QUEENS BOTANICAL GARDEN FIELD TRIP REPORT

Fall 2025
ARC 486
Architectural Design V
Professor LoPiccolo

https://queensbotanical.org/sustainability/va-building/

BY STEVEN BERG

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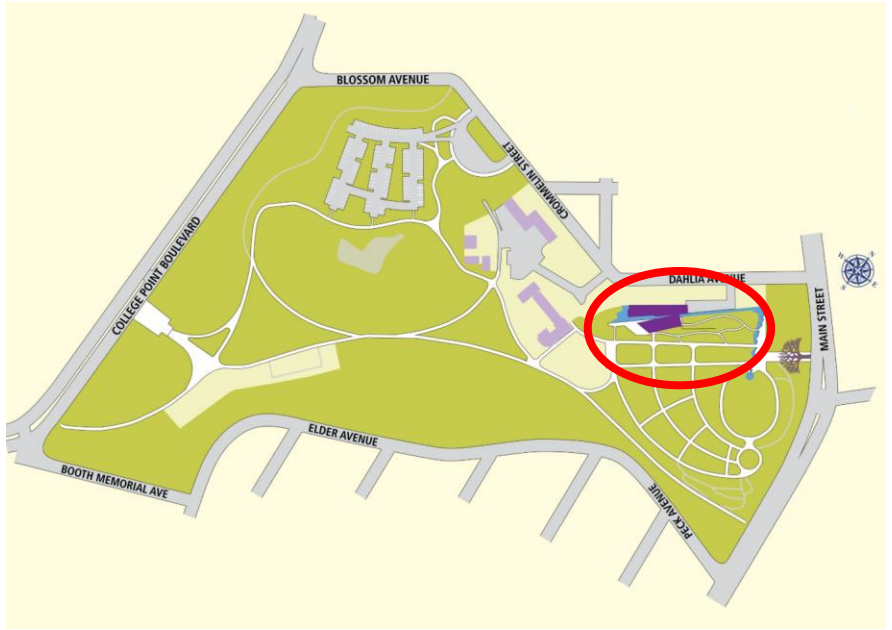
Building Information

Queens Botanical Garden Visitors Center
- Passive, biophilic, linear design
- 43-50 Crommelin Street, Flushing, NY 11355
- BKSK Architects
  - Lead Architects: Joan Krevlin, Stephen F. Byrns
- Grand Opening September 2007
- Gross Floor Area: 16,000 sq. ft.
- Total Project Cost: $ 12,000,000
- Cost per sq. ft = $ 750

https://www.aiatopten.org/node/127



https://queensbotanical.org/gardens/

Interesting Facts

1. NYC first publicly funded building to achieve LEED Platinum certification
   - ASLA NY Merit Awar
   - AIA New York Chapter Design Award 2009.

https://www.aiatopten.org/node/127

2. The building uses 82% less water because of the cistern and wetland greywater filtration system

3. The foot-path bridges that go over the water feature are made from recycled bottles

4. The auditorium was sunken into the ground to accommodate for proper height and allow for the walkable green roof design
   - Solid fill for the area that is too shallow in between the beginning of the green roof and edge of auditorium

5. The site was a dump before it was turned into the gardens – deep down there is a toxic layer of soil that kills old trees when their long roots reach it

History

The visitor's center was created as an exemplary component of the Queens Botanical Garden master plan. It took 4 components of sustainability into account: water, energy, materials, and light. The goal was to welcome visitors, house staff and make sustainability visible as part of the gardens mission. The gardens mission is to foster an inclusive environment for everyone especially in the middle of a very diverse community.

The gardens evolved from Flushing Meadows-Corona Park - the five-acre Gardens on Parade exhibit in 1939 at the New York World's Fair. The garden remained at the original Worlds's Fair site until 1961 then moved to its current location on Main Street.

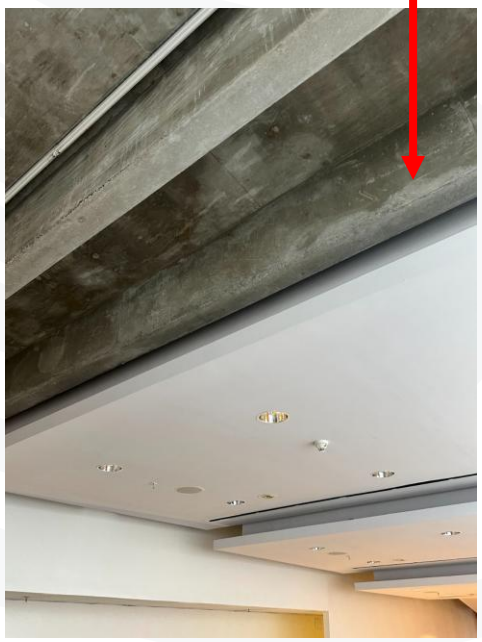
Their mission also acknowledges its past ancestors. They respect the Matinecock people by continuing their dedication to the land. They continue to steward the land with sustainable practices, community love and commitment to equity. Education is also a big part of their mission – They help local students learn about the environment and sustainability and are currently building a new education center.

Main Lawn

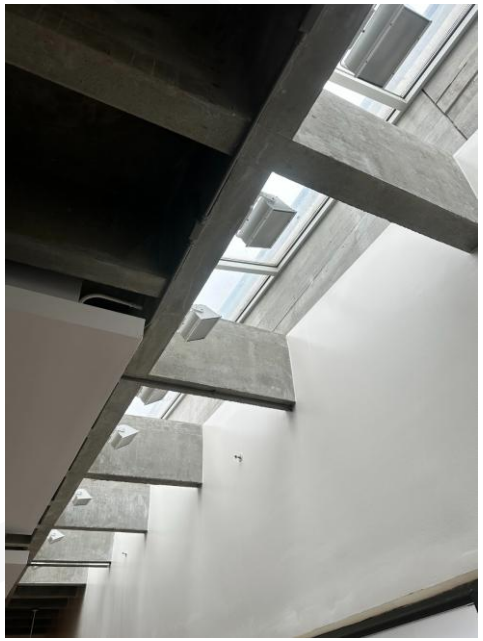
Gardens

Construction

The primary structure for the visitor's center is a steel frame system, indicating a type I or II construction. The structural steel columns and beams allow for large interior open spaces. They were also exposed and coated in intumescent paint to increase the fire rating. The envelope of the building also contains load bearing concrete masonry unit walls – these improve energy efficiency in terms of thermal envelope as well. The auditorium also had exposed concrete structural beams which indicate the support for the weight of the green roof above.



Auditorium



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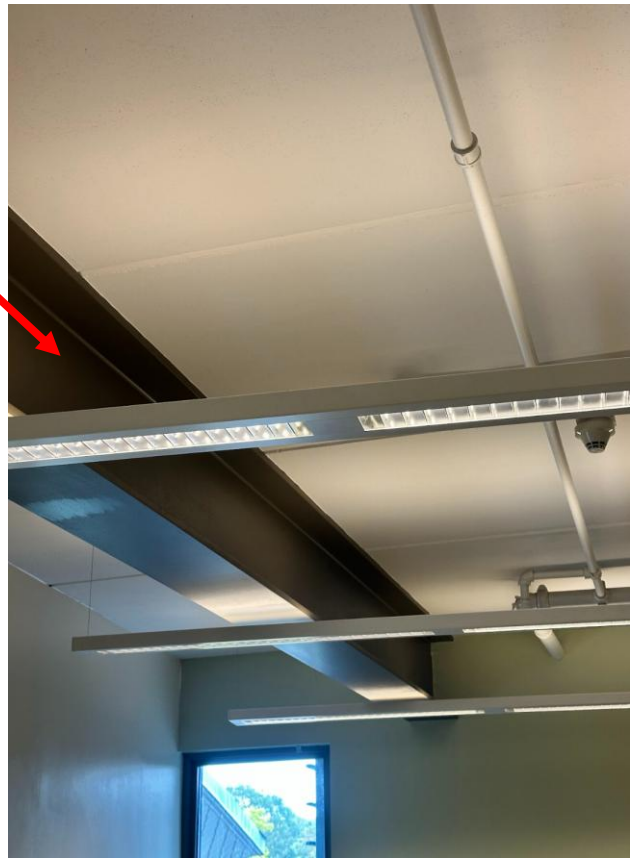
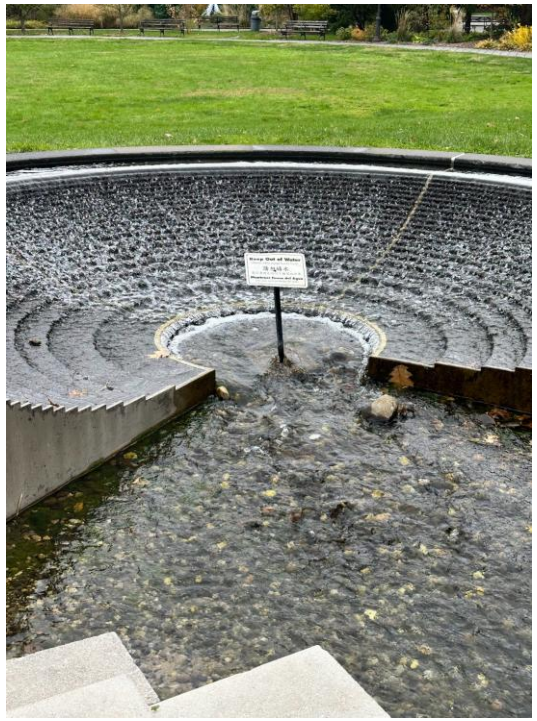


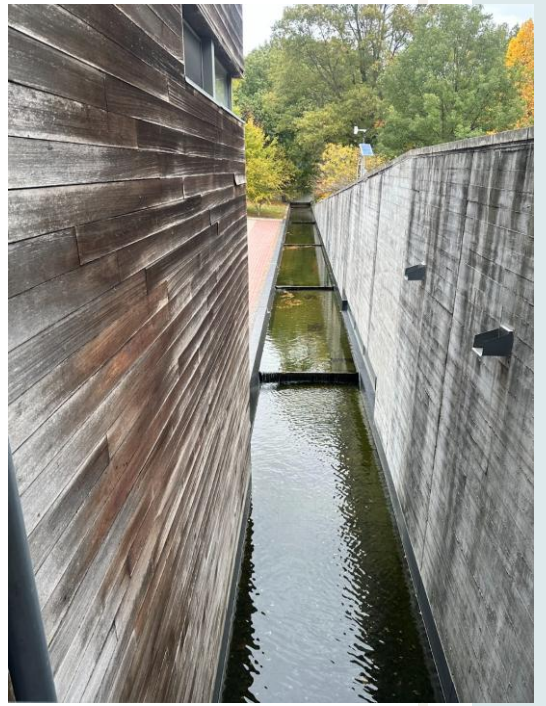
Second Floor of Visitors Center

Sustainable Exterior Finishes

The building was designed with a sophisticated rainwater collection system. A large canopy roof-like structure shading the entrance of the building acts as a large funnel – collecting rainwater and funneling it into a collection pond. This collection pond also acts as a biotope and river/fountain feature that wraps around the whole building. Another interesting fact is that all materials used to construct the building were sourced within 200 miles of the site to limit emission pollution. The cedar siding is also sustainable because of its natural properties. The main building is also equipped with solar panels which produces 17-20% of the building's electricity.

Visitors Center Entrance/Canopy

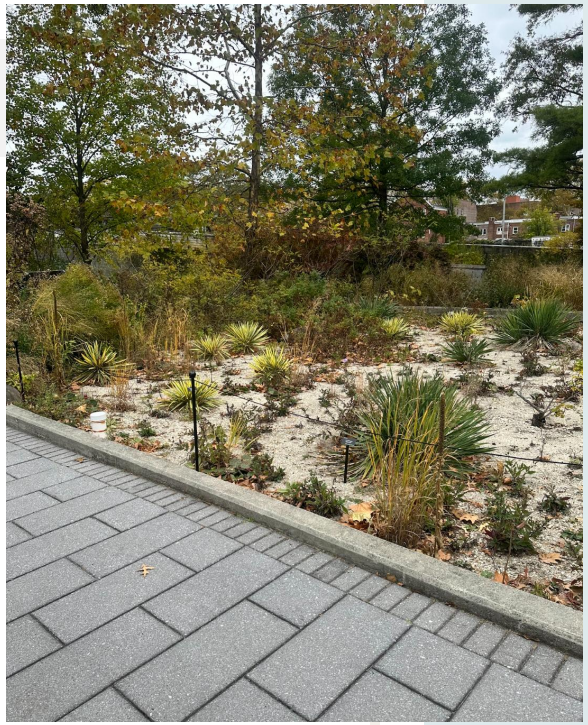




Rainwater Fountain/Collection Feature Between Auditorium & Visitors Center

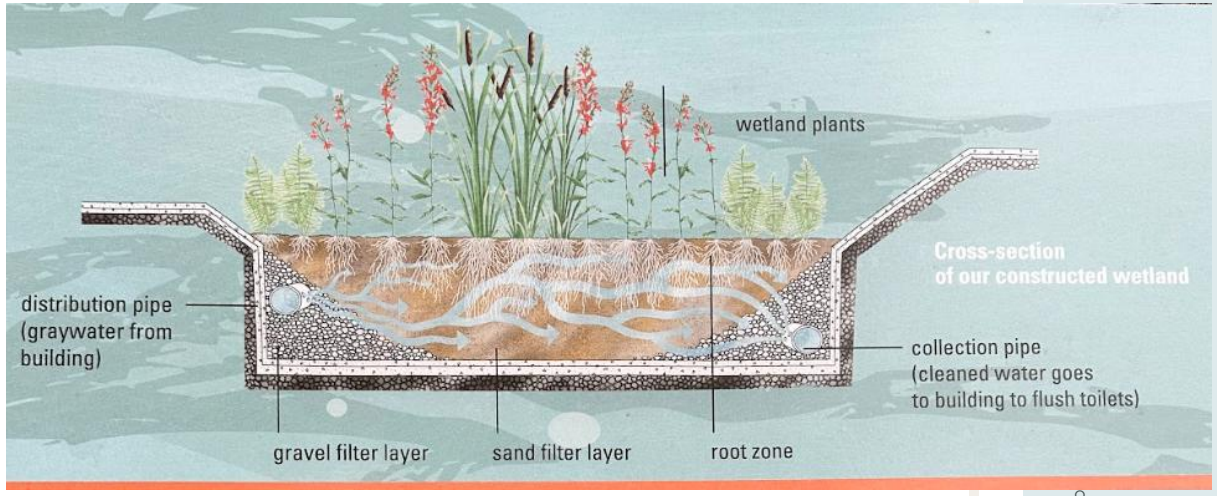
Sustainable Exterior Finishes

The exterior façade is equipped with brise-soleil – this is the horizontal slats running across the exterior of the south facing glass. This feature helps control the temperature inside of the building using the sun. When the sun is high in the summer, these slats cast a shadow inside the building blocking out the heat from the sun. When the sun is lower in the winter – these slats let in more of the light to help heat up the interior spaces. The next feature is the man-made wetlands. This feature acts as a "natural" filtration system for graywater exiting the building. Water coming from sinks, laundry, or showers drains into this wetland and is filtered by layers of plants, sand, soil, and gravel. It is then collected after filtration and used for water to flush the toilets.



Man-made Wetlands

Visitors Center Biotope

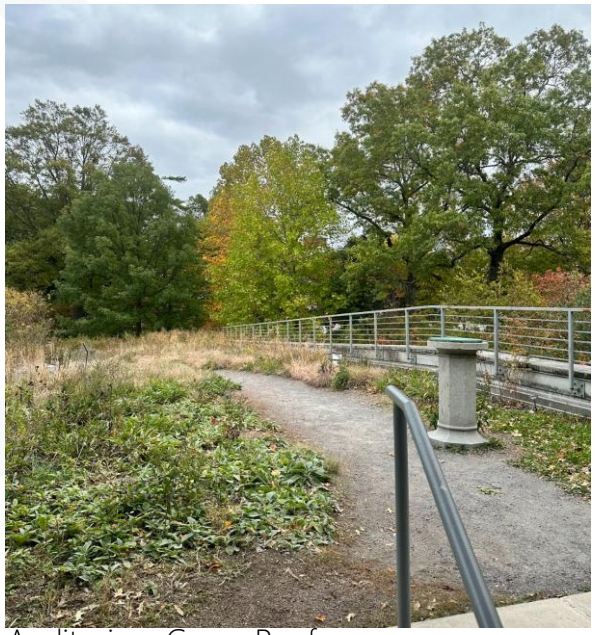


Green Roof

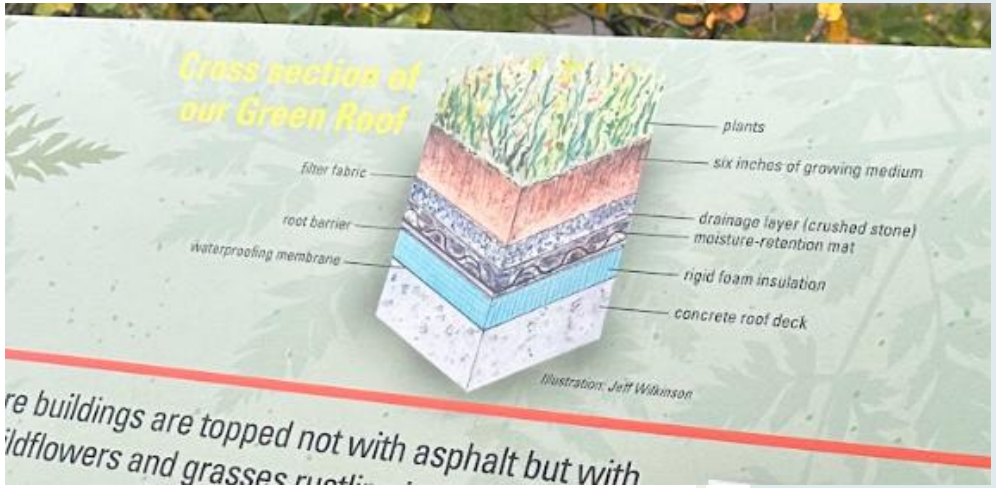
The accessible green roof design is both sustainable and sophisticated. Seamlessly integrated into a garden path as if not building exists underneath the nature path. This design decreases the urban heat island affect by absorbing and transferring heat into vegetation. Without this, normal structures like concrete absorb the heat and release it back into the air at night increasing local and global temperatures. This 8000 sq ft green roof allows for native plant growth while using mostly aggregate as substrate because it is lighter than standard soil.

Auditorium Green Roof

Auditorium Green Roof – From Staff Parking Lot



Auditorium Green Roof

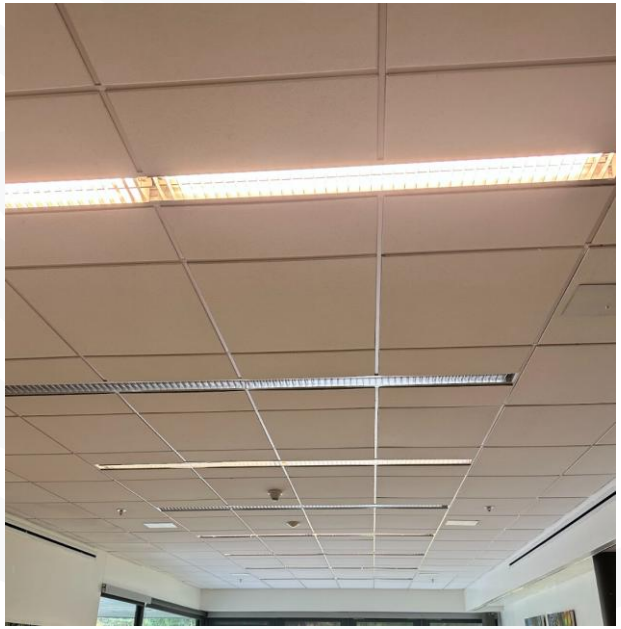


Sustainable Interior Finishes

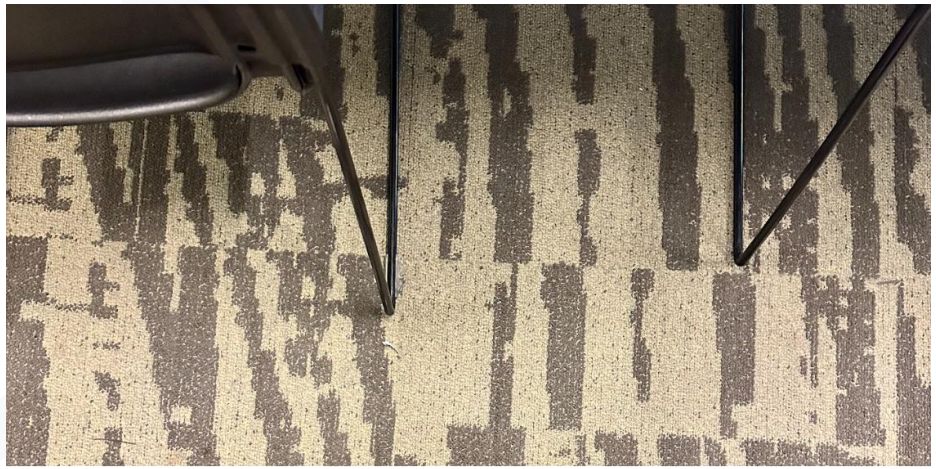
The lights inside of the building are all sensor activated so they only turn on when people enter the area. They are also sunlight-sensitive so they dim/brighten depending on how much light is entering the room from the windows. Some of the toilets are composting toilets so the only use 3 tablespoons of water to flush. The waste then goes down into a composting bin and is used as natural fertilizer. The floors are sustainable as well. The carpets are forever recyclable and made from polyresin. The concrete floors are made with an additive called fly ash. This decreases cracking, cures faster and diverts toxic fly-ash compounds from landfills.

Composting Toilet System

Visitor Center First Floor



Visitor Center First Floor



Visitor Center Second Floor

Site and Landscape Features

One example of a sustainable feature outside of the building are the bioswales – these allow for increase infiltration of water and decreased non source point pollution. The main reason for this was to decrease the overflow of rainwater diverted to street sewer systems.

Bio-swale next to Parking Garden

Main Trail Bio-swale

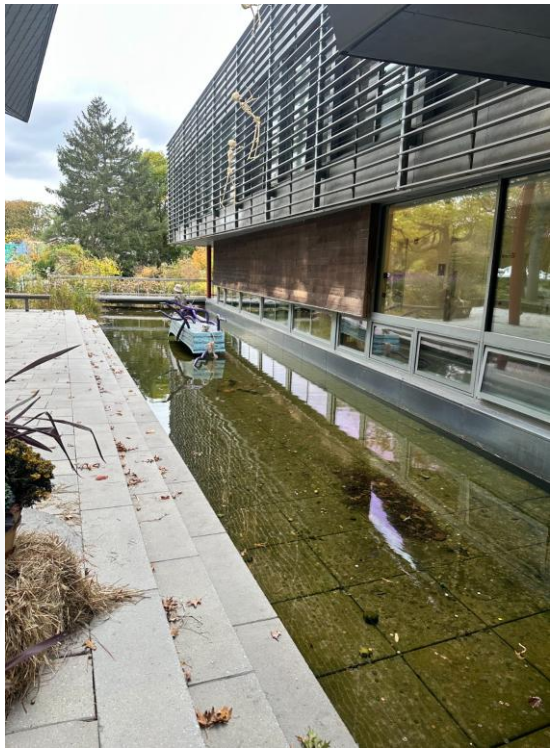
Another example is the parking garden. Not only are the bays separated by vegetation to allow for infiltration, but it is also built with permeable pavers. The gaps in-between each paver allow for increased infiltration and decrease the amount of rainwater runoff to local sewage as well.

Parking Garden

Site and Landscape Features

Biotopes are areas where water is collected and stored. These areas are great for local vegetation to thrive because of the constant source of water. Storing the rainwater in these biotopes is reclaiming water that would have been lost and pushed to sewage and instead used to provide areas for plant growth. The combination of natural rainwater and native species is great for the environment.

The site is also built with an underground water catch basin. There is a 20,000-gallon tank that catches storm water from grass and paver infiltration and stores it for building use (flushing toilets)



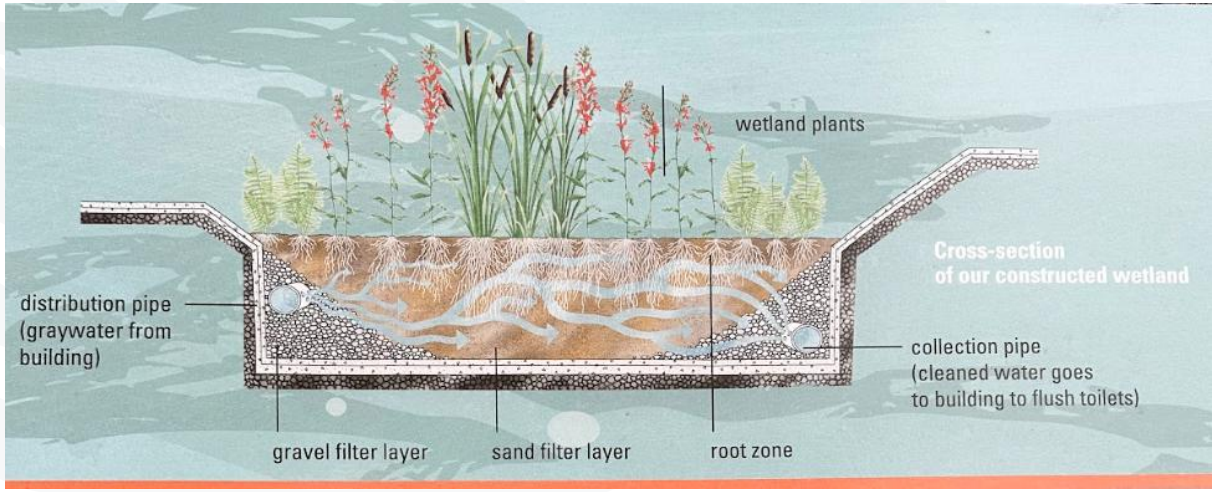
Rainwater Collection Feature

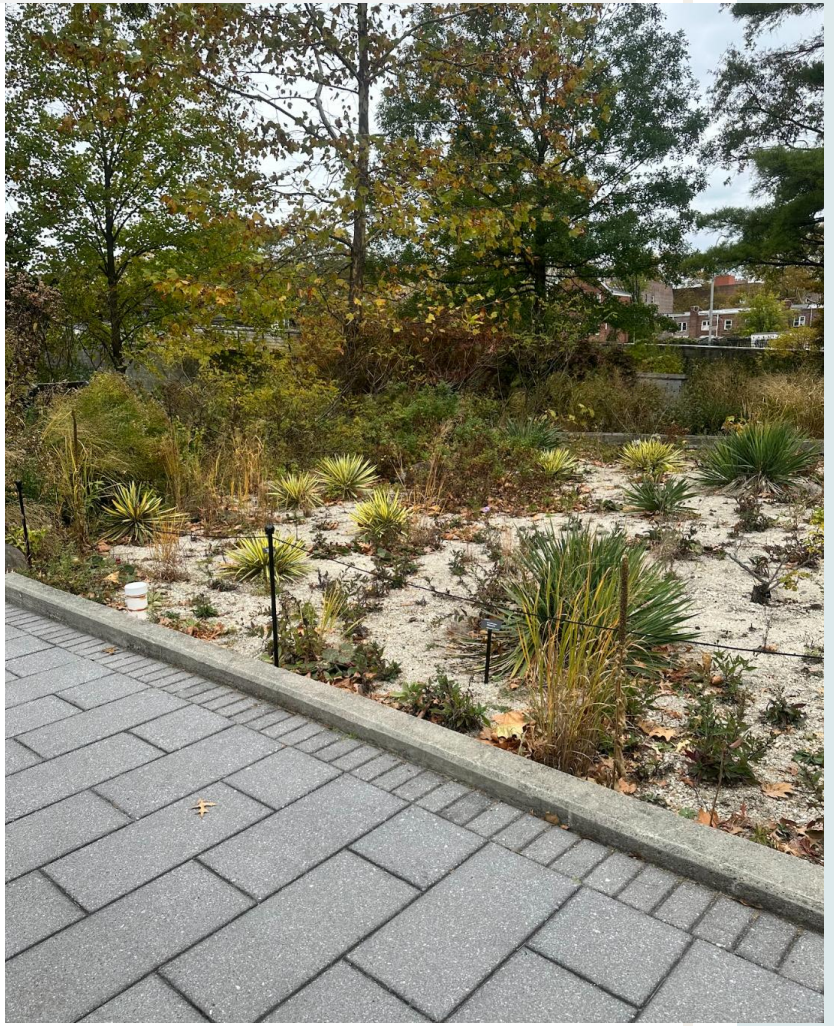
Biotope

Rainwater Collection Feature

Most Interesting

I thought that the most interesting part of the Queens Botanical Garden was the man-made wetland system. This system is purely genius to me and really puts an emphasis on reclaiming and recycling. I have never seen anything like this in a building design and to see it in person was truly special. Reusing semi-clean water that was going to go to waste anyway is amazing. It is a perfect solution to use for flushing toilets because the waste from sinks, showers, and laundry machines is mixed with soap usually, so having it filter through a sand and gravel wetland to be reused in toilet flushing is very innovative. The system also allows for vegetation growth which is sustainable as well.





Man-made Wetlands

Another Sustainable Building

Suffolk County Community College – Renewable Energy and STEM Center (Brentwood, NY)

Features:
- No fossil fuel consumption – fully electric – heating, cooling, lighting
- photovoltaic panels – 468 panels – 208 kW capacity designed to exceed annual energy use – net zero building design
    - South facing/sloped solar panel array
- High performance glazing, R-40 thermal insulation
- Geothermal heating/cooling system
- Green Roof – outdoor classroom – integrated into ground level