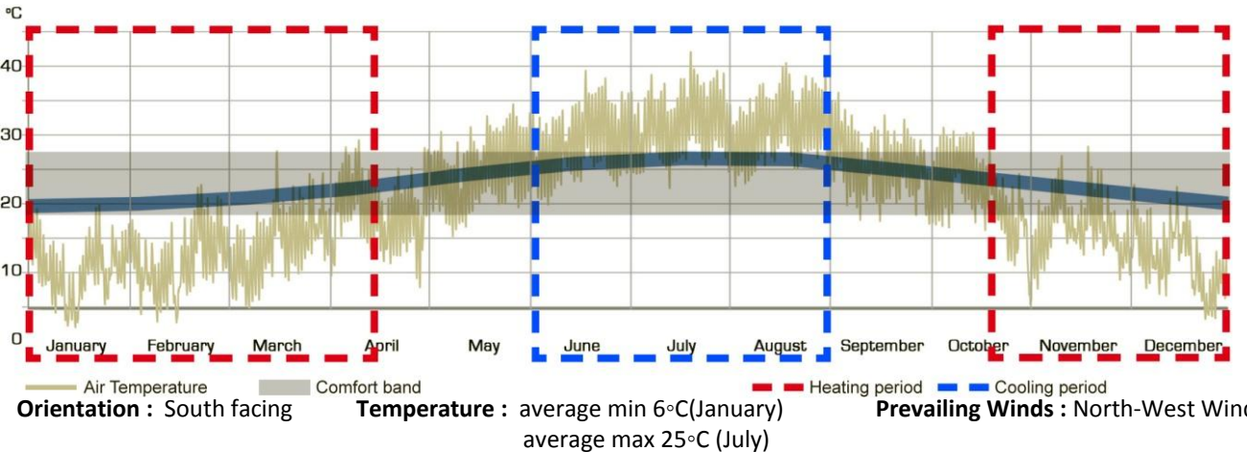
Data Study

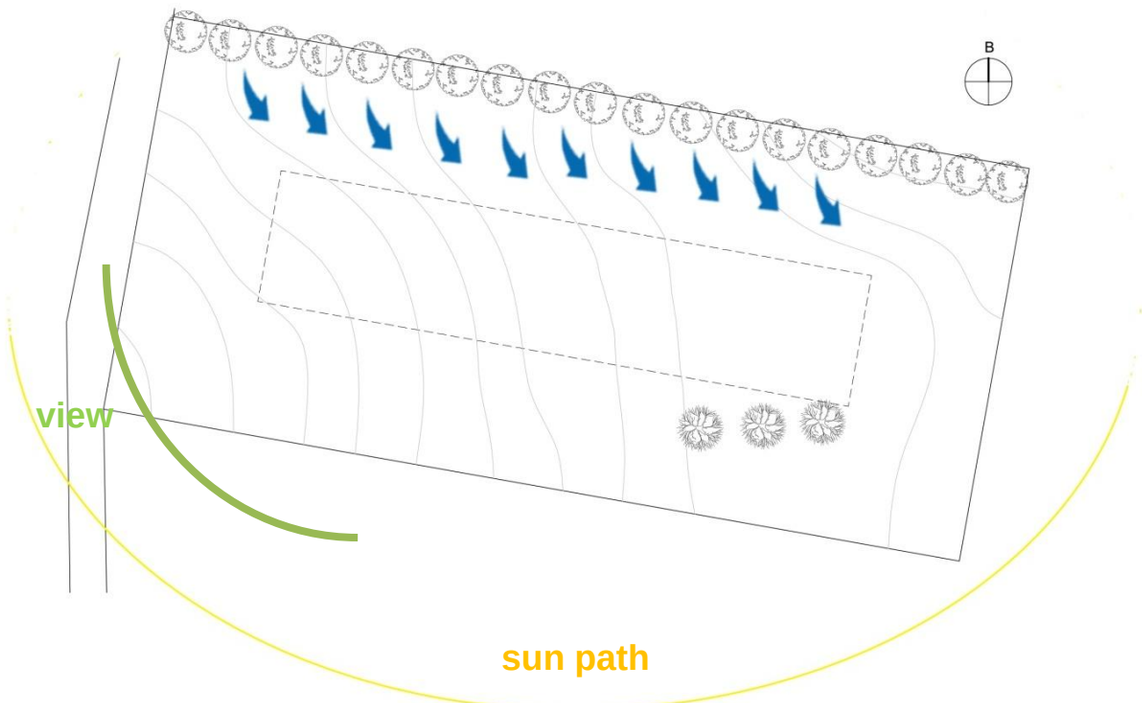
Thessaloniki

Suburb's location

Site



Orientation : South facing **Temperature :** average min 6◦C(January) average max 25◦C (July) **Prevailing Winds :** North-West Winds



Architectural Design

Architectural Objectives

- pleasant – healthy environment
- take advantage of the view
- encourage the interconnection of the built and inbuilt environment
- separate public and private spaces

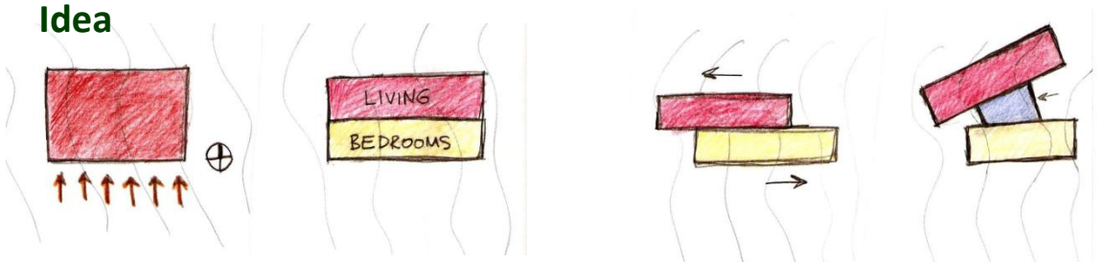
Environmental Objectives

- zero emissions
- eliminate heating and cooling loads
- eliminate electricity demand
- design for internal and visual comfort
- eliminate artificial lighting
- use renewable energy
- encourage independence from transport means
- water management

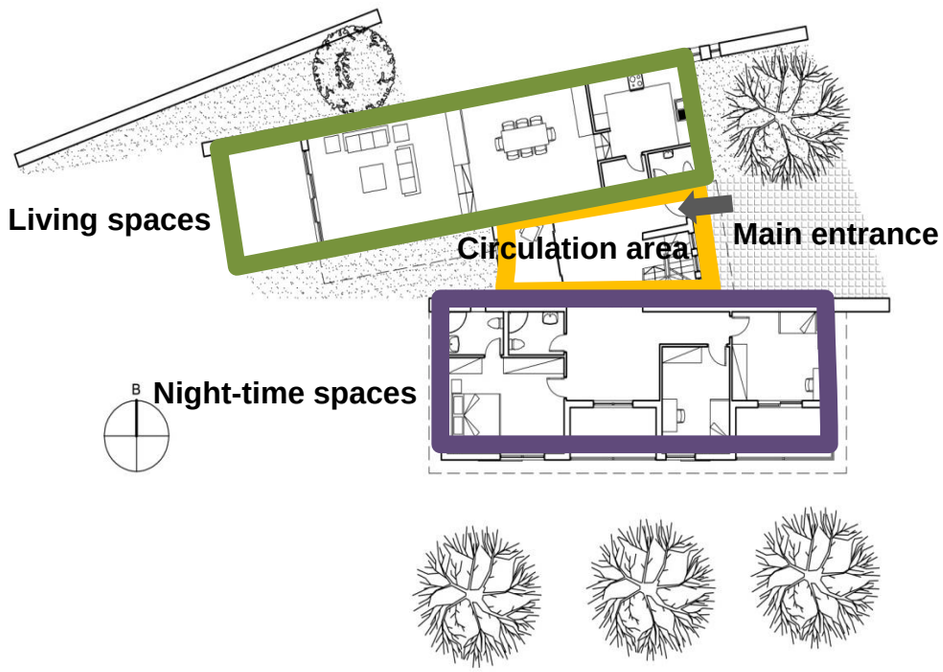
Building Program

- main residence
- house for a 4 members family

Idea



1 volume Divided to 2 volumes Sliding volumes Rotate the one volume



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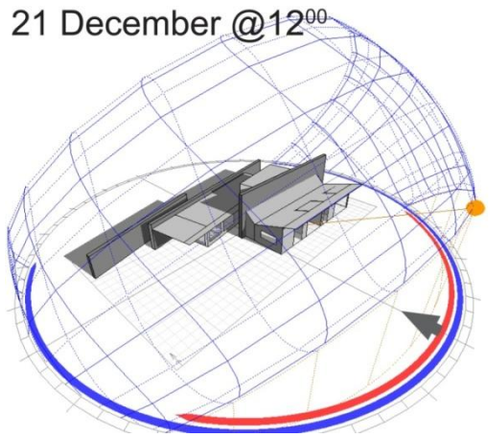
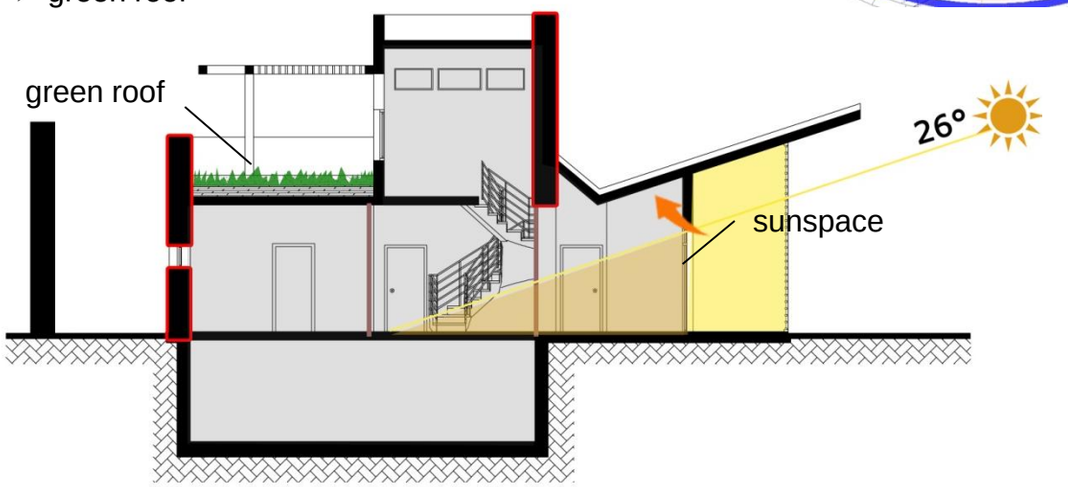
WORKING GROUP – Kalatha A., Kazempour S., Lykantidou M., Papadopoulou D., Ozkan C.

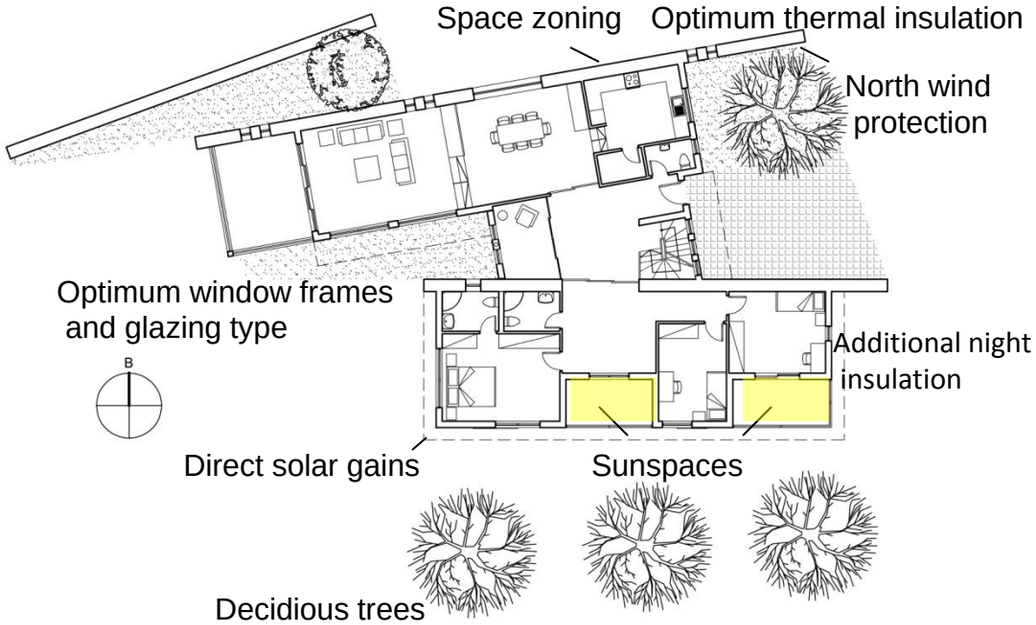
Winter Strategies

Eliminate Heating Loads

- optimize thermal insulation of low U-value
- optimize window frames and glazing type
- direct solar gain
- modifiable exposure level
- additional night insulation
- thermal mass – heat storage
- space zoning (buffering and movable elements)
- open able sunspace
- settle North East cold winter wind
- green roof

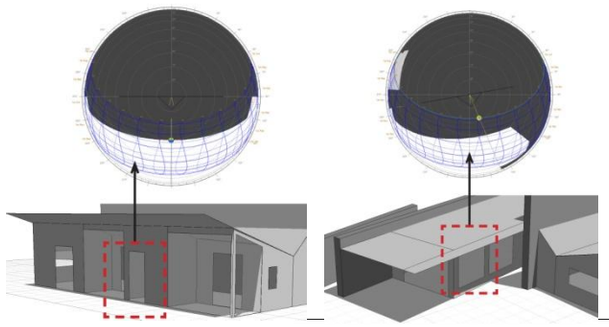




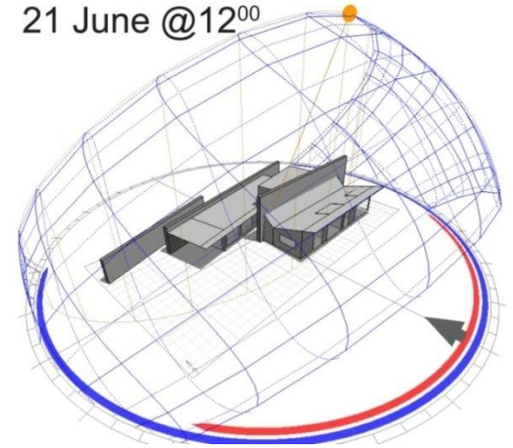


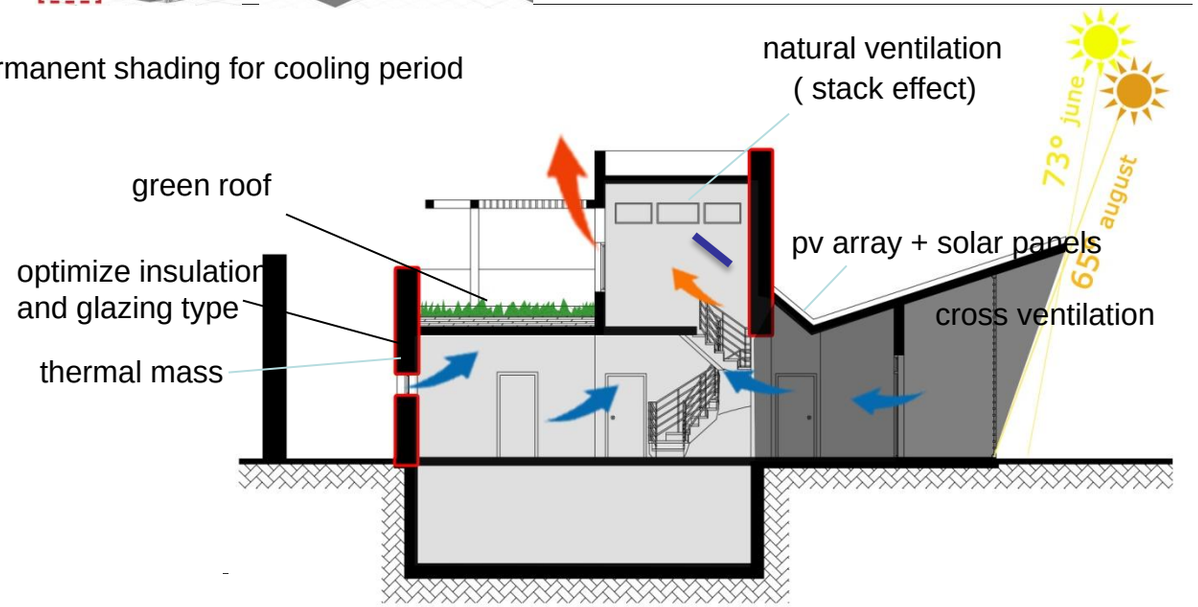
Summer Strategies

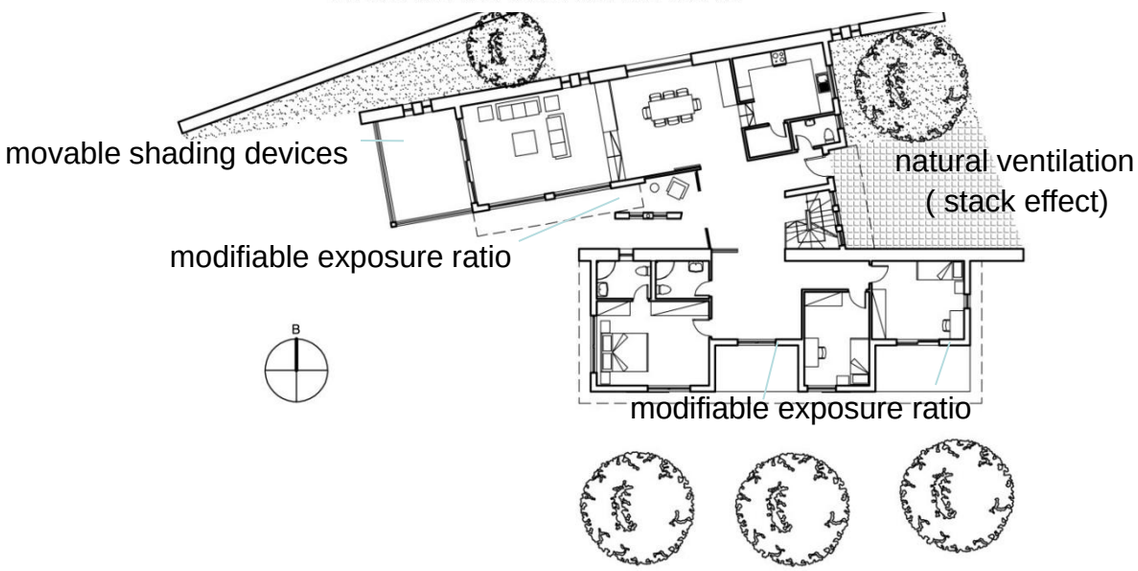
Eliminate Cooling Loads



permanent shading for cooling period







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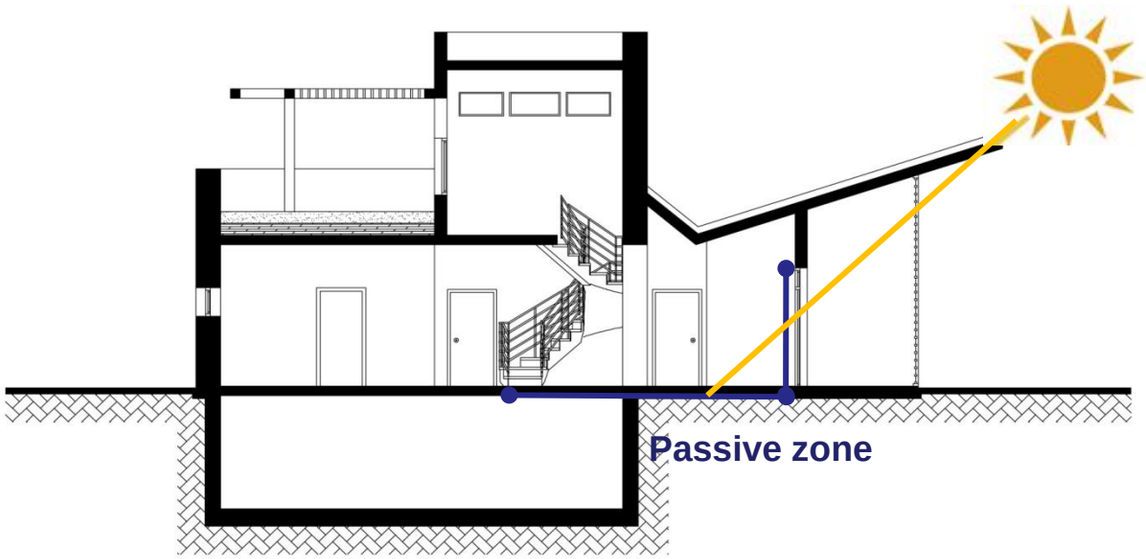
Daylight Strategies

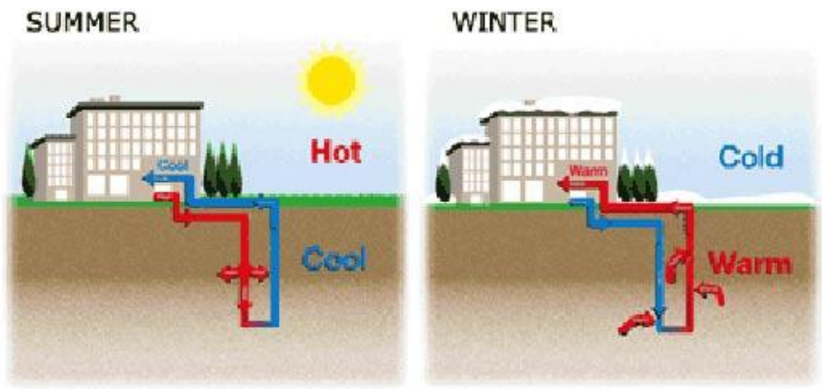
Eliminate Lighting Loads

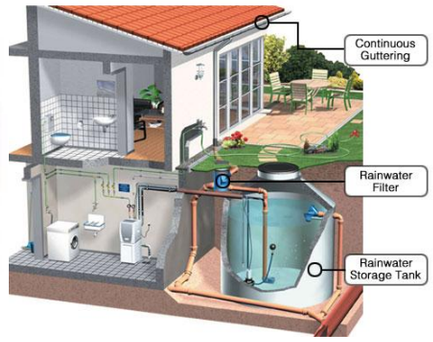
- shallow plans up to passive zone (d=2h)
- light colors inside for IRC
- avoid overshadowing from the volumetry of the building itself or vegetation



Other energy saving techniques

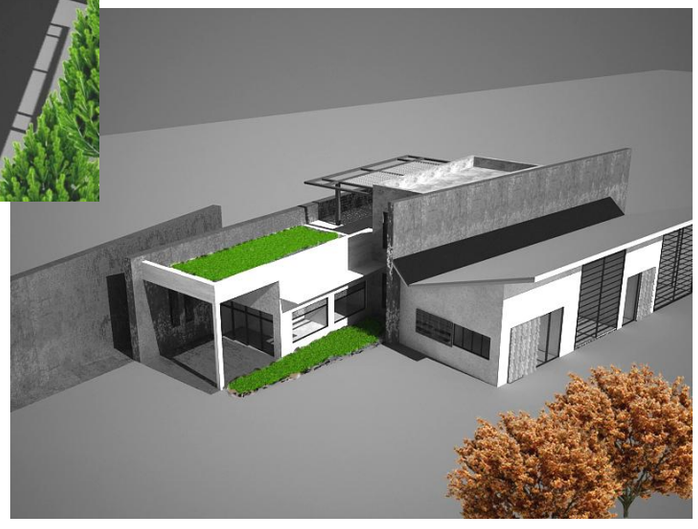
- provision for PV panels
- thermal panels for hot water
- rainwater collection and storage
- alternative heating systems (geothermal energy or heat pumps or biomass)
- energy efficient equipment
- create a working space at home
- Mediterranean plants (reduced need for irrigation)
- recyclable materials or low embodied energy materials
- encourage the use of bicycle





3D Views

Main entrance



South – west view

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