



Michaels Engineering Energy Brief

EFFICIENT LIGHTING DESIGN



SUGGESTIONS...

Do you have certain Energy Efficiency topics you'd like to know more about? Send an email with your suggestion to the author listed below and your topic might become a future Energy Brief!

DID YOU KNOW...

...An efficient lighting approach includes low-level ambient lighting augmented with individually controlled task fixtures.

...Uniformity in ambient light reduces contrast as well as the perception of decreased foot-candles or light level.

MEET THE AUTHOR



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→ EFFICIENT LIGHTING DESIGN - DECOUPLING AMBIENT LIGHTING AND TASK LIGHTING IN OFFICES

The seasoned electrical engineer who has been doing lighting design for 30 years will tell you "I can do task lighting design if you can tell me the tasks".

That is the challenge - What are the tasks, where are the tasks, and who is doing the tasks. Since these questions may be difficult to answer with certainty in a office, often what a customer ends up getting is a "belt-and-suspenders" fixed-intensity lighting system that pounds enough light into a space so that an 80 year old can read the 4th carbon copy.

→ WASTED ENERGY!! WHAT TO DO?

A more desirable and efficient lighting approach would be to provide uniform, low-level ambient lighting augmented with individually controlled task fixtures.

Uniformity in ambient light is very important because it reduces the contrast as well as the perception of decreased foot-candles or light level. Uniformity can effectively be achieved by using indirect lighting coupled with high reflectance lighter colored surfaces, and dovetailing the artificial lighting design with the natural daylighting provided via windows.

Although local codes may require a minimum ambient light level in an office space up to 30 foot-candles, it is possible to provide adequate ambient light with only 10 foot-candles provided contrast and glare are minimized.

Effective task lighting needs to be flexible. Individual perception is everything when it comes to task lighting and acceptable light levels can vary dramatically between individuals. Flexibility may be accomplished by either providing multi-level individual lighting controls or dedicated task lighting integrated into the occupants desks or cubicles.

Consider the following two lighting designs for a single office:

- A conventional T8 linear fluorescent fixed-intensity system providing 60 foot-candles for both task and ambient lighting.
- A decoupled T8 linear fluorescent ambient lighting system providing 20 foot-candles ambient light and a single lamp T8 fluorescent fixture for task lighting.

System two would save approximately 40% energy compared to system one using the same technology and similar costs.