

daylighting lessons 2002.



Joel Loveland
BetterBricks Daylighting Director
Territory: Idaho, Montana, Oregon and Washington

joel@lightingdesignlab.com
LDL extension 32

The Lighting Design Lab's Betterbricks Daylighting Lab has had a fantastic run of luck over the last 3 years. We have had the opportunity to watch and work with some of the most innovative architects in the Pacific Northwest. They have brought great daylighting work into the Lab, and we've had the opportunity to work with them to test and fine-tune their ideas. Winter 2003 marks the first time when, after 3 years we have a significant number of buildings that have been completed that illustrate the good work of these design teams.

It's on this basis that we are setting out to document this work and publish a series of articles entitled, Daylighting Lessons Learned. We have sketched a preview of several of these architectural ideas. I will offer a class this winter in your region on Lessons Learned 2003. An expanded article is available on our website.

• **You don't need to trade LESS - building area for BETTER - performance.**

A well daylight illuminated building can be built for the capital budget allocations, typical of common construction, and these buildings can save 40-60% on their overall electric lighting operations costs with daylighting controls. A typical daylight illuminated (high performance) office, classroom, or gymnasium in this context will be saving 60-80% of lighting operations expenses.

• **Don't over glaze for daylighting.**
The typical window to wall area in most commercial buildings is commonly limited to 25-30% of the wall area through the value engineering process. The daylighting work being completed this last autumn indicates that the window area doesn't need to exceed this range, or 10-20% of floor area. The most critical caveat to those rules-of-thumb is to be concerned about the orientation of the window to the path of the sun.

• **Let the building and its windows tell the story of the daylight/sunlight.**

South-facing windows, within 15° of due South, are often best because the sun moves on a daily basis more horizontally, and therefore can be more easily protected from glare and over-

heating by an exterior overhang.

West-facing windows, can provide excellent daylighting when shaded as we would recommend you shade a south window. This is particularly true in K-12 schools that are occupied more in the morning than the afternoon.

North-facing windows, can be a great daylight asset in Cascadia, but when further East, the climate is colder and most probably clearer. Here North windows mean greatly increased heat loss, but conversely, an exceptionally dark North clear-sky, requiring greater amounts of glazing.

East-facing windows, generally East windows are not of great daylighting value in most commercial or institutional buildings because of glare, and are difficulty to control overheating from the sun, . (for a more, see "Loveland - Common Myths of Daylighting Design" @Betterbricks.com)

• **Refine the Window's design.**

The window **MUST** be shaded with fixed architectural elements, whether they are exterior overhangs, interior lightshelves, vegetation etc. The period for this shading must be carefully timed to balance sun time and position with clock time and the space's hours of use.

• **Match the daylight where people need it most AND where they spend the most time.**

Daylight the most critical visual task areas such as offices, classrooms, or gyms. NOT directly into the circulation spaces. A well daylight illuminated office or school concentrates well balanced and controlled daylight from the North and South.



Left: Back to the Future 1952, Wilson School, first daylights the classrooms and secondly borrows the light to illuminate the corridors. A good daylighting design matches the daylight to the students' critical learning environments.