

C A S E S T U D Y

Van Andel
Institute
Grand Rapids,
MI

WattStopper joins intelligent building team to help Van Andel Institute achieve LEED Platinum



Jeff Dykehouse

Key benefits of lighting controls:

- Energy savings
- Maintenance savings
- Longer equipment life
- Occupant comfort

WattStopper lighting controls used:

Occupancy sensors; open and closed loop photosensors; lighting control panels; emergency lighting control units

The Van Andel Institute's (VAI) 240,000 square-foot Phase II biomedical research center relies on intelligent building controls to achieve both energy and operational efficiencies. Building Intelligence Group President and Founder Paul Ehrlich planned the system integration which includes WattStopper lighting controls, and uses open protocols for communications and to ensure that the facility is adaptable to technology upgrades.

Says VAI Chairman and CEO David Van Andel, "Van Andel Institute's Phase II building is innovative in design, and incorporates a multitude of green initiatives beyond what seemed possible for a research institute just a few short years ago."

In April 2011 the U. S. Green Building Council (USGBC) awarded the new building a rare LEED Platinum certification in recognition of the myriad strategies employed to save energy and water, reduce CO₂ emissions, improve indoor environmental quality, and provide stewardship of resources.

The eight-story, \$178 million addition features a glass roof design that introduces an abundance of natural

light throughout the facility. Unique daylight open laboratories offer the highest quality environment for scientists. In addition to labs, the building includes offices, meeting rooms, a 90-seat conference center, a 100-seat cafeteria, an interactive discovery wall and an expanded library. In outlining the facility's LEED building features, the VAI cites:

- **Daylight controls automatically reduce lighting levels in the building to reduce energy consumption**
- **Intelligent Building Controls, right-sizing of equipment and system commissioning reduce overall energy usage, provide feedback on system performance, and identify areas for improvements.**

Advanced lighting control system

Lighting generally comprises one of the largest energy loads in a building and is historically the hardest to control, with burning hours far exceeding inhabited hours in a building. Deployment of occupancy sensors provided a cost-effective and simple route to achieving optimum savings. If sensors do not detect activity in a particular part of the building, the system can bring down illumination levels to minimum levels or switch lighting off.

WattStopper[®]

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The introduction of natural light throughout the building required multiple daylight control strategies.

The net decrease in energy expenses of 10 percent over conventional building performance will generate savings of \$130,000 a year. The mission improvements generate savings of \$600,000 per year.

– Building Intelligence Group

Additionally, in daylit spaces that are occupied, photosensors automatically dim the electric lights when the design light level is reached and maintained by either a combination of daylight and electric light, or daylight only. A key consideration in selecting WattStopper controls was the availability of both open and closed loop photosensors for optimal 'daylight harvesting' solutions in the many different types of daylit spaces throughout the facility.

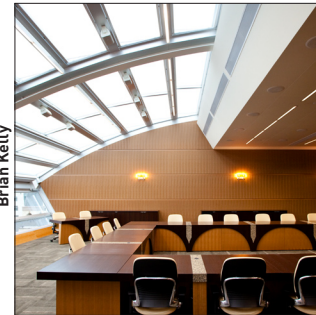
These controls can typically reduce lighting energy costs by as much as 20 to 50 percent without compromising lighting quality. And, since savings coincide with the time of day when utility companies experience peak demand, daylighting provides a natural form of 'demand response.'

The lighting system integrates with other building systems such as HVAC, fire, security and card access systems.

The system operates autonomously to control lighting, but shares lighting status, lighting levels, and energy usage via BACnet, and is compatible with Tridium's Niagara framework.

Technology partners and estimated efficiency

Building Intelligence Group designed the integrated building technology systems for cost effectiveness and functionality. The group also planned a retrofit of the existing (Phase I) VAI building, including adding



Brian Kelly

WattStopper controls, and estimated the ROI based on the implementation and integration of intelligent technologies in both VAI facilities as follows:

- Net investment: \$1,075,000
- Annual operational savings: \$100,000
- Annual energy savings: \$130,000
- Mission improvement: \$600,000
- Simple payback: 1.6 years
- ROI (over 5 years): 178 percent

The annual energy savings is a net decrease in energy expenses of 10 percent over conventional building performance. The mission improvements are based on a productivity improvement of one percent.

ControlNet managed the project controls design using Tridium's Niagara framework to offer a tailored package of unique features. The framework technology facilitates an open and interoperable approach for control solutions by enabling convergence of the IT enterprise with building automation controls systems and

the underlying mechanical systems. The controls platform was designed to be interoperable and fully integrated to support peer-to-peer data communication, which enables the system to initiate requests for data across different applications and subsystems. Incorporating the same core technology and operating software in HVAC and lighting has enabled the facilities management team to easily adapt to ever changing operational scenarios.

Based on "North American Intelligent Buildings Roadmap 2011"
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