



# Global Campus Energy Manager's Workshop

## Designing efficient buildings

Universitat Autònoma de Barcelona (UAB).

ICTA-ICP's Building.





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## The UAB at a glance

- Year of construction:  
1969 (40% of the buildings were built 45 years ago)
- Occupancy:  
40,000 people (students, staff, and teachers)

- The Campus:

642 acres Bellaterra Campus

50 buildings. 42 buildings in the  
Bellaterra

Campus and 8 in other Campus.

6M sq feet area



- Campus Budget: \$28M, \$5M (Utilities)



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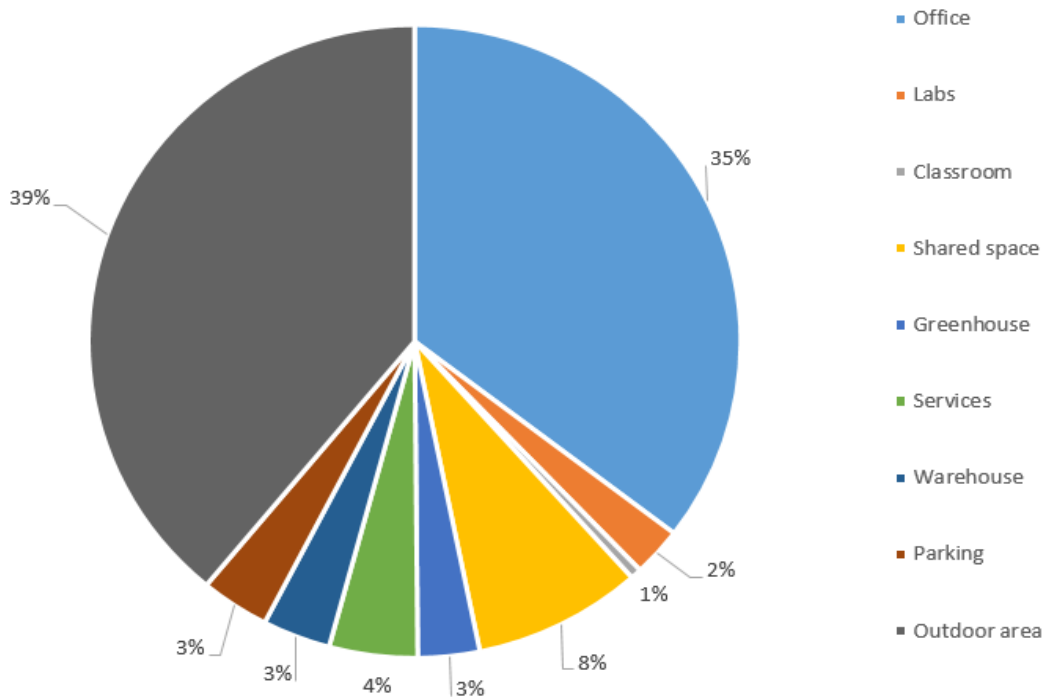
## ICTA-ICP's Building

### General data:

Built area: 16,000 sq feet

Budget: 9,000,00 \$

Execution time: May 2012 – January 2014





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## ICTA-ICP's Building



### Construction



- Four separate “buildings”
- High quality natural lighting
- Natural ventilation system that dissipates the internal thermal load
- High insulation

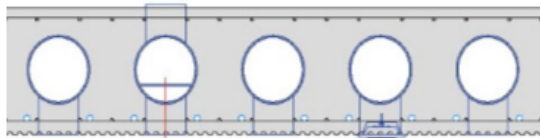
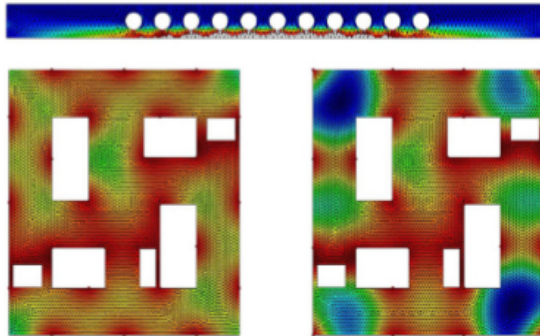


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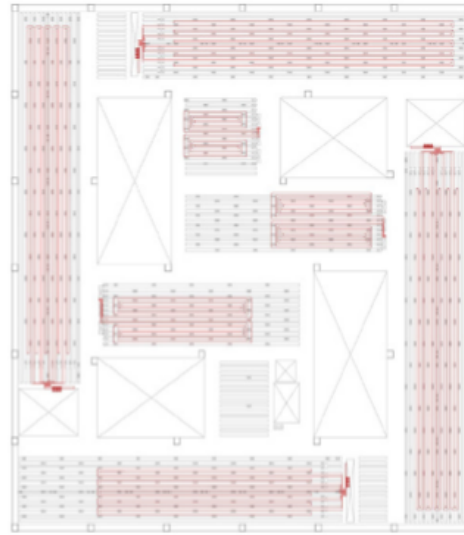
## ICTA-ICP's Building



### Structure



Details of concrete slabs



Thermally activated structure

- High thermal inertia
- Incorporates the ventilation system and the heating system which is a radiant floor system
- Second skin, mobile polycarbonate, takes advantage of natural lighting and ventilation
- Pre conditioned air by Canadian wells

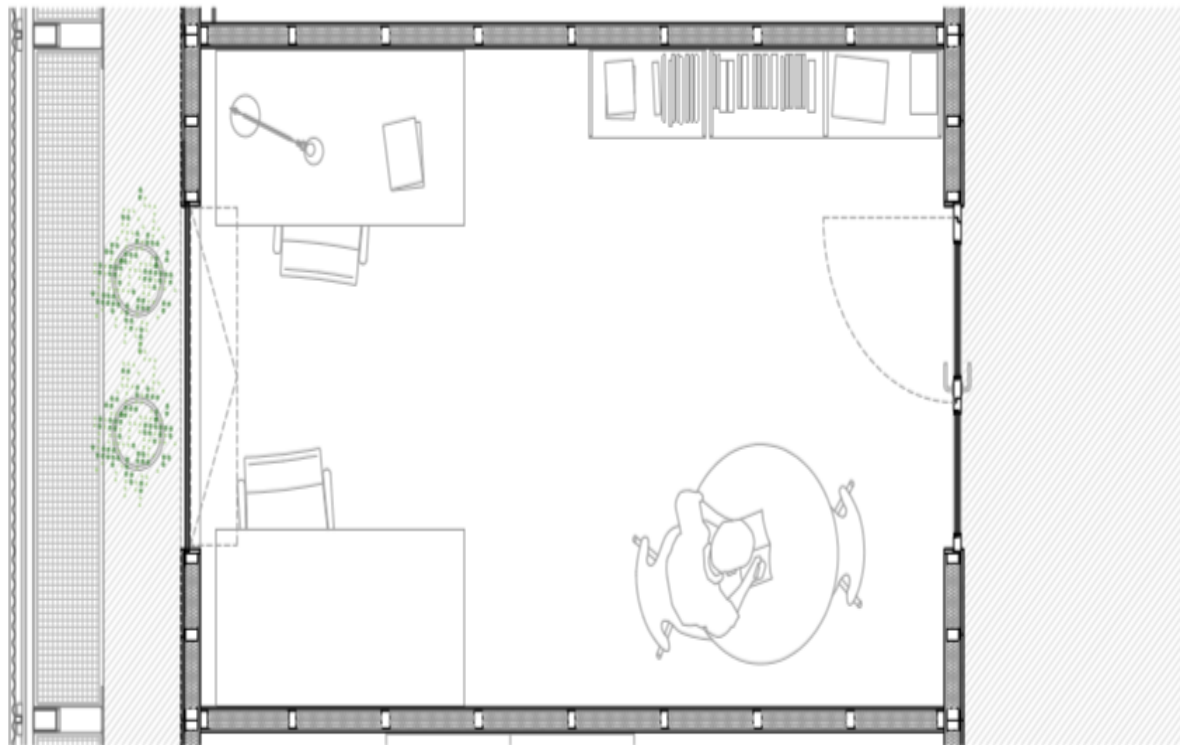


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## ICTA-ICP's Building



Natural lighting



Office floor plan

l0

l1

l2m

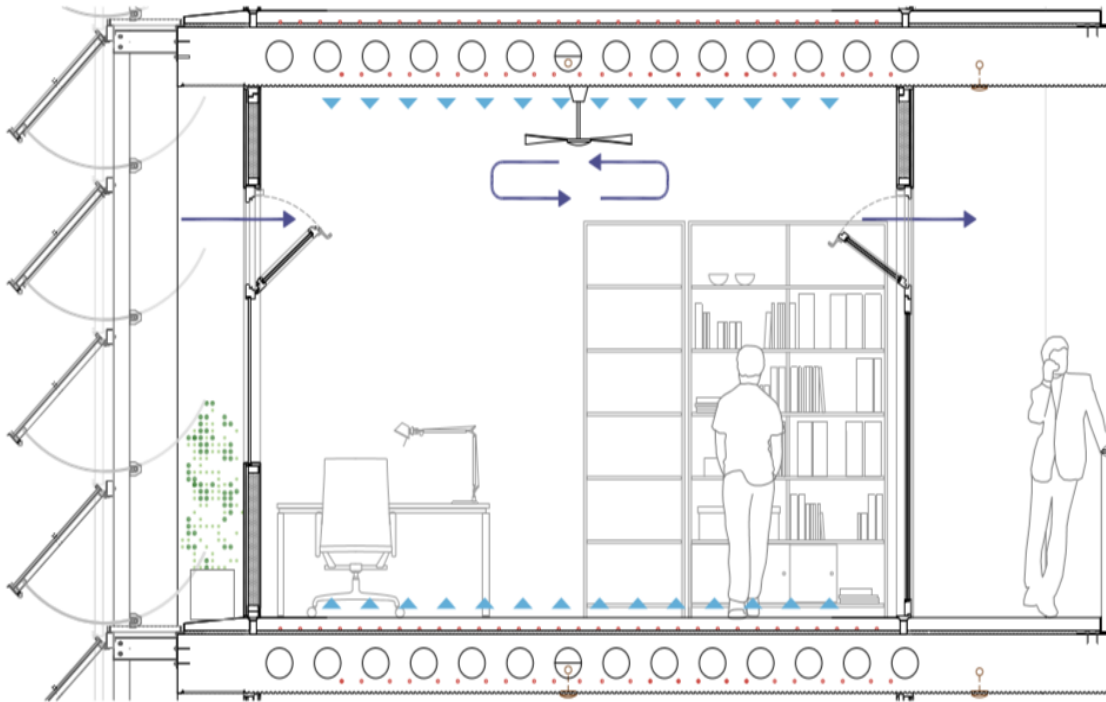
- Occupancy and lighting sensors
- Second skin, mobile polycarbonate, takes advantage of natural lighting



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## ICTA-ICP's Building

Bioclimatism: Indoor climates and management



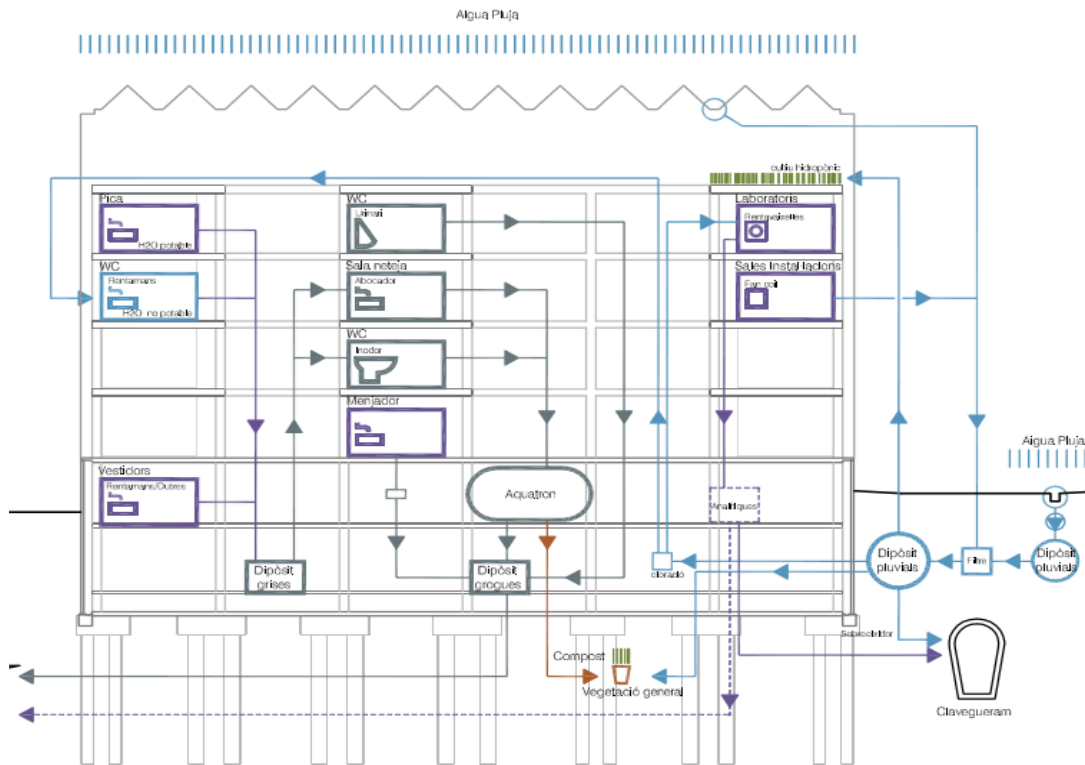
- Indoor windows are opened by the control system to guarantee the natural ventilation
- Fans
- Pre conditioned air by Canadian wells
- Structure incorporates the ventilation system and the heating system which is radiant system



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## ICTA-ICP's Building

### Water cycle



- Reduced demand due to elements efficacy: dry urinals, low-flush toilets, with aerators and automatic faucets
- Rainwater: toilets and irrigation.
- Greywater: toilets flushing water.





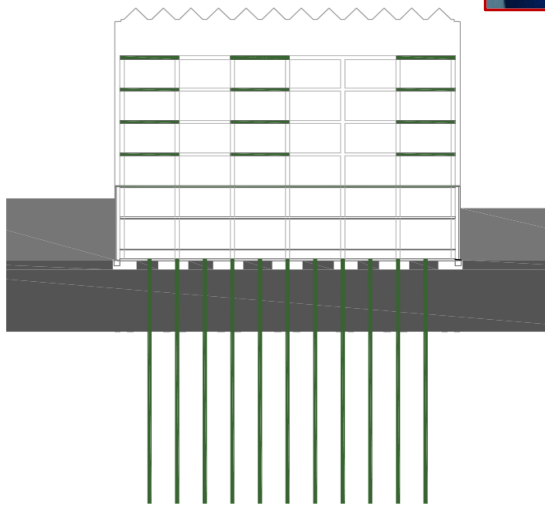
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## ICTA-ICP's Building

Geothermal  
heat pump



- The structure is activated by the geothermal pump exchanging temperature with the terrain.





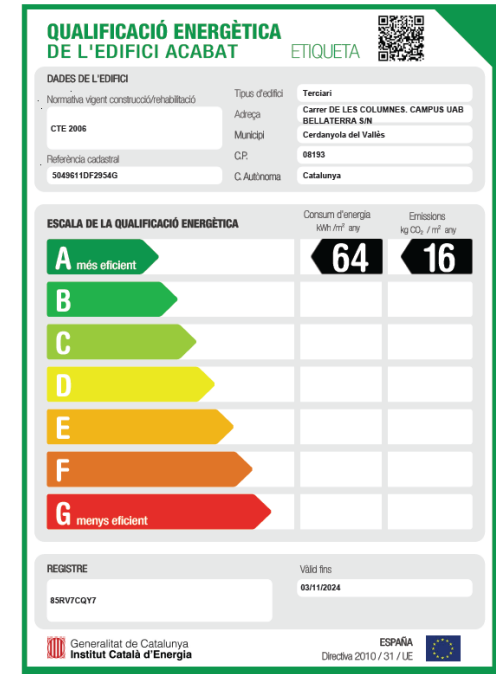
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## ICTA-ICP's Building

Certifications:

Spanish Certification Class A

LEED Gold Certification (72 points)





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