



The architecture of the Issaquah Library echoes a Northwest Indian longhouse, utilizing timber construction and a tall ceiling roof monitor. The high ceilings and open plan made lighting the book stacks a challenge. Collaborating with the project architect, Robert Miller of Bohlin Cysinski Jackson, the design team at Candela Architectural Lighting

decided the solution was custom luminaires mounted on the top of each stack. After analyzing the design of the custom stack light, and performing extensive calculations, Mary Claire Frazier of Candela decided to call upon the Lighting Design Lab's mockup services for a closer evaluation of the design.

In order to do a good job of lighting books in a library, the luminaire must adequately distribute light uniformly on the vertical surfaces. The titles on the books on the bottom shelf should be legible, and not obscured by shadow. Since the proposed custom stack light was an unknown quantity, they needed to satisfy the client's questions regarding fixture performance.

mockups



Actual Installation



Mock-up

Issaquah Library
Issaquah, Washington
IESNA Section IIDA Guth Award
photography. Art Grice

This project used custom luminaires that were specified by the architect. The lighting designer used LDL mockup services to establish the that the luminaire performed to the design goals.

Robert Miller, Bohlin Cywinski Jackson Architects

Mary Claire Frazier, IALD, LC,
Candela Lighting Design

“No Matter how many calculations you do, you never know for sure...until you see it.”

*Mary Claire Frazier, IALD, LC
Candela Architectural Lighting*

A mockup was done at the LDL so the team could learn how the custom fixture would perform. The mockup gave them the opportunity to tweak the fixture design, confirm the vertical brightness performance and evaluate the appearance. Doing the mockup at the Lighting Design Lab ensured that the final design would work, before construction would even begin. The lighting design for the Issaquah Public Library won this year's Illuminating Engineering Society's Guth Award from the Puget Sound Section.

If you would like more information about doing mockups at the Lighting Design Lab, visit <http://www.lightingdesignlab.com/mockup>. You will find examples of the types of mockups we have done, and you may download the information packet for conducting a mockup. If you have questions about the mockup process, contact Eric Strandberg, our mockup coordinator at 206-325-9711 x28.

News

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daylight modeling.

daylighting terminology.

daylight

light produced by solar radiation. Daylight includes direct sunlight, and sunlight diffused by the atmosphere and various reflected cloud types.

daylight availability

the luminous flux dictated by the sun and/or sky at a specific location, time, date, & sky condition.

daylight factor

a measure of daylight illuminance at a point on a given plane expressed as a ratio of the illuminance on that plane at that point to the simultaneous exterior illuminance on a horizontal plane from the whole of an unobstructed sky of assumed or known luminance distribution. Direct sunlight is excluded from both interior and exterior values of illuminance.

clerestory

upper part of an interior wall, containing openings for daylighting of interiors.

lightshelf

an exterior horizontal shelf positioned (usually above eye level) to reflect daylight onto the ceiling and to shield direct glare from the sky.

overhang

a horizontal building projection, usually above a window, for the purpose of shading

skylight

A relatively horizontal glazed roof aperture for the admission of daylight.



Top: Interior view of the model from Boora Architects used for the daylight model study of Central Intermediate School.

Bottom: Photo of actual space during latter stages of construction.

Photos: LDL

Some types of buildings change purposes a lot during their lives, but schools typically stay schools the entire time. So building design decisions may impact the performance of generations of students and teachers. Boora Architects of Portland, Oregon understands how important it is to design sustainable, efficient schools. Heinz Rudolf of Boora has used daylighting services at the LDL dating back to the North Clackamas, Oregon school analysis, and recently

he brought the Central Intermediate School in Independence, Oregon for analysis by our daylight specialists.

Heinz is a firm believer in analytical design. "The only way to see what is really happening is a daylit space under various seasonal conditions is to model it. I believe that every important daylighted room should be modeled." Using the direct-beam heliodon and overcast sky at the Seattle BetterBricks Daylighting Lab, Boora learned how their spaces actually react to the natural environment with sunlight. "If we don't do modeling on our spaces, we're just guessing," said Mr. Rudolf.

Boora finds the daylighting services from the BetterBricks Daylighting Lab immensely valuable during design. "Having this expertise avail-

"I believe every important daylighted room should be modeled...if we don't do modeling...we're just guessing"

*Heinz Rudolf
Boora Architects*

able saved us a great deal of time and expense. "We can count on the predictions of how the space will perform. There is always a place for improvement in a design."

A growing body of research into learning behavior shows a positive correlation between daylight and student learning. This makes it even more important to integrate daylight and electric light into the design of our schools.

If you would like to download a tutorial on the daylight modeling process, go to www.lightingdesignlab.com/daylighting/daylighting_studio_newtips.htm for our modeling tips and model study checklist. For more information on integrating daylight with electric light visit www.BetterBricks.com.

If you would like to discuss conducting a daylight model study at the Lighting Design Lab, either email daylighting@lightingdesignlab.com or call 206-325-9711 x36 and ask for Kevin or Chris.

lighting consultations.



Above: The on-site consultation by Michael Lane at Eastern Oregon University revealed a variety of options for improving the lighting. The large daylight contribution provided an opportunity for photocell controls

Photo by LDL

Consultation services from the Lighting Design Lab are a means of collaborating with clients to identify effective options for their lighting challenges. The purpose of the consultation is not a full lighting design, but rather to produce a list of different solutions for consideration by the design team. The options we identify aim at providing the best solutions for lighting quality and energy-effectiveness.

Our consultations take place at the Lighting Design Lab, at the client's office, or at the project location as warranted by the project needs. One project that involved a site visit for evaluation was the library at Eastern Oregon University in La Grande, Oregon. Michael Lane, senior lighting specialist at LDL, was contacted by the local electric utility and the facility manager, who were seeking to improve the energy efficiency and lighting quality at the university, including their library.

Michael was already planning to visit Eastern Oregon on other projects for Oregon Trail Electric Co-op, and added a stop at the school. He toured the facility,

evaluating existing lighting equipment, and measuring light levels. The facility had a high energy usage, was overlit in some areas, and the library received a lot of daylight.

Michael outlined the lighting options, including simple relamping and ballasting to T-8s and electronic ballasts; delamping from 4-lamps to 3-lamps; plus some choices for completely replacing the lighting system with new fixture types. Some of the library had over 200 footcandles of illumination from daylight, so the report included control options for photocell dimming in response to the available daylight. He consulted the standards from the Illuminating Engineering Society of North America for proper illumination levels in offices and libraries. He made sure that his recommendations would provide light levels that met those standards. The options offered in his report could produce energy savings over 30%, while maintaining or improving the lighting quality.

Lighting consultations are provided by the Lighting Design Lab at no cost to the client. We have 3 lighting specialists available for consultations on commercial, industrial, and multifamily projects.

What do you get from a lighting consultation?

- Options for solving your lighting problems. Since every project has different goals, budgets and timelines, our lighting specialists work to provide suggested solutions showing the mix of available designs and technologies.
- Solutions that provide good lighting quality. Every project is examined for issues of glare, contrast, and the visual tasks that are being performed. Energy efficiency is the goal of every consultation, but never at the cost of occupant comfort and productivity. Our lighting specialists benchmark your spaces against the standards provided by the IESNA and others for professional practice.
- Opportunities to integrate electric lighting with daylight. Working closely with our Daylighting Specialists, we identify spaces in buildings where daylighting can provide additional energy savings by using controls.

How do you get a lighting consultation?

Call-800-354-3864

- In Montana, eastern Washington and Northern Idaho, contact Shaun Darragh - ext 27 - or email him at shaun@lightingdesignlab.com.
- In southern Washington, Oregon and southern Idaho, contact Michael Lane - ext 26 - or email him at michael@lightingdesignlab.com.
- In the Puget Sound area, call on Michael Lane and Shaun Darragh, Eric Strandberg - ext 28 - or email him at eric@lightingdesignlab.com.

did you know?

Members of professional design organizations (AIA, NCQLP/LC, ALA, BOC, and others) may be able to receive continuing education credits for attending events offered by the LDL.

To self-certify your credits (sometimes called learning units) make sure you keep the Certificate of Completion that we distribute at each event.

Learning unit credits are almost always issued at a rate equal to the contact hours. So a 2 hour class would be worth 2 credits.

For information about how your organization works with continuing education credits visit their website at:

AIA
aia.org

ALA
americanlightingassoc.com

ASID
asid.org

BOC
nec.net/boc.htm

BOMA
boma.org

IFMA
ifma.org

IIDA
iida.com

NCQLP
ncqlp.org

fall 2002 events.

Registration Form
on Page 7

All Registration **must be in advance**. All fees must be **paid in advance**. No registrations or fees will be accepted at the door.

1 • lighting design workshop. \$50

Bozeman: Wednesday 10/23 • 9:00am - 4:00pm
Seattle: Tuesday 10/15 • 9:00am - 4:00pm
Boise: Tuesday 10/29 • 9:00am - 4:00pm
Portland: Tuesday 11/12 • 9:00am - 4:00pm
Eugene: Wednesday 11/13 • 9:00am - 4:00pm

To be truly successful, any architectural conception must include an awareness of the play of light, shadow, and vision. This hands-on interactive workshop will help participants learn to balance conceptual application of light with human vision and task requirements. Integration of the two results in superior projects.

Participants in the workshop will learn the process of developing a lighting design by working with a provided architectural space. Students will explore the conceptual effect of daylight, electric light and luminaires on the space and occupants. The initial concept will be refined through an interactive process into a working design. Issues of human productivity and system efficiency will also be addressed.



The participant will leave with an understanding of the steps involved in creating a successful lighting design. They will have an understanding of lighting concepts and strategies applicable to future projects. Additional resource information will be available to participants.

Class size is limited to 16

(6 CEU contact hours)

• project design reviews.

The lighting specialist will be available by appointment on the day following the workshop for schematic design review of proposed lighting strategies on your commercial and industrial lighting projects. Please contact the specialist for your territory (see article on page 7) to set up an appointment in your office.

 = basic   = intermediate    = expert



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lunch & learn seminars:

LDL is now offering lunchtime seminars at the offices of design firms throughout the region. Our lighting specialists are scheduling one week a month in their specific territories (see article on page 7). The following are your topic choices. Times may be limited, so contact us early. If you are interested in arranging a seminar at your office, complete information on registration form and you will be contacted by the lighting specialist who serves your area.

2 • light & architecture.

To be truly successful, any architectural conception must include an awareness of light, shadow and human vision. This hour will be a visual discussion light reveals the forms and surfaces of architecture and enables optimum human functionality in the buildings..



(1 CEU contact hour)

3 • using mockups as a lighting design tool.

Whether you are an architect, engineer, designer or contractor, nothing gives you and your clients a feel of how a lighting strategy will work than literally walking through the space. This presentation describes the process of creating a full-size mock-up at the Lighting Design Lab, and will show examples of previous mock-ups.



(1 CEU contact hour)

4 • what's new in lighting?

This presentation summarizes the most interesting and efficient lamps, ballasts, fixtures, controls and other products of interest for your projects as seen at LightFair International.



(1 CEU contact hour)

5 • daylighting for schools. by Joel Loveland

Seattle: Fall Quarter • Nine Fridays • noon - 1:00pm • \$50

This class is the lecture/seminar portion of Joel's annual University of Washington Advanced Lighting Topics - Daylighting Course. The UW students meet Mondays and Fridays from 11:30 – 1:00 PM, Mondays are lab days and field trips. Fridays are dedicated to daylighting seminar lectures and discussions. This Lighting Design Lab course is meant to offer access to the Friday daylighting lecture/discussions. The topic that the class will use to explore daylighting design is the design of schools with daylight. (9 hours)



6 • lighting research center update: light & health

Seattle: Thursday 10/17 • 12:00pm - 1:00pm

America's foremost lighting researchers present an overview of the current state of research into the relationship between light and health. Recent research on worker productivity and the importance of lighting to our aging population will be covered. Join Mariana Figueiro and Mark Rea from the LRC at this exciting lunchtime seminar.



7 • open house.

Seattle: Wednesday 12/11 • 10:00am - 3:00pm

Join us in our yearly celebration of lighting in our region. We kick off the day with our New Products Trade Show at 10 AM, where the best new lighting products are on display, and local manufacturer representatives will answer all of your questions. Our keynote speaker (to be announced) will talk from 11 - Noon. The buffet lunch from 12 - 1 will give you a chance to catch up with old friends and discuss the stimulating topic addressed by the keynote speaker, and revisit the trade show. Our What's New in Lighting seminar will be held from 1 - 2. The trade show ends at 3.



registration form.

Fall 2002 Classes

PAYMENT POLICY: Fees MUST BE PAID IN ADVANCE before attending class. Purchase Orders, checks, and credit cards are accepted. A credit toward future LDL classes will be issued for unused registration fees.
NO PAYMENT OR REGISTRATION WILL BE ACCEPTED AT THE DOOR.

Secure On-line registration is available at <http://www.lightingdesignlab.com/classes>

registration fee paid by. (circle one)

credit card • enclosed check • purchase order • credit from previous LDL event •

registration information.

Name • _____

Company • _____

Profession • _____

I Pay My Electric Bill To • _____

billing information. (must be complete to process card transactions)

Phone • _____

E-Mail • _____ Fax • _____

Address • _____

City, State, Zip • _____

Credit Card Number (VISA & MasterCard ONLY) • Please include your CVV Code - last 3 digits of the number on the back of your card near your signature

Expiration Date • _____

please check the circles of the class(es) and event(s) you wish to attend (online registration available).

1 • lighting design workshop. \$50

- Bozeman: Wed 10/23 • 9:00am - 4:00pm
- Seattle: Tues 10/15 • 9:00am - 4:00pm
- Boise: Tues 10/29 • 9:00am - 4:00pm
- Portland: Tues 11/12 • 9:00am - 4:00pm
- Eugene: Wed 11/13 • 9:00am - 4:00pm

2 • lunch & learn: light & architecture.

- Contact me using the information provided above to arrange a seminar at my office.

3 • lunch & learn: effective mockups.

- Contact me using the information provided above to arrange a seminar at my office.

4 • lunch & learn: what's new in lighting?

- Contact me using the information provided above to arrange a seminar at my office.

5 • daylighting for schools. \$50

- Seattle: Fridays
Fall Quarter — Univ of Washington
Noon - 1:00pm

6 • update from the LRC.

- Seattle: Thurs 10/17 • 12:00pm - 1:00pm

7 • annual ldl open house.

- Seattle: Wed 12/11 • 10:00am - 3:00pm

Class Locations.

Bozeman: Montana State University
Strand Union Bldg, Room 276
7th & Grant
Bozeman MT

Portland: University of Oregon
Portland Center
722 SW 2nd Ave, Lecture Hall
Portland, OR

Eugene: EWEB Training Center
500 E 4th Ave
Eugene, OR

Boise: Idaho Power Headquarters
1221 W Idaho St, 1st Floor
Auditorium Ease
Boise ID

Seattle: Lighting Design Lab
400 E Pine St, Suite 100
Seattle WA

You can register instantly and securely online. Payment is accepted by credit card, check and purchase order.

www.lightingdesignlab.com/classes

BetterBricks services.

Earlier this summer, the Northwest Energy Efficiency Alliance relaunched its BetterBricks program to help commercial building professionals take advantage of the design and financial benefits of energy efficiency. Northwest building owners, developers, facility managers, architects and engineers can find resources through BetterBricks.com, an advisor service and toll-free hotline that will help them create more energy-effective buildings.

Buildings that use energy efficiently and effectively can provide real benefits to their occupants and their owners in terms of lower operating costs, improved employee productivity and increased profitability. BetterBricks is dedicated to raising awareness and demand for energy efficiency in buildings by sharing information and resources with the people who design, own and operate them.

For example, the BetterBricks advisor service can help maximize a building's performance potential by filling critical information gaps in the design process and minimizing the cost and risk of using different-than-standard practices. The website at www.BetterBricks.com provides articles and case studies that demonstrate what others have done to improve the efficiency of their commercial buildings.

BetterBricks is funded by the Northwest Energy Efficiency Alliance, a nonprofit group working to make affordable energy-efficient products and services available in the marketplace. The program is also coordinated with other Alliance projects such as the Lighting Design Lab and the BetterBricks Daylighting Design Labs located in Seattle and Portland. To be eligible for BetterBricks advisor or hotline services, a building project must be located in the Northwest states of Idaho, Montana, Oregon or Washington. Most services are free of charge. Visit the website at www.BetterBricks.com or to receive customized assistance, call the toll-free hotline at 888-216-5357.

new lighting territories.

In an effort to simplify contacts for our customers, and maximize the effectiveness of our regional travel, the Lighting Design Lab is moving to a territory system for our Lighting Specialists. Each Lighting Specialist will be responsible for a geographical area. They will be responsible for classes, consultations, and our new lunch & learn seminars in their regions.

By scheduling regular travel times to communities, designers may more easily set up consultations at job locations and in their offices. Our lighting specialists will be able to become more familiar with the local lighting communities, and better tailor our services.

Here is our new directory of service territories:

- **Eastern Washington, Northern Idaho, and Montana**

Shaun Darragh: territory travel 4th week of each month

- **Southern Idaho, Southern Washington, and Oregon**

Michael Lane: territory travel 2nd week of each month

- **Bellingham to Centralia**

Michael Lane
Shaun Darragh
Eric Strandberg

- **Mock-ups**

Eric Strandberg - Coordinator

- **Contacts**

Shaun Darragh
800-354-3864 extension 27
shaun@lightingdesignlab.com

Michael Lane
800-354-3864 extension 26
michael@lightingdesignlab.com

Eric Strandberg
800-354-3864 extension 28
eric@lightingdesignlab.com

lighting updates.

- **Lighting Award Winners**

Award-winning lighting projects in Washington and Oregon that received Cutler, EPRI, Guth and Waterbury Awards from local Sections of the IESNA are now on our website

One project, Ross DeAlessi Lighting Design's Firth of Forth Bridge received an International Award of Excellence. All these award winners are available now online at www.lightingdesignlab.com/locations.

- **Daylighting Projects**

We have been posting recent project reports on a monthly basis. You can download the report for the Central Intermediate School in Independence, Oregon that was featured on page 2 of this newsletter at www.lightingdesignlab.com/daylighting/daylighting_studio.htm.

- **Mock-Ups**

We've added more pictures and descriptions of the mock-ups done at the Lighting Design Lab. More detailed information about the Issaquah Library mock-up that was featured on page 1 of this newsletter is available in the Mock-Up section of the website at www.lightingdesignlab.com/mockup.

- **Dimming Ballasts**

The City of Seattle now requires dimming ballasts in daylight zones for projects using the Prescriptive Path of the Energy Code. The ballpark price range for added cost to a fixture (distributor net) for a 2-lamp 0-10V dimming ballast currently seems to be approximately :

T8 fixtures: ~\$35 - \$50

T5HO fixtures: ~\$85 - \$130

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lighting design lab



400 East Pine Street #100, Seattle WA 98122
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400 E. Pine Street #100 Seattle WA 98122

contact us.

General Phones · **206.325.9711**
· **800.354.3864**

Fax · **206.329.9532**

Project Manager · **Diana Grant** - ext 24
· diana@lightingdesignlab.com

Schedule Coordinator · **Front Desk** - ext 0
· info@lightingdesignlab.com

Lighting Specialists · **Michael Lane** - ext 26
· michael@lightingdesignlab.com

· **Shaun Darragh** - ext 27
· shaun@lightingdesignlab.com

· **Eric Strandberg** - ext 28
· Mockup Coordinator
· eric@lightingdesignlab.com

Daylighting Specialists · **Joel Loveland** - ext 32
· joel@lightingdesignlab.com

· **Kevin VanDenWymelenberg & Chris Meek** - ext 36
· daylighting@lightingdesignlab.com

Librarian & Editor · **Randy Smith** - ext 29
· randy@lightingdesignlab.com

Stage Technicians · **Adam Griffen** - ext 37
· adam@lightingdesignlab.com

· **Nacho Bravo** - ext 31
· nacho@lightingdesignlab.com

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The Northwest Energy Efficiency Alliance is a nonprofit group of electric utilities, state governments, public interest groups, and industry representatives committed to bringing affordable, energy-efficient products to the marketplace.



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