Rozhi New Co.

A new home for Sulaymaniyah

University of Applied Science Rotterdam

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10-8-2015

GRADUATION RESEARCH

A new home for Sulaymaniyah

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Foreword

For the completion of the Engineering study at university of applied sciences of Rotterdam this thesis has been made. Through a design problem on living conditions of the middle class in Sulaymaniyah in Kurdistan, Rozhi Nwe Co. has given me the opportunity to apply my knowledge and experience of the study in this research. Doing this research and writing my thesis took place in the period March 2014 - August 2015.

I would like to thank contractor and developer Rozhi Nwe Co. who has given me the opportunity to gain more experience by involving me in an issue on Kurdistan. My thanks go especially to my company supervisor Safeen Muhammed for the time and effort he took to accompany me during this research project. It was a very valuable learning period to conduct research at an international level.

I also want to thank my first reader, also my supervisor Shy Shavit, for the support and trust he had in me. Finally, my thanks go to PIT (Platform Initiatives Temporality) Ludwin Budde, Wim Verbakel, Bram Janssen and Jan Hein Geerdink for their support and sharing their knowledge and experiences.

SUMMARY

This research is done for contractor and developer Rozhi Nwe Co. where the subject is a new home for Sulaymaniyah. The problem the client is dealing with, is that the people of the middle class have difficulties to provide themselves with a qualitative and suitable ground dwelling within their budget. By this research the client wants to know how to create a suitable house for the middle class of Sulaymaniyah. The goal of the research is to yield a plan for Rozhi Nwe Co. about the future living of the middle class. The central research question, 'how to create a family house (ground dwelling) that fits the character and culture of the city Sulaymaniyah in South-Kurdistan, with available materials and equipment?', is answered by three sub researches: the traditional living, the present living and the future living.

Firstly the traditional living of the inhabitants of Kurdistan in general is studied. In this sub category there has been a research about traditional architecture, the variety, style, shape, material use, construction/construction-methods and the detailing. The results showed that there are two kinds of lay outs: the mountain- and plain layout. The research about the mountain layout also showed us that there's more density, what means there's a lot of contact with neighbours and no private rooms for each habitant. At the plain layout there's a large area of land around the building. A fundamental difference between the two layouts is privacy. Furthermore, there's observed that the spaces in the homes are divided based on the functions and duties between the man and the woman. The husband has the simple tasks and the wife has the harder tasks as taking care of animals and preparing food. Because of the many tasks of the wife, she's the one who is more involved with each room of the house. Lastly there's observed that the used materials are very useful and weatherproof, like the loam which is not easy to maintain, but comfortable to live in.

The second part of the research is about the present living of the inhabitants of Sulaymaniyah, there has been a research about the changing climate, use of cars and relationship between women, men and visitors. There's also observed that the ground of Sulaymaniyah is very fertile for flora. Against this there's environmental pollution due to the economic booming and increasing of number of cars. A middle class family owns an average of 2 or 3 cars. Further, this part of research showed that in Sulaymaniyah electricity is not available for 24hours, which is not pleasurable with the extreme weather circumstances. It also showed that the inhabitants of Sulaymaniyah are very interested in foreign architecture and the government and the contractors hire foreign workers. It is important to know a foreign product, which is essentially made only for the interest of appearance, does not always guarantee quality.

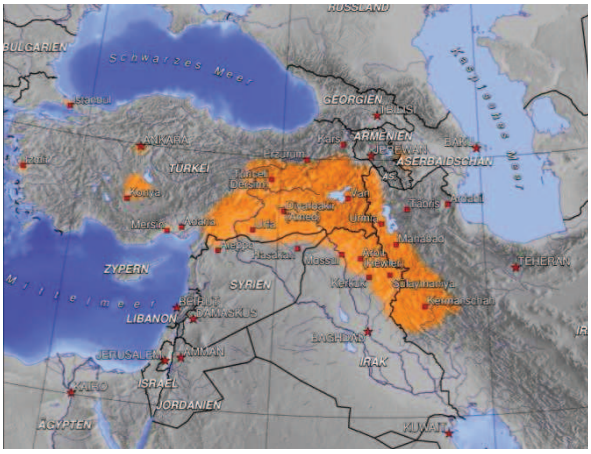
Projects of ground dwellings, flats and villas are analysed and compared with each other. Based on a few subjects there's observed that:
- Typology: All the projects have the necessary spaces (a living room, kitchen, bathroom and several sleeping rooms). It is noticeable all the rooms of the houses have a window to the outside. All the plans have the same route for visitors, which are from the entrance to the reception/ living room or to the kitchen. Further then these rooms there is the private area where it is not desirable that the guests get there.
- Activity relations: At this subject analyses are about where the main activities, like sleeping and eating take place. This analyse showed that the most of the activities takes place in the living room. Also the living room is the room with the highest occupation at one time.
- Users and public/private: The husband mainly uses the public areas, such as the living room, dining area and garden. This also applies to the visitors. Because of the cleaning and food preparing tasks of the wife we can conclude that she occupies the whole house.
- Building technique: The floors and the roof are made of in situ concrete, the walls of the ground dwellings and flats are made of hollow concrete blocks. For floors mostly tiles are used and for the inside and outside of the walls stucco. For the ceilings a false ceiling of polystyrene is used. There's a lack of attention for quality.
- Appearance: Houses in one area have the same colour. The colours of the interior and the exterior don't have any relation. Regarding the materials there is a relation between the exterior and the interior.

In the new plan that is made for the client, aspects like more private space for each inhabitant, more parking space due to the increase of cars and especially technical aspects are included due to the extreme climate. This plan will make the client Rozhi Nwe co. able to implement the recommendations that are made for a new home for the middle class of Sulaymaniyah. Further it's important to include the relation between each family member and the spaces that are used by this member in combination with the surrounding and design aspects for making a house suitable for the middle class household.

Content

Introduction

Opening
Kurdistan is located in the Middle East. Officially, Kurdistan is not a country. Its people are called Kurds and these are spread across Turkey, Syria, Iran and Iraq. The Kurdish area that is spread over all these countries is estimated to be between 190.000-390.000 km2,[1] bigger than Germany: 357.168 km2.[2]
See map 1.[3]



The Kurdish Autonomous Region of Iraq, Kurdistan is divided into several cities, with the largest cities Erbil (Arbil), Duhok, Zaxo, Kirkuk, Ranya and Sulaymaniyah. The last, Sulaymaniyah is located in the south of Kurdistan and is the city where the research is focused. With over 1.5 million inhabitants Sulaymaniyah is the cultural centre for Sorani-speaking Kurds. See map 2.[1]

The research will be done into how a family house can be created that fits the character and culture of the middle class of Sulaymaniyah. It also includes how this family house using modern technologies, new habits, materials and equipment can be designed for a more authentic Sulaymaniyah. Further, the needs of the target group will play a major role in the design.

Problem definition
The response of the study is to the low and poor supply that Sulaymaniyah offers in housing for its middle class. Since the fall of Saddam Hussein Sulaymaniyah is developing with a furious pace in the economical field, without standing still money is being invested in "easy and superficial" imported architecture, with little consideration for own culture, traditions and lifestyles of the people of Sulaymaniyah. Because of the profitability of the sales and rental of houses, they build mainly for the upper class. The problem is that the people of the middle class have difficulties to provide themselves with a qualitative, durable, comfortable, and especially a suitable ground dwelling within their budget.[4]

Goal
Company goal
"The purpose of this research is to produce a proposal for builder and developer Rozhi Nwe Co. in August 2015. Advice will be given on how the client, with which resources, can provide the middle class of Sulaymaniyah, with a qualitative and comfortable ground dwelling, taking the culture and traditions into account."

Personal goal
"The personal goal of this research is to demonstrate that a ground dwelling design for the middle class with the application of new customs, needs and techniques and with the preservation of culture and traditions is realizable and achievable."

[1] (Maps of World)
[2] (The world bank)
[3] (Wikipedia)
[4] (Invest in Group)

Structure of the study

Approach of the research
The research will focus on how Rozhi Nwe Co. can design/build comfortable single-family ground dwellings for the middle class of Sulaymaniyah. Hereby will be looked at wat is of essential factors for this research. These factors include the current materials, technologies, needs and desires of the middle class. The central research question will be answered by a number of studies, these include sub-studies which investigate:

- The traditional architecture of the family house: Research into traditional architecture of the family home in the area (research of literature but especially locally). In addition, the architecture, the variety, style, shape, material use, construction/construction methods and the detailing.
- The present architecture of the house: Research on the 'type' no longer meets the needs of the current occupant (interviews with people and analysis of current situation). Think of a changing climate (it is colder at night) or to the increased use of cars. But also a changing relationship between generations (old-young, men and women). Etc. This results in a design research with a number of, at the level of building analysed projects.

Based on these studies conclusions will be taken and recommendations will be given. Recommendations results from the research will be implemented into a design. Resources that may be needed in the study include the client, online data and engineers in the Netherlands and in Kurdistan.

- The future living: Design of a ground dwelling for a family in the Kurdish city of Sulaymaniyah (Kurdistan / Northern Iraq). In words and pictures (sketches, drawings, photographs of models) is illustrated both process and outcome of design.

Reliability
The method of analysing and collection data is based on reliability. The reliability indicates that the search is stable, and that the result will be the same in repetition of the studies. The reliability of this research will be ensured by mentioning all the sources used in the bibliography. Furthermore, the reliability will be ensured by combining different perspectives.

Structure of the thesis
The main question will be answered based on the sub-studies which are presented in Table 1. In this way, the examination will lead to a solution to the problem.

Main question: How to create a family house (ground dwelling) that fits the character and culture of the city Sulaymaniyah in South-Kurdistan (Iraq), with available materials and equipment?	
Part 1	The traditional living
Part 2	The present living
Part 3	Future living

Table 1

1. The traditional living

Background

Kurds are a peasant people. This means that they have made a bridge from the peasant life and the ensuing lifestyle to the urbanization and city life.[5] The traditional lifestyle, of living, originates from daily necessities and living environment. The living areas of homes are roughly divided into two categories:

- The “mountain" layout
- The "plain” layout

Mountain layout

The mountain layout means that the houses, of the farmers, were built in the mountain. The houses are built in a stairways form on the mountain. *As shown in figure 1.* The houses are situated such that they are oriented to the south. The mountain climate is cold, hence the location of the homes. Because it is very hot in the summer, the windows are made vertically to get light inside but not the summer heat.

The structure of the layout that is shown in *Figure 1* is semi-circular, which means that the village is built around a religious centre. This is in contradiction with the window concept. This has to do with the density of the mountains. When the distance between mountains is bigger, the houses are constructed to the south. When the mountains are closer to each other *(as shown in Figure 1)* the houses are built around a centre, thus there are houses with their backs to the south.[6]

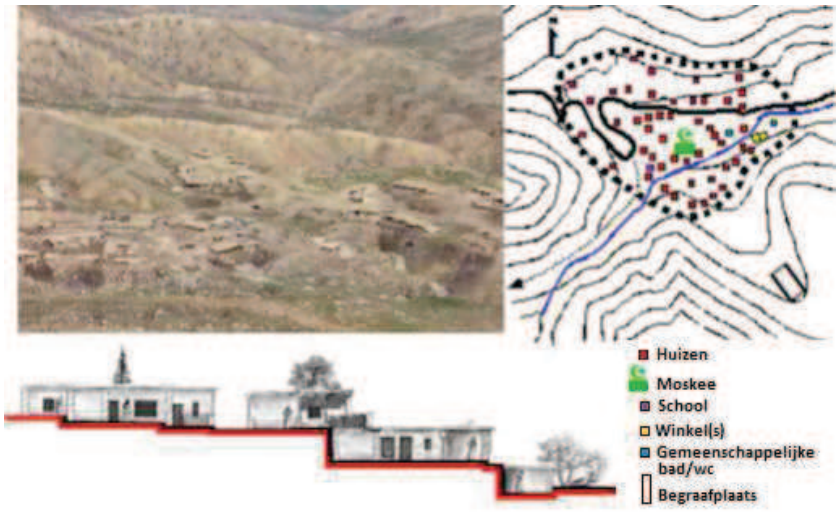


Figure 1: The stairways form in the mountain-layout, of a village [1]

An interesting factor in the mountain layout is that the roof of the underlying resident, the terrace is located above the occupant. This concept is shown in *picture 1.* In the picture you can see a wedding in a village with a mountain layout where people reside both on their own and others’ roof.

The terrace concept is unique, because the underlying property is private. The community in the village has a better communication and this concept is accepted. The acceptance of this concept has to do with the construction concept of the housing. The houses are made based on the daily necessities of the families. The people wanted to minimize land use for houses because of waste of productive land. This is also the reason why there is little space around a property.[6]

Picture 1: Terrace concept, wedding celebration

[5] (MERIP)
[6] (Research on Humanities and Social Sciences , 2013)

Plain layout

On the plain part of the land, the construction concept is built with the same idea as a mountain layout. The difference lies in the location. Where in the mountains the houses are built in a stairway form, on the plain area they are built side by side and more spread. The "roof terrace" concept in this concept is transformed into a garden or patio on private land. *See Figure 2.*[6]

In this layout, the community is more self-sufficient and each family has become a micro community. Most activities are done on private property, such as; recreation, animal keeping, etc. Except praying and shopping of essential life products (on the market), all other activities is done within the family and not as the mountain layout, in a more communal atmosphere.

Figure 2: Plain layout of a village[6]

Also in this layout, the village built around a religious centre and both the mountain and plain layout in a later era schools and health facilities added to the villages. The transition from the mountain to the plain layout is clearly manifested in the confiscation of land. While here are no significant changes in the floor plan.[6] The change in scale and magnitude has happened at a later period, the reasons are discussed in the next chapter (*The present living*).

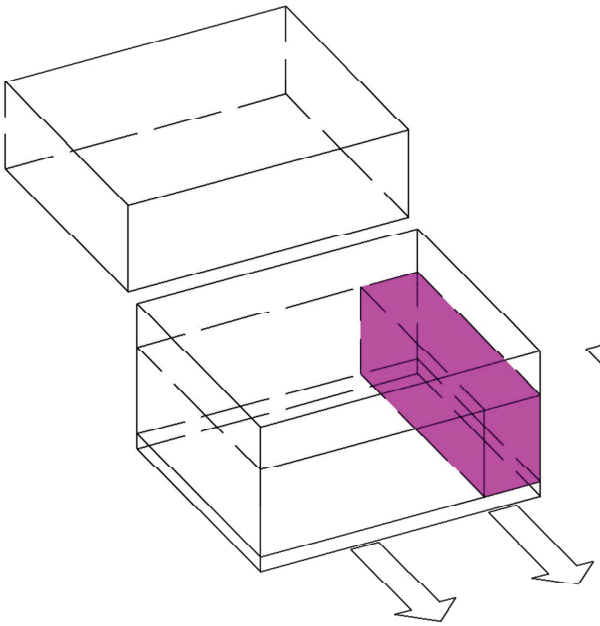
Program

The layout and floor plan of the houses were designed according to the needs of the residents. A space has multiple functions as a space was used as a "living room", and then served at night as "sleeping area". Thanks to the concept of only to build what is actually necessary, so other land can be used for other purposes, this concept has a general appreciation in society.[7]

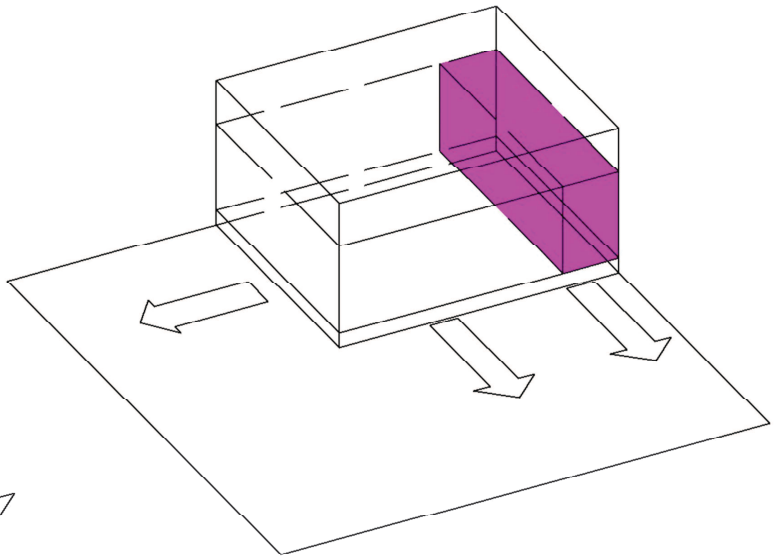
[6] (Research on Humanities and Social Sciences , 2013)
[7] (Musa, Nadir, Nadir, Ramzi, & Abdulrahim, 2014)

The primal floorplans of the mountain- and plain-layout are shown below:

See attachment 1 for further explanation and examples of houses from both layouts.



MOUNTAIN LAYOUT
- House as a single zone
- Facilities area, on the side
- Single orientation to the center of the village
- Floor as bearing zone
- >1 floors
- Diagonal structure
- Terrace on roof



PLAIN LAYOUT
- House next to each other >2
- Facilities area, on the side
- Double orientation 90°, to the center of the village and one other side
- Floor as bearing zone
- >1 floors
- Row structure
- With outside area

Relations and conditions

The mountain layout has a more open relationship. The openness to the outside world is bigger (to other villagers). In contrast with the plain layout, the relationships of the families in the mountain layout are stronger; one of the reasons is that the people are living close to each other. An argument can be seen on *picture 1 (picture of a mountain village layout)*, in which everyone is "present" at a wedding. These open characteristics are significantly reduced in the plain layout. A cause for the shrinking of this property is the self-sufficiency of the people. What both the mountain and plain layout have in common, is the functions and relationships of the family members. The husband is the king at home followed by the son(s), then the wife(s) and the daughter(s). Of course, there were exceptions. This rank distribution is also traced back to jobs and stay within a home.[7]

The tasks of the husband are often simple. When the husband awakens, breakfast must be ready. After that the men gather in the local tea/domino house or at a store of a friend/acquaintance/family. The men eat earlier than women. The women often eat separately, because the men "occupy" the space. Within the family the husband and the son(s) always sit "above". "Above" is a term that is often used in Kurdish, this has to do with the orientation of the house. A house always has a facade towards the mountain, when you sit in a room with their backs to the mountain then you're so called above. This is a tradition that is honoured to date. When visitors come, it is polite to offer them this place to the visit.[7][8][9] *In picture 2 this can be seen.*

Picture 2: sitting above

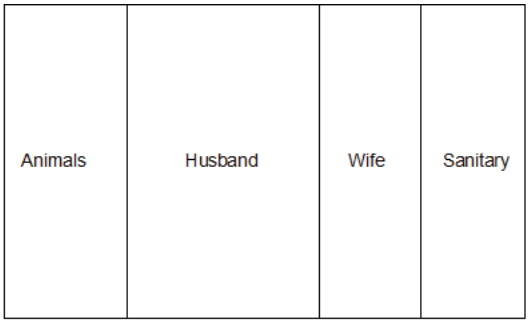
The woman has often the harder tasks. Besides making food, the herding animals, milking the animals, fetching water and cleaning the house and terrace/garden, she also has to ensure and educate the children. Besides all the tasks, the woman feels inferior in daily life, for example by sitting "lower" than the man and preparing and placing food and/or drinks for the man.[7][8] *In picture 3 and for these subjects are shown.*
Indoors the husband is king, as being the husband he only uses a part of the house. The activity the husband does inside is receiving visit and sleep. Besides these tasks the wife also cleans and cooks. The wife uses all the rooms of the house. The husband does not go everywhere. He doesn't go to the kitchen, because this would be an insult to his manhood.[7][8][9]

Picture 3: The wife herding the animals

Picture 4: the wife sits lower than the husband

Below a drawing is made that show a schematic pattern of use by the husband and wife in the traditional living.

Schematic drawing of space occupations.



[6] (Research on Humanities and Social Sciences , 2013)
[7] (Musa, Nadir, Nadir, Ramzi, & Abdulrahim, 2014)
[8] (Ponzetti, 2003)
[9] (KurdistanTV, 2014)

Materials and construction technology

Since the peasant folk did not have current technical expertise, they made use of local equipment and materials. The materials that were used were [6710]:

- Loam
- Wood
- Stone
- Iron

The equipment that the people used was mainly manpower and for transportation they used donkeys or horses. They also used small equipment such as hammers and tongs. A special equipment that has been used and is still being used for pounding and flattening the, loam, roof is called "bagrdén" (ba-gr-den). A bagrdén is a concrete cylinder with an iron grip, *as can been seen in picture 5.*[6]

Picture 5: Bagrdén, for pounding and flattening the roof [11]

Roof

The loam roof is placed on a wooden beam ceiling. The beams can be seen from inside the house. *The ceiling is shown in picture 6.* [610]

Picture 6: ceiling with the wooden beams, beneath the roof.

Walls

The walls are often made of loam or loam blocks. The walls were very thick compared to contemporary concrete walls. Another variant of building that was used and is still being used, by financial capable people, is a stone wall. The stone wall is built with (local) mountain stones in combination with mortar (or loam) as a binder. This method of design is also seen in contemporary architecture as a showpiece in the interior or exterior of a building.[610]

In the picture 7 a wall can be seen that is made of the combination of stone and loam.[10]

Picture: 7: wall, stone and loam

[10] (Musa S.)
[6] (Research on Humanities and Social Sciences , 2013)
[10] (Musa S.)

In this type of use, the stone wall is not used as a showpiece but more as a constructive wall. When compared to the loam walls, the stone wall is a showpiece because of the high costs.
In cases of rebuild or renovation or extensions to the construction, sometimes another material was used, often because of the financial capacity of the owner. At a later period the adjustments in construction were made with concrete blocks.

The foundation of the houses where made of (mountain) stones. In order to counteract rising damp, they stacked a number of layers above ground. The door and window frames where often made of metal, for security, there are stable rods against thieves. The doors to the storage rooms and the animal area where made of solid wood with steel plating.[6][10] *In the picture 8, the window and door security can be seen.*

Picture 8: Window and door security

Floor
Usually the ground layer is kept as it was, the ground was crushed and flattened with a little slope. In special cases, at a later period in all cases, there was a concrete layer poured over the ground. The reason for this was the easiness with the maintenance. In all cases, it was made with a little slope for washing the ground (with water). In the summer for cooling and easiness of cleaning it is washed with water and in the winter they put carpets on the floor.

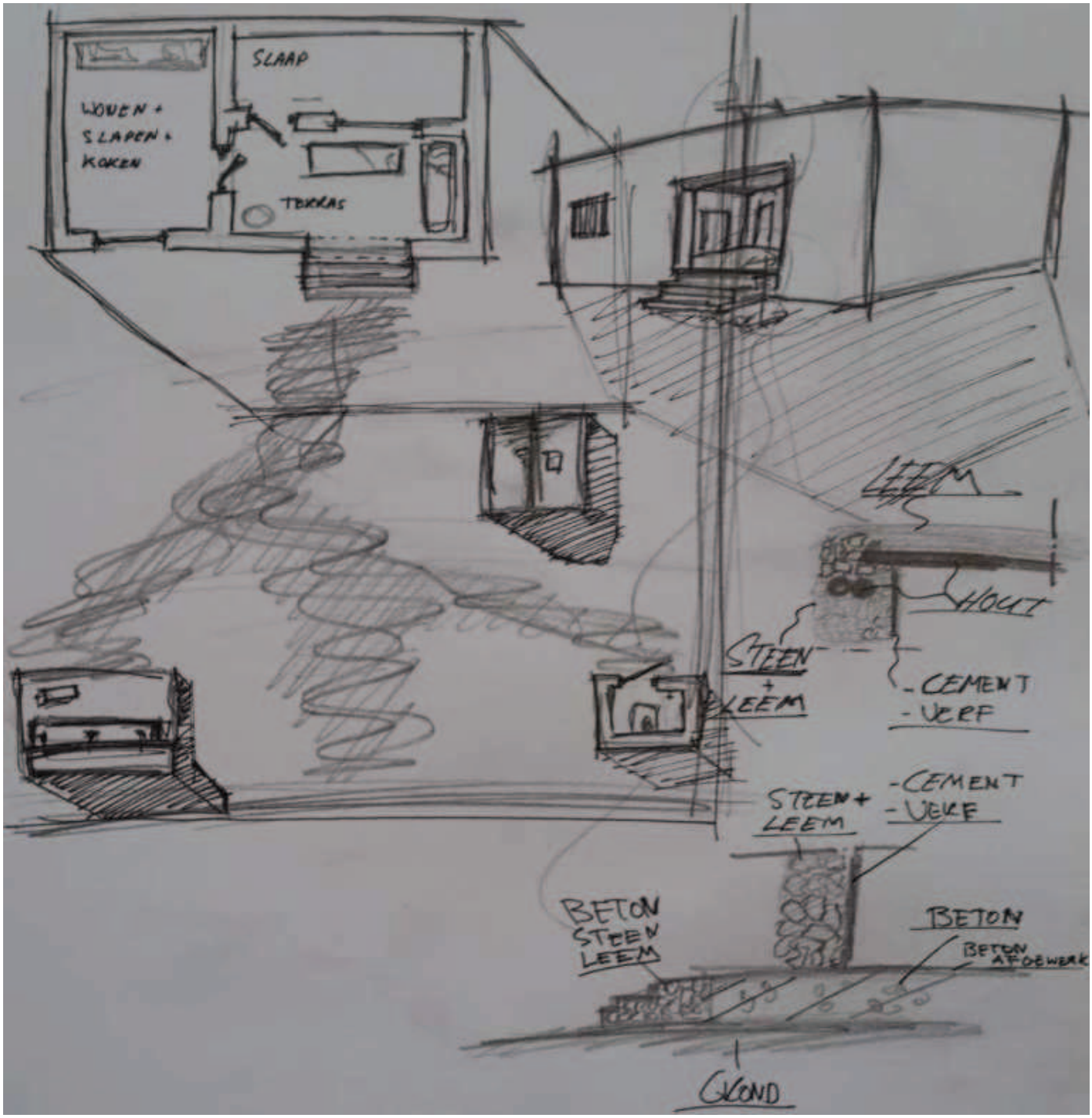
In the case of a house in a plain region, a stairway is constructed to the roof for accessibility. The terrace of the house was also crushed with a layer of concrete. People with more financial resources used tiles or other "decorative materials" as finish.[12][6][10]

In picture 9 a house is made in the traditional way and received a minor update later. The improvements include concrete and finish with paint (in the interior, *picture 6*). In the *drawing 1* the plans and details of this house is drawn.

Picture 9: On the right a house in the rural area.

[6] (Research on Humanities and Social Sciences , 2013)
[10] (Musa S.)

Drawing 1: The plan and details of the house (picture 9)



2. The present living

Sulaymaniyah

Sulaymania or Slemani, (Kurdish: سلێمانی / Silêmanî).
Sulaymaniyah is the capital of Sulaymaniyah Governorate. Sulaymaniyah is surrounded by the Azmer Mountain, Goyija Mountain and the Qaiwan Mountain in the northeast, Chwarta Mountain in the south and the Tasluja Hills in the west. The city has a semi-arid climate with very hot dry summers and cool wet winters. Sulaymaniyah served as the capital of the historic Kurdish principality of Baban from 1784 to 1850. Sulaymaniyah is often called the "Paris of Iraq" for its vibrant cultural life and its wide tree-lined boulevards.[13]

In picture 10: a variety of places are shown of Sulaymania as an impression.

The modern city of Sulaymaniyah was founded on 14 November 1784 by the Kurdish prince Ibrahim Pasha Baban who named it after his father Sulaiman Pasha.[14] Because it was founded as the capital of a powerful Kurdish principality, Sulaymaniyah has developed into a large city with a population of more than 1,500,000 people.[15] It is an important economic centre for northern Iraq and has been named the cultural centre for Sorani-speaking Kurds continuously since 1992. From its foundation Sulaymaniyah was always a centre of great poets, writers, historians, politicians, scholars and singers.[16]

In map 3 the governorate of Sulaymaniyah is shown and also the exact location of Sulaymaniyah.[17]

[13] (Salihi, 2012)
[14] (The Kurdistan Tribune, 2011)
[15] (knoema, 2011)
[16] (UNESCO)
[17] (USAID Iraq)

History

In 1783, Ibrahim Pasha of Baban became ruler of the Emirate and began the construction of a new city which would become the capital of the Baban Emirate. The emirate was an important strategic territory in the war between the Ottoman Empire and the Safavid dynasty. In 1784 he finished erecting a number of palaces for trade called Qeyserîs and bazaars, which were also used as baths, and began inviting people from the surrounding villages and Emirates to move to the newly established city. Soon Melkendî, which was originally intended to be the city itself, instead became one of its quarters and still is today.[18]

Picture 11: Statue of Ibrahim Pasha.

Mahmud Barzanji was the self-declared king of the Kingdom of Kurdistan from 1922–1924. Sulaymaniyah has since its foundation been the centre of Kurdish nationalism, and it was from here that Mahmud Barzanji sparked the first rebellion against the British occupation on May 22, 1919 with the arrest of British officials in Sulaymaniyah. He attempted to declare an independent Kingdom of Kurdistan on 10 October 1921, issuing a statement in Sulaymaniyah, then the capital of Kurdistan, to establish The Kingdom of Kurdistan. In January 1926 the League of Nations gave the mandate over the territory to Iraq, with the provision for special rights for Kurds. In 1930-1931, Sheikh Mahmud Barzanji made his last unsuccessful attempt to free Kurdistan. He retreated into the mountains and later signed a peace accord with the Iraqi government and settled in the new Iraq in 1932.[18]

Picture 11: Photo of Sheikh Mahmud Barzanji.

Sabûnkaran was of the city's first neighbourhoods; its name means "those who make soap" in Kurdish and its residents were mainly involved in the soap industry. Çûlekan, the Jewish neighbourhood, was mainly inhabited by Kurdish Jews. In the 1950s, after the establishment of the state of Israel, most of its inhabitants migrated to the newly created state. On 23 April 1982, during the Iran-Iraq War, a demonstration broke out in the city against the arrests and torture of the city's youths who were accused of planning a revolt against the ruling Arab Ba'ath regime (Regime of Saddam Hussain). Since 2003 the Kurds have been working with the U.S., politically and military. Since then it has support on various aspects from the U.S. The safety in the KRG (Kurdistan Regional Government) has led to partnerships with USA, UK, UAE, etc. which has led to an economic growth.[18]

The 1920 Treaty of Sevres, which created the modern states of Iraq, Syria and Kuwait, was to have included the possibility of a Kurdish state in the region. However, it was never implemented. After the overthrow of the Turkish monarchy by Kemal Ataturk, Turkey, Iran and Iraq each agreed not to recognize an independent Kurdish state.[19][20] The part which Sulaymaniyah lays, Iraq, the UK had control over it. In some places there are still marks left that can prove the work of the English people. Also they provided students and refugees to go to the UK and stay (study or work) there.

Picture 12: Sulaymaniyah 1925, the neighbourhood of Malkandi. The houses were built, like the traditional plain-layout houses.[21]

[18] (Ministry of Interior)
[19] (Ildiz, 2007)
[20] (McDowall, 1996)
[21] (Facebook)

Geography and climate

Because the city is surrounded by mountains it is called "windy city". The surrounding mountains do not have proper flora, this is the main cause of sandstorms in Sulaymaniyah and also because between Kurdistan and Baghdad there is desert. Sulaymaniyah has warm summers and cool winters, in comparison with other regions it has cooler winters and wetter winter. In the summer the temperature can go up to 50 degrees Celsius. The effect of the warmth in at noon in the summer is that it splits the day, in morning and evening. In the afternoon people work barely. In de evening the people go back out to work or to enjoy their time.[22]
Sulaymaniyah is one of the cities in Kurdistan that always had a proper sewerage throughout the city. Thanks to that floods are avoided in the rainy season. In the winter the roads can be dangerous due to the snow and ice.

Picture 13: The seasons shown in 4 photos.

Economy

The economy in Sulaymaniyah is growing fast. Through the city are developments and are busy building towers and districts. The Sulaymaniyah Governorate has much fertile land such as the Sharazur and Bitwan plains which are considered two of the most fertile plains in the Middle East. Historically, Sulaymaniyah was mainly agricultural and one of the major suppliers of wheat and other agricultural products. Its role declined due to the policies of Saddam Hussein aimed at reducing the city's economic potential as it was a centre of the Kurdish revolution.
Since 2003 Iraq has seen a huge economic boom. The economy of KRG (Kurdistan Region Government) has also been growing ever since. The Kurdistan Region is now among the best and most vibrant emerging markets in the world, thanks largely to the efforts of workers and business owners in the private sector. [10] the economy of Sulaymaniyah relies on tourism and a large number of factories and companies in the private sector. Also a small number of small factories, most of which are involved in the building trade.[23]

The growth in economy brought also a lot of international influence with it. The international influences are noticeable in the thinking of people about living. The influence of the UAE is also visible in the lifestyle. The Kurdistan Region is undergoing a facelift that is sometimes compared to Dubai's incredible economic boom. Shopping malls, luxury hotels, high-rise buildings and even Kurdistan's own airline have many Kurds hoping that their autonomous enclave is emerging into the next Dubai.[24] It is not a problem to strive for reorganization as a country by doing what (for example) Dubai has done, but not to forget the Kurdish heritage when doing

[22] (Sulaymaniyah Governorate Profile, 2015)
[23] (KRG)
[24] (Rudaw, 2014)

this. A lot of old/historical buildings are being demolished for the purpose of building new ones. This kind of thinking is done by private owners and is approved by the congregation.

Compared to the private sector the governmental sector is not doing their jobs as good and fast. *In pictures 14* the difference between the time of Saddam and after Saddam's era of the same road is shown. The changes are: the increase of cars and the road had a facelift. The lamps, the trees, the pavements and the electricity poles are the same, the picture shows that the progress of an individual is much more than that of the government.

Picture 14: The difference between before 2000 and after 2005

Lifestyle

The lifestyle of the people in Sulaymaniyah (and the rest of South Kurdistan) is very influenced by the things they see on television and what they see on the internet. These developments have led to copy-paste behaviour of what they see rather than what they actually need and actually have to spend.
The suddenly changes in the environment have led to the freedom that they always dreamed of, so they try to catch up everything they ever wanted. This is visible in the daily activities and needs of people. In the past not everyone had a car, the person who owned a car was working and had to earn enough money. Today, almost all households have at least one or two cars.[710]

The developments in the field of lifestyle and tend to want to look like what they see on TV or the Internet, often at the expense of fundamental characteristics of a city. The factors such as more cars and bigger houses of various materials and therefore more electronics for cooling and heating of the relevant areas , has led to high levels of smog compared to 10 to 20 years back. 10 years ago one could sleep on the roof, in the summer, with a blanket. Nowadays that is not realistic in Sulaymaniyah, due to the dirty air by objects such as cars and aggregates.[710]
The positive developments in relation to the time of Saddam Hussain have emerged with freedom to import products and services. By an abundance of available materials such as TVs, air conditioning and many other electronic devices, the demand for electricity has gone up. In Sulaymaniyah electricity is not available for 24hours. Each season, the number of hours varies, on average the government provides ±20 hours and the rest is supplied by a district, private or personal aggregate.[710]

The common household don't have the old hierarchy, the husband is still the head of the family but now followed by the woman then the son and the daughter. An average household has 5 people.[27] The children are more reclusive and spend more time alone or with friend outside, this is also a reason for more cars. *In table 2, the demographic indicators of Sulaymaniyah*

Indicators	Suleimany city	KRG
Average household size	5.0 persons	6.2 persons
Male member in family	2.8 persons	3.0 persons
Female members in family	2.9 persons	3.2 persons
Less than 5 years old	10,2%	13.3%
5-14 years old	20,2%	25.5%
15- 64 years old	62,3%	57.2%
65 years old and older	5,7%	4.0%
Urban	80.9%	72.5%
Rural	19.1%	27.5%

Table 2: Demographic indicators [27]

Religion, in the pas of Sulaymaniyah a house that was orientated to Kaaba -

(Mecca), the pray direction in the Islam, had more value. This is changed due to the combination of climate and the need of houses. The houses are lined based on the land and urban design plans. In Sulaymaniyah, as well as South-Kurdistan, religion is mostly practised at house do not have a special place in the house. In the urban plans of a new district at least one mosque must be build.

Architecture

The architecture and construction techniques have changed over the years. As previously mentioned thanks to, the development, in technology, people have a wider view of the world and got to see more of what is happening in other countries. Given the cramped freedom of Saddam Hussain which had a major impact on the previous generation, which is now growing in the financial area, want to take advantage of the freedom. Freedom in the sense of come and go, build, invest and do business where previously was not allowed.

In the construction there are significant developments occurred both in Sulaymaniyah and throughout South Kurdistan. The government and individuals have the freedom and the financial resources to build whatever they want. Due to the lack of domestic tools, such as material and equipment but also in work force, often (experienced) foreign workers are hired for the design and construction of the desired building. Hiring foreign power does not necessarily mean that the work is done better, but it also has to do with showing of their financial power to others.

Here we concentrate on design in combination with the reality of construction. This means that the design is "up to date", which means that engineers are good with the current software and the design principals. The main issue is that they don't think about how contractors build. Because there is not a contract system that allows the engineer or architect to be the supervisor, only when demanded by the client himself, when the drawings are finished they are handed to the client who chooses the contractor himself.
So when the drawings are made, with current software, they are handed over to the client (who is not technical) and with these drawing he chooses or selects a constructor. Another concept that is used is that contractors have their own designers. This results in a more compact collaboration in which the contractor to taste and own principles traded within own limits and limitations. This does not mean that it is good or worse is built. It means, however, that the houses are not built with new materials and new techniques.
People in Sulaymaniyah and Kurdistan in generally are more interested in how the building looks rather than how the quality is in general. The buildings are also realised by the appearance of the building. The buildings are often the same as the 3D drawing of the designer. As for the housing market that the contractors design and build themselves, they want to make an good profit. If they were to include a lot of technical aspects such as insolation and mechanical ventilation and also better quality equipment's the price of a house will not be as profitable. After completion the house one is free to do with it what one wants. So they keep the prices low also for the people to be affordable. In time the house becomes more expensive for the buyer, due the lack of quality of the equipment's that are used. [7][10]

Pictures 15 & 16: Modern drawings, on modern software, by local designers/ architects.

Picture 15: Zaniary Tower + apartments, Sulaymaniyah.

Picture 16: Bakrajo Gate, Sulaymaniyah.

[7] (Musa, Nadir, Nadir, Ramzi, & Abdulrahim, 2014)
[10] (Musa S.)

Housing

The traditional house of Kurdistan was built on the logic of "only build what is actually necessary". Previously discussed changes, both in the economy and personality of the people in South Kurdistan, also the needs and necessities are changed. This has consequences for the design and layout of houses, like described below. The plot has a standard distribution of 200m² (this varied by location and by city, the exact measurements depend on the urban plans), there are no further criteria for planting and gardening or something in the regulations.

For those with more capital ability, there are housing projects where larger houses are included with more floor space and more living space. Often people with more capital assets make their own houses. Hereby they often hire a designer, sometimes after the drawings they change things to the drawings so it is to their own taste. The majority of people do not have the capacity to do this. There are developers who have the ability to build a district subsidized by the government. The subsidy often holds that they get a piece of land for very little money, but the district should accommodate the standard amenities. These include; housing (land-based/flat), mosque, retail space (for food), drugstore, pharmacy, school, a sick post and play and leisure spaces.

District that are built by developers are built based on pre-decided target groups, mainly they are built for people in the middle or low-income class. The houses are all the same and are built with the same features, sometimes with different colours per street or area. Using a lending system for the buyers, they have to pay the amount of money back to the contractor. The period of time which they have to pay the money back is fixed beforehand, in the contract. It has to be minimal 5 years. From the moment the house is completed and the first instalments are paid, the "home owner" has the right to sell the house, including the unpaid instalments. The customer also has the possibility of getting a loan from a government bank as described below:

There are three sources of housing finance:

- The Real Estate Bank: This requires a regular government job, ownership of land and makes low-interest loans available, usually for 12 years for non-Government employees and 15-20 years for Government employees, depending on salary. The maximum size of the loan is determined by the household's income.
- The Housing Fund: This is meant to provide interest-free loans of 5-10 years, to very low-income households with regular government jobs – or an acceptable guarantor. The maximum loan size cannot exceed 30-40% of the house cost.
- Private Banks: are relatively new and limited both in the range and the size of their operations, and do not really lend for housing, except for bridging finance in the case of a very few, selected individual individuals well known personally to the Bank.

Regulations for constructing:

- Properties on streets wider than 10m, the building line must start 2.5m from the land border.
- Properties on streets 10m or narrower, the building line must start 1.5m from the land border.
    - In both cases, starting from the second layer it is allowed to build until the land border.
    - In both cases, an indoor garage is allowed at the land border.
- When a property is specified as a commercial ground (a commercial ground means that is can has a function for selling and trading example: hotel, flat, mall, etc.) it must contain:
    - All the necessary anti-fire facilities,
    - Elevator (and stairs), all buildings with more than 1 layer.
- For the extensions of multiple layers of living area above a house or rebuilding a house with multiple layers, permission of the neighbours and an approval of the municipality is needed, in cases of a developers area permission of the developer is also needed.[7]

Because of this phenomenon, many people have become richer, because often the purchase price is less than it is worth in the end (after completion).

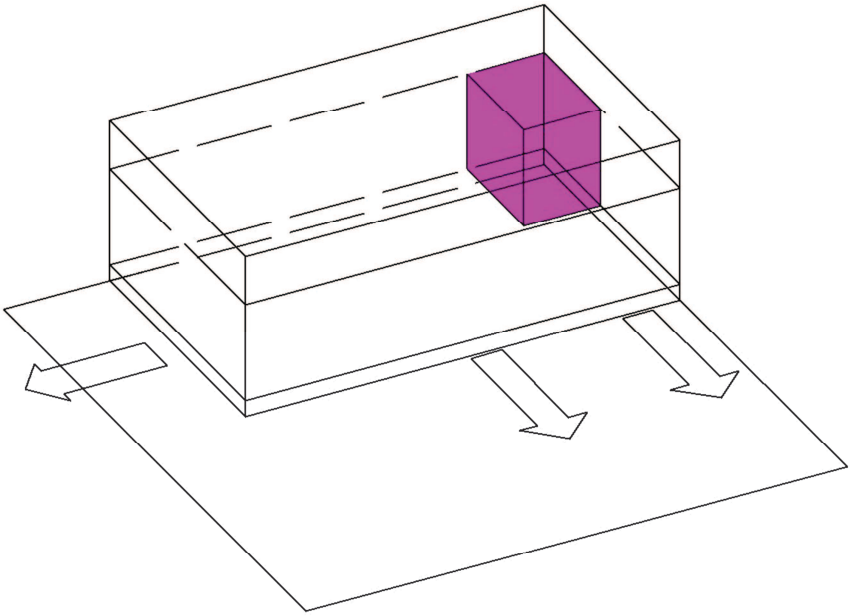
A lot of companies and organizations have designed and created and built, so did my client (Rozhi Nwe Co.). They have recently completed a project for the group that I want to focus on: affordable houses for people with low budget.
The project that they have completed is called: Shari Nmunayi translated Exemplary City. *See attachment 2: Project analyses, Exemplary City*. They want to make a statement with this project, for what they see as a good example of how a home should be the city of Sulaymaniyah.

[7] (Musa, Nadir, Nadir, Ramzi, & Abdulrahim, 2014)

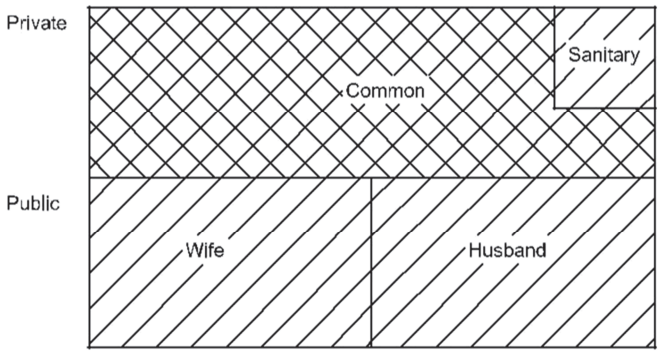
Project analyses

In this sub-study several different projects are explored that have direct links with a family house or similarities in materials, such as ground dwellings, flats or villa. Hereby additional text is written to clear up the drawings and the activities carried out within the areas. Based on the text, drawings, and the pre-depth research drawings are made, including public and private distinction and a user's drawing. Also is included a relationship diagram of the spaces.

Below a drawing is shown of a primal floor of a house from the present living, also of rough display of areas occupied by the husband and wife.
In *attachment 2* you will find the supporting text, per project; project explanations, impressions, plans, public and private drawings, zone plans and relationship diagrams.



PRESENT LIVING
- House next to each other
- Facilities area, In a corner In the back
- Double orientation 90°, to the center of the village and one other side
- Floor as bearing zone
- >1 floors
- Row structure
- With outside area and parking place



3. Analyses

In this chapter the analyses are given based on the research of the traditional and present living.

The traditional living

Kurds are a peasant people. The living areas of homes are roughly divided into two categories:
The “mountain" layout
The "plain” layout

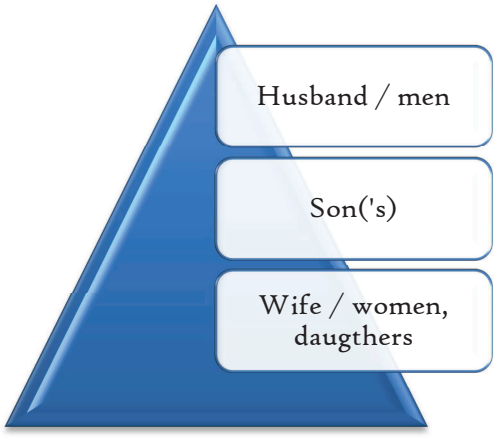
	Mountain layout	Plain layout
Structure of layout	Stairway concept	Next to each other
Program	Neighbour’s roof is terrace Small lots, only build what is necessary	Private Bigger lots due to garden
Positioning	Build around a mosque	Build around a mosque
Social aspect	More communication and acceptance between villagers	Individualistic
Orientation	Facing the south Windows only facing south	Facing the south Windows mainly facing south

Program

The floorplans of the houses in the mountain layout shows that there are no entrance halls, but direct access to the living room. The living room is the main room of the house and is connected to the kitchen and storage. Though the bath and toilet are connected to the house, they are not directly accessible via the living room or kitchen.

The floorplans of the plain layout shows that it has several layers: the lowest level is for car parking, the second is for the garden, toilet and bath and the upper level is for the house. In this plan an entrance hall is introduced in the form of an indoor terrace. The indoor terrace is the centre of the house and is connected to all the rooms. In other situations just an elevated terrace is made as centre, this is not roofed. Also a parking place is made, although it can be used as a shop or other activity if it is indoors.

Relations and conditions



The pyramid above shows the hierarchy in a house. The hierarchy applies to the place of sitting and eating. The amount of duties increases from the top to the bottom, in the pyramid.

Materials and construction technology

The main materials that used for building where:

- Loam: floor, wall and ceiling, thick walls for comfort and strength,
- Stone: wall, for strength and looks,
- Wood: ceiling, door, for strength,
- Iron: windows and door, for safety,
- In a later period concrete also was used for floors and concrete blocks for walls.

The present living

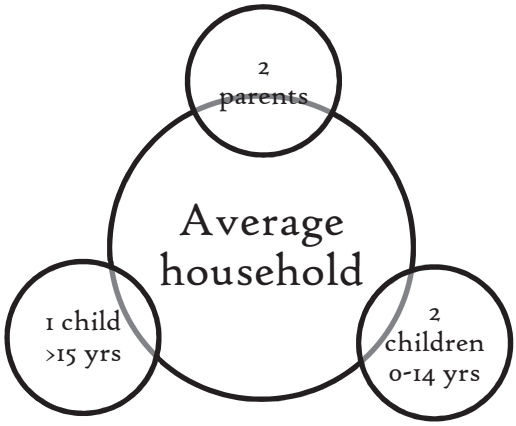
With over 1.5 million inhabitants Sulaymaniyah is the cultural centre for Sorani-speaking Kurds. The problem is that the people of the middle class have difficulties to provide themselves with a qualitative, durable, comfortable, and especially a suitable ground dwelling within their budget.
Sulaymaniyah has a semi-arid climate with very hot dry summers and cool wet winters. Due to the lack of flora on the surrounding mountains, sandstorms are very common (mainly in the summer). The summer is very hot: the temperatures can reach up to 50 degrees Celsius. The winter is very cool and snowy.

Economy

The economy in Sulaymaniyah is growing fast, mainly thanks to the efforts of workers and business owners in the private sector. The growth in economy brought a lot of international influence. The international influences are noticeable in the thinking of people about living. There is an increase of cars, the average house hold has 2 or more cars.

Lifestyle

People of south-Kurdistan are very influenced by the things they see on TV and internet, such as bigger houses of various materials and more electronic devices. In Sulaymaniyah water, gas and electricity is not available for 24hours.
Children play outside or isolate themselves in their own room.
Religion is an activity that is done by an individual or communal in a mosque, every district has at least one mosque.



Architecture

The government and individuals have the freedom and the financial resources to build whatever they want. Due to the lack of domestic tools, such as material and equipment but also in work force, often (experienced) foreign workers are hired for the design and construction of the desired building. People in Sulaymaniyah and Kurdistan in generally are more interested in how the building looks rather than how the quality is in general. As for the housing market, the contractors design and build themselves so they can make more profit.

Housing

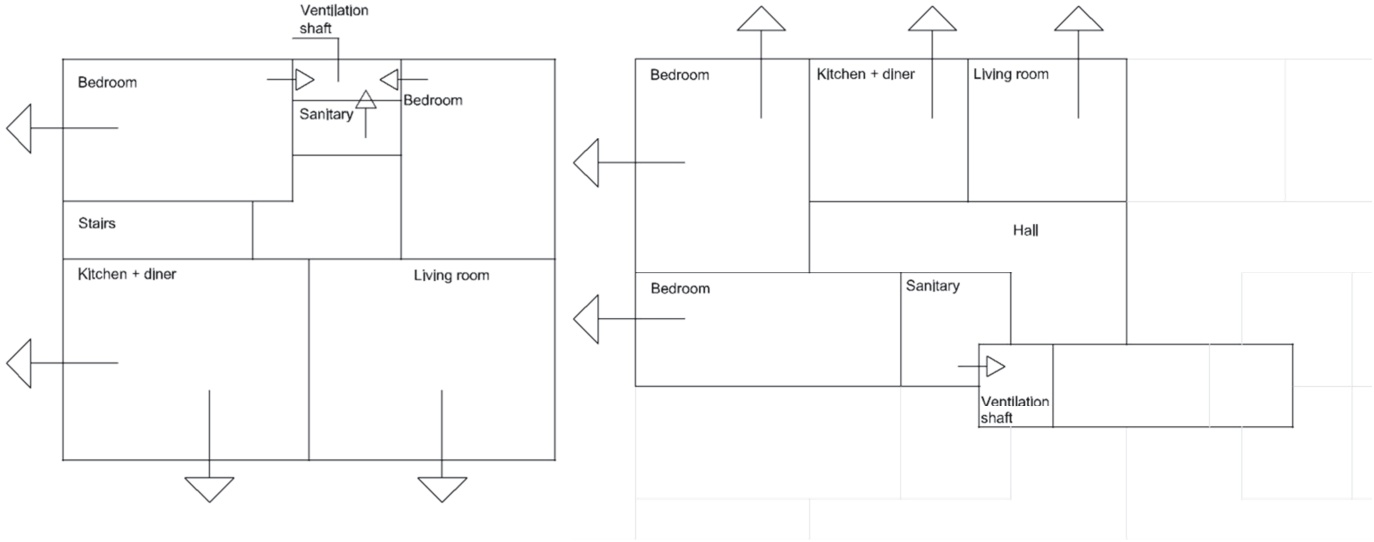
The plot has a standard distribution of 200m², measurements depend on the urban plans. The majority of the people in Sulaymaniyah do not have the financial capacity to build their own house, so they buy a developers build house in a district that is subsidized by the government. The district must include: housing (land-based/flat), mosque, retail space (for food), drugstore, pharmacy, school, a sick post and play and leisure spaces. These projects are built based on their target groups. The houses mainly look the same and have the same layout.
Finance, one type of buying a house is to pay the whole amount before of the project starts. The other type is via a loan: there are 2 types of loan:
- A company loan of minimal 5 years and a government loan for 12 years for non-government employees and 15-20 years for government employees.
- A company loan of minimal 5 years and interest-free loans of 5-10 years, to very low-income households with regular government jobs – or an acceptable guarantor. The maximum loan size cannot exceed 30-40% of the house cost.

The regulations for building houses are not sophisticated. For houses on streets >10m, building starts 2.5m from land border. On streets <10m, building starts 1.5m from land border. For expansion or remodelling of a house, permission of the developer, neighbours and approval of the municipality is needed.

Project analyses

- *Typology*:
  Conceptually the projects are principally the same, this goes for the houses, flats and the villas. All the projects have the necessary spaces as we have seen in all the plans: they all included a living room (±25m²), kitchen (±16m²), bathroom (±8.5m²) and several bedrooms (±16.8m²). The ground dwellings also include a garden and parking lot (1). All the rooms have a window to the outside, for ventilation rather than view.
  Because of the offered facilities in a flat, it has become more attractive than in the past. The flat staff offers 24h electricity, gas and water against monthly fee. The floor plans of the flats have the same distribution of space as in the ground dwellings.
  Most of the projects have a separate kitchen and living room. In contrary to the traditional living, the sanitary area is included and accessible from the inside. The roof must be accessible because of the installations of water.

Below diagrammatic drawings are shown of aground dwelling and a flat floorplan, roughly showing the necessary rooms and that each space must have a window to the "outside" for ventilation rather than view.



- *Activity relations: This subject is about the relations between the different activities in a spaces/room, the relation between the spaces/rooms and by how many people and during which time, in a day and in the seasons a spaces/rooms is occupied. Also what the differences are between a ground dwelling and a flat.*

  The most activities are: gathering, eating, sleeping and having visitors.
  The activity 'gathering', spending time, mainly takes place in the living room, also when there are visitors. The occupancy of the living room is throughout the day, the highest occupancy is when there is visit. For 'sitting' the reception is also used, but only for formal visitors.
  'Eating' is done as well in the living room as the kitchen as in the dining area. When there is visit, 'eating' takes place only in the dining area. The most occupation of the dining area and the kitchen takes places when it is time to prepare food by the woman and to eat with the family/visit. This means the most occupation is when it is breakfast-, lunch-, and dinnertime. When there is a scullery the food is prepared here and not in the kitchen. The kitchen functions then as a storage/showroom. The scullery is only occupied when the woman has to prepare food.
  'Sleeping' takes place as well in the living room, summer nap, as in the bedrooms, at night in all the seasons.
  The activities listed above, except sleeping, are also done in the garden. In the past 'sleeping' was also done on the roof by the whole family at night. But because of polluted air and the increasing warmth, sleeping on the roof is not done anymore.
  We can conclude the most of the activities takes place in the living room. Also the living room is the room with the highest occupation at one time. For the activities above, there are no differences for a ground dwelling or a flat, except for the activities that are done in the garden and on the roof.

- *<u>Users and public/private</u>: This theme is about which areas are public and are private and what relations they have with the users and what role they have in relation to each other (public-private). Also what the relation is between the physical- and the visual-relation of public-and the private areas.*

  The husband mainly uses the public areas, such as the living room, dining area and garden. This also applies to the visitors. Because of the cleaning and food preparing tasks of the wife occupies the whole house.
  Based on the occupancy of the kitchen it is a public area where the women collect, mainly when the men occupy the living room/reception.
  The common areas where the family goes, inside the house, are private. Based on the route to the toilet/bathroom (from living room/reception, kitchen or dining area), the person that walks there is visible.
  Depending on the height and transparency of the outside fences, whether the garden is visible or not makes it a public or private are, for the people walking by.

- *<u>Building technique:</u> This theme is about the building system(s) that are used. Also about the used materials and installation(s) in the houses that are used and their qualities. Sustainability of these subjects will also be taken in account.*

  A lot of a ground dwelling is approx. 200m² and the building ground is between 120m² and 135m². The living space of a flat differs from 85m² till 185m².
  Based on the drawings and photos of the projects first the land is flattened and the foundation, with reinforcement, is poured. The floors and the roof are made of in situ concrete, with reinforcement. The (inside) walls of the ground dwellings are all made of hollow concrete blocks. In the flats, first the columns are poured and later hollow concrete blocks are used, to fill the space between them. The inside walls of the flat are all made of hollow concrete blocks.
  The installations in both ground dwellings and flats are attached on the wall and after that the finish is applied. For floors mostly tiles is used and for the inside and outside of the walls stucco. For the ceilings a false ceiling of polystyrene is used.

- *<u>Appearance</u>: This theme is about how the buildings present them self to their surroundings and the city itself. Also about the interior and the exterior of the houses.*

  Based on the position of the house, on the lot, most of the project has at least two free sides. The houses have high walls, between lots, to ensure privacy between them. The relation between the houses in one area is that they have the same colour. Because of the different colours, per area in one project, there is no relation between the project and the house with the city.
  The colours of the interior and the exterior don't have any relation. Regarding the materials, the tiles, concrete, stucco and tiles are all used also inside the house because of the easy application.

4. Conclusions

Conclusions: The traditional living

We can conclude that the people living in the mountain layout where more open and had a better neighbours relationship, due to the fact of usage of each other's property and small lots. The villages where build around a mosque, from this we can conclude that shops, barbershops, etc. where also located at the centre. All the necessary activities of the village where done in the centre. If the house is located facing the south, smaller windows were made and if facing the north bigger windows were made, due to the warmth and cold.
The floorplans of the mountain layout has a big energy loss due to the absence of an entrance hall as an airlock, but on the other hand because of this there is a win on ground space. Because of the lack of ventilation, the bath, toilet and animal supply storage were accessible from the outside.

The relationship of people living in the plain layout was more based on the family. The family did the activities on their own lot, therefore there was less contact with the other neighbours in contrast to the mountain layout. Like the mountain layout, in the plain layout the houses were also built around a mosque. The windows where made not only of the south side of the houses but also on other sides, for ventilation and illumination.
The separation of the heights in the house and outdoor design is to refine the structure of usage. The upper level (the house itself) is where the most activities are done and also as a security factor for the property. The energy loss is reduces in the form of an indoor terrace in the plain layout. The terrace has the function of a hall between the spaces.

The relation and tasks of the male and female gender does not relate to the functions and locations of the spaces. The plans of the houses were still based on the fact: only build what is necessary. The plans are based more on reception and public and private factor. Based on the fact that the husband is at the top of the pyramid, he has the most saying in the house and orders things.
Religion had no effect on the layout of the house, but it does have effect on the situating the house to the mosque (the centre of the village).

Because of the thickness of the walls the floor area was decreased and concrete was introduced as an alternative. The quality and comfort where exchanged for land surface.

Conclusions: The present living

Sulaymaniyah: There is a need for qualitative, durable, comfortable and suitable ground dwellings for the middle class within their budget: between $80.000 and $125.000.
Due to the extreme warmth in the summer season, the day is split in 3. The morning, afternoon and evening is the time for work and pleasure and in the evening people spend their time at home. Due to the weather conditions it is best to add flora and orientate the houses in a way that the high summer sun is not directly shining in the most used rooms, but in winter does. For the other seasons it is pleasant to sit outside without immediate discomfort of the weather.

Economy and lifestyle: The increasing growth of the economy will attract more people from the rural areas to the city. So the need of houses will grow.
In combination of the growth of the economy and the influences of the lifestyle the households will lead to more individualization, so there is a need of common ground for activities outside of the house. The increase of demand of electricity, water and gas there is a need of solution to decrease these needs in the form of self-sufficient houses that can generate electricity and/or warm water. The fact that the average household has 5 members, a house needs 4 bedrooms.

Architecture: It is not a problem for the people of Sulaymaniyah to use imported materials and/or builders. The quality of the houses must be more than only the appearance of the house. A technical house is more profitable, if people know how to use the house correctly, so there is a need for a qualitative house with a user guide.

Housing: A plot cannot be bigger than 200m², but it can also be 100 or 150m². Reducing the plot size can reduce the costs.
Because of the loan system every family, also a middle class family, can buy a house. After the contractor is finished with building the houses, the buyer is free to decorate and build a new layer for example. To attract more people and aiming to build for a family and thus improving the quality and environment of the house, introducing diversity in layout and design is necessary. The loan system makes having a home accessible for the middle class. The regulations are not leading in the design.

Project analysis:

- *Typology*: It is better to make the most used spaces the largest. It is best to have three sides free for ventilation. The garden must be orientated to the sun so that flora can grow. People are willing to pay extra money for facilities such as 24h electricity, also for a ground dwelling. An open or closed kitchen does not matter, as long as there is another room for the other gender to sit separate. An opening to the outside is necessary in each room, this can also be upwards. In addition to the garden, the roof must be used as a terrace and/or common staying area, like in the traditional living.

  Activity relations: We can conclude the most of the activities takes place in the living room. Also the living room is the room with the highest occupation at one time. So the living room has to be the biggest room. There has to be a dining area, so the other gender can sit there when the living room is occupied. The roof has to be more approachable to spend time and sleeping there, by taking measures against the weather.

  Users and public/private: Because visit is customary, it is important to keep the private parts of the house separate to the public by making a clear border. We can conclude it is a problem for women to walk, seen by the men, to the toilet.

  Building technique: A ground dwelling does not need to be all on one layer, if the areas are place above each other there can be created more outside space. Even the lot can be made smaller that way, which makes the property cheaper.
  Concrete is sustainable, but the hollow blocks used for the walls are not. Due to the hollowness of the blocks the warmth, cold and the moisture causes the stucco to rip, on the inner side of the house. The lack of consideration of the weather condition causes discomfort in the house. There need to be taken actions like blinds against the sun and also insulation in order to prevent energy loss.

  Appearance: By making the whole project in one colour, the project will behave in a more commune way and for dividing areas, different kinds of trees or sidewalk colours can be used. Using the difference in heights, of the ground levels like in the traditional living, there will be a more defined structure between public, private (of the outside area) and outside –inside. This also can be used in the interior, for indicating the difference of spaces and their functions.

5. Future living

Implementation

Vision

In this chapter I will give my vison on the developments and how the influences from outside, affects the housing- and living culture of Sulaymaniyah.

Kurdistan and Sulaymaniyah will have another economic growth, if Kurdistan is recognized as a country. The confidence of people will grow: people will trade and invest more which will lead to a more prosperous community with more demands for and in the house.
This development will cause more people from the rural area to move to the city. The effects of the moving of these people will once more cause the need of houses and expanding the city borders and also more demands because of the developing techniques and equipment.
To accommodate these changes we must now take into account the future wishes and necessities of a household, by using materials that are easy to edit for expansion or renovation.

The basic instinct or cultural behavior of the people of being friendly to their neighbors is little by little despairing and this will get worse. It is important that a place is reserved for activities and events, within the project. The traditional living had a communal center, the same concept is needed so that the neighbors will have closer bonds together and together contribute to the welfare and safety of their neighborhood.
To accomplish this, a number of people have to shoulder the task of organizing and implementing the activities and events. This will lead to a safer environment for children to live and play in.

In times of financial stability more children are made, due to the certainty that they can maintain the child and can fulfil his/her needs. This taken in account, will lead to the need to enlarge the house or move to a larger house. Also there is a chance that when the economic growth will continue, young people want to separate from their parent and seek their own resident. This is a contradiction to the culture and tradition of staying as long as possible with their parents.
To accommodate this change we must think of a way to make the house flexible an enlargeable, without degrading the street or the appearance of the house. To expand and renovate, not to demolish and rebuild a new home, is also a tradition.

External influences have direct effects on living which affects their life. What people see in foreign series, for example, large living rooms and kitchens, large furniture, so their houses are never too big. If the growth of economy goes on, the behavior of copying such images will become more. In order to respond to this, it is important to design the housing in such a way, that they are timeless. If they are big- looking and feeling from the inside, for example: by making higher rooms, making the most used rooms wider and adding windows in an efficient manner so that energy is optimally utilized.

The problems of not having 24h of water, electricity and gas can be solved by the government, when it is become a country. Until then, it is important to take make the houses sustainable so that just with the necessary facilities the house can be comfortable and livable. By teaching the residents how best to use and maintain their houses this will also be achievable, this can be done thru a user manual.

Religion is an important factor in today's society, mainly through acts of ISIS. The actions have led to confusion and different view of Islam in politics, this does not apply to the observance of the religion itself by an individual. Religion is therefore returned in the plan, as it has always done, and also according to the regulations that each new district has at least one mosque. This will be beneficial for the tradition and culture, because it is an archetype for construction in this society.

Design brief

To design a ground-dwelling for the middle class, a program of requirements must be written. This is done based on the conclusions of the traditional- and present living and my vision for future.

Location:

- The project should be built around a centre with mosque, small shop area and park for activities and events,
- In front of each house, between the road and side walk, a parking place for at least one car,
- Planting trees, preferable fruit trees so there is a form of profit to obtain from it,

- Each 30-40 houses should have a small park area for children, youth and adults can play, sit and spend time, this is based on: out of 60 households 180 are non-adults,
- Safety in the district, placing thresholds so that speed can be limited,
- Installing big water containers and electricity generators for residents who are willing to pay extra for these facilities,
- Making an organisation out of the people within the project for planning and organizing activities and events.

House orientation:

- The house must be constructed on a plot of max. 210m^2,
- The orientation of the house should be as much as possible towards the south,
- Introducing different height in order to indicate diversity of use,
- Creating more outdoor space, this will provide more openness and also a bigger task for the husband so the balance of tasks as the wife will be even,
- More flora, because this will add shadow in the summers and acts as a wind screen. It also affects the air of the area, with the result that it has a positive effect on the people,
- Two free sides for ventilation and illumination of other houses (on the north side),
- Providing options for outdoor sitting area: covering for garden and rooftop, screen or fencing against wind. By doing this, the terrace of the plain layout is brought back,
- After the houses are done, the residents should not be allowed to make external visible changes or modification, without approval of the project staff, so it does not affect the street scene, project- and house quality,
- Fencing between houses and gardens, also fences to the street.

House:

- Must have an airlock, as in the plain layout (in door terrace) for the purpose of not losing energy,
- Should have minimal 3 bedrooms,
- The living room has to be the biggest room, >20m^2,
- A separate diner area is needed for sitting of at least 5 people, >15m^2,
- Placing the toilet in such a way that women can go there unseen by the men, a standard eastern (ground) toilet,
- A common bathroom with shower and washing stand,
- Most used rooms should face the south, for illumination, warmth and for ventilating thru the house, they should also have high ceilings,
- Each room should have an opening to outside, for ventilation,
- Introducing diversity in house design, by making it enlargeable for flexibility of a family (by taking their numbers in to account) and their demands. To make a house <u>with</u> a family, the life span of the house will significantly increase because of the specific needs/wishes of the residents were taken along,
- All types of electronics, the kitchen and appliances and lighting are on the residents,
- Two water tank on the roof per house,
- A user manual should be written and illustrated to utilize all facets of the house optimally.

Materials:

- Introducing insulation, as an upgrade to the comfort and liveability of a house, insulation is a must, also for the sustainability and energy efficiency of a house. With this improvement the housing of Sulaymaniyah will change for the good of health and life and will make a major contribution to the wishes of the people in the future. The addition of insulation will also decrease the use of electricity for heating and cooling, also the decrease of gas for heating. Insulation also works against the façade and construction getting hot (in the summer), which is now the case, so it is more pleasant to sit outside or on roof,
- Floor is finished with dark coloured tiles, for the withdrawal of heat (in winter) and cooling (in summer)
- Interior and exterior walls are finished by contractor,
- Adding blinds for shades in the house an on terrace(s),
- The project needs to have one colour, a light colour like white is very appropriate against warmth and cold,
- A part of the kitchen and all the sanitary area is tiled.

Finance:

- The common income of a middle class household is $2.000,
- A ground dwelling should cost between $80.000 and $125.000,
- Contractors loan spread over 6 years, instead of 5 years to make it affordable, in combination with the government loan,

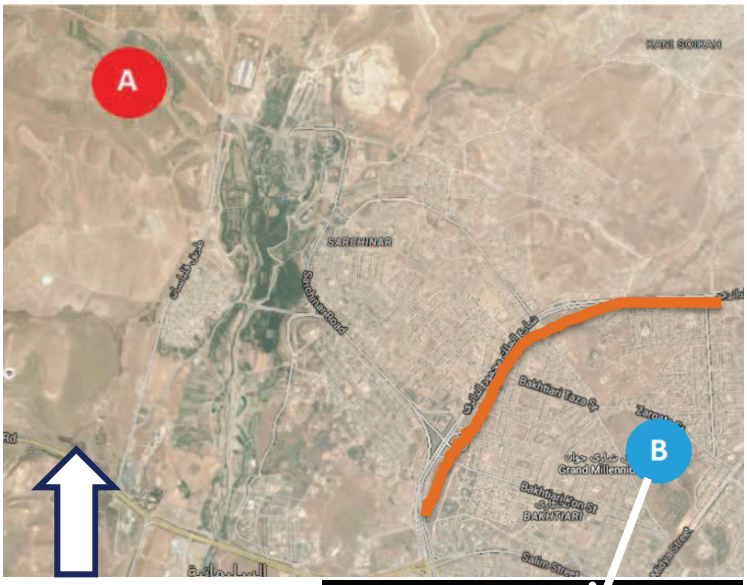
Design plan

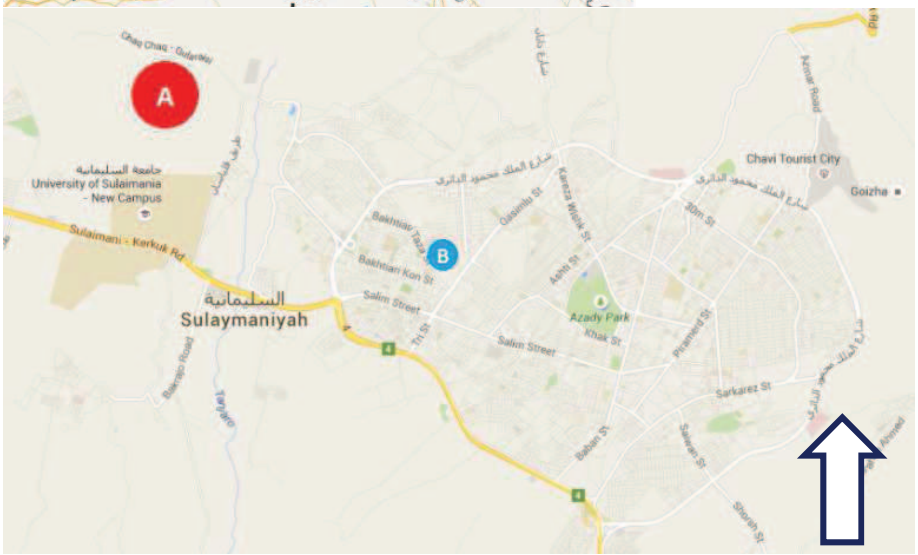
Based on design plan I will make my own design for a ground dwelling for a middle class family. Firstly a location is chosen in Sulaymaniyah, also the properties of the location will be shown. Based on the location and previously discussed subjects: conclusions and vision, several sketches and a final design will be made. The financial aspect such as the costs and benefits will also be explained.

Design

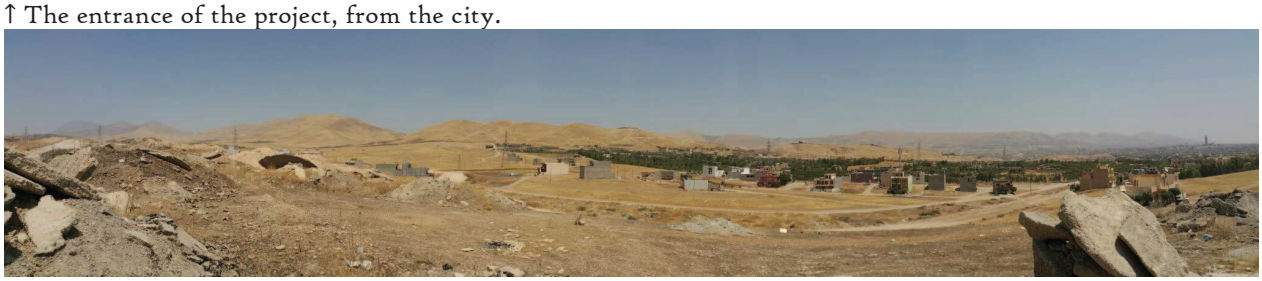
The location that I have chosen for my design is also the location that my client, Rozhi Nwe Co., possesses and momentarily is building the exemplary city on (*exemplary city can be found in the project analyses*). I have chosen this because of the fact that the location is theirs, also because of ground prices. Around the city of Sulaymaniyah several area that are in the same price class as this location and if we take the future in to consideration, my design concept can also be applied there.

Below, several maps are displayed indicating the location: Point A is the location, it lies at a distance of 5 minutes from the orange line (which is the 60m road around the city). Point B is the grand millennium hotel which will act as a reference point for the photos of the location, because of its height. On the next page several photos are shown of the location and its surrounding.

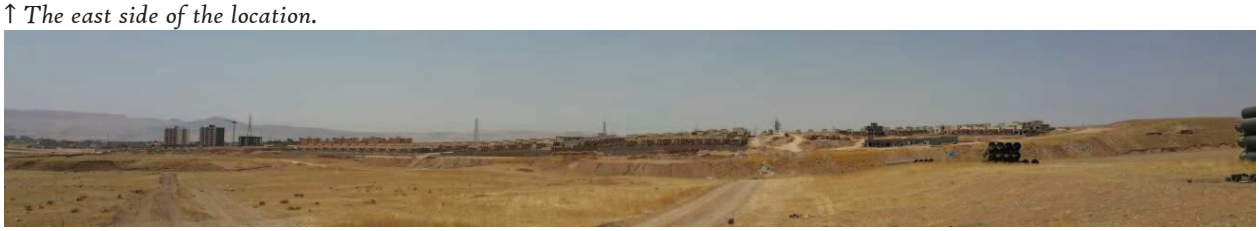




↑ The entrance of the project, from the city.



↑ *The east side of the location.*



↑ *The location as seen from the east side.*

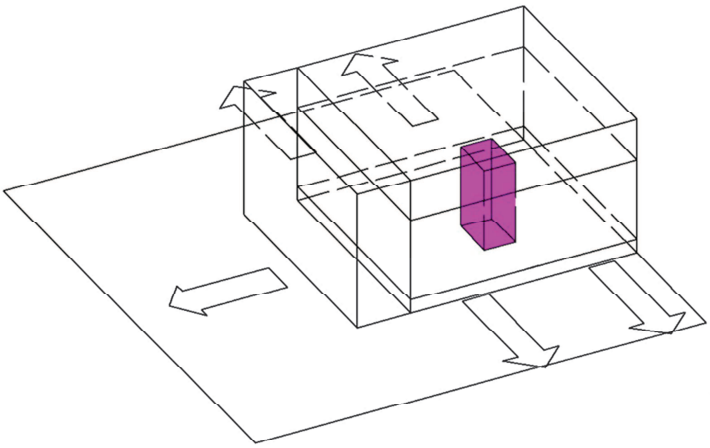
↑ *The location from the north.*

↑ *The location from the south-east.*

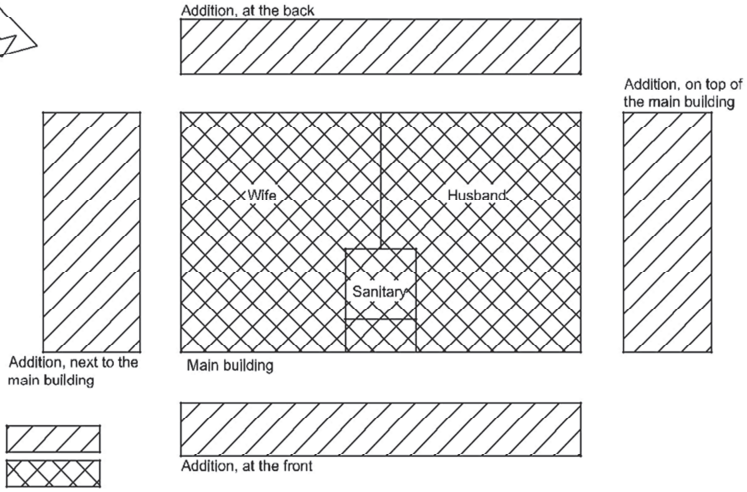
↑ *The project from south-west.*

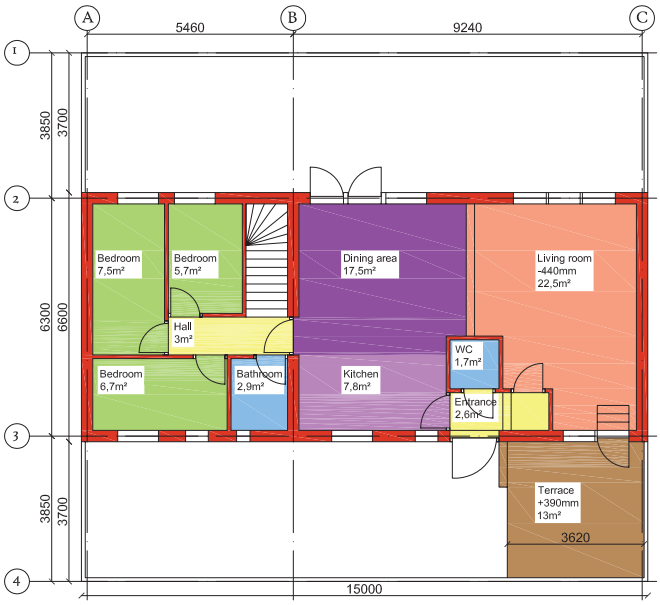
Designs and floorplan
The designs and the floorplans are drawn as an artist impression but also with technical aspects.

First the primeval plan of the future family house, to show and compare it to the traditional and the present living plan. The plan show great opportunities for flexibility around the main building. The main building is the centre of the house and doesn't get smaller in shape, however it is enlargeable. Based on this concept I have design 2 models and also made 3D drawings. *Below the primeval drawings are shown and on the following pages the designs are shown.*

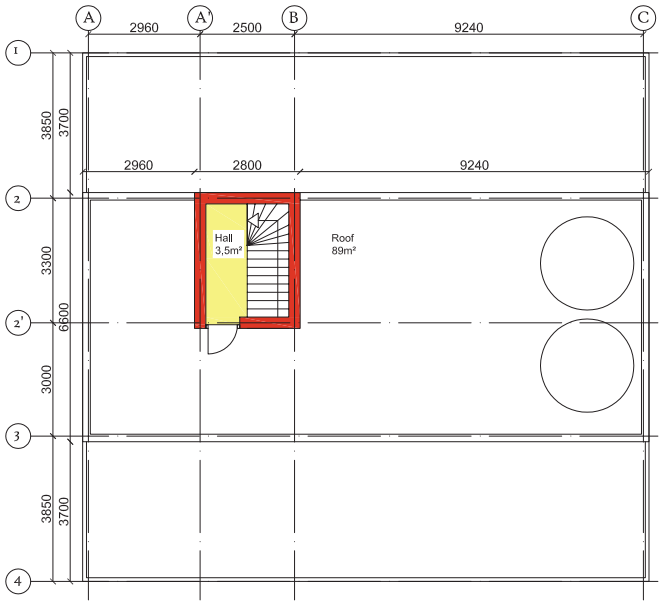


FUTURE LIVING
- Facilities area, spread in public and private, directly after the entrance
- Three free sides, does not matter how the house is orientated
- Floor as bearing zone
- >1 floors
- > can be built on to
- Row structure
- With a lot of outside area
- Parking place on lot or in front of lot



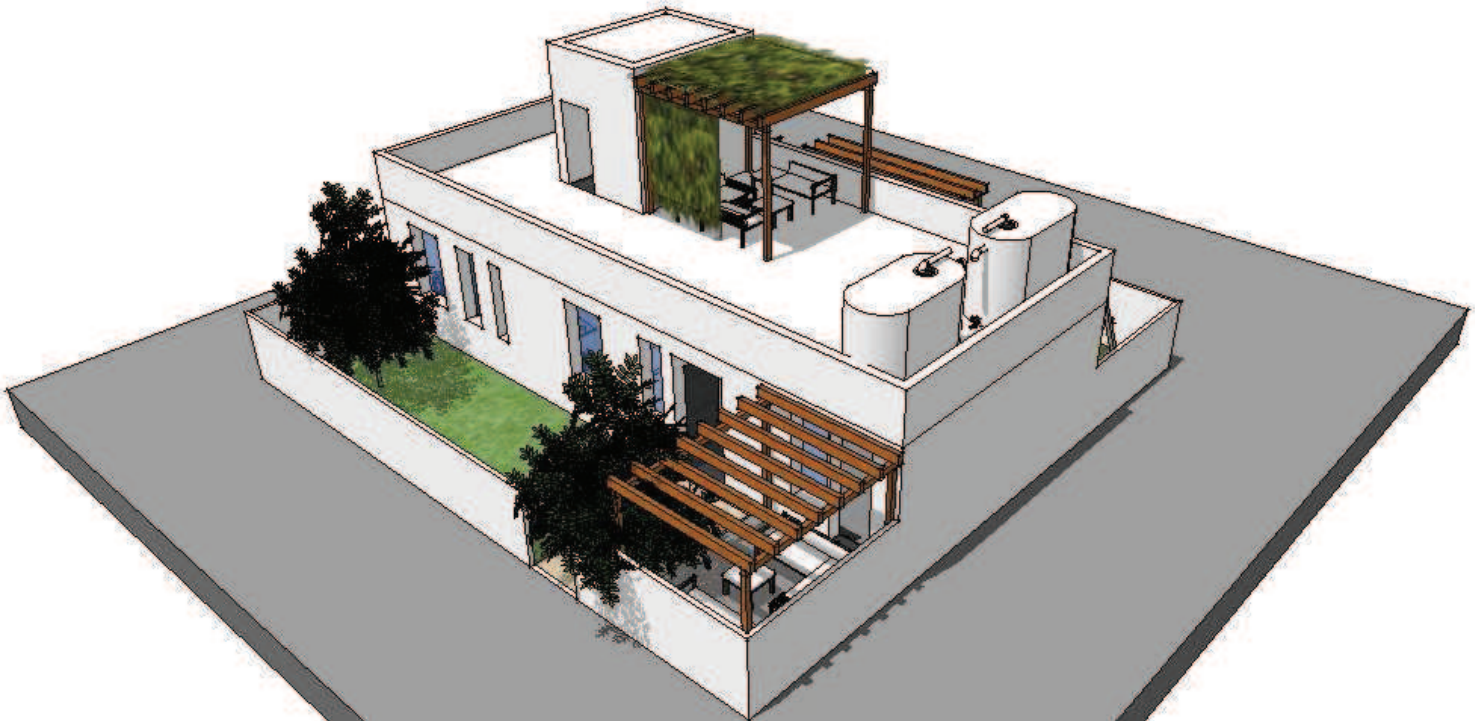


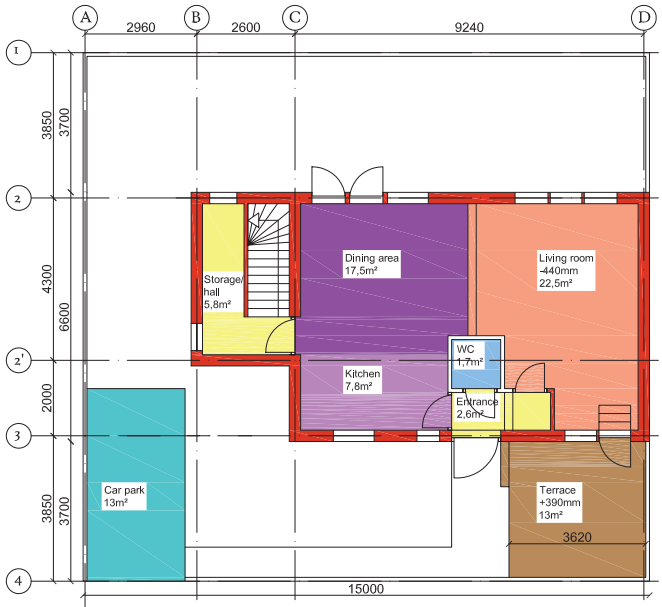
Ground floor
Total area: 210m²
Building: 99m²



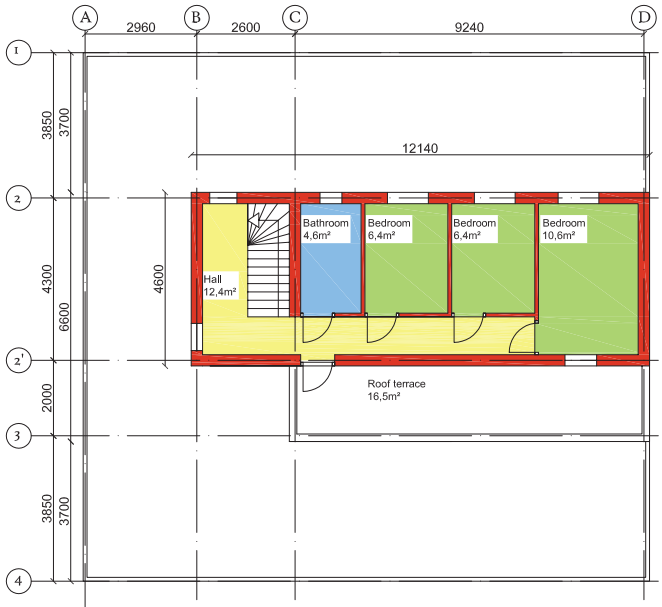
Roof
Total area: 99m²
Building: 10m²

FUTURE DESIGN	
Model 1.	
Type:inline	
Scale 1:100	mm
A3	Orientation: n.a.
Shakar Musa	

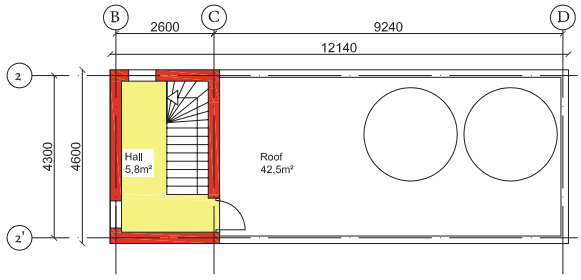




Ground floor
Total area: 210m²
Building: 75m²

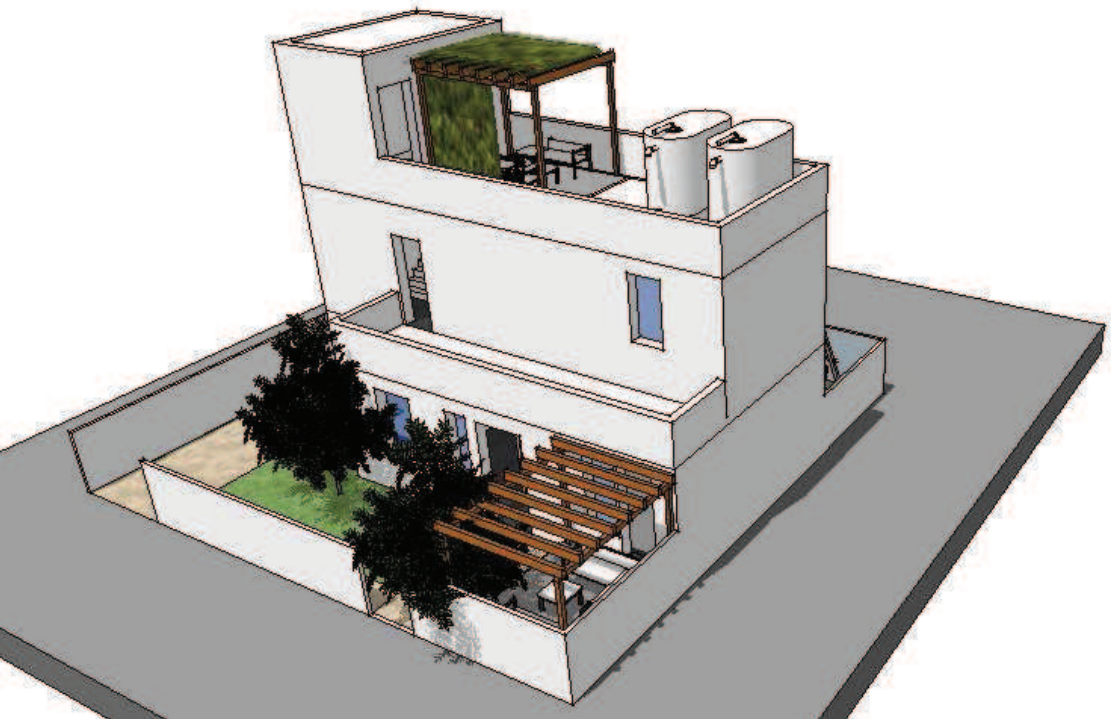


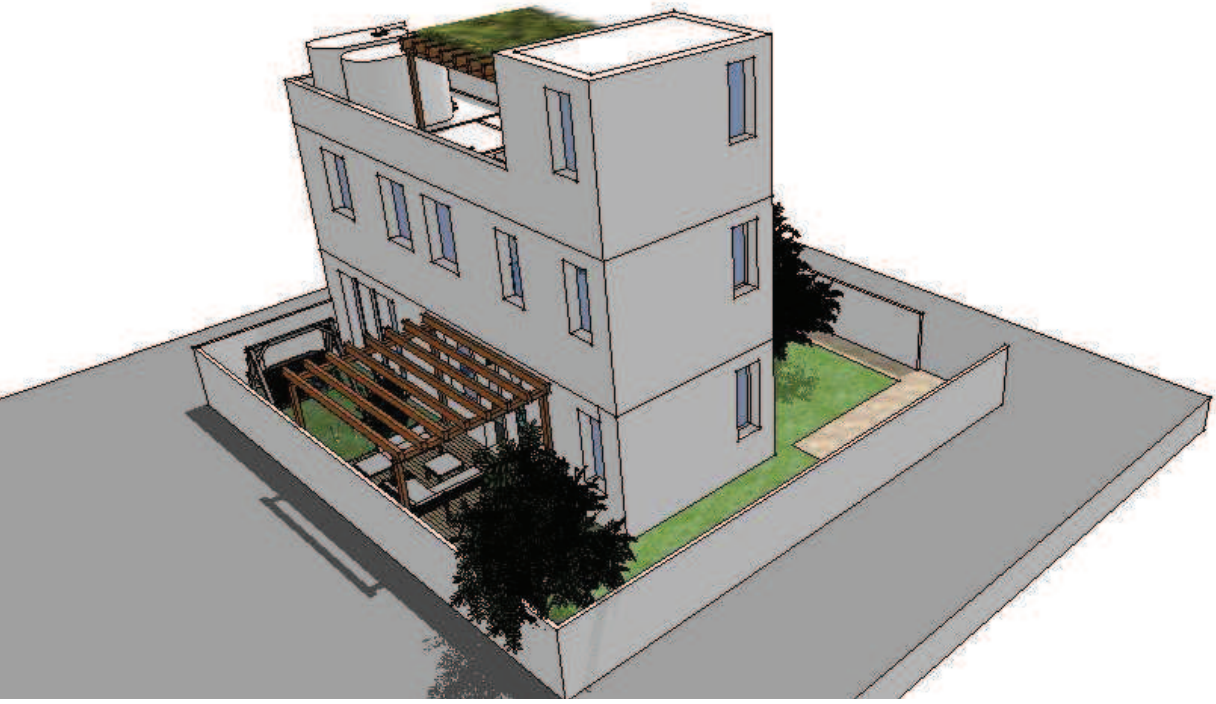
Second floor
Total area: 75m²
Building: 55,8m²

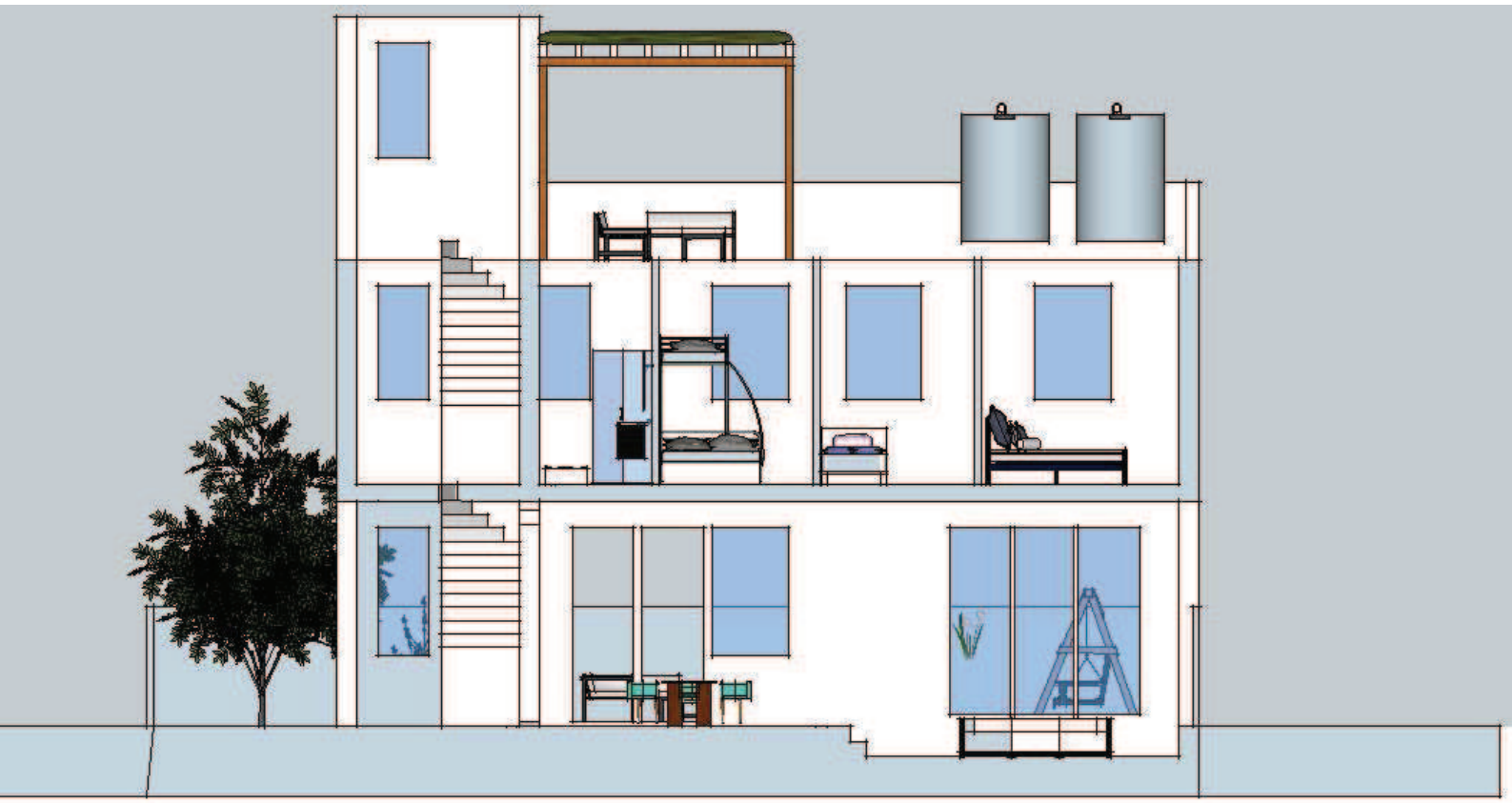


Roof
Total area: 55,8m²
Building: 13,3m²

FUTURE DESIGN	
Model 2.	
Type: stacked	
Scale 1:100	mm
A3	Orientation: n.a.
Shakar Musa	



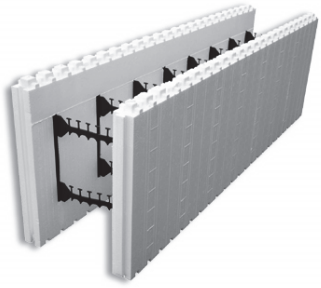




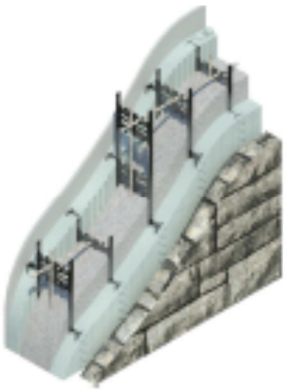
Additional information:
Here I will give extra information about the wall material and solar equipment that can, which also is flexible and easy to implement by the workers of Rozhi Nwe.

Wall material:

- ICF Building Systems (Insulated Concrete Formwork) is a building system based on light weight hollow blocks consisting of insulating material. It is a type of lost formwork. There is space created by the insulation panels, in this space reinforcement is placed and after placement of the blocks filled with concrete.



1. ICF block2.



2. ICF with finish.

In picture 1 (above) the ICF panel is shown with in between "webs". Webs are placed to keep the panels together and also as holders of the reinforcement steel, which can be seen in picture 2.

This system is quick and easy to learn, it does not require high techniques for execution. It can be learned and placed fast by local workers. ICF can be placed local with mobile manufacturing units (Dick van Merwe, Van den Berg Groep). The material shows good thermal insulation, sound insulation, humidity resistance, as well as a good sustainability.

In attachment 4, fundamental and generic details of ICF are shown.

Finance

For implementing the design cost are involved. The costs for the types are shown below in tables. The costs are calculated based the land price and construction costs. The cost of the project of my client: exemplary city, is listed first followed by 2 models designed by me. The source for the costs of ICF, where I founded the prices, is indicated within the table.

The calculations show that both models are within the financial capabilities for both the client and the middle class household.

Rozhi nwe			
Yellow zone, ground price	$	200	
Ground area	m^2	210	x
Total price of ground:	**$**	**42000**	
Total price of a house:	$	88300	
Total price of ground:	$	42000	-
Total construction costs:	**$**	**46300**	
Building area	m^2	135	
Hight of a layer	m	2,8	x
Building	**m^3**	**378**	
Construction cost	$	46300	
Building	m^3	378	/
Construction cost per m^3	**$**	**122,49**	

Model 1								
Yellow zone, ground price	$	200						
Ground area	m^2	210	x					
Total price of ground:	**$**	**42.000,00**						
Cost ICF (based on calaculation masters research of J. Timmers - Hasselt Univeristy)								
Costs	€	70,75		1,09	**$**	**77,12**		
Wage	€	1,8		1,09	**$**	**1,96**	+	
Total costs ICF per m^2						**79,08**		
Total costs ICF per m^2						79,08		
Total ICF area Model 1 per m^2						387,04	x	
Total costs ICF					**$**	**30.606,93**		
Total costs other activities					**$**	**10.000,00**		
Ground price	$	42.000,00						
Construction cost	$	40.606,93	+					
Construction cost per m^3	**$**	**82.606,93**						

Model 2								
Yellow zone, ground price	$	200						
Ground area	m²	210	x					
Total price of ground:	$	42.000,00						
Cost ICF (based on calaculation masters research of J. Timmers - Hasselt Univeristy)								
Costs	€	70,75		1,09	**$**	**77,12**		
Wage	€	1,8		1,09	**$**	**1,96**	+	
Total costs ICF per m²						**79,08**		
Total costs ICF per m²						79,08		
Total ICF area Model 2 per m²						614,49	x	
Total costs ICF					**$**	**48.593,56**		
Total costs other activities					**$**	**10.000,00**		
Ground price	$	42.000,00						
Construction cost	$	58.593,56	+					
Construction cost per m³	**$**	**100.593,56**						

Solution of the main question

Main question: 'How to create a family house (ground dwelling) that fits the character and culture of the city Sulaymaniyah in South-Kurdistan, with available materials and equipment?':

Creating a family house that fits the needs of a middle class family of Sulaymaniyah can be achieved by knowing what these needs are. In this case the needs are decided by the relation between the family members, space and visitors. At the same time it is also decided by the lifestyle of a middle class family and their communication with the neighbours and surrounding.
Not having electricity 24 hours and extreme weather is very important to use shades from trees and fences but also using the height of the sun to warm up the house. It is not only important to create a useful interior, but also an outside that suits them. A middle class family attaches great value to a nice appearance, for the exterior and interior of a house. Parking space for 2/3 cars should be included in the new design, this does not need to be on the lot itself. When putting it next to the lot, in a parking space next to the road, a lot of space is won on the lot. Nonetheless it is important to live in a house that suits them and is specifically for them.
The house is a very flexible and can be implemented in various orientations by my client. Also the future resident should be involved before the start of the build so they can shape it to their desires, by adding and/or replacing spaces, walls, doors and windows.
As for the materials and facilities, it is important to look at how familiar a material is and what it does to the appearance and comfort of the house. In the end it's all about whether it suits the occupant and the occupant likes it and wants to buy it.

Goals

Company goal

The goal we're achieving by the plan of a new house for the middle class of Sulaymaniyah is:
A proposal for builder and developer Rozhi Nwe Co. in August 2015 which provides advice on how and with what resources the client can provide the middle class, of Sulaymaniyah, with a qualitative and comfortable ground dwelling, taking the culture and traditions into account.

The plan is an implementation of advices and example design which includes attention for quality, comfort, culture and traditions. With this plan the goal of providing the middle class of Sulaymaniyah a suitable house can be achieved.

Personal goal
The personal goal is to demonstrate that a ground dwelling design for the middle class with the application of new customs, needs and techniques and with the preservation of culture and traditions is realizable and achievable.

This goal will also be achieved with the design that is made. The plan makes it able to demonstrate how a ground dwelling for the middle class of Sulaymaniyah can be realized with all the aspects that are written in design brief.

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ATTACHMENTS

Traditional living plans

Project analyses

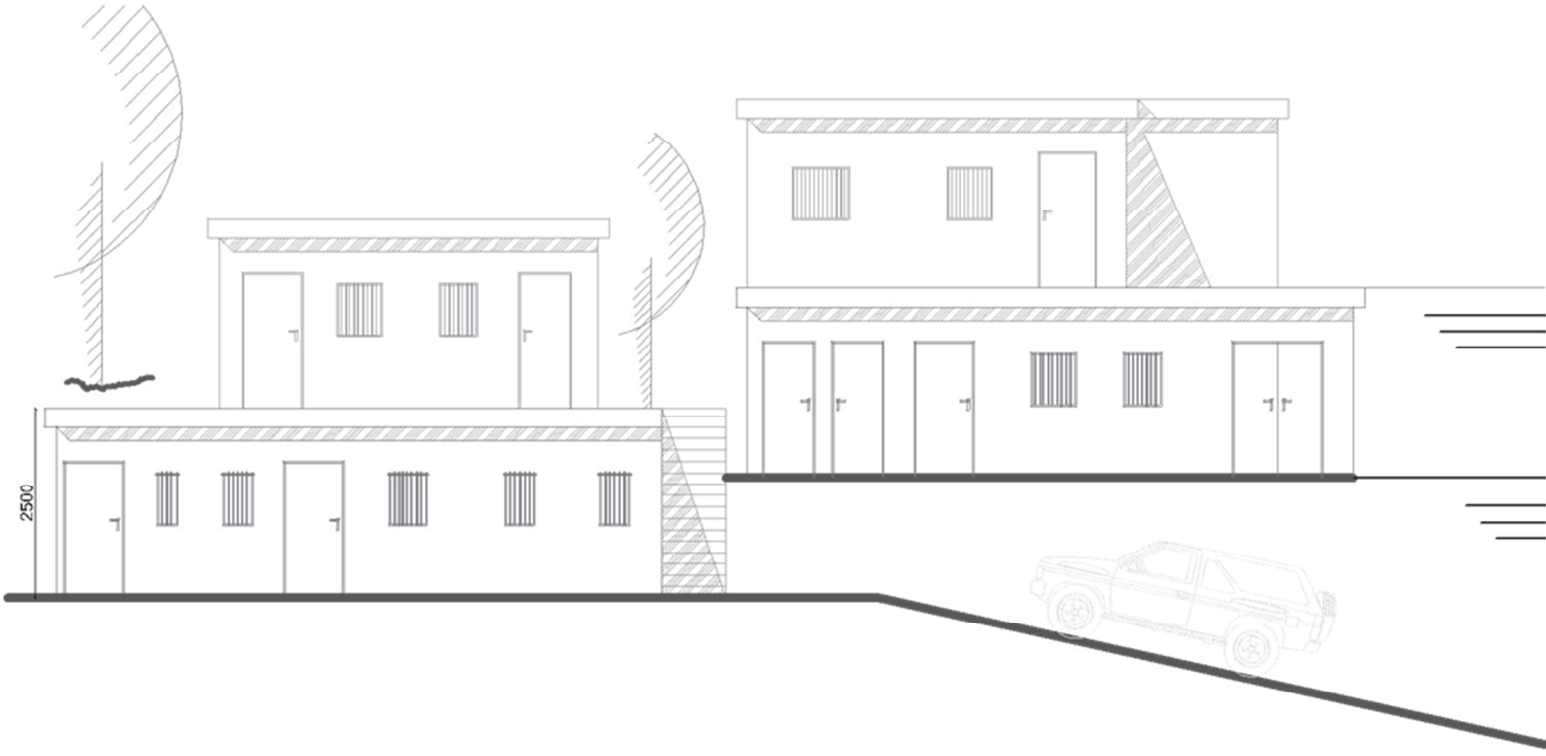
- **Supporting text**
- **Map of Sulaymaniyah**
- **Project plans**

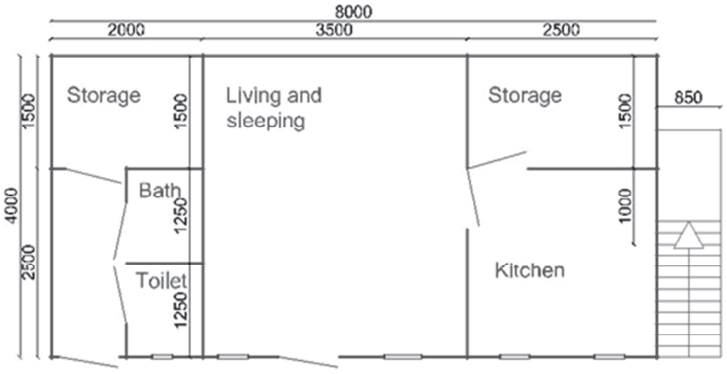
ICF details

Traditional living plans
Mountain- and plain layout

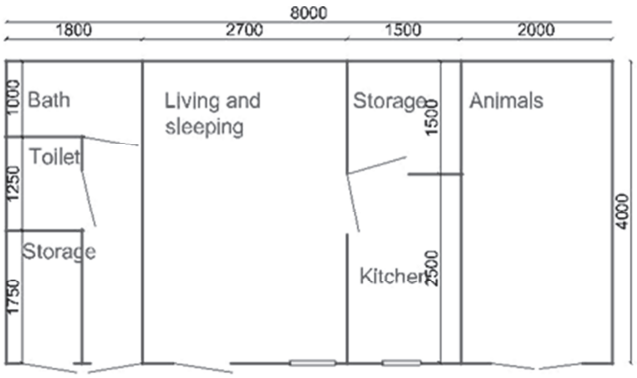
The overall programming of a home in the mountains:

- Outside/ terrace: This is done on the roof of the "underlying" neighbours,
- Space/ shelter for animals: This can be done near the building, but also a bit outside of the residential area,
- Space for goods: Food for animals, wool, etc.
- Toilet and shower,
- Cooking area,
- Common space; (size and amount of spaces depend on the number of members of the family) Housing, reception area, dining area and sleeping area.

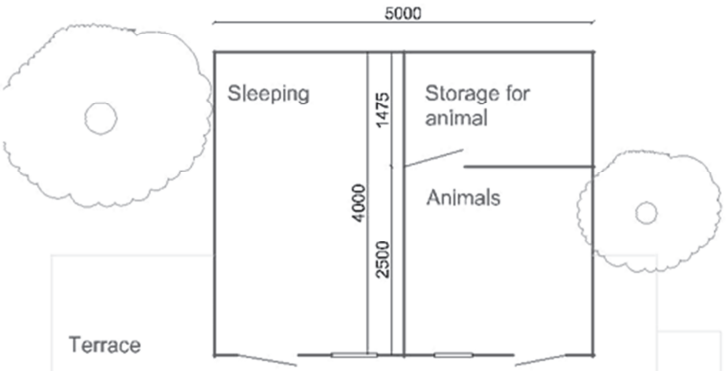




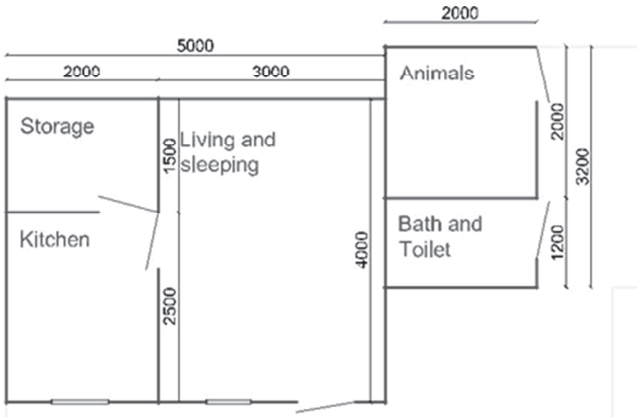
Ground floor



Ground residence



Second floor

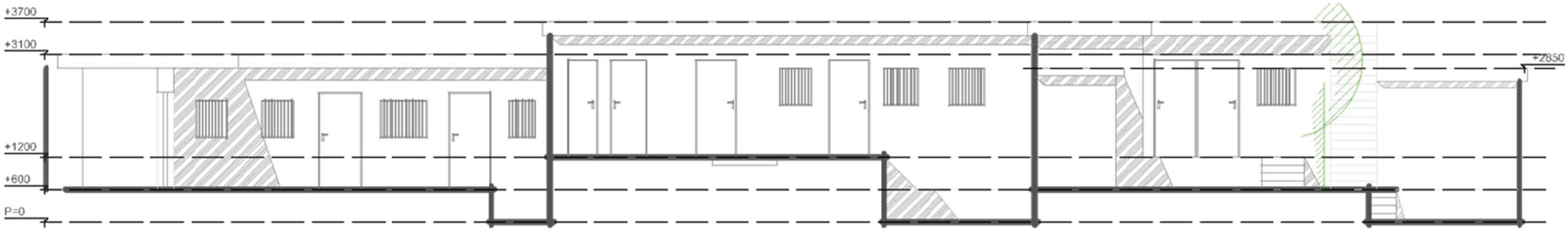


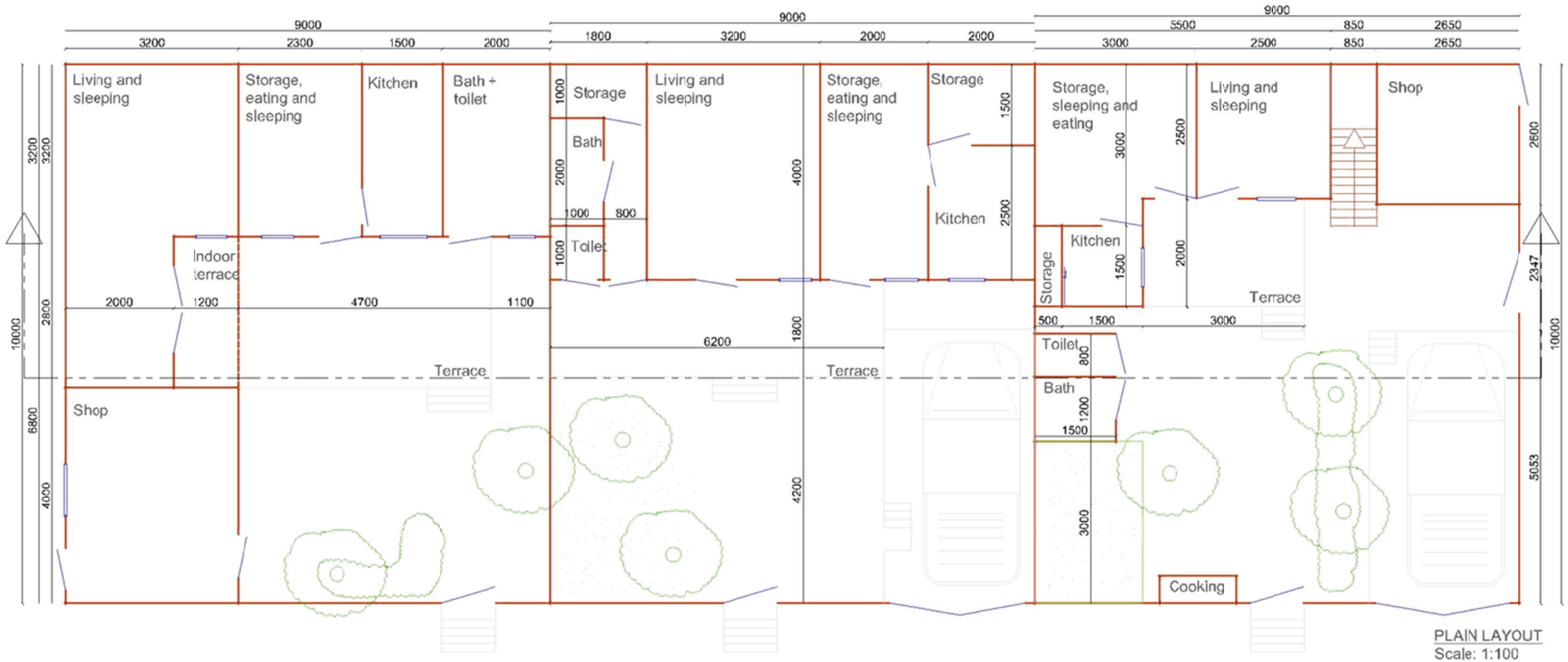
Upper residence

MOUNTAIN LAYOUT
Scale: 1:100
Sizes in mm

The overall programming of a home in the plain area:

- Outside/ terrace: This occurs on private land, garden,
- Space/ shelter for: animals, tools for agriculture,
- Space for goods: food for animals, wool, etc.
- Toilet and shower,
- Cooking area,
- Common space; (size and amount of spaces depend on the number of members of the family) Housing, reception area, dining area and sleeping area.





PLAIN LAYOUT
Scale: 1:100
Sizes in mm

Project analyses

Supporting text:
In this text I will explain relationships between house space (Area) and different roles of standard family (wife, husband, and children).

Finance
The projects are sold based on direct sale and loan. There are 2 loans involved: a company loan which is arranged from the company based on the cost of the building, often this loan is fixed on a number of years. The other loan is given by the bank of investment. This loan is given to people working for governmental institutions or is authorized by a person who works for a governmental institution. Both loans are interest free and are given to the people so that renter's percentage goes down. The loan is not paid back fixed on a number of years, but based on the amount of income of the person.

Living room/ reception
Living room is commonly used by the family which they spend most of their time. This room also considered public place due to the fact that visitors also uses this room that is why living room is kept more clean and tidy. If there is a dining area in the house, the husband only goes there to eat or to pass it to another room. When there is a visitor, men and woman sit separately, except when the visitor is a close relative. The dining area (the table) is then occupied by women and the men sit in the living room/ the couch. While the men does not go to the women's area, the women and children still go to the living room to bring tea and snacks. When the family is together, there is the rule, such as (earlier) in the villages that the man/husband due to his social position as a man is sitting in a place above (higher) in the room. This is determined by the slope of the mountain. This rule also applies when there are visitors; this "higher" place is assigned to the husband and / or wife.

If there are a lot of visitors and there is no place for the women to sit, then they move to the kitchen or a 2nd living room if there is one. It is also possible when friends of the husband come to visit they do not sit in the living room, but in the 2nd living room, then the wife or women sit in the living room. It is more for the formal visitors to take place in the living room and the more casual in the 2nd living room. When visitor is informal, it does not matter whether women or men will be sitting in living room or in the 2nd living room or together. But men never sit in the kitchen.

Living room is used also when children have friends over. It is not often that "large" group of friends come along. Good friends or girlfriends are received informal. Where and with whom they stay is not important.

Second living room
This room is used as living room for the family. Visitors are not supposed to use this room. In this room the whole family come together to spend time and watch TV. If visitors are more than capacity of regular living room then second living room is used, otherwise men and women split up or children go to another room. It is a casual space in contrast to the living room (above). In some cases when close family comes for dinner and there is no enough space in the dining area, this room is also used. It does not matter what kind of furniture used in this room, as long as there can be sat. This room is generally not kept as tidy as the reception.

If there is a 2nd living room in a house, then it would be at the centre of the ground floor. The effect is that when the visitor wants to use the bathroom, he/she must walk through it whether it is tidy or not. This space is also used as sleeping area in the noon, which is also known in Spain and Italy as siesta. Again, in this culture women and kids are responsible of cleaning the house.

Dining area
In smaller houses like the ones we analysed, the dining area is often located in the living room. There usually is a dedicated space for dining table in this room. This is occupied by the family during dinner. The wife and children have the task to make this space (along with the living room) clean and tidy and keeping it that way. When there is visitor, it is used as a common dining area and as a rest place for women.

Sometimes dining area is in the kitchen. This makes the kitchen when eating, also a public space, because the visitors also sit there. Even if the dining area is in the kitchen, it is used as the sitting place of the women (if men sitting in the living room). It is possible that the kitchen or dining area is too small to sit during dining (with visitors) then they will eat on the ground in the living/reception room.

WC
When visitors want to use the bathroom they have to go beyond the reception area and go in to the private area, this is not appreciated by the homeowner. When the visitor goes to the bathroom, whether it is from the dining or the living

room, they disappear from the sight of the homeowner. It is not desirable for women to go to the bathroom before the eyes of men. When they are visible when walking out the room they do not feel at ease.

Kitchen
The kitchen is strictly speaking the female domain. Here the wife spends most of her time when she is at home. Making Kurdish cuisine takes time; hence they spend a lot of time in the kitchen.

In very special cases husband cooks, for example when close family or close relatives are visiting and when the wife is ill. The roles of the wife in the kitchen are: cooking, keeping the kitchen clean and making shopping lists. The husband usually goes shopping alone or with his wife. If the husband is not home, she sends one or two of her kids to do the shopping. In some districts, there are men who bring fruit and vegetables along with a push cart.

Scullery
Sometimes in addition to the kitchen there is a small utility room. This is always attached to the kitchen and help with ventilation. Here the homeowners put a small stove, a small sink and small refrigerator. This "small kitchen" is used as the main kitchen and the "normal kitchen" is not used and serves as a show model. In the kitchen, the wife is helped by her children, mainly by the daughter (s) (if there are any daughters). The female-visitor also goes in to the kitchen, to help the lady of the house or just to chat with her while she is working. This small kitchen is often not visible to the male visitor. The food is served in the dining area.

Bedrooms
In one story houses there are several bedrooms located at the ground floor. One room is always used by parents. If there is one bedroom on the ground floor then it is given up to the grandmother or grandfather, if this is not the case then parents sleep there. This is mainly due to the fact that they are the guardians of the house.

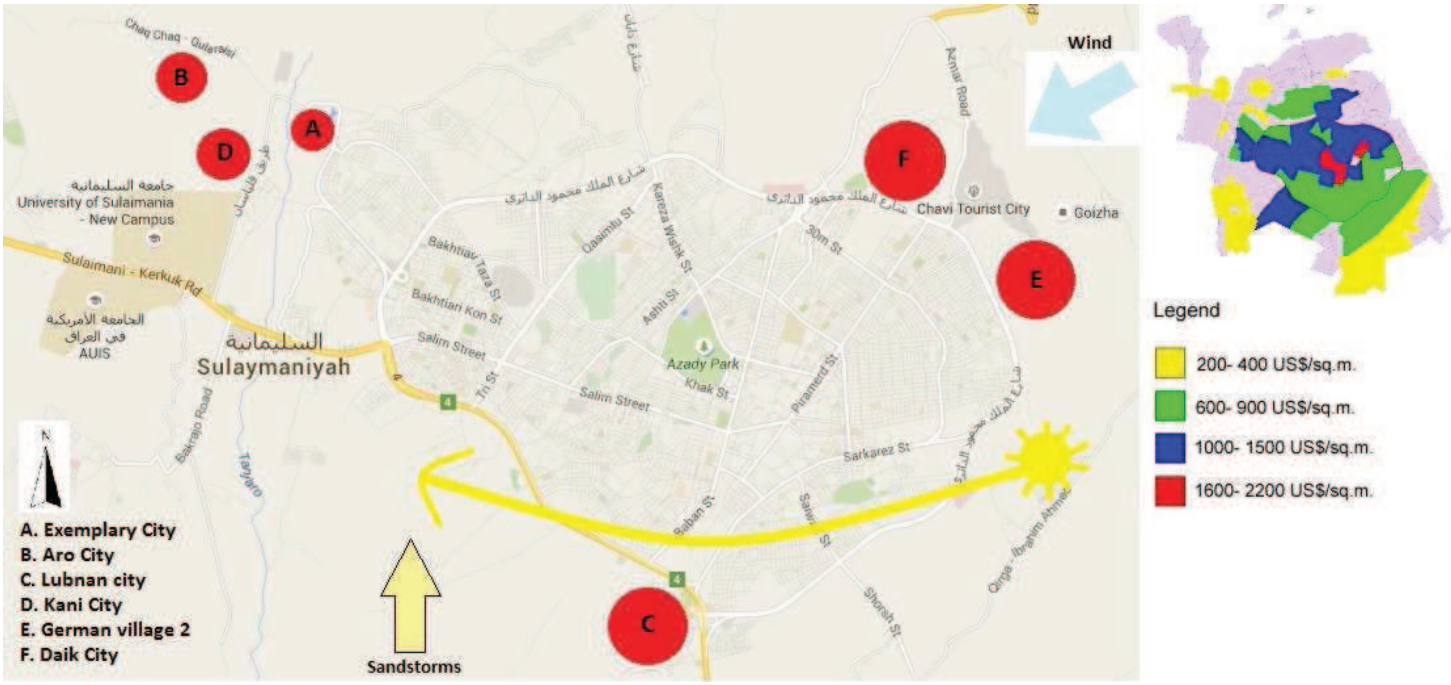
If there are more bedrooms on the ground floor, they shall be used by children from young to old. The youngest have less to choose compared to the older children. The older child often wants more privacy and goes to the first floor or wants a private room. The younger children stay on the ground floor and sometimes they sleep together in one room.

The master bedroom is cleaned by wife. The other bedrooms are serviced by children and also cleaned by them and the mother. In larger houses there are toilet facilities placed in the master bedroom, they are used only by room occupants.

Outdoor
In all cases there is outside space on the lot. It includes parking and a piece of garden activities. The husband is primarily responsible for the outdoor area. His tasks are, cleaning, thus washing the pavement and maintaining the (small) garden and making barbeque is usually men's job. The whole family gather place here and it is a public space where visitors are received, if the weather permits and there is enough space.

The wife makes contribution to house outdoor activities as well. If they don't have a dryer, the wife has to hang up the laundry. For the rest, it is not up to the wife to spend her time here, because the exterior walls are often low (up to 1.5m) and they are (clearly) seen from outside. This also counts for the daughter(s).

Map of Sulaymaniyah



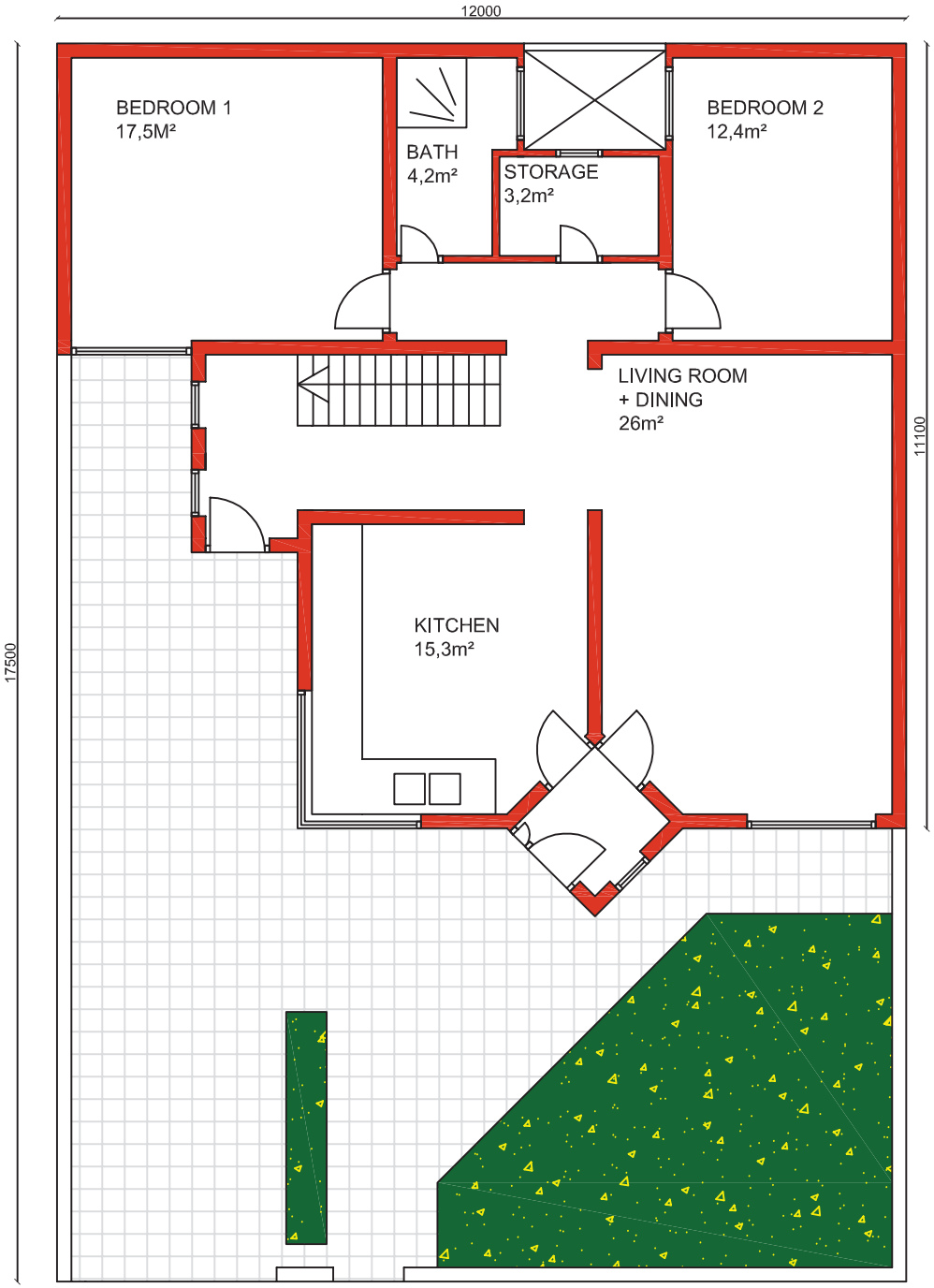
Project plans
Rozhi Nwe Company
A. Exemplary City
Housing projects build in 2012. Consisting of 435 houses, each lot is 210m². The houses are built on 135m². The houses consist of the following accommodations: 2 bedrooms, kitchen, living room with dining area and sanitary spaces. The outside spaces consist of a garden and carpark are 75m². This house can accommodate max. 5 people. The house costs $88.300 this is spread over a loan, of the company, of 5 years.

Materials:
Hollow concrete blocks for the walls, in situ concrete floors (outside and inside) and roofs, tiles for the floors (inside and outside of the house) and walls (in the kitchen and sanitary spaces), stucco and paint (exterior walls and the rest of the interior), the doors and windows of the house are made of PVC, the fences and outside doors are made of wood.

Building method:
Stacking and pouring. Process:
Flattening of the ground, Pouring the foundation, Shuttering and pouring the floor, Stacking up the blocks with mortal in between, Shuttering and pouring the roof, Finishing (stucco, tiles, paint), Windows and doors, Garden, Outside doors and fences.

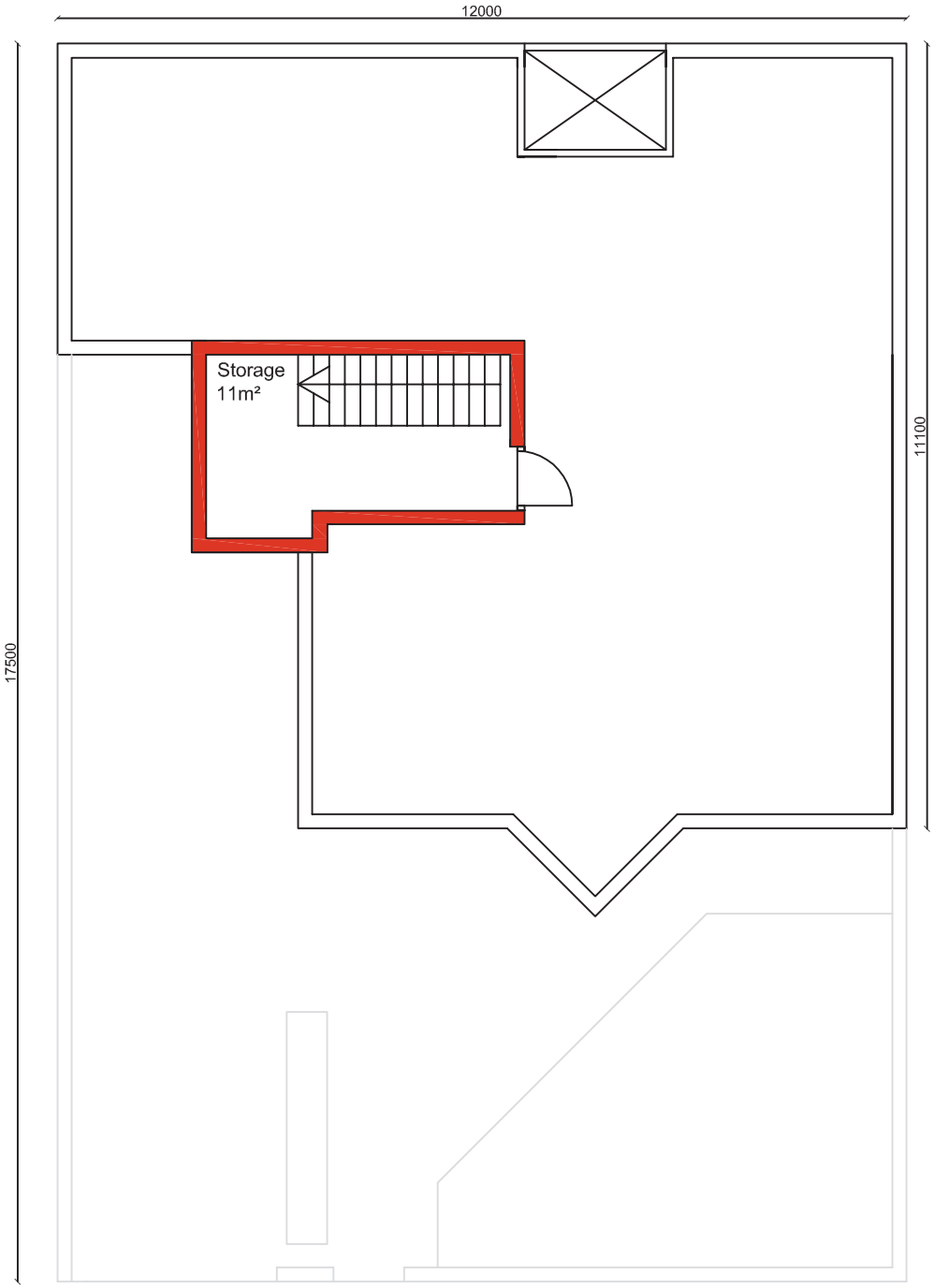
Installations:
Electricity, from the government and district aggregate via cabling underground and personal aggregate on the roof or somewhere outside the house,
The electricity cables are places in the finishing layer of the stucco or tiles.
Water, from the government to water tanks on the roof or in some cases from a personal well via a water compressor to the water tanks, by stainless steel pipes.
The water pipes are laid from the outside to the sanitary places and kitchen.
Warm water is produces via an electric boiler, placed outside the bathroom or kitchen.
The sewerage is laid thru the ground floor to the nearest outside space, to the main line outside the lot.
There are no gas pipes in a house, a gas cylinder is purchased and placed near the stove. When the cylinder is empty, it must be exchanged for a full one against a payment.
For heating and cooling, of a room, heaters and/or air conditioning are used.

Impressions:



Ground floor

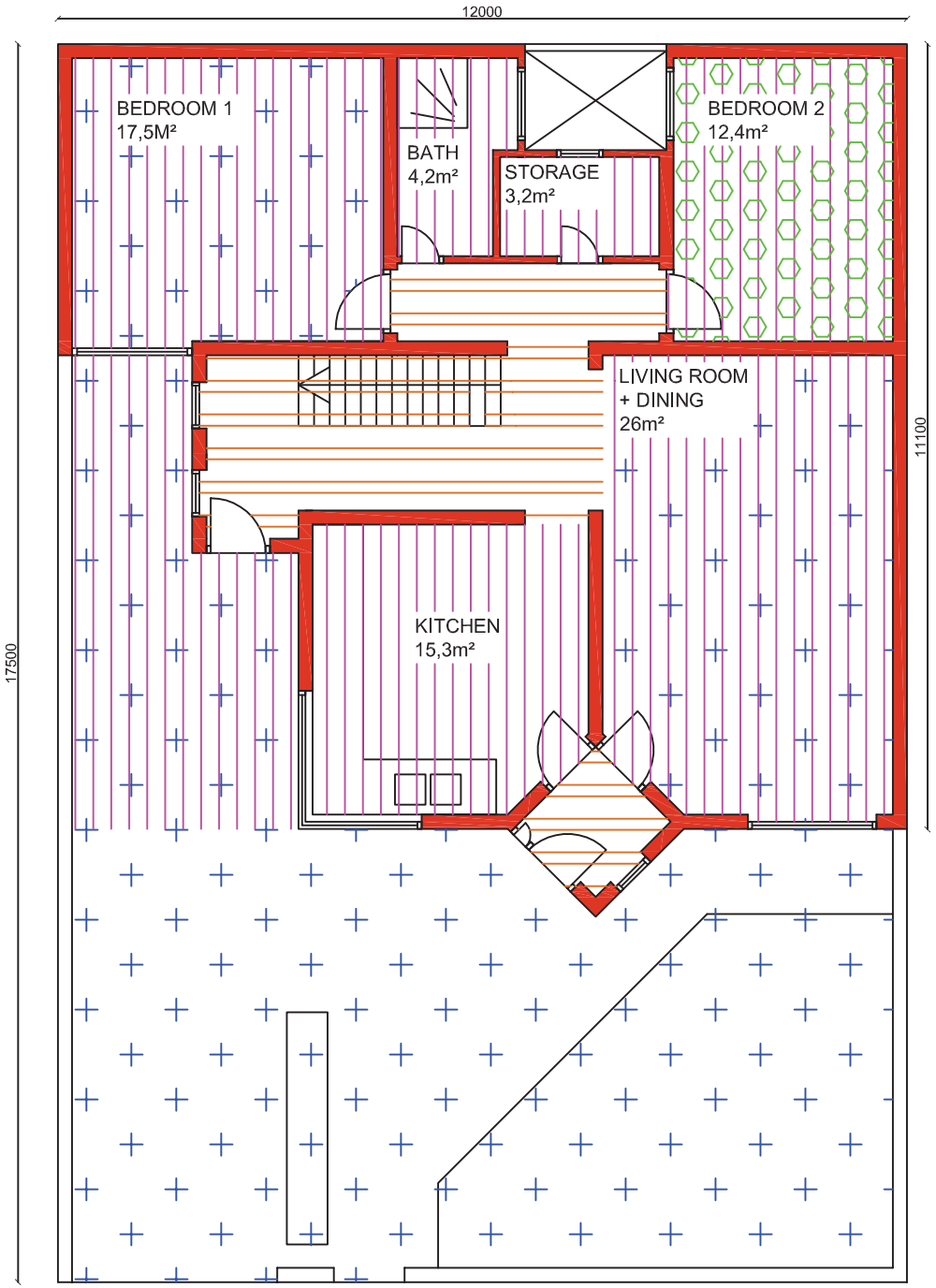
Total area: 210m²
Building: 116m²



First floor

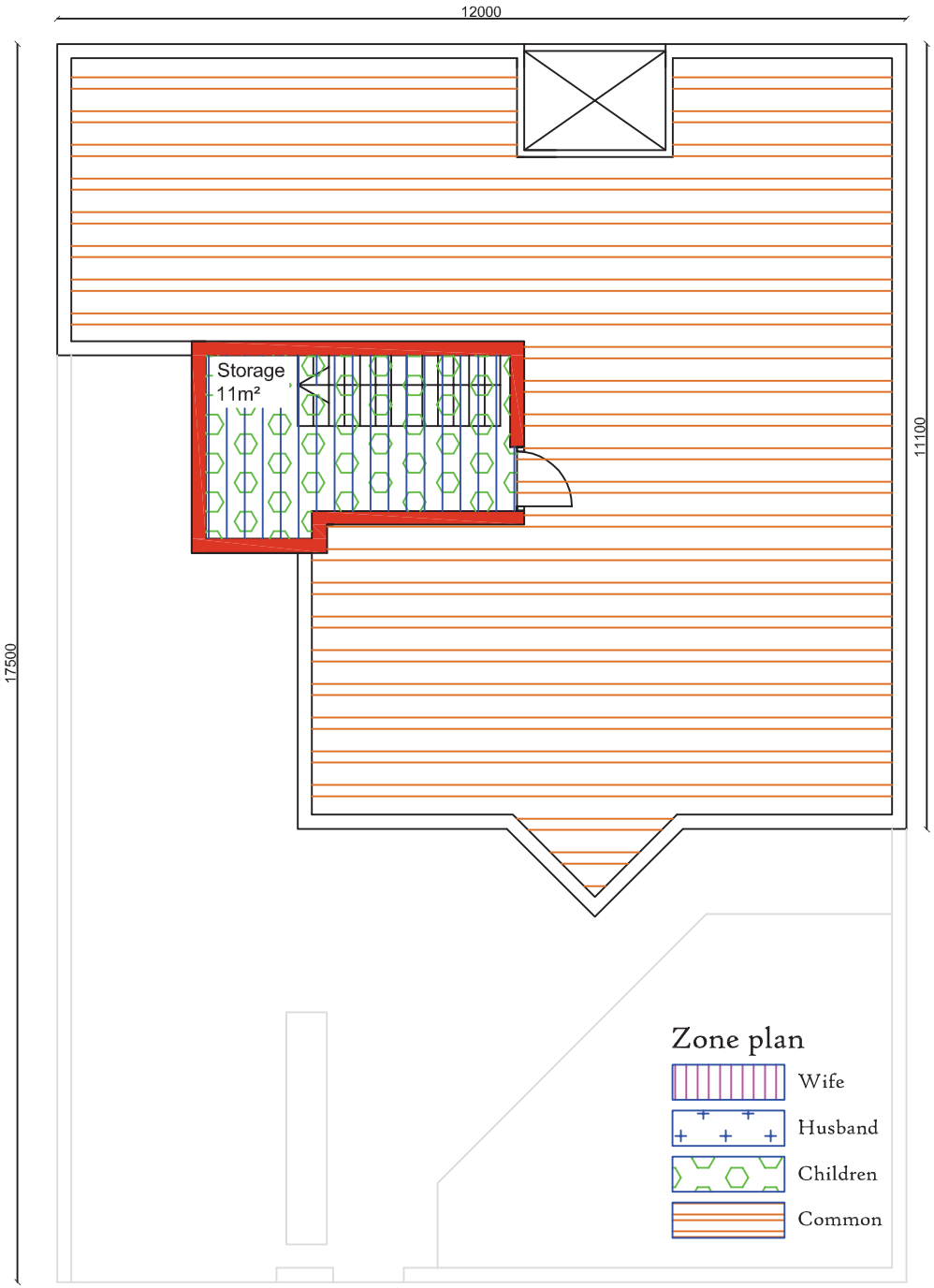
Total area: 210m²
Building: 116m²

Floor plans



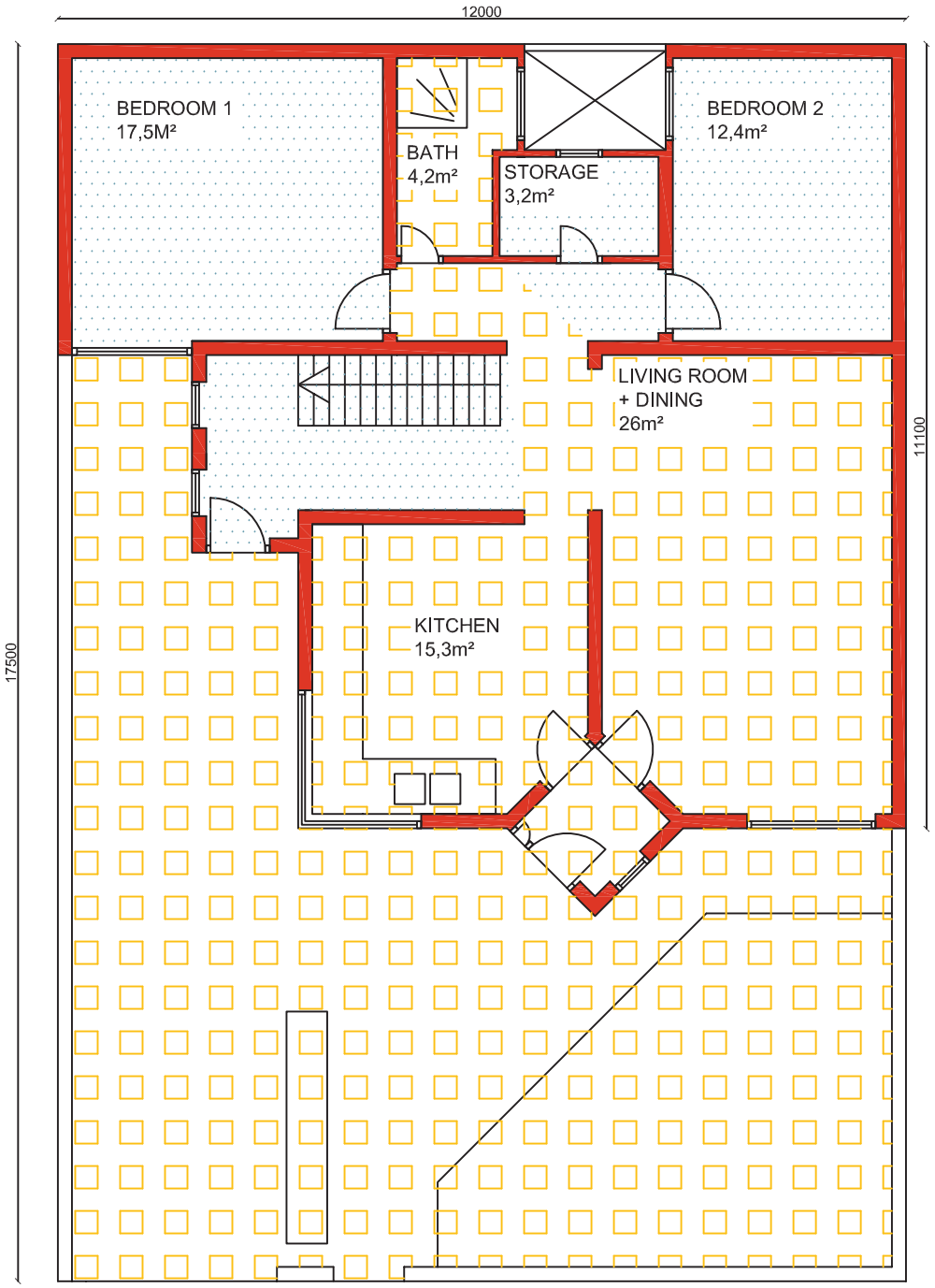
Ground floor

Total area: 210m²
Building: 116m²



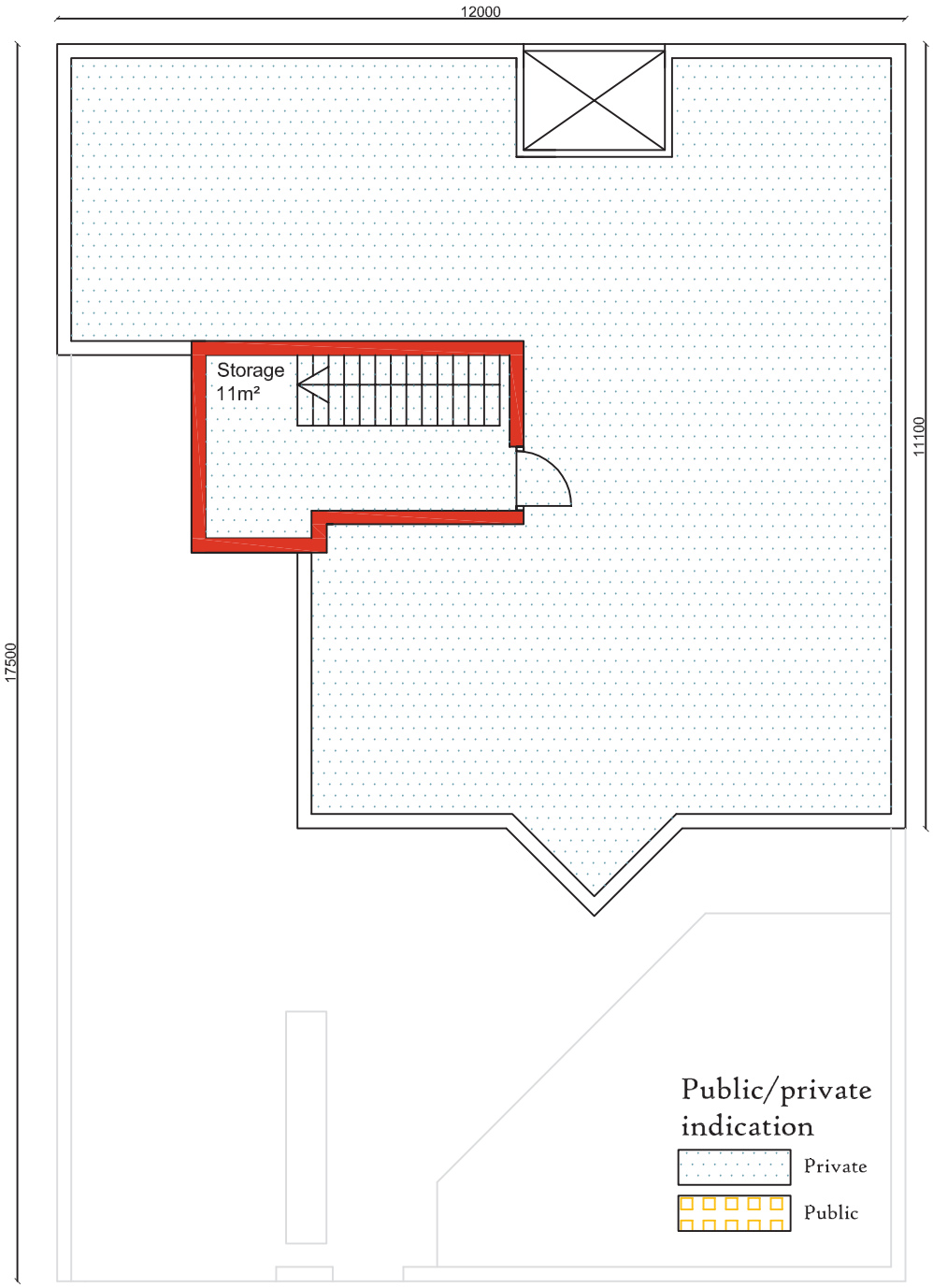
First floor

Total area: 210m²
Building: 116m²



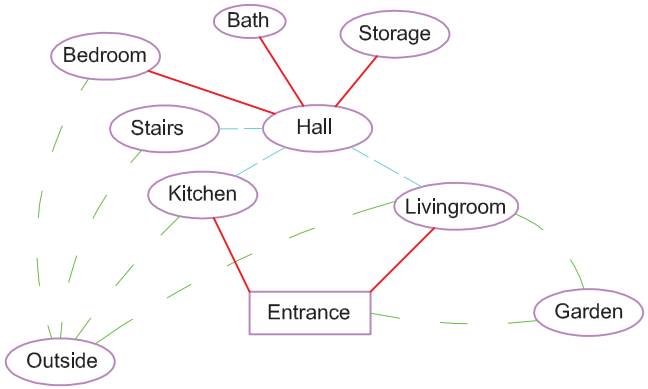
Ground floor

Total area: 210m²
Building: 116m²

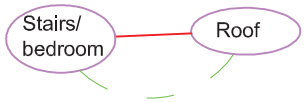


First floor

Total area: 210m²
Building: 116m²



Exemplary city
Ground floor



Exemplary city
First floor

Legend:

Red: Physical relation
Blue: Short path
Green: Visual relation
Orange: Physical connection

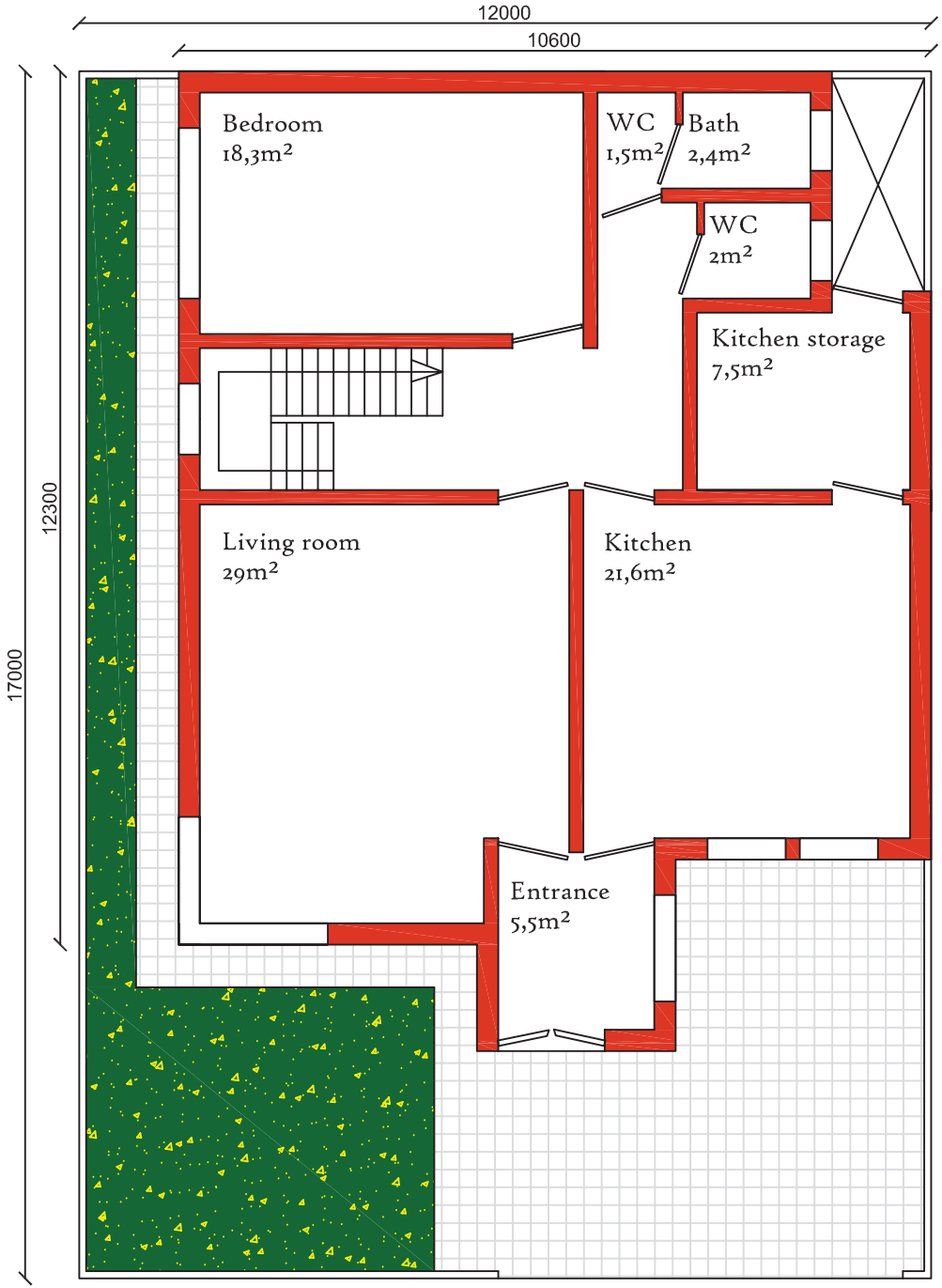
B. Aro City (Aro is a name)
This project consist of 182 villa's each 204 m² (12m x 17m) and is 80% finished. The houses are built on 120 m² and the living area is 80 m² with a balcony of 15 m². The costs of these houses are $100.000, $125.000 has to be paid when buying it and the rest is a loan over 5 years the houses contain a kitchen, living room, bedroom and a common bathroom. On the second floor there three other bedrooms, one master bedroom with bathroom and 2 separate bedrooms and a common bathroom, also a garden and a parking place.

Materials:
Hollow concrete blocks for the walls, in situ concrete foundation and floors (outside and inside) and roofs, tiles for the floors (inside and outside of the house) and walls (in the kitchen and sanitary spaces), stucco and paint and PVC panels (exterior walls and the rest of the interior), the doors and windows of the house are made of PVC, the fences and outside doors are made blocks and stainless steel.

Building method:
Stacking and pouring. Process:
Flattening of the ground, Pouring the foundation, Shuttering and pouring the floor, Stacking up the blocks with mortal in between, Shuttering and pouring the roof, Finishing (stucco, tiles, paint), Windows and doors, Garden, Outside doors and fences.

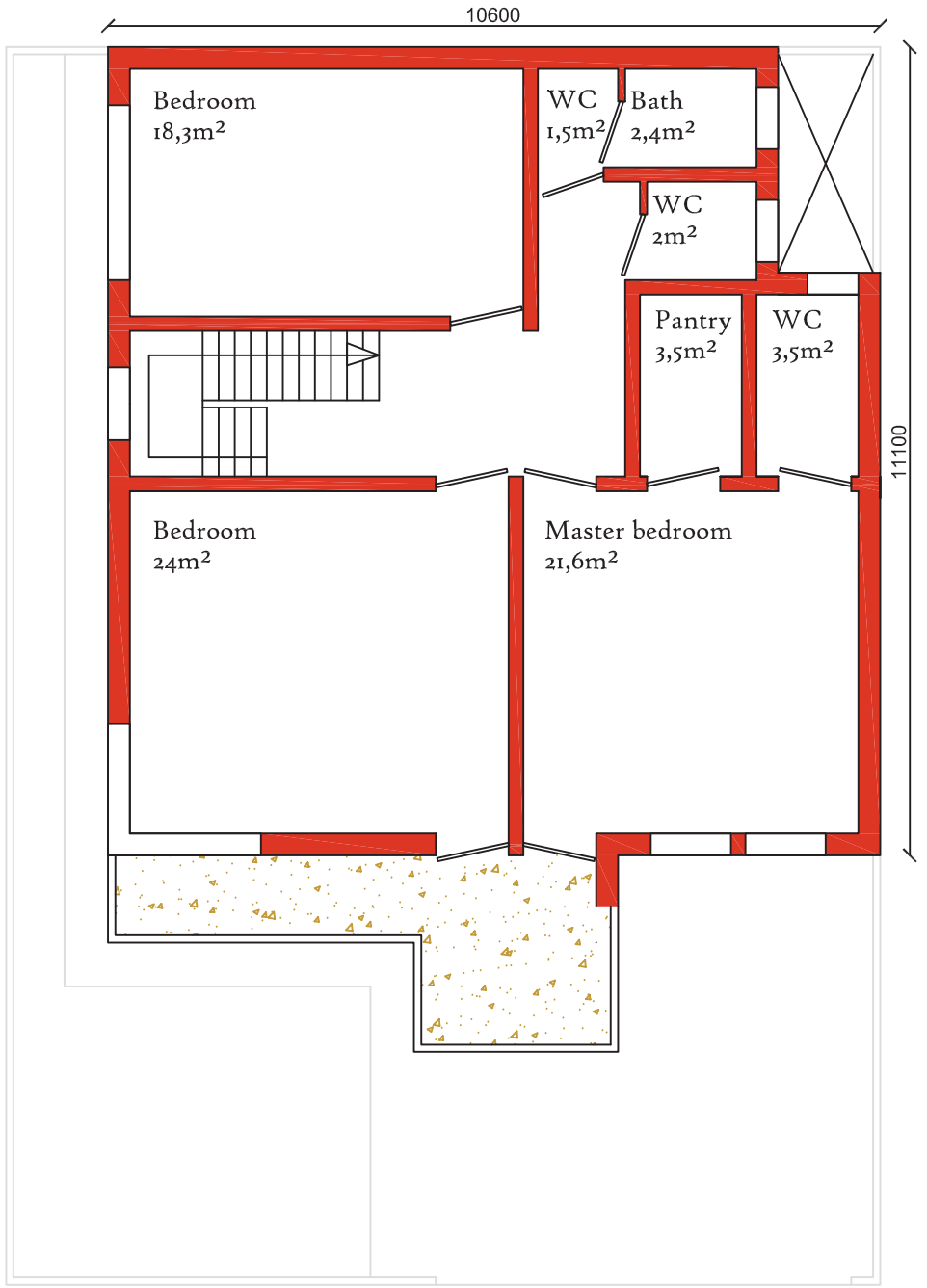
Installations:
Electricity, from the government and district aggregate via cabling underground and personal aggregate on the roof or somewhere outside the house,
The electricity cables are places in the finishing layer of the stucco or tiles.
Water, from the government to water tanks on the roof or in some cases from a personal well via a water compressor to the water tanks, by stainless steel pipes.
The water pipes are laid from the outside to the sanitary places and kitchen.
Warm water is produces via an electric boiler, placed outside the bathroom or kitchen.
The sewerage is laid thru the ground floor to the nearest outside space, to the main line outside the lot.
There are no gas pipes in a house, a gas cylinder is purchased and placed near the stove. When the cylinder is empty, it must be exchanged for a full one against a payment.
For heating and cooling, of a room, heaters and/or air conditioning are used.
There also air conditioning placed already.

Impressions:



Ground floor

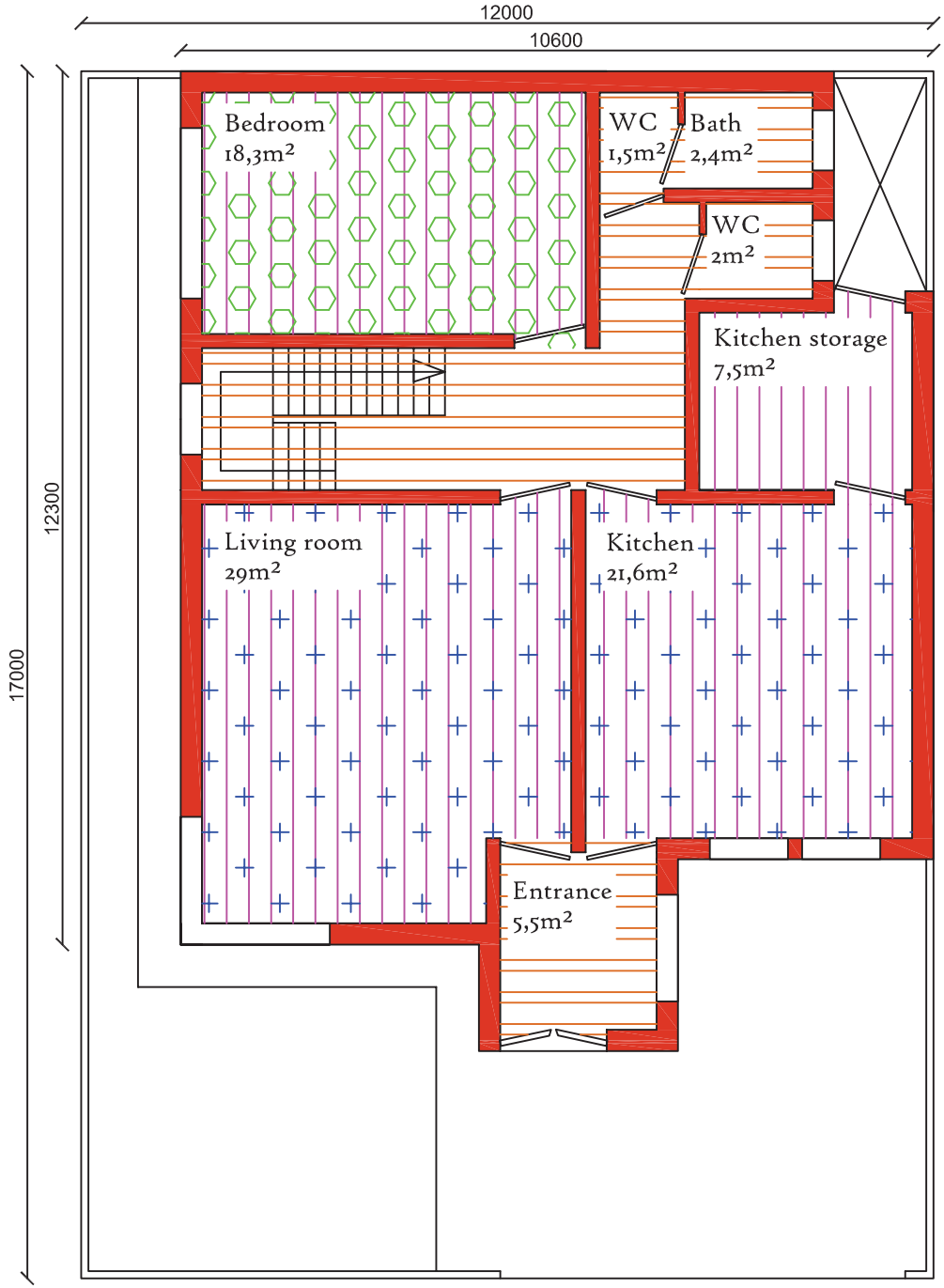
Total area: 204m²
Building: 126m²



First floor

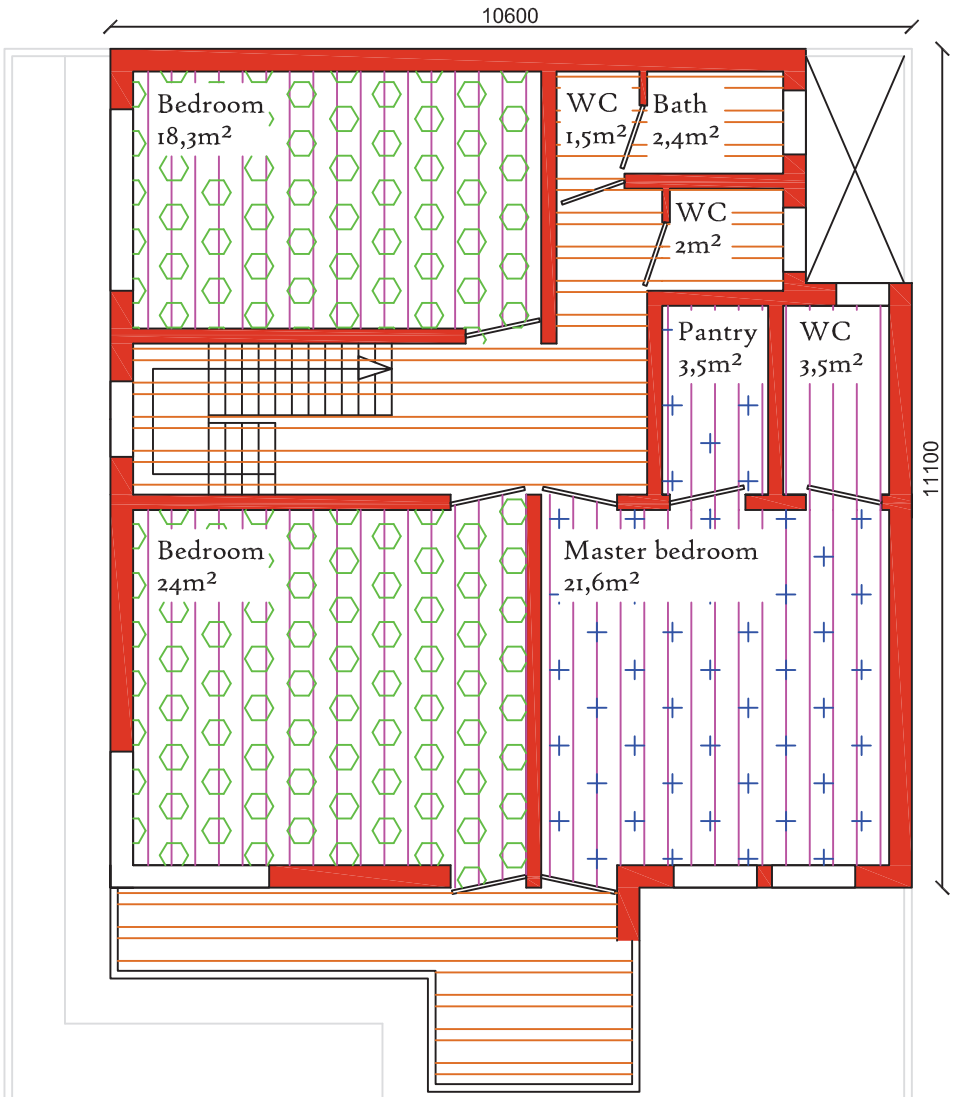
Building: 112m²

Floor plans



Ground floor

Total area: 204m²
Building: 126m²

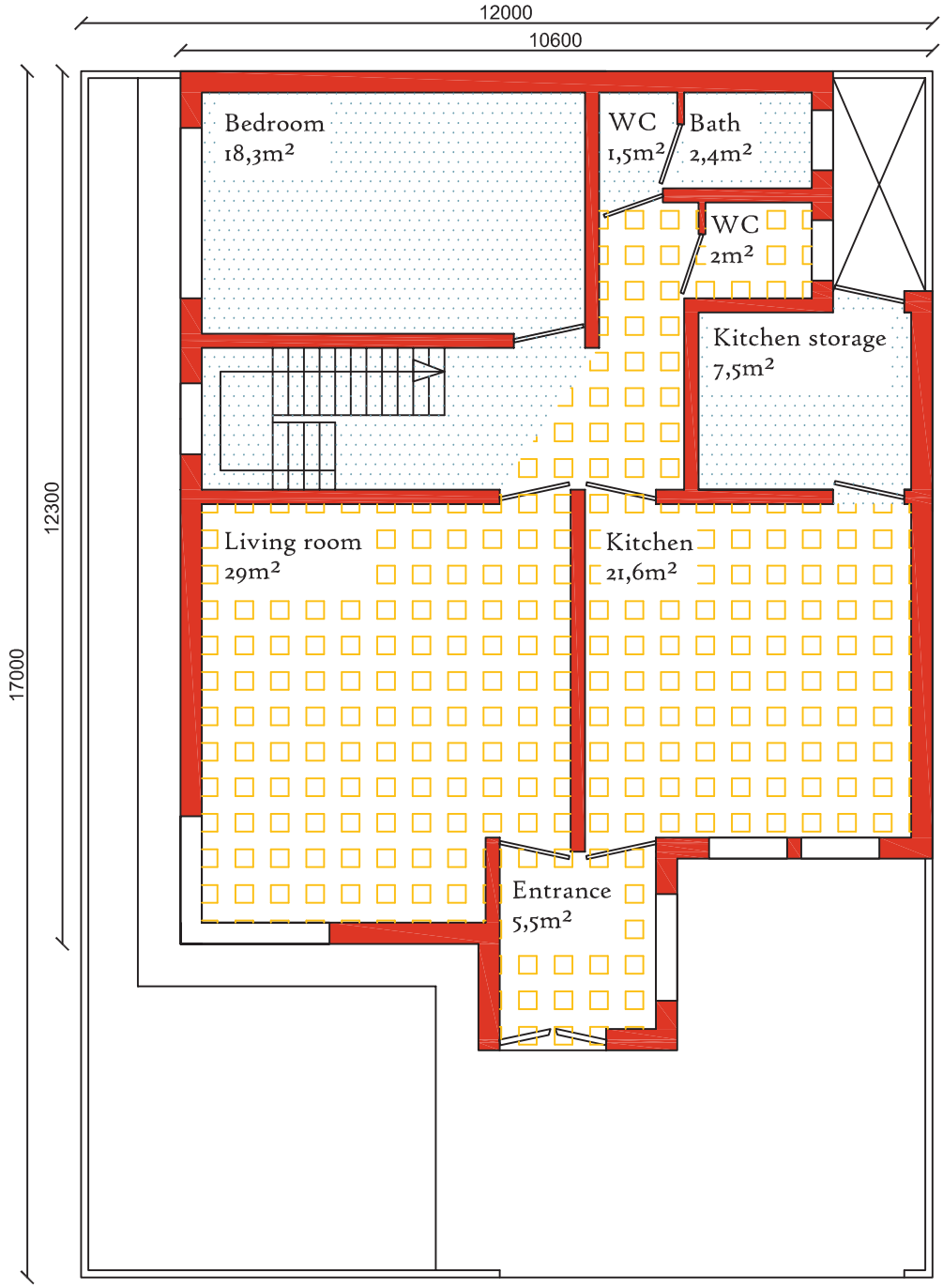


First floor

Building: 112m²

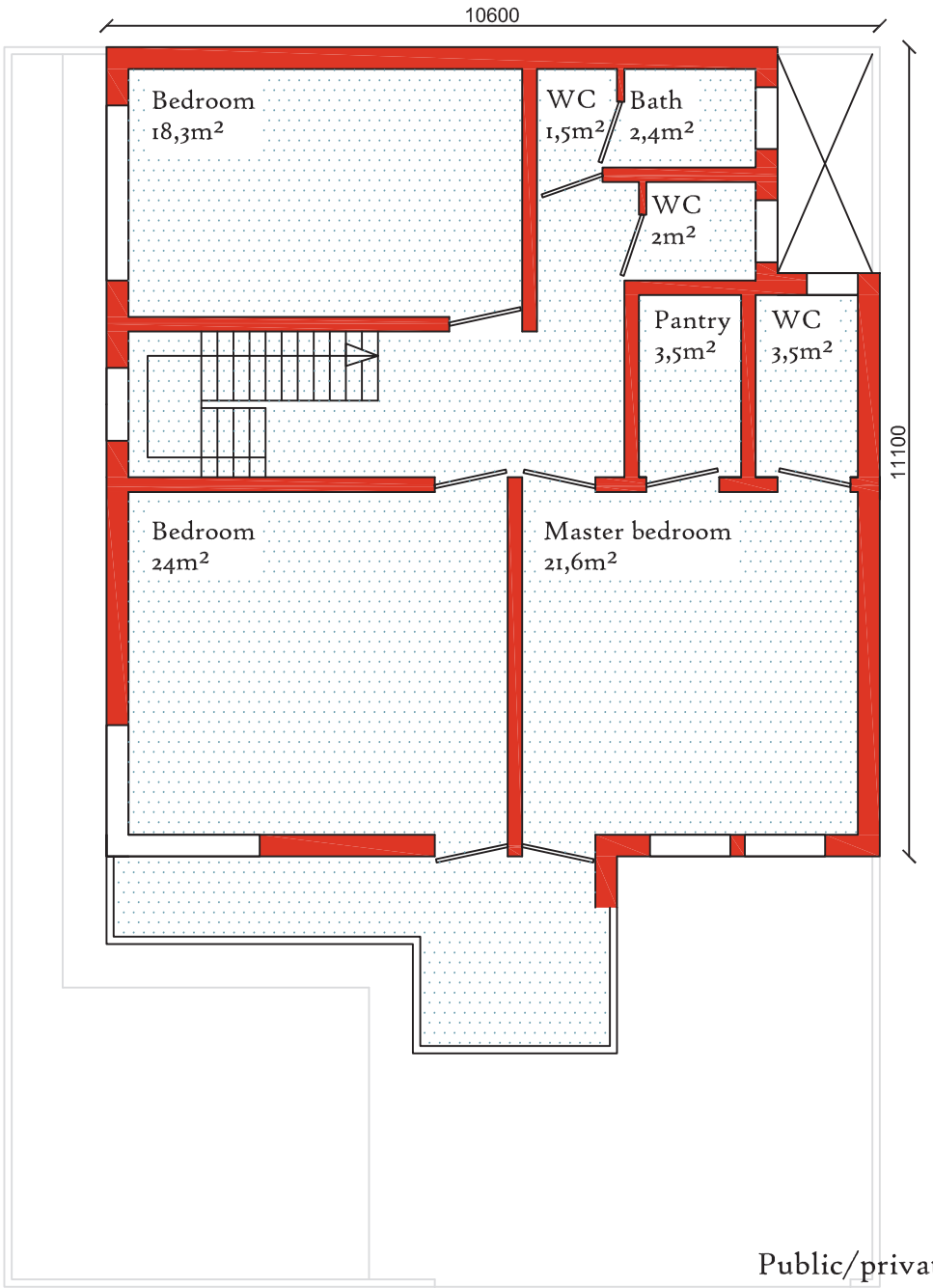
Zone plan

- Wife
- Husband
- Children
- Common



Ground floor

Total area: 204m²
Building: 126m²



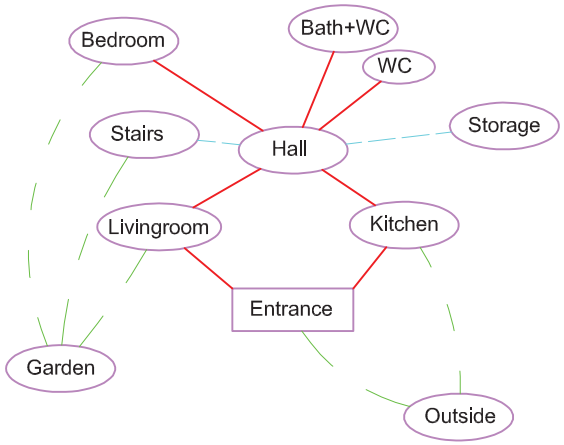
First floor

Building: 112m²

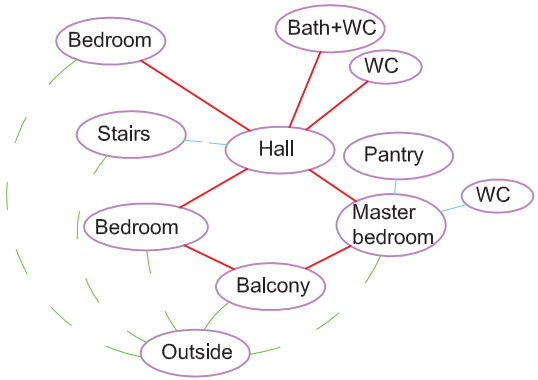
Public/private indication

Private

Public



Aro city
Ground floor



Aro city
First floor

Legend:

Red: Physical relation
Blue: Short path
Green: Visual relation
Orange: Physical connection

C. Lubnan City
This project consists of 296 houses on a total area of 11.000m².

Materials:
Hollow concrete blocks for the walls, in situ concrete floors (outside and inside) and roofs, tiles for the floors (inside and outside of the house) and walls (in the kitchen and sanitary spaces), stucco and paint (exterior walls and the rest of the interior), the doors and windows of the house are made of PVC, the fences are made of blocks and outside doors are made of stainless steel.

Building method:
Stacking and pouring. Process:
Flattening of the ground, Pouring the foundation, Shuttering and pouring the floor, Stacking up the blocks with mortal in between, Shuttering and pouring the roof, Finishing (stucco, tiles, paint), Windows and doors, Garden, Outside doors and fences.

Installations:
Electricity, from the government and district aggregate via cabling underground and personal aggregate on the roof or somewhere outside the house,
The electricity cables are places in the finishing layer of the stucco or tiles.
Water, from the government to water tanks on the roof or in some cases from a personal well via a water compressor to the water tanks, by stainless steel pipes.
The water pipes are laid from the outside to the sanitary places and kitchen.
Warm water is produces via an electric boiler, placed outside the bathroom or kitchen.
The sewerage is laid thru the ground floor to the nearest outside space, to the main line outside the lot.
There are no gas pipes in a house, a gas cylinder is purchased and placed near the stove. When the cylinder is empty, it must be exchanged for a full one against a payment.
For heating and cooling, of a room, heaters and/or air conditioning are used.

Impressions:

Model 1

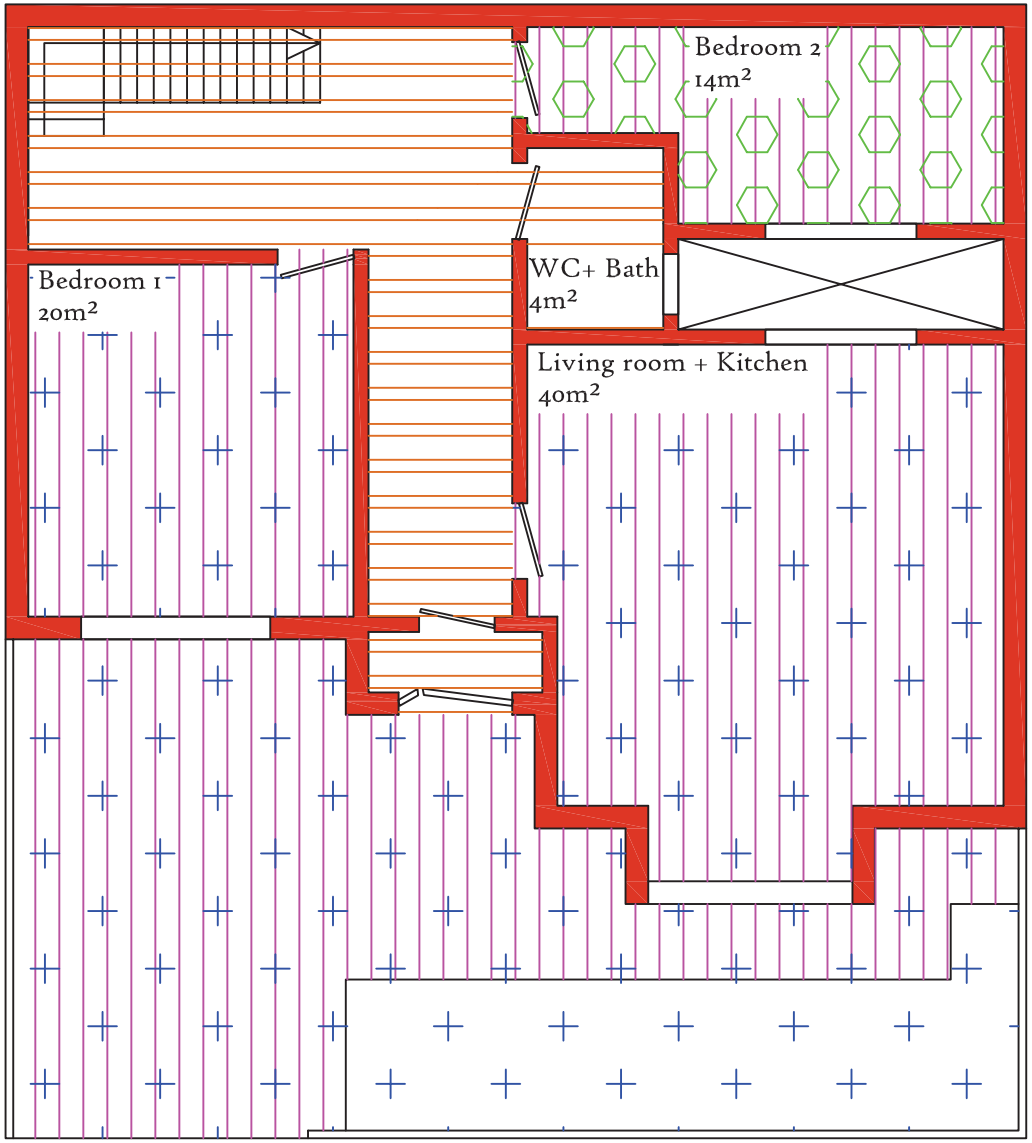
Ground floor

Total area: 202m²
Building: 130m²

First floor

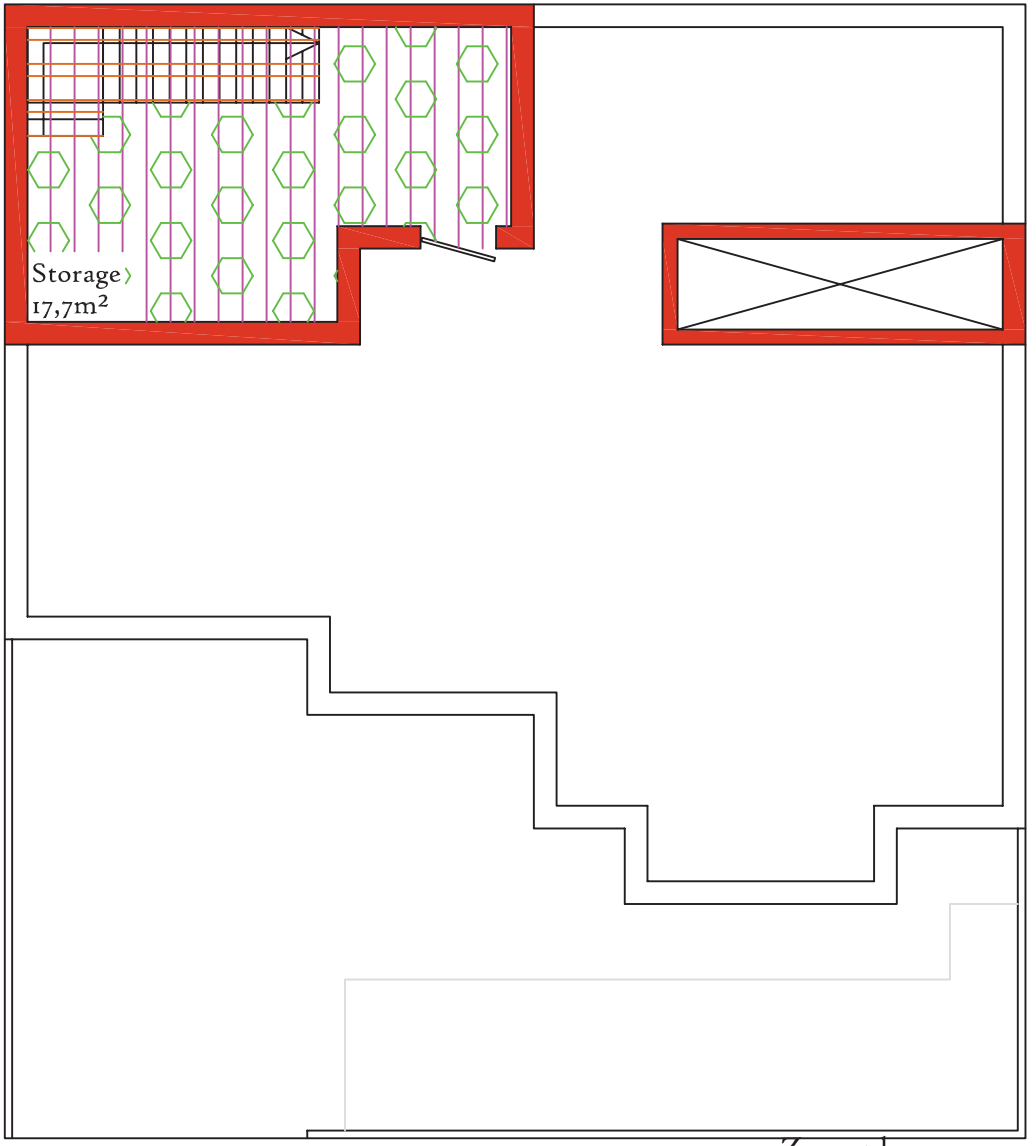
Total area: 204m²
Building: 126m²

Model 1



Ground floor

Total area: 202m²
Building: 130m²



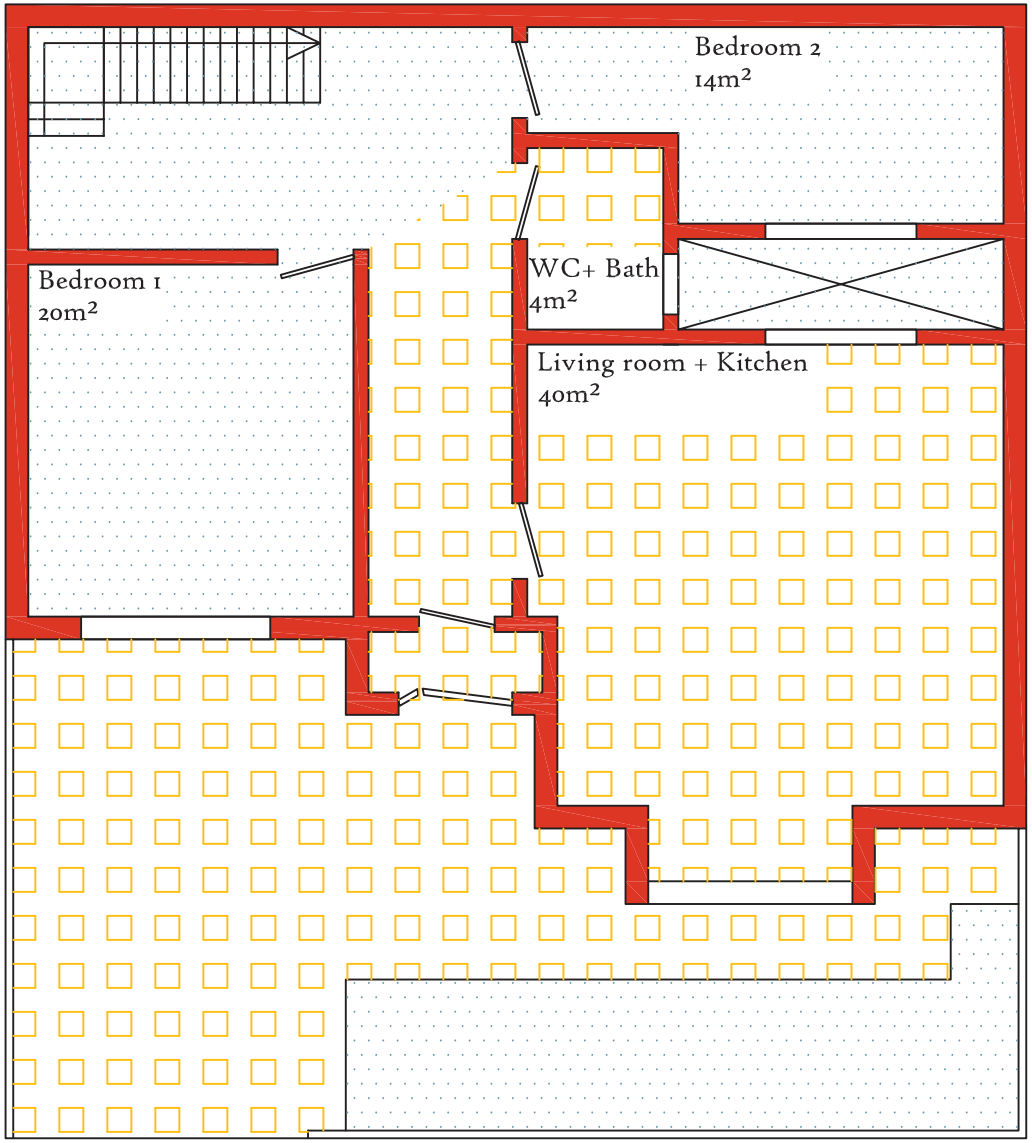
First floor

Total area: 204m²
Building: 126m²

Zone plan

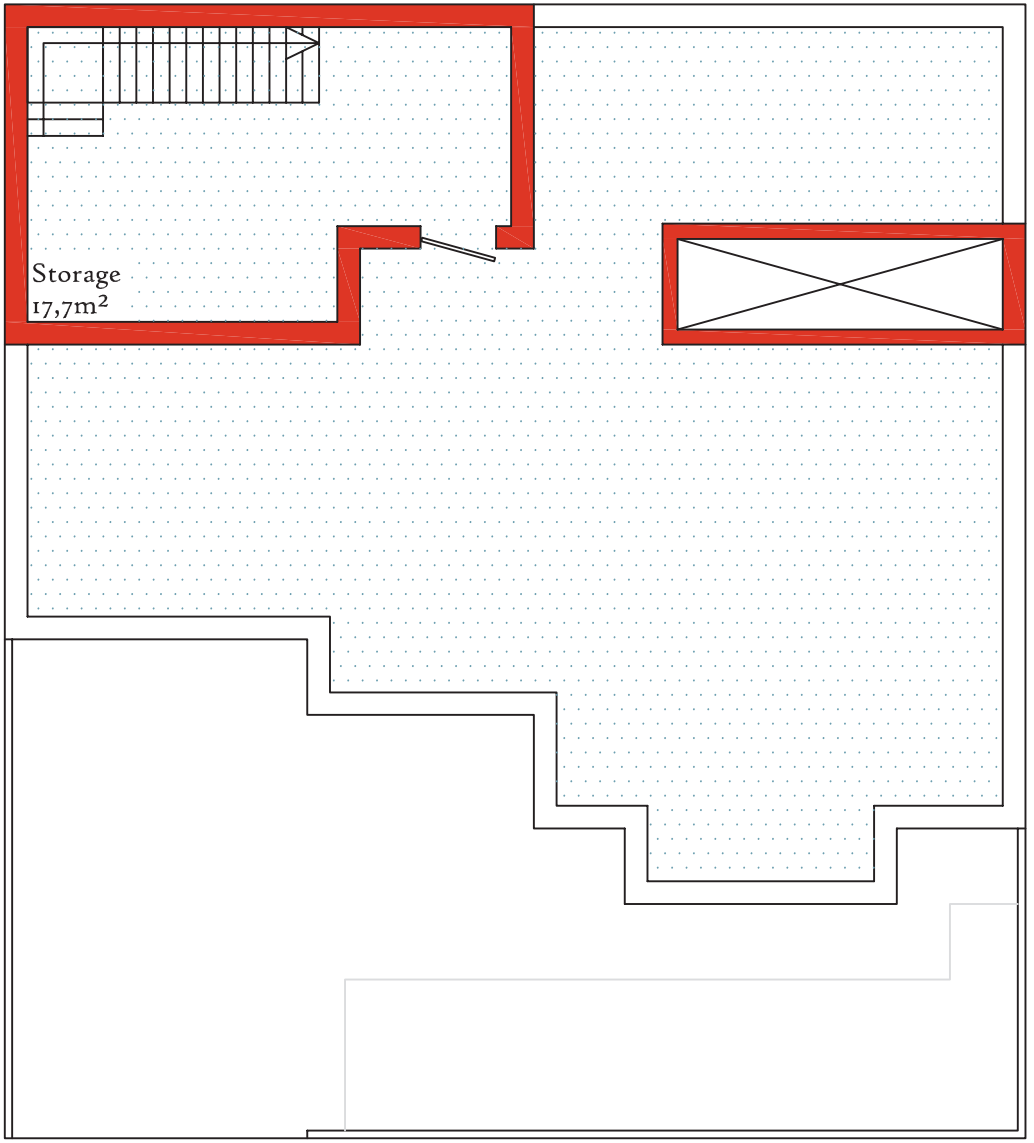
- Wife
- Husband
- Children
- Common

Model 1



Ground floor

Total area: 202m²
Building: 130m²



First floor

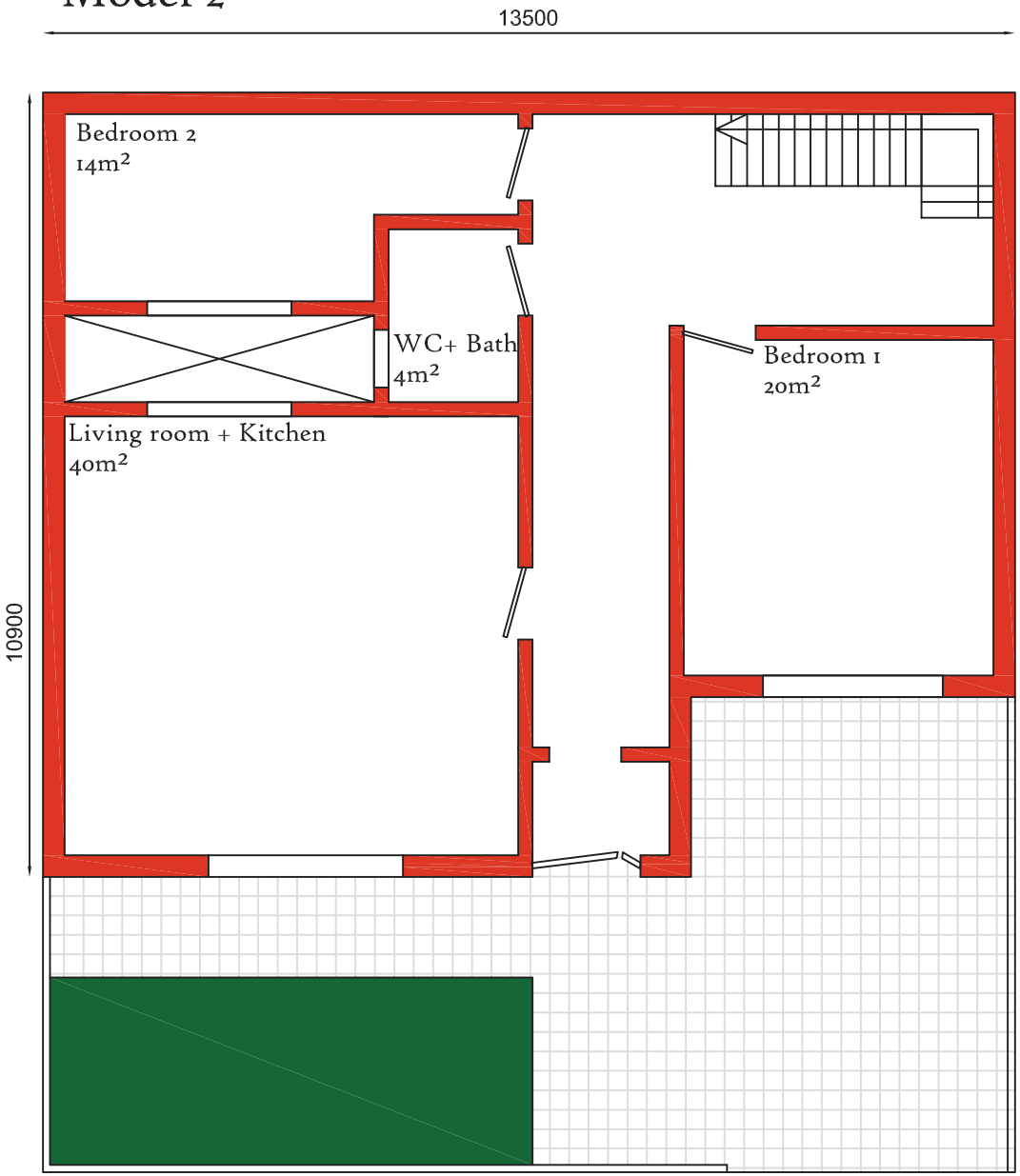
Total area: 204m²
Building: 126m²

Public/private indication

Private

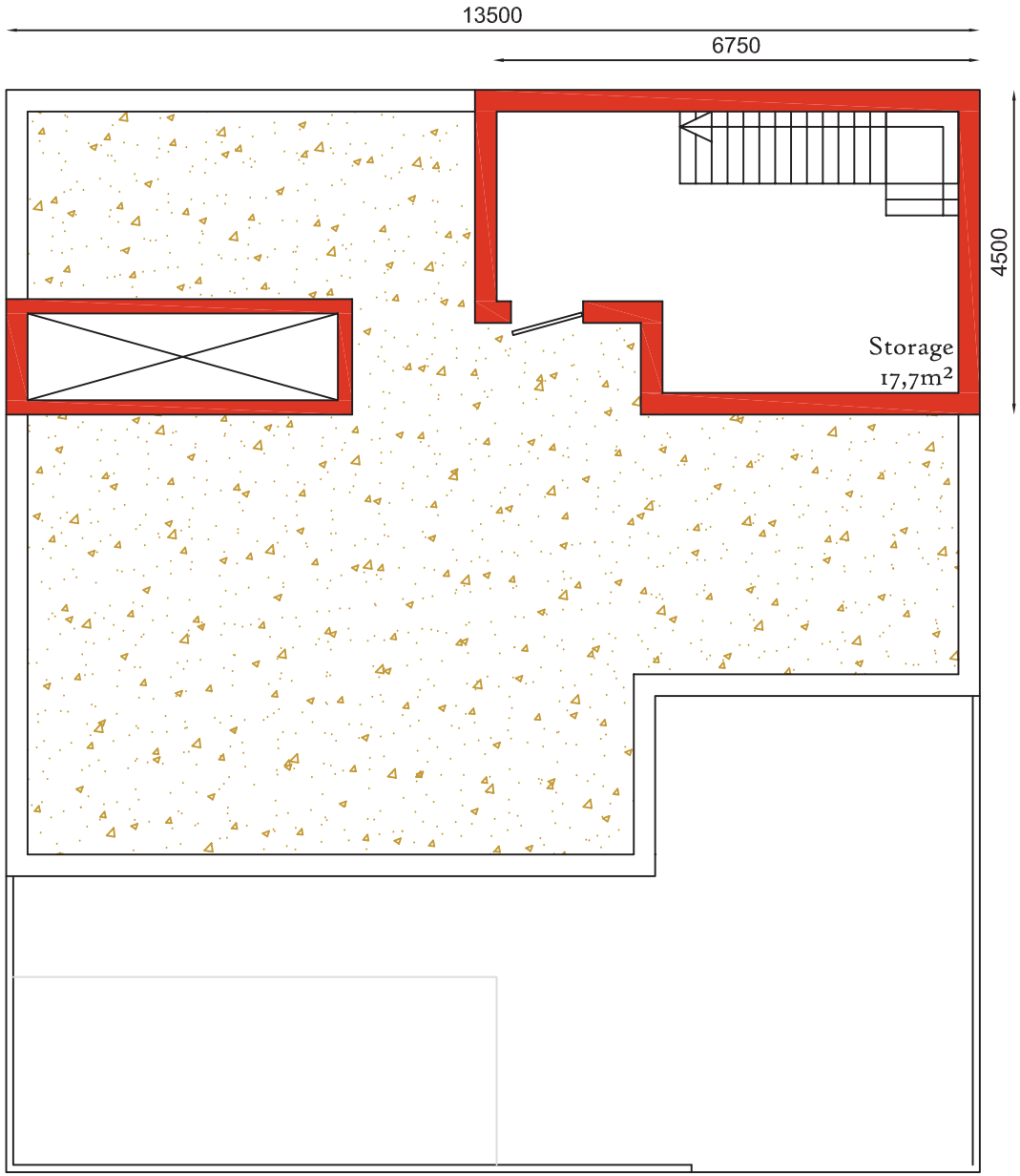
Public

Model 2



Ground floor

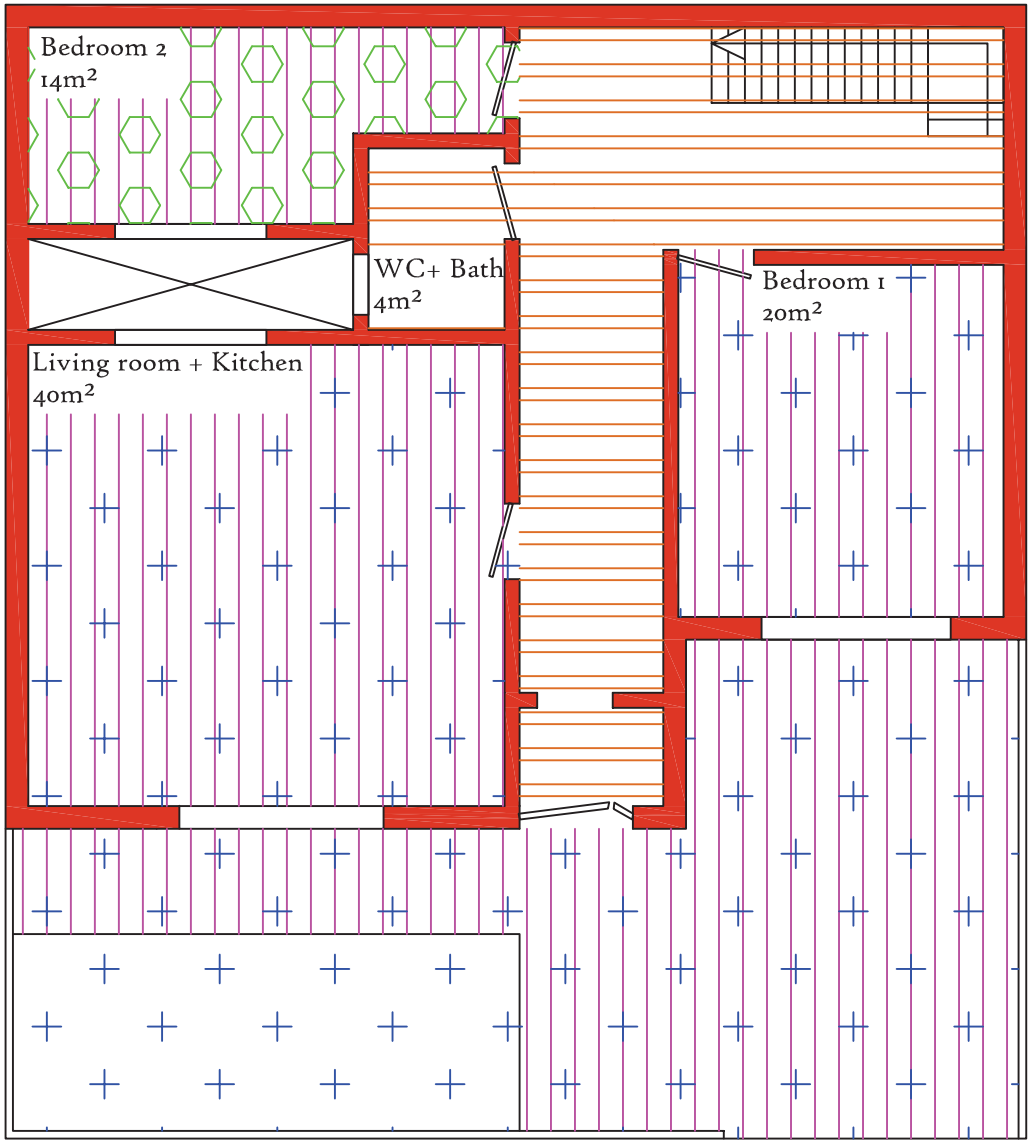
Total area: 202m²
Building: 130m²



First floor

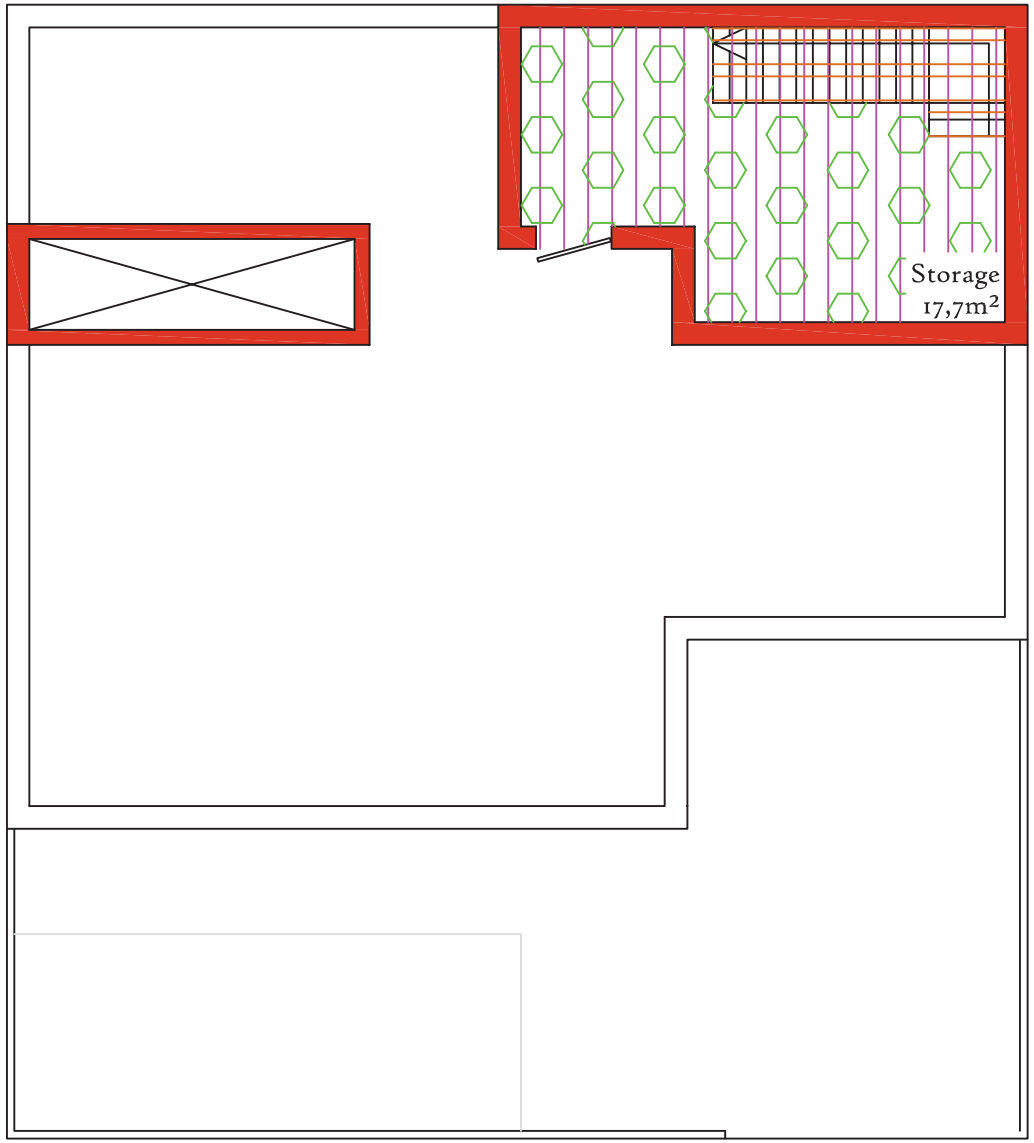
Total area: 204m²
Building: 126m²

Model 2



Ground floor

Total area: 202m²
Building: 130m²



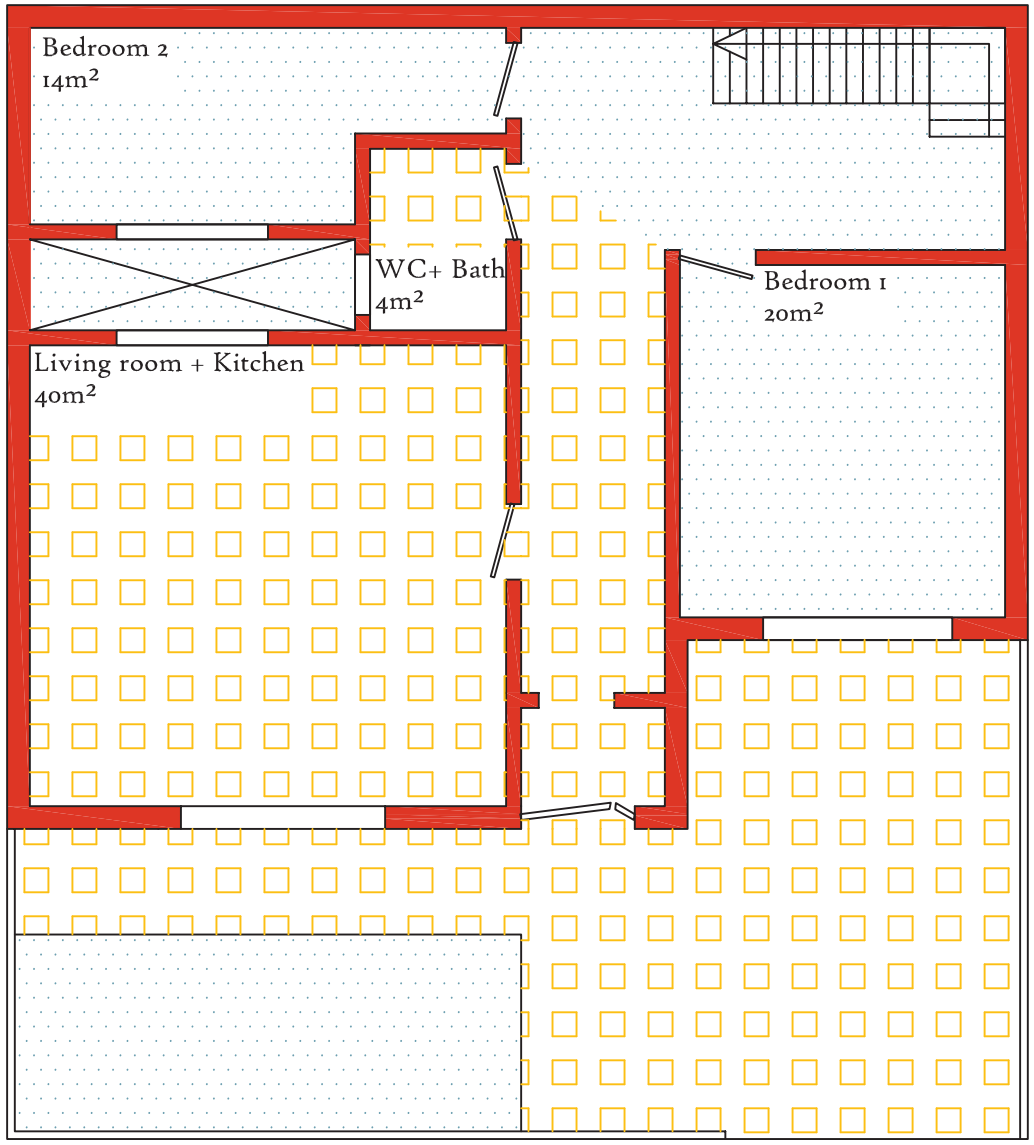
First floor

Total area: 204m²
Building: 126m²

Zone plan

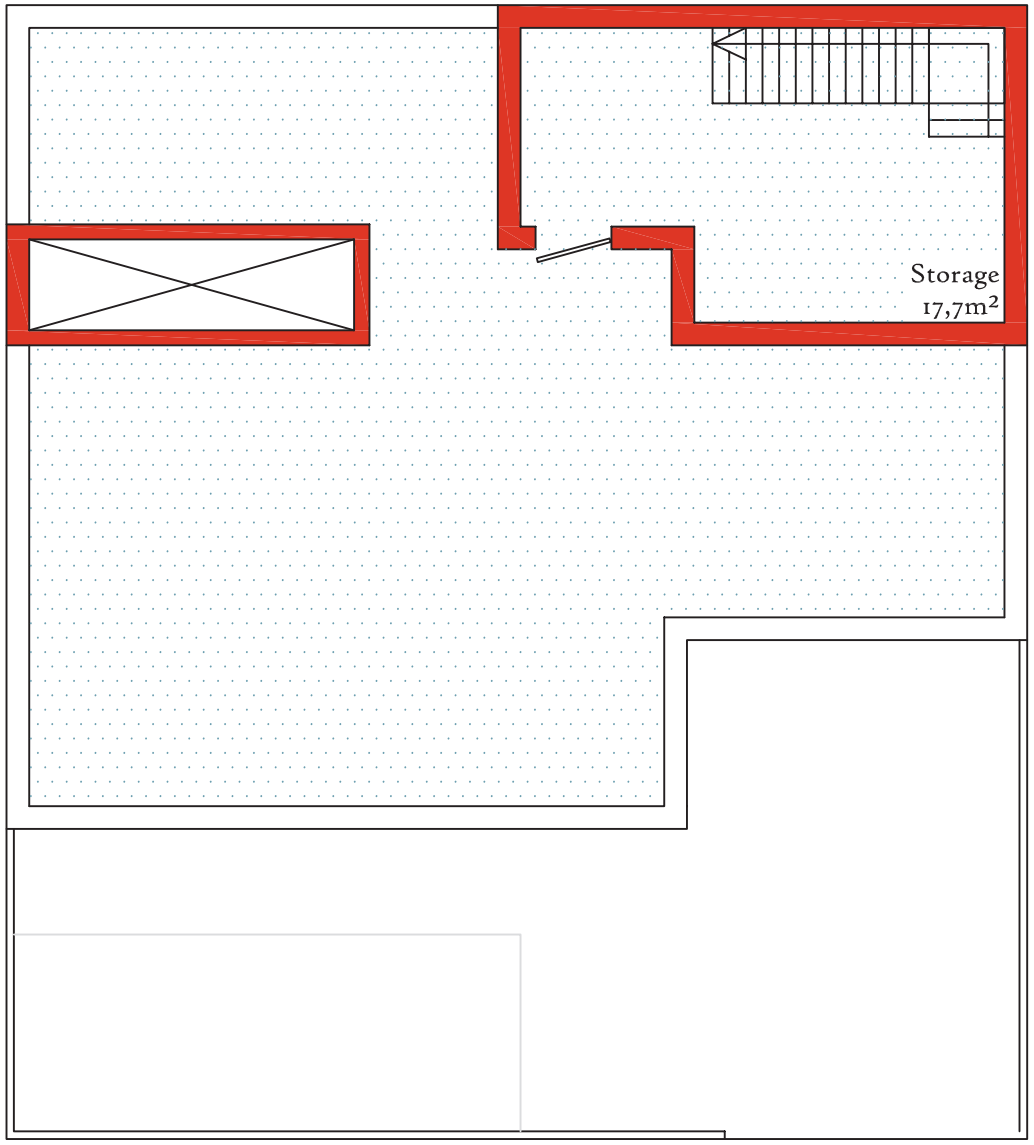
- Wife
- Husband
- Children
- Common

Model 2



Ground floor

Total area: 202m²
Building: 130m²



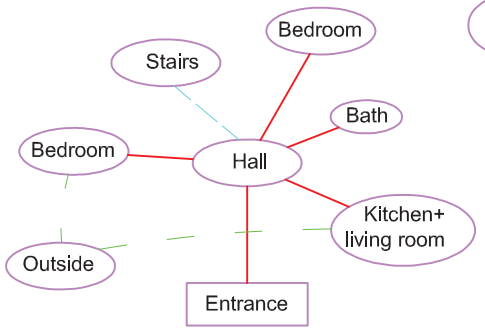
First floor

Total area: 204m²
Building: 126m²

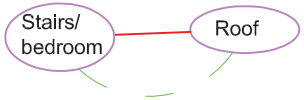
Public/private indication

Private

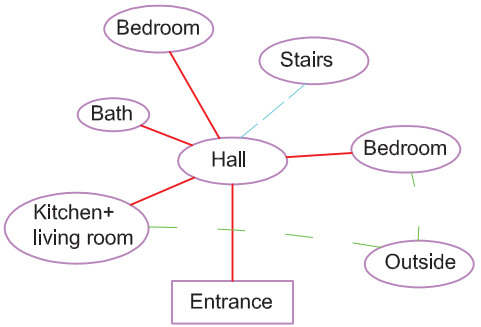
Public



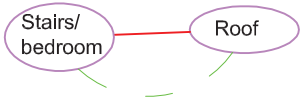
Lubnan city
Model 1
Ground floor



Lubnan city
Model 1
First floor



Lubnan city
Model 2
Ground floor



Lubnan city
Model 1
First floor

Legend:

Red: Physical relation
Blue: Short path
Green: Visual relation
Orange: Physical connection

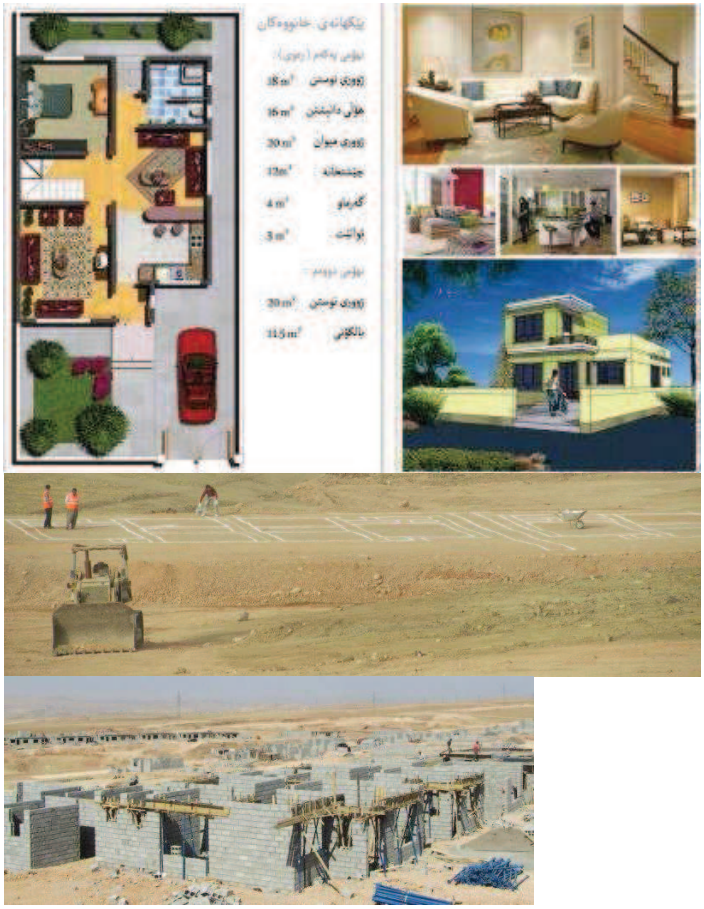
D. Kani city
This project consists of 517 houses of one type and each is 200m², with building area of 135m². The project also consists 420 apartments in the form of flats with each a floor area of 105m². The total area of the project itself is 347.500m². Still under construction.

Materials:
Hollow concrete blocks for the walls, in situ concrete floors (outside and inside) and roofs. The rest is not yet published or finished.

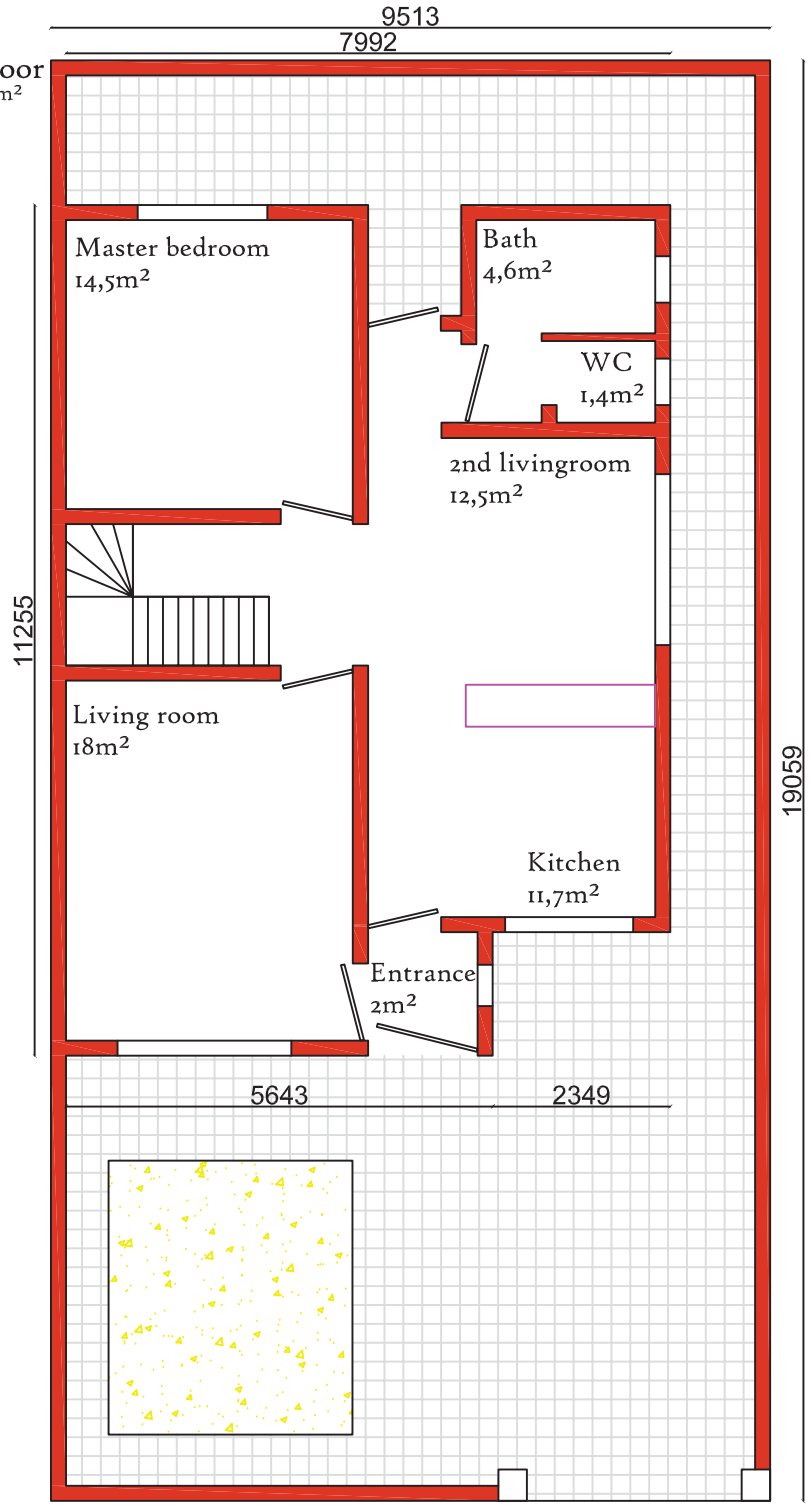
Building method:
Stacking and pouring. Process:
Flattening of the ground, Pouring the foundation, Shuttering and pouring the floor, Stacking up the blocks with mortal in between, Shuttering and pouring the roof.

Installations:
Unknown, but it will not be much different from the Exemplary city:
Electricity, from the government and district aggregate via cabling underground and personal aggregate on the roof or somewhere outside the house,
The electricity cables are places in the finishing layer of the stucco or tiles.
Water, from the government to water tanks on the roof or in some cases from a personal well via a water compressor to the water tanks, by stainless steel pipes.
The water pipes are laid from the outside to the sanitary places and kitchen.
Warm water is produces via an electric boiler, placed outside the bathroom or kitchen.
The sewerage is laid thru the ground floor to the nearest outside space, to the main line outside the lot.
There are no gas pipes in a house, a gas cylinder is purchased and placed near the stove. When the cylinder is empty, it must be exchanged for a full one against a payment.
For heating and cooling, of a room, heaters and/or air conditioning are used.

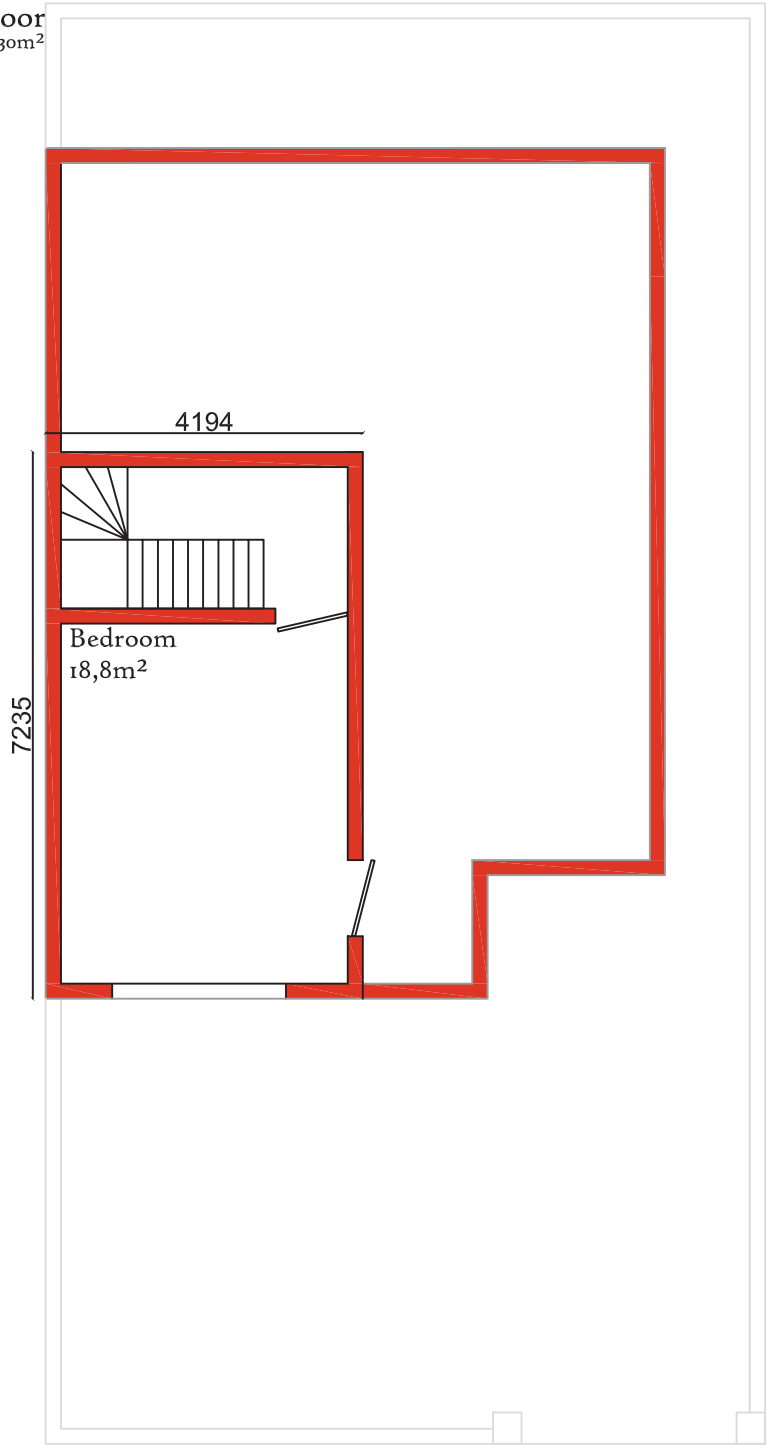
Impressions:



Ground floor
Total area: 180m²
Building: 86m²

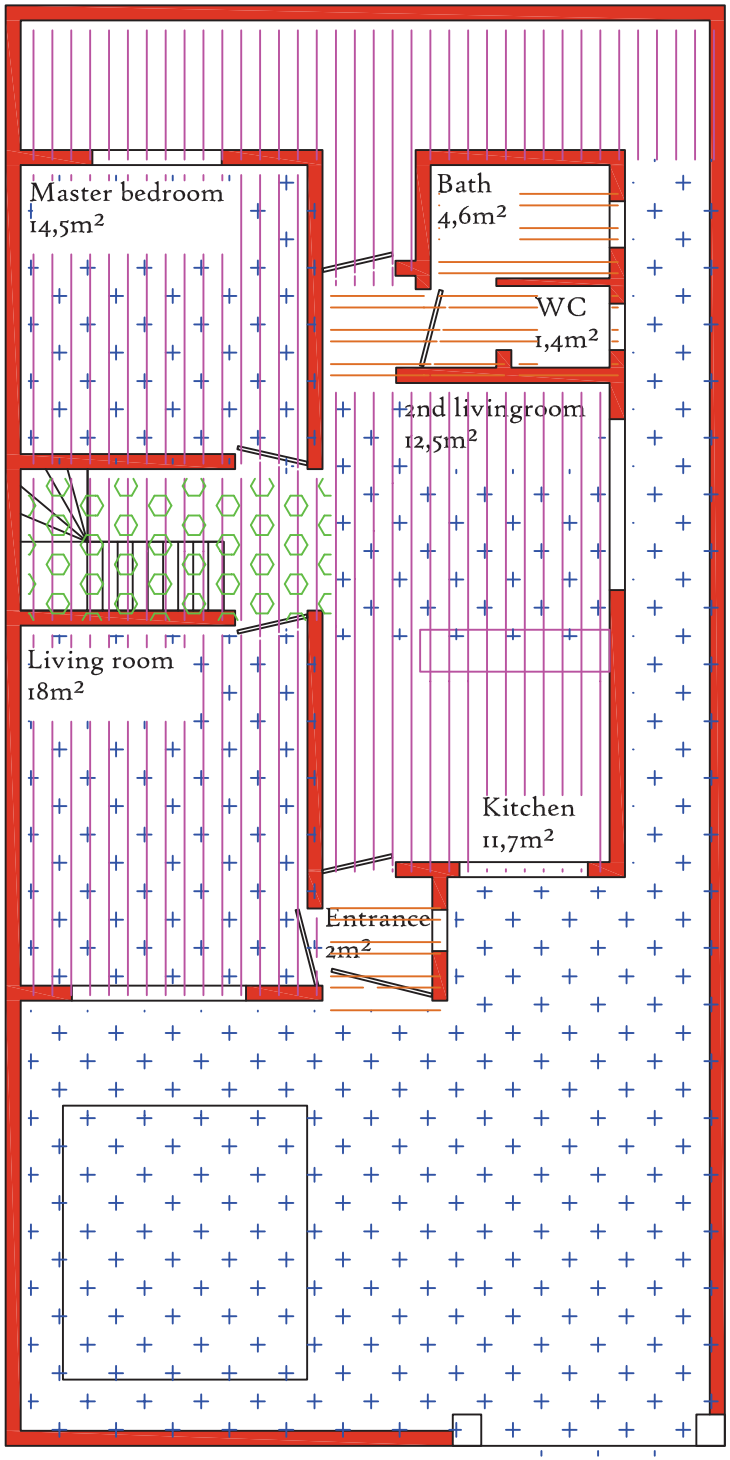


First floor
Building: 30m²

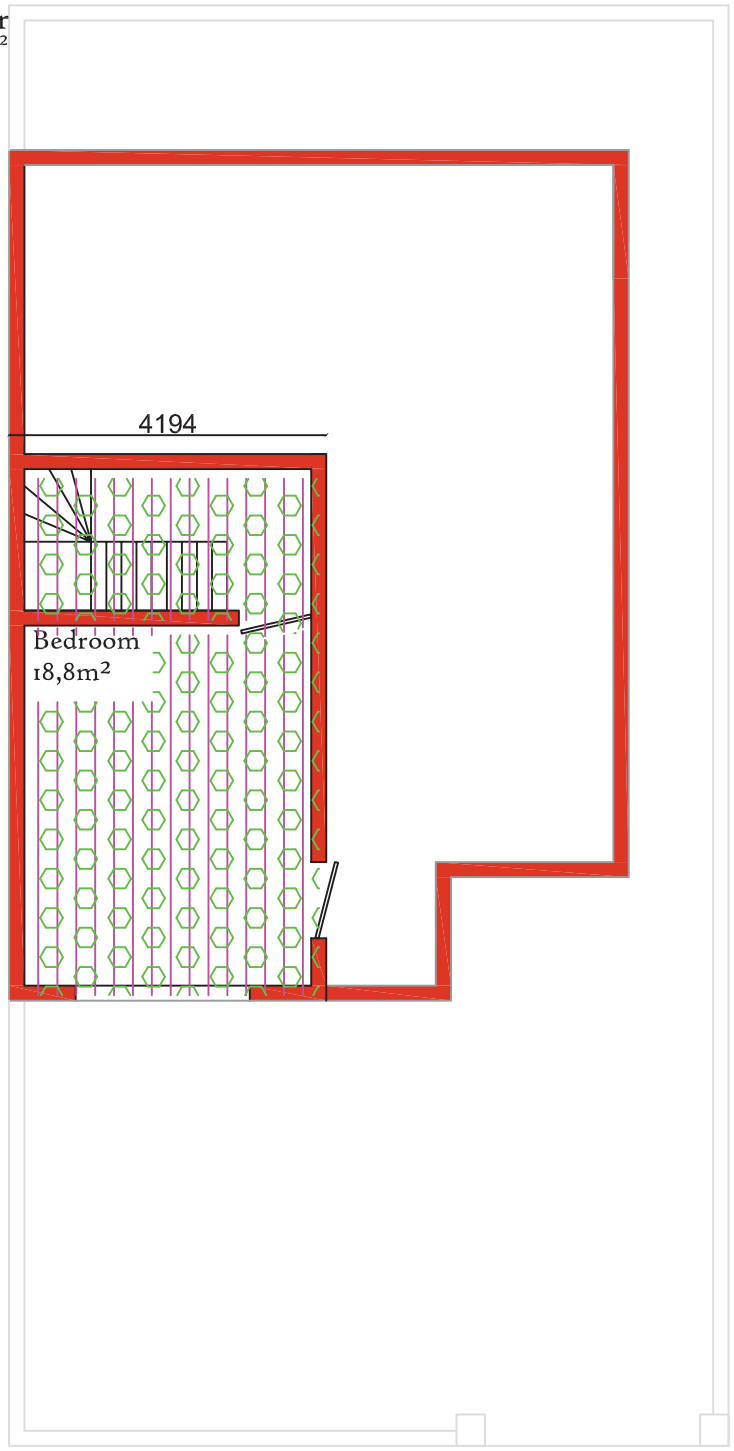


Floor plans

Ground floor
Total area: 180m²
Building: 86m²



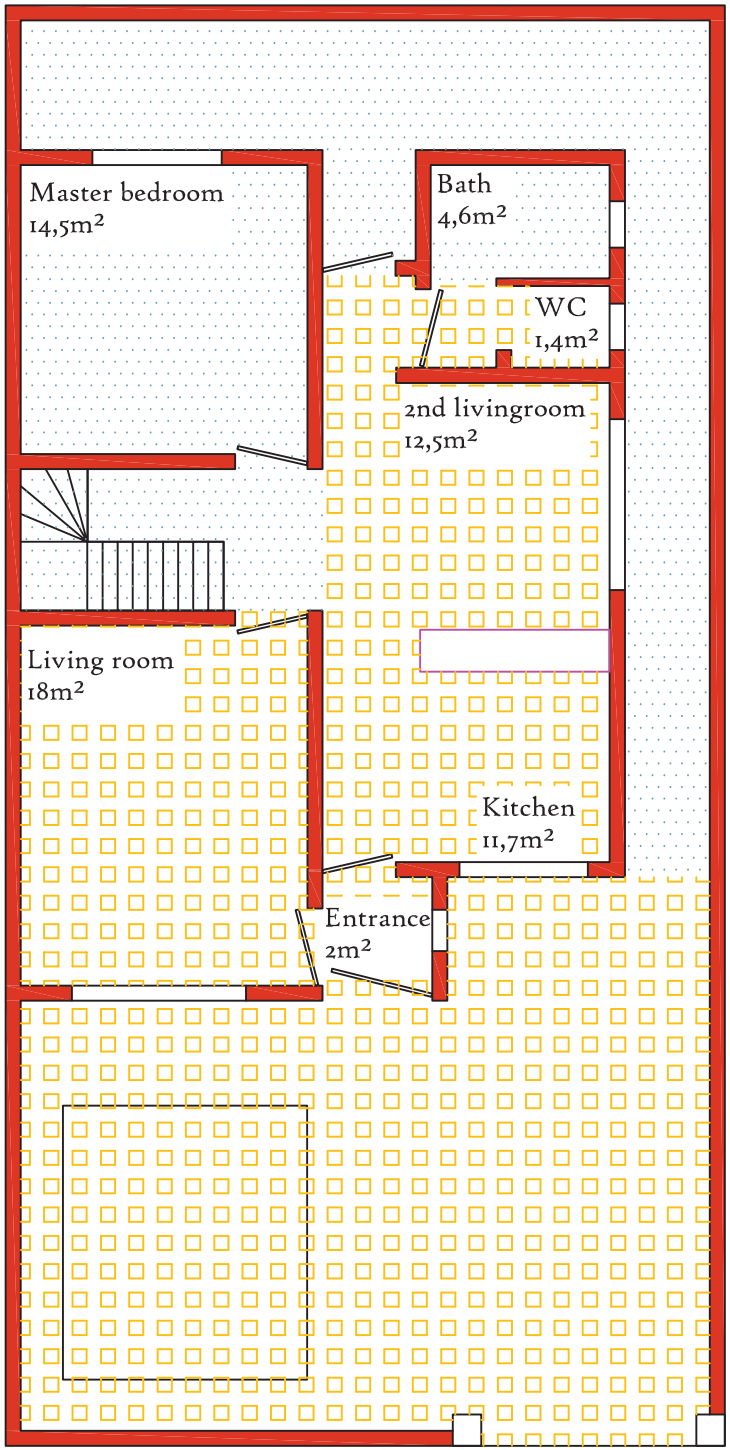
First floor
Building: 30m²



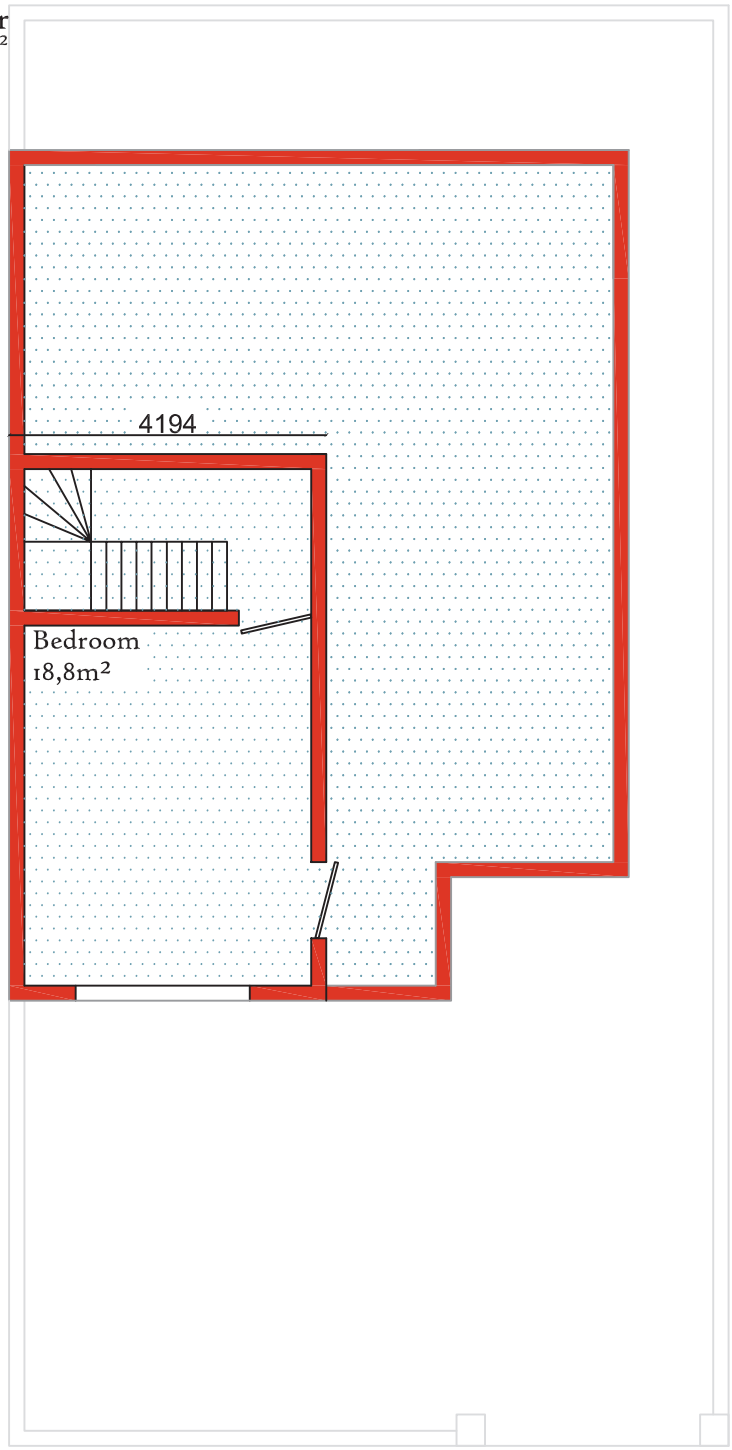
Zone plan

- Wife
- Husband
- Children
- Common

Ground floor
Total area: 180m²
Building: 86m²



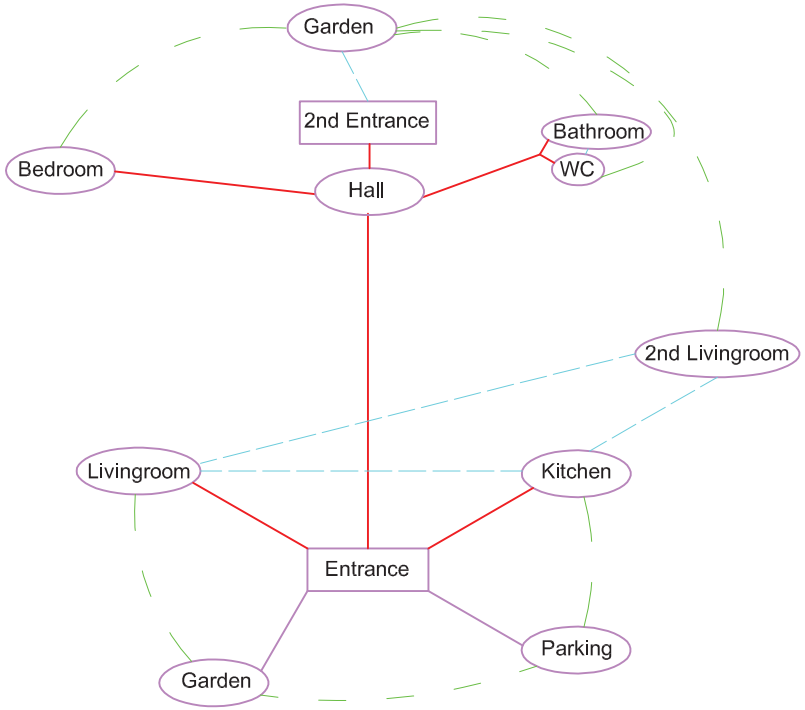
First floor
Building: 30m²



Public/private indication

Private

Public



Kani City

Ground-dwelling

Legend:

Red: Physical relation

Blue: Short path

Green: Visual relation

Orange: Physical connection

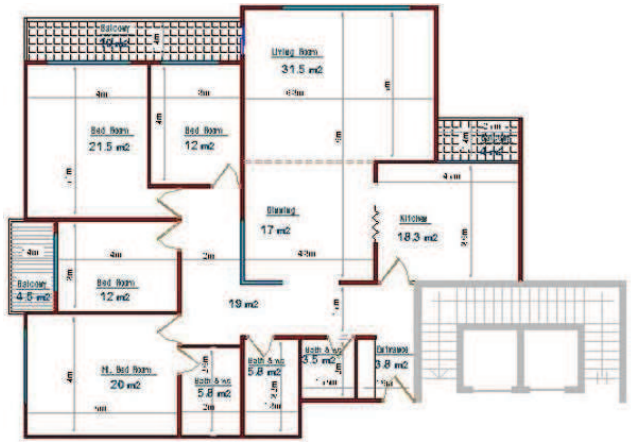
Nalia Group
E. Gundi Almani 2 (Flats) (German Village 2)
The flats are available in two types, I will analyse the bigger one for comparison with the other plans. The area of this flat is 220m², the price varies per view. The view of the mountain Goizha is 120.000 USD and the price with the view to the city is 130.000USD.
The flat contains four bedrooms, the master bedroom has its own bathroom. A toilet, bathroom, a living room with dining area and three balconies.

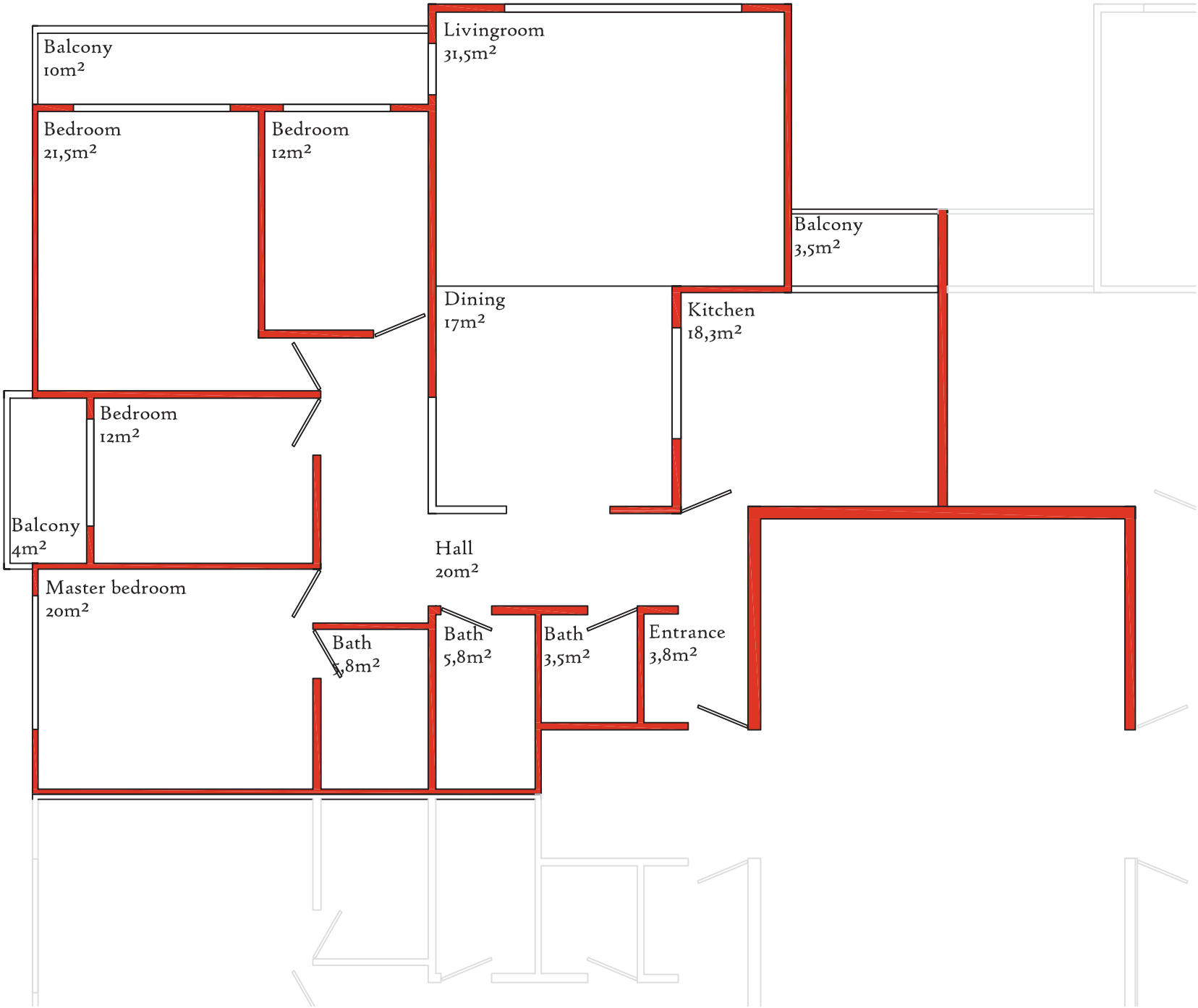
Materials:
In situ concrete for the foundation and columns, hollow concrete blocks for the walls, in situ concrete for floors (outside and inside), tiles for the floors (inside and outside) and walls (in the kitchen and sanitary spaces), wood and roof tiles for the roof, stucco and paint (exterior walls and the rest of the interior), the doors and windows of the house are made of PVC, the fences are stainless steel.

Building method:
Stacking and pouring. Process:
Flattening of the ground, Pouring the foundation, Shuttering and pouring the floor and columns, Stacking up the blocks with mortal in between, etc., placing beams, plates and laying roof tiles, Finishing (stucco, tiles, paint), Windows and doors, Fences of the balcony.

Installations:
Electricity, from the government and flat aggregate. The electricity cables are places in the finishing layer of the stucco or tiles.
Water: from the government to water tanks and flat well. Via a water compressor, thru stainless steel pipes, to the apartments. Warm water is produces via an electric boiler, placed in the bathroom or kitchen in each apartment.
There are gas pipes in each apartment, a large gas container is filled by the flat staff.

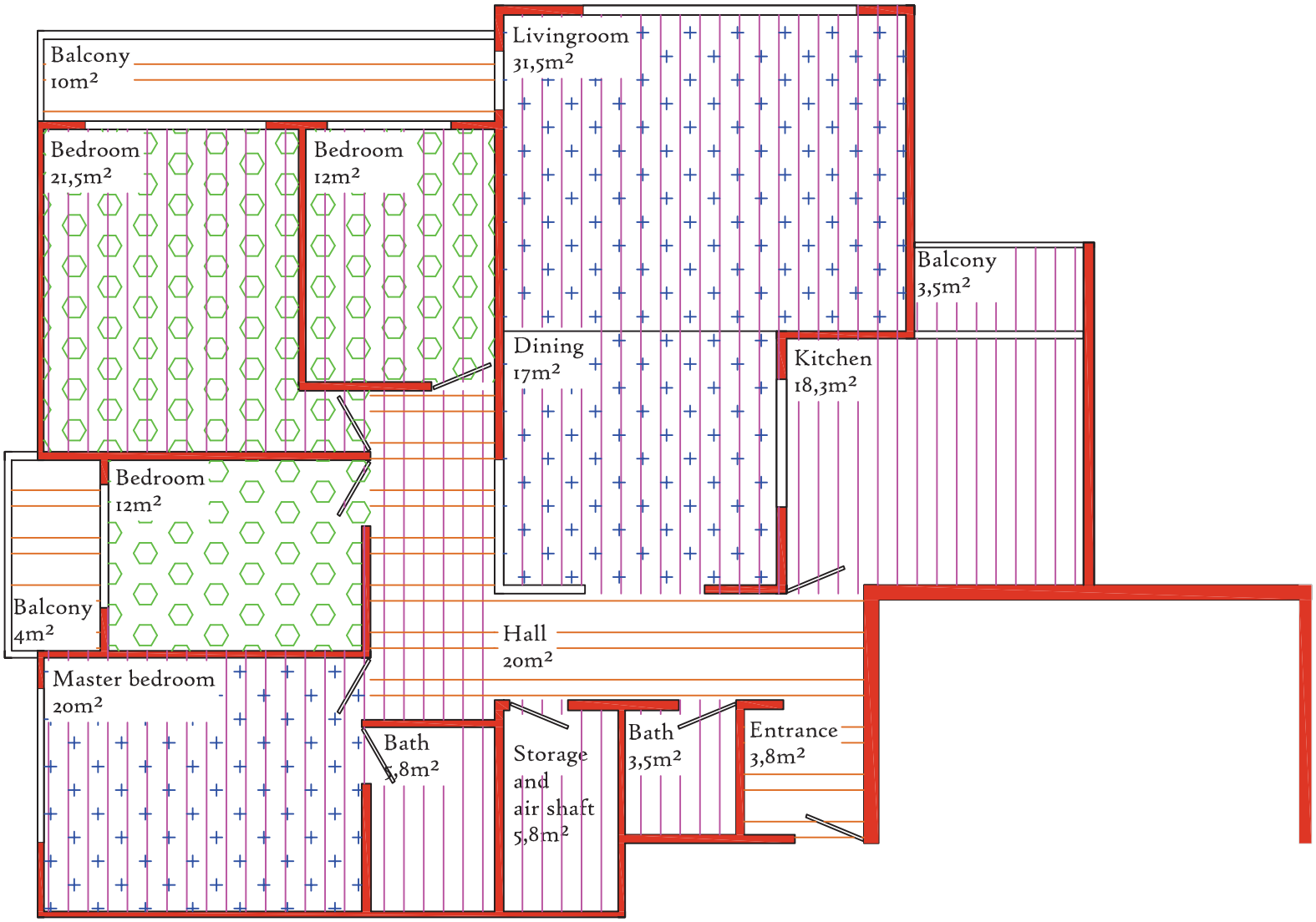
Impressions:





Flat, apartment

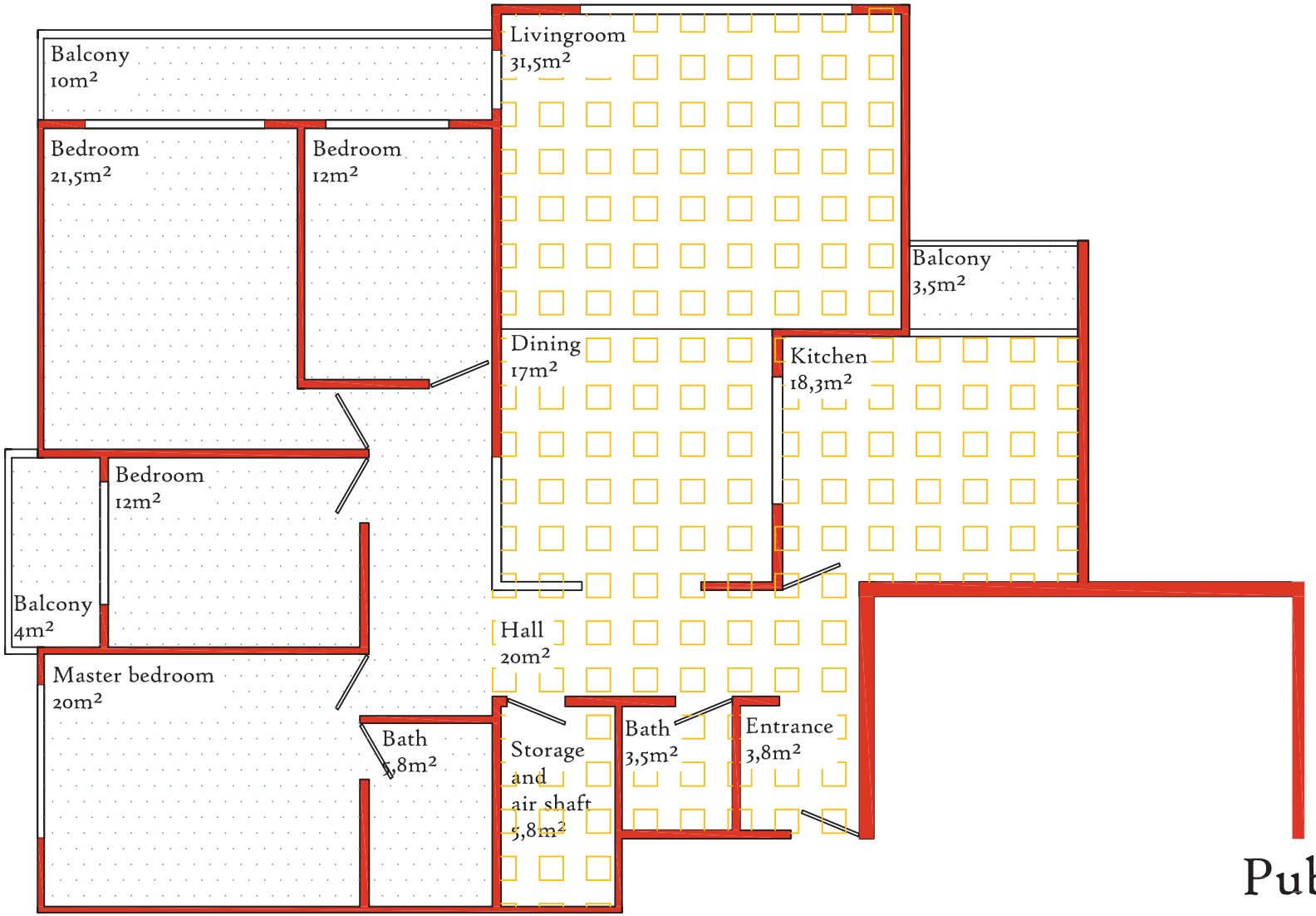
Floor plan



Flat, apartment

Zone plan

- Wife
- Husband
- Children
- Common

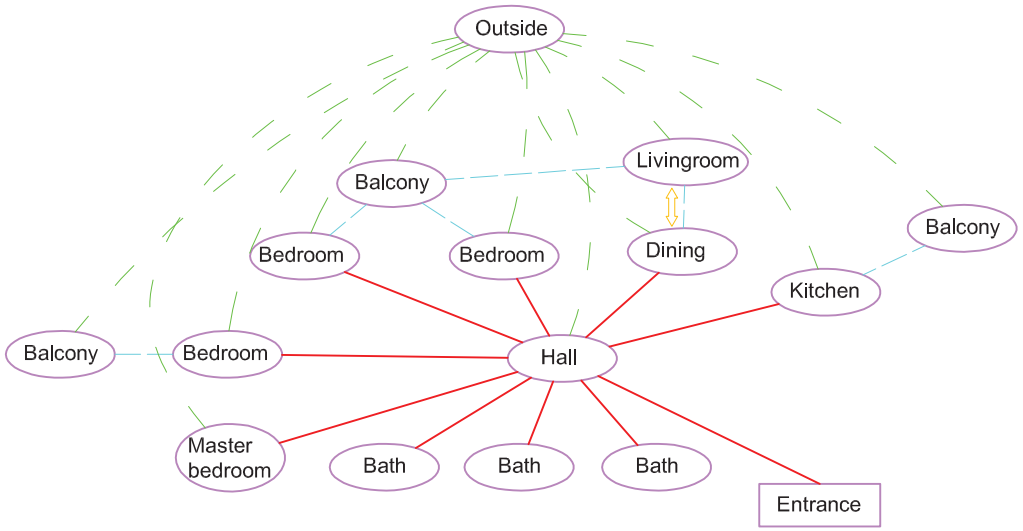


Flat, apartment

Public/private indication

Private

Public



German village

Flat model 1

Legend:

Red: Physical relation

Blue: Short path

Green: Visual relation

Orange: Physical connection

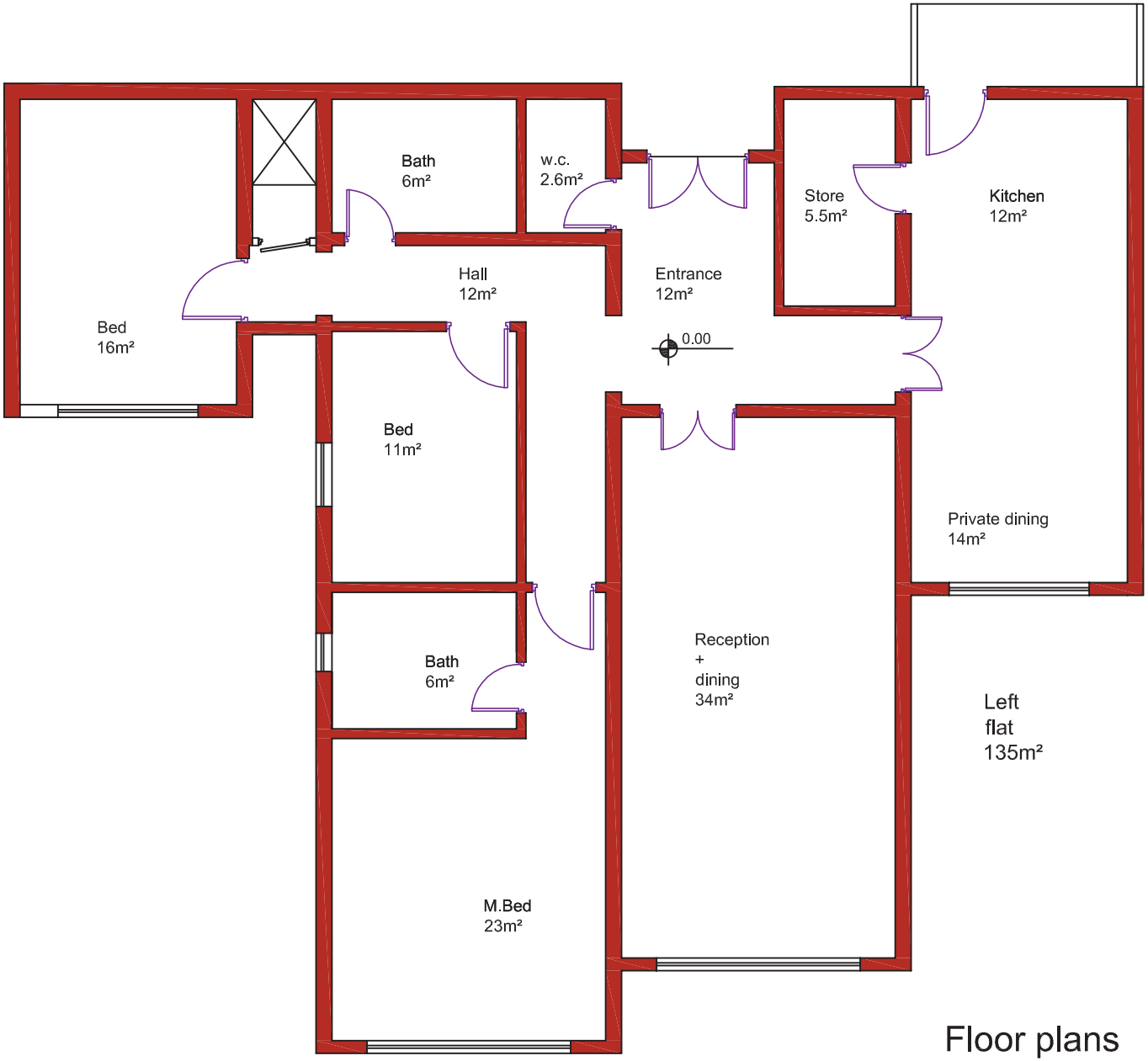
F. Shary Daik (City of mother(s))
This project is a residential neighbourhood with 50 villas and 456 flats (apartments) and is still under construction. The design of this project is different in concept. Other projects intended to give the design a foreign look and give them a foreign name. This project has done that in harmony by applying Kurdish architectonic characteristics. This design resembles the mountain layout. The flats are not built consistent vertically but along the mountain and a portion of the design is even layered like the mountain layout. The project has two types of one is constructed out of nine floors and the other one is constructed out of thirteen floors.
The flats are formed in sets of four flats next to each other. The first four floors of the nine layer flats are layered along the mountain, the other floors are located vertically on top of each other. The thirteen floors flat have only the first three floors layered along the mountain. Each two flats have an entrance and a stairwell. The lower floors terraces above each rooftops like the mountain layout. The upper floors have balconies at the back. The two top floors are bigger than the rest and have a larger glass surface. The two flats right of the set have a different design glass surface than the two on the left of the set.

Materials:
In situ concrete for the foundation and columns, hollow concrete blocks for the walls, in situ concrete for floors and roof (outside and inside), tiles for the floors (inside and outside) and walls (in the kitchen and sanitary spaces). The rest is not yet published or finished.

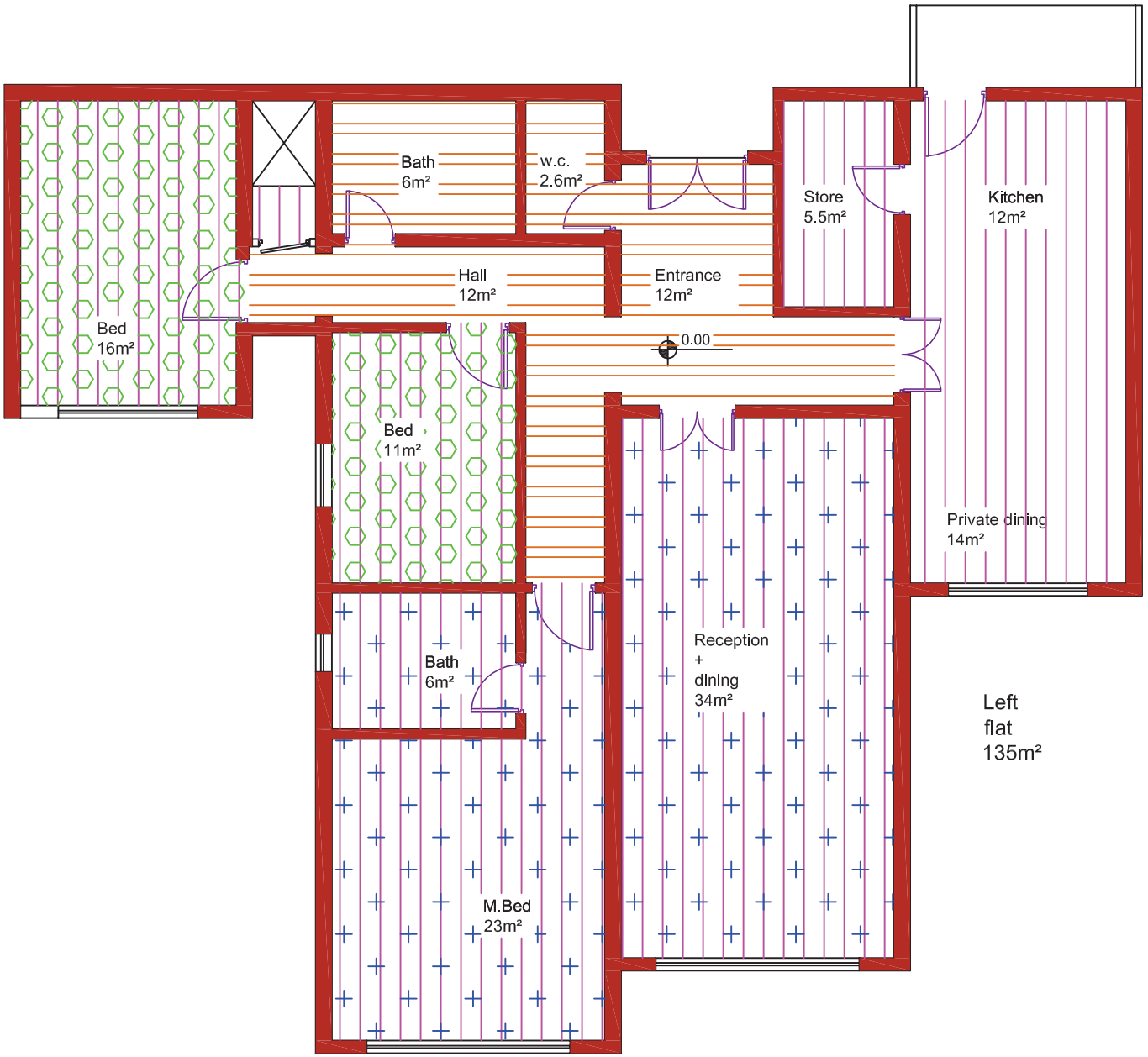
Building method:
Stacking and pouring. Process:
Flattening of the ground and mountain, Pouring the foundation, Shuttering and pouring the floor and columns, Stacking up the blocks with mortal in between, etc.,

Installations:
Electricity, from the government and flat aggregate. The electricity cables are places in the finishing layer of the stucco or tiles.
Water: from the government to water tanks and flat well. Via a water compressor, thru stainless steel pipes, to the apartments. Warm water is produces via an electric boiler, placed in the bathroom or kitchen in each apartment.
There are gas pipes in each apartment, a large gas container is filled by the flat staff.

Impressions:

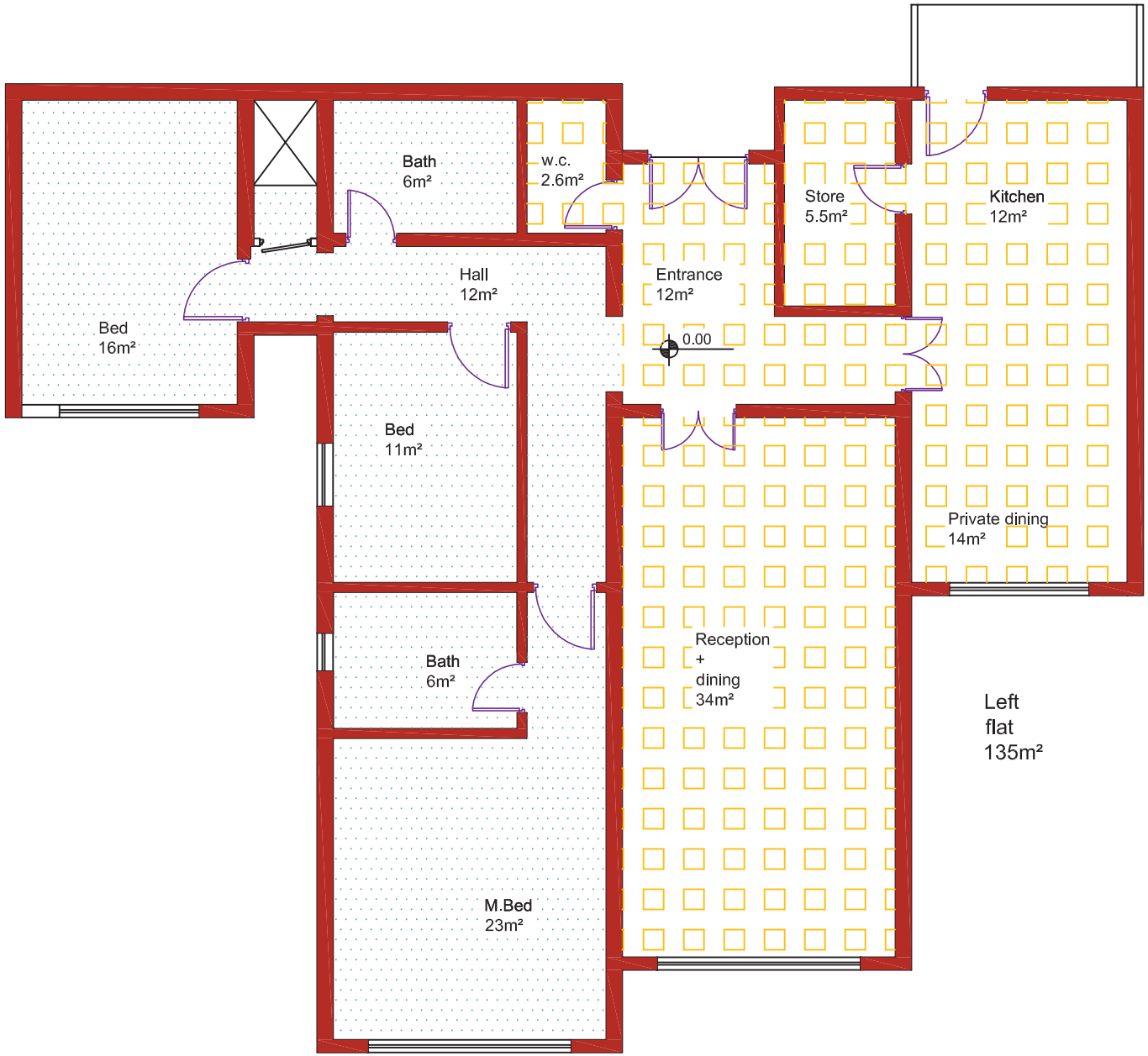

Bath
6m²
w.c.
2.6m²
Store
5.5m²
Kitchen
12m²
Hall
12m²
Entrance
12m²
Bed
16m²
0.00
Bed
11m²
Private dining
14m²
Bath
6m²
Reception
+
dining
34m²
Left
flat
135m²
M.Bed
23m²

Floor plans



Zone plan

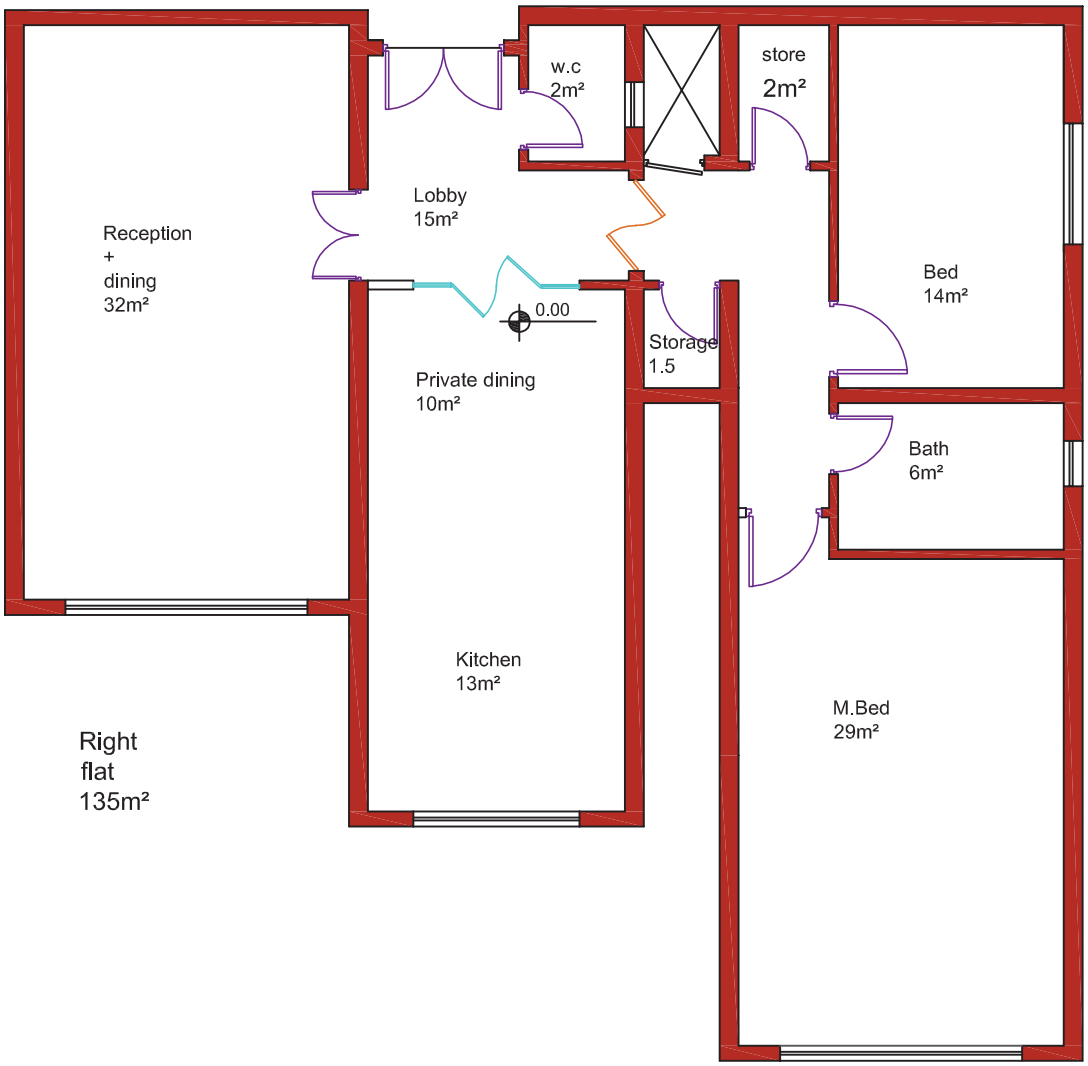
- Wife
- Husband
- Children
- Common



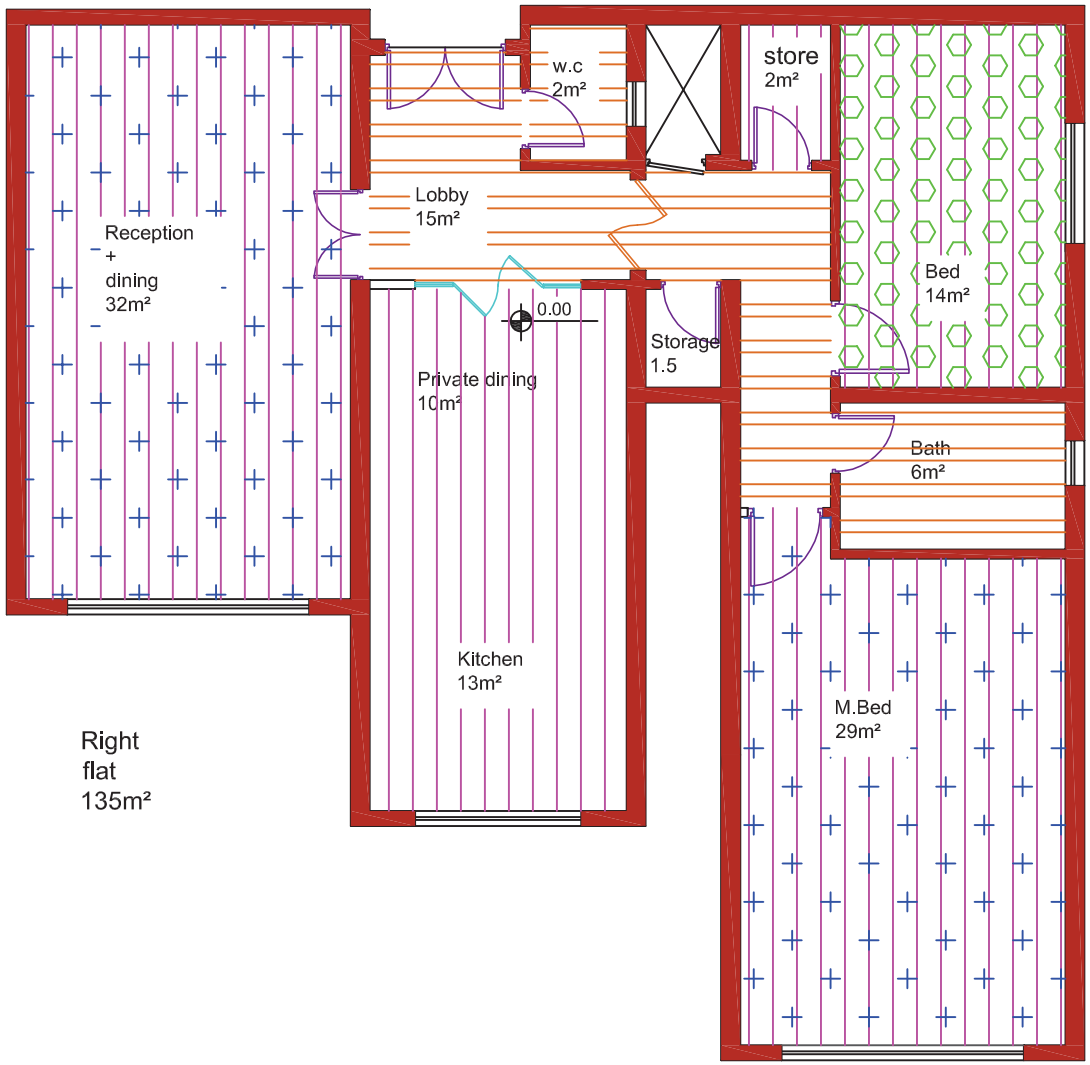
Public/private indication

Private

Public

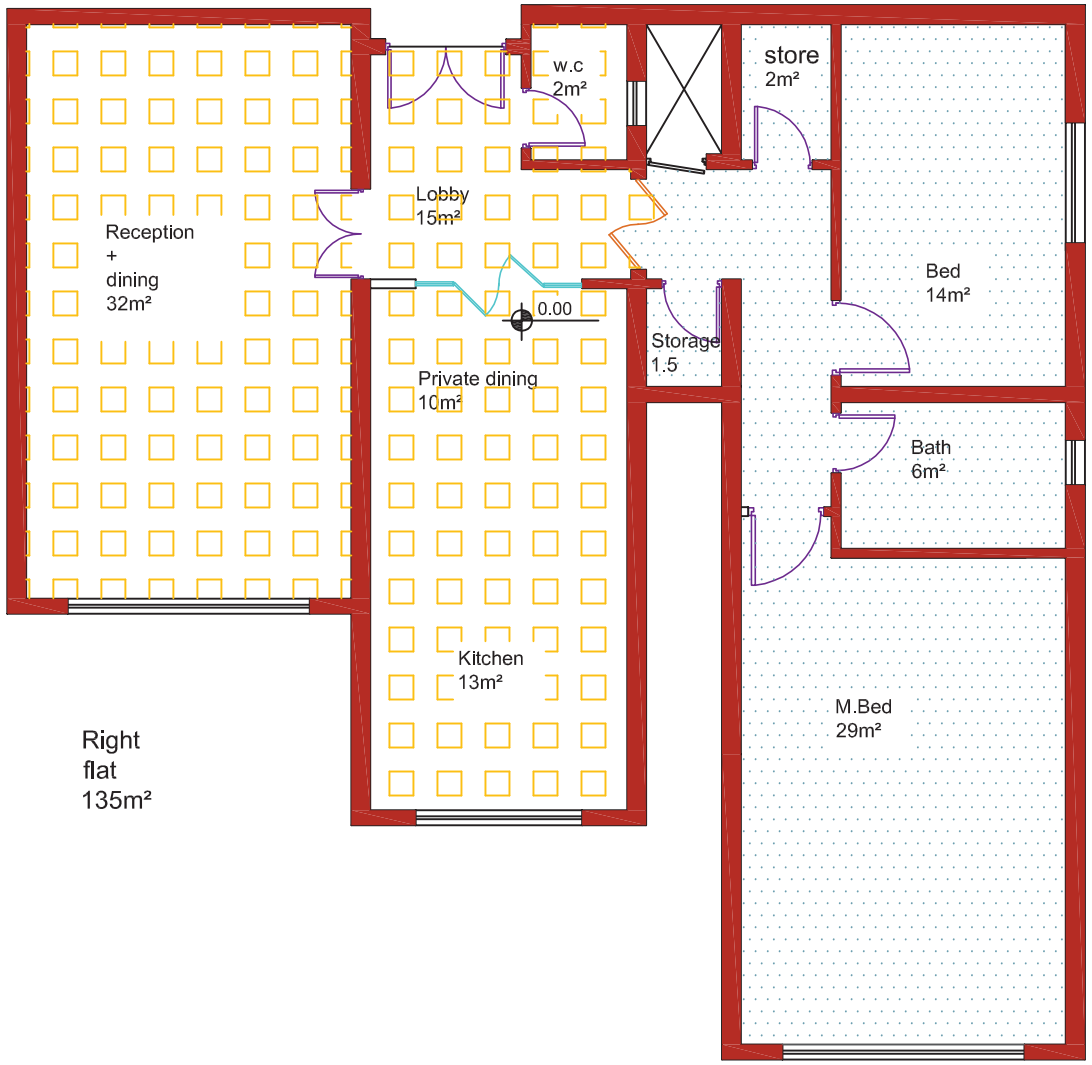

w.c
2m²
store
2m²
Lobby
15m²
Reception
+
dining
32m²
0.00
Storage
1.5
Bed
14m²
Private dining
10m²
Bath
6m²
Kitchen
13m²
M.Bed
29m²
Right
flat
135m²

Floor plans



Zone plan

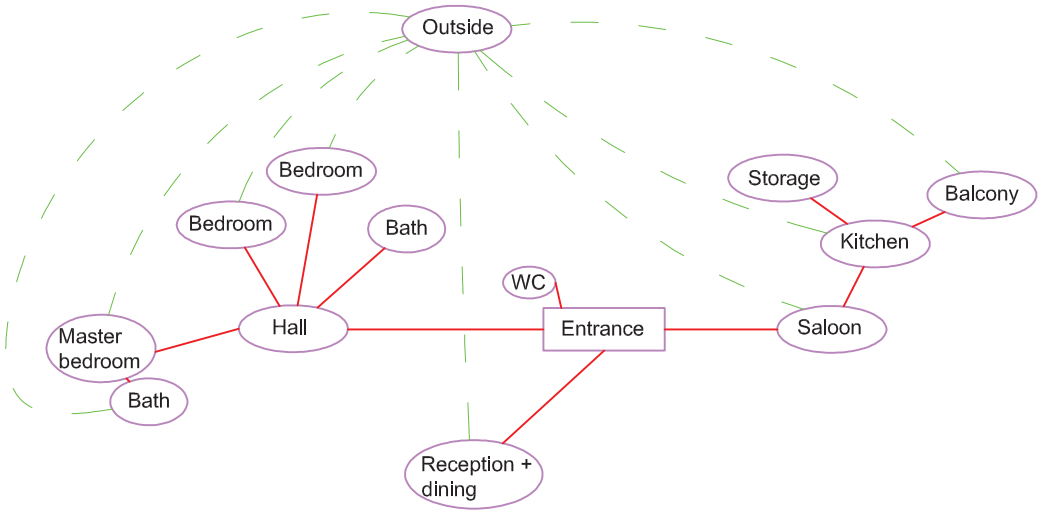
- Wife
- Husband
- Children
- Common



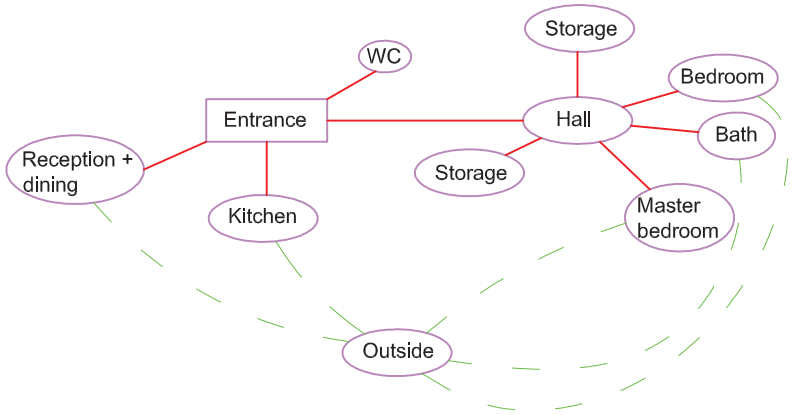
Public/private indication

Private

Public



Shary Daik
Flat model 1



Shary Daik
Flat model 2

Legend:

Red: Physical relation
Blue: Short path
Green: Visual relation
Orange: Physical connection

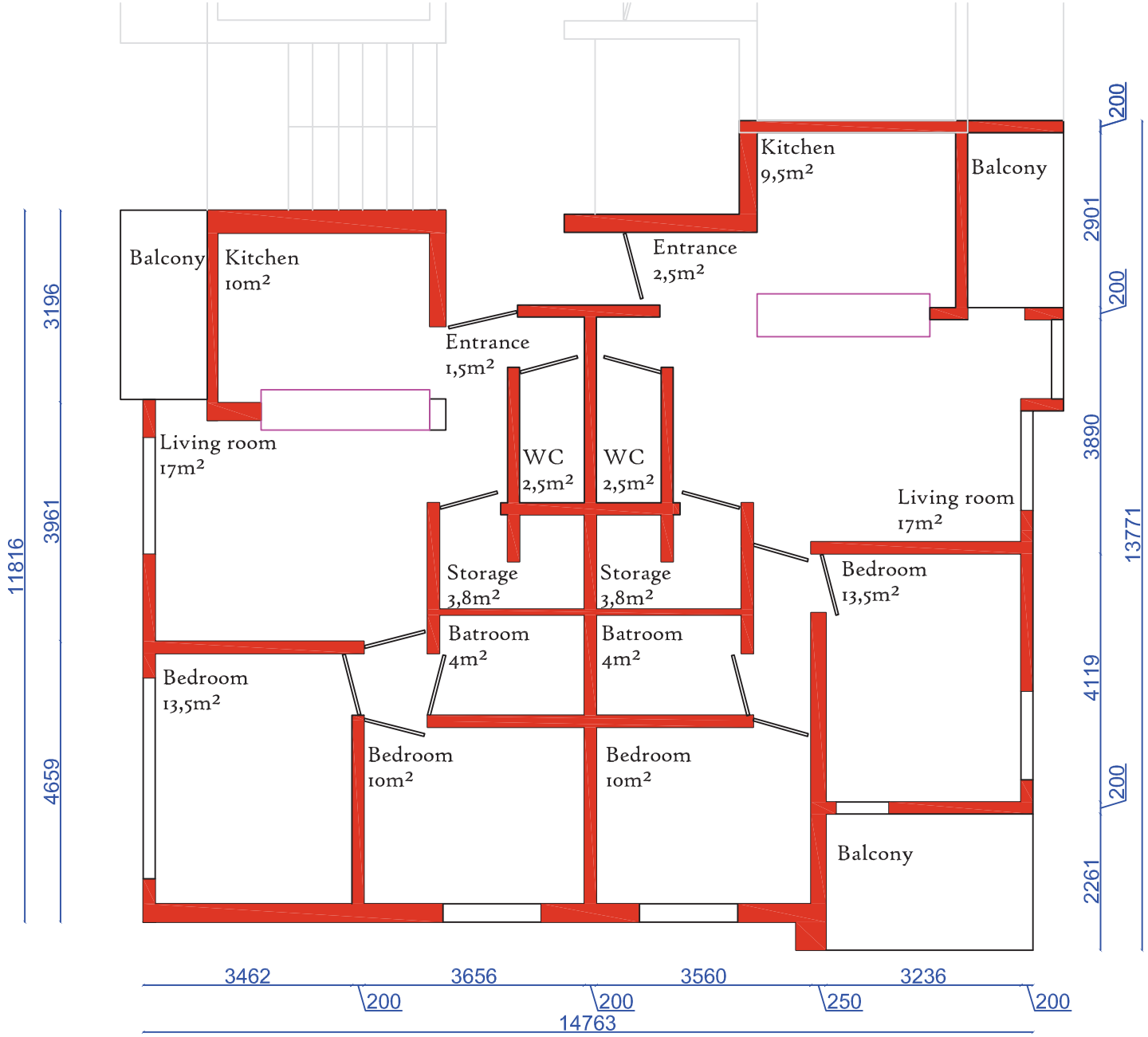
D. Kani city (Flats)
There are 70 flats, in each flat there are 6 apartments in the form of flats with each a floor area of 105m².

Materials:
In situ concrete for the foundation and columns, hollow concrete blocks for the walls, in situ concrete for floors and roof (outside and inside), The rest is not yet published or finished.

Building method:
Stacking and pouring. Process:
Flattening of the ground and mountain, Pouring the foundation, Shuttering and pouring the floor and columns, Stacking up the blocks with mortal in between, etc.,

Installations:
Electricity, from the government and flat aggregate. The electricity cables are places in the finishing layer of the stucco or tiles.
Water: from the government to water tanks and flat well. Via a water compressor, thru stainless steel pipes, to the apartments. Warm water is produces via an electric boiler, placed in the bathroom or kitchen in each apartment.
There are gas pipes in each apartment, a large gas container is filled by the flat staff.

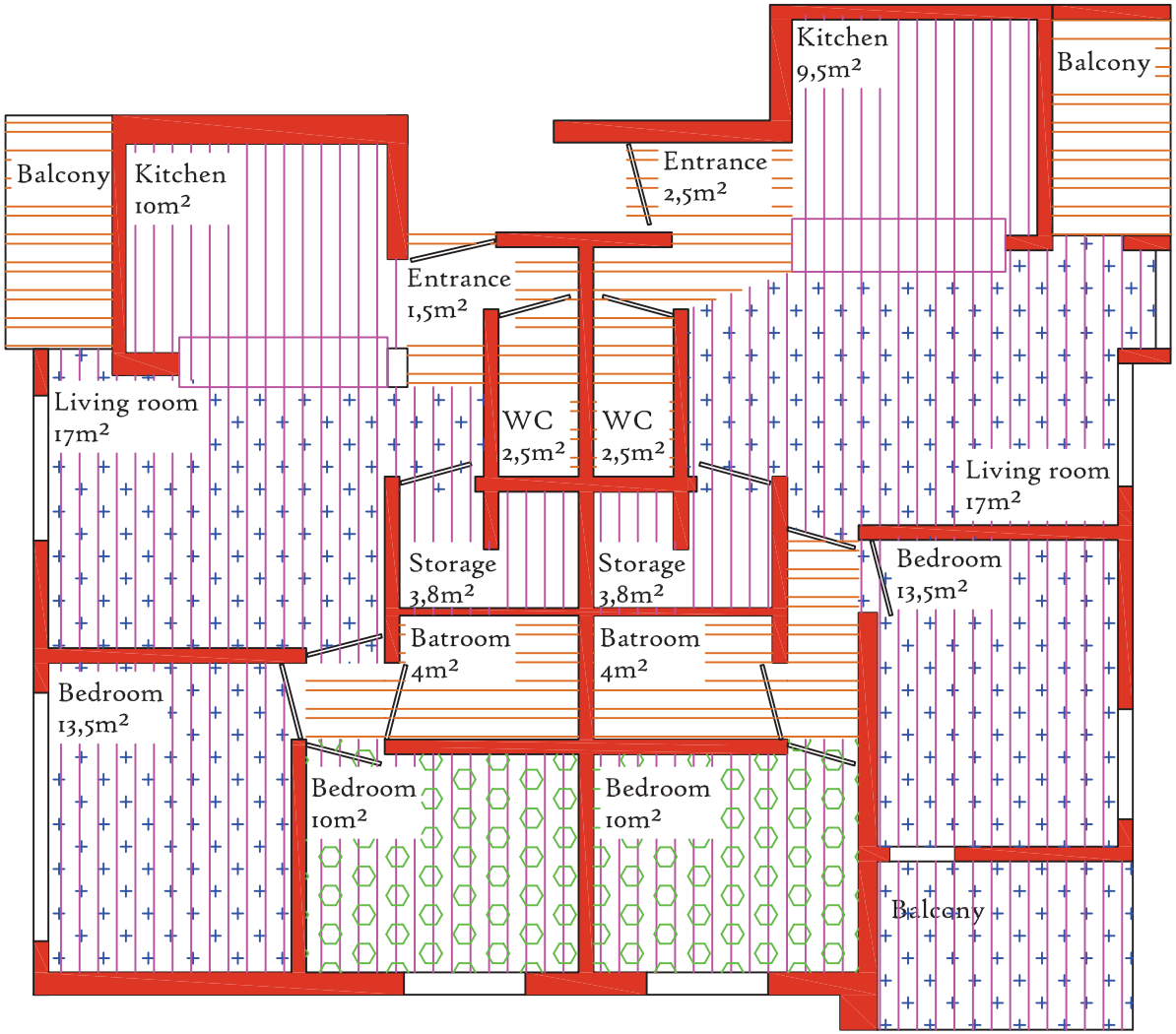
Impressions:



Model 1
Building: 85m²

Model 2
Building: 98m²

Floor plans

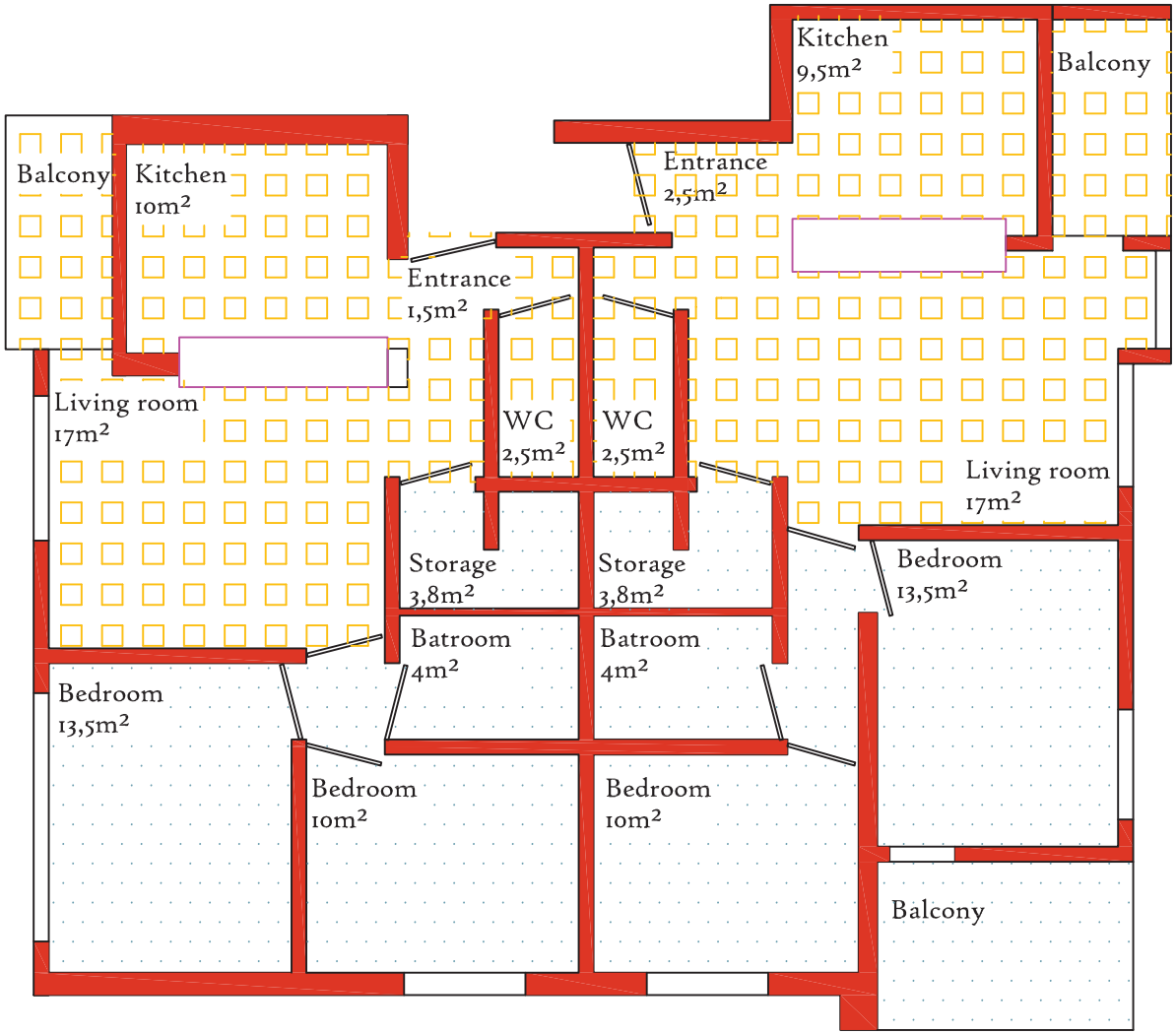


Model 1
Building: 85m²

Model 2
Building: 98m²

Zone plan

- Wife
- Husband
- Children
- Common



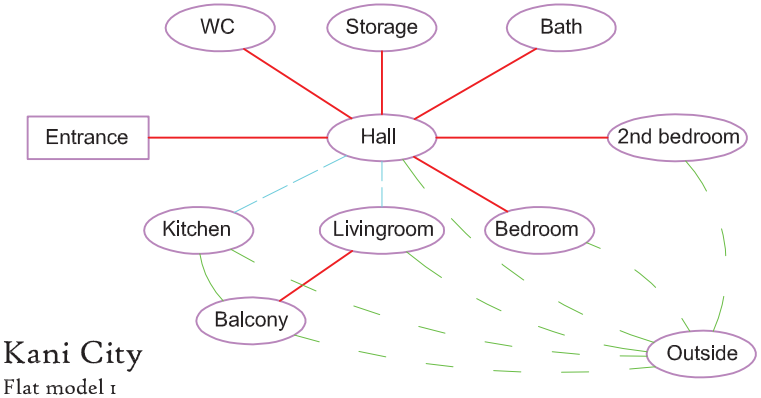
Model 1
Building: 85m²

Model 2
Building: 98m²

Public/private indication

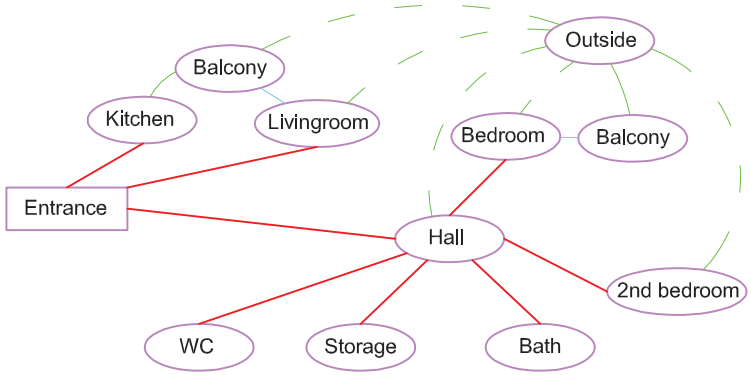
Private

Public



Kani City

Flat model 1



Kani City

Flat model 2

Legend:

- Red: Physical relation
- Blue: Short path
- Green: Visual relation
- Orange: Physical connection

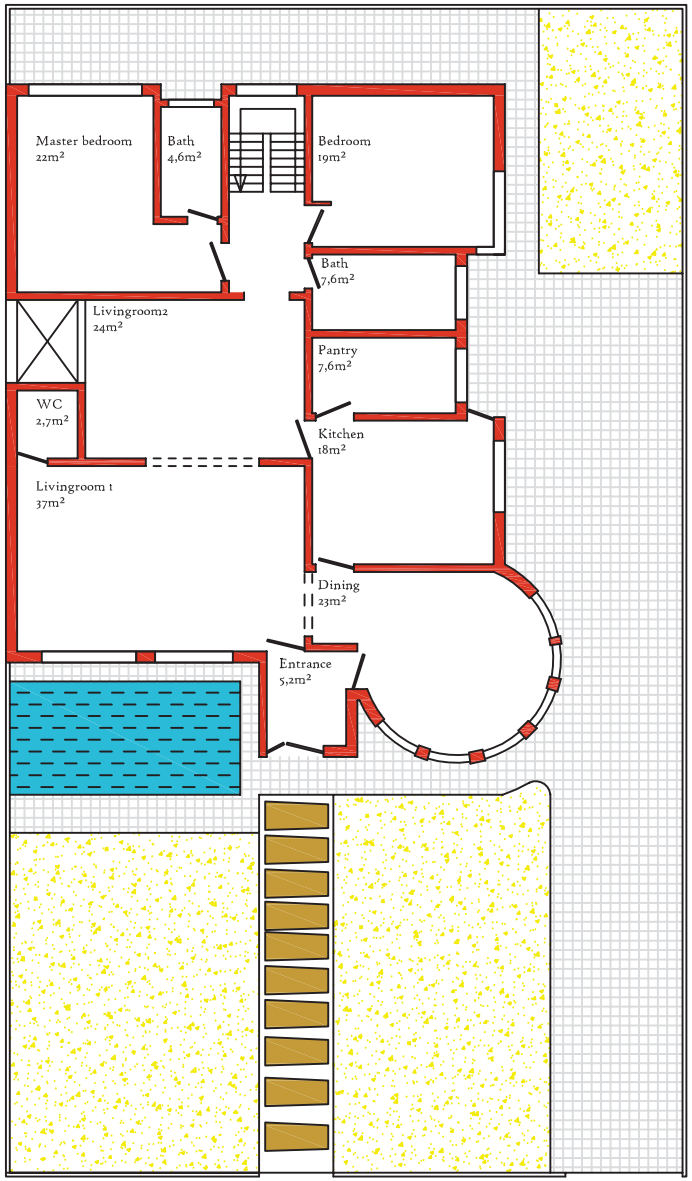
Nalia Group
E. Gundi Almani 2 (Villas) (German Village 2)
This project is built in 2009 and includes 424 resident units, which are 104 villas and 320 flats. There are different kinds of villa and flats. The total costs for this project were $62 million and the surface of land is 250.000 m². The villa that I have analysed is 558m² and costs $300.000 if faced towards the mountain and $320.000 if faced toward the city. The villa is 3 floors, each floor is 205m², the villa contains 6 bedrooms with each its own bathroom, a reception, living room, dining room, kitchen and scullery, sanitary space, balcony, play room, swimming pool, garden and 4 parking spaces.

Materials:
Red bricks for the walls and pillars, in situ concrete for foundation - floors (outside and inside) -roofs, tiles for the floors (inside and outside of the house) and walls (in the kitchen and sanitary spaces), wood and roof tiles for the roof, stucco and paint (exterior walls and the rest of the interior), the doors and windows of the house are made of PVC, the fences and outside doors are made of hollow concrete blocks and stainless steel.

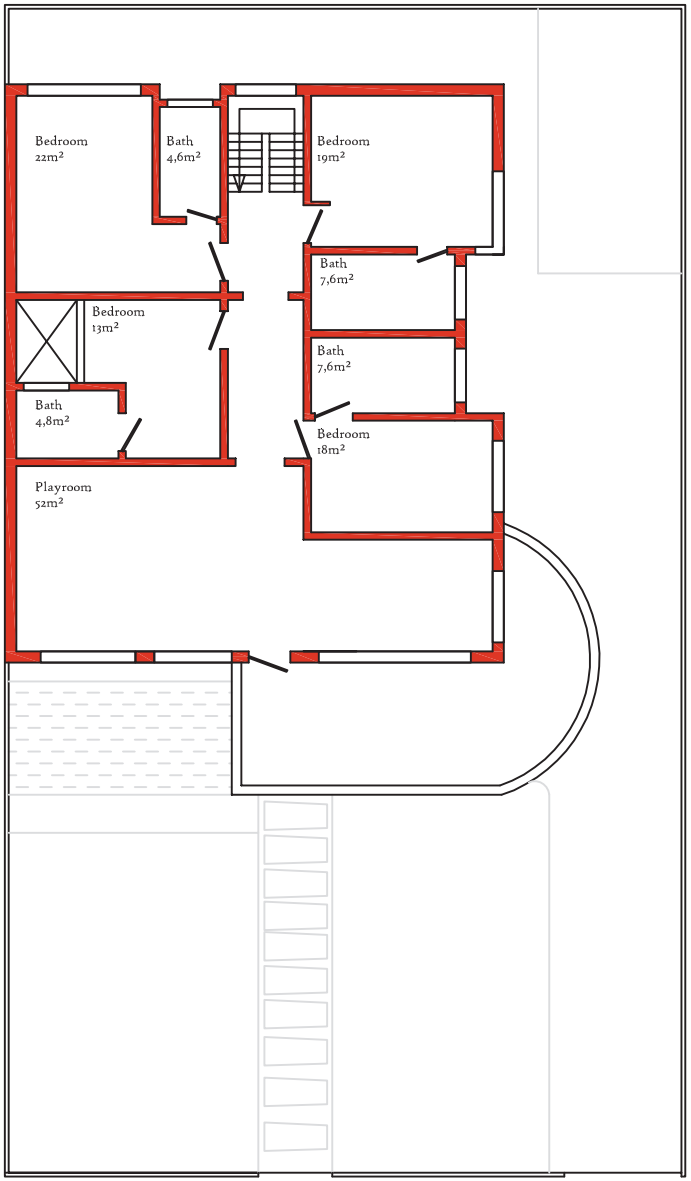
Building method:
Stacking and pouring. Process:
Flattening of the ground, Pouring the foundation and begin of the walls, Shuttering and pouring the floor, Stacking up the bricks with mortal in between, Shuttering and pouring the second floor and begin of the walls, placing beams, plates and laying roof tiles, Finishing (stucco, tiles, paint), Windows and doors, Garden and pouring the walls of the swimming pool, Outside doors and fences.

Installations:
Electricity, from the government and district aggregate via cabling underground and personal aggregate on the roof or somewhere outside the house,
The electricity cables are places in the finishing layer of the stucco or tiles.
Water: from the government to water tanks under the garden and in some cases from a personal well. Via a water compressor, thru stainless steel pipes, to the sanitary places and kitchen. Warm water is produces via an electric boiler, placed in the bathroom or kitchen.
The sewerage is laid thru the floors to the nearest outside space, to the main line outside the lot.
There are no gas pipes in a house, a gas cylinder is purchased and placed near the stove. When the cylinder is empty, it must be exchanged for a full one against a payment.
For heating and cooling, of a room, heaters and/or air conditioning are used.

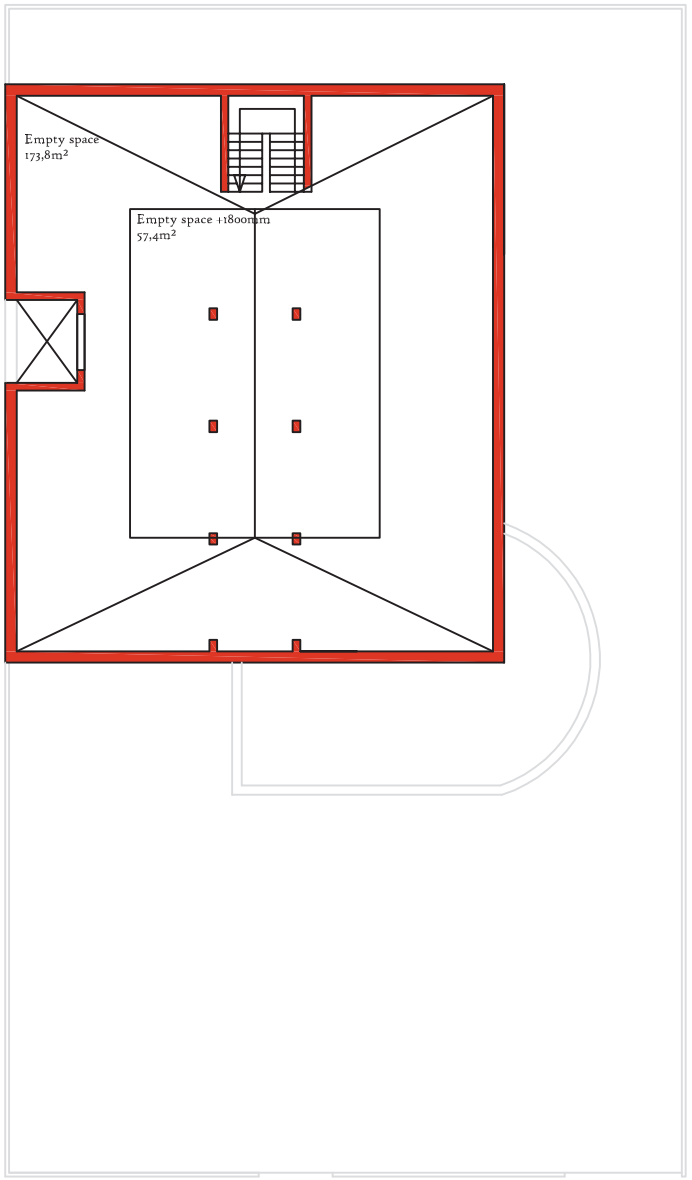
Impressions:



Ground floor

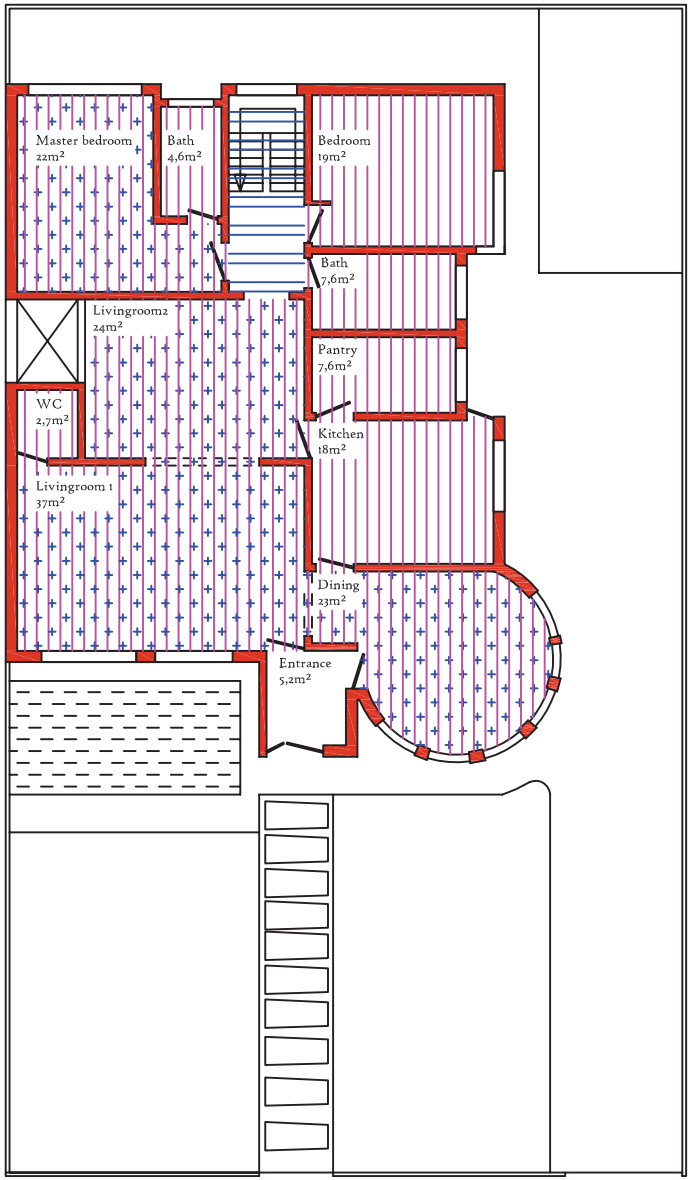


First floor

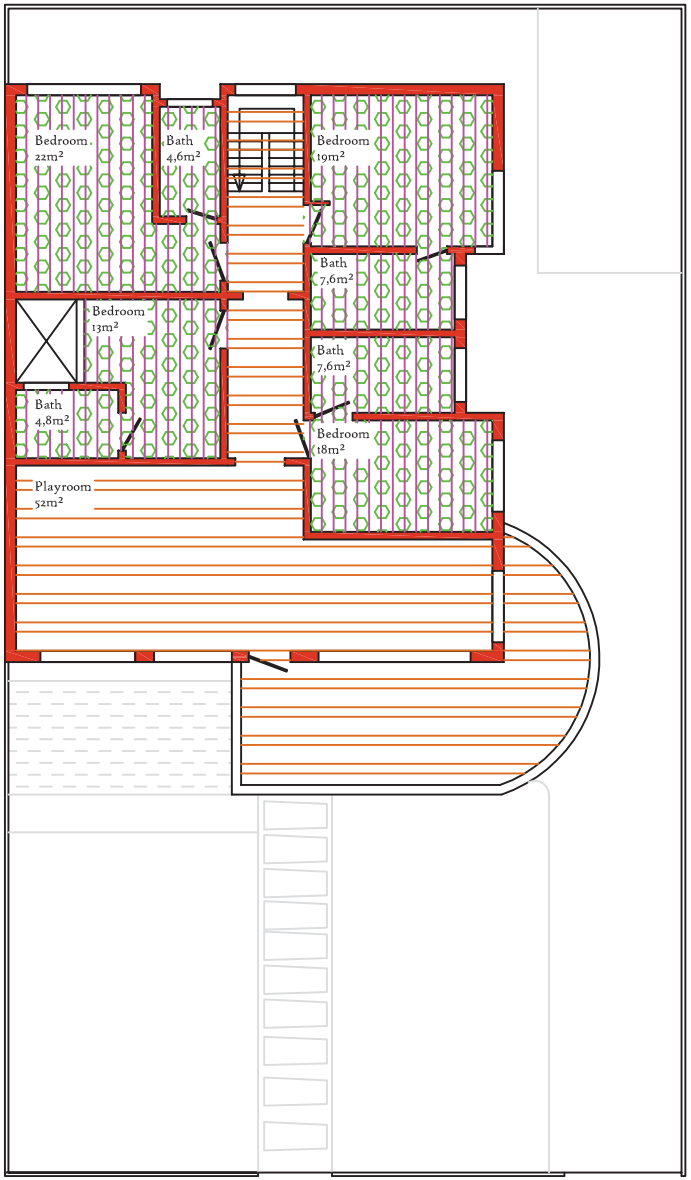


Second floor

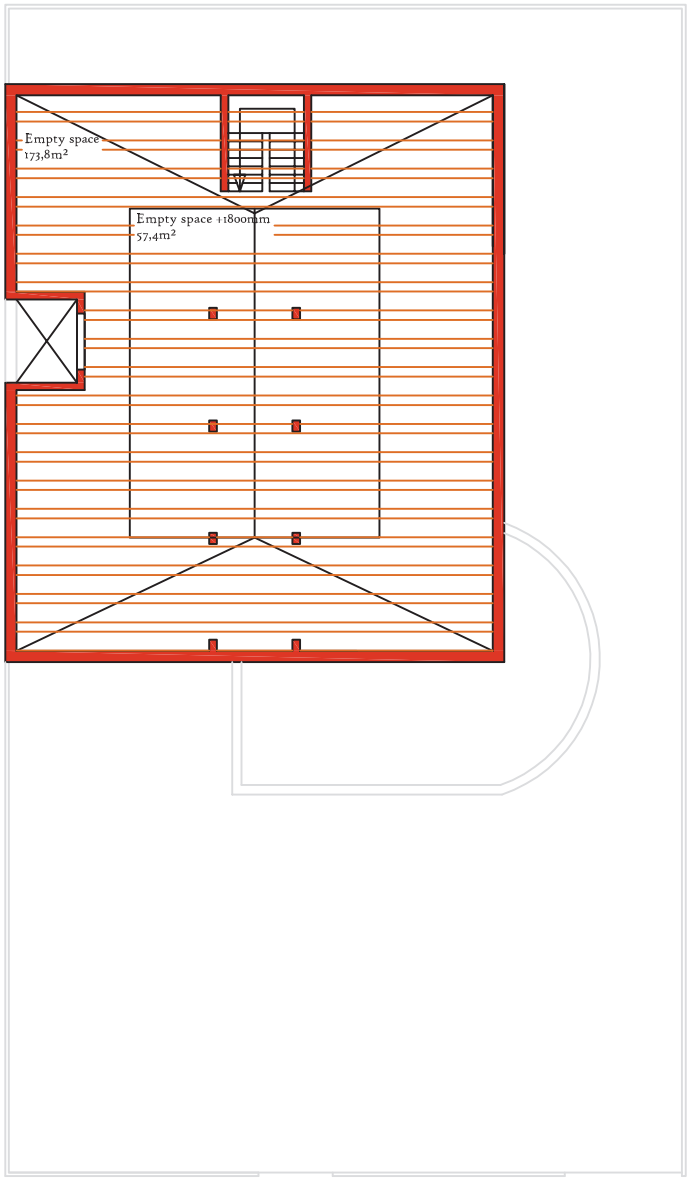
Floor plans



Ground floor



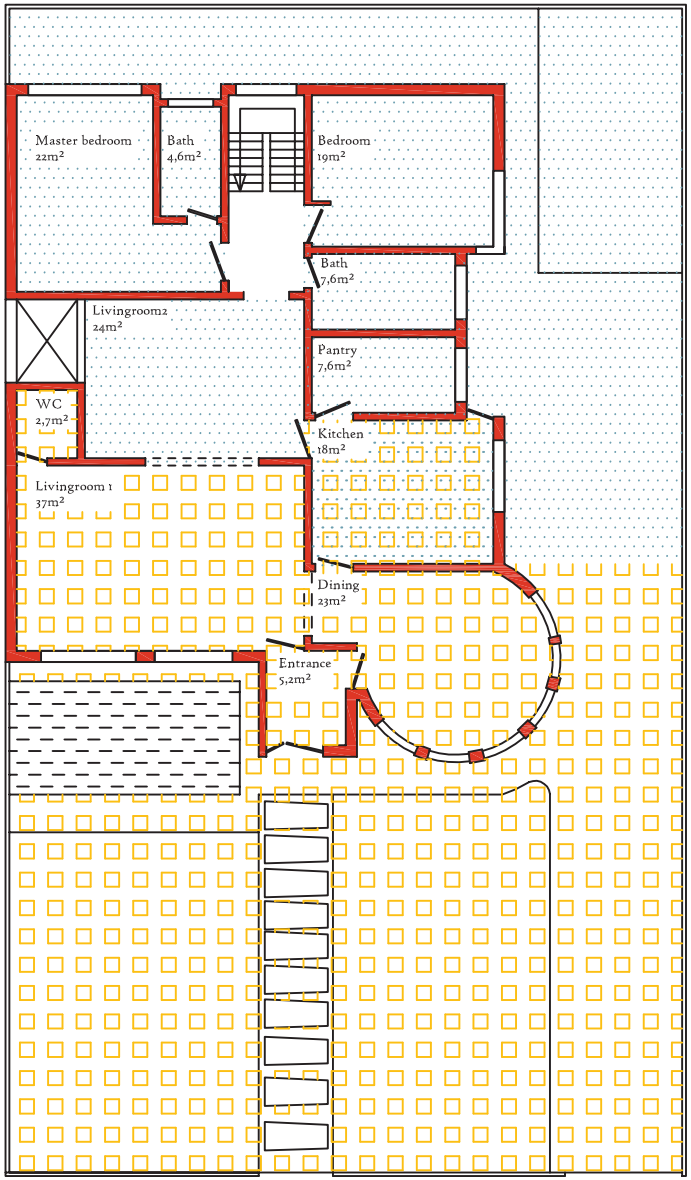
First floor



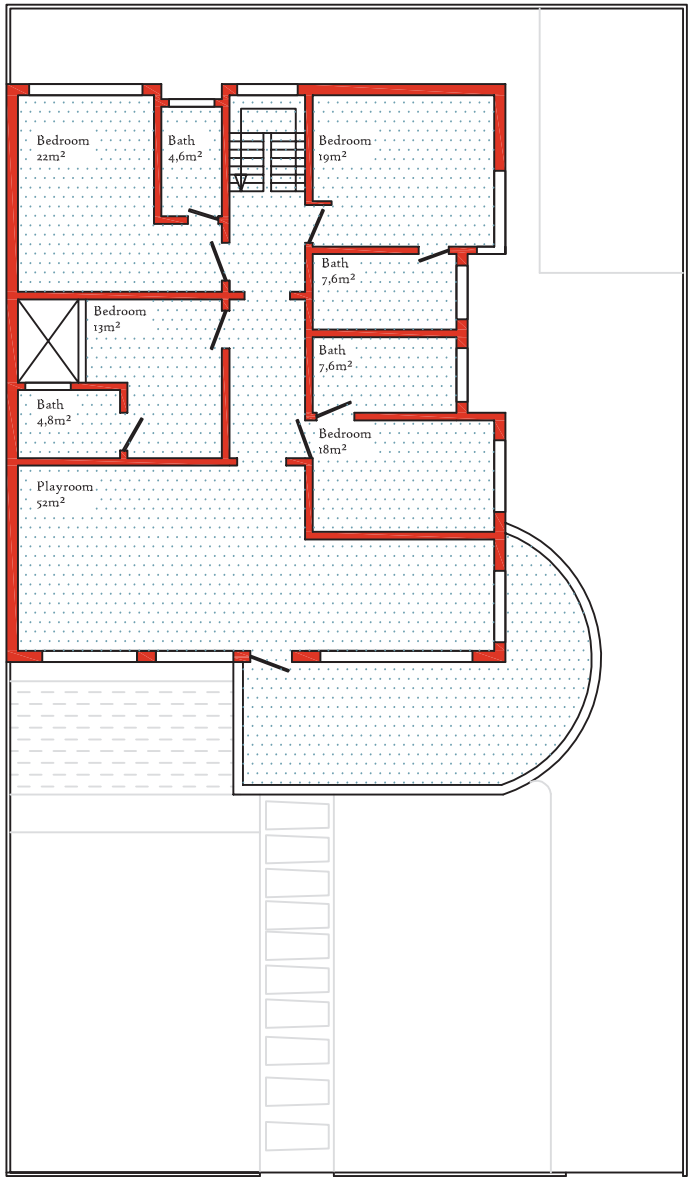
Second floor

Zone plan

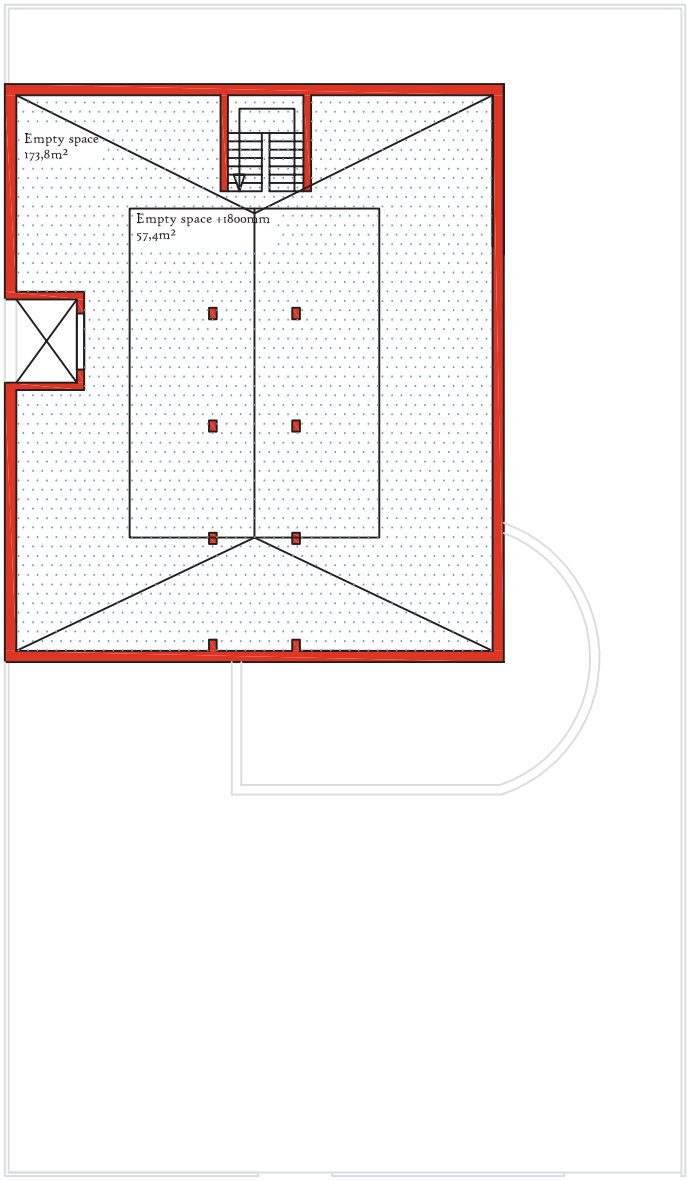
- Wife
- Husband
- Children
- Common



Ground floor



First floor



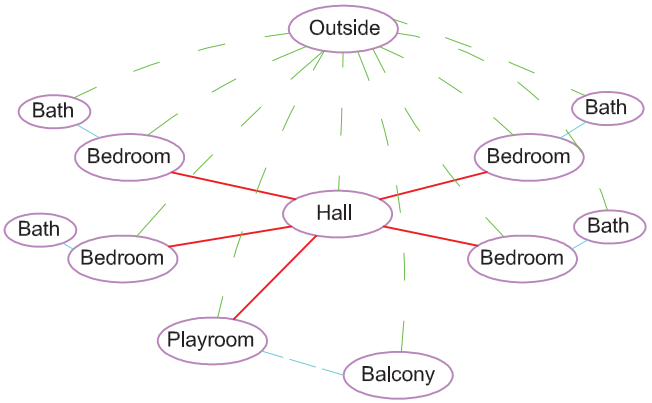
Second floor

Public/private indication

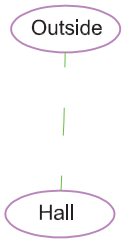
Private

Public

German village
Ground floor



German village
First floor



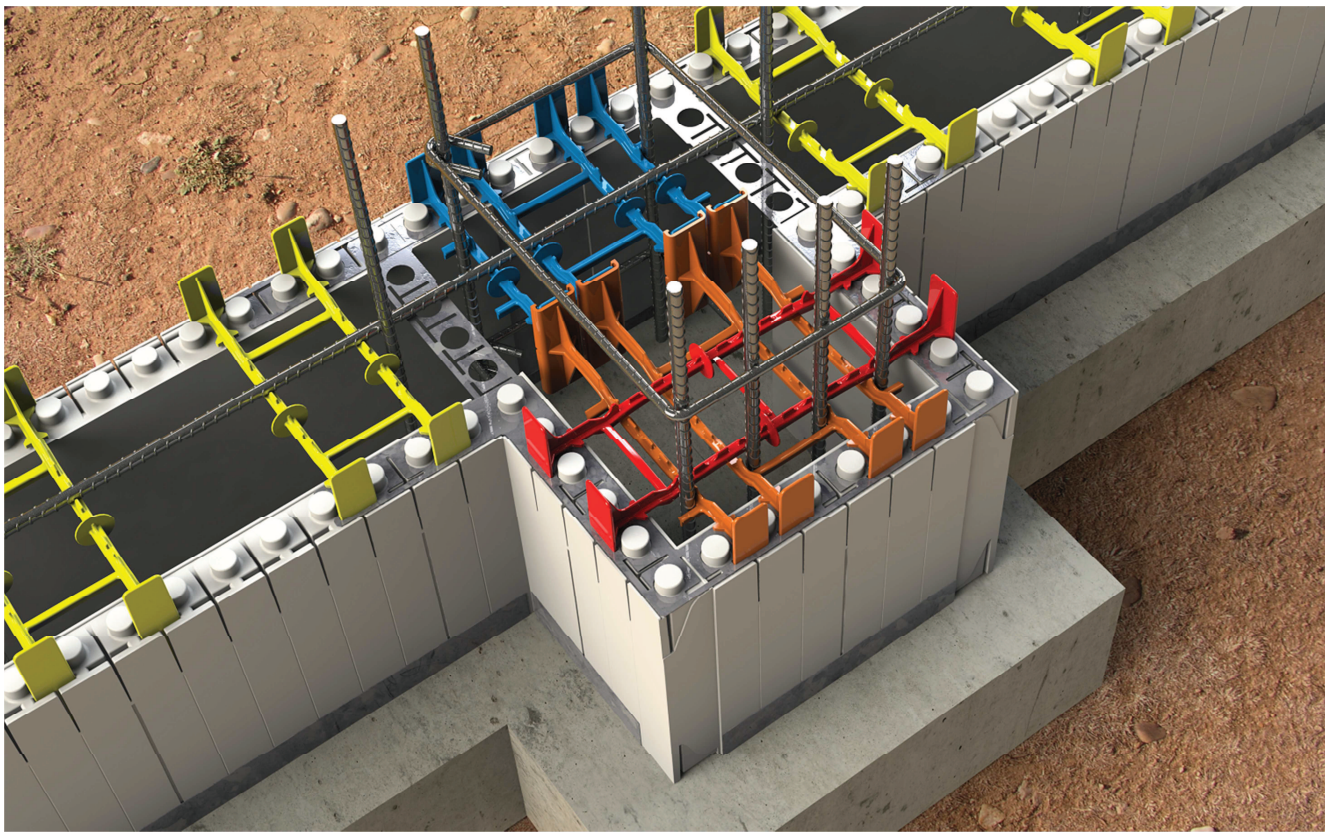
German village
Second floor

Legend:

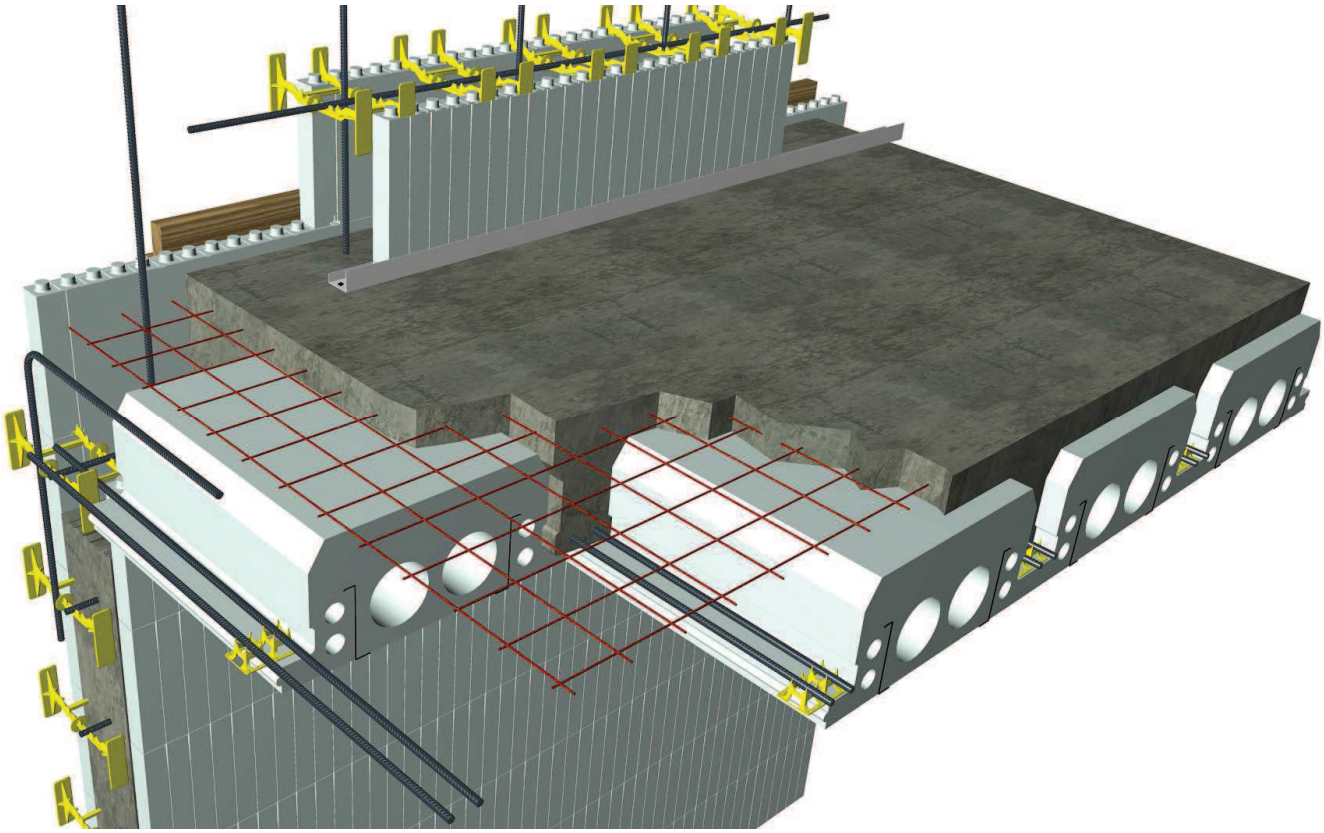
Red: Physical relation
Blue: Short path
Green: Visual relation
Orange: Physical connection

ICF DETAILS

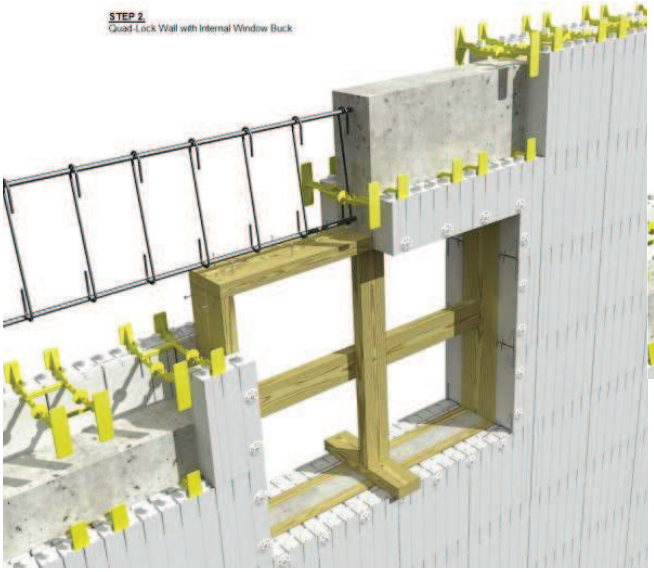
Foundation detail

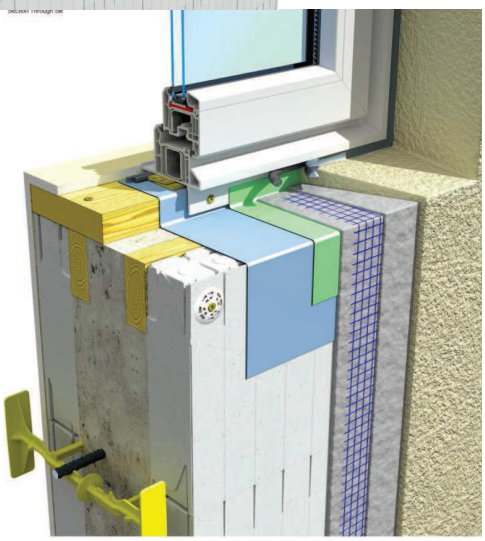


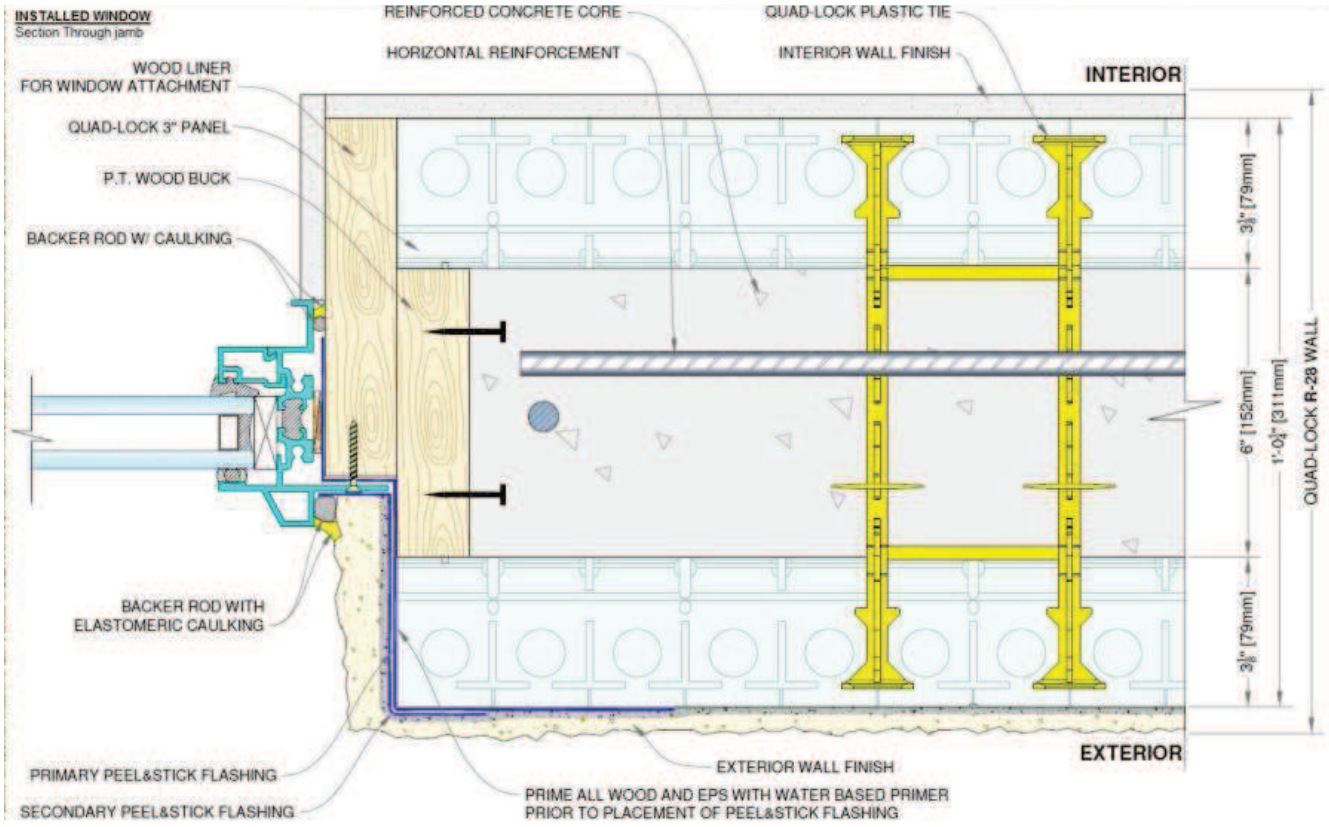
Wall- floor detail



An opening (in this case a window) detail.






INSTALLED WINDOW
Section Through jamb
REINFORCED CONCRETE CORE
QUAD-LOCK PLASTIC TIE
HORIZONTAL REINFORCEMENT
INTERIOR WALL FINISH
INTERIOR
WOOD LINER
FOR WINDOW ATTACHMENT
QUAD-LOCK 3" PANEL
P.T. WOOD BUCK
BACKER ROD W/ CAULKING
BACKER ROD WITH
ELASTOMERIC CAULKING
PRIMARY PEEL&STICK FLASHING
SECONDARY PEEL&STICK FLASHING
EXTERIOR WALL FINISH
PRIME ALL WOOD AND EPS WITH WATER BASED PRIMER
PRIOR TO PLACEMENT OF PEEL&STICK FLASHING
EXTERIOR
3⅛" [79mm]
6" [152mm]
1'-0¼" [311mm]
3⅛" [79mm]
QUAD-LOCK R-28 WALL

Detail of a roof (with vegetation)