

LEED and structured cabling: What's the connection?

As a society, we are inundated with statistics and information on global warming, CO₂ emissions and environmental messages. In the United States, buildings are currently linked to 39% of the energy consumption, 39% of all CO₂ emissions, 12% of the water usage, and 136 million tons of construction/demolition waste per year.*

The building industry is engaged and taking action to reduce its impact on the environment. Benefits of green buildings—or sustainable design—not only positively affect the environment through improved air and water quality, solid-waste reduction, ecosystem protection and community health, but they also have economic advantages. Operating cost reductions in the range of 8 to 9% and increased building value of up to 7.5% have been reported for green buildings, according to the United States Green Building Council (www.usgbc.gov). In addition to increased demand for more environmentally responsible residential, institutional/office and educational construction, government initiatives are also driving momentum.

The Energy Independence and Security Act of 2007 included establishment of an “Office of High-Performance Green Buildings” within the U.S. General Services Administration. The office’s objective is to promote green-building technology for federal buildings. In February, the Department of Energy issued a memorandum to its leadership to adhere to an executive order containing green building criteria for new buildings of \$5 million or greater. Additionally, the Departments of Agriculture, Health and Human Services, Interior, State and the Environmental Protection Agency have green-construction directives.

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For now, there are no direct links for earning credits, but opportunities abound for impacting energy reduction.

Transforming for the environment

At the helm of the building industry’s green initiative is the U.S. Green Building Council, commonly referred to as the USGBC. Founded in 1993, the USGBC is a non-profit organization comprising leaders represented by various sectors of the building industry—owners, contractors, real estate developers, architects, product and building system manufacturers. The group’s mission, in its own words, is to “transform the way buildings and communities are designed, built and operated, enabling an environmentally friendly and socially responsible, healthy and prosperous environment that improves the quality of life.”

The Leadership in Energy and Environmental Design (LEED) rating system is a third-party certification program developed by the USGBC for the design, construction, and operation of high-performance and sustainable buildings. LEED provides owners and operators with a framework and set of tools for creating sustainability targets and assessing a building’s impact on the environment. Currently, there are nine rating systems finished or in pilot stages (noted with an asterisk in the list below) for various building types:

- LEED Rating Systems
- Existing Buildings
- Core and Shell
- Retail*
- Homes
- New Construction
- Commercial Interiors
- Schools
- Healthcare
- Neighborhood Development*

Whole-building health

LEED promotes a whole-building approach with certification based on the building/project meeting a set of performance criteria. Within each of the rating systems are six focus areas, each containing a set of prerequisites followed by a series of criteria, that if met, will



lead to “points” or “credits”:

1. *Sustainable Site* seeks to protect natural and agricultural areas by limiting development to appropriate sites.
2. *Water Efficiency* aims to reduce the quantity of water used within the building, and thus relieve the burden on supply and treatment.
3. *Energy and Atmosphere* strives to optimize energy efficiency and encourages alternative and renewable energy sources.
4. *Materials and Resource* seeks to reduce the quantity of materials needed, reduce and manage waste, and use materials with less environmental impact.
5. *Indoor Environmental Quality* intends to establish good indoor air quality.
6. *Innovation and Design Process* recognizes exceptional performance in any of the previous categories, and innovation in areas not addressed by the other categories.

Recognition levels—Certified, Silver, Gold and Platinum—are awarded based on the number of total credits achieved.

Currently, a rating system to specifically address data centers does not exist within the LEED framework; however, several data centers have achieved certification under one of the existing rating systems, with credits distributed among all six major categories. Most of the facilities that have achieved certification are “mixed use” where the building contains data center space as well as office space. By applying the LEED criteria to the office space as well, the energy and water consumption effects of the data center are mitigated, allowing for sufficient credits to achieve silver and even gold status.

Simply stated, certifications have been achieved based on the overall building design and construction, rather than a focus on the data center alone.

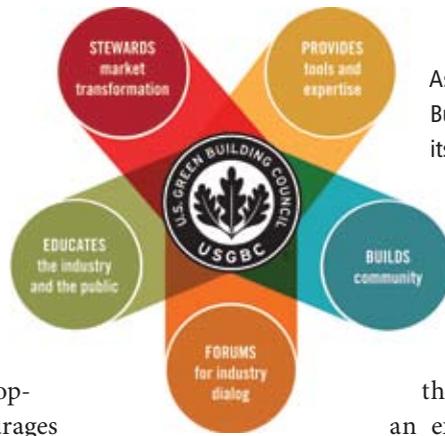
Where cabling fits in

With a focus on overall building design and construction, where does this leave the structured cabling component in terms of credit contribution?

One category within the LEED criteria that is ripe for structured cabling contribution is Energy and Atmosphere. An objective of this category is to demonstrate a percentage im-



The four levels of LEED recognition are Certified, Silver, Gold, and Platinum.



As this illustration depicts, the United States Green Building Council does more than grant points or credits for environmentally-designed buildings.

Improvement in the proposed building’s energy-saving performance, compared with a baseline performance through a “whole building energy simulation.”

Up to 10 credits are available based on the percentage of energy-cost reduction. As an example, in a data center facility, operating power and cooling cost reductions can be recognized when deploying a high-density optical network versus a Category 6A network for 10 Gigabit Ethernet (GbE) applications. When evaluating a 10-GbE system, annual energy cost reductions are estimated to range from 75 to 85% based on port counts of 48 to 288, when comparing 10GBase-S to 10GBase-T electronics.

Additionally, high-density cabling solutions can reduce con-

LEED for new construction ratings	
Certified	26-32 points
Silver	33-38 points
Gold	39-51 points
Platinum	52-69 points

gestion in pathways and cabinets, thereby promoting airflow, and may have a positive impact on credit contribution. Further, passive cooling solutions that incorporate innovative cabinet designs promote optimized air flow management and may positively contribute to credits within the Energy and Atmosphere category. As LEED takes a holistic approach, however, the energy savings associated with an optical network and/or optimized air flow management should be incorporated into the overall energy reduction strategy for the entire building.

No direct correlation yet

One may think that the Materials and Resource section within the LEED rating systems is an obvious home for structured cabling, specifically in the areas of waste reduction, recycled content and regional materials. But the USGBC currently recognizes only CSI Master Format Division 2-10 products, common construction materials, for this section.

At this time, Division 27 products (communications products) are not recognized toward calculations for LEED points within this category, meaning there is not a direct correlation for structured cabling within the Materials and Resource category. Industry-leading groups are in discussion with the USGBC to expand coverage to include Division 27 products. Should communication products be recognized in the future, subcategories—such as regional materials, where

credit criteria is established for products manufactured within a 500 mile radius of the site—may be an area where structured cabling could have an impact. Additionally, packaging optimization and packaging reduction initiatives would be of value with respect to waste management credits.

In summary, within the current LEED framework, there is not a direct link for structured cabling products to provide credits. But there are opportunities for a positive impact associated with structured cabling relative to energy reduction. Becoming a member of the USGBC provides

organizations with a voice to influence change and evolution within the LEED rating system, with the ultimate goal of high-performing, sustainable buildings for present and future generations. ✖*

* Sources: 2003 U.S. Department of Energy Buildings Energy Data Book, EIA Annual Energy Review 2005, U.S. Geological Service data from 1995, and the 1997 update of the U.S. Environmental Protection Agency's Characterization of Construction and Demolition Debris in the United States.

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