

# Michaels Engineering LEED® Brief

## NOT-SO-OBVIOUS, LOW-COST SUSTAINABLE BUILDING DESIGN

### SUGGESTIONS...

Do you have certain LEED® topics you'd like to know more about? Send an email with your suggestion to the author listed below and your topic might become a future LEED® Brief!

### DID YOU KNOW...

...Building green doesn't have to cost a fortune.

...Additional cost savings can be achieved by simply placing a greater priority on efficiency while cutting costs on expensive trim and furnishings in favor of high efficiency HVAC equipment and controls.

### MEET THE AUTHOR



Patrick O'Donnell is an Energy Engineer at Michaels Engineering. For more information on this topic or additional energy concerns, please contact Patrick at:

(608) 785-1900 or  
 PCO@MichaelsEngineering.com

### → NOT-SO-OBVIOUS, LOW-COST SUSTAINABLE BUILDING DESIGN MEASURES

Building green doesn't have to cost a fortune. In fact, it may only cost a little extra effort to ask your designer some simple questions as well as consider a few options outside of your typical cookie-cutter building design. Many sustainable measures make plain good sense and don't necessarily cost any more than the conventional alternatives. Let's look at a few examples[i]...

Measure	Real Sustainability Benefit
Optimize window-to-wall ratio for thermal performance and daylighting <sup>1</sup>	Energy savings can be very significant: glass is not a good insulator compared with an insulated wall. As a rule of thumb keep window-to-wall ratios under 35%.
Optimize lighting design so that it is only on when and where it needs to be and works in harmony <sup>2</sup> with natural daylighting from windows	Energy savings, improved occupant comfort and indoor lighting quality. Lighting controls are already required by code in most cases; make sure they are saving energy. Turn off daylight perimeter spaces with an astronomical time clock during the day. Exterior lighting power can almost always be reduced.
Ensure that all HVAC systems are functioning as they were intended to	The most efficient boiler will use more energy than a 20-year-old roof top unit if it is not properly controlled. Depending on the complexity of the system, this could be done for relatively low cost and short-term payback with building commissioning or retro-commissioning.
Reduce internal obstructions within a space	Allow occupants access to natural views, daylight, and maximize airflow distribution.
Take advantage of your energy modeler	Assuming this person is already on board with the project, explore optimum system configurations by manipulating the building envelope and HVAC systems as well as easily varying internal and exterior loading conditions. This should be done early in the design phase.
Reduce internal loads during unoccupied periods	Energy savings and reduction in cooling loads can be achieved by turning off appliances and office equipment when it is not in use. This can really add up!
Optimizing building orientation <sup>3</sup>	Proper orientation of a building's exposure can account for up to 5% energy savings.
Optimize use of continuous vs. batt insulation	Energy savings and thermal comfort for occupants. Continuous insulation minimizes the effects of thermal bridging.
Make building site more pedestrian-friendly and optimize or eliminate the parking lot	Reduce storm water run off and urban heat island effect, and have healthier occupants. Consider sizing the parking lot for only what is required and encourage people to use alternative means to commute.

First Cost Rating		
First cost savings over conventional measures	Neutral: no first cost increase or decrease	Modest increase in first cost, generally pays back within 5 years

### → CONCLUSION: THINK SIMPLIFICATION, OPTIMIZATION & INTEGRATION

As shown in the examples above, sustainable design doesn't have to cost you more. Another thing to keep in mind is that when building systems aren't optimized, they may dramatically increase energy consumption! Additional cost savings can be achieved by simply placing a greater priority on efficiency while cutting costs on expensive trim and furnishings. Saved dollars can be invested in high efficiency HVAC equipment, controls, and commissioning, which generally generate a high return on investment compared to other building expenditures. This upfront planning and optimization will help to uncover more cost effective, long-term building solutions.