space where people want to be
Pervious pavement	Should draw all ages	Garbage bin /trash can/open trash (3 votes)	Educational (stormwater, history)
Benches/Place to sit (3 votes)	Well lit	Historic markers (if applicable) (1 vote)	Inviting
Play space/for kids/(playgroung?,sandbox?, mini climbing wall? (3 votes)		Lights (1 vote)	Lite
Rec- fitness/Track for running(3 votes)		Trees/ + other shorter greenery (shrubs, etc)/ Medium trees/ shade (5 votes)	Quiet at night
Trees/Medium trees (3 votes)		Native plants, rain gardens (2 votes)	Safe (6 votes)
Safe (2 votes)		Neighborhood branding (1 vote)	
Well lit (2 votes)		Paths or something that gives structure and a structured place to walk to get across (1 vote)	
		Permeable pavers (1 vote)	
		Pervious pavement (1 vote)	
		Play space/for kids/playgroung?,sandbox?, mini climbing wall? (4 votes)	
		Rec.- fitness/ Track for running (2 vote)	
		Seating with shade (1 vote)	
		Water for hot days (but not mosquitoes)	

Drainage Area Maximization



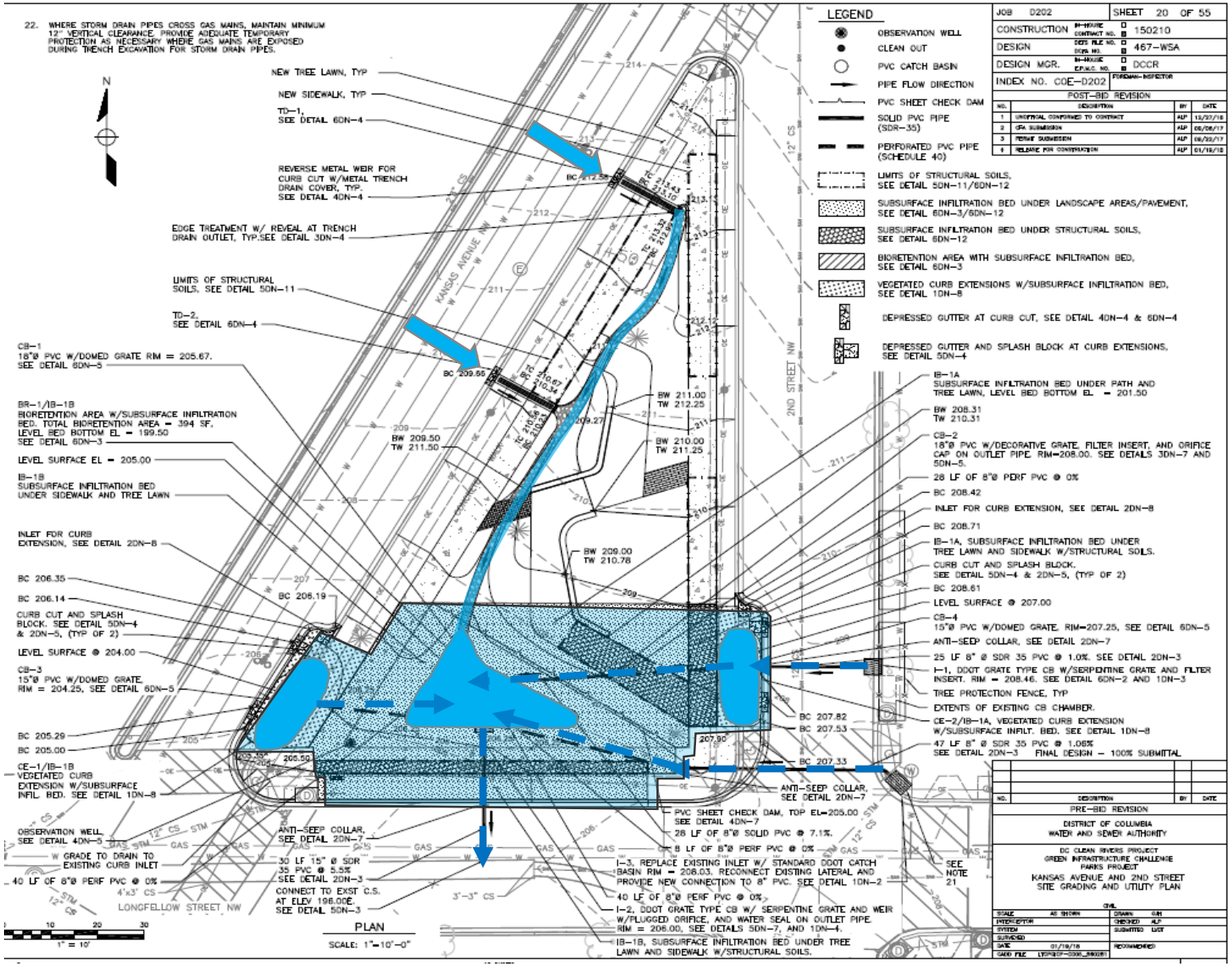
Kansas Avenue and 2nd Street NW – Highlights

- Annual capture: 1.1 million gallons/yr
- Trench drains convey runoff into a decorative cobble channel
- Water flows through channel to a bioretention, underlain by a subsurface infiltration bed
- Stepping stones, decorative boulders, and grated pedestrian bridges help to reveal the stormwater processes to the public
- Additional street runoff is captured in two vegetated curb extensions, which provide shelter for the plaza and traffic calming
- New amenities include an open lawn space, nature play spaces, art play pavement markings, seat walls, attractive plantings, and enhanced tree canopy



Site Layout design produced in collaboration with WRT

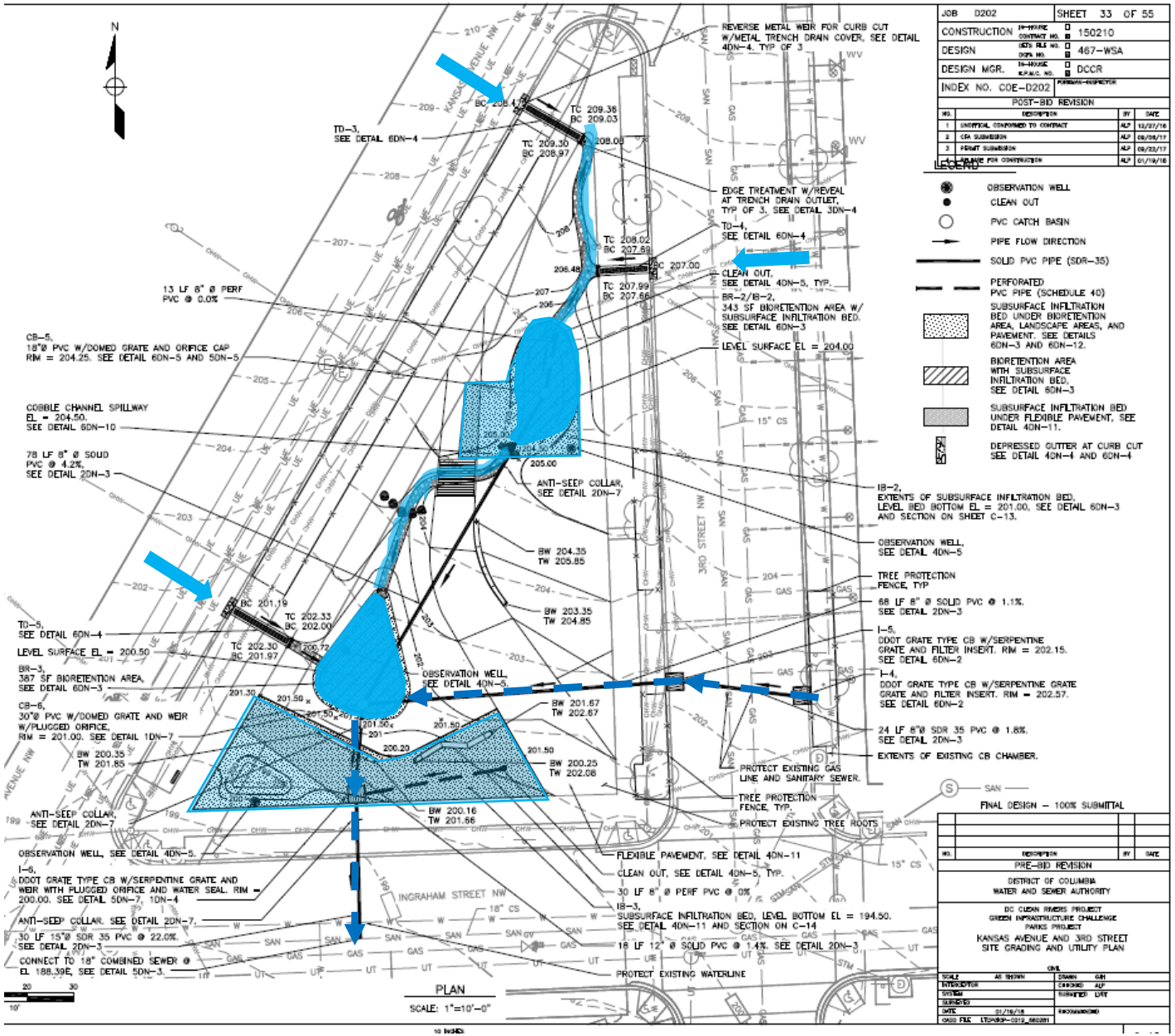
Utility Plan



Kansas Avenue and 3rd Street NW – Highlights

- Annual capture: 450,000 gallons/yr
- Similar material and plant palette as Kansas and 2nd
- Decorative trench drains convey street runoff to cobble channel
- Channel conveys the runoff in series from upper to lower bioretentions, both surrounded by decorative boulders.
- Bioretentinos and plaza underlain by subsurface infiltration beds.
- Amenities at this site include a new flexible porous pavement walkway, small seating area/outdoor classroom with benches, a grated pedestrian footbridge, open lawn space, and new plantings and trees

Utility Plan



Overcoming Challenges

- Ever changing urban environment
  - New utility poles added
  - ADA curb ramps replaced
  - Trees planted
- Agency coordination and differing priorities
  - Urban Forestry required sidewalks to be reconstructed to provide a tree lawn
  - Curb extension configurations
  - Evolving standard details and sizing criteria
  - Extent of ADA ramp installations
  - Permitting

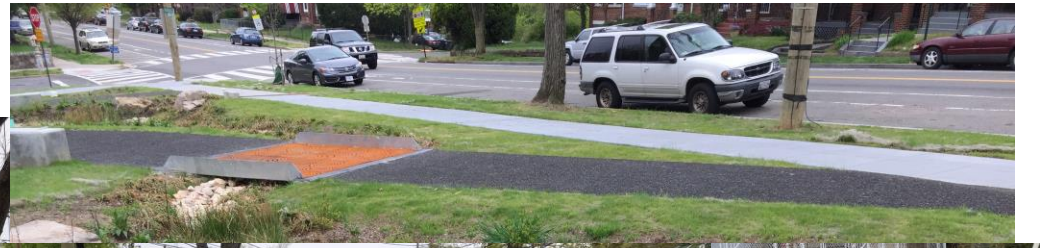
Construction

Construction Complete Kansas & 2nd - April 2019

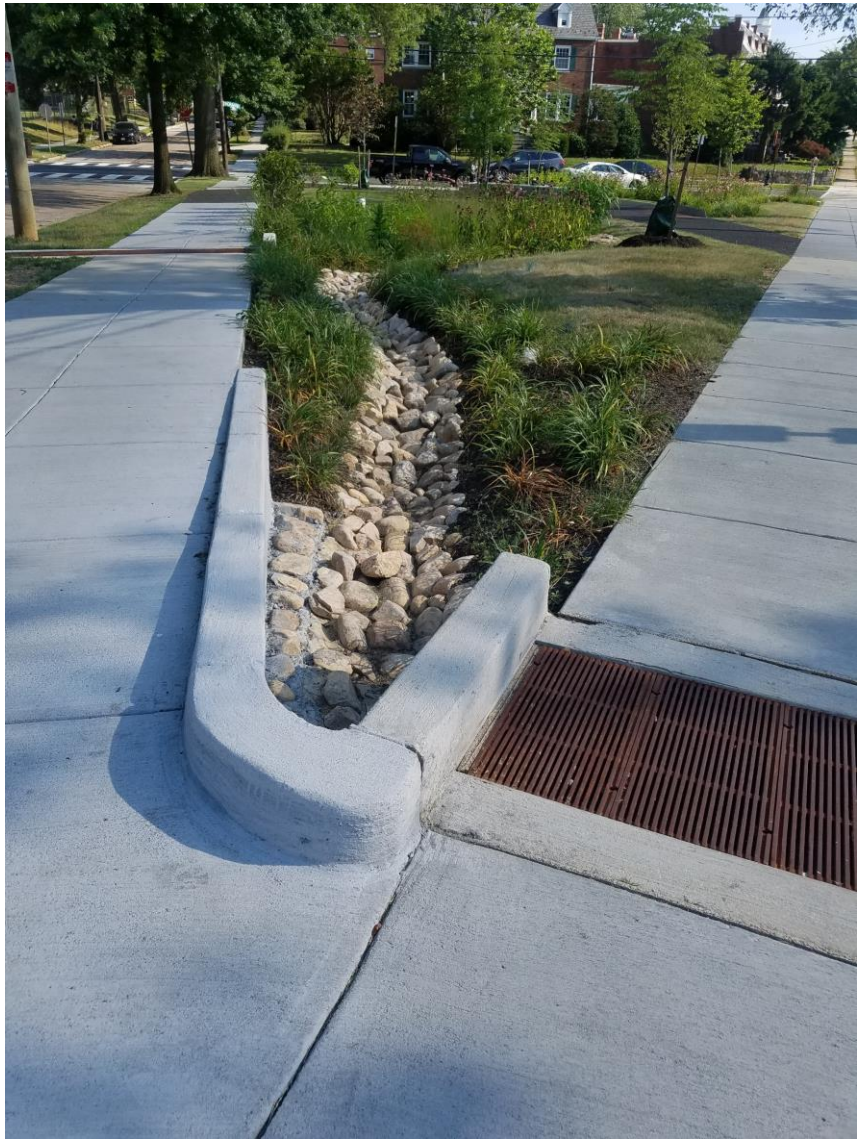
Construction Complete
Kansas & 2nd – June 2019

Construction Complete
Kansas & 2nd – November 2019

Construction Complete
Kansas & 3rd - April 2019



Construction Complete
Kansas & 3rd - June 2019



Summary

- GI integrated into the urban environments
- Community engagement guides site designs
- Two distinct neighborhood places will be created with triple bottom line benefits
- Challenges and agency coordination can be significant but can be overcome
- Revealed stormwater elements can be an amenity

The new green triangle at Illinois and 9th delivers a variety of benefits, **with significant cumulative benefits if the green triangle park typology is replicated throughout the combined sewersheds on a City scale.**

Thank You

Questions?

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