


ALFARO LAIF

by david medina / 2019-06-10 19:33:16 / Internazionale / 5735 / EN



Primary energy need :

110 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 : 2019
Delivery year : 2019
Address 1 - street : ARAMAR 101 66036 FRACC CUMBRES LA RIOJA, GARCÍA NL, Mexico
Climate zone : [Cwa] Mild, dry winter, hot and wet summer.

Net Floor Area : 95 m²
Construction/refurbishment cost : 53 824 €
Cost/m2 : 566.57 €/m²

Certifications :



Proposed by :



General information

The 5 residential housing project consist in two floor plan building oriented EAST TO WEST, located in Garcia, Nuevo Leon, Mexico in warm weather and high humidity in summer. They are the first 5 passive house that achieve the Classic standar in México.

PROJECT CHALLENGE

The project is the first foreground of efficient buildings in Mexico that can reduce up to 84% of CO2 emissions to the atmosphere by integrating an optimized thermal envelope in a climate zone where the overcost of energy efficiency measures competes with today's market. They are the first houses to achieve high energy efficiency standards of Passive Haus and are a cultural precedent of efficient use and energy and water savings for the user.

It is intended to compare the design of traditional homes with those designed from construction systems with low thermal transfer, specialized window with high

solar factor, ventilation with heat and energy recovery, free of bridges energy saving water use and renewable energy use. In this way you can verify the percentage of energy savings that can be obtained by improving the thermal envelope and making design decisions with a sustainable approach, optimizing resources according to orientation and cost benefit.

See more details about this project

https://passivehouse-database.org/index.php?lang=en#d_6024

Stakeholders

Contractor

Name : ALTTA HOMES NORTE S. DE R.L. DE C.V.

Contact : Calle Matamoros No.1236 Col. Centro, Monterrey, N. L.

Construction Manager

Name : ARQ. DAVID MEDINA RANGEL

Contact : dmedina[at]sadasi.com

<https://www.sadasi.com>

Stakeholders

Function : Assistance to the Contracting Authority

ING. OSCAR EDGARDO VILLAGRÁN GUEVARA

ovillagran[at]sadasi.com

<https://www.sadasi.com>

Function : Structures calculist

INCLAR Ingeniería de Clima Artificial / Alttá Homes Norte

<http://inclar.com/>

Function : Thermal consultancy agency

Martha Isabel Arreola Rangel

marthaiar79[at]hotmail.com

Energy

Energy consumption

Primary energy need : 110,00 kWhpe/m².year

Calculation method : Other

Breakdown for energy consumption : Annual heating demand 5 kWh/(m²a) calculated according to PHPP

Heating load 18 W/m²

Cooling load 10 W/m²

Cooling and dehumidification demand 33 kWh/(m²a) calculated according to PHPP

Envelope performance

More information :

Exterior wall: U-value = 0.288 W/(m²K) (average)

Basement floor / floor slab: U-value = 0.364 W/(m²K)

Roof: U-value = 0.194 W/(m²K)

Frame: U w-value = 1.328 W/(m²K)

Glazing: U g-value = 1.5 W/(m²K) - g -value = 28 %

Entrance door: U d-value = 1.011 W/(m²K)

Envelope description:

- Exterior wall:

- 1.Exterior Masonary concrete block with Termosil and insulating foam XPS 3"=75 mm $\lambda=0.029\text{W/mK}$. Exterior finishing: mortar and thermal crestuco and interior plaster.
2. The same Masonary concrete block with quarry stone in facade.
3. Adjacent Masonary concrete block with insuliting EPS 5" without termosil.

- Basement floor / floor slab:

- 1- Concrete Foundation 4"=100mm $\lambda=1.74\text{W/mK}$
- 2- Covered insulating foam xps 3"=75mm $\lambda=0.029\text{ W/mK}$
- 3- adhesive
- 4- Ceramic floor

- Roof:

Concrete Slab of joist and vault 13-57/64"=353mm composed by:

- 1- Roof Waterproofing MasterSeal 780 BASF 0-1/8"=3mm $\lambda=0.073$ (EQUAL LAYER)
- 2- Roof Pasty Termocret 2"=50mm $\lambda=0.076$ (EQUAL LAYER)
- 3- Covered Insulating Foam XPS 4"=100mm $\lambda=0.029$ (EQUAL LAYER)
- 4- Concrete Compression Layer 0-5/32"=40mm $\lambda=1.74$ (EQUAL LAYER)
- 5- Concrete Joist and Polystyrene Vault(EPS) Composed by:
 - 5a- Steel Reinforced Concrete 4"=100mm $\lambda=1.74$ (NOT EQUAL LAYER)
 - 5b- Polystyrene Vault(EPS) 4"100mm $\lambda=0.041$ (NOT EQUAL LAYER)
 - 5c- Sheet Polystyrene Vault(EPS)indoor 2"=50mm $\lambda=0.041$ (EQUAL LAYER)
- 6- Plaster Finish 0-25/64"=10mm $\lambda=372$ (EQUAL LAYER)

- Frame:

REHAU, Geneo M72 H57

Window Profile PVC White color, thickness=0.13m. It is consider an average U value as the installed windows.

- Glazing:

Manufacturer Saint Gobain

Product Name COOL-LITE SKN 154 II

glazing composed by:

- 1- layer 1 glass Planiclear 1/4"=6mm
- 2- layer 2 Air between glasses 1/2"=12.70mm
- 3- layer 3 glass Planilux 1/4"=6mm

- Entrance door:

Manufacturer Masonite

Product Name Belleville

Front Door made with fiberglass, WallNut Color, Widht 35-7/16"=900mm Height 83-55/64"=2130mm Thickness 1-3/4"=44mm wooden frame, WallNut color, thickness 2"=50mm

Indicator : n50

Air Tightness Value : 0,60

More information

Generation of renewable energy: 23 kWh /(m²a) based on the projected area

Renewable energy demand (PER demand according to PHPP): 84 kWh /(m²a) on heating installation, domestic hot water, household electricity and auxiliary electricity

Renewables & systems

Systems

Heating system :

- Heat pump

Hot water system :

- Gas boiler
- Solar Thermal

Cooling system :

- No cooling system

Ventilation system :

- Double flow heat exchanger

Renewable systems :

- Solar Thermal

Other information on HVAC :

- Domestic hot water Solar Heater
- Manufacturer AXOL, Product Name MS 2.5 Blue
- Storage Tank capacity 240L
- Surface Solar Collector 2.33m²
- Located on Rooftop

Generation of renewable energy: 23 kWh /(m²a) based on the projected area

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Environment

Urban environment

The project site is considered within the urbancontainment perimeter defined by Law in a new area where all water and electricity services, hospitals, schools and shopping centers are available and is part of a set of townhouses in a closed residential-level split.

Products

Product

Termosil

Termolia

<http://www.termolita.com/en/Construction/Termosil/>

Product category : Table 'c21_italy.innov_category' doesn't exist SELECT one.innov_category AS current,two.innov_category AS parentFROM innov_category AS oneINNER JOIN innov_category AS two ON one.parent_id = two.idWHERE one.state=1AND one.id = '9'

Termosil is expanded mineral perlite treated with silicone. It is used for the insulation of walls made of termoblock or of traditional block. Comparing the insulating factor, characteristics and costs obtained with Termosil, an excellent cost-benefit relation is achieved. The purpose of the silicone is to achieve a waterproof condition, avoiding in this way problems that could arise as a result of water leaks in walls and slabs.



MasterSeal 780

BASF

<https://www.master-builders-solutions.basf.com.au>

Product category : Table 'c21_italy.innov_category' doesn't exist SELECT one.innov_category AS current,two.innov_category AS parentFROM innov_category AS oneINNER JOIN innov_category AS two ON one.parent_id = two.idWHERE one.state=1AND one.id = '12'

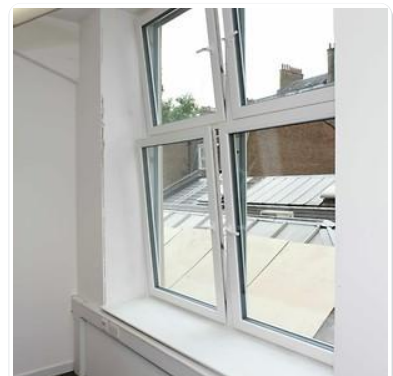


Geneo M72 H57

REHAU

<https://www.rehau.com/gb-en/pvcu-windows-doors--composite-curtain-walling/windows/tilt-and-turn-windows/geneo>

Product category : Table 'c21_italy.innov_category' doesn't exist SELECT one.innov_category AS current,two.innov_category AS parentFROM innov_category AS oneINNER JOIN innov_category AS two ON one.parent_id = two.idWHERE one.state=1AND one.id = '10'



COOL-LITE SKN 154 II

Saint-Gobain

<https://glassolutions.co.uk/en-gb/products/cool-lite-skn-154>

Product category : Table 'c21_italy.innov_category' doesn't exist SELECT one.innov_category AS current,two.innov_category AS parentFROM innov_category AS oneINNER JOIN innov_category AS two ON one.parent_id = two.idWHERE one.state=1AND one.id = '10'



Belleville

Masonite

<https://residential.masonite.com/product-overview/exterior-doors/fiberglass-collections/belleville-door/>

Product category : Table 'c21_italy.innov_category' doesn't exist SELECT one.innov_category AS current,two.innov_category AS parentFROM innov_category AS oneINNER JOIN innov_category AS two ON one.parent_id = two.idWHERE one.state=1AND one.id = '10'



WS 160 FLAT ET

MAICO

<https://www.maico-ventilatoren.com/en/products/g/ws-160-flat-g53201/>

Product category : Table 'c21_italy.innov_category' doesn't exist SELECT one.innov_category AS current,two.innov_category AS parentFROM innov_category AS oneINNER JOIN innov_category AS two ON one.parent_id = two.idWHERE one.state=1AND one.id = '19'



Xpower Ultra Inverter 53UTQ123A

Carrier

<http://www.carrier.com.mx/residencial/69/>

Product category : Table 'c21_italy.innov_category' doesn't exist SELECT one.innov_category AS current,two.innov_category AS parentFROM innov_category AS oneINNER JOIN innov_category AS two ON one.parent_id = two.idWHERE one.state=1AND one.id = '18'



MS 2.5 Blue

AXOL

<http://www.modulosolar.com.mx/AXOL/>

Product category : Table 'c21_italy.innov_category' doesn't exist SELECT one.innov_category AS current,two.innov_category AS parentFROM innov_category AS oneINNER JOIN innov_category AS two ON one.parent_id = two.idWHERE one.state=1AND one.id = '18'



COXDPI-16

Calorex

<http://www.calorex.com.mx/calentadores/calorex/instantaneo/instantaneo-modulante/calorex-instantaneo-modulante-coxdpi-16-lp>

Product category : Table 'c21_italy.innov_category' doesn't exist SELECT one.innov_category AS current,two.innov_category AS parentFROM innov_category



Costs

Construction and exploitation costs

Additional information on costs :

Construction costs: 755 €/m2 Treated Floor Area

Building structure costs (gross): 568 €/m2 Treated Floor Area

Health and comfort

Water management

Water Saving Devices:

- Toilets maximum consumption 3.8 Lpd
- Energy saving faucets 6 Lpm consumption
- Ecological grade watering cans 3.8 Lpm consumption
- Sectioning valves washbasins, sink, toilet, water heater and water tank.

Indoor Air quality

The project is calculated to reduce CO2 about 84.19%.

Comfort

Health & comfort : Dehumidifier MIDEA to achieve confort at the highest percentage of humidity.

Contest

Reasons for participating in the competition(s)

- Energy efficiency: no cooling system + solar thermal system
- Low cost for a passive house: 567 €/m2
- Good confort: ventilation

Building candidate in the category



Energy & Hot Climates





Low Carbon



Users' Choice



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