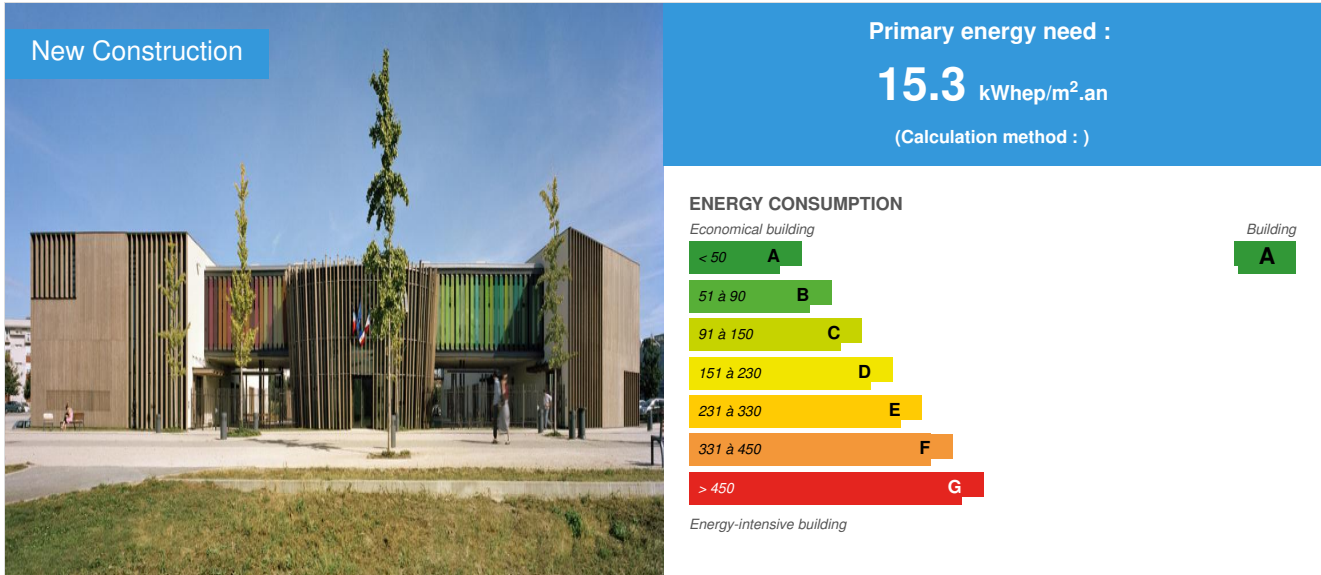


# Kindergarten and primary school group Simone Veil

by [Tekhne Architectes](#) / 2015-06-12 10:59:54 / France / 24499 / FR



**Building Type** : School, college, university  
**Construction Year** : 2014  
**Delivery year** : 2014  
**Address 1 - street** : 1, Promenade des Rêveries 38300 BOURGOIN JAILLEU, France  
**Climate zone** : [Csb] Coastal Mediterranean - Mild with cool, dry summer.

**Net Floor Area** : 2 455 m<sup>2</sup>  
**Construction/refurbishment cost** : 4 541 268 €  
**Number of Pupil** : 350 Pupil  
**Cost/m<sup>2</sup>** : 1849.8 €/m<sup>2</sup>

## General information

Located along the street structuring the reconversion of the Diederichs industrial site, along the urban park of the Lilattes on Grand Tissage Avenue, the school group benefits from a location that lets it stand out as an institutional building.

The project set up the program in two two-storeys buildings on the northern limits (kindergarten) and South (primary school) of the plot. The two buildings are connected by a building functioning as a "bridge" along the street, anchored to the ground by an organic volume hosting the common spaces. This distribution preserves the opening of the playground to the park while forming the covered yards. The access to elementary and kindergarten are distinct.

The northern and southern facades are coated with a masonned coating, interrupted by the joinery of the bays their fixed sunscreens. The western facade is composed with wooden planks and cladding that creates a relationship with the nearby park. The courtyards are separated by a shrubby limit, which could disappear, depending on how teaching practices. Medium trees are planted to shade access and the western side of the "bridge" building.

## Sustainable development approach of the project owner

Construction of a low consumption school complex  
 High demands in integration to the site  
 High demands in thermal comfort, daylight, visual and acoustic comforts  
 High demands in air quality  
 High demands in maintenance perenity

High demands in waste management

## Architectural description

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## Building users opinion

Ongoing survey

## See more details about this project

[http://www.tekhne-architectes.com/projet\\_archi/groupe-scolaire-maternelle-et-primaire/?cat=Enseignement](http://www.tekhne-architectes.com/projet_archi/groupe-scolaire-maternelle-et-primaire/?cat=Enseignement)

<http://www.construction21.org/france/articles/fr/laureat-sante--confort-2015-groupe-scolaire-simone-veil-france.html>

## Stakeholders

### Stakeholders

Function : Contractor

Ville de BOURGOIN JALLIEU

Mme Valérie Libon - vlibon@bourgoinjallieu.fr

Function : Designer

TEKHNE ARCHITECTES

M.Christian Charignon - tekhne@tekhne-architectes.com

<http://www.tekhne-architectes.com/>

Function : Thermal consultancy agency

ASTRIUS

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Function : Other consultancy agency

TRIBU

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Environment Research Bureau

Function : Structures calculist

DPI

Didier Pierron - secretariat@dpistrustructure.com

Function : Other consultancy agency

DENIZOU

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Design office economy

Function : Structures calculist

PEUTZ

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Function : Other consultancy agency

ACI

Alain Clément - aci.clement@wanadoo.fr

Kitchen design office

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Function : Other consultancy agency

EODD

Cecillia Ellul - c.ellul@eodd.fr

Soil remediation design office

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Function : Environmental consultancy

CEREMA

Nathalie Moral - Nathalie.Moral@cerema.fr

Auditor RT2012

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## Contracting method

Separate batches

## Type of market

Table 'c21\_belgium.rex\_market\_type' doesn't exist

# Energy

## Energy consumption

Primary energy need : 15,30 kWhep/m<sup>2</sup>.an

Primary energy need for standard building : 82,50 kWhep/m<sup>2</sup>.an

Calculation method :

Breakdown for energy consumption : Consumptions are expressed as primary energy

- Heating 34.00 kWhep/m<sup>2</sup>.year
- Cooling 0.00 kWhep/m<sup>2</sup>.year
- Hot Water 2,00 kWhep/m<sup>2</sup>
- Lighting 7,90 kWhep/m<sup>2</sup>
- Auxiliaries 6,30 kWhep/m<sup>2</sup>

## Real final energy consumption

Final Energy : 51,15 kWhf/m<sup>2</sup>.an

## Envelope performance

More information :

Bbio = 41.9; Bbio Bbiomax = - 49.21%

Building "clasps"

Timber-concrete structure: heavy inertia (restricted access to inertia through suspended ceiling in the rooms)

Wall: rockwool external thermal insulation 20cm

Roof: vegetated roof 24 cm PUR

Paving: 8cm PUR

Building "bridge"

Timber-Steel structure: light inertia

Wall: 24cm rockwool

Roof: Membrane 20cm heavy wooden wool + 8 cm rockwool to strengthen inertia

Floor: projection mineral wool 300mm + 75mm wood fiber panel

Everywhere:

Double glazed wood joinery low-emissive argon, solar control adapted to orientations

Avoided thermal bridges: psi Ratio: 0.05 W / (m<sup>2</sup>.K)

Indicator : I4

Air Tightness Value : 0,77

Users' control system opinion : Ongoing survey

## More information

Underway, stock expected in October 2015

## Renewables & systems

### Systems

#### Heating system :

- Condensing gas boiler
- Water radiator
- Low temperature floor heating

#### Hot water system :

- Condensing gas boiler
- Individual electric boiler

#### Cooling system :

- No cooling system

#### Ventilation system :

- Natural ventilation
- Free-cooling
- humidity sensitive Air Handling Unit (hygro A)
- Double flow heat exchanger

#### Renewable systems :

- No renewable energy systems

#### Other information on HVAC :

Assisted natural ventilation through turrets in classes and common spaces.

Assisted natural ventilation through openings are piloted in circulation spaces.

## Smart Building

#### BMS :

Management: boiler, heating circuit, BMS in the school restaurant, blinds and sun breakers, openings for ventilation, general extinction of lighting. Monitoring: counting of energies (gas, water, electricity) by, Supervisor TREND 963 - 6 Auto

#### Smartgrid :

Remote access to BMS information from a remote computer station.

Users' opinion on the Smart Building functions : First steps and adjustments in progress (first year) Favourable Opinion

## Environment

### Urban environment

Land plot area : 2 595,00 m<sup>2</sup>

Built-up area : 61,00 %

Green space : 1 300,00

Prom implementation of a conversion site near a large treed park, along a treed road to the city center.

## Products

### Product

Windcatcher X air

Monodraught

nick.hopper@monodraught.com

<http://www.monodraught.com/news/56/windcatcher-x-air-no-leak-guarantee/>

Product category : Génie climatique, électricité / Ventilation, rafraîchissement

Assisted natural ventilation turret

Good Appreciation

Favorable acceptance of taking manual control (forced closing/opening) for a given time

Comment on rattling noise when fonctionning in a very quiet environment.



Strong PAVATHERM

Pavatex

jeremie.Boucher@pavatex.fr

<http://www.pavatex.fr/fr/produits/sol-isolant/pavatherm-forte/>

Product category : Second œuvre / Cloisons, isolation

High phase insulation

Hidden insulation, not perceived but highly limiting the impact of the weak structural inertia of this part of the school group on overheating in summer.



Wood-aluminum curtain wall

Raico

info@raico.fr

<http://www.raico.de/fr/Produits/THERM/Fa%C3%A7ade-bois.php>

Product category : Second œuvre / Menuiseries extérieures

Curtain wall with thermal bridges breaks on wooden support

Favorable appreciation

Warm material



A color filter incorporated in the glazing

Vanceva

patricia.bezie@saint-gobain.com

<http://www.vanceva.com/en/Default.aspx>

Product category : Second œuvre / Menuiseries extérieures

Film incorporated in the glazing to create colorful sun breakers

Favorable appreciation

Playful material



skylights

solarspot

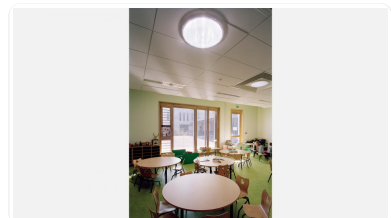
<http://www.solarspot-lfr.com/contact.php>

<http://www.solarspot-lfr.com/>

Product category : Gros œuvre / Système passif

Natural light intake by duct from the roof;

Very well received generous contribution of light on the second row in classes



## Costs

### Construction and exploitation costs

Cost of studies : 585 840 €

Total cost of the building : 4 541 268 €

### Water management

Consumption from water network : 1 500,00 m<sup>3</sup>

Water Consumption/m<sup>2</sup> : 0.61

Water Consumption/Pupil : 4.29

Rainwater is timed on the roof before being discharged into the network according to the prescribed leakage rate.

Water collected in the yard infiltrates into the vegetated ditch separating the two courtyards.

### Indoor Air quality

Measured VOCs concentrations in the various rooms are well below the indoor air guide values (see ratio measurements). Air renewal rate: 25m<sup>3</sup>/h.person, higher than the norm. Anticipation of the recommendations to come on air quality in childcare institutions

### Comfort

**Health & comfort :** Direct access to classrooms for kindergarten classes and ground level school restaurants.

Natural lighting of all spaces, second day by skylights in the kindergarten classes, second day by window bays in circulations in elementary classes.

Brightness control by adjustable external sun breakers in classrooms, by interior blinds in the dorms and the audiovisual room.

Natural ventilation assisted with turrets, modulated class by class and by indoor and external temperature sensors plus a VOC sensor.

Autonomous night overventilation

Special attention on the materials used: selection of healthy and low-emission VOC materials, European ecolabel

**Measured indoor CO<sub>2</sub> concentration :**

mesures en cours

**Acoustic comfort :** Sensitive premises (dormitories) have been distanced from potential noise sources (roads and courtyards)

Implementation of a screed against impact noise (motricity room upstairs)

Implementation of absorbing wood panels perforated to strengthening the absorption (school restaurant and motricity room)

Implementation of privacy protections in bullet pierced wooden panels to partition refectories and avoid vocal escalation voice (calling out from one end of the room to the other)

Inside acoustic tests

Emission - Outside on Grand Tissage Avenue; Reception - Resting Room 4: Windcatcher open = 39dB, Windcatcher closed = 38dB; Isolation required DNTA, tr = 35 dB; C compliant

Emission - Outdoor (North Park); Reception - Resting room 1: Windcatcher open = 40dB, Windcatcher closed = 40dB; Isolation required DNTA, tr = 35 dB; C compliant

Emission - Courtyard ; Reception - Preschool Room 4: Windcatcher open = 39dB, Windcatcher closed = 38dB; Isolation required DNTA, tr = 35 dB; C compliant

## Carbon

### GHG emissions

GHG in use : 8,74 KgCO<sub>2</sub>/m<sup>2</sup>/an

**Methodology used :**

RT2012

### Life Cycle Analysis

**Eco-design material :** Local wood for framing, siding, insulation and joinery

Linoleum flooring

Paints with European ecolabel

## Contest

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

While controlling the GHG emissions, the issue of the student's health and comfort was especially taken care of:

- Beyond winter comfort, summer comfort already is and will be increasingly an essential concern in buildings. Designing a school capable of keeping a maximum temperature of 26°C without any active cooling system after 3 heatwave days and with 30 students per class, was the challenge the team had to take on.
- By cross-integrating environmental vectors: bioclimatic orientation, heavy inertia and over-insulation of the envelope, exhaustive solar protection, assisted natural over-ventilation, high albedo of the outside floors and preservation of enclaved green spaces, the school adapts to strong climatic variations, with nearly no use of energy.

Other factors strongly contribute to the comfort and health of the users :

- Air quality helps calm and concentration of the students: in this school, set up on a former industrial site, there was a double challenge, on CO2 levels and on specific pollutants.
- Here the adopted air renewal system anticipates on the regulations for school and other places of children care, with a rate of 25m<sup>3</sup>/h.person. Materials were carefully selected with labels certifying minimal VOC emissions. VOC measurements when delivering the building confirm the success of this approach.
- In addition, the double flow assisted natural ventilation (by turrets) is innovative and requires almost no maintenance when it comes to mechanical systems.
- Acoustic quality of the rooms, which is critical to the quality of attention of the students, has been validated by post-construction tests.
- Positive influence of daylight is valued by the generous sizes of the bays, the mastered dosage through mobile solar protections and the secondary daylight income.
- Views and access to the outside, the privileged relation of the courtyards to the public space encourages social bonding and participates to peace in the community.

## Building candidate in the category

