

# Rehabilitation of the Cité du Centenaire in Montignies-sur-Sambre in an eco-district

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Urban renewal

Address 1 - street : 6061 RUE TRIEU KAISIN 70, 6031 CHARLEROI, Belgique



1 ha

Population : 278 hab

Starting year of the project : 2012

Delivery year of the project : 2017

Key words : Adaptability; Bioclimatic; Biodiversity; Garden city; Composting; Integrated design; Short cycle; Densification; eco-neighborhood ; energy saving ; Multidisciplinary team; Collective spaces; Airtightness; Training; Management



6 000 000 €

Proposed by :

Certifications :



## ID CARD

The rehabilitation of a city of social housing "Centenary City" included, in its original situation, 7 identical buildings of 4 levels installed repetitively as well as 2 batteries of 15 garages.

The aim of the intervention was to:

- The demolition of the 30 garages and a 12units building;
- The energy renovation of 6 buildings, ie 72 dwellings;
- The construction of a building of 12 apartments on the part of the land made free after demolition of the garages;
- Development of the surroundings.

The principles implemented are as follows:

- Encourage gentle travel by reducing the pressure generated by the presence of the automobile,
- **Reducing the energy costs of tenants by favoring the passive design of housing both in rehabilitation and new construction,**
- Emphasize the adaptability of new housing and its accessibility,
- Minimize the environmental footprint of housing interventions and operations,
- Encourage social relations in the neighborhood,
- Pilot project on the management of construction waste,
- Vegetation of common spaces,
- Integration of artistic intervention.

This project goes beyond the "simple" renovation of housing but is part of an overall redesign of the neighborhood in order to requalify it.

The new 12-unit building is built on stilts to organize parking lots under the building, which limits the visual presence of cars. Traditional heavy design, the structure nevertheless allows to modulate the housing in 1 or 2 rooms. Thanks to an elevator and the adequate layout of the premises, they are also accessible and adaptable. The passive design makes it possible to greatly reduce the energy costs of tenants, which has a favorable impact on their budget and facilitates the payment of rents.

The heavy renovation of the buildings has also been studied on the principles of a passive design.

## Programme

- Housing
- Public spaces
- Green spaces

## CO2 Impact

CO2 Impact : 100 tCO2

### Method used to calculate CO2 impact

Estimated on the basis of the CO2 emissions assessed, before work, by the energy audit of the existing buildings and, after work, by the PEB certificates. For new buildings, the assessment is carried out on the basis of the CO2 emission calculated in the PEB certificates and an estimate of the CO2 emission of a building complying with the maximum PEB requirements.

## Project progress

- Delivery phase
- Operational phase

## Key points

- Governance
- Quality of life
- Economic development
- Mobility
- Resources
- Biodiversity
- Energy /Climate

## Certifications

- Autre

## More info

<http://www.hainauthorizons.be/cite-centenaire/>

## Data reliability

Self-declared

## TERRITORY

### Type of territory

The site concerned by the initiative is located in the province of Hainaut in the commune of Charleroi. It comprises 7 buildings with 12 apartments each, representing 92 units, or approximately 250 inhabitants. Originally, the whole site and the buildings were designed by the architect Victor Bourgeois on the basis of the principle of the garden's cities, for the Foyer Montagnard, in 1957 and built in 1959. In 1978, the architectural aspect of Buildings has been denatured by the installation, on the façades, of a 4 cm mineral wool insulation and cladding in white asbestos-cement panels.

Following a European public service contract, the "St.Ar.Tech Management group" team was appointed to carry out this project. From the first sketches, the principles of sustainable development were taken into consideration thanks to the good collaboration of an integrated team, with all the necessary skills. The goal of rehabilitation is to enhance the site and integrate it into a global reflection at the neighborhood level, as Victor Bourgeois had done in his day. Eco-mobility: The city of Centenaire is located in the heart of an urban area well served by public transport (bus and metro lines), close to public facilities (nurseries, schools, hospitals, etc.), shops and services, necessary base to project a city

in the sustainable. In order to reduce vehicle pressure on the site, mild travel modes are favored and the surrounding areas are treated accordingly, both for pedestrians and for cyclists. The pedestrian paths connect the site to the various existing pedestrian networks and specific equipment for bicycles are provided. The rational use of territory: In addition to the rehabilitation of the 68 dwellings and the construction of a building of 12 apartments on stilts, two new buildings with 6 dwellings will densify the site. They will fill the "hollow teeth" by filling the empty spaces along Centennial Avenue to ensure the continuity of the currently broken built front. The density increases from 84 dwellings / ha to 96 dwellings / ha. Waste treatment: The demolition products were recovered by reuse and recycling after the buildings were cleaned up by dismantling all the asbestos elements which were evacuated according to the legislation to an approved sorting center: - for the decommissioning of two buildings: two tons of demolition products, one tonne was re-used as it was (boilers and radiators), 17 tons were completely recycled (wood and metals) and only 2 tons were considered Scrap and treated in an approved sorting center. - during the demolition of the building (No. 123), most of the materials were recycled: the rubble was used to backfill the cellars; The blue stone foundations were carefully dismantled and reused on the gable of the building remained naked after demolition as well as to pave the future place to be realized at the right of the demolished building; The glass brick panels of the underground basement bays were carefully dismantled and recovered to replace those degraded in the renovated buildings. Respect for nature, water and biodiversity Tarmac-covered car parks, located at the front of existing buildings, have been demolished in favor of vegetated areas that are common green spaces. All the car parks are located nearby and under the new building on stilts to limit the right of way of the car (little used by the inhabitants) in the city. Coating of the surrounding areas and roadways promotes permeability. The choice of plantations favors indigenous species in order to contribute to the development of local biodiversity. Climbing plants cover the existing chimneys and the pergolas of the car parks at the perimeter of the new building. Rainwater is collected and brought to a collective rainwater tank which will be used for the maintenance of the surrounding area and will remain available to all tenants (washing cars, bikes, watering the collective garden, etc.) by the use of a manual pump. Rational use of energy: The newly certified passive buildings, designed according to bioclimatic principles and the renovation of passive buildings, make it possible to reduce the primary energy consumption of both new and renovated dwellings. The impact on the use of buildings will be limited in terms of CO2 emissions. For all work and where possible, the choice of recyclable materials (wooden frame with removable aluminum cover, external insulation applied, high-strength compressed mineral wool cladding, etc.) or low-emissivity materials (building materials Without formaldehyde,

## Climate zone

[Cfc] Marine Cool Winter & summer- Mild with no dry season.

## KEY FIGURES

### Neighbourhood paved surfaces

Neighbourhood paved surfaces : 5 420 m<sup>2</sup>

### Green areas, roofs included

Green areas, roofs included : 3 684 m<sup>2</sup>

### Public spaces area

Public spaces area : 5 670 m<sup>2</sup>

### Housing floor area

Housing floor area : 6 309 m<sup>2</sup>

### Refurbished floor area

Refurbished floor area : 5 130,00 ha

### Number of residential units

Number of residential units : 96

### Number of social housing units

Number of social housing units : 96

### Green spaces /inhabitant

13.25

### Public spaces/inhabitant

20.4

### Total investment costs (before tax)

Total investment costs (before tax) : 6 000 000 € HT

### Detail of subsidies

The rehabilitation was initially foreseen within the framework of the exceptional investment plan of the Walloon Region (PEI), the aim of which was to improve the quality of the envelope, the safety and the healthiness of social housing buildings. Given that the budget was not sufficient to rehabilitate all the dwellings, the client and the Walloon Housing Corporation reoriented the financing of the project in order to benefit from several different sources (PEI 2008/1244, CPEI 2009 / 088, AC58 / 2010-2012, PIVERT 1 and PIVERT 2).

## GOVERNANCE

## Project holder

Name : La Sambrienne

Type : Para-public owner)

General description :

The Sambrienne is the Public Service Housing Company (SLSP) of Charleroi and Gerpinnes. It is one of the 64 companies in Wallonia approved by the Société Wallonne du Logement (SWL). With nearly 10,000 homes and more than 2,000 garages in its heritage, it is the largest in the sector. Born in June 2013 of the merger of the five SLSPs of Charleroi, the Sambrienne is an essential actor of the municipal policy of housing. It occupies nearly 200 people in the service of its tenants and candidates-tenants. La Sambrienne's main missions are: to rent housing to the most precarious people, to build and renovate housing intended for rental or sale, to welcome candidates - tenants and tenants by providing them with social support.

## Project management

Description :

The rehabilitation program incorporates the needs expressed by tenants in the consultation with the Tenant Advisory Committee. It is the result of various contacts with the SWL and the Cabinet of the Walloon Housing Minister to obtain the financing necessary for its development.

During the development of the project, the study team often visited the site, met with the tenants, which made it possible to gather their wishes and grievances, upstream of the project, in order to integrate them into the different Phases of their development.

The project author, the owner and interested tenants participated in information and exchange meetings organized by the City of Charleroi within the framework of the network of shared gardens "Jacquady" in order to initiate the garden project.

As part of the development of the surrounding area, consultations were organized with the applicants, the Intercommunal waste management center (ICDI), the traffic police department of Charleroi and representatives of the city with a view to Retrocession of the roads to the town of Charleroi. As a result of contacts with ICDI and on the basis of the facilities provided on the site, specialized eco-advisers will be in charge of informing the inhabitants of the area about practices aimed at limiting the production of waste.

At the initiative of the project team, the students of the school in the neighborhood were given the task of assigning a name to each building. On the other hand, creative workshops were organized in order to involve the adolescents and the young people of the district in the drawing of a fresco that was realized by the artist Léopoldine Roux on a blind gable of one of the renovated buildings .

## Project stakeholders

Stratech Management Group

Function : Architecture agency

The multidisciplinary team STARTECH Management Group has been appointed, based on a European service market, to design and carry out the complete study of the neighborhood including the layout of the external spaces but also the renovation of the existing building and the Creation of new housing. This team, which integrates all the skills, has ensured both the urban design, the architectural design and the technical studies (stability, HVAC, PEB ...).

Abrassart Nathalie - Barattucci Marcel

Construction21 company page :



Startech Management Group

<http://www.startech-group.eu>

<http://www.startech-group.eu/>

## QUALITY OF LIFE

### Quality of life / density

The development of the surrounding areas (square, pedagogical garden and shared gardens, common premises for selective sorting ...) is designed to favor meeting spaces, encourage contacts between inhabitants and increase social cohesion. The space covered under piles, located under the new passive building, can be used for the organization of various activities and leisure (party neighborhoods, flea market ...).

The road between the buildings 125/127 and 129/131 is closed to traffic, which makes it possible to transform it into a safe place for children's games and with a multiple vocation for the whole neighborhood (flea market, party, various animation, ...). It will remain accessible to the emergency services (firemen, ambulances, police, ...) and for removals.

At the end of it, there is a play area, on both sides of the staircase which is renovated. The slopes are reconfigured in tiers to replace the damaged walls and constitute a place of attraction, by their position and their sunshine. A wooden seat will be placed on the first steps for landing and relaxation.

The comfort of the inhabitants is enhanced by the increase in the living area of the existing dwellings. The surface of the existing balconies is added to the living room as well as the kitchen by the demolition of the dividing partition, to constitute a single and vast living space. New balconies on independent structure and storage spaces are arranged. After renovation, the kitchens are equipped with hot water. The passive and very low energy characteristic greatly improves the comfort of both winter and summer and has a favorable impact on the budget of the inhabitants by the significant reduction in heating loads, which contributes to increase their purchasing power and helps them pay more for rent.



The sobriety of the architectural and artistic expression proposed by the use of a clear vocabulary aimed at efficiency by a balanced choice of materials, selected above all for their environmental performance while combining an aesthetic character of the place makes it possible to requalify the buildings. This makes it possible to break their repetitive character and the negative image that it generates in order to increase the residential aspect by the personalization of the buildings. The treatment of the surroundings is studied in such a way as to reduce the automobile pressure and to favor the modes of soft travel through paths through diversified green areas, which contributes to the improvement of the living environment.

## Net density

-0.02

## Culture and heritage

In 1978, the architectural aspect of the buildings was denatured by the installation, on the façades, of a 4 cm mineral wool insulation and cladding in asbestos-cement panels of white color which has very poorly aged. Stained wooden chassis replaced the old white painted frames, without respecting the original divisions. As a result of these different operations, the initial architectural value was lost.

The aim of the rehabilitation project is to enhance the site and integrate it into a global reflection at the neighborhood level, as Victor Bourgeois did during his design. He was one of the first architects in Belgium to defend and illustrate by his action, his works and his writings, functional architecture and social urban planning.

An artistic integration had been planned by the architect Bourgeois in a neighboring building (rue Trieu Kaisin n° 74) by the realization of a mural painted by the artist Jo Delahaut. Unfortunately, it has now disappeared. In the same spirit, an artistic integration was carried out to dress the gable of one of the buildings, which had become blind after demolition, by means of mineral wool panels representing the colors collected in the demolished building, as a testimony of past lives. This collection was carried out in the framework of workshops with the children of the school of nearby cities and under the direction of the artist Léopoldine Roux. This proposal was selected and funded in the context of a call for proposals launched by the Commission of Arts of the French Community of Belgium in collaboration with the SWL.

The red tint of the plasters of the renovated buildings was chosen in reinterpretation of Victor Bourgeois's objective, which wrote in the magazine *La Maison* n° 10 of October 1954: *"the colors of the blocks also establish a link with the agglomeration; the parallelepipeds on the periphery are red - a red a little warmer than that of neighboring houses - and showcase the buildings of the center, higher and lighter."*

## Social diversity

After renovation, the city presents a range of public housing diversified "social" and "average" (balance or integration), comprising 1 to 3 rooms for each type. In addition, the 12 units of the new passive building are adaptable. This will make it possible to reinforce the generational mixing by keeping on the site and in the district of tenants in loss of mobility.

## Social inclusion and safety

The activity and the animation created by the new collective spaces (gardens, covered space under the new building ...) will strengthen the control, social cohesion and appropriation of the site by the occupants, which will have a favorable impact against Vandalism.

Speed traps are created on the access roads in order to limit the speed of the vehicles and to secure the pedestrians.

## Ambient air quality and health

For both renovation and new construction, the materials are chosen without organic volatile compounds (VOCs) and so as not to affect the health of the workers responsible for carrying out the work and the inhabitants.

The installation of a dual-flow ventilation system ensures good indoor air quality for the occupants.

Gentle travel patterns are favored on the site, which reduces local pollution and promotes the practice of physical exercises for the inhabitants.

The goal of developing a shared garden is to encourage people to grow their own fruit and vegetables and improve the quality of their food.

The new acoustic standard has been applied both in renovations and in the construction of the new building, which increases comfort of occupancy.

Natural lighting was favored when designing new housing.

# ECONOMIC DEVELOPMENT

## Local development

The creation of a plot of land in the demolished building and a covered space under the passive building are likely to encourage the organization of exchange activities.

The basements of the rehabilitated buildings will also be able to host workshops of small repairs similar to the "ressourceries", activities that can be organized by the inhabitants. However, since the project was part of a very diversified urban fabric (presence of schools, shops, etc. nearby), the establishment of additional commercial functions was not justified.

The dismantling work before transformations was carried out by a social economy enterprise, which made it possible to ensure work for more than a month to this category of workers. Social clauses have been provided for in public works contracts in order to promote local employment. The company, which carried out the demolition work, hired 5 workers from the region to carry out this work and extended their contract for other projects that had been completed in the region.

## % of public spaces

## Circular economy

The creation of collective gardens and shared gardens on the site available to the inhabitants of the neighborhood allows them to enroll in the local circular economy.

## TRANSPORT

### Mobility strategy

The city of Centenaire is located in the heart of an urban area well served by public transport (bus and metro lines), close to public facilities (nurseries, schools, hospitals, etc.), shops and services, necessary base to project a city in the sustainable.

In order to reduce the car pressure due to the through-ways, mild travel modes are favored on the site and the surrounding areas are treated accordingly, both for pedestrians and for cyclists. Specific equipment for bicycles is provided and the pedestrian paths connect the site to the various existing pedestrian networks. These paths are adapted and free of obstacles to allow a safe movement of people with reduced mobility as well as the elderly. Speed traps are created on the access roads in order to limit the speed of the vehicles and to secure the pedestrians.

**Car parking:** The new building is built on stilts, the ground floor is open to the outside and accommodates parking spaces. Other parking areas, whether covered or not, are also provided on site.

22 underneath new buildings (12 reserved for inhabitants of this building and 10 available for other users), 6 covered parking spaces and 36 other pitches. These areas of parking include seven sites for people with reduced mobility. In total, there are 0.75 places per dwelling.

**Parking Bicycle and two wheels :** Four premises for two wheels (private enclosure), with a capacity of 18 bicycles each, are arranged: One under the new building and three others near the renovated buildings. Secure spaces are also available for visitors' bike parking (under the stairwells). In addition, at least one private cellar is present for each dwelling located in the renovated buildings. Ramps make it easier to access the basement from the outside. There are an average of 1.72 bicycle or two-wheeler locations per dwelling.

## SMART CITY

### Smart City strategy

The access control of the common areas (staircase, bike room, trash room ...) is carried out by an electronic system with badge reader and code keypad, which also allows access to external services. Maintenance, meter reading ...

## RESOURCES

### % Paved surfaces

54

### Water management

Rainwater is collected and brought to a collective rainwater tank which will be used for the maintenance of the surrounding area and will remain available to all tenants (washing cars, bikes, watering the collective garden, etc.) By the use of a manual pump.

### Soil management

The treatment of the approaches and the roads is studied in order to increase the permeable zones:

Reduction of impermeable surfaces by:

- Replacement of tarmac areas in front of existing buildings by gardens and around garages demolished by stabilized gravel.
- Development of new dolomite pathways.
- New parking spaces will be constructed of permeable metalling (beyond the existing sidewalks preserved)

Realization of plant roofs both on the roofs of existing buildings and on new buildings.

### Waste management

As part of the development of the surroundings, a consultation was organized the Intercommunal waste management (ICDI). Following the contacts made and on the basis of the facilities provided on the site, specialized eco-advisers are in charge of informing the inhabitants of the neighborhood about practices aimed at limiting the production of waste. On the ground floor of the new building, a dustbin is used for the inhabitants of the building. Three more are attached to the renovated buildings and are easily accessible by the removal service.

In order to improve the management of waste for the inhabitants, sufficient spaces dedicated to selective sorting have been created in the apartments. A composting zone is also planned near the vegetable garden for organic waste.

**Pilot project for the recovery of demolition / construction waste**

The demolition products were recovered by reuse and recycling after the building was cleaned up by dismantling all the asbestos elements that were evacuated according to the legislation to an approved sorting center:

- for the dismantling before conversion of all the renovated buildings. For buildings 125 - 127, out of 20 tons of demolition products, one tonne was reused (boilers and radiators), 17 tons were fully recycled (wood and metals) and only 2 tons were considered as waste and treated in an approved sorting center.

- during the demolition of building no. 123, most of the materials were recycled: the rubble was used to fill the cellars; The blue stone foundations were carefully dismantled and reused on the gable of the building remained naked after demolition and to pave the future place to be realized at the right of the demolished building; The glass brick panels of the underground basement bays were carefully dismantled and recovered to replace those degraded in the renovated buildings.

## BIODIVERSITY

### Biodiversity and natural areas

All the car parks are located nearby and under the new building on stilts to limit the right of way of the car (little used by the inhabitants) in the city. The treatment of the approaches and the roads is studied in order to increase the permeable zones. The choice of plantations favors local species in order to contribute to the development of local biodiversity. Climbing plants are planted and must cover the existing and preserved chimneys. The pergolas covering the car parks at the perimeter of the new building are intended to be covered with climbing plants.

The treatment of green spaces is illustrated in particular by the following actions:

- Limit unaffected areas covered by lawn to:

- The creation of private gardens for all dwellings on the ground floor of existing buildings
- The creation of a collective kitchen garden at the back of building no. 121
- The planting of wooded massifs requiring little or no maintenance at the foot of the buildings
- The use of residual space following the demolition of building no. 123 by a collective kitchen garden
- The creation of new massifs planted to bring nature closer to places of life and placed judiciously in order to create a green flow linking the buildings to each other

- Create secure and attractive friendly places to promote social ties.

- To provide green spaces so that they can be used in different ways; They can be described as spaces with multiple vocations

- Improve the environment between the two preserved buildings 129/131 and 125/127 by privatizing the spaces located at the front and made available to the tenants and made accessible by a staircase from the new terrace

- Medium-stem plantations to mitigate overgrown buildings and enhance space

- Ecological management of green spaces in order to:

- Limit the maintenance and use of pesticides
- Promote the use of local species
- Ensure the right balance between flora and fauna by: Encouraging the creation of an apiary by the local authority; Planting an orchard; (Hawthorns, beeches, hawthorns) which by their function of refuge attract many animals, birds, hedgehogs, insects ....

## ENERGY/CLIMATE

### Climate adaptation, resources conservation, GHG emissions

Passive certification of the new building designed according to bioclimatic principles as well as the very low energy renovation of preserved buildings, close to the passive character, make it possible to reduce the primary energy consumption of the houses created and renovated. The impact on the use of buildings is limited in terms of CO2 emissions. For the construction of the new building as well as for the renovation and, to the extent possible, the choice of recyclable materials has been favored (wooden frame with removable aluminum cover, applied external insulation, high strength compressed mineral wool cladding, etc.) .

### Energy sobriety

One of the main objectives of the project is to reduce the energy costs of the tenants by favoring the passive design of housing both in rehabilitation and new construction and thus reduce the environmental footprint of housing.

The new 12-unit building is certified as passive.

Ambitious renovations from an energy point of view were carried out on existing buildings, with the aim of applying the concepts of passive construction and thus drastically reducing the energy consumption of these buildings.

The performance of these renovated buildings is exemplary, as evidenced by the results of the PEB study, which classifies the apartments most exposed to A-level losses and those less exposed to an A + level, which is the maximum possible result.

**At the end of the realization of these buildings, this renovation has made it possible to obtain results that are superior to what is currently done in terms of new standard construction, while retaining the advantages of a renovation, which makes these apartments renovated, the best performers in Wallonia in the field of public housing.**

This "upgrading" of consumption, both for the tenants of the new passive building and for those of the transformed buildings makes it possible

to standardize the energy bill and the comfort of the occupants, factor of equity between the inhabitants of the city.

Since the energy requirements for the various building envelope measures have been greatly reduced, the use of complex heat production technologies has been considered to be of little relevance. Consequently, standard heat production systems have been installed, namely highly efficient condensing gas boilers with very limited power. In addition, facilities management methods are easy to use for the occupants.

However, due to low consumption, an innovative heat distribution system has been installed in the new building: a common circulation loop serves both for DHW heating and for space heating. The heat for domestic hot water (DHW) is supplied to a heat exchanger specific to each apartment.

Ventilation duct networks have been minimized by taking this parameter into account as soon as the project is designed, which makes it possible to achieve an efficient system and reduce installation costs.

## BUILDINGS

### Buildings

**The volume of the new building is compact**, its composition on piles and its south facade is entirely glazed give it an impression of lightness. This building is set back from the street and has a ground floor completely open and 3 floors. The rear façade to the north has few openings and is animated by a green flow descending stepped from the vegetated roof terrace to the massifs of plantations created at the foot of the vertical circulations.

The existing gauge **of renovated buildings** remains unchanged: the balconies will be closed to increase the living area and improve the compactness of the building. New balconies on an independent structure are installed and allow the rhythm of the facades and increase the useful surface of the houses.

The sobriety of the architectural and artistic expression proposed by the use of a clear vocabulary aimed at efficiency by a balanced choice of materials, selected above all for their environmental performance while combining an aesthetic character of the place makes it possible to requalify the buildings . This makes it possible to break their repetitive character and the negative image that it generates in order to increase the residential aspect by the personalization of the buildings.

All the interventions carried out on both the existing building and the new construction are based on identical principles:

- Strengthen the insulation of the protected volume;
- Ensure a very good air tightness of the protected volume;
- Limit thermal bridges to the maximum;
- Install dual-flow mechanical ventilation with heat recovery unit;
- Maximize solar inputs in winter while limiting the risk of summer overheating;
- Ensure acoustic comfort;
- ...

## Contest

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

#### Building candidate in the category



Grand Prix Ville Durable



Coup de Cœur des Internautes





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