

TO: AASHE STARS

FROM: Steve Marshall CEM CLEP

DATE: July 14, 2011

RE: Letter of Affirmation for uniqueness and usefulness of the Campus-wide LED Retrofit at Cleveland State University.

This is a brief description of the credential of the designer, and the features of the LED lighting system installed at CSU by The Brewer-Garrett Company as a part of their Campus-Wide Energy Conservation and Management Program.

1. Credentials/Background:

Steve Marshall is an alumnus of The University of Toledo, graduating with a B.S. in Mechanical Engineering Technology in 2007. He has been working as an Energy Engineer with The Brewer-Garrett Company with a specific concentration in energy efficient and sustainable lighting design. As part of this responsibility, Steve has created the practices and standards used by Brewer-Garrett to properly assess existing exterior and interior lighting systems to allow development of economical and energy efficient lighting designs and retrofits following the guidelines set forth by the Illuminating Engineering Society of North America (IESNA).

Steve is a member of both the Illuminating Engineering Society of North America as well as the Association of Energy Engineers, holding certifications as a Certified Energy Manager and a Certified Lighting Efficiency Professional.

In his career with Brewer-Garrett, Steve has been responsible for the solution development and design of millions of dollars in innovative lighting solutions at many large government and educational institutions including Cleveland State University, Kent State University, Cuyahoga Community College, and Cuyahoga County as examples.

2. Project description and its uniqueness/innovative aspects:

The Exterior LED Lighting Upgrade project at Cleveland State University was a significant part of an even larger 42 million dollar Campus-Wide Energy Conservation and Management Program which focused on sustainability and energy efficiency across the entire CSU Campus. This program is entirely self-funded through guaranteed energy and maintenance savings, to provide CSU with significantly improved facility systems at no net cost.

The Exterior LED Lighting Upgrade project is the very first of its kind in the country, looking at all of CSU's exterior lighting systems across the campus. The final project scope includes complete retrofits and replacements of parking lot lighting, parking garage lighting, and walkway and sidewalk lighting throughout the entire CSU campus, totaling nearly 1700 new Exterior LED fixtures. In all, this project changed the quality and efficiency of lighting systems in 5 covered parking garages, 10 surface parking lots, and more than 2.5 miles of walkways, sidewalks, and plazas. As a result of this project, today, an

estimated 75% of all exterior lighting on the 85 acre urban campus has been converted to LED. This scope size makes this project:

- The Largest Parking Lot LED Retrofit project in the US.
- The Largest University Exterior LED Retrofit in the US.
- The Largest Exterior LED Retrofit Project in the US. (Non Municipal Street Lighting)

Not only is this project innovative because of its size, but also because of the utility savings and better visual environment generated as a result of increased efficiency and proper optical control. Because of the Exterior LED Lighting Upgrade project, CSU's electrical load was reduced by 196,000 watts with a total reduction in consumption of over 1 million kilowatt-hours, a 54% reduction in usage over the previous lighting technologies. These new lighting systems also significantly improved color perception and created better lighting distribution and uniformity. This allows for better facial recognition and an enhanced security environment. Figure 1 shows the dramatic change in visual environment as a result of this project.

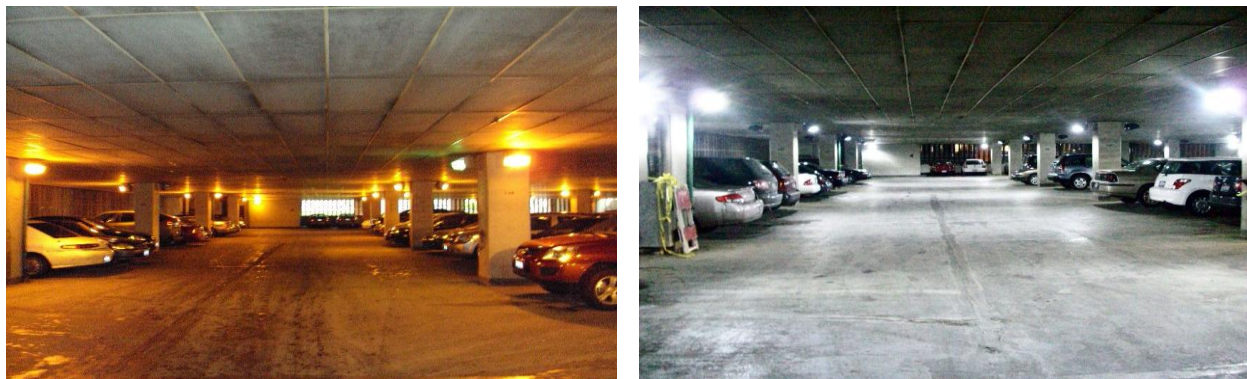


Figure 1 - Before and After Photograph of a Covered Parking Garage

The selection of LED lighting sources in this project also reduces maintenance costs and increases the campus's sustainability and environmental awareness. The LED light sources contain no Mercury, which is found in most other lighting sources such as Fluorescent and HID. These fixtures are also rated for 70,000+ Hours of life, which eliminates all lamp and ballast replacements over their lifetime. This will reduce CSU's wastestream now and into the future.

The overall Campus-Wide Energy Conservation and Management Program has won CSU the Crain's 2009 Emerald Award for sustainability, distinguishing them as one of the leaders in sustainability in the region.

3. Overall assessment of the project's innovative nature and its suitability to be a STAR Innovation Credit:

The results obtained from this project showed significant improvements in overall lighting quality, energy efficiency, reduced maintenance needs, and sustainability. It has been shown that this type of self-funding LED lighting retrofit and redesign have had a significant positive impact for Cleveland State University, and these principles can be carried forward for implementation at other large universities, K-12 school districts, municipalities, and healthcare institutions.