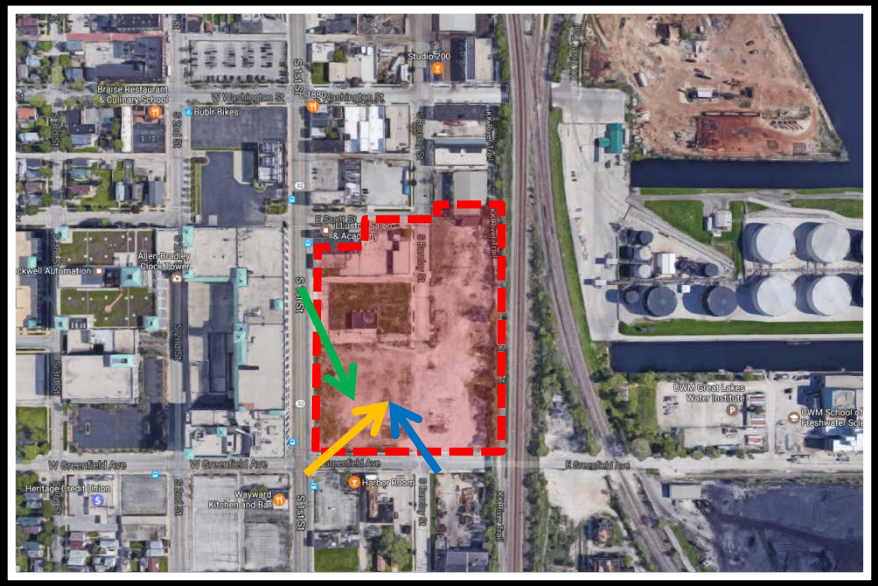
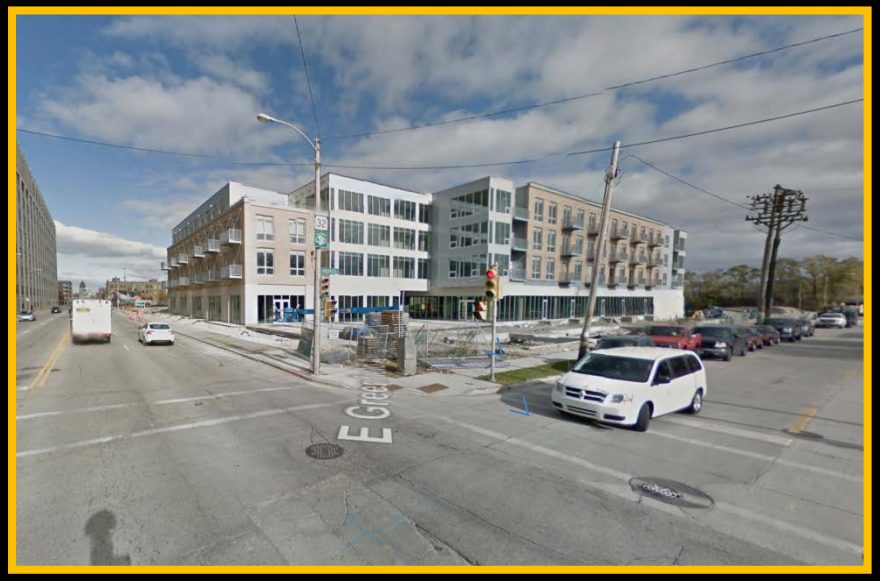
File No. 161713. Resolution relating to a Minor Modification to the Detailed Planned Development known as 1st and Greenfield - Phase 1 for approval of the water feature at 1320 South 1st Street, located on the north side of East Greenfield Avenue, east of South 1st Street, in the 12th Aldermanic District.

File No. 161713. Site Context Photos

View looking South 1st Street, looking southeast



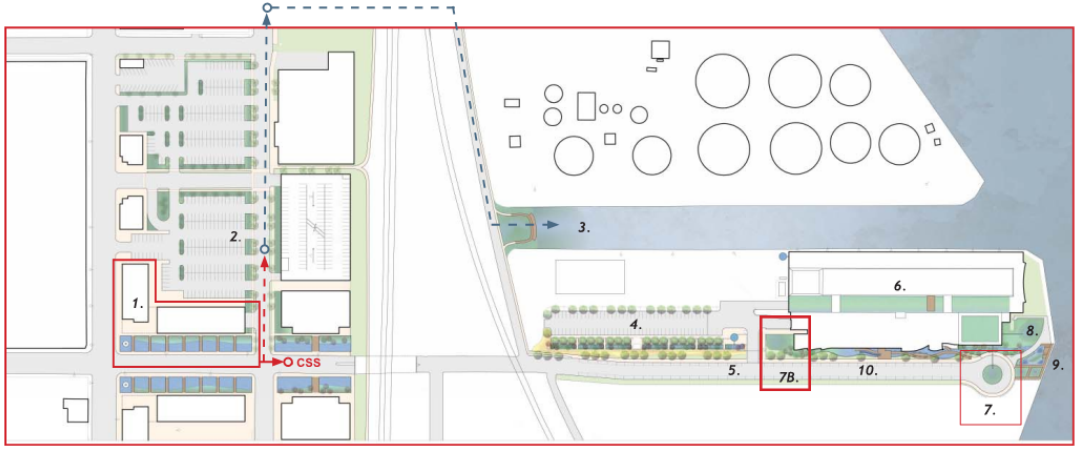


View from East Greenfield Avenue and South 1st Street

View from East Greenfield Avenue, looking northwest

File No. 161713. Site Context

The Ecological Waterscape Plan for Greenfield Avenue
and the UWM School of Freshwater Sciences
GREENFIELD AVENUE GATEWAY PROJECT +
THE SFS WEST ENTRY AQUACULTURE FOUNTAIN



1. *The Greenfield Avenue Gateway Stormwater Fountain*
2. *The Grede Foundry Combined Sewer Disconnection*
3. *The Greenfield Slip Wetland*
4. *The Experimental Street Tree Test Cells*
5. *The West GLRF Roof Fountain and Rain Garden*
6. *The GLRF Green Roof*
7. *The Circle Sluice and Circle Wetland Garden*

7B. *The SFS West Entry Aquaculture Fountain*

8. *The Administrative Building Scupper*
9. *The SFS Spawning Stream and Harbor Plaza*
10. *The Aquarium*

Defining a Research and Demonstration Agenda for a Civic Waterscape Showcasing Milwaukee as a Global Water City

The Greenfield Avenue Gateway is a proposed civic space occupying a 40' right of way along Greenfield Avenue from First Street heading east to the railroad embankment. The goal of the City in creating this civic space is to create a symbolic and sculptural 'gateway' to the UWM School of Freshwater Sciences and the Harbor.

As originally proposed in the 'Ecological Waterscapes Plan for Greenfield Avenue and the UWM School of Freshwater Sciences,' the centerpiece of this civic space is a permanent water feature fed by stormwater and designed to showcase emerging principles and technologies of 'water-centric' urban design. Similarly to the canal-filtering water feature at the Global Water Center, this gateway is meant to announce Milwaukee as a global leader in water technology and design.

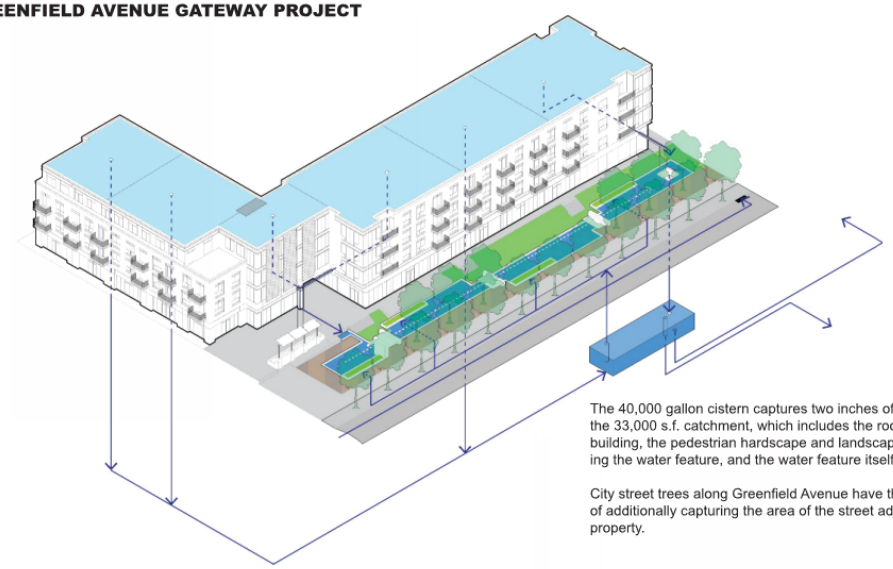
Complimenting this gateway element at the School of Freshwater Sciences, the newly defined SFS West Entry Aquaculture Fountain Project repeats the sculptural sluice motif of the Gateway, creating a permanent fountain feature powered not by stormwater but by the previously discarded discharge water from the Aquaculture research facilities within the buidling. Here the water falls into a pool that will be managed by successive generations of students to create various types of habitat.

Together, these two waterscapes collapse the distance separating the City and the UWM School of Freshwater Sciences. The Gateway project creates a venue for applied research by the designers, technology manufacturers, installers and the City itself, such that all will expand their expertize into new areas. The West Entry Sluice makes the point that all resource flows are resources, not to be wasted but put to ecologically benificial use. Together, these bookended projects demonstrate advances in water technology, green infrastructure engineering, and ecologically progressive urban design and landscape architecture.

Ecological Waterscapes Plan for Greenfield Avenue and the UWM School of Freshwater Sciences
UWM Institute for Ecological Design
in partnership with the MMSD
2012.

File No. 161713. Water feature Design Concept

The Ecological Waterscape Plan for Greenfield Avenue
and the UWM School of Freshwater Sciences
GREENFIELD AVENUE GATEWAY PROJECT



The 40,000 gallon cistern captures two inches of rainfall on the 33,000 s.f. catchment, which includes the roof of the building, the pedestrian hardscape and landscape surrounding the water feature, and the water feature itself.

City street trees along Greenfield Avenue have the potential of additionally capturing the area of the street adjacent to the property.

Overall Performance Goals

The Greenfield Avenue Gateway is designed to manage stored stormwater dynamically through predictive weather analytics to maximize the capture of a rain event, circulate that water through a suite of passive and low-energy purification technologies to create a fountain that minimizes biofilms without the use of chemicals. The goal is to produce water capable of meeting future TMDL standards, and then discharge that water at will into the combined sewer or pump it into a new stormwater conveyance system designed to be connected to the Greenfield slip.

The basic design provides greater capacity and flow control than a comparable green roof at less than half the price per gallon captured, and the proposed demonstration technologies will enhance the quality of that stored water significantly. This makes it a high-value system for dense urban environments where the amenity value of green infrastructure is a compelling selling point. Finally, these technologies as a suite may have broader relevance to improving the ecological function of a wide variety of existing detention strategies, which currently address TSS standards but make other aspects of water quality worse by increasing biological oxygen demand.

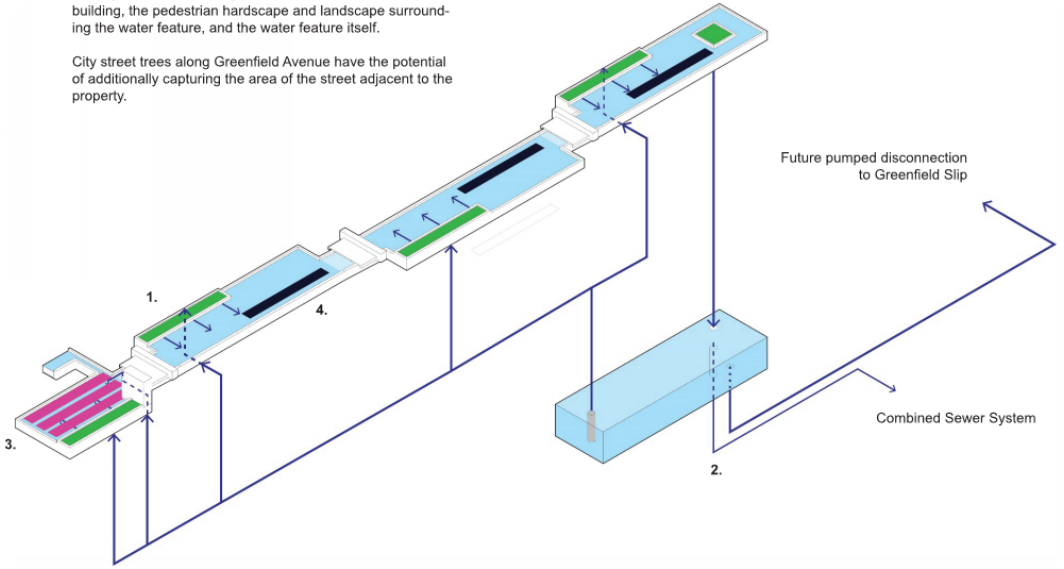
An Experiment in Integrating Demonstration Technologies

1. **Aquascapes Inc.- Forced Upflow Wetland Planters-** overflowing planters provide a primary visual source of water for the fountain and the primary means for water quality filtration.

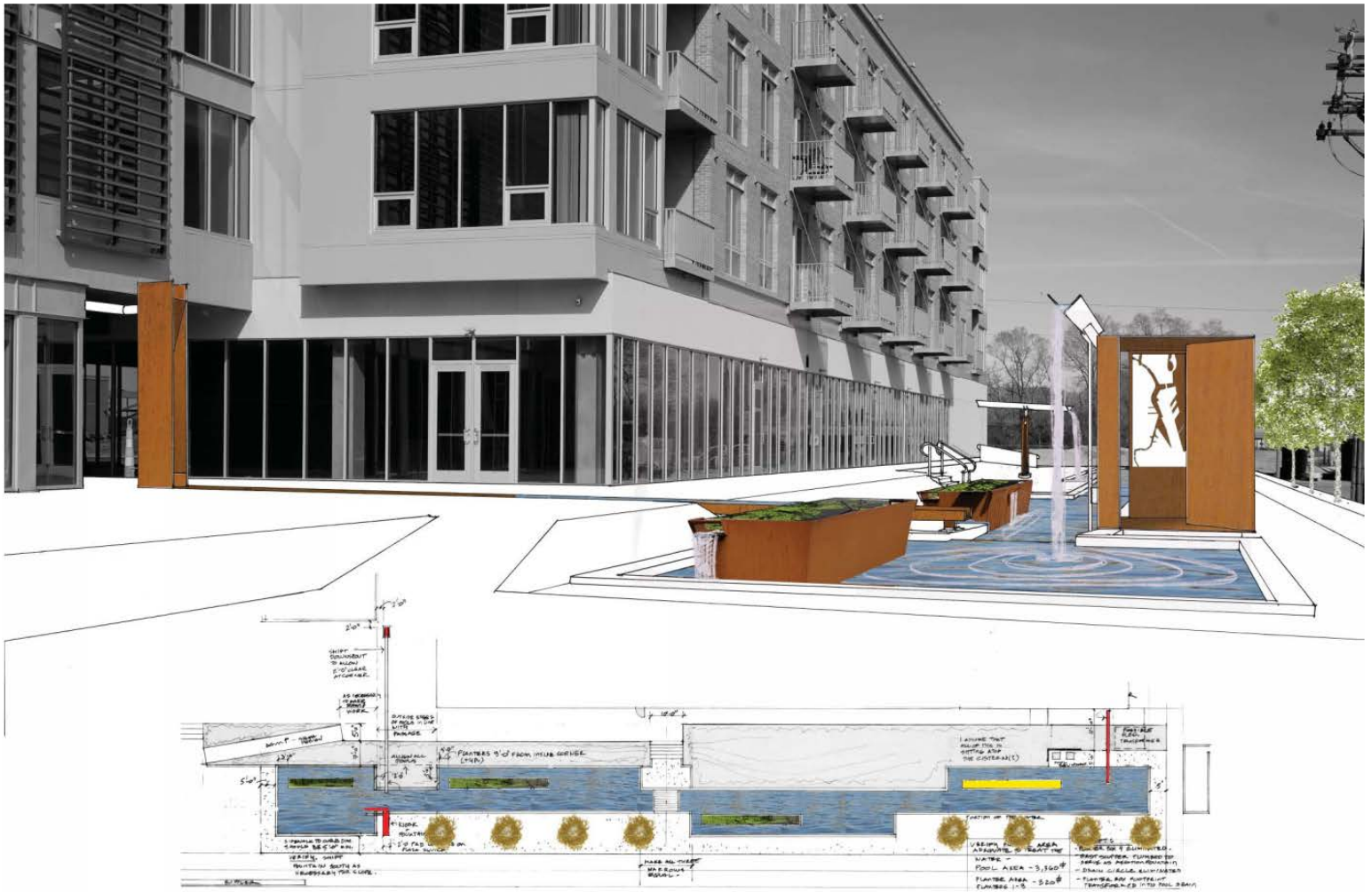
2. **Veolia Rain:Net-** Web connected predictive controls that provide a signal to purge the cistern in anticipation of a rain event. Veolia has committed to including the Greenfield Avenue Gateway in their pilot project as one of seven active sites to be equipped and monitored.

3. **Solar Water Works**- Solar-powered, catalytic oxidation process for stormwater disinfection. This system will be designed to treat 20 gallons/ minute at pool 1. Recent conversations suggest a novel application of the technology that may allow us to treat a far greater volume of water for the same cost. The idea is to dispense with the housing, pump and plumbing for the catalytic surface and suspend the catalyst panels within the basin proper.

4. **UWM Phosphorous Sequestering Tea Bags-** Blankets of multi-layered filtering geotextiles with closable pouches filled with treated zeolite, suspended below the surface of the pools in a rack system similar to the optional method of deploying the Solar Water Works catalytic surface.

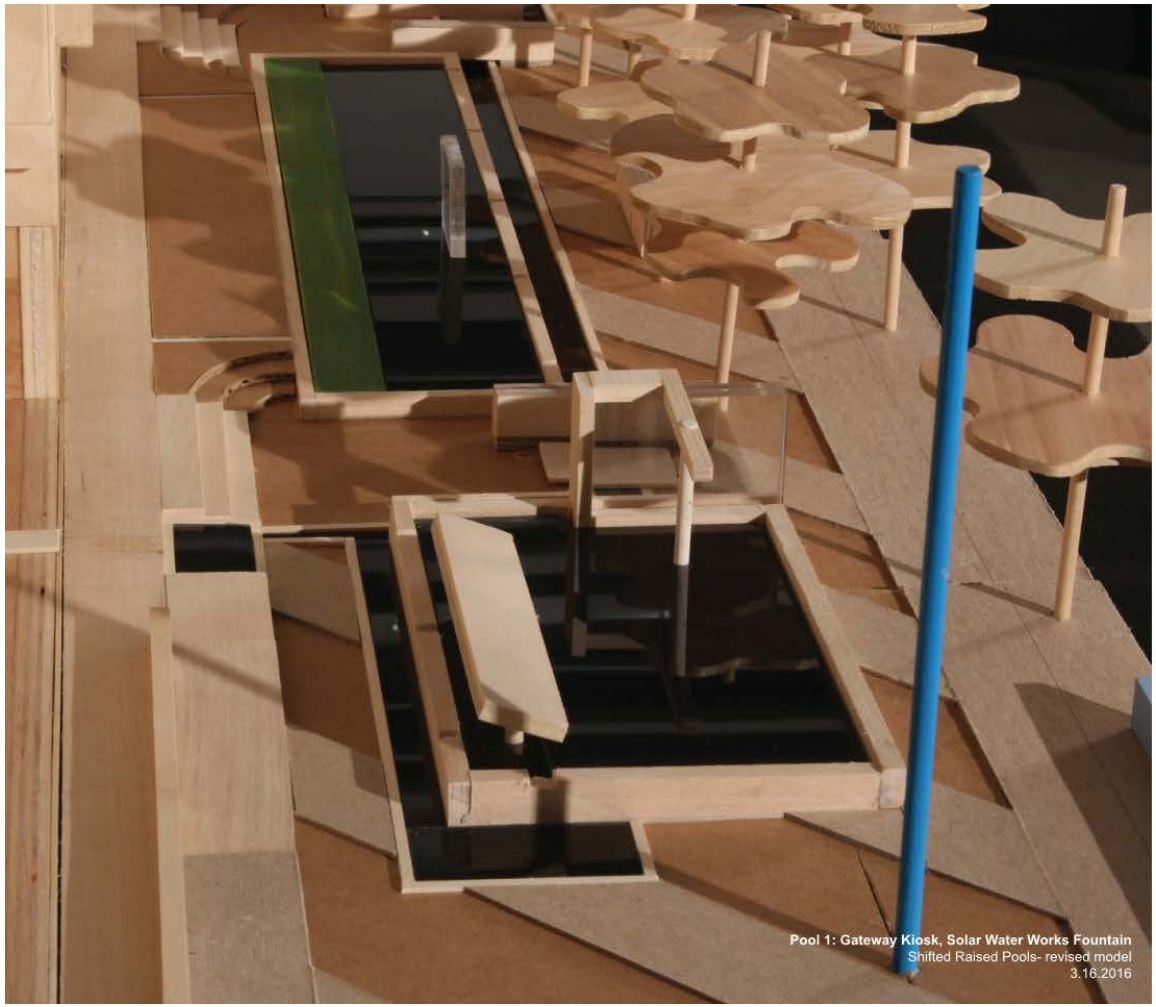


File No. 161713. Water feature Design images.



Greenfield Ave. Gateway Stormwater Demonstration Fountain
2017.04.09

File No. 161713. Water feature Design Model images.



The Ecological Waterscape Plan for Greenfield Avenue and the UWM School of Freshwater Sciences

GREENFIELD AVENUE GATEWAY PROJECT

Ecological Waterscape Demonstration Design Objectives

1: Maximum Stormwater Management Benefiting the MMSD

2: No Potable Water Use

3: No Chemical Treatment

4: Carbon Neutral Operation

5: Ecologically Beneficial Habitat Creation

6: Designed to Account for the Presence of Algae

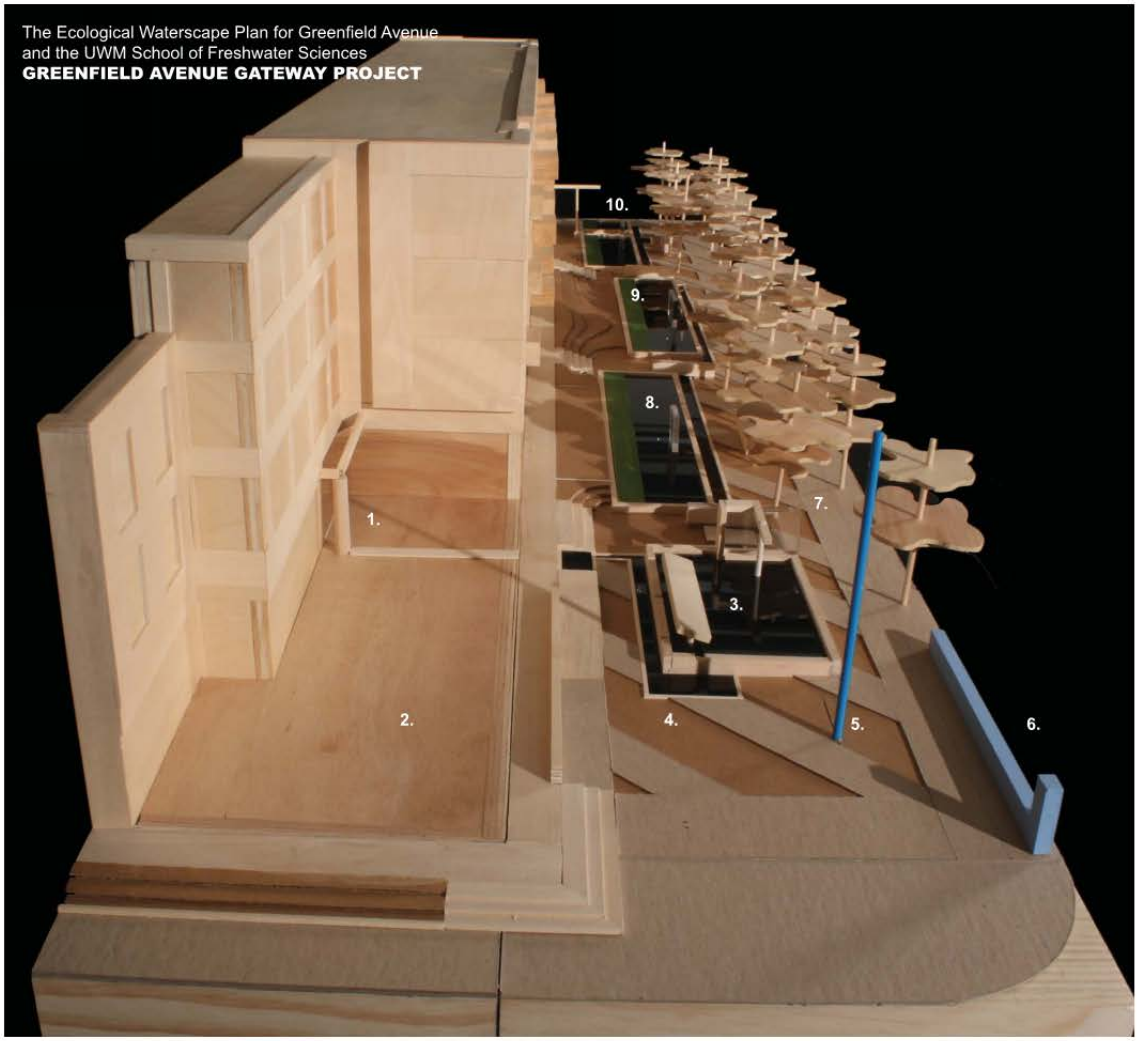
7: Designed to Celebrate Winter

8: Designed to Announce the Presence of the SFS and Celebrate Milwaukee's Water Technology Prowess Directly through Interpretive Display

9: Designed to Actively Participate in the Creation of the BLUE STREAK Interpretive Walk envisioned by Artist Mary Miss

10: Designed to Achieve the Highest Level of International Certification for Sustainable Site Design

File No. 161713. Water feature Design Model images.



The View from Rockwell

1. Eastern sculptural scupper conveying water from the roof of the building to the head of the linear water feature.

2. Freshwater Plaza- upper level. This plaza sits 18" above the street level and is reserved for outdoor cafe seating.

3. Freshwater Plaza- lower level. Pool 1: Solar Water Works UV treatment system fountain feature. Primary Harbor District signage in edge lit glass incorporated into a sculptural scupper spilling UV sterilized water from a height of ten feet, facing First Street.

4. East flowing runnel collects water overflowing from scuppers in each reflecting pool and returns to recirculation drain at the far end.

5. (Space provided for) WALK A BLUE STREAK artwork by Mary Miss.

6. Bubler Station along Greenfield Avenue.

7. Pools shaded by stormwater street trees forming a promenade of pervious surfaces marked by a bold diagonal pattern emphasizing movement along Greenfield Avenue. The southern row of street trees in the City right of way capture runoff from Greenfield Avenue and are not plumbed into the water feature. The northern row of trees and the pervious landscape sit on a liner and are captured by the water feature.

8. Edge lit glass interpretive signage sitting within the reflecting pools also provides a vertical water feature in each pool for enhanced oxygenation. Benches and signage throughout designed and built by UWM faculty and students.

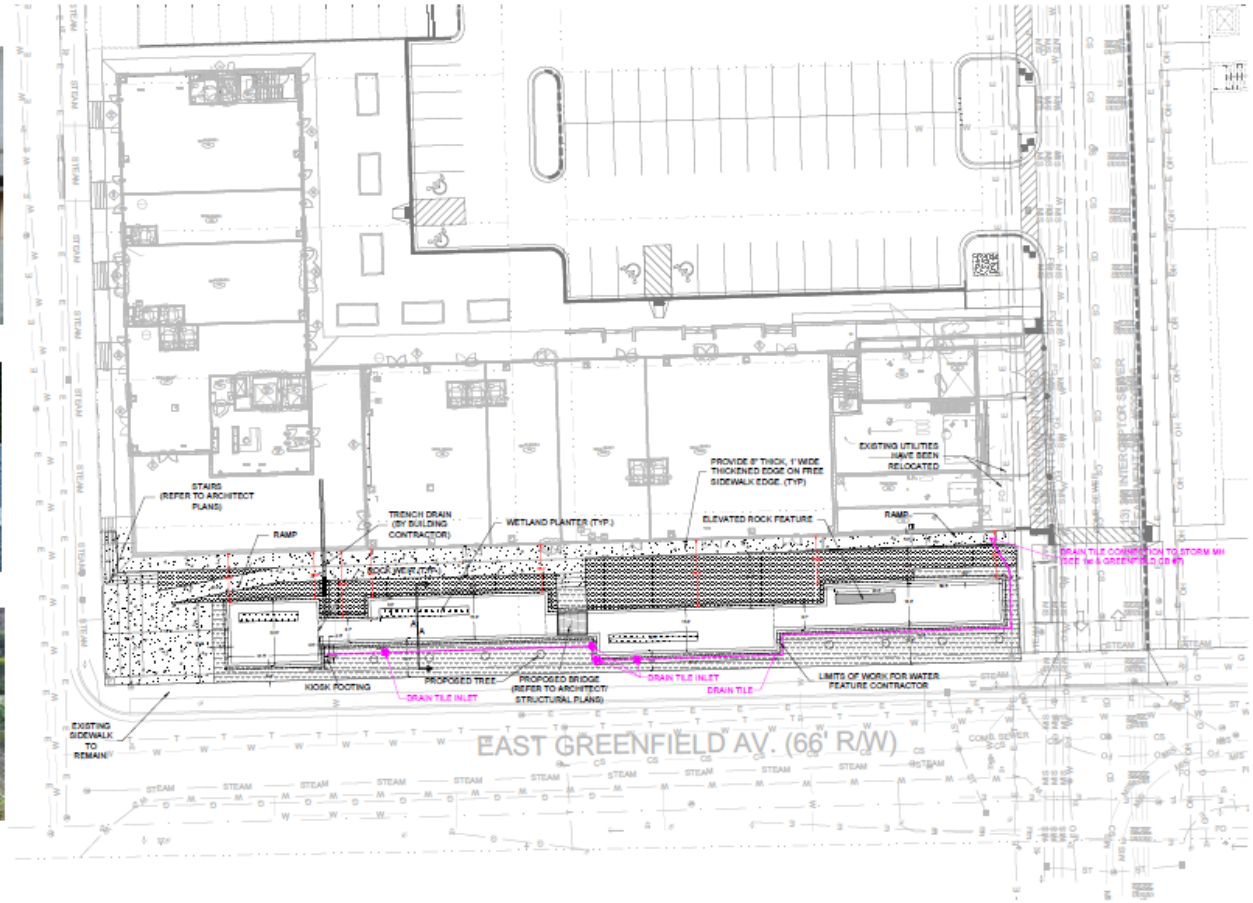
9. Pool 2-4: Forced wetland planters up-well polished water into reflecting pools. Water spills out of each pool along the promenade into a continuous runnel and runs east towards the Harbor.

10. Western sculptural scupper. Runnel return to cistern below. This fountain feature has the potential to flow continually to provide oxygen.

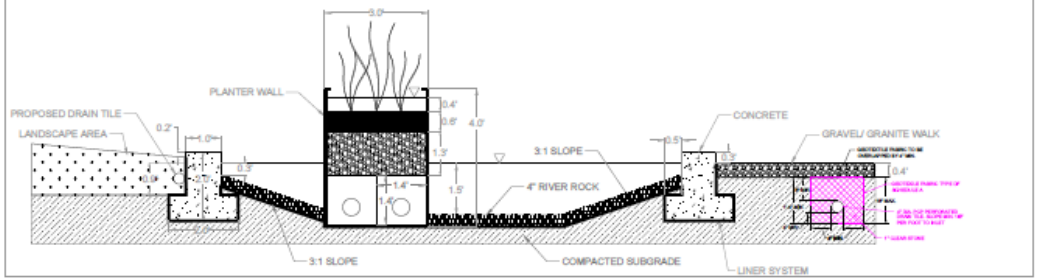
The water feature as a whole has the capacity to capture 40,000 gallons of stormwater, manage it dynamically, filter it to meet future TMDL water quality standards, and pump it at will out of the combined sewer system and into the drainage to the North to be drained to Greenfield Slip.

File No. 161713. Water feature site plan, section, and conceptual images.

The images above are shown as an example of corten steel planter boxes that were used in a similar water feature context.



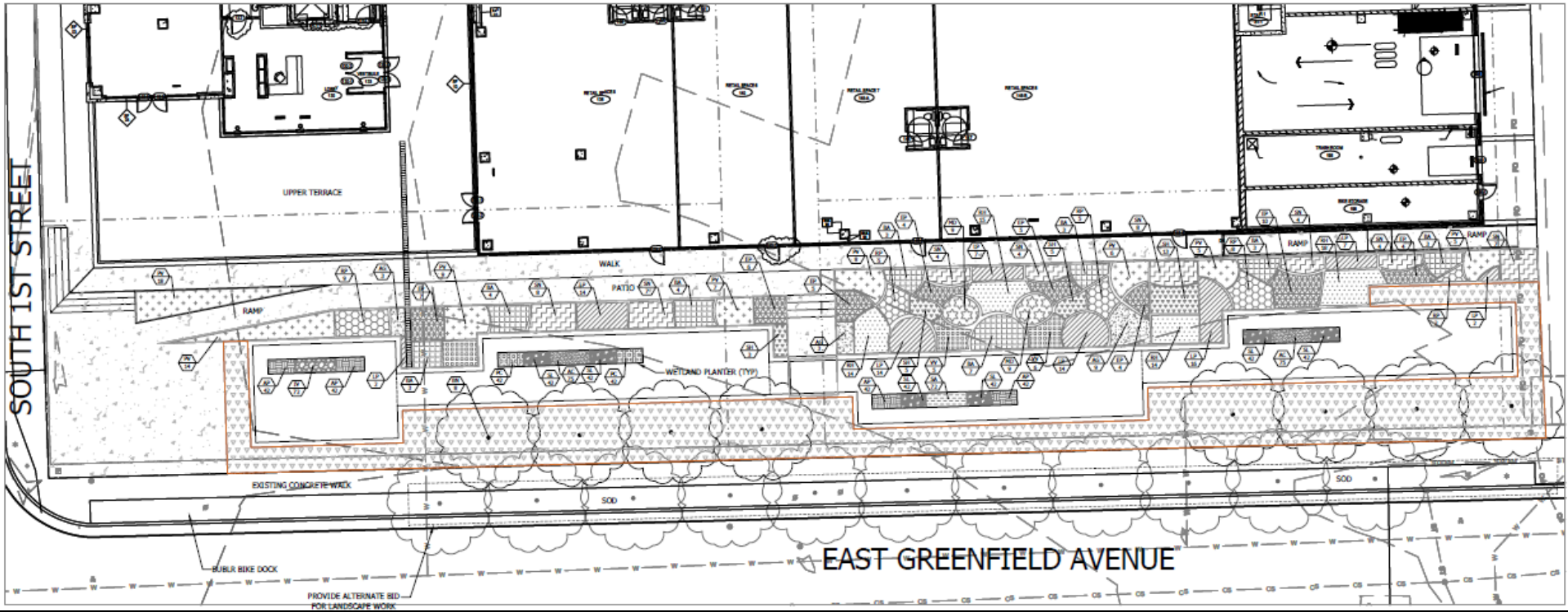
WATER FEATURE SECTION VIEW A-A



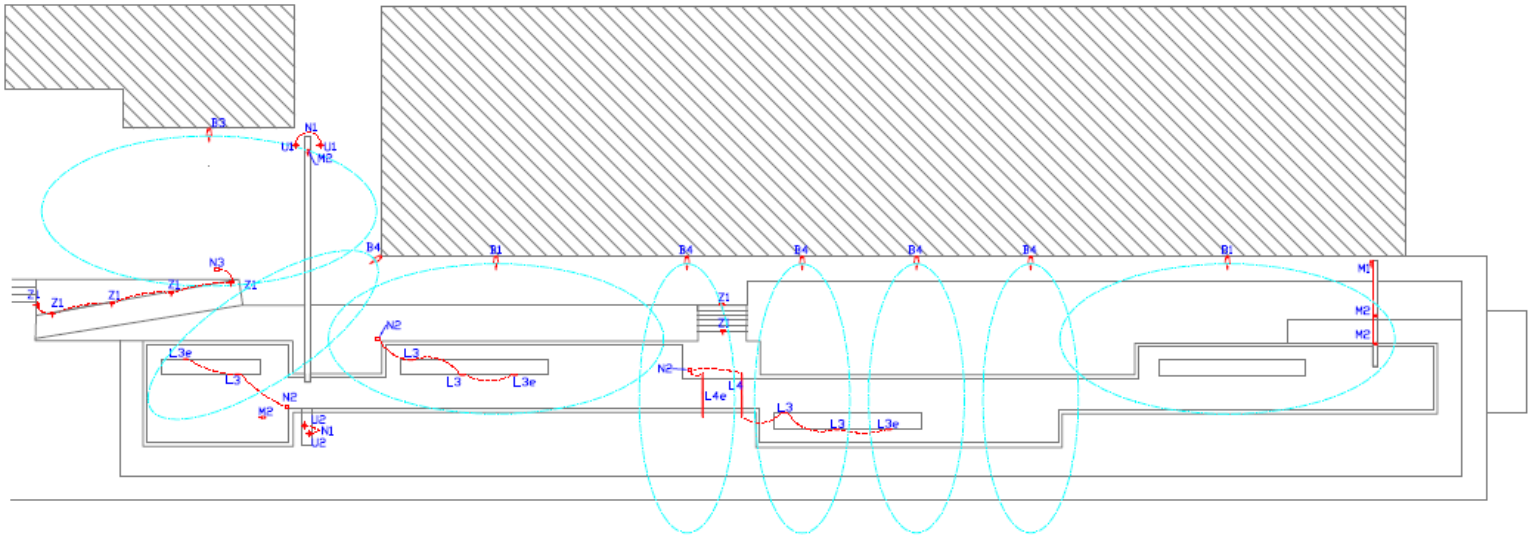
GENERAL NOTES:

1. THE UNDERGROUND UTILITY INFORMATION SHOWN ON THIS DRAWING IS BASED ON FIELD LOCATIONS AND/OR RECORDS FURNISHED BY MUNICIPALITIES AND UTILITY COMPANIES. THE LOCATION AND ACCURACY OF WHICH CANNOT BE GUARANTEED. THERE MAY BE ADDITIONAL UNDERGROUND UTILITY INSTALLATIONS WITHIN THE PROJECT AREA THAT ARE NOT SHOWN.
2. VERIFY ACTUAL LOCATIONS AND INVERTS IN THE FIELD. ANY POTENTIAL ERRORS, OMISSIONS, OR DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION.
3. WORK TO BE COMPLETED IS INDICATED IN BOLD TYPE LINES AND EXISTING CONDITIONS ARE INDICATED BY LIGHT TYPE LINES.
4. ELECTRONIC CIVIL FILES ARE AVAILABLE UPON WRITTEN REQUEST. DO NOT USE ELECTRONIC CIVIL FILES TO LAYOUT FOUNDATIONS, COLUMN LINES, LIGHT POLES, OR OTHER NON CIVIL SITE WORK. REFER TO ARCHITECTURAL DRAWINGS FOR DIMENSIONS OF BUILDING AND ARCHITECTURAL FEATURES.
5. DIMENSIONS ARE FROM FACE OF CURB OR EDGE OF PAVEMENT.
6. WORK WITHIN THE PUBLIC RIGHT OF WAY, INCLUDING BUT NOT LIMITED TO DRIVEWAY OPENINGS, SIDEWALK AND RAMPS, PAVING, AND CURB AND GUTTER SHALL BE COMPLETED PER MUNICIPAL AND/OR COUNTY REQUIREMENTS AND STANDARDS.

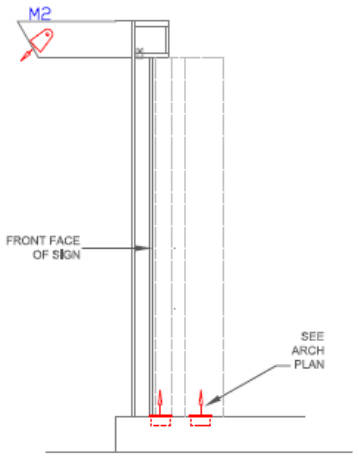
File No. 161713. Landscape plan.



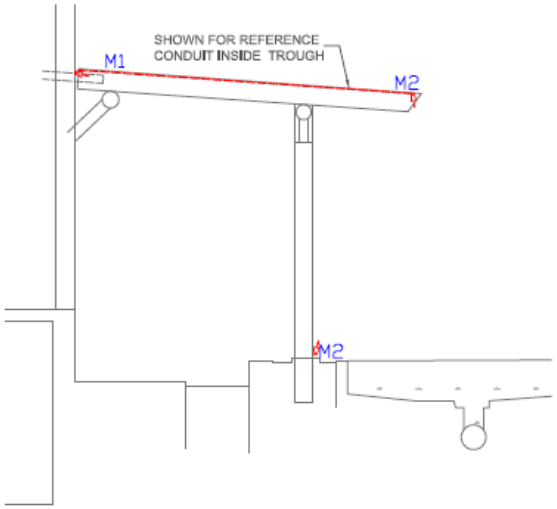
File No. 161713. Kiosk sections and site plan.



① FRESHWATER PLAZA LIGHTING PLAN
NTS



② FRESHWATER PLAZA LIGHTING - SIGN KIOSK SECTION
NTS



③ FRESHWATER PLAZA LIGHTING SECTION - TROUGH
NTS

File No. 161713. Lighting plan.