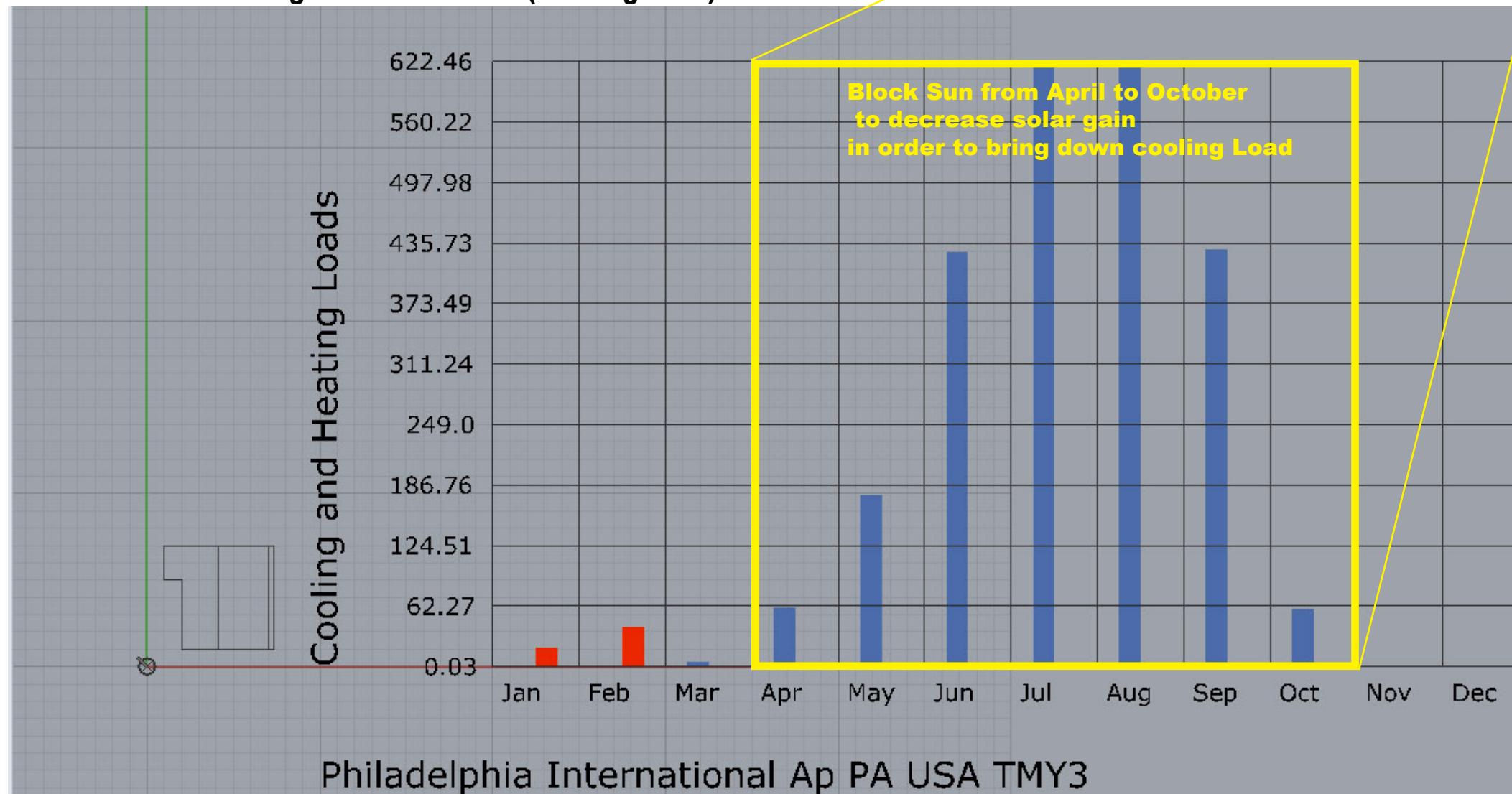


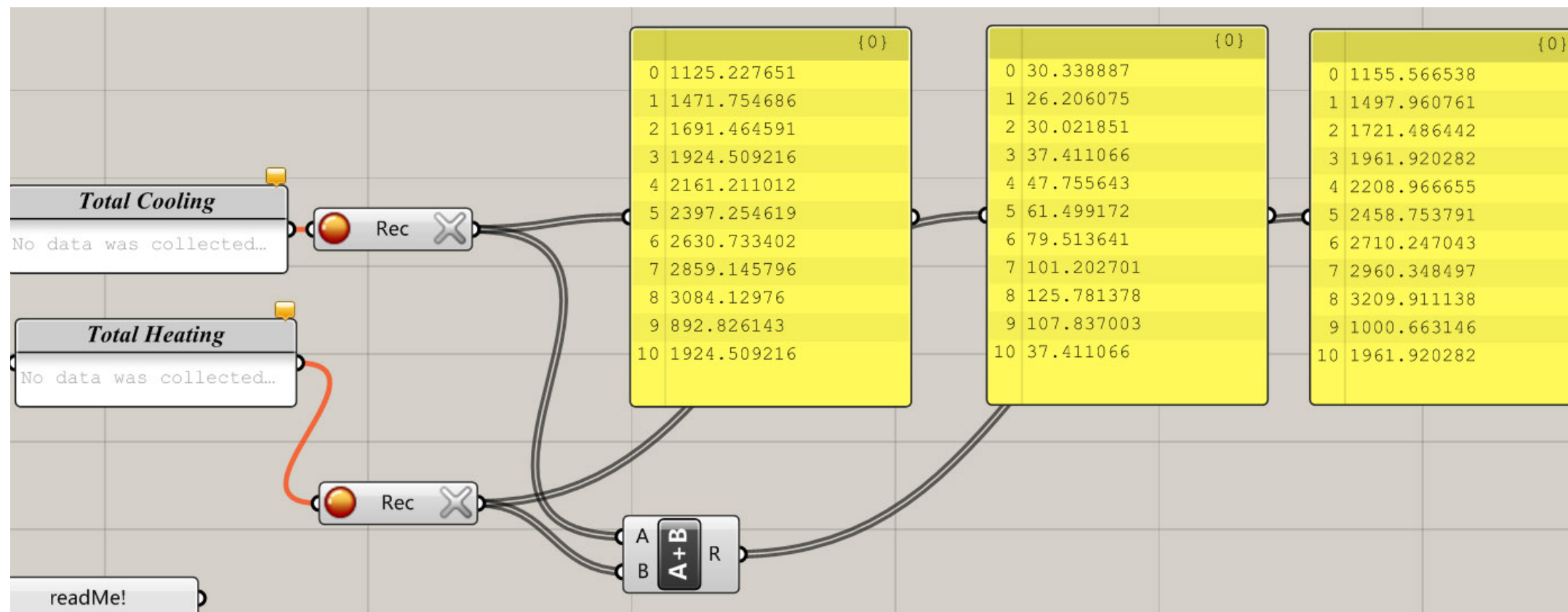
## 1 OVERALL STRATEGY:

First, Select the **Glass Surface Area** with **Smallest Total Load**, then **design shading** for this area to decrease **harmful solar gain** in order to further bring down **Total Load** (Cooling Load).



**Window to Wall Ratio =  $R$**   
No Glass, When  $R=0$ , Total Load = 821  
All Glass, When  $R=1$ , Total Load = 2701  
The Load is between 821 to 2701

**Heating Energy for TEST\_ROOM (Monthly)**  
**Cooling Energy for TEST\_ROOM (Monthly)**



## 2 Select the Glass Surface Area with Smallest Total Load:

Do simulation for 9 different Ratio from 0.1-0.9,

Select **0.2, 0.3** senario for further Study,

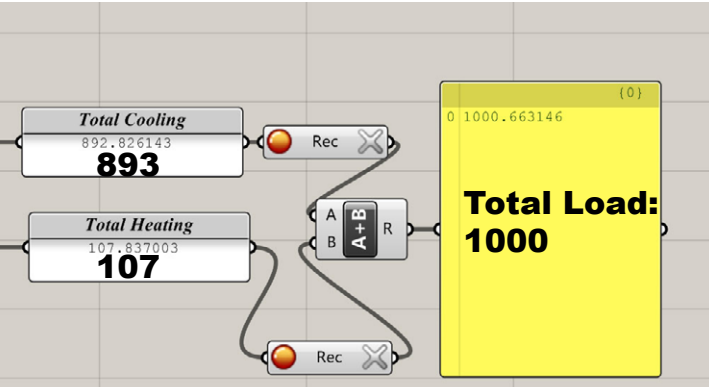
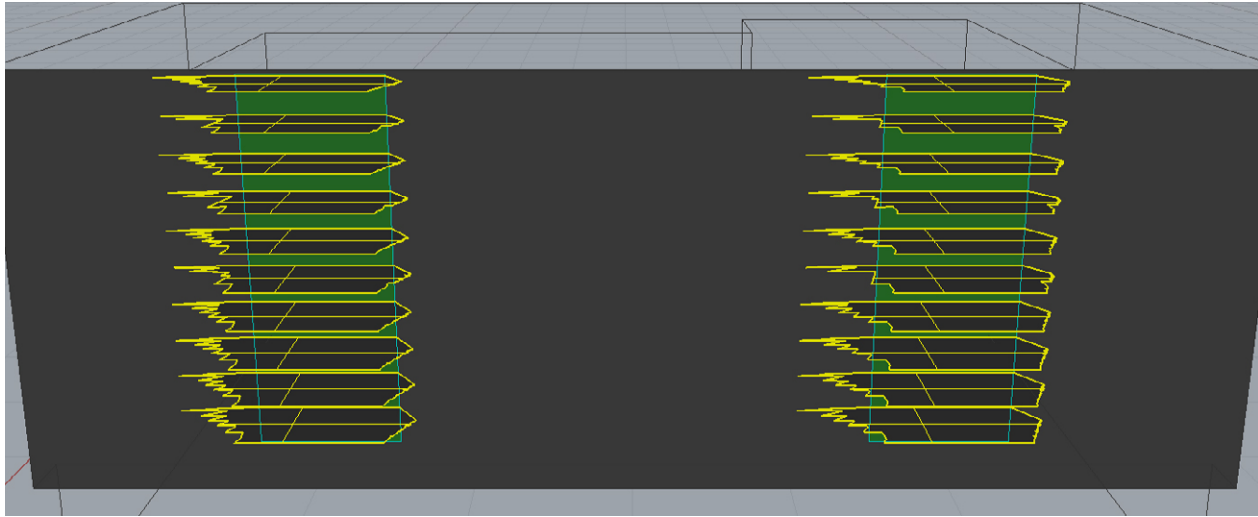
Since They have the **Smallest Heat-ing Load,**

In the next Step, just need to bring down the cooling load

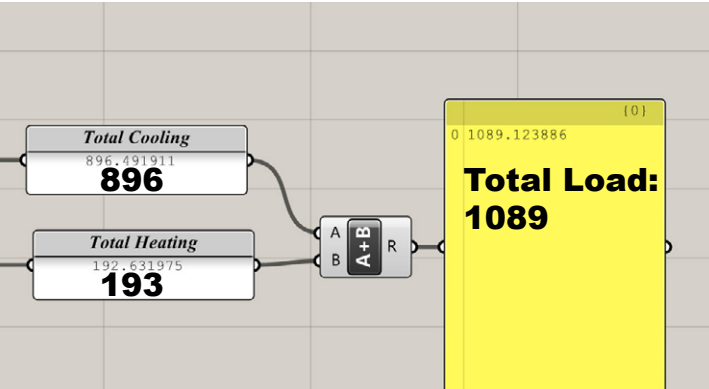
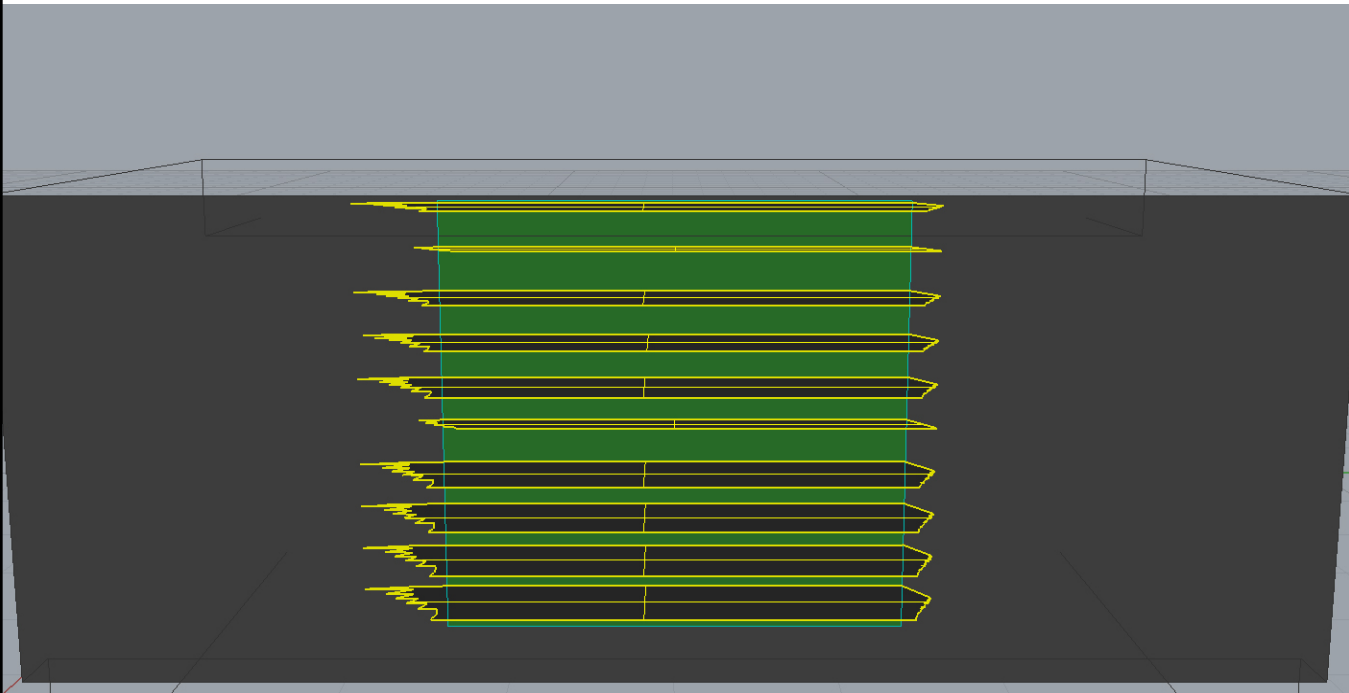
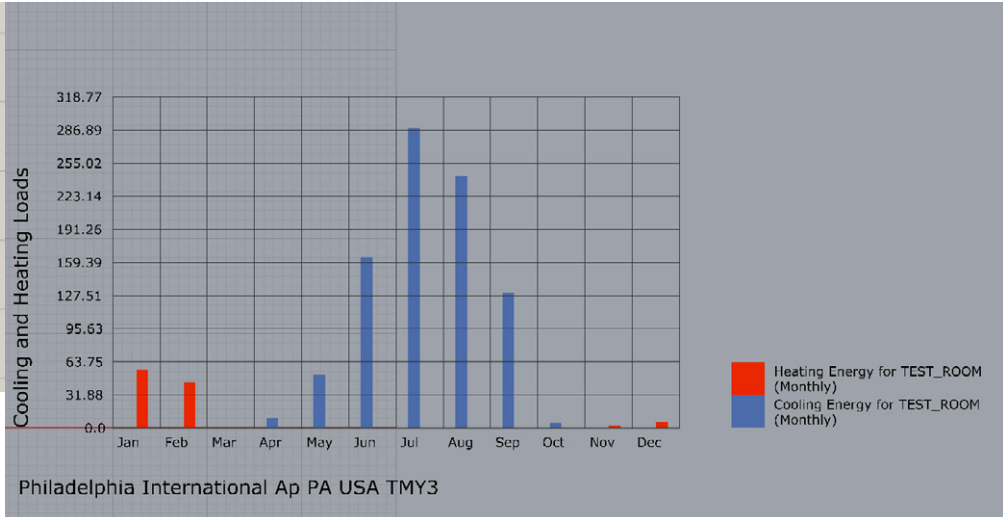
<b>R</b>	Total Cooling {0}		Total Heating {0}		Total Load {0}	
<b>0.1</b>	1125.227651	<b>1125</b>	30.338887	<b>30</b>	1155.566538	<b>1155</b>
<b>0.2</b>	1471.754686	<b>1471</b>	26.206075	<b>26</b>	1497.960761	<b>1497</b>
<b>0.3</b>	1691.464591	<b>1691</b>	30.021851	<b>30</b>	1721.486442	<b>1721</b>
<b>0.4</b>	1924.509216	<b>1924</b>	37.411066	<b>37</b>	1961.920282	<b>1961</b>
<b>0.5</b>	2161.211012	<b>2161</b>	47.755643	<b>47</b>	2208.966655	<b>2208</b>
<b>0.6</b>	2397.254619	<b>2397</b>	61.499172	<b>61</b>	2458.753791	<b>2458</b>
<b>0.7</b>	2630.733402	<b>2630</b>	79.513641	<b>79</b>	2710.247043	<b>2710</b>
<b>0.8</b>	2859.145796	<b>2859</b>	101.202701	<b>101</b>	2960.348497	<b>2960</b>
<b>0.9</b>	3084.12976	<b>3084</b>	125.781378	<b>125</b>	3209.911138	<b>3209</b>

\*R=0.1 has the lowest Total Load. However, the glass area is too small for Apartment( Not Enough Daylighting) .

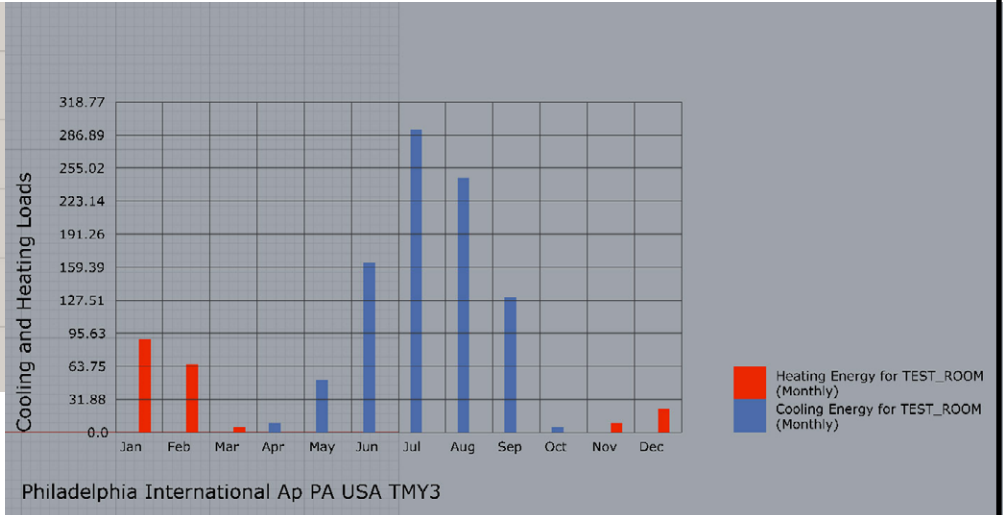
Based on my experience in my own apartment which R value=0.25, I thought 0.2-0.3 is fine for Daylighting.



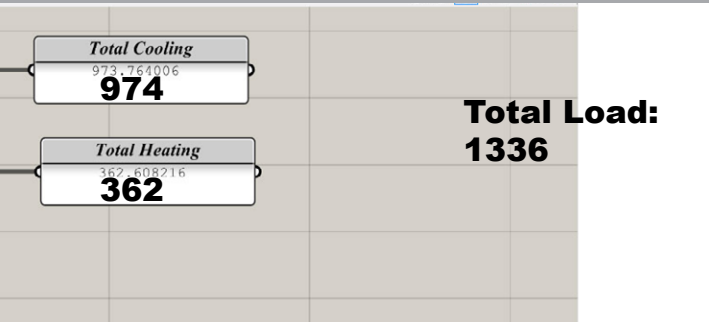
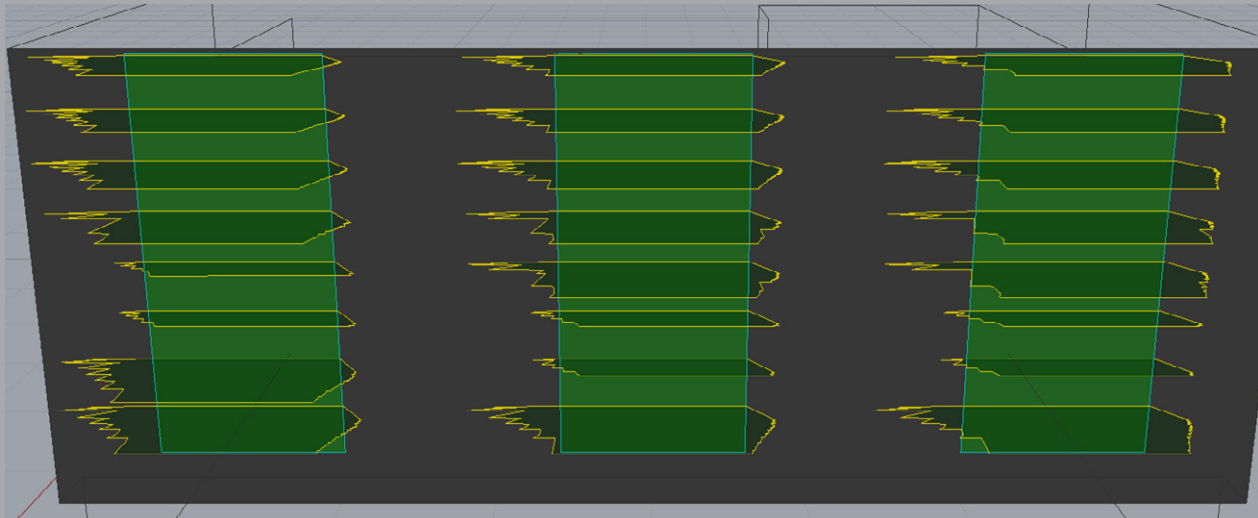
**0.2 Window/Wall Ratio,  
Probably not enough Daylighting  
Lowest Total Load**



**0.3 Window/Wall Ratio,  
Enough Daylighting  
Low Total Load**



## Comparison



**0.6 Window/Wall Ratio,  
Enough Daylighting  
Higher Total Load**

