

DESIGN SYSTEMS, INC. NEWS

Specializing in Manufacturing Process
Design and Integration

www.DSIDSC.com

A Design Systems
Corporate Update

SEPTEMBER 2009

Investing In Renewable Resources

This edition of the Design Systems newsletter is devoted to energy conservation and the use of renewable energy. We, the engineering community, are charged with making intelligent choices such that all of our design decisions reflect a considered approach to energy consumption.

As an example, a conveyor drive that uses a high efficiency motor provides little benefit if it is connected to a 60% efficient gear box. Even a high efficiency VFD motor designed to run normally at 75% of synchronous speed may sacrifice substantially in energy efficiency.

We must reconsider all of our traditional engineering practices and take into consideration the "energy factor" of design: evaluating "old" manufacturing practices and applying new technologies or new methods.

Many opportunities are available to help in the quest of energy independence and reducing greenhouse gas emissions. It is our job to seek out the technologies, question our traditional approaches and be willing to take the risk of doing things differently. After all, we are operating in unprecedented times...

We must reconsider all of our traditional engineering practices and take into consideration the "energy factor" of design.

energy solutions provider



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Design Systems, Inc. Headquarters

38799 West 12 Mile Road
Suite 100

Farmington Hills, MI 48331-2903
800-660-4374 • 248-489-4300
Fax 248-489-4321



DESIGN SYSTEMS, INC.

LEED....

Unlock the opportunities in your Existing Buildings

If you look at the life cycle of a building, most are constructed in less than one year and operate for decades. The root word in Sustainability (sustain) implies a journey, not a destination. While sustainable construction methods are very important, implementing sustainability into the operations and maintenance of existing buildings over their extended life cycle will yield considerably more financial, environmental, and political benefits.

Employing the US Green Building Council's LEED (Leadership in Energy and Environmental Design) methodology for the construction of new buildings is a solid practice that has consistently produced measureable results. What most don't realize is that there are different formulas and criteria within LEED for the construction of new buildings than there are for existing buildings. LEED NC (New Construction) is only one of many rating systems developed by the USGBC.

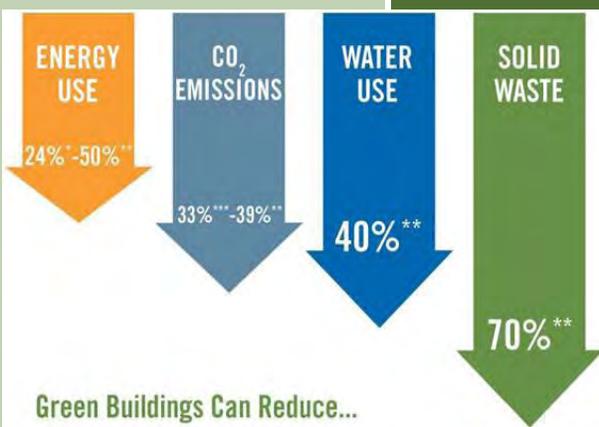
In the United States, less than 5% of the buildings are newly constructed annually. To make a significant difference in our sustainability, we need to affect change on a portion of the 95% of facilities that are not new. The USGBC has recognized this need, and has developed different rating systems for different building usage types and milestones in a facility's lifecycle. Regardless of which LEED rating system governs your facility, LEED has proven to deliver in every area of sustainability.

"What can LEED do for me if I am not building a new facility, or undergoing a large scale renovation?" More than you might think! By creating an awareness of the factors that contribute to energy savings, occupant health, and environmental stewardship, LEED assembles all of the criteria upon which change can be affected.

Acknowledging that technology in other sectors of our lives is rapidly advancing and that action must be taken to keep up with it, we don't always apply this same rationale regarding operation and maintenance of our facilities. The typical approach more closely resembles the old standby: "If it isn't broken, don't fix it!" While that is a handy cliché, the real value lies in the ability to determine when it is 'broken'. If a facility is not effectively satisfying the original premise for design, and not doing it efficiently, by definition it is broken.

If you are an operations person or facilities manager, LEED sets forth prescriptive methods for reducing loads on existing equipment and adjusting systems to optimize effectiveness. Additionally, LEED offers a means for creating a benchmark of existing operations and a tracking mechanism for quantifying the results of any changes. In this competitive work environment, there is increasing value in the ability to achieve and measure results.

While Sustainable construction methods are very important, implementing sustainability into the operations and maintenance of existing buildings over the extended life cycle of a building will yield considerably more financial, environmental, and political benefits.



building sustainable solutions



Energy Savings realized for a Local School District

Our goal with this project was to solve the issues that existed in the two spaces using minimal capital costs, optimize the building control system, and design a solution that paid for itself in a very short period of time.

As with most engineering projects, the following case study began with a problem. Our goal with this project was to solve the issues that existed in the two spaces using minimal capital costs, optimize the building control system that was already in place, and design a solution that paid for itself in a very short period of time.

The first issue that we set out to solve was a condition in the Gymnasium. In its relatively short seven-year lifespan, the gymnasium floor was showing signs of premature shrinkage and cracking. It was our thought that floor was drying out due to the lack humidification during winter months.

We performed a study of the existing ventilation system capabilities and set points and determined that it was not possible to achieve the minimum recommended humidity levels with the HVAC system as it was currently equipped. We also determined during our evaluation that the system was designed to and currently operated at a ventilation rate condition that only needs to be satisfied 5% of the time. So, the action plan involved changing set points to more accurately address the necessity for fresh air, thereby reducing the energy cost to operate the gymnasium, as well as implementing a humidification system to slow the premature shrinkage of the wood flooring. The savings that was identified in changing set-points was found to be more than sufficient to cover the cost of a humidification system. In fact, by employing this solution, the savings that will be realized will be approximately **\$100,000** a year. This savings allowed for the gymnasium floor humidification issue to be resolved with a payback of less than (9) nine months, without factoring the cost avoidance of extensive repairs to the gymnasium floor.

The second issue we addressed was in the pool area. The issue was that during hot, humid summer days, the current system struggled to reduce humidity to acceptable levels. The pool ventilation system was designed to cool the warm, humidity laden air to dehumidify it, and then reheat it for use in the pool area. Though the system does achieve the set points most of the time, it was determined that there was a more efficient way to achieve the desired conditions. By calculating the amount of moisture, via evaporation, that the three (3) pools produce, combined with the humidity that is drawn in with the summer air, we concluded that direct dehumidification would be the best option. By implementing a dehumidification system to reduce the humidity in the air, rather than using the cooling tower and boiler, the required set points could be met. Like the gymnasium, the savings attributed to reducing the load on the boiler and cooling tower proved to be sufficient to cover the cost of a direct dehumidification system to produce dehumidified air. Mixing the fresh dehumidified air with the recirculated air greatly

reduces the amount of energy required for dehumidification. An annual savings of approximately **\$26,000** is expected.

In summary, the total annual savings for both projects is approximately **\$126,000 with a capital investment payback of 9 months or less.**





**Providing
Innovative
Solutions
For the
Future**

As you read this, we are busy planning for the future. Our plans are driven by your contributions and input. We know that we cannot be content to maintain status quo, but need to continuously improve, constantly change, and relentlessly pursue opportunities on a global scale. We look forward, with you, to the future!

- *Privately owned and operated*
- *Founded in 1983*
- *Focus on long-term relationships with over 85% repeat business*
- *Strategic office locations to serve the global marketplace*
- *Over 150 engineering and support personnel*
- *ISO 9001:2000 Certified*

Looking ahead



DESIGN SYSTEMS, INC.

D S I D S C . C O M

Specializing in Manufacturing Process Design and Integration

Design Systems, Inc.
38799 West 12 Mile Road
Suite 100
Farmington Hills, MI 48331
248-489-4300
Fax: 248-489-4321
DSIDSC.com

DSI Engineering Services
No. 175, 3rd E Cross, 11 Block
111 Stage,
Basaveshwara Nagar,
Bangalore 560 079 India
(011-91) 990-219-9448

Design Systems Canada, Ltd.
3585 Rhodes Drive, Unit A
Windsor, Ontario
Canada N8W 583
519-944-8807
Fax: 519-944-8853

Design Systems Inc.
Mexico Office
(011.52) 844-155-2524