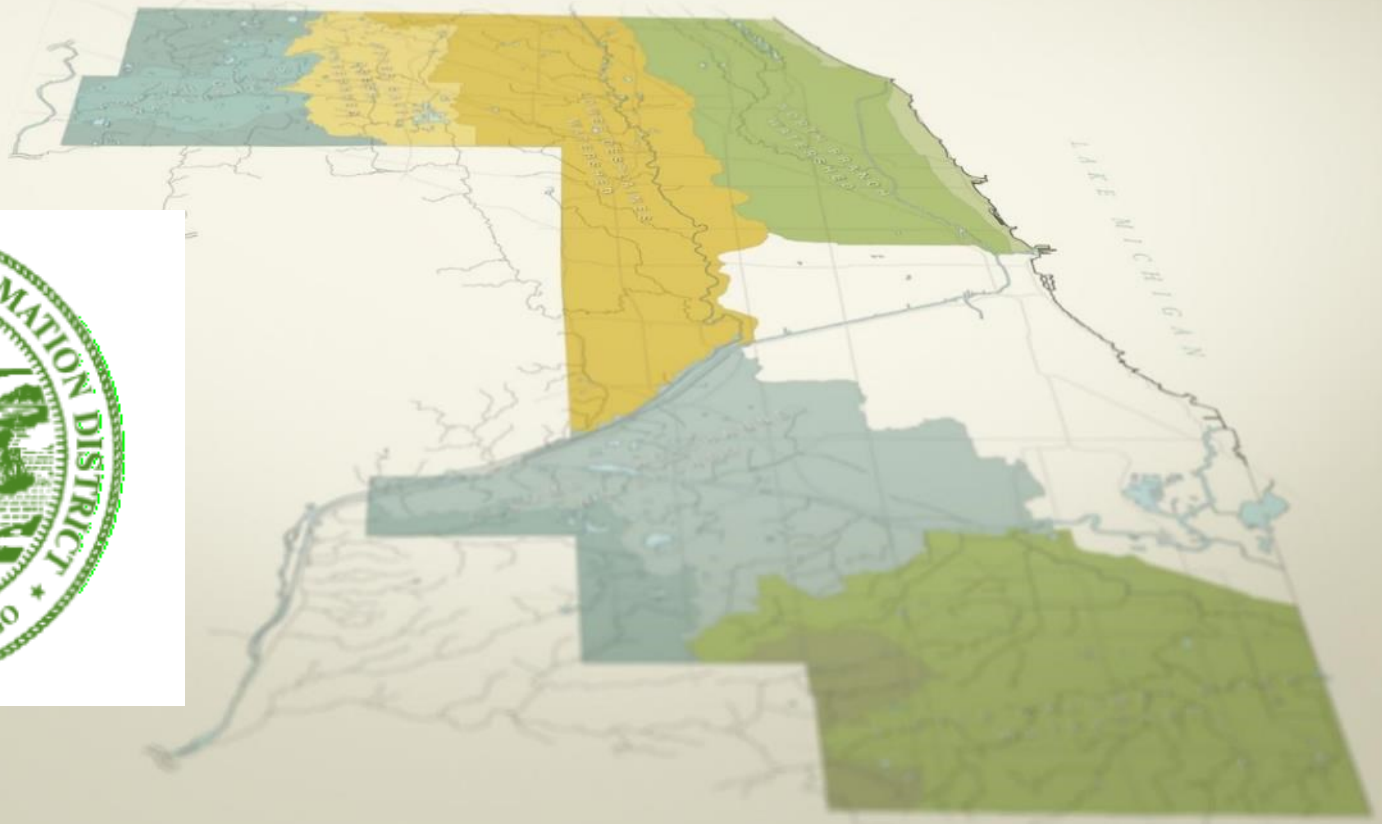
Metropolitan Water Reclamation District of Greater Chicago

Green Infrastructure Program Updates



Calumet Stormwater Collaborative

June 1, 2018 - Chicago

Stormwater Management Programs

Flooding remains our #1 issue

- Stormwater Phase I (DWP) Projects
  - Design and Construction of Regional Flood Control and Streambank Stabilization Projects
- Stormwater Phase II Projects
  - Funding of Shovel-Ready Projects
  - Design of Conceptual Projects
- Green Infrastructure
  - Partnerships with Local Communities
- Flood-Prone Property Acquisitions
  - Voluntary buyouts where no practical engineered solution exists

Stormwater Management Program

MWRD conveyed authority in November 2004 to plan, manage, implement, and finance activities relating to stormwater management in Cook County

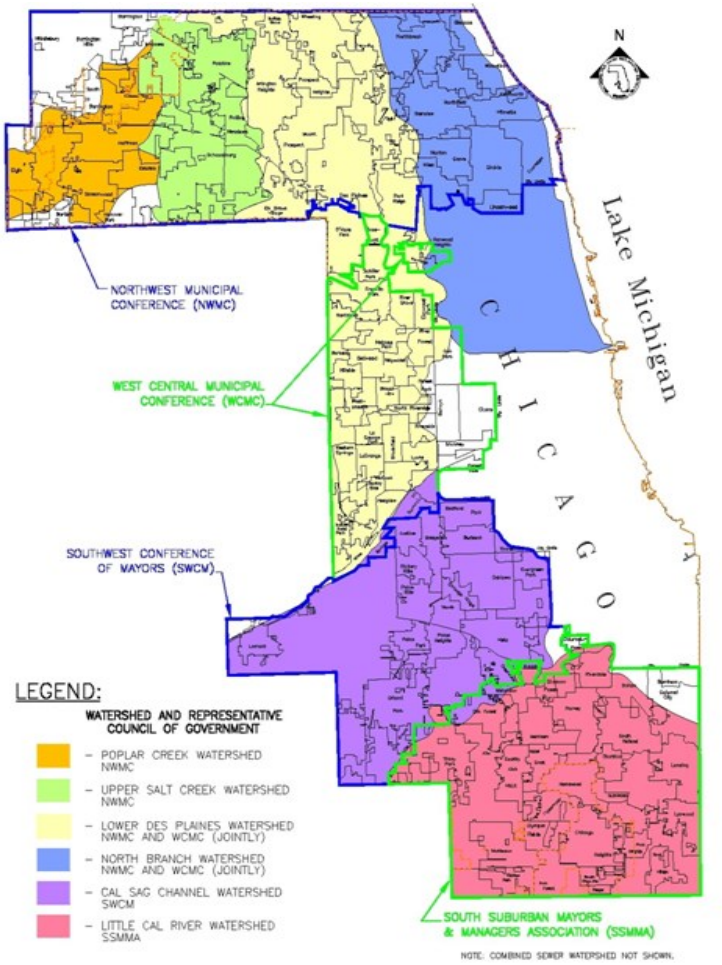
Cook County Stormwater Management Plan (CCSMP) adopted in 2007 establishing program framework

Primary Stormwater Management Activities:

- Develop Capital Improvement Program (CIP) to address REGIONAL stormwater problems
- Comprehensive uniform stormwater regulations to ensure future development and redevelopment does not exacerbate flooding

Detailed Watershed Plan Development

- Poplar Creek
- Upper Salt Creek
- Lower Des Plaines River
- North Branch Chicago River
- Calumet-Sag Channel
- Little Calumet River

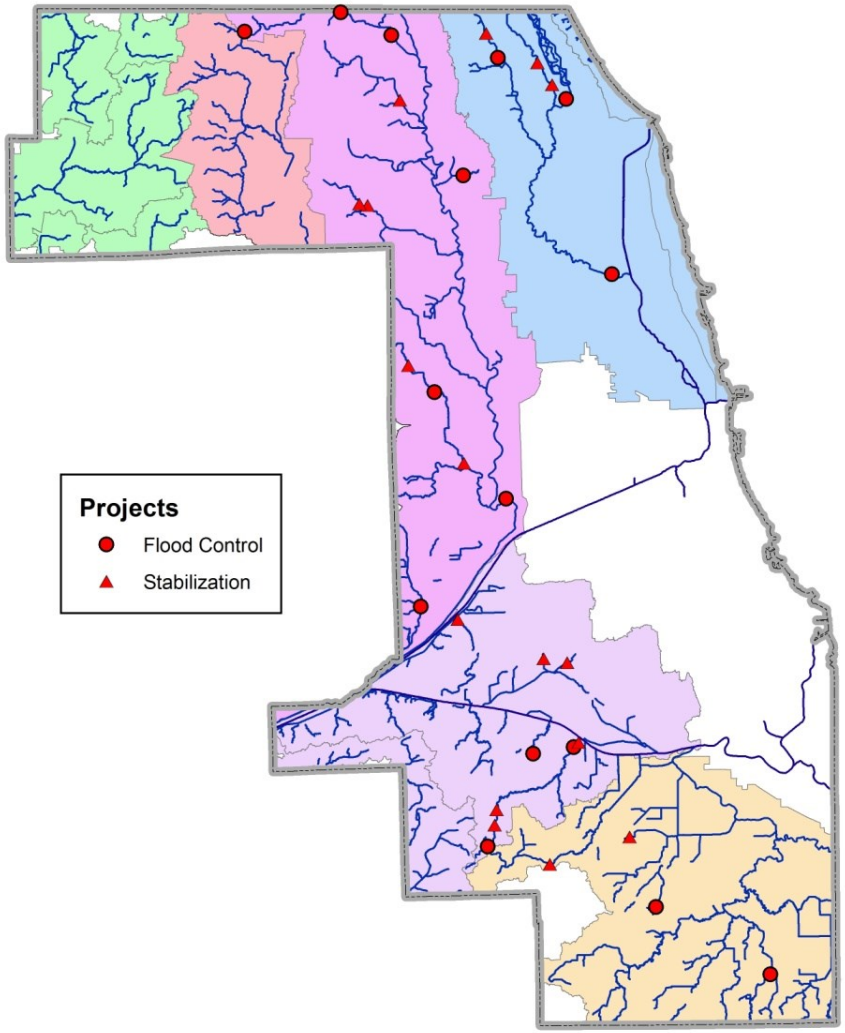


Recommended DWP Projects

15 Flood Control Projects to address overbank flooding

12 Streambank Stabilization Projects to address critical erosion

Prioritized based on Benefit-to-Cost Ratio and Distributed across Cook County



Regional Streambank Projects

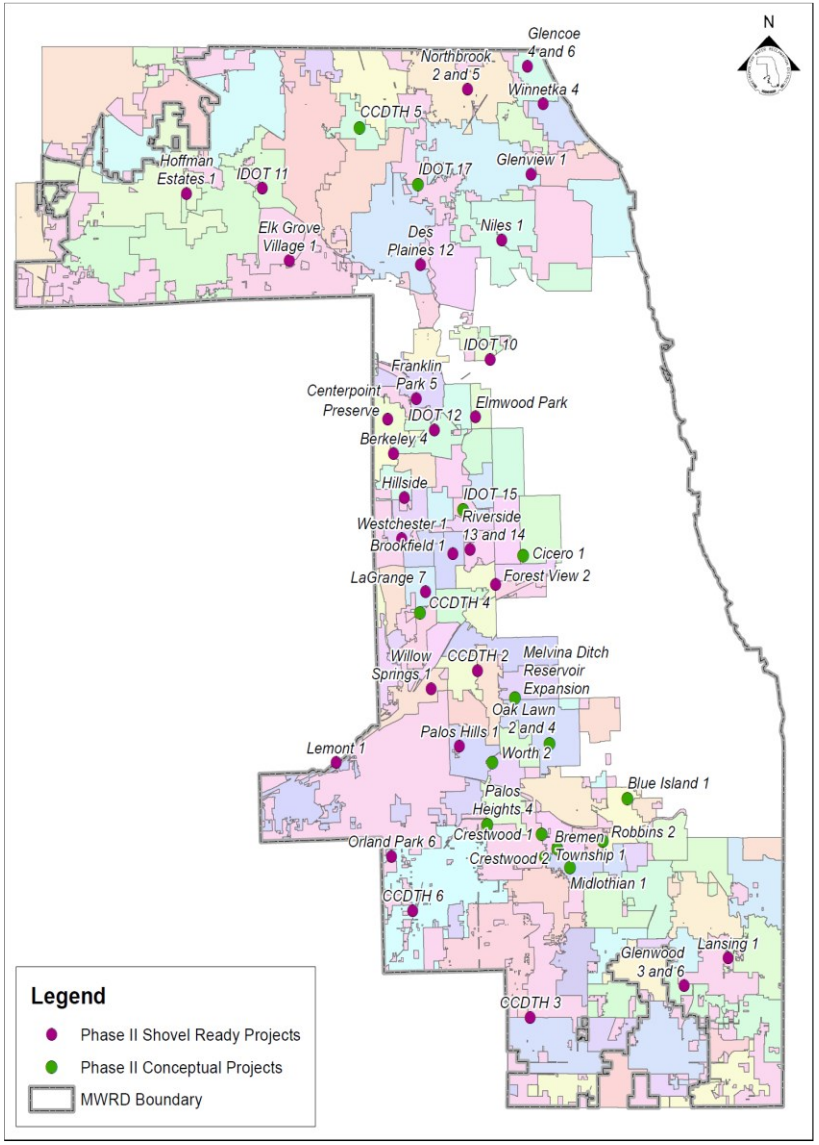
Streambank Stabilization Projects

- Address erosion threatening structures, roadways, utilities on regional waterways
- Natural channel design is our goal where practical
- Structural measures when necessary
  - Concrete walls
  - Sheet piles
  - Gabions

Phase II Flood Control Program

Initial (2014) Call for Projects

- 21 Shovel Ready Projects (3 GI)
- >3,000 Structures Protected
- $81M Construction Costs
- $41M in MWRD Dollars
- 13 Conceptual Projects
- 5 Pilot Study Master Plans
- >$15M in Engineering Fees
- Final Design in progress or under development



Green Infrastructure Program

Space to Grow

- Managed by Healthy Schools Campaign and Openlands
- Funding and technical assistance from
  - Chicago Public Schools
  - Chicago Dept. of Water Management
  - MWRDGC

Chicago Housing Authority

- Dearborn Homes Rainwater Harvesting

Local Municipalities

- Evanston, Blue Island, Kenilworth, Wilmette, Northbrook, Niles, and Berwyn (complete)
- Skokie (under construction)

Green Infrastructure Program

2017 GI Call for Projects:

- Projects solicited from Cook County Municipalities, Townships, and other Governmental Organizations
- Applications mailed to elected officials, posted on mwrd.org, and publicized through press releases, and at various public events
- Application period May 25th -July 14
- Fillable Application Form (PDF) format
- Eligibility Information and Instructions

Metropolitan Water Reclamation District *of* Greater Chicago

Press Release

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For immediate release
June 14, 2017

Calling all green infrastructure projects: MWRD welcomes government partners

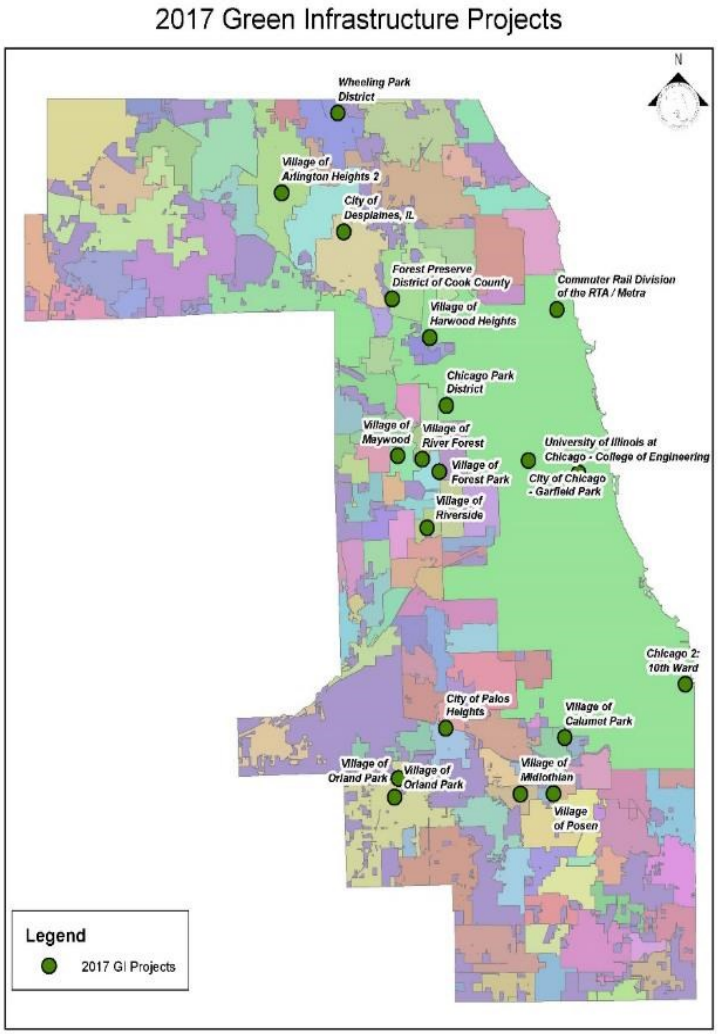
Applications are being accepted until July 14 by the Metropolitan Water Reclamation District of Greater Chicago (MWRD) to help fund local government projects that utilize green infrastructure (GI) to better manage stormwater.

GI is designed to capture water and allow it to infiltrate into the ground before it enters the traditional

Green Infrastructure Program

2017 GI Call for Projects:

- 47 Projects submitted
- 20 Projects were accepted
- 730 Structures to Benefit
- $11.7M estimated total Construction Costs
- 3.6M gal Design Retention Capacity estimated
- Applicants whose projects were not selected notified their proposals may be eligible for future consideration



2017 GI Call for Project Results

Primary Selection Criteria

- Structures protected by project
- Project timeframe
- Project visibility/educational opportunity
- Median income of area

Other factors

- Total cost of project
- Combined Sewer Area
- Resources and experience in performing maintenance
- Partner agency new to MWRD GI funding

2017 GI Call for Project Results

2017 Recommended Projects:

Arlington Heights – permeable parking lot pavers and a bioinfiltration basin at Arlington Heights Police Station.

Calumet Park – detention pond, bioswales, permeable pavement and rain gardens as part of the Winchester Avenue improvements.

City of Chicago, Department of Planning and Development – Stormwater storage at Garfield Park Community Eco Orchard.

City of Chicago, 10th Ward – green alleys

Chicago Park District – improving stormwater infiltration through the establishment of native habitat at three Chicago parks.

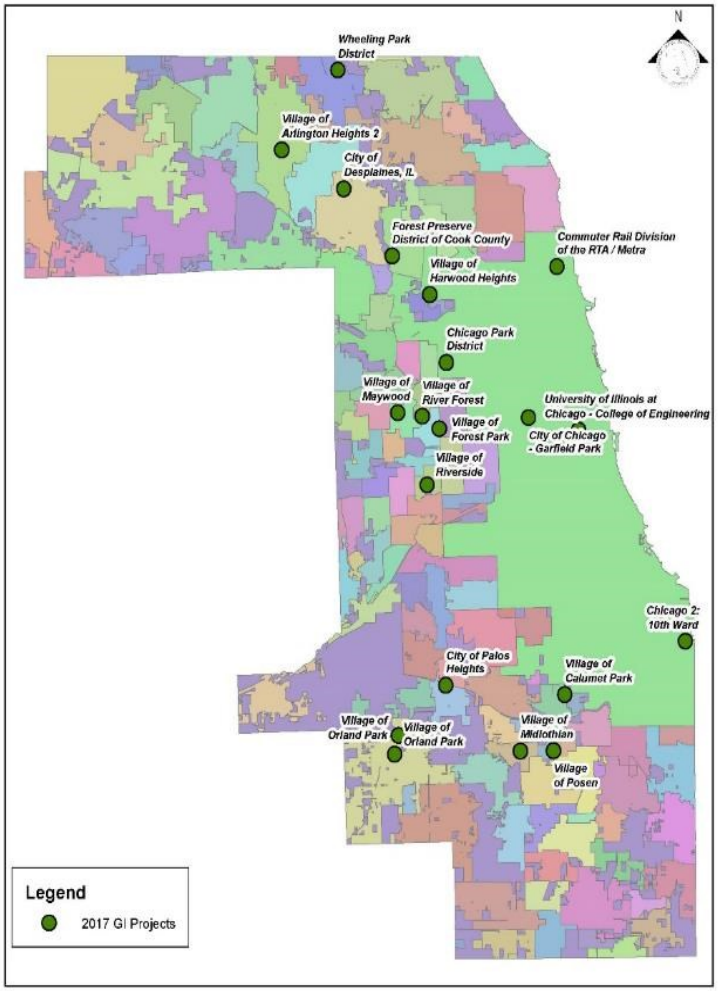
Metra –permeable pavement, naturalized plantings and other GI improvements for the new Peterson Ridge Metra station in Edgewater neighborhood.

University of Illinois at Chicago – permeable pavers and rain gardens at Arthington Mall and Parking Lot B2.

Des Plaines – green alleys.

Forest Park – green alleys.

2017 Green Infrastructure Projects



2017 GI Call for Project Results

2017 Recommended Projects:

Harwood Heights – green alleys.

Maywood – green alleys.

Midlothian – permeable pavement, bioswales and rain garden.

Orland Park – green roof on the Orland Park Village Hall and Nature Center.

Palos Heights – permeable pavers in the Lake Katherine Nature Center parking lot.

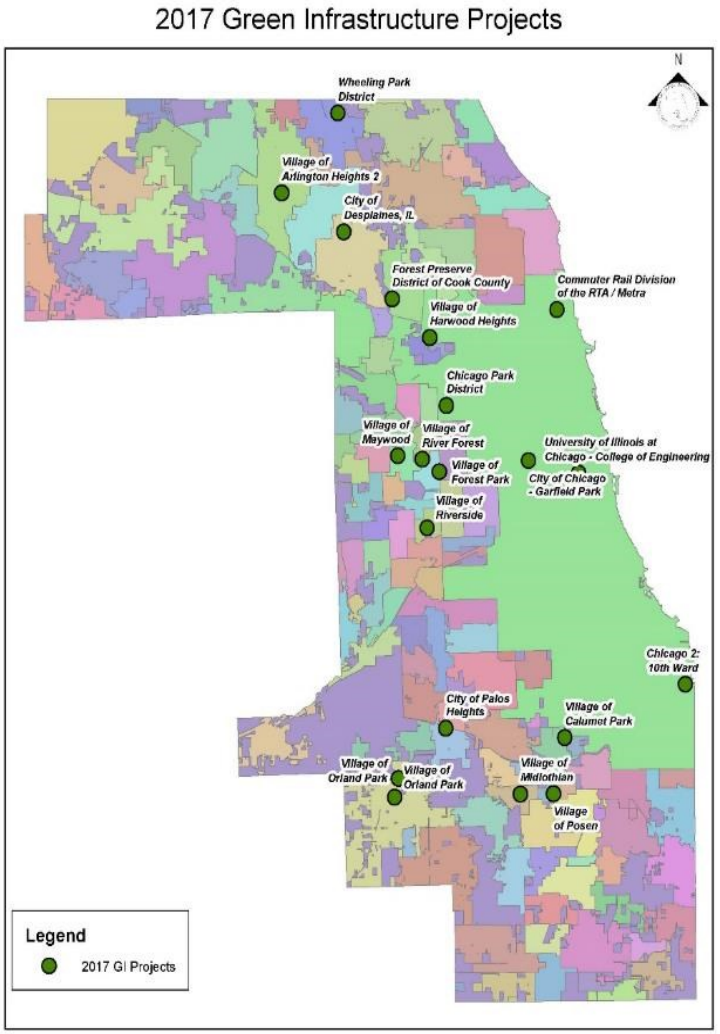
Forest Preserve District of Cook County – porous parking lot retrofit and pavement removal and naturalization at the Dam No. 4 Woods East.

Posen – rain gardens and permeable parking lots as municipal facilities.

Riverside – permeable pavers in the commuter parking lot.

River Forest – green alleys.

Wheeling Park District – reconstructing the Chamber Park parking lot with a rain garden.



GI Applicant Eligibility Requirements

- ✓ Project located within District's corporate limits
- ✓ Project designed to include onsite stormwater control measures using Green Infrastructure
- ✓ Project must be bid and awarded in accordance with District's Purchasing Act, MPLA, and Diversity Requirements
- ✓ Applicant must be willing and capable of performing maintenance of the project
- ✓ Applicant must be able to enter into an Intergovernmental Agreement with the District
- ✓ District will consider whether potential partner agency is in compliance with WMO & IICP when prioritizing

Green Infrastructure Program

Program Components

- Rain Barrel Program
- Comprehensive Land Use Policy
- Community Assistance and Public Outreach
- Projects and Design Retention Capacity

Protecting Our Water Environment

Metropolitan Water Reclamation District of Greater Chicago

Blue Island Rain Garden

Blue Island Permeable Parking Lot

Evanston Permeable Parking

Evanston Bioswale

Egan WRP Permeable Parking Lot

Berwyn Green Alleys During Construction

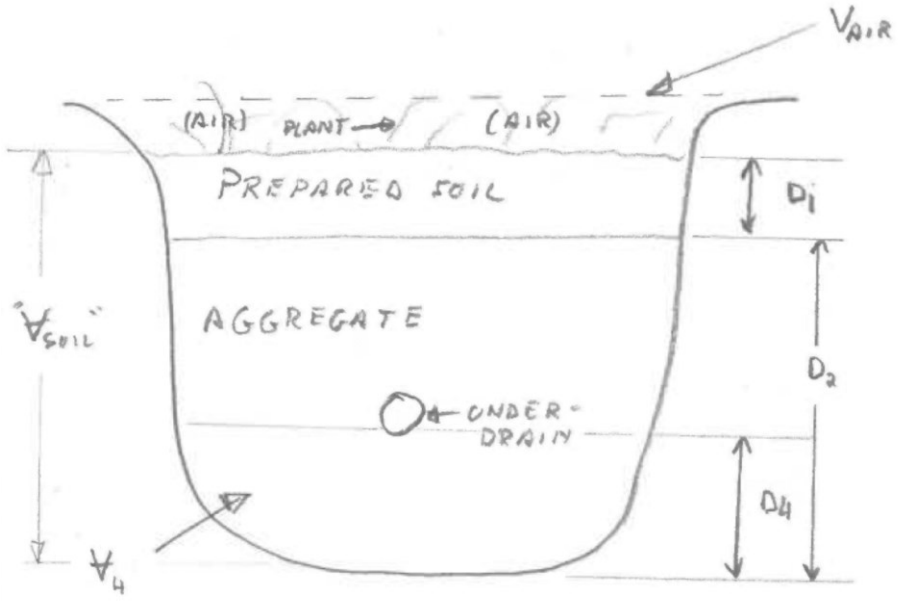
Berwyn Green Alleys After Construction

Wadsworth School Before Construction

Wadsworth School After Construction

Design Retention Capacity: Definition & Calculation

- Volume of stormwater prevented from entering the sewer
- Includes retention volume and 6-hr infiltration
- 50% credit given for void volume above underdrain (much will drain to sewer)
- 100% credit given for void volume below underdrain (retained and infiltrated)



Design Retention Capacity: Calculation Spreadsheet

	Section 3 BMP Specifications				Reference (Page#, report, etc)
10	Dimensions of the bioinfiltration facility (length, width, or area)	L		feet	
		W		feet	
		A_{BMP}		square feet	
11	Depth of prepared soil	D_1		feet	
12	Prepared soil porosity (0.25 maximum unless detailed materials report provided)	P_1		[unitless]	
13	Depth of underlying aggregate (optional)	D_2		feet	
14	Aggregate porosity (0.38 maximum unless detailed materials report provided)	P_2		[unitless]	
15	Surface storage volume (provide supporting calculations, max depth 12 inches) (=6" for projects with safety-limited surface storage (CPS))	V_{AIR}		cubic feet	
16	Total media void volume = A_{BMP} * [(D_1 * P_1) + (D_2 * P_2)]	V_{SOIL}	0	cubic feet	
	DRC Volume Including Infiltration				Reference (Page#, report, etc)
20	Depth of Prepared Soil Below Drain (if drained, if not drained, total depth of prepared soil)	D_3		feet	
21	Soil Void Volume Below Drain = (A_{BMP}*D_3*P_1)	V_3	0	cubic feet	
22	Depth of Prepared Aggregate Below Drain (if drained, if not drained, total depth of prepared aggregate) (must be less than or equal to total depth, D_1+D_2)	D_4		feet	
23	Aggregate Void Volume Below Drain = (A_{BMP}*D_4*P_2)	V_4	0	cubic feet	
24	6-hr infiltrated volume = (i*A_{BMP}*5[hrs]/12[in/ft])	V_5	0	cubic feet	
25	50% of Volume Above Drain = 0.5*(VSOIL-V4-V3)	V_6	0	cubic feet	
26	Total Retained and Infiltration Volume (V_3+V_4+V_5+V_6+V_{AIR})	V_{DRC}	0	cubic feet	
27	V_{DRC} = Above [in Gallons]	V_{DRC}	0	gallons	

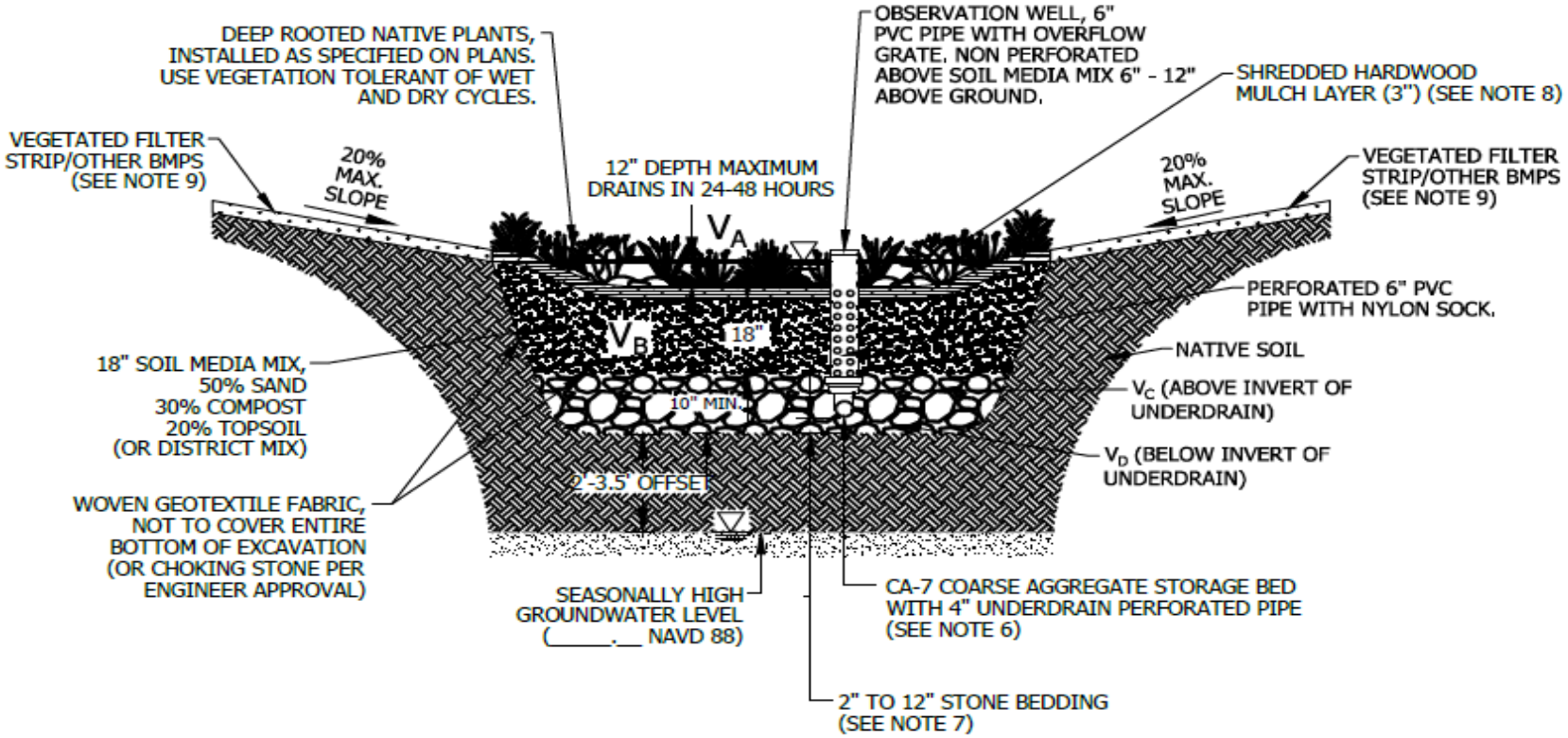
Design Retention Capacity (Constructed So Far) – Part 1

Project Title	Type of GI	DRC Estimate (gal)
CPS Green Infrastructure 2014 (Phase I)	All Types	731,004
CPS Green Infrastructure 2015 (Phase IIA)	All Types	364,504
CPS Green Infrastructure 2016 (Phase IIB)	All Types	388,648
Blue Island GI	Rain Gardens, Permeable Pavement	150,809
Evanston Civic Center Parking Lot (GI)	Permeable Pavement, Rain Gardens	167,278
Northbrook - Wescott Park Stormwater Reuse (GI)	Real-Time Control, Retention and Re-use	162,926

Design Retention Capacity (Constructed So Far) – Part 2

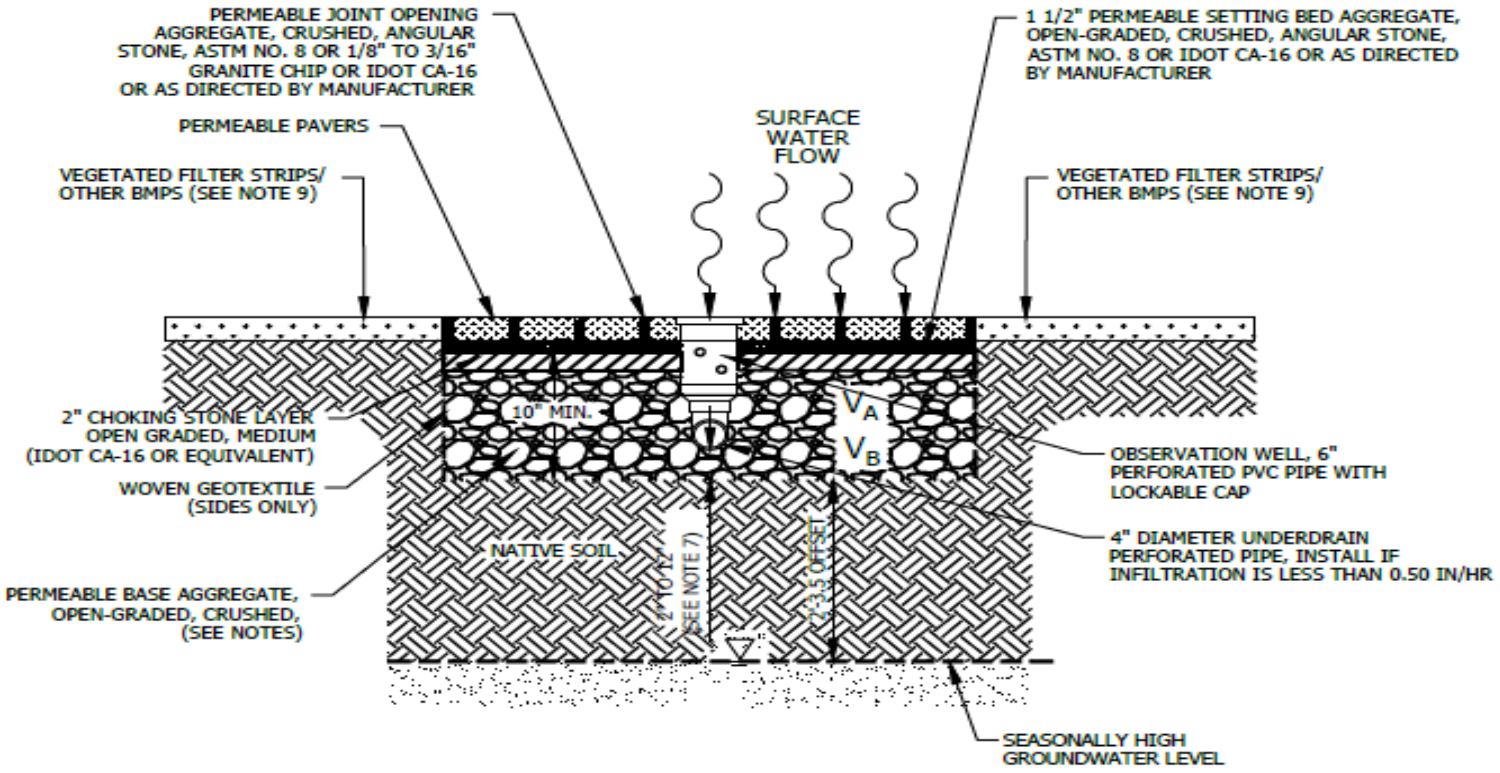
Kenilworth (GI)	Porous Asphalt streets, rain gardens, "porous parkways"	1,319,897
Wilmette Green Alleys	Permeable Pavement	74,677
Skokie GI	Rain Gardens / Bioswales	46,424
Niles	Bioswale and Permeable Parking	53,811
Berwyn Green Alleys	Green Alleys	679,122
Egan Parking Lot and Rain Gardens	Rain Garden and Permeable Parking	360,855
Rain Barrels	Rain Barrels	5,311,570
	TOTAL Built	**9,811,524**
	Total Projected by Dec 2018	**11,129,027**

Bioretention Facility Detail



VOLUME TYPE	POROSITY	MEDIA VOLUME	STORAGE VOLUME	VOLUME PROVIDED
SURFACE STORAGE	1.00	V_A	1.00 x V_A	
SOIL MEDIA MIX	0.25	V_B	0.5 x 0.25 x V_B	
COARSE AGG. (ABOVE INVERT)	0.36	V_C	0.5 x 0.36 x V_C	
COARSE AGG. (BELOW INVERT)	0.36	V_D	0.36 x V_D	
			TOTAL	

Permeable Pavers Detail



VOLUME TYPE	POROSITY	MEDIA VOLUME	STORAGE VOLUME	VOLUME PROVIDED
COARSE AGGREGATE (ABOVE INVERT)	0.36	V_A	0.50 X 0.36 x V_A	
COARSE AGGREGATE (BELOW INVERT)	0.36	V_B	0.36 x V_B	
			TOTAL	

New Initiatives

Develop Green Book targeting multiple audiences:

- Guide for residents to build rain gardens, etc.
- Enhanced green infrastructure details for developers
- Suite of GI/BMP details for use by municipal engineers

Develop and Implement a Flood Relief Plan for Cook County

- Work with local communities to find solutions to stormwater issues using an outcome-based approach
- Deliver results that address stormwater and other community issues at an affordable cost

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