

## Rainwater Harvesting

- **EXAMPLE:** Adaptation and Community Improvement
- **SYSTEM:** Community
- **CHALLENGE:** Large-Scale Collection and Channeling of Rainwater for Agriculture
- **CREATIVE SOLUTION:** Design and Construction of Rainwater Harvesting Structures



Justin Hegarty and Andrew Plier of Reflo at 30th Street Cistern project

Working in Guatemala with the student chapter of the non-profit Engineers Without Borders, Justin Hegarty and Andrew Plier had the opportunity to design, construct and organize several water collection, treatment and distribution projects.

The experience was inspirational and life changing for both Justin and Andrew. Both eager to take the lessons learned from the Guatemalan water projects, they worked with a community garden to design and build a water harvesting structure in Milwaukee. Soon after, the City of Milwaukee began discouraging residents from using city hydrant water for community gardens because of the potential for disrupting firefighting operations.

The first rainwater harvesting project completed was at the

Hide House Community Garden in Bayview. Andrew worked with the students at University of Milwaukee, Wisconsin's Chapter of Engineers Without Borders to design and build the system. The design utilized a neighboring warehouse rooftop to collect water and transfer it three stories down to a 500 gallon collection system where the gardeners could access it for use in the gardens. This project led to a large number of requests for similar rainwater harvesting systems. It was quickly realized that additional help would be needed. In response, Andrew collaborated with several others in Milwaukee who were doing similar work. From this effort, "Reflo—Sustainable Water Solutions" (Reflo) was formed with the mission to provide sustainable water education through the implementation of creative and collaborative community based water projects.

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# Adaptation Strategy



In 2013, Reflo was contacted by the Guest House, Milwaukee's largest male homeless shelter, and UW-Extension to help design a system to provide a sustainable source of water for the shelter's urban gardens. The gardens consisted of 56 raised beds and nearly one-half-acre for in-ground planting. The Guest House uses the gardens for their Urban Agriculture Training Program that provides job training on basic agriculture, urban gardening and the green industry. Formerly homeless individuals that graduate from the training have skills for a variety of jobs including produce departments of grocery stores, landscaping, farm markets and other urban agriculture jobs. With funding from the Brewers Community Foundation, the Guest House gathered VetterDenk Architects, Reflo—Sustainable Water Solutions, and Orta Construction to design a community pavilion equipped with specialized rainwater harvesting components, the first of its kind in Milwaukee.

The project included a community pavilion with a 550 gallon rainwater harvesting, rain gardens, and informational signage. To accommodate the extreme rain storms from climate change, the 550 gallon cistern is designed to overflow into the onsite rain garden. When the big build day arrived the Brewers, Guest House clients, and volunteers from all the project partners came to construct the project.

In part due to the rainwater harvesting structure, Cream City gardens produced 3,500 pounds of produce in 2014. Because this area of the city uses a combined sewer system, the project also helps to keep over 17,000 gallons of annual stormwater runoff from overflowing with sanitary/combined system overflows, further protecting Milwaukee's surface water quality.

The Cream City Gardens and Rain Harvesting Project was nominated for a Milwaukee Awards for Neighborhood Development Innovation (MANDI). The MANDI awards recognize those working to revitalize Milwaukee's most distressed urban neighborhoods. The project was nominated for a Trail Blazer award and won the Wells Fargo People's Choice Award. The People's Choice Award was a new interactive award category where the winner was chosen by the public through an online voting system and came with a \$1,000 prize! The project also received a Mayors 2015 Design Award.

Reflo continues to give educational programs at the Cream City Gardens about the rainwater harvesting project.

And more water is still needed for the gardens, so stay tuned for a Phase II project.



Guest House



## Rain and Popcorn

The Martin Drive Community Gardens on the west side of Milwaukee needed access to a more sustainable source of water for their growing raised bed planters. Reflo helped to design a multi-functioning rainwater collection system that even serves as an outdoor movie screen! The neighborhood uses the community garden as a gathering place for kid activities and outdoor movies in the summer. Now they have a small scale pavilion that collects rainwater for the garden, a picnic table for shade and eating, and a movie screen stand!



*Martin Drive Community Gardens*



## Parkside School for the Arts

Parkside School for the Arts in Bayview asked Reflo to assist with planning how to redevelop an underutilized courtyard. Over six months, Reflo held a number of charrettes getting input from the staff, students, and management. The result was a collaborative design that included native landscaping, rain gardens, a green wall and many ideas of how the built project will be an important part of the schools learning environment. The school held a large public unveiling with over 300 in attendance including Milwaukee's Mayor Barrett. The courtyard is now a great asset to the school and community and host to an ongoing conversation about greening local school spaces.



*Parkside School for the Arts*





## Cisterns at 30th Street

As part of a large team including the EPA, Wisconsin Department of Natural Resources, City of Milwaukee, GZA GeoEnvironmental, UW-Extension, and several others, Reflo helped to organize and build a 40,000 gallon rainwater harvesting cistern on a brownfield redevelopment project in the heart of the 30th Street Industrial Corridor of the City of Milwaukee. The project incorporated a 2-day community build event with over 100 people in attendance to build the 40,000



gallon modular block system cistern that captures the site's stormwater runoff and recycles it for the sites proposed 1.5 acres urban farm. The project will also include an innovative green infrastructure remote monitoring and control pilot

system for the Milwaukee Metropolitan Sewerage District to assist in ongoing educational programming at the site. Additionally the project includes a community outreach component consisting of partnering with several area schools and community nonprofits to engage the community around the sustainable aspects of the project.



*Cisterns at 30th Street*





*Cisterns at 30th Street*

Andrew shared that one of the most humbling and favorite things that happens frequently with these projects results from getting people involved and engaged. "Coming from the consulting world it is interesting to come to community based projects. It is much more involved and complicated. It is great, no matter how many experts you have at the table, there is always one resident at the table that comes up with the idea that no experts would ever have come up with."

Reflo has two requirements for project owners to get involved with: 1) Participate in the planning and design; and 2) Contribute part of the cost. Both of these create a buy-in and a commitment to the effort. They also like to plan big ribbon cutting parties and celebrations once a project is complete.

All of these elements are helping to make the model Reflo uses a success, with demand for their services increasing like a steady summer rain.



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