

## USGBC and LEED®

The US Green Building Council (USGBC) is a non-profit organization committed to expanding sustainable building practices.

With a community comprising 79 local affiliates, more than 16,000 member companies and organizations, and more than 160,000 LEED Professional Credential holders, USGBC is the driving force of an industry that is projected to contribute \$554 billion to the U.S. gross domestic product from 2009-2013. USGBC leads an unlikely diverse constituency of builders and environmentalists, corporations and nonprofit organizations, elected officials and concerned citizens, and teachers and students.

Buildings in the United States are responsible for 39% of CO<sub>2</sub> emissions, 40% of energy consumption, 13% water consumption and 15% of GDP per year, making green building a source of significant economic and environmental opportunity. Greater building efficiency can meet 85% of future U.S. demand for energy, and a national commitment to green building has the potential to generate 2.5 million American jobs.

### Introduction: What is LEED®?

LEED (Leadership in Energy and Environmental Design) 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, CO<sub>2</sub> 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 Products

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

- |  |                            |
|--|----------------------------|
| • New Construction and Major Renovations | • Schools                  |
| • Existing Buildings                     | • Retail Space             |
| • Commercial Interiors                   | • Healthcare Facilities    |
| • Core & Shell                           | • Homes                    |
|  | • Neighborhood Development |

### LEED 2011 New Construction

LEED rating systems can be applied to any building 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 five environmental categories:

1. Sustainable sites
2. Water Efficiency
3. Energy & Atmosphere
4. Materials & Resources
5. Indoor Environmental Qualities

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
Sustainable Sites	26
Water Efficiency	10
Energy and Atmosphere	35
Materials & Resources	14
Indoor Environmental Quality	15
Innovation in Design	6
Regional Priority	4
<b>Total Points Available</b>	<b>110</b>

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

Level	Points Earned
Certified	40 +
Silver	50 +
Gold	60 +
Platinum	80 +

More information on the rating system, the process, how to get started and how to achieve certification are available at the USGBC website, [www.usgbc.org](http://www.usgbc.org)

### **K-Rain Efficient Irrigation Products and LEED®**

K-Rain 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 solutions that can help homeowners, contractors and designers earn LEED credits for their homes or projects.



K-Rains high efficiency landscape products and non-potable product line can earn points for the following credits in the LEED for New Construction System:

- Water Efficiency Credit 1 (2 Options)
- Innovation in Design Credit 1
- Sustainable Sites Credit 5.1
- Sustainable Sites Credit 6.1
- Sustainable Sites Credit 7.2
- Energy and Atmosphere Credit 1

There are 10 points available in the Water Efficiency (WE) category, of which 4 points can be earned on Credit 1 if both Options are met by making efficient landscape and irrigation decisions. Irrigation may also effect the 5 other Credits listed above.

Water Efficiency Credit	Credit Title
WE 1 Option 1	Water Efficient Landscaping: Reduce water use by 50%
WE 1 Option 2	Water Efficient Landscaping: No Potable Water Use or Irrigation

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.

K-Rain’s high-efficiency irrigation products can aid the designer in producing an efficient irrigation system that uses less water and help to meet the requirements to earn the points for the Water Efficiency category. All documentation and narratives must follow the procedure set forth by the USGBC to be considered for point awards. The USGBC website ([www.usgbc.org](http://www.usgbc.org)) is the best resource to find forms and documentation for successful submittals and certification.

**Water Efficiency Credit 1 (WE 1):**

Water Efficient Landscaping – Option 1: Reduce by 50% (2 points)

**Intent:**

To limit or eliminate the use of potable water, or other natural surface or subsurface water resources available on or near the project site, for landscape irrigation.

**Requirements:**

Reduce potable water consumption for irrigation by 50% from a calculated mid-summer baseline case.



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

- Plant species factor
- 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 and Strategies:**

Perform a soil/climate analysis to determine appropriate 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 calculation must be based on irrigation during the month with the highest evapotranspiration (ET) rate. Local ET<sub>o</sub> values are available from the EPA’s WaterSense website, [www.epa.org](http://www.epa.org)

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 the LEED reference guide, and should be used to calculate the baseline case water use.

### **Water Efficiency Credit 1**

### **Calculations (continued):**

Irrigation Efficiency for the Design case may use different number than Baseline case based on the efficiency number of the product selected for the irrigation plan.

Controller Efficiency (CE) is another number that may have to be determined, as 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 ( $CE = 1 - \% \text{ savings in decimal form}$ ). As an example, if a K-Rain RPS 1224 Controller is installed on a project with a K-Rain K-Brain Rain Sensor, and the estimated water savings is 20%, the CE would be 0.8 ( $CE = 1 - 0.2 = 0.8$ ).



If applicable, the volume of reuse water (capture 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.

Once the water savings based on vegetation types, irrigation efficiency, controller efficiency, controller efficiency, and reuse water are calculated, the total percentage reduction of potable water use must be equal or greater that 50% to earn WE Credit 1, Option 1. The Reference Guide, and the USGBC website contain detailed explanation, examples, worksheets and forms required to complete calculations for all LEED credits

### K-Rain Water Efficient Products

The table below lists the K-Rain products that a designer can use to help achieve the required 50% reduction to earn the points for this Credit Option.

Product Category	K-Rain Model	Water Savings Percentage	Reference
<b>Rotating Stream Sprinklers</b>	RN200 Series Rotary Nozzles	30%	<i>Performance and Water Conservation Potential of Multi-Stream, Multi-Trajectory Rotating Sprinklers for Landscape Irrigation</i> K.H. Solomon, J.A. Kissinger, G.P Farrens, J. Borneman
<b>Pressure Regulating Spray Head Bodies</b>	Pro S Spray with –PR Option	5 to 50+% (based on pressure differential)	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. See: <a href="#">Bernoulli’s Equation</a>
<b>Check Valves</b>	Pop-Up Sprays and Rotors	5 + %	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 slow in the sprinkler zone.
<b>Automatic Controllers</b>	RPS 46, 469 and 1224 Controllers	10%	K-Rain controllers have the programming flexibility to accommodate a wide variety of landscape materials and climate types, as well as adjust for seasonal weather changes. Savings are based on manufacturer testing, and rely on user input for programming and seasonal changes.
<b>Rain Sensor</b>	K-Brain Sensor	Up to 20%	Rain sensors automatically preempt or stop irrigation when sufficient precipitation has occurred, and the sensor is activated. Water savings is dependent on the number or rain events, and the quantity of ran that occurs during the irrigation season.



## **Water Efficiency Credit 1 (WE 1)**

Water Efficient Landscaping – Option 2. No Potable Water Use or No Irrigation (2 Points)

### **Intent:**

Eliminate the use of potable water, or other natural surface or subsurface water resources available on or near the project site, for landscape irrigation.

### **Requirements:**

Meet the requirements for WE Credit 1, Option 1

AND

### **Path 1**

Use only captured rainwater, recycled wastewater, recycled graywater, or water treated and conveyed by a public agency specifically for non-potable uses for irrigation.

OR

### **Path 2**

Install landscaping that does not require permanent irrigation systems. Temporary irrigation systems used for plant establishment are allowed if removed within a period not to exceed 18 months of installation.

### **Potential Technologies & Strategies:**

Perform a soil/climate analysis to determine appropriate 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.

***If the percent reduction of potable water is 100% AND the percent reduction of total water is equal or greater than 50%, both Option 1 and Option 2 are earned.***



## K-Rain Products for use in Non-Potable Water Irrigation Systems

The list below contains K-Rain products that are designed to be used in irrigation systems that use non-potable water. If attempting to achieve WE Credit 1, Option 2, many local codes require that systems be installed with proper identification to alert the public to the use of non-potable water.

Product Category	Product Family	Non-Potable Water Identification
<b>Pop-Up Spray Bodies</b>	<ul style="list-style-type: none"><li>○ K-Sprays</li><li>○ Pro S Sprays</li></ul>	K-Spray and Pro S Spray products designed for non-potable systems have an optional, factory installed Purple Reclaimed Water Twist Cap. The cap may be ordered separately and installed in the field, if desired.
<b>Rotor Sprinklers</b>	<ul style="list-style-type: none"><li>○ Pro Plus</li><li>○ Super Pro</li><li>○ RPS75</li><li>○ MiniPro</li><li>○ ProCom</li><li>○ ProSport</li><li>○ K2 Smartset</li><li>○ K8000 Smartset</li></ul>	K-Rain gear driven sprinklers designed for non-potable systems have an optional, factory installed Purple Reclaimed Water Twist Cap. The cap may be ordered separately and installed in the field, if desired.
<b>Indexing Valves</b>	<ul style="list-style-type: none"><li>○ 4000 Series Indexing Valves, Four Outlet Models</li><li>○ 4000 Series Indexing Valves, Six Outlet Models</li><li>○ 6000 Series Indexing Valves, Four Outlet Models</li><li>○ 6000 Series Indexing Valves, Six Outlet Models</li></ul>	K-Rain Indexing Valves designed for non-potable systems have a factory installed Reclaimed Water Top. In the 4000 Series, the purple top is molded out of high-impact ABS. In the 6000 Series is die cast and treated with heavy duty powder coat to indicate Reclaimed Water Usage.

## **Other LEED Credits**

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

### **Sustainable Sites Credit 5.1: Site Development – Protect and Restore Habitat (1 Point)**

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 6.1: Storm water Design – Quantity (1 Point)**

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

### **Sustainable Sites Credit 7.2: Heat Island Effect – Roof (1 Point)**

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 K-Rain's RN200 Rotary Nozzle can be used to effectively irrigate plant material on these roofs.

### **Energy and Atmosphere Credit 1: Optimize Energy Performance (1 – 19 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 wind, and also shading from summer sun. These strategies can help 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, affecting energy usage. Green walls and mature trees to shade the building, and appropriate turf areas to cool the immediate areas surrounding structures, can be helpful to meet the requirements. Efficient irrigation can be important in supporting the plant material for optimum benefit.



## Innovative 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 requirement 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.



### **K-Rain and the Environment:**

***K-RAIN GROWS GREEN is a philosophy of conservation and environmental responsibility that guides our product development, manufacturing process and corporate culture.***

We are doing our part to prepare a greener future for generations to come through our everyday activities:

- We design high quality irrigation products that enable the efficient use of water and water recycling.
- We evaluate and invest in our manufacturing facilities and processes to continually consume less of the earth's diminishing resources.
- We strive for zero waste in all our activities. From our corporate offices to the factory floor, we promote the recycling of all materials back into nature or the marketplace in a manner that protects human health and the environment.
- We foster a corporate culture of social and environmental responsibility that includes: volunteering and sponsoring social programs in the communities in which we live and operate; developing a digital strategy that reduces total supply chain paper consumption; developing educational programs for the irrigation industry that promote water recycling and conservation