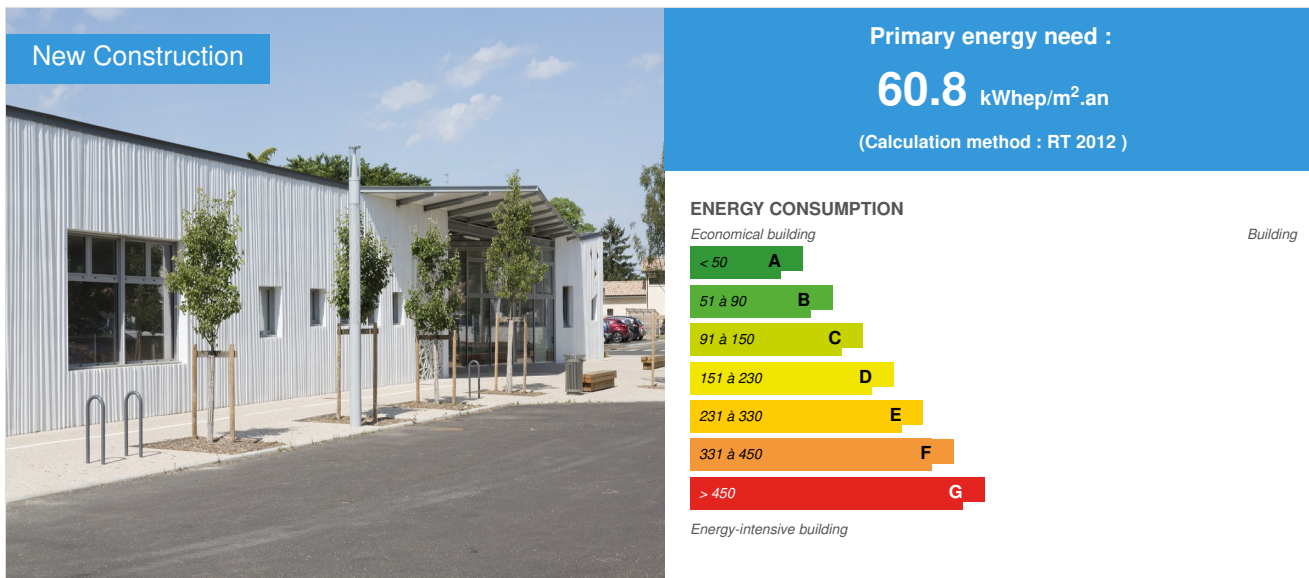


## The Passerelle - multi function building

by [HOERNER ORDONNEAU architectures](#) / 2022-05-30 00:00:00 / France / 1744 / FR



**Building Type** : Other building

**Construction Year** : 2020

**Delivery year** : 2021

**Address 1 - street** : 48 rue Pompière 33300 LE BOUSCAT, France

**Climate zone** : [Cfb] Marine Mild Winter, warm summer, no dry season.

**Net Floor Area** : 2 302 m<sup>2</sup>

**Construction/refurbishment cost** : 4 100 000 €

**Cost/m2** : 1781.06 €/m<sup>2</sup>

**Certifications :**



### General information

The building is located on the northern part of Square Arnstadt. It is stretched in length and as narrow as possible to give pride of place to the park and the gardens of the structure and to present its smaller sides on the side of the 2 streets. The West zone is more urban and open, with a forecourt to the North. The East zone is more intimate and private, bordered by a pedestrian path on the allotment side. The site is permeable on its east, west and north sides, which turns into a pedestrian path.

The "gateway" ecostructure brings together 5 public premises (ERPs) (Nursery, Early Childhood Centre, Parent-Child Reception Center, Ricochet Social Center and the Municipal Postal Agency) and forges links between inhabitants, age groups, uses, nature and buildings, neighboring EPA... Located on the northern part of Square Arnstadt, it offers great freedom of use through generous open spaces, through and framed views of the park. **Architecture creates the conditions for a strong inside-outside relationship, strengthening human-nature ties and environmental awareness.**

The spaces are designed from the inside out, with great care given to users. Limited and wide circulation, generous heights and supernumerary exits avoid any feeling of claustrophobia and promote well-being.

The project offers the maximum amount of air and natural light.

The **use of dry wood construction and the use of bio-sourced materials** lower the carbon footprint. The hemp concrete walls bring inertia, hygrometric comfort, purify the air. The frugal or sober approach offers **an eco-responsible building connected to its context and its use, integrating natural and passive inputs** (solar heating, inertia, cross ventilation, shade, plantations, natural lighting, etc.). It uses renewable energies (wood boiler, photovoltaic) and aims for positive energy. The building is E+C- of level E2C1.

A BIM approach has been adopted.

La Passerelle is a benevolent building, soft and connected to both nature and the neighborhood. He lets himself be crossed.

## Building users opinion

The project owner/main contractor relationship was close and of high quality. The owner gave us full latitude to carry out the project, from the studies to the site. He accompanied us all along, in a relationship of benevolence of trust, which was transcribed towards the companies which in return did quality work in a difficult context of health crisis. The public can feel this atmosphere after the building is completed. Mrs. Lavergne: "This place emanates good vibrations"

## If you had to do it again?

A curved hemp concrete wall was planned for the market, which had to have a fireproof report and overlook a room with high humidity: in view of the lack of progress in the report of biosourced materials, this wall was finally made as a wall wooden frame, mineral wool filling and hydro plasterboard. This type of situation is for the moment too complex to deal with it in biosourced materials, because we combine a fire safety ERP requirement, a room with high humidity and a curved wall...

## See more details about this project

<https://www.palmares.archi/projets-candidats/smlxl/la-passerelle/>

[https://www.bouscat.fr/fileadmin/user\\_upload/fichiers/PUBLICATION/BouscatMAG/BOUSCAT\\_MAG\\_ETE\\_2021.pdf](https://www.bouscat.fr/fileadmin/user_upload/fichiers/PUBLICATION/BouscatMAG/BOUSCAT_MAG_ETE_2021.pdf)

[https://www.bouscat.fr/fileadmin/user\\_upload/fichiers/PUBLICATION/BouscatMAG/BOUSCAT\\_Mag\\_Printemps\\_2021.pdf](https://www.bouscat.fr/fileadmin/user_upload/fichiers/PUBLICATION/BouscatMAG/BOUSCAT_Mag_Printemps_2021.pdf)

## Photo credit

Jean-Christophe Garcia

Hoerner Ordonneau architectures

## Stakeholders

### Contractor

**Name :** VILLE DU BOUSCAT

**Contact :** M. Alvarez, Chef du Service Patrimoine et Bureau d'Etudes Services techniques Mairie LE BOUSCAT

<https://www.bouscat.fr>

### Construction Manager

**Name :** HOERNER ORDONNEAU architectures

**Contact :** Frédérique Hoerner Mandataire chef de projet, [contact@hoerner-ordonneau.fr](mailto:contact@hoerner-ordonneau.fr)

<https://www.hoerner-ordonneau.fr>

### Stakeholders

**Function :** Designer

Eric Fouché

[archi\[at\]e-fouche.fr](mailto:archi[at]e-fouche.fr)

associate architect

**Function :** Designer

### Contracting method

Separate batches

### Type of market

Global performance contract

## Energy

## Energy consumption

Primary energy need : 60,80 kWh<sub>ep</sub>/m<sup>2</sup>.an

Primary energy need for standard building : 78,10 kWh<sub>ep</sub>/m<sup>2</sup>.an

Calculation method : RT 2012

Breakdown for energy consumption : see RT study

## Real final energy consumption

Final Energy : 62,50 kWh<sub>ep</sub>/m<sup>2</sup>.an

Real final energy consumption/m<sup>2</sup> : 78,10 kWh<sub>ep</sub>/m<sup>2</sup>.an

Year of the real energy consumption : 2 021

## Envelope performance

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

More information :

INDICATOR USED TO DETERMINE THE AIR TIGHTNESS COEFFICIENT:

Q4Pasurf. Target value: 1.7 m<sup>3</sup>/(h.m<sup>2</sup>).

PROOFS OR TESTIMONIALS OF ENERGY PERFORMANCE OR AIR TIGHTNESS:

intermediate airtightness tests which were carried out during construction in order to ensure (and correct if necessary) the defects of implementation according to the infiltrations observed.

Building Compactness Coefficient : 0,51

Air Tightness Value : 1,70

Users' control system opinion :

Users are demanding monitoring and control of consumption. The GTC put in place responds to this request.

## More information

Gain 22.2% (RT -20%) The passive level targeted in design is reached with a Cep<sub>project</sub> ≤ -20% of Cep<sub>max</sub>.

## Renewables & systems

### Systems

Heating system :

- Heat pump
- Water radiator
- Low temperature floor heating
- Wood boiler
- Solar thermal

Hot water system :

- Wood boiler

Cooling system :

- Reversible heat pump
- Floor cooling
- No cooling system

Ventilation system :

- Natural ventilation
- Nocturnal Over ventilation
- Free-cooling
- Double flow heat exchanger

Renewable systems :

- Solar photovoltaic
- Wood boiler
- Heat pump

Renewable energy production : 10,00 %

Other information on HVAC :

8.6 kW reversible air/water heat pump

Wood pellet boiler

Photovoltaic solar panels

Solutions enhancing nature free gains :

INFORMATIONS COMPLÉMENTAIRES SUR LES ÉNERGIES RENOUVELABLES : 32,7 kWhp/(m².an)

SOLUTIONS AMÉLIORANT LES GAINS PASSIFS EN ÉNERGIE : chaudière bois de 60 kW

## Smart Building

BMS :

GTC

Smartgrid :

Implementation of a GTC that regulates energy equipment and in particular the wood boiler / heat pump mix

## Environment

### Risks

Hazards to which the building is exposed :

- Geotechnical drought (Clay soil shrinkage and swelling)
- Earthquake
- Urban heat island

Risks measures put in place :

The building is resilient to global warming, through passive treatment and complemented by mechanical summer thermal systems. The building is frugal, it is designed according to its environment and its orientation and integrates passive winter and summer building solutions: heating and storage of winter solar gains, shade and freshness without summer air conditioning by overventilation, patios and revegetation. Paving and masonry walls, and the implementation of hemp concrete shear walls bring inertia to the building.

The heat island effect is treated by the strong vegetation of the site in the South, the mineralized forecourt part is located in the North. The masonry walls linked to this square are to the north. To the south, west and east, the facades have a wooden frame and cladding. Light colors make it possible to respect the Albedo. The revegetation extends to the foot of the building to avoid the reverberation of heat on hard ground.

The building is mostly flexible and light (mostly wood frame and framework, few masonry walls, roof with large non-welded panels). The building can move in the event of shrinkage and swelling of the clays in the ground or in the event of an earthquake. Expansion joints are provided. Seismic studies have been integrated into the structural calculations.

### Urban environment

Land plot area : 5 950,00 m<sup>2</sup>

Built-up area : 38,70 %

Green space : 1 694,00

The land is located on the northern part of Square Arnstadt, in the municipality of Bouscat.

Square Arnstadt is bordered to the east by a path serving a large area of allotments and overlooking the old railway line planned to be replaced by an urban park linking Bouscat to Bordeaux at Place Ravezies and line C of the tramway .

The project is located as close as possible to the northern limit of the site to preserve as much of the square as possible on the south side, the gardens are placed to the south in continuity with the square and the trees of the square located in the right-of-way of the gardens are preserved.

The idea is to keep as much afforestation as possible, to complete it following the works and to give the greatest possible freedom of use to the square through generous open spaces, crossing walks and pleasant views for all from the roads, the park or building.

To the North East of the plot, a "piece of forest" allows the evolution of the site, its pedestrian and visual crossing in the East-West direction and the continuity of the ecosystem of the square in the North-South direction of type green corridor, in connection with the shared gardens and the future park on the railway.

A recolonization of the land by nature accompanies the project, architecture and landscape are intertwined.

The square development project retains, reinforces and completes the existing facilities that are well made, in good condition and appreciated by local residents. The latter have proven their attachment to the square by protesting against its amputation, so it seems essential to us to preserve everything that can be preserved: plantations, leveling, paths, pavings, pergolas, pavilions, century-old olive trees, street furniture.

## Products

## Product

hemp concrete wall

Poitou chanvre

La Vergne, 79500 MELLE / Tel 0549077003

<http://www.poitou-chanvre.com>

**Product category :**

Hemp concrete shear wall made up of a wooden frame, a hanging support in cannisse on which hemp concrete is projected: biomaterial mulch in hemp shiv + natural hydraulic lime. Hemp lime plasters cover both sides of the wall.

The solution is appreciated for the warm atmosphere created as well as the hygrothermal and acoustic comfort.



wood boiler room

Froling modèle PA Pellet 60.

entreprise K2 Energie, M Peyron, P 06 24 27 01 78, jerome.peyron[at]k2energies.com

<http://www.k2energies.com>

**Product category :** HVAC, électricité / heating, hot water

wood boiler 60 kW

The main heating solution of the ecostructure is the wood boiler room for the best desired carbon footprint.

In addition, an air/water heat pump is used for mid-season and when there is a high level of occasional demand. The first year, the delicate commissioning required a lot of adjustments. At the end of the heating period, this tended to improve.

indoor air quality (IAQ)

**Product category :** Management / Others

There has been careful selection in the selection of low VOC and formaldehyde materials. A furniture consulting mission made it possible to select virtuous manufacturers and create bespoke wood-based furniture. Air quality measurement tests were carried out on benzene, formaldehyde and CO2 levels.



mashrabiya - passive summer cooling

JSD

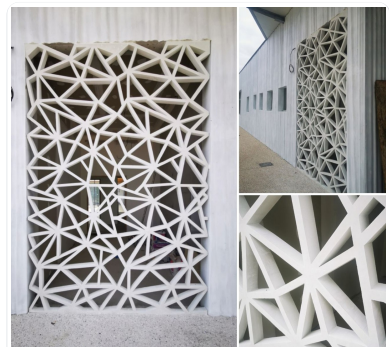
entreprise JSD, M DIDIER SOULE DUPUY Gérant 06.72.00.89.25, d.soule-dupuy[at]jsd-groupe.com

<http://www.jsd-groupe.com>

**Product category :** Structural work / Passive system

Two BEFUP concrete mashrabiya located on the north facade complete the natural cooling system of the building in addition to the thermal draft openings located on the roof. Other transom openings or bay windows on multi-orientation and on patios complete the passive summer cooling system.

Moucharabiehs are well accepted mainly for their aesthetics.



## Costs

## Circular Economy

## Environmental assessment

**Impacts avoided :** water, waste, CO2 :

CO2: low carbon footprint (level C1)

clean site charter with waste sorting

## Social economy

### Social economy and professional integration :

insertion clause planned for 11 lots out of 12, 1925 H in total.

The town of Le Bouscat is committed to a proactive policy of integrating people in difficulty through work. To do this, they appeal to companies through public procurement. The incumbents carried out an integration action with a public encountering difficulties in accessing employment.

## Health and comfort

### Indoor Air quality

Specific actions aimed at promoting indoor air quality: hemp concrete walls, careful selection of low-grade finishing materials, selection of virtuous furniture suppliers, production of bespoke wooden furniture, dual-flow ventilation.

IAQ test results on measured rooms / measured concentration:

#### 4. RESULTATS

##### 4.1 Benzène - Formaldéhyde

Pour la mise en perspective de ces résultats avec les valeurs de référence mentionnées au § 3, un code couleur est utilisé :

**Vert :** Le résultat est inférieur à la valeur guide réglementaire

**Orange :** Le résultat est supérieur à la valeur guide réglementaire mais inférieur à la valeur limite

**Rouge :** Le résultat est supérieur à la valeur limite

N° kit	Bâtiment*	Local*	Période de mesures*	Paramètre	Concentration (µg/m³)
B286	Ecostructure - Bouscat	Salle de vie 1	Du 04/10/2021 Au 11/10/2021 (10095 minutes)	Benzène	0,342
F316				Formaldéhyde	11,5
F317		Dortoir 1	Du 04/10/2021 Au 11/10/2021 (10080 minutes)	Formaldéhyde	9,00

\*Informations obtenues sur la base d'une déclaration de l'utilisateur du kit à ITGA

##### 4.2 Dioxyde de carbone

Pour la mise en perspective de ces résultats avec les valeurs mentionnées au § 3, un code couleur est utilisé :

**Vert :** L'indice ICONE est inférieur ou égal à 3

**Orange :** L'indice ICONE est égal à 4

**Rouge :** L'indice ICONE est égal à 5

N° kit	Bâtiment*	Emplacement*	Période de mesures*	Indice ICONE	Niveau de confinement
C113	Ecostructure - Bouscat	Salle de vie 1	Du 04/10/2021 Au 11/10/2021 (10110 minutes)	0	Confinement nul
C112		Dortoir 1	Du 04/10/2021 Au 11/10/2021 (10080 minutes)	0	Confinement nul

## Comfort

### Health & comfort :

measured concentration of:

- Benzene = 0.342 (living room 1)
- Formaldehyde = 11.5 (living room 1)
- Formaldehyde = 9.00 (dorm 1)

### Calculated indoor CO2 concentration :

sans objet

### Measured indoor CO2 concentration :

concentration mesurée de dioxyde de carbone salle de vie 1 = 0, dortoir 1 = 0

### Calculated thermal comfort : RT 2012 - 20%

Measured thermal comfort : bilan saison de chauffe en cours ( effectué sur 1 an )

### Acoustic comfort :

The control method used to verify the acoustic quality of buildings is that defined in standard NF EN ISO 10052.

Acoustic test results compliant:

Average reverberation time, in seconds, in octaves centered on 500, 1000 and 2000 Hz

- Programmatic objective: < or = 0.7 s (activity room)

- Measured: 0.7s (activity room)

**Daylight factor :** La lumière naturelle a été étudiée sur l'ensemble des pièces à occupation prolongée en phases APS et APD par des calculs type FLJ (Facteur Lumière Jour) réalisés avec le logiciel Dialux. Les FLJ atteints varient entre 1,5 et 4% selon les pièces.

## Contest

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

Le bâtiment est construit sur le principe de la sobriété heureuse.

L'orientation détermine les modes constructifs et solutions de façade. Le bâtiment est E+C- de niveau E2 et C1. Le bois est présent en ossature, bardage, menuiserie et mobilier. Une chaufferie bois par pellets a été créée.

Le bâtiment intègre une forte réflexion de thermique d'été et de qualité de l'air avec notamment des murs de refend en béton de chanvre, régulateurs d'hygrométrie, apporteurs d'inertie l'été et absorbants de l'air intérieur pollué.

De larges avant-toits, la création de patios d'ombrage et fraîcheur, des pluri-orientations, et enfin une forte végétalisation du site et des surfaces, traitent l'effet îlot de chaleur et permettent de rafraîchir le bâtiment. De grands ouvrants en façade et à soufflet en façades opposées permettent de surventiler. Des zones tampon thermique en combles et façade Nord tempèrent le bâtiment hiver et été.

Le bâtiment est conforme à la RT 2012 - 20%.

crèche labellisée Ecolo crèche®

HQE sans certification, qualité de l'air

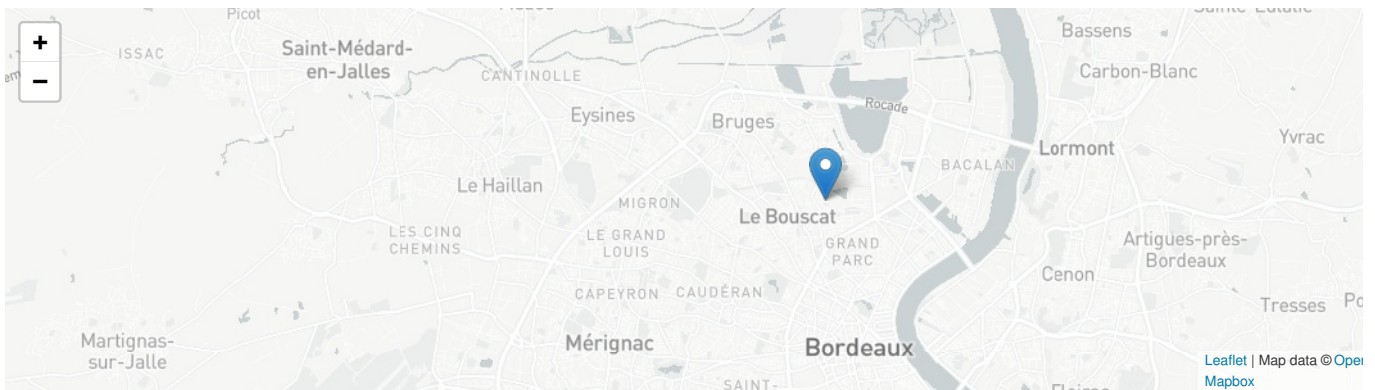
E+C- de niveau E2C1 sans certification

conception BIM de niveau 2

### Building candidate in the category



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