

essay

Have you ever been to a project meeting with an architect or owner and been asked how many footcandles there would be in the designed space? Have you ever been tasked to meet a prescribed number of footcandles to satisfy a code requirement or an institution's standards? Did it take the wind out of your professional sails and make you feel like your role in the project was more bean counter than designer?

While the footcandle is a useful 1001 in the lighting design process, it cannot be the only or final determinant of quality of lighting. A footcandle is a measurement of only the illuminance, or the amount of light striking a surface, but the human eye cannot see a footcandle. The eye, instead, sees the light emitted or reflected off of a surface, measured in candelas per square meter (cd/m^2). So if we can't see a footcandle, why do we insist on using it? The reason is that it's easy to measure and calculate.

AN INCOMPLETE PICTURE

In today's complex world, competing lighting requirements are issued and implemented by multiple entities that often don't recognize the impact of the edicts they issue. In well-intended efforts to protect the safety of the public, many national and local building codes attempt to standardize and simplify complex matters such as lighting levels into charts and rules with requirements for light levels measured in footcandles alone.

For example, the Safety Code for Elevators and Escalators (ASME A17.1-2007/CSA 44-07) requires a minimum of 10 fc at the threshold of an elevator and the Life Safety Code (NFPA 101 2009) requires a minimum of 10 fc on the walking surface for new stairs. Experienced lighting designers can cite examples where less than 10 fc provided more than adequate lighting and, vice versa, where more than 10 fc was less than adequate depending on the various factors, including finish, of the surrounding materials in the space.

In Washington State, the WAC 246-366-120 (Washington Administrative Code) requires

the challenge
for lighting
designers who
are trained to
understand
the visual
environment
becomes
educating others
in the built
environment
industry to stop
relying only on
the footcandle

by

RANDALL P. FISHER

Published in LD+A July 2010

a minimum of 50 fc in some specialized education classrooms. Notice the nuance of “minimum footcandles” not “average footcandles”. This means literally, in the corner of the room, where no desk would likely be, there must be at least 50 fc. To achieve this minimum, the average in the room will likely be over 70 fc. The WAC lighting requirement would have been better written as a minimum average illuminance level throughout the room with the addition of an average-to-minimum ratio value. Although this uniformity ratio uses illuminance to calculate, it ensures proper uniformity of light throughout the room.

WHAT CAN A DESIGNER DO?

The challenge for lighting designers who are trained to understand the visual environment becomes educating others in the built environment industry to stop relying only on the footcandle.

In the real world, light is a unique building element that interacts with different types of materials in mostly predictable ways but is completely intangible. The color, placement, uniformity and intensity of light are under the lighting designer's control. Lighting designers should actively participate in evaluating finishes, textures, colors, etc., with the design team to explain how the light will interplay with the surfaces. A grazing light on a textured brick wall may be desirable, but the same light on an average gypsum board wall could be a disaster.

With the designer's understanding of how light reacts with various materials, how contrast can inhibit or improve visibility depending on the circumstances, and the many other nuances of light, our role is to listen to the architect and interior designer, describe their vision and create a mental image of the space. That image might be warm and inviting, cool and calming, fun and playful, or dark and mysterious. Then the designer must work interactively with the design team to confirm the concept or lead them to an alternate understanding that will more successfully deliver the appropriate visual environment.

When collaboration occurs, a space comes to life. If other design team members

aren't familiar with working with a professional lighting designer, it's our job to go the extra mile to create real-world examples that they can relate to. Example project photos and lighting mock-ups are great tools that don't have to take a lot of time but can elicit a reaction from clients that will further the progress of the design in a way that “dots on drawings” cannot.

On a recent healthcare project, we proposed to silhouette a large bas relief art installation using linear “neon-like” LED. During the early phases of the project, we rendered the lighting effect to get the approval of the concept from the design team and owner. When it came to creating a mounting detail, we drew sketches, but it was clear from the architect's translation of our concept that they did not fully understand the nuances of the detail. To get everyone on the same page, we created a very simple mock-up out of cardboard, gaffer tape, pencils and two 12 inch sections of the LED product. We presented the mock-up to the design team and literally in one second they said, “Now we get it!”

CHANGE THE DIALOGUE

The next time someone asks how many footcandles there will be in a space, ask them instead how they want the space to feel or what tasks they want to accomplish within the space. The footcandle will always be with us, and we will always have to calculate and measure it. However, we can bring a broader understanding of what constitutes a vibrant, exciting visual environment to each of our projects. Then, we will have brought a level of value to the project that the team would not have had without us. The unique knowledge within the professional lighting designer can enable the design team's vision to become a reality. As lighting designers, we can help a project truly transcend beyond the ordinary.

RANDALL P. FISHER

Is an Associate and Senior Lighting Designer designer at Candela Lighting Design and Consulting, San Diego. Candela is headquartered in Seattle.