

## **MAKING THE CASE FOR DAYLIGHTING**

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The occupant of a modern building has become increasingly isolated from the outside world. As occupants, we are isolated from the daylight, weather, time of day and the moods of the season. In our glass boxes built to celebrate transparency, we must draw the drapes or close the blinds on the glare of the sun in order to work.

Electric lighting consumes 40-50% of the total energy required to operate a public building. It's a very big target in terms of reduction of energy. As electric bills continue to rise and more hydrocarbons are pumped into the air, one wonders if there isn't a better way to build a building.

By utilizing the "free" light of the sun to illuminate the building, electric energy is saved. It can also make the building more comfortable, functional and delightful. Recent studies have correlated daylighting in schools with increased test scores. Anecdotal evidence links daylighting and reduced absenteeism in commercial offices. At least one study suggests higher sales in daylit aisles of retail stores.

Daylighting is a desirable building amenity, but it has to be more thoughtfully applied than just putting windows or skylights in buildings. It is using the building to collect, control and distribute the light. An efficient window is very good at transmitting visible light. In fact, it's easy to have 8,000 footcandles at the edge of a building on a sunny day. If that is the approach, it becomes an incredibly uncomfortable glare source.

The object of a good daylit building is to take the sunlight that falls on the building, control the glare through effective shading, project the light to the interior, and distribute the light in usable quantities as far into the building as possible. A good daylit building also shades the vision glass to preserve the connection to the outdoors, provide time of day cues and a sense of visual delight. These are all wonderful goals, but how do we achieve them as a design team?



## **Luma's Contribution to the Design Team:**

As lighting designers, we often design luminaires. In lighting terms, a "luminaire" is the combination of a light source, or "lamp", with a delivery system, or "fixture". In daylighting, the light source is the sun and the "fixture" is the building. The combination of the sun and the building form the "luminaire". As daylighting consultants, we collaborate with the architect and other design consultants to make the building as efficient, effective and delightful as possible.

Luma works with the architect to incorporate daylighting into the design of the building. We analyze the sun angles at the site for shading requirements, both for personal comfort and to avoid excessive heat gain caused by direct sun penetration. Then we coordinate that work with the electric lighting system to provide a seamless set of controls to supplement the daylight and "take over" the lighting as daylight fades. As a design team, we are all involved in a holistic process of integrating all of the lighting and building systems into the design rather than adding those systems on.

Daylighting is a good first step towards a sustainable design goal. In our work on the daylit terminal buildings at Portland International Airport, the Pendleton Air National Guard facility, West Salem High School, Pacific Lutheran University and Northgate Library we integrate daylighting into the daily lives of many people.

At Luma we find our daylighting work to be a very rewarding part of our practice.