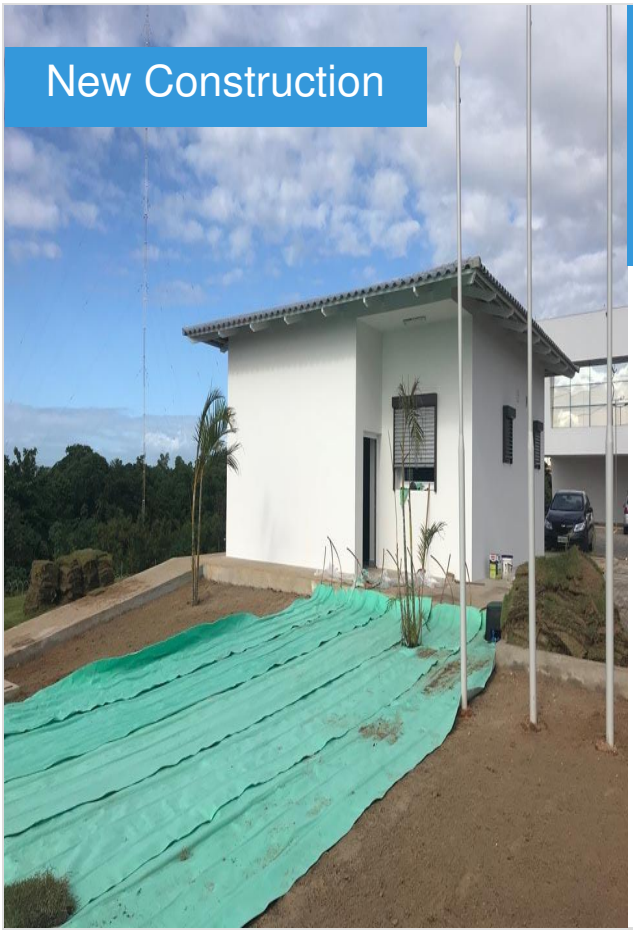
First passive house in Brazil

by Camille Sifferlen / 2019-06-14 16:39:28 / International / 7195 / EN



Primary energy need :

113 kWhpe/m².year

(Calculation method : Other)

ENERGY CONSUMPTION

Economical building *Building*

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

Energy-intensive building

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 m²
Construction/refurbishment cost : 68 000 €

Number of Dwelling : 1 Dwelling
Cost/m2 : 1214.29 €/m^2

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

Name : Luiz Bezerra (Project Manager, EcoGerman - Brasil) / Thorsten Pollatz (Project Manager, Agroscience – Germany)
Contact : luiz.alberto@b3rep.com.br
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Construction Manager

Name : Luiz Bezerra (Project Manager, EcoGerman - Brasil) / Thorsten Pollatz (Project Manager, Agroscience – Germany)
Contact : luiz.alberto@b3rep.com.br
https://www.linkedin.com/in/luiz-bezerra-18b7b056/

Stakeholders

Function : Designer

Felipe Bezerra Arquitetos - Brasil, Architekten Stein Hemmes Wirtz - Germany

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Function : Structures calculist

Joel Araujo

Function : Certification company

Passive House Institute

Camille Sifferlen

https://passivehouse.com/

Contracting method

Other methods

Energy

Energy consumption

Primary energy need : 113,00 kWhpe/m^2.year

Primary energy need for standard building : 300,00 kWhpe/m^2.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 :

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.

Products

Product

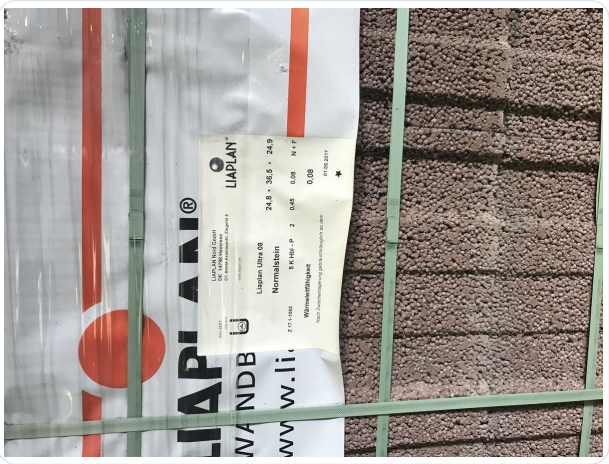
LIAPLAN ULTRA 08

LIAPLAN STEINE

https://www.liaplan.de/

Product category : Gros œuvre / Structure, maçonnerie, façade

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. (https://www.ecorain.com/)

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 $KgCO_2/m^2/year$

According to PHPP

Contest

Reasons for participating in the competition(s)

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.

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Building candidate in the category

Energy & Hot Climates

Low Carbon

Health & Comfort

Users' Choice

Date Export : 20230726093257