



TRANSFORMING CENTRAL HIGH SCHOOL

SAINT PAUL PUBLIC SCHOOLS
OLDEST HIGH SCHOOL IN MN



CAPITOL REGION WATERSHED DISTRICT

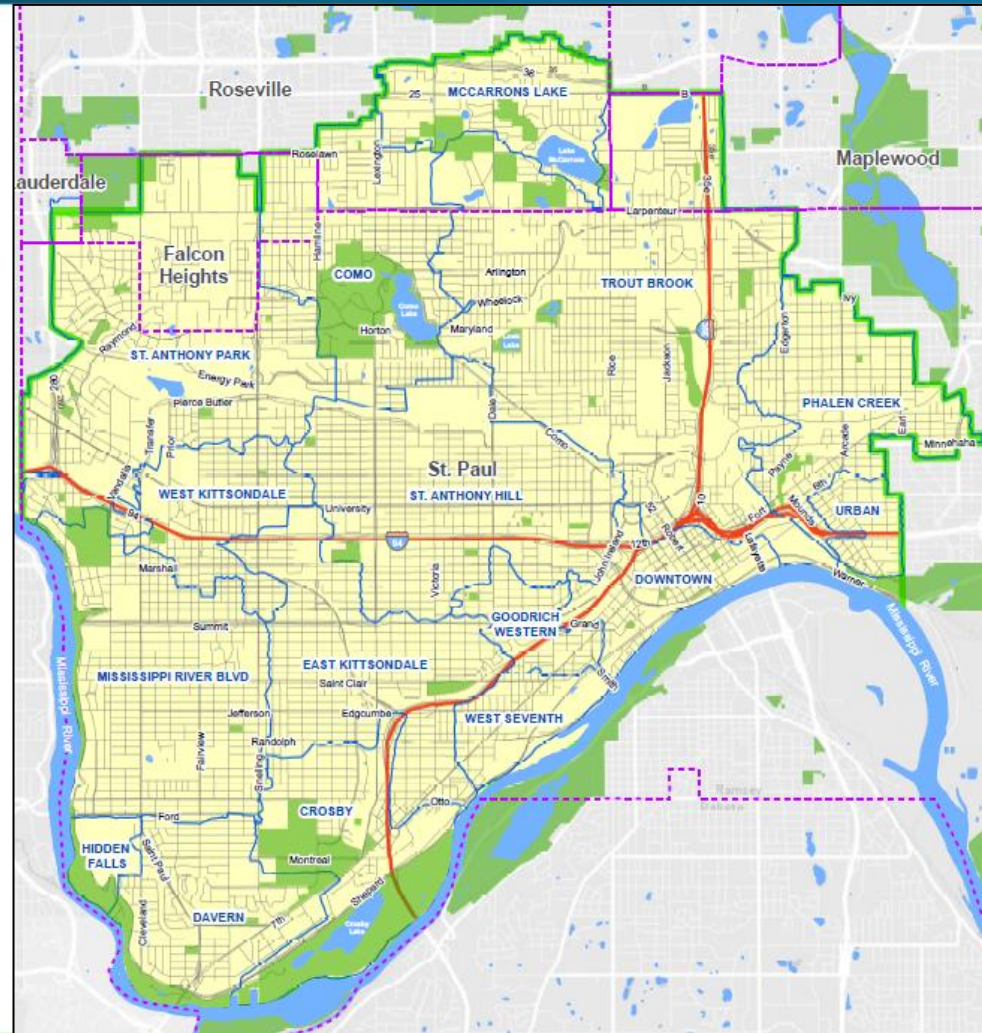
Capitol Region Watershed District

“Watershed District: A special purpose unit of MN local government”

- Established by Watershed District Act of 1955
- Boundaries based on drainage patterns
- Regulatory authority
- Funded through tax levy

Capitol Region Watershed District

- St. Paul, Minnesota
- Drainage area: 41 mi²
 - 5 lakes
 - Storm sewer network
 - 13 mi. of Mississippi
- Population: 245,000
- Highly urbanized
 - 47% impervious





All of CRWD Drains to Mississippi River



Transforming **Central**

students+environment+community

Transforming **Central**

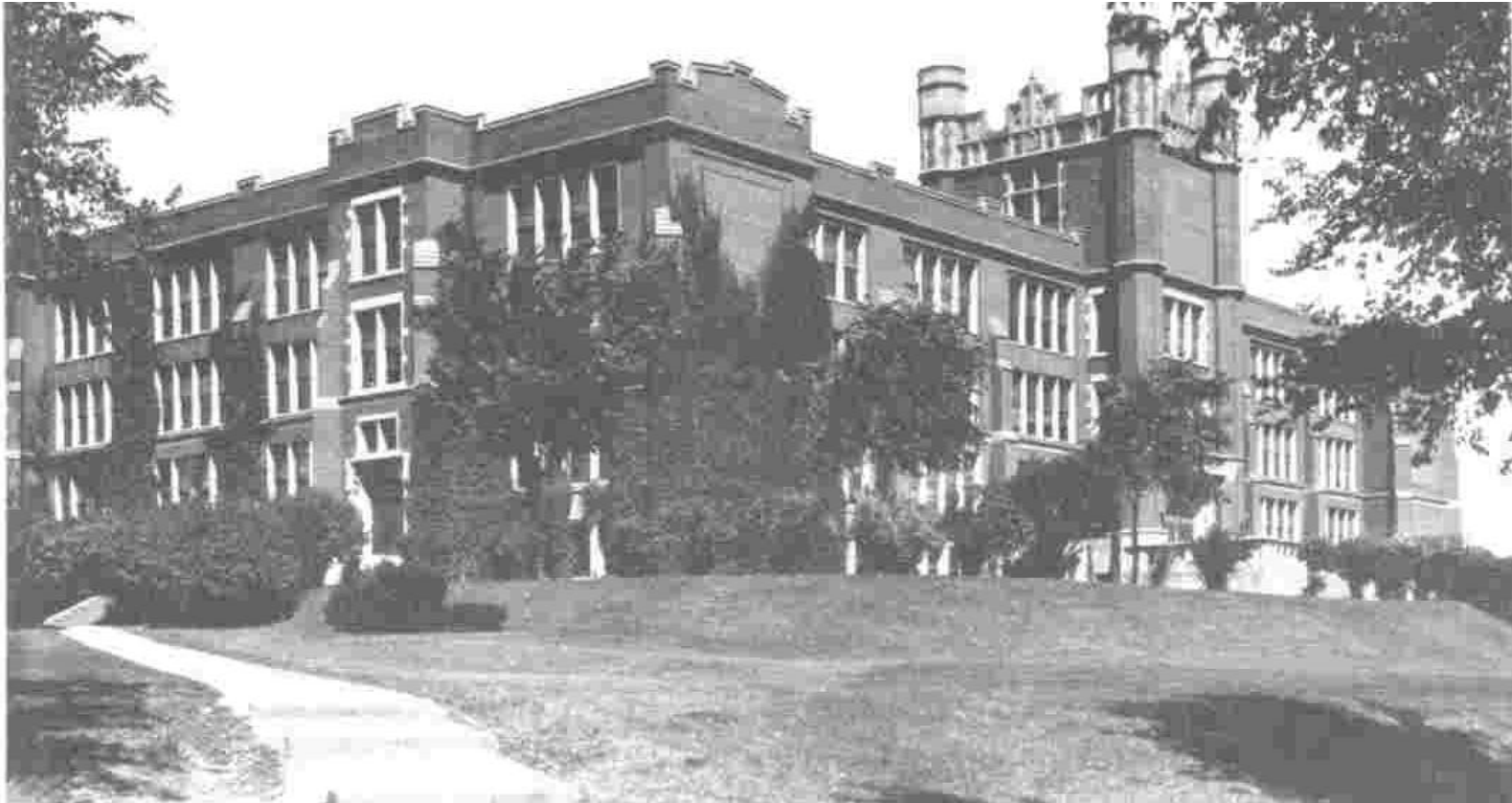
students+environment+community

central.spps.org/transformingcentral

Please Donate

Central High School

150th Anniversary - 1866 - 2016



Central High School - 2011



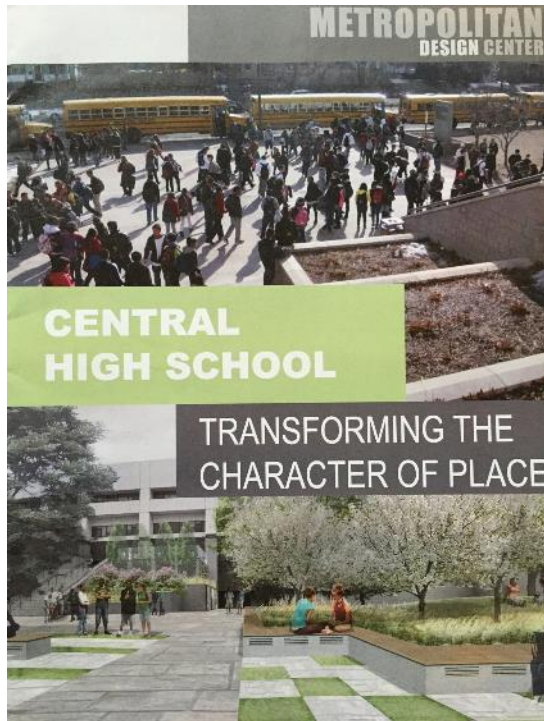
Transforming Central

*students • environment
• community*

A community effort to reshape the urban landscape of St. Paul Central High School in order to improve the students' daily experience, address the environmental impacts of our campus, and connect with the vibrant community that embraces the school.



Partnerships/Community Support



- Metropolitan Design Center
- St. Paul Public Schools – Facilities, School Board
- Neighbors, Community Councils, City Council Members
- Teachers – outdoor classroom and curriculum opportunities
- Student groups – Roots and Shoots/seNHS
- Parents
- Marshall Street residents
- Local business and churches and organizations, Grand Avenue Business Association, etc.
- Community Councils

Defining the Project

students • environment • community

The **student** experience is at the forefront of the project, providing:

- improved pathways, additional lighting and seating, and intentional gathering areas
- a sense of belonging and school pride
- educational opportunities inside and outside of the classroom
- daily contact with nature in an urban location

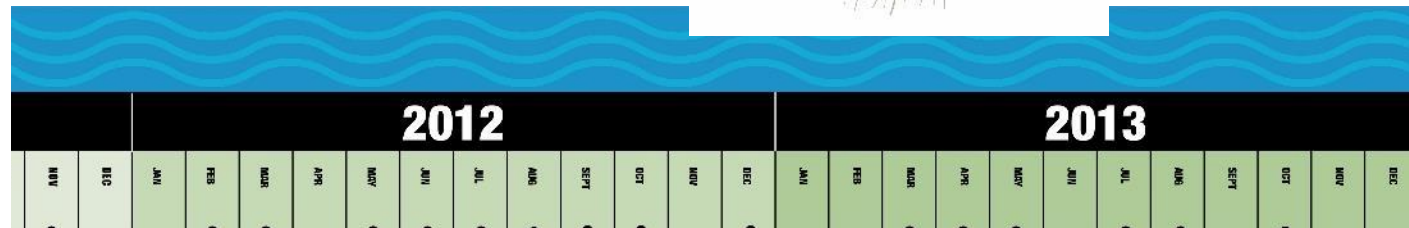




—Rodney H. Matsuoka, PhD



A SITE IMPROVEMENT PROJECT



CAPITOL REGION WATERSHED DISTRICT



Transforming Central Committee

A team of committed parents with a diversity of strengths and skills.

- Leadership
- Fundraising/Development
- Grant-writing
- Community Organizing
- Financial
- Project Documentation
- Project Management
- Graphic Design



Fundraising Events

Individuals
Family Foundations
Corporate and
Business Funders
Alumni

House Parties
Silent Auctions
Give MN
Musical Events



F. R. Bigelow Foundation
 Board of Water and Soil Resources Capitol
 Region Watershed District
 Immanuel Lutheran Church
 Jeanne and Gordon Shepard Family Foundation
 Lex Ham Community Council
 Mardag Foundation
 Minnesota Historical Society
 Minnesota Environment and Natural Resources
 Trust Fund
 Pheasants Forever
 Richard M. Schulze Family Foundation
 Saint Paul Public Schools
 Saint Paul Neighborhood STAR Program
 Saint Paul Foundation
 University of Minnesota Monarch Lab



The Central High School Community is grateful to all who contributed to Transforming Central, with special recognition to these major donors:

Individual Major Donors

Anonymous	Lisa & Bruce Hannum	Jennifer Needle '91
The Ahlquist-Mundt Family	Andrea Hauser & L. Charles Hardy	The Nelsestuen Family
Patricia Eaves & Stuart Alger	Kate Hedstrom	Mary Cerkvenik & David Norgard
Angeli Goel and Michael Alter	The Heyman Family	Valerie & Mike O'Keefe
Nicole Ankeny '90	The Hobbie-Benjamin Family	The O'Reilly-Wimes Family
Meg Arnosti	The Hudson-Gee Family	Peter '83, Roderic '85 & Matthew '86 Olson
Wall '56 & Ginger Blomholm '58 Bailey	Ruth & John Huss	Tim & Katie Parke-Reimer
Roger & Nancy Benjamin	Sam ('54) & Sylvia Kaplan	Anne & Bill Parker
Beth Black	Peter Lewis & Hyun Joo Kim	Dr. Michael & Paula Pergament
Mary Bolckcom	Dana Simonson & Jon Lahti	Lawrence '56 & Linda Peterson Perlman
Marianne Ludwig & Jonathan Boylan	Peter Leggett '02	Jeanne & Stuart Paraghesse
Amber Buckner	Judy Mahle Lutter '57	The Raeder-Devens Family
Laura & Nick Coleman	Principal Mary Mackbee	Margaret Jones & Jeff Risberg
Mary Baremore & Roberta Cordano	The Malm Family	Alan Ruvelson '61
The Danielson Family	The Marckel Family	T. Denny Sanford '58
The Davies Family	Deborah Carter & Donald McCoy	Erica Schumacher '96
The Dietz Family	The McCready Family	Mary & Jim Stahlmann
Sara & Mahadev Davey-Wudali	The McCullough Family	Robi Skupka
Lori Rikke & J. Eric Dunn	William & Virginia McDonald	The Tonnason Family
Chris Faust	Daniel and Janey McGeary-Farber	The Tuttle Family
Astrid Garino	Dana Murdoch & Roger Meyer	Hans & Kristin Ulland
Therese Sexe & David Hage	Peter M. Morales	Susan Lawrenz-Smith & Jon Weissman
Kris & Tim Hageman	Janette Kihn & Michael Moulsoff	Scott & Sheri Yarosh

Organizations

Bayer Bee Care
 Central High School Class of 1955
 Central High School Class of 2013
 Central High School Class of 2015
 Central High School Drama Board
 Central High School Roots and Shoots
 Central High School Staff
 Central High School
 National Honor Society
 Central High School Parent
 Advisory Council
 St Paul Central High School Foundation
 Concordia University
 House of Hope Presbyterian Church
 Lexington-Hamline Community Council
 Macalester College
 St Paul Sunrise Rotary Club
 The William R. Kennedy
 Family Foundation
 Unity Church Unitarian of St Paul

Grants

Bayer Bee Care
 F. R. Bigelow Foundation
 Cabela's Outdoor Fund
 Capitol Region Watershed District
 DuPont Pioneer
 Immanuel Lutheran Church
 John S. and James L.
 Knight Foundation
 Mardag Foundation
 Minnesota Board of
 Water and Soil Resources
 Minnesota Environment and Natural
 Resources Trust Fund
 Minnesota Historical Society
 Pheasants Forever
 The Saint Paul Foundation
 Saint Paul Public Schools
 Saint Paul Neighborhood
 STAR Program
 St. Paul Smart Trips
 Richard M. Schulze
 Family Foundation
 Jeanne and Gordon Shepard
 Family Foundation
 U of M Monarch Lab and
 US Forest Service

Businesses

Armidon Graphics
 Annie Samson Calander, Graphic Designer
 Associated Bank
 Bank Cherokee
 Bluhm Brothers Landscaping
 Emmons & Olivier Resources
 Paul Tushaus '83 and Creative Images Inc.
 Roehr Schmitt Architecture
 Sally Gagne Design
 Sunrise Banks
 The Vagary
 University of Minnesota
 Design Center
 Village Communications
 Walker West Academy
 White Bear Millsbishi
 Whole Foods

Thank You!

Summer 2016 - Installation



Dedication and 150th Celebration

Dedication – Fall 2016



150th Celebration Spring 2017

*Please join the Central community on **May 18th** from **5-6:30pm** for a special 150th **Birthday Party Picnic** on the new plaza.*

Student and Alumni
Musicians
Outdoor Photography
Exhibit

Central High School

- Oldest high school in Minnesota
- Last renovated in 1980
- “prison”-like exterior and site
- Extensive impervious



Central High School

- 2.5 acre drainage area
- Significant erosion and sediment issues
- Lack of areas for student occupation and engagement within the site



Student & Faculty Engagement



Visual Preference Survey

- Had attendees at after-school meeting rate a variety of different site images to understand the desired character for the site
- Rate from 1 (very positive) to 5 (very negative)



“Funny Money” Exercise

- Prioritizing site elements
- Limited (and sometimes unknown budget)
- Students and staff broke into groups and selected the items they most wanted

\$10	Additional Landscape		<input checked="" type="radio"/>
		<i>YES</i>	
		<i>Group 1 - votes</i>	\$10
\$5	Signage Frame - Lexington Marshall		<input checked="" type="radio"/>
		<i>yes, but,</i>	
		<i>Next phase...</i>	
		<i>talk to users - is the current system complained about?</i>	\$5
\$20	Seatwall/Architectural Enhancements		<input checked="" type="radio"/>
			\$20

Funny Money Results

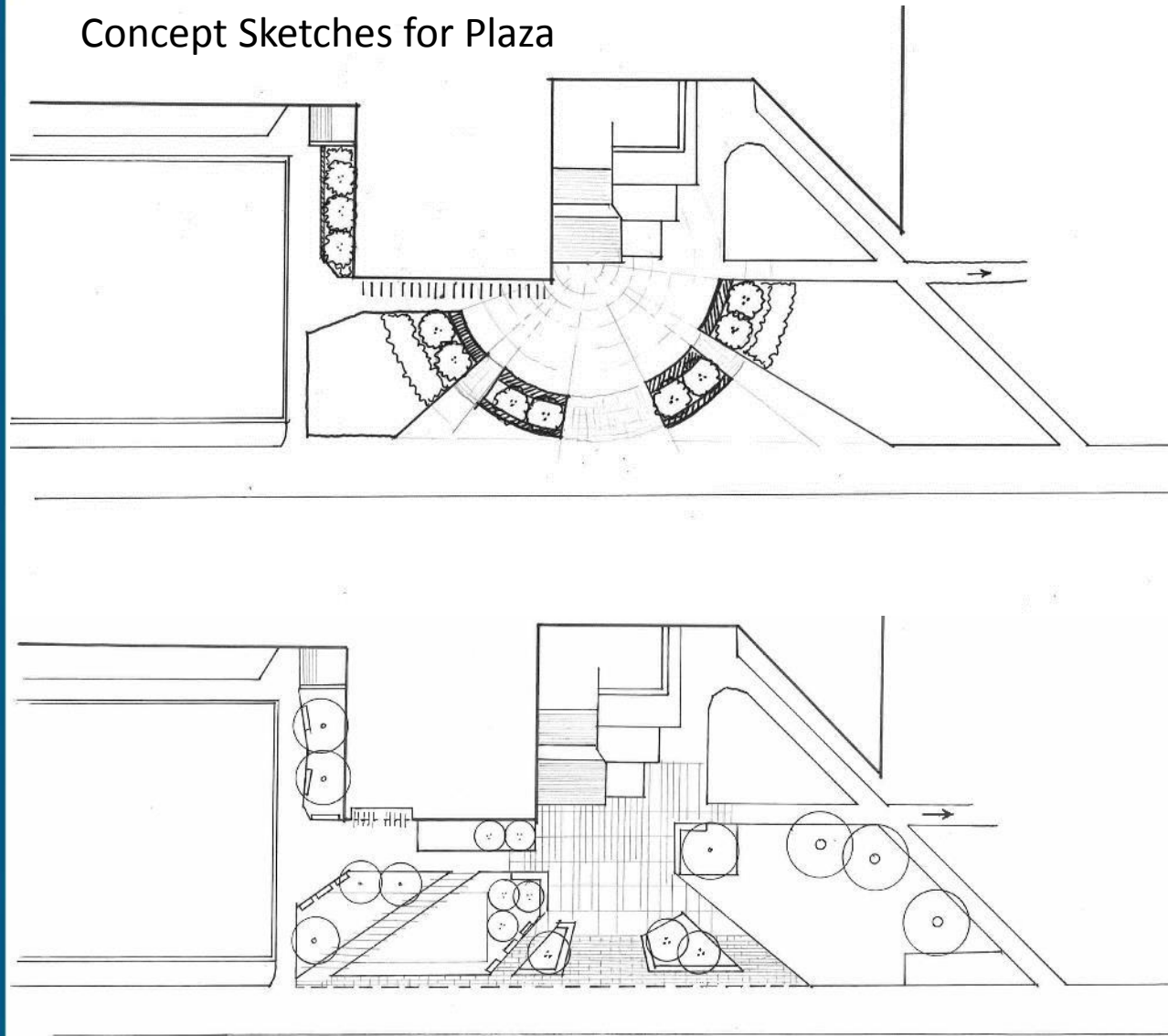
- Outdoor Classroom
- Plaza Enhancements
- Seatwalls and architectural enhancements
- Signage

Category	Amount	Group 1	Group 2	Group 3	Group 4
Additional Art Projects	\$20				<input checked="" type="checkbox"/>
Additional Furnishings	\$10				
	\$20				
Additional Landscape	\$10	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
	\$20				
Additional Lighting	\$20	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
	\$30				
Hillside Prairie	\$20		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
Large Trellis/Green Screen on Wall	\$20				
Main Sign Replacement	\$10				<input checked="" type="checkbox"/>
	\$20		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Outdoor Classroom	\$15				
	\$30	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Plaza Enhancements	\$20	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
	\$30			<input checked="" type="checkbox"/>	
Seatwall/Architectural Enhancements	\$20	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
	\$30			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Signage Frame - Lexington Marshall	\$5	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
Site learning Features	\$10	<input checked="" type="checkbox"/>			
Water Harvesting Tank @Tiered Beds	\$10	<input checked="" type="checkbox"/>			

Concept Sketches for Plaza

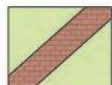
Design and Bidding

- Used school motto: “Many Traditions, One School” as inspiration
- Created multiple concept design iterations, and revised based on feedback from the group
- Bid project with many add alternates because budget was unknown due to fundraising even up until the time of bidding



CENTRAL HIGH SCHOOL CLEAN WATER PARTNERSHIP

With support from Saint Paul Public Schools and Capitol Region Watershed District, 1.4 million gallons of polluted stormwater runoff are filtered on Central's campus every year.



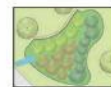
Permeable pavers have gaps so stormwater runoff and snowmelt can soak into the ground instead of flowing to storm drains in the street.



Two **tree trenches** in the plaza capture stormwater runoff and use it to water trees and plants. Underground pipes take excess water to the underground rock trench.



A large **underground rock trench** with perforated pipes can hold 49,400 gallons of stormwater runoff so it can seep into the rock and soil below.



Two **rain gardens** and a **native planting** capture stormwater runoff from the plaza and grassy hill areas so it can soak into the ground and be filtered by the plants.



CAPITOL REGION WATERSHED DISTRICT



Infiltration Gallery Construction



Infiltration Gallery Construction



Infiltration Gallery Construction



Infiltration Gallery Construction



Tree Trenches & Permeable Pavers





Plaza - *Before*



Plaza – *After Improvements*



Lawn & Outdoor Classroom - *Before*



Lawn & Outdoor Classroom – *After*



Erosion Issues - *Before*



Plaza Rain Garden - After





LETTING IT ALL SOAK IN

Stormwater bio-infiltration at Central High School helps reduce pollution in the Mississippi River. Here's how:

Permeable pavement allows water to soak into the ground, where it is filtered by soil and plants. This process reduces the amount of pollutants that enter the water supply. The system also helps to recharge groundwater and reduce the risk of flooding.

Why?

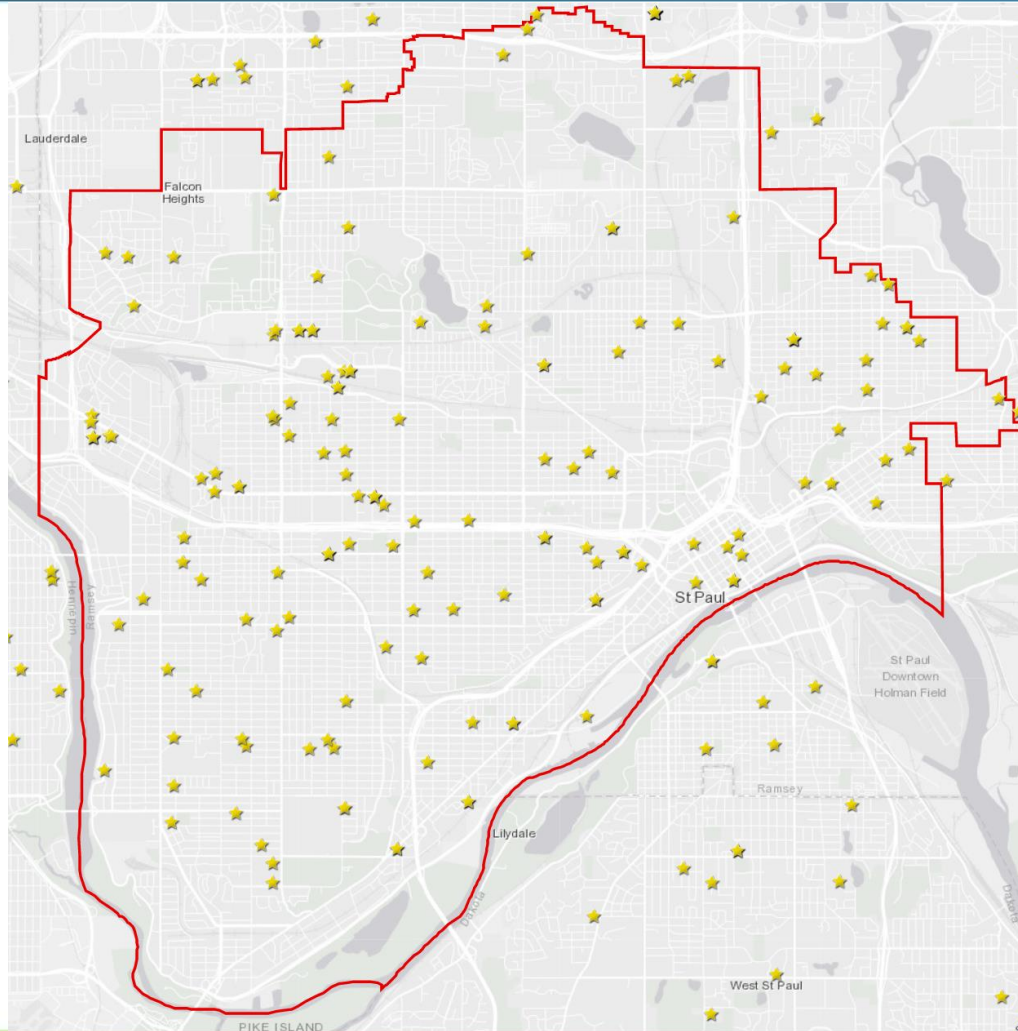
• Reduces runoff and flooding
• Filters pollutants
• Recharges groundwater
• Reduces the risk of flooding



CAPITOL REGION WATERSHED DISTRICT



Why Partner with Schools?



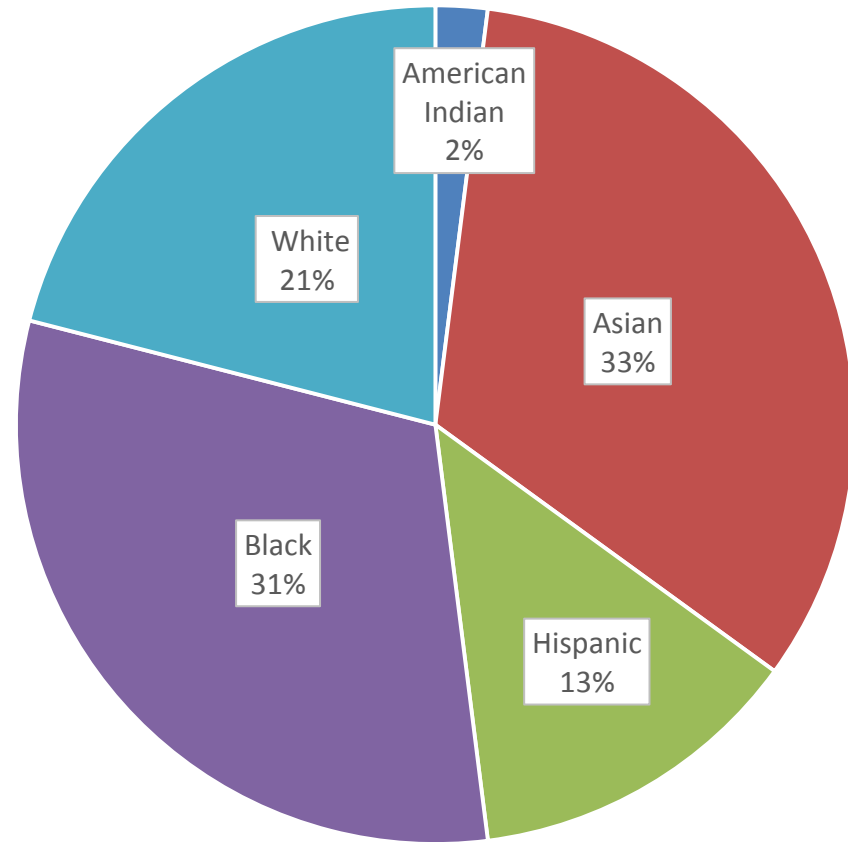
Schools are Great Partners

- Major Land Owners
- Support Clean Water Initiatives
- Need You! Technical and Financial Support
- Cost savings by pairing stormwater improvements with school capital improvements
- Opportunities to connect with students and community

Schools are Great Partners

- 38,000 students in SPPS
- 1,800 students at Central HS (~450/grade)
- Spatial distribution
- Diverse populations (77% S.O.C.)

SPPS Student Population



Educational Signage



Educational Signage

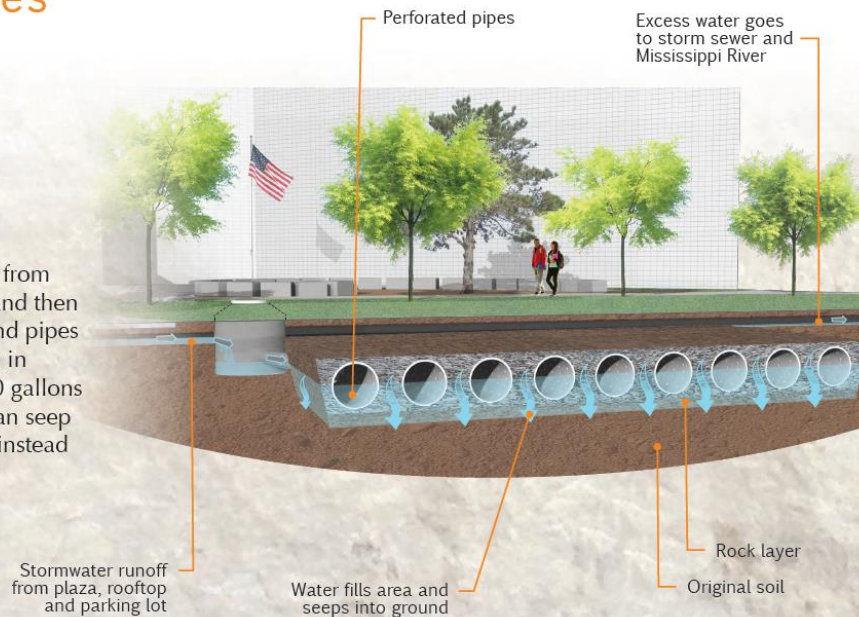


Educational Signage

WHAT'S BENEATH YOUR FEET?

Underground rock trenches at Central High School help reduce pollution in the Mississippi River. Here's how —

Polluted stormwater runoff from Central used to flow from rooftops, parking lots and sidewalks to storm drains and then the Mississippi River. The school installed underground pipes with thousands of holes (perforated) and buried them in rock-filled trenches. The rock trench can store 49,400 gallons of stormwater runoff from around campus where it can seep through the holes into the surrounding rock and soil instead of flowing to the river untreated.



Why?

Did you know that when it rains or snow melts, water carries trash, dirt, oil, pet waste, grass and leaves to the Mississippi River? Water that flows over hard surfaces is called runoff. Projects like this one at Central are essential to capture, clean and reduce runoff before it reaches nearby lakes and rivers. Saint Paul Public Schools completed this project in partnership with Capitol Region Watershed District.

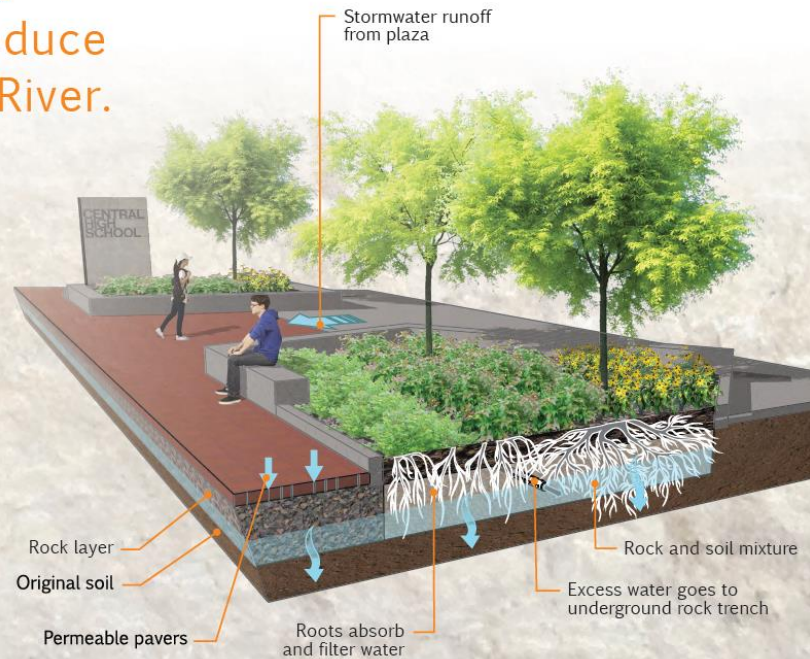


Educational Signage

LETTING IT ALL SOAK IN

Stormwater tree trenches at Central High School help reduce pollution in the Mississippi River. Here's how —

Polluted stormwater runoff from Central used to flow from the rooftops, parking lots and sidewalks to storm drains and then the Mississippi River. The school installed tree trenches and permeable pavers to capture runoff and snowmelt from the plaza. Runoff flows through gaps in the pavers where it can be used by the plants and trees in the tree trenches. Excess water soaks into the ground or flows to the underground rock trench instead of flowing to the river untreated.

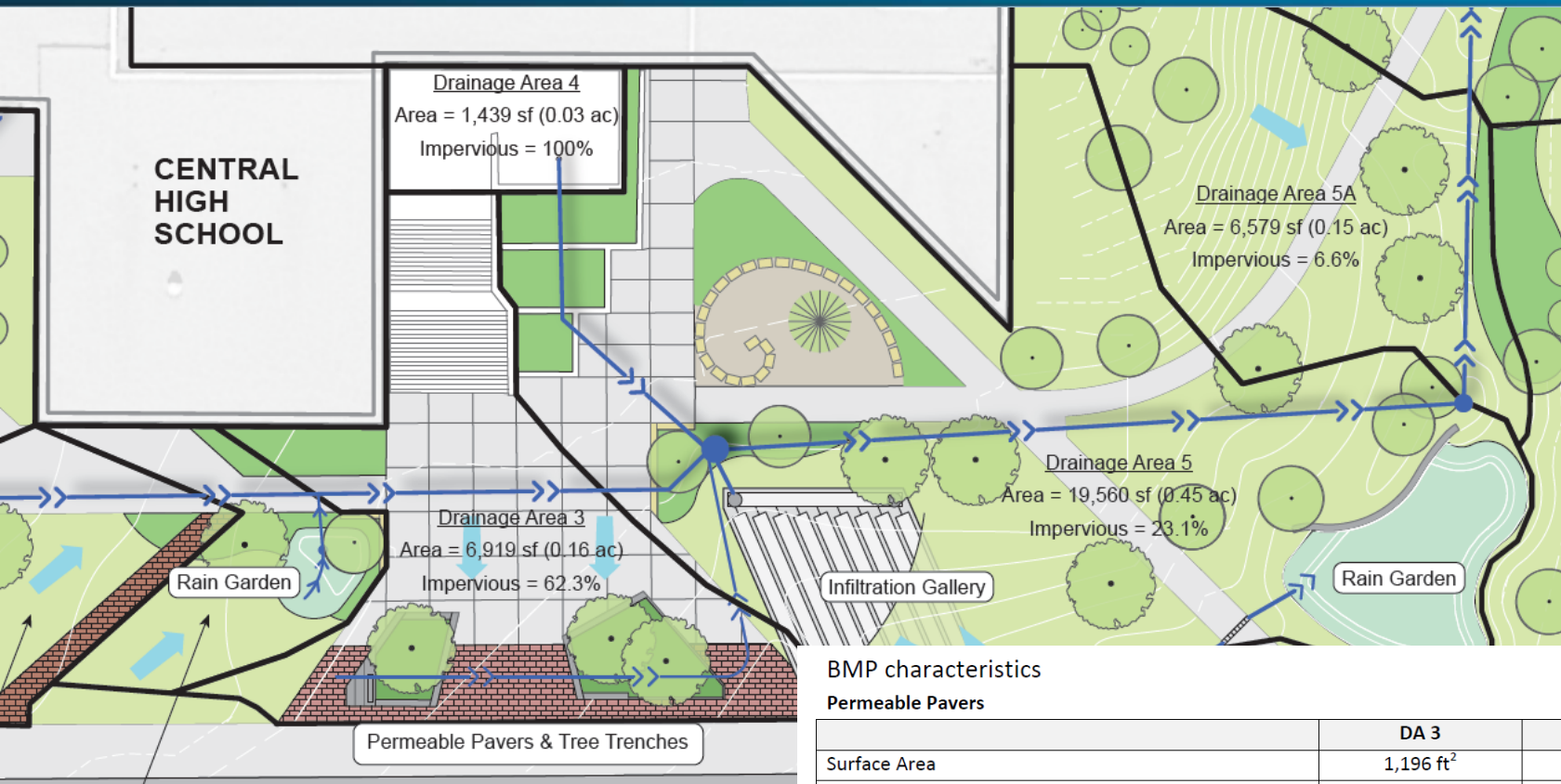


Why?

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Curriculum Integration



BMP characteristics

Permeable Pavers

	DA 3	DA 3B
Surface Area	1,196 ft ²	449 ft ²
Pavers - Height/Void Space	4 inches, 15% voids	4 inches, 15% voids
Pea Gravel - Height/Void Space	2 inches, 40% voids	2 inches, 40% voids
Quarry Stone (diameter ¾ - 1 in) - Height/Void Space	4 inches, 40% voids	4 inches, 40% voids
Quarry Stone (diameter 1 ½ - 3 in) - Height/Void Space	24 inches, 40% voids	6 inches, 40% voids
Infiltration Rate of Subsoils	0.3 in/hr	0.3 in/hr

Tree Trenches - can be treated as permeable pavement, installed the same as pavers in drainage area 3, for the sake of hydrologic calculations

	Tree Trench #1	Tree Trench #2
Tree Box Surface Area	228 ft ²	459 ft ²

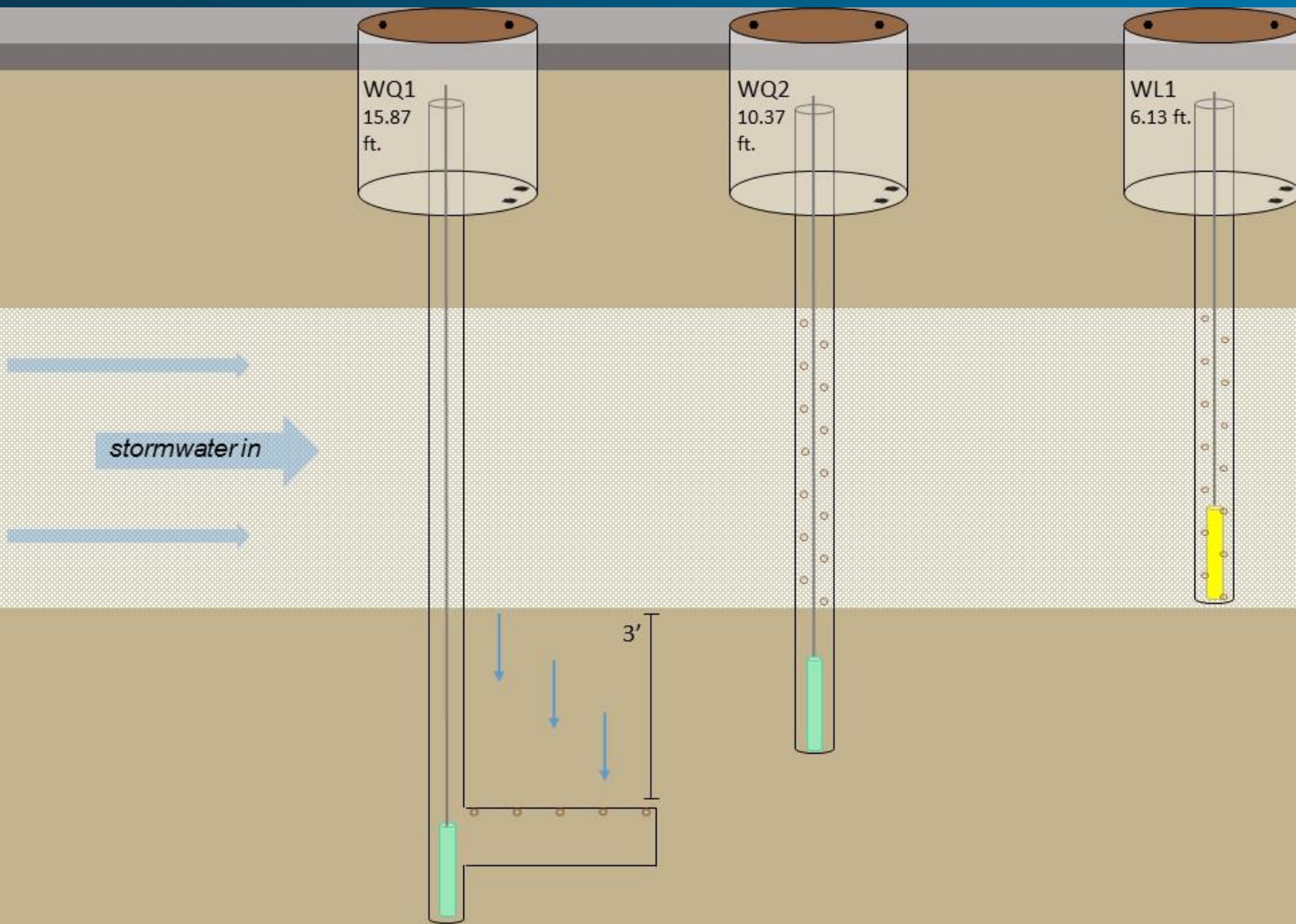
Monitoring Wells





Monitoring Wells





**diagram not to scale*

Curriculum Integration



Central High School

- 2.5 acres treated
- >90% reduction in Vol, TSS, and TP
- ~\$800,000 for design and construction
- >\$430,000 covered by grants



Project Achievements

- Students, staff, and community were key stakeholders in planning process
- Campus beautification improves students' daily experience
- Environmental improvements integrated with school curriculum

Nate Zwonitzer
Water Resource Project Manager
Capitol Region Watershed District

651-644-8888
nate@capitolregionwd.org



CAPITOL REGION WATERSHED DISTRICT

