VWP09

An Overview of the LEED Certification Process

Introduction

LEED certification is becoming increasingly desirable, as building owners seek to lower both their utility bills and their carbon footprint. Getting your building LEED certified is the best way to convey to your industry and your community that you support a cleaner environment and more responsible energy usage.

LEED (Leadership in Energy and Environmental Design) is a third-party certification program developed by the US Green Building Council (USGBC) in 1998 that assesses the energy efficiency and sustainability of commercial spaces using a "whole building" approach. The LEED certification process looks at the building only, not products, services, or companies. The building is examined from the point of view of the five key areas of environmental health: sustainable site development, water savings, energy efficiency, materials selection, indoor environmental quality.

The benefits of LEED certification for the building owner are varied. In most cases, utility bills will be lower after implementation of energy-efficient improvements. Many states also have tax credits and incentives associated with these improvements, because of the resulting reduction in the facility's environmental impact on the community. Finally, LEED certification is an outward demonstration of commitment to environmental stewardship.

Overview

There are several Ratings Systems that can be applied for. A building owner must study each system to determine which is most appropriate for the structure to be certified.

- New Construction
- Existing Buildings: greater than 2 years old
- Commercial Interiors: for tenants who lease their space or do not occupy an entire building
- Core and Shell: covers design and construction materials
- Schools: K-12 institutions
- Healthcare: hospitals, long-term care facilities, outpatient facilities, assisted living centers, and education and research centers
- Homes: for residential structures only
- Neighborhood development: describes requirements for a whole community, including location, a healthy-living environment, and protection for threatened species
- Retail (pilot stage)

Within each Ratings System, numerous credits are described, with point values assigned for each credit. A building owner must examine these credits to decide what improvements to make to the building. As credits are satisfied, points are accrued. The total number of points earned determines what certification level (Certified, Silver, Gold, or Platinum) the building qualifies for.

Applying for LEED Certification

The basic process for LEED certification is simple:

- Register the building with the US Green Building Council.
- Choose a Ratings System and certification level to apply for.
- Implement improvements to the building, earning points for improvements described for the chosen Ratings System. Sufficient credits must be chosen to earn points for the desired certification level.
- Prepare the LEED application by documenting building performance data and operational procedures, based on the improvements made.
- USGBC will review the application to determine whether the LEED credits have been satisfied, awarding points where earned.
- If the application is approved, USGBC will send the LEED certificate.

The most time-consuming phase of this process for the building owner is often the implementation of improvements to the building. The owner has a choice when making these improvements. He must only choose credits that will earn enough points for the desired certification level; therefore, many credits in the program can be omitted from implementation.

One important distinction to make is prerequisites vs. credits. Points are awarded for the credits. However, to earn any credits in a category, the building owner must first satisfy the prerequisites for that category. Prerequisites do not have point values associated with them. For example, if a building owner wants to include any of the Indoor Environmental Quality (IEQ) credits in his application, he must also satisfy two IEQ prerequisites, for which no points are awarded. Any strategies implemented for IEQ credits are invalid if the IEQ prerequisites are not satisfied first.

Point Values

Points are awarded based on the design of energy-efficent systems and environmentally-friendly practices. The "whole building" approach precludes the awarding of points based solely on installation of environmentally-friendly products; the building owner must prove that the overall design accomplishes the goal laid out in the Ratings System.

For example, the criteria for Water Use Reduction in the New Construction Ratings System (WE 3) calls for a reduction in the total water use in the building's lavatory facilities, showers, and sinks. One strategy to accomplish this reduction is through the installation of high-efficiency fixtures. However, replacement of fixtures is not sufficient to earn these points. The building owner must demonstrate that the new fixtures are successful in reducing building-wide water usage. The point is earned based in the overall effectiveness of the design, not on the strategy used to employ it.

For More Information

LEED Version 3 launched on April 27, 2009. All new projects will be required to apply under the Version 3 requirements. The Ratings Systems and a detailed application procedure can all be found at www.usgbc.org.

Selection Guide for Existing Buildings

Criteria	Requirement	Products Available
WE 1 Option 1 (1 point)	"Have in place permanently installed water metering that measures the total potable water use for the entire building and associated grounds. Meter data must be recorded on a regular basis and compiled into monthly and annual summaries."	• For residential buildings: all plastic and metal tee flow sensors (monitor required) • For commercial buildings: all SDI and insertion flow sensors (monitor required), nutating disc, and turbine meters
WE 1 Option 2 (2 points)	"Meet the requirements for Option 1 and have in place permanently installed metering for one or more of the following water subsystems: Irrigation…Indoor plumbing fixtures and fittings…Cooling towers…Domestic hot water…Other process water."	• Irrigation systems: plastic tee flow sensors (monitor required) • Indoor plumbing: plastic/metal tee, insertion, and SDI flow sensors (monitor required) • Cooling towers: SDI and insertion flow sensors (monitor required) • Hot water: plastic/metal tee, insertion, and SDI flow sensors (monitor required) • For wastewater: Magnetoflow meter
EA 1 Case 1 (1-18 points)	"Have energy meters that measure all energy use throughout the performance period of buildings to be certified."	• Power monitoring – Enercept (H80xx Series) • Power monitoring plus extended data collection – H84xx • Tenant submetering – H81xx
EA 2.1 (2 points)	"Document the breakdown of energy use in the building."	• Power monitoring at the branch level – E30, E31 • Cost allocation for utility bills (up to 92 circuits) – E30, E31 • Power distribution panels with branch circuits larger than 100 A – H8238 • Submetering applications for one 3-phase tenant – H81xx
EA 3.2 (1-2 points)	"Develop a breakdown of energy use in the building… Based on the energy use breakdown, employ system-level metering covering at least 40% or 80% of the total expected annual energy consumption of the building. Permanent metering and recording are required."	
EA 4 (1-6 points)	"Meet some or all of the building's total energy use with on-site or off-site renewable energy systems." (Points awarded based on the percentage of total energy consumed that comes from renewable sources.)	• For use with solar energy collection systems – Enercept (H80xx Series) • Power monitoring plus extended data collection – E50 Series
IEQ 2.2 (1 point)	"Use lighting controls that enable adjustments to suit the task needs and preferences of individuals for at least 50% of individual workstations, and for groups sharing a multioccupant space or working area for at least 50% of multi-occupant space in the building."	Occupancy/Lighting Control – • Ceiling mount – MSCx Series • Wall mount – MSBx Series
IEQ 2.3 (1 point)	"Have in place a system for continuous tracking and optimization of systems that regulate indoor comfort and conditions (air temperature, humidity, air speed and radiant temperature) in occupied spaces. Have a permanent monitoring system to ensure ongoing building performance to the desired comfort criteria as determined by ASHRAE 55-2004, Thermal Comfort Conditions for Human Occupancy."	Humidity – • Duct mount: HD, HED • Wall mount: HWL, HEW, HT, HWS Temperature – • Duct mount: TD, TDDA, TF, TG, TA, TB • Wall mount: TWS, TW, TE, TEA • Ceiling mount: TC, TS
IEQ 1.2 Case 2 (1 point)	"Have a CO_2 sensor or sampling location for each densely occupied space and compare it with outdoor ambient CO_2 concentrations."	CO_2 – • Duct mount: CDL, CDE • Wall mount: CWL, CWE, CWV

Selection Guide for New Construction

Criteria	Requirement	Products Available
WE 3 (2-4 points)	"Employ strategies that in aggregate use less water than the water use baseline calculated for the building."	• For residential buildings: all plastic and metal tee flow sensors (monitor required) • For commercial buildings: all SDI and insertion flow sensors (monitor required), nutating disc, and turbine meters • For wastewater: Magnetoflow meter
EA 1 (1-19 points)	"Quantify energy performance compared with a baseline building."	Meeting this criteria requires an integrated energy monitoring package throughout the facility. • For mains up to 2400 A − Enercept (H80xx Series) • For individual circuits − H81xx, H8238, E30, E31, E50
EA 2 (1-7 points)	"Calculate project performance by expressing the energy produced by the renewable systems as a percentage of the building's annual energy energy cost."	
EA 5 (3 points)	"Install necessary metering equipment to measure energy use."	
EA 6 (2 points)	"Provide at least 35% of the building's electricity from renewable sources."	• For use with solar energy collection systems − Enercept (H80xx Series) • Power monitoring plus extended data collection − E50 Series
IEQ 6.1 (1 point)	"Provide individual lighting controls for 90% of the building occupants to enable adjustments to suit individual task needs and preferences. Provide lighting system controls for all shared mulit-occupant spaces to enable adjustments that meet group needs and preferences."	Occupancy/Lighting Control − • Ceiling mount − MSCx Series • Wall mount − MSBx Series
IEQ 6.2 (1 point)	"Provide comfort system controls for 50% (minimum) of the building occupants to enable adjustments to meet individual needs and preferences...Conditions for thermal comfort are described in ASHRAE Standard 55-2004 and include the primary factors of air temperature, radiant temperature, air speed and humidity."	Humidity − • Duct mount: HD, HED • Wall mount: HWL, HEW, HT, HWS Temperature − • Duct mount: TD, TDDA, TF, TG, TA, TB • Wall mount: TWS, TW, TE, TEA • Ceiling mount: TC, TS
IEQ 7.1 (1 point)	"Design heating, ventilating, and air conditioning (HVAC) systems and the building envelope to meet the requirements of ASHRAE Standard 55-2004, Thermal Comfort Conditions for Human Occupancy."	Humidity − • Duct mount: HD, HED • Wall mount: HWL, HEW, HT, HWS Temperature − • Duct mount: TD, TDDA, TF, TG, TA, TB • Wall mount: TWS, TW, TE, TEA • Ceiling mount: TC, TS
IEQ 1 (1 point)	"Install permanent monitoring systems to ensure that ventilation systems maintain design minimum requirements. Configure all monitoring equipment to generate an alarm when airflow values or carbon dioxide (CO_2) levels vary by 10% or more from the design values via either a building automation system alarm to the building operator or a visual or audible alert to the building occupants."	CO_2 − • Duct mount: CDL, CDE • Wall mount: CWL, CWE, CWV