WINDOW DESIGN FOR NATURAL VENTILATION

Dr. Hassan Hassoon

ARCH 326

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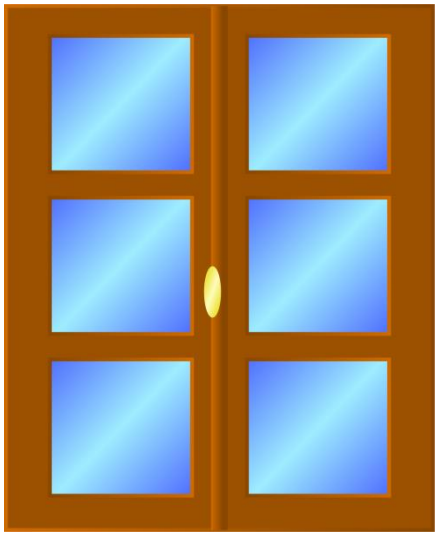
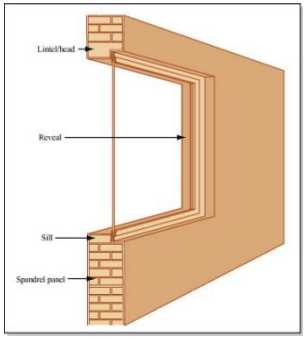
- External and internal factors influence the air movement and its speed within the built environment, they are:
- Window location
- Orientation of the window opening
- Area of the opening
- Types of window opening





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- External Factors are:
- Horizontal extensions, cantilever
- The vertical extensions
- Trees

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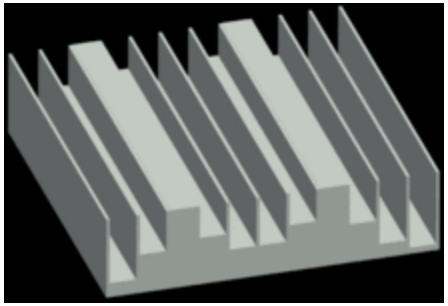
- Internal Factors are:
- Space dimension
- Internal partitions within space.



CALCULATIONS OF NATURAL VENTILATION FLOW RATE

- VENTILATION ENHANCED IN BUILDINGS EITHER BY:

A-Natural Ventilation due to strong wind.

- Q=Cv.A.v
- where Q=air flow m3/s
- A=area of inlet opening m2
- Wind velocity m/s
- Cv opening effectiveness
- 0.5 to 0.6 for perpendicular winds
- 0.25 to 0.36 for diagonal winds

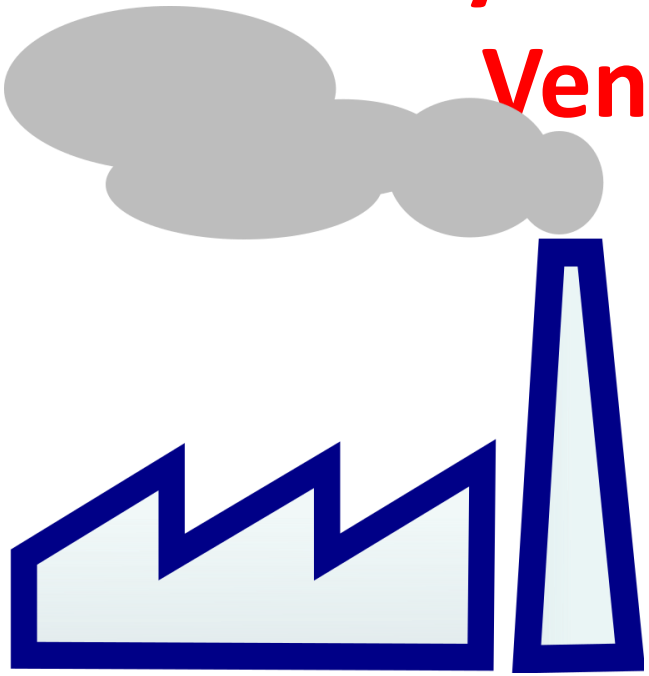
Chimney Effect and Natural Ventilation

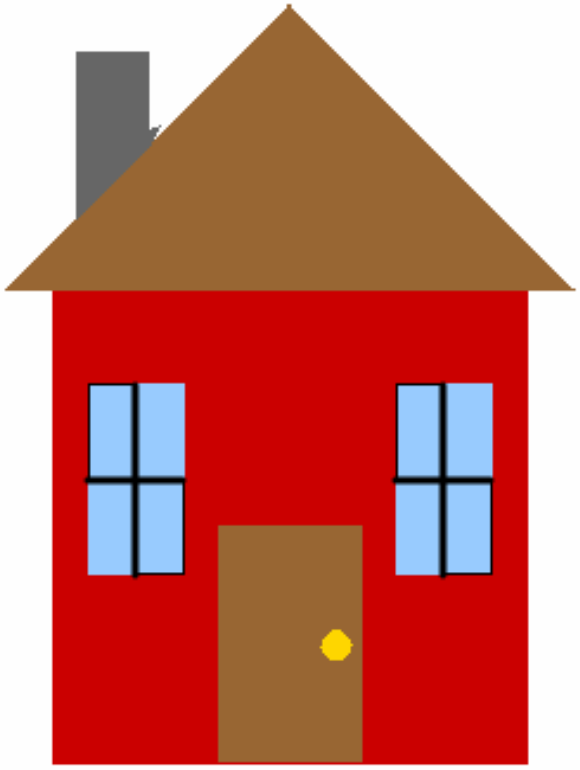
B-The natural ventilation due to air temperature difference between inside and outside of the built space is called buoyancy effect or stack effect or ḍhimney effect as shown in figure

Ex: outside wind speed north-western direction 20 km/hr, area of window crack is .001 m*2 estimate the volume of air infiltrating the through the window.?

Q=Cv.A.v Q=0.3x.001x20x1000/3600= **0.0017m cub/s** i.e **3.6 cfm**

Chimney Effect and Natural Ventilation





The Advantages of Natural Ventilations in Built Environment