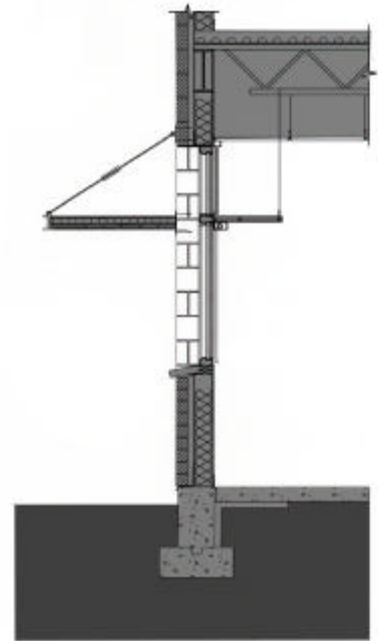


Refining the Window:

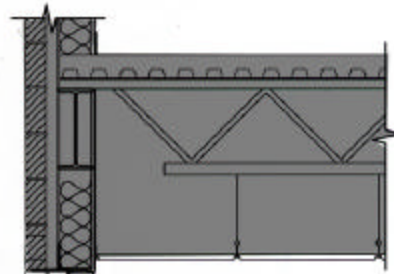
Controlling Direct Sun and Providing
Even, Diffuse Daylight From the
Perimeter on the South (...and Maybe
West) Elevation



Daylight Window



View Window



← The “Daylight” window’s primary function is to provide a maximum amount of daylight deep into the space from the perimeter. Typically the daylight provided to the interior will be approximately 2 times the head height of the window. We recommend using High Performance Glass in this window- glass which provides high visible light transmission (Tvis 70%+) and low solar heat gain coefficient (SHGC 38% or less).

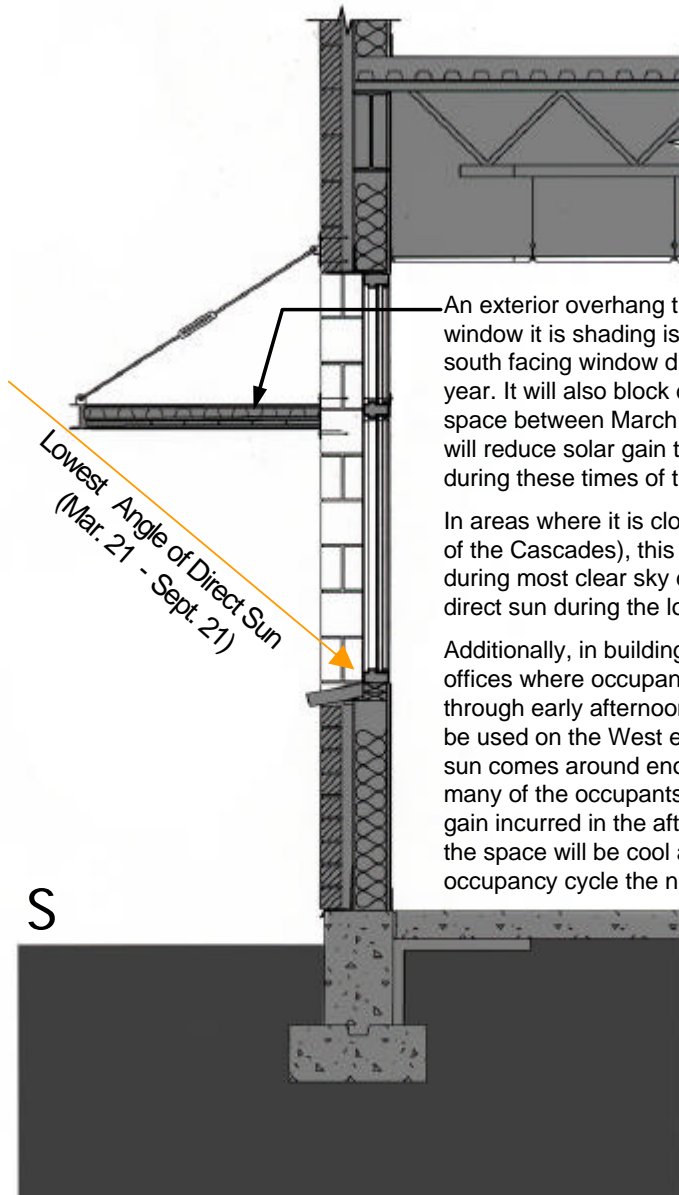
← The “View” window’s primary function is to provide a comfortable view to the exterior. This gives the occupants of the space the ability to relax their eye muscles by allowing for deep visual focus. It also gives people a connection to the outdoor environment. The glazing in the view window is often tinted to about 50% visible light transmission. This reduces the contrast ratio between the interior surfaces of the space and the brighter exterior view. This will help to avoid glare conditions in the room.

S



Differentiate the Window into its Component Parts: The *Daylight Window* and the *View Window*

Overhang Shading View Glazing



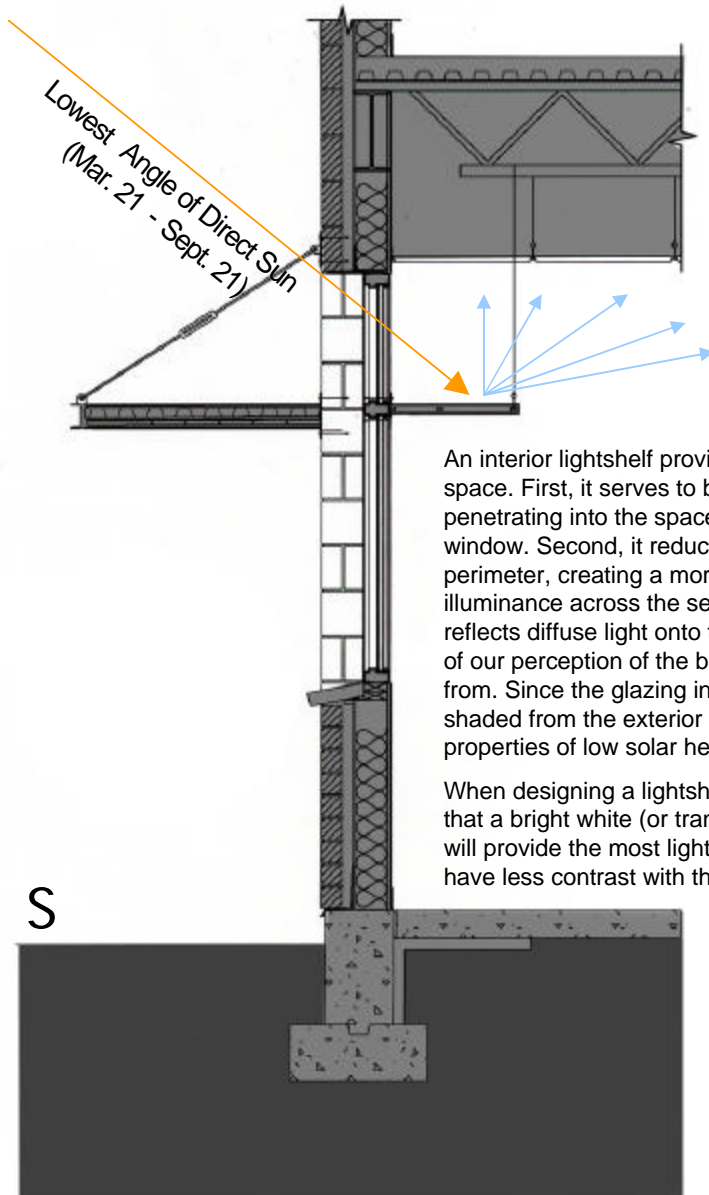
An exterior overhang that is about as deep as the window it is shading is high (1:1 Ratio) will shade a south facing window during the hottest times of the year. It will also block direct sun from entering the space between March 21st and September 21st. This will reduce solar gain through the glazing significantly during these times of the year.

In areas where it is cloudy much of the year (i.e. west of the Cascades), this strategy will provide sun control during most clear sky days. Overcast skies diffuse direct sun during the low sun angle days of winter.

Additionally, in building types such as schools and offices where occupancy times are limited to mornings through early afternoons (until 3PM), this strategy can be used on the West elevation as well. By the time the sun comes around enough to begin entering the space, many of the occupants will have left the space. Heat gain incurred in the afternoon can be night-flushed and the space will be cool at the beginning of the occupancy cycle the next morning.



Shade the View Window to Block Direct Sun, Eliminate Glare, and Reduce Solar Gain.



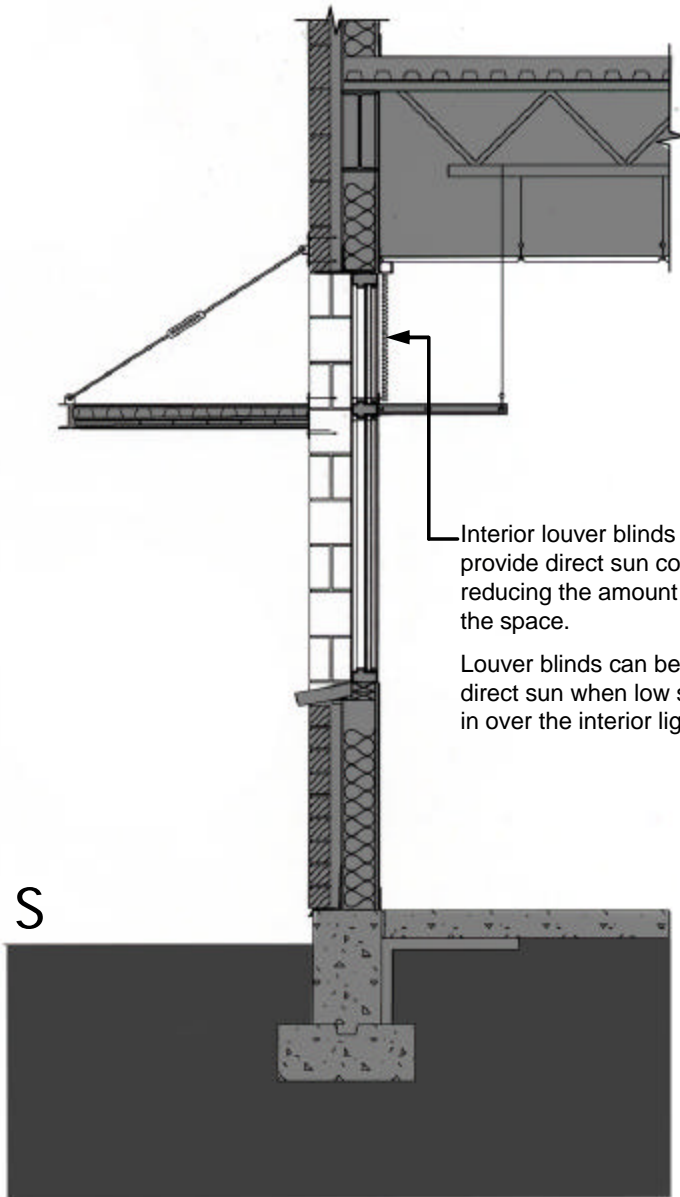
An interior lightshelf provides three major benefits to a space. First, it serves to block direct sun from penetrating into the space through the upper “daylight” window. Second, it reduces light levels at the perimeter, creating a more evenly distributed illuminance across the section of a room. Third, it reflects diffuse light onto the ceiling plane, where much of our perception of the brightness of a space comes from. Since the glazing in the “daylight” window is not shaded from the exterior it is crucial that the glass have properties of low solar heat gain coefficient (SHGC).

When designing a lightshelf, it is important to consider that a bright white (or translucent) matte finish surface will provide the most light diffusing quality, and will have less contrast with the light source it is obscuring.

Interior Lightshelf



Use an Interior Lightshelf to Provide Diffuse Daylight and Block Direct Glare

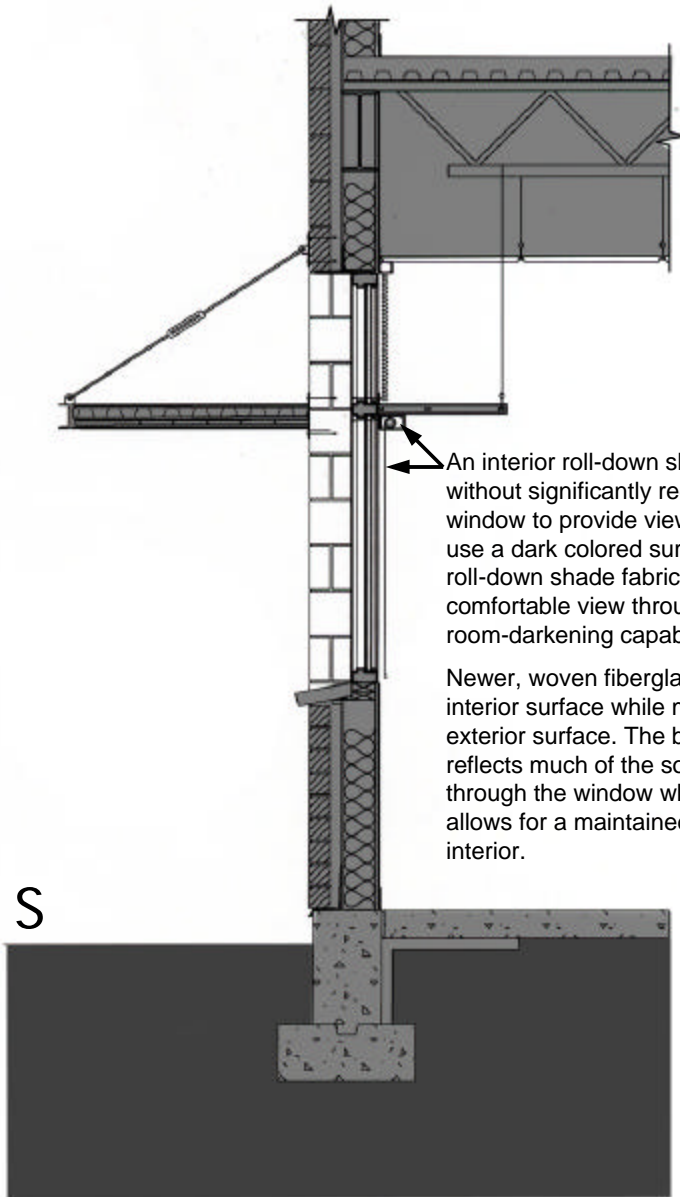


Interior louver blinds in the "Daylight" window can provide direct sun control without significantly reducing the amount of diffuse daylight entering the space.

Louver blinds can be adjusted seasonally to block direct sun when low sun angles threaten to come in over the interior lightshelf.

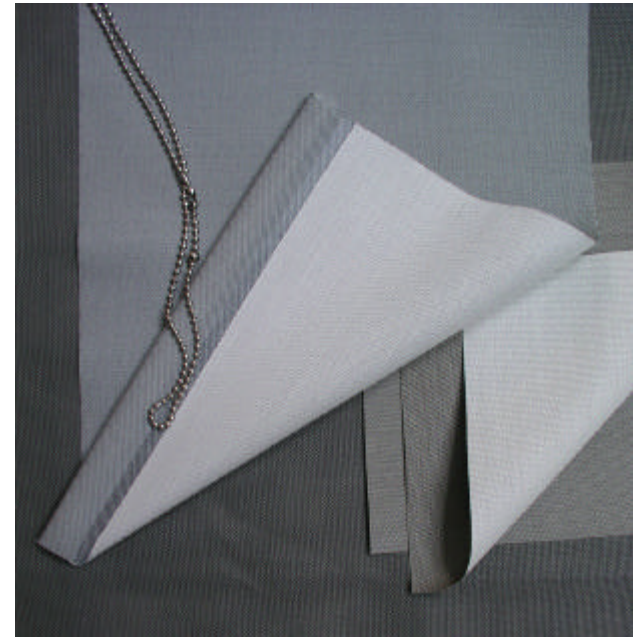


Provide Adjustable Louver Blinds at the Upper "Daylight" Window

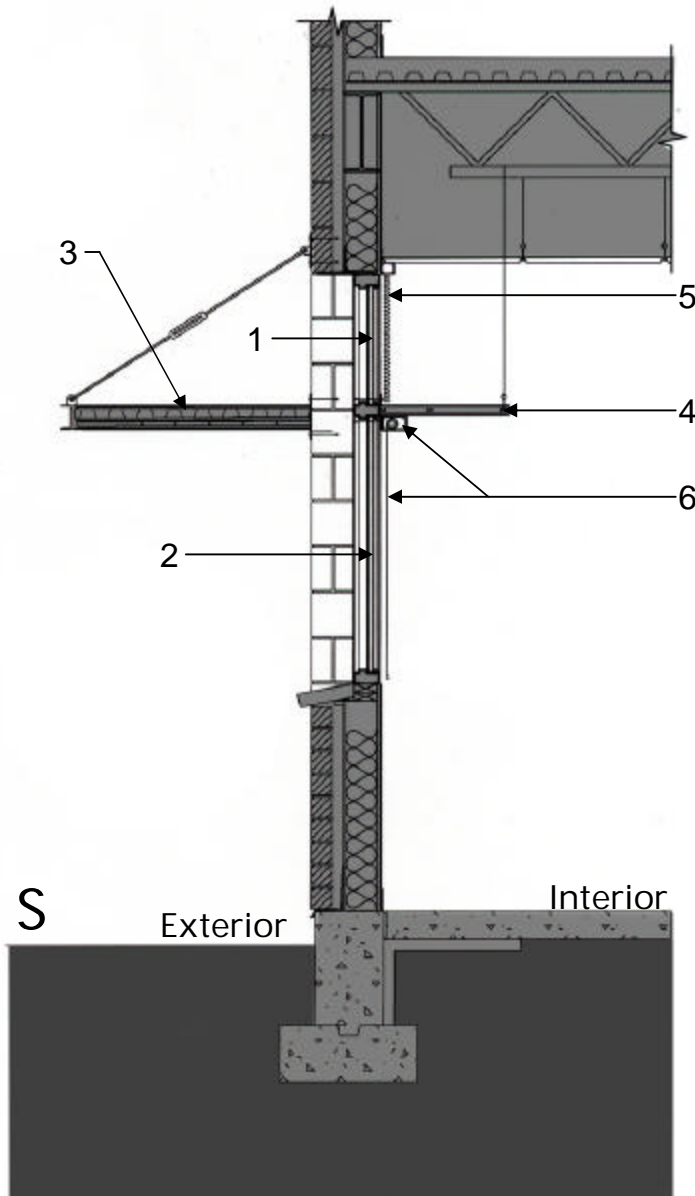


An interior roll-down shade can control direct sun without significantly reducing the ability of the window to provide views to the exterior. Always use a dark colored surface on the interior of the roll-down shade fabric. This allows for a comfortable view through the fabric, and provides room-darkening capabilities.

Newer, woven fiberglass fabrics, provide a dark interior surface while maintaining a light colored exterior surface. The bright exterior surface reflects much of the solar heat gain back out through the window while the dark interior surface allows for a maintained view corridor from the interior.



Use a Roll-Down Shade to Control Direct Sun in the "View" Window



Common Material Selections

1. **Daylight Window:** High performance glazing- High visible light transmittance (T_{vis} of 70% or greater), low solar heat gain coefficient (SHGC of 38% or less).
2. **View Window:** Standard glazing section- Tinted to 50% Visible Light Transmittance (T_{vis}) often Low E to reduce heat loss.
3. **Exterior Overhang:** Can be almost any material depending on the architectural vocabulary of the building, common choices include Panel Systems, Metal Grate, Tempered Translucent Glass, Polycarbonates, etc.
4. **Interior Lightshelf:** Often made of painted plywood, gypsum board, MDF, perforated metal, translucent glass, etc. It is crucial that the top surface be matte finish white. A light colored bottom surface will help decrease contrast between the lightshelf and the window.
5. **Louver Blind:** Horizontal adjustable louver blinds are very common. They range between very inexpensive standard aluminum louvers, to highly engineered specialty louver systems.
6. **Roll-Down Fabric Shade:** Aluminum roller housings for the roll-down shades are standard from several manufacturers. The fabric can be dark colored vinyl, or woven fiberglass fabric- which offers more flexibility with surface color differentiation, and creates less V.O.C's off-gassing than vinyl.

North windows need to be clear (high visible light transmittance), due to the fact that north sky, especially on clear sky days provides much less light than the south sky. Ideally, north windows will be larger than south windows for this reason. Heat-loss is a major issue on the north side, so this often controls the size of glazing allowable in this orientation. We always recommend low-e glass for north facing applications.

In most climate zones, for typical occupancy times, direct sun is not a critical concern- making sun control devices (excepting louver blinds) unnecessary.

Provide High Visible Light Transmittant Low-E Glass at North Facing Windows

