



Weathermatic

LEED Rating Guide

USGBC and LEED®

The U.S. Green Building Council (USGBC) is a non-profit organization committed to expanding sustainable building practices. USGBC is composed of 55 local affiliates, more than 12,000 member companies and organizations, and more than 200,000+ LEED Professional Credential holders. This diverse group from across the building industry is working to advance structures that are environmentally responsible, profitable, and healthy places to live and work. Members includes building owners and end-users, real estate developers, environmentalists, facility managers, architects, designers, engineers, general contractors, subcontractors, product and building system manufacturers, government agencies, and nonprofits.

USGBC's Mission

To transform the way buildings and communities are designed, built and operated, enabling an environmentally and socially responsible, healthy, and prosperous environment that improves the quality of life.

Introduction: What LEED® Is

The LEED® (Leadership in Energy and Environmental Design) Green Building Rating System™ is a voluntary, internationally recognized green building certification system, providing third-party verification that a building or community was designed and built using strategies aimed at improving performance across all the metrics that matter most: energy savings, water efficiency, CO2 emissions reduction, improved indoor environmental quality, and stewardship of resources and sensitivity to their impacts.

Developed by the U.S. Green Building Council (USGBC), LEED provides building owners and operators a concise framework for identifying and implementing practical and measurable green building design, construction, operations and maintenance solutions.

LEED Rating System for Building Design and Construction

There are several different rating systems to choose from, depending on the goals, and the type of project being considered.

- New Construction and Major Renovation
- Core and Shell Development
- Data Centers
- Healthcare
- Hospitality
- Retail
- Schools
- Warehouses and Distribution Centers

LEED New Construction

LEED rating systems can be applied to any building type and any building lifecycle phase. They promote a whole-building approach to sustainability by recognizing performance in key areas. There are different product categories to consider meeting the project requirements, and irrigation products contribute similarly to most of them. This document will look specifically at the New Construction and Major Renovations rating system.

The rating system is organized into six environmental categories:

1. Location and Transportation
2. Sustainable Sites
3. Water Efficiency
4. Energy & Atmosphere
5. Materials & Resources
6. Indoor Environmental Quality

There are also two other key performance areas:

1. Innovation in Design
2. Regional Priority

Each of the categories has a certain number of points available as follows:

Category	Points
Location and Transportation	16
Sustainable Sites	10
Water Efficiency	11
Energy & Atmosphere	33
Materials & Resources	13
Indoor Environmental Quality	16
Innovation in Design	6
Regional Priority	4
Total Points Available	110

There are four different levels of certification available, based on the goals of the project, and the number of points the project earns:

- Certified (40+ Points)
- Silver (50+ Points)
- Gold (60+ Points)
- Platinum (80+ Points)

More information on the rating systems, the process, how to get started, and how to achieve certification are available at the USGBC website: www.usgbc.org.



Weathermatic and LEED

Weathermatic supports the overall goals of LEED and strives to provide the irrigation industry with the most water efficient products. We manufacture a variety of irrigation components that can help designers, and owners earn LEED credits for their projects. The LEED system does not certify individual products; however, the selection of products plays an essential role in making a building project meet the requirements to earn points. Weathermatic's high efficiency landscape irrigation products can contribute to the earning of points for the following Credits in the LEED for New Construction system:

- Water Efficiency Credit – Outdoor Water Use Reduction (2 Options – 2 Points)
- Water Efficiency Credit – Water Metering (1 Point)
- Sustainable Sites Credit: Site Development—Protect and Restore Habitat (1-2 Points)
- Sustainable Sites Credit: Rainwater Management (1-3 Points)
- Sustainable Sites Credit: Heat Island Reduction (1-2 Points)
- Energy and Atmosphere Credit: Optimize Energy Performance (1—20 Points)
- Innovation in Design Credit 1: Innovation in Design (1—5 Points)

There are 11 total points available in the Water Efficiency (WE) category, of which 3 points can be earned as WE Credit if the WE Prerequisite AND 50% Outdoor Water Use Reduction is met AND irrigation metering is installed. Irrigation may also affect the 5 other Credits listed above.

- 30 % Outdoor Water Use Reduction – Required
- 20% Indoor Water Use Reduction – Required
- Building-Level Water Metering – Required
- 50% Outdoor Water Use Reduction – 2 points
- 25%- 50% Indoor Water Use Reduction – 6 points
- Cooling Tower Water Use – 2 points
- Subsystem (including irrigation) Water Metering – 1 point

Buildings are major users of our potable water supply. The goal of the Water Efficiency credit category is to encourage smarter use of water, inside and out. Water reduction is typically achieved through more efficient appliances, fixtures and fittings inside and water-wise landscaping outside.

According to the US Environmental Protection Agency, outdoor water use accounts for about 70 percent of annual water usage in the West and Southwest and about 10% of annual usage in the North and Northeast. Meanwhile, up to 50 percent of water used for landscape irrigation is lost due to over-watering, evaporation or bad irrigation system design or maintenance.

Weathermatic's high-efficiency irrigation products can aid the designer in producing an efficient irrigation system that can use less water and help to meet the requirements to earn the points for the Water Efficiency category. All documentation and narratives must follow the procedures set forth by the USGBC, to be considered for point awards. The USGBC website (www.usgbc.org) is the best resource to find forms, and documentation for successful submittals, and certification.

Water Efficiency Credit (WE):

Outdoor Water Use Reduction – Option 1. No Irrigation Required (2 Points)

Intent

To reduce outdoor water consumption.

Requirements

Reduce outdoor water use through one of the following options. Non-vegetated surfaces, such as permeable or impermeable pavement, should be excluded from landscape area calculations. Athletic fields and playgrounds (if vegetated) and food gardens may be included or excluded at the project team’s discretion.

Option 1. No Irrigation Required (2 points)

Show that the landscape does not require a permanent irrigation system beyond a maximum two-year establishment period.

Water Efficiency Credit (WE):

Outdoor Water Use Reduction – Option 2. Reduce by 50% (1-2 Points)

Intent

To reduce outdoor water consumption.

Requirements

Reduce the project’s landscape water requirement (LWR) by at least 50% from the calculated baseline for the site’s peak watering month. Reductions must first be achieved through plant species selection and irrigation system efficiency as calculated in the Environmental Protection Agency (EPA) WaterSense Water Budget Tool.

Additional reductions beyond 30% may be achieved using any combination of efficiency, alternative water sources, and smart scheduling technologies.

Table 1. Points for reducing irrigation water

<i>Percentage reduction from baseline</i>	<i>Points</i>
50%	1
75%	--
100%	2

Reductions shall be attributed to any combination of the following items:

- Irrigation efficiency
- Use of captured rainwater
- Use of recycled wastewater
- Use of water treated and conveyed by a public agency specifically for non-potable uses



Potential Technologies & Strategies

Perform a soil/climate analysis to determine appropriated plant material and design the landscape with native or adapted plants to reduce or eliminate irrigation requirements. Where irrigation is required, use high-efficiency equipment and/or climate-based controllers.

Calculations

To calculate the percent reduction in potable use for this credit, establish a baseline water use rate for your project, which represents a “typical” landscape that could be found on a similar project in the area. Then, calculate the as-designed water use rate for the project. To complete these calculations, you will need to know the landscape coefficients for the major vegetation types, and the area of each.

All calculations must be based on irrigation during the month with the highest evapotranspiration (ET) rate. Local ETO values are available from the EPA’s WaterSense website.

You will also need to document the Irrigation Efficiency (IE) for each landscape area, based on the type of irrigation used. Standard numbers for Sprinkler and Drip are given in the LEED reference guide, and should be used to calculate the baseline case water use.

Irrigation Efficiency for the Design case may use different numbers than in the Baseline case based on the efficiency numbers of the products selected for the irrigation plan.

Controller Efficiency (CE) is another number that may have to be determined, and is defined as the percent reduction in water use from any weather-based controllers or moisture sensor-based systems. It is equal to 1 minus the estimated percentage of overall irrigation water saved by the controller ($CE = 1 - \% \text{ Savings}$). As an example, if a Weathermatic SmartLine Controller is installed on a project with a Weathermatic SLW weather station, and the estimated water savings is 20%, the CE would be 0.8 ($CE = 1 - 0.2 = 0.8$).

Weathermatic SmartLine weather-based controllers automatically calculate on-site ET (evapotranspiration), the landscape's daily water loss and schedules irrigation to replace it. As a result, SmartLine saves 25- 50% on water costs, virtually eliminates runoff, and protects the landscape. This is accomplished by measuring the weather in combination with controller inputs customized by zone for plant type, soil type, slope and sprinkler type. Property owners can also select omit days, dates and times to ensure compliance with local watering regulations.

The following provides 3rd party testimonials and case studies of proven water savings for Weathermatic controllers:

[El Segundo Schools Case Study:](#)

[City of LaVerne, CA Case Study:](#)

[Pennbrooke Homeowners Association Case Study:](#)

[Prestonwood Baptist Church Case Study:](#)

[Seis Lagos Utility District Case Study:](#)

[ValleyCrest Companies Case Study:](#)

Innovative Landscapes Testimonial:

"Customers don't hesitate when they find out they'll save 20 to 50 percent on their water bills and that the system will pay itself within 12 to 18 months. SmartLine is the most affordable 'smart system' on the market."

- Tom Raden, Innovative Landscapes – Quartz Hill, California



Prestonwood Baptist Church Testimonial:

“Prestonwood Baptist Church is an amazing property with over 138 acres at our Plano location with 26 Weathermatic SmartLine controllers and weather monitors. The quality of our sports fields and the beauty of the campus reflect a lot about who we are and who we serve. We have a goal of becoming the most efficient church campus of this type in the country. The Weathermatic SmartLine System reduced our water usage in the first year 53% and allowed me to dedicate my time to other tasks rather than adjusting controllers with every weather change.

- *Jerry Owen, Prestonwood Baptist Church - Plano, Texas*

Soundview Landscape Testimonial:

“SmartLine is a revolutionary product and has changed the way we irrigate. For example, we converted the landscaping at a condominium resort in Kona, Hawaii, to SmartLine. The water savings have been so dramatic that the resort asked us to convert additional sites. Assuming the next six months of water savings are equal to the first six months, we will realize a savings of six million gallons of water the first year alone.”

- *George Kenney, Soundview Landscape - Kona, Hawaii*

Commercial Property Manager Testimonial:

"The guesswork is gone. As a property manager, I am very concerned about the health of the landscape. We were getting letters because we were using too much water in the summer. Then we switched to SmartLine and the change has been dramatic. It cycles the irrigation so that water percolates to the root zone and keeps the plants looking great, even in a Texas drought. Water savings average 22% a year and are even greater when you factor in the rising costs of water."

- *Mike Maring, Commercial Property Manager – San Antonio, Texas*

Additional 3rd party verification studies of proven water savings for Weathermatic controllers:

Irrigation Association SWAT Test

The Irrigation Association www.irrigation.org has developed an independent third party testing protocol specific to “smart” controllers www.irrigation.org/SWAT. Currently the protocol is administered through the Center for Irrigation Technology (CIT), an independent testing laboratory, applied research facility and educational resource center based at California State University, Fresno. The objective of this protocol is to evaluate how well current commercial technology has integrated the scientific data into a practical system that meets the agronomic needs of turf and landscape plants.

Each product evaluation is conducted by creating a six-zone virtual landscape subjected to real-time climate through monitoring of a selected weather station to evaluate the ability of individual “smart” controllers to adequately and efficiently irrigate that landscape.

After initial programming and calibration, the controller is expected to perform without further intervention during the test period. Performance results indicate to what degree the controller maintained root zone moistures within an acceptable range:

- If moisture levels are maintained without deficit, it can be assumed the level of irrigation will be adequate to maintain the health and beauty of the landscape
- If moisture levels are maintained without excess, it can be assumed that scheduling maximizes water-use efficiency

Irrigation Association SWAT testing protocol results for the Weathermatic SmartLine Controller:



6540 Arlington Boulevard
Falls Church, VA 22042

Tel: 703-536-7080
www.irrigation.org

Smart Water Application Technology™ (SWAT™) Performance Report					
Testing Agency: Center for Irrigation Technology			www.californiawater.org		
Product: Weathermatic SL1600					
Product Type: Climatologically Based Controller					
Product Description: Weathermatic SL1600 controller with SLW series on-site weather monitor					
SWAT™ Protocol [®] : Turf and Landscape Equipment Climatologically Based Controllers 7 th Draft Testing Protocol (November 2006)					
<p>The concept of climatologically controlling irrigation systems has an extensive history of scientific study and documentation. The objective of this protocol is to evaluate how well current commercial technology has integrated the scientific data into a practical system that meets the agronomic needs of turf and landscape plants. The evaluation is accomplished by creating a virtual landscape subjected to a representative climate to evaluate the ability of individual controllers to adequately and efficiently irrigate that landscape. After initial programming and calibration the controller is expected to perform without further intervention during the test period. Performance results indicate to what degree the controller maintained root zone moistures within an acceptable range. If moisture levels are maintained without deficit, it can be assumed the crop growth and quality will be adequate. If moisture levels are maintained without excess it can be assumed that scheduling is efficient.</p> <p>*All SWAT™ Protocol may be viewed at www.irrigation.org</p>					
Weathermatic SL1600 Controller SWAT™ Performance Summary					
Irrigation Adequacy			Irrigation Excess		
Minimum of 6 test zones: 100% Maximum of 6 test zones: 100% Mean/Average of 6 test zones: 100% Irrigation Adequacy represents how well irrigation met the needs of the plant material. This reflects the percentage of required water for turf or plant material supplied by rainfall and controller-scheduled irrigations. Research suggests that if this value is between 80% and 100%, the acceptable quality of vegetation will be maintained.			Minimum of 6 test zones: 0% Maximum of 6 test zones: 2.3% Mean/Average of 6 test zones: 0.4% Irrigation Excess represents how much irrigation water was applied beyond the needs of the plant material. This reflects the percentage of water applied in excess of 100% of required water according to data from CIMIS station #80 Fresno State, Fresno County during the test period.		
Product Detail Supplied by Manufacturer					
Weathermatic SL1600					www.smartline.com
Installation	Data Source	Data Link	Initial Purchase	Additional Hardware	Additional Fees
Replaces existing controller or is installed on a new system.	Weathermatic on-site weather monitor	Direct low voltage wire or wireless	Purchase price is based on number of zones. Weather monitor is an additional cost.	None required	None
Additional Features					
Zones	Time of Day	Day of Week	Other	If Data Link is Discontinued	
Available in 4-8, 4-24, 12- 48 zone models	Capable of restricting the time of day for watering.	Capable of restricting watering days by selection or interval.	<input type="checkbox"/> Built in valve locator feature <input type="checkbox"/> Calculates irrigation schedules based on zone-specific, Irrigation Association recommended parameters including plant, soil, slope, and sprinkler type. <input type="checkbox"/> On-board multi-meter	If weather monitor connection is discontinued it may be used as a standard irrigation controller with water budget and cycle and soak capability.	



EPA WaterSense Product Labeling

WaterSense, a partnership program by the U.S. Environmental Protection Agency, seeks to protect the future of our nation's water supply by offering people a simple way to use less water with water-efficient products, new homes, and services.

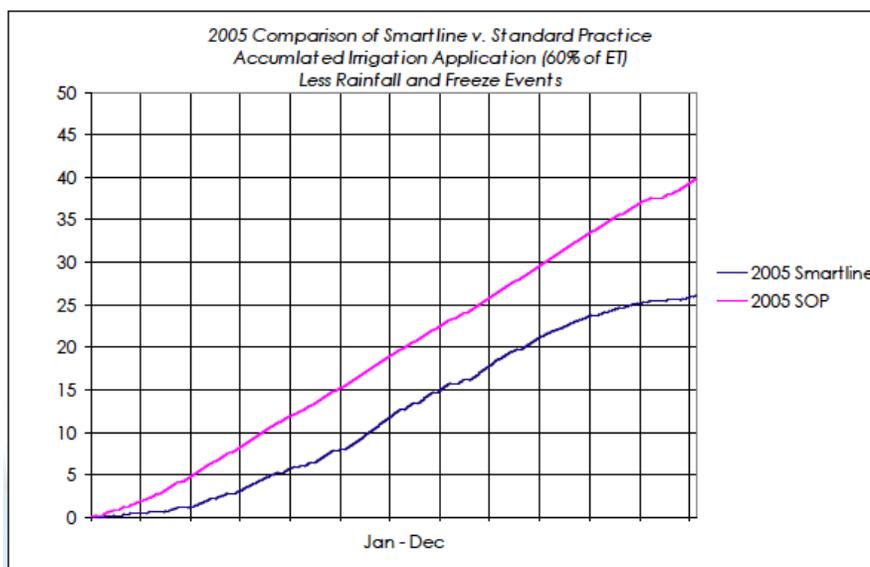
The program seeks to help consumers make smart water choices that save money and maintain high environmental standards without compromising performance. Products and services that have earned the [WaterSense label](#) have been certified to be at least 20 percent more efficient without sacrificing performance.

Upgrading to more efficient WaterSense labeled products can help us to save billions of gallons of water in the country every year. Something as simple as twisting on a WaterSense labeled aerator and upgrading to a WaterSense labeled faucet could save a household 11,000 gallons over the life of the faucet. Learn more about how you can save water and help WaterSense preserve and protect our nation's water resources.

EPA WaterSense labeled Weathermatic SmartLine Controller can be found at the following link starting on page 6: <http://www.epa.gov/WaterSense/products/controltech.html>

Additional water savings study:

When comparing SmartLine's weather based irrigation scheduling versus traditional scheduling methods and basic rain/freeze devices, savings from SmartLine can be conservatively estimated between 30-35%. We frequently are able to reduce an existing property's water use by more than 50%. The chart below shows the results of a comparison of baseline irrigation scheduling practices in the Dallas/Fort Worth area in 2005, a hot and dry year in the Metroplex, compared to the SmartLine weather based irrigation schedule. The results were a reduction of 35% from 40" of supplemental irrigation to 26" of supplemental irrigation. With a conservative savings estimate of 30%, the SmartLine controller has a controller efficiency (CE) rating of 0.7.



If applicable, the volume of reuse water (captured rainwater, re-cycled graywater, or treated wastewater) available in the month with the highest irrigation demand can be added into the savings of potable water.

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Once the water savings based on vegetation types, irrigation efficiency, controller efficiency, and reuse water are calculated; the total percentage reduction of potable water use must be equal to or greater than 50% to earn WE Credit. The Reference Guide, and the USGBC website contain detailed explanations, examples, worksheets, and forms required to complete the calculations for all LEED Credits.

Weathermatic Water Efficient Products

The table below lists the Weathermatic products that landscape professionals can use to help achieve the required 50% reduction to earn the points for this Credit Option.

Product Category	Weathermatic Model	Water Savings Percentage	Reference
Automatic Controllers	SL800 SL1600 SL1624 SL4800 SL9600	30%	Weather-based smart controllers automatically calculate ET (evapotranspiration - the landscape's daily water loss) and then schedule irrigation to replace it. As a result, they can save 20-50% on water costs, eliminate runoff and protect the landscape. This is accomplished by measuring the weather in combination with controller inputs customized by zone for plant type, soil type, slope and sprinkler type. A Weather Station or ET Sensor, when paired with the proper smart controller, can monitor the on-site weather, and adjust the controller based on the conditions at the site. This includes rain, freeze and wind sensing. Average savings is dependent on many variables, but averages of 30% are documented in many studies. See references: www.weathermatic.com/customerstories
ET Weather Stations	SLW1 SLW5		
Remote Access/Alerts	SmartLink SL-AIRCARD	10%	Remote access allows the manager of a large site, or multiple sites to control and monitor many irrigation controllers from one location. Water savings is achieved through quick response to water loss issues and improved monitoring.
Flow Sensors	SLFSI-T10 SLFSI-T15 SLFSI-T20 SLFSI-S30 SLFSI-S40 SLFSI-B15	15%	Flow sensors can automatically stop irrigation when a high flow condition is detected. High flows can be the result of a broken sprinkler, a missing nozzle, a lateral line break, or a main line break. Water savings is dependent on the type of problem causing the high flow, and the amount of time the issue goes without detection or resolution.

Product Category	Weathermatic Model	Water Savings Percentage	Reference
Pressure Regulating Spray Head Bodies	MAX-PRS	20%	Pressures above the manufacturer's stated optimum pressure can cause sprinkler inefficiencies in distribution pattern, misting, overspray, and higher volume. Savings percentages vary with the difference in pressure between the optimum and the actual pressure. Pressure regulation helps to bring the operating pressure into the optimum range and reduces water usage by approximately 1 to 2% for every 1 PSI reduction in pressure. See Bernoulli's Equation: http://www.princeton.edu/~asmits/Bicycle_web/Bernoulli.html
Valve Pressure Regulation	PRK-24	5%	See Above Pressure Regulation Reference
Check Valves	MAX-CV Series Sprayheads T3 Series Rotors CT Series Rotors	10%	Any amount of slope to the piping system can lead to water draining out the lowest point of the system. In-sprinklers check valves save water by holding the water in the piping system when the irrigation system is not operating. Potential savings depends on the amount of piping in the ground, and slope in the sprinkler zone.

Note: Irrigation component performance depends on proper design, installation, management, and maintenance of the entire irrigation system. These factors along with site weather conditions, soils, plant material, and previous irrigation management practices will influence the amount of savings realized. The percentages given here, are representative of potential savings, and may not be the actual savings achieved.



Water Efficiency Credit (WE):

Water Metering (1 Point)

Intent

To support water management and identify opportunities for additional water savings by tracking water consumption.

Requirements

Install permanent water meters for two or more of the following water subsystems, as applicable to the project:

Irrigation

Meter water systems serving at least 80% of the irrigated landscaped area. Calculate the percentage of irrigated landscape area served as the total metered irrigated landscape area divided by the total irrigated landscape area. Landscape areas fully covered with xeriscaping or native vegetation that requires no routine irrigation may be excluded from the calculation

Potential Technologies & Strategies

Utilizing a flow sensor as part of a smart irrigation system provides valuable water use calculations for use in determining overall irrigation system water use as well as irrigation shutdown and alerts for system breaks. Flow sensing is just as critical to the success of the system in saving water as weather-based scheduling. Without a flow sensor it is very possible to hit a water savings goal of 25-30% using ET only to lose all your savings through a broken sprinkler or stuck valve over a short 24-48 hour period.

Ideally, we need to prove we are accomplishing the intended goals for the site regarding water savings and restriction compliance. To do this our system needs the ability to generate basic water use data and reports with the use of a flow sensor.

Weathermatic Water Efficient Products

The table below lists the Weathermatic products that landscape professionals can use to help achieve the required Water Metering to earn the point for this Credit Option.

Product Category	Weathermatic Model	Water Savings Percentage	Reference
Flow Sensors*	SLFSI-T10 SLFSI-T15 SLFSI-T20 SLFSI-S30 SLFSI-S40 SLFSI-B15	15%	Flow sensors can automatically stop irrigation when a high flow condition is detected. High flows can be the result of a broken sprinkler, a missing nozzle, a lateral line break, or a main line break. Water savings is dependent on the type of problem causing the high flow, and the amount of time the issue goes without detection or resolution.

*Requires SmartLine Controller and SmartLink Flow Aircard.

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Other LEED Credits

There are several other Credits where irrigation products and landscape strategies can be used to achieve points.

Sustainable Sites Credit: Site Development—Protect and Restore Habitat (1-2 Points)

Landscape design, and the use of efficient irrigation components can play a pivotal role in protecting and restoring habitats previously disrupted, or newly constructed sites. Re-establishing native vegetation, and meeting the percentage landscape requirements for this Credit could entail designing appropriate irrigation for plant establishment and maintenance. Vegetated roof surfaces may also apply to the requirements for this Credit.

Sustainable Sites Credit: Rainwater Management (1-3 Points)

The intent of this Credit is to limit disruption of natural hydrology by reducing impervious cover, increasing on-site infiltration, and managing stormwater runoff. Landscape design that directs water to the landscape instead of off the site, pervious pavement, and appropriate landscape materials to increase on-site infiltration can help to achieve this credit. Captured rainwater on the site can be dispersed by an irrigation system to minimize runoff, and increase infiltration.

Sustainable Sites Credit: Heat Island Reduction (1-2 Points)

The constructed environment tends to increase thermal gradient differences compared to undeveloped areas. One option in this Credit is to install a vegetated roof for a certain percentage of the total roof area. Efficient irrigation products such as Weathermatic SmartLine/SmartLink can be used to effectively irrigated plant material on these roofs.

Energy and Atmosphere Credit: Optimize Energy Performance (1—20 Points)

The intent of this Credit is to achieve increasing levels of energy performance above a baseline standard, to reduce environmental and economic impacts associated with excessive energy use. Appropriate landscape design can aid in the sheltering of buildings from winter winds, and also shading from the summer sun. These strategies can help to reduce the heating and cooling loads, saving energy, and the impacts that energy generation can have. The surrounding landscape of the building can also have an effect on the ambient temperature near buildings, effecting energy usage. Green walls and mature trees to shade the building, and appropriate turf areas to cool the immediate area around structures, can be helpful to meet the requirements. Efficient irrigation can be important in supporting the plant material for optimum benefit.

Innovation in Design Credit 1: Innovation in Design (1—5 Points)

The intent of this Credit is to provide design teams and projects the opportunity to achieve exceptional performance above the requirements set, and/or innovative performance in Green Building categories not specifically addressed by the system. Creative use of irrigation or in the overall landscape strategy which leads to environmental benefits that are quantifiable, and surpass any of the existing LEED requirements, may be considered for points in this Credit.