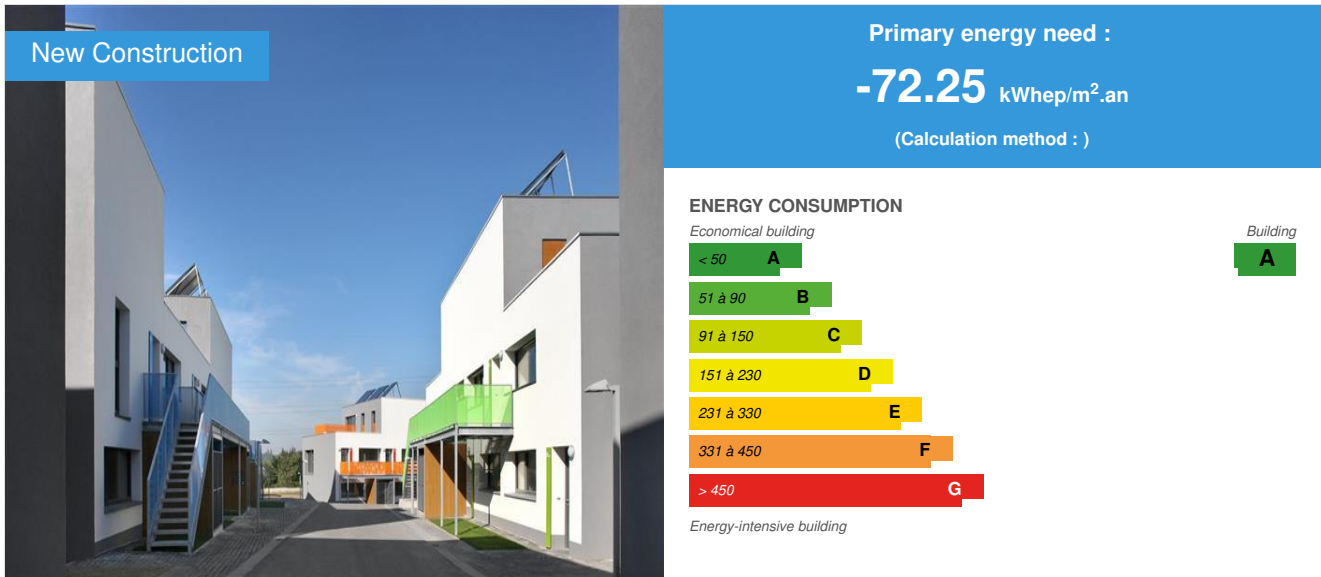


## HAREN 02

by Claire Lheureux / 2015-07-08 15:02:24 / Belgique / 13378 / FR



**Building Type** : Collective housing < 50m  
**Construction Year** : 2011  
**Delivery year** : 2013  
**Address 1 - street** : Rue du Harenberg 1130 HAREN, Belgique  
**Climate zone** : [Cfb] Marine Mild Winter, warm summer, no dry season.

**Net Floor Area** : 3 377 m<sup>2</sup> Other  
**Construction/refurbishment cost** : 4 931 431 €  
**Number of Dwelling** : 30 Dwelling  
**Cost/m2** : 1460.3 €/m<sup>2</sup>

**Certifications :**



### General information

First step in a comprehensive restructuring of Harenberg neighborhood (district of Haren), the project is the creation of an eco-neighborhood. It integrates the construction of housing 30 PASSIVE, 5 completely zero-energy, and the reprocessing of some of the waste water in situ.

Bringing an original and reproducible solution, the procedure is also intended to signal a contemporary architecture in the heart of a city in perpetual metamorphosis.

#### TERRITORY

The Brussels Region has experienced strong population growth. Land reserves are scarce, urbanization often performs as opportunities arise and no overall

vision. This is particularly the case in Haren, whose fragmented network of small narrow and rambling streets fills gradually, without reflection on equipment or mobility. It is in this context that in 2009 the Property Management Agency of the City of Brussels ordered to architects and planners A2M | MSA a feasibility study on the possibilities for restructuring the Harenberg neighborhood. The first tranche of 30 units is directly inspired by this study.

The area is structured by very deep plots with houses along the street Harenberg, and dead zones in plots of background. The project offers a first phase to open up his plots funds. The created road invites the neighborhood to enjoy this space. This road, carried out in the spirit of a woonerf, where the pedestrian to the top priority, just connect to the green promenade. The locals then spent to join this walk, called from the street Camppar a clear perspective on the horizon. They will also be invited to stop in the tranquility of woonerf, in the central square, or perhaps continue until the green zone maintained on the back half of the field. They will then discover the rosière basin and the wadi, and a didactic panel explaining their functioning, and the general philosophy of neighborhood revitalization in a spirit of sustainable design.

The project strengthens the urban continuity with the housing in alignment on the street and through household access to other accommodation in the heart of parcel, while preserving the openness of the landscape (we distinguish the Atomium and the Royal Park Laeken beyond the railway). Buildings are simple in form and restricted clearance (ground + 1, ground + 2). Alternative to the form of "closed", the circulation allows the subsequent urbanization of the site. By work of the ground plane, the initial request for 25 units has been increased to 30, ensuring good valuation of the land.

For sustainability issues at the neighborhood level, A2M was inspired by Memento principles for Sustainable Neighbourhoods advocated by Brussels Environment for the urbanization of new district in the regional territory.

#### MOBILITY

Given the availability of public transportation close to the parcel, and our desire to encourage the use of gentle movement, we limited the number of car parking spaces at 1 for 2 dwellings. We have also planned bicycle parking spaces covered.

Regarding disabled people, the slopes of the internal roads have been studied so that a person in a wheel chair can access everywhere. All apartments on the ground floor of blocks A, B and C are accessible, and 2 of them are fully adapted.

#### ECOSYSTEM BIODIVERSITY

The creation of a pool for reprocessing rosière on-site gray and black water, creating a wadi as a storm basin and infiltration of treated water by the basin rosière, maintenance of the green area on the half back ground, creating the ground garden and construction of a parking lot slab grass are ways to promote the maintenance or development of biodiversity on this greenfield site today.

#### ENERGY PERFORMANCE

The liability standard for us is obvious.

Heating needs are almost negated:

The building envelope is very isolated;

The airtightness is cured;

Each apartment is equipped with a ventilation with high efficiency heat exchanger;

Construction free of thermal bridges.

The summer comfort is provided by passive cooling strategies

External expenses are limited by solar protections placed on all windows facing south and west facades;

The equipment is chosen energy efficient, allowing the same time limit the internal loads;

The remaining charges are dissipated, including manual opening night of the windows.

Energy requirements are thus minimized. The remaining needs are covered by a maximum of renewable energies.

At least half of the energy needed for the ECS of each accommodation is provided by solar panels. For block B, the rest of the energy required for hot water, the Heating, domestic, auxiliaries, in other words all of the remaining energy required is covered by photovoltaic solar panels.

The 5 units of block B are fully ZERO ENERGY.

#### MODULARITY

The project is organized around a modular principle which makes possible prefabrication. The technical choices help ensure low cost construction, rapid construction (construction time are set at eight months) and limited disturbance to local residents.

The architects played with the basic module to offer housing duplex or ground floor, with garden or roof terrace, access via the ground floor or the first floor by a walkway, etc. The accommodation accessible to the ground have a garden and open frontally. Gateways, remote one meter facades, provide duplex access which have an inverted cup (lounge is located at the top, enjoying magnificent views and a "loft" atmosphere) and an inverted plane (they also open laterally east / south / west).

The color white is reserved for the front and back, the gray side faces. The metal fittings are delivered in specific colors to each of the five sets of housing.

The construction costs amounted to € 950 / m2 (excluding VAT, excluding fees) for buildings, or € 1,027 / m2 built including the development of the surroundings and the lagoon. This makes a strong argument in favor of its social sustainability. It is also one of the reasons why the heads of the European project PassReg to do one of their "Beacons" - one of three projects Brussels drivers.

More? : [Http://a2m.be/haren.html](http://a2m.be/haren.html)

After adapting to the systems and operation of the building, tenants now enjoy fully their new homes.

## See more details about this project

<http://a2m.be/haren.html>

## Data reliability

3rd part certified

## Stakeholders

### Stakeholders

**Function :** Contractor

Ville de Bruxelles - Régie Foncière

Marc Libens ; marc.libens@brucity.be

**Function :** Designer

A2M sc sprl

Sebastian Moreno VAcca ; moreno@a2m.be

<http://www.a2m.be>

Design, monitoring and reception site

**Function :** Thermal consultancy agency

Brouae snc

Gérome Forthomme ; gforthomme@brouae.be

encoding PHPP

**Function :** Construction company

DEMOCO

-

<http://www.democo.be>

General Enterprise

**Function :** Structures calculist

StuBeCo

Tom MOLKENS ; tom@stubeco.be

Stability consultancy office

**Function :** Structures calculist

D2S

Geert DESANGHERE ; geert.desanghere@d2sint.com

Acoustic Design Office

**Function :** Other consultancy agency

Istema sa

Bureau of Special Technical Studies

## Owner approach of sustainability

The Brussels Region has experienced strong population growth. Land reserves are scarce, urbanization often performs as opportunities arise and no overall vision. This is particularly the case in Haren, whose fragmented network of small narrow and rambling streets fills gradually, without reflection on equipment or mobility.

## Architectural description

The Harenberg Street appears as a succession of small houses and uncultivated plots occupied by vegetable gardens or planting. The streets are narrow and local use, but escaped the large side attached to a geographical reading of the site, a sort of vast plateau gashed by the railway infrastructure and caressed by planes taking off from the airport runway nearby .

## Energy

### Energy consumption

Primary energy need : -72,25 kWh/m<sup>2</sup>.an

Primary energy need for standard building : 252,00 kWh/m<sup>2</sup>.an

Calculation method :

CEEB : 0.0001

Final Energy : -28,90 kWh/m<sup>2</sup>.an

Breakdown for energy consumption :

Heating: 3.6 kWh / m<sup>2</sup>.year (33%)

ECS: 5.2 kWh / m<sup>2</sup>.year (48%)

Auxiliary: 2.1 kWh / m<sup>2</sup>.year (19%)

Solar PV Production: 39.8 kWh / m<sup>2</sup>.year (-365%)

More information :

This data is based on consumption of housing. Calculation via PHPP 2007

### Envelope performance

Envelope U-Value : 0,15 W.m<sup>-2</sup>.K<sup>-1</sup>

More information :

The average U-value of the walls is about 0083 W / m<sup>2</sup>.K

The average U-value of the roof is 0.067 W / m<sup>2</sup>.K

The average U value of the land is 0.104 W / m<sup>2</sup>.K

The average value Uw joinery is 0.75 W / m<sup>2</sup>.K

Building Compactness Coefficient : 1,79

Indicator : n50

Air Tightness Value : 0,40

## Renewables & systems

### Systems

Heating system :

- Heat pump
- VAV System

Hot water system :

- Heat pump

Cooling system :

- No cooling system

Ventilation system :

- Double flow heat exchanger

Renewable systems :

- Solar photovoltaic

Renewable energy production : 138,00 %

## Environment

### Urban environment

The Brussels Region has experienced strong population growth. Land reserves are scarce, urbanization often performs as opportunities arise and no overall

vision. This is particularly the case in Haren, whose fragmented network of small narrow and rambling streets fills gradually, without reflection on equipment or mobility. It is in this context that in 2009 the Property Management Agency of the City of Brussels ordered to architects and planners A2M | MSA a feasibility study on the possibilities for restructuring the Harenberg neighborhood. The first tranche of 30 units is directly inspired by this study.

Land plot area : 6 407,00 m<sup>2</sup>

Built-up area : 23,00 %

Green space : 3 824,00

## Products

### Product

Integrated multi system

Nilan

info@nilanbelgium.be

<http://www.nilanbelgium.be/>

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 = '29'

The multiintégré system combines comfort ventilation, heating and producing hot water in one compact system.

Validated



External insulation Neopor Type

Willco products

-

<http://www.willcoproducts.be>

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'

External insulation with Neopor insulating type (Lambda = 0.032 W / mK)

Validated



Photovoltaic Solar

JA Solar

info.eu@jasolar.com

<http://www.jasolar.com>

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 = '29'

Installation of photovoltaic solar panels for compensating the electrical consumption of the housing

Validated



## Costs

### Construction and exploitation costs

## Health and comfort

### Water management

In times of normal rain, the water is collected in cisterns for reuse, and stormy period when the tanks are full, the water is sent to a wadi, storage area from which the water goes slowly infiltrate into the ground.

### Indoor Air quality

Room ventilation is provided by a D system associated with a heat pump, which allows an optimal recovery of the heat energy in the exhaust air. Ventilation is EXEMPLARY BUILDINGS 2011 - TECHNICAL PROJECT ON PAGE 28 33 - CALL FOR PROJECTS "BEST BUILDINGS» 2011 - 30/06/2011

### Comfort

**Health & comfort :** The passive standard offers unparalleled comfort: by simple physical principles, a pleasant temperature of air and walls is ensured, and a constant air renewal.

**Calculated thermal comfort :** inférieur à 5% du temps d'occupation au dessus des 25°C (critère passif)

**Acoustic comfort :** A support for acoustic requirements at the design stage of the project seems essential to achieve the acoustic performance described by the new NBN-S01-400-1 standards according to category called "normal acoustic comfort" to reduce transmission of airborne and impact between apartments.

## Carbon

### GHG emissions

**GHG in use :** -20,95 KgCO<sub>2</sub>/m<sup>2</sup>/an

**Methodology used :**

Calculation of CO<sub>2</sub> emissions from heating consumption, ECS, lighting and auxiliary using conversion factors of primary energy / CO<sub>2</sub> (0.198 kg CO<sub>2</sub> / kWh EP for gas and 0.29 kg CO<sub>2</sub> / kWh for EP electricity)

## Contest

### Building candidate in the category

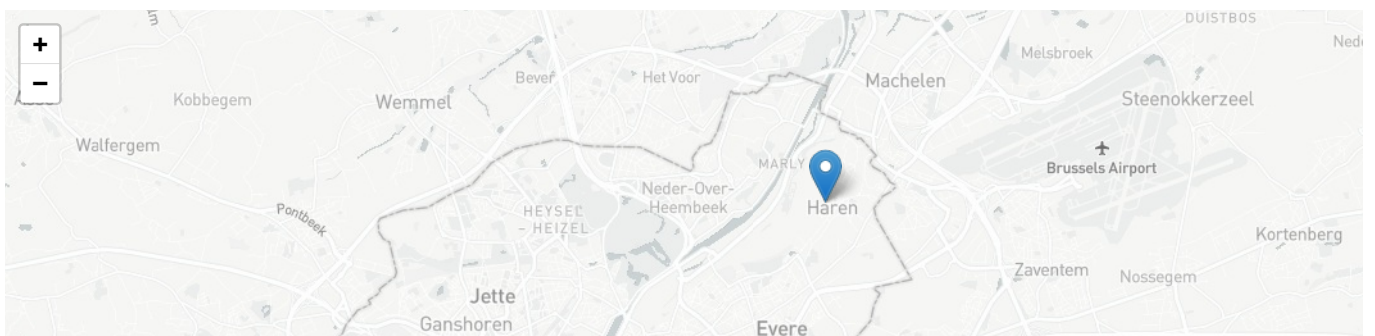


Bâtiment zéro énergie



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