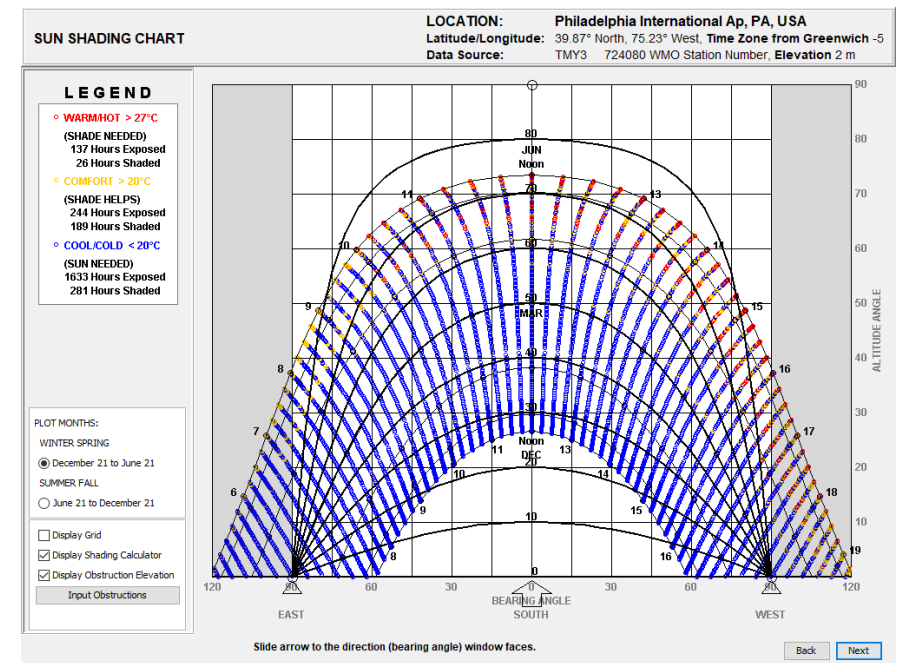


Sun Shading Chart
 : June 21 to December 21



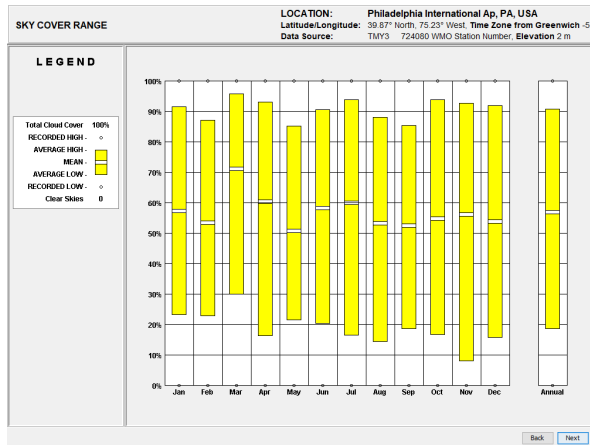
Sun Shading Chart
 : December 21 to June 21

1. Passive Heating / Shading for Solar Heat Gain

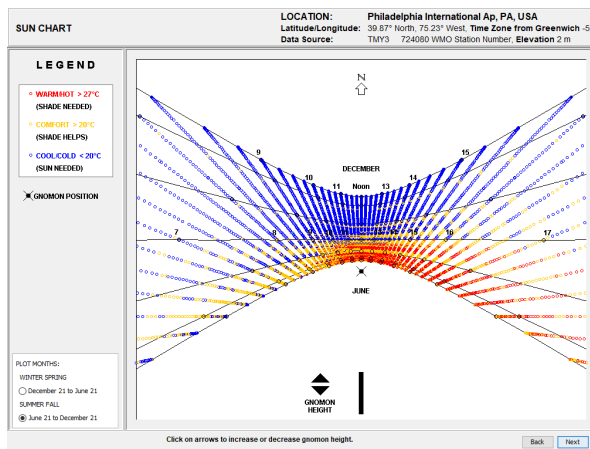
This is the sun shading chart from 'Climate Consultant' program which focusing on Philadelphia.

With the 'sun shading chart', architects can consider the amount of the interior shades. Shades are important because they can keep the heat from the sun which coming through the window. Roofs and walls are keeping the sunlight's heat to reduce cooling loads. Shading is good material for design to let the natural sunlight and heat into the building while rejecting it. Moreover, it can be also adapted by making it movable.

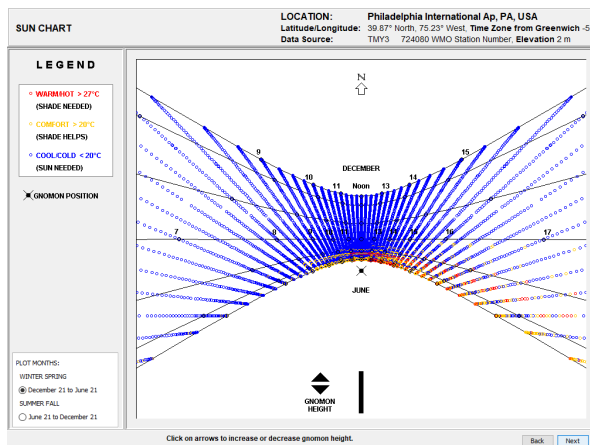
The shading strategies is useful during the summer because shade can avoid solar heat gain. For example, Rooftop solar panels can be used as shades and act as energy generators and energy load reducers. By fixing horizontal overhang with calculated width, it is possible to shade during summer because sun is at a higher angle. Moreover, during winter, the overhang can allow the sunlight and heat in because the sun is lower.



Sky Cover Range Chart



Sun Chart
: June 21 to December 21

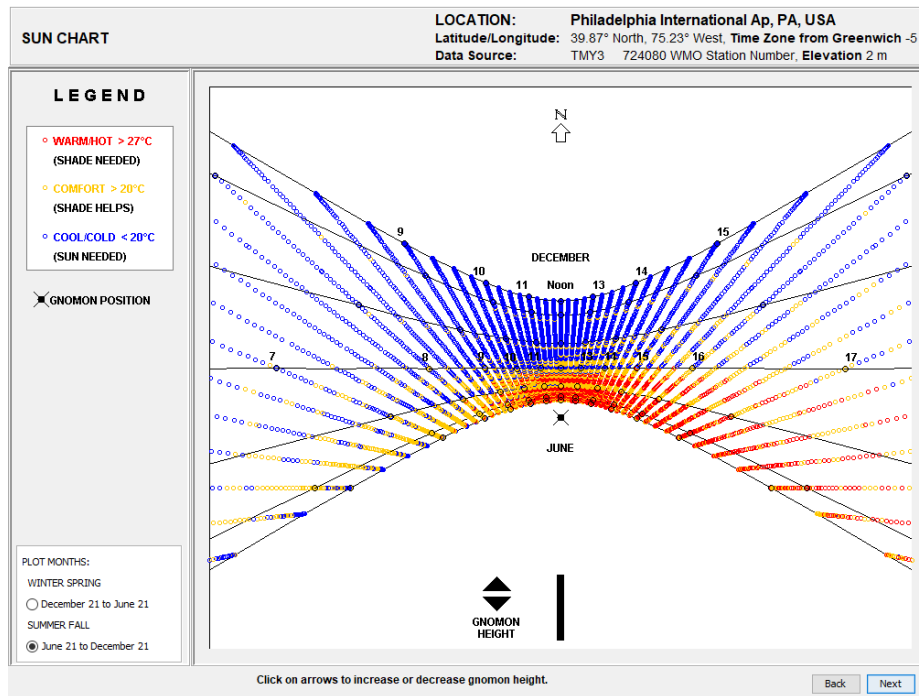


Sun Chart
: December 21 to June 21

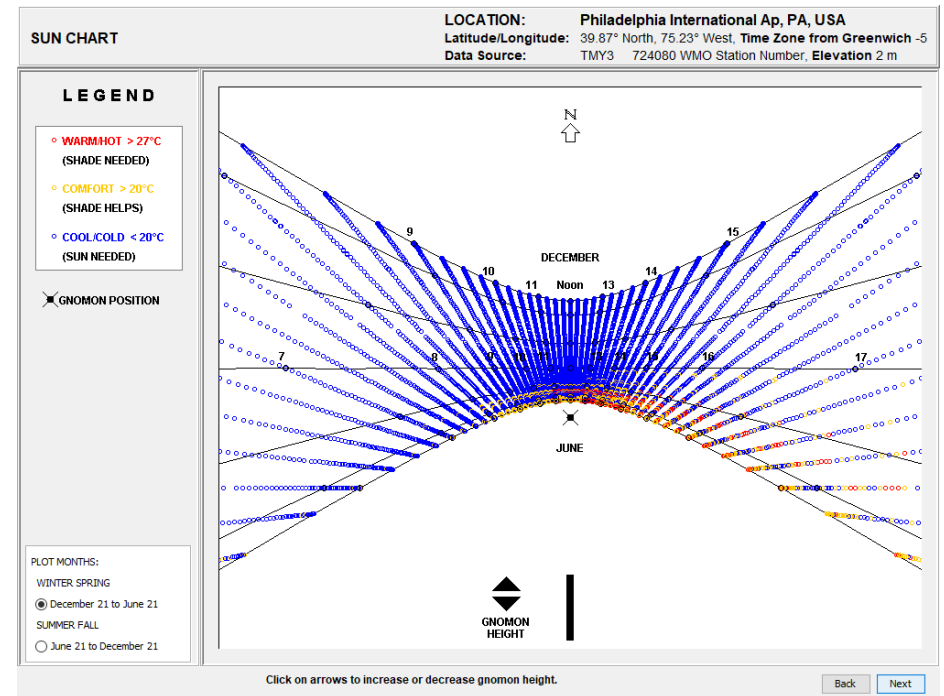
2. Lighting and Daylighting Design

Daylighting is a great architectural material to design the energy efficient buildings. With these 'Sun' Charts and 'Sky Cover Range' chart, it is easy to use daylighting and efficient lights to reduce energy demands.

The Sun and Sky Cover Range can be predicted, so sunlight will be used for the light. With the predictable strategies, the design of building can be carefully managed to illuminate the building and it will save the building's energy.



Sun Chart
: June 21 to December 21



Sun Chart
: December 21 to June 21

3. Passive Heating / Direct Solar Gain

Sunlight heat the space, walls and roofs. Heat from the sun can be collect and use as building's thermal mass. This is 'Direct Solar Gain.' With the sun chart, it is possible to predict the amount of saving heat. This will be useful for hot sunny climates especially in summer. Moreover, it is more desired in the morning than the afternoon.

1. Thermal Mass

Thermal mass is important because it absorbs and retains heat. It helps to keep the heat and making the space warm with sunlight.

2. Surface Color and Cool Roofs

Dark color surface absorbs energy quilkcky. Light color surface makes light bounce with in the space. Therefore, "Cool roofs" use light colors to reflect the heat.

3. Glazing for Solar Gain

Glazing systems gain a lot of heat and pull the sun heat into the interior space or reject it. Shades block excess sun at warmer times and allow the sun's heat in at cooler times.