POLITECNICO DI MILANO
School of Architecture and Society
Master of Architecture

Meeting-up in Sofia

Integrating common spaces and functions into architecture

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I.ABSTRACT

I. Abstract

This thesis investigates the question: can architecture improve the way people share space? We will examine two general groups of people, workers and residents, both of which coexist in the same places but never or rarely meet and connect. We will explore how connections within each group and between the groups can be improved by incorporating common spaces and functions into the architecture space in order to stimulate people to live not only as strong individuals but also as a strong community.

The building typology which will be researched is a modern, eco-friendly, self-sufficient hybrid building consisting of three major parts: residential, office and sports. The area considered is located in Lozents district near the center of Sofia, Bulgaria.

The methodology implemented in this research considers that, by taking a look at the built environment, we should realize that architecture creates an emotional connection between people and building for a life satisfying experience.

The design approach is set to be realistic, innovative and hands-on. It combines research, survey and "learn by doing", where strategic decisions are taken considering the key stakeholders: residents, workers, vendors, city officials, community members and other interested parties.

The justification of the project is that architecture is a powerful tool for connecting people and improving their lives. It develops a sense of belonging to a community, a sincere interest in the well-being of the environment and its inhabitants. A facility that can foster this is essential for the service of the community in Sofia, Bulgaria.

Keywords: reconnect, working, community, sense of place, co-housing, co-working, identity

II. Prologue
The reasons for this research

We began our thesis driven by the desire to redefine the residential building in Sofia, Bulgaria. The majority of the urban dwellings currently in place are a remnant of the past, a setting which has turned into a symbol of isolation and segregation. Our passion about our city and its people guided us in designing our proposal for improving the urban building.

We decided to approach this project with the concept of housing combined with offices and their collaborative aspects.

We chose this particular topic because we believe that collaboration throughout each day can and will improve each individual's everyday life in the urban environment. Nevertheless, in order to promote collaboration there is the need of close proximity between people, which is found in an urban dwelling. We will refer to this as Meeting-up. Although meeting and collaboration might seem similar, they are actually quite different. The first one can be simply an accidental meeting in the corridor in front of someone's apartment; the latter one is the deliberate action when a group of people Meet-up and have the opportunity to do to something together.

In order to promote the Meeting-up of people, the current model of urban dwellings will be transformed into a mixed-function building. This is not a new idea but it is a completely new concept to be realised in Bulgaria.

In order to closely follow the leading concept behind the thesis, the design was set taking into consideration the participatory approach. An online survey was conducted to fully understand the attitude towards this new concept. In

the meantime, a couple of interviews were carried out with professors from the University of Architecture, Construction and Geodesy in Sofia. The renowned architects were somewhat doubtful whether the concept is applicable to the reality in Bulgaria. Nevertheless, the people, the potential users of this type of building, showed remarkable interest in the subject.

III. Context
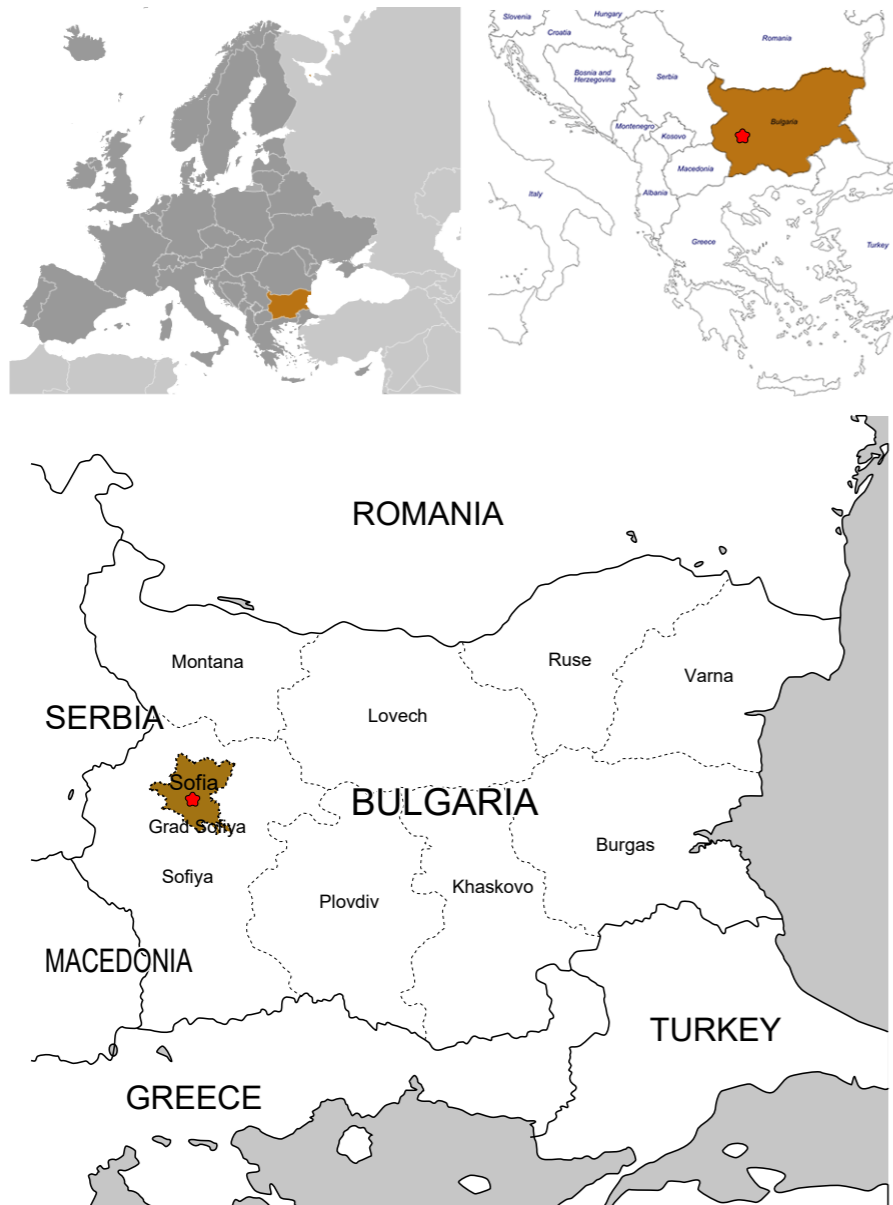
i. Bulgaria: a general introduction

Bulgaria is located in Southeast Europe, in the northeast part of the Balkan Peninsula. The country is a transport crossroad between Europe and Asia, allowing access to Western Europe, the Near East and the Middle East, and the Mediterranean.

Since Bulgaria is situated within the southern part of the temperate climate zone, on the transition line to the subtropical climate zone, its climate conditions are influenced by the latter as well. Bulgaria's geographic position determines the relatively wide angle of sunlight that falls on the country, making it predominantly sunny.

ii. The Bulgarian architecture: major influences over time

The architecture of Bulgaria has been continuously shaped since the country's establishment on the Balkan Peninsula in the 7th century.

Remarkable works of Thracians, Romans and Greeks are preserved in the Bulgarian lands. While the Middle Ages saw the rich architectural activity of the Bulgarian Empire, the consequent Ottoman yoke was a period of considerable decline for the Bulgarian architecture. During the Bulgarian National Revival in the 18th -19th century, however, the country experienced another period of architectural upsurge. In the late 19th and early 20th century the architecture of Bulgaria was dominated by the fashionable revival styles of western architecture. The second half of the last century saw the influence of the Communist rule before finally, since the democratic changes in the 1990s, modern styles have been moulding the architecture.

iii. Sofia city
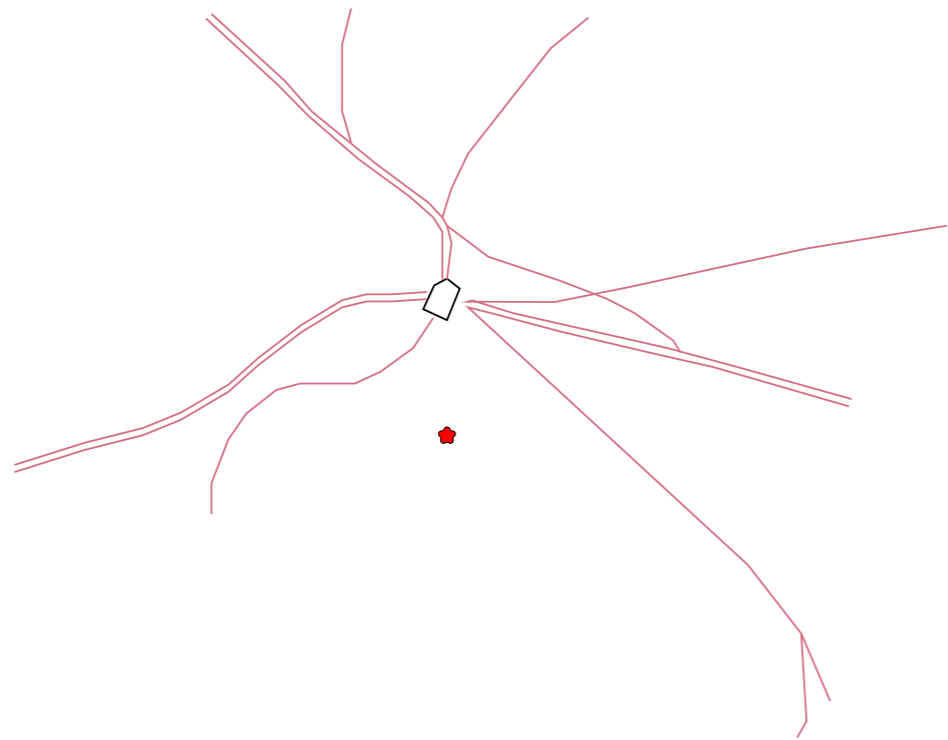
IX-XIV

Historical development
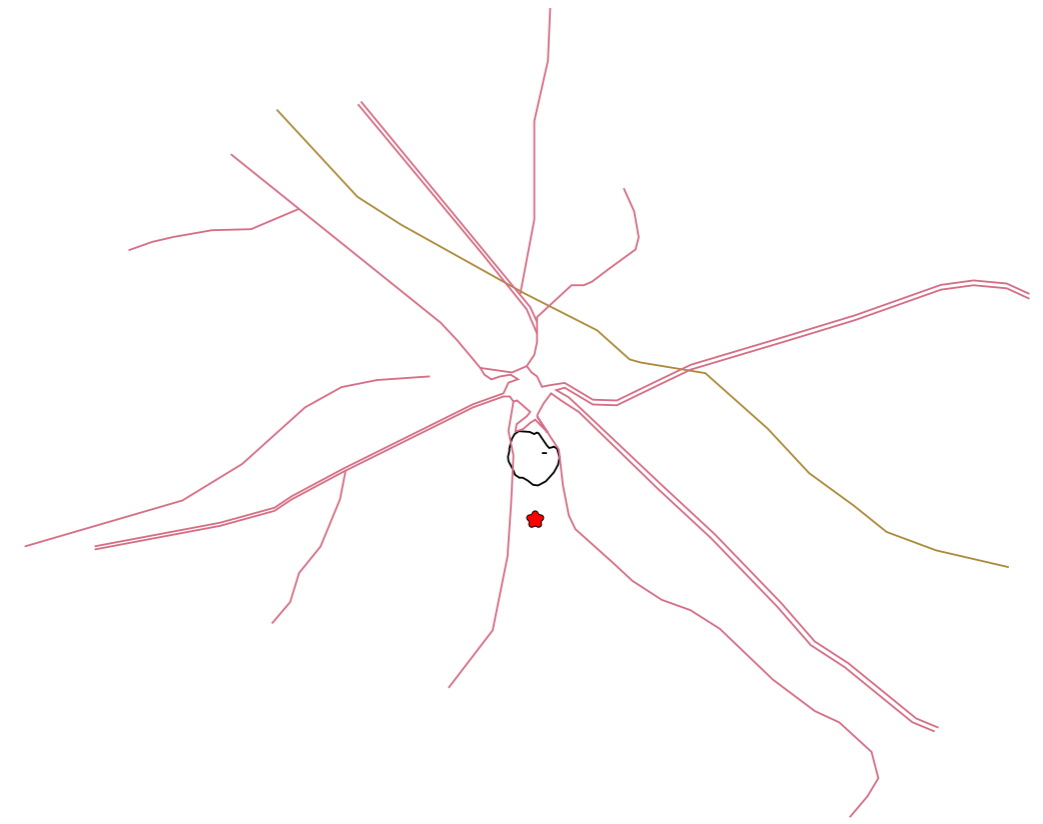
XVI-XIX

Historical development

1919
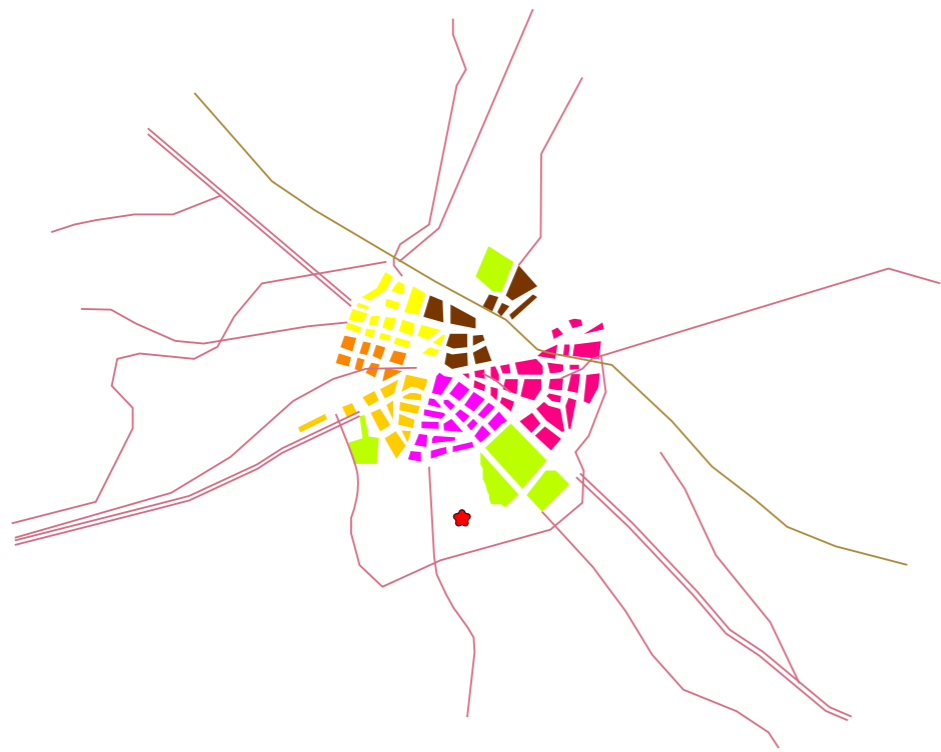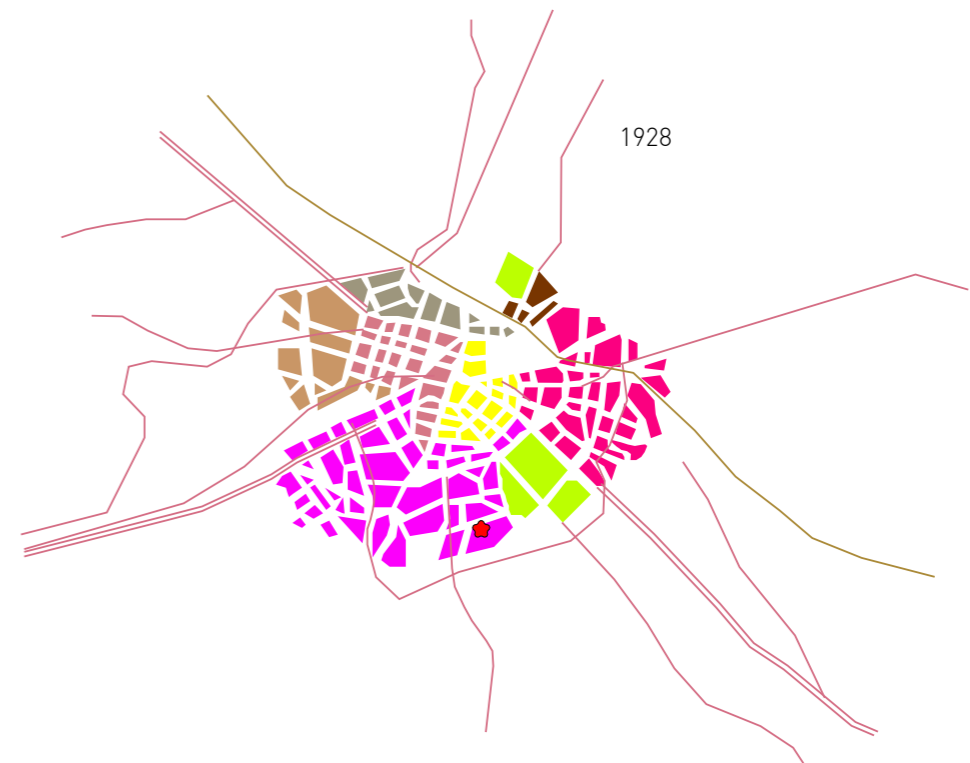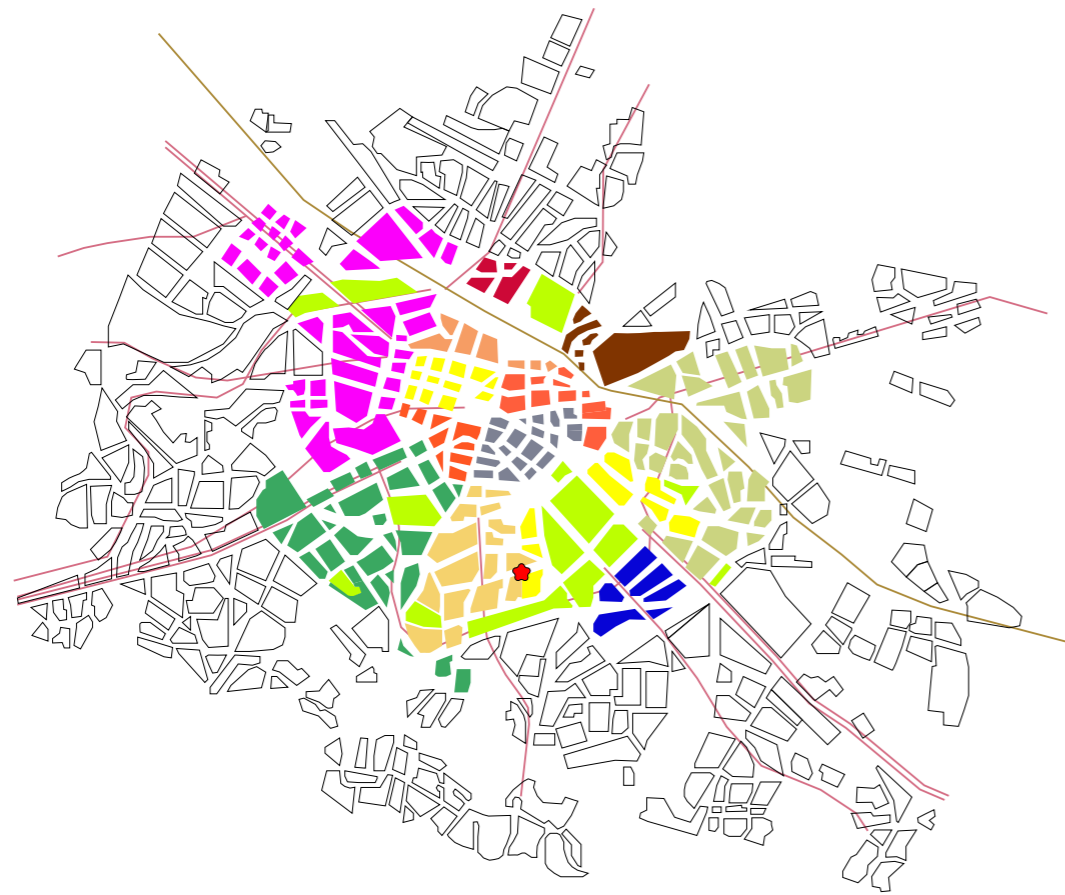
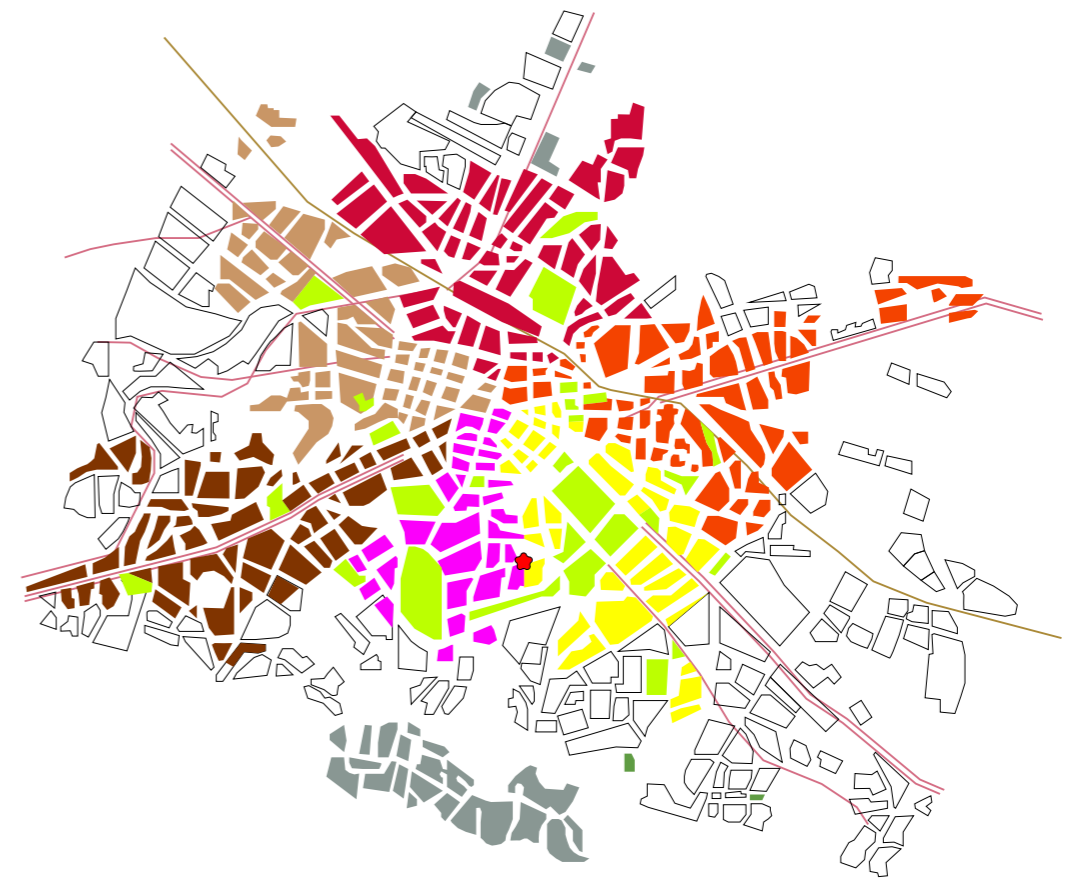Historical development

1928

1928

Historical development
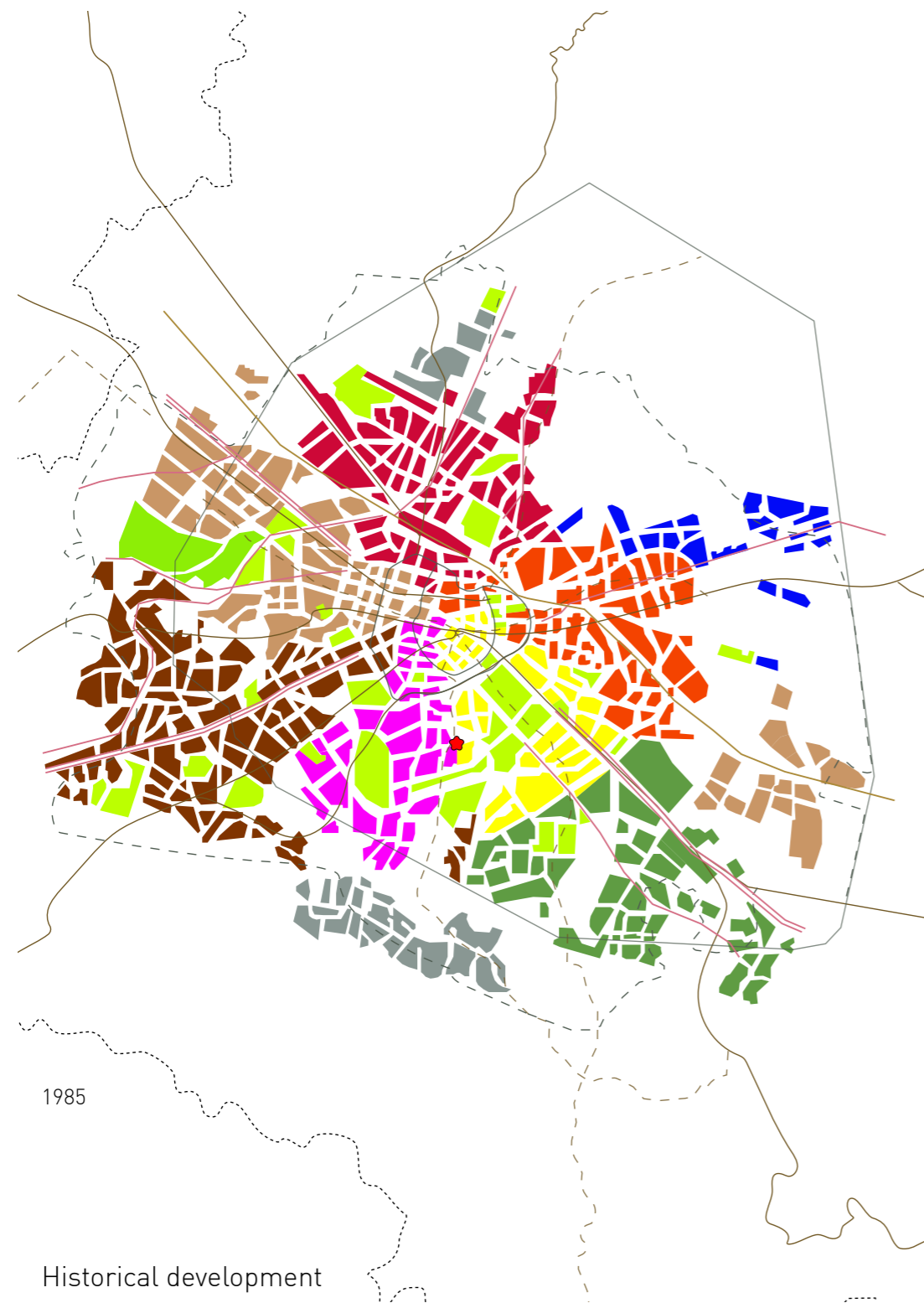
1939

Historical development

1965

Historical development

1985

Historical development

Sofia, the capital of Bulgaria, is a 6,000 years old settlement with the look and feel of a modern and upbeat European metropolis. The young spirit of the city is an embodiment of the city motto "It grows, but never gets old."

It is a wonderful place to live in. The density of people (it is the biggest and most populated city in the country) makes Sofia rich and diverse. The close proximity to the slopes of Vitosha Mountain and the abundance of parks and city gardens gives the city its vibrant and refreshing charm.

iv. Architecture and city planning

The first modern urban plan of Sofia is characterized by a radial-circled structure. The urban lay-out follows the Vienna and Paris examples of rectangular street-planning oriented by the two main east-west and north-south axes designed yet by the Romans.

v. Architecture of the socialist type

Public buildings

Following the end of the Second World War, the new state authorities initiated a large-scale construction of public buildings in Sofia in the spirit of the 'social realism' and the 'late socialist eclectics'. This drastically changed the urban outlook. Emblematic examples of this type of architecture are the present-day governmental complex (the Presidency, the Council of Ministers, and former Communist Party House), the Printing Works on Tsarigradsko Shose Blvd., and the building of the former House of Bulgarian-Soviet Amity on Evlogi Georgiev Blvd. During the Socialist age, the construction of huge hotels and public edifices grew rapidly, the most substantial among them being the National Palace of Culture, the Winter Sports Palace, Universiada Hall, the Central Railway Station, Kempinski-Zografski Hotel (now Radisson SAS), Ro-

dina Hotel, and Pliska Hotel. A number of universities and higher educational institutions were designed and built, too.

Residential buildings

Distinctive of the residential architecture of the socialist period are the complexes of prefab-panel blocks – a typical example of industrialized hous-ing-construction.

vi, Existing situation

Urban development

The majority of people in Sofia live in apartment blocks that were built during the 60s and the 70s of 20th century.

In this period, new neighbourhoods were developed in order to extend the housing capacity of the city. Since urban planning at that time was dictated by ideological, political, social and economic motives, the new buildings were standardized and mass-produced using structural insulated panels. The col-loquial term used in Bulgaria for these buildings is panelka (plural: panelki) – a panel building constructed of pre-fabricated, pre-stressed concrete. The most widely spread type of these blocks are elongated, separated into several sec-tions with separate entrances.

City community profile

Many of the newly-formed residential neighbourhoods lack social infra-structure, public spaces and green areas. This is detrimental to the social life of the residents and predisposes to the alienation of people. These areas are foreign to the city, they are not part of it. This is the reason why one of the lead-ing objectives of the project is to create a building that is inspired by the city

and belongs to it - a building where the corridors are regarded as streets, pub-lic spaces are seen as squares, and housing units are considered as single-family buildings.

The existing common space

One of the most prominent features of the panel buildings is the exist-ence of a large common space situated in front of each block. This space pro-vides both opportunities due to its vast size and limitations due to its lack of varied infrastructure.

This open space was designed to serve everyone equally providing enough space for all the residents. Still, it was not appropriately designed – it functions well when a lot of people gather in it but when they are too few, it becomes too big, out of scale. Over time, due to the change in attitudes, the above discour-aged the residents from using the space on a daily basis and it became out-dated and neglected. It changed its main function from a common space for the residents to car parks for their cars.

How did this happen? During the socialist period, the focus was on the community while the individual was rather neglected. After the end of this era, the focus diametrically shifted towards the individual: people became more isolated, sometimes egoistic, following their goals without considering others.

A change in attitudes

However, as we have started to realize recently, both of the above models of the world do not create sustainable value. People today create value mostly individually but they are not grouped in an enriching way. The solution, we be-lieve, is taking advantage of both the uniqueness of the individual and the syn-ergies created by the group.

The community could not be created solely around ideas or individuals. Strong individuals with similar ideas and believes can create communities that work better in synergy. Nowadays, there is a new shift driven by this concept. There are numerous campaigns, start-ups, social media that connect like-minded people. Now there is a wave of people who are open-minded, eager to make a change.

The challenge

In the recent years, we have been observing the emergence of mixed-use buildings which feature common facilities. They allow to optimize, to experiment with new constructive solutions, inspired by the concepts of bio-architecture, allowing energy saving and the use of innovative technologies, as well as to reduce consumptions and costs for both the single individuals and the whole community.

While this is already a well-established reality in countries such as the USA, Denmark, UK, Netherlands, Sweden and Germany, it is certainly a great challenge for Bulgaria. The recent changes have reflected on the Bulgarian society but are yet to reflect on the places where people live and work – the built environment still has to catch up with the ideologies of those who use and inhabit it. We believe that if we facilitate the creation of communities of strong individuals by providing places where they can Meet-up, we can make our society stronger, help it blossom.

Thus, the main goal of the thesis is creating value by helping individuals create synergetic communities. As already stated, we decided to approach this by incorporating common spaces into the fabric of the urban building.

Chapter 1
Introduction

1.   Introduction

1.1   The thesis project

We chose to design a modern, eco-friendly, self-sufficient mixed-function building near the center of Sofia. We aimed to create strong, meaningful and relevant design driven by the potential users.

While working on our thesis, our goal was to be realistic, innovative and practical. Throughout the project we applied different tools. In the initial phase, we conducted research, carried out interviews and questionnaires. During the design phase, we experienced the process of "learning by doing", where we assessed and adapted our design solutions considering the key stakeholders: residents, workers, vendors, city officials, community members and other interested parties. All of this helped us strengthen our concept and final proposal for the thesis project.

1.2   Primary research: the online questionnaire

To acquire a better understanding of the attitudes and needs of the potential users, we made an online questionnaire. We made use of the social media in order to reach a big number of people of various age, background, occupation and interests.
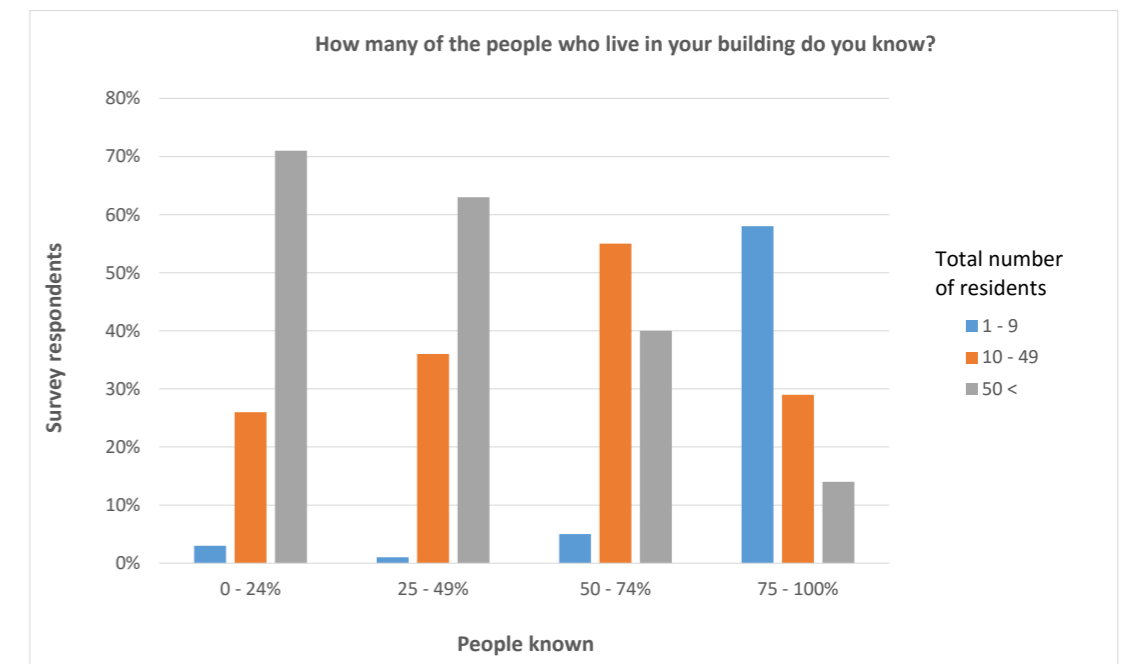
Slightly over 40% of the people who completed the questionnaire responded that there was some common space near their home. Of these people, a little over 30% said they felt no actual connection to it. Interestingly, most people assumed it is their obligation to take care of that space, whereas it is actually the local municipality's responsibility. These findings were promising. They let us conclude that, although the existing common spaces are currently neglected and unused, people recognize their existence and feel a certain level of responsibility to them.

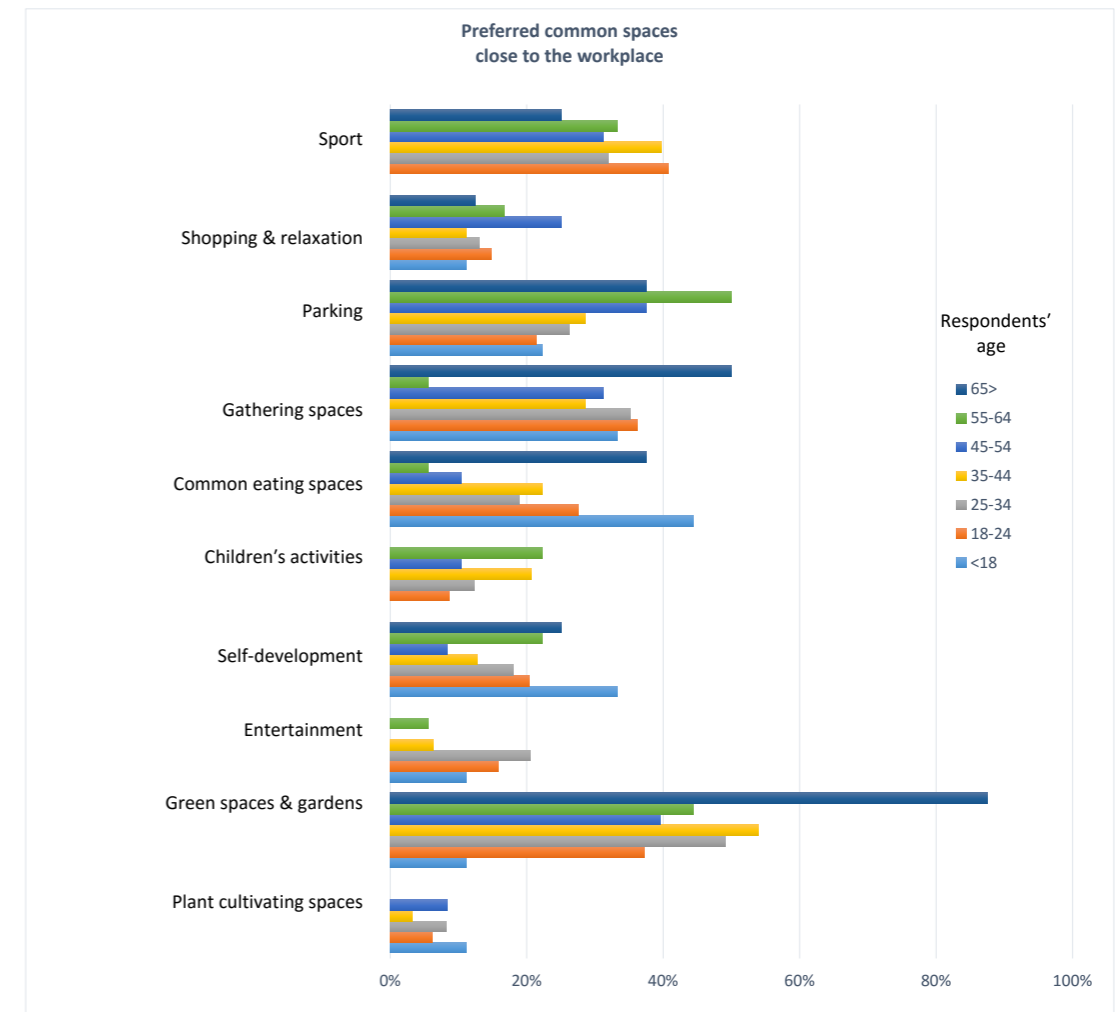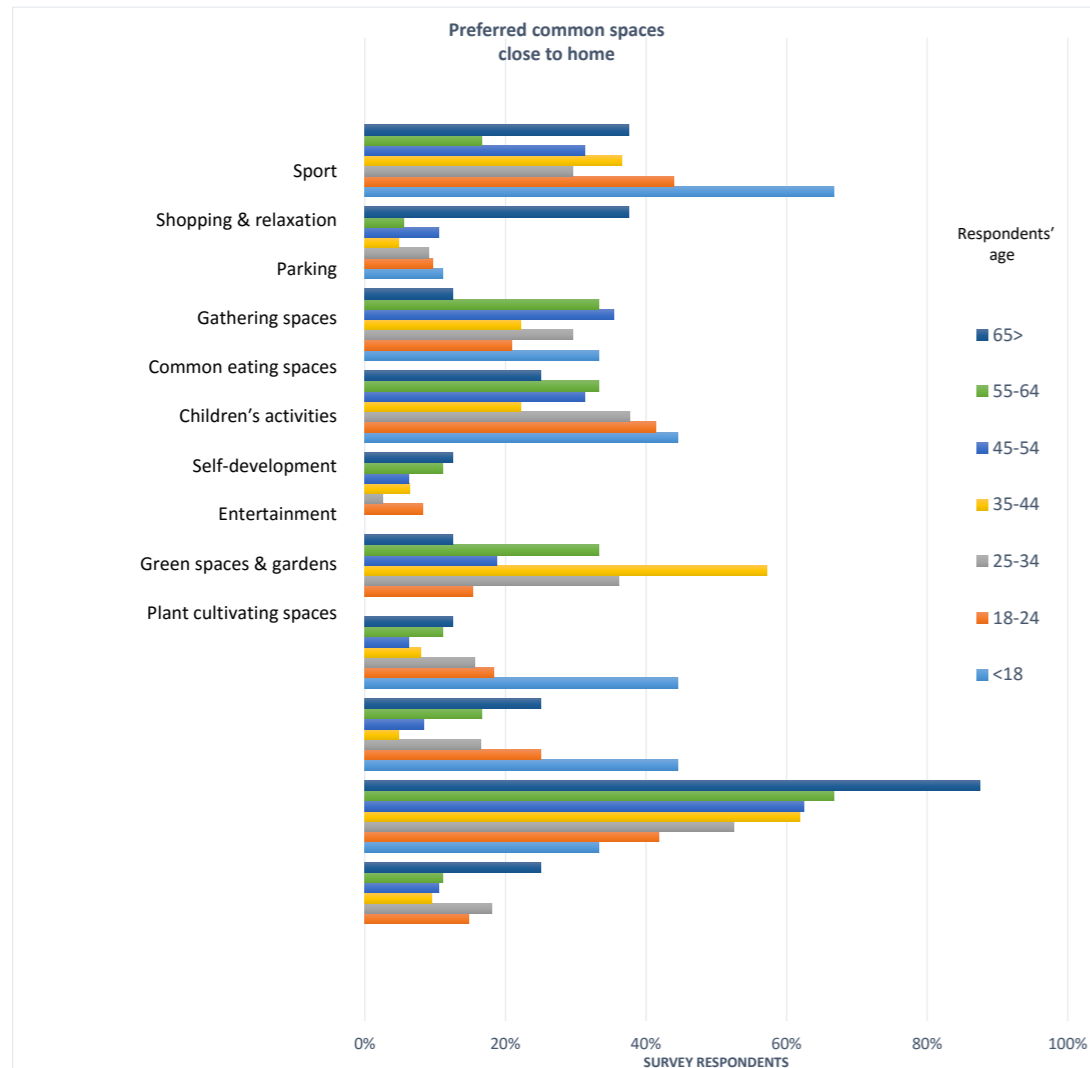Further analysis on the survey that we carried out.

The next step was introducing to people the idea of a common space located near their home where they could engage in various activities on their own, with their family or friends. When presented with this idea, 70% of the respondents believed the existence of such a space would improve their life and the life of their relatives and friends. Moreover, 90% said they personally would participate in taking care of such a place.

In addition to this, we surveyed people's opinion on common spaces in the context of the office environment. This allowed us to test and consequently prove the applicability of our project concept.
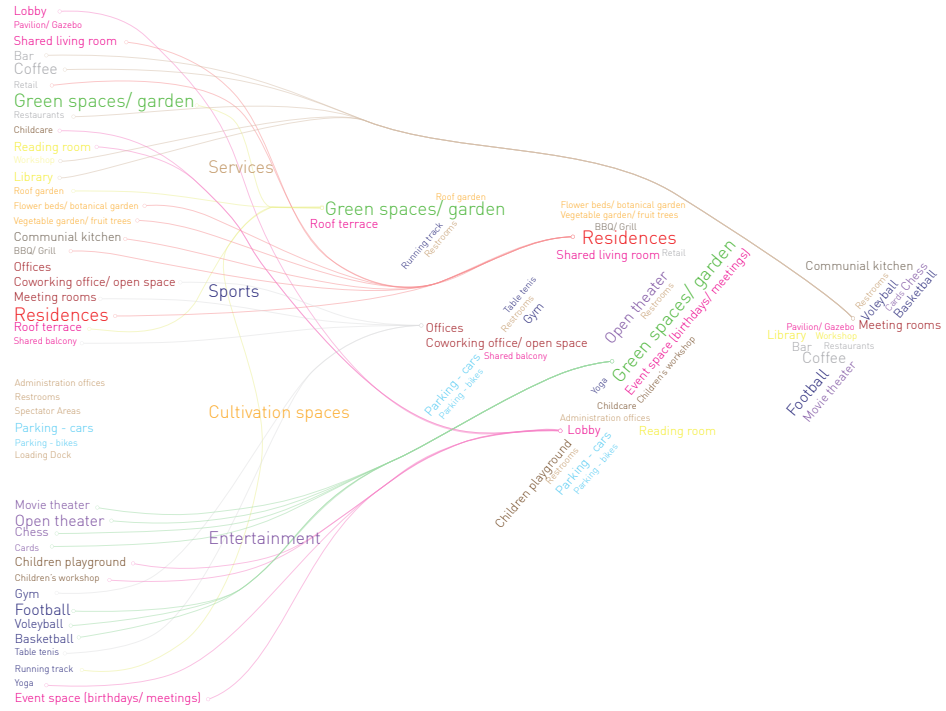
Finally, we identified the spaces and functions that appeal to the potential inhabitants and users of our building. The survey made us confident that people are open-minded and welcoming to new proposals.

Preferred common spaces
close to home

Preferred common spaces
close to the workplace

Children's activities

Hours/days	People devided by state		General functions

Cultivation spaces
Sports
Entertainment
Green spaces/ garden
Self-development
Children's activities
Common eating spaces
Gathering spaces
Parking
Shopping and leisure areas

Chapter 2
Theoretical Framework

2.   Theoretical Framework

2.1   Conceptual Framework

Creation of an abacus of potential solutions for each problem in the form of diagrams setting of overall principles that can follow further in the project to create our new type of mixed residential building

2.1.1 Common spaces and functions as part of the architecture

The common areas as part of the architecture maintain important spaces in the environment for human habitation. Well-designed and positioned common spaces create an atmosphere for the whole building itself. These areas could be used as mixed use space for creating ideas or to rest your mind.

Thinking of common spaces and functions all together and analysing the methods of integration into architecture is a new type of thinking architecture for Sofia.

"...the desire for community living is winning over more and more individuals who are looking for real contact with their neighbours, the experience of using spaces alongside others, the resolution of urban frictons, the haring of common spaces, and the collective experience in general" (New forms of collective housing in Europe. p35)

2.1.2 Humans and environment

"Man's insistent search for a home of his own is being confronted, in a time of generalised urbanisation, with a whole range of new complexities. To the realisation that the practical use of urban space involves a physical disconnection from the place of residence is added that of the importance of the relationships that surround it. With places of work and leisure being scattered ever more loosely over a wide geographical area, there has been a revival of interest in belonging to a genuine neighbourhood" (New forms of collective housing in Europe. p44)

Living in the city is becoming an economical and sustainable trend. This aspect is linked to a variety of city features such as bikeability, walkability, good infrastructure, abundance of ammenities, supporting local businesses, etc.

It is essential to understand that individuals are often surrounded by environments that were once natural. In today's surroundings, most of what we occupy, live in, work at, or visit, is creation of humankind or has been altered or affected by other people. In an urban setting, such as Sofia, much of what we see are results of human intervention. We have slowly taken over the natural world, leaving few fragments of what we could consider natural to the environment.

In these circumstances, each individual will have a different perception of what is a natural atmosphere. And each of their perceptions brinds a different kind of joy, delight, and excitement to them. To understand this, let us observe the followin examples of what we perceive as our natural environment:

• the sunlight that filters through our bedroom window every morning

• people's sporadic activity around our flat

• books, tools, music, computer, that provides us things to do on a day to day basis

This should tell you that our natural environment in the morning creates a lively morning for ourselve, and people's activity around our flat tells us that

we are not isolated. With these facts we automatically perceive an environment for ourselve that we personally enjoy.

As a human being we all know that good or bad situations or places can affect human's state of mind in a negative or positive way.

Understanding that architecture has implications on a person's emotional behavior highlights the complexity of shared housing.

"This is the true nature of home - it is the place of peace: the shelter, not only from injury, but from all terror, doubt, and division. In so far as it is not this, it is not home.. it is then only a part of the outer world which you have roofed over.."(Ruskin, 1865)

To understand what is a home we should ask What elements of architecture can affect individual characteristics of a human being in apositive manner?

A home can be characterized along six dimmensions: It should be a haven, providing security, refuge and protection. It should have order, both spatially and temporally, it should express identity, which would be a result of the transformation from house to home, it should provide connectedness: to people, place, past and future, it should radiate warmth both symbolically and interpersonally, and finally it ought to be physically suitable in order to match the psychological needs of its users (Strumse, 2008).

Cruz (2010) reported that architecture that contributes to social well-being of a community is "less about the physical building, and more about social flows". He states that density is not just about the size of the area, but the number of social and economic exchanges. In a social climate, like today's especially in large Metropolitan statistical areas, social exchanges are more on the negative side than the positive. (Cruz , 2010)

This simply means that humanism is lacking in such places.

Davis says that architecture reflects social attitudes aspirations, and values. He claims that much of the history of architecture in respect to housing
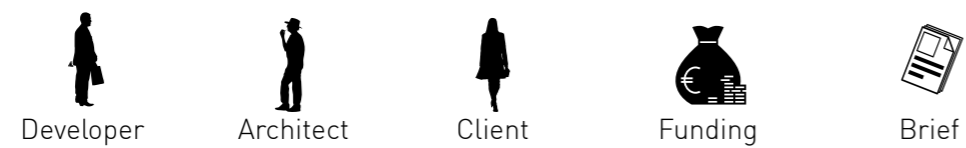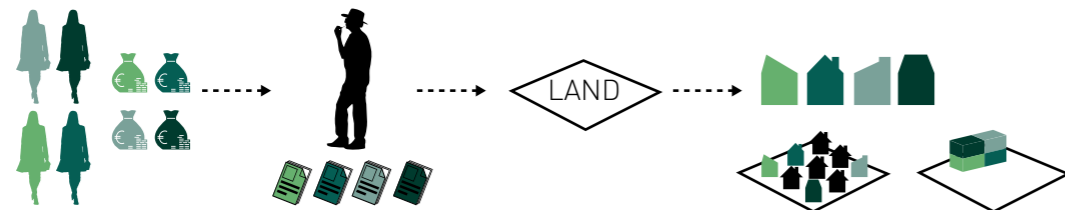
Conventional Speculative Housing
Developer-led, one-size-fits-all.
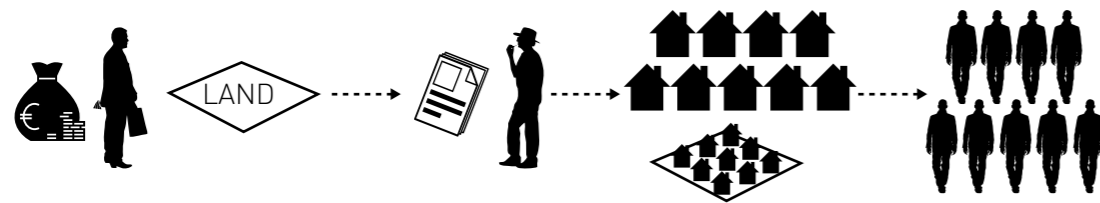
Custom Build Proposal
A group of clients with an architect
designing to their needs, strong
client input, large cost savings.

Developer   Architect   Client   Funding   Brief

has suffered a negative attitude that those at the lower end of the economic scale deserve little, and certainly not a well designed building (Davis, 2006).

However, in the 1960s, many architects began to evaluate how a dwelling reflects identity, both to the individual who inhabits there and to others. Ärchitects began to realize that good buildings can improve the quality of life both physical and emotional". (Davis, 2006).

Summarized, our findings revealed that designers have taken building design one step further, by taking human interactions as a major consideration in the design and thinking more about the connection between the habitants than the disconnection followed from the rise of the privacy level in the design..

2.2   Planning aspects

2.2.1 Site analysis

The analysisof the building site is being made following the characteris-

tics of:

1.Wind breaks
Due to the almost constant wind in Sofia with direction North-South and West-South, the wind breaks are important for the design of the building since we analised and took the natural ventilation system for our proposed design.

2.Shade from existing buildings and trees
Watson and Labs (19830 recommend placing a building in such a way that it gets shading from existing trees and landmasses. For this reason the shaded south side of the building is left with less pores. The shading provide air movement for ventilation if wind breaks are absent and help to keep buildings cool through the shade provided by surrounding buildings.
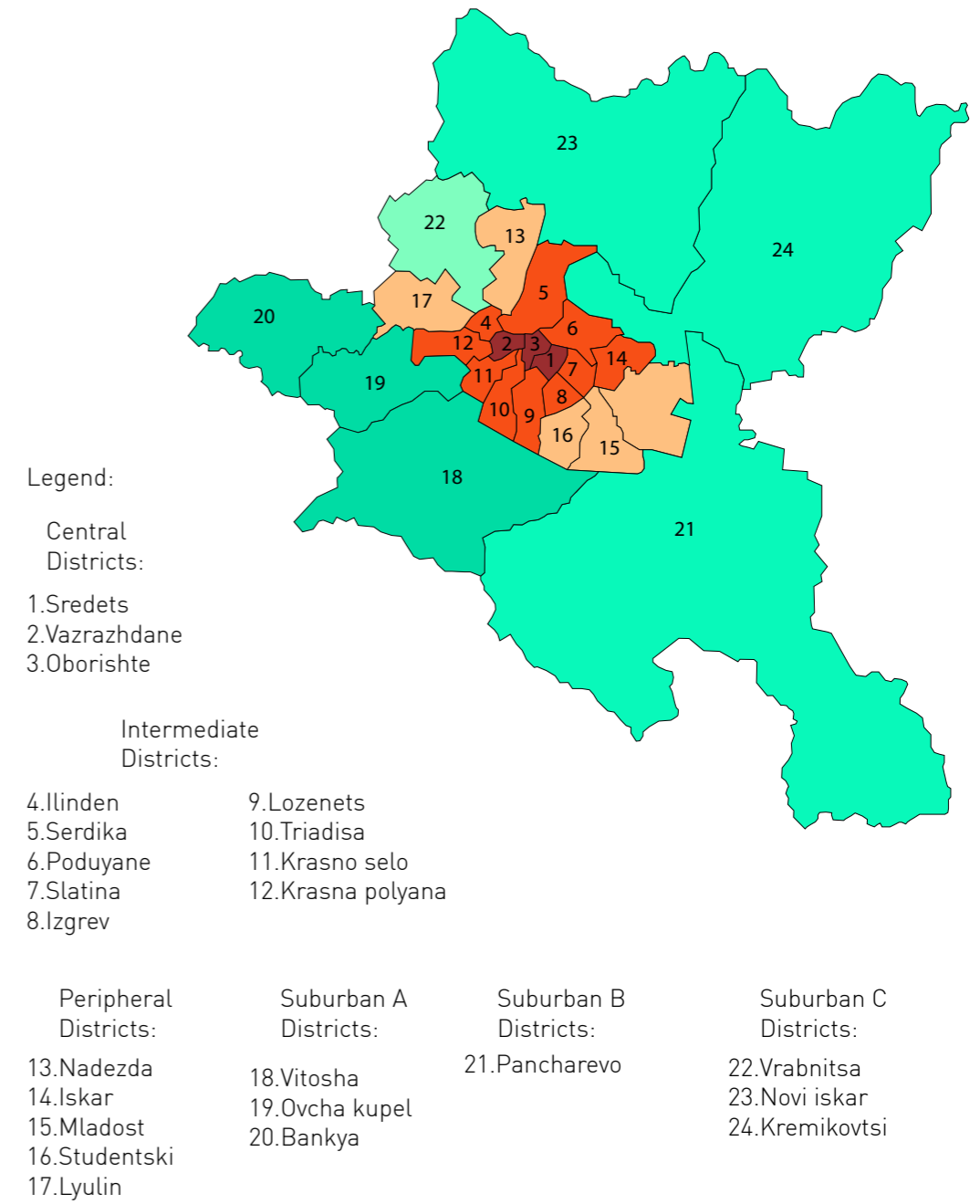

The site we select is currently stated for a residential building construction. It is situated in the highest and most communicative part of the Lozenets district, on the crossroad of boulevard Tscherni Vrah to the west, str. Korab Planina - to the north and str. Bigla - to the south. The main void of the building composition is situated to the south, east and west, and the vertical connections are to the north and west - staircases and panoramic elevators.
The main approach to the building are from the two survice streets to the north and south, with a main entrance to the west. This way the single residential void is detatched to the east lot boundary and provides enough green space to the boulevard in the shape of balconies and terraces, and provides in this way light and space infront of the sports facilities, the bar-coffee and the shops in the basement level.
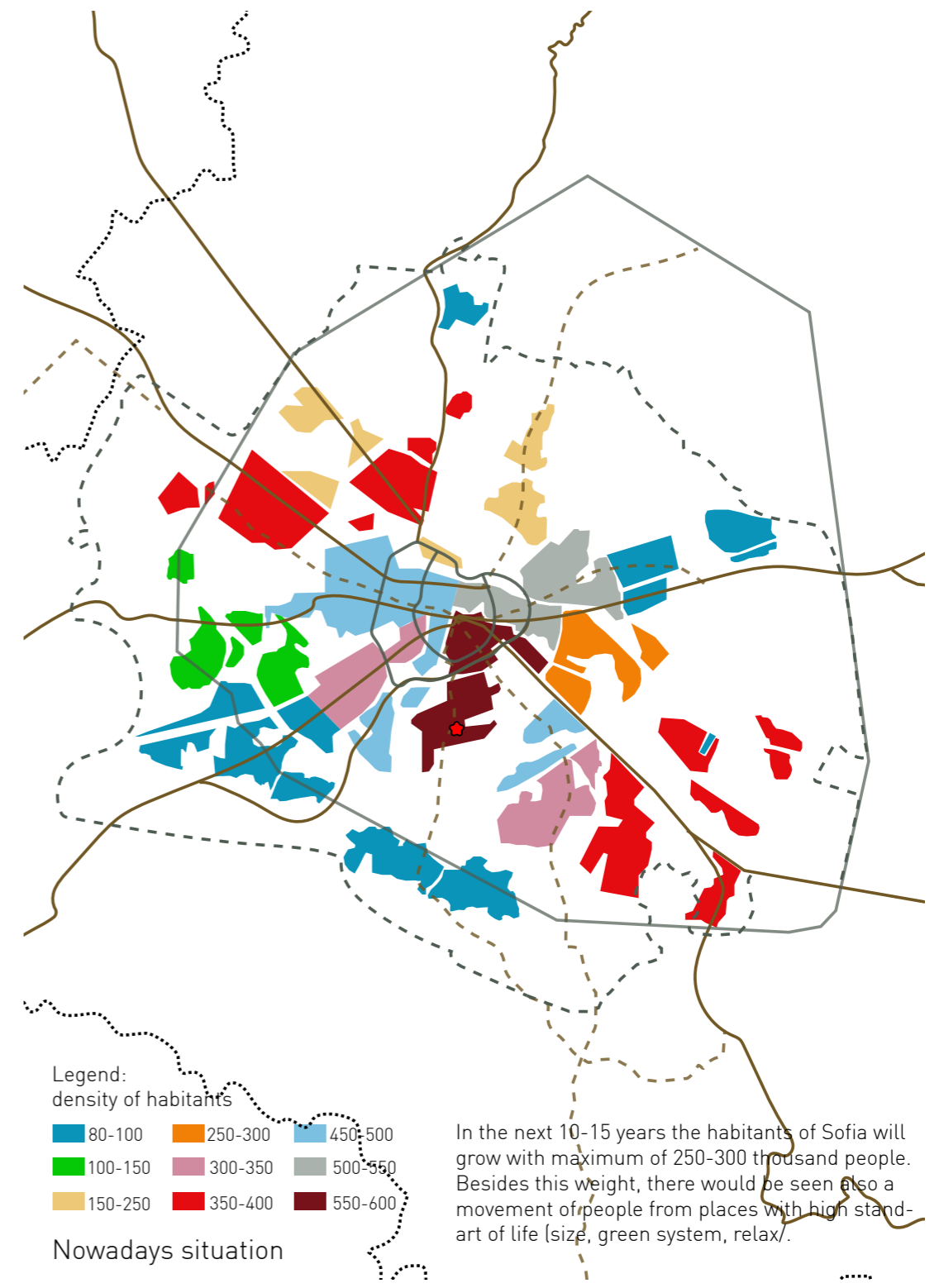We have selected (site) because it is currently for sale, unoccupied and is located in market with a need for a modern multifunctional residential building. The situation is realistic and opportunistic. In addition, it is one of only a handful of permit-ready multifunctional residential projects in Sofia.
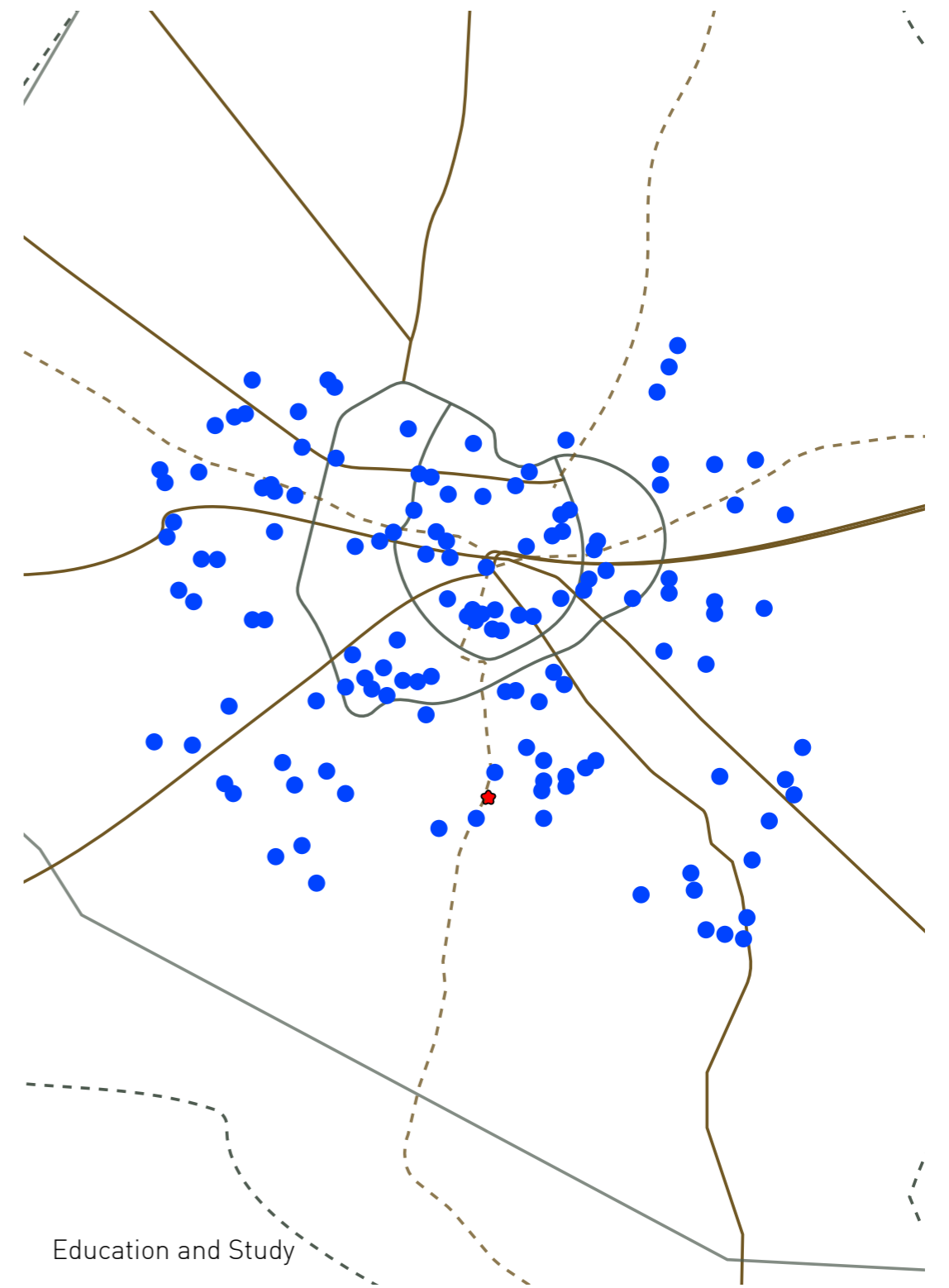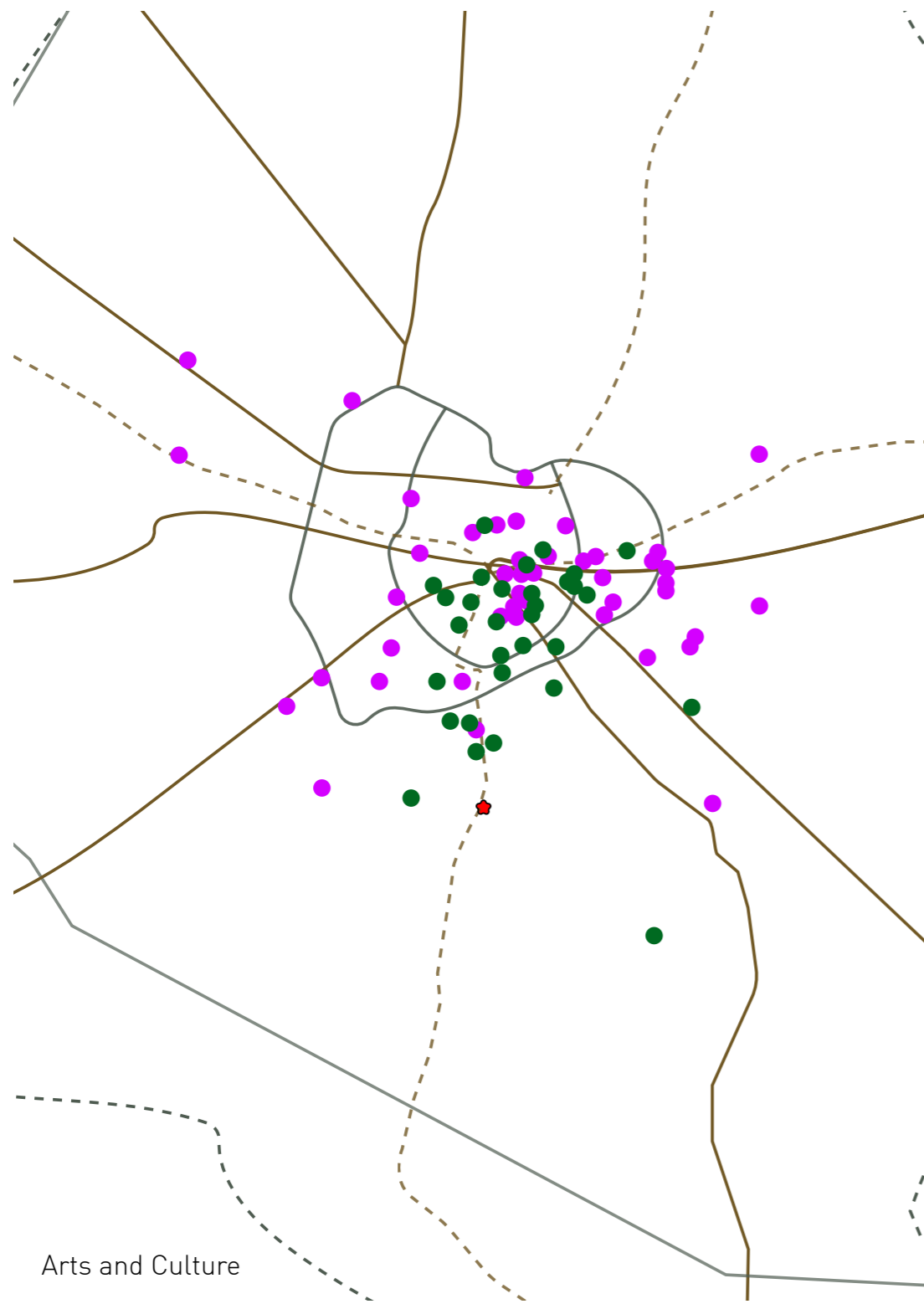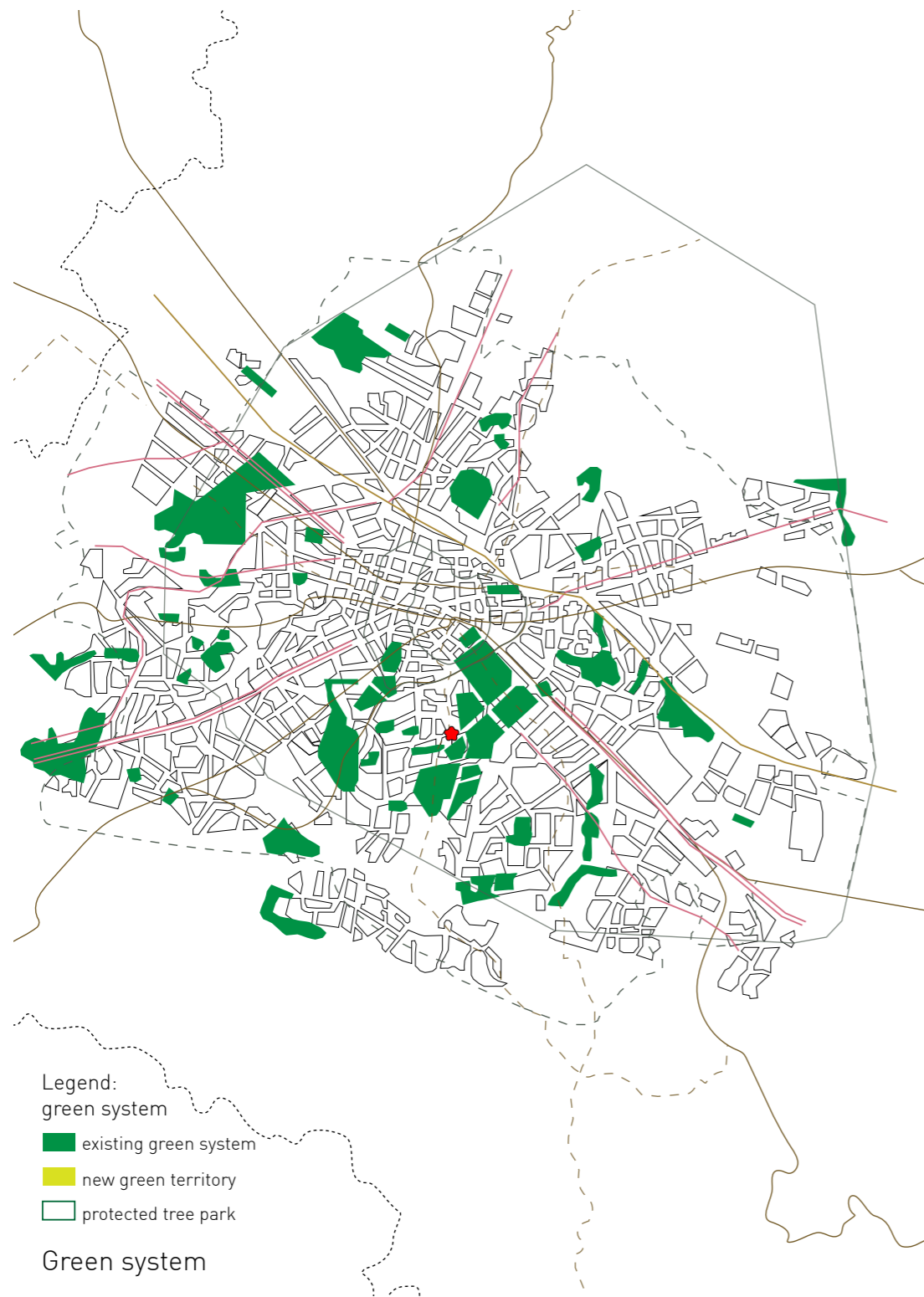
Territory of Sofia municipaly

Legend:

Central
Districts:

1.Sredets
2.Vazrazhdane
3.Oborishte

Intermediate
Districts:

4.Ilinden
5.Serdika
6.Poduyane
7.Slatina
8.Izgrev

9.Lozenets
10.Triadisa
11.Krasno selo
12.Krasna polyana

Peripheral
Districts:

13.Nadezda
14.Iskar
15.Mladost
16.Studentski
17.Lyulin

Suburban A
Districts:

18.Vitosha
19.Ovcha kupel
20.Bankya

Suburban B
Districts:

21.Pancharevo

Suburban C
Districts:

22.Vrabnitsa
23.Novi iskar
24.Kremikovtsi

Districts of Sofia

Districts of Sofia

Legend:
density of habitants

80-100	250-300	450-500
100-150	300-350	500-550
150-250	350-400	550-600

Nowadays situation

In the next 10-15 years the habitants of Sofia will grow with maximum of 250-300 thousand people. Besides this weight, there would be seen also a movement of people from places with high stand-art of life (size, green system, relax/.

Arts and Culture

Education and Study

Legend:
green system

■ existing green system

■ new green territory

□ protected tree park

Green system

The almost missing green areas of the city in the future are supposed to grow and develop. The future plans involve connection between the city center and the protected tree parks Vitosha, Pan-charevo, Bankya, Iskar river.

Green system

Green Areas

2.2.2 Building form
The urban composition - a single void, surrounding a green space, and the development of the building as tracing dwelings - gardens, are based and in relationship with the concepts idea of creating a self sufficient residential organism, that is not completely separated from the chaos and breathtaking dynamics of the urban life, but with visual boundaries, providing "green" peace and safety, and in the same time in an immediate and convenient connection with the required utilitarian service.
The project is an expression as of the desire to combine the advantages of residential buildings with a higher standard of living, as creating opportunities for recreation and social interaction, and the ability to work and sports.

2.2.3 Building orientation
Proper oriented buildings take advantage of solar radiation and prevailing wind. According to Gut and Ackerknecht (1993), the longer axis of the building should lie along east-west direction for minimum solar heat gain by the building envelope.
 The passive design feature on orienting the longer axis of the building towards east- west direction is not always possible,especially due to actual orientation of the site, that is, when the site itself is longer on the west and east sides. Such cases are outside the influence of the developer and the architect. In such cases, the west facade needs more attention because it heats up in the afternoon and important rooms such as bedrooms are generally used later during the day when residents return from office. The east side is less problematic as it warms only in the morning wwhen only few households occupy the major rooms. The wes t facade can be treated by locating auxiliary spaces, kitchen and staircases to minimize solar heat gain and openings should be avoided on the west and if they cannot be avoided, they should be adequately shaded by using verandahs.
It is important to note that the orientation requirement for wind flow can conflict with the requirement for solar protection.

Traditional Building   The Idea
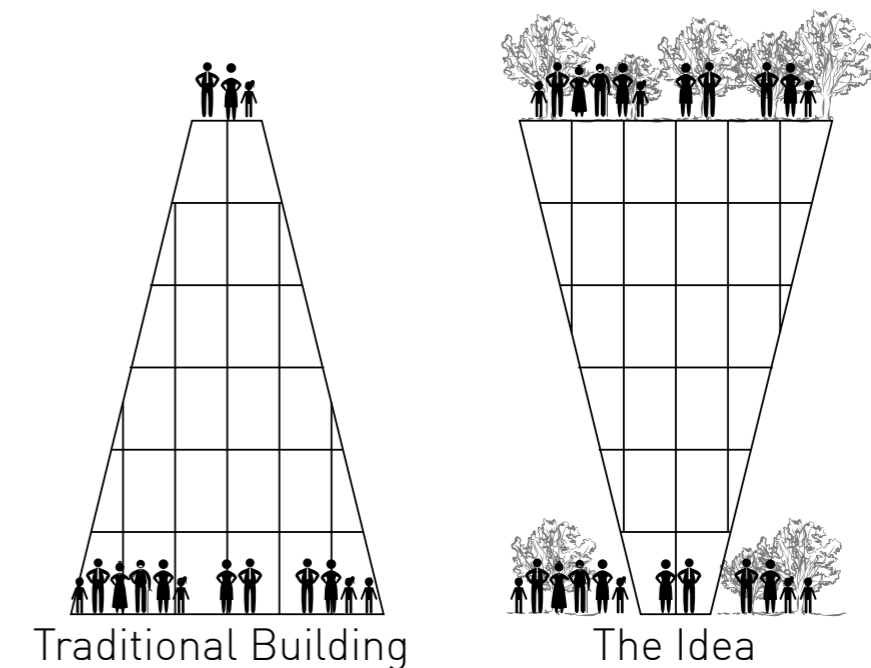
2.2.4 Room orientation and arrangement

According to Gut and Ackerknecht (1993), the arrangement of rooms depends on their function and according to the time of the day, they are in use. Watson and Labs (1983) have claimed that a house can be made more energy efficient if it is planned according to solar orientation and prevailing wind direction. However, they did specify how much energy saving is possible through such planning.

When designing a multi-unit residential building, architects design one unit and use the 'mirror command' to copy the plan of one unit in a definite position. The Mirror command in AutoCAD (computer application for architectural drawings) allows mirroring selected objects in drawings by picking them and then defining the position of an imaginary mirror line using two points. Architects misuse this command and do not consider the consequences. Though the design of the original unit may have proper orientations, it fails to meet the orientation requirements as soon as it is 'mirrored'.

The usual trend for orientation of rooms in residential buildings of Sofia is to give maximum priority to master bedroom followed by other bedrooms. Though dining spaces are used most frequently, dining spaces are rarely given importance. Living spaces are also not given due importance. Dining spaces are centrally located and perform more as circulation space. Owing to its central location and compactness of building form, dining spaces do not get adequate daylight and natural ventilation.

2.2.5 Landscaping

In Bulgaria the trend is being green in a sence that the parks and the tree gardens are being renewed or revived. The landscape architects are agains the idea of green architecture in which the trees are growing on the buildings due to the weather conditions and the lack of propriate tree kind on the territory of Bulgaria. But due to the global weather conditions the temperature on Earth rises every year and new kinds of plants are being formed. Due to this occasion the architects are projecting with the idea of the green vertical garden residential/office building.

Even though appropriate tree plantation can bring significant amount of energy savings, this design principle can only be applicable in buildings of Sofia if adequate space is left open either as a set back area or as designated green space. Due to this we organize our building with pores and loggias.

Land use

Connections

Green Computing System connecting all specific main functions of the architecture as one
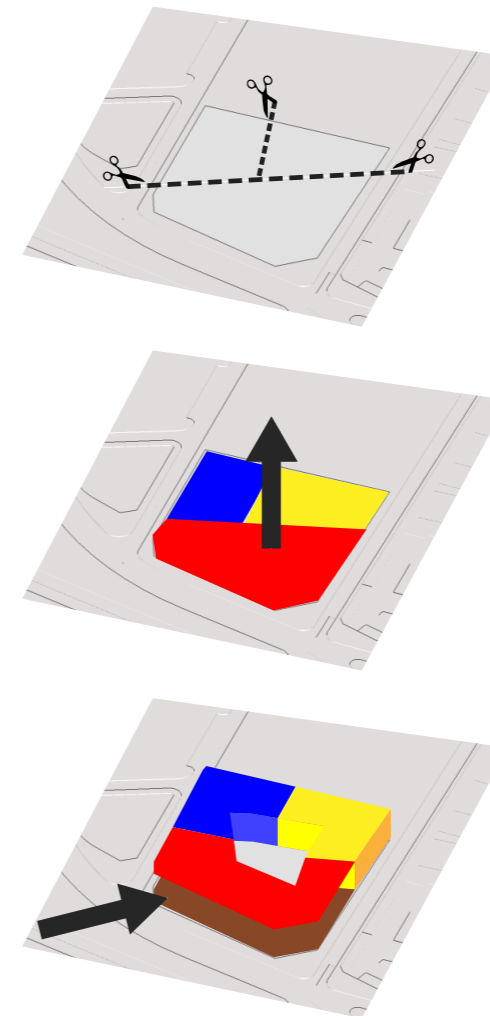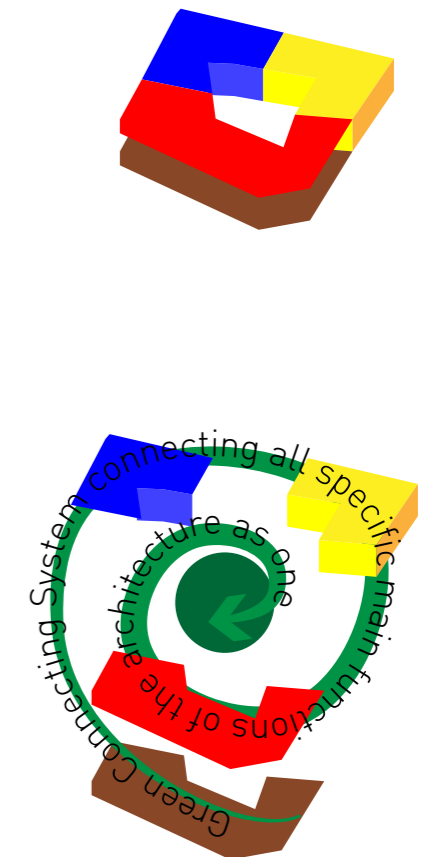
Office
Residence
Retail
Sport
Green

2.3   Building envelope

2.3.1 External wall

As the main goal in building design of tropical climates is reduction of direct heat gain by radiation through openings and reduction of internal surface temperature, the building should be designed with protected openings and walls (Gut and Ackerknecht, 1993). The walls can be protected by designing the roof so that it extends far beyond the line of walls and has broad over-hanging eaves.

Residential buildings in Sofia have 300 mm thick external walls made of brick to make most of the floor area and to reduce construction costs. It should be noted that older buildings had thicker walls ranging from 350 mm to 500mm. With the advent of multi-unit residential buildings due to increasing pressure on building land and structural system, thick walls were replaced with 300 mm walls. The local building material for external walls in Sofia is burnt brick and it is much cheaper when compared to the cost of concrete. According to Gut and Ackerknecht (1993), the transmittance value or U value (measure-ment of heat transfer through a given building material) of 250 mm hollow concrete block whitewashed externally is 1.7 W/m2. The U value of a 280 mm brick wall (115 mm brick + 50 mm air gap + 115 mm brick) including an air cavity of 50 mm and whitewashed externally is also 1.7 W/m2. These U val-ues suggest that energy savings from using brick instead of using concrete should be roughly the same as calculated by Wong and Li. Hence, for Sofia's context 280 mm brick walls including an air cavity of 50 mm can be used in-stead of hollow concrete blocks on east and west facades.

2.3.2 Building material

It has already been mentioned that this study focuses only on the energy used by a building during the operation stage. It will not consider the energy used in manufacturing the building materials and transporting the building materi-als from the production plant to the site. Neither will it consider the energy used in on-site construction activities and the energy used in the demolition of the building and the recycling of their parts.

As discussed in the previous section, burnt clay bricks are common building materials in Sofia.

2.3.3 Roof

The roof is an important element of the design when it comes to conserving energy because this part of the building receives most of the solar radiation and its shading is not easy. s the residential buildings are mostly six-storied, roofs are flat for aesthetic reasons.

Green roofs have been increasingly investigated in order to determine how they could improve the quality of the urban environment. Teemusk and Man-der (2009) have described green roofs as consisting of the following layers: a water- proofing membrane, a drainage layer, a filter membrane, a substrate
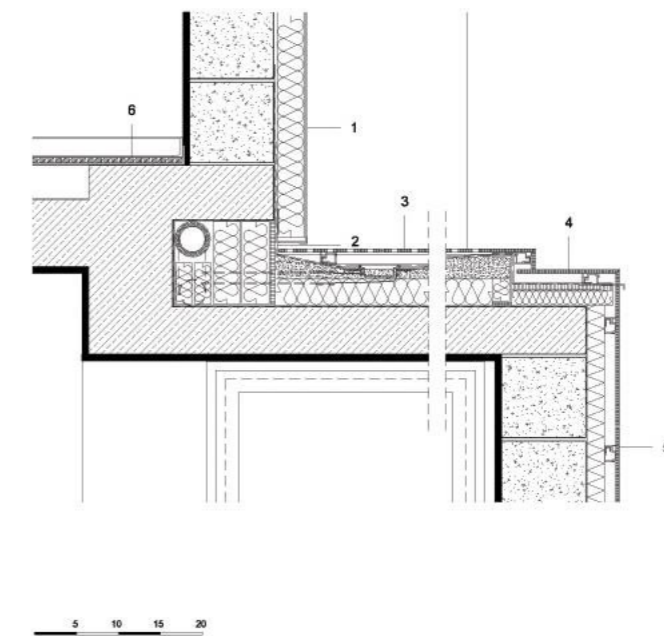

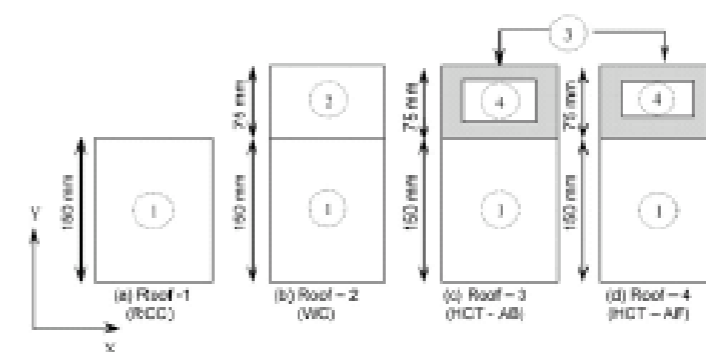**Fig. 1:** External wall construction

Fig. 2: Roof structures under investigation (uni-form width of 75 mm) (material: 1-RCC, 2-WC, 3-HCT, 4-air)
Source: Vijaykumar, K.C.K., Srinivasan, P.S.S. & Dhandapani, S. (2007).

layer and plants ; the composition and thickness of this substrate layer is decisive.

Accessible roof gardens are known as intensive green roofs and are found in the new building developments. These roof gardens are accessible by people and are used as parks or building amenities. Hence, they usually incorporate paving and seating areas. Their increased weight, higher capital cost, intensive planting and higher maintenance requirements characterize intensive green roofs. Inaccessible roof gardens, on the other hand, are known as extensive green roofs. They are not designed for public use; instead they are mainly developed for aesthetic and ecological benefits. They are distinguished by being low cost, lightweight (50–150 kg/m2) and with thin mineral substrates. Minimal maintenance is required and inspection is performed one to two times per year.

Despite the benefits that have been discussed about roof gardens, there are disadvantages of roof gardens that need to be considered before they are planned. Gut and Ackerknecht (1993) have reflected upon the following disadvantages of roof gardens:

• They add a heavy load on the roof structure.

• Reliable waterproofing of the roof is not easy to achieve.

• Roof gardens reduce heat emission at night.

• Draining channels and outlets may get clogged.

• High water use of roof gardens should be considered in regions with scarcity of water.

2.3.4 Windows

The windows are important part of the architecture. The size of the windows is chosen according to the maximum admitted daylight in the room. The structural design of the windows is thought with natural ventilation. They provide enought light but they do not let the room difficultly heated during the winter season.

Ventilation is the movement of air. According to Watson & Labs (1983), ventilation has three useful functions in the building sector. It is used to:

* satisfy the fresh air needs of the occupants

* increase the rate of evaporative and sensible heat loss from the body

* cool the building interior by an exchange of warm indoor air by cooler outdoor air.

Chapter 3
Methods of Analysis

3. Materials and Methods

3.1 Research methodology

The research study consists of three clear stages of work. Began as a desk work in Milan was later extended into field work and survey in person in Sofia. The first stage of the work progress defined the theoretical framework for this research paperwork. In addition, it identified the methodology of analysis and issues that were investigated later in the case studies. This phase, done completely as a on desk work, encompassed extensive literature reviews of books, journal papers, researches and documents to identify the principles used as a base for designing a multifunctional residential building with main focus on the common spaces and functions in the architecture that could be used for the context of Sofia as a city nominated for capital of culture in 2018.

The second phase involved a field trip to Sofia that was accomplished during the summer break time at the beginning of August. The fieldwork consisted of visits to the University of Architecture, Structures and Geodesy and interviews with the residents of the city of Sofia. Survey was made also on the site and interviews were taken with te guests of the nearby hotels and the workers at the nearby corporation headquarter. Quantitative and qualitative data were collected from the field trip and the survey. All the information that was analyzed during this phase was intended to fulfil the structure outline in theoretical framework formed in the first phase. As the fieldwork was done during the summer, temperature readings for the winter season were taken from additional paper references. Secondary sources such as articles in local newspapers or in the internet were also used to complement the information. The limits for integrating common spaces and functions, creatung natural ventilation and light suffieciency in residential buildings were investigated in this phase by interviewing professors, architects and other concerned people.

The third phase comprised of a desk study for the second time to analyze and evaluate the data from thefirst and second phase studies using quantitative and qualitative methods. The data on light/shadow of different flats/units in the building were analyzed quantitatively and the design features of the apartment were analyzed both quantitatively and qualitatively according to the basic design principles laid out in the theoretical framework.

Light studies based on maximum light and natural ventilation in the flats that were identified through literature review were summarized and analyzed quantitatively to determine the energy savings of all the features that could be applied in the context of Sofia. Calculations were then made to see how much light the flats of the proposed building project could get, by adopting the light efficient design principles.

3.2   Case study methodology – Cooperative housing

3.2.1 Research design – Design principles of Co-housing

3.2.1.1 Sightlines
Careful design of slightlines can be used to tie a community together and pro-
tect the privacy of individuals.

3.2.1.1.1   Clear views
• Houses to common house
• House to house

3.2.1.1.2   Blocked view or screened view
Public areas into semi private and private areas
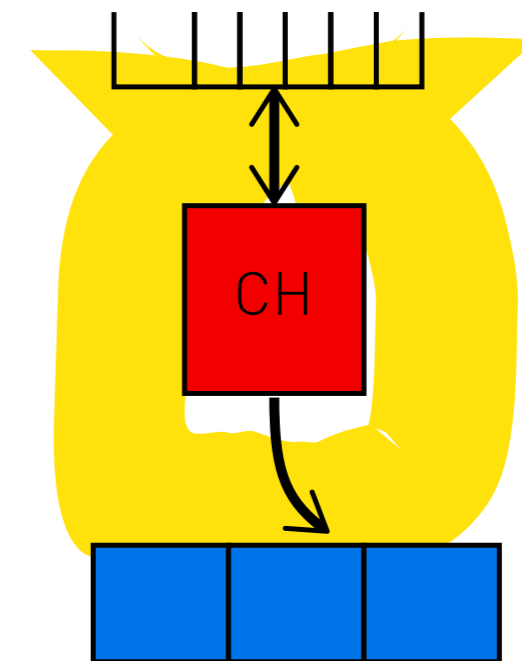
Fig. 3: Circulation Diagram

3.2.1.2 Circulation

Daily routines can create opportunities for social interaction
- Locate buildings and route paths so that frequent trips will cause members to pass the common house or travel through communal areas.
- Consider connections with the surrounding neighborhood. What are the appropriate levels of control and of interaction for entrances to the community?
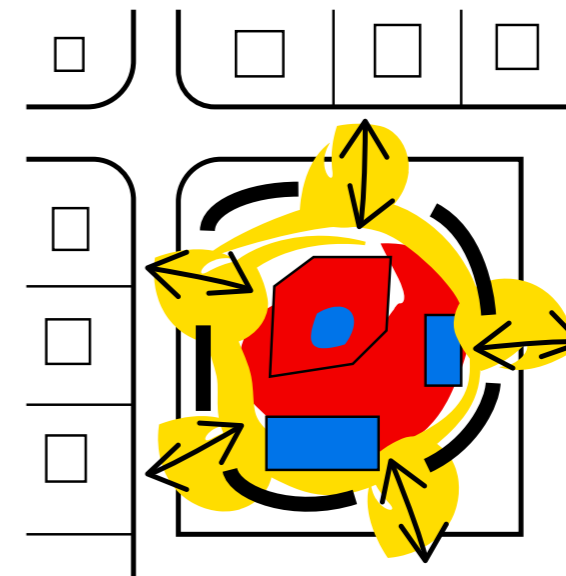
Fig. 4: Boundaries Diagram

3.2.1.3 Boundaries

Clear demarcation of physical areas can help clarity of ownership and help clarify appropriate social interactions

3.2.1.3.1   Soft boundaries
• Low fences/walls
• Low landscaping
• Built forms such as steps or benches
• Fences/wall allowing a filtered or screened view
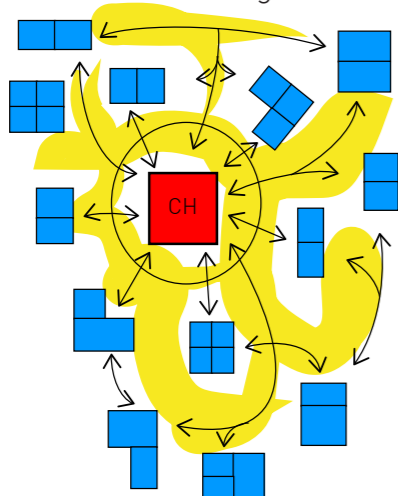
Fig. 6: Dispersed community layout Diagram

3.2.1.3.2   Hard boundaries
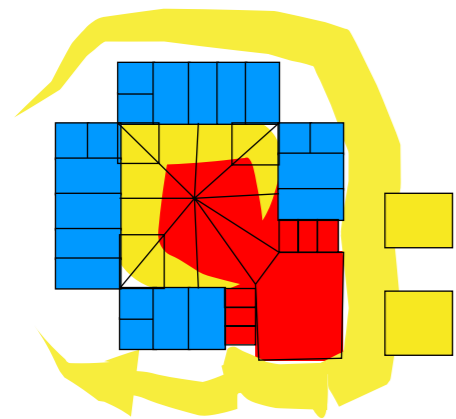
• High fences/walls and opaque landscaping

Fig. 5: Hybrid community layout

• Sides of buildings

3.2.2 Examples of community layout
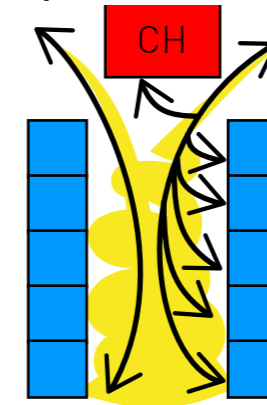
Fig. 7: Linear community layout Diagram

3.2.2.1 Linear
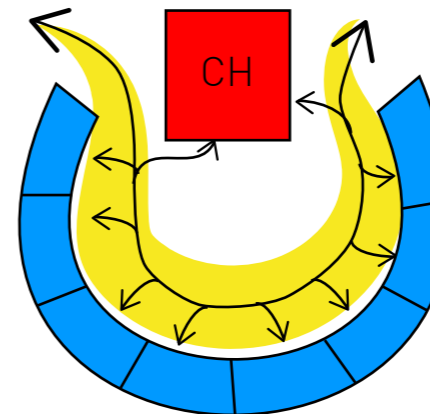
Fig. 8: Central community layout Diagram

3.2.2.2 Central courtyard
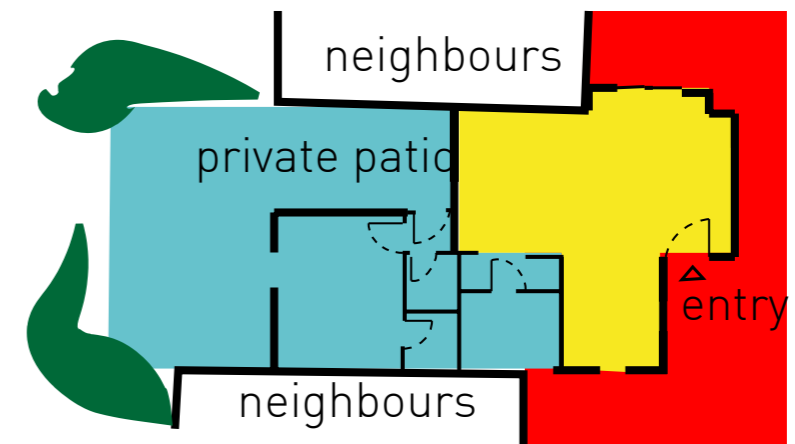
Fig. 9: One-storey units drawing A

3.2.2.3 Dispersed
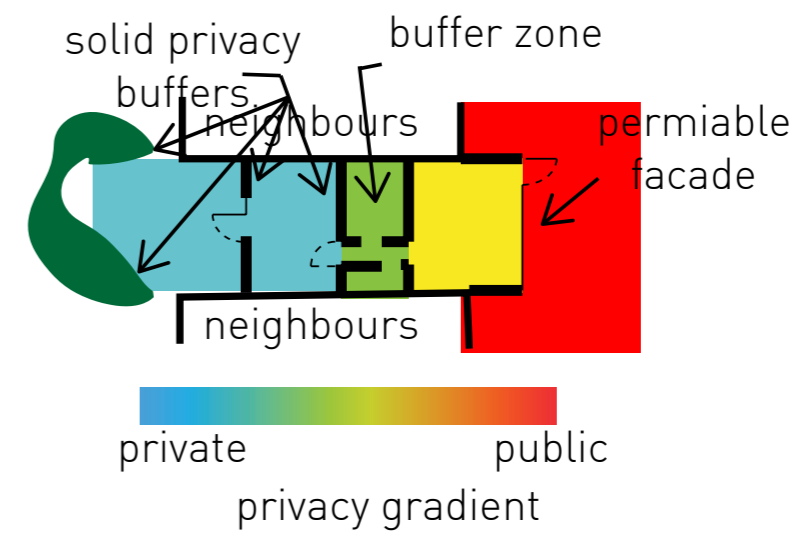
3.2.2.4 Hybrid

Fig. 10: One-storey units drawing B

Staggered units

3.2.3 Co-Housing - achieving privacy amidst community

3.2.3.1 One-storey units
- Privacy without level change is harder
- Create visual and auditory barriers
- Create a layered space with the private zones away from the community spaces
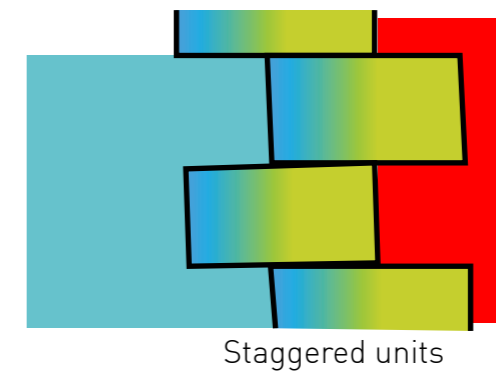
Fig. 11: Unit relationships drawing A

fokus

spread

Control view
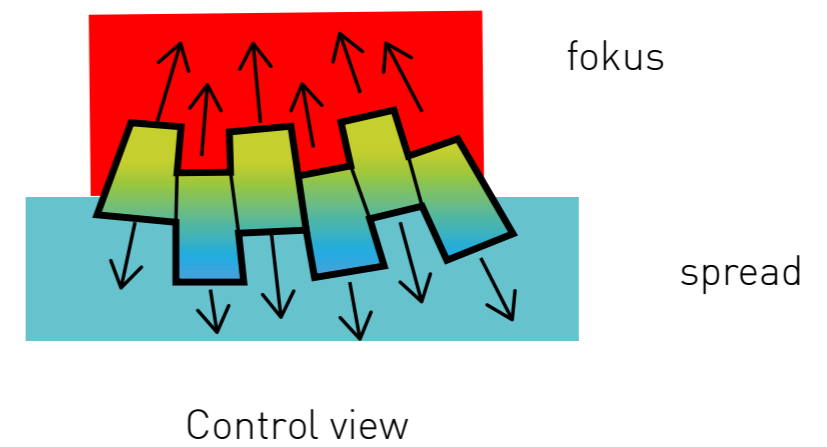
Fig. 12: Unit relationships drawing B

3.2.3.2 Unit relationships
- Be aware of your views
- Buffer private zones with intermediate space
- Use unit placement as your advantage

BR   BR
2nd floor **plan**

Living   KIT   public entry
1st floor **plan**

BR   public entry
section

Fig. 13: Multi-storey units drawing A

shared wall

private space

shared wall

privacy divides   **plan diagram**

most private

private

private   intermediate   public

section diagram
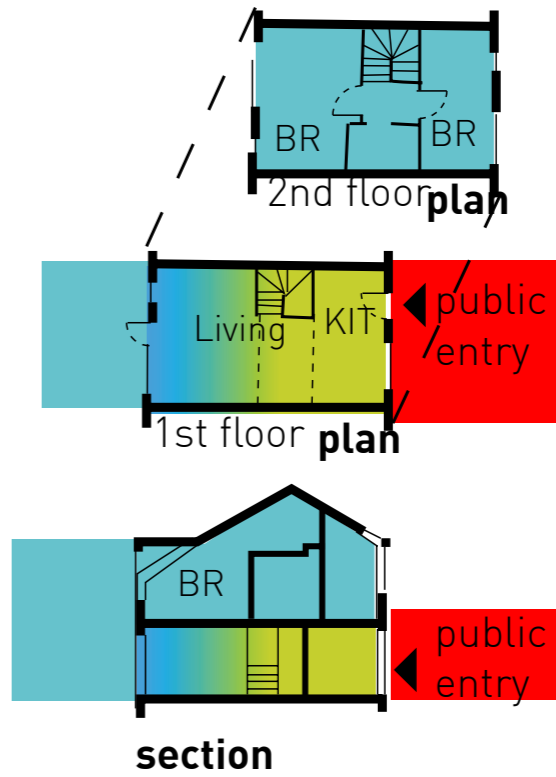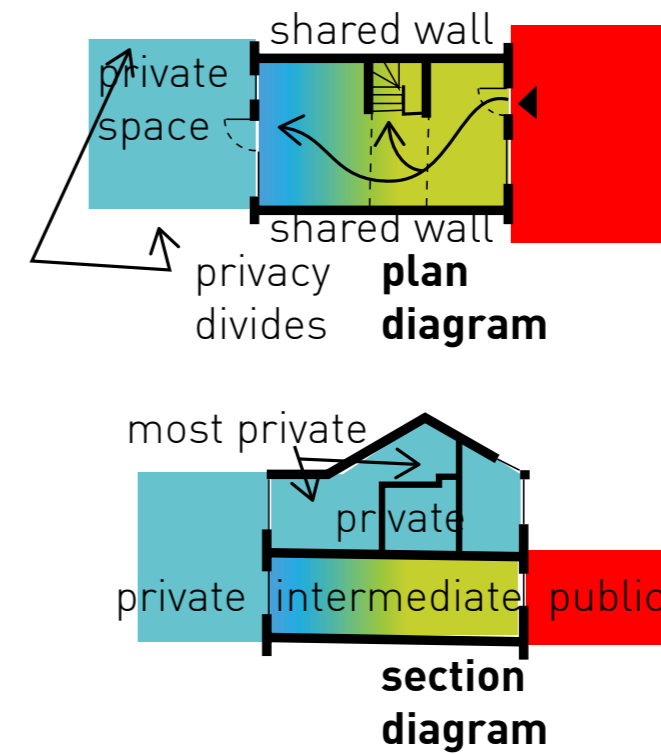
Fig. 14: Multi-storey units drawing B

Fig. 15: Example section A

3.2.3.3 Multi-storey units

- A small upstairs or loft creates a very private space
- Walking up stairs separates you psychologically and visually from below
- There are more options for privacy above as the rooms can not be approached directly by the outside community nor viewed as readily
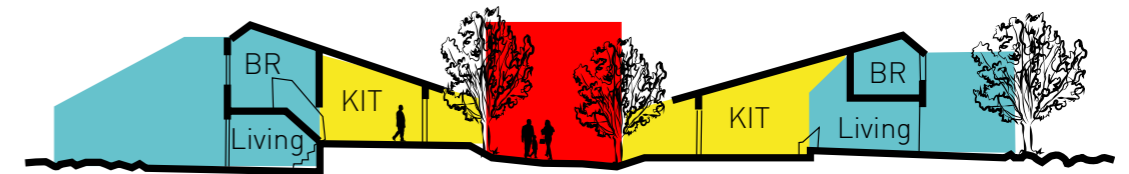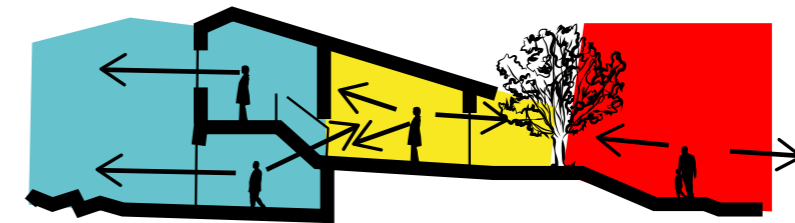
Fig. 16: Example section B

3.2.4 Small changes in grade
- A few steps or a gradual hill provides both visual and auditory shelter
- Lowering the common area or raising the units creates privacy
- Level changes can be easily created in flat places

3.2.5 Selection of case studies
In this research, the three case studies are residential apartment buildings with mixed use. They are chosen for the analysis of the cooperative living and working. The primary case is the use of the common spaces and the way they are integrated in the building, what are the common functions of the working and the living. The organization of the flats as of level of privacy is the embedded topic of analysis. The selection of the buildings for the research is based on the following criteria:
- It is representative of typical multifunctional residential building design
- The architectural drawings of the apartments were available
- The households are cooperative
- The common spaces and functions are part of architecture

3.2.6 Issues investigated
Apart from the design aspects that were identified in the theoretical framewok, the following issues in the case studies have also been investigated:
- energy use practices of households (appliances used, energy by those appliances)
- energy use for cooling and lighing in typical multifunctional residential building
- program use of green areas and open spaces
- general living pattern of the households
- role of the architects, developers and interior designers in the design
- role of architects, developers, interior designers and clients in creating barriers for designing multifunctional residential buildingcommon amenities provided by the developers in typical multifunctional residential building

3.2.7 Data gathering strategies

By dividing the data gathering strategies nto a mixture of qualitative and quantitative approaches, were adopted thefollowing different combinations of data gathering strategies:

- qualitative and quantitative physical survey of the case studies
- qualitative and quantitative semi-structured interviews that have closed questions
- quantitative calculation of energy use
- qualitative and quantitative architectural drawings of the cases
- archival records of computerized quantitative statistics on the climate of Bulgaria
- quantitative statistics from newspaper clippings
- photographics (qualitative and quantitative)

3.2.8 Evaluation and Analysis of the investigated cases

The data gathered called for a number of different methods of analysis in order to find connections between the object of research and the otcomes with reference to the original research questions. Throughout the evaluation and analysis process, options were kept open to new opportunities and insights. Data has been categorized and recombined to address the initial purpose of the study. Focused, short, repeated interviews were necessary to gather additional data to verify key observations or check the known data. Data was analyzed y placing iinformation into array, creating tables and spreadsheets. Specific techniques include placing information into array, creating matrices of categories, creating pie charts, tables and spreadsheets.
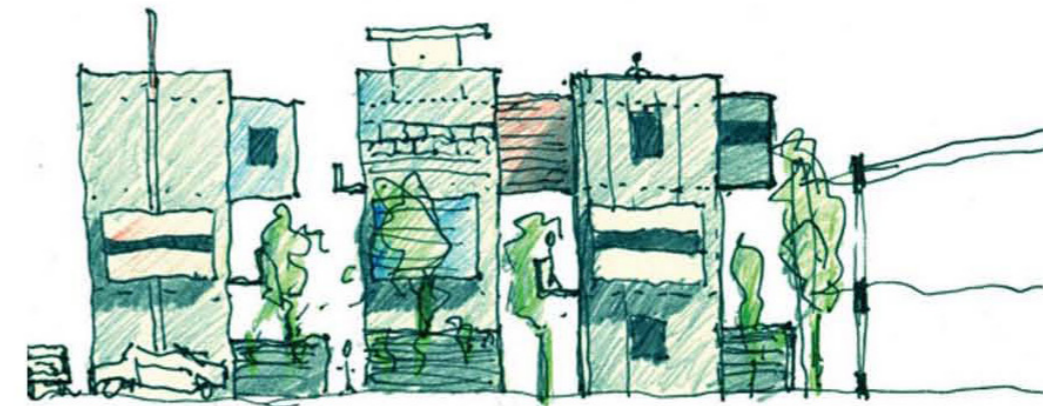
3.2.8.1 *Case study: Urban Metasis*

Project: Rag Flats

Architect: Onion Flats (Timothy, Patrick, Johnny McDonald, Kurt Schlen-laker)

Building type/Program: Residences, Community Garden, Gym

Size: 25,000 sq. ft.

Price: $3.6m USD

Location: Fishtown, Philadelphia, PA

Built: 2005 (opened 2006)

Number of floors: 5

Number of flats: 11

Amenities:

Background: Fishtown is a neighbourhood near Delaware River in Philadelphia. It was during the 1830's where fish market industry thrived at that time and mainly consisted of run-down houses mainly inhabited by Irish Catholic families. Decades after decline of industries in Pennsylvania the area still has been a working class district until the revitalization opportunity came.

Onion Flats, architectural-developer firm, kicked off with building 11 affordable multifamily housing in and around a former rag factory. From the last 10 years before the purchase, the then-abandoned factory was a dumpster with feral stray cats. They first bought a borded up, five-storey factory (circa 1820's) from a masonry contractor and maintained it ever since. Using much of the original brick envelope and experimenting with materials they transformed the property into stylized residences, each unique with architectural character. This is Onion Flat's early projects to propel sustainable, affordable, community-engaging and hands-on design across America.

Initial observations:

Urbanity

From Architectural Record:

The Factory's shell serves as a starting place for various types of dwellings. The original rough-hewn red brick became the front and the sidewall of two lofts, with two row houses on the street-facing side, and a single one-storey pavilion and five three-level units filling out the back portion of the site. Called Trinities, the three-storey units are one of Philadelphia's most charismatic residential building types.

There are eleven houses in this complex, five of them are three-storey residence called "Trinities". All eleven units surround an interior courtyard of bamboo gardens, parking areas placed with textured turf pavers. Every Trinities space (approx.. 20' x 20' in block) features both indoor and outdoor spaces equipped with features one would find inside the house.
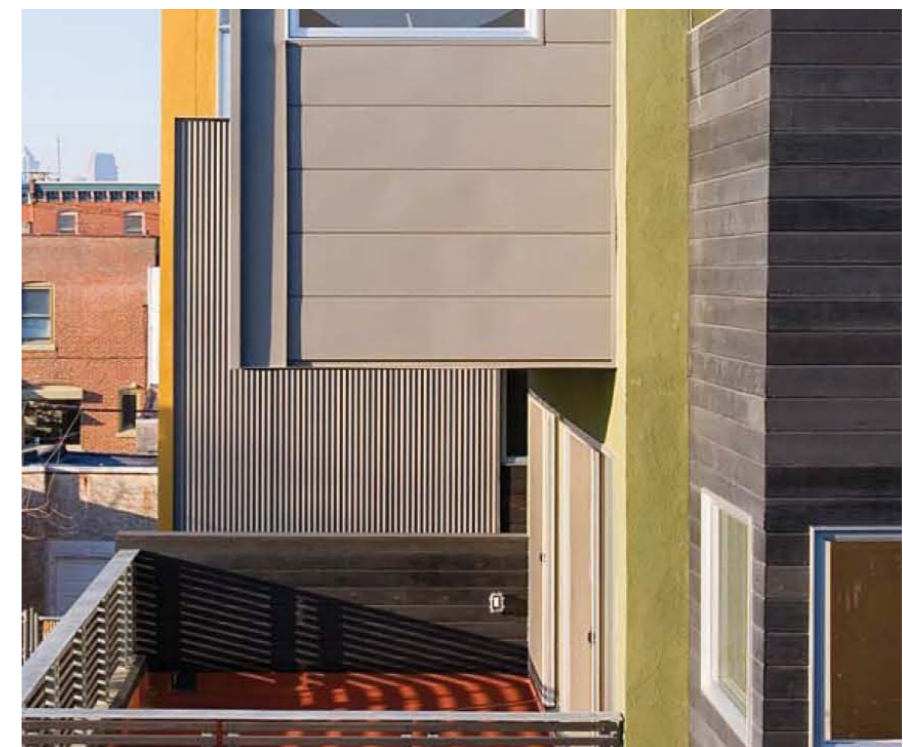
Ecology

Tim, Pat and John McDonald all have architectural degree, plumbing knowledge and finance/market expertise. Tim has worked hard to preserve most of the building façade through experimenting Cor-ten steel, glass, wood and stucco for grafting onto existing envelope.

Pat has experimented, and built a prototype of water collection system. His system collects up to 1580 sqm of rainwater collection that harvest and reutilize rather than pay exorbitant fee of irrigated city water. His system is only $600 a piece, and the City of Philadelphia praised them for innovation. Planner and research of Philadelphia water works Chris Crockett quoted that Onion Flats has stepped up in creating sustainable development and now the city charges ahead requiring all developers to implement storm water collection rather than diverting it into city sewer.

More importantly, the City lies at the floodplain of the river, prone to flooding so this has attributed to push for conserving rainwater rather than importing them from neighbours.

Things that worked:

The knowhow water system collector is contributing in a good way to the architecture.

Things that did not work:
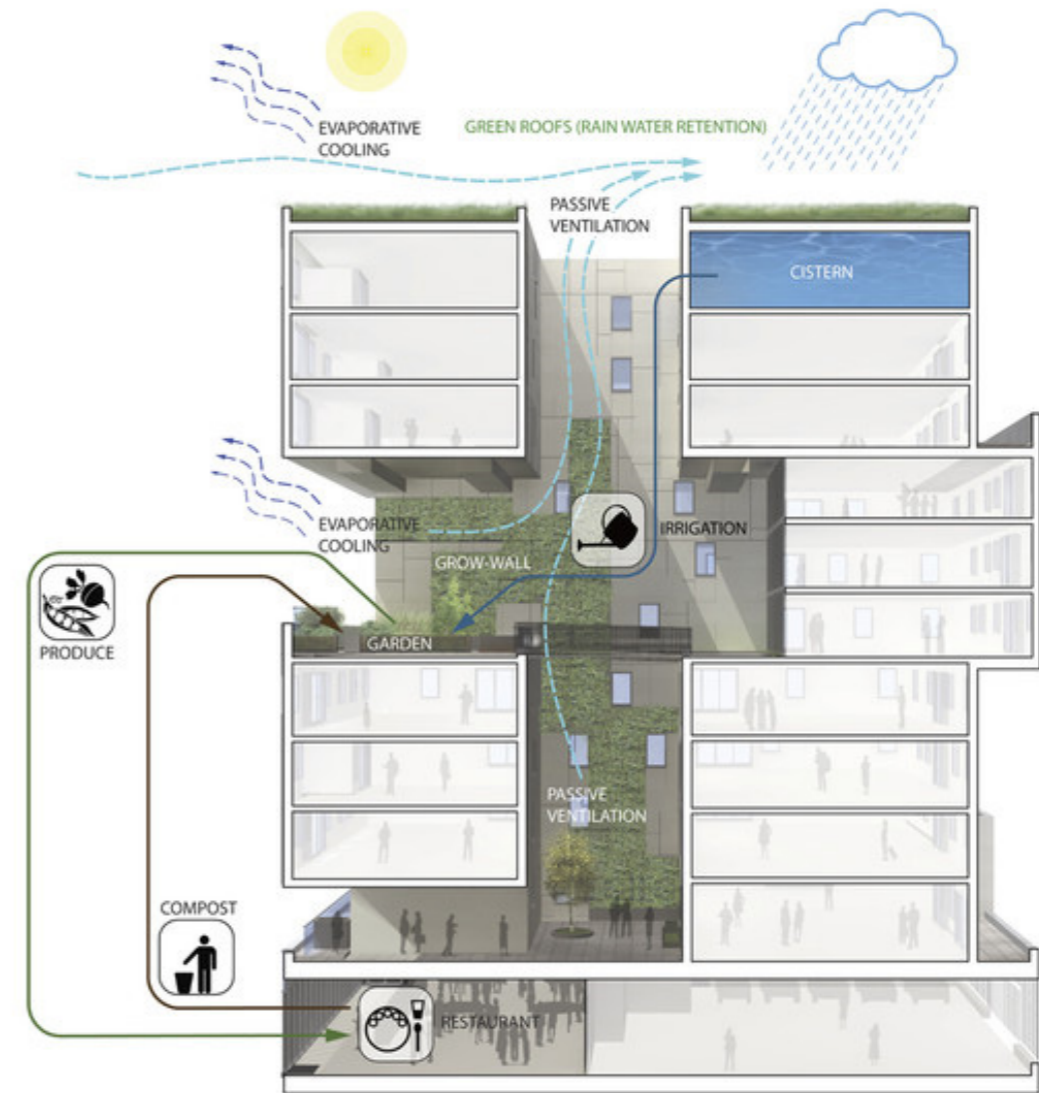
3.2.8.2 Case study: Sun, Earth and Sky

Project: 60 Richmond St.E.

Architect: Teeple Architects

Clients: Toronto Community Housing Corporation

Building type: Residences, Community Garden, Restaurant, Training Kitchen

Size: 99,565 sq. ft.

Price: $20 m CDN

Location: Regent Park, Toronto, ON

Number of floors: 11

Number of flats: 85

Built: March 2010

Amenities:

1:200 Second Floor Plan

N ↑

Residential Corridor
Amenity Space
Outdoor Amenity Space

1:200 Ground Floor Plan

N ↑

Support and Service Space
Residential Lobby
Restaurant and Training Facility

Background: In the late 1940's, Regent Park, a 69-acre brutalism mid-rise tenement buildings appeared to serve the city's bludgeoning growth of immigrants coming into the city. Regent Park, hard hit by poverty and crime, has made Toronto's downtown uninhabitable and socially marginalized. From 2005 and onwards, the city and its agency, Toronto Community Housing Corporation, sought to revitalize the run-down neighbourhood through addition of green design, starting with demolishing the former homeless shelter to make way for housing hospitality workers in the area.

Residents are mostly sous-chefs, kitchen helpers, hotel cleaning staffs within the walking distance to the workplace. A restaurant is open along with teaching kitchen, to enliven the street with activities. The 60 Richmond provides 85 one-to three-bedroom apartments in a new, 11 story building. Geared to low income and those looking for affordable rent spaces in the downtown, 60 Richmond elevates the liveability of the neighbourhood through urban renewal development.

TCHC and Teeple envision that this project will be one of the leading sustainable and affordable housings in the City. Compared to previous blight of St. Jamestown and Moss Park developments the Corporation works to avoid the past mistake of producing undesirable, dark and cold space in favour of residences that can be sustainable and hospitalizing to its tenants for longer term,
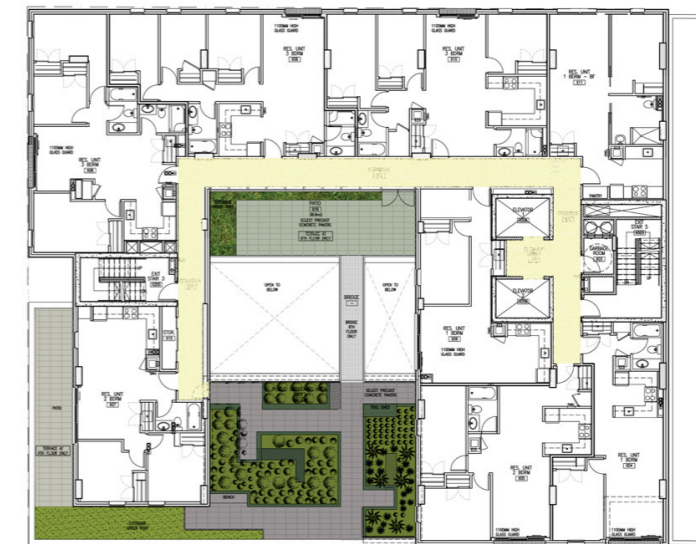
1:200 Sixth Floor Plan

Residential Corridor

Outdoor Amenity Space
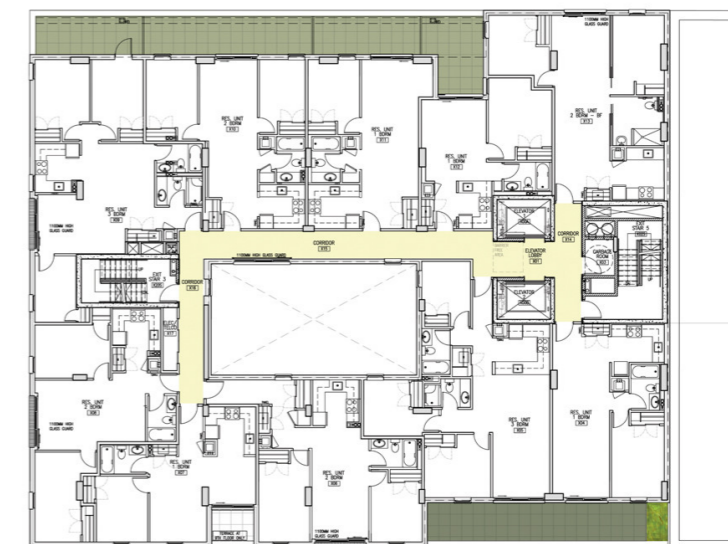
1:200 Ninth Floor Plan

Residential Corridor

Outdoor Amenity Space

Initial observations:

Unlike the myriad of condominiums that populate the downtown landscape, 60 Richmond was conceived a solid mass that was carved-out to create openings and terraces at various levels. To break down the mass of the building, Teeple organized the main façade into an irregular series of projecting volumes – three bumped-out volumes, separated by recessed areas and a sixth-floor reveal opens to a full-height courtyard occupying the central core of the entire volume.

Stephen Teeple (principal and founder of Teeple) describes that solid façade restores the edge of a block, and emphasizes that it does not have to be banal, repetitive architecture to keep the neighbourhood stand out. While the project makes a strong architectural statement, it also serves as an extension of downtown's urban fabric. "The building defines the public and semipublic spaces of the city and the courtyard it encloses. Its mass wraps around the corner, bringing dynamism to this urban intersection", explains Teeple.

One of the building's most innovative elements is a productive garden for the sixth floor of the building, intended to supply some of the food for the ground-floor restaurant. The garden was created by cutting large voids both horizontally and vertically into the mass of the building. These carved –out spaces, along with bright white exterior cladding on setbacks and cutouts, introduce daylight into the center of the building, reducing the need for artificial lighting in the apartments, and contribute to natural ventilation throughout. By hanging a metal framework on the sheltered East face of the void, the architects also accommodate a large vertical growing wall for landscaping along the side of the building's central void. The space was designed to double as a community space while at the same time supplying fresh herbs and vegetables, demonstrating that productive gardens can also be social spaces.

Ecology

Heat-recovery units in apartments and limited glazing on the exterior contribute to overall energy savings, while a sophisticated mechanical system transfers energy from the warm to the cold side of the building as temperatures change.

Rainwater collection irrigates the gardens, and a green roof mitigates storm water and the heat-island effect, creating an interesting ecosystem in urban fabric. A garden tended by residents on a sixth-floor courtyard will produce vegetables for the restaurant, while compost from the kitchen will fertilize the growing soil.

"We cut away the mass of the building from the street façade, creating outdoor green terraces, while allowing the primary faces to define the public space of the street", says Teeple. "We didn't set back these terraces or disconnect them from the city but instead wove the greenery into the fabric of the city", he continues.

"You get natural light and natural ventilation through all corridors", Teeple says, "and it creates a sense of connectivity between neighbours". As the residents look out on the terraces and hang out there – which is happening already – "you get a sense of community that you would never get otherwise, in a slab building", Teeple says.

Things that worked:

The project is exciting in its exploration of urban form that integrates food-growing spaces with other green building features. It is a positive sign for the future of affordable housing that such building initiatives can get funding and recognition, for this shows how technologies and strategies can contribute to the making of a sustainable productive city.

Things that did not work:

The building is itself open to the weather conditions at the built area and in this way it is exposed to the climate changes making the heating/cooling of the common areas difficult to control manually.

3.2.8.3 Case study: Communal Spaces

Project: The Co-housing Vienna - Wohnprojekt Wien

Architect: Einszueins Architektur

Building type: Residential, retail and hotel development

Price:

Location: Nordbahnhofgelände, Vienna

Number of floors:

Number of flats: 39

Built: December 2013

Amenities:
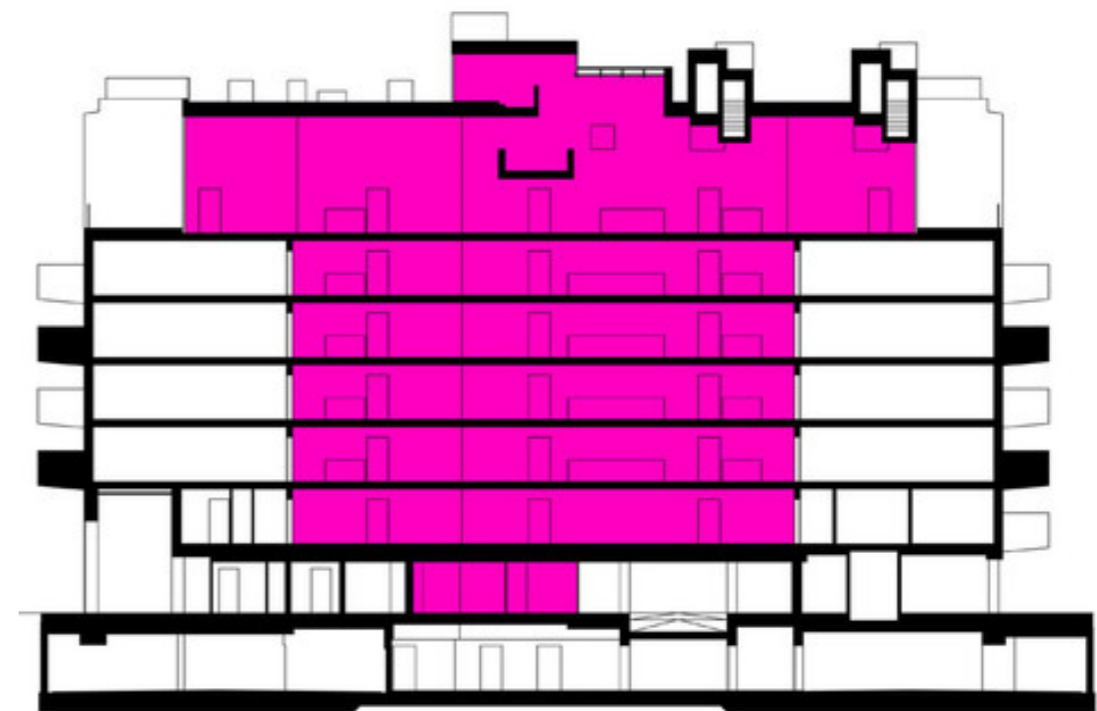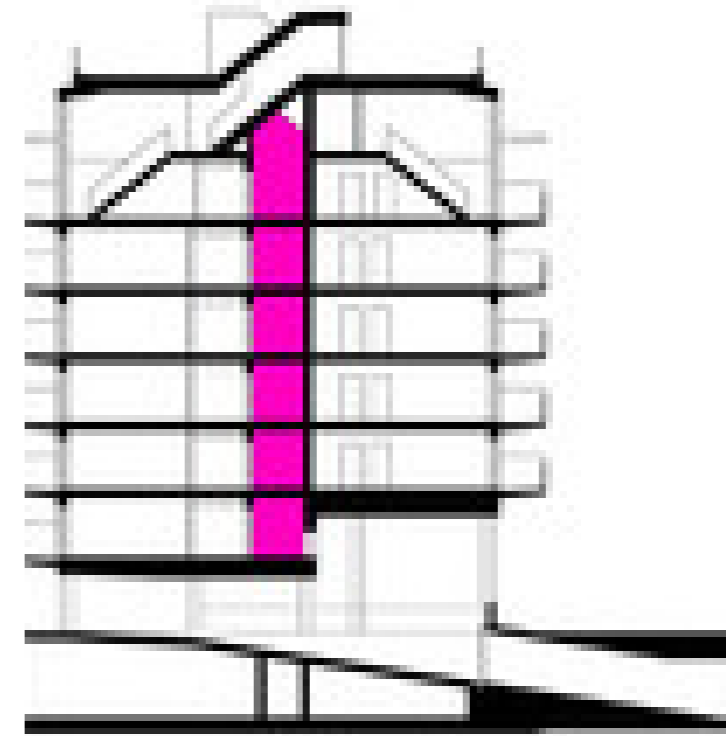
Initial observations:

The heart of the project is a self-organised community and the shared dream to live together in the city in a sustainable, collaborative and open-minded way. This way started from the very beginning with the participatory planning process of the communal spaces and the individual apartment units, continued with the creation of an alternative mobility system, a communal garden for the neighbourhood, and ended up with the communal ownership of the building, in other words with active participation during all the levels of the project´s development.

One of the greatest challenges of the project was to achieve high individualisation inside the frames of community and to express it in terms of architectural design. Several communal spaces offer the possibility for exchange and communication while the individual apartment units can be spaces for retreat. The communicative architecture of the building promotes free and spontaneous encounters. The apartments and the common spaces were developed and designed from the very beginning under the cooperation of the architects and the residents, allowing in this way alternative modes of living and flexible uses. The common spaces consist of the guest apartments, a sauna on the roof and on the lower floors, a communal kitchen, workshops and event rooms including a playroom for children and adults. The project is hosting different models of living and working, multiple generations and diverse cultures under the same roof.

The building is planned with almost passive house standards and consists of a massive construction body with a wood facade. The energy efficiency is supported by a mechanical ventilation system with temperature controlled through groundwater and a photovoltaic installation on the rooftop

The architectural concept gives space for community and communication organizing the forty apartments around a central hallway with connecting airspace. The community kitchen and children's playroom as well as the surfaces

ground floor   standard floor

6th floor   top floor
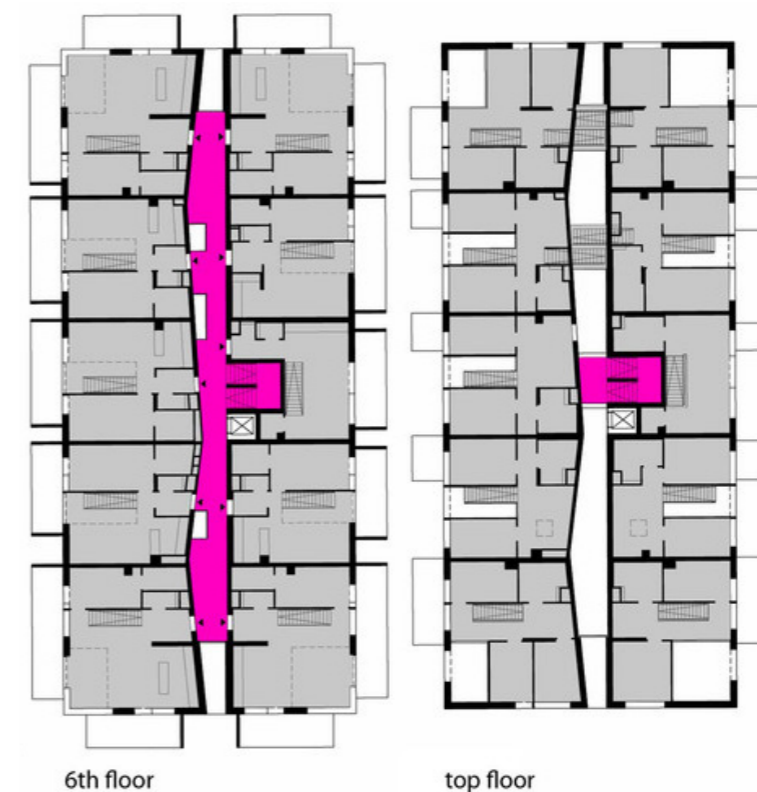
for trade are situated on the ground floor connecting with the surroundings. A big event room with a sunken court allows the assembly of all members and cultural activities for the neighborhood. The roof top belongs to the community: a sauna, a meditation room, the guest apartments and a library are facing a big roof terrace and a roof garden.

The structural concept of the house and innovative methods allowed a high level of planning participation for the group. Everybody could plan his or her apartment individually, workshops where held for the community spaces and contribution of the flats and an architecture work group was involved in all planning decisions from the urban plan to the electric sockets.

Beyond the communicative and sustainable architecture the project integrates many other ideas of sharing and social sustainability. Vehicle sharing with cars and cargo bikes, csa membership, shared ownership, supported apartments for people in need, cultural activities or a little shop on the corner as meeting point for the neighborhood are further contributions for a future orientated way of life

Things that worked:

- active community life

- possibility to share space and resources

- possibility to (co-) create your living environment

- possibility to (co-) plan your apartment (close to needs)

- close contact to future users

- acquire new skills (communikcation, ...)

- chances for another form of creativity

- specialization

- local social networks, people take over responsibility

- high identification with house and surroundings

- more commitment to the neighbourhood

- alternative to urban sprawl

- cost-price instead of market value prevents speculation

- users are the commisioners and are usualy interested in high energy

standard and ecological sustainability

Things that did not worked:

There is a lack of privacy. The building is strongly focused on the shared

functions and activities.

3.2.9 Generalization

3.2.9.1 Common spaces

3.2.9.1.1   Existing situation
The majority of people in Sofia live in apartments blocks that were built during the 60s and the 70s of IX century. One of the main aspects of those buildings was the existence of a large common space, which was situated in front of each of those blocks. It was designed to serve everyone equally providing all the necessary space that children and grownups could potential spent their free time. However, those spaces were not actually designed but rather left as a huge open space in which the people should find what to do. It was regarded as giving equal opportunity to everyone to do whatever they liked doing.
However, we believe that in today's time people strive to express their individuality and do not appreciate to regard as identical to one another, they prefer to be regarded as individuals.

Through the survey that we carried out 40 % of the people pointed out that they have a dedicated common space near to where they live, of which 40 % said that they had no actual connection to it.

Strangely people assumed that it is their obligation to take care of those spaces, whereas on the contrary it is the local municipality's responsibility. Nevertheless, those common spaces situated between blocks of apartments are highly neglected and are rapidly changing their main function from a common space for the local residents to car parks for their cars.

To sum up, people are indifferent to those spaces in their current condition, but are open-minded to have something new prepared for them.

Chapter 4
The Project Proposed

4.   Common spaces

4.1. New approach to common spaces and functions in a hybrid building

Following the previous statements, we set to redefine the existing common spaces in a way that will improve the wellbeing of people and promote their Meeting-up.

Guiding principles
The need for mobility in various scales and definitions
- Fast movement within the physical space
    o   Pedestrian/bicycle/car/public transport connections
- Virtual
    o   Quick access to the Internet

Structures which encourage Meeting-up
- The need for direct "face to face" contact
- The need for diversity with surprising elements
Abandon the mass scale and repeatability
Individual solutions
The need for contact with nature

Following the precedents on cohousing, we set up a design principle dealing with how to distribute the common spaces through the building in order to provide at least one space that is easily accessible to each occupant of the building.

As we stated previously, the occupants of the building will be strong individuals and each one of them will come with his/her specific needs. However, the goal of the project is not to alienate individuals but rather to provide opportunities that promote their meeting-ups. These opportunities will take place both in accidental places as well as in common spaces. The latter will be one of the main aspects of our project.

Diversify the common spaces
- Increase their number
- Reduce the size
- Provide different spaces that are suitable for the needs of:
    o   2 people
    o   5 people
    o   10 people
    o   25 people
- Different orientation

- o   Towards the inner courtyard
- o   Towards the street
- o   In the core of the building
- For different climate situations
- o   Hot
- o   Cold
- Use those common/open spaces as
- o   Elements of passive ventilation system
- o   Openings to permit daylight further inside the building
- Provide sufficient daylight to all of them
- Regulate accessibility
- o   Only to residents
- o   Only to workers
- o   To both

N

The building is situated on top of a hill and we designed in such a way that when you approach it from the main bullevar Cherni Vruh you could take a glance at its highest point.

Lot
taking in accordance the whole constuction area

Building volume

Division of the volume
the building is cut and creates a connection
inside-outside

Height variations
the height variations are according to the light and the
surrounding buildings

Formation of terraces
creating balconies and terraces according to the views

Connecting the building

Creating pores
taking in accordance the ventilation of the building
and the wind

Form Design Concept

• Apartments are orientated in a way that 70 % of them have always at least two sides receiving direct sunlight

We believe that creating a monolithic structure that houses all the necessary functions inside will not be beneficial to the local community by any means.

Thus, we designed the building to be porous and welcoming to the local community.

The ground floor is enlivened by a café, shops, restaurant, bookshop, sport centre including a gym and a pool and a child day-care centre.

We chose the previous function regarding two principles:
1   Functions which a person can use even if he or she has only 10 free minutre
a.   Retail, café, bookshop
2   Functions which a person searches for in advance before going to them
a.   Child day-care centre, restaurant, sports centre

Because of those 2 principles we situated the 1 group to the most visible and places. Whereas the second group is placed in more hidden zones of the ground floor.

•   Main pedestrian axes leading to the main public transport stops

N
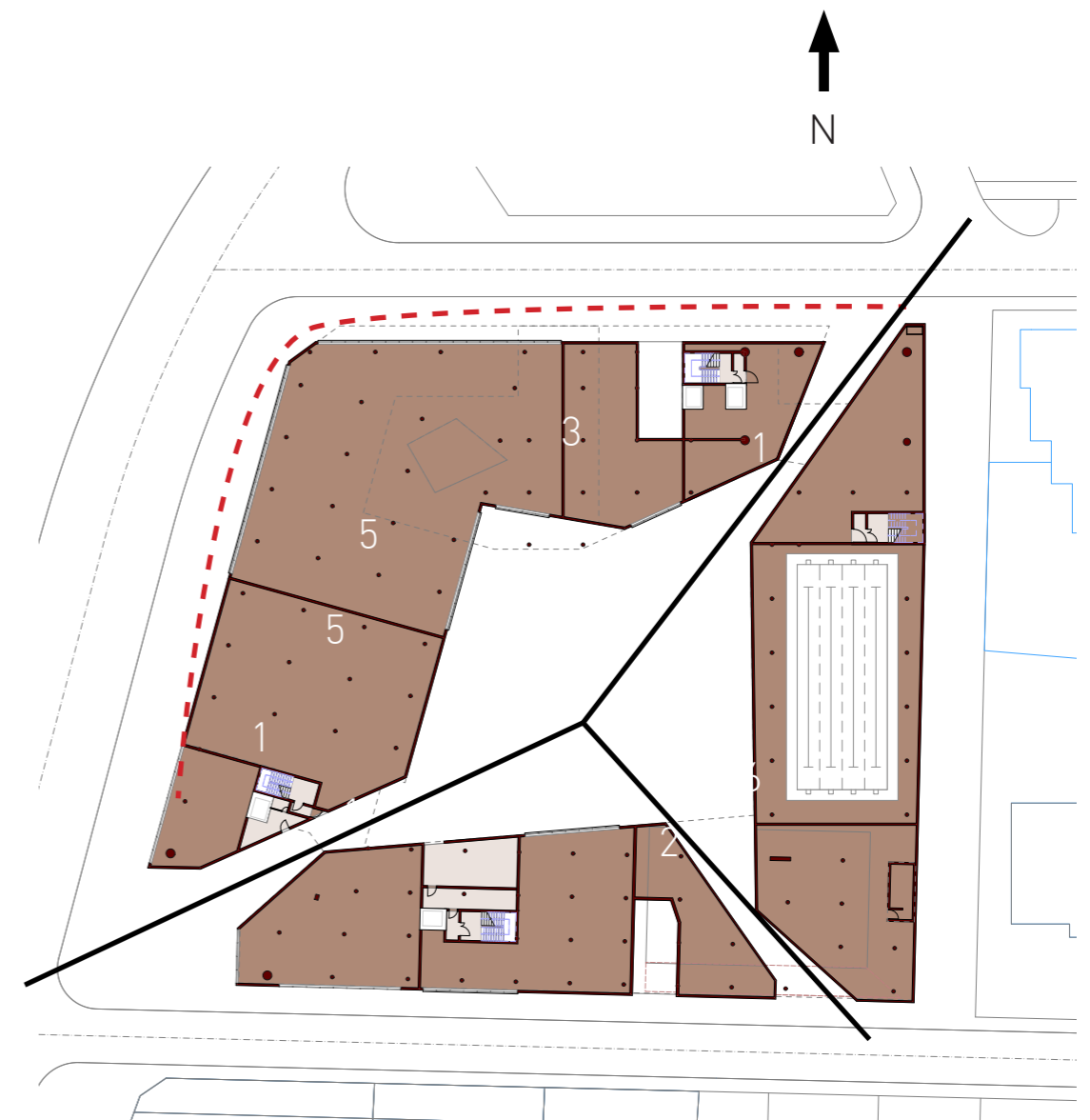
_____ new main pedestrian path

▬ ▬ ▬ old main pedestrian path

1. Retail
2. Cafe
3. Bookshop
4. Chil day-care centre
5. Restaurant
6. Sport centre

Solar design

We calculated the solar altituted in order to maximise the solar gains and to permite daylighting to entere further inside the building

summer
71.45°

winter
24.55°

summer

winter

0   5   10
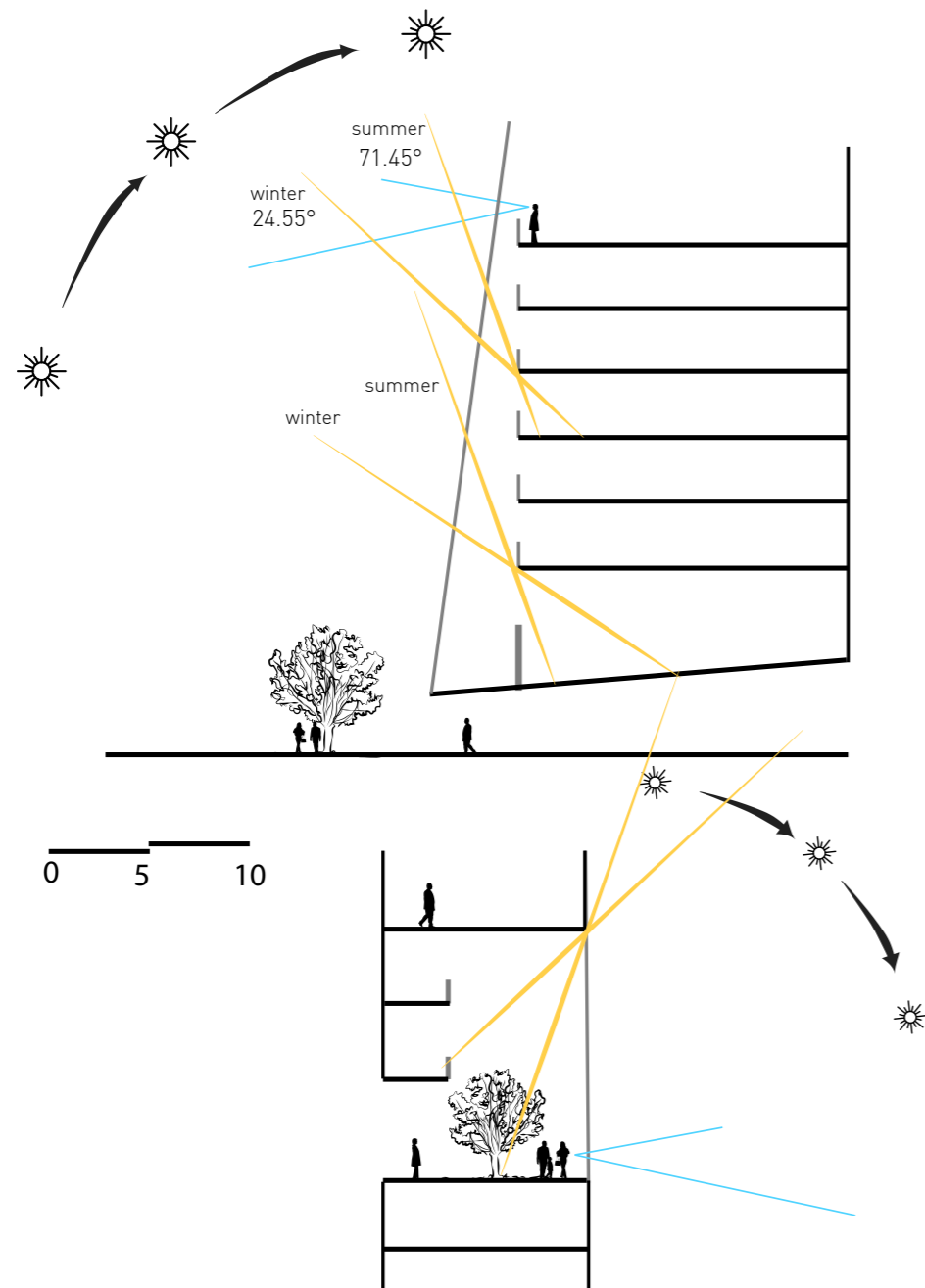
Natural Light - Atrium

winter

summer

0   5   10
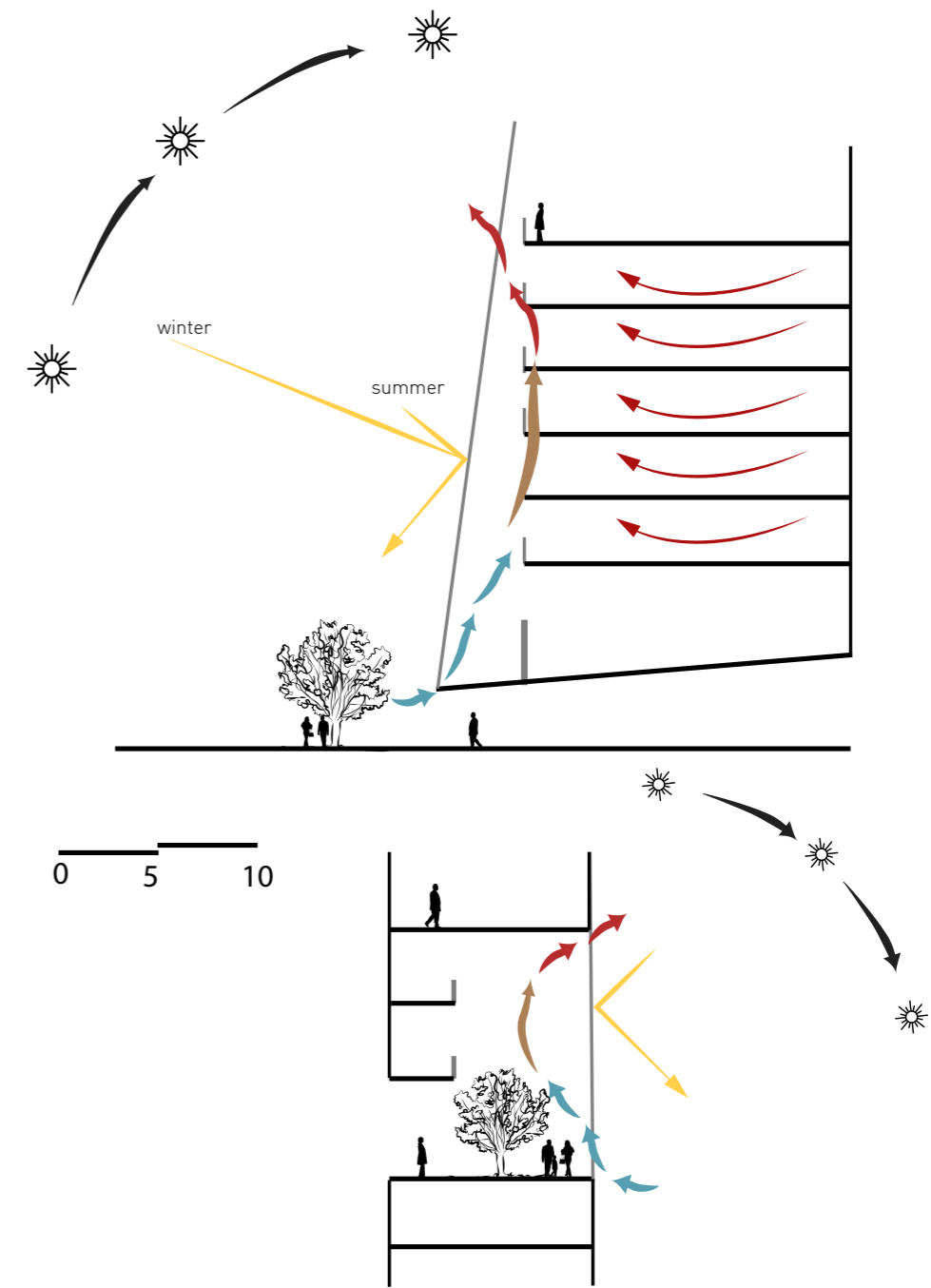
Ventialtion - Atrium

East elevation
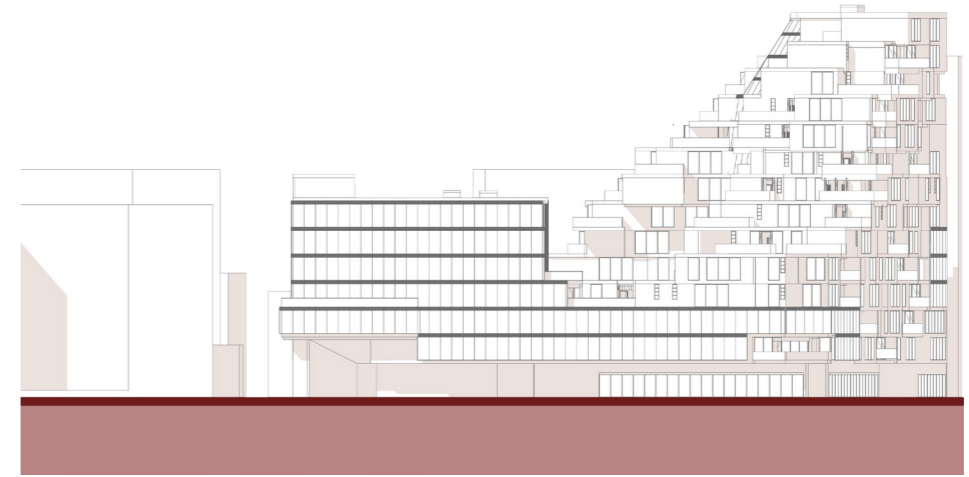
North elevation
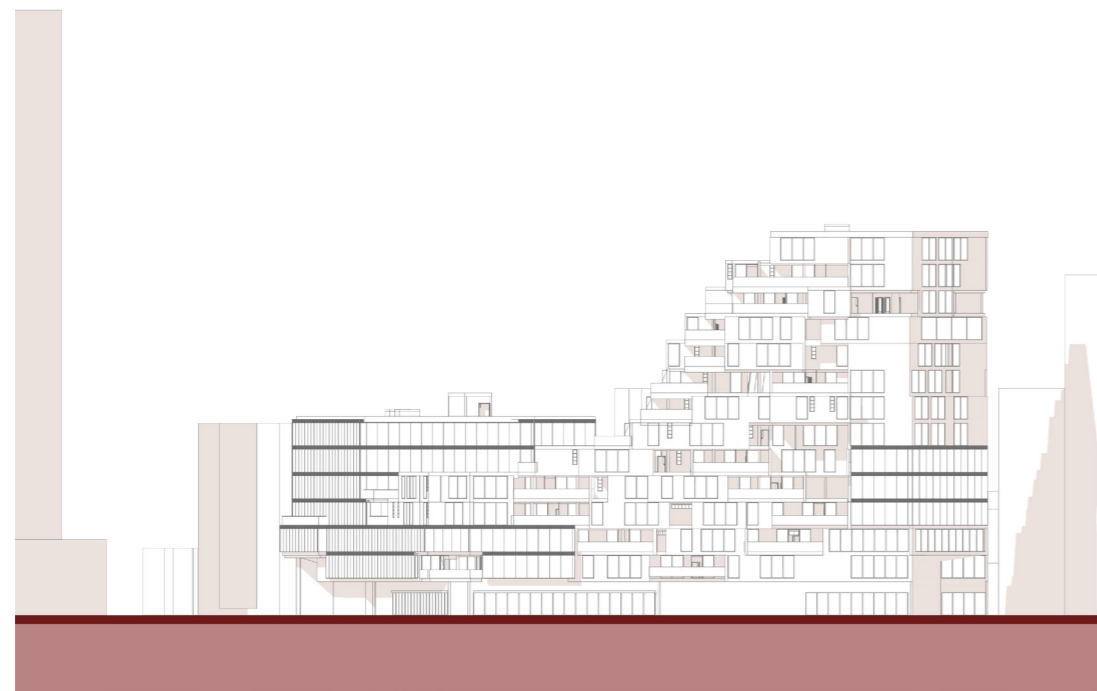
West elevation

South elevation

summer sun

winter sun at 15:00

0   5   10   15
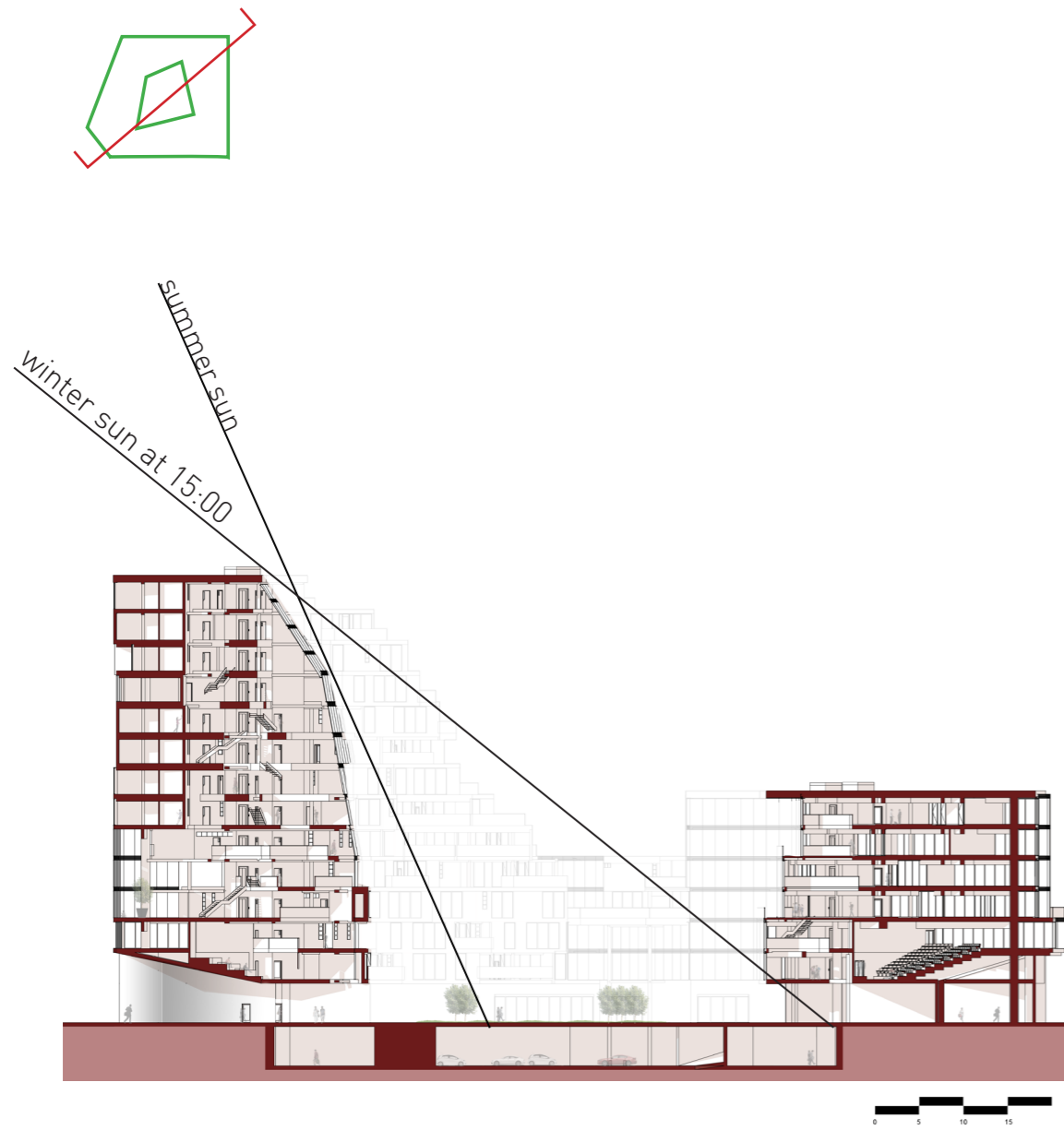
The main residential tower is designed to be the highest part of the building in order to house the maximum nubmer of apartment. However, it's maximum height is calculated in such a way that during the winter when the sun is at's lowest it would not overshadown any of the offices floors until 15:00
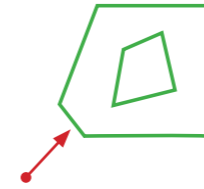
Vertical allocation and connection of functions
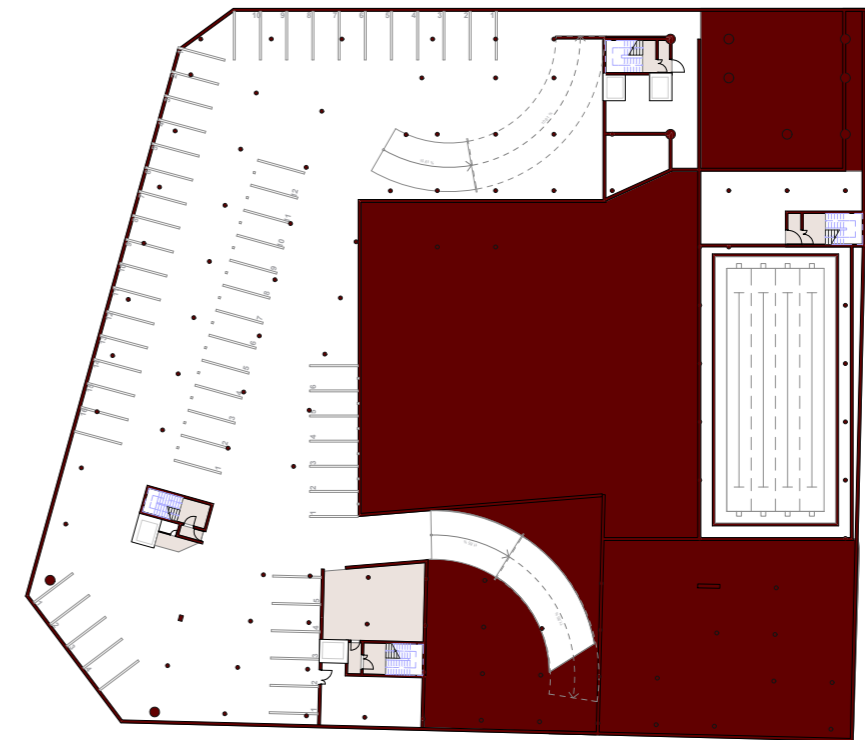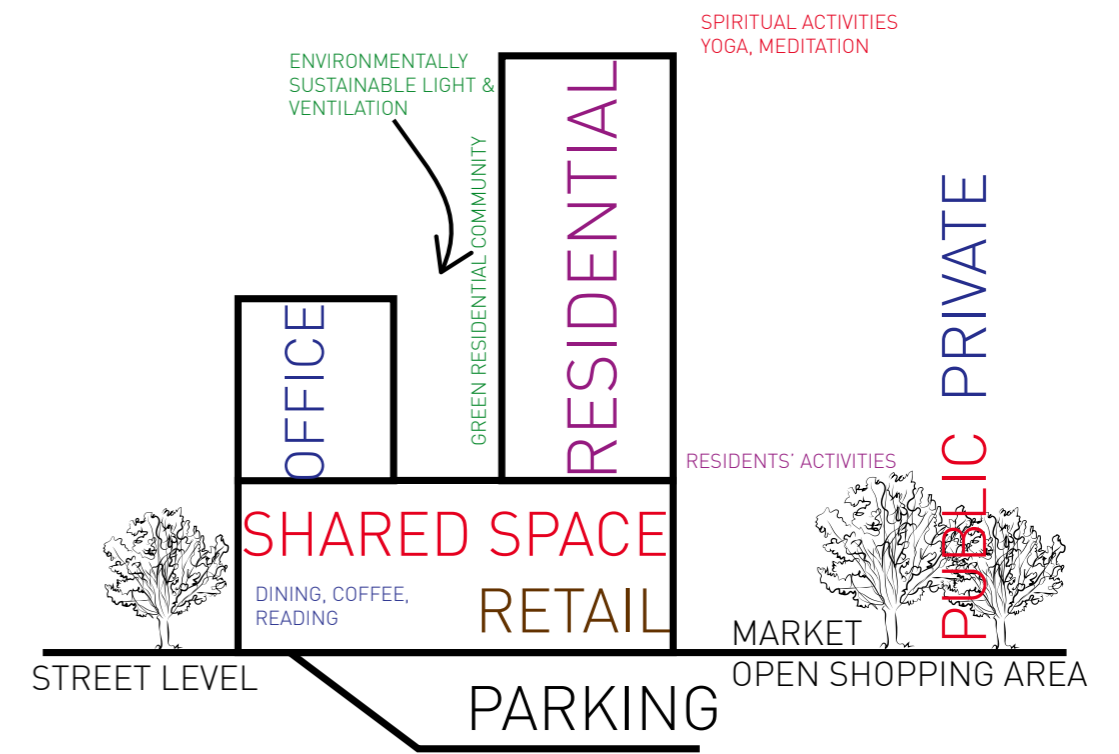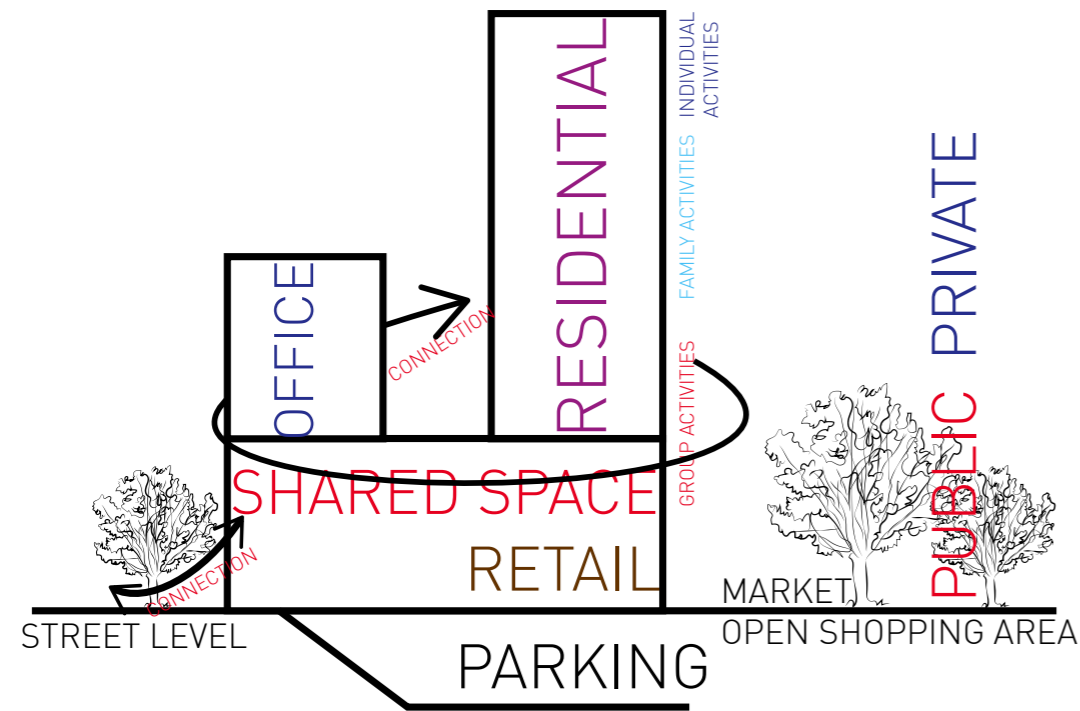
Exploded axonometry of the building

General arrangement of functions accross the building

Phases of construction
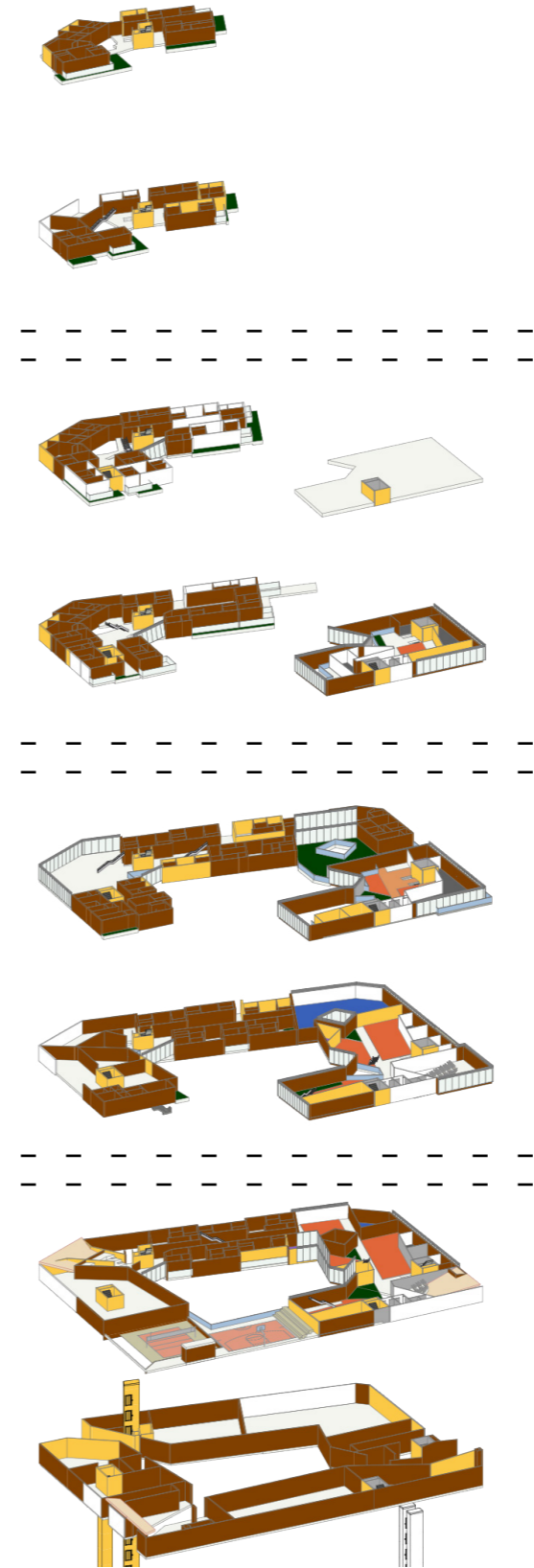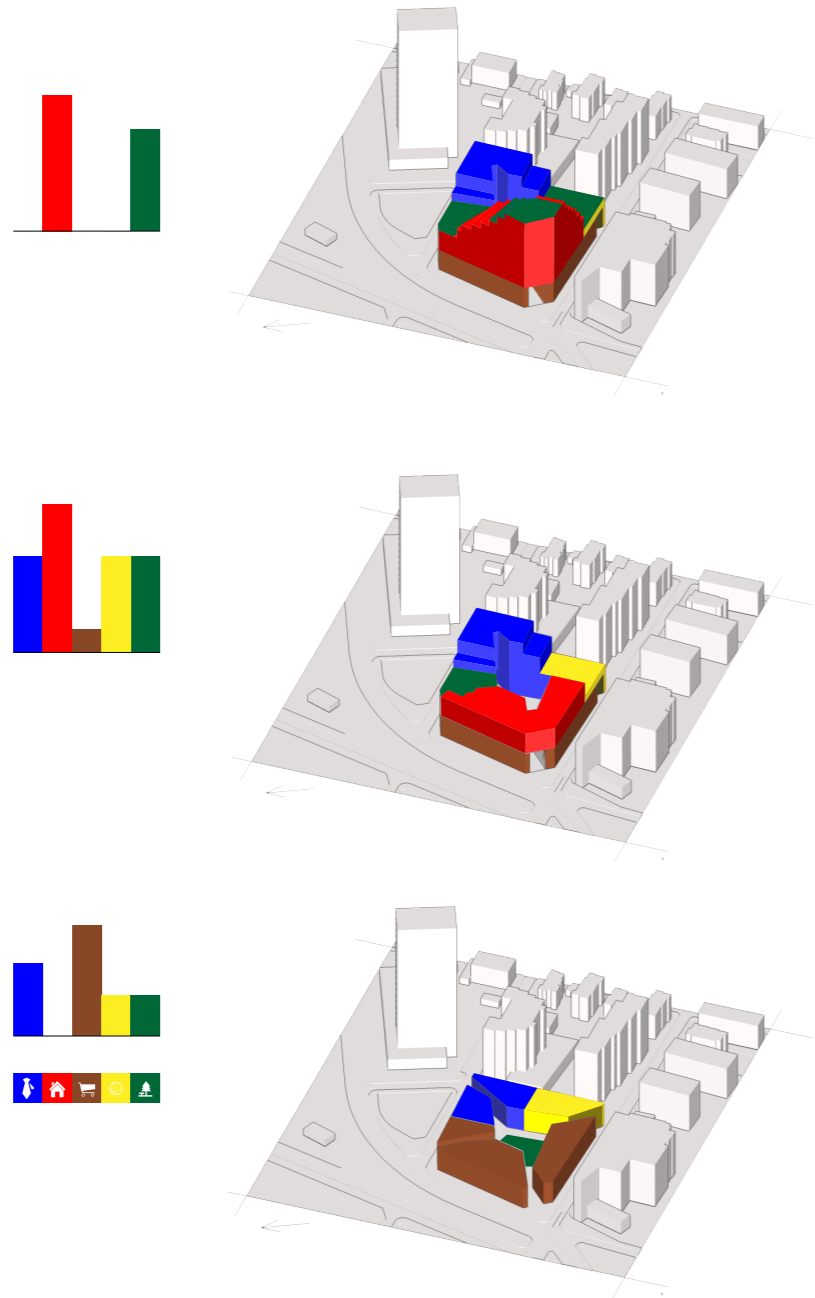
Isolation

Separation

Meeting-up beetween residents and workers

Link to local community
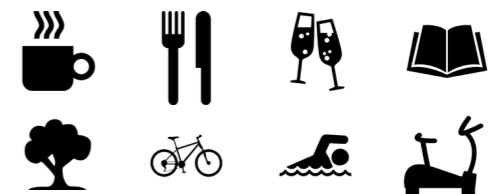
Common spaces for: Possible functions

play cards/pool
drink coffee
have a chat with a friend
accidental meeting
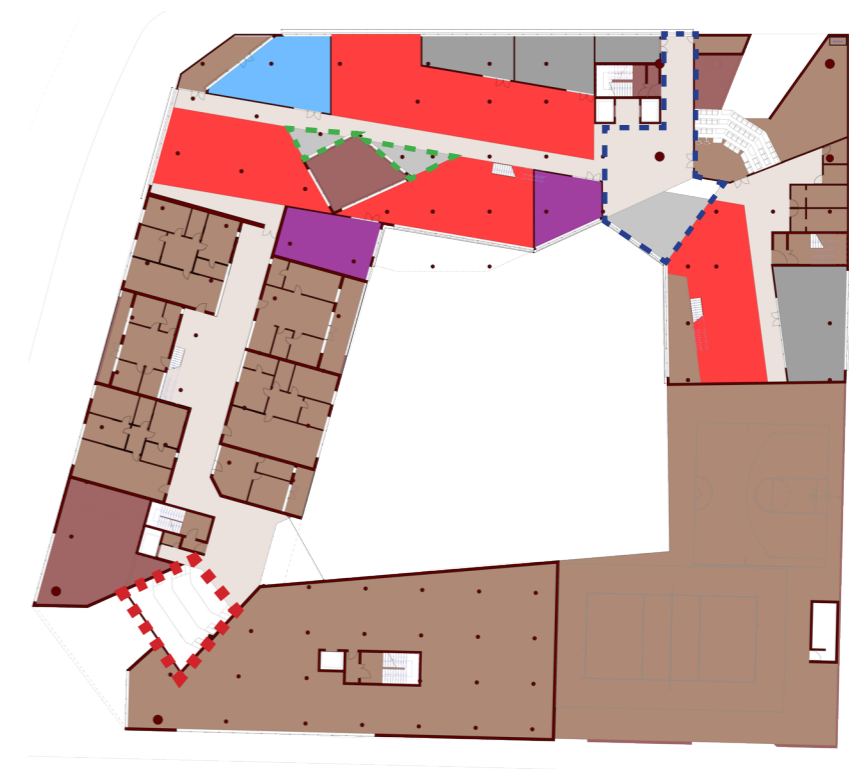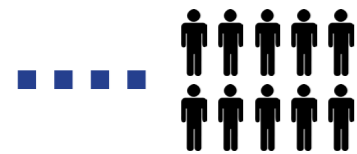
Informa office space   Common room

Formal office space   Common spaces

Meeting rooms   Horizontal circulation

Kitchen   1st floor

Common spaces for:

Possible functions
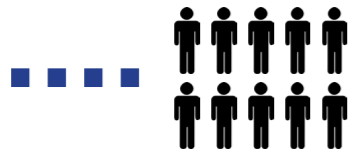
watch a film
play basketball/volleyball
have a picnic/barbecue
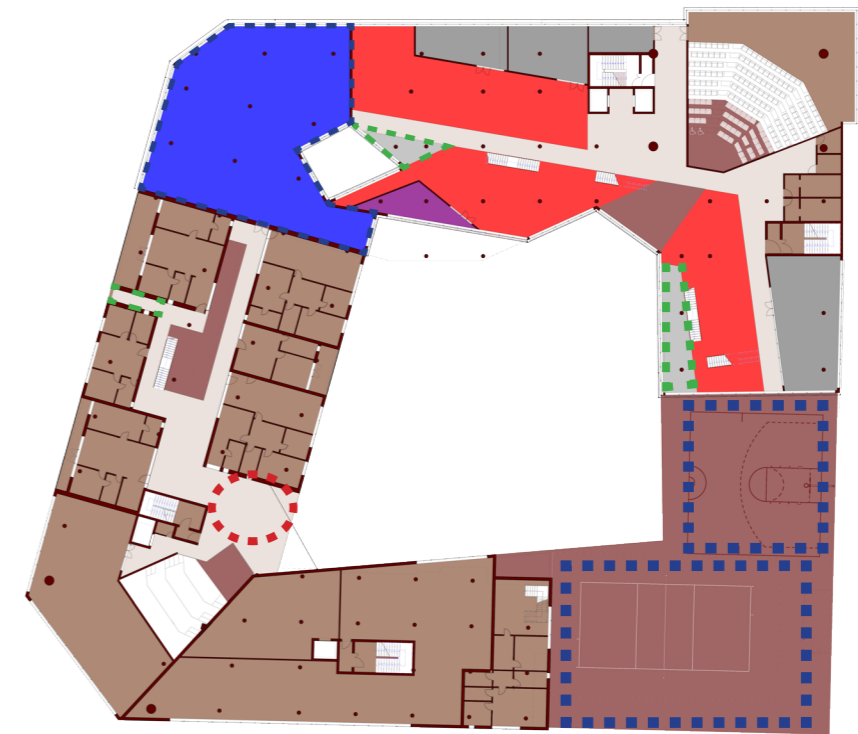
Informa office space   Common room

Formal office space   Common spaces

Meeting rooms   Horizontal circulation

Kitchen   2nd floor

Common spaces for:
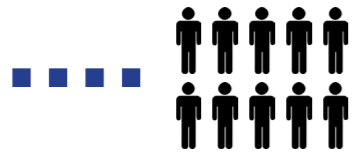
Possible functions

play football
do yoga
celebrate a birthday
party
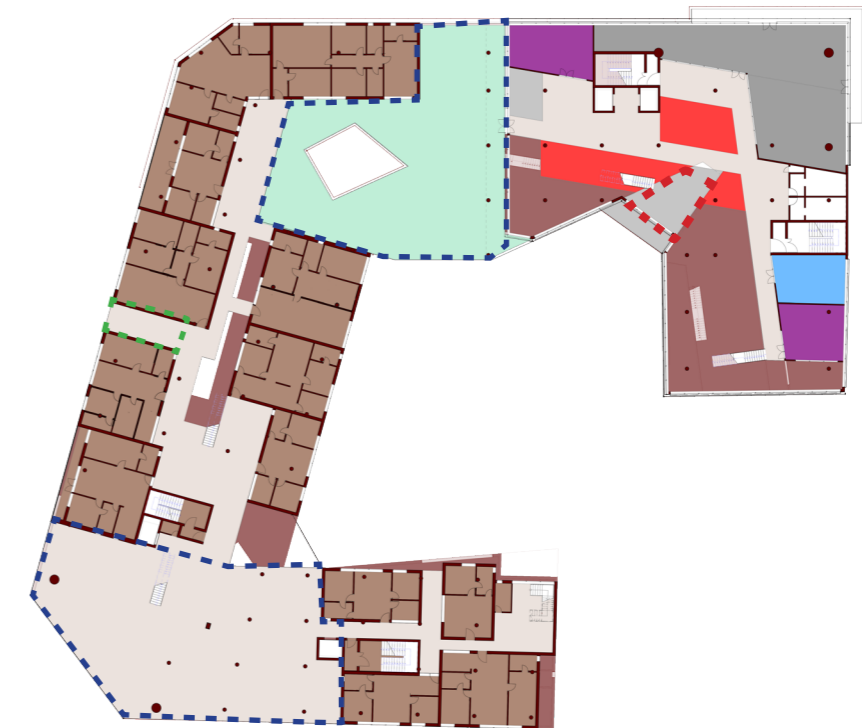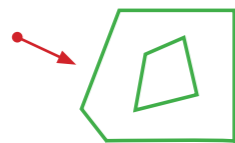
Informa office space

Formal office space

Meeting rooms

Kitchen

Common room

Common spaces

Horizontal circulation

3rd floor
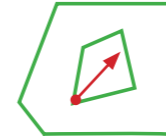
Office spaces

Offices
In order to provide a more enriching working environment we started by dividing the space into two main functional zones:

Formal working area
        A place where everyone has his dedicated working area
        The area is strictly organised
        Low levels of noise and almost no distractions
        Ideal for firms

Informal working area
        Open working space
        Free environment
        A place to meet-up with new people with different fields of interest
        Enriching environment
        Positioned closer to the south side of the building in order to
        provide maximum amount of sun light
        Ideal for individuals or small teams

We designed

Formal Office   Inormal Office
40%   60%

Offices - Formal/Informal use
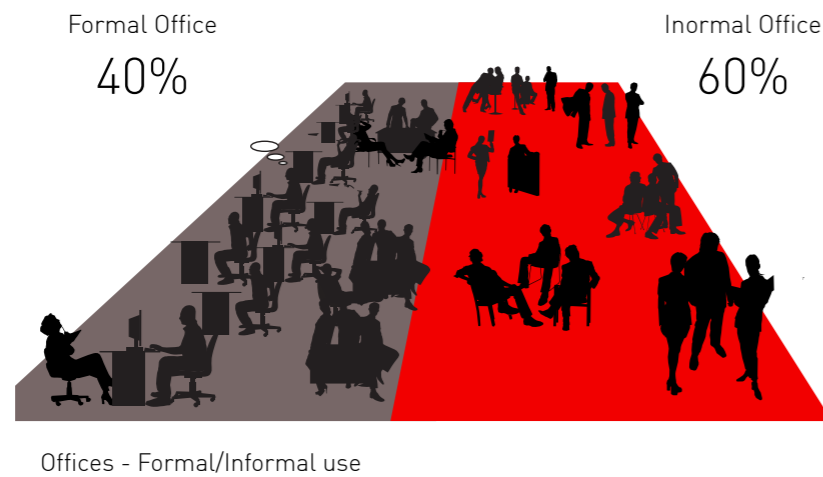
The zone is firstly organised by rotating it towards the sun and providing maximum sunlight between the hours of 10 and 15. Thus the arrangement of the office space is created by diagonal zones.

15:00

12:00   10:00
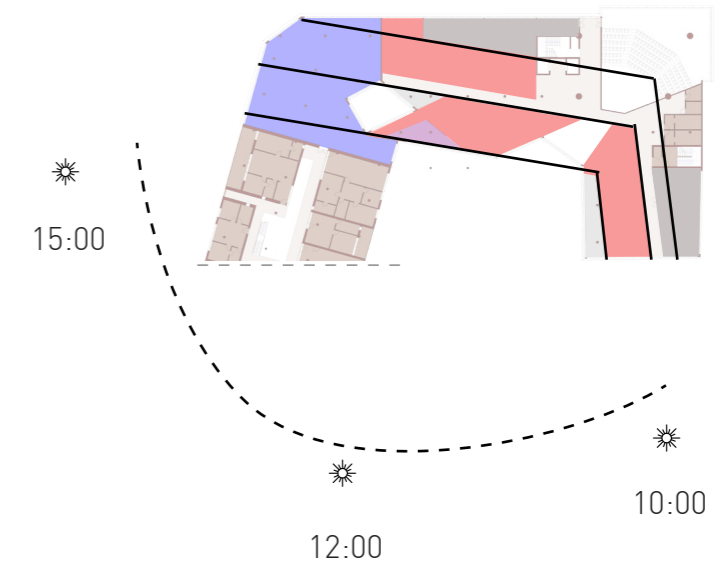
Auxiliary spaces:

Following the data collected from the survey we decided to provide the workers with different kinds of common spaces that could enrich their stay in the office:

-        Kitchens
o   Large enough to accommodate a group of people which can have the experience of having a lunch together
-        Meeting rooms
o   80% of them are placed conveniently near the main circulation in order to provide easy access to guests to the building
-        Conference room
-        Accidental meeting spaces
o   Placed near key transitional areas thus increasing the probability of two people meeting there
o   Can be used as informal meeting space
-        Terraces
o   Accidental meeting
o   Fresh air

summer sun

winter sun
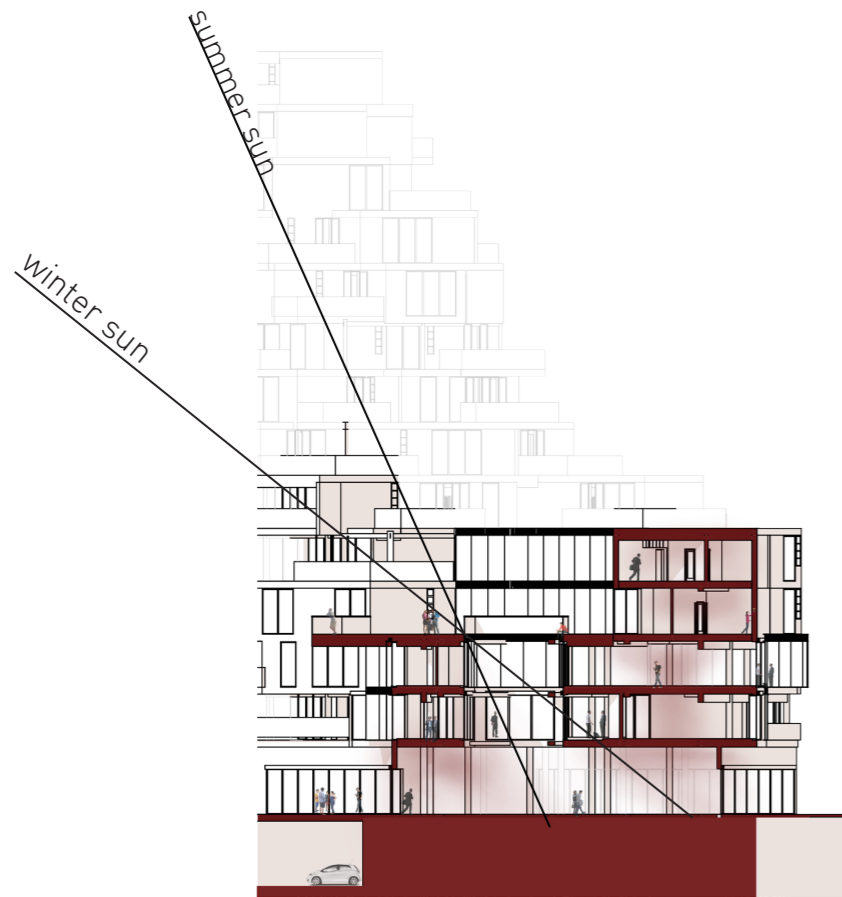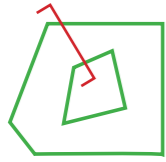
This courtyard in the buidling is designed to allow daylight to penetrate furhter inside the common room and office space.
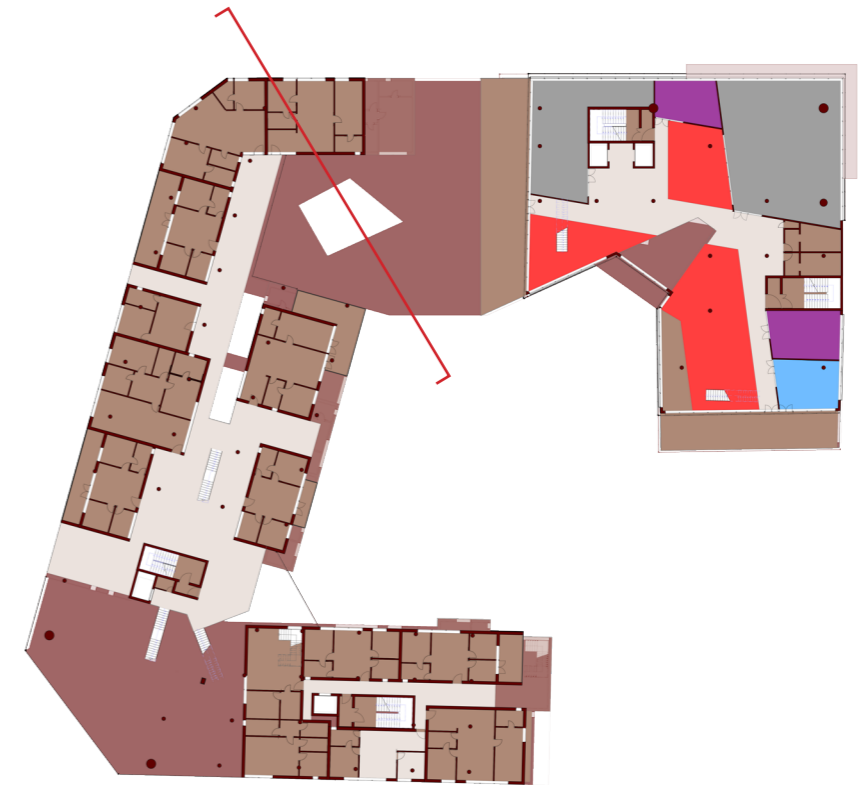
0   5   10   15

■ Informa office space

■ Formal office space

■ Meeting rooms

■ Kitchen

■ Common room

■ Common spaces

□ Horizontal circulation

4th floor

The higher you go up the building the
informal spaces start to disappear.

75 - 100

50 - 74

25 - 49

0 - 24
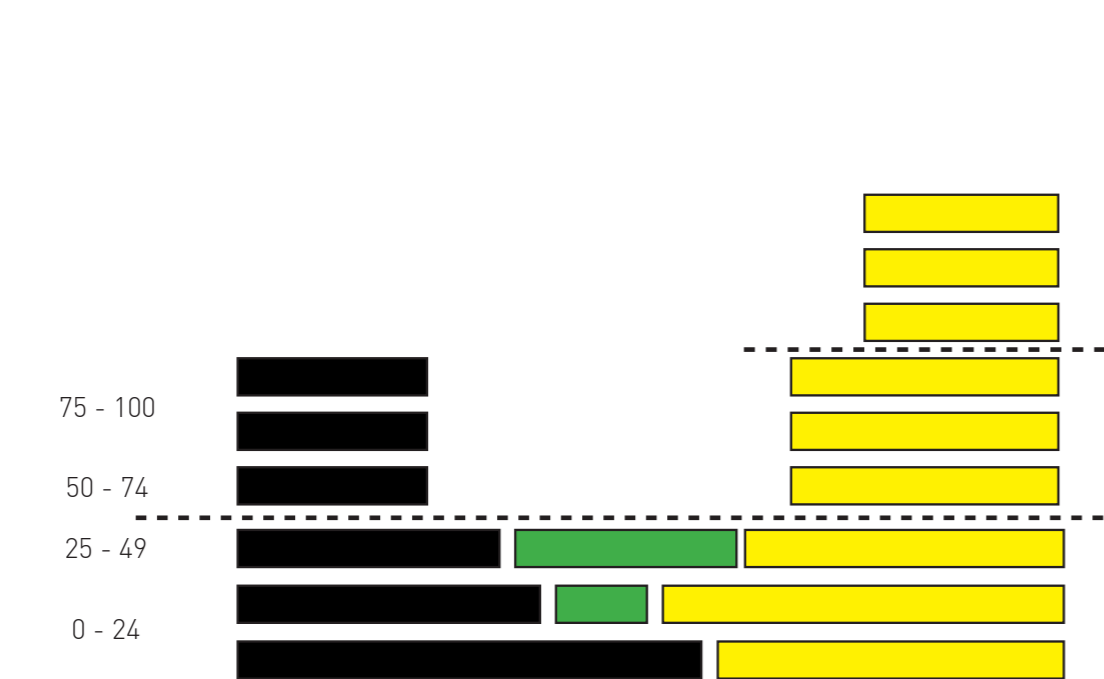
percentage of
formal offices

■ office
■ residences
■ shared space

■ Informa office space   ■ Common room

■ Formal office space   ■ Common spaces

■ Meeting rooms   ■ Horizontal circulation
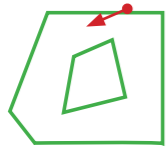
■ Kitchen

5th floor

infromal office view to green rooftop
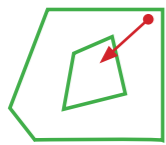
informal meeting space in office

Informa office space

Formal office space

Meeting rooms

Kitchen

Common room

Common spaces

Horizontal circulation

6th floor

Residential buildings

4x types of sizes of apartments

While some dwellings are similar in size and/or in terms of the number of rooms, no two are identical.
The difference in personal needs was considered in the layouts.

Apartments + common spaces
Diagonal diagram of different types of apartments

Common spaces are:
•   allocated near the apartments in accordance with the needs of each type of apartment

Types of apartments grouped by similarities in conditions offered
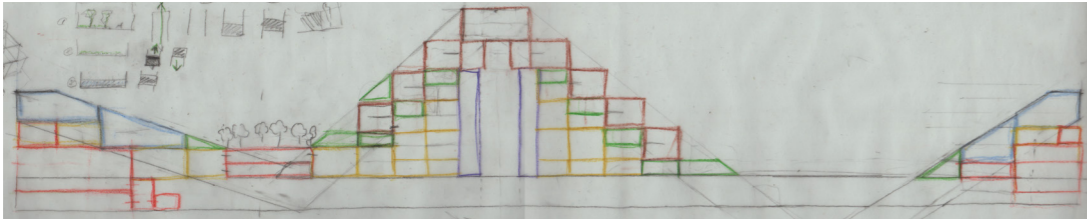
 Edge

double exposure
to daylight
need closed space

 Core

needs
open space

 Inner

close to main circulation
needs
fresh air
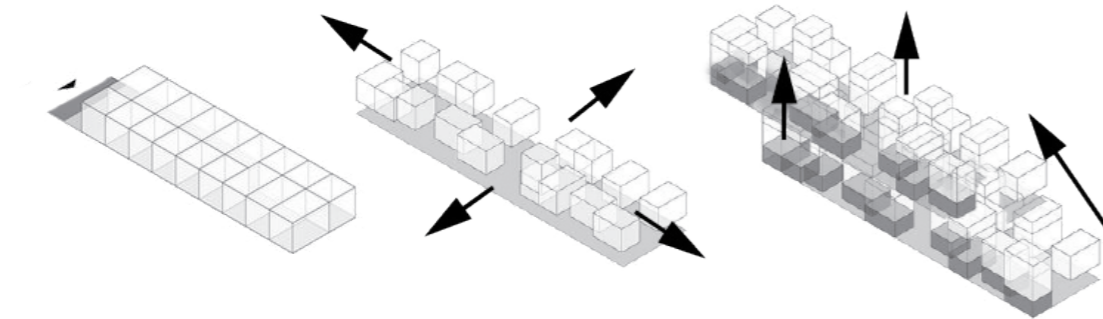
7th floor

Common spaces:

Placed in accordance to the needs of the 3 types of apartments
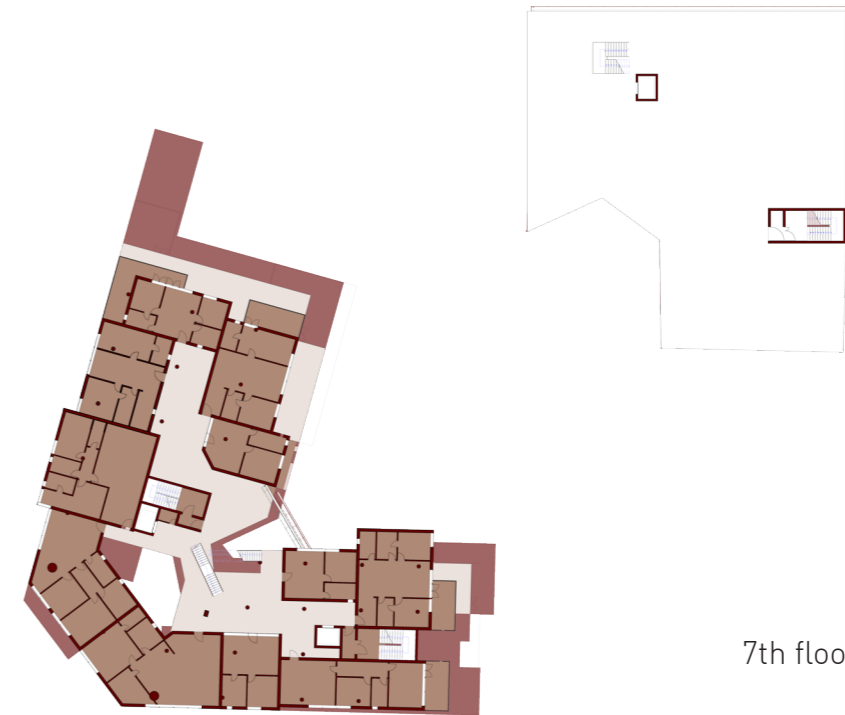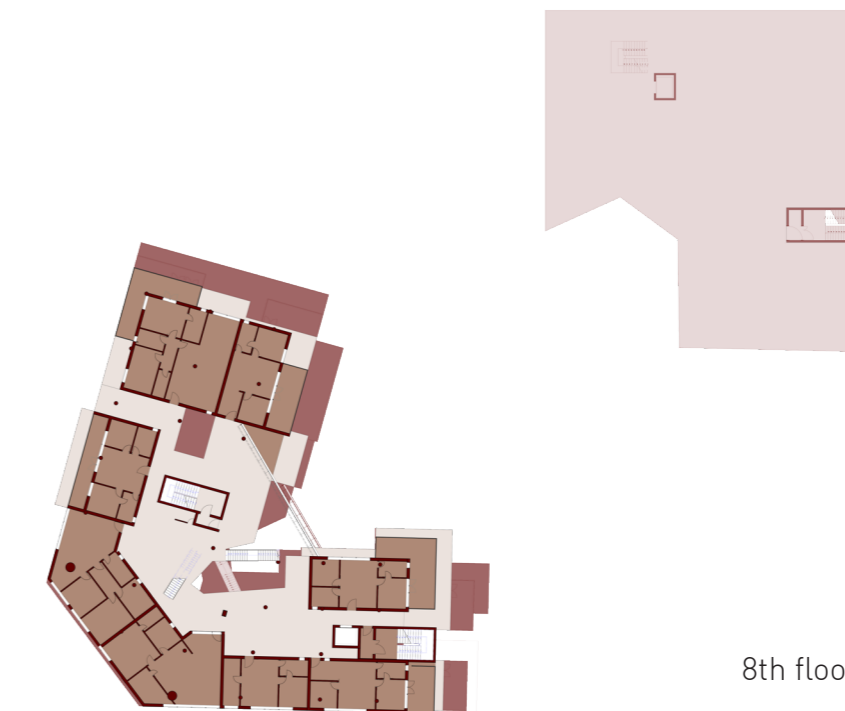
8th floor

Apartment typology and
flexibility

one bedroom
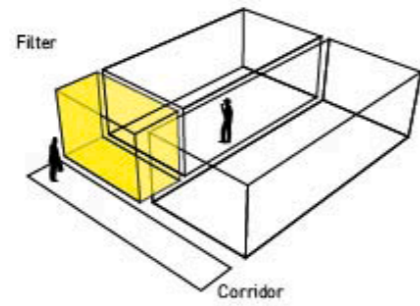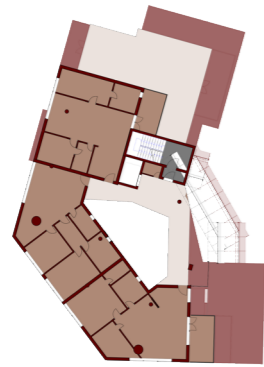
two bedroom

three bedroom
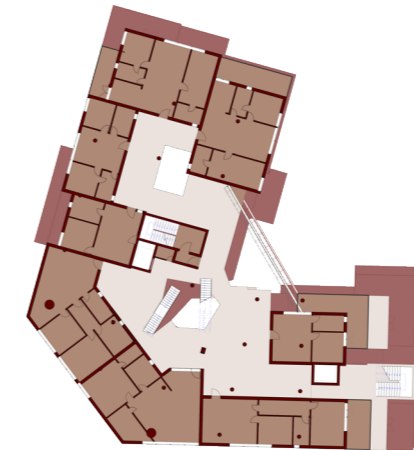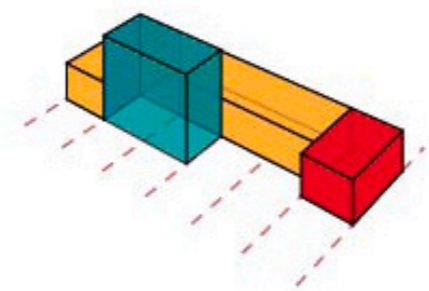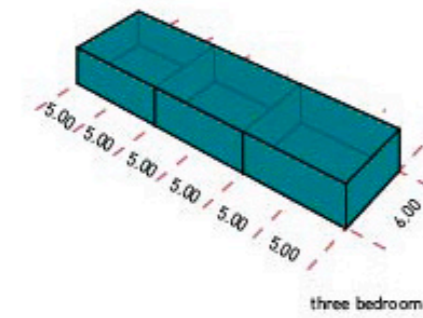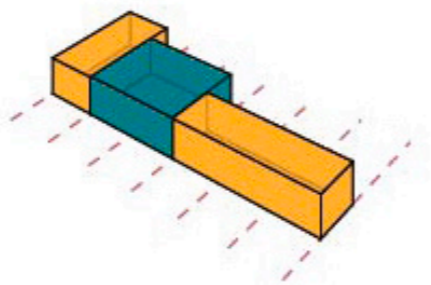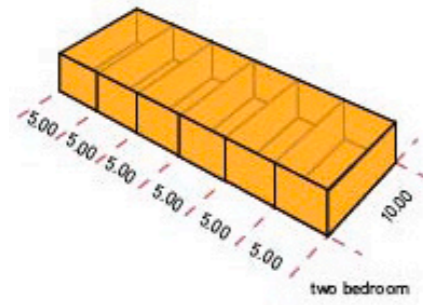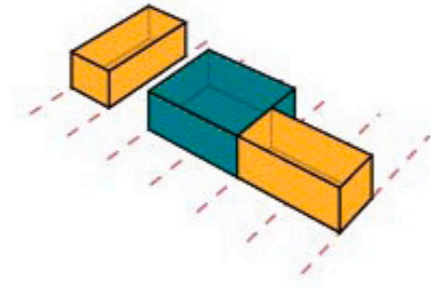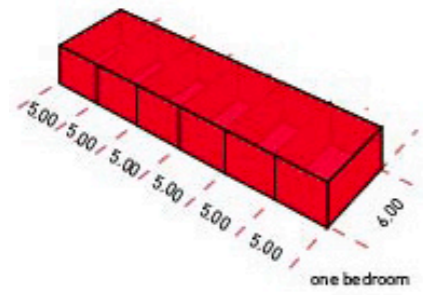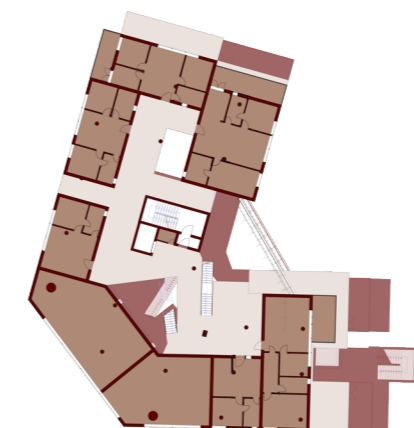
9th floor

10th floor

Apartment typology and
flexibility
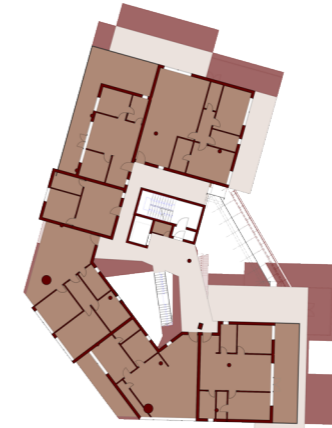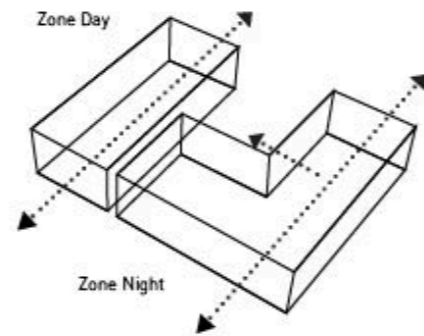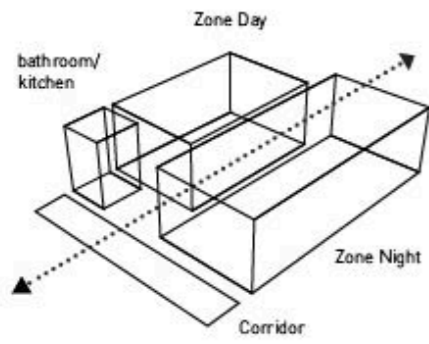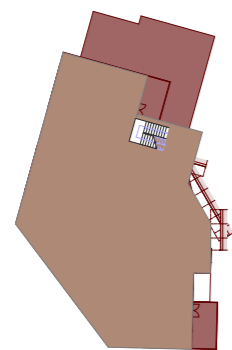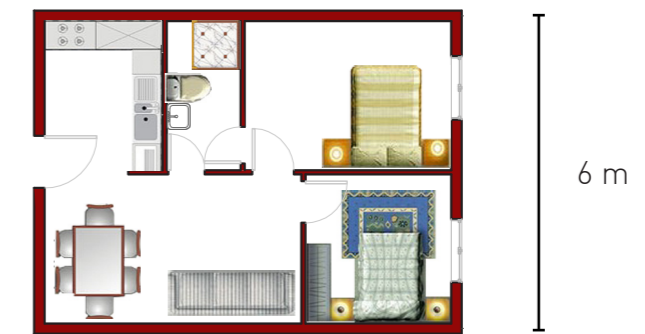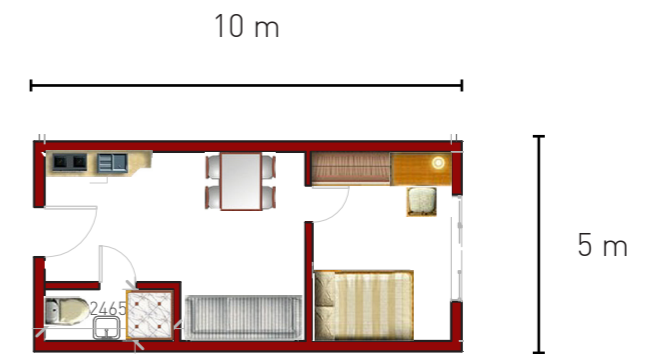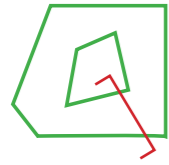

11th floor

12th floor

Example layout of 3 different apartments

10 m

5 m

6 m

9 m

13th floor
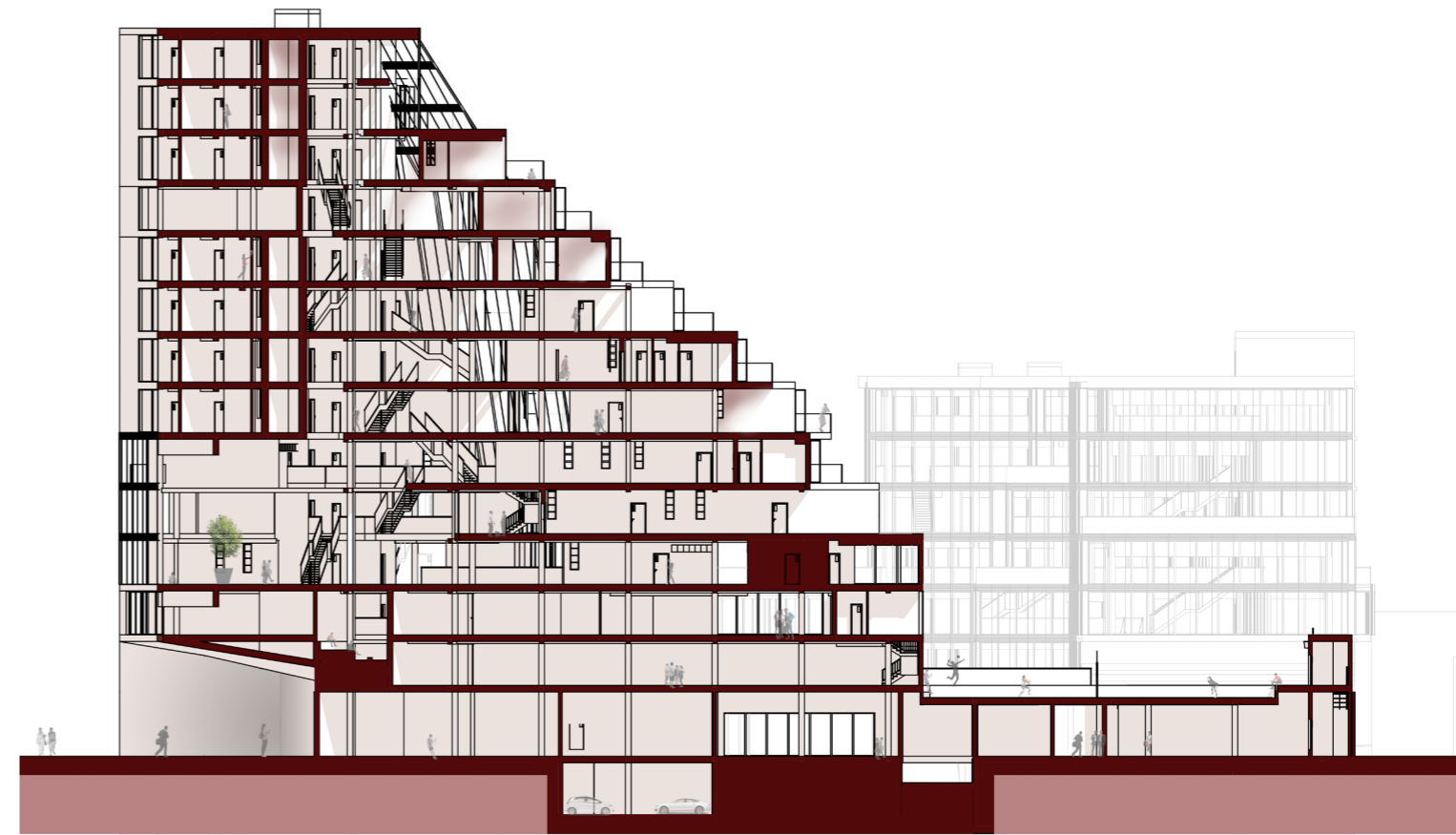

Roof

Cross-connections
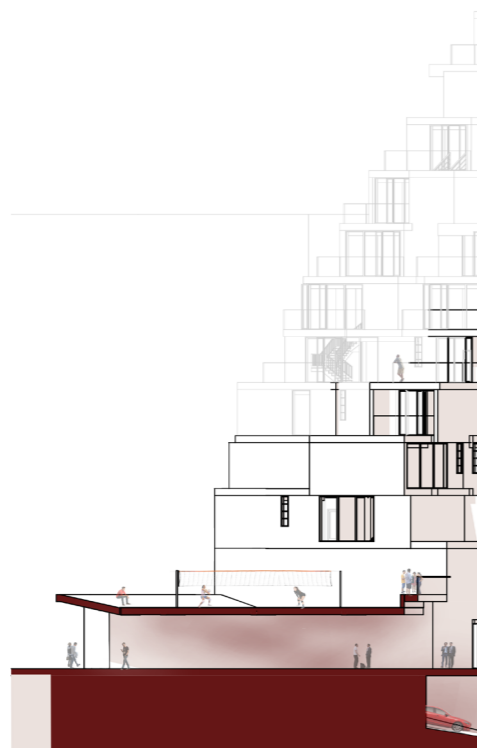
volleyball court

Main entrance to the sports center
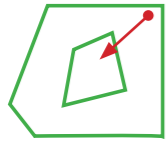

common space - winter garden

movie theater

residential buildng ⟷ sports center
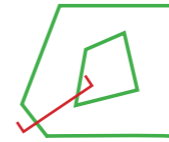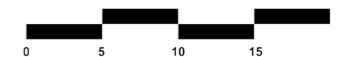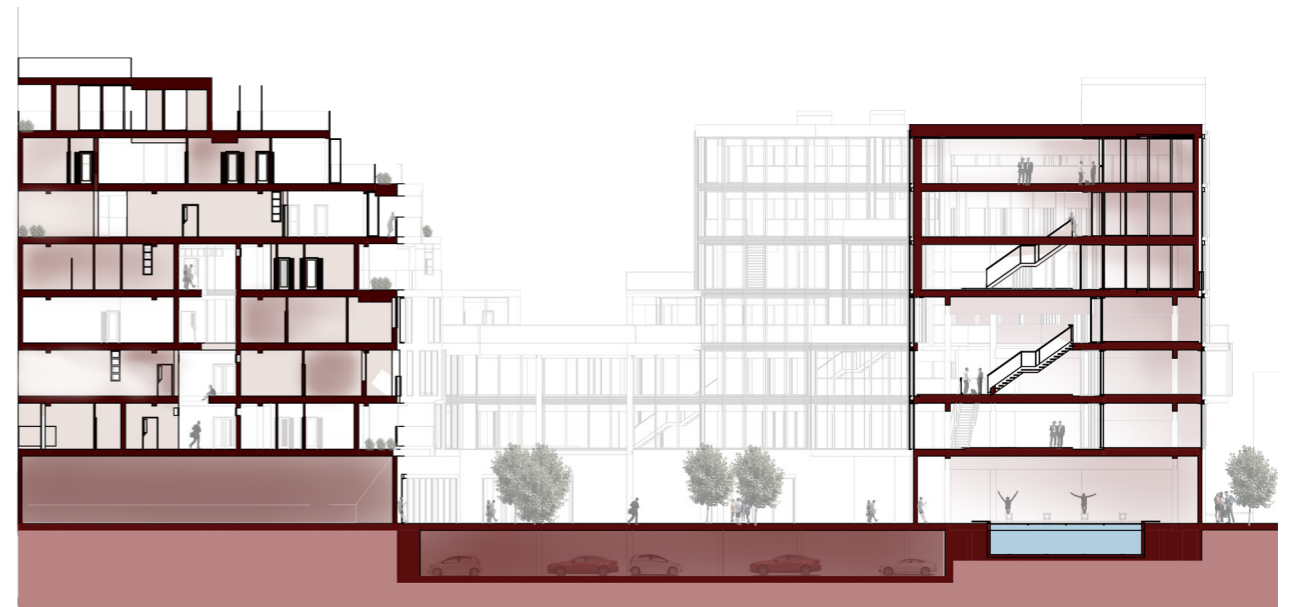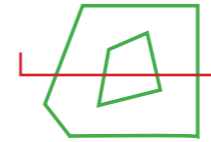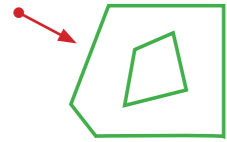
common space - winter garden

common space - winter garden

movie theater

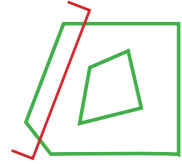Main entrance to the residential building
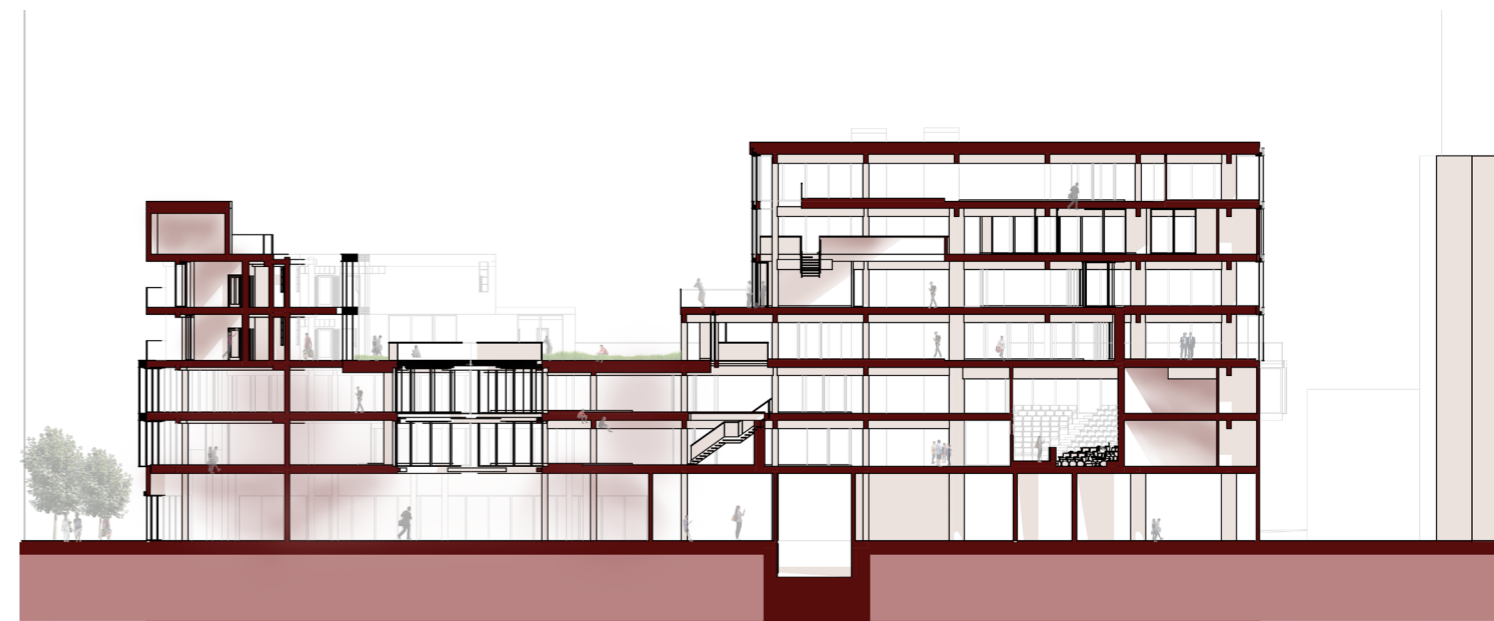
residential buildng
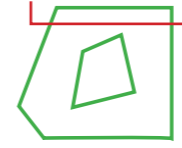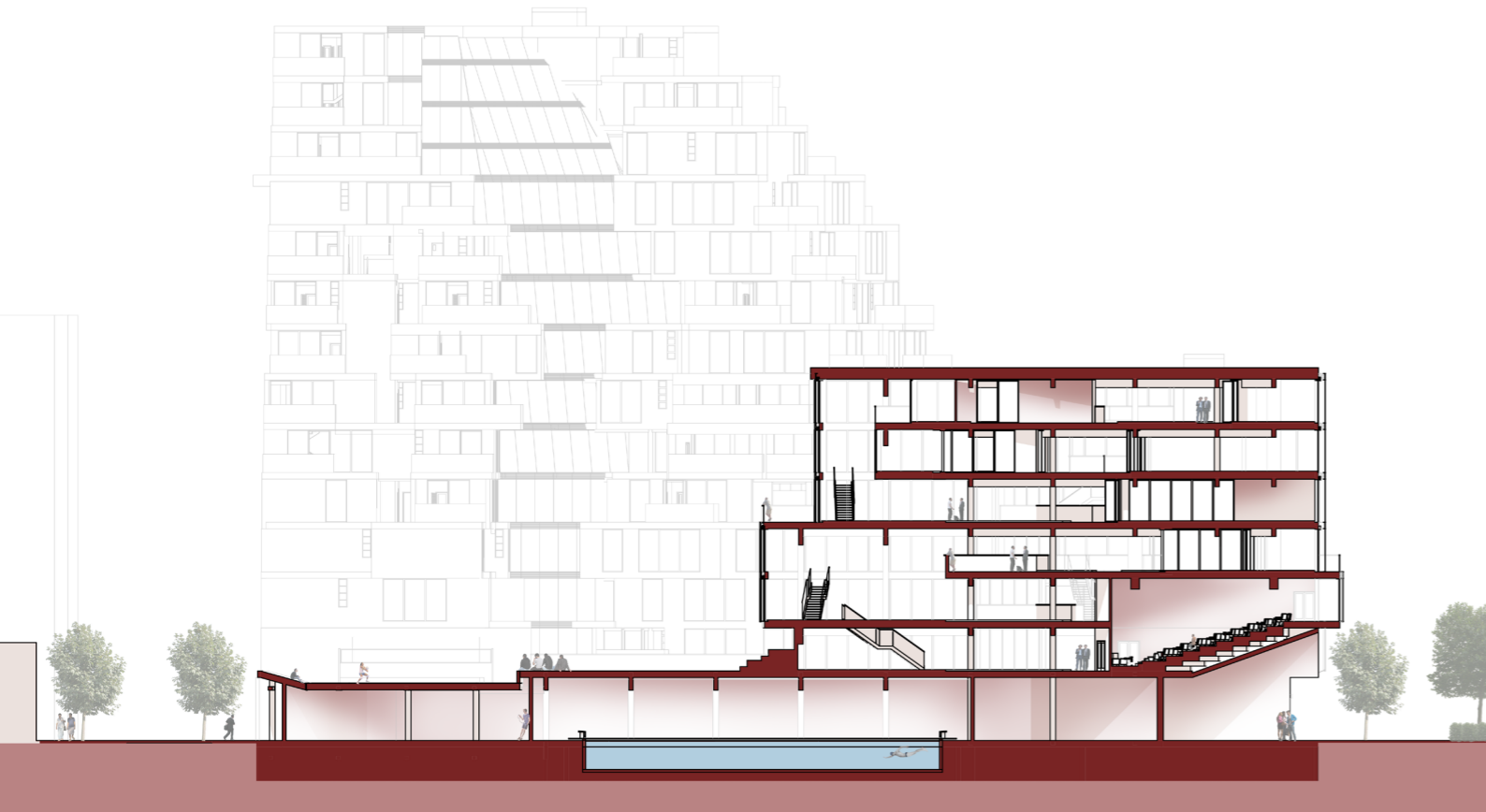
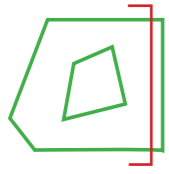**X**

office buildign

sport centre

residential buildng ⟷ office buildign

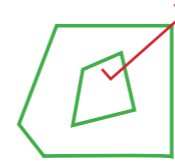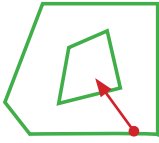residential buildng ⟷ office buildign

sports center ⟷ office buildign

conference room

Main entrance to the office building

Chapter 5
Conclusion & Discussion

4.   Appendices

Survey

How old are you?

Option	Number of respondents	Relative percentage
<18	10	2.1%
18-24	202	41.6%
25-34	125	25.8%
35-44	64	13.2%
45-54	57	11.8%
55-64	19	3.9%
65<	8	1.6%

Which best describes your family composition?

Option	Number of respondents	Relative percentage
Single	142	29.3%
Couple	99	20.4%
Two or more (sharing housing)	40	8.2%
Family	160	33%
Extended family (parents, children, grandparents)	44	9.1%

Where do you live?

Option	Number of respondents	Relative percentage
Sofia city	408	84.8%
Sofia – general area	9	1.9%
Other	64	13.3%

Which part of the town/city do you live in?

Option	Number of respondents	Relative percentage
Center	59	12.2%
Near the center	279	57.5%
Suburbs	147	30.3%

What is your working status?

Option	Number of respondents	Relative percentage
Employed	348	71.8%
Unemployed, but actively seeking employment	68	14%
Unemployed and not seeking employment in the near future	69	14.2%

Is your workplace located in the building you live in?

Option	Number of respondents	Relative percentage
Yes	17	4.9%
No	331	95.1%

Would you like your workplace to be located in the building where you live?

Option	Number of respondents	Relative percentage
Yes	125	30%
No	291	70%

What type of dwelling you live in?

Option	Number of respondents	Relative percentage
Detached house	69	14.2%
Apartment (in a building built before 2009)	356	73.4%
Apartment (in a building built after 2009)	60	12.4%

Do you like the building in which you live?

Option	Number of respondents	Relative percentage
1: Definitely no	27	5.6%
2	51	10.5%
3	160	33%
4	150	30.9%
5: Definitely yes	97	20%

How many people live there?

Option	Number of respondents	Relative percentage
1-9	86	17.7%
10-49	152	31.3%
50<	247	50.9%

How many of these people you know?

Option	Number of respondents	Relative percentage
0-24%	224	46.2%
25-49%	75	15.5%
50-74%	55	11.3%
75-100%	131	27%

Is there an open/shared space dedicated to the people living in the building?

Option	Number of respondents	Relative percentage
Yes	203	41.9%
No	282	58.1%

Do you feel connected to this space in any way?

Option	Number of respondents	Relative percentage
Yes	135	66.5%
No	68	33.5%

How would you rate the quality of this space?

Option	Number of respondents	Relative percentage
1: Very bad	9	4.5%
2	35	17.4%
3	57	28.4%
4	54	26.9%
5: Very good	46	22.9%

Who is responsible for taking care of this place?

Option	Number of respondents	Relative percentage
The residents	173	85.2%
The municipality	20	9.9%
Someone else	10	4.9%

Let's suppose that there is a place dedicated to you and your family and/or friends, where you can engage in various activities.

Would you participate in taking caring of this place?

Option	Number of respondents	Relative percentage
Yes	447	92.2%
No	38	7.8%

Do you think your relatives and/or friends would participate in the maintenance of this place?

Option	Number of respondents	Relative percentage
Yes	399	82.3%
No	86	17.7%

Do you think that the existence of such a place dedicated to you and your family and/or friends will improve your life in any way?

Option	Number of respondents	Relative percentage
1: Definitely no	19	3.9%
2	18	3.7%
3	108	22.3%
4	179	36.9%
5: Definitely yes	161	33.2%

Which three types of areas/activities do you think will most likely improve the lives of you and your family and/or friends?

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