



#### Award Category

Lighting and Controls

#### Green Features

Skylights bring daylight into the space

Occupancy sensors

Fixtures use an automatic rotating sequence to extend lamp life

#### Annual Energy Savings

Over 61,000 kWh

\$70,000

#### Cost

\$185,000

Fully funded by the MBCx Program offered through local utilities

#### Contacts

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#### Completion Date

Winter 2006

#### More Information

[www.solatube.com](http://www.solatube.com)

[www.wattstopper.com](http://www.wattstopper.com)

[www.greenheck.com](http://www.greenheck.com)

# CSU Dominguez Hills Gymnasium Lighting Retrofit

Retrofitting the student gymnasium with efficient T5 sport fixtures, occupancy sensors, and SolaTube skylights has reduced the facility's energy usage by 15 percent. The project was fully funded by the Monitoring-Based Commissioning Program offered through local utilities to improve energy efficiency statewide.

Sixty 21-inch diameter SolaTube skylights spot the ceiling of the gymnasium at CSU Dominguez Hills, diffusing natural light onto the courts. These skylights are just one component of the university's first comprehensive energy efficiency project. Highly efficient lights, occupancy sensors, and skylights have revitalized the student gymnasium with higher quality—and lower cost—lighting.

The gym's tubular skylights capture sunlight hitting the roof and direct it down a highly reflective shaft, where it is introduced into the building interior. With daylight contributing significantly to the gym's ambient light level, the campus was able to remove all 144 existing U-Tube fluorescent fixtures and replace them with just 72 efficient T5 sport fixtures.

A survey conducted by the university prior to the retrofit showed that lights were usually left on at night, even when the gym was completely unused. To address this, the campus installed occupancy sensors manufactured by Watt Stopper. These controls automatically turn lights off when the space is empty. Each light is equipped with an infrared sensor and operates independent of other fixtures, allowing lights to turn off in any unused portion of the gym. With this feature in place the entire gym does not have to be empty for the campus to achieve energy and cost savings.

The Watt Stopper controls automatically rotate which lamps are illuminated in each fixture so that all lamps burn the same number of hours. This minimizes burn-out and extends lamp life, which reduces relamping costs incurred by the campus.

Upgrading the gym's lighting system is part of a larger monitoring-based commissioning (MBCx) project performed on the building. To maximize the gym's energy efficiency, the campus removed all of the rooftop air handling units (AHU) except for two used to heat the building. Variable frequency drives



View of the well-lit gymnasium interior post-retrofit. Photo: Steven Richards.

were installed on the two remaining units to increase their operating efficiency. Six Greenheck air ventilators, which require much less energy to cool the building effectively, have replaced the old AHUs. Additionally, the MBCx program funded the purchase and installation of a metering system that will continuously monitor energy usage and help staff optimize the building's energy performance.

With these energy saving strategies working in unison, CSU Dominguez Hills has realized a 61,000 kWh reduction in energy used by the gym. This represents about a 15 percent drop in the building's energy consumption, and approximately \$70,000 in annual savings.

*Best Practices* is written and produced by the Green Building Research Center, at the University of California, Berkeley.

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