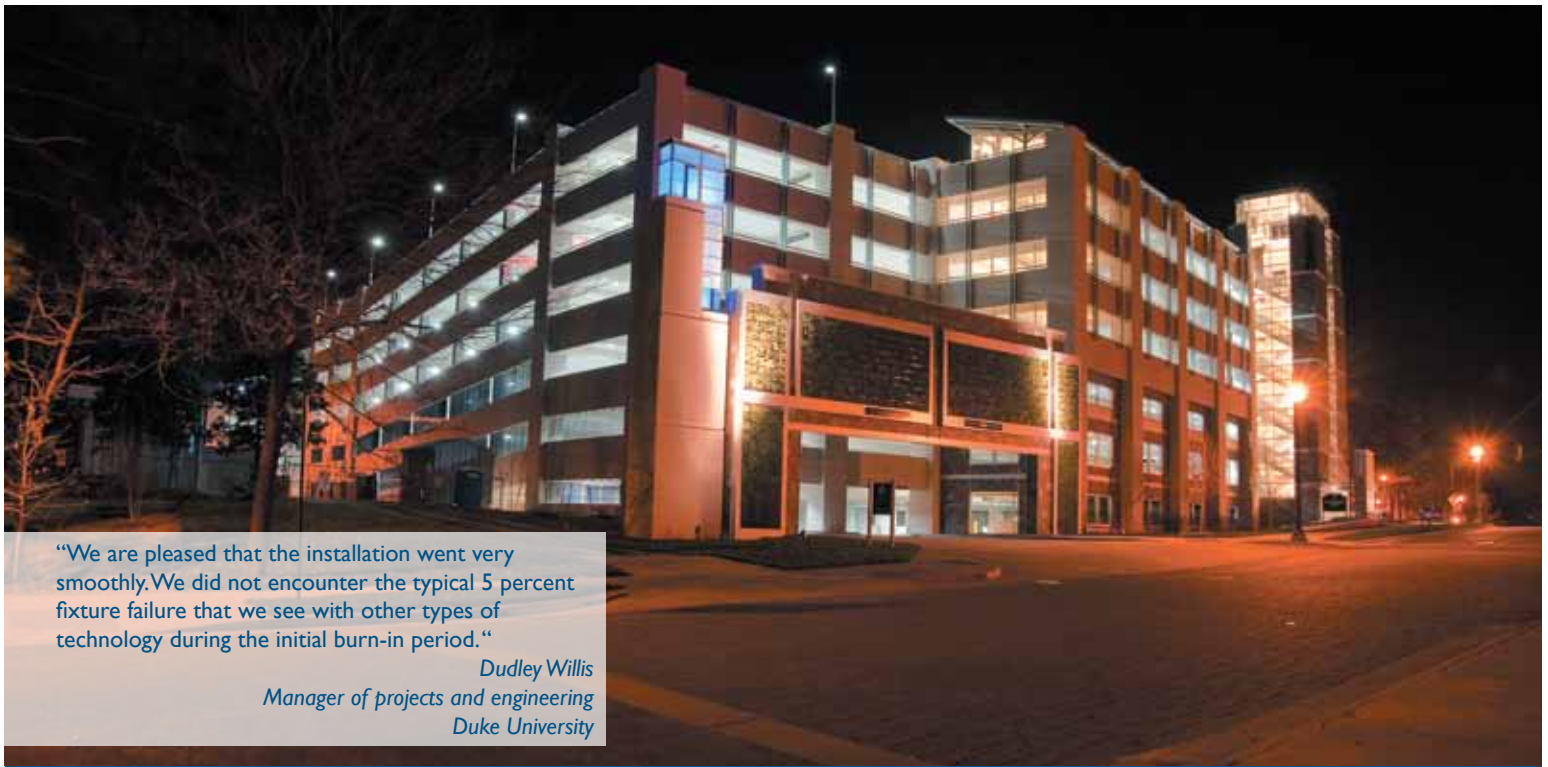


LED APPLICATION: Parking Structure Lighting (New Construction)



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*Dudley Willis
Manager of projects and engineering
Duke University*

LED PRODUCTS



BetaLED THE EDGE direct mount parking structure luminaires:

- 990 with Type V optics and 80 LEDs
- 50 with Type V optics and 40 LEDs



BetaLED THE EDGE wall mount security luminaires:

- 10 with Type V optics and 100 LEDs
- 7 with Type V optics and 60 LEDs



BetaLED THE EDGE area luminaires:

- 8 with Type V optics and 180 LEDs
- 4 with Type V optics and 140 LEDs
- 5 with Type III backlight control optics and 80 LEDs

BENEFITS

- BetaLED luminaires contribute toward monumental LEED certification.
- Exclusive NanoOptic® technology with backlight control dramatically minimize light spill outside of the parking structure perimeter.
- Anticipated low energy use and reduced luminaire maintenance will provide a cost-effective, long-life lighting solution.

University's First Green Garage; First LED Solution



Duke University's new Sands Parking Garage – the first “green” garage for the campus – opened in January 2010. The structure houses 1,920 vehicles and is an eco-friendly addition to Duke's sustainability program. Construction began on the \$43 million garage at the intersection of Erwin Road and Research Drive in June 2008.

The eco-friendly parking garage is part of Duke's campus initiative to make all buildings sustainable and environmentally friendly. The seven-level structure houses the first outdoor LED installation at the university and was selected by the U.S. Green Building Council as the nation's first single-use stand-alone LEED Certified parking facility. The installation of 1,074 energy-efficient BetaLED luminaires contributed to certification credits.

Dudley Willis, Duke University's manager of projects and engineering, selected the BetaLED luminaires for their low energy use, anticipated reduced maintenance costs and sustainable product features that contribute to the university's green initiative.

Walker Parking Consultants/Engineers, Inc. developed the lighting design around Willis' requirements including the need to eliminate light spill outside the perimeter of the parking structure. The challenge was accomplished by shielding the luminaires with BetaLED's exclusive NanoOptic® technology with backlight control that provides the required sharp perimeter cutoff.

“We are pleased that the installation went very smoothly. We did not encounter the typical 5 percent fixture failure that we see with other types of technology during the initial burn-in period,” said Willis. “We look forward to reviewing the energy use after the first year and comparing to similar installations around campus. If it turns out to be true that we do not have to spend the usual time and effort in changing burned out lamps, this will contribute significantly to the university's sustainability initiatives. We also liked the aesthetics of the fixtures compared to the look of traditional metal halide, or the industrial look of flourescents.”

Beyond lighting, the effort to make the garage LEED certified includes these “green” aspects:

- Two 10,000 gallon cisterns collect rainwater that falls on the facility's roof and re-use it to irrigate landscaping surrounding the structure.
- Overhead canopies grow plants to provide shade on the roof.
- Some parking spaces are reserved for carpool, low emissions and hybrid vehicles with electrical outlets for battery re-charging.