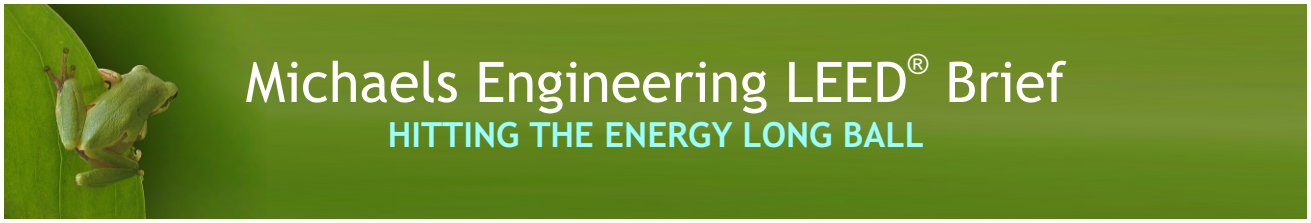

Michaels Engineering LEED® Brief

HITTING THE ENERGY LONG BALL

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...

...Dedicated outdoor air systems can save huge amounts of energy compared to what the new code requires.

...Typically, a ground-source heat pump system can achieve 20-25% energy cost savings, good for perhaps 5 of 10 LEED® energy points.

MEET THE AUTHOR

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LONG BALL

Beating the energy code a couple years ago was like a major leaguer teeing off on a little league pitcher. However, most of the gimmies, like energy recovery, variable frequency drives, and many control strategies that used to "save" lots of energy, are now considered standard practice.

Those days are gone. With the new codes and LEED® baseline, achieving substantial savings can be more like getting lucky with an infield single, stealing second, moving over to third on a fielders choice and finally scoring on a sacrifice fly. Woohoo! You may win 1-0.

We're going for the blowout.

To save a significant percentage of energy relative to baseline - to score - requires an intense understanding of systems and the next generation of design innovations and their correct application and control. Savings from efficient equipment, extra insulation, and energy-saving windows might get you a seeing-eye single here and there, but to bag round-tripper points, you need to attack the systems and controls.

SYSTEMS AND CONTROLS

System design includes the delivery of heating, cooling, and ventilation air to all temperature control zones in large complex buildings. Components include air handling equipment, ductwork, and temperature and flow control. Three examples below, if applied to the right application, can save a large percentage of energy garnering a good share of the 10 LEED® energy efficiency points available.

- Dedicated outdoor air systems (see Brief #14 Dedicated Outdoor Air Systems) can save huge amounts of energy compared to what the new code requires. We recently completed a design of one such system for a laboratory facility that saves almost 50% relative to the LEED®/energy code baseline - resulting in the potential harvest of the maximum 10 LEED® energy points.

- Displacement ventilation systems can also provide significant energy savings. Displacement ventilation works by "oozing" fresh, cool air at floor level, letting it rise through the occupied space that we inhabit, and returning through the plenum above the ceiling. Displacement ventilation requires much less fan power than a conventional variable air volume system, and results in energy savings by allowing for higher return and supply air temperatures, which allow for more efficient chiller operation. The higher supply air temperature also allows for more hours of free cooling with a water-side economizer, although humidity control must be considered. On top of all of this, it provides better air quality with less ventilation and associated energy costs!

- Ground-source heat pump systems are widely accepted in some regions. One of the advantages of ground-source heat pumps is they are simple and work more efficiently when the design is kept simple. Adding boilers or cooling towers to the ground loop, or supplemental heating and cooling of fresh air as "backup, just in case" can be a disaster from an energy perspective. We will cover this later in another brief. But typically, a ground-source heat pump system can achieve 20-25% energy cost savings, good for perhaps 5 of 10 LEED® energy points.

BOTTOM LINE

The bottom line is, to achieve HVAC system efficiency that is a significant departure from LEED® minimum requirements and to score substantial energy efficiency points, the system design and controls need to be the power hitters in your LEED® lineup.

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