QUEENS BOTANICAL GARDEN’S VISITOR & ADMINISTRATION CENTER

Overview:
Location: Flushing, NY
Building Type: Interpretive Center
New construction
15,800 sq. feet (1,470 sq. meters)
Project scope: Single Building, Urban Setting
Completed September 2007
Total Project Cost (excluding land): $12,000
Financing Mechanism: Grant: Public Agency

Visitor & Administration Center includes:
- Reception Area
- Auditorium
- Garden Store
- Gallery Space
- Meeting Rooms
- Administrative Offices
- Mechanical Room

Owner & Occupancy:
- Owned & Occupied by Queens Botanical Garden, Local Government
- Typically occupied by 15 people, 40 hours per person per week; and 5,400 visitors per week, 2 hours per visitor.

Vision Statement
“To be the Botanical Garden noted for presentation of plants as unique expressions of cultural traditions.”

Mission Statement
“The Queens Botanical Garden, a living museum serving the most ethnically diverse county in the United States, is committed to presenting collections, education and research initiatives and programs that demonstrate environmental stewardship, promote sustainability and celebrate the rich cultural connections between people and plants.”

SITE LOCATION

Location: Flushing, NY
- Located on 39 acres of land.
- Open to the public & admission is free.
- Flood-Prone site, which once included a creek, has been filled and excavated a number of times.
- The existing soil had no original structure remaining.
- All grounds not designated for intensive use were planted with native species.
- Community driven planning process emphasized the importance of water as a resource vital to all cultures.

SITE DESCRIPTION
- Nested among mature trees on the site of a former parking lot.
- Flood-Prone site, which once included a creek, has been filled and excavated a number of times.
- The existing soil had no original structure remaining.
- All grounds not designated for intensive use were planted with native species.
- Community driven planning process emphasized the importance of water as a resource vital to all cultures.
AREAS TO INVESTIGATE

1. What are the site and building currently doing to be green?
2. How does the current site and building score on the Regenerative Based Checklist?
3. What can be done to improve the current status?
4. How can the suggested improvements increase the Regenerative Based Checklist score?

WATER CONSERVATION & USE

A Graywater System that is separate from the Stormwater System uses an adjacent wetland to cleanse and repurpose building water for flushing toilets, reducing the potable water consumption by 55%. The project also features waterless urinals and composting toilets.

Indoor Potable Water Use: 36,700 gal/yr

Strategies:
- Ecosystem Restoration
  - Replant damaged sites with native vegetation.
- Waterless Fixtures
  - Composting Toilets
  - Waterless Urinals
- Water Conservation Education to visitors
- Remediation of Damaged Sites
- Rebuilding of degraded soils
- Wastewater and Graywater Recycling
- Integration with Site Resources
- Celebrate and Enhance existing Landscape Features
  - Cleansing Biotope
  - Bioswales
  - Constructed Wetlands (can cleanse and recycle up to 4,000 gallons of water per day)

ENERGY

"Each part of the Center is designed to use strategies tailored to the local climate to reduce energy use."

Designed to use 41% less energy, by cost, than a comparable conventional building.

Strategies:
- Dramatic Canopy over the entrance forecourt provides shelter from the sun and weather, emulating the adjacent mature oak trees.
  - The top of the canopy is covered with a material that reduces solar heat gain.
- A 3,000 square-foot Green Roof, planted with native plant species that require minimum watering.
- The Reception Building is long, narrow shape, oriented along the east-west axis.
  - Allowing daylight to penetrate 84% of interior spaces.
- A wooden brise-soleil that wraps the western and southern walls of the building reduces unwanted heat gain and glare, while allowing full views of the surrounding gardens.
- An Efficient lighting system including; daylight dimming and occupancy sensors are used to further reduce energy consumption.
- Operable windows in regularly occupied rooms and set temperature days, glass doors and windows open to provide cross ventilation.
- A ground source heat pump system uses the earth’s constant temperature to reduce energy use.
- Integrated Photovoltaic Panels atop the main building are anticipated to provide 18% of the projects electricity needs.
INDOOR ENVIRONMENT

- On temperate days, sliding glass doors and windows on the main building can be opened in all occupied spaces.
- Connects the building’s occupants directly to the gardens.
- Narrow footprint & open-plan reception and workspaces allow diffuse light, filtered through the brise-soleil, to penetrate the interior.
- Well insulated through conventional insulation as well as the auditorium’s green roof, contributing to a thermally consistent, quiet and comfortable indoor environment.
- Lighting system that responds to occupancy and daylight levels, providing a visually pleasing environment in conjunction with energy savings.
- Wherever possible, systems and structure were left exposed and where paints, carpet and finishes were selected with low chemical emissions.
- Ensured separate ventilation to contain construction dust and required a two-week building flush-out with 100% outside air.

CURRENT PARKING PROJECT

- Composed of a variety of paving materials including permeable pavers.
- Allows infiltration of water and parking bays interrupted by planted Bioswales that manage on-site Storm Water.
- Will include:
  - (6) ADA compliant spaces
  - (92) Standard spaces
  - (19) Overflow spaces (composed of grass grown in a gravel medium)

TOTAL: 117 SPACES

"These new landscapes all contribute to Queen Botanical Garden’s Visitor Center’s effort to foster environmental stewardship and enhance the visitor experience."

MATERIALS & RESOURCES

More than 33% of the materials in the building, by cost, were harvested or manufactured within 500 miles of the project site.

Green Products Used:
- Bamboo Panels & Veneer
- Composting Toilets
- Energy-Efficient Interior Luminaires
- Green Roof System
- Non-Water-Using Urinals
- Photovoltaic Collectors
- Recycled-Content, Formaldehyde-Free MDF Moldings
- Whole-Building Digital Lighting Controls
- Wood Materials from Salvaged Urban Trees
- Zero-VOC Interior Paints

Designed for Future Use:
- The project team relied on concrete, steel and glass for much of the project’s structure in order to enhance durability and reduce maintenance requirements.
- Approximately 80% of construction waste, by weight, was recycled and diverted from landfills.

AWARDS & RECOGNITION

- Chicago Athenaeum American Architecture Award – 2008
- AIA/EDIE Top Ten Green Projects – 2008
- AIA New York Building Type Awards – 2008
- Category: Honor Award for Sustainable Design
- Achieved LEED platinum certification
- Received Green Building Design Competition Award
REGENERATION BASED CHECKLIST RESULTS

Holly’s Checklist - Results: 1800
Roxanne’s Checklist - Results: 1700
Amy’s Checklist – Results: 1125

Group Average Score: 1542

THE RE-DESIGN

• The building is designed to use 41% of the energy than a comparable conventional building.
• The use of integrated Photovoltaic Panels atop the main building are anticipated to provide 18% of the project’s electricity needs.

HOWEVER…These could be improved by incorporating:
• Wind Turbines and an energy storage station below grade.
• Solar-Powered electric car charging station to generate additional power to store.
• The site scored low in food generation and soil improvements. This could also be better by expanding the current garden spaces.

RE-DESIGN: WIND TURBINES

• Location: Southwest Corridor.
• Generate additional energy needed for the building’s daily use.
• Additional energy to be stored in an underground storage station for future use.

RE-DESIGN: A PHOTOVOLTAIC CHARGING STATION

Provides more power and encourages employees and visitors to use alternative modes of transportation.
### RE-DESIGN: COMMUNITY GARDEN SPACE

**Buying locally grown produce or GROWING your own...**
- Uses less fuel and energy than transporting from elsewhere.
- Currently, there is a very small garden for senior citizens and employees, but none that are open to the public.

**HEALTH:**
- Active pursuit in yielding fresh food, nutritious foods and promotes physical fitness and health.

**LEARNING:**
- Mentally stimulating and adds to an individual’s knowledge and expertise because organic gardening is a knowledge-based system of gardening rather than one based on quick fixes.

**SOCIAL:**
- Meet others in a social venue where they are used to build a sense of community and belonging.

### RE-DESIGN: PROPOSED LOCATIONS

### REGENERATION BASED CHECKLIST - IMPROVED

After implementing the redesign suggestions, the Regeneration Checklist score could be improved to **1875!**

### CONCLUSION

1. Is the current site and building green?  
   **YES,** they have taken almost every measure available to be green.

2. How does the current site and building rate on the regenerative based checklist?  
   As a group average, we rated the site and building 1542.

3. What can be done to improve the current status?  
   The current status could be improved with the addition of wind turbines to generate and store extra energy for use as needed, the addition of a photovoltaic electric car charging station, and the expansion of the garden center.

4. How can the suggested improvements increase the Regenerative Based Checklist score?  
   After the suggested improvements, we rated the site and building 1875 which is more than 300 points better.