

The Tilleuls - Boulbon school

by Daniel FANZUTTI / 2022-06-28 00:00:00 / France / 943 / FR




Primary energy need :

60.5 kWhep/m².an

(Calculation method : RT 2012)

ENERGY CONSUMPTION

Economical building *Building*

< 50	A	
51 à 90	B	B
91 à 150	C	
151 à 230	D	
231 à 330	E	
331 à 450	F	
> 450	G	

Energy-intensive building

Building Type : Preschool, kindergarten, nursery
Construction Year : 2016
Delivery year : 2018
Address 1 - street : 5 Place Victor Barberin 13150 BOULBON, France
Climate zone : [Csa] Interior Mediterranean - Mild with dry, hot summer.

Net Floor Area : 1 249 m² Autre type de surface nette
Construction/refurbishment cost : 2 863 449 €
Cost/m2 : 2292.59 €/m²

Certifications :



General information

The Boulbon school is set up in a rural context, but whose constraints are worth those of an urban context; **flood** -prone area, **high seismic risk** zone, adjoining the habitat of a high-density village and poorly oriented narrow plot.

The answer to these characteristics:

- North-South **reorientation** of classrooms;
- **protection against strong solar incidence** from the west and wind from the north;
- **creation of a large crawl space** constituting a protection platform against floods, produce the essential part of the morphological work of this equipment. It offers a simple typology on a well-oriented plateau, and protected from the traffic nuisances of the service road at the edge of the plot.

The architectural relationship to the site is resolved by a composition where the masses dominate over the voids, and where the use of exposed site concrete offers a contemporary building, which resonates with the masses of stones of the constructions of the village of 'welcome.

Photo credit

Flora Fanzutti

Stakeholders

Contractor

Name : MAIRIE DE BOULBON

Contact : 04 90 43 95 47

<http://www.mairie-boulbon.fr/>

Construction Manager

Name : Daniel Fanzutti Architecte

Contact : 04 90 80 04 93

<https://www.fanzutti-architecte.fr/>

Stakeholders

Function : Structures calculist

Calder

bet[at]calder-ingenierie.com

<https://www.calder-ingenierie.com/>

Structure

Function : Thermal consultancy agency

SOL.A.I.R

solair[at]solair-aix.fr

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Bet fluids - VRD - SSI - Q.E

Function : Other consultancy agency

EIBAT

contact[at]eibat.fr

Economist - OPC

Function : Other consultancy agency

BE INGECOR

be.ingecor[at]ingecor.fr

<https://ingecor.fr/>

kitchen designer

Type of market

Global performance contract

Energy

Energy consumption

Primary energy need : 60,50 kWhpe/m².an

Primary energy need for standard building : 78,30 kWhpe/m².an

Calculation method : RT 2012

Breakdown for energy consumption : Heating (electric) = 28.3 kWhpe/m².year Cooling = 0 kWhpe/m².year Domestic hot water = 9.9 kWhpe/m².year Lighting = 9 kWhpe/m².year Toilet auxiliaries = 12.7 kWhpe/m².year Distribution auxiliaries = 0.6 kWhpe/m².year

Systems

Heating system :

- Geothermal heat pump
- Low temperature floor heating

Hot water system :

- Heat pump
- Solar Thermal
- Other hot water system

Cooling system :

- Geothermal heat pump

Ventilation system :

- Free-cooling
- Double flow heat exchanger

Renewable systems :

- Solar Thermal

Environment

Risks

Hazards to which the building is exposed :

- Flooding/Runoff
- Flooding/Slow flood
- Flooding/Fast Recession
- Geotechnical drought (Clay soil shrinkage and swelling)
- Earthquake
- Wind / Cyclone

Risks measures put in place :

The project had to deal with two very strong technical constraints : soil potentially liquefied by an earthquake, and the flooding nature of the site. In the absence of precise and definitive studies on the behavior of the soil requiring significant investigations and analyses, we have opted for the following hypotheses.

The floor at the water level at 13.32 NGF (general level of France) is supported by peripheral walls which release the flow of water in the gravitational direction, North-South as indicated by the surveyor's level points. To the West, three small volumes to the South of each classroom provide an outdoor space planted in the ground and sheltered from the wind. In addition to the quality of use that it brings to the classes cut off from the ground by an imposed altimetry, this device offers hard points for bracing against horizontal seismic stresses and completes the efficiency of continuous supports. On the east side, the front wall contains the courtyard in relation to the void under the school.

The technical response is in phase with the architectural response. The influence of the school is important, the residual height under low structure, less than two meters, which does not allow to have a space of appropriate quality. The portico will be in the shade, damp and without the possibility of growing any plants. By avoiding a construction on piles, this negative aspect for the insertion in the site is avoided by an effective technical answer as well for the image as for the use.

Urban environment

Land plot area : 4 950,00 m²

Built-up area : 23,50 %

Green space : 620,00

The village has an important architectural heritage including several listed buildings and is dominated by the ruins of the feudal castle.

The land is located on the edge of the historic core and a more recent extension (suburban fabric to the south). At the foot of the Montagnette massif to the east, it opens up to agricultural land to the west.

It is located within the perimeter of protection of classified and registered monuments (Ruins of the castle and Sainte Anne chapel) and the registered site of "La Montagnette".

Product

Stone column foundation / Rigid inclusion technique

Menard

Menard

<https://menardcanada.ca/fr/solutions-damelioration-des-sols/colonnes-ballastees/>

Product category : Gros œuvre / Structure, maçonnerie, façade

The treatment by stone columns allows, like most soil improvement techniques, to reduce settlements, to increase the bearing capacity of the soil, but it also allows to accelerate the consolidation of the soil by the strong draining character of the material. columns. Stone columns are particularly effective in improving the sliding stability of slopes and in treating the soil against liquefaction.



Costs

Construction and exploitation costs

Cost of studies : 343 613 €

Total cost of the building : 2 863 449 €

Contest

Reasons for participating in the competition(s)

The notion of resilience linked to this operation comes from the unique character of the site. The desire of the community and the state to include the construction of the new school in immediate continuity of the old center corresponds to the objective of opposing urban sprawl that consumes agricultural land, which multiplies travel and pollution.

This compelling objective comes up against very difficult site conditions that had to be resolved step by step, in the interpretation of the program and its installation on the ground.

Taking into account the earthquake with a level of soil liquefaction required reinforcement of the soil with a mattress of stone columns. The flooding of the site represents the strongest constraint of this operation. The school floor was placed about 2m above the natural ground in order to escape the highest flood levels of the Rhone. The large dining and games rooms constitute a safe and easily accessible refuge space, not only for children and their teachers, but also for the population close to the old centre. All of these issues required a very strong common approach between the state and the community, which resulted in a public utility survey intended to make this tenement contiguous to the old center legally constructible. This investigation was based on the technical and architectural resolutions provided by our project. Demonstration made that a reasoned architectural approach can bring viable answers in the approach of sites with strong risks, of which the flood.

This atypical altimetric situation raised the question of access to the school, as well as accessibility for people with disabilities. Access is provided by a very gently sloping ramp (2%) which runs along the school from rue des Saules, parallel to the new road to the school entrance located in the center of the main facade. This very wide ramp offers comfort and safety to children going to class; as well as parents who accompany the little ones in pushchairs. It also allows the school to be part of a perfect morphological and road continuity of the village center, ensuring a place in the urban fabric and its history.

This equipment has been designed to meet current environmental requirements by limiting energy consumption. A set of 8 probes plunged 100 m underground to capture free calories which will be used to supply the heating. A heated floor covers the whole school. It diffuses a soft and homogeneous heat which brings great comfort, especially to the little ones when they find themselves in direct contact with the ground.

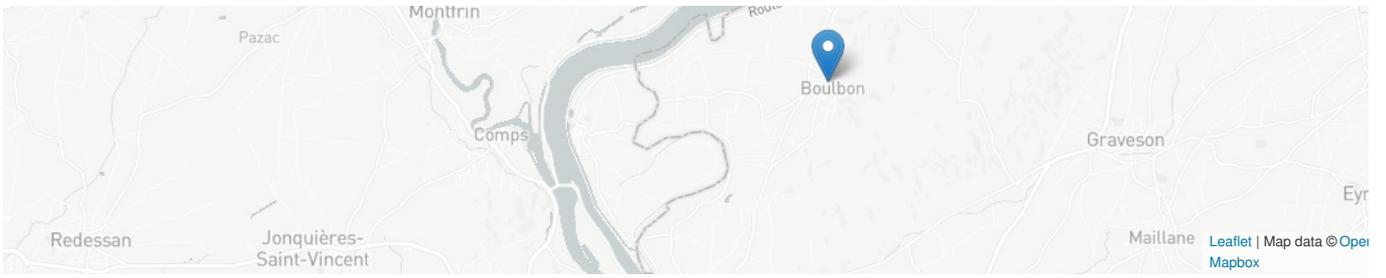
The project for the Boulbon school responds to the ambition of the municipal team for a school that is well integrated into its village, providing the best comfort and service to school children, energy efficient, and well built to limit costs. medium and long term maintenance.

Building candidate in the category



Prix du public





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