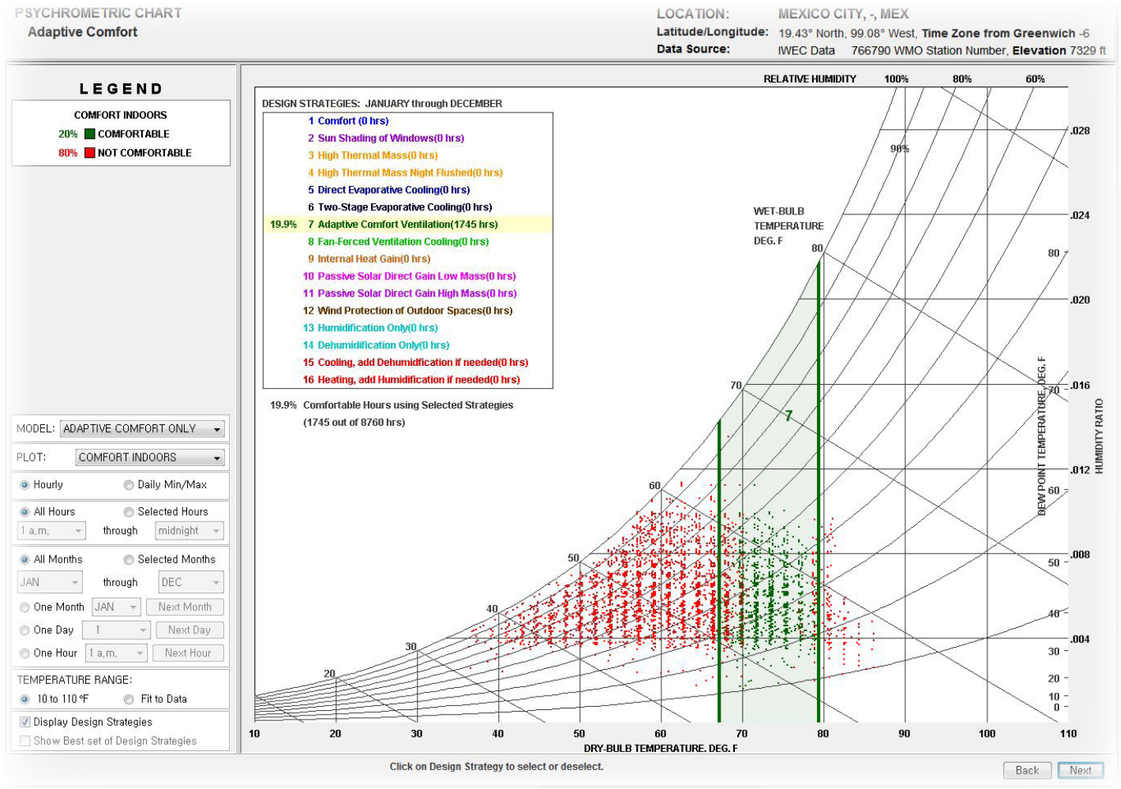
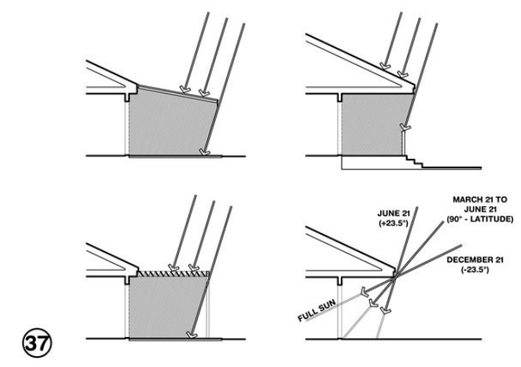
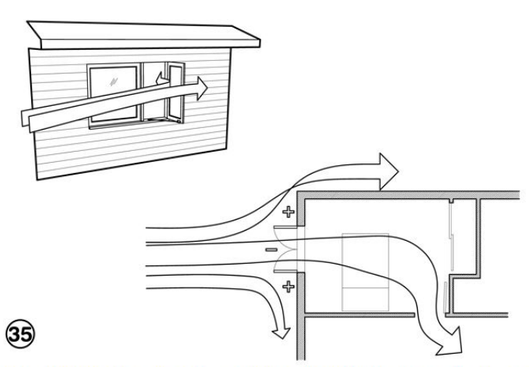
Mexico city weather data analysis for basic design strategy





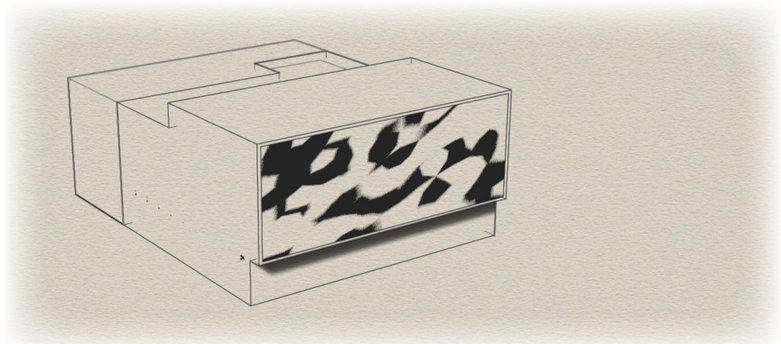
Window overhangs (designed for this latitude) or operable sunshades (awnings that extend in summer) can reduce or eliminate air conditioning



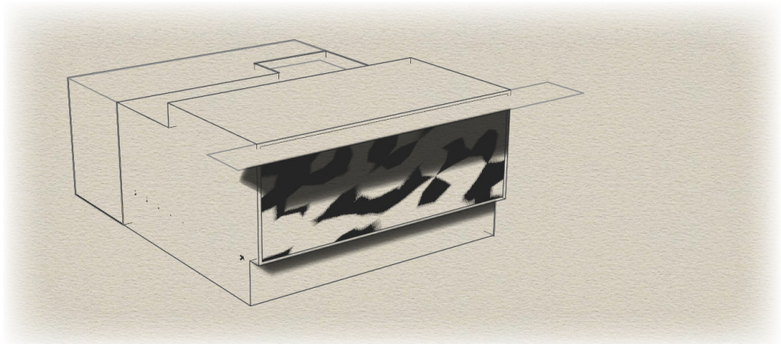
Good natural ventilation can reduce or eliminate air conditioning in warm weather, if windows are well shaded and oriented to prevailing breezes

From the climate data consultant, the psychrometric chart could be achieved.
Based on the data, two design strategies was chosen. Mainly, operable sunshade will be main design concept.

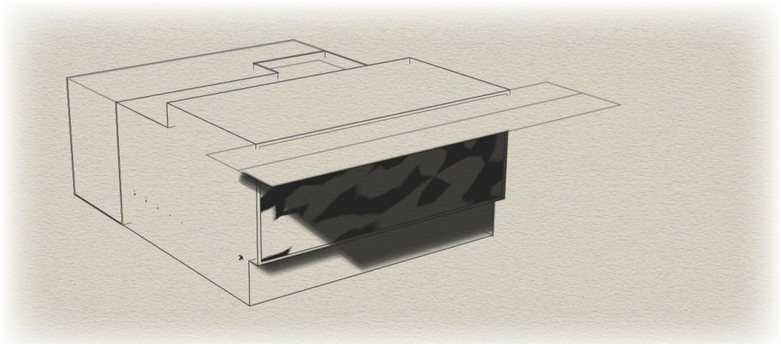
Shade design approach 0010 (Summer time)



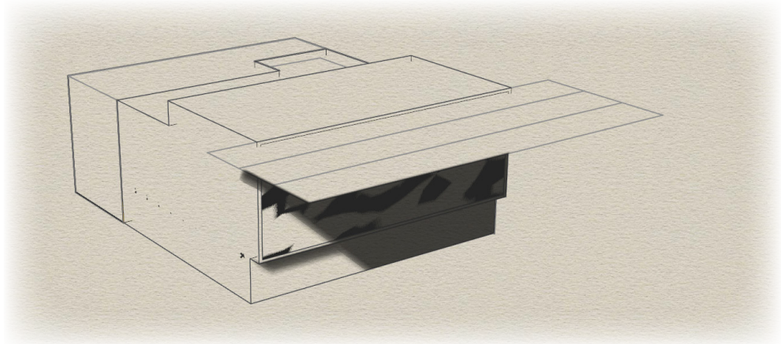
Test initial model without any shade device.
This model shows 0 % comfort overall.



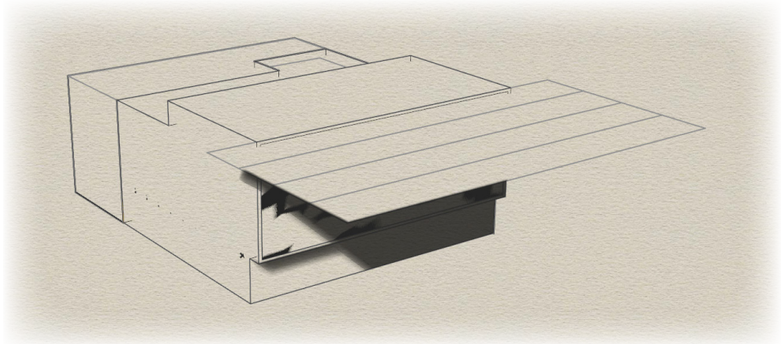
By giving 1 meter length shade, this shade shows 0.13% comfort from adaptive comfort calculator.



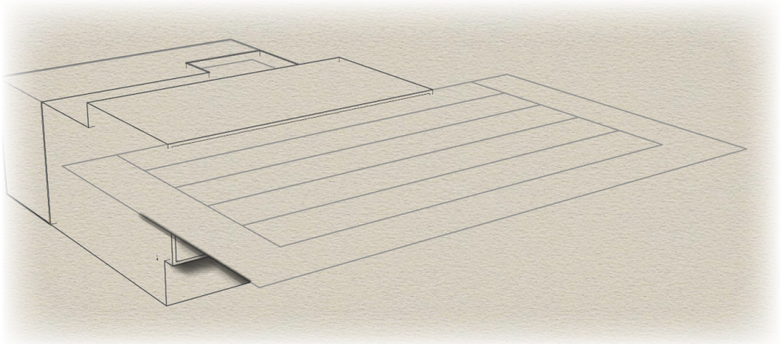
2 meter legnth shade; 0.38 % comfort



2 meter legnth shade; 0.38 % comfort

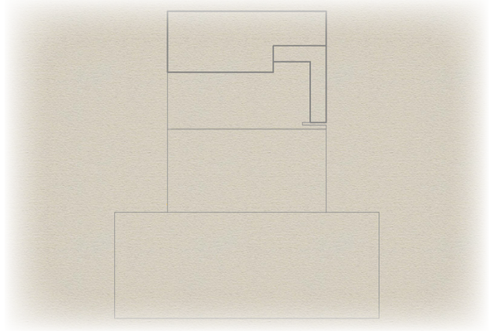


4 meter legnth shade; 0.77 % comfort



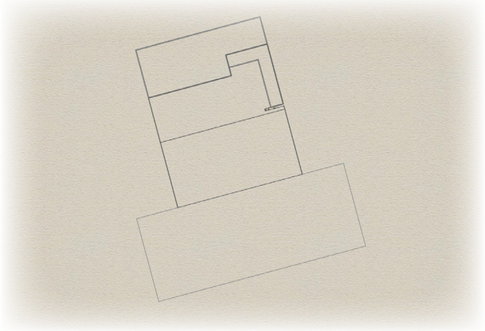
4 meter legnth shade with 1 meter wider shade; 1.65 % comfort

Shade design approach 002 (including 4 meter length with 1 meter wider shade)

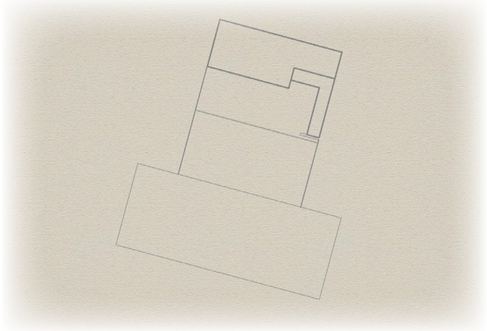


S

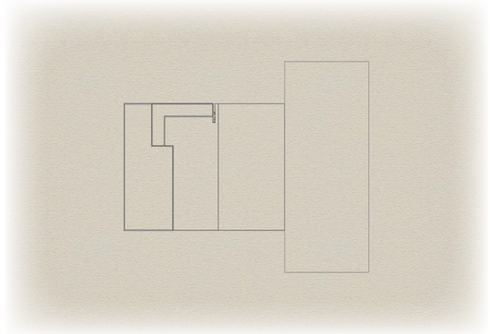
From this page, I tried to find best orientation
of this space for comfort.
Current comfort:1.65%



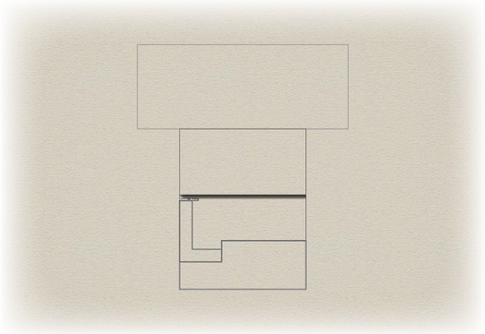
Change 15 degree to east.
Current comfort: 0.66%



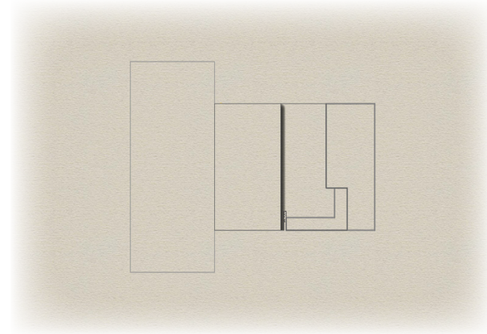
Change 15 degree to west.
Current comfort: 0.42%



Right East
Current comfort:0.75%



Right north
Current comfort: 0.27%



Right West
Current comfort:0.77%

Shade design approach 003 (including 4 meter length with 1 meter wider shade)

Double glazing window glass material variation

Double galzing window property
(solar transmittance= 0.5, air gap= 2cm)
Conductivity / Comfort
0.9 / 4.47%
0.8 / 3.89%
0.7 / 3.19%
0.6 / 3.67%
0.5 / 3.91 %
0.4 / 3.5%

→

Double galzing window property
(conductivity= 0.5, air gap= 2cm)
Solar transmittance / Comfort
0.5 / 6.26%
0.4 / 9.50%
0.3 / 13.39%
0.1 / 17.67%
0.0 / 60%

→

Double galzing window property
(conductivity= 0.5, Solar transmittance=0.0)
Air gap / Comfort
0.5cm / 74.9%
1cm / 67.85%
2cm / 60%
3cm / 58.95%
4cm / 59.48%
5cm / 59.96%
6cm / 59.98%

By appying ideal material for double glazing windows, 74.9 % of comfort was achieved.