REDEFINING PROJECT DELIVERY
VOLUME 14 ■ ISSUE 1

Solutions

ADD VALUE TO YOUR PROJECT

CHOOSE A KNOWLEDGEABLE BUSINESS PARTNER

What buildings cost — what you are being charged — whether it be initial costs, life cycle costs, or both, is a primary factor in go/no go decisions for construction projects.

As a systems integrator, FINFROCK studies and understands every subsystem in a building in order to maximize the efficiency of each building we design. By casting many subsystems into the precast concrete members during manufacturing, we further compress schedules, lower costs, and minimize disruption during construction. Using research and development and our manufacturing expertise, we are advancing the ability to deliver buildings — which are manufactured in a state of the art facility and assembled on site — with absolute cost certainty and for the lowest price possible. This is just one of the ways FINFROCK works to reduce owner costs.

However, we don't stop at charging you less initial costs; we give you the information you need to decrease lifetime costs too. **We analyze all costs of purchasing and owning a building to better inform and guide owners through their decisions during design, in construction, and throughout the life of a building.**

While we have data on many subsystems, in this issue we focus on lighting, an important decision owners of buildings, particularly as it relates to structured parking, frequently find difficult to make. Many different types of lighting exist and owners regularly question if upgrading to LED (light-emitting diode) is worth the investment for parking. Inside is information you need to guide those decisions.

FINFROCK®

There are two kinds of companies, those that work to try to charge more and those that work to charge less. We will be the second. **~ Jeff Bezos**

LIGHTING — It's come a long way since Thomas Edison

A common question owners ask while contemplating a building purchase is this: "What are my operating and maintenance costs?" One pricey aspect of operation, especially in parking garages, is power consumption, which comes primarily from lighting.

For years the industry standard light fixture for a parking garage was high-pressure sodium, chosen mostly for economy of power consumption, reasonable first cost and good light levels…theoretically.

High-pressure sodium was eventually abandoned as the standard since the light they emitted had a low-quality yellow/orange hue (despite the fact that light meters indicated acceptable light levels and uniformity).

Metal halide fixtures eventually replaced high-pressure sodium fixtures as the standard. They emitted a large amount of whiter light but with higher power consumption and higher installation costs.

As owners, designers, and builders looked for better lighting solutions, they turned to fluorescent fixtures. Issues that had previously plagued fluorescence were eliminated, such as poor performance in colder temperatures or wet/humid locations and poor ballast function. Fluorescent fixtures continue to be very competitive on first-costs.

The newest fixtures to enter today's market are LED, which have overcome hurdles in their ascension to industry standard status. Until recently, higher first-costs made LED fixtures a choice mainly for those concerned with less power usage or "being green". Their payback period — either non-existent or beyond 10 years — made them a less likely option in the private market.

Manufacturers now inform us that within the last two years, output of LED fixtures has doubled while costs have halved. These advancements have increased the benefit of LED fixtures to the point that they should be considered for nearly every project.

LED ADVANTAGES:

- Lowest possible operating cost (the "greenest" option)
- Excellent lighting uniformity (especially in recently developed fixtures)
- Far less maintenance

LED DISADVANTAGES:

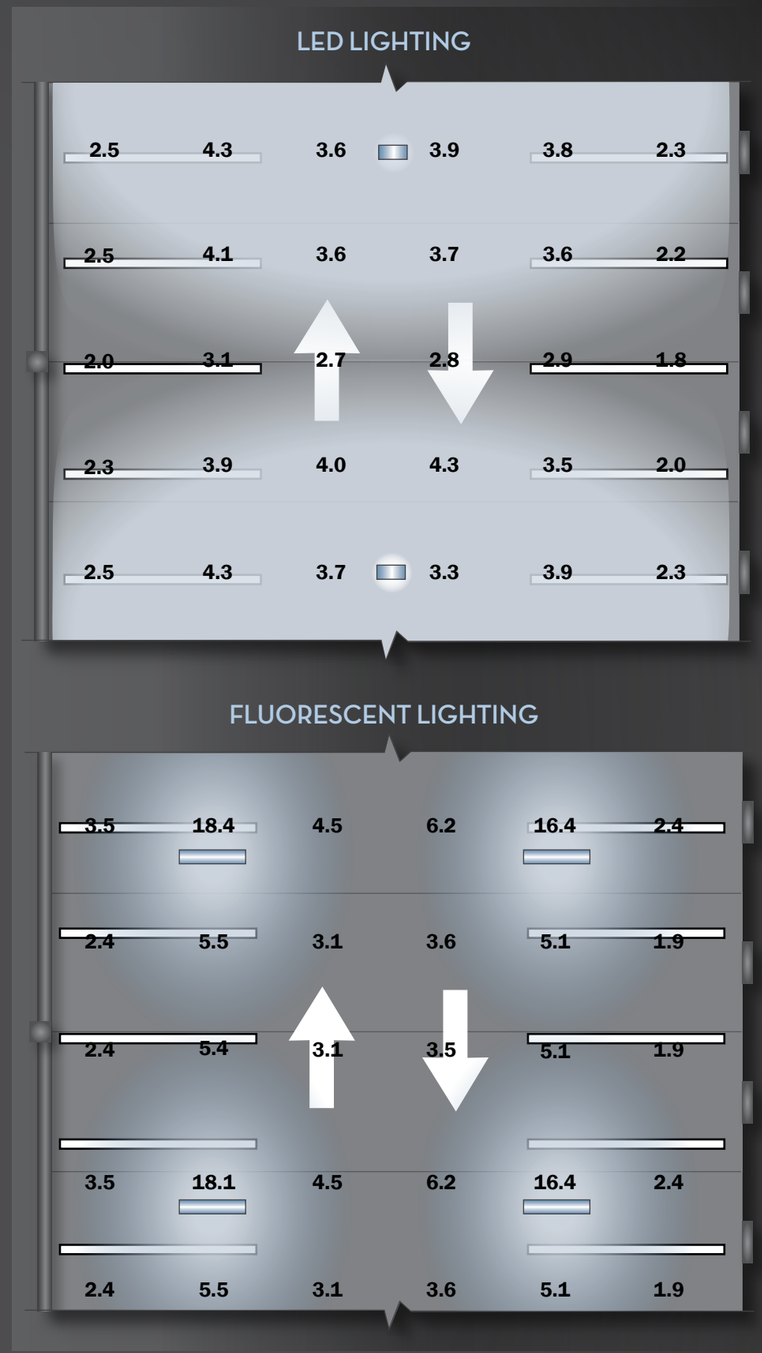
- Higher installation or "first" costs

WHAT'S THE DIFFERENCE IN LIGHT LEVELS?

The photometric layouts to the right show the difference in performance of LED and fluorescent fixtures. An advantage of LED lighting is the ability to achieve a high degree of light level uniformity. With LED lights, you might see maximum light levels of 5 to 7 foot-candles directly under the fixture, and minimums of 1 to 2 foot-candles at the extremes. Such a layout would meet Illuminating Engineering Society (IES) standards and probably provide an average of 3 to 4 foot candles throughout.

Alternatively, a fluorescent layout might have 15 to 20 foot candles of light directly under the fixture; yet quickly drop off to 1 to 2 foot candles at the extremes, even though the overall average light level is higher at 5 to 6 foot candles. Despite the higher average light level for fluorescent fixtures, light quality is no better. It could be argued that overall lighting performance is considerably worse.

How can this be? The human pupil constricts upon encountering a bright light source and dilates in darker spaces. Therefore, when standing under a bright light source (the fixture), objects in the distant darker areas are more difficult to decipher. LED fixtures lessen this effect, allowing the human eye to see more clearly despite the lower average light level.



HOW MUCH LIGHT DO I NEED IN MY GARAGE ANYWAY?

It depends! One would assume the more light provided in a parking garage, the safer it is — yet it commonly comes down to user perception. A garage owner would want to provide not only safety, but the strongest perception of safety. A parking garage would demand the best possible light levels to accomplish both goals — to ensure that patrons are and feel safe. In an employee-only garage, actual safety are still paramount, but perception of safety may be dependent upon other factors. So, lower light levels may be acceptable.

Newer LED lighting fixtures should be analyzed for your next parking project to determine if they are the right solution for your needs. LED technology continues to advance — soon becoming the definitive choice.

Is there a building code that requires a certain level of light in a garage? The answer is "sort of". Adopted by some municipalities, but not others, is the IES standards. As a rule, many garage designers follow IES recommendations as the most common and thorough lighting standard. Those who desire high light levels frequently specify an average level of light such as, "6 foot-candles of light". This request does not consider the uniformity of light, dictating a maximum to minimum ratio (meaning, the point of maximum light in a garage divided by the point of minimum light). Some IES standards ignore "average" light levels completely, and specify only the minimum light level and a maximum to minimum ratio. The RP-20 IES standard for example, recommends a minimum light level for a parking garage of 1 foot-candle with a maximum-to-minimum ratio of 10 to 1.

WHAT DOES ALL THIS MEAN?

LED fixtures still have trouble competing with lower-cost fluorescent fixtures when a specification only states an average light level — even when considering the full life-cycle cost of a parking structure. FINFROCK takes many factors into account and specifies lighting levels according to your building and user needs rather than applying simple "standards". By allowing a lower average level of light and requiring an improved uniformity, you will gain more lighting quality with a full cost return in just a few years.

Still wondering about lighting options? Call us. Whether it is a photometric or economic analysis of new or replacement lighting, FINFROCK has the experts to assist you with this rapidly changing technology.

Images in this issue: Private Healthcare Parking Facility, Orlando, Florida. FINFROCK Design, Inc.

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