A Specifying Engineer's Viewpoint on Exterior Visual Comfort Lighting and Controls

Catherine Hollenshead, P.E., Lighting Assistant Dept. Leader with Estes, McClure & Associates, talks about visual comfort lighting and controls.

There are so many important factors to consider when planning an exterior lighting design: safety and security, building architecture highlighting, creating inviting pedestrian walkways, meeting local building codes, etc.

One goal that should always be top of mind in an outdoor environment is making sure the lighting is visually comfortable for individuals.

What are some of the characteristics of visually comfortable exterior lighting?

Appropriate light levels and uniformity. There are IES recommendations for exterior lighting applications and most city ordinances have maximum and minimum light levels at building entrances, property lines, parking areas and pedestrian walking areas. It is imperative to be mindful with our exterior lighting designs for both the people on the site and the neighbors on adjacent property.

Glare control. LEDs inherently produce glare and the high lumen output luminaires that are used in exterior lighting can be visually obtrusive. Using the luminaire B-U-G ratings can help you choose luminaires that are visually appealing. Also, several manufacturers are creating "visually comfortable" luminaires for lower mounting height applications, like wall packs and walkway lighting, where the luminaire is edge-lit and has a lens with engineered optics.

Safety and security. Lighting can be used to deter vandalism and keep buildings secure. When the exterior is properly lit, then building and site occupants feel

safe. This is important to the workers that must occasionally work late, consumers shopping after dark or spectators leaving an evening sporting event. Proper lighting can create an environment that is inviting, and where people feel safe.

Once you have your exterior lighting layout, use controls can enhance your design. Of course, there are control strategies that are required by energy codes, but make sure to customize them for your project within the code constraints.

Photocell control. Most codes have a requirement for control of the exterior lighting based on available daylight. If the exterior lighting is going to be controlled by a lighting control system (LCS) or energy management control system (EMCS), then you can have a photocell input to the system. Or you could have an integral photocell on each of your exterior luminaires.

Motion sensor control. Motion sensors can be used to dim or turn off parking lot or walkway luminaires when no motion has been detected for at least 15 minutes. You can implement an integral motion sensor on each of the poles or if you have an LCS, when one motion sensor has been triggered within a control zone group it will turn all luminaires on to 100% within that group.

Time-based control. Some exterior lighting types like wall packs and landscape lighting must also be controlled via a time schedule based on the building operating hours. An LCS or EMCS are ideal for this type of control.

Wireless control components. The latest generation of LCS components are using wireless controls technology. Exterior lighting controls is an ideal application for this kind of system. One of the benefits of using wireless controls technology is the ability to change control zone groups after installation. You are no longer constrained by the circuiting of the exterior lighting for your control zone groups. This can be invaluable benefit for an owner.

About the Author - Catherine Hollenshead, P.E.

Ms. Hollenshead obtained her B.S. in Electrical Engineering from The University of Texas at Tyler in 2004. She began her engineering career with EMA in 2004. During the first eleven years of her career, Ms. Hollenshead was responsible for preparing complete electrical specifications, electrical power and lighting drawings, coordinating with architects, other engineering disciplines and utility providers. During this time, she developed an unwavering passion for lighting and earned the title of Lighting Specialist. Over the last three years, Ms. Hollenshead has created and managed EMA's lighting department. She is responsible for developing lighting design standards and specifications, training lighting designers and educating the firm on new code requirements and innovative lighting trends. Ms. Hollenshead became a Licensed Professional Engineer by the Texas Board of Professional Engineers in 2009 and Lighting Certified by the NCQLP in 2012.