Original Parameter

Total Thermal Energy - kWh
Jan 1 1:00 - Dec 31 24:00
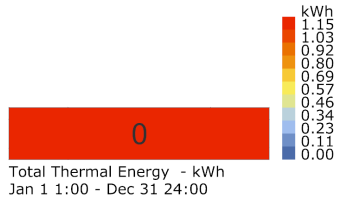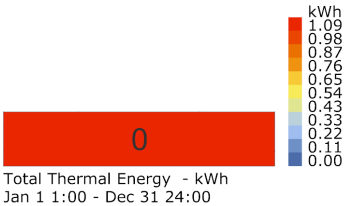
Dimensions:12.2 X 2.4 X 2.9
WWR: 0.3 0.3 0.3 0.3
Blind depth: No Blinds
Number of blinds: No Blinds
Conditioned

ARCH633 Environmental Systems I

Cooling Load: 153.75 kWh/m2
Heating Load: 184.06 kWh/m2
Total Load: 337.81 kWh/m2

1. Window to wall ratio: 0.2,0.2,0.2

Total Thermal Energy - kWh
Jan 1 1:00 - Dec 31 24:00

Dimensions:12.2 X 2.4 X 2.9
WWR: 0.2 0.2 0.2 0.2
Blind depth: No Blinds
Number of blinds: No Blinds
Conditioned

ARCH633 Environmental Systems I

Cooling Load: 128.49 kWh/m2
Heating Load: 191.82 kWh/m2
Total Load: 320.31 kWh/m2

2. Blind depth: 0.5

Total Thermal Energy - kWh
Jan 1 1:00 - Dec 31 24:00
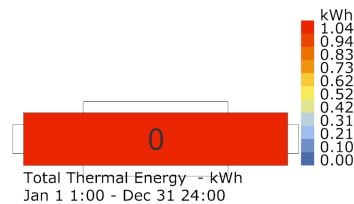
Dimensions:12.2 X 2.4 X 2.9
WWR: 0.3 0.3 0.3 0.3
Blind depth: 0.5
Number of blinds: 3
Conditioned

ARCH633 Environmental Systems I

Cooling Load: 99.90 kWh/m2
Heating Load: 206.50 kWh/m2
Total Load: 306.40 kWh/m2

3. Construction: Wall R-10.4 Roof R-14.8, Air change 1

Total Thermal Energy - kWh
Jan 1 1:00 - Dec 31 24:00

Dimensions:12.2 X 2.4 X 2.9
WWR: 0.3 0.3 0.3 0.3
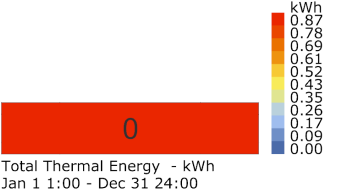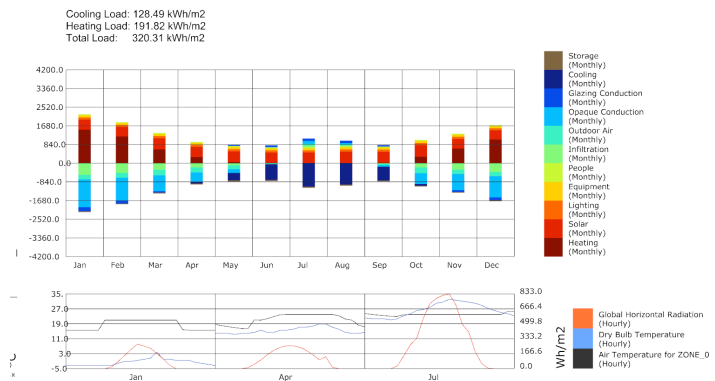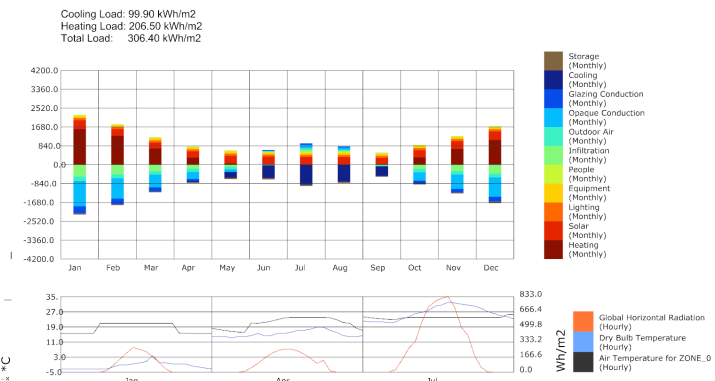Blind depth: No Blinds
Number of blinds: No Blinds
Conditioned

ARCH633 Environmental Systems I

Cooling Load: 145.17 kWh/m2
Heating Load: 110.15 kWh/m2
Total Load: 255.32 kWh/m2
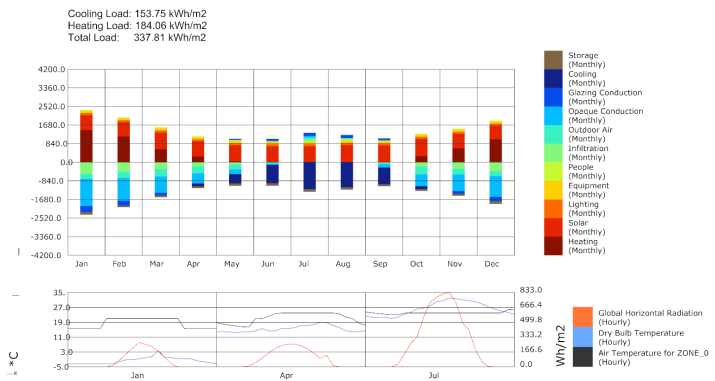
4. Thermal Mass: +8"Concrete

kWh
1.15
1.03
0.92
0.80
0.69
0.57
0.46
0.34
0.23
0.11
0.00

0

Total Thermal Energy - kWh
Jan 1 1:00 - Dec 31 24:00

Dimensions:12.2 X 2.4 X 2.9
WWR: 0.3 0.3 0.3 0.3
Blind depth: No Blinds
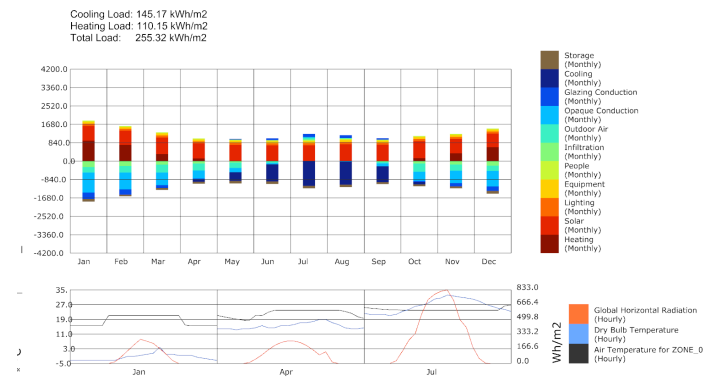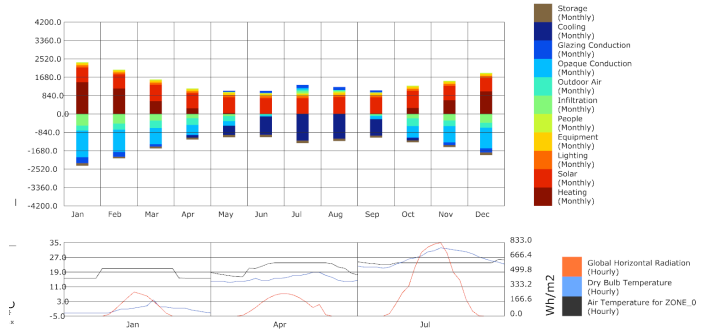Number of blinds: No Blinds
Conditioned

ARCH633 Environmental Systems I

Cooling Load: 153.75 kWh/m2
Heating Load: 184.06 kWh/m2
Total Load: 337.81 kWh/m2

Submit your findings in a report and discuss: - Which parameter(s) is/are the most effective? - What is the temperature range inside the container in summer and winter with no systems after applying all your changes?

1. Within four parameters, construction is the most effective parameter. By double the R value of external wall and roof, the total load decrease from 337.81kwh/m2 to 255.32kwh/m2

2. My changes for the shopping container are:
    increase south wwr to 0.6, decrease other side wwr to 0.2
    all 0.5m depth blinds
    increase wall R value to 8.7, roof R value to 14.8
    add 8" concrete thermal mass

Summer T range is 20c-30c
Winter T range is -4c-4c