MASTERCLASS
SUSTAINABLE NEIGHBOURHOODS

2018

Ambassade
van de Bondsrepubliek Duitsland
Brussel

Deutschlandjahr 2018

UHASSELT KNOWLEDGE IN ACTION
FACULTEIT
ARCHITECTUUR EN KUNST

Prof. Rob Cuyvers Prof. Jo Berben, dr. Bart Janssens, Jonas Knapen

PREFACE

INTRO

Yearly, the Faculty of Architecture and arts (Fac-Ark) at Hasselt University organizes a one-week international Masterclass and offers it to architecture students. Each Masterclass is organized around a specific topic or theme on which students work in a workshop format, under the supervision of national and international tutors. The topic or theme is carefully selected out of a long list of societal-relevant quests. For the Masterclass of 2018, the topic of 'Sustainable Residential Neighbourhoods' was selected, specifically focusing on the context of Flanders, one of three regions in Belgium.

MOTIVATION FOR THE TOPIC FROM THE PERSPECTIVE OF THE FACULTY

Fac-Ark adopts the 'civic university' vision of Hasselt University. This vision reconnects the mission of the university (education, research and social engagement) and the issues of society. Within the architecture and building sector, these issues can be related to both physical-spatial as building-technical aspects. Both kinds of issues are addressed in the Fac-Ark.

Housing and sustainability are, amongst others, two important focal points of the Fac-Ark. Together with the motives stated above, Fac-Ark wants to enhance the uptake of sustainable residential projects by conducting research and including project-based learning in its curriculum. This Masterclass strengthens this mission.

INTERNATIONALLY ORIENTED

The idea of 'Think global, Act local', the core idea of Global Citizenship, is embodied in the faculty's mission on internationalisation. Each Masterclass links up to the international context, either by involving students and tutors from international partner institutions, either by having an expert / tutor from abroad.
In 2018, Hasselt University, together with the city of Hasselt and the province of Limburg, organises the 'Deutschlandjahr'. During this year, the organizers develop and deepen existing academic, economic and cultural ties with Germany. Within this context, an expert / tutor from Germany was invited to contribute to the Masterclass. We were pleased to have senior architect Bert Wasmer of Rolf Disch Solar Architecture (Freiburg, Germany - http://www.rolfdisch.de/) as he and his architectural office has extensive experience in sustainable residential neighbourhoods.

Rolf Disch Solar Architecture is driven by giving a positive impact on society based on a clear vision of a sustainable and energy efficient future. The office has designed the first Plusenergy Houses ever. The breakthrough came in 1994 with the experimental Heliotrope building. Starting in 2000, the Solar Settlement was built with 50 terraced houses, the Sun Ship office and commercial building with 9 penthouses – all of them Plusenergy buildings. Currently, the office is applying the Plusenergy principles to other building typologies, such as large-scale residential multistorey buildings (Berlin, Schallstadt), or industrial architecture (Stuttgart). Also projects in France and Poland are in development. Many of the projects – even the Heliotrope – are timber constructions. Currently, a six-storey residential building in solid wood is under construction in Freiburg.

In collaboration with Architectuurwijzer, Bert Wasmer held a public lecture in Hasselt in which he presented the vision and some of the main projects of Rolf Disch Solar Architecture. This lecture was introduced by the dean of the Fac-Ark, prof. ir. Rob Cuyvers.

TARGETED READERS

The targeted readers for this booklet fall into four groups. Firstly, urban planners and architectdesigners, practitioners in the building sector, are addressed, as they can implement the outcomes in their daily practice. Secondly, policy makers are addressed, as the findings may incentivise policy making. Thirdly, project developers are addressed, as the results may influence the design briefs of future projects. And fourthly, and last, academics, involved in both education and research, as the setup of the Masterclass could be valuable for future similar classes.

ACKNOWLEDGEMENTS

This booklet presents the setup and results of the Masterclass ’18 of the Faculty of Architecture and arts at Hasselt University.

A Masterclass held over an intense period of 1 week, made possible by a thorough preparation beforehand and a careful follow-up tutoring during the class. This overview predominantly presents the results of personal efforts of involved students. However, highly valuable contributions and support from many individuals made this Masterclass possible and successful.

First of all, special thanks to dean prof. ir. Rob Cuyvers who took the initiative of this Masterclass and who is responsible for selecting this year’s topic. Without his initiative and support this Masterclass would never have come about. In addition, it was prof. arch. Jo Berben who supervised the Masterclass and managed the smooth running of the entire procedure. Many thanks to arch. Bert Wasmer of Rolf Disch Solar Architecture (Freiburg, Germany) to be our guest tutor. Each meeting with him was inspiring and valuable.

We are also grateful towards the City of Genk, the design office of BUUR and project developer Matexi to engage in the discussions with students and to deliver insights and experiences from their respective backgrounds. Last, but by no means least, thanks to all involved students for their enthusiasm.

TUTORS

prof. Rob Cuyvers
prof. Jo Berben
Bert Wasmer
dr. Bart Janssens
Jonas Knapen

PARTICIPANTS

Lilit Abgaryan
Soukaina Azdud
Jonas Bernaerts
Lieselotte Braekers
Pieter Dockx
Steven Frenks
Elshanaj Henor
Stiene Jehoul
Neset Emre Karaagac
Peter Karmo
Steven Liberloo
Julie Linsen
Naomi Neelen
Indy Nelissen
Laura Paolino
Jakob Raemaekers
Elke Rutten
Naömi Schuermans
Didem Sekban
Kevin Slijpen
Ella Smets
Severien Steegmans
Hanne Swinnen
Malinde Valee
Maud van Oerle
Ann-Sofie Vancleef
Katrien Vankrunkelsven
Robin Wils
Marion Wittenberg
Elif Yilmaz

EXTERNAL PANEL

Stad Genk- Hanne Coninx
Matexi - Gert Petit
BUUR - Arnout Vandenbossche

1
INTRODUCTION

1.1 MOTIVE

1.1.1 INCENTIVES

Three incentives *from a general point of view.*

First, as there has been an increasing awareness of the severity and consequences of global warming over recent decades, there has also been increasing efforts to mitigate and adapt to climate change. Demand and desire for sustainable development have been growing year by year and have consequently encouraged the integration of aspects of sustainability in the built environment. In other words, sustainable strategies in urban planning, engineering and building design are being encouraged (IPCC, 2014). (Janssens, 2015)

Second, the idea of density as a sustainable concept, as a powerful leverage towards sustainable built environments, is collectively agreed by international panels (technocrats and academics) on conventions and targets such as The Brundtland Report (1987), The earth Summit at Rio de Janeiro (1992) and The Green Paper on the Urban Environment (CEC) (1990). As a consequence, it is noticed that within the building sector, contemporary housing developments implement this strategy of density in a rigorous way. There seems to be an urge, a necessity for density when planning and designing new housing projects, regardless the scale (e.g. building block, neighbourhood, district), the typology (e.g. apartment, single family house) or the morphology (e.g. slab, tower, infill, low rise). (Janssens, 2014)

Third, futures thinking in architecture and urban planning is on the agenda of the building sector for many decades. The awareness of changing needs and requirements regarding practical functionalities and building performances, and ultimately financial investments, underlines the need for 'future-proofing' built works of architecture. Looking at the Brundtland Commission's definition of a sustainable development (WCED, 1987), it is clear that futures thinking is inextricably linked with sustainability: '"sustainable development seeks to meet the needs and aspirations of the present without compromising the ability to meet those of the future". (Janssens, 2017)

Five incentives *within the context of Flanders.*

First, due to the fact that housing was reduced to an individualistic affair over the course of the twentieth century because of socio-political incentives, for decades the focus was on individual and low density planning programmes. As a result, traditional Flemish developments have a strong focus on private dwellings. Housing developments are predominantly situated in new allotments, with low

densities as the building and living culture (popular media) unveils a rather nuanced appreciation, or even criticism or rejection, for projects with higher densities.

Second, Flanders undergoes a change in demographics. The population is expected to grow from 6,4 million people in 2013 to 7,2 million by 2060. This increase has its cause in an aging population and migration. Important other demographic changes are i.a. the growing amount of single people and newly assembled families. By 2060 the amount of households is expected to increase with 19% compared to the amount of households today. (Ruimte Vlaanderen, 2016)

Third, because of demographic changes, people are in need of a more flexible way of living and thus Flanders is in need of a more flexible housing stock. Today we can see that the housing stock is not evenly responding to the demographic changes and thus the need for more contemporary housing typologies (Becker, et al., 2015). Even our Flemish 'bouwmeester' is favouring these new flexible ways of living for a changing family. He states that we need to design family-friendly apartments with collective spaces where communal activities can take place. (Vermeersch, 2016)

Fourth, the Flemish government has set up stringent requirements concerning energy use, waste (construction, demolition and the building's operational-related waste) and water (waste disposal and storm water) among other issues. Despite these requirements and a growing interest in sustainability, only a small share of contemporary projects addresses the 'People', 'Planet', 'Prosperity' and 'Political' pillars of sustainable building. (Janssens, 2015)

Fifth, a collectively agreed urge for sustainability and the vast growing sector of collective residential projects, foster a growing interest in sustainable housing. However, only a small share of contemporary projects are contributing to sustainable development. In Flanders, it remains a challenge to achieve qualitative residential neighbourhoods, especially in a (sprawled) urbanized context, due to a socio-political context that for decades was fully focused on individual housing. Then, it is difficult to develop projects which address all aspects of sustainable building. (Janssens, 2015)

1.1.2 PROBLEM STATEMENT

In Flanders, the development of sustainable residential neighbourhoods is locked in stalemate due to the private-driven approach, and the lack of a vision, of possibilities, of perspectives to unlock this historically grown situation.

In the Flemish tradition of dealing with housing developments by allotments in a context of urban sprawl, the public, semi-public and/ or transitional spaces (street, plaza, courtyard, gallery, corridor, ...) are under-addressed. The private-driven approach often overlooks the scale of the building block / neighbourhood and is strongly dependent on individual ownership. The notion of dispersion is not only applicable to the Flemish urban tissue, but also on the entire construction economy. The economy is predominantly organised towards individual housing and relatively small-scale developments.

This condition has proven not to be very open / favourable towards innovative housing or development of sustainable projects on a neighbourhood level as it results in a limited amount of possibilities to organize inspiring, liveable and sustainability-contributing spaces. The added value of neighbourhood design is underestimated, leading to developments with a limited collective dimension, spaces which create conflicts, a plot-based – and thus narrow/insufficient - approach to sustainability.

1.2 AMBITION

1.2.1 OBJECTIVE

The objectives consist of a primary objective and a number of underlying objectives.

Primary objective
Given that a transition towards a sustainable built environment is necessary and sustainable residential neighbourhoods with higher densities in a sprawled urbanized context as Flanders are favourable, the primary objective of this Masterclass consists of developing promising perspectives for Flemish sustainable residential neighbourhoods, leading to insights in the sustainability quest by students, architect-designers, urban planners, policy makers and project developers.

Underlying objectives
Fulfilling the primary objective may lead to several underlying pursued objectives:

• to provide incentives for further discussion, research and education initiatives,
• to broaden the support base for and, ultimately, mainstream sustainability in the built environment,
• to incentivise practitioners in the building sector (urban planners, architect-designers, project developers), policy makers.

1.2.2 OUTPUT

The Masterclass aims to generate output as follows:
• a public exhibition and presentation of, and debate with stakeholders on, the outcomes at the Fac-Ark, (held on Friday March 30th, as part of the Masterclass)
• the detailed Masterclass activities and outcomes, (provided
• in this booklet)
• a presentation with proceeding at a conference and/or journal article, (to do)

All output is seen as means for obtaining feedback for the benefit of successive research and/or education initiatives.

1.2.3 RESEARCH APPROACH

Substantive focus point
Literature emphasizes the reconciling abilities of public and semi-public spaces, and of primary functional oriented transitional spaces. Bolos (2009) states: “Transitional spaces help to ease architecture’s interaction with the natural environment, creating a relationship rather than a conflict.” ... “*Transitional spaces are potential agents of unmatched experiential, intellectual, and sensory stimulators. They have also functioned as, and can once again become, the successful mediation of humans upon the earth.*”

Janssens (2015) states that due to the fact that public, semipublic and transitional spaces are inextricably linked to the concept of neighbourhoods / building blocks, and these spaces are within the sphere of influence of the project team (public parts exceed most

individual projects; private is lost space, cfr. Romans), it is plausible to state that these spaces have high potential to act as solution spaces for sustainability. They are manageable and not, or only limited, users dependent. These spaces have the ability to act as powerful leverage towards full sustainable projects, now or later, as they are intrinsically beneficial for and/or can host design measures for both social and ecological sustainability.

This promising role depends on the intrinsic quantity and quality of these spaces. From the early design phases on, focus has to be on a good physical-spatial design. Therefore, the primary focus of this Masterclass is on the exploration of a new promising public – semi public – private ratio and gradient (how to deal with boundaries between these 3 kinds of spaces/ownership), as this newly developed ratio and gradient will hold opportunities, acts as a starting point, for implementing design measures regarding both ecological and social sustainability. By rethinking this ratio and gradient design strategies and measures for sustainability can be upscaled leading to a higher potential to reach sustainability successes.

Thorough, even disruptive, rather than incremental

Although the uptake of aspects of sustainability is increasing, it is still at a relatively low level. The Masterclass adopts a thorough approach in the process of developing promising perspectives. Rather than incremental ideas, radical / disruptive ideas are pursued which could lead to a trend reversal. This approach fosters a broad perspective and enhances innovation, without restrictions from the existing.

1.2.4 RESEARCH QUESTIONS

The questions are subdivided in a main question and sub-questions.

Main question
From the primary objective and the research approach, the main question (MQ) has been derived.

[MQ] Which thorough promising perspectives regarding the public – semi public – private ratio, gradient and layout in Flemish residential neighbourhoods can be developed which holds opportunities, acts as a starting point, for implementing sustainability design measures, and to which urban and architectural 'content' / 'places' could this lead for achieving integral (ecological and social) and integrated (in the urban and architectural concept) sustainability?

Sub-questions
In order to structure the Masterclass and being able to answer the main research question, sub-questions (SQ) are formulated. As the Masterclass addresses the added-values of a neighbourhood-level approach regarding sustainability, aspects of 'blue-green network / landscape', 'building siting, massing & density', 'mobility, infrastructure & management', 'cycles of food, waste & productivity', and 'inclusive neighbourhood' need to be studied.

1.
BLUE-GREEN NET-WORK/LANDSCAPE

[SQ_1] What could be a Blue-Green Network, covering the building and neighbourhood level, which facilitates sustainability aspects related to Water, Air, Ecology and Attractiveness?

2.
BUILDING SITING, MASSING & DENSITY

[SQ_2] How could the built and unbuilt space, especially the building siting, massing and orientation, contribute to the sustainability components Energy, Materials, Soil, Social Interaction, Security, Health & Comfort, Flexibility and Attractiveness?

3.
MOBILITY, INFRASTRUCTURE & MANAGEMENT

[SQ_3] How can we design shared spaces and infrastructures which can simultaneously accommodate the current modes of transportation and the future in which car ownership might take different forms? What mobility infrastructure could lead to a sustainable transport system, and support/ strengthen Social Interaction, Social Cohesion, Security, Availability, and Attractiveness?

4.
CYCLES OF FOOD, WASTE, MATERIALS & PRODUCTIVITY

[SQ_4] How could the neighbourhood reduce flows on Energy, Water, Materials and Waste, or even close loops, by producing/processing on site? In what way could the neighbourhood become a self-sufficient development in which housing goes hand in hand with the local production of food & energy and the processing of waste?

5.
AN INCLUSIVE NEIGHBOURHOOD

[SQ_5] How could the neighbourhood be inclusive for all, including the surrounding residents, now and in the future, and how could public, semi public and private ‘spaces’ become ‘places’?

1.3 METHODOLOGY

1.3.1 STRATEGIC APPROACH

The strategy adopted to answer the research questions consists of a designerly exploration. This strategy was believed to suit best the profile of the students and the setup of the one-week Masterclass. This designerly exploration was operationalized by lectures, literature review on case studies, research by design, and a focus group.

Process

Insights in the research field were provided by: first, lectures on the urban aspects of Flanders (by Jonas Knapen), sustainable development / sustainable building / guiding principles (by Bart Janssens), communal housing projects (by Peggy Totté), and insights from the perspective of the practicing architect (by Bert Wasmer); and second, literature review on multiple state-of-the-art cases.

Innovation was achieved by case study research focused on a specific case. For practical reasons, a case within the context of Hasselt was selected: 'op t Stoep' in Genk. The site, which is one of the last potential residential development sites at walking distance of the city centre, is fringed by the existing neighbourhoods of Kolderbos and Vlakveld, and the municipal cemetery. The plot has the potential to be developed in a new housing district in the near future and could become a testing lab for innovative neighbourhood design. The Masterclass took the existing masterplan by BUUR (2016) as a starting point. The detailed setup of the research by design is specified in subsection 1.3.2.

Verification and validation of the research-by-design outcomes were done by a focus group meeting.

Apart from involved students and tutors, this focus group consisted of representatives of stakeholders from the building industry: Hanne Coninx of the city of Genk, Gert Petit of Matexi (project developer), and Arnout Vandenbossche of BUUR (urban design office, responsible for the existing masterplan). First, students presented their innovative ideas illustrated by plans, sketches and scale models; second, the representatives provided feedback; third, a group discussion highlighted food for thoughts.

In short

The strategic approach consisted of research by design on a specific case in the context of Hasselt/Genk (Belgium), backed by theory and case study research, in which (provided) guiding principles for ecological and social sustainability guides the exploration of innovative ideas, and where a focus group with stakeholders verifies and validates the outcomes.

1.3.2 PLAN OF THE MASTERCLASS

Based on the research questions and the strategic approach, the Masterclass was structured into five work packages, one per day, each builds on the results of the previous one and in turn determines the content of the following. This sequence of work packages with assigned methods systematically tackles the research questions, leading to the objectives. For each work package a section is included in this booklet.

26th march

01
Kick-off!

project briefing
casestudies
site visit

lecture Bert Wasmer
Rolf Disch
20h15 @ Nieuwe Zaal
Maastrichterstraat 96

27th march

02
The Neighborhood

Group work
thematic explorations
(1/2)

28th march

03
Switching scales

Group work
thematic
explorations (2/2)

29th march

04
The Architecture

Individual projects
architectural
design

30th march

05
Wrap-up!

Individual projects
architectural
design

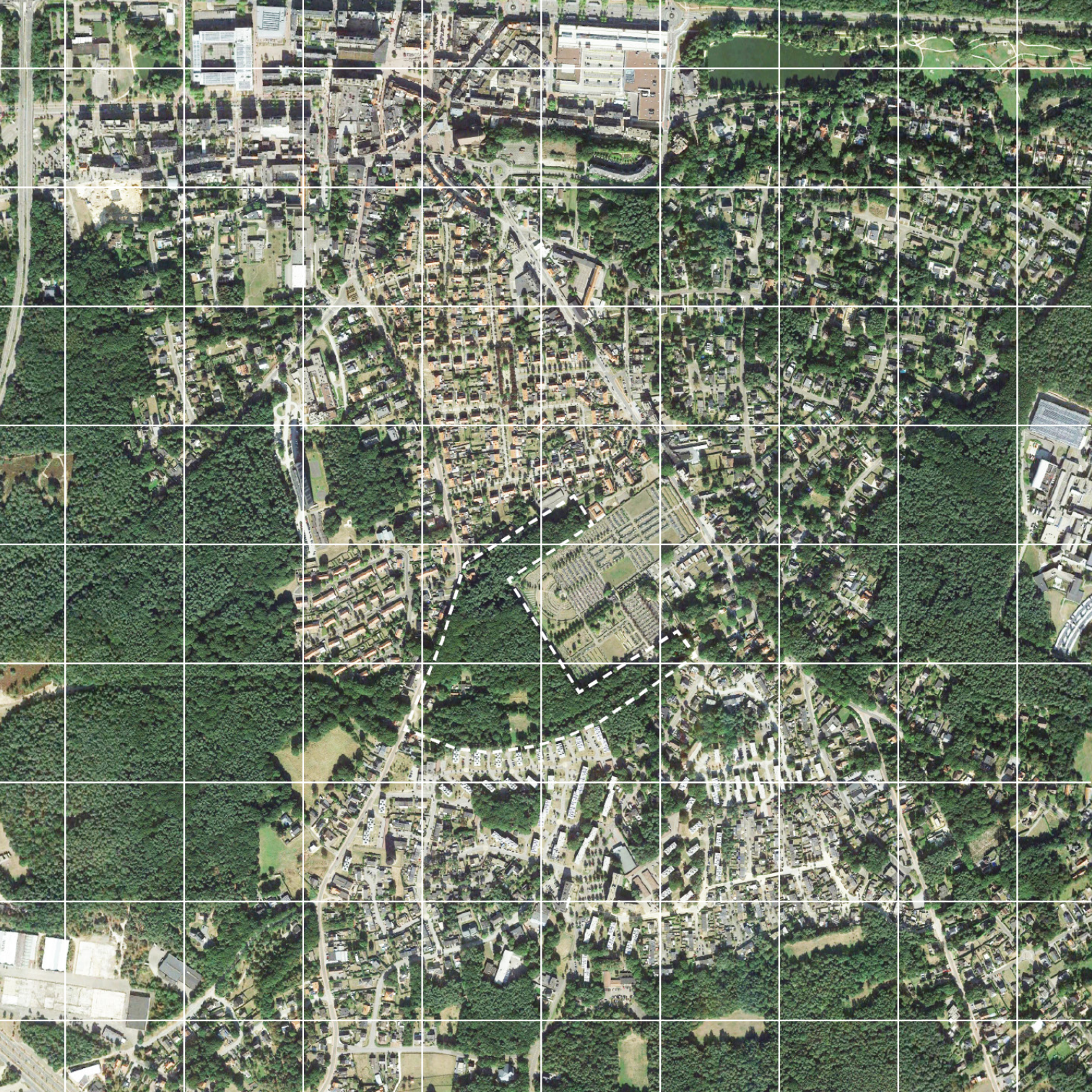
expo & wrap-up
16h @ UHasselt

1.3.3 CASE ‘OP ‘T STROEP’

The site of ‘op t Stroep’ is fringed in between the existing neighbourhoods of Kolderbos, Vlakveld and the municipal cemetary is one of the last potential residential development sites at walking distance of the city center. The plot has the potential to be developed in a new housing district in the near future. Due to the fact that the site has, on the one hand, been assigned by the Flemish government to a residential and development and on the other hand is currently a greenfield with a considerable ecological and natural value, the development of a project holds a certain ambiguity. It could therefore become an interesting testing lab for innovative neighbourhood design with a strong focus towards sustainability.

The masterclass will take the existing masterplan by BUUR (2016) as a starting point and will, through research by design, develop new spatial concepts for future development, based on the previously mentioned research questions.

image by participants, based on Google earth



The initial masterplan by BUUR was terminated in fall 2016 by a commission of the city of Genk, as one of the main proprietors of the land. The design of BUUR took the creation of east-west oriented ecological corridor as a starting point with a clear vision of combining a new development with both retaining as reinforcing the existing natural qualities on the site. Innovative combinations of singular housing and more dense developments of apartments was developed as an alternative to rather traditional and individually oriented 'parcel-by-parcel' developments.

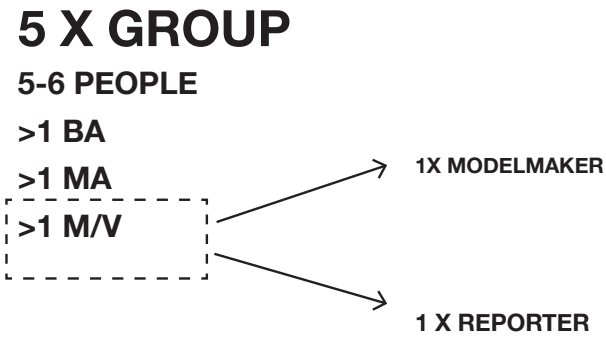
In a partnership between the city of Genk, the existing landowners and external project developers the project would be developed step by step. At the time of writing, negotiations between the different partners on the terms of development are still ongoing.

all images by BUUR

2.1 KICK-OFF - GETTING TO KNOW THE RESEARCH TOPIC

The first day of the masterclass the students are introduced to the methodology, the research questions and the site.
Presentations by both Bert Wasmer and Peggy Totté (ArchitectuurWijzer) on different approaches on sustainability are followed by an interactive discussion, in which the participants are invited to engage. The main research question on shift from an individually oriented development mode towards a more collective approach is introduced and widely discussed among the participants.

Followed by the introduction, students selected a ‘sub-question’ as a thematic research topic in groups of 5-6 participants. The groups are heterogeneous and consist of a combination of both bachelor and master-students. Groups are conceived as ‘independent design teams’ and expected to self-organize and assign a responsible for modelmaking and reporting withing their group.
Following to the introduction, a site visit is organized in which the participants have the opportunity to get to know the site and its immediate surroundings. The results of the brief fieldwork (photograhps, ideas,...) are shared on an online platform.



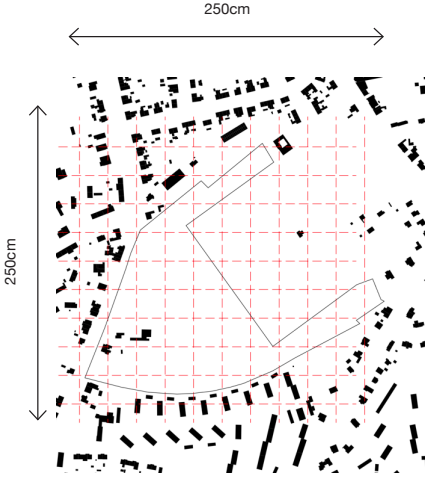
all images by participants

2.2 THEMATIC EXPLORATIONS

The second day kicks-off with thematic explorations in each group. Based on the sub-questions each group is challenging the traditional approach on neighbourhood level design methods and sustainability in Flanders. Within the key principles of the masterplan of BUUR students consider the effects of innovative strategies such as car-sharing, different forms of ownership, flows of waste & energy, etc...

These designerly explorations take place through skechting and conceptual modelmaking. On a large scale 2m50 by 2m50 model (1/200) each group is asked to immediately translate their ideas into a physical from in order to clearly communicate the ideas and confront their impacts with those of other groups.

To encourage the different groups to think beyond traditional methods of design the film ‘Plannen Voor Plaats’by Nic Balthazar and the Team Vlaams Bouwmeester was shown. During the evening, students attented a lecture by Bert Wasmer on the work of Rolf Disch Solar Architektur, followed by a discussion.



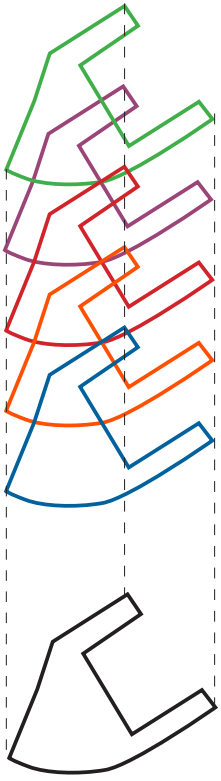
MONDAY - WEDNESDAY
THEMATIC GROUP (5-6 STUDENTS)
CONCEPTUAL URBAN DESIGN MODEL

all images by participants, except pg. 29 upper left by Team Vlaams Bouwmeester


Plannen voor plaats
Een documentaire van Nic Balthazar

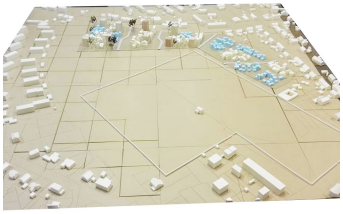
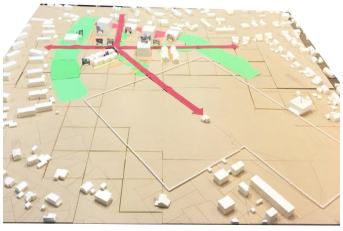
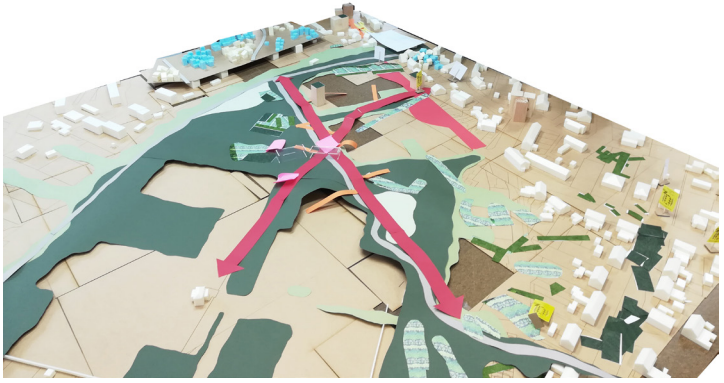
2.3 THE NEIGHBOURHOOD - AN INTEGRAL STRATEGY

By the end of the third day, each group presents their vision on the site and their response to the sub-question through a conceptual model. The groups present their findings to each other and confront the opportunitities, challenges or conflicts to each other and are asked to combine their respective visions into an integral strategy for the entire site, hereby answering to both the main research question as to the sub-questions.



all images by participants



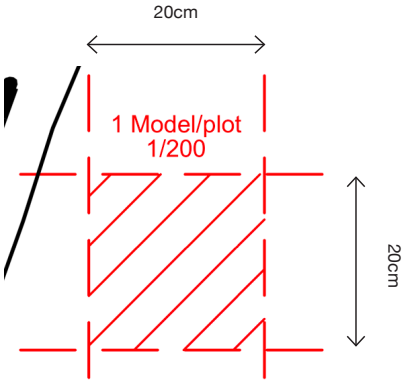





2.4 THE ARCHITECTURAL PROJECT - ILLUSTRATIVE DESIGNS

Based on the integral vision on the neighbourhood, the participants are now continuing the design research on an architectural scale, once again through physical modelmaking.

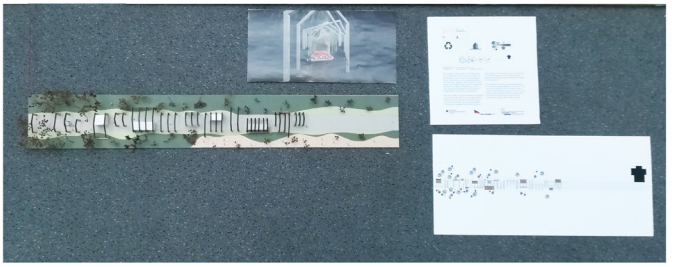
In groups of 2-3, the students design architectural design strategies on sites with a strategic location which, on the one hand can show a high level of innovation and on the other combine the different themes elaborated in the thematic explorations. The challenges of changing harder borders (between public and private, between individual and collective, between landscape and residential, between infrastructure and park,...) became a recurrent theme in these architectural design exercises.

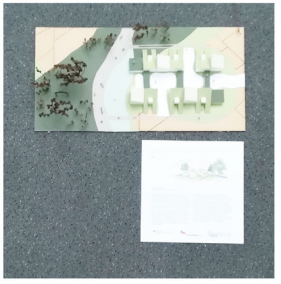
The models with architectural explorations are then linked to the larger 2m50 by 2m50 model, bridging the architectural projects with the neighbourhood strategy. Examples of the architecture projects included the development of a flexible structure which can combine multi-level parking with urban farming and a resource for renewable energy or the development of a new housing district which combines a high degree of compact buidling typologies to a flexible and adaptive construction method.

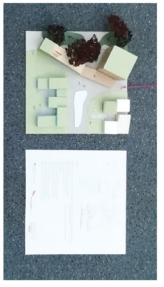


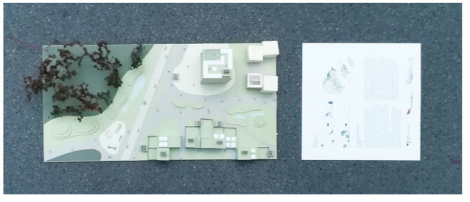
WEDNESDAY - FRIDAY
DESIGN GROUP (2 STUDENTS)
ARCHITECTURAL MODEL

all images by participants









2.5 WRAP-UP - OVERVIEW AND STAKEHOLDER DISCUSSIONS

The final models are set up in Fac-Arck's central atrium and the participants present the outcomes of an intensive week of design resarch to a diverse external panel of professional stakeholders. The panel of experts consisted of professionals who are involved with neighbourhood scale developments on a day to day basis, but each from within a different field of practice.

The presentations are followed by a discussion. This discussion deliberately differs from a 'traditional' academic evaluation but aims to identify the innovative aspects, the challenges and the opportunities of each strategy and its possibility of realization on the longer term. The outcomes of these discussions are summarized in the reflection.

image by participants

3
REFLECTION

3.1 RETROSPECTION

Providing a detailed retrospection on the Masterclass is not yet possible as data are still being collected. However, some general comments were noted on the perspective of the students, the adopted approach and the impact.

Perspective of the students
In contrary to what students are used to in the design studios of the regular Architecture programme, the masterclass was short (5 days) and very focused (no other courses). These features were highly appreciated by involved students. The week was characterised as being very intense, but this allowed a continued and thorough process.

Adopted approach
The thorough approach for developing promising perspectives was welcomed by the representatives of stakeholders during the focus group. It was believed that 'out-of-the-box' and 'high-end' design and management measures are needed to develop a mind shift in the quest for sustainable building. The development of demonstration projects in which these measures are implemented would create a support base for a sustainable transition of the built environment.

Impact
Situating direct impacts of the Masterclass is not possible. However, involved representatives of the stakeholders declared that the outcomes will in one way or another influence their thinking and eventually their work.

3.2 EPILOGUE

“Sustainability is a term first used in forestry. It means that a tree planted today will not be used before at least two generations. So the meaning of sustainability is to act today in a responsible way for the future. Sustainability is geared to processes in nature. Everything in nature is connected, sometimes visible, sometimes subtle. Natural processes work in cycles, not linear. In nature there is no final end but multiple changes. There is no waste, everything is reused.
Sustainable thinking and acting needs to overcome our usual common mindset of today. So we encouraged the students to become free in the mind, become more open minded, more visionary, more radical, more creative.
What does sustainability actually mean for public/semipublic spaces and how does it go along with mobility, food production, dwelling areas, a forest, a cemetery, density, construction material and processes, landscape design and what does this all mean for social processes? It means first of all raising down borders both in the mind and also physical (on the plan and on the model), it means connecting functions that we are used to separate, creating cycles in different fields.
What the students did in the different areas the worked on is sometimes radical but that´s what is needed for managing our future problems. The result is not meant as a final stage but to show the process of approaching a complex topic from different perspectives.”

ir. Bert Wasmer

The setup and outcomes of this Masterclass revealed topics which are eligible to incorporate in education and for further research. Similar workshops, a design studio and actual research (e.g. PhD) are promising for both the discussion on and uptake of sustainability aspects in the built environment, and for the profiling of the Fac-Ark of UHasselt.

4
ANNEXES

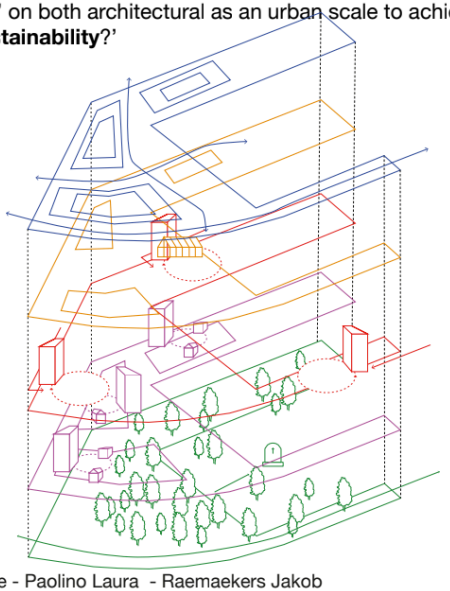
4.1 BIBLIOGRAPHY

- Becker, A., et al. (2015). Building and Living in Communities. Basel: Birkhäuser Verlag GmbH.
- Bolos, C.C. (2009). Transitional Space in Architecture: Elements and Profound Experiences. Department of Architectural Studies, University of Utah.
- IPCC (2014). Summary for Policymakers: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. (C.B. Field, V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea and L.L. White, eds). Cambridge, UK and NY, USA: Cambridge University Press, pp. 1–32.
- Janssens, B. (2014). Transitional Spaces: Reconciling Conflicts in Dense Housing Projects. Paper. The European Conference on Sustainability, Energy and the Environment (ECSEE) 2014, Brighton, United Kingdom.
- Janssens, B. (2015). Design Support for Sustainable Building – Guiding-into-action tools tailored to architect-designers (Doctoral dissertation), University of Antwerp.
- Janssens, B. and Verbeeck, G. (2017). Architectural Strategies for Long-Term Obedience to Increasing Building-Constructive Energy Performance Requirements. The 8th Nordic Passive House Conference (PHN 17), Helsinki, Finland.
- Ruimte Vlaanderen (2016). Leidraad goede praktijk: Hoe omgaan met gemeenschappelijk wonen. via https://www.ruimtelijkeordening.be/Portals/108/docs/Wetgeving/leidraad_gemeenschappelijk_wonen.pdf [Accessed on 10 October 2017].
- Vermeersch, L. (2016). Bouwmeester Van Broeck wil Vlaming uit zijn villa lokken. via http:// www.bruzz.be/nl/actua/bouwmeester-van-broeck-wil-vlaming-uit-zijn-villa-lokken [Accessed on 27 September 2017].
- WCED (1987). Our Common Future. Oxford: Oxford University Press

4.2 STUDENT ABSTRACTS

all following images by participants

What could be a new **public - semi public - private ratio**, gradient and layout in Flemish residential neighbourhoods which holds opportunities for implementing **sustainability design measures**? How can we design '**places**' on both architectural as an urban scale to achieve 'an **integral ecological** and **social** and integrated **sustainability**?'



Masterplan

Jehoul Stiene - Liberloo Steven - Linsen Julie - Paolino Laura - Raemaekers Jakob

The cycle of life is the main concept that drives this sustainable masterplan.
This means bringing back the community life by connecting shattered elements in the landscape. We also keep the forest and turn it into a peace forest going into the cemetery. Also connecting the green from east to west creates a green corridor running through the city. By densifying the housing area we can keep more of the existing forest. Three different building typologies will be used to meet the requirements of a broad variety of inhabitants with their own wishes and needs. One typology are larger building blocks scattered over the plot that will provide public functions on the ground floors. Some of these high density building blocks, close to the streets, will foresee parking spaces for car sharing. This way the public and semi-public roads will be mainly car free. They are only allowed on the plot for drop-off, this by a one way traffic route. There are three main public routes, the connection from east to west, the connection to the centre and the connection into the cemetery. Along the way these public roads broaden in which public functions can happen. The semi-public spaces are between the different typologies. The private spaces are within the housing. Around the semi-public spaces there are community vegetable gardens in which the habitants can cultivate their own food. This way the community life is accentuated and shifts from a ego minded society to an eco minded society.

Forest of life

Naomi Neelen
Ann-Sofie Vancleef

Our design is located between the cemetery and the residential area. At the moment it concerns a poorly maintained forest which is not used by the neighbourhood. We wanted to create a forest where both children can play and visitors of the cemetry can walk in peace while they grieve. While walking you get in touch by different atmospheres. The peaceforest has trees with high branches that form a closing ceiling.

The playforest has low branches where can be climbed on and temporal constructions can be hanged onto. We created a path in between the playforest and the peaceforest that, together with some low bushes, creates a border between the two times of forests. Our sustainable ambition was to have a minimal impact on the excisting forest. We keep the existing trees and we put swings and hammocks in the trees.

1.
BLUE-GREEN NETWORK/LANDSCAPE

What could be a Blue-Green Network, covering the building and neighbourhood level, which facilitates sustainability aspects related to water, air, ecology and attractiveness?

Green living

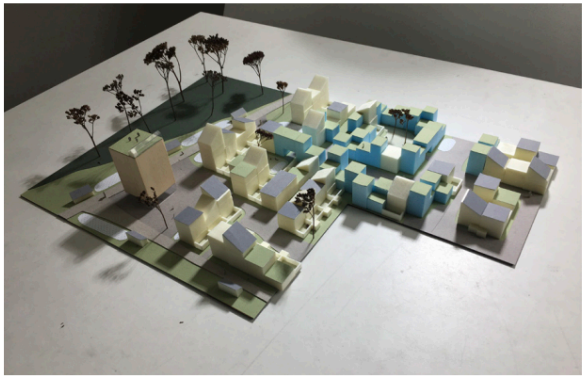
Naömi Schuermans
Ella Smets
Maud van Oerle

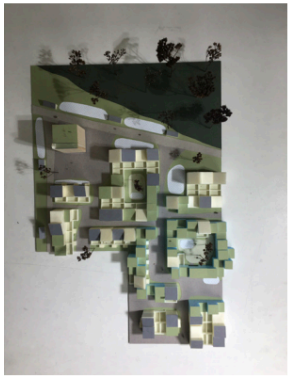
The concept is based on green living. The houses are integrated in slopes and together they created a kind of cluster. The slopes are orientated towards the outside of the cluster and provide insulation for the houses. In the slopes are dormers integrated for private entrances and residents can personalize their own dormers. The transition from the public street into the cluster is made by a water buffer, this water can also be used for gardening. To produce energy, solar panels are integrated on some sloped roofs. These roofs are west oriented to optimize the energy gaining. For heating, a collective co-generation system is integrated to heat the whole cluster.

The idea is to make an transition between the individual and collective. There are some private gardens, but they are very small and are located on the rooftops. In contrast to private gardens, the collective gardens are lager and located on ground level. The collective gardens are used to grow vegetables for the surrounded homes. Shared storage spaces for the gardens are integrated between the collective gardens. These storage spaces are at the moment overdimensioned, but in the future they can be used for extending and connecting the houses when their familysituation is changed.

2.
BUILDING SITING, MASSING & DENSITY

How could be the built and unbuilt space, especially the building siting, massing and orientation, contribute to the sustainability components energy, materials, soil, social Interaction, security, health & comfort, flexibility and attractiveness?





GREEN DEN-CITY

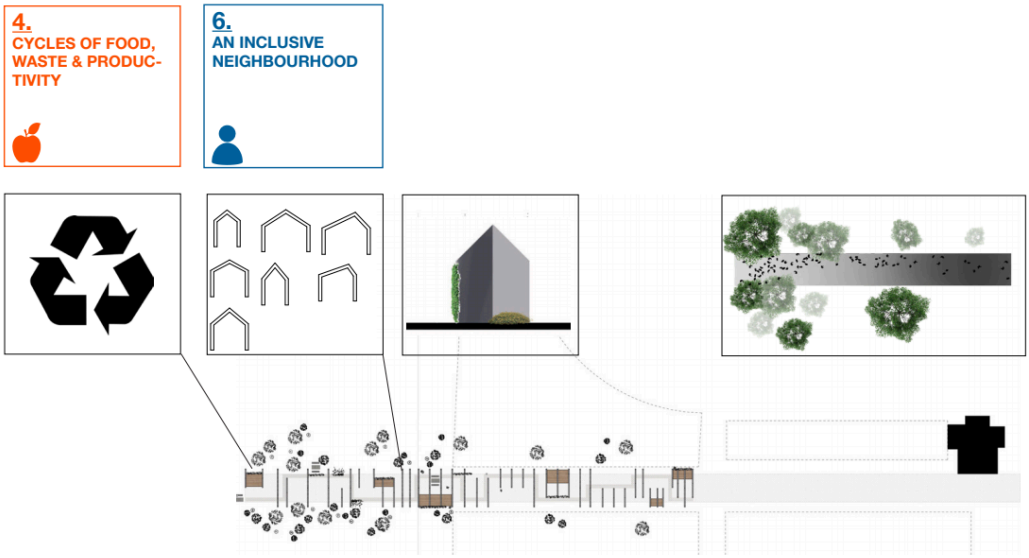
Lieselotte Braekers
Severien Steegmans
Marion Wittenberg

By raising a high dens residential area, we create more green in the neighbourhood. Both, the residential area and the environment around, will get profit of it. We create private, collective and public green spaces. By the combination of these three types of green space, the residents get a lot opportunities to create their own green space or connect with the neighbourhood.

By orientating the lower buildings at the south and the higher buildings at the northern side, with the high-rise building on the northern corner, we tried to optimise the light in all buildings and green spaces. By orienting the slope of the roofs towards the northern side, we catch more sunlight on the area behind it. The sloping roofs orientated to the south can get covered by solar panels to generate electricity for the community.

The energy installations of all the houses get collected together, hereby more efficient systems can be used and shared.

On the area, different residential building types are combined: houses with their own private garden, land-based apartments with a rooftop terrace and the apartments in the high-rise building block.



Title: DGL_ Dynamic Greenhouse Structure

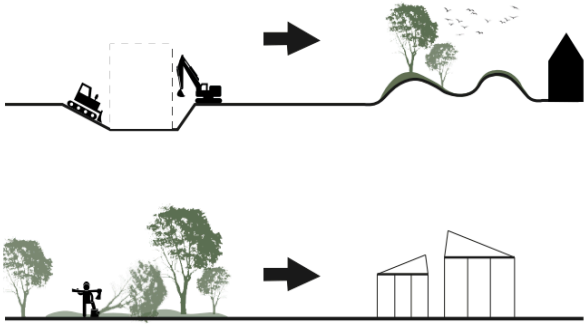
Lilit Abgaryan Hanne Swinnen Katrien Vankrunkelsven

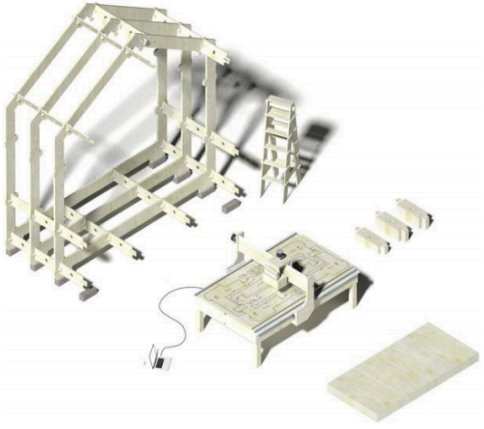
An important starting point of the design was the involvement of the community in their own public space. The community is responsible for the maintenance of the vegetable gardens and the green, besides a great quality of public space, the inhabitants also get fruit, vegetables and flowers in return for their labor. In this way, the project strengthens not only social sustainability, but also food sustainability.

With our project we hope to create a sustainable living environment with a strong group identity, where the community likes to live and wants to come outside their own home and garden. The boundary between the private domain of the residents and the public space, but also the boundary between the public space and the graveyard are made softer and more accessible to the residents.

The mitigation of these boundaries takes place by means of a freely fillable structure, which can function as a space to rest, a space to play, a space to grow flowers, a space to drink a cup of coffee etc. By gradually changing the program in the structure, the design plays with the boundaries of public, semi-public, private.

5.
MATERIALS, CONSTRUCTION METHODS & ENERGY





AT THE CROSSROAD

Jonas Bernaerts
Pieter Dockx

To tackle the question of durable construction methods, we came up with two strategies to reduce the ecological footprint of the construction site. First we make sure to limit the amount of traffic comming to and from the site. Normaly, when we dig out the soil to build our foundation, the excess of soil is moved to an other location with large trucks. Instead of removing the soil from the site, it will be used to shape the public space and aid the architecture of the landscape.
The same principle goes for the construction of the build environment. By using the open-source construction method of Wikihouse, the building components can be produced locally and therefor reduce the stress on the environment. This construction method also has the advantage of being modular, which makes the house addaptable and flexible in the end.
For the issue of energy, we must first see that all the buildings consume as less energy as possible. The energy production on the site will be taken care of by using photovoltaïc cladding on the fascade of the mid-rise building blocks. They will act as an energy generator for the surrounding houses. The bicycle storage also produces renewable energy, tobe used for charging electric bikes and contribute to the general production of energy on the site.

6.
AN INCLUSIVE NEIGHBOURHOOD

BETWEEN THE TREES

HENOR ELSHANAJ NESET EMRE KARAAGAC

Originally there was a strong division on the site between the forest, the green landscape and the building blocks. In the design proposal these borders mostly have been removed. By gradually allowing the forest to invade the space of the building blocks interesting confrontations have been created.

First and foremost the neighbourhood takes over the green identity of the environment. This happens by letting the densified forest get very close to the living area. Other patches exist out of a small amount of trees with a higher flexibility level and allows people to use the space as a meeting point, for sports or for other activities. Some areas are defined as collective food production land. Such collective activities in the neighbourhood generate cohesion between the inhabitants.

The walkway which connects these different types of landscapes is lifted in the whole project. It starts with a small height near the buildings blocks and gradually rises as it enters the forest. In this manner the green character of the site stays continuous. The idea of lifted walkways in the peace forest also creates architecture in harmony with the context.