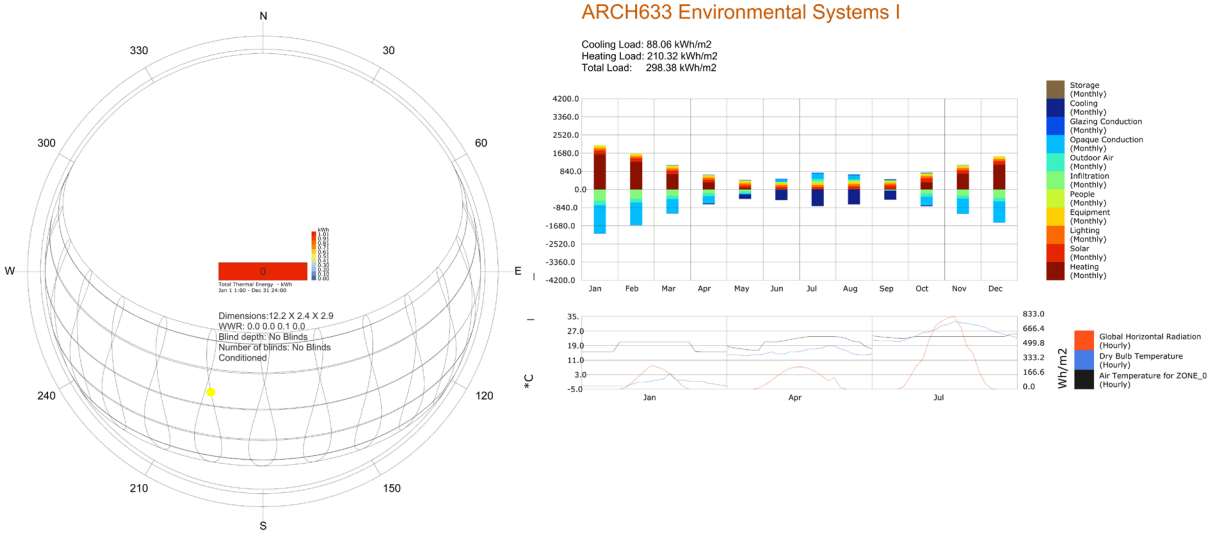


Sun-Path Diagram - Latitude: 39.87
1 APR 13:00, ALT = 52.88, AZM = 203.29

SETTINGS
WWR-N 0.0
WWR-W 0.0
WWR-S 0.1
WWR-E 0.0

BLINDS
OFF

EXTERIOR WALL R5.5
EXTERIOR WINDOW R0.7, SHGC 0.65
EXTERIOR ROOF R9.2

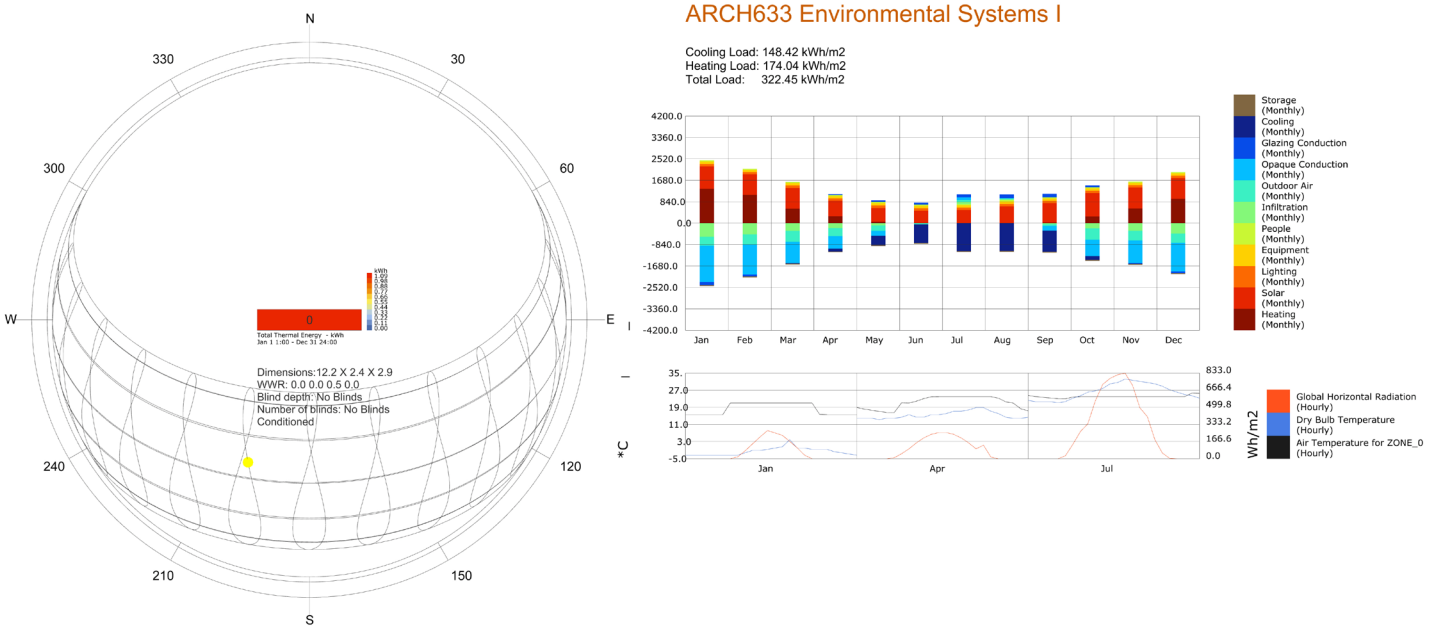
AIRCHANGEHOUR 2.00
EXISTING SLAB CONSTRUCTION
SYSTEM TRUE
ZONE NUMBER 0

MONTH 4
DAY 1
HOUR 13

COOLING LOAD: 88.06 kWh/m2
HEATING LOAD: 210.32 kWh/m2
TOTAL LOAD: 298.38 kWh/m2

THESE ARE THE SETTINGS I WILL BEGIN WITH AND USE AS A REFERENCE POINT. ACCORDING TO THE GRAPHS, THE COOLING LOAD IS 88.06 kWh/m2, THE HEATING LOAD 210.32 kWh/m2, and TOTAL LOAD 298.38 kWh/m2.

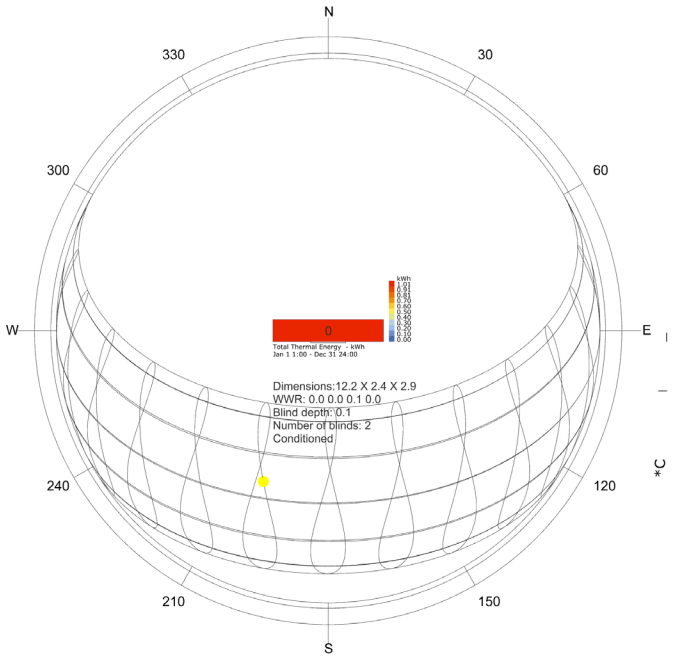
My hypothesis is that the blinds and wall to window numbers will be the most influential elements. The thermal mass however will probably not make too much of an impact.
note* system is on



Sun-Path Diagram - Latitude: 39.87
1 APR 13:00, ALT = 52.88, AZM = 203.29

COOLING LOAD: 148.42 kWh/m2
HEATING LOAD: 174.04 kWH/m2
TOTAL LOAD: 322.45 kWh/m2

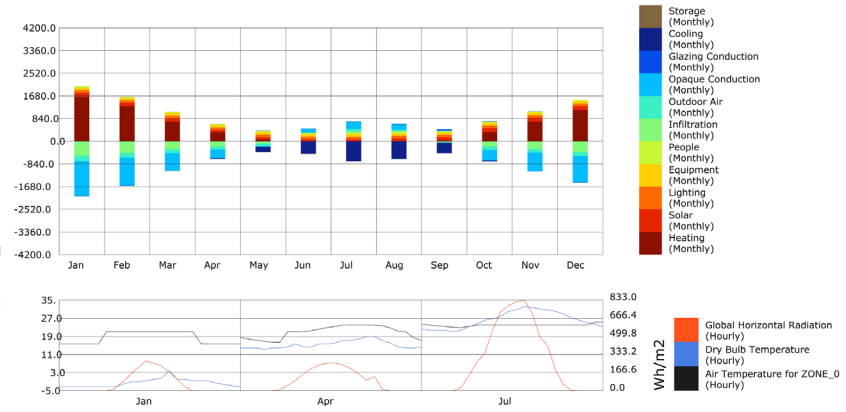
IN THIS SCENARIO, I INCREASED WWR-S 0.5 WHICH INCREASED THE TOTAL LOAD TO 298.38 kWh/m2.



Sun-Path Diagram - Latitude: 39.87
1 APR 13:00, ALT = 52.88, AZM = 203.29

ARCH633 Environmental Systems I

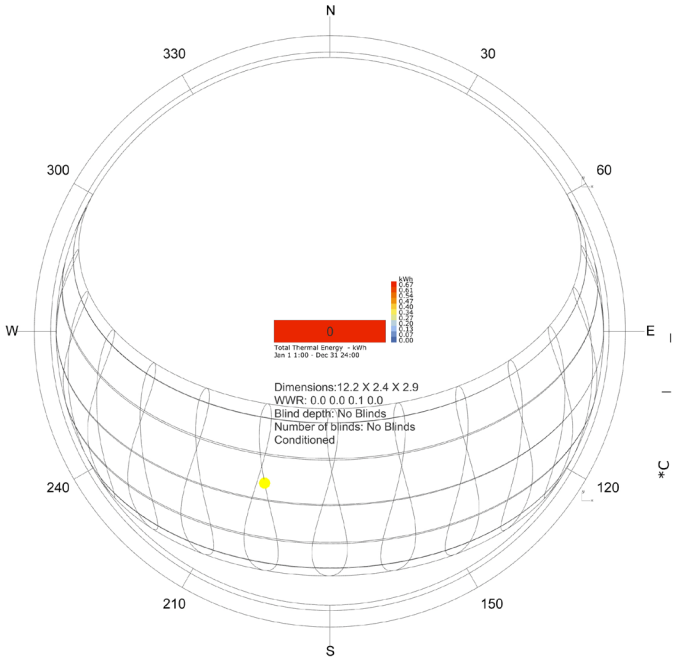
Cooling Load: 83.60 kWh/m2
Heating Load: 213.10 kWh/m2
Total Load: 296.70 kWh/m2



COOLING LOAD: 83.60 kWh/m2
HEATING LOAD: 213.10 kWH/m2
TOTAL LOAD: 296.70 kWh/m2

IN THIS SCENARIO, I ADDED BLINDS WITH A SHADE DEPTH OF .1 AND 2 BLINDS. THE COOLING LOAD DECREASED AND THE HEATING LOAD INCREASED FROM 210.32 kWh/m2 to 213.10 kWH/m2.

ONE OF THE MOST NOTICEABLE CHANGES IS THAT THE MONTHLY HEATING SEEMS TO HAVE INCREASED, IN THIS SCENARIO.



Sun-Path Diagram - Latitude: 39.87
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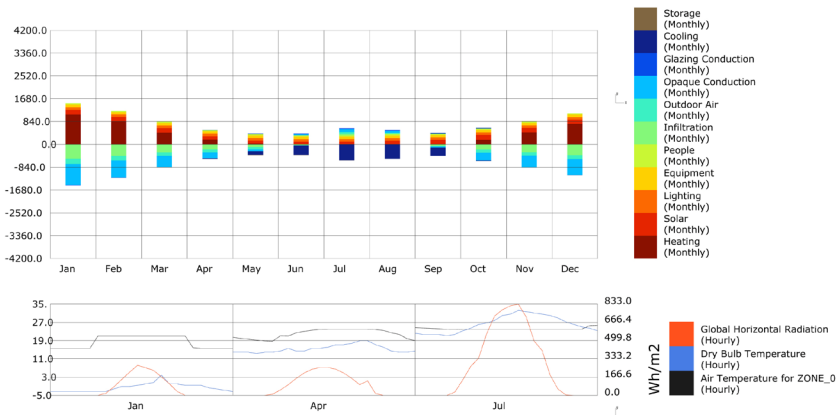
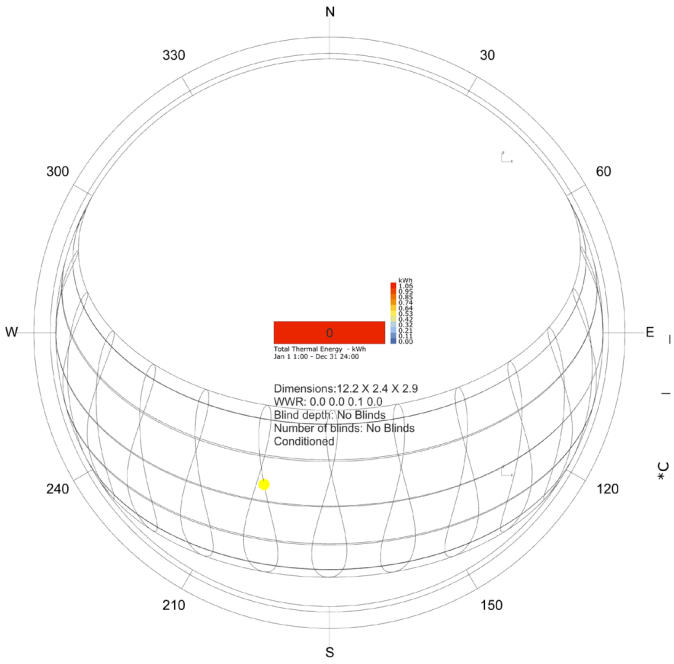
ARCH633 Environmental Systems I

Cooling Load: 65.56 kWh/m2
Heating Load: 133.17 kWh/m2
Total Load: 198.74 kWh/m2



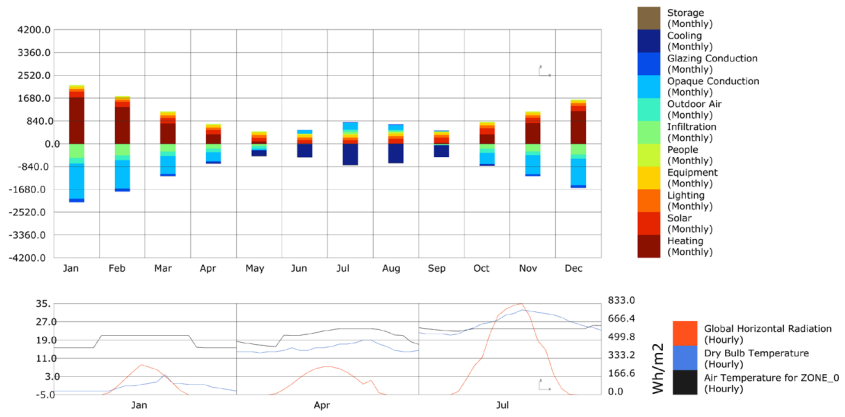
COOLING LOAD: 65.56 kWh/m2
HEATING LOAD: 133.17 kWH/m2
TOTAL LOAD: 198.74 kWh/m2

IN THIS SCENARIO, THE TOTAL LOAD DECREASED FROM THE ORIGINAL 298.38 IN THE FIRST SCENARIO, TO 198.74 kWh/m2. I CHANGED THE EXTERIOR WALL TO R34.4. THIS SIGNIFICANTLY DECREASED THE TOTAL LOAD, LOWERING THE COOLING LOAD TO 65.56 kWh/m2
AND THE HEATING LOAD TO 133.17 kWH/m2.
ONE OF THE MOST NOTICEABLE CHANGES IS THAT THE MONTHLY HEATING SEEMS TO HAVE INCREASED, IN THIS SCENARIO.



ARCH633 Environmental Systems I

Cooling Load: 91.12 kWh/m2
Heating Load: 221.47 kWh/m2
Total Load: 312.59 kWh/m2



Sun-Path Diagram - Latitude: 39.87
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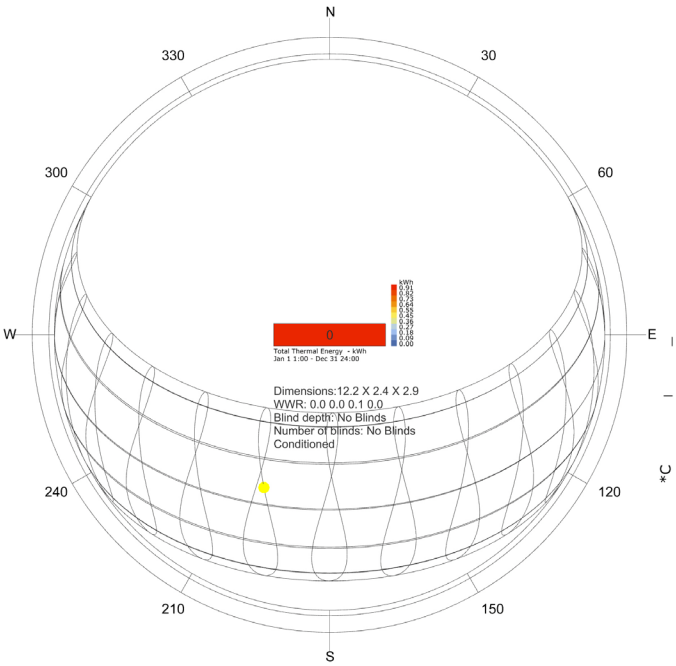
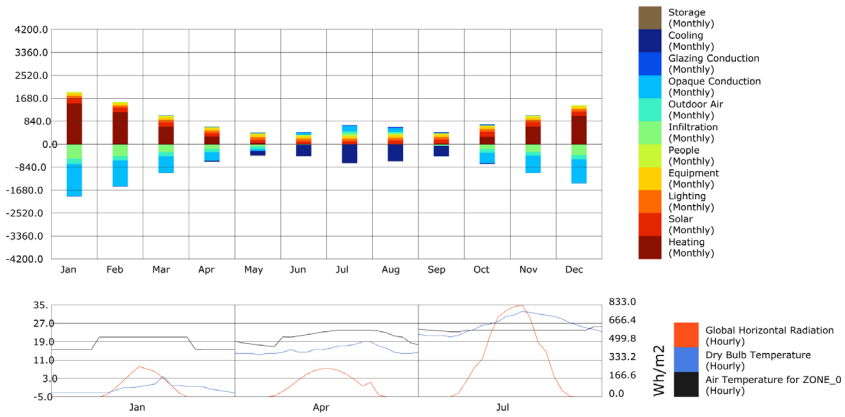
COOLING LOAD: 91.12 kWh/m2
HEATING LOAD: 221.47 kWH/m2
TOTAL LOAD: 312.59 kWh/m2

IN THIS SCENARIO, I CHANGED THE EXTERIOR WINDOW TO R1.0, SHGC 0.7. IN. THE VALUE OF THE TOTAL LOAD INCREASED AGAIN, THE COOLING AND HEATING LOAD INCREASED.



ARCH633 Environmental Systems I

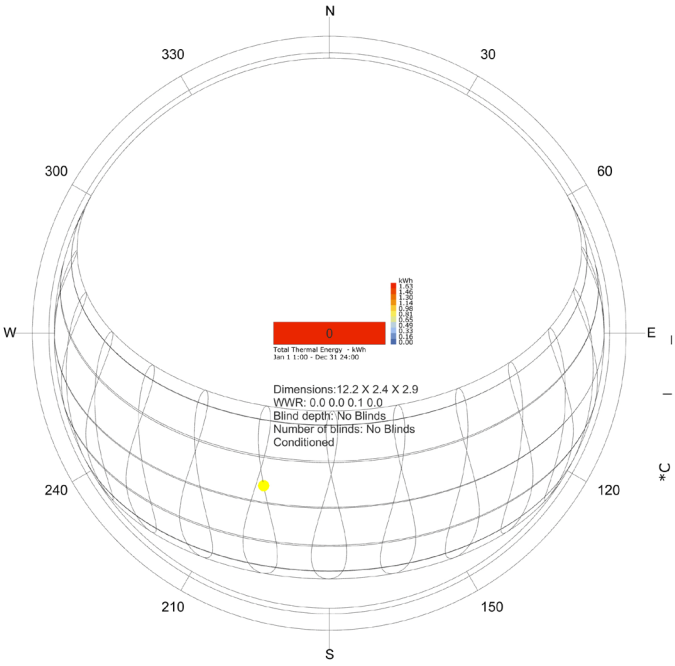
Cooling Load: 78.64 kWh/m2
Heating Load: 189.37 kWh/m2
Total Load: 268.00 kWh/m2



Sun-Path Diagram - Latitude: 39.87
1 APR 13:00, ALT = 52.88, AZM = 203.29

COOLING LOAD: 78.64 kWh/m2
HEATING LOAD: 189.37 kWH/m2
TOTAL LOAD: 268.00 kWh/m2

IN THIS SCENARIO, I CHANGED THE EXTERIOR ROOF TO R34.4 WHICH DECREASED THE TOTAL LOAD TO 268.00 kWh/m2. THE COOLING AND HEATING LOADS BOTH DECREASED INDIVIDUALLY. THE GRAPHS IN THIS SCENARIO LOOK QUITE SIMILAR TO THE ORIGINAL SCENARIO HOWEVER.



Sun-Path Diagram - Latitude: 39.87
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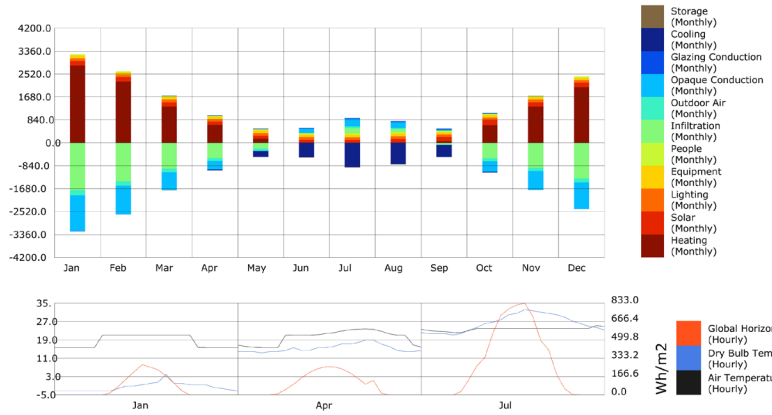
ARCH633 Environmental Systems I

Cooling Load: 98.91 kWh/m2
Heating Load: 379.98 kWh/m2
Total Load: 478.89 kWh/m2



COOLING LOAD: 98.91 kWh/m2
HEATING LOAD: 379.98 kWh/m2
TOTAL LOAD: 478.89 kWh/m2

IN THIS SCENARIO, I INCREASED THE AIR CHANGE HOUR TO 6.68 WHICH CAUSED THE TOTAL LOAD TO SIGNFICANTLY INCREASE FROM THE ORIGINAL 298.38 kWh/m2 TO 478.89 kWh/m2. THE COOLING LOAD AND HEATING LOAD BOTH INCREASED. THE GRAPH SHOWS SIGNIFICANT MONTHLY HEATING AND INFILTRATION, PERHAPS THE WORST SCENARIO THUSFAR.

MY DESIGN

Which parameter(s) is/are the most effective?

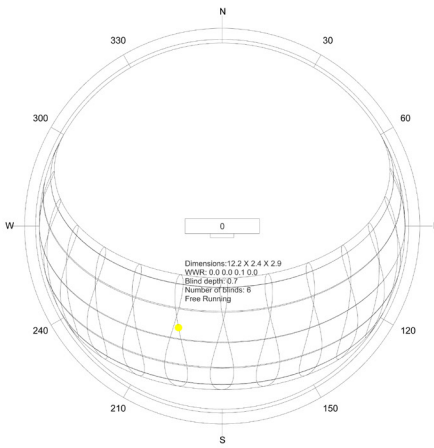
THE MOST EFFECTIVE PARAMETERS WERE: BLINDS, EXTERIOR WALL (CONSTRUCTION), AND EXTERIOR ROOF (CONSTRUCTION)

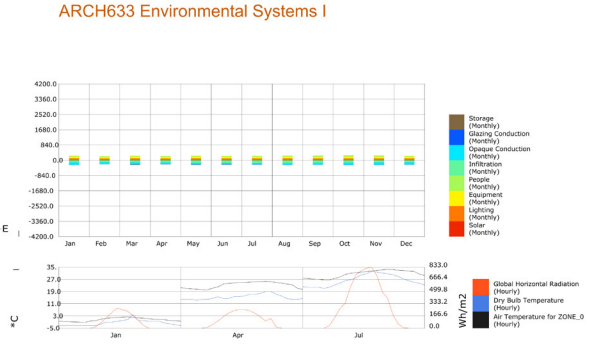
I DREW THESE CONCLUSIONS BECAUSE I SAW IMPROVEMENTS IN THE TOTAL LOAD WHEN I CHANGED THE VALUES OF THE PREVIOUSLY MENTIONED PARAMETERS. IN CONSEQUNCE, I FOCUSED ON THOSE PARAMETERS TO CREATE MY OWN CONDITION.

THOUGHT PROCESS: FIRST I ADDED BLINDS, I RAN THE SIMULATION AND SAW THAT THE TOTAL LOAD DECREASED, SO I MOVED TO THE NEXT PARAMETER--EXTERIOR WALL. I CHANGED THE WALL TO R34.4. THE TOTAL LOAD WAS STILL LESS THAN THE ORIGNAL, SO I CONTINUED. I CHANGED THE EXTERIOR ROOF TO R34.4. THE LOAD CONTINUED TO DECREASE. AT THIS POINT, THE TOTAL LOAD IS 184.3 kWh/m2 WHICH IS THE LOWEST VALUE I HAVE ACHIEVED.

What is the temperature range inside the container in summer and winter with no systems after applying all your changes?

ONCE THE SYSTEM IS OFF, YOU SEE CLEAR JUMPS IN THE DRY BULB TEMPERATURE FROM JAN TO APRIL TO JULY. MEANING, THE TEMPERATURE RANGE IN SUMMER AND WINTER IS EXTREMELY DIFFERENT WHEN WHAT YOU WANT TO CONSISTANCY OR RATHER, THE SYSTEM TO REGULATE THE INTERIOR SEASON TO SEASON. FOR SPECIFICS, JANUARY OR WINTER APPEARS TO BE AROUND AROUND 1 DEGREE CELCIUS WHERAS SUMMER TIME SHOWS TEMPERTURES UP TO TO 33 DEGREES CELCIUS.





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