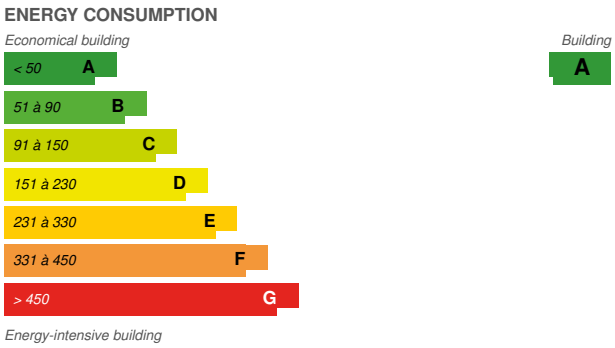
Kindergarten and primary school group Simone Veil

by Tekhne Architectes / 2015-06-12 10:59:54 / France / 23930 / FR

Primary energy need :

15.3 kWhep/m^2.an

(Calculation method : RT 2012)



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^2
Construction/refurbishment cost : 4 541 268 €
Cost/m2 : 1849.8 €/m^2

General informations

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 acesses 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.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

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Function : Thermal consultancy agency

ASTRIUS

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Function : Other consultancy agency

TRIBU

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http://www.tribu-concevoirdurable.fr/
Environment Research Bureau

Function :

DPI

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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

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Kitchen design office

Function : Other consultancy agency

EODD

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Soil remediation design office

Function : Environmental consultancy

CEREMA

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Auditor RT2012

Contracting method

Separate batches

Type of market

Global performance contract

Energy

Energy consumption

Primary energy need : 15,30 kWhep/m^2.an

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

Calculation method : RT 2012

Breakdown for energy consumption : Consumptions are expressed as primary energy
- Heating 34.00 kWhep/m².year
- Cooling 0.00 KWhep/m².year
- Hot Water 2,00 kWhep/m²
- Lighting 7,90 kWhep/m²
- Auxiliaries 6,30 kWhep/m²

Real final energy consumption

Final Energy : 51,15 kWhef/m^2.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 / (m².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: counteing 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^2

Built-up area : 61,00 %

Green space : 1 300,00

Prow 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 : HVAC, électricité / ventilation, cooling

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 : Finishing work / Partitions, insulation

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 : Finishing work / Exterior joinery - Doors and Windows

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 : Finishing work / Exterior joinery - Doors and Windows

Film incorporated in the glazing to create colorful sun breakers

Favorable appreciation
Playful material

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skylights

solarspot

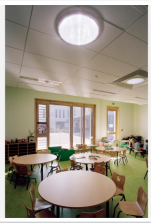
http://www.solarspot-lfr.com/contact.php

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

Product category : Structural work / Passive system

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 €

Health and comfort

Water management

Consumption from water network : 1 500,00 m^3

Water Consumption/m2 : 0.61

Water Consumption/Pupil : 4.29

Rainwater is timed on the roof before being discharged into the network according 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: 25m3/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 CO2 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 $KgCO_2/m^2/an$

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)

Paralèllement à la maîtrise des émissions de gaz à effets de serre, la question de la santé et des conforts a été l'objet d'une attention méticuleuse pour ce groupe scolaire.

- Au delà du confort d'hiver, le confort thermique d'été est déjà et sera de façon croissante dans les prochaines années une problématique essentielle du

cadre bâti. Concevoir une école capable de se maintenir sans système de rafraîchissement actif à une température maximale de 26° après 3 jours de canicule et avec 30 élèves par classe est le défi que l'équipe a su relever, constat à l'appui en ce début juillet.

- Par l'intégration croisée des vecteurs ambiantaux : Orientation bioclimatique, inertie lourde et sur-isolation de l'enveloppe, protection solaire exhaustive, surventilation naturelle assistée, albédo élevé des sols extérieurs et préservation d'enclaves d'espaces verts, l'école s'adapte aux fortes amplitudes de la variation climatique avec un recours à l'énergie quasi nul.

D'autres facteurs agissent fortement sur le confort et la santé des occupants :

- la qualité de l'air favorise le calme et la concentration : Dans cette école, installée sur un ancien site industriel, l'enjeu était double, portant sur le CO2 comme dans tout établissement et de surcroit sur les polluants spécifiques.
- Ici le renouvellement d'air adopté anticipe sur la réglementation pour les lieux d'accueil des jeunes enfants avec un taux de 25m3/h.personne. Les matériaux sont choisis avec soin parmi les labels certifiant d'émission minimale de COV. Les mesures de concentration de COV réalisés à réception confirment la réussite de la démarche.
- De plus le système choisi : une ventilation naturelle double flux assistée, par tourelle, est innovant et demande entretien quasi nul au regard des systèmes mécaniques, où gaines et filtres sont susceptibles de s'encrasser.
- la qualité acoustique des locaux indispensable à la qualité de l'attention des élèves a été validée par les tests de fin de chantier.
- l'influence bénéfique de la lumière du jour est valorisée par le dimensionnement généreux des baies, la maîtrise du dosage grâce aux protections mobiles et l'apport de lumière du jour en second rang.
- les vues et les accès à l'extérieur, la relation privilégiée des cours à l'espace public encourage le lien social, et participe à la pacification des relations dans la cité.

Building candidate in the category

Santé et confort

Green Building Solutions Awards 2015
powered by Construction21

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