

Sustainable Office Design Program:
**A Guide for Applicants
and Lighting Designers**

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Introduction



The Sustainable Office Design (SOD) Lighting Program offers incentives to building owners and lighting designers for well-planned, innovative and controls-rich lighting designs.

SOD-qualifying lighting designs use sophisticated lighting controls and follow an efficient, low-installed-wattage lighting plan.

SOD is different than other programs because it does not dictate specific products or technologies. Lighting designs must meet a target performance level, but the program does not dictate the means of doing so.

This guide outlines best practices for creating lighting solutions that emphasize efficiency and comfort – and that qualify for financial incentives from the Energize Connecticut initiative.

Benefits to Building Owners

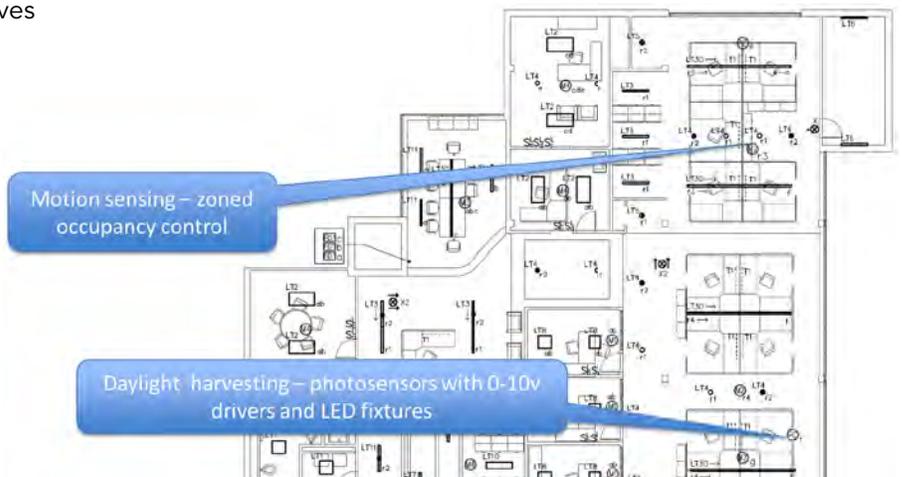
- Higher energy and operational savings (kWh/sf/year)
- Contributes to LEED and ENERGY STAR® certification
- Shows leadership in sustainability goals
- Higher tenant productivity and satisfaction
- Higher building occupancy and rental rates
- \$1/sf incentive

Benefits to Lighting Designers

- Helps prevent value engineering of efficient lighting and control systems
- Supports creativity in design
- Allows for flexibility in product options
- Provides competitive advantage
- Financial incentive up to 20% of total incentive amount

What to Expect

- Step 1: Organize your area by space types.
- Step 2: Select fixtures and layouts that deliver appropriate lighting and meet the LPD guidelines.
- Step 3: Select controls that meet minimum performance requirements.
- Step 4: Compare design with requirements and complete an application form.



Step 1 - Organize Your Space

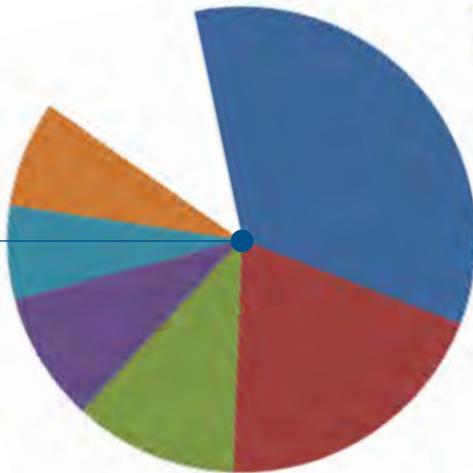
Organize the leased area into commonly used office space types before selecting lighting fixtures and controls.

Assign specific lighting design patterns to common spaces, such as open offices areas, private offices, meeting and conference rooms, reception areas, and other spaces found within the typical business office.

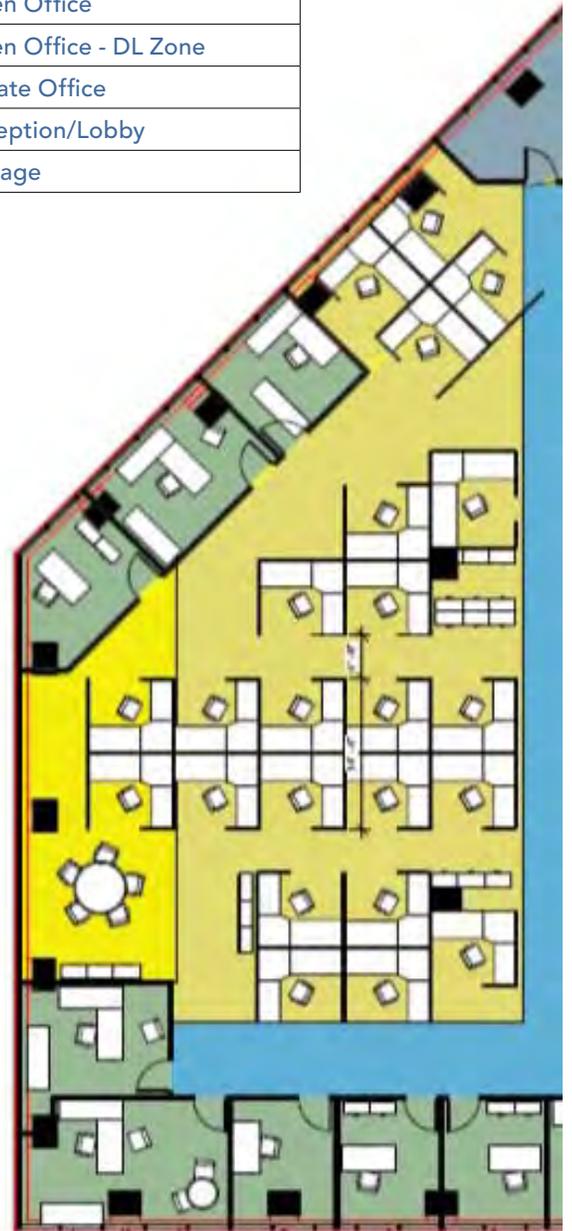
- Total office space must be at least 7,500 sf or larger.
- Open office space must occupy more than 40% of the floor area of a SOD-qualifying installation. Both interior open offices and day-lit open offices (perimeter exposure or below skylights) plans qualify.
- Large (greater than 300 sf) private offices offer control options that differ from the typical small office.
- Each size range has its own recommended lighting design patterns and lighting control requirements.

SPACE USE LEGEND	
	Conference or Training
	Copy/Mail Room
	Corridors
	Employee Break Room
	Open Office
	Open Office - DL Zone
	Private Office
	Reception/Lobby
	Storage

The six space types that make up the majority of space use in the modern office offer the greatest energy-saving opportunities.



-  Open Office Daylit Zone
-  Open Office
-  Corridors
-  Private Offices <300sf
-  Conference or Training >300sf
-  Conference and Training Rooms <300sf



Step 2 - Select Lighting Solutions

Select lighting fixtures and layouts that deliver appropriate lighting levels and quality to the space while meeting the lighting power density(LPD) target for that space type.

Advances in lighting technology make low-LPD designs possible.



Private offices placed on the perimeter should have daylight dimming capability

Solid State Lighting (SSL), using LEDs as a light source, is now found in almost every fixture type from every major manufacturer. SSL creates visible light with reduced heat generation and less energy dissipation than fluorescent lighting.

Lighting with full dimming capability has a low incremental cost.



- > Areas within 15 ft. of windows should have daylighting controls.
- > Recessed luminaires are most appropriate for open plan spaces with ceilings 8'4" or lower, since they do not illuminate the ceilings and have a greater potential for high angle glare. Suspended luminaires provide better quality for open plan ceiling heights above 8'4".
- > Suspended linear fixtures are available with both high-efficiency fluorescent and LED sources.

DESIGN LIGHTING FOR EACH SPACE TYPE AT OR BELOW THE FOLLOWING LPD GUIDELINES

Space Type	LPD (W/sf)	Foot-candles (horizontal)	Notes
Open Offices	0.6	30-50 fC	Shared workspace with open desks or less than 48" high cubical partitions; maximum 2,500 sf per control area
Private Offices	0.7	30-50 fC	Private, enclosed office with one primary occupant
Small Meeting Rooms	0.9	20-70 fC	Work room with area <300 sf
Conference Rooms	1.1	20-70 fC	Work room with area >300 sf and multipurpose lighting
Corridors	0.5	10-20 fC	
Lobbies and Reception Areas	1.0	5-20 fC	
Copy, File and Work Rooms	0.7	20-50 fC	

Foot-candle illumination levels based on information gathered from the IES "The Lighting Handbook" 10th Edition

Steps 3 & 4 - Select Controls

Select control components and technologies that meet the minimum performance requirements for each space type.

OFFICE SPACE TYPE	SOD CONTROL CATEGORY*
Open Office	A
Open Office Daylit Zone	B
Private Offices (<300sf)	C
Large Private Offices (>300sf)	D
Conference and Training Rooms (<300sf)	E
Conference and Training Rooms (>300sf)	F
Corridors	G
Copy, File and Work Rooms	H
Reception Areas, Lobbies and Waiting Rooms	K
Store Rooms	O
Employee Break Rooms	P



Digital control products operating on wireless networks extend room-lighting controls to the desktop and conference table.

* See notes on space-specific guidelines and an explanation of what each control category consists of will follow on later pages.

Pair space types with controls

Match a lighting control category to each assigned space, such as open offices areas, private offices, meeting and conference rooms, and other spaces found in a typical business office.

Use the best control technologies

Digital lighting controls enable remote programming, provide for energy reporting and diagnostics, and allows for easy integration of additional control strategies in the future.

Fixture-mounted sensors and digital controls can simplify installation. An integrated control scheme using smart fixtures incorporating networked (wireless or wired) controls is a recommended alternative to localized low voltage control of line voltage loads. Control can be provided by independent, stand-alone, low-voltage sensors and relays using Class 2 wiring.



Occupancy sensors automatically turn off lights in an unoccupied space.



Auto on/off activated, wall-mounted occupancy sensors with dual relays provide control of two lighting circuits or two lighting levels.

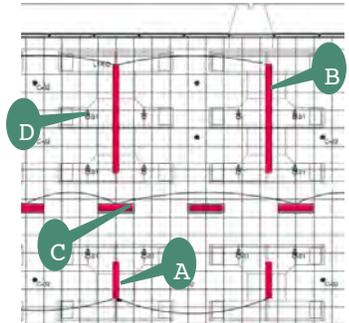
Compare the as-designed LPD and as-designed number of control points with SOD lighting incentive requirements. If satisfied, complete an application form.

Open Offices

Use an LPD target of 0.6 W/sf for open offices.

Lighting in open office spaces should maximize daylight, provide adequate lighting for user tasks and collaboration, and increase sensitivity of control to personal preferences, while maximizing quality and minimizing energy consumption.

- A. Indirect/direct suspended fixtures or high-efficiency recessed fixtures provide the ambient illumination in work areas.
- B. Fixtures specified with continuous dimming down to 10% or lower of full output are used for daylight harvesting. These fixtures are capable of reducing electric light in response to the availability of natural light and are controlled by photosensors.
- C. Fixtures in hallways provide ambient lighting in circulation zones.
- D. Task lights supplement the ambient lighting for any employee who simply desires more light.



Open offices have a target average horizontal lighting level of 30-35 foot-candles (fC), with 45-75 fC on the work surfaces.



Keep office cubicle partitions no higher than 48 inches to allow for greater efficiency and more comfortable light levels.

SOD lighting plans go beyond 2012 IECC standards	Use Control Category A in interior open offices	Use Control Category B in daylit open offices
<ul style="list-style-type: none"> • Manual control of two lighting loads to allow reasonably uniform minimum 50% reduction in connected load. • Lighting in daylit zones controlled separately from general lighting, with stepped or continuous dimming to minimum 35% reduction. • Automated shut-off from time clock or building management control after hours. • Occupancy sensors not required. 	<ul style="list-style-type: none"> • Manual control of two lighting loads to allow reasonably uniform minimum 50% reduction in connected load. • Dual technology-zoned occupancy controls. • Automated shut-off time clock or building management control after hours. 	<ul style="list-style-type: none"> • Manual control of two lighting loads to allow reasonably uniform minimum 50% reduction in connected load. • Dual Technology Zoned occupancy controls. • Photosensors for 0-10 VDC electronic dimming in daylit zones to minimum 20%. • Automated shut-off from time clock or building management control after hours.

Products

Major manufacturers provide design guidance for the use of automated controls, including line voltage, low voltage, and wired and wireless digital controls. Integrated digital control systems take advantage of new digital (LED) lighting and “networked-ready” lighting products.

Conventional lighting can be controlled with stand-alone sensors (with necessary control packs). Examples include, but are not limited to, SensorSwitch CM-ADC-DZ series with CM-ADC series photosensors, Wattstopper DT-300/DT-305 series with LightSaver LS-301 series photosensors, and Cooper OAC-DT-1000-MV series with Greengate DLC-PD-DIM series photosensors.

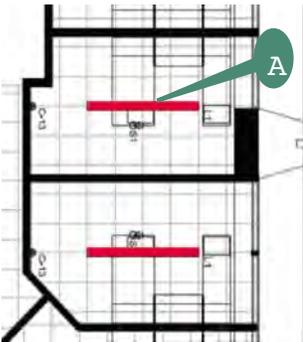
Private Offices

Use an LPD target of 0.6 W/sf for private offices.



Private office lighting needs to balance the brightness of the room surfaces as well as provide multi-level illumination. This variation accommodates personal needs and increases energy savings. Vacancy sensors are a minimum control strategy.

Private offices with high ceilings and windows can use suspended indirect/direct luminaires that illuminate the ceilings and walls as well as the desk area, providing a visually balanced and comfortable workplace. Adjustable desk lights can be used to supplement illumination for tasks and give users personal control and increased satisfaction.



A. Indirect/direct suspended or recessed fixtures are used for ambient lighting.

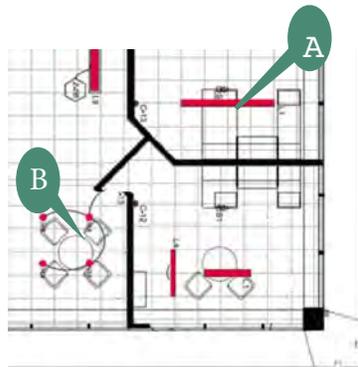
B. Wall washers and down-lights for secondary-use areas provide accent lighting in larger offices.

Private offices have a target average horizontal lighting level of 30-35 fC, with 45-75 fC on the work surfaces.

SOD lighting plans go beyond 2012 IECC standards	Use Control Category C in small private offices	Use Control Category D in larger daylit offices
<ul style="list-style-type: none"> Manual control of two lighting loads to allow reasonably uniform minimum 50% reduction in connected load. Lighting in daylit zones controlled separately from general lighting, with stepped or continuous dimming to minimum 35% reduction. Automated shut-off from time clock or building management control after hours. Occupancy sensors not required. 	<ul style="list-style-type: none"> Manual control of two lighting loads to allow reasonably uniform minimum 50% reduction in connected load. Dual technology-zoned occupancy controls. Automated shut-off from time clock or building management control after hours. 	<ul style="list-style-type: none"> Manual control of two lighting loads to allow reasonably uniform minimum 50% reduction in connected load. Dual technology-zoned occupancy controls. Photosensors for 0-10 VDC electronic dimming in daylit zones to minimum 20%. Automated shut-off from time clock or building management control after hours.

Daylighting

Although locating private offices on the interior and open-plan offices at the building perimeter is a better strategy for daylight harvesting controls, daylighting controls should still be considered for private offices with perimeter windows.



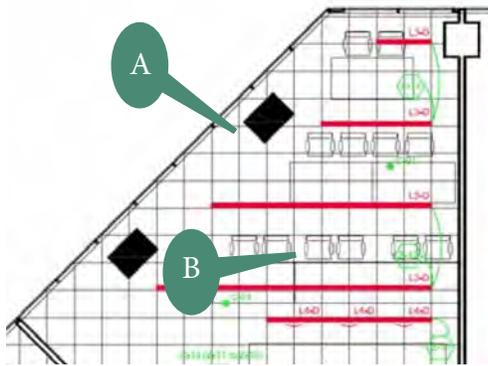
Products

Integrated digital control systems offer the most flexibility and can take advantage of new digital (LED) lighting and "network-ready" lighting products. More conventional lighting can be controlled with stand-alone sensors (with necessary control packs).

Examples include, but are not limited to, SensorSwitch WSD-PDT-2P series, Wattstopper DW-200 series, Cooper ONW-D-1001-DMV series and 0-10 VDC electronic dimming wallbox control (if dimmable fixtures used).

Meeting Rooms and Conference Rooms

Use an LPD target of 0.9 to 1.1 W/sf for meeting and conference rooms.



Flexibility, glare control and visual comfort are high priorities for interior meeting and conference environments.

- A. Indirect/direct suspended luminaires, used for ambient lighting and dimmable, down to 1% of full output for audio/visual purposes.
- B. Wallwasher, recessed above the ceiling with reflector and shield, oriented toward the walls to spread the light uniformly.



Meeting rooms have a target horizontal illuminance (average maintained fC) on the work surface of 45-55 fC for paper task performance. Vertical illuminance of 20-30 fC should be provided on selected display walls

SOD lighting plans go beyond 2012 IECC standards	Use Control Category E in interior small meeting rooms	Use Control Category F in larger conference rooms
<ul style="list-style-type: none"> • Manual control of two lighting loads to allow reasonably uniform minimum 50% reduction in connected load. • Lighting in daylight zones controlled separately from general lighting, with stepped or continuous dimming to minimum 35% reduction. • Automated shut-off from time clock or building management control after hours. • Occupancy sensors not required. 	<ul style="list-style-type: none"> • Manual control of two lighting loads to allow reasonably uniform minimum 50% reduction in connected load. • Dual technology-zoned occupancy controls. • Automated shut-off from time clock or building management control after hours. 	<ul style="list-style-type: none"> • Manual control of two lighting loads to allow reasonably uniform minimum 50% reduction in connected load. • Dual technology-zoned occupancy controls. • Photosensors for 0-10 VDC electronic dimming in daylight zones to minimum 20%. • Automated shut-off from time clock or building management control after hours.

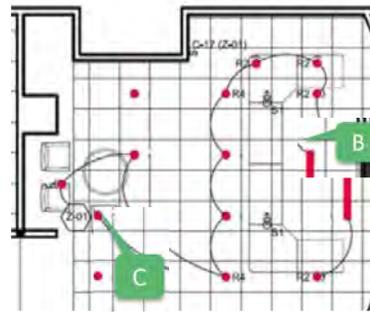
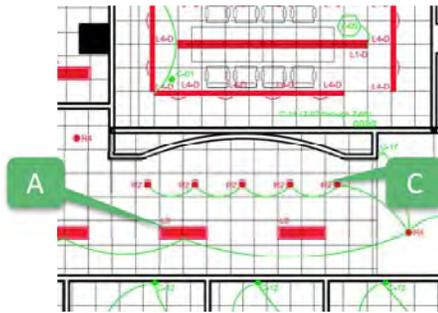
Products

Integrated digital control systems offer the most flexibility and can take advantage of new digital (LED) lighting and "network-ready" lighting products. More conventional lighting can be controlled with stand-alone sensors (with necessary control packs).

Examples include, but are not limited to, Sensor Switch CM-10, Wattstopper CI-305, Cooper VAC-P series, with low-voltage switch, Manufacturer's guidelines and literature should be checked before final specification of products.

Reception Areas and General Circulation

Lighting in general circulation areas should be comfortable and pleasing while avoiding excessively high illumination levels and glare. Lighting should also contribute to wayfinding.



- A. Recessed high-efficiency linear architectural troffers along cross corridors.
- B. Recessed high-efficiency architectural troffers over primary work surfaces.
- C. Recessed LED wall washers and down-lights at areas of interest and for general ambient lighting.

Meeting rooms have a target horizontal illuminance (average maintained fC) on the work surface of 45-55 fC for paper task performance. Vertical illuminance of 20-30 fC should be provided on the vertical surface.

SOD Lighting Plans go beyond 2012 IECC	Use Control Category G in circulation	Use Control Category K in Reception Areas
<ul style="list-style-type: none"> • Manual control of two lighting loads to allow reasonably uniform minimum 50% reduction in connected load. • Lighting in daylight zones controlled separately from general lighting, with stepped or continuous dimming to minimum 35% reduction. • Automated shut off from time clock or building management control after hours. • Occupancy sensors not required. 	<ul style="list-style-type: none"> • Manual control of two lighting loads to allow reasonably uniform minimum 50% reduction in connected load. • Dual Technology Zoned occupancy controls. • Automated shut off from time clock or building management control after hours. 	<ul style="list-style-type: none"> • Manual control of two lighting loads to allow reasonably uniform minimum 50% reduction in connected load. • Dual Technology Zoned occupancy controls. • Photosensors for 0-10 VDC electronic dimming in daylight zones to minimum 20%. • Automated shut off from time clock or building management control after hours.

Products

Integrated digital control systems offer the most flexibility and can take advantage of new digital (LED) lighting and 'network ready' lighting products. More conventional lighting can be controlled with stand-alone sensors (with necessary control packs).

Examples include, but are not limited, to Sensor Switch CM-10, Wattstopper CI-305 and Cooper VAC-P series (with low-voltage switch). Manufacturer's guidelines and literature should be checked before final specification of products.

Action Plan

Step 1: Make Sure Your Project is Eligible

- Contact your utility representative before purchasing the equipment.
- Equipment should be new and should be installed in a commercial office building within either Eversource or The United Illuminating Company service territory.
- Confirm space receiving new lighting exceeds 7,500 sf in total area.
- Confirm Open Plan Office component exceeds 40% of total tenant area.
- Confirm that Open Office Cubicle Partition heights are no higher than 48 inches.
- Confirm that installed LPD does not exceed program limits of 0.675 W/sf.
- Confirm that the number of control points meets program requirements of less than an average of 290 sf per control point.

Step 2: Submit a Completed Application Form

- Review the terms and conditions governing the program, then submit a completed application:
 - > Eversource customers,
contact Jordan Schellens, jordan.schellens@eversource.com
 - > The United Illuminating Company customers,
contact Glen Eigo, glen.eigo@uinet.com
- Once pre-approved, a "pre-approval incentive letter" will be issued.

Step 3: Request Post-Installation Verification

- Once pre-approved, purchase and install the qualifying equipment within six months of utility representative's pre-approval.
- If there is a change in equipment, submit updated application materials.
- At the post-installation verification, sign the post-installation customer acknowledgment section.



Enroll Today

The Sustainable Office Design (SOD) program offers building owners a predictable \$1/sf incentive for improving the performance and energy efficiency of their lighting systems. SOD also provides lighting designers with a way to give their clients improved savings by moving beyond simple prescriptive lamp and ballast approaches to system-based, integrated design solutions.

The simplified qualification and application process leverages documentation common to commercial tenant fit-out construction processes.

Program Requirements

All projects qualifying for this program must:

- Be a code-dependent office fit-out project or extensive/substantial renovation project that consists of the installation of new fixtures throughout the building or renovated spaces.
- Provide maintained lighting levels in accordance with the recommendations of the Illuminating Engineering Society of North America's (IESNA) 10th Edition Handbook or supporting Design Guides.
- Provide high-quality lighting achieving appropriate levels of glare control, color rendering, lighting uniformity and other lighting-quality parameters.
- Meet all requirements as specified in this application document.
- LED products should meet or exceed ENERGY STAR or Design Lights Consortium (DLC) technical requirements. Those that are not ENERGY STAR or DLC-rated should be discussed with your utility representative.
- Projects must meet current state and local code requirements.
- Only lighting designers who have obtained LC, CLEP or CLD certification, or who are current members of IALD, are eligible. The lighting designer must design, engineer or install and not benefit solely from the sale of the lighting.

Contact Us

Eversource Customers:

Jordan Schellens, jordan.schellens@eversource.com

UI Customers:

Glen Eigo, glen.eigo@uinet.com

Visit EnergizeCT.com to download your SOD application.

Development of the SOD Lighting Program has been supported by the work of Waypoint Building Group and Weller & Michal Architects.

Frequently Asked Questions

- 1. How is the rebate calculated?** Qualifying projects receive an incentive of \$1/sf of controlled and conditioned interior spaces. 100% of the incentive will be paid after project occupancy.
- 2. What are the basic project qualifications?** The project must be at least 7,500 sf. At least one lighting control point must be provided, on average, for every 290 sf of space. The project must achieve a LPD of not greater than 0.675 W/SF.
- 3. When calculating the 7,500 SF threshold, can this include connecting corridors and common areas if they are included in a lighting upgrade?** The SOD lighting incentive applies only to individual tenant spaces. Common areas, building lobbies and corridors between discrete tenants cannot be used as part of the qualifying square footage, nor is that square footage eligible for the SOD incentive.
- 4. How is the minimum square footage verified?** It is verified by examination of a signed COMcheck report.
- 5. Does qualifying for SOD incentives make me eligible for other lighting incentives?** Projects that are eligible for this incentive program are not eligible for other prescriptive lighting incentives that support ballasts, occupancy sensors, photocells and time clocks.
- 6. Are exterior lighting projects eligible for this program?** No, exterior lighting systems are not eligible for this program. Qualifying projects must be in controlled and conditioned interior spaces. Please contact your utility representative for other program opportunities for exterior lighting and HVAC.
- 7. Are LED lighting technologies eligible for this program?** Yes, as long as the LED fixtures meet or exceed ENERGY STAR or DLC technical requirements and are installed in conjunction with the program's qualifications. Other LED products should be discussed with your utility representative before use.
- 8. Where can I find a list of approved products?** There is no requirement that specific products be used. A list of recommended products can be found at the program webpage. Please note: Eversource and The United Illuminating Company do not endorse any particular manufacturers and encourages our customers to meet with different representatives to determine which system best meets their needs. Manufacturer guidelines and literature should be consulted before choosing a product.

