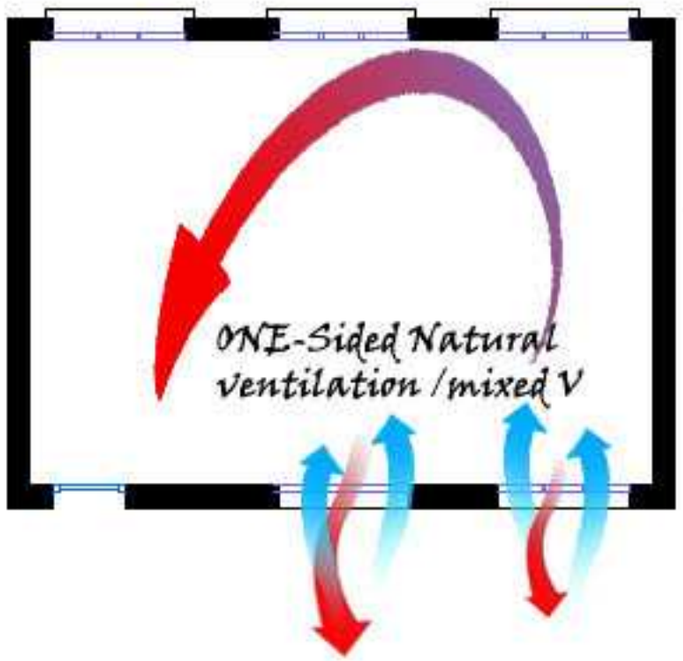
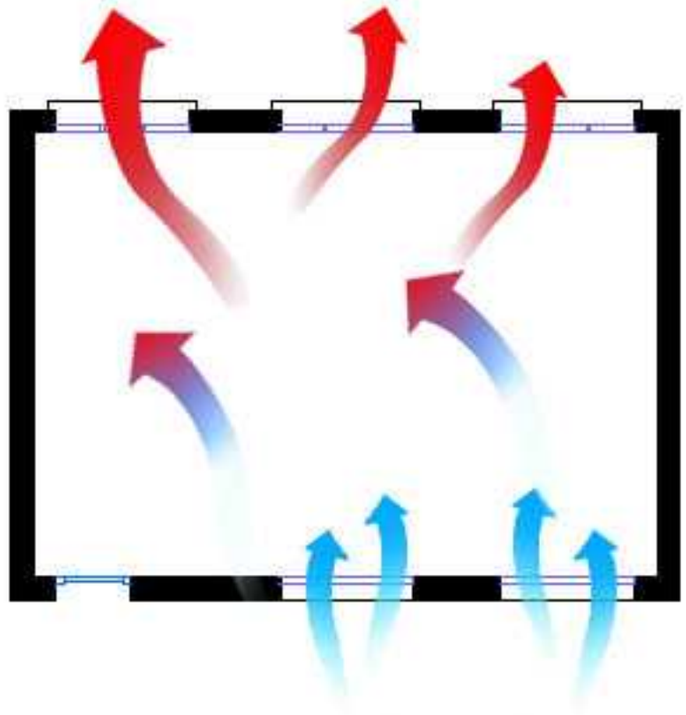
G-PLANS

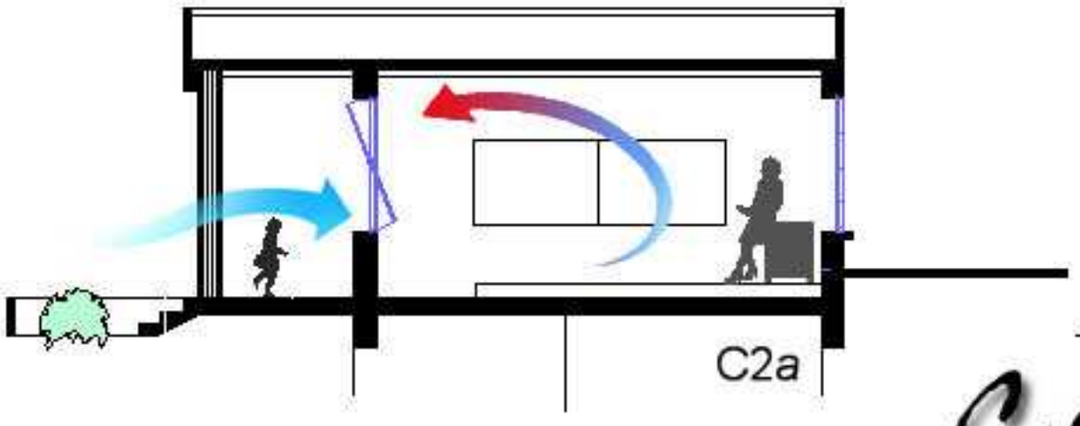


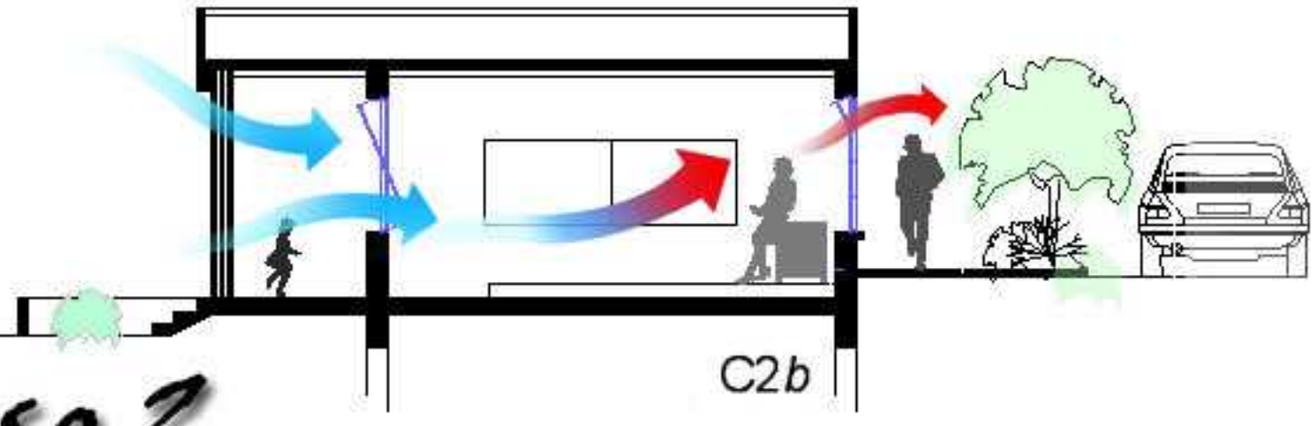
All windows closed

Broken or fixed. and below part coverd with papers.



SECTIONS





Case2

Base case 2/ Natural ventilation

Mixing mode through large opening

(Mixing mode; one-sided and cross ventilation)

Fig.113. Cases of strategies.02

G.PLANS

SECTIONS

■ Trickle/base P window frame

■ Trickle/base P window frame

C3a

■ Black painted vertical element or coated by alum sheet to enhance stack effect

■ Wall vent with louvers and fan

■ Wall vent with filter/s creen and damper integrated

C3b

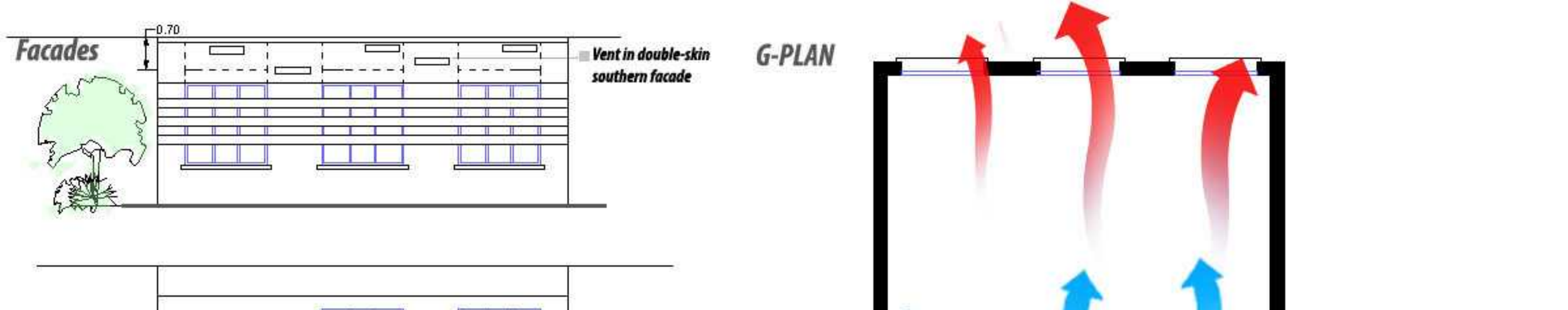
Case3

Case3 / Natural ventilation/hybrid

Displacement mode through small opening

(Displacement mode; basic stack and enhanced stack ventilation)

Fig.113. Cases of strategies.03

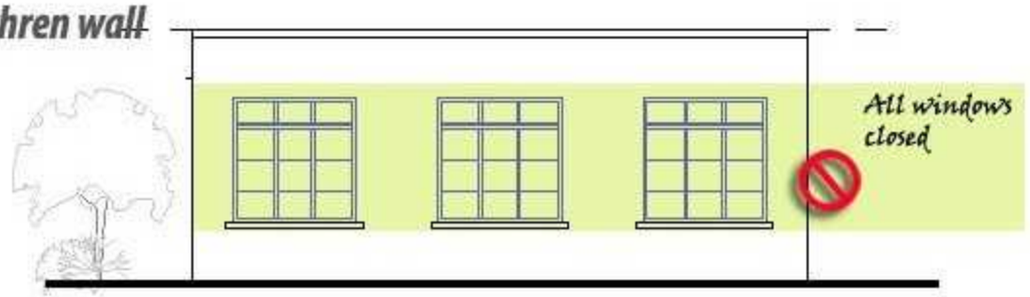


(Displacement mode; cross ventilation ;enhanced stack ventilation)

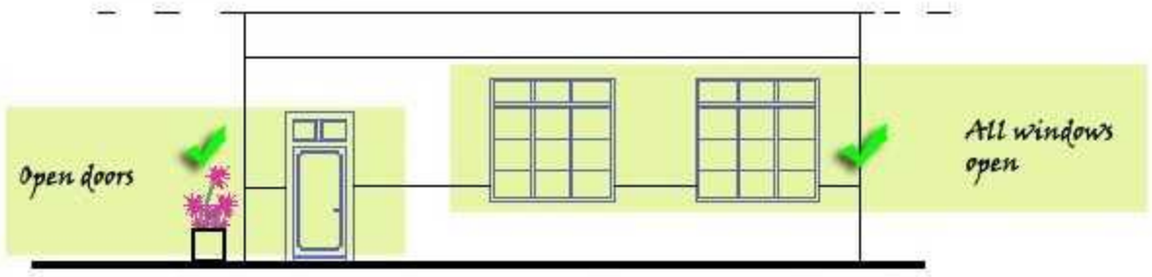
Fig.113. Cases of strategies.04

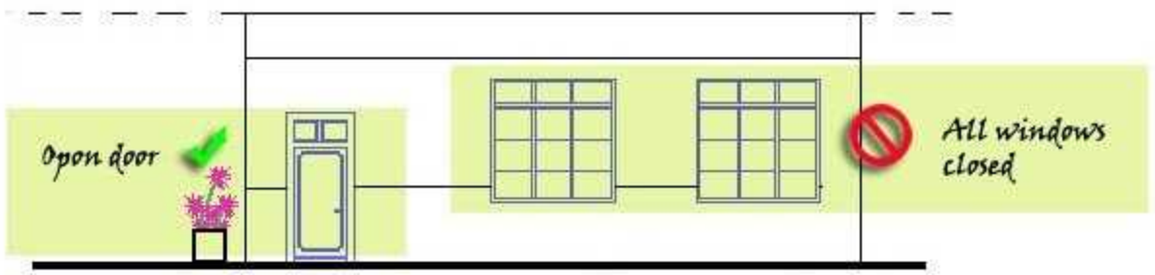
FACADEs

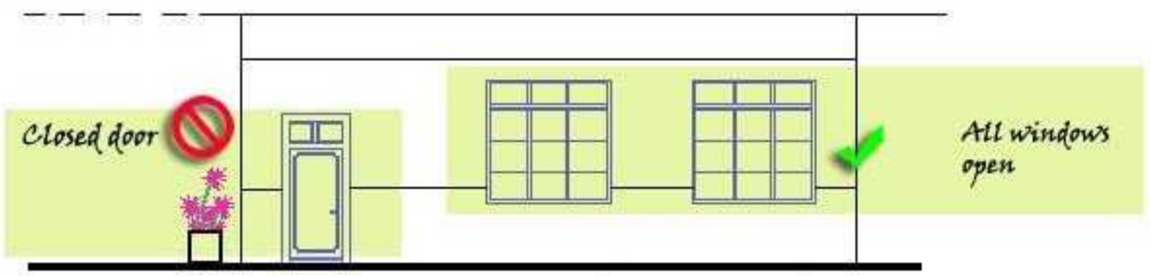
Southren wall

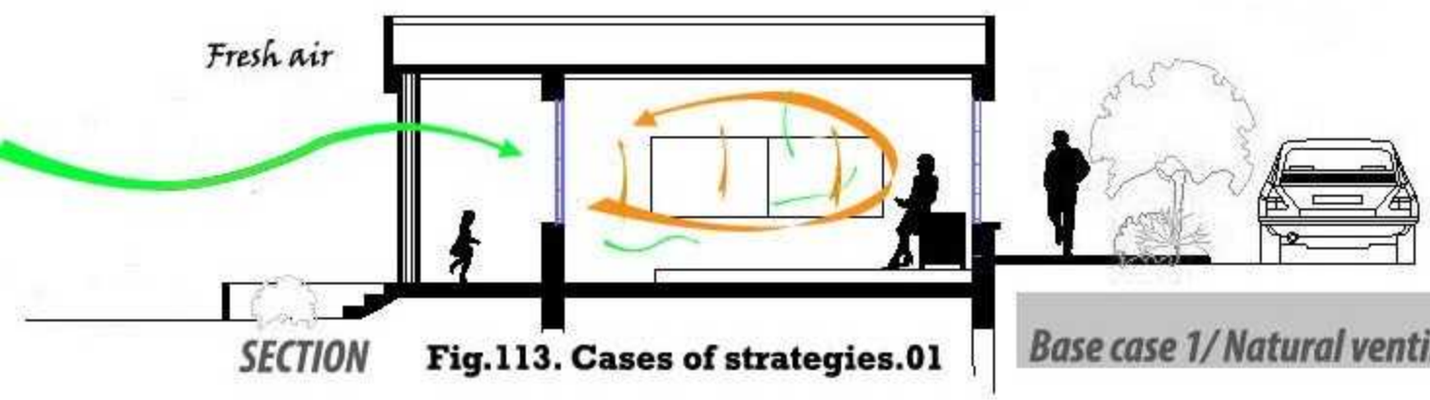


Northern Wall





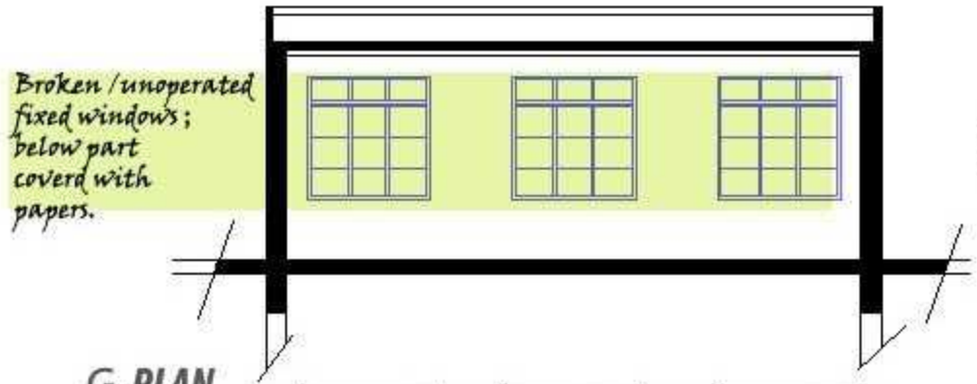




SECTION

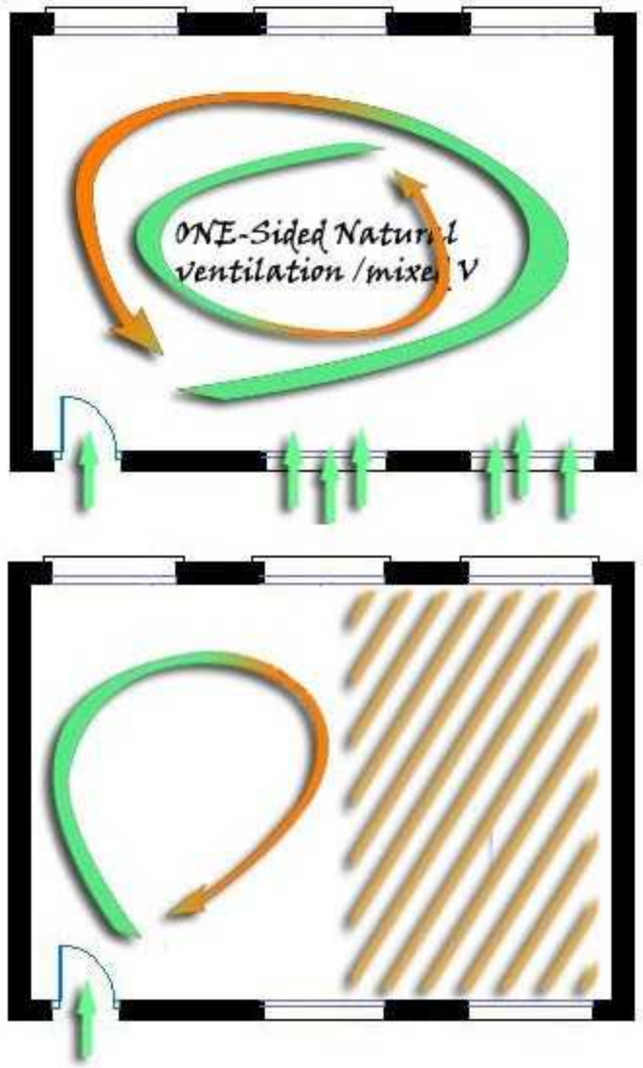
Fig.113. Cases of strategies.01

SECTION

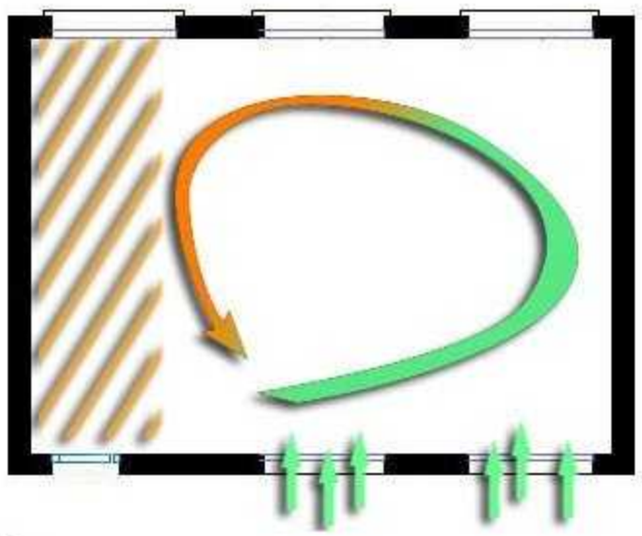


BC*1a*

G-PLAN



BC*1c*



BC*1b*

BC*1b*

Base case 1/ Natural ventilation **Base case 1** Behaviors Cases

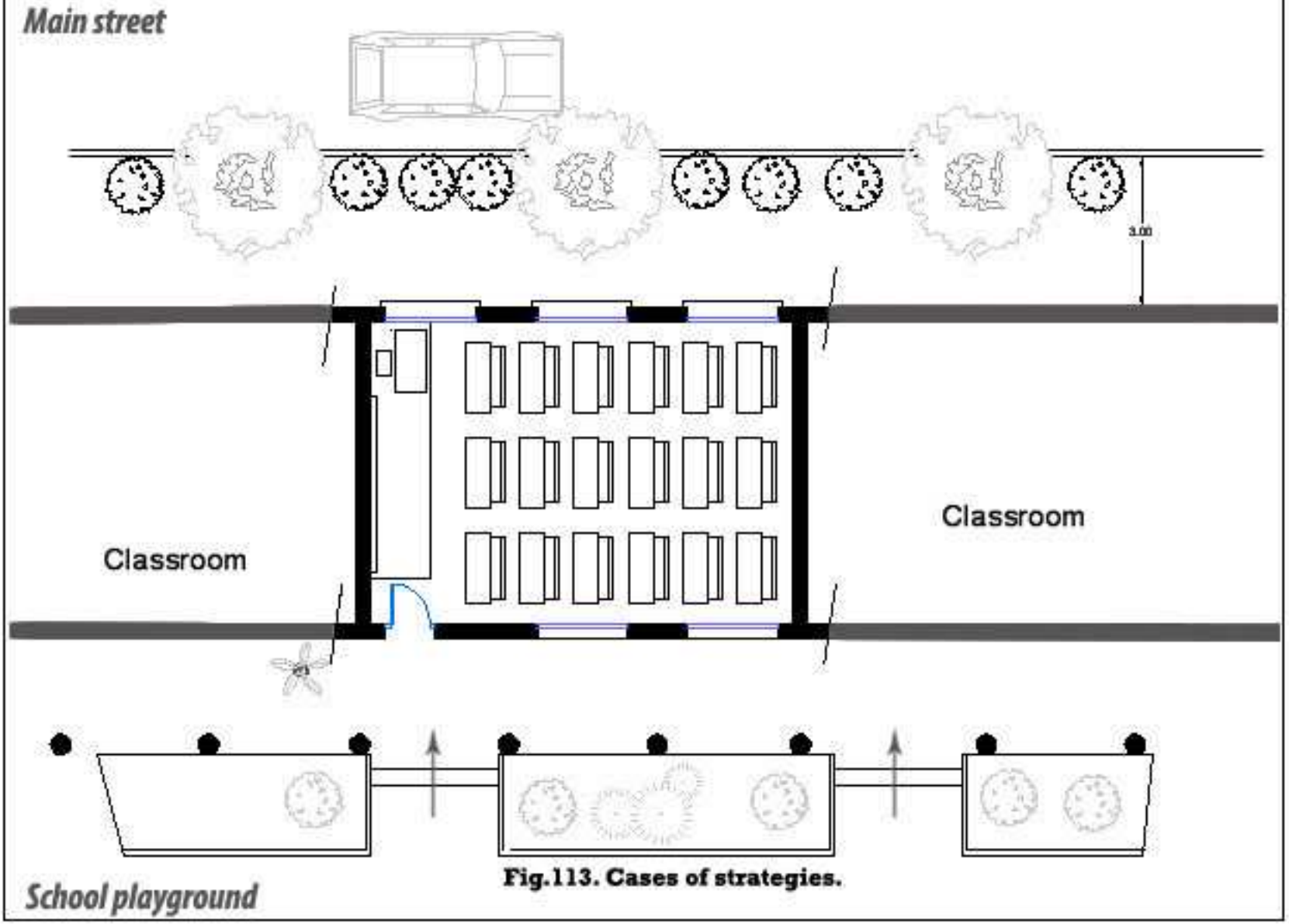
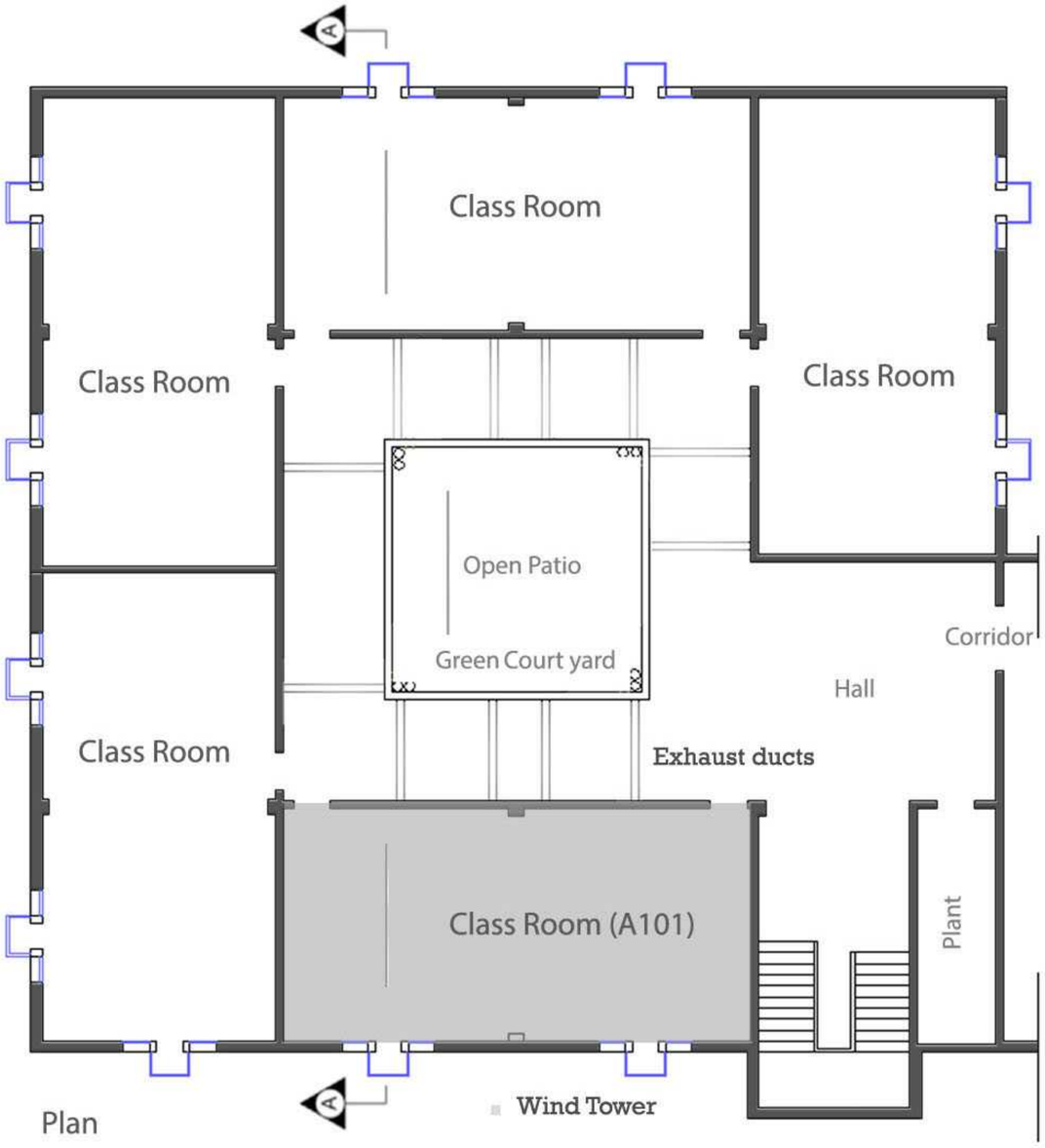


Fig.113. Cases of strategies.



Plan

Block **A**

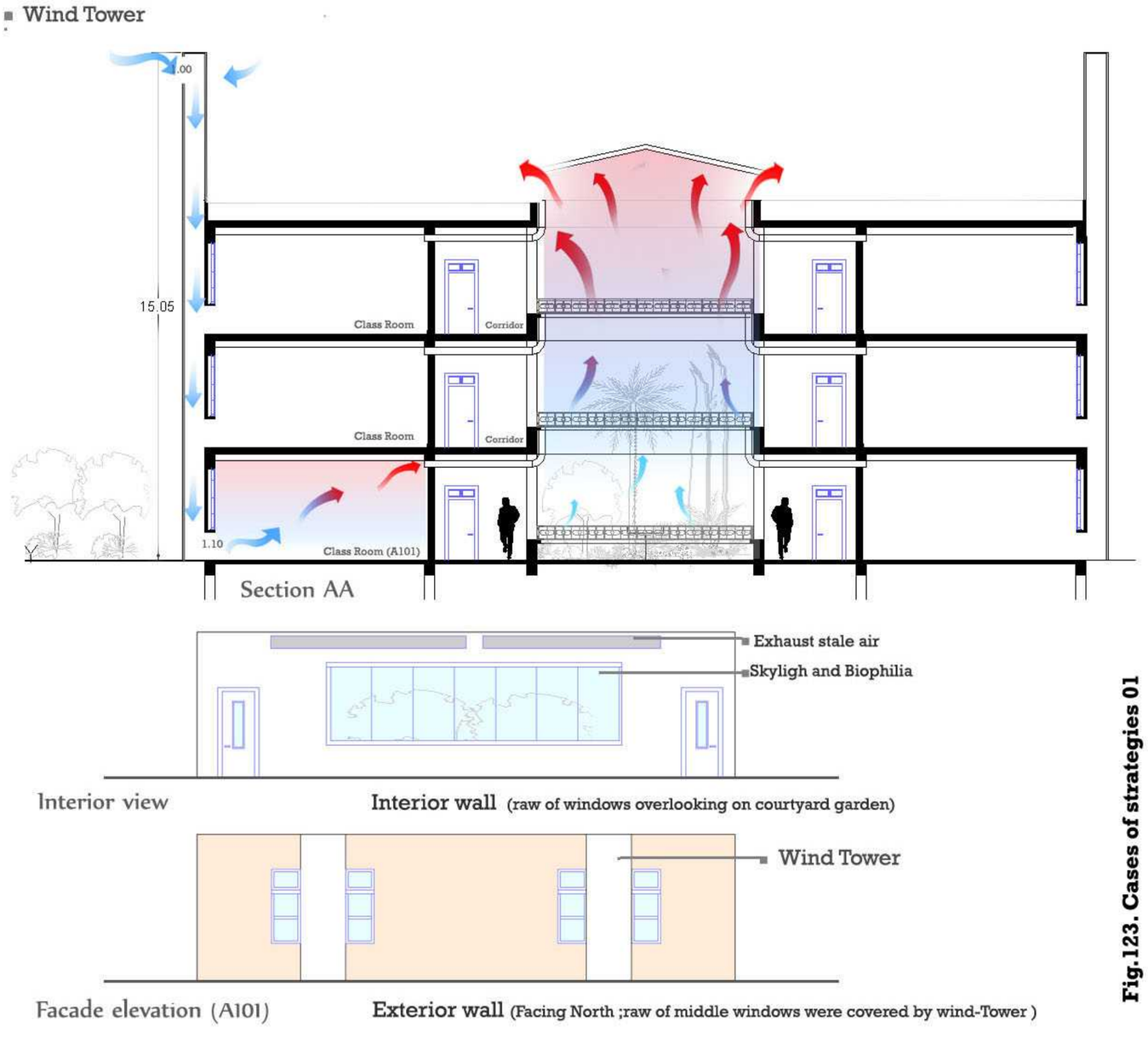
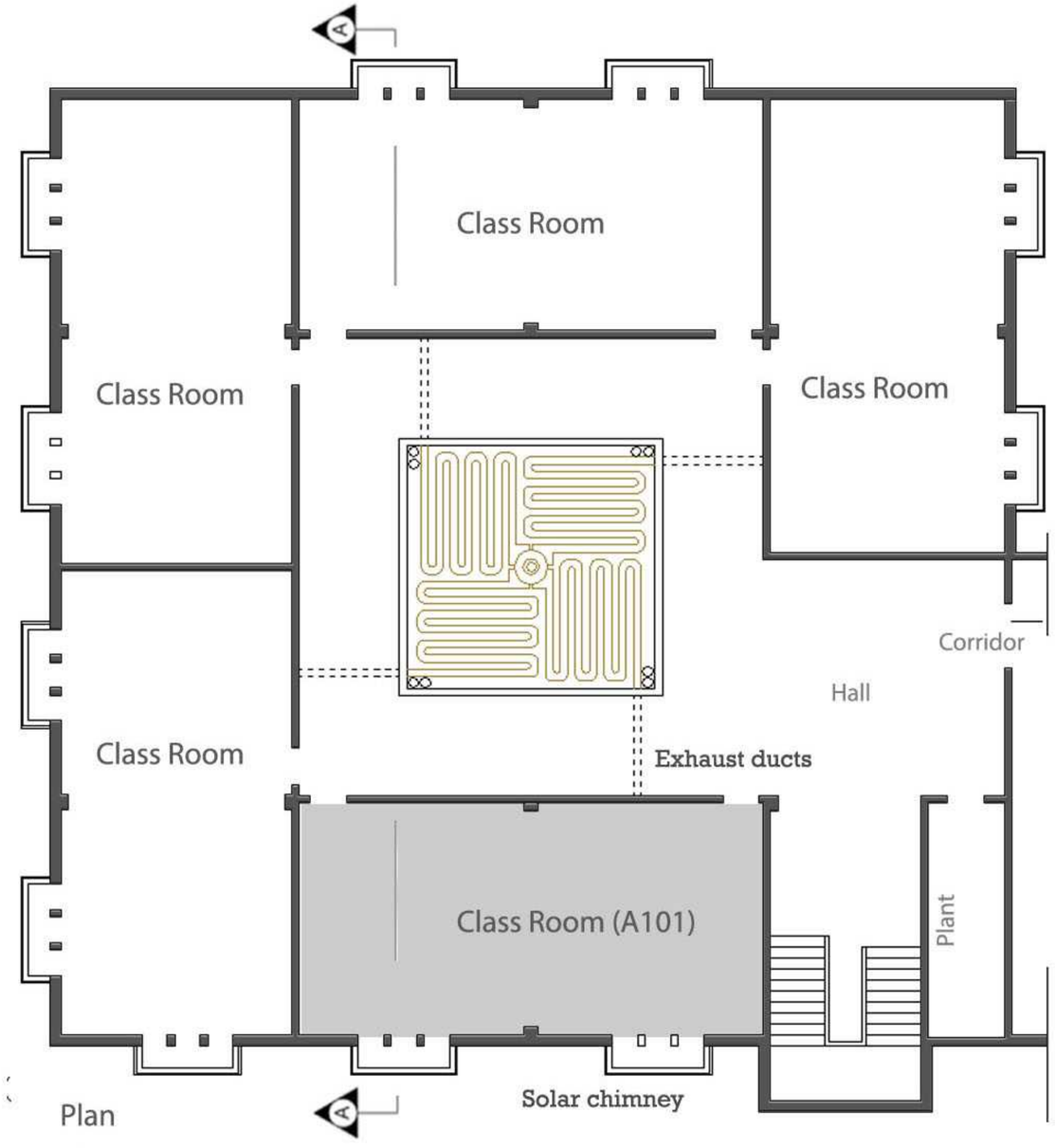
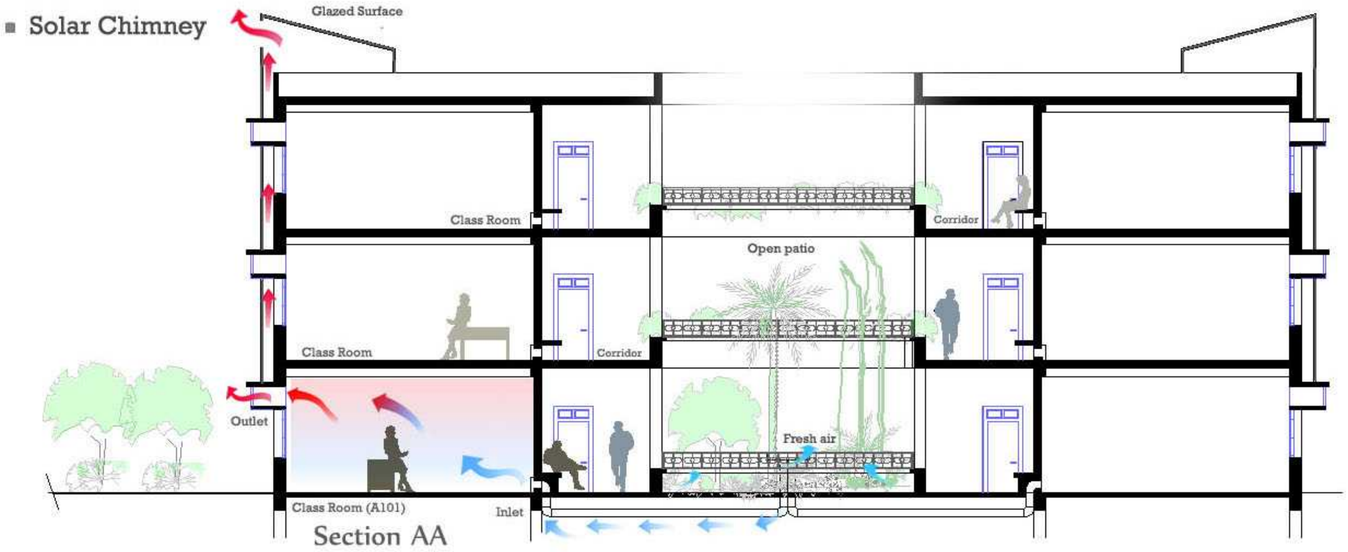


Fig.123. Cases of strategies 01

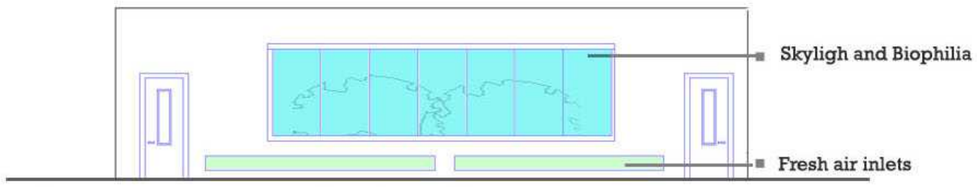


Plan

Block **A**



Section AA



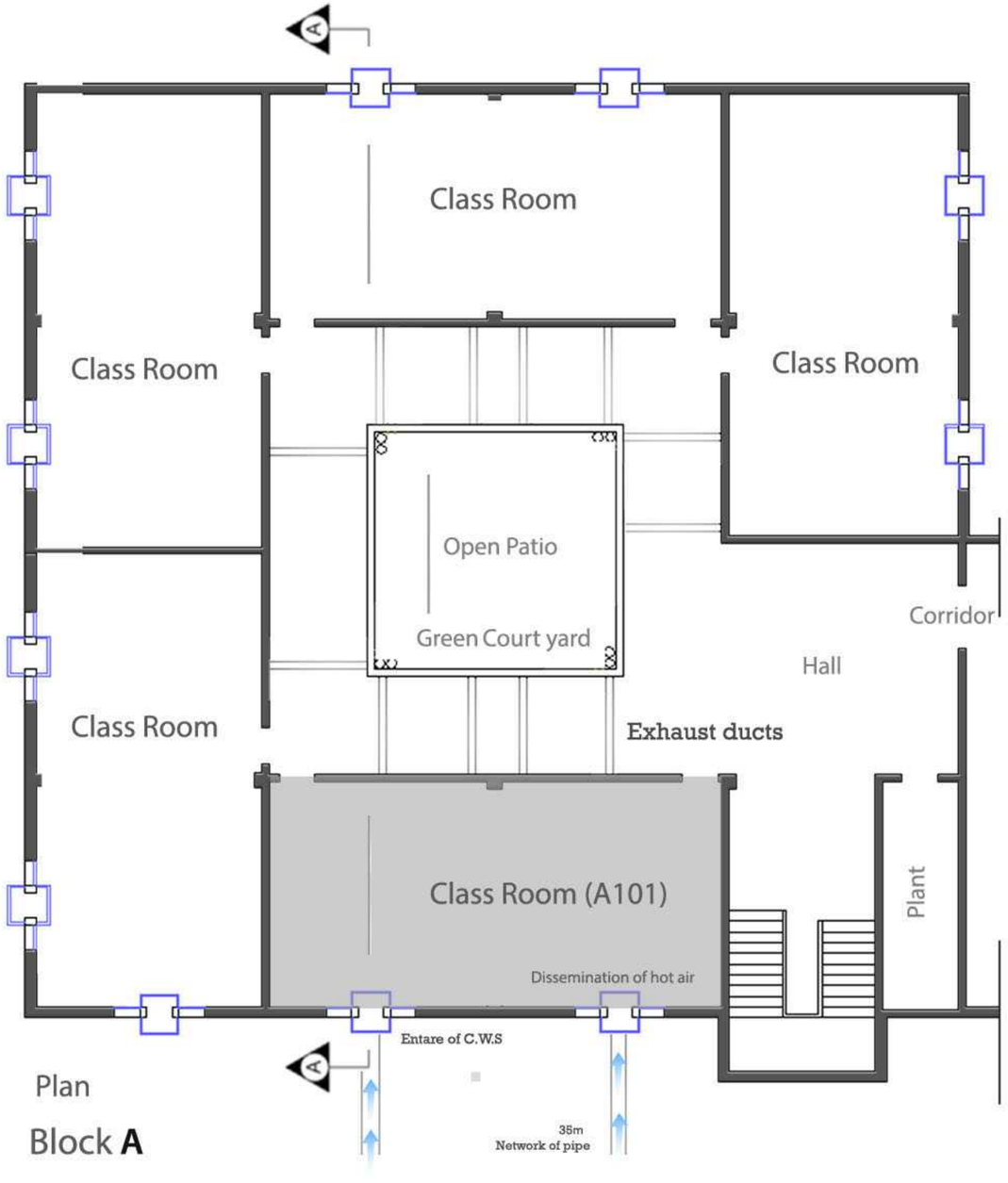
Interior view

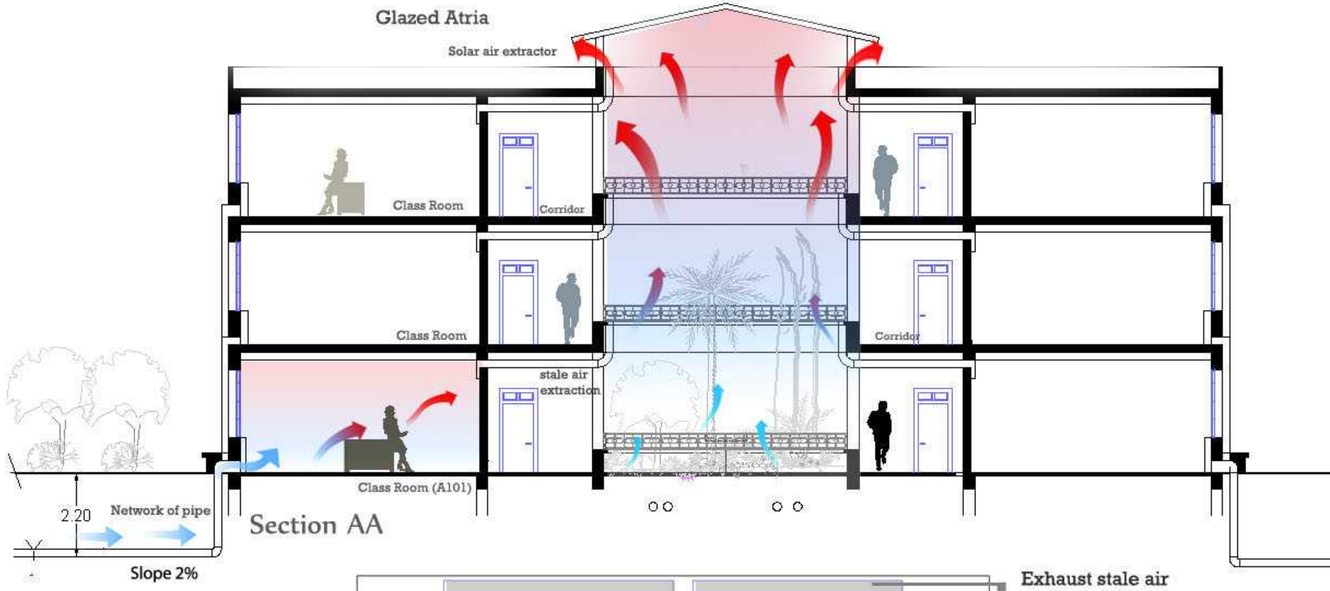
Interior wall (raw of windows overlooking on courtyard garden)

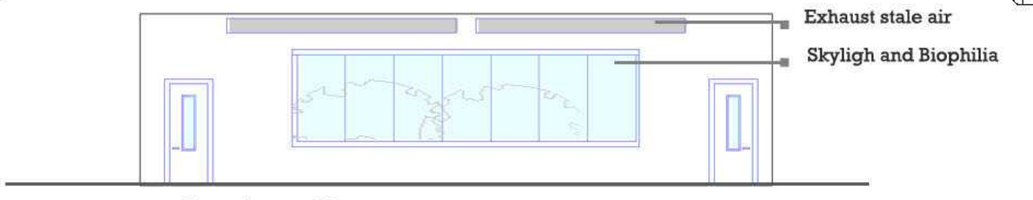
Facade elevation (A101)

Exterior wall (Facing North; Solar chimeny monted above windows)

Fig.123. Cases of strategies 02







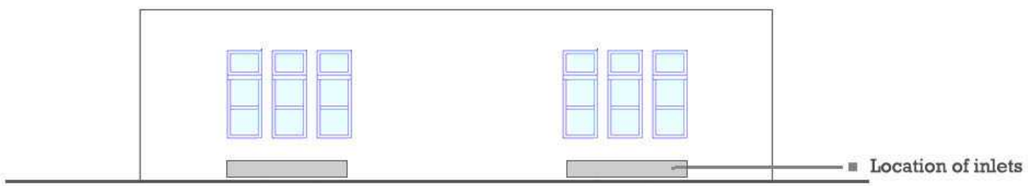
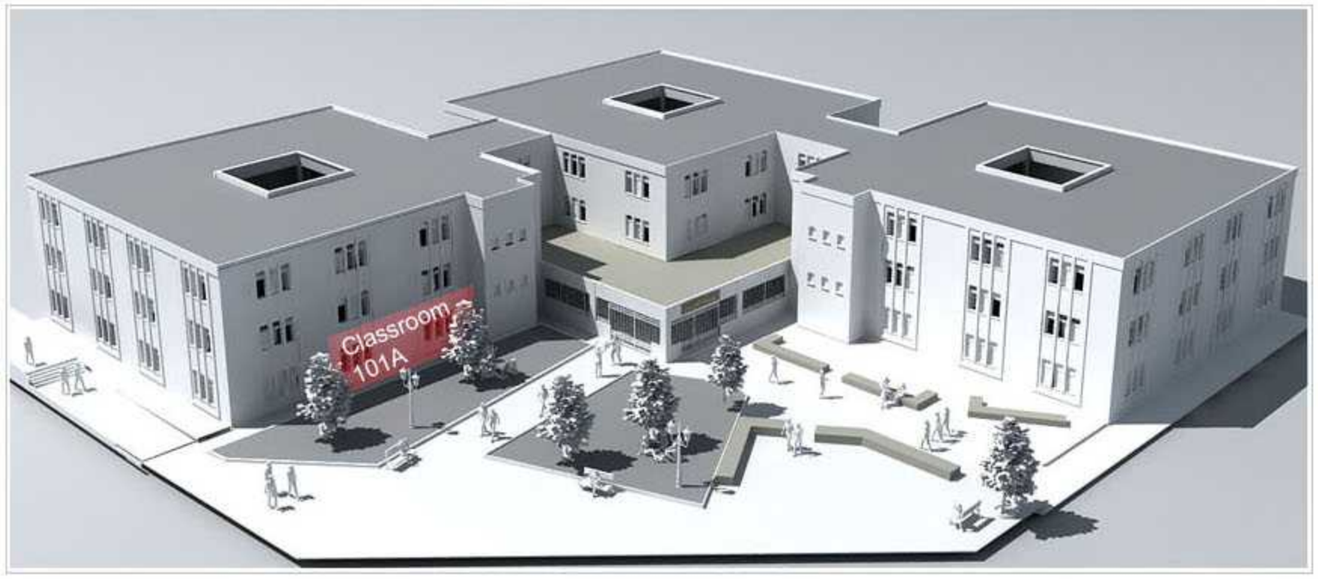
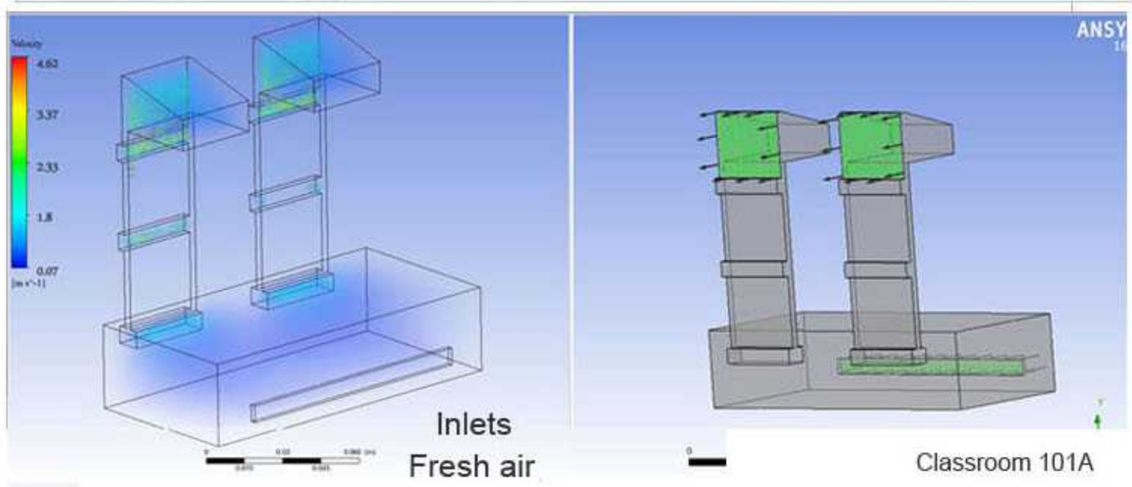


Fig.123. Cases of strategies 03

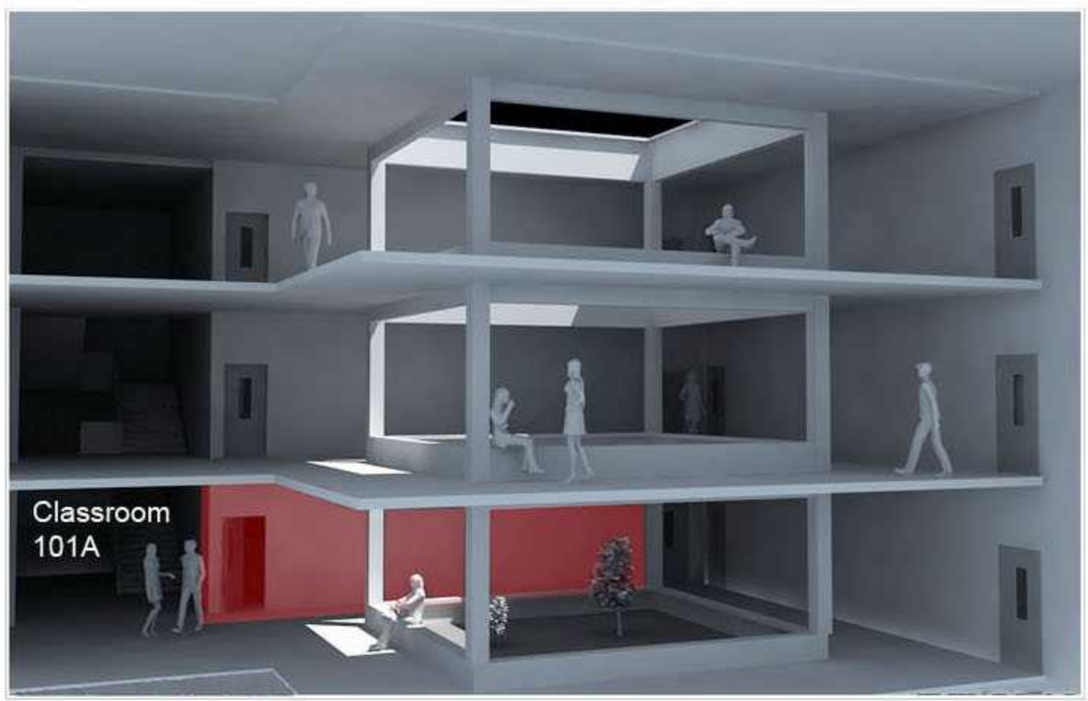


Different 3d views show the location of the classroom model and its context (urban area);with its micro-climate features.

3D View shows the entrance of the Architecture and Urbanism studies



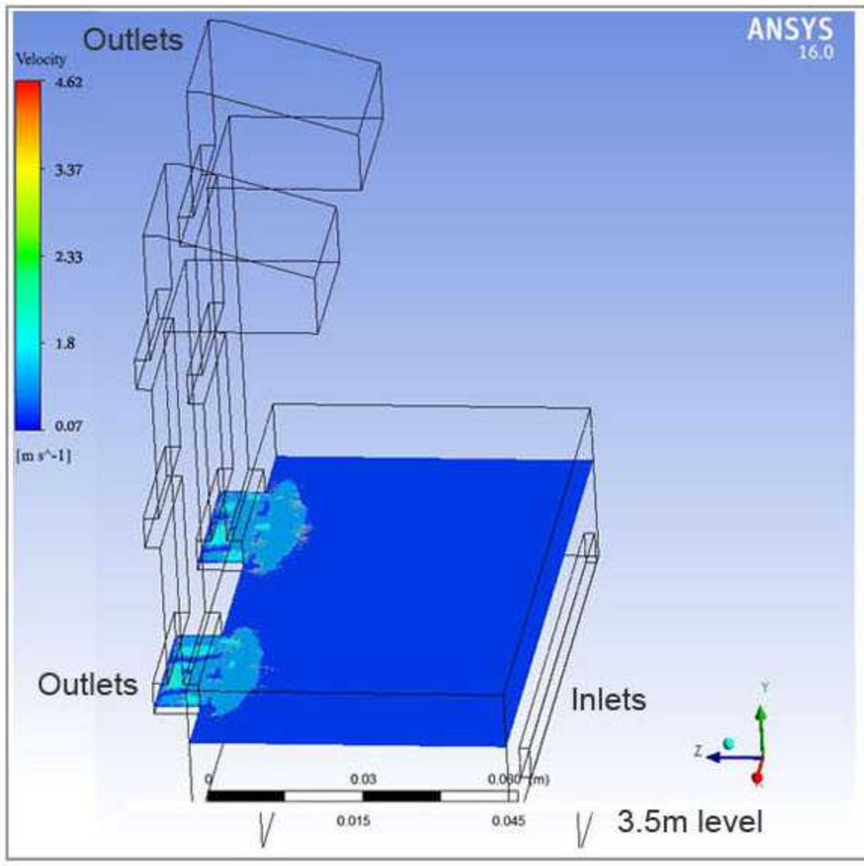
The CFD model of the classroom was designed with simple geometry form . the classromm is pratically with no funiture arrangements. the measurments were taken from our field measurment at location.

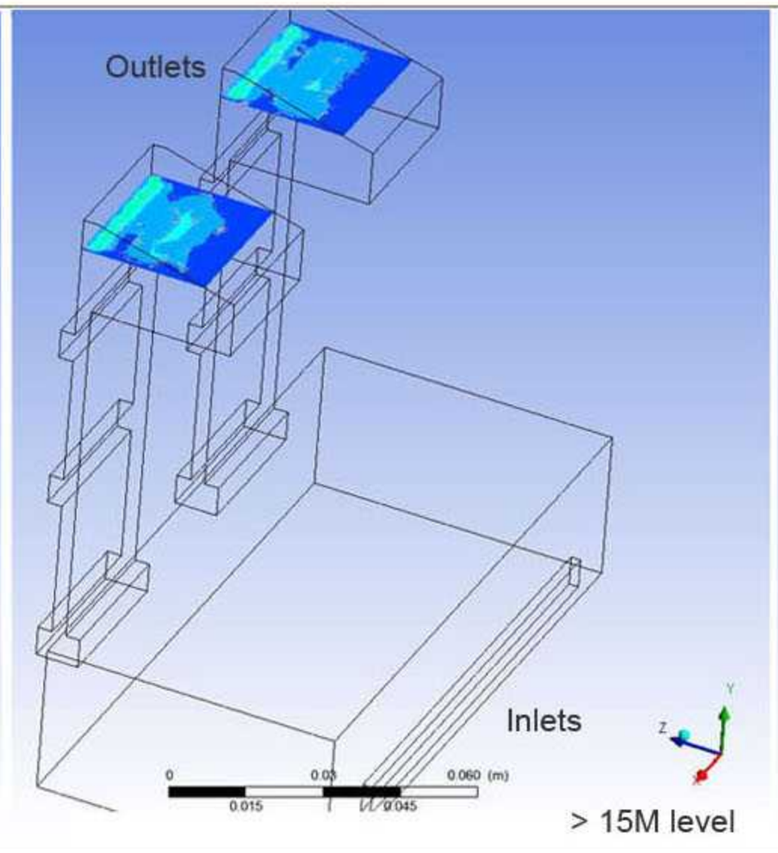


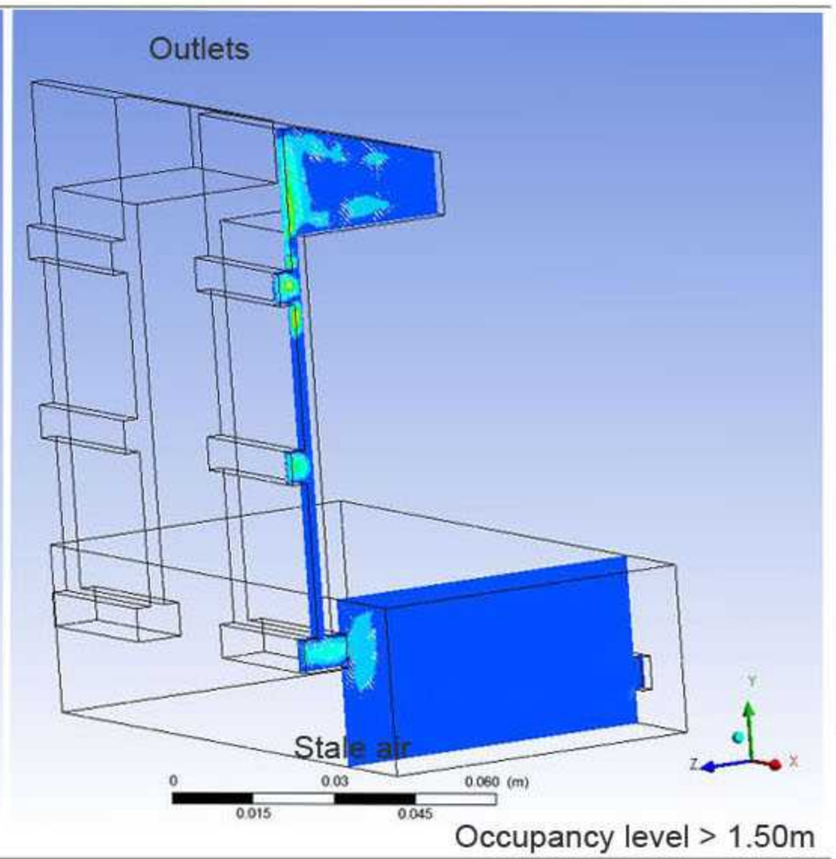
3D View shows the center of bloc A courtyard and open lightwell with 3 levels

Classroom 101A

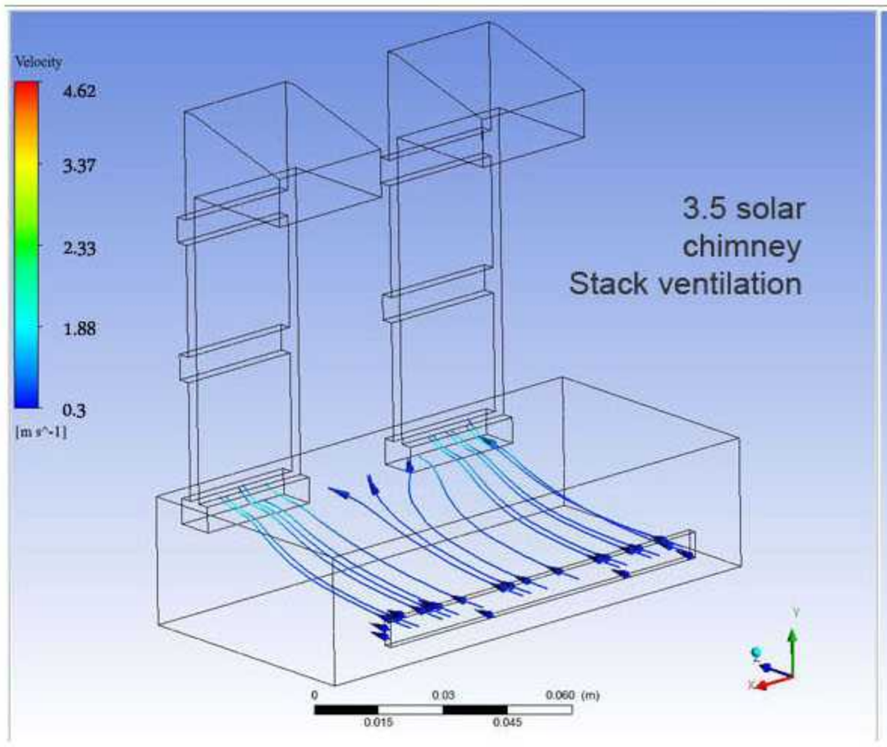
Fig.124. 3D views and simulations 02

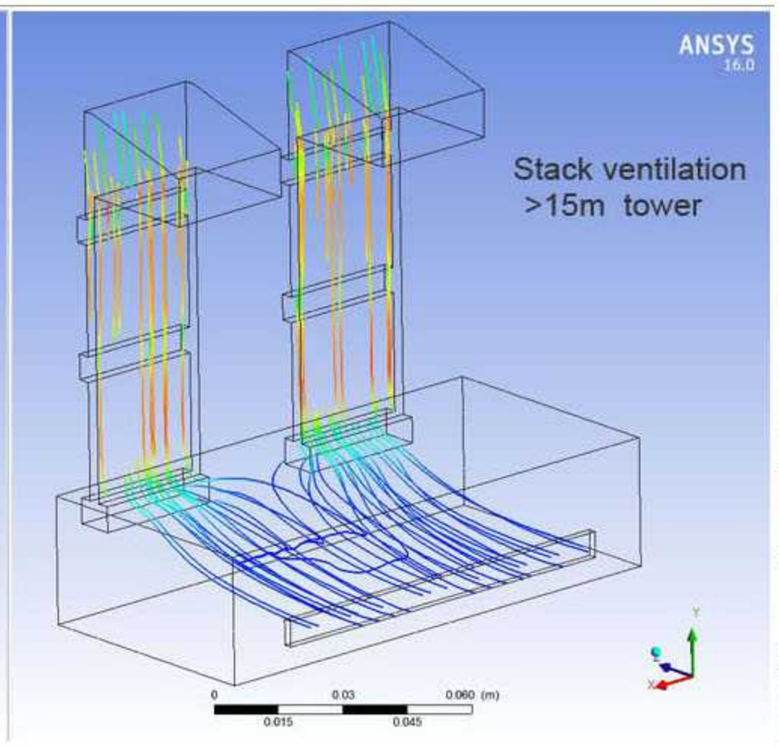


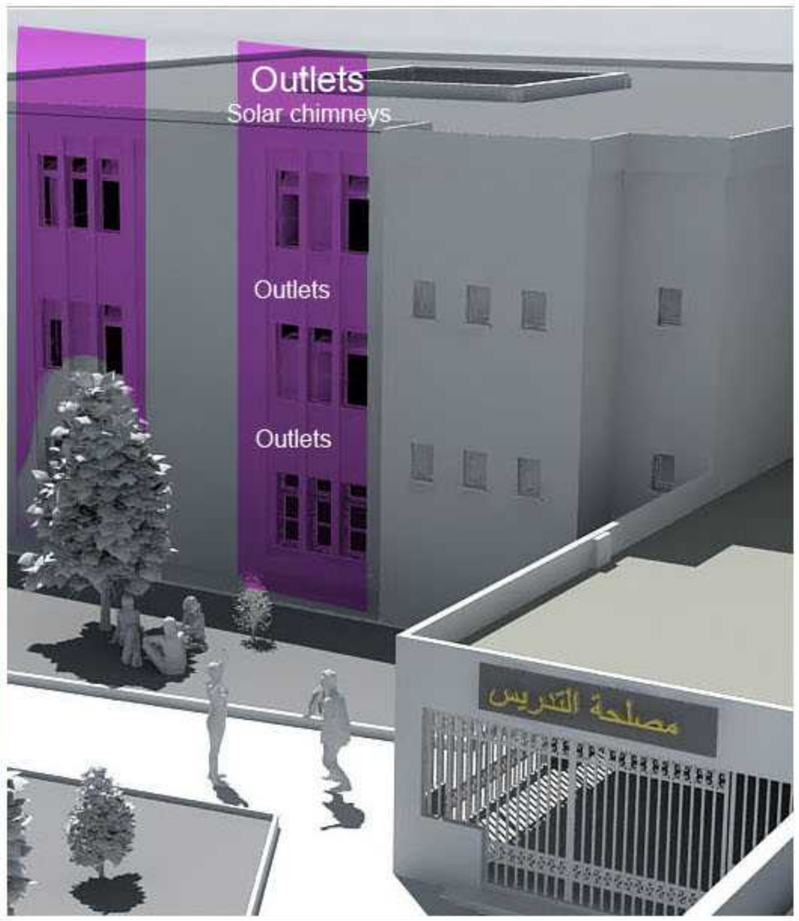




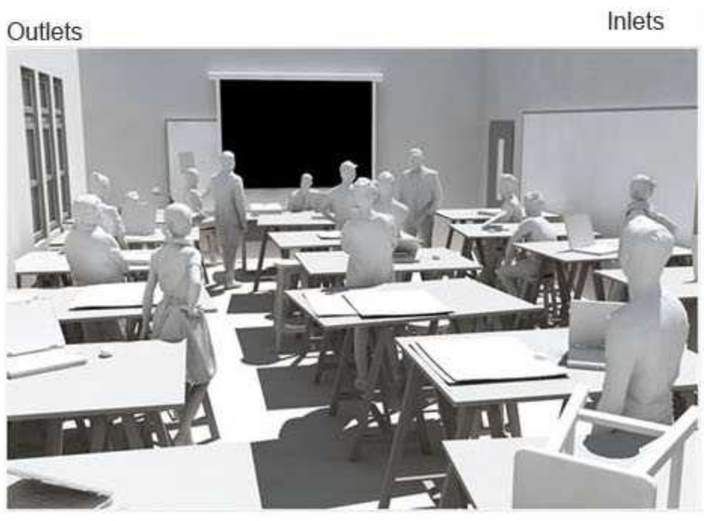
The inlets and outlets of the classroom were designed to support displacement ventilation mode ; were inlets installed in the bottom of southernn side , whereas the oulets wrere instaled on northern wall on higher part of the wall,

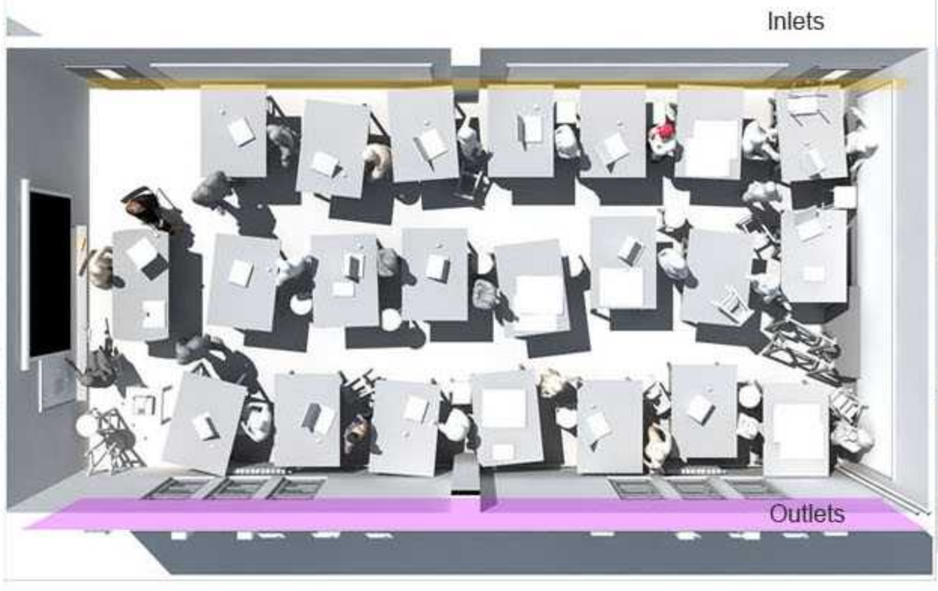


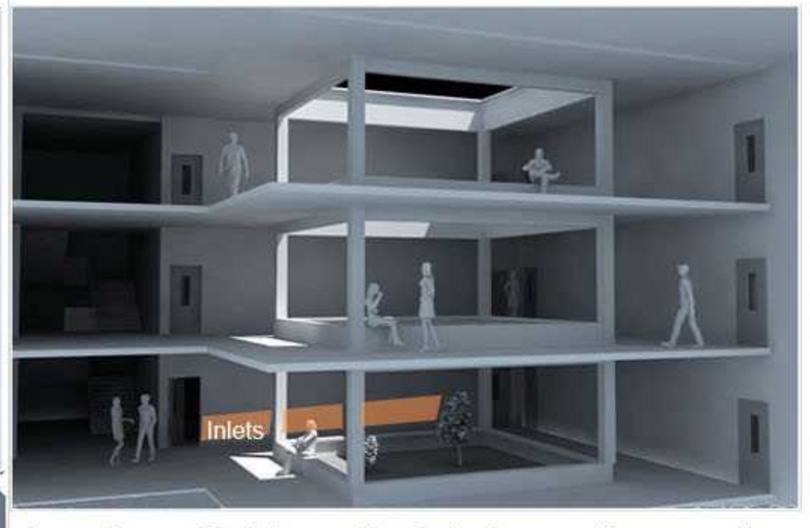




Location of outlets on the facade







Location of inlets on the interior southern wall

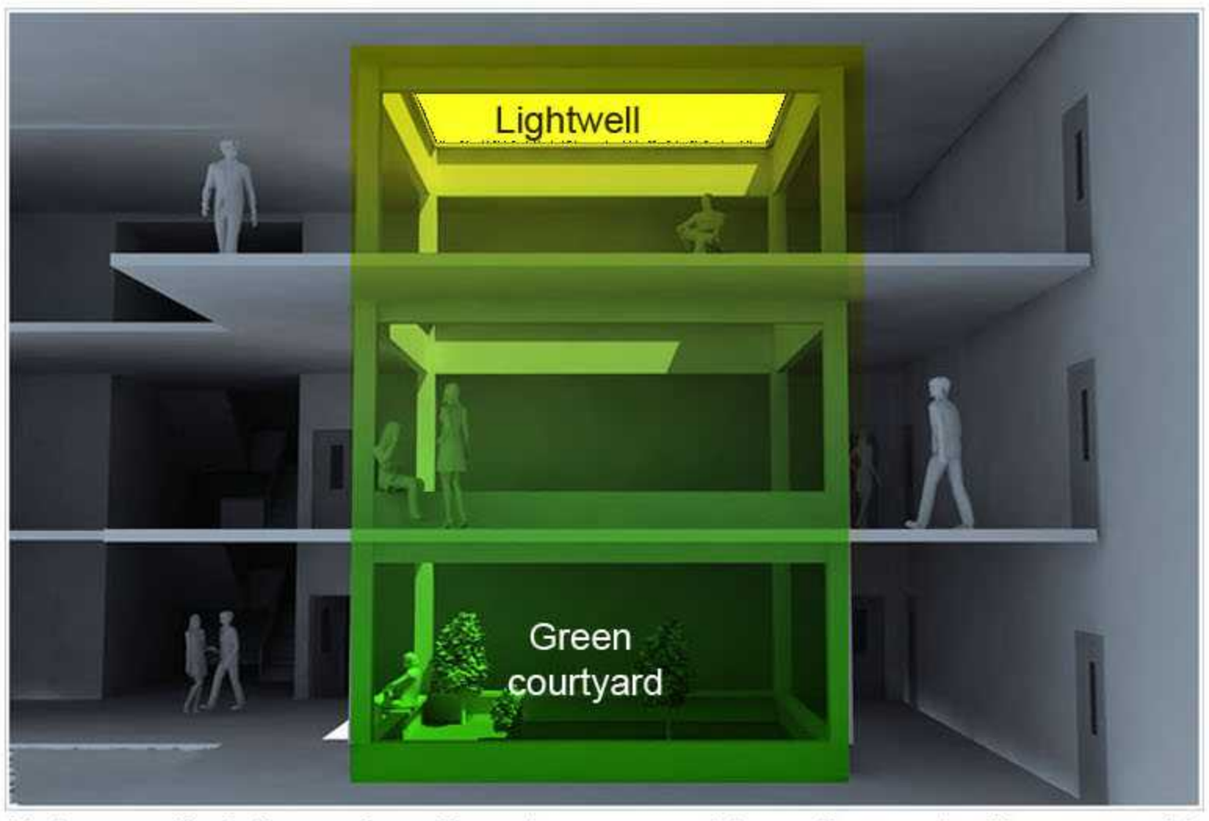
Classroom 101 A ;Ventilation inlet at courtyard base

Different 3d views show the wind behavior in the classroom model and in /out of resh air intake ; stale air outakes.

Fig.124. 3D views and simulations 03

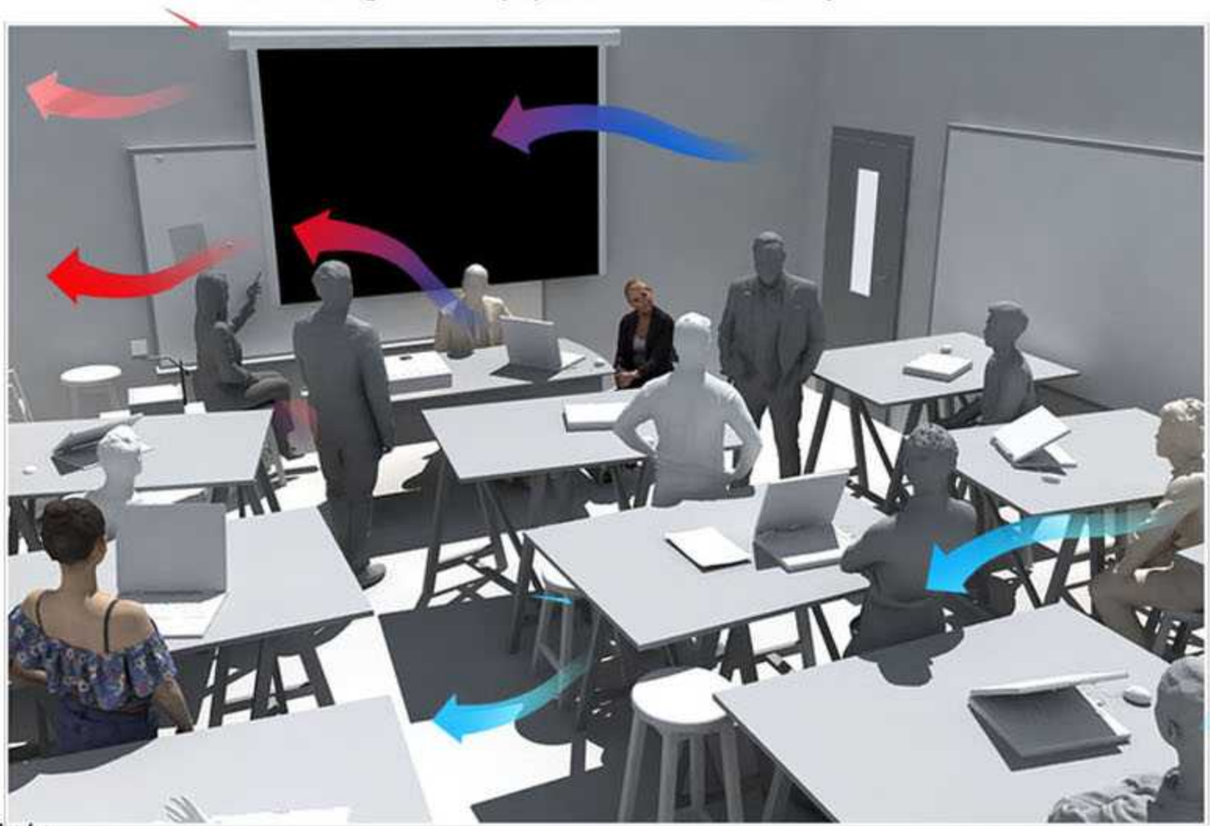
Ventilation stacks/solar chimneys are incorprated in the roof and end each level. the solar chimneies on the roof faced south .

Building Block (A) with solar chimeys



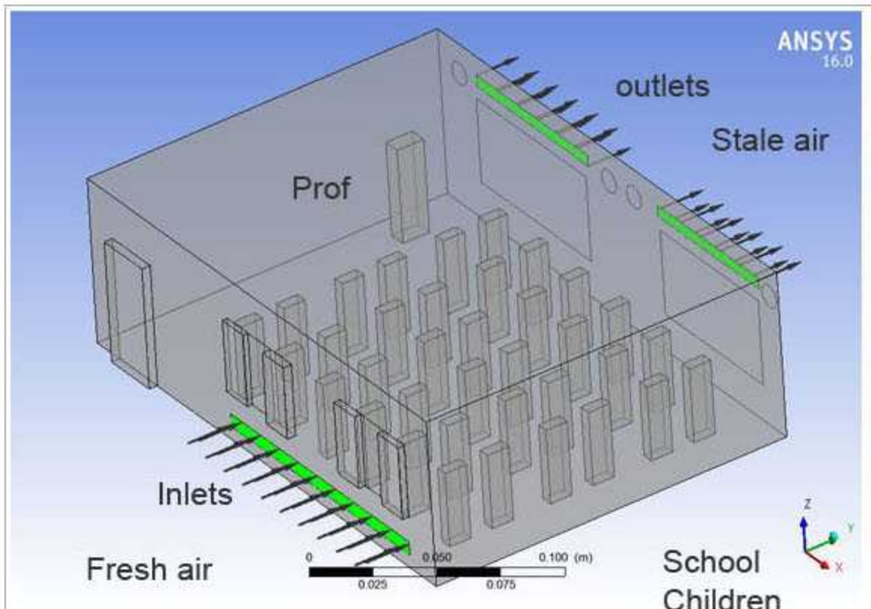
Air is supplied through wall center- open atria wall mounted low speed inlets

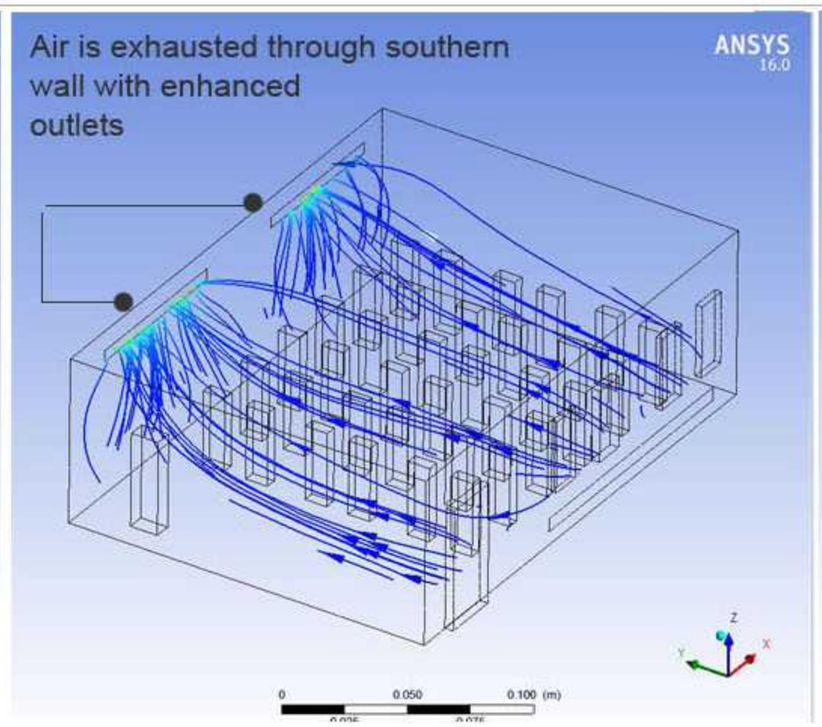
The natural ventilation from the green open courtdyard (lightwell). under the passage.

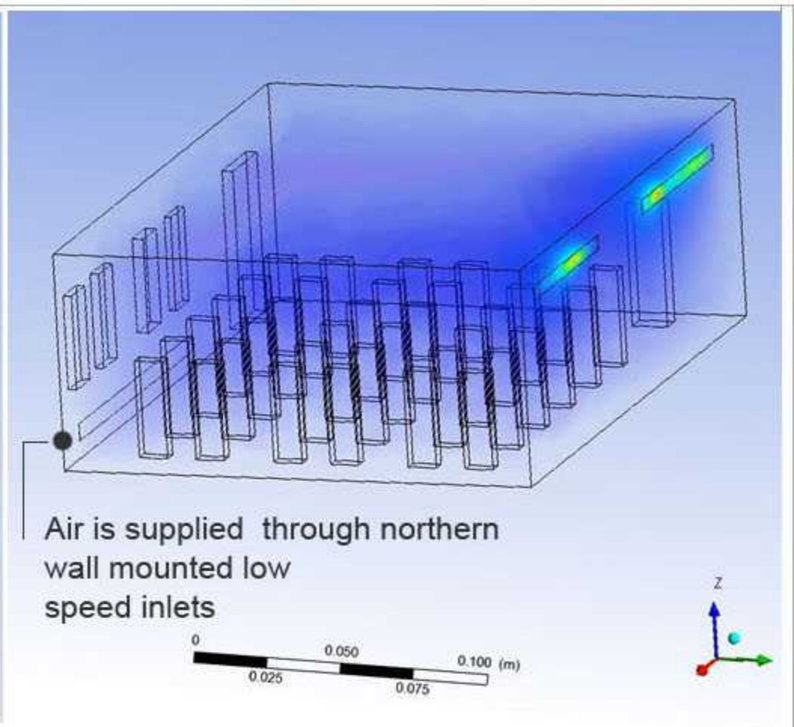


Interior view of the classroom (101A) and students interaction

Fig.124. 3D views and simulations 01

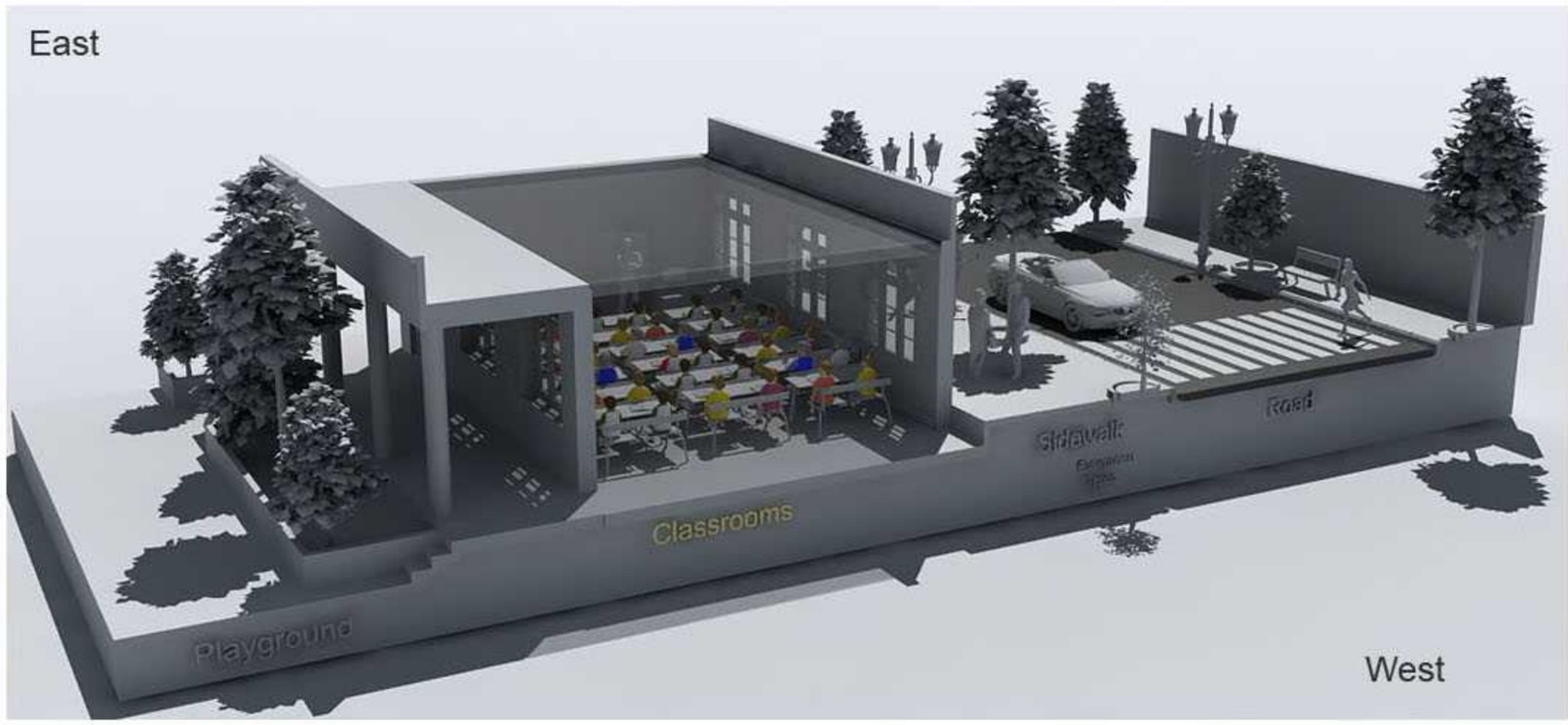






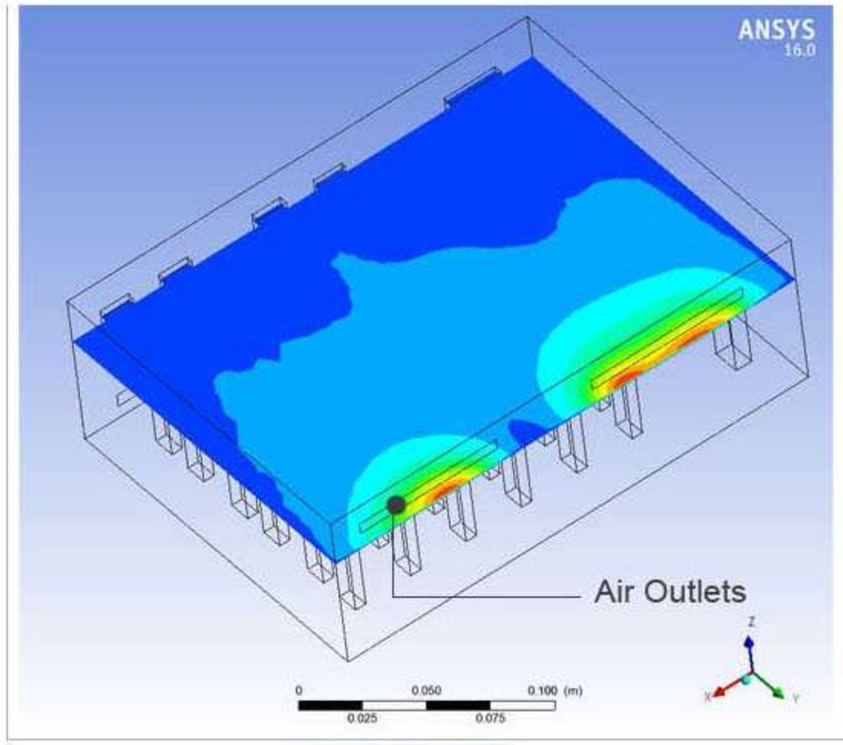
The CFD model of the classroom was designed accoridng to the most basic geometry of the classroom. Occupancy and furniture arrangements were presented by simplfied geometry and designed to fit the field measurmentss connditions.

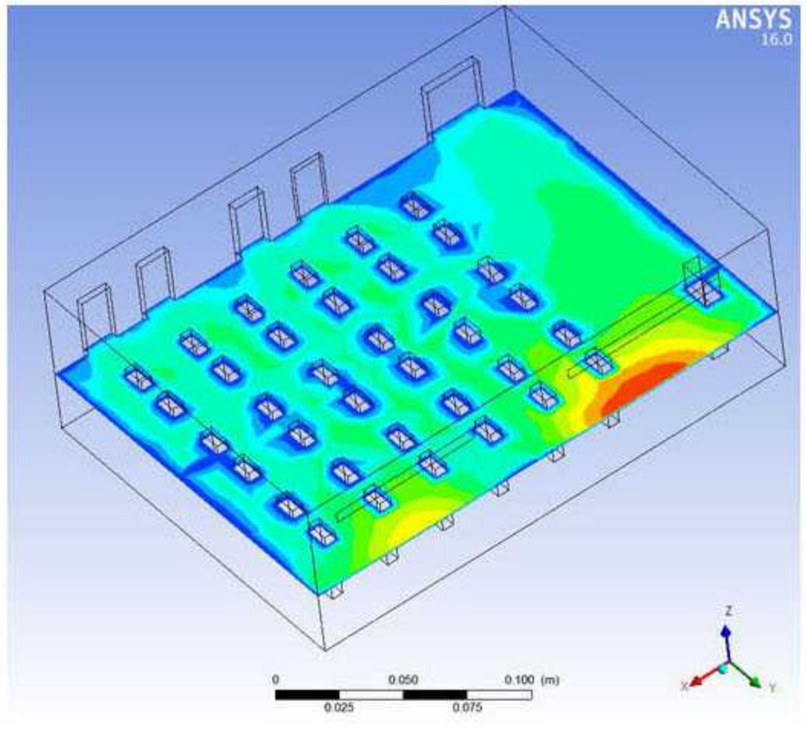
The inlets and outlets of the classroom were designed to support displacement ventilation mode; the were inlets installed in the tbottom of windows norther side , whereas the oulets wrere instaled on souther wall on higher part of the wall,

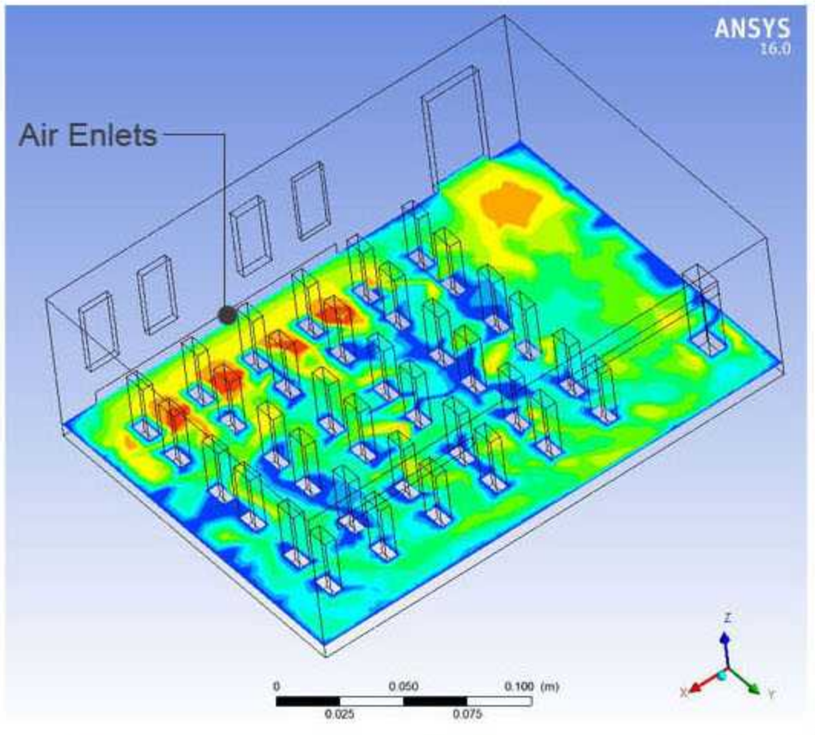


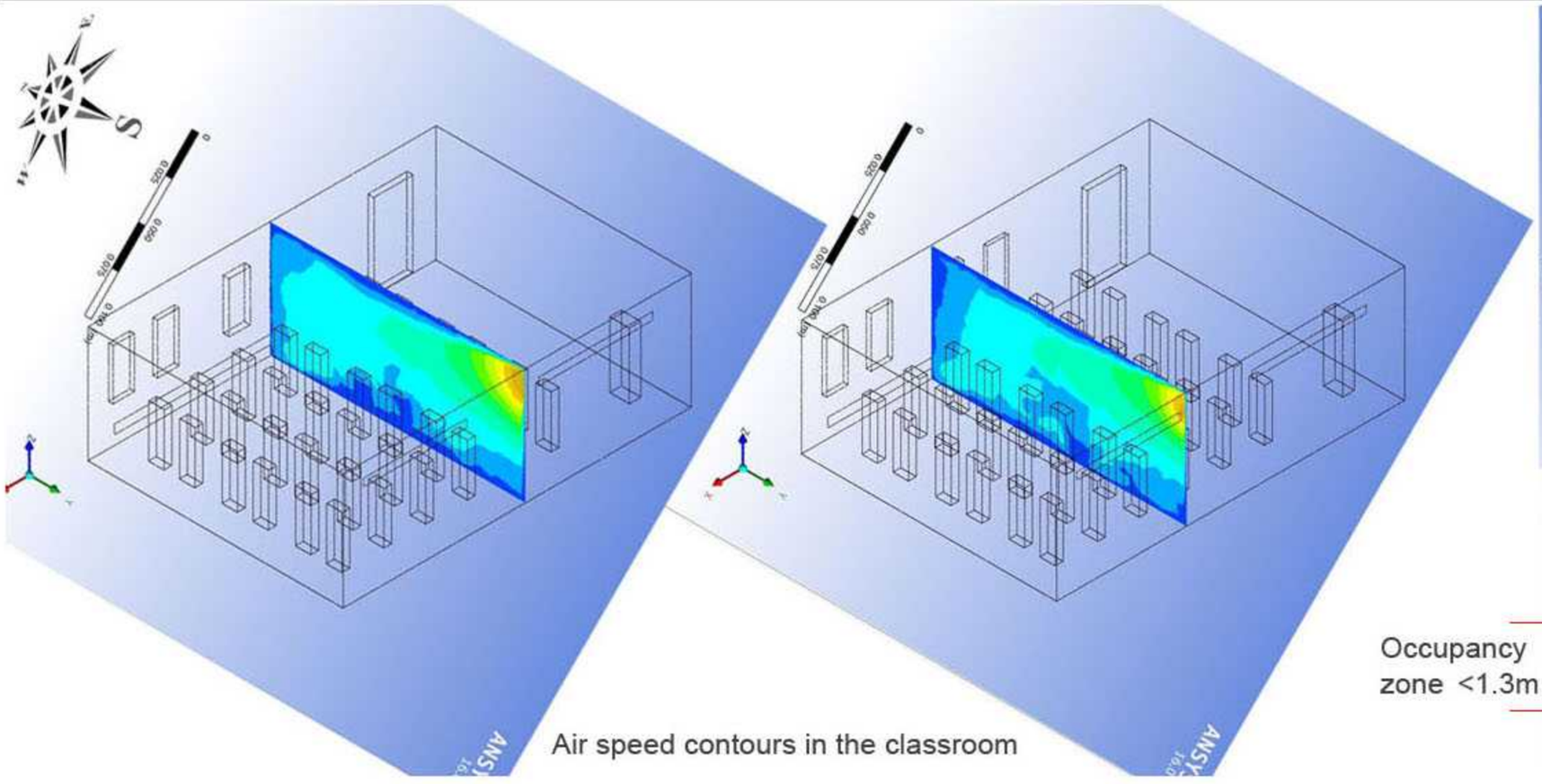
Different 3d views show the location of the classroom model and its context (urban area);with its micro-climate features.

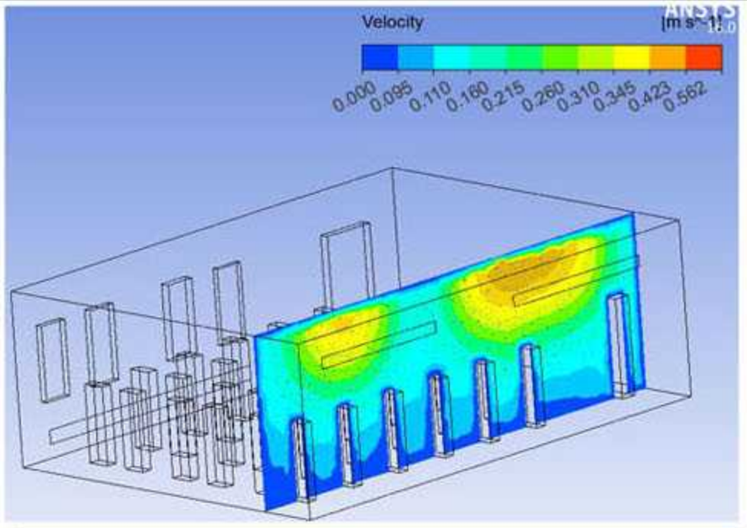
Fig.114. 3D views and simulations 02

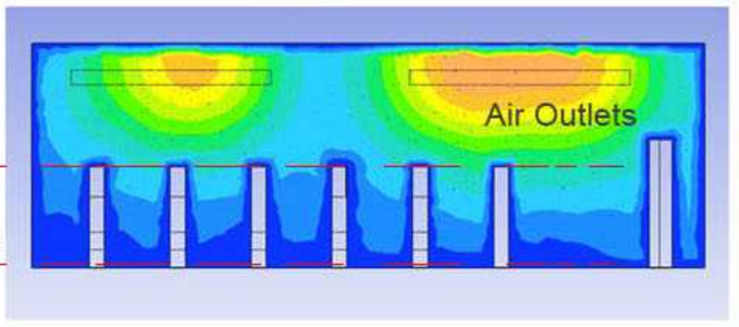


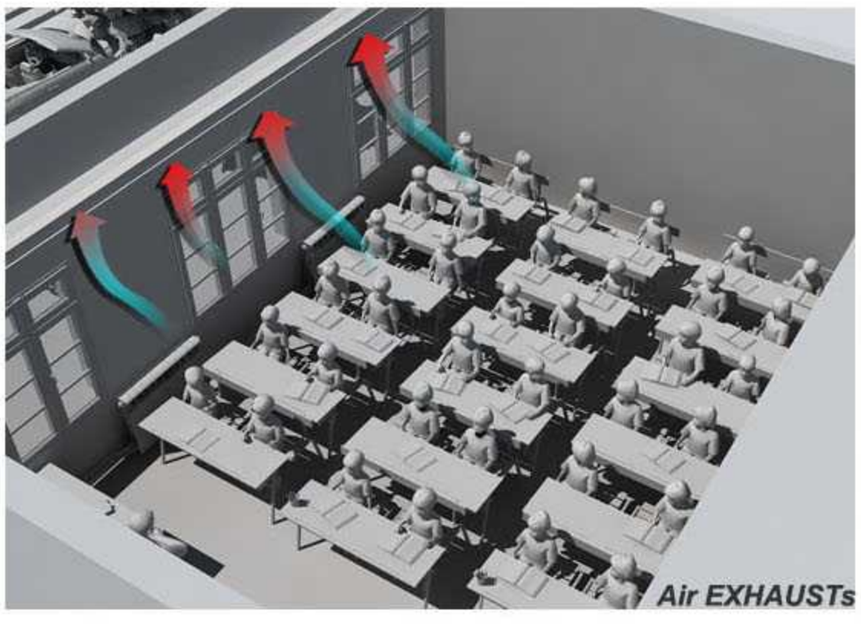












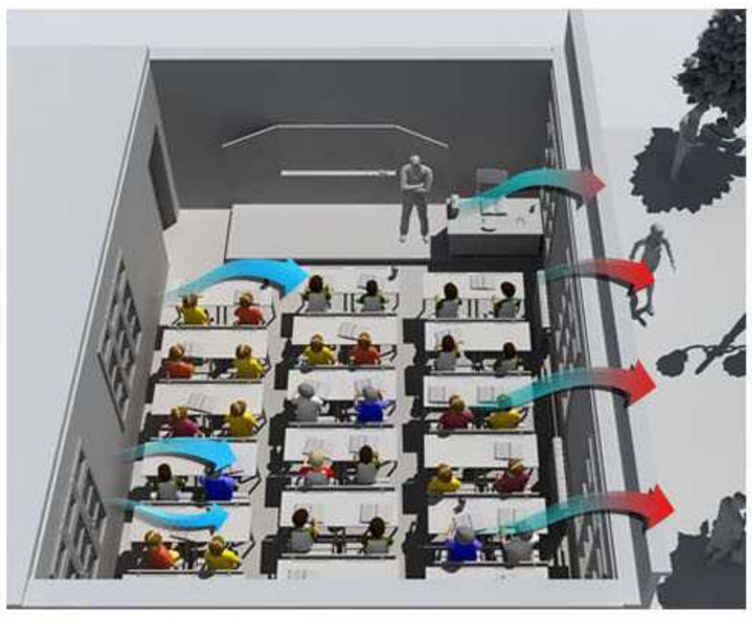
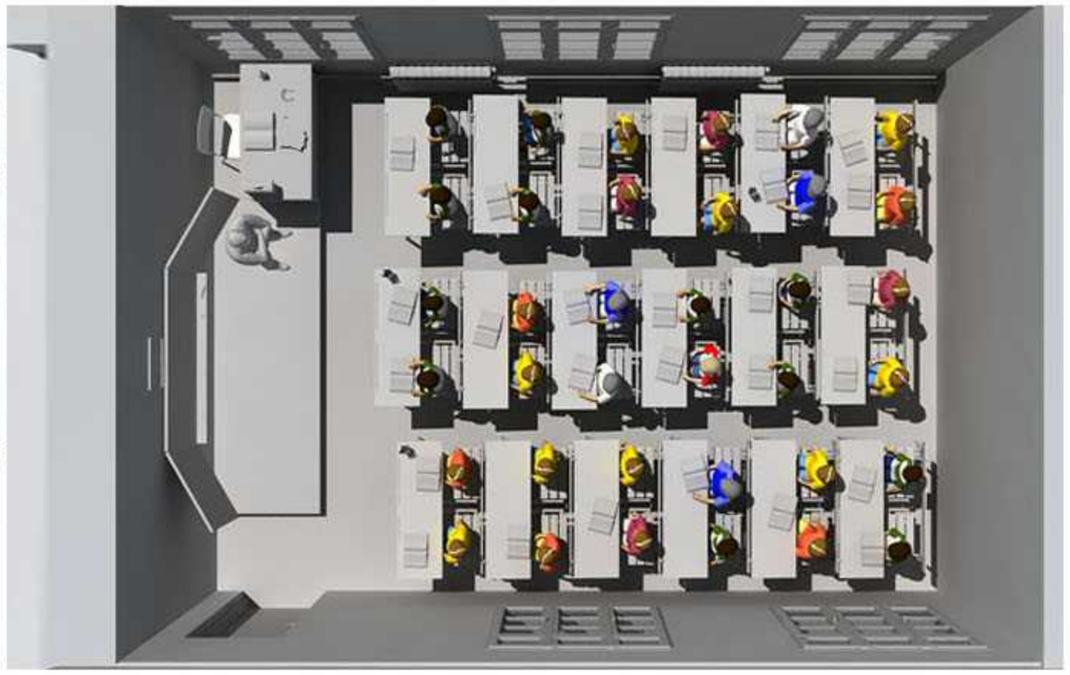


Fig.114. 3D views and simulations 01

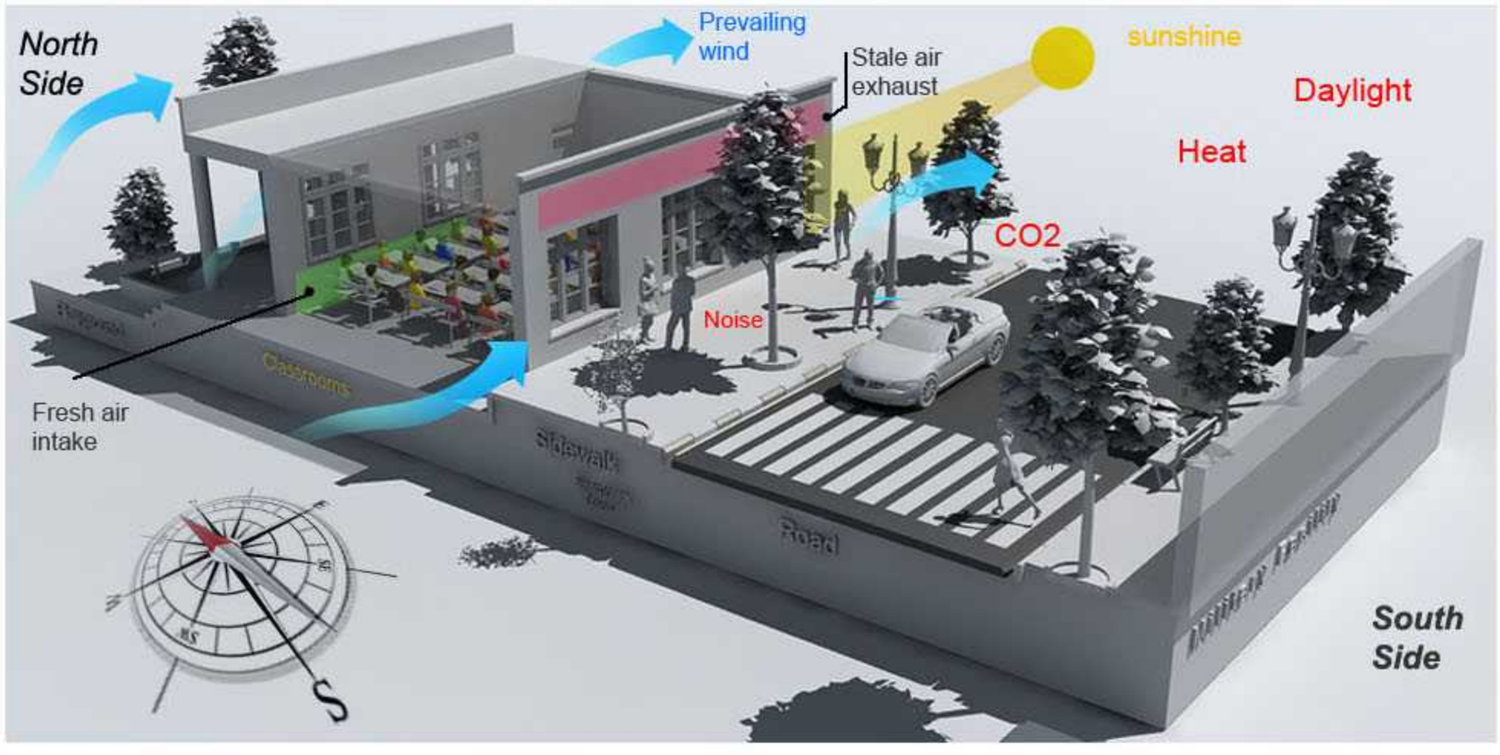
Southern Facade



Classroom interior

Palayground/courtyard

Northern Facade



Classroom and its micro-climate environment

Diagrams and 3d views show the different air flow behavior in/out the classroom and the disadvantage of micro-climate(Noise , air pollution, strong sunlight- heat and raise the temperature of the local microclimate-Indoor classroom.)

Fig.114. 3D views and simulations 03