

A Property Management Model for Green Infrastructure Site Maintenance



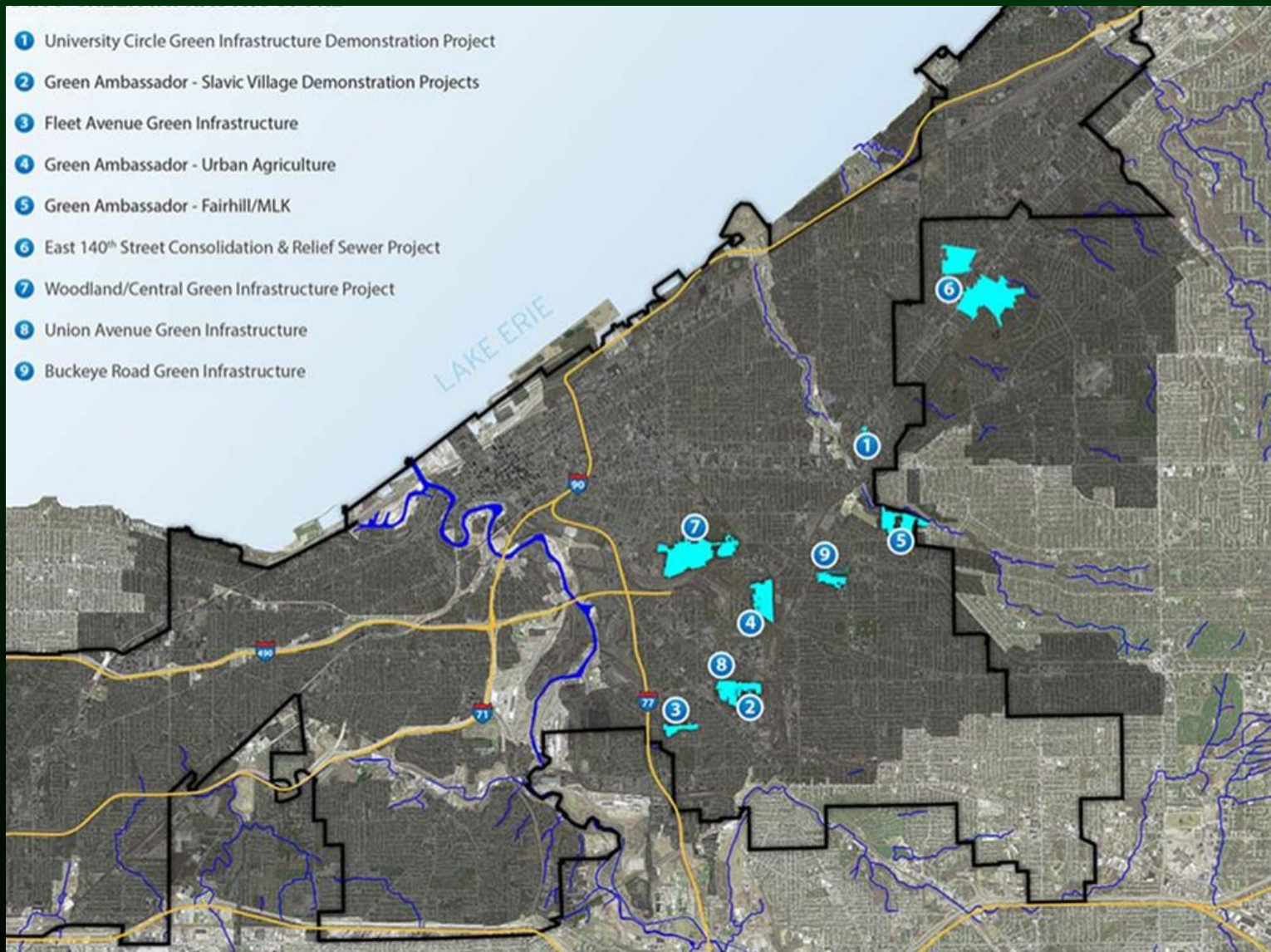
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NEORSD – GREEN INFRASTRUCTURE SYSTEM LOCATIONS

- 1 University Circle Green Infrastructure Demonstration Project
- 2 Green Ambassador - Slavic Village Demonstration Projects
- 3 Fleet Avenue Green Infrastructure
- 4 Green Ambassador - Urban Agriculture
- 5 Green Ambassador - Fairhill/MLK
- 6 East 140th Street Consolidation & Relief Sewer Project
- 7 Woodland/Central Green Infrastructure Project
- 8 Union Avenue Green Infrastructure
- 9 Buckeye Road Green Infrastructure

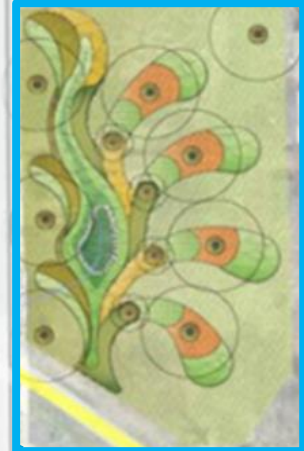


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SLAVIC VILLAGE G.I. DEMONSTRATION SITE



EAST-75TH

EAST-78TH



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SLAVIC VILLAGE G.I. DEMONSTRATION SITE – EAST 75TH STREET NORTH BASIN



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FLEET AVENUE GREEN INFRASTRUCTURE SITE



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FLEET AVENUE GREEN INFRASTRUCTURE SITE EAST 53RD STREET - BIO-RETENTION BASIN

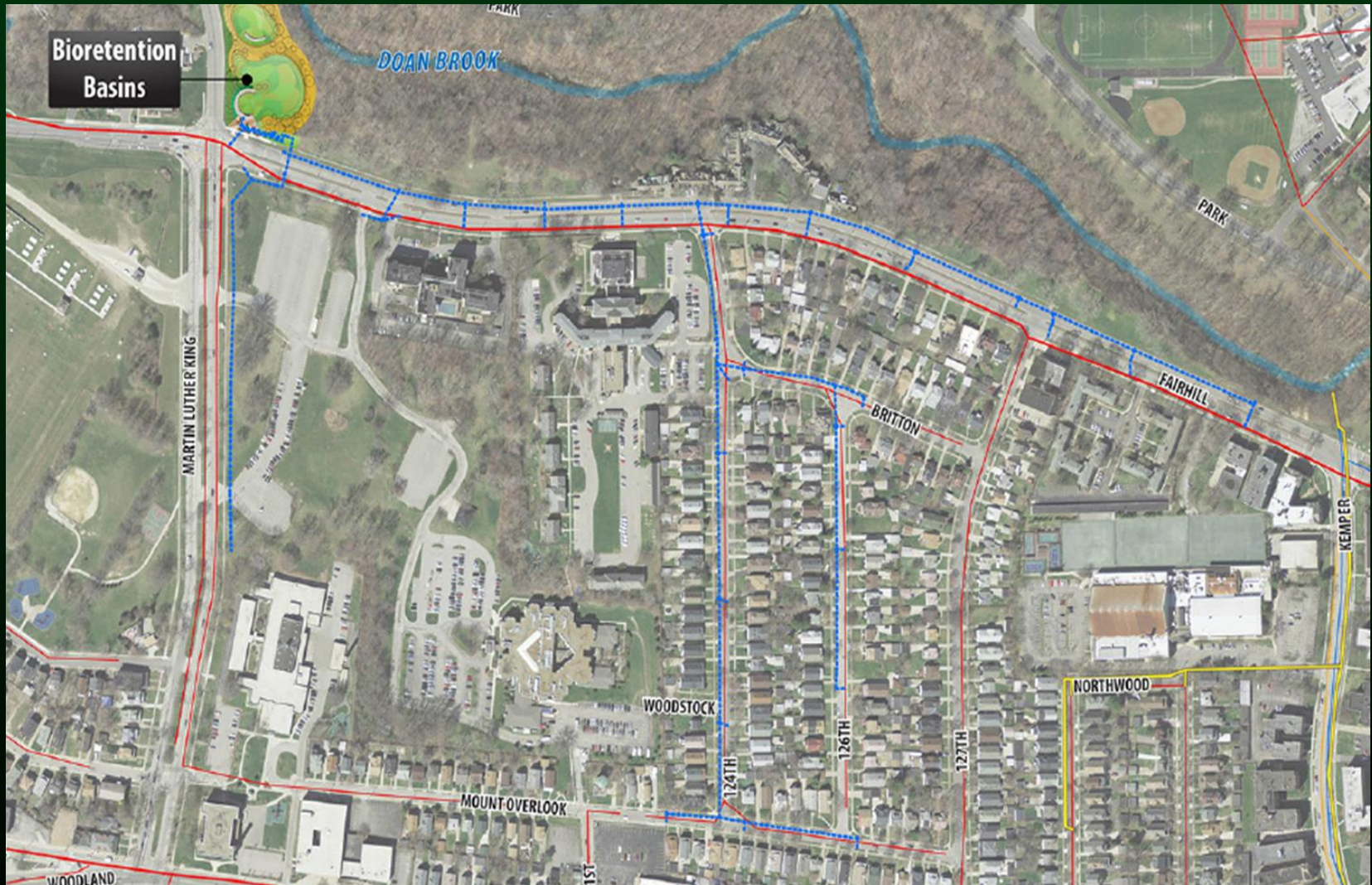


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Fairhill/MLK GREEN INFRASTRUCTURE SITE



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FAIRHILL/MLK G.I. SITE – UPPER BIO-RETENTION BASIN



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GREEN INFRASTRUCTURE MAINTENANCE

"GREEN SYSTEM COMPONENTS"

- Storm water basins
- Artificial wetlands
- Rain gardens
- Street bump outs
- Bio-swales
- Green Roofs & Walls
- Tree Wells

Plants

- Turf Lawn
- "Low Mow" Grass
- Wetland Plants
- Trees, Bushes/Shrubs
- Perennial Plants



GREEN INFRASTRUCTURE MAINTENANCE "GRAY" SYSTEM COMPONENTS

- Storm water laterals /catch basins
- Flow diversion structures
- Pretreatment structures
- Storm water curb cuts
- Splash pads/ Flow dissipaters
- Basin underdrain systems
- Overflow structures
- Permeable pavement
- Storm water curb cuts
- Site Amenities
 - Public benches
 - Lighting
 - Bike racks
 - Trash receptacles



SLAVIC VILLAGE G.I. DEMONSTRATION SITE

Green & Gray Components



“Green Elements”

- Turf Lawn
- Low Mow Grass
- Basin Plantings
- Upland Plantings
- Bushes, Trees
- What is/isn't a weed!?!)

“Gray Elements”

- Sidewalks
- Curb cuts
- Splash pads
- Overflow structures
- Basin underdrain systems
- Site Amenities



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SLAVIC VILLAGE G.I. – KNOW YOUR PLANTS WHICH PLANT IS STAYS & WHICH NEEDS TO BE PULLED?



IRIS PLANT - STAYS



YUCCA PLANT - GOES



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**SLAVIC VILLAGE G.I.
NOT KNOWING WHAT TO DO CAN COST YOU AND THE CLIENT \$\$\$**



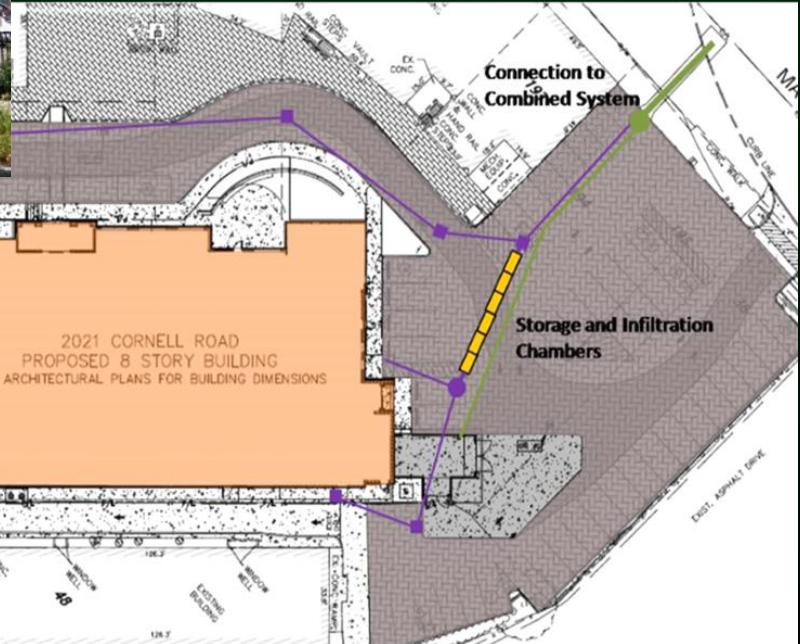
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UCI/MARRIOTT HOTEL GREEN INFRASTRUCTURE SITE

Pervious Concrete Paver Block System



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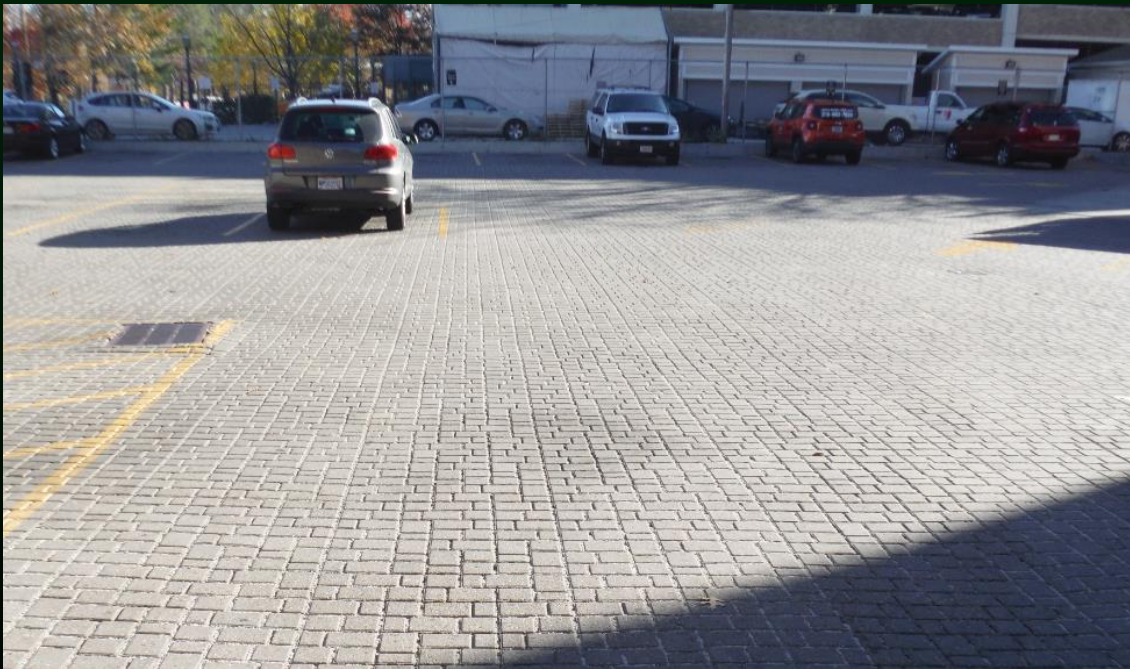
UCI/MARRIOTT HOTEL G.I. SITE GREEN & GRAY COMPONENTS

“Green Elements”

- No Plants
- Leave / Weed Removal

“Gray Elements”

- Permeable Pavement
- Catch Basins
- Lateral Lines
- ADS Basin underdrain systems
- Site Amenities
 - Public Signage



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UCI/MARRIOTT HOTEL G.I. SITE PERVIOUS PAVER MAINTENANCE ISSUES



Snow Pile/Debris

Frost Heave of Pavers



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UCI/MARRIOTT HOTEL G.I. SITE CLOGGED PAVER AGGREGATE



Bentonite Clay mistakenly used in an attempt to remove the oil

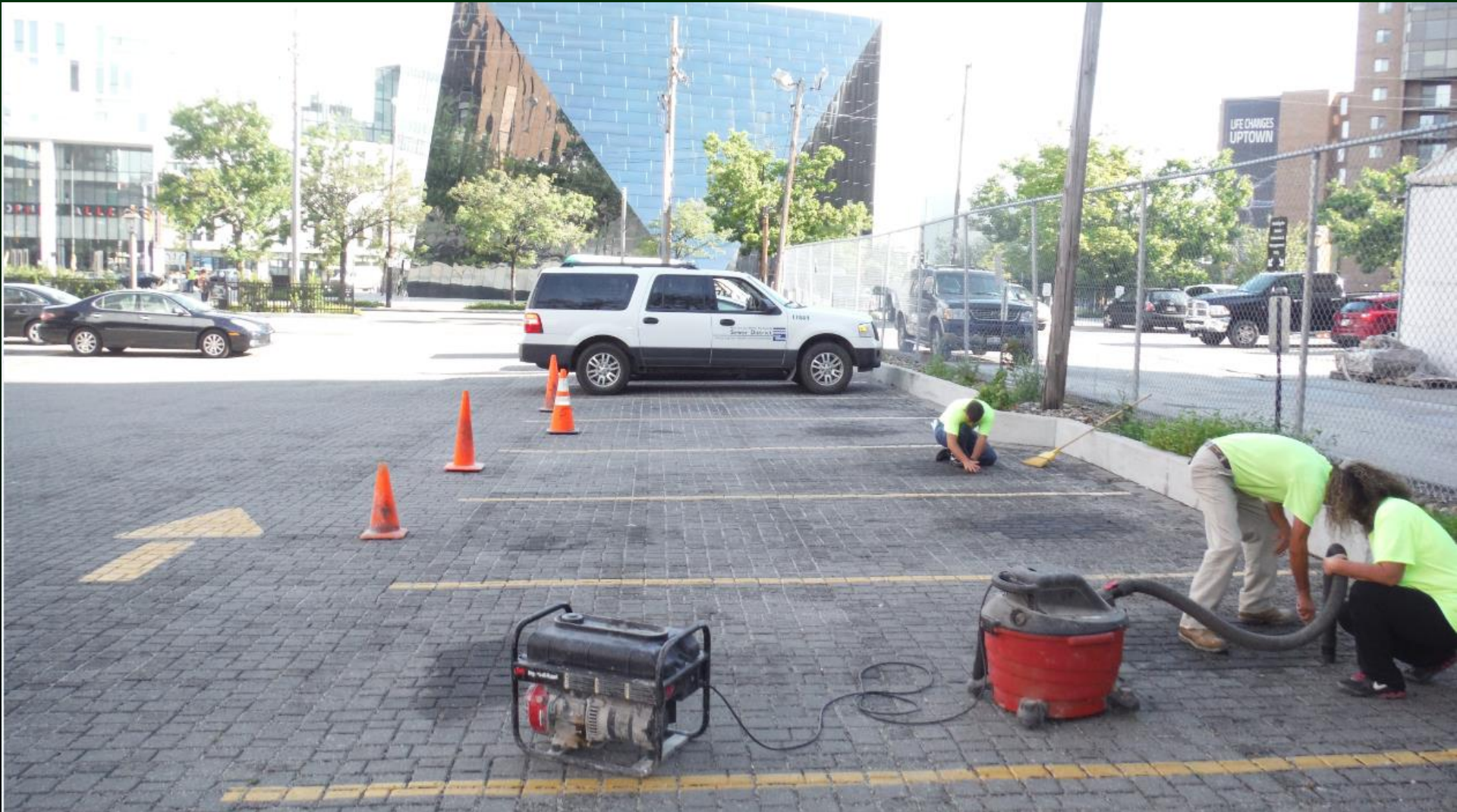


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UCI/MARRIOTT HOTEL G.I. SITE PAVER MAINTENANCE



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NEORSD GREEN INFRASTRUCTURE 2014 - 2016 MAINTENANCE PROGRAM

- **Annual Grounds Maintenance Contract**
 - Outlying Facilities, Property Acquisition Sites & 5 Green Infrastructure Sites
 - Attempted to have contractor clean some “gray components” of G.I. sites

- **UCI Marriott: Annual Maintenance Contract**
 - Removal/Replacement of clogged aggregate
 - Did not address cleanout of catch basins and ADS Stormtech® chamber

- **G.I. Gray Infrastructure Maintenance Contract**
 - Vacuum cleaning of pretreatment devices, lateral lines & catch basins

- **Project Specific Contracts**
 - Covered G.I. Site Repairs



NEORSD GREEN INFRASTRUCTURE 2017 – BEYOND MAINTENANCE PROGRAM OPTIONS

G.I. Maintenance needs to address “Green & Gray” Components

- In Perpetuity Maintenance
- Aesthetics
- Functionality
- Community Involvement & Workforce Development

Maintenance Options

1. Develop an in-house G.I. District Workforce

- Union Staff & Good Neighbor Ambassadors
- Staff limitations
- Skill and equipment
- Little to No Community involvement and workforce development

2. Property Management of G.I. Sites

- One stop shop for Maintenance Services
- Pre-skilled Staff with Landscaping/G.I. Certification
- Property Manager to provide all equipment
- Contract flexibility
- NEORSD can direct community involvement and workforce development



NEORSD GREEN INFRASTRUCTURE MAINTENANCE PROGRAM PILOT CONTRACT

Pilot Contract Requirements:

- 2-Year Maintenance of 5 G.I. Sites
- Vegetative Maintenance
- Non-Vegetative Maintenance
- Site Monitoring
- Green Infrastructure Site Assessment
- Monthly Status Reporting
- Community Involvement & Workforce Development
 - ❖ 50% MBE/FBE Requirement
 - ❖ Option for Community Education Activities



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NEORSD GREEN INFRASTRUCTURE MAINTENANCE PROGRAM PILOT CONTRACT STATUS

- Consultant Down-select: April 2017
- Contract Award: June 2017
- Maintenance Start: July 2017
- G.I. Site Assessment: September 2017
- Urban/Ag Site Improvements: Fall 2017 & Spring 2018
- Three additional G.I. sites: Summer 2018



Sometimes the BOLDEST Impact
Can be the QUIETEST.

GREEN INFRASTRUCTURE MAINTENANCE PROGRAM MANAGEMENT AND SERVICES
Aesthetic, Educational and Operational Improvements 10.17.2017



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GREEN INFRASTRUCTURE PROPERTY MANAGEMENT

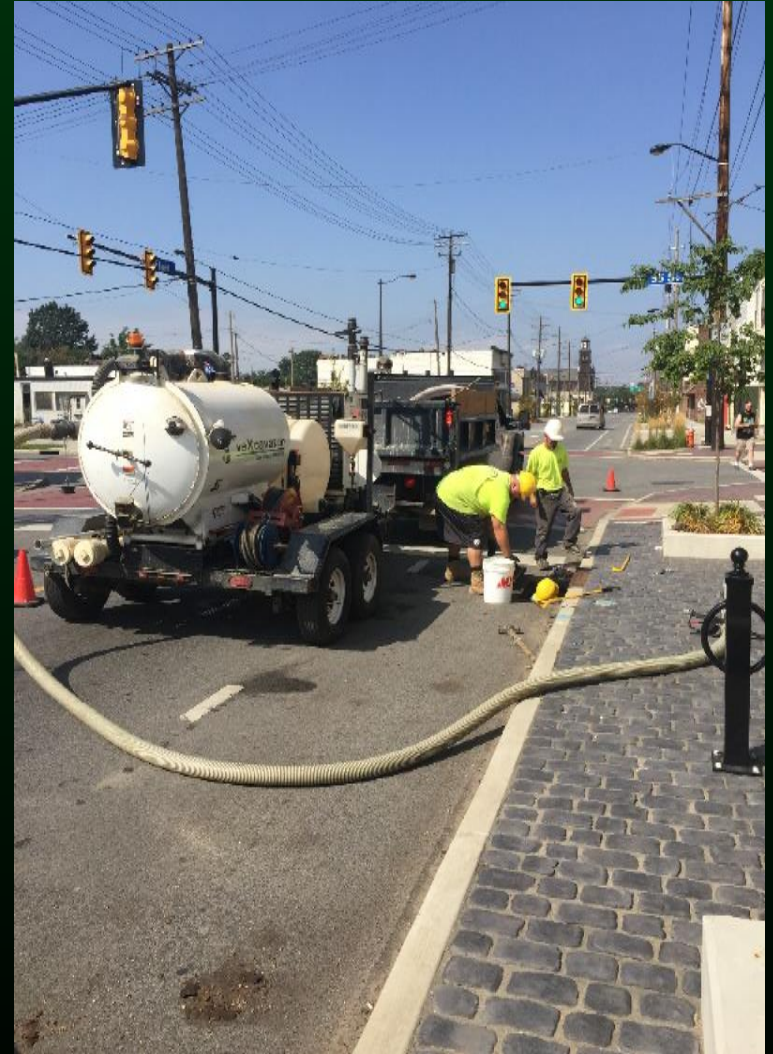
“GREEN” SYSTEM COMPONENTS

- Bioretention, planting beds, residual lawn areas and tree lawn areas
- Annual pruning of trees, shrubs
- Weekly care of perennials (including weeding during growing season)
- Mowing (including review and repair of runneling)
- Care of no mow areas including weed control
- Replacement of mulch and bioretention soil as needed
- Invasive species management
- Fall & Spring cleanup (e.g. leaf pickup)



GREEN INFRASTRUCTURE PROPERTY MANAGEMENT "GRAY" SYSTEM COMPONENTS

- Amenity cleaning: snow plowing, trash receptacles, benches, anti-graffiti
- Stormwater inflow/outflow structures & underdrains
- Sediment/trash/blockage from inlets, trench drains, overflow structures, underdrains, curb cut (flume), splash pad
- Storm sewer lines & catch basin inspection & cleaning (within project area)
- Suntime Nutrient Separating Baffle Box maintenance
- ADS Stormtech Chamber maintenance (2-inches of sediment)
- Pervious Pavement maintenance



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GREEN INFRASTRUCTURE PROPERTY MANAGEMENT SITE EVALUATIONS

- Individual site checklists
- Drone, photos, and sketches of existing conditions
- Vegetation establishment and condition
- Sediment accumulation
- Trash/debris or bare soil
- Runnels, divots and sinkholes
- Runoff bypass or short-circuiting
- Weather conditions
- Identification of maintenance needs

Slavic Village Inspection and Maintenance Checklist - Weekly Log

Facility: Slavic Village E. 78th OR North E. 75th OR South E. 75th (Circle site that applies) Date of Last Inspection: 4/26/2017
 Location/Address: 11000 E. 75th Ave. Weather Conditions: 50s & 60s Title: 6000
 Inspector: J. G. H. If yes, list amount and timing: 6000
 Rain in Last 24 Hours: Yes No If yes, list amount and timing: 6000
 Pre-treatment: 6000
 Methods of Maintenance Performed and Photos Attached (before and after maintenance): Yes No
 Complete the form below by indicating the performance condition for each inspection item.
 Performance Condition Key:
 Level 1: Good condition, no corrective action required.
 Level 2: Fair condition, but still functional. Follow-up inspection in 6 months (or as corrective action dictates) is recommended.
 Level 3: Poor condition, needing maintenance, repair and/or replacement - alert Property Manager immediately!

Inspection Item	Comment	Condition (1, 2, or 3)
1. GENERAL VISUAL ASSESSMENT OF EDUCATIONAL SIGNS & BOULDERS		
Educational sign undamaged and clear?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3
Missing or damaged boulders around address?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3
Any graffiti if so where?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3
2. SIDEWALKS		
Trench drain missing grate? Or broken?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3
Trench drain has sediment blocking flow?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3
Sidewalk broken or heaving?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3
3. DEWATERING		
Standing water is visible on the bioretention surface after a 1" rain event in 40 hours	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3
4. PRETREATMENT		
Sediment has accumulated	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3
Trash and debris have accumulated	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3
5. INLETS		
Inlets are in poor structural condition	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3
Sediment, trash, or debris have accumulated and/or is blocking the inlets	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3
Erosion is occurring around the inlets	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3
6. CONCRETE FLUME CURB CUTS		
Sediment has accumulated	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3
7. CONCRETE SPLASH PAD & MOUND		
Is there excessive sediment accumulation?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3
8. UNDERDRAIN & BALL VALVE SYS		
Is there wash, debris or vandalism of the system?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3
9. OVERFLOW LINES		
Is there trash, debris or vandalism of the system?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3

SLAVIC VILLAGE EAST 75TH NORTH 6/21/2017



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GREEN INFRASTRUCTURE PROPERTY MANAGEMENT PERFORMANCE MONITORING

- Supplemental to Monitoring Program
- Infiltration Basins
 - Rainfall visual inspection - draw down 40 hours after rain event
 - Infiltration testing - known volume and visual observation
- Inlet and Flow Structures
 - Visual inspection



GREEN INFRASTRUCTURE PROPERTY MANAGEMENT OUTREACH AND TRAINING

- Workforce development such as Oriana House & Express Employment Professionals
 - Parolees & ex-offenders
- Good Neighbor Ambassador Program
 - Program to train workers
 - Awareness for ownership and education
- Community Outreach
 - Coordination with District Community Relations Office
 - Perennial Plant Splitting
 - Local School Program



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NEORSD GREEN INFRASTRUCTURE PROPERTY MANAGER MONTHLY REPORTING

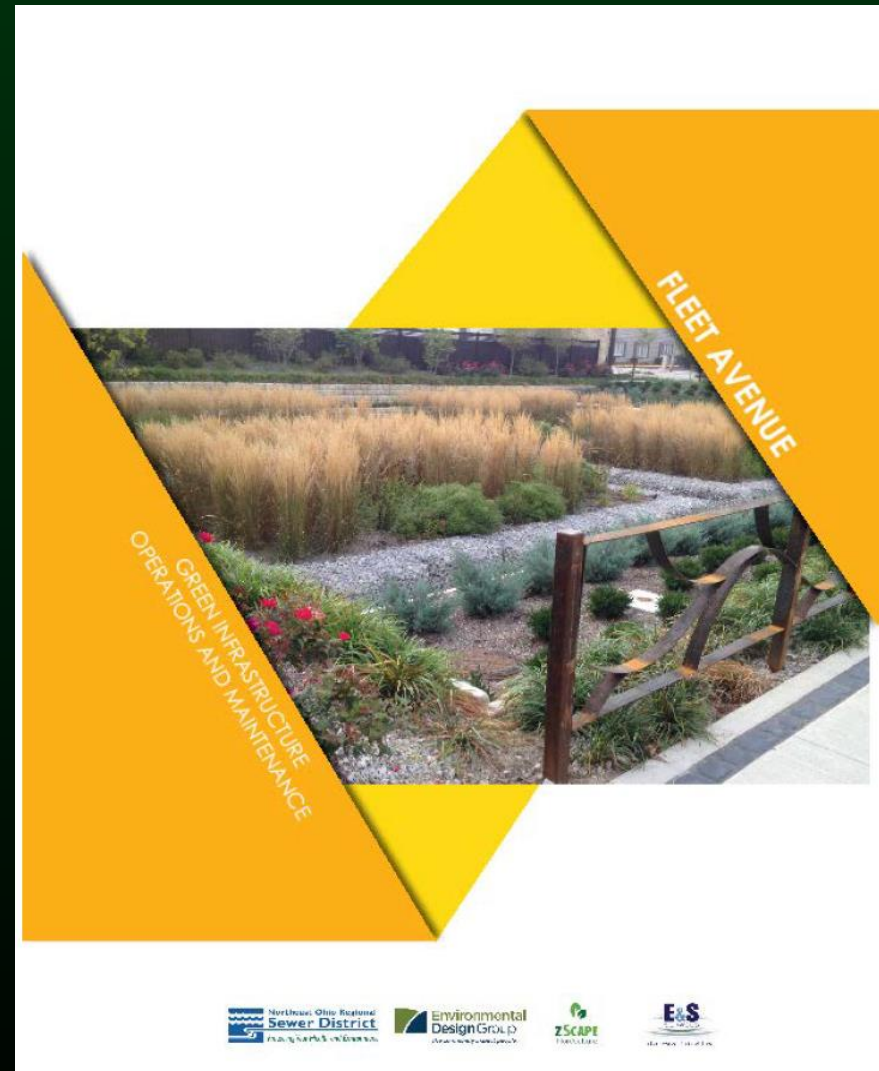
G.I. Property Manager provides the following project updates:

➤ **Overall Contract Metrics**

- Monthly Budgetary Numbers
- MBE/FBE/SBE Costs

➤ **Existing G.I. Site Conditions**

- Completed Maintenance Tasks
- Site inspection results
- Upcoming Maintenance Tasks
- Recommended Site Enhancements/Repairs

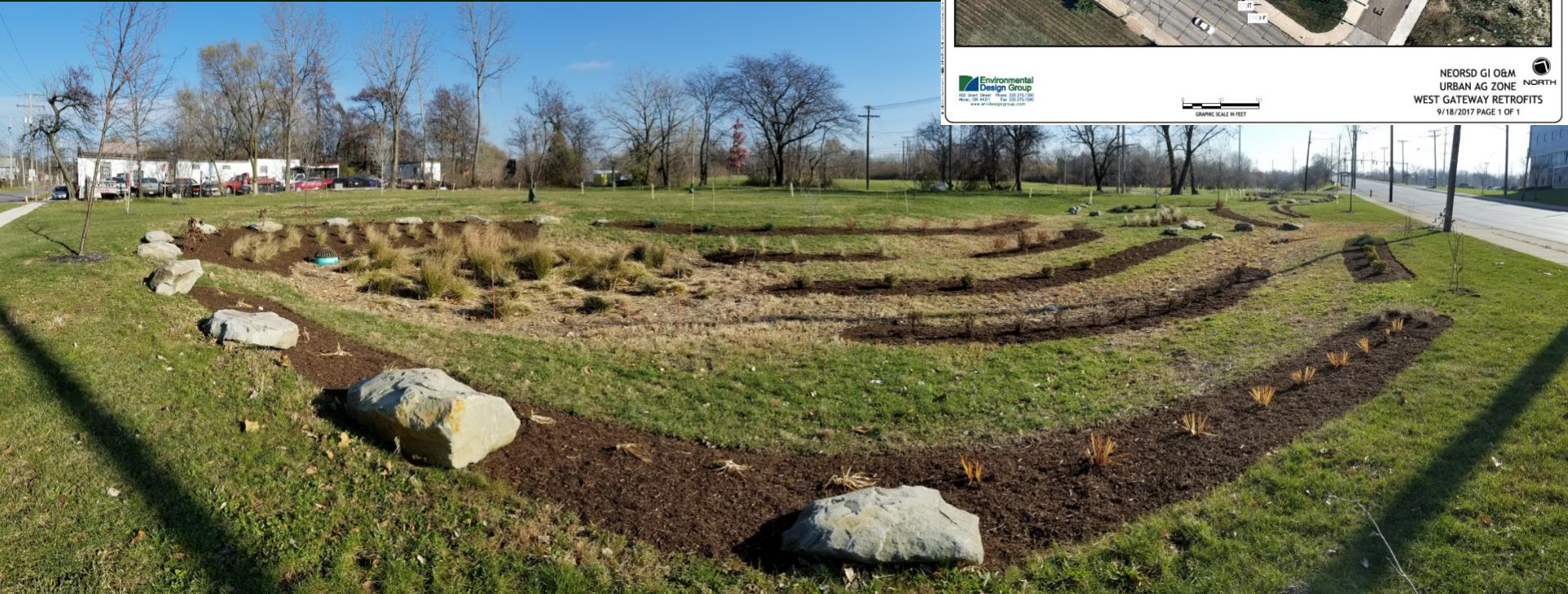


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NEORSD GREEN INFRASTRUCTURE URBAN/AG G.I. WEST ENTRY FEATURE SITE ENHANCEMENTS



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Questions?



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