

In this issue

- 1 feature quality of the visual environment *
- 2 flash! hot products *
- 2 futurespast Henningsen's designs *
- 5 making contact manufacturers mentioned in this issue *
- 5 switched online QVE resources on the web *
- 5 luminaires we'd love to see *
- 5 trade in flux lighting software *

Quality issues gain momentum

by Naomi Johnson Miller

Lighting can be good, bad, or indifferent. Bad lighting is easy to recognize. It isn't pleasing to look at or work in. Indifferent lighting simply allows for basic functionality and comfort, without aesthetic value. Good lighting stands out as it meets people's needs for work and comfort while maintaining visual appeal.

Lighting designers rely on their instinct, experience, and aesthetic sense as they struggle to achieve the style, comfort, and utility necessary for good lighting. They've done so without a guide that specifically addresses quality issues.

Energy vs. quality

Those quality issues came to crisis in the 1980s when tough lighting energy codes came into being. Using watts-per-square-foot values, conservationists assumed they could achieve good lighting by providing sufficient footcandles on the workplane with the most efficient luminaire available and concentrating the light on the desk. Lighting designers responded by saying, "Yes, you can meet the required footcandle levels with that low power density, but you end up working in a glary office that feels like a cave! Would anyone want to work there eight hours a day?" Suddenly, it became critical for the lighting profession to discuss all the quality issues that designers previously considered intuitively.

The effort to devise a guide for quality lighting has kept a group of lighting designers busy for several years in committees established specifically for that purpose. The work of the Illuminating Engineering Society of North America's (IESNA) Quality of the Visual Environment (QVE) Committee will be seen later this year when, for the first time, the *IESNA Lighting Handbook* includes a Lighting Design Guide.

In 1992, the IESNA established the QVE Committee, which cooperates with the Metrics of Quality (MOQ) Committee of the International Association of Lighting Designers (IALD). The mandate of these volunteer committees is to

- investigate issues that contribute to lighting quality
- develop guidelines on how to design with these issues in mind
- raise awareness and standards of lighting design

The workshop method

To tackle this large task, committee members began by educating themselves about quality issues through workshops. Designers, educators, and researchers met, talked, argued, laughed, and designed pilot experiments in weekend workshops. They examined theories about brightness perception, luminance ratios, wall luminance, work-plane illuminance, and

glare. The lighting industry has supported the efforts by providing sites, equipment, and funds for the work.

The pilot experiments were rudimentary, intended to test the merit of a hypothesis and determine what variables should be controlled for formal research. Overhead glare is an example of one such pilot study (see Figure 1). Have you ever sat underneath a recessed downlight or a parabolic louver luminaire and felt as though you'd be much happier wearing a baseball cap? You were the victim of overhead glare. You could run a visual comfort probability or unified glare rating calculation to figure out just how uncomfortable you are.

continued on page 3

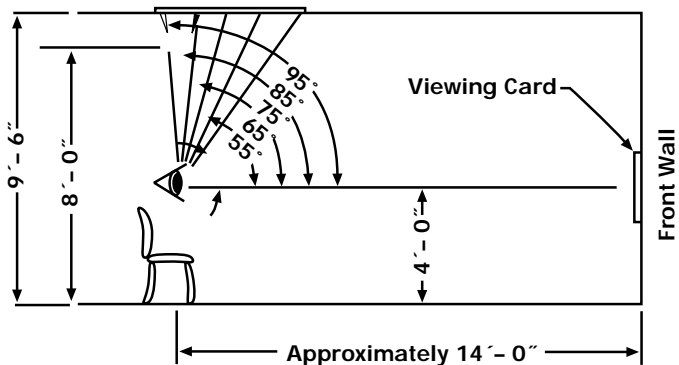


Figure 1. Diagram of the overhead glare pilot experiment.

Quality issues may drive change

by Kathleen Daly

The move is on to characterize and better define some of the elements of lighting quality. The Quality of the Visual Environment Committee of the Illuminating Engineering Society of North America (IESNA) has been studying and analyzing quality issues through workshops and pilot experiments. The committee's work and experience are the basis for the Lighting Design Guide to be included in the 9th edition of the *IESNA Lighting Handbook*, due out later this year. This will be the first time the *Handbook* places design issues in balance with illuminance selection.

Committee members hope to give lighting specifiers, end users, and manufacturers broad guidelines for lighting designs that more effectively meet user needs for functionality, comfort, appearance, energy efficiency, and cost.

The focus on quality may well lead to changes in lighting products and lighting technology. The committee's work on overhead glare has practical implications. Brighter, smaller light sources are more likely to produce overhead glare unless the light is controlled. For example, it may turn out to be unacceptable to use T5 linear, T5 compact fluorescent lamps (CFLs), or T4 CFLs in open downlights without glare control. Those open-reflector 32-watt CFL

downlights and 2-by-2-foot parabolic reflectors with three 40-watt CFLs jammed into them may be too bright

and uncomfortable for long-term working environments.

The committee also learned that lighting from multiple directions (through direct/indirect luminaires or recessed downlights and wall sconces or wallwashers) produces better task visibility, visual comfort, room surface brightness, and facial modeling than rooms lit with single-direction lighting. This information may increase the demand for direct/indirect luminaires as well as luminaires designed to add light to walls.

Predictions of change

Two IESNA QVE committee members with long experience in the lighting industry agree. Advisory member Steven Mesh, director of lighting applications at the Lighting Group in New York City, sees the quality guidelines as giving new technologies a boost.

"Most of the outcome of the committee will substantiate what lighting designers have come to realize on their own," he said.

Mesh predicted that lamp technologies such as (well-shielded) T5 fluorescent lamps, triple-tube CFLs, and metal halide parabolic aluminized reflector (PAR) lamps will likely gain greater acceptance as the lighting quality guidelines are adopted.

These sources have excellent color-rendering properties and are compact.

The focus on quality may well lead to changes in lighting products and lighting technology.

When applied in uplights, wallwashers, sconces, or other products, they direct the light onto ceilings, walls, or objects.

The light goes where it is wanted and needed, not into the eyes of the user.

More generally, Mesh also predicts advances in indirect systems, which would go hand in hand with the development of T5 lamps. "Because it's a more precise optical system, it enables us to increase the performance and energy efficiency of the system," he said.

Demand may shift market

Committee member Terry McGowan thinks the design guide will help drive changes in lighting technology.

"If a designer demands lighting equipment to meet a higher standard of lighting quality, then it's the best of all possible worlds," he said. "The designer with an order in hand asking manufacturers what they're going to do to solve the problem puts new equipment with a built-in demand into the marketplace quickly. It's a more efficient, customer-driven rather than manufacturer-driven approach."

continued on page 3

Twilight sconces vary illumination



Twilight Bedroom Wall sconces from Perry Pratt Lighting are designed for use in residential and health care settings. Three individual lamps provide different levels of illumination. The lamps include one to two compact fluorescent and a narrow spot parabolic aluminum reflector.

Perry Pratt Lighting

Louis Poulsen designs pendant luminaire for CFLs



The Minimal Pendant from Louis Poulsen is designed for use with compact fluorescent lamps (CFLs). The conical shade is manufactured of hand-blown opal glass, white powder-coated aluminum, or opal acrylic. The housing is powder-coated, painted gray or white. The Minimal Pendant uses a maximum of 18 watts.

Louis Poulsen Lighting Inc.

Advance Transformer Co. offers new dimming ballasts



Advance Transformer Co. has designed two new dimming ballasts for 40-watt twin tube fluorescent lamps. Included under the Advance line of Mark X Architectural Dimming Ballasts and the new Mark VII Controllable Electronic ballasts, they provide full-range dimming and do not require additional control leads. The ballasts are designed for two-lamp operation, 120 or 277 volts, and are suitable for use with occupancy sensors and photosensors.

Advance Transformer Co.

Signos Decorative Downlight Trims add to luminaires



The Signos line of Decorative Downlight Trims from Prescolite is designed to mount onto existing Prescolite luminaires to update the look without incurring the cost of luminaire replacement. Both round and square models are available in metal, glass, and acrylic. For round downlights, cone or dome-shaped luminaire trims are offered, while solid and lattice-style trims are options for square downlights.

Prescolite

Space shuttle uses Unison's OptiFlex

OptiFlex Light Pipe from Unison Fiber Optic Lighting Systems is being used on board the NASA Space Shuttle Discovery to illuminate instrument panels. OptiFlex Light Pipe works by transferring light from an illuminator in the instrument box to the display panel without generating heat at the fiber ends. With this design, the shuttle instrument panels can be read from different angles.

Unison Fiber Optic Lighting Systems

The Watt Stopper Inc. introduces new control



The Watt Stopper Inc. has introduced the CS-200, a personal desktop environmental controller for plug loads and dimming. The CS-200 combines remote on/off control with the capability of lamp dimming when used with proper ballast technology. In order to work effectively with the CS-200, dimming ballasts must be equipped with a 0-10 volts direct current control signal. The CS-200 is designed for small or large applications and can be integrated into existing lighting control systems.

The Watt Stopper Inc.

Do-it-yourself alternative to custom lighting installation

The Omni-Lite Adjustable Undercabinet Halogen Lighting System, from LITETRONICS, is intended for kitchen and office designs. The Omni-Lite has a swivel head to allow the user to focus the light on the task area and a built-in high-low dimmer switch. Individual Omni-Lite units can be linked together by a bridge cord, eliminating the need for multiple line cords, plugs, and transformers. Units are available in lengths of 6, 12, and 18 inches, and each can be operated independently of any others in the installation. The Omni-Lite comes with 2000-hour, 25-watt, 120-volt halogen bulbs included.

LITETRONICS

Color Kinetics introduces digital color-changing lamp



Color Kinetics is now offering its iColor MR, a digital color-changing lamp designed to fit in standard MR 16 fixtures. The lamp uses a microprocessor and red-blue-green color mixing of light-emitting diodes to produce a broad range of colored lighting effects. It can run an assortment of lighting shows such as color cross fades, color washes, random color changes, and constant colors without using motors and color filters. No external controller is required, but the iColor MR can accept data from industry-standard DMX512 controllers or PCs.

Color Kinetics *

LIGHTING FUTURES

Covering advances in lighting technologies, techniques, and trade

Editor: Kathleen Daly July 1999
Sponsor: U.S. Environmental Protection Agency Vol. 4, No. 1
Production Manager: Susan Mahar

Lighting Futures (ISSN 1081-8227) is published by the Lighting Research Center, Rensselaer Polytechnic Institute. For more information about *Lighting Futures* and other Lighting Research Center publications, contact Publications, Lighting Research Center, Rensselaer Polytechnic Institute, Troy, New York 12180-3590, phone: 518-276-8717, fax: 518-276-4835, e-mail: lrc@rpi.edu, web: www.lrc.rpi.edu

Contents © 1999 Rensselaer Polytechnic Institute. All rights reserved. Neither the entire publication nor any of the information contained herein may be duplicated or excerpted in any way in any other publications, databases, or other media without express written permission of the publisher. Making copies of all or part of this publication for any purpose other than for undistributed personal use is a violation of United States copyright law. Mention of specific products, technologies, applications, and organizations does not imply their endorsement by the Lighting Research Center or the U.S. Environmental Protection Agency. The Lighting Research Center does not test or validate any claims made in *Lighting Futures*. All product names mentioned herein are the trademarks of their respective manufacturers.

Send editorial correspondence to Kathleen Daly, Lighting Research Center, Rensselaer Polytechnic Institute, Troy, New York 12180-3590 fax: 518-276-2999, email: dalyk@rpi.edu



futurepast: Henningsen's designs

by S. Noel Simpson

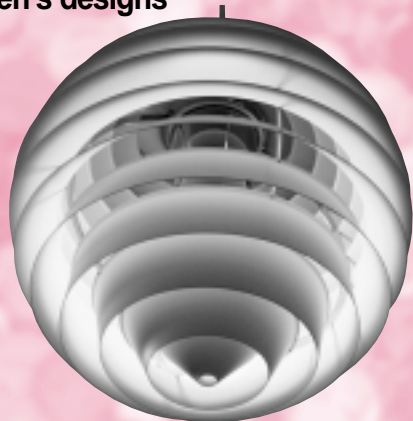
When electric lighting was in its infancy in the early 1920s, luminaire design rarely went beyond functionality. In 1926, Poul Henningsen (1894-1967) combined form and function in a way that helped define the art deco movement in interior design.

The PH Lamp was a new breed, shaded with lines unlike anything that had come before. The most famous incarnation of Henningsen's luminaire with its familiar three-shaded design redefined lighting design by proving that light did not have to be a harsh force that invaded and conquered darkness. Light could blend into the setting in a manner that was easy on the eyes.

Henningsen was a self-taught inventor, an artist, a designer, an architect, and a film producer when he turned to lighting. Legend has it that he came up with the revolutionary three-shade design while mulling over a cup of coffee. His methodical and scientific pursuit of this daydream led to research in luminaire design and lighting distribution that is still highly regarded. His contributions to exterior lighting design, road lighting design, and architecture were years ahead of their time.

The Opal Glass luminaire, one of the original three-shaded designs, with hand-blown opal shades and sandblasted undersides, defined Henningsen's design. It allowed some light to show through the shades, with the majority still being reflected downward.

Henningsen's designs are found everywhere, from classrooms to studios, from family kitchens to monumental dining halls, and from the tops of desks to the heights of The Forum in Copenhagen.



A Louis Poulsen Lighting Inc. luminaire based on Poul Henningsen's Louvre design that hangs in the Lighting Research Center in Watervliet, NY.

Henningsen created beautiful industrial luminaires. The seven-shaded Septima with amber-colored, alternately frosted glass shades was displayed in the Danish Museum of Decorative Art. The Black Out exterior light, created for use in war-targeted Tivoli, emitted light horizontally so it could not be seen from the air. A teardrop-shaped fixture called the Spiral, made of connected descending metal shades, is one of the most exquisite of his designs. Several examples hang in the main hall of the University of Aarhus in Denmark. *

Quality issues gain momentum

continued from page 1

However, the calculations don't cover this circumstance because the luminaire is technically out of view, and the resultant ratings would tell you it is not causing you any discomfort!

QVE Committee member Peter Ngai of Peerless Lighting led the overhead glare investigation, which included four experiments. Variables included the angle of light and the luminaire luminance. The angle of light was moved to five positions between 55 and 95 degrees above a horizontal line of sight. The luminances were set at three values, approximately 17,000, 8000, and 5000 candelas per square meter at each angle. The ambient lighting was provided by a direct/indirect lighting system.

Ngai and QVE Committee advisory member Dr. Peter Boyce of the Lighting Research Center processed the study results. They noted a significant discomfort response from bright lighting positioned beyond the classical limit of view of 53 degrees. Higher luminances triggered a stronger glare response, Ngai said, while higher overhead luminances were more tolerable under higher ambient room illuminances. The glare source was most uncomfortable at 55 degrees above the line of sight, he said, and the discomfort diminished with higher angles but didn't disappear until the source was at 85 degrees or greater (see Figure 2). Currently used calculations for glare do not predict these results because they do not include this range of angles.

The IESNA Lighting Handbook

Under the leadership of Terry McGowan, chair of the QVE Committee's Handbook Chapter Subcommittee, the QVE committee developed the basis of the new IESNA Lighting Design Guide. The Lighting Design Guide lists a number of design issues such as source/task/eye geometry, flicker, and appearance of space and luminaires for a lighting application in a matrix format (see page 4). For each task or location, the relevant design issues are indicated by their level of importance.

Accompanying the recommendation tables are definitions of the design issues and illustrations of how the issues apply to six typical

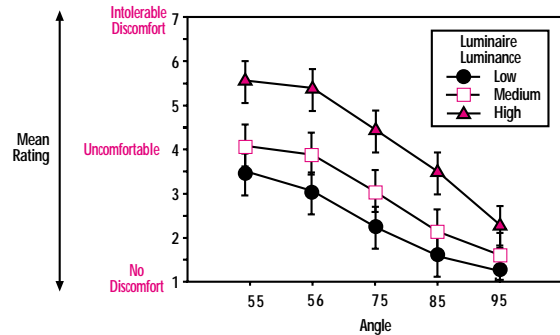


Figure 2. This graph from the overhead glare experiment illustrates that high luminance luminaires can cause discomfort beyond 55° above the horizontal. Existing scales for discomfort only cover angles up to 53° and so would not reveal discomfort from these steeper angles.

spaces: an office, an industrial machine floor, a supermarket, a restaurant parking lot, an airline cabin, and an indoor tennis court.

Does the Lighting Design Guide list all the design issues that lighting designers need to consider? No. In almost all applications, the designer must consider initial project costs, maintenance costs, energy use, emergency, safety, security, and equipment performance and reliability. Every application has a different list of design issues, but each may have special considerations, such as hazardous location issues or special cleaning needs.

Will the Lighting Design Guide eliminate bad lighting? It offers no guarantee, but it's a start. The tables and text developed by the committee might well reduce the amount of thoughtless and inappropriate lighting design.

Will this work ensure good lighting? No. Adequate lighting meets the needs of the client and users, but good lighting requires a bit of transcendent visual delight. Designers who follow these guidelines may be able to avoid the major pitfalls of bad lighting. It takes experience, skill, and taste, however, to add the inspiration that, to quote Dr. Boyce, raises "adequate lighting to the level of lighting which lifts the spirit." ✨

Lighting quality issues

Here are the quality considerations covered by the Lighting Design Guide in the 9th edition of the *IESNA Lighting Handbook*.

- Appearance of space and luminaires
- Color appearance (color contrast)
- Cost
- Daylighting integration and control
- Energy
- Direct glare
- Reflected glare
- Flicker (and strobe)
- Illuminance (as it relates to task visibility)
- Light distribution on surfaces
- Light distribution on task plane (uniformity)
- Luminances of room surfaces
- Modeling of faces or objects
- Point(s) of interest
- Shadows
- Source/task/eye geometry
- Sparkle/desirable reflected highlights
- Surface characteristics
- System control and flexibility

These considerations will vary according to the application. For example, a designer will be more concerned about peripheral detection in a parking garage than in a cafeteria or sparkle in a restaurant than in an office. ✨

Quality issues may drive change

continued from page 1

McGowan, the principal of Lighting Ideas Inc. and executive director of the Lighting Research Office for the Electric Power Research Institute, also believes the quality guidelines will contribute to energy efficiency in lighting.

"Data from the QVE workshops indicates that, in commercial buildings, some workplane illuminance can be traded for more brightness on partitions, ceilings, and walls," he said. "Then, instead of blasting a room with grids of three-lamp 2-foot-by-4-foot parabolic fixtures, the quality guideline will steer designers towards using lower-brightness luminaires that require fewer lamps, combined with some lower-wattage task lights, wall sconces, or wallwashers. A thoughtfully designed system often ends up using less energy than the usual sea of 2-by-4 troffers!"

Education is critical

Franz Euler, senior product engineer at Litecontrol, said the Lighting Design Guide may have some effect on technology, particularly indirect lighting and related optical changes. "My phrase is 'specialized optical distributions,' which will control the luminance of the wall relative to the ceiling, the distribution of luminance on the wall itself, and the gradient on any surface," he said. "New fixture distributions have the power to generate those things."

More than guidelines, however, will be necessary to truly change technology, Euler said.

"... the customers have to be made to believe in investing in the benefits," he said. "It's OK for the lighting researchers to believe in them, but does the facility manager, the owner, the school superintendent really care? These benefits have to be easy to identify."

Manufacturers will have to be convinced their customers will invest in the benefits of lighting quality before investing in new technologies for lamps or luminaires themselves, he said. End users must be educated about the benefits of quality lighting, he added.

The Lighting Design Guide may well provide that education, according to Mesh. "Newer technology usually costs more money," he said. "The work our committee is doing ... is making it easier for manufacturers to make a case for these products." ✨



Spotlight

Spotlight, a new feature in *Lighting Futures*, will introduce leaders in lighting whose work is connected to the issue's main story.

Hayden McKay

Hayden McKay is well known for her involvement in energy-conscious lighting. A lighting designer, architect, and author with 25 years' experience, McKay is a member of the American Institute of Architects, a fellow of the International Association of Lighting Designers (IALD), and a fellow of the Illuminating Engineering Society of North America (IESNA). She is the founder and chairperson of the IALD Metrics of Quality Committee and vice-chairperson of the IESNA Quality of the Visual Environment (QVE) Committee. She is the principal of Hayden McKay Lighting Design.

Q What role have you played in the movement toward QVE?

A I didn't invent lighting quality, I'm just one of its champions. My interest in daylighting and sustainable design was a natural outgrowth of my environmental concerns during the 1960s. I've been active on the Energy Management Committee of the IESNA since the 1970s, when the committee was faced with determining appropriate limits for connected loads for various space functions, in conjunction with ASHRAE/IESNA Energy Standard 90.1. There was tremendous pressure to restrict lighting to the minimum amount necessary to meet illuminance recommendations on the horizontal plane with the most "efficient" equipment available. I think we used the expression "energy-effective lighting" in the early 1980s to emphasize the point that systems that saved energy while disabling the occupant were in fact wasting energy. The *IESNA Lighting Handbook* is filled with qualitative guidance, yet illuminance (footcandles) is mistakenly considered the most important factor in lighting. This showed us that the qualitative factors would only be considered if they could be quantified, and preferably they should be linked to some measurable economic benefit, like employee productivity or increased sales. The major emphasis of visual research was on short-term performance, not long-term comfort.

I got together a multi-disciplinary group in 1990 to brainstorm ways to quantify qualitative factors This group turned into the IALD Metrics of Quality Committee. ✨

the lighter side



Cave lighting

Jim Gross '99

Putting the Lighting Design Guide to work

by Naomi Johnson Miller

Hired to design the lighting for a bank, you are working on the teller stations. One approach to the design is to look up "tellers' stations" in the Illuminance Selection Tables of the 8th edition of the Illuminating Engineering Society of North America's (IESNA) *Lighting Handbook* to pick a light level. Tellers' stations are category E, calling for 50, 75, or 100 footcandles. Say you pick a recessed compact fluorescent downlight with two 26-watt quad lamps. Then you do a lighting calculation to figure out that you will need to space the downlights 6 feet on center over the teller counter. You draw the circles on the lighting plan, add the luminaires to your lighting schedule, and then move on to designing the lighting for the bank vault.

But wait! Think about the task and space a little more. What happens at a teller station? Tellers must see clearly in order to read checks and deposit slips and count money, without reflected glare that will wash out contrast. They also have to read a computer screen. Color rendering may be important in detecting counterfeit bills. The uniformity of illuminance across the counter surface may be significant so that papers don't get lost in the shadows. Both the teller and the customer must be able to see each other, because watching facial expressions can improve conversation comprehension and speed identification. If a security camera covers the station, you will need to consider the amount of vertical illuminance falling on the customer's face.

Surely, the teller's visual comfort is important, so you need to evaluate glare. Will bright windows or glass doors create disability glare for the teller or security camera? What about appearance? Does it make sense to space those downlights 6 feet on center when the teller stations are spaced 5 feet on center? The appearance of the space will improve if the rhythm of the lighting corresponds to the rhythm of the furniture.

These design issues can be considered in these terms (see Figure 1):

- Source/task/eye geometry
- Color appearance
- Light distribution on the task plane (uniformity)
- Modeling of faces and objects
- Direct glare
- Reflected glare
- Daylight integration and control
- Appearance of space and luminaires

Do they matter? Yes! The bank manager, teller, customer, and security officer may have different concerns, but all consider at least some of these issues important. A lighting solution that addresses them is more likely to be successful because it meets the needs of the clients and users.

Experienced designers can deal with these important questions, and the obvious solution for good lighting design is to hire a lighting designer. But how do new designers become aware of these issues? How can they learn to solve problems that even experienced lighting designers have trouble articulating?

The Quality of the Visual Environment Committee of the IESNA (see "Quality issues gain momentum" on page 1) hopes to help answer these questions. The work and experience of its members are the basis for the Lighting Design Guide that appears in the 9th edition of the *IESNA Lighting Handbook*, due out later this year.

Here's a more detailed look at how the Lighting Design Guide can apply to bank tellers' stations (see Figure 2).

- **Source/task/eye geometry:** The teller deals with many paper tasks that may use shiny ink or lead. Locate downlights to avoid reflected glare.

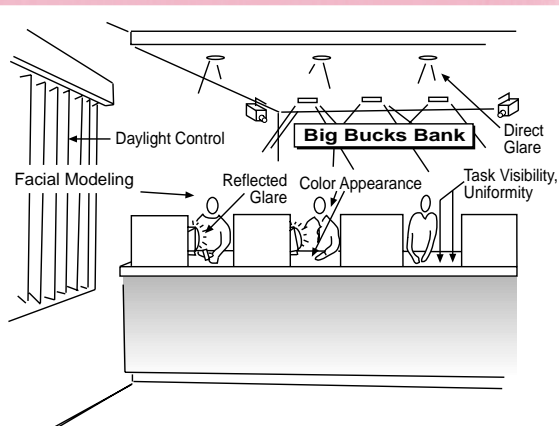


Figure 1. Lighting design for bank teller stations.

The bank manager, teller, customer, and security officer may have different concerns.... A lighting solution that addresses them is more likely to be successful.

	General	Writing Area	Tellers' Station
Source/Task/Eye Geometry			
Color Appearance			
Direct Glare			
Reflected Glare			
Luminances of Surfaces			
Light Distribution on Room Surfaces			
Light Distribution on Task Plane			
Modeling of Faces and Objects			
Daylighting Integration and Control			
Appearance of Space and Luminaires			
Shadows			
System Control and Flexibility			
Special Considerations ¹			
Illuminance (Horizontal)			
Illuminance Value	C	D	E
Illuminance (Vertical)			
Illuminance Value	A	A	A

¹ Refers to security camera considerations

	Very Important
	Important
	Somewhat Important
	Not Important or Not Applicable

Figure 2. Adaption of the Lighting Design Guide for a bank.

- **Light distribution on the task plane (uniformity):** A ratio of maximum to minimum illuminance on the teller counter of 3 to 1 will help minimize shadows on the workplace.
- **Modeling of faces and objects:** Avoid harsh downlighting on the faces of the teller or customer. Some diffuse light from ceiling luminaires or bounced light from ceiling and wall surfaces will help soften facial shadows.
- **Direct glare:** Luminaires should limit the amount of light directed into the eyes of the teller and customer. Also, luminaires directly above the teller should not have bare lamps visible if the lamp luminance exceeds 20,000 candelas per square meter.
- **Reflected glare:** Minimize lighting problems on VDT screens by using high-luminance computer screens with anti-reflection coatings. Orient the screen to avoid reflections from windows.
- **Daylight integration and control:** Use overhangs, blinds, shades, or drapes on windows to control daytime glare.
- **Appearance of space and luminaires:** The lighting should enhance the architectural features of the space and correspond to the layout of the teller station. ✨

Naomi Johnson Miller chairs the IESNA's QVE Committee. An award-winning lighting designer and principal of Naomi Miller Lighting Design, she is an adjunct professor in Rensselaer Polytechnic Institute's MS in Lighting program and the School of Architecture. ✨

Facial modeling

Lighting can significantly affect the perception of faces, or facial modeling. The photographs at right illustrate the dramatic effect lighting can have on facial modeling. In the left photo, the subject sits beneath four recessed luminaires with parabolic louvers. This creates a dramatic shadowing that is very harsh around the eyes and mouth and under the chin.

In the right photograph, she sits between two wall washers with additional ambient light from all directions. This combination enhances the modeling somewhat by softening the shadows. However, it maintains some darkness around the eyes. ✨



National Dimming Initiative introduced at LightFair

The National Dimming Initiative (NDI) is a proactive industry initiative designed to drive greater awareness and market acceptance of lighting controls and fluorescent dimming products.

Launched at LightFair International 1999 in May, NDI aims to assist building designers, lighting specifiers, engineers, and end users in specifying lighting controls.

NDI has released a CD-ROM designed to educate end users and the lighting community about lighting control and fluorescent dimming technology while making it easier to specify these products. The CD-ROM includes case studies, a lighting controls tutorial and estimator, a catalog of industry products from multiple manufacturers to assist in specification of compatible components for a complete system, and a multi-level lighting controls game.

Lamp ballast manufacturer Advance Transformer Co. initiated NDI, which has the support of numerous lighting controls manufacturers nationwide. NDI supporters plan to extend participation to building design, engineering, and specification firms;

lighting professionals; end users; and others who can contribute information to NDI and benefit from the success of the lighting controls market. NDI will distribute 5000 to 10,000 copies of its CD-ROM and brochure, supported by targeted public relations and advertising messages.

NDI's charter supporters include: ALM Systems Inc., AMX Corporation, Avab America Inc., Clanton & Associates, Clark Engineering Southwest Inc., Douglas Lighting Controls, GE Total Lighting Control, Horton Controls Inc., Hunt Dimming, Johnson Controls Inc., Lawrence Berkeley National Laboratory, Lithonia Lighting, Marlin Controls Inc., Novitas Inc., PCI Lighting Controls Systems, Sensor Switch, Sterner Controls, Vari-Light Inc., and The Watt Stopper Inc. The Lighting Research Center is also a supporter.

For more information on NDI, the lighting controls CD-ROM tool, or NDI participation, call Steve Purdy, NDI coordinator and Advance Transformer Company's director of specification sales, at 847-390-5136, or check the website www.alcp.com. *

Luminaires we'd love to see

Luminaires we'd love to see is designed to generate solutions to nagging lighting problems by offering concepts for useful products that aren't on the market or for finding ways to use new technologies. Send your ideas via email to lrc@rpi.edu.

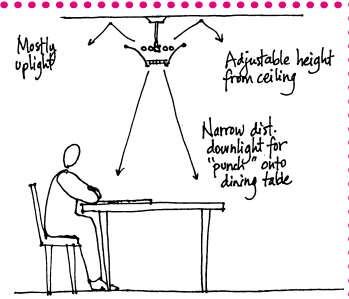
Published ideas become available for development by anyone; neither the author nor Lighting Futures retains any intellectual property rights to these ideas.

In this column, Naomi Johnson Miller and Janet Lennox Moyer collaborate on a luminaire idea. Miller is adjunct assistant professor of architecture at Rensselaer Polytechnic Institute and Lennox Moyer is a research assistant professor at the Lighting Research Center and author of *The Landscape Lighting Book*.

A retractable pendant with compact fluorescent lamps would make a great tool for lighting designers. Often, people can work more easily and with more comfort if they have a high ambient light level with concentrated task lighting. That can apply to a family kitchen or a small conference room.

This type of luminaire would be especially useful for elderly folks who need a higher general light level to see well. They also need a more evenly lighted space. This luminaire fills both needs.

The opportunity to raise or lower the luminaire on a retractable cord allows the user to set the luminaire at a comfortable height and vary the amount and distribution of task and general lighting.



The luminaire should have a wide angle in the upward portion of the shade: in the range of 100 to 120 degrees overall or 50 to 60 degrees on one side. This maximizes the upright component coverage of the ceiling. To concentrate the task light component and minimize direct lamp glare, the size of the downward opening should be restricted, and a white, concentric ring baffle should be used to limit the candlepower distribution above 35 degrees from nadir. *

trade in flux

Lighting software by Devki RajGuru

Software: Every industry interested in surviving in the technological age has it. Lighting design, however, has long held onto the tradition of handwork. Until recently, lighting designers relied on communicating their ideas through drawings, whether a sketch on a cocktail napkin or an elaborate full-color rendering.

Soft-tools, software packages specially geared for the lighting designer and specifier, are relatively new. As industry members realized the benefits of these new tools, they began to integrate them into standards of operation, creating a greater need.

Software manufacturers have stepped in to meet that need, providing newer, better software packages. Thanks to the competition, programmers have redesigned their old programs to include features and functions that customers demand. While a handful of software programs once dominated the field, independent software programs today flood the market, along with a host of proprietary programs offered by manufacturers and some design firms.

As you sift through the vast array of software available, consider the following:

1. Know what you want the software to do for you. Lighting industry software falls into four general categories:
 - (a) **Calculations:** luminance and illuminance
 - (b) **Modeling/Rendering:** creating rooms, scenes, or luminaires
 - (c) **Communication:** layouts, specifications, control schedules
 - (d) **Financial Computation:** estimations of simple pay back or life-cycle cost
2. Look for programs that work with IESNA data files (designated by the extension .ies). Although they are not the only way to describe photometrics (i.e., light distribution, intensity, and lamp characteristics), they are quickly becoming the standard. You can get the specifications directly from the IESNA.
3. Get catalogs and free demonstration CDs from manufacturers. A great source of information on software products is the inter.Light Inc. web page (www.lightsearch.com). Along with many other lighting products and services, the page contains a software category. This web page provides links directly to manufacturers' homepages. Most offer free catalogs or demo packages.

Why spend the time, energy, and money to find, purchase, and learn software? Software programs make it possible to communicate clearly, quickly, and without bounds of time zones and country borders. In a world where time is of the essence, the designers of today who want to be working tomorrow must upgrade. *

Light Right wants to quantify quality benefits

Sponsors from a broad spectrum of the lighting industry are working together to quantify the benefits of quality, energy-efficient lighting and encourage its use. The Light Right Consortium includes manufacturers, government agencies, utilities, specifiers, end users, and other stakeholders.

"The Light Right Consortium will perform coordinated research to prove and quantify the value of quality lighting," said Carol C. Jones, lighting program manager at Battelle Pacific Northwest Division, which manages the consortium. "With this information, we can start to harness the economic and environmental benefits of quality lighting."

Incorporating the talents of many members of the lighting industry, the consortium will also work with groups outside the lighting industry involved in building and productivity, Jones said. Its policy is to work with related efforts to maximize the impact of research dollars.

"Light Right is best described as research inside of a market transformation vehicle," Jones said. By providing information about the quantitative benefits of quality lighting, Light Right hopes to transform the lighting market so end users will buy new lighting systems to reap these benefits, she explained. "Unlike a typical research project, market transformation elements are built into the scope of work and are considered as critical to the success of the program as the research."

Battelle Pacific Northwest Division is performing the market transformation work and will ensure close integration of the different and concurrent research projects. The Board of Directors will decide on research projects and research subcontractors will be selected through a

solicitation process. Battelle is researching the current market to understand the priorities, concerns, and decision processes of major corporations and end users. This will inform the strategic plan for market transformation, and the research and experimental designs will include measures that will actually influence the market, Jones said.

Research master planning is another important element. In a workshop earlier this year, scientists, practitioners, and market representatives agreed that it is possible to measure the impacts of lighting quality on humans and organizations and deliver that information in a predictive format, Jones said. They also developed a concept of how the work should be organized and proposed several different research models.

Light Right will also perform research projects, strategically chosen and targeted for maximum value to its sponsors, she said. Every project will be geared toward providing predictive information that can become an incentive for building owners and end users to purchase new lighting in order to realize these ancillary benefits.

This research will extend beyond visual performance to address aesthetics and psychological processes that mediate human response to the physical environment. The Light Right Consortium plans to address economics, energy effectiveness, and the impact of light on organizations.

For more information

For further information or to stay up to date on Light Right Consortium activities, contact Jones at the Battelle office in Cambridge, Massachusetts, by phone at 617-577-7254, ext. 34, or by email at Carol.Jones@pnl.gov. *

making contact

Advance Transformer Co., 10275 West Higgins Road, O'Hare International Center, Rosemont, IL 60018, phone: 847-390-5000 * Colorkinetics, 50 Milk St., 17th floor, Boston, MA 01209, phone 888-FULL-RGB, www.colorkinetics.com * Illuminating Engineering Society of North America (IESNA), 120 Wall Street, 17th Floor, New York, NY 10005-4001, phone: 212-248-5000, www.iesna.org * International Association of Lighting Designers (IALD), Merchandise Mart, Suite 487, 200 World Trade Center, Chicago, IL 60654, phone: 312-527-3677, www.iald.org *

LITETRONICS International Inc., 4101 W. 123rd St. Alsip, IL 60803, Phone: 708-389-8000 www.litetronics.com * Louis Poulsen Lighting Inc., 3260 Meridian Parkway, Ft. Lauderdale, FL 33331, phone: 954-349-2525, www.louis-poulsen.com * Perry Pratt Lighting, 22 Dorrance Street, Charlestown, MA 02129, phone: 617-242-0743, email: PerryPratt@aol.com * Prescolite, 1250 Doolittle Drive, San Leandro, CA 94577, phone: 510-562-3500 * Unison Fiber Optic Lighting Systems, 32000 Aurora Road, Solon, OH 44139, phone: 440-519-1033 * The Watt Stopper, Inc., 2800 De La Cruz Blvd., Santa Clara, CA 95050, phone: 408-988-5331 *

switched online

QVE on the web by Robert Wolsey

A web search for the term, "Quality of the visual environment" won't turn up many hits, but you can find some surprisingly in-depth web content on the subject, thanks to the National Research Council's Institute for Research in Construction (IRC). The IRC is Canada's construction technology center, performing research, building code development, and materials evaluation services.

They also have a nice web site that contains the full texts of research reports on many aspects of construction and the indoor environment. Check out their section on lighting quality at www.nrc.ca/irc/light/lq_project/publications.html and you'll find some good review papers on the subject. Included is a 1997 study of lighting quality's effect on task performance, mood, health, satisfaction, and comfort.

Another section of the IRC's site has a good summary of research on the subject of full-spectrum lighting and its effects on performance, mood, and health. There's no shortage of controversy over how important full-spectrum lighting is to lighting quality, and you can get both sides of the story here: fox.cisti.nrc.ca/irc/fulltext/ir659/contents.html.

The Illuminating Engineering Society of North America (IESNA) has a committee devoted to the Quality of the Visual Environment. IESNA committees are very influential in the development of codes, standards, and measures for lighting. A list of the committees and committee members can be found on their site at www.iesna.org/iesna/comm_list.html.

Screwbase CFL online database updated

The National Lighting Product Information Program (NLPIP) recently updated its searchable database of screwbase compact fluorescent lamp data. The database can be accessed free from within NLPIP Online at www.lrc.rpi.edu/nlpip. It includes manufacturer-reported data and the results of NLPIP's most recent independent tests. *