Latitude: 39.87° North
Longitude: 75.23° West
Elevation: 6 ft.
Time Zone: UTC -05:00

File source:
USA_PA_Philadelphia.Intl.
AP.724080_TMY3.epw

I. TEMPERATURE RANGE

II. RELATIVE HUMIDITY / DEW POINT

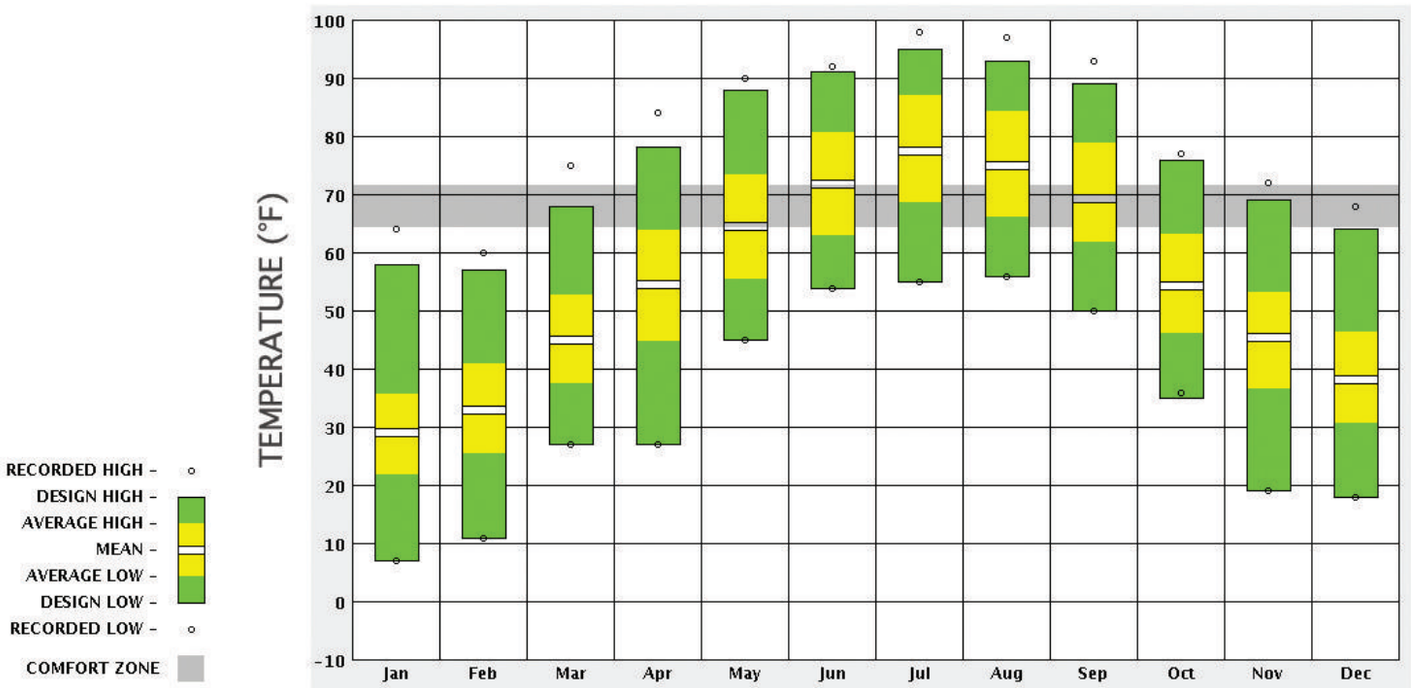
III. SKY COVER

IV. WIND VELOCITY / DIRECTION

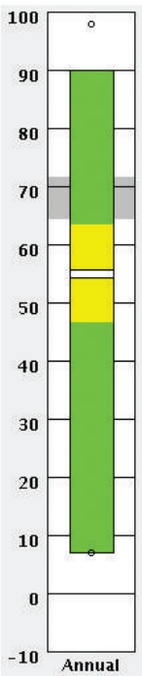
V. ILLUMINATION

VI. POSSIBLE DESIGN STRATEGIES

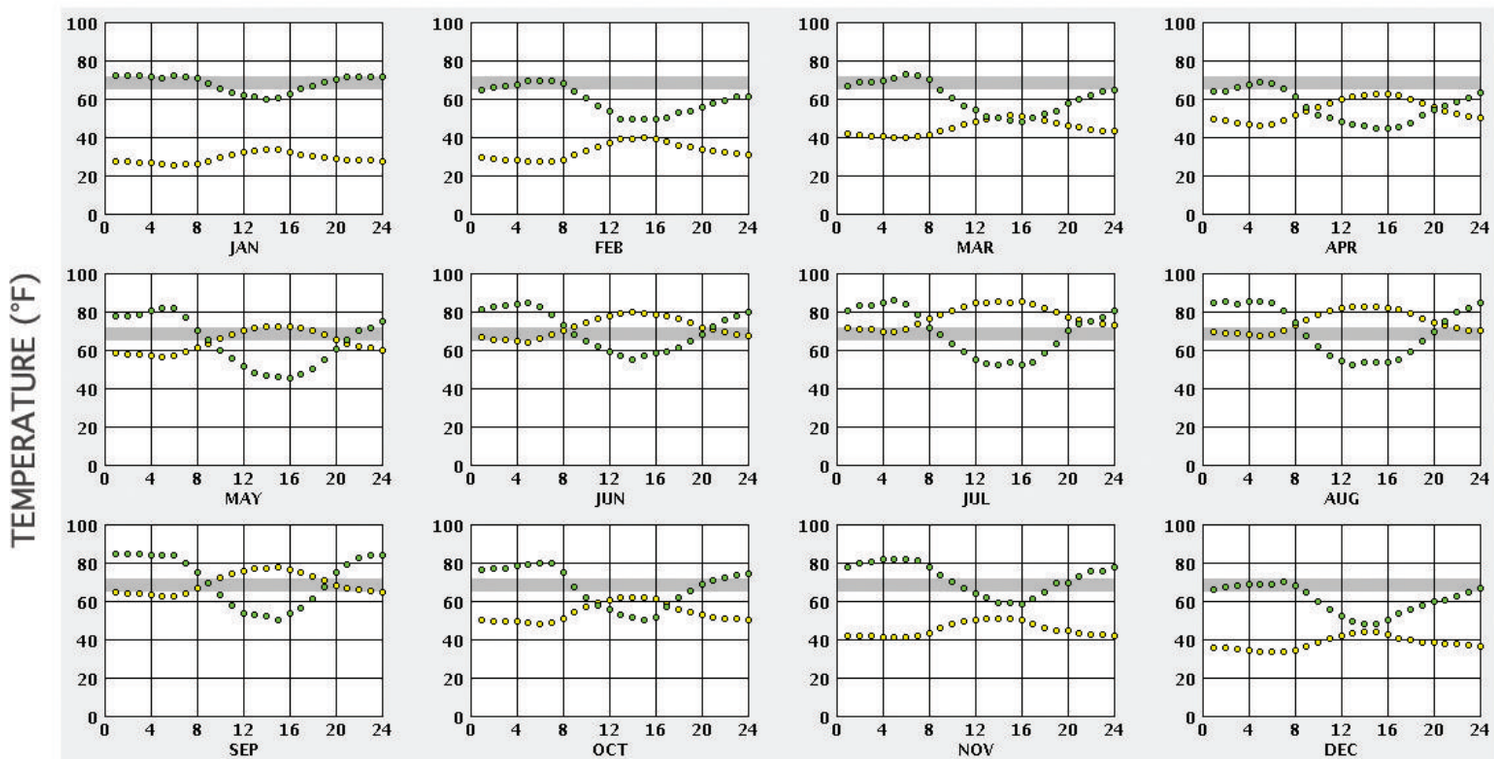
MONTHLY AVERAGE TEMPERATURE AND INTERIOR COMFORT ZONE (64.4°F - 71.6°F)



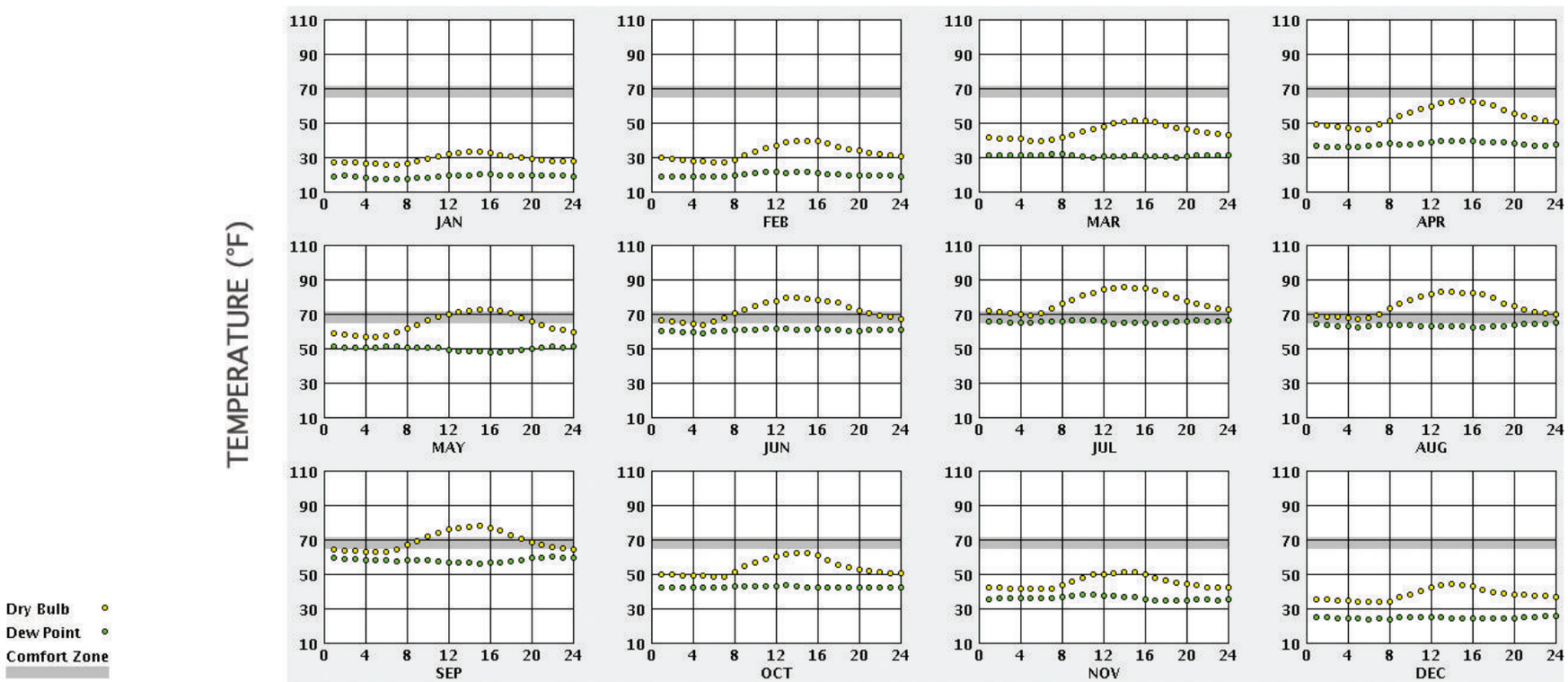
The chart on the left indicates the average monthly high and low temperatures for Philadelphia in relation to an interior comfort zone between 64.4°F to 71.6°F. On average, the outside temperature between the months of October - mid May are below the recommeded interior temperature. The period between mid June to August, the outside temperature is above the interior comfort zone.
The chart on the right synthesizes the monthly temperatures into a single annual reading.

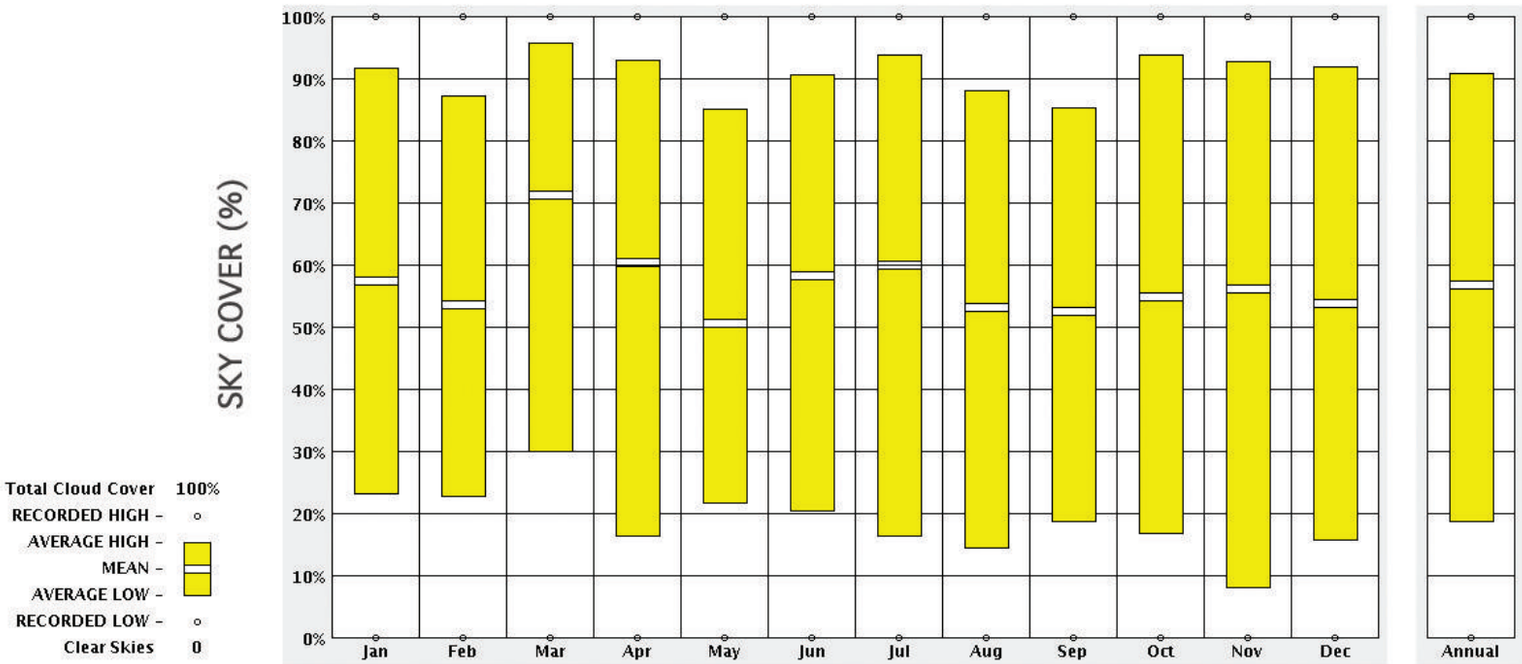


DAILY AVERAGE TEMPERATURE AND RELATIVE HUMIDITY IN RELATION TO COMFORT ZONE

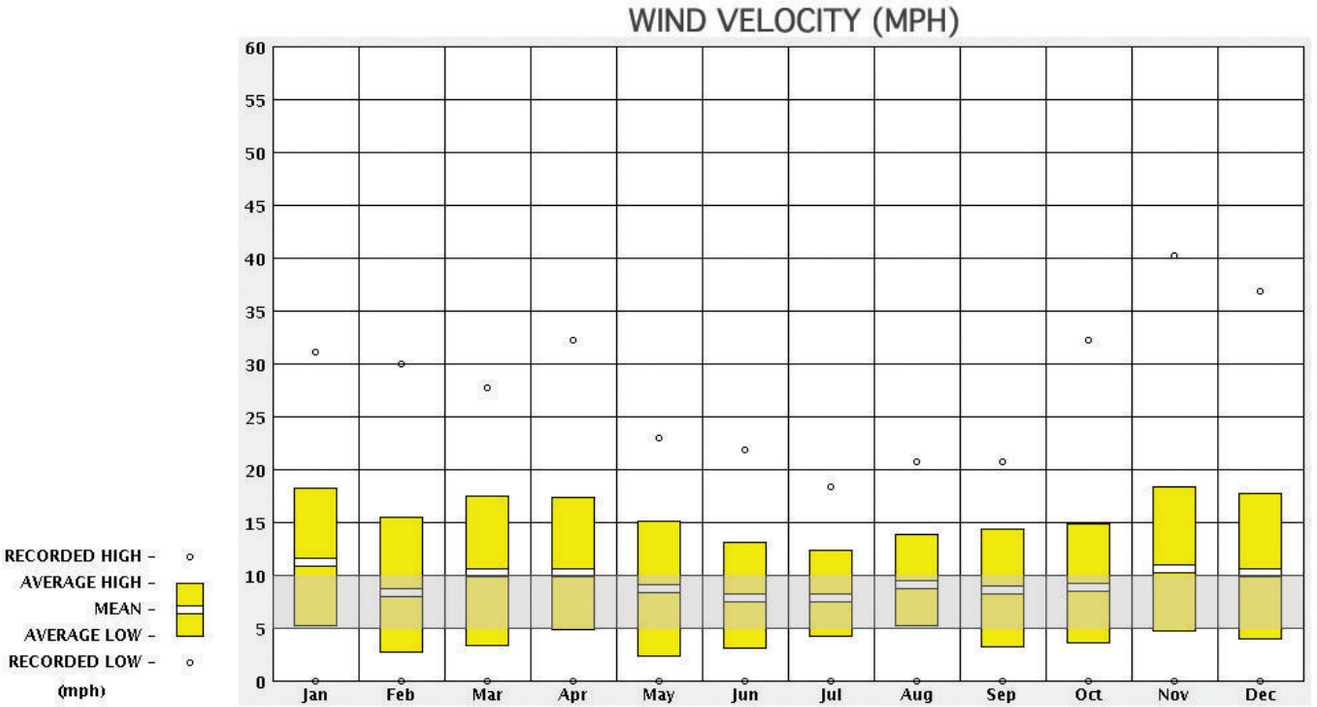


DAILY AVERAGE TEMPERATURE AND DEW POINT IN RELATION TO COMFORT ZONE



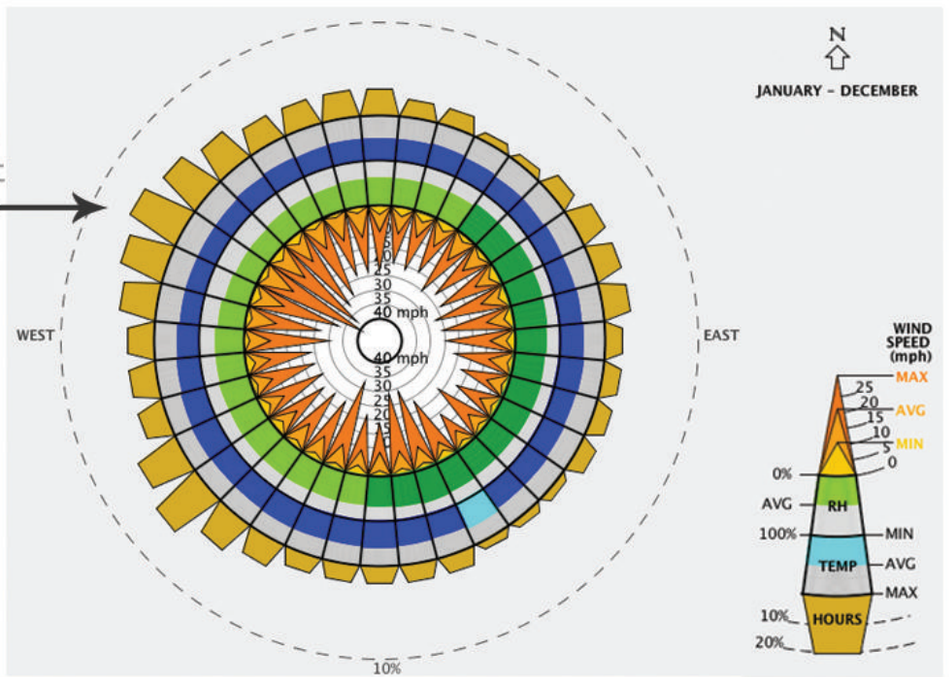


The avergae cloud coverage in Philadelphia is ~ 55% with a fairly consistent range throughout the year between 18% - 91%.

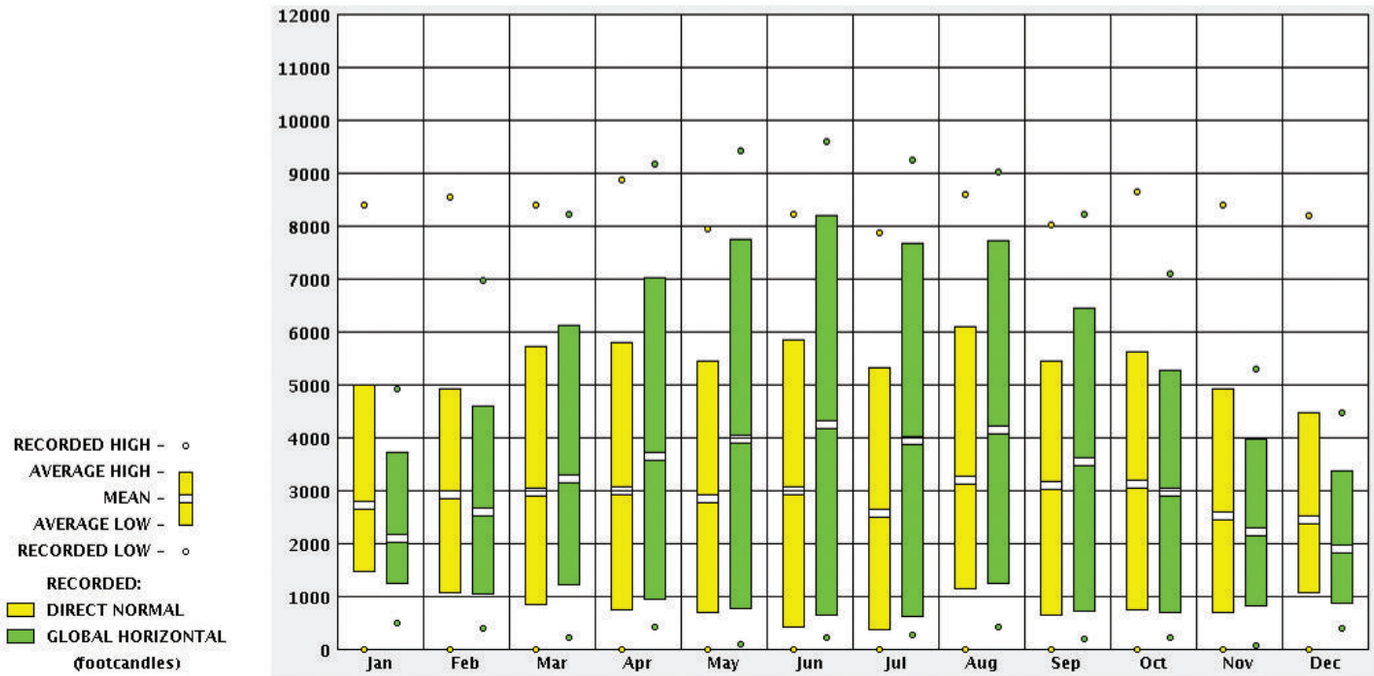


The chart on the left deails average monthly wind velocities in relation to the optimal range of 5-10 mph.

The highest winds approach the city from the north west at longer periods of time.



AVERGAE OUTDOOR ILLUMINATION (LUX)



The illumination refers to the brightness level. A typical clear day is approximately 10,000 lux outdoors. The recommended interior illumination depends on the distance from the window and the types of activities the space accomodates. The area closest to the window may measure 1,000 lux while the middle of the room can be reduced to approximately 25-50 lux in which additional lighting is required.

Condition	(lux)
Sunlight	107527
Full Daylight	10752
Overcast Day	1075
Very Dark Day	107
Twilight	10.8
Deep Twilight	1.08
Full Moon	0.108
Quarter Moon	0.0108
Starlight	0.0011
Overcast Night	0.0001

Passive design strategies utilize the architecture of the building to minimize energy consumption but maintian a level of thermal comfort for its inhabitants.

Passive Design Strategy 1: Since most of the year experiences average temperatures below the specified comfort zone, steps must be taken to ensure the building remains warm. A good design strategy is a **well-insulated envelope** taht retains solar gains.

Passive Design Strategy 2: Philadelphia also experiences periods of high sky cover. To maximize the amount of natural light, buildings can be designed with **high ceilings and tall windows**.

Passive Design Strategy 3: During the two months that Philadelphia experiences higher than comfort zone temperatures, the building may utilize **operable shading devices** to block solar gains.

Sources:
Climate CoLab | https://climatecolab.org/contests/2014/buildings/c/proposal/1309226
Climate Consultant
The Engineering ToolBox | http://www.engineeringtoolbox.com/light-level-rooms-d_708.html