

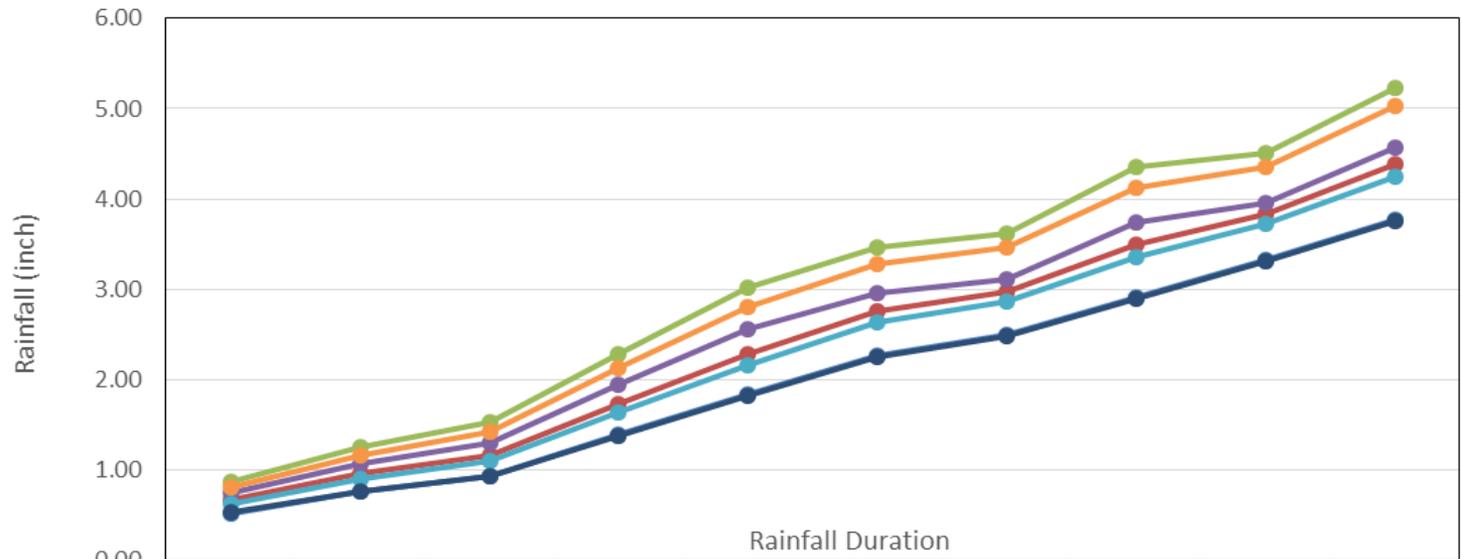
Low Impact Development for Resilience



Historical and Future

Use	TP-40 - 1961 (inches)	Bulletin 71 - 1992 (inches)	Today - Atlas 14 (inches)	2050 (inches)	2085 (inches)
Water Quality Treatment Volume	--	--	0.99	1.04 - 1.31	1.01 - 1.25
Channel Protection	2.49	2.37	2.56	2.69 - 3.34	2.67 - 3.75
Pipe Conveyance	1.81	1.65	1.83	1.81 - 3.01	2.16 - 3.20
Local Flood Protection	4.23	4.45	4.66	4.67 - 7.06	5.64 - 7.55
Local Flood Protection	4.99	6.15	6.27	6.39 - 11.06	8.36 - 10.93

10 Year



	5-min	10-min	15-min	30-min	1-hr	2-hr	3-hr	6-hr	12-hr	24-hr
NOAA Atlas 14	0.52	0.76	0.93	1.39	1.83	2.26	2.50	2.91	3.33	3.77
MIROC5, RCP8.5	0.66	0.95	1.16	1.73	2.29	2.75	2.97	3.50	3.84	4.39
CNRM-CM5, RCP 8.5	0.87	1.25	1.53	2.28	3.01	3.47	3.62	4.35	4.51	5.23
BCC-CSM-1-1, RCP 8.5	0.74	1.07	1.30	1.94	2.56	2.96	3.12	3.74	3.95	4.56
IPSL-CM5B-LR, RCP 4.5	0.62	0.90	1.09	1.63	2.15	2.63	2.86	3.35	3.73	4.25
CNRM-CM5, RCP 4.5	0.81	1.16	1.42	2.12	2.80	3.28	3.46	4.13	4.35	5.03
BCC-CSM-1-1, RCP 4.5	0.53	0.76	0.92	1.37	1.81	2.24	2.49	2.89	3.32	3.75

Waterford Court



Tremont Park



TREMONT GREEN SPACE MASTER PLAN

September 30, 2013



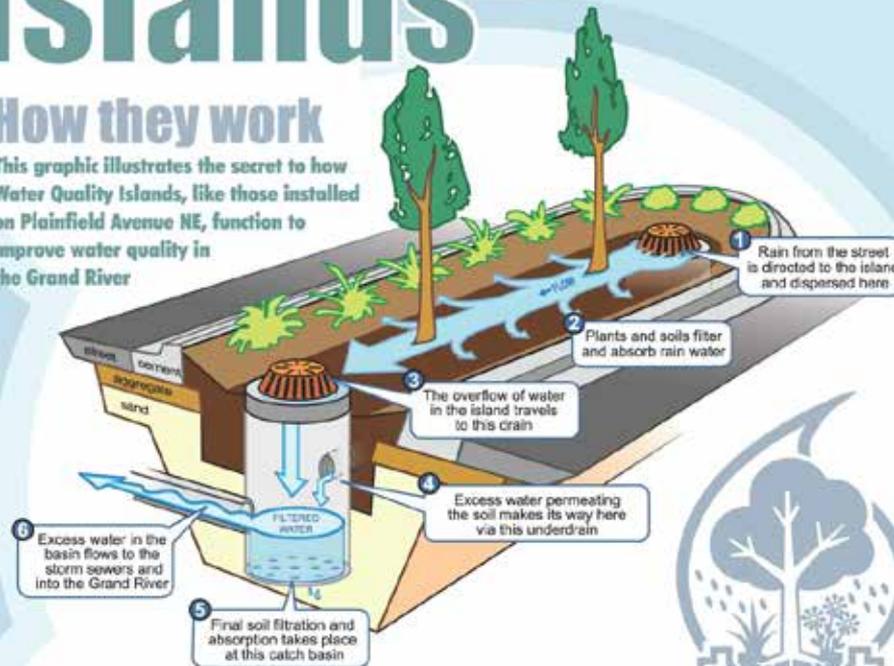
MASTER PLAN



Water Quality Islands

How they work

This graphic illustrates the secret to how Water Quality Islands, like those installed on Plainfield Avenue NE, function to improve water quality in the Grand River



Benefits of the Plainfield Islands

Economic

- Enriches the neighborhood
- Triggers additional investments
- Increases property values

Social

- Enhances pedestrian safety through traffic calming and increases driver awareness
- Heightens community pride
- Provides inspiration for social responsibility

Environment

- Filters out pollutants and keeps them from the Grand River
- Reduces the volume of water going to the river and decreases flooding
- Slows the velocity of water flowing to the river and minimizes erosion



Oct 2012 – Dec 2012 No Discharge
28 Rain Days (0.07" to 1.14")

April 2013 – 17 Rain Days
2 outflows

Results

Increase of fecal coliforms, chlorides, conductivity, phosphorus, nitrates, and nitrites, discoloration and reduction in volatile and semi-volatile organic



Plainfield Islands

Lessons Learned

Staff reviewed the data and construction information and made the following hypotheses:

Conductivity - Conductivity in the samples is likely from the road salt that collects in the islands. It is noteworthy that the increase in conductivity across the island was less during the December event, when significant snow had not yet fallen, than the spring sampling events.

Fecal coliforms, e. coli, nitrates, nitrites, and phosphorous – The best assumption on the increase in these parameters is that the soils and/or mulch utilized in the island contained fertilizers that incorporated these parameters. In the future, specifications should ensure that minimal fertilizers have been used on/mixed into the soils.

Visual color – Dyed mulch was initially utilized in the islands. It is likely that this is the cause for the visual color change. It is recommended that undyed, shredded hardwood mulch be utilized in bioswales in the future.





GREEN GRAND RAPIDS

SPECIAL STUDY: JOE TAYLOR MEMORIAL PARK MASTER PLAN

Joe Taylor Park



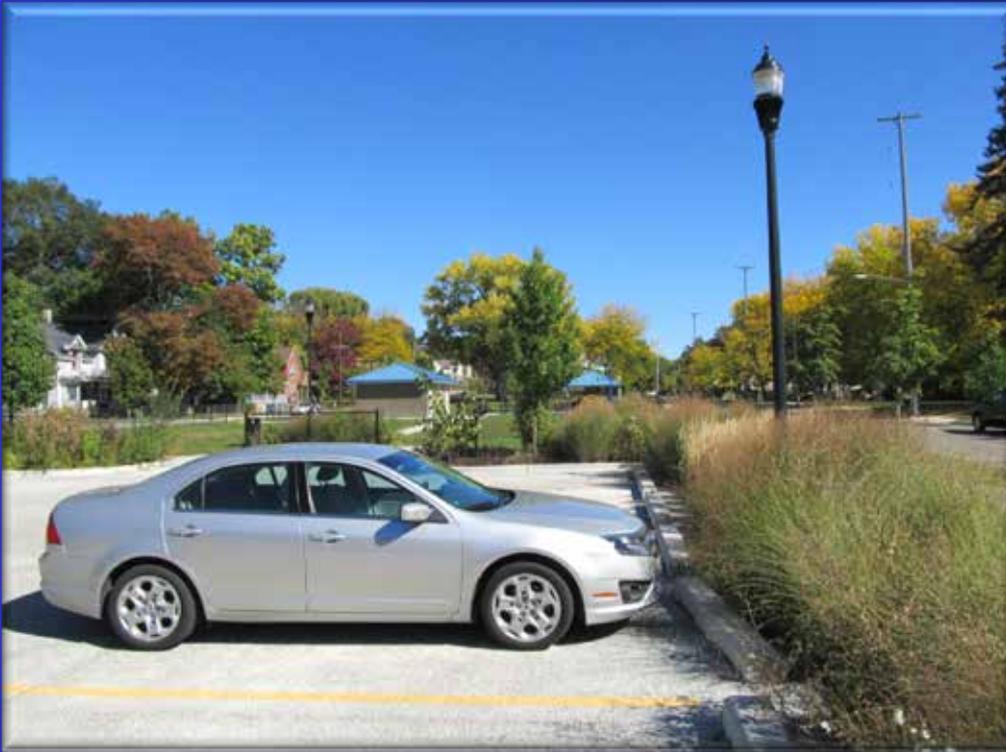
CITY OF
GRAND
RAPIDS









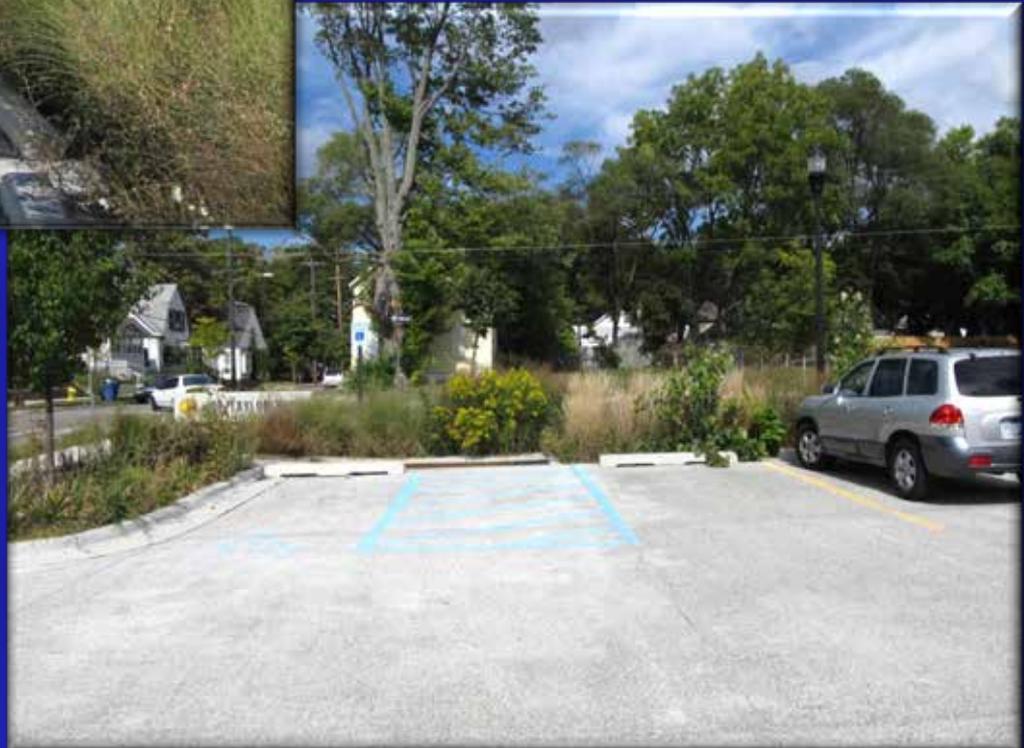


July 7, 2015:

Rainfall	0.16 inches
Max Intensity	0.84 inches/hr.
Inflow	21,789 gals
ByPass	4,824 gals
Outflow	0 gal

July 13, 2015

Rainfall	0.51 inches
Max. Intensity	1.80 inches/hr.
Inflow	105,827 gals
ByPass	38,297 gals
Outflow	4,700 gals



Rainfall Data taken from Chester Street SE Rain Gauge



Mary Waters Park

SUMMARY OF ESTIMATED COSTS

for

East Side Sewer Improvements Program Separation Project Contract No. 26C –
Storm Water Storage and Treatment Improvements at Mary Waters Park and in
College Avenue from 70' North to 190' North of Coldbrook Street

3 – Hydrodynamic Separators
\$60,000 Each

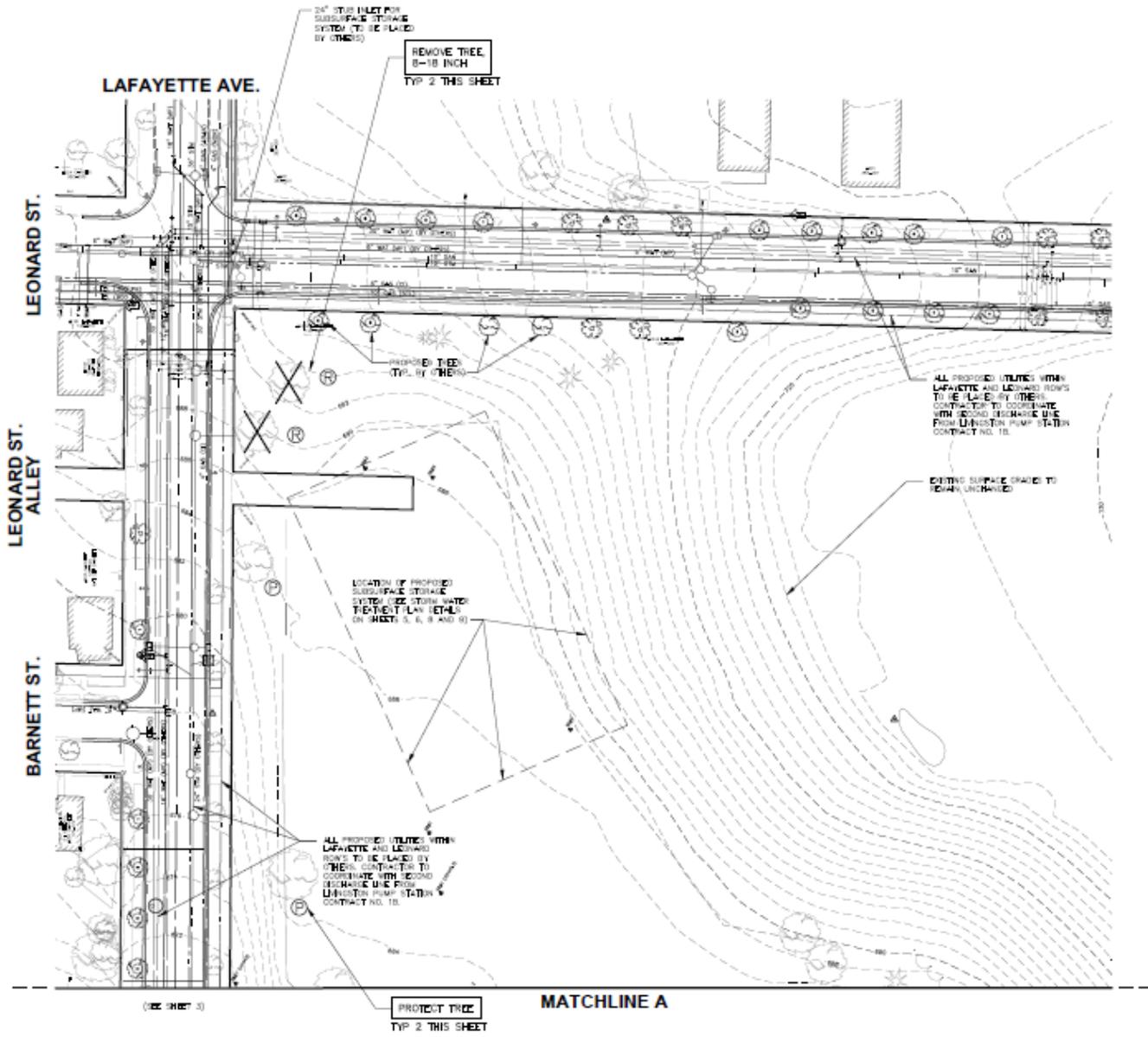
Subsurface Storage System
\$725,000

Project Funding Source(s)

	<u>Currently Approved</u>	<u>Budget Change Request(s)</u>	<u>Revised Project Estimate</u>
Sewer System Fund Series 2012 Revenue Bonds	\$117,000	\$1,577,000	\$1,694,000
Total Project Sources	\$117,000	\$1,577,000	\$1,694,000

Breakdown of Project Uses

Construction Contract	\$1,294,895
Additional Design Phase Services by Black & Veatch	15,560
Construction Phase Services Including Inspection by Black & Veatch	127,477
Public Information Program Administration	2,500
	<u>72,021</u>
Sub-Total	\$1,512,453
Contingencies (12%)	<u>181,547</u>
Total Project Uses	\$1,694,000



CSO Contract 27



Benefits

- Porous Pavement – ~2,000,000 gallons / year
- Infiltration Basins - ~300,000 gallons / year
- Trees – 1/10th of an inch per rainfall
- Less Gray Infrastructure
- Improved Quality of Life

Cost CSO 27

- 2,350 tons of porous pavement @ \$116/ton (\$40/ton increase over LVSP asphalt used in drive lanes): \$94,000 in additional cost
- 4,000 CY aggregate base open graded @ \$72/CY (\$32.40/CY increase over 21AA used under LVSP): \$129,600 in additional cost
- 17 Infiltration basins (\$9,200 vs \$2,600 for stand basin): \$112,200 in additional cost
- 9 urban bulb-outs at \$50,400
- 298 street trees at \$113,820
- Total = \$500,020

CSO 27 on Facebook

The screenshot shows a Facebook browser window with the following elements:

- Browser Tabs:** (8) GR CSO27 project, USGS Current Conditions..., Log into WebProcure.
- Address Bar:** https://www.facebook.com/groups/365711850284194/
- Facebook Header:** Search bar, Mike (user name), Home, Find Friends.
- Group Name:** GR CSO27 project
- Map:** A map of Grand Rapids, Michigan, showing streets and construction phases. Phases include: July-Aug. (Carman Ave), Aug-Sept. (Caledonia), July-Sept. (Quimby St), May-July (Berlin Pl), and Sept.-Oct. (Maide North). A large graphic on the right says "PHASE 1 (2015)".
- Group Navigation:** Discussion, Members, Events, Photos, Files.
- Post Options:** Write Post, Add Photo / Video, Ask Question, Add File.
- Post Content:**

Write something

Jeff Hoffman 14 hrs

Attention Carman Ave residents...

Good news is concrete items such as curb/gutter, driveways, and walks will begin to be poured tomorrow on your block. The bad news is that you will lose access to your driveway for a while. Make sure to get your cars out of your driveway if you plan to leave. Also, for the new curb to be placed, cars must be off of roadway for the entire stretch.

I did distribute handouts today with more information, but basically fresh concrete cannot be dr... See More

4 people like this. Seen by 22
- Members:** 72 members (1 new)
- Description:** CSO27 project - Contract between the City of Grand Rapids and Georgetown Construction Co.
- Recent Group Photos:** Three photos showing construction work on a street.
- Left Sidebar:** Navigation menu including Favorites (News Feed, Messages, Events), Pages (City of Grand Rapids, Pages Feed, Like Pages, Create Ad, Create Page), Groups (GR CSO27 project, Michelle Lunn Hop..., Ada Woods Neigh..., Powers Catholic Cl..., Cremer Tielman De..., New Groups, Create Group), Apps (Games, On This Day, Chess Friends, Texas HoldEm Poker, Words With Friends, Games Feed), Friends (City of Grand Rapids), Interests (Pages and Public...), and Events.
- Right Sidebar:** Member list including Marianne Wysocki, Dan Pass, Mitch Krutzenga, Noella Evans Lu..., Penny Mortimore, Fred Canano, Brian Mortimore, Jeff Pugh, Kara Terry, Sam Sedlecky, Elliot Sedlecky, Emily Sedlecky, Chelsea Sedlecky, Ann Marie Stauber, Laura Snyder, Ben Sedlecky, Justin Sedlecky, Emily Huber, Sue Sedlecky Lunn, Luke Snyder, and Joe Sedlecky.

Bartlett and Finney

