Performing at a Higher Level: Healthy Buildings For Your Campus

October 26, 2017
Agenda

1. Sustainability on campus
2. Practical application of sustainability on a Georgia Campus
3. Cutting edge strategies for sustainable health and wellness
According to the Princeton Review, 91% of survey respondents said they take environmental concerns into account when selecting their college or university.
A building that integrates and optimizes all major high-performance attributes, including energy efficiency, durability, life-cycle performance, and occupant productivity.
Health - Defined

A state of complete physical, mental and social well-being not merely the absence of disease.

- World Health Organization
GREEN BUILDINGS FOR EVERYONE WITHIN THIS GENERATION
The Fitbit for your building.
• State of the art reporting platform
• Real-time performance metrics
• Benchmarking against industry peers
• Establish baseline for future operational improvement
Ongoing, real time tracking and reporting of efficiency and sustainability metrics

What gets measured gets improved
POTENTIAL

ACADEMICS
- Affordability
- Accessibility
- Student retention
- Graduation rates
- Program differentiation
- Career readiness
- Employability
- Career pathways

OPERATIONS
- Deferred maintenance
- Limited staff resources
- Human experience
- Energy
- Carbon
- Water
- Waste
OPPORTUNITY

ACADEMICS

- Affordability
- Accessibility
- Student retention
- Graduation rates
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- Career readiness
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X

OPERATIONS

- Deferred maintenance
- Limited staff resources
- Human experience
- Energy
- Carbon
- Water
- Waste
LEEDLAB

» Identify a project on the campus

» Educate students on the principles of LEED

» Create project team

» Implement LEED EB

» Make submissions to GBCI

» Pursue a LEED AP Credential

» Project is certified by GBCI
LEED® Lab™

BY THE NUMBERS

January 2014 – June 2017

# of institutions offering course: 25
# of students: 1,000+
# of disciplines represented: 40
DISCIPLINES ENGAGED IN LEED® Lab™

Working with the students has allowed us to gain an outside perspective that has proven beneficial to evaluate our plans and processes, to rethink some applications and to put our monitoring efforts into a working document that can be modified as needed and tracked to obtain measurable data.

Chris Vetick, Assistant Director of Grounds and Fleet
The Catholic University of America, U.S.
“The ability to work with students from varying disciplines, apply critical thinking skills and engage in a professional project that improves our university was very rewarding. [LEED Lab] has been my favorite course at NC State.”

Jacob Seyle, student at North Carolina State University, U.S.
Located in Decatur, GA
Founded in 1889

Population
• 950 students
• 350 faculty/staff

Footprint
• 30 buildings – 1,000,000 sq ft.
• 100 acre campus
• 2,000 trees
LEED Lab with Kennesaw State University

Largest number of environmental residents since beginning the program

All three theme houses connected to sustainable food

Interns for 2016-2017 & 2017-2018 from these majors: math (3), physics (2), chemistry (1), sociology (1)
Build Internal Support
Find Visible, Cost Neutral Project
Find the Right Fit for Implementation & Financing

- Assess options
- Gather building data
- Find broad-based interest & support

For Agnes Scott
- Donor supported Green Revolving Fund
- Geothermal HVAC
- Investor solar arrays
<table>
<thead>
<tr>
<th>Grants to Green GRF Projects</th>
<th>Bid Cost</th>
<th>Projected Cost Savings</th>
<th>Payback &amp; ROI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lighting &amp; Electrical</td>
<td>$475,000</td>
<td>$93,600</td>
<td>5.1</td>
</tr>
<tr>
<td>Water Usage</td>
<td>$155,000</td>
<td>$41,900</td>
<td>3.7</td>
</tr>
<tr>
<td>HVAC, Mechanical</td>
<td>$449,000</td>
<td>$77,500</td>
<td>5.8</td>
</tr>
<tr>
<td>Grants to Green Total</td>
<td>$1,079,000</td>
<td>$212,900/yr</td>
<td>5.1 years, 19.7%</td>
</tr>
<tr>
<td>All GRF Projects</td>
<td>$1,351,000</td>
<td>$298,300/yr</td>
<td>4.5 years, 22.0%</td>
</tr>
<tr>
<td>Future GRF Projects: 2017-2018 &amp; beyond</td>
<td>Bid Cost</td>
<td>Projected Cost Savings</td>
<td>Payback: Number of years</td>
</tr>
<tr>
<td>----------------------------------------</td>
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<td>------------------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>Lighting &amp; Electrical</td>
<td>$120,350</td>
<td>$19,518/yr</td>
<td></td>
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<tr>
<td>Water Usage</td>
<td>$22,500</td>
<td>$5,241/yr</td>
<td></td>
</tr>
<tr>
<td>HVAC, Mechanical</td>
<td>$310,000</td>
<td>$69,500/yr</td>
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<tr>
<td>TOTAL future projects</td>
<td>$452,850</td>
<td>$94,259/yr</td>
<td>4.8</td>
</tr>
<tr>
<td>Previous total of all GRF Projects</td>
<td>$1,351,000</td>
<td>$298,300/yr</td>
<td>4.5</td>
</tr>
</tbody>
</table>
Campbell Hall Renovation

1950s Science Building
Converted to ½ residence hall & ½ academic space
LEED Gold certification
Geothermal HVAC
Solar Arrays

Five Completed Projects To Date

238 kw

Science Center 20.7kw
Facilities Roof 100kw
Parking Deck 92.72kw
Observatory Roof 6kw
Soccer/Tennis Court 18.59kw

Training student intern to complete FY 2016-2017

Propose annual GHG with intern selected by faculty

Fellow updating Climate Action Plan

- Set new targets for efficiency upgrades & renewables
- Address offset options
- Confirm climate neutrality by 2037
Agnes Scott College – Annual Carbon Emissions Per Capita

<table>
<thead>
<tr>
<th>Year</th>
<th>MT eCO2</th>
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<tbody>
<tr>
<td>2011-12</td>
<td>8.0788</td>
</tr>
<tr>
<td>2013-14</td>
<td>7.9446</td>
</tr>
<tr>
<td>2014-15</td>
<td>7.5557</td>
</tr>
<tr>
<td>2015-16</td>
<td>7.3302</td>
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</tbody>
</table>
Achieving Efficiencies

- Solar Ready Design
- Iterative Energy Modeling process to guide design decisions
- Storm Water Management
- Native Landscaping
- Local/Reclaimed Materials
- Storage Space for students to store reusable goods
**ASHRAE 189.1**

**High-Performance Green Building Design**

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<tr>
<th>Feature</th>
<th>Brief Description</th>
<th>Benefits to Campus</th>
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<tr>
<td><strong>Integrative Design Process</strong></td>
<td>Early collaboration among representatives of each stakeholder and participating consultant on the project.</td>
<td>Develop cost savings and elegant solutions through a collaborative process.</td>
</tr>
<tr>
<td><strong>Commissioning</strong></td>
<td>Third Party review of building design and construction to ensure owner’s project requirements are met. Testing of equipment prior to occupancy.</td>
<td>Achieve goals of the project and identify risks during construction. Deliver a functional building with fewer “day one” issues. Reduce contractor call backs. Provide a comfortable and safe environment for students and staff.</td>
</tr>
<tr>
<td><strong>Water Efficiency</strong></td>
<td>Use efficient irrigation and high performance plumbing fixtures</td>
<td>Conserve resources, save money, reduce maintenance costs.</td>
</tr>
<tr>
<td><strong>Energy Efficiency/ Renewables</strong></td>
<td>Establishes best practices for lighting and HVAC efficiency. Sets standards for building envelope that go beyond 90.1</td>
<td>Conserve resources, save money, reduce maintenance costs, improve thermal comfort.</td>
</tr>
<tr>
<td><strong>Indoor Air Quality</strong></td>
<td>Promotes human health by requiring use of air filtration and low-emitting paints, adhesives, and sealants</td>
<td>Promotes student and staff health and wellness. Improved indoor air quality is shown to improve cognitive performance (Harvard Study).</td>
</tr>
</tbody>
</table>
The nutrition label for your building
Why WELL?

- Americans spend approximately 90% of their time indoors
- WELL focusses solely on the people in the building
- Attracting and retaining quality student population
- Facilitating student productivity and achievement
- Promoting student health
## WELL Building Standard

*Optimize the indoor environment for human health and productivity*

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<tr>
<td><strong>Feature 54: Circadian Lighting Design</strong></td>
<td>Select lighting systems that follow the same pattern as natural daylight</td>
<td>Enhance mood and productivity by choosing lighting systems that benefit student sleep patterns</td>
</tr>
<tr>
<td><strong>Feature 88: Biophilia</strong></td>
<td>Include natural elements/patterns in the design</td>
<td>Nurture the innate human-nature connection within the project</td>
</tr>
<tr>
<td><strong>Feature 39: Processed Foods</strong></td>
<td>Limit sugar, promote whole grain foods</td>
<td>Promote healthy weight and reduce risk of diabetes</td>
</tr>
<tr>
<td><strong>Feature 84: Health and Wellness Awareness</strong></td>
<td>Provide a health and wellness library</td>
<td>Promote healthy literacy</td>
</tr>
<tr>
<td><strong>Feature 95: Stress and Addiction Treatment</strong></td>
<td>Provide programs for students to receive mental health counseling and guidance</td>
<td>Provide students with tools to manage stress and anxiety</td>
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Circadian Lighting
WELL Building Standard
WELL Building Standard
WELL Building Standard
WELL Building Standard
Getting Started…
High Performance, Wellness on your campus

- Set your building up in ARC
- Start a Green Revolving Fund
- Incorporate ASHRAE 189.1 into your campus standards
- Pick 10 wellness features to implement on your next building
Open Discussion

Question + Answers
Thank you