ARCH-753-001 Building Performance Simulation

Energy Simulation Report

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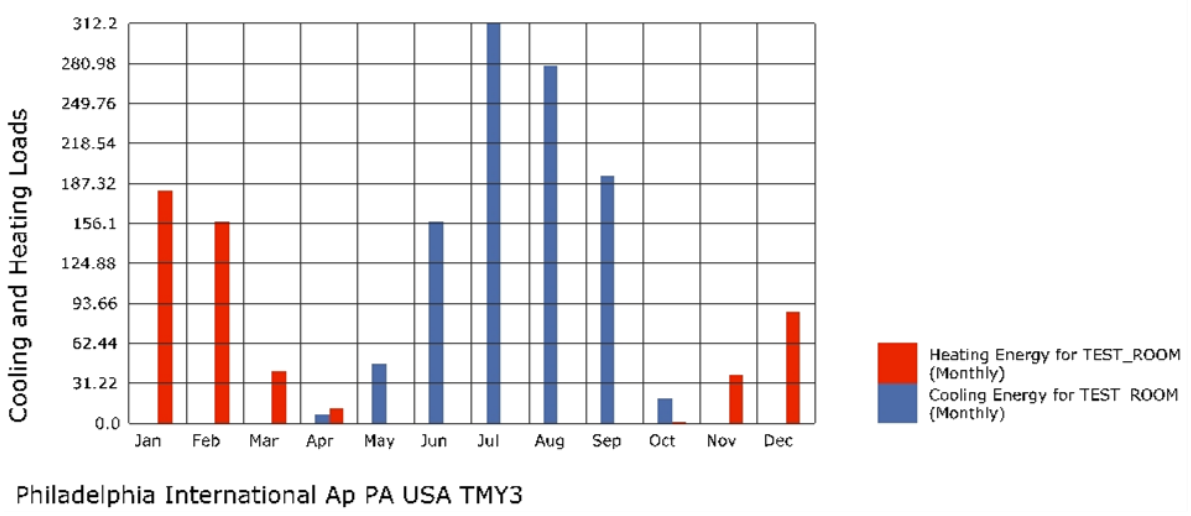
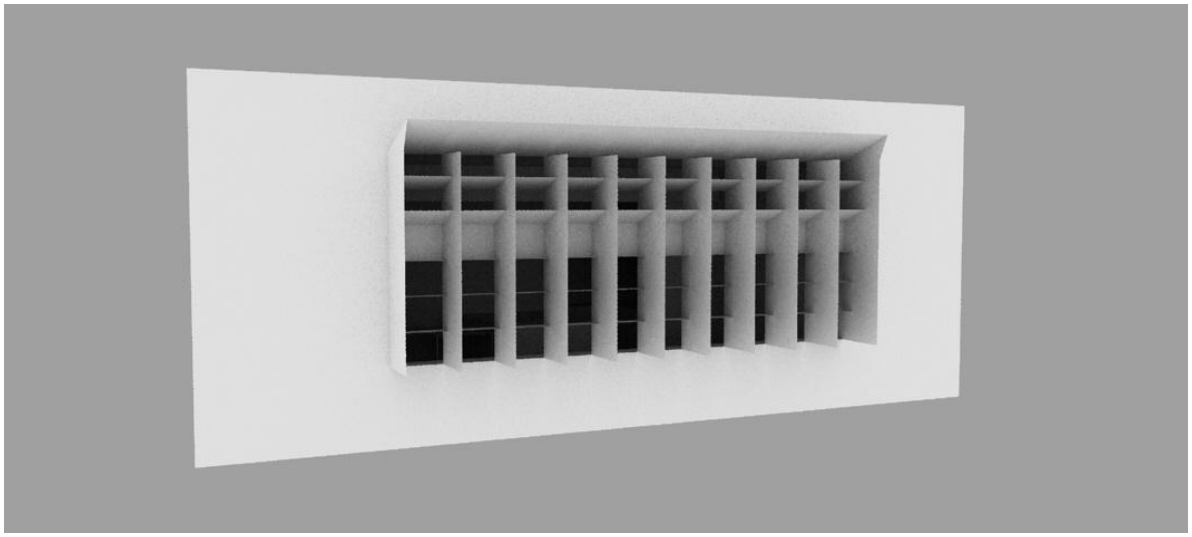
2 November 2015

Base Design Energy Simulation

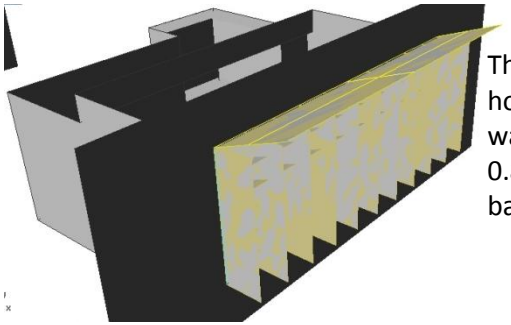




The initial design energy simulation shows total heating and cooling load of 1531.
Heating Load: 515
Cooling Load: 1016

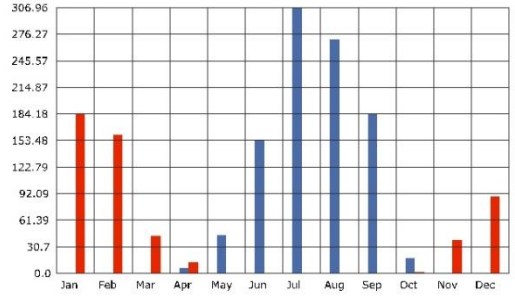
Design transformation process

- To reach an optimum design for cooling and heating loads many different alternatives were tried and simulated.
- The challenge is to design for an optimum scenario which shading is reducing the cooling load while is not causing heating load in cold seasons.
- However, even in best scenario, the heating load did not go below 867 and cooling load below 505.

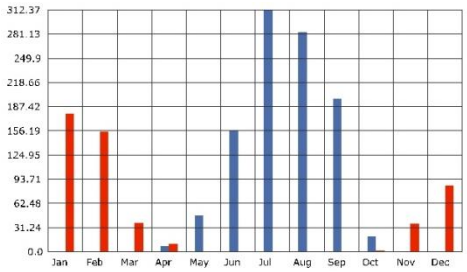


The first upper horizontal shade was extended from 0.85m to 1.30m based on the VSA.

Fourth horizontal shade was rotated 20 for an optimum result.



Heating load:530.66
Cooling Load:984.94

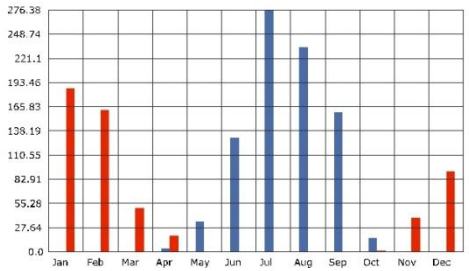


Heating load:503.60
Cooling Load:1026.47

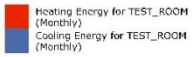
Design transformation process
Best alternative result

- Best result of total heating and cooling load was 1373.51.

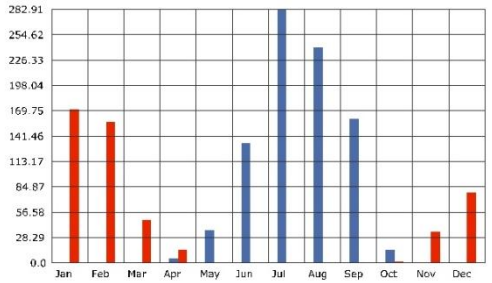
Added to all strategies applied in previous alternates In this last alternative the angle of the upper horizontal shade was changed to 30 which is the maximum angle for optimum horizontal shade.



Last design alternative was causing much heating load due to the shading.
In this alternative the 4 middle vertical shades are narrower to their half width.

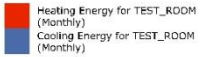


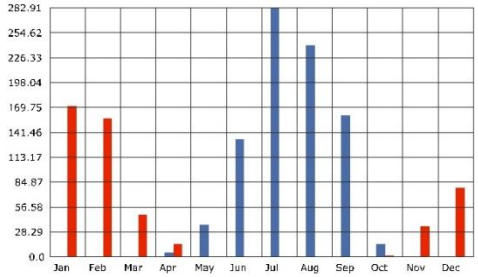
Heating load:477.40
Cooling Load:918.19



Fourth horizontal shade was rotated 20 for an optimum result.

Heating load:549.57
Cooling Load:855.32





Heating load:506
Cooling Load:867.51