Home

Post-war housing typology
for Aleppo – *the city of tomorrow*

RANIA MARRAWI

Will Alsop, Land of Hope and Glory, 2012

«The ideal home is never what you think.»

—Will Alsop

This thesis is dedicated
to Prof. Will Alsop,

who I learned from, that architecture
is not about rules, it is about challenging ourselves
to create unique spaces we enjoy and love,
spaces where we and others can have fun, dance,
eat, cry … simply live.

May your spirit always be free.
May you spread colors and joy
in every place you visit.

Thank you

Manfred Berthold
Prof. Arch. DI Dr.

Michael Surböck
Ass. Prof. DI Dr. techn.

Home

Post-war housing typology for Aleppo – *the city of tomorrow*

/

Nachkriegs-Wohn-Typologie
für Aleppo – *die Stadt von morgen*

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Rania Marrawi
Matrikelnr. 01225164

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Abstract

ENGLISH

Aleppo is Syria's second most important city, once called the »Jewel of Syria«, this city could be the world's oldest continuously inhabited one, the evidence of settlement goes back to 6.000 BC, but excavations suggest it may have been inhabited 5.000 years before that.

The ancient town in Aleppo has developed over the centuries. Residential neighborhoods have grown steadily and have taken various forms that have been influenced by several factors. The housing sector, the core of the city and the most important part of it, has suffered of many problems during this development. Although the traditional courtyard house, which is a common building typology in the old town, is one of the most sustainable housing systems, that regards the social values of the Arabic oriental culture. However, the development of the housing system in subsequent periods of the last century took a wrong turn. The erroneous imitation of the European styles and the misuse of technology without taking into consideration the climate effects of the surrounding environment and the social background of the population led to the production of rigid concrete blocks, that drained the city of its identity.

Aleppo which have survived many conflicts over decades, is still alive but in ruins. After seven years of civil war, among the Syrian cities, Aleppo received the largest share of destruction, the housing sector has been hit the hardest. Whole neighborhoods were destroyed, leaving large areas of rubble and thousands of people homeless. More than 40 % of homes in the city have been completely damaged. Now that the situation has relatively calmed down, these destroyed neighborhoods must be rebuilt soon, but this time properly and environmentally friendly, in a way to interact with the climate, society and history of Aleppo, to allow the residents to return to their home city.

This research takes Aleppo as an example of a Syrian city. In the first three chapters of the book the city will be studied regarding its location, climate, history and the development of its housing typologies to take their current forms.

In the last chapter, considering the facts and information in the previous sections of the study, a model of post-war housing typology will be defined. This model will try to solve the problems of the current housing system, based on several climatic, economic, social and historical aspects and takes the traditional courtyard house as an inspiration.

These aspects form the foundations to design the new typology, that offers in a short time the residents of Aleppo, who lost their homes during the war, a new way of living, which is suitable for the climate there and takes in consideration the social and historical background of the Syrian society.

The *Home* project is a realization of these principles, as a prototype of the future housing typology in the city of tomorrow – in Aleppo.

DEUTSCH

Aleppo ist Syriens zweitwichtigste Stadt und wurde einst als »Juwel von Syrien« bezeichnet, und könnte die älteste noch heute besiedelte Stadt sein. Es wurden Beweise gefunden das Siedlungen bereits 6000 v. Chr. existierten und weitere Ausgrabungen indizieren das bereits 5000 Jahre davor Menschen hier lebten.

Die Altstadt von Aleppo entwickelte und wandelte sich über die Jahrhunderte. Die Wohnsiedlungen wuchsen zusehend und wurden über die Jahre von diversen Faktoren beeinflusst. Der Wohnbau, eine der wichtigsten Komponenten der Stadt, entwickelte sich problematisch. In Syrien gibt es prinzipiell sehr gute Ansätze für Wohnsysteme. Das traditionelle Wohnhaus mit Innenhof, welches in der Altstadt sehr oft Verwendung fand, ist noch immer eines der nachhaltigsten Systeme welches auf die sozialen Werte der arabischen orientalischen Gesellschaft abgestimmt ist. Mit der Zeit wurde der Wohnbau aber immer mehr von europäischen Einflüssen geprägt und es wurden Plattenbauten errichtet, die weder das Klima noch die soziografischen Einflüsse beachteten – die Stadt verlor immer mehr an Identität.

Aleppo hat in seiner Geschichte viele Konflikte, Kriege und Belagerungen überstanden. Nach sieben Jahren Bürgerkrieg ist Aleppo eine der meistzerstörtesten Städte in Syrien. Mehr als 40 % aller Wohnhäuser sind zerstört oder beschädigt, ganze Stadtteile wurden zerstört und ein großer Teil der Bevölkerung sind obdachlos.

Der Bürgerkrieg ist zwar noch nicht beendet aber die Lage in Aleppo hat sich zunehmend beruhigt und es wird Zeit den Einwohnern ihre Stadt zurückzugeben. Dies ist auch eine gute Gelegenheit um den Wohnbau neu zu betrachten und vergessene Konzepte und neue Ideen zu einem harmonischen Ganzen zu kombinieren, welche mit dem Klima, der Kultur und Geschichte von Aleppo interagieren.

Diese Arbeit nimmt Aleppo als Beispiel einer syrischen Stadt. In den ersten drei Kapiteln wird die Lage, das Klima, die Geschichte und die Entwicklung des Wohnbaus betrachtet.

Im letzten Kapitel wird, basierend auf den Fakten und Informationen in den vorherigen Abschnitten der Studie, ein Model einer Wohnungstypologie entwickelt, welches versucht die Probleme des aktuellen Wohnbaus zu lösen. Wichtige Faktoren für diese Entwicklung sind Klima, Ökonomie, soziale und geschichtliche Aspekte. Eine der primären Inspirationen ist das traditionelle Wohnhaus mit Innegnhof.

Diese Ansätze formen die Basis für eine neue Typologie welche zeigen soll wie die Einwohner von Aleppo ihre Stadt wieder besiedeln können.

Das *Home* Projekt berücksichtigt den sozialen und geschichtlichen Hintergrund von Aleppo, die klimatischen Verhältnisse und zeigt mit diesem Wohnbauprojekt wie eine syrische Stadt wie Aleppo eine Brücke zwischen Vergangenheit und Zukunft schlagen kann.

Fig. 02: Aleppo citadel

Fig. 01: View of old Aleppo
taken from the citadel

Introduction

I lived in Damascus, Syria for 27 years, where I lived with my family in a flat in a cooperative housing suburb. I didn't like our flat, I never felt like home in it. It was hot in summer and cold in winter, the only private space to sit and study was the bedroom when visitors were in the living room. All what could be seen from the window were grey, rigid concrete blocks which were not connected to each other or their location. On the other hand, I, among all the Damascians, was fascinated with the old historical city with its narrow human-scaled streets and the traditional courtyard houses with their fountains and trees.

In 2012, after one year of the beginning of the civil war in Syria, I moved to Vienna and continued my master study at the TU. Living and studying here changed my whole idea about housing systems, through seeing and researching a lot of the new housing projects in Vienna and the social and environmental aspects which they are trying to reach and their continuous developments. This encouraged me to implement the knowledge I received here in my master thesis to create a new housing typology for the Syrian cities after the war.

I chose Aleppo as my case of study because it is one of the most destroyed cities in Syria during the civil war. More than 40 % of the homes need to be completely rebuild. I have never been in Aleppo, that's why I had to get to know it and study its location, climate, resources, the history and the development of the city and its housing typologies, to be able to achieve my approach in defining the new typology which is suitable for the city.

From analyzing and examining the city and its current housing systems, I was able to set up the aspects on which the post-war housing typology is based and defined. These aspects can be implemented to create new houses or to rehabilitate the minor and medium destroyed houses.

As a prototype I designed a housing project based on these aspects, to give a vision and image of the post-war housing typology and how it could look and be like. A typology which can be simple and fast constructed. A typology which is suitable for the location and climate, social background and history. A typology which is flexible and can develop and grow. A typology which gives the people who left the city during the war a chance to come back and feel like *Home*.

Fig. 03: View of Aleppo City

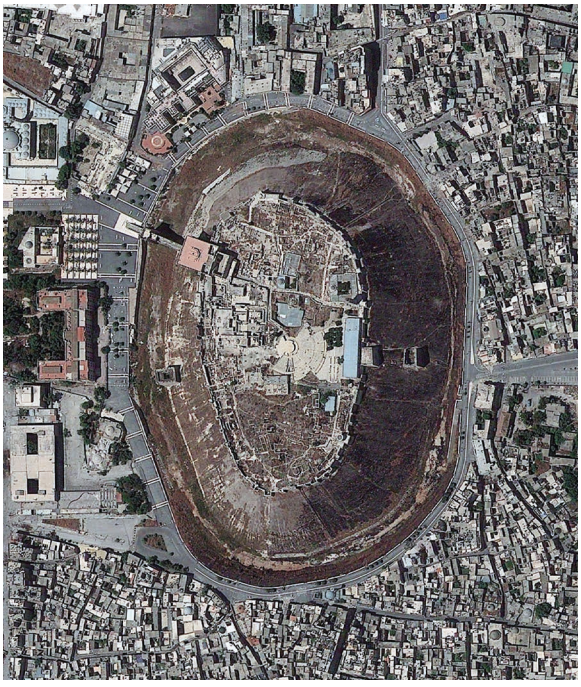

Fig. 04: Aleppo citadel from above

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CHAPTER

1

THE CHARACTERISTICS OF ALEPPO CITY

Location

Site characteristics

Population

1.1 Location

Fig. 1.1: Map of Aleppo's location

Aleppo is located in the north of Syria, serving as the capital of Aleppo governorate. It lies about 120 km inland from the Mediterranean Sea, on a plateau 380 m above sea level, 45 km east of the Syrian-Turkish border checkpoint of Bab Al Hawa. The governorate has a 221 kilometers long northern boundary with the Turkey. To the west lies Idlib governorate. To the south lies Hama governorate. River Euphrates forms most of the southern half of the eastern boundary with the Raqqa governorate.

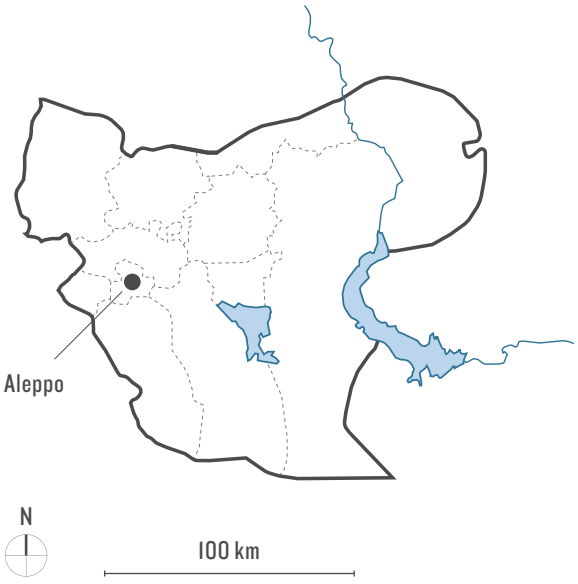


Fig. 1.2: Map of Aleppo governorate

The governorate is generally deforested except for a dispersed forest of about 50 km² on the eastern slope of Mount Kurd where it faces the plain of Azaz. The main trees are Aleppo pine and oak. **Arable land makes up 66 % of the total area in the governorate.** The city is surrounded by farmlands from the north and the west, widely cultivated with olives, figs, plums, pomegranates, vegetables, grains, rice, and pistachios. **Agriculture was traditionally supported by rivers.**

The main rivers in Aleppo are the Queiq, Ifrin and Euphrates. However, all of these rivers arise in Turkey, and due to irrigation projects on the Turkish side of the border the flow of these rivers dropped so much that most of them could no longer support agriculture. The Queiq, for example, dried up completely in the 1950s. The vanishing of the rivers forced farmers to depend largely on rainfall and on water diverted from the Euphrates. A pumping station at Maskanah (95 km east of Aleppo) provides drinking water for Aleppo from the Euphrates. Recently Euphrates water has been diverted to revive the dead Queiq river, and thus revive agriculture in the plains south of Aleppo. **Urban areas, highlands, swamps, forests, and grazing land make up 34 % of the total area of the governorate. The remaining 14 % is a desert area** in the southeast that is continuous with the Syrian desert and known as Aleppo desert.

The largest lake in the governorate is lake Jabboul, located 40 kilometers southeast of Aleppo. Lake Assad (the largest lake in Syria) separates Aleppo governorate from Raqqa governorate. Other artificial lakes include the Lake of 17th of April on River Ifrin and the revived Shaba Lake on river Queiq.

Archeological sites are abundant in the governorate, especially at Mount Simeon in the west and the plains that extend beyond towards Antioch and Idlib. This region, known as the Limestone Massif, has the largest concentration of late Antiquity churches in the world, with a unique Syrian architectural style. It also has the famous dead cities of Syria.

The city was founded a few kilometers south of the location of the current old city, on the right bank of Queiq river which arises from the Aintab plateau in the north and runs through Aleppo southward to the fertile country of Qinnasrin. It was surrounded by a circle of eight hills surrounding a prominent central hill on which the castle (originally a temple dating to the second millennium BC) was erected. The radius of the circle is about 10 km. The old city was enclosed within an ancient wall that was last rebuilt by the Mamluks. The wall has since disappeared. It had nine gates and was surrounded by a broad deep ditch.

The citys significance in history has been its location at one end of the Silk road, which passed through central Asia and Mesopotamia. When the Suez Canal was inaugurated in 1869, trade was diverted to sea and **Aleppo began its slow decline.** At the fall of the Ottoman empire after World War I, Aleppo ceded its northern hinterland to modern Turkey, as well as the important railway connecting it to Mosul. In the 1940s, it lost its main access to the sea, Antakya and İskenderun, also to Turkey. Finally, the isolation of Syria in the past few decades further exacerbated the situation. **This decline may have helped to preserve the old city of Aleppo, its medieval architecture and traditional heritage.** It won the title of the «Islamic Capital of Culture 2006» and has had a wave of successful restorations of its historic landmarks.

1.2 Site characteristics

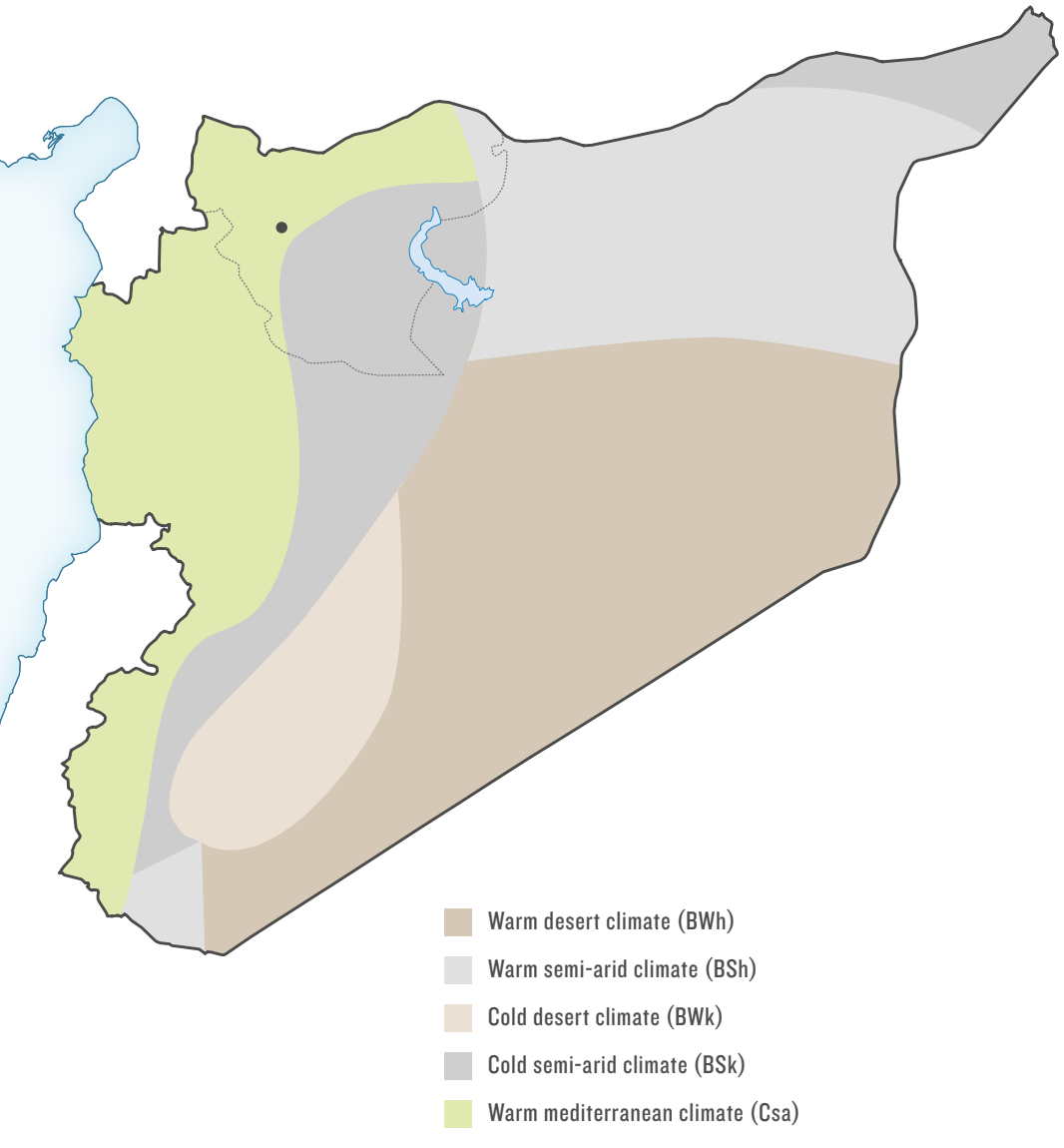


Fig. 1.3: Map of Syria shows the köppen climate classification

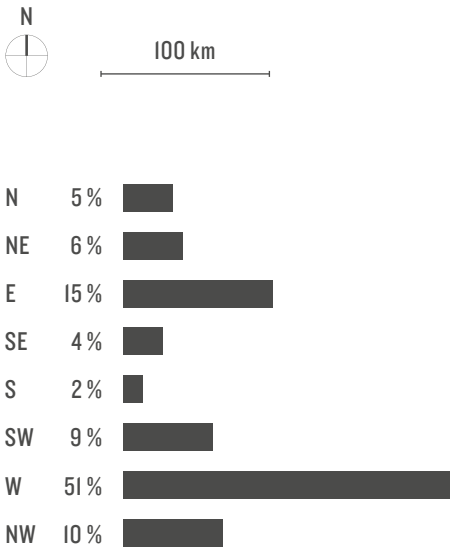


Fig. 1.4: Wind direction in Aleppo during the year

1.2.1

Climate

Aleppo is located in the north, at 400 meters above sea level and it has a **cool steppe climate.** The mountain series that run along the Mediterranean coast, largely block the effects of the Mediterranean on climate (rain shadow effect) and block the humid air. The winters are moderately cold with a January average of 6 °C and hot and sunny summers with dry air with an average in July and August of 28.5 °C. **The average high and low temperature throughout the year is 23.8 and 11.1 °C.**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
°C min	2	2	5	9	14	18	21	21	17	12	6	3
°C max	10	13	17	23	29	34	36	36	33	27	17	12

Fig. 1.5: Table for the average temperatures

The average precipitation is 330 mm per year. More than 80 % of precipitation occurs between October and March. But it is moderate only in winter, while it never rains from June to September.

During winter, from December to February or early March, cold spells lasting a few days, with snow and frost, may occur. In some years, the rains from December to March can be abundant. Average humidity is 55,7 %.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
mm prec.	60	50	45	35	20	2	0	0	2	20	35	60
days	13	14	10	7	4	1	0	0	1	4	7	11

Fig. 1.5: Table for the average percipation

1.2.2

Natural resources and infrastructure

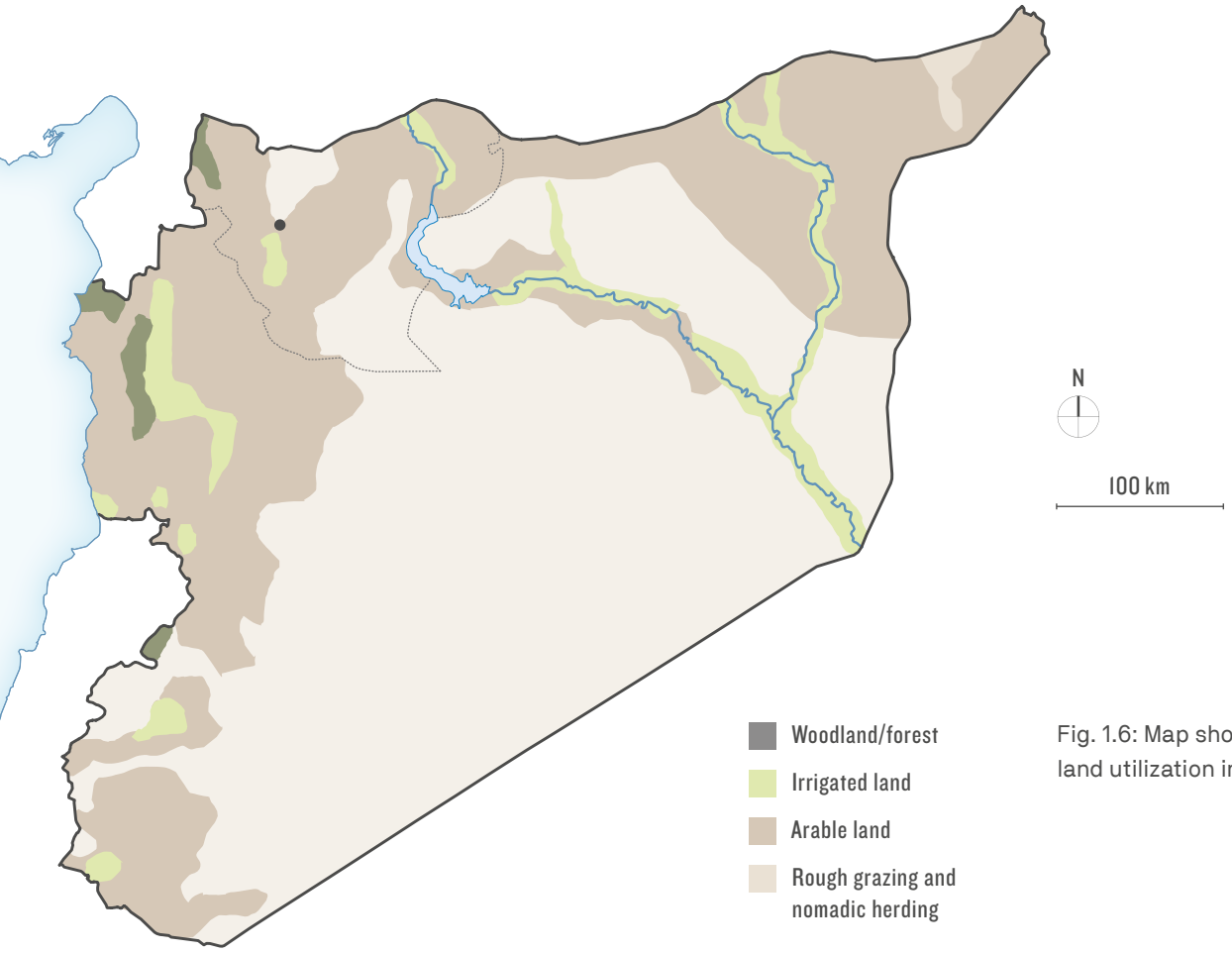


Fig. 1.6: Map shows the land utilization in Syria

Before the civil war, Syria's economy was diverse, including agriculture (22 % of the economy), industry and excavation (25 %), retail (23 %) and tourism (12 %).

Syria is considered as a geologically rich and diverse country. **It has a great deal of natural components that can be transformed, using simple methods, into durable building materials.** This includes lime stone in northern regions, coral stone near coastal areas, sand stone in the central province, lava stone in southern areas, and clay in river beds that can produce mud brick in the eastern part of the country.

Crude oil and phosphate rock were Syrias main contributions to the world supply of minerals in 2009. Syria produced about 1, 9 % of the world's phosphate rock output and was the world's ninth ranked producer of phosphate rock. Other raw and processed mineral commodities produced in Syria included cement, gypsum, industrial sand (silica), marble, natural crude asphalt, nitrogen fertilizer, phosphate fertilizer, salt, steel, and volcanic tuff. Wood is no longer an important natural resource.

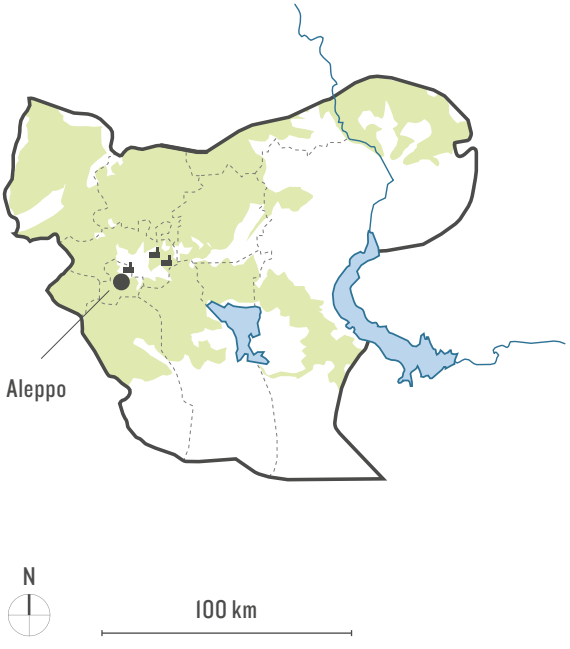


Fig. 1.7: Map shows the agriculture in Aleppo governorate

About a fourth of Syria is fit for agricultural use. Syria's climate can be described in three zones. The western (coastal) and northern regions consist of cultivated land where fruits, olives, and tobacco are grown. Bordering this area to the south and east are steppe-lands where one may find nomads and sheep herders. As one travels further south and east, the steppe gives way to desert. The one exception to this is the Euphrates River which runs from the northwest through the southeastern corner of Syria into Iraq's Anbar province. Along the Euphrates are cultivated lands where sheep are raised, and wheat is grown.

Syria depends for 43 % on the water of the Euphrates, which it has to share with Turkey and Iraq. Irrigation water accounts for almost 90 % of Syria's water demand – and yet, only a small portion of the arable land is irrigated

In 1973, an artificial lake (lake Assad) was created when a dam was erected in the river near Al Thawra. It provides water for irrigation purposes and drinking water for the inhabitants of Aleppo.

According to the ministry of the environment, 45 % of the lands consists of pastures, 32 % of fertile lands, 20 % of arid lands and only 3 % of forests (as compared to 32 % at the beginning of the 20th century). Yew, lime, and fir trees grow in what is left of the forests on the mountain slopes.

Fig. 1.8: Map shows the watercourse of the Queiq river

1.2.3

The river

The Queiq river, also known in English as the Aleppo river is a 129 kilometers long river that flows through the city of Aleppo. It arises from the southern Aintab plateau in southeastern Turkey. The former town of Qinnasrin lies on its banks. The valley has been occupied for thousands of years and in ancient times the Queiq valley was noted for its flint industries and pottery.

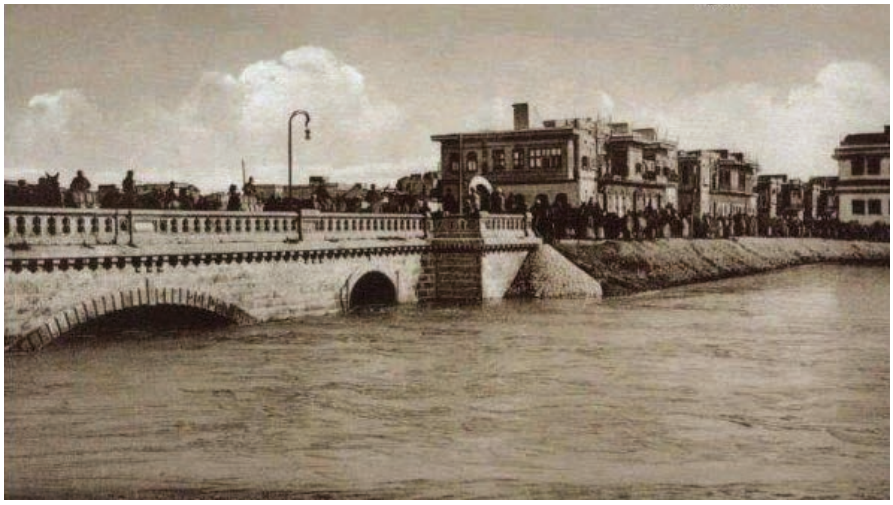


Fig. 1.9: Photo of the flood of
Quieq river in Jabri Square in 1922

The river dried up completely in the late 1960s, due to irrigation projects on the Turkish side of the border. **Recently, water from the Euphrates has been diverted to revive the dead river, and thus revive agriculture in the plains south of Aleppo.**

After 30 years of disappearance, the famous Aleppo river, Queiq river goes back to appear in the city of Aleppo through the project of «Cascade of the river» which began in late 2009 and ended late 2010. The project, which began in several places in Aleppo, restored the days of the exposed river before it was covered. Now that the Euphrates River has been drained and the water has returned to its streams, the Aleppo city council has decided to expose the river through this project.

The study of this project was presented by the Aga Khan foundation to the city council and included several proposed scenarios. The council chose the most appropriate scenario for the city and was supervised by a representative of the city center service directorate, in conjunction with the military housing foundation, which was the implementing agency.

Fig. 1.10: Queiq river

Fig. 1.11: Photo of the Quieq river in 2014

The project was to drag three cubic meters per second from the Euphrates to the riverbed, and to reveal the river and remove the former concrete cover and rehabilitate the tunnel. **The architectural aspect of the project has added a beautiful architectural character to the city.** In addition there is an environmental importance because the region was suffering of great problems.

The river will be carried out throughout the year except for a period of 15 days a year, which will be dedicated to maintenance works, thus creating a lake with the flooded agricultural lands south of Aleppo.

1.3 Population

Aleppo is an ancient city, and one of the oldest continuously inhabited cities in the world. It may have been inhabited since the 6th millennium BC. Excavations at Tell Al Sawda and Tell Al Ansari, just south of the old city of Aleppo, show that the area was occupied by Amorites since at least the latter part of the 3rd millennium BC and this is also when Aleppo is first mentioned in cuneiform tablets unearthed in Ebla and Mesopotamia, in which it is a part of the Amorite state of Yamhad, and noted for its commercial and military proficiency. **Such a long history is attributed to its strategic location as a trading center midway between the Mediterranean sea and Mesopotamia** (i. e. modern Iraq).

For centuries, Aleppo was the largest city in the Syrian region, and the Ottoman empires third-largest after Constantinople and Cairo. It was also one of the largest cities in the Levant before the advent of the Syrian Civil War, with an official population of 4.6 million in 2010.

Now Aleppo is likely the second-largest city in Syria after the capital Damascus, with an estimated population of 1.8 million in 2017.

More than **80 % of Aleppo's inhabitants are Sunni Muslims.** They are mainly Arabs followed by Turkmens and Kurds. Other Muslim groups include small numbers of ethnic Circassians, Chechens, Albanians, Bosniaks, Greeks and Bulgarians. The northwestern districts of Aleppo, in particular the Sheikh maksud district, are the Kurdish section of the city. Kurds constituted about 7–10 % of the city population.

Until the breakup of the battle of Aleppo in 2012 within the frames of the Syrian civil war, the city was one of the largest Christian communities in the middle east, with many Oriental Orthodox Christian congregations, mainly Armenians and Assyrians (locally known Syriacs). Historically, the city is the main center of French Catholic Missionaries in Syria.

Christian population in Aleppo was slightly more than 250.000 prior to the civil war, representing about 12 % of the total population of the city. However, as a consequence of the Syrian civil war, the Christian population of the city fell down to less than 100.000 as of the beginning of 2017, of whom around 30 % are ethnic Armenians.

The city was home to a significant Jewish population since ancient times. The great synagogue, built in the 5th century, housed the Aleppo Codex. In the early 20th century, the town's Jews lived mainly in Al Jamiliya, Bab Al Farag and the neighborhoods around the great synagogue. In December 1947, after the UN decided the partition of Palestine, many of the town's remaining 6.000 Jews emigrated. In 1968, there were an estimated 700 Jews still remaining in Aleppo. In 1992, the Syrian government lifted the travel ban on its 4.500 Jewish citizens. Most traveled to the united states. The last Jews of Aleppo, the Halabi family, were evacuated from the city in October 2016 by the free Syrian army and now live in Palestine.

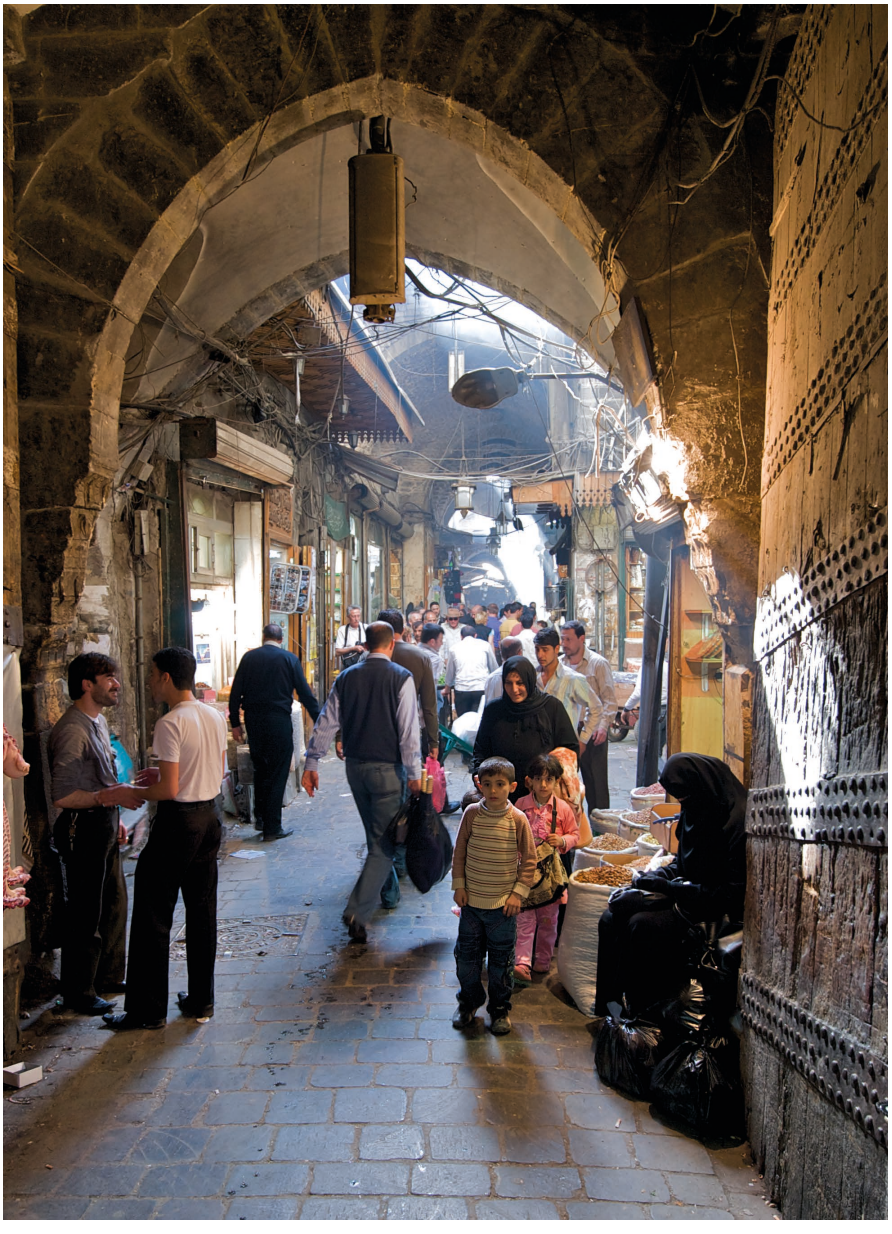


Fig. 1.12: Suq of Aleppo

The existence of different ethnic groups and confessions in Aleppo was already present in the Ottoman empire. It still determines the heterogeneous character of the population as in almost all the old Syrian-Levantine cities. **Foreign nationalities have already found themselves in Aleppo since the founding of the city** (Indo-European Hittites, Greek Seleucids, etc.). Arabs came to the city as immigrants, through trade, and finally, during the Islamic conquests. Turks, Turkmen, Kurds, Circassians, Indians, Macedonians, Serbs and many others followed them.

The colorful mixture of nationalities is additionally accompanied by the existence of different confessions of **Judaism, Christianity, and Islam.**

Most of these mentioned nationalities have more or less culturally assimilated over time and now constitute the inhabitants of the city with their own Arabic Aleppinian dialect. The former Kurdish, Turkish, Turkmenian and others, which came to the northeastern part of the old quarter in the Ottoman period is no longer culturally distinct. Rather, the inhabitants of the old town (and most of the residents of the new town) have a strong sense of belonging to Aleppo.

The denominational affiliation continues to divide the Aleppinian into different communities, which is reflected in the still tendential segregation of the residential districts (in the old town as well as in the new districts) and the different lifestyles corresponding to the respective religion. The religious affinity certainly plays a decisive role in the fact that the significant Armenian minority in Aleppo has maintained its own identity to this day.

The Armenians came to Aleppo as refugees during the Turkish persecutions in the second world war. The situation is similar with the smaller community of Aramaic Syrian Christians who fled at the same time for political reasons from Iraq. The majority migration of the Jewish population of Aleppo to Palestine since 1948 is also a significant example of the essential influence of religious affiliation on the individual community.

If one goes through the **mostly unplanned quarters of the Aleppo city** periphery inhabited by the rural population, the rural character of these residential areas is reflected where women and men sit in front of their houses together in the evening and **use the streets as an extended habitat.**

Apart from these religious and ethnic criteria, which still characterize the heterogeneous cityscape, the political, economic and cultural confrontation with the west has led to a social change of the Aleppinian and thus also to greater diversification of the population. This includes above all the sometimes weaker orientation of many Aleppinian in the Western lifestyle, which manifests itself in a variety

of general lifestyles. But even the less prosperous Aleppinian families are affected in different ways by «Westernization».

Social change is reflected, among other things, in the composition of the new district. In addition to ethnic and religious criteria, the social background plays an important role more than before. The new urban districts are more homogeneous in the social status of their inhabitants than in the Ottoman period, where rich and poor families lived side by side in the old town. Nowadays there are various districts in the new town for diverse social classes, from the Nobel district to the quarters where the state-financed social apartments are located. **The different qualities of these quarters shows how far the Aleppinian population has developed partly.**

Rich / Poor

Recently, in Syria, as in many underdeveloped third world countries, the **phenomenon of a divided society in the poor and the rich has intensified** and the social imbalances in society have shifted markedly. **The lack of housing in the city led to a reduction in the standard of living** of the city's population and to numerous environmental problems. Thus, in the first few years, poor mud hut agglomeration, slums and misery quarters on the outskirts of the city developed.

In the early 60s and 70s, the city was able to accommodate a larger proportion of immigrants in a kind of social housing with very cheap small apartments in the outskirts. Only in connection with the expropriations and the state compulsory economy, informal settlements on the outskirts of the big cities began to spread uncontrollably in the early sixties. In the course of the modernization process, Aleppo has developed into a city type characterized mainly by a peripheral, central social decline. The rapid population growth and the related urban expansion have strongly influenced and shaped the urban space physically. In the city developed sub-branches, whose inhabitants depended on each other, but according to their own laws. This development has been possible only through the penetration of the modern sector and the suppression of the traditional sector, i.e. through homogenization of the structures.

In contrast to previous migrations in which the peoples conquered land, in order to build up a rural nutritional base, people started to seek the cities. Immigrants did not come to farm, but to find work in the cities. The once-on-a-way hiking process became more concentrated and an urban mass problem. However, the modern, open structure of the city seems to make it possible to absorb and urbanize an almost unlimited number of people. The city developed its own organism, which works in itself and out of itself.

CHAPTER

2

City history and structure

Urban development
and city planning

City development plan

city structure and urban planing

2.1 City history and structure

5000 years of urban development in Aleppo

Aleppo appears in historical records as an important city much earlier than Damascus. Its ancient site has been occupied from around 5000 BC, as shown by excavations in Tell Al Sawda. However, concrete historical references in written sources have only appeared in the second century BC, where Aleppo was partly under the influence of Egypt and Minor Asia. Since then the city has taken its current name as Hallab. As it shows in the written tablets of Mari and Ebla, **Aleppo had a remarkable blooming time in the second century BC.** It was the main city of the Amorite kingdom of the king Yamhad in the north of Syria and it had a strong connection with Mari and another kingdom.

In the 1st century BC, Aleppo was on one side under the rule of Hittite empire and on the other side under the rule of the old Assyrian empire. Aleppo has sometimes benefited from its weaknesses through the constant war, creating a small empire for itself. After the fall of the Assyrian empire Aleppo was occupied by the new Babylonians between 612 and 535 BC.

After the victory of Alexander against the Persian Achaemenids in 333 BC the Persians had to go out of Syria. The city back then was located on the west side of the today's old city.

Under the Seleucids Aleppo in the third century BC has been extended and had the name Beroia. The city got again its old name under the Byzantines. With these Hellenistic foundations, the city back then was extended along the central axis between Bab Antakia and the citadel hill.

540 the Sassanid king Hosrou destroyed and burnt down the Byzantine Aleppo. In 518–565 and after the peace between the Byzantines and the Persian, the Byzantine king Justinian rebuilt the city and build its stone wall around it. Further modifications, extensions and conversions of the city in the roman time is uncertain.

The islamic conquest

The Islamic rule began in 636 by Khaled ben al walid. **Between 705–750 the Umayyad ruled in Aleppo and in this time the big mosque was built.** In 750 the Abbasid took the city. In 877 the city was under the Tulunidian rule till 903 when they lost the city against the Carmathians. In 937 the city was under the Ihsididen control until Saif Al Daula won the city in 944 for the Hamdanide.

In 962 the Byzantines invaded the city and fifty years of struggle between Byzantines, Hamdanide and Fatimids over the city began. In that time, **the city witnessed more destruction than construction.** At the same time of insecurity and governmental impotence started the orientalization of the city. **The transformation of the city form and its quarters happened rather by social and natural factors then by urban development.** Quartier structures, as they have already been structured in the ancient orient, developed with the Islam and the associated right and social order for certain features in the cityscape, with the quartiers differentiated by various religious and ethnic groups from one another.

By the constant threat, the cohesion of a group, a tribe, a family became stronger, and the quarters were oriented inwards and protect outwards. In political terms, this is clearly reflected in the choice of the district leader and the setup of a citizen's home. In the construction, this is reflected by the inner city urban defense systems, such as the large, representative, public buildings of the city. In 1015, the Fatimid brought Aleppo under their control till they lost it in 1079 to the Uqailids, who lost the city in 1035 for the Seleucid empire.

This Seleucid city was facing the greatest danger of the crusaders, who brought the city to the edge of ruin. **Aleppo went through sixteen years of darkness. But under the Zangids this has changed.**

Imadeddin (1127–1146) proceeded decisively and compulsorily against the crusaders and provided for the economic boom of his state. He left to his son Nuraddin (1146–1173), who after his death took over the rule in Aleppo, a city which had already been restored and nurtured. **Nuraddin rebuilt the city wall, the citadel, the great mosque, rebuilt the suqs (bazars) and restored the water pipeline. He founded numerous schools (madrasas) in the city. Nuraddin created other faculties and founded a hospital, which is still preserved today.**

The Zangids also brought **new forms of construction from the east,** such as Iwan, which first appeared in madrasa Nuraddin in Damascus.

These stone buildings, which characterize the whole town, found their perfection in the Aiyubid period and attained complete clarity and balance.

In 1183, the Aiyubids conquered the city by Salahaddin, who appointed his son Gazi as the governor of the city. With Gazi, another period of Aleppo flourished, which until the end of the Aiyubid dominion over Aleppo in 1260 developed vigorously. **Aleppo reached the height of its medieval development after more than 130 peaceful years.**

Gazi continued Nuraddin's policy. New suburbs were modernized and strengthened, the citadel was completely rebuilt, the suqs were enlarged, the town's water supply system got renewed and extended, countless religious and economic buildings were built and considerable quarters outside the city walls were founded in the southwest, in front of the city gates, along the roadways to the west, southeast, and northeast.

What had initially emerged in the early Islamic period is the **centralization and the stabilization of downtown** through residential compacted areas built of stone, due to the growth of the population. Because of the same reason, **the looser, more random quarters outside the city walls, with their houses, which were probably built of mud bricks, were developed.**

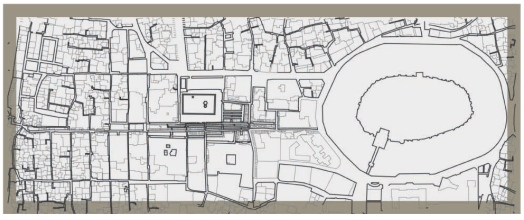
This less restrictive construction, as well as the lack of protection and openness of these quarters, could be regarded as reasons for the invading Mongols to destroy the boards of the city. However, the quarters outside the city wall also continued to grow and change, but their position remained mostly constant. After 131 peaceful years, in 1260, the Mongols conquered the city, plundered, destroyed and ejected the Aiyubids. In 1230, the Mamlukes, the successors of the Aiyubibs, were to rule Aleppo for another 258 years until the Ottoman conquest in 1518.

Aleppo was the economic center of northern Syria with its impressive commercial buildings, such as khans, with their Mamluken walls, that have white and black stone rows and representative entrance portals. The economic center, which also contains the khans, formed a triangle between the main axes towards Bab Al Ginan (northwest) and Bab Antakia and today's hammam Al Nahhasin, next to the suq of the goldsmith. **The main streets were within the city walls.** The tanneries and the soap factories as well as the workshops of the stonemasons laid north of the Bab Al Ginan axis and proved the strong growth tendency from the center to the north. This northward orientation also gave Bab Al Naser axis more and more weight. The importance of the axes is further emphasized by the type and number of mosques that are lined along them. **The main road network within today's old town and neighboring suburbs is largely identical to that of the 15th century.** With deviations, also with that of the Aiyubid and before Aiyubid time. **During the times of threat, the neighborhoods had stabilized in the walled inner-city area, while entire suburban quarters have changed, and even disappeared,** like the great Aiyubid suburbs in the south of the city.

On the other hand, the eastern quarters were able to preserve their position and grew into the surrounding areas, becoming more powerful, more densely populated and thus more protective. With the construction of the outer city wall along the Kandaq al rum, **former suburban quarters became inner city areas,** with the suburbs expanding further and further east.

However, the biggest change in the city took place in the north, where the economic areas started to grow, which led to the evolution of the residential districts toward the north. As a result of the destruction of Muslim sanctuaries by the cruisers, Christians were separated from the inner city into the dynamically evolving new suburbs north of the Bab Al Naser. Here the Christians found probably the only way to settle down, as Muslims lived in the suburbs in the east and south, and the valley of the Queiq was occupied by commerce.

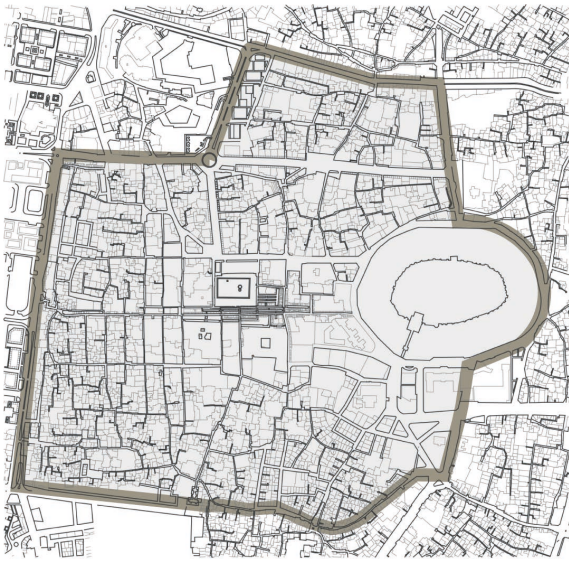
Aleppo is thus perhaps one of the few Islamic cities that **no Christians lived within the city walls.** With the development to the north, the southern orientation of the city in Aiyubian, Zangid and Hamadanidian times became a northern orientation among the Mamluks and Ottomans.



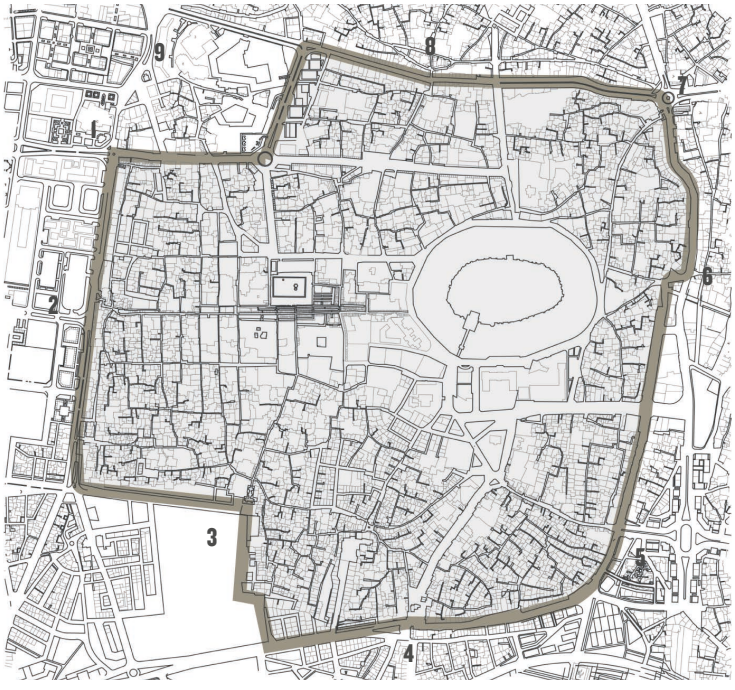
N

250 m

Hellenistic city foundation along the central axis between Bab Antakia and the citadel hill



Ayyubid city



Mamluk city

1 Bab Al Ginan
2 Bab Antakia
3 Bab Qinnasrin
4 Bab Al Maqam
5 Bab Al Nairab
6 Bab Al Ahmar
7 Bab Al Hadid
8 Bab Al Nasr
9 Bab Al Farag

Fig. 2.1: Map shows the Hellenistic city foundation, Ayyubid city and Mamluk city

Fig. 2.2: Map shows the main axes of the old town

Road systems of the inner city

It is to be assumed that **the Aiyubid water pipeline ran along the main axes of the city** in that time, and this led to conclusions about the city structure, which, in addition to the **radial alleys leading to the city gates,** shows two basic patterns: the right, originally **Hellenistic road network in the center** and a **shifted road network to the main axis in the southern part of the city.** It is difficult to make a precise statement whether it was a new organization of the city's plan, or a resumed, older or advanced road system. This displacement, however, is shown on four or five axes, all of which were strikingly parallel to the ramp of the citadel.

The first axis led from Bab Al Naser to Bab Qinnasrin. It was interrupted by the center and continued towards Damascus. This direction clearly stands out in the alley, which ran from Bab Al Maqam to the free square south of the citadel. The fourth axis is not so clear, but it was situated on the connecting road (Bab Al Ahmar), which led from the fifth axis, which bordered the city wall of Banqusa to the east. Madrasas and mosques, which date back to the pre-and early-Muslim period, are located on all these axes.

The city center was connected with the important city gate Bab Al Iraq and both overland roads in the northeast in the direction of Mosul and Euphrates and in the southeast towards fertile hinterland and further to Baghdad.

The indicated road system shows a close interweaving to the east and south. It integrates the citadel with the external axes. The question arises whether this pattern may be based on much older structures, which have been resumed or strengthened under the Aiyubids and corresponded, according to the ancient oriental idea, to the citadel as a high, holy place and later royal supremacy. Here, on the citadel, there are remains of the royal court, palaces and other buildings.

The importance of road developments changed in the course of history, while the overall structure of the development system and the associated functional sites remained relatively unchanged until the middle of the 20th century. For example, the location of the trading center (the suq), which became increasingly important as a result of the long period of peace.

Aleppo under the Ottomans

In 1518 Aleppo was conquered by the Ottomans. **It was one of the most important points of the exchange between India, Iran and Europe.** The inner city was characterized by high-ranking inner-city functions, such as khans of distance trade, religious buildings and above all the suq. **In all the European reports, the city's elegance, its clean streets, its stone buildings and its khans, were highlighted alongside the city, in addition to the citadel and suq as a pulse of the city.**

The transformation of the city did not take place by means of a large, extensive expansion, but in the inner city by relocating the sites and clearing up land for commercial buildings. In addition to mosques and schools, these foundations included khans, commercial dwellings, shops, coffee houses, baths, commercial establishments and individual dwelling-houses. The great early Ottoman waqfs, such as Adiliya, Husruwiya, Osmaniya, Ahmadiya, and the Hag Musa, which were concentrated in the western south of the Bab Antakia axis; have obtained their form and structure till our days, and determine the unique standardized, traditional, Islamic-orientalist cityscape. By transferring the inner-city commercial enterprises to the periphery, **the khans were used to storage the agricultural products from the surrounding areas. The suqs – the trade street, had the most important and many different functions, which linked the entire city.**

In his book «A natural history of Aleppo», A. Russell drew an image of subdivided suburbs in 1794. He described Banqusa as a suburb, which extented far to the northeast, with many beautiful houses, various mosques, bazaars, khans, coffee houses and a grain market.

At Banqusa, in the north, Christians lived, and to the south, to Bab Al Nairab, Turkmen, Kurds, Arabs and others settled, who were mainly concerned with agriculture. **In this area was still free space, which was visible in all urban outlines of that time.**

Outside Bab Al Nairab gate was the district of the gypsies, who were responsible for music, dance and entertainment in the Islamic society. In the southwest, there was a small settlement, Al Kallasa, where the tanneries were located and near Bab Antakia many khans developed at the foot of the western wall.

The inner city and the outer city became a multifaceted whole, a form which remained constant in spite of changing conditions, as it appeared in the middle of the eighteenth century.

In 1840, Istanbul initiated a reorganization of the empire (Tanzimat) into which a lot of European thought flowed. **An upper class had begun to relocate their homes into the agricultural areas, where it was easy to irrigate the gardens by the Queiq. With this European-influenced suburban ideology, the so-called Westernization of the city began.** Houses did not fit into one another and did not form into a differentiated, grown spatial order. Instead, they were arranged as a principle of organization in a planned grid with streets and squares.

The unity of the neighborhood, in the protection of the state, began to dissolve. The outward-looking, representative, individual house became the city symbol of power and wealth.

In contrast to other Islamic-oriental cities, **Aleppo was open to these European ideas and models** at a very early stage. At the same time, a tradition-conscious, conserved way of thinking effected these influences and made it possible for a **fusion of existing and new.** The economic, social and religious life continued to take place in the traditional trade and shopping center and was linked to the newly emerging new construction areas via Bab Al Farag axis.

Fig. 2.3: Photo of Bab Al Farag

The **square at Bab Al Farag**, where a clock tower in the center indicates the time since 1898, developed into the turning and **anchoring point between old and new town.** The 14-meter-wide ring road was also added to the connecting element on the former city moat (1893–1900). On rue Khandaq, in contrast to the narrow suq, donkeys and horse carts were able to transport bulky goods, making it the preferred place to go for commercial buildings and crafts.

The implied change in the structure of the city through the construction of new transport routes accelerated through the use of new means of transport, such as the railway (1906 Hejaz railway, 1912 Baghdad railway) and new communication systems, such as telegraphy, and became more and more striking.

The population distribution, the density of housing and the density of development, can be determined in relation to the size of the quarters.

Fig. 2.4: Map shows Al-Kallasa,
Al-Aziziya and Bab Al Farag

N

500 m

1 Al Aziziya
2 Bab Al Farag
3 Al Kallasa

It turns out that the size of the quarters is related to their age (the older, the larger) and that the largest were located within the former Aiyubidian city wall. The average population was 500–1500 inhabitants per district. The occupancy and building density was greatest in the Jewish and Christian neighborhoods.

There were quarters with only one district mosque, as well as those in the central inner-city area with 8 mosques, 2 madrasas, 2 zawiyas, 1 school, 8 wells and 1 hammam, but no residential houses. Altogether the old town (including the traditional suburbs) around 1900 had about 10.000 houses with about 10.000 inhabitants as well as: 284 mosques, 39 bakeries, 75 Muslim religious buildings, 44 coffee houses, 8 churches, 90 khans, 1 synagogue, 40 Qisariyas, 40 schools of all kinds, 9 soap factories, 34 public baths, 189 fountain, 59 mills and 20 other commercial enterprises.

In the nineteenth century, the Aleppinians did not consider the historical buildings as monuments of the past, which should be conserved for the coming generation. Contrariwise, the historical buildings have been used, cultivated, renewed, supplemented and modified by alterations and additions responding to changing needs. What past generations created as the material foundation of their lives, their culture, and their social order, still fully met the requirements of that time-present.

In such aspects, it seemed almost indifferent in the 19th century whether the buildings concerned are Aiyubid or Mamluk, early or high Ottoman. In unbroken continuity, new buildings have been inserted alongside and between the older buildings, which fulfill the same functions. Stylistically they can easily be seen as buildings of the early or late 19th century.

However, the basic architectural concept remained unchanged, which means that they had also been used as much as the old buildings.

Since the second half of the 19th century, but particularly in the 20th century, **the effects of European-Western influence became also increasingly apparent in Aleppo.** The transition to such modern forms of life often meant that **the use of old building structures as a work frame could no longer be adapted to respond to the supposed needs of that time generation.**

Fig. 2.5: Photo of Bab Al Farag and Al-Khandaq street

Aleppo in the 20th century

Like the cityscape, Aleppo's society had hardly changed at the beginning of the 20th century despite the reforms in the time of the Tanzimat, which had entered by the Ottoman constitution of 1876. In addition to the traditional school – madrasa – there were new schools with European teaching and contents. Administration and bureaucracy were organized according to the French model, and the army modernized with the help of German military advisors. At the outbreak of the first world war, the Ottoman empire was destroyed. French troops marched in. The French had received a mandate over Syria.

On the eve of the first world war, **Aleppo was the leading trading city in Syria.** Famous with its traditional Aleppinian products such as textiles and soap. **The population had risen to three times** than it was in 1800, and agricultural production and purchasing power were also likely to have increased this factor.

In the decades around 1860/1870, the border of settlements had been advanced far from Aleppo to the east, and some energetic governors had achieved remarkable successes in the satisfaction of the Bedouins, the urban upper class no longer seemed to require the protection of the city wall. Above all, the Christians and the Europeans were starting to move their **homes out of the inner city, preferably to the west, where the irrigation gardens on the Queiq promised a cool and refreshing summer.**

Aziziya district, which is mainly inhabited by Christians, was founded in 1868, northwest of the historic old town and near to the site of the ancient Christian and Jewish cemetery, later, around 1890, another Christian district of Sulaimaniya was founded, and since 1883 to the southwest Aziziya, on the other side of the Queiq, Gamaliya district was established, where mainly European and Jewish families migrated. In 1885 the Wali and the military governor built there their palaces.

On behalf of the Ottoman government, the German architect Jung worked out an **urban development plan for the neighborhoods of the new town in the west** in 1882. The street layout of these quarters was already laid out in a regular chessboard pattern, and the **architecture of the houses was reminiscent of Western models.** There were often no inner courtyard complexes, but detached houses surrounded by a small garden or terraced houses with windows and balconies oriented outside. With the help of steel carriers, which were imported to Aleppo since the railway connection in 1960, however, multi-stored rental housing blocks were also built. The economic centers were still connected in the khans of the old town. In the upper floor of many khans, larger tracts had been converted into apartments for European merchants.

After the residential areas have moved into the young, modern quarters of the city, the former dwellings were free to be used as an office or warehouse. **The connection between the new residential zones and the traditional business center was via the northwestern city gate Bab Al Farag.**

The road which connected this gate of the inner city with the central social district of the suq was the main axis of development of a first Western-oriented city formation.

In 1912–1916, the city administration allowed the narrow and angled alley to be widened, the adjacent old houses were demolished and replaced by modern buildings, shops and office buildings in the style fin de siècle (end of century), and also banks, simple hotels and guesthouses, as well as the offices of import and export companies. As a symbol of progressive urban development, the clock tower at Bab Al Farag was built in 1898–1899, between the old town and the young outer quarters.

The connection of Aleppo to the Baghdad railway (to the north) and to the inner-Syrian railway Hama-Homs (to the south) supported the trend of the modern city because the railway line ran west of the Queiq. In 1906 west of Gamaliya the Damascus station and in 1912 northwest of Aziziya the Baghdad station have been opened. As a result of the railway connection, the inflow of Western goods and modern technology became intensified, and the **new residential areas were expanded rapidly between the two railway stations** as a transport hub for passenger and traffic in the city center.

The map of Aleppo in 1912 in comparison with the Ottoman map in 1900 shows, that the areas west of the railways with the regular rectangle development pattern were over coated.

Around the turn of the century the economic centers also moved from the old town to the new western town. The road, which led from the square north of Bab Al Farag to the west via the Pont Neuf to Damascus station (later Boulevard de France), was the starting point of a modern business center since about 1885. To the south, in the area of Bustan Culab, khan-style-inner courtyard buildings, workshops, hotels, restaurants and office buildings were built. In the north, however, a cemetery had for long time prevented any cultivation.

It was only 40 years ago that the Waqf administration built modern houses with shops in the lower floor. In 1914, there were in these new city extensions not only hospitals and secondary schools. But also, the residence of the governor.

Fig. 2.6: Hotel Baron

Hotel Baron, one of the most prestigious places of the city, was already built in 1911 by the brothers Mazloumian west of Bab Al Farag.

The consulates of France, the USA and Persia were still in the khans of the central suq in 1914. Austria, Great Britain, the German empire and Russia, on the other hand, had already moved their consulates to Aziziya.

The decades of the French mandate from 1919 to 1945 had allowed the new town quarters to flourish further. Based on the development mentioned above, the mandate power in Aleppo after the first world war already founded modern town-districts of the west. The Aleppinian new town of the Ottoman period was **further developed as the basis of a French Western urbanization.**

Modern factories were being built on the northern outskirts of the city, and the ring road, which had been already built in the Ottoman period, in front of the city wall, became a favorite place in the city for wholesale- and mechanical trade. **North of the historic old town, since 1920, temporary sheltered housing had been created for Armenian refugees, which were rapidly expanded into quarters with more modern floor apartments.**

The development of the city from the turn of the century to the late of the 20th century could be easily understood on the basis of the plans that originated mainly in the mandate time. Thus, since the beginning of the nineteenth century, there had been a relatively inaccurate plan of the French consul of Aleppo Rousseau, the «Plan général de ville d'Alep» in 1818. In the Ottoman period **the «Plan général de ville d'Alep« on scale 1:5000, was the basis for the first map of Aleppo, which appeared in 1919 in the first year of the mandate time.**

The city maps and cadastral surveys of the mandate gave a good idea of the spatial expansion and the infrastructure consolidation of the modern city between the two world wars.

In the period from 1926 to 1930, under the direction of C. Durrafourd, recording and surveying of accurate cadastral plans began. The city was divided into twelve constituencies. 133 cadastral plans were drawn up at a scale of 1:500. As well as a general map, «Ville d'Alep» in the scale 1:20000 and a four-page map in scale 1:5000. **The city's plan around 1930 was the most documented, and today's plans as well as the historical plans are based on this foundation.**

The French city planners R. Danger in 1931 and M. Ecochard in 1936 also based their work on this plan to evolve their urban development concepts. In 1945 the old and new Sarai, the prison, the city administration and several modern hospitals and

schools were still existed in the old town. After 1945, new buildings were erected south of the citadel hill, the justice palace and the cadastral office. The French city map in 1948 showed the facilities added in the new town between 1930 and 1945. There were schools and hospitals, an engineering school and an American college, another hospital and a quarantine station, a sports center, a museum, a large water reservoir, and several modern factories along the Queiq north of the city.

The historic old town of Aleppo was not far from any renewal or modernization during the French period. On the other hand, the sectors of administration, Western education, medical care and military, were also concentrated in the young city districts in the west. **But the economic, social and religious life of the city was still focused in the old town.**

This was applied not only on the traditional but also on many modern economies. The new Sarai was built south of the citadel in 1930/1932, while the three modern banks were located north of the grand mosque, and in 1932 two photographers and the agencies of five shipping companies were also located in the old town. In Aleppo, during the period of the French mandate, the various economic connections between the old town and the new town, which had been linked in Ottoman times, did not detract. **The two tram lines, which were built between 1929 and 1932, not only opened up the new town squares,** but also led them to the old town, connecting them to the younger city districts. Since the end of the second world war, however, a process became visible in Aleppo, which characterized the development of the large oriental cities.

The more modern business areas of the western part of the city were developed on the basis of traffic-favored guidelines and development axes. The offices and branches of the major trading and finance companies moved into these neighborhoods, and in the shops, there was focus on high-quality goods for customers of high purchasing power and Western consumer habits.

The central business area of the suqs, on the other hand, remained a place of purchase for more traditional clientele of lower purchasing power and a location for a trade with predominantly traditional production methods.

Between 1948–1950 **a large park on the Queiq river was created,** to increase the attraction to the new city as a public place for the non-working hours.

Fig. 2.7: Public park on the Quieq river

Since the second world war, the city map in Aleppo had shown a clear tendency towards fundamental modernization and the best possible access to motor vehicle traffic. The conservation of historic monuments had an even more severe challenge against such conditions in the east than in Europe.

Although the western new town quarters had already been developed by the German architect Jung with a geometrical and regular street plan in the last decades of the Ottoman empire after 1882, and although some of the streets were still Ottoman-sided in the old town, the modern urban development planning in Aleppo was still subjected by the French mandate legislation.

In 1931, the French city planner R. Danger presented his plan, in which historic old town was largely unaffected by the planning, almost all proposals referred to the young urban developments in the west. Also the urban development plan of the French architect M. Écochard in 1936 largely saved the historic old districts in conscious heritage conservation purpose. Thus, the interventions in buildings structure of the old town was from 1880 to 1950 restricted in few road expansions and some short road breakthroughs.

However, the urban development plan of the French architect A. Gutton in 1952, which was published in 1954, hit heavier than usual in the old town areas. Although the proposed areas and the 22 m wide road breaks were only partly realized between 1952 to 1972, this led to the destruction of the structure in the most valuable buildings, and some old town quarters lost their original character. Especially north of the citadel and the central axis of the suqs, as well as in the old suburbs west, north and northeast of the wall of the town, urban and architectural, protection worthy, irreplaceable parts of the old town were demolished, or they have been fundamentally altered in their appearance by the use of readymade street slabs and have been severely damaged in their social relations and cohesions.

Fig. 2.8: The grand mosque in the old city

The urban development plan, conceived in 1972 and abandoned in 1974, was developed by the Japanese architect G. Banshoya and the French geographer J. C. David in collaboration with Aleppo city administration. **This plan aimed to keep the central areas of the old town free of severe planning interventions by creating peripherally roads which were supposed to run as dead-end from a ring road around the old town to access the center and end up with large open parking spaces.**

In addition, the plan proposed a total rehabilitation of the old Jewish quarter Bahsita in the northwest of the old town. This was carried out in 1979, despite all protests. In 1981/82, the beautiful old nomads suq east of Bab Al Nairab was demolished.

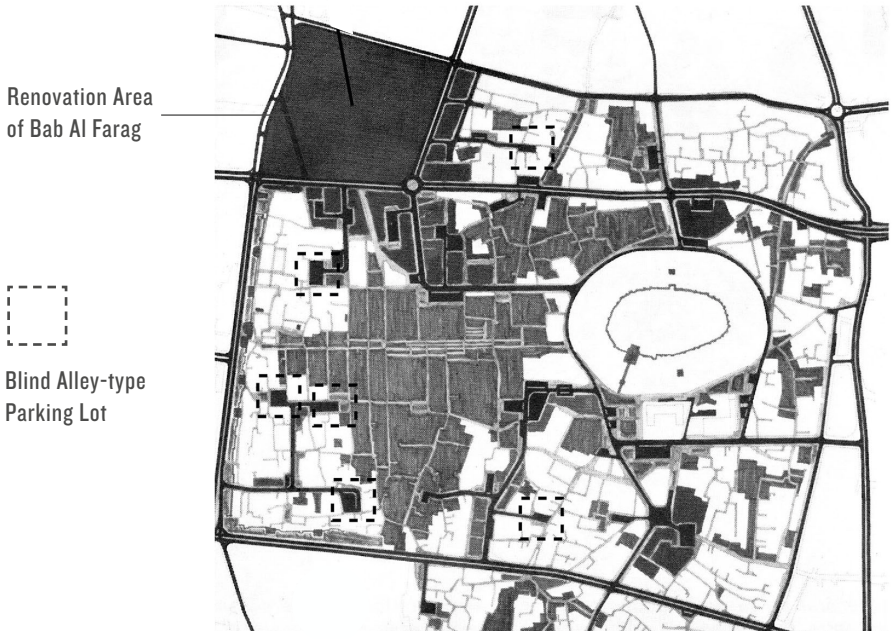


Fig. 2.9: Map show the proposed plan for the old city by Banshoya and David

A strong and broad citizens' movement has been protesting against the development plan of 1972. In 1978, the Antiques department succeeded in **officially registering the entire old town as an architectural monument,** and the Archaeological Society was able to work with the governor of Aleppo **against further interventions and demolition plans.**

This prompted the Syrian government to turn to UNESCO for help. In February 1980, a small working group led by the Swiss architect Dr. Stefano A. Bianca came for a short stay in the city. As a result of this mission, a report was published in July 1980: The conservation of the old city of Aleppo.

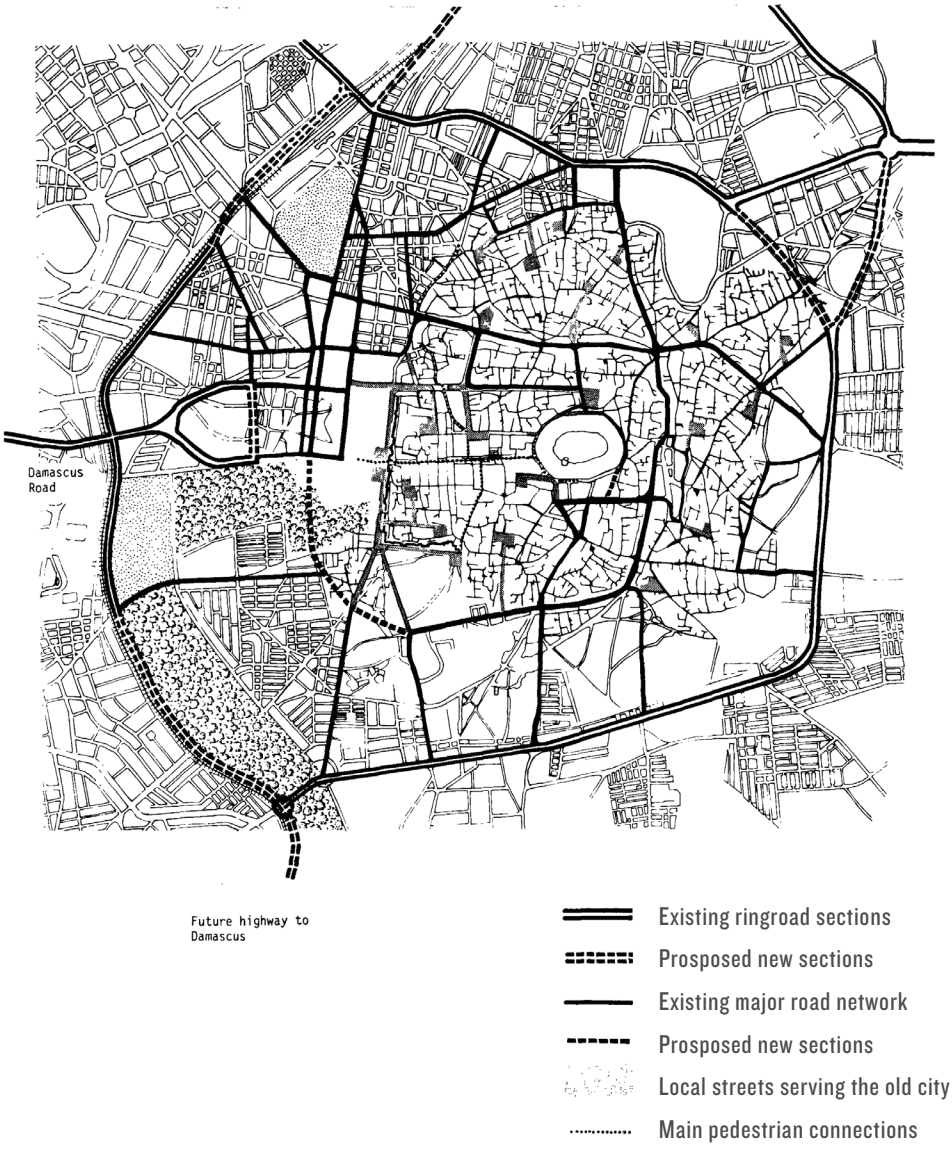


Fig. 2.10: Map show the new traffic scheme proposed by Dr. Stefano A. Bianca to ease circulation around the old city and to relieve the historic fabric from present pressure.

Fig. 2.11: Map shows the important areas in the old city

2.2 Urban development and city planning

Fig. 2.12: House in the old city of Aleppo

1958–1960

The city of Aleppo was already in a strong growth phase in 1960. Starting from the historical town, the city grew and developed in the north, east and west with European style constructions. In addition, a number of settlements were scattered in front of the city's periphery, resulting in a fragmentation of the townscape with a multitude of open spaces and urban farming land.

The growth of the settlements took place mainly within the ring road. The urban area still showed a loose density. Far away from the city center, the industrial development, the existing villages and newly founded settlements marked the further growth of the city. **The Queiq river formed a natural barrier until 1960, which was later crossed.**

1980

Aleppo experienced a strong growth in the 1980s. The structure of the city showed high densification in the center. At that time, around the old town center, **a ring of small-scale settlements with numerous open spaces was built, which became later compacted.** The new settlements, as well as the existing villages of the suburbs, such as the fast-growing «Al Ansari village» in the south of Aleppo, were integrated into the urban area during the 1960s. The river and the parallel railway were no longer a growth barrier. The secluded industrial areas in the north and northwest were not yet directly connected to the city, although large-scale informal settlements were formed around them.

In general, the urban development took place in a fragmented form, with a series of individual settlements in the outside area.

1994

Aleppo experienced the strongest growth in the 1990s. While in the southeast the settlement activity was restricted by agriculture, the city developed on a broad front to the west and northeast. The entire western and northern urban areas were connected to the industrial zone «Balliramoun». In the west, the construction works reached the «ring highway» but not exceeded it yet. The areas there were still filled with buildings.

While the individual settlements in the suburbs were integrated into the urban area in the course of the 80s, a new small industrial area expanded in the northeast and a large settlement developed in the southeast near the airport. In the northwest the former village «Kafer Hamra» developed into a villa suburb. **The urban space of Aleppo started to offer a much less fragmented picture than in the previous decades. A wide settlement belt with ragged edges has spread around the compact core town.**

Over a period of 40 years, the area of Aleppo has almost quadrupled from 2.200 ha in 1958 over 4.900 ha in 1983 and approximately 7.300 ha in 1994 to more than 7.900 ha in 1999. This means that the urban area has doubled almost every 15 years. In the same period the population has also doubled. The region of Aleppo was 534 km² in 1998. The built-up area reached to 79 km², of this almost 90 % were for buildings, including the traffic areas. About 10 % were green- or open spaces. Of the built-up area, more than half was used for housing, the rest for commercial purposes and general supplies. Densified housing was spread over five- and multi-floor appartments within the formal area.

Three different settlements which were available

1 The old town, with one to two-floor courtyard houses, most of them go back in time to the last century or the beginning of this century
2 The formal city, with up to six-floor residential buildings
3 The informal, raster-like, spontaneous settlements which structured as a ring around the city, except the west side

Fig. 2.13: Houses in the old city of Aleppo

The urban structure of Aleppo was determined by two factors: on one hand the compact area growth of the city, little disturbed by the natural obstacles of the landscape, and on the other hand by Aleppo city's commercial policy of development which has led to decentralized expansions. The proximity of workplaces and the favorable location have resulted an **intensive building activity in the most important metropolis of the northern region of Syria.** This development was supported by the emergence of new industrial areas in the north and south of the city. The large-scale settlement development in the north belonged to a medium and high densification, while the settlements of high standards and low densification concentrated on the western part of the city. The former quarries, which used to be located outside the city in the north and which were still constituted barriers several years ago, were populated by the lower classes and have difficult conditions. The olives and pistachios groves in the northeast and the east had almost disappeared and were illegally populated. **The southeastern quarter of the city, had an enormous potential for development after the opening of the city center.**

The concentrically developed part of Aleppo is characterized by: public facilities, parks, Residential areas of different standards, with the center having an average density. On the other hand, there was a low density in the west, while a high density was observed in all other directions.

Urban Development Plan

In 1974, the city administration formed a group led by Kenzo Tange and Gyoji Banshoya, who was commissioned by Hans Roller to work out new planning studies, with the participation of the municipal planning office. With these studies, the future development and expansion of the city was supposed to begin by the end of that century. The general development plan which was presented, went from population growth to 1.5 million inhabitants, which corresponded to an annual growth rate of 4 %.

The border of the vast Aleppo area was expanded by this plan. The expansion of the city took place in addition to the already developed areas in the west, in two further regions north and south of the city, but also in the east, where the pistachio groves were spreading, and a cultivation was forbidden until then. Here, according to the planning since the beginning of the 70s, with long interruptions, the largest industrial zone of the region was created.

G. Banshoya laid out a **rehabilitation plan** for the old town in Aleppo. According to this plan two main roads were laid across the old city structure (eastwest) and many other secondary breakthroughs, **to open up all residential areas for traffic.** The negative consequences of this reorganization plan, was the penetration of traditional neighborhoods with wide streets, which meant that the **neighborhoods were formed on the lines of the streets and surrounded with high-rise buildings. The direct consequence was the decay of the inner rest area.** Such measures also led slowly to a change in the area use of the old town.

The expansion of the new residential districts outside the old town, which was established after 1945, was mainly based on the socialist legal system, exclusively in the sector of housing construction, more precisely in the concept of housing ownership. This meant that most of the properties were built according to different investment models, sometimes even with support from the state. The rental housing construction was avoided, both by the private builders and construction companies as well as by the government because the tenancy law gave the tenant a lifelong living right after conclusion of the contract.

As stated above, the city of Aleppo was characterized by shortcomings and diverse planning ambitions, ideas and ideologies of all eras and the contradictions of the economic and political conditions. **The tremendous dynamic development of Aleppo led the planners to take drastic measures when setting up the urban development plans.** The main attraction was in the west, north and south. A basic idea was the attempt to settle the business areas in the outer surrounding zones of the city, away from the city center, and to pursue a concentric city model. One important reason for this was the preservation of the valuable agricultural land in the southeast.

Building structure

The early expansion of the city in the French mandate time was **characterized by a maximum of 4-storey buildings, predominantly with colonial-influenced modern architecture.** This zone was bordered by a bypass road.

In following decades, very old substances in that area have been demolished and instead medium standard buildings have been built with uniform forms. Apart from that, areas with a high standard and a very individual design of the buildings were emerging. The road network was often irregularly based on international urban development models. The urban outline clearly reflected the urban development until 1960.

The colonial city stood out clearly from the old town, due to its rectangular traffic network and building block pattern. Each new quarter was distinguished by its own, regular floor plans. Since the network structures were not coordinated with one another, there were not only formal-spatial breaks, but also functional difficulties, especially traffic problems. The city expansion of the 1980s **continued the diversity of the settlement structure.** The city extensions with their individual floor plan formed side by side a disordered pattern (square, rectangular, spider-net and irregular).

In the residential areas in the north, east and northeast, low-rise buildings **formed a homogeneous urban structure,** with large, dense settlements of public social housing. The formal settlements were **limited by straight-lined streets with no hierarchy.**

In the informal or self-built settlements, on the other hand, there was a **hierarchical system in the development of the connecting roads.** From the main roads secondary roads split up, which divided to footpaths that led in the open countryside, which opened up further to the residential areas.

In the city center, there were only limited commercial areas. The industrial and commercial sites were located both in the north (about 1.5 km) and in the south (about 1 km). In the past, these businesses were located outside the city, but due to the expansion of the city, the new residential areas hit the borders of the commercial areas. The mixed construction areas in the old city reflected the multifaceted, commercial character of Aleppo. There were mainly the bazar area (suq) and the caravanserai (khan), the new economic center (Bab Al Farag) and numerous important business streets. The most important open spaces in the urban area were the public gardens, the bank of the Queiq river and several small gardens in the districts.

Fig. 2.14: Photo of the French mandate time houses with maximal of 4 floors in Rue de France, renamed after Shukri al-Quwatli upon the independence of Syria

Fig. 2.15: French mandate time house

Formal / Informal

After the independence of Syria in 1946, the country soon became an industrial center where the industries settled at the edges of the cities and their old towns. That is why **the cities needed new workers. A migration of workers from the surrounding areas into the cities led to a great growth of the urban population.** The growth of the city took place, however, mainly within the already existing districts by means of restorations and replenishment of the structure of the building and extended later to the edges.

In 1922 Aleppo had 111.000 inhabitants, in 1970 about 680.000 and in 1994 about 1.58 million inhabitants. In 2000, the population grew to around 2 million and reached 2.3 million by 2005, with an official population of 4.6 million in 2010. (According to the data provided by the Statistical office in Damascus).

year	inhabitants
1922	111.000
1970	680.000
1994	1.580.000
1999	1.873.000
2005	2.300.000
2020	ca. 5.000.000

Fig. 2.16: Table of the growth of the inhabitants of Aleppo

Under this strong pressure of growing demand for affordable housing, the city administration has lost its planning task in the last fifty years. Large areas emerged spontaneously and illegally.

According to the estimates of the construction office, the informal settlements had a share of the urban growth of about 40 % in the 80s. This share rose to about 50 % in the mid 90s. The informal settlement area rose from 330 ha in 1958 over 1.375 ha in 1981 to 2.100 ha in 1994. This means that this settlement area has grown by a factor of seven within 35 years. This development confirms the assumption that informal settlements doubled every 7 to 8 years. In 1958, the formal living space was 1.050 ha. It rose to 2.030 ha by 1983. This corresponds to a growth rate of 93 %. The informal living space rose in the same period, however, from 330 ha to 1,530 ha, which corresponds to a growth rate of 463 %.

The size of the total urban area shows that the city, both the formal and informal areas, is characterized by strong density and expansion of large areas.

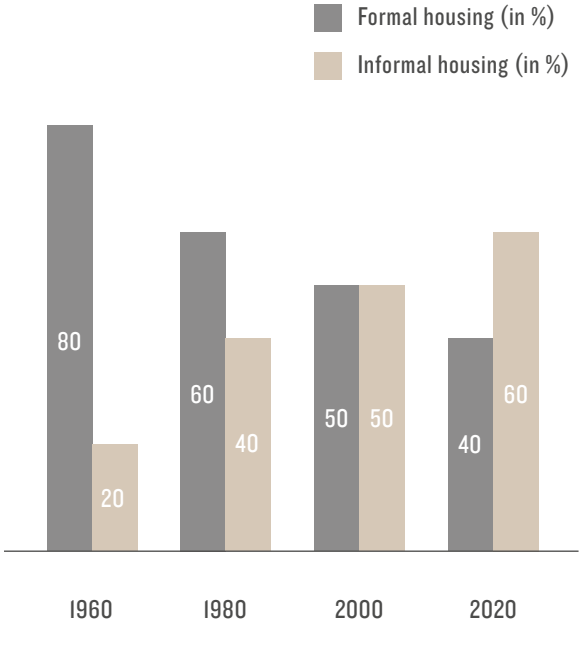


Fig. 2.17: Graphic chart of the housing development in Aleppo

Fig. 2.18: Photo of the middle standard houses

Fig. 2.19: Photo of the middle standard houses

2.3 City development plan

Residental settlements development

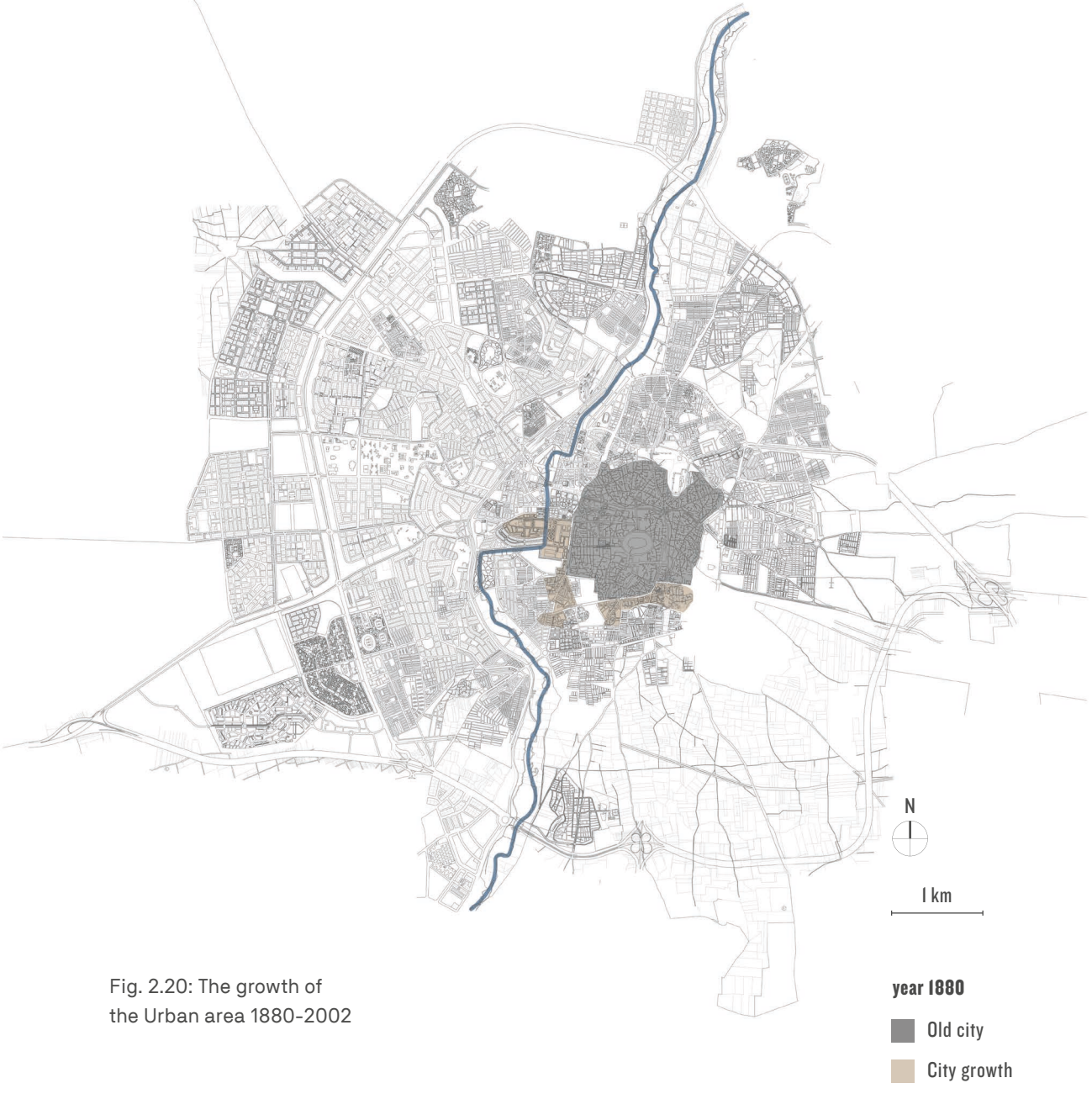
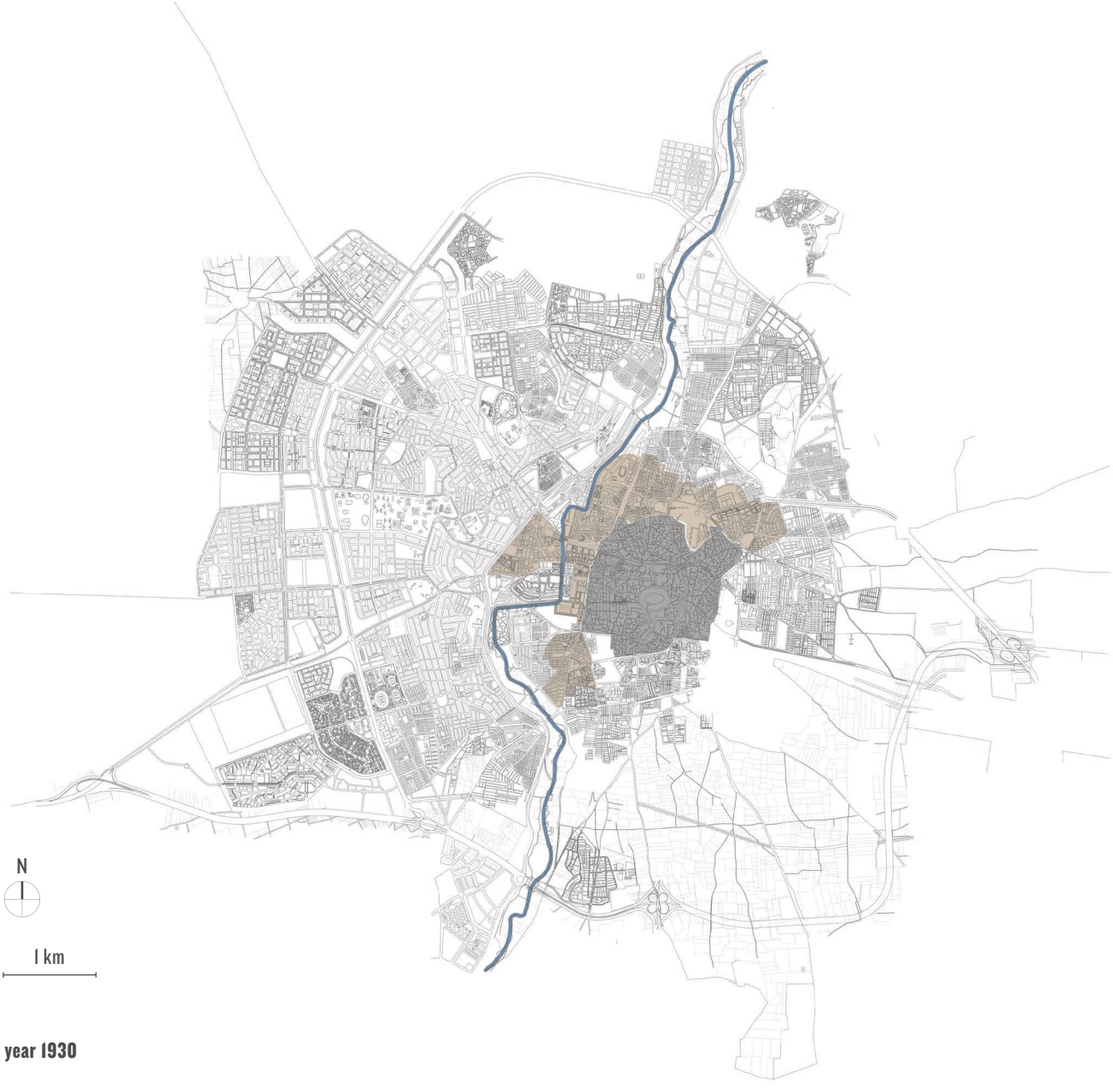
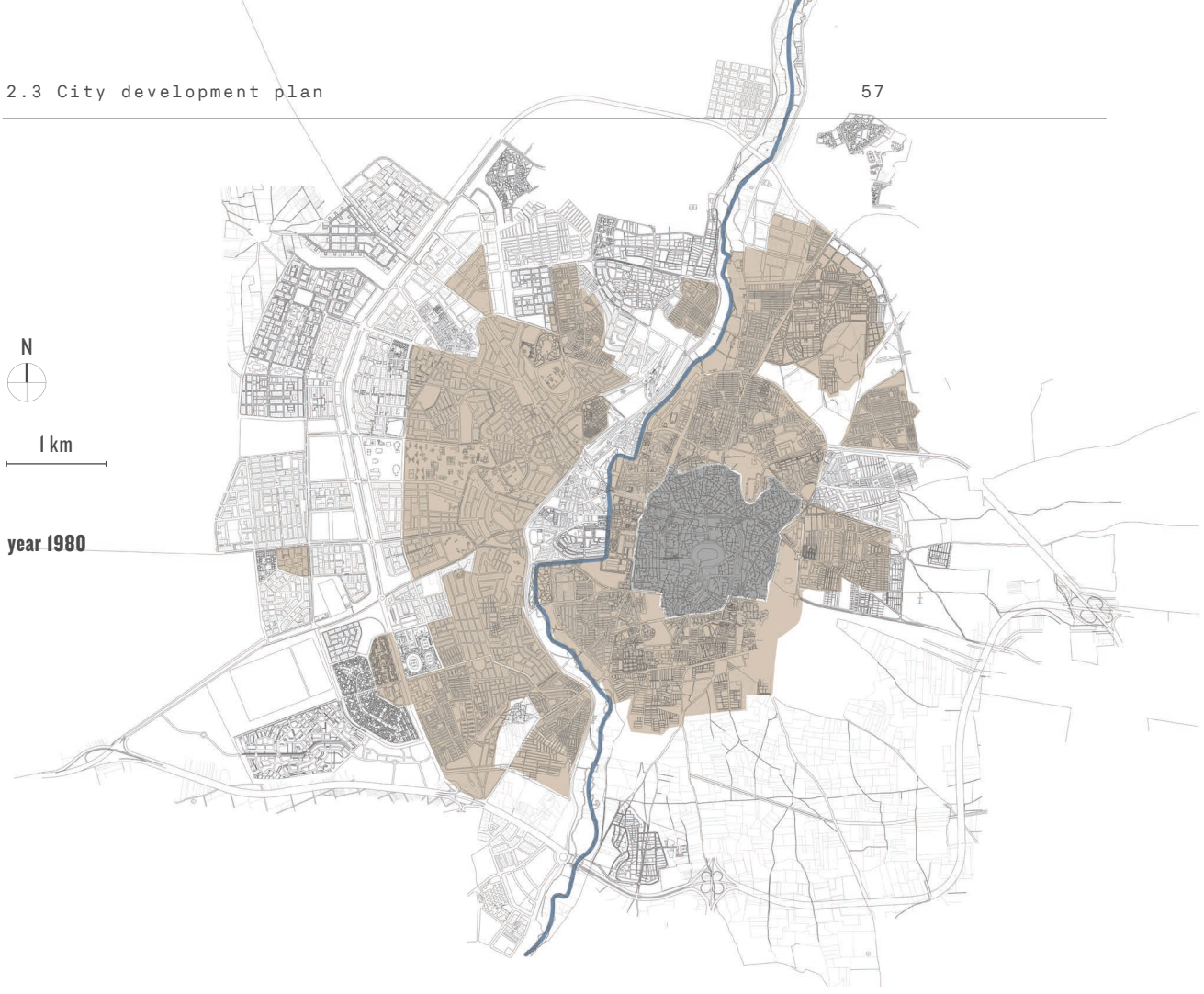


Fig. 2.20: The growth of the Urban area 1880-2002



year 1930

year 1954


N
1 km
year 1980


N
1 km
year 2002

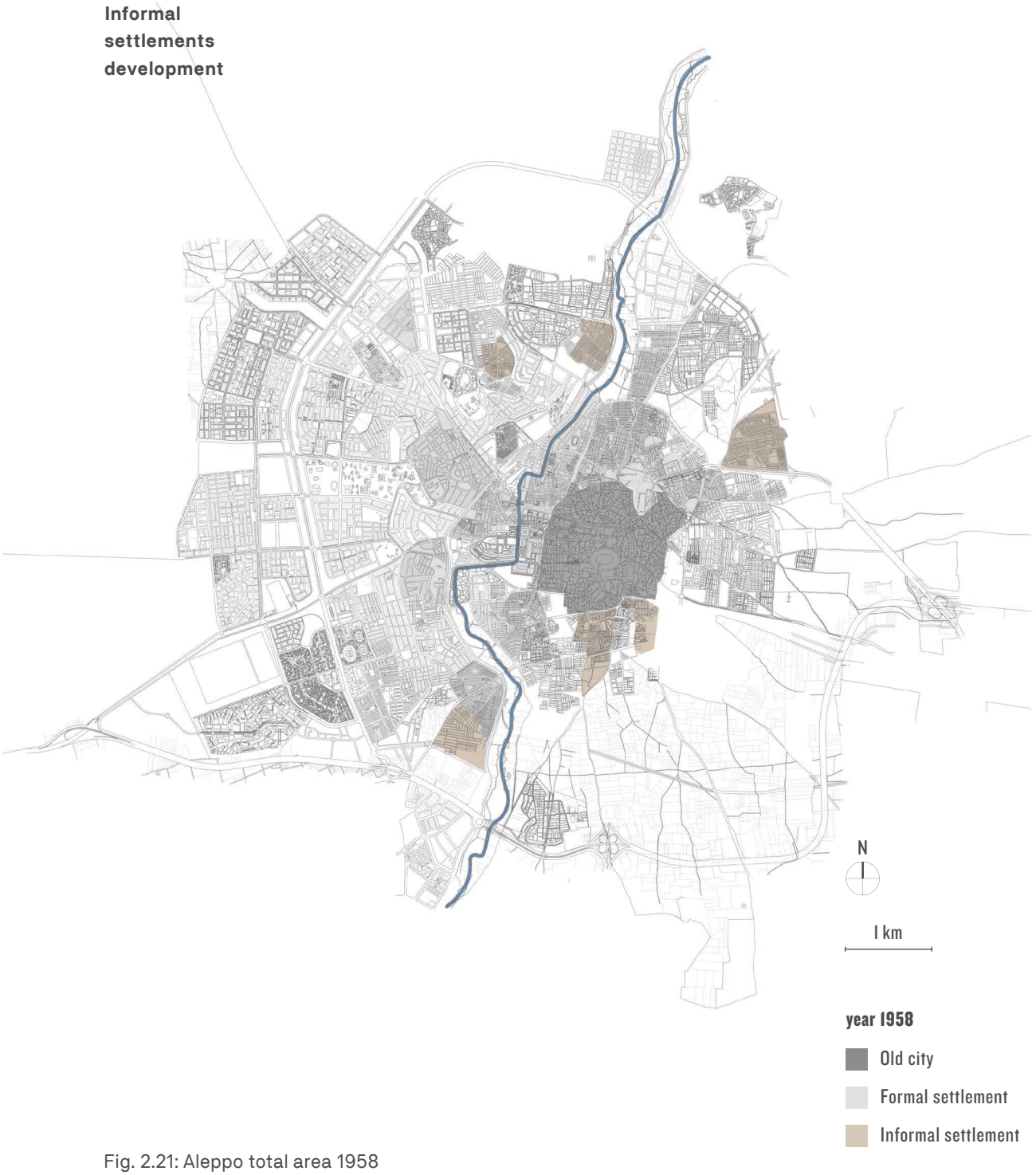


Fig. 2.21: Aleppo total area 1958

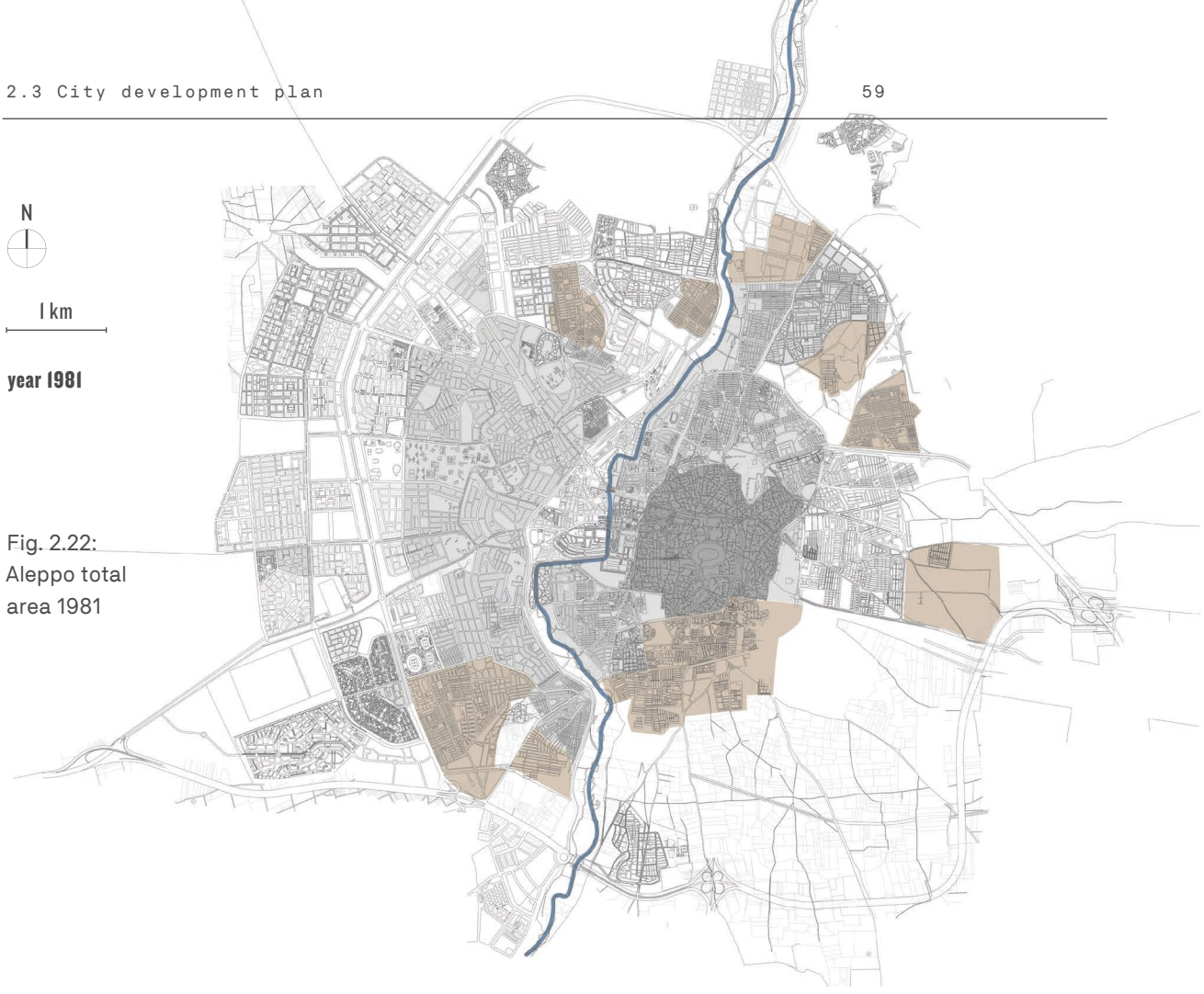


Fig. 2.22:
Aleppo total
area 1981

Fig. 2.23:
Aleppo total
area 2002

City plans 2010

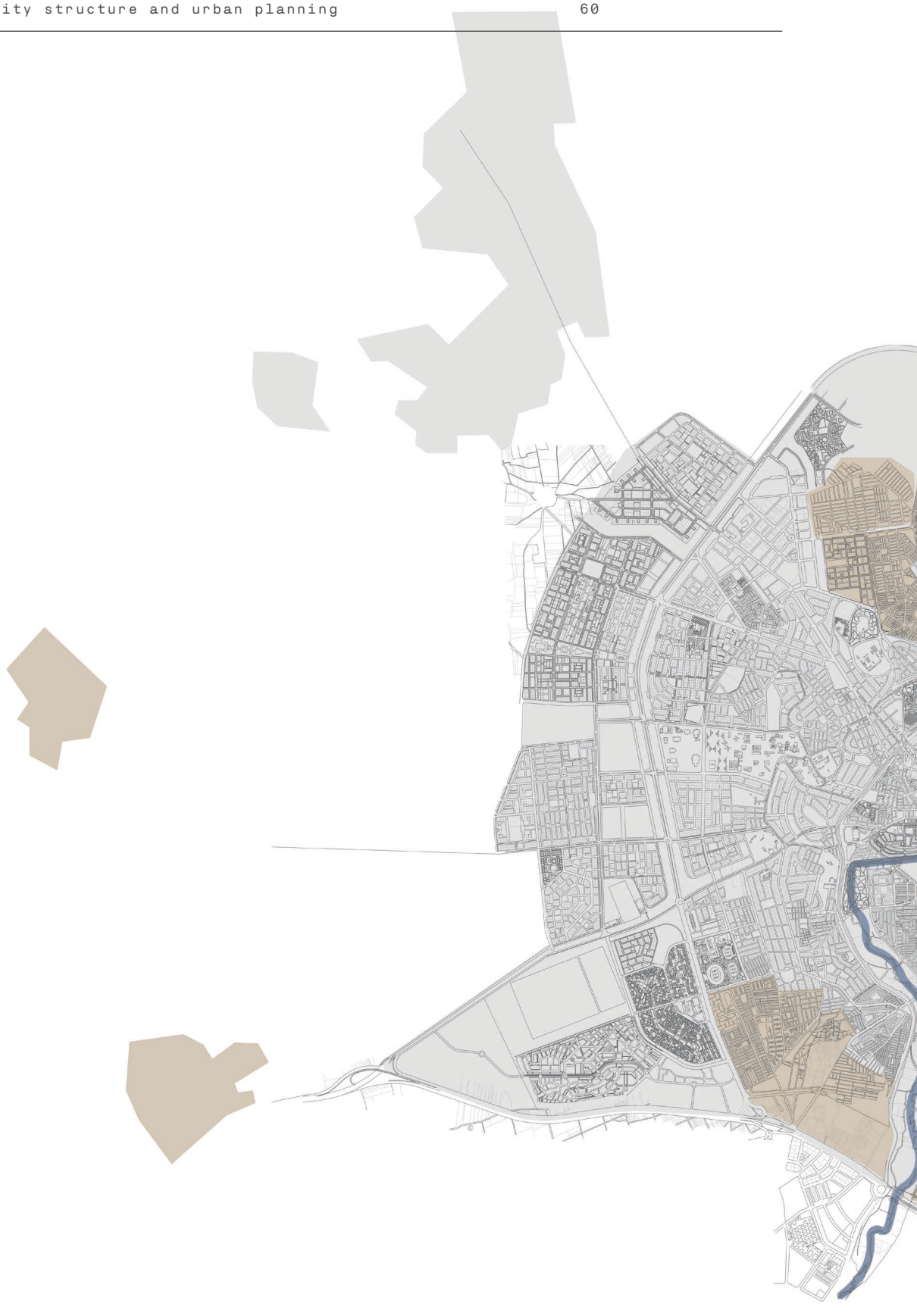
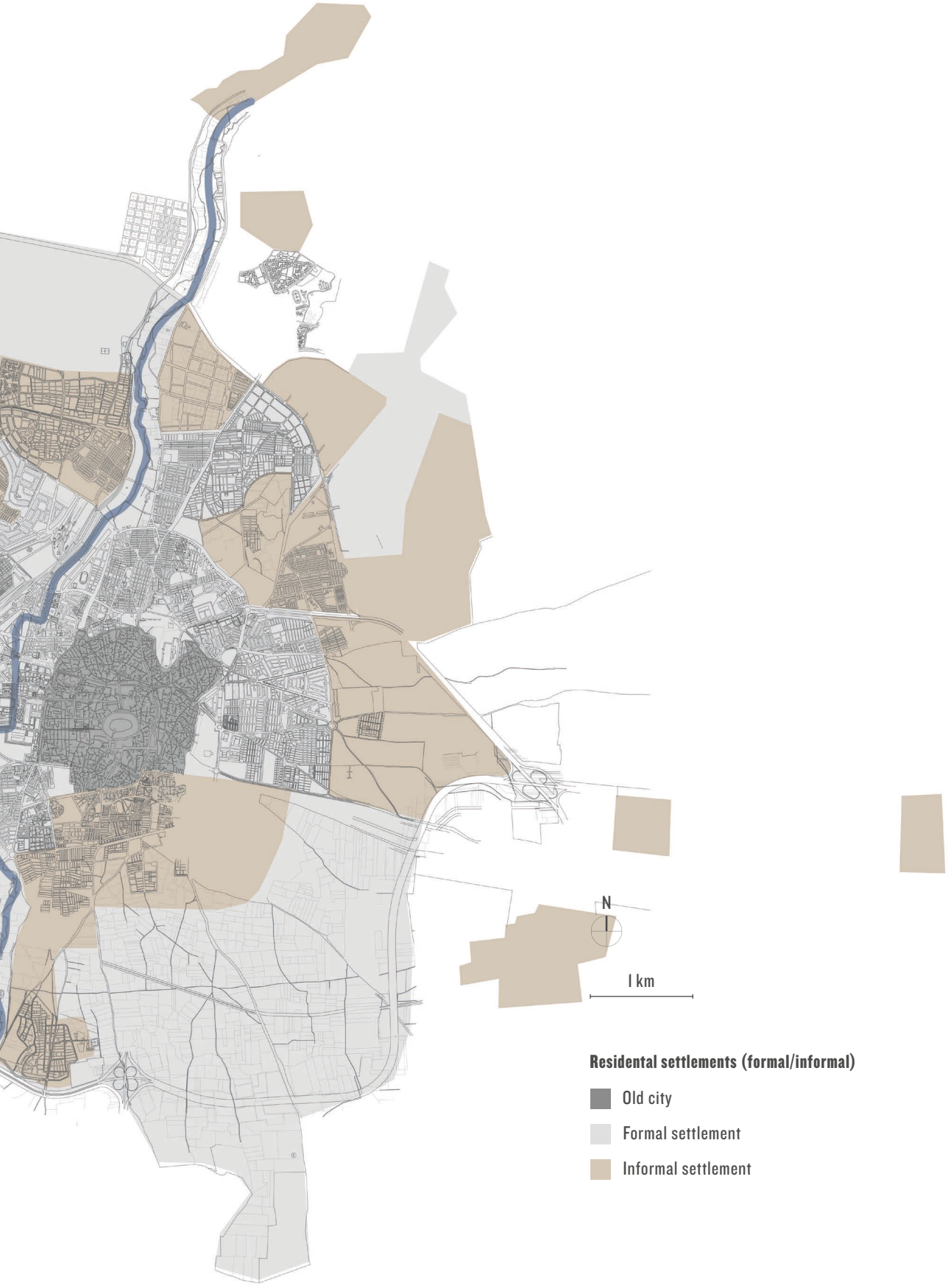


Fig. 2.24: Residential settlement plan


N
1 km
Residental settlements (formal/informal)
Old city
Formal settlement
Informal settlement

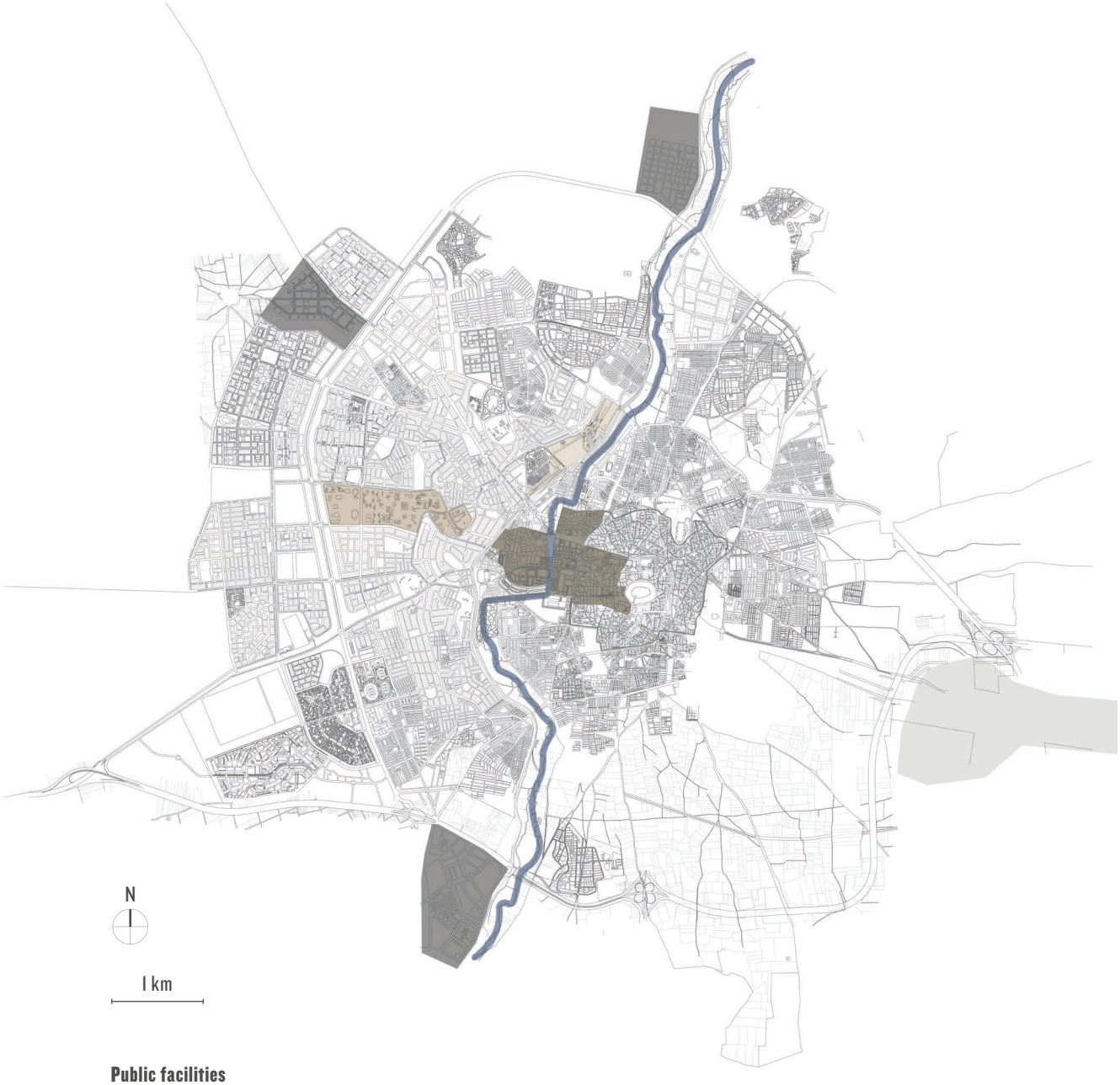


Fig. 2.25: Public facilities plan

Fig. 2.26: Parks and open spaces plan

CHAPTER 3

Residental building typologies and history

Traditional houses
in the old city

Social housing

Private economic housing

Cooperative housing

Informal housing

3.1 Traditional houses in the old city

The old town of Aleppo, with its 150.000 inhabitants and some 20.000 traditional court houses, is one of the oldest inhabited cities in the world, which was included in the list of world cultural monuments by UNESCO in 1983. However, the strong growth pressure and the rapid socioeconomic changes in the past decades, endagered the original and the multifunctional role of the old city as a residential and commercial place for all population strata.

This city among all other oriental cities, has a particular urban structure, which is characterized in the early modern times with its old buildings. **Houses, palaces and public buildings were built around an open courtyard.** These courtyard houses, with their introverted character, formed narrow streets for pedestrians and carts.

The old city was surrounded by a wall ring, which was often divided into different districts by inner walls. Every ethnic or religious group lived in its own district. By the end of the 19th century the individual city districts were divided into clearly defined, smaller quarters. The individual quarters were largely autonomous and, according to their size, were equipped with their own facilities (bazaars, baths, coffee houses, etc.) and separated from each other by neighborhood gates closed at night.

The streets network was divided to

1 main roads led radially from the City center to individual city gates, which some of them were leading to a long-distance trade or pilgrimage routes
2 neighborhood streets (Darb) formed the next smaller unit connecting the main roads with each other
3 dead-end roads (Zugak) were narrow and opened up to the entrance doors of the individual houses

In addition to the religious and social influence, there were climatic factors which influenced the structure of the city. The dense and compact texture of the buildings, which formed narrow streets, led to **optimal shading and caused the movement of cool and fresh air.** The inner courtyard concept which is suitable for the dry hot climate zones, ensured with its **wells and plants balanced temperatures and humidity between day and night.**

In addition to the public buildings, the quarters were characterized mainly by the traditional courtyard houses.

The smallest units of the city were the dwelling houses, which were constructed that they could not be recognized from the outside by their exact form and decoration. The house ensured the privacy of the family which had a great importance.

Depending on the material prosperity and the religious affiliation of the owners, the houses differed in size, ground plan and splendor. The basic concept is nevertheless the same: **the closeness to outside, the multifunctional spaces and the non-covered courtyard which is the central element and often designed magnificently.** Around the inner courtyard, the rooms are grouped according to the size of the house on one, two, three or even four sides. They are open to the courtyard and are not connected to each other.

The rooms are used for different purposes, depending on the day and the season. The Iwan is the central place family residences in larger houses. The high hall, which is covered with a bow, is open to the courtyard and rises above it by 50–60 cm. It ist located on the southern side of the house. As a result, it provides shade during the hot summer months. The upper floor is accessed via a staircase from the courtyard. The most important living and reception areas are entered from the courtyard and are often symmetrical to the vertical axis of the house. There is a spatial order which is emphasized by the location of doors and windows as well as by the ornamental fields of the interior façades. The vertical axis is in the center of the courtyard and it is the only big opening through which light and air flow into the chamber of the house.

In the middle of the open courtyard there is a fountain and also a few fruit trees and jasmine bushes that contribute as a small garden to it, which create a domestic «microcosm place» that revolves around its own axis and carries all the imprints of creation within itself.

Fig. 3.1:
The courtyard house

I Main Entrance
2 Kitchen
3 Lobby in winter
4 Room
5 Lobby in summer
6 Fountain
7 Green spaces
8 Courtyard
9 Side entrance
II Stairway
I2 Bathroom

N

Fig. 3.2: Plan of the courtyard house

The inner division into (private) and (public) spaces was not architecturally fixed at once and for all, but more a question of usage and social conventions. It also varied according to the wealth of the family, the size of the house, as well as according to regional custom.

In the town house, there was usually a directly accessible living room on the ground floor, near the entrance, which was used for the reception visitors. For some time, the entrance was also assigned to separate small rooms, which allowed to receipt visitors, without leading them into the actual house. The upper floors were reserved to the private household and the lower floor to the visitors.

The connection between the house interior and the exterior was particularly critical: **the doorway never led directly into the center of the house,** but first into an intermediate zone from where the interior of the house could not be seen. This could be a dark, enclosed antechamber, provided with long benches for unloading goods or as a waiting room for people.

The living halls in the traditional house were used in a much more flexible and varied way than in the bourgeois European living culture of modern times. In Europe, since the 17th, 18th century there was a separation of the individual functions of eating, sleeping, household and receiving, and for this purpose a heavy furniture adapted to specific purposes laid down the specific function of individual rooms unambiguously and unalterably. **Generally, the traditional house had only light and mobile furniture.** The usual habit of sitting on the floor required carpets and pillows instead of chairs. Tables were made of low, collapsible footboards and slidable copper plates, cabinets were replaced by built-in wall niches, mattresses could be rolled up, layered or placed in adjoining rooms. Long, flat upholstery benches ran along the walls or the sides of the windows and serve for sleeping, lying down, sitting or offering a backrest on the floor. **The traditional courtyard house consists of two-stories. Its construction: supporting construction masonry, flat roofs, wooden beams, thick bricks and stone walls and plaster.**

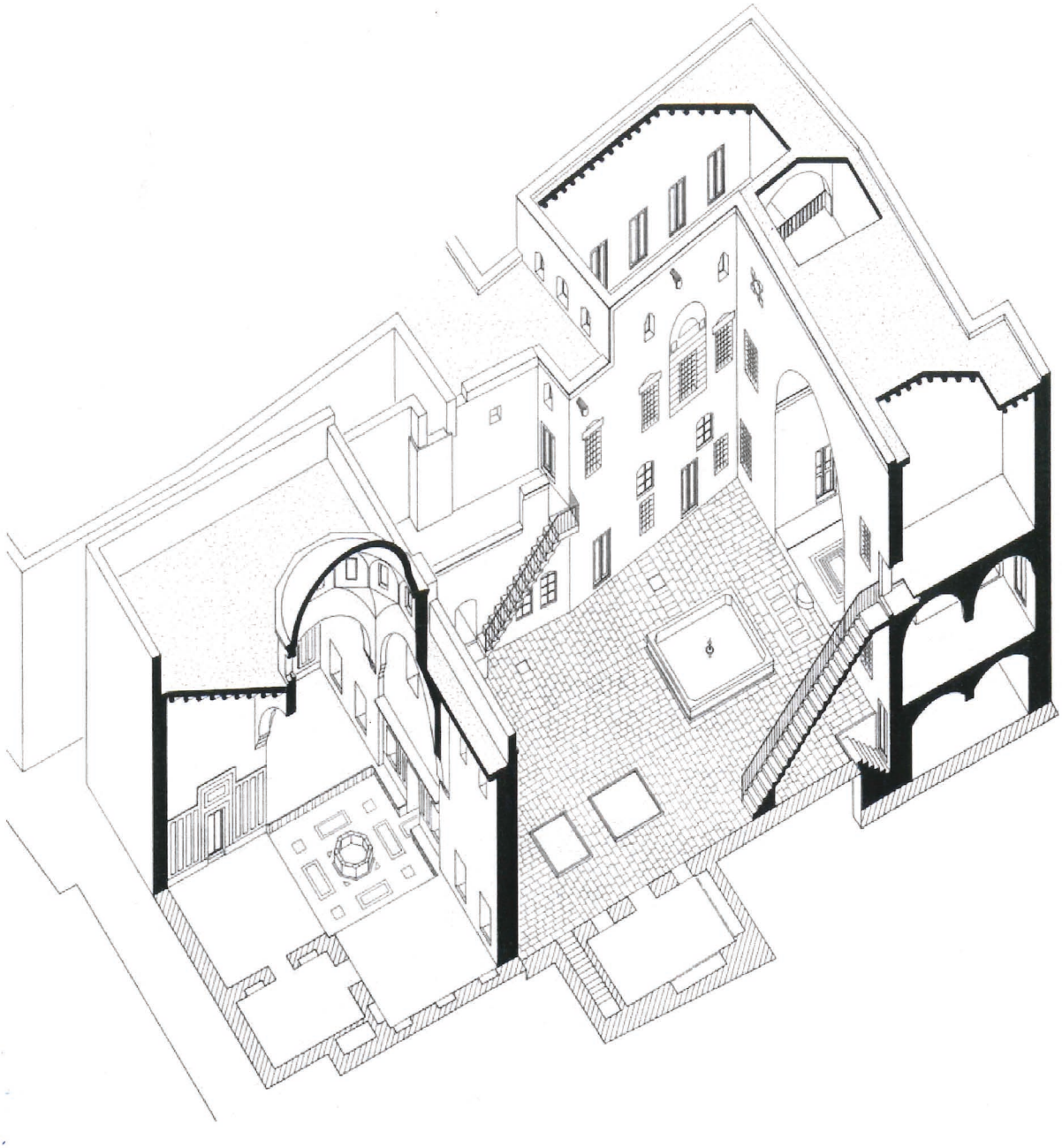


Fig. 3.3: Perspective
of the courtyard house

3.2 Social housing

Fig. 3.4: Plan of Hamdaniya

Syrian cities have generally known social housing construction only since 1954. Before, housing construction was traditionally private with a clear market orientation. The government was concerned with housing construction only when, in 1950, **a rapid population growth led to a lack of housing and slums on the outskirts of the city started to be built.** Due to the socialist state policy multi-storey tenement **houses with very cheap small apartments were built in the outskirts** of the large Syrian cities.

This form of government-subsidized property was intended for low-income, and governmental or military personnel. In essence, the urban construction concepts from socialist countries were copied and executed. It was only later that the disadvantages of this housing typology were realized – **they did not correspond to the habits of the inhabitants** and the rent was too expensive for them.

The housing construction program offered a range of alternative housing and different sizes of flats. E. g. five to seven storey, detached residential buildings with small **European-style apartments, with a square ground plan and small balconies.** Three types were offered: low-cost housing, middle-income housing and higher-income housing, although the last type was no longer financed by the state.

In the mid 1980s, a settlement of maximum two storey houses was established in the southwestern part of the city for employees of the military service. The disadvantages were, on one hand, that the **dwellings were too small**, in proportion to the size of the family, and on the other hand the detached construction was **not adapted to the way of life of the inhabitants.**

Social housing used predominantly **concrete frame constructions, which were filled with bricks and plastered with mortar.**

An example of the social housing in Aleppo is the **settlement of Hamdaniya**, where prefabricated parts were used for the first time. The settlement was built in several phases. Construction duration was 4 years. The first quarter was built in 1976–1977. It consisted of four-floor buildings with bearing masonry. The district had public free spaces and was only for state employees with low incomes. **The buildings had a low quality,** particularly due to the outer covering, such as windows, plaster, tiles, etc. The floor area is approximately 128 m². The second quarter was built of concrete walls, which were assembled on the construction site. The area of the apartment is 76 m². The bad execution of the construction work has led to **many constructive damages.** The villa district was for state directors. It was however not fully occupied, because the neighborhood was near to the low-income district, so the rich families hesitated for a long time to live there. The third quarter consisted of 4–5-storey houses in skeletal-construction. The apartments have 80 m². The Skyscraper District consisted of tower houses with 14 floors. The Floor area is about 130 m². The inhabitants were mainly civil servants. This project was initially planned by a state housing construction company. However, **many changes were made to the building fabric without authorizations,** such as the glazing of the balconies or shops in the ground floor. The settlement today has a very high density and a good infrastructure.

Fig. 3.5: Hamdaniya

Fig. 3.6: Hamdaniya settlement location

3.3 Private economic housing

Fig. 3.7: Plan of Saif Al Daula

The main difference between the private and the public sector is the financing organization and the official supervision. In general, **the residential buildings of this typology were constructed according to the traditional methods.** The concrete frames and ceilings were poured in place and filled with bricks. The façades were cladded in the Aleppo limestone sandstone. As in the informal sector, there is also private housing construction verticalization process. A clear example of this is «Saif Al Daula», where originally single-storey, freestanding houses were quickly converted into four to five-storey buildings and in some areas even seven-storey houses. Even existing, more storey residential buildings are gradually being built up. The main problem in this area is the bureaucratic routine in the procurement of building permits and the rise in land prices due to the scarcity of the construction land.

Saif Al Daula settlement

This settlement is located in the west of Aleppo. It has a formal, private property pattern and it is oriented to the Western building style. The residents belong to the middle class.

- **The type of houses**
  modern, freestanding houses, predominantly multi-storey, three to four Floors with balconies.
- **Construction material**
  load-bearing masonry, concrete skeleton construction, brick and natural stone paneling.
- **Infrastructure on city level**
  a religious place, radio and television station, 4 private hospitals, nursing home care and women's School (Andalusian school before).
- **Infrastructure on neighborhood level**
  6 mosques, 7 schools, 6 kindergardens and 4 green areas. There is one market for grocery, plus a sales area for small vegetable traders. The shops are scattered along the main street. **The parking places are missing in the area,** so the cars park on the citizens' pavement and hinder the pedestrians.

The area was divided by the authorities in the mid of 1960. At first, single-family detached houses with one or two storeys were built. During the first 20 years the area developed rapidly. The quarters changed when the crisis began on the housing market in 1980, the houses were mostly jacked up with three and more floors.

Today the detached single-family houses have disappeared, and multi-storey houses characterize the settlement. The area has now become a mixed area. The trade and the strong building density lead in some areas to chaotic situation.

Fig. 3.8: Saif Al Daula

Fig. 3.9: Saif Al Daula settlement location

Fig. 3.10: Plan of Al Shahba

Fig. 3.11: Al Shahba

Al Shahba settlement

- **Settlement pattern:** formal, private property
- **Residents:** Upper class
- **Infrastructure:** Two parks
- **Construction:** Load-bearing walls, skeleton construction, brick and natural stone cladding.
- **The type of houses:** Family houses (villas), with one to three floors and a garage on the ground floor. The plots are large and built in a luxurious way. In the new part of the settlement, the villas consist of two-family houses with a common entrance.
- **Development phase:** The settlement has evolved since the beginning of 1970. Today it is well planned and maintained. The neighborhood consists of two parts, an old and a new part.

All the houses have a Western style appearance, they are exaggeratedly decorated (many ornaments imitating different ages). On average, the families consist of three to four people with good education. 15 % are employees, 30 % are doctors and engineers, 50 % are wealthy business men. The inhabitants belong to the upper class, who used to live in the large, rich houses of Aleppo's old town.

The main roads are between 10 and 12 m wide. Parking spaces are available. Despite constant change and the rise in land prices in all parts of Aleppo, the settlement has kept its identity. The density is still relatively low compared to other areas.

Fig. 3.12: Al Shahba

Fig. 3.13: Al Shahba settlement location

3.4 Cooperative housing

Fig. 3.14: Plan of Al Mohandiseen

Large, modern residential districts have been developed in Aleppo's outer districts. An example of this form of housing construction is the settlement of the cooperative university employees, post offices, doctors, etc.

The members of the academic and liberal professions form a social group in the Syrian society, which can be classified between upper and middle classes. their social rank is more determined by their Western education and orientation than by a high income. This can also be seen in urban development.

The road layout and building types in **the cooperative settlements are based on European-Western models and standards.** Irrespective of religion or ethnic groups, the new settlements now have people with the same purchasing power and consumption patterns. In contrast to the old town districts, the separation is no longer based on cultural and religious groups but on social and economic status.

The cooperative housing projects in Aleppo are mostly **built on a geometric grid with regular street.** The buildings are detached and freestanding, three to six storeys, two apartments with two, three or four rooms are accessed via a staircase. The buildings are covered with the local typical sand-lime brick.

With the takeover of Western building styles with balconies and large windows facing the street, the traditional housing typology has been left behind, which was characterized by the courtyard house which corresponded to the social and climatic conditions. The result of these construction methods, is the increased use of technology (heating and air conditioning) and the associated problems of maintenance and energy consumption.

All the residential areas in the west of the city, where the social upper class is located, are developed in the cooperative way: A development plan would be drawn up by the building authority, which sets the building parameters and procedures, the number of floors and the floor space. Based on a submitted and approved building application, a project plan would be subsequently prepared. The whole process, from planning to key handover, woud take an average of 15 years. Despite the promotions, there are also many obstacles. These include in particular the bureaucratic approval process, the rising prices, as well as the development of the general economic and political situation of the state.

The apartments of the **cooperative housing offer high standards,** such as large rooms, good facilities and a sophisticated representation to outside (entrance, façade, stairwell), which is appreciated by the middle and upper class. However, it must be noted that cooperative construction has not reached its intended goal. **It could not offer a favorable living space to the socially weak class, for whom it was actually created.** The residential cooperative housing only helped those who were well off in society.

Fig. 3.15: Al Mohandiseen

Fig. 3.16: Al Mohandiseen

Al Mohandiseen settlement

- **Residents:** middle to upper class
- **The type of houses:** four storey houses, each floor has either one or two apartments.
- **Location:** it is located in the west of Aleppo, outside the green belt of the city. To the south of the area lies the planned Arab trade fair and in the north the extension area of the university.
- **Infrastructure:** There is a public green space, the architects club, a mosque, a small market, a primary school and a secondary school as well as a kindergarten.
- **Development phase:** In 1989, the first buildings were erected. The first part of the settlement has 472 residential units with a total area of more than 100.000 m^2. Later the settlement was extended by several projects to create more housing for the members. «project 11» has 400 residential units, in the same area of the first part. The «project 12» has 159 residential units in the university area. The «project 13» has 104 residential units west of the ring street and «project 14» 30 residential units were built in «Halab al jadida».
- **Building materials:** Supporting masonry, skeleton construction, brick and natural stone cladding of the exterior walls and behind it the Aleppo local typical sand-lime brick is used without any insulation materials, this playing just a primary role in thermal insulation because of the air bubbles inside the bricks.
- **Type of construction:** it is built based on a geometric and regular road grid. The buildings are detached and free-standing, four-storey buildings. Two apartments with three, four or five rooms are accessed via a staircase. The apartments have an average living space of 180–300 m^2. Prosperity and luxury are displayed in the well planned and executed settlement. The settlement is well planned and executed. Public spaces are sufficient (parking lots, green areas, public transport and the distances between the houses).
- **Residents:** On average, there are families with 6 people with good education. The inhabitants belong to the upper class, who used to live in the large, rich houses in the old town of Aleppo.

Fig. 3.17: Al Mohandiseen settlement location

3.5 Informal housing

Fig. 3.18: Kafer Dael settlement

Legal and economic background

In Syria, as in many developing countries, where the economy is very weak, people tend to invest their money in real estate. Due to the strong population growth, the demand for land is growing constantly, and therefore it is the ideal object for speculation. According to the factors mentioned above, the value of the land is constantly increasing. In Aleppo 1975/76, there were land use and development plans for large urban expansion areas, which should have been implemented by the year 2000. This planning was based on that time expected growth of the city. Meanwhile the fast development which took place largely, did not correspond to the requirements of the 1975 urban expansion plan.

The circumstances which helped the informal urban settlements in their increasing growth

1 There are jobs in the cities.
2 The cities offer the inhabitants a higher level of life and better services than the villages in the country. This is why new immigrants are coming to the cities.
3 For the rural immigrants, there was no alternative to self-construction housing because the apartments of public and private housing in the city were not affordable for them
4 Continued population growth in rural as well as urban areas continued to increase which led to the need for new housing (Aleppo growth rate of 3,6 %).
5 The existing informal settlements also attracted more immigrants through the traditionally strong family ties. Newcomers liked to move into the areas inhabited by their relatives or former village neighbors and thus contributed to the growth of the settlement.
6 The profits from agricultural lands are much lower than those from the sale of the land.
7 The high tax of cultivated land led the owners to sale their lands to construction workers and construction companies.

The growth of the informal periphery

The development of the informal areas was the fastest east, north and south of Aleppo. These rural settlements have been built on the periphery around the city in 1960 and 1970 near the large industrial areas. **Only in the west of the city there were no informal settlements,** due to the expensive building land in the west, which made it prohibitive for the poorer population groups and also the land there was protected from illegal immigration by the state, so the western periphery was left out as a migrant quarter. In all other directions, however, was illegally settled. **The informal housing of the immigrants could be found particularly on the roads, depending on where they came from.** For example, in the eastern outskirts of the city there is mainly immigrants from the east of the country (formerly Bedouins). The area in the north, e. g. Al Ashrafiya, Sheikh maksud, is mainly inhabited by Kurds who came from the northern regions. Rural immigrants settled in the southern region of Aleppo like Al Dahya, Al Janubiya or Al Sukkari. Also, poor people from the city of Aleppo settled in the informal areas because the housing is cheaper there. In 1994, the focus of settlement activity was shifted somehow in the northeast direction. There was a distinct gradient from west to east and from north to south in the regions.

The attractiveness of the outer districts was the result of several related factors

1 Relatively inexpensive land with water supply, which was mostly agricultural land.
2 Adjacent to existing settlements. Access to food and construction supplies, water, electricity, as well as health services and schools. The location of these settlements near to the formal districts, gave the residents the hope in infrastructures installation in the future.
3 Proximity to workplaces in the city.
4 No corresponding accommodation in the formal districts. The center is crowded, and the prices in the housing market are too high.

The city allowed the people to settle without interfering. Later it tried to upgrade the neighborhoods. At the beginning the households were neither supplied with electricity nor with running water. Later, the electricity and waterworks had been supplied to anyone who paid, even if he had no building permit. A sewer system was still missing.

The informal northeastern area

Built in 1958 from small residential units, far from the official city. At that time, the settlement had a low density and it was still clear how the houses and the walkways were divided according to the organic natural structure of the land. **Because of the urban growth in 1983, the settlement developed and became denser.**

The areas in the east of the city were originally in municipal ownership. The city sold them as an agricultural land, divided into large estates, to private agents, who subsequently parceled them and resold them to building enthusiasts. This has been a profitable business especially since 1980, as the general housing crisis has led to an enormous rise in land prices, which became tenfold between 1983 and 1993. The informal settlement took place by building up the lands of the former pistachios and olive groves completely and following the natural pattern of the land. **The strong expansion of the informal settlements in 1994 was accelerated particularly by the establishment of new illegal industrial areas in the middle of the fields.**

The informal areas to the north

The settlement activities had shifted more strongly towards the two industrial areas Al Shokaif in the north and Balliramoun in the northwest. The proximity to neighboring settlements that are formal and well cared for, the chance for a speedy legalization of the area and to a later development of infrastructure were the leading factors to establish the informal neighborhoods of Khalidiya and AI Ashrafiya in the north of the city in the mid 50s.

The informal areas in the south

The informal neighborhoods in the south are among the oldest in Aleppo and extended into traditional and cultivation areas. This area of the city has a **mixed structure of courtyard houses and multi storey buildings.** The houses in these settlements were built robustly. They consist of stone, cement and concrete and give the district a solid character. The city of Aleppo had developed a rating system according to which the individual areas were classified according to their infrastructural needs. The southern regions were considered to be 80 % supplied. There are seven schools, several mosques and **many shops in the ground floor of the houses**. The inhabitants are actively involved in the development of their neighborhood. Waste disposal is organized privately. For instance, private individuals who are paid monthly by every house are concerned to collect the daily garbage in front of the front door. Under the houses there are sewage pits which are emptied once a year by a corresponding vehicle.

The future of the growth areas

In 1970 and 1980 more and more people settled in Aleppo's urban areas. The unplanted area multiplied, the structure and appearance of the city changed, and the development became independent in the absence of state planning, which had not tackled the problem of immigration.

In the end of 1950 the settlements on the periphery of the city already occupied almost 20 % of Aleppo's developed area. **The city had grown more than doubled between 1958 and 1983. On the other hand, the informal construction area had almost quintupled at the same time.** From approximately 300 hectares in 1958 the area rose to 1530 hectares in 1983, when the informally built areas occupied for 40 % of the total area of Aleppo. This index rose to 50 % by 1999. To the west of Aleppo expensive land prevented the growth of the informal settlements. Although a growth could took place to the east, it would perhaps which made the situation problematic due to the distance from the workplaces. The improvements in semi-public transport had strongly promoted informal settlement activities towards the north, northeast and northwest because of the industries which are located there.

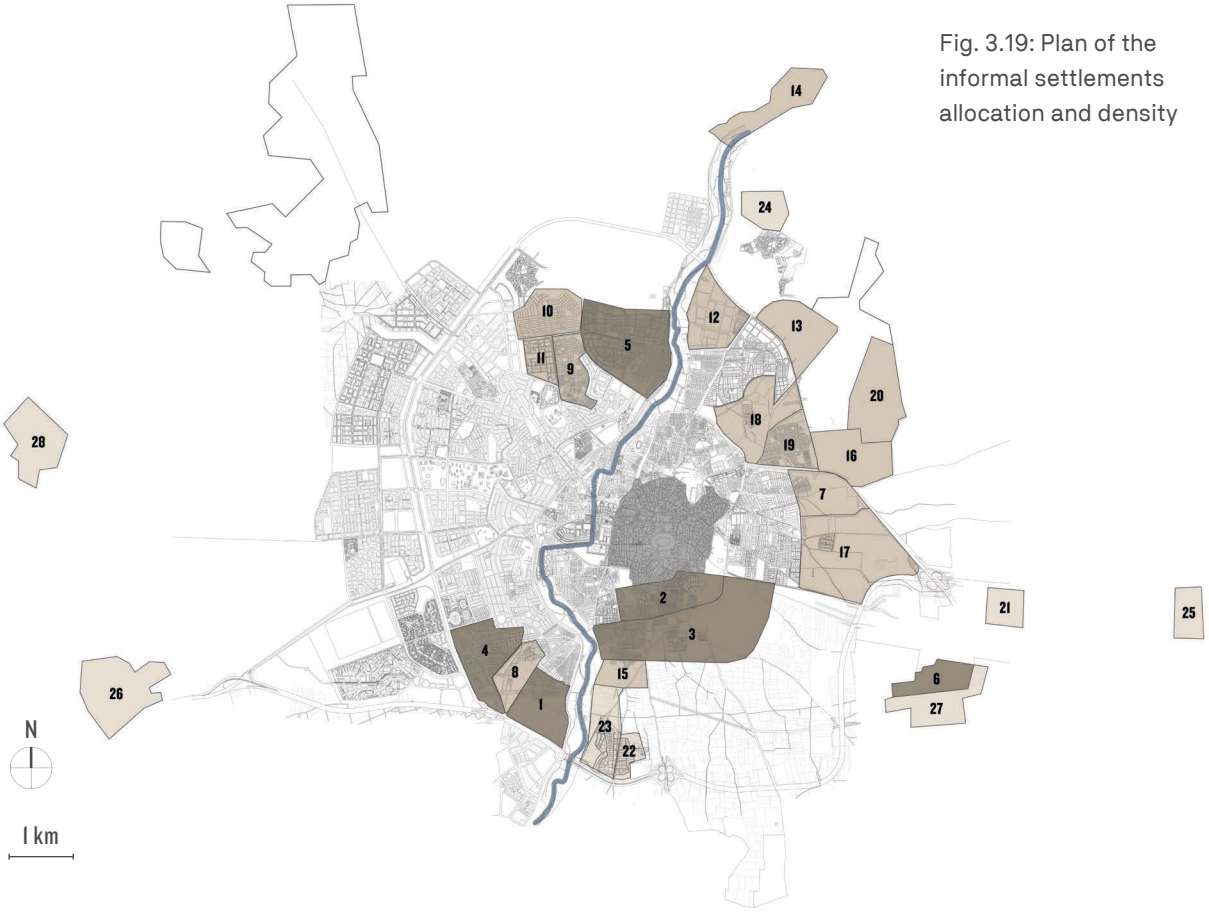


Fig. 3.19: Plan of the informal settlements allocation and density

High density settlement

Medium density settlement

Low density settlement

1 Tal Al Zarazeir
2 Al Dahiaa Al Janoubeyeh
3 Al Dahiaa Al Janoubeyeh (Extension)
4 Ard Al Sabbagh
5 Sheikh Maqsoud
6 Al Neirab Camp
7 Al Maasaranyeh
8 Ansari Village
9 Ashrafeyeh 1
10 Ashrafeyeh 2
11 Ashrafeyeh Beni-Zeid
12 Ein Al Tal
13 Haidareyeh
14 Handerat Camp
15 Haret Al Shahhadin
16 Jabal Badro
17 Karm Al Jazmati
18 Sheikh Fares
19 Sheikh Khodr
20 Sheikh Najjar
21 Al Malkeyeh
22 Sheikh Seied East
23 Sheikh Seied West
24 Aweja
25 Dwereneh
26 Khan Al Assal
27 Al Neirab Village
28 Kafar Dael

Fig. 3.20: Tal Al Zarazeir

Characteristic building structure

For the direct and indirect reasons mentioned above, the state had lost control on the development of the city of Aleppo. Large areas of settlements extended mainly spontaneously and informally at the periphery. **In these areas, according to the estimate of the building authorities in Aleppo, about 50 % of the city inhabitants live.** The informal housing construction was created in the districts of the urban outlying areas, whose inhabitants belong to the low-income class. In Aleppo, «Manatek al muchalafat» were designated as «illegal mass settlement».

Here the term «illegal resettlement» was mentioned by the city because the land was first marketed illegally and therefore the householder did not have a clear ownership, and secondly because there was no building permit. Their «informality» is therefore due to their «illegality» throughout the entire process of construction. It was found by survey that **most of the «illegal resettlements» were built on farmland,** which, according to the «expropriation law of the landowners», actually belonged to the state.

Among the informal residential buildings, two types of housing and construction processes can be distinguished

1 Growing houses with 2–3 storeys, built of supporting brickwork or quarry stone and reinforced concrete ceilings, or of reinforced concrete skeleton constructions with inscriptions by non-bearing brick walls. The houses, which are mostly inhabited by their builders themselves, grow horizontally and laterally vertically, rooms for rooms or floors, depending on the financial possibilities.
2 Turn-key residential buildings of similar construction, built by private developers for rent or sale.

In 1970, the informal settlements have enormously grown, with this massive growth the huts which has been built in the early stages, **were transformed into permanent buildings that were based on the traditional architecture.** Courtyard houses with thick stone walls and wooden ceilings with cement floor. The informal housing attracted critical attention only in the early 1980. The emergence of the informal settlements on the border of the city was directly related to the migration from the villages to the cities. Informal buildings in Aleppo show an advanced stage of development. **A modern informal design has developed, namely the concrete skeleton construction with coat roofing.**

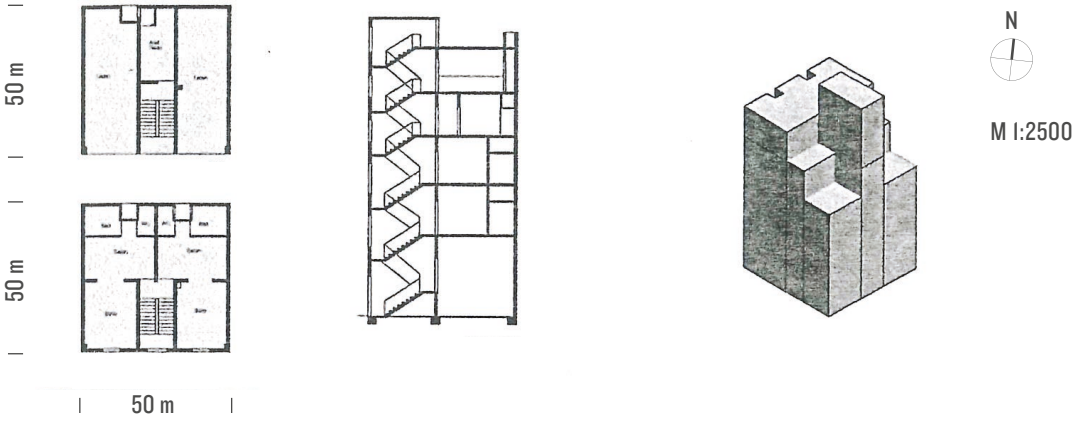
In general, there are three forms of the informal settlements

1 The irregular structure, which mostly reflects the traditional settlement structure of former or existing villages (for example the Al Ansari village). These are the informal settlements that spread around the villages.
2 The fragmentary pattern of settlements is typical on the outermost border of the urban periphery (for example Kafer Dael, Aweja in the north of Aleppo). In the north of Aleppo, an irregular topography along the main road developed that differs very widely from the grid.
3 The linear raster form, which is found mainly in the margins and is largely similar to the official planning guidelines. This linear arrangement is typical for 70–80 % of all informal residential settlements. In particular, the older settlements show irregular blocks reminding of the old traditional dead-end neighborhoods. The contemporary or modern, informal architecture shows a rigid grid structure with regular blocks of flats.

Fig. 3.21: Al Ansari settlement

Fig. 3.22: Ard Al Sabbagh settlement

Fig. 3.23: Kafer Dael settlement



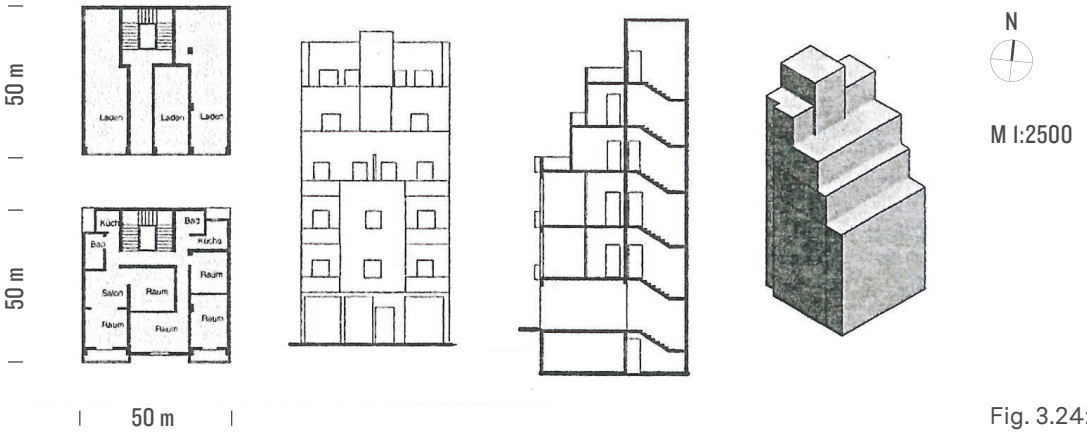


Fig. 3.24: Examples of informal housing typology

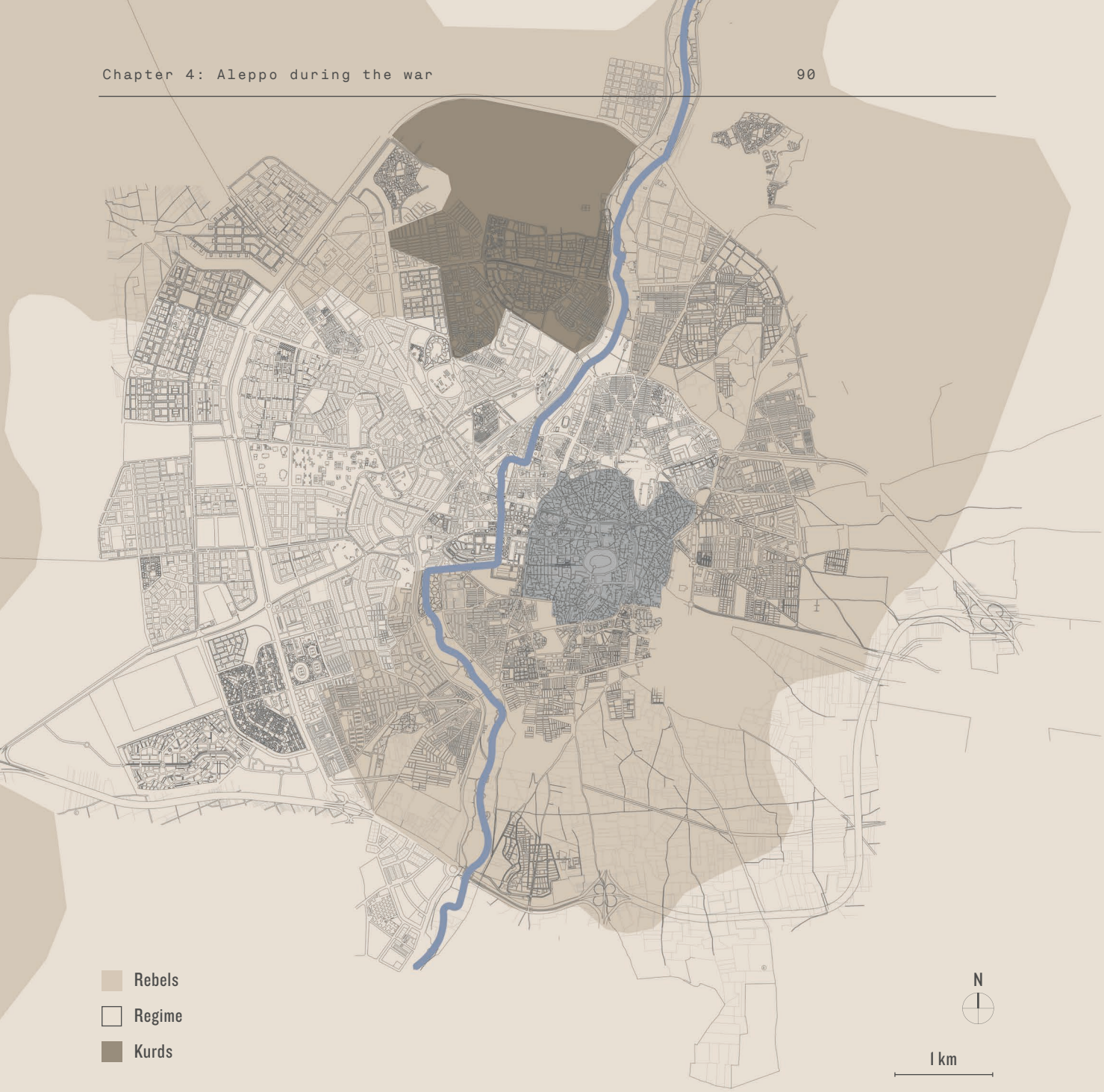
Comparison of traditional and informal settlement structure

Traditional buildings in the old town	Informal buildings
The inhabitants had lived in the city for generations and have the required knowledge to build with stone and wood. They were mostly engaged in crafts and trade.	The inhabitants were farmers of rural origin and knowledge with clay to build. They were mostly unskilled workers and unemployed.
The house was built by a building contractor	The inhabitants themselves mostly built the house or with the help of craftsmen.
Living and working is separated. Trade and commerce took place in the Bazar.	Living and working is taking place in the same place (shops or rentals)
Introvert architecture, classic courtyard house	First, the courtyard house, which went through a rapid condensation and verticalization, emerged as a hybrid type of house.
Open central courtyard, which was used for private residential functions.	The yard had become smaller and had lost its quality and role.
The blocks of the houses were defined by narrow streets and house clusters. There were no clear outlines and their sizes were unidentifiable.	The residential blocks are orthogonal and divided into even plots of land.
The particular houses from inside had unique identity but from outside the whole town had an organic form.	The houses are repeated in a grid, great similarities
Took into consideration the environmental conditions, topography and climate	Neglect of climatic factors. Consistency with the available financial resources.
The traditional houses were first completely built and then referenced and inhabitant. The change (enlargement) of the house continued within narrow limits.	These are growing houses, which started with only one room, and then grew over several steps up to a multi-storey apartment house.

4

CHAPTER

ALEPPO DURING THE WAR



The conflict in Syria started in 2011. One year later the civil war reached Aleppo, when rebel fighters from the neighboring villages who had already taken control of most of the northern areas of the province converged and penetrated into Aleppo, to which the government responded with heavy-handed bombardment of the city. **on the 19th of July 2012 the so-called the «battle of Aleppo» has started and the city was soon divided between a western half under government control and the east, held by the rebels.** The frontline that split the city shifted marginally during the conflict. Most battles took place around the city, in northern and southern countryside, driving out most of the population and killing thousands. **This situation that lasted four years finally ended in July 2016,** when Syrian government troops closed the rebels' last supply line into Aleppo. In response, rebel forces launched unsuccessful counteroffensives in September and October that failed to break the siege. In November, government forces embarked on a decisive campaign that resulted in the recapture of all of Aleppo by December 2016.

Fig. 4.1: Map shows the lines of control in Aleppo in April 2016

Fig. 4.2:
The destruction in Aleppo

After four years of fighting many sections and medieval buildings in the ancient city of Aleppo one of the (if not the) oldest, continuously occupied cities in the world which belong to the UNESCO World Heritage Sites, were destroyed and ruined or burnt. The UNESCO team reported extensive damage at the great Umayyad mosque, the citadel, mosques, churches, suqs, khans, madrasas, hammams, museums and other significant historic buildings in Aleppo. According to a preliminary assessment in 2016, some **60 % of the old city of Aleppo has been severely damaged, with 30 % totally destroyed.**

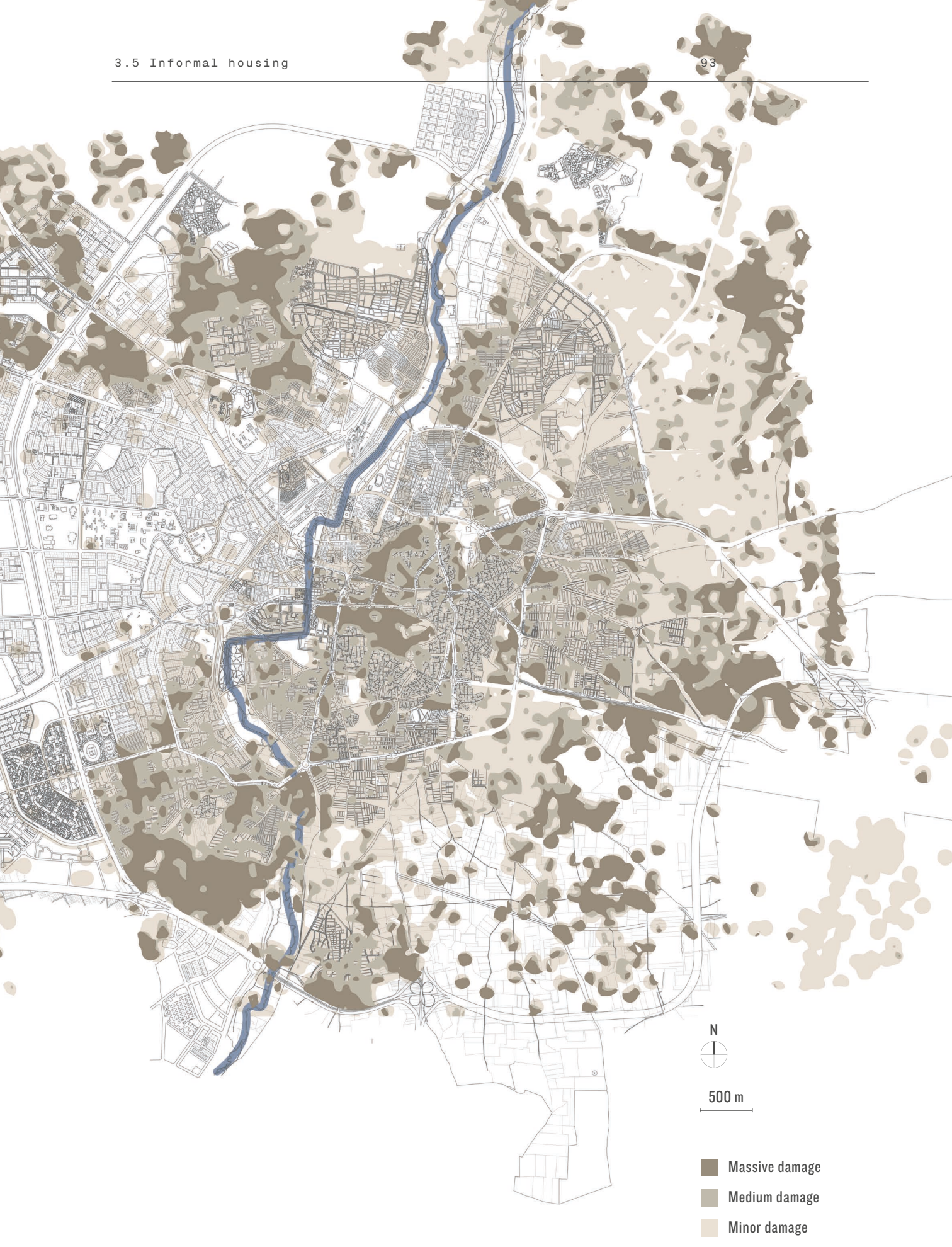
In addition to the old city, Aleppo suffered catastrophic damages in the buildings and the infrastructure. Using satellite imagery analysis, the UNOSAT in 2016 identified a total of 33.521 damaged structures. These damaged structures are compared with total numbers of buildings found in a pre-conflict satellite images collected in 2009 to determine the percentage of damaged buildings across the city. Based on this analysis, in twenty-five neighborhoods with the most identified damage **more than 40 % of the buildings have been damaged.** The most damaged neighborhood is Al Aqabeh with 65,61 % of buildings damaged and the most significant change since UNOSAT 2015 analysis is Khalidiya, which increased in percentage damage from 4,20 % to 55,80 %. Note that this analysis considers only damage in residential areas and excludes industrial areas.

An initial damage assessment commissioned in the second half of 2016 estimated that **at least one-third of housing units across the city have either suffered significant material damage or been destroyed entirely.**

In 2017 the municipality of Aleppo in collaboration with Engineers Union in the city, started a project to **evaluate the structural condition of the damaged buildings in nine districts** (Al Kallasa, Bustan Al Qasr, Khalidiya, Al Ashrafiya, Midan, Kadi Askar, Saif Al Daula, Al Mashhad and Al Zubaidiya) to classify the buildings according to the damage level.

The Committee who was responsible of the classification, has defined **three levels of damage:** Simple – only needs to be repaired, Medium – needs structure enforcement and restoration and total and serious damage – needs demolition and reconstruction. The implementation of the project started in Al Kallasa and Bustan Alqasr districts, where rubble removal and building reinforcement have begun.

Fig. 4.3: Map shows the damage in residential areas in Aleppo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500 m
Massive damage
Medium damage
Minor damage

Fig. 4.4, 4.5, 4.6: The destruction in Aleppo

CHAPTER

5

THE VISION

The post-war housing typology

The selected location

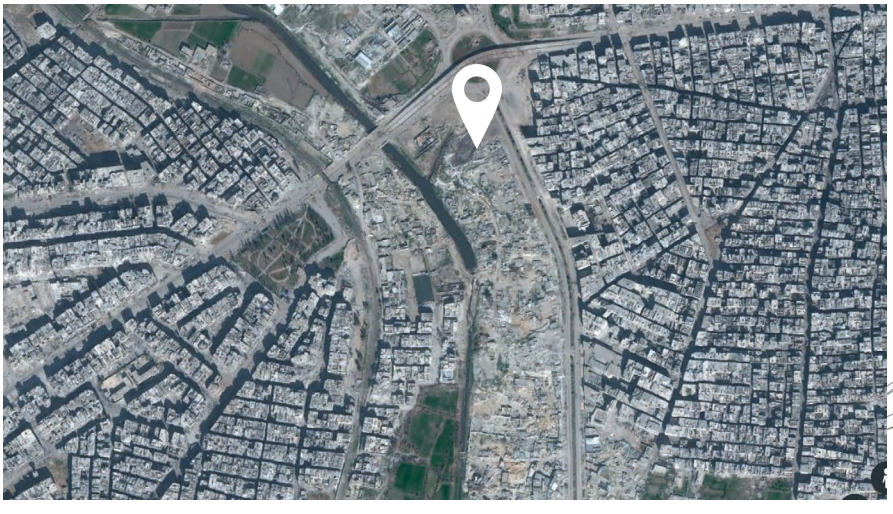
The concept and
the aspects to be achieved

The project

5.1 The selected location

The project is located in the south of the city to the southwest of the city center and the citadel, on the east bank of Queiq river, where the informal houses were destroyed during the war. The location is in the sixth district between Al Sukkari neighborhood to the west (more than 50 % of homes were damaged and destroyed) and the informal settlement of Al Dahiaa Al Janoubeyeh to the east (more than 20 % of homes were damaged and destroyed).

The importance of the location is due to its proximity to the river, as a considered promising area to be planned in the future as car-free residential, parks and pedestrian shopping zones.



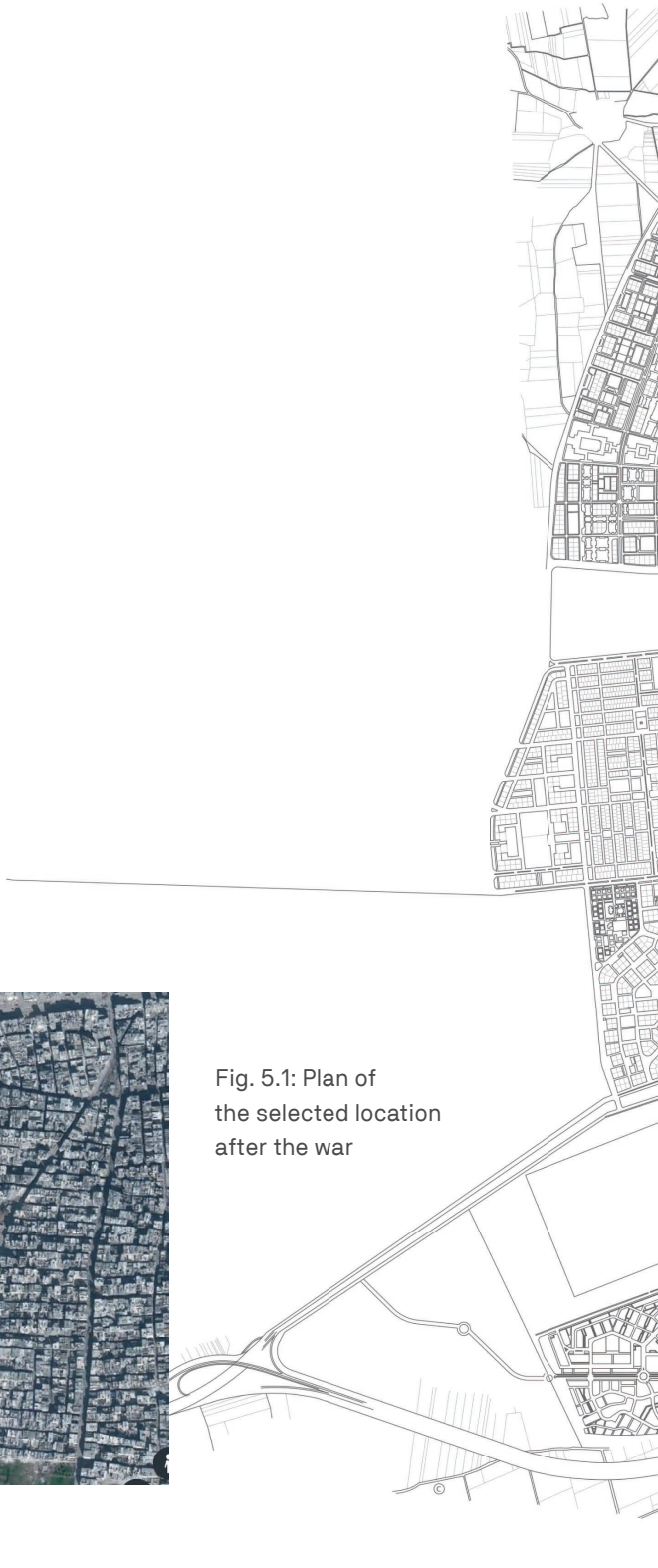


Fig. 5.1: Plan of the selected location after the war

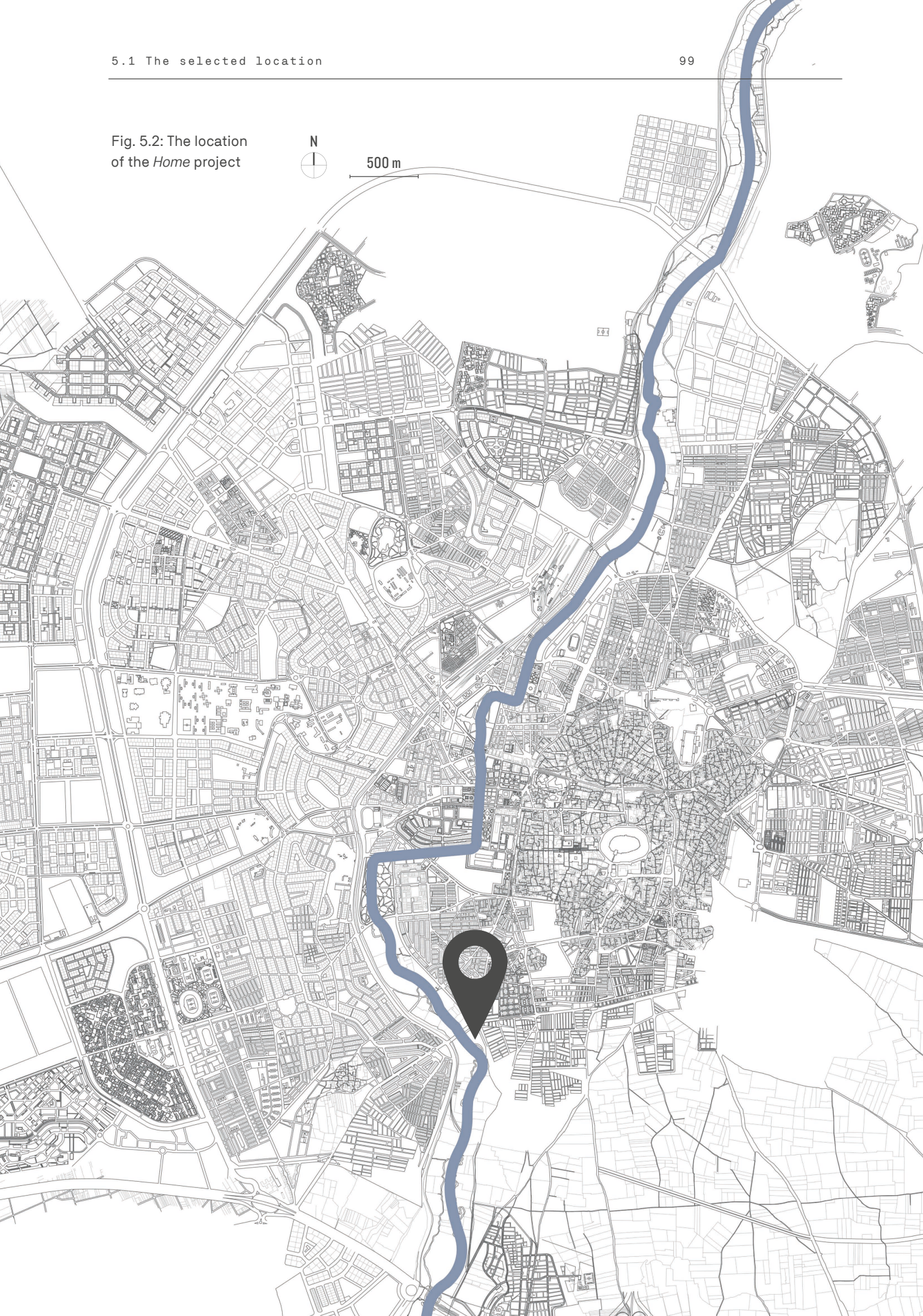


Fig. 5.2: The location of the *Home* project

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Fig. 5.3: Site plan of the *Home* Project

Future residental areas with parks

Future parks and gardens

5.2 The concept and the aspects to be achieved

The aim of the post-war housing typology is to offer the middle/poor class of the residents of Aleppo, who were living in the southern informal settlements and who lost their homes during the war, a new way of living in a short time. The typology is one the hand suitable for the climate there and on the other hand takes the social and historical background of the Syrian society in consideration. At the same time, it seeks to solve many problems which the current housing system is suffering from and give the river its importance back as an essence of the city, which has been forgotten for a long time.

The new housing system is based on the following aspects

5.2.1 Environmental & Economic
5.2.2 Traditional architecture as an inspiration
5.2.3 Social
5.2.4 Saving construction time
5.2.5 Living and working
5.2.6 Underground parking lots

Fig. 5.4: View from the citadel

5.2.1

Environmental & Economic

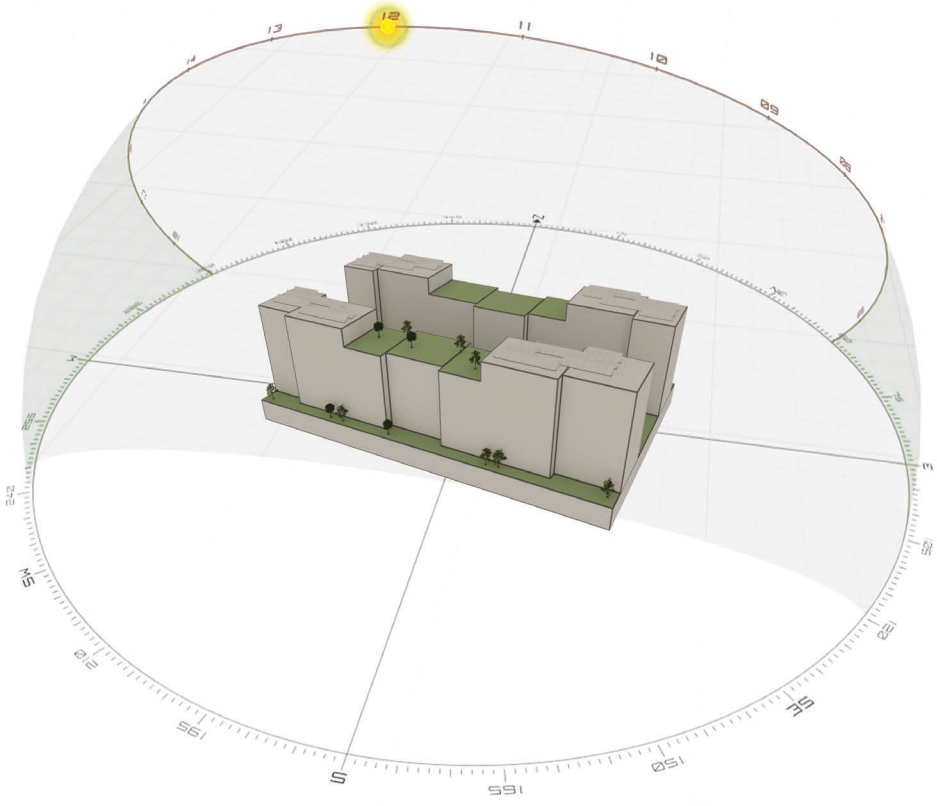
The environmental aspect is a prominent aspect to be considered, not just for its importance to design a sustainable building, as in Syria this became a must due to the desertification problem. But also, this aspect has a big influence on the economic situation because in Syria in general and in Aleppo in specific, a full reliance on technical mechanical power is not available. Electricity is not obtainable 24 hours a day to be used for heating and cooling and using burning fuel as a resource of energy causes a lot of pollution. So, the renewable energy should be a main source of power.

The best orientation of the building in Aleppo City is 195 degrees to the southwest, where it benefits from the southern side to ensure sun-heating in winter and from the west to ensure good ventilation in Summer. Sunlight falls on the longitudinal facade (south), which provides the greatest benefit from the heat of these fallen rays in winter, because the sun's path is long in the south, while the short facades of the building are in the east and west. The sun's path in summer is shorter compared to it in winter and the elevation angle of the sun in summer is higher than it is in winter, which helps to increase the protection from these facades of the summer sun.

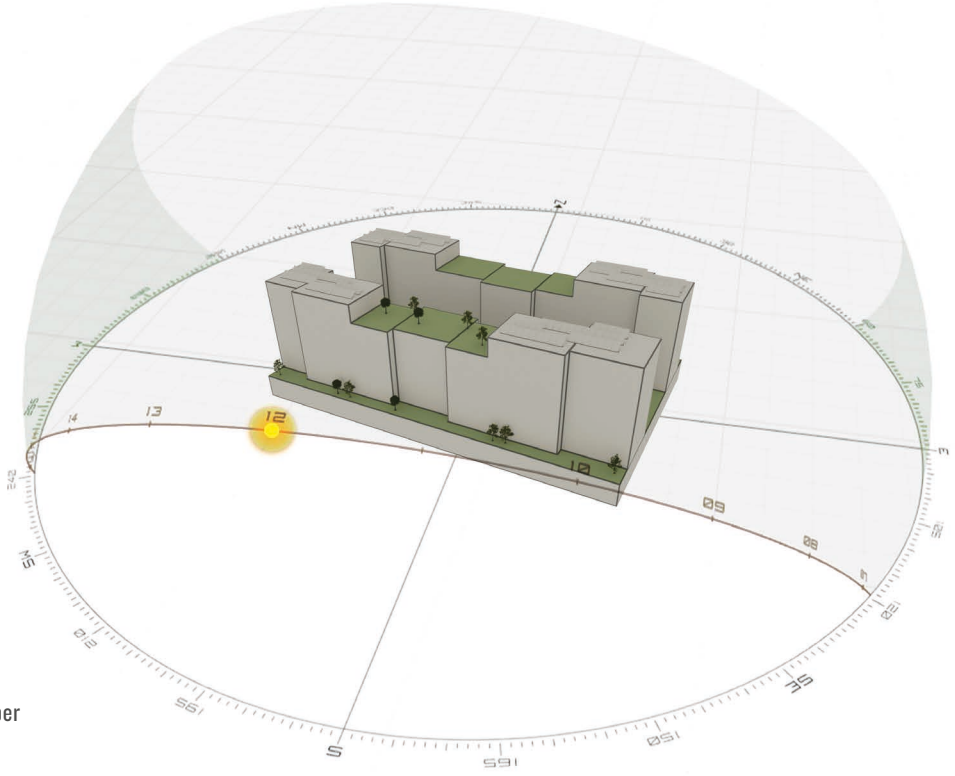
Periods	Dates	solar elevation
Summer Solstice	21st of June	78,6°
Winter Solstice	21st of December	32,7°
Autumnal equinox	21st of September	56,6°
Spring equinox	21st of March	56,3°

Fig. 5.5: Solar elevation angle during the period of the seasonal coup in Aleppo

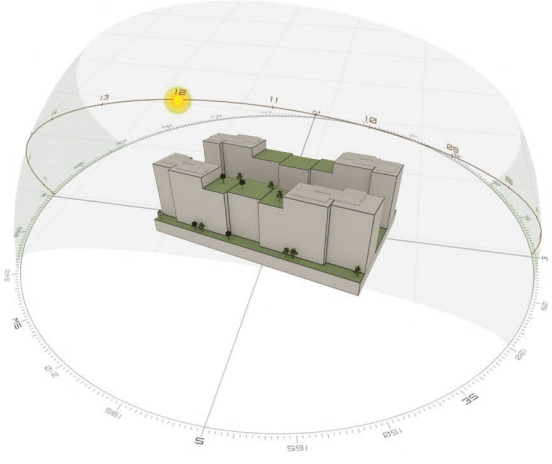
Fig. 5.6: The best direction of a residential building in Aleppo



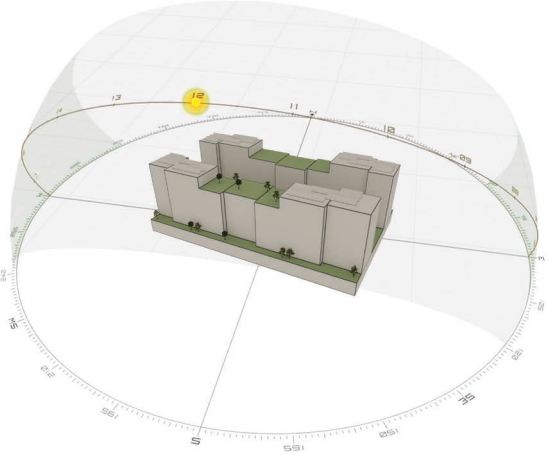
21st of june



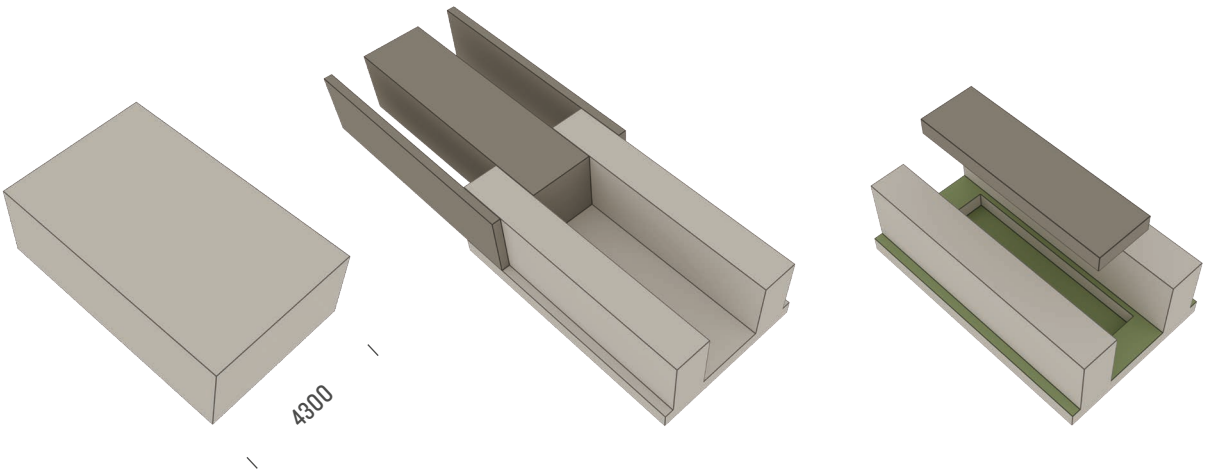
21st of december



21st of september



21st of march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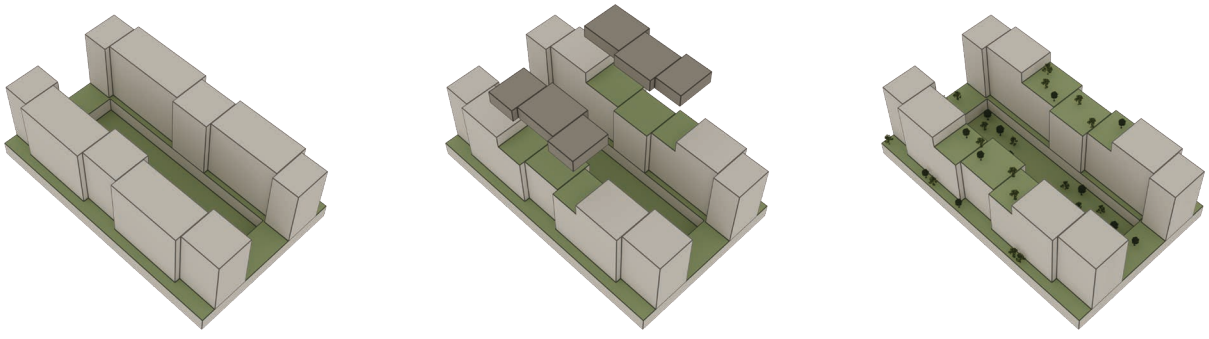


Fig. 5.7: Concept development

The skin and the orientation of the building

The building has a rectangular shape with its longitudinal axis oriented to the east-west axis, with a rotation of 15 degrees from the horizon. The sun rays fall on the longitudinal (southern) facade, which provides the greatest benefit from the heat of these falling rays in the cold periods (winter) due to the long-time of the sun presence in the south.

The short sides of the building are without any opening and they are oriented to the east and west. This orientation of the building provides protection from sunlight in summer since the path of the sun in summer is short compared to it in winter and it is at a higher angle than it is in winter.

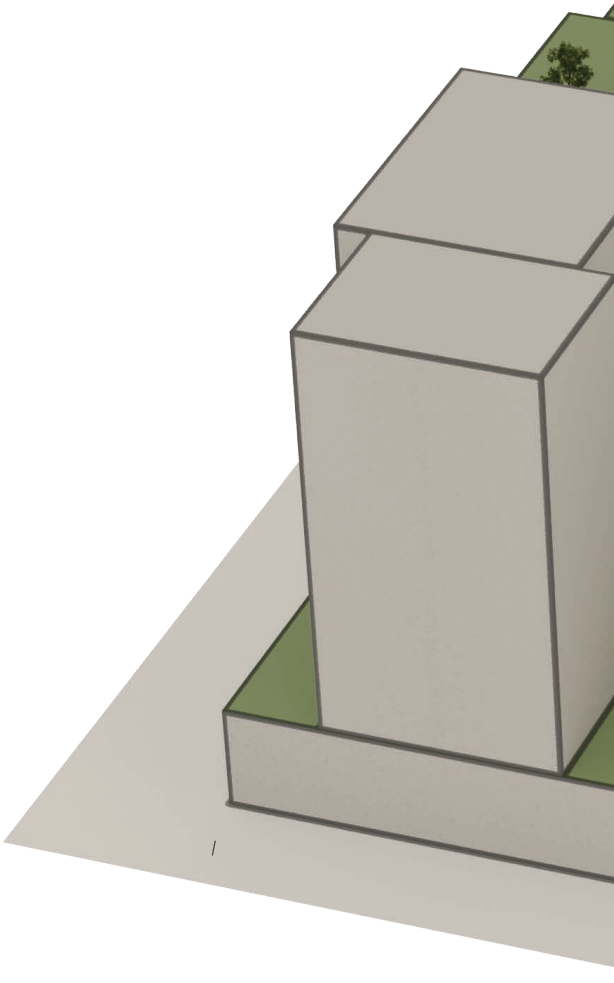
The schematic pattern of the building with a cohesive and compact form, and differences in heights and in facade line reduces the surfaces that are exposed to the influence of the outside atmosphere. At the same time this helps to create shade and to protect from the sun and to move the air around the building because of the temperature differences between the shaded areas (low pressure zones) and sunny areas (high pressure zones).

Fig 5.8: The orientation
and the form of the *Home* project

The green layers

1 The inner courtyard has a rectangular shape and its longitudinal axis is oriented with the west-east axis. The short sides of the courtyard are open to allow western wind to flow inside it in summer as well as the southern sun rays to access to the building in winter. In addition, the green spaces, the trees and the fountain play a big role in creating shadows and cooling down the temperature in summer.
2 The first-floor terraces are private for the first-floor apartments.
3 The roof gardens protect the roof of the building from the sun in summer and provide thermal insulation in winter, and they can be used by the residents to plant their own vegetables and fruits as they used to do in the war time because they could not go out of their homes to buy groceries. This useful habit could be carried on in the new homes.

As soon as the trees, which are planted in the green spaces of the building get bigger they can be transferred and planted in the fields around the complex. The trees in the north of the location are planted vertically to face the northern undesired wind, to protect the location from it and reduce its speed. At the same time these trees reduce the noise coming from the near streets.



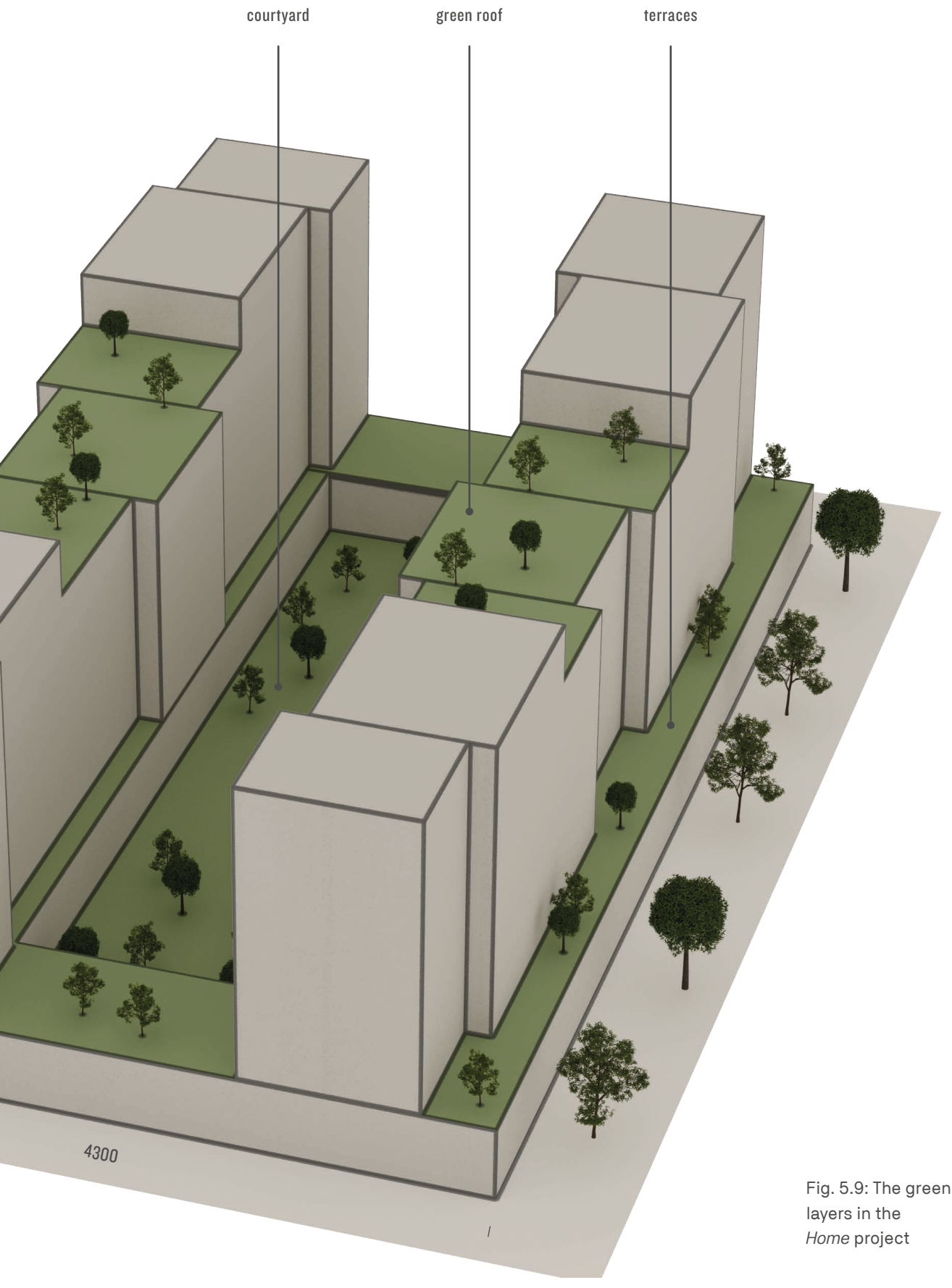


Fig. 5.9: The green layers in the *Home* project

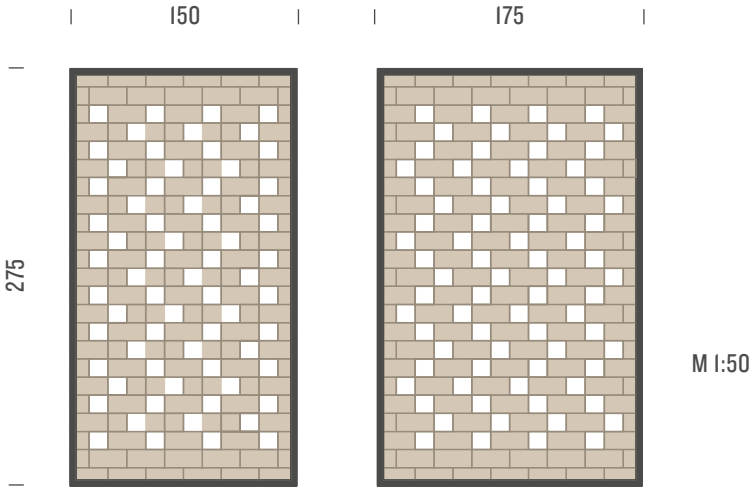


Fig. 5.10: Front view of the brick panels

The clay brick sliding panels

These panels are designed in a way to allow the residents to control the sun and wind flow inside the flats and give them the opportunity to have indirect sun in summer. They are in the westsouth and the eastnorth facades, facing each other to let the summer wind (from the west), enter the flats and to create an air circulation when they are open in summer specially at night to cool down the heat. At day they can be closed on the southern façade to reduce the flow of the sun radiation. In winter they can be open at day in the southern façade to allow the sun rays to enter inside the flats and increase the heat gain.

The panels have two sizes – 150/275 cm and 175/275 cm and they consist of a light steel frame with Flexbrick units inside it, which are distinctive for their light weight (less than 1 kg per unit) and their thin depth (3 cm). Also, they can be produced in different sizes. The used size in the project is 25 cm width by 12 cm height.

Fig. 5.11: The function of
the sliding clay brick panels

The Solar panels.

Before the war the electricity in Syria was available for 95 % of homes, and even in these homes the electricity was cut for approximately 4 hours a day. During seven years of war the transmission network and power stations including the Aleppo thermal power plant and three hydropower dams have been destroyed tactically and accidentally, leaving Syrians predominantly reliant on heavily polluting and expensive diesel generators to keep the lights on. This condition opens the eyes of Syria to the importance of renewable energy. Many solar panels systems were installed on the roofs of hospitals and refugee camps.

In the project 172 solar panels in the size of 99/164 cm with 265 Watt will be installed on the roof of each building. This means 45,58 kWh, by assuming 6 hours of sun a day they produce 273,48 kWh/day. So, each flat of the 36 flats will get 7,6 kWh/day. The average family of four people needs 16 kWh/day, so they can receive almost half of the energy from the use of the solar panels.

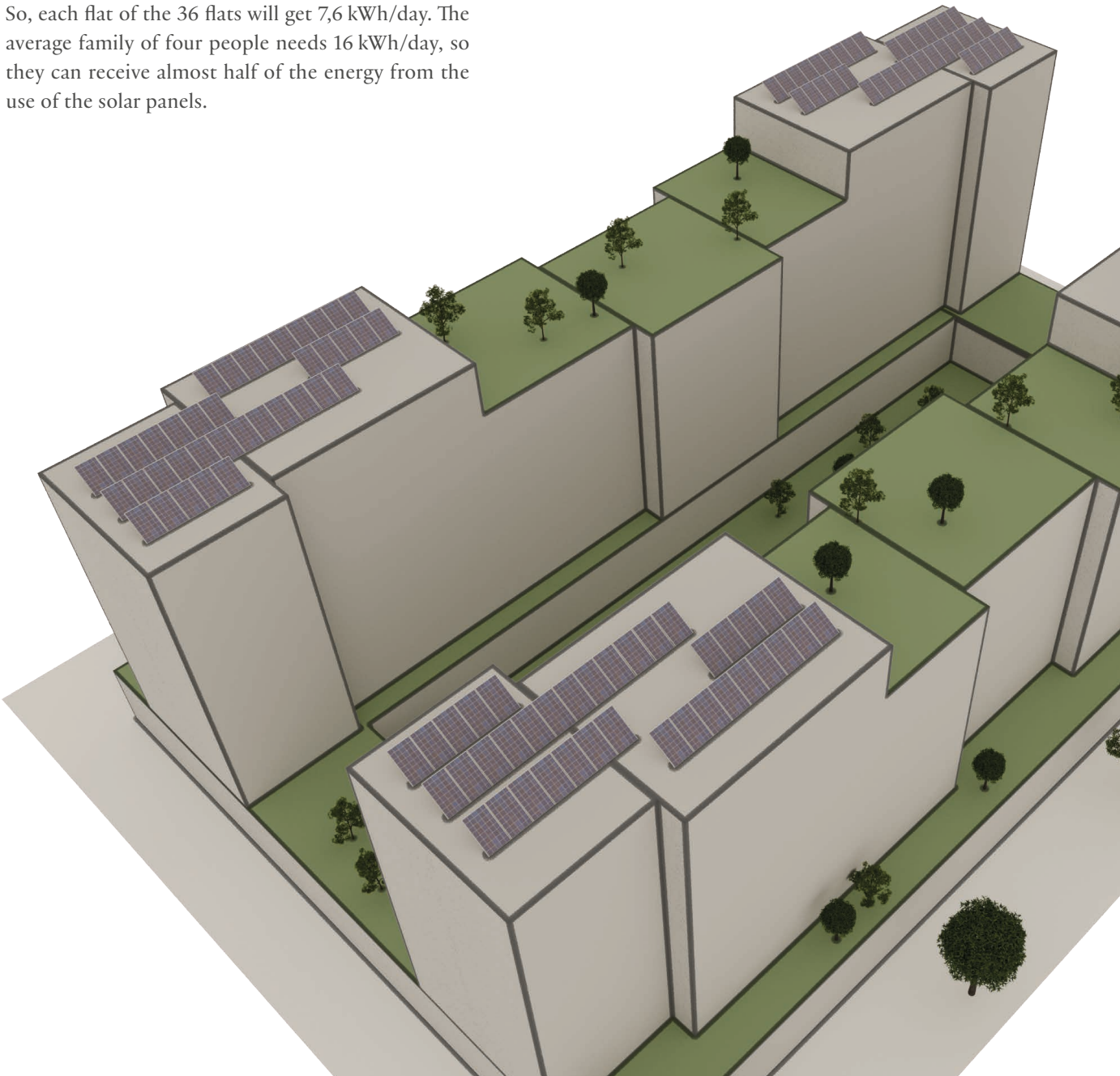


Fig. 5.13: The solar panels on the roof of a hospital in Aleppo

Fig. 5.14: The solar panels on the roof of a refugee camp in Aleppo

Fig. 5.12: The solar panels on the roof of the *Home* project

5.2.2.

Traditional architecture as an inspiration

The inspiration of the project came from the courtyard house which is considered as one of the most enduring architectural forms – transcending regional, historical and cultural boundaries. Its balance of simple and appropriate construction, environmental control and social and familiar structures continues to engage architects and architectural historians. This typology of housing, despite its importance, was unfortunately no longer considered in the Syrian housing systems in the late centuries. The homes started to take other forms influenced by the European and many other styles and the wrong use of construction techniques.

This project is trying to revive the following aspects of the traditional courtyard house.

Al Mashrabiya: The sliding clay brick panels

This is a very important architectural element to be used in hot weather. It is a wooden balcony located on the outer façade of the house. It provides a cool screened space which controls the passage of light and air flow, reduces the air temperature, increases humidity of air and ensures privacy.

Because wood became a rare building material due to the desertification, the wooden balconies of Al Mashrabiya are implemented as balconies with clay brick sliding panels.

Fig. 5.15: The traditional Mashrabiya

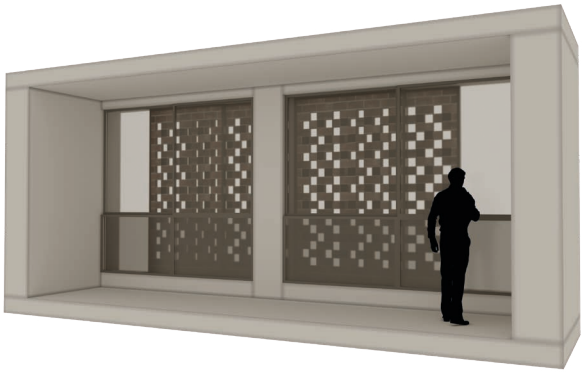


Fig. 5.16: Al Mashrabiya in the *Home* project

The inner courtyard

Courtyards exist since thousands of years and it was one of the elements of Mesopotamian (Sumerian and Babylonian) architecture. With the development of the Arabic architecture, the courtyard became an essential typological element. The traditional courtyard house is one of the most common building typologies in Syria. It can be found in all Syrian cities, just as it can be found in all Mediterranean countries. A number of famous courtyard houses are in Aleppo.

This building typology is characterized by a small number of relatively small openings in the external façade, and a large number of openings onto the inner courtyard which is known for its trees and fountain that create a microclimate system that helps to cool down the temperature in summer. The inner courtyard was the private open space for the family. In the project it is the green open private space for the residents.

Fig. 5.17, 5.18:
The inner courtyard in a traditional courtyard house

The covered gallery called »Al Riwaq«

Al Riwaq is an arcade or portico open on at least one side. Located in the ground floor, it serves as the transition space between the interior and outdoor spaces. As portico or arcade structure, it provides shade and adjustment to sunlight in hot seasons, and cover from rain in winter.

In the project, the concept of Al Riwaq is implemented as a connecting element between the workshops, the inner courtyard and the shopping street.

Fig. 5.19: Al Riwaq in Shibani church

The building materials

The building materials locally available have greatly influenced the construction and the shape of the Syrian courtyard house. The abundance of stone in the area made it the main building material in the construction of the courtyard houses. Walls are frequently formed by layers of white and black stones to create a pattern called Al Ablaq which forms a distinctive characteristic of the courtyard houses in Aleppo. From here Aleppo became its name Al Shahba, which means «the white-colored mixed with black» because it is famous for its white marble.

The massive stone walls (ca. 70 cm) create a big thermal mass and isolation which provide a comfortable climate inside the house, which keeps it cool in summer and a warm in winter. Later the concrete became the main building material. The wrong construction methods without using any isolation led to many problems in the current housing typologies in Syria. The inner climate of the flats is affected by the changes of the outside climate (hot in summer and cold in winter). Possessing the most developed commercial and industrial plants in Syria, Aleppo is a major center for manufacturing building material, especially precious metals and stones.

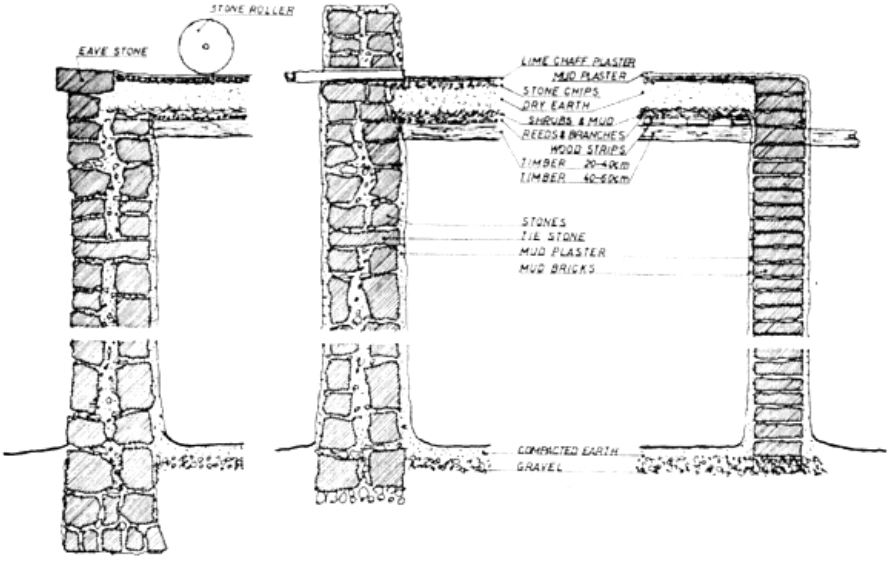


Fig. 5.20: Detailed drawing for a traditional stone and mud brick wall with flat roof

Fig. 5.21: White stone buildings in the old city

In order to improve the current housing situation and inspired by the traditional construction methods, the idea of using clay brick as the main building material in the project, resulted. Clay brick is a natural building material which can be produced locally from abundant natural clay and shale resources. It is fire-resistant up to one hour and it is insect-proof. It has a lot of thermal mass, which helps to retain heat. Its mass qualities keep homes cooler in the late spring and warm in winter. Improved manufacturing processes use less energy and reduce emissions. It has good good acoustic protection and is able to hinder the sound from outside. Also a long life cycle, durabilty, low maintenance and no painting required. It is recyclable and biodegradable, thereby reducing its embodied energy. It additionally offers lower utility expense.

Brick's natural beauty is timeless and the design possibilities are endless. Brick's longevity and local availability makes it to one of the greenest building products made today.

The structure of the walls used in the project consists of the inner layer of clay brick (38 cm thick) which provides high compressive strength and high thermal mass while the outer layer is insulated. The walls on the east and west facades are massive and solid without any opening to provide protection from the sun rays falling on these facades in summer. The double glass sliding windows with the sliding Flexbrick panels are on the south and north facades to allow the thermal exchange between the inner and outer environment (sun in winter and air flow in summer).

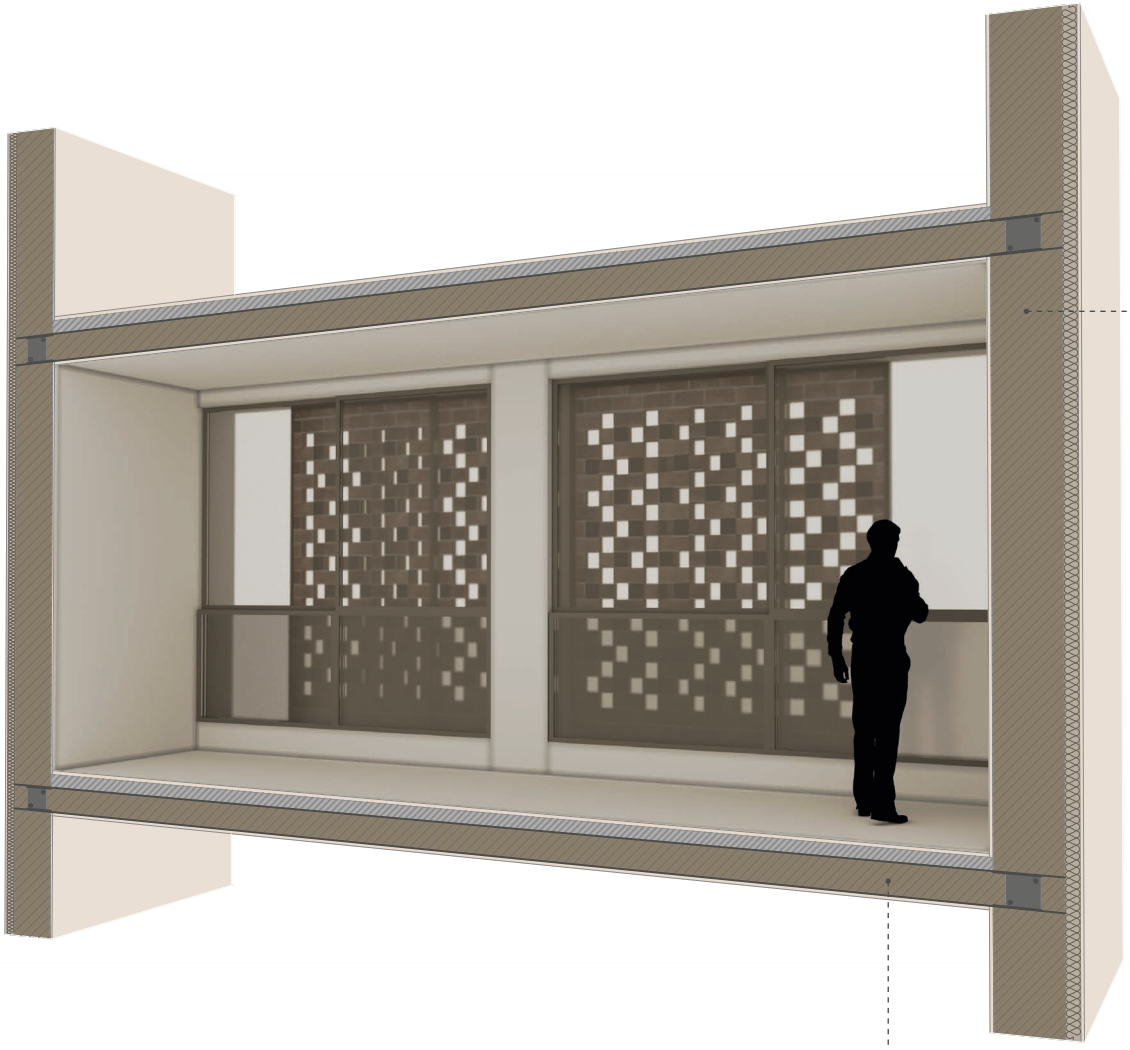
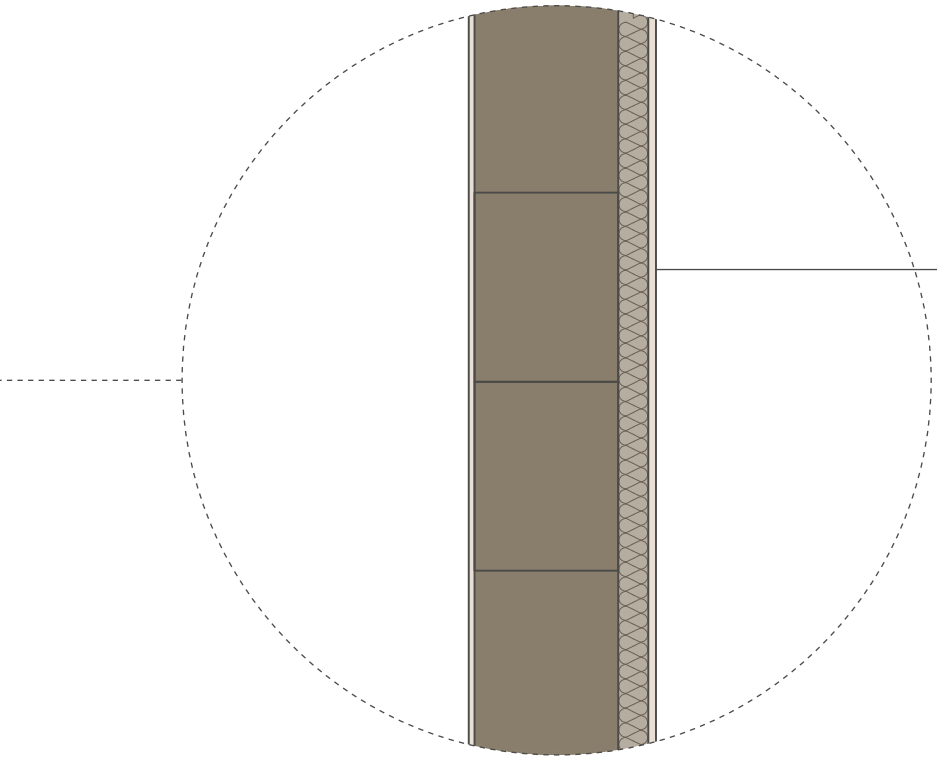
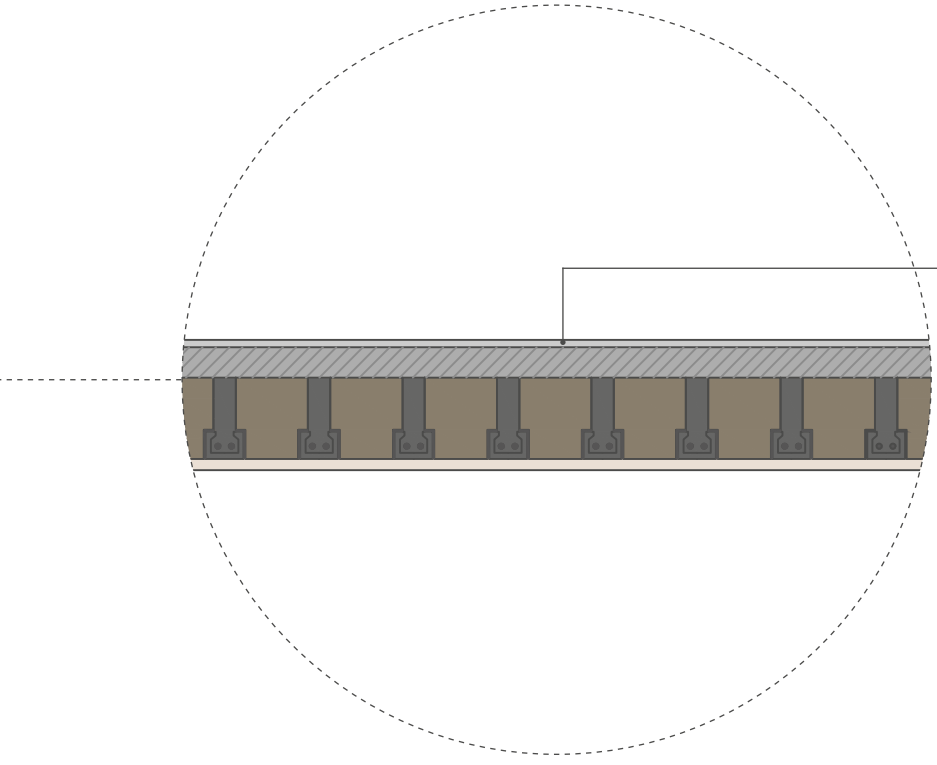


Fig. 5.22: Detailed drawing of a wall and floor structure in the *Home* project



Wall detail
M 1:20

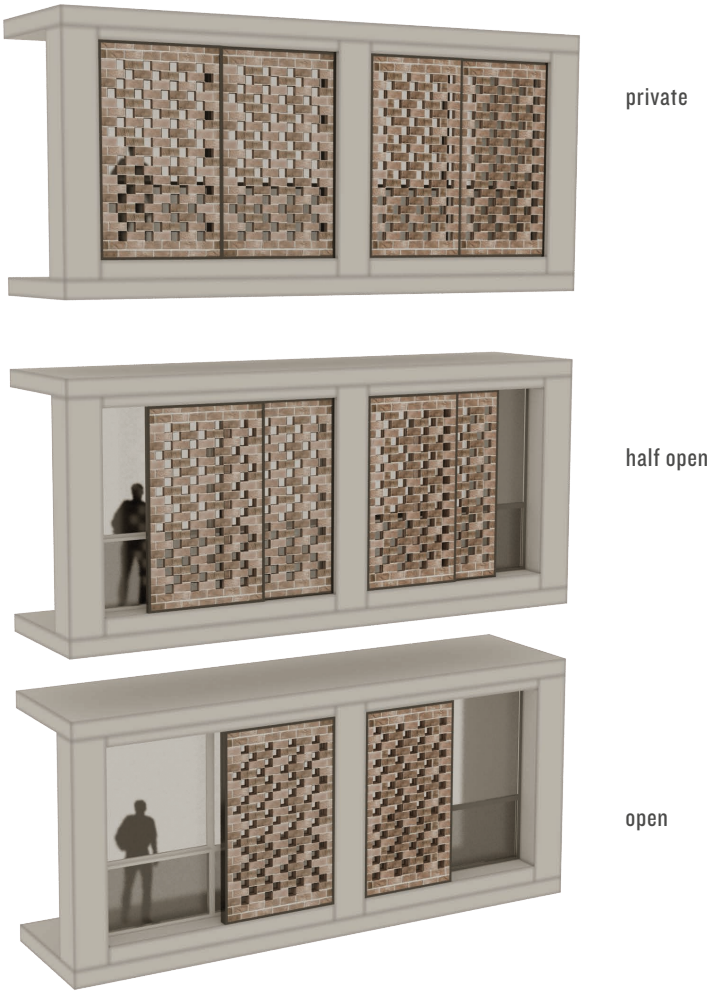
Plaster 15 mm
Clay brick 380 mm
Isolation 80 mm
Plaster 20 mm



Floor detail
M 1:20

Flooring 20 mm
Floor screed 70 mm
Clay brick 210 mm
Reinforcement steel
and grouting concrete
Plaster 20 mm

Fig. 5.23 The condition of
the balconies in Aleppo



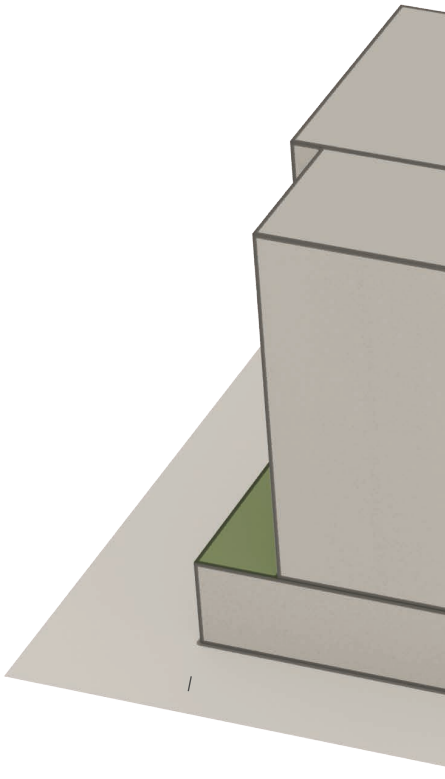


Fig. 5.24: The balconies in the *Home* project

5.2.3.

Social

Due to the social and religious background in the Syrian society and the hot weather, people prefer not to have balconies because they don't like to be exposed or seen and they want to avoid the sun heat. They cover the balconies either with glass or with curtains.

According to these facts came the solution with the integrated balconies that are covered with glass and Flexbrick panels which allow the residents to have a connection with the outside and give them their privacy at the same time.

Also, the inner courtyard gives the residents an open private green space where they can gather and their children can play safely.

Fig. 5.25:
The inner courtyard in the *Home* project

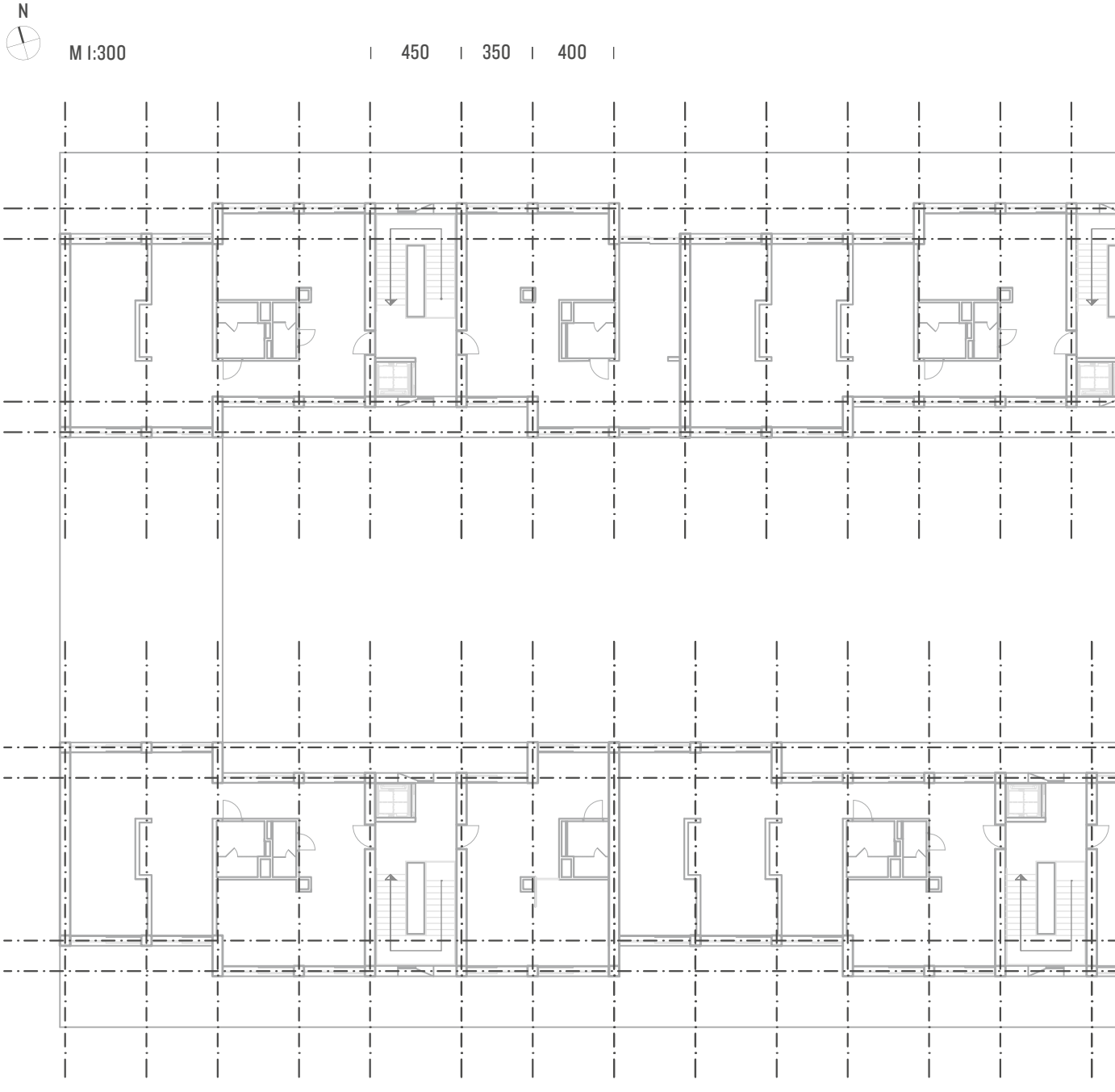
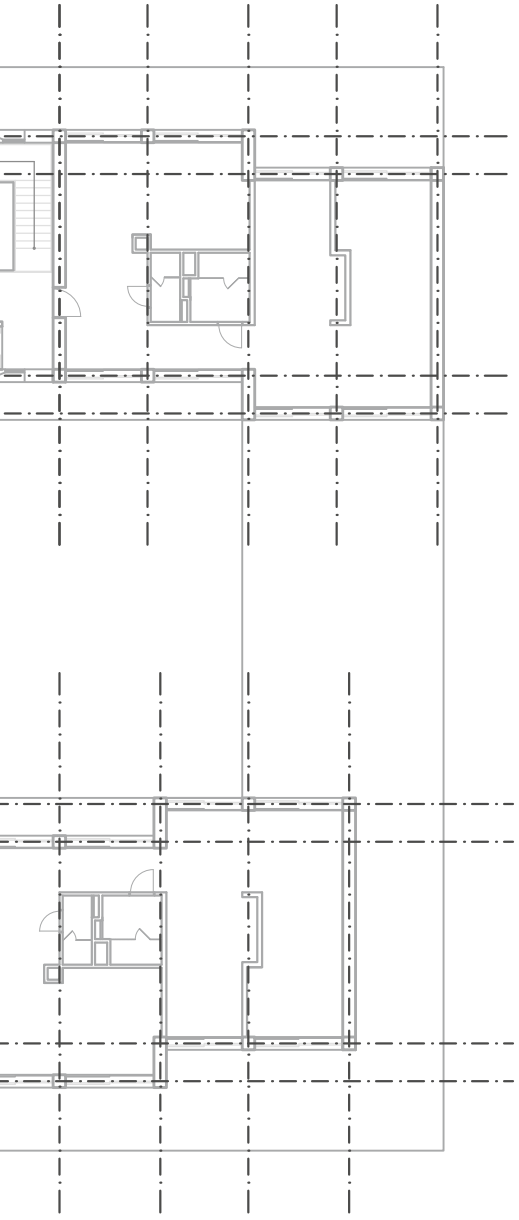


Fig. 5.26: The grid – based on it the *Home* project was designed



5.2.4.

Saving construction time

Reducing the construction time is very important as many people who lost their homes in the war, would like to come back. Portable construction, in addition to the many benefits that it has, takes significantly less time to build than on-site construction. In many instances, prefabrication takes less than half of the time when compared to traditional construction. The project is designed based on a schematic grid to create modular parts, so that the walls, ceiling slaps and windows have modular and particular sizes to be pre-fabricated and then installed and build together on the site.

Fig. 5.27, 5.28:
The pre-fabricated
brick walls and ceiling

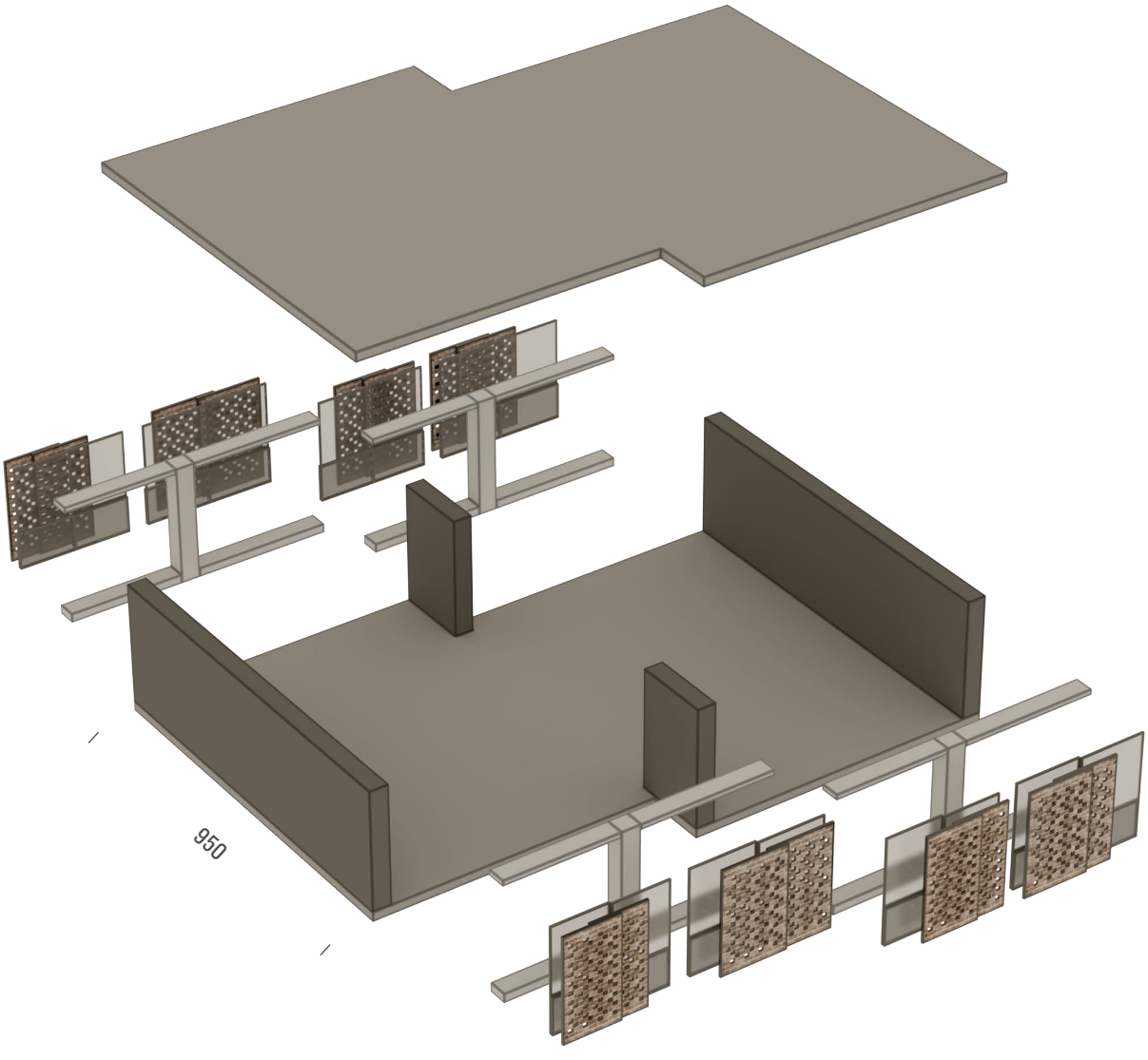


Fig. 5.29: The pre-fabricated parts
of the *Home* project

5.2.5.

Living and working

In the informal settlement and some parts of the old town, living and working is a common aspect, where the craftsmen have their workshops and shops in the ground floor of their homes.

Fig. 5.30, 5.31: The shops in the ground floor in the old city

Fig. 5.32, 5.33: Traffic and parking situation in Aleppo

5.2.6.

Underground parking lots

Finding a parking place is a challenge in big cities in Syria, so cars parks on the sidewalk leaving the pedestrians with no place to walk. The project solves this problem with underground parking garages which leave the ground floor as a car-free shopping zone for pedestrians and bicycles and helps to gain more green areas and reduce pollution.

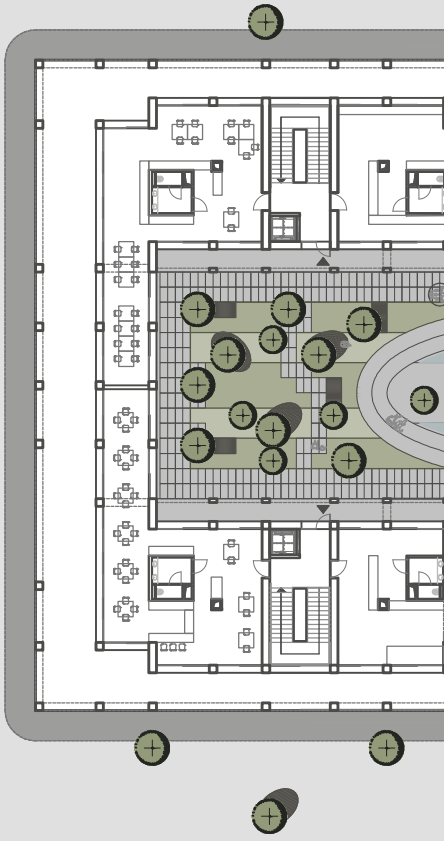
5.3

The project

5.3.1

Description, plans, area use, 3D render

The project consists of **two residential parallel blocks rotated 15° from the horizon** and oriented to the southwest. Each block has an **underground parking garage** and a **social shared ground floor area with inner courtyard.** Beginning from the first floor till the fifth floor there are **36 flats with 2 shared roof gardens.** The floor area of each block is extended on 3000 m^2. Between the two blocks there is a 15 m bright shopping street with arcades for pedestrians and bicycles. On this street there are workshops, shops, cafes and restaurants. The location is surrounded with parks and playgrounds, end up on the southwest with the river. On the north and the east there are two streets for cars.



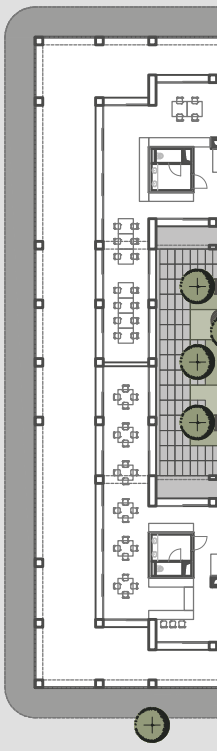


Fig. 5.34:
Ground floor plan

Fig. 5.35: 3D rendering, shopping street

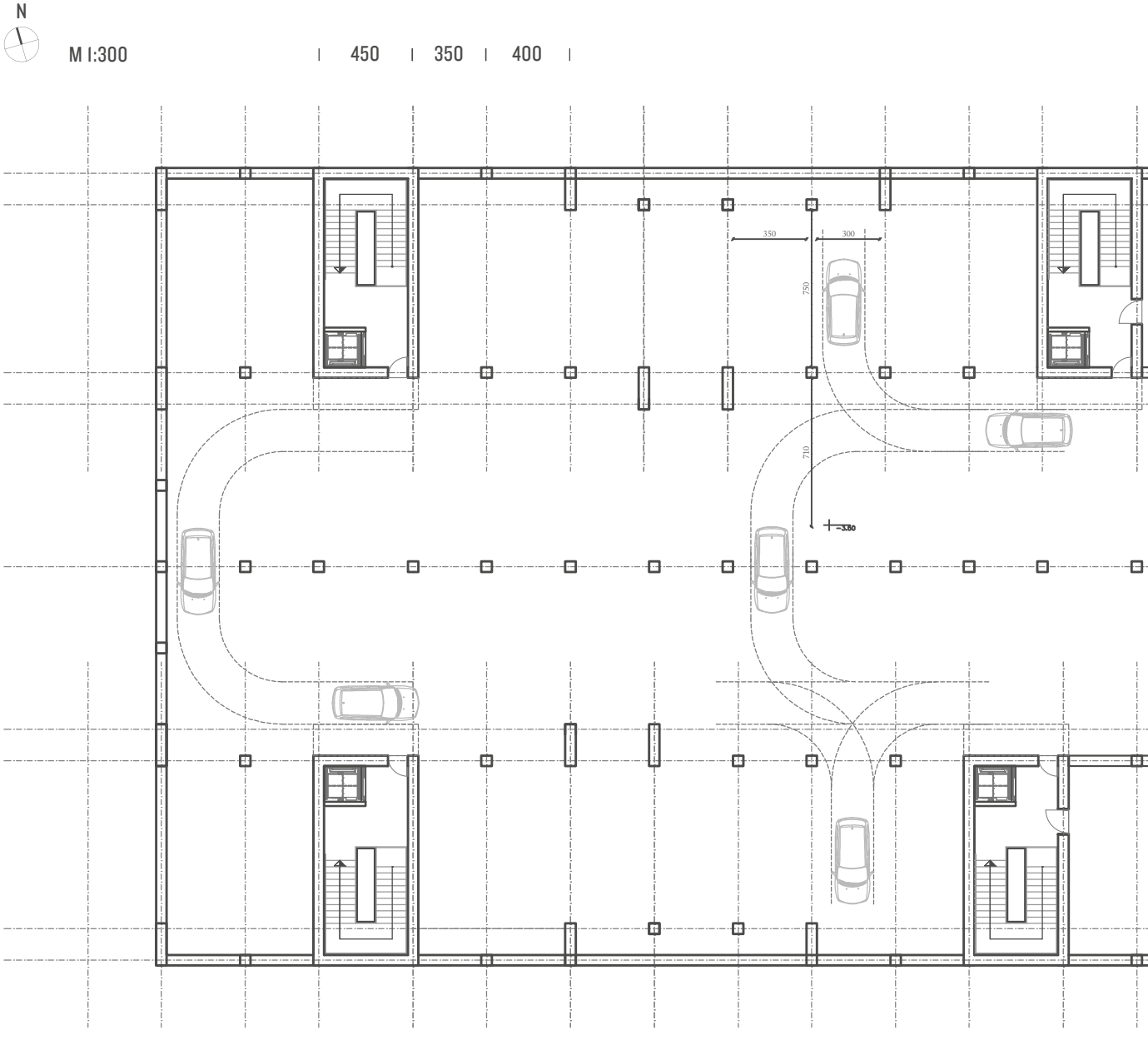
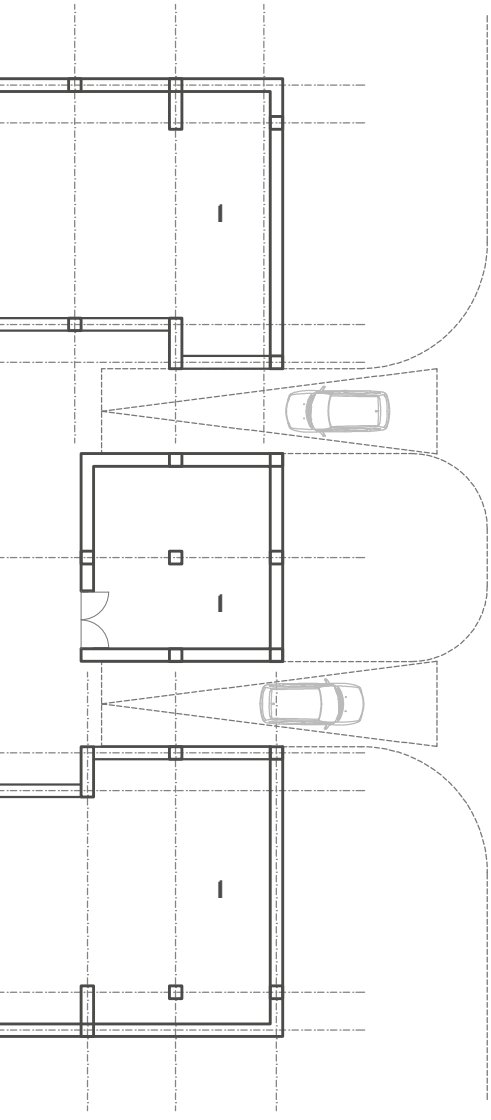


Fig. 5.36: Underground floor plan



I Technical room

Underground floor

The underground floor contains technical rooms and a parking garage for 25 cars. It has two ramps with 15 % slope as an entrance and exit and 7 m bright streets. The garage is connected with the ground floor through 4 staircases with 4 elevators. The resident's storage rooms could be in an optional second underground floor.

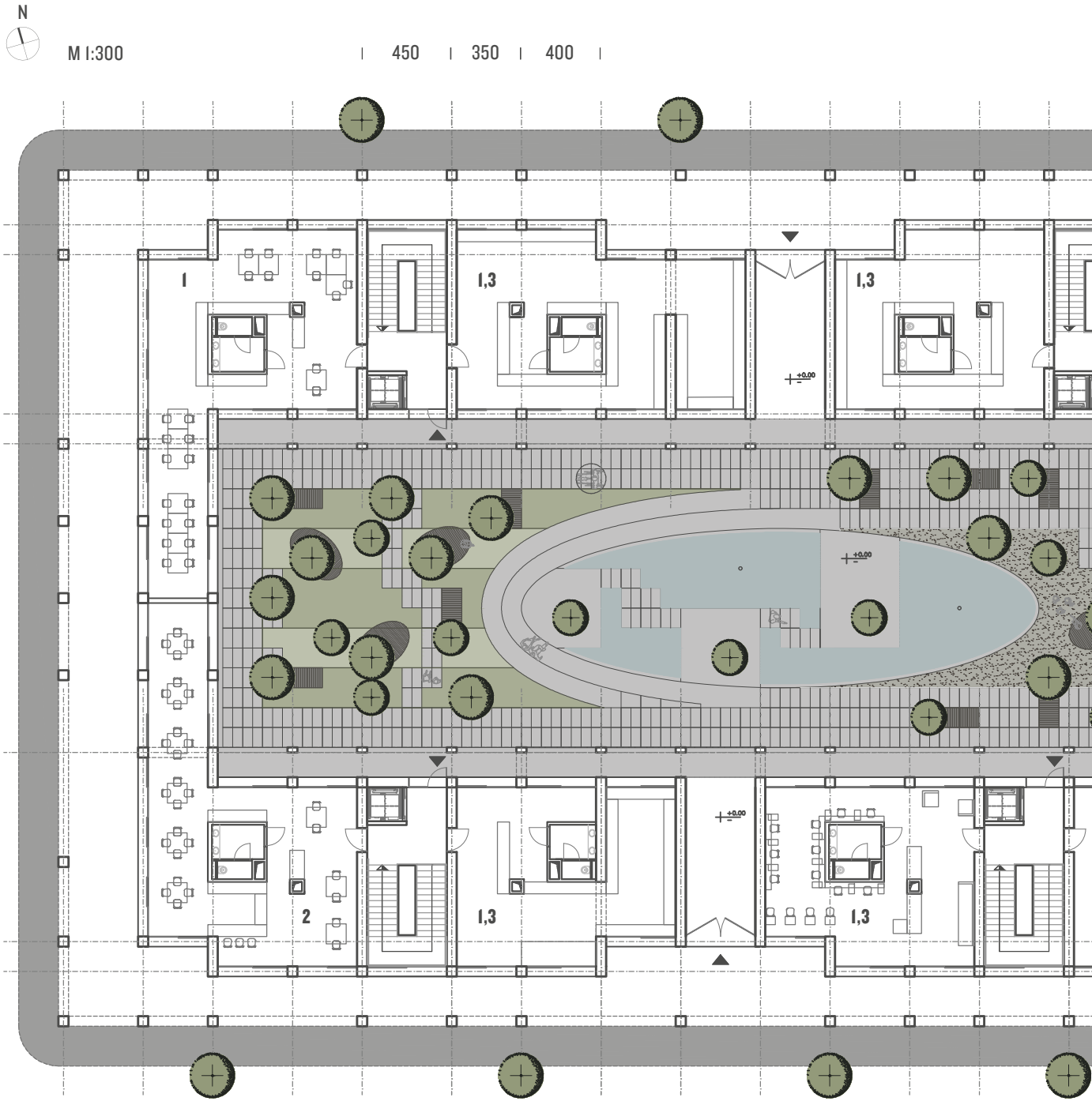
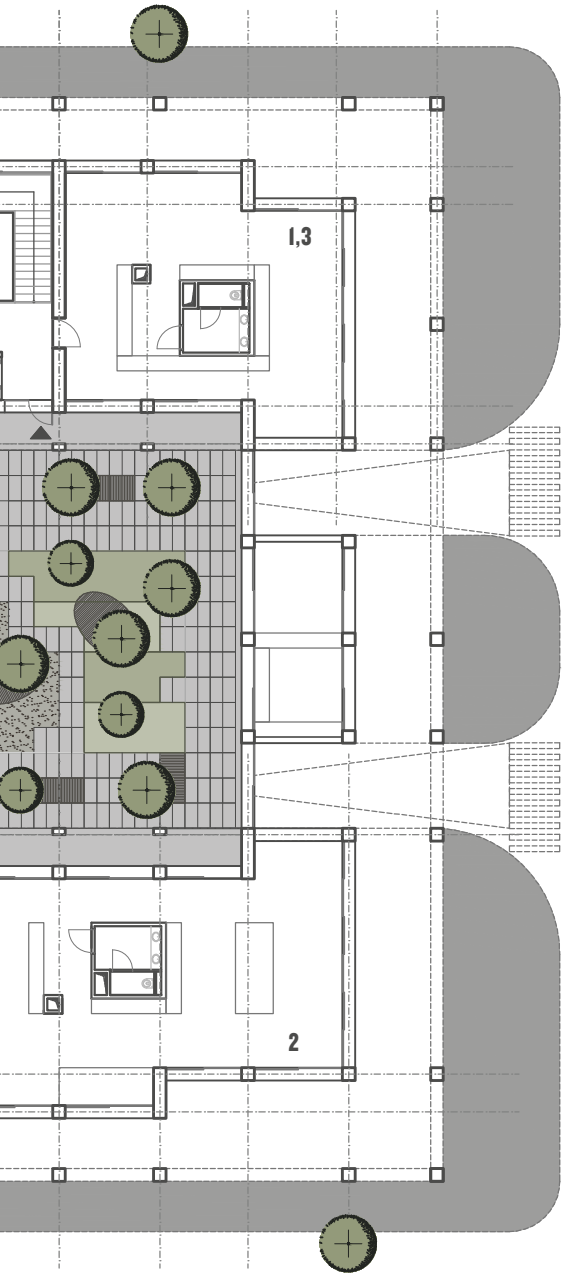


Fig. 5.37: Ground floor plan



Ground floor

The ground floor is the shared private space for the residents where the social activities between the neighbors can take a place. It contains workshops, multifunctional rooms and shops. These halls are connected with an inner courtyard with arched passages which are approximately 1,50 m wide. The inner courtyard with its fountain, green zones and playground can be used by the residents as their open private space.

1 Workshops

2 Mutifunctional rooms

3 Shops

Fig. 5.38: 3D rendering, Ground floor, courtyard

Fig. 5.39: 3D rendering, Ground floor, courtyard

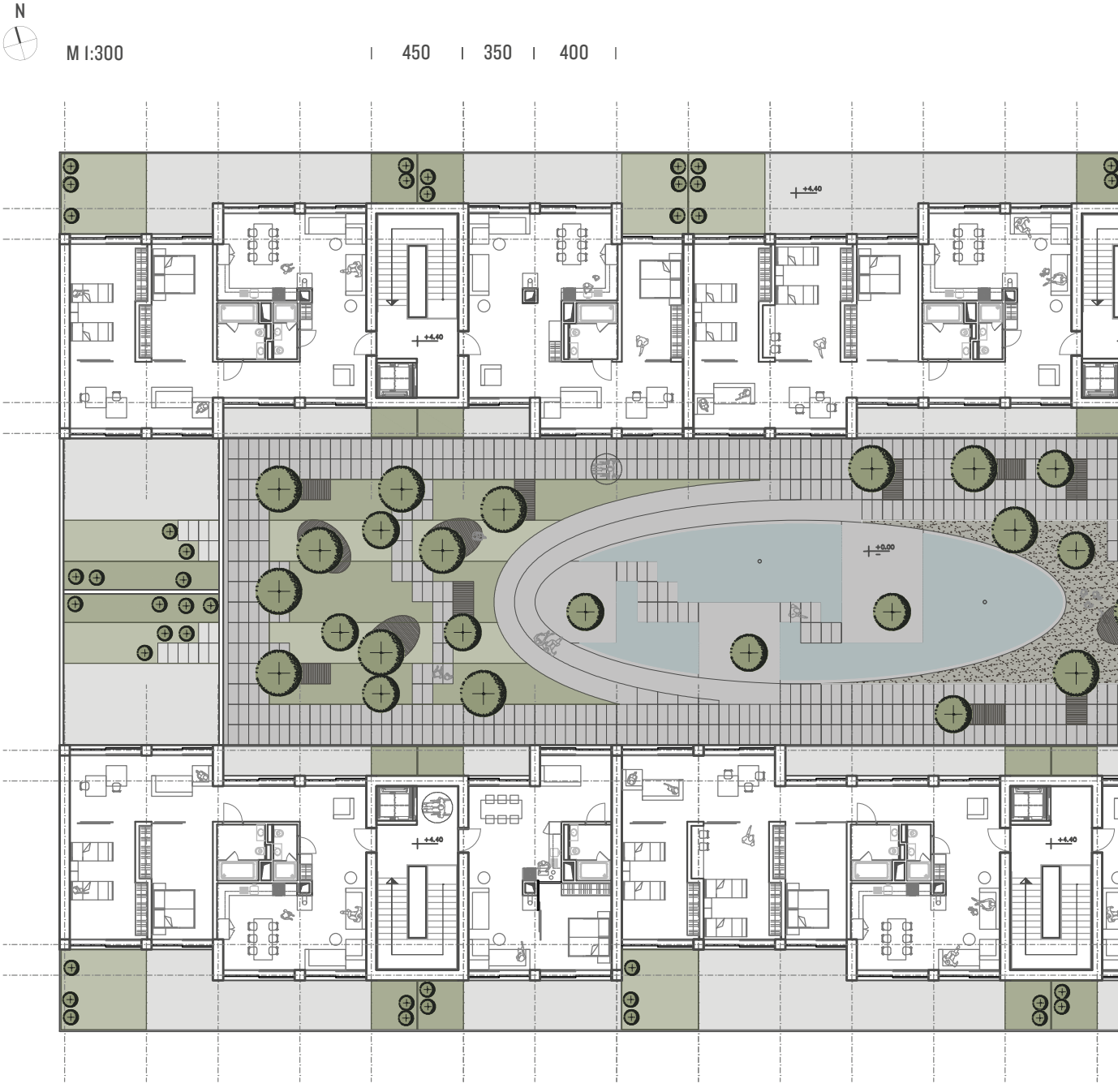
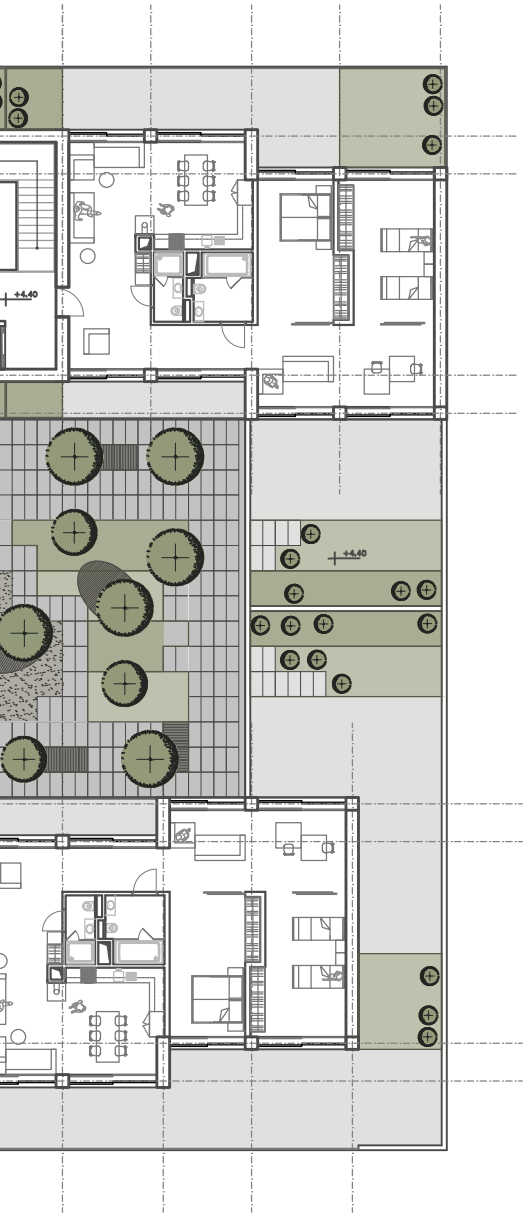


Fig. 5.40: First floor plan



First floor

The first floor includes 8 apartments, 4 staircases and private terraces. Every two flats are reached through a staircase with an elevator. Each apartment has two terraces, one has a view to the inner courtyard and the other to the pedestrian street.

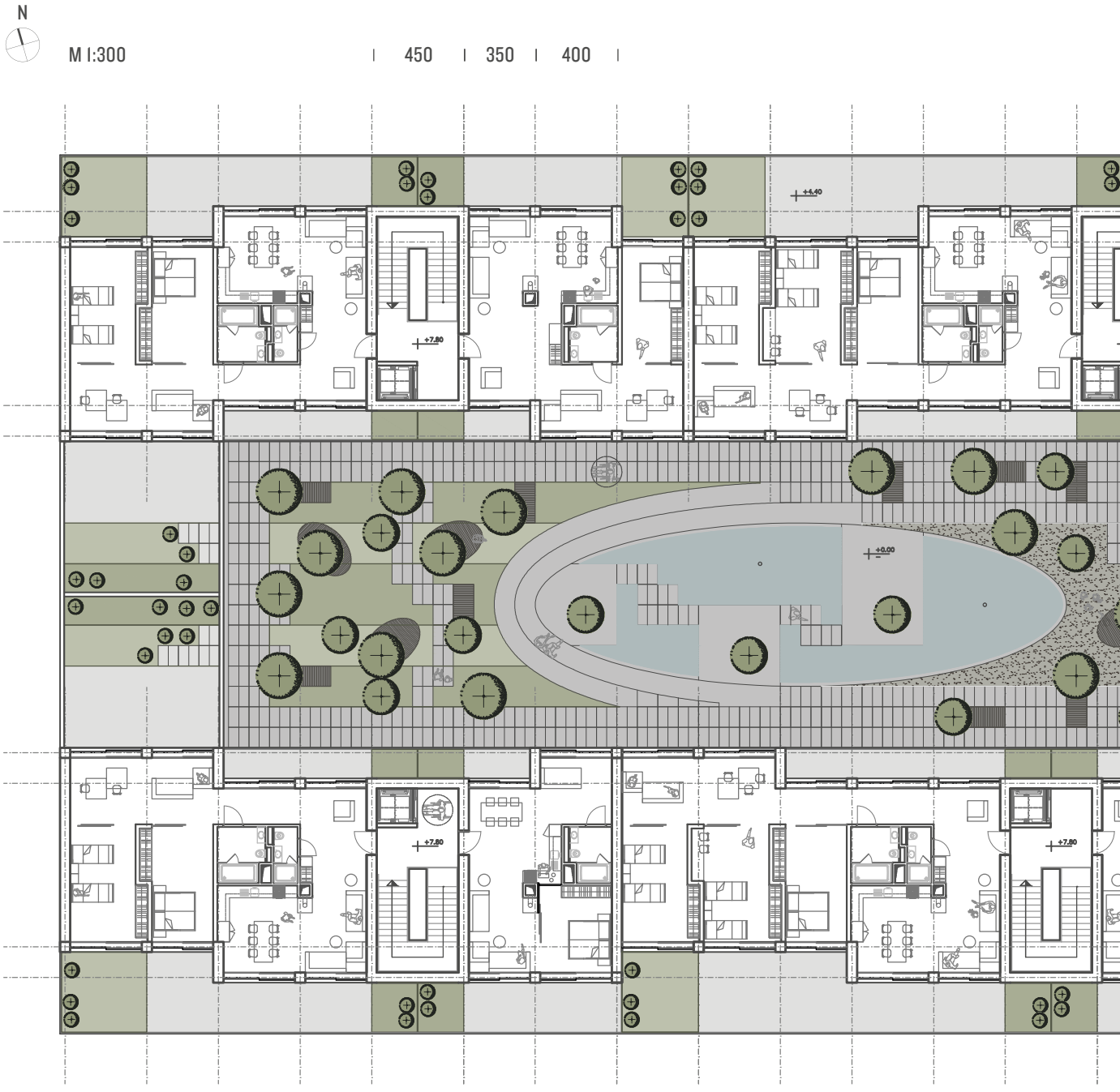
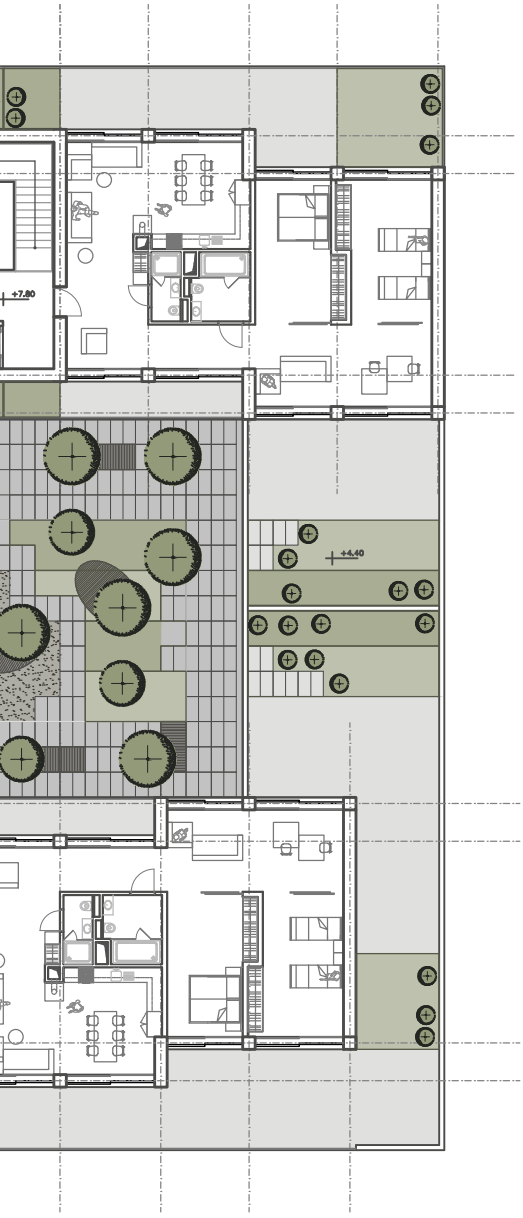


Fig. 5.41: Regular floor plan



Regular floor (from the second to the fourth floor)

Each floor is 3 m high and contains 8 flats and 4 staircases with 4 elevators. One for each two apartments. These modular floors are open from the facades in the southwest and the northeast. The integrated balconies covered with glass and Flexbrick panels, have a view to the inner courtyard and to the shopping street.

Fig. 5.42: 3D rendering southwest facade

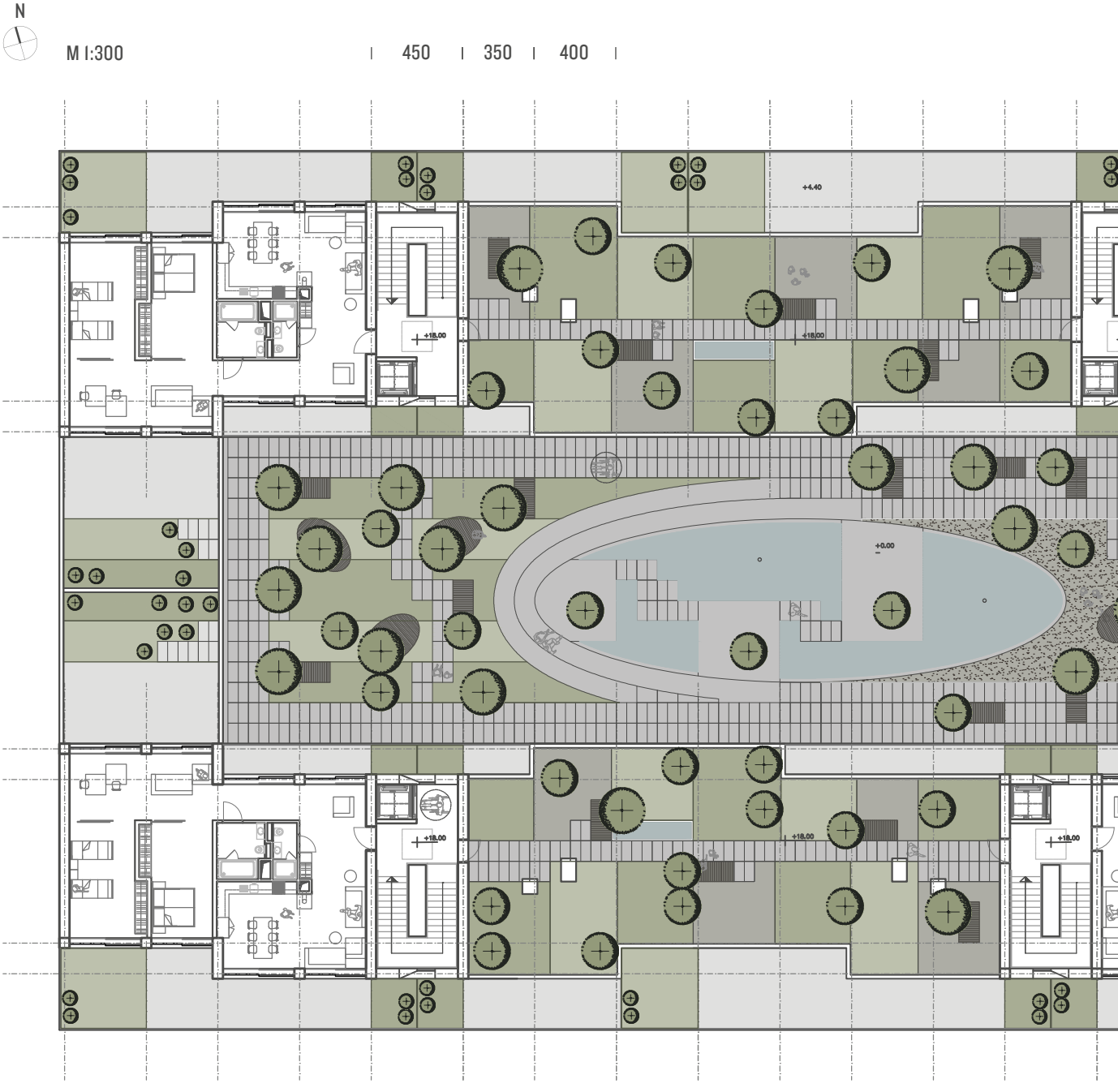
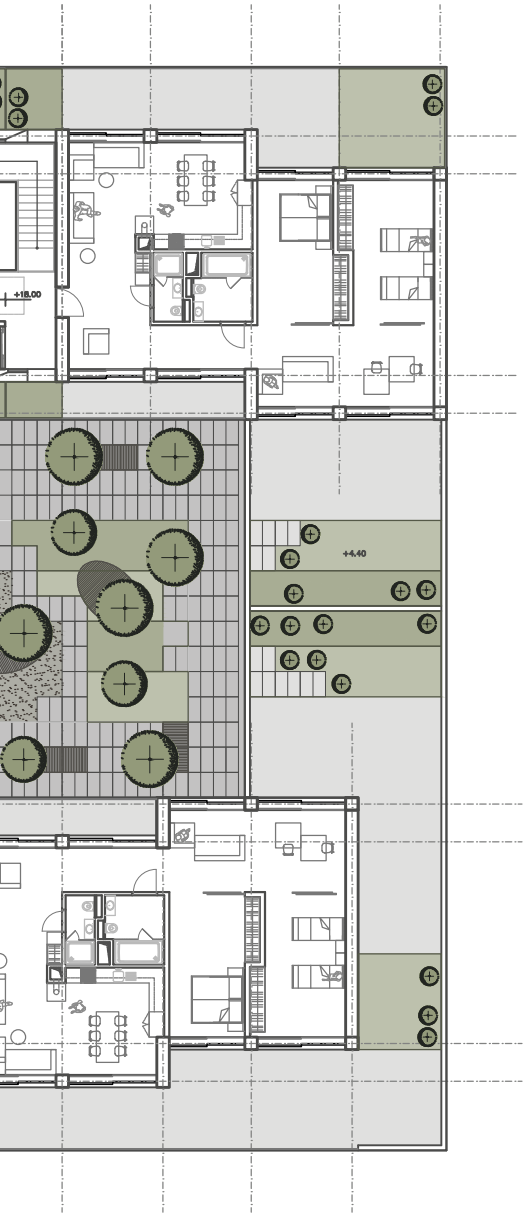


Fig. 5.43: Fifth floor plan



Fifth floor

The fifth floor contains 4 apartments and 2 roof gardens. Each garden can be reached through 2 staircases. The gardens can be used from the residents to grow vegetables and fruits for their private use or for sell.

Fig. 5.44: 3D rendering, roof garden

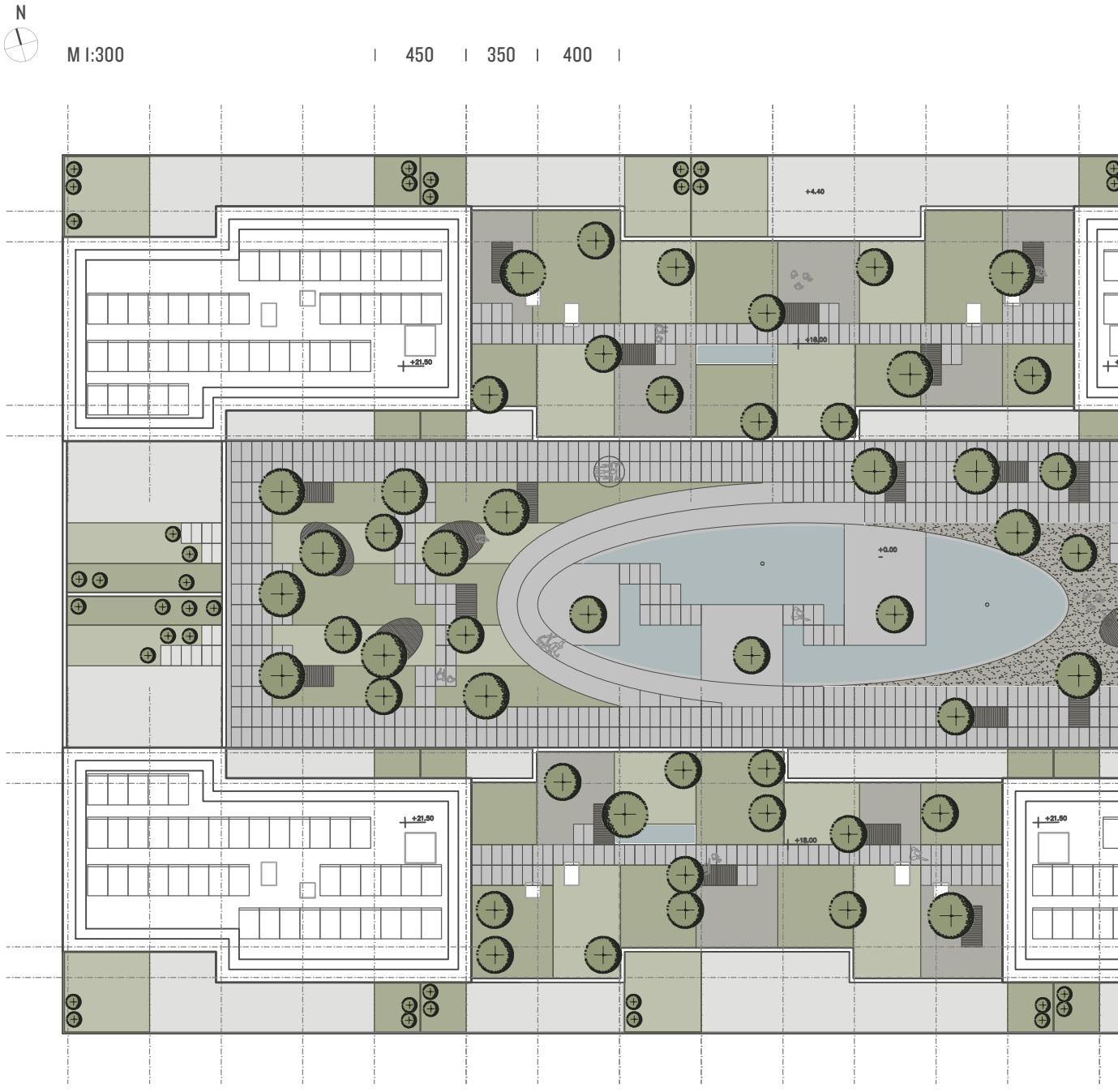
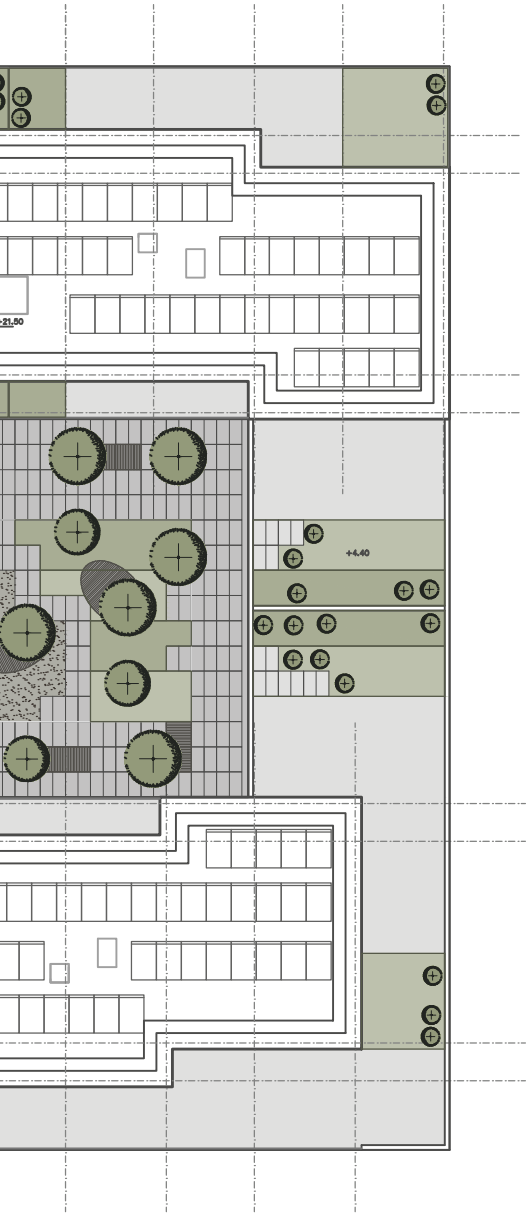


Fig. 5.45: The roof plan



The roof

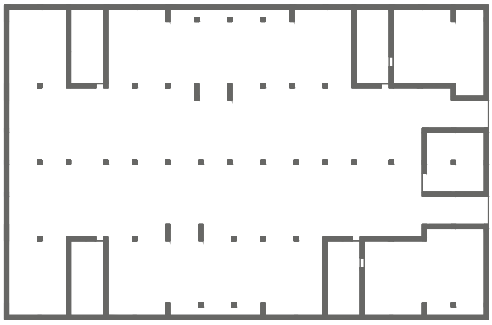
The fifth floor roof is used to install 172 solar panels on top of it to be used as an additional resource of energy for lighting, heating, cooling etc.

Fig. 5.46: 3D rendering, project overview

Area use
Fig. 5.47: Area use plans

Underground floor

Total area 2223 m²



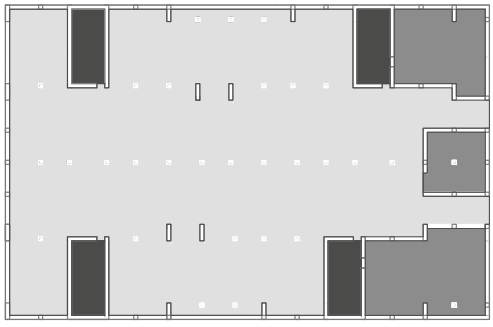
Wall area 113 m²
5 % from total area

Ground floor

Total area 2987 m²

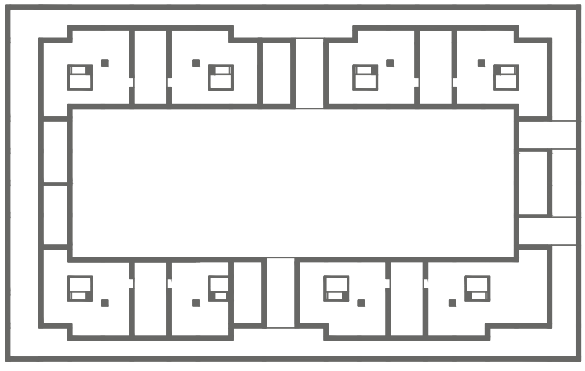
Total build area 2024 m²
67,8 % from total area

Green area 963 m²
32,2 % from total area

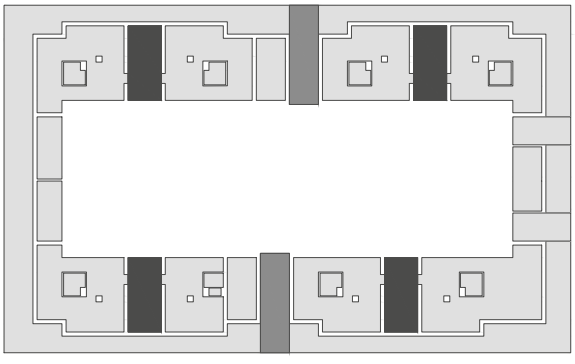


Used area 2110 m²
95 % from total area

Staircase area 144 m²
Technical area 295 m²
Parking space 1500 m²



Wall area 365 m²
18 % from total build area

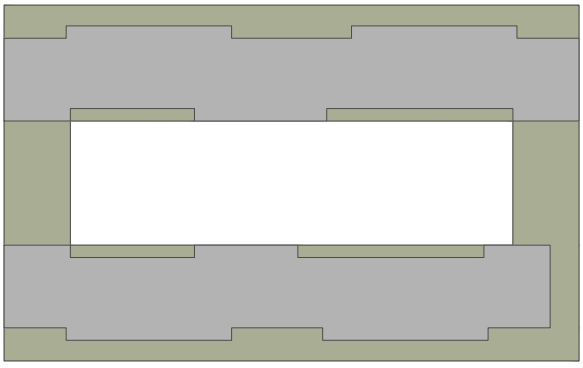


Used area 1660 m²
82 % from total build area

Staircase area 144 m²
Movement area 84 m²
Public space area 1385 m²

First floor

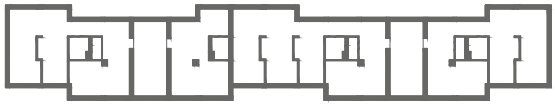
Total area 2186 m²



Total build area 1363 m²
62,3 % from total area

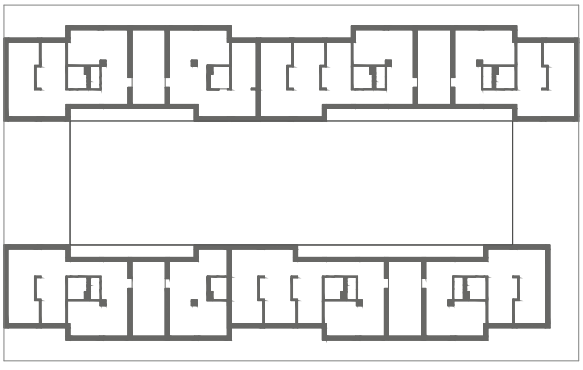
Green area 823 m²
37,6 % from total area

Regular floor

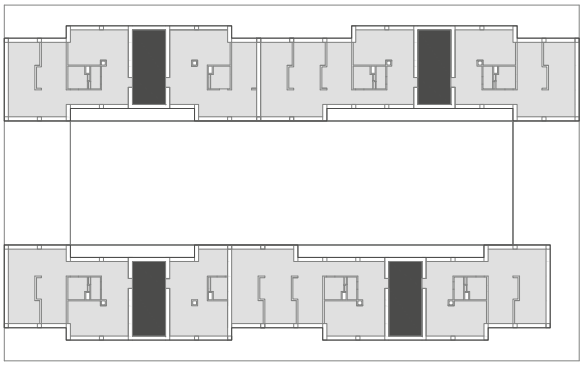


Total area 1363 m²

Wall area 252 m²
18,5 % from total area



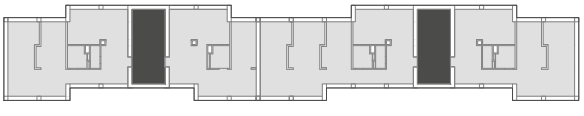
Wall area 252 m²
18,5 % from total build area

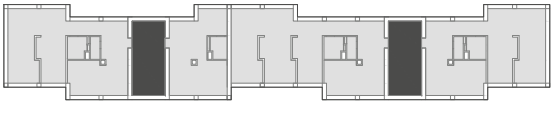


Used area 1111 m²
82 % from total build area

Staircase area 144 m²

Living space area 967 m²



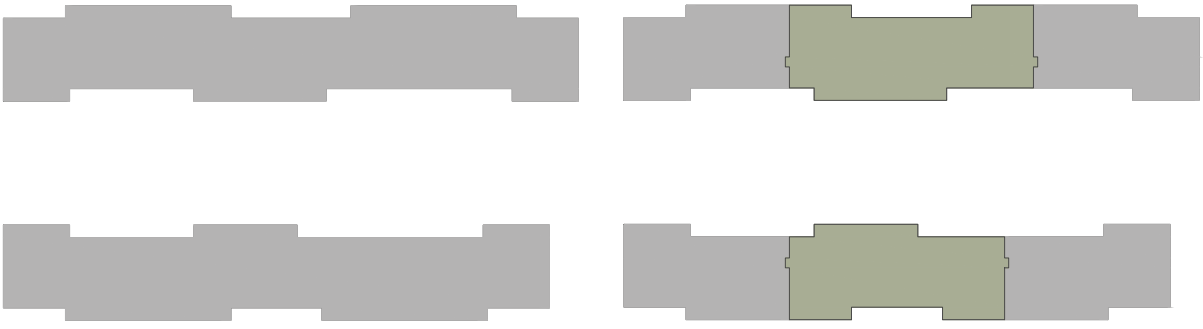


Used area 1111 m²
82 % from total area

Staircase area 144 m²

Living space area 967 m²

Fifth floor



Total area 1363 m²

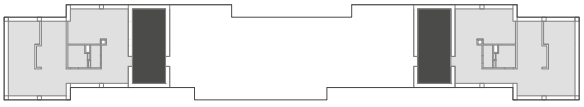
Total build area 800 m²
58,7 % from total area

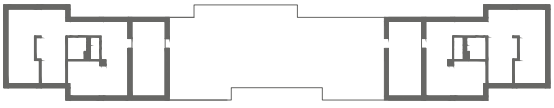
Green area 563 m²
41,3 % from total area

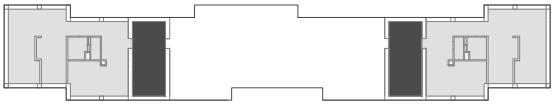
The roof

Total area 800 m²

Wall area 280 m²
35 % from total area





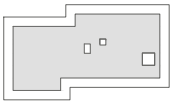


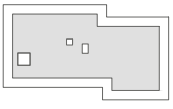
Wall area 160 m²
20 % from total build area

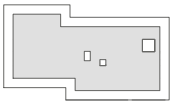
Used area 640 m²
80 % from total build area

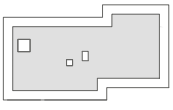
Staircase area 144 m²

Living space area 498 m²









Used area 520 m²
65 % from total area

Fig. 5.48: Southwest facade

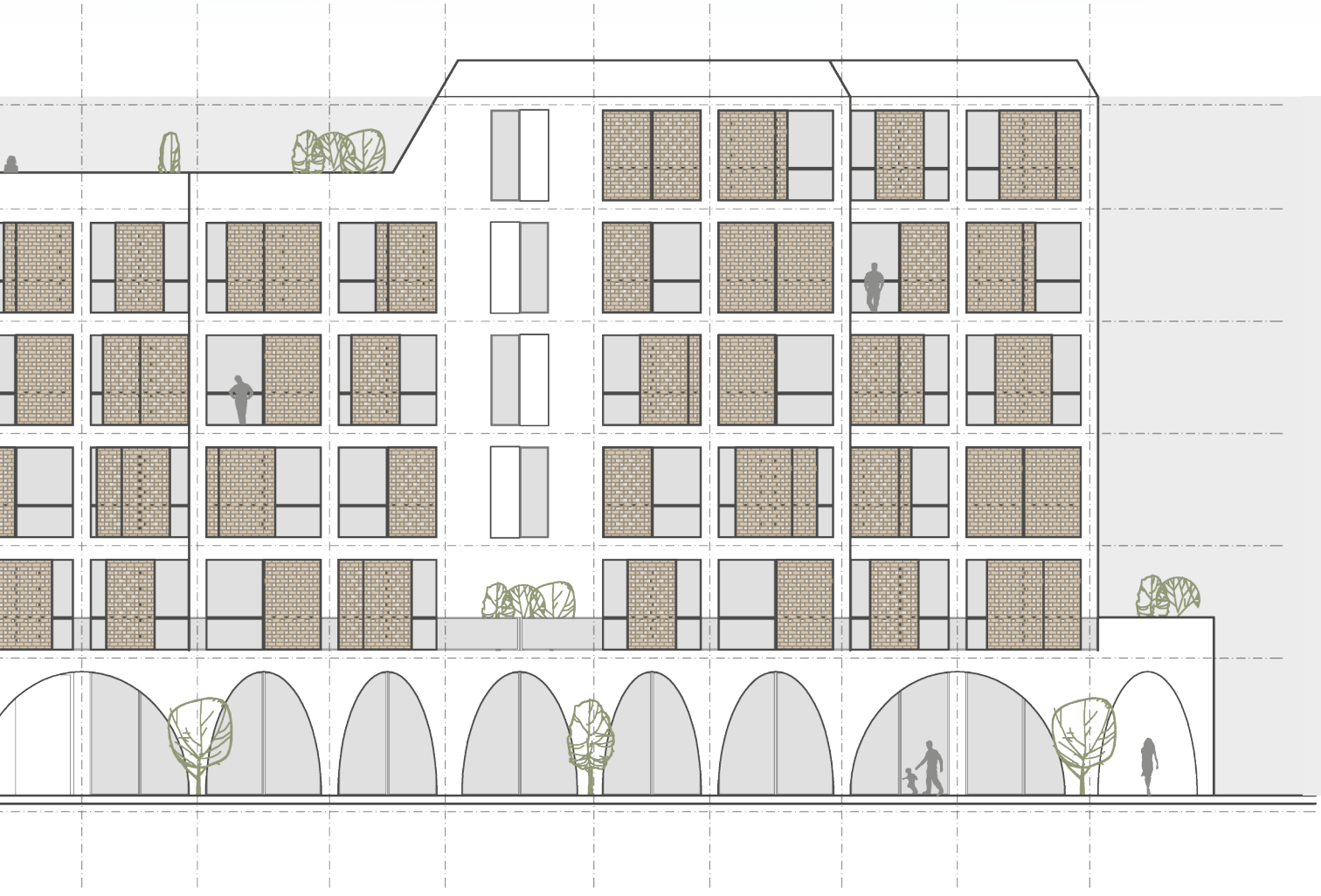


Fig. 5.49: Section A-A

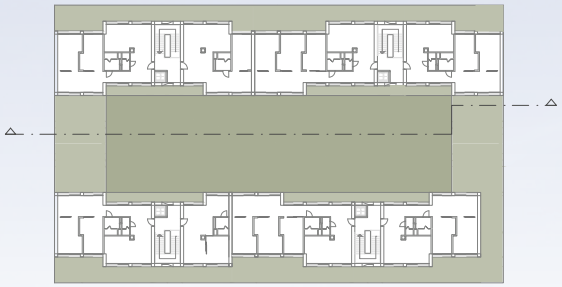


Fig. 5.50: 3D rendering, southwest facade

M 1:300

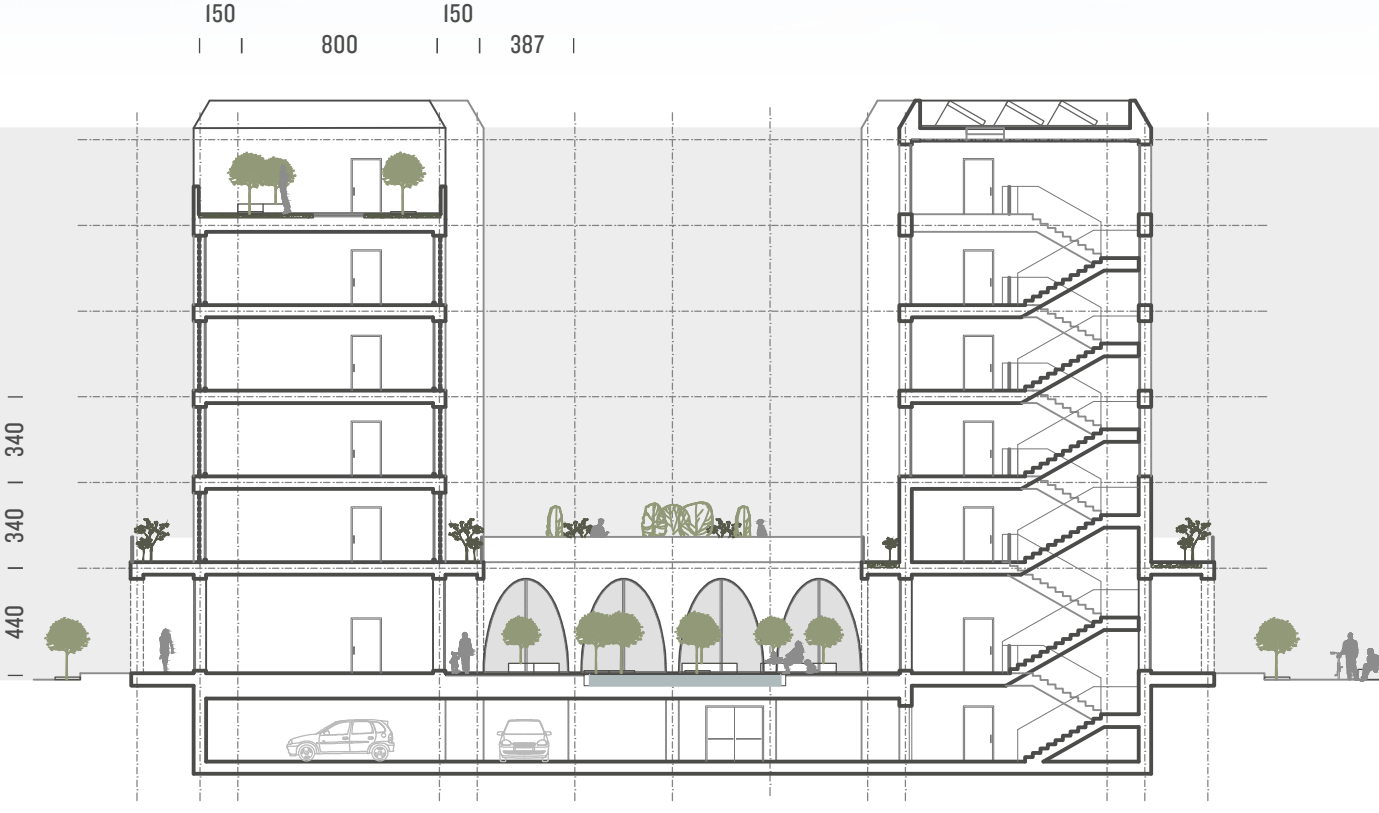
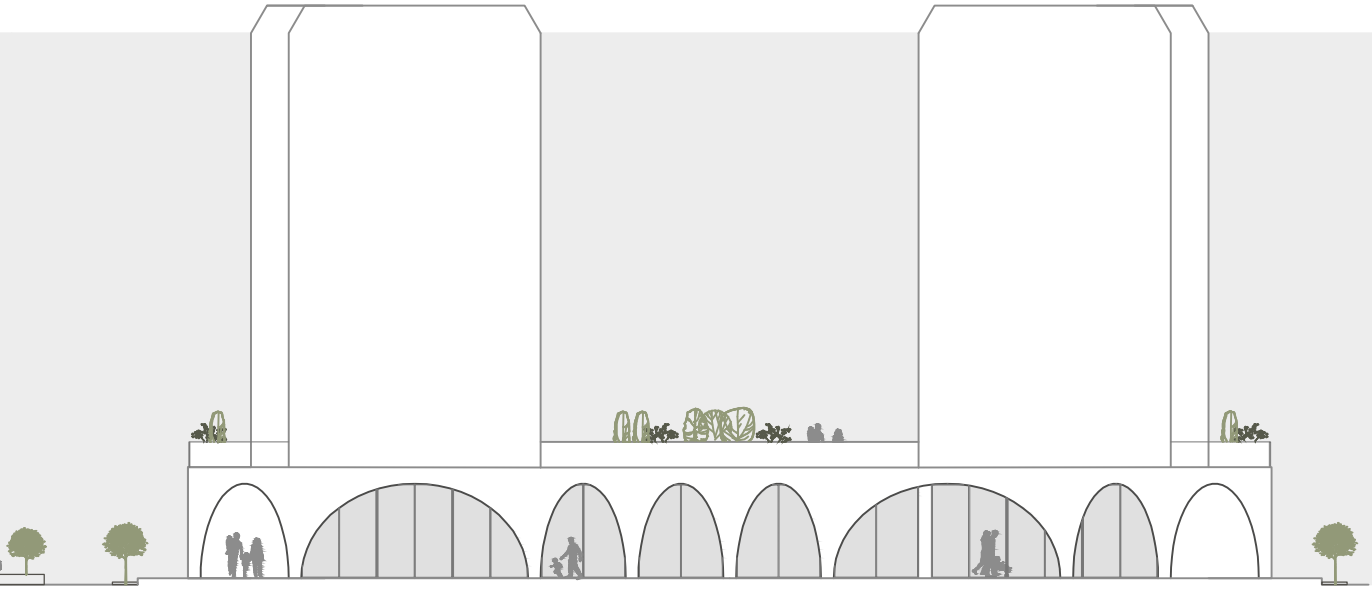
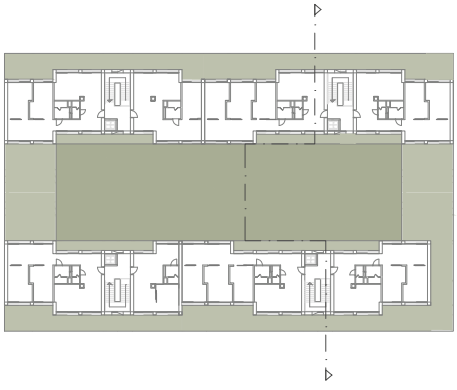


Fig. 5.51: Section B-B





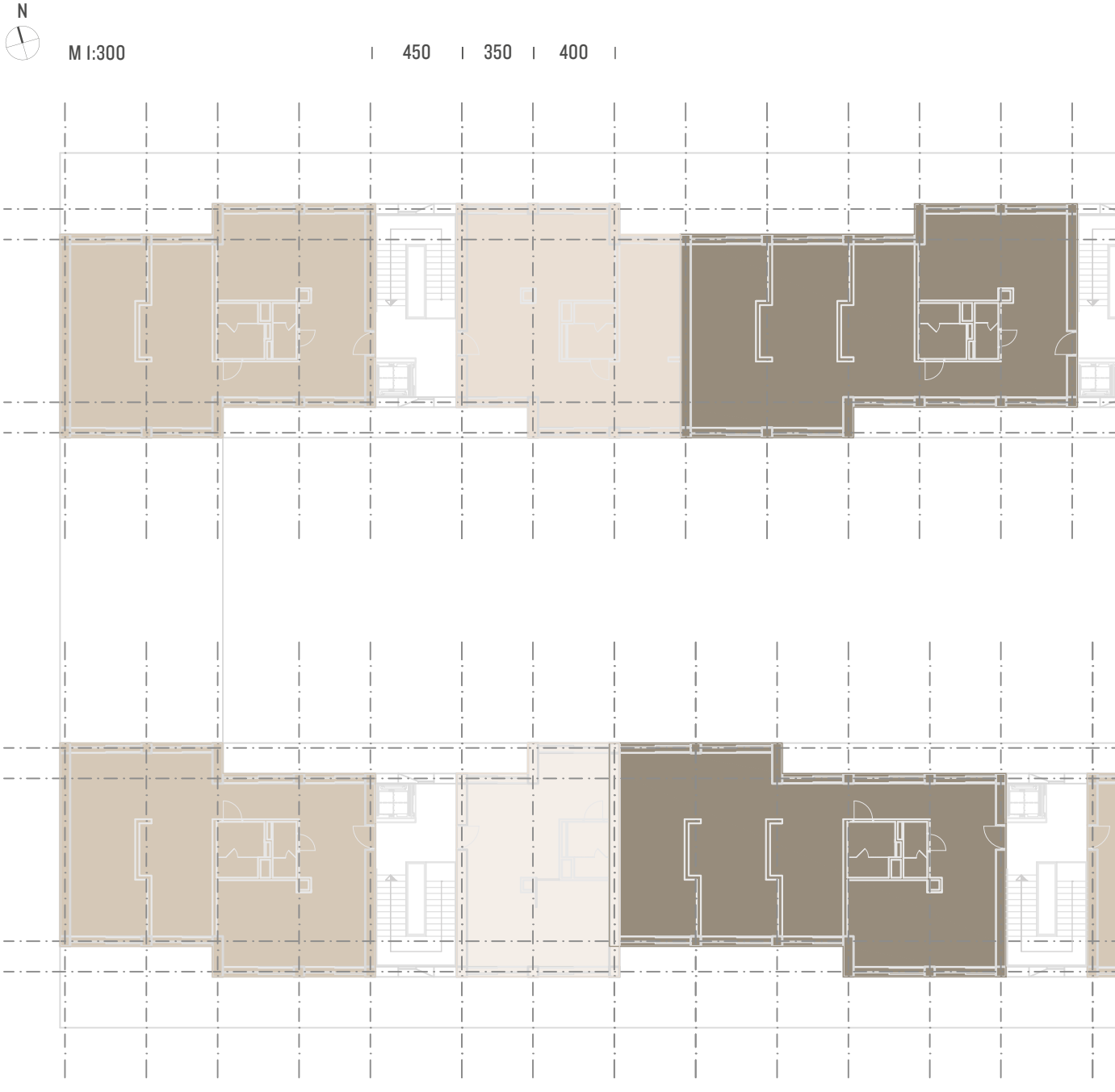


Fig. 5.52: Flat types plan

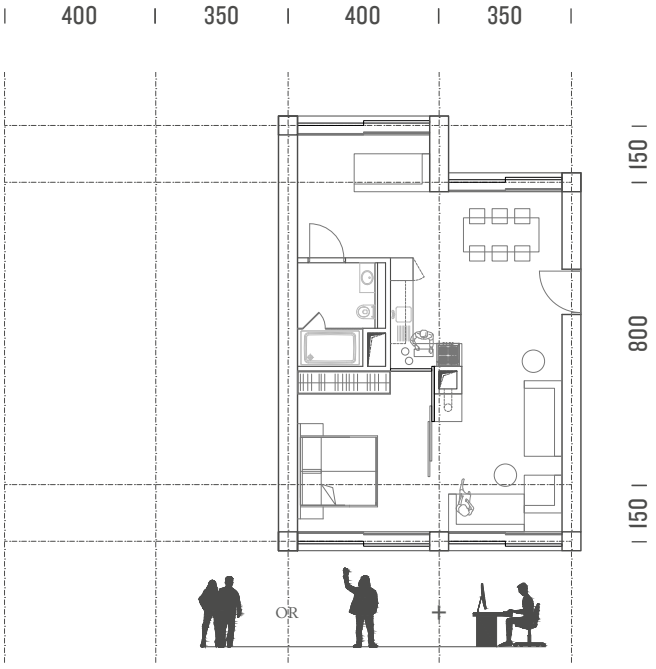
5.3.2

Flat types

- 4 Type C
- 2 Type D
- I Type B
- I Type A

Each floor contains 8 apartments. The apartments are designed based on a schematic grid which creates a modular pattern and provides a flexible space, with the bathrooms in the core of the open-plan flat. The design is based on a simple method. Integrated balconies facing each other, to create an air flow inside the rooms and to allow the residents to control the air movement, the light amount which is entering inside and to control their privacy through the sliding clay brick panels.

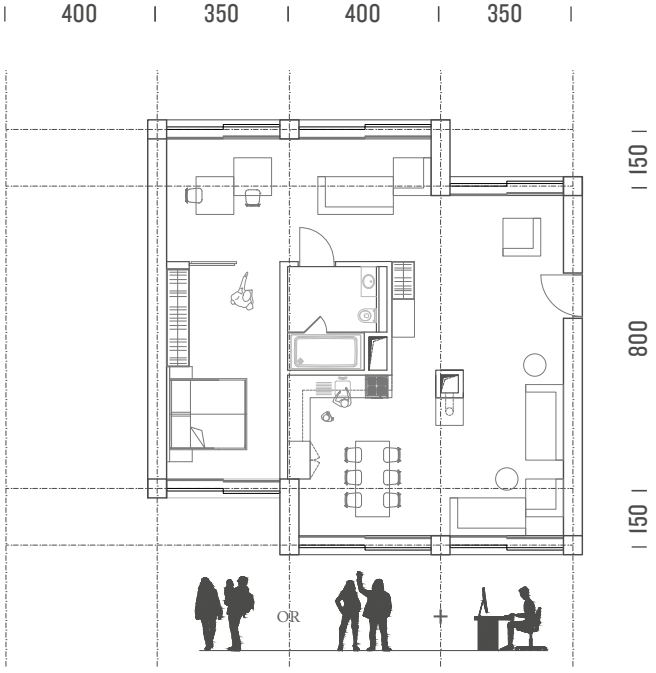
The balconies which open on the inner courtyard are the free private space of the flat, which can be used by the residents as they want (working, living, sport …etc.)



N

M 1:200

Flat Type A
- 65 m²
- 5 m² balcony
- 1 bed room
- 5,5 m² bathroom



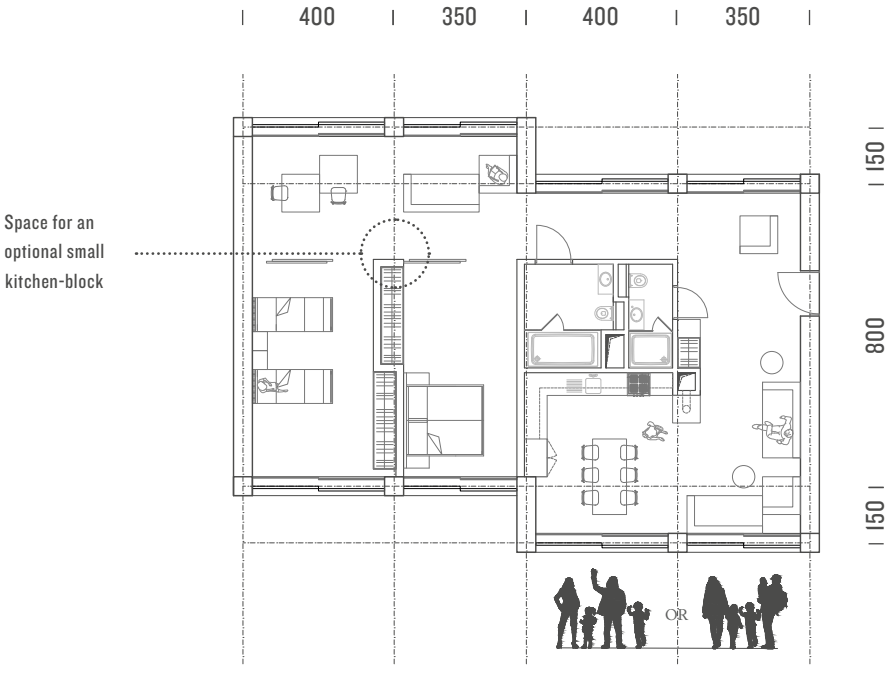
N

M 1:200

Flat Type B
- 95 m²
- 10 m² balcony
- 1 bed room
- 6 m² bathroom

M 1:200

Flat Type C
- 120 m²
- 20 m² balcony
- 2 bed rooms
- 9,5 m² for 2 bathrooms or 1 bathroom and 1 storage-room



M 1:200

Flat Type D
- 155 m²
- 20 m² balcony
- 3 bed rooms
- 9,5 m² for 2 bathrooms or 1 bathroom and 1 storage-room

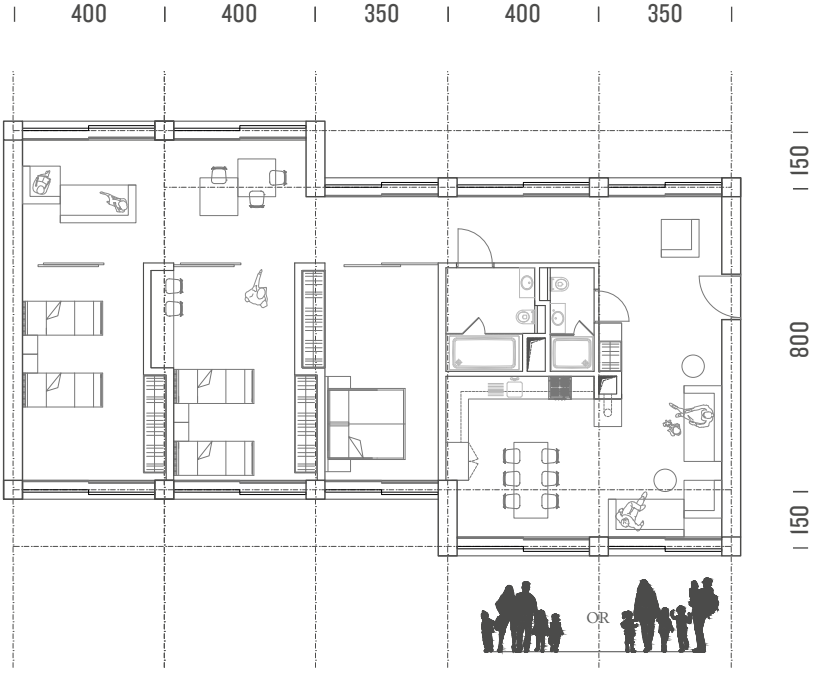
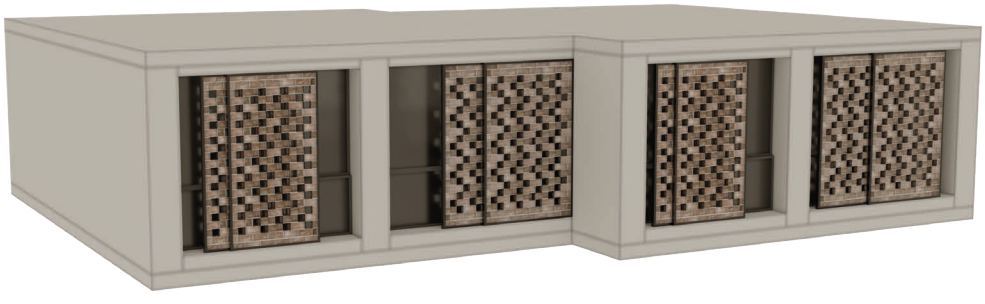


Fig. 5.53: Flat types

These apartments which compose the core of these housing blocks, can be connected with each other in many different ways, to form various housing units with different shapes.

Flat Type A



Flat Type C

Flat Type B

Flat Type D

Fig. 5.53: Flat types

Fig. 5.54: 3D rendering, interior, kitchen and dining space

5.3.3

Interior, 3D render

The inner space of the flat is designed based on the open flexible plan to allow the residents to arrange it and use it according to their needs. The flat consists of the half private zone including the entrance, the living room and the kitchen.

Fig. 5.55: 3D rendering, interior, living space

Fig. 5.56: 3D rendering, interior, multifunctional private space

The private area includes the sleeping rooms and a free space, where the balconies provide a connection between inside and outside. A kitchen unit could also be installed in the private section of the flat.

Fig. 5.57: 3D rendering, interior, multifunctional private space

As the distance to the entrance gets further the privacy level increases. The furniture is flexible and serves multiple purposes like sitting, sleeping, reading etc.

Fig. 5.58: 3D rendering, interior, bedroom

Fig. 5.59: 3D rendering, interior, bedroom

5.3.4

Conclusion

The *Home* project through its design and structure fulfills the researched aspects, which are very important to provide the city with simple, fast constructed, modular and flexible units (the flats) which can be repeated and connected in different forms, to shape the post-war housing typology in Aleppo and other Syrian cities in the near future. The same concept can be also used to rehabilitate the houses which suffered from minor and medium damages because of the war.

The post-war housing typology will give the city, which was stripped of its identity during the war, a harmonic image and a contemporary way of living, through connecting it with its location and climate, society and history, and solves the problems that the housing sector suffered from before the war. It will give the residents the opportunity to return to their home soil and live together again.

Fig. 5.60:
3D rendering, outside view from the river

CHAPTER

6

APPENDIX

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Figures

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Fig. 04: Aleppo citadel from above
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Formal residential area: 1800 ha
Informal settlement area: 400 ha
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- Marrawi Rania, 3ds Max, Adobe Photoshop, 2018

Fig. 5.47: Area use plans
- Marrawi Rania, AutoCAD, 2018

Fig. 5.48: Southwest facade
- Marrawi Rania, AutoCAD, 2018

Fig. 5.49: Section A-A
- Marrawi Rania, AutoCAD, 2018

Fig. 5.50: 3D rendering, southwest facade
- Marrawi Rania, 3ds Max, Adobe Photoshop, 2018

Fig. 5.51: Section B-B
- Marrawi Rania, AutoCAD, 2018

Fig. 5.52: Flat types plan
- Marrawi Rania, AutoCAD, 2018

Fig. 5.53: Flat types
- Marrawi Rania, AutoCAD, 3ds Max, Adobe Photoshop, 2018

Fig. 5.54: 3D rendering, interior, kitchen and dining space
- Marrawi Rania, 3ds Max, Adobe Photoshop, 2018

Fig. 5.55: 3D rendering, interior, living space
- Marrawi Rania, 3ds Max, Adobe Photoshop, 2018

Fig. 5.56: 3D rendering, interior, multifunctional private space
- Marrawi Rania, 3ds Max, Adobe Photoshop, 2018

Fig. 5.57: 3D rendering, interior, multifunctional private space
- Marrawi Rania, 3ds Max, Adobe Photoshop, 2018

Fig. 5.58: 3D rendering, interior, bedroom
- Marrawi Rania, 3ds Max, Adobe Photoshop, 2018

Fig. 5.59: 3D rendering, interior, bedroom
- Marrawi Rania, 3ds Max, Adobe Photoshop, 2018

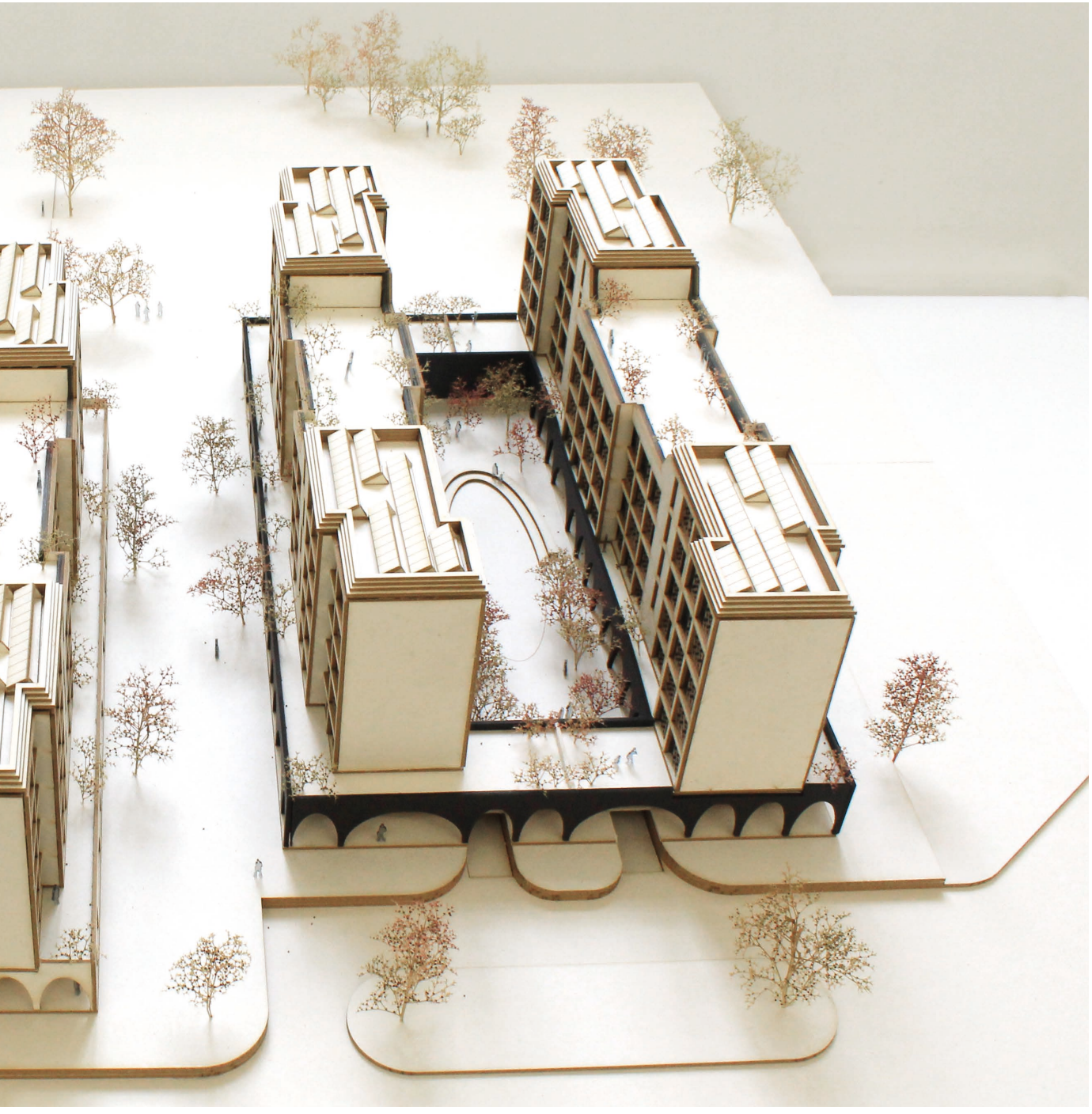
Fig. 5.60: 3D rendering, outside view from the river
- Marrawi Rania, 3ds Max, Adobe Photoshop, 2018

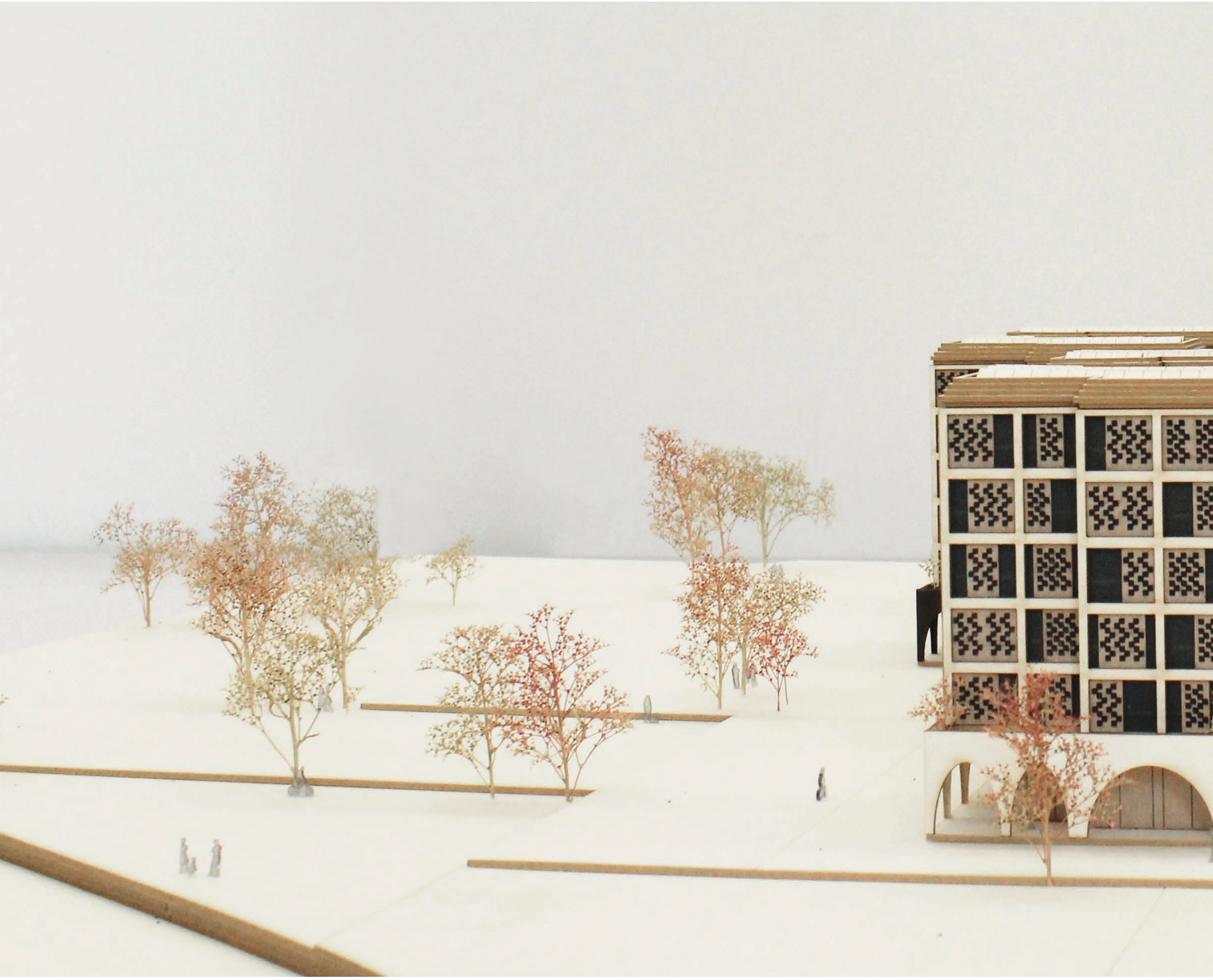
CHAPTER

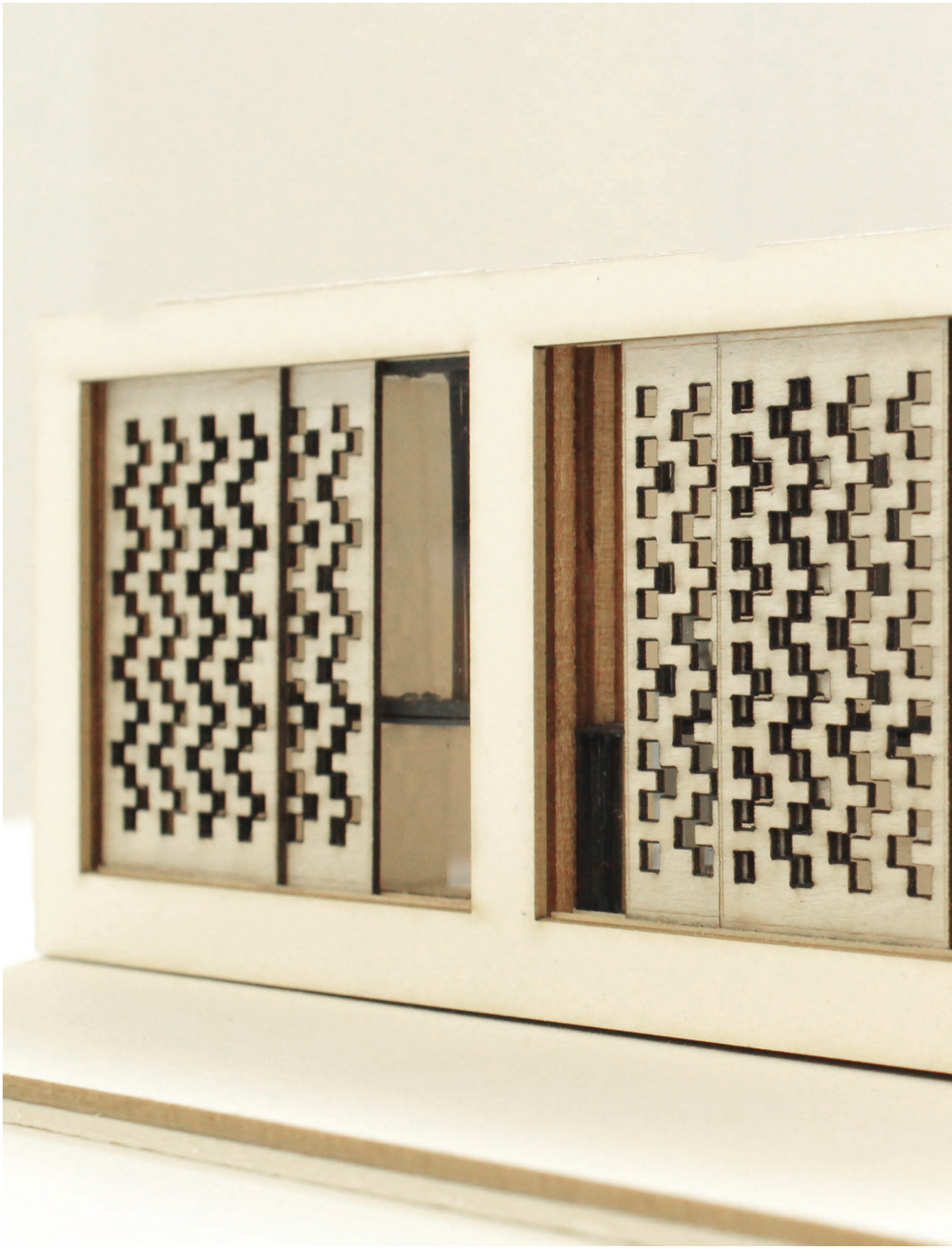
7

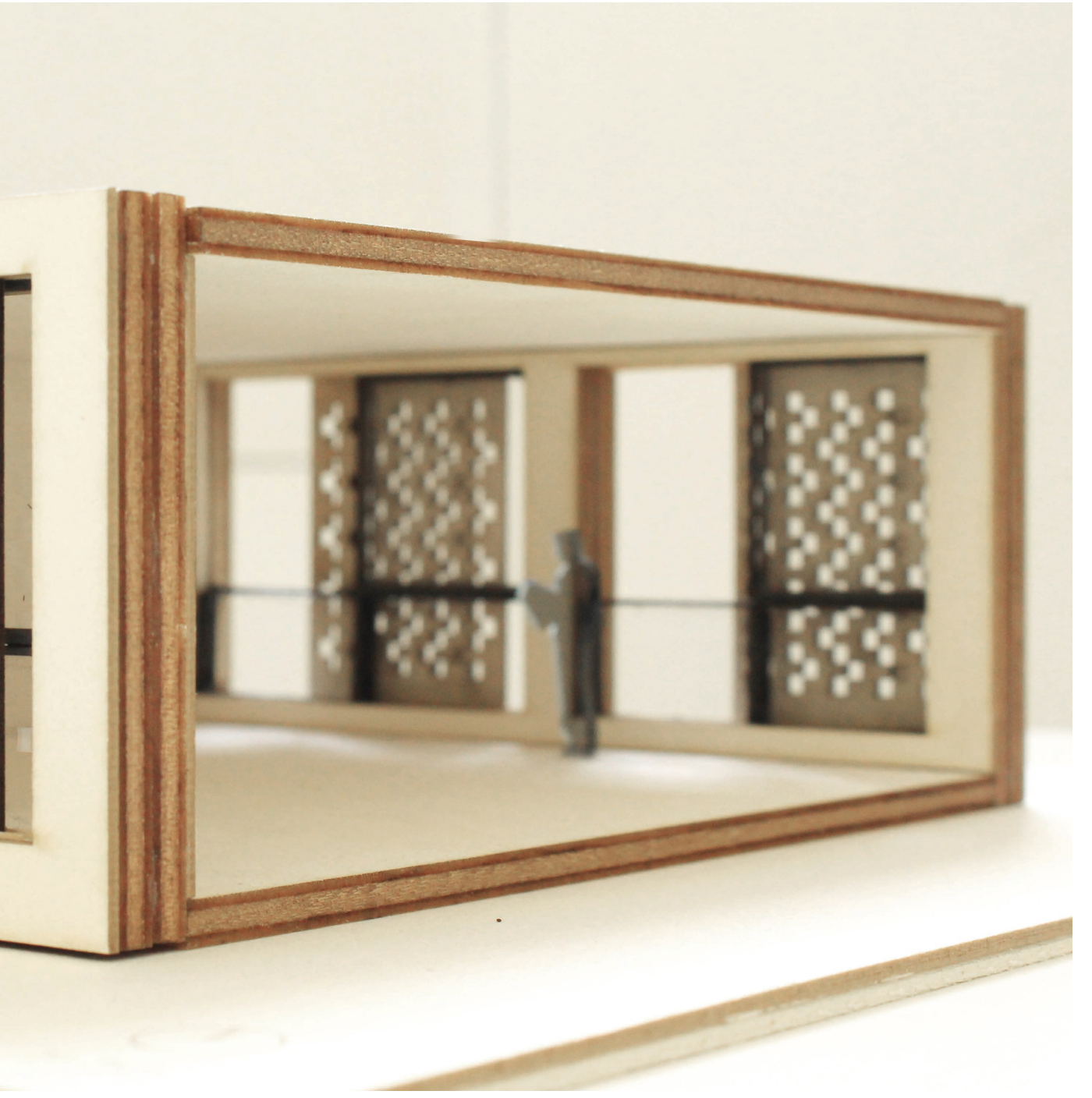
Model

Photographies









Curriculum Vitae

Rania Marrawi
31st of May 1985
raniamarrawi@gmail.com

Languages

Arabic, German, English

Education

2012–2018
Master of Architecture
Technical University of Vienna

2009–2011
Master of Architecture
University of Damascus

2004–2009
Bachelor of Architecture
University of Damascus

Professional experience

2009–2012
Senior planner and designer
Ebla Wood Works
Damascus, Syria
ebla-woodwork.com

2015–2018
planner, exterior and interior designer
SWZT Chartered Consultants GmbH
A–1010 Wien, Franz Josefs-Kai 21/14
www.swzt.at

Software

AutoCAD, 3ds Max
Adobe software, Microsoft Office