**Greening the world, one structure at a time:**
**Case Study of a the Sweetwater Creek State Park Visitor Center in Douglas County, GA**

**Short Memo 2**
**Ted Maclin**

**Ecology 8710**

## Background

Today's "green" buildings, designed to have minimal ecological impact at local, regional, and global scales, are in many respects products of the global sustainability movement described under the United Nations' Agenda 21 in 1992. While Agenda 21 was not the first articulation of the sustainability concept, its adoption marked a sea change in policy, leading to increased public awareness and a mainstreaming of environmentalism—making sustainable construction not only desirable in the public eye but also economically feasible.

Internationally, the efforts of the United Nations regarding construction have been directed largely toward the International Initiative for a Sustainable Built Environment (iiSBE) through the United Nations Environment Program (UNEP) (Eubank 2005). The iiSBE is also supported by the International Council for Research and Innovation in Building and Construction (CIB), who have published their own Agenda 21 for Sustainable Construction (CIB 1999). The work of the iiSBE and CIB have been largely in network building and education, and they remain relatively undiscussed in the US.

In the United States, green building focus has been tied to LEED (Leadership in Energy and Environmental Design) certification, developed and administered by the US Green Building Council (USGBC). In 1998, USGBC founder David Gottfried announced the development of the World Green Building Council (WorldGBC) while in Nagoya, Japan at the opening of Japan Green Building Council. The WorldGBC is a federation of national GBCs (including the US, Japan, UK, Australia, Canada, United Arab Emirates, India, Mexico, New Zealand, and Taiwan) forming a parallel track to the efforts of the iiSBE and CIB and focusing on LEED certification in each home country.

LEED certification is a point-based system based on site sustainability, water efficiency, air and energy impacts, use of recycled materials and renewable resources, improvement of indoor air quality, and environmentally friendly innovation in the design process (US Green Building Council 2000). Certain certification items, such as erosion control during construction and collection of recyclables, are prerequisites for certification. Others, such as monitoring of $CO_2$ output, are optional credits toward the final point score leading toward a specific level of certification, from LEED Certified through LEED Platinum (see Table 1). The LEED rating system is unique in that it was developed extragovernmentally through the construction industry. It has become increasingly widespread and has the possibility of significanly impacting building construction in the US (Augenbroe and Pearce 2000).

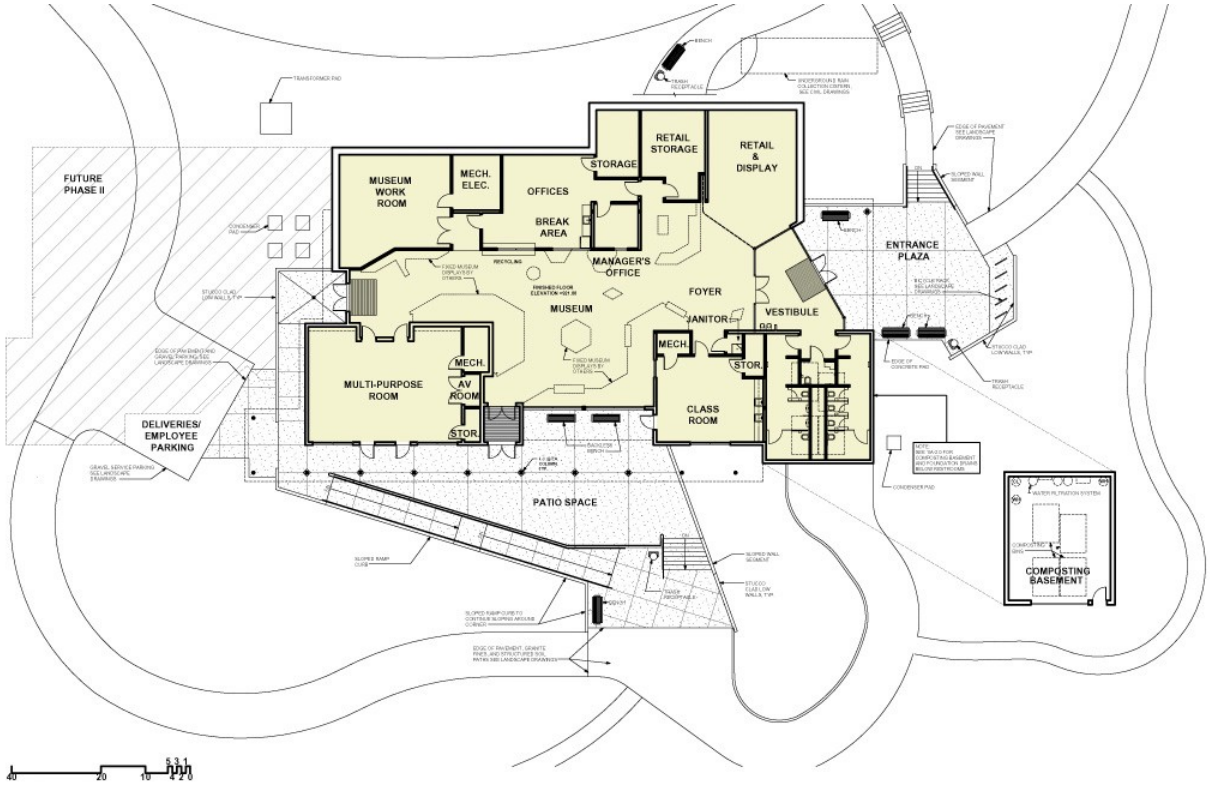


*Figure 1: The Sweetwater Creek Visitor Center, from southface.org*

| **LEED Green Building Certification Levels** |
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| LEED Certified = 26 - 32 Points<br>LEED Certified Silver Level = 33 - 38 Points<br>LEED Certified Gold Level = 39 - 51 Points<br>LEED Certified Platinum Level = 52+ Points |
| ***Table 1:*** *US LEED certification levels* |

**The site: Sweetwater Creek State Park**

Located just 30 minutes from downtown Atlanta, Sweetwater Creek State Park covers 2549 acres, including a 215-acre lake, 9 miles of hiking trails, picnic shelters, canoe rentals, and interpretive programs such as wildflower hikes and tours of the Civil War-era New Manchester textile mill. The presence of Native American archaeological sites strengthened the case for protecting the land in the area of the current park, and in 1972 creation of the park was authorized by the State Legislature.

Through the 1970s and 1980s, park administrators called for the creation of a park orientation center for visitors. During the 1990s a group called the Friends of the Sweetwater Creek State Park, Inc. began lobbying and fundraising for this center. The state of Georgia set aside $1.5 million, with the remaining $500,000 to come from local fundraising. By 2004, the project was fully funded. (http://friendsofsweetwatercreek.org/center.htm). Although the visitor center was originally planned to achieve LEED Silver certification, that goal was amended when developers realized that they could reach Platinum certification and still remain within their budget (**Hodgdon 2007).**

**The Sweetwater Creek State Park Visitor Center**

*Figure 2: Solar Array, Sweetwater Creek Visitor Center, from southface.org*

The visitor center at Sweetwater Creek State Park was designed through an integrated process involving engineers, architects, landscape architects, and other consultants working collaboratively to achieve LEED goals, using the LEED scorecard as a guide (Freedman 2006.) In addition to the low overall cost of construction, the building was designed with other cost saving measures in mind, including a rainwater reuse system which will reduce water use, interior photocells to reduce electric needs, and a south-facing glass and glazing surface with sunshades to reduce costs for heating and lighting—all of which will reduce the annual operating costs of the building, providing further savings. Other green building features of the visitor center can be seen in Table 2.

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| **Sustainable Sites** |
| There is no post development increase in stormwater discharge and the detention facilities provide adequate treatment for suspended solids and phosphorus. |
| Light colored impervious surfaces and a vegetated roof minimize the heat island effect. |
| **Water Efficiency** |
| No potable water is used for irrigation. |
| Water use has been reduced by 77 percent. |
| **Energy and Atmosphere** |
| The building is 51percent more energy efficient than a standard building. This includes 20% of energy needs that are derived from a renewable energy source. |
| **Materials and Resources** |
| A construction waste management plan resulted in 80% of the construction waste being diverted from a landfill. |
| 14 percent of the building materials were salvaged materials |
| 13 percent of building materials had recycled content. |
| 33 percent of the building materials were manufactured within 500 miles and 25 percent of those materials were extracted within 500 miles |
| **Indoor Environmental Quality** |
| An Indoor Air Quality Management Plan during construction and prior to occupancy resulted in a clean and healthy interior environment. |
| All paints, adhesives, sealants and carpets contained low VOC levels. |
| 83 percent of the interior spaces receive natural light and 98 percent of the interior spaces have views to the outside. |
| ***Table 2:*** *Some green building features at Sweetwater Creek State Park (from Freedman 2006)* |

**Conclusions: lessons for other sites**

The Sweetwater Creek State Park Visitor Center is significant, not only because it was one of the first LEED Platinum certified buildings in the southeast, but because it reached that certification within its original budget. The final cost for the building project was "$1,973,647 including sitework and exhibits. The cost for the building only was $1,514,393 or $173 per square foot" (Freedman 2006). In addition to the cost effectiveness of the project, the collaboration of actors within the community, State, and commercial sectors enabled this project to move to fruition. Involvement of multiple partners allowed for both initial lobbying and eventual fundraising, and this type of partnership may be imitable by other sites where public projects and private interests are mutually supportive.

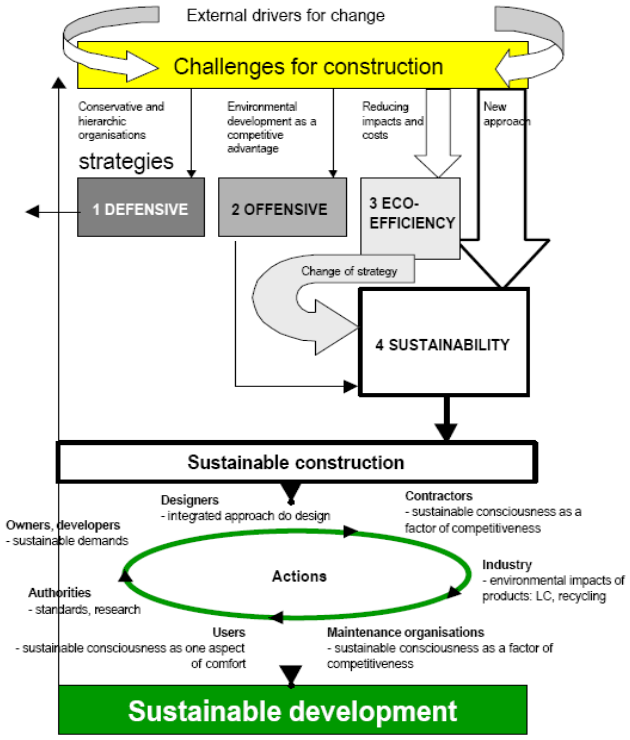


*Figure 3: Challenges in sustainable construction, from CID 2001*

One of the chief constraints on the implementation of sustainable construction is the cost (CIB 1999, see Figure 1), particularly the "first cost" or total cost to get the building up and running. While consumers generally recognize that the operating costs of a green building may be lower than that of a conventional construction, there is a continuing perception that the first cost is substantially higher. Factors contributing to this perception include the cost of LEED certification and the high public visibility of projects such as the Aspen Sundeck Restaurant ($425/square foot) and the Chesapeake Bay Foundation Headquarters ($208/square foot) (USGBC 2001, cited in Hanson, et al. 2003). Though green builders, meanwhile, continue to insist that LEED certification can be achieved for similar or less first cost than conventional construction (Hanson 2003, Rominger 2006), direct comparisons to conventional costs are difficult to generalize, given the extreme variety of construction types. Low-cost LEED certified buildings certainly exist—for example, the Pennsylvania Department of Environmental Protection office building ($78 per square foot)(USGBC 2001, cited in Hanson, et al. 2003)—and those costs are dropping as materials and LEED-trained construction professionals become more common.

It may seem, therefore, curious that more buildings are not built with energy saving, cost efficient, publicly welcome green standards in mind. Although the technical knowledge needed for achieving green buildings has been present for many years, and the economic benefits have become clear in recent projects such as the Sweetwater Creek State Park visitor center, purely technical and economic views fail to recognize the social nature of buildings. Even views recognizing less tangible benefits of green buildings such as "civic pride, urban regeneration, added value of good design, corporate identity, health and well-being, and educational attainment" (Macmillan 2006) posit humans as rational actors making decisions based primarily on broadly-defined economic welfare. Lighting, water flow, even the sound of a toilet's flush are, to some degree, socially determined phenomena. Seen through this lens, buildings are less concrete products of technology and economics and more a "material product of competing social practices" (Guy 2006). Successful construction of green buildings in popular public spaces may be one step toward changing those social habits to allow for the implementation of already existing green technology, but fruitful replication of green building successes will require looking into site-specific cultural contexts (Guy 2005) in addition to the development of checklists.

**References**


Augenbroe, G. L. M., and A. R. Pearce
2000 Sustainable construction in the USA: perspectives to the year 2010. Pp. 1. Atlanta, USA: College of Architecture, Georgia Institute of Technology.

CIB
1999 Agenda 21 on Sustainable Construction. L. Bourdieu, ed. Pp. 8. Rotterdam, The Netherlands: CIB (International Council for Research and Innovation in Building and Construction).

Ellis, Cliff
2002 The New Urbanism: Critiques and Rebuttals. Journal of Urban Design 7(3):261-291.

Eubank, Huston
2005 State of the World: High-Performance Building: Urban Land Institute (ULI).

Freedman, David
2006 Greening Georgia's State Parks : The Sweetwater Creek State Park Visitor Center. *In* igreenbuild.com. Pp. 2.

Guy, Simon
2005 Cultures of architecture and sustainability. Building Research & Information 33(5):468-471.

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2006 Designing urban knowledge: competing perspectives on energy and buildings. Environment & Planning C: Government and Policy 24(5):645-659.

Hanson, Mark, et al.
2003 On Making Green Buildings the Rule: Hoffman Corporation.

Hodgdon, Steve
2007 Gerding Collaborative Pushes Virtual Modeling to LEED Platinum Success, March 19, 2007: AECnews.com. http://aecnews.com/articles/2298.aspx.

Kibert, Charles J.
2003 Green buildings: an overview of progress. Journal of Land Use and Environmental Law 19:491-502.

Lorch, Richard
2005 Sustainable development and regionalism. *In* Building Research & Information. Pp.

393-396.
Macmillan, S.
2006 Added value of good design. Building Research & Information 34(3):257-271.
Rominger, Atticus
2006 Architects Prove Green Building Smart and Cost Effective in Platinum LEED Design. Pp. 3. Atlanta, GA: Cristina Anderson & Company, Inc.
US Green Building Council
2000 LEED Green Building Rating System : Leadership in Energy and Environmental Design. Pp. 25. Washington, DC.
US Green Building Council
2001 LEED Training Workshop Notebooks for Madison, Wisconsin on December 6, 2001 and Milwaukee, Wisconsin on May 22, 2001. Washington, D.C.
Vellinga, Marcel
2005 Anthropology and the challenges of sustainable architecture. Anthropology Today 21(3):3-7.