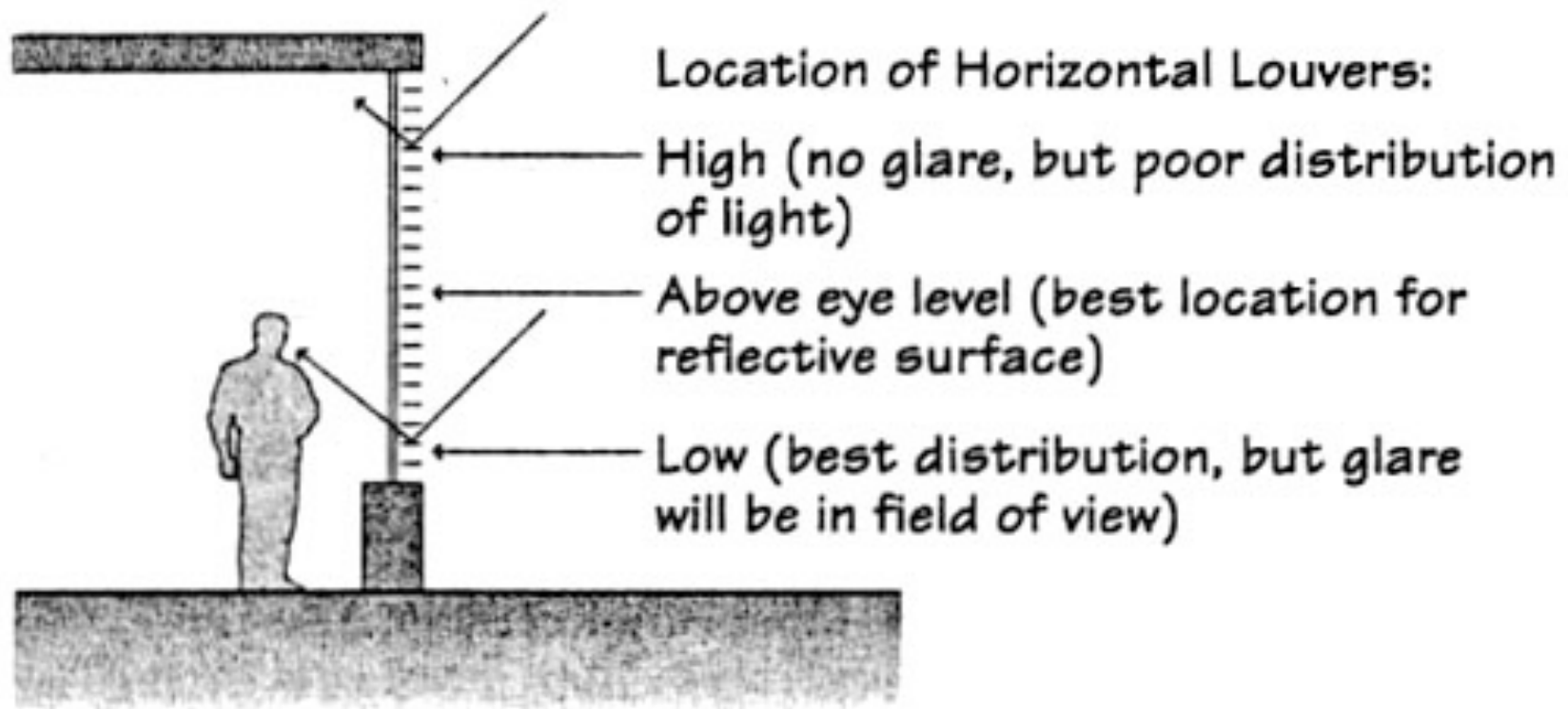


Sun Light Redirecting Devices

- Similar geometric logic as shading devices
- Oriented to receive max illumination and redirect light to needed interior area
- Limited effectiveness in overcast condition
- High reflective/specular surfaces
- Glare in viewing angles can be a problem

Sun Light Redirecting Devices



Sun Light Redirecting Devices

light shelves

- Horizontal shading and redirecting devices
- Improve uniform light distribution
 - Reduce level of illumination by window and redirecting it into the interior
 - 2 apertures clerestory and lower viewing
- Most effective to be located as low in space as possible - but avoid glare- good ht. around 7' align with other headers

Sun Light Redirecting Devices

light shelves con't

- Min depth of light shelf is determined by shading requirements
- Prevent glare- do not let direct light from upper window to penetrate past edge of light shelf
- Uniformity of light distribution can be improved by extending depth of shelf

Sun Light Redirecting Devices

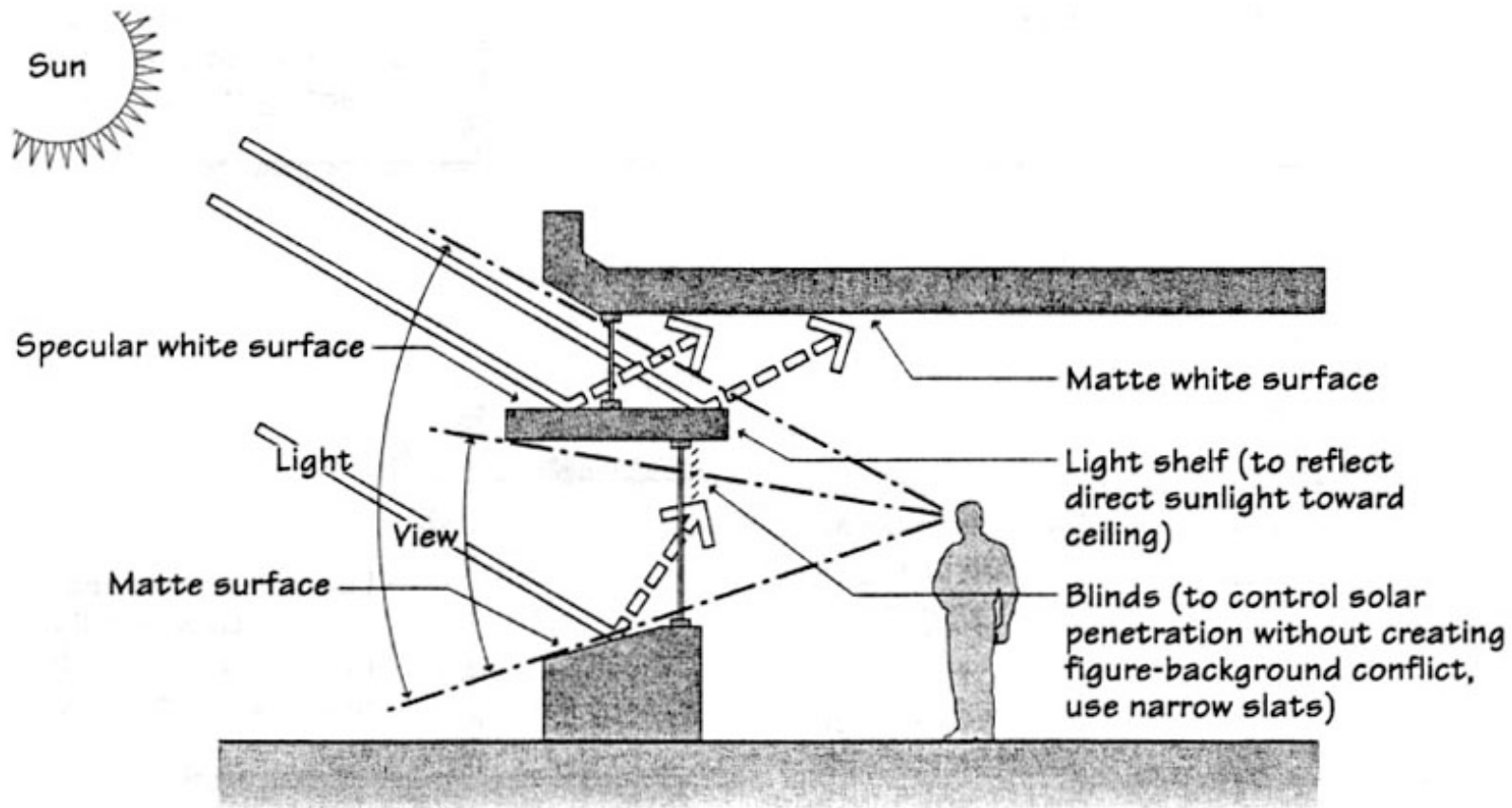
light shelves- con't

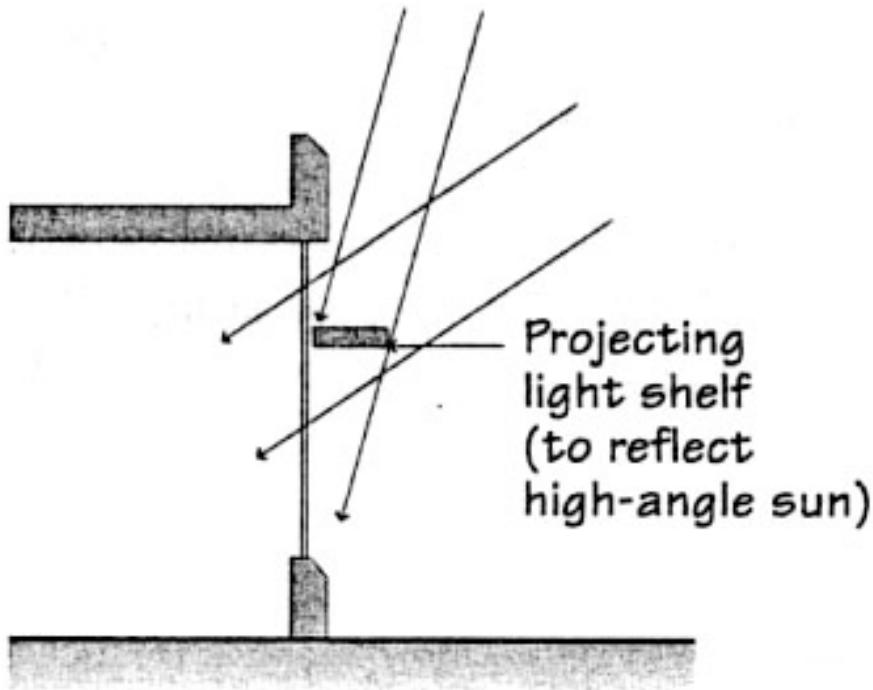
Basic Elements:

- Light shelf should be as fully illuminated as possible when light is desired
- High sun angles - horizontal shelf projects openings in façade-shading opening below shelf

Sun Light Redirecting Devices

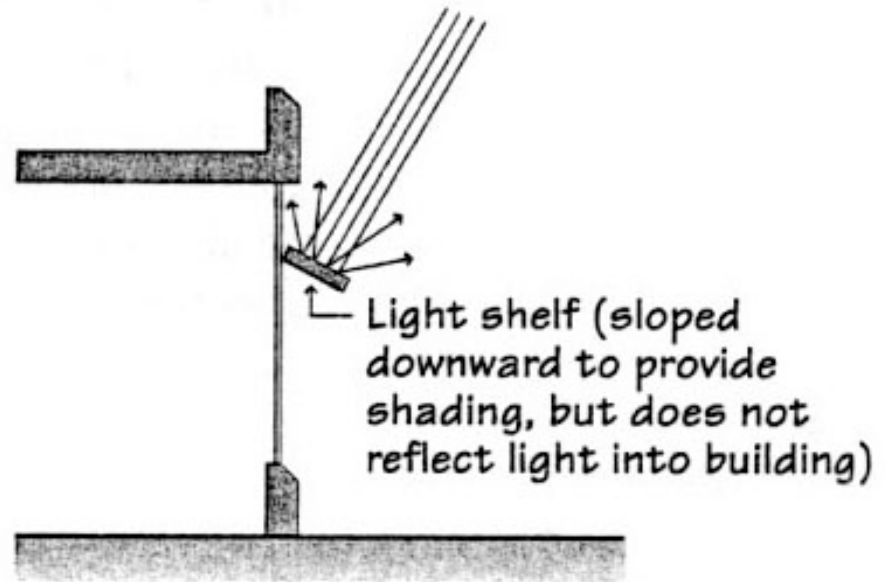
light shelves

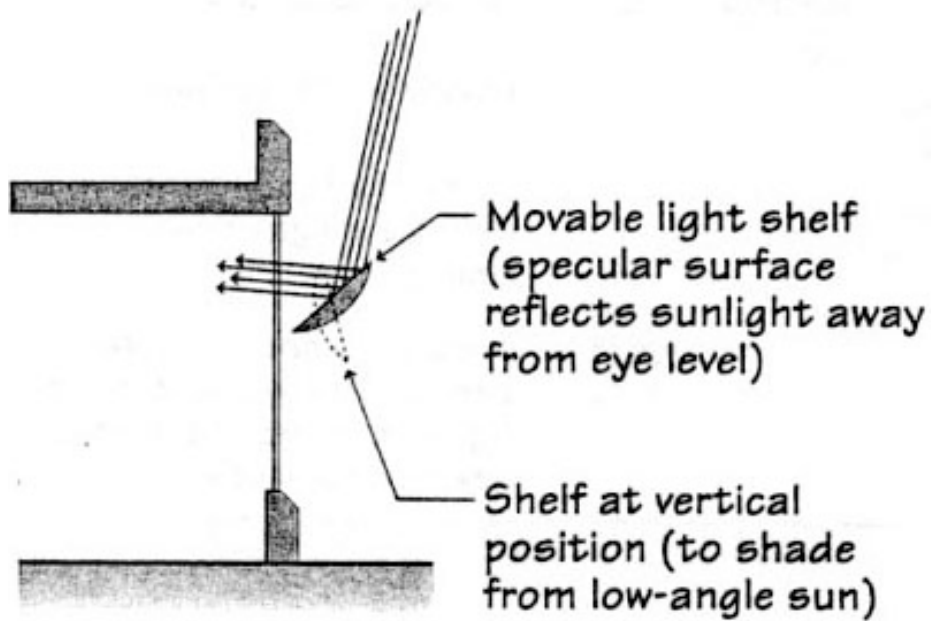




Typical- level
Know floating shelf concept

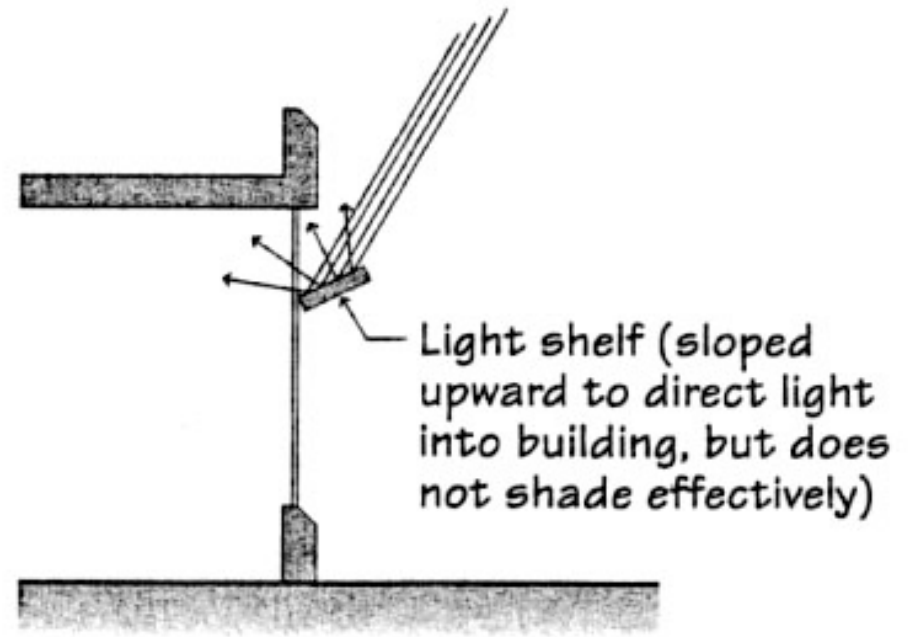
Sloping downward-
assists shading
Diminishes light
distribution





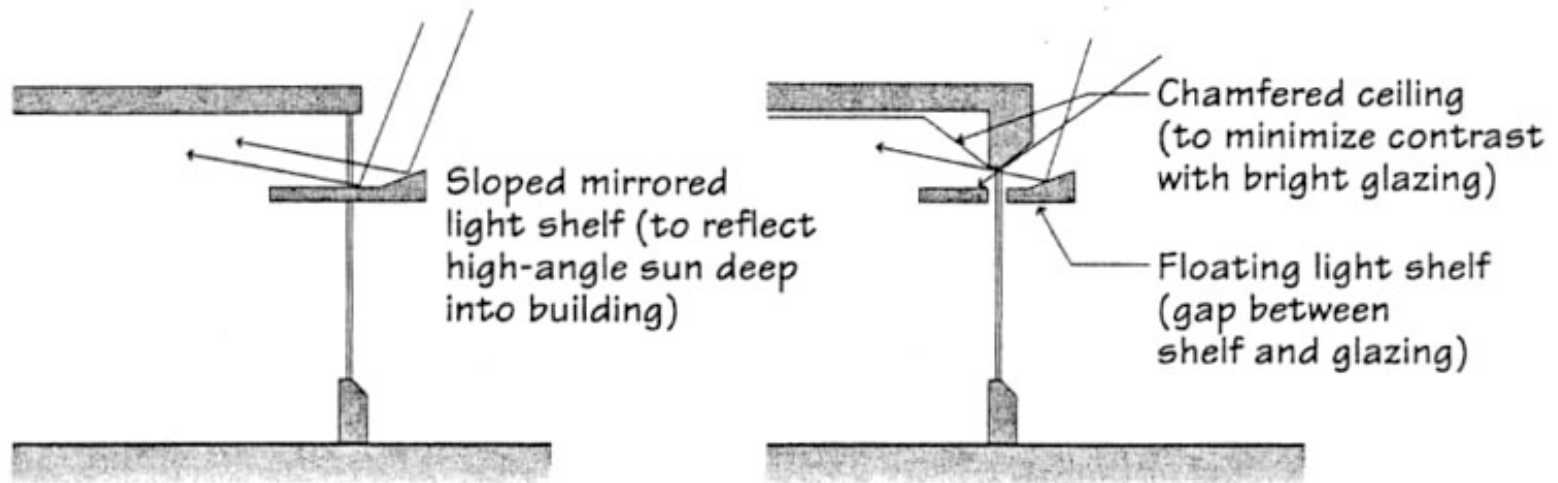
Inward sloping-

- Pushes high angle sunlight deeply into space
- Can have glare problem



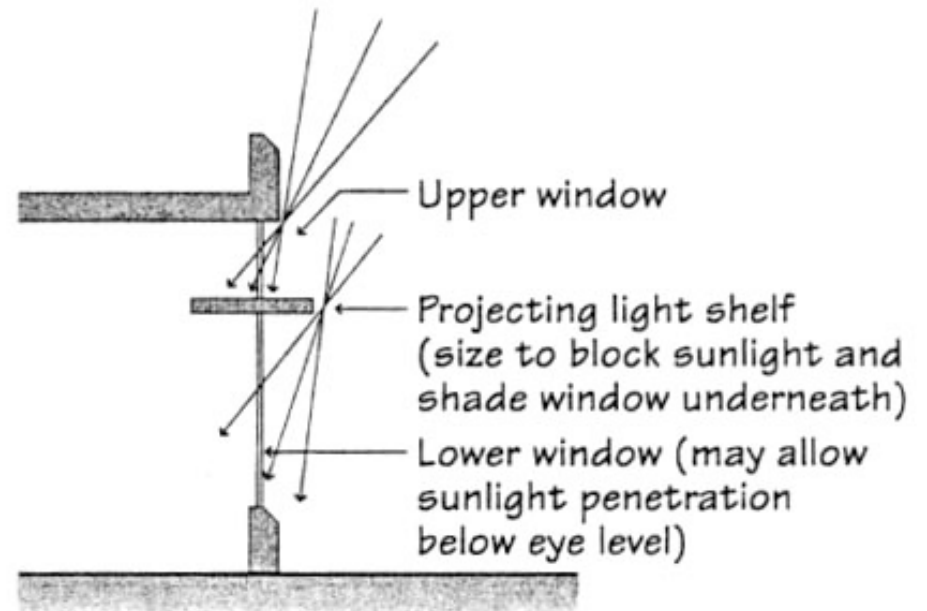
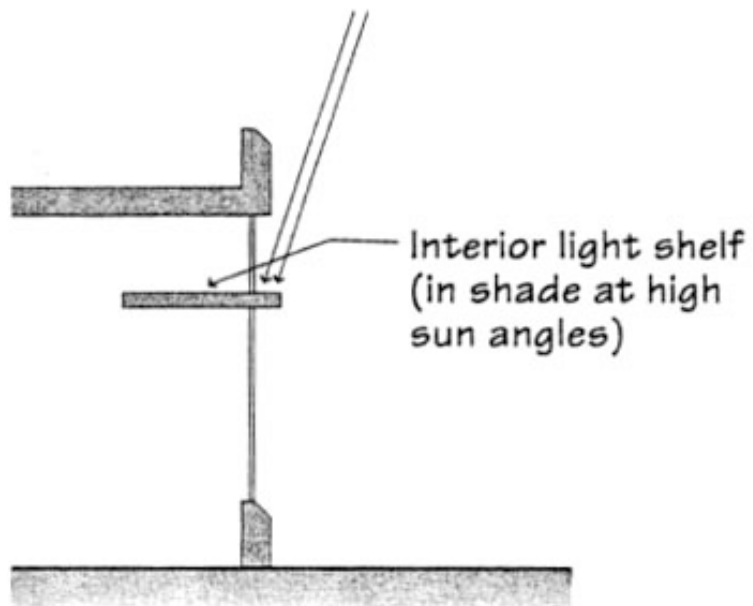
Interior Surfaces

- Sloping ceiling downward at window reduces contrast
- Can shape exterior surface to maximize illumination and reflection
- Large shelves and shelves w/o viewing windows can have shadowed area beneath shelf creating undesired contrast
- Alleviated with a floating shelf



Light Shelves

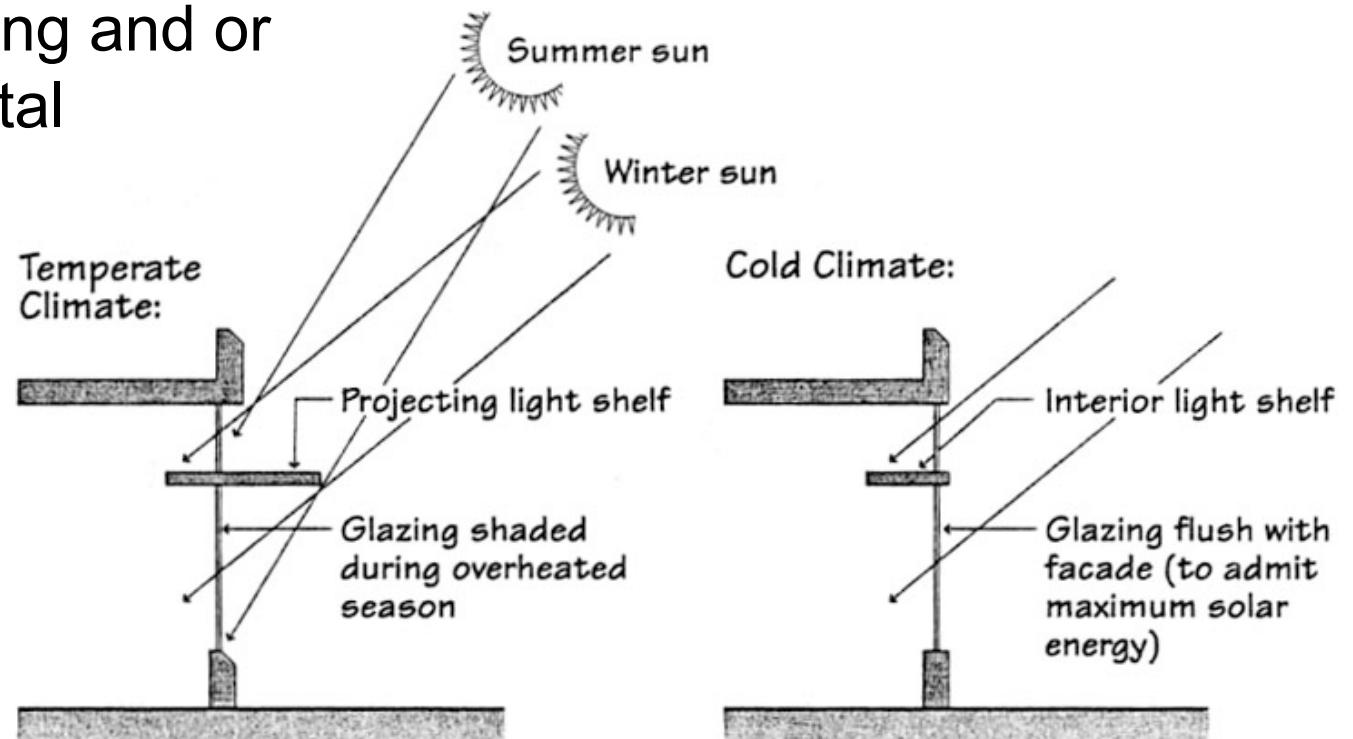
Interior Surfaces- con't



Orientation

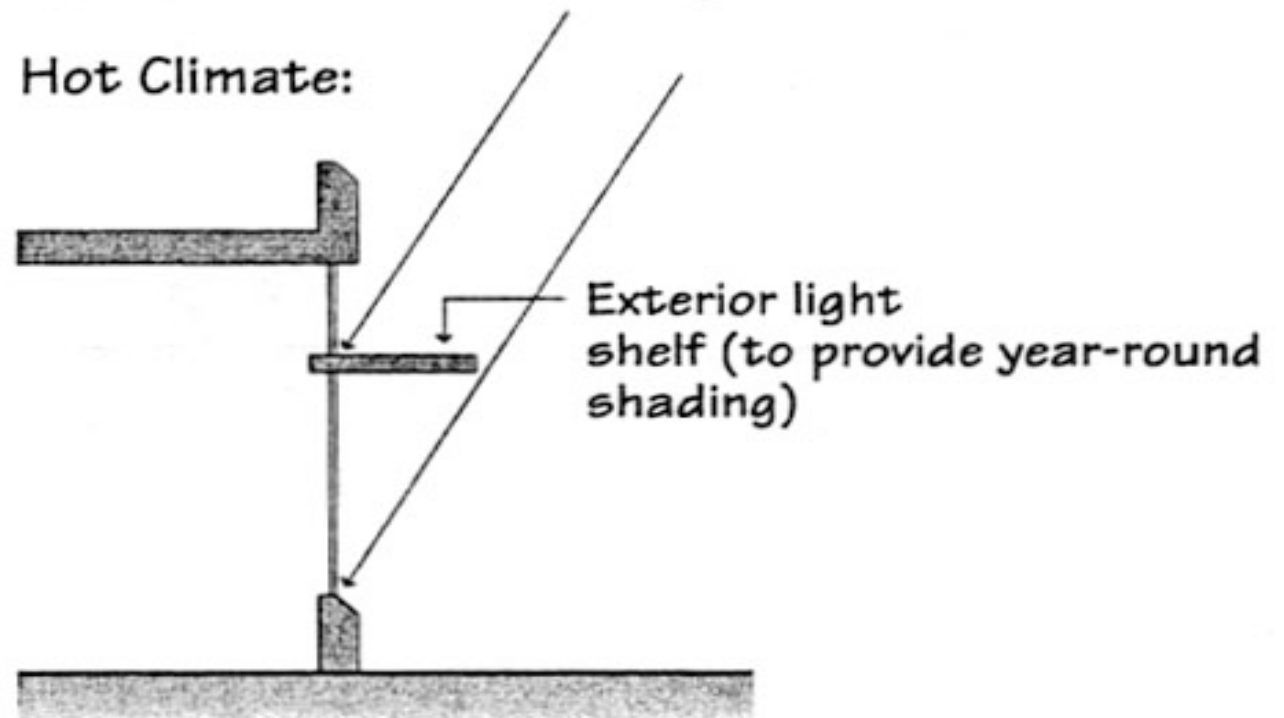
- Light shelves most effective, in various climates, on South side

- Effective shading on E&W sides consider augmenting with vertical shading and or additional horizontal louvers(operable)



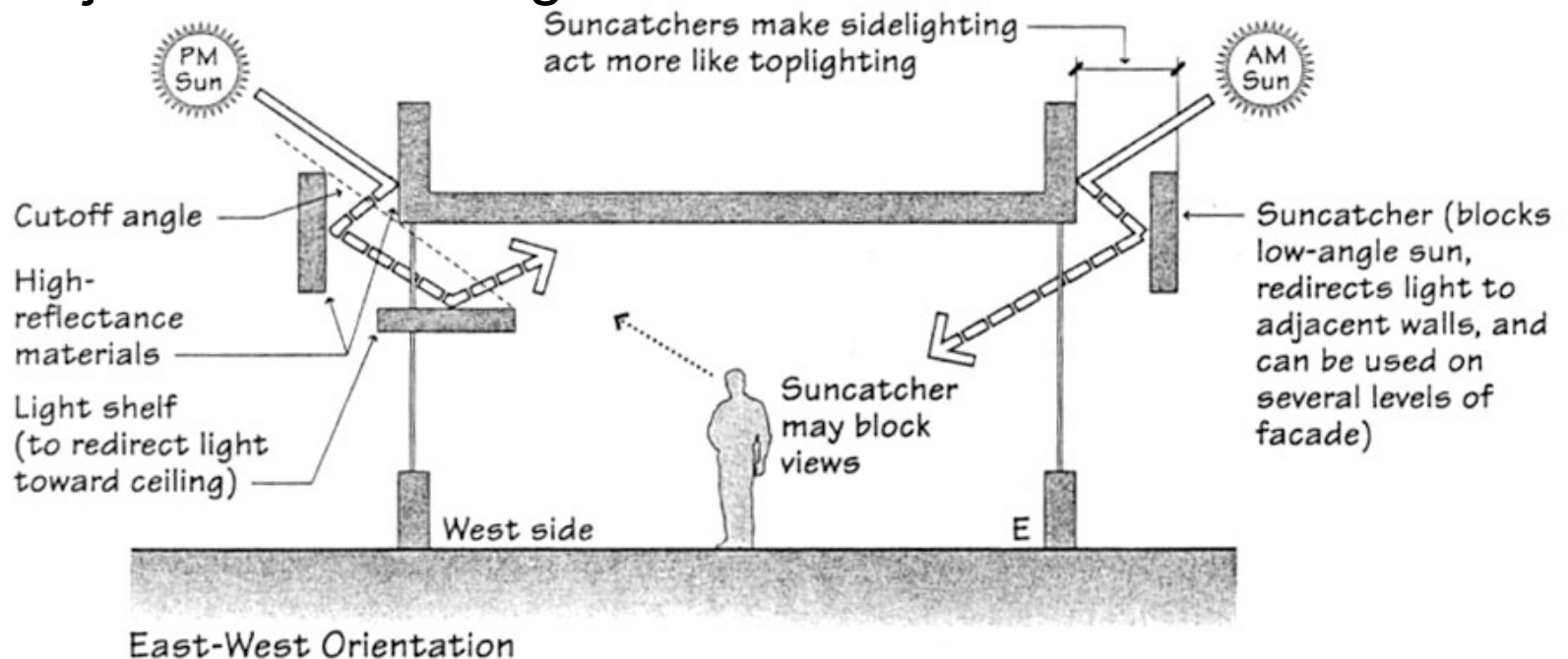
Orientation

South side light shelf all year protection



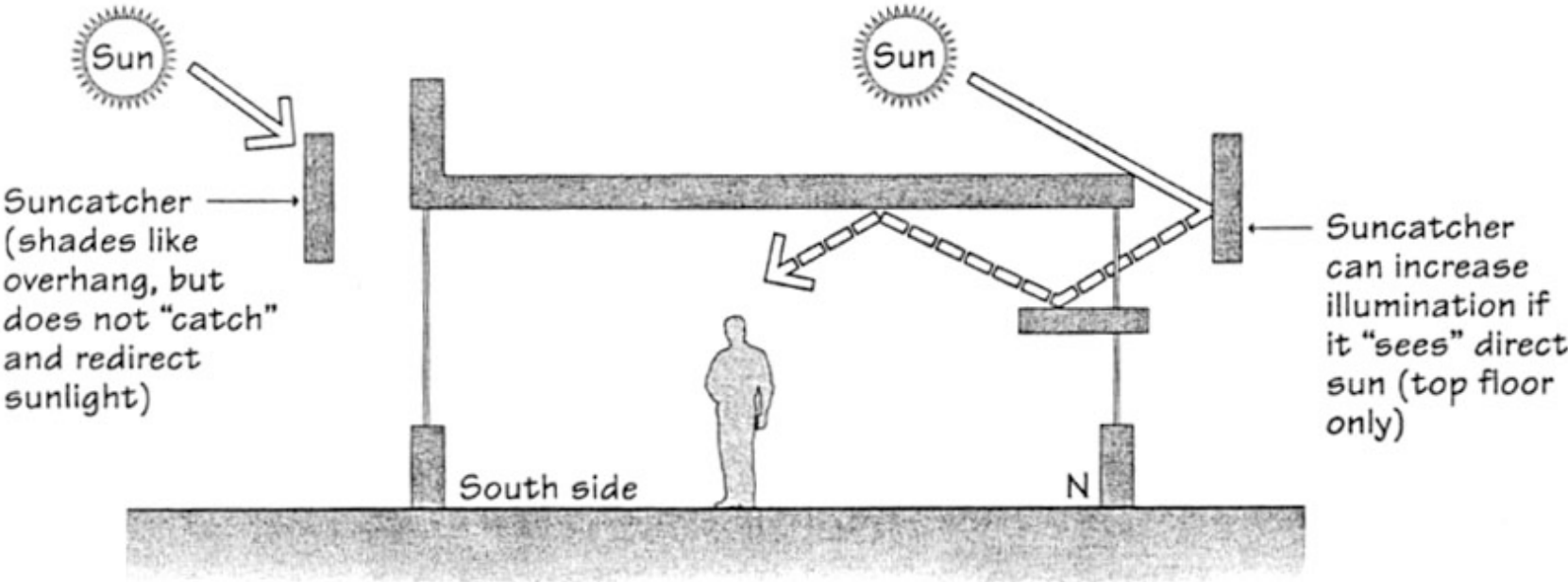
Suncatchers

- Vertical redirecting devices on building façade
- Best for capturing low sun angles
- Can capture and direct light into North side of building
- Can create glare- direct light toward walls, ceiling and or use in conjunction with a light shelf



Suncatchers

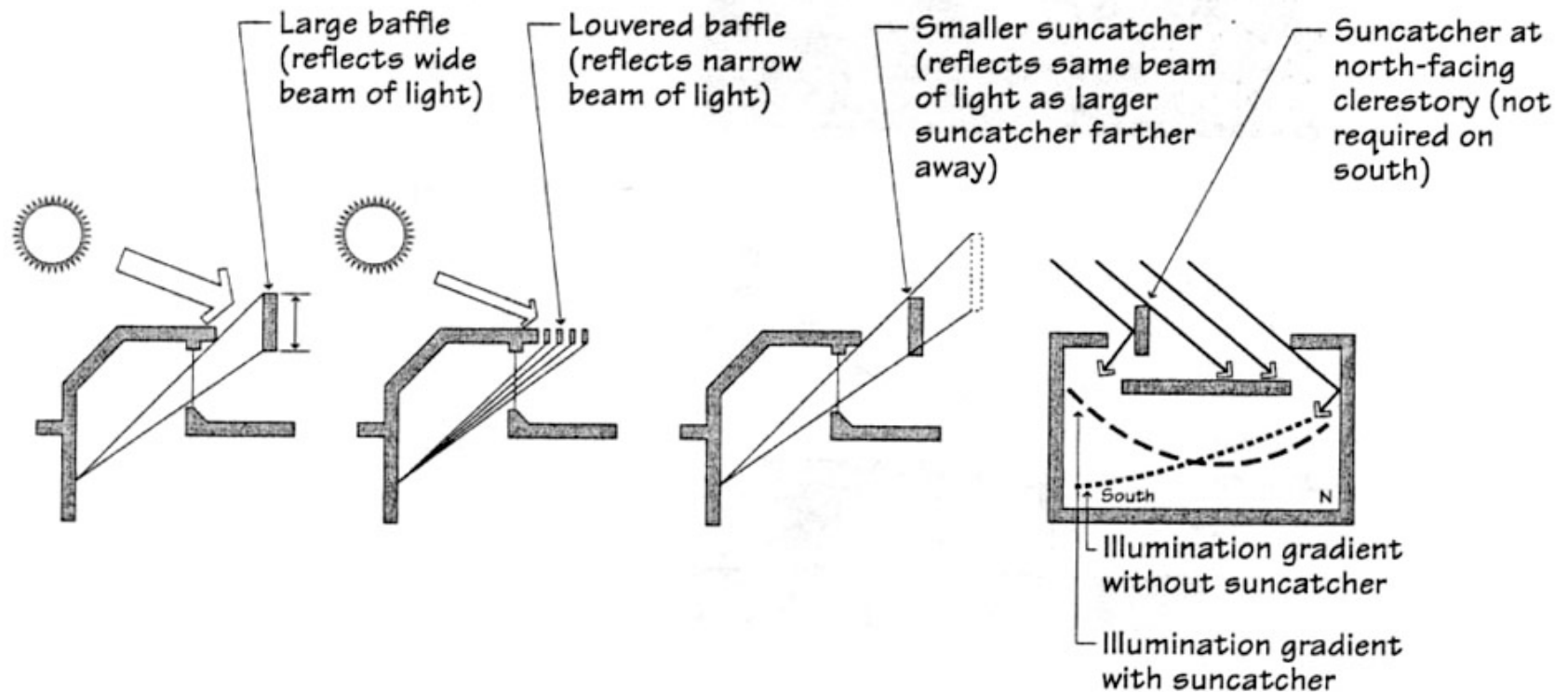
Con't



North-South Orientation

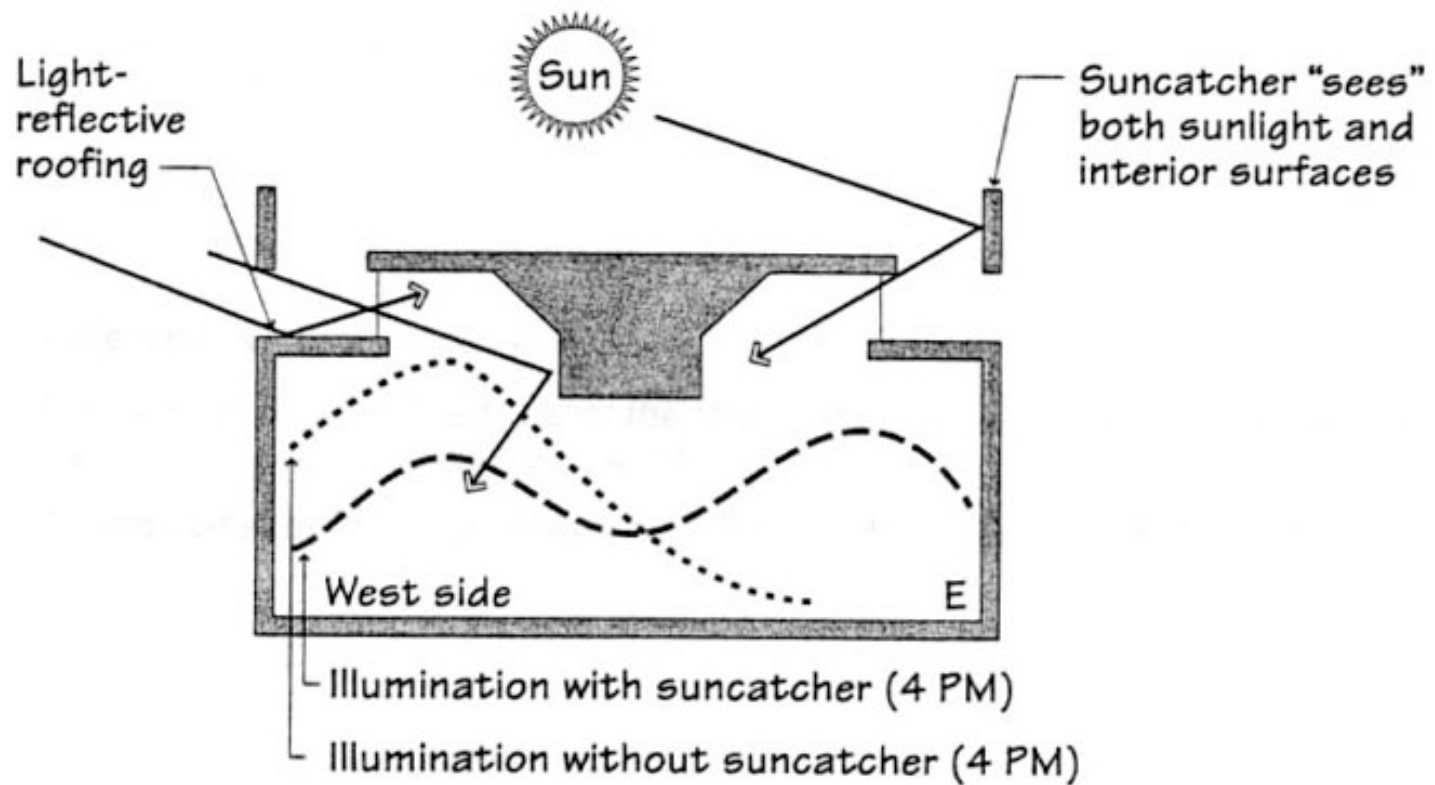
Suncatchers- Clerestory applications

- Can improve light through clerestory glazing (except south facing openings)
- On North they can be utilized to improve balance of light and increase the quantity - especially useful in conjunction with South facing openings

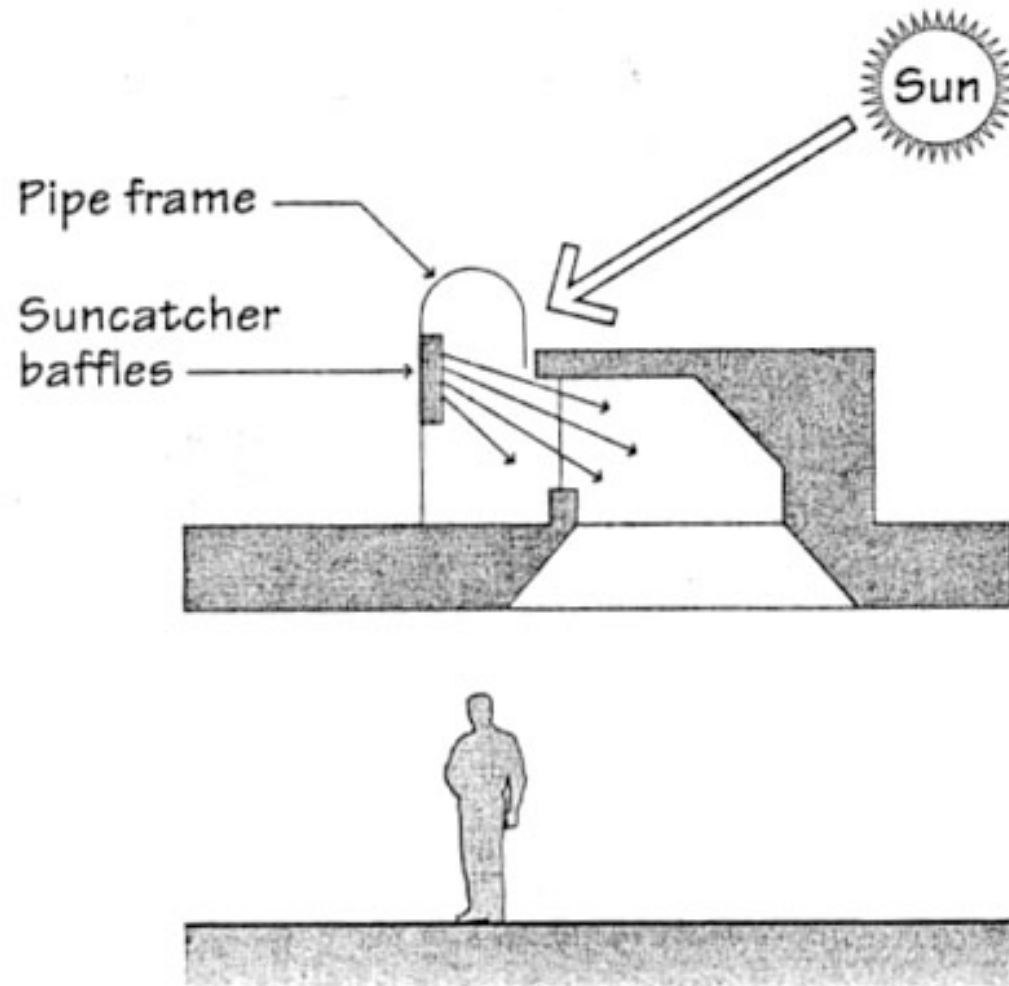


Suncatchers- Clerestory applications- con't

- E&W openings even out quantity of light over the day
- Provides balance of light over day if space is lit through E&W facades

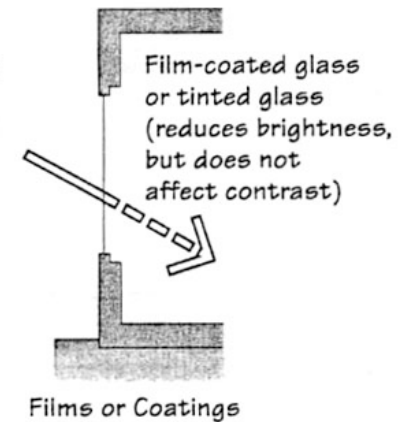
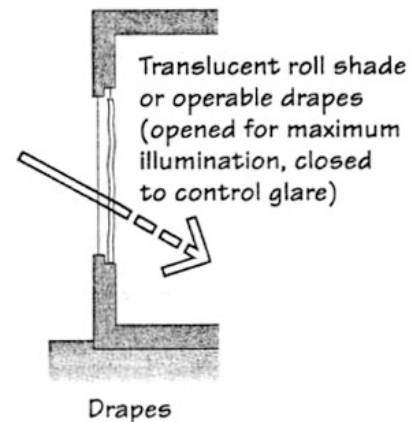
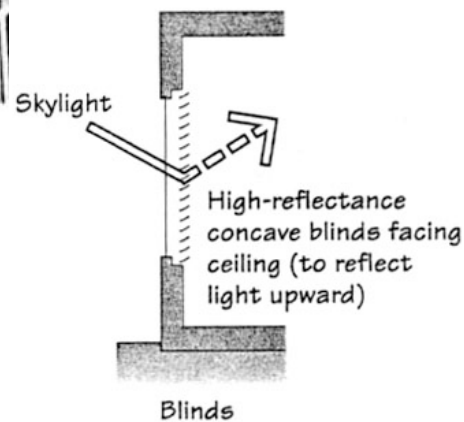


Suncatchers- Clerestory applications- con't



Shutters, Blinds, Screens

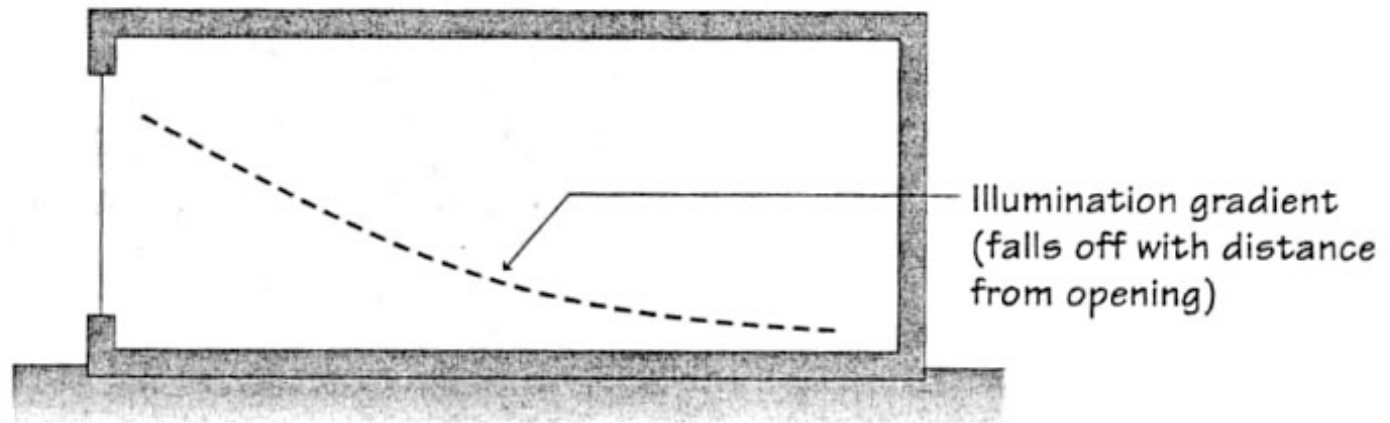
- Use of operable devices behind fixed screening elements
- For the most part- do not redirect light only diffuse or reject light
- Entering light should receive maximum redistribution



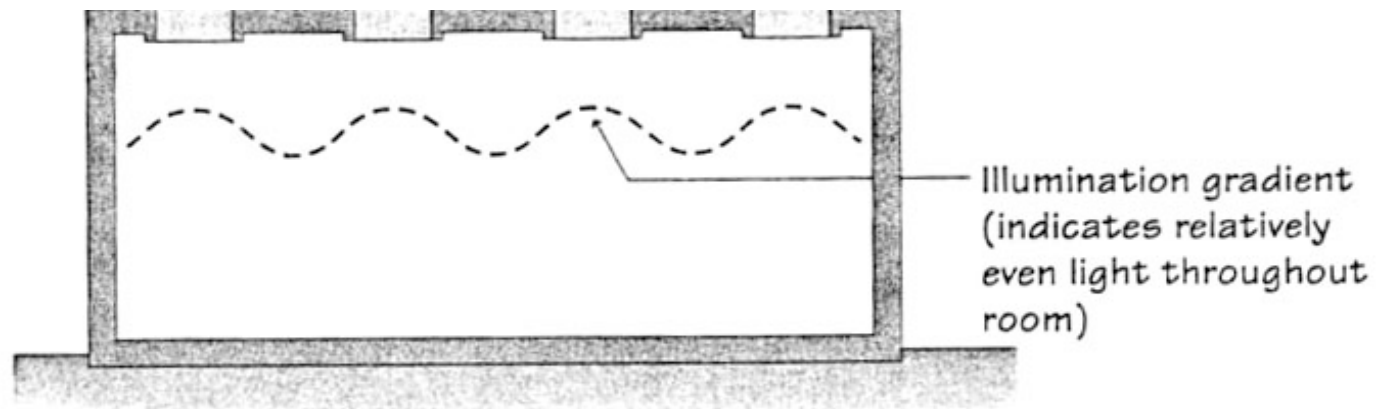
Toplighting- Basics

- Skylights and Clerestories
- Differs form sidelighting
 - Not typically for viewing - see interior lighted surfaces
 - Provides more light per unit of opening than sidelt'g
 - Largely Independent of building orientation
 - Provides deep penetration into Single story / top story
 - Be careful of glare, unwanted contrasts, heat loss and overheating

Toplighting



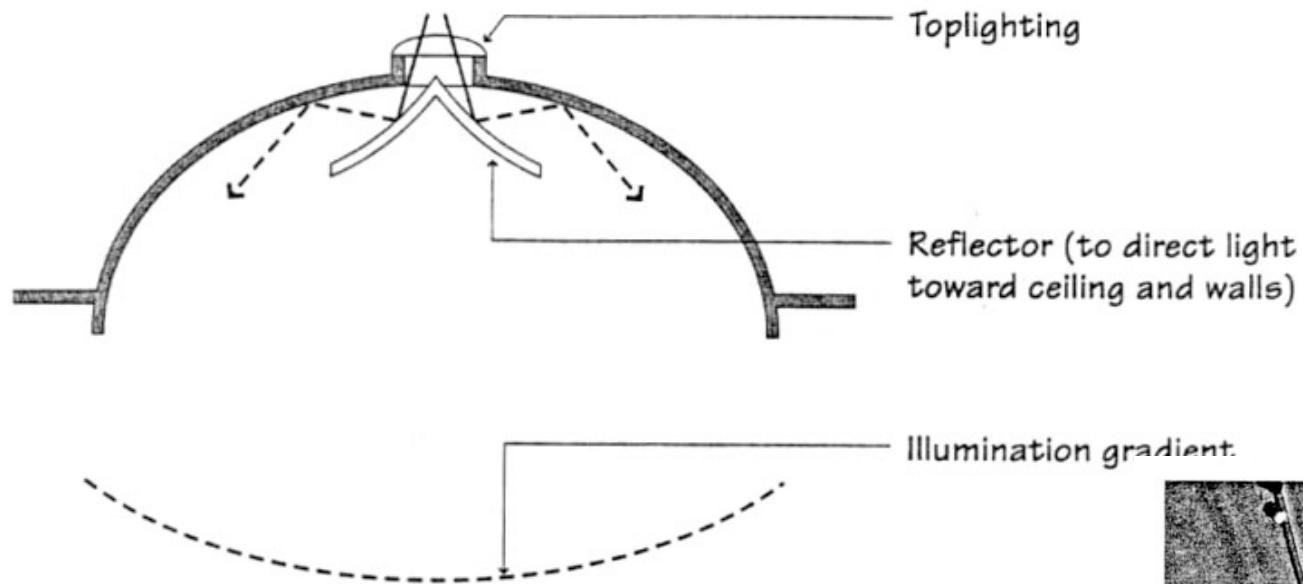
Sidelighting



Toplighting

Toplighting - Shape

- Surface reflectances and shape of surfaces critical
- Best used indirectly

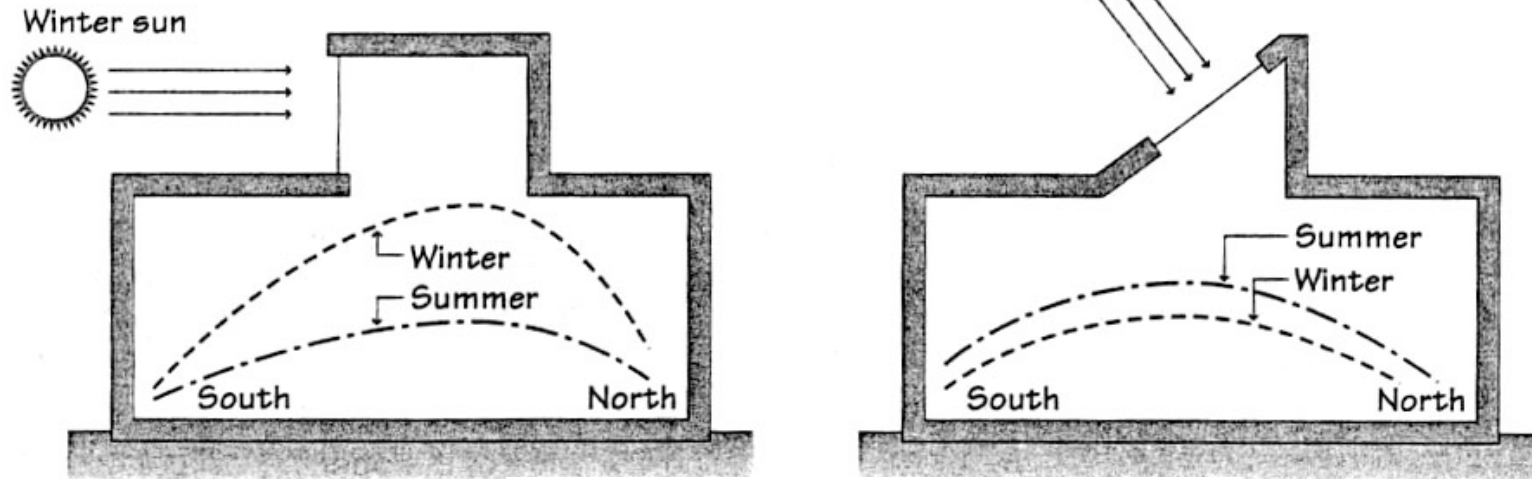


Tilt- captures seasonal opportunities

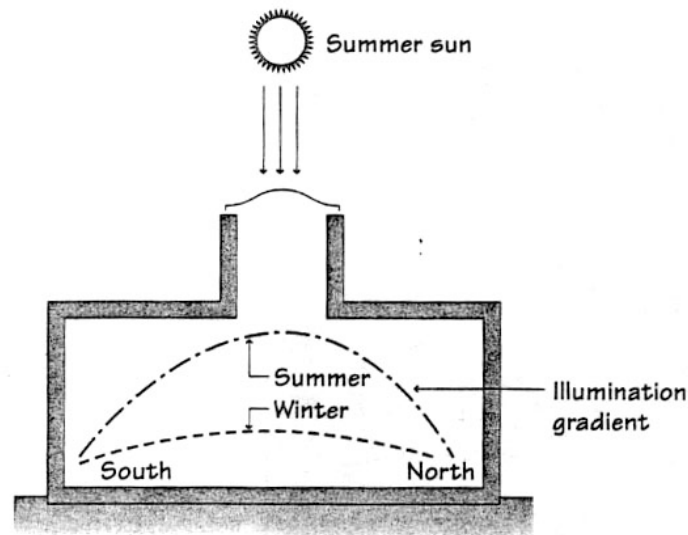
Interior / exterior shading

Horizontal Best for over cast conditions

Vertical best for daylight-direct beam radiation

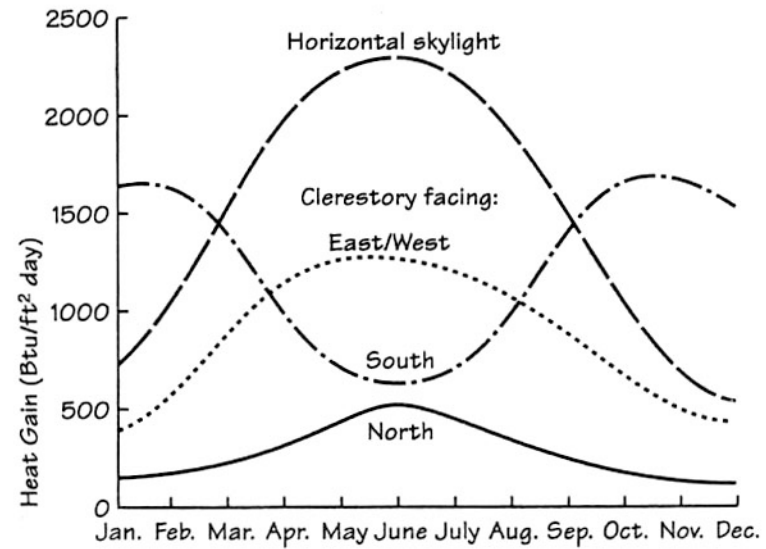
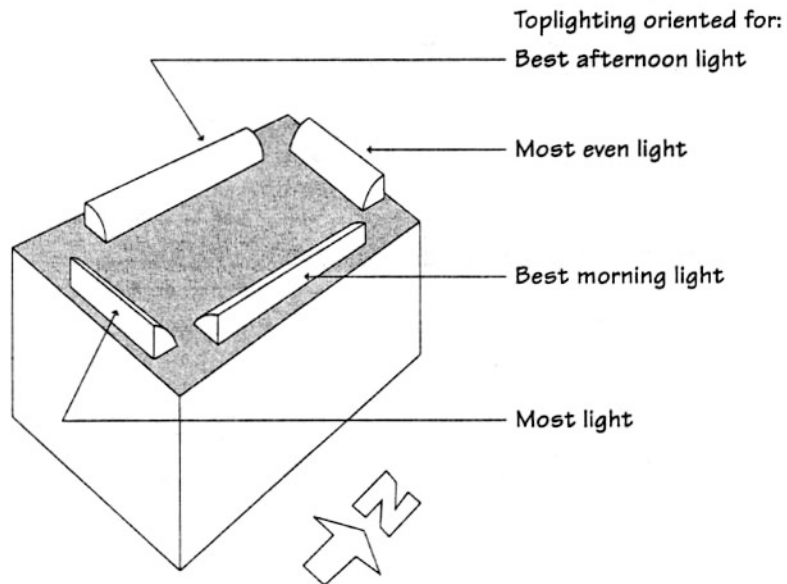


Vertical



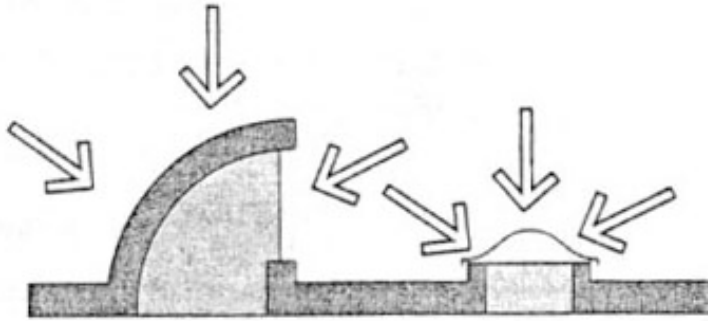
Horizontal

Bearing Angles Diurnal opportunities

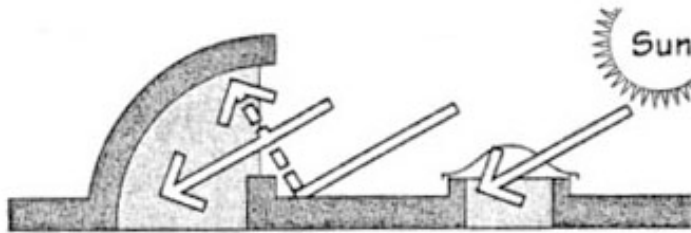


Response to Natural light

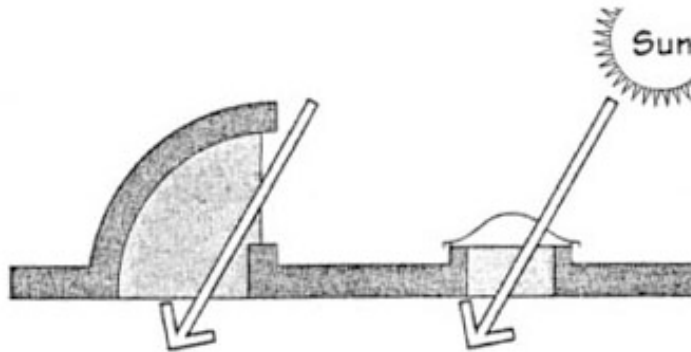
See toplighting guidelines in Handout



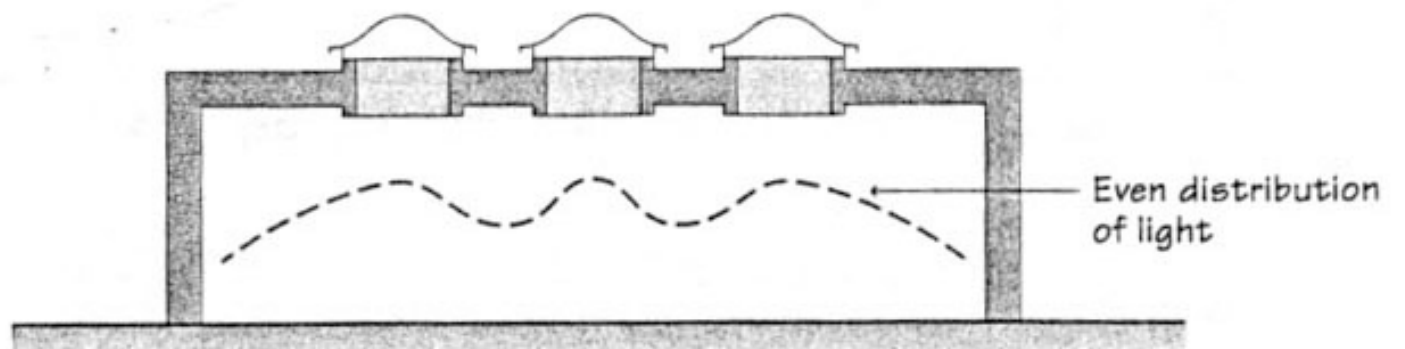
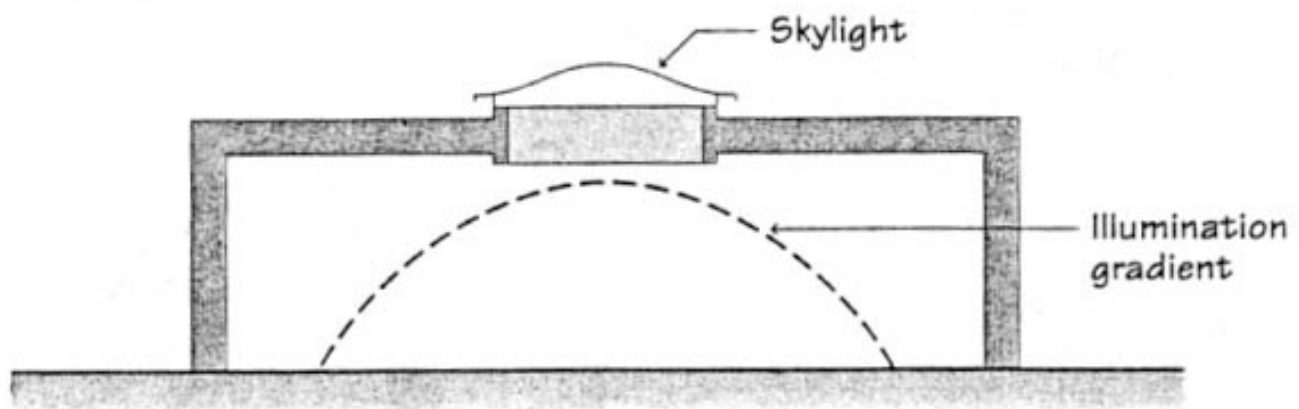
Overcast Sky:
Horizontal skylights
collect more light

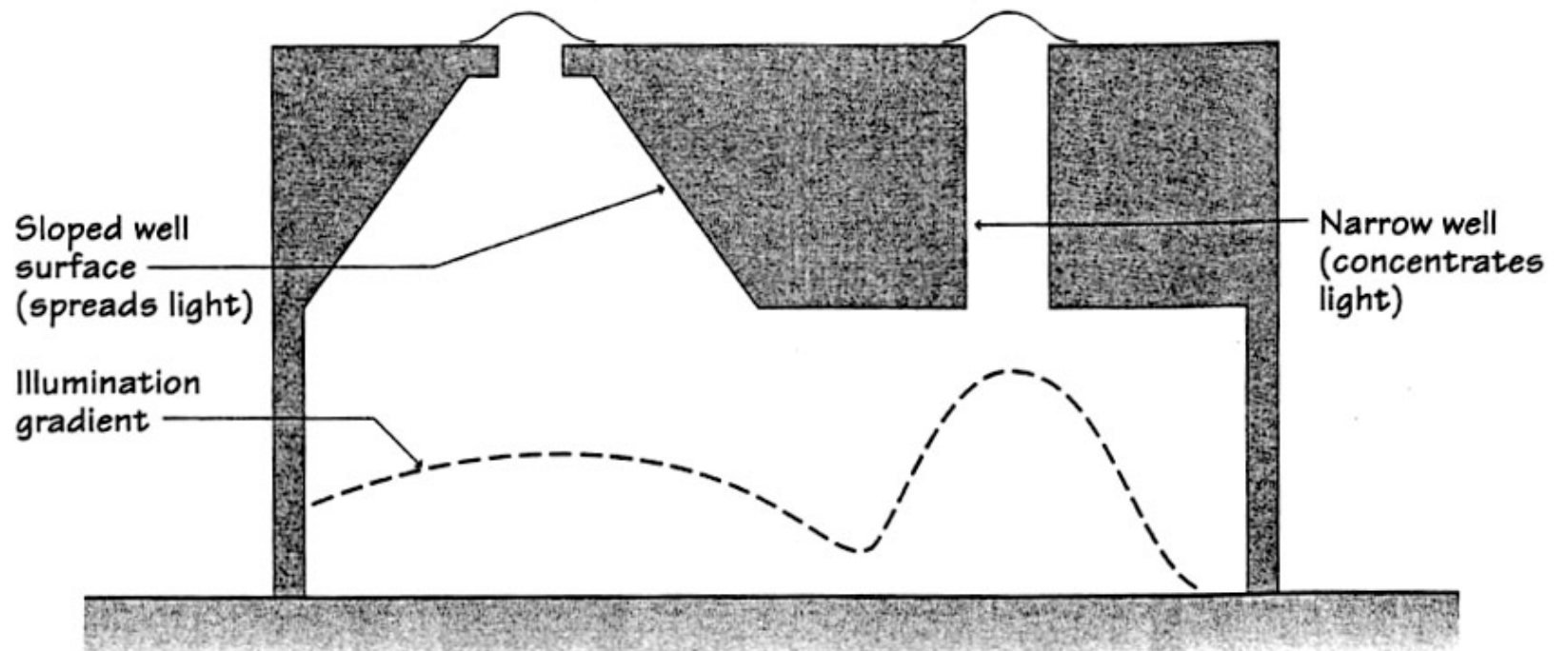


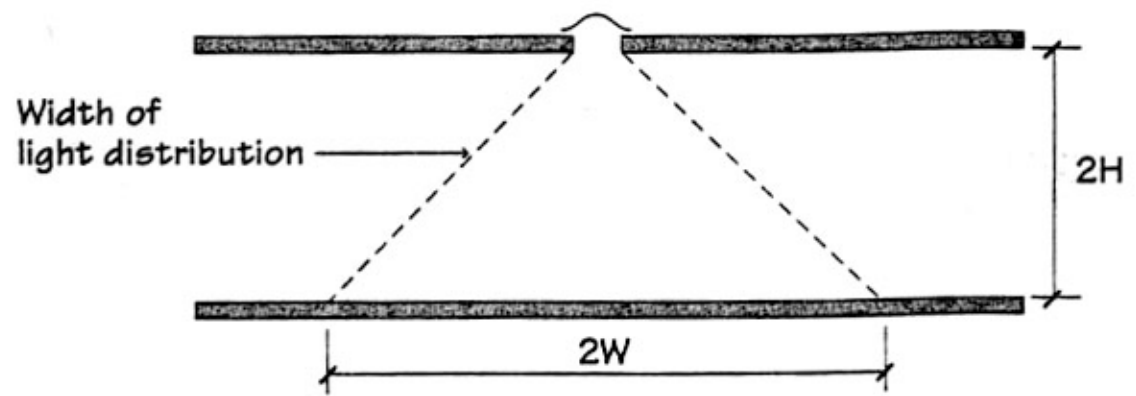
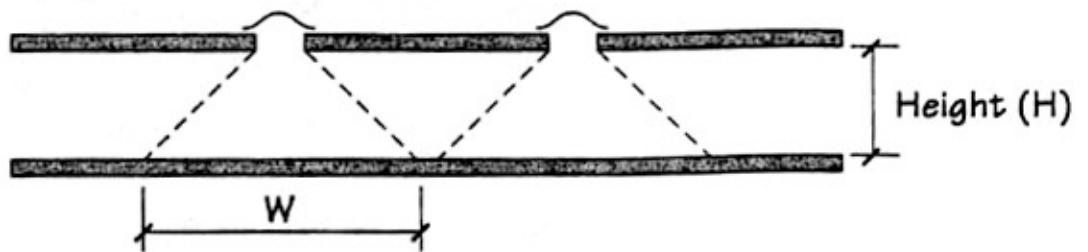
Low Sun Angles and
Reflected Light:
Vertical clerestories
collect more light

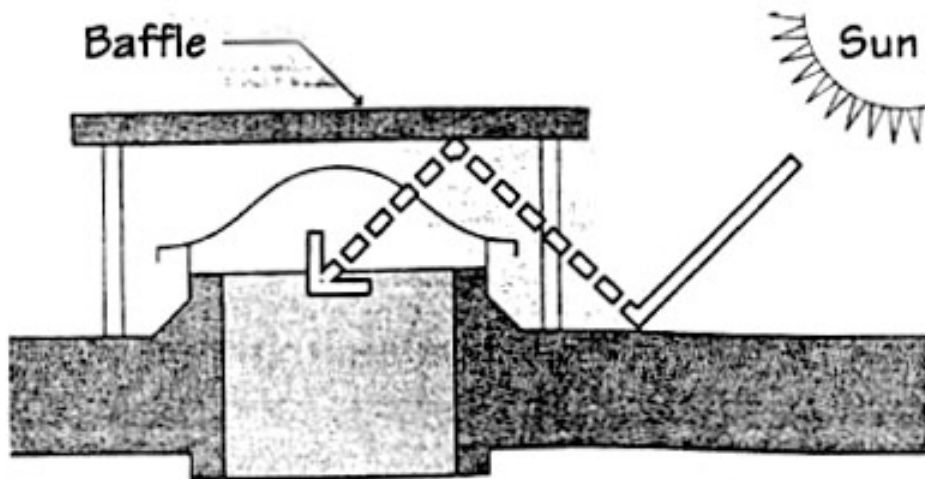
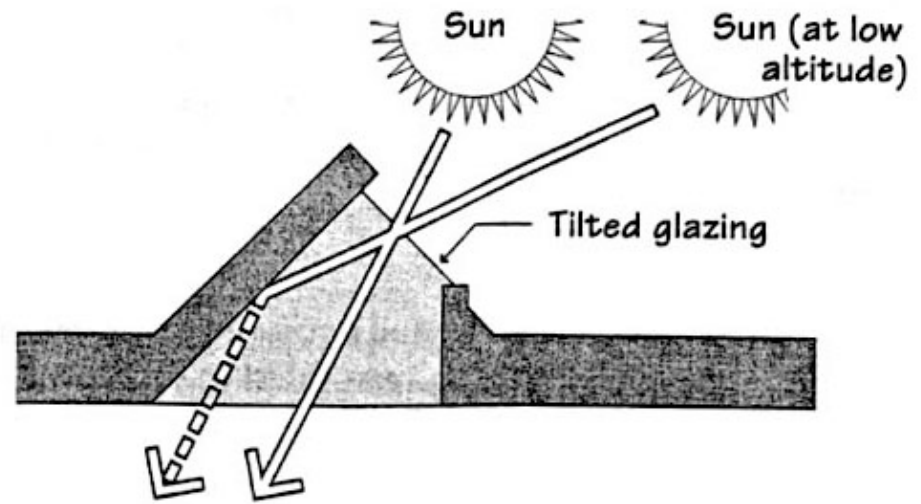


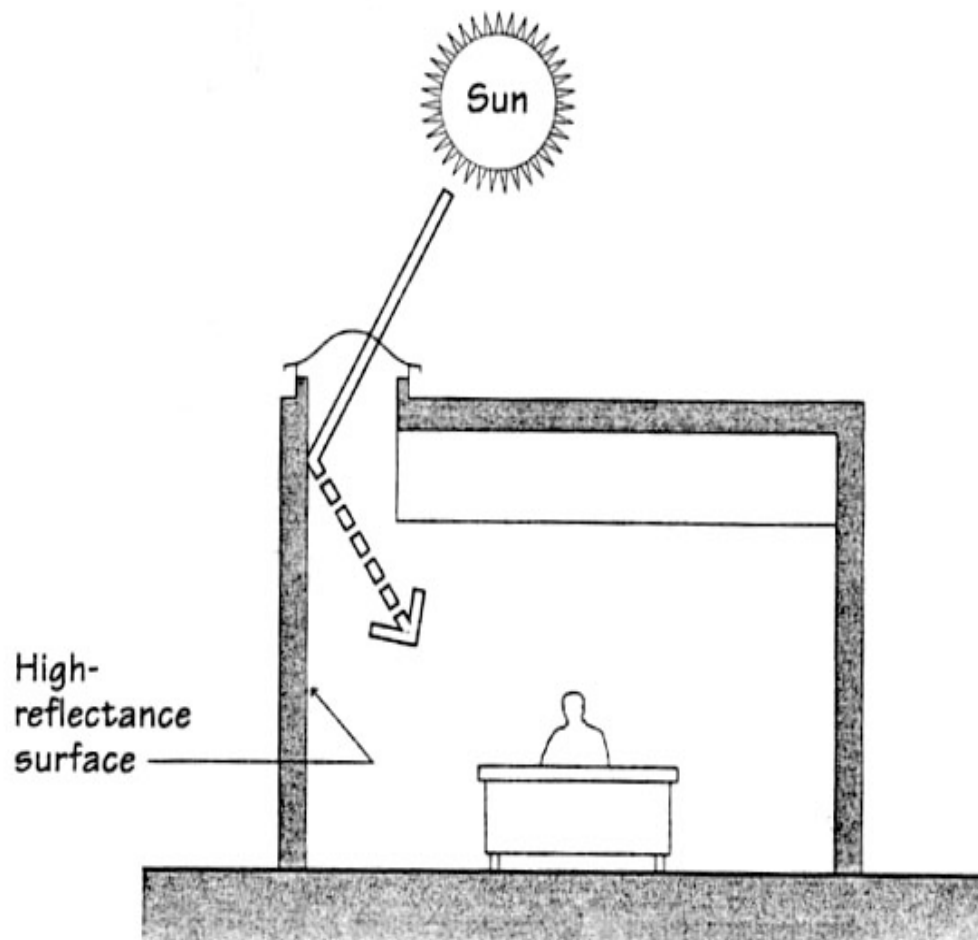
High Sun Angles:
Horizontal skylights
receive maximum
heat gain

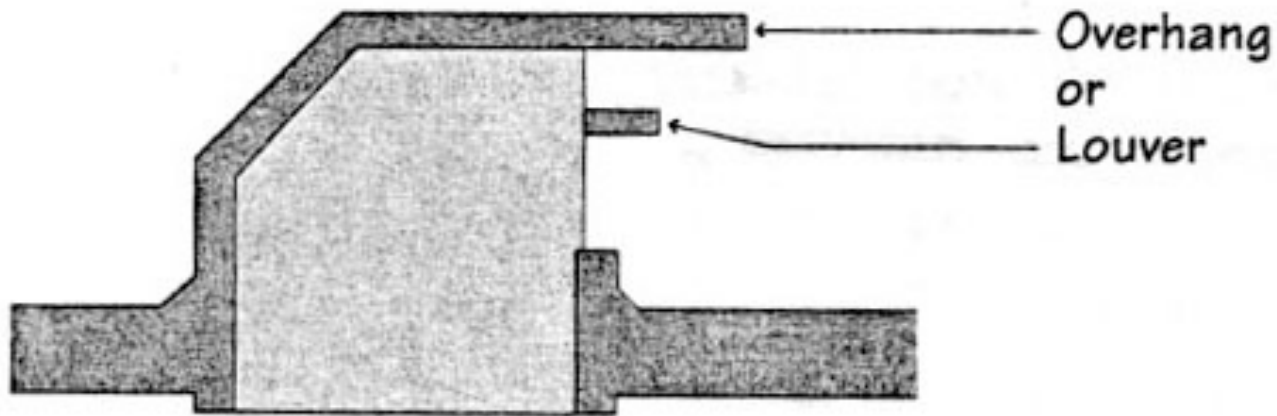




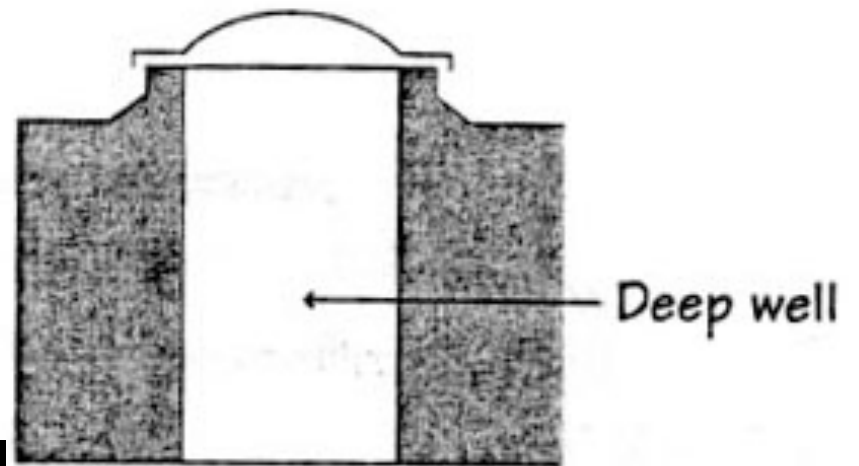








Exterior control



Interior control

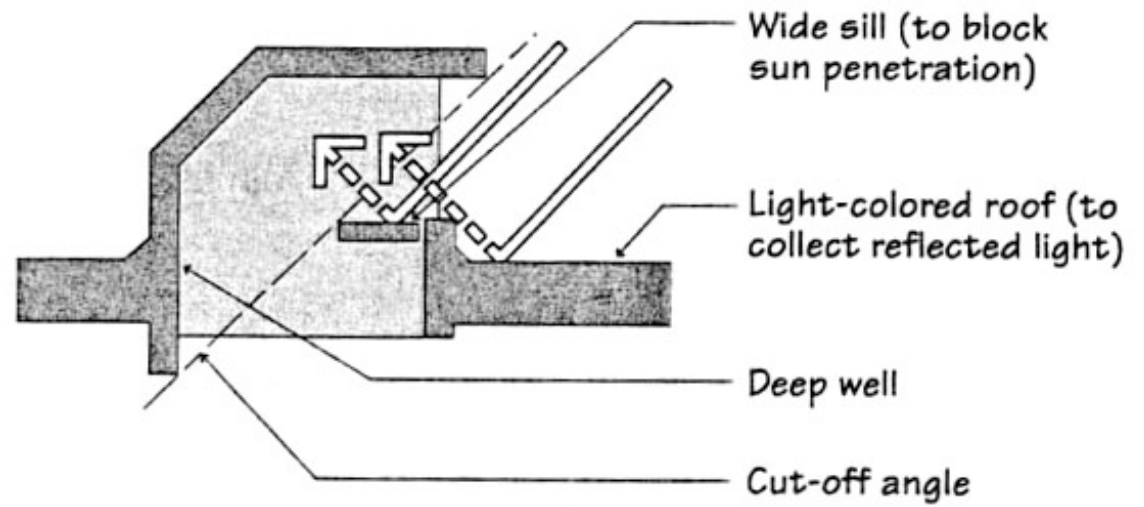
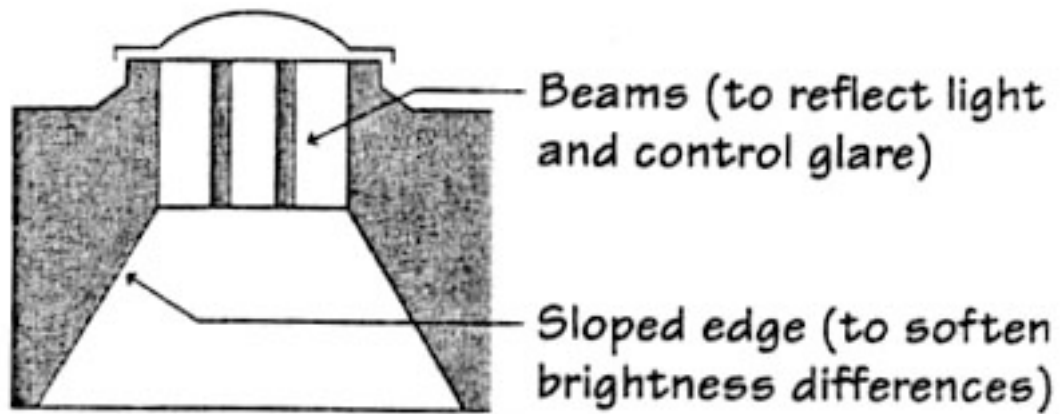


FIGURE 10-11



Interior Controls

Direct Gain - Plus

