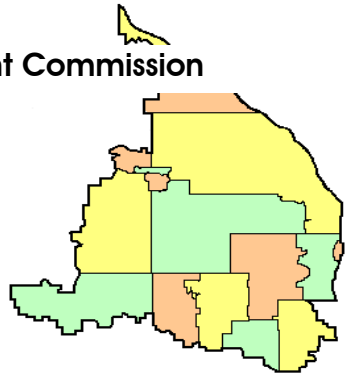
TAC Item 1

Shingle Creek Watershed Management Commission

West Mississippi Watershed Management Commission



3235 Fernbrook Lane N • Plymouth, MN 55447
Tel: 763.553.1144 • Fax: 763.553.9326
Email: judie@jass.biz • Website: www.shinglecreek.org

A meeting of the joint Technical Advisory Committee (TAC) of the Shingle Creek and West Mississippi Watershed Management Commissions is scheduled for 11:00 a.m. – 12:30 p.m., Thursday, March 9, 2017, at the Clubhouse at Edinburgh USA, 8700 Edinbrook Crossing, Brooklyn Park, MN. *Please note this new time and location.*

A G E N D A

Meeting docs (*) will be available on the website at
http://www.shinglecreek.org/tac-meetings.html

1. Approve agenda.*

2. Approve January 31, 2017 meeting.*

3. 2016 NPDES Activity Report.*

4. City Cost Share Project Recommendations.*
   a. Crystal Phase 16 Street Reconstruction Project*
   b. Robbinsdale 37th Avenue Infiltration Chambers.*

5. Grant project updates.

6. Other business.

7. Next Meeting _____

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Shingle Creek Watershed Management Commission
West Mississippi Watershed Management Commission

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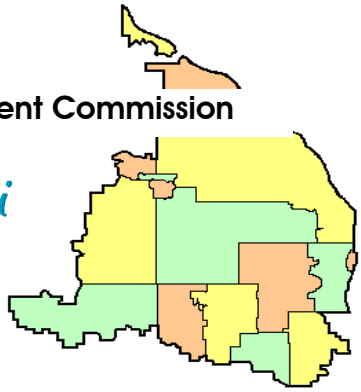

MINUTES
January 31, 2017

A meeting of the Technical Advisory Committee (TAC) of the Shingle Creek and West Mississippi Watershed Management Commissions was called to order by Chairman Richard McCoy at 8:48 a.m., Tuesday, January 31, 2017, at Crystal City Hall, 4141 Douglas Drive North, Crystal, MN.

Present were: Andrew Hogg, Brooklyn Center; Jesse Struve, Brooklyn Park; Todd Tuominen, Champlin; Mark Ray, Crystal; Liz Stout, Minneapolis; Shawn Markham, New Hope; Richard McCoy, Robbinsdale; Ed Matthiesen and Diane Spector, Wenck Associates, Inc.; and Judie Anderson, JASS.

Not represented: Maple Grove, Osseo, and Plymouth.

I. Motion by Ray, second by Struve to approve the **agenda.*** *Motion carried unanimously.*

II. Motion by Ray, second by Hogg to approve the **minutes of the December 8, 2016 meeting**.* *Motion carried unanimously.*

III. Cost Share Policies.*

A. The Third Generation Plan sets forth three **potential funding sources for capital projects** in the two watersheds – 100% Commission-funded; 100% City-funded; and 25% Commission/75% City-funded. The Plan also notes that the Commissions intend to operate using the latter option, but that any of these three options are open for consideration on any project.

The Commissions have previously discussed proceeding with 100% Commission funding on certain types of projects and authorized a Minor Plan Amendment to fully fund lake internal load projects. To codify this approach, and to provide planning clarity for future projects, Staff drafted a Cost Share Policy.*

1. The first three paragraphs of the policy are from, with some minor modification, existing CIP application documents.

2. The section under the subheading *Projects of Watershed-Wide Benefit* is new language crafted from TAC and Commission discussions as well as Staff's recommendations.

3. The final section under the subheading *Operations and Maintenance* is also new language based on discussions arising from the Public Art Reaeration Projects. Those projects will require annual electric power to run the pumps associated with the artwork, as well as other costs to maintain and winterize the artwork. The Commissions have discussed creating a line item in their operating budgets to reimburse the cities for these expenses. Expenses incurred under this category cannot be included in an ad valorem levy or grant funding.

Much discussion ensued regarding what would be the characterization of watershed-wide benefiting projects.

Motion by Struve, second by Stout to recommend to the Commissions that sections 1 and 2 of the proposed policy be adopted. *Motion carried unanimously*. The third section will be discussed in more depth at a future TAC meeting.

B. Partnership Cost-Share Program.

The Partnership Cost Share Policy* provides for matching the cost of private investment in BMPs that go above and beyond the Commission's requirements. At this time the Partnership Cost Share applies only to Shingle Creek and not to West Mississippi. Since none have been awarded to date, the members agreed that the program as currently operated is not likely to attract participants. It was noted that some other WMOs with similar programs provide 75% or even 100% funding.

Motion by Ray, second by Tuominen to recommend to the Shingle Creek Commission that the match be increased to 100%, with no change to the other guidelines, and that the maximum balance in the Partnership Cost Share Account be $100,000, with any amount above that transferred into the Cost Share Account to be made available for public cost share projects. *Motion carried unanimously*.

IV. 2017 CIP/Cost Share Projects.*

The member cities are requested to submit to the TAC any requests to add, delete or change a project on the CIP or request that a project be moved to a different year. Staff's January 24, 2017 memo shows the current CIPs for both watershed organizations along with a history of projects already implemented or underway. Applications are requested by February 17, 2017, so that they can be reviewed at the next TAC meeting. Submittal documents were included in the meeting packet.

McCoy indicated his city will be submitting a cost-share project.

New Hope may submit a project dealing with BMPs on their City Hall project. Motion by Hogg, second by Ray to approve the New Hope project in principal for submittal. *Motion carried unanimously.* New Hope will submit the project including associated costs.

V. Grant Updates.

Matthiesen provided updates on the **Public Art Reaeration** and **Iron/Biochar Enhanced Sand Filter Projects.**

VI. Other Business.

A. The **next meeting** is scheduled for February 23, 2017, at 8:30 a.m. at Crystal City Hall.

B. The meeting was adjourned at 10:13 a.m.

Respectfully submitted,

Judie A. Anderson
Recording Secretary

TAC Item 3-1

Technical Memo

WENCK ASSOCIATES

Responsive partner.
Exceptional outcomes.

To: Shingle Creek/West Mississippi WMO Commissioners

From: Ed Matthiesen, P.E.
Diane Spector

Date: March 3, 2017

Subject: 2016 NPDES Education and Outreach Annual Report

Recommended Commission Action	Adopt the report and direct staff to distribute to the member cities for their use in preparing their 2016 NPDES reports.

Since the Commissions' Second Generation Watershed Management Plan was approved in 2004, and reaffirmed in the Third Generation Watershed Management Plan, the Commissions continue to provide education and outreach programming to meet Commission objectives and to help member cities satisfy their education and outreach goals under their National Pollution Discharge Elimination System (NPDES) MS4 permits. This Annual Report serves both as a report to the Commissions and a report to the member cities that they can use in the preparation of their annual NPDES reports.

Shingle Creek Watershed Management Commission

West Mississippi Watershed Management Commission

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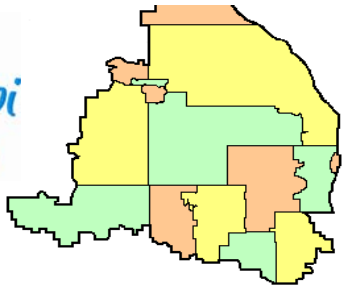

NPDES Phase II Education and Public Outreach Program
2016 Annual Report

The Shingle Creek and West Mississippi Watershed Management Commissions conducted education and public outreach activities in 2016 in fulfillment of their Third Generation Watershed Management Plan Watershed Education and Public Outreach Program goals.

EDUCATION AND PUBLIC OUTREACH PROGRAM GOALS

1. All members of the community become knowledgeable about the water resources in the watersheds and take positive action to protect and improve them.
2. All members of the community have a general understanding of watersheds and water resources and the organizations that manage them.
3. All members of the community have a general understanding of the Impaired Waters in the watersheds and take positive actions to implement TMDL requirements.

The Commissions identified the following general education and outreach strategies in the Third Generation Watershed Management Plan. More detailed educational goals by stakeholder groups may be found in Appendix E of that Plan.

- Maintain an active Education and Outreach Committee with representatives from all member cities to advise the Commissions and to assist in program development and implementation
- Participate in the West Metro Water Alliance (WMWA) to promote interagency cooperation and collaboration, pool resources to undertake activities in a cost-effective manner, and promote consistency of messages
- Use the Commissions', member cities', and educational partners' websites and newsletters, and local newspapers and cable TV to share useful information to stakeholders on ways to improve water quality
- Prominently display the Commissions' logos on information and outreach items, project and interpretive signs, and other locations to increase visibility
- Provide opportunities for the public to learn about and participate in water quality activities
- Provide cost-share funding to assist in the installation of small BMPs and demonstration projects
- Educate elected and appointed officials and other decision makers
- Enhance education opportunities for youth
- Each year review and modify or develop and prioritize education and outreach activities and strategies for the coming two years

Program: Watershed PREP (Protection, Restoration, Education, and Prevention)

Audience: Fourth grade students, educators, and families; the general public

Program Goals:

a. Engage elementary students in hands-on learning about the water cycle and how the built environment influences stormwater runoff and downstream water quality.
b. Provide general watershed and water quality education to citizens, lake associations, other civic organizations, youth groups, etc.

Educational Goals:

a. Have a general understanding of watersheds, water resources and the organizations that manage them.
b. Understand the connection between actions and water quality and water quantity.

Specific Activities to Reach Goals:

Watershed PREP is a program of the West Metro Water Alliance (WMWA), a consortium of four WMOs including the Shingle Creek and West Mississippi WMOs, and stands for Protection, Restoration, Education, and Prevention. 2016 was the fourth year of the program. Four persons with science education backgrounds serve as contract educators to be shared between the member WMOs. The focus of the program is two-fold - to present water resource-based classes to fourth grade students and to provide education and outreach to citizens, lake associations, civic organizations, youth groups, etc.

Fourth Grade Program. Three individual classes meeting State of Minnesota education standards have been developed. **Lesson 1*, What is a Watershed and Why do we care?,*** provides an overview of the watershed concept and is specific to each school's watershed. It describes threats to the watershed. **Lesson 2, *The Incredible Journey,*** describes the movement and status of water as it travels through the water cycle. **Lesson 3,** *Stormwater Walk,* investigates movement of surface water on schools grounds. The ultimate goal is to make this program available to all fourth graders in the four WMWA watersheds (Shingle Creek, West Mississippi, Bassett Creek, and Elm Creek), and to other schools as contracted. The program is offered to public, private, parochial, and charter schools.

Table 1. Watershed PREP Program participation growth.

Year	# Classrooms	# Students	# and Type of Schools
Lesson 1			
2013	63	1,679	13 in six districts; one charter school; one parochial school
2014	116	3,469	30 in seven districts; one magnet school; one parochial school
2015	122	3,183	36 in nine districts; two charter schools; five parochial schools
2016	107*	2,850	29 in seven districts, one charter school, 5 parochial schools
Lesson 2			
2013	14	390	Three in three districts; one charter school; one parochial school
2014	22	645	Five in three districts
2015	27	859	Six in five districts
2016	20	524	Five in three districts, one parochial school

*Includes four classrooms in the Pioneer-Sarah Creek watershed and six in the Minnehaha Creek Watershed District paid for by others.

Table 2. 2016 schools and students participating in Lesson 1: What is a Watershed?

	Date	School	School District	City	Watershed	Classes	Students
1	1/12	Shirley Hills Primary	Westonka	Mound	Minnehaha	1	25
2	1/25	St. Alphonsus	Parochial	Brooklyn Ctr	Shingle	1	30
3	1/26	Hilltop Primary	Westonka	Minnetrista	Minnehaha	3	90
4	2/5	Lakeview Elementary	Robbinsdale	Robbinsdale	Shingle	3	69
5	2/8	Palmer Lake	Osseo	Brooklyn Pk	Shingle	4	80
6	2/22	Hassan	Elk River	Rogers	Elm	5	124
7	2/23	Zachary Lane Elementary	Robbinsdale	Plymouth	Bassett	3	78
8	3/9	Forest Elementary	Robbinsdale	Crystal	Shingle		
9	3/11	Good Shepherd	Parochial	St. Louis Park	Bassett	2	50
10	3/15	Sacred Heart	Parochial	Robbinsdale	Shingle	1	20
11	3/17	Gleason Lake	Wayzata	Plymouth	Minnehaha	2	48
12	3/22	Oakwood	Wayzata	Plymouth	Minnehaha	4	110
13	3/24	Plymouth Creek	Wayzata	Plymouth	Bassett	5	115
14	4/5	Mary Queen Of Peace	Parochial	Rogers	Elm	1	8
15	4/27	Rush Creek	Osseo	Maple Grove	Elm	7	196
16	5/2	Earle Brown Elementary	Brooklyn Ctr	Brooklyn Ctr	W. Miss	6	156
17	5/12	Kimberly Lane	Wayzata	Plymouth	Bassett	4	104
18	6/7	St. Vincent de Paul School	Parochial	Brooklyn Pk	W. Miss	2	48
19	10/5	Basswood	Osseo	Maple Grove	Elm	6	171
20	10/5	FAIR School	Robbinsdale	Crystal	Shingle	4	108
21	10/12	Rice Lake	Osseo	Maple Grove	Elm	4	114
22	10/13	Champlin BP Academy	Anoka-Henn	Champlin	W. Miss	5	148
23	10/14	Rogers Elementary	Elk River	Rogers	Elm	10	265
24	10/17	Oxbow Creek Elementary	Anoka-Henn	Champlin	W. Miss	6	179
25	10/25	School of Engrg & Arts (SEA)	Robbinsdale	Golden Valley	Bassett	3	78
26	10/27	Woodland Elementary	Osseo	Brooklyn Pk	W. Miss	4	123
27	11/21	Monroe Elementary	Anoka-Henn	Brooklyn Pk	W. Miss	4	118
28	11/21	Sonnesyn Elementary	Robbinsdale	New Hope	Shingle	2	75
29	12/20	Robbinsdale Spanish Immersion	Robbinsdale	New Hope	Bassett	5	120
30		Jackson MS (8th gr.) Expert day	Anoka-Henn		W. Miss		
31		Birchview	Wayzata	Plymouth	Bassett		
32		Sunset Hill	Wayzata	Plymouth	Bassett		
33		New Millennium	Mpls	Brooklyn Ctr	Bassett		
34		Elm Creek Elementary	Osseo	Maple Grove	Elm		
35		Meadow Lake	Robbinsdale	New Hope	Shingle		
36		Weaver Lake Science Math & Tech	Osseo	Maple Grove	Elm		
27		Fernbrook Elementary	Osseo	Maple Grove	Elm		
38		Noble Academy	Charter	Brooklyn Pk	W. Miss		
					Total:	**107**	**2850**

Table 3. 2016 schools and students participating in Lesson 2: The Incredible Journey

Date	School	School District		Watershed	Classes	Students
2/16-17	Palmer Lake	Osseo		Shingle	4	82
4/05	Mary Queen of Peace	Parochial		Elm	1	15
4/26-27	Rush Creek	Osseo		Elm	7	196
6/16	Earle Brown	Brooklyn Ctr		W. Miss	6	156
11/21	Sonnesyn Elementary	Robbinsdale		Shingle	2	75
				Total	**20**	**524**

Community Education and Outreach. The PREP educators provided outreach at nine community and school events. Because of the nature of these events, it is difficult to keep a tally of the number of contacts made and citizens engaged. One of the largest of these events is the Plymouth Home Expo. WMWA and its four WMOs staff adjoining booths to do combined outreach to the 1,000+ visitors to the Expo. Events are detailed in Table 4.

Table 4. 2016 Watershed PREP community education and outreach participation

Date	Event	City	Watershed	Participants
3/7	Basswood Science Night	Maple Grove	Elm Creek	
4/8	Plymouth Home Expo	Plymouth	Bassett Creek, Elm Creek, Shingle Creek	1,000
4/16	Brooklyn Center Clean Up	Brooklyn Ctr	Shingle Creek, West Mississippi	
5/24	Fernbrook Nature Night	Maple Grove	Elm Creek	
6/4	New Hope City Days	New Hope	Shingle Creek	
7/28	Plymouth Kids Fest	Plymouth	Bassett Creek, Elm Creek, Shingle Creek	
9/17	New Hope Farmers Market	New Hope	Shingle Creek	
9/20-22	HC Nature Fest	Henn County	Bassett Creek, Elm Creek, Shingle Creek	
9/20	Coon Rapids Dam TRPD Nature Fest	Brooklyn Park	West Mississippi	
9/29	HC Enviro Edu Conversation	Brooklyn Ctr	Shingle Creek, West Mississippi	

Evaluation:
The educators evaluate the success of the Fourth Grade Program by surveying students and teachers about the quality of the program, the learning that was observed, and the performance of the educators. Much of the feedback occurs during and right after the presentations in spontaneous comments.

Program: Distribute Educational Materials

Audience: Multiple

Program Goals:

a. Inform various stakeholders about the watershed organizations and their programs.
b. Provide useful information to a variety of stakeholders on priority topics.
c. Engage stakeholders and encourage positive, water-friendly behaviors.

Educational Goals:

a. Property owners maintain properties and best management practices (BMPs) to protect water resources.

b. Property owners adopt practices that protect water resources.
c. Stakeholders support and engage in protection and restoration efforts.

Specific Activities to Reach Goals:

Maintain Your Property the Watershed Friendly Way
This handbook is targeted to small businesses, multi-family housing properties, and common ownership communities such as homeowners' associations. It contains tips for specifying and hiring turf and snow maintenance contractors, and includes checklists for BMP inspections. Electronic copies have been provided to Shingle Creek and West Mississippi cities for their use and to be displayed on their websites. The handbook also appears on the WMWA website. Print copies are available for distribution.

Press Releases and Newspaper Articles

- The Commissions contribute to the WMWA eNewsletter Water Links, which has about 1,950 subscribers, a 59% increase over last year. Aside from general interest pieces and announcements, articles specific to SCWM included: Fall 2016, Shingle Creek Twin Lake Carp project underway and Minnesota's new buffer initiative; and Summer 2016, the Connections at Shingle Creek project.
- SunPost newspapers published a November 5 article about the Twin Lake Carp project.
- SunPost newspapers published a January 6 article about the Connections at Shingle Creek project.
- ForsterDailyNews, publisher of the trade journal Stormwater, published a January 20 article about road salt-related chloride impairments, and described the Shingle Creek chloride TMDL and implementation actions.

Web Site
The Commissions maintained a joint web site, shinglecreek.org, which includes information about the watersheds, the Commissions, and the water resources in the watersheds. In 2015 the website was refreshed and significantly updated. Commission staff worked to develop a new site using the free web building tool Weebly. This allow staff us complete control over the website and its content and the ability to add things such as interactive mapping, blogging, and a calendar. These web building sites use templates that are easy to use and which also can automatically generate mobile-friendly versions of the site. They are also search engine optimized, and there are additional analytics that Staff can access to better track how often the site is being accessed. In 2016 the site received over 9,700 pageviews.

Social Media. The Commission established a Facebook page in May 2016. At the end of 2016 there were 61 "likes" and 5,581 "reaches." A reach is logged when a timeline post is seen by a viewer. Viewers were "engaged" 449 times. An engagement is a click to open a post, view a photo or video, make a comment, or click on a reaction emoji. In late 2016 WMWA contracted with a social media consultant to generate regular posts that are shared on the WMWA page and the pages sponsored by WMWA member WMOs.

Seed Packets
One of the priority messages in 2016 was the pledge to plant for pollinators and clean water. To help promote this message, the Commissions handed out 360 packets of native seeds. A short educational message was printed on the seed packets.

Evaluation:
Evaluation measures are as noted above: number of brochures and handbooks distributed; number of website hits; number of link-throughs on the eNewsletter; social media engagement. The new website uses Google Analytics to better track page views and unique visitors. The 2016 website activity is shown on the following pages.

Shingle Creek WMC
All Web Site Data

GO TO REPORT

SCWM

Jan 1, 2016 - Dec 31, 2016

All Users
100.00% Sessions

Pageviews

9,722
% of Total: 100.00% (9,722)

Unique Pageviews

7,943
% of Total: 100.00% (7,943)

Pageviews by Landing Page

Landing Page	Pageviews
/	7,622
/minutes--meeting-packets.html	408
/www1.free-share-buttons.top	176
/maps.html	137
/shingle-creek-commissioners.html	79
/rules-and-standards.html	77
/twin-lake-carp-management.html	76
/tac-meetings.html	68
/projects-underway.html	67
/west-mississippi-commissioners.html	54

Pageviews and Unique Pageviews by Page

Page	Pageviews	Unique Pageviews
/	4,045	3,275
/minutes--meeting-packets.html	761	616
/rules-and-standards.html	612	546
/maps.html	345	308
/shingle-creek-commissioners.html	232	201
/contact-us.html	202	173
/projects-underway.html	199	161
/commissions.html	186	93
/www1.free-share-buttons.top	176	61
/management-plan.html	171	155

Pageviews

Shingle Creek WMC
All Web Site Data

GO TO REPORT

SCWM

Oct 1, 2016 - Dec 31, 2016

All Users
100.00% Sessions

Pageviews

1,874
% of Total: 92.45% (2,027)

Unique Pageviews

1,577
% of Total: 95.81% (1,646)

Pageviews by Landing Page

Landing Page	Pageviews
/	1,400
/minutes--meeting-packets.html	82
/twin-lake-carp-management.html	46
/recent-projects.html	26
/carp-tracking.html	25
/maps.html	25
/shingle-creek-commissioners.html	24
/history.html	22
/tac-meetings.html	21
/apps/search?q=construction+permit	20

Pageviews and Unique Pageviews by Page

Page	Pageviews	Unique Pageviews
/	699	563
/minutes--meeting-packets.html	174	145
/rules-and-standards.html	134	118
/maps.html	89	81
/staff.html	59	54
/twin-lake-carp-management.html	52	45
/shingle-creek-commissioners.html	49	40
/carp-tracking.html	45	38
/standard-details.html	43	34
/projects-underway.html	41	36


Shingle Creek WMC
All Web Site Data
GO TO REPORT
Users Flow
Oct 1, 2016 - Dec 31, 2016
All Users
100.00% Sessions
Country
United States
796
Starting pages
796 sessions, 256 drop-offs
/
540
/minutes-m...ckets.html
57
/twin-lake-...ement.html
31
/carp-tracking.html
19
/maps.html
15
(29 more pages)
134
1st Interaction
442 sessions, 243 drop-offs
/rules-and-...dards.html
69
/minutes-m...ckets.html
66
/maps.html
53
/staff.html
21
/
20
(34 more pages)
213
2nd Interaction
199 sessions, 87 drop-offs
/
49
/rules-and-...dards.html
19
/minutes-m...ckets.html
12
/staff.html
11
/standard-d...tails.html
11
(31 more pages)
97
3rd Interaction
112 sessions, 44 drop-offs
/
14
/minutes-m...ckets.html
11
/staff.html
10
/maps.html
9
/rules-and-...dards.html
9
(29 more pages)
59
4th Interaction
68 sessions, 25 drop-offs
/
14
/minutes-m...ckets.html
8
/rules-and-...dards.html
8
/apps/search
4
/recent-projects.html
3
(24 more pages)
31
© 2017 Google

Program: Public Outreach
Audience: Residents, youth

Program Goals:

a. Provide opportunities for people of all ages to participate in hands-on activities to protect and improve waters.
b. Provide opportunities for people to learn about ways they can protect and improve waters.

Educational Goals:

a. Maintain their properties and best management practices (BMPs) to protect water resources.
b. Adopt practices that protect water resources.
c. Support and engage in protection and restoration efforts.
d. Participate in volunteer activities.

Specific Activities to Reach Goals:

Pledge to Plant Campaign. At WMWA's request, Metro Blooms/Blue Thumb submitted a proposal for a project that would encourage residents to replace impervious surface and turf grass with native plantings to benefit clean water by reducing stormwater runoff. The project includes the additional benefit of creating habitat for pollinators. An agreement between Metro Blooms and the Shingle Creek Commission, as fiscal agent, to move the project forward was approved.

Phase one of the project began with creation of a name, tag line and logo. The project was promoted in the Blue Thumb space at the State Fair where the public voted to name the campaign, *Pledge to Plant for Clean Water and Pollinators.*

Phase two included a roll out of the Pledge campaign on the Metro Blooms and WMWA websites where citizens can enter the square footage of their new plantings, creation of a Pledge to Plant banner for events, and a social media campaign that began in May 2016. The Campaign was promoted at the State Fair and other area events.

Pledge to Plant at the State Fair Eco Experience.

As of December 31, 2016, over 250 people had submitted the Pledge online covering approximately 25 acres, though several submissions did not specify area to be planted, so it may be more. The total includes a few larger prairie restoration projects. Most of the Pledges come from the metro area, but Pledges have been received from Oklahoma, Arkansas, Missouri, Kansas, Ohio, Wisconsin, Indiana and California

Rain Garden Workshops

The Commissions partnered with WMWA to sponsor three Rain Garden workshops through Metro Blooms in 2016. Metro Blooms is a non-profit organization whose mission is to promote and celebrate gardening, to beautify our communities and help heal and protect our environment. The three-hour workshop *Raingardens and Beyond: Clean Water, Healthy Habitat* combines pollinator-friendly yard care basics, intro to raingardens and shoreline plantings, and one-on-one design assistance from landscape professionals and Master Gardeners The locations and number of participants are shown in Table 5.

Table 5. 2016 Rain garden workshop locations and participation.

Location	Date	# Participants
Brooklyn Center Community Center	May 5	12
Champlin – Champlin City Hall	May 12	7
Plymouth – St Barnabas Church	April 19	35

Shingle Creek Cleanup

The 15th Annual Great Shingle Creek Cleanup was held the week of April 16 to April 23, 2016. Each city sponsored its own cleanup, which could be a special event or simply a request that the existing Adopt-a-Park volunteers schedule their spring cleanup during that week.

Volunteer Monitoring

The Commissions provide opportunities for high school students and adults to gain hands-on experience monitoring lakes, streams, and wetlands.

Lakes. Volunteer lake monitoring is performed through the Met Council's Citizen Assisted Lake Monitoring Program (CAMP). The Met Council provides the monitoring equipment and the laboratory work and data analysis while the Shingle Creek Commission staff recruit and train volunteers to perform sampling, collect the volunteers' water quality samples, and get them to the Met Council. In 2016, volunteer monitoring was completed on Crystal and Middle Twin Bass Lakes.

Streams. Routine stream macroinvertebrate monitoring in both watersheds is conducted by volunteers through Hennepin County's River Watch program. This program was initiated in 1995 to provide hands-on environmental education for high school and college students, promote river stewardship, and obtain water quality information on the streams in Hennepin County. Hennepin County coordinates student and adult volunteers who use the River Watch protocols to collect physical, chemical, and biological data to help determine the health of streams in the watershed. Two sites on Shingle Creek were monitored in 2016 – the long-term site next to Park Center High School in Brooklyn Park, monitored by students from Park Center High School; and a site in Lions Park in Brooklyn Center, monitored by students from Calvin Christian Academy of Fridley.

Wetlands. Two sites in the Shingle Creek watershed and two sites in the West Mississippi watershed were monitored through the Hennepin County Environmental Services' Wetland Health Evaluation Program (WHEP). The WHEP program uses trained adult volunteers to monitor and assess wetland plant and animal communities in order to score monitored wetlands on an Index of Biological Integrity for macroinvertebrates and vegetation. In 2016 the monitored sites were at Timber Shores Park in Plymouth and in Brookdale Park in Brooklyn Park. The sites in West Mississippi were the Environmental Preserve and the Zane Sports Park, both in Brooklyn Park.

Evaluation:

Evaluation of these programs is based on participation.

Program: Collaborative Efforts

Audience: Multiple

Program Goals:

a. Promote interagency cooperation and collaboration, pool resources to undertake activities in a cost-effective manner, and promote consistency of messages.
b. Share information and ideas with other partners.

Educational Goals:

a. All people have a general understanding of watersheds, water resources and the organizations that manage them.
b. All people understand the connection between actions and water quality and water quantity.

Specific Activities to Reach Goals:

WMWA

The Commissions partner with the Bassett Creek WMO and the Elm Creek WMO and other interested parties as the West Metro Water Alliance (WMWA). Other participating parties include the Freshwater Society, Hennepin County Environment and Energy, and Three Rivers Park District. The Mississippi WMO also participates but is not a formal member. Each member watershed organization contributes funds to WMWA, which sponsors programs such as Watershed PREP, the eNewsletter *Water Links*, standardized brochures and booklets, and the Planting for Clean Water Program. WMWA publishes an annual report on its activities.

Other Partnerships

The Commissions are also members of:

- WaterShed Partners, a coalition of agencies, educational institutions, WMOs, Watershed Districts, and Soil and Water Conservation Districts that coordinate water resources education and public outreach planning in the Metro area;
- BlueThumb, a consortium of agencies and vendors partnering to increase outreach and awareness; and
- NEMO (Nonpoint Education for Municipal Officials), a program that provides educational and skill-building programming to elected and appointed officials and community leaders to increase their knowledge of the connection of land use and management decisions to water quality and natural resources.

Evaluation:

No specific evaluation of this programing has been completed.

Program: Continuing Education

Audience: Commissioners, Technical Advisory Committee (TAC)

Program Goals:

a. Effectively and efficiently manage the water resources in the watershed.
b. Increase awareness and knowledge of broader water resources issues and trends.

Educational Goals:

a. Commissioners and TAC understand watershed management, water quality and quantity conditions and issues in the watershed, regulatory requirements and the current standards and practices.
b. Commissioners and TAC aware of broader water management issues and trends in Minnesota and elsewhere.

Specific Activities to Reach Goals:

Staff Presentations

- Staff presented the Annual Water Quality Monitoring report findings.
- Staff provided an update on the new Buffer Law and how it might impact the watersheds.
- Staff provided an update on the Mississippi River Corridor Critical Area Rulemaking and how it might impact the watersheds.

Guest Speakers

- County Commissioner Mike Opat attended the March meeting and the Commissions provided an overview of accomplishments and ongoing efforts.
- Dave Weirens, Assistant Director for Programs and Policy for the Board of Water and Soil Resources (BWSR), presented an update on the status of buffer program development.

Other

- The Commission made a contribution to funding the annual Road Salt Symposium sponsored by the Freshwater Society.
- The Commissions made a contribution toward the Clean Water Minnesota Campaign sponsored by Watershed Partners.

Evaluation:

No specific evaluation of this programing has been completed

TAC Item 4

Technical Memo

WENCK ASSOCIATES

Responsive partner.
Exceptional outcomes.

To: Shingle Creek/West Mississippi WMO Commissioners/TAC

From: Ed Matthiesen, P.E.
Diane Spector

Date: March 3, 2017

Subject: City Cost-Share Project Recommendations

Recommended Commission Action	The TAC will meet just prior to the Commission meeting and will make a recommendation for funding at the March 9, 2017 meeting.

Two cities have submitted applications for 2017 cost share funds for small projects under $100,000. Projects must be for water quality improvement, and must be for improvement above and beyond what would be required to meet Commission rules. Priority is given to projects identified in a subwatershed assessment or TMDL. The maximum cost share is $50,000 per project, and the city must at least match that share.

Both projects submitted are in Shingle Creek. Tables 1 and 2 detail the history of the cost share accounts for the two watersheds. Shingle Creek had an estimated encumbered balance of $36,540 at the end of 2016 and has levied $101,000 for collection in 2017, for an estimated year-end balance of $137,540. No projects have been submitted for cost share in West Mississippi. As a reminder, earlier this year the Commission adopted a policy revision setting a maximum balance for the partnership cot share account, with any balance in excess of that ceiling to be transferred into the city cost-share account.

The TAC will review each project at its meeting just prior to the March 9, 2017 Commission meeting and will make a recommendation for funding. The applications are attached and summarized below.

City of Crystal Phase 16 Street Reconstruction

In 2017 the City will be reconstructing streets in the Skyway Neighborhood adjacent to Crystal Airport. Approximately nine infiltration sump manholes and infiltration swales are proposed to be installed to reduce runoff and alleviate some drainage issues. Much of the neighborhood surface flows to the Airport and then to Upper Twin Lake, an impaired water. Request is for $50,000.

City of Robbinsdale 37th Avenue Infiltration Chambers

In 2017 the City will be reconstructing Noble Avenue, in a subwatershed draining to Crystal Lake, and impaired water. The City proposes to install two infiltration chambers designed for Atlas 14 10-year storm events. The reduction in annual TP load to Crystal Lake is estimated at 15 lbs/year. A subwatershed assessment was completed for the Crystal Lake drainage area in Robbinsdale, and increased infiltration was recommended in this catchment. Request is for $50,000.

Table 1. Shingle Creek City Cost-Share Account Balance.

2015	Request	Actual
Levy	$50,000	$47,710
Brooklyn Center City Garage	30,000	28,116
New Hope Street Project Rain Garden	17,200	
-Encumbered		17,200
Balance		$ 2,394
2016	**Request**	**Actual**
Encumbered Balance Forward	$ 2,394	
Levy	100,000	98,546
Brooklyn Park Bass Cr Neighborhood BMPs	30,200	
Blooming Alleys for Crystal Lake	17,000	
Balance		100,940
-Encumbered		64,400
Encumbered Balance		$36,540
2017	**Request**	**Actual**
Encumbered Balance Forward	$36,540	
Levy	101,000	
Project 1		
Project 2		
Estimated Balance	$137,540	
-Encumbered		
Estimated Balance		

Table 2. West Mississippi City Cost Share Account Balance.

2015	Request	Actual
Levy	$50,000	$49,959
No projects		
Balance		$49,959
2016	**Request**	**Actual**
Encumbered Balance Forward	$49,959	
Levy	50,000	49,447
No projects		
Encumbered Balance		$ 99,006
2017	**Request**	**Actual**
Encumbered Balance Forward	$99,006	
Levy	50,500	
Project 1		
Project 2		
Estimated Balance	$149,506	

Shingle Creek Watershed Management Commission

West Mississippi Watershed Management Commission

3235 Fernbrook Lane N • Plymouth, MN 55447
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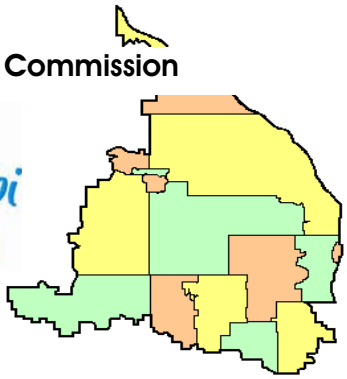
Email: judie@jass.biz • Website: www.shinglecreek.org



Shingle Creek and West Mississippi
Watershed Management Commissions
Cost-Share Program Guidelines
February 2015

The Shingle Creek and West Mississippi Watershed Management Commissions will from time to time make funds available to its member cities to help fund the cost of Best Management Practices (BMPs) projects that cost less than $100,000. The following are the guidelines for the award of cost-share grants from this program:

1. Projects must be for water quality improvement, and must be for improvement above and beyond what would be required to meet Commission rules. Only the cost of "upsizing" a BMP above and beyond is eligible.
2. Priority is given to projects identified in a subwatershed assessment or TMDL.
3. Projects should cost less than $100,000; projects costing more than $100,000 should be submitted to the CIP.
4. Commission will share in funding projects on a 1:1 basis.
5. The cost of land acquisition may be included as City match.
6. The minimum cost-share per project is $10,000 and the maximum is $50,000.
7. Projects must be reviewed by the Technical Advisory Committee (TAC) and recommended to the Commissions for funding.
8. The Commissions will call for projects in December of each year, with potential projects reviewed by the TAC at its end of January meeting.
9. Cost-share is on a reimbursable basis following completion of project.
10. The TAC has discretion on a case-by-case basis to consider and recommend to the Commissions projects that do not meet the letter of these guidelines, including projects submitted mid-year.
11. Unallocated funds will carry over from year to year and be maintained in a designated fund account.
12. The standard Commission/Member Cooperative Agreement will executed prior to project construction.

Shingle Creek Watershed Management Commission

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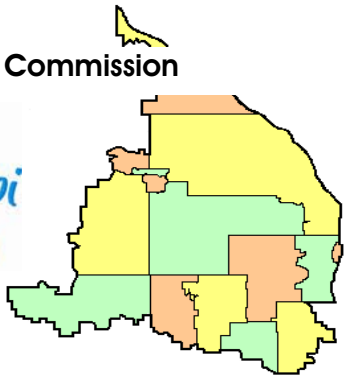


Shingle Creek and West Mississippi Watershed Management Commissions
Cost-Share Program Application
February 2015

City:	Crystal
Contact Name:	Mark Ray, Director of Public Works
Contact Phone:	(763) 531-1160
Contact Email:	Mark.ray@crystalmn.gov
Project Name:	Phase 16 Street Reconstruction Project
Total Project Cost:	$100,000
Amount Requested:	$50,000
Project Location:	Skyway Neighborhood

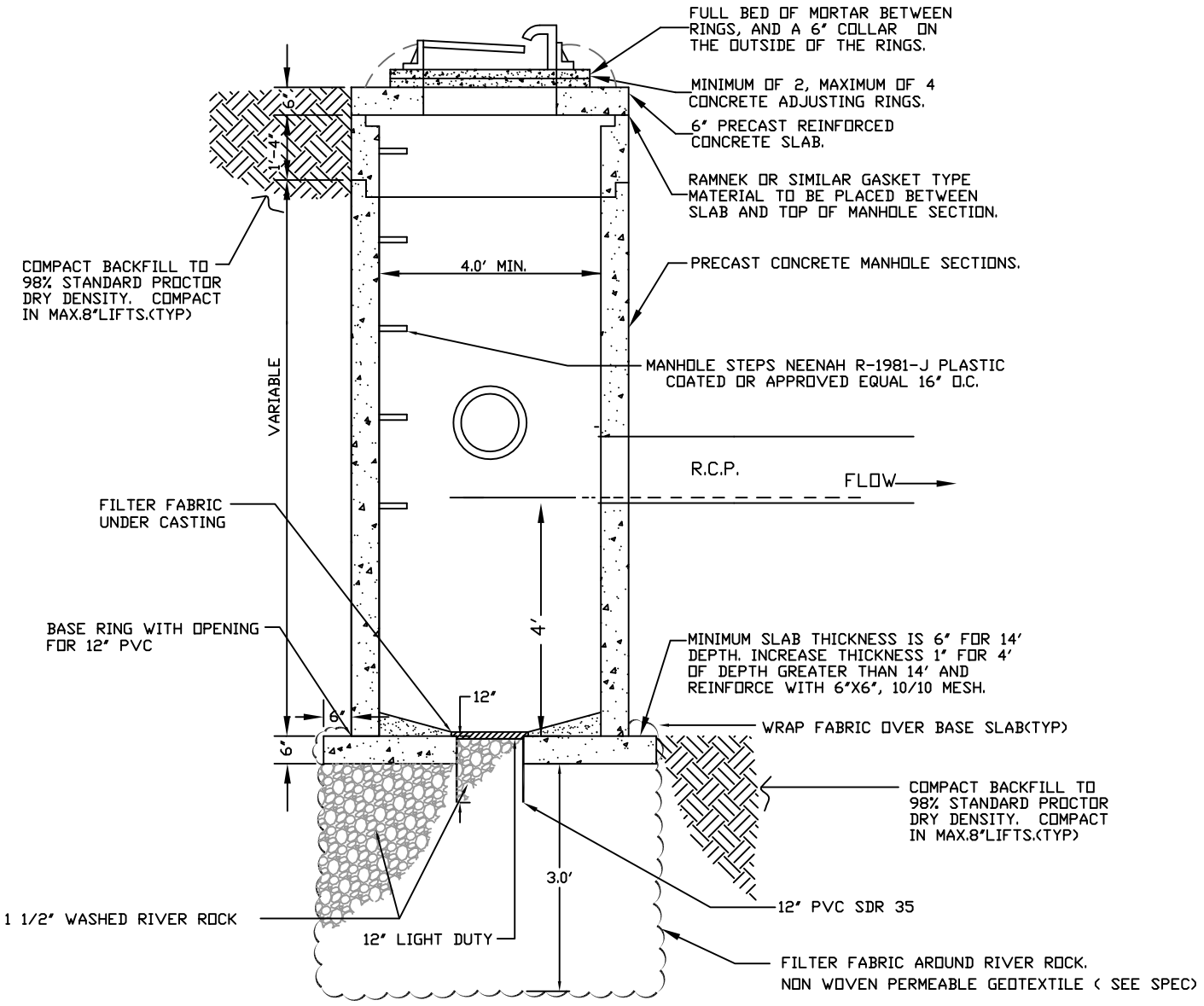
1. *Describe the BMP(s) proposed in your project. Describe the current condition and how the BMP(s) will reduce pollutant loading and/or runoff volume. Note the estimated annual load and volume reduction by parameter, if known, and how they were calculated. Attach figures showing project location and BMP details including drainage area to the BMP(s).* **As part of the Phase 16 Street Reconstruction Project, the City of Crystal is proposing to incorporate a number of storm water infiltration components as shown on the attached location map. These components will include:**
    a. **infiltration sump manholes as per the attached detail,**
    b. **infiltration swales along Florida Ave. adjacent to Skyway Park and along Douglas Dr., and**
    c. **potentially some re-grading of the MAC property to improve water flow through the area and expand a flat area for infiltration.**

2. If this request is for cost share in "upsizing" a BMP, explain how the upsize cost and benefit were computed. **Most of the Skyway Neighborhood currently surface flows toward the Crystal Airport. As part of the reconstruction project, new curb and gutter will be put in. Due to sandy soils, infiltration is going to be included in locations with a history of drainage problems to help reduce the water runoff. No specific cost/benefit was calculated because any improvements will be a reduction from today's current run off.**

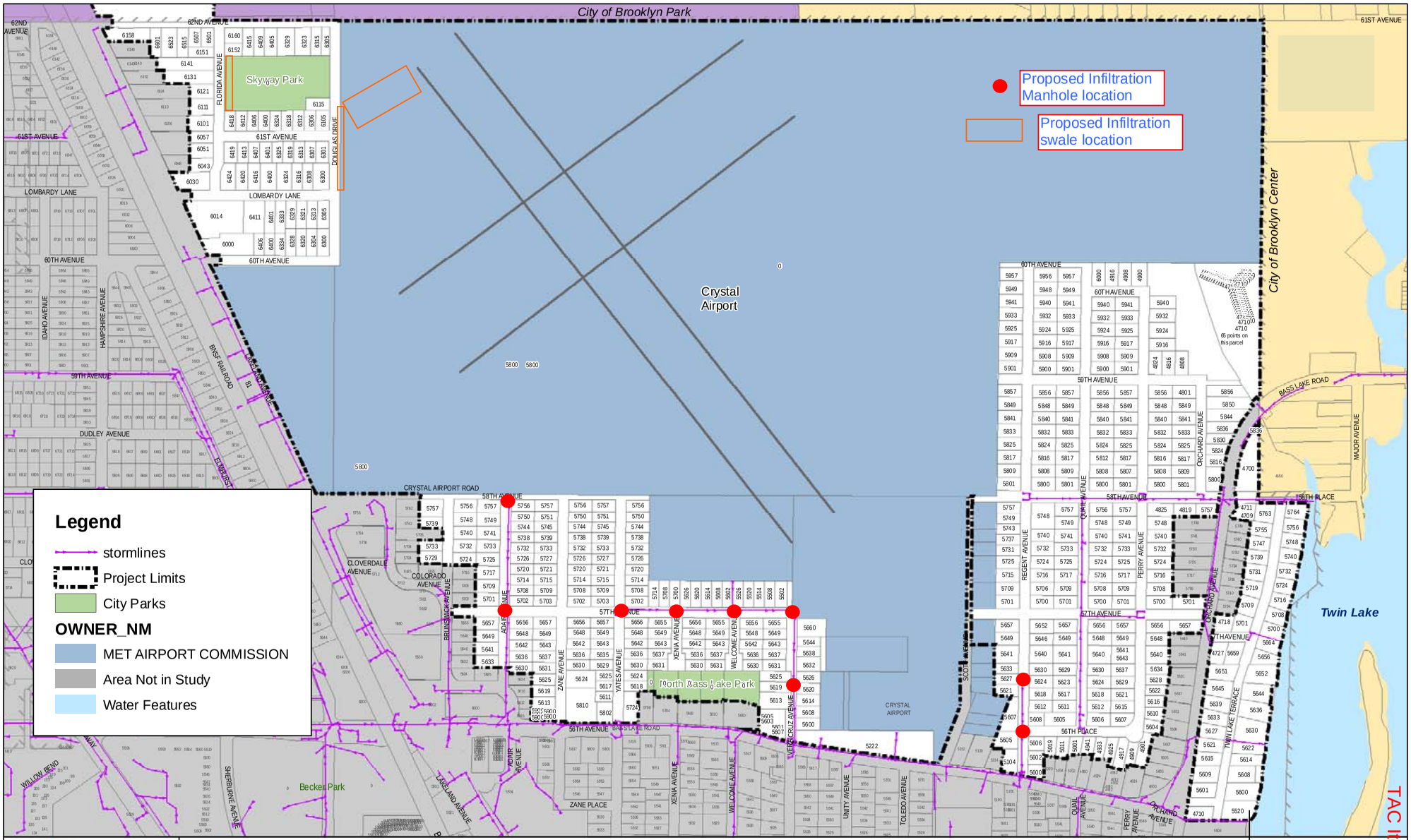
3. Show total project cost, amount of cost share requested, and the amount and source of matching funds. **Total storm water infiltration costs: $100,000; Watershed cost share: $50,000; City storm water utility fund: $50,000.**

4. What is the project schedule, when will work on the BMP(s) commence and when will work be complete? **Work will be incorporated as part of the Phase 16 Street Reconstruction Project. Work will take place during the 2017 construction season.**

NOTE:
ACCEPTABLE CATCH BASIN CASTINGS DEPENDING UPON THE CIRCUMSTANCES.
NEENAH R-3067 GRATE AND CASTING
24"X36"SLAB OPENING FOR NEENAH R-3067 CASTING, FOR EQUAL, WITH D.L., D.R. OR VANE GRATE.
27" DIAMETER OPENING FOR NEENAH R-1642-B COVER AND CASTING.



DRAWN BY:	STANDARD DETAILS SUMP CATCH BASIN W/DRAIN	REVISED: 3-04
APPROV. BY:	Cost Share Projects|Crystal|Phase 16 ST-20 Detail	CITY PL. NO. ST-20


City of Brooklyn Park
Proposed Infiltration Manhole location
Proposed Infiltration swale location
Skyway Park
Crystal Airport
City of Brooklyn Center
Twin Lake
North Bass Lake Park
Becker Park
CRYSTAL AIRPORT ROAD
BASS LAKE ROAD
61ST AVENUE
62ND AVENUE
60TH AVENUE
59TH AVENUE
58TH AVENUE
57TH AVENUE
56TH AVENUE
56TH PLACE
58TH PLACE
LOMBARDY LANE
DUDLEY AVENUE
FLORIDA AVENUE
DOUGLAS DRIVE
IDAHO AVENUE
HAMPSHIRE AVENUE
BNSF RAILROAD
ELMHURST LANE
CLOVERDALE AVENUE
COLORADO AVENUE
BRUNSWICK AVENUE
ADAIR AVENUE
ZANE AVENUE
YATES AVENUE
XENIA AVENUE
WELCOME AVENUE
VERACRUZ AVENUE
UNITY AVENUE
TOLEDO AVENUE
QUAIL AVENUE
PERRY AVENUE
ORCHARD AVENUE
REGENT AVENUE
SCOTT AVENUE
MAJOR AVENUE
TWIN LAKE TERRACE
LAKELAND AVENUE
SHERBURNE AVENUE
WILLOW BEND
ZANE PLACE
Legend
stormlines
Project Limits
City Parks
OWNER_NM
MET AIRPORT COMMISSION
Area Not in Study
Water Features
PHASE 16
LOCATION MAP
0 250 500
Feet
FILE NO.
CRYST137212
FIGURE 1
TAC Item 4a
Path: P:\AE\C\Cryst\137212\GIS\Maps\Figure1 Location Map.mxd
Date: 6/13/2016

Shingle Creek Watershed Management Commission

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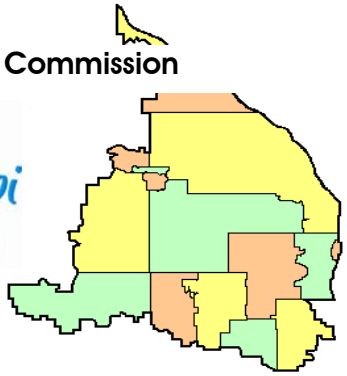

Shingle Creek and West Mississippi
Watershed Management Commissions
Cost-Share Program Guidelines
February 2015

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7. Projects must be reviewed by the Technical Advisory Committee (TAC) and recommended to the Commissions for funding.
8. The Commissions will call for projects in December of each year, with potential projects reviewed by the TAC at its end of January meeting.
9. Cost-share is on a reimbursable basis following completion of project.
10. The TAC has discretion on a case-by-case basis to consider and recommend to the Commissions projects that do not meet the letter of these guidelines, including projects submitted mid-year.
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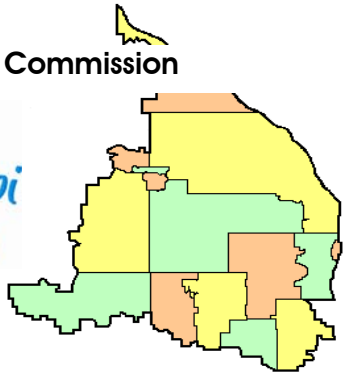


Shingle Creek and West Mississippi
Watershed Management Commissions
Cost-Share Program Application
February 2017

City:	City of Robbinsdale
Contact Name:	Richard McCoy
Contact Phone:	763-531-1260
Contact Email:	rmccoy@ci.robbinsdale.mn.us
Project Name:	37th Avenue Infiltration Chambers (as part of Noble Ave Reconstruction)
Total Project Cost:	$ 175,000 (per Chamber) $ 6,100,000 (Entire Noble Ave Project)
Amount Requested:	$ 50,000
Project Location:	37th Avenue (Chamber 1 between Major and Noble, Chamber 2 between Noble and Orchard)

1. Describe the BMP(s) proposed in your project. Describe the current condition and how the BMP(s) will reduce pollutant loading and/or runoff volume. Note the estimated annual load and volume reduction by parameter, if known, and how they were calculated. Attach figures showing project location and BMP details including drainage area to the BMP(s).

It is proposed to install 2 infiltration chambers consisting of Stormtech MC-4500 Chambers (or equivalent) sitting on a 12" rock base. Each chamber will be 4 rows wide and contain approximately 230 individual chamber units. The chambers, along with downstream stormwater infrastructure, have been designed for Atlas 14 10 year storm events. Outflow will be controlled by a 9"dia orifice and overflow weir for larger storm events. Basic details of the chambers are as follows –

	Storage ft^3	Storage af	Upstream Catchment (ac)	Inflow cfs	Outflow cfs
Chamber 1	41,953	0.963	7.73	13.32	3.9
Chamber 2	41,596	0.955	8.14	13.80	6.3

There are currently no stormwater treatment facilities in this part of the catchment. The catchment drains to Crystal Lake which is impaired for Nutrients. Based on modelling, it is expected that the removal of Phosphorus from the combined chambers will be approximately 15lb/yr.

Diagrams of the chambers location and typical detail are attached.

2. If this request is for cost share in "upsizing" a BMP, explain how the upsize cost and benefit were computed.

The proposed facility is not a requirement of the overall linear project as the reconstruction is not creating an additional 1 acre or greater of runoff area. Consequently, the entire facility is 'above and beyond' Commission requirements.

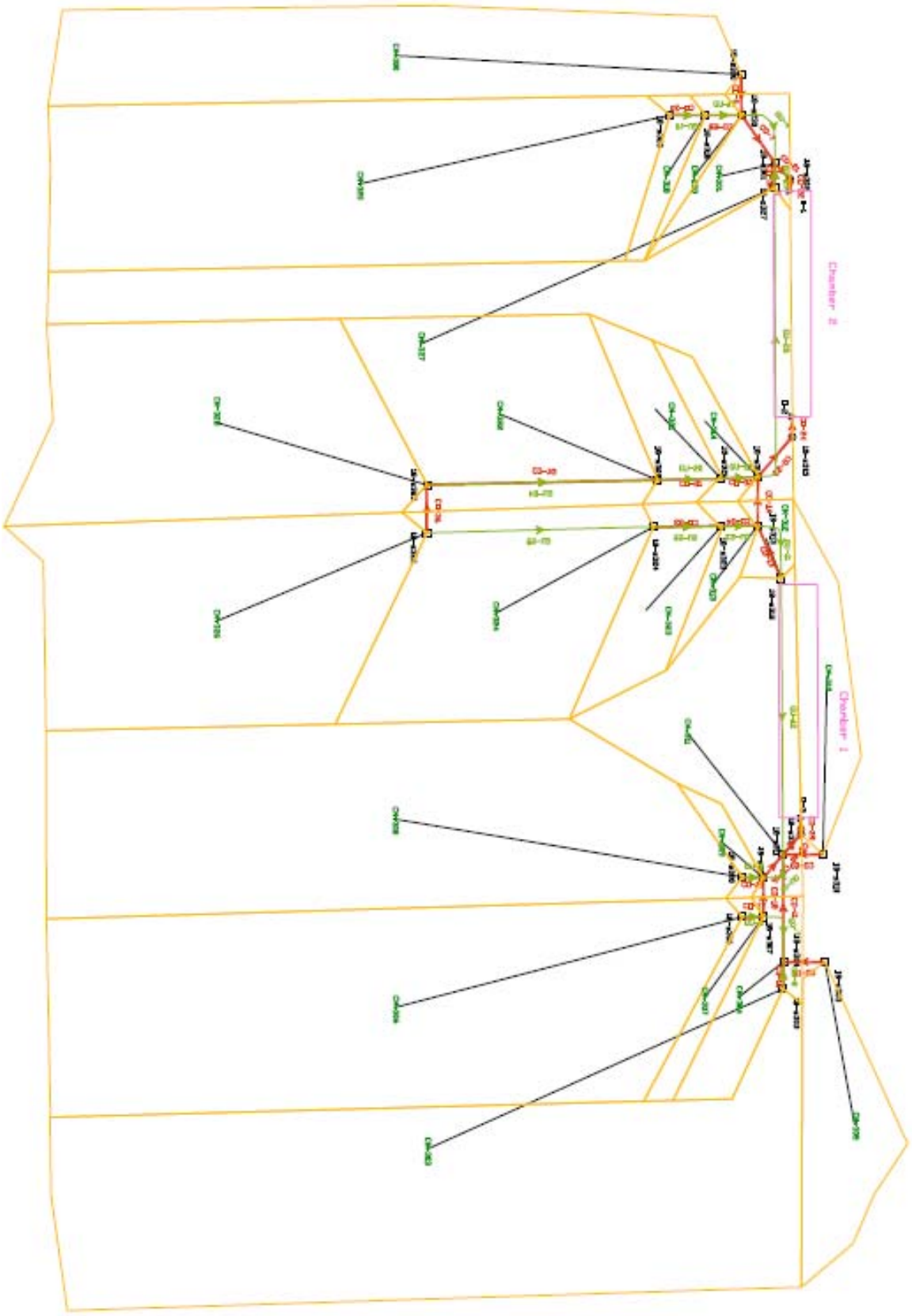
3. Show total project cost, amount of cost share requested, and the amount and source of matching funds.

The proposed chambers are part of a much larger Capital project estimated at $ 6,100.000. Considering the cost of the chambers alone, the cost breakdown is shown below –

Total estimated cost	2 x $ 175,000	= $ 350,000
Source of Funds –		
Cost Sharing requested		= $ 50,000
City Stormsewer Utility		= $ 300,000

4. What is the project schedule, when will work on the BMP(s) commence and when will work be complete?

Project is expected to have bid awarded at April 4th, 2017 City Council Meeting.
Construction is required to be complete in November 2017.


Chamber 2
Chamber 1

CONCEPTUAL LAYOUT - SYSTEM 1

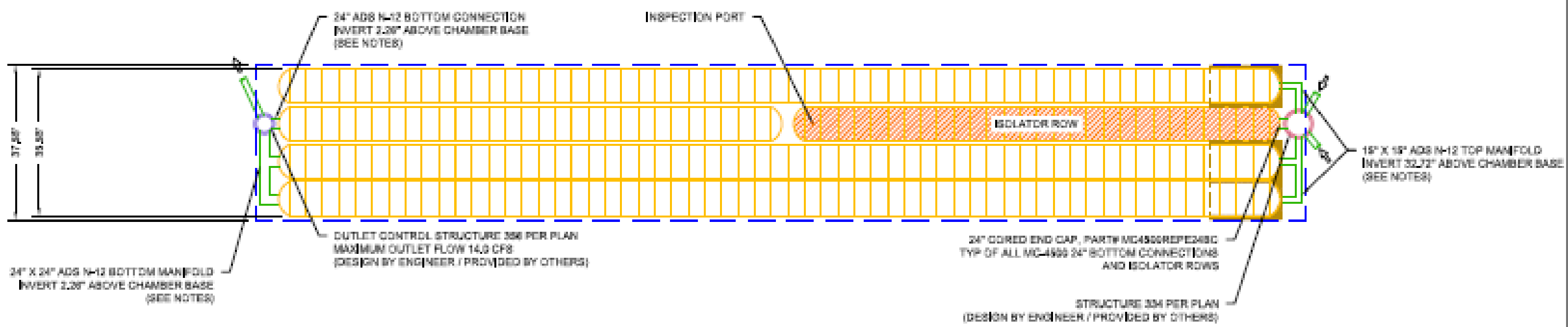
234	STORMTECH MC-4500 CHAMBERS
10	STORMTECH MC-4500 END CAPS
12	STONE ABOVE (in)
12	STONE BELOW (in)
40	% STONE VOID
41,653	INSTALLED SYSTEM VOLUME (CF) (PERIMETER STONE INCLUDED)
8,999	SYSTEM AREA (ft²)
554	SYSTEM PERIMETER (ft)

CONCEPTUAL ELEVATIONS - SYSTEM 1

MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED):	890.29
MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC):	885.79
MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC):	885.29
MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT):	885.29
MINIMUM ALLOWABLE GRADE (TOP OF RIGID PAVEMENT):	885.29
TOP OF STONE:	884.29
TOP OF MC-4500 CHAMBER:	883.29
18" TOP MANIFOLD INVERT:	879.20
24" BOTTOM MANIFOLD INVERT:	878.44
24" ISOLATOR ROW INVERT:	878.44
BOTTOM OF MC-4500 CHAMBER:	878.29
UNDERDRAIN INVERT:	877.29
BOTTOM OF STONE:	877.29

NOTES

- MANIFOLD SIZE TO BE DETERMINED BY SITE DESIGN ENGINEER. SEE TECH SHEET #7 FOR MANIFOLD SIZING GUIDANCE.
- DUE TO THE ADAPTATION OF THIS CHAMBER SYSTEM TO SPECIFIC SITE AND DESIGN CONSTRAINTS, IT MAY BE NECESSARY TO CUT AND COUPLE ADDITIONAL PIPE TO STANDARD MANIFOLD COMPONENTS IN THE FIELD.



ADS — 4640 TRUEMAN BLVD, HILLIARD, OH 43026

StormTech

REV	DRW	CKD	DESCRIPTION
02/09/17	AMD	DAF	SPECIFIC POSTAL, REMOVE UD, ADD CHAMBERS

37TH STREET UNDERGROUND SYSTEM
ROBBINSDALE, MN

DATE: 02/02/2017 DRAWN: VLW
PROJECT #: 173615 CHECKED: GFI

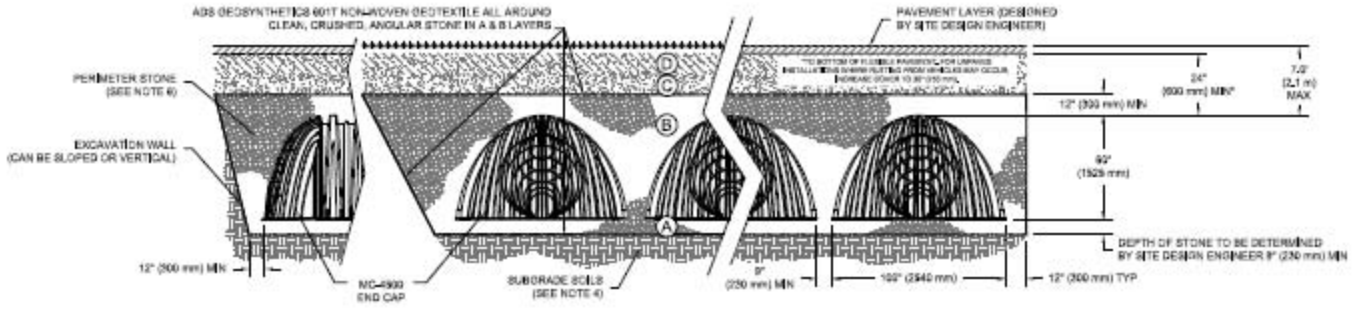
SHEET 2 OF 6

THIS DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED TO ADS UNDER THE DIRECTION OF THE SITE DESIGN ENGINEER OR OTHER PROJECT REPRESENTATIVE. THE SITE DESIGN ENGINEER SHALL REVIEW THIS DRAWING PRIOR TO CONSTRUCTION. IT IS THE ULTIMATE RESPONSIBILITY OF THE SITE DESIGN ENGINEER TO ENSURE THAT THE PRODUCT(S) DEPICTED AND ALL ASSOCIATED DETAILS MEET ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS.

ACCEPTABLE FILL MATERIALS: STORMTECH MC-4500 CHAMBER SYSTEMS

	MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER.	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE (B' LAYER) TO 24" (600 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 24" (600 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 12" (300 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS.
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 4	NO COMPACTION REQUIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 4	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE.[2,3]

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 9" (230 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.



NOTES:

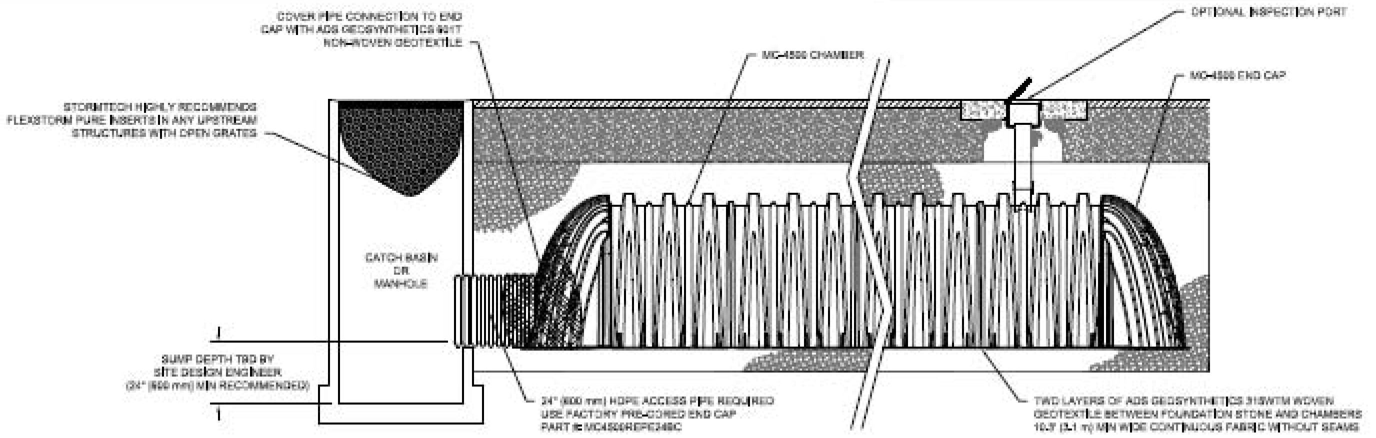
1. MC-4500 CHAMBERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F2418 "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
2. MC-4500 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. "ACCEPTABLE FILL MATERIALS" TABLE ABOVE PROVIDES MATERIAL LOCATIONS, DESCRIPTIONS, GRADATIONS, AND COMPACTION REQUIREMENTS FOR FOUNDATION, EMBEDMENT, AND FILL MATERIALS.
4. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
5. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.
6. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.

37TH STREET UNDERGROUND SYSTEM
ROBBINSDALE, MN
DATE: 02/02/2017 DRAWN: VLW
PROJECT #: 173615 CHECKED: CFT

StormTech

4640 TRUEMAN BLVD
HILLIARD, OH 43026

4 SHEET OF 6



MC-4500 ISOLATOR ROW DETAIL
NTS

INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
  - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
  - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - A.4. LOWER A CAMERA INTO ISOLATOR ROW FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW THROUGH OUTLET PIPE
    - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

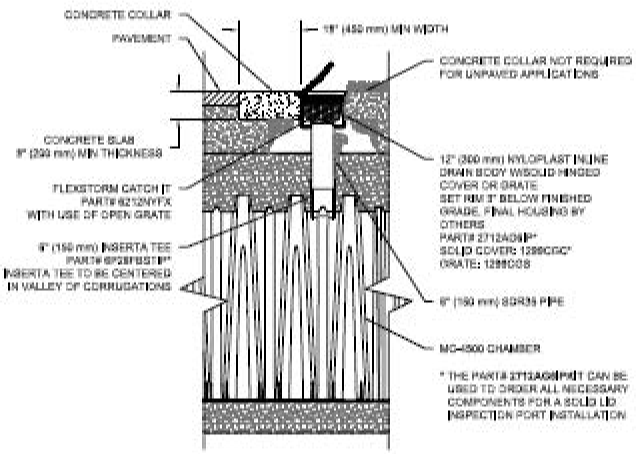
STEP 2) CLEAN OUT ISOLATOR ROW USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45" (1.1 m) OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS REQUIRED

STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.



MC-4500 6" INSPECTION PORT DETAIL
NTS

4640 TRUEMAN BLVD
HILLIARD, OH 43026

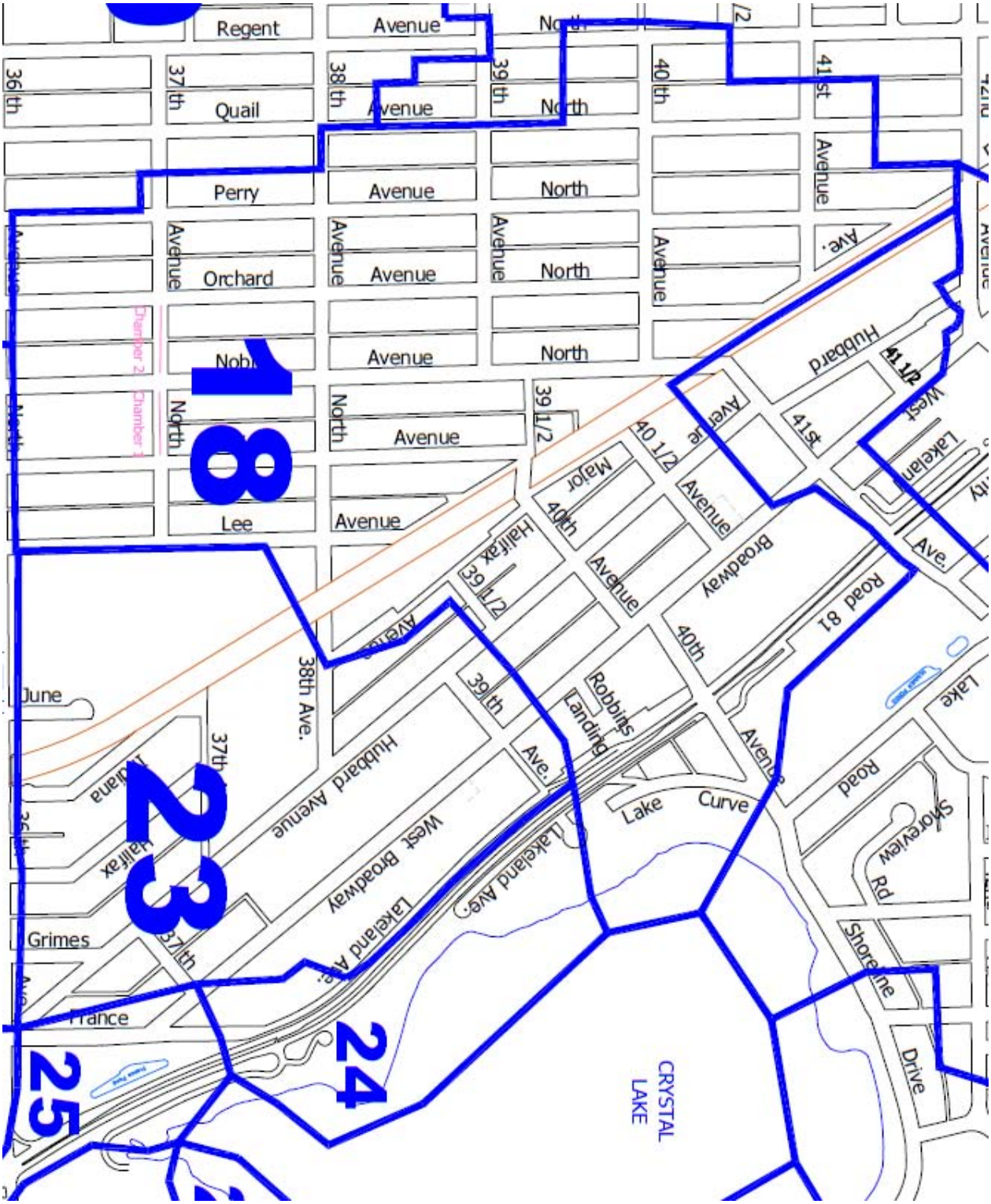
StormTech

REV	DRW	CKD	DESCRIPTION
02/02/17	AWD	DAF	

37TH STREET UNDERGROUND SYSTEM
ROBBINSDALE, MN

DATE: 02/02/2017 DRAWN: VLW
PROJECT #: 173815 CHECKED: GFI

SHEET 5 OF 6


Regent
Avenue
36th
37th
Quail
38th
Avenue
39th
North
40th
41st
Avenue
Perry
Avenue
North
Avenue
Orchard
Avenue
Avenue
North
Avenue
Avenue
Ave.
Hubbard
41 1/2
West
Lakelan
18
Lee
Avenue
North
Avenue
39 1/2
40 1/2
Major
40th
Avenue
41st
Ave.
Halifax
39 1/2
Avenue
Broadway
Road 81
Ave.
38th Ave.
39th
Robbins
Landing
40th
Lake
June
37th
Hubbard Avenue
Ave.
Lake
Curve
Road
Shoreview
Rd
23
Halifax
West Broadway
Lakeland Ave.
Grimes
37th
Shoreline
France
24
CRYSTAL
LAKE
Drive
25