WINDOWS

Total Load: 345.82

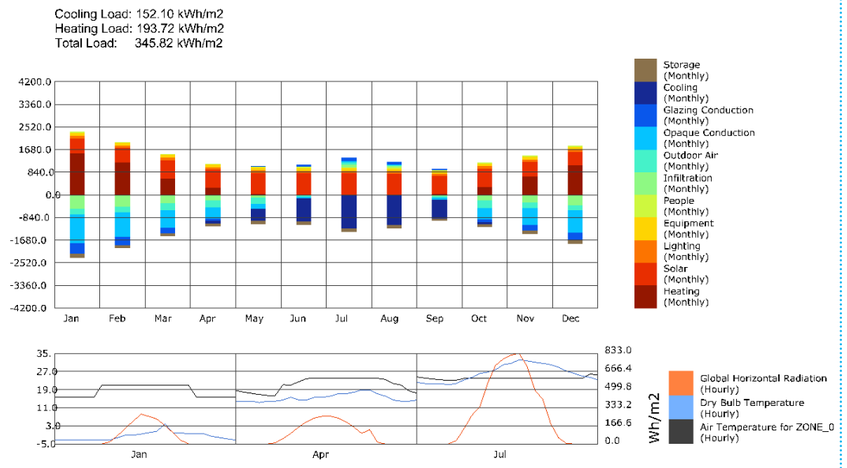
Dimensions: 12.2 x 2.4 x 2.9
WWR: 0.6 0.2 0.2 0.2
Blind Depth: No Blinds
Number of Blinds: No Blinds
Conditioned: YES

For this variable, I quickly found that removing windows entirely will of course reduce the total load, all the way to 300, for a total load reduction of 75 kWh/m2. However, since aperture plays such a crucial role in architectural design, this is typically not an option.

Therefore, I reduced the window size on the WEST and EAST facades the most, leaving more window on the NORTH, and a medium amount on the SOUTH.

This left me with a not insignificant reduction of 25 kWh/m2, resulting in a total load of 345.82 kWh/m2.

The most significant analysis variable affected by these transformations was the bright red MONTHLY SOLAR.



BLINDS

Total Load: 312.62

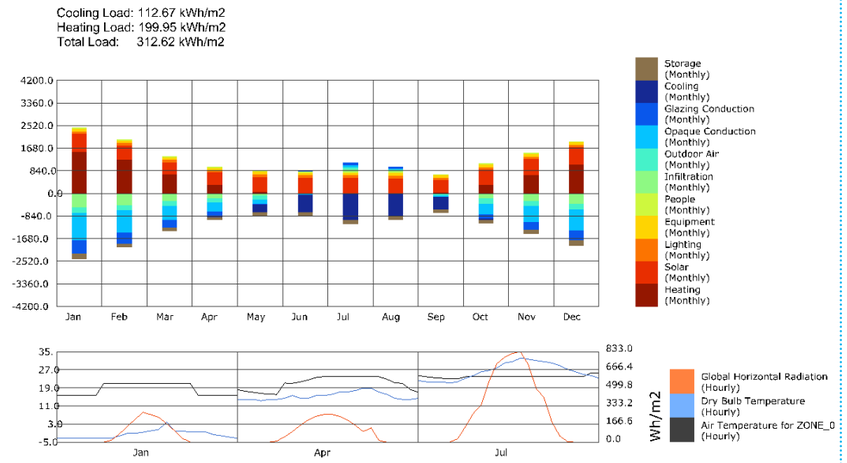
Dimensions: 12.2 x 2.4 x 2.9
WWR: 0.5 0.5 0.5 0.5
Blind Depth: 0.3
Number of Blinds: 6
Conditioned: YES

The conclusion from this study is that when it comes to blinds, bigger is NOT better. Maximizing out the number of blinds and depth of blind caused a major increase in the solar heat gain, since there was more surface area exposed to the sun.

To accomplish a good reduction of the total load, I added six blinds that were only 0.3, trying to accomplish shading without adding too much visual obstruction or heat gain. Interestingly, adding four more blinds to make ten blinds total didn't decrease the total load more than 3, making that a less significant variable.

In this analysis, I was able to reduce the total load by 63 kWh/m2, resulting in a total load of 312.62 kWh/m2.

The most significant analysis variable affected by these transformations was the bright red MONTHLY SOLAR.



CONSTRUCTION

Total Load: 302.47

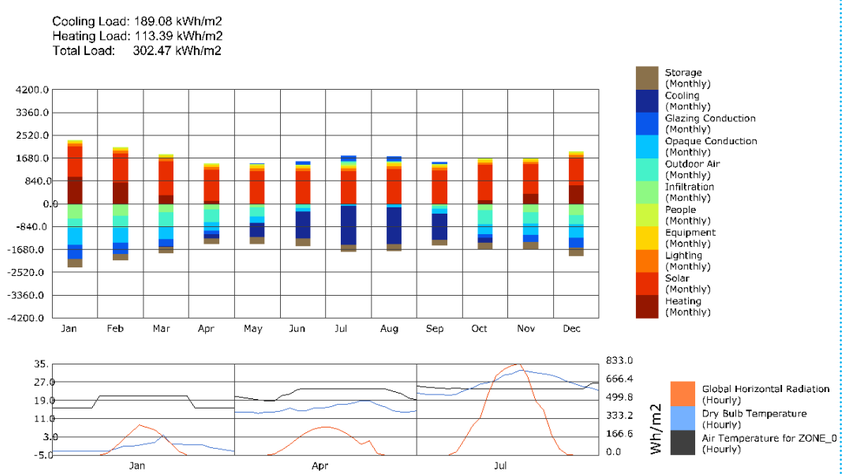
Dimensions: 12.2 x 2.4 x 2.9
WWR: 0.5 0.5 0.5 0.5
Blind Depth: No Blinds
Number of Blinds: No Blinds
Conditioned: YES

This variable was simple enough: I just maxed out the R-Value available for construction. This was by far the most significant reduction of load yet.

In this analysis, I was able to reduce the total load by 73 kWh/m2, resulting in a total load of 302.47 kWh/m2.

The most significant analysis variable affected by these transformations was the light blue OPAQUE CONDUCTION.

There was also a reduction of heating and cooling load, due to the increased insulation value.



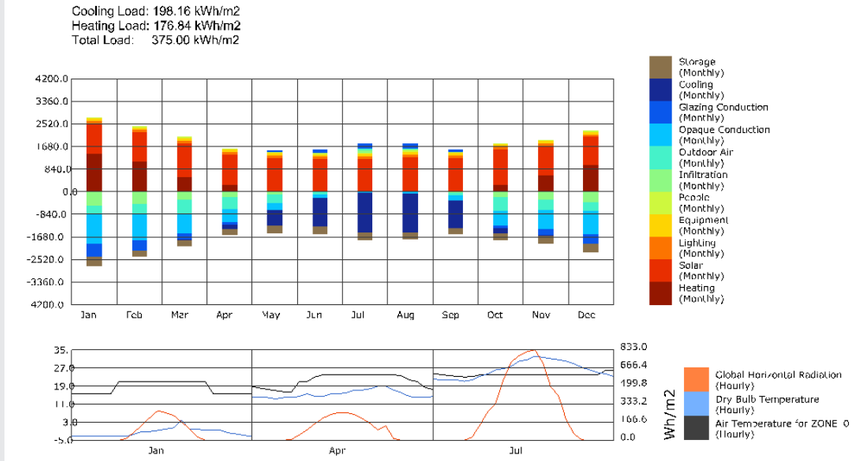
THERMAL MASS

Total Load: 375.00

Dimensions: 12.2 x 2.4 x 2.9
WWR: 0.5 0.5 0.5 0.5
Blind Depth: No Blinds
Number of Blinds: No Blinds
Conditioned: YES

My conclusion from this study was that Thermal Mass is the least significant impact on Total Load.

I used the 8in Thermal Mass construction, and saw no decrease in overall load.



COMBINED

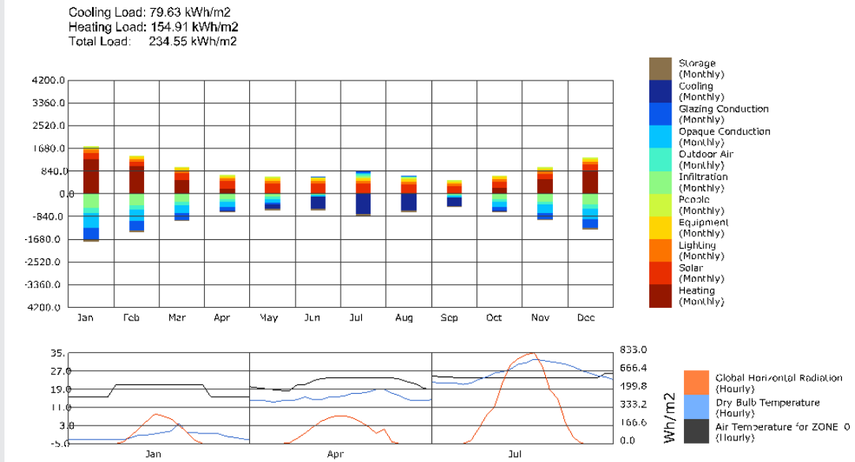
Total Load: 234.55

Dimensions: 12.2 x 2.4 x 2.9
WWR: 0.6 0.2 0.2 0.2
Blind Depth: 0.3
Number of Blinds: 6
Conditioned: YES

Combining the variables from each of the studies prior (except Thermal Mass) resuted in the expected reduction of Total Load.

In this analysis, I was able to reduce the total load by 141 kWh/m2, resulting in a total load of 234 kWh/m2.

The least significant analysis variable affected by these transformations was the dark red MONTHLY HEATING



COMBINED+NO CONDITIONING

TempRange At Zone : 0<x<38+

Dimensions: 12.2 x 2.4 x 2.9
WWR: 0.6 0.2 0.2 0.2
Blind Depth: 0.3
Number of Blinds: 6
FREE RUNNING

Removing the conditioning systems from this building increases the temp range from 15<x<27 degrees celsius, to a much more radical 0<x<38+ degrees celsius.

In conclusion, the most significant variable I was able to change was the CONSTRUCTION, but when used in conjunction with BLINDS and WINDOW RATIO, it was the most effective.