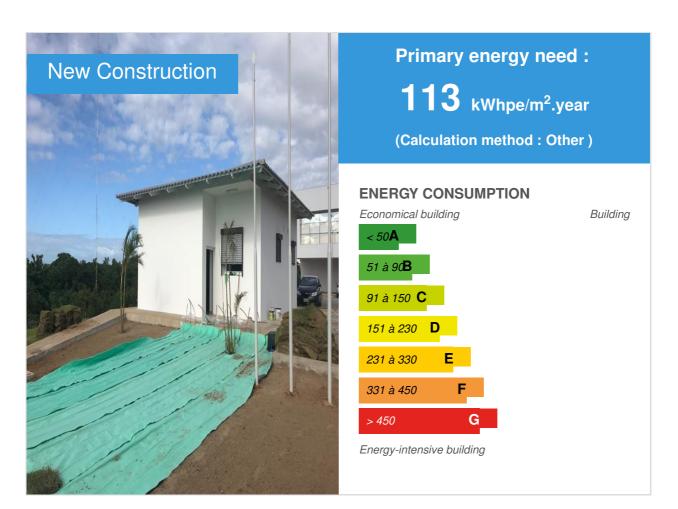


# **First passive house in Brazil**

by Camille Sifferlen / 🕚 2019-06-14 16:39:28 / International / 💿 6596 / 🍽 EN



Building Type : Isolated or semi-detached house Construction Year : 2017 Delivery year : 2017 Address 1 - street : BR - 59290-972 0000 SãO GONçALO DO AMARANTE (NORTHEAST), Brazil Climate zone : [As] Tropical dry

Net Floor Area : 56 m<sup>2</sup> Other Construction/refurbishment cost : 68 000 € Cost/m2 : 1214.29 €/m<sup>2</sup>

#### **Certifications :**



### **General information**

First construction in Brazil built according to the international Passive House standard and financed by the Bundesministerium für Bildung und Forschung – BMBF (German ministry of Education and Research) in partnership with SENAI – RN (Brasil). This project was built with (imported) German technologies, because there's currently not much technology available in Brazil with the necessary performance.

We imported bricks from a company called LIAPAN, because these bricks can be produced in Brazil and they are not burnt as the ones we have on the market, which will help reducing the CO2 emission from brick companies.

The main focus is to improve Brazilian building standards construction to make people pay more attention to air quality, thermal comfort, energy spending, amongst others.

The house is located at SENAI, which is a school focused on developing construction labor (from Brick layers to Construction coordinators). This pilot project will be used to spread Passive House technologies: it will serve as a seminar room for hand labor, engineers, architects and anyone who is curious about it.

We also want to use this building to convince local manufacturers to produce the required high performance components. This will have a social impact, with the creation of new jobs and knowledge sharing.

In this project we also have an irrigation system (EcoRain – Germany) which can save up to 70% of water for grass irrigation, the whole system is automated. This system is way better than what we have available on our market because it avoids the over use of water because of evaporation, and also guarantees that every part is irrigated with the same amount of water (differently than the spliclers we have available).

# See more details about this project

https://passivehouse-database.org/#d\_5892

Photo credit

Luiz Bezerra

### Stakeholders

# Contractor

# **Construction Manager**

# Stakeholders

Function : DesignerFelipe Bezerra Arquitetos - Brasil, Architekten Stein Hemmes Wirtz - Germany

Function : Structures calculist Joel Araujo

Function : Certification companyPassive House Institute

Camille Sifferlen

https://passivehouse.com/

# Contracting method

Other methods

### Energy

### **Energy consumption**

Primary energy need : 113,00 kWhpe/m<sup>2</sup>.year Primary energy need for standard building : 300,00 kWhpe/m<sup>2</sup>.year Calculation method : Other CEEB : 0.0028 Breakdown for energy consumption : Cooling load 10 W/m2 Cooling and dehumidification demand 69 kWh /(m2a ) calculated according to PHPP

### Envelope performance

More information : Exterior wall LIAPLAN ULTRA 08 - 0,080 W/(mK) - 365 mm Exterior Plaster: 0,30 W/(mK) - 10 mm U-value = 0.21 W/(m2K)

Basement floor / floor slab Concrete - 2,50 W/(mK) - 200 mm XPS - 0,035 W/(mK) - 250 mm U-value = 0.138 W/(m2K)

Roof Concrete - 2,50 W/(mK) - 200 mm XPS - 0,035 W/(mK) - 250 mm U-value = 0.135 W/(m2K)

Frame Unilux , IsoStar PVC FRAMES U w-value = 0.95 W/(m2K)

Glazing U g-value = 0.75 W/(m2K) g -value = 21 % Entrance door U d-value = 0.71 W/(m2K)

Indicator: DIN 4108-7

Air Tightness Value : 0,49

### Renewables & systems

# **Systems**

#### Heating system :

No heating system

#### Hot water system :

• No domestic hot water system

#### Cooling system :

• Reversible heat pump

#### Ventilation system :

Double flow heat exchanger

#### Renewable systems :

• No renewable energy systems

#### Other information on HVAC :

PAUL, novus F 300 ventilation unit with 84% heat recovery and 73% humidity recovery

### Environment

### Urban environment

The building was built on the site of the construction training school for the construction industry, SENAI-RN. This school is located in the Northern Zone of Natal City, a region that is predominantly low in purchasing power.

### Product

LIAPLAN ULTRA 08

LIAPLAN STEINE

https://www.liaplan.de/

Product category : Structural work / Structure - Masonry - Facade Uv= 0.08 W/(mK) - Dimensions: 24,8 x 36,5 x 24,9 It's made out of clay and it's not burnt during its fabrication process.

We decided to use a material which can be



produced in our regions (bricks made out of clay). For this house we imported all the bricks from Germany, but at the moment we are looking for manufacturers to start producing the bricks in Brazil.

### Costs

### Construction and exploitation costs

Total cost of the building : 68 000 €

Subsidies : 68 000 €

Additional information on costs :

As we had to import everything from Germany (even the bricks) the cost was around \$68.000 euros (R\$ 340.000,00 reais – Brazilian Currency).

### Health and comfort

### Water management

Irrigation system that can save up to 70% water, german technology from ECORAIN.

# Comfort

Health & comfort : At the moment we are collecting information about temperature and humidity in the house.

### Carbon

# **GHG** emissions

GHG in use : 23,20 KgCO<sub>2</sub>/m<sup>2</sup>/year According to PHPP

### Contest

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

?

# **Building candidate in the category**

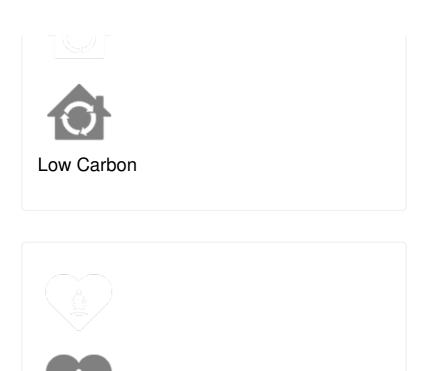


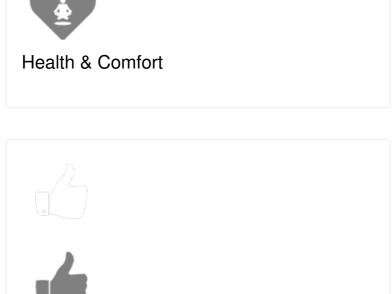




Energy & Hot Climates







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