







Slide 1

Site	Water	Energy	Materials	IEQ
				

**Defining a Sustainable Building**




LEED™: Leadership in Energy and Environmental Design

Welcome to the LEED NC 2.2 Online Training. LEED is the acronym for the USGBC's Leadership in Energy and Environmental Design certification program, and is a tool to help benchmark how "green" a commercial building project is designed and operated.

Mike Barcik, Director of Technical Services at Southface Energy institute will be narrating the course. The course is designed to guide you through the LEED process and works best if accompanied with the LEED Reference Guide or Rating System for reference. Each lesson will provide an overview, credit criteria and additional notes for further learning beyond the narration.

The course was developed by Southface Energy Institute in Atlanta, Georgia, who is recognized as an affiliate of the U.S. Green Building Council. Southface is a non-profit organization which has been promoting sustainable homes, workplaces and communities through education, research, advocacy and technical assistance since 1978.



## U.S. Green Building Council

A coalition of leaders from across the building industry working to promote buildings that are

- environmentally responsible
- profitable
- healthy places to live and work

The organization's purpose is to:

- *Integrate* building industry sectors
- *Lead* market transformation
- *Educate* owners and practitioners

The U.S. Green Building Council is a national nonprofit organization that was formed in 1993 in Washington, DC. The USGBC is the developer and administrator of the LEED Green Building Rating System. Its membership includes representation from organizations across the building industry. USGBC serves its members and the community through the development of industry standards, design practices and tools, policy advocacy, and education.



## What is LEED?


A leading-edge system for designing, constructing, operating and certifying the world's greenest buildings.

### **A Green Building Standard created to...**

- Define "green building" by establishing a common standard of measurement
- Promote integrated, whole-building design practices
- Recognize environmental leadership in the building industry
- Stimulate green competition
- Raise consumer awareness of green building benefits
- Transform the building market

The Leadership in Energy and Environmental Design (LEED) Green Building Rating System™, is the U.S. Green Building Council's (USGBC's) primary vehicle for promoting sustainable design and construction. The USGBC began to develop the LEED Rating System in 1995 in response to the U.S. market's demand for a definition of "green building." The LEED standard was developed by USGBC members through volunteer committees. The support tools, such as the Reference Guide and Training Workshop, were originally developed with funding from the U.S. Department of Energy.

\* The LEED NC version 2.2 rating system is available as a free .pdf from the USGBC website ([www.usgbc.org](http://www.usgbc.org)).



**Why Was LEED Created?**

- To facilitate positive results for the environment, occupant health and financial return
- Define “green” by providing a standard for measurement
- Prevent “greenwashing” (false or exaggerated claims)

**What are the Benefits of using LEED?**

- Receive third party validation
- Establish clear, specific environmental goals
- Prevent team from backsliding
- Reap PR benefits
- Attain a measurable degree of sustainability
- Qualify for government incentives

LEED is a tool that measures the environmental performance of a building. This is critical because buildings consume tremendous amounts of resources in both the continuous use and the development process. With strict environmental standards in place, the program develops a high performance building that lasts longer and has lower social and environmental impacts. In essence, LEED facilitates marketplace transformation into more sustainable building practices and materials, with happier occupants.

## LEED-NC



New Construction & Major Renovations

**LEED-NC Program:**

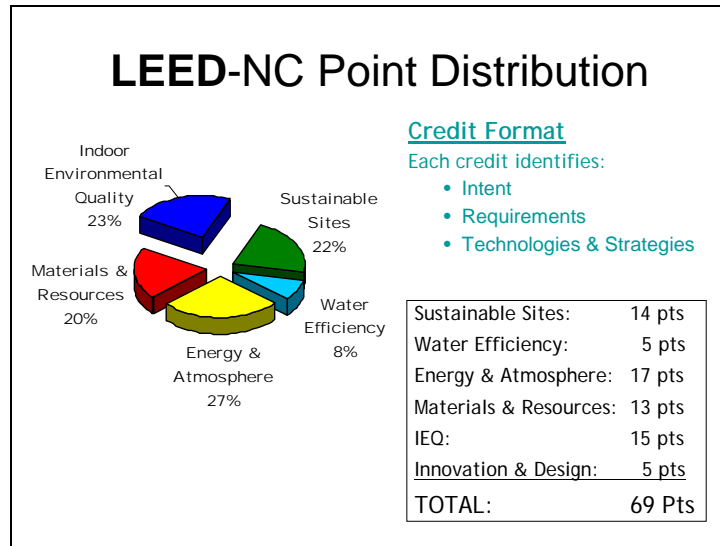
- Prerequisites: Non-negotiable
- Core Credits: 64 optional points
- Innovation Credits: 5 optional bonus credits

**Levels of Certification:**

- Certified 26-32 points
- Silver 33-38 points
- Gold 39-51 points
- Platinum 52-69 points

Atlanta Community Food Bank,  
LEED NC Silver

The LEED for New Construction and Major Renovation Rating System works to improve the building process and create high performance, healthful, durable, affordable, and environmentally sound buildings. The program is applicable for commercial, institutional, and high-rise residential buildings. Major renovation is defined as major HVAC renovation, significant envelope modifications, and major interior rehabilitation. There are seven prerequisites and 26 points that must be fulfilled in order to be a part of the program and achieve LEED Certification. A project can achieve more optional points to get a higher Certification, and a higher performance building.



Within LEED New Construction and Major Renovation, energy makes up the most points, though other aspects that create a sustainable building are very important. Understanding the major components of the Rating System and what they encompass is important for passing the test. Each credit has an intent, requirements, technologies and strategies, as well as the submittal documents necessary to achieve points.



## LEED Standards

- New Construction (NC)
- Existing Buildings (EB)
- Commercial Interiors (CI)
- Core & Shell Projects (CS)
  - LEED for Schools (similar to NC)
  - LEED for Retail (pilot)
  - LEED for Homes (H)
  - LEED for Neighborhood Development (ND) (in pilot)

These are the different LEED programs that exist or are in development:

LEED-NC: For building owners and design teams that address the new building design and construction or major renovations process.

LEED-EB: Set of performance standards for the sustainable operation of existing buildings. The LEED-EB criteria cover building operations and systems upgrades in existing buildings where the majority of interior or exterior surfaces remain unchanged.

LEED-CI: Addresses the specifics of tenant spaces in office, retail, and institutional buildings.

LEED-CS: Broadly defined, core and shell construction covers base building elements, such as the structure, envelope and building-level systems, such as central HVAC, etc. The CS product recognizes that the division between owner and tenant responsibility for certain elements of the building varies between markets. CS is used for buildings where the owner does not control interior design and fit-out.

LEED-H: LEED for Homes is a product for single family homes.

LEED-ND: This program looks at community developments and how to make them more sustainable on a larger scale.

## LEED-EB



- Whole-building maintenance issues, including chemical use
- Ongoing indoor air quality
- Energy efficiency
- Water efficiency
- Recycling programs and facilities
- Exterior maintenance programs
- Systems upgrades to meet green building energy, water, indoor air quality, and lighting performance standards



For existing buildings there is also an opportunity to be LEED certified. Instead of looking at the building of a facility, it concentrates more on current operations and maintenance practices. Specifically, it addresses site maintenance, water and energy use, environmentally preferred products, waste management and indoor environmental quality.

One example of a LEED for Existing Buildings is the Johnson Diversey Building located in Sturtevant, Wisconsin (pictured). It is a three-story mixed-use facility constructed in 1997. The building floor area is 277,440 square feet, of which 70% is office space and 30% is research laboratories. The building was designed based on green-building principles, including high-energy efficiency, extensive use of natural lighting, and individual control of workspace environments. Because it was built with sustainability in mind, applying LEED-EB to the building was primarily a matter of fine-tuning the building's operations practices and improving the documentation of existing sustainable practices. The Johnson Diversey Global Headquarters was certified LEED-EB Gold in March, 2004.



## LEED-CI

- Selection of sustainable tenant space
- Efficiency of water usage
- Energy performance optimization, including lighting
- Resource utilization for interior building systems and furnishings
- Indoor environmental quality, including emissions criteria



Interface Showroom,  
LEED-CI Platinum

LEED for Commercial Interiors provides a set of standards for tenant projects. This program provides guidelines for tenant spaces for healthcare, restaurant, retail, office, and hotels. LEED-CI addresses the same main areas as LEED-NC, including sustainable sites, water efficiency, energy & atmosphere, materials & resources, indoor environmental quality.

\* The Interface Showroom, located in midtown Atlanta, Georgia, participated in the LEED-CI pilot program in 2004 and received a Platinum rating from the U.S. Green Building Council for their efforts in addressing alternative transportation, water use reduction, optimizing energy, lighting power and controls, construction waste management, rapidly renewable resources, and daylighting and views.

## LEED-CS

- Building site selection
- Efficient water use in base core and shell building systems
- Energy optimization of the base core and shell systems and provisions for fit out to optimize operational building energy use
- Materials and resource guidelines for construction of building core and shell
- Planning to ensure tenant fit out optimizes indoor environmental quality attributes (daylight and views) as well as prevention of contamination from indoor pollutants



1180 Peachtree  
Atlanta GA

LEED for Core and Shell provides an opportunity to certify a building even when key building areas such as space layout and finishes are outside the direct control of the developer. LEED-CS in conjunction with LEED-CI establish green building criteria for both the owner and the tenants. LEED-CS addresses the same issues as LEED-NC and LEED-CI such as site selection, water efficiency, energy, materials and resources as well as indoor environmental quality.

\* The 1180 Peachtree building in Atlanta achieved LEED-CS Gold.




## LEED Reference Guide (for NC)

**LEED Reference Guide**  
Version 2.2

- Available for purchase
- Comprehensive Guide to individual Credits/Criteria

**LEED Rating System**

- Available in a downloadable .pdf file from the USGBC website
- Contains credit intent, requirements, submittals and technologies/strategies
- includes the Credit Checklist.

Green Building Rating System  
For New Construction &  
Major Renovations

Version 2.2

For Public Use and Display

October 2005\*

\*Revised EA section for projects registered after June 28, 2007

The Reference Guide is the detailed “User’s Manual” that explains the LEED credits in sufficient detail, and is available for purchase on the U.S. Green Building Council’s website. The rating system is a condensed version of the guide that is a free downloadable .pdf file from the website which contains a credit checklist, followed by a brief summary for each credit criteria, including intent, requirements, and potential technologies and strategies.

## LEED Application Guides (for NC)

- Application guides provide direction on how to apply **LEED** for a specific type of construction
- **LEED** Application guide for lodging is available online (for low-rise projects, including dormitories, hotels, etc.)
- Guides for Campus, Retail, Healthcare, Laboratories, and Schools are in development or pending approval
- Application Guides are being phased out – *ex. LEED for Schools*



There are Application Guides made to assist specific projects such as Retail, Healthcare and Schools achieve LEED. The Guides address the LEED-NC credits specifically to the issues applicable to a particular sector. Today, these are being used less and less as new LEED programs are being made that target specific building project types such as LEED for Schools.



The certification process is made up of four overarching steps. The first is project registration, which is necessary to begin the LEED process and costs \$450 (members) and \$600 (non-members). The second step is learning how to achieve these credits with support from the USGBC website, reference guide and credit interpretations. The third step is optional; if the project team is interested they can submit their design credits for review, this costs 2.5 cent per square foot. Finally, the whole project is submitted for review which cost 1 cent a square foot or 3.5 cents a square foot if the initial design review was not done.

## Design Review

(optional)

1. At 100% CD's submit Design Phase credits via LEED Online
2. Owner pays the first submittal fee
3. Team receives midpoint scoring feedback from the USGBC
4. Helps confirm project is on track

### Registration Fees


Charges	Fixed Rate
Members	\$450.00
Non-Members	\$600.00

### Certification Fees for LEED-NC

	Less than 50,000	50,000 - 500,000	More than 500,000
	Square Feet	Square Feet	Square Feet
<b>Option 1</b>	Fixed Rate	Based on Square Ft.	Fixed Rate
<b>Design Review</b>			
Members	\$1,250.00	\$0.025/Square Ft.	\$12,500.00
Non-Members	\$1,500.00	\$0.03/Square Ft.	\$15,000.00
<b>Construction Review</b>			
Members	\$500.00	\$0.01/Square Ft.	\$5,000.00
Non-Members	\$750.00	\$0.015/Square Ft.	\$7,500.00
<b>Option 2</b>	Fixed Rate	Based on Square Ft.	Fixed Rate
<b>Design &amp; Construction Review Combined</b>			
Members	\$1,750.00	\$0.035/Square Ft.	\$17,500.00
Non-Members	\$2,250.00	\$0.045/Square Ft.	\$22,500.00

If you would like the project to be reviewed before your final LEED submission, you may submit Design Phase credits for a Design Review. Though not all projects are required to do this, it is highly suggested in order to make sure that the project is on track to receiving the desired credits for LEED certification. This is essentially a two-phase process of submittal and costs 2.5 cents per square foot for the initial Design Review phase, and an additional 1 cent per square foot submittal for the final Construction Review phase. If an individual Design Review is not done, a combination of a design and construction review can be performed at the final submittal phase. The cost for the combined review is 3.5 cents per square foot.

## Register your Project



**LEED**  
GREEN BUILDING RATING SYSTEM

**LEED PROJECT REGISTRATION**

Build green. Everyone profits.

**INSTRUCTIONS:** Please complete all required fields below. All numeric fields should be entered without punctuations. Upon completion, click submit to securely process your order. You will receive email confirmation once your registration has been received.

\* Indicates a Required Field

**PROJECT TYPE**

RATING SYSTEM TYPE	MEMBER PRICE	NON-MEMBER PRICE
LEED-NC v2.2	\$450	\$600
LEED-EB v2.0	\$450	\$600
LEED-CI v2.0	\$450	\$600
LEED-CS PILOT	\$450	\$600
APPLICATION GUIDE PILOTS	\$2000	\$3000

Please select a project type and indicate whether you are a USGBC National Member to determine your registration fee.

Select a Rating System Type


\$0.00

\* Are you a member of USGBC?      Amount Due

Go online [www.usgbc.org](http://www.usgbc.org)


To begin the LEED process, registration is necessary. Projects can be registered at <http://www.usgbc.org/DisplayPage.aspx?CMSPageID=65>. The website includes guidance on the costs associated and the following steps. By registering the project, the project team receives access to essential software and information from the USGBC.

Once you navigate to the products and services page and click on LEED registration, this screen comes up. You click on “add to cart” and then “check out.” Then, it will tell you to click on enter data, at which point it will ask you to log in or register. To register, it will ask you for personal and project information that is important in the LEED process.



## LEED Tools for the Design Team

- **LEED** v 2.2 Rating System and Reference
- Scorecard
- LEED Online
- LEED Credit Templates / Calculators Online
- Credit Interpretation Requests/Rulings (CIRs)



After registering, there are many tools provided to the project team to help achieve LEED certification. These are accessible on the USGBC website, [www.usgbc.org](http://www.usgbc.org).

Above is a list of the different LEED tools available. These tools will be explained in more detail in this section of the LEED Study Guide. The LEED letter templates and LEED calculators are tools you can use to demonstrate compliance with the LEED rating system.



**LEED-NC**  
**LEED-NC Version 2.2 Registered Project Checklist**  
 Your Project Name  
 Anytown, USA

Yes  No

<b>Sustainable Sites</b>		14 Points
Prereq 1	<b>Construction Activity Pollution Prevention</b>	Required
Credit 1	<b>Site Selection</b>	1
Credit 2	<b>Development Density &amp; Community Connectivity</b>	1
Credit 3	<b>Brownfield Redevelopment</b>	1
Credit 4.1	<b>Alternative Transportation, Public Transportation Access</b>	1
Credit 4.2	<b>Alternative Transportation, Bicycle Storage &amp; Changing Rooms</b>	1
Credit 4.3	<b>Alternative Transportation, Low-Emitting and Fuel-Efficient Vehicles</b>	1
Credit 4.4	<b>Alternative Transportation, Parking Capacity</b>	1
Credit 5.1	<b>Site Development, Protect or Restore Habitat</b>	1
Credit 5.2	<b>Site Development, Maximize Open Space</b>	1
Credit 6.1	<b>Stormwater Design, Quantity Control</b>	1
Credit 6.2	<b>Stormwater Design, Quality Control</b>	1
Credit 7.1	<b>Heat Island Effect, Non-Roof</b>	1
Credit 7.2	<b>Heat Island Effect, Roof</b>	1
Credit 8	<b>Light Pollution Reduction</b>	1
Yes <input type="checkbox"/>	No <input type="checkbox"/>	
<b>Water Efficiency</b>		5 Points
Credit 1.1	<b>Water Efficient Landscaping, Reduce by 50%</b>	1
Credit 1.2	<b>Water Efficient Landscaping, No Potable Use or No Irrigation</b>	1
Credit 2	<b>Innovative Wastewater Technologies</b>	1
Credit 3.1	<b>Water Use Reduction, 20% Reduction</b>	1
Credit 3.2	<b>Water Use Reduction, 30% Reduction</b>	1
Yes <input type="checkbox"/>	No <input type="checkbox"/>	

The scorecard is a critical component early on in the LEED integrated design process. The scorecard lists all of the credits and helps the project team track which ones are ideal for the project to attempt. For example, in a charrette (an early project brainstorming effort), the scorecard estimates the number of points and certification level a project would achieve.

## LEED Online

The screenshot displays the LEED Online interface with the following sections:

- SCORECARD AND STATUS:** A notification states "Credit successfully assigned to a team member."
- MY ACTION ITEMS:** A list of tasks including "Please assemble a Project Team by clicking on the 'Team Admin' page," "You have not completed all of your attempted Design Credits. Please unattempt any Design Credits you no longer wish to pursue," and "To attempt Credits, assign them to a member of your Project Team."
- POTENTIAL LEED RATING:** Shows three circular icons for Certified, Silver, and Gold. Below them, it states "This Project has attempted enough p..."
- ATTEMPTED CREDIT SUMMARY:** A table showing attempted points for Design and Construction.
- APPEALED CREDIT SUMMARY:** A section for reviewing appealed credits, with the note "This Project is not currently under a..."

Status	Points		
	Design	Construction	Total
Pending:	28	14	42
Total Attempted:	28	14	42

- Access to USGBC resources
- Online Project Listing

LEED Online is the database for all LEED Project documentation. Here is where LEED APs and team members can access the Credit Templates necessary for submission. In addition to credit documentation there are several other things that need to be submitted. The USGBC requires an overall project narrative along with drawings and photographs of the site plan, floor plan, building section, primary elevation, and rendering of the project.

USGBC uses Adobe PDF forms that building project teams can download from USGBC's website, [www.leedonline.usgbc.org](http://www.leedonline.usgbc.org). Each form is associated with a particular building system which can receive credits. These forms can be completed offline and e-mailed to co-workers for additional information. Supportive documentation can be attached to the document and uploaded to LEED Online.

Via LEED Online, project members, USGBC staff, and other invited individuals can review the application forms and express concerns or issues. After the application has been reviewed, design and construction managers can visit the project to see if the applications have been approved or need additional documentation.

## Online Credit Templates

- LEED 2.2 credit templates streamline certification
- Each asks for certain data & lists any other documentation required to achieve the credit (or prerequisite)
- Only complete for the credits (+ all prerequisites) the team is attempting

The screenshot shows a LEED-NC 2.2 Submittal Template form for WE Credit 1: Water Efficient Landscaping. The form includes fields for the responsible individual and company name, a declaration of accuracy, and a section to select an option for compliance. Below this is a 'CREDIT COMPLIANCE' section with input fields for gallons and percentage reduction of potable water.

LEED-NC 2.2 Submittal Template  
WE Credit 1: Water Efficient Landscaping

(Responsible Individual) from (Company Name)  
I verify that the information provided below is accurate, to the best of my knowledge.

**SELECT OPTION**  
Please select the appropriate compliance path option (this will activate the remainder of the submittal form)

Option 1: The landscaping and irrigation systems have been designed to reduce irrigation water consumption from a calculated baseline case (3 points)

Option 2: The irrigation water used on site is supplied by a non-potable source (3 points)

Option 3: The landscaping and irrigation systems have been designed to reduce irrigation water consumption from a calculated baseline case, AND the irrigation water used on site is supplied by a non-potable source (up to 2 points)

Option 4: The landscaping installed does not require permanent irrigation systems. Temporary irrigation systems used for plant establishment will be removed within one year of installation. (2 points)

**CREDIT COMPLIANCE**

Option 1 (WE c.1.1): Landscaping and Irrigation Systems

gallons - Calculated Baseline Irrigation Water Consumption (Total Water Applied - TWA)

gallons - Calculated Design Case Irrigation Water Consumption (Total Water Applied - TWA)

gallons - Calculated Total Potable Water Applied - TWA

% - Percentage Reduction of Potable Water

A 10% reduction in Potable Water Use is required for 1 point. A 10% reduction in potable water use, and a 30% reduction of total water is required for 2 points.

The LEED Credit Templates are all in the USGBC website, under the button titled “Resources”, then specified as “LEED resources”. They are interactive Adobe PDF forms that cater to each credit’s requirements and submittals. The templates explain all of the necessary submittal documentation required and make it easy for all members of the project team to fill them out correctly.

Slide 20

**LEED-NC**  
LEED FOR NONRESIDENTIAL BUILDINGS

LEED-NC 2.2 Submittal Template  
WE Credit 1: Water Efficient Landscaping

**NARRATIVE (Optional)**  
Please provide any additional comments or notes regarding special circumstances or considerations regarding the project's credit approach.

The project is seeking point(s) for this credit using an alternate compliance approach. The compliance approach, including references to any applicable Credit Interpretation Rulings is fully documented in the narrative above. (Indicate the number of points documented in the field below).

Alternative Compliance Points Documented

Project Name: IKEA North America Service Office

Credit: WE Credit 1: Water Efficient Landscaping Points Documented: 0

READY TO SAVE THIS TEMPLATE TO LEED-ONLINE! Please enter your first name, last name and today's date below, followed by your LEED-Online Username and Password associated with the Project listed above to confirm submission of this template.

Maggie Michtosh maggiem@southface.org  
First Name Last Name Date Username (Email Address) Password

SAVE TEMPLATE TO LEED-ONLINE PRINT TEMPLATE

Letter Template Version: A1

At the end of every online template is some critical information; for example once documentation is completed, the "Points Documented" button will indicate the points attained for this credit. If working off-line, simply click on the "Save Template to LEED Online" button to upload the latest information.

\* When all of the components are filled, a project team member will save the template online with a username and password.

## Credit Interpretation Requests (CIRs)

**Credit Interpretations**

[Credit Rulings Home](#) > [Materials & Resources](#)

**MATERIALS & RESOURCES**

1/11/2005 - **Credit Interpretation Request**  
In what cases and how is it calculated? How does MEP fact

1/11/2005 - **Ruling**  
Per the CIR under MRc5.1 default value for MR credit details.

1/11/2005 - **Credit Interpretation Request**  
What is the threshold for a

1/11/2005 - **Ruling**  
Exemplary Performance for recycled content of total m been identified as the three incremental step, as MRc4.

If a question arises about applying a credit to a specific project:

1. Consult the **Reference Guide** for a detailed description of the credit intent, requirements, and calculations.
2. Evaluate whether the project meets the **intent** of the credit.
3. Review the **CIR Web page** for previously logged CIRs on relevant credits.
4. If the question is not answered, **call** the USGBC.
5. Submit a **formal CIR** for \$220.

The CIR database is also on the LEED Online website and a great resource for credit changes, specifics, and ideas for Innovation in Design points. From time to time, a design team will come across challenges in achieving a credit. Often the Reference Guide will not specifically address the issue at hand and more information is needed. To address these issues, the USGBC has created the Credit Interpretation Ruling process. The list above is the best way to trouble shoot a LEED question without spending a lot of money and time. In most cases, past CIRs address the issue at hand, but sometimes a new submission is needed. LEED Administrators have access to this website and are able to submit these requests for the project.

## Building Certification

1. Register project
2. Collect all documentation
3. Submit documentation
4. Pay certification fee (~\$0.035/s.f)
5. USGBC review
6. Team response
7. Final ruling
8. Appeal (if necessary)
9. Receive plaque & PR



When all of the project's attempted credits have documentation from the project team, it is necessary to submit the LEED Online database to the USGBC. The review process can consist of the optional design review or a full design and construction review. The certification fee is 3.5 cents per square foot.

The USGBC will take approximately 25 days to review the submittal and send it back to the project team. The team will have the same amount of time to correct any mistakes or missing documentation requirements and send it back to the USGBC for a final review. The USGBC will then take 15 days to perform the final review and upon the final ruling, award the project the level of LEED Certification attained.

Once certification is awarded to the project, there is one more chance that the team can improve certification. If the project team feels that they would be able to improve the outcome of a credit and have another chance for more points, they can do so in the appeal process by paying \$500 per credit and providing better documentation to the USGBC. There is no guarantee that the USGBC will award points, but it could help the team reach a higher LEED Certification for their project.