




rural studio:
Reinventing
Langenweddingen

Rural Studio - Reinventing Langenweddingen

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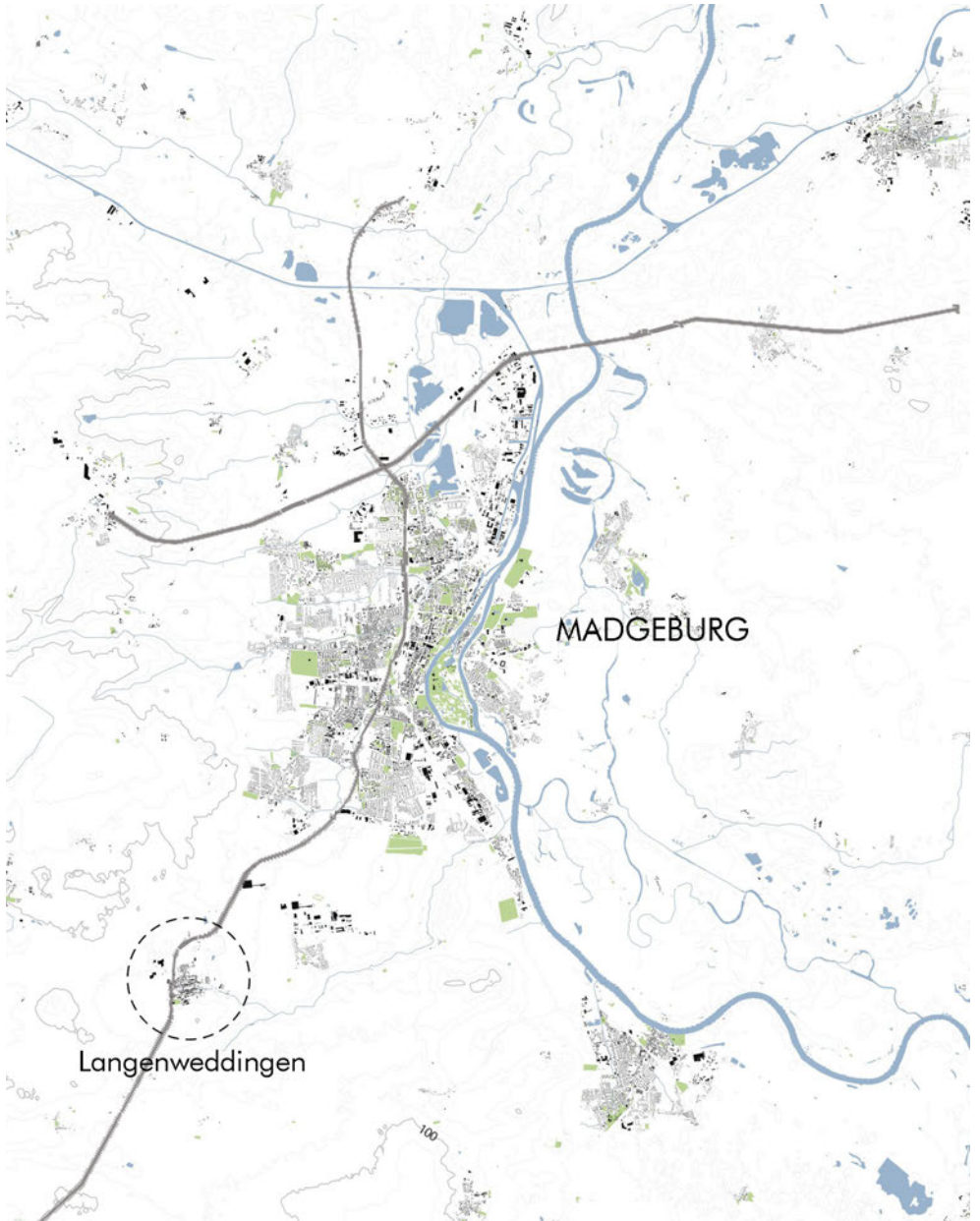
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The Rainbow - William Wordsworth

My heart leaps up when I behold

A rainbow in the sky:

So was it when my life began;

So is it now I am a man;

So be it when I shall grow old,

Or let me die!

The Child is father of the Man;

And I could wish my days to be

Bound each to each by natural piety.

Abstract

Intel is a company that was founded on 1968 in California, USA, that produces mainly technological products and known for the invention of microprocessors. Intel is situated mostly in USA, and also in Leixlip, Ireland in Europe. The headquarters have decided to locate a factory that serves as a new center for Europe and that will solve the problem of semiconductor manufacturing. They have decided on Langenweddigen, Madgeburg due to the following reasons: First, the site is a rural area, which means it is safe for the people to have the factory rather than an urban center. At the same time, it is close to developed urbanized areas, such as Madgeburg city center, Leipzig and Berlin. The outcome is good distribution opportunities. The company has decided on providing housing for the workers that will be placed in Langenweddigen.

The reaction to this design problem evolved around the research question of "How Langenweddigen can develop under the impact of the Intel investment?". The research by design project aimed at creating such a masterplan that the new site will be integrated into the already existing patterns of the village and develop it altogether with offering new typologies, green spaces and interests that will benefit socio-economy of the people of Langenweddigen. In addition to that, it will be connected to the existing infrastructure and won't cause insufficiency. Social housing developed rapidly during the Industrial Revolution. It contributed to the understanding of modern urbanization and it transformed the residential apartments.

There were experiments based on residential typologies. In some cases, the old hierarchical residential buildings have been separated into individual, low rise-high density structures. The fact that this studio emerges on a Rural Residential topic, it is crucial to mention the affect of nature. The residential will allow a relationship with nature to happen and give point to increased mental health whereas giving way to social interactions.

The short poem written by William Wordsworth reflects the spirit of the project by the verses of growing up with positive feelings surrounded by nature. There is the love of nature, the relationship between the natural world and the individual self, and the importance of childhood in making the poet the man he becomes, in the poem. The project aims at focusing on nature while developing the system around it. Therefore, it is suggested that nature brings happiness and peace to man.

The aim was to design various numbers of housing typologies in a modular way to create volumetric complexity. With the help of a grid, there will be a masterplan with public and private functions and the application of modularity would make the design flexible. This arrangement would be done in order to create the psychology of a community and a sense of belonging, with the help of organic architecture. Some buildings in the site are restored with public functions. To continue with, when thinking of togetherness in a rural and natural concept, one of the activities suggested in this project is farming.

On the public and semi-public areas that connect the people together, there will be fields for farming provided, either close to or separated from a private domain. This gives socio-economic opportunities with the restored organic markets and a sense of community gathered around a common area and a common goal. In addition to that, there are community gardens that gives opportunities to kids to play around with the surveillance of parents in an area that doesn't offer access to cars. The site is created mostly as a pedestrian and bike friendly environment.

I would like to thank both of my advisors. I thank my first advisor Prof. Johannes Kalvelage, for always being willing to discuss the project, guidance, and listening to what students have to say. I thank my second advisor, Corrado di Domenico for creating time from Naples, Italy and meeting regularly online. I see him full of knowledge and he's always willing to share, guide and support. I thank my parents for standing by me throughout the process, and my best friend Otto, for the moral support, and the delicious food. I would like to thank all the family members and friends who made it possible for me to concentrate and develop the project. This wouldn't have been possible without any of them.

To conclude, creating a healthy community with respect to nature was intended. The social identities that will be developed in the rural area will give way to act as a community and benefit from the socio-economic chances created, whereas a person will be an independent one at peace and harmony with the surrounding.

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1.Introduction

1.1 Introduction to Intel

The Intel Corporation has decided to invest 17 billion euros on factories of mega scale in Madgeburg, Germany.



Figure 1: Intel logo, *illustration from intel.de*

The world's largest semiconductor chip manufacturer is going to invest on farmlands which belong to rural communities. The land is characterized by humus and has high moisture capacity, which results in high agricultural yields. It has to be taken into consideration that any construction happening on those land, are to be done with taking care of the natural environment.

The villages and rural communities in the countryside of South Madgeburg have a long history of over thousand years. The investment from Intel is going to have a big impact on these rural communities and villages. It is important that the construction will not destroy the natural appeal enrich the area and make way for development by means of building a sense of community with community centres, schools, housing, infrastructure, parks and gardens. The project to be discussed mainly deals with housing and how it brings similar developments in Langenweddingen, grounded by the Intel investment. One of the major focuses of this project is to acknowledge the heritage and the identity (genius loci) of the place and the personality of the old village.

1.2 Introduction to Magdeburg, Sülzetal, Langenweddingen

Langenweddingen is a part of the Sülzetal municipality in Börde district in the federal state of Saxony-Anhalt and on the territory of the former DDR/GDR (Eastern Germany/German Democratic Republic). The population is 1961 as of December 2019, it is located 11km south-southwest of Magdeburg and 55km east of Wernigerode. The town is attached to the nearby Autobahn 7 for road traffic and has a train stop (a small train station) on the Magdeburg-Thale railway, a non-electrified largely single-track mainline connecting Magdeburg in the north with Thale (Schroeder, 2020). The soil present is loess, which is a clastic, silt-sized sediment and is very fertile.

The Magdeburg Börde is the famous central landscape of Sachsen-Anhalt. The soil type is loess, which is a clastic, silt-sized sediment. It is very fertile allowing for high agricultural yields. The culture and civilisation has been evolving and here has its own traditions.



Figure 2: Location of Magdeburg

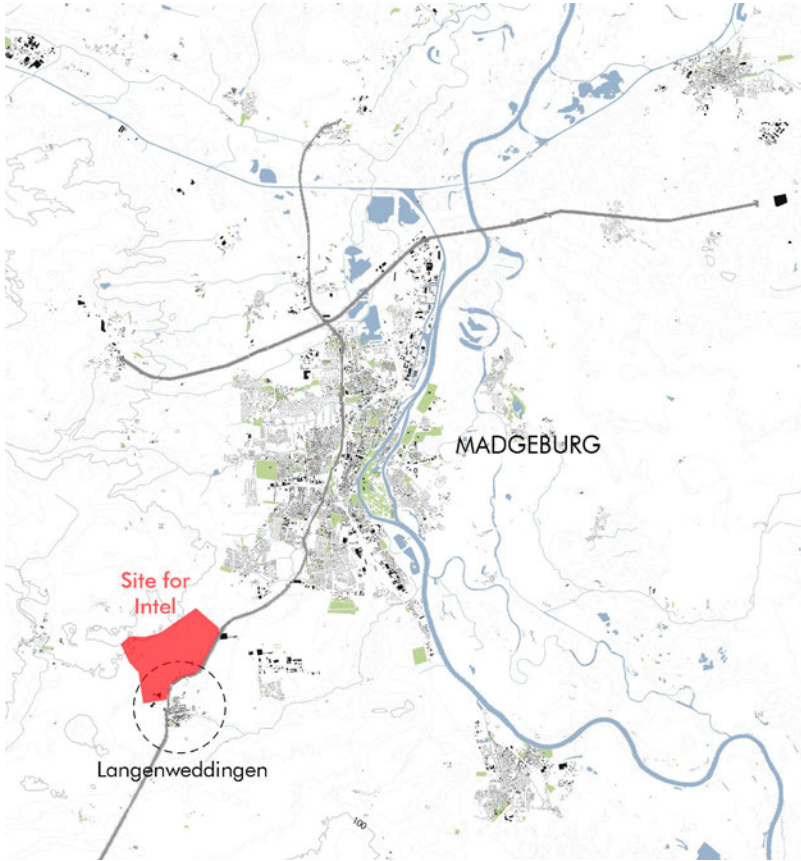


Figure 3: Map showing Madgeburg and Langenweddingen



Figure 4: Aerial view of Langenweddingen, via Google Maps

1.3 Problem Definition

Intel has decided to create a housing complex for the people that will be employed in the factory. With their improved mental health and well-being, the production chain can go on and both parties (Intel and the workers) would be benefiting from the contract. The houses should be suitable to support the life of the workers and their families.

The people who are already living in Langenweddingen are mostly families. The aim of the integration of the social housing comes with considerations.

“How will people reach the site?”

“What public functions do the site already has? Does it need new one?”

“Do the site need more greens? If so, what type of greens?”

The ultimate goal for the thesis is creating residential units for the workers to socialize and enjoy the nature. Meanwhile, people from Langenweddingen can come to the site and develop relationships with the workers that will arrive. Therefore, this project should propose not only housing but logical areas that brings people together. This way, the people of Langenweddingen will accept the workers and there will not be any isolation.

When doing this, it is crucial to remember that while one member of the family will be employed, the other member such as a parent, the kids of different ages or even the grandparents of the kids will need to adapt to the new location. The project can propose various activities that would give them a reason to go out, explore the site and make interactions with other people. The activities suggested will be a motivation for people to integrate themselves into the site. Levels of privacy and public usage should also be considered. Putting the theory of organic architecture to the center, which suggest to take a look at the already existing typologies when designing at the site, the houses in Langenweddingen can be considered for inspiration. Thus, the ultimate goal of this thesis is to come up with a strategy for creating housing embedded in nature and developing the Langenweddingen. Considering both the settled people in Langenweddingen and the new workers arriving it is necessary to investigate how the genius loci might be included in the process of building new residential places. With these considerations, It is critical to first define a purview in order to find the right techniques. In comparison to the physical and theoretical studies, this purview would become more apparent in the later sections of the thesis.

1.4 Research Question

This section is dedicated to forming the thesis question. The main question for this thesis and project was discovered as a result of the questions and challenges that were encountered throughout the research and the design process. These aspects would also be critical in the progression of this strategy.

The main thesis question would be:

“How Langenweddingen can develop under the impact of the Intel investment?”

The critical aim is to revitalize the countryside by means of social and economic. Since designing with nature is a critical point and it is proved to improve the well-being of people, natural implications on a rural project with a scale like this should be researched. The main natural spaces that comes to mind are:

- Gardens
- Parks
- Children play areas
- Farming fields

When we divide this question into parts which will help for understanding what type of approaches would be feasible for this topic, there are supporting questions that emerges:

“How can soil be used to create a beneficial, sustainable farming life?”

Since one of the goals is to integrate people together, it is needed to be asked:

“Who is the main target group? Is there a design approach that will be helpful to adapt itself to changing age groups?”

To answer this question, the flexibility of the volumetrical complexity of various designs will put advantage to the design in order to adapt to the changing needs and desires of different groups.

“What are the strengths and weaknesses of the site?”

When looking at the map, it is clear that there are rather small municipalities near Magdeburg. That means, the people who live in these villages can go to the big city by buses, trains or cars but there is a life present even without going to the big city. Therefore, the lifestyles and the activities present for the local people here are mostly about sharing with each other and enjoying nature. The weakness can be considered a lack of a big city infrastructure such as the distance to airports or hospitals. However, strengths of the site is that it is peaceful and away from the noise, pollution and the chaos the big city brings.

“What type of activities could be suggested? How can there be life with nature, can animals be part of it?”

This question was addressed by literature review and case studies and site visit.

“What buildings, senses or connections could be restored in order to fit in to the site and manage the resource?”

This suggests the annalyses of buildings to be

- Restored,
- Tore down
- Restored up to a certain degree.

The train and bus station connection should be considered as well.

1.5 Research Methodology

The aim of this thesis is to analyze, understand the already existing settlement of the site and design residentials and green areas to react to the needs of the Intel workers. Various methodologies were used to analyze the site, apply the knowledge on similar topics and try to evaluate the best possible outcome.

Methods

- Literature Review
- Case Studies
- Historical Analysis
- Socio-economic Analysis
- Site Visit

Methodology

The methodology used for this project is to understand every aspect of this combination during this design task and start to layer every aspect. The first aspect will be the function of the building, whether it is a private or a public domain. The second aspect is people, such as the target user group who will live there. The third aspect is the accesibility of the cluster. The fourth aspect is the different type of architecturally defined natural space that the user will experience. One critical point is where the privacy begins and the

semi-private or public usage ends. Some green areas can be connected with each other. In order to create a social life style, houses can be grouped. Sharing the immediate surroundings such as entrances or terraces can mean interacting with the neighbour so that it could create an extroverted push and therefore repeatedly eased interactions. These will encourage people to develop relationships, immediately with their close neighbours in the to-be-defined clusters.

In addition to that, the direction of the sunlight is considered. In residential, it is important to provide comfort by means of thermal and visual. It is important to consider that it is desired to have bedrooms which have East or West sunlight.

2. Literature Review - Case Studies

2.1 Literature Review

For this project, it was beneficial to read the following theories:

- Low Rise High Density
- Organic Architecture
- Social Housing

Low Rise High Density

Low rise high density housing emerged as a criticism of residentials being detached from each other as the cities kept growing. Sauer defines low-rise high-density in 4 principles:

1) to reach adequate real-estate densities suited to an urban setting (350-550 inhabitantsper hectare) through blocks not more than four storeys high.

However, in this brief of the project, it was decided that the houses would be max. 2 storeys high.

2) to provide each home-unit with a strong sense of individuality with the clear identification of separate elements of access, as far as possible directly from ground level.

3) to eliminate spaces without a precise territorial connotation, in particular to privatize most of the outside spaces by relating them directly to home-units.

4) instead of keeping housing blocks, streets and spaces separate, to create continuity of the constructions by a system of 'built fabric', governed by a grid and achieved by a system of overlapping home-units' (Vasilevska, 2011).

Low-rise, high-density structures achieve greater density not by increasing height but by decreasing unbuilt surface area. It is an approach that aims the integration of the buildings with the surrounding and prevent alienation of the buildings.

Low-rise, high-density housing attempts to combine the best elements of both urban and suburban development schemes: a multitude of public transportation options, access to urban services, moderate scale, public open space and individualized dwellings, such as providing tenants with more privacy and ownership of their space with fewer floors per building. It can therefore reduce sprawl and efficiently use the limited space found in the urban environment, while also maintaining the street grid and pedestrian pathways.

Organic Architecture

The term 'Organic Architecture' was used first by the American architect Frank Lloyd Wright on the beginning of the 20th Century. It can be defined as creating places that humans feel a part of the nature. It could be by means of materials or the design itself, both the architecture and the landscape. It aims to create a sustainable ecology and be in harmony with the nature. This also means respecting what was there before in the location of the building to be intended and ideologically it refers to 'Restoration', since preserving is a philosophy of Organic Architecture. "So here I am, preaching organic architecture, proclaiming organic architecture to be the contemporary ideal and the instruction so much required if we are to perceive the whole of life and now serve the whole of life, holding no traditions vital to the grand tradition..." (Wright, 1984). The houses that are designed by the architects who followed the theory of Organic Architecture experimented with walls. They mostly designed open floor plans so that the behaviour of human-beings would be more flexible, as if they are existing in nature. Natural sunlight and thermal accumulation is again a quality of Organic Architecture.



Figure 5: Portrait of Frank Lloyd Wright, via archeyes.com

Social Housing

The term 'Social Housing' can be mixed with the term 'Public Housing'. It is a tradition to offer the workers of a certain factory places to live since the age of Industrialization, since factories are mostly located on the outskirts of towns due to the environmental risks. However, this tradition changed on the 20th Century and social housing is seen even in cities which serve people with different job groups. According to the Cambridge Dictionary, the term means houses and flats that are owned by local government or by other organizations that do not make a profit, and that are rented to people who have low incomes. Social housing is defined as residential rental accommodation provided at sub-market prices that is targeted and allocated according to specific rules, such as identified need or waiting lists (Salvi del Pero et al., 2016). In this brief, some qualities of social housing have been considered, such as coming together in social areas and making common activities.

Even though Social Housing aims to fix some economic problems, it can also offer some solutions to social segregation and raise environmental awareness. (Grazuleviciute-Vileniske, 2013). According to Williams, there has been a demand from the housing ministers to even tore down the balconies and windows because they were simply 'unnecessary'. What social housing puts forward is a Humanistic approach which considers the wellbeing of the users. The developers cannot deliver characterless, poorly planned blocks. Social Housing should not "just provide a roof and four walls but should utilize creative design to make low-cost buildings feel like high-quality homes" (Nettler, 2013).

2.2 Case Studies

2.2.1. Maison Citrohan (1927), Stuttgart, Germany

The Citrohan house is the multiple-built design, between which three basic prototypes (Domino, Monol, Citrohan) that Le Corbusier designed for private houses that could be built in sequence (like the machines) could be built to create. The ground floor for access and dependencies is resolved freely, behind the visual curtain of the pilotis, by means of a layout with semi-cylindrical volumetric projections. On the first floor, the well-known living-dining room, kitchen and service areas appear resolved with great



Figure 6: Maison Citrohan, via www.wordpress.org

simplicity through the use of three partitions, two of them curved, and a central hearth. The second floor is reserved as usual for the master bedroom and its balcony boudoir. The use of curved partitions makes it possible to fully resolve the design of the minimal compartmentalized bathroom. (Schrader, 1996). The open plan is evident in the total plasticity and functionality with which it manages its straight or curved partitions, with complete independence of the supporting function exerted by the thin pilotis. The free façade allows the appearance of the

large double-height window, the elongated side windows and a small pulpit-shaped balcony, according to the needs of the functional program.

The free façade meant the possibility of freeing the surrounding wall from load-bearing functions, in order to have the freedom to order the solids and voids according to geometric compositional criteria. The fluency of the spaces must be observed, with the total opening of the room to the outside and the nuanced separation between the rooms, the route that forces the exploration of the entire construction, the free plasticity of the internal enclosures, the furniture, often of concrete or embedded, forming part of the house, the contrast between the structural base box and the other enclosing elements.

“There is no shame in living in a house without a painted roof and windows like those of factories” (Corbusier, 1931).

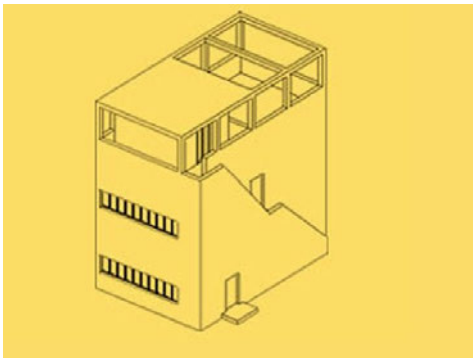


Figure 7: Axonometric drawing,
via *Wiki Arquitectura*

2.2.2 The Papaverhof, The Hague, Netherlands

The Papaverhof, a complex of 125 middle-class homes, was built on behalf of the Cooperative Housing Association Tuinstadwijk 'Daal en Berg'. The architect is Jan Wils. The complex consists of 65 single-family homes in two layers around a green square of approximately 70 x 100 meters.

The green square was made possible because Wils applied an ingenious circuit for the single-family homes. The houses are connected in pairs and mutually in such a way that space is left between the pairs for the entrances. The houses that face the street with their living room and entrance, overlook the square with their kitchen; the opposite applies to the houses on the square. The houses are spacious.



Figure 8: Entrance of residentials, www.architectuurgids.nl/

On the ground floor they contain a living room, a kitchen and a spacious entrance hall with a landing staircase that gives access to three bedrooms and a bathroom on the first floor. Above the bay window at the front of the house is a narrow window strip, so that sunlight can penetrate deep into the house. The apartments, which generally consist of four rooms, are accessed by a central stairwell. (Teunissen, 2017). Nationally, the complex shows kinship with the ideals of "De Stijl" (in the rectangular forms, the balanced compositions, the limitation of the decoration), internationally there are connections with the work of the American architect FL Wright (the many horizontal accents, the variation in block-shaped, open and closed building volumes and the subtle relief formation through the application of horizontal and vertical bands, the connection of the houses with nature. Partly due to these (inter)national connections, De Papaverhof has special cultural-historical value. In addition, the complex is an important opus in Wils' oeuvre and that it occupies a prominent place in the history of public housing, because the architect paid great attention to living in an urban community (Cultural Heritage Agency of the Netherlands).



Figure 9: Communal green space of the Papaverhof housing, www.architectuurgids.nl/

2.2.3 Zehlendorf Settlement, Berlin, Germany

Bruno Taut was just one of the many influential figures searching for deep change. Much of his utopian idealism came from his interest in the Garden City movement led by Sir Ebenezer Howard. The urban planning concept sought to find a balance between urban and rural landscapes. He was very attracted by the possibility of creating such communities. (Winfried, n.d.). The settlement of Zehlendorf was built between 1926 and 1931, on a scale for around 5,000 residents in around 2,000 residential units, of which 1,100 were rented apartments and around 900 were single-family terraced houses. affordable small apartments for lower income groups. (Röhrbein, 2019). The architecture is characterized by clarity and simplicity in design. A high level of spatial differentiation was achieved through the protrusions of the building structure.



Figure 10: Masterplan of Zehlendorf Settlement, via Röhrbein 2019

The trees were also included in the planning, so that a close proximity of nature and architecture could be preserved. The rows of houses open up again and again to reveal a view of the trees in the tenant gardens (Visit Berlin, n.d.). It is characterized by a three-story perimeter development and three-story rows perpendicular to the street. There are multiple typologies and a monotonous arrangement was avoided with variations and rotations.



Figure 11: Entrance façade of one of the various typologies, via www.brenne-architekten.de



Figure 12: Backyard and the green space of one of the various typologies, via www.onkeltomsladenstrasse.de

2.2.4 Urban Cluster

This project is taken from the book "Community and Privacy, Toward a New Architecture of Humanism" by Serge Chermayeff and Christopher Alexander by Anchor Books in the year of 1965. It is on page 204. It was designed by the thesis student Kozinsky in Yale School of Architecture and named "Urban Cluster". It creates a distinction from the street and create rather protected entrances, even though it can generate noise. It is beneficial that the car parks are central however they might need additional visual protection when the windows are facing towards them. For this project, the cluster and the courtyard approach is suitable with a local sunlight application.

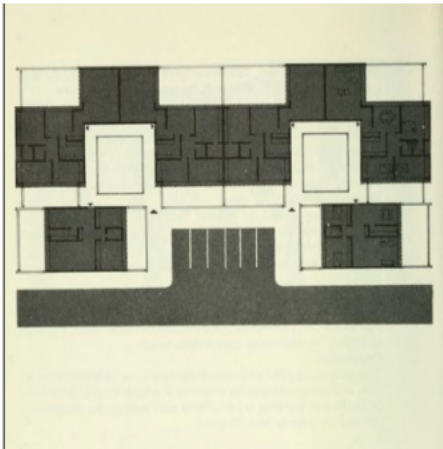


Figure 13: Floor plan of Kozinsky's thesis project, via the book 'Community and Privacy', pg 204.

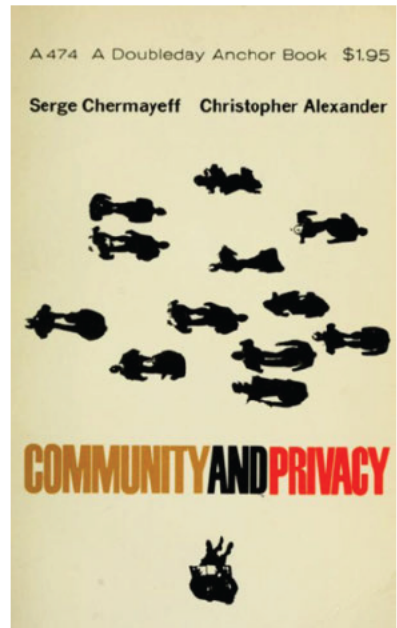


Figure 14: Cover page of the book 'Community and Privacy', via Amazon

2.2.5 Spangen Quarter Housing, Rotterdam

The Spangen estate, or Justus van Effen complex, is a rectangular four-story brick urban block, centered around two large courts. It is the first housing project where the concept of Streets on the sky is carried out. Concrete balconies give access to the duplex apartments on the top floors. In its heyday, the project offered many shared amenities, like a public bath house located between the two courtyards. A communal spirit was further promoted by making the decks publicly accessible; large cargo lifts allowed tradesmen to reach tenants' front doors. (Wensing, 2014). The access to housing is made through a one kilometre length and 2-3 meter width gallery. The gallery is located in the interior courtyard of the building, so it is considered as a private space and there is no visual connection with the neighbourhood. However, it is the first time in a built project where it appears a transition space between the public street and the flats. The Concept of streets in the sky was developed in future projects such as L'Unite d'Habitation of Le Corbusier. (Hidden Architecture, 2015).



Figure 15: Entrance facade, via *Hidden Architecture*

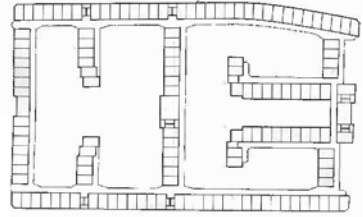


Figure 16: Plans of first floor, via *Hidden Architecture*



Figure 17: The courtyard and bicycles, via *Hidden Architecture*

3. Context

This section would look at two specific ways of analyses.

1. A contextual investigation of Langenweddingen through maps and research.
2. In site examinations such as taking photos, sketching, analysing at site and talking to local people.

The majority of the information is obtained through site visits and current maps available on municipal websites. It is crucial to fully grasp the potentials, strength and weaknesses of the site and the orientation it could bring for the new design.

3.1 Contextual Analysis of Langenweddingen

Contextual Investigation consists of the following:

- Historical Analysis
- Socio-economic Analysis
- Weather Analysis
- Soil Analysis
- Vehicle Paths

3.1.1. Historical Analysis

In 937 the place was donated to the Moritz monastery by Otto I. From 1563 it belonged to the office of Hadmersleben. In addition to the widely ramified "de Weddinge" family, two knights and 15 farmers were also resident in the town in 1363. Since then, the growth of the area was intended to be as an urban one. There was no less than three churches further in the Middle Ages, the Georgskirche, now the village church, the Stephanskirche until the 12th century and that of the village of Schleningen. The St. George's Church was rebuilt in 1703, including the western transept (around 1200). In 1563 it was already the only church in town. The 3 towns of Weddingen, Kreipe and Schleningen, which were originally separate towns, have merged into Langenweddingen. In 1563, Langenweddingen was the largest village in the Magdeburg region. Until the 19th century, Langenweddingen was characterized by agriculture and two chicory kilns, one kiln and a sugar factory were in operation as related industries. There were 5 windmills and watermills, the Meiersche, the Mittel-, the Kirchen-, the Plat- and the Amtsmühle. A biscuit factory was created from the old lime works on the Osterberge, and after 1945 a canning factory. Many of the former farms are still preserved today as witnesses of the past. Its size and furnishings show the wealth of the peasants from the 19th century to the middle of the 20th century (Gemeinde Sülzetal).

Thanks to its favorable location in relation to the state capital, Langenweddingen has the prerequisites to develop into a modern residential area. The quarries between Langenweddingen and Sülldorf invite nature lovers to take a hike. In the middle of the merger of the municipalities on April 1st, 2001, Langenweddingen is a district of the new unified municipality of Sülzetal. Before it was founded, referendums were held in the seven formerly independent municipalities of Altenweddingen, Bahrendorf/Stemmern, Dodendorf, Langenweddingen, Osterweddingen, Schwaneberg and Sülldorf. Today the municipality consists of eight equal districts. In each district, a local council was elected to represent the interests of the respective district.

Due to its location in the middle of the Magdeburg Börde, the municipality is characterized by agriculture to this day, grain, potatoes and sugar beet are the main crops. Due to the good infrastructure - the A14 and the federal highways 71 and 81 touch and cross the community directly, the state capital Magdeburg is right in front of the door - a big economic growth has been recorded in recent years. The settlement of companies here have created thousands of job opportunities in the logistics sector, mechanical engineering and food production - and this development is continuing.

The creation of jobs also means a large increase in the population. In the individual districts, large areas of private homes were created, which brought many young families with children to the community, so that the occupancy of the day-care center is secured for the time being.



Figure 18: View of the Culture House in Langenweddingen in 1951, via <https://de.nailizakon.com/s/15-st/sulzetal/sulzetal.html>

3.1.2. Socio-Economic Analysis

Branch	Altenweddg.	Bahren-dorf	Doden-dorf	Langenweddg.	Osterweddg.	Schwan-berg	Stem-mern	Sülldorf	Gesamt Branche
Carpentry	32	11	18	28	29	4	1	8	131
Services	45	9	20	46	71	7	4	5	207
Trade	17	5	8	18	20	2	0	1	71
PV-Installations	1	0	0	2	1	0	0	0	4
Hospitality	2	1	0	1	3	1	0	1	9
Agriculture	4	1	1	10	5	5	3	4	33
Transport	6	0	4	6	10	0	2	0	28
Industrie	1	0	8	4	25	0	0	1	39
Open Mining	0	0	0	1	0	0	0	0	1
Others	9	2	1	6	6	2	0	0	26
Private Sales	47	19	19	42	41	8	5	6	187
Total	164	48	79	164	211	29	15	26	736

(Quelle: Daten Statistisches Landesamt Sachsen-Anhalt, 2017)

Figure 19: Branches of people working in Langenweddingen, via Landesamt Sachsony Anhalt

Main choice of income for the inhabitants are Services, Private Sales and Carpentry. Noticeable is the low percentage of working Individuals in the Village, and further a lower percentage of Technology/Industry occupations. Additionally, Sachsen-Anhalt is one of the Federal States with the least graduates. According to "Integrierte Gemeindeentwicklungskonzept" there is a need for Growth Strategies in terms of Industry. Therefore the Intel investment will change this distribution graphic and there will be an increase in Industry.

Agriculture is the 4th most preferred source of income. There are people present on the site who are already applying their knowledge and skills in agriculture. Due to datas from Sachsony Anhalt Stateoffice, the population in Langenweddingen will decrease. The mitigation of the workers with their families with kids will change this number and the distribution of the age drastically.

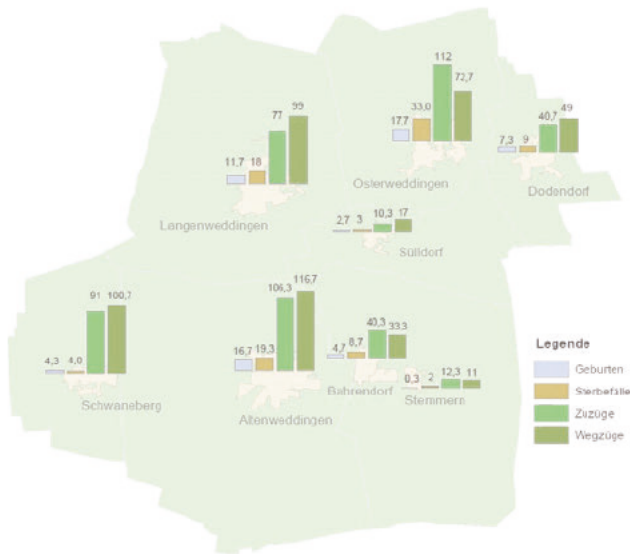
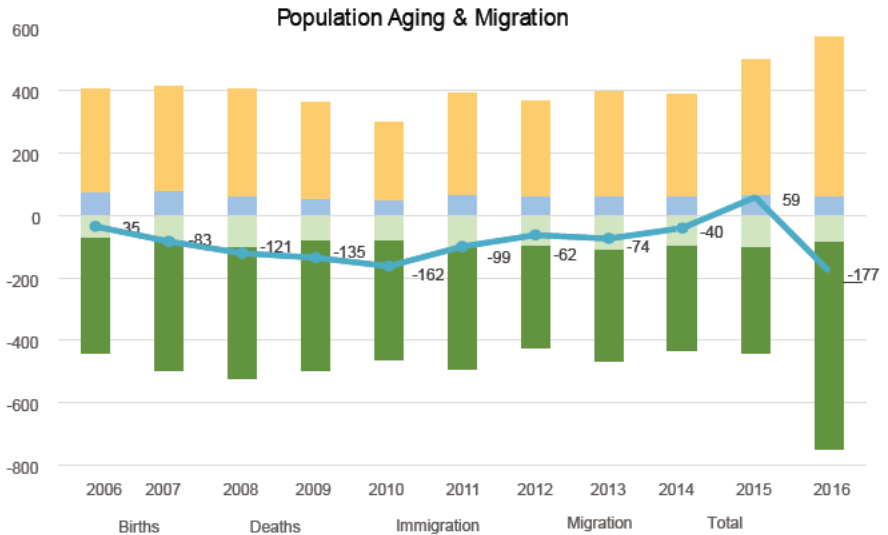


Figure 20: Ratio of birth, death, people who move away and move in, via Landesamt Sachsony Anhalt



(Quelle: Daten Statistisches Landesamt Sachsen-Anhalt, 2017)

Figure 21: Graph showing population aging & migration through years, via Landesamt Sachsony Anhalt

3.1.3. Weather Analysis

In the data graph in Figure 22, the coldest temperature in Winter is -7°C . In warmest temperature estimated in Summer 2023 is 26°C . For the graph, every month has been taken into consideration. August for Summer and February for winter had been selected to represent the warmest and coldest temperatures in 2023.

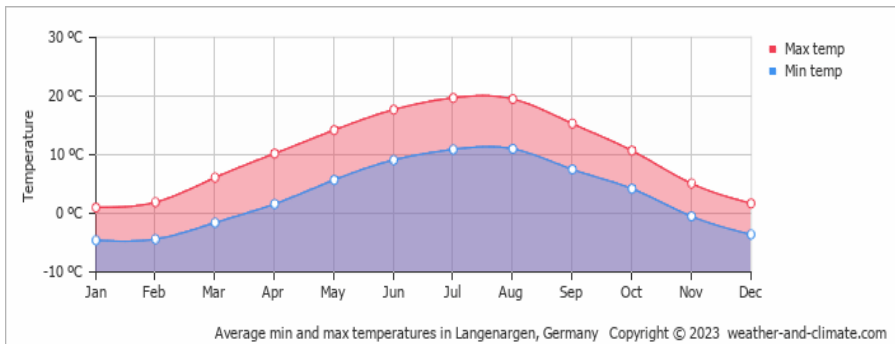


Figure 22: Average min and max temperatures, via www.weather-and-climate.com

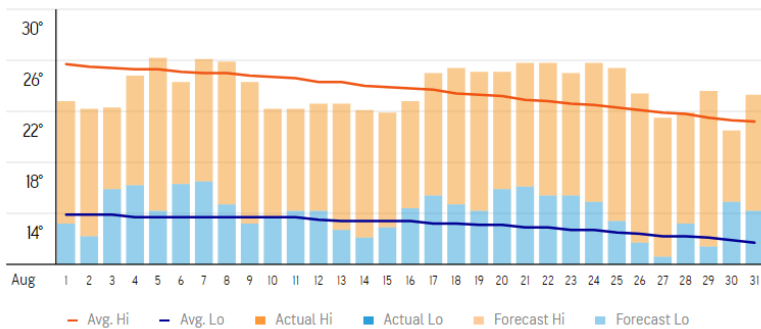


Figure 23: August 2023 temperatures in Langenweddingen, via www.accuweather.com

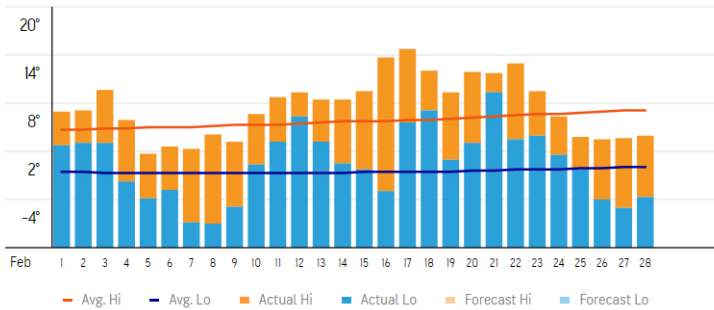


Figure 24: February 2023 temperatures in Langenweddingen, via www.accuweather.com

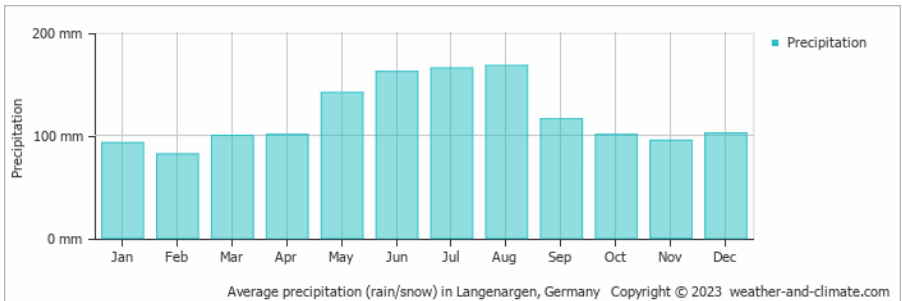


Figure 25: Monthly precipitation, via www.weather-and-climate.com

3.1.4. Soil Analysis

A loess is a clastic, predominantly silt-sized sediment that is formed by the accumulation of wind-blown dust. Ten percent of Earth's land area is covered by loesses or similar deposits. (Frechen, 2011). Loesses have been described as rich, dust-like soil. Under appropriate climatic conditions, it is considered to be one of the most agriculturally productive terrain in the world.

3.1.5. Vehicle Paths

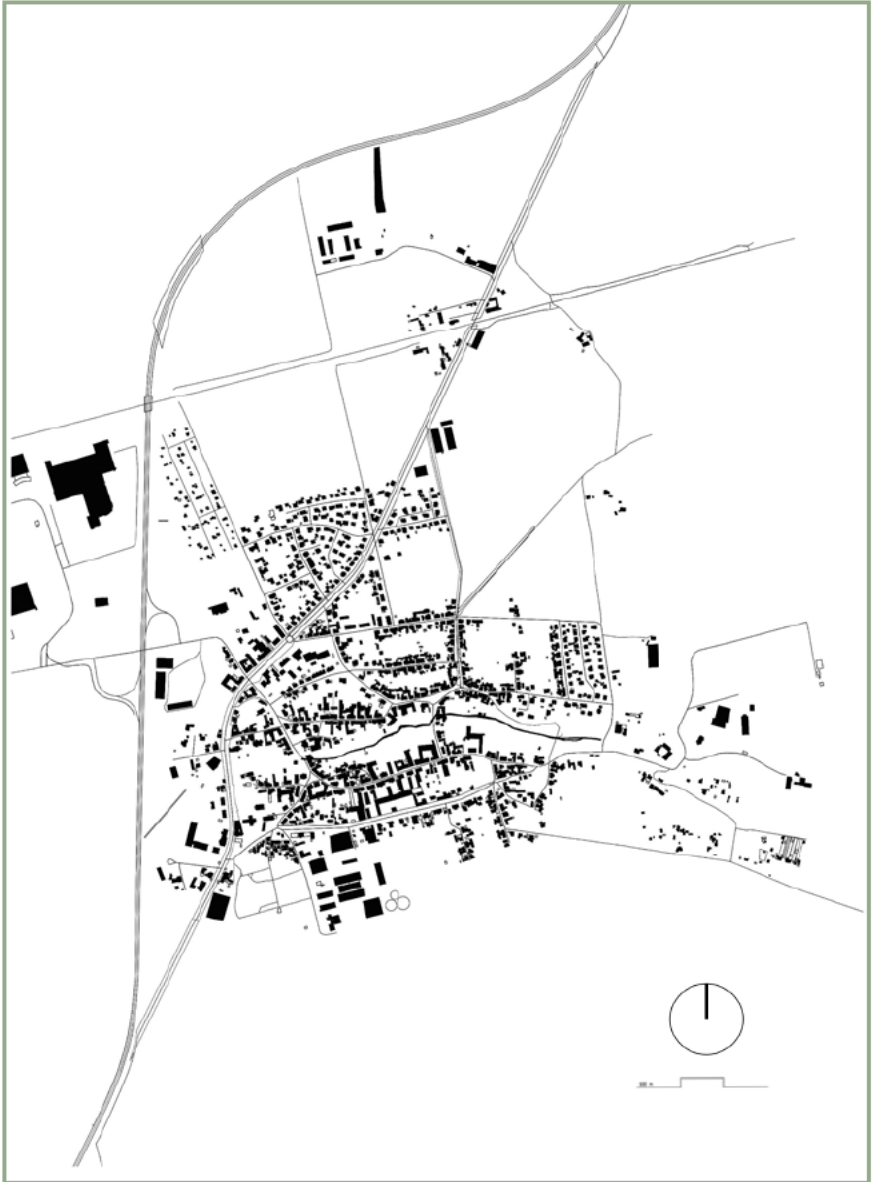


Figure 26: Schwarz Plan

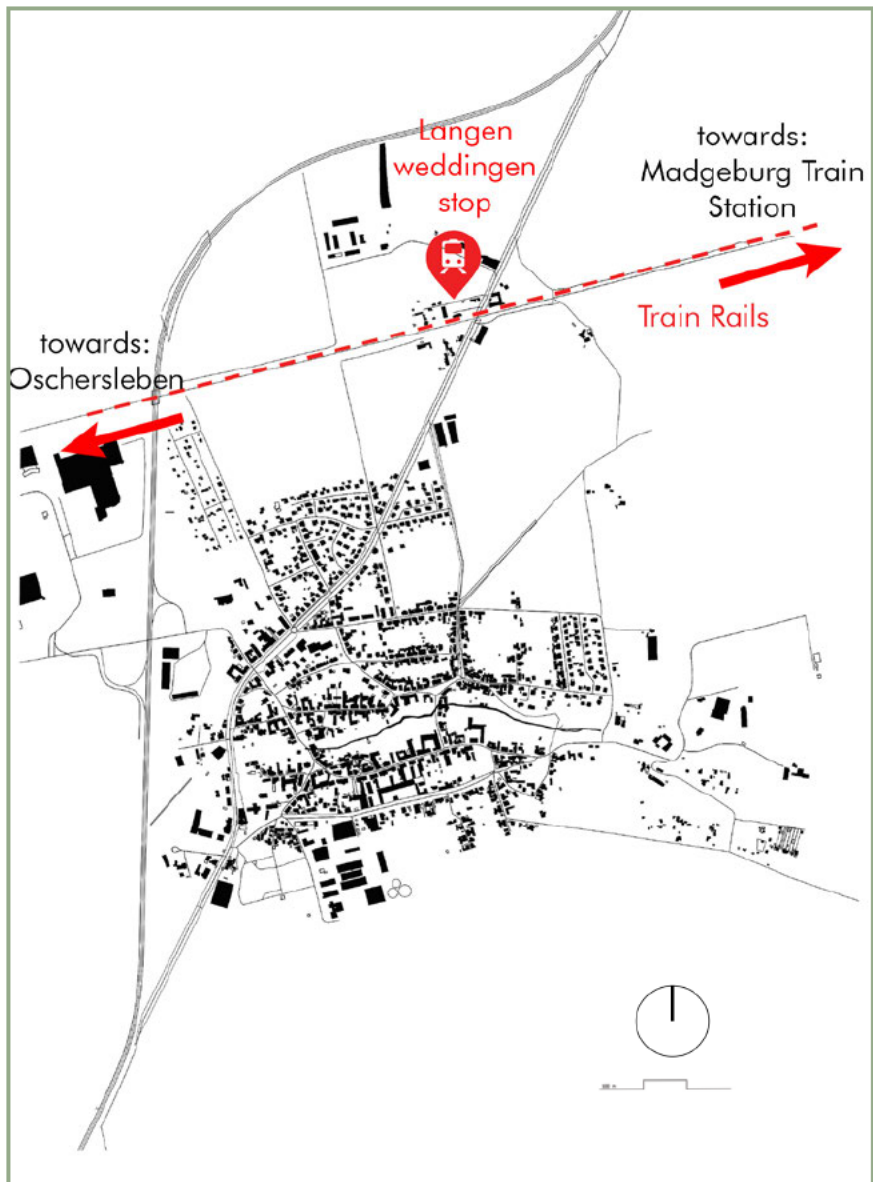


Figure 27: The train rails and train connection



Figure 28: Highway 81



Figure 29: Site selected for the project to be constructed



Figure 30: Aerial view of the selected site, via Google Maps

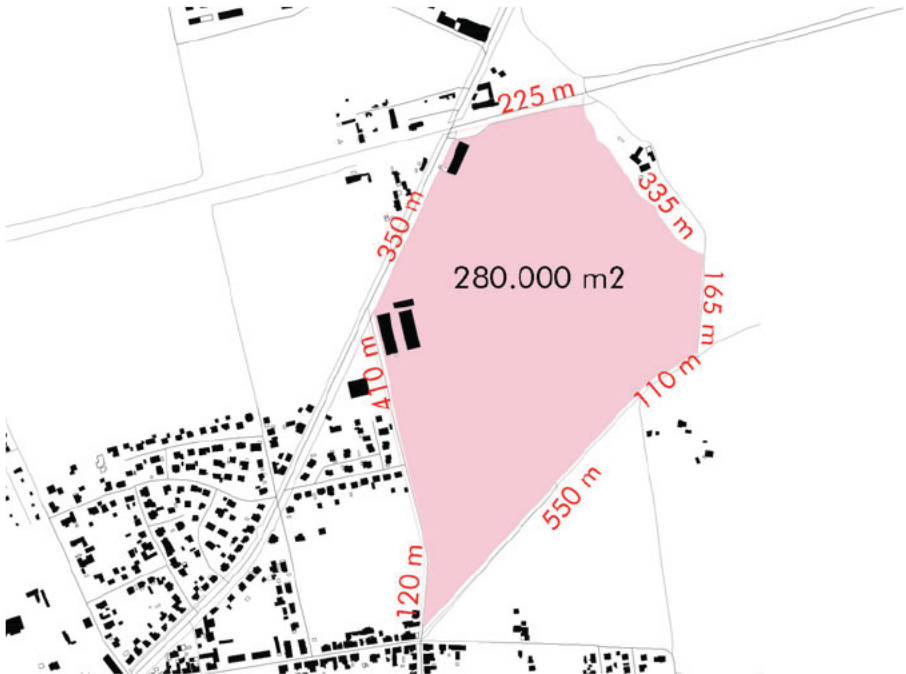


Figure 31: Measurements of the selected site



Figure 32: Already existing green on the selected site

3.2 In Site Analysis

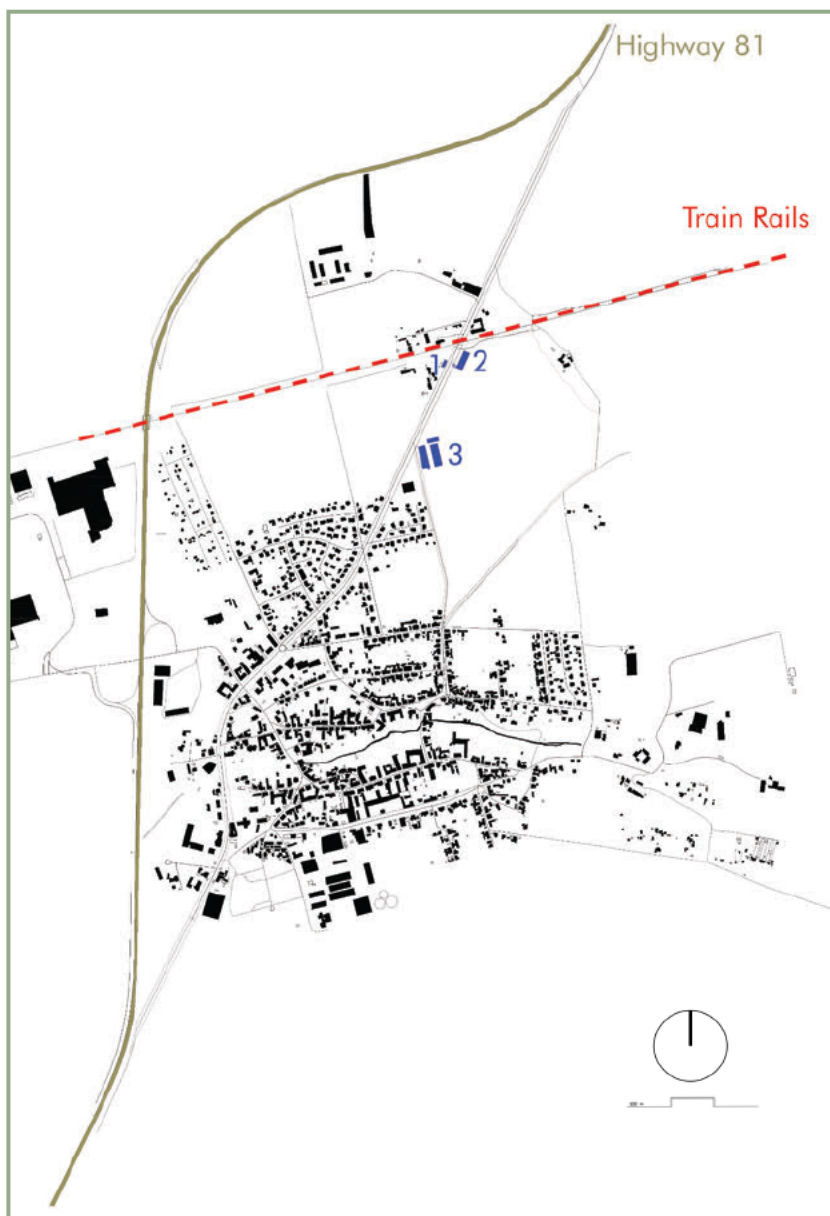


Figure 33: Map showing elements 1, 2 and 3.



Figure 34: Building next to the train station number 1 on Figure 33



Figure 35: Old, longitudinal factory buildings number 2 on Figure 33

There is a train station present. After the train station, there is a 500 m distance to reach the closest residential present so there is a more public potential there. Here, safety is needed when considering day and night.

There are longitudinally structured, old factories present towards the Northwest of the site (Figure 35). The buildings are in a good shape, they could be restored. Since it is close to the train station, the area can be used as more of a public space. The potential of festivals during holidays or summer breaks can be considered, since the beauty and the greatness of the nature is also present. There is a building made out of brick (Figure 36), across the road of the train station, with multiple storeys. This building can also be restored and turned into a commercial center. Would it be suitable as a bazaar?



Figure 36: Brick building with multiple storeys next to the train station number 3 on Figure 33.

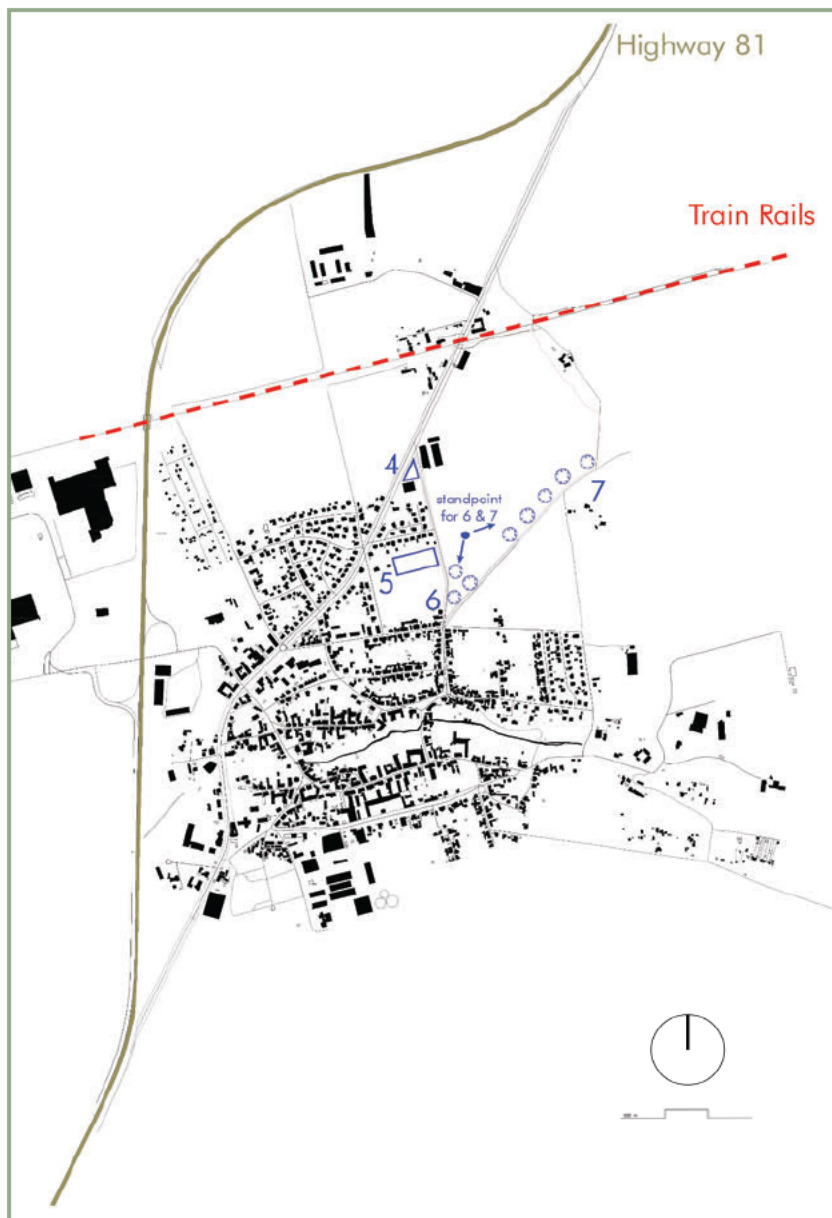


Figure 37: Map showing elements 4, 5, 6 and 7.



Figure 38: A foal at the site, in a horse farm, number 4 on Figure 37.

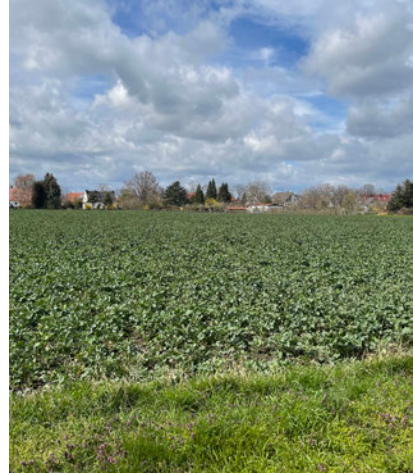


Figure 39: Agricultural fields at the site, number 5 on Figure 37.

On Figure 39, there are lamb lettuce fields present. On Figure 40 and 41, there is a periphery of linden trees present on the Southwest of the site. The idea of organic architecture is towards preservation so these trees could be preserved. There is a path next to it, which belongs to the 8th Century. This can also be preserved. This could mean the entrance of the cars can be controlled and the locations where trees are present won't be open to allow access from cars. Therefore this space can be a more natural area.



Figure 40: Linden trees with a pathway, number 6 on Figure 37.



Figure 41: Linden trees, number 7 on Figure 37.

Towards the village

Langenweddingen is a very quiet, rural area. The height of the houses are not more than maximum of 8-9 meters as could be seen in Figure A. The storey of most residential are 3 max. The materials of the residential change from brick to wood, to stucco plaster paint to salk lime. The colours also differentiate however generally, there aren't many bright colours on the façade, other than the red house with an inner courtyard which has a garden (Figure 57).

Since it is a rural area, houses are designed in such a way that they include nature on their private domains. Houses are also close to green spaces that are considered to be in walkable distances. The site feels rather peaceful.

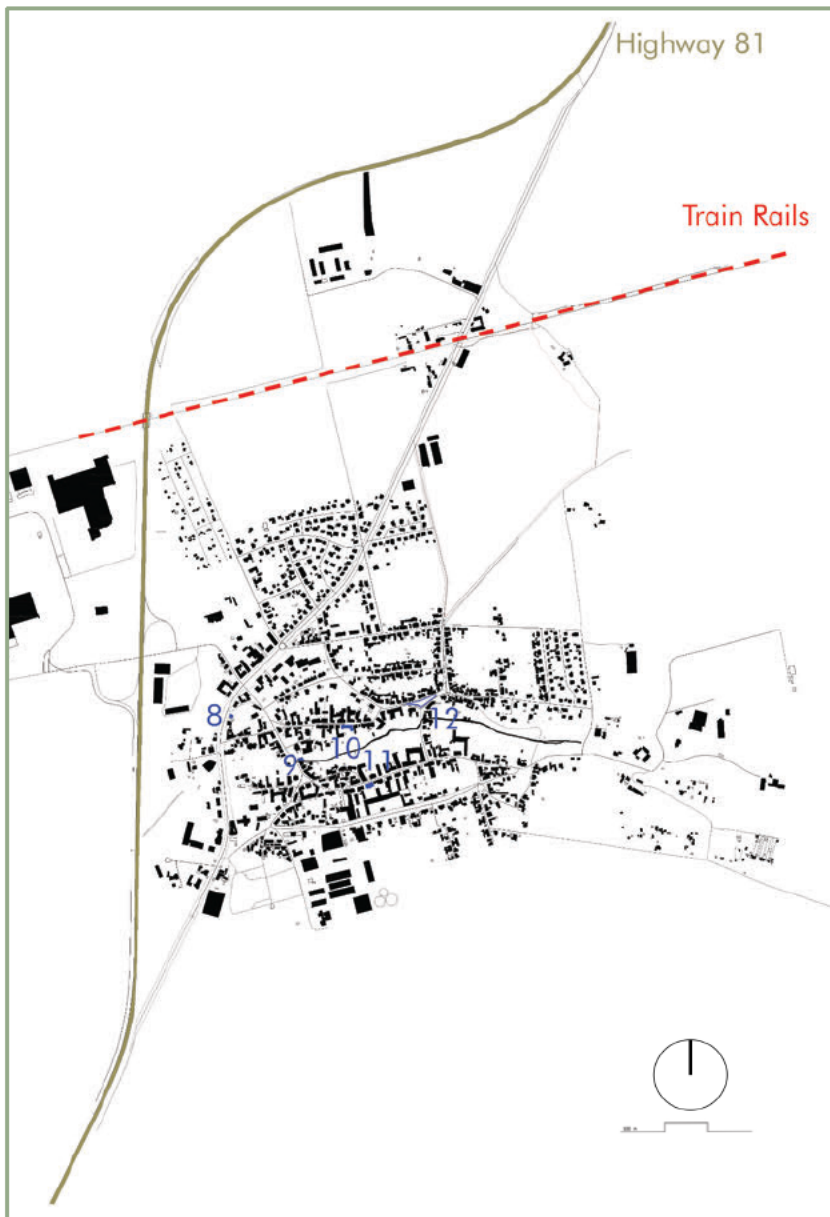


Figure 42: Map showing elements 8, 9, 10, 11 and 12.



Figure 43: A house with nature branching on the façade, number 8 on Figure 42.



Figure 44: A backyard and its relationship with the common green, number 9 on Figure 42.



Figure 45: House with red openings, a courtyard with a garden in the middle, number 10 in Figure 42.



Figure 46: Architectural qualities of the residentials, height max. 8 meters, number 11 in Figure 43.



Figure 47: Common green in the neighbourhood, number 12 in Figure 45.

There is a 2 storey kindergarden present in the village. When the Intel workers arrive, it would be beneficial to keep it in mind that this kindergarden will not be enough for 300-400 residential homes, when given the ratio, most of them will be families with kids. Additional day care will be needed.



Figure 48: The kindergarden in Langenweddingen

4. Design Development

4.1 Design Philosophy

This section would help to define a design approach. It contains four sub-headings in order to clarify the process. Those are:

- Design Problem
- Approach's Definition
- Users
- Targeted Values

4.1.1. Design Problem

This site has side length greater than 400 m (Figure 31). So this means it could be a logical idea to develop groups of residentials, where different typologies can be designed and adapted to target users considering the length of the site. Also, the soil is fertile (Figure 30), so there could be a distinction of strategies on where to develop the residentials, where to offer the common green areas and where to use the soil to generate food.

Will there be car entrances to the site? Most possibly yes, workers will own cars. So, there should be a sufficient car road designed around the groups of homes and lands. However, they should not prevail the quality of life and green spaces, and generate too much noise and pollution.

4.1.2. Approach's Definition

The main approach when designing the masterplan is creating a gridal system which repeats itself throughout the site since it is an area of 28.000 m², which will adapt and differentiate to different aspects; such as different buildings, car roads (access), users and contain green spaces. In order to benefit from this repeated grid system, the essence of this grid should include every aspect that will be needed to sustain each cluster. Then the building typology will start to evolve as different types of residentials. It is crucial to mention the strategy of differentiating spaces and green areas as *public* or *private* will help the development in the sense that the approach will aim to satisfy the user on different levels.

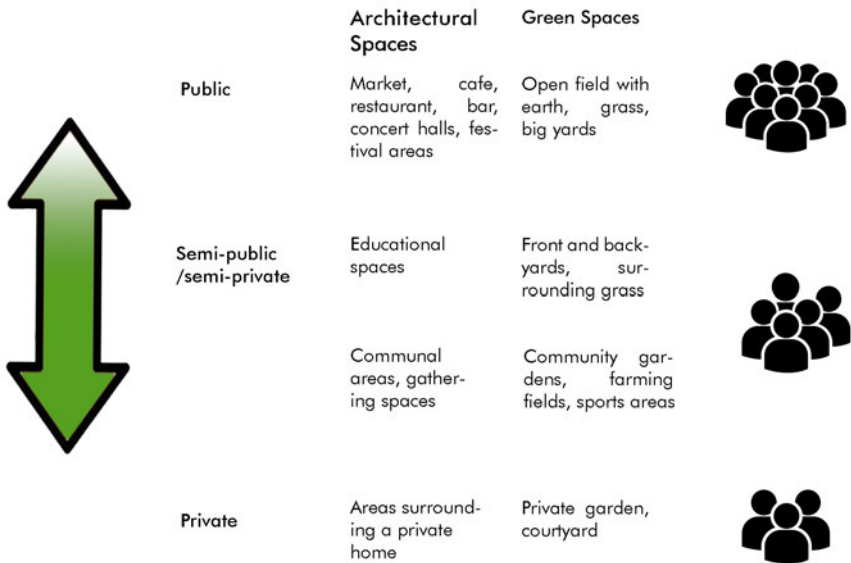


Figure 49: The changing level of privacy and the correspondant space design with qualitative number of people

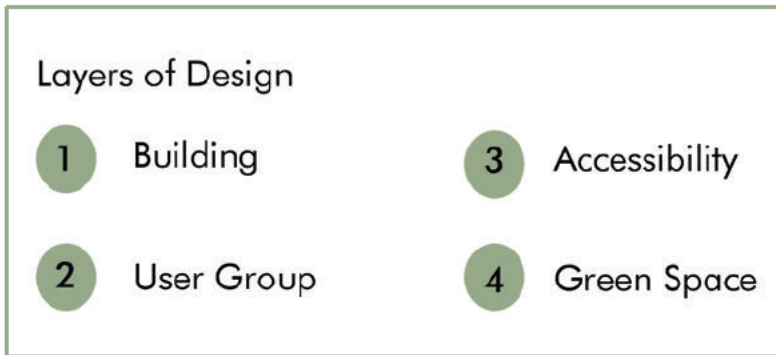


Figure 50: Layers of design, with 4 aspects

There can be examples given for private, semi-private and public buildings and activities. Residentials will be considered as private domains, whereas the space for the immediate-gardens and yards can be considered semi-private. To suggest activities on a public level, the markets, restaurants, the green areas that surround it can be proposed. It can be said that every island and building should have a car access. The accessibility can change depending on the public or the private level of the space.

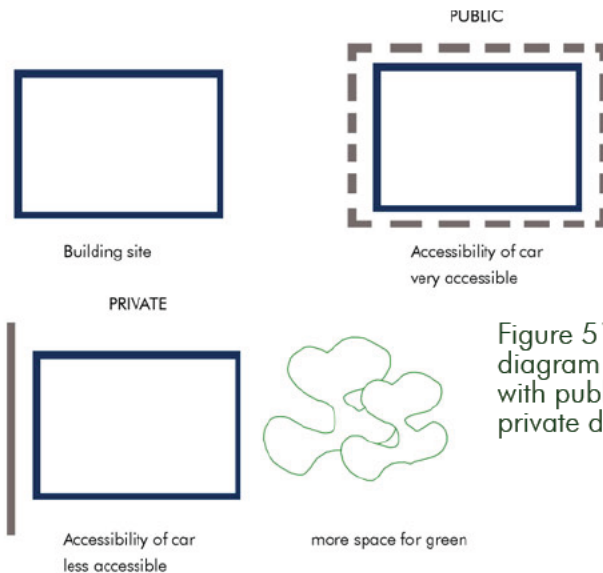


Figure 51: Accessibility diagram for cars differing with public and private domains.

4.1.3. User

- Workers for Intel. Families with different numbers of kids. The housing units for the Intel workers will be consisting of mostly educated people, such as white-collar workers.
- For public areas: Workers for Intel and their families as well as the people of Langenweddingen.
- For commercial purposes, people from villages nearby, or Madgeburg can be considered.

4.1.4. Targeted Values

- Comfort for the residents
- Balanced and connected lifestyle to nature, which offers good mental and physical health
- Local food production resources
- Social areas for connection and a communal life-style
- Socio-economic opportunities, in accordance with ecology

Gardening and farming is included in targeted values by means of creating green areas and giving ecologic socio-economic opportunities.

Gardening - Farming

Urban gardening has the potential to turn the growing number of consumers into conscious producers by raising awareness of natural resource cycles, contributing to environmental conservation and climate change mitigation (Winkler, 2019). Langenweddingen is a rural setting. However, the consumer is also located in the rural setting. Therefore, if people who live here will benefit from the production in the site, then there won't be any transportation vehicle which gives out CO₂. Also, if the operating efficiency is improved or farming techniques that use less fuel is adopted, such as no-till, they will reduce their fossil fuel-based emissions. Therefore there will be a sustainable production chain of local food sources offered and new job opportunities for the people will be created. The worker and the client will be living in the same area. When the producers want to sell the vegetables and the fruits gathered, they can sell it directly at the site, in the market areas. This can attract people to the site as well.

The people living in Langenweddingen are already farming for a source of income (Figure 19).

Therefore, when this activity is suggested for the new residents, they can bond well with people who live in Langenweddingen. One person in the family of the user group will already be occupied with his/her job in Intel. The farming and gardening activities can be offered as a hobby to the already occupied person.

On the other hand, a person in the family who is not employed by Intel can do this as a source of income. Therefore, the suggested activity will be flexible.

It is crucial to mention that there should be storage places and markets nearby present so that the transportation wouldn't cost much and damage the environment.



Figure 52: Farming example, via NBC News

In Langenweddingen, it already grows lamb's lettuce and lettuce. These can be suggested to be planted on farming fields. The possibility of gardening can also be proposed, which could be in closer distances to residential areas to suggest a different type of activity. They could be situated in common greens or even backyards.

Proposal of types of plants to grow on the residential site:

1. Lettuce



2. Lamb's lettuce



3. Berries



Figure 53: Photos of types of plants that grows in Langenweddingen, via *NDR, Better homes and gardens* and *www.hedging.ie* respectively

To conclude, the main strategy used in this approach is to:

- Define the building, whether it is a residential or what type of a residential. The distinctions between residentials will be further explained in the following chapter.
- Define the user group, families with how many kids or teenagers will use the area.
- Define the green area, whether it is a common or a private area.
- Define the car road connection, whether it is a dynamic road or a static one where cars are allowed to wait.
- Getting help from the critical point of deciding on which scale the area will be public or private, and the following question: 'What type of a relationship with the immediate surrounding will be formed?'

4.2. Application to Site

The site shown on Figure 29 is selected because of the fertile soil and the connection to the possible restored buildings. To begin with, a generic grid has been applied with dimensions of a rectangle to be able to suit a house of 10 m x 10 m. To get these dimensions, the houses measured in Site Analysis was taken as a reference.

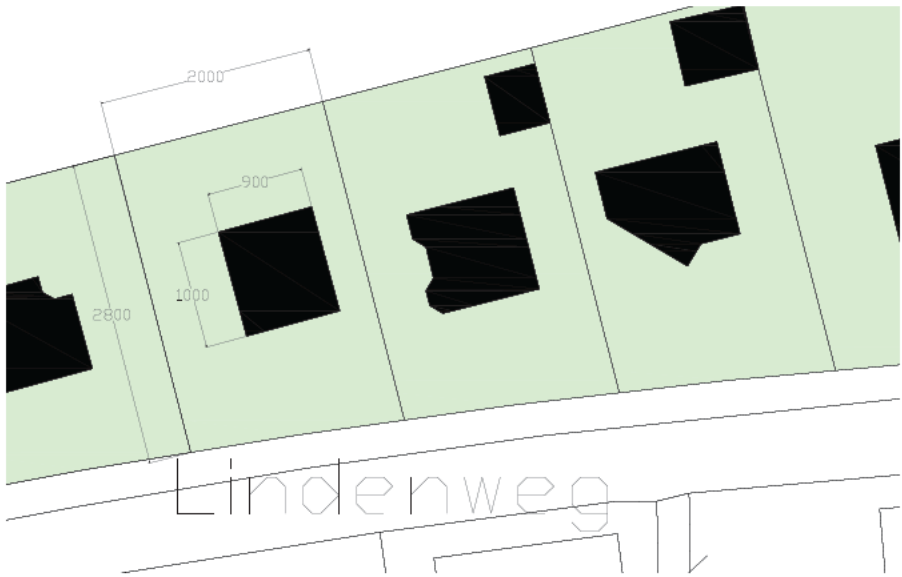


Figure 54: Plot of the houses in Lindenweg, Langenweddingen, showing measurements



Figure 55: Sketching through the already existing patterns, forming the grid.



Figure 56: The generic grid of 20 m X 40 m, next to the preserved farming area in green.

This generic grid on Figure 41 originated from the already existing pattern of site boundaries of the houses. The houses found in Langenweddingen have mostly %20 building - %80 green, and the houses are usually 10 m x 10. This grid is 20 m x 40 m, so that it could be experimented with social

This grid will be advantageous to understand the ratio of greens and houses to be located and to adapt the groups of buildings to the car roads to be suggested.

One of the common green spaces can be the fertile soil in Figure 29. After Site Visit, it was clear that it is ready for sowing and reaping. If the distances from the fields to the houses are logical, this could work as a socio-economic opportunity for people to farm, store and sell together. When suggesting this, it is important to keep in mind that surrounding the field, could be activities present to support and motivate the person to work, such as resting and social areas. This site is suitable for physical activities, a person can go back home after working in the field by bicycle or walking. The possibility of reaching the field with trucks or cars will be explained further in this chapter.

The building number 1 in Figure 57 will be restored and used as a market, since it is close to the fertile ground so that goods can be stored here. It is also close to the train station and the main road. A person can easily stop by and shop from the market.

The longitudinal factories in Frame 2 in Figure 57, will also be restored and kept as restaurants, bars, cafes and retail shops such as banks, post offices, hairdressers, bookshops etc. Therefore, in the area that is adjacent to the main road, will be a social center present, supported by the train station. It suggest communal and public activities to be located on an easily accessible location.

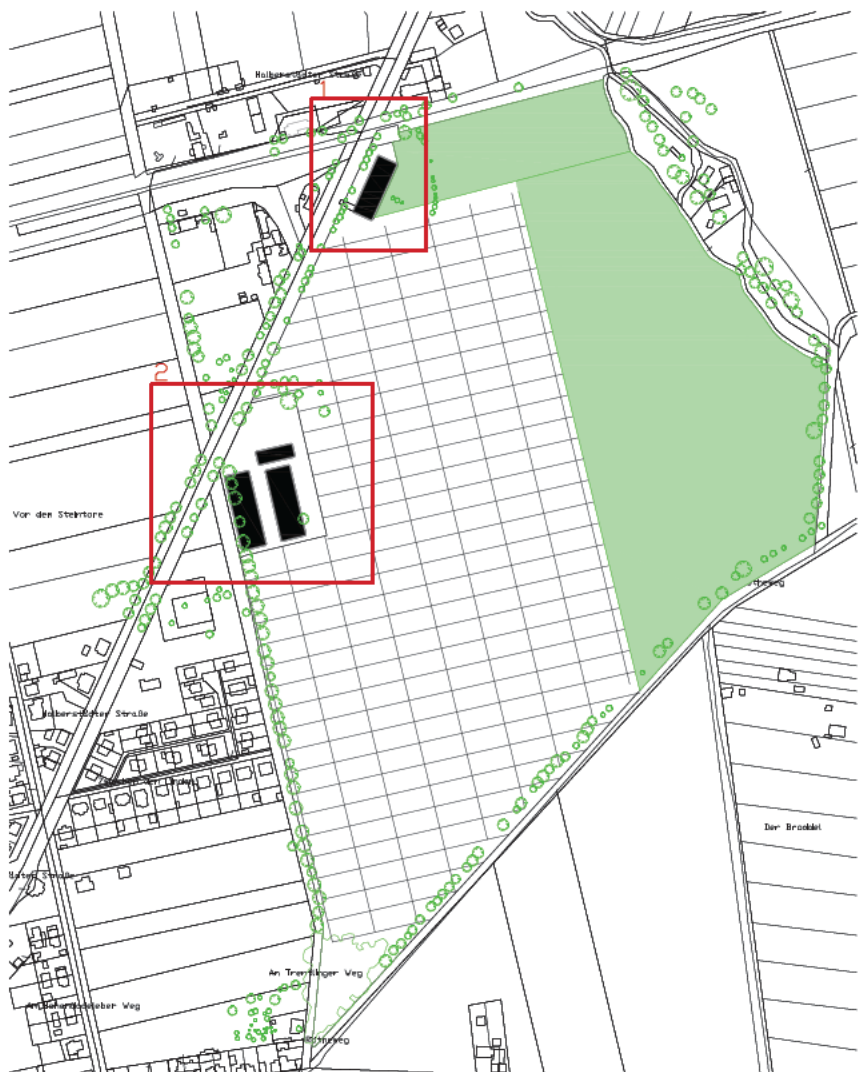


Figure 57: Frames number 1 and number 2, showing already existing buildings

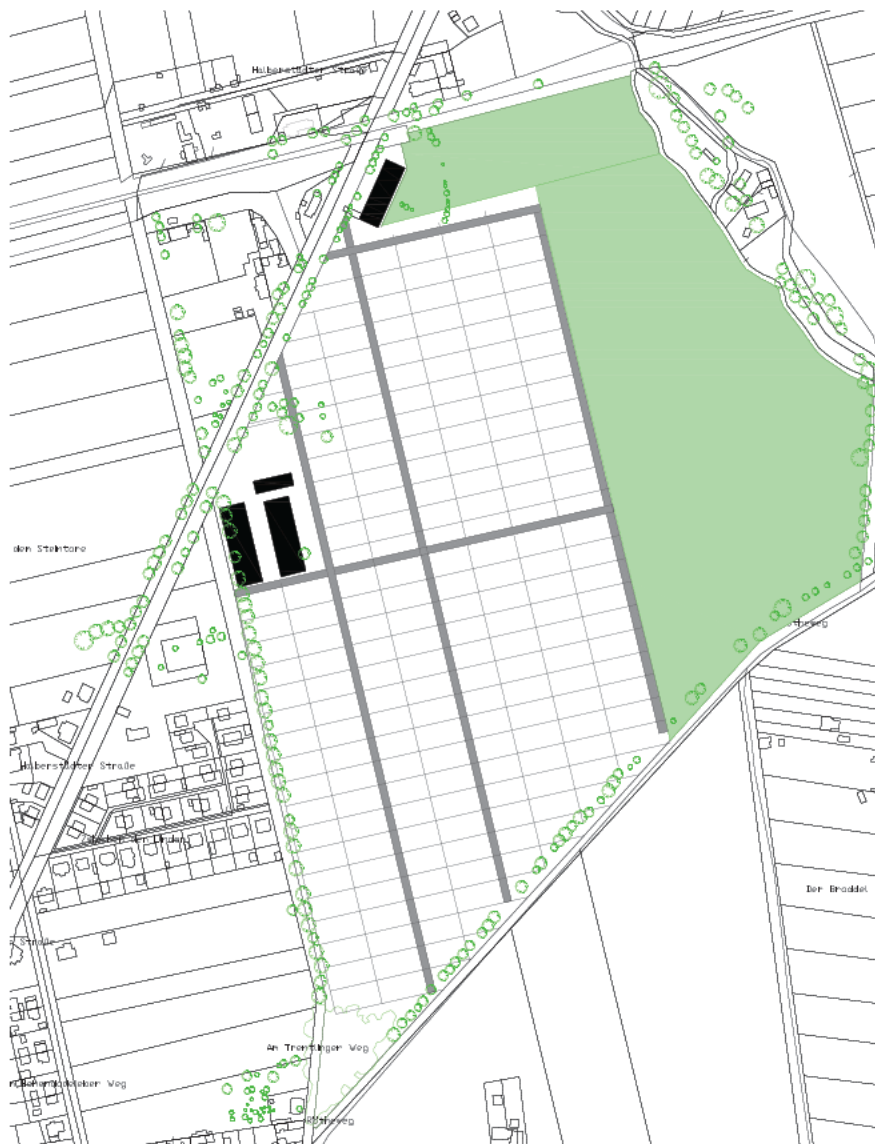


Figure 58: Application of car roads next to the public functions.

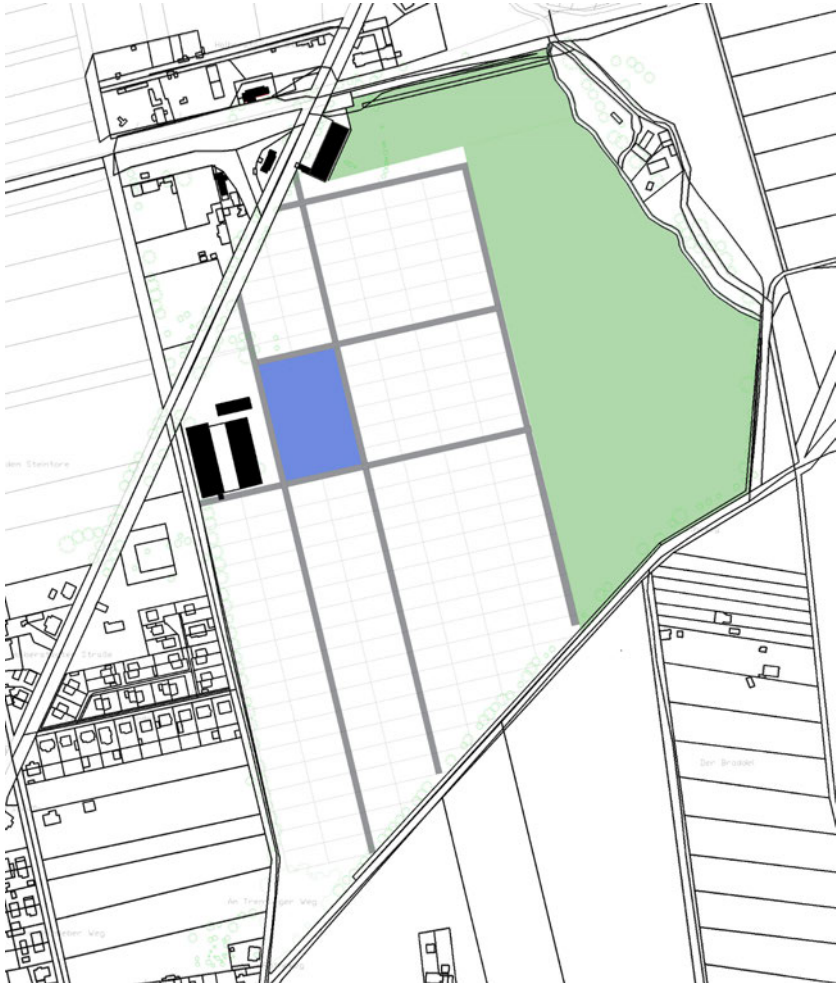


Figure 59: Locating the kindergarden next to the social area and close to the train station.



Figure 60: Showing the evolution of the grid when educational buildings and the green area is applied, Frame 3 and Frame 4.

The area shown in blue in Figure 59 is suitable for kindergarden and the school because it is close to the social areas and the train station. When parents come to pick up the child, they can benefit from the social opportunities such as eating and drinking in cafes or getting things done in retail shops. This location of educational buildings for young children suggest locating of residentials next to the area so that the environment where kids are interacting is a communal, family environment. There can be sport facilities present close by, such as a skate park or gardens where they can refresh after school.

Frame 4 in Figure 60 suggest a common green area since it is in the middle of the site. It can be reached by everyone since it is located in the center. Residentials can be located surrounding it. This will be close to the kindergarden and the social area, as well as the residentials that will follow. Quantitavely there can be more than one green space, which will be further adressed in this chapter.

Now that it is clear there is a public center of social, educational and commercial present, in the following, more information on the application and the evolution of the residential typologies are given. There are 2 house typologies present:

- 1) Row House Typology
- 2) Courtyard House Typology

Row House Typology

The main aim was to locate houses as groups. The design of the first typology had emerged with considering the desire for privacy of the user in a green area to be owned in the private domain. In order to adjust suitable privacy, private front and backgardens are designed. Given in the brief, the houses would be maximum of 2 storeys. In the Case Study 2, Papaverhof Houses are grouped next to each other. Also, there can be multiple typologies and variations present. According to the theory of Organic Architecture, the inner walls of the first typology would be open and flexible. The idea is to lead people to spend time outdoors in the green rather than inside. Therefore, these guidance lead to a longitudinal, compact design of the row houses.

Front garden separates the car road and the house, and acts as a buffer zone of where the privacy of the home begins. Some part of the solids on the entrance is taken out to define the entrance and create a shelter for it. In order to allow for natural sunlight for the corridor found on the second floor where the bedrooms are situated, skylight windows are situated on the roof.

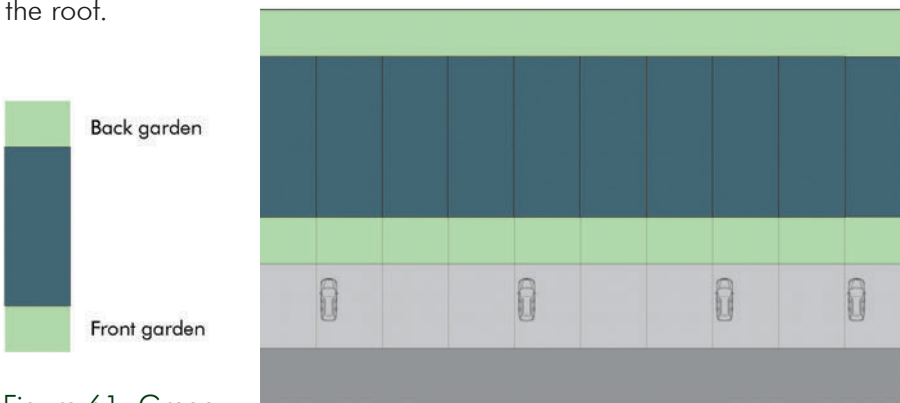


Figure 61: Green and building ratio

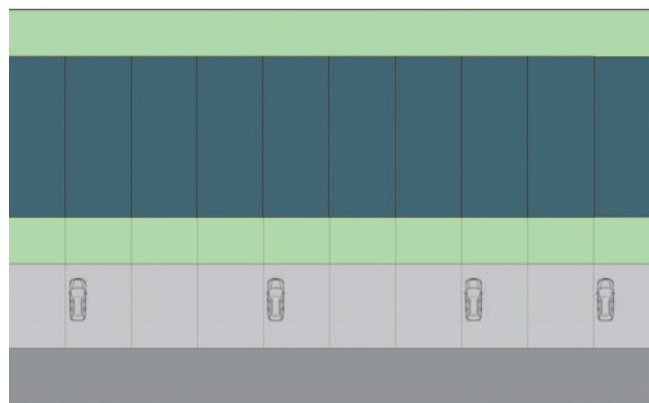
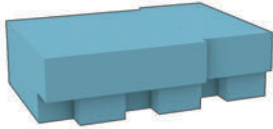
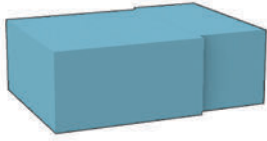


Figure 62: Creating roads and open garages



When the Row House Typology is to be located as groups, according to the social and communal idea, the main question was 'In which orientation should they be placed on the grids?'. Remembering the idea is to create extroverted, social people, the communal gardens are placed when the back garden ends.

Figure 63: Solid void relationship of the entrances of type A

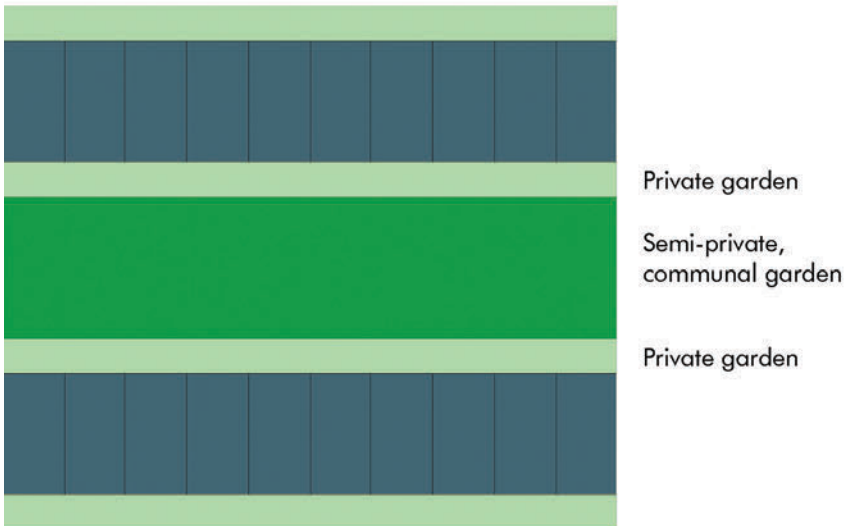


Figure 64: Private and common greens

This site offers a big farming area and social gathering places. Therefore, the aim of these communal gardens, which are close to private domains could be semi-private, which is offered to the neighbours of this shared Row House Cluster. This grid can be located close to the Kindergarden, so families with young children and babies can be placed here. The access to the kindergarden would be short and easy. Since this typology can be considered narrow, with a width of 7 meters and a length of 20 m, it suits the idea of placing families with small children. However, this also leads to the idea of preservation and surveillance. Therefore, fences are added to the side of the garden which can be decorated with bushes or natural aspects. This suggest that the entry is possible only from the private back gardens of the houses or by a person who has the key such as the staff of the community.

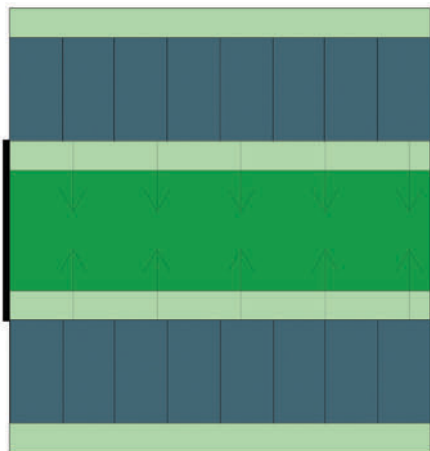


Figure 65: Preservation of the community gardens

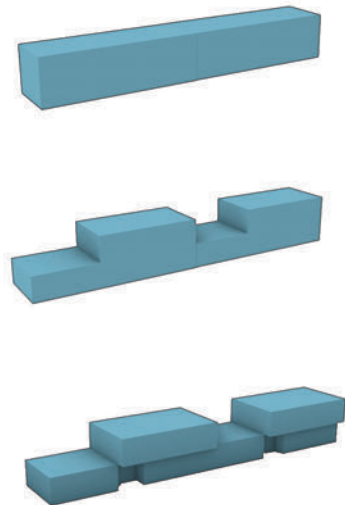


Figure 66: Solid void relationship of the entrances and the terraces of type B

In this sense, when kids are interacting and playing, they would be safe from the cars, accidents, noises and strangers. While playing in a guarded area, it is possible for them to develop their social identities. After locating the row houses one by one, it was clear that the houses on the South side had the potential risk of getting too cold in winter and too warm in summer due to the sunlight coming from South. Also, when the sun is up in the noon, the back garden can't have enough sunlight so the pleasure of spending time there would be prevented. When Case Study 1, Maison Citrohan, was considered, a part of the solid mass was removed to create a terrace which would allow sunlight and create a new facade. Also, this would create volumetric complexity by means of offering an alternative. The first typology is named Type A and the second one is named Type B. In order to save some thermal insulation, the garage is located under the terrace. With the aim of creating a buffer zone on where the exterior begins and the interior ends, winter gardens are placed in between the terrace and the bedrooms. They will offer natural places also during winter.

The windows are aimed to be as large as possible for the maximum intake of sunlight and to follow the theory of Organic Architecture where the houses acts as one as the nature.

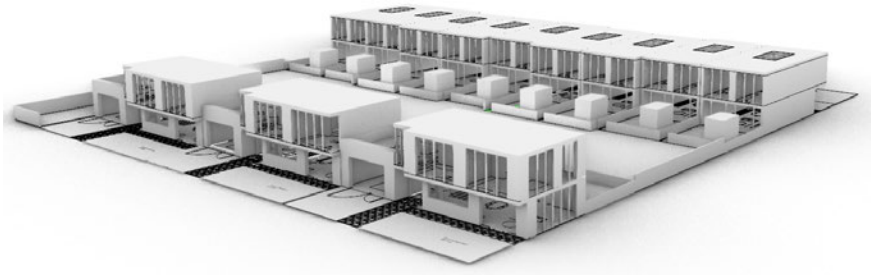


Figure 67: South facade of the Rowhouse typology

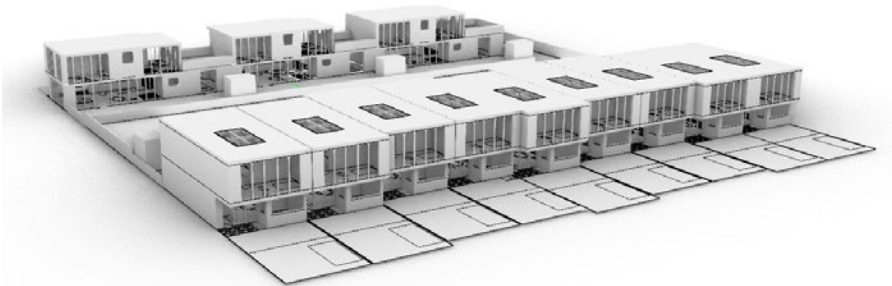


Figure 68: North facade of the Rowhouse typology

There could be playground toys added. Areas with sand or stone pools can be designed to offer kids physical activities. In order for this Rowhouse typology to be close to the Kindergarden, group is located on the frame number 5, in Figure 69.

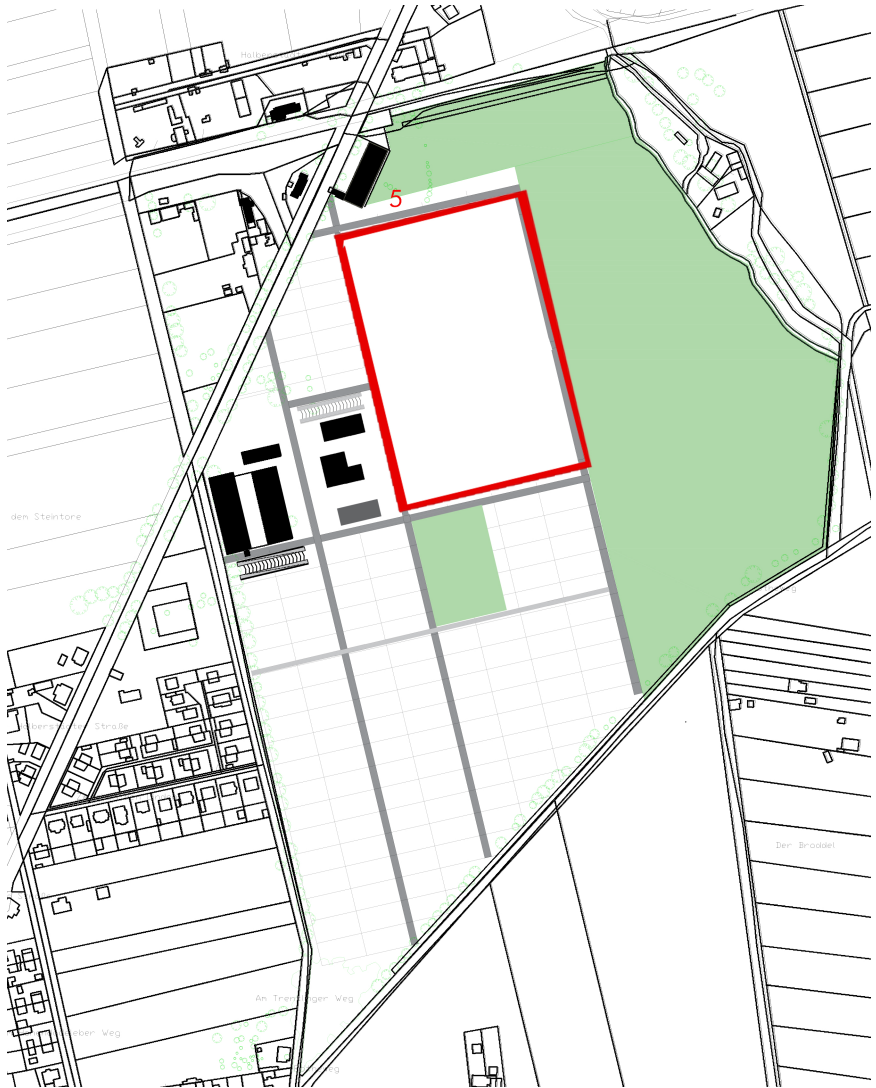


Figure 69: Grid showing the location of the Row Houses



Figure 70: Row Houses applied

It is important to have car roads due to the fact that workers will have the chance travel to Intel site with their cars, which they can park on the front of their houses. However, it wouldn't be pleasant to have cars in greens. In order to preserve the greens and gardens, and to promote physical activity, pedestrians are given the priority of circulation.

The Row Houses have been placed on an orthogonal matrix. Even though it was helpful to create an order, some of the houses were subtracted in order to prevent a monotonous arrangement in the internal grid. This will create a playful environment where people and especially kids can discover how the site reacts differently according to the different locations on the grid. Row House Typology 1 are rotated 15 degrees. After placing the houses, it occurred that the left part of the developed site is more of a commercial center whereas a social and commercial activity area missing in between the farming fields and the residential. In order to develop the area, a cafe is suggested where the people who work in the fields can rest after work, in the frame number 6 on Figure 71.

In the frame number 7, there are markets for storage and selling the goods from the farm. It suggests an alternative so that market framed number 1 is not overcrowded and is located next to different functions. Since the sports area on frame 4 can be considered far away from the Row House Typology residential situated on the Northern part of the site, the frame number 8 suggest football pitches and number 9 green areas and parks. In this way, the public plant field is categorized into different green functions. The frame number 4 is suitable for gardens and walking and bicycling paths, whereas the frame number 8 suggest green areas where people can lay down and have a picnic.

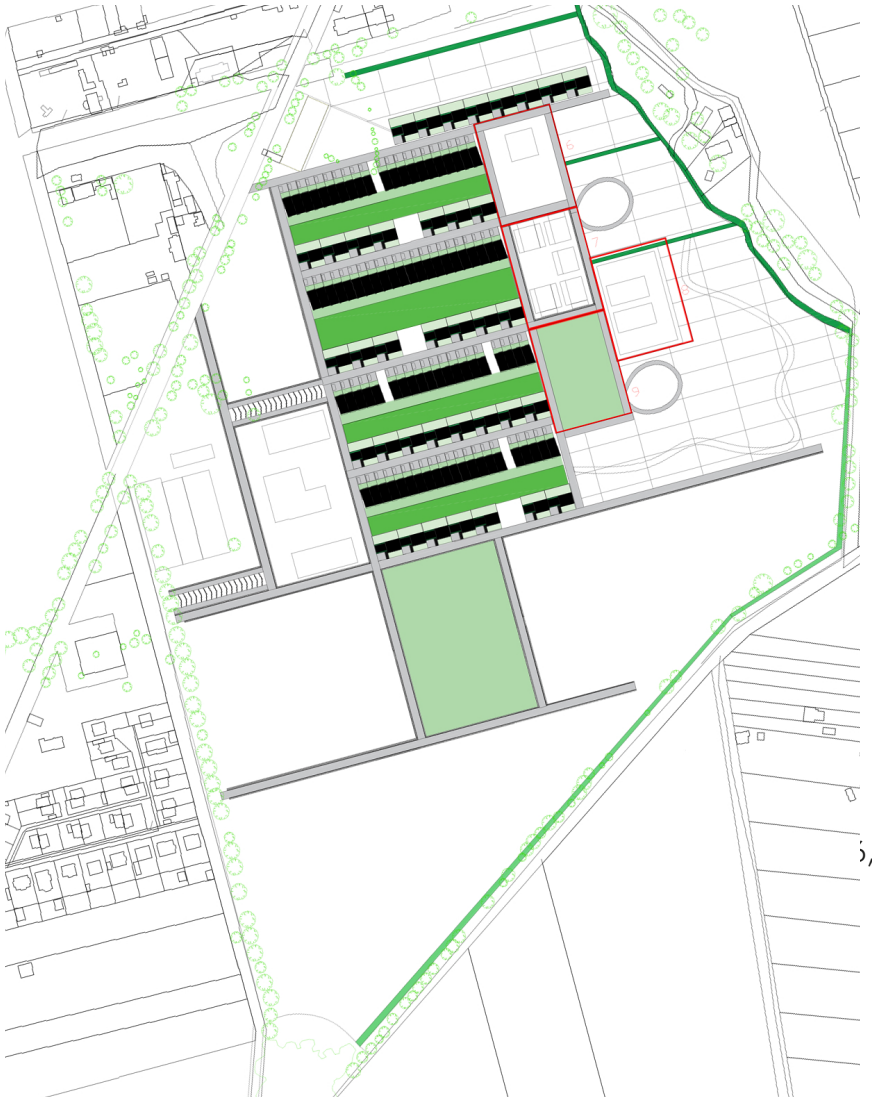


Figure 71: Frames number 6, 7, 8, and 9

There are a total of 84 Row House Type A and 37 Row House Type B designs present. It makes up a total of 121 Row House Typology houses.

Courtyard Typology

A search for a new typology emerged. Since the Row Houses suggest playgrounds for kids, this new typology could differentiate according to the different numbers of kids present. This led to designing with modularity in mind. With the help of it, it is easier to add or subtract rooms. On the Papaverhof case study, it suggests to put more communal functions on the household such as a kitchen and a living room to be placed facing the street whereas the private bedrooms to be placed where they are away from the noise and transparency. For this typology, offering of Eastern and Western sunlight was important since it was not the priority on the Row House Typology. Even though it was aimed for the Courtyard Typology to be grouped, one side of the houses inside the clusters are detached from each other. Whereas the other side is attached, creating twin houses, making semi-detached houses. However, they don't have to be designed exactly the same, in order not to be monotonous, but suggesting socializing. The typology of a courtyard suggested that Eastern and Western light accumulation could be possible around the bedrooms, when the courtyards are placed in between. In this way, more private gardens would serve the family. On the space where the houses are detached from each other, there is again a green corridor present.

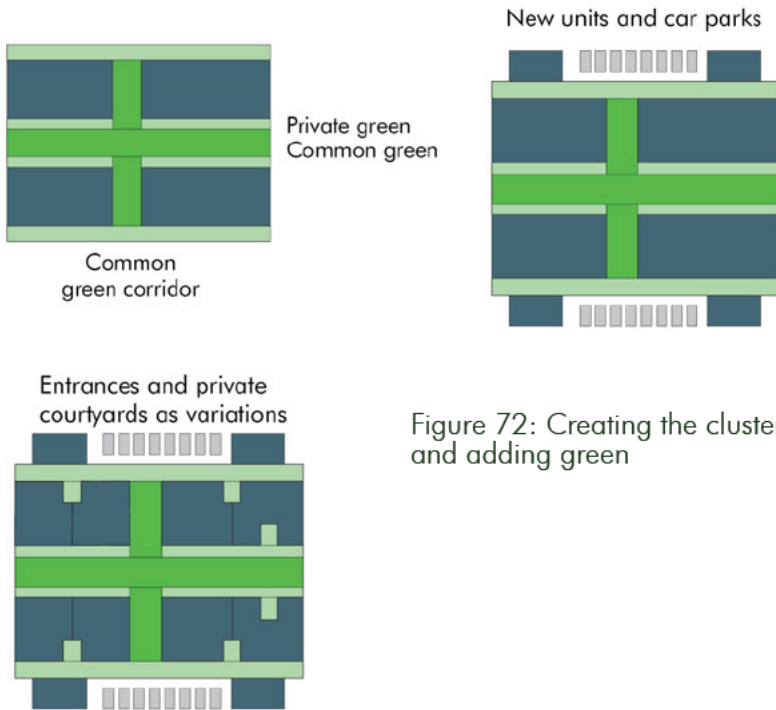


Figure 72: Creating the clusters and adding green

Getting inspired from the case studies, Kozinsky also designed an entrance courtyard where semi-private greens can be found. The houses are clustered in such a way that when additional rectangular houses are applied adjacent to the street, there is a car park formed. This strategy is used for this project. On the commentary in the book 'Community and Privacy', it is said that noise can be a negative impact. In order to prevent this and preserve the privacy of the houses, the windows that are facing the car parks are raised above 1.60 m.

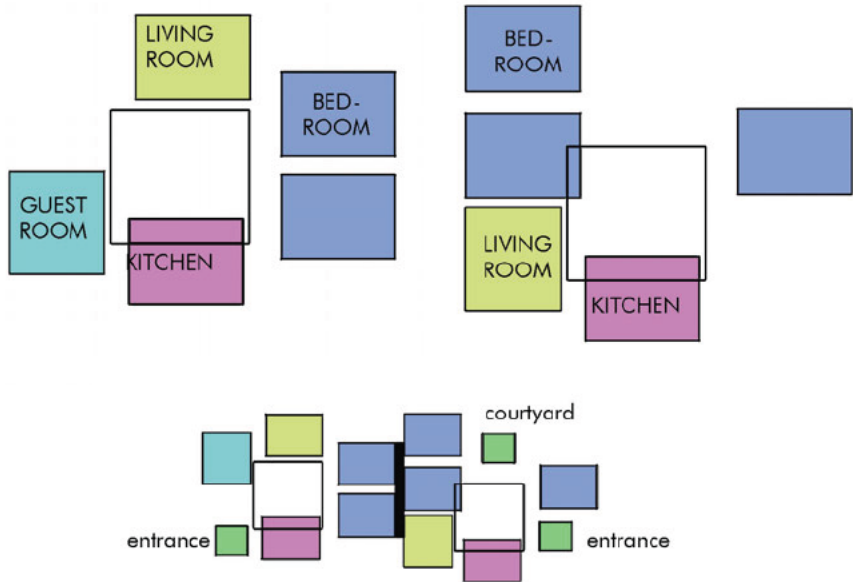


Figure 73: Modularity diagram of the one storey courtyard typology house, showing the flexibility of modular elements

The green element can be used to give volume for an empty space for the desired purpose, which can be a space for entrance on the front, a courtyard in the middle, in order to give way to natural sunlight intake in the rooms surrounding the courtyard, or a back garden to offer a space for eating and resting. There can be multiple activities happening in the courtyards, such as eating, grilling and relaxing. When the typology is designed in such a way that the light intake is sufficient and there's no need for a courtyard in between, back gardens can be offered for a private eating and resting area. The gardens and the courtyards can be protected with fences and bushes, which draws the boundary of the private area. The private activities differentiate the courtyards and backgardens, between the entrance area, which acts as a buffer zone to distinguish the communal car park and the private house.

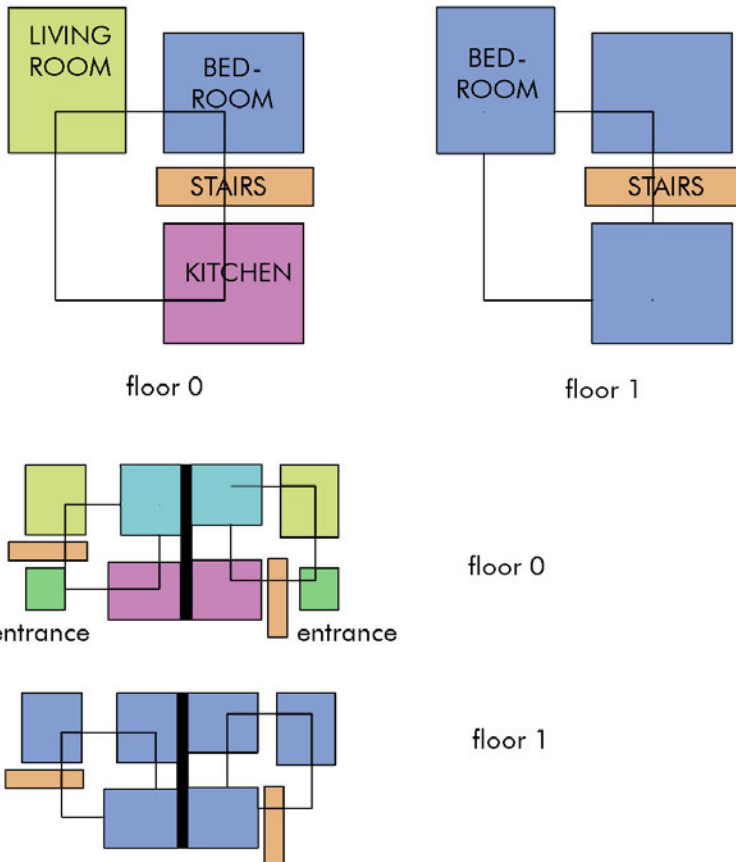


Figure 74: Modularity diagram of the two storey courtyard typology house, showing the flexibility of modular elements

Entrances are through external passages, which are placed adjacent to each other when the clusters are formed so that the walkway towards the car park is on a shared route, therefore more social interactions can happen. Playing and resting areas can also be offered to the user in the green areas in the entrance, by means of differentiating hard and soft surfaces. Hard pavement is found on the entrance, mostly out of gravel which directs the user to the doors, whereas play areas are made out of grass. There is a layer of trees on the front of the car park, which acts as a visual barrier for the privacy.

In order to support the volumetric complexity and variations, houses numbered 1 and 2 are one storey houses.

It is important to be careful of not placing windows facing each other to preserve the privacy. There can be a tree placed next to the windows of the houses numbered 5 and 7. This can prevent the user of the house looking at a car but rather, the view can be generated in a natural way. The noise can also be blocked. In addition to that, the minimum distance between 2 houses are 4 meters to protect privacy. One of the things that is desired in the arrangement of the housing is that houses have the capacity to be used by different numbers of kids, therefore have different combinations of bedrooms. When a baby joins the family, or when it is within the family planning, the family can have the chance to move inside the site to another house. Therefore, this courtyard typology have various houses with differing numbers of bedrooms. The concept of modularity is present in this design to guide the arrangement.

When the residential typology is placed, it is clear that they are away from the farming field found in Figure 56. They already have either private gardens or courtyards. Therefore, the communal activity suggested when clustering the estates, is farming on a small scale. There could be additional storage units present to store the goods and the farming equipment right next to the field. The older kids of the families can help with the farming and form a social identity with the neighbours by spending time in the nature together. This also suggest to be involved in the selling of the products.

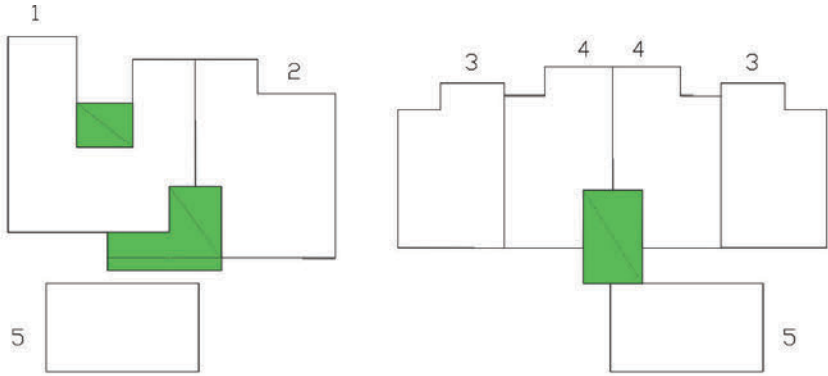


Figure 75: Group A

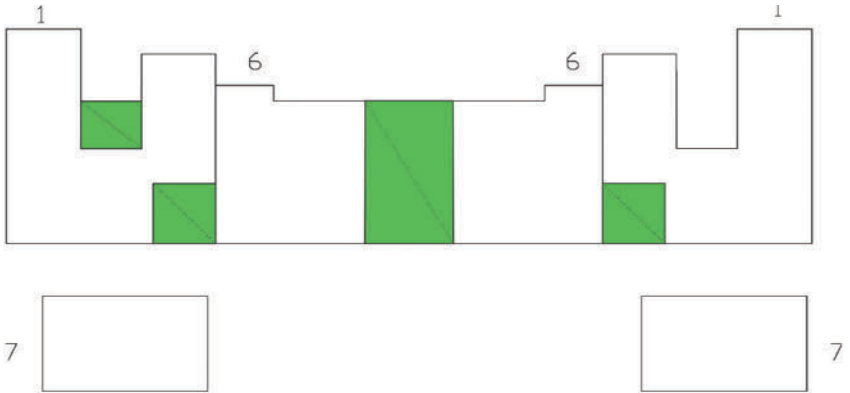


Figure 76: Group B

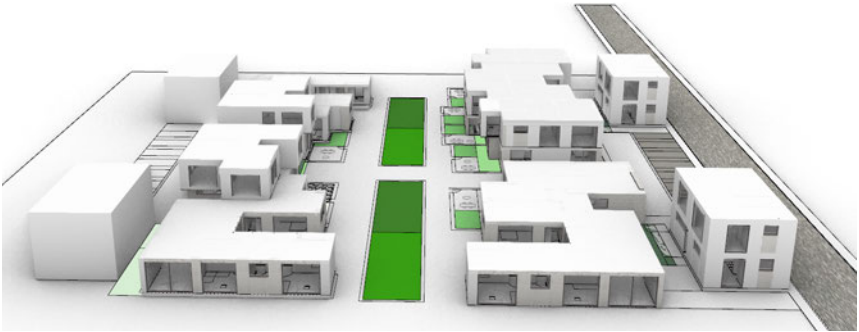


Figure 77: The communal farms on the clusters and the arrangement.



Figure 78: A view overlooking the entrance on the Courtyard Typology

Materials

The materials discussed in this chapter includes the materials for the Row House and the Courtyard House Typology.

In Langenweddingen, there are various houses present with different materials and facade elements such as stone, wood, sand lime and concrete. As the theory of Organic Architecture suggests, when an architect is looking for a material, he/she should not look far away and try to adapt to the already existing site. The facade materials are mostly inspired from Langenweddingen.

The main structure of the design is steel reinforced concrete. There is a steel frame present numbered 1 on Figure 78. Light Gauge Steel Construction is a type of construction that is common for residential and small buildings in North America and parts of Europe. This is similar to wood framed construction, except that light gauge steel members are used in place of wood two-by-fours. Light gauge steel is steel that is in the form of thin (1-3mm) sheets of steel that have been bent into shape to form C-sections or Z-sections. Concrete is a cheap and suitable option as an infill material in Germany. Another option would be the usage of kalksand. It is a very lean and lime-base conglomerate, the use of which spreads as of the mid-1840s, mainly in rural domains. Similar to concrete, it is poured in formworks to build walls and, in a few cases, onto centrings to build vaults (Aprea, 2015). Concrete or kalksand will be surrounding the steel in the steel reinforced concrete design.

For the frames of the windows, aluminum is used and coloured in dark tones, such as black or dark brown, depending on the harmony with the house facade. Mostly clear glass is used for the windows. Energy efficiency double paned windows provide weatherproof, which is mostly needed in a climate such as Germany. The glasses of the toilets are frosted glass. In order to preserve the privacy, sunbreakers could be added according to the demand. Curtains are a must for every room in this design and would be provided in every house to help with the sunlight control and privacy.

The insulation material is EPS rigid foam since it is highly common in Germany. It is important to point out that in bedrooms next to the toilets, additional sound insulation materials have been used. In this project, most of the houses are adjacent to each other. On the walls that are shared, there is an additional thermal insulation present to prevent the spread of fires and sound insulation to preserve the privacy.

The outer walls are 40 cm, whereas non-structure bearing inner walls are 20 cm. Outer walls are thicker for various reasons such as a good thermal and sound insulation. In Figure 22, average temperatures in summer and in winter are given. The insulation material will create such a climate that in winters the houses will be warm and in summers the houses will be cool.

The facade materials can be stone, painted stucco with variable colours and white limestone sand. Multiple variations have been offered to prevent monotonous formations. There are many buildings in Langenweddingen with white limestone sand. In the renders of the buildings, that will be shown in the next chapter, the houses with white limestone sands will be displayed in order to create harmony.

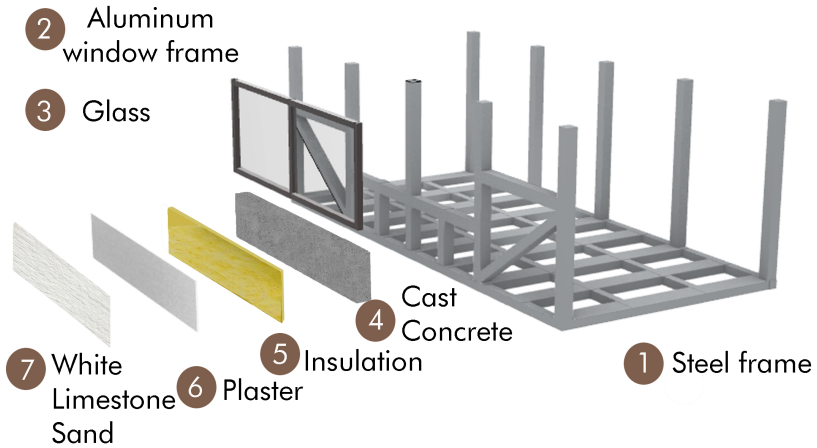


Figure 79: Material Diagram

The facades of the houses can be arranged as groups or according to the demand of the user group.

The roofs are flat roofs covered in asphalt roof tiles with gutters. Even though the traditional German residential architecture offers tilted roofs, with the advanced technology in the 21st Century, rainwater and snow can be collected through gutters or pipes on the roof and be transferred to the ground, where luckily grass and green areas are present in this project.

Since the houses are 2 storey high, light gauge steel frame will be enough to be used as a load bearing structure. Madgeburg is not in a danger zone for earthquake. Therefore extra earthquake reinforcement will not be necessary.

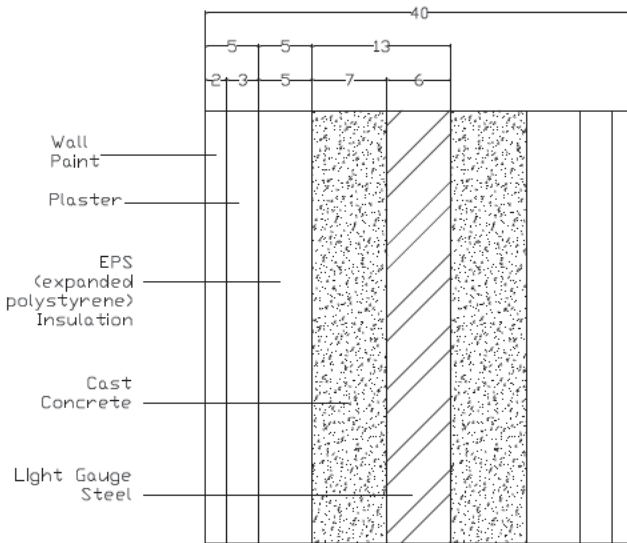


Figure 80: Shared wall drawing, dimensions are given in cm.

The Courtyard Typologies have been placed to the convenient areas. For the brief, it is aimed to create a gridal adaptation following the residential variation. The relationship between the courtyard typologies allows the courtyards to be placed as a group to locations outside of the grid, or to be rotated when needed. This is possible, thanks to the variation of the placement of windows that receive sunlight through differencing orientations. The East, West, South or North sunlights can enter most of the houses through the windows located to receive sunlight through different angles. This typology in particular has high amounts of differentiations of windows, either quantitatively or qualitatively, such as differing width, lengths and positions. Therefore, when the groups are rotated to receive either one of them, there will still be enough sunlight. However, as the sunlight demand from the user changes, the rotations can be done more or less.



Figure 81: Showing the grid with Courtyard Houses, dead-end and truck circles applied.

The linden trees present on Figure 40 and 41 are preserved. Therefore, there isn't a car road suggested on these sides of the site. In order for every user in the Courtyard Typology to have access to the car park, a car road is connected to each group. Therefore, a user who is reaching the Courtyard Typology will have to turn from the dead ends. Turning circles with the radius of 8 m are added.

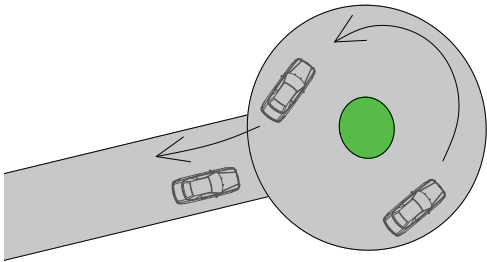


Figure 82: Circle showing the turn of the cars from the dead end roads.

After adding the Courtyard Typology, last touches to the site have been made. There should be wide roads present to serve the farming fields on Figure 56. Therefore, this circle on Figure 83 had been adapted next to the fields to make it easy for the trucks to stop, drop people or letting them in, turn and continue. The radius is again 8 m. The truck shown in the figure has a length of 12 m in total and a load zone of 9 m. The inner surface can be used as a waiting and resting area with green. This design prevents a direct entrance to the fields which controls the access and allows for the user group to enter. The circles are situated close to the commercial areas.

There is a water element present on the field area to store and distribute the water. There will be sprinklers present in field to help water the crops. According to Figure 25, During autumn and winter, the rainfall precipitation is not enough on its own to water the crops. Therefore there will be sprinkler/spray irrigation, which will help distribute the water to the crops from the water storage. The water storage will accumulate water from the rainfall throughout the year. The method of applying water to a controlled manner in that is similar to rainfall. The water is distributed through a network that may consist of pumps, valves, pipes and sprinklers.

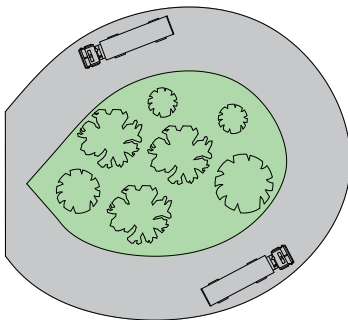


Figure 83: Circle showing the turn of the trucks for farming and the usage of the green area in the middle.

Figure 84: An example sprinkler system that could be used for the site, via <https://sswm.info>

Overall, when locating the residentials, too much of a similar organization and a symmetry has been avoided according to the philosophy of Organic Architecture. In nature, the pattern is somehow chaotic but still falls into an order. In addition to that, the idea of a strict uniformity is unwanted in this site since it has the potential to generate feelings of a hierarchy and prevent autonomy from the user.

5. Design Response

5.1 Objectives

The objectives of the design response are targeted as an initial strategy for further developments.



Figure 85: Physical, Social, Economical and Ecological objectives

The ecology found in the site is by means of having linden trees, soft surfaces such as earth and grass, animals such as foals and human-beings living with their families in the neighbourhood. The plant life can be improved with adding new families of trees, such as oak tree, pine or spruce. The plant life will be improved with the adding of lettuce, lamb's lettuce and berry trees. There can be new plant species on the gardens with the choice of the private domain owner, garden plants can be chosen, for example flowers such as roses, boxwood, ornamental grass and trailing plants. There will be birds flying. There is a chance that occasionally, a shepherd with sheeps and cows will show up in the open fields due to the village life. There can be animals such as squirrels or bunnies inside the site on the communal areas. Interaction between the animals and the human beings will add to the harmony of living together with nature. People can own pets such as dogs or cats in the private domain. There can be a ratio of single workers for Intel. In accordance with the idea of having a social life, they can still move in to the typologies suggested and rent the rooms. The lifestyle of Wohngemeinschaft - WG is very common throughout the Germany. However, in this brief, life with families is mainly considered.

According to the research and findings discussed, the social design of the residentials in Langenweddingen are categorized under economic, social, physical and ecological objectives. The interactions offered to the people can be considered in public and private scales. The public scale interactions can be considered as: Markets where local people can sell their goods, doing sports and socializing together, whereas on a semi-private scale would be: spending time in the gardens, grilling, socializing on the clusteral openings in the neighbourhood or in the communal green spaces. The private interactions will happen inside the residentials or the private gardens offered to the families.

There are short and long-term objectives. For short term objectives, the architectural quality and the arrangement of natural areas will be enough for the workers to work in Intel and have a healthy life in the site.

For a long-term objective, creating a new economy in the site to generate a socio-economic development in Langenweddingen with farming, gardening and selling together is aimed. This production chain will take time. The interaction of the people who will come to live in the site and the people who are already farming in the fields of Langenweddingen will come together and transfer the knowledge and techniques. Once this chain of planting, reaping and selling is managed, it will boost the socio-economic life of the site. The increased population of Langenweddingen will have a sustainable life circle in the site. The customers can be the locals of Langenweddingen, which adds to the sustainable life circle, or can be people from the neighbouring villages. This idea suggest regularity.

Since Sülzetal is a municipality formed of 8 villages, Langenweddingen can stand out by means of having organic products, an offer of a living area which suggest a job to work at the site and a social life that comes with it.


For more public functions such as airports, hospitals or vacations people will leave the site. However, on a scale of the daily life, this site is intended to sustain the needs of the users. Basic functions of retails such as a hairdresser, banks, post office etc. can be situated in the social hub of the site which can create a small-scale independency.

SHORT-TERM OBJECTIVES



- Increasing the social interactions with people so that they develop a social identity and a sense of belonging to the site
- Boosting mental and physical health in a green area which will boost the career in Intel as well
- A healthy and peaceful life in accordance with the environment

LONG-TERM OBJECTIVES



- The sustainable production chain of vegetables and fruits from the gardens and the fields and selling of them by the residents of the site.
- Development of Langenweddingen by means of socio-economy, with the integration of Intel workers and people of Langenweddingen.
- Being a rural housing example, for similar cases such as the Intel investment, with a self sustaining life in the village.

Figure 86: Short and Longterm Objectives

5.2. Design Strategies

In order to design the masterplan and the architectural typologies, various priorities have been considered. The first step was to embrace what the site has to suggest such as the already existing buildings, trees and patterns that can help with the development of the design. These were investigated and considered when taking a further step and start sketching. Defining the layers of design created a formula in which the design can be applied using a base grid. With the help of defining private and public locations and attaining the right functions to bring people together on different levels was a main strategy used for this project.

- 1) Sketching a Grid (Figure 55)
- 2) Applying the layers of design (Figure 50)
- 3) Getting critical help from the differentiation between public and private areas.

Masterplan Design:

- Green Areas
- Car roads
- Usage of green patterns
- Commercial
- Social
- Restoration
- Transportation connection
- A Public Shell
- Education

Architectural Typology Design:

- Modularity
- Flexibility
- Privacy
- Light
- Social connections
- Gardens
- Thermal accumulation
- Insulation
- Communal areas

5.3 Final Design



Figure 87: Masterplan



Figure 88: Legend of the buildings



Figure 89: Restored and New Buildings Diagram

--- Site Entrance for Cars



Figure 90: Site Entrance for Cars diagram



Figure 91: Section A-A' and Section B-B'

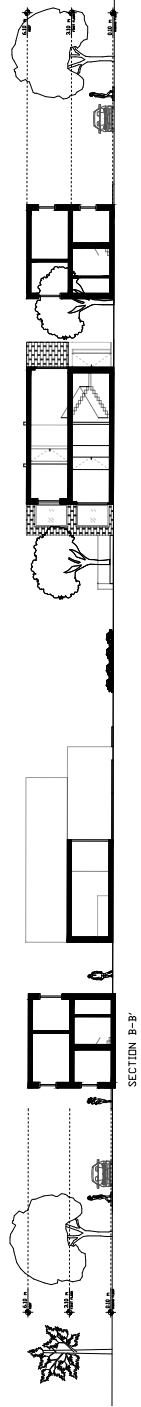
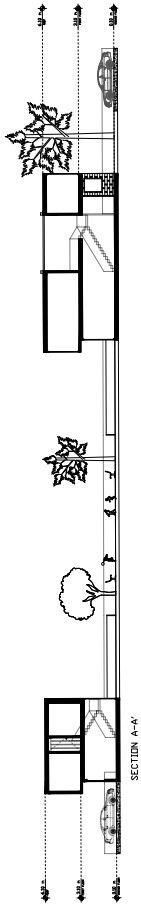


Figure 92: Rotated Section A-A' and Section B-B' respectively



Figure 93: Frame 1 showing Row House Typology and Frame 2 showing Courtyard House Typology

1



Figure 94: Frame 1, rowhouses combined

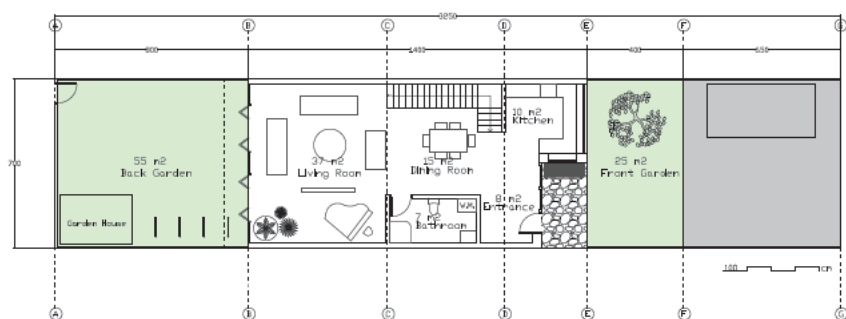


Figure 95: Groundfloor of Row House Type 1

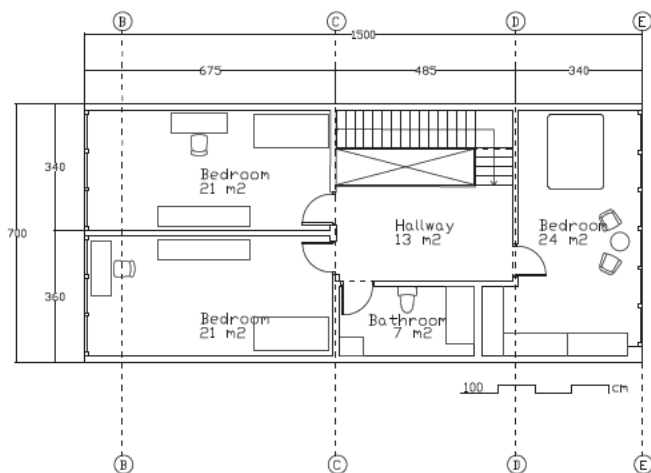


Figure 96: Firstfloor of Row House Type 1

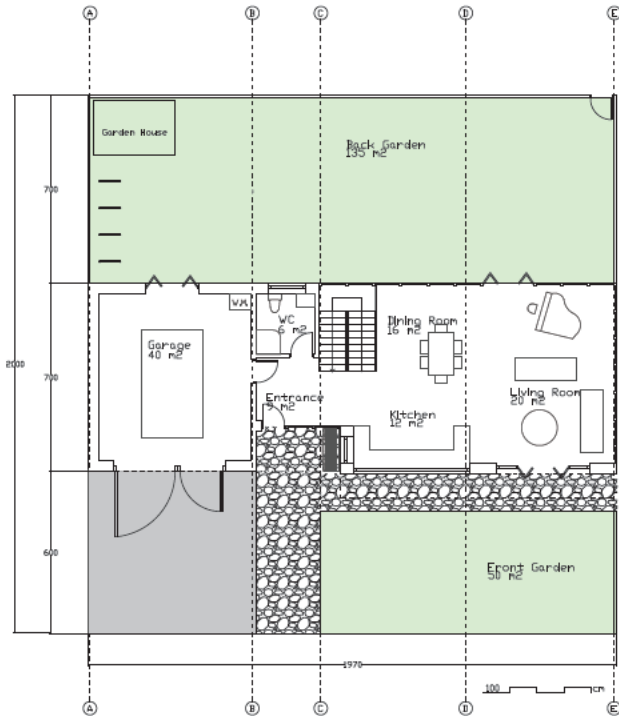


Figure 97: Groundfloor of Row House Type 2

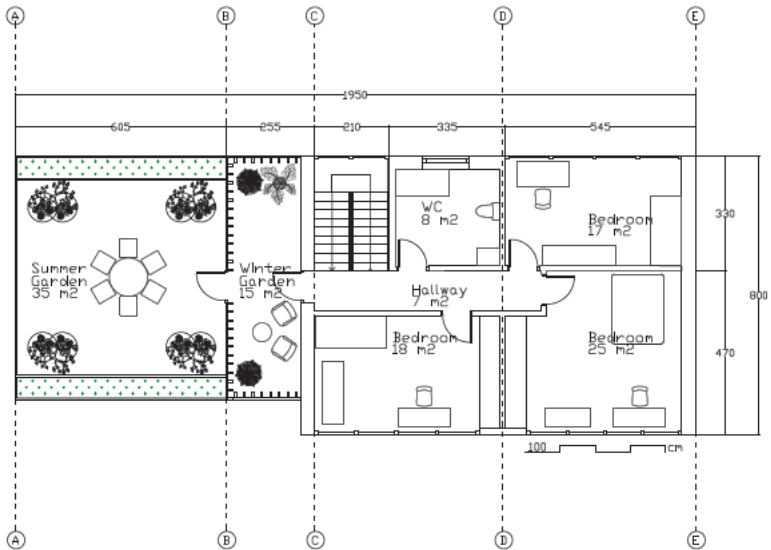


Figure 98: Firstfloor of Row House Type 2

A parallel development to the kitchen with dining area is the 'open' kitchen, where the kitchen area is open to the living room and dining area. This can be designed as an 'American fitted kitchen', a functional area connected to the living room, with for example a kitchen breakfast/snack bar as divider. (Neufert, 2012). In Type A, the stairs and the toilets are placed in areas that can be considered rather dark than the areas that are close to windows. The places for daytime activities that require sunlight are placed next to windows, such as Kitchen and Living Room. In Type B, the sunlight availability is greater because of the 90 degrees rotation of the block. The area that receives the sunlight is not 7 m but close to 20 m. There is again an open floor plan idea present, not with a longitudinal movement, but with more compact circulation opportunities. This adds to the volumetric complexity of the houses and the variety of usage. The open plan attempts to meld together the inside and outside spaces as far as possible through an almost complete lack of solid (unglazed) external walls. The aspects of privacy and publicity are (supposedly) neutralised. Minimalist and often subtly adapted fittings increase the contrast to a total view (Neufert, 2012).



Figure 99: Render of the frame A, showing the communal and the private green areas of the Row House Typology, house type 2.



Figure 100: Render of the frame A, showing the communal and the private green areas of the Row House Typology.

2



Figure 101: Frame 2, Courtyard House Typology Group A

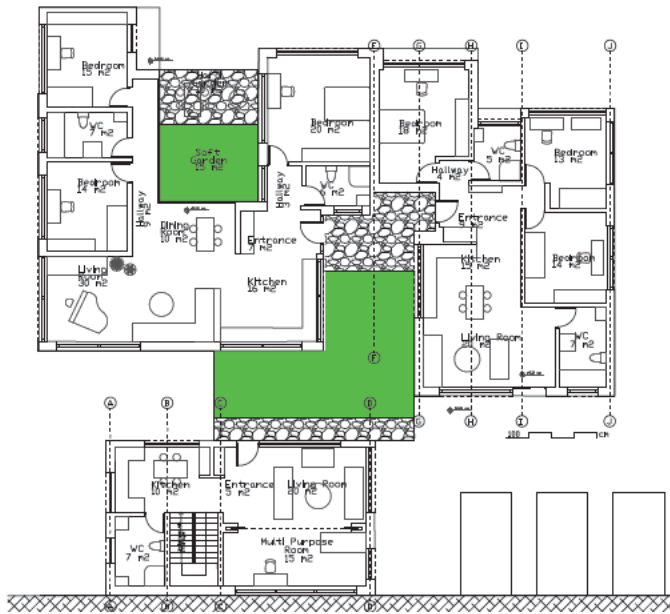


Figure 102: Ground floor of House 1, 2 and 5

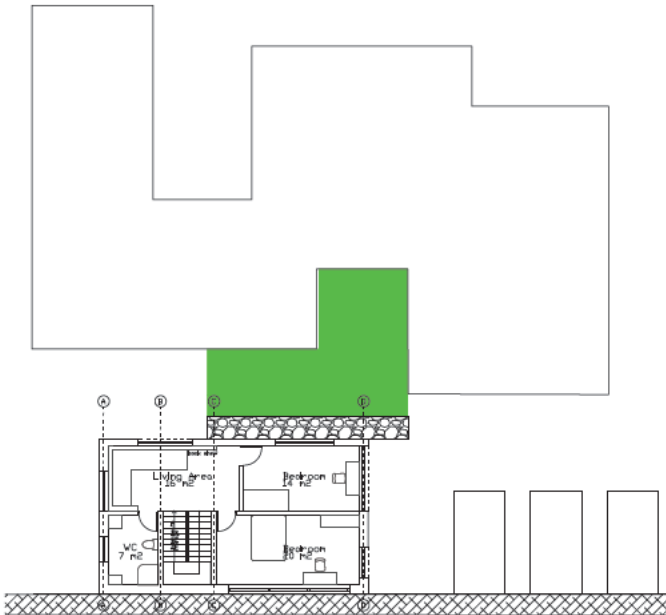


Figure 103: First floor of House 5

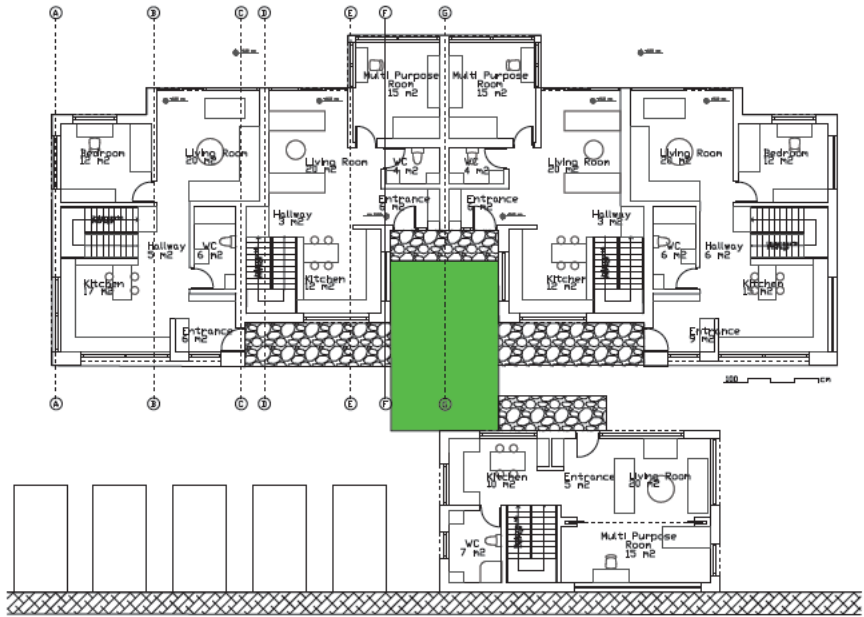


Figure 104: Ground floor of House 3, 4 and 5

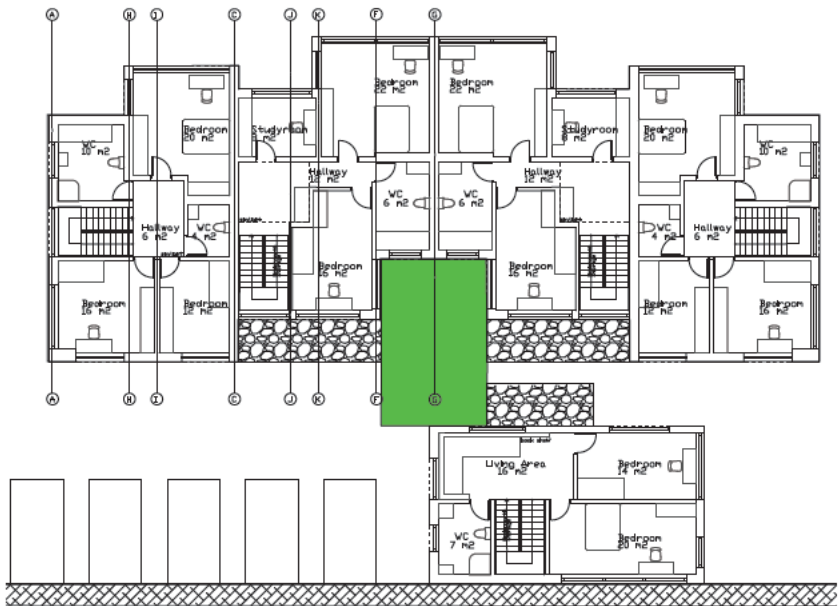


Figure 105: First floor of House 3, 4 and 5

In Figure 104 on the ground floor of House 5, it shows the possibility to divide the room with wooden panels. From the Architects' Data by Neufert: "The classic common and individual areas within a house are becoming less significant in terms of area, and the 'multi-purpose room'(living-working room, shared living space as in a flat etc.), which occurs in both private and public housing, is developing into a significant room type." (p.150), it is stated that the multi-purpose room type has been an increasingly used room type in the modern times. When a baby comes to the family, the family can decide to turn the multi-purpose room into a bedroom. When grandparents or other relatives are visiting, they can make this room a guest room. Other than that, people can study or make this room a hobby room. Therefore the existence of this room will create more flexibility by means of living and adapting to what future can bring to the family.

The wooden panels can be opened or closed to make 2 small rooms or 1 big room. There is also a guest or multi-purpose room present even without the need to separate with wooden panels in this project, such as on the ground floor of House 4 (Figure 104). This offers a variety of usage, which gives way to define the needs and desires of the each family, therefore the adaptability can be reflected as original personalities when using the house.

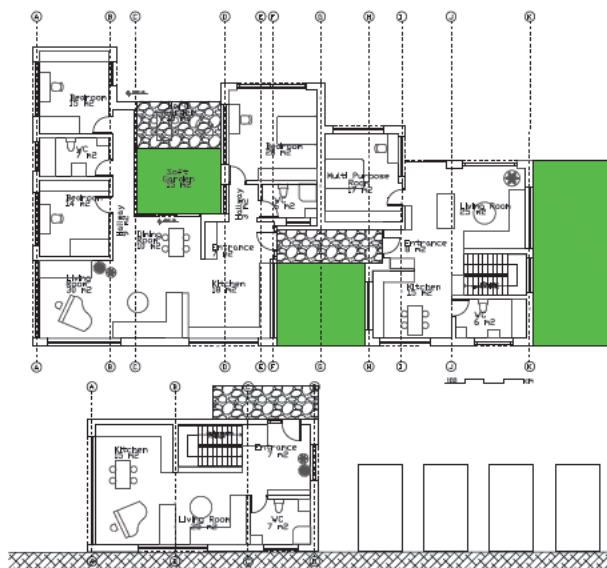


Figure 106: Ground floor of House 1, 6 and 7

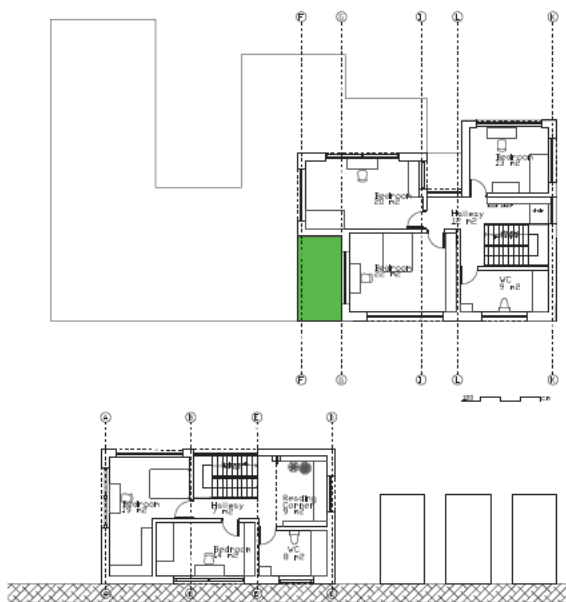


Figure 107: First floor of House 6 and 7



Figure 108: Render of the communal car park and entrance to Courtyard House Typology, group A



Figure 109: Render of the communal farm and backyards of the Courtyard House Typology

6. Conclusion

Langenweddingen can develop under the Intel investment. The village can develop with several ways. To begin with, there will be an increase population in the population. The branches people are working on will differ since there will be white-collar, high-technology workers living in the village. This will change the lifestyle of the village, following a change on what people will be doing in their free time. This will bring new opportunities to the site. Therefore what is suggested in this thesis is an infrastructure that will develop Langenweddingen and set out goals in accordance to the sustain this growth. There are socio-economic development strategies, which look close to Langenweddingen itself and not far away. The strategy generated is to develop the village with the help of farming and gardening.

The literature review of Low-Rise High-Density, Organic Architecture and Social Housing has suggested a theoretical background for the research and intellectually stimulation during the process. The case studies have shown similar projects done in the same theoretical approaches and have been a source of inspiration and guidance for the housing in Langenweddingen. The site analysis made it clear that the area has been developing over centuries and it has an identity of its own. Even though today Langenweddingen loses population, the potentials of the rural area had been discovered with the help of Intel Investment. The weather analysis show that Langenweddingen is an example of a normal German village, which is rather cold in winter and warm during summer.

When it became evident that the soil is fertile through the site analysis, it created the first steps of examining this project with the frame of potentials the soil can bring. When more explorations were made and it became clear that houses can be situated close to the agricultural field, the activity of farming and gardening came to the picture. The socio-economic development idea gathered around the farming.

Through the design development, the grid generated, helped to think modularly. The layers defined created a package of thinking which can be applied anywhere in the grid. The blocks formed inside the grid evolved naturally, by reacting to the immediate surrounding and by fitting in to the already existing pattern of the site. The integration of the roads was a realistic ground the project stood on. It gave way to adapt the raw field and make it a liveable community where around 300 houses are situated.

The development of the grid is explained clearly in the design development chapter. The story of the project is told through the evolution of the grid and to talk about the public and private functions that is assigned in order to develop Langenweddingen. In order to decide on the functions, a closer look was needed into the target user and the life-style the target user is going to have. Even though, the site will greatly shape the life-style the target user is going to have, the designation of the planning was made accordingly to a family lifestyle. Then the green spaces became a main layer during the design phase. Many green space activities have been researched. After that, the critical processes of trial and error have been made. The critics from the advisors have been very helpful.

The residential typologies developed with the grid itself. Therefore, it can be said that even the first steps of the masterplan was designed before the residential typology research by design began, at one point the masterplan evolved together with the residential typologies. Following that, locating the car roads was another step to carry the grid further. Following that, since applying greens was a main rule by means of applying 4 of the layers to every block, deciding on what type of a green activity will be located immediately next to the residential or on the common green areas, have been discussed. When every user group in both private and public scenarios have been considered, the necessary applications were made in order to create a healthy and peaceful environment for the user. Mostly, green is the main element that provides the peace in the site. It was a delicate play between the transitions from private to public, asking the question of individuality and communal living. By this way, it was an experimental design.

This experimental approach can be found in projects like this. When something new is originating for the first time, before making loud and clear statements, there would mostly be trials which ask the right questions. That's why it was more important to ask the right questions, rather than stating on one answer which can lead the way to develop Langenweddingen. Yes, Langenweddingen can be developed under the Intel investment, but there can be multiple approaches. This paper focuses on the green aspects, and giving people free room for individuality whereas trying to state that a community comes alive when there is a spirit of uniformity through feelings of belonging and the forming of a social identity.

Therefore, human is put to the center and it can only be possible with the presence of nature. The green areas present in the site also offers sports and physical activities which lead people to refresh and recharge. This will contribute to the overall happiness and productivity of the users. The design of the houses originated organically, as if a person started to walk on the car roads provided in the grid, the empathy was shown to the user. Mostly, the connection between the common green areas have lead the way when designing. In addition to that, situating the communal functions in the house such as a kitchen and a living room on the ground floor that has the view of gardens made sense. This way, private and public greens could be easily differentiated with the arrangement of accessibility to greens and forming groups. Bedrooms are situated on the first floor which generates another classification, inside the house itself, by means of private and public usage, when the target group of a family is seperated into an individual as a private user and the family is the common, public domain. This modular thinking was helpful to generate the scenario for the architectural typologies.

As the user will mainly be the family; mothers, fathers and kids of various ages have been considered. For the needs of the kids and the parents, the masterplan offers educational areas for the kids from a very young age so that the life of the families are self-sustained within the boundaries of the site. If a person is looking for a job, they can simply be involved with the producing and selling of vegetations and fruits. The architectural design of the clusters offers the chance to relax to the worker who comes back home after work, on the backyard garden facing green areas.

If a family moves to a certain house, they don't have to consider to move out to another village or city when they have a new baby. They can easily be relocated to another house found in the house since there are multiple alternatives. The roads are considered on a level that when a person lives on this site, the priority is again an outcome of a healthy lifestyle: walking and biking. The changing angles of the windows offer natural sunlight and it is intended that more sunlight will contribute to the happiness of the users of the site.

The materials suggested are local materials from Germany. For a material research, the site was examined closely.

What could be done differently was to suggest bigger commercial areas which puts something else in the centre, rather than making a production chain in the green. Maybe teaching facilities which include music or arts would have suggested to educate the kids of the workers, or the workers themselves. Education is the key when considering development in areas like this. Making forums is another way to bring people together. However, since it is a rural area, turning to nature is the predictable thing to do. In a social way, there isn't any helpless group present, neither it is a place that immigrants choose to live in, nor the area is in a hazardous situation. It is a big, a rather safe area with lots of open fields. In that sense, green areas can be considered as a big forum of the in the rural life, that brings people together.

Mostly, residential housing typology have been emerging rapidly on the 20th Century, after urbanization and modernization. What is new in this project is that it is generated in the reality of 21st Century. In the Case Studies, there wasn't a project that was suggesting farming as a community activity. Integrating farming and housing is not something new. However, within the boundaries of the investment of a company, it can be considered as an interesting combination of multiple point of views. When housing projects like this are done in bigger cities, urban gardening is suggested. In the future, if a similar project is considered, some aspects can change if there's ever an adaptation needed to a city, such as the animals and the transportation connections. In city, the quiet rural life changes and it's replaced with increased commercial activities. Therefore the communal activities suggested can differ. What this project contributed to the academy is the combination of farming and living whereas the main aim is to work in Intel. It should also be considered that the aim of socio-economic development is only possible through integration of the locals of Langenweddingen and workers of Intel, therefore additional social places that would also serve the locals are generated. This areas can be visited by people outside of Langenweddingen, which would be more than welcomed.

To explain the ideas, 2D and 3D diagrams have been produced for this project. Site visit photos are mentioned and maps driven from drawings are used.

To conclude, coming together in green areas in the life circle of producing, resting, being a human and doing it again is the main aim of this design. Putting humans on the center and acknowledging the nature of being a human means accepting that humans are social beings and that we all belong to nature. Living areas cannot be separated. Giving rise to individual independence in a nucleus of a family and still being neighbours, co-workers, friends is what gives the spirit of this project.

7. References

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