Architecture Lighting: Beautiful and Sustainable

By Kevin Orth, Director of Sales, Beta Lighting and Kramer Lighting

Today is an exciting time for the lighting industry as the benefits of LEDs provide significant solutions for design styles, configuration and concepts. With compact size, great efficiency and long life, LED technology is viable from a performance and economic standpoint moving it into mainstream lighting applications.

There are many opportunities for architects, lighting designers and engineers to make a building sustainable, attractive and meet an owner's needs. For example, sustainable lighting that is seamlessly integrated with the design will add to the building's aesthetics. Interaction among all building disciplines is required to achieve overarching building design goals. Early commitment and participation of these parties that extends throughout all stages of the design process is necessary to optimize overall performance and sustainability.

Demand for green buildings is being driven on multiple fronts. The need for healthier environments has grabbed the attention of owners and tenants, while the long-term value proposition of efficient buildings is gaining credibility. Even municipalities are weighing in with a mix of mandates and incentives. For example, Washington, D.C. became the first major US city to require large, private non-residential buildings to be environmentally friendly. Under the Green Building Act of 2006, new and substantially improved commercial buildings of 50,000 square feet or more must meet or exceed LEED New Construction or LEED Core and Shell standards by 2012.

Boston also wrote green building requirements into its zoning code in 2006. In Chicago, Mayor Richard M. Daley has laid out a goal to make Chicago the greenest city in the US and business owners can receive tax incentives for greening their buildings. California's Savings by Design program - sponsored by four of the state's largest utility companies - provides design assistance and subsidies for energy efficient nonresidential buildings.

These mandates and incentives provide an excellent catalyst for LED luminaire manufacturers to continually improve the technology and product designs, and for lighting designers, engineers and architects to truly integrate energy efficient LED luminaires into a building's plan.

Whether the project is new construction or renovating an existing building, the architectural integrity does not need to be compromised for the sake of sustainability and energy efficiency. Today, lighting designers, architects and engineers have technology choices for both interior and exterior lighting such as intelligent lighting, skylights, electronic dimming ballasts, occupancy sensors and computer-controlled daylight sensors that offer energy savings options that easily integrate into building designs. New LED technology allows designers to provide quality lighting within the requirements of the latest energy codes, integrate controls and provide life-long energy savings and decreased re-lamping costs to facility owners.

Take this interesting luminaire comparison: Based on calculations and a case study by Charlotte, N.C.-based architecture firm SFL & A, a 100,000-square-foot building without sustainable-design features such as LEDs might cost about $30 million to operate over 40 years. However, the same building with about $3.5 million in green design features could save the owner/operator $8 million in utility costs over the same period. As this example illustrates, lighting provides one of the greatest potentials for saving energy since lighting applications represent 40 to 50 percent of commercial establishments' energy costs. And, electricity consumption in buildings doubled between 1989 and 2005, and if this growth rate is sustained, electricity demand in buildings will increase another 150 percent by 2030.

In-addition to well-designed green buildings yielding lower utility costs, these buildings have a tremendous human resources advantage. Employers are seeing greater productivity, less absenteeism and stronger attraction and retention of workers than in standard buildings. An article in the Harvard Business Review, "Building the Green Way," highlighted a company that built a new 12-story LEED-Platinum headquarter facility and experienced an increase in employee morale, satisfaction and improved productivity because it utilized abundant day-lighting, individual climate controls and outdoor views.

Following are two recent outdoor lighting applications. One illustrates how design doesn't need to be compromised for the sake of sustainability and the second example highlights that even in a parking garage, lighting can enhance the facility and drivers' experience while also achieving dramatic energy savings.

Brooklyn Bridge Celebrates 125 years

Recently, the Brooklyn Bridge's pedestrian walkway received a lighting makeover; This Way, as it's been titled, is a permanent light art installation that illuminates and points the way to the Down Under the Manhattan Bridge Overpass (DUMBO) entrance of the Brooklyn Bridge's pedestrian walkway. Designed by Linnaea Tillett, principal of Tillett Lighting Design, in collaboration with architect Karin Tehve of KT3D, the project was commissioned by the city's Percent for Art program and the DUMBO Business Improvement District to commemorate the bridge's 125th Anniversary.

The installation also had to light the roadway, and, as with the way-finding, the designers wanted to do so in a new manner. Tillett decided on an LED fixture that achieves significant coverage at relatively low wattage. In fact, during the year or so that the project was under development, the LED manufacturer kept increasing the fixture's efficiency so that the team was able to continue to tighten the overall wattage.

Brooklyn Bridge Pedestrian Walkway, New York Utilizing LED Luminaires and Fiber Optics

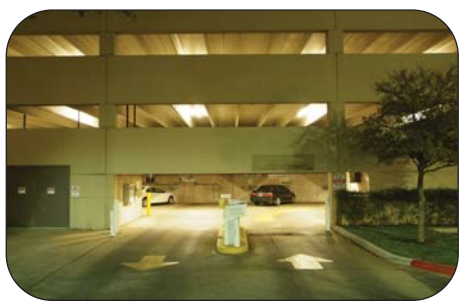
The fixtures in use now range from 79 watts to 128 watts. As a design element, Tillett covered each fixture with a blue filter. The blue light also aids way-finding from a distance, as residents can now show the way to visitors by simply pointing them toward the blue light.

Austin on Its Way to Becoming an All-LED City

Austin, Texas was recently ranked by MSN as the No. 1 greenest city in America. And it's no wonder since city leaders passed a conservation resolution almost 10 years ago and established the first green building program in the country. As part of the newly announced Austin Climate Protection Plan, all facilities, fleets and operations will be carbon-neutral by 2020, and 100 percent of city facilities will be

powered by renewable energy by 2012.

As part of this initiative, the city recently changed the first floor of a four-story parking garage to LEDs. This test site, along with numerous others throughout the city including a portion of the lights surrounding the Lady Bird Lake Hike and Bike Trail, demonstrate Austin Energy's significant commitment to installing high-quality, energy-efficient LED lighting throughout the city and are propelling Austin's mission of becoming an All-LED City.



Entrance to Parking Structure in Austin, TX with BetaLED Luminaires

LEDs represent a new, exciting technology that can help the city of Austin achieve its ambitious goals within the Austin Climate Protection Plan, which aims to implement the most energy efficient codes in the nation and dramatically increase municipal and private use of renewable energy sources, and attain Energy Star and LEED Accreditation for city of Austin buildings.

Entrance to Parking Structure with Traditional Fluorescent Strip Lighting

Exterior lighting has three primary functions - safety, security and ambiance. Some examples where lighting form and function do not always meet are parking garages, walkways, canopies and parking lots. However, with LEDs as the light source, these applications can retain the aesthetic and performance integrity of the property, while offering savings on energy and maintenance.

LED technology presents an excellent return on investment. Sustainability and design complement each other and provide a win for everyone. Lighting design, whether for a parking garage, office building, or renowned bridge, can achieve beautiful aesthetics while reducing our carbon footprint. Energy efficient LED luminaires allow designers and architects to creatively express themselves through this ever-improving technology and also reduce energy and maintenance costs. The impact of lighting design and sustainability working in sync is tremendous and the opportunities limitless.

Kevin Orth is the director of Sales for Beta Lighting and Kramer Lighting. Throughout his 13 years with the organization, he has worked in various capacities within the sales team of Beta/Kramer. His experience has allowed him to work extensively with electrical contractors, engineers, architects, interior designers and lighting designers nationwide, growing his knowledge of the industry. Kevin is an associate member of the IESNA, a graduate of the University of Wisconsin-Madison, and completed his MBA from the University of Wisconsin-Milwaukee in May 2008. He can be reached at Kevin_orth@beta-kramer.com or (262) 884-3132.

Do you have an idea for a contributed article?
Submit abstracts to Heather Krier at heatherk@infowebcom.com