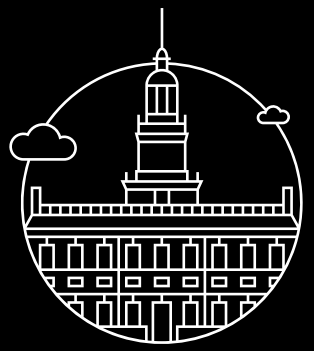
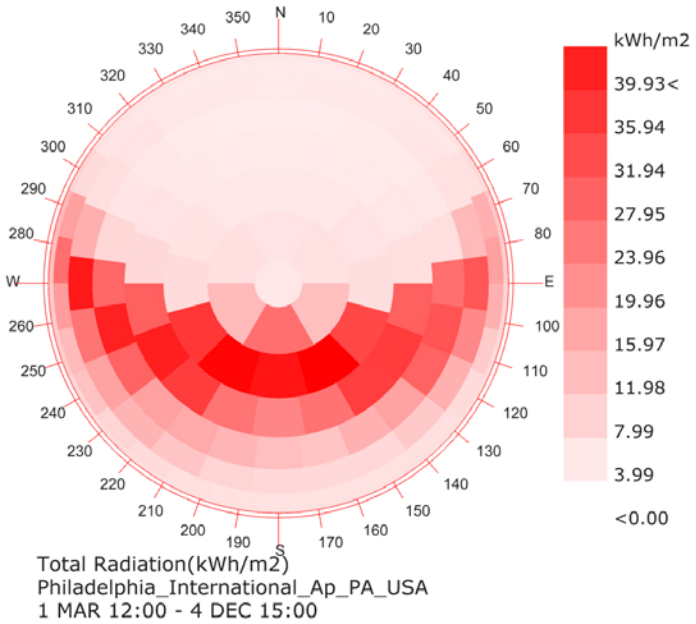
Assignment 07 | Meyerson Massing



39.87° N | 75.23° W

PennDesign
Environmental Systems I
Fall 2017
Andrew Matia

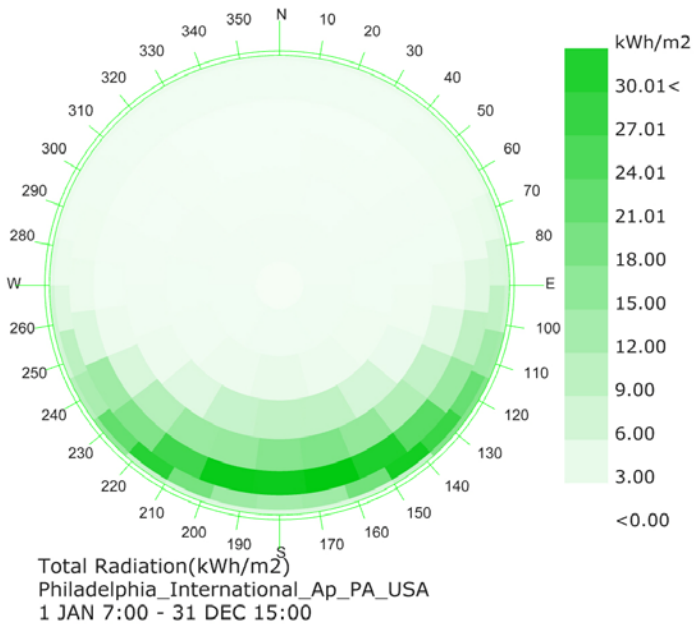
Solar Radiation Sky Dome



[clockwise from top]

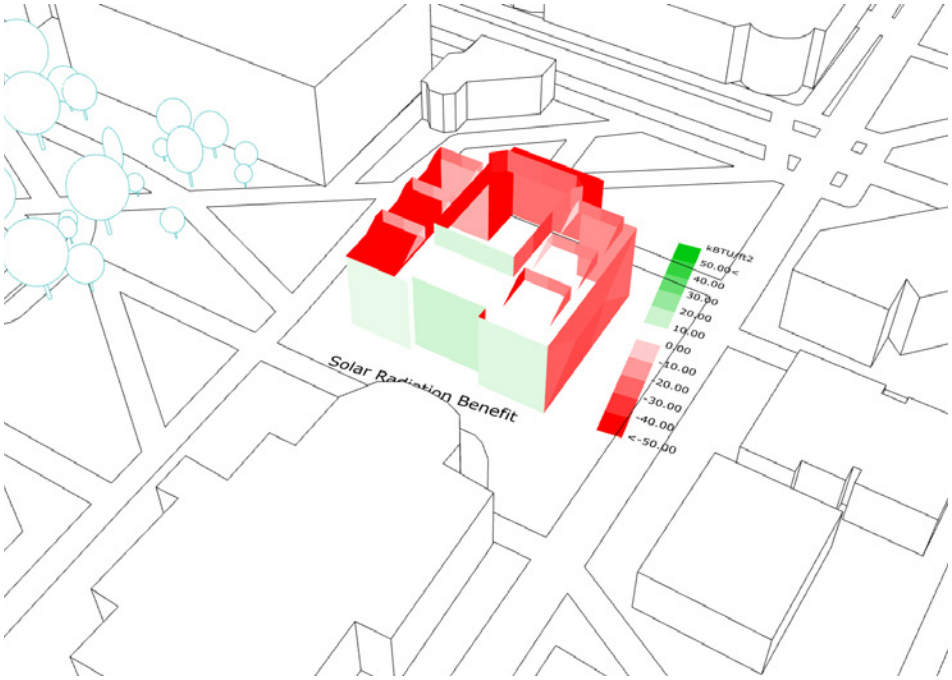
Summer Sky

Winter Sky



Meyerson Hall_Massing Original

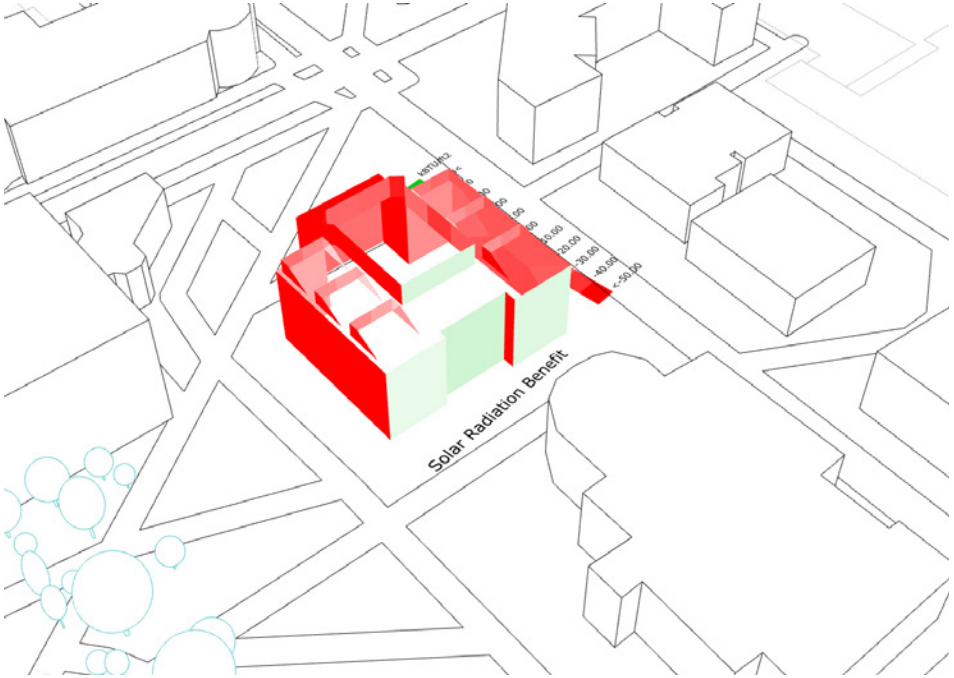
// **net solar benefit** = -3,359



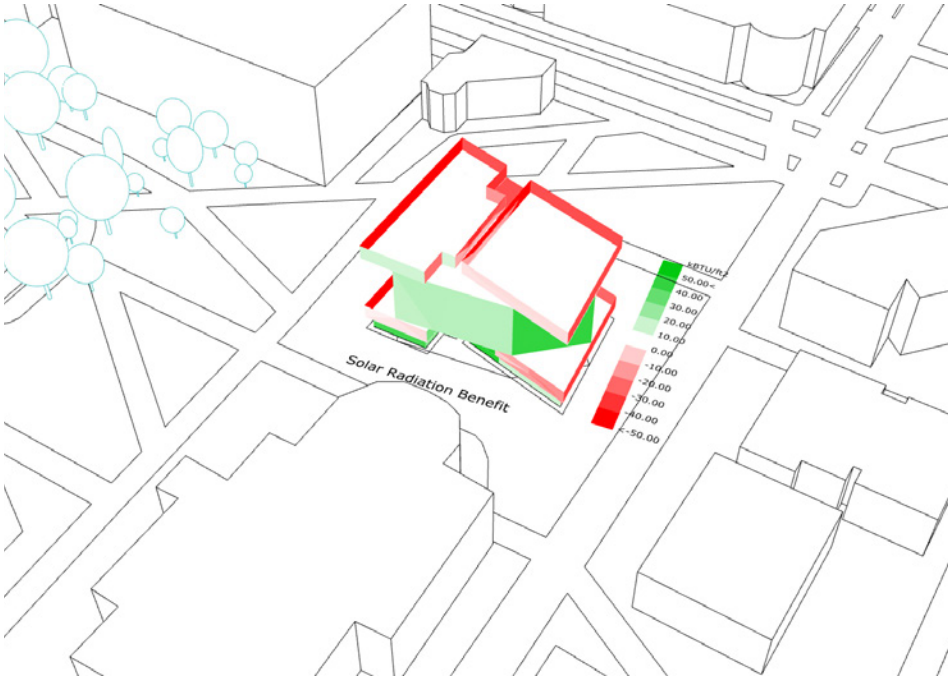
[clockwise]

View from the South-East

View from the South-West



Meyerson Hall_Massing 1

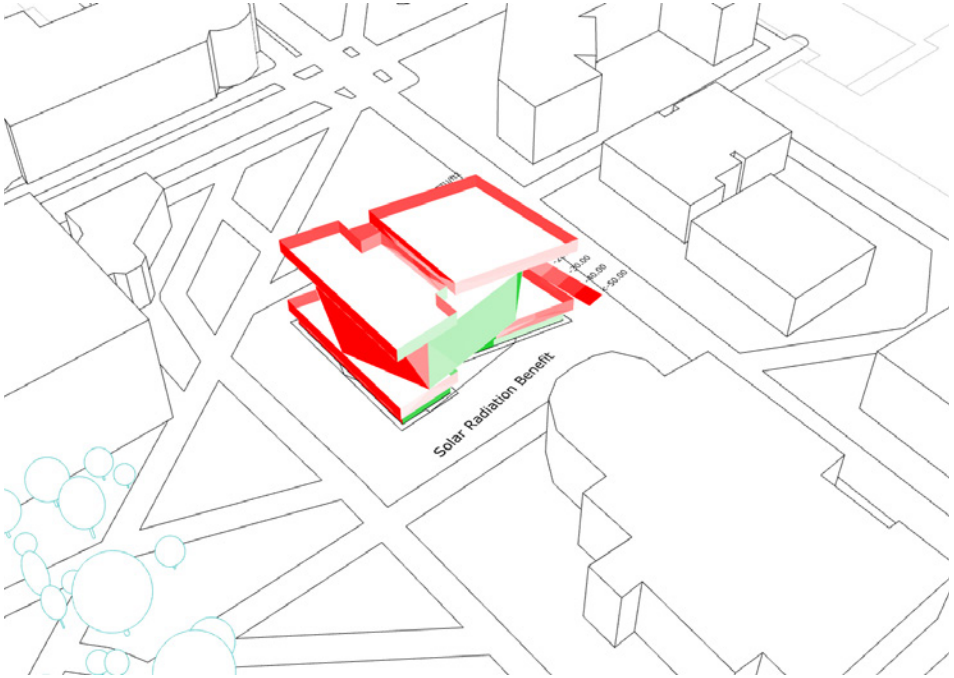


// net solar benefit = -4,749

[clockwise]

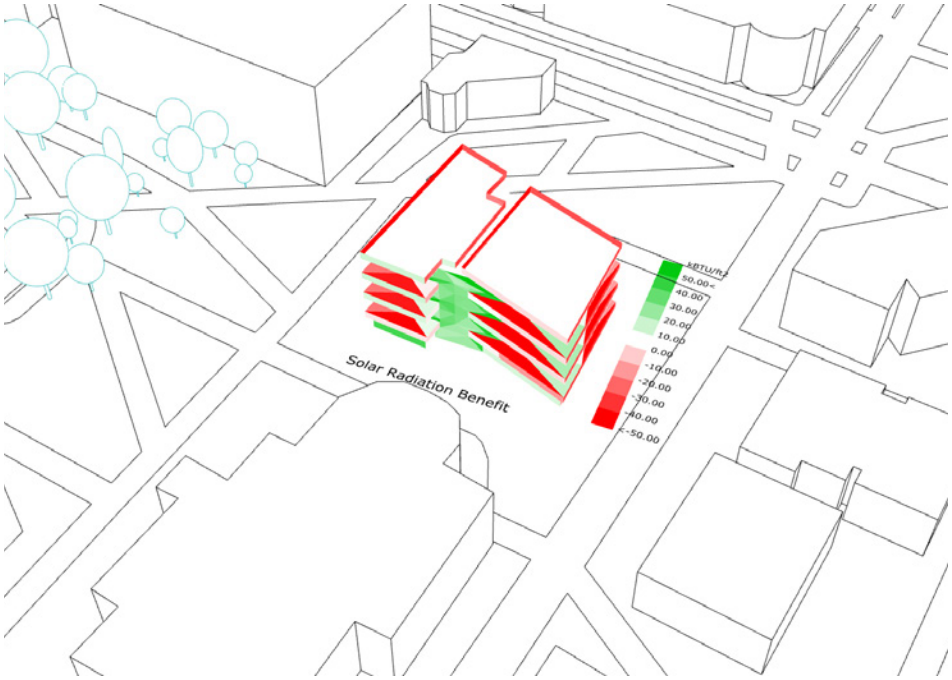
View from the South-East

View from the South-West



Meyerson Hall_Massing 2

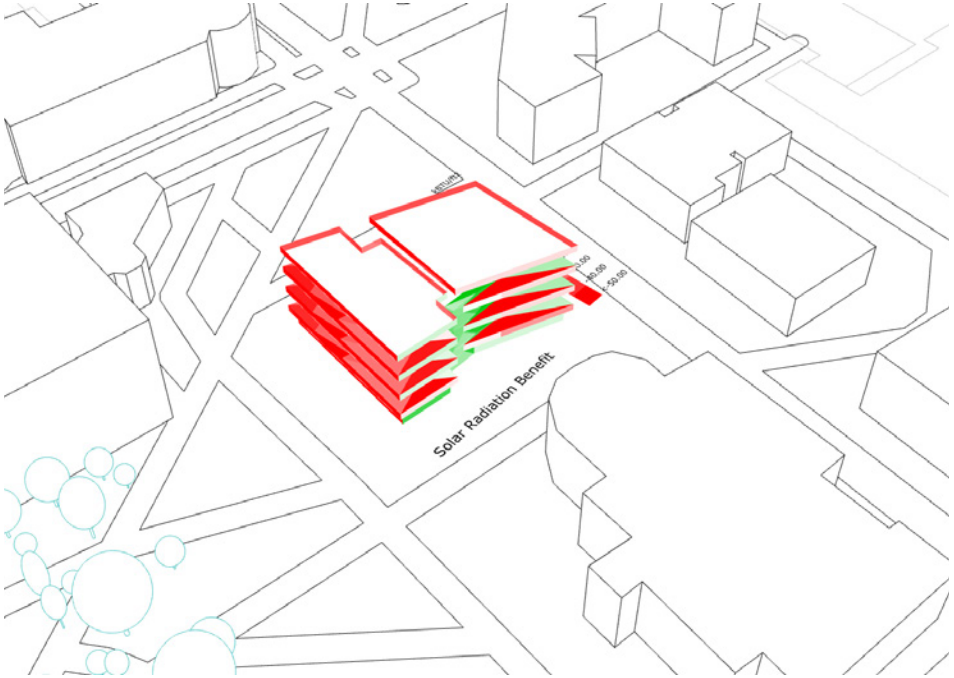
// net solar benefit = -15,113



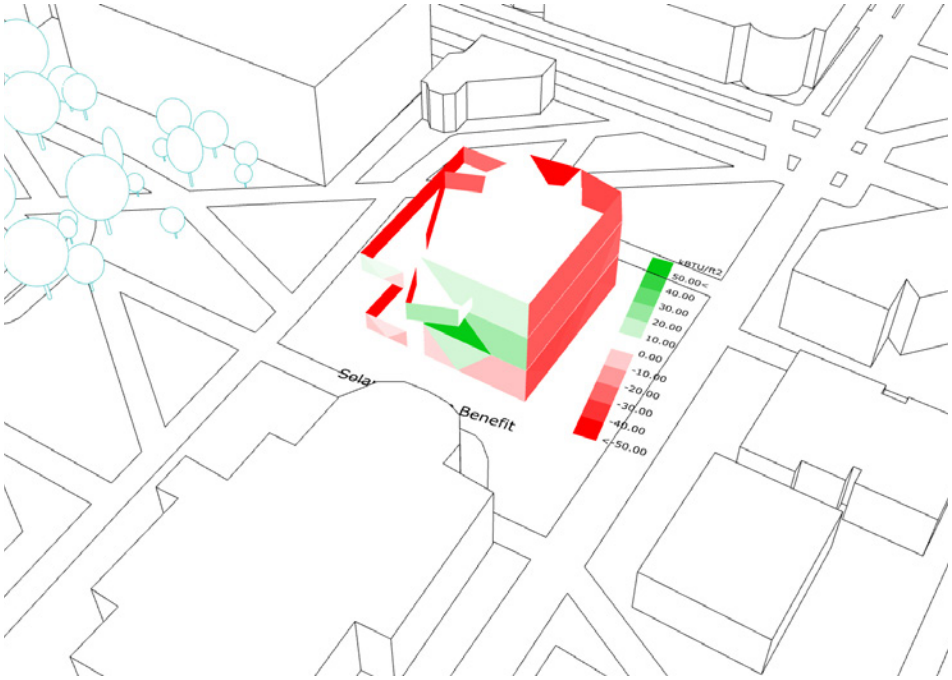
[clockwise]

View from the South-East

View from the South-West



Meyerson Hall_Massing 3

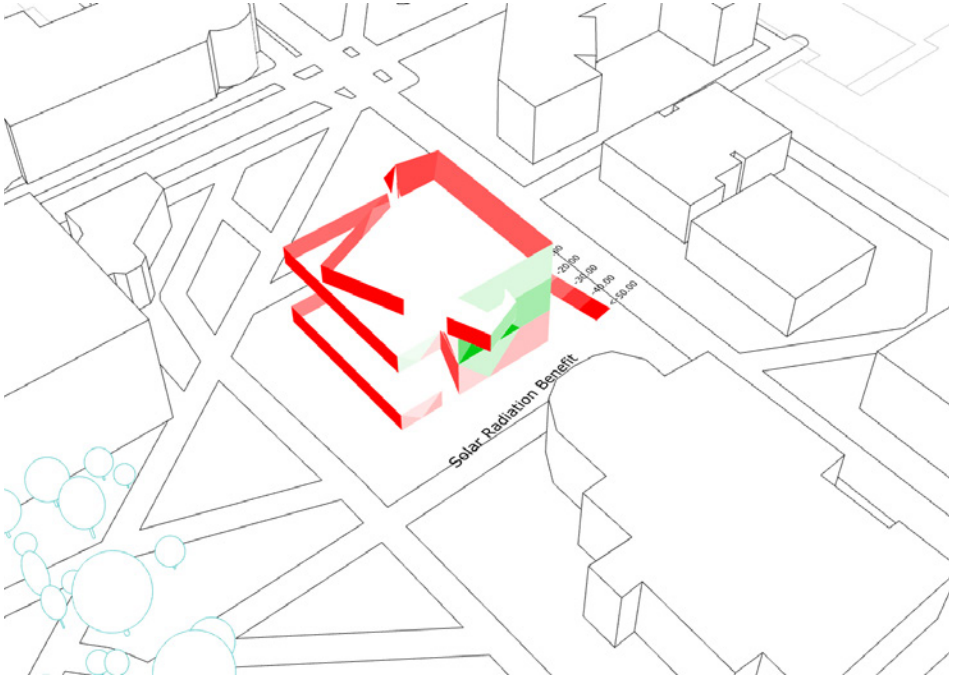


// net solar benefit = -1,734

[clockwise]

View from the South-East

View from the South-West



Net Solar Benefit

Original Mass = -4,749

New Mass = -1,1734

Total Square Area

Original Mass = 8,712 m^2

New Mass = 10,714 m^2

My initial approach to the building mass was to use the massing itself as a means to shade the building. The idea was that the elevated, larger mass on top would block out the negative summer sky but still allow the positive winter sky to hit the building facade. The first attempt showed a solar benefit that was slightly less beneficial than the orginal mass (-4,749 vs -3,359). My second attempt, to increase shading, had directly the opposite effect than what I was hoping for and decreased the solar benefit to -15,113. I think this was mostly due to a largely increased surface area that receiving harmful summer solar radiation. My third, and most successful attempt involved manipulating the mass of the building entirely. The goal of using a portion of the mass to shade the majority of the building remained the same, but I greatly increased the distance between the upper portion and the rest of the facade. This move allowed the net solar benefit to climb to -1,734. The final result is still a ways off from positive solar benefit but I think the strategy is on the right track. Further steps would involve the introduction of secondary shading devices to help control solar exposure.