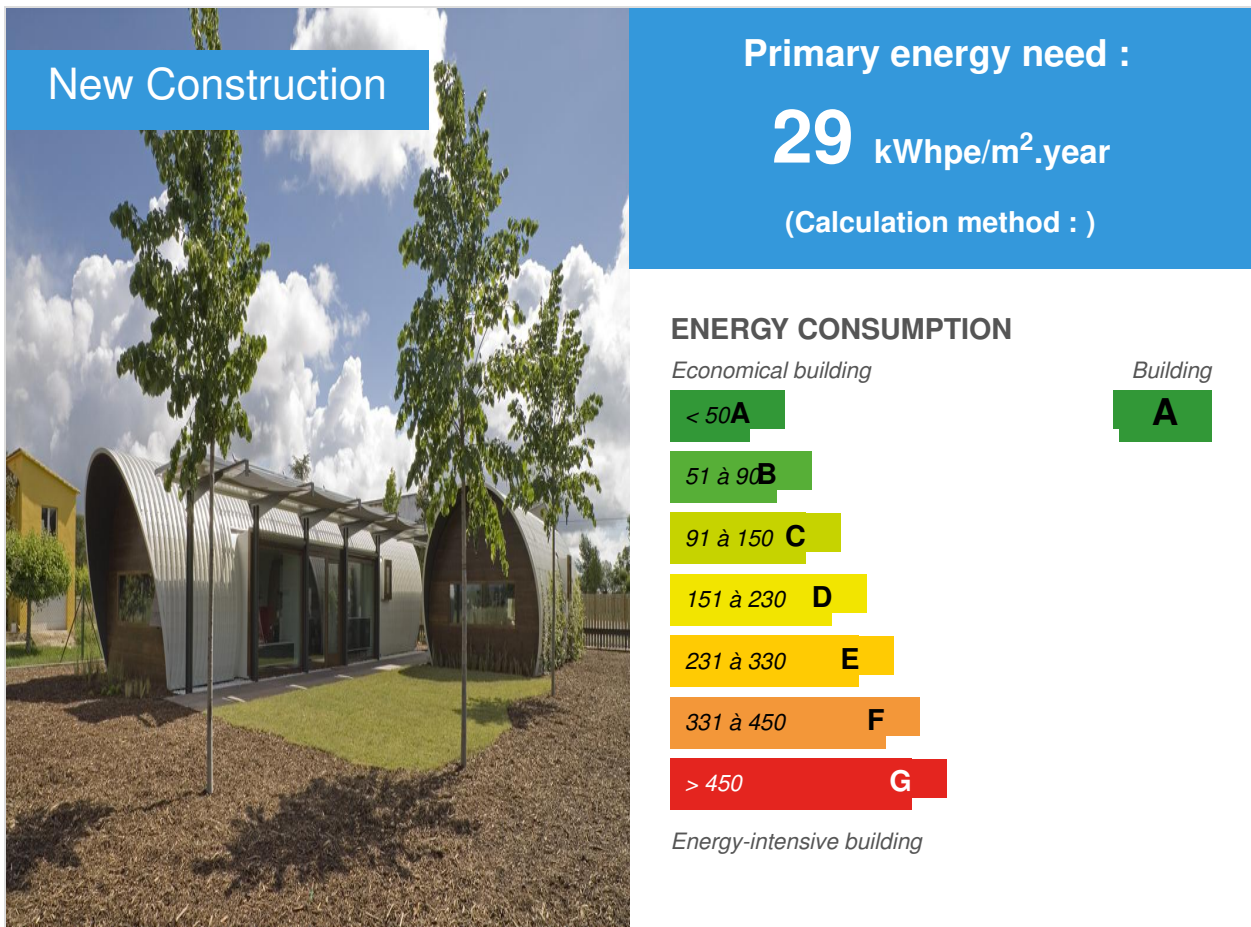


## New Life Concept

by Pere Pedrero Cunill / ⌚ 2018-06-17 16:17:58 / Espagne / 👁 12704 / 🇪🇸 ES



**Building Type** : Isolated or semi-detached house

**Construction Year** : 2013

**Delivery year** : 2013

**Address 1 - street** : 17185 VILOBÍ D'ONYAR, España

**Climate zone** : [Csa] Interior Mediterranean - Mild with dry, hot summer.

**Net Floor Area** : 95 m²

**Construction/refurbishment cost** : 150 000 €

**Cost/m2** : 1578.95 €/m²

## General information

There is a feeling that building is very expensive, without having the guarantee of the quality of the result. It is not because of the lack of commitment of the professionals involved, but because of a low efficiency in the organization of work.

### Where is the efficiency of a building?

- In its construction
- In its use
- In its maintenance

### Efficiency in construction:

To improve it, we must introduce **manufacturing concepts**, both in terms of organization and quality control and work performance management. We must transform the construction process of the work in a **process of assembly**. The objective is to **guarantee quality and comfort by reducing costs** in order to offer a more adjusted price.

### Efficiency in its use:

We have to make **buildings with low energy demand** with the aim of reducing consumption, through **high levels of insulation and air tightness**. Our buildings consume a third of energy than those of the same characteristics in traditional construction.

### Efficiency in its maintenance:

**All the operations of repair, modification, substitution and expansion must be agile** both at the level of the construction elements and the facilities.

All the facilities (drains, water, electricity, air conditioning and ventilation) pass through a 120-cm-high basement that occupies the entire building. By having a direct access from the outside all these operations **are carried out without entering the habitable zone**.

We have designed a **specific and open computer program that centralizes in a single screen the management of all facilities**, both existing and those that may be incorporated in the future. This screen gives us information about the operation and consumption of the different installations and **allows their manipulation from any device, even remote (mobile phone)**. It is connected to a fault center, from where small problems can be solved or find the necessary repair.

### How do we get it?

With a new integral constructive system that incorporates a new way of understanding the envelope of the space, the incorporation of the concept of assembly on site, maximizing the work in the workshop and a centralized management of all the facilities.

### **The why of the form:**

If the skin of a building is where we lose (winter) or win (summer) energy. If we keep in mind that the roof and edges are the points of maximum energy loss, **the cylindrical shape allows us to reduce these critical points by covering the maximum volume of air with the minimum surface of skin.** There is more volume of indoor air with the same useful surface. We gain depth in the work planes and storage areas (between 20 and 30 cm in tables, bedside tables, shelves, kitchen countertops and cabinets). All this gives a great feeling of spaciousness and comfort.

### **New constructive system a240:**

It is based on the free combination of three types of independent structural rings. The original ring (A) consists of a base and two blind arches. The second type (B) is blind on one side and open on the other and the third (C) is open on both sides. The lateral openings can be used to connect laterally with other rings. The internal diameter is 410 cm, a free height of 310 cm and a depth of 265 cm with a step width of 352 cm. The lateral openings have a height of 210 cm over the entire width of the ring.

These rings are composed of a galvanized metal structure, an inner skin of GRC (concrete reinforced with fiberglass) that has the appearance of a coating and externally there is 24 cm thick rock wool insulation with a ventilated air chamber of 4 cm and finished with a lacquered galvanized sheet.

The decomposition of these rings in smaller pieces (fragment of arch and flat pieces) of little weight allows us a standard transport and a download and assembly on site without special machinery.

### **Other features:**

The lateral facades are of double fir wood panel with 12 cm thickness of EPS insulation, exterior finish with lasures treatment (water-based varnish) and interior finish with painted wood panel.

Carpentry made of laminated wood with laser treatment, with triple sealing gasket and thermal, acoustic and safety glasses.

Space under the building with XPS insulation and fully waterproofed, with access from the outside and possibility of access from inside.

All the elements of the interior fixed furniture, some of which are already included in the price of the construction, are standardized and can be incorporated or deleted according to the needs.

You can choose between three levels of interior finishes. The exterior treatment (landscaping and enclosure of the plot), as well as different extra options in the facilities to increase energy autonomy, are optional.

We get a versatile and flexible system, with a high level of insulation and air tightness, which adapts to any residential program or even services. From the outside it might not seem like it, but its spaces are wide, bright and comfortable. Its large windows (glass without subdivisions) facilitate the relationship between the interior and exterior, especially attractive at night where the interior lighting of the cylinder is projected outward through what might seem a showcase. This system allows us to give a closed price and execute the whole work in less than three months.

## See more details about this project

<http://www.newlifeconcept.com/>

## Data reliability

Self-declared

## Stakeholders

### Contractor

**Name :** Construccions Busquets Sitjà SL

**Contact :** Calle Madrenys 29. 17185 Vilobí d'Onyar. Girona. Tf. 972 47 31 08. e-mail: info@busquetssl.cat

<http://www.busquetssitja.com/>

### Construction Manager

**Name :** Construccions Busquets Sitjà SL

**Contact :** Calle Madrenys 29. 17185 Vilobí d'Onyar. Girona. Tf. 972 47 31 08. e-mail: info@busquetssl.cat

<http://www.busquetssitja.com/>

### Stakeholders

**Function :** Designer

LPR Arquitectes SLP

Plaza Carme Monturiol 11, oficina 4. 08026 Barcelona. Tf. 93 245 89 12. e-mail: lpr.arq@coac.es

<http://www.lprarquitectes.com/>

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**Function :** Manufacturer

Prefabricats Planas

Carretera de Sils S/N. 17430 Santa Coloma de Farners. Girona. Tf. 972 84 34 67. e-mail: planas@prefabricatsplanas.com

<http://prefabricatsplanas.com/>

Concrete reinforced with fiberglass (GRC)

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**Function :** Manufacturer

Fusteria Danés

Calle Gironella, S/N. 17160 Anglès. Girona. Tf. 972 42 24 45. e-mail: danescreus@gmail.com

Carpentry

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**Function :** Structures calculist

Blazquez-Guanter SLP

Calle Sant Josep 3. 17004 Girona. Tf. 972 20 72 85. e-mail: info@bg-arquitectes.com

<https://www.bg-arquitectes.com>

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**Function :** Construction company

Tramatecnoambiental TTA

Av. Meridiana 153. 08026 Barcelona. Tf. 93 446 32 34. e-mail: jaume.srrasolses@tta.com.es

<http://www.tta.com.es/ca/>

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**Function :** Construction company

Emblemma

Calle Ramón Turró 7. 17005 Girona. Tf. 619 780 250. e-mail: juliacolomer@emblemma.com

Illumination

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**Function :** Others

SiS consultoria acústica SL

Calle Pont Major 105. 17007 Girona. Tf. 972 22 66 59. e-mail: info@sisconsultoria.com

## Contracting method

Lump-sum turnkey

## Owner approach of sustainability

This house is just one example of the multiple possibilities of a new constructive system.

### Efficiency in construction:

Introduction of manufacturing concepts. They transform the construction process into a mounting process to guarantee quality and comfort while reducing costs. It is based on the free combination of three types of independent structural rings. Only types A and B have been used in the Villobí house. Composed of a galvanized metal structure, an interior GRC skin (fiberglass reinforced concrete), 24 cm of rock wool, 4 cm ventilated air chamber and a lacquered galvanized sheet. The decomposition of these rings in smaller pieces of little weight allows us a standard transport and a download and assembly to work without special machinery. The partitions come to the work painted and with the mechanisms installed and all connections are made through the basement. This system allows us to give a closed price and execute all the work in less than 3 months.

### Energy efficiency:

We have to make buildings with low energy demand with the aim of reducing consumption, through high levels of insulation and air tightness. If the skin of a building is where energy is lost or gained, the cylindrical shape allows us to reduce the critical points and supply the maximum volume of air with the minimum surface of the skin. We gain depth in the work planes and storage areas. Efficiency in its maintenance: All the facilities go through a basement of 120 cm of height that occupies the whole building with a direct access from outside that allows any type of intervention without having to enter the habitable zone. A computer program has been designed that centralizes on a single screen the management of all the facilities, gives information on the operation and consumption and allows its manipulation, even remotely.

## Architectural description

### **General description of the project in relation to the environment**

The proposal wants to emphasize the possibility of proposing non-compact constructions to facilitate the conjunction between needs, budget and evolution of the family nucleus. The project proposes the construction of a main body and a secondary body: the main body has the base program for a house with two rooms and the secondary body is an annex that can incorporate a free program (two rooms with a bathroom, a study, a small workshop, an office,

a music room, meeting room of different types, a children's playroom, an office, etc.). The proposal seeks a very low demand in energy demand of buildings as a guarantee of quality. It is for this reason that the main building has the main façade facing south, to achieve a series of characteristics of the building, as well as achieving the desired objective. The secondary body is located towards east, next to the entrance to the plot, as reception building. The two bodies and the entrance are joined by an element of paved pergola. The main fence of the plot is set aside, in a stretch, in relation to the alignment of the road to produce the parking space of the cars.

### Description of the building

The buildings are generated starting from a circular section with an internal diameter of 410 cm. The base element has a length of 265 cm and the cross section is formed by three pieces, constructed with an arc-shaped metallic structure that holds a GRC sheet to two of them and a flat metallic structure with wooden ceiling that holds the another: the first two have the outer envelope function and the third as the lower envelope. These elements are embedded in concrete beams that act as foundations. This blind base piece has a variant, with a lateral opening; the opening is formed by lateral concrete panels embedded into the foundation and acting as a stiffener. The entire system is completed with the end plug elements, which may have different formalizations, although the construction base is always the same. The entire building is generated from these base pieces with the incorporation of specific elements as the different types of openings that are produced by necessity or will. In our case we have a main body of 3 blind pieces and 3 pieces with lateral opening and a secondary body with 2 blind pieces and one with lateral opening. The main body has the housing program with two rooms, living room-kitchen with laundry equipment and a bathroom. The secondary body is prepared for two rooms and a bathroom that, at the moment, will not be distributed. The outer envelope is ventilated with continuous coating. The contact with the land is with a ventilated and accessible air chamber. The joinery is made of laminated pine wood.

### If you had to do it again?

Solve sealing problems of the enclosure.

## Energy

### Energy consumption

Primary energy need : 29,00 kWhpe/m<sup>2</sup>.year

Primary energy need for standard building : 29,00 kWhpe/m<sup>2</sup>.year

Calculation method :

### Systems

#### Heating system :

- Heat pump
- Canadian well

#### Hot water system :

- Heat pump
- Solar Thermal

#### Cooling system :

- Reversible heat pump

#### Ventilation system :

- Natural ventilation
- Nocturnal ventilation
- Double flow

#### Renewable systems :

- Solar photovoltaic
- Solar Thermal
- Heat pump

### Smart Building

## Products

### Product

Heat recuperator GTDHE

Airtradecentre

Eerste Tochtweg 11 2913 LN Nieuwerkerk a/d IJssel The Netherlands Tel: +31 (0)88 031 85 90

<https://airtradecentre.com/>



**Product category :**

High performance heat recuperator with electronic fans with low consumption and compact dimensions.

It was very well accepted.



GBC

Prefabricats planas

Direcció: Carretera de Sils, s / n. 17430 –  
Santa Coloma de Farners (Girona) Telèfon  
clients: 972.843.512 Telèfon proveïdors:  
972.843.467 Correu electrònic:  
ventas1@prefabricatsplanas.com

<http://prefabricatsplanas.com/>



**Product category :**

The GRC, which is the acronym in English of "Glassfibre Reinforced Cement" is a composite material, consisting of a matrix of reinforced concrete mortar with glass fibers resistant to the mortar's alkalis.

The matrix is formed by a gray cement mortar CEM I 52,5 R or white BL II 42.5 R, with resistances of 52.5 and 42.5 N / mm<sup>2</sup>

respectively, and sand

of silicon with a content of Quartz (SiO<sub>2</sub>) greater than 96% of the weight of the sand and with a granulometry of maximum 1.6 mm in diameter. Cement and sand are mix with the indicated proportion of water and additives. These additives can be: plasticizers, fluidifying, superplasticizers, waterproofing,

Water-resistant ..., depending on the properties, design, manufacture ...

Glass fibers are alkali resistant and have a filament shape, with a tensile strength of 3,500 MPa and with minimum Zirconium content of 15%, which is the component that gives the fiber this resistance.

The ways of manufacturing the GRC, projecting it with a gun or premix, make that is modelable to all geometry, texture... that added to the possible Subsequent treatments gives you an unlimited range of finishes.

The high mechanical resistance of the GRC to bending and impact allow make parts resistant even to vandalism, with reduced section and low weight.

In addition, the GRC is a very durable material that requires low maintenance, because it is waterproof, resistant to atmospheric agents, incombustible and non-flammable. And it has a low environmental impact.

It was well accepted.

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## Attached board FINSA FINLIGHT

### FINSA

Carrer Ferralla, 4, 08755 Castellbisbal,  
Barcelona 937 03 81 00

<http://www.finsa.com/>

#### Product category :

Finlight is an innovative board that allows a considerable reduction in weight, making the handling easier and more comfortable.

Its surface allows lacquering and coating with decorative materials such as natural veneer, HPL laminate or finish foil.

Some of the advantages derived from the use of FINLIGHT are the following:

Lightness: considerable weight reduction of large and bulky pieces.



Resistance and stability: exceptional resistance to bending, enhanced by the own formation of Finlight (formed by three solid boards).

Easy handling: Finlight supports standard processes of handling, cutting and edging

Logistical advantages: perfect optimized from the point of view of transport and storage.

Other advantages: optimizes the use of raw materials, helping to preserve the environment.

Classification E1: low formaldehyde content

Range and design: very wide range of thicknesses and qualities that allows to adapt FinLight to all types of context and application.

It was very well accepted.

## Costs

## Construction and exploitation costs

Total cost of the building : 150 000 €

## Urban environment

Urban data:

Current planning: Urban Plan of Vilobí d'Onyar, initially approved on July 29, 2010

Land classification: Urban land

Area name: Area of arrangement of isolated houses (key 6)

Subzone: Predominance typology of single-family residential building in the form of garden city (key 6C)

Admitted uses: Single-family housing

Minimum parking space 2 places / housing

Other planning: Special Plan of the general airport system of Girona, approved on November 18, 2004

## Land plot area

Land plot area : 1 014,00 m<sup>2</sup>

## Built-up area

Built-up area : 159,00 %

## Green space

Green space : 817,00

## Parking spaces

2 parking spaces

### Building Environmental Quality

- Building flexibility
- indoor air quality and health
- biodiversity
- acoustics
- comfort (visual, olfactive, thermal)
- water management
- energy efficiency
- renewable energies
- maintenance
- integration in the land
- building process
- products and materials

## Contest

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

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## Building candidate in the category



Energía & Climas Temperados





**Bajo Carbono**



**Salud & Comodidad**



**Edificio Inteligente**



**Premio de los Usuarios**

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