

BetaLED® Project Brief Overview

University of Colorado – Boulder, Colorado



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*Joe Branchaw
Campus Electrical Engineer
University of Colorado at Boulder*



PROJECT SUMMARY

End User:	University of Colorado at Boulder, Colorado
Application:	Campus Outdoor Area and Security Lighting Retrofit
Products:	<p>59 THE EDGE luminaires from BetaLED® include:</p> <ul style="list-style-type: none">• 22 area lights for top of Regent AutoPark structure; 80 LEDs with Type III optics• Four area lights around Varsity Lake pathway; 60 LEDs with Type III optics• Six direct-mount area lights in Dalton Trumbo Fountain Courtyard; four with 60 LEDs; two with 40 LEDs; Type III optics• One direct-arm mount area light over Regent Administrative Center rear entryway; 60 LEDs with Type III optics• Two direct-arm mount area lights in dock• Six area lights along main campus entryway and pedestrian walkway/bicycle underpass; 60 LEDs with Type III optics• 13 area lights around a new Visual Arts Complex; 60 LEDs with Type III optics• Five area lights around Norlin Library; 80 LEDs with Type III optics
Benefits:	<ul style="list-style-type: none">• Area lighting on a rooftop parking structure saves approximately 70 percent in annual energy use.• 62 percent annual energy reduction achieved in a one-for-one replacement of 30 pathway (three light bar) area lights.• BetaLED luminaires cost less than the former metal halide lighting technology they replaced, provide improved illumination, and last longer.



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BetaLED saves energy, contributes to green campus status



The University of Colorado at Boulder main campus is located at the base of the Rocky Mountains in the heart of beautiful Boulder, Colorado. Safety is of utmost importance for the 30,000 students and nearly 6,000 faculty members who travel throughout the campus during daylight and nighttime hours. For the university facilities management department, outdoor campus lighting is essential in creating a safe environment. Parking lots and structures, main pedestrian walkways and bike paths, and most campus building exteriors are illuminated all night long.

University of Colorado at Boulder campus electrical engineer, Joe Branchaw, is in the process of a long-term project to re-light the 132-year-old campus. Beyond improving safety, Branchaw is looking to reduce energy use and extend maintenance by replacing metal halide technology with less expensive BetaLED luminaires – a nice surprise for the budget.

“The campus-wide relighting project is happening in phases as the budget becomes available with the level of maintenance required for existing fixtures driving prioritization,” remarked Branchaw. “The university will continue making installations with a goal to relight the entire campus. My next task is to light all surface parking lots with LED area lights,” he said.



With help from Denver-based The Lighting Agency, Branchaw selected BetaLED's THE EDGE area luminaires for a trial in late 2007. Pleased with the significantly improved lighting quality, energy savings and low maintenance, BetaLED luminaires were selected for the project. Branchaw is now in the midst of a long-term relighting project with a goal to achieve an overall energy and maintenance savings payback in three to five years.

Even with a partial installation, success is being realized with savings in both areas. A 62 percent annual energy reduction (~15,720 kWh) is achieved by replacing thirty 175-watt metal halide lights (~210 system watts) with the same number of BetaLED 79-watt (60 LEDs) area lights that illuminate campus pathways 4,000 hours per year. Currently, the BetaLED area luminaires are installed throughout six locations including pathways that lead to university housing and the top level of a campus parking structure.

“My daughter, who's a graduate of the university, visited campus recently and remarked about how the dimly lit area by the underpass that leads to residence halls where she used to be afraid to walk is now brightly lit,” said Branchaw. “She said she wouldn't be afraid to walk through that area any more.”

Regent Drive AutoPark is a two-level parking garage illuminated with 22 (104 watt) BetaLED area luminaires on the upper level. Branchaw said getting approval to replace the 27 (250 watt) high intensity discharge (HID) fixtures was no easy task. He had to convince skeptical university officials that LED luminaires were a better choice than fluorescent luminaires.

Branchaw took the head of parking and transportation for the university on a field trip to see a similar BetaLED installation. The show-and-tell dispelled the myth that LEDs provide less light and require more fixtures and gave Branchaw clearance for relighting the structure. With an HID lamp rated life expectancy of 15,000 hours and a typical lamp replacement needed approximately every 6,000 hours (1-1/2 years), Branchaw calculated a savings based on a comparison to the BetaLED product. BetaLED luminaires achieve maintenance-free operation for an average 50,000 hours (~12 years) with lumen depreciation of less than one percent per year. With a savings of approximately 5,515 watts (calculated using 289 system watts for 27 HID fixtures and 104 watts for 22 BetaLED luminaires), the lamp life expectancy increased dramatically and saves a tremendous 70-percent in annual energy use.

“Campus police and motorists navigating the parking structure immediately noticed a huge improvement in light and visibility after the installation,” said Branchaw. “University maintenance personnel also thanked us for the improved lighting in the Dalton Trumbo Fountain student courtyard. They said it helps them perform their work more easily during dimly lit hours.”

The new lighting installation is a contribution to sustainable practices that helped achieve the ranking of top “green” university in the nation by Sierra Club Analysis and Ranking of American Campuses for 2009. The university is aiming for a 20 percent reduction in overall energy consumption from 2005-2006 levels by the 2011-2012 academic years. Campus design standards mandate that all new buildings and major renovations meet LEED Gold standards. There are currently four LEED-Gold buildings on campus and two LEED Gold submissions.

