Green Effects: Daylighting

LEED V4 Indoor Environmental Quality: Daylight

LEED NC 2.2 – EA 1.0

Daylighting shading systems work through redirecting the natural light to reduce the usage of artificial lighting and thereby reduce the energy used both for powering electric lights and energy used cooling the heat generate by the electric lights.

However, using the daylight to accomplish this requires dynamic control over the solar energy entering the building for two reasons, the total solar energy transmitted to a typical window can exceed 1,300 watts per square meter and direct unfiltered sunlight is too bright for typical office interiors. The illuminance or intensity of the incident light is measured in lux. Illuminance levels required for office work lie between 250 and 1,000 lux, with 500 lux being the generally preferred amount. Direct sunlight can produce illuminance levels of over 100,000 lux, far exceeding a comfortable amount.

A common strategy for harvesting this daylight is to redirect the light into areas where illuminance levels are supported with artificial light. For example, a passive or active light shelf can be both installed internally and/or externally along the upper portion of the glazing to catch and bounce the incident sun rays and direct them father into the space. Using a shelf with a high reflective or albedo value allows the light to be directed further into the space. Further enhancing this daylight harvesting can be achieved through ceiling systems, which also utilize a high albedo rating thereby assisting in moving the daylight further into the space. The common misconception is that these systems create more light and illuminance, however, these systems simply move the large light levels produced from the sun into areas not normally given exposure to the sun.

Using dynamic daylighting solutions such as light shelves, daylight enhancing louvered blinds and Techstyle® Acoustical Ceilings from Hunter Douglas can assist in reducing artificial lighting by up to 50% depending on the space and location of the building.