

Arch 463
ECS
Fall 2021

Name _____

Quiz #1

"Duke of York Comes to Moscow"

For this problem you are the site and climate analyst for Phil Mead who wants to bring the Duke of York Restaurant to Moscow. Phil advocates eating al fresco in all seasons. Your task is to suggest appropriate strategies for manipulating the retractable windows to provide passive comfort for diners in a near outdoor environment. **Try to maximize the cafe's openness to the site in all seasons during its 11am-11pm operations!**

Climate Context. Moscow, ID.

Original Architect's Intent. In creating a restaurant for all seasons we sought a dynamic relationship between the interior of the restaurant and Duke of York Square. It is the windows that give the restaurant this sense of performance: three large, curved panels, 3.2m high and 9.5m wide, glide into the basement on a counterweight, like a sash window. Our materials selection balanced a desire for refined transparency with structural requirements and stringent environmental standards. A perimeter frame for the glazing is powder-coated mild steel section, which can withstand the high stresses induced by the large moving units. The panels within the three wider openings are retractable, completely opening up the ground-floor space during fine weather and allowing the restaurant to spill onto the surrounding Duke of York Square, while the roof continues to provide shade.

Although similar retraction systems have been installed outside the UK, all have used straight panels. This makes the restaurant the world's first example of a retractable curved glass system, while celebrating a mechanism that is as strikingly simple as a weighted sash window, sliding down gracefully into a basement trench.

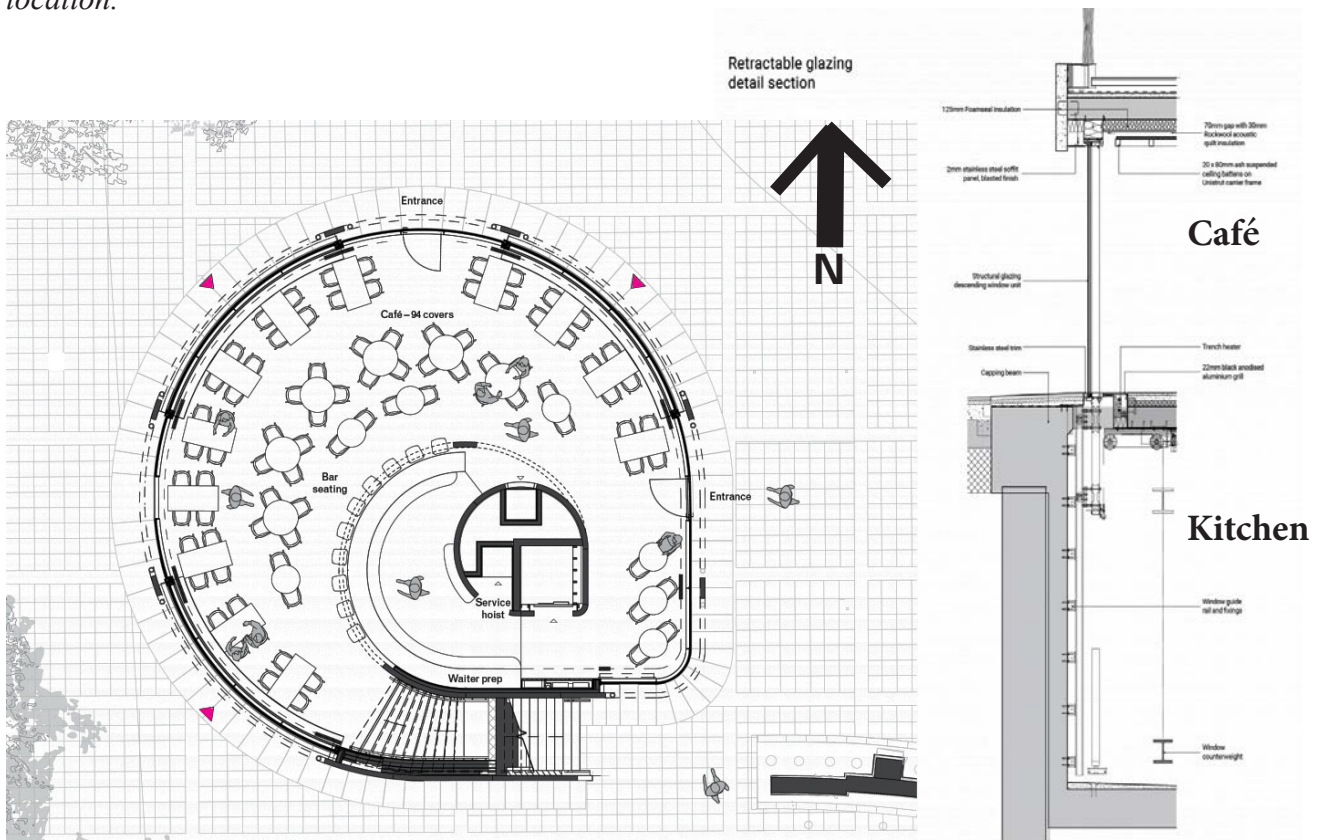
Comfort Goal. Maximize the use of passive strategies for comfort throughout the year. We used Climate Consultant to present the Moscow 2020 climate.



The Duke of York peering in the NW window, retracted. And it has a roof garden!



The proposed Moscow site for the Duke of York Café is on the abandoned section of Main Street just across highway 95 southbound. The roof plan in the center of the site photo shows the desired location.



Duke of York Café plan. The magenta arrows indicate the three retractable windows, which face SW, NW, and NE..

Typical Re-tractable Window Positions:

Fully Closed ———>



Half Open ———>



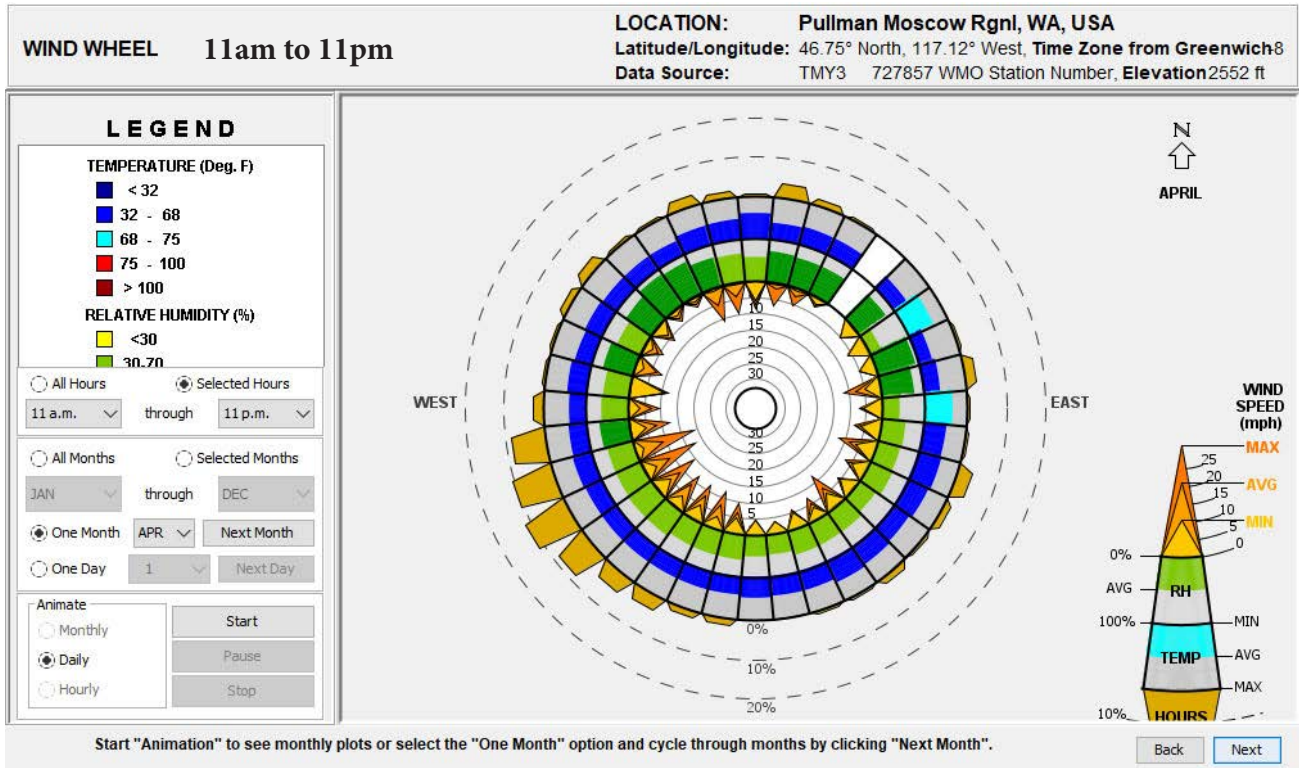
Fully Open ———>



4 points

April (also see psychrometric charts on p. 8)

1. Describe the position for two of the three retractable windows for passive comfort on a sunny April day and explain how your passive strategies will be effective. Use barrier, filter, connector, switch terminology in your explanation. Comment on the diner's clo and met levels.



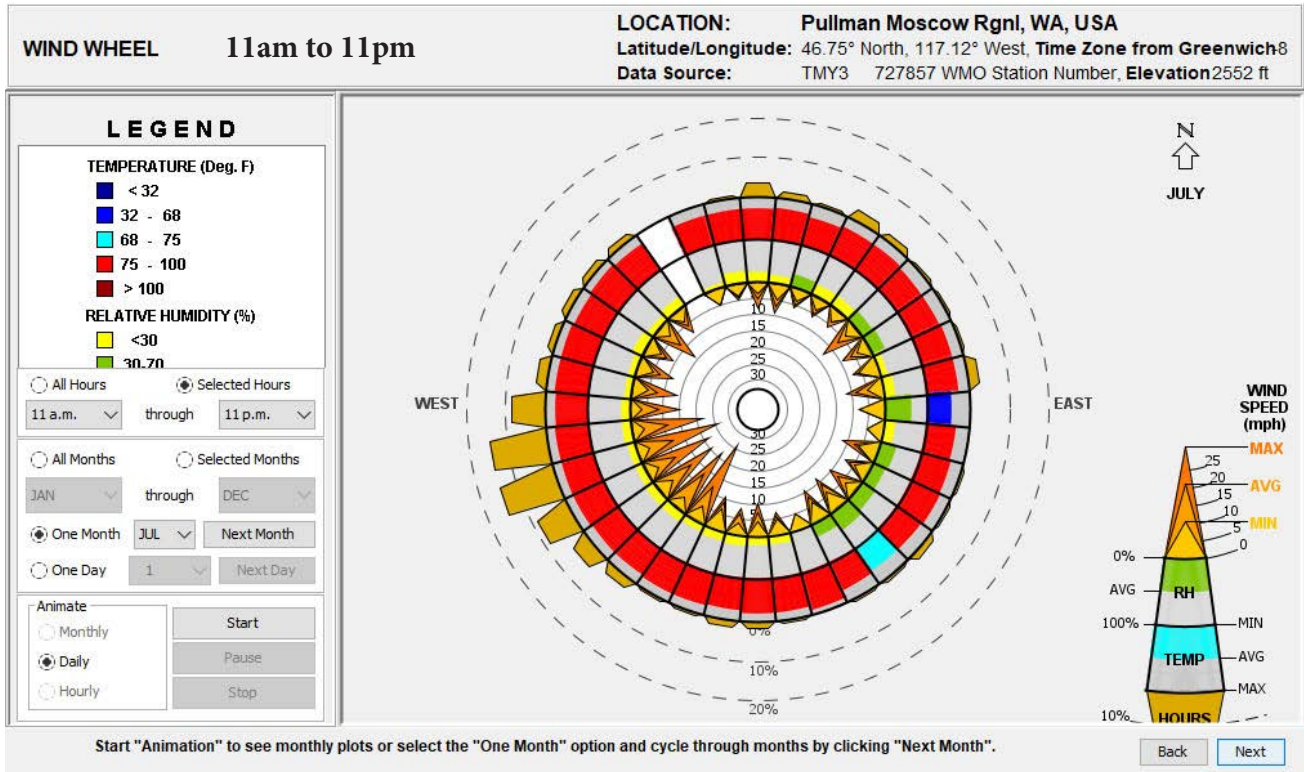
SW Window

NW Window

July

6 points

2. Describe the position for each of the three retractable windows for passive comfort on a sunny July day and explain how your passive strategies will be effective. Use barrier, filter, connector, switch terminology in your explanation. Comment on the diner's clo and met levels.



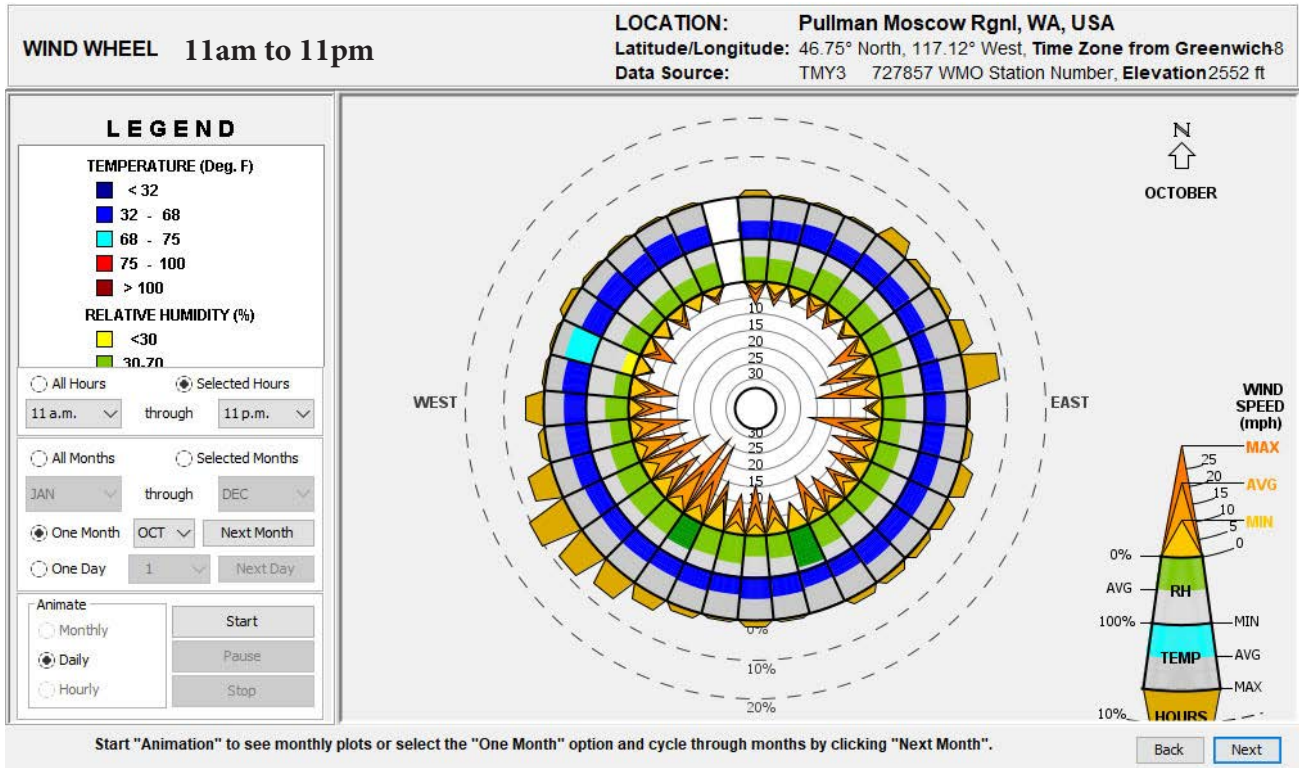
SW Window

NW Window

NE Window

October

6 points
3. Describe the position for each of the three retractable windows for passive comfort on a sunny October day and explain how your passive strategies will be effective. Use barrier, filter, connector, switch terminology in your explanation. Comment on the diner's clo and met levels.



SW Window

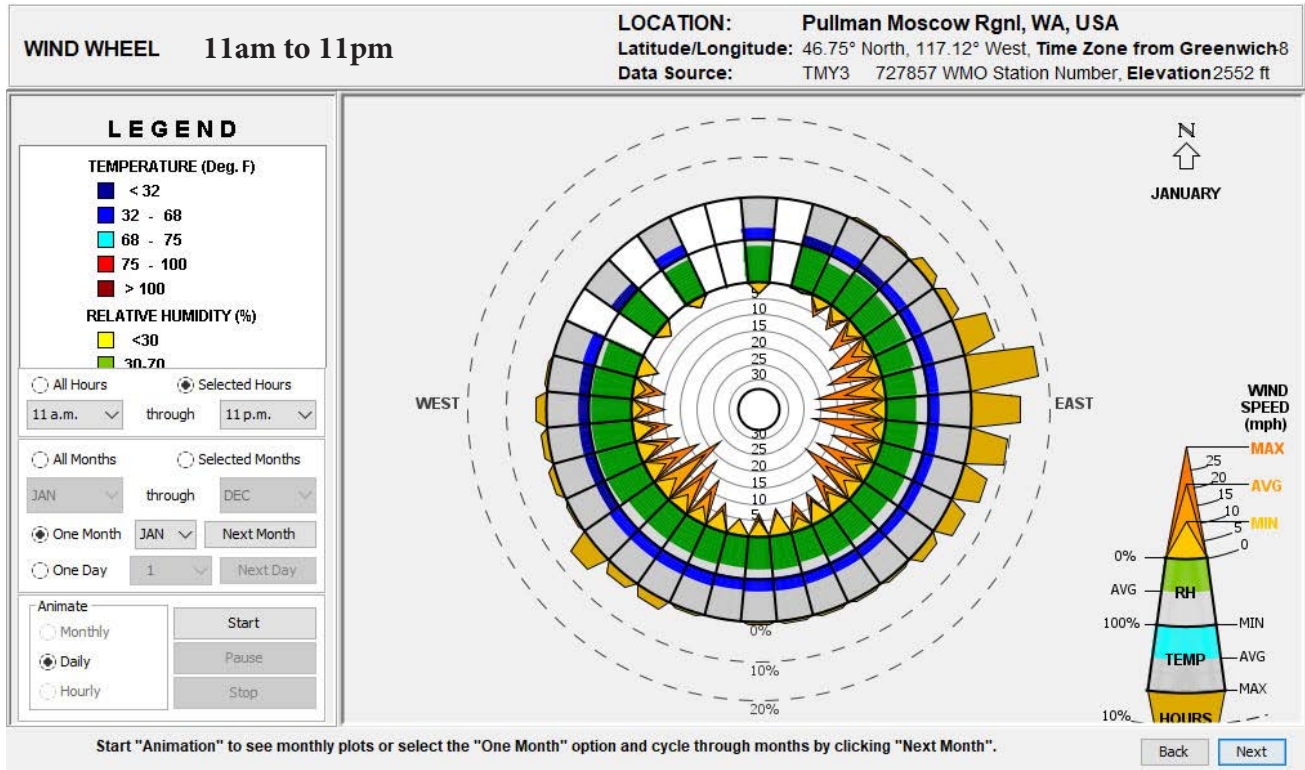
NW Window

NE Window

January

4 points

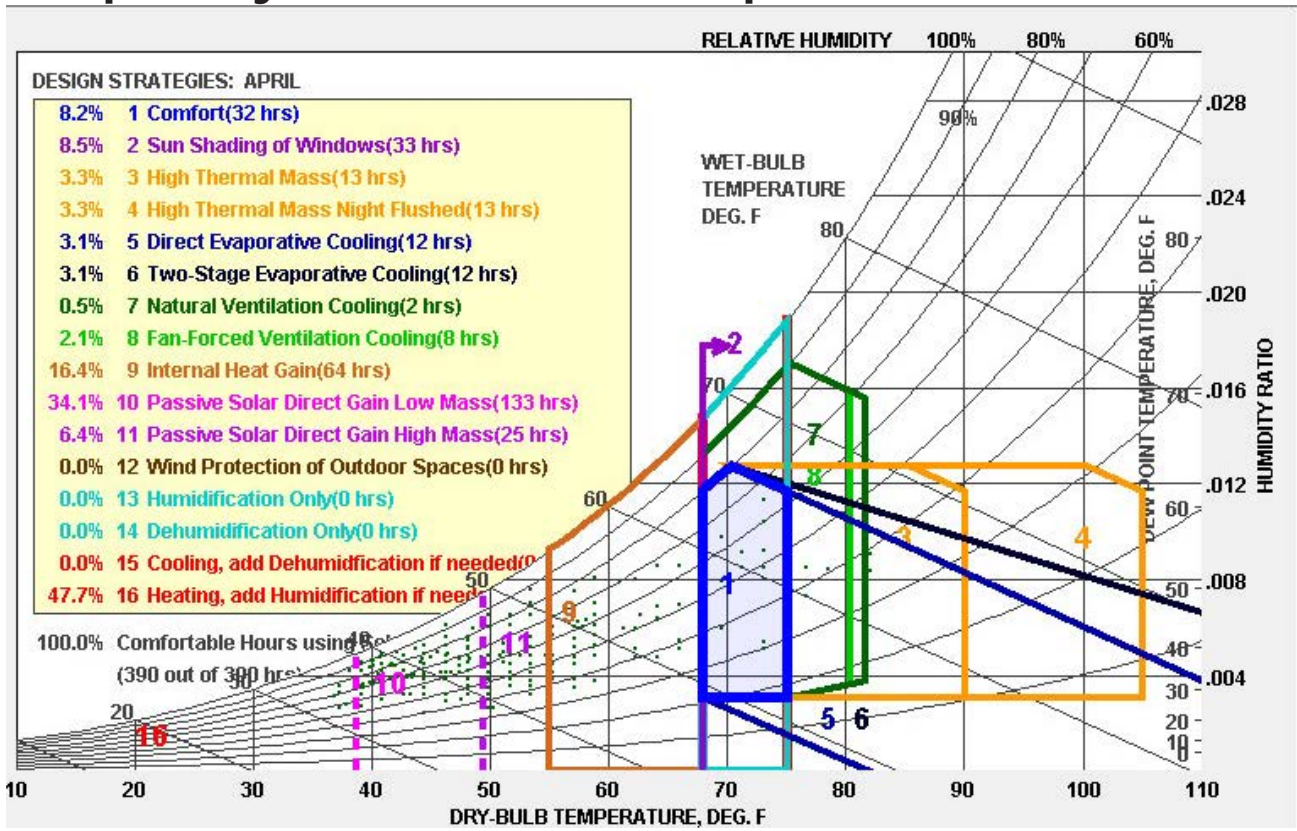
4. Describe the position for two of the three retractable windows for passive comfort on a sunny January day and explain how your passive strategies will be effective. Use barrier, filter, connector, switch terminology in your explanation. Comment on the diner's clo and met levels.



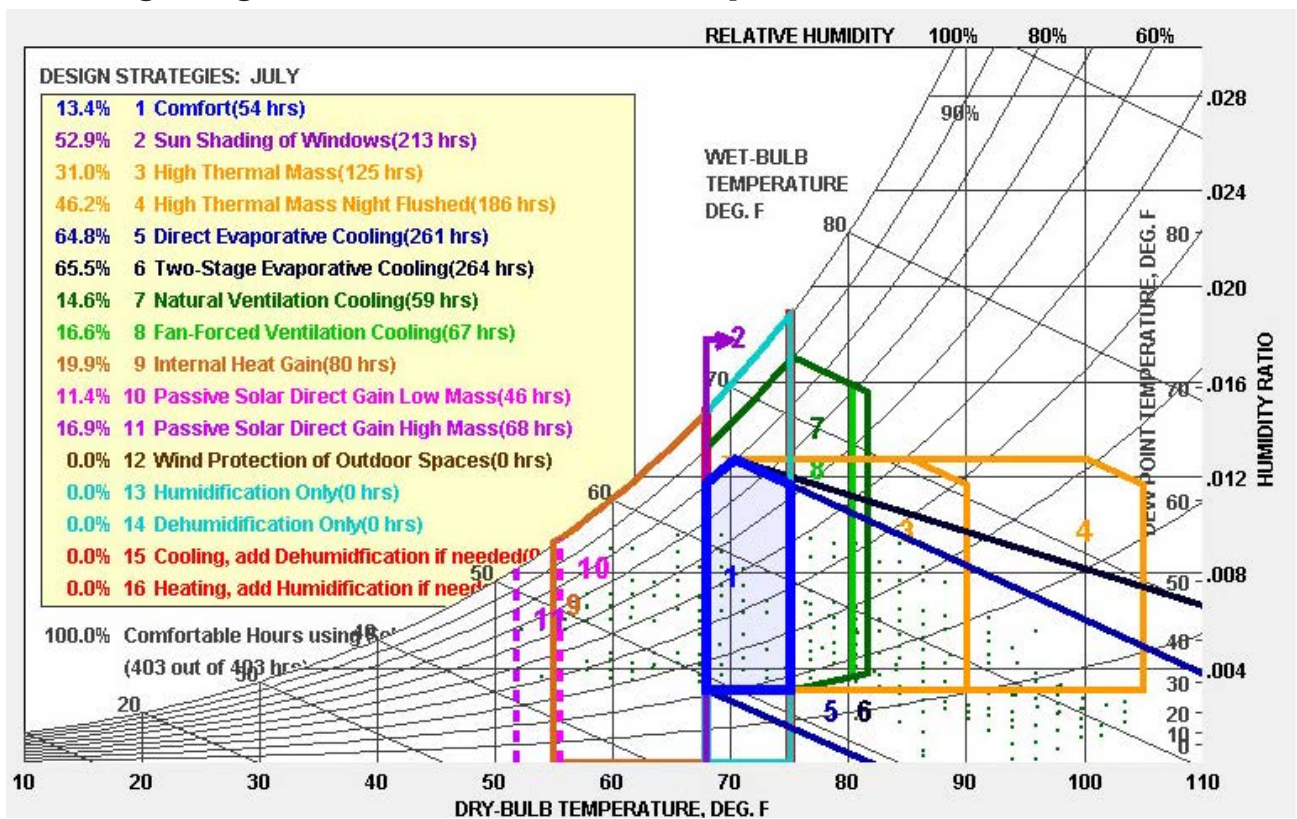
SW Window

NW Window

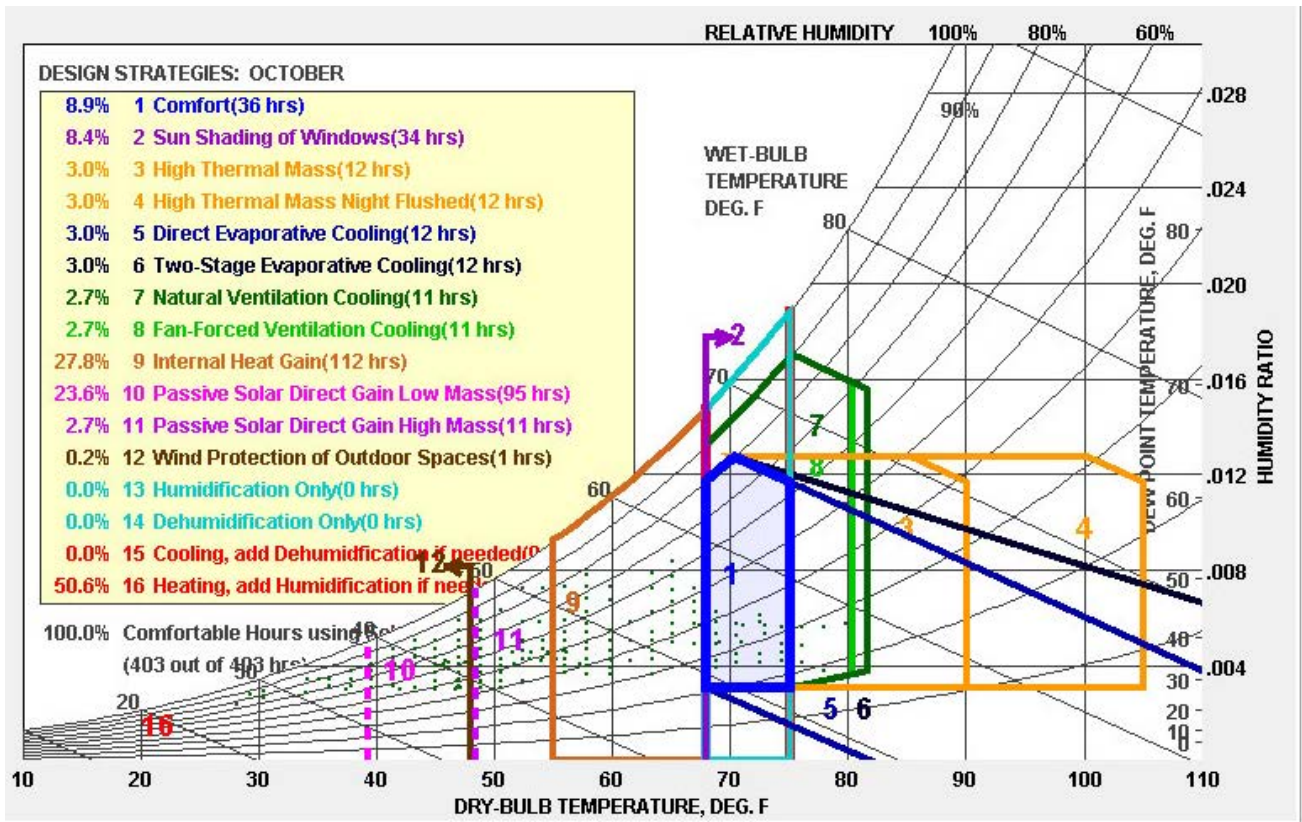
April Psych Chart 11am - 11pm



July Psych Chart 11am - 11pm



October Psych Chart 11am - 11pm



January Psych Chart 11am - 11pm

