



VINCENT HIGH SCHOOL'S CONCEPTUAL SCHOOL GROUNDS REDEVELOPMENT PLAN

May 2019



**MILWAUKEE
PUBLIC SCHOOLS**



MILWAUKEE PUBLIC SCHOOLS
FOUNDATION



**Green Schools
Consortium of Milwaukee**
A Green & Healthy Schools Wisconsin Regional Network



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INTRODUCTION

City youth grow up surrounded by imperviousness. Impervious surfaces (hardscapes including asphalt and concrete) characterize so much of our built environment that we no longer even notice how they shape the contours of our urban communities. Excessive imperviousness leads to sewage overflows and basement backups, degrades the quality of our rivers and lake, and costs us millions each year in economic losses and infrastructure repair, all of which deter investment and retard socioeconomic progress. Yet imperviousness also has other human impacts—consider how it affects the development of a young person’s mind. Schools surrounded by seas of splintering asphalt offer opportunities to replace imperviousness with beautiful, nature-inspired landscapes that increase urban biodiversity, educate, and inspire.

Through funding provided by the Milwaukee Metropolitan Sewerage District and the Fund for Lake Michigan, the nonprofit Reflo and its partners collaborate with five schools annually to develop the following conceptual outdoor redevelopment plan that holistically address the issue of the school’s imperviousness. This document compiles over a year of conceptual planning in order to provide the school, administrators, potential funders, and project partners with a single, feasible vision for redeveloping to a greener, healthier school. Redeveloping the existing underutilized school grounds also provides a multitude of potential STEAM (science, technology, engineering, arts, and mathematics) curriculum connections as well as triple-bottom-line (social, environmental, and economic) benefits for the students, school, and community.



ACKNOWLEDGMENTS

The successes at Vincenet High School to date and all of the planned activities laid out in this document are the result of many individuals and organizations that have worked for several years to support the school. The following is a short list of those that we would like to thank for their contributions:



VINCENTS GREEN TEAM AGRICULTURE SCIENCES TEAM

PROJECT PARTNERS:



Justin Hegarty
Wilniesha Smith
Michael Timm
Jose Basaldua
Michael Snowden
Barbara Richards
Denice Niebuhr
Rose Kuzj
Leah Holloway
Lisa Neeb



Karen Sands
Lisa Sasso
Jay Feiker



Vicki Elkin



Travis Luzney
John Linn
Sean Kane
Mark Bethel
Ashley Adsit
Leah Alsteen
Rochelle Sandrin
Angeline Koch



Erick Shambarger



Wendell Willis
Kelly Rickman



Carolyn Esswein
Bill Noelck
Jack Grover
Mahshid Seyedehmahshid



August Ball



Sean Kiebzak

BENEFITS OF GREEN SCHOOLYARDS

NATURE CAN IMPROVE ACADEMIC OUTCOMES

Spending time in nature enhances educational outcomes by improving children's academic performance, focus, behavior, and love of learning.

BETTER ACADEMIC PERFORMANCE

Learning in natural environments can:



BOOST PERFORMANCE in reading, writing, math, science and social studies
1, 2, 3, 4, 5



ENHANCE creativity, critical thinking and problem solving⁹

Seeing nature from school buildings can foster academic success^{6, 7, 8}

ENHANCED ATTENTION

Spending time in nature can help children focus their attention:



FOCUS AND ATTENTION
10, 11, 12, 13



ADHD SYMPTOMS
14, 15

The greener the setting, the better the focus^{14, 15}

INCREASED ENGAGEMENT & ENTHUSIASM

Exploration and discovery through outdoor experiences can promote motivation to learn:



INCREASED ENTHUSIASM FOR LEARNING
1, 16



GREATER ENGAGEMENT WITH LEARNING¹⁷

IMPROVED BEHAVIOR

Nature-based learning is associated with reduced aggression and fewer discipline problems:^{18, 19}



MORE IMPULSE CONTROL¹⁰



LESS DISRUPTIVE BEHAVIOR
20



ADDITIONAL RESEARCH ON THE BENEFITS OF NATURE AVAILABLE AT childrenandnature.org/research

SUPPORTING RESEARCH

¹Lieberman & Hoody (1998). Closing the achievement gap: Using the environment as an integrating context for learning. Results of a Nationwide Study. *San Diego: SEER*. ²Chawla (2015). Benefits of nature contact for children. *J Plan Lit*, 30(4), 433-452. ³Berezowitz et al. (2015). School gardens enhance academic performance and dietary outcomes in children. *J School Health*, 85(8), 508-518. ⁴Williams & Dixon (2012). Impact of garden-based learning on academic outcomes in schools: Synthesis of research between 1990 and 2010. *Rev Educ Res*, 83(2), 211-235. ⁵Wells et al. (2015). The effects of school gardens on children's science knowledge: A randomized controlled trial of low-income elementary schools. *Int J Sci Edu*, 37(17), 2858-2878. ⁶Li & Sullivan (2016). Impact of views to school landscapes on recovery from stress and mental fatigue. *Landscape Urban Plan*, 148, 149-158. ⁷Wu et al. (2014). Linking student performance in Massachusetts elementary schools with the "greenness" of school surroundings using remote sensing. *PLoS ONE* 9(10): e108548. ⁸Matsuoka, R. H. 2010. Student performance and high school landscapes. *Landscape and Urban Planning* 97 (4), 273-282. ⁹Moore & Wong (1997). Natural Learning: Rediscovering Nature's Way of Teaching. Berkeley, CA: MIG Communications. ¹⁰Faber Taylor et al. (2002). Views of nature and self-discipline: Evidence from inner-city children. *J Environ Psy*, 22, 49-63. ¹¹Mårtensson et al. (2009). Outdoor environmental assessment of attention promoting settings for preschool children. *Health Place*, 15(4), 1149-1157. ¹²Wells (2000). At home with nature effects of "greenness" on children's cognitive functioning. *Environ Behav*, 32(6), 775-795. ¹³Berto et al. (2015). How does psychological restoration work in children? An exploratory study. *J Child Adolesc Behav* 3(3). ¹⁴Faber Taylor et al. (2001). Coping with ADD: The surprising connection to green play settings. *Environ Behav*, 33(1), 54-77. ¹⁵Amoly et al. (2014). Green and blue spaces and behavioral development in Barcelona schoolchildren: The BREATHE Project. *Environ Health Perspect*, 122,1351-1358. ¹⁶Blair (2009) The child in the garden: An evaluative review of the benefits of school gardening. *J Environ Educ*, 40(2), 15-38. ¹⁷Rios & Brewer (2014). Outdoor education and science achievement. *Appl Environ Educ Commun*, 13(4), 234-240. ¹⁸Bell & Dymont (2008). Grounds for health: The intersection of green school grounds and health-promoting schools. *Environ Educ Res*, 14(1), 77-90. ¹⁹Nedovic & Morrissey (2013). Calm, active and focused: Children's responses to an organic outdoor learning environment. *Learn Environ Res*, 16(2), 281-295. ²⁰Ruiz-Gallardo & Valdés (2013). Garden-based learning: An experience with "at risk" secondary education students. *J Environ Educ*, 44(4), 252-270.

GREEN SCHOOLYARDS CAN PROVIDE MENTAL HEALTH BENEFITS

Green schoolyards can enhance mental health and well-being and promote social-emotional skill development.

GREEN SCHOOLYARDS HELP KIDS FEEL:

CALMER & LESS STRESSED^{2,3}

Views of green landscapes from classroom windows helped high school students recover more quickly from stressful events.⁴

POSITIVE & RESTORED³

Forest schools enhanced positive and decreased negative emotions.⁵

RESILIENT²

Natural areas enhanced feelings of competence and increased supportive social relationships that help build resilience.²



GREEN SCHOOLYARDS PROMOTE SOCIAL-EMOTIONAL SKILLS

PRACTICE RELATIONSHIP SKILLS²

Children demonstrated more cooperative play, civil behavior and positive social relationships in green schoolyards.^{6,7}

DEVELOP SELF-AWARENESS & SELF-MANAGEMENT

Green schoolyards can reduce aggression and discipline problems.^{6,7}
Gardening at school helped students feel proud, responsible & confident.²



SUPPORTING RESEARCH

¹www.nlm.nih.gov/health/statistics/prevalence/any-disorder-among-children.shtml ²Chawla et al. (2014). Green schoolyards as havens from stress and resources for resilience in childhood and adolescence. *Health Place*, 28, 1-13. ³Kelz et al. (2015). The restorative effects of redesigning the schoolyard: A multi-methodological, quasi-experimental study in rural Austrian middle schools. *Environ Behav*, 47(2), 119-139. ⁴Li & Sullivan (2016). Impact of views to school landscapes on recovery from stress and mental fatigue. *Landscape Urban Plan*, 148, 149-158. ⁵Roe & Aspinall (2011). The restorative outcomes of forest school and conventional school in young people with good and poor behaviour. *Urban For Urban Gree*, 10(3), 205-212. ⁶Bell & Dymont (2008). Grounds for health: The intersection of green school grounds and health-promoting schools. *Environ Educ Res*, 14(1), 77-90. ⁷Nedovic & Morrissey (2013). Calm, active and focused: Children's responses to an organic outdoor learning environment. *Learn Environ Res*, 16(2), 281-295.



SCHOOL STORY



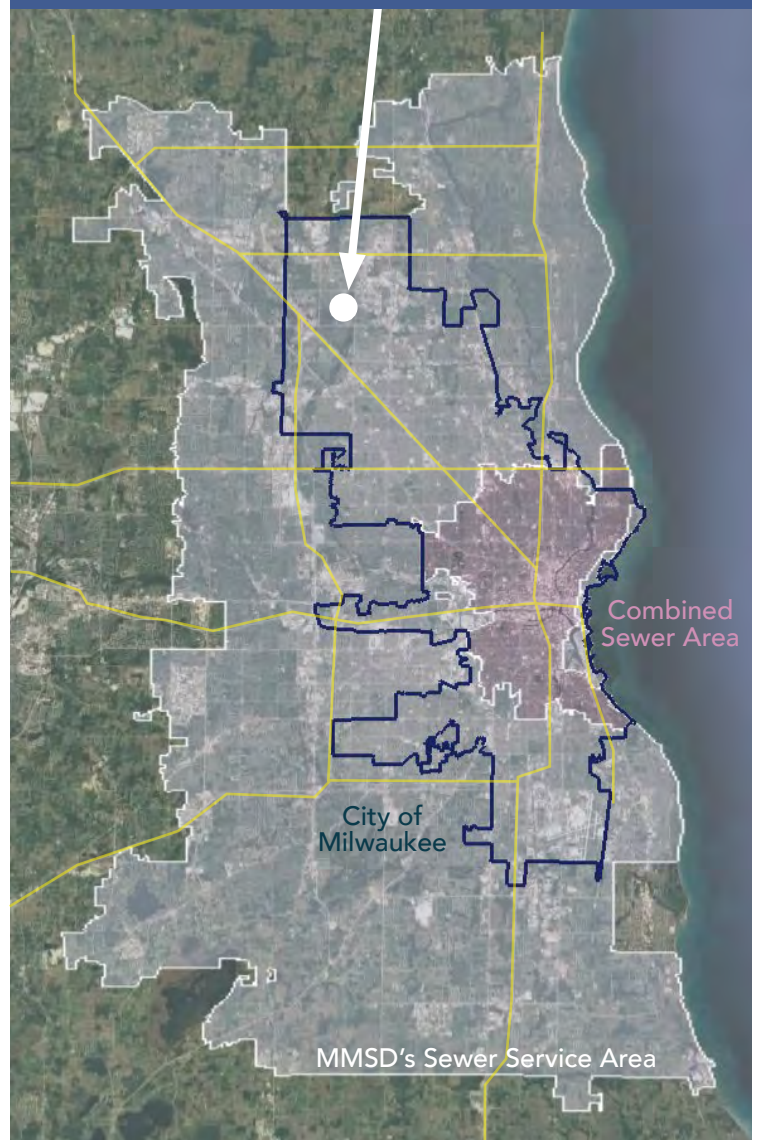
VISION:

Vincent High School of Agricultural Sciences envisions a nurturing, safe, and professional environment that supports the educational, social, emotional and physical development of all. We are planting the seeds of success for all stakeholders in the fertile soil of a rigorous curriculum and supportive school culture that will promote an authentic enthusiasm for life-long learning, creativity, respect and a commitment to growing to our full potential. We embrace a strong partnership with our diverse communities and one that promotes a passionate commitment to the Agricultural Sciences.

VALUES:

Balance, Connections, Effort, Forgiveness, Generosity, Honor, Humility, Humor, Imagination, Resilience, Respect, Responsibility, Time Value, Wisdom

VINCENT HIGH SCHOOL





Vincent High School
7501 N Granville Rd, Milwaukee

- Milwaukee Public School
- Grades: 9th through 12th
- 806 students
- 81.7% economically disadvantaged
- Separated Sewer Area
- Menomonee River watershed
- 70 acre property





MARK A. SAIN - PAST MPS BOARD PRESIDENT

It has been exciting to watch the progress and growth the past few years at Vincent High School of Agricultural Sciences. The possibility of incorporating water conservation, habitat restoration, storm water management, and increase green space will bring additional opportunities for young people to engage in a robust educational experience.



KATE M. NELSON - CHIEF SUSTAINABILITY OFFICER, UNIVERSITY OF WISCONSIN-MILWAUKEE

As Vincent High School of Agricultural Sciences invests its time and talents into rebuilding its agricultural programs and curriculum, it is also wonderful to see the community recognize the importance of supporting this effort further. The redevelopment of the land only builds on their capacity to fulfill programs that get students outside, connecting to their food system, and sustainable practices.



MARVA HERNDON - MPS SCHOOL BOARD MEMBER

The Vincent High School "Green Schoolyards" redevelopment project is an exceptional concept. The fact that this project centers around the different facets of exploration and is connected to education is extraordinary. The planned cultural relevant curriculum shows the forward thinking of those developing this program.





DR. MOLLY JAHN - UW-MADISON PROFESSOR OF GENETICS AND AGRONOMY

Vincent High School of Agricultural Sciences and all the students, staff and community touched by this school will directly benefit from these sustainable projects. Together, we have the opportunity to make national history here by bringing new and extraordinary educational and life opportunities for Vincent's students and all they will touch through their futures—our futures. It HAS BEEN DEEPLY INSPIRING FOR ME TO HAVE THE PRIVILEGE OF WATCHING THIS SCHOOL TRANSFORM, to see what's going on here today and what will happen in the future. THE FUTURE OF THE STUDENTS AT VINCENT HIGH WILL BE THE FUTURE OF OUR NATION.



JEFF HICKEN – AGRICULTURE EDUCATION CONSULTANT/STATE FFA ADVISOR, WISCONSIN DEPARTMENT OF PUBLIC INSTRUCTION

Thank you for this opportunity to express my full support for the Milwaukee Vincent High School Agriculture Education program and their green school yard design project. I am excited to see urban students have the opportunities to learn about agriculture and sustainability. Students at Milwaukee Vincent have the chance to take courses in animal science, horticulture, food science, culinary arts and, environmental science. This school, is the only one in the Milwaukee Public Schools that focuses on agriculture education and the youth organization FFA. Great things are happening at Milwaukee Vincent and we look forward to greater things in the future.





CONCEPTUAL REDEVELOPMENT PLANS

On an annual basis, the nonprofit Reflo and its partners, with the support of the Milwaukee Metropolitan Sewerage District, works through the Green Schools Consortium of Milwaukee (GSCM) to select and collaborate with schools that are interested in redeveloping their school grounds. Planning efforts incorporate creative applications of stormwater green infrastructure, outdoor educational elements, and other features that improve the social, environmental, and economic health of the school and community. With the approval of school and district administrators, schools apply for and are selected to receive conceptual planning support. The over year-long collaborative planning process has resulted in the production of this conceptual planning document, which is intended to guide the multi-year redevelopment process.

Vincent's conceptual plans include many stakeholder perspectives including those of students, parents, teachers, administrators, maintenance staff, neighborhood residents, and project partners. The plans are intended to be feasible and to support the school's and project stakeholders' needs and interests. Significant care was taken to consolidate project ideas and coalesce around one unified project vision. As the project progresses through the fundraising and detailed design phases, project components will be further defined and best fit to the amount of funds raised.

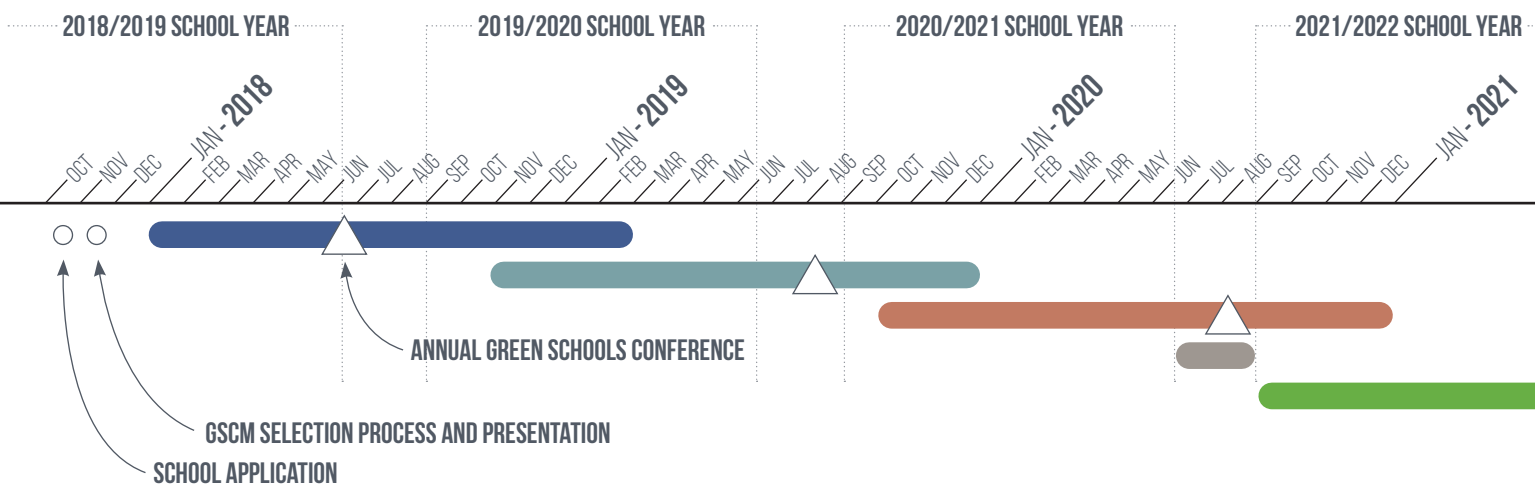


The GSCM is a local network of practitioners, agencies, and funders that are committed to supporting greener, healthier schools and eco-literacy in the Milwaukee-area. The GSCM gathers on a bi-monthly and annual basis to share resources and lessons learned. The 3rd Annual Green Schools Conference hosted 260 participants, 40 exhibitors, and 30 workshops/presentations. Each year the GSCM also hears from schools that are interested in schoolyard redevelopment projects and collectively decides which projects to support, in part, based on need and enthusiasm.



PROJECT DEVELOPMENT PROCESS AND TIMELINE

The following process diagram and timeline visualizes the major project development phases that a typical schoolyard redevelopment project in the Milwaukee-area undertakes when supported by Reflo and the GSCM. The process begins in October with schools applying to receive a conceptual planning grant provided by Reflo and the Milwaukee Metropolitan Sewerage District. Schools that advance to the second stage are then asked to present to the GSCM's Project Selection Committee on their *need* and *enthusiasm*. From that process, five schools are awarded the planning grant and begin the conceptual planning process with monthly Green Team meetings starting in January.



EXAMPLES OF CURRICULUM CONNECTIONS THROUGHOUT



Student dioramas of their schoolyard redevelopment ideas that then get shared at Green Team Meetings



School-wide Earth Day events and community outreach events



Meaningful engagement with project engineers and other potential career pathways



Project documentation, interviews, story telling



Engagement during maintenance activities



Example of a bioswale that can manage large quantities of stormwater at Fondy Park in Lindsay Heights, Milwaukee



STORMWATER GREEN INFRASTRUCTURE

Green infrastructure is a strategy that diverts stormwater runoff from entering the sewer system and manages stormwater where it falls through a more sustainable means, mimicking natural water systems. Green infrastructure can also serve as an opportunity for creative science, technology, engineering, arts, and math (STEAM) student and community engagement. The school grounds currently contributes a significant amount of stormwater runoff that can lead to area flooding and impaired water quality for our rivers and lake. The conceptual redevelopment plan includes multiple green infrastructure strategies that helps to manage as much stormwater on the school grounds as feasible.

The plan includes establishment of an approximate 6.8 acre hardwood forest that manages stormwater and connects multiple educational and career pathways at Vincent. To support the school's farm and livestock operations, the plan calls for a large-scale cistern for rainwater harvesting. Also included are bioswales in the parking lot and a large-scale native Wisconsin prairie restoration complete with native vegetation and soil amendments that help to manage stormwater and provide habitat for pollinator species, crucial for the school's farm. The plan manages approximately **128,752 gallons** of stormwater per rain event.

Example of potential student engagement in planting green infrastructure



A student leads a tour of school green infrastructure supported by custom signage - picture taken at Milwaukee Environmental Sciences Academy



DEPAVING

Hard surfaces like asphalt and concrete are the primary sources of stormwater runoff. Replacing hardscapes with more porous landcovers help to infiltrate stormwater into the ground and prevent it from running off into the sewer system. Removing pavement also offers the opportunity to replace it with other types of green infrastructure that promote better stormwater management. Furthermore, the co-benefits that come with greener spaces include reduced heat island effect, improved social-emotional outlook, and significantly improved habitat, promoting biodiversity.



BIOSWALES

Bioswales typically capture stormwater from roads and parking lots, often with lower water quality, infiltrating runoff into the ground and cleaning it naturally. They are planted with vegetation that helps to soak up and clean the polluted runoff. They can be installed as meandering or straight channels depending on the land that's available, and are designed to maximize the time rainwater spends in the swale.



ABOVE-GROUND CISTERNS

Rainwater harvesting is the practice of capturing rainwater, storing it in cisterns, and reusing it, typically for irrigation. Above ground cisterns are convenient because they can be elevated to allow gravity to help put some pressure on the outflow hosing. The pictured 550-gallon system includes plumbing that helps improve water quality and reduces maintenance.



NATIVE GRASSES

Vegetation native to Wisconsin is more adapt to the region's climate and typically have deeper root systems that help to withstand droughts and heavier rains that also allow for greater stormwater infiltration. These grasses can also serve as sensory gardens and promote biodiversity by providing habitat for pollinator species.





Rendering by CDS of Vincent's proposed barn and raised-bed garden expansion



OUTDOOR EDUCATION AND HEALTHY FOOD ACCESS

As illustrated in the infographics produced by Children & Nature Network and Cream City Conservation Corps (found in the Introduction of this document), access to outdoor classrooms on school grounds can significantly enhance learning outcomes and social-emotional wellbeing. School gardens also offer the opportunity to provide low-cost, healthy food options to students, their families, and the surrounding communities. Successful Green Teams use school gardens as educational opportunities to explore topics such as water and life cycles, ecosystems, economics, geometry, conservation, and social studies.

Vincent's conceptual outdoor redevelopment includes a new outdoor classroom / amphitheater space just behind the school, complete with seating and materials to support outdoor learning. Nearby green infrastructure including stormwater trees, bioswales, and native grasses will also serve as **unique learning spaces**. Educational and artistic **signage** throughout the school grounds is intended to support student-curated tours. Future phases of development also include a new barn and additional classrooms for teaching focused on agriculture sciences.

Example of student-engaged maintenance of raised-bed gardens



Classroom activities with school-grown produce

OUTDOOR CLASSROOMS AND EDUCATIONAL SIGNAGE

Outdoor classrooms can include natural green space and/or built shade structures. Seating and shade elements are common design features to accommodate longer class periods outdoors. Educational signage can serve as an opportunity to engage local artists and support learning not only by students, but also the surrounding community that may make use of the facilities after school hours.



CULTURALLY RELEVANT CURRICULAR CONNECTIONS

Developing lesson plans that are culturally relevant to students can help to create a sense of inclusiveness and promote positive learning outcomes for all students. For example, school gardens can include a diversity of crops that support exploration of different cultures and can demonstrate that food production is an important component of all cultures.



SCHOOL GARDENS

School gardens range in scale from the typical 4 foot by 8 foot raised-bed garden, to hoop houses, to larger-scale greenhouses and farms. Milwaukee-area schools have successful demonstrations of each scale of school garden and are best sized based on the interest level and capacity of the school's Green Team to manage the gardening operations.



HEALTHY FOOD ACCESS

Some communities do not have easy access to low-cost, healthy foods. On top of providing engaging outdoor learning opportunities, school gardens are excellent opportunities to provide fresh, locally grown produce. Culinary arts lesson plans and tasting programs can demonstrate how healthy food can also be tasty food.





Professional local artist, Reynaldo Hernandez, with students from Parkside School from the Arts during an unveiling of the new outdoor murals, created by the students and artist, at the school.



ARTS AND COMMUNITY ENGAGEMENT

The arts can be a simple, yet profound way to address educational equity in our communities. Through the use of arts-enhanced and arts-integrated classroom methodologies, teachers can learn devices or strategies to support their curricular areas, maximizing student engagement and furthering academic success. As a green and healthy school, experiential learning through the arts can be used to inspire ideas, take in-depth looks at our impact on the environment and learn unintended consequences of our actions that can be explored through visual and performing art forms.

Arts @ Large and Milwaukee Public Schools are committed to designing programs that promote **social-emotional learning** (SEL). Creating supportive environments for students in our schools and engaging families meaningfully are two areas of specific need. Training staff about the impacts of **trauma** and explicit instruction of SEL skills is an important part of this work. Research tells us that in order for students to use the skills they have learned, they must be in an environment that supports the use of those skills. As a green and healthy school, this is becoming a reality and the inclusion of the arts and environmental education better engages youth in the 21st century and positions them for potential future careers.

Example of local professional artists hired through Arts @ Large to work with students in the classroom



Musicians and performing artists can play vital roles in helping to activate spaces, here artists are shown performing during one of Paliapito Park's Music Under the Stars Series



SOCIAL-EMOTIONAL LEARNING

The arts can be an incredible vehicle to model best practices in Social Emotional Learning (SEL). SEL is the process of developing fundamental skills for life success within supportive, participatory learning environments. These skills include recognizing, managing emotions, setting/achieving goals, feeling/demonstrating empathy for others, establishing/maintaining positive relationships, and making responsible decisions.



VISUAL ARTS

The use of visual arts strategies in the classroom can lead to greater engagement and deeper learning by the student. When paired with a project such as a school yard redevelopment, the works of art created by the students will not only beautify the space, but provide a sense of ownership and accomplishment to celebrate with the students and their families. With the visual arts, the invisible become visible!



PERFORMING ARTS

The performing arts can be an incredible tool to activate spaces within the school environment. Theatrical performances and activities are a great way to explore a space and learn how to create meaningful interactions between students and nature, develop empathy for other forms of life and learn to embrace sustainability as a community practice.



EXHIBITION

Creating student led exhibitions is a great way to build an understanding of how nature sustains life. Through research and design, students can learn from content experts and share their experiences and knowledge through docent led exhibits.





Rendering by CDS of Vincent's observation deck - one of the stops on the fit trail



RECREATION AND OTHER SITE IMPROVEMENTS

Well supported and engaging recreational opportunities during the school day can help to increase attention spans, improve social-emotional learning, and help to support team building. Creative applications of visual arts on walls and ground coverings can help to guide students in independent and group physical fitness activities. These recreational improvements can lead to reduced instances of childhood obesity and other positive health outcomes.

Vincent's conceptual redevelopment plan includes fit trails with signage on **physical fitness**. The intent is to compliment the school's existing stadium, soccer fields, baseball, shot-put, and other activities. The new fit trail will also be used by the surrounding community and can serve as an opportunity to take tours through the various environments and initiatives on the school's grounds. Through the MPS Recreation Department, Vincent hosts many athletic competitions throughout the year on its expansive campus which furthers the potential for additional engagement outside of the school and surrounding community.

The conceptual plan also calls for the development of an observation deck on Milwaukee County grounds that would serve as an opportunity for students to sample the water quality through the environmental sciences academic pathway.



Examples of physical fitness trail-type activities and locals to be explored at Vincent



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OPEN GRASS FIELD

Several acres of unused Kentucky Blue Grass cover the northern perimeter of Vincent's property and in-between the ball fields, which requires regular maintenance by Facilities and Recreation Department staff



OPEN GRASS FIELD

NEW STADIUM

Vincent's stadium with a synthetic turf soccer / football field was built in 2018 and hosts many regional games through MPS' Recreation Department



STADIUM

EXISTING TIERED GRASS AMPHITHEATER

As part of the original building construction, an outdoor tiered grass seating area was built behind the school, but it currently is not utilized, in-part due to a lack of amenities



SOCCER FIELD

BASEBALL FIELD

BASEBALL FIELDS

TENNIS COURTS

MILWAUKEE COUNTY PROPERTY

W CALUMET ROAD

EXISTING SITE PLAN

Drawing Title:

Project:
 Vincent High School
 7501 N Granville Road
 Milwaukee WI 53224
 Designed By: Reflo, CDS, and the School's Green Team
 Drawn By: Justin Hegarty
 Dated: 2/1/2019

Project No.
 2018.MKE.14
 Figure No.

Prepared by:



BARN

Vincent's barn houses goats, chicken, cows, and horses. The existing facility does not have any utilities and water is carried from the main building to feed the livestock and water the nearby farm field



MPS FACILITIES' TEMPORARY STORAGE YARD (ASPHALT)

FARM FIELD

BARN

GREENHOUSE

VINCENT HIGH SCHOOL BUILDING

MAIN ENTRANCE

PARKING

ELECTRICAL SUBSTATION

PARKING

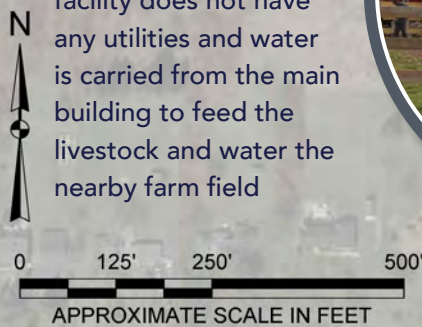
N 99TH STREET

W EVERTS STREET

SITE BOUNDARY

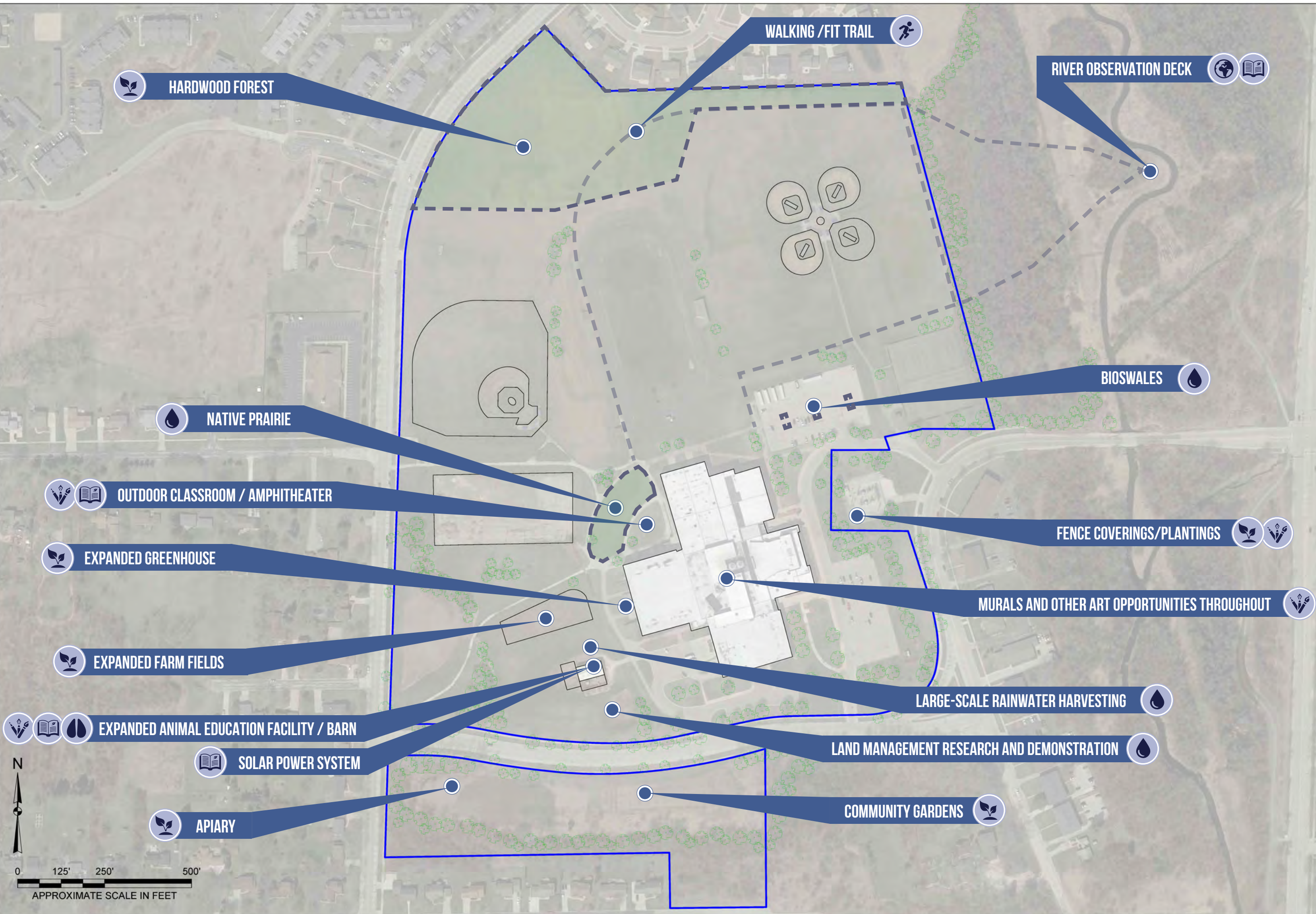
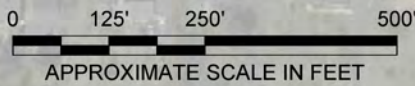
N GRANVILLE ROAD

LITTLE MENOMONEE RIVER



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 **HARDWOOD FOREST**

WALKING /FIT TRAIL 

RIVER OBSERVATION DECK  

 **NATIVE PRAIRIE**

 **OUTDOOR CLASSROOM / AMPHITHEATER**

 **EXPANDED GREENHOUSE**

 **EXPANDED FARM FIELDS**

  **EXPANDED ANIMAL EDUCATION FACILITY / BARN**

 **SOLAR POWER SYSTEM**

 **APIARY**

BIOSWALES 

FENCE COVERINGS/PLANTINGS  

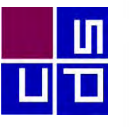
MURALS AND OTHER ART OPPORTUNITIES THROUGHOUT 

LARGE-SCALE RAINWATER HARVESTING 

LAND MANAGEMENT RESEARCH AND DEMONSTRATION 

COMMUNITY GARDENS 

Prepared by:



PROPOSED MAJOR PROJECTS

Drawing Title:

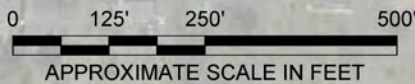
Project:
Vincent High School
7501 N Granville Road
Milwaukee WI 53224

Project No.
2018.MKE.14
Figure No.

Designed By: Reflo, CDS, and the School's Green Team
Drawn By: Justin Hegarty
Date: 2/1/2019

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APPROXIMATE SCALE IN FEET

**TOTAL POTENTIAL
GREEN INFRASTRUCTURE
CAPTURE CAPACITY =
128,752 GALLONS**

STORMWATER TREES

Over 2,700 stormwater trees are intended to be planted to create a hardwood forest on the northern 6.8 acres of Vincent's property. The forest will serve as an opportunity for students to actively manage a hardwood forest from planting, maintaining, projecting the potential harvest value, and career shadowing with professional foresters and land managers.

Managing approx. 67,500 gallons
(calculated using MMSD's Capacity Table)

NATIVE GRASSES

The native plantings area would be approximately 418 sq.ft.

Managing approx. 10,528 gallons
(calculated using MMSD's Capacity Table)

SOIL AMMENDMENTS

The native plantings area would also be treated with soil ammendments to further support rainwater capture capacity

Managing approx. 5264 gallons
(calculated using MMSD's Capacity Table)

UNDERGROUND CISTERN

Collecting stormwater from the barn, the underground cistern would be used to irrigate crops and water livestock.

Managing approx. 20,000 gallons
(calculated using MMSD's Capacity Table)

BIOSWALES

Located at the three lowest points of the parking lot, three identical bioswales would be sized to manage a 25-year rain event.

Managing approx. a total of 25,460 gallons
(calculated by engineering estimates)

NOTES

The planned green infrastructure is intended to manage a 25 year - 24 hour storm event, 4.53 inches of rainfall, as described in the National Oceanic and Atmospheric Administration's (NOAA) Atlas 14 precipitation frequency estimates for the Milwaukee Mitchell Airport station. All conceptual planning depictions and estimates, including stormwater management capacity, will need to be confirmed during the detailed design and construction as-built processes.

Prepared by:



STORMWATER GREEN INFRASTRUCTURE PLAN (PHASE 1)

Drawing Title:

Project:
Vincent High School
7501 N Granville Road
Milwaukee WI 53224

Project No.
2018.MKE.14
Figure No.

Designed By: Reflo, CDS, and the School's Green Team
Drawn By: Justin Hegarty
Date: 2/1/2019

CONCEPTUAL PLAN SUPPORTING ORGANIZATIONS



As a nonprofit, Reflo partners with Milwaukee-area schools, neighborhood associations, community garden groups, and local governments to promote sustainable water management such as green infrastructure through education, research, and the implementation of community based water projects.



Community Design Solutions (CDS) is a funded design center in the UWM School of Architecture & Urban Planning (SARUP) that assists communities, agencies, civic groups, and campuses throughout Wisconsin. CDS provides preliminary design and planning services to underserved communities and agencies.



Cream City Conservation is a two-prong social enterprise: working with organizations to address internal cultures and practices that contribute to workforce homogeneity; and training and employing young adults 15-25 whose social identities are traditionally underrepresented in the environmental industry.



The Milwaukee Metropolitan Sewerage District (MMSD) is a regional government agency that provides water reclamation and flood management services for about 1.1 million people in 28 communities in the Greater Milwaukee Area. MMSD is a strong supporter of green infrastructure, with many available resources.



The Fund for Lake Michigan (FFLM) provides grants to support organizations and communities committed to enhancing the Lake's health through projects with both immediate and long-term benefits. The FFLM has been a long time partner of the green and healthy schools movement and continuously promotes its expansion.



Milwaukee Public Schools is committed to accelerating student achievement, building positive relationships between youth and adults and cultivating leadership at all levels. Many departments are engaged on an ongoing basis to support the multi-faceted schoolyard redevelopment projects.



The Green Schools Consortium of Milwaukee (GSCM) is a robust local network of schools and resource providers that are motivated to promote greener, healthier schools. Through bi-monthly meetings and an annual conference, hundreds have collectively shared ideas, resources, and lessons-learned.



Arts @ Large activates Milwaukee's education communities to build environments that support arts-rich, life-long learning. Arts @ Large uses the arts as a tool to engage students in academic learning and provide meaningful work for artists.

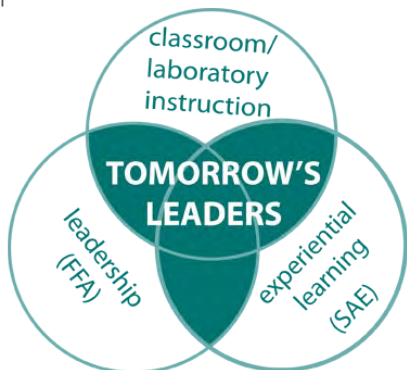


PLANNED CURRICULUM CONNECTIONS

Vincent High School of Agricultural Sciences strives to provide real-life and hands on agricultural experiences to urban students of Milwaukee. As this program continues to transform the high school into Wisconsin's first and only high school with all curriculum centered on the exciting agriculture industry; this curriculum provides the proper instructional foundation to prepare students to become the future leaders, voters, and consumers equipped with knowledge of the contributions of the agricultural industry to economic and environmental sustainability. Students are immersed in learning environments that provide opportunities for leadership development, personal growth, and career success in one of the nation's largest and high-demand industries.

The National FFA's Agricultural Education Mission: Agricultural education prepares students for successful careers and a lifetime of informed choices in the global agriculture, food, fiber and natural resources systems.

Agricultural education instruction is delivered through three major components:





FOOD SCIENCE

This pathway is designed to help students learn about the relationships between science, food, and nutrition. Students are able to explore the characteristics of each component found in food. Experiments done in class help students see how scientific principles are applied to creating nutritious food products. By the end of the course, students can understand the relationship between food and science allowing them to evaluate the health impact of different foods and ultimately make wiser food choices.



HARDWOOD FOREST

- Understand and apply the principles of science to the food products and processing industry by collecting, processing, and packaging maple syrup.
- Select and process food products (fruit, nuts, or syrup) for storage, distribution, and consumption.



COMMUNITY GARDEN

- Select and process food products from the garden for storage, distribution, and consumption.
- Apply scientific principals to the food products and processing industry from the community garden.
- Apply safety principles, recommend management techniques to the food industry for the produce that is grown in the community garden.
- Examine the food industry and development of food products processing for the produce that is grown in the community garden.



FARM FIELD

- Select and process food products from the farm field for storage, distribution, and consumption.
- Apply the principles of science to the food products and processing industry by collecting, processing, and packaging the produce grown in the farm field
- Examine the food industry and the development of the food product processing and apply it to the produce grown in the farm field.



APIARY

- Select and process food products for storage, distribution, and consumption of honey.
- Understanding and applying the principles of science to the food products and processing industry by collecting, processing, and packaging.



NATIVE PRAIRIE

- Examine the food industry and development of food products processing by learning about and collecting native, edible plants to work with in the food science classes.
- Select and process food products for storage, distribution, and consumption of native, edible plants. 23



HORTICULTURE SCIENCE

This pathway offers challenging, yet diverse topics best explored utilizing a variety of different instructional tools. These tools include but are not limited to: investigations of plant physiology and plant biology; hands-on application of fruit, vegetable and flower production; quantitative analysis of various growing systems; and introductory landscape design and greenhouse management. Individual student horticultural science folders are provided to demonstrate and retain achievements throughout the course.



HARDWOOD FOREST

- The ability to utilize a place that can be used for proper identification of trees, insects, plants, and wildlife
- Ability to create shade gardens to educate the community of possible plants that would grow great in shade locations
- Utilize a sugar maple forest that can be tapped to collect sap which we can collaborate with the food science and agribusiness pathways to maple syrup that can be then sold
- Conduct research on the biodiversity of the forest and implement ways to improve it



BARN / GREENHOUSE

- Educational space that allows students the hands-on learning that they eagerly thrive for
- Greenhouse will be able to grow annuals, perennials, vegetables that can be utilized for educational purposes and allows a plant sale where students will be able to hone their soft skills to make them more marketable after
- Foster a growing environment that allows students to explore the amazing opportunities that Horticulture has to offer
- Educate on how different seasonal crops are able to grow
- Allow a space that can be utilized to grow produce in both hydroponic and aquaponic



COMMUNITY GARDEN

- Develop and cultivate community engagement and support through education of self sustaining agriculture involvement
- Allow students the opportunity to help support a local Community Supported Agriculture program (CSA)
- Create an environment to improve biodiversity



CULINARY ARTS

Students in this pathway will be exposed to the ProStart culinary curriculum created by the National Restaurant Association. It features real-world culinary arts and food service management opportunities to help student learn skills that not only prepare them for careers in the fast-paced food and beverage industry, but that can last a lifetime.



HARDWOOD FOREST

- Collect, process and package maple syrup
- Collect, process and harvest wild berries for jams and sauces



BARN AND GREENHOUSE

- Use eggs in classroom
- Use processed meats in classroom lessons



COMMUNITY GARDEN

- Process and package produce
- Use produce in classroom setting
- Using produce grown in fresh market café





ANIMAL SCIENCE

This pathway helps students understand and connect to the roles animals play in our lives, from food to medical research to companionship and guidance for people with disabilities. General principles of animal nutrition, handling, equipment, safety, housing, health, and behavior is addressed. Students are also introduced to veterinary medicine including: physiology, reproduction, genetics, disease diagnosis/treatment and veterinary techniques. Student lab activities focus on hands-on experiences with these animals and tasks involved in their daily care.



OUTDOOR CLASSROOM / AMPHITHEATER

- Create opportunities for students to present information about animals to peers and other schools in the area.
- Ability to present information to students in an outdoor classroom setting where animals can be showcased and students are in a easily manageable space.

CD4: Identify & Apply employability skills

AS2: Classify, evaluate, select & manage animals



ANIMAL EDUCATION AND HOUSING

- Provide appropriate housing for all classes of livestock that are housed at Vincent High School.
- Provide students hands on opportunities to work with livestock.
- Provide students 21st century work skills to help develop them into valuable employees.
- Collaborate with other pathways to provide products from livestock.

AS3: Provide for the proper health care of animals

AS4: Apply principles of animal nutrition

AS7: Select facilities, equipment for safe production, housing, and handling of animals



APIARY

- Collaborate with the Wisconsin Honey Producers Association to promote a positive image of bees and how they produce products for us.
- Work with local beekeepers to provide students with skills to harvest products from the apiary



LAND MANAGEMENT RESEARCH AND DEMONSTRATION

- Educational opportunities showcasing the use of land in agricultural practices

AS8: Analyze environmental factors associated with animal production.



AGRIBUSINESS ENTREPRENEURSHIP

This pathway highlights how financial success in business operations often depends upon the managerial skills of the individual owner/operator. The course is designed to give students a background in the decision-making process, day-to-day management skills and financial management required to effectively operate a business. Through exploring economic, marketing, and management business types, students will be introduced to the communication, ethics and social responsibility that are associated with this field of study. Students will develop a business plan where they will document their knowledge pertaining to financial record-keeping, accounting, staffing, insurance and liabilities, taxes and government regulations.



HARDWOOD FOREST

- Work with the National Association of State Foresters website to learn about the management of state forests and privately owned lands.
- Discover how maple syrup is produced and work with the taping, selling, and marketing process.



BARN AND GREENHOUSE

- Combine with the Horticulture class to host plant and vegetable sales.
- Combine with the Animal Science Class to sell products raised and grown on the farm.



COMMUNITY GARDEN

- Learn about seed/bulb costs of vegetables that are to be planted in the Spring.
- Create Excel documents to organize what types of vegetables and fruits are planted in the garden.
- Utilize Excel documents to manage community involvement and participation.



BIOSWALE

- Utilize Ag Engineering and Ag Business equations to measure the amount of water/land used in a bioswale.



NATIVE PRAIRIE

- Learn about ways to gain profits by having a Native Prairie on a private property.
- Discover laws and regulations about how Native Prairies should be organized on the state and national levels.



ENVIRONMENTAL SCIENCE

Sound environmental management practices and principles are applied when students study and explore the relation between the environment and the security of humans through a proactive lens. Students are asked to solve real-world problems, provide analysis, and utilize visionary applications. This course, best explored utilizing a variety of different instructional tools. Some tools include; interactive computer-based technology, laboratory explorations, active class discussion, and extensive analysis of current scientific literature and research.



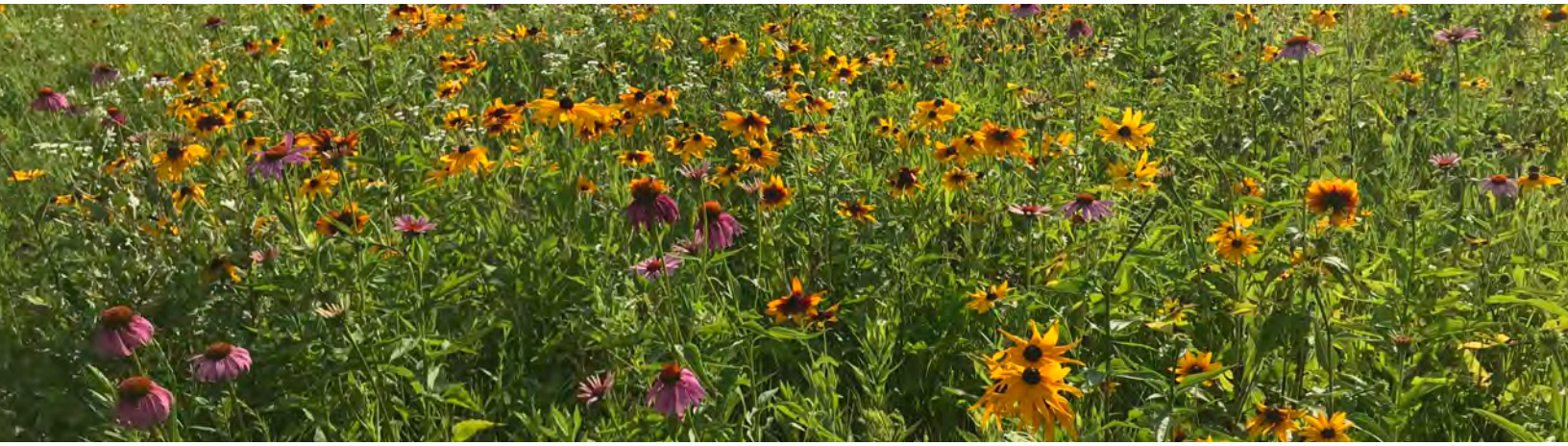
LAND MANAGEMENT RESEARCH AND DEMONSTRATION

- Develop questions and detailed procedures for investigating agricultural runoff.
- Analyze agriculture management and their impacts on the environment.
- Advocate for land stewardship.



HARDWOOD FOREST

- Participate in citizen science by observing, collecting, and recording data that is shared to a national network of scientist studying seasonal changes in ecosystems.
- Model animal mimicry and interpret data.
- Observe and various symbiotic relationships.
- Partner with the city of Milwaukee's Forestry Services to learn sustainable forestry management practices and participate in career exploration.
- Locate invasive species, and practice removal skills.
- Observe and record species migration.
- Collaborate with the Food Science, Agriculture Business, and Culinary Arts on the production of Vincent High School maple syrup, fruits, and nuts.
- Utilize observations of succession to design a visual representation (i.e. graphic novel, flipbook).
- Compare and contrast student data on climate variation in the hardwood forest and native prairie.
- Evaluate soil quality.
- Identify and measure species to calculate carrying capacity.



NATIVE PRAIRIE

- Partner with the Wisconsin Department of Natural Resources to perform a prescribed burn.
- Interpret historical articles on the change in Wisconsin topography and succession of native prairies.
- Summarize the importance of native prairies on the Wisconsin citizens throughout history.
- Identify invasive species, and practice removal skills.
- Discover laws and regulations regarding native prairie protection.
- Measure the native prairie biodiversity.
- Identify and quantify invertebrates in soil samples with and without perennial roots.
- Test and compare the rates at which water infiltrates soil with different amounts and/or kinds of roots.
- Construct methods to support pollinators.
- Evaluate the current status of Wisconsin's native prairie endangered species.
- Experience the movements of carbon through the environment, including its time sequestered in roots.
- Analyze ecosystem resilience.
- Apply GIS skills to monitor and control the spread of invasive species.



RIVER OBSERVATION DECK

- Identify and describe criteria used to gauge the health of a waterway.
- Analyze water quality.
- Make inferences about the potential effects of aquatic pollutants on wildlife and wildlife habitat.
- Calculate the biotic index of the Little Menomonee River.
- Recognize and identify major species of freshwater ecosystems.
- Describe the value of fish species in the Little Menomonee River.
- Observe and record the characteristics of a wetland.
- Collect water samples to analyze utilizing laboratory instruments, strengthening equipment skills.
- Analyze correlated relationships between events and their possible effects on the waterway.
- Observe the characteristics of oligotrophic and eutrophic aquatic habitats, emphasizing the effects of nutrient loading.
- Evaluate water quality policies and justify reform.



MAINTENANCE CONSIDERATIONS

Consideration for maintenance, especially for green infrastructure, can often be overlooked. As part of the conceptual redevelopment planning process, special consideration was given to recommend easier-to-maintain features. However, many features called for in this conceptual plan require some level of maintenance. The following section provides a summary of seasonal and monthly maintenance needs for the school's new green features. Full, more in-depth maintenance requirements will need to be developed in the project's detailed design phase.

It should be noted that generally the school's engineer/janitorial staff are responsible for additional maintenance

needs. However, some maintenance activities such as weeding, debris pickup, inspection of plant health, crop harvesting, watering, etc. can provide an opportunity to further engage faculty, students, and the surrounding neighborhood in school activities and outdoor learning.



Well-maintained green infrastructure and playspaces can help reduce the potential need for costly repairs and/or replacement.



ASPHALT REMOVAL

Ongoing/Monthly Considerations:

- Depending on the groundcover replacement such as grass, wood chips, permeable pavement, etc., the replacement may require additional maintenance such as grass cutting, wood chip replacement, vacuuming etc.

Seasonal/Annual Considerations:

- Some asphalt areas at schools are used in winter as snow management locations. Confirming the seasonal use of the asphalt areas can help with determining the feasibility of asphalt removal and/or ways to adjust snow management.



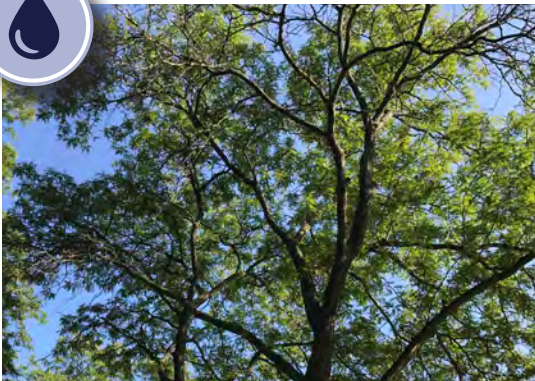
GARDENS

Ongoing/Monthly Considerations:

- Gardens will require ongoing weeding and watering (weekly/daily)—determining who will be responsible (ideally multiple people/groups/classrooms) beyond planting the gardens is important, especially over summer months.

Seasonal/Annual Considerations:

- Spring planting and harvest events are great ways to engage the school and prepare the garden—accounting will be needed for the cost and storage of required hoses, shovels, gloves, buckets, etc.



TREE PLANTINGS

Ongoing/Monthly Considerations:

- Newly planted trees (first few years) will require protection from children wanting to play around them—strategies such as temporary (or permanent) fencing, signage, or planting boxes can help allow the trees space and time to grow.

Seasonal/Annual Considerations:

- Berries, leaves, sticks, and branches often fall from trees during spring or fall. Tree litter may not need to be actively managed. However, depending on amount of tree litter, it may need to be disposed of or composted.



RAINWATER CISTERNS

Ongoing/Monthly Considerations:

- Rainwater harvesting systems can become complex and may require site specific strategies; however, monthly inspection is typically recommended to remove debris, prevent stagnated water, and confirm that the cistern is draining as intended.

Seasonal/Annual Considerations:

- Most cisterns need to be drained in late fall to prevent water damage during winter freezing. Then in spring, cisterns will again need to be adjusted to accept rainwater.



NATIVE PLANTINGS

Ongoing/Monthly Considerations:

- Similar to raised bed gardens, native plantings will require ongoing weeding (weekly) as they mature — determining who will be responsible (ideally multiple people/groups/classrooms) beyond planting is important, especially over summer months.

Seasonal/Annual Considerations:

- Native plants are more resilient and require less ongoing maintenance as they mature. Between 1-3 years of initial weeding are required, but after that period, maintenance is minimal.



FUNDRAISING TARGETS

An important component of the conceptual planning effort was to develop plans that were feasible. Estimates of funding requirements were discussed throughout the planning effort in order to keep the designs within reasonable cost ranges. The following table of estimated costs are presented in terms of “fundraising targets” to better represent the approximate budgetary nature of the numbers.

It should be noted that the following funding targets represent conceptual, high-level estimates with many assumptions, not consultant or contractor bids based on detailed design work, which would be more accurate. The following estimates are expected to vary from actually incurred expenses. However, significant consideration and review of the fundraising targets were provided from engineers, contractors, and school administrators with experience in school redevelopment projects.

Although the following fundraising targets are intended to incorporate reasonable cost expectations for school grounds redevelopment, changes to the design, contracting requirements, or amount of in-kind contributions can significantly impact the following numbers either upward or downward.








It is ideal to raise enough funds to be able to complete the redevelopment in one pass; however in some cases, projects can take several years to be completed due to funding constraints

INVITATION FOR SUPPORT

We invite your enthusiastic review of this conceptual plan document and welcome any questions you may have on the school grounds redevelopment. Please visit Reflo’s website for status updates and how to donate to the redevelopment project:

www.RefloH2o.com

CONCEPTUAL REDEVELOPMENT PLAN FUNDRAISING TARGETS

	Apx. Fundraising Targets	Apx. Inkind Contribution
 Stormwater Green Infrastructure		
Asphalt removal, sawcutting, etc.	\$ 31,000	
2700 Stormwater trees	\$ 360,000	\$ 25,000
Native plantings	\$ 20,000	\$ 2,500
Bioswale soils and plantings	\$ 48,000	\$ 2,500
Underground cistern	\$ 50,000	\$ 7,500
Survey, Detailed Design and Permitting	\$ 50,000	
Project Management	\$ 5,000	\$ 10,000
Continued Reflo Support	\$ 7,500	\$ 7,500
Project Signage	\$ 5,000	\$ 2,500
Water Related Arts Programing		\$ 10,000
Demonstrations, Workshops, Tours		\$ 2,500
Water Focused Curricular Activities	\$ 10,000	
Vegetation Establishment	\$ 25,000	\$ 5,000
<i>Stormwater Green Infrastructure Subtotal</i>	<i>\$ 611,500</i>	<i>\$ 75,000</i>
 School Garden and Healthy Food Access		
(Budget included in future phases of development)		
<i>School Garden and Healthy Food Access Subtotal</i>	<i>\$ -</i>	<i>\$ -</i>
 Recreational Improvements		
Fit trail paths and equipment	\$ 100,000	
<i>Recreational Improvements Subtotal</i>	<i>\$ 100,000</i>	<i>\$ -</i>
 Educational Elements		
School murals	\$ 50,000	\$ 5,000
Outdoor classroom		
Structure	\$ 60,000	
Seating and Classroom Materials	\$ 20,000	
<i>Educational Elements Subtotal</i>	<i>\$ 130,000</i>	<i>\$ 5,000</i>
 Other Site Improvements		
New entrance development	\$ 25,000	
<i>Other Site Improvements Subtotal</i>	<i>\$ 25,000</i>	<i>\$ -</i>
Total Estimated Fundraising Targets:	<i>\$ 866,500</i>	<i>\$ 80,000</i>



PROJECT TIMELINES AND NEXT STEPS

Although there has already been a significant amount of time and energy invested in the conceptual redevelopment planning by Vincent and its partners, the compilation of this conceptual plan document realistically represents step one of a multi-year, major construction-focused redevelopment project.

The **next phase of project development is fundraising** which is intended to conclude by the end of 2019. The scope of the construction is based on the funds obtained through budget allocations, grants, donations, and school fundraisers. Engineering, surveying, and architecture firms are typically hired in fall to support the detailed design and permitting process. To minimize disruption to regularly scheduled school functions, construction is preferred to be conducted over a relatively short time-frame in summer months.

Big changes like this project require a great deal of time, resources, and most of all, commitment. Accomplishing this conceptual redevelopment plan is a major milestone itself. This plan shows the school's desire and ability to focus its efforts on meaningful outdoor education and healthy learning spaces for their students and community.



FOR INFORMATION ON HOW TO SUPPORT VINCENT'S SCHOOL GROUNDS REDEVELOPMENT:

Please go to Reflo's website: www.RefloH2o.com
or send an email to: justin.hegarty@refloh2o.com

ADDITIONAL RESOURCES



GREEN SCHOOLS CONSORTIUM OF MILWAUKEE

Local network of green school practitioners, funders, and supporting agencies. Bi-monthly meetings, an annual conference and multiple local grants and resources can be found at: www.gscm.refloh2o.com



REFLO - SUSTAINABLE WATER SOLUTIONS

Compilation of various water-related curricular connections including the Resource Replication Guide: Green Infrastructure for Milwaukee-Area Schoolyards: www.refloh2o.com/educational-resources/



MILWAUKEE METROPOLITAN SEWERAGE DISTRICT

MMSD has a publicly available resource center, annual rain garden plant sale, a guidebook on green infrastructure at schools, and annual green infrastructure funding opportunities: www.mmsd.com



GREEN AND HEALTHY SCHOOLS WISCONSIN

Compilation of green school curricular connections and a guidebook, "Growing a Green and Healthy School": www.ghswisconsin.org



CHILDREN IN NATURE NETWORK

National green school news, training, and research (source for infographics used in this document's introduction): www.childrenandnature.org/learn/research/



U.S. GREEN BUILDING COUNCIL - CENTER FOR GREEN SCHOOLS

National green school research, articles, project examples, and lesson plans. Connection to the LEED accreditation program and Green Apple Day of Service: www.centerforgreenschools.org/green-school



GREEN SCHOOLYARDS AMERICA

Green school research, policy, activity guides, and case studies: www.greenschoolyards.org



**FOR MORE INFORMATION ON HOW TO SUPPORT VINCENT'S
SCHOOLGROUNDS REDEVELOPMENT PLEASE CONTACT:**

Daryl Burns, Principal
Vincent High School
burnsdx@milwaukee.k12.wi.us

Gail Kraus, Agriculture Program Specialist
Vincent High School
krausgm@milwaukee.k12.wi.us

Justin Hegarty, P.E., LEED A.P.
Reflo - Sustainable Water Solutions
justin.hegarty@refloh2o.com

