



complex projects

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**COMPLEX PROJECTS**  
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*How should affordable housing be designed in a socio-economically segregated context such as Beirut?*

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# RESEARCH PLAN

01





## INTRODUCTION

One of the most important issues in our society today, is the question of:

“How do we want to live in the future?”

The rapid population growth worldwide and the resulting densification of cities, combined with the problems of climate change, are leading to the fact that the housing situation in large cities is becoming increasingly complex and should be subjected to critical scrutiny. Major cities in the Global South are already facing decisive challenges, and this is particularly evident in the capital of Lebanon: Beirut.

Characterized by cultural diversity, the city has a multi-religious society, with unfortunately a rampant space shrinkage issue. With in particular the Public domain. Evidenced by limited infrastructure and virtually no affordable housing, the cityscape is strongly demarcated by historic and religiously-motivated conflicts. However today, this is all overshadowed by the wide income gap.

## DEMOGRAPHIC

Greater Beirut is home to 2.3 million inhabitants, almost 1/3 of Lebanon's total population.

In general, it can be observed that “the Lebanese population is highly urbanized, with an estimated 90% living in cities.” (UN-ESCWA, 2012, as cited in Fawaz et al., 2014, P.16).

*But how do citizens live in Lebanon in the first place?*

According to one report, the 30-64 age group makes up as much as 40% of society.

Although Lebanon has always been a regular destination for refugee flows, more than 80% of its inhabitants still have ancestral Lebanese origins (International Labour Organization, 2019).

Housing culture in Lebanon is very family-oriented, which is why only 10% of households are individual households. The average size of an household is 3.8 persons and the classic role model of the man as the head of the family is still very much in place, which can also be seen in the fact that “Around 18% of households were headed by women and 82% by men.” (International Labour Organization, 2019, P. 6).

When looking to property ownership, it can be seen that in 2012, around 70% of Lebanese families owned their property, while 35.3% of Lebanese families had inherited their properties. Finally, with 46.7% having purchased the real estate with savings. However, it is interesting, and at the same time frightening, that “housing is only available through the market”. Because “There are, for instance, no public housing projects in the country.” (Fawaz et al., 2014, P.16/17).

This is also reflected in the fact that the percentage of homeowners in Greater Beirut is significantly higher than in Beirut itself. Only 43% of the population in Beirut owns their own property. In comparison, up to 85% of the population in the periphery own their own property (Fawaz et al., 2014, P.16/17).

Between 2003-2013, land prices in Beirut have increased by over 200%, and in some cases have caused urban sprawl again (Marot et al., 2021).

Facts like these are causing skyrocketing prices in the housing market, which is regulated only by supply and demand.

# Beirut Studio

## CHALLENGES

After suffering much violence from the long civil war, the inhabitants of Lebanon, and Beirut in particular, have been suffering for decades from a corrupt government, a low standard of living, and in addition to this, high inflation of the currency and a completely inadequate supply of electricity. (see diagram 1)

These already poor living conditions were significantly worsened by a devastating explosion (ammonium nitrate) in the port of Beirut on 04 August 2020 (Fakih & Majzoub, 2021).

This explosion not only exacerbated the already existing electricity and currency crises, but also triggered additional gasoline, gas, medical and food crises (Ibrahim, 2021).

## HOUSING MARKET

In order to grasp the extent of the explosion, one has to consider that more than 77.000 apartments were damaged, and in some cases even destroyed. This left more than 300.000 residents homeless within a single day. This has further aggravated the already tight housing market (Fakih & Majzoub, 2021).

The housing market of the city, is already being addressed before the explosion by the "2013: World Bank Study" with „Lebanon has been facing a housing crisis for the past three decades.“ (World Bank, 2013, P. 125).

For decades, the housing market has not been managed by the state, in other words, it has not been strengthened by necessary construction, market and rent regulations by the state.

The lack of this necessary regulatory framework has resulted in the entire construction and housing industry being maximally profit-oriented, with the construction industry's focus on building high-rise luxury housing units that promise the greatest profit margins (Fawaz et al., 2014).

Thus, in 2017, the average size of newly built apartments was 182m<sup>2</sup> (RAMCO, 2018).

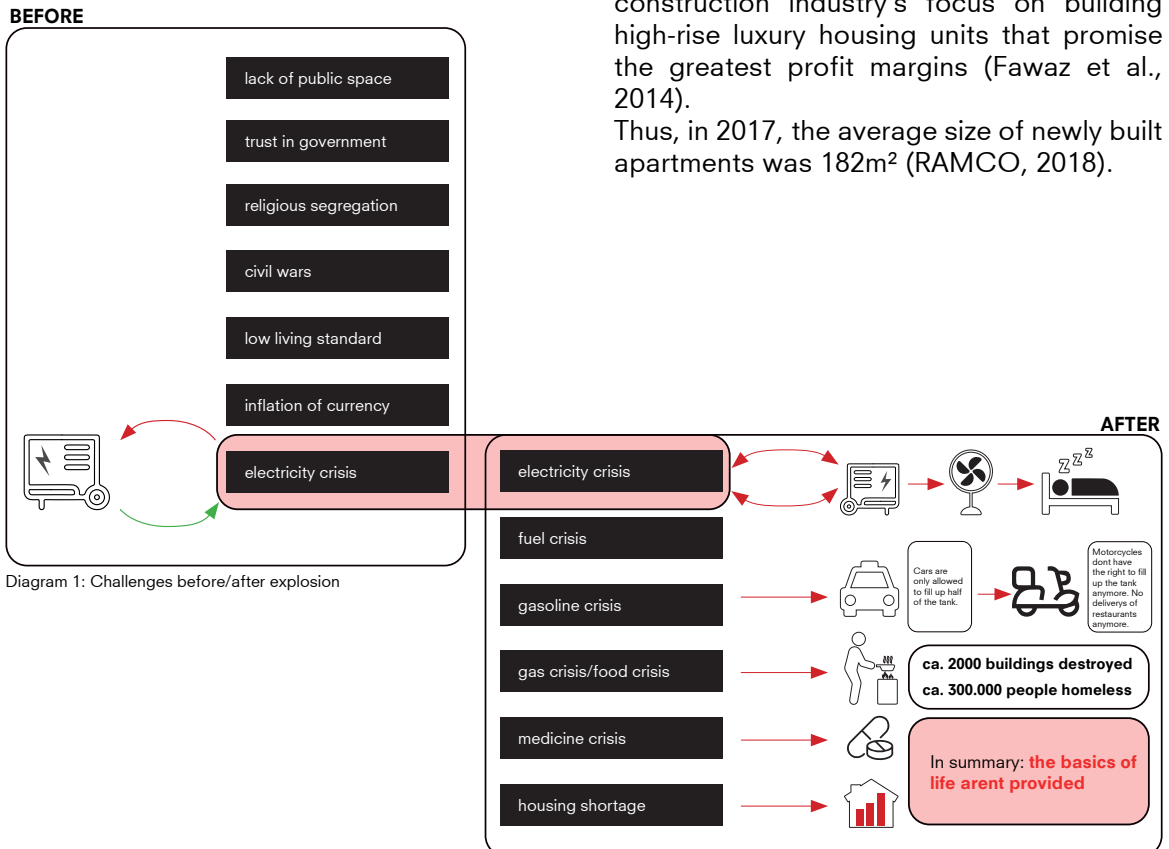


Diagram 1: Challenges before/after explosion



Accordingly, the cityscape has also changed greatly in the last century:

In the 19th century, the cityscape was still characterized by the typical Beirut Houses of the middle and upper classes, which were between 1-3 stories high and architecturally adapted to the prevailing weather conditions (Beirut Heritage Initiative, 2021). (See image 1)

Today, on the other hand, the cityscape is predominantly characterized by mid- and high-rises. (See image 2)

In order to be able to erect these profit-promising buildings in the densely populated city at all, both undeveloped/built-up land and public space were purchased by investors. Often this was only possible by changing or disregarding the legal basis, for which politicians and influential private individuals were responsible.

Thus, not only was the housing market deteriorated, but at the same time access to public space was restricted and ultimately denied to citizens. The author Abir Saksouk gives the explanation with his statement: „Private capital and its demands have overthrown other priorities formerly protected in law, particularly related to the common good.“ (Saksouk & Public Works Studio, n.d., P. 14).

Furthermore Saksouk explains „This investigation has demonstrated that the manipulation of the regulatory framework for

building development in Lebanon have systematically encouraged an intensive circulation of capital, enabling private actors to take charge of planning of the city.“ (Saksouk & Public Works Studio, n.d., P. 14).

As a result of this development, the city today offers hardly any public space as a meeting place for cultures, and private housing is no longer affordable for the majority of society.

For example, the monthly minimum wage before the explosion was about 350 USD and the average price of an apartment in Beirut was 1,091,000 USD. This means that a person with this minimum wage would need approx. 260 years to pay off the apartment without covering any other living expenses at all. Simply impossible (Fawaz et al., 2014).

After the explosion, the purchasing power of this minimum wage has fallen below \$30 due to the inflation of the Lebanese lira (CARE, 2021).

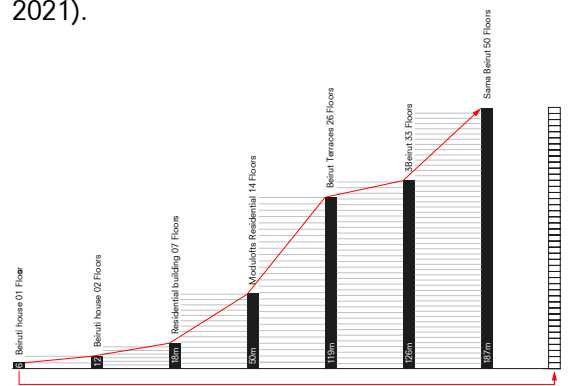


Diagram 2: Height increase



Image 1: Beirut houses



Image 2: Highrise culture in Beirut 2021

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## PROBLEM STATEMENT

In summary, 3 major challenges can be identified:

### 1. Living conditions:

To secure essential livelihoods, an enormous effort is required by the residents of Beirut. The difficult food supply and the connection to the supply network are of particular concern.

### 2. The housing market:

The greed for profit on the one hand is opposed by the fundamental desire for housing on the other. The two opposing interest groups have such conflicting needs that in the past 30 years it has not been possible to balance the requirements in a meaningful way that is acceptable to both groups. Finding a resolution here will have a decisive influence on the future of the city.

### 3. The lack of public space:

While suitable public space may not be seen as essential in contrast to access to food and housing, we come to understand that for such a socio-economically and religiously multi-cultural city as Beirut public space is in fact a vital key into understanding the society.

As a consequence of a considerable mismanagement and reduction of the public space there has been an intensification of conflicts between different religious communities over many years, triggering a strong distancing between communities, which can be seen today in the local cityscape.

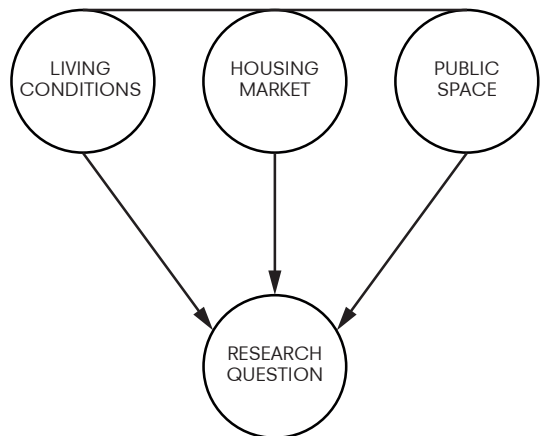
Therefore with limited opportunities for social interaction today, we come to understand the public space as a vital domain for designing a cohesive society.

## RESEARCH QUESTION

Based on this complex problem, I set myself the simple but nevertheless extensive research question:

**“How should affordable housing be designed in a socio-economically segregated context such as Beirut?”**

This question can be further broken down in order to help structure the research.



### **Sub-questions:**

#### 1. What is affordable housing in general?

- What does affordable housing (aff. h.) mean?
- What is the difference to social housing?
- What are the characteristics of affordable dwellings?
- Is aff. h. a replicable concept? How can you design a case study ?
- How large is the futurability of certain rules/ concepts?

2. How can architecture influence segregated socio-economic classes?

- What are similarities or common spaces/ activities/cultures/religions etc.?
- What are the differences between the socio-economic classes?  
What roles do people fulfill in their culture?
- What are buildings/spaces which are used by all of the classes?
- Is it possible to link the segregated social classes? Are there examples in Beirut?
- How to break cultural norms/segregation to create a new community?

3. What role does public space play in such a scenario?

- Would Beirutis use this space?
- What could be the benefits for the different social groups?
- Can architecture contribute to an inclusive public sphere?
- What power does space/architecture have in general and especially in low income beirut housing?
- If the project gets public space, how do you make residents feel responsible for their built environment? Why would they take the responsibility for something?

4. How does affordable housing relate to material and building processes?

- Use of local employees or local material?
- Importing material?
- Construction method? Modular and Prefabrication?

5. Who are the stakeholders involved in financing such a building, especially in a context like that of Beirut?

- Profit organisations or non profit organisations?
- Should it be the municipality?  
Should it be the government?
- How can public space in aff. h. be financed at all? What are opportunities?

# Beirut Studio

## RESEARCH FRAMEWORK

The scientific basis of my work will be, among others, a combination of the concepts of Behaviourism, Praxeology, an analysis of case studies and architectural typologies in Beirut as well as historically relevant demographic context in the city.

To supplement my work, I will be informing my design research process with various ethnographic insights gained during my one-week stay in Beirut in October 2021. These help to understand to what extent the harsh realities, lived experiences and subsequent behaviours of residents in Beirut differ from my own Western European context. Though due to limited access this embodied reading serves only to better contextualize the site and acknowledges my background not originating from the Global South.

It was during this excursion where the evident need for housing became clear, supported then by demographic and contextual research the scope of the project zoomed into housing in Beirut. Here we need to consider, however, the historical and political context, and the different starting situations and concerns of the residents as individuals but also as a community.

One question which I felt personally attached to in this context is whether and with what supportive means these demographic groups can be enabled to live together instead of economically, and therefore physically, segregated in the future. In this context, the question also arises:

*What power does space actually have? How can space, or architecture, influence people's behavior?*

Here, I intend to use Jan Gehl's work as a starting point to understand the connection between space, architecture and human behaviorism and praxeology. However, I again acknowledge the predominant Western origin of his work and therefore intend to extend the scope of literature used to other academics and researchers whose work

centers the Global South.

On behaviorism, the book "Beyond Freedom and Dignity" by the American psychologist B.F. Skinner describes here the importance of one's environment:

"It is now clear that we must take into account what the environment does to an organism not only before but after it responds. Behaviour is shaped and maintained by its consequences... It is true that man's genetic endowment can be changed only very slowly, but changes in the environment of the individual have quick and dramatic effects." (B.F. Skinner, 1971, P. 24)

Similarly, Dan Lockton explains that "Bounded rationality = people responding to the limitations and priorities of the context in which they are making decisions" (Lockton, 2015)

These quotes reveal that people are not exclusively responsible for their own social exclusion.

Rather, this is clearly forged by the surroundings and the living environment. An environment that does not offer space for interaction does not offer the chance for population groups to live together and to see themselves as part of a whole. Here I would also like to incorporate the notions of urban resilience and learn how this phenomenon is usually triggered in order to generate a sustainable long term plan for a socio-economically integrated housing project.

The environment with its opportunities for development, strongly shapes the behavior of residents, can promote open-mindedness, helpfulness and shared activities and friendships as well as understanding of each other's points of view. It can promote the breaking down of inner boundaries and thus also help to overcome outer boundaries.

## RESEARCH METHODS

To answer my research question, I have already and will use different methods that are data driven, yet rooted in praxeological study.

In the first 5 weeks of the master's thesis, I conducted fundamental background research on Lebanon and Beirut.

Firstly, by informing myself about the history of the housing culture and architecture of Lebanon and Beirut. Here, I was able to get a first impression with the help of a lecture series by the Beirut Heritage Initiative.

### Typology studies

In the course of the master thesis, my goal is to trace the historical change of housing in Beirut in a first analysis and to compare different housing and building types (Lebanese and international) under historical and thematic aspects.

Additionally, a further analysis of case studies regarding the integration of the architectural language of the Beirut Houses into today's architecture will follow. (See appendix)

Furthermore, in a third analysis I will compare buildings and living situations in which people from different cultures meet and also develop common activities. The main goal is to identify examples in Lebanon in order to develop a suitable housing concept that could also work. (Examples: Bar Elias Pavillon, House of One)

Based on these three analyses, I will develop a concept for a wide scale framework for appropriate affordable housing construction in Beirut. This will inform both the design and concept of my final housing proposal.



Image 3: Fishermen housing in Beirut



Image 4: Affordable housing development in Mexico



# Beirut Studio

## Beirut Trip – Fieldtrip experience

It quickly became apparent to my work group and me during the background research that Beirut was not yet tangible, despite several weeks of research. We were able to gain a rough understanding of the layout of the city, but not of the processes within this Habitat City of Beirut and the behaviors of the people.

Therefore, as a small group of 8 students, we planned a 4-day study visit to Beirut. By even staying longer than a week, we were able to better grasp and understand our proposed area for group work on the one hand and the people and their culture on the other.

## **Group activities in Beirut:**

### *Interviews:*

Before the beginning of the trip, we contacted various experts in Beirut and were thus able to obtain further information and assistance on site.

For example, from Rani al Rajjii, a Lebanese architect on the history, demarcation of different population groups and grievances in Beirut, as well as from the professors David Aouad and Roula El Khoury (LAU) on the urban planning area (Ramlet Al Baida) belonging to our project.

From the Urban Lab of the American University of Beirut we received the latest analysis results about the city and its infrastructure.

Also the Nabil Gohlam Architects, one of the most famous architectural offices in Beirut, gave us insights into their planning work considering the different climatic conditions in Beirut and the influence on their residential building design.

## *Refugee camp*

On the last day as a large group of the students, we decided to visit the refugee camp “Mar Elias” in our area.

The refugee camp is strictly hierarchically structured under -armed- leadership, not every external person gets access.

After explanations to the so-called “boss” we were allowed a tour accompanied by a “guide”.



Image 5: Mar Elias Refugeecamp and empty plot used as football field

Among other things, we were able to establish contact with young people living there, who indicated table soccer, soccer and BMX biking as leisure and daily activities. For lack of other possibilities, playing soccer, for example, is so far only possible on still vacant building plots, which will not be available in the foreseeable future.



Image 6: Freetime activities of children

When asked about female youths, they simply stated that they spend their free time inside the apartments. While this challenged our European egalitarian upbringing, it did confirm the demographic research we had previously only read about.

Therefore, I became further curious around the activities of the inhabitants of the refugee camp during the day.

Does interaction with other groups take place?

Are there schools for the children in or nearby? What futures can these children expect in this environment and what opportunities will they have? How can good architecture improve the living environment and perhaps the perspective of life for the residents? These questions were deeply prompted on site and will certainly inform the research questions, sub questions and direction of this investigation.

Important to note: The refugee camp we visited does not correspond to the widespread image of a refugee camp; it is more like a small town of its own, with buildings that are even six stories high in some places. An isolated city within a city, without communication with the outside world.



Image 8: Table soccer in the entrance area of the camp



Image 7: Alleyways in refugee camp



Image 9: Farewell photo with the children

# Beirut Studio



## Individual activities in Beirut

### Questionnaire

Before we flew to Beirut, I created a survey questionnaire. My goal was to seek direct contact with residents and ask them to fill out my questionnaire to get a better understanding of the general housing situation in Beirut.

First part of the questionnaire: "Hard Facts", such as household size, number of rooms, apartment size, owning or renting.

Second part of the questionnaire: "Soft Facts", such as mainly used space, whether the respondent likes the apartment; what should be changed and how he/she envisions the future of the housing market and housing in Beirut.

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**Questionnaire for my master thesis about residential buildings in Beirut.**

Age \_\_\_\_\_

Gender  male  female

Household size  1  2  3  4

Type of home  house  flat

Property  owned  rented 4

Floors of building  1/2  <5  10  <15  
 <20  <30  <40  <50

Building age  <20  <30  <40  <50  
 <60  <80  <100  >100

Number of rooms  1/2  <5  <10  <15

Squaremeters  <20  <30  <40  <50  
 <60  <80  <100  >100

Do you have a:  garden  balcony  nothing

Do you want a:  garden  balcony

In which room do you spent the most time?  living  kitchen  sleeping

Why? \_\_\_\_\_

Do you identify with your building?  yes  no  
how? \_\_\_\_\_

Do you like your flat?  yes  no  
why? \_\_\_\_\_

What are you missing? \_\_\_\_\_

What should be changed? \_\_\_\_\_

How do you imagine the future of housing in Beirut? \_\_\_\_\_

Hello, my name is Loy Dönne and I am currently writing my master thesis (architecture) at TU Delft in the Netherlands. I am dealing with the topic of Beirut and its residential buildings. Therefore, I would like to ask you if you would answer a few questions regarding your home.

Thank you a lot for your help!

### In practice,

the interviews were not as simple as I had imagined when writing them from the comforts of my European context: Due to the prevailing poverty in our district/area - apart from language barriers - it became clear that it would have been partly disrespectful/macabre to question these people on their housing situation and their desires and conceptions.

For this reason I asked in particular the professors and students of the universities and also the interview partners whether they could fill out my questionnaire.

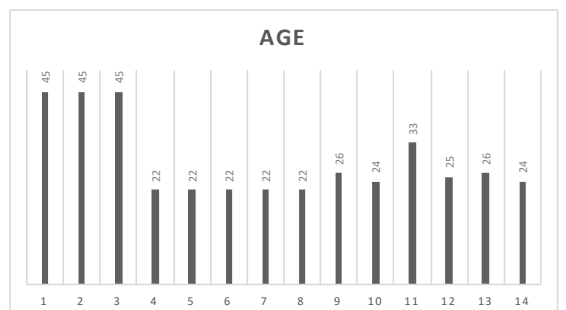
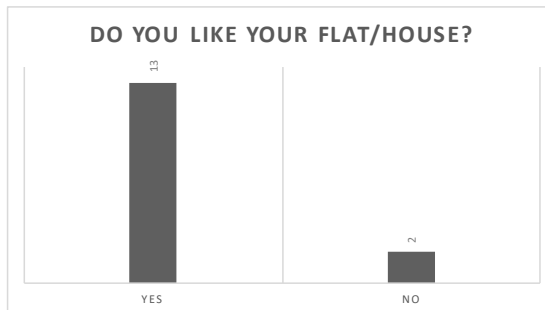
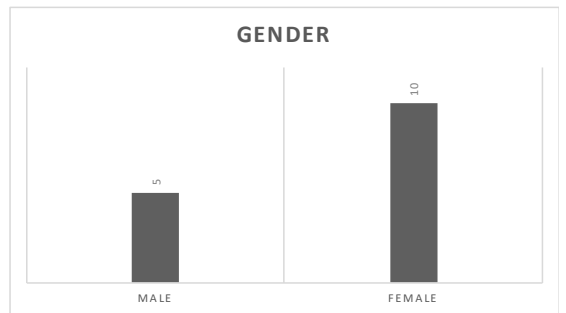
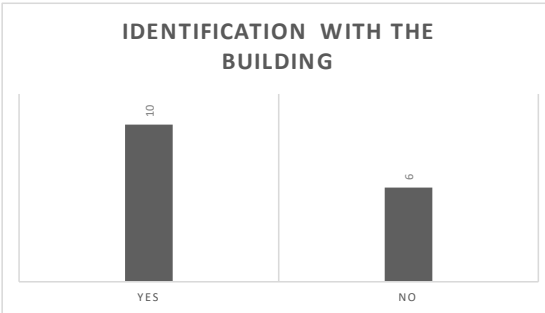
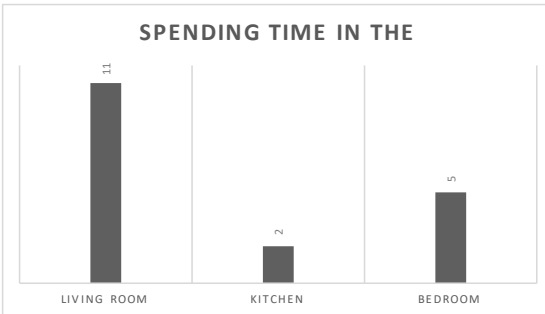
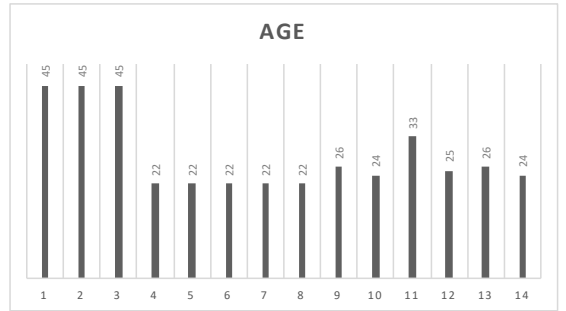
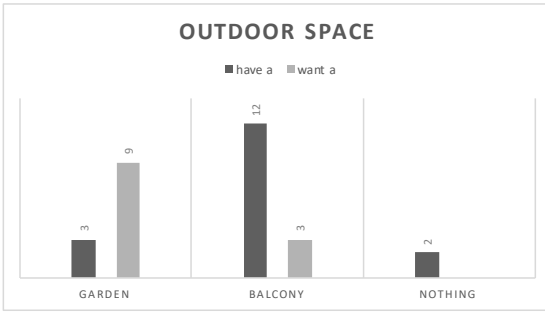
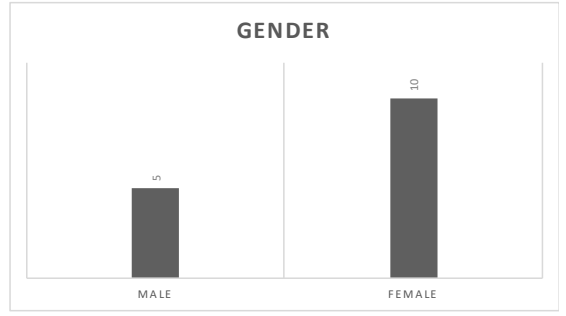
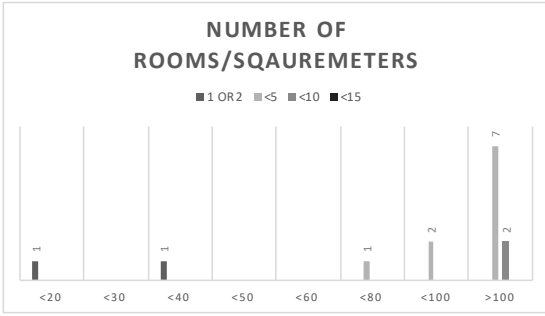
The advantage of this method is that I could obtain the direct circumstances and also the professional opinions of people with an understanding of architecture, urbanism and housing culture in Beirut.

The disadvantage is the belonging of these respondents to the upper middle class of Beirut and the lack of concrete statements from the low-income population.

I will organize the results of the survey by specific user groups and categories in order to make more informed statements about my proposal for a new type of housing in Beirut.

→ *For the results of the second half of the questionnaire, please have a look at the appendix.*





# Beirut Studio

## Lecture

I also attended a lecture by Elie Harfouche, a professor at LAU who studies the history of social housing in Lebanon. This explained that Social Housing in Lebanon is organized by religious communities and it is actually hardly supported by politics. (Elie Harfouche Lecture at LAU 07.10.2021)

For my further research, just the contact with him will help me. I hope to discuss my question and concept with him in another meeting.

related projects. Much more, they also show that there really is an interest in this among the population. (See appendix)

## After the trip

Through the contact with Professor Roula El Khoury, I was able to attend a lecture entitled "How to look at architecture". In it, she reported on the appropriation/occupation of public space in Beirut by children. Due to the lack of alternative ways to play in Beirut, children quickly appropriate public space, such as the streets, junkyards and parking lots, in order to play there.

## Photo album

In the course of the next few weeks, the creation of a photo album with thematic chapters, such as residential buildings, public life, streetscape, greenery, etc. to illustrate the atmosphere of the city of Beirut will follow.

## Interview

In order to get further and also more specific information about the housing situation from the young people, I interviewed a student from LAU. The evaluation of the interview will follow in the next weeks.

I plan to interview "Catalytic Action Program" further as a research methodology. This is an organization that connects diverse population groups in Lebanon through participation in architectural programs. Their projects, such as playgrounds and pavilions show in Lebanon that it is possible to ease and lift socio-economic tensions through spatially-

## CONCLUSION

Reflecting on this research plan, it becomes clear that when presenting a seemingly simple question such as 'How to design affordable housing in Beirut' we realize that in fact it is no simple question at all.

The multiple / endless sub questions attached lead to a complex multi-disciplinary research proposal. By looking at human behaviorism, typology studies as well as practical questions around financing it becomes evident that through the simplicity of the question a realistic design proposal is required, and one that would hopefully present a case study solution to Beirut's Housing Crisis.

A first conclusion from my research so far is that architecture influences people and their behavior. In the further course of my work, I would like to trace above all how this happens and to what extent. From the knowledge gained so far, I conclude that segregation in Beirut is a self-fertilizing process that can only be broken by creating space for mixing.

This public space is to be the basis of my housing project. Because one question remains unanswered: Will the residents of Beirut accept a housing development in which there is no segregation? It is through my study of "Catalytic Action Program" that I believe so, and have therefore made the decision to focus my design on this domain.

My research will therefore paint a realistic picture of the mishmash of life in Beirut, tracing the three different problems to their origins. Along the way, I will use Behaviourism, Praxeology and Sociology among others, to discuss which factors have an influence on the actual problem.

From the origin, I will then recompose the factors with the knowledge gained from the previous scientific investigation, as well as from my observations in the field and based on the plot of land provided to me. In doing so, I will develop far-reaching measures to counteract the renewed emergence of the problems.

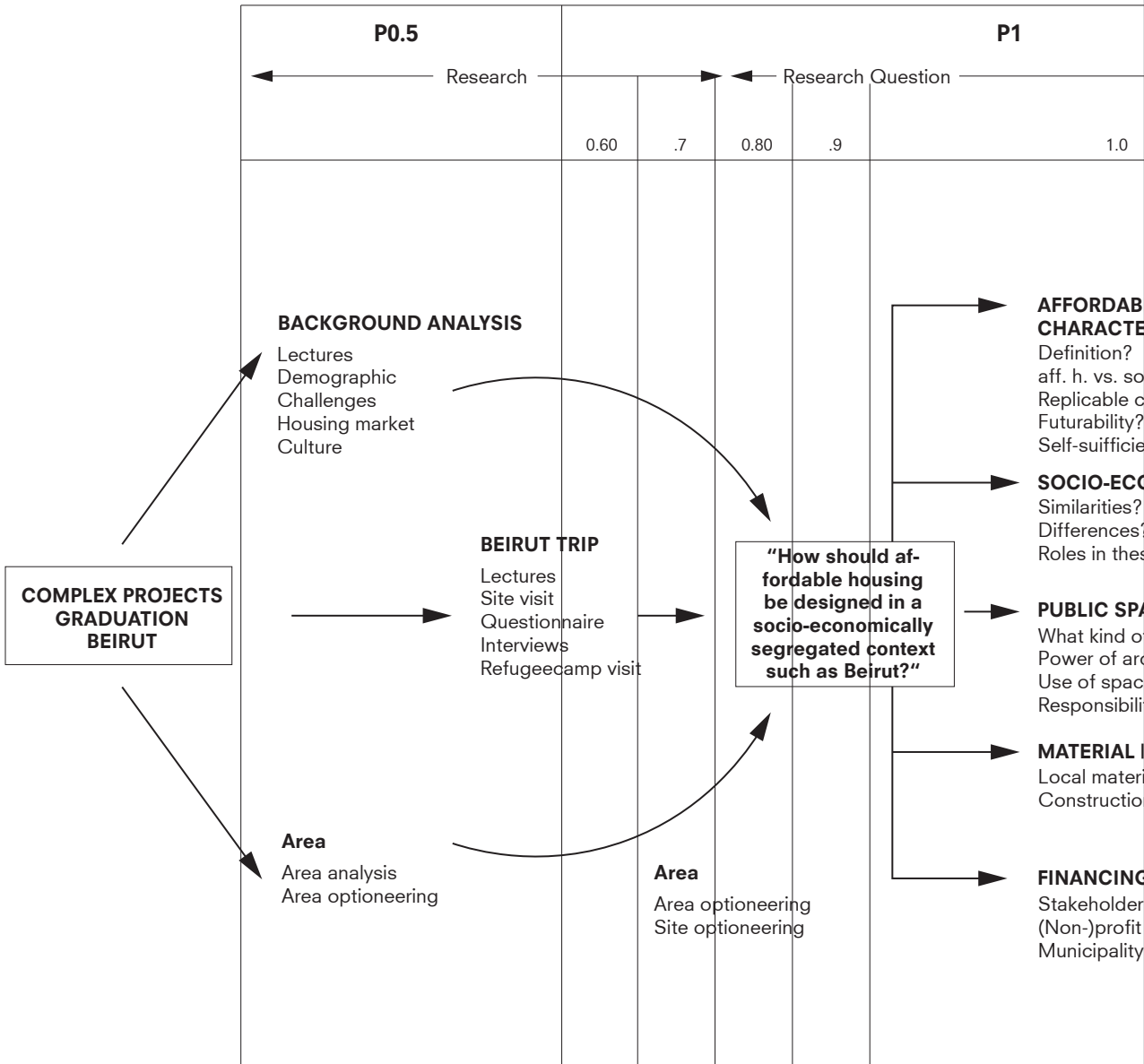
The work will aim to result in a building complex that brings people together at its base. Shared areas will be researched further in order to understand, how they can become play, learning and business areas, available to all ages.

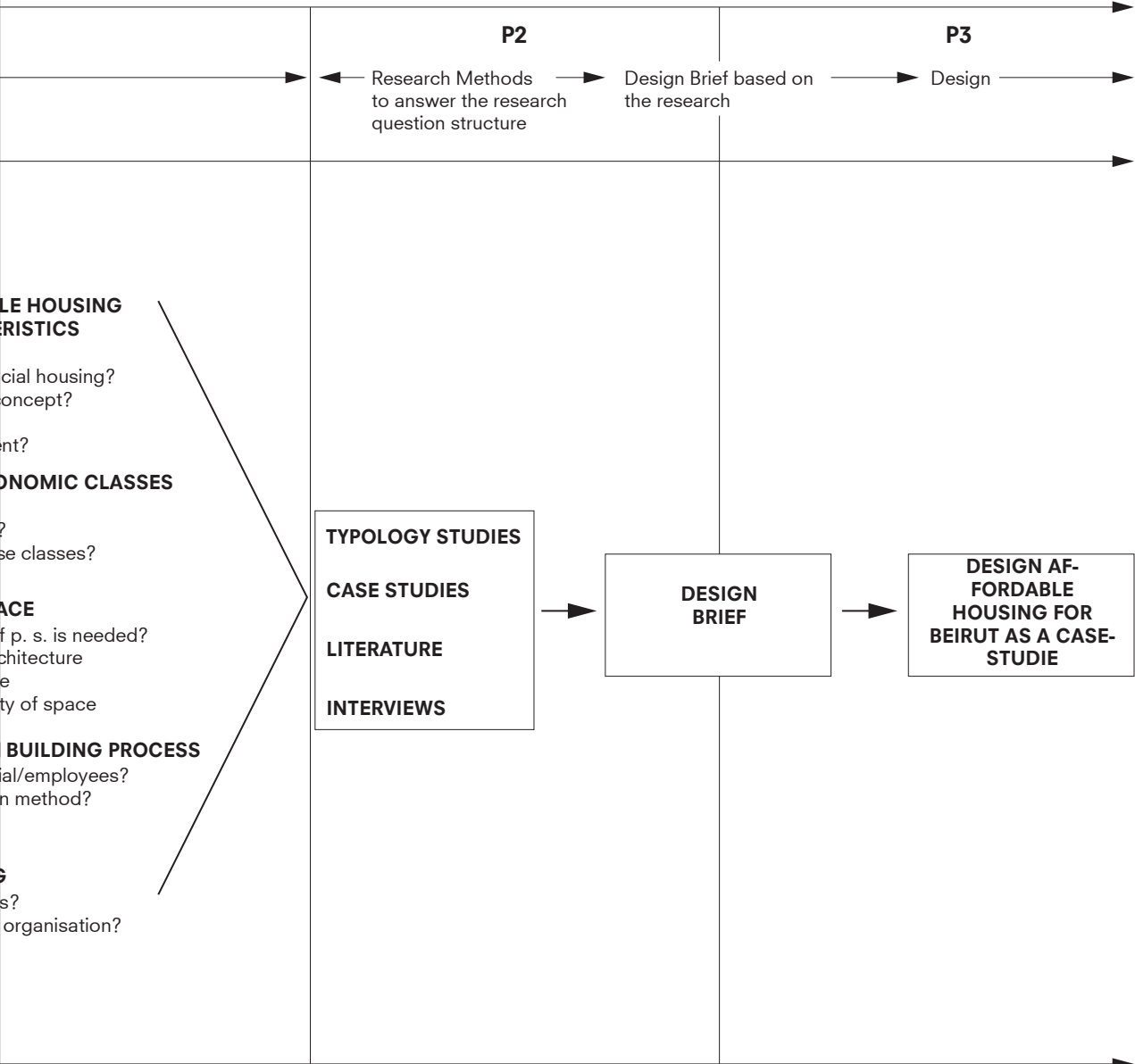
The structure's architecture, construction and financing will be such that any low-income family will be able to compete for housing. All spaces, exterior and interior, will be designed and implemented with the well-being of people and a peaceful and united neighborhood fabric in mind.

The goal is to create a sustainable housing idea that helps to bring a vision of living in community across the boundaries of religion and wealth. This is an increasingly significant challenge in the internationalised global context, and also really relevant to support and create a new generation and identity, especially in Beirut.

# Beirut Studio

## Research diagram





# DESIGN BRIEF

02



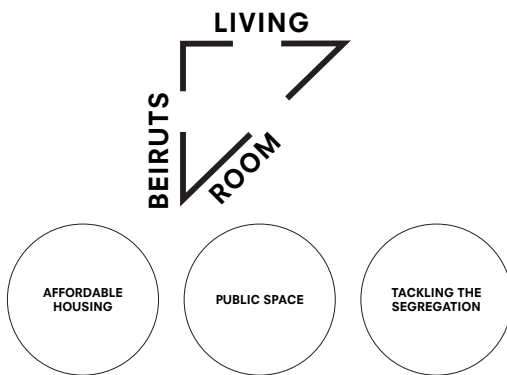
# Beirut Studio

## DESIGN BRIEF

### Research Question

Based on the research question “How should affordable housing be designed in a socio-economically segregated context such as Beirut”, different research methods have already been applied to create the design brief.

The goal must be to combine affordable housing with public space and thereby also reduce the segregation of the different social groups.



### Questionnaire

The evaluation of the interviews conducted in Beirut revealed that, above all, a new housing typology is needed.

About 50% of the interviewees stated that affordable housing and smaller apartments play a decisive role for the future of Beirut and are absolutely necessary. An important aspect for this affordable housing is also that it should be available for different income groups.

Furthermore, the coverage of basic needs, such as the supply of electricity, water, air and daylight is crucial to guarantee better living conditions. There must also be changes in the area of spatial design. Above all, areas and spaces for communal use are required, but also private areas such as balconies.

A decisive factor for the well-being and appreciation of private living space is the possibility of exerting one's own influence on the design of the furnishings or, in general, that the furnishings are modern and beautifully designed. Therefore, the aim is to provide future residents with a kind of modular system for the interior, which can be reconfigured for the new user when the occupant changes.

Through the survey it is also clear that based on the utilization and usage time of the rooms, they should also be correspondingly more generous or less generous. Thus, it is only logical that the room that is used the least should also preferably be the smallest. According to interview results, this is the kitchen.

These survey results have confirmed the previous research results and partly also added important aspects. Thus, it is only logical that the combination of both research branches must result in a synergy for the future of the housing market in Beirut. Therefore, a building must be designed as a pioneer for the change of the housing market in Beirut, which specializes in affordable housing units for different income groups.

**WHAT:** MIXED INCOME AFFORDABLE HOUSING

**OFFER:** LONG TERM RENT  
SUPPLY OF BASIC NEEDS

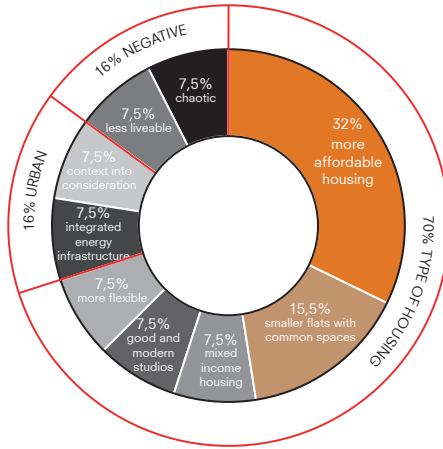
**SPACES:** COMMUNAL SPACES  
IMPLEMENTING OF GREEN SPACE  
SHARED TRANSPORTATION  
PRIVATE AND PUBLIC OPEN SPACES

**INTERIOR:** STANDARDIZED FURNITURE  
OPPORTUNITY TO CUSTOMIZE IT

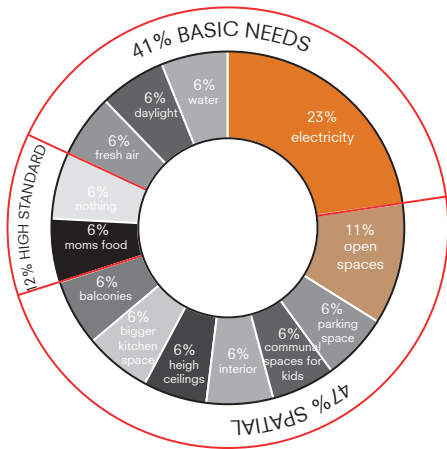
**SIZES:** SMALLER APARTMENTS  
LIVING ROOM > BEDROOM > KITCHEN



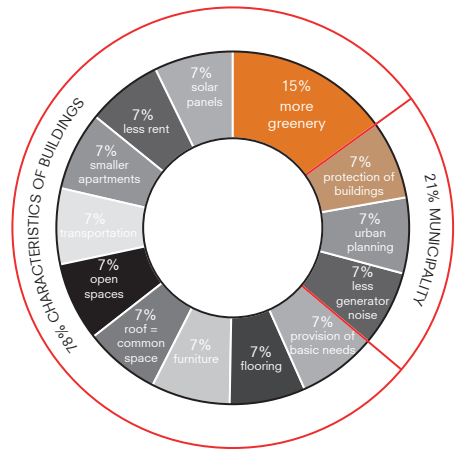
### HOW DO YOU IMAGINE THE FUTURE OF HOUSING IN BEIRUT?



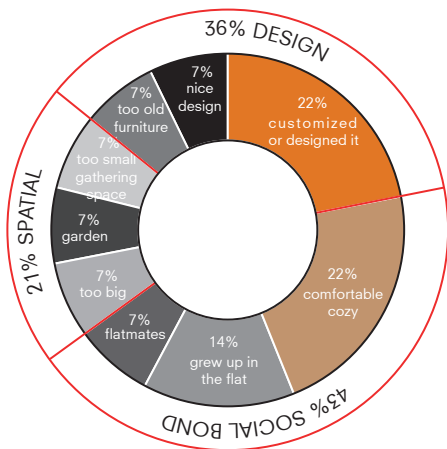
### WHAT ARE YOU MISSING?



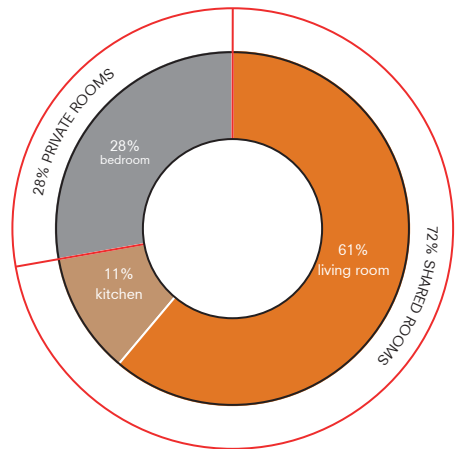
### WHAT SHOULD BE CHANGED?



### WHY DO YOU LIKE YOUR FLAT?



### IN WHICH ROOM DO YOU SPEND THE MOST TIME?



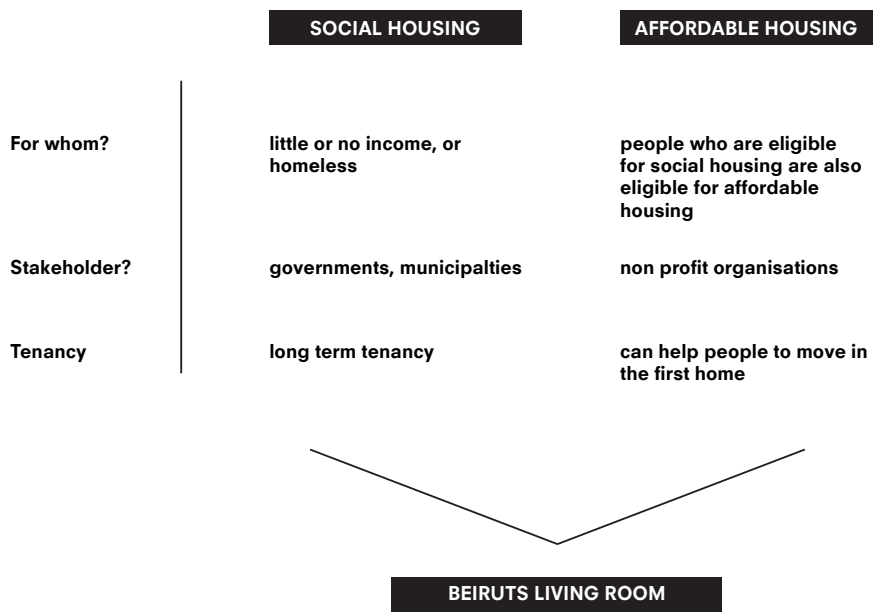
# Beirut Studio

## *Social housing vs. affordable housing*

By comparing social housing and affordable housing, it has become clear that neither option really fits 100% for the housing market in Beirut. Therefore, as illustrated in Diagram X, the best and most important points of both housing ideas need to be combined to create a new housing concept that is also possible for the circumstances in Beirut.

As an example, in social housing, the state or municipality is often the client. In Lebanon or in Beirut in particular, there is a lack of financial resources and also a lack of will to tackle social housing. Therefore, it makes sense to choose a non-profit organization as the client for the project, as in affordable housing, which in cooperation with the municipality can actually tackle such a project. Combining the target groups of the housing concepts allows Beirut's Living Room to address not only the households that have almost no income, but also households with a middle income. In this way, a certain diversity

and an avoidance of larger homogeneous clusters, as is the case with the refugee camps, should be avoided. This also plays a special role with regard to the tensions between the groupings in Beirut. Only when they begin to interact can change take place. Furthermore, the broader target group also allows for better funding opportunities. It would be conceivable, for example, to assess the rent as a percentage of salaries. In this way, middle-income groups can obtain good and more affordable housing, but also contribute to the lower income group being able to afford it at all.



## Casestudies

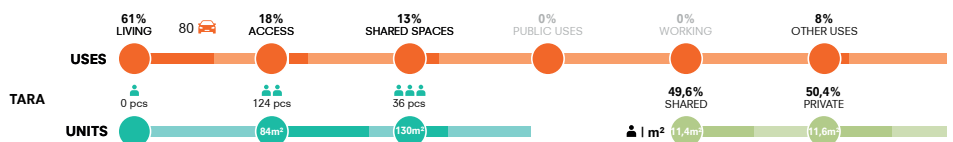
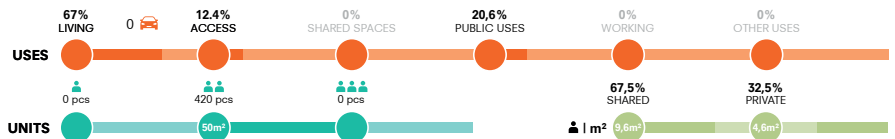
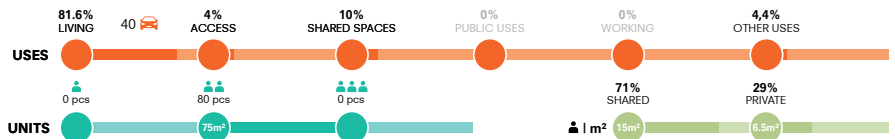
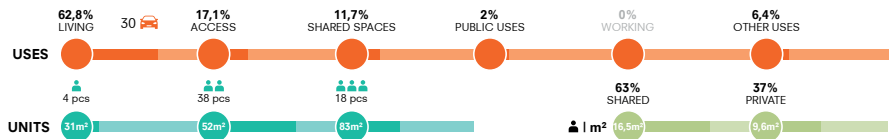
To get an idea of social and affordable housing projects in the global south, different housing projects were compared. The following housing projects were chosen for comparison:

Las Americas, León, Mexico  
 Housing for the Fishermen, Tyre, Lebanon  
 Heliopolis, Sao Paulo, Brazil  
 Tara housing, New Delhi, India

These projects were chosen not only because they offer variety and diversity, but in some cases were realized in a context at least as difficult as Beirut. Both the Las Americas and Heliopolis buildings were built in a favela area and both address a very low-income target group.

The Housing of the Fishermen project was chosen because it is one of the few low class housing projects in Lebanon that could be built with the help of organizations.

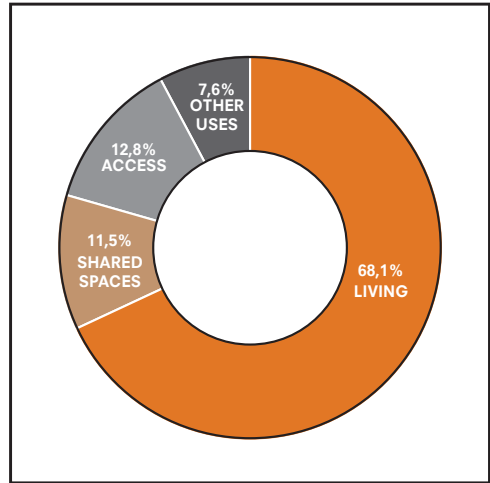
The Tara Housing project, which was designed for the middle class in India, serves as a counterpart. A special feature is the park between the buildings, which is used as a communal "garden".



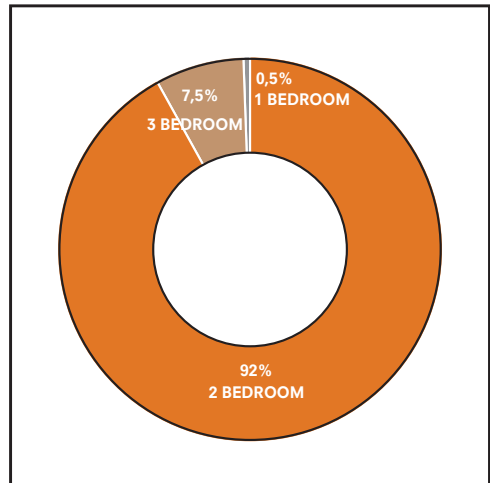
# Beirut Studio

## Result

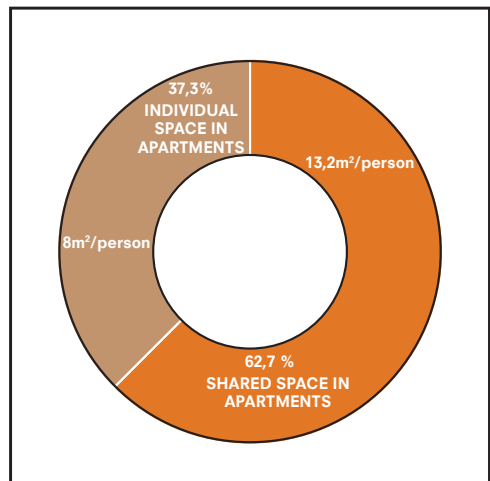
When comparing the percentages of public and private land in the Built up Area, the average percentages are approximately 70% residential units, 12.8% development, 11.5% common areas, and 7.6% other uses such as parking, etc.



It is also noticeable that the focus is almost exclusively on 2-bedroom apartments. Individual apartments are only available in one of the case studies and are also a minority in this one.



It is interesting that in the respective apartments there is almost always 2/3 common area per person and about 1/3 private area in the form of the bedroom. On average, this is 13.2m<sup>2</sup>/person common area and 8m<sup>2</sup>/person private area.



## Density comparison

The comparison of the different buildings in terms of building typology, lot area, coverage, buildup area, FAR, units per hectare, persons per hectare and buildingscosts is enormously important, especially for the later determination of the building size, in order to get a better impression for the selected lot and the building mass to be chosen.

As a particularly good example of a dense building, the Heliopolis building can be seen. With about 1400 people per hectare, it creates 3-4 times more living space for more people.



# Beirut Studio

## Dwelling floorplans

It is interesting to note that although all the apartments are designed to meet the same need, namely social and affordable housing, all the floor plans are fundamentally different.

The Las Americas floor plans, for example, have no corridor space due to clever arrangement of rooms in the apartments.

In comparison, the Housing for the fishermen floor plans have more and more corridor space the more floors the individual apartment has.

Furthermore, the previously mentioned buildings have 3 completely different apartment typologies and, for example, the Heliopolis building has only two very similar ones.

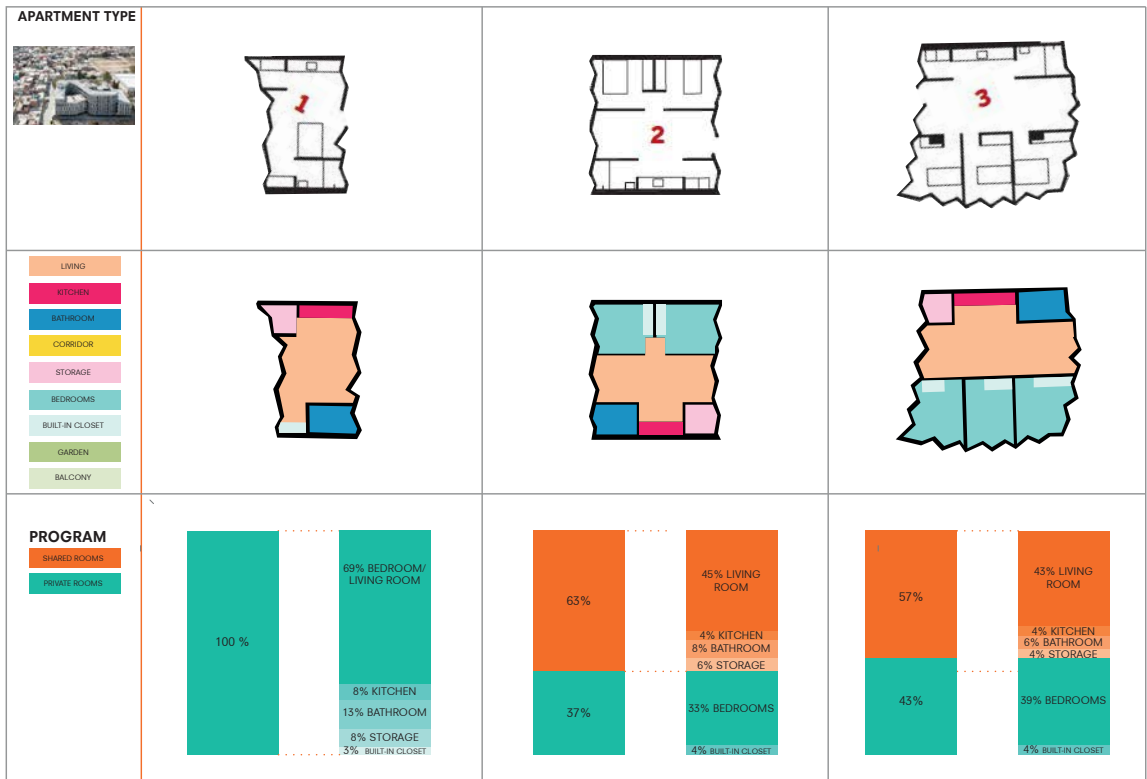
The Tara Housing units also have a lot of corridor space, as they are always on 2 floors. Furthermore, they even have 2 bathrooms. Whether 2 bathrooms are really necessary should be critically questioned for Beirut's Living Room.

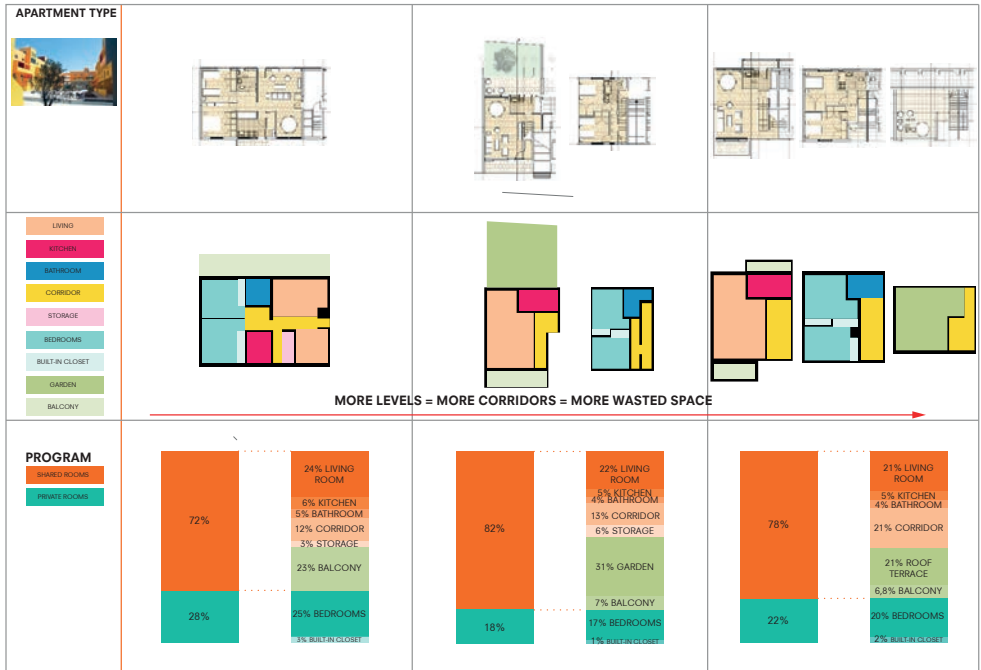
## Result

In the end, it can be said that the planning of the interior is probably the biggest challenge. It is the planning of interiors, such as built-in cabinets, that will determine whether this project will be successful or not.

It should be noted that any corridor space within the residential units is wasted space. Therefore, if possible, care must be taken to design the residential units as single-story only.

In addition, it is important to recognize that the more people living in a dwelling, the less area per person is needed, as rooms and common areas are shared with more people. This is essential especially in terms of the efficiency and cost of the building.





# Beirut Studio

## Density











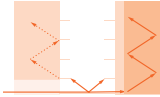


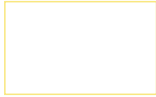














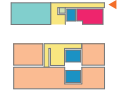



Comparing the architectural principles, it is noticeable that all buildings were planned with an inner courtyard. This makes it possible to achieve a higher density without having to build a high-rise building.

In terms of the arrangement of spaces, the Las Americas building is exemplary because it does not use corridors.

For the arrangement of vertical and horizontal residential units, the Heliopolis building leads the way.


The Las Americas building is also exemplary in terms of the construction method. To support local workers and allow as many people as possible to benefit from the construction work, extra modular concrete blocks were developed for the facade, which had the dimensions and appropriate weight to be carried and placed by a worker.

Identifying features of the buildings are almost always highlighted by bright and vivid colors. Examples are stair cores, building entrances or the apartment doors.

CONTEXT	BUILDING TYPOLOGY	ACCESS	ARRANGEMENT OF FLATS (SECTION)	ARRANGEMENT OF ROOMS	MATERIALITY	IDENTIFICATION	CONSTRUCTION
							
							
							
							



**STANDARDIZATION OF APARTMENTS**



**ARRANGEMENT OF FLATS WITHOUT CORRIDOR SPACE IS POSSIBLE**



**CONSTRUCTION PROCESS IN FAVOR OF LOCAL BUSINESSES**



**IDENTIFICATION THROUGH COLORS**

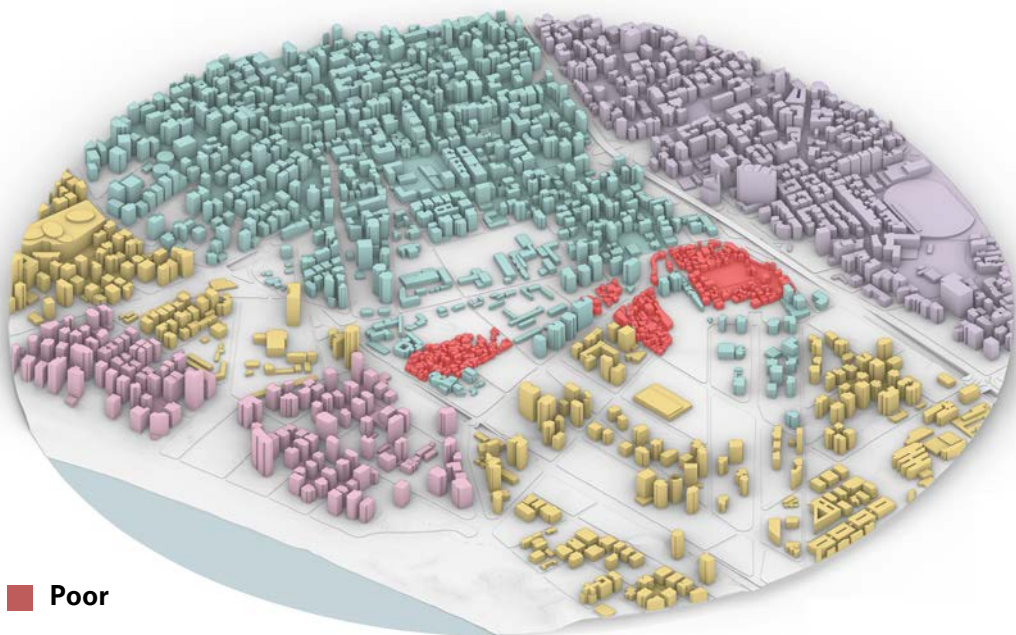


### *Segregation in the suburb*

The diagram shows that there is a large disparity in the suburb. The two refugee camps stand out especially because of their poor construction and also because of the poor living conditions of the inhabitants.

For the refugees, the rent price is the decisive factor when choosing an apartment. This factor alone makes the differentiation from other socio-economic groups stronger.

So the goal should not only be to reduce the segregation by housing only for the residents, but also to create a public and inclusive offer that provides an advantage for all.

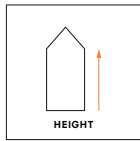
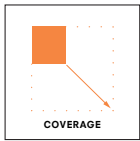


- Poor**
- Low income**
- Middle income**
- High income**
- Luxurious**

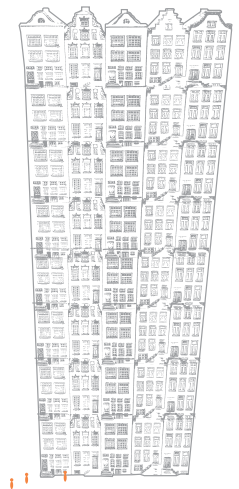


## Conclusion density

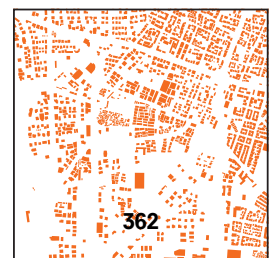
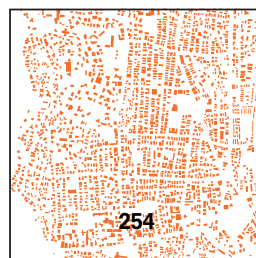
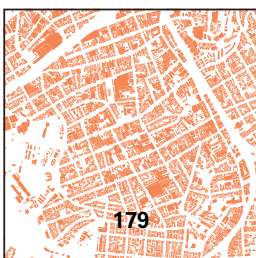
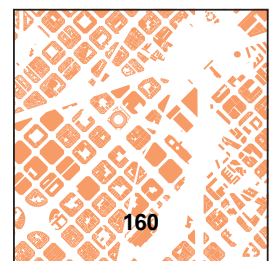
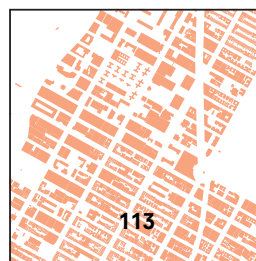
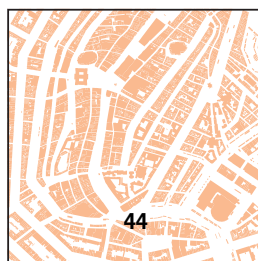
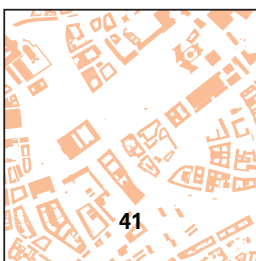
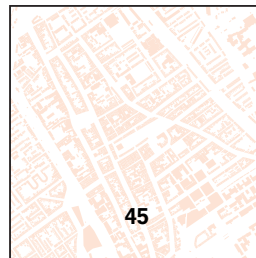
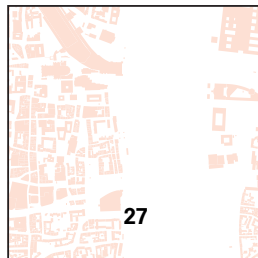
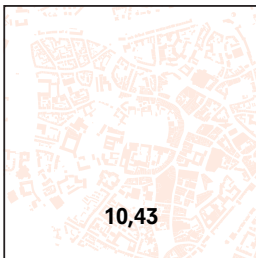
This can only suggest that the density of the city depends not only on the density of the development, i.e. the coverage, but also on the height and even especially on how many people or families live in one housing unit. In Beirut, for example, several families share one apartment in some districts. If you transfer the density of Beirut to Delft, it would simply be eight times the current density. So it's an insane difference.



Delft density  
45/ha



Beirut density in Delft  
362/ha





# Beirut Studio

## Projects for inclusion in Lebanon

In Lebanon, there are few initiatives to create inclusive buildings.

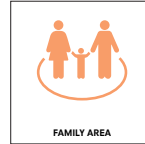
But there is a group called Catalytic Action, which has set itself the task of creating various inclusive places in Lebanon to counteract the segregation of socio-economic classes.

These places and parks can often be described by the following place or object characteristics:

Vertical levels, sports, benches, shaded areas, education items.

Generally, these parks also always have in 3 major activity zones.

1. Family area
2. Playground area
3. Active sports area



### VERTICAL LEVELS



### SPORTS



### BENCHES / SHADED AREAS



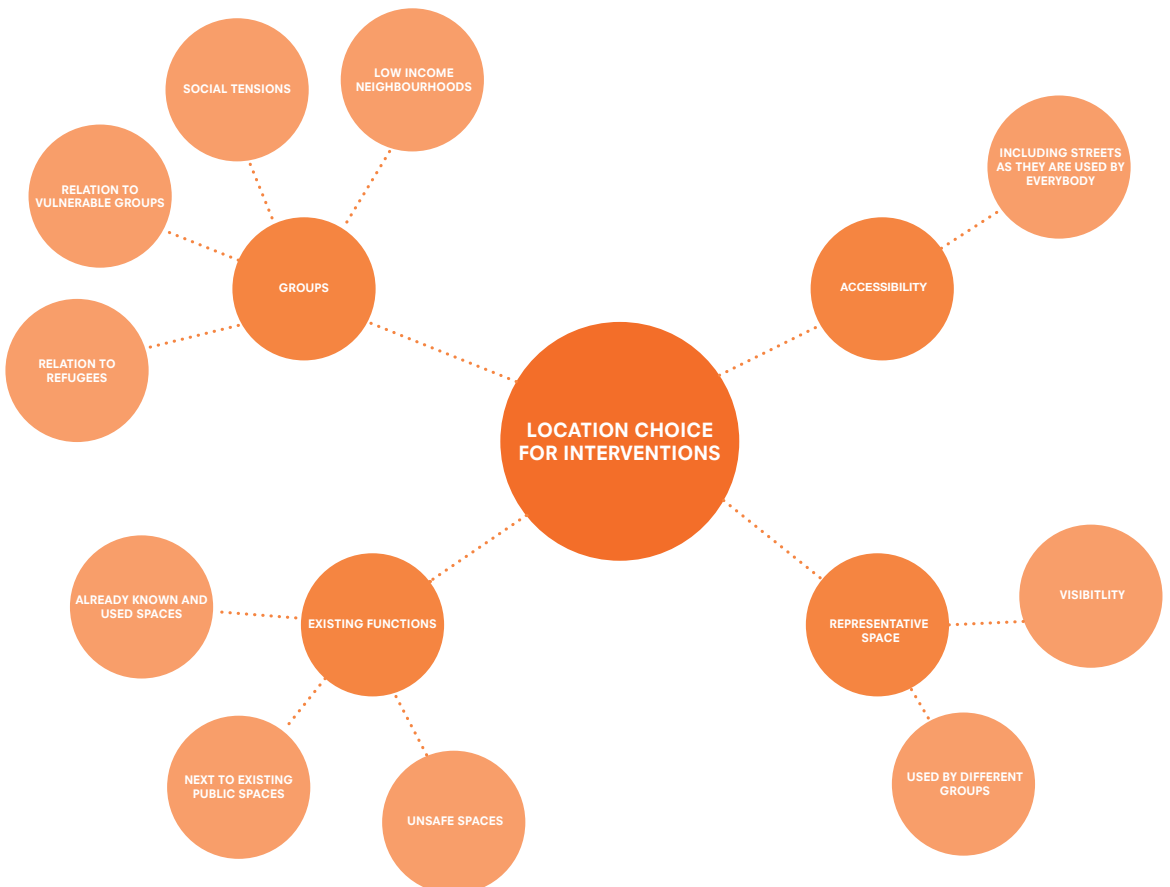
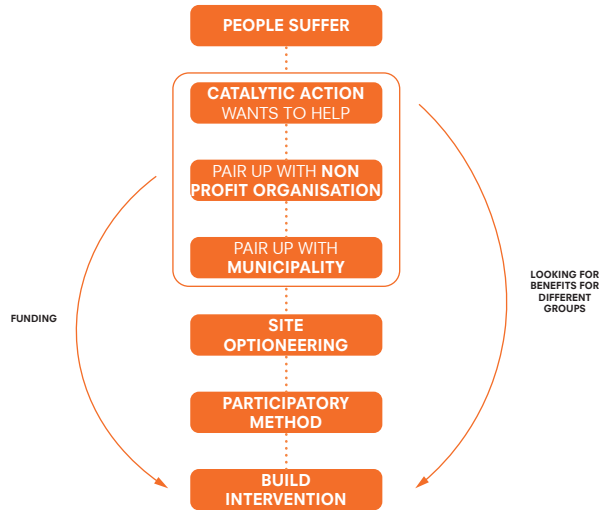
### EDUCATION



## Principles of the inclusive parks

All parks have a similar stakeholder overview. Catalytic Action sees how people are suffering and wants to help. Based on this, they look for non-profit organizations. Then they start to cooperate with the municipality or city and different locations for interventions are chosen.

The conditions under which these locations are chosen can be seen in the diagram below.



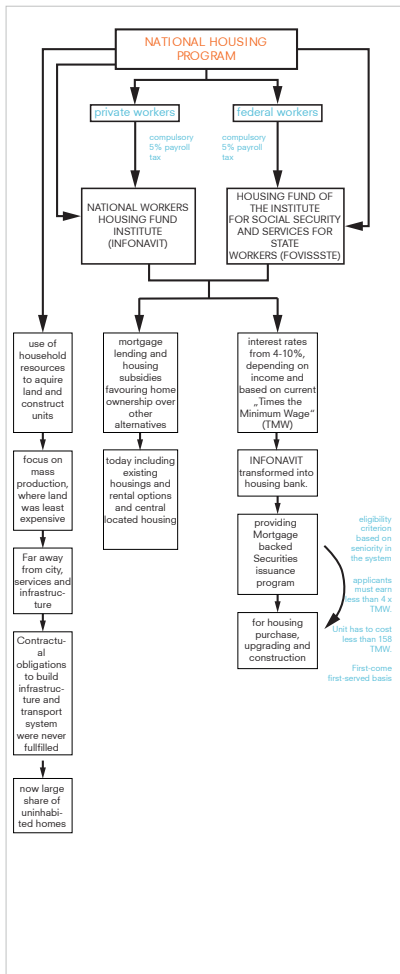
# Beirut Studio

## Financing casestudies

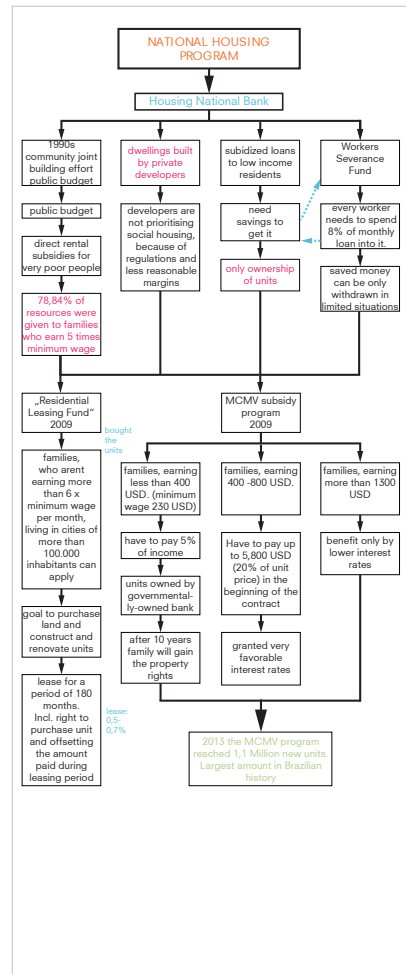
To develop an idea of a financing method for an inclusive and affordable housing project, different Social Housing Programs and its financing were analyzed and compared. The focus of the analysis was on Mexico, Brazil, Vienna and a contribution of a competition for the first affordable housing in Beirut.



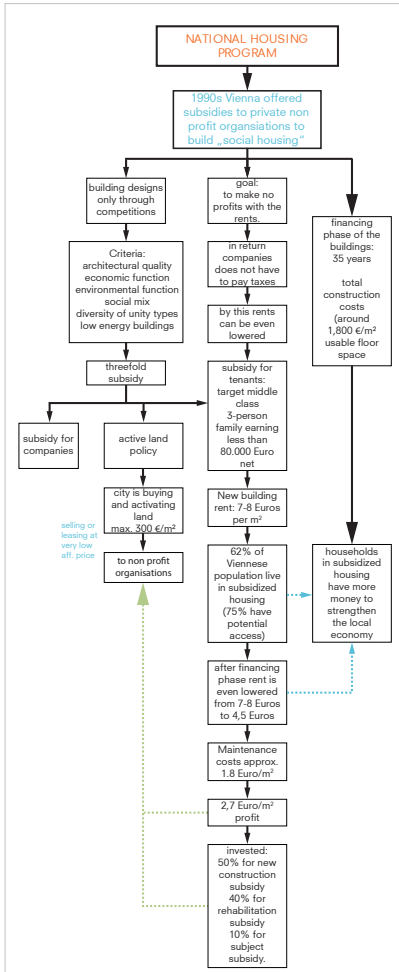
### MEXICO



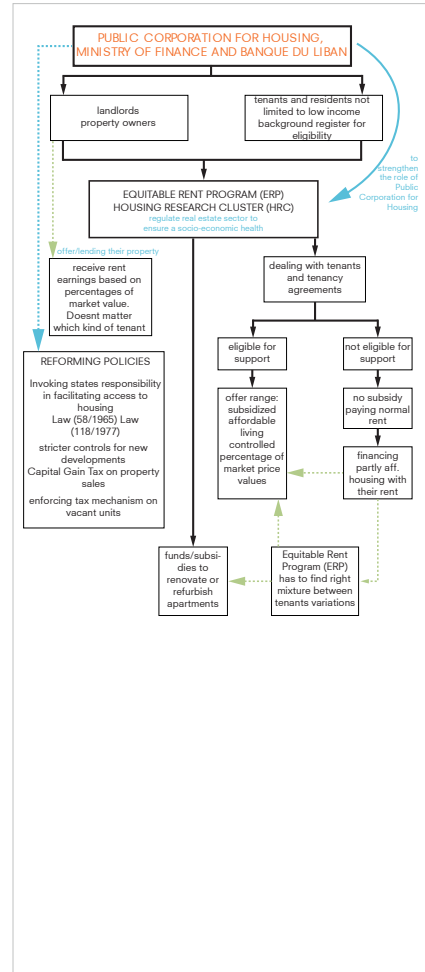
### BRAZIL



## VIENNA



## BEIRUT COMPETITION



Result:

Important for the approach and the financing for beiruts living room are especially that quality is more important than mass and developments shouldnt be positioned in the outskirts, but next to public areas like parks. Furthermore a rent based system is

important, to think long-term and to create a repetitive system.

**QUALITY MORE IMPORTANT THAN MASS PRODUCTION**  
**DEVELOPMENTS SHOULDN'T MOVE PEOPLE TO THE OUTSKIRTS (OTHERWISE VACANT BUILDINGS)**

**CHANGING THE SYSTEM FROM OWNERSHIP TO SOCIAL RENT HELPED FOR VERY LOW INCOME**

**THINK LONG-TERM**  
**CREATE REPETITIVE SYSTEM**  
**DENSITY ONLY WORKS WELL WITH QUALITY**  
**FOCUS ON A BIG TARGET GROUP**  
**CREATE HOUSING NEXT TO PUBLIC SPACES LIKE EASY ACCESSIBLE PARKS**

**CREATING A PROGRAM WHICH DEALS WITH LANDLORDS AND TENANTS IS A HUGE BENEFIT**  
**THROUGH**  
**DISTRIBUTION OF UNITS GENERATING INCOME**

# Beirut Studio

## Financing system

Based on this an individual financing system was developed.

The non-profit housing organisation apply for a credit. Downpayment could be done by selling some of the units.

Additional stakeholders like the municipality could help to find a plot.

The general building program splits up into public plinth and housing units.

Rent income will be gained through retail, service and offices on groundfloor. The additional social program can be financed through stakeholders like UNHCR.

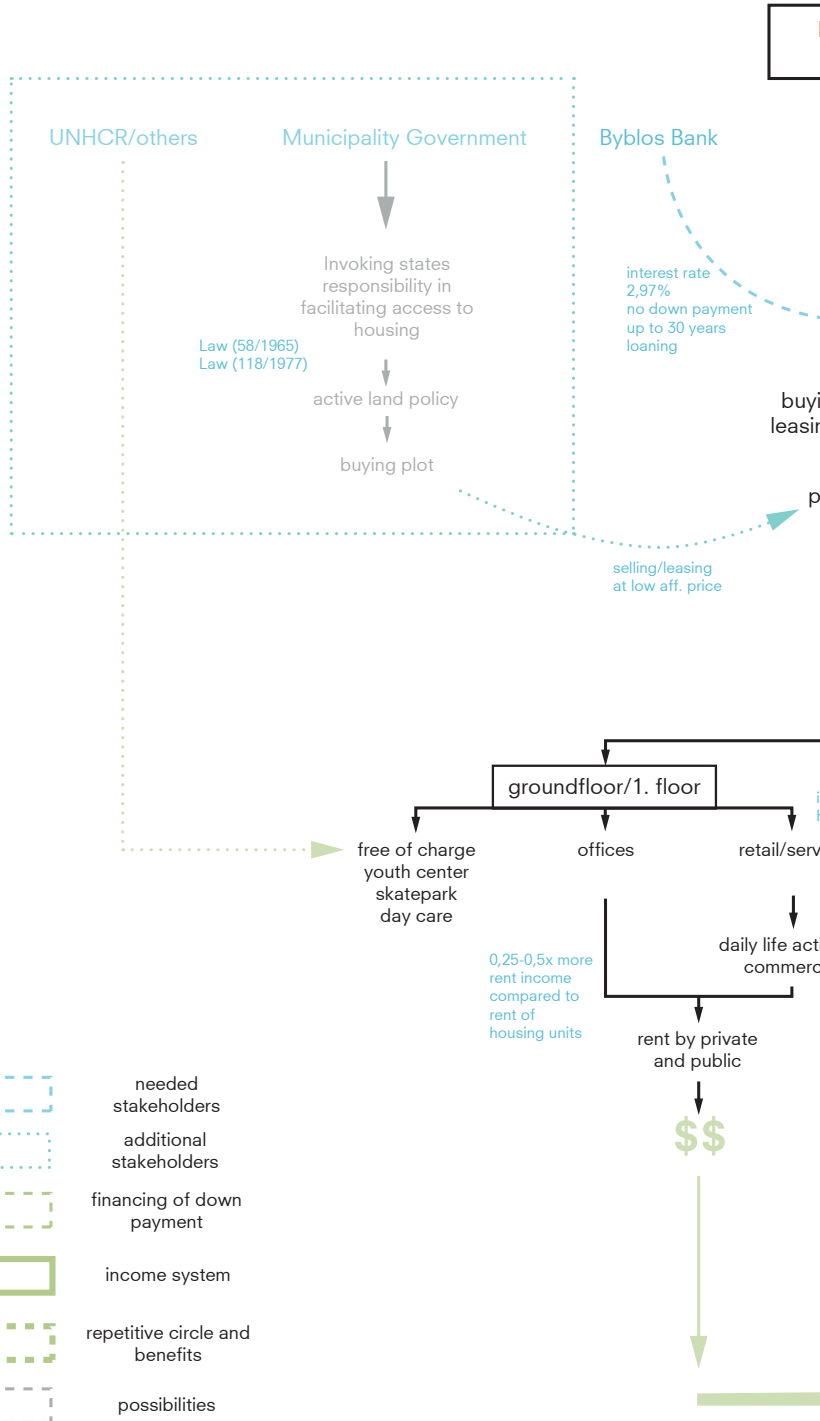
The housing units will be rented through the organisation to the tenants.

The housing organization will distinguish between normal tenants and subsidized rentals.

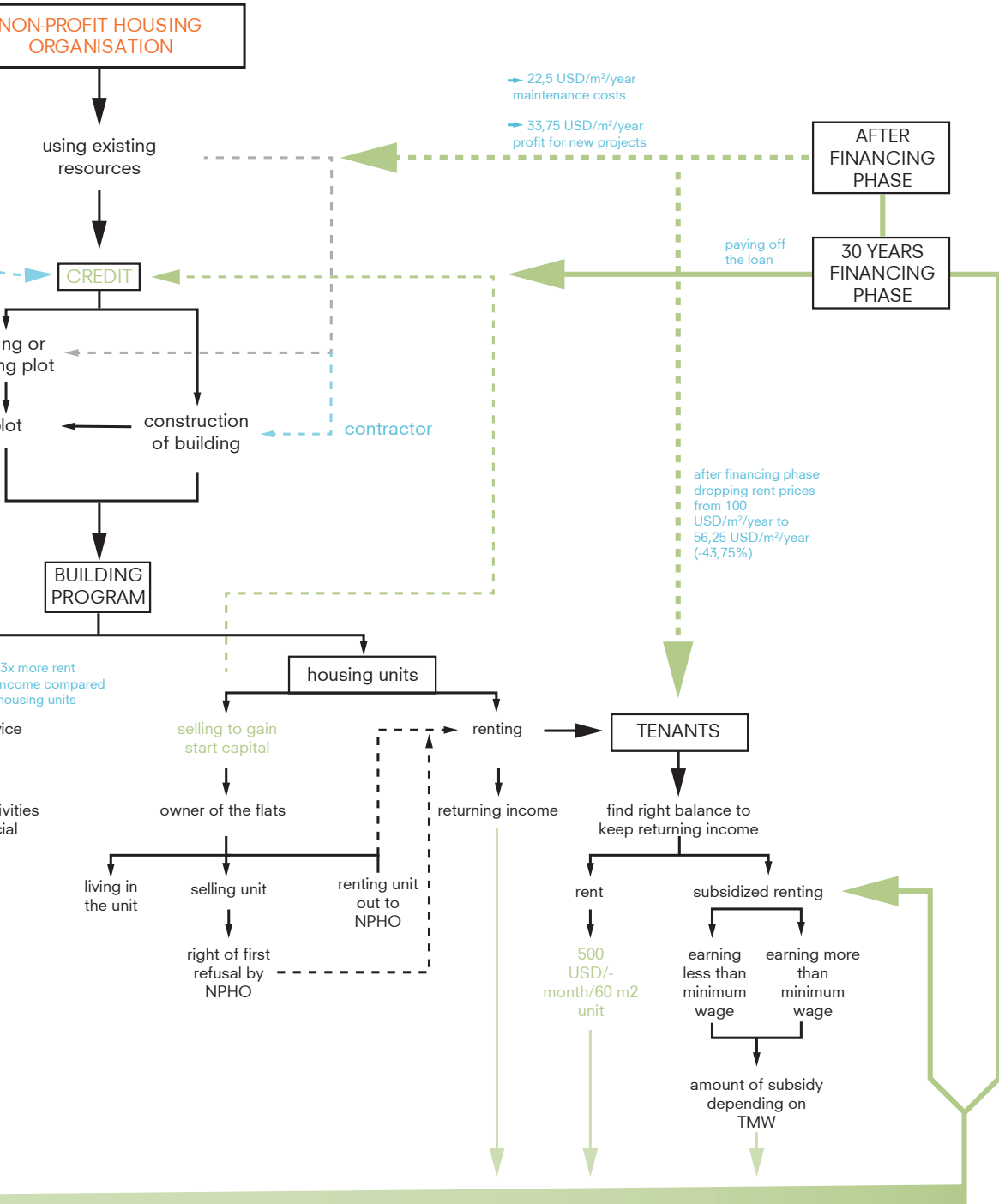
The subsidized rentals and the credit will be financed by the rent income of the public plinth and normal tenants.

After the financing period, the rent can be lowered and the profit will be used for a new affordable housing project.

To sum up, that system is possible without the engagement of the state, no speculation is possible and it creates repetitive and diverse income streams.







**POSSIBLE WITHOUT THE ENGAGEMENT OF STATE**

**NO SPECULATION**

**MAKING HOUSING ACCESSIBLE TO HUGE TARGET GROUP**

**DAILY LIFE/RETAIL STORES NEAR BY**

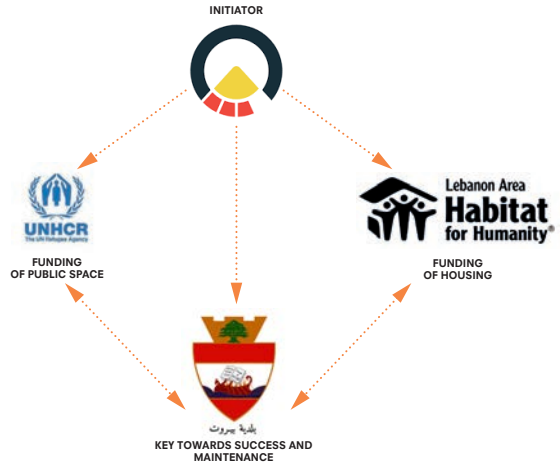
**CREATING REPETITIVE AND DIVERSE INCOME STREAMS**

**THINK LONG-TERM**

# Beirut Studio

## Stakeholders

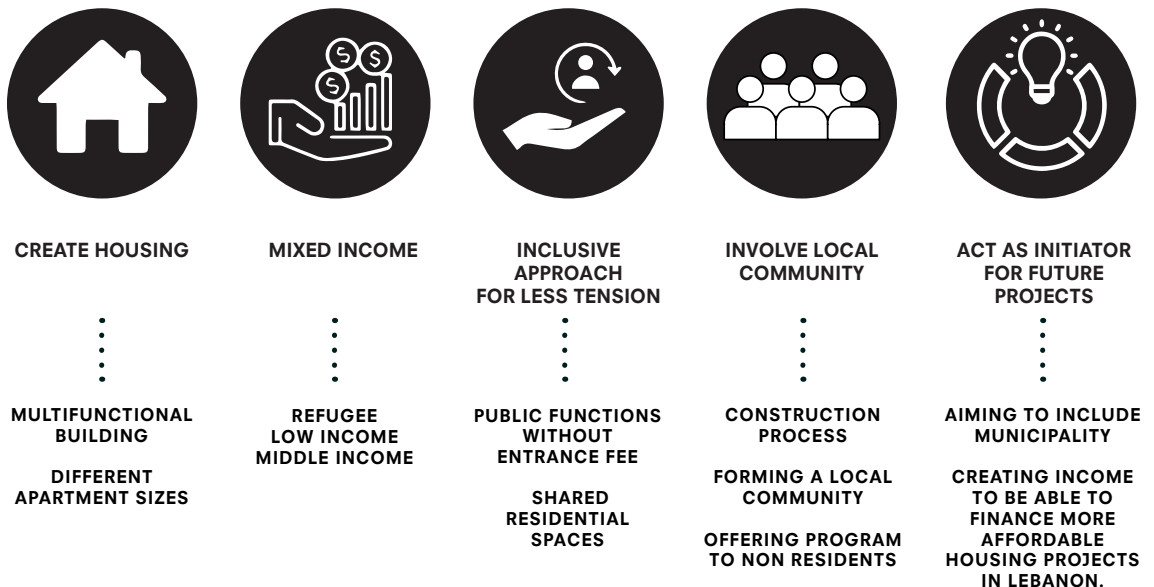
Similar to the previously mentioned inclusive parks, the initiator is to be Catalytic Action. They will work with UNHCR and Lebanon Area Habitat for Humanity to fund Beirut's Living Room. The Municipality of Beirut will be the key partner to make this project successful.



## Project Ambition

The general goal must be to create a building for different income levels with many housing units, which follows an inclusive approach and can provide added value for the whole society.

It is particularly important that the local community can also benefit from it. For example, similar to the Las Americas building, the construction method should be designed in such a way that not only large trades can benefit from it. Furthermore, it should be clear that this project should serve as an initiator for further housing projects in Beirut and thus, if possible, repetitive methods should be used for both the financing and the construction process.



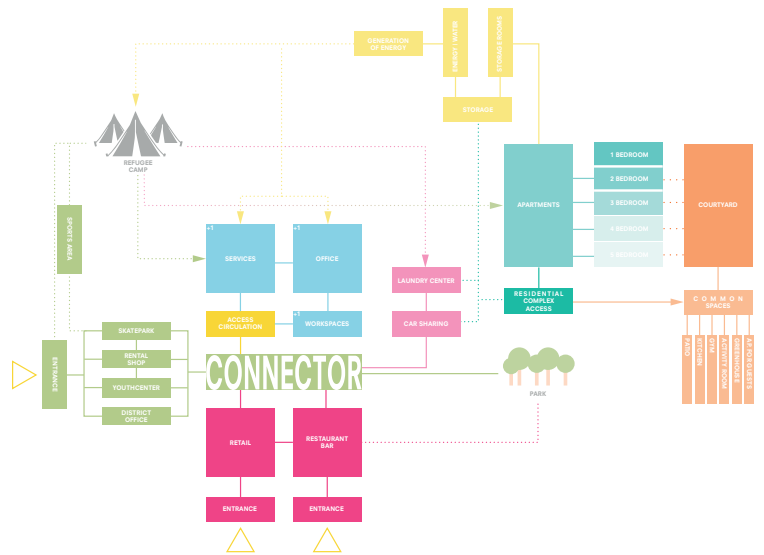
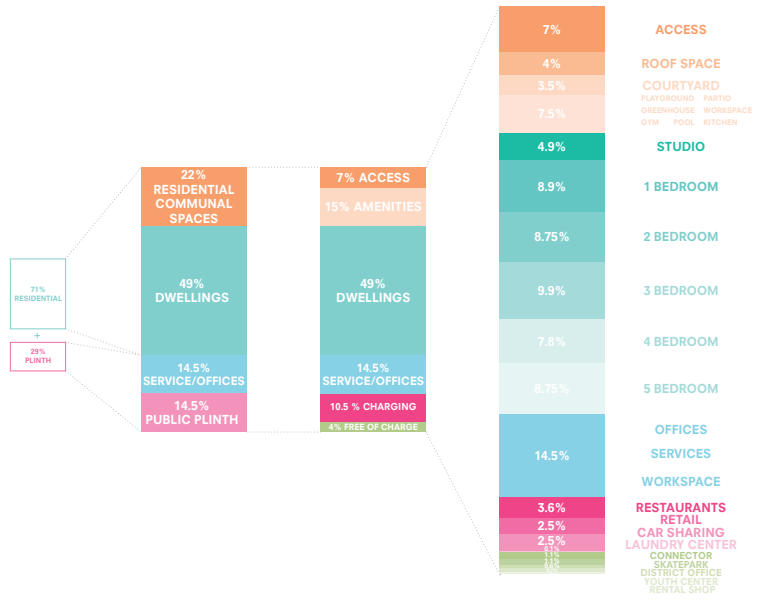
## Program

Based on the case study results, the percentages of common and private parts of the apartment complex were determined.

It is important to note that the focus should be on apartments that contain multiple bedrooms. Especially in view of the average household size of refugee families of 5.2 persons/household. For the further process of building planning it is necessary to find out in which ratio vulnerable families(subsidized) and not subsidized families should live together. This is decisive for the financing concept of the building.

Below the housing complex, various public functions are placed to enrich people's lives, make them easier and more inclusive. A magnet for leisure activities is to be created, which can be used for the most part independently of financial means.

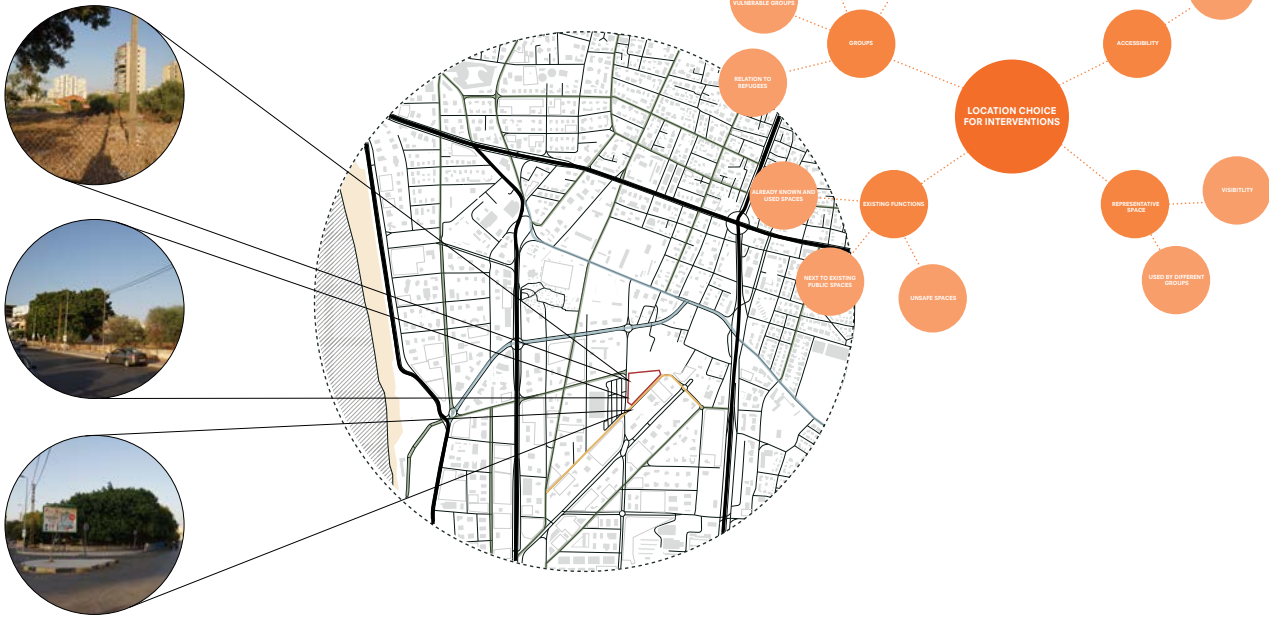
On the one hand, a branch of the city is to help the residents of the suburb sort out all sorts of things. On the other hand, a youth center, combined with a skate park and an inclusive park, is to offer a wide range of leisure activities for the youth and all age groups. Various retail areas, restaurants and office opportunities will help to revitalize and finance the project.



# Beirut Studio

## Location

Based on the selection criteria for an intervention by Catalytic Action, the site was chosen. On the one hand, it is directly adjacent to the Mousseitbeh refugee camp, and on the other hand, it is located on an already well known site across from the Spinney. In order to save construction costs, it was important that, if possible, the plot is built on as little as possible to avoid demolition costs.





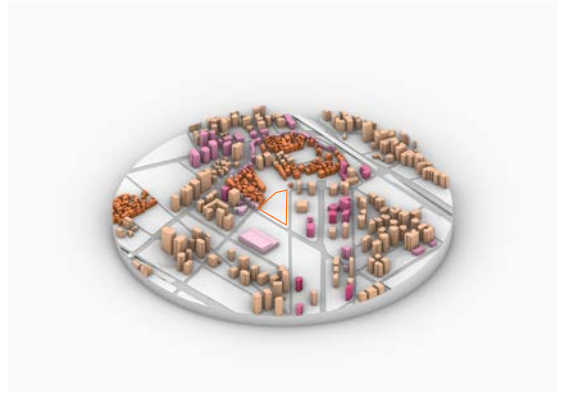
Housing



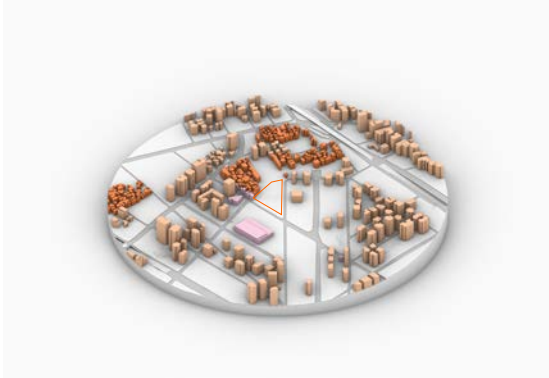
Offices



Refugee camps



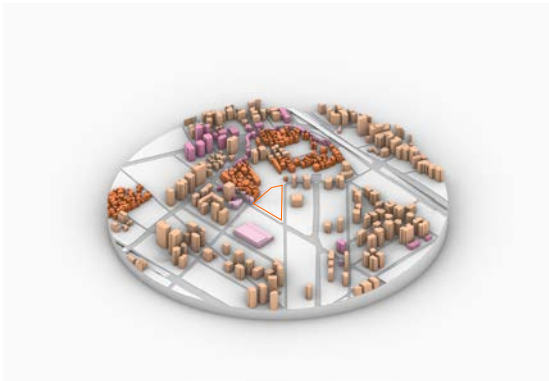
Health care



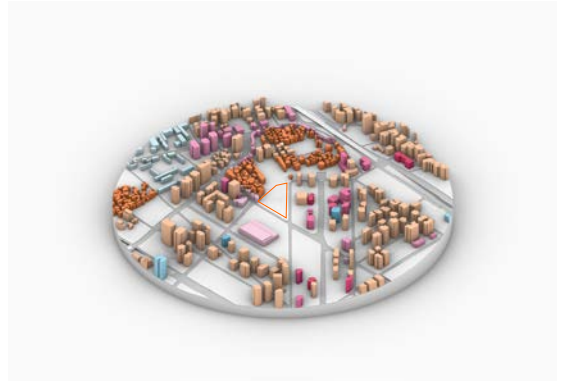
Food



Factories



Shops



Unesco + UNHCR



# Beirut Studio

## Massing studies

Based on the massing study, it can be said that the higher the density becomes, the more likely a courtyard typology will result. Furthermore, there should be two residential units per floor depth to achieve the highest possible density.

In principle, the height should increase towards the park and sports area and decrease towards the refugee camp. The best relation to the surroundings despite high density can be achieved by using the tower-block combination as typology.

### TYOLOGY

0,9 FAR  
7280 BUA  
365 RESIDENTS  
6% OF CAMP

1,25 FAR  
10.110 BUA  
508 RESIDENTS  
9% OF CAMP

2,5 FAR  
20.221 BUA  
1016 RESIDENTS  
19% OF CAMP

3,75 FAR  
30.332 BUA  
1524 RESIDENTS  
28% OF CAMP

### BLOCK



### TOWER



### TOWER BLOCK



### STACKED



### SPLITTED VOLUME



## Result

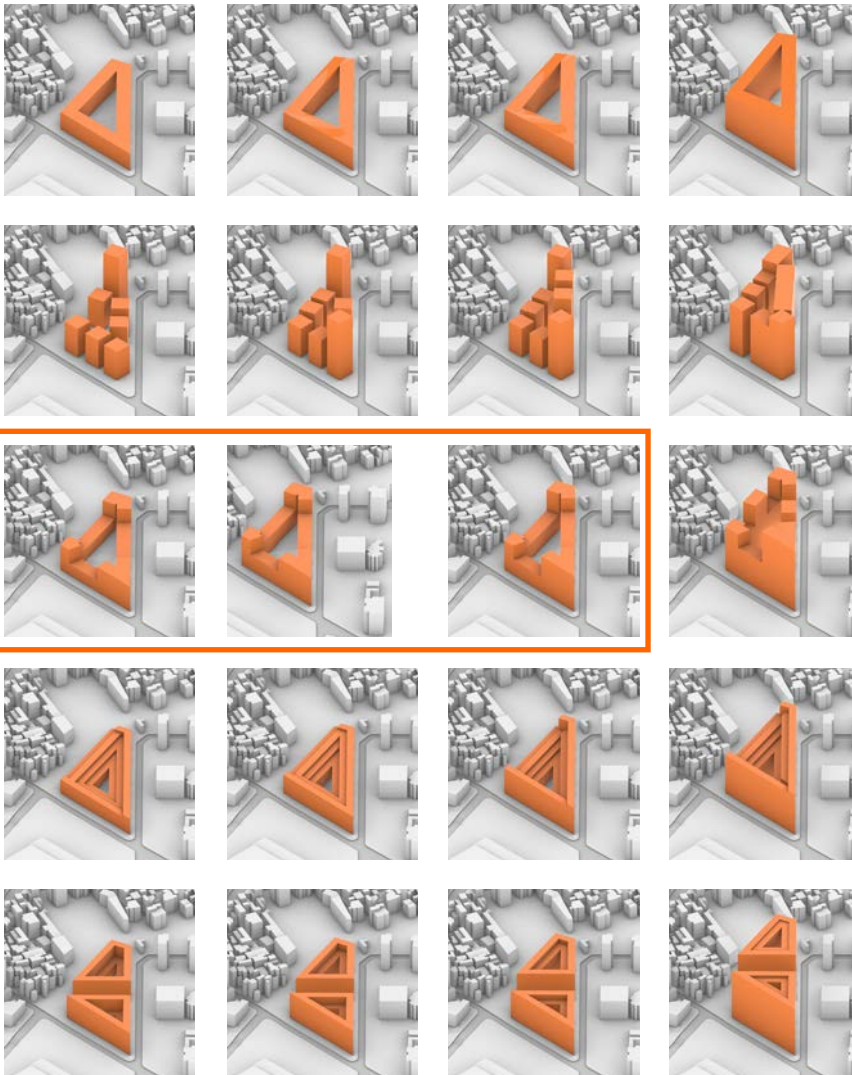
The previous Massingstudy shows that a FAR of 5-7.5 with a BUA of 40-60,000m<sup>2</sup> is most appropriate to the context and also suitable for the future elevation pattern of the Beirut city. Thus, between 2000-3000 residents could occupy this site and up to 37-56% of the refugee camp could be built back.

5 FAR  
40.443 BUA  
2032 RESIDENTS  
37% OF CAMP

6,25 FAR  
50.553 BUA  
2540 RESIDENTS  
46% OF CAMP

7,5 FAR  
60.664 BUA  
3048 RESIDENTS  
56% OF CAMP

13,4 FAR  
108.387 BUA  
5470 RESIDENTS  
100% OF CAMP



# Beirut Studio

## Apartment arrangements

Based on the analysis of the social housing casestudies as well as the average standards of apartments sizes the following table was created. Different typical arrangements were tested in relation to the room numbers. Its visible that the 4 and 5 bedroom apartment doesnt suit the row constructions as they

need more facade area for more rooms. Therefore the tower typology and the ends of the row constructions would suit.

household size						
percentage of apartments	10.2 %	18.2 %	17.5 %	20.4 %	16.1 %	17.5 %
average sizes casestudies	31 m <sup>2</sup>		65 m <sup>2</sup>	106,5 m <sup>2</sup>		
average space/person of casestudies x household size	21 m <sup>2</sup>	42 m <sup>2</sup>	63 m <sup>2</sup>	84 m <sup>2</sup>	105 m <sup>2</sup>	126 m <sup>2</sup>
europaean standards	30 m <sup>2</sup>	45 m <sup>2</sup>	45-60 m <sup>2</sup>	65-85 m <sup>2</sup>	75-125 m <sup>2</sup>	90-150 m <sup>2</sup>

m <sup>2</sup>	INHABITANTS/ BEDROOMS			
30m <sup>2</sup>				
40m <sup>2</sup>				
60m <sup>2</sup>				
85m <sup>2</sup>				
100m <sup>2</sup>				
120m <sup>2</sup>				

- LIVING
- BEDROOM
- BATHROOM
- KITCHEN
- ACCESS



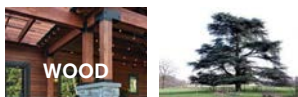


# Beirut Studio

## Material studies

An important question is which material and construction method should be used to build the building. If you look back at the history of Lebanon, you can see that traditional materials were mainly limestone and wood. Nowadays, however, only concrete is used for construction, which of course does not really have sustainable properties. However, since Lebanon does not have its own wood production, it is worth considering concrete despite its inferior properties compared to wood. However, if one looks beyond the country's borders, importing wood is a more sustainable and resource-saving alternative than using concrete.

Cedar wood can be imported from both Turkey and Syria, Lebanon's neighboring countries. The draft is only between 50 and 250 km, which in this way can almost represent a local supply. The prefabrication methods, lighter construction, easier assembly, less time and a cost saving of about 15% compared to concrete have led to the choice of wood as the main construction method. In the further course of the project, more specific timber constructions will be investigated, which may then be used in a hybrid construction with concrete.



- BAD
- OKAY
- GOOD

*Next steps*

The next steps will include the detailed floor plan concepts for the development as well as for the residential units and public areas. Based on the analyses of case studies, various utilization concepts will have to be worked out. At the moment, it is especially clear to me that the shared areas should also be made available to certain users, since otherwise, with a residential complex occupancy of about 2500 people, an identity problem can quickly arise, a lack of responsibility for areas and no functioning social coexistence can develop. Good examples of this can be found especially in the social housing of Vienna. Often a gradation of different clusters is used. For example, there are areas in the building that may only be used by the directly adjacent residential units. Outdoor areas, however, can then be used by everyone. In this way, more private areas are created that can be assigned to stronger groupings. The outdoor area, which can be used by

everyone outside the housing complex, requires thorough planning. For this purpose, an interview will be conducted with Catalytic Action, which will lead the way. In addition, it is important to find out how the local community can be involved in the process of construction, so that they also benefit from the construction of the building. Of course, building a single residential building will only help a limited number of people. However, by planning a housing concept with a modular design, a repetitive system should be created in order to realize further affordable housing projects in Beirut.



# DESIGN OPTIONS

03



## Beirut Studio

### *P2 Design option 1*

Character of the two main sites:

The south-eastern site of the building is directly linked to the proposed park. Therefore the restaurants and bars are located at this site. A calm and relaxing area will be created.



## *Result*

The north-eastern site is characterized by the relation towards the refugee camp. The interaction zone between the building and the refugee camp will be designed in a way that not only the pedestrians from the Cola station will benefit, but especially the inhabitants and residents, which are able to use the sports area, a playground and different facilities in the building for free.



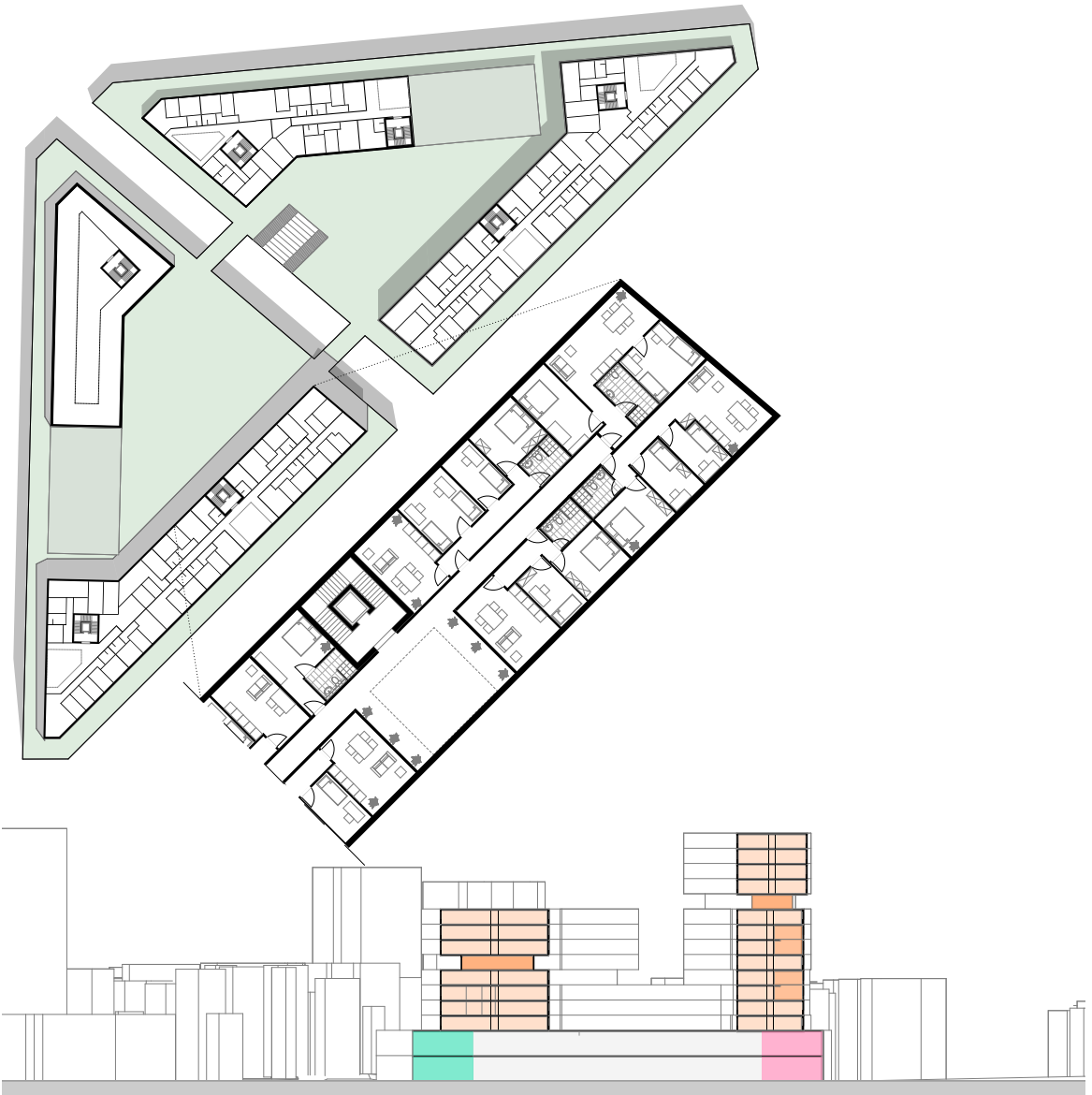




## *Design option: Courtyard*

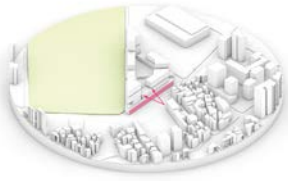
The Courtyard design combines high density and demarcation between residents and surroundings.

A very positive aspect is the quality of the outdoor area to be shared by the residents, which is very much privatized. This definitely has a community-building effect.





RELATION TO INTERACTION ZONE



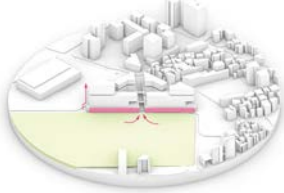
- strong plinth boundary
- + openings in shape reduce the effect

COMPRESSION AND RELEASE



- no compression and release
- no quality of space

RELATION TO PARK



- strong plinth boundary
- + opening creates access

PLINTH PROGRAM



- flow only around building
- public program facing nearly only outside
- + high BUA of public functions

RELATION TO SPINNEYS



- strong plinth boundary
- + opening creates better visual connection

MATERIAL



- + light colored material of dwelling complex to reduce impact
- + change of materiality of dwelling volumes reducing height impact even more
- + strong/colorful plinth facade for human focus

BUA VS. UNBUILT



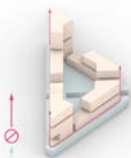
- plinth really dense
- + more breathing space for upper part

DWELLING SHARED SPACE



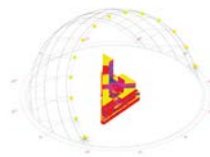
- + shared indoor spaces through setbacks
- + outdoor spaces: terraces and high quality courtyard
- + good privacy of outdoor space

PUBLIC VS. DWELLING

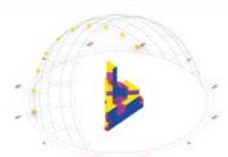


- qualities like the view & courtyard can't be used by public
- + clear space and privacy only for residents

SUN ANALYSIS



summer

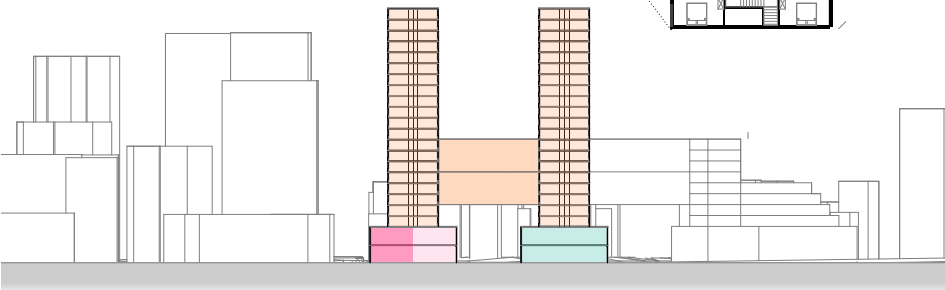


winter



*Design option: Row construction*

Compared to the Courtyard design, this design is characterized by more interaction through the staircase towards the Refugee Camp.



RELATION TO INTERACTION ZONE



- + very low building in direction of refugee camp
- + openings in the plinth help the appropriation by pedestrians

COMPRESSION AND RELEASE



- compression really monotonous
- + release creates only quality spaces facing the park

RELATION TO PARK



- + opening up towards park
- + setback of lower levels are more engaging/human scale
- + cool smaller spaces

PLINTH PROGRAM



- complete split of public and private
- + programmatic clusters
- + splitting of programs
- + more interactive and public zone

RELATION TO SPINNEYS



- strong plinth boundary
- monoton wall

MATERIAL



- + light colored material of dwelling complex to reduce impact
- + strong/colorful plinth facade for human focus

BUA VS. UNBUILT



- + breathing space for plinth and dwellings

DWELLING SHARED SPACE



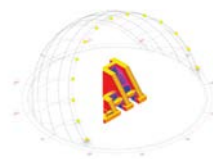
- no bordered space
- privacy is missing
- no connection of shared spaces

PUBLIC VS. DWELLING

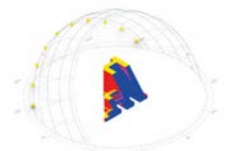


- qualities, like the view, can't be used by public
- + clear space and privacy only for residents

SUN ANALYSIS



summer

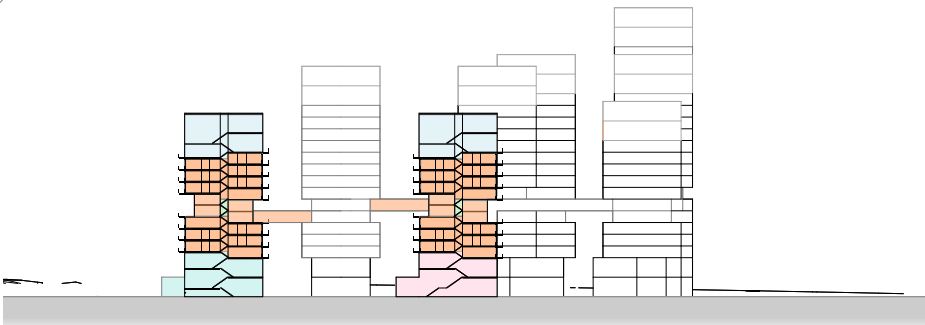


winter



*Design option: Tower*

In contrast to the other designs is the Tower design. The aim is to design a first floor that is as flowing and public as possible, contrary to the Beirutian standard. This should create an attractive offer for different groups.



### RELATION TO INTERACTION ZONE



- least area for retail
- + good relation to refugee camp through big openings

### COMPRESSION AND RELEASE



- + strong compression and releases
- + creating a good flow
- + creating high quality squares and spaces with different characters

### RELATION TO PARK



- strong vertical boundary
- + opening up towards park
- + different sizes of spaces

### PLINTH PROGRAM



- smallest amount of BUA plinth = lowest rent income
- + representative office spaces
- + programatic clusters
- + most interactive plinth

### RELATION TO SPINNEYS



- strong vertical boundary
- + different plinth gestures create inviting character
- + different sizes of spaces

### MATERIAL



- strong focus on verticality through monotonous dwelling material
- + office/community space out of glass reduce optical mass
- + strong/colorful plinth facade for human focus

### BUA VS. UNBUILT



- even if lowest BUA, through arrangement quite dense
- + highest unbuilt volume

### DWELLING SHARED SPACE



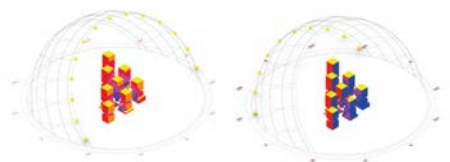
- no outdoor space, except loggia
- shared spaces are quite limited by size of the tower
- + great connection of shared spaces

### PUBLIC VS. DWELLING



- highest part only for offices - more diversity would be needed
- no complete privacy
- + representative office spaces
- + creating different qualities for the public

### SUN ANALYSIS



summer

winter

# Beirut Studio

## *Design typologies testing*

The different typologies were tested with the help of the model. The favorite is the combination of tower and row building.



Row construction staircase



Row construction flat

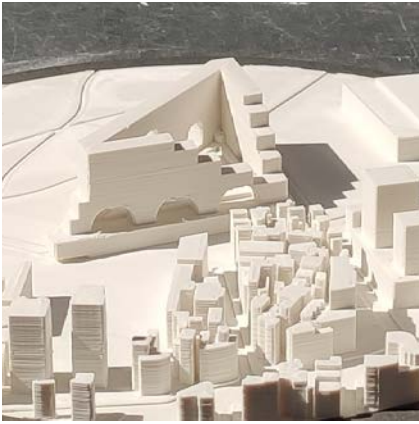


Tower + courtyard



Tower





Courtyard closed off



Courtyard opened up



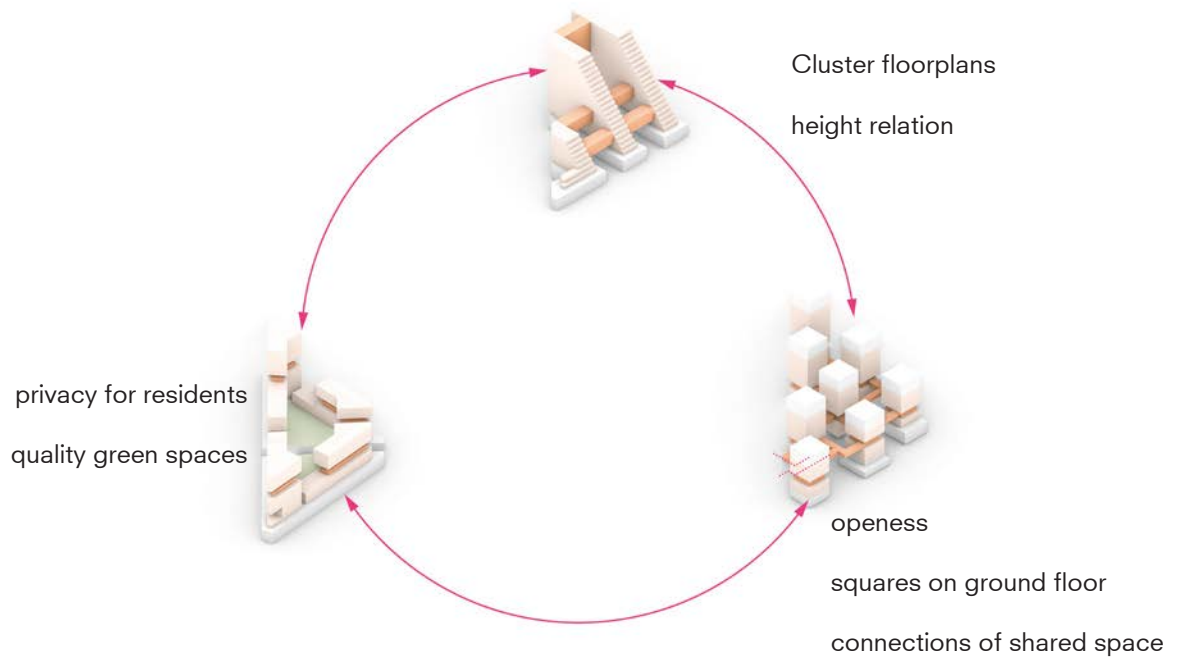
Tower + Row construction



Tower massive

## *Design typologies testing*

Based on the combination of the various positive properties of the designs, the next design will be developed.





### *Density*

Another essential design aspect is how to deal with the density/mass of the structure. How can the building structure not appear massive despite a large mass?

If one pays attention to the construction methods in Beirut, one sees that the building is almost exclusively massive in height and that there is no interaction of the volume with the surroundings.

### *Hybrid - Pixelbuildings*

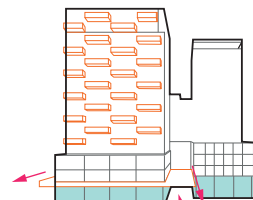
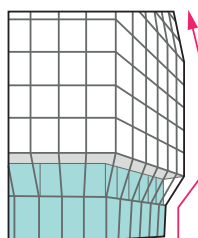
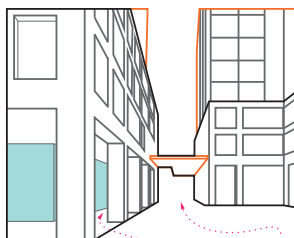
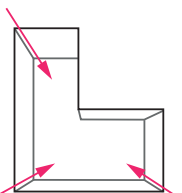
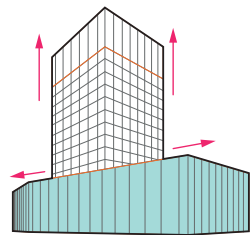
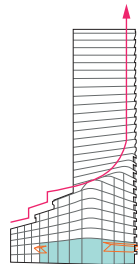
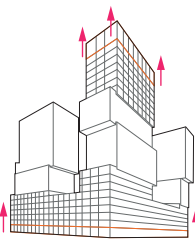
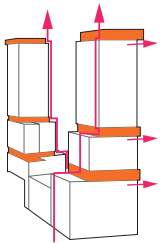
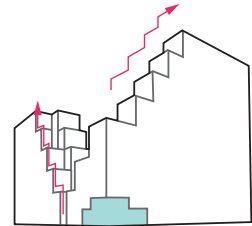
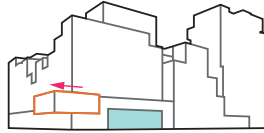
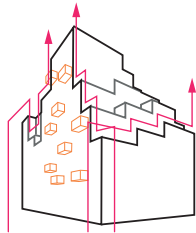
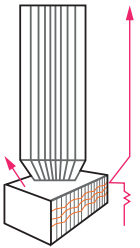
To answer this question, different hybrid buildings and subsequently pixelbuilding were analyzed. The basic principle is defined as follows:

The more pixels/shifts = the greater the resolution of the mass. Variations in the arrangements help.

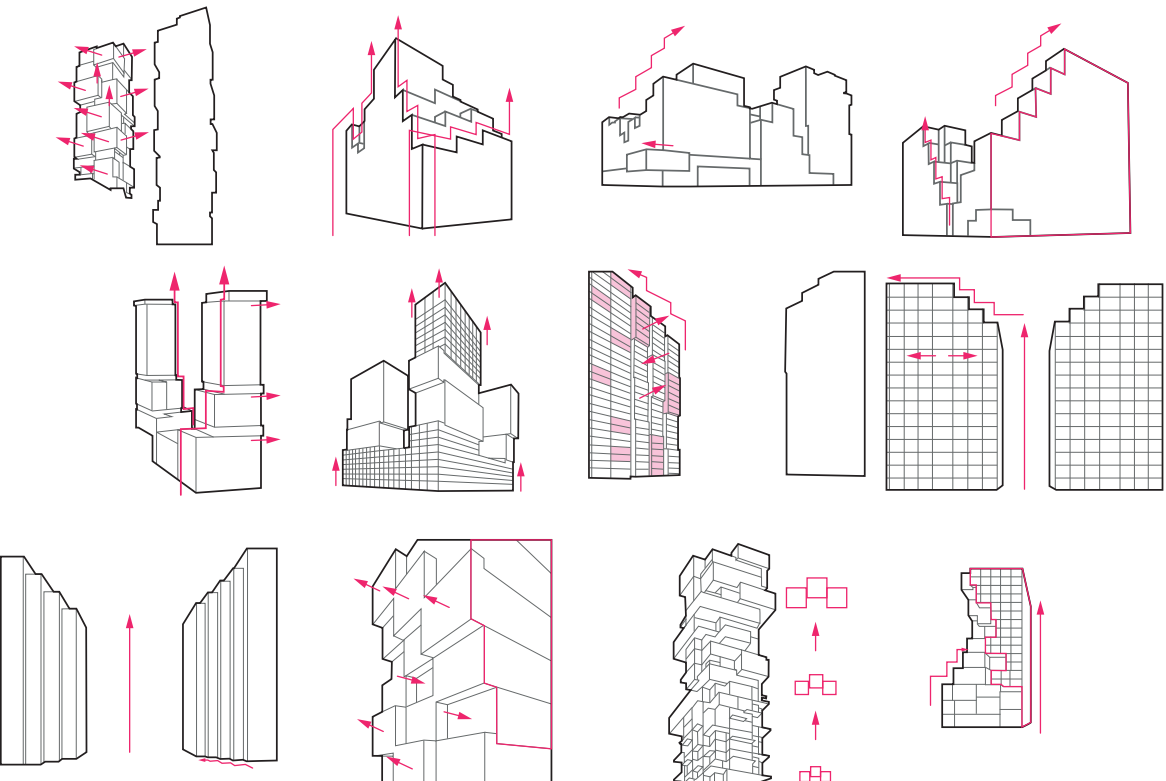
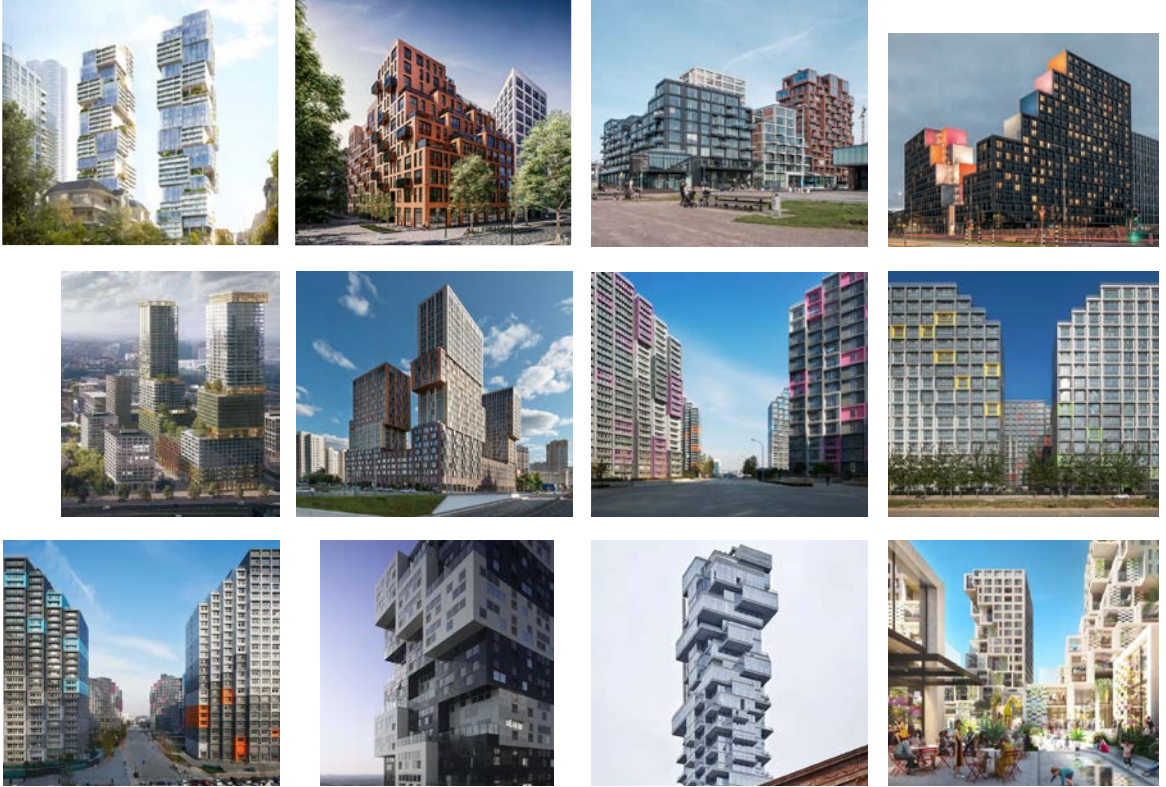


# Beirut Studio

Hybrid buildings - loosening up their mass



*Pixel buildings - loosening up their mass*

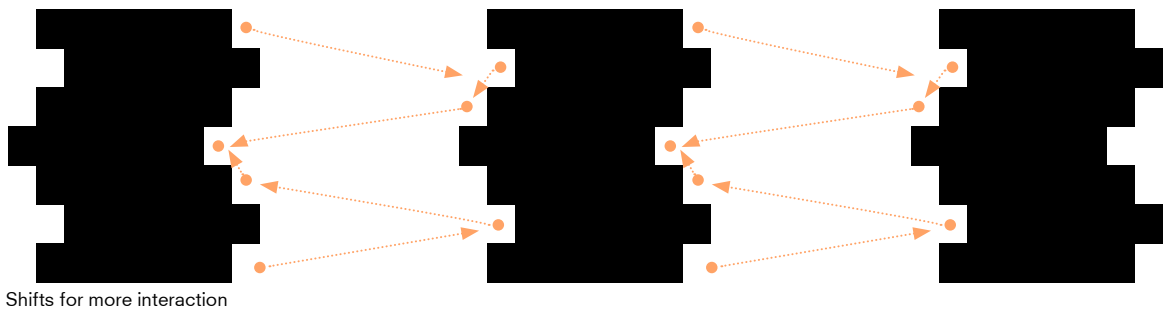
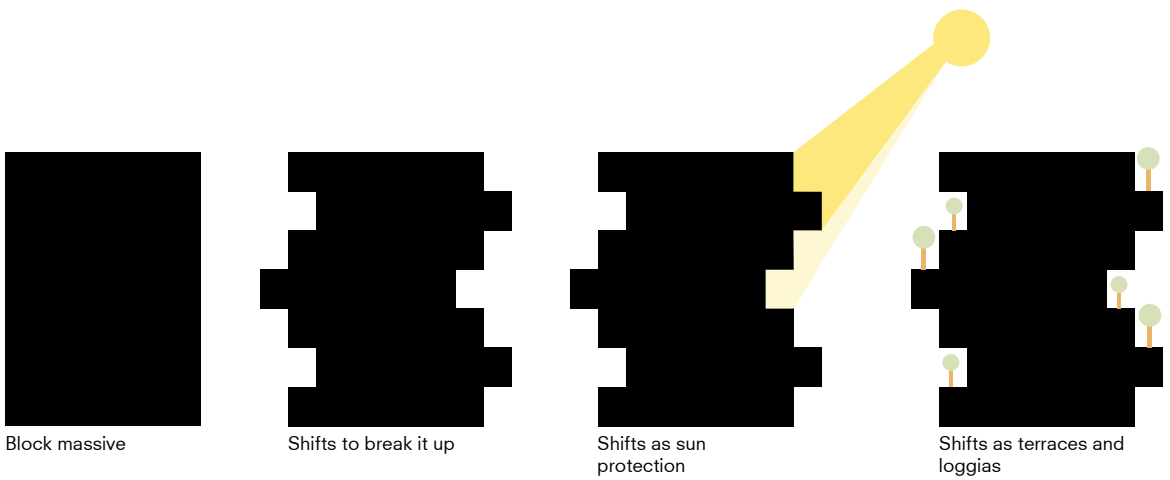


# Beirut Studio

## Shifts

Based on the analysis of the hybrid and pixel buildings, a concept for using the resolution of the volume was developed.

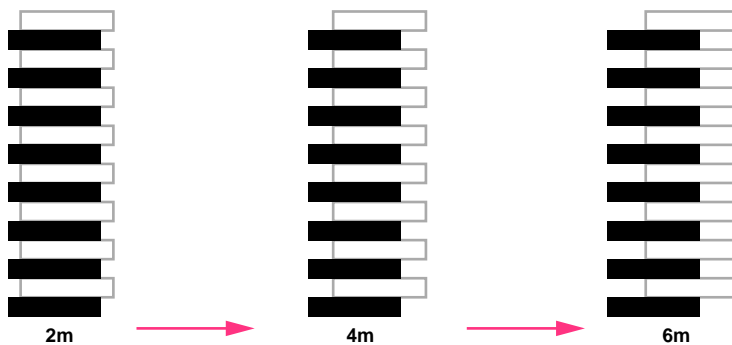
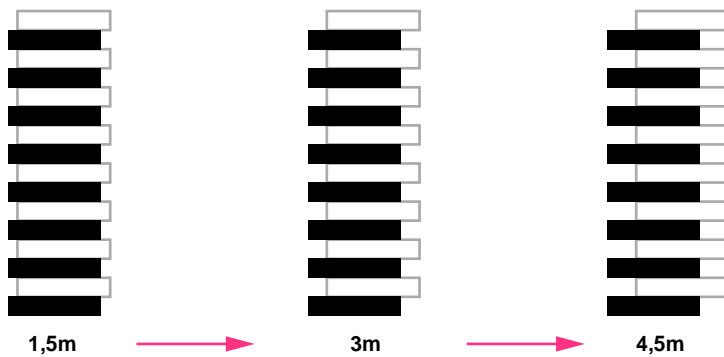
Thus, the shifts are not only to resolve the mass, but at the same time to serve as natural sunscreens, as terraces and loggias, and as a means to increase the interactions of the residents.



### Shift sizes?

How big must a shift be to have a good usability?

Based on the size of a balcony, the minimum depth should be approx. 1.5m so that a small table can also be used and the balcony really generates a quality of stay. Therefore, different shifts with 1.5m and with 2m were first tried out.



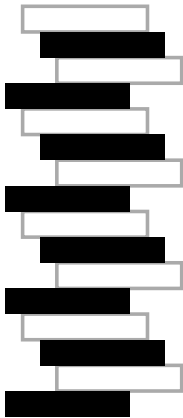
# Beirut Studio

## Shifts

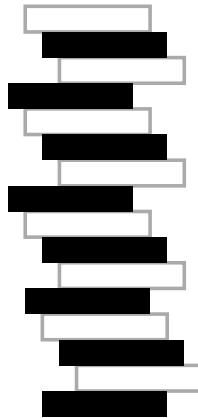
Various extremes were tested to establish rules for a sensible arrangement. For example, deep loggians may only ever be developed in a cascade principle to ensure sufficient light incidence. Furthermore, the shifts must still provide sufficient overlapping area with the neighboring floors to ensure efficient development and duct routing.

## First design - shift principle

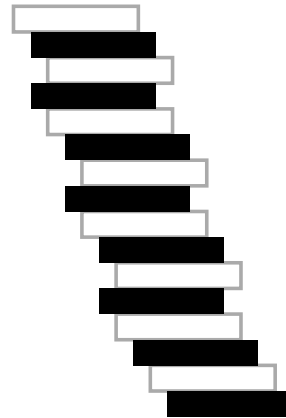
Based on this shift idea, the next design was developed, which is always shifted by the same parameter throughout the floor. On the right side are first impressions.



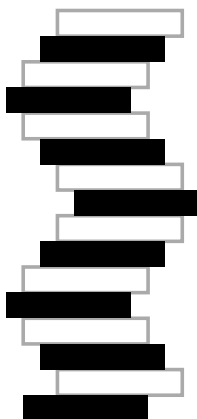
stepped terrace  
max 6m depth  
loggia



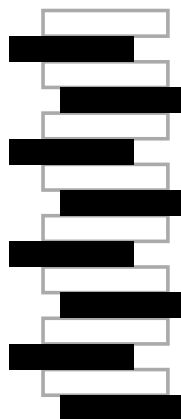
stepped terrace  
max 4m depth  
loggia



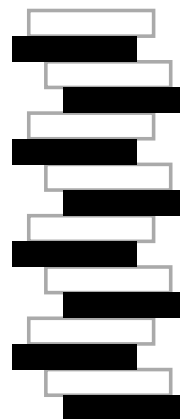
stepped terrace  
ALWAYS  
2m depth  
loggia



stepped terrace  
max 4m depth  
loggia



4m left side  
+ 2/4m left side



2m/6m left side



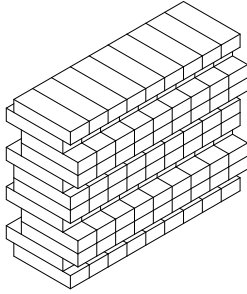




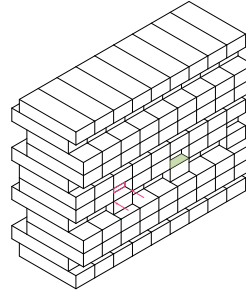
## Beirut Studio

### *Shifting whole level challenge*

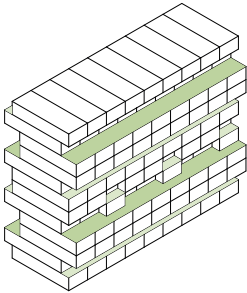
After the first draft of the Shift principle, it became clear that it does not make sense to shift an entire floor in its entirety. It does not make sense, because there is always too much outdoor space in the form of balconies on only one side, which can not be used efficiently enough. Therefore, the individual modules should be shifted in one direction or the other under certain rules. In this way, terrace areas can be created on one side as well as on the other, so that each residential unit has access to a private outdoor area. Larger terraces/loggias are to be assigned to the larger residential units with multiple residents.



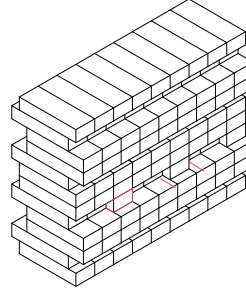
full level shifts



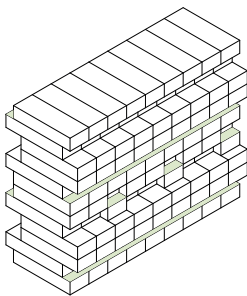
creating loggias



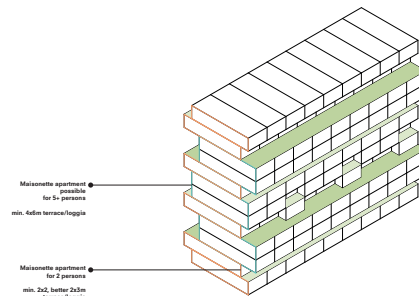
2,5m and 5m depth



reducing terrace space



creating diverse spaces



distribution

# Beirut Studio

## Relation to context

In general, there are two important relationships of the building. One is the relationship with the current context and the other is the relationship with the master plan.

With regard to the relationship with the master plan of the group, the immediate environment of the building must also be adapted.

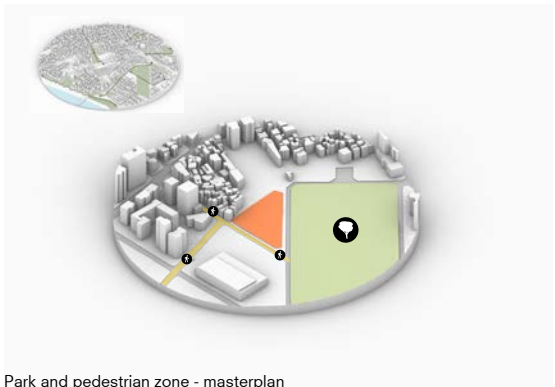
The pedestrian walkway, which previously led from the Education District to the beach, will be connected to Cola Station through the deconstruction of some of the buildings of the refugee camp. In the southern area, a park directly adjacent to the street is planned. Therefore, the lot will also be extended by the width of the street, since the street is hardly used anyway. Thus, the building can still be accessed by car in the north-east.

The new pedestrian zone between the property and the refugee camp should become an interaction zone. Therefore, the former sports field will also be reactivated. In direct interaction, the skate park will be placed as close as possible to the sports field to create an active sports zone. Below the skatepark, the Municipality Office, Lend store and the Youthcenter will be placed, which together create a synergy.

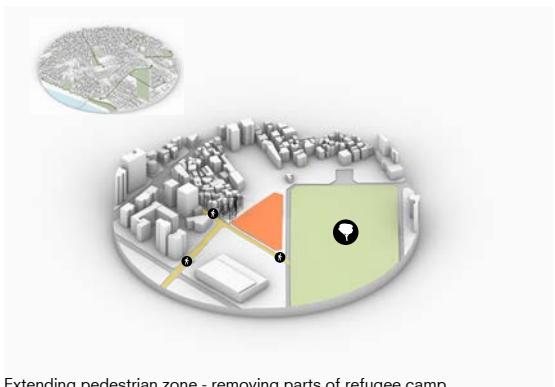
Furthermore, the restaurants will be placed towards the park and the connector, which can benefit from the view into the park. The retail areas will be placed in the direction of Spinneys, thus obtaining a more representative place and fitting into the existing character of the area. The offices and service spaces will be placed on top of the groundfloor.



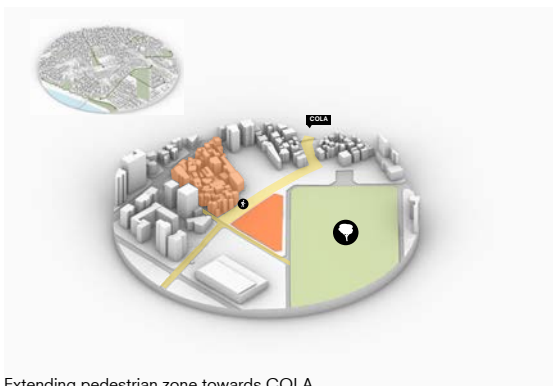
Area



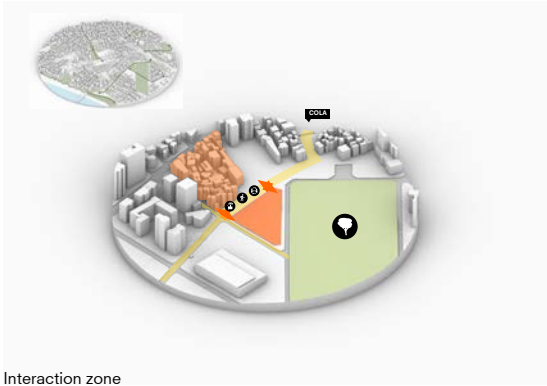
Park and pedestrian zone - masterplan



Extending pedestrian zone - removing parts of refugee camp



Extending pedestrian zone towards COLA



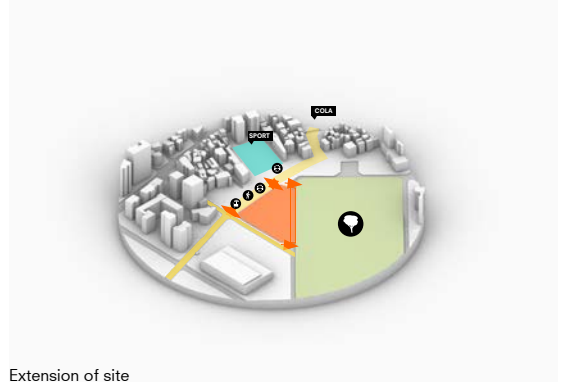
Interaction zone



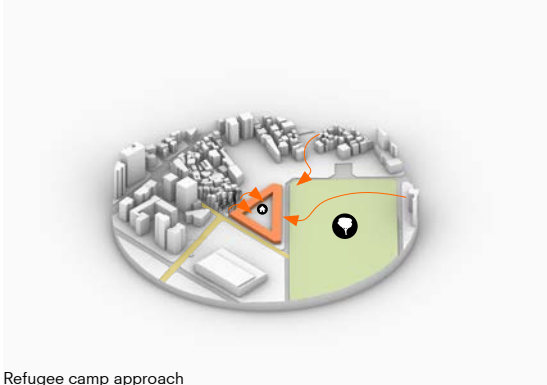
New affordable housing, with better standards



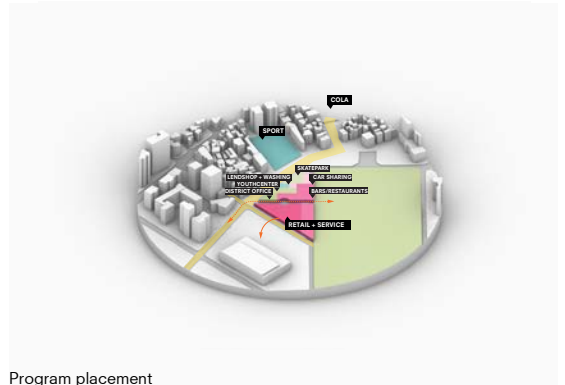
Sports area



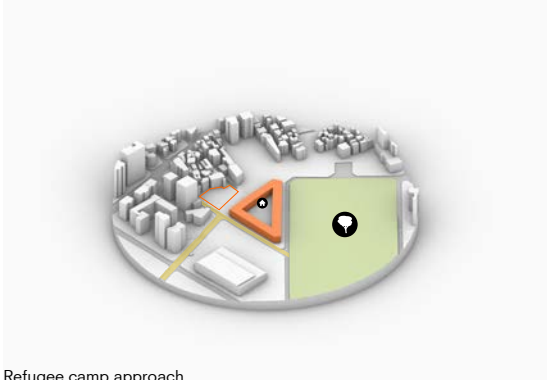
Extension of site



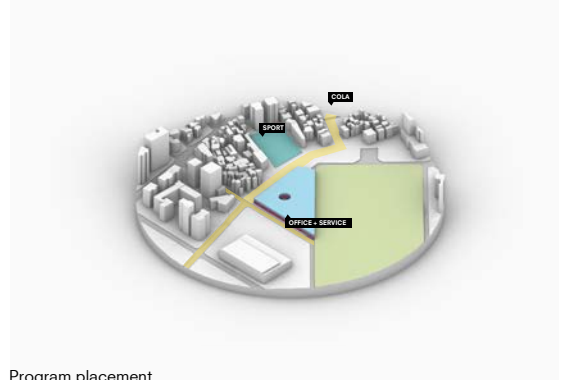
Refugee camp approach



Program placement



Refugee camp approach



Program placement

# Beirut Studio

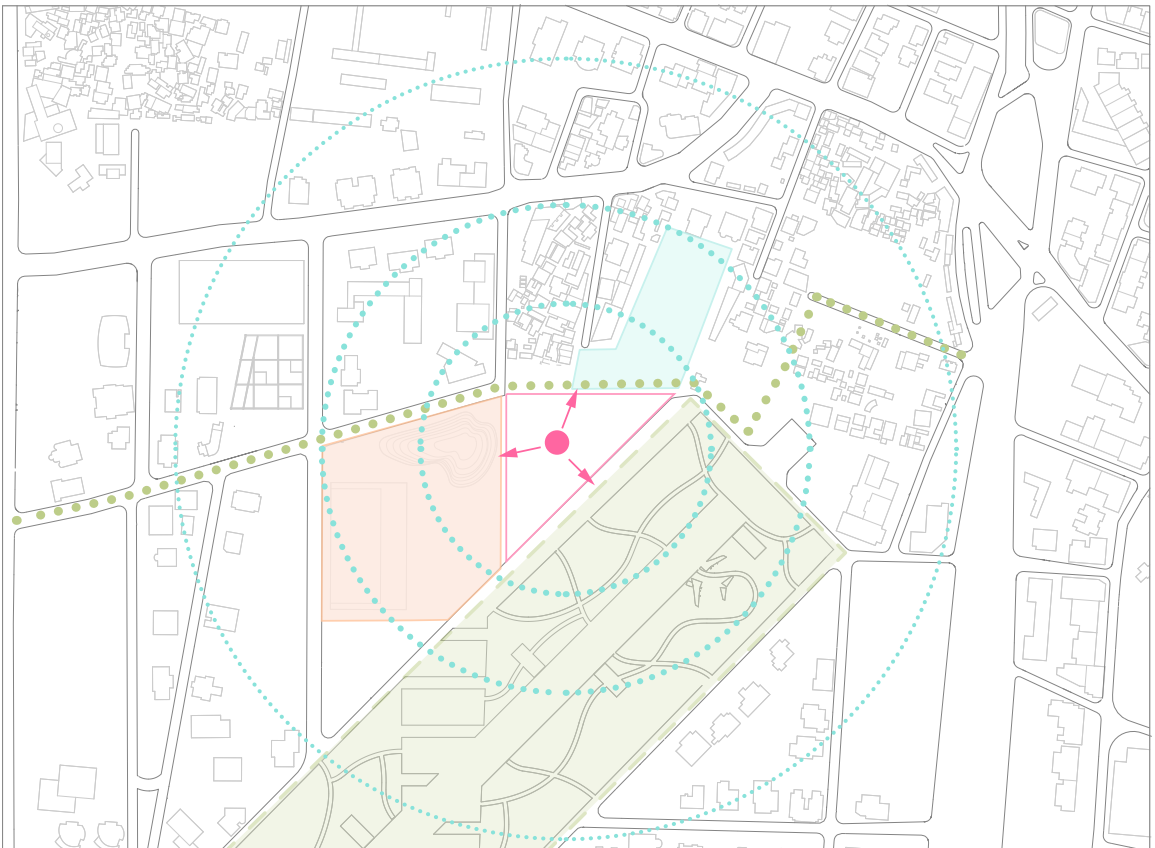
## Context Mosaic

The chosen plot borders 3 totally different sides of the Mosaic.

1. the Cola/Interaction Zone between the plot and the refugee shelter.
2. the Air park
3. spinneys / eventsquare

With this starting point, it is the most decisive project for the planning and the vision of the Core Intervention.

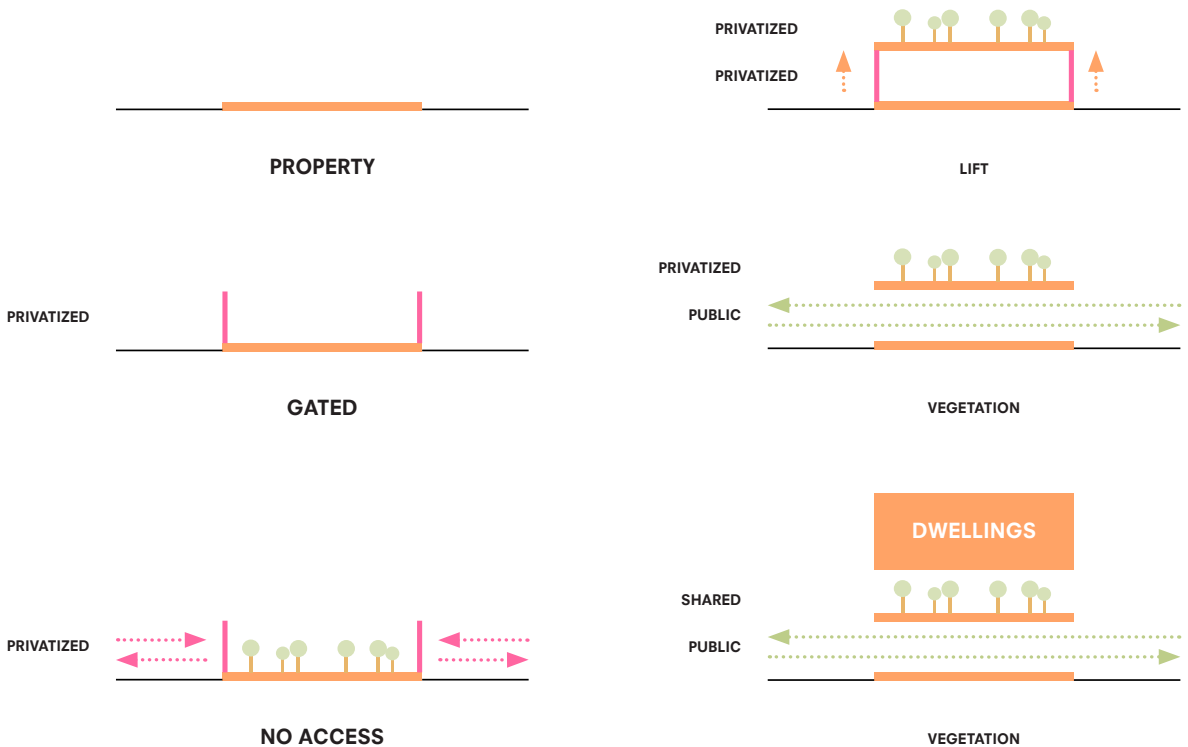
The goal must be to respond differently to the different characteristics of the property boundaries and to have a binding effect.



## Private - Public space in Beirut

When the use and restriction of public areas is considered, it quickly becomes clear that all undeveloped areas are always privatized by the respective owners with the help of a fence.

For the selected plot, the private area is to be raised to a higher level so that a public zone for the population can be created on the first floor. Above the private outdoor area, the various residential units are then to be placed.



# Beirut Studio

## *Grid system*

Based on the efficient support grid of 10 x 10m for retail spaces, zoning of the site was done.





## *Flow*

The goal is to make the first floor as accessible and flowing as possible. Different routes should enable pedestrians to use the space and the public offer. The site opens up primarily towards the park and interaction zone.

Different sized plazas in the center of the site provide a better quality of stay and slow down the flow.



# Beirut Studio

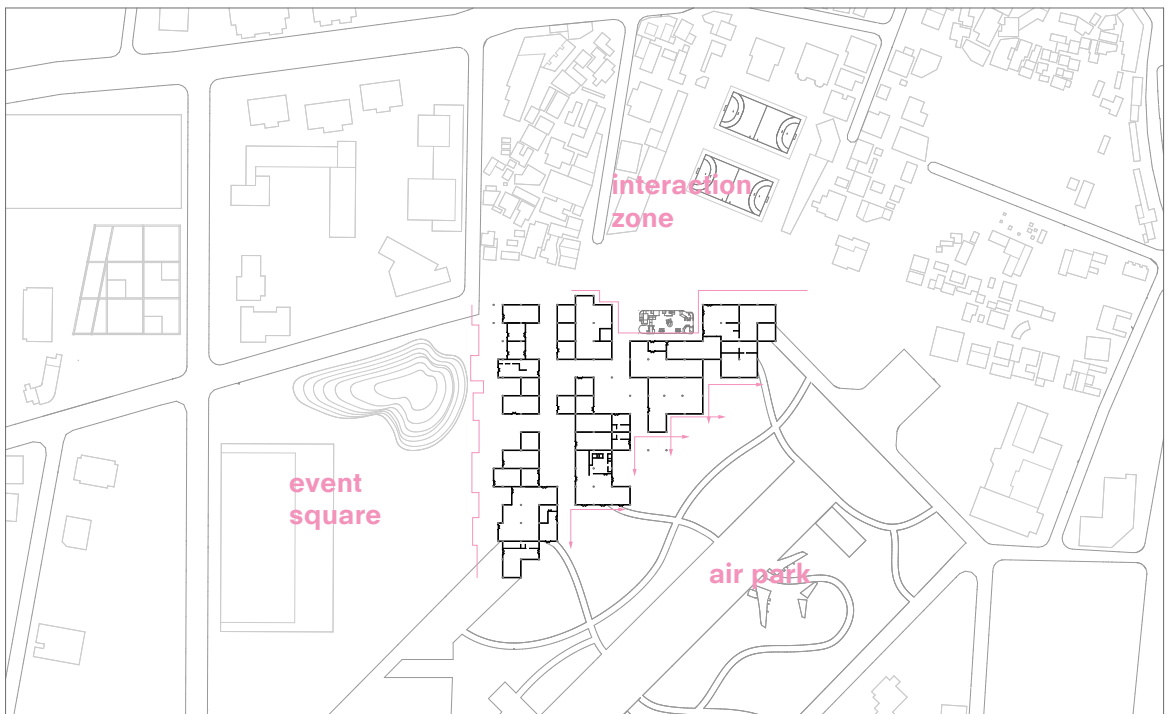
## *Interaction of the plinth*

The interaction of the plinth with the environment is crucial.

Interaction zone: The goal is to direct the interaction zone into the plinth. A kind of square in the plinth should promote interaction.

Event Square/Spinneys: On the one hand the plinth should frame the square and on the other hand it should be a passable border between the Eventsquare and the property. This side will be designed more closed.

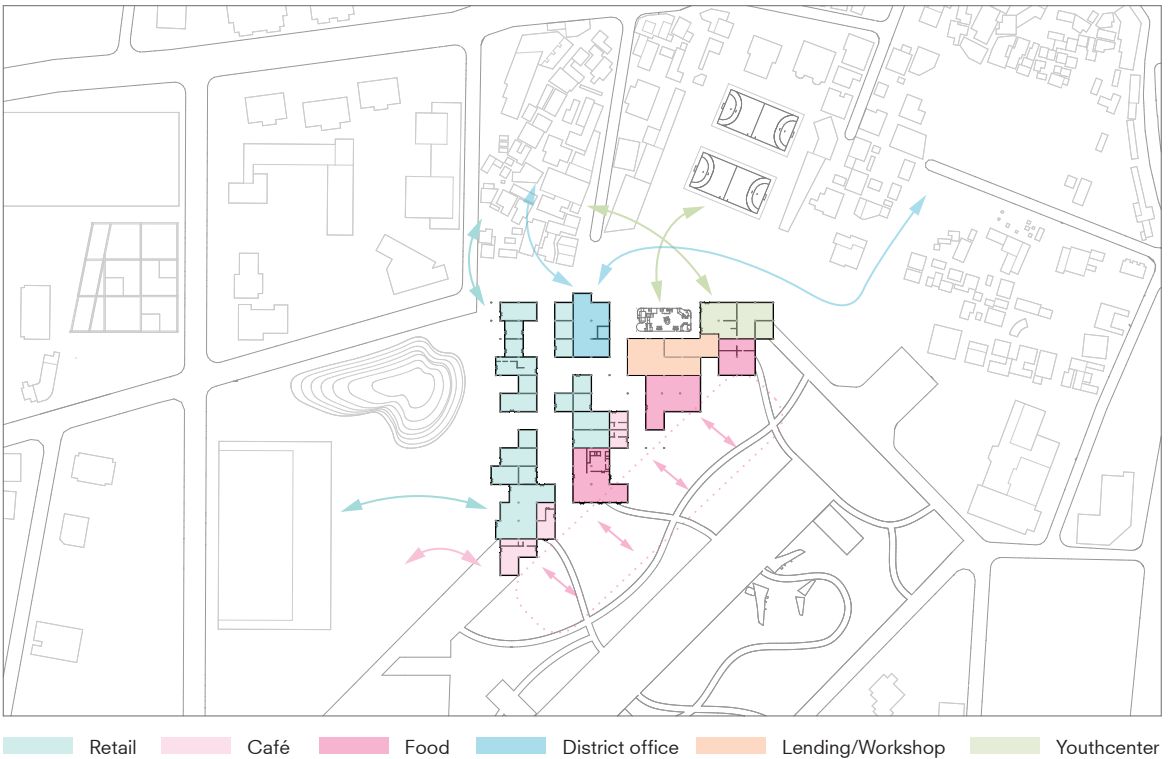
Air park: An open arrangement with various large squares should make the atmosphere of the park usable.



### Detailed program placement

The general goal of Program Placement is to tie into the existing character or the character planned in the Master Plan.

For example, free of charge facilities should be planned adjacent to the interaction zone and retail adjacent to the Spinneys.



# Beirut Studio

*Plinth groundfloor*

*0m*

Based on the column grid, different sized and subsequently changeable typologies can be created.

For example, it is possible to create smaller divisions and store sizes in the direction of the refugee camp, so that these can be used by the residents of the camp to sell goods.



Plinth roof

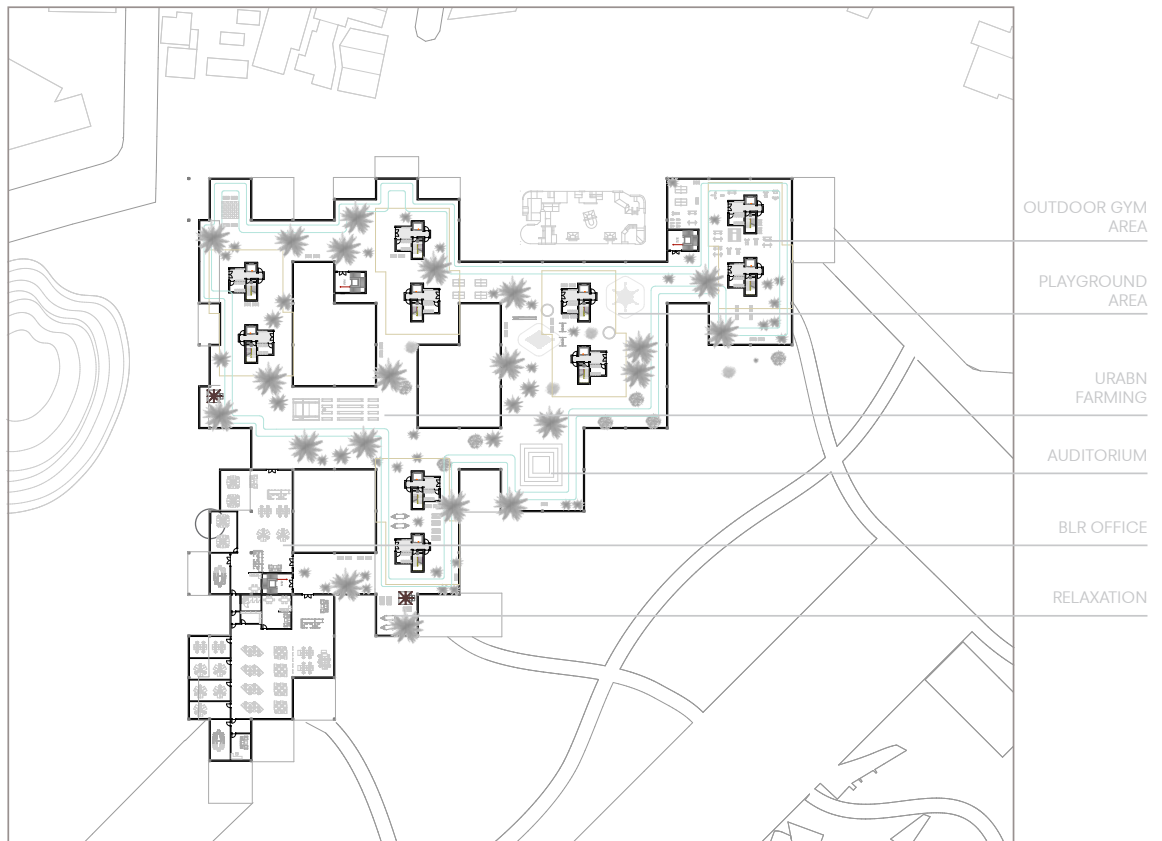
+12m

The divided outdoor space of the residents will include different activity zones with low maintenance. The zones will be placed to fit the character.

Spinneys: loud - a lot going on

Interaction zone: children + sports activities

Park: rest and relaxation

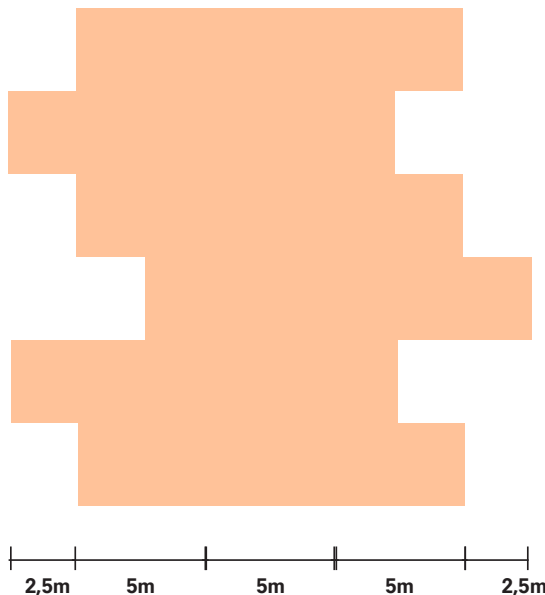
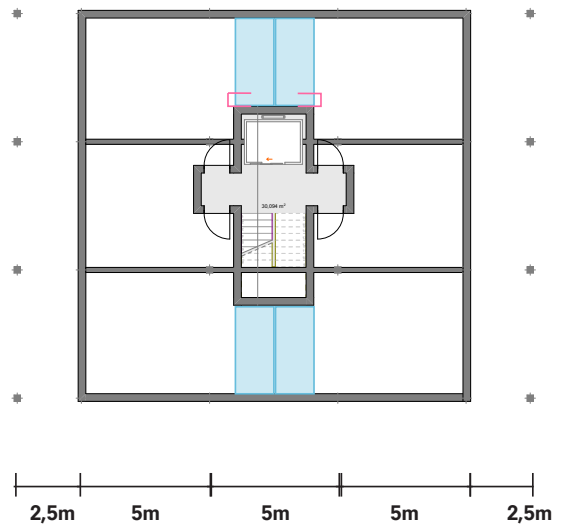
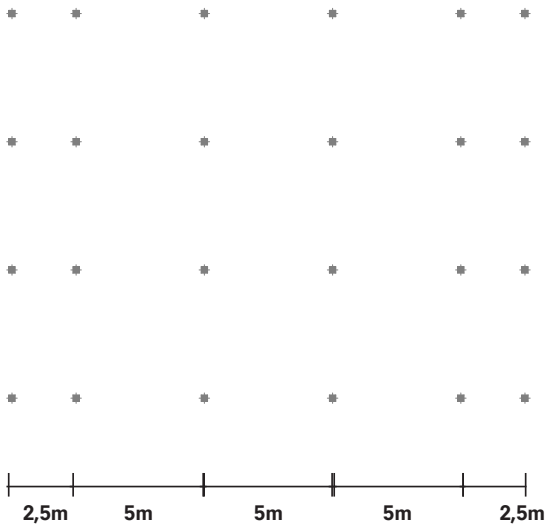


# Beirut Studio

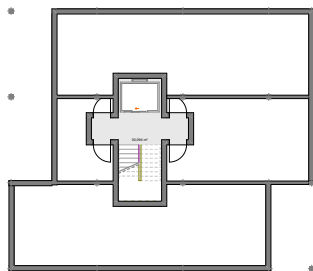
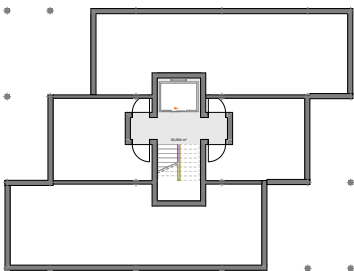
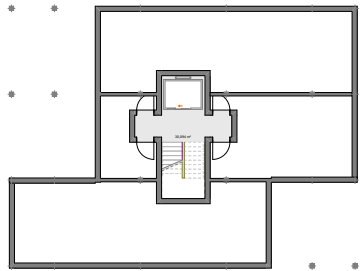
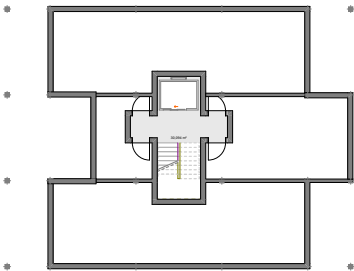
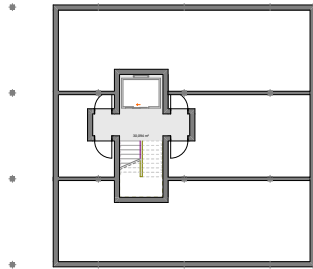
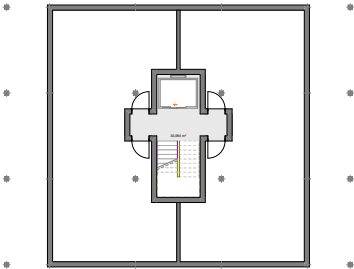
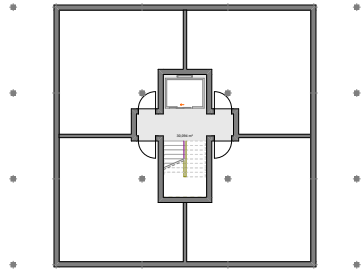
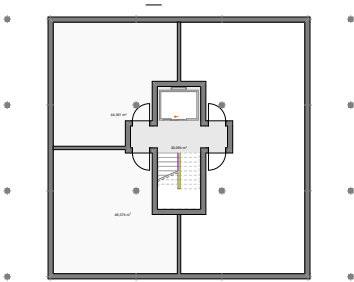
## Dwelling units

The residential units are planned in the same grid system as the Plinth. The grid for the residential units is based on a 5x5m grid, which is supplemented by a 2.5m grid at the edges to allow for various shifts.

The development core also acts as an installation level for the bathrooms and ventilation systems, which must always be placed on the head side.



*Some division options*









# REFLECTION

04

















## **THE RELATIONSHIP BETWEEN YOUR GRADUATION TOPIC AND STUDIO TOPIC**

The studio theme is the explosion in the port of Beirut and its social impact. The objective as a studio is to develop different visions of the future for various areas of the city of Beirut and collectively bring them together into a larger vision for Beirut. Interactions and connections of the areas are one of the key challenges.

In tendency, it can be said that each of the group areas in Beirut is characterized by at least two of the same problems. The first is the ever-shrinking public space and the second is the living conditions or housing circumstances of the various socio-cultural groupings.

By assigning the Suburb area for our group, the actual explosion for the area to be analyzed and the society living there, however, represents only one of many disasters. The area is characterized by the many and densely built refugee camps, by different zoning in terms of income groupings, by the beach but also, above all, by the areas that have not yet been built on compared to the city center.

With regard to the chosen topic of housing, a new approach is needed, especially for these undeveloped areas, which, contrary to the current focus on exclusively luxurious high-rise buildings, can also generate good and affordable housing conditions for lower-income groups, which have been pushed primarily into the suburbs.

## Beirut Studio

### RESEARCH METHOD AND APPROACH CHOSEN BY THE STUDENT IN RELATION TO THE GRADUATION STUDIO

Fieldtrip.

It quickly became apparent to my work group and me during the background research that Beirut was not tangible, despite several weeks of research. We were able to gain a rough understanding of the layout of the city, but not of the processes within this Habitat City of Beirut and the behaviors of the people. Therefore, as a small group of 8 students, we planned study visit to Beirut.

By even staying longer than a week, we were able to better grasp and understand our proposed area for group work on the one hand and the people and their culture on the other.

The evaluation of the interviews conducted in Beirut revealed that, above all, a new housing typology is needed.

About 50% of the interviewees stated that affordable housing and smaller apartments play a decisive role for the future of Beirut and are absolutely necessary. An important aspect for this affordable housing is also that it should be available for different income groups.

One of the most important experiences for me personally was the visit to the Mar Elias Refugee camp. To see that these people live in a kind of parallel society in the refugee camp and that hardly anything is done to improve the living conditions of these people.

Typologies.

One of the most utilized research methods was the comparison of different case studies, typologies and concepts.

In the course of the master thesis the historical change of housing in Beirut was traced in a first analysis and different housing and building types (Lebanese and international) under historical and thematic aspects like social and affordable housing typologies were compared.

Additionally, a further analysis of case studies regarding the integration of the architectural language of the Beirut Houses into today's architecture was carried out.

Furthermore, in a third analysis buildings and living situations in which people from different cultures meet and also develop common activities were compared. By this the idea of an interactive housing project of different social-economic groups was manifested.

## THE RELATIONSHIP BETWEEN RESEARCH AND DESIGN

Compared to other courses and studios I have taken during my bachelor and master studies in architecture, the research in the Complex Graduation Studio is crucial for the later design. This is partly because Beirut as a context and Lebanese culture was not sufficiently known and partly because, similar to the Complex Projects course "Dutch Change", a sufficient amount of time was actually dedicated to research. Especially with regard to the unknown context, it can be said that without proper research and without a correct and intensive problem identification, the later design would have been completely irrelevant.

What is the point of a design if it is not based on any researched findings? If the context is not understood or incorporated? If the design has no social relevance?

Through the research, the design goal of developing affordable housing with an inclusive approach was determined. The research informed whether there is even a foundation for diverse populations to live together and coexist.

In the course of the master's thesis, there was a smooth transition from the research to the design process because the research was also, for the most part, very goal-oriented and insightful. Basically, an attempt was made to translate the results of the research into the design concept.

The direct translation of the research into a design, however, only worked through various design stages. The results of the research were not always directly transferable into a design, sometimes compromises between design and research had to be found. For example, with regard to the density of the development. Especially when a lot of living space is needed, the effect of the mass *or the interaction with the surroundings must also be considered in the design.*

## Beirut Studio

### RELATIONSHIP BETWEEN THE GRADUATION PROJECT AND THE WIDER SOCIAL, PROFESSIONAL AND SCIENTIFIC RELEVANCE

The master thesis represents a significant social relevance for the society in Lebanon. In recent decades, socio-economic groupings have been increasingly separated from each other through various experiences, such as civil wars, refugee influxes, a corrupt government and the unregulated housing market. Mentally as well as spatially. However, various initiatives in Lebanon show that there are first tendencies for a rapprochement of the different groups and that there is more openness. Also in view of the new elections in Lebanon, the new generation is in favor of living together instead of side by side. Based on this, this project should lead to a better collaboration and create living space that is affordable for everyone.

For today's society, it is becoming increasingly important to figure out how we manage to create high-quality and sufficient living space. The classic detached single-family house on a vacant greenfield can no longer be a solution given the population growth and the shortage of space.

But how much building volume is too much?  
What are the limits?  
What is still compatible with the context?  
How can we ensure that enough housing is planned?  
How can a large building volume still be designed in an appealing way?  
How can you ensure human scale in large building volumes?  
How can a building ensure that there is no anonymity?

### ETHICAL ISSUES AND DILEMMAS YOU MAY HAVE ENCOUNTERED DURING GRADUATION

In the process of the master's thesis, I have been observing different ethnical problems. Especially compared to a European city, there is a very strict cluster building of socio-economic groups in Beirut. Sometimes there are even parallel societies.

But how can one deal with such a context? Should one simply continue to operate within the existing system? Should one try to break the system?

Is it even allowed to develop a social housing project for refugees, among others, if the own population itself suffers very much and partly also fights for survival? In such a context, is one life placed above the other?

Do all the problems of the native population have to be eliminated first, so that one is allowed to take care of other population groups?

Is it okay to offer different housing standards for different population groups? For the inhabitants of the refugee camps, for example, almost every new housing project would be an improvement in their living conditions, even if these housing typologies would have less comfort than the average standard.

## CONCLUSION

In conclusion, it can be said that architecture can only provide options. Whether something is really accepted by the population later can only be answered theoretically until something is put into practice.

The example of Beirut shows the impact that architecture can have on society.

Personally, I believe that architecture even has the power to change a society in the long term and that the project is conceptually an answer to the question "How should affordable housing be designed in a socio-economically segregated context such as Beirut?"









**DRAWING SET**

**05**







# Beirut Studio

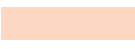
## Urban implementation



- Retail
- Café
- Food
- Dis



District office



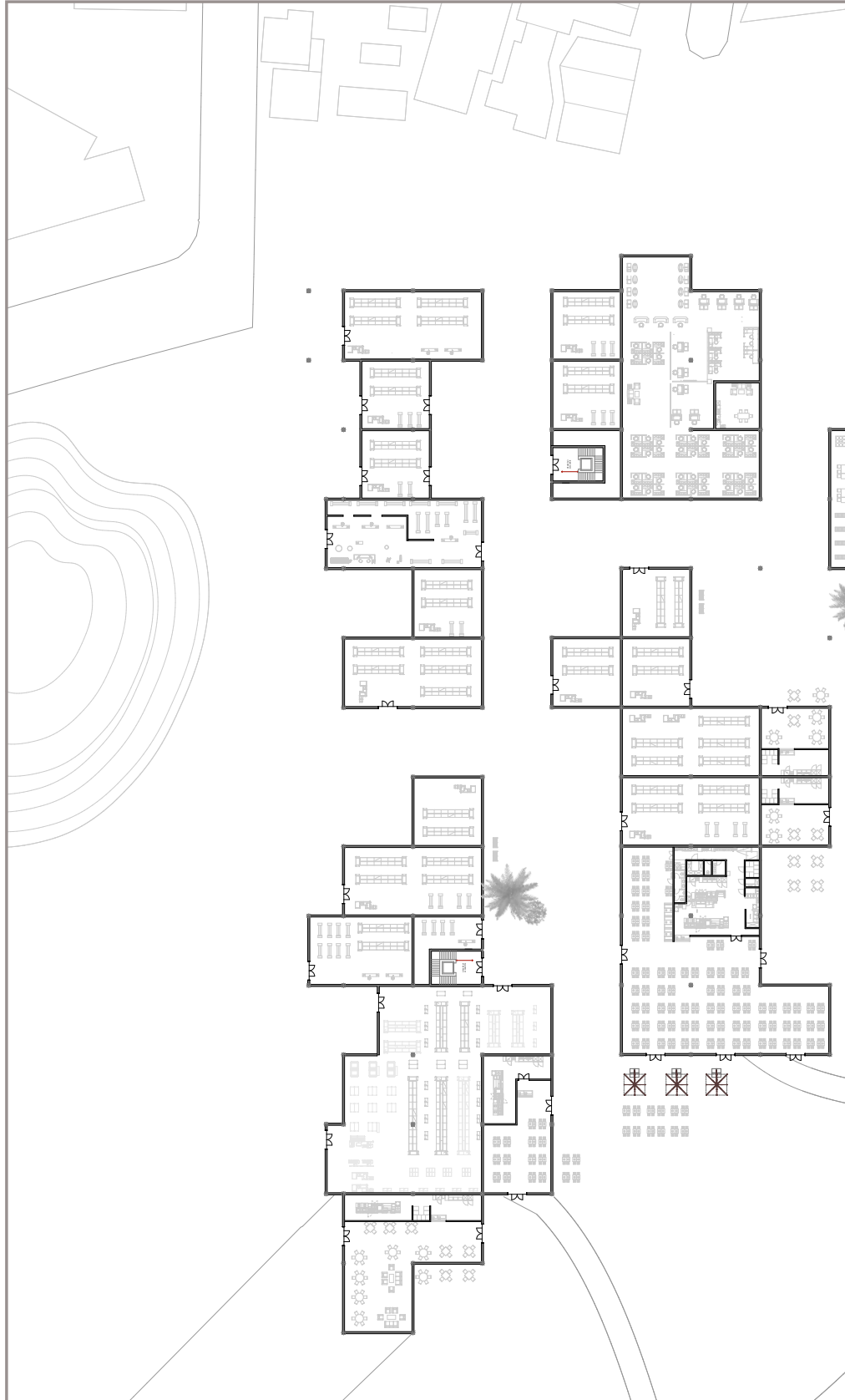
Lending/Workshop



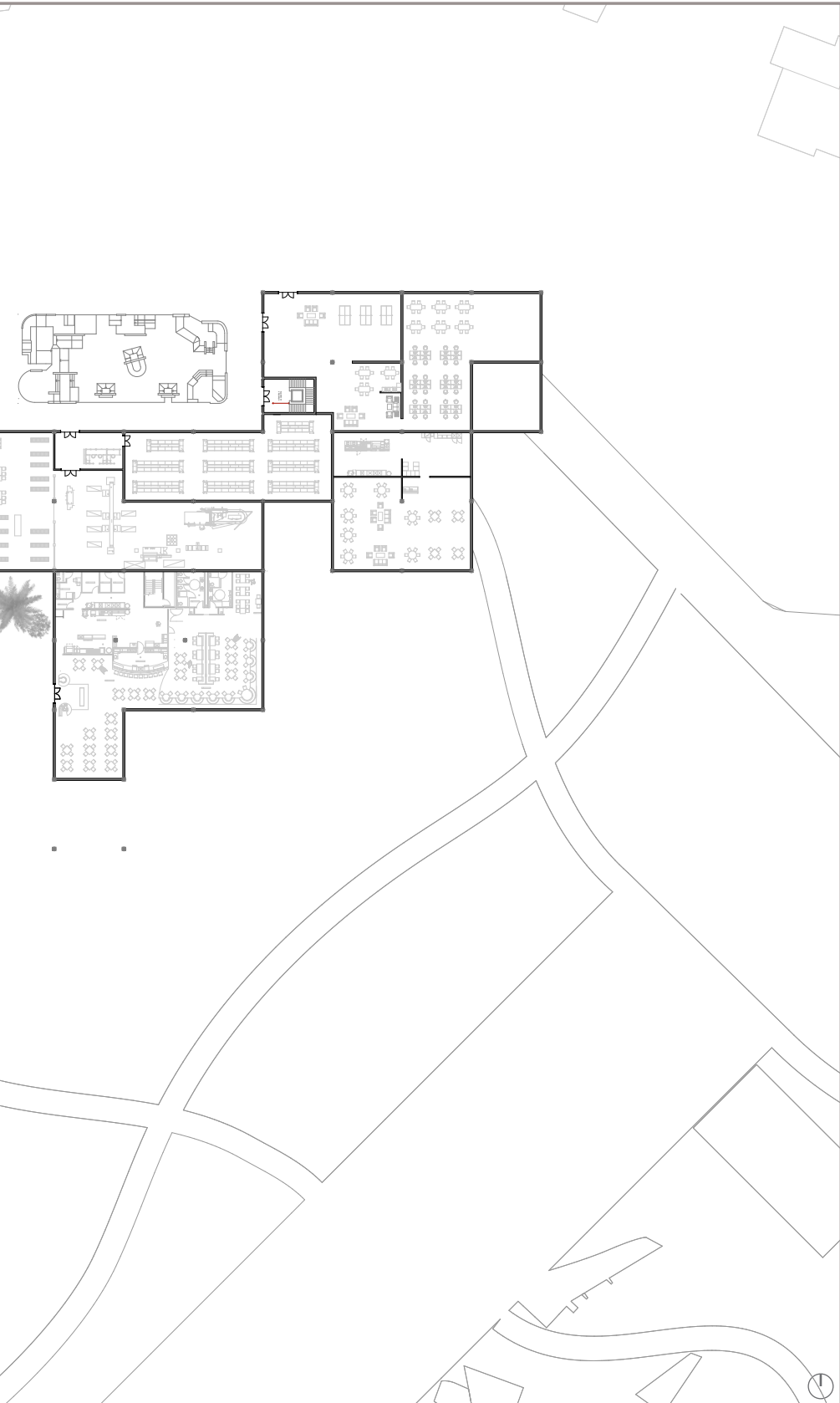
Youthcenter

# Beirut Studio

Plinth groundfloor  
0m

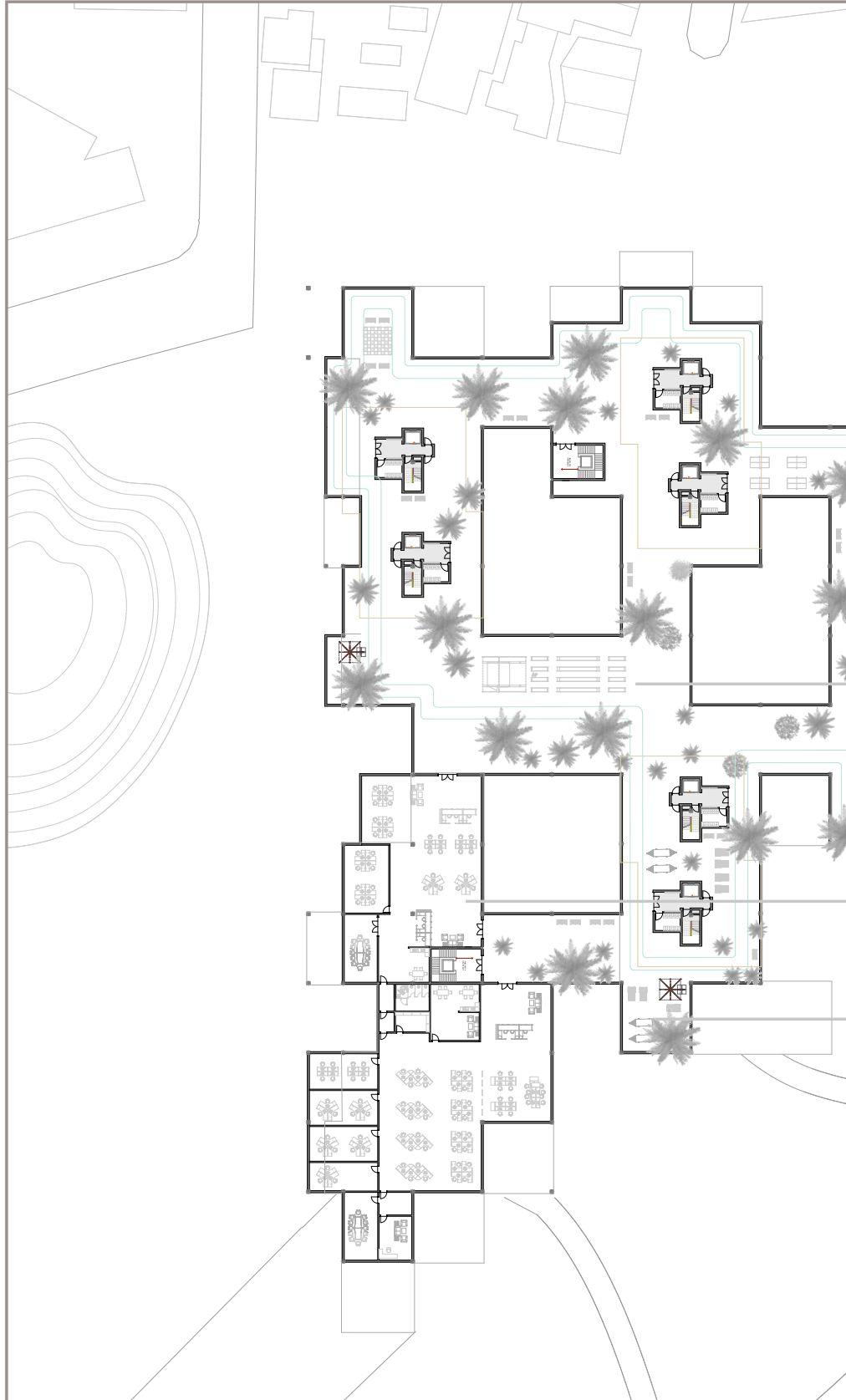






# Beirut Studio

Plinth roof  
+12m





OUTDOOR GYM  
AREA

PLAYGROUND  
AREA

URABN  
FARMING

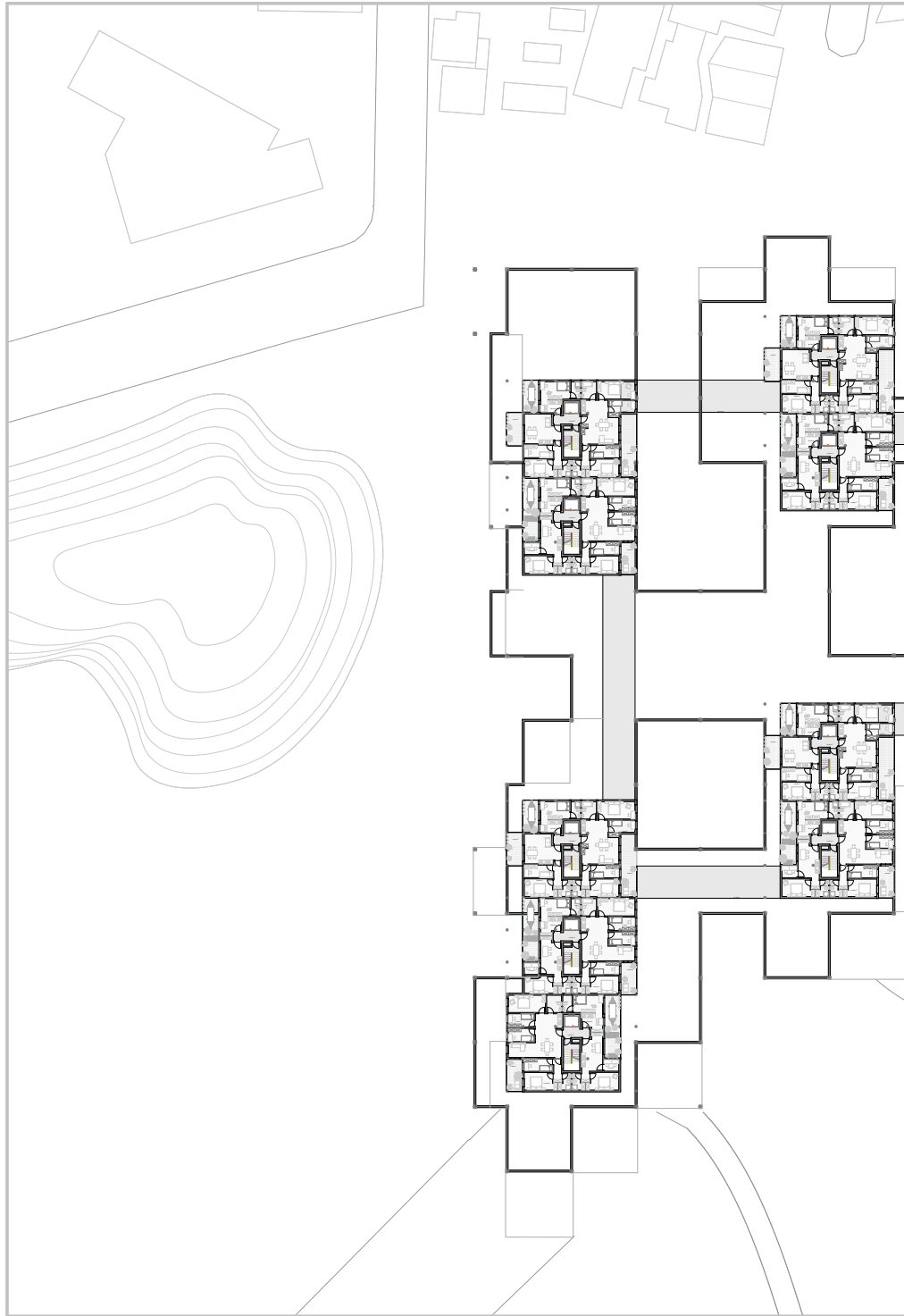
AUDITORIUM

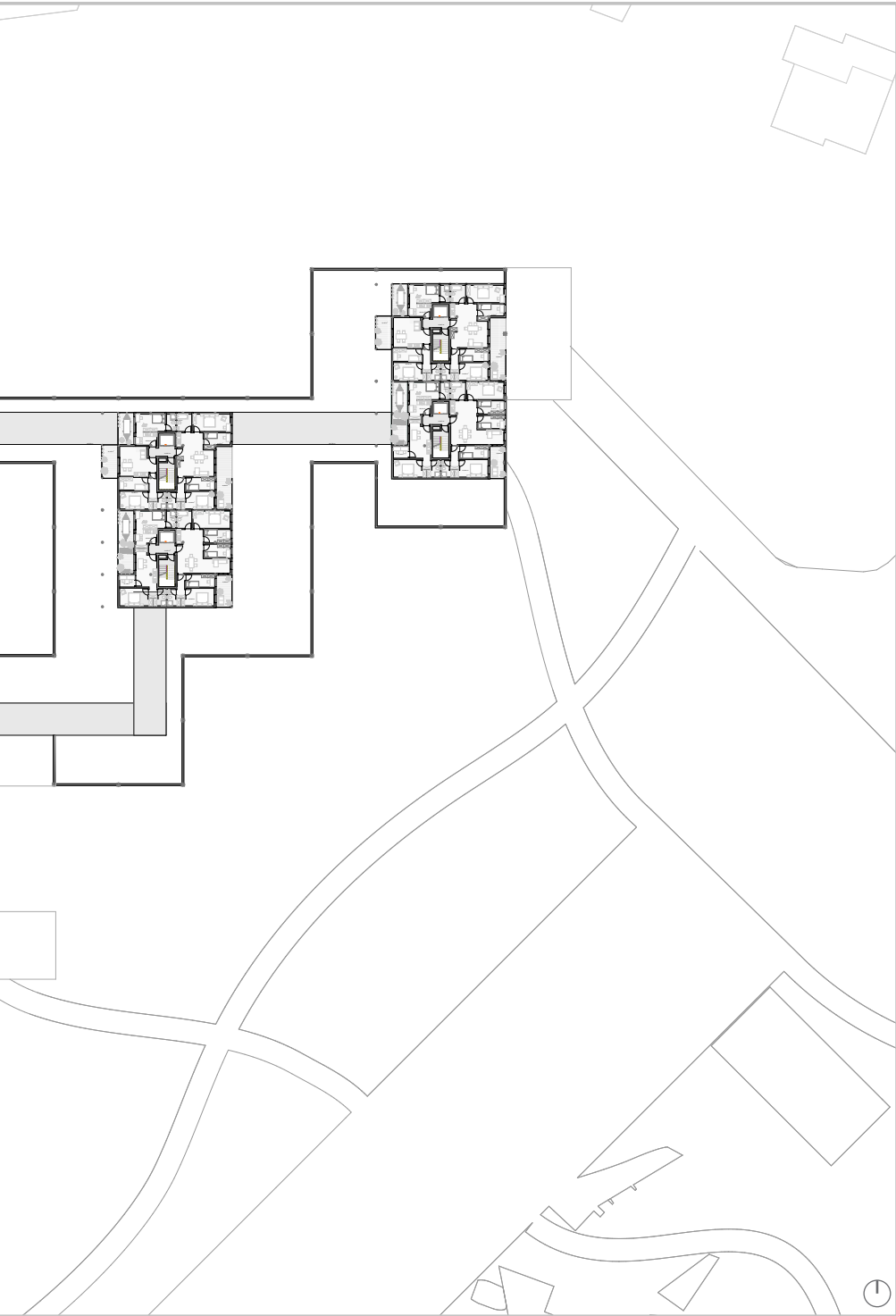
BLR OFFICE

RELAXATION

# Beirut Studio

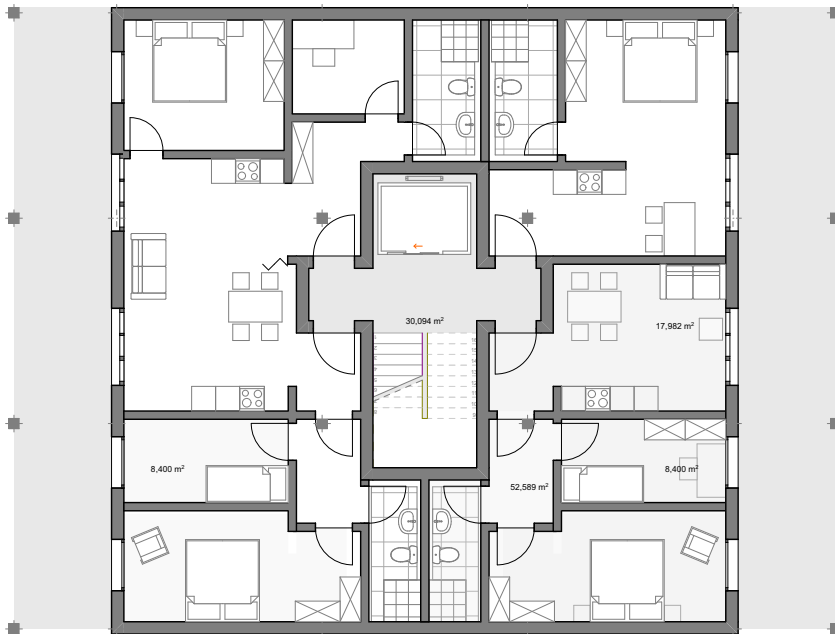
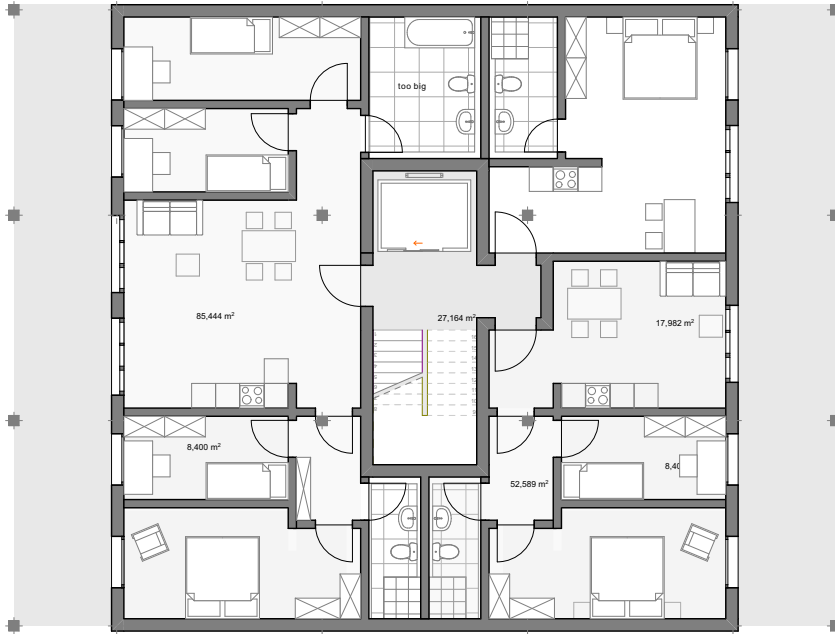
*Regular dwelling level*



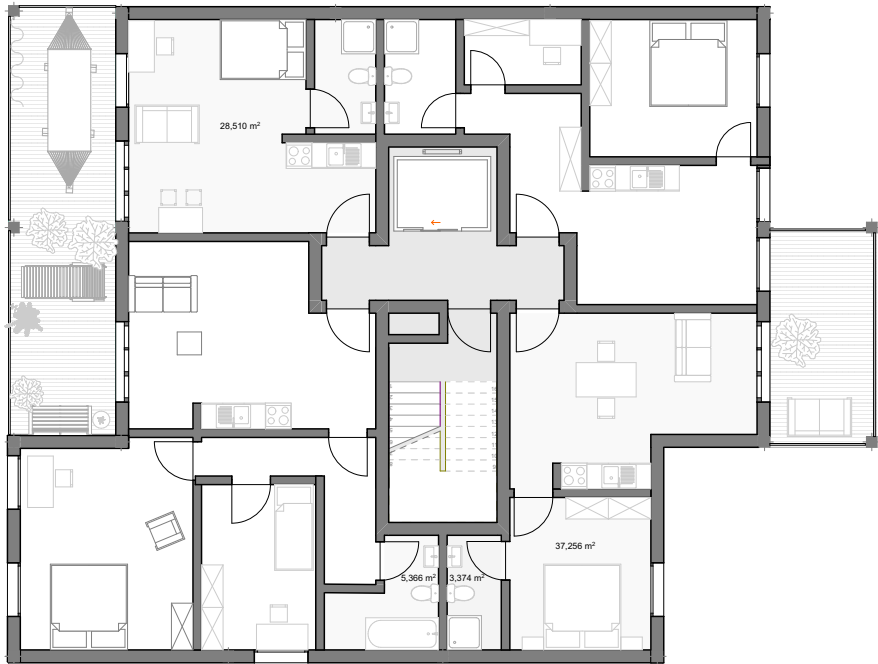
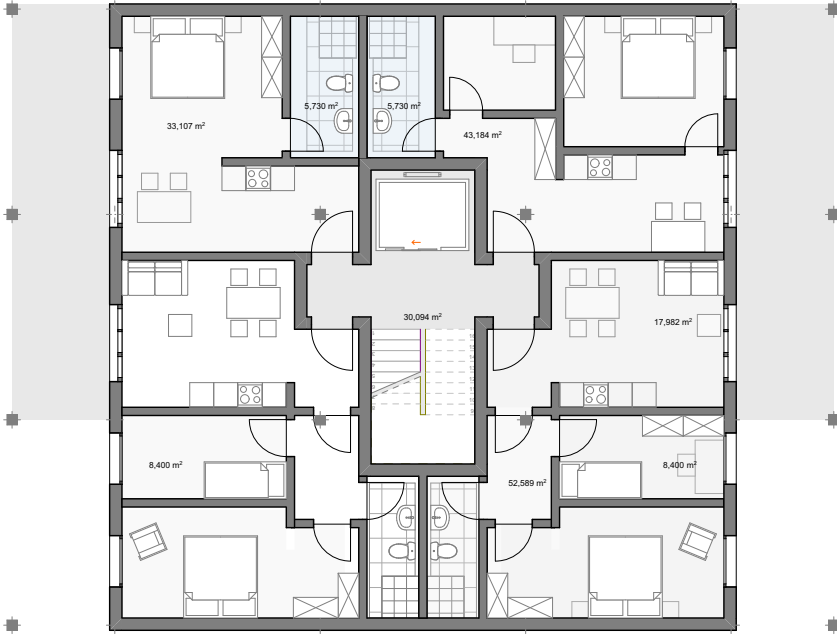


# Beirut Studio

## Dwelling units floorplans

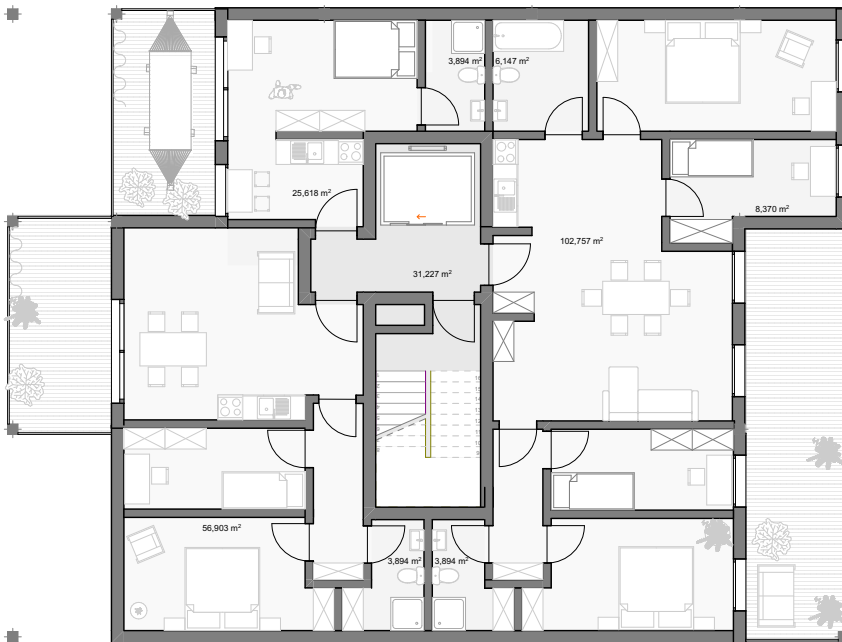
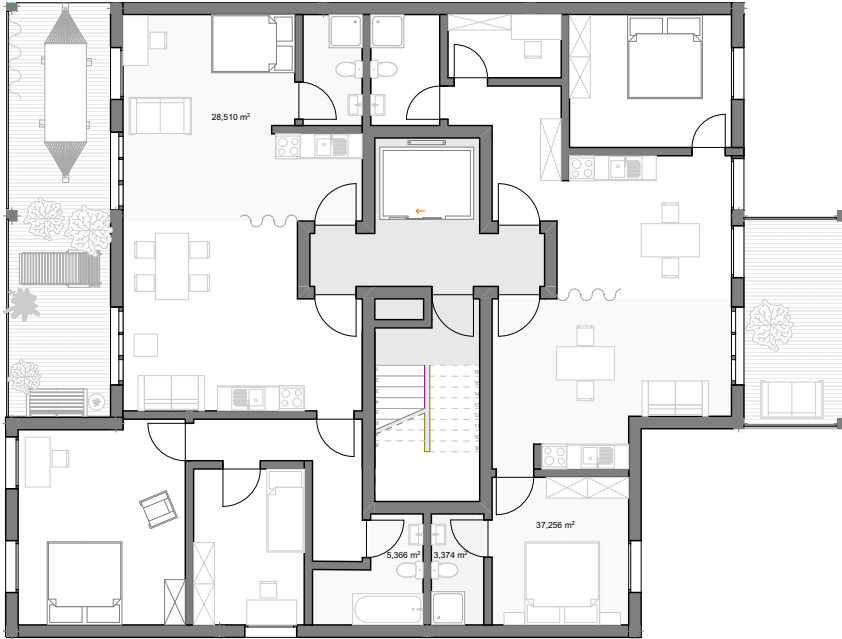


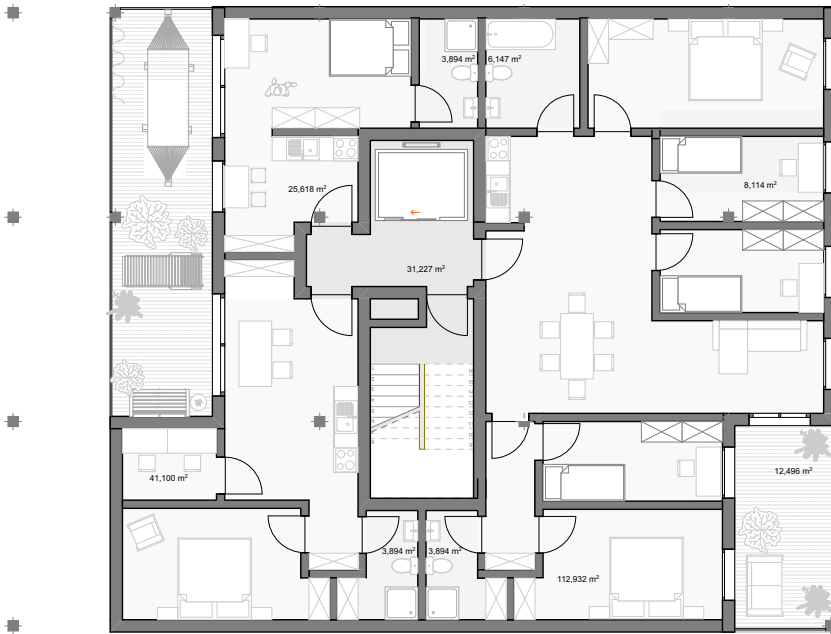


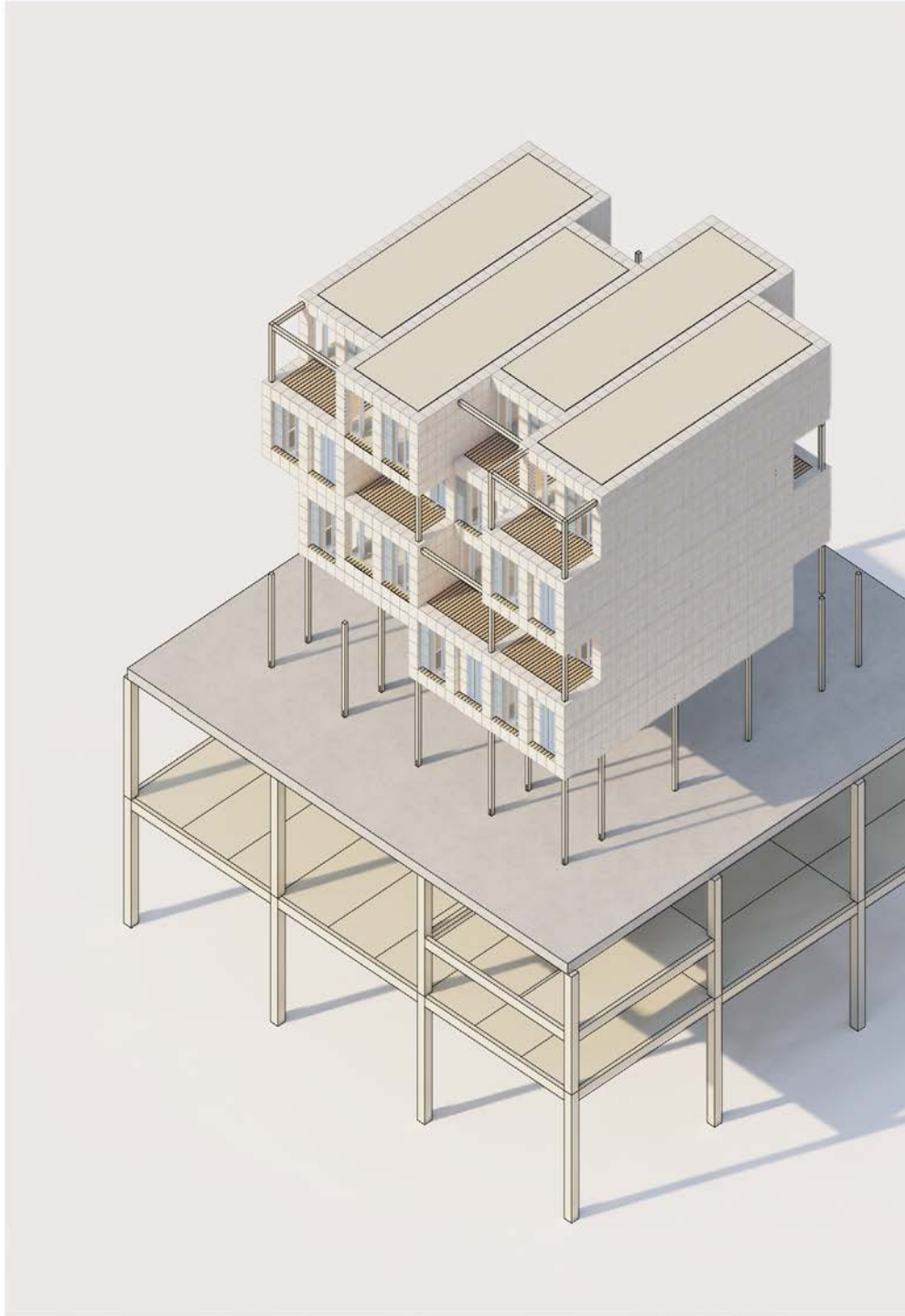


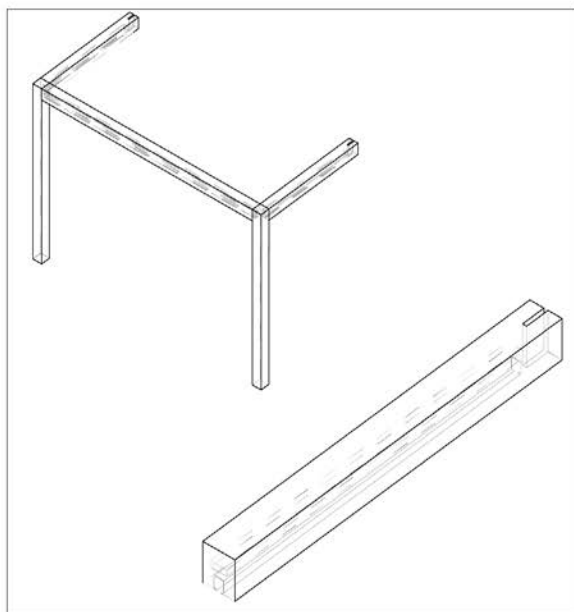
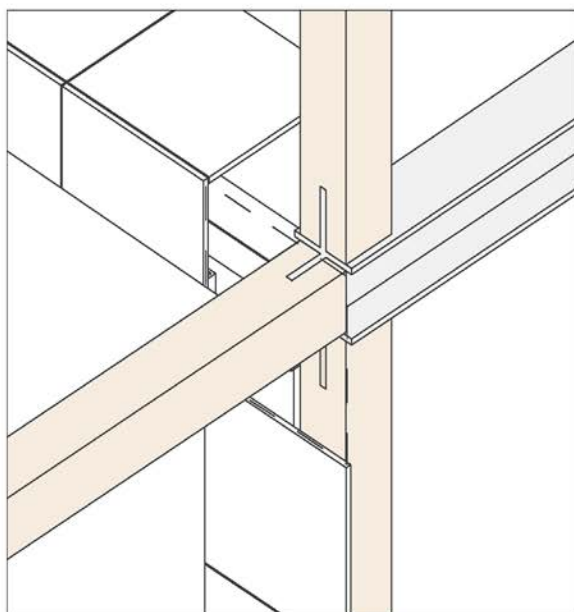
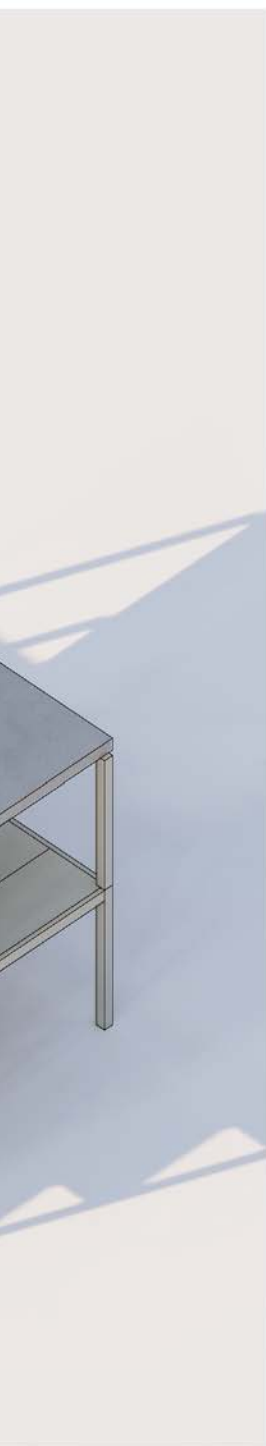
# Beirut Studio

## Dwelling units floorplans





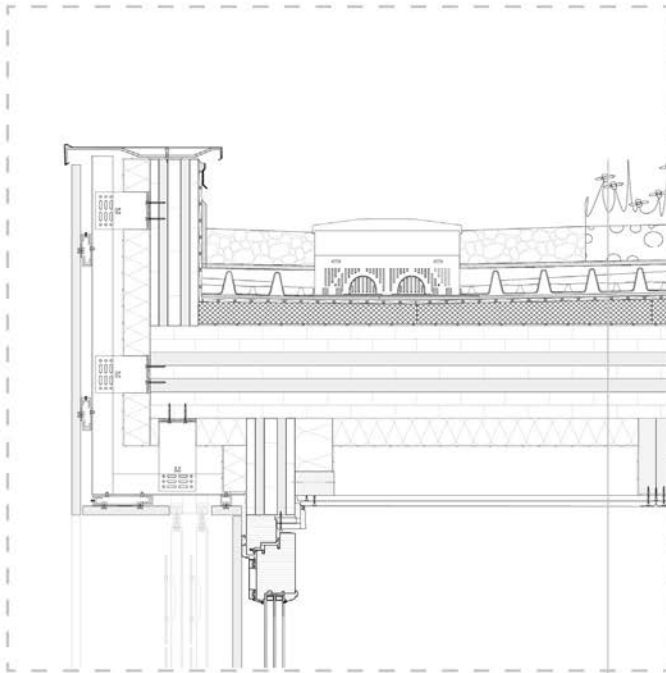




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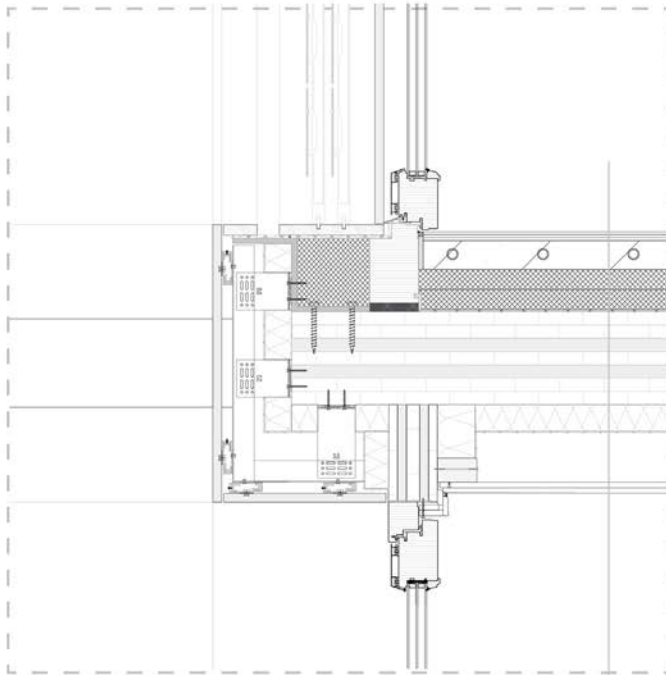




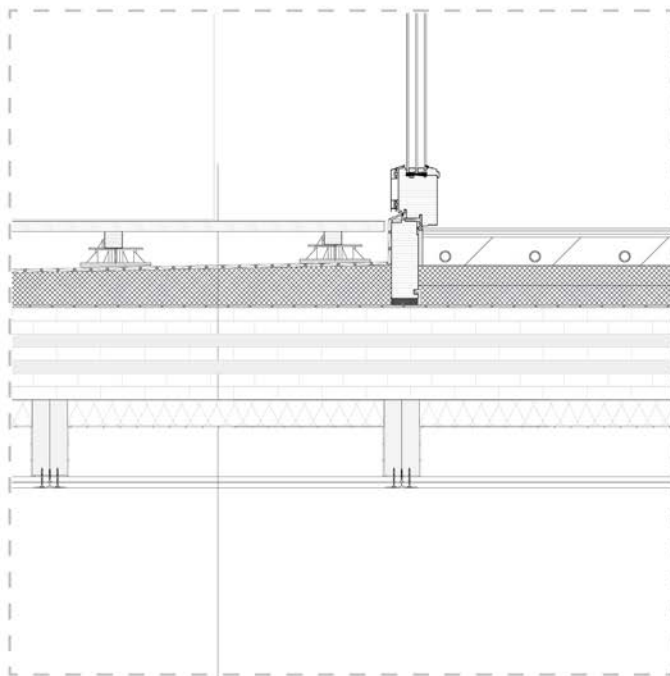


PLANTING  
 EXTENSIVE SUBSTRATE  
 GRAVEL STRIP  
 FILTER FLEECE FIL 105  
 WATER RETENTION ELEMENT  
 PROTECTION FLEECE  
 BITUMEN WATERPROFFING MEMBRAN  
 SLOPE INSULATION  
 210mm CLT, LL-210/7s

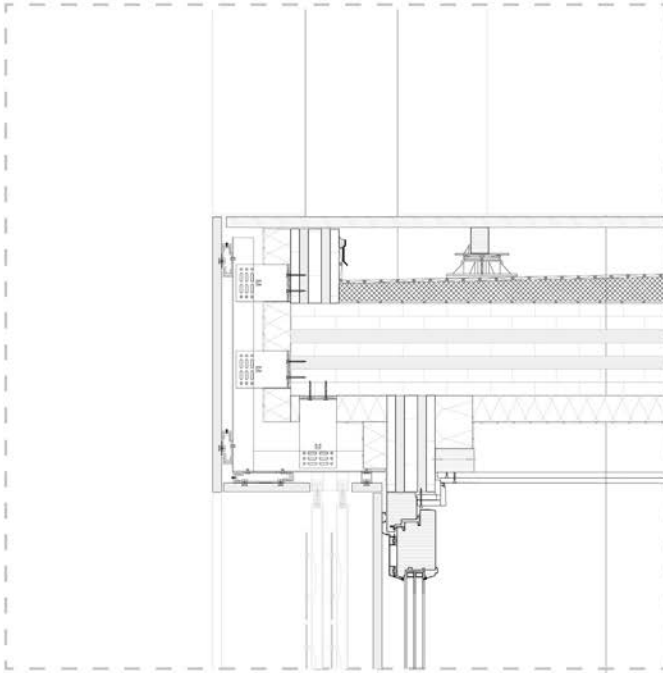
RETENTION VOLUME. ca. 32l/m<sup>2</sup>  
 WATER RESERVOIR: 55-100l/m<sup>2</sup>



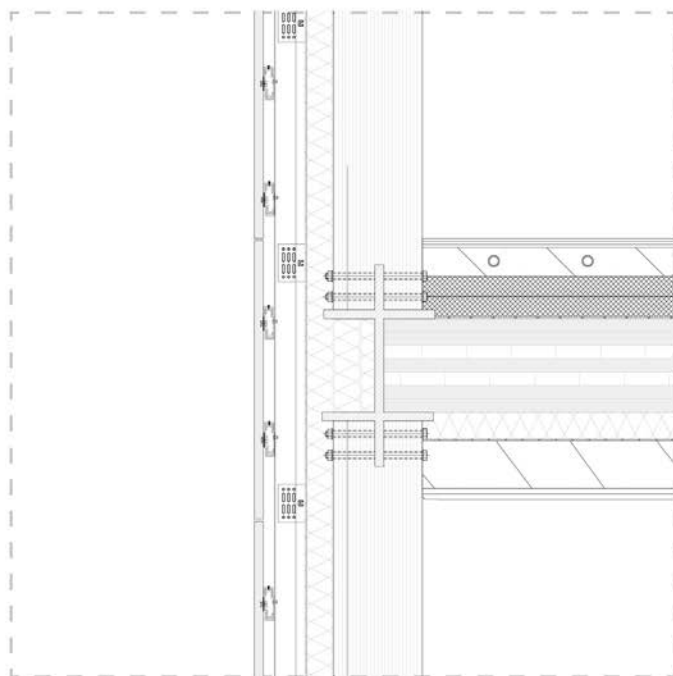
20mm PARQUET, OAK  
85mm SCREED + FLOOR HEATING  
30mm x 2 SOUND INSULATION  
VAPOR BARRIER  
210mm CLT, LL-210/7s  
WOODEN BEAMS 270x80  
240mm CELLULOSE INSULATION  
VAPOR BARRIER  
25mm PLASTERBOARD (2 \* 12,5mm,  
joint staggered)



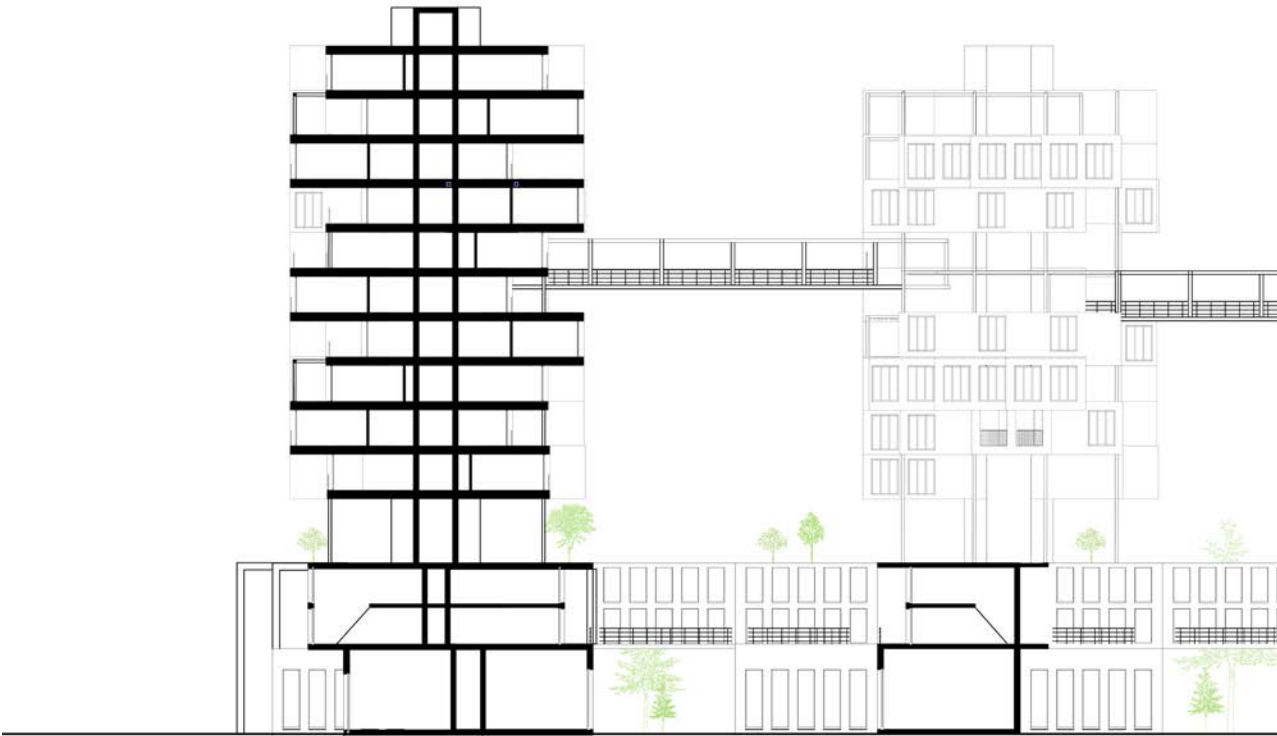
NON-SLIP WOOD FLOORING  
CONSTRUCTION WOOD  
STILT BEARING ADJUSTABLE FEET  
HEIGHT 35-70mm  
BITUMEN - WATERPROOFING  
MEMBRANE  
SLOPE INSULATION  
VAPOR BARRIER  
210mm CLT, LL-210/7s

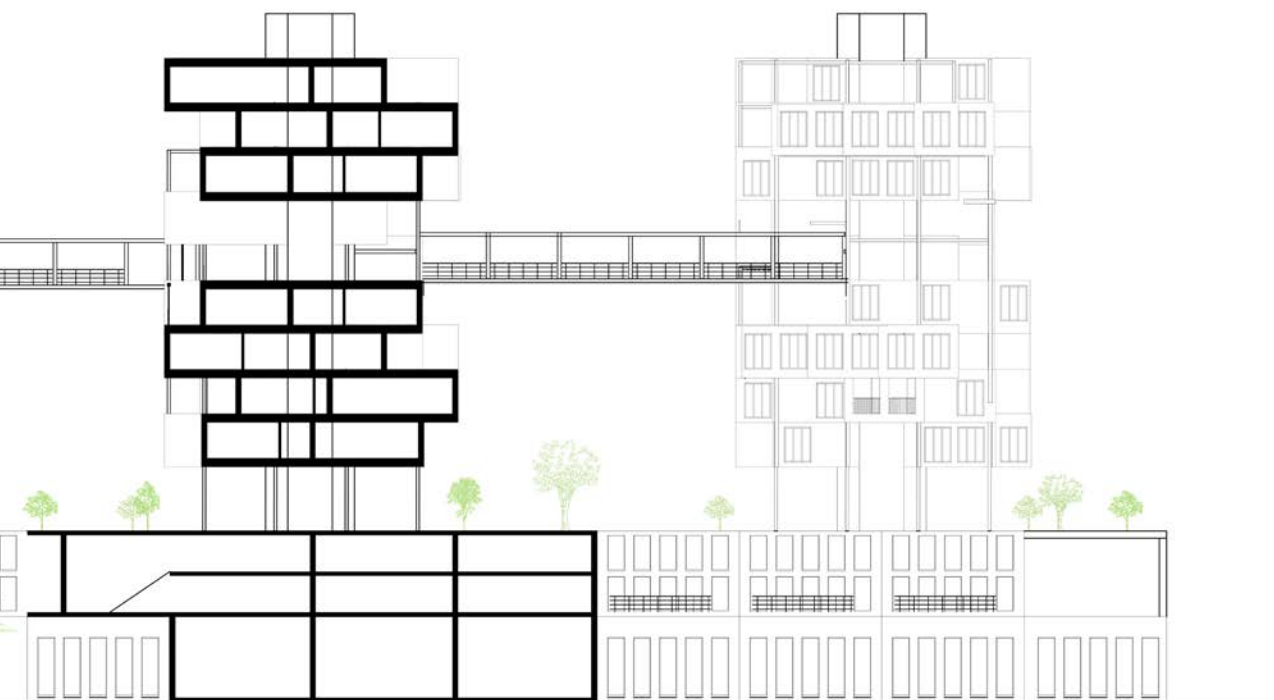


20mm PARQUET, OAK  
85mm SCREED + FLOOR HEATING  
30mm x 2 SOUND INSULATION  
VAPOR BARRIER  
210mm CLT, LL-210/7s  
WOODEN BEAMS 270x80  
240mm CELLULOSE INSULATION  
VAPOR BARRIER  
25mm PLASTERBOARD (2 \* 12,5mm,  
joint staggered)

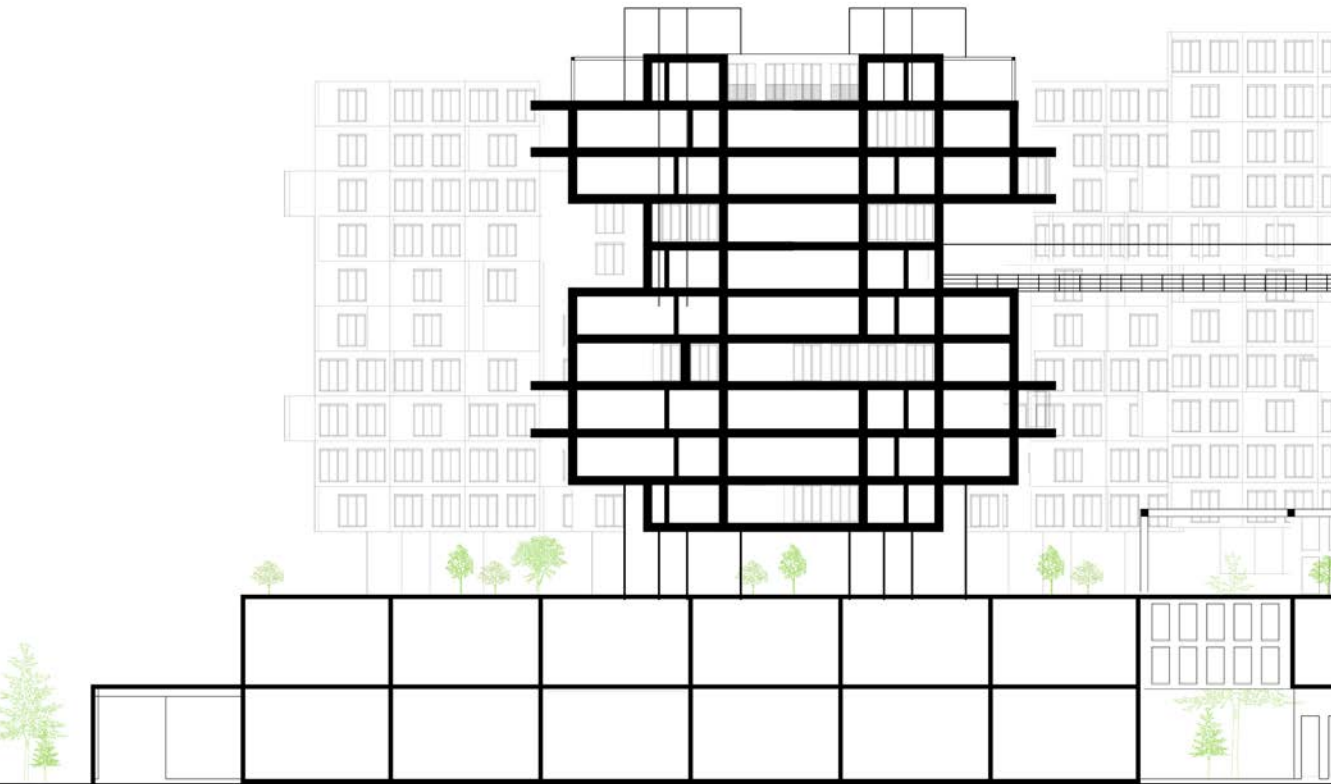


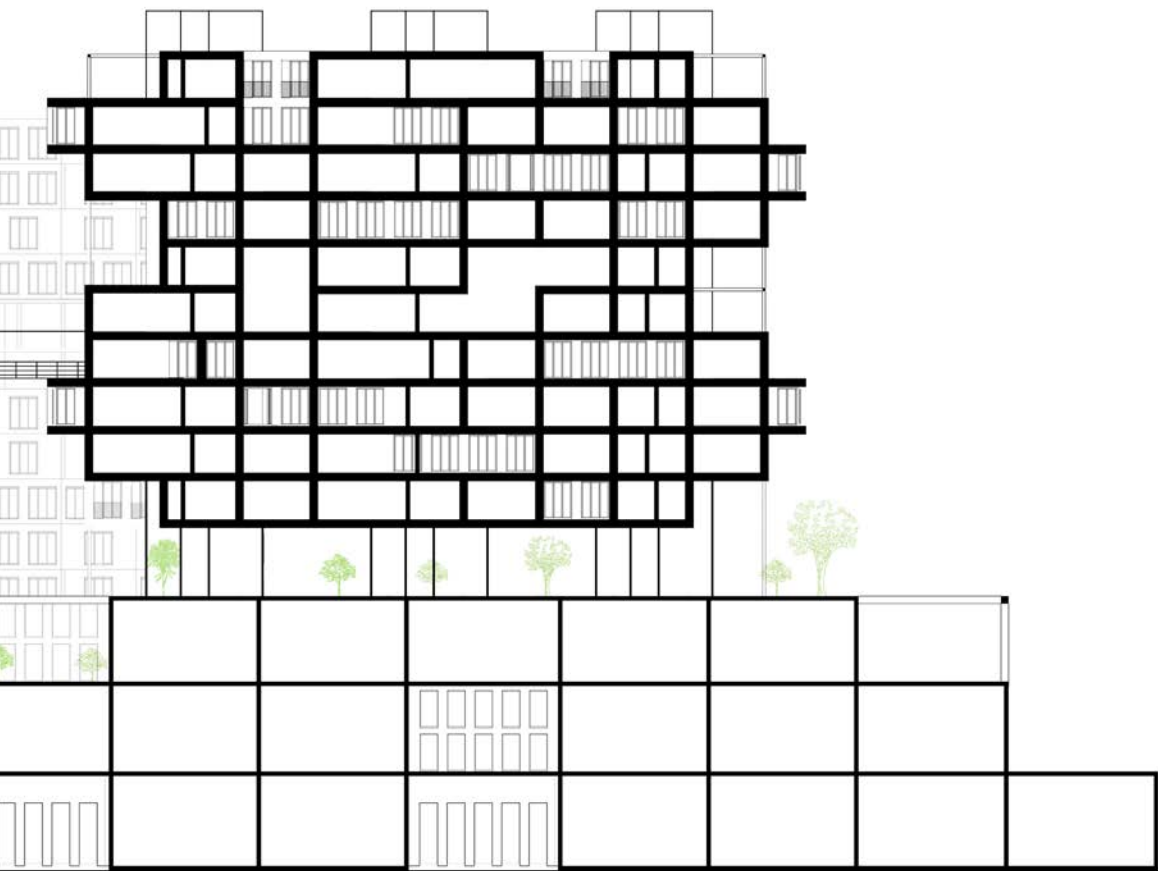
WOODEN PILLAR 200x200mm  
HEB PROFILE BEAM WITH  
CONNECTION















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06



# Beirut Studio

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## Images

All images and diagrams, which are not listed, are created by my own.

- Image 1: Beirut houses. (2021). [Photograph]. <https://www.youtube.com/watch?v=Fw3JUKMB2I4&t=2729s>
- Image 2: Sellies, F. (2021). Beirut [Photograph]. <https://www.skyscrapercity.com/threads/beirut.451636/page-422>
- Image 3: Baan. (n.d.). Affordable housing development in Mexico [Photograph]. <https://www.dezeen.com/2021/04/15/so-il-builds-las-americas-affordable-housing-development-in-mexico/>
- Image 4: Housing for the Fishermen. (2013). [Photograph]. <https://langerthesis.wordpress.com/2013/02/08/housing-for-the-fishermen-of-tyre-beirut-lebanon/>
- Image 5: van Vliet. (2021). Freetime activities of children [Photograph].



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