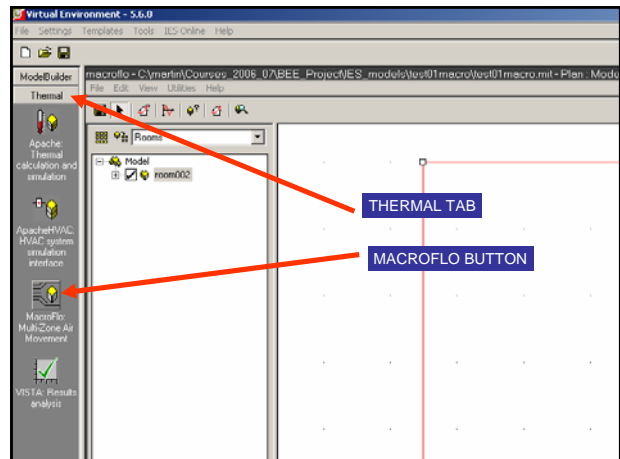


# Macro\_Flo

Natural air flow through buildings

By calculation of **BULK** air flow



# Natural air flow

Air infiltration

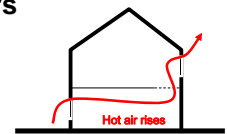
Ventilation

Through:  
 external and internal **doors**,  
 external and internal **windows**  
 external and internal **holes**

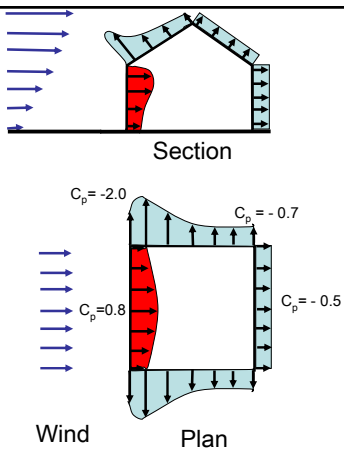
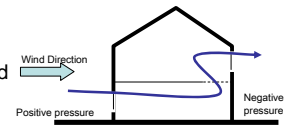
# Bulk air flow

## Drivers

Thermal stack effect



Pressure differences from wind



# Bulk air flow

## Resistances

Crack length      Used when opening is closed

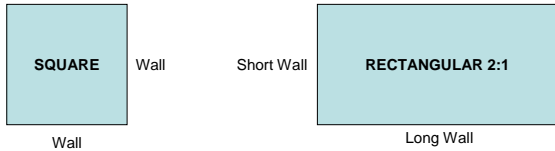
Opening of aperture      Used when opening is opened

### Exposure types for buildings up to 12.5m height

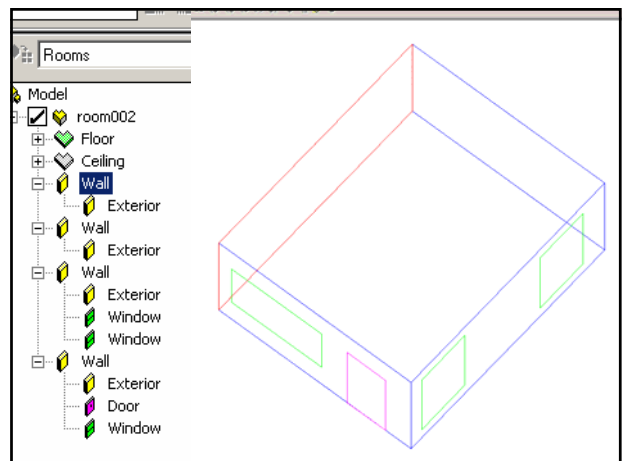
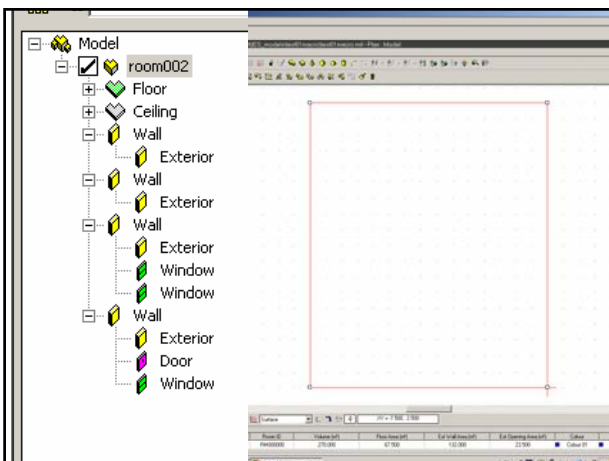
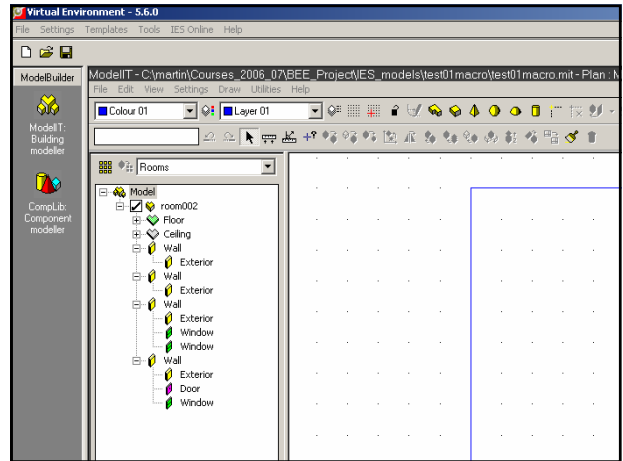
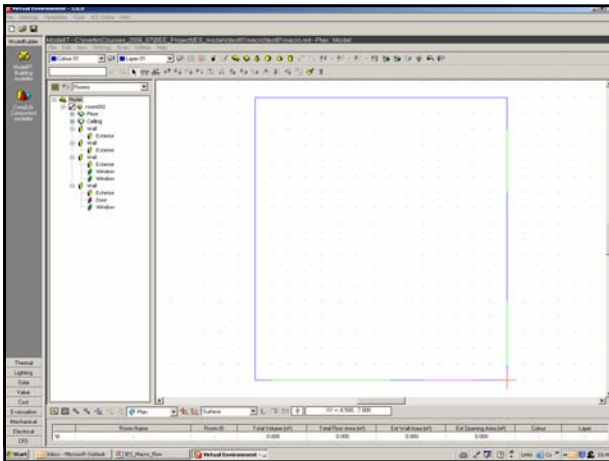
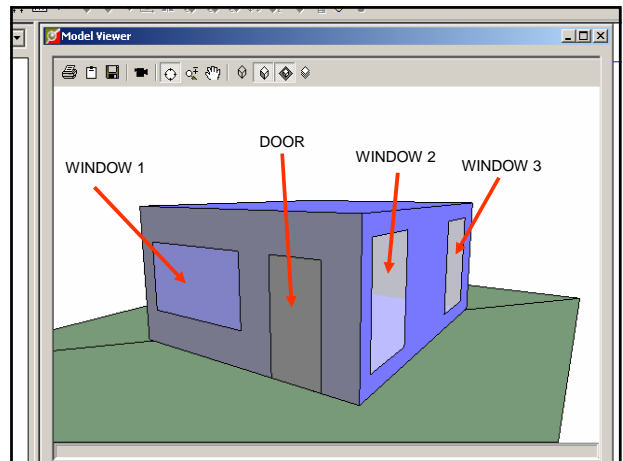
**Exposed** - standing in open ground with no obstructions nearby

**Semi-exposed** - surrounded by obstructions lower in height than itself

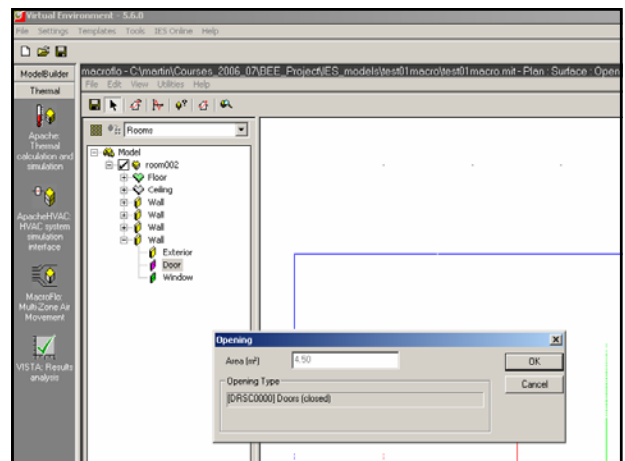
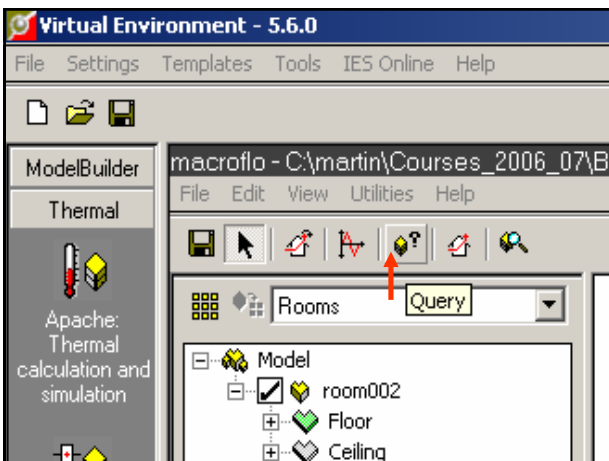
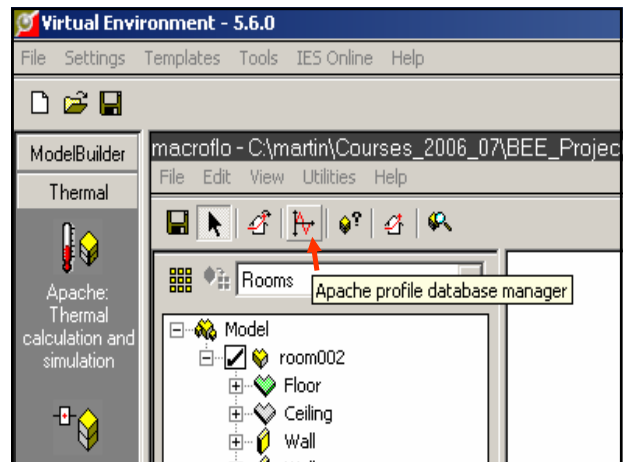
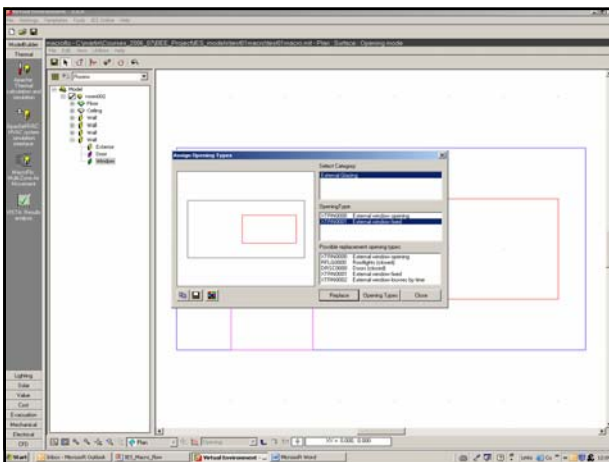
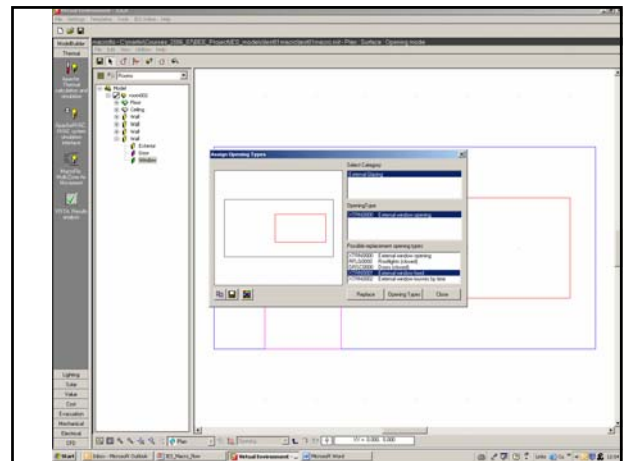
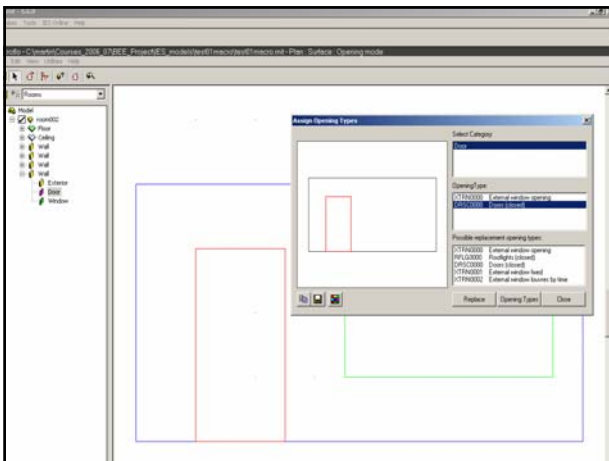
**Sheltered** - surrounded by buildings of a similar height to itself

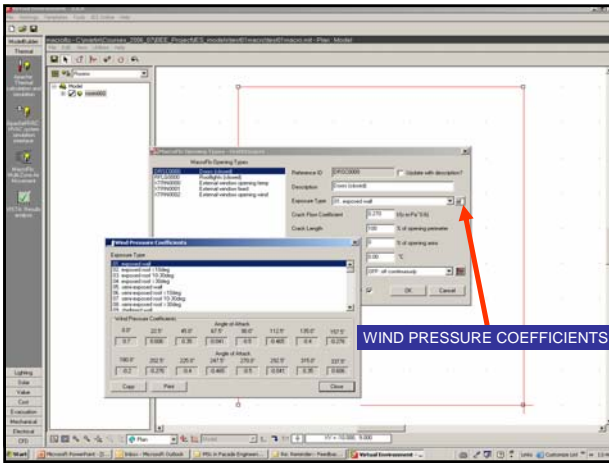
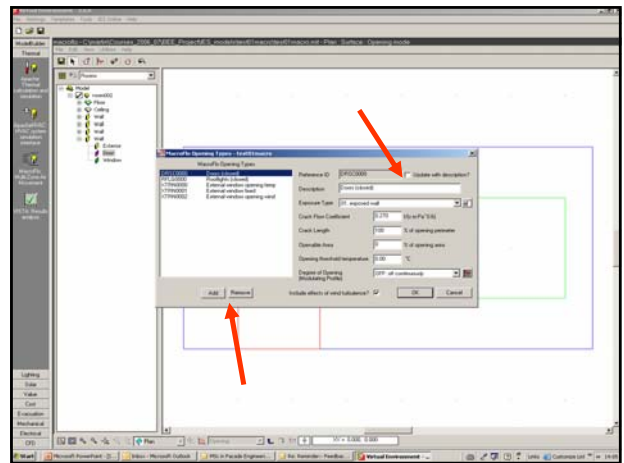
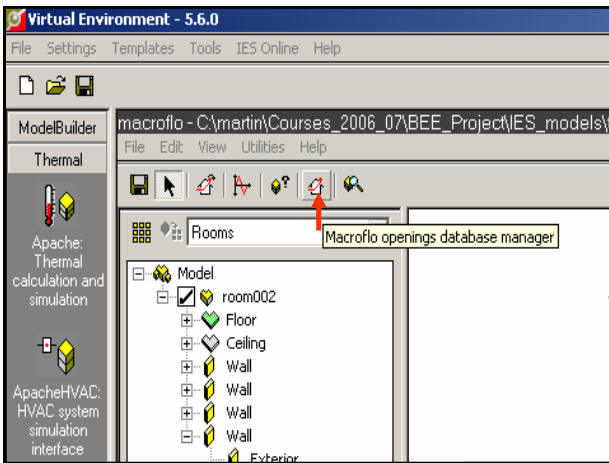


**Internal** - if applied to external openings sets pressure coefficients to zero









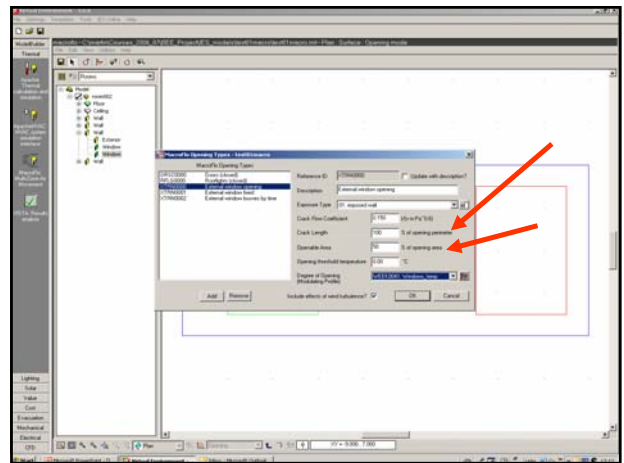
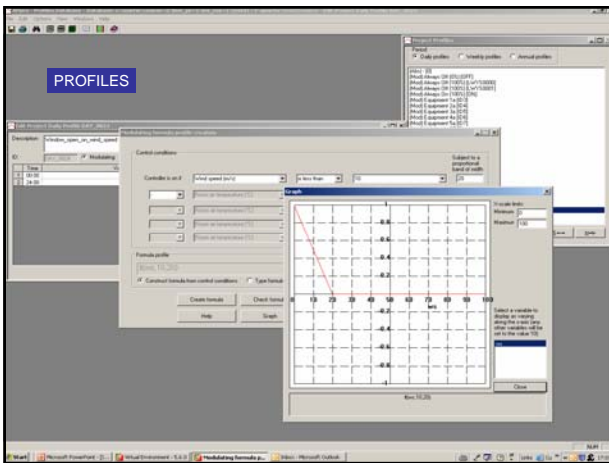
**Wind Pressure Coefficients**

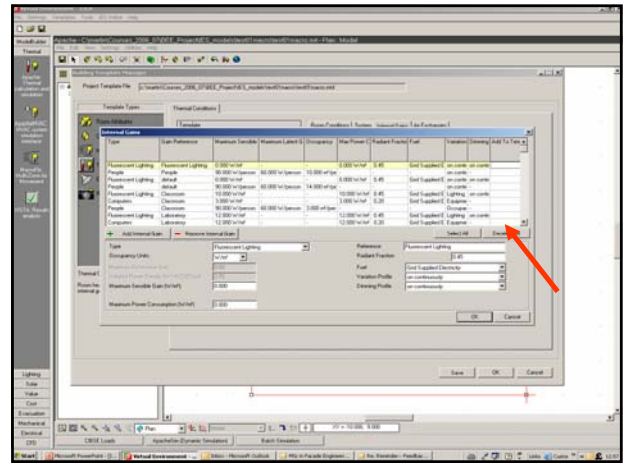
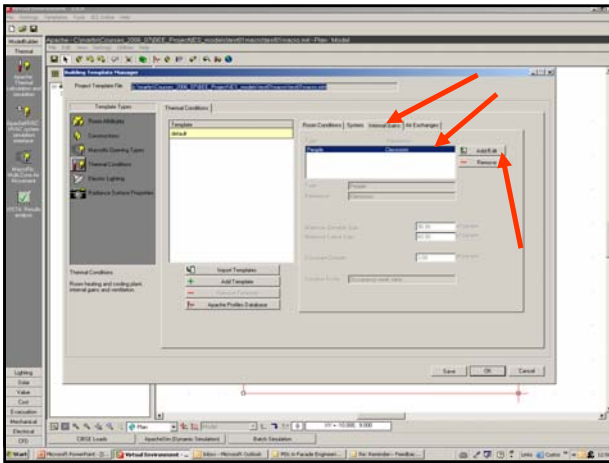
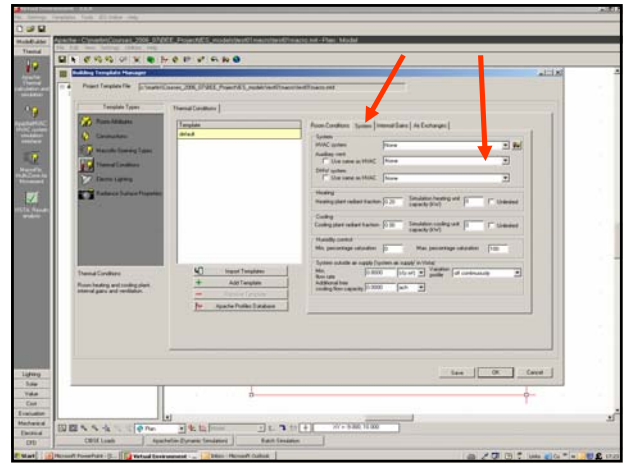
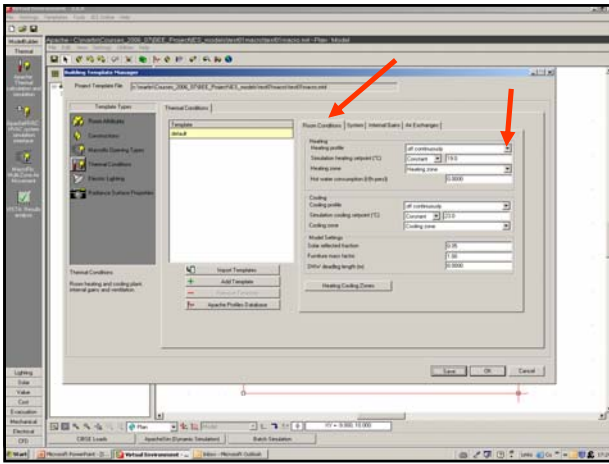
Exposure Type

- 01. exposed wall
- 02. exposed roof <10deg
- 03. exposed roof 10-30deg
- 04. exposed roof >30deg
- 05. semi-exposed wall
- 06. semi-exposed roof <10deg
- 07. semi-exposed roof 10-30deg
- 08. semi-exposed roof >30deg
- 09. sheltered wall

Wind Pressure Coefficients		Angle of Attack							
		0.0°	22.5°	45.0°	67.5°	90.0°	112.5°	135.0°	157.5°
01	02	0.7	0.606	0.35	-0.041	-0.5	-0.465	-0.4	-0.276
		Angle of Attack							
		180.0°	202.5°	225.0°	247.5°	270.0°	292.5°	315.0°	337.5°
03	04	-0.2	-0.276	-0.4	-0.465	-0.5	-0.041	0.35	0.606

Copy Print Close





Room Latent G	Occupancy	Max Power C	Radiant Fractio	Fuel	Variation	Dimming	Add To Tem
W/m²	-	40.000 W/m²	0.30	Grid Supplied E	Equipme	-	
W/person	3.000 m²/pe	-	-	-	Occupar	-	
	10.000 W/m²	0.45	Grid Supplied E	Lighting	on contir		
	10.000 W/m²	0.20	Grid Supplied E	Equipme	-		
W/person	20.000 m²/pe	-	-	-	Occupar	-	
	8.000 W/m²	0.45	Grid Supplied E	Lighting	on contir		
W/person	30.000 m²/pe	-	-	-	Occupar	-	
W/person	3.000 m²/pe	-	-	-	Occupar	-	
W/person	3.000 m²/pe	-	-	-	Occupar	-	

Reference: Fluorescent Lighting  
 Radiant Fraction: 0.45  
 Fuel: Grid Supplied Electricity  
 Variation Profile: on continuously  
 Dimming Profile: on continuously

