

WATER PETAL CASE STUDY

PHIPPS CENTER FOR SUSTAINABLE LANDSCAPES

LOCATION

PITTSBURGH, PA

TYPE

OFFICE + EDUCATION

SIZE

24,350 SQUARE FEET

DAILY OCCUPANTS

40 - 50 FULL-TIME

VISITORS PER YEAR

250,000

RAINWATER HARVESTED

500,000 GALLONS/YEAR

CLIMATE

HUMID CONTINENTAL

38 inches of rain/year

80 days of precipitation/year

The Phipps Conservatory has been a staple of Pittsburgh's cultural and architectural circuit since 1893, bringing visitors together to discover the beauty of native and exotic botany. In recent years, Phipps has expanded their vision to include displays of the world's most advanced green building technologies and innovative water systems. Jason Wirick was hired onto the Phipps team as the Director of Facilities and Sustainability Management just before the Center for Sustainable Landscapes (CSL) broke ground as the centerpiece of Phipps' focus on regenerative infrastructure. As they delivered the project through permitting, construction and operation, Jason and the rest of the Phipps team pushed the envelope of wastewater treatment while developing strong partnerships with their regulatory agencies.

SYSTEMS

The focal point of the CSL water system is undoubtedly the constructed wetland and lagoon, which together capture and treat the site's stormwater and wastewater. This water, along with captured rainwater, offsets 93% of Phipps' municipal water use.

RAINWATER HARVESTING

Rainwater is harvested from the roof, treated via UV filter and used for toilet flushing, as well as interior irrigation and maintenance as required. Any excess rainwater is stored in a 60,000 gallon storage tank.

STORMWATER MANAGEMENT

Any stormwater runoff from the site is captured by a lagoon system, which replicates the natural processes of local wetlands and marshes. It's treated to tertiary non-potable standards and is stored in the rain tank for irrigation.

WASTEWATER TREATMENT

All wastewater from the CSL and the adjacent maintenance building is treated with a constructed wetland and additional sand filtration. A UV filter further disinfects the water to greywater standards. Excess treated sanitary water is redirected to an Epiphany solar distillation system, which uses solar energy to distill the water to pharmaceutical grade for use in watering orchids.

FILTERING SAND PITS AT THE CSL



DIAGRAM COURTESY

WATER PETAL CASE STUDY POLICY SOLUTIONS

WASTEWATER TREATMENT

The Center for Sustainable Landscapes is situated on a former brownfield that had leaking underground storage tanks and highly compacted soil. Part of designing a Net Positive Water project involved cleaning and restoring the soil, so that the water that is infiltrated back into the aquifer is not contaminated.

After remediation was complete, the team's design started to evolve based on conversations with the Pennsylvania Department of Environmental Protection. In 2012, the DEP published its "Reuse of Treated Wastewater Guidance Manual," which Jason and his team used as a permitting guide. However, this document never formally recognizes greywater – any potable water that has been used is considered blackwater and subjected to more stringent treatment processes. This prevented the team from using treated greywater for anything other than toilet flushing and irrigation, and also increased the cost of treatment.

CONSTRUCTED LAGOON AT THE CSL



PHOTO COURTESY PAUL PAUL WIEGMAN

Additionally, as with many Net Positive Water projects, Jason and his team struggled with issues of scale. As a public education center, they are larger than a private residence or office but much smaller than a municipality or community. Unfortunately, most regulatory agencies (including Pennsylvania) will defer to the larger of the two options, which makes treatment and operation costs unreasonable for mid-sized publicly accessible institutions like Phipps. Fortunately, the Phipps team found a lawyer that was willing to negotiate these conditions down pro bono, creating a precedent for future projects.

THE RIGHT ATTITUDE

In the process of permitting and operating the Center for Sustainable Landscapes, Jason Wirick picked up a few winning strategies. Respect and communication were essential to forging a mutually productive partnership. Jason and his team recognized that the regulators they worked with had years of experience with the status quo keeping people safe. They brought code officials out to the site throughout the design process to create a more collaborative process.

TIPS AND TRICKS

- o Engage with regulators as early as possible
- o Try to find a champion within the organization to push things along
- o Know the history of the site and leverage it
- o Consider the process as ongoing: focus on educating officials + including them in the design, creating relationships, setting up future project teams
- o Try to find lawyers who will do pro bono work to develop new code language