paradisexpress, **econeighbourhood**

Investor	Fedimmo (subsidiary of Befimmo)
Architects	A2M
	Jaspers-Eyers Architects
	Bureau d'Architecture Greish
Structural engineers	Bureau Lemaire
Special techniques	TPF Engineering
Acoustics	D2S
Landscape	Heinz Winters - Atelier Paysage
General contractor	Duchêne - Galère - Interbuild
Other	HSP

2016 WINNER
BEST FUTURA PROJECT
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Abstract

Program	**Eco Neighbourhood:** • 160 housing units • 350 m² shops • 750 m² services • 21 000 m² office building
Investor	Fedimmo
Architects association:	A2M Jaspers-Eyers Architects Bureau d'Architecture Greish
Engineering Structural: Techniques: Acoustics:	 Bureau Lemaire TPF Engineering D2S
Landscape architects:	Heinz Winters Atelier Paysage
General contractor association	Duchêne Galère Interbuild
Surface	38 000 m²
Performance	Passivehouse BREEAM very good
Location	Liège (BE)

Summary

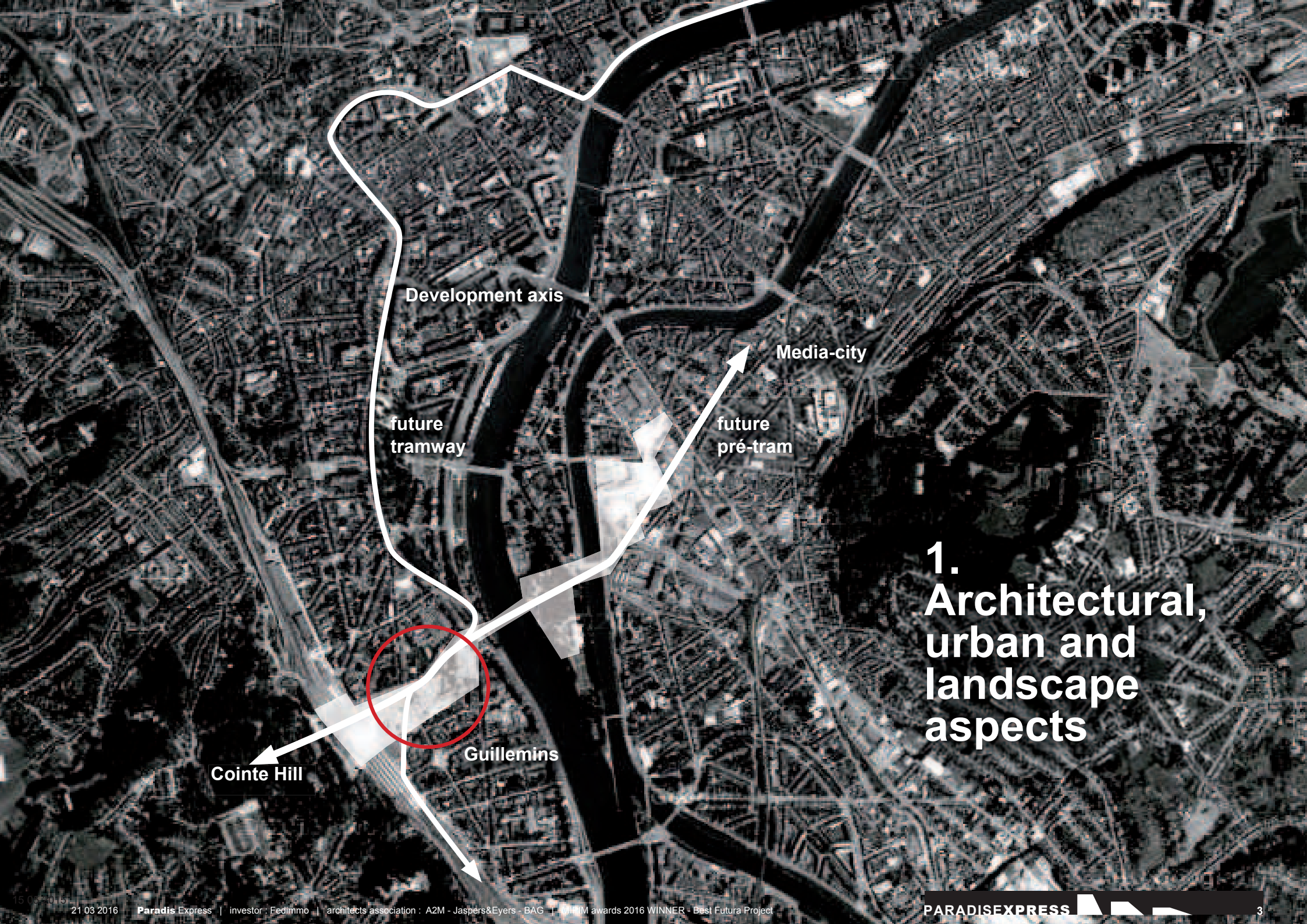
1 . Architectural, urban and landscape aspects

S M L XL Liege - a multiple scale city
A plot framework embedded into the urban fabric
A new ground for the city
Neighbourhood architectural identity
Rolling green spaces

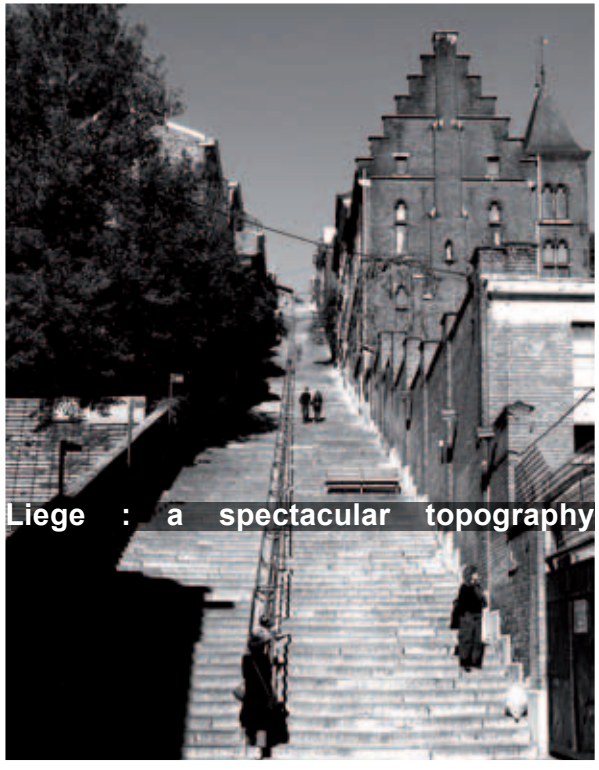
2. Energy performance

Passif standard, what else ?
BREEAM: quality assurance
Light and sunshine

3. Views



1. Architectural, urban and landscape aspects



Liege : a spectacular topography

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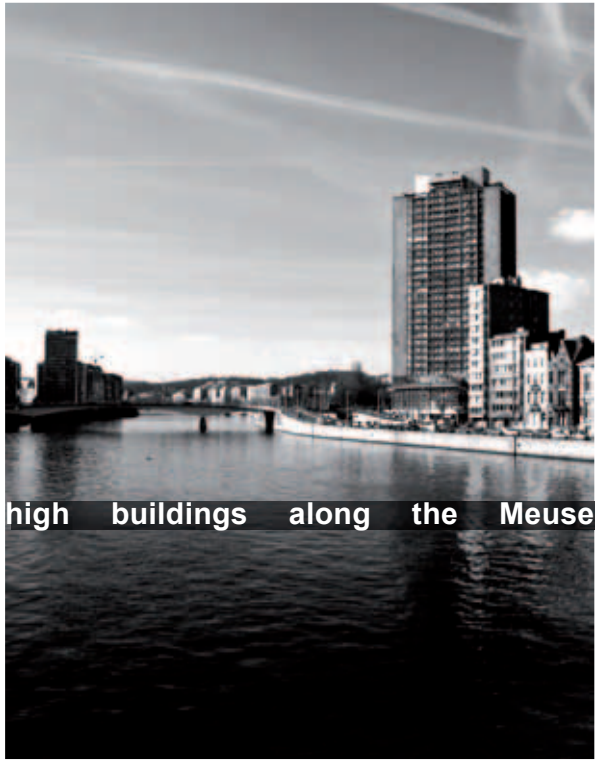


high buildings along the Meuse

S M L XL, Liege - a multiple scale city

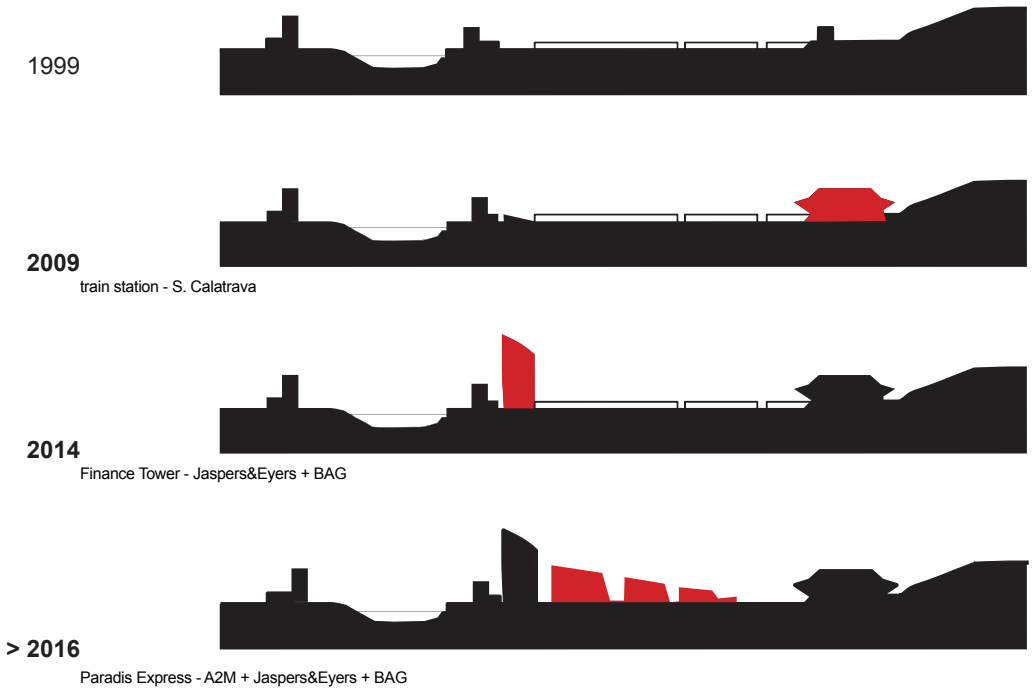
Liege has undergone profound changes in fifteen years. This is particularly the case of the Guillemins district, situated at the start of the urban development axe which links the monumental train station designed by S. Calatrava with the Media-city cluster designed by R. Arad. With a little perspective, however, we notice the way the train station plays with the height of Cointe Hill, and in the distance, with that of the Chartreuse, revealing the topographic disposition of Liege at the neighbourhood scale.

From the hills to the bed of the Meuse, the surface of the city creates sizeable level variations. These are magnified by the diversity in size of the buildings covering them. Caught between two giants, disproportionate compared to the houses that compose the major part of the district, the main challenge in our view, is to reconcile these discrepancies that characterise the city today.

We define levels of reference among the latter. As such, the dock level marks the foot of our buildings. The neighbouring buildings which line the Meuse then determine the height. Finally, the heights of the houses in the neighbourhood form a landmark which balances the whole.

The thousand steeples of Liege

The strength of the proposed urban planning lies in reconciling, on a cleared ground, relatively high buildings, while harmonising them perfectly within their context and integrating in turn all the components of the urban fabric and landscape of Liege. In a city with a thousand steeples, the project takes its place in the Liege skyline. It promotes harmony between the different structures which shape the skyline.



S M L XL, Liege - a multiple scale city

What place can be occupied within these levels? Answering with a third massive signal would be a mistake which would suffocate the neighbourhood, obstruct the view and traffic, and create a rupture within the city.

To integrate the substantial programme, we decided to act on measured travel movements and on simple choices so as to appropriate space in a coherent and efficient manner within this context.

Firstly, we wanted to free a maximum of ground to provide a public area which can contribute to the urban cohesion and accentuate the landscape continuity between the hill and the Meuse – in other words, to create space.

A second approach was to understand the city. Whereas these large contemporary buildings are impressive, towers have been part of the identity of Liege for a long time. The urban context actually consists of a tradition of height and variations. It is up to us to propose proper variations and a harmonious rhythm for the city and its landscape.

Free ground space

Taking space

Making space

Giving the city rhythm

Rhythm openings

Vary volumes

A piece of the city caught between 2 giants

A regular plot framework

Alignments which criss-cross the site ...

Defining a check pattern

Distribution of the mass ...

... adapted to the urban context

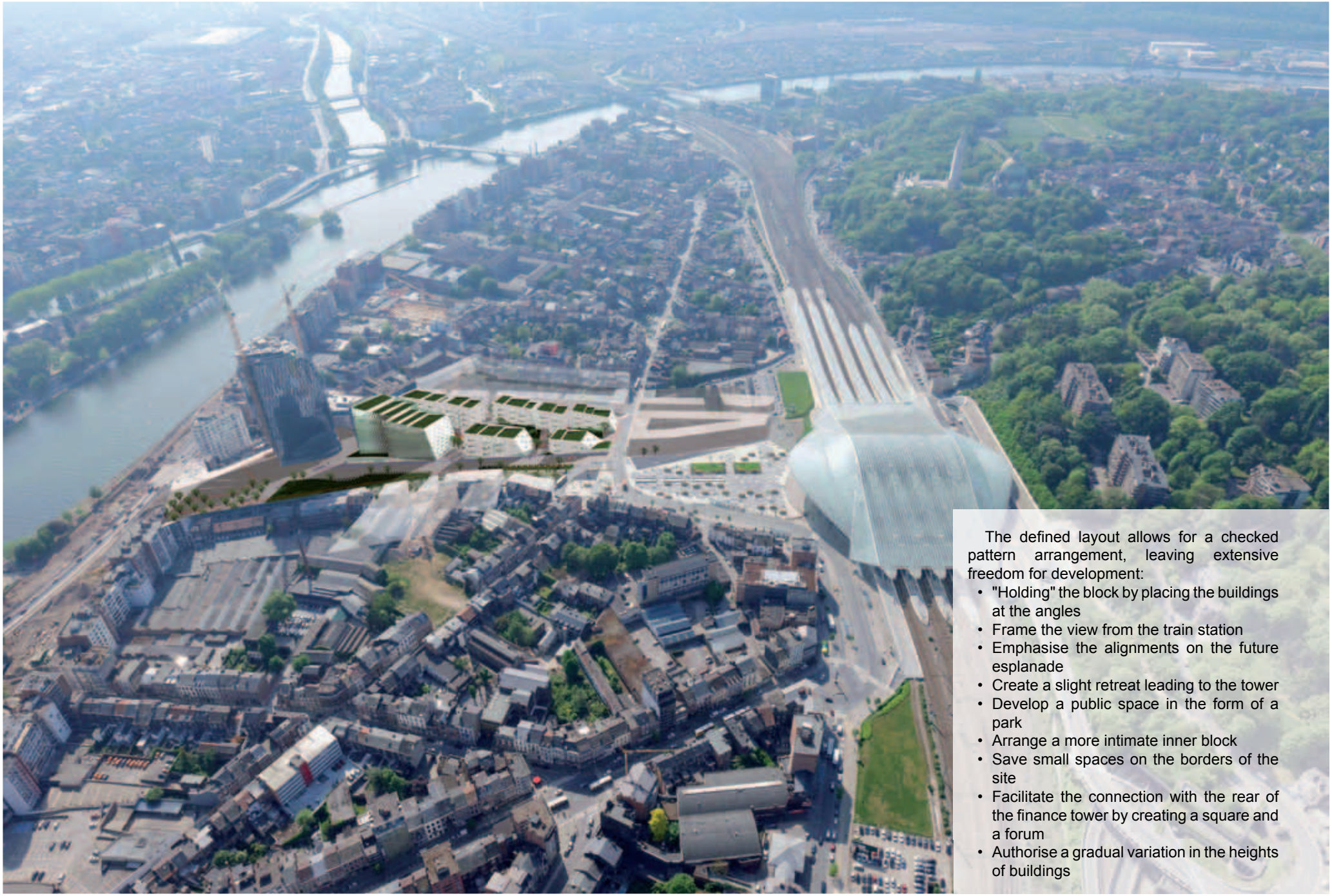
A plot framework embedded into the urban fabric

Pursuant to these intentions, our method was to identify the marks which, in spite of major contemporary works, continue to structure and bear the memory of the place. Whereas everything has been or is bound to be transformed, what are those marks?

We used the narrow layout of plots bordering the site as a starting point, with a 6m average width, attesting to its former cultivation use. We extended that pattern and spread it according to the angles formed by the block. The sequential pattern thus defined is gradually extended from the train station to the Meuse.

Examining the past just as much as the future, we also relied on the new main axes in Liege as well as on the axis determined by the tramway and the Guillemins-Médiacité line.

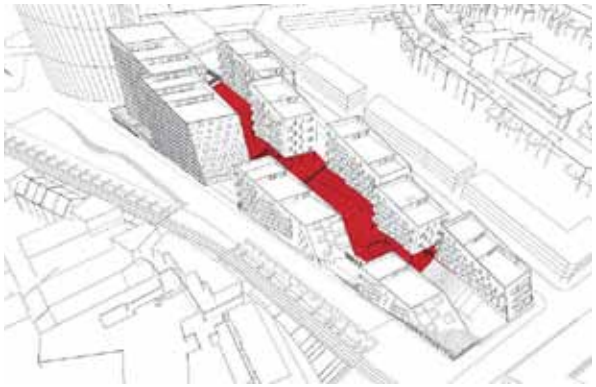
The strength of the proposed urban planning lies in reconciling, on a cleared ground, relatively high buildings, while harmonising them perfectly within their context and integrating in turn all the components of the urban fabric and landscape of Liege. In a city with a thousand steeples, the project takes its place in the Liege skyline. It promotes harmony between the different structures which shape the skyline.



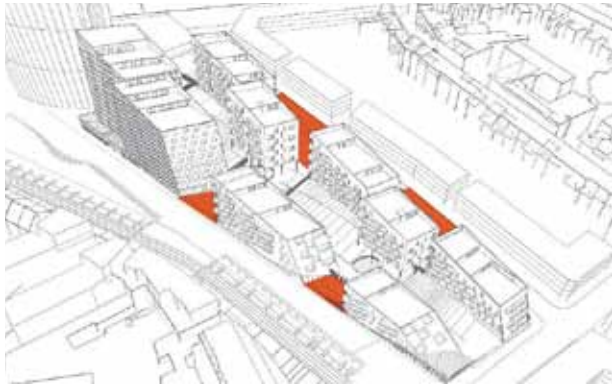
The defined layout allows for a checked pattern arrangement, leaving extensive freedom for development:

- "Holding" the block by placing the buildings at the angles
- Frame the view from the train station
- Emphasise the alignments on the future esplanade
- Create a slight retreat leading to the tower
- Develop a public space in the form of a park
- Arrange a more intimate inner block
- Save small spaces on the borders of the site
- Facilitate the connection with the rear of the finance tower by creating a square and a forum
- Authorise a gradual variation in the heights of buildings

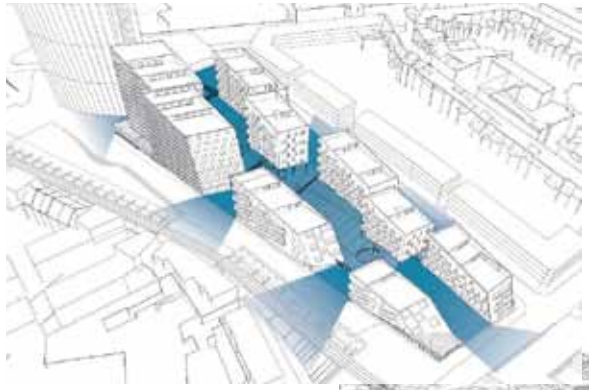
Hanging gardens as private space



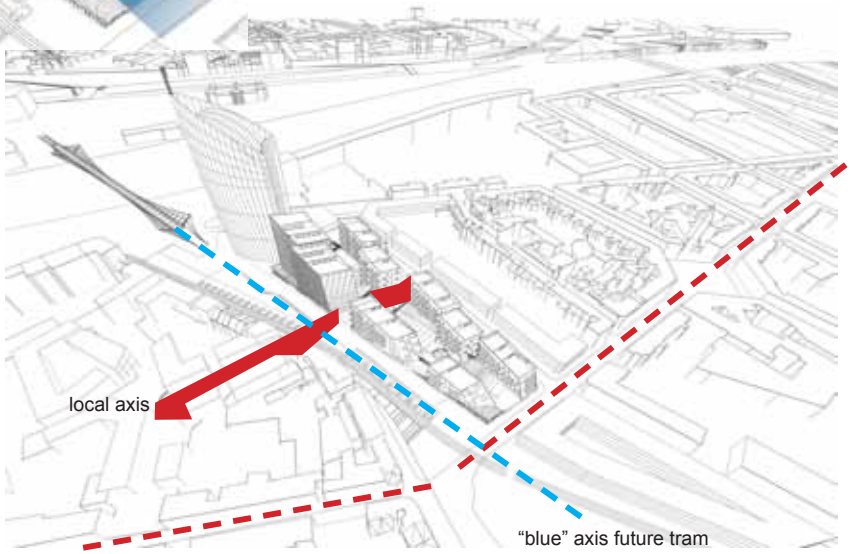
Continuity of public space and intimacy in the inner block



A network of small squares arranging space on a human scale

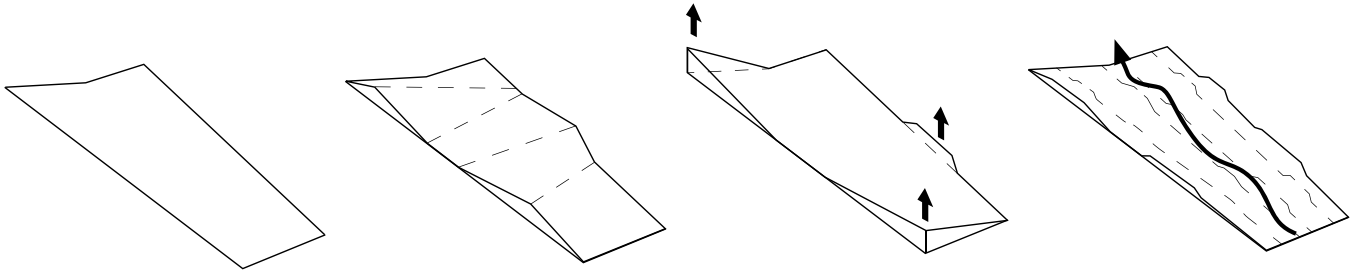


Visual opening

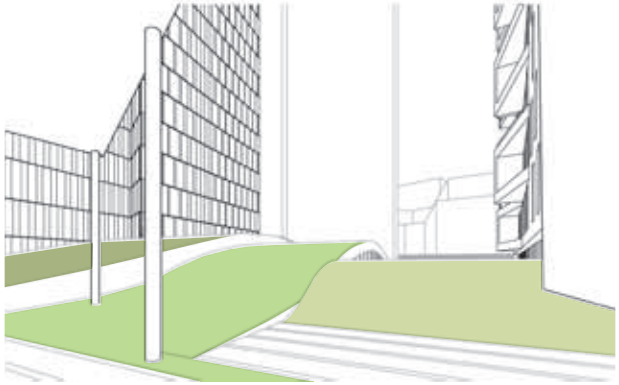


Integrating the project in the new urban framework

From Cointe to the Meuse, nature in the city: the urban park as a foundation of the project



Ground Folds Emerging structures Waves



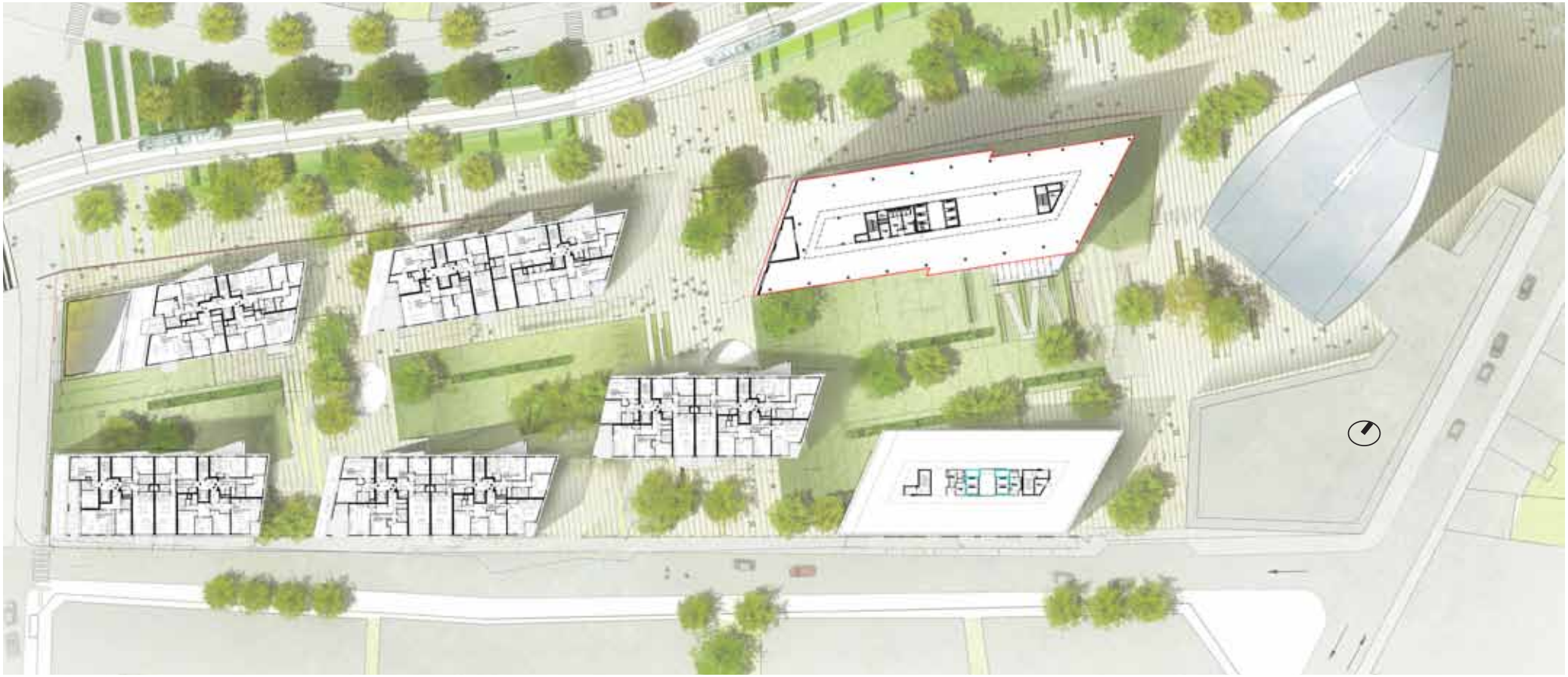
A new ground for the city

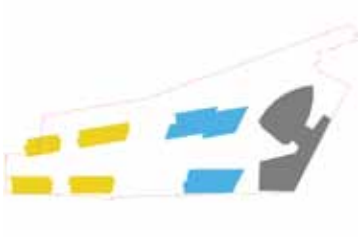
Undulating green waves recalling the topography of the city with its succession of hills and valleys form the basis of the layout. These waves cross the site lengthwise, flexibly linking the buildings to the city. Several distinct axes are created and treated differently according to the rationale and dynamics of the site.

A new ground for the city

Longitudinal Axis

A new ground for the city





Niv +1

Niv +3

Niv +7

housing
offices

Functions

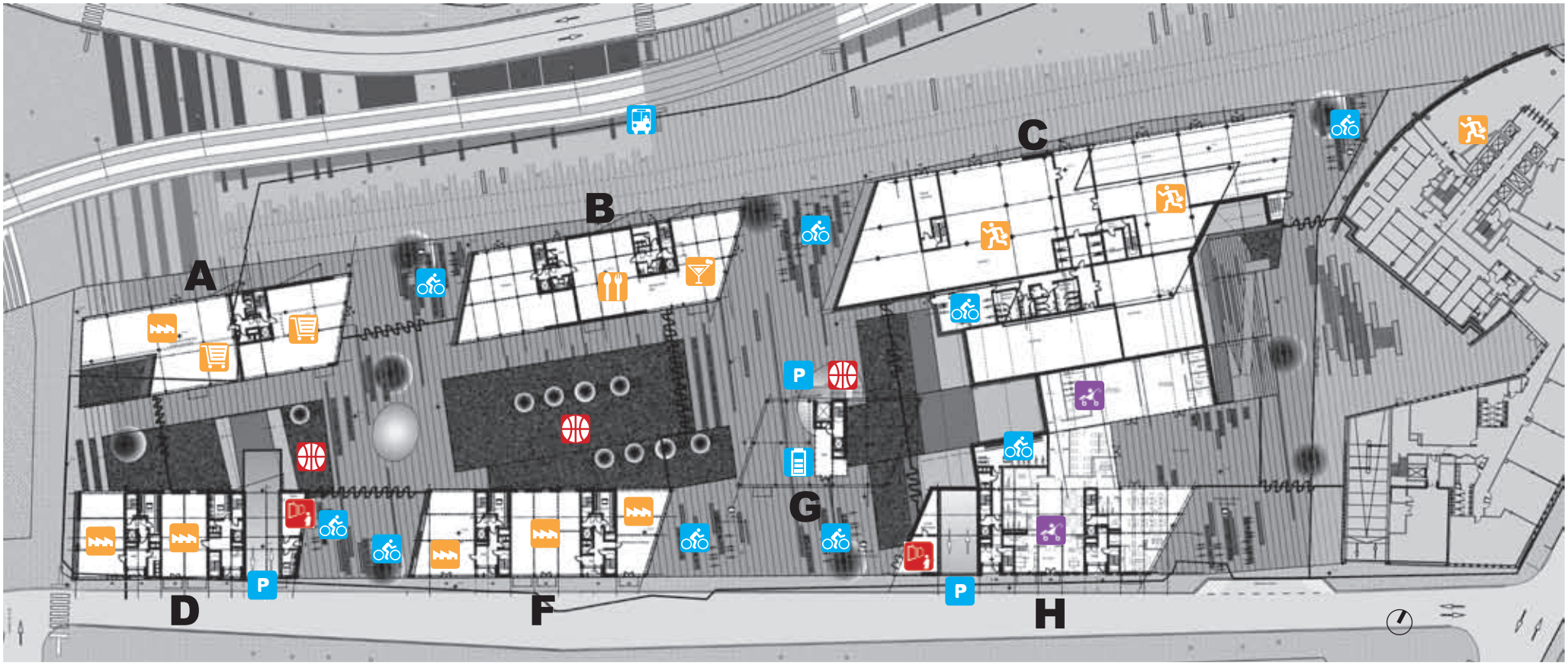
The programme plans for over 160 housing units on the site as well as offices and services:

160 housing units

350 m² shops

750 m² services

21 000 m² office building



Public services

- school
- nursery
- mosque
- cleanliness office

Communal services

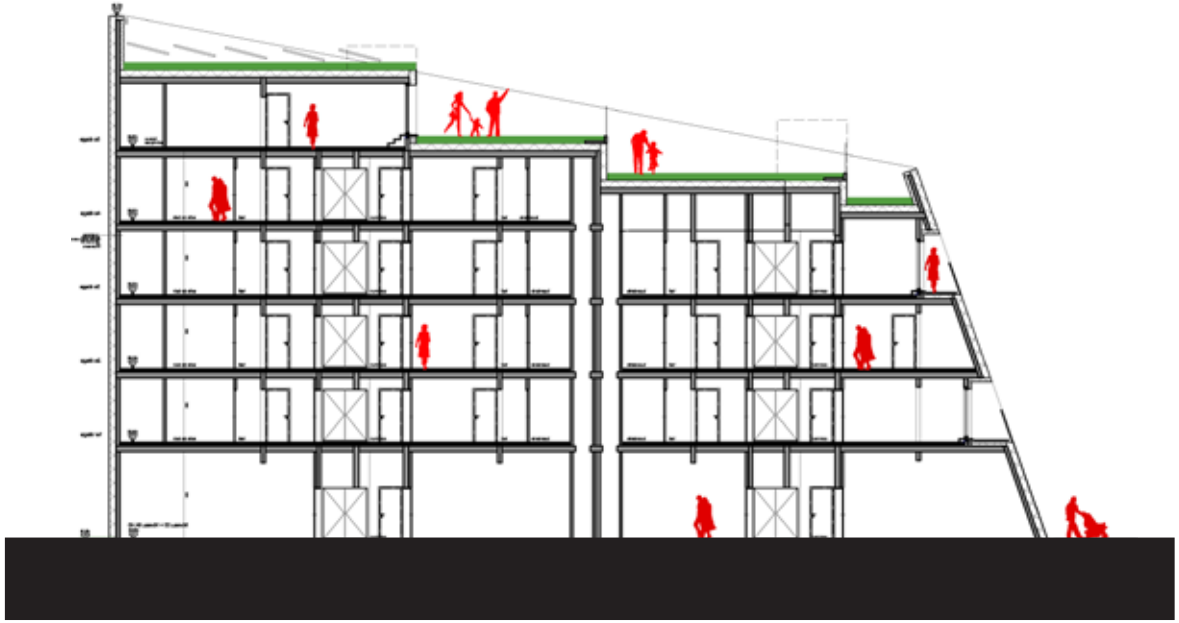
- educational garden/ garden shed
- solarium
- communal ecological utility room
- shared library
- playground
- private vegetable patch
- beehive
- bird houses
- bike repair area
- neighbourhood committe room / exhibition
- pizza/ bread oven
- recycling area
- communal room (residents)
- bat shelter

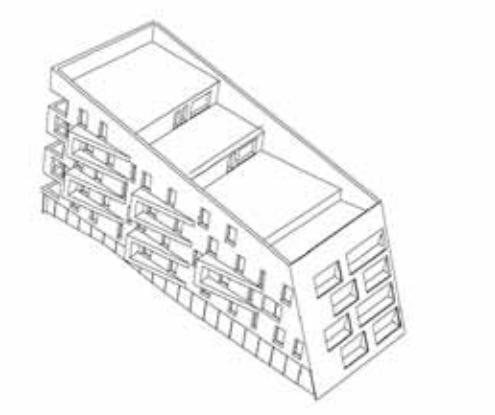
Commercial services

- restaurant
- shop
- cafe
- offices
- shopping
- covered market
- liberal profession

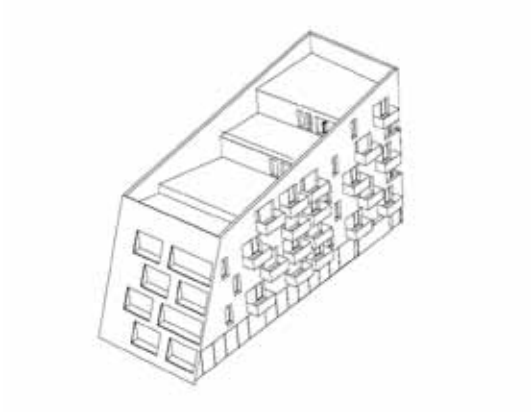
Mobility

- bus/tram
- cambio
- villo
- bike parking
- recharging terminals
- parking entrance





North facing facade

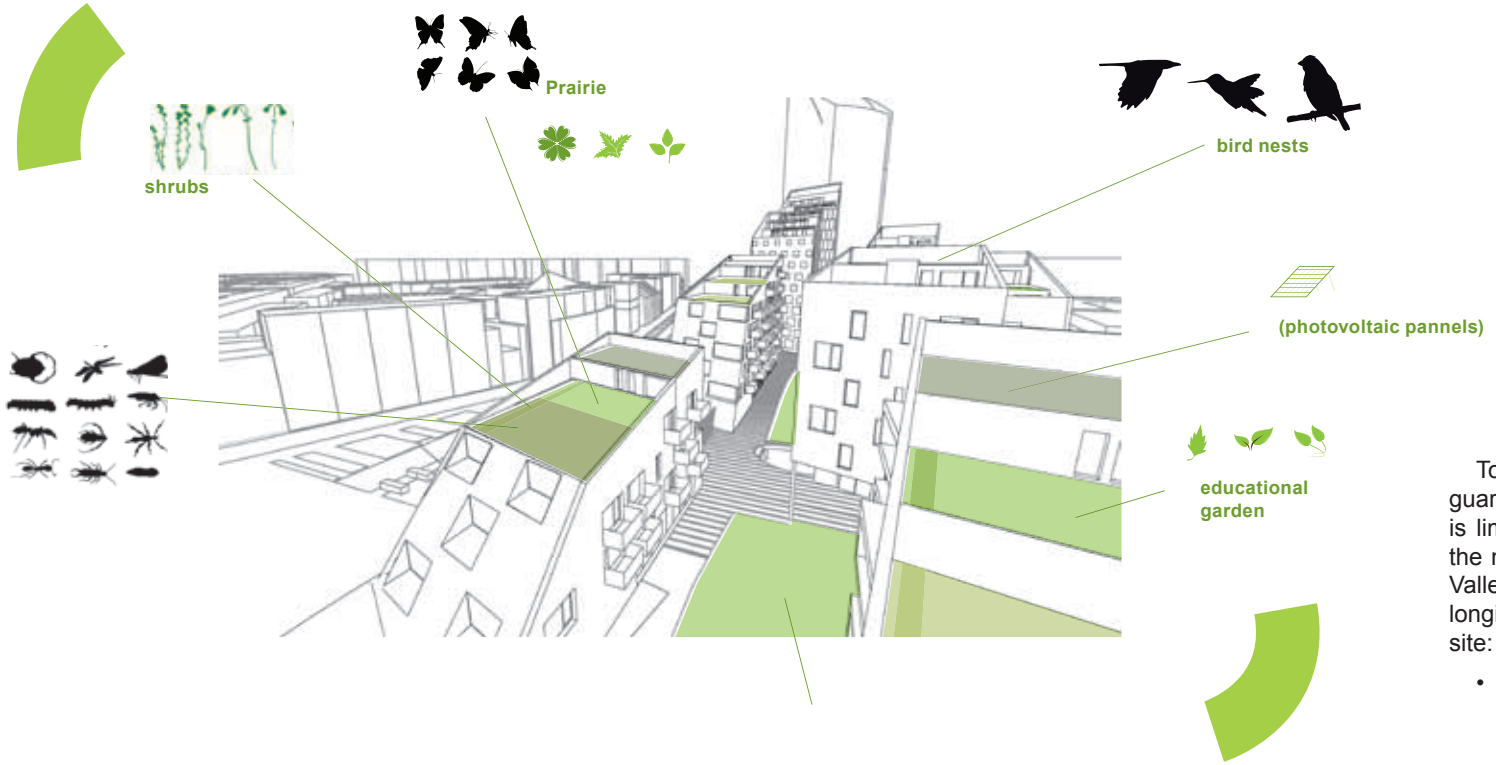


South facing facade

Neighbourhood architectural identity

The form of the building was worked so as to underscore the integration of the project within the urban and landscape setting. It provides for additional comfort of use and ensures a punctuated, sober and resolutely contemporary architectural approach.

Neighbourhood architectural identity



A strong public space

Generous private spaces

Rolling green spaces

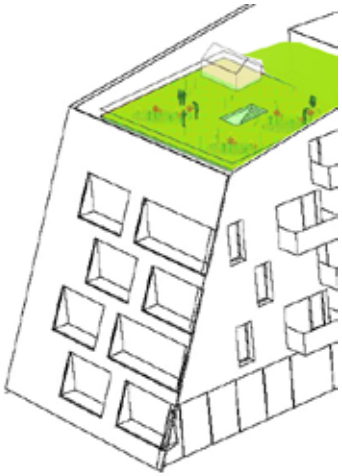
To create a mass effect, a strong image and to guarantee the unity of the whole, the range of materials is limited. Whereas an undulating green layer recalls the natural morphology of the city (Cointe Hill, Meuse Valley, Chartreuse, etc.), the different treatment of the longitudinal/transverse axes defines the rationale of the site:

- The transverse axis channels traffic from the esplanade directly to the new road system. The main direct lines are arranged as such: benches and lighting in the form of integrated strips in the same direction as the ground pattern, in connection with the esplanade.
- The longitudinal axis opens onto the green areas to settle itself. The vegetation forms more undulating movements, underscoring the relief of the waves and reinforcing their presence (intermediate vegetation lines, lighting posts in the vegetation).

A continuous row of trees connects the different spaces, without hindering the views or impacting the legibility of the site. All points of view, inside or outside the neighbourhood, enable the trees to be perceived from 2 different angles. No alignments, but an arrangement by small groups which give the impression of a spontaneous and natural distribution, as undergrowth.

More “intimate” spaces with benches can be found under these trees, thus becoming spaces on a human scale, where people can sit and relax.

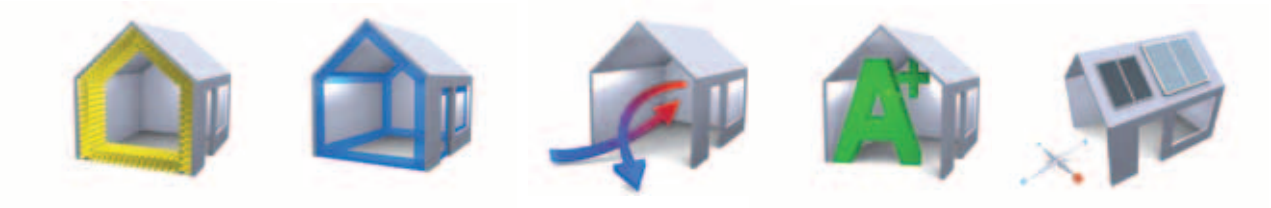
Rolling green spaces



Rolling green spaces

2. energy performance

Due to simple and efficient means, all the buildings follow the passive and nearly Zero -Energy building standard:



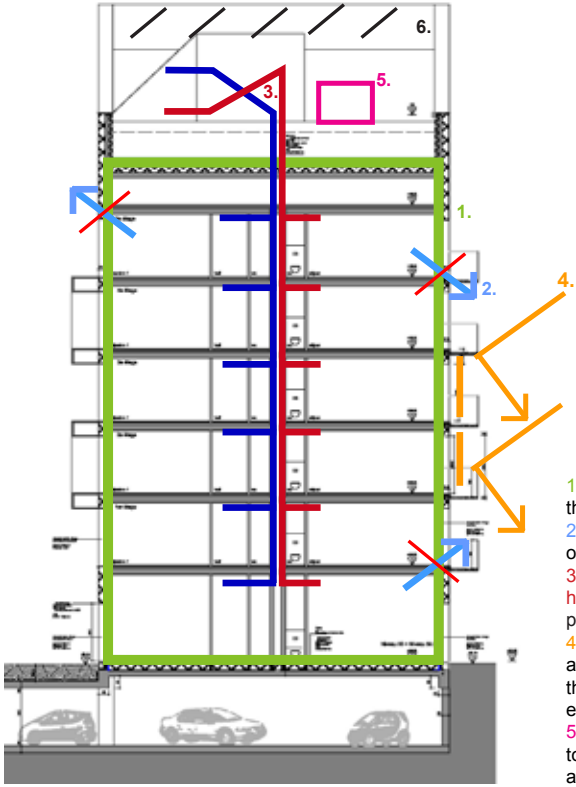
1 insulation
heating needs < 15 kWh/m².year
cooling needs < 15 kWh/m².year

2 Air tightness
n50 < 0.6 vol/h

3 Ventilation: with heat extraction

4 Efficient installations

5 Onsite renewable energy production



1. Insulation: treatment of the envelope
2. Air tightness: limitation of air leaks
3. Ventilation: VMC with high efficiency double-pipe heat exchanger
4. Solar protection: fight against overheating through motorised external solar protection
5 co-generation
to supply the common areas energy needs

The passive standard enables savings of about 60% compared with a conventional project, or approximately €220,000 /year and a reduction of approximately 600 tonnes of CO2/ year.

Passif standard, what else ?

housing

The passive standard is being increasingly established in Belgium. One of the regions has made it its official standard as of 2015. There are currently more than one million m² of passive buildings built or planned in Belgium!

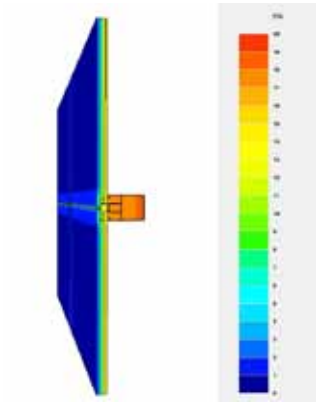
Achieving the passive standard is self-evident. The passive certification criteria in Belgium are as follows:

- Heating: max 15 kWh/m ²/ year in energy needs
- Air tightness: max 0.6 vol/h (for a pressure differential of 50 Pascal)
- Overheating: max 5% of the time > 25°C

The PHPP software shows that the project meets these criteria. The results according to the PEB software are therefore also very good: the E varies between 20 and 40, maximum for the buildings.

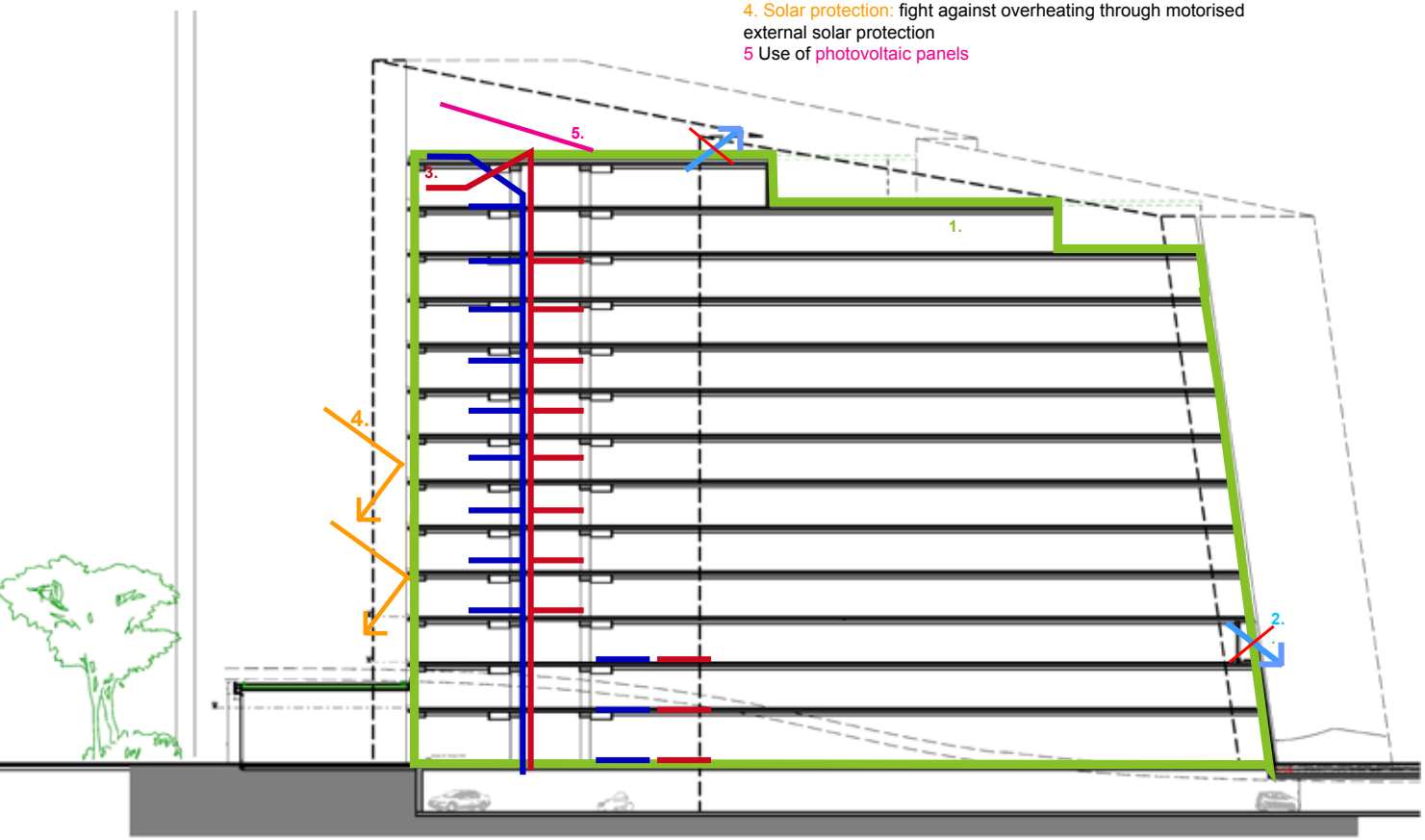
Visually, this means that the power of an iron is sufficient to maintain the minimum comfort temperature (20°c) throughout the year in a 100 m² apartment.

Passive buildings are also extremely comfortable because, not only are there no cold surfaces, but air is renewed through continuous ventilation.



Isothermal calculation
of the glass wall

1. Insulation: treatment of the envelope
2. Air tightness: limitation of air leaks
3. Ventilation: VMC with high efficiency double-pipe heat exchanger
4. Solar protection: fight against overheating through motorised external solar protection
5 Use of photovoltaic panels



Passif standard, what else ?

offices

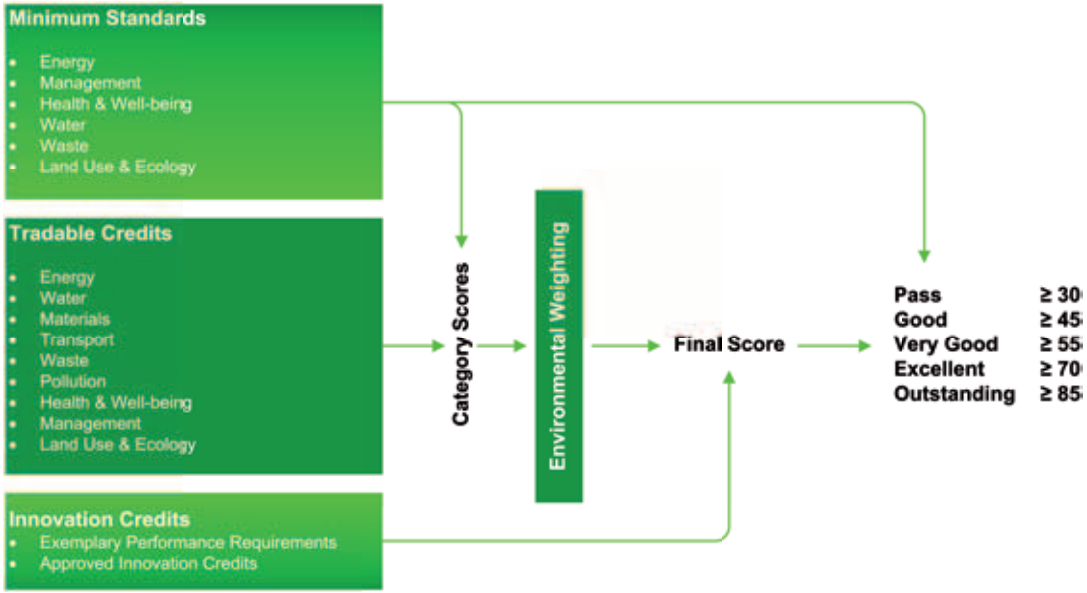
For offices, the first criteria of the passive standard are identical, but two additional ones are added:

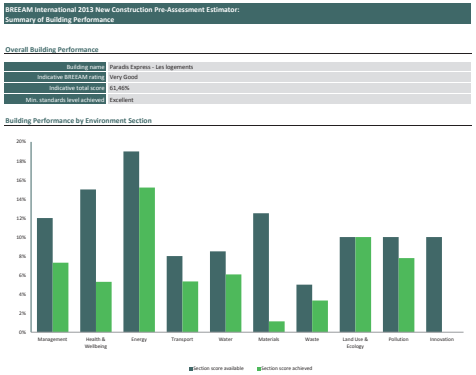
- Heating: max 15 kWh/m²/ year in energy needs
- Air tightness: max 0.6 vol/h (for a pressure differential of 50 Pascal)
- Overheating: max 5% of the time > 25°C
- Overheating: The EN 15 251 comfort standard is also applied
- Cooling: max 15 kWh/m²/year in cooling needs for offices

Whereas heating in winter requires the most energy in housing units, cooling becomes an important item for offices that are occupied mainly during the day. An active cooling limitation criterion is thus established, as well as a mandatory control of summer comfort in the building.

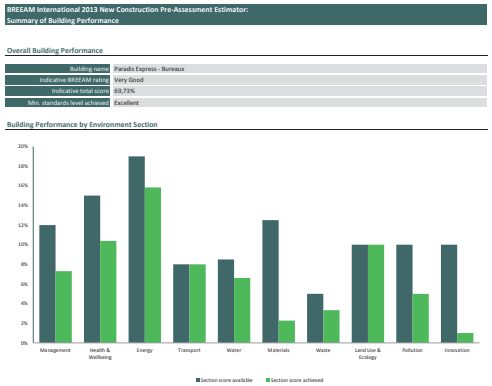
On the technical level, in addition to reinforced insulation and particular attention to the air tightness of the building, exterior protection limits solar gains in the summer.

The 10 categories of BREEAM:





The project achieves a very good level for housing units.



The project achieves a very good level for offices.

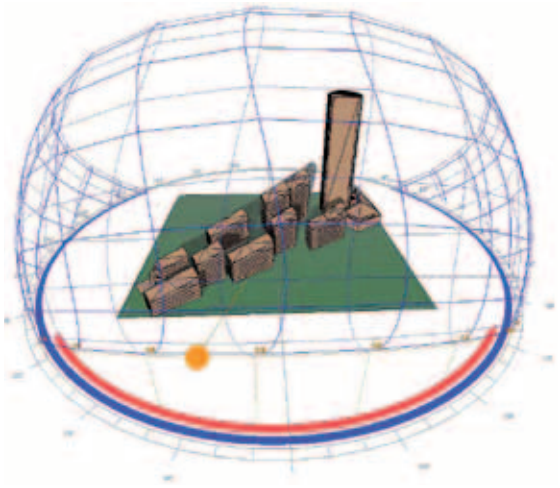
BREEAM: quality assurance

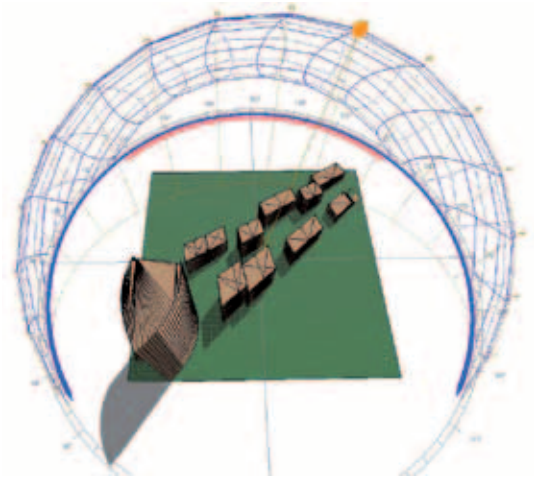
BREEAM (British Research Establishment Environmental Assessment Method, www.breeam.org) is the most widely used environmental certification to assess a building's sustainable construction qualities. The BREEAM assessment process takes into account sustainable development principles from the design phase and for the building's entire lifecycle.

The certification works on the basis of a list of criteria for different categories. A certain number of criteria are mandatory (minimum standards) depending on the targeted level of certification (Pass, Good, Very Good, Excellent; Outstanding). Each category is weighted (see diagram) to calculate the final result.

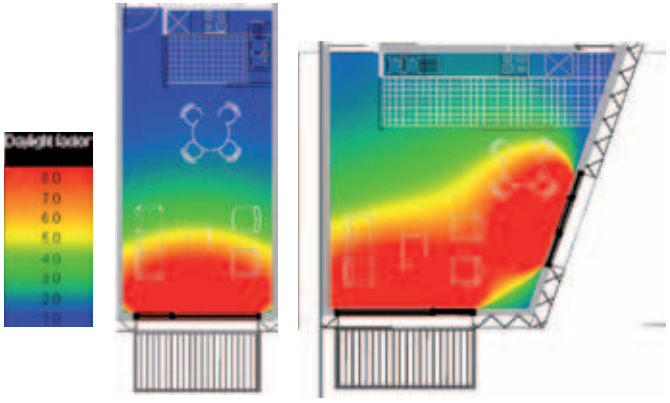
We used these criteria as a code of conduct from the design phase to guide our architectural, structural and technical choices. In fact, the project not only meets the passive standard but also the BREEAM criteria.

At this stage, we assessed the project using the "BREEAM_International_NC_2013_Pre_Assessment_Estimator_v1.0". We achieved a "**very good**" result for the different choices and objectives of the project (cf. graph opposite). The indicated results represent the minimum objectives expected.





21 December 13h30



In addition to the fact that all living rooms are South-East facing, we made sure that the levels of light achieved are excellent.

To gauge the situation, we studied the daylight factor using the Velux Daylight Vizualizer2.

The average daylight factor obtained varies between 4 and 6% according to the different housing units analysed, whereas BREEAM requires only 1.5%.

Light and sunshine

Natural light has a direct effect on the occupant's physiological and psychological health.

Natural light will, for example, influence our circadian cycle, which regulates sleep, our feeling of hunger and our mood.

In today's society, we spend the major part of our time indoors, where lighting is a hundred to a thousand times weaker than outdoors. It is therefore vital to design interior spaces that promote the penetration of natural light.

Moreover, we are aware that the sun promotes our production of Vitamin D. Unfortunately, the spectral radiance contributing to this effect does not go through glazing. We must therefore improve the design of public spaces so as to allow for the most sunshine possible.

The analysis was done using the Ecotect software, which enabled the 3D modelling of the project, the study of direct solar gains and the calculation of shading for the desired climate.

Despite the substantial programme, we managed to optimise sunshine into the site and buildings, not only through the chosen orientation but also through the position of the buildings.

Thus, the incline of the buildings was studied so as to minimise the shadows cast. We reach a minimum of 2 hours of sunshine per day on all facades throughout the year, not including those facing north.

With regards to the public space, we focused primarily on optimal sunshine during the summer.


3
views

21.06.2016 | **Paradis** Express | Investor : Fedimmo | Architect Association : A2M - Jaspers&Eyers - BAC | WINNER - Best Futura Project

MIPIM awards 2016 WINNER - Best Future Project

21 03 2016 | **Paradis** Express | investor : Fedimmo | architects association : A2M - Jaspers&Eyers - BAG | MIPIM awards 2010 WINNER - Best Cultural Project