New York State
Environmental Facilities Corporation

Green Innovation Grant Program

Southeast New York Stormwater Conference

Beacon, NY

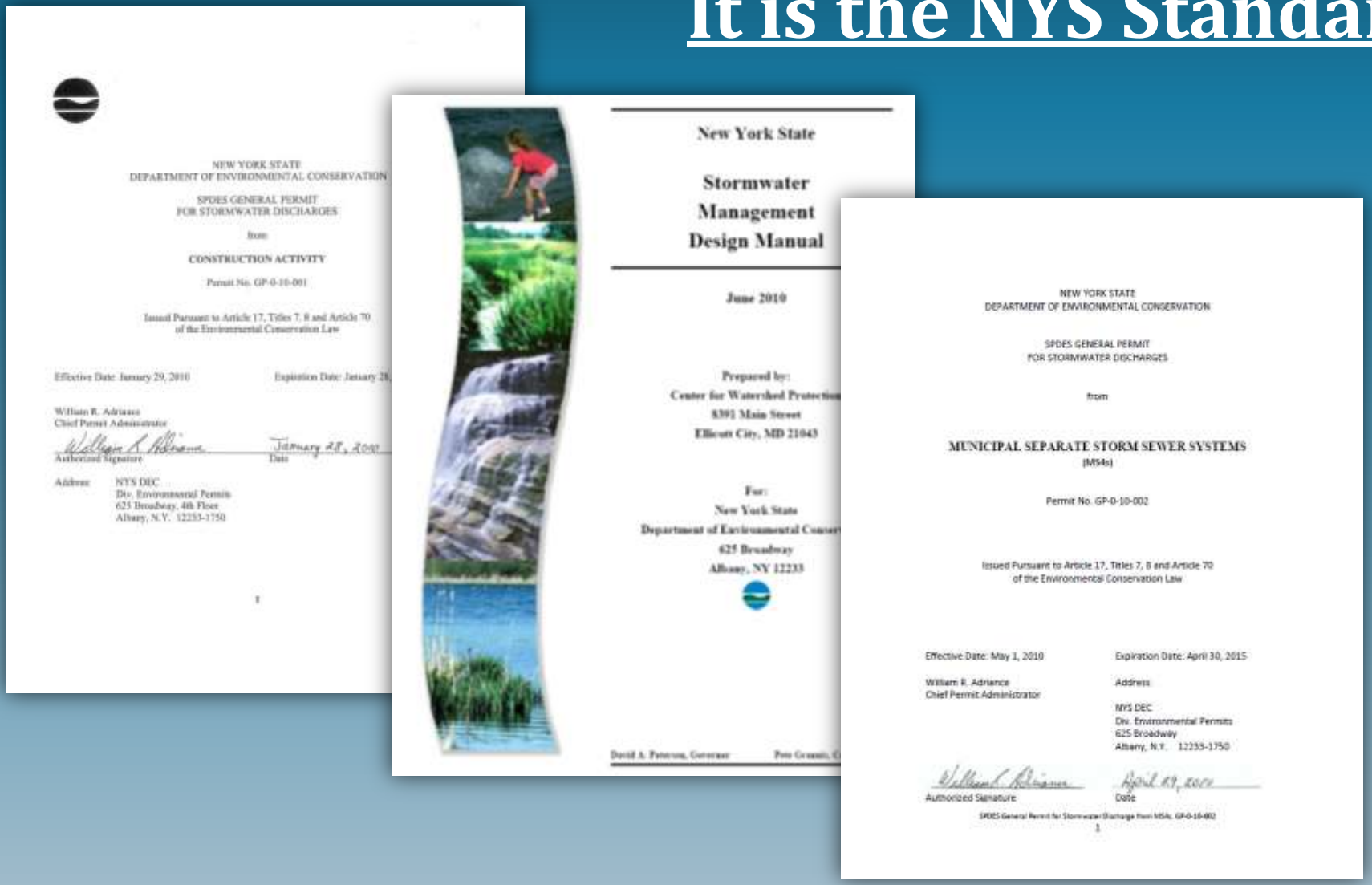
October 15, 2014

What is Green Infrastructure?

- *Green stormwater infrastructure includes a wide array of practices at multiple scales that manage wet weather and that* ***maintain and restore natural hydrology by infiltrating, evapotranspiring and harvesting and using stormwater.***
- *On a* ***regional scale*** *green infrastructure is the preservation and restoration of natural landscape features, such as forests, floodplains and wetlands, coupled with policies such as infill and redevelopment that reduce overall imperviousness in a watershed.*
- *On a* ***local scale*** *green infrastructure consists of site- and neighborhood-specific green stormwater practices, such as bioretention, trees, green roofs, permeable pavements and cisterns.*

Why use Green Infrastructure?

It is the NYS Standard



NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SPDES GENERAL PERMIT
FOR STORMWATER DISCHARGES

from

CONSTRUCTION ACTIVITY

Permit No. GP-0-10-001

Issued Pursuant to Article 17, Titles 7, 8 and Article 70
of the Environmental Conservation Law

Effective Date: January 29, 2010

William R. Adriance
Chief Permit Administrator

Authorized Signature

Date

Address: NYS DEC
Div. Environmental Permits
625 Broadway, 4th Floor
Albany, N.Y. 12233-1750

New York State

Stormwater
Management
Design Manual

June 2010

Prepared by:
Center for Watershed Protection
8391 Main Street
Ellicott City, MD 21043

For:
New York State
Department of Environmental Conser
625 Broadway
Albany, NY 12233

David A. Paterson, Governor

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SPDES GENERAL PERMIT
FOR STORMWATER DISCHARGES

from

MUNICIPAL SEPARATE STORM SEWER SYSTEMS
(MS4s)

Permit No. GP-0-10-002

Issued Pursuant to Article 17, Titles 7, 8 and Article 70
of the Environmental Conservation Law

Effective Date: May 1, 2010

Expiration Date: April 30, 2015

William R. Adriance
Chief Permit Administrator

Address:
NYS DEC
Div. Environmental Permits
625 Broadway
Albany, N.Y. 12233-1750

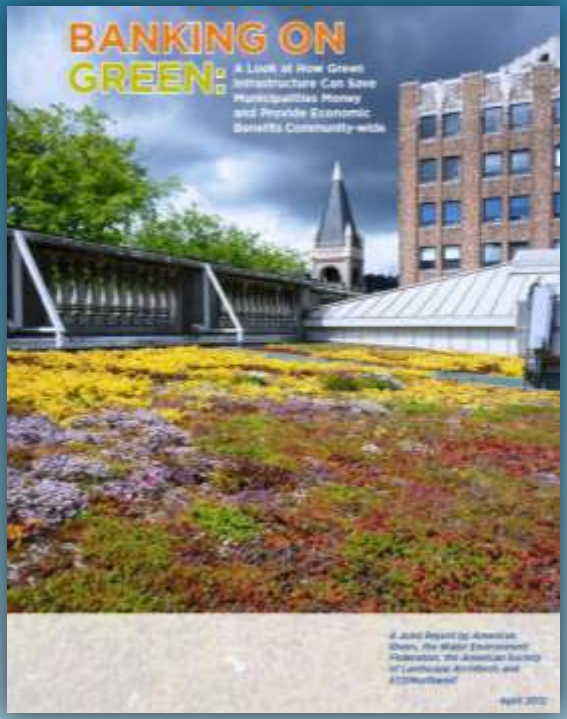
Authorized Signature

Date

SPDES General Permit for Stormwater Discharge from MS4s, GP-0-10-002

Why use Green Infrastructure?

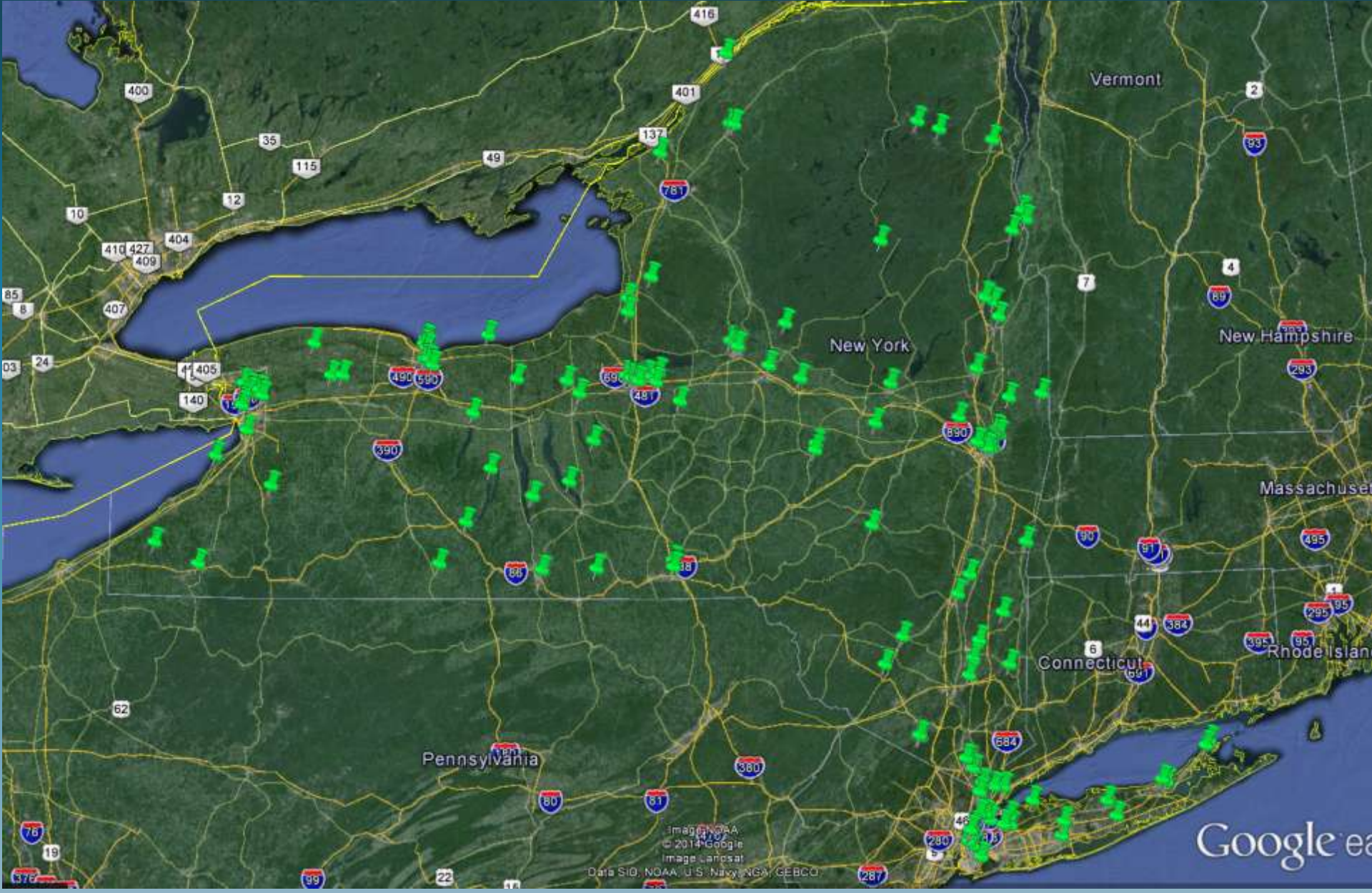
It is Cost Effective



Green Innovation Grant Program (GIGP)

Goals:

- Protect and improve water quality
- Spur innovation
- Build green capacity -- locally and beyond
- Facilitate the transfer of these technologies to other areas of the State



GIGP-funded Green Infrastructure Projects

What are Stormwater Retrofits?

Stormwater retrofits are required where stormwater management controls did not previously exist or were inadequate or ineffective (CWP). Typical goals are to:

- Fix Past Mistakes & Maintenance Problems
- Demonstration & Education
- Reduce Pollutants of Concern
- Alleviate Chronic Flooding Problems
- Reduce Stormwater Runoff Volumes
- Reduce Downstream Channel Erosion
- Trap Trash & Floatables
- Support Stream or Watershed Restoration Projects

GIGP Green Stormwater Practices

Grant-Eligible Practices:

1. Porous Pavement
2. Bioretention and rain gardens
3. Disconnect downspouts
4. Harvest and use the rainwater (cisterns, rain barrels)
5. Green Roof / Green walls
6. Stormwater Street trees and Urban Forestry Programs
7. Construction / Restoration of Wetlands, Floodplains, and Riparian Buffers
8. Stream Daylighting

Cooperstown, NY

Green Streetscape and Water Quality Improvements

Cooperstown, NY

Green Infrastructure Technology:
Porous Pavers, Bioretention
Total Project Cost: $1,029,228
GIGP Grant: $636,854

Conceptual Drawing

Construction

East Washington Street Green Streets

Downtown Syracuse, NY

East Washington Street
Green Streets
Downtown Syracuse, NY

Construction

East Washington Street Green Streets

Downtown Syracuse, NY

Construction

East Washington Street Green Streets

Green Infrastructure Technology:
Permeable Pavers, Bioretention

Total Project Cost: $910,000

EFC Grant: $819.000

After

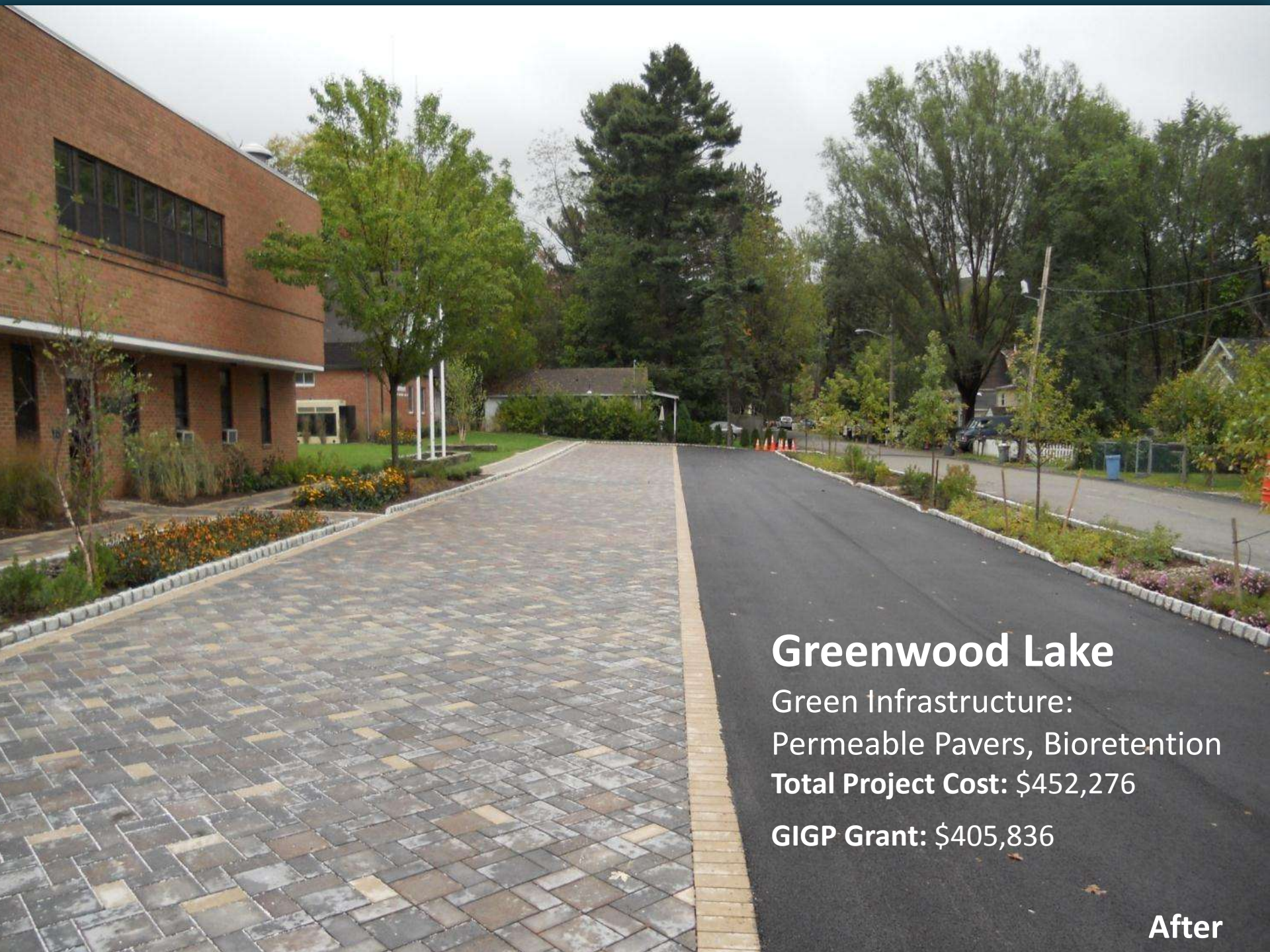
Greenwood Lake Village Hall

Stormwater Management Plan

Green Infrastructure:
Porous Pavement, Bioretention

Images: Lehman and Getz Engineering

Before


Greenwood Lake
Green Infrastructure:
Permeable Pavers, Bioretention
Total Project Cost: $452,276
GIGP Grant: $405,836
After

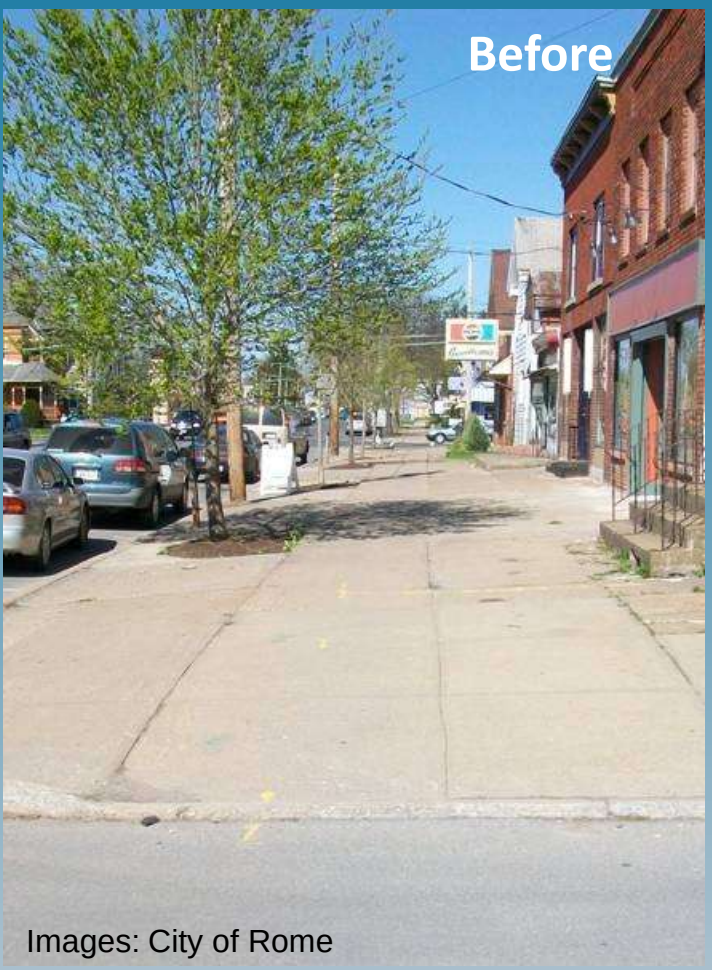
Stormwater Street Trees and Urban Forestry Programs

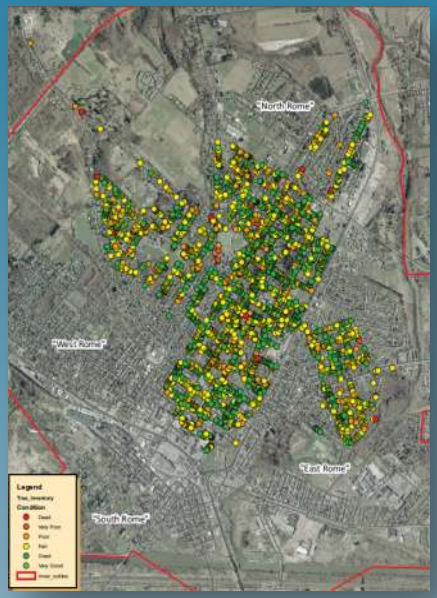
City of Rome, Oneida County, NY

Green Infrastructure Practice: Stormwater Street Trees, Porous Pavement

Total Project Cost: $301,027

GIGP Grant: $246,682





Street Tree Inventory

Images: City of Rome

Bioretention and Rain Gardens

City of North Tonawanda

Manhattan Street Parking Lot

Green Infrastructure Technology: Bioretention

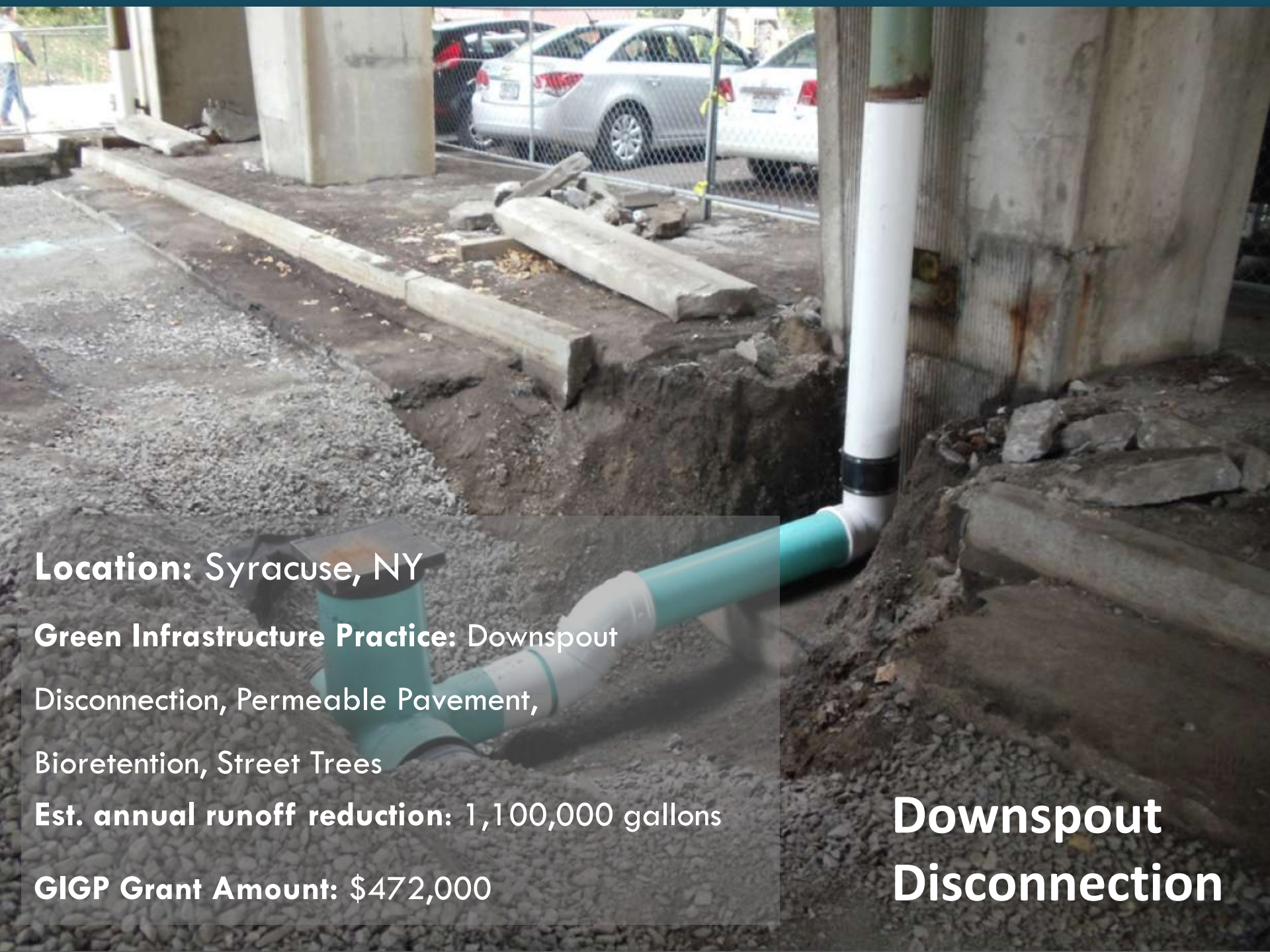
Before

City of North Tonawanda

Green Infrastructure Technology: Bioretention

Total Project Cost: $333,828

GIGP Grant: $298,678



Location: Syracuse, NY

Green Infrastructure Practice: Downspout Disconnection, Permeable Pavement, Bioretention, Street Trees

Est. annual runoff reduction: 1,100,000 gallons

GIGP Grant Amount: $472,000

Downspout Disconnection

Onondaga County War Memorial Arena

Syracuse, NY

Green Infrastructure Technology:
Stormwater Harvesting & Re-use

Total Project Cost: $1,600,000

EFC Grant Amount: $750,000

War Memorial Rainwater Reuse System Project
Onondaga County

Image: Saw Mill River Coalition

Stream Daylighting

Saw Mill River being buried in the 1920s.

City of Yonkers

Daylighting of the Saw Mill River

Construction

Daylighting of the Saw Mill River
City of Yonkers

Green Infrastructure Practice:

Stream Daylighting, Wetland Construction,

Riparian Buffer Restoration

Total Project Cost: $21,259,924

GIGP Grant: $750,000

Case Studies

Canandaigua Downtown Streetscape

Buffalo Sewer Authority

Canandaigua, NY

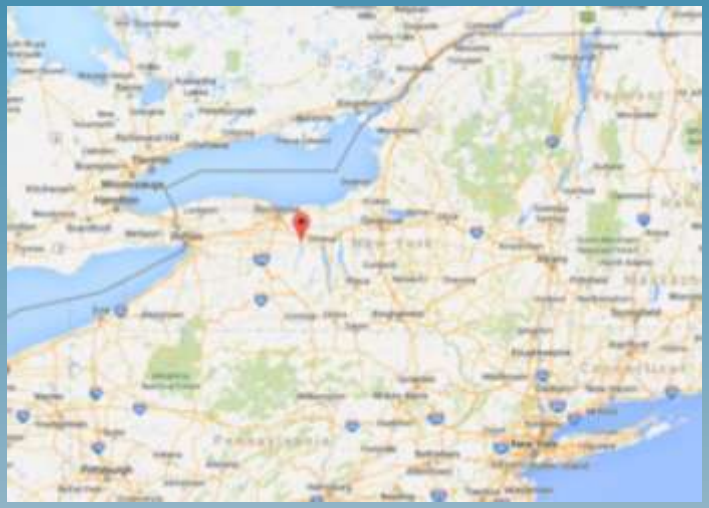
Green Streetscape and Water Quality Improvements

Canandaigua, NY

Green Infrastructure Technology: Permeable Pavers, Bioretention

Total Project Cost: $995,500

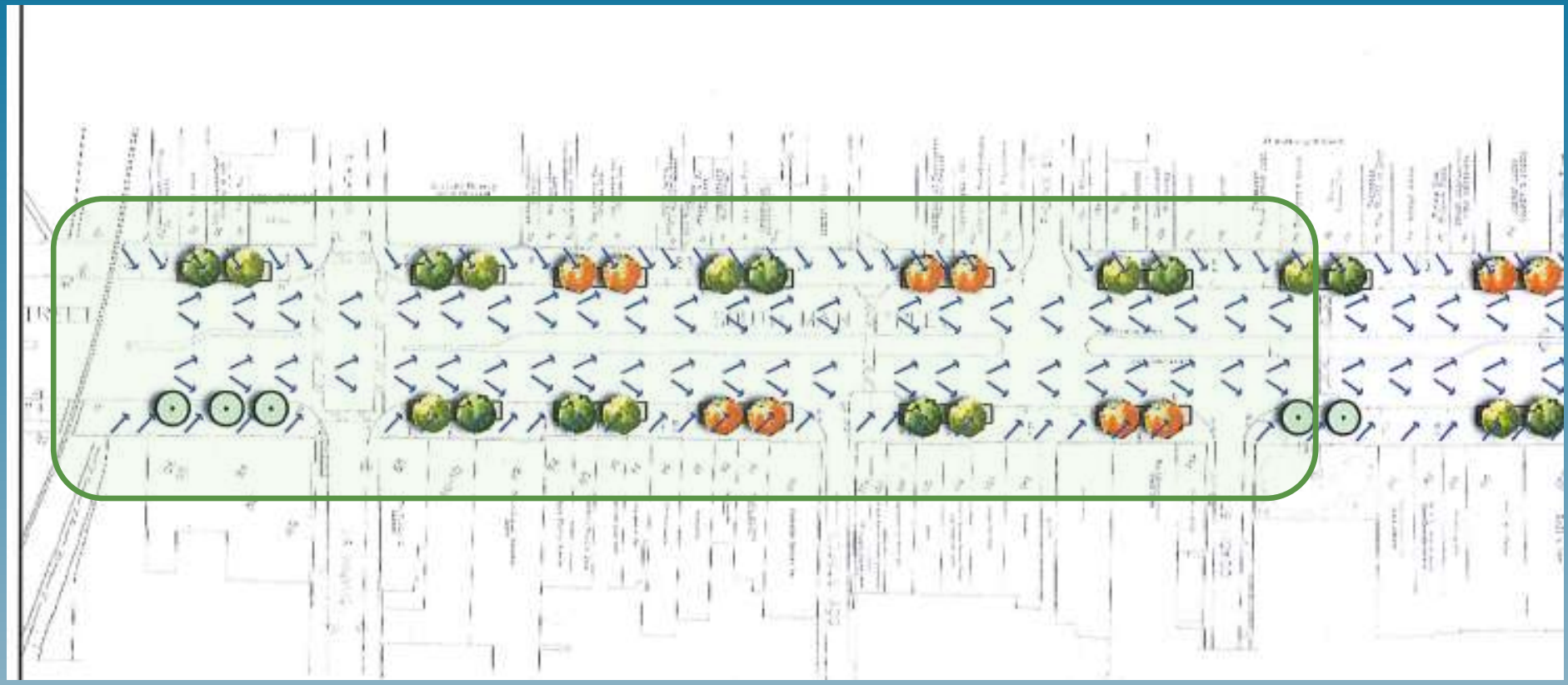
GIGP Grant: $385,000



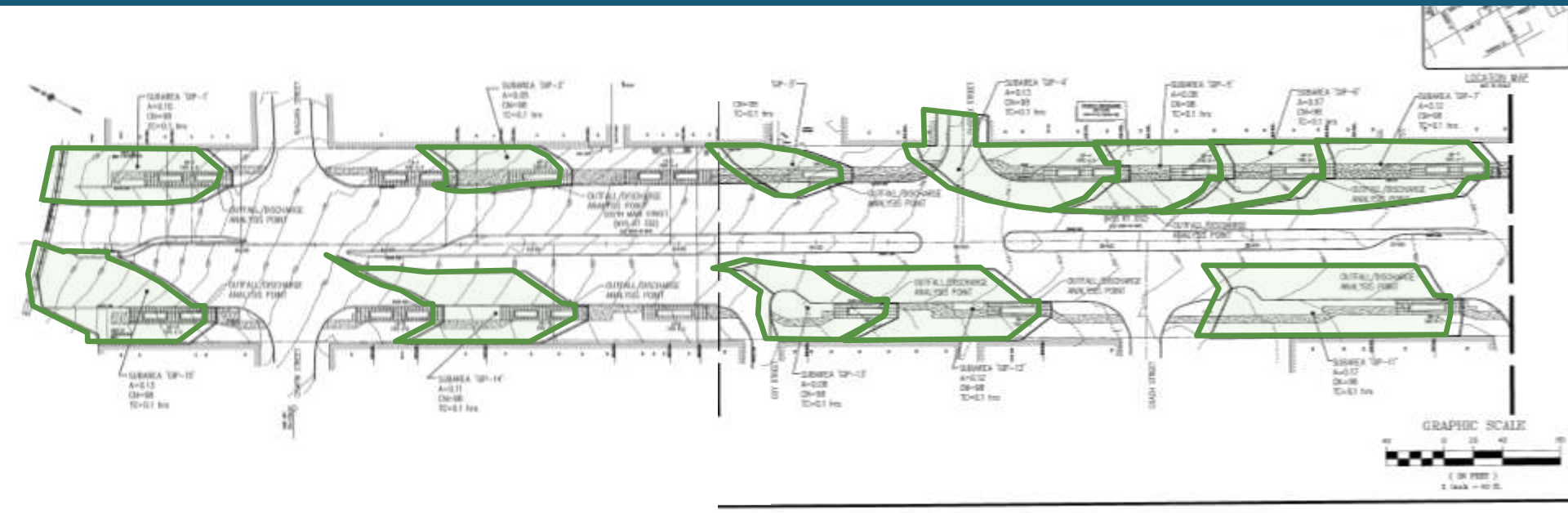
Location Map

After

Stormwater Flow Path



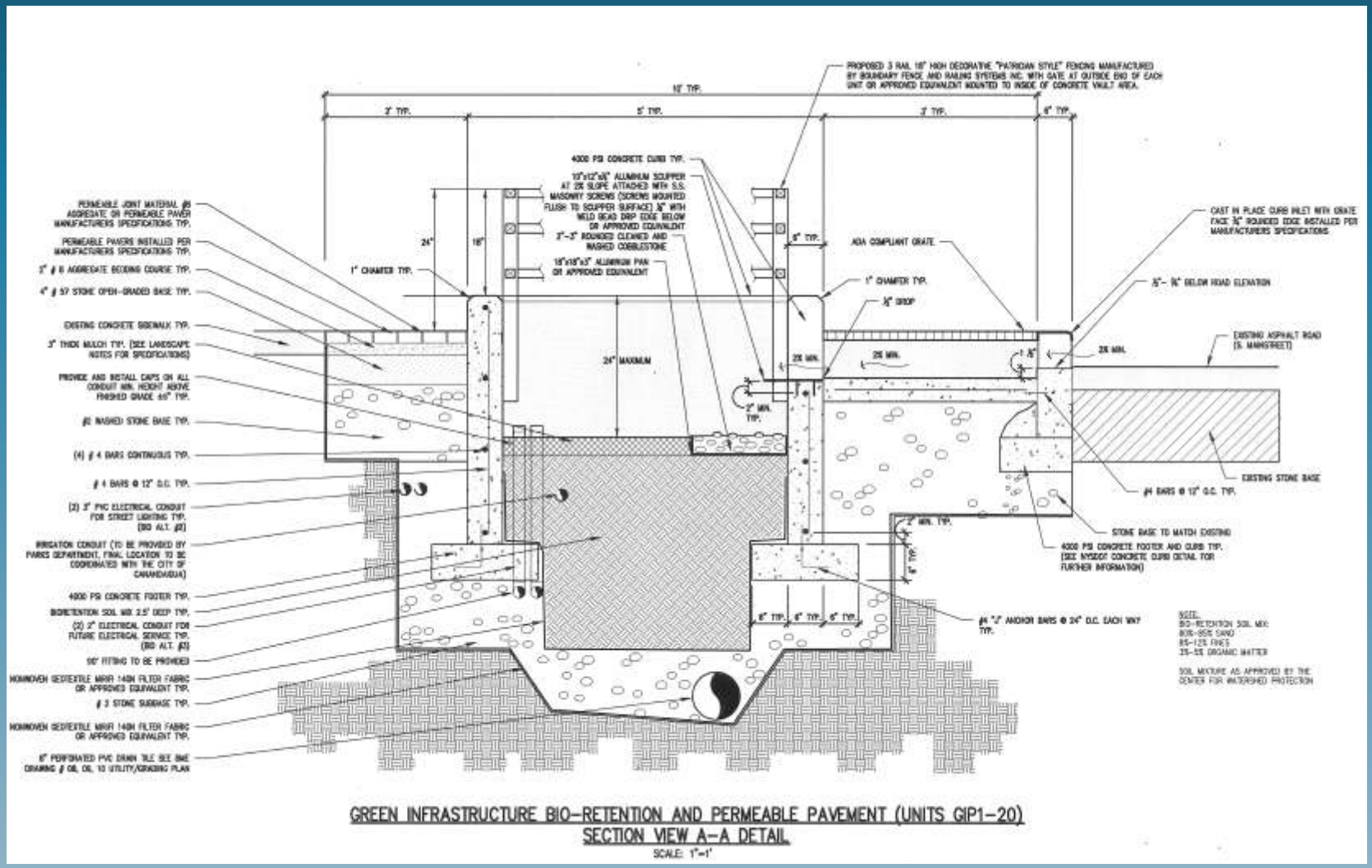
Design-Subareas



Main Street Canandaigua

15 subareas calculated

Bioretention Detail



GREEN INFRASTRUCTURE BIO-RETENTION AND PERMEABLE PAVEMENT (UNITS GIP1-20)
SECTION VIEW A-A DETAIL
SCALE: 1"=1'

Construction

Construction

Post-Construction

Performance/Modeling

Watershed Treatment Model (WTM)

- Easily Understandable
- Applicant doesn't need to purchase software
- Doesn't require excessive amounts of data

CENTER FOR WATERSHED PROTECTION

Design Storm (Inches)	1.0					
Water Quality Volumes	Provide Full WQv	100%				
Discount Factors						
Design	ame for all (Enter at the righ	Value:				
Maintenance	ame for all (Enter at the righ	Value:				
	Basic Site Information. Make sure to Enter Data in Green Cells					
	Area Captured (acres)	Impervious Percentage	Is this a Retrofit of an Existing Facility?	What Practice Was the Original Facility?	Dominant Soil Type in Drainage Area	Depth to Groundwater (from Practice Bottom)
Practices from Education Programs						
Rooftop Disconnection	0.000	100%	No	N/A	A Soils	>5 Feet
Soil Amendments	0.000	0%	No	N/A	C Soils	>5 Feet
Practice Type						
Bioretention			No	N/A	C Soils	3-5 Feet
Wet Pond			No	N/A	A Soils	3-5 Feet
Enter Practice			No	N/A	C Soils	>5 Feet
Enter Practice			No	N/A	C Soils	>5 Feet
Enter Practice			No	N/A	C Soils	>5 Feet
Enter Practice			No	N/A	C Soils	>5 Feet
Enter Practice			No	N/A	C Soils	>5 Feet

Existing Conditions

Purple Cells Reflect "Bottom Line" Loads or Load Reductions. Purple Tabs Summarize Loads from Other Sheets

PRIMARY SOURCES - Land Use
Watershed

Category	Detailed Description	Area (Acres)	Impervious Cover (%)	Concentrations: Turf Cover (%)	TN (mg/l)	TP (mg/l)	TSS (mg/l)	Annual Loading Rates: FC (MPN/100 ml)	TN (lb/acre)	TP (lb/acre)	TSS (lbs/acre)
Residential	LDR (<1du/acre)		12%	70%	2.1	0.31	49	20000	5.5	0.8	129
	MDR (1-4 du/acre)		21%	63%	2.1	0.31	49	20000	6.9	1.0	162
	HDR (>4 du/acre)		33%	54%	2.1	0.31	49	20000	8.8	1.3	205
	Multifamily		44%	45%	2.1	0.31	49	20000	10.5	1.5	244
				0%	2.1	0.31	49	20000	0.8	0.1	19
				0%	2.1	0.31	49	20000	0.8	0.1	19
				0%	2.1	0.31	49	20000	0.8	0.1	19
				0%	2.1	0.31	49	20000	0.8	0.1	19
				0%	2.1	0.31	49	20000	0.8	0.1	19
				0%	2.1	0.31	49	20000	0.8	0.1	19
Commercial	Commercial		72%	22%	2.1	0.22	43	20000	14.8	1.5	302
				0%	2.1	0.22	43	20000	0.8	0.1	16
				0%	2.1	0.22	43	20000	0.8	0.1	16
				0%	2.1	0.22	43	20000	0.8	0.1	16
				0%	2.1	0.22	43	20000	0.8	0.1	16
Roadway	Roadway	1.6	100%	0%	2.3	0.25	134	20000	20.9	2.3	1217
				0%	2.3	0.25	134	20000	0.9	0.1	51
				0%	2.3	0.25	134	20000	0.9	0.1	51
				0%	2.3	0.25	134	20000	0.9	0.1	51
				0%	2.3	0.25	134	20000	0.9	0.1	51
Industrial	Industrial		53%	38%	2.2	0.25	81	20000	12.4	1.4	457
				0%	2.2	0.25	81	20000	0.8	0.1	31
				0%	2.2	0.25	81	20000	0.8	0.1	31
				0%	2.2	0.25	81	20000	0.8	0.1	31
				0%	2.2	0.25	81	20000	0.8	0.1	31
Forest	Forest								2.5	0.2	100

Watershed Data

Annual Rainfall (inches)	47
Watershed Area (acres)	1
Stream Length (miles)	0

Soils Information	Soil Fraction(%)	Runoff Coefficients: Impervious	Turf	Forest	Rural
HYDROLOGIC SOIL GROUP					
A Soils		0.95	0.15	0.02	0.02
B Soils		0.95	0.20	0.03	0.03
C Soils	100%	0.95	0.22	0.04	0.04
D Soils		0.95	0.25	0.05	0.05
		0.95	**0.22**	**0.04**	**0.04**

DEPTH TO GROUNDWATER	
<3 Feet	
3-5 Feet	
>5 Feet	100%

Existing Condition Data Input

- Land Use area
- Annual rainfall
- Soil type
- Depth to groundwater

Existing Loads to Surface Water

Existing Runoff:	1,629,257	(gal/year)
Existing Sediment:	0.97	(tons/year)
Existing Phosphorous:	3.63	(lbs/year)
Existing Nitrogen:	33	(lbs/year)

Existing Loads to Surface Waters					
	TN lb/year	TP lb/year	TSS lb/year	Fecal Coliform billion/year	Runoff Volume (acre-feet/year)
Urban Land	33	3.63	1,947	1,324	5
Active Construction	-	-	-	-	-
SSOs	-	-	-	-	-
CSOs	-	-	-	-	-
Channel Erosion	-	-	-	-	-
Road Sanding	-	-	-	-	-
Forest	-	-	-	-	-
Rural Land	-	-	-	-	-
Livestock	-	-	-	-	-
Illicit Connections	-	-	-	-	-
Marinas	-	-	-	-	-
Point Source Discharges	-	-	-	-	-
OSDS	-	-	-	-	-
Open Water	-	-	-	-	-
Total Storm Load	33	3.63	1,947	1,324	5
Total Non-Storm Load	-	-	-	-	-
Total Load to Surface Waters	33	4	1,947	1,324	5

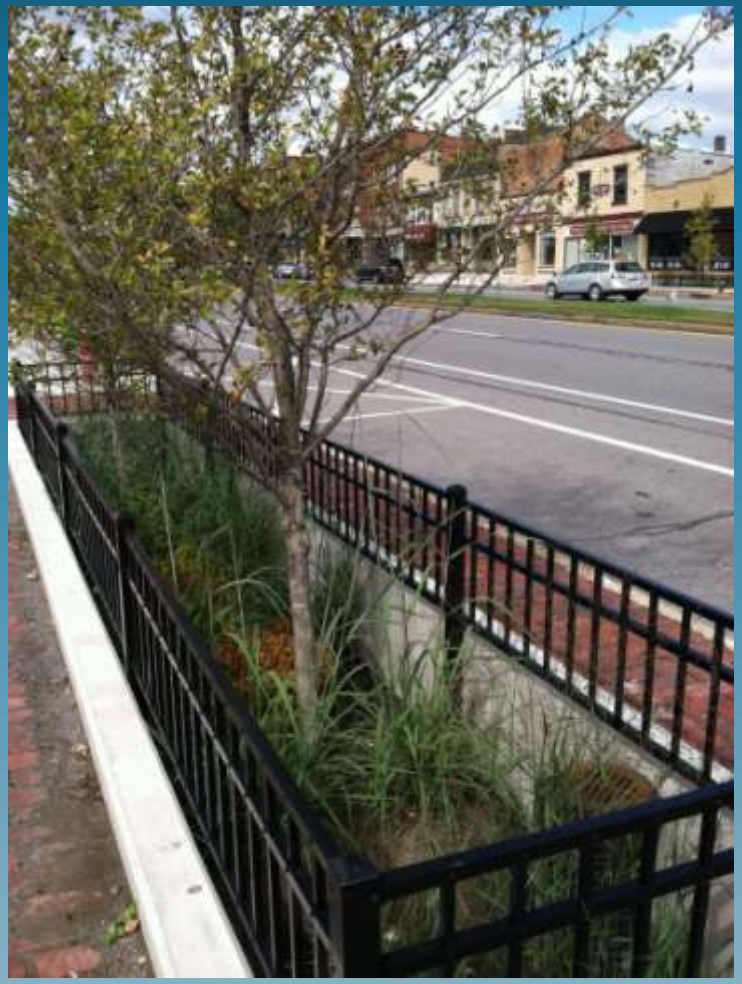
Loads with New Development

Loads to Surface Waters with Future Practices	TN lb/year	TP lb/year	TSS lb/year	Fecal Coliform billion/year	Runoff Volume (acre-feet/year)
Urban Land	15.6	1.8	987.9	672.0	3.8
Total Load to Surface Waters	**15.6**	**1.8**	**987.9**	**672.0**	**3.8**

Existing Loads to Surface Waters	TN lb/year	TP lb/year	TSS lb/year	Fecal Coliform billion/year	Runoff Volume (acre-feet/year)
Urban Land	33	3.63	1,947	1,324	5
Total Load to Surface Waters	**33**	**4**	**1,947**	**1,324**	**5**

Design Calculations Modeling Summary

Capture Area(sq. feet):	68,149
Runoff Reduction	
Gallons per year:	391,022
Percent reduction:	24%
Sediment Reduction	
Tons/year:	.48
Percent reduction:	49.5%
Phosphorous Reduction	
Lbs/year:	2.2
Percent reduction:	55.0%
Nitrogen Reduction	
Lbs/year:	17.6
Percent reduction:	53.3%



Lessons Learned

Planting selection & location

Lessons Learned

Ownership of planting

CSO 060 Green Streets Demonstration Project City of Buffalo

Green Infrastructure Practice:

Permeable Pavement & Rain Gardens

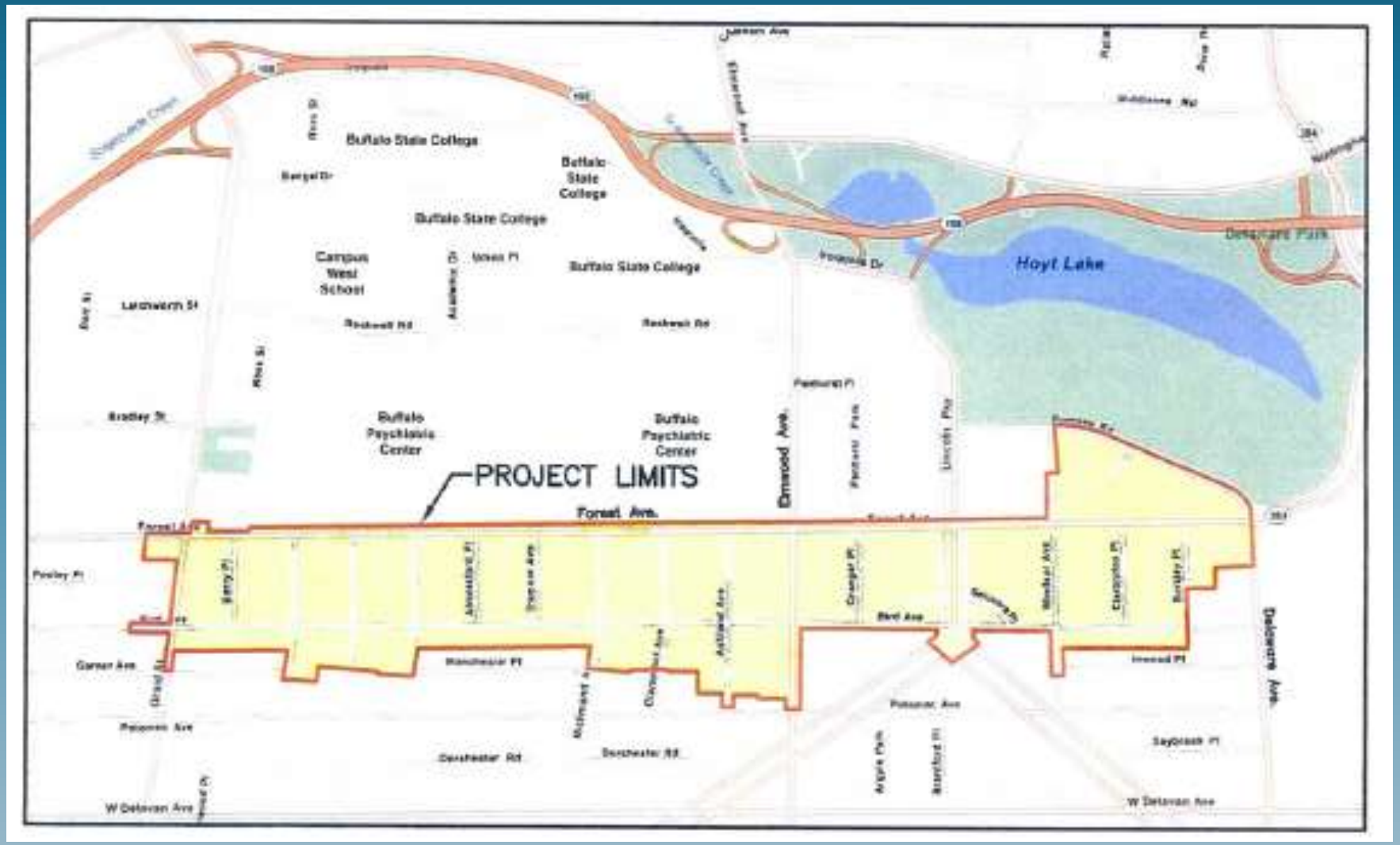
Total Project Cost: $1,600,520

GIGP Grant: $750,000

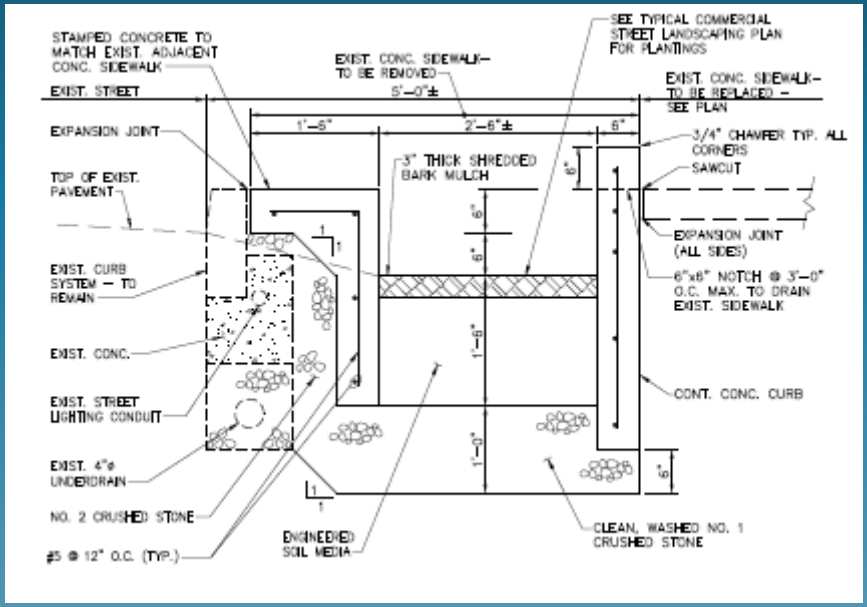
Construction Completion: Fall 2013

Location Map

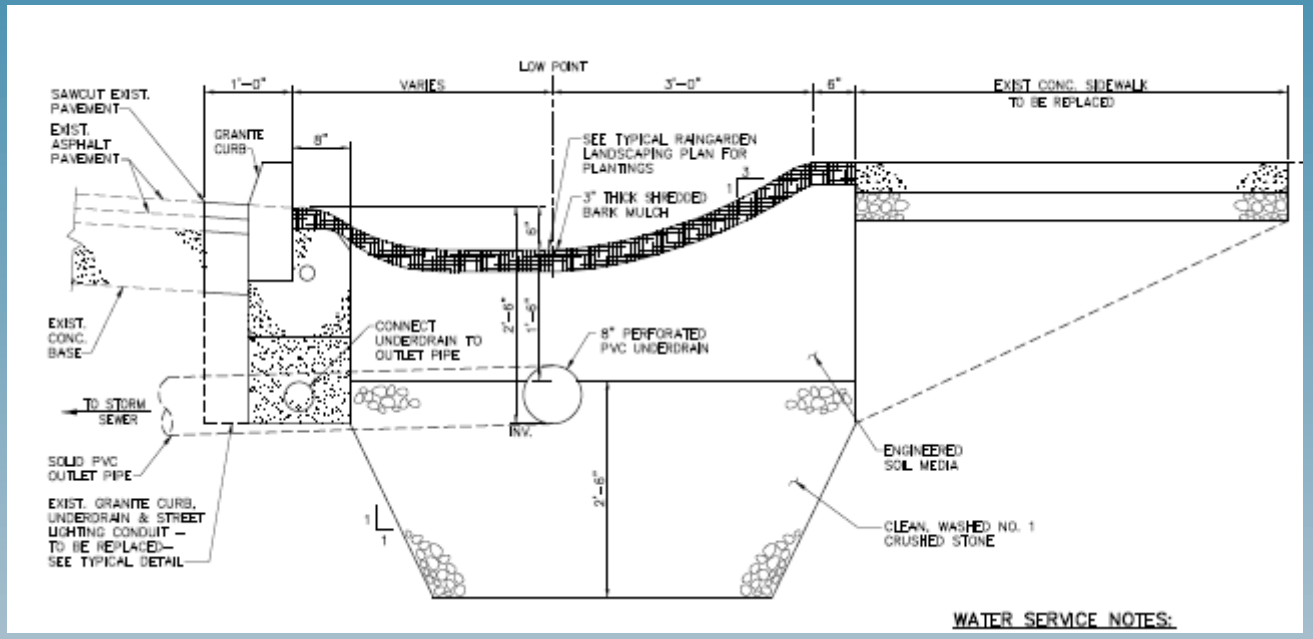
Project Location Map



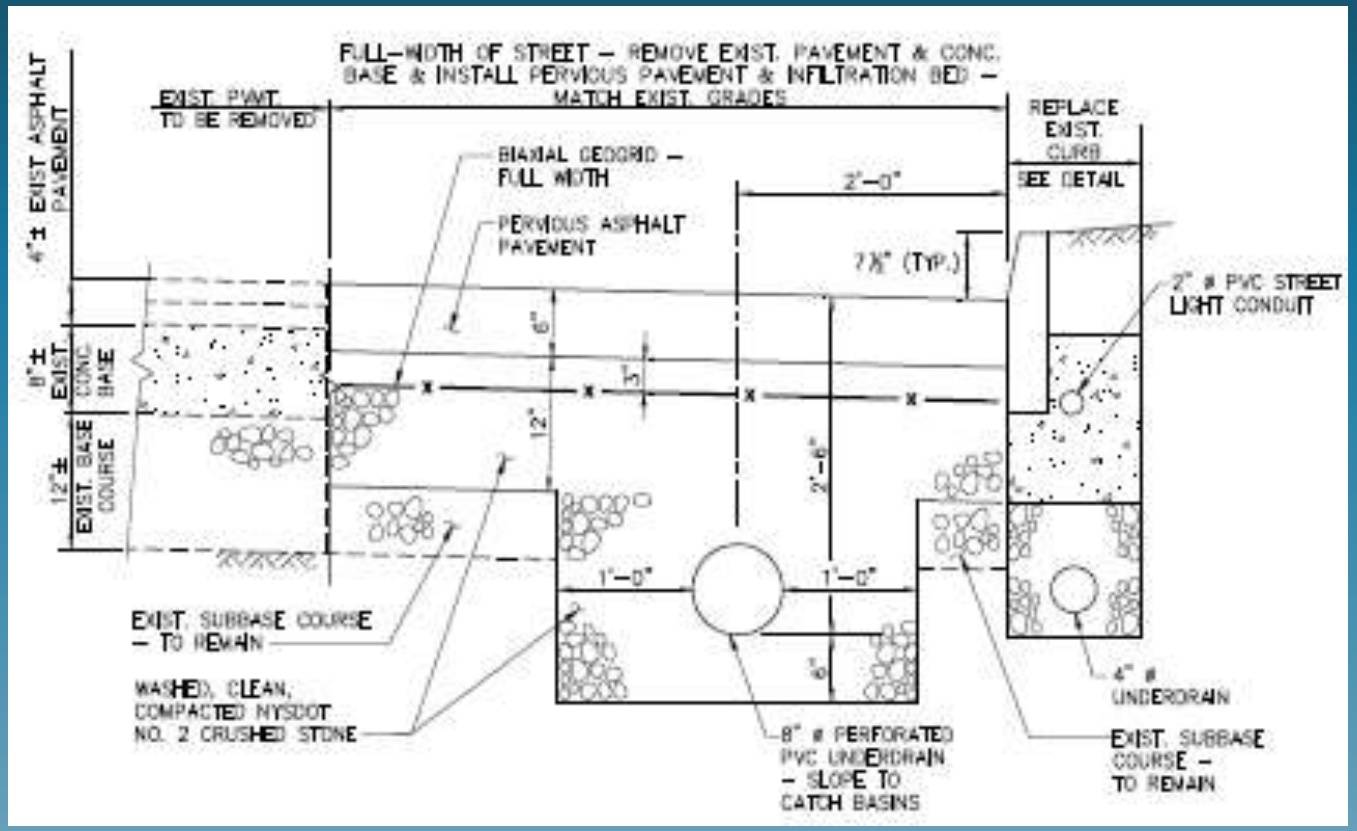
Commercial Street Rain Garden Details



Residential Rain Garden Details



Porous Asphalt Detail



Porous Pavement Section

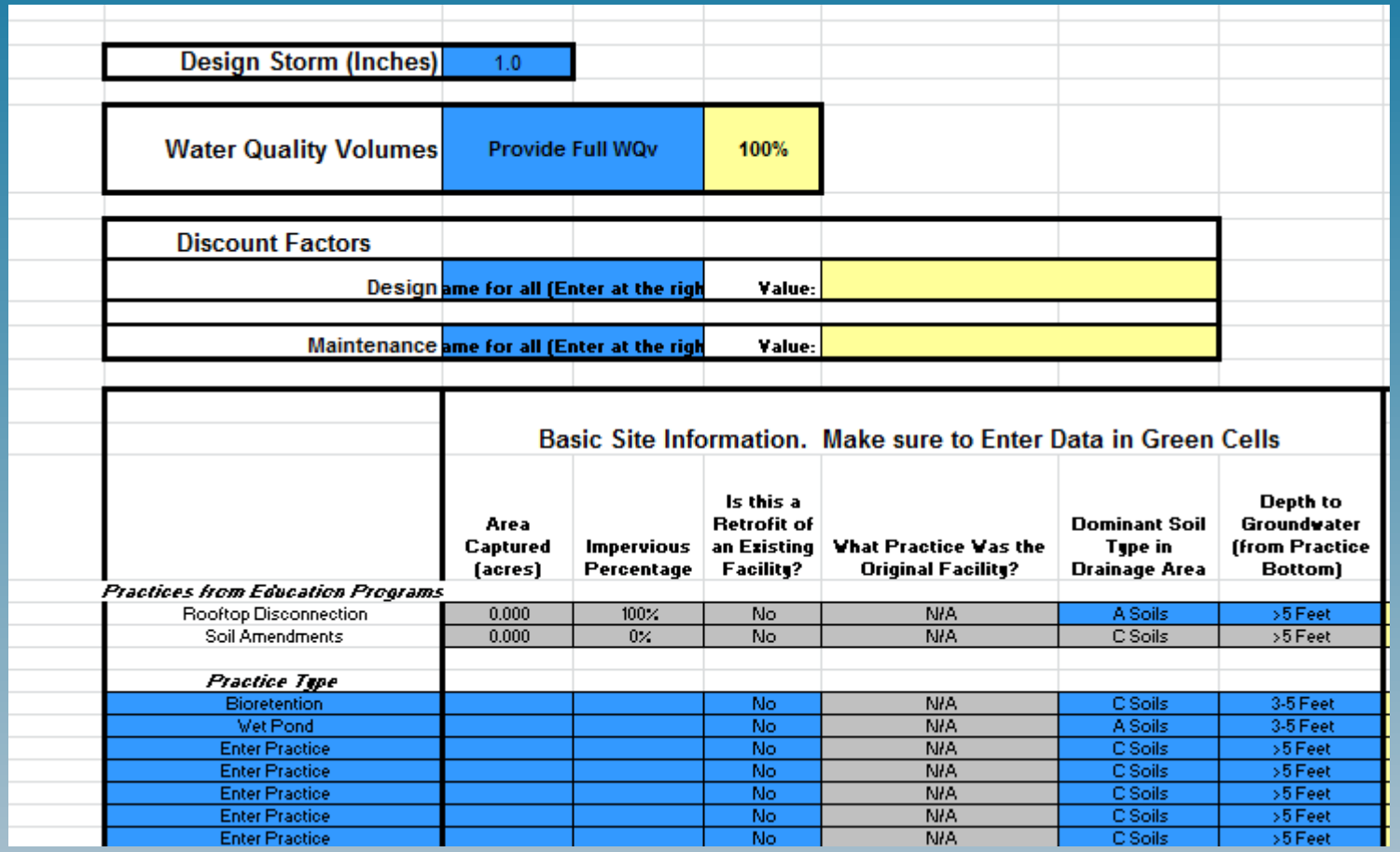
Post-Construction

Post Construction

Performance/Modeling

Watershed Treatment Model (WTM)

- Easily Understandable
- Applicant doesn't need to purchase software
- Doesn't require excessive amounts of data



Design Storm (Inches)	1.0					
Water Quality Volumes	Provide Full WQv	100%				
Discount Factors						
Design	ame for all (Enter at the righ	Value:				
Maintenance	ame for all (Enter at the righ	Value:				
	Basic Site Information. Make sure to Enter Data in Green Cells					
	Area Captured (acres)	Impervious Percentage	Is this a Retrofit of an Existing Facility?	What Practice Was the Original Facility?	Dominant Soil Type in Drainage Area	Depth to Groundwater (from Practice Bottom)
Practices from Education Programs						
Rooftop Disconnection	0.000	100%	No	N/A	A Soils	>5 Feet
Soil Amendments	0.000	0%	No	N/A	C Soils	>5 Feet
Practice Type						
Bioretention			No	N/A	C Soils	3-5 Feet
Wet Pond			No	N/A	A Soils	3-5 Feet
Enter Practice			No	N/A	C Soils	>5 Feet
Enter Practice			No	N/A	C Soils	>5 Feet
Enter Practice			No	N/A	C Soils	>5 Feet
Enter Practice			No	N/A	C Soils	>5 Feet
Enter Practice			No	N/A	C Soils	>5 Feet

Existing Conditions

PRIMARY SOURCES - Land Use Watershed				Concentrations				Annual Loading Rates			
		Area (Acres)	Impervious Cover (%)	Turf Cover (%)	TN (mg/l)	TP (mg/l)	TSS (mg/l)	FC (MPN/100 ml)	TN (lb/acre)	TP (lb/acre)	TSS (lbs/acre)
Category	Detailed Description										
Residential	LDR (<1du/acre)		12%	70%	2.1	0.31	49	20000	4.8	0.7	111
	MDR (1-4 du/acre)		21%	63%	2.1	0.31	49	20000	6.0	0.9	139
	HDR (>4 du/acre)		33%	54%	2.1	0.31	49	20000	7.6	1.1	176
	Multifamily		44%	45%	2.1	0.31	49	20000	9.0	1.3	210
				0%	2.1	0.31	49	20000	0.7	0.1	16
				0%	2.1	0.31	49	20000	0.7	0.1	16
				0%	2.1	0.31	49	20000	0.7	0.1	16
				0%	2.1	0.31	49	20000	0.7	0.1	16
				0%	2.1	0.31	49	20000	0.7	0.1	16
				0%	2.1	0.31	49	20000	0.7	0.1	16
Commercial	Commercial		72%	22%	2.1	0.22	43	20000	12.7	1.3	261
				0%	2.1	0.22	43	20000	0.7	0.1	14
				0%	2.1	0.22	43	20000	0.7	0.1	14
				0%	2.1	0.22	43	20000	0.7	0.1	14
				0%	2.1	0.22	43	20000	0.7	0.1	14
Roadway	Roadway	8.2	100%	0%	2.3	0.25	134	20000	18.0	2.0	1049
				0%	2.3	0.25	134	20000	0.8	0.1	44
				0%	2.3	0.25	134	20000	0.8	0.1	44
				0%	2.3	0.25	134	20000	0.8	0.1	44
				0%	2.3	0.25	134	20000	0.8	0.1	44
Industrial	Industrial		53%	38%	2.2	0.25	81	20000	10.7	1.2	394
				0%	2.2	0.25	81	20000	0.7	0.1	27
				0%	2.2	0.25	81	20000	0.7	0.1	27
				0%	2.2	0.25	81	20000	0.7	0.1	27
				0%	2.2	0.25	81	20000	0.7	0.1	27

Watershed Data	
Annual Rainfall (inches)	40.5
Watershed Area (acres)	8
Stream Length (miles)	0

Soils Information	Soil Fraction(%)	Runoff Coefficients: Impervious	Turf	Forest	Rural
HYDROLOGIC SOIL GROUP					
A Soils		0.95	0.15	0.02	0.02
B Soils		0.95	0.20	0.03	0.03
C Soils	100%	0.95	0.22	0.04	0.04
D Soils		0.95	0.25	0.05	0.05
		0.95	0.22	0.04	0.04
DEPTH TO GROUNDWATER					
<3 Feet					
3-5 Feet					
>5 Feet	100%				

Existing Condition Data Input

- Land Use area
- Annual rainfall
- Soil type
- Depth to groundwater

Existing Loads to Surface Water

Existing Runoff:	7,820,000	(gal/year)
Existing Sediment:	4.3	(tons/year)
Existing Phosphorous:	16.04	(lbs/year)
Existing Nitrogen:	148	(lbs/year)

Existing Loads to Surface Waters					
	TN lb/year	TP lb/year	TSS lb/year	Fecal Coliform billion/year	Runoff Volume (acre-feet/year)
Urban Land	148	16.04	8,599	5,849	24
Active Construction	-	-	-	-	-
SSOs	-	-	-	-	-
CSOs	-	-	-	-	-
Channel Erosion	-	-	-	-	-
Road Sanding	-	-	-	-	-
Forest	-	-	-	-	-
Rural Land	-	-	-	-	-
Livestock	-	-	-	-	-
Illicit Connections	-	-	-	-	-
Marinas	-	-	-	-	-
Point Source Discharges	-	-	-	-	-
OSDS	-	-	-	-	-
Open Water	-	-	-	-	-
Total Storm Load	148	16.04	8,599	5,849	24
Total Non-Storm Load	-	-	-	-	-
Total Load to Surface Waters	**148**	**16**	**8,599**	**5,849**	**24**

Loads with New Development

Loads to Surface Waters with Future Practices					
	TN lb/year	TP lb/year	TSS lb/year	Fecal Coliform billion/year	Runoff Volume (acre-feet/year)
Urban Land	74.0	8.5	4536.9	3312.1	16.5
Active Construction	0.0	0.0	0.0	0.0	0.0
SSOs	0.0	0.0	0.0	0.0	0.0
CSOs	0.0	0.0	0.0	0.0	0.0
Channel Erosion	0.0	0.0	0.0	0.0	0.0
Road Sanding	0.0	0.0	0.0	0.0	0.0
Forest	0.0	0.0	0.0	0.0	0.0
Rural Land	0.0	0.0	0.0	0.0	0.0
Livestock	0.0	0.0	0.0	0.0	0.0
Illicit Connections	0.0	0.0	0.0	0.0	0.0
Marinas	0.0	0.0	0.0	0.0	0.0
Point Sources	0.0	0.0	0.0	0.0	0.0
Septic Systems	0.0	0.0	0.0	0.0	0.0
Open Water	0.0	0.0	0.0	0.0	0.0
Total Storm Load	74.0	8.5	4536.9	3312.1	16.5
Total Non-Storm Load	0.0	0.0	0.0	0.0	0.0
Total Load to Surface Waters	**74.0**	**8.5**	**4536.9**	**3312.1**	**16.5**

Design Calculations Modeling Summary

Capture Area(sq. feet):	357,192
Runoff Reduction	
Gallons per year:	2,443,886
Percent reduction:	31.0%
Sediment Reduction	
Tons/year:	2.04
Percent reduction:	47.45%
Phosphorous Reduction	
Lbs/year:	7.5
Percent reduction:	46.8%
Nitrogen Reduction	
Lbs/year:	74
Percent reduction:	50.0%

Design Calculations Modeling Analysis

Rain Garden		Porous Pavement	
Runoff Reduction		**Runoff Reduction**	
Gallons per year:	1,205,650	Gallons per year:	912,384
Percent reduction:	26.4%	Percent reduction:	31.0%
Sediment Reduction		**Sediment Reduction**	
Tons/year:	1.32	Tons/year:	.71
Percent reduction:	50.3%	Percent reduction:	42.0%
Phosphorous Reduction		**Phosphorous Reduction**	
Lbs/year:	5.1	Lbs/year:	2.4
Percent reduction:	51%	Percent reduction:	40.0%
Nitrogen Reduction		**Nitrogen Reduction**	
Lbs/year:	49.2	Lbs/year:	24.8
Percent reduction:	54.6%	Percent reduction:	42.8%

Post Construction Monitoring

Stormwater Sampling Data

URS Corporation
257 West Genesee Street, Suite 400
Buffalo, New York 14202
Telephone: (716)-856-5636
Fax: (716)-856-2546

PROJECT: CSO Outfall No. 60- Sewer Separation Project/ Green Infrastructure Project
Client: Buffalo Sewer Authority
URS JOB No. 11176203
URS PROJECT MANAGER: Thomas M. McPherson, P.E.

Stormwater Sampling Analysis - Summary

Site Number: 001
Location: Bird/Granger
Green Infrustructure Type: None

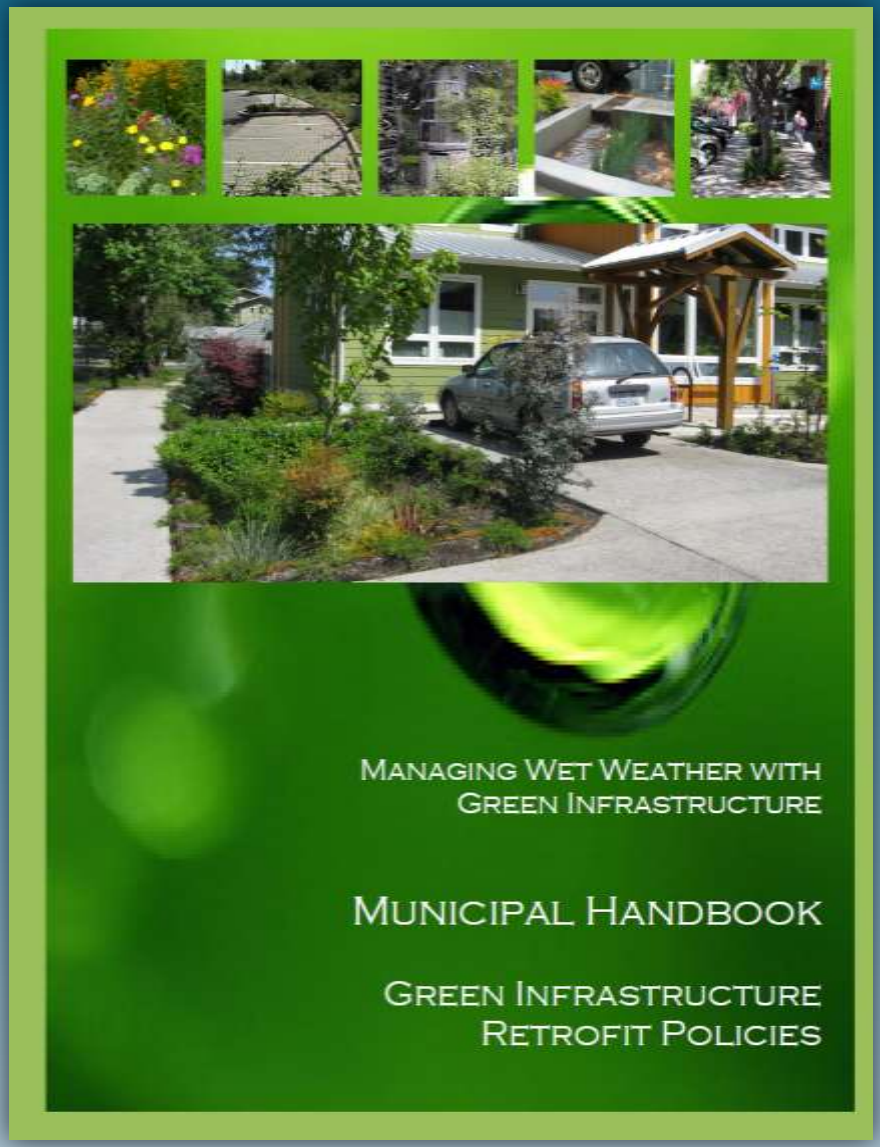
Date Sampled	Temp (deg F)	Dissolved Oxygen (mg/L)	Biochemical Oxygen Demand (mg/L)	Total Suspended Solids (mg/L)	Total Phosphorus (mg/L)	Fecal Coliform (cfu/100mls)
12/10/2012	-	Not enough flow to collect samples				
12/18/2012	-	8.7	< 24	70	0.11	200
8/1/2013	-	Not enough flow to collect samples				
10/4/2013	-	Not enough flow to collect samples				
10/7/2013	-	8.5	4.9	14	0.29	>10,000
10/31/2013	-	7.5	11.6	37	0.20	500
4/4/2014	48.7	9.6	5.6	114	0.20	110
4/29/2014	-	9.70	6.5	244	0.68	800
6/3/2014	68.2	Not enough flow to collect samples				>10,000
7/7/2014	-	Not enough flow to collect samples				

Additional "Upstream" Samples

Date Sampled	Sample collection point	Dissolved Oxygen (mg/L)	Biochemical Oxygen Demand (mg/L)	Total Suspended Solids (mg/L)	Total Phosphorus (mg/L)	Fecal Coliform (cfu/100mls)
6/6/2013	Manhole on the sat Elmwood and Bird (south side of Bird)	9.54	5.20	48.4	0.14	7,800
10/31/2013	Upstream manhole at Elmwood and Bird (south side of Bird)	Not enough flow to collect samples				1,100
10/31/2013	Catch basin at Windsor and Bird (west side of Windsor)	Not enough flow to collect samples				5,000

Lessons Learned

Stormwater Management Retrofits Using Green Infrastructure



"Green infrastructure's ability to reduce both stormwater volumes and pollutant concentrations is critical to reducing pollutant loads from urban areas and improving water quality."

-- U.S. EPA

Resources

- The Center for Neighborhood Technology (CNT) "Upgrade Your Infrastructure" **http://www.cnt.org/2012/12/18/setting-standards-for-green-infrastructure-retrofits/**

- U.S. EPA Green Infrastructure resources: **http://water.epa.gov/infrastructure/greeninfrastructure/index.cfm**

- NYS DOT Specifications for Porous Pavement: **https://www.dot.ny.gov/pic**

- NYC DEP Standard Designs: **http://www.nyc.gov/html/dep/pdf/green_infrastructure/bioswales-standard-designs.pdf**

- Philadelphia Green Streets Design Manual: **http://www.phillywatersheds.org/what_were_doing/gsdm**

Applying for GIGP

- Feasibility Study
- Conceptual Site Plan
- Project Location Map
- Site Photographs
- Completed online Consolidated Funding Application

Apply through the Consolidated Funding Application (CFA)
http://nyworks.ny.gov

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