NEWS

Lighting Design Lab to open Outdoor Lighting Test Facility

The Lighting Design Lab is working with the Bonneville Power Administration, Seattle City Light, Washington State University and South Seattle Community College to create an Outdoor Lighting Center to test the performance of LED, Induction and Plasma light sources in typical residential and arterial street lighting situations. The planned startup date for the outdoor testing is the Fall 2010.

Regionally and nationally there is a big push to switch from existing HPS (High Pressure Sodium) street lights to LED (Light Emitting Diode), Induction or Plasma sources due to the perceived energy savings and decreased maintenance issues and costs. One big unanswered question however is: "Will these broader spectrum light sources perform better than, equal to, or poorer than yellowish HPS in the varied rain, fog, snow, and dry conditions of the Pacific Northwest?"

The Center will be located at South Seattle Community College on the end of a controlled access road. There we will be able to simulate approximately 600 feet of street lighting using 6 lighting towers. Each tower will be movable along the length of the road to allow for simulating different pole spacing and will have an adjustable height luminaire bracket to allow for luminaire mounting heights up to 35 feet. Each bracket will be able to simultaneously mount three street lights at the same height to quickly evaluate the lighting of three different sources.

The goal will be to test various LED, Induction and Plasma lights and to create a series of lighting guides on street lighting showing the effects of various technologies for a given spacing and mounting height and associated energy savings for retrofit and new installations. Also included on the guides will be observations on how rain, fog and maybe snow effect the lighting distribution and glare considerations of each luminaire.

Above Top: View of the section of South Seattle Community College campus where the LED streetlighting tests will be conducted. Above Bottom: software rendering of how the testing will look.

Below: Andrea Dahlman (left), mockup technician and Eric Strandberg (right), senior commercial lighting specialist pictured with the rolling cart used for easy measuring of low light levels in mockups of streetlighting in our mockup room. Andrea and Eric have been evaluating the performance of LED, HPS, Metal Halide and Induction streetlights for several months in preparation for the new outdoor center. Andrea recently became a permanent full-time staffer at the LDL.

fall 2010 classes.

REGISTRATION NOTE: There is no registration form in this newsletter—all registrations are now **only** online. Our new registration system will allow both credit card payment and check payment but registration is only online. When classes fill up, registration will automatically stop for that class. Just go to our homepage and click on the link for class registration

Classes.

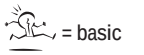
1) 10 - Noon: What's New in Lighting: 2010

The fall tradition continues of reviewing the latest innovations in exterior and interior lighting luminaires, lamps, ballasts, publications, controls and components. Also included in the class will be award winning products recognized throughout the industry. This class is intended for those already familiar with basic lighting terminology (i.e. CRI, CCT, L/W, CMH, LED, OLED etc.) but can be of interest to those just entering the lighting industry as well.

Noon - 1 pm. Lunch is included and we answer your project lighting questions in a Q&A session.

2) 1 - 3 pm: Revisiting the Retrofit Process for Offices

This class will delve into the idea of retrofitting spaces that may have already received a retrofit using case studies from a selection of today's modern offices as an example. Many new and very efficient lamps, ballasts, and controls have recently come on to the market which make it possible to reach even deeper energy and money saving goals. We will look at these technologies, and link them to real world applications while making sure that lighting design and quality are maintained.

 = basic  = intermediate  = expert

Class Dates.

Bozeman:	Wednesday September 8	• 10:00 am - 3:00 pm
Boise:	Wednesday September 15	• 10:00 am - 3:00 pm
Spokane:	Wednesday September 22	• 10:00 am - 3:00 pm
Portland:	Wednesday September 29	• 10:00 am - 3:00 pm
Tacoma:	Thursday October 7	• 10:00 am - 3:00 pm
Everett:	Wednesday October 13	• 10:00 am - 3:00 pm
Bellevue:	Thursday October 21	• 10:00 am - 3:00 pm
Seattle:	Thursday October 28	• 10:00 am - 3:00 pm

Class Locations.

Bozeman: Bozeman Public Library, 626 Main Street, Bozeman, MT 59715 (Large meeting Room)

Boise: Idaho AGC, 1649 West Shoreline Drive, Boise, ID 83702 (Training Center)

Spokane: Class location will be finalized in late August. Spokane, WA 99202

Portland: UO Portland, White Stag Block, 70 NW Couch St, Portland, OR 97209 (Room 142/144)

Tacoma: Pacific Grill Events Center, 1530 Pacific Ave, Tacoma, WA 98402 (Pearl Room)

Everett: Snohomish County PUD, 2320 California St, Everett, WA 98201 (Commission Room)

Bellevue: Puget Sound Energy, 10885 NE 4th St, Bellevue, WA 98009 (Forum Room)

Seattle: Lighting Design Lab 2915 4th Ave S, Seattle WA 98134

articles.

Small Step Retrofits by Jeff Robbins LC

Many small step retrofit opportunities present themselves in today's lighting market due to recent additions to existing product lines.

Consider the menu of T8 lamp and ballast options. The typical 4ft. lamp, rated at 32W, is available in (initial) lumen packages of 2900 (avg.) for standard output, and up to 3100 for high performance. There are also three energy saving lamp options: 30W, 28W, and 25W. The first step would be to retrofit the baseline (#3) lamp, 32W fixture with, in the case of Option 1, (3) 28 W lamps, light level output will only be reduced by 6%, but the result will be an energy savings of 12%, even though the ballast factor is ***lower***! Option 2 illustrates how, if desired, light levels might be increased, (in this case by 19%), by retaining the 32W lamps, and choosing a 'normal' ballast factor ballast. Option 3 offers a 44% energy savings over Option 1 simply by dropping a lamp.

Lamping and Ballast Factor*	Baseline 3 -32 watt T8 (741) NBF	Option1 3 -28watt T8 (841) LBF	Option2 3 -32watt T8 (841) NBF	Option3 2 -28watt T8 (841) LBF	Option4 2 -32watt T8 (841) HBF
Watts/ fixture- Total watts- (6 fixtures)	85 watts 510 watts	75 watts 450 watts	83 watts 498 watts	42 watts 252 watts	77 watts 462 watts
Power density (LPD)	.65 w/sq'	.58 w/sq'	.64 w/sq'	.32 w/sq'	.59 w/sq'
Average foot-candles	37 Avg. FC	35 Avg. FC	43 Avg. FC	23 Avg. FC	38 Avg. FC

All simulations are done using mean lamp lumens. All retrofits use "NEMA Premium" ballast power ratings. Baseline incorporated a .9 dirt depreciation factor (not in the retrofits). All models use the "same" lensed prismatic troffers on 8' x 10' spacing. No alterations were made to the room surfaces.

*Ballast Factor
LBF=.77, NBF=.88, HBF=1.15

Predictably, light levels suffer by 34%, so this step should not be taken unless the lower light levels are appropriate for the space. Option 4 offers the intriguing possibility of increasing light output, (albeit by only 3%), while saving 10% energy against the Baseline, even though one lamp has been dropped. The reason? An increase of 27% in light by specifying a high ballast factor.

The more extreme possibility is the 25W version, which if used as a replacement for the full wattage lamp, would result in a 22% energy savings while only reducing light output by 13%. The caveat here however is that this lamp may not be compatible with every full wattage ballast. And by the way, 23W and 20W T8's are on the horizon!

As an additional note, lamp manufacturers claim that ballasts with ballast factors between .71 and 1.38 will not adversely affect lamp life. By thinking small, you may still be able to realize big results.

LED misLED by Eric Strandberg LC

I am reading the marketing material from a reputable recessed fixture manufacturer and following is typical of what I see. **"Annual Operating Cost Reduced by 58%"**… but, it is the fine print that I am looking at. The claims made about LED products, still need to be viewed with a degree of faith. It is difficult to check data like 50,000 hrs life but, the "baseline" data used to compare products to CFL, can be checked. First, they compare their product to a 10,000 hr 26 watt Triple Tube (TT) CFL. These CFLs lamps have been rated at 12,000 hrs for over a decade (the 2,000 hr difference adds over 6 months more of operation). Since the headline is about annual operating cost, it should be noted that the TT CFLs are rated at 20,000 hrs on 12 hr/day operation which results in almost another 2 yrs of operation. The other odd thing about the marketing is "Annual Relamping Cost Per Fixture" which is $0 for the LED and $5.84 for the CFL. If that is the cost of a lamp, (which is about right), then the lamp is being replaced every year (which is about 4 times too frequent). If it is a prorated lamp cost, then the assumption is way too high, over $20 for each lamp. Again, the reason this matters is that these "baseline" figures feed directly into the ability to reach that "58% cost reduction". We see the assumptions on CFL life underestimated and operation costs overinflated.

This disparity is consistent with computer modeling I have done on LED recessed fixtures that claim to out perform CFL fixtures from a light level standpoint. Very few of the simulations, (using the manufacturers own data), live up to the performance claims (see "LED Resources Page" on our web site). With all of the existing advances in LED technology, why are manufacturers making these claims? The cost of LED fixtures is still so high compared to existing fixtures, that there needs to be a compelling reason to adopt them. There must be either; significant energy savings, much lower operation costs, or an improvement in quality of light. It is important though to look critically at the data in manufacturers literature and not just "bottom line figures". Ask—how did they arrive at those numbers?

Note: The lamp life on CFL even from the GE '06 catalog (12,000 hrs and 20,000 hrs). This is typical of other major lamp manufacturers.

Nominal Lamp Base	Watts	Lamp Length in.	Color Code	Description	Case Qty.	Rated Volt	Rated Life Hours	Rated Life 12 Hrs.	Lumens Initial	Lumens Mean	Color Temp. K.	CRI
PLUG-IN LAMPS (CONTINUED)												
4-PIN TRIPLE BIAX® (CONTINUED)												
GX24q-2	18	4.8	97627	F18TBX/841/A/ECO	10		12000	20000	1200	1020	4100	82
GX24q-3	26	5.2	97618	F26TBX827/4P/ECO	10		12000	20000	1710	1440	2700	82
			97614	F26TBX/827/A/ECO	10		12000	20000	1710	1440	2700	82
			97615	F26TBX/830/A/ECO	10		12000	20000	1710	1440	3000	82
			97616	F26TBX/835/A/ECO	10		12000	20000	1710	1440	3500	82
			97617	F26TBX/841/A/ECO	10		12000	20000	1710	1440	4100	82

lighting design lab

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lighting design lab news
is published by the lighting design lab
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