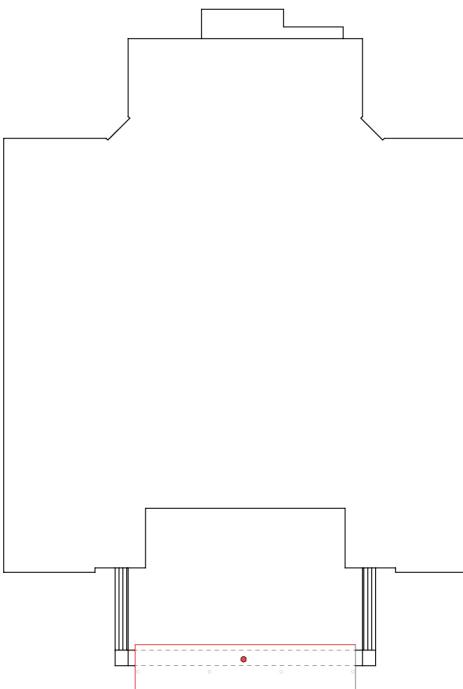
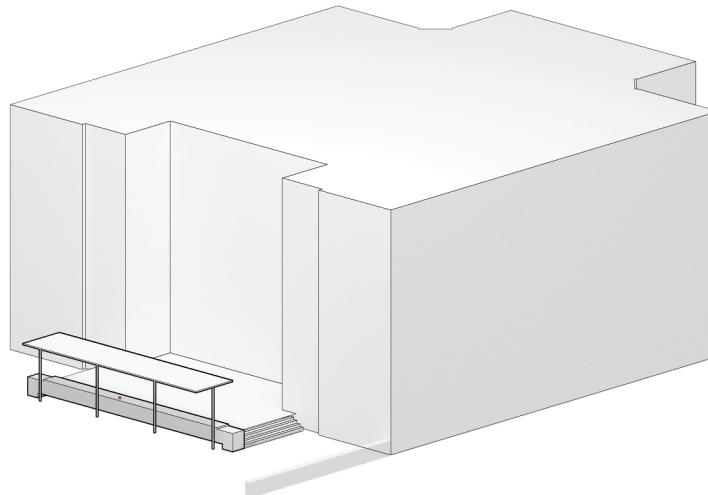


# **ENVIRONMENTAL SYSTEMS I**

ASSIGNMENT 3: Meyerson Hall Outdoor Space Thermal Comfort Analysis

Ting Su

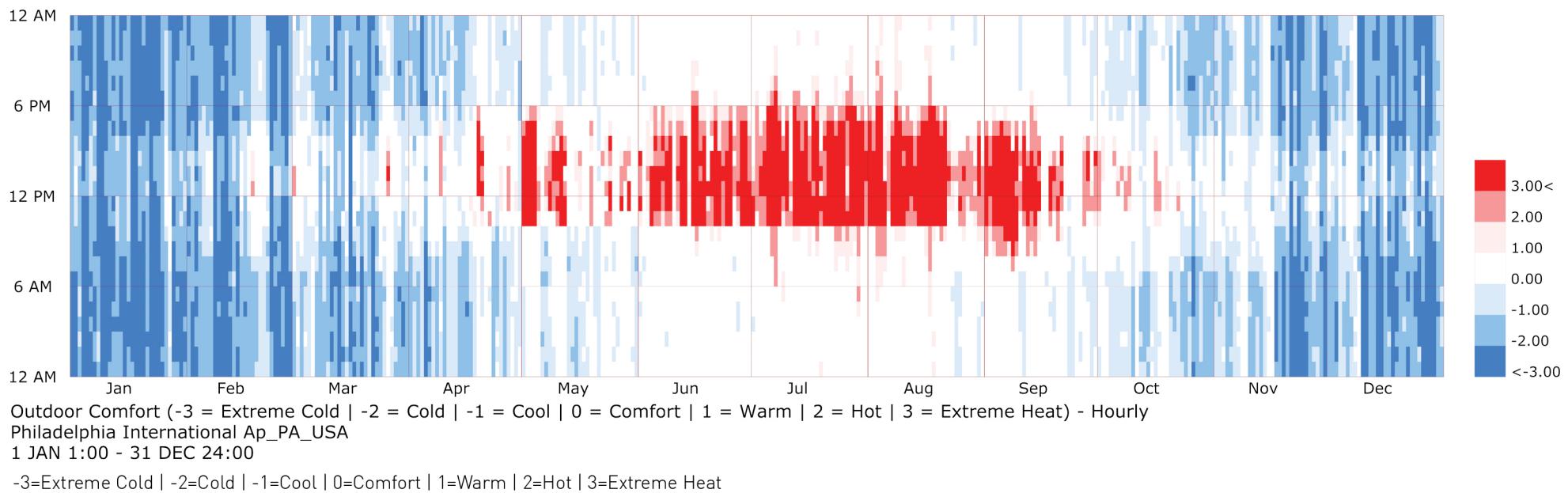
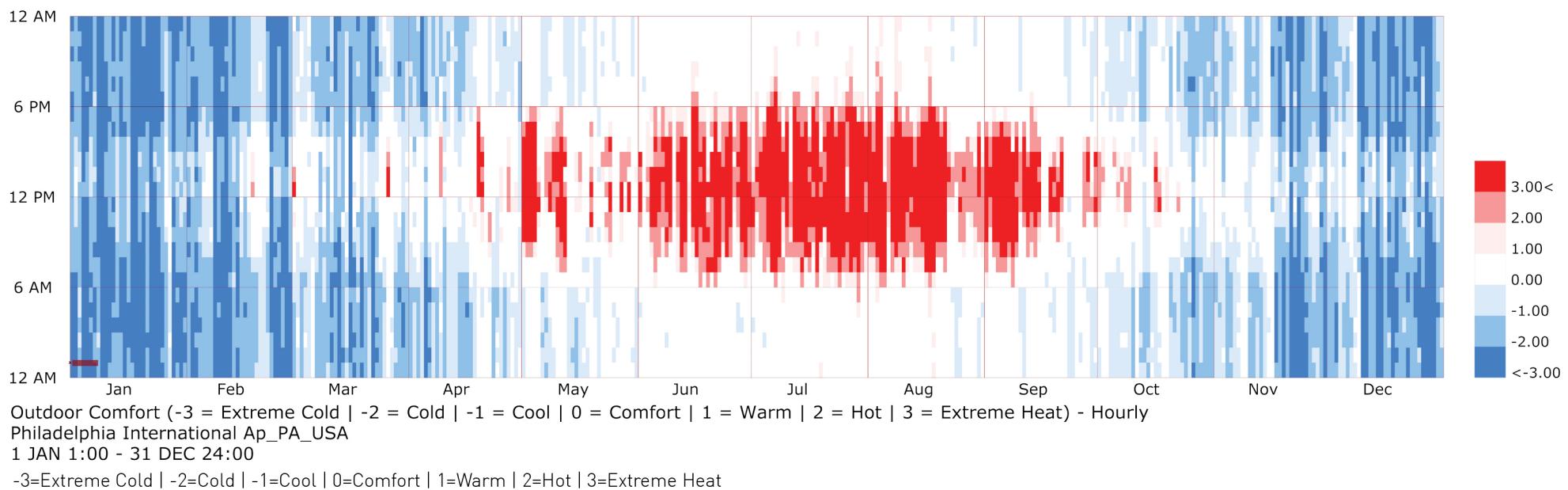
# OPTION #1



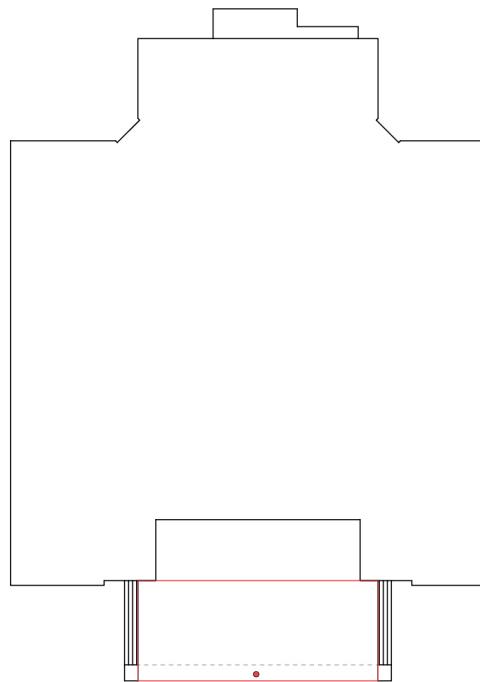
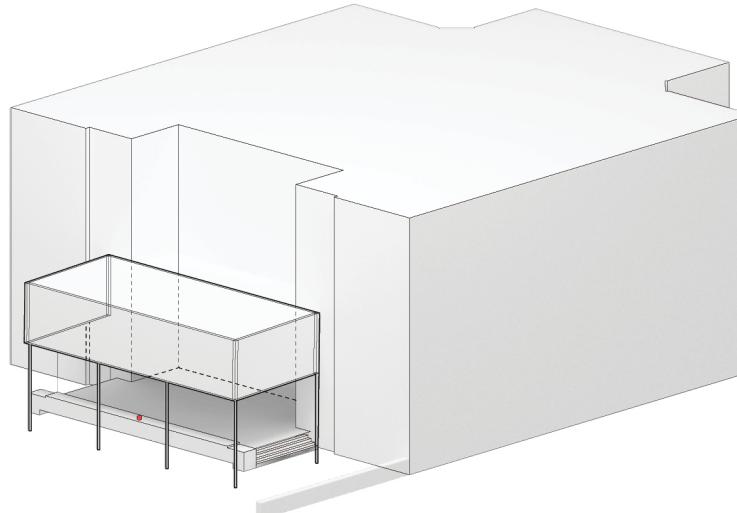
## Philadelphia

Percentage of time comfortable: 37.340183  
 Percentage of heat stress: 12.511416  
 Percentage of cold stress: 31.643836

This option uses a flat shading that cover the sitting area in front of Mayerson Hall. During summer time, the shading can block some of the sunlight when the sun angle is relatively high. The shading can't block sunlight from relatively low angle, for example during late afternoon.



# OPTION #2



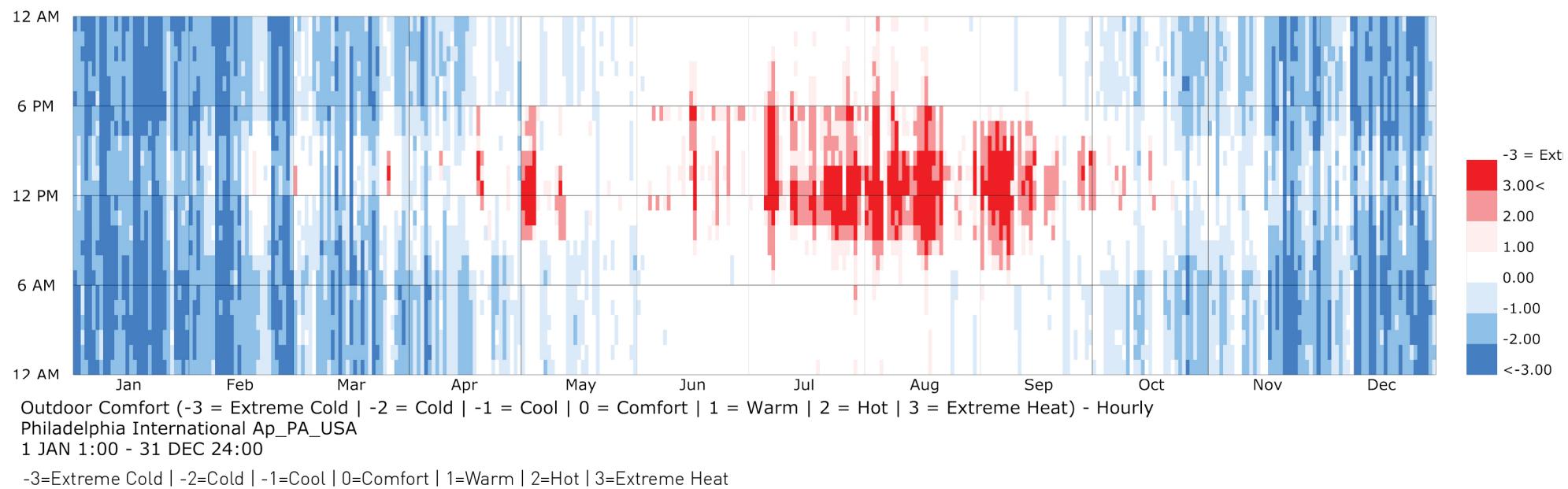
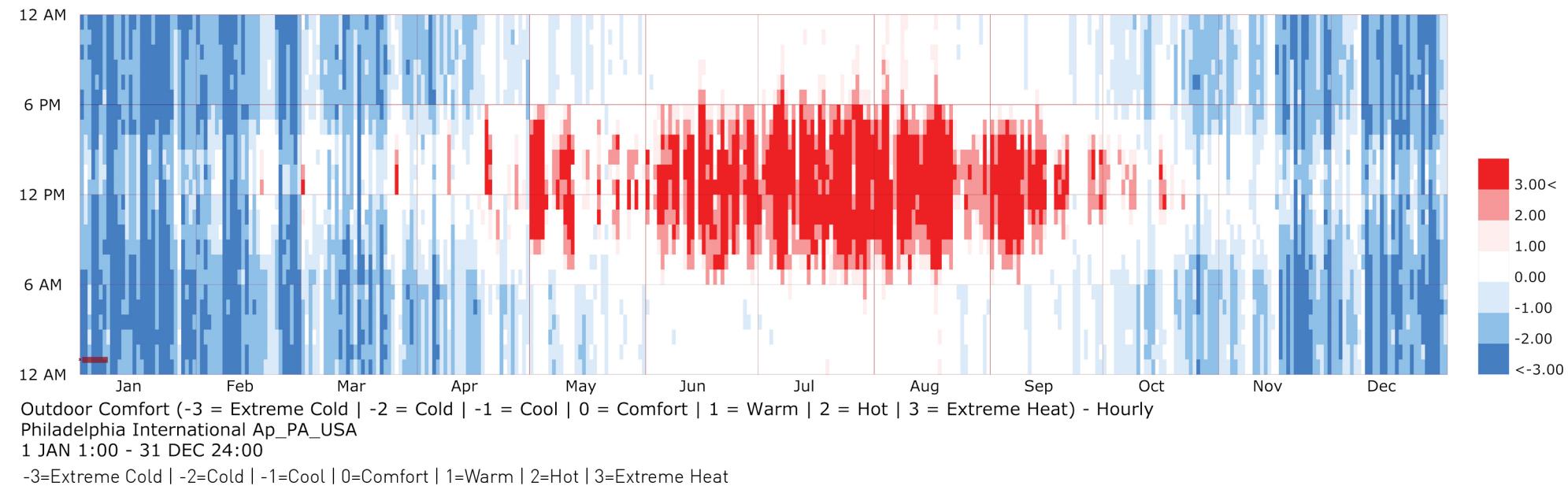
## Philadelphia

Percentage of time comfortable: 37.340183  
 Percentage of heat stress: 12.511416  
 Percentage of cold stress: 31.643836

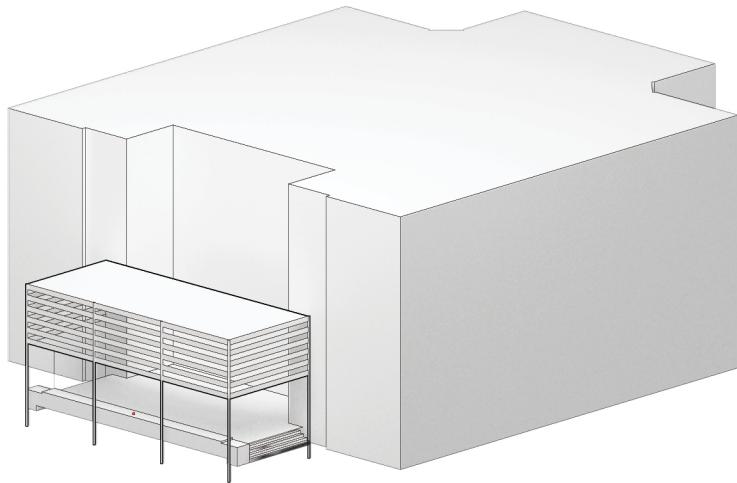
## Target spot

Percentage of time comfortable: 51.73546  
 Percentage of heat stress: 6.324201  
 Percentage of cold stress: 31.689498

This option have a horizontal shading on the top and three vertical shadings. Because after analyse option 1, one of the weak point of option 1 is it can't block sunlight from low angle. This option use three vertical shading to block more low angle sunlight.



# OPTION #3



0 37.340183  
1 12.511416

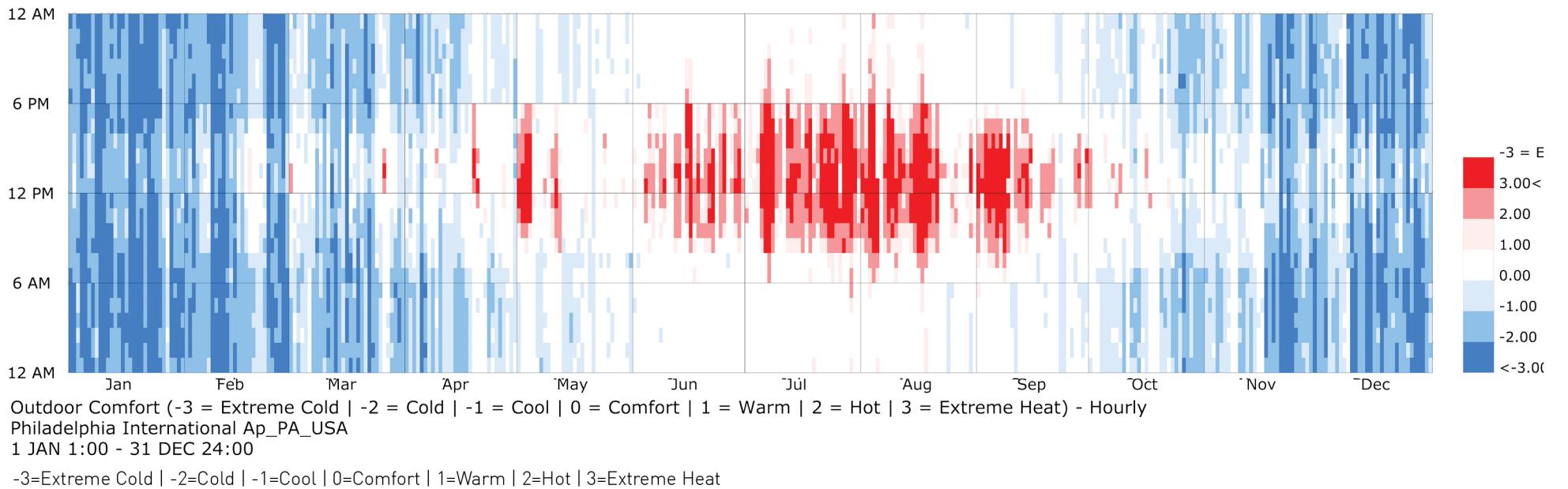
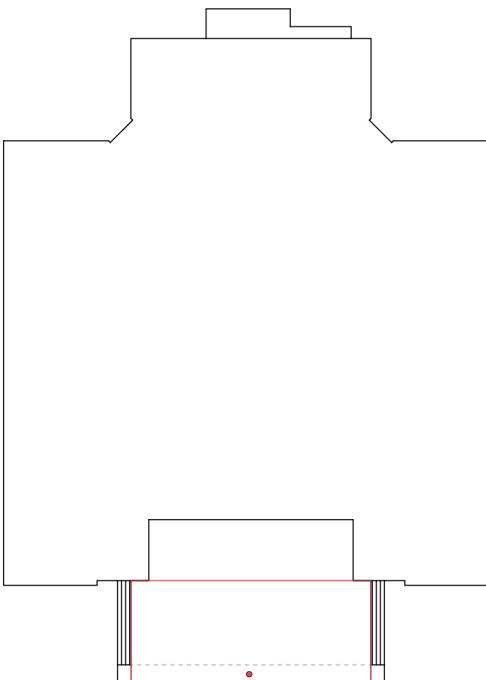
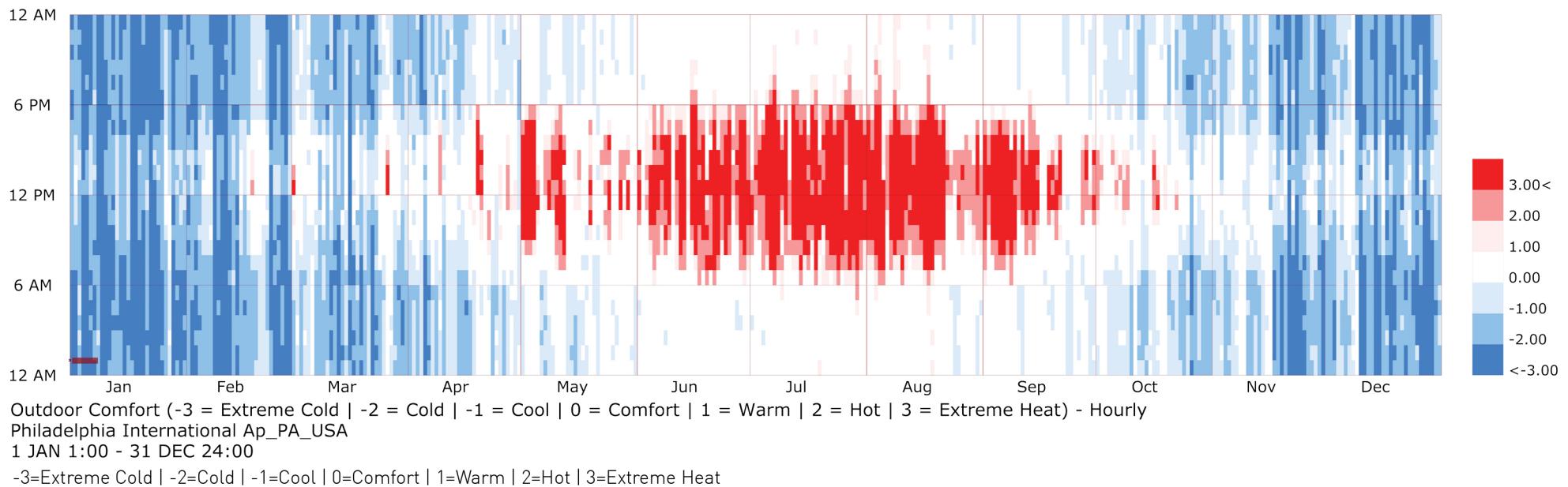
## Philadelphia

Percentage of time comfortable: 37.340183  
Percentage of heat stress: 12.511416  
Percentage of cold stress: 31.643836

## Target spot

Percentage of time comfortable: 39.942922  
Percentage of heat stress: 8.344749  
Percentage of cold stress: 31.62005

This option is generated from option 2. Option 2 has better performance in blocking low sun angle light, however, it also blocks views. In this case, the vertical shading become vertical louvers, the louver block sunlight but also provide some open views to people who sit there.



# CONCLUSION

After analysis and interview, one of the main problem of the area is that during afternoon the sunlight angle is very low and it cause glare. Thus, all those three options are intend to design shadings that can block those low angle and strong afternoon sunlight.

The reason the UTCI can't be 1 is that the shading can't block all those light and during the hot and cold days, the shading can't change the temperature.