MASTER-/DIPLOMARBEIT

Vojvodinisches Haus

Typologie und Möglichkeiten der horizontalen Verdichtung

Vojvodinian House

Typologie and possibilities of horizontal densifying

ausgeführt zum Zwecke der Erlangung
des akademischen Grades eines
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ABSTRAKT I DE

Die Masterarbeit befasst sich mit der Analyse unterschiedlicher Grundrisse ländlicher Architektur in der Vojvodina, Serbien im 19. Jahrhundert und den Umsetzungsmöglichkeiten in urbanen und suburbanen Räumen. Dieses Projekt zielt darauf ab, die Bedürfnisse und Funktionsweisen des Alltagslebens in einem ländlichen Haushalt aufzuzeigen und inwiefern eine solche Architektur zunehmend zu einem Bewohner passt, der in einem städtischen Umfeld lebt. In Anbetracht dessen, dass aktuelle Tendenzen in der Architektur zu mehr Privatsphäre „unter freiem Himmel" sowie zur Auflösung der Grenzen zwischen Arbeits-, Privat- und Erholungsraum tendieren; Ein solches Konzept führt uns zu der Frage, wie eine typische ländliche Einheit im städtischen Bereich umgesetzt werden kann. Ziel des Projekts ist es, die Individualität des privaten Freiraums zu bewahren und gleichzeitig den Stadtraum nach dem Landhausprinzip zu verdichten. Eine der Herausforderungen dieses Projekts ist die Verwendung traditioneller Bautechnologien, um eine nachhaltige und moderne Struktur zu erreichen.

ABSTRACT I EN

The master's thesis deals with the analysis of different layouts of rural architecture in Vojvodina, Serbia in the 19th century and the possibilities for implementation in urban and suburban areas. This project aims to show the needs and functioning of everyday life in a rural household and the way in which such architecture increasingly suits an inhabitant living in an urban environment. Considering that current tendencies in architecture tend to achieve more private space "under the open sky" as well as the dissolving of borders between work, private and recreational space; such a concept leads us to the question on how a typical rural unit can be implemented in urban area. The goal of the project is to preserve the individuality of private open space and at the same time condense urban space according to the principle of a country house. One of the challenges of this project is the use of traditional construction technologies to achieve a sustainable and modern structure.

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1.1_INTRODUCTION

The subject matter of the master's thesis centers around an analysis of different rural architecture layouts prevalent in Vojvodina, Serbia during the 19th century, with a focus on exploring the possibilities for their implementation in urban and suburban areas.

Given the current architectural trend towards achieving more private space *under the open sky*, along with the breaking down of barriers between work, private, and recreational spaces, this concept leads to a pertinent question: how can a typical rural unit be integrated into urban areas? One of the key challenges in this project lies in utilizing traditional construction technologies to achieve a sustainable and modern housing. Achieving this objective will require a balance between preserving the cultural heritage of rural architecture while simultaneously meeting the demands of contemporary living standards. The objective of the project is to maintain the individuality of private open space and in a same time condensing urban space according to the principles of a country house. The way of modern living does not change rapidly, but it is usually changed by circumstances that affect the essential order of daily life. The end of the medieval way of life was marked by the appearance of industrialization. The man starts working outside his private property. In this regard, there are rapid and inconceivable changes in the way of doing and organizing living space.

„Die industrielle Revolution, die Plötzlich Produktionssteigerung, die im 18.Jahrhundret durch die Einführung des Fabriksystems unter der Maschine ausgelöst wurde, ändere des gesamte Bild der Weltgrünlicher als die soziale Revolution in Frankreich. Ihre Auswirkung auf Denken und Gefühl war so groß, dass wir auch heute noch nicht zu ermessen vermögen, wie tief sie in das innerste der Menschen gedrungen ist, und was für Größe Veränderung sie dort hervorrief. Niemand konnte diesen Auswirkungen entgehen, denn die industrielle Revolution war nicht eine politische Umwälzung, die ihren Konsequenzen begrenzt ist. Vielmehr nahm sie Besitz von ganzen Menschen und seiner ganzen Welt. Auch enden politische Revolutionen nach einer gewissen Zeit in einem neuen sozialen Gleichgewicht; das Gleichgewicht hingegen, das dem menschlichen Leben mit der industriellen Revolution verlorenging, wurde bis heute nicht wie dargestellt. Die Zerstörung der inneren Ruhe und Sicherheit des Menschen bleibt die auffallendes Folge der industriellen Revolution. Das Individuum geht unter in dem Drang nach Produktion; es wird von ihm verzehrt."[1]

The impact of such changes goes far and they have an incalculable impact on a multitude of subtle facts on human habitus. Individuality in the way of living is becoming an increasingly insignificant category. If the product of this process is called the Global Village, then it seems that we are in the process of development in the middle of the port, leading to the very beginning of industrialization. The modern way of life is increasingly striving for automation and replacement of human levarage in all spheres of work where manufactured process are not necessary. From the moment of the appearance of computers and the beginning of its commercial use, modern man is increasingly turning to personal creativity and looking for creative jobs in general, which commonly do not require traditional knowledge and skills. In this regard, shifting in the field of education and skills are happening very fast. Such jobs are not defined by location, and generally can be done anywhere.

[1] Gideon S. „Raum, Zeit, Architektur" Teil 3, Page 128.

The definition of the craft needed for performing such tasks is also very fluid. Professional matter is also very difficult to define: it seems that boundaries of professional development moving to know how concept. The way of life is gaining more and more importance over the product, individual or collective. This process has a perpetual tone to return on its origin environment; public spaces are good example for that becoming rapidly spacious.

The question that this situation imposes leads architecture to the solutions of urban settlements that have already been presented and very gladly accepted by the inhabitants of urban areas, and refers to houses with gardens, detached or terraced houses. Already in the 1940s and a little later in the 1970s, with the introduction of prefabricated elements into mass production, new possibilities opened up for the horizontal densification of urban and suburban areas. Detached family house is without a doubt one of the most desirable forms of housing around the world, and one of the multiple motives is: owning personal property, clearly demarcated private space private space and a green area that has an important physio-psychological aspect of staying in a contact with soil.

As the city's soil increasingly suffered from the need for free spaces, the most efficient type of housing was in building growing in height, on the other hand, the needs of newly settled residents who insisted on acquiring personal property and individuality had to be supported. However, the more individual the form of housing, the more expensive the infrastructural, energy and communal connection with the city center, because the cities are still strictly centralized. The logical sequence led architecture to a concept that has the task of forming settlements or groups of detached family houses that will provide the most compact urban solutions with their spatial organization. Not far behind us, we were touched by the experience with the epidemic disease. More than ever, the urban population was looking for new methods to organize living space, especially the one intended for work. Physical contacts between people are temporarily, administrative shorted on close social circles. The so-called *New reality* or *New normal* also included new patterns of behavior and action. Home office has become part of everyday life. Working nomads centralized within a four walls striving for their own piece of sky is also New normal.

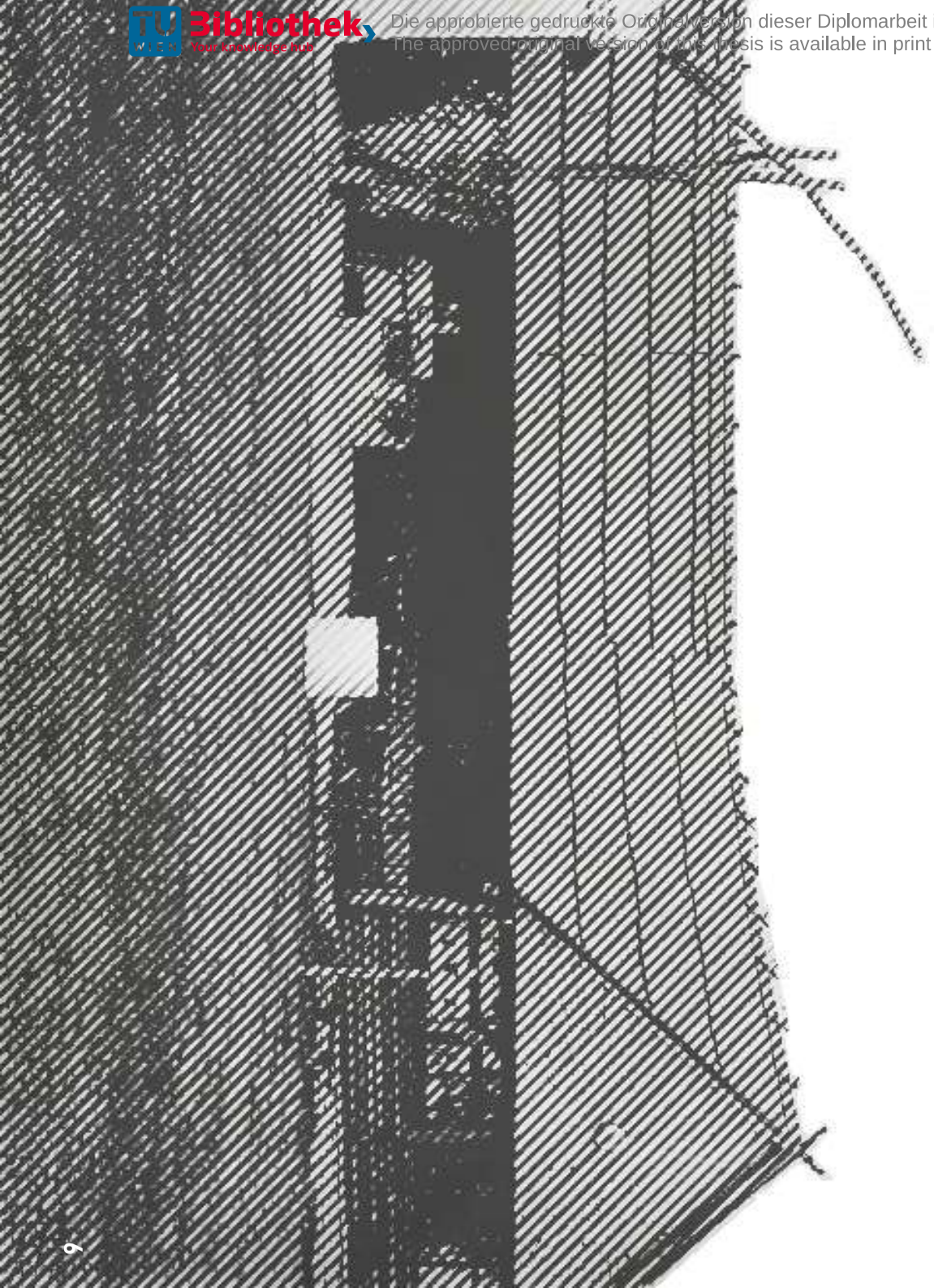
Another thing that has greatly gained in value is the independence of basic life resources; biological and energetic A human needs today, and undoubtedly a person living in an urban area, is in the hands of local or global producers. Food, electricity, water and everything elseproduced by man in the countryside until less than a century ago, implying ecological self-sustainability, is today produced by industry under a polluting and land exhausting circumstances. The energy crisis that hits, independently both urban and rural places and the high prices of energy hints extremely high price of agricultural products that will inevitably continue to be higher. Good example for impacts of centralized resource is war events in Ukraine threaten that the one entire region, will once again enter a state of war uncertainty, which will result in the creation of food reserves due to fears of a shortage of basic food products. It is noticeable, and rightly so, that citizens, taught by the experience of the recent past, are again emptying the shelves of markets, creating household supplies. A significant part of the population moved from the countryside to the cities, left the villages that has always been our feeder and turned to cheaper, lower quality food. The stated duality of the comparison between life and resources economy in the rural and urban places leads us to look for some variable solutions. Distinguishing this tendencies, it is concluding that the power of variability has become one of the imperatives. The temporal and locational determinants of a property have been drastically changed and simultaneously framed by the conditioning instantaneity.

Instantaneity is not necessarily a product of questionable quality; it also means experiential elaboration that is acquired through many years of practice This is supported by the technique of building a house from. the rammed earth. Centuries-old technique that needs to find a way to implement it into modern tendencies. Combining this sustainable building model with the idea of variability, it results something that can be „inserted" or „jumped in". These can be sub-urban or urban areas undergoing a conversation of use properties. Building with a low density concept with a potential to be built twice as much in the same framework in those areas remain self-sustainable and long-term variability in housing.

Macro variability implies the possibility of settlement growth or changing its location without endangering built-up soil. Micro variability refers to changes within settlements and private plots; the relationship between residential, agricultural and common land. Combining this sustainable building model with the idea of variability, it results something that can be „inserted" or „jumped in". These can be sub-urban or urban areas undergoing a conversation of use properties. Building with a low density concept with a potential to be built twice as much in the same framework in those areas remain self-sustainable and long-term variability in housing. Macro variability implies the possibility of settlement growth or changing its location without endangering built-up soil. Micro variability refers to changes within settlements and private plots; the relationship between residential, agricultural and common land.

The functional determinants of the settlement should ensure the self-sustainability of the proactive community. A proactive community is considered to be a working-age group of people that shares common material and spiritual interests, a common living and working space. Community are provided of self-sufficient food production and energy independence, a common work space in the immediate vicinity, a healthy open space for recreation and facilities for the care and education of children. Another good side of self-sus. aining settlements is that it potentially realizes the possibility of a partially administratively independent community, where the home city determines not far then location conditions and common laws and securities. This way working nomads could achieve a rural states of independency in an urban environment

Fig. 1.1.1 Farm household *Majkin salas*, "House on Elbow" or "Turned key House"



2.1_SITUATION ANALYSIS

Under the concept of a traditional single family house in Vojvodina a unique architectural phenomenon is accepted: it is the house that has been created and developed in the period from the end of eighteen, during the nineteenth and early twentieth century in the entire province of Vojvodina. Regarding the origin of the house, theoretical expert attitudes are not harmonized, but most of them believe that this is a unique combination of German and local architectural tradition.[2]

The national architecture of Serbia has a rich heritage of diverse styles and shapes, and the different civilizations that inhabited this area of the Balkan Peninsula bear witness to the robust form of habitats. A dynamic set of geomorphic, economic and cultural factors influenced the development of villages with a specific urban and architectural expression. Taking into account the first recorded data on residential architecture of the early Middle Ages, the division of the type of houses was made based on geomorphic properties. The geographical area of Vojvodina occupies the northern part of Serbian territory, from the Sava and Danube rivers in the south to the far northern border with Hungary. All over its territory, it is in the Panonian lowlands, rich in water surfaces, rivers and lakes. The coverage of the sum is extremely low while as much as 70% is cultivated soil, and the specific geological shapes are alluvial flats and sandstone. This uniform physical and geographical environment in its own way influenced constructive features of the house. However, the socio-political factor influenced the structure and composition of buildings, both residential and collective buildings, to a much greater extent. After the Romans, these areas (especially those south of the confluence of the Sava and the Danube) were colonized by the Ottoman Empire, during whose rule, especially in terms of economic and cultural prosperity, stagnation occurred, which also applies to residential architecture. The architecture of that time is clearly divided into rural and town houses, and they differ from each other in the number of private rooms and possibly some forms of balconies and terraces that are typical for town houses. The change from Turkish to Austrian rule greatly contributed to the development of villages in Vojvodina. Seeing its benefits in fertile soil, as well as a kind of protection from new invasions on theempire border, Austro-Hungarian Monarchy , works to improve the economy by largely immigrating Serbs from the south, Germans, Hungarians and Hebrew from the north. In addition to colonization, in 1977 a complete record of the land was conducted and parcelization was introduced, surveys were carried out and new rural units were determined, as well as water defense systems and irrigation canals. the end of the era of the rule of the Habsburg monarchy, for the duchy, the construction process began, which did not deviate much from the functional and communal regulations, but also gave importance to aesthetics.

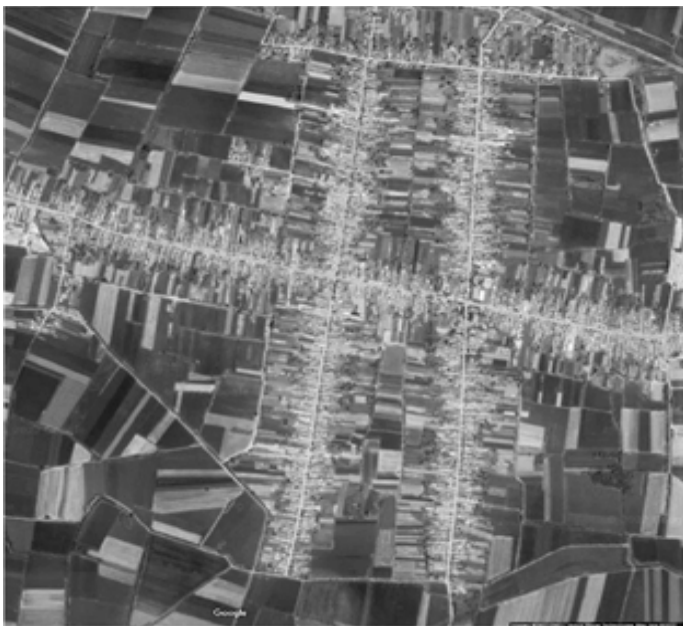


Fig.2.1.1 Satelit Foto on typical Vojvodinian Vilage
Vilage: Martinci, Serbia

[2] Janjetović Z. Neprolazna svakodnevica: Nemački doprinos narodnoj kulturi Vojvodine [The Timeless Every Day Life: The German Contribution to Popular Culture in Vojvodina], Tokovi istorije, Institut za noviju istoriju Srbije, (2008), Page 214-224

Fig.2.1.2 Satelit Foto on typical Vojvodinian Vilage
Vilage: Pivnice, Serbia

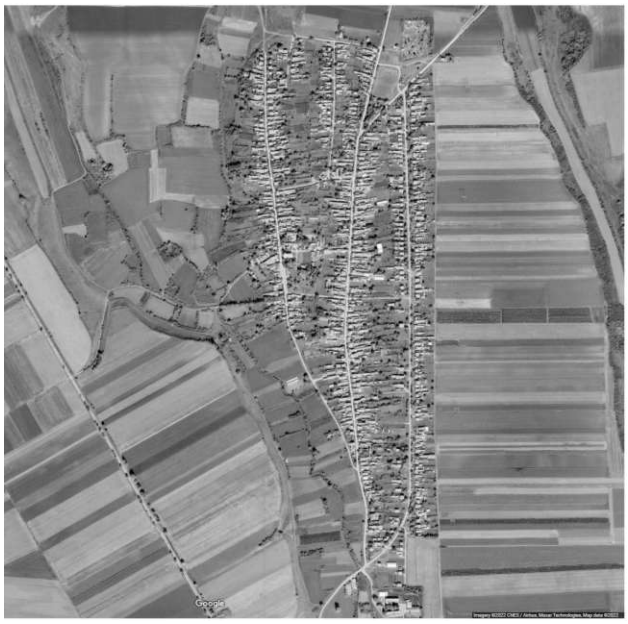


Fig.2.1.3 Satelit Foto on typical Vojvodinian Vilage
Vilage: Mandjelos, Serbia

With the process of increasing the number of houses in one settlement and their axial gathering around the main street for accessibility to trade, the plots are getting narrower, with their front joining the street. The shape of the plot also imposed the shape of a house that is typically elongated rectangular in shape. The house was built along the plot, a few steps higher than the front yard. The simple shape and design of the facility allows for its expansion or for increasing the square footage of its surfaces with an aim of getting larger production areas. Dimensions of houses from the analyzed typology range from 5-6 m x 12-18 m.[3]

Fig.2.2.1 Three-part house, also recognised as the house house with a porch positioned longitudinally along the plot. View from the street, Kovilj, Serbia

A typical Vojvodinian house is single-storey and very rarely has a basement (with the exception of houses that were in a vineyard area, so there was a specific need for them. The ceiling under the rooftop was an indispensable storage space for many vegetable-based products.) backyard, garden and orchard, between which there were clear physical boundaries in the form of wooden or earthen fences. Access to the house is possible only through the front yard, which is also physically separated from the street. The exception is the type of house that was accessed directly from the street to its gang or port, and then to the house. The porch that covered the entire length of the house was approached first. The porch led directly into the kitchen, and from there sideways into the front and back rooms. The room next to the street was mostly a guest room, and everyday life took place in the „back room". This spatial principle permeates every type of Vojvodina house. The centrality of space is almost non-existent in a morphological sense, rather, we talk about the linearity of space. In the example of the front yard, it is the central part of the open space, which is mostly equal in area to the back yard, except that their functionality is not the same because different activities are performed in them. The back yard serves the purpose of storage, accommodation of domestic animals, etc., while the front yard serves for rest and should be representative for the visitor. The relationship between the rooms is similar; the kitchen occupies the central space because it is accessed first, but the last room is the one where all activities take place, in this regard, it is expected that, as in modern practice, at least the living room is accessed first. The guest room is quite logically placed next to the street, while the back room is often accessed from the backyard. The hierarchy of activities is clearly shown through

[3] Stanisic J., Reba D.

Fig.2.2.2 Three-part house, porch and courtyard, Kovilj, Serbia

positioning both in the outdoor and interior space. Here we also have several types – houses that do not have a separate entrance, those that have a door as an entrance, and those that have a wide, covered entrance (called ajnfort in Vojvodina), and they are usually built by two brothers on their father's plot. They share one ajnfort as a common entrance, while the left part of the house belongs to one household, the right part to the other household, and the yard is mutual. The walls are made of mud mixed with reeds, and later of brick. The floor is made of packed earth that is paved with bricks, the ceiling is made of wooden construction - beams with earthen filling and reeds. The roof is also mostly made of reeds, while later it was combined with brick tiles.

In the Banat county, houses of this type are characterized by a flat facade, plastered with mud and painted in mostly in white, with an accented plinth in brown or black. The facade is characterized by two smaller windows, with no street entrance to the house. The entrance to the house is placed in the middle of the courtyard facade and it is at the level of the courtyard terrain. The roof planes are steep in order to facilitate the drainage of water from them, since before the tiles they were covered first with straw, then with reeds, and in some places with shingles.

In time, flat façades have started to disappear and now feature decorative plastic details. Also, instead of triangular gables there are specially built, decorative gables. Gable is an ordinary triangular wall with an attic behind it. The gables in Srem County are heavily influenced by the Nuremberg-style architecture, from where the colonists came to Srem. On the other hand, gables in Bačka and Banat counties are made from wood, namely from „vertically arranged planks, which are, in some cases, decorated with battens

and are a typical feature of the national architecture of certain ethnic communities, as well as geographically located settlements, especially those close to the Tisa River. The municipality of Novi Bečej has several such houses, as well as those with the so-called sun gable, since the sun was the most common decorative motif used on wooden gables.[4] The Slovaks are the ones that began putting up ceramic tiles on their facades or using facade bricks. The Germans and Hungarians used the secessionist motifs from 1900 to 1918.

2.3_TYPOLOGIE

Existing types of Vojvodinian house typology, based on the relationship between the house position and the plot are: Furrow house or House along the furrow , Long house, Front house, Elbow house and Turn-key house (following figure under paragraph Fig.4)[5]. The development of the three-part household is identified as the basic type in the rural architecture of Vojvodina; Three-part household is based on three functional units (Fig. 5.):

1. House with porch
2. Front yard
3. Garden

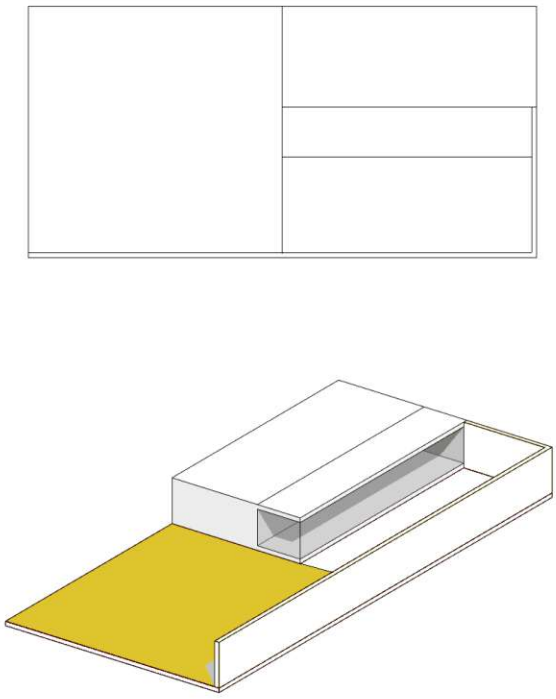


Fig. 2.3.1 Three-part house base Acsonometry

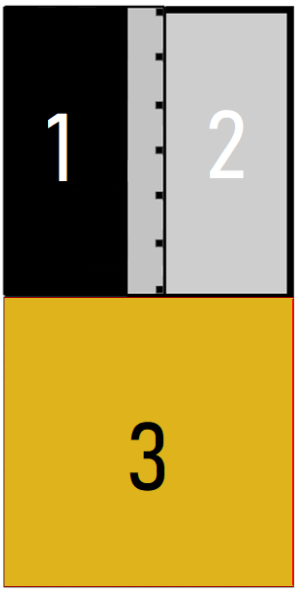


Fig. 2.3.2 Three-part house base

[4] B. Milic, Z. Slavic „Banat je kao priča“, Heritage Preservation Institute, Zrenjanin, 2011.

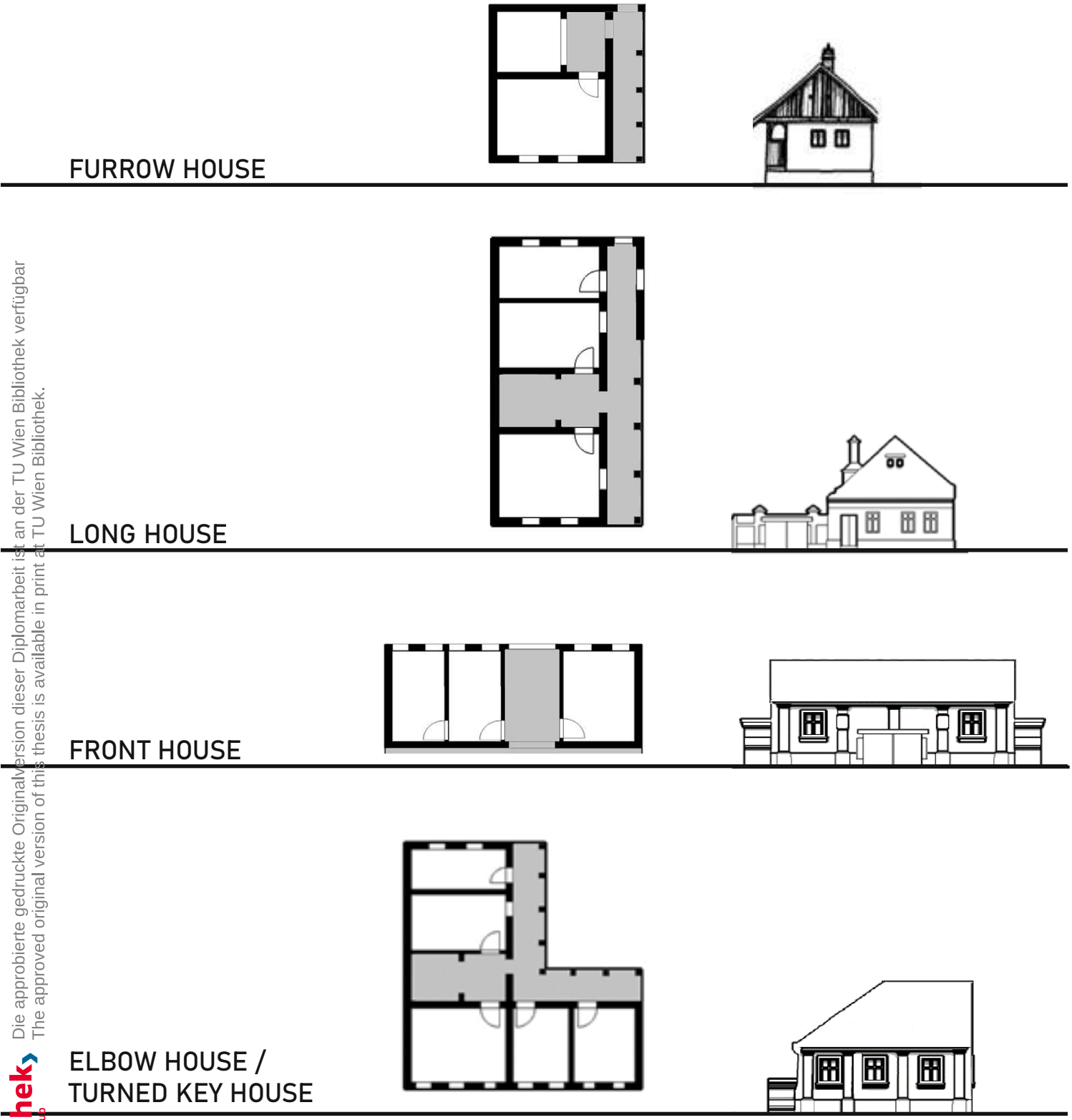


Fig. 2.3.3 Vojvoinian house typologie,
ground floors and Views

[5] The original name on serbian local dialect, following order in a text: Kuća na brazdu, Duzna kuća, Preka kuća, Kuća na lakat, Kuća na obrnuti kljuc, source of translated names: Stanisic J., Reba D., Implementation of energy efficient principles of tradicional vojvodina house on the contemporary facility of local monoculture farming system (pp.262,263)

WHY VOJVODINIAN HOUSE?

Why Vojvodina house as model of a self-sustaining cycle? The first reason is the way of living that comes from architecture and unbuilt space, which I can talk about from my own experience. It is about basic folk architecture, derived from the function and from the soil which it stands on. Thus, an aesthetic and material sources circle is clean closed. The land area occupied by one private plot is compact and economically used down to the last centimeter. There is no space that does not serve anything and its expansion occurs for immediate reasons, which is mostly an example of the expansion of the family. The ratio between built and unbuilt space is always in a functional relation, which also belongs to the primary parameters of this project.

The basic principles of the traditional Vojvodina house are:

1. rationality of function and technology (economy/availability)
2. functionality and flexibility of solutions
3. Simple feasibility, simplicity of technical solutions.

„Vojvodinian houses are made from same soil they stan on"[6]

this sentence is the building block of the concept of this research. The life cycle of soil as a construction material, from its extraction to recycling, is reduced to almost zero energy and raw material waste with minimal energy consumption. The aim of this thesis is the rehabilitation of a traditional architecture and presentation of the variable possibilities of its implementation on urban and sub-urban areas for the purpose of temporary densification. Positioning of the Vojvodinian house on the urban soil with the aim of preserving the sustainable benefits of detached house is an imperative. Current research of traditional architecture in Vojvodinian and other parts of Serbia, mostly related to the adaptation of houses for contemporary needs and / or its technical rehabilitation and possibly new construction in order to acquire constructional skills that prevailed in the era from which houses dated. In this regard, there was a tendency to contemplate about the Vojvodinian House from a broader perspective, and to perceive the opportunities it offers in urban planning. Architectural and construction practices gain experience through the needs of users.

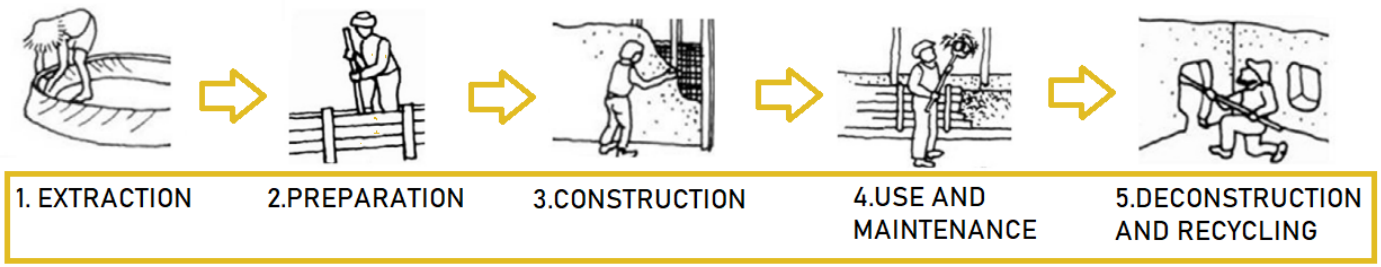


Fig. 3.1.1 Life circle of a rammed earthtechnic

[6] Vojvodinian Hauses: Art of Living, Milosevic Z., 2018
[7] As already stated in the title, the horizontal forms of densification in residential construction are based on the need for densification. The degree of compaction is defined by the number of floor areas and by the ratio of floor area to property area.

*floor area/plot area
The degree of densification mainly depends on urban planning and commercial interest and is divided into weak (GFZ 0.3-0.5), medium

Fig. 4.1.1 Plan shape skatch

One of the most powerful changes with an even stronger echo is the emergence of Modern architecture; that primordial need to illuminate the interior space and get rid of medieval dust on lampshades and facade decorations, resonates even further. All the principles of the former Modern are the main principles of contemporary construction praxis. Like any process, it requires the passage of time, although rectilinear, the results very often act as the effect of light passing through a prism.. What experience does not teach us, history can do? New strategies will be necessary to meet the complex requirements at the beginning of the 21st century. In the process, concepts such as natural or built landscape will have to be reinterpreted just as much as building or floor plan typologies. Due to new framework conditions and technologies moving on a fast-lane, planning processes will have to react advanceable, remaining variability. In his book Low Rise – High Density, Horizontale Verdichtungsformen im Wohnbau, Professor Helmut Schramm defined the concept of horizontal densification :

"As already stated in the title, the horizontal forms of densification in residential construction are based on the need for densification. The degree of compaction is defined by the number of floor areas and by the ratio of floor area to property area." [7]

Based on the types of densification defined by Professor Schramm, it was concluded that the implementation and densification based on Vojvodinian house belongs to the linearly structured construction (Reihenhaus). In addition to this type, Schramm also defines a detached Single-family house as a flat structure (Hofhaus), which is equivalent to the original form of the Vojvodinian house. The horizontal densification forms of residential building are not only defined by the building typology, but also by urban development concepts.

One of the crucial aspects to consider when commencing a project is gaining a comprehensive understanding of the traditional essence of the Vojvodinian house and the typologies showcased in the previous chapter. In particular, the linear position of the building with an accentuated porch serves as a fundamental point of reference. The source of inspiration extends beyond the formal and artistic properties of the house itself and is reflective of a thoughtful consideration of the urban solution.

Considering the critical importance of general rationality and economy, the appearance of the buildings will depend on a thorough analysis of applied resource-efficient principles from both traditional Vojvodinian house architecture and current building technologies. Furthermore, based on an existing typology of Vojvodinian houses, a detailed analysis will be carried out in the plan. Upon examining the existing typologies, it has been deduced that the architecture of the „Long House" holds the potential to deliver the most compact results in forming nucleated settlements adaptable to the urban environment. The progress of the project is multidimensional, with the forming of the settlement working on systemic patterns at both the physical and temporal levels. The primal plan shape of the settlement has been designed to initiate the final plan shape, which implies

(GFZ 0.5-1.0) and strong densification (GFZ > 1.0), The weak densification is intended to be a response to urban sprawl in rural and small-town areas, while the strong densification is intended to represent a counterpoint to urban development models such as perimeter enclosed block building development and linear building development.

the fully implemented planned densifying of the settlement through an expansion of usable built-up space. Densification, which is directed towards the micro level, has a direct impact on the settlement. The project is being developed through two levels of planning: the first level pertains to the design of the house and belongs to the micro level, while the second level is concerned with the design of the settlement shape and belongs to the macro level. From the micro to the macro level, the project is being developed using the method of fractal multiplication, with architectural patterns that apply at the micro level also being applicable at the macro level. Given that the principle on which the settlement is formed is based on the concept that applies to a single house unit, the same concept is extended to the entire settlement

Fig. 4.2.1 Base funktion - Micro level

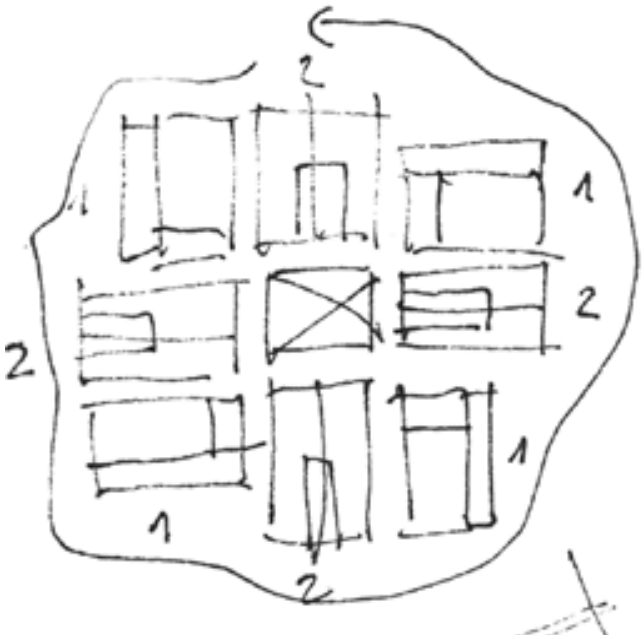
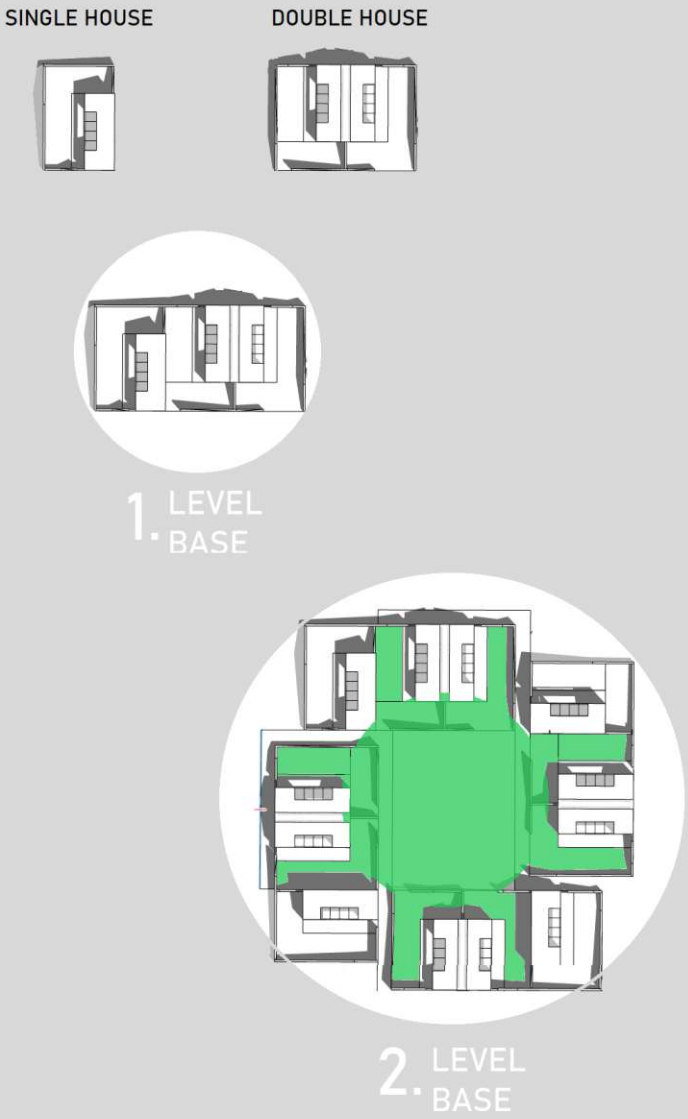


Fig. 4.2.2 Plan shape skatch



4.2_PLAN SHAPE AND FORM

In the formation of the plan shape, the house belongs to the base unit. In order to achieve better settlement density from the very beginning, a double house is formed. One double house and one detached house make up the first level base (3 residential units). Another step is to create a settlement plan shape by multiplication of first level base. Creating a settlement form is carried out by circular axial multiplication. Second level base contains four central oriented first level base (3x4= 12 residental units). Second level base is closed formation, central oriented on a recreation area, green space – common garden. The initial joint activity at this level is recreation. The last level in the formation of settlements arising from the same system. Second level base is axial multiplied in semi-closed plan shape. It contains four or more second level bases (4x12= 48 reseidental units). This formation is final settlement in project referred as a macro level. In the center of the settlement there are objects intended for work, shared or individual. The initial mutual activity at this level is work. The macro level is a settlement compact formatted. Settlement can also be a scattered, depending on the terrain where it is being built. The referent model in this work will be compacted, nucleated settlement as an initial result of fractal multiplication.

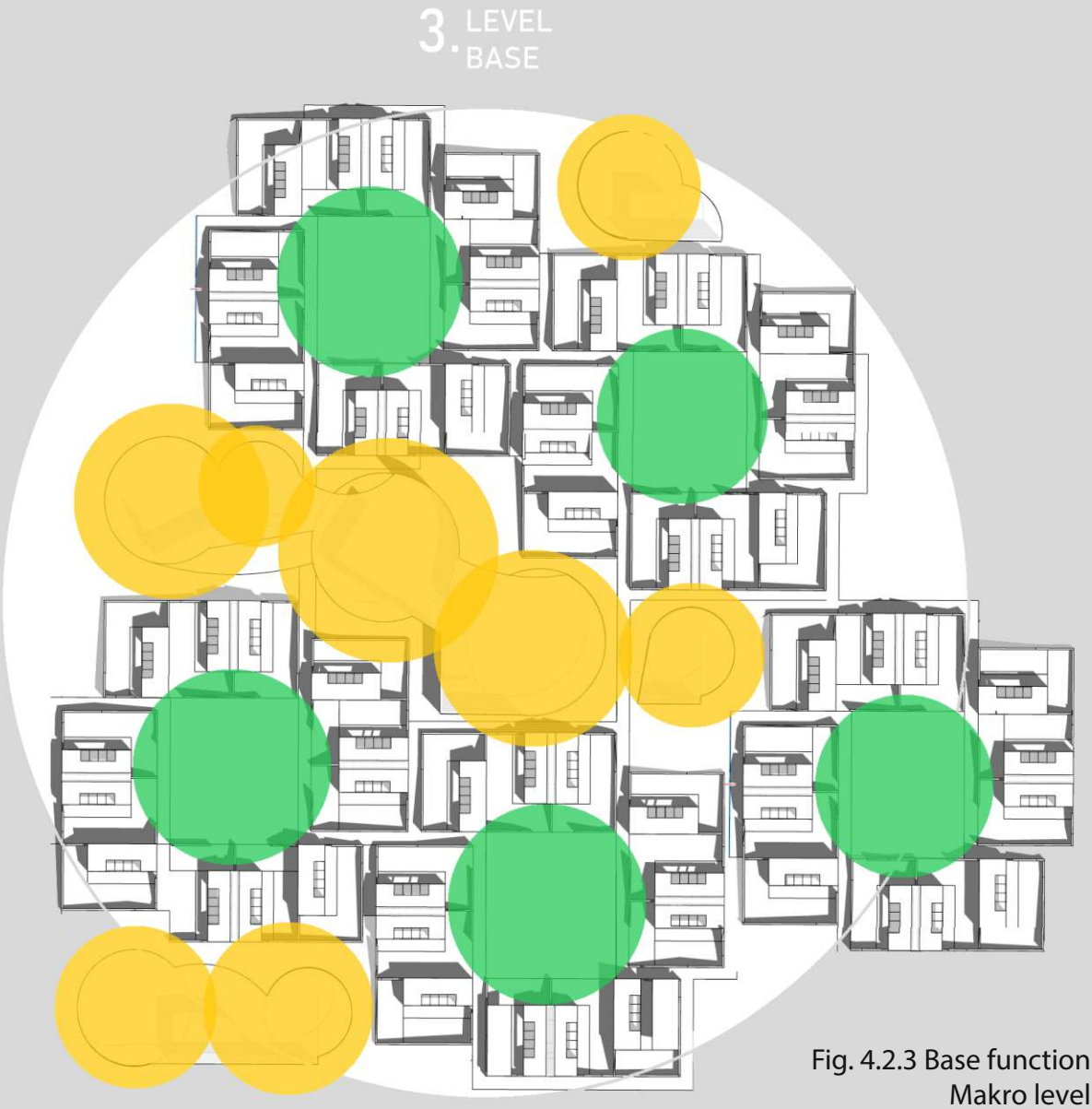


Fig. 4.2.3 Base function
Makro level

4.3_INTERPRETATION_MACRO

The spatial organization of settlements relies on functional determinants. However, beyond mere functional concerns, the spatial organization of settlements must also take into account the social aspect of community living. In this regard, the second level of organization is centrally oriented around recreational activities, which serve to bring people together and promote a sense of community. In order to preserve privacy, the private space within the settlement is clearly defined by fencing. This allows for joint performance of activities without disturbing private activities, while at the same time enabling residents to choose their own level of privacy among neighbors. The base of the second level is centrally closed, which promotes close neighborly relations and fosters a sense of community within the settlement. The same principle applies to the base of the third level, which is oriented around job functions that bring together the bases of the second level.

The central zone of the settlement serves as a hub for activities related to the connection and functional interaction of the settlement with the surrounding urban structures. The central zone that serve the residents of the settlement, as well as those who visit for economic and recreational purposes. The facilities intended for the use of residents are typically in the function of education and work. Educational and creative facilities provide space for pre-school children, including living rooms for education, workshops, and outdoor areas. Workspaces can provide individual or communal spaces of various forms, such as offices or workshops.

The facilities that provide space for interaction between the inhabitants of the settlement and the surrounding population refer to business premises, including local manufactures, gastronomy, workshops, accommodation for potential guests, and entertainment facilities such as restaurants, libraries, and self-service hobby workshops. Movement through the settlement is also defined by the physical organization of the space itself. The base of the second level is exclusively a pedestrian zone and is inadequate for motorized traffic. It supports sidewalks up to 3 meters wide and green areas, which promote a sense of community and encourage residents to interact with one another. Roads intended for motor traffic, which are necessary for the economic needs of the settlement, move along the central zone. Finally, parking spaces for the vehicles of settlement users and visitors are located on the outskirts of the settlement.

Comunity Design:

The concept emphasizes the importance of communal spaces and a sense of shared identity within the settlement. By incorporating common gathering areas, public squares, and community facilities, it encourages social interactions and the formation of stronger community bonds. These shared spaces can serve as meeting points, promoting socialization and collaboration

Shared Facilities and Amenities:

The concept incorporates shared facilities, such as community gardens, co-working spaces, and recreational areas. These shared resources provide collaborative activities, exchange knowledge and skills, and foster social connections. Shared spaces also encourage intergenerational interactions and promote a sense of community ownership.

Pedestrian Friendly Environment:

The concept promotes walkability and pedestrian-friendly design principles. By prioritizing human-scale infrastructure, such as narrower streets, pedestrian pathways, and bike lanes, it creates opportunities for casual interactions between residents. Increased pedestrian activity encourages neighborly interactions, and enhances social cohesion.

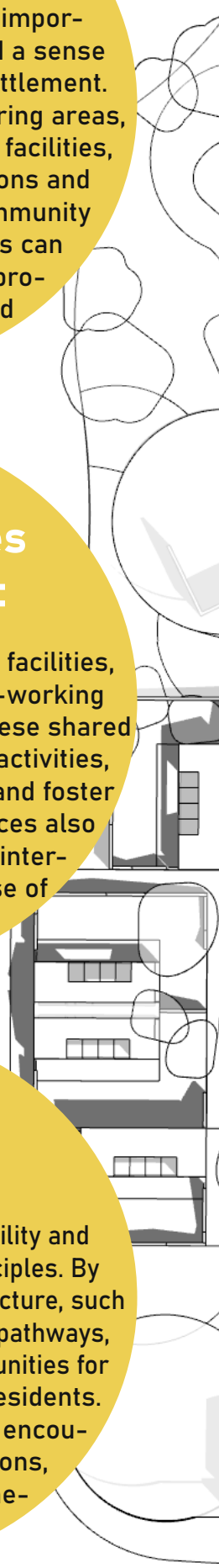


Fig. 4.3.1 Makro level pattern of community development

Mixed-Use Development:

The integration of residential, commercial, and recreational spaces within the settlement promotes mixed-use development. This approach creates a vibrant environment where people live, work, and play in close proximity. By reducing the separation of land uses, it enhances opportunities for social interaction and supports local businesses.

Environmental Consciousness:

The concept's emphasis on sustainability and connection with nature can foster a collective environmental consciousness among residents. Community initiatives such as urban farming, composting, and recycling can further strengthen social ties and promote a sense of collective responsibility.

Recreational zones of 2nd base level

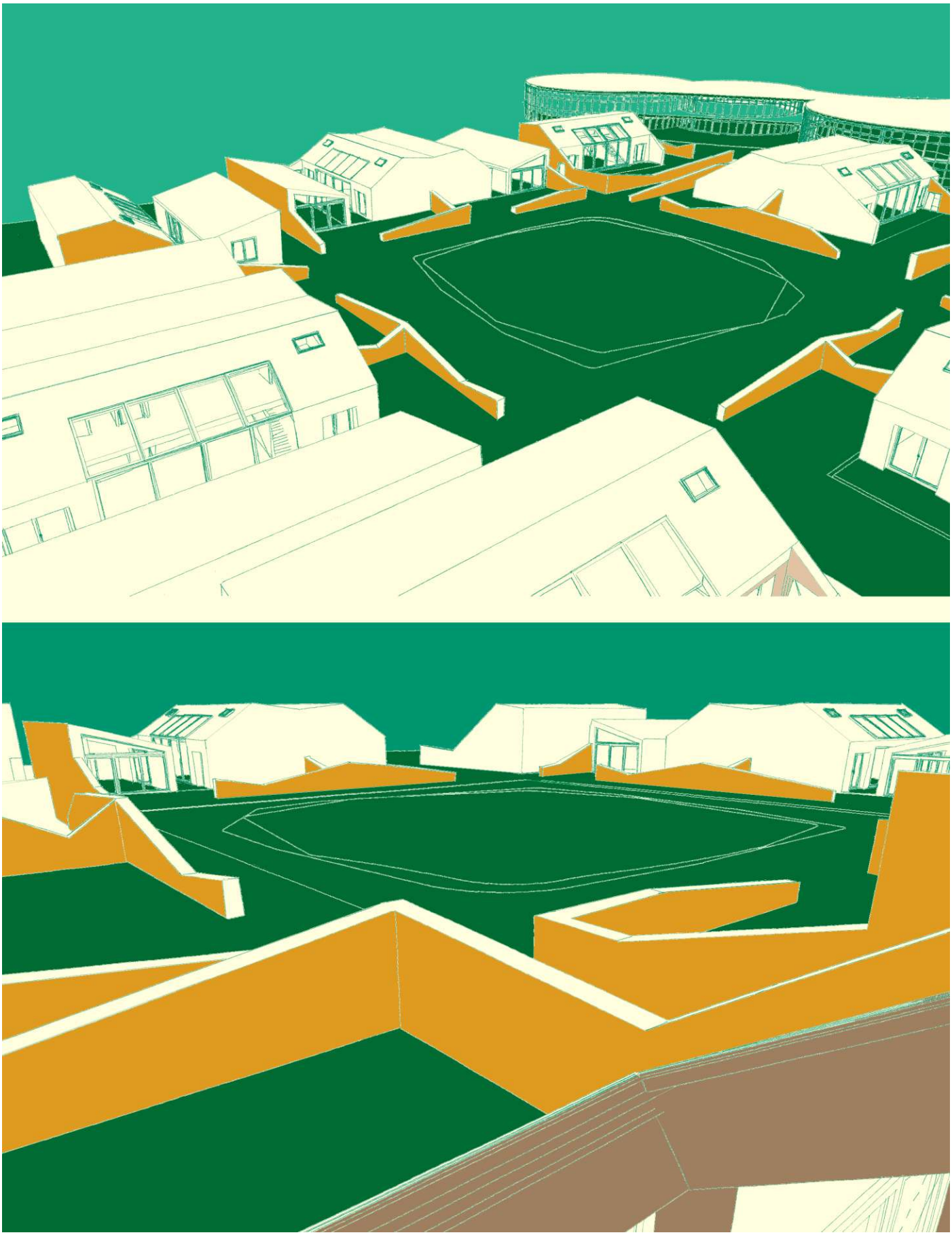


Fig. 4.3.2 Bird perspective view on seattlement
- Second level base

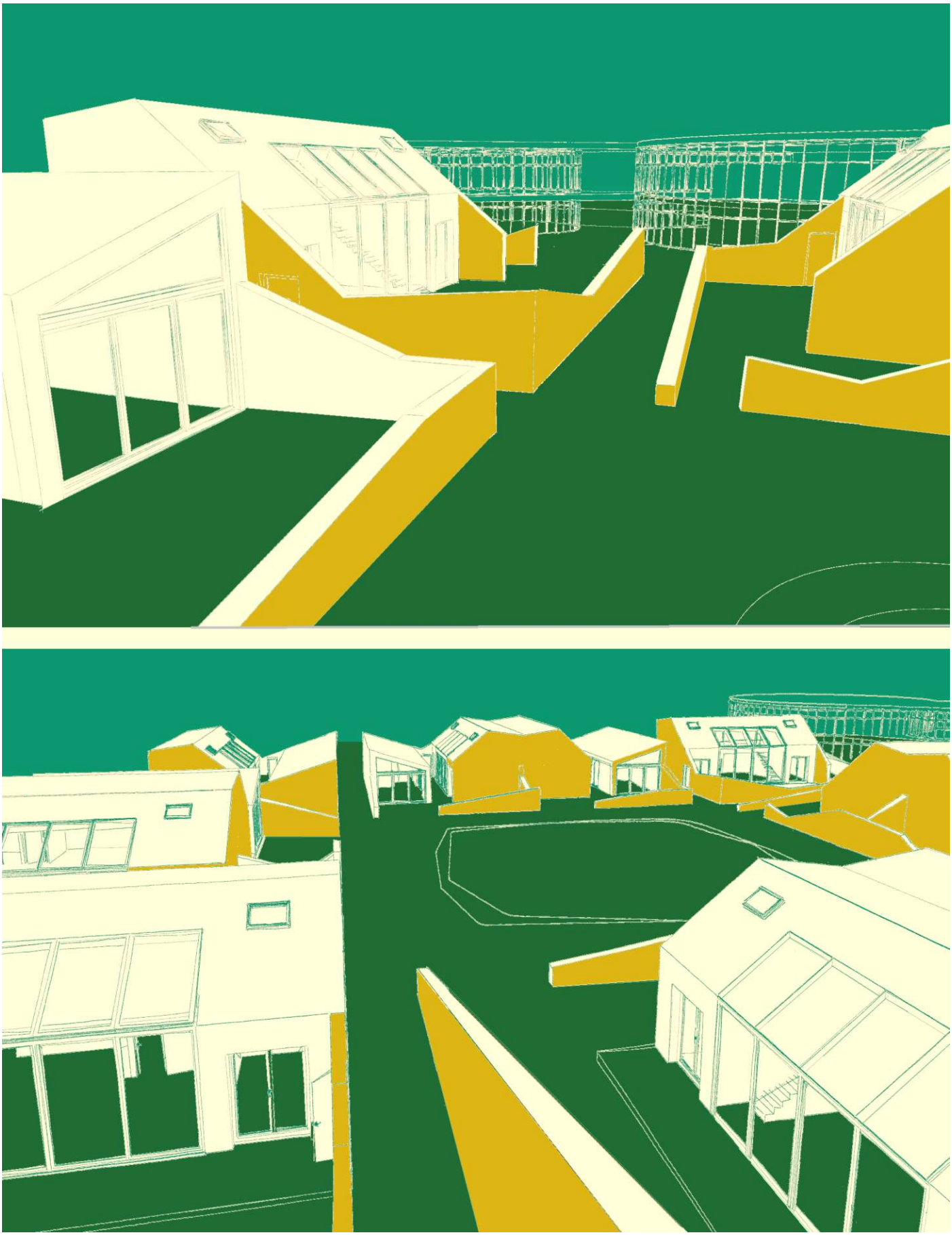


Fig. 4.3.3 Bird perspective view on settlement
- Second level base

4.4_CONECTION AND PROGRAM

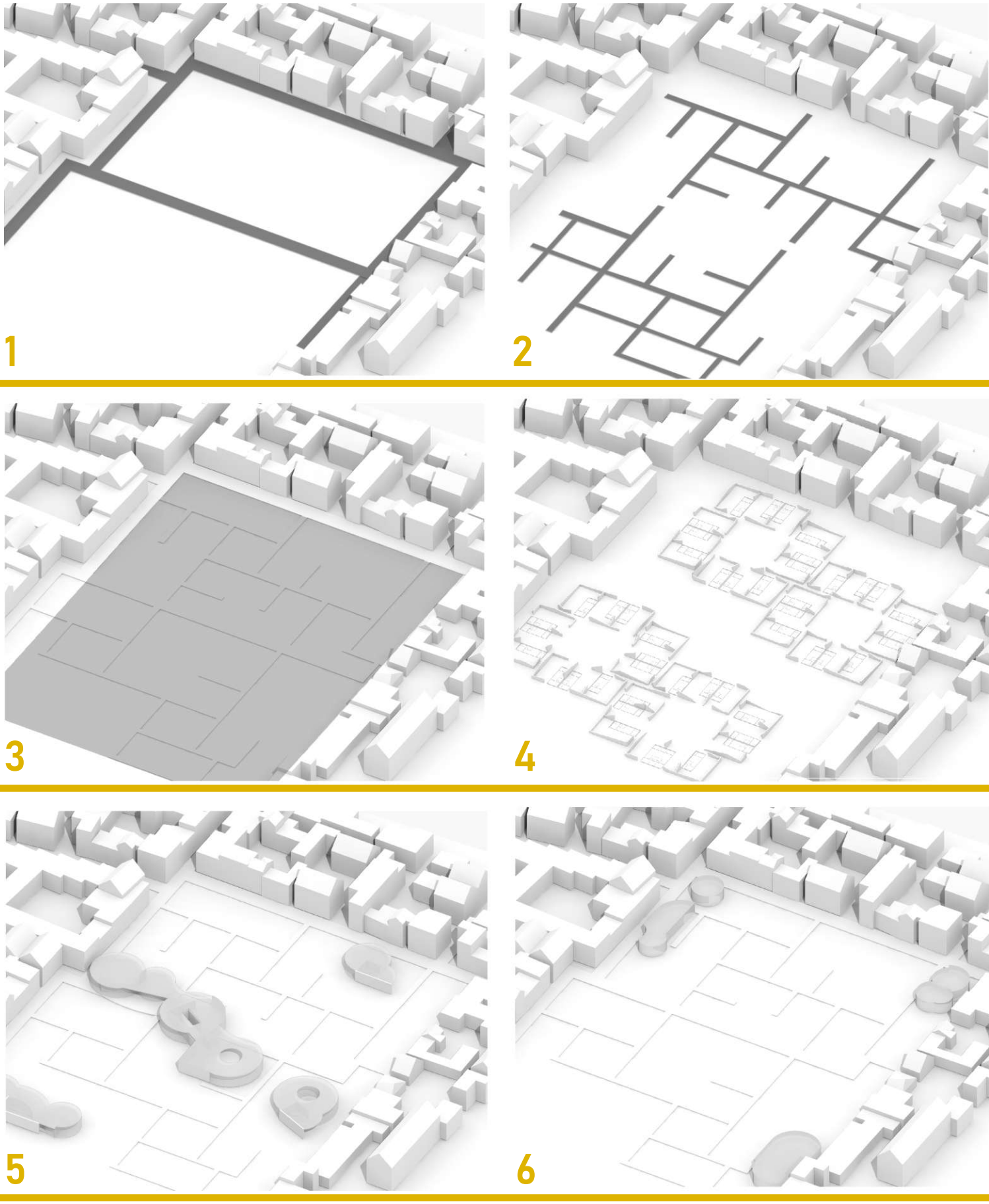


Fig. 4.4.1 Program and functions of seattlement

1. MAIN TRANSPORT STREETS

Suitable for city traffic; It serves the purpose of transporting food to the settlement, technical communal functions and city transport.

2. PEDESTRIAN STREETS

Inside of seattlement, up to 3m wide, suitable for pedestian and becycle lanes.

3. PEDESTRIAN ZONE

Up to 45% frei area of shared facilities, such as community gardens, co-working spaces, and recreational areas

4. PRIVAT SLOT/HOUSES

30-60% building area of living space. Current design includes 48 House

5. SHARED FACILITYES / COMMUNITY OBJECTS:

Comunity objects occupy the central zone of the settlement and all the activities of the residents of the settlement are oriented towards them.

6. SHARED FACILITYES / COMMUNITY OBJECTS - possible extension

Zones on edeges of seattlement planes for building new shared facilityes and objects depends on which activity will expanding and need more space.

Fig. 4.4.2 Functions of community building

WORKING SPACE - SHARED FACILITYES
Workshops, hobby workshops, offices, conference rooms, mediatheks

LOCAL BUSSINES SPACE
small market of local gods, hobby shops, vegetable market

HOSTING OBJECTS
Hostel/Hotel, Gallery, Theater

EDUCATION OBJECTS
Kindergarten and crèche

EDUCATION OBJECTS
Primary Scool, bilbiothek, gallery, kids workshops, indoor sports

WORKING SPACE - SHARED FACILITYES
Workshops, hobby workshops, offices, conference rooms, mediatheks

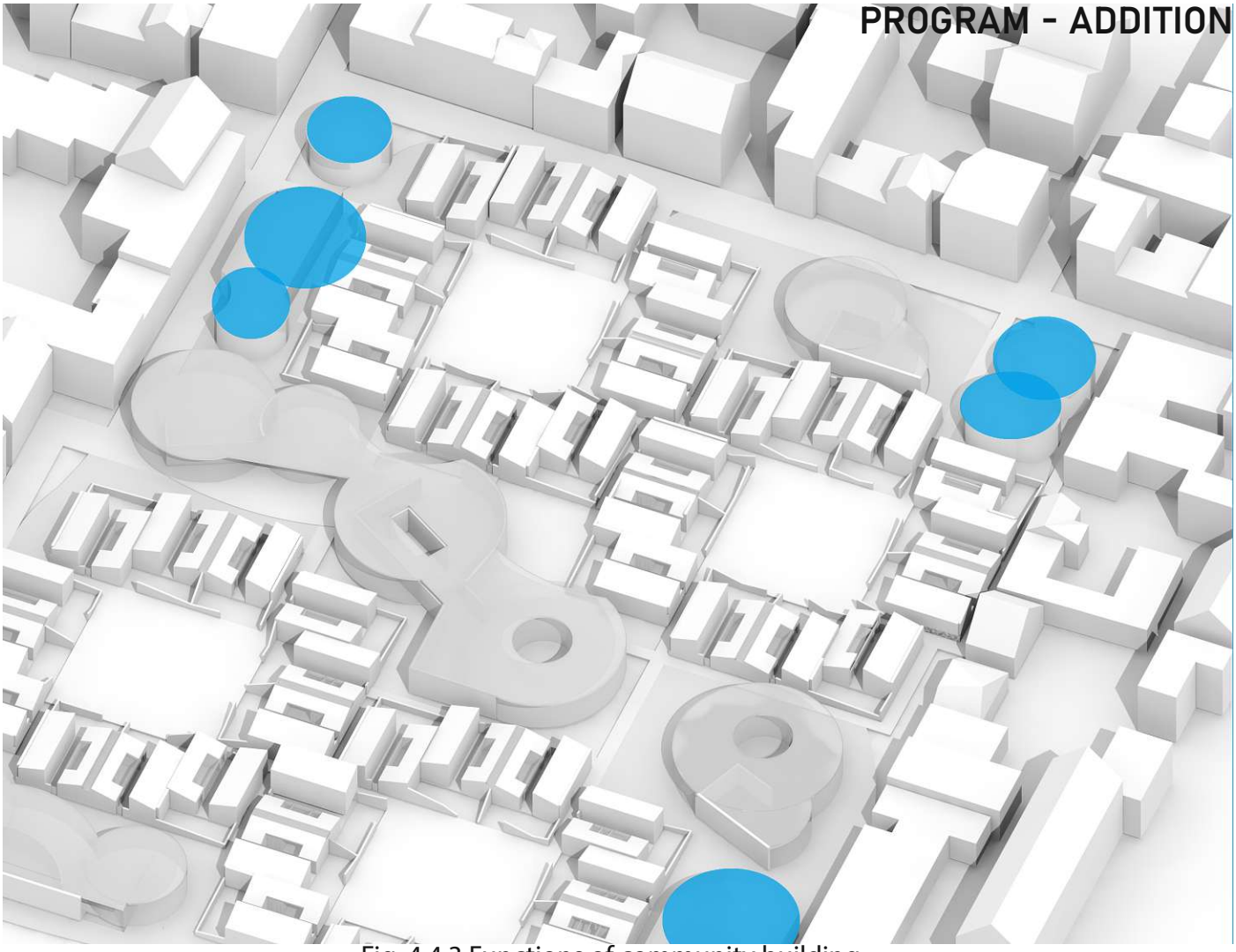


Fig. 4.4.3 Functions of community building -
possailities for additional building

4.5_SELF-SUSTAINABILITY AND VARIABILITY

One of the fundamental principles of this project is sustainable architecture, which involves the use of building materials efficiently and selecting renewable energy sources. The selection of construction materials was based on their ecological properties and their technological applicability in modern construction.

It is also essential to choose materials that support settlement variability. The quality of settlement variability is reflected in the footprint left during construction, demolition, or relocation. This principle is equally important in expanding living spaces on a micro-level. Considering that the settlement is planned to maintain its original residential qualities after densification, the use of building materials with a low footprint is a quality parameter. As land occupancy increases, the footprint factor also increases, making it crucial to avoid drastically increasing the value of the footprint during settlement densification. Natural materials with good mechanical and physical characteristics can help achieve this result. In fact, *„Vojvodinian houses are made from the same soil they stand on."* Using earth as a construction material reduces the life cycle from extraction to recycling to almost zero energy and raw material waste, with minimal energy consumption.

Both bearing walls and partition walls can be entirely built of rammed earth, which is the heaviest clay building material. Rammed earth is used today in both renovation and new construction for load-bearing walls.[8] The earth-moist, spread-out clay is placed in layers in a suitable slip form and mechanically compacted. The embedded rammed earth can usually be dismantled immediately. Colored clay components can be added to the rammed clay mixture during the compaction process to create an aesthetically pleasing structure, eliminating the need for any other surface treatment.

Construction with this technique also favors the microclimate of the settlement. Rammed earth walls have good temperature exchange performance, absorb and store heat from the sun, and reduce heat radiation in the outside space. This kind of heat exchange is favorable for climate regulation in both winter and summer. Similarly, earthen walls have a positive effect on the balance of air comfort in interior and exterior spaces since the earth is a good absorber of vibrations and sound, providing protection from noise from the surrounding urban environment, especially traffic. The project also envisions the use and production of energy from renewable sources, particularly the accumulation of electricity through solar panels. The ground floor features a technical room that would serve as an energy management system. The plan is to place 26 m² of solar panels on the roof of each house, producing 3-5 kW of electricity, which would cover the average household consumption of electricity.[9]

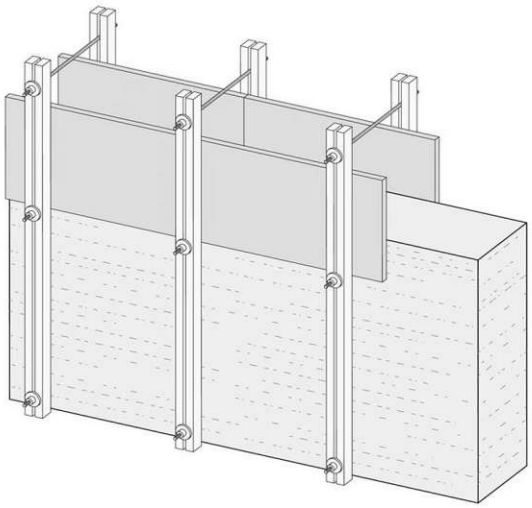


Fig. 4.5.1 Rammed earth makeing technic

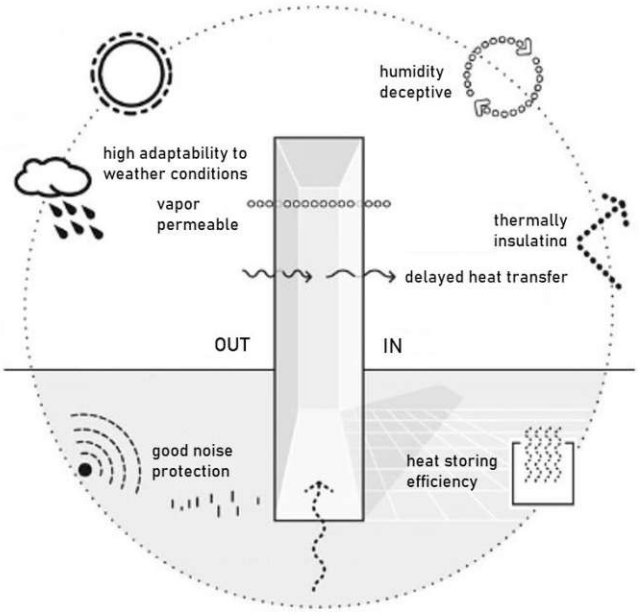


Fig. 4.5.2 Rammed earth physical characterictic

[8] Rammed earth is finely crumbly and earth-moist processed building material which, after compaction and drying out, achieves bulk densities of between 1700 and 2200 kg/m³.

[9] With 1 kW, about 1,000 kWh of electricity can be generated annually (with a roof area of about 7 – 9 m²). https://www.infina.at/ratgeber/photovoltaik-kosten-foerderung/

4.6_MICROCLIME

Adequate arrangement of vegetation on plots contribute to the regulation of local climate conditions. Vegetation absorption of sunlight lowers the ambient temperature and reflection in the summer time. This is ensured by intending half of the total area of the plot for planting food plants. Optimum heating of the soil is maintained even in the situation of building extensions. The mutual distance of the buildings also ensures good ventilation of the settlement, while the ground-level architecture ensures good protection from the wind by the fact that the deciduous trees will always exceed higher of the house. The existing concept of organization with placing building along the depth of the plot and gable facade, on the street regulation line very suitable for the use of renewable source of solar energy. This ensures uninterrupted sunshine on the south side of the plot and better use of solar gains.

Land Use Planning:

By adopting the principles of horizontal densification and efficient spatial organization, the concept encourages the optimal use of available land within urban and suburban areas. This approach minimizes the need for urban sprawl and helps preserve valuable agricultural land on the outskirts of the city. Preserving agricultural land reduces soil degradation, maintains biodiversity, and supports local food production.

Green Spaces and Open Areas:

The proposed architectural concept emphasizes the importance of private open spaces and communal green areas within the settlement. These spaces can incorporate landscaping features such as gardens, parks, and green roofs, which promote soil health and preservation. These green spaces contribute to urban greening efforts, facilitate rainwater absorption, and help mitigate the heat island effect in urban environments.

4.7_CITY SOIL PRESERVATION

The concept of integrating rural architecture layouts into urban and suburban areas can be connected with preserving city soil through several key considerations:

Sustainable Construction Practices:

The concept's integration of rammed earth construction techniques aligns with sustainable building practices. Rammed earth walls are made from locally sourced materials and have minimal environmental impact. By utilizing such materials, the concept minimizes soil extraction and disruption, preserving the natural composition and fertility of the land.

Education and Awareness:

The integration of rural architecture layouts into urban and suburban areas provides an opportunity to raise awareness about the importance of preserving city soil. By showcasing sustainable construction techniques, green spaces, and the benefits of soil conservation, the concept can educate residents, architects, and urban planners about the value of soil and encourage practices that promote its long-term health.

4.8. INTERPRETATION_MACRO PLAN SHAPE
Base

Fig. 4.8.1 Site plan of settlement - base shape

SECOND LEVEL BASE
Ground floor 1:500

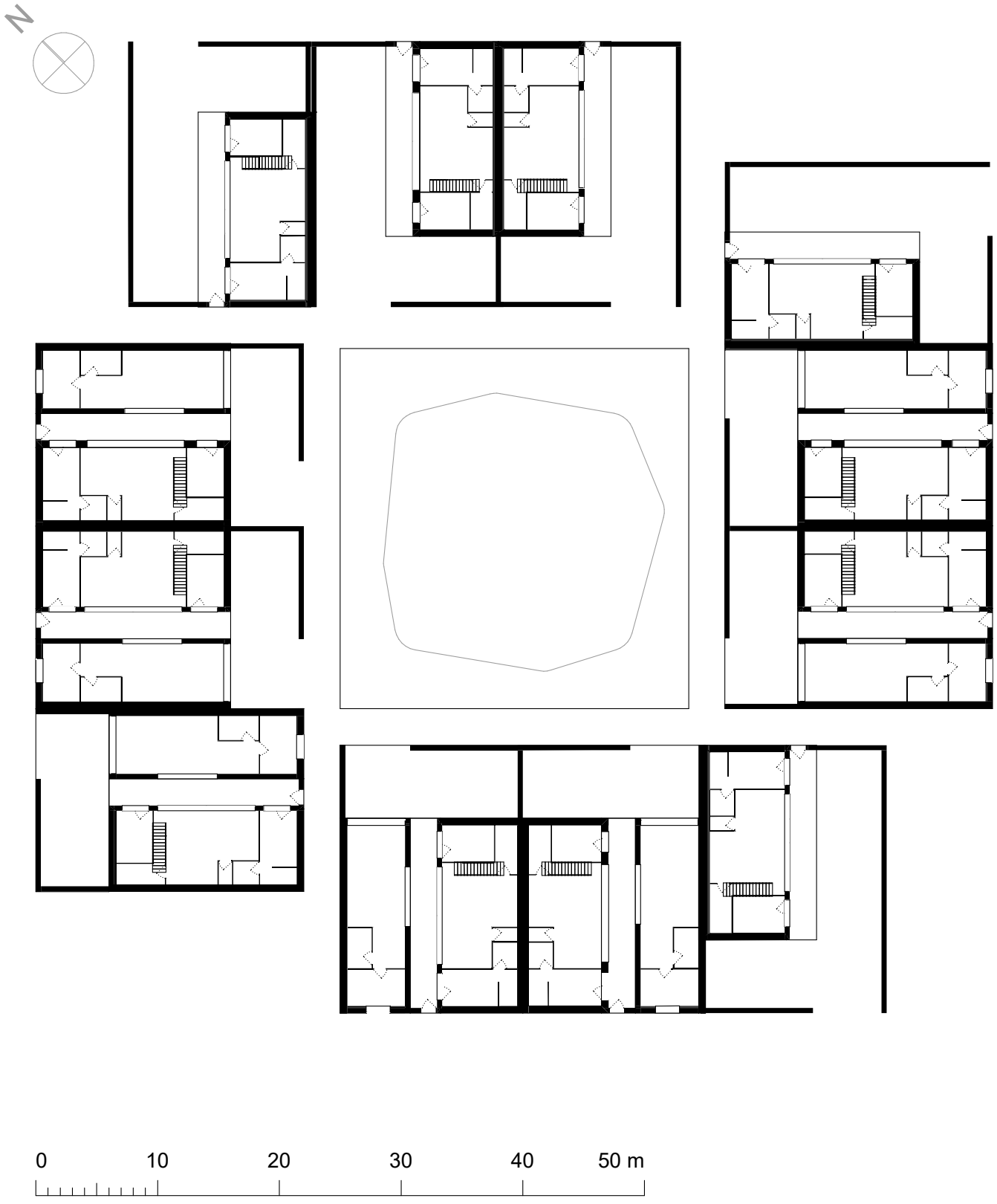
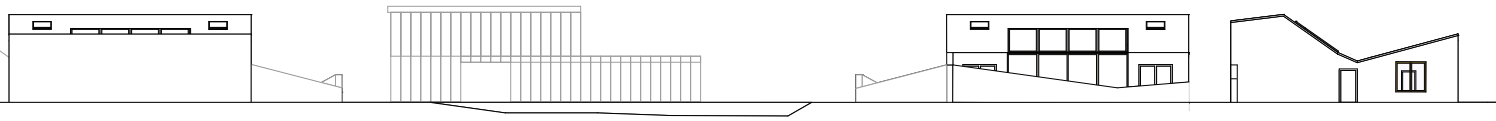


Fig. 4.8.2 Ground floor - base shape

SECOND LEVEL BASE
Attic 1:500

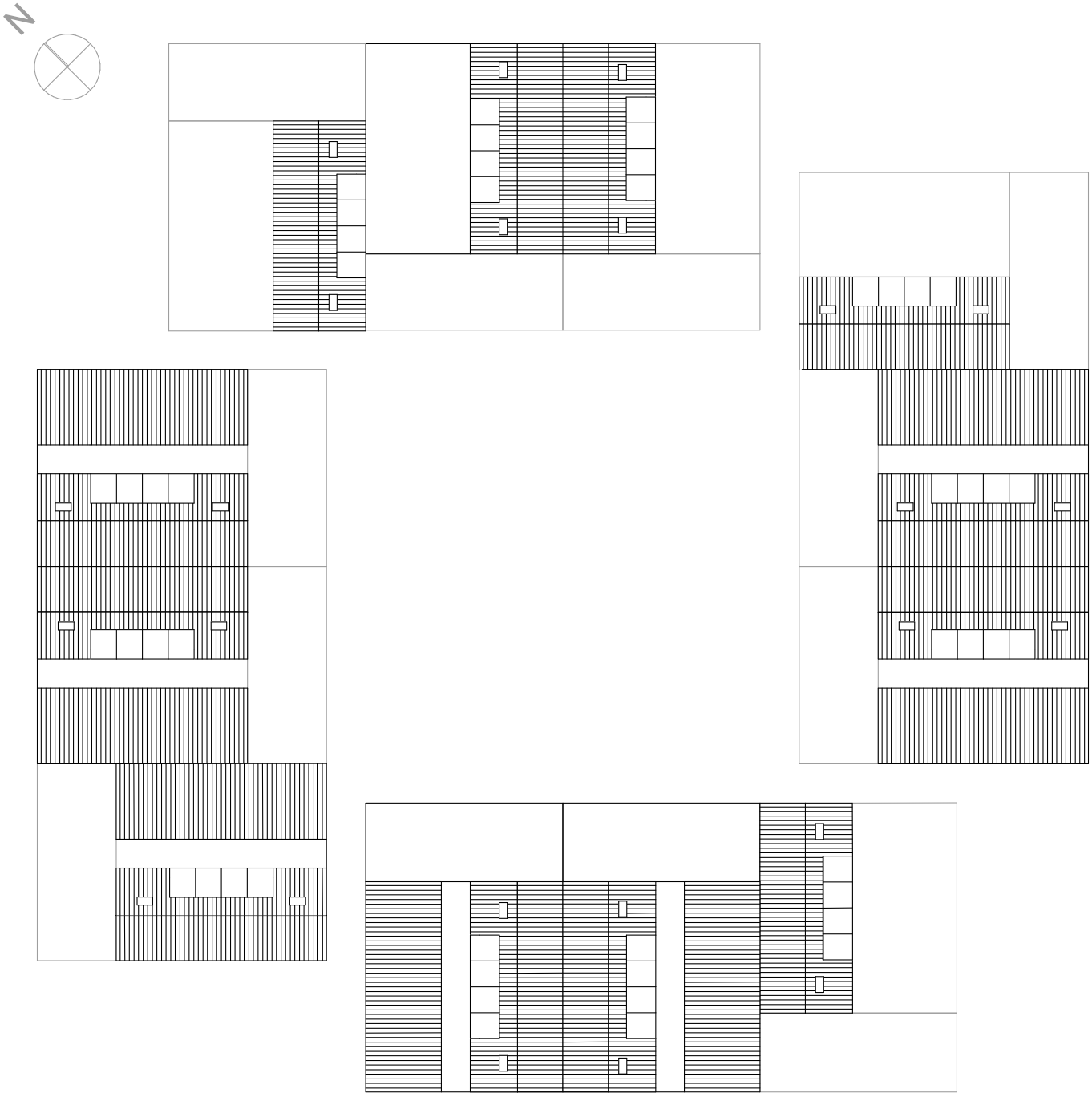
Fig. 4.8.3 Attic - base shape



Section thru Seattlement1:500

SECOND LEVEL BASE
Roof-top 1:500

Fig. 4.8.4 Roofs top- base shape



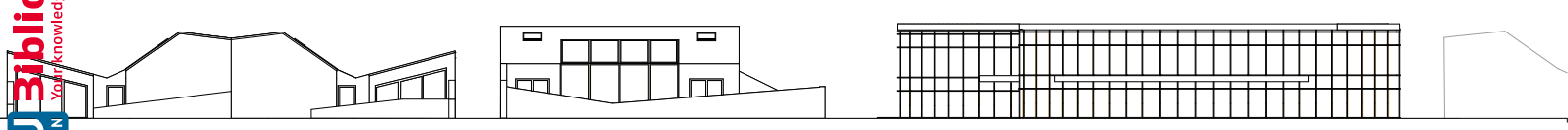
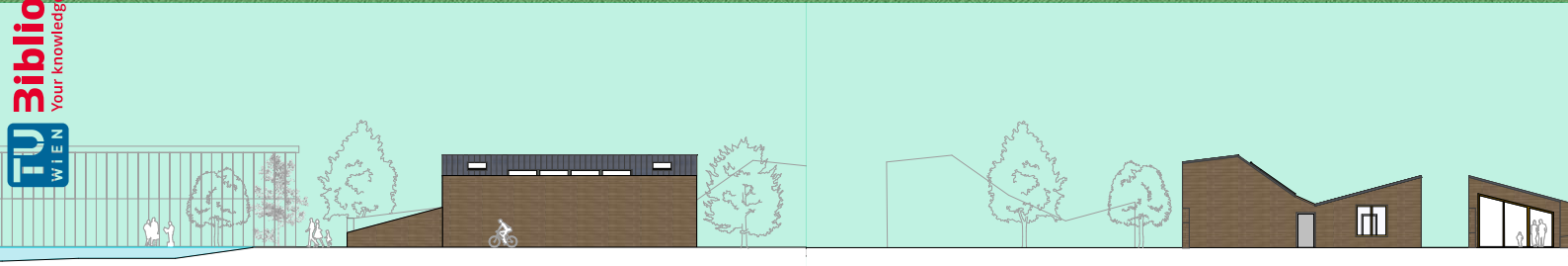


Fig. 4.8.5 Long Section

Fig. 4.8.6 Site plan of settlement - densyfied



INTERPRETATION_MACRO
Densyfied

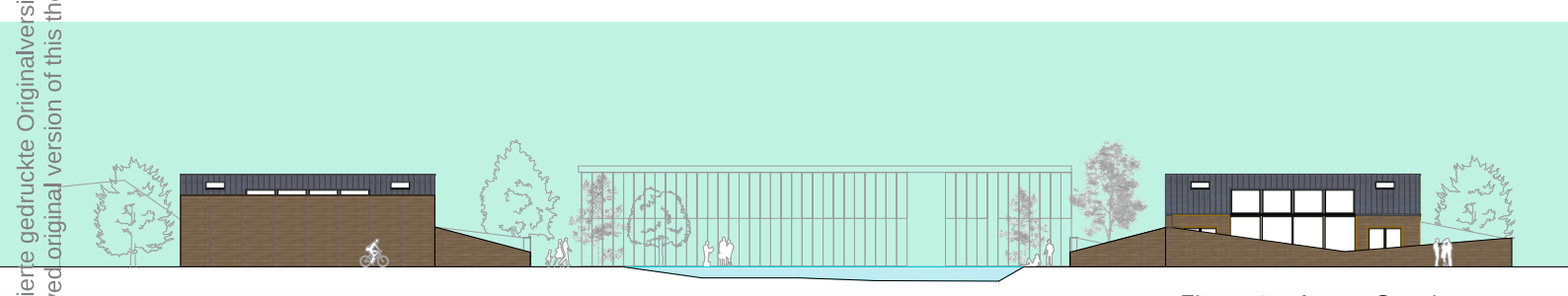


Fig. 4.8.7 Long Section

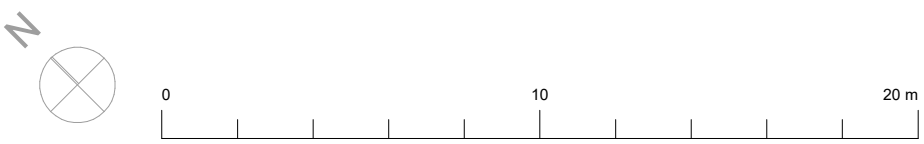
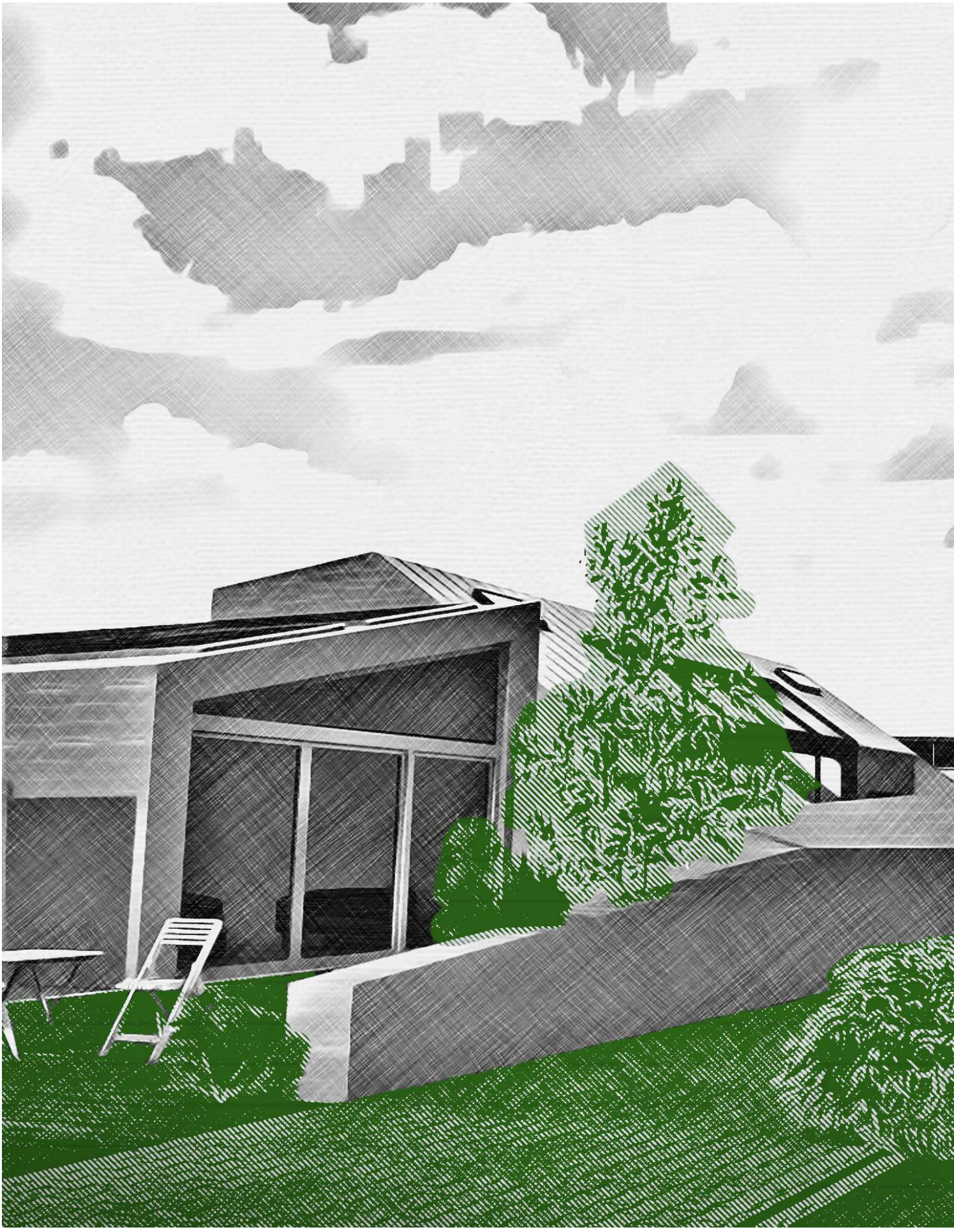


Fig. 4.8.8 Long Section

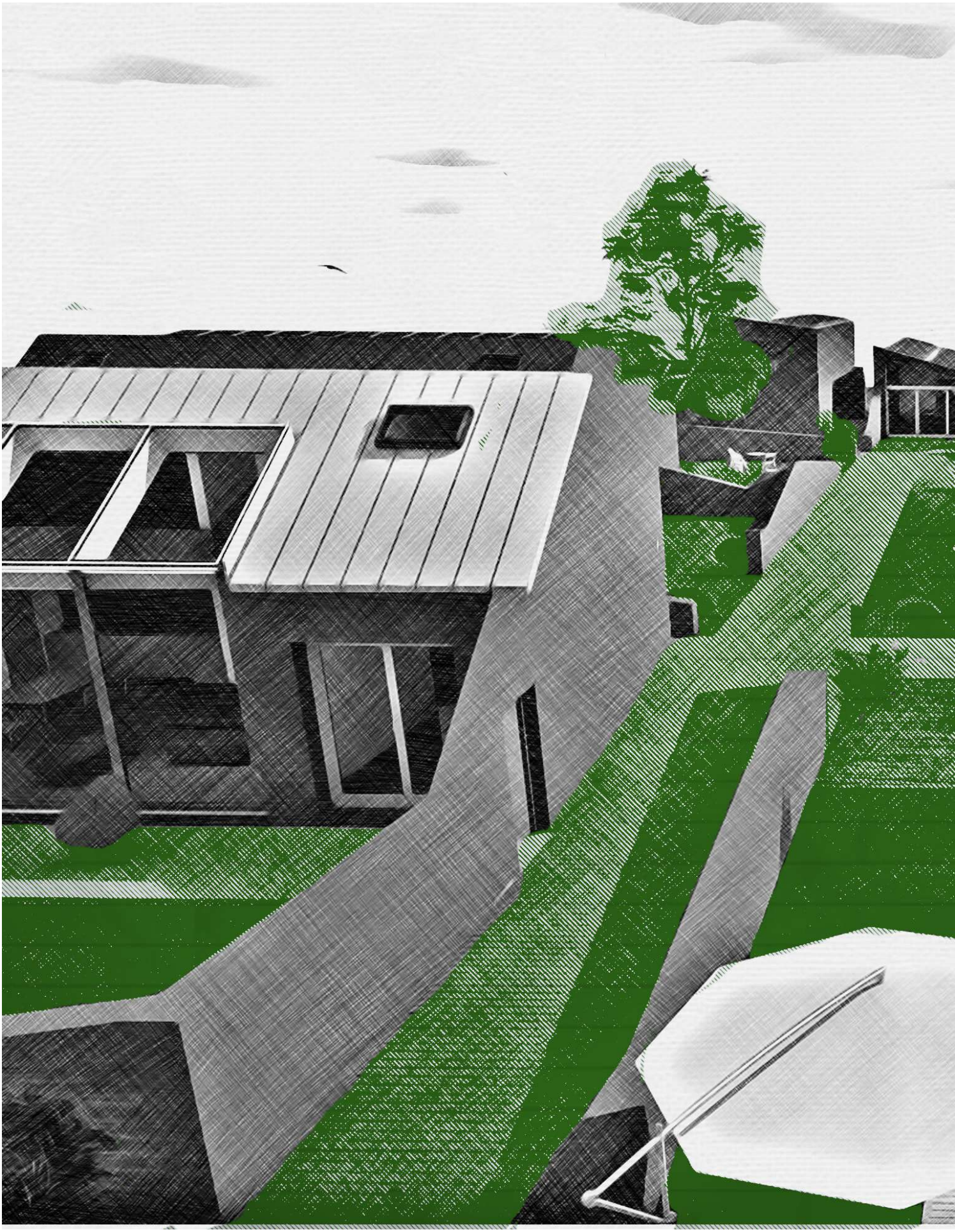
Perspective view on recreational zone and privet gardens

Fig. 4.8.9 Render collage



Perspective view on recreational zone and privet gardens

Fig. 4.8.10 Render collage



4.9_INTERPRETATION_MICRO
BASE PLAN SHAPE

Analyzing the project on both micro and macro levels offers a nuanced perspective into the functioning of the settlement, from the smallest building components to the largest urban units. The primary aim of the diploma thesis is to establish and elaborate on the concept of socio-economically active coexistence in a single urban settlement that aligns with the urban research levels. Nevertheless, it is equally imperative to showcase the architectural solution for residential units since they form an integral part of the settlement. A single housing unit constitutes a fundamental element of the first level, which operates within the planning hierarchy of the settlement. These units can be part of a double house or an independent building, with all properties situated on independent plots of the same size, and oriented towards the central part of the base of the second row.

The overarching objective of the architectural design is to create a functional and morphological reinterpretation of the existing Vojvodina house. The design parameters include a one-story building with a linear layout of the porch and rooms, a one-way orientation towards the entrance yard, and one-way access to the house. Notably, significant deviations from the original architecture of the house are represented by the attic. Whereas basements were infrequently used in the original Vojvodina house, attics were primarily employed for storing winter or non-perishable food. Expanding living space occurred on the ground level, rather than vertically. However, given that the settlement is planned for an urban or suburban location, it is necessary to approach the optimal density index, which is presented in the sixth chapter of the evaluation. The same principle applies to the added building, except for the one without an attic. The base house's characteristic design is reflected in the glazed facade that occupies both the facade and the roof surface. The aim is to create a sense of openness, transparency, and interconnectivity between the interior and exterior spaces. The building's morphology is optimized to facilitate natural light and ventilation throughout the day, thus enhancing the living experience of the occupants. Additionally, the design maximizes the use of available space, ensuring that every square inch is utilized effectively and efficiently. In contrast, the added house emphasizes a high ceiling and an open connection to the backyard, creating an environment that fosters social interaction, relaxation, and privacy. The architecture of the added house prioritizes a sense of harmony with the surrounding environment, as it strives to establish a connection with the natural landscape, rather than imposing itself on the surroundings. This approach aligns with the broader concept of socio-economically active coexistence, which seeks to create a symbiotic relationship between the built environment and the natural world.

LEGEND:

GROUND FLOOR 124,78 m2
BR-Bedroom 18,29 m2
WR-Workroom 12,30 m2
B-Bathroom 4,21 m2
LR-Livingroom 46,18 m2
S-Storage/Technic 7,32 m2
WC 2,20 m2

Porch 34,28 m2
Courtyard 89,78 m2
Garden 86,67 m2

Fig. 4.9.1 **Ground floor 1:200**

<u>1.FLOOR / ATTIC 58,60 m2</u>
Badroom 12,75 m2
Badroom 13,17 m2
Bathroom 4,21 m2
Livingroom 26,27 m2
WC 2,20 m2

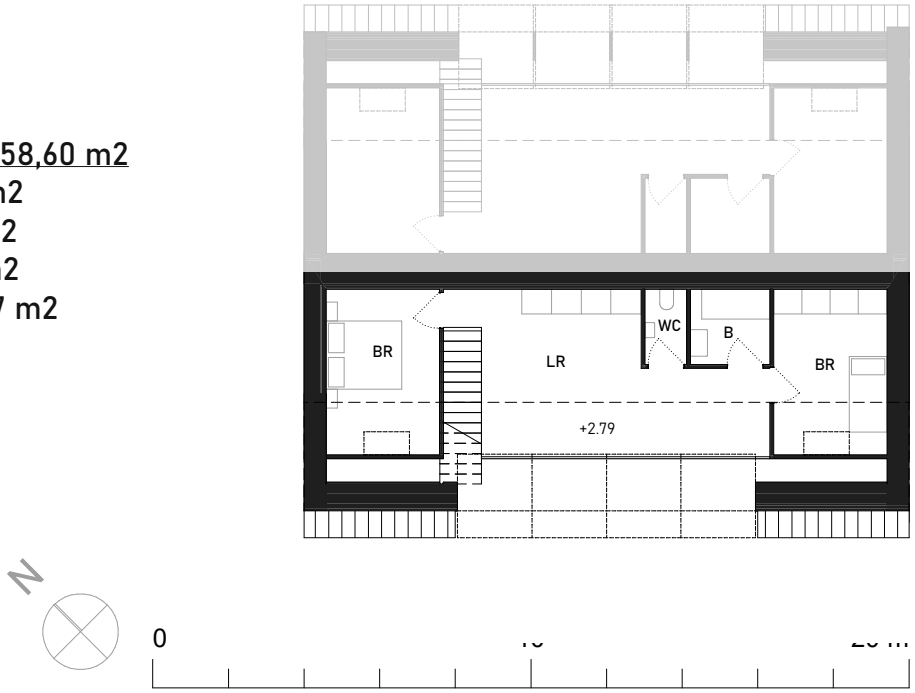


Fig. 4.9.2 **Attic 1:200**

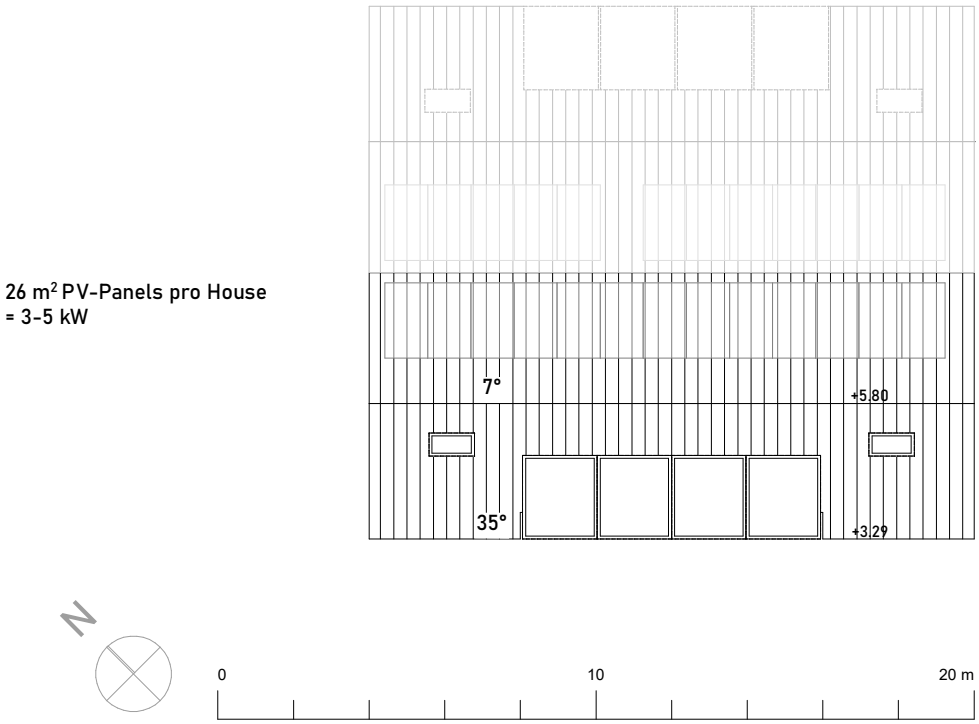


Fig. 4.9.3 **Roof-top 1:200**

Fig. 4.9.4 **Section A 1:200**

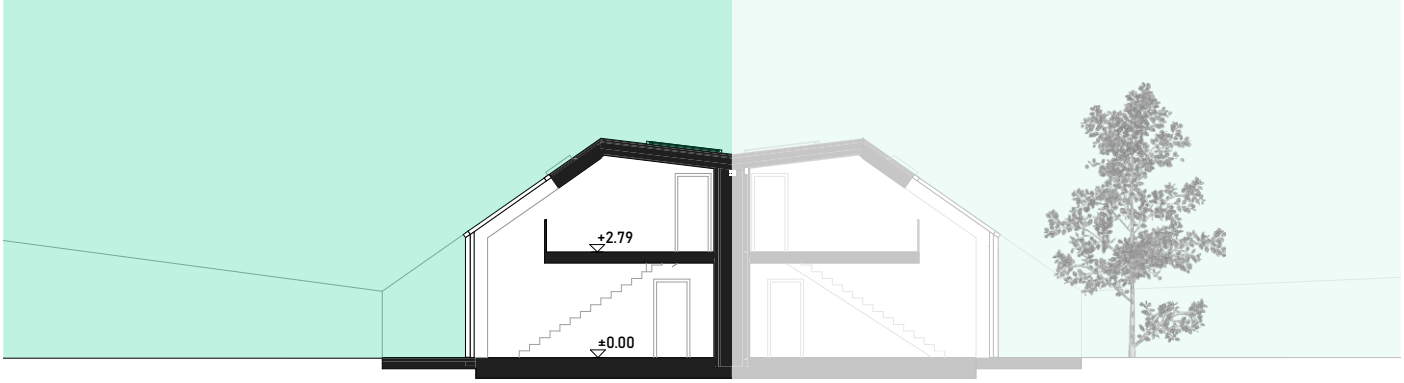


Fig. 4.9.5 **Section B 1:200**

ARCHITECTURAL FEATURES AND PLAN STUDY

The design of the house is directly related to the original positioning and architecture of the Vojvodinian House. To preserve the consistency of the original design and to make optimal use of the urban soil, the space under the roof will be utilized. The ground floor of the house will be dedicated to daily activities, while the bedrooms will be positioned in the attic. Traditional rural settlements in Vojvodinian are based on an orthogonal urban scheme, which results in a plan form with a particular organization. The existing concept of organization, which places the house along the depth of the plot and the gable facade on the street regulation line, is highly suitable for household needs that dictate the functional pattern. The organization pattern, house-porch-garden, remains the same after expansion. The living room with the kitchen and porch is the central gathering space in the house. The porch is defined by the movement and connection of the interior space and is the only access point to the rooms on the ground floor adjacent to the central area. The working/study room and the master bedroom are situated on the left and right sides of the living room, respectively, and are directly accessible from the porch, thereby increasing the porch's significance as part of the interior space. Although the porch is not physically part of the interior space, the importance of its function gives it the characteristic of centrality that the living room has. To achieve the same goal, the physical barrier between the living room and the porch was reduced to a glass facade. The glass facade is connected to a glazed roof surface, which together equalize the vertical and horizontal barrier between the exterior and interior space. The one-sided open house contributes to its simplicity of functioning and technical performance. The one-sided orientation also provides the possibility of creating a double-house, and in that case, the mutual wall is used for technical installations, eliminating the need for additional partition walls for those purposes.

Fig. 4.9.6 View on main / garden facade 1:200

Fig. 4.9.7 Front-Entrance view / Street view 1:200

4.10_DENSIFYING
DENSYFIED PLAN SHAPE

Fig. 4.10.1 **Ground floor 1:200**

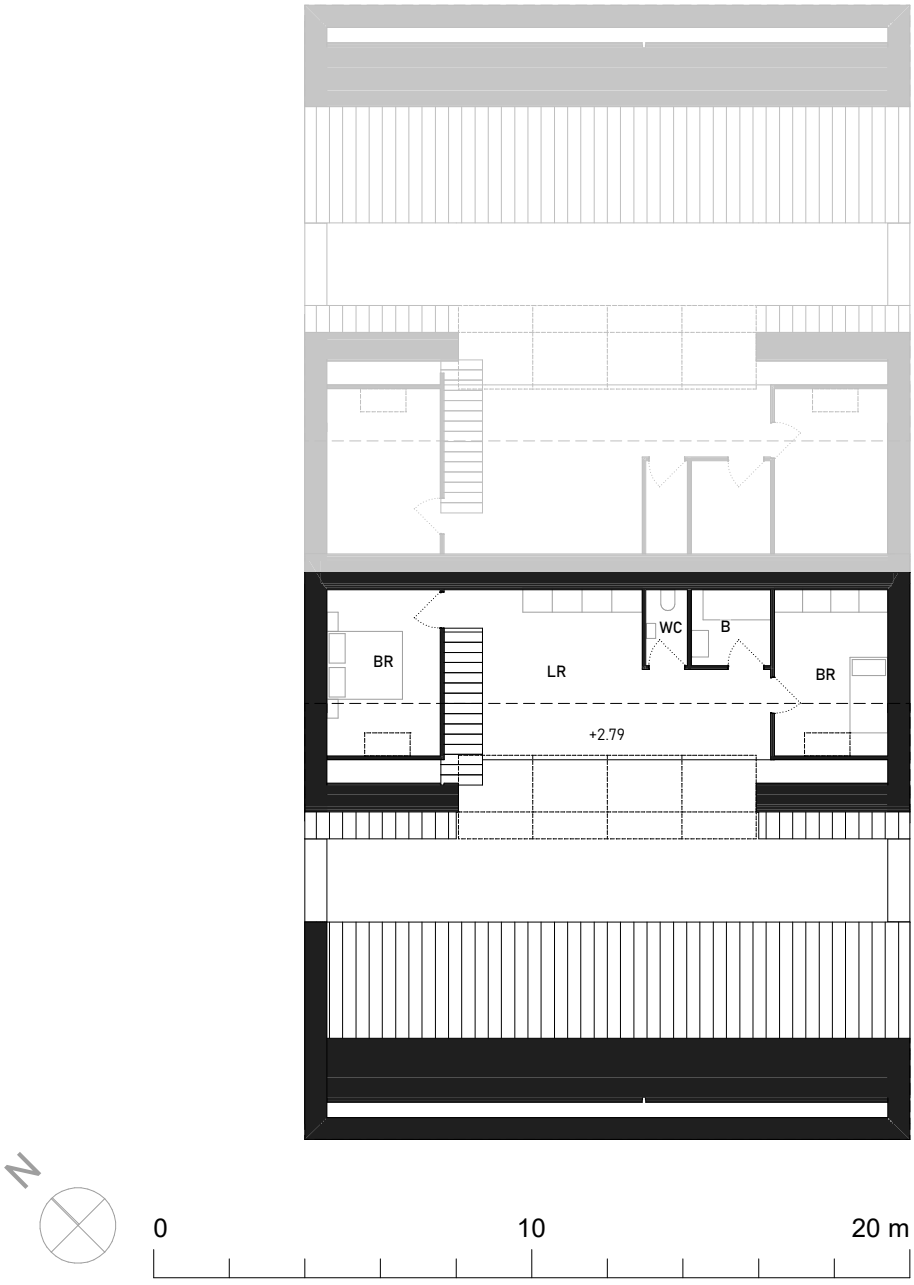
LEGEND:

GROUND FLOOR 194,78 m2
BR-Bedroom 18,29 m2
WR+Workroom 12,30 m2
B-Bathroom 4,21 m2
LR-Livingroom 46,18 m2
S-Storage/Technic 7,32 m2
WC 2,20 m2

Porch 34,28 m2
Garden 86,67 m2

ADDITION
Bedroom 14,26 m2
Bathroom 6,61 m2
Livingroom 48,66 m2

Fig. 4.10.2 **Attic 1:200**



1.FLOOR / ATTIC 58,60 m2
Bedroom 12,75 m2
Bedroom 13,17 m2
Bathroom 4,21 m2
Livingroom 26,27 m2
WC 2,20 m2

Fig. 4.10.3 **Roof-top 1:200**

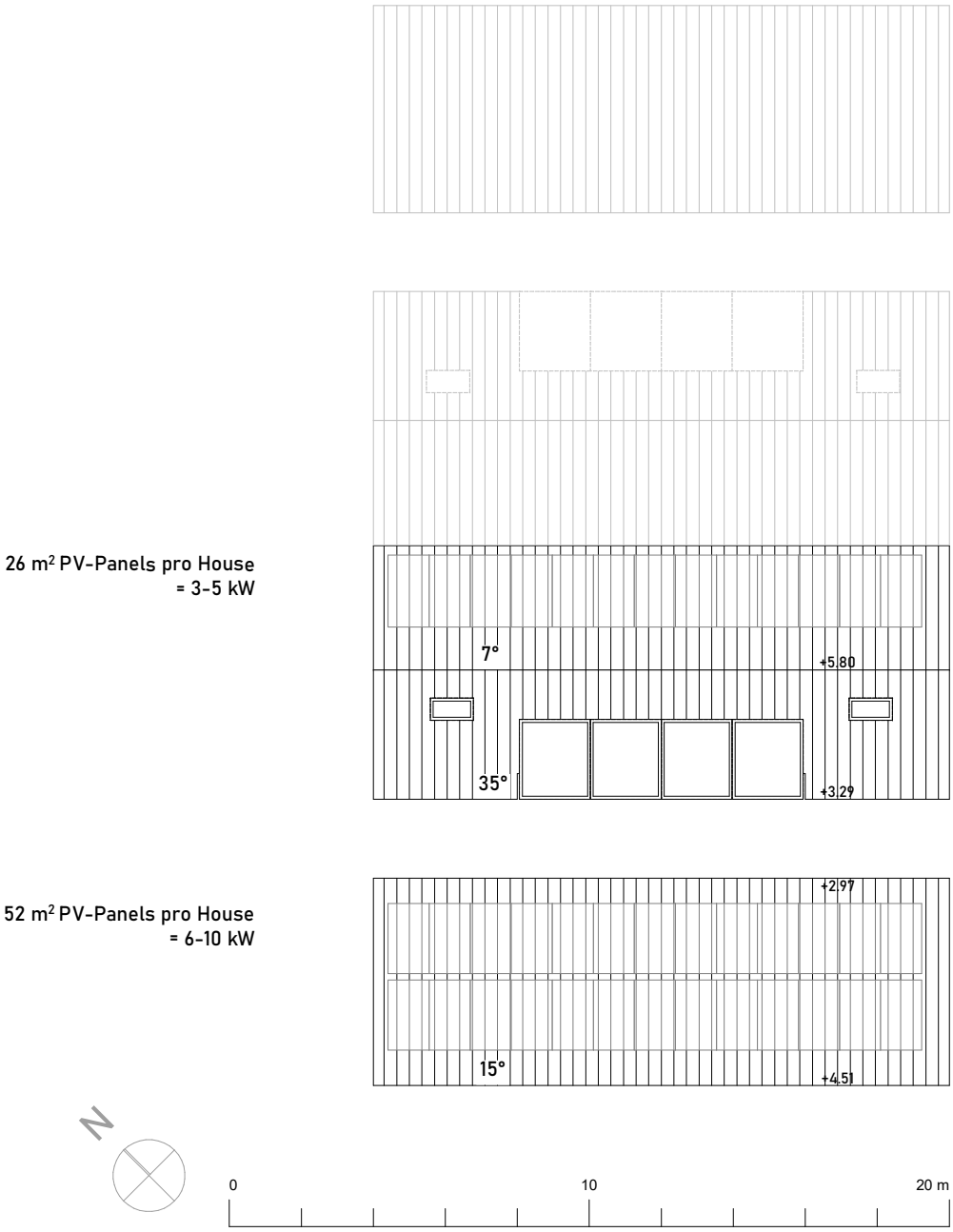


Fig. 4.10.4 **Garden-side facade, View S-E, 1:200**

Fig. 4.10.5 **Front / Street facade, View W-N1, 1:200**

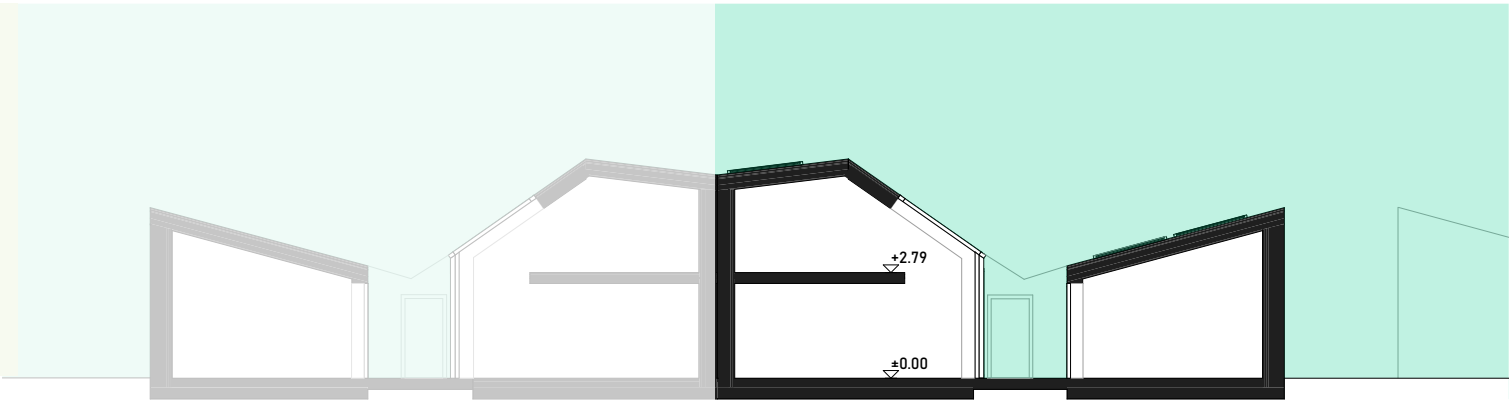


Fig. 4.10.6 **Section B1 1:200**

4.11_CONNECTIONS AND INTERACTIONS

GROUND FLOOR

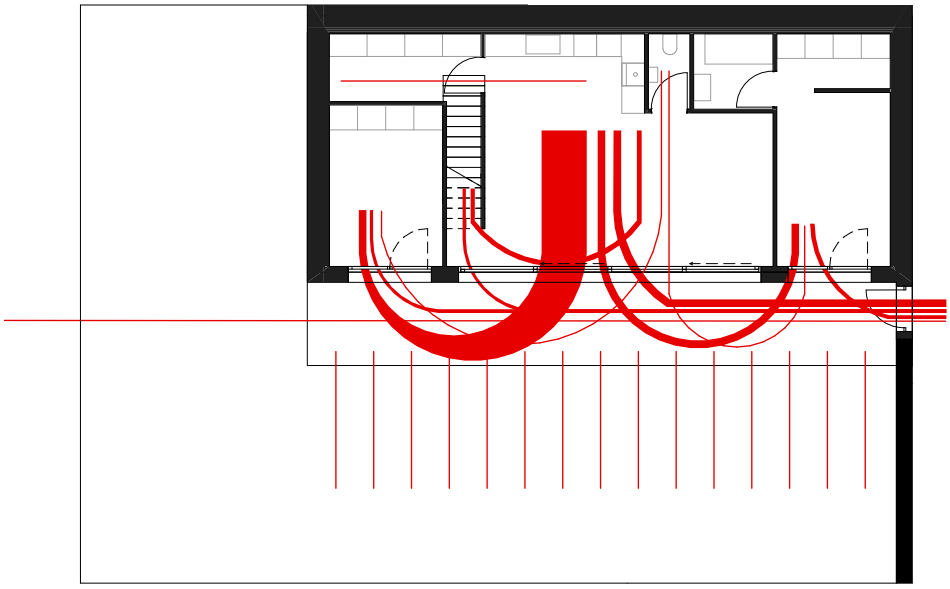


Fig. 4.11.1 Schematic movements thru the house and porch

BASE PLAN SHAPE
Ground floor 1:200

ATTIC

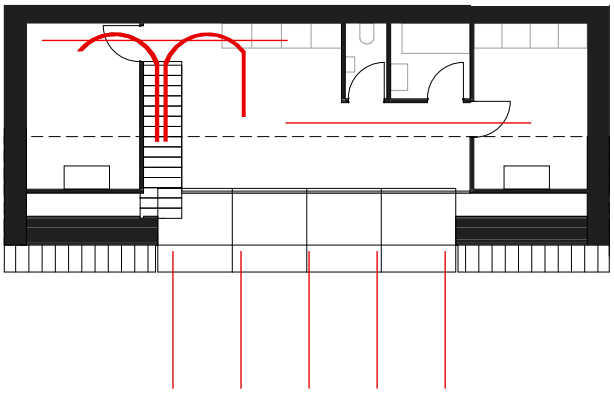


Fig. 4.11.2 Schematic movements thru the house and porch

BASE PLAN SHAPE
Attic 1:200

GROUND FLOOR

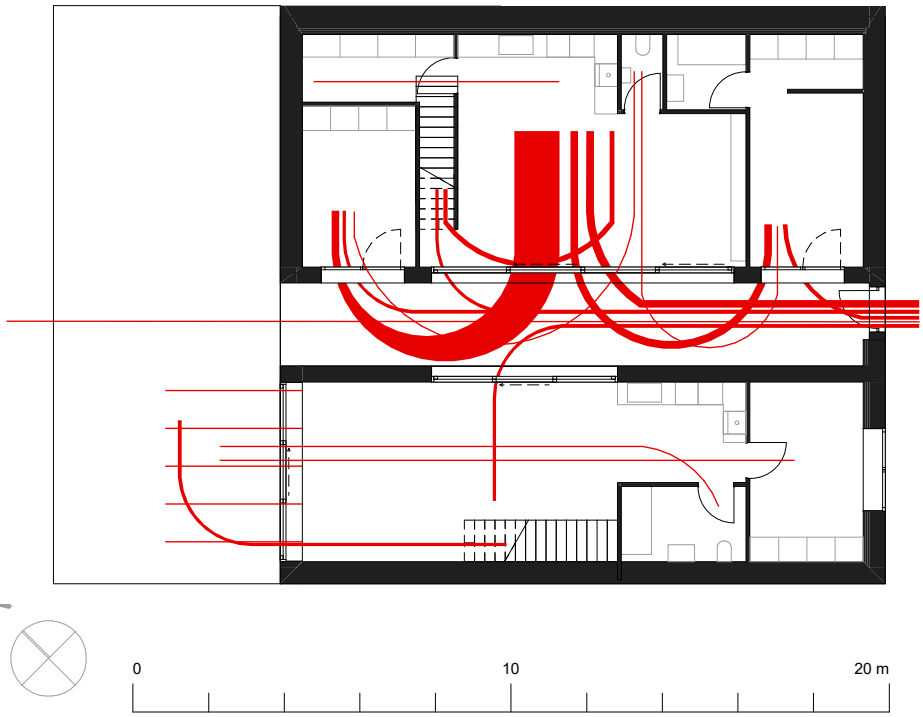


Fig. 4.11.2 Schematic movements thru the house and porch

DENSYFIED PLAN SHAPE
Ground floor 1:200

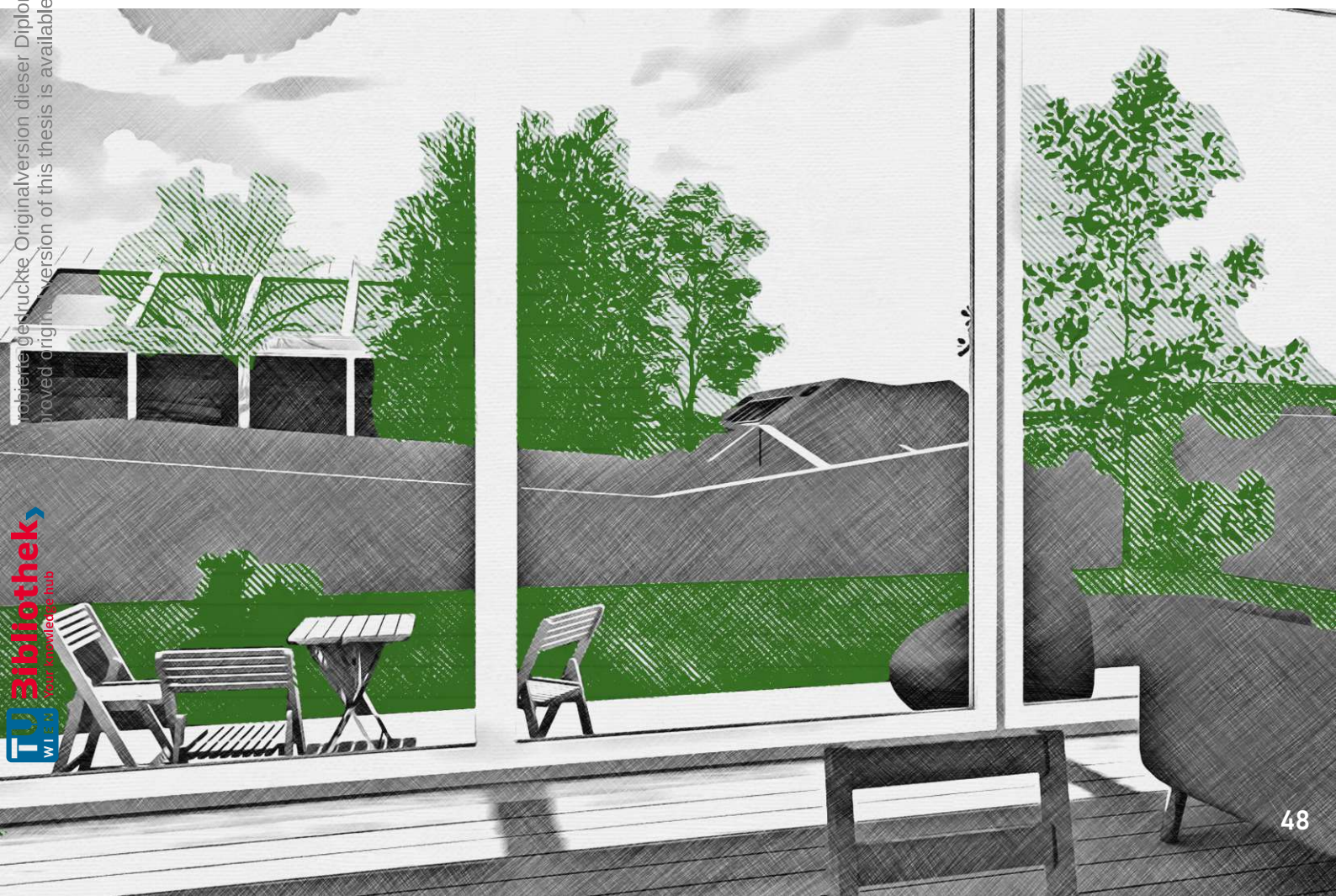
4.12. INTERPRETATION MICRO - Perspective view on house

Fig. 4.12.1 Render collage - Front / Street view

Fig. 4.12.2 Render collage - View on main facade from a street

Fig. 4.12.3 Render collage - View on from garden on porch

Fig. 4.12.4 Render collage - View from living room on garden



4.13_FANCEING

As previously stated, in a Vojvodinian settlement, plots are typically positioned orthogonally in a row along the street. In this case, the outer wall of each house facing the street lies on the plot boundary and faces its neighbor, thus providing privacy without the need for fences. Only the back gardens lack visual barriers. Research on the compactness and fluidity of functions within the settlement did not result in a conceptual solution that matches the original orthogonal form of the street and settlement, which raised concerns about the exposure of private space. Therefore, the base unit is circular and multiplied to form a semi-closed settlement.

The primary objective is to optimize the physical positioning and fitting of the residential unit with other plots while maintaining the original concept of the Vojvodinian house without disrupting it with fences. Excessive exposure from neighboring houses should be avoided, particularly in cases where all rooms are view-opened and accessible along the porch. The first step is to identify the most exposed zones on the plot and house and the areas where there is the greatest possibility of being exposed from outside the plot. The exposure research includes all direct and side views from the street or neighbors.

Fig. 4.13.1/2 Aerial view on Vrsac Town, Serbia

Fig. 4.13.4 Render collage
View on recreational zone

The exposure of the porch and inside space is divided into secondary and primary exposure. Primary exposure is the one that comes from the street and requires more or less classical fencing, as in the case of any kind of linear housing side-by-side. Secondary exposure occurs between neighbors in a closed unit system or in passages located in between. A simple linear coupling system determines that the extension of the view point contributes to the highest amount of exposure. The fence's characteristic shape is defined based on the observer's position in the direction of the house. The principle of finding the form of the fencing is based on functionality and visual comfort. Extending the gable wall, following the slope of the roof, which connects with the ground, forms a type of side fencing. The fence design evokes a comparable characteristic to the original location of the Pannonian house, where the plain is surrounded by mountain ranges. On figure 4.13.3 is shown inspirational design of fanceing made of Pannonian plain and the Carpathian mountain.

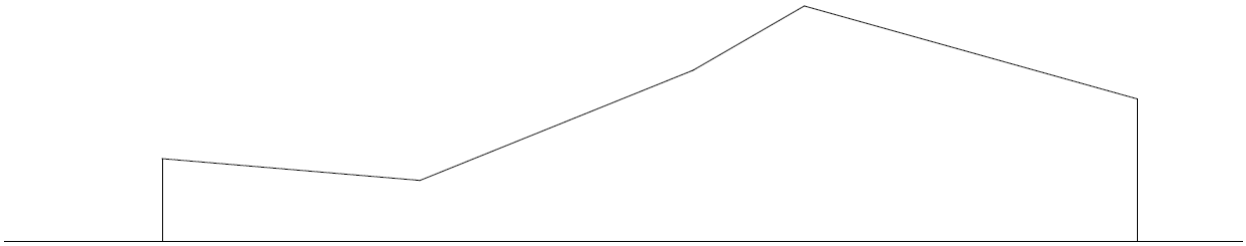


Fig. 4.13.3 Initional shape for fanceing forming

5.1_RESULT

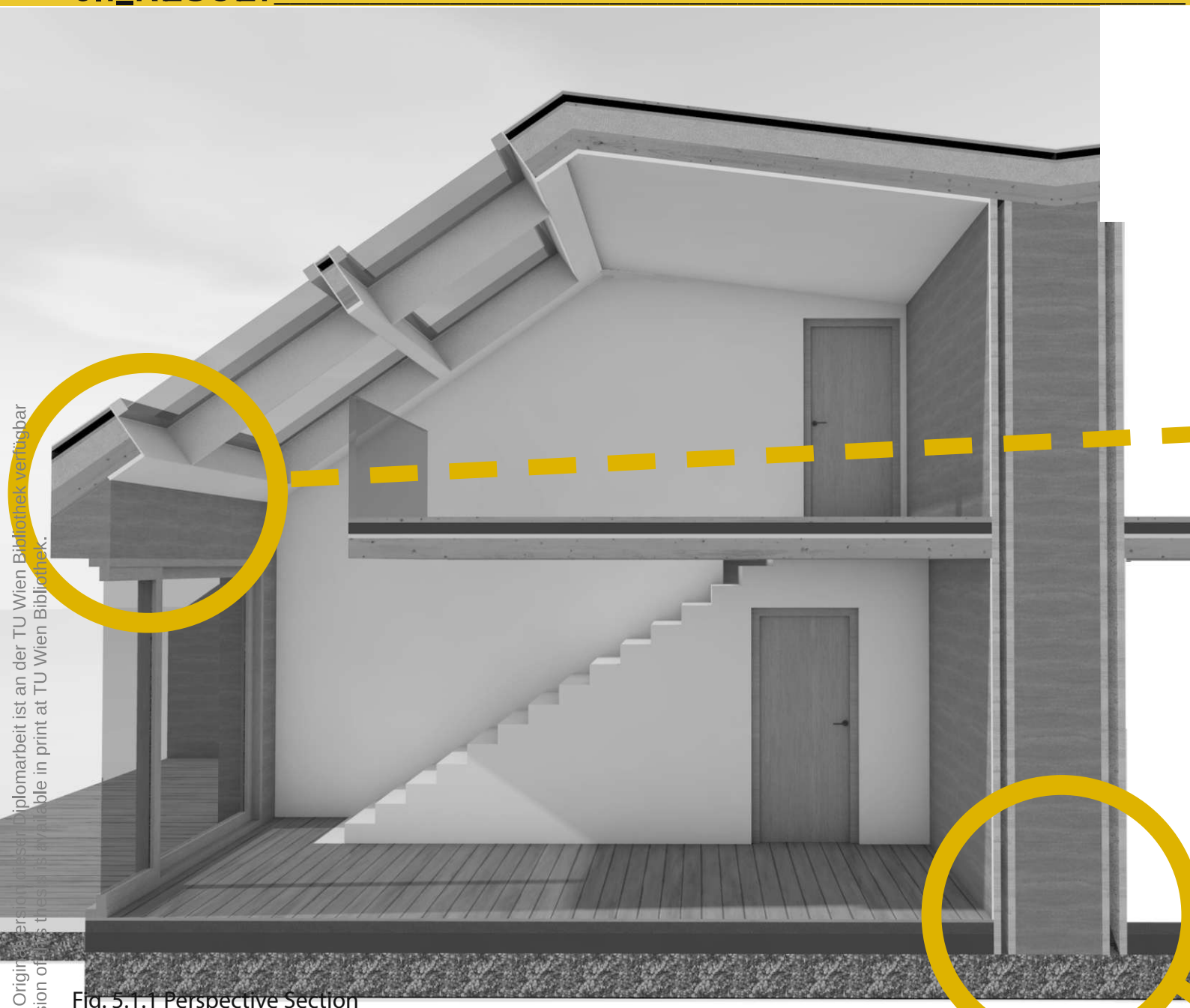
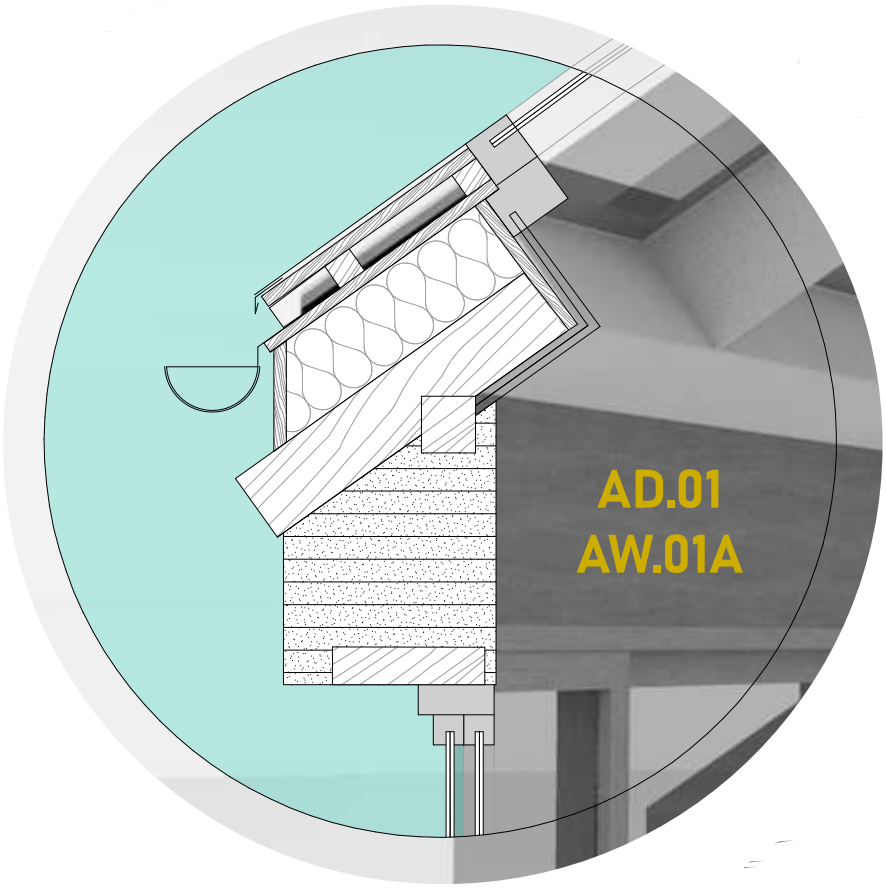


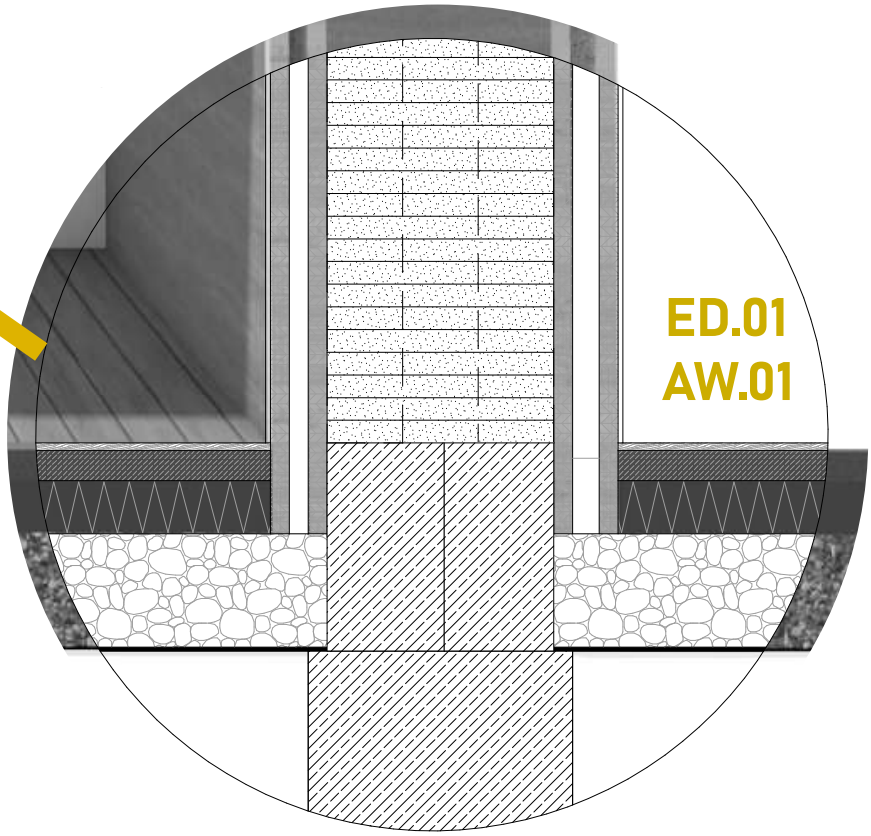
Fig. 5.1.1 Perspective Section

Through extensive research and development, the idea of creating a compact urban settlement based on self-sustainable architecture has been thoroughly explored. However, it is essential to demonstrate the feasibility of constructing the proposed structure. To achieve this, modern technological practices in construction have been adapted to suit an average economic framework. One of the primary materials used in the proposed construction is rammed earth, a sustainable building material that is highly regarded for its durability and aesthetic appeal. Although it is relatively more expensive than other building materials, it has a significant potential to be used in more construction projects, especially those aimed at environmental sustainability. One of the ways to encourage the use of rammed earth walls is by advocating for the construction of collective residential buildings funded by state and district budgets. This would go a long way in demonstrating the viability of using rammed earth walls in modern construction. Traditionally, rammed earth construction has been prevalent in many countries, including the United States and Australia, with Germany establishing binding standards for earth building since 2013. Today, earth building is fully integrated into modern building trade,



AW.01A Load-bearing wall

0.0300 m clay plaster /
0.0500 m lime cement plaster
0.0500 m Reed mats
0.0700 m Instalation layer for HVAC
0.0500 m Reed mats
0.6000 m rammed earth dzw. Beams
0.0500 m Reed mats
0.0700 m Instalation layer for HVAC
0.0500 m Reed mats
0.0300 m clay plaster /
0.0500 m lime cement plaster



AW.01 Load-bearing separating wall

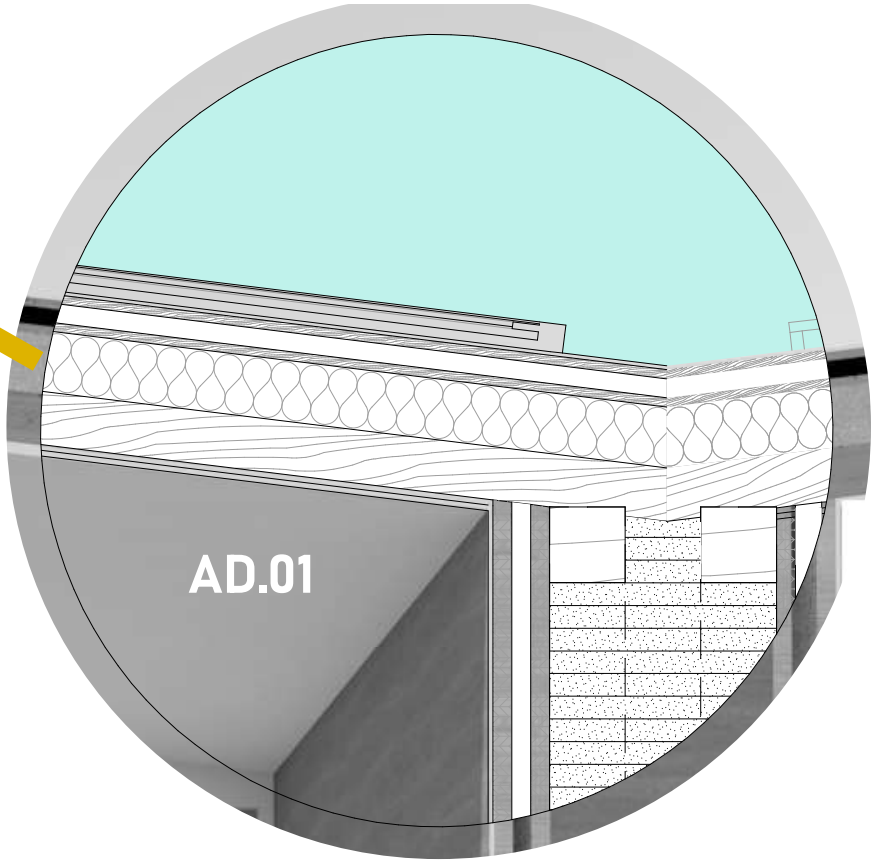
0.4000 m rammed earth dzw. Beams
0.0500 m Reed mats
0.0700 m Instalation layer for HVAC
0.0500 m Reed mats
0.0300 m clay plaster /
0.0500 m lime cement plaster
ED.01 Foundation Floor
0,0200 m Flooring
0,0800 m Clay protection
0.1400 m EPS
0.0100 m Geotex foil
0.3000 m Foam-glass gravel
0.1000 m Granular subbase

Fig. 5.1.2 Building Structure
Load bearing rammed earth walls, 1:20

-with the revised DIN Lehmbau standards indicating its significant potential in the construction industry. The proposed construction solution is a blend of contemporary design principles that rely on the traditional Vojvodina house's architecture and advanced building practices derived from centuries-old construction technologies. One of the critical aspects considered in the house's design is the visibility of the used materials, both on the facade and in the interior. This approach is aimed at showcasing the earthen material components that appear in the load-bearing walls, floor, roof, and foundation slab.

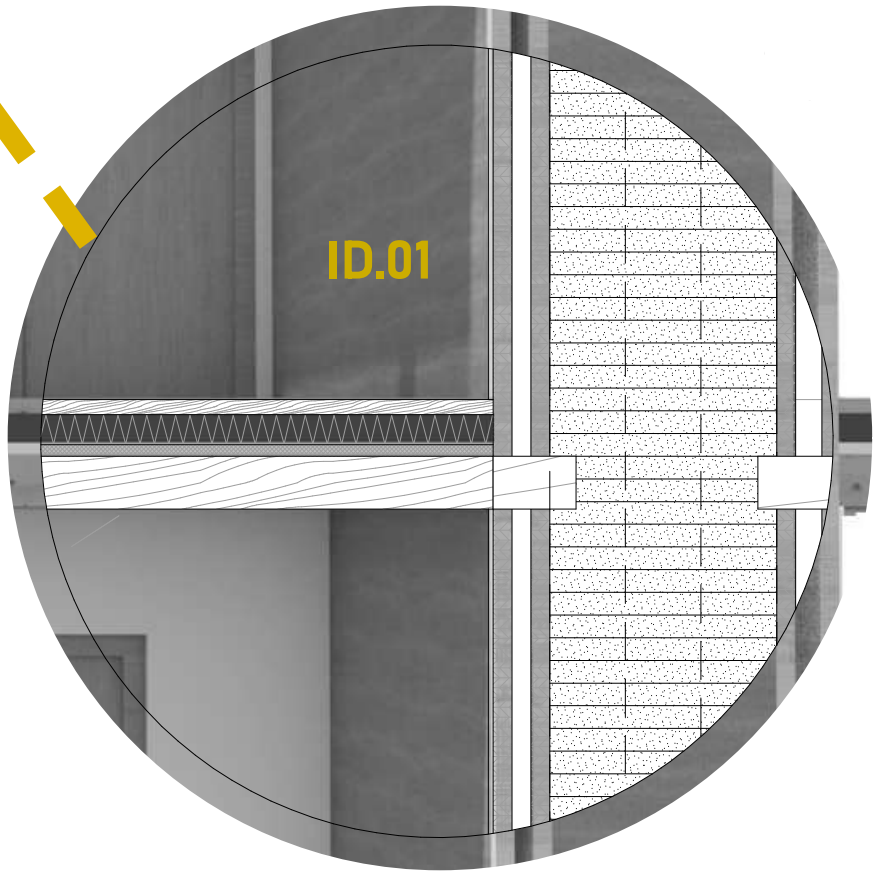
As the adage goes, „A building material is not interesting because of what it is but because of what it can do for society." The proposed construction solution aligns with this idea and presents a unique opportunity for the building industry to shift towards sustainable building materials and practices that are not only environmentally friendly but also economically viable. When designing new buildings that incorporate earth building materials for their outer wall construction, it is crucial to ensure adequate protection against moisture. This can be achieved by providing a high base in the foundation area of at least 50 cm above the ground level, made of a water-resistant material to act as a splash guard. Additionally, it is recommended to install a horizontal barrier to prevent rising moisture from penetrating the earth wall. These protective measures are necessary to ensure the longevity and durability of the building, as moisture can weaken the structural integrity of the earth wall and cause damage over time.

STRUKTURE 1:20



AD.01 Non-ventilated roof
Wooden beem roof

0.0800 m Eternit cover
0.0300 m Batten 3/5
0.0500 m Bounterbatten /
Rear ventilation
0.0005 m Diffusion-open
windproof foredeck web
0.0240 m Solid wood formwork
0.1000 m Wooden substructure /
MW WLF 0.032 W/mK
0.1600 m Wooden substructure /
MW WLF 0.032 W/mK
0.0040 m Vapour barrier
and Rainproof cover GV-45
0.1400 m Wooden beams
according to static.
0.0500 m Reed mats
0.0300 m clay plaster
0.0500 m lime cement plaster



ID.01 Cealing Floor

0,0300 m Wooden plank
0.0800 m Clay protection
0.0300 m Impact sound insulation
0.1400 m Board stacking ceiling (visible)

IW.02 Partition wall

0,0125 m clay plaster
0,0500 m Mineral wool
between Metal-Frame
0,0125 m clay plaster

Fig. 5.1.3 Building Structure
Roof and cealing, 1:20

6.1_EVALUATION

In light of current trends in housing, predicting a far-reaching architectural solution can be a daunting task. However, we can gain insight from the history of urban and rural housing and the factors that have influenced their evolution over time. Adapting characteristics to meet changing needs has been a defining characteristic of housing design throughout history. While economically engaging architecture continues to rely on prefabricated concrete elements, the production process for these elements has not significantly improved since the 1960s. Collectively, residential architecture depends heavily on concrete construction technologies, with reinforced concrete playing a central role in vertical architecture. As urban residential areas expand upwards to win as much square footage as possible, basic comfort conditions are sometimes overlooked.

While the concept of horizontally dense urban residential areas has been somewhat forgotten since the early 20th century, the paradigm of city versus rural settlements and suburban areas is shifting. Cities are no longer solely industrial centers, and as the need for human labor decreases with the computerization and automation of industry, the population seeking to live in suburban areas outside of densely populated city centers is growing. This trend is creating conditions for the horizontal expansion of housing space, which can rely on modern ecological construction techniques.

As we look at contemporary buildings and architecture through the lens of ecology, we see a shift in the selection of construction materials and processing of raw materials. The focus is now on environmentally-friendly building materials that compensate for the most accessible materials currently available on the market. The state of current architecture is instrumental in shaping opportunities for change, with lower energy consumption for the extraction, processing, and installation of building materials being the optimal choice. The goal of this project is to show that environmentally conscious selection of materials and functional planning of settlements based on the needs of residents can compensate for the qualities of current residential architecture. One of the primary qualities of current architecture is the utilization range of the building area, and the relationship between quality and quantity in this regard is a metaphysical connotation.

The conceptual solution presented in this project responds to current tendencies by proposing the horizontal densification of urban and suburban zones. By prioritizing sustainable building practices and addressing the needs of residents, we can create more functional and environmentally-friendly living spaces.

The primal state of the formed settlement meets the level of land utilization that can be compared with rural settlements. In that case, the index of built-up square meters (GFZ[10]) does not exceed 0.6, which means that the built-up residential space is in a ratio of approximately 1:2 with the plot area. After the planned expansion of the residential area, that ratio was moved to 0.8.

[10]GFZ = *Geschossfläche/Grundstuckfläche
Der Grad der Verdichtung richtet sich hauptsächlich nach städtebaulichen und kommerziellen Interesse und wird in Schwache (GFZ 0,3-0,5), Mittlere (GFZ 0,5-1,0) und Starke Verdichtung (GFZ > 1,0) unterschieden.
TRANSLATION: *floor area/plot area
The degree of densification mainly depends on urban planning and commercial interest and is divided into weak (GFZ 0.3-0.5), medium (GFZ 0.5-1.0) and strong densification (GFZ > 1.0)

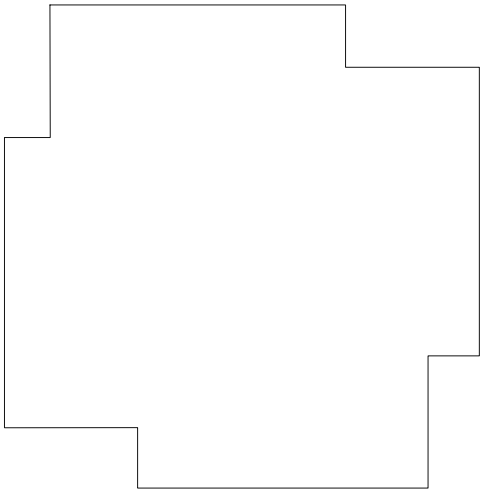
State:	Primal	Expanden
Ground Floor	124,78 m²	194,31 m²
Attic	58,60 m²	58,60 m²
Plot Area	325,00 m²	325,00 m²
Living Space Area	183,38 m²	252,91 m²
GFZ	0,6	0,8

Expanded State	
Ground Floor	
Bathroom	4,21 m²
Bathroom	6,61 m²
Bedroom	18,29 m²
Bedroom/Workroom	14,26 m²
Living room	44,18 m²
Living room	48,66 m²
Storage/Technic	7,32 m²
WC	2,20 m²
Workroom	12,30 m²
Porch	36,20 m²
Garden	86,87 m²
Attic	
Bathroom	4,21 m²
Bedroom	13,17 m²
Bedroom	12,75 m²
Living room/Hobbyroom	26,27 m²

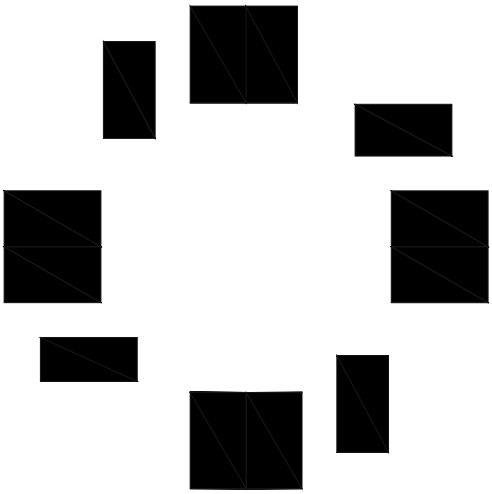
Primal State	
Ground Floor	
Bathroom	4,21 m²
Bedroom	18,29 m²
Living room	44,18 m²
Storage/Technic	7,32 m²
WC	2,20 m²
Workroom	12,30 m²
Porch	36,20 m²
Courtyard	89,78 m²
Garden	86,87m²
Attic	
Bathroom	4,21 m²
Bedroom	13,17 m²
Bedroom	12,75 m²
Living room/Hobbyroom	26,27 m²

Fig. 6.1.1 Living Space Area review

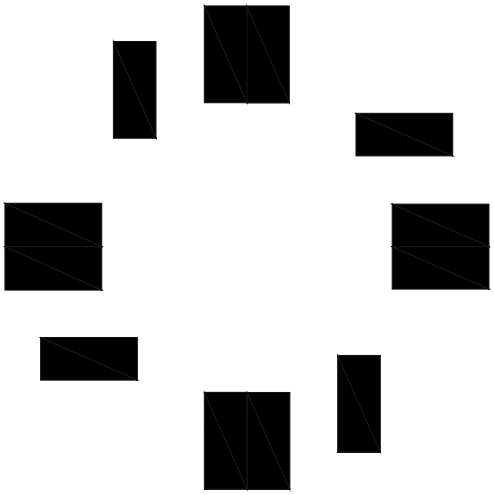
PROOF OF AREA - Micro level - Base shape
CONSTRUCTION SITE / BUILDING



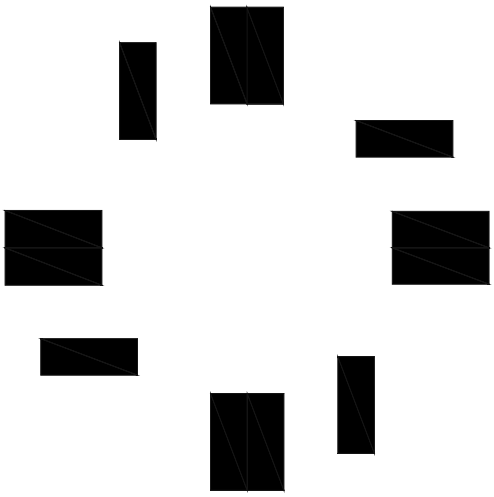
CONSTRUCTION SITE GROSS AREA (GA)
Ger.: Parzelle Brutto Grundfläche (BGF)
5 470 m²



BUILDING SITE GROSS AREA (GA)
Ger.: Brutto Grundfläche (BGF)
1 680 m²
30,53% of GA (BGF)

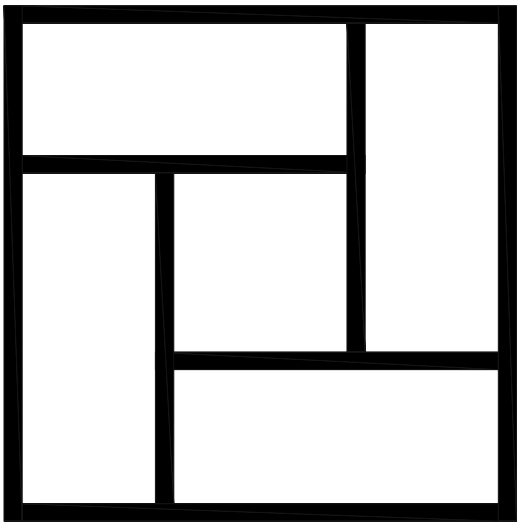


GROSS FLOOR AREA (GFA) - Ground floor
Ger.: Nützfläche (NF) - Erdgeschoss
1 344 m²
24,62% of GA (BGF)

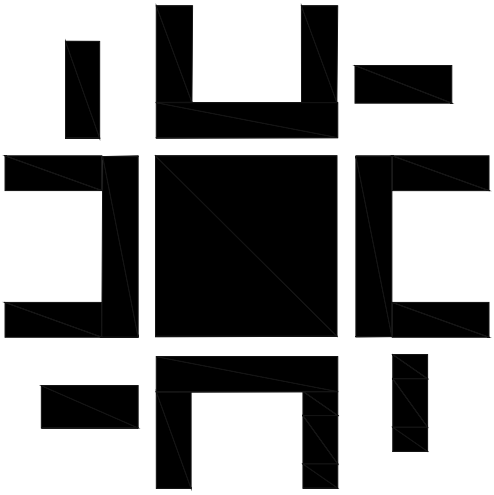


GROSS FLOOR AREA (GFA) - Obergeschoss
Ger.: Nützfläche (NF) - Attic
960 m²
17,55% of GA (BGF)

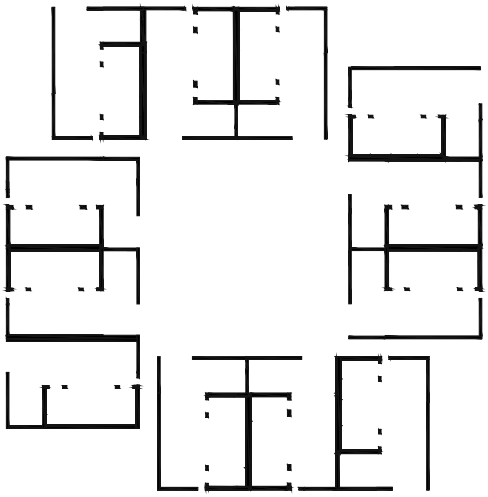
Fig. 6.1.2 Proof of area - Micro level - Base shape



GROSS TRAFFIC AREA (GTA)
Ger.: Verkehrfläche (VF)
1 324 m²
24,20% of GA (BGF)

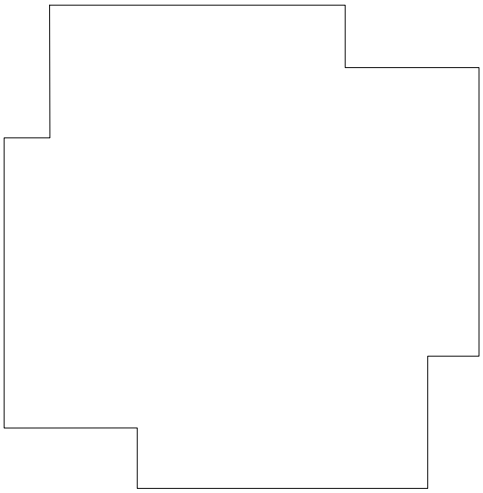


GROSS FREE AREA (GFA)
Ger.: Freifläche (FF)
2 732 m²
43,36% von GA (BGF)

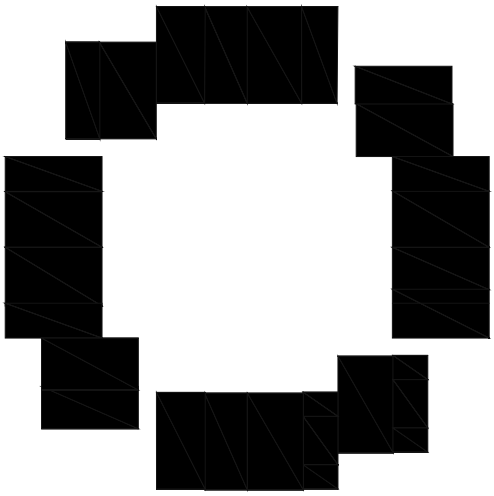


CONSTRUCTION GROUND AREA (CGA)
Ger.: Konstruktionsgrundfläche (KFG)
461,68 m²
8,44% of GA (BGF)

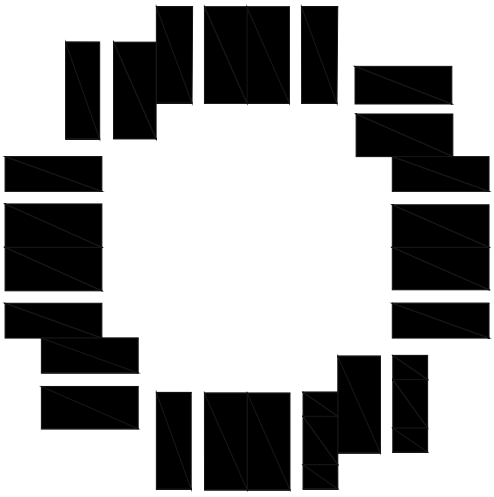
PROOF OF AREA - Micro level - Desnyfied shape
CONSTRUCTION SITE / BUILDING



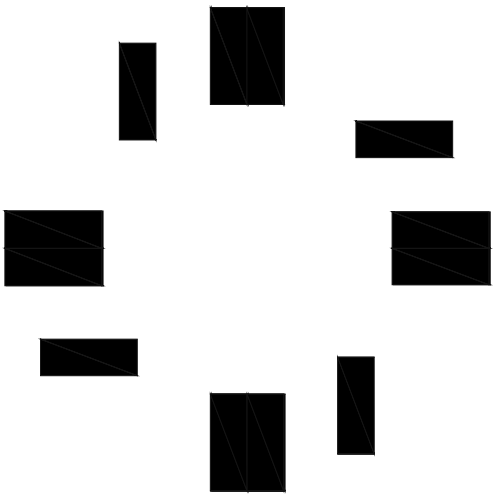
CONSTRUCTION SITE GROSS AREA (GA)
Ger.: Parzelle Brutto Grundfläche (BGF)
5 470 m²



BUILDING SITE GROSS AREA (GA)
Ger.: Brutto Grundfläche (BGF)
3 168 m²
57,91 % of GA (BGF)

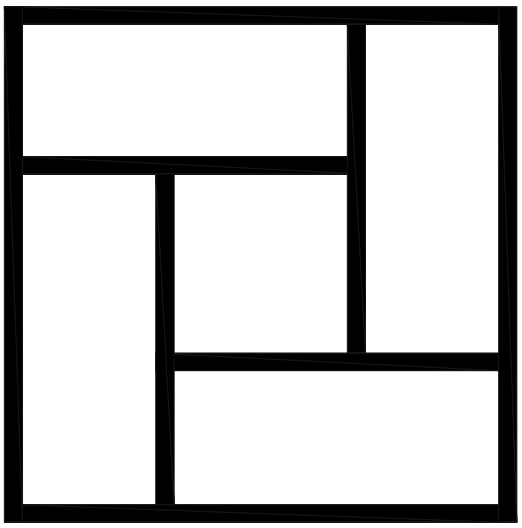


GROSS FLOOR AREA (GFA) - Ground floor
Ger.: Nützfläche (NF) - Erdgeschoss
2 856 m²
52,21 % of GA (BGF)

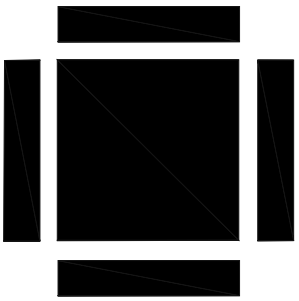


GROSS FLOOR AREA (GFA) - Obergeschoss
Ger.: Nützfläche (NF) - Attic
960 m²
17,55% of GA (BGF)

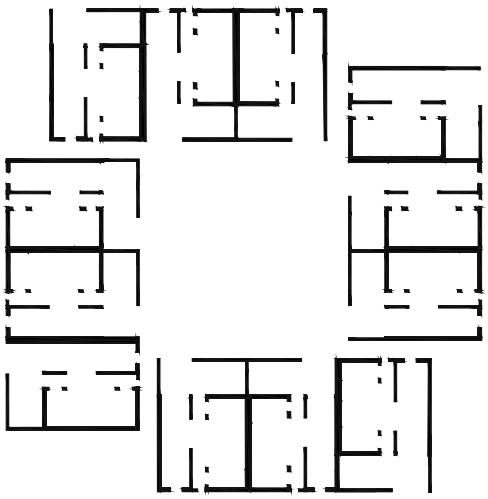
Fig. 6.1.3 Proof of area - Micro level - Densyfied shape



GROSS TRAFFIC AREA (GTA)
Ger.: Verkehrfläche (VF)
1 324 m²
24,20% of GA (BGF)



GROSS FREE AREA (GFA)
Ger.: Freifläche (FF)
1 592 m²
29,10 % von GA (BGF)



CONSTRUCTION GROUND AREA (CGA)
Ger.: Konstruktionsgrundfläche (KFG)
641,60 m²
11,79 % of GA (BGF)

7.1_CONCLUSION

In conclusion, this master's thesis explored the analysis and implementation possibilities of rural architecture layouts prevalent in Vojvodina, Serbia during the 19th century, with a focus on adapting them to urban and suburban areas. The objective was to maintain the individuality of private open space while condensing urban space according to the principles of a country house. The thesis aimed to strike a delicate balance between preserving the cultural heritage of rural architecture and meeting contemporary living standards. The research highlighted the importance of understanding the historical context and functionality of rural households in order to integrate their architectural elements into urban environments effectively. By examining the principles of rationality, functionality, flexibility, and simple feasibility inherent in traditional Vojvodina houses, the thesis provided a foundation for the proposed architectural concept.

The concept focused on utilizing the available space efficiently and promoting a sense of community within the settlement. It emphasized the spatial organization based on functional determinants, ensuring optimal use of space and infrastructure to support smooth settlement functioning. Privacy was preserved through defined boundaries and fencing, allowing for both joint activities and individual privacy among neighbors. To achieve sustainability and modernity in construction, traditional construction technologies were combined with contemporary design principles. The proposed construction solution incorporated rammed earth as a sustainable building material known for its durability and aesthetic appeal. The use of rammed earth walls showcased the material's natural qualities, both on the facade and in the interior. It also emphasized the importance of moisture protection and proper foundation design to ensure the longevity and structural integrity of the building. Furthermore, the thesis acknowledged the evolving trends in housing, where the paradigm of city ver sus rural settlements and suburban areas is shifting.The growing population seeking to live in suburban areas outside densely populated city centers creates opportunities for horizontal expansion and ecological construction techniques. The concept presented in this thesis aimed to address these trends by proposing the horizontal densification of urban and suburban zones, prioritizing sustainable building practices and residents' needs. In conclusion, the concept of integrating rural architecture layouts into urban and suburban areas can contribute to the development of better social connections by promoting community design, pedestrian-friendly environments, mixed-use development, shared facilities, environmental consciousness, and a sense of place. By creating opportunities for social interaction, collaboration, and a shared sense of identity, the concept lays the foundation for a more connected and cohesive community.

In conclusion, the concept of integrating rural architecture layouts into urban and suburban areas can contribute to the development of better social connections by promoting community design, pedestrian-friendly environments, mixed-use development, shared facilities, environmental consciousness, and a sense of place. By creating opportunities for social interaction, collaboration, and a shared sense of identity, the concept lays the foundation for a more connected and cohesive community. Overall, this master's thesis demonstrated the potential of integrating rural architecture layouts from Vojvodina into urban and suburban areas. By embracing the principles of functionality, sustainability, and community, it provided insights into creating more functional, environmentally-friendly, and socially cohesive living spaces. The proposed architectural concept can serve as a valuable reference for architects, urban planners, and policymakers seeking innovative solutions to accommodate evolving societal needs while preserving cultural heritage.

8.1_SOURCES

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INTERNET

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https://www.dachverband-lehm.de/
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FIGURE:

_CURRICULUM VITAE

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- Berufspraktikum – Architekturbüro Urban, Kosovska Mitrovica, Serbien, 02.2014 - 07.2014).
-Berufspraktikum - International Business Collage, K. Mitrovica
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- Aktiv in der Zeitgenössische Malerei tätig sowie Teilnahme an künstlerischen Ausstellungen und Veranstaltungen.