01

URBAN ELEVATION

URBAN SITUATION PLAN

DESIGN PRINCIPLES

Simplicity, equity and ecological dsign are the distinguishing principles of quiality design of buildings. All four buildings same sized, same made and oriented. Easy! This all reduces the economic burden to a minimum. Economy of enviromental aspects takes into account not only the selection of the recycled materials for the construction, but also and specially the management of energy and water, which is recycled or produced from renewable sources. Ecological.

In addition to the design principles of simplicity, equality and ecology, the principle of mobility is presented in the same level. Mobility in the terms of people movement from outer space acces to the space in-between the buildings as a barrier-free space.

PURPOSE / INTENTION

The purpose of the project, is not just a mere technocratic demand for increased efficiency, but also for current and future requirements of energy supply, ie. reduction of it, by providing energy from renewable sources. The project tries to rais awareness among underprivileged families through the ecology and lifestyle. The overall purpose of the project is to provide added value for the development of suburbs. This will now ensure quality by combining the urban and rural.

The image of the new organization design directly converts the environment itself - the nature of the field. Field as territory is constantly changing through it's nature in every possible form. This nature platform continues as a design concept of open space between buildings. This continued field is not left over for self management of the residents, but is self managed by the nature.

CIRCULATION DIAGRAM

AREAS DIAGRAM

02

SECTIONS

1:200

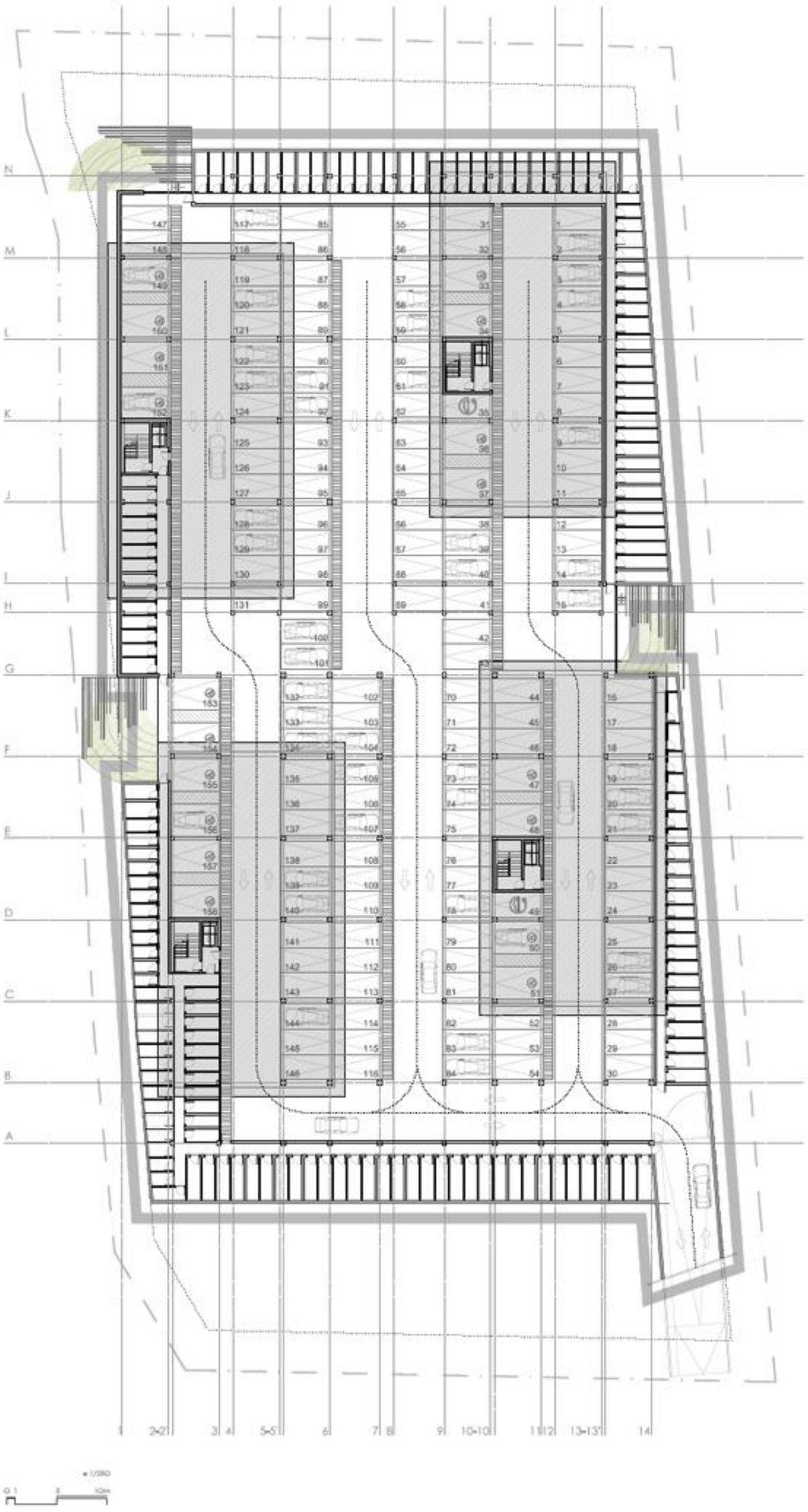
0 1 5 10m

BASEMENT

Safety of the individual ways of movement throughout the plot is strictly separated. The principle of separation traffic from other users is a prerequisite for the design movement. Understanding this, the realization of that when we arrived at the plot, all modes of movement change in walking, is helpful.

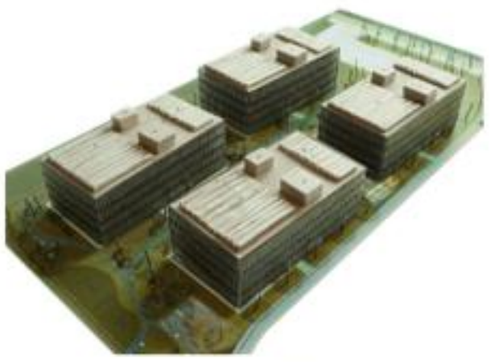
Priority for pedestrians and people with disabilities is highlighted by regulating parking ramps on the south side and in the most remote location of the blocks.

Parking units required	**204**
Underground level	**5586 sqm**
Parking units	140
Handicap units	18
Ground level	
Parking units	43
Handicap units	3

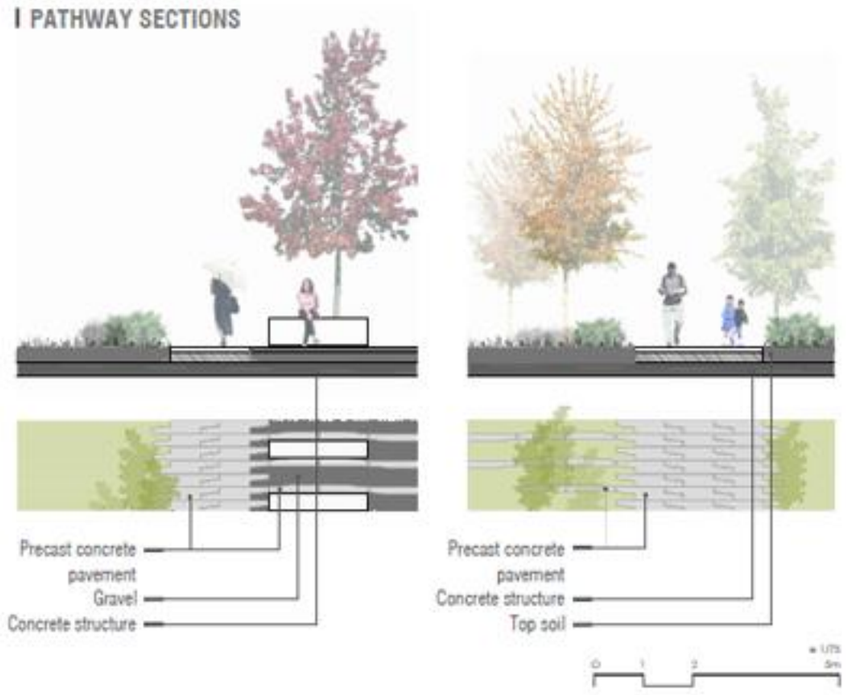


1:250

0 1 5 10m



PATHWAY SECTIONS



PLOT DATA

EUP	9167.15 sqm
PLOT (IN CONTROL LINE)	8487 sqm
BUILD-UP FACTOR (fz=30%)	2546 sqm
GROUND FLOOR + 3	10184 sqm

PROJECT DATA

BUILD UP FACTOR	**2538 sqm**
Each block floorplan ocupation	634.5 (x 4)
TOTAL AREA (F)	**10152 sqm**
Ground floor + 3	2538 (x4)
TOTAL UG-L AREA (G)	**5586 sqm**
TOTAL BUILT AREA (F+G)	**15738 sqm**

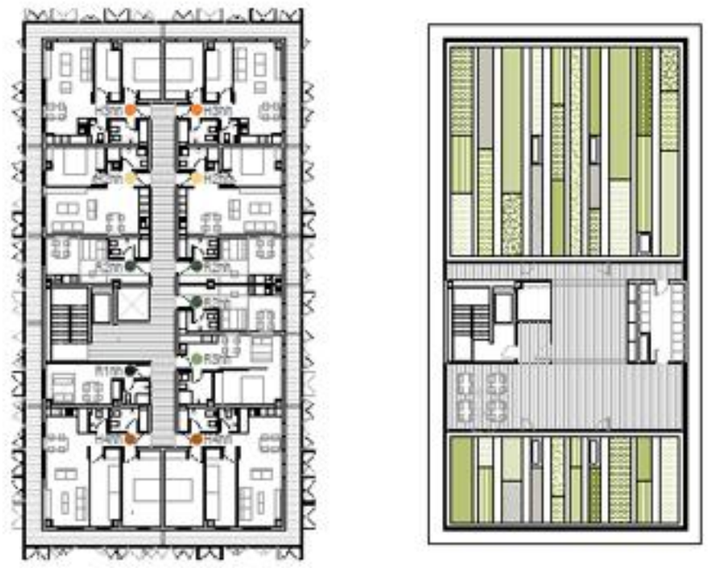
DESIGN PRINCIPLE

The ideology of plot space design, which comes directly from the platform of nature, through the quality of the design of individual buildings, continues to design homes, which encourages better quality lifestyle. Lifestyle, which till now was not in reach for everybody. Such lifestyle is activating the inter-related social activities, which is generated by a dynamic variable space by means of partitions walls and open florplans, as a prime constuction system, through shaded balconies with framed vertical gardens and roof top gardens as common areas. All together act as social condensers for reinforcing the free time activities within neigbours in one building.

PUZZLE: UNIT CONFIGURATION OPTIONS

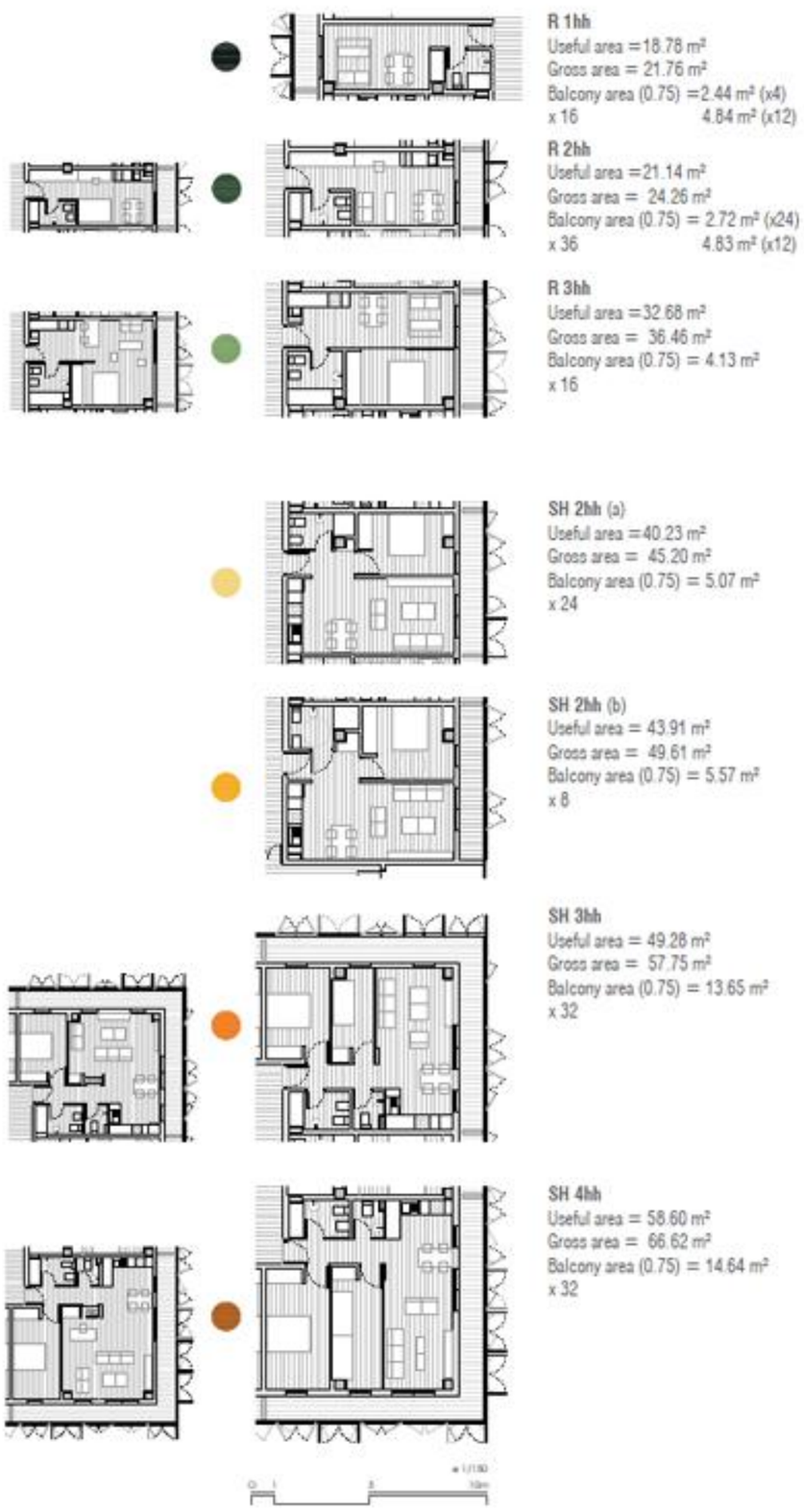
Chosen option				Example option			
Residences (41%)	**68**	**Houses (59%)**	**96**	**Residences (57%)**	**96**	**Houses (43%)**	**72**
1 household member	16	2 household member (a)	24	1 household member	24	2 household member (a)	0
2 household members	36	2 household member (b)	8	2 household members	36	2 household member (b)	8
3 household members	16	3 household member	32	3 household members	36	3 household member	8
		4 household member	32			4 household member	56
Total 164 units				**Total 168 units**			

ABOVE GROUND FLOORPLANS AND ROOFPLAN



GROUND FLOORPLAN AND LANDSCAPE DESIGN

TYPOLOGIES



R 1hh
Useful area =18.78 m²
Gross area = 21.76 m²
Balcony area (0.75) =2.44 m² (x4)
x 16 4.84 m² (x12)

R 2hh
Useful area =21.14 m²
Gross area = 24.26 m²
Balcony area (0.75) = 2.72 m² (x24)
x 36 4.83 m² (x12)

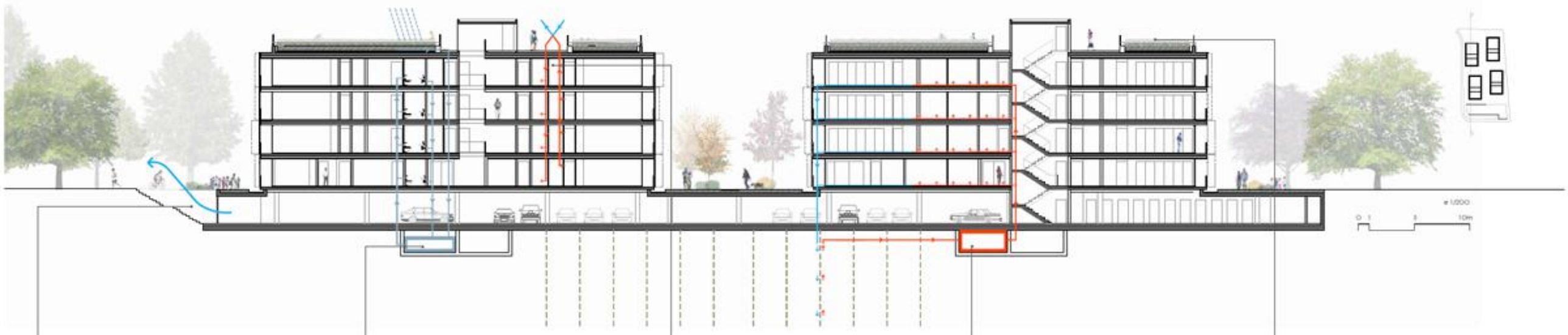
R 3hh
Useful area =32.68 m²
Gross area = 36.46 m²
Balcony area (0.75) = 4.13 m²
x 16

SH 2hh (a)
Useful area =40.23 m²
Gross area = 45.20 m²
Balcony area (0.75) = 5.07 m²
x 24

SH 2hh (b)
Useful area = 43.91 m²
Gross area = 49.61 m²
Balcony area (0.75) = 5.57 m²
x 8

SH 3hh
Useful area = 49.28 m²
Gross area = 57.75 m²
Balcony area (0.75) = 13.65 m²
x 32

SH 4hh
Useful area = 58.60 m²
Gross area = 66.62 m²
Balcony area (0.75) = 14.64 m²
x 32



1.PARKING NATURAL VENTILATION

The parking is connected to the exterior through the entrance and through openings on opposite façades creating pressure differences that allow natural ventilation to happen. On this way the air quality of the parking is improved without energy consumption associated to the ventilation system.

2.1.RAIN WATER HARVESTING

The rainwater harvested on the green roof is driven to a tank located on the basement. The water is used as grey water for toilet flushing and for cleaning or irrigation purposes. This reduces flood risk and reduces tap water consumption.

2.2.GREY WATER HARVESTING

Economical use of water is not just the mixer and pans with a brief flush, but also by recycling gray water for flushing toilet cisterns.

3.HEAT RECOVERY SYSTEM

Each ventilation shaft of the building is coupled to a heat recovery system located at the rooftop of the building. The efficiency of the ventilation heat recovery will be at least 75% so energy consumption for heating is greatly reduced. The HRV proposed is a crossflow system.

4.GEOTHERMAL HEATING

Bearing in mind that most of the energy needed to provide thermal comfort is used on heating, geothermal energy will be used.

The geothermal system will be coupled to a stratified storage tank. This storage unit increases the efficiency of the HVAC system as it has the possibility of supplying water at different temperatures, so the end use of the thermal energy is more fitted to the energy needs.

5.ROOF TOP GARDENS

The roof is the part of the building that is most exposed to the sky, thus it is the constructive system that has more energy gains and losses.

This system has the advantage of increased thermal insulation and a great capability of absorbing solar gains during summer without a temperature increase. On this way, the heat loss/gain through the roof is reduced.

6.VEGETABLE GARDEN AS SOCIAL CONDENSER

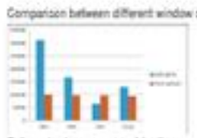
The idea of "green" lifestyle in terms of leisure time, is followed by the creation of the roof, not only as a fifth facade, but as usable space for socializing.

Therefore, a barbecue space and a vegetable garden have been designed, so the users can cultivate in groups or individually, slovenian native vegetable species, such as the ones proposed below. The proposed green roof is also intended to be used as a city farm that could provide food to the inhabitants of the building.

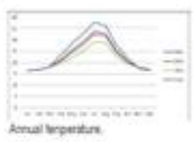
7.FAÇADE

The thermal insulation of the façade has been increased to reduce energy loss through the exterior walls. The glazing size on each façade has been studied. The proposed design allows solar gains and natural light harvesting. The preliminary simulations of the thermal performance of the building showed that using small glazings did not allow a proper profiting of solar energy, and that very big glazing size could cause overheating during summer. Final designs were fitted to a correct balance providing a comfortable living place with low energy consumption.

Comparison between different window sizes.



Solar gains in summer and heating loads in winter.

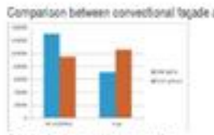


Annual temperature.

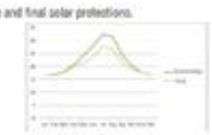
7.1.SOLAR SHADING

To avoid overheating on the dwellings, a solar control glazing has been selected for the south and west façades.

Comparison between convectional façade and final solar protections.

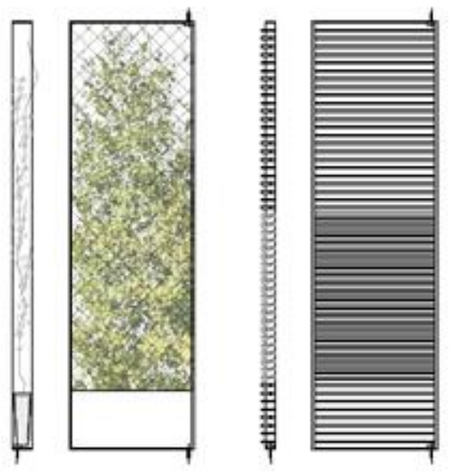


Solar gains in summer and heating loads in winter.



Annual temperature.

The balcony is provided with a solar shading system composed of wood frames that block direct solar radiation but allow gathering natural light. "Green" framework is designed as a composite element of the frame that allows different possitions to control flow of light to the plants and views of users.



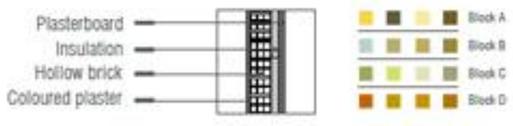
The metal frame contains a prefabricated metal sinks that allows the cultivation of plants.

7.2.GLAZING

The proposed glazing is a double glazing with an argon infill that has a thermal transmittance of 1.1w/m2K. To reduce solar gains, south and west facing façades will use a solar control glazing with a solar control factor of 0.3. This latter is not needed on north and east facing windows as incident solar radiation is not critical.

7.3.INNER FAÇADE

An Enhanced thermal insulation that reduces energy demand and consumption. It is made of bricks in a convencitional way. The exterior cladding is made of coloured plaster. Inner façade of each block is painted with a ratio of colours that makes them unique and easy to recognize.



8.FLOORING

The main source for heating and cooling is a geothermal system. As the energy provided by the earth is of low temperature, using a radiant floor system will reduce energy consumption as the water can be used at low temperature. Besides having a better energy performance, the radiant floor system improves thermal comfort as there are less high temperature surfaces.