MECH3023 Building Energy Management and Control Systems

http://me.hku.hk/bse/mech3023/

Exercise 01 – Building Energy Simulation (Using MIT Design Advisor)

MIT Design Advisor : http://designadvisor.mit.edu/design/

Input Data (base case):

Location: Hong Kong

Occupancy and equipment: Office building, 9am-6pm, 0.1 people/m^2, lighting 500 lux, equipment 10 W/m^2

HVAC: Mechanical cooling & heating, indoor 24±1 ºC, RH 60%, fresh air 15 L/s/person, air change rate = 2

Thermal mass: lightweight

Building geometry: Entire floor (4 facades + core) well-mixed air between zones, orientation N-S/E-W, 30 m x 30 m

Roof: bitumen roof

Room properties: 30 m (W) x 30 m (L) x 3.5 m (H), façade facing east, window 50% of exterior wall area, no shading devices, clear glass

Wall: commercial low insulation, R-value 3 m^2. K/W

Alternative Design:

1. Lighting: 400 lux
2. Person density: 0.25 people/m^2
3. Roof: Green roof