

RiverGreen Technology Park

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EEOS 476

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Class Project

- Evaluate The RiverGreen Technology Park formerly known as General Electric (GE)
- Project focuses on Renewable Energy and GHG pollution and Stormwater runoff
- Green Roofs and Green Walls are viable solutions
- Community Development & Youth Program



Methodology

- This assessment and evaluation of the RiverGreen Technology Park site was conducted by consulting key documents such as the Mystic River Master Plan, Lower Mystic River Corridor Strategy as well as additional available sources.

Acknowledgements

- This project was made possible with the assistance of key people such as Nick Cohen as and Anamarija Frankic.
- We are extremely grateful to them for making themselves available for all questions and for their guidance through out the process.

Project Master Plan Overview

- The RiverGreen Technology Site in Everett MA is a 40 acre riverfront site
- ESS Group plan to build a Park that offers research, development of light manufacturing and assembly, office space
- Goals are to provide economic stimulus, growth and development for the local community, public/environmental services, incorporation of renewable energy generation and public access to the Malden river



Site Condition/Assessment

- GE was main employer for the 35,701 Everett Residents
- When plant closed in 1989 1000 jobs were lost.
- Everett now classified as an Economically Distressed Area (EDA)
- 9.2% of families live below poverty line as opposed to 6.7% for the state
- High minority and low income relative to the state average.

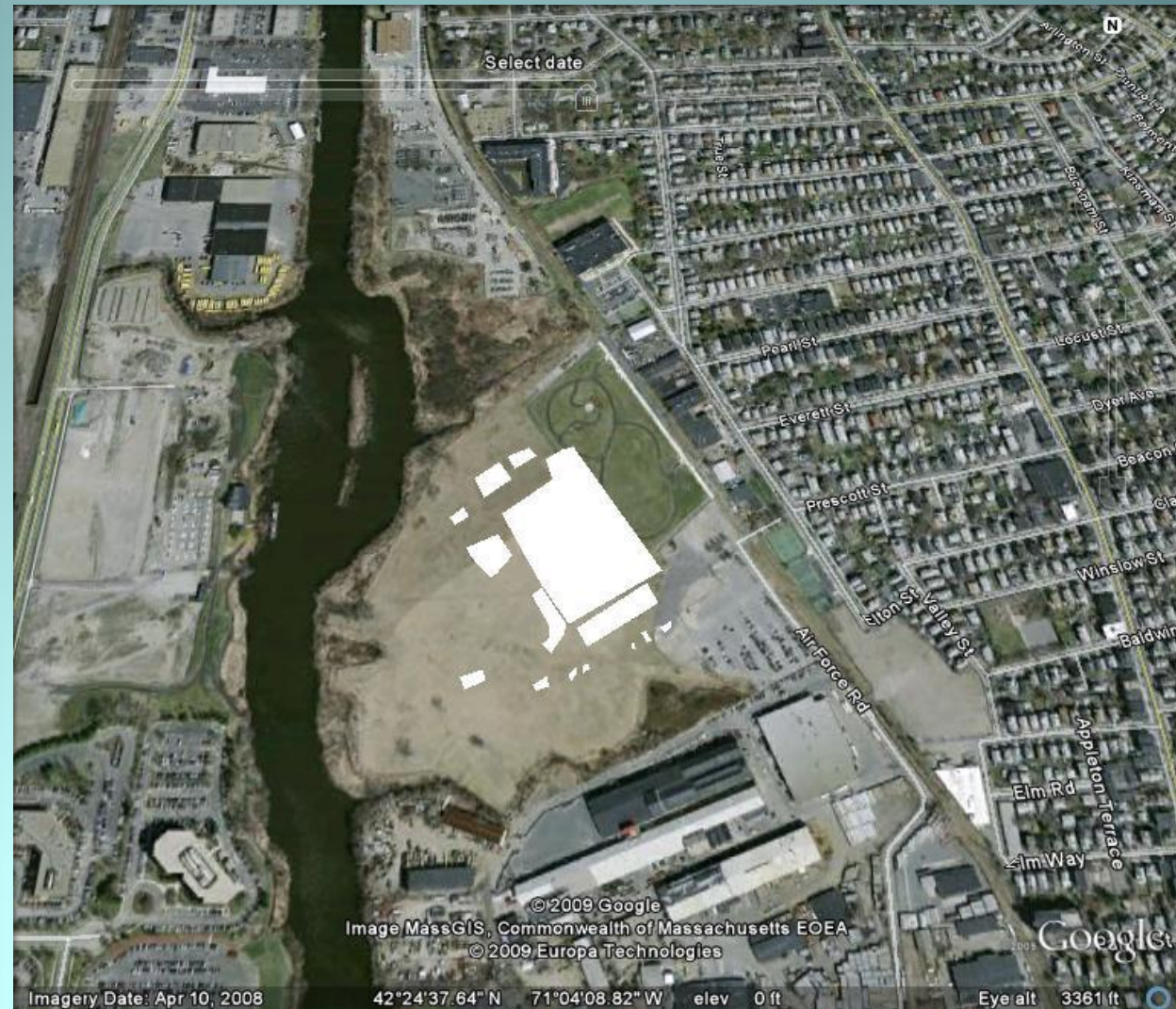
Site Conditions/Assessment cont.

- Vacant Brownfield site, with 5 feet of fill material
- High-yield non-potential drinking water source area
- Site poses risk for future residents, construction workers, and children
- Remedial Action Plan prohibited residential use and disturbance of soil or groundwater
- Lot 5 presents a significant risk for human health for commercial/industrial workers.

Brownfield

GE Site former building placement

- According to the EPA, "real property, where the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant"



ESS Group, Inc.

- Environment Consulting and Engineering Services, they are the lead permitting and site engineers for the RiverGreen Technology Park.
- Other than the RiverGreen Park, the ESS Group has worked on the Cape Winds Renewable Energy Project and the Devens Recycling Center among others

ESS Group Project Goals

- Low-impact development – sustainable design principles and environmentally conscious development practices
- Parking, Public amenities and transportation to & from Orange Line at Wellington Station
- Employment opportunities and revenue generation
- Public land-use and accessibility to Malden Riverfront
- Aesthetics and environmental quality

ESS Goals cont.

Renewable Energy Plan

- On-Site Renewable Energy
- Create enough energy to greatly reduce carbon footprint
- Each of the five buildings will support a photovoltaic (PV) array covering 50 percent of the roof area.
- Estimated annual PV energy production will be 2,225 MWh/yr, or 46 percent of the estimated annual energy use
- Another way to think about that: an offset of 1,121 tons of CO₂ per year. An estimated 41 percent reduction



Becoming LEED Certified

- Leadership in Energy & Environmental Design
- Whole-building approach to sustainability
- Judges buildings on:
 - site selection
 - efficient use of water
 - efficient and clean energy use
 - sustainable use and reuse of materials
 - location in reference to infrastructure, transportation and open space
 - buildings are also awarded for innovation
- Out of 100 base points:
 - Certified – 40-49
 - Silver – 50-59
 - Gold 60-79
 - Platinum 80+

Stormwater BMPs

- Pretreatment: Remove coarse sediment
 - Deep sump catch basins
 - Vegetated filter strips
- Conveyance: removes sediments and other pollutants
 - Gravel Wetland
- Filtration: Natural filtration system
 - Bioretention areas
- Treatment Basins: Effective for flood control
 - Wet and dry retention/detention basins

Picture from:

<http://sustainablestormwater.org/2009/05/28/stormwater-101-detention-and-retention-basins/>



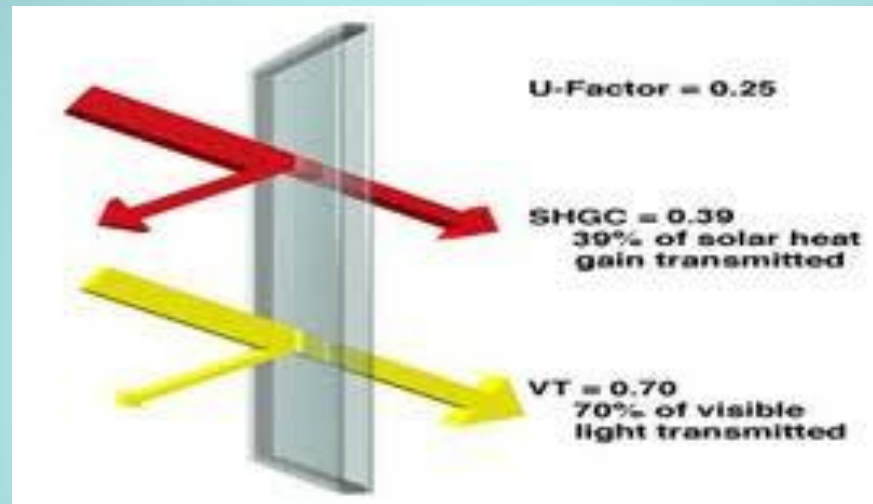
Sustainable Development

- High albedo or very reflective coatings lower the absorption of solar energy, reduce surface temperatures, and decrease heat transfer into the building.
- But high-albedo roof coatings degrade significantly during the first year and more so after around the tenth year when microbial growth begins.



Sustainable Development, cont.

- Solar Heat Gain Coefficient (SHGC) is a measure of the fraction of solar energy that hits the window that is transmitted into the interior of the building.
- More or less solar radiation would be allowed to enter the building to get the desired heating or cooling effect.



Current ESS Group, Inc. Plan

Strategies two and three of the Lower Mystic River Corridor Strategy (LMRCS)

- Enhance and encourage sustainable development and redevelopment within the corridor
 - Redevelopment opportunities
 - New offices, commercial and industrial facilities
 - New investments opportunities and job creation
 - Larger tax base
- Improve access through public transit
 - Greater access to commute through urban ring
 - Foster Social links within Everett, Malden and Medford through the urban ring

Good But Not Great

- Possible mismatch between new jobs and skill levels
- Greater access means larger labor pool
 - Unlikely that park will higher primarily from local labor force
- Limited economic opportunities for low-income Everett residents
- Little mention of community ownership despite stipulations in Chapter 91.
- Private developers ill-suited to foster genuine comprehensive community development

Findings/Recommendations

- Green roofs and walls
- Low Impact Development and sustainability
- Environmental awareness/community ownership youth program

Go Green

- Green-roofing and green-walls for example would greatly help moderate building temperatures, aid in storm-water retention and management, all while adding to the aesthetics of a potentially beautiful Technology park.
- A living green-roof would filter the air and remove CO₂
- The combined use of performance windows and green-walls could be an even more effective combination.



Pictures from: <http://www.worldchanging.com/archives/010211.html>,
<http://www.examiner.com/green-building-materials-in-philadelphia/green-walls-take-planting-to-another-dimension>

Green Roofs & Green Walls

- Best management Practice technologies to mitigate urbanization on air quality, aesthetic aspect, reduction of surface temperatures and heat transfers to buildings
- Green roofs are a proven technology for aiding in storm water runoff, filtration and volume control, the reduction of Urban Heat Island Effect, interior insulation
- Green walls reduce the need for insulation, mitigate heat transfer and improve overall air quality year round.
- Positive sustainable model for youth, engage locals as stakeholders in environmental justice, stress relieving, beautiful

Case Study – The Solaire, NY

- **LEED-Gold**
- **Water**
 - On-site water treatment system recycles 100% of the building's wastewater for
 - use in cooling towers, toilets and landscape irrigation.
 - Plumbing is designed to accommodate graywater separation.
- **Energy**
 - Large exterior windows and high ceilings optimize daylighting.
 - Lamps dim automatically.
 - Sensors control electric lighting.
 - High-performance windows and doors

Case Study – The Solaire, NY

- 75% of the open roof area is planted
 - cooling effect around the building
 - Drought-tolerant, wind-resistant, self-sustaining shrubs
 - adaptable to shallow soil depths between 6” and 18”.
- A water retention layer reduces stormwater velocity and volume.
- Stormwater runoff is collected in a 10,000-gallon basement storage tank with a sediment basin and treatment system and used for irrigating landscaping and operating the cooling tower.



Green Roofs work well in combination with the use of solar panels



Picture from: <http://www.worldchanging.com/archives/010211.html>,

Environmental Awareness (EACOYP)

- Local public elementary schools, such as: Madeline English School and Albert N. Parlin School.
 - After school green gardens program, using green roofs/walls at RiverGreen Technology Park
- Benefits:
 - Aligned with Mystic River Master Plan and Lower Corridor Strategy
 - Community engagement and outreach
 - Public access to recreational area
 - Additional Benefits
 - Environmental awareness,
 - Maintenance of green roofs/walls
 - Greater sense of community ownership for youth
 - Cost effective/Long term sustainability

Community Leader

- The Park has a unique opportunity to demonstrate how sustainable development practices can further local development, protect the environment, and beautify any community.

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