Quick Guide to LEED®

What is LEED?

The Leadership in Energy and Environmental Design (LEED) Green Building Rating System™ is a point rating system devised by the United States Green Building Council (USGBC) to evaluate the environmental performance of a building over its life cycle and to encourage market transformation towards sustainable design. This voluntary system is credit-based, allowing projects to earn points for environmentally friendly construction of a building and its site. LEED was launched in 1999 in an effort to develop a "consensus-based, market driven rating system to accelerate the development and implementation of green building practices."

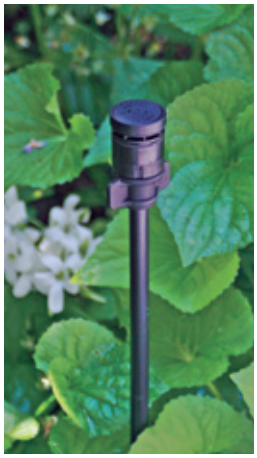
LEED is the nationally recognized benchmark for the design, construction, and operation of high performance green buildings. LEED provides building owners and operators with the tools they need to have an immediate and measurable impact on their buildings' performance. LEED promotes a whole-building approach to sustainability by recognizing performance in five key areas of human and environmental health: sustainable sites, water savings, energy efficiency, materials selection, and indoor environmental quality.

LEED covers many different types of buildings and construction under the following LEED products:

- LEED for Existing Buildings ("LEED-EB")
- LEED for New Construction and Major Renovations ("LEED-NC")
- LEED for Commercial Interiors ("LEED-CI")
- LEED for Core and Shell ("LEED-CS")
- LEED for Schools
- LEED for Homes
- Under development: LEED for Neighborhoods, LEED for Retail, LEED for Healthcare

The LEED rating system has five main credit categories, which are broken down into individual points. A certain number of points must be achieved to obtain certification. Point levels vary by LEED product. The main credit categories are:

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



Additional credits can be earned for innovation, exceptional performance, and the use of a LEED accredited professional on the project team.

The levels of certification are:

- Certified
- Silver
- Gold
- Platinum

Detailed information on obtaining credits and the project certification process is available from the USGBC on their LEED website: www.usgbc.org. The website outlines the intent, requirements, and strategies for meeting each credit.

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Points for Certification for LEED 2009

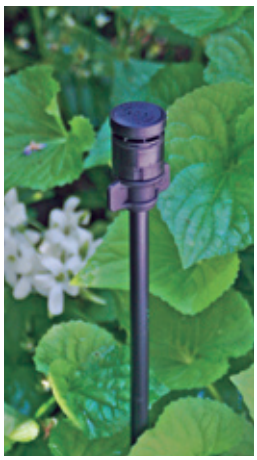
The "LEED 2009 Vision and Executive Summary" basically states that LEED is growing at an exponential rate, will now start to be revised on a periodic basis similar to code improvements, incorporate a "transparent environmental/human impact credit weighting" scheme, and add some form of regionalism into the point system. LEED-NC, LEED-CS, LEED-CI, LEED-EB, and LEED for Schools are all being edited under the new system and will be rolled out throughout 2009. A building requires at least 40 points to achieve certification. Silver (50 pts.), Gold (60 pts.), and Platinum (80 pts.) levels are also available.

Credit Category	Points Available
Sustainable Sites	26
Water Efficiency	10
Energy and Atmosphere	35
Materials and Resources	14
Indoor Environmental Quality	15
Innovation and Design Process	6
Regional Priority Credits	4
Total Points	110

Irrigation Systems and LEED

Using highly efficient irrigation products can increase the number of points awarded to a project trying to obtain LEED certification. The areas that efficient irrigation products can contribute include:

Water Efficiency Credit 1.1: Reduce Irrigation need by 50% – (2 points)
Water Efficiency Credit 1.2: No Potable Water Use or No Irrigation – (2 points)
Materials and Resources Credit 4.1 and 4.2: Recycled Content – (1 point)
Innovation in Design Credit 1: Innovation in Design – (5 points)
Innovation in Design Credit 2: LEED Accredited Professional – (1 point)
Regional Points Credit 1 – (4 points)
Sustainable Sites Credit 5.1: Site Development: Protect or Restore Habitat – (1 point)
Sustainable Sites Credit 6.1: Stormwater Design: Quantity Control – (1 point)
Sustainable Sites Credit 7.2: Heat Island Effect – (1 point)
Energy and Atmosphere Credit 1: Optimize Energy Performance – (1-19 points)



The following are suggestions for earning LEED 2009 points through the use of efficient irrigation products. The headings below correspond to the credit categories used in the LEED rating system. Points must be documented according to LEED procedures in order to qualify. The USGBC website, www.usgbc.org, contains downloadable templates that simplify the process of registering a LEED project and submitting documentation toward certification.

Credit	Title	Summary
WE 1.1	Water Efficient Landscaping: Reduce by 50%	Reduce potable water consumption for irrigation by 50% from a calculated mid-summer baseline case.
WE 1.2	Water Efficient Landscaping: No Potable Water Use or No Irrigation	Eliminate the use of potable water, or other natural surface or subsurface water resources available on or near the project site, for landscape irrigation.

Water Efficiency Credit 1.1:
Water Efficient Landscaping: Reduce by 50%

2 points

Intent

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:

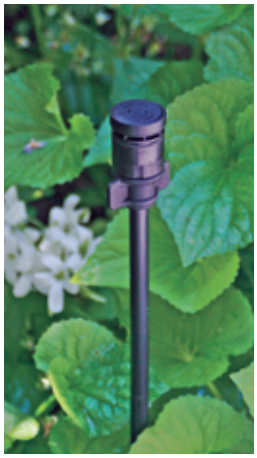
- Plant species factor
- Irrigation efficiency
- Use of captured rainwater
- Use of recycled wastewater
- Use of water treated and conveyed by a public agency specifically for non-potable uses

Potential Technologies & 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.

Rain Bird Notes:

The designer on the LEED project will need to provide an irrigation plan and legend, as well as calculations, a description of the baseline, and cut sheets of the irrigation system demonstrating how water consumption is reduced by 50%. Guidance and worksheets for calculating water use can be found in the reference guides on the USGBC website. The following Rain Bird products help to achieve a 50% reduction in water consumption.



Category	Models	Water Savings[1]	3rd party validation
Rain Sensors (2009 - 2010 Rain Bird Catalog, page 132)	Rain Sensor	20%	Water savings confirmed in the S.L. Davis, M.D. Dukes, G.L. Miller study Irrigation by Evapotranspiration-Based Irrigation Controllers in Florida presented at the International Irrigation Association Show in 2008. http://irrigation.ifas.ufl.edu/ET/pubs/2008%20Final%20IA%20Manuscript%20-%20SLD.pdf
Landscape Drip (2009 - 2010 Rain Bird Catalog, pages 165-206)	Xerigation/ Landscape Drip products	40%	Average water savings confirmed by Bilderback, T.E. and M.A. Powell. Efficient irrigation. North Carolina Extension Service, Publication Number AG-508-6, March 1996. 21 January 2005. http://www.bae.ncsu.edu/programs/extension/publicat/wqwm/ag508_6.html
	Drip Control Zone Kit (XCZ)	5%+	Every 5 psi reduction in pressure reduces water usage by 6-8%. A 70 psi system reduced to a recommend 30 psi can provide more than 50% in water savings. Derived from Bernoulli's equation (5.19). Refer to Roberson/Crowe, Engineering Fluid Mechanics (fourth Edition), Houghton Mifflin Co. Boston, MA 1990. http://www.engineeringtoolbox.com/bernouilli-equation-d_183.html or http://en.wikipedia.org/wiki/Bernoulli's_principle

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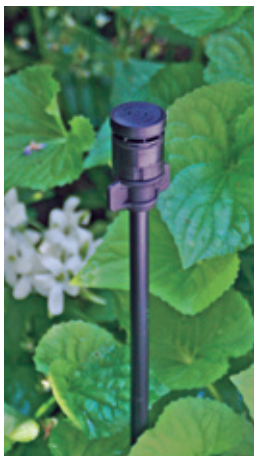
Category	Models	Water Savings[1]	3rd party validation
Central Control (2009 - 2010 Rain Bird Catalog, pages 135-156)	IQ™, MDC, SiteControl, Maxicom²®	35%	Water savings are average values for multiple installations. Case studies verifying these water saving can be found on the LEED website as well as www.rainbird.com/landscape/site_reports/index.htm
Controllers (ET type) (2009 - 2010 Rain Bird Catalog, pages 123-125)	ET Manager	30%	Average savings for ET-based irrigation. Based on water savings confirmed in the S.L. Davis, M.D. Dukes, G.L. Miller study Irrigation by Evapotranspiration-Based Irrigation Controllers in Florida presented at the International Irrigation Association Show in 2008. http://irrigation.ifas.ufl.edu/ET/pubs/2008%20Final%20IA%20Manuscript%20-%20SLD.pdf
Controllers (2009 - 2010 Rain Bird Catalog, pages 119-127)	ESP Modular Series, ESP-LX Modular Series, ESP-MC Series	10%	Based on Manufacturer's testing. Manually set Monthly Season Adjust (water budget for every month of the year) will save water over baseline unadjusted schedule.
Spray Heads (2009 - 2010 Rain Bird Catalog, pages 7-18)	1800-PRS, 1800-SAM-PRS, 1800 PCS	5%+	Every 5 psi reduction in pressure reduces water usage by 6-8%. A 70 psi system reduced to a recommend 30 psi can provide more than 50% in water savings. Derived from Bernoulli's equation (5.19). Refer to Roberson/Crowe, Engineering Fluid Mechanics (fourth Edition), Houghton Mifflin Co. Boston, MA 1990. http://www.engineeringtoolbox.com/bernouilli-equation-d_183.html or http://en.wikipedia.org/wiki/Bernoulli's_principle
Spray Head Nozzles (2009 - 2010 Rain Bird Catalog, pages 20-27)	U-Series	30%	Based on manufacturer's testing
	Rotary Nozzles	30%	Average water savings. Rotary-type nozzles use 20-30% less water than traditional spray heads because they operate with lower precipitation rates, greater uniformity of distribution, and a greater radius of coverage, according to the Metropolitan Water District of Southern California. Savings of 21-40% were also show in a study by Joseph Kissinger and Dr. Kenneth H. Solomon in 2006.
Rotors (2009 - 2010 Rain Bird Catalog, pages 48-50, 76-77)	5000 Plus PRS, TSJ-PRS	5%+	Same pressure regulation reference as above.
Rotor Nozzles with Rain Curtain Technology (2009 - 2010 Rain Bird Catalog, page 45)	High Efficiency Nozzles	5%+	Rain Curtain™ nozzle technology delivers thick water droplets in a uniform, consistent pattern, eliminating over-spray which results in water savings. Calculated water savings can be achieved based on designs using Nozzle Performance data available from the Center for Irrigation Technology. http://cati.csufresno.edu/cit
Valves (2009 - 2010 Rain Bird Catalog, pages 107-108)	PRS-Dial	5%+	Same pressure regulation reference as above.

[1] All claims of water savings dependent on proper design, installation, and maintenance of irrigation products. Actual water savings may vary from user to user depending on weather, irrigation system and site conditions, and previous irrigation practices.



System Efficiency

As part of WE 1.1 Credit, the designer should provide a planting plan, plant list, and narrative describing how water consumption is reduced by 50%. Irrigation efficiency is a key component of calculating water use savings.

Proper head selection and spacing improves the overall water application efficiency of an irrigation system and minimizes irrigation water runoff. The following list provides guideline efficiencies for irrigation products that can be found in the LEED for Homes reference guide. The appropriate Rain Bird product is listed for each for reference. The Minimum and Maximum Irrigation Efficiencies (IE) are dependent on proper design, installation, maintenance of a site and varies from user to user. Please note: the use of pressure regulating devices ensures heads operate at optimum pressure for efficiency.

Category	Model	IE Min	IE Max
Fixed spray	1800 Series, UNI-Spray Series	0.4	0.6
Impact and micro-sprays	Rain Bird impact and micro-sprays	0.5	0.7
Rotors	All Rain Bird rotors	0.6	0.8
Multi-stream rotors	Rotary Nozzles	0.6	0.8
Low volume and point source	Landscape Drip products	0.7	0.9

Water Efficiency Credit 1.2: Water Efficient Landscaping: No Potable Water Use or No Irrigation

2 Points in addition to WE Credit 1.1

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

Achieve WE Credit 1.1.and:

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

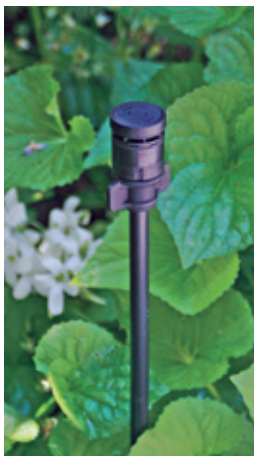
-OR-

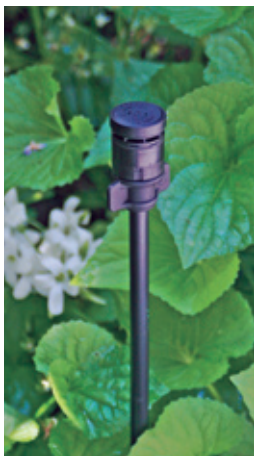
Install landscaping that does not require permanent irrigation systems. Temporary irrigation systems used for plant establishment are allowed only if removed within one year of installation.

If the Percent Reduction of Potable Water is 100% AND the Percent Reduction of Total Water is equal to or greater than 50%, WE Credit 1.2 is earned in addition to WE Credit 1.1.

Potential Technologies & Strategies

Perform a soil/climate analysis to determine appropriate landscape types and design the landscape with indigenous plants to reduce or eliminate irrigation requirements. Consider using stormwater, greywater, and/or condensate water for irrigation.





Rain Bird Notes:

The following Rain Bird products are designed for operation in non-potable systems and help achieve this credit. (Please see page 6 of the 2009 - 2010 Rain Bird Landscape Irrigation Products Catalog for more information).

Category	Model	Non-Potable Water Applicability
Spray Heads	1800 NP Clip-on Cover (1800 Series)	1800 clip-on covers for non-potable applications (purple)
	PA-8S-NP (Plastic Shrub Adapter)	Shrub adapter for non-potable applications (purple)
	US NP Cover (UNI-Spray™)	UNI-Spray cover for non-potable applications (purple)
Rotors	3500 NP Cover	3500 cover for non-potable applications (purple)
	5000 NP Cover	5000 cover for non-potable applications (purple)
	8005 NP Cover	8005 cover for non-potable applications (purple)
	7005 NP Cover	7005 cover for non-potable applications (purple)
	F4-FC-NP/F4-PC-NP/F4-FC-SS-NP/ F4-PC-SS-NP(Falcon 6504)	Falcon 6504 cover for non-potable applications (purple)
	2045A Maxi-Paw-NP/ 2045 Maxi-Paw-SAM-NP	Maxi-Paw cover for non-potable applications (purple)
Valves	PESB-R Series Valves	Reclaimed water valves able to handle chlorine and other chemicals
	EFB-CP-R Series Valves	Reclaimed water valves able to handle chlorine and other chemicals
Non-Potable Handles for Valves	PGA-NP-HAN1	Non-potable handles (purple) for 1" and 1½" PGA Valves
	PGA-NP-HAN2	Non-potable handles (purple) for 2" PGA valves
	PEB-NP-HAN1	Non-potable handles (purple) for 1" PEB and PESB valves
	PEB-NP-HAN2	Non-potable handles (purple) for 1½" and 2" PEB and PESB valves
	EFB-GB-NP-HAN	Non-potable handles (purple) for all GB and EFB-CP Valves
	BPE-NP-HAN	Non-potable handles (purple) for 3" BPE and BPES valves
Quick Coupling Valves	33DNP	Locking purple covers
	44NP	Locking purple covers
	5NP	Locking purple covers
Valve Boxes	VB-JMBP	Jumbo box and purple lid
	VB-JMBP-H	Jumbo box and purple lid + lock
	VB-JMBP-L	Jumbo box purple lid only
	VB-STDP	Standard box and purple lid
	VB-STDP-H	Standard box and purple lid + lock
	VB-STDP-L	Standard box purple lid only
	VB-STDP-6	Standard 6" box and purple lid
	VB-10RNDP	10" Round box and purple lid
	VB-10RNDP-H	10" Round box and purple lid + lock
	VB-10RNDP-L	10" Round box purple lid only
	VB-7RNDP	7" round box and purple lid
Drip Irrigation	Purple Landscape Dripline, XF Dripline	Purple-colored tubing for non-potable applications
	Xeri-Black Stripe Tubing with Emission Devices	Available with purple stripe for non-potable applications
	XCZ-100-B-COM	Control zone kit for non-potable applications
Accessories	MDCFPCAP	Purple flush cap with fitting for non-potable applications
	SPXFLEXRW	Swing pipe for reclaimed water
	RWS-GRATE-P	Purple covers (grates) for RWS Series

Materials and Resources Credit 4.1 and 4.2: Recycled Content – (1-2 point)
The intent of this credit is to use materials with recycled content, thereby preserving precious natural resources. One point is awarded if the sum of the post-consumer recycled content plus one-half of the pre-consumer recycled content constitutes at least 10% (based on cost) of the total value of the materials in the project. MR Credit 4.2 is similar but requires a total of 20%, based on cost.

Rain Bird's black valve box bodies and lids contain 100% recycled HDPE (high-density polyethylene). These valve boxes come in an assortment of sizes, including Standard, Jumbo, Super Jumbo, Maxi Jumbo, 10" Round, 7" Round sizes, all made of 100% recycled content.

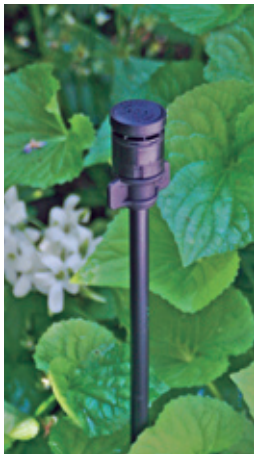
Rain Bird's RWS 36" and RWS Mini (18") contain at least 10% recycled Poly Ethylene (swing pipe) and Poly Propylene (all other parts).

Innovation in Design Credit 1: Innovation in Design/Exceptional Performance – (5 points)
In addition to the points above, 1-5 points can be achieved as Innovation in Design (ID) Credits. These points can be applied for if an innovative green design strategy is used that does not fit into the point structure of the five LEED categories or goes significantly beyond a credit requirement (e.g. substantially exceed performance in water efficiency) and demonstrates exceptional environmental performance. One example is the development of an actively instructional educational program which includes 2 of the 3 following elements:

1. A comprehensive signage program that may include…signs to call attention to water-conserving landscape features
2. Development of a manual, guidelines or case study on the project
3. An educational outreach program or guided tour of the project

Innovation in Design Credit 2: LEED Accredited Professional – (1 point)
In addition, one point is given if a principal participant of the project team is a LEED Accredited Professional. The irrigation industry has LEED-experienced professionals available to help maximize the points for efficient irrigation and landscaping.

Regional Points Credit (RP Credit 1) – (4 points)
Earn one of the six Regional Priority credits – to a maximum of 4 credits per project (credits identified as having additional regional environmental importance by the USGBC Regional Councils and Chapters for the project's location). A database of Regional Priority credits and their geographic applicability is available as they are released on the USGBC website – www.usgbc.org.



One point is awarded for each Regional Priority credit earned. No more than 4 Regional Priority credits may be earned. Non-U.S. projects are not eligible for Regional Priority credits.

Other Potential Points
Efficient irrigation products can also be used to obtain points indirectly.

Sustainable Credits 5.1: Site Development: Protect or Restore Habitat – (1 point)
Efficient irrigation systems can play a key role in protecting/restoring habitats.

Sustainable Sites Credit 6.1: Stormwater Design: Quantity Control – (1 point)
Limiting disruption of natural water hydrology by reducing impervious cover, increasing on-site infiltration, reducing or eliminating pollution from stormwater runoff, and eliminating contaminants can earn points for Sustainable Sites Credit 6.1: Stormwater Design: Quantity Control. Irrigation can be used to eliminate stormwater run-off by using all captured rainwater and run-off for irrigating the landscape.

Sustainable Sites Credit 7.2: Heat Island Effect – (1 point)
Efficient irrigation products, in particular drip systems, can irrigate vegetated ("green") roofs for Sustainable Sites Credit 7.2: Heat Island Effect.

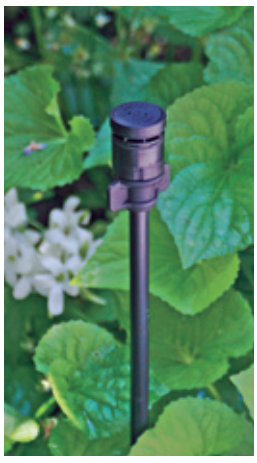
Energy and Atmosphere Credit 1: Optimize Energy Performance – (1-19 points)
Achieve increasing levels of energy performance above the baseline in the prerequisite standard to reduce environmental and economic impacts associated with excessive energy use. 1-19 points can be achieved by demonstrating progressive compliance to one of three options. Using a Rain Bird Variable Frequency Drive (VFD) Booster Pump for irrigation instead of a Constant Speed Booster Pump can reduce energy consumption of the station during operation by as much as 10-25%. Rain Bird Maxicom$^{2®}$ and SiteControl Central Control can also contribute energy savings with its Flow Manager™ feature. Flow Manager™ optimizes the available flow with required zone flow of an irrigation system thereby reducing the total run time and amount of energy consumed by a pump station operating on the system. This energy savings can be used to support the Energy and Atmosphere Credit for Optimize Energy Performance of the entire project.

Benefits of LEED Certification

The benefits of LEED Certification are numerous. These range from projecting a positive environmental image to the community to achieving water, energy and cost savings over the life of a project. Other advantages include better air quality and a greener environment, which can translate into higher productivity and higher profits.

By certifying a project, the USGBC provides third party validation of achievement, signified with a plaque to mount on the building and provides recognition and marketing exposure through its web site, case studies, and media announcements. A growing number of cities and states either provide tax credits or other incentives for green buildings, or require green building certification for public buildings. The U.S. government is adopting green building programs similar to LEED through the General Services Administration, the U.S. Army, the Department of State, the Department of Energy (DOE), and the Environmental Protection Agency (EPA). State and local governments across the country are adopting LEED for public-owned and public-funded buildings. LEED also extends globally as over 41 countries have LEED projects in progress. Eleven other countries have their own chapters of the Green Building Council and rating systems adapted to meet the needs in their regions. Support of green building globally has increased rapidly over the last five years and is projected to continue doing so.

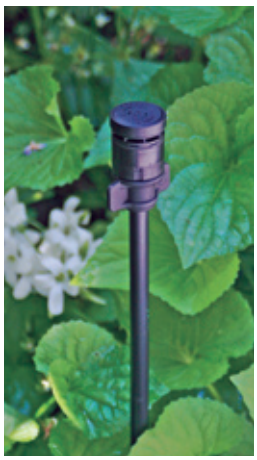
The LEED Green Building Rating System promotes environmentally sustainable buildings for the improvement of indoor and outdoor building quality, the conservation of resources, and the reduction of waste during the building process. Highly efficient irrigation products can be used in conjunction with the LEED program to earn LEED certification.



LEED Project Checklist

How efficient irrigation products can help achieve points

Water Efficiency		Points
Credit 1.1	Reduce Potable Water by 50%	2
Credit 1.2	No Potable Water Use	2
Materials and Resources		
Credit 4.1 and 4.2	Recycled Content	1-2
Innovation and Design Process		
Credit 1	Innovation in Design/Exceptional Performance	1-5
Credit 2	LEED Accredited Professional	1
Sustainable Sites		
Credit 5.1	Site Development: Protect or Restore Habitat	1
Credit 6.1	Stormwater Design: Quantity Control	1
Credit 7.2	Heat Island Effect	1
Energy and Atmosphere		
Credit 1	Optimize Energy Performance	1-19
Regional Credits		
Credit 1	Vary by region	1-4
TOTAL		1-38



Rain Bird Corporation
6991 E. Southpoint Road • Tucson, AZ 85706
Phone: (520) 741-6100 • Fax: (520) 741-6522

www.rainbird.com