

***A Case Study of the Sustainable Sites Initiative (SITES):  
Will Municipalities Embrace SITES to Guide Future Development?***

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## *Abstract*

The Sustainable Sites Initiative (SITES) is attempting to become the benchmark certification for sustainable landscape development in the United States (Sustainable Sites Initiative 2009a). Currently in pilot, the SITES 2009 Guidelines and Performance Benchmarks are expected to be revised by November 2013, at which time SITES will begin open enrollment.

In 2009, Sarasota County, Florida converted a capped and closed landfill into a public park, Rothenbach Park. This park is home to a long list of sustainable features and is the winner of a 2010 American Academy of Environmental Engineers (AAEE) Excellence in Environmental Engineering Award in Sustainability (PBS&J 2010).

Through a case study of Rothenbach Park, this study attempts to determine if SITES adequately measures landscape sustainability and if SITES will be attractive to municipal policy makers as a guide for green development. The case study included a SITES score of Rothenbach Park using the 2009 SITES Guidelines and Performance Benchmarks. Input from six landscape sustainability experts, public records, and information provided by four Sarasota County officials involved with the development of Rothenbach Park were used to prepare the score.

While Rothenbach Park scored well (estimated at a two star rating), there were areas for potential improvement, and recommendations are provided for improvement to park and county sustainable landscape practices.

Feedback from Sarasota County officials about SITES was generally positive. The consensus was that SITES is an excellent tool for assessing landscape sustainability and would be useful as a tool for guiding development. However, in a time of limited local government resources, it is going to be important for SITES to become an educational support resource for municipalities to embrace its guidelines. Recommendations are provided to further that goal.

Finally, communities like Sarasota County can benefit from SITES as a complement to existing sustainable development commitments. Potential policy tools to allow assimilation of SITES and its guiding principles into county land development are discussed.

## ***Introduction***

*Sustainability (def.) – the ability to meet the needs of the present without compromising the ability of future generations to meet their own needs* (World Commission on Environment and Development 1987).

### ***Why Sustainability Certification?***

Sustainability has been an important environmental buzzword since *Our Common Future* defined it over 25 years ago. It is applied to a wide variety of human efforts, from supply chain dynamics and economics to forestry, watershed management, and energy efficiency and construction techniques, among many more. Sustainability has become an almost ubiquitous goal.

Rating and certification systems, or ecolabels, and have arisen in recent years to help define and standardize results when undertaking sustainability initiatives which include a triple bottom line approach – economic benefit, environmental stewardship, and social responsibility. There are currently at least 435 ecolabels in 197 countries worldwide, spanning 25 industry sectors (Ecolabel Index 2013).

In manufacturing, voluntary environmental management standards have arisen in the form of ISO 9001 and ISO 14001. More than 1.3 million businesses worldwide have adopted these third-party verified, environmental management plans. Businesses have benefitted from adopting these standards through improved operational performance, improvement of internal efficiencies, greater customer satisfaction, and a heightened status as “environmentally conscious” among customers, suppliers, and stakeholders. Additionally, environmental improvements from the adoption of ISO standards include: reduction of resource consumption, greenhouse gas emission reductions, and decreased institutional waste (Heras-Saizarbitoria and Boiral 2013).

Certification for sustainability also comes in the form of consumer ecolabels. Industry uses consumer labeling to ensure their products meet minimum standards of sustainability, helping to secure market advantage in an increasingly eco-friendly marketplace (Modl and Hermann 1995). Examples of consumer ecolabels are: Forest Stewardship Council, a label for sustainably

sourced wood and wood fiber products; Rainforest Alliance, a label that works with agriculture, forestry, tourism and carbon markets to preserve biodiversity, protect forests, and improve livelihood in developing tropical countries; and USDA Organic, which certifies food, alcohol, textile and cosmetic products as being produced using verifiable organic agriculture and production methods (Forest Stewardship Council 2013; Rainforest Alliance 2013; United States Department of Agriculture 2013).

Institutions are also using certification programs to improve sustainability performance. The Association for the Advancement of Sustainability in Higher Education (AASHE) developed the Sustainability Tracking, Assessment and Rating System (STARS) to promote sustainability practices and innovation on campus, improve inter-institutional sharing of advancements in sustainability and facilitate campuses in becoming models of sustainability on a national scale. STARS includes environmental, economic and social indicators in categories related to campus activities including: Education and Research, Operations, Planning, Administration and Engagement, and Innovation. The benefits institutions receive from participation in STARS are, like consumer ecolabels, recognition as an institution that values sustainability, but institutions also benefit from significant information sharing among members (Association for the Advancement of Sustainability in Higher Education 2013).

In the built environment, energy efficiency and carbon reduction strategies have received a great deal of attention. Established in 2000, the U.S. Green Building Council's (USGBC) LEED (Leadership in Energy and Environmental Design) certification program is likely the best-known example of a certification program in the built environment, with nearly 50,000 projects in 135 countries, and around 181,000 LEED accredited professionals (U.S. Green Building Council 2013). According to the USGBC website, LEED "is a voluntary, consensus-based, market-driven program that provides third-party verification of green buildings." LEED has multiple rating systems for specific types of projects. These include:

- New Construction
- Existing Buildings Operations and Maintenance
- Commercial Interiors
- Retail

- Homes
- Neighborhoods
- Schools
- Healthcare

Prerequisites and credits comprise the following categories:

- Sustainable sites
- Water efficiency
- Energy and atmosphere
- Materials and resources
- Indoor environmental quality

In addition to those core credit areas, LEED for Neighborhood Development also contains credits in: Smart location and linkage, Neighborhood pattern and design, and Green infrastructure and buildings; LEED for Homes contains: Location and linkage and Awareness and education; bonus credits are available for all rating systems in: Innovation in design or innovation in operations and Regional priority credits.

LEED certified buildings are designed to benefit the environment by reducing the amount of waste diverted to landfills, conserving energy and water, providing healthier interior environments when compared to traditional construction, and reducing greenhouse gas emissions (U.S. Green Building Council 2013). For example, when compared to traditional construction, a LEED Gold certified commercial building consumes 25% less energy and 11% less water, 34% lower emissions of greenhouse gasses, has lower maintenance costs, and higher occupant satisfaction (U.S. Green Building Council 2013a).

In addition to enjoying broad commercial and public exposure, LEED also enjoys a high level of governmental support. In the federal government alone, there are almost 16,000 LEED Certified projects, totaling over 109 million square feet, and around 1,400 LEED certified professionals working in federal government (U.S. Green Building Council 2013b). In addition to federal projects, some municipal jurisdictions have adopted green building standards or policies, many of which include LEED certification. These policies fall into three main categories: government requirements, requirements for private development, and incentive programs (Retzlaff 2009).

Clearly, LEED has been a significant success as a voluntary certification system and serves as an excellent example for how certification can gain wide acceptance.

### *Beyond the Buildings – Landscape Sustainability*

While improving the efficiencies of our industrial system and building stock is important, it is also imperative that the performance of the surrounding landscape is considered. Outside of the halls and walls of our lives, the landscape provides a kind of ecological life support system (United States Department of Agriculture Forest Service 2013). Two thirds of the world's natural resources have been impacted by human development and activities (Conservation International 2013).

The understanding of these impacts has led to the development of the concept of ecosystem services. Ecosystem services are the benefits that healthy and functioning ecosystems provide to the human population. There are four broad categories of ecosystem services (Millennium Ecosystem Assessment 2005):

- *Provisioning services* are goods and services provided by ecosystem for human use or consumption, such as food, water, wood, etc.
- *Regulating services* are the regulation of natural processes such as flooding, heat control, and water and air filtration by ecosystems.
- *Cultural services* provide nonmaterial benefits such as recreation, aesthetic and spiritual.
- *Supporting services* are functions which maintain all other services, such as nutrient cycling, soil formation, and primary production.

All ecosystems provide these benefits to humans and society, to one degree or another. Very rich ecosystems such as tropical rainforest provide an incredible wealth of ecosystem services, while highly developed and damaged urban ecosystems provide little. Human impacts upon ecosystems then, by extension, impact the ecosystems services upon which life survives. This is the essence of why sustainability efforts are needed for human development in the landscape.



The urban landscape has received a great deal of attention regarding the need for planning that takes ecology and ecosystem services into account (Appu 2012; Niemela et al. 2010; Deng, Cai, and Li 2012; White and Ellis 2007). However, our urban footprint has caused a significant loss in open space and high quality agricultural land, requiring that sustainable development take into account not only the impact of urban, suburban, and exurban landscape development, but the impacts upon entire ecoregions (ASLA 2013).

With such a broad and complex set of challenges, landscape sustainability by necessity must take a holistic view of sustainability.

The need for improvement of ecosystem services in developed areas has brought about several recent attempts to define what sustainability looks like in the landscape. In the academic realm, there has been an elegant framework called the “Humane Metropolis” that examines how science, culture, politics, and people can be brought together to forge sustainable places (Pickett et al. 2011), as well as a more detailed discussion of six points, or the “Six Es”, involved in landscape sustainability: Environment, Ethics, Equity, Experience, Economy, and aEsthetics (Musacchio 2009).

The American Society of Landscape Architects (ASLA), has provided a working definition of sustainable landscapes for practitioners (ASLA 2013):

Sustainable landscapes are responsive to the environment, re-generative, and can actively contribute to the development of healthy communities. Sustainable landscapes sequester carbon, clean the air and water, increase energy efficiency, restore habitats, and create value through significant economic, social and, environmental benefits.

The challenge for practitioners has been to take those concepts and put them into practice.

Several programs designed to address landscape sustainability exist. The U.S. Environmental Protection Agency (EPA) has a voluntary, non-certification program called Greenscapes which is designed to help reduce natural resource usage and divert waste from landfills that is generated through landscaping. Greenscapes includes best practices for landscaping companies, government agencies, large-scale landscapes (such as golf courses and corporate

campuses), and homeowners in material selection, soil conservation, composting, water management, and pest management (US EPA 2013).

The National Wildlife Federation (NWF) has a Certified Wildlife Habitat program. The program is accessible to properties ranging from an apartment balcony to large farms, and encourages landscape development that is wildlife friendly. NWF certifies a property as a Wildlife Habitat when provided with examples of landscape feature that provide: food sources (such as feeders and native plants), water sources (like natural ponds, birdbaths, or created water features), cover (bird houses, rock piles, evergreen hedges), and places to raise young (nesting boxes, ponds, dense shrubs) (National Wildlife Federation 2013).

Audubon International's Signature Program is currently the most comprehensive program open for enrollment. In the Signature Program, Audubon International becomes involved with a land development project from the beginning and provides environmental education and conservation assistance from planning through long-term management of the project. The participants become certified upon an on-site review conducted by Audubon International staff after initial completion of the project. Continuing audits are required for re-certification every third year after initial certification (Audubon International 2013).

While each of the above programs has merit in their own right, there is not currently a rigorous, comprehensive platform for certification of sustainable landscape development which offers third-party verification.

### *The Sustainable Sites Initiative (SITES)*

The Sustainable Sites Initiative (SITES), is a partnership of the American Society of Landscape Architects, the Lady Bird Johnson Wildflower Center and the United States Botanic Garden, and, having full support of the USGBC, is attempting to become the nationally accepted benchmark for sustainable landscape development in the United States (Sustainable Sites Initiative 2009a).

SITES has developed a holistic approach to landscape sustainability that is designed to translate across regions, be accessible and practical for practitioners while at the same time maintaining verifiable scientific rigor. Each of the three columns of sustainability is addressed in the SITES

guidelines, as well. Not only are environmental improvements and economic viability important in the rating system, but SITES also maintains guidelines addressing social responsibility and equity. This approach has ten guiding principles (Sustainable Sites Initiative 2009b):

- *Do no harm* – Changes to the site should not degrade adjacent landscapes. Projects on previously developed or disturbed should be given preference. Promote regeneration of ecosystem services through sustainable design.
- *Precautionary principle* – Caution should be used to avoid decisions that may cause risk to the health of both humans and the environment. Consider every alternative, including inaction, and be aware of effects on all potential stakeholders.
- *Design with nature and culture* – Designs should respect local, regional and global contexts and be adaptable to environmental, economic and cultural conditions.
- *Use a decision-making hierarchy of preservation, conservation, and regeneration* – Enhancing and replicating ecosystem services should guide the preservation of existing environmental features, regeneration of lost ecosystem services, and the conservation of resources in a sustainable fashion.
- *Provide regenerative systems as intergenerational equity* – Future generations deserve to be endowed with a sustainable environment which contains regenerative systems and resources.
- *Support a living process* – Use adaptive management to respond to changes in environment and demographics. Continuously reevaluate assumptions.
- *Use a systems thinking approach* – Respect the interconnectedness of all aspects of an ecosystem. Understand that there exists an essential relationship between human activity and ecosystem function. Work to integrate an approach to development that values these truths.
- *Use a collaborative and ethical approach* – Ethics and long-term sustainability should be encouraged through open dialogue between all stakeholders.
- *Maintain integrity in leadership and research* – Transparency should be maintained at all times. Leadership should be participatory in nature and should emphasize technical rigor and timely communication of new findings.
- *Foster environmental stewardship* – The responsible management of healthy ecosystems provides for an increase in the quality of life for both present and future generations. This ethic of environmental stewardship should be fostered in all development efforts.

SITES adopted its first set of guidelines in 2009 and began an evaluative pilot program. In the spring of 2012, SITES officially certified the first projects from the pilot group which had met all the requirements and intends to open the program in 2013. There are currently 15 projects out of the over 150 involved in the pilot projects which have received certification (Sustainable Sites Initiative 2012). The requirements for SITES certification include prerequisites and credits in the following areas (Sustainable Sites Initiative 2009a):

- Site Selection
- Pre-Design Assessment and Planning
- Site Design – Water
- Site Design – Soil and Vegetation
- Site Design – Materials Selection
- Site Design – Human Health and Well-Being
- Construction
- Operations and Maintenance
- Monitoring and Innovation

There are a total of 15 prerequisites and 250 possible points. SITES has a four star rating system. In order to receive certification, a project must meet all of the prerequisites and receive a minimum of 40% of the possible points (100). Certification levels are:

- One Star – 40% or 100 points
- Two Stars – 50% or 125 points
- Three Stars – 60% or 150 points
- Four Stars – 80% or 200 points

According to Danielle Pieranunzi, Director of the Sustainable Sites Initiative, SITES is currently in negotiations with the Green Building Certification Institute (GBCI) to become a third-party verifier of SITES projects (Pieranunzi 2013). GBCI also audits LEED projects.

### *Sarasota County and Rothenbach Park*

Sarasota County, Florida (highlighted in red at right) is located in southwest Florida along the Gulf Coast. The County's population is predominantly white and middle-class, with higher than average education and income levels (Sarasota County 2012a). In 2006, the County adopted its "Roadmap to Sustainability" (Roadmap) as a framework to guide future development and restoration.



The Roadmap defines sustainability as follows: "Within Sarasota County, we understand sustainability to mean stewardship of all our resources in such a way that we can meet the basic human need for a quality place to live today and leave a legacy of enhancement for future generations". It was adopted after a series of town hall-style "Community Conversations" in which policy makers gauged public opinion on how to advance the county's future development and found significant public support for sustainability (Sarasota County 2006).

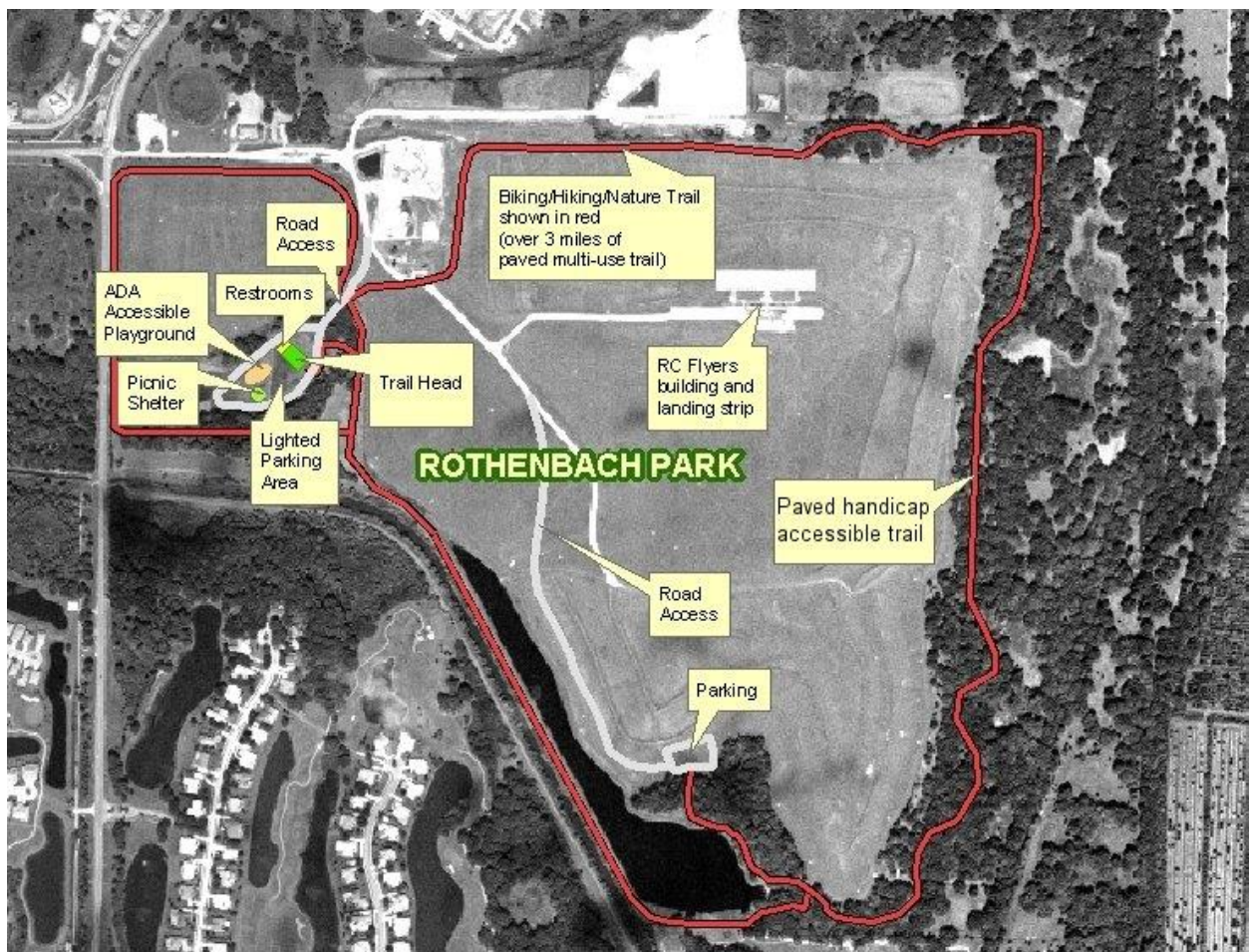
The County has made many commitments to sustainable growth and development, including Environmentally Preferable Procurement, greenhouse gas emission inventory, Low Impact Development, alternative energy development and LEED certification in government buildings, among others (Sarasota County Government 2008). The Roadmap was developed in cooperation with local business leaders, the University of Florida, Florida EPA, Florida Green Building Alliance, the Audubon Society, as well as active local community organizations and many other interested parties (Sarasota County 2006).

One of Sarasota's sustainable public projects serves as a case for this study: Rothenbach Park.

Rothenbach Park is located on the former Bee Ridge Landfill. According to documentation provided by Sarasota County Parks and Recreation, the Bee Ridge Landfill was open in 1970 and accepted approximately 250,000 tons annually when in operation. It stopped accepting trash in 1998 and was officially capped and closed in 2000. The cap consists of an impervious plastic

liner overlaid with two feet of engineered soil and a layer of sod. The entire landfill is surrounded by a slurry wall of bentonite clay 2.5 feet wide which extends down to native, undisturbed soil and acts as a barrier, protecting the groundwater in surrounding areas. A series of monitoring wells dot the site which are used to monitor groundwater for chemical composition. A flaring system burns off methane that is captured from the decomposition of landfill materials. The entire Bee Ridge site is 450 acres, 220 of which is landfill.

County officials wanted to use the site as an example of how brownfield redevelopment could provide a public amenity. Planners decided upon a park model for the site, and a joint management agreement was agreed upon by the Parks and Recreation and Solid Waste Divisions of county government. Below is a conceptual diagram of what is now Rothenbach Park.



The light grey area above is the capped landfill. It is surrounded by native live oak hammocks, a slough (the dark area to the bottom of the picture) and abuts residential areas and a golf course. Due to the sensitive nature of the cap, very little activity is permitted on the cap itself, but a walking trail is located on the eastern section of cap which provides access to a 250kW solar array which is leased and operated by Florida Power and Light (FPL) and supplies electricity to the municipal grid. A local group of radio-controlled airplane hobbyists is allowed use of a designated site on the cap as well.

According to Anthony Bell, Project Manager who oversaw the development of the park, construction consisted of two, concurrent phases, beginning in 2008. The first phase involved the building of bridges and paving of approximately five miles of ADA accessible trails on the cap and through the hammocks, along with grading in and around where the pavilion was to be constructed, which included a bioretention pond. The second phase consisted of the construction of the pavilion and playground areas.

The design of the site includes an impressive list of sustainability features including, waterless urinals, all native planting, composite beams in place of timber, recycled content in most construction materials, on-site collection and treatment of storm water, among others (Sarasota County 2012b).

Named after a longtime director of Sarasota County Parks and Recreation, Walter J. Rothenbach, Jr., Rothenbach Park was opened to the public in 2009. In 2010, the park was awarded an Excellence in Environmental Engineering Award by the American Academy of Environmental Engineers (PBS&J 2010).

Site amenities include a picnic shelter, separate picnic tables and grills, two ADA playgrounds, public restrooms, and multi-use paved trails that are enjoyed by bicyclists, runners, birdwatchers, and nature lovers (Sarasota County 2012b). According to Lynda Eppinger, Park Naturalist who manages Rothenbach Park, the county provides quarterly bike tours and hiking tours, four summer camps annually, and the pavilion is reserved, on average, four times per month.

## *Objectives*

The first objective of this research was to take Rothenbach Park, a previously developed site which had sustainability at its core throughout the development process and has been independently recognized as having excellence in sustainability (PBS&J 2010), and prepare a SITES score for it. This was accomplished through a case study of the park which consisted of a site visit, collection of documentation regarding the park's development and operation, discussion with Sarasota County personnel that are familiar with the park's construction, maintenance and operation, and consultation with national experts in landscape sustainability that have been involved in the development SITES.

The second objective was to use the expertise of those individuals involved in the design, development, construction, and management of Rothenbach Park to determine if they view SITES as a useful tool for guiding future sustainable landscape development and for informing county policy regarding sustainable landscapes. Additionally, based on their experiences with other voluntary certification systems, such as LEED, how likely would they be to consider applying for SITES certification upon its release for open enrollment.

The third objective of this study was to gain an understanding of the utility of SITES for determining sustainability in municipal projects, assess its attractiveness to municipal decision makers, and prepare recommendations as to how SITES can become widely adopted and/or recommended by government officials. A set of ideas are presented for municipalities as to how SITES can be embraced through both seeking individual public project certification as well as implementation of SITES principles without necessarily applying for certification. Additionally, thoughts are provided as to how public entities can play a role in aiding market penetration and public awareness of SITES.

Fourth, for Rothenbach Park, recommendations were developed including discrete improvements to the park itself.



## *Methodology*

A case study of the design, functionality, maintenance and operation of Rothenbach Park was undertaken in order to supply background information on each of the nine areas of performance in SITES. This information was obtained through publicly available information, as well as through communication with park and county officials.

The preparation of SITES scoring was completed in consultation with landscape sustainability experts nationwide. They possess expertise in various performance areas of SITES, experience on SITES technical subcommittees, and in conducting scoring reviews of pilot projects. These were semi structured interviews in which the experts were asked questions directly related to SITES credits, submittal requirements, and relevant aspects of Rothenbach Park's sustainability performance.

The following experts were consulted for this project. Biographical information is available for each professional in Appendix A.

- Danielle Pieranunzi – Director, Sustainable Sites Initiative
- Dr. William Hunt – Associate Professor and Extension Specialist, Biological and Agricultural Engineering, Urban Stormwater Management, North Carolina State University
- Dr. Susan Day – Assistant Professor of Urban Forestry in the Department of Forest Resources and Environmental Conservation, Virginia Tech
- Dr. Fred Cowett – Post-doctoral associate, Department of Horticulture, Cornell University
- Dr. Kathleen Wolf – Research Social Scientist with the College of the Environment, University of Washington
- Ray Mims – Conservation and Sustainability, US Botanic Garden

Park and county officials contacted for this project included park planners, the project manager involved with the development of Rothenbach, the current Park naturalist and county sustainability manager. They were asked not only about points relating to SITES scoring, but

also about their experience with green development certifications in general, like LEED, and how they would view using something like SITES to guide future county development. The park experts consulted were (biographical information in Appendix A):

- Lynda Eppinger – Park Naturalist, Sarasota County Parks and Recreation
- Lee Hayes Byron – Sustainability Manager, Sarasota County
- Anthony Bell – Project Manager, Sarasota County
- Jessica Ritter – Parks and Recreation Planner, Sarasota County Parks and Recreation

Using case study materials, input from the above experts, and resources available through SITES, a score was developed for Rothenbach Park (see SITES worksheets in Appendix B). This score, along with information on SITES was provided to the above park experts, who were asked to consider the utility of the SITES program as a tool to guide future municipal development.

The views of both sustainable landscape and park experts were considered in developing recommendations for Rothenbach Park and SITES, as well as lessons learned from successful, and unsuccessful, public and private initiatives undertaken by institutions, government agencies and other certification bodies.

## ***Results and Discussion***

The SITES Guidelines and Performance Benchmarks contain the requirement for submittal documentation in support of each of the prerequisites and credits for which a project applies. In lieu of formal submittals prepared by county officials, any publicly available extant documentation regarding park development and operation and visual confirmation of elements necessary for some credits were utilized in scoring. In some cases clear answers were not possible. In those cases, discussions with Anthony Bell, Project Manager during the construction of the park, Lynda Eppinger, Park Naturalist responsible for park management, and Lee Hayes Byron, Sustainability Manager for Sarasota County were used to help determine credit eligibility. Any assumptions regarding scoring for Rothenbach Park are clearly outlined in the SITES scoring worksheets in Appendix B.

Based upon this study's subjective scoring, Rothenbach Park would likely receive a 2 Star SITES rating if it were to formally apply for certification and provide all necessary submittal documentation, receiving 135 of the possible 250 points, or 54%.

A detailed accounting of each prerequisite and credit score is provided in Appendix B. A brief summary of how the park scored in each of the performance areas is provided below:

- Site Selection – 16 of 21 possible points
  - The site's designation as a brownfield redevelopment in a populated area earned it points, but did not earn points due to lack of easy access via public or non-motorized transit.
- Pre-Design – Assessment and Planning – 4 of 4 possible points
  - Public consultation and a strong diversity of consulting scientist in the development process made for a perfect score.
- Site Design – Water – 16 of 44 possible points
  - The site does an excellent job of stormwater collection and treatment on site, but several possible credits center around wetland preservation or restoration which is not possible on this site.
- Site Design – Soil and Vegetation – 36 of 51 possible points
  - The park was exemplary in soil conservation and native plant communities. Points not awarded for reducing heating and cooling requirements of buildings, which was not an issue at the pavilion.
- Site Design – Materials Selection – 10 of 36 possible points
  - Construction on site earned points for reuse of materials and use of recycled content in materials selection. Points were missed due to lack of current building stock to maintain and/or reuse, and because there was no attention given to the sustainability practices of the material suppliers.
- Site Design – Human Health and Well-being – 19 of 32 possible points
  - The site does an excellent job of providing equitable access to the community and also scores well on providing beautiful places for exercise and mental restoration, addressing sustainability education on site, and having guided access

to the park. Points were missed due to lack of on-site support services (emergency phones, water stations) and because, as a former landfill, the site lacked historical or cultural significance. Also, during construction there was no Community Benefits Agreement (CBA) or Living Wage requirement with the contractors. A CBA is defined as, “an agreement made between the developer and coalition(s) of community organizations, addressing a broad range of community needs...” (Sustainable Sites Initiative 2009a).

- Construction – 13 of 21 possible points
  - Again, soil and vegetation conservation earned points. However, not having a formal plan for construction waste diversion or requirements for low-emission equipment cost points.
- Operations and Maintenance – 5 of 23 possible points
  - The county’s anti-tobacco campus policy and the existence of the solar array on site earned points in this area, however county maintenance practices do little to reduce emissions from maintenance equipment.
- Monitoring and Innovation – 16 of 18 possible points
  - The reuse, or “recycling,” of a capped landfill as a public amenity is certainly innovative and the careful planning involved with making the park a reality is an excellent example of sustainable development.

Overall, a two-star rating for the park is a significant achievement, given that Rothenbach was not part of the SITES pilot program. In fact, only three of the current SITES certified pilot projects have achieved above a two star rating (Sustainable Sites Initiative 2012). By that standard, Rothenbach Park and Sarasota County’s approach to development in this case has been excellent.

By design, SITES is a holistic program, designed to measure all aspects of sustainability. If Sarasota County wishes to achieve a level of sustainable landscape development in line with four-star SITES ratings, then county planners should consider the following recommendations:

- Work with developers and contractors to ensure greater supply chain sustainability and social benefits.
  - The chain of custody of materials used in construction activities can have a large impact on how sustainable a site is. In fact, chain of custody has been called “critical” to maintaining verifiable sustainability standards (Vlosky and Ozanne 1995). Contractors should be encouraged and/or specified to use only materials that come from sources using sustainable manufacturing techniques. One potential avenue to consider for ensuring sustainable sourcing of materials is to prepare a list of acceptable ecolabels for materials being used by contractors, such as FSC for wood products or USDA organic for plant material.
  - Careful consideration should be given to requiring contractors to pay a Living Wage during construction of county projects and to developing Community Benefits Agreements during such projects. Both of these tools have the potential to improve the welfare of the workers involved in creating projects, and enhance the positive impact the development can have in the community (Pollin and Luce 1998; Wolf-Powers 2010).
- Improve county maintenance routines and equipment.
  - Sarasota County has taken efforts to introduce cleaner-burning engines into county fleet vehicles (Sarasota County Government 2008) and should consider replacing or converting landscape maintenance equipment with reduced-emissions tools as replacements are needed. For instance, some institutions, such as the University of Louisville, have converted their mower fleet to propane-powered mowers, which use up to thirty percent less fuel and offer significant emission reductions (University of Louisville 2011). Replacing old, two-stroke equipment such as blowers and chainsaws with new four-stroke models is another effective way to reduce emissions from maintenance activities (Michigan State University 2013). Also, attention should be paid to when maintenance activities are conducted in order to minimize public exposure to equipment emissions and noise during peak use hours.

The general impression of SITES during the course of developing a score for Rothenbach Park was favorable. The metrics seem to align well with the goals the county had in developing the site in a sustainable fashion. However, opinion was mixed on how likely the county would be to adopt another certification program.

Sarasota County Park Planner, Jessica Ritter, admits that having a structured framework, such as SITES, to present at public meetings when considering projects, can be a valuable tool. Certification programs can provide greater credibility to the ideas being put forth, allowing discussion to move from attempting to reach high-level consensus on big-picture ideas to allowing for greater focus on more immediate details pertaining to the project at hand. Further, having a set of guidelines can help to add metrics to the county's sustainability goals. Ritter admits that there is a balance between how time-consuming submittals can be and how much utility planners receive.

Sustainability Manager for Sarasota County, Lee Hayes Byron, is responsible for facilitating the county's sustainability efforts and admits that there is a sort of "certification fatigue" at the county level. They are currently struggling to keep momentum going in their green building policy. They currently use LEED certification as a public building standard, but are re-evaluating how useful it is as a tool. Budget tightening and staff limitations have caused Byron to consider whether the county has the capacity to maintain the paperwork and submittal information needed for formal certification. Despite her reluctance to embrace a new certification system in the current political and economic environment, Hayes believes that SITES has great potential to inform public discourse around sustainable landscape development.

Every technical expert consulted for this project admitted that the 2009 Guidelines carried submittal requirements that were burdensome at worst or could, at best, benefit from greater clarity as to what the expectations were. Danielle Pieranunzi, SITES Director, admits that the biggest goal in the revised 2013 Guidelines was to make SITES "accessible and practical, but also rigorous and verifiable." Ultimately, SITES wants to ensure the program is approachable enough to encourage broad participation.

Based upon conversations with Sarasota County officials, the following recommendations may help SITES even reach into counties that are suffering from “certification fatigue”:

- Make the scoring system more user-friendly.
  - Sarasota County officials cited onerous submittal requirements as one significant barrier to applying for any certification. In discussions with SITES experts, this is an issue of which SITES is intimately aware and is working hard to ensure the rigor of the guidelines while cutting back on paperwork. The 2013 Guidelines will be an excellent test of how successful they were.
  - Consider simplifying the scoring system. LEED operates on 100 point system, which provides a familiar grading paradigm similar to the grade on a school exam. The existing 250 point system has the potential to be confusing.
- Become a significant resource for education about landscape sustainability.
  - Make public development professionals aware of SITES through training sessions that provide CEU credits and at professional conferences can help to bring the sustainability practices that SITES encourages into the public realm, whether the projects seek formal certification or not.
  - Make it known that SITES professionals are available to provide technical assistance on public projects, regardless of whether that individual project will initially apply for certification or not. Weary officials will initially be reluctant to embrace SITES without having some experience with guiding principles in action. In order to break down those walls, make technical support free and available.
  - Actively engage cooperative extension agents, county sustainability officers, and any other county agents that have direct public outreach responsibilities and offer brochures and other informational pieces for free download. Provide PowerPoint presentations that can be used in reaching out to the general public and landscape practitioners.

Sarasota County, with its Roadmap to Sustainability (Sarasota County 2006), has embraced a responsibility for sustainable development. SITES is a potential tool that any county can use to help achieve deeper sustainability when approaching development. In her article, *The Use of*

*LEED in Planning and Development Regulation: An Exploratory Analysis* (2009), Rebecca Retzlaff describes three possible categories of policy tools municipalities can utilize to adopt voluntary green building certification standards. These include: 1. Certification requirement for government development; 2. Certification requirement for private development; 3. Incentives for seeking certification. As was previously discussed, there is currently a level of hesitancy in government to implement certification requirements for projects. In light of that point, the policy tools that hold the most promise for SITES involve incentives.

The following is a list of potential policy incentives that could help counties like Sarasota embrace SITES while not necessarily directly requiring certification:

- Set goals for the number of private development projects that become SITES certified.
  - This has been used to encourage the development of urban gardens in Oakland, Seattle, Madison (WI), Saanich (British Columbia), and Seattle (Public Health Law & Policy 2008).
  - The following policies can be used in support of reaching private development goals:
    - Expedite permitting – Sarasota County already embraces this tool for LEED projects and requires. This is a very low-risk policy tool to encourage projects to consider SITES certification.
    - Waive permitting and inspection fees – This provides direct monetary incentive for pursuing certification.
    - Provide tax incentives for certified projects – A reduction in property taxes for certified properties provides economic incentive, but also acknowledges that sites developed in a sustainable fashion put less stress on public waste processing systems, decrease resource usage, pollute less, and provide societal benefits that justify such a reduction.
- Require knowledge of SITES guiding principles as part of county contractor licensing.
  - This does not require that contractors become certified professionals regarding the specific requirements of SITES or any other green building certification system, but by requiring high-level understanding of the principles of



sustainability, counties can ensure a knowledge base among its contractors that makes it more likely they educate their clients on sustainability and more likely they will seek certification.

- Consider requiring SITES for new development only.
  - Sarasota County already requires LEED Gold certification for new construction and Audubon International Signature Program certification and enrollment for new golf courses (Sarasota County 2006).

This paper will be submitted to both Sarasota County and SITES. It is hoped that both entities will consider the recommendations provided.

Sarasota County has a strong commitment to sustainability and SITES complements those commitments. SITES expands the reach of sustainable development beyond the halls of government to the local landscapes that make Sarasota County such a desirable vacation destination. Additionally, the social components of SITES ensure that projects do not simply improve the function of local ecosystems, but provide tangible benefits to county residents.

SITES has been incredibly helpful and responsive during the course of this study. Every expert consulted expressed genuine interest in the outcome of this paper and was enthusiastic and optimistic about the future of SITES. The recommendations provided here can help that enthusiasm reach out to decision makers and officials that will play a large part in SITES gaining the type of market impact that LEED enjoys.

## ***Conclusions***

*The gap between science and policy must be bridged and a dialogue established between researchers, policy makers and those actively changing the landscape – the planners, developers and landowners – with the common goal to generate sustainable landscapes. To achieve this, we may need to focus more effort on establishing such a dialogue, and less on development of new tools. (Dramstad and Fjellstad 2011)*

The Sustainable Sites Initiative is a new tool that has the ability to fill a gap in the conversation between policy, academia, and practitioner in pursuit of sustainable landscapes. When SITES

enters open enrollment it will be the only third-party verified, comprehensive voluntary landscape sustainability certification program in existence.

The case of Rothenbach Park in Sarasota County, Florida illustrates that sustainability-minded communities have the will and ability to create projects that meet the standards set forth by SITES. However, the political and economic realities that many of these communities face provide a challenge to the ability of SITES to achieve LEED-like penetration into municipal green development.

SITES is an effective measure of site sustainability that has appeal to planners and policy-makers at the municipal level. While policies requiring SITES certification may not happen immediately, the SITES has a great opportunity to make an impact on community dialogue regarding what a sustainable landscape looks like.

Broad participation on the municipal level can be achieved if SITES can provide adequate technical support, educational opportunities, and minimize onerous paperwork necessary for certification while maintaining adequate rigor. Municipalities can ensure SITES becomes meaningful through creative policy solutions that provide educational and financial incentives to the adoption of SITES principles.

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## *Appendix A: Biographies of Experts Consulted for the Project*

The following experts on the Sustainable Sites Initiative were consulted for this project:

- **Danielle Pieranunzi, LEED AP BD+C, Affiliate ASLA** – *Sustainable Sites Initiative, Director* – Danielle Pieranunzi is the Director for the Sustainable Sites Initiative™ (SITES™) – a program created to transform land development and management practices toward regenerative design. For the past six years, Danielle has worked closely with over 70 experts from across the country researching and developing comprehensive, science-based guidelines and criteria for high performance landscapes. A national, voluntary rating system was developed by SITES as the mechanism to promote and reward leadership in landscape sustainability. She is currently overseeing review of the 150-plus pilot projects from around the world that are testing the rating system and seeking to be certified as sustainable sites. Additionally, Danielle is working on the transition toward a third party certification system and development of a related education program. In the past, Danielle has also coordinated the Conservation Development program for the Lady Bird Johnson Wildflower Center, developing both symposia and educational materials to educate and inspire the public about environmentally responsible land development practices. Danielle is a LEED Accredited Professional (U.S. Green Building Council) and has a M.S. in Sustainable Design from The University of Texas at Austin and a B.S. in Business from Arizona State University.
- **Dr. Fred Cowett** – *Cornell University, post-doctoral associate, Department of Horticulture* – Dr. Cowett has a BA from Harvard College, and an MLA and Ph.D. from Cornell University. He is a member of the Soils Technical Subcommittee of the Sustainable Sites Initiative for whom he also reviews projects for certification.
- **Dr. Susan Downing Day** – *Virginia Tech, Assistant Professor of Urban Forestry in the Department of Forest Resources and Environmental Conservation* – Dr. Day holds a joint appointment in the Department of Horticulture. She teaches undergraduate and graduate classes in environmental landscape horticulture and urban forest ecosystem management and was instrumental in the development of the urban forestry curriculum at Virginia Tech and subsequent accreditation by the Society of American Foresters. Her areas of expertise include urban soils, soil/root interactions, stormwater mitigation, and tree preservation during construction. She serves as Associate Editor for the Journal of Forestry and for Arboriculture and Urban Forestry and as a subject-matter expert for the Sustainable Sites Initiative (SITES™)—a national initiative that has developed voluntary certification standards for sustainable site development and landscapes. Dr. Day is the 2010 recipient of the Early Career Scientist Award from the International Society of Arboriculture. Dr. Day has published more than 60 articles and book chapters on her areas of expertise and her research has appeared in a variety of scientific journals. She

has a B.A. in Philosophy from Yale University, a Master's Degree in Urban Horticulture from Cornell University, and a Ph D. in Forestry from Virginia Tech.

- **Dr. Kathleen Wolf** – *University of Washington, Research Social Scientist with the College of the Environment* – Dr. Wolf has been a key collaborator with the US Forest Service Pacific NW Research Station in the development of a program on Urban Natural Resources Stewardship. Since receiving her Ph.D. from the University of Michigan Dr. Wolf has done research to better understand the human dimensions of urban forestry and urban ecosystems. She has also worked professionally as a landscape architect and as an environmental planner. Kathy's studies are based on the principles of environmental psychology; her professional mission is to discover, understand and communicate human behavior and benefits, as people experience nature in cities and towns. Moreover, Kathy is interested in how scientific information can be integrated into local government policy and planning. She is a member of the Environmental Design Research Association, the International Society of Arboriculture, Society of American Foresters, the Transportation Research Board national committee on Landscape and Environment, the Washington State Community Forestry Council, as well as a technical contributor on human well-being to the Sustainable Sites Initiative, and Research Advisor to the TKF Foundation. Dr Wolf has presented her research throughout the United States, in Canada, Europe, Australia and Japan. An overview of Dr. Wolf's research programs can be found at [www.naturewithin.info](http://www.naturewithin.info); additional research findings on Green Cities: Good Health: [www.greenhealth.washington.edu](http://www.greenhealth.washington.edu)
- **Dr. William Hunt** – *North Carolina State University. Associate Professor and Extension Specialist, Biological and Agricultural Engineering, Urban Stormwater Management* – Dr. Hunt is an Associate Professor and Extension Specialist in North Carolina State University's Department of Biological and Agricultural Engineering department. Hunt holds degrees in Civil Engineering (NCSU, B.S., 1994), Economics (NCSU, B.S., 1995), Biological and Agricultural Engineering (NCSU, M.S., 1997) and Agricultural and Biological Engineering, (Penn State, Ph.D., 2003). Dr. Hunt is a registered PE in North Carolina. Since 2000, Hunt has assisted with the design, installation, and/or monitoring of over 90 stormwater best management practices (BMPs), including bioretention, stormwater wetlands, innovative wet ponds, green roofs, permeable pavement, water harvesting/cistern systems and level spreaders. He teaches 20-25 short courses and workshops each year on stormwater BMP design and function throughout NC and the US. Hunt is an active member of the American Society of Agricultural and Biological Engineers (ASABE), serving as NC Section President and as Past-Chair of the National ASABE Extension Committee. He is also a member of the American Society of Civil Engineers (ASCE), where he serves on the Urban Water Resources Research Council, the LID committee, and is co-chair of the Bioretention Task

Committee. He was chair of the 2nd National LID Conference held in Wilmington, NC, in March 2007. Locally, he is a member of the Neuse Education Team, NC Watershed Education Network and the NC Association of Extension Specialists.

- **Ray Mims** – *United States Botanic Garden, Conservation and Sustainability* - Ray oversees the ongoing development and implementation of sustainability efforts, conservation partnerships, and threatened plant collections at the United States Botanic Garden (USBG). Additionally he represents USBG throughout the development of the *Sustainable Sites Initiative (SITES)* and *Landscapes for Life*. Prior to joining USBG, he served as the Director of Horticulture at Denver Botanic Gardens, Director of Horticulture and Grounds at the Washington National Cathedral, and Horticulturist at the Atlanta Botanical Garden. After working as an engineer manager for the Dow Chemical Company, Mims returned to school in 1994 to study horticulture, a passion learned from his maternal grandmother. He also completed a Botanic Garden Management diploma at the Royal Botanic Garden, Kew.

Experts consulted with Sarasota County:

- **Lynda Eppinger** – *Sarasota County Parks and Recreation, Park Naturalist* - Lynda's childhood was spent out-of-doors, sparking a love for nature that has lasted a lifetime. After a long career in another field, she went back to college and received her Bachelor's Degree in Environmental Studies from Florida Gulf Coast University in December 2001, and embarked on a career centered on nature. She has served as a Park Ranger for the Florida Park Service, a Program Extension Agent with the University of Florida/Lee County Extension, and as a Park Ranger for Lee County. Currently, Lynda is employed as a Parks Naturalist with Sarasota County Parks and Recreation, and serves as the manager of Urfer Family Park and Rothenbach Park, two of the newest parks in the County. Her duties include , in part, customer service, land management, safety inspections, maintenance management, and administrative tasks related to park management. Her favorite part of the job is public outreach to increase awareness of Sarasota County Parks, and creating and delivering programs focused on nature interpretation and environmental education.
- **Lee Hayes Byron** – *Sarasota County, Sustainability Manager* – Lee Hayes oversees sustainability improvements within government operations and the efforts to create a sustainable community across Sarasota County. Among her responsibilities are promoting energy efficiency to residents and businesses, ensuring sustainability improvements in county facilities and fleet, employee education and legislative review. She previously worked in the county's environmentally sensitive lands program managing several of the county's preserves. Prior to coming to the county, Lee Hayes had four years of experience working on energy and climate change policy in



Washington DC as the Coordinator of the US Climate Action Network, a coalition of environmental organizations working to establish climate change policies at the state, federal, and international levels. Lee Hayes is a native of Sarasota.

- **Anthony Bell** – *Sarasota County Public Works, Project Manager* – Anthony was the project manager overseeing the construction of Rothenbach Park. Sarasota County Project managers provide comprehensive projects construction oversight monitoring and maintaining accurate compliance concerning engineering design, scheduling, cost estimations and contract documents for Sarasota Florida County Public works construction division including, but not limited to: Facilities Construction, Park Development Construction, Park and Facility planning and project management of all Capital Improvement Projects (CIP) for the Community Services division and the Road and Bridge Program. Direct supervision of engineering / Architectural firms consulting firms etc. involved in all projects as well as supervision of the General Contractor and all sub-contractors involved in an awarded CIP project together with the day to day administration and reporting and scheduling of such projects. Working with various agencies form Federal, State, local and surrounding Counties to ensure all regulations are followed during the construction process. Work also includes Engineering firm scope and price negotiations. Contractor changes order review and processing, procurement bid review, budget analysis, drawing review, contract review, environmental review, building inspection of existing county facilities, maintenance oversight, warranty oversight and permit reviews. Project final close-out and turnover to the proper entity/ department.
- **Jessica Ritter** – *Sarasota County Parks and Recreation, Park and Recreation Planner* - Jessica was born and raised in Silver Spring, Maryland and graduated with a Bachelor of Science degree (Geography and Environmental Planning) from Towson University in 1996. In 1996 she began her professional career as a planner working for the Maryland Department of the Environment Air Quality Planning Program with primary responsibilities including public outreach and education and coordination with local governments and Metropolitan Planning Organizations for the Baltimore and Washington area. In 1999, Jessica began working for Howard County Government (located in Maryland, between Washington, DC and Baltimore, MD) in the Environmental and Community Planning Program. She was instrumental in developing the General Plan 2000 and worked on community initiatives such as the Route 1 Revitalization Study and neighborhood revitalization projects. Jessica and her husband decided to relocate to Sarasota, FL after she was offered a job with Sarasota County Planning and Development Services in February of 2006. While gaining a better understanding of Florida politics and planning initiatives, she realized that planning for Parks and Recreation was a desirable area of County government. Jessica has worked

with Sarasota County Parks and Recreation since December of 2006. She has been instrumental in the development of several park concept plans, including Blackburn Point Park, Siesta Beach, Turtle Beach, Longboat Key Site and several others. Jessica plays an integral role in park capital improvement projects and also serves as a neighborhood liaison. Jessica is a Certified Park and Recreation Professional (CPRP) and a member of the Florida Recreation Park Association.

## Appendix B: SITES Scoring Worksheets for Rothenbach Park

The following was adapted for this project from a form provided by Ray Mims of the US Botanic Gardens.

### SITES Pilot Checklist - 2009 Guidelines & Performance Benchmarks

Rothenbach Park  
Sarasota County, Florida

Reviewed by Jesse Howley, MEM Candidate, Duke University

Yes No

135	68	<b>Project Totals (Estimates)</b>	<b>250 Possible Points</b>
<b>2 Stars (54%)</b>	<b>1 Star: 100 pts or 40%</b>	<b>2 Stars: 125 pts or 50%</b>	<b>3 Stars: 150 pts or 60%</b>
			<b>4 Stars: 200 pts or 80%</b>

Yes No

16	5	<b>• 1 Site Selection</b>	<b>21 Points</b>	<b>Notes</b>
Yes		<b>1.1 - Prerequisite:</b> Limit development of soils as prime farmland, unique farmland, and farmland of state wide importance	Required	The site's status as a redeveloped brownfield provides for this prerequisite.
Yes		<b>1.2 - Prerequisite:</b> Protect floodplain function	Required	The former landfill provided excellent floodplain protection and was monitored regularly both before and after closure.
Yes		<b>1.3 - Prerequisite:</b> Preserve wetlands	Required	The existing slough was protected by the landfill and the park was designed to maintain that protection.
Yes		<b>1.4 - Prerequisite:</b> Preserve threatened or endangered species and their habitats	Required	There are no known endangered species at the park.

10		<b>1.5 - Credit:</b>	Select brownfields or greyfields for redevelopment	5 or 10	As a capped and closed landfill, the site qualifies as a brownfield, qualifying it for the higher, 10-point credit.
6		<b>1.6 - Credit:</b>	Select sites within existing communities	6	The park is a formerly developed property and abuts a municipal golf course and residential areas on at least 75% of its perimeter.
	5	<b>1.7 - Credit:</b>	Select site that encourage non-motorized transportation and use of public transit	5	While the site is bicycle friendly and people do ride out to it, it is not located within easy walking/biking distance from a population center.

Yes No

4	0	<b>• 2 Pre-Design ~ Assessment &amp; Planning</b>		<b>4 Points</b>	<b>Notes</b>
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Yes		<b>2.1 - Prerequisite:</b>	Conduct a pre-design site assessment and explore opportunities for site sustainability	Required	The park is a direct result of asking how a former landfill could be used by the public and serve as an example of sustainability.
Yes		<b>2.2 - Prerequisite:</b>	Use an integrated site development process	Required	There was a diverse scientific staff involved in the project from soil and water engineers, city and park planners, ecologists and arborists.
4		<b>2.3 - Credit:</b>	Engage users and other stakeholders in site design	4	There were public hearings and outreach during the design & development of the park.

Yes No

16	19	<b>3 Site-Design ~ Water</b>		<b>44 Points</b>	<b>Notes</b>
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Yes		<b>3.1 - Prerequisite:</b>	Reduce potable water use for landscape irrigation by 50 percent from established baseline	Required	The selection of native & no-water grasses for the cap provides adequate potable water reduction for this prerequisite... although the redevelopment of the site from its brownfied condition does increase water use.
	5	<b>3.2 - Credit:</b>	Reduce potable water use for landscape irrigation by 75 percent or more from established baseline	2-5	There is no existing greywater or stormwater collection and reuse system.

	8	<b>3.3 - Credit:</b>	Protect and restore riparian, wetland, and shoreline buffers	3-8	There was no change in the average vegetated buffer width around the existing slough.
	5	<b>3.4 - Credit:</b>	Rehabilitate lost streams, wetlands, and shorelines	2-5	There was no restoration of previously altered wetlands on this site
10		<b>3.5 - Credit:</b>	Manage stormwater on-site	5-10	All stormwater from the capped landfill was contained on site. Additional retention was necessary and provided with development of the pavilion, qualifying for the highest point total
5		<b>3.6 - Credit:</b>	Protect and enhance on-site water resources and receiving water quality	3-9	The site contains vegetated swales and bioretention swales that effectively deal with on-site water to the 90% level. 95% is required for 8 points, 100% for 9.
1		<b>3.7 - Credit:</b>	Design rainwater / stormwater features to provide a landscape amenity	1-3	The retention area in the pavilion area is well planted and provides an interesting feature. However, since it does not retain water as consistently as envisioned, its aesthetic attributes are not as high as they could be. Enhanced access to the retention area would also help to raise its value.
	1	<b>3.8 - Credit:</b>	Maintain water features to conserve water and other resources	1-4	There are no water features on site.

Yes No

36 8		<b>• 4 Site-Design ~ Soil and Vegetation</b>		<b>51 Points</b>	<b>Notes</b>
Y		<b>4.1 - Prerequisite:</b>	Control and Manage known invasive plants found on-site	Required	County park employees and volunteers routinely manage invasives on site.
Y		<b>4.2 - Prerequisite:</b>	Use appropriate, non-invasive plants	Required	Minimal planting was done on site, plants that were added were either native or regionally adapted, non-invasives.

Y		<b>4.3 - Prerequisite:</b>	Create soil management plan	Required	The soils on site are highly engineered to protect the integrity of the landfill cap and the integrity of the soils in the live oak hammocks was carefully considered and planned for.
6		<b>4.4 - Credit:</b>	Minimize soil disturbance in design and construction	6	Novel approaches to pathway construction was used, including saw-cutting the path edges prior to excavation to minimize root zone disturbance. Very minimal disturbance was permitted around the landfill cap in order to assure its integrity - asphalt was poured on top of cap.
5		<b>4.5 - Credit:</b>	Preserve all vegetation designated as special status	5	The hammocks contain mature, old-growth live oak trees. Construction disturbance in and around the root zones was minimized. Less than 10% of the hammock area was developed or contained construction activity.
8		<b>4.6 - Credit:</b>	Preserve or restore appropriate plant biomass on site	3-8	Plant biomass on site was increased significantly. Prior to capping, the site was a landfill mostly bereft of plant life. Now, the cap is vegetated, adding 220 acres of vegetated land, raising the site Biomass Density Index from previously .36 to 2.96, qualifying for the highest credit value.
4		<b>4.7 - Credit:</b>	Use native plants	1-4	4 points were granted for 100% native plant material, although the grasses on the landfill cap are not 100% native, there was no viable option otherwise. Where possible, 100% were native.
5		<b>4.8 - Credit:</b>	Preserve plant communities native to the ecoregion	2-6	The native live oak hammocks were preserved. There is no habitat corridor connection to qualify for the sixth point.
	1	<b>4.9 - Credit:</b>	Restore plant communities native to the ecoregion	1-5	Although a case could be made for restoration of plant communities due to the addition of all native plants where possible, no points are given in this category.
	2	<b>4.10 - Credit:</b>	Use vegetation to minimize building heating requirements	2-4	The pavilion is not climate controlled.
	5	<b>4.11 - Credit:</b>	Use vegetation to minimize building cooling requirements	2-5	The pavilion is not climate controlled.

5		<b>4.12 - Credit:</b>	Reduce urban heat island effects	3-5	While not provided for in the credit options, I believe capping a heat and methane-producing landfill and vegetating the cap over 220 acres provides for significant heat island reduction. While this falls just short of the 60% requirement for hardscapes, I feel that the increase
3		<b>4.13 - Credit:</b>	Reduce the risk of catastrophic wildfires	3	The site design meets the Firewise construction recommendations at <a href="http://www.firewise.org">www.firewise.org</a> as required by the credit.

Yes No

10	16	<b>• 5 Site Design ~ Materials Selection</b>		<b>36 Points</b>	<b>Notes</b>
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Y		<b>5.1 - Prerequisite:</b>	Eliminate use of lumber from threatened tree species	Required	The pavilion was constructed using salvaged pine and oak.
	4	<b>5.2 - Credit:</b>	Maintain on-site structures, hardscapes, and landscape amenities	1-4	There was no existing building stock, so this credit does not apply.
	3	<b>5.3 - Credit:</b>	Design for deconstruction and disassembly	1-3	There is no evidence that the removal of building materials was planned for during development.
2		<b>5.4 - Credit:</b>	Reuse salvaged materials and plants	2-4	All excavation spoils were salvaged and reused on site. A few plants were removed and transplanted during construction, but not enough to account for 20% of used plant material and qualify for the higher point total.
2		<b>5.5 - Credit:</b>	Use recycled content materials	2-4	Cementitious siding, composite wood beams, and structural steel components all contain recycled material. Concrete used is 20% fly ash by weight. 40% of total material is necessary to achieve the higher point total.

	1	<b>5.6 - Credit:</b>	Use certified wood	1-4	There was no requirement for wood procurement according to Forest Stewardship Council principles and criteria.
6		<b>5.7 - Credit:</b>	Use regional materials	2-6	100% of materials were sourced within 500 miles of site, qualifying for the highest point total.
	2	<b>5.8 - Credit:</b>	Use adhesives, sealants, paints, and coatings with reduced VOC emissions	2	Volatile Organic Compound emissions were not taken into account when selecting building materials.
	3	<b>5.9 - Credit:</b>	Support sustainable practices in plant production	3	There was no requirement for consideration of growers' sustainability practices in plant procurement.
	3	<b>5.10 - Credit:</b>	Support sustainable practices in materials manufacturing	3-6	There was no requirement for consideration of suppliers' sustainability practices in materials procurement.

Yes No

19	7	<b>• 6 Site Design ~ Human Health &amp; Well Being</b>		<b>32 Points</b>	<b>Notes</b>
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1		<b>6.1 - Credit:</b>	Promote equitable site development	1-3	The county intentionally used local design/engineering and construction firms in the development of the park. There were no living wage requirements or Community Benefits Agreements involved to qualify for additional points.
3		<b>6.2 - Credit:</b>	Promote equitable use of the site	1-4	The county identified a need for bicycle trails and publicly-accessible outdoor space for gatherings, picnics, grilling, etc. which the pavilion provides. Park personnel provide 4 hiking programs per year, 4 bicycle tours per year and 4 summer camp programs per year.



4		<b>6.3 - Credit:</b>	Promote sustainability awareness and education	2-4	The park has a minimum of three interpretive signs describing its sustainability efforts (solar array, landfill cap & reuse, recycling). In addition, Sarasota County provides extensive educational and interpretive programming in both the Parks Department and in the Office of Sustainability that qualify for 4 points.
	2	<b>6.4 - Credit:</b>	Protect and maintain unique cultural and historical places	2-4	As a former landfill, the site does not qualify for cultural or historical designation.
3		<b>6.5 - Credit:</b>	Provide for optimum site accessibility, safety, and wayfinding	3	Rothenbach Park is fully ADA compliant and goes beyond by having all trails accessible to not only wheelchairs/other mobility devices, but all bridges are engineered to support emergency vehicles. In addition, clear sight lines, abundant natural lighting, and intuitive/directed wayfinding is present along with daytime public access (gate-restricted after dark), substantial landmarks, and distinct usage areas provide for both safety and ease of use.
	5	<b>6.6 - Credit:</b>	Provide opportunities for outdoor physical activity	4-5	Contained at the park are: a 5 mile, ADA accessible hiking/biking trail, playground sufficient for active play, workout stations along the trail, abundant ambient light and sight lines, and incredible access to vegetation along the trail, but lacks the required support services (i.e. water stations, emergency call boxes) to qualify for this credit.
3		<b>6.7 - Credit:</b>	Provide views of vegetation and quiet outdoor spaces for mental restoration	3-4	No noise abatement is necessary. The trails are beautiful and provide several stopping points for mental restoration in comfortable, naturally sheltered areas. There are no regularly occupied buildings to qualify for the additional point.

3		<b>6.8 - Credit:</b>	Provide outdoor spaces for social interaction	3	The pavilion at the park contains a variety of seating options and can accommodate groups of 60 or more. It provides picnic/dining areas, playground, available food service area. As with all of the park, beautiful vegetated areas are within easy sight.
2		<b>6.9 - Credit:</b>	Reduce light pollution	2	The park is a LZ1. While there is no lumen ranking data available, points are awarded due to the day use nature of the park, requiring little to no nighttime illumination.

Yes No

13	6	<b>• 7 Construction</b>		<b>21 Points</b>	<b>Notes</b>
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Y	<b>7.1 - Prerequisite:</b>	Control and retain construction pollutants	Required	Little site disturbance was involved in the construction of the pavilion or walkways and, since the landfill cap is engineered and highly restrictive of the type of activities that can take place on it, it was of the utmost importance to control soil & sedimentation erosion.
Y	<b>7.2 - Prerequisite:</b>	Restore soils disturbed during construction	Required	Soils in the live oak hammocks were minimally disturbed due to the addition of the asphalt pathways: path edges were saw cut prior to excavation to reduce disturbance of tree root zones and only a small area of hammock (<10%) was disturbed. This qualifies as a Vegetation and Soil Protection Zone. Around the pavilion, no soil was imported as spoils from the creation of the retention area were used for fill as needed.

8		<b>7.3 - Credit:</b>	Restore soils disturbed by previous development	2-8	The highly engineered nature of a capped landfill prevents restoration of those soils to a "natural" state, however, in discussion with SITES, it is reasonable to assume significant benefit above the landfill baseline and, with over 200 acres of landfill cap, it is also reasonable to award 8 points for restoration and revegetation of >5 acres of severely disturbed soil.
	3	<b>7.4 - Credit:</b>	Divert construction and demolition materials from disposal	3-5	While the park certainly took great care to avoid the disposal of excavation spoils, there was no evidence of a construction waste management plan that identified how all construction waste was to be managed.
5		<b>7.5 - Credit:</b>	Reuse or recycle vegetation, rocks, and soil generated during construction	3-5	100% of land-clearing material was re-used on site.
	3	<b>7.6 - Credit:</b>	Minimize generation of greenhouse gas emissions and exposure to localized air pollutants	1-3	There was no specification of low emission vehicles or equipment.

Yes No

5	7	<b>• 8 Operations and Maintenance</b>		<b>23 Points</b>	<b>Notes</b>
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Y		<b>8.1 - Prerequisite:</b>	Plan for sustainable site maintenance	Required	The site is actively co-managed by the Parks Department and Solid Waste, and meets all of the requirements.
Y		<b>8.2 - Prerequisite:</b>	Provide for storage and collection of recyclables	Required	Recycling containers are co-located with trash bins on site. As part of the prerequisite, a waste audit is called for, but is outside the scope of this project.
	2	<b>8.3 - Credit:</b>	Recycle organic matter generated during site operations and maintenance	2-6	This is a potential area for low-cost improvement to the sustainable activities of the site.

1		<b>8.4 - Credit:</b>	Reduce outdoor energy consumption for all landscape and exterior operation	1-4	There is an extensive list of the sustainability features contained on site on the park web site. Because exact specifications of fixtures are not available for energy use comparison purposes, the lowest credit is given.
2		<b>8.5 - Credit:</b>	Use renewable sources for landscape electricity needs	2-3	Electricity is through the municipal provider (FPL), however, the presence of the 250 kW solar array on the property, operated by FPL more than offsets on-site use, allowing for 2 point credit. Use on site would give the third point.
2		<b>8.6 - Credit:</b>	Minimize exposure to Environmental Tobacco Smoke (ETS)	1-2	Sarasota County has a smoke-free campus policy, prohibiting cigarette smoking on all county-owned properties, allowing for 2 points in this credit.
	1	<b>8.7 - Credit:</b>	Minimize generation of greenhouse gases and exposure to localized air pollutants during landscape maintenance activities	1-4	Even though the grasses on the landfill cap are mowed only every six months, there is no provision in the maintenance plan to use low-emission equipment or to provide maintenance in slow usage times.
	4	<b>8.8 - Credit:</b>	Reduce emissions and promote the use of fuel efficient vehicles	4	There are currently no preferred parking or alternative fuel refueling stations on site.

Yes	No				
16	0	<b>• 9 Monitoring and Innovation</b>	<b>18 Points</b>	<b>Notes</b>	

10		<b>9.1 - Credit:</b>	Monitor performance of sustainable design practices	10	Landfill cap is constantly monitored for efficacy. Solar array output is monitored, park is routinely cleared of invasive plants, and adjustments to sustainability features are continuously considered - i.e. adding energy generation to flaring methane gas.
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**9.2 - Credit:**

Innovation in Site Design

8

Multiple uses of brownfield redevelopment including hiking, biking, play, R/C club, energy production are examples of innovative use. Potentially incorporate other sustainability measures - recycling comes to mind as an opportunity to tie the park to its past and qualify for additional points in this credit.