

## Prytanes II

by Pascal RABEAU / 2016-06-24 11:16:32 / Francia / 9500 / FR



Extension + refurbishment

Primary energy need :

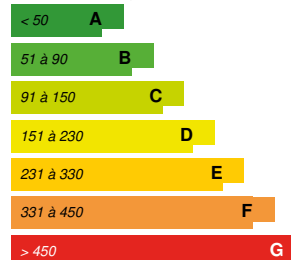
**32** kWhep/m<sup>2</sup>.an

(Calculation method : RT 2012 )

### ENERGY CONSUMPTION

Economical building

Building



Energy-intensive building

**Building Type** : Nursing home or Retirement home

**Construction Year** : 2015

**Delivery year** : 2015

**Address 1 - street** : 4185, route de Gardanne 13080 LUYNES, France

**Climate zone** : [Csa] Interior Mediterranean - Mild with dry, hot summer.

**Net Floor Area** : 418 m<sup>2</sup>

**Construction/refurbishment cost** : 1 042 000 €

**Number of Bed** : 9 Bed

**Cost/m<sup>2</sup>** : 2492.82 €/m<sup>2</sup>

**Certifications** :



### General information

This is the combination of a unique program consisting of the reception and accommodation of heirless people, aiming for a return to autonomy, and a green building project. Nine studio type units, in an environment with road constraints, are organized around a strong community life. This project includes, in interior spaces, a reception desk, a multipurpose meeting room, a local care, and a laundry room, linen room, and outdoor spaces, an organic garden and henhouse self-production with dedicated equipment.

The ambition and the means for a green building have been made effective by achieving a passive building with hot water by solar energy, setting up a natural protective shield noise from the track and rainwater harvesting to use irrigation of cultivated areas.

### Sustainable development approach of the project owner

The high-quality social housing project towards populations in large marginality called "Les Prytanes II" was born from a neighboring operation more successful small scale in a neighboring residential hamlet, Luynes, next to Aix en- Provence: in 2009, PACT Rhône Bouches-du-placed at disposal of the association Alternative Social Habitat, which aims to "defend the right to housing and the right to health, the dignity of the most vulnerable", a restored villa became "Prytanes" operation.

In the Athenian democracy Prytanes, from the five hundred elected the ball (the Council), have a central political role, but their power is limited. They assume the institutions of organizational and operational missions. The Prytanes reside day and night, accommodated, housed and fed by the city, in an adjoining building ... They are thus able to enter the session at any time.

From the success of this operation for users is born the operation "Prytanes II" consisting in the idea of allowing these people to recover in a place where they decide for themselves, what they want to do, a shared place with high tolerance and where the collective and the individual make participation an insertion tool into the city.

The partnership PACT 13 / HAS - Habitat Alternative Social / Team Work of Master with architect Anne VADON the heating engineer BIO CONCEPT Frédéric MICHEL was developed in this context of equitable and sustainable development. The program was organized from existing homes in 9 housing units, community living spaces of reintegration assistance: reception hall, multi-purpose social living room space nursing, laundry - common laundry - sanitary, technical room receiving all common equipment and energy metering. It has also been sought in this project, a saving in energy implemented and autonomy in terms of public facilities. Thus was born a place upgraded compared to its constraints, and low energy consumption, thus also bioclimatic as possible, yet easy to use every day: A program of providing a passive building has established itself with a seal to perfect air, the quality control of indoor air and an energy metering for dwellings. The operation is thus part of the process BDM - Mediterranean Sustainable Buildings and requires ongoing support that can be envisaged that is perpetuated in other places and in other forms, no doubt...

## Architectural description

The treatment by the project management team, building structure, its wrapping and outdoor facilities was a reflection of the passive construction and bioclimatic approach stems from the will of the Client and the operator, in a summer goal of comfort as winter to the attention of a reinsertionable population in an ordinary life.

After identifying the site resources, and constraints, (website suburban near a road with heavy traffic and a railway track, but still natural area - forest land and agricultural- to upgrade, zone low seismicity, land subject to the risk of shrinkage and swelling clays).

Building realization of the concepts are born of simple ideas:

- Use direct solar heat to produce hot water and, conversely, occultations systems berries and solar shields summer maneuver by curtains manual
- Using the natural inertia of certain materials (paving)
- natural cross ventilation enabling the operation of passive character
- structure is wood and insulation in natural wood wool surface coatings to local sands and lime applied manually
- cover in traditional curved tiles with Genoese protection against rain
- Circulations horizontal slats of wood galvanized steel substrates without coating or additional maintenance.

However, implementations were highly technical:

- High isolation of the envelope and pushed treatment of thermal bridges,
- efficient solar panels - Machineries and counting calories in a dedicated technical room
- external joinery in aluminium profiles and wood reinforced insulation triple glazing
- colourful coated Canvas high weather resistance,
- autonomous Sanitation with compact filter massive zeolite ...

Like these processes, the outdoor areas are doomed to remain in its natural state:

- traffic vehicles and pedestrians on stabilized earth
- very slight fence dotted with vegetation forming natural screen against the nuisances of the road,
- vegetable garden to residents as part of integration activities and passive protection against fires the nearby forest.

In addition to the strong environmental provisions, a "green site Charter" was established, requiring compliance with a number of site organization criteria by the intervening companies.

## Stakeholders

### Stakeholders

Function : Contractor

PACT13

Pascal RABEAU

<http://www.pact13.fr/>

Function : Thermal consultancy agency

Concept BIO

Frédéric MICHEL

<http://www.concept-bio.com/>

CATEGORY

Function : Designer

EURL AVB

Anne Vadon

Project manager design, Project management Design Assistant

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Function : Designer

Atelier d'Architecture PACT13

## Energy

### Energy consumption

Primary energy need : 32,00 kWhep/m<sup>2</sup>.an

Primary energy need for standard building : 162,00 kWhep/m<sup>2</sup>.an

Calculation method : RT 2012

CEEB : 0.0001

Initial consumption : 250,00 kWhep/m<sup>2</sup>.an

### Envelope performance

Envelope U-Value : 0,31 W.m<sup>-2</sup>.K<sup>-1</sup>

More information :

- Timber frame Floor: Insulation under screed by 12cm polyurethane + floor hourdie polystyrene (UP27)

Walls:

Wood wool (140mm) + mental wood fiber wall (52 & 60); lime & plaster cladding

Ceiling:

Cellulose wadding: 30cm; 20cm + 10cm Excelsior extruded

Joinery:

PVC, triple glazing; Ug: 0,61W / m<sup>2</sup>.K, Uf = 0,96W / m<sup>2</sup>.K; FS = 62%

Air Tightness Value : 0,64

## Renewables & systems

### Systems

Heating system :

- Individual electric boiler

Hot water system :

- Individual electric boiler
- Solar Thermal

Cooling system :

- No cooling system

Ventilation system :

- Double flow heat exchanger

Renewable systems :

- Solar Thermal

Renewable energy production : 72,00 %

Other information on HVAC :

- Extra electric heating - VMC 2F high efficiency PAUL NOVUS 450

Electro-Solar (72% coverage of 12m<sup>2</sup> panels ECS-)

## Environment

## Urban environment

The Prytanes II is located on the Route de Gardanne in Luynes. The plot stretches between the D7 (Gardanne, Aix) and a railway. Low Density Residential. There is an old building into disuse. This building will be preserved and rehabilitated.

### Products

#### Product

DHW solar thermal

Vaillant

[https://www.vaillant.fr/accueil/service-support/vous-avez-une-question/index\\_fr.html](https://www.vaillant.fr/accueil/service-support/vous-avez-une-question/index_fr.html)

<http://www.vaillant.fr>

**Product category :** Table 'c21\_italy.innov\_category' doesn't exist SELECT one.innov\_category AS current,two.innov\_category AS parentFROM innov\_category AS oneINNER JOIN innov\_category AS two ON one.parent\_id = two.idWHERE one.state=1AND one.id = '18'

The auroTHERM classic sensors can be installed on, or be integrated with all types of roofing slate, tile or metal roof, terrace or building facade. The various pre-assembled installation accessories are a quick and easy implementation in 4 movements only. This sensor is dedicated to operations with more modules auroFLOW When the sensor fields consist of two or three sensors, fields can be connected on the same side. A battery, or sensor field has a maximum of 6 sensors connected to both sides, also called diagonally. The lengths to / sensor fields must be identical on the principle of the loop Tickelmann, and have the same number of bends. For the installation of a number of sensors greater than 6, the hydraulic connection should be divided into parallel branches, each branch must have the same number of sensors.

In regular contact with HAS. The feedback is very positive on all "products" that we have implemented in this project.



wood wool insulation

Homatherm

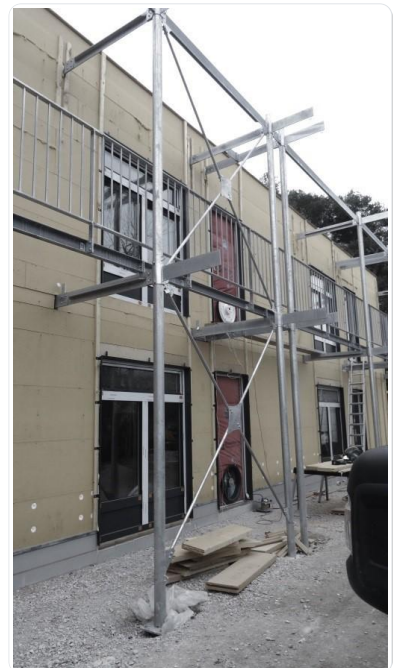
[france@homatherm.com](mailto:france@homatherm.com), +33(0)3 25 55 10 00

<http://www.homatherm.com/fr/>

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WOOD WOOL - SIDING: UD Protect - The UD protect boards which were used on the building finished with a wooden cladding protects against both wind and rain. But not only, because thanks to its low thermal conductivity and a thickness up to 160 mm, it saves energy and offers optimal results for protection against heat and noise. Arranged outside insulation, the stability of form and strength of its corners make these panels of high-end products. Overview of insulation advantages: Made by a modern dry process groove and tongue peripheral symmetrical high compressive strength hydrophobic Integral treatment slip surface, Permeable to vapor diffusion, general approval by the planning authorities Applications: Insulation outdoor wood frame behind facades (directly on the frame), solid wood walls, ventilated facades on brickwork WOOD WOOL – COATED: Energy More comfort. The insulating panel of wood fibers with fire protection. EnergiePlus FR is a homogeneous plaster base panel with optimized fire protection class Euro C "resistant" to DIN EN 13501-1. This plaster base panel opens new perspectives. In terms of formats, strength and hydrophobic treatment, the plaster board is specifically designed for applications in timber frame construction. Thus, it can be mounted directly to the frame and provides a solid and perfect support for the application of the coating. Thermal bridges are avoided. A thickness up to 160 mm guarantees excellent protection against heat. Overview of insulation advantages: Made by a modern dry process Surface coating Groove Low thermal conductivity and symmetrical peripheral tongue high compressive strength integral hydrophobic treatment Permeable vapor sector: the plaster panel for composite thermal insulation systems

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The mixed wood screed / concrete

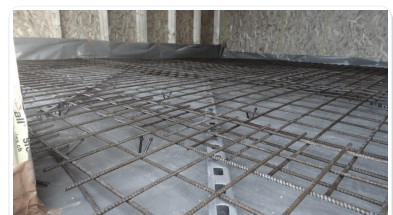
SFS Intec

+33 4 75 75 44 2, [fr.construction@sfsintec.biz](mailto:fr.construction@sfsintec.biz)

<http://www.sfsintec.biz/mo/fr/fr/web/homepage.html>

**Product category :** Table 'c21\_italy.innov\_category' doesn't exist SELECT one.innov\_category AS current,two.innov\_category AS parentFROM innov\_category AS oneINNER JOIN innov\_category AS two ON one.parent\_id = two.idWHERE one.state=1AND one.id = '6'

This mixed timber-concrete system is formed of a concrete slab with a minimum thickness of 6cm, rigidly connected to a wooden joist. Wooden beams and show traction while the concrete slab is stressed in compression. Compared to a simple wooden joists, the deformation of the floor is smaller and considerably increased bearing capacity. It is thus possible to cross large spans (up to 8.50 m!) Safely and economically. Key element, the connector provides the connection between wood and concrete. He is the guarantor of the benefits you offer the system, namely low distortion



and low stress in the wood and concrete.

In regular contact with HAS. The feedback is very positive on all "products" that we have implemented in this project.

solar control windshield sun horizontal / vertical and awning

SERGE FERRARI

+33(0) 4 74 97 41 33

<http://www.sergeferrari.com/>

**Product category :** Table 'c21\_italy.innov\_category' doesn't exist SELECT one.innov\_category AS current,two.innov\_category AS parentFROM innov\_category AS oneINNER JOIN innov\_category AS two ON one.parent\_id = two.idWHERE one.state=1AND one.id = '8'

The benefits of sunscreen: Check the solar heat and natural light has a considerable effect on the energy needs of a building. In order to make sure that sun protection can control effectively to the reduction of energy consumption, the choice of the best solution has to be done very early in the project. The outdoor sun protection: thermal comfort. It effectively fights against overheating by preventing heat radiation from reaching the window and therefore inside the room. It also protects against glare and promotes the visual comfort of the user. Placed outside the screens soltis 92-2045 halt 95% of thermal radiation. A real benefit in terms of user comfort and energy savings.

In regular contact with HAS. The feedback is very positive on all "products" that we have implemented in this project.



## Costs

### Construction and exploitation costs

**Total cost of the building :** 1 608 000 €

**Subsidies :** 728 000 €

## Health and comfort

### Water management

Rainwater collection for garden perspiration old walls is preserved: iso fiber based (stone or wood) + lime plaster. phytopurification dry toilet greywater

### Comfort

**Health & comfort :** The occupation of the day building generates internal substantial gains that accumulate the hours we typically as part of an ERP or tertiary use, which means face to buildings that can harshly dispense with cooling. To prevent "air conditioning", We worked on the flow rate of 20 natural ventilations and considered less conventional refresh solutions (and ceiling fan fogger enslaved probe temperature sensor). Furthermore, it has been defined with the project owner behavioural rules to reduce the energy dissipated during the day in the building: observe the occultation level fixed, avoid indoor activities and the kitchen during warm periods do not leave doors or windows open during the day, limit the ventilation flow as needed induced occupation (variable flow / CO2 sensor).

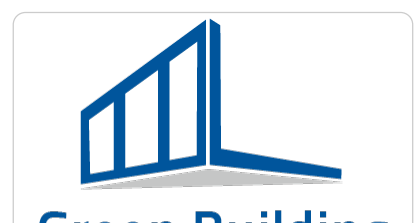
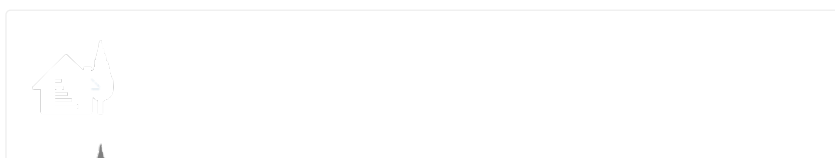
## Contest

### Reasons for participating in the competition(s)

The location of the project in the heart of the town of Aix en Provence, between the towns of Luynes and Gardanne, allows us to affirm that we are in the "temperate climate" category. Although the Mediterranean climate characterizes us a little more.

During the project design phase and during its implementation, the energy conservation and economy have been our leitmotiv. Indeed, there is no independent heating system, because the Prytanee 2 building is a passive building. Moreover, there is no need for air conditioning as a natural ventilation through-process (performed overnight) allows to refresh the housing units. Then we set up a solar control system pushed, wich allows, through horizontal, vertical blinds and independant fabrics to regulate sunshine living rooms. Importantly, domestic hot water, which is mostly produced by solar. And finally, all light bulbs are low consumption and LEDs, and appliances quantity is reduced to the bare needs of users.

### Building candidate in the category





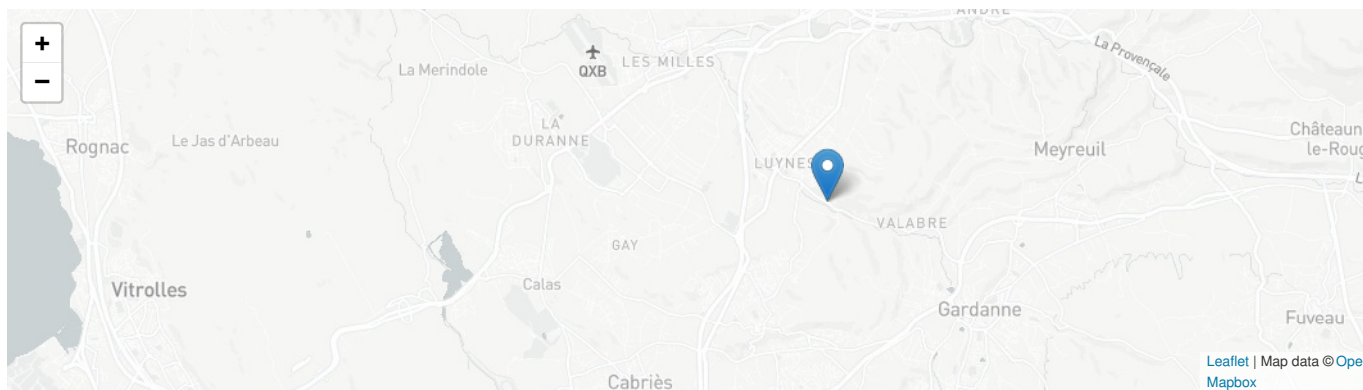
Energie & Climats Tempérés

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Coup de Coeur des Internautes



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