**Doing Light Right**
*by Mary Anne Donovan-Wright*

**Too many facility executives accept cookie-cutter lighting design — and miss the chance to support employee performance.**

You know the scene: a sea of office cubicles, lit by blinding, glaring, flickering fluorescent fixtures mounted 8 feet apart in dropped, tiled ceilings.

“This was the legacy of the 20th century way of doing lighting design,” says Gary Steffy, owner of Gary Steffy Lighting Design. “Lighting systems were plopped into place. All people wanted was a lot of light."

There is a price to pay for this method of office lighting. Yet the norm for office lighting is still the 2-by-4-foot fixture equipped with three 4-foot lamps that produce more light than recommended by ANSI and IEEE standards.

“These were the commodity fixtures used every day,” says Mitchell B. Kohn, owner of Mitchell B. Kohn Lighting Design. “And they are not appropriate for the office.”

To understand why they’re not the best choice, facility executives need to remember the link between lighting and employee performance. Effective lighting designs can support worker productivity as measured by visual performance.

Visual performance is determined by speed and accuracy. “The goal today is to get people to work faster and make fewer errors,” says Kohn. “The difference between a good and bad lighting design can result in a 5 percent difference in visual performance.” Energy costs offer another reason to think twice before accepting cookie-cutter lighting designs. “The newer systems yield significant savings in the long term,” says Janet Nolan, owner of JS Nolan + Associates Lighting Design.

The problem, she says, is that many of these systems have higher initial costs than the older systems, which can sometimes make them a tough sell. “People are short-sighted,” says Nolan. “They tend to focus on first cost only, not the long-term savings.”

When considering choices for office lighting, facility executives should also keep in mind that lighting shapes employee and client perceptions of the office environment.

Effective lighting design can direct activity in a given space. The starting point is to answer questions about the space. Is it a public or private area? Are people supposed to linger, or is it a space where people should move through quickly?

**The Task at Hand**
Newer lighting designs combine indirect lighting with task lighting — a combination that yields a pleasing overall office ambience and supports individual task productivity. In addition, this combination yields greater energy efficiency.

“A low-intensity general lighting scheme creates a pleasant environment,” says Kohn. “With added task lighting, there can be as much as a 20 to 40 percent savings on total wattage expended as well as increased focus on the task.”

But decisions about task lighting too often fall into unskilled hands. A big problem, says Michael Souter, owner of Luminae Souter Associates, is that good design is sacrificed for what is readily available. And in many office projects, task lighting decisions become the milieu of the furniture supplier.

“The decision gets reduced to the lowest common denominator — what’s cheapest — without considering the quality of light,” says Kohn. “The decision becomes ‘buy a shelf, get a light’ without recognition of the impact on visual performance.”

Indirect lighting systems with task lighting solve many of the problems inherent in using direct lighting alone. One problem with many overhead direct-lighting schemes is glare on computer screens. One way of getting around that problem has been to use recessed overhead fixtures. But that approach creates problems of its own.

“This system looks good on paper but does not promote good long-term performance,” says Hayden McKay of Hayden McKay Lighting Design. One difficulty is that it exaggerates facial features and creates harsh shadows. “A total direct system makes people look like raccoons,” she adds.

The goal today is often to create soft, low level lighting in the background — on the walls and ceilings — coupled with task lighting at the desktop. In some workplaces, the ambient lighting level can be very low. Most general office environments are lit at a 30- to 35-footcandle level, says Nolan, but today, some staffs prefer general lighting at the 15 to 20 footcandle level.

“Young people are generally very comfortable in this range,” says Nolan. “They work 14 to 16 hours each day, and they want darker, less corporate environments.”

**The Lighting Design Process**
When designing lighting systems for clients, Steffy looks at criteria in three main areas. First are the special factors of the area. Criteria within this category include visual environment pleasantness, circulation, flexibility, controls, ceiling systems, codes, ordinances and sustainability. Second are desired psychological and physiological factors, including sensory responses, visual hierarchies and focal centers, visual attraction, subjective impressions, daylighting, nightlighting and health. The third set of factors includes those related to the task itself: visual tasks, luminances, surface reflectances, surface transmittances and illuminances. “Evaluate the entire environment,” says Souter. “Start with the usage of the space, operating hours, how much sunlight comes in and budget issues.”

One way to evaluate the potential benefits of an innovative lighting design is to create a mockup. “You take a space with a similar ceiling, put the lighting in, put people in it to work and show them what the space is like,” says Sandra Stashik, principal for lighting design firm Grenald Waldron Associates. “See if it makes people feel more comfortable, especially if they’re spending extra money for the installation.”

A big factor in effective office lighting design systems is control systems.

“Today there is a focus on control,” says Souter. “First, we can maximize the use of daylight, and second, we can control lighting based on occupancy.”

Daylight harvesting systems continually read the daylight and turn off or dim lights accordingly; these systems are designed to maintain an even level of general illumination throughout the area. Motion detectors automatically turn lights on and off depending upon activity in the space.

**Technological Evolution**
Like controls, lamp technology also has improved significantly. The first big step was to replace T12 lamps and magnetic ballasts with T8 lamps and electronic ballasts; the latter reduced energy costs, eliminated the annoying flickering common to previous generations of fluorescents and improved color rendering. More recently, the T5 has been introduced; it is smaller, brighter and more efficient than the T8 and is especially effective in indirect lighting designs.

“The T5 now allows designers to space fixtures farther apart, which saves energy and cost,” says Souter. Stashik says the availability of the T5 lamp will encourage better design in indirect systems. “The T5 will start pushing the envelope for good, indirect lighting fixtures.”

Steffy remains skeptical about the widespread proliferation of the new lighting designs and systems. “There are clients who subscribe to these kinds of criteria of sustainable, ergonomic design,” he says. “But the only way I believe we’ll see the entire paradigm shift is if it is legislated through energy or sustainability issues.”

That assessment may be too bleak, given the opportunities effective lighting design presents to reduce energy costs, improve employee performance and enhance the appearance of the workplace. But despite those opportunities, the importance of well-designed lighting is often overlooked.

“Lighting is typically selected by cost, and people pay the price in lost energy, absenteeism and lower worker satisfaction,” says Kohn. “The negative impacts of poor lighting design aren’t always recognized.” If a paradigm shift is to take place, a recognition of those problems may be the place it starts.