Retirement home in Krapina - Zagorje, Croatia

degree project in architecture

Leon Ladišić

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degree project in architecture by Leon Ladišić

to

Elin Daun and Jesper Magnusson
supervisor and examiner

Đurđica Klancir-Ladišić
Tihomir Ladišić
for their never-ending support, that by far exceeded mere parental obligations

Tonči Žarnić
for teaching me about architecture

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for being a mentor and believing in me

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for all the fun we had during our studies

my friends at New Greenhouse
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author
Leon Ladišić

supervisor
Elin Daun

examiner
Jesper Magnusson

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contents

summary

Population decline in rural areas is observed in almost every European country. In Croatia, there are no meaningful strategies to mitigate the consequences of depopulation. As a result, many rural communities have already disappeared, while more are becoming unsustainable. Krapina-Zagorje is a region severely impacted by the shrinking and aging of its population. This thesis approaches depopulation from an architectural viewpoint. The retirement home typology is leveraged to address senior care needs while improving the long-term sustainability of rural communities.

To design a realistic and economical retirement home, the legal framework in Croatia was investigated. Along with this, several reference projects have been examined, demonstrating the development of retirement homes in the last 70 years. To integrate the design proposal into the local context and to make use of the qualities of existing rural patterns, a detailed survey of the region was carried out in search of good building sites.

During early planning, the chosen site and its surroundings were taken as a starting point. A retirement home for 60 residents was deemed appropriate given the site's dimensions. The home's common areas were expanded to service the senior residents of the surrounding village, integrating it into the existing community.

The retirement home as a typology was found to have great potential to act towards revitalisation of rural areas, which was demonstrated in the design proposal. However, for this potential to materialize in other projects, a committed and meaningful architectural interaction with the building's wider context is always necessary.

introduction

The opening chapter offers a summary of background information regarding the degree project topic, centering on the issue of rural depopulation. A driving question is presented: can retirement homes be a tool for revitalizing endangered rural communities? Finally, methods used in the degree project are laid out, describing the planned investigations and the funal case study architectural design.

background

Krapina-Zagorje is a historical region situated in the north of Croatia. It has a predominantly rural identity and is considered part of the wider metropolitan area of Zagreb, Croatia's capital city. (Županijska skupština 2002) Although the region features beautiful nature and a rich history, it is troubled by emigration and the ageing of its population. Smaller communities are declining rapidly. Young people and working adults are moving to larger towns and cities, leaving behind the elderly. (Akrap 2004)

In Krapina-Zagorje, there is a general shortage of adequate accommodation for older residents. Demand has risen for adapted living spaces, co-living arrangements and conventional retirement homes all over Croatia, especially in less developed rural areas. In parallel, the long-term functional sustainability of rural communities is threatened. (Županijska skupština 2011) Many struggling villages have only a few remaining residents, usually seniors who are barely able to care for themselves. As a result, infrastructure maintenance costs are too high given the small amount of employed taxpayers. The healthcare sector is especially impacted, as it is becoming impossible to provide an adequate standard of care to the aged population. (Hrvatski sabor 2017) Insight is scarce regarding the future of small villages across Krapina-Zagorje. Despite the region's population decline, there are no implemented strategies to mitigate the negative consequences of depopulation.

A gradual redistribution of the population into more dense urban communities would be more sustainable, but the contemporary paradigm of social sustainability places an emphasis on preserving cultural landscapes. In short, existing communities should be strenghtened wherever possible. (Čipin 2020) Older residents are especially hesitant to move into a more urban setting, having lived in the countryside for their entire lives. Seniors, who are still bearers of the region's rich past culture and traditions, will eventually make up the majority of residents in Krapina-Zagorje (Županijska skupština 2002). While it is definitely necessary to improve the overall sustainability of the region's inhabited areas, it has to be done without sacrificing Krapina-Zagorje's rural identity. There is a close connection between the problem of declining rural communities and the need for additional accommodation for the elderly. On one hand, the seniors who need care are often from the numerous nearly-empty villages. On the other hand, care facilities have the potential to be inserted into existing communities, working towards their revitalisation. Retirement homes present the ideal solution, as they allow a large number of seniors to receive proper care while using the least amount of resources.

purpose and goals

This degree project will explore the architectural and urban typology of retirement homes in the context of a rural environment faced with population decline. The end goal is a design that guarantees adequate care for seniors while simultaneously positively impacting the surrounding context. As there are no widely accepted strategies regarding retirement homes in rural settings, this degree project will attempt to formulate good practices that can be applied beyond a particular design proposal and even beyond the boundaries of Krapina-Zagorje.

In terms of architecture, three primary approaches will be taken. Firstly, it is important to see how the past development of retirement homes can influence their contemporary design.

Afterwards, the thesis will investigate how a large development such as a retirement home can fit into the rural landscape, either as an intervention into the natural environment or as an extension of existing village structures. Local terrain, waterways and foliage will be explored to define optimal site conditions. A dialogue will be established with existing village patterns, centering on the question of functional and formal integration. Finally, the legal framework and contemporary good practice in Croatia

will be assessed and compiled to define realistic standards for a retirement home.

From the viewpoint of urban design, the thesis will examine how the retirement home can be leveraged to improve the functioning of its surroundings. First, the ideal capacity of the retirement home will be defined, with regards to the capacity of the chosen site and the local housing needs. The building's functions will be evaluated in terms of their accessibility to outside users, exploring the possibility of opening up parts of the retirement home for use by the local community. Finally, the degree project will examine the place-making capabilities of a retirement home. Building upon its physical and social infrastructure, can a retirement home be made into a local center with functional and cultural significance?

approach

Through the process of architectural design, this degree project will tackle the previously outlined challenges in a practical manner. Theoretical conclusions will be drawn from solutions to problems discovered during various design stages. In this manner, the degree project can be considered close to a case study. The design process itself will be a linear decision making process, in line with theories by Hannes Meyer and subsequent functionalists. (Schnaidt, 1965) A series of investigations will define as many boundary parameters as possible. Creative decisions by the architect play a relatively minor role, resolving conflicts between parameters and deciding on elements which are not otherwise defined.

Initially, the degree project will focus on three parallel investigations which will shape the preliminary design proposal of a retirement home. One research path will focus on the context. Starting from a loosely defined area of interest within the Krapina-Zagorje region, the investigation will enable a better insight into the physical environment and local conditions. Key sites of interest will be identified and systematically evaluated in several stages until a final project site is chosen. The site evaluations will be based on a complex set of criteria including insights gained during the site visit and, later on, evaluations of local physical plans. A final site overview will be drawn, displaying all relevant information in a concise manner for future reference.

The second line of research will explore the various laws, bylaws and physical plans governing retirement homes and healthcare buildings in general. Primarily, documents specifically dealing with retirement homes will be analyzed and interpreted in a shortened manner. Relevant parts of the applicable physical plan will also be consulted. All the legal provisions will be compiled and connected with other research to form a design program for the architectural proposal.

The third part of the research will be an overview of the development of retirement homes as an architectural typology. Reference projects will be chosen from a pool of professionally recognized projects. This includes projects published in prestigious magazines or awarded with international prizes. Such an overview will serve to create a base of references which will be useful when developing the final design proposal.

As the investigations enter their later stages, the proposal for a retirement home will be sketched out. At first, it will be drawn in an abstract location, investigating the qualities of different dispositions and relations to the physical and cultural context. As these sketches progress, the design will be placed on the chosen site and developed functionally. As the design process is heavily tied to the investigations, the final retirement home proposal will be a direct result of previous conclusions. By evaluating the qualities and shortfalls of the design proposal, the feasibility of using retirement homes for rural renewal will be determined.

site visit and selection of project site

It was necessary to conduct a series of detailed on-site explorations in order to get a good understanding of the physical environment. These site visits were conducted in early 2023. Field notes were digitalized and compared to local zoning plans to identify potential project sites. Using a well-defined set of criteria, an optimal site was chosen for development.

preparations for the site visit

Having defined the wider area of interest, it was necessary to conduct a series of site visits to get a good understanding of the physical environment. While the chosen region within Krapina-Zagorje is relatively homogenous, countless different micro-ambiances exist within. Some of these locations will naturally be much better suited than others for the development of a retirement home. Usually, when looking for a suitable development site, an array of available resources would be consulted before the site visit itself. These resources would include cadastral maps, local zoning ordinances, and satellite images. By overlaying all the available data, a selection of potential locations could be defined. A site visit would be conducted only after initial research, to assess the physical environment. This approach is considered the norm because it keeps fieldwork focused, reducing unnecessary time spent exploring potential locations.

However, because of the area's rural nature and irregular terrain, it is impossible to get a good impression of potential sites using maps, satellite images, literature, or internet resources. Furthermore, even within the available sources, the selected part of Krapina-Zagorje is poorly documented. As a result, no detailed investigation of potential sites could be done before conducting a site visit. This meant that the site visit itself would be exploratory, primarily focused on getting an initial impression of the area. A lot of time would have to be spent in the field.

The ultimate goal of the site visit was to roughly define a series of potential locations based exclusively on the physical environment. These would later be compared to local spatial plans and cadastral maps to narrow down realistic project sites. The primary disadvantage of this approach is its exploratory nature. No detailed information is compiled before the site visit itself, and many of the potentially interesting sites would have to be eliminated at a later stage.

The wider area of interest features complex terrain and imperfect roads, making a systematic site visit difficult to plan. It was decided to follow the main regional roads going through the area, with occasional detours to explore more remote rural centers. Whilst a significant portion of the region will remain unexplored, locations distanced from good

typical landscape of the chosen wider area within Krapina-Zagorje Country

hillside villages in Krapina-Zagorje

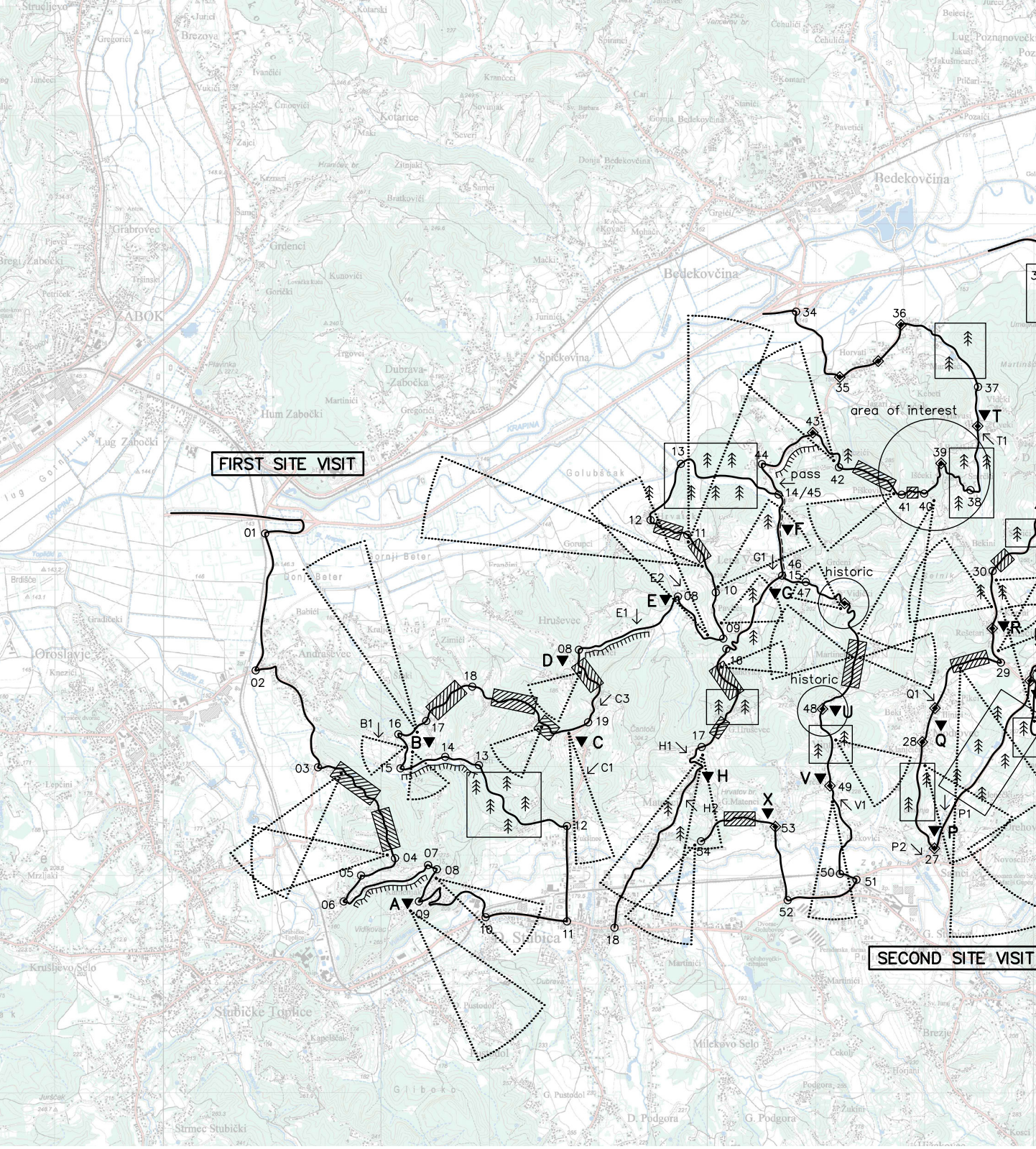
regional road running through a valley

transportation infrastructure are thought to be inadequate anyway. This is because the hypothetical retirement home needs to be connected to a regional road, so quick access to the surrounding area could be guaranteed.

As the site visits needed to cover a broad area, it was decided to split the region into three zones that could be covered in three total site visits. The first zone would cover the east part of the wider area, with the visit starting from Zabok in the northeast and following the hilly terrain above Donja Stubica. The second zone encompasses the center, with the visit starting from Bedekovčina in the north and following river valley roads towards Gornja Stubica in the south. Then, a U-turn would be made to explore the hill roads to the north, all the way back to Bedekovčina. The third zone covers the final, eastern portion of the wider area. The approach would be made from Marija Bistrica in the east, following mostly valley roads before turning around and finishing off the loop near Zlatar.

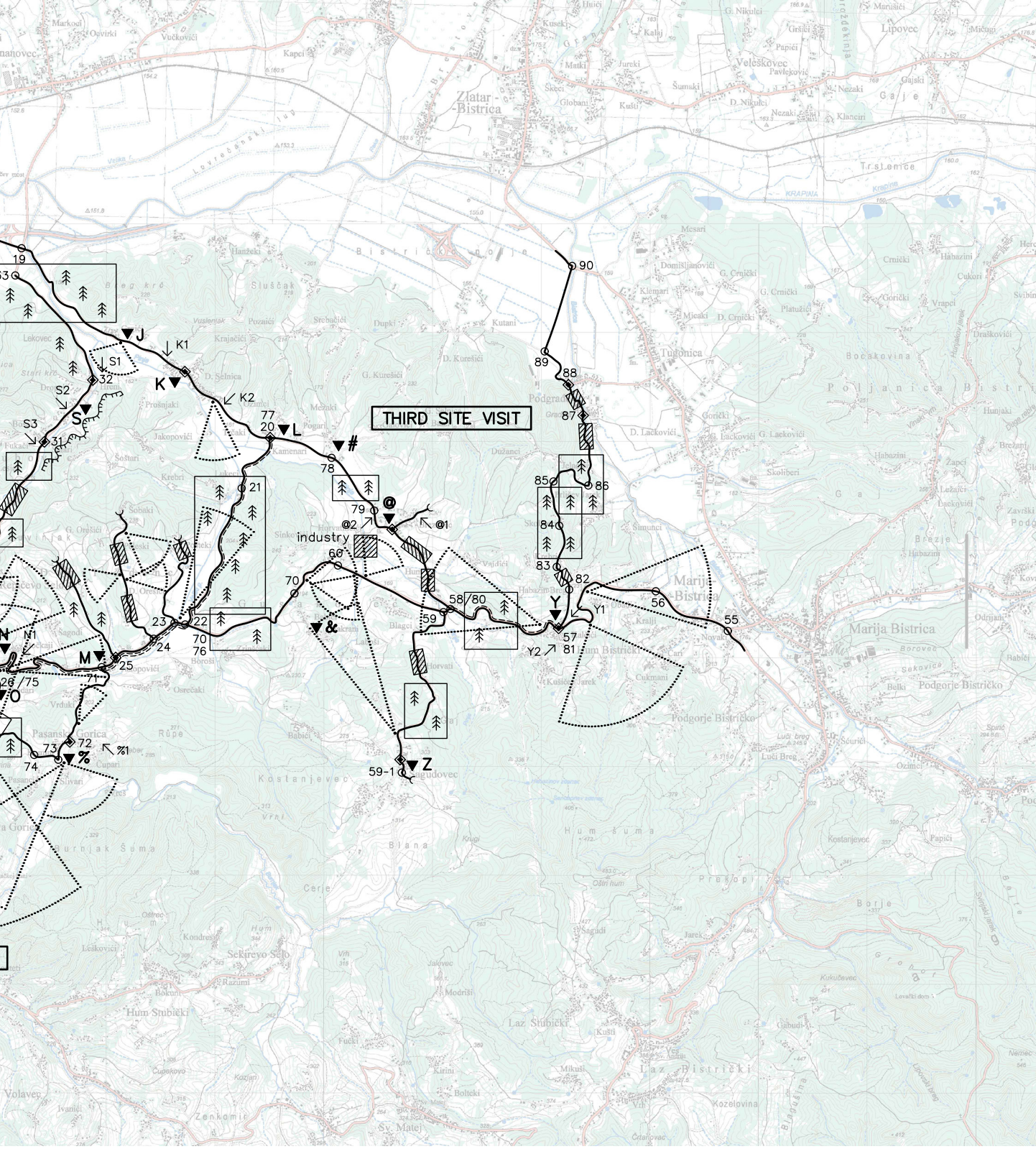
During the site visit, Google Maps would be used for defining routes in real-time and getting a clear idea of one's current location. Meanwhile, the route taken would be marked on printed-out topographic maps, as well as any sites of interest found along the way. Asides from potential development sites, it was planned to mark significant viewpoints, valuable nature, and existing rural centers.

Sites of interest have no specific criteria at this stage. Any location that appears interesting could be noted, whilst keeping in mind some common sense restrictions. As mentioned before, the site needs to be close to a regional road so good connections are made to surrounding towns. Locations on overly complex terrain are also inappropriate, as well as locations that would obviously harm valuable landscapes or nature. Connections to existing rural communities are important, but at this stage no special restrictions will be given on the size or type of potential villages. Finally, the greatest value of the site visit is the ability to judge different elements of the physical environment in situ, so a lot of room for improvisation is left during the visit.



digitalized and assembled field notes

1 : 50 000 scale; on underlay:
Detailed Topographic Map of Croatia, DTK 25
(originally in 1 : 25 000 scale)



travelled route
revisited route
dead-end route
waypoint
rural center
unsuitable zone
shaded zone
valuable nature
nature (zone)
potential site
point of interest
viewpoint

photograph taken during the site visit, showing one of the impressive viewpoints in Krapina-Zagorje

summary of the site visit

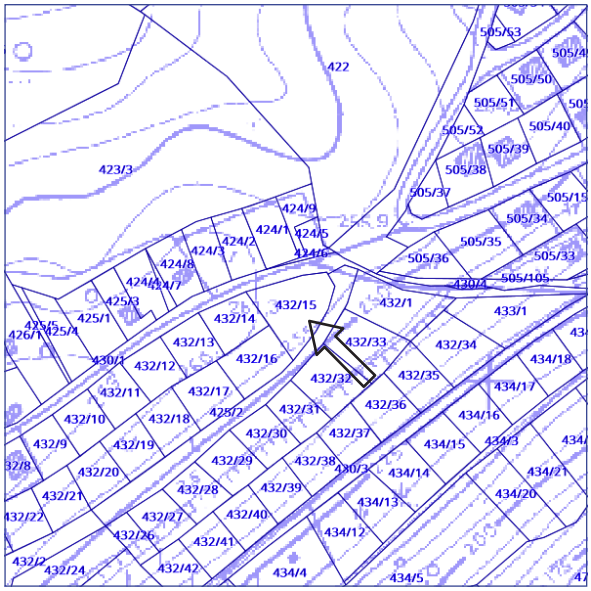
As dictated by the thesis's timeframe, a site visit was to be conducted in early January 2023. It featured three separate trips, each one lasting for a day. Weather conditions were similarly favorable on all three days of the visit. The sky was clear, allowing for plenty of sunshine to help judge the orientation and insolation of individual locations. During all three of the site visits, there was no occurrence of precipitation or strong winds.

Conducting the site visit during winter, it was necessary to take into account the season's effect on the physical environment. The foliage was bare, greatly altering the landscape's appearance compared to spring or summer. This is especially impactful because most of the area is covered by lush deciduous forests. Sightlines were longer and more of the terrain's features were visible.

However, it was difficult to get a good impression of the forest's geometry, which is an essential part of the area's natural landscape. Another factor that had to be taken into account was the sun's angle. Because the site visit was conducted during winter time, the sun's altitude at noon would be a low 22 degrees. This can be seen as a positive factor because any areas that were isolated during the site visit would have plenty of sunshine all year round. Overall, while conducting the site visit in winter wasn't ideal, good weather conditions enabled a good survey of the physical environment.

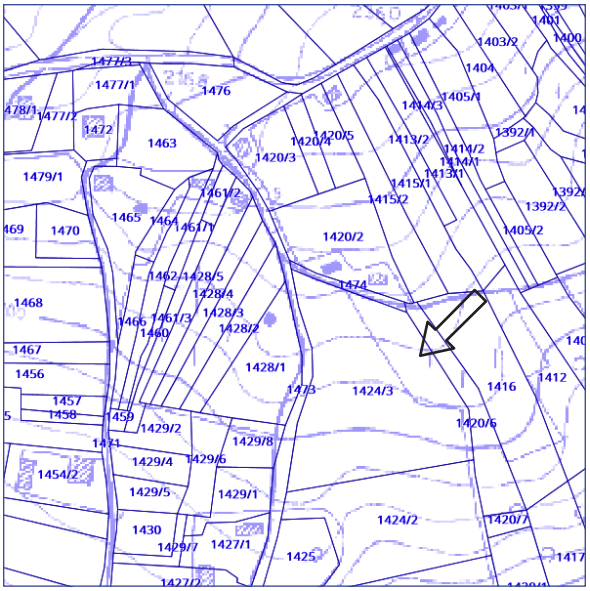
As planned, areas north of Donja Stubica were surveyed on the first day of the site visit. This area is characterized by particularly complex terrain, meaning most of the potential sites were on relatively steep hillsides. While driving on the numerous hilltop roads, amazing sightlines were revealed. Numerous vantage points offered overviews of the surrounding landscape. There were not many smaller rural communities within this zone, and many of the existing ones were overly close to (and dependent on) larger towns. The area is situated inside a triangle formed by three significant local centers. These are Zabok, Oroslavje, and Donja Stubica. As a result, the infrastructure is better developed compared to the rest of the wider area of interest. Most of the buildings are summer houses, often organized in stretches along a hilltop road, with vineyards on the slopes underneath. In terms of the natural environment, the zone is mostly covered in extensive hillside forests. 8 potential sites were identified during this phase of the site visit

The second phase of the site visit was the longest and most extensive of the three. It was conducted in two parts. First, the regional roads between Bedekovčina and Gornja Stubica were explored, and afterward, a detour was taken through the hills to the west. Several river valleys stretch north of Gornja Stubica. They historically provided passage through the hilly terrain, and today form the routes for



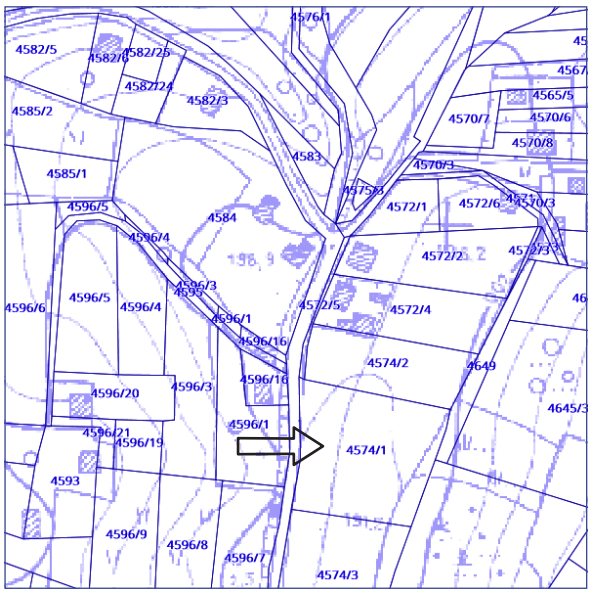
potential site 'A' - Stubički Kamenjak
well-positioned intersection in a new community

micro-location	1/3	nature	2/3
macro-location	2/3	community	2/3
regulations	2/3		
		total	9



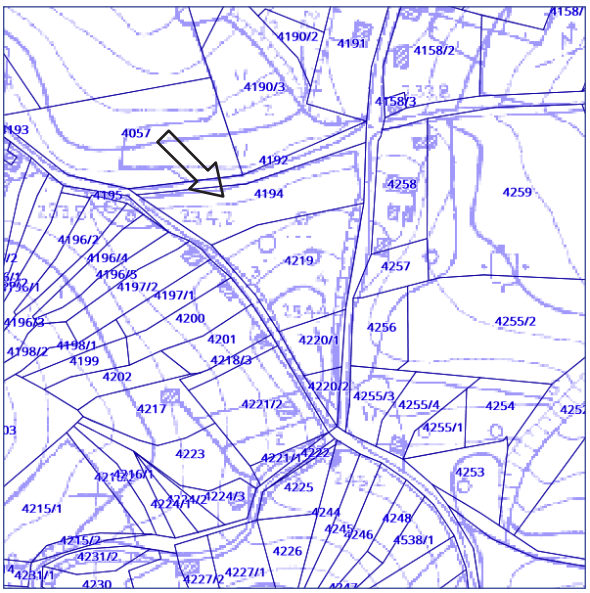
potential site 'B'
a remote hillside site well-connected to nature

micro-location	2/3	nature	2/3
macro-location	1/3	community	1/3
regulations	1/3		
		total	7



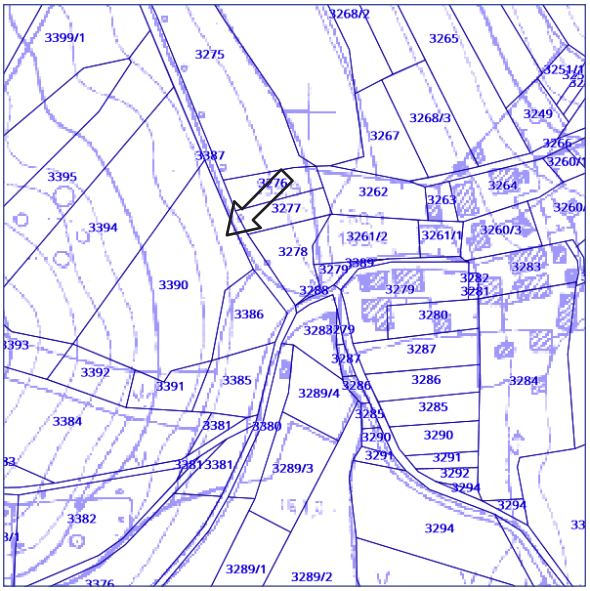
potential site 'C' - Vukšenec
a series of sites in a small valley along the road

micro-location	3/3	nature	3/3
macro-location	2/3	community	1/3
regulations	2/3		
		total	11



potential site 'D'
an older village core on complex terrain

micro-location	1/3	nature	2/3
macro-location	1/3	community	1/3
regulations	1/3		
		total	6

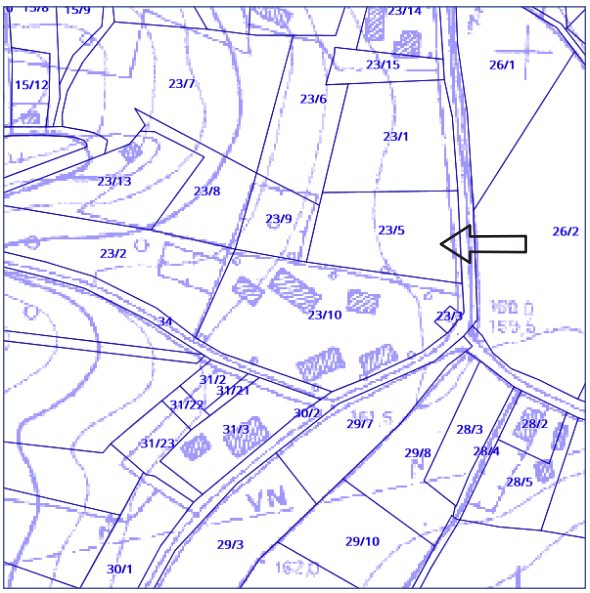


potential site 'E'
a remote valley site next to impressive nature

micro-location	2/3	nature	2/3
macro-location	1/3	community	1/3
regulations	1/3		
		total	7

potential site 'F' - Lepa Ves (north)
a small community next to an important road

micro-location	1/3	nature	2/3
macro-location	2/3	community	1/3
regulations	1/3		
		total	7

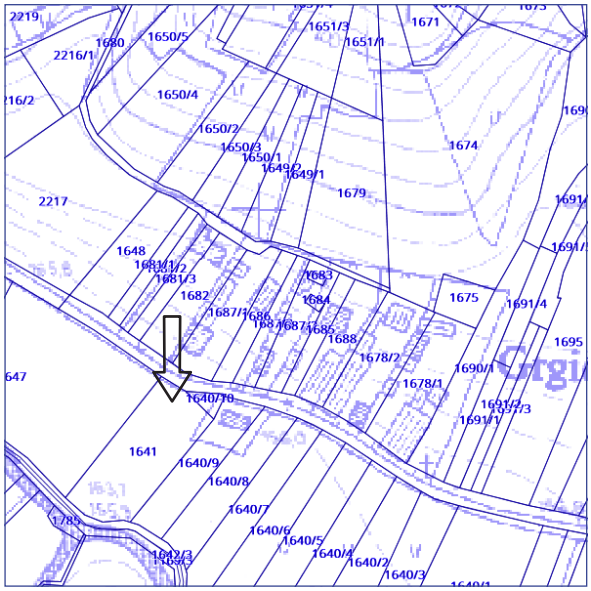


potential site 'G' - Lepa Ves (south)
a important crossroads in beautiful surroundings

micro-location	2/3	nature	2/3
macro-location	3/3	community	3/3
regulations	2/3		
		total	12

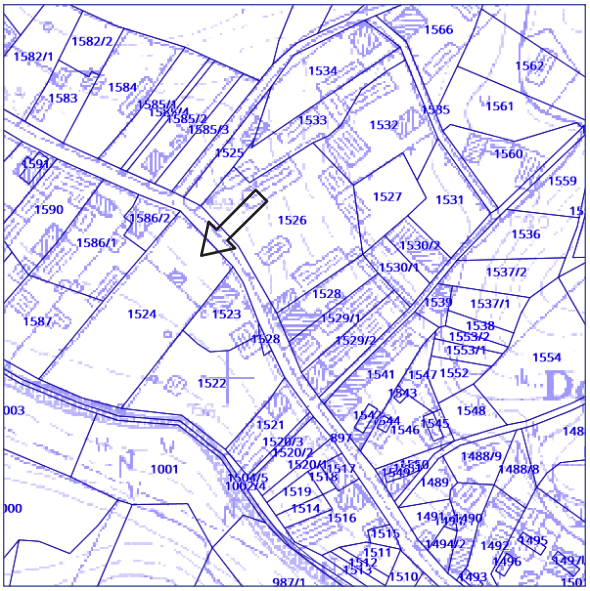
potential site 'H' - Matenci
an established village close to urban centers

micro-location	2/3	nature	2/3
macro-location	1/3	community	3/3
regulations	2/3		
		total	10



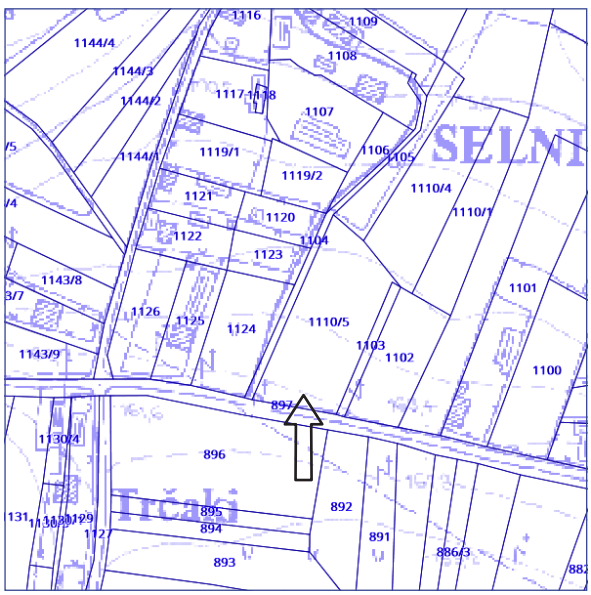
potential site 'J' - Grgići
a small old village in a river walley

micro-location	2/3	nature	3/3
macro-location	2/3	community	1/3
regulations	0/3		
		total	X



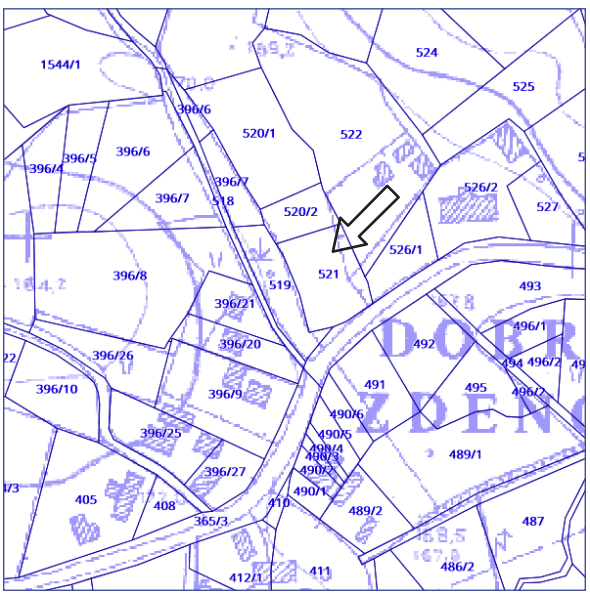
potential site 'K' - Donja Selnica
well-formed old village in a river walley

micro-location	2/3	nature	3/3
macro-location	2/3	community	3/3
regulations	1/3		
		total	11



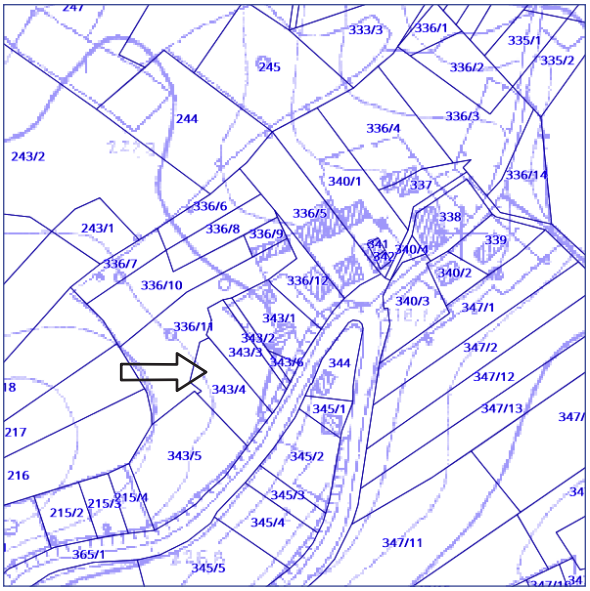
potential site 'L' - Trčaki
a small crossroads village in a river valley

micro-location	2/3	nature	3/3
macro-location	2/3	community	1/3
regulations	2/3		
		total	10



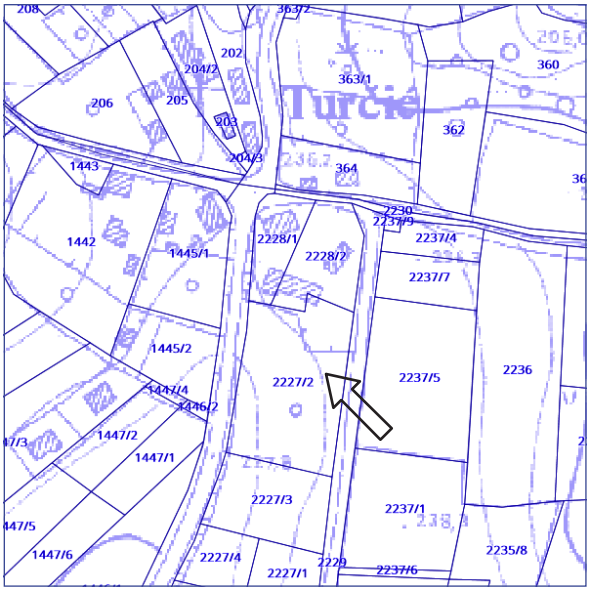
potential site 'M' - Dobri Zdenci
a small village core along an important road

micro-location	2/3	nature	2/3
macro-location	2/3	community	1/3
regulations	0/3		
		total	X



potential site 'N'
a collection of houses at an serpentine road

micro-location	1/3	nature	3/3
macro-location	2/3	community	1/3
regulations	2/3		
		total	9

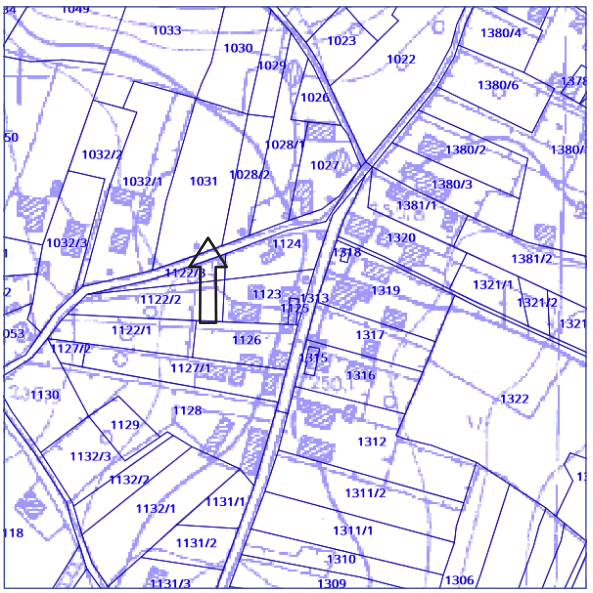


potential site 'O' - Turčić
an old village core zoned for development

micro-location	1/3	nature	2/3
macro-location	2/3	community	2/3
regulations	2/3		
		total	9

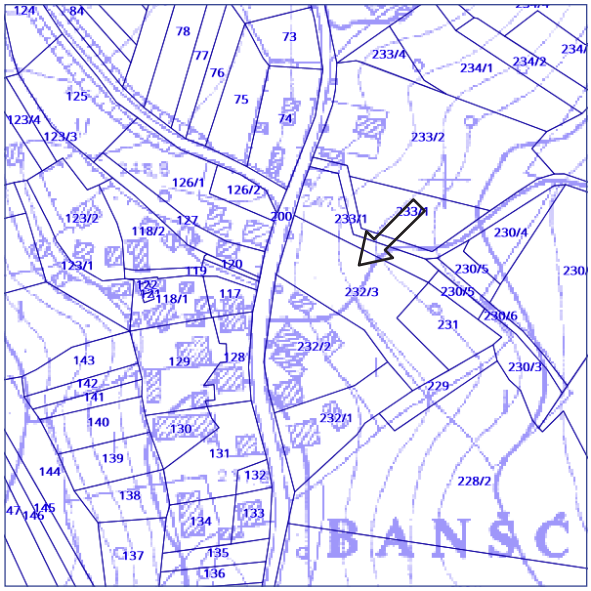
potential site 'P' - Samci
a newer large village with a built-up core

micro-location	2/3	nature	1/3
macro-location	2/3	community	2/3
regulations	3/3		
		total	10



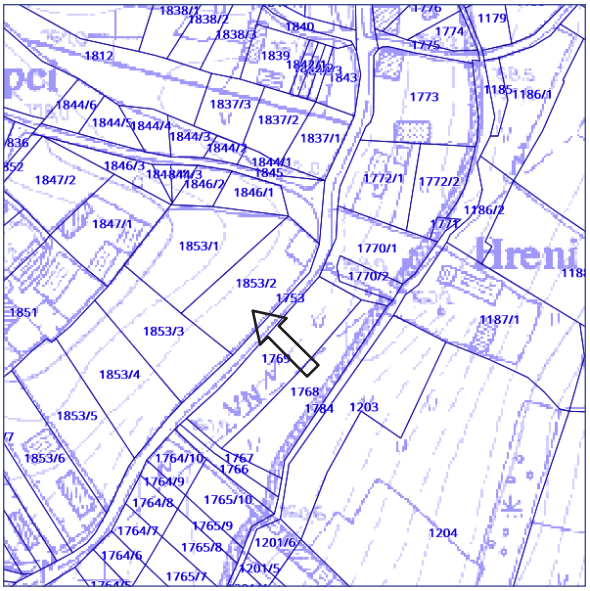
potential site 'Q' - Modrovec
a larger hilltop village close to hiking trails

micro-location	2/3	nature	3/3
macro-location	3/3	community	2/3
regulations	3/3		
		total	13



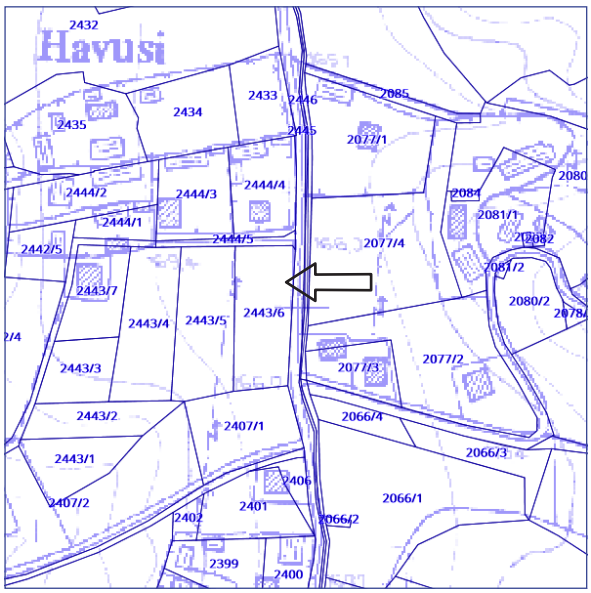
potential site 'R' - Banšćica
small hilltop village with great views

micro-location	1/3	nature	2/3
macro-location	2/3	community	1/3
regulations	1/3		
		total	7



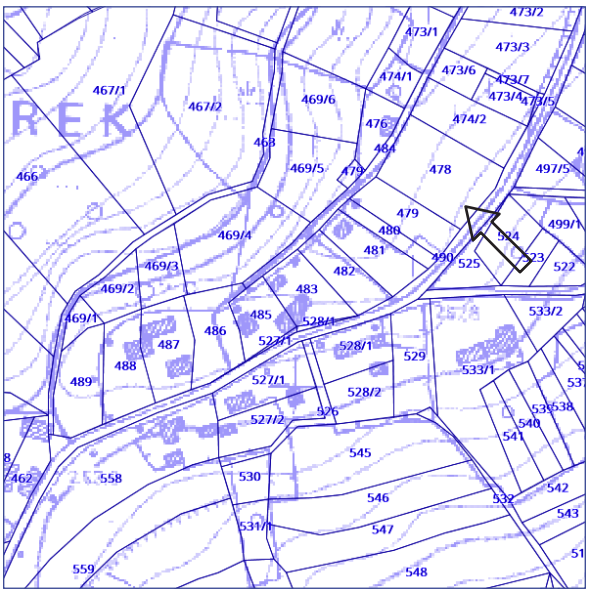
potential site 'S' - Dubovec
series of sites along a river valley road

micro-location	1/3	nature	2/3
macro-location	2/3	community	1/3
regulations	1/3		
		total	7



potential site 'T' - Havusi
a spread-out small village along a valley road

micro-location	1/3	nature	3/3
macro-location	2/3	community	2/3
regulations	1/3		
		total	9

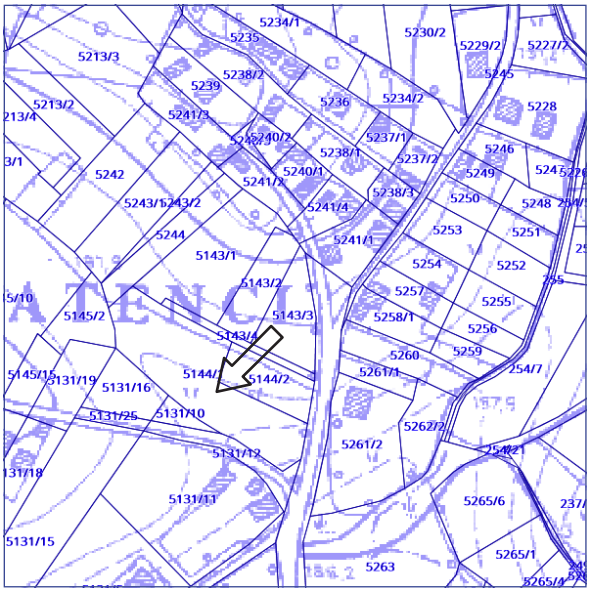


potential site 'U' - Jarek
very picturesqe village on a remote hillside

micro-location	1/3	nature	3/3
macro-location	2/3	community	1/3
regulations	1/3		
		total	8

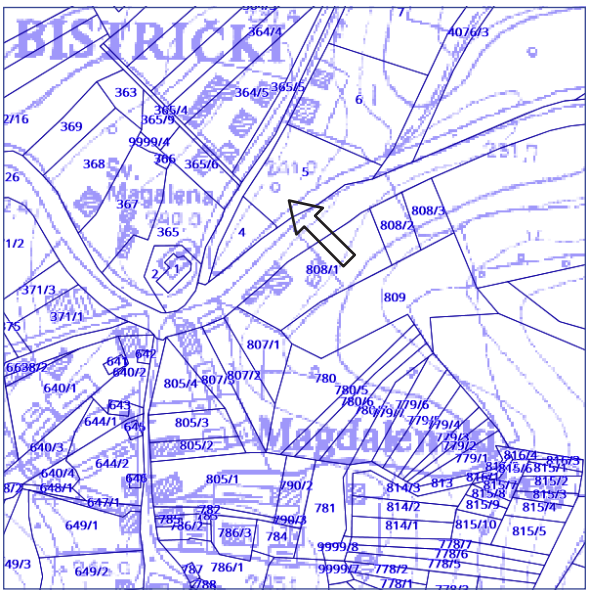
potential site 'V' - Vinterovec
a hillside of houses close to Gornja stubica

micro-location	2/3	nature	1/3
macro-location	1/3	community	0/3
regulations	3/3		
		total	X



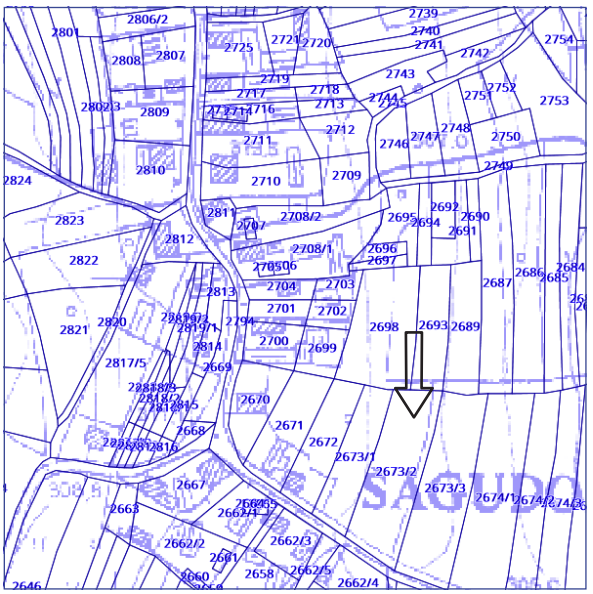
potential site 'X' - Matenci
hillside village close to Donja stubica

micro-location	2/3	nature	1/3
macro-location	1/3	community	1/3
regulations	2/3		
		total	7



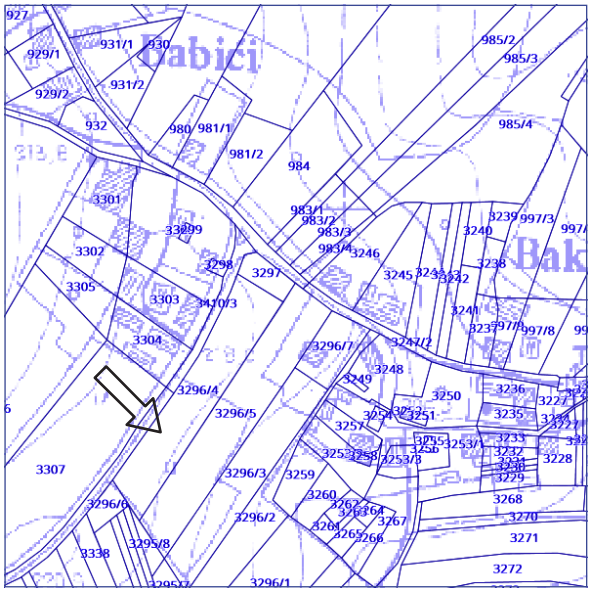
potential site 'Y' - Magdalenski Breg
protected traditional hilltop village with a curch

micro-location	2/3	nature	3/3
macro-location	2/3	community	3/3
regulations	1/3		
		total	11



potential site 'Z' - Šagudovec
layered large hilltop village with curch

micro-location	1/3	nature	3/3
macro-location	1/3	community	2/3
regulations	1/3		
		total	8

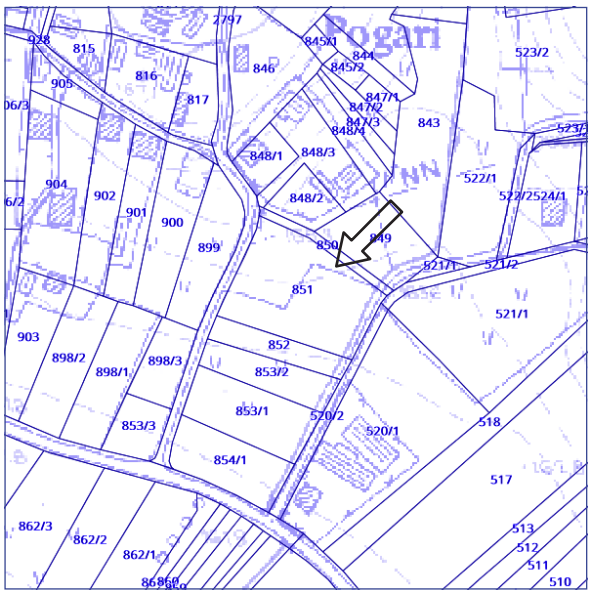


potential site '&' - Babići
two smaller hilltop villages with great views

micro-location	2/3	nature	2/3
macro-location	1/3	community	2/3
regulations	2/3		
		total	9

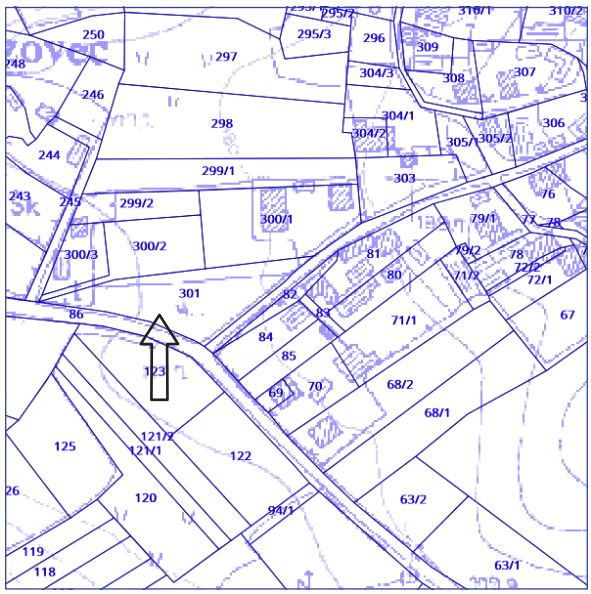
potential site '%' - Pasanska Gorica
moderately-sized hilltop village with a view

micro-location	2/3	nature	3/3
macro-location	3/3	community	1/3
regulations	3/3		
		total	12



potential site '#' - Pogari
collection of houses close to a valley road

micro-location	1/3	nature	1/3
macro-location	1/3	community	1/3
regulations	3/3		
		total	7



potential site '@' - Brezovec
small village with a school looking over the valley

micro-location	1/3	nature	2/3
macro-location	2/3	community	1/3
regulations	1/3		
		total	7

summary of potential project sites

potential site		MiL	MaL	R	N	C	total score	
first site visit								
A	Stubički Kamenjak	1	2	2	2	2	9	•
B	-	2	1	1	2	1	7	
C	Vukušenec	3	2	2	3	1	11	•
D	-	1	1	1	2	1	6	
E	-	2	1	1	2	1	7	
F	Lepa Ves (north)	1	2	1	2	1	7	
G	Lepa Ves (south)	2	3	2	2	3	12	
H	Matenci	2	1	2	2	3	10	
second site visit								
J	Grgići	2	2	0	3	1	disqualified	
K	Donja Selnica	2	2	1	3	3	11	•
L	Trčaki	2	2	2	3	1	10	
M	Dobri Zdenci	2	2	0	2	1	disqualified	
N	-	1	2	2	3	1	9	
O	Turčić	1	2	2	2	2	9	
P	Samci	2	2	3	1	2	10	
Q	Modrovec	2	3	3	3	2	13	•
R	Banšćica	1	2	1	2	1	7	
S	Dubovec	1	2	1	2	1	7	
T	Havusi	1	2	1	3	2	9	
U	Jarek	1	2	1	3	1	8	

potential site		MiL	MaL	R	N	C	total score	
V	Vinterovec	2	1	3	1	0	disqualified	
X	Matenci	2	1	2	1	1	7	
third site visit								
Y	Magdalenski Breg	2	2	1	3	3	11	•
Z	Šagudovec	1	1	1	3	2	8	
&	Babići	2	1	2	2	2	9	
%	Pasanska Gorica	2	3	3	3	1	12	
#	Pogari	1	1	3	1	1	7	
@	Brezovec	1	2	1	2	1	7	

potential sites shown on Hrvatska osnovna karta, HOK (General Map of Croata) at 1:5000 scale

MiL	micro-location	total score	sum of all points (maximum 15 points)
MaL	macro location		
R	regulations		
N	nature	disqualified	if one category equals 0
C	community		
	(maximum 3 points per category)	marked •	selected sites

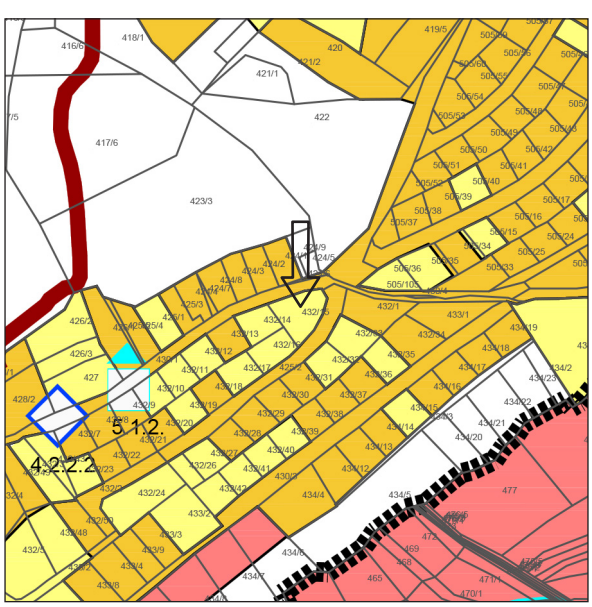
most of the area's regional roads. The valleys offer beautiful rural vistas that form the area's unique identity. Although well-accessible, most of this area is distanced from the bigger towns. Rural communities were able to form freely. Historically, these villages were quite independent, but today nevertheless rely on nearby urban centers and suffer from sharp depopulation. Many abandoned villages were observed while driving through this area, often featuring valuable traditional rural architecture. These were especially common in the hills directly between Gornja Stubica and Bedekovčina. While old villages in the hills aren't well off, most of the newer and more lively communities are located in the valleys. A couple of smaller schools are located in this area, forming gravitational points for the surrounding population. This area appears to be developing rural tourism. Smaller hotels and restaurants were observed along the way. In total, 14 potential sites were identified during this phase of the site visit.

The last day of the site visit encompassed the eastern portion of the wider area of interest. This site visit started from the municipal center of Marija Bistrica, which is also an important national religious site. Driving westwards, the terrain is varied. Roads traverse both hills and valleys, eventually linking up to the previously traversed route between Bedekovčina and

potential site 'A' - Stubički Kamenjak

This site is by far one of the newest rural structures being considered. It has been developed in a planned fashion on a south-facing hillside close to Donja Stubica. The location is a good compromise of remoteness and proximity to urban centers while offering amazing views of the surrounding landscape.

There are a couple of rural tourism attractions located nearby. Several parcels are available next to a prominent intersection, allowing for a central position, but they feature awkward terrain that is not very suitable for the development of a retirement home. Land use plans are favorable, allowing for new buildings at this location.

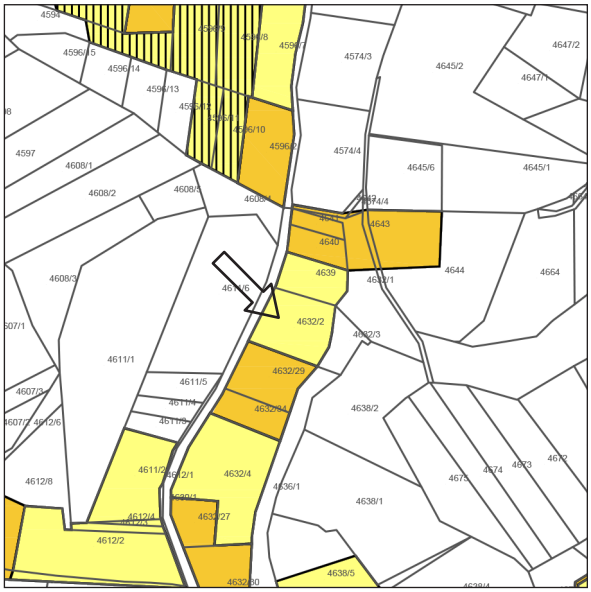


spatial plan of Općina Donja Stubica (2021)

site photograph from the east

potential site 'C' - Vukšenec

Site C has one of the best macro-locations, being located along an important but not too busy road and at a reasonable distance from nearby Donja Stubica. It is reachable by bike and on foot from the closest train station. The nature surrounding the site is also a big advantage - a small valley surrounded by overgrown hillsides. Potential parcels are flat and suitable for a retirement home, as well as being marked as developable in the local land use plans. However, insolation on the available parcels is not optimal. The main disadvantage of site C is the absence of a strong rural core and traditional structures.

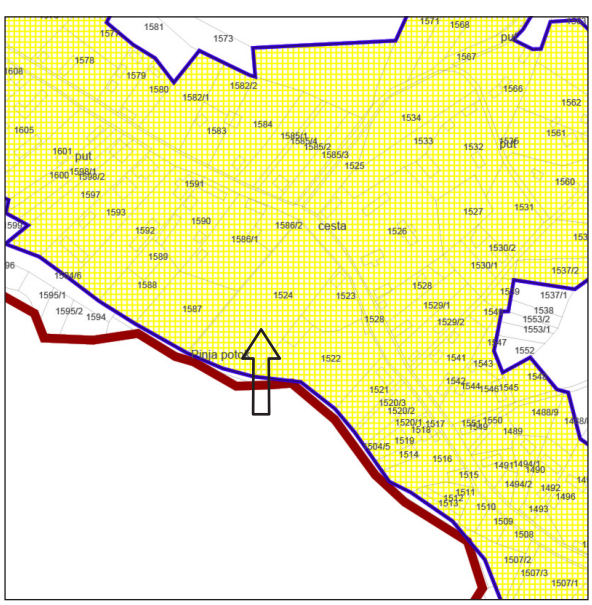


site photograph from the south (Maps, 1)

spatial plan of Općina Donja Stubica (2021)

potential site 'K' - Donja Selnica

This site features one of the most impressive traditional rural formations in the area of interest. Today's conglomerate is a result of three traditional villages growing and merging. The available parcel is located in the very center of the village and features a completely flat configuration. Several traditional buildings are located on the parcel, which could be interpreted in the project. The surrounding nature is high-quality, offering plenty of options for recreation. The site's overall macro-location is pretty remote, but still acceptable. The main downside is a hill located to the south of the parcel, casting shade in the winter months.

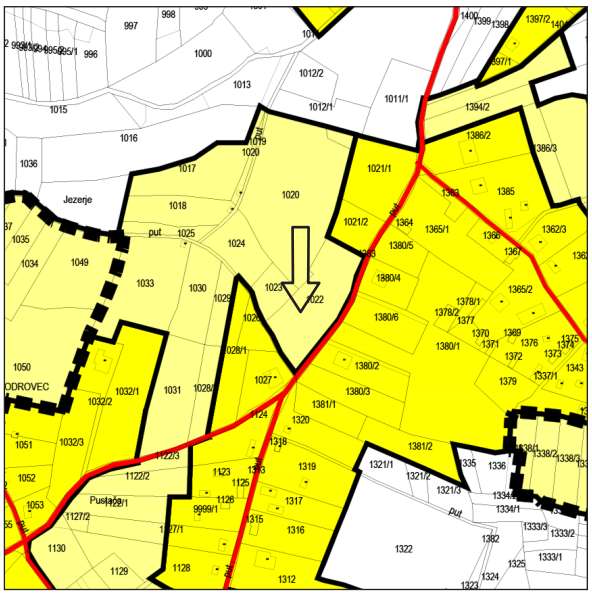


site photograph from the north (Maps, 2)

spatial plan of Općina Marija Bistrica (2019)

potential site 'Q' - Modrovec

The hilltop village of Modrovec offers a very good macro-location, being close to both Gornja and Donja Stubica while retaining the ambiance of remoteness. However, accessibility may be limited due to poorly sized access roads. The surrounding nature is beautiful and vistas of the rural landscape are abundant. Hiking trails, picturesqe forests, and several historical points of interest are located nearby. The available parcels are central, well-proportioned, and zoned for development, but often feature awkwardly sloped terrain. The village itself is unfortunately not traditional, comprised mostly of newer buildings without a strong center.

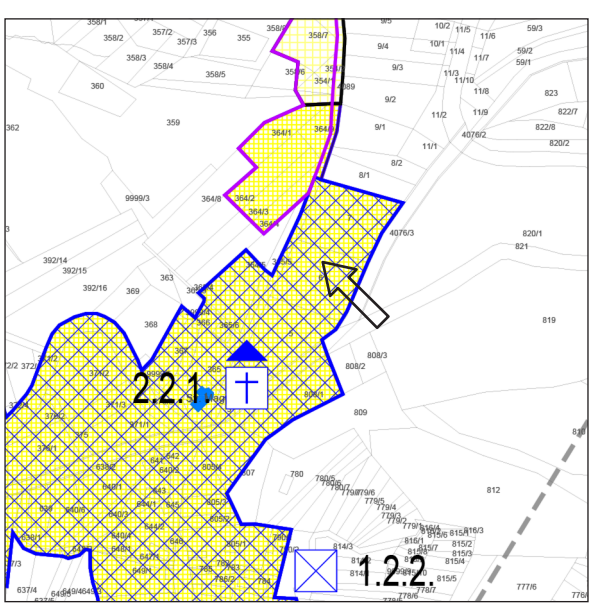


site photograph from the south (Maps, 3)

spatial plan of Općina Gornja Stubica (2014)

potential site 'Y' - Magdalenski Breg

Magdalenski Breg is a valuable historic village located on a hilltop. Many examples of traditional rural architecture and a small central church are located within the bounds. The entire complex is registered as a protected heritage site, thus limiting possible architectural interventions. The village is located very close to Marija Bistrica, which is an important religious site as well as an administrative center. The views of the surrounding landscape are unique, and the nearby nature is picturesque. Available parcels are unfortunately small, awkwardly shaped, and on complex terrain, which is the primary downside of this location.



site photograph from the south-west (Maps, 4)

spatial plan of Općina Marija Bistrica (2019)

Gornja Stubica. Same as the first zone, this area is distinguished by amazing hilltop views overlooking large portions of the surrounding landscape. However, the most important characteristic is the valuable historic rural centers found in this area. While the villages visited earlier were indisputably traditional formations, they were just smaller communities without a rural center in the form of a square or a church. Villages visited on the third day feature old churches at their centers, making them very valuable from a historical point of view. Two such villages were recognized as potential sites: Magdalenski Breg and Šagudovec. Apart from this, the area is unfortunately marked by the invasion of industrial buildings into the rural landscape, with storage halls and other inappropriate structures diminishing the value of some landscapes. As a result, several interesting locations were eventually not taken into consideration. 6 potential sites were identified during this day.

Overall, the site visit was a success. Aided by good weather and sunlight, there was plenty of opportunity to get a good impression of the area's spatial characteristics. After the visit, it was easy to distinguish specific zones within the area and, most importantly, identify those zones that had the biggest potential for the development of a retirement home. Having visited most of the wider area, orientation on maps became more intuitive, and further considerations about the project site were easier. Insights gained during the visit directly impacted the criteria for narrowing down potential sites and for selecting the final project site. In total, 28 potential sites had been identified.

description of chosen project site

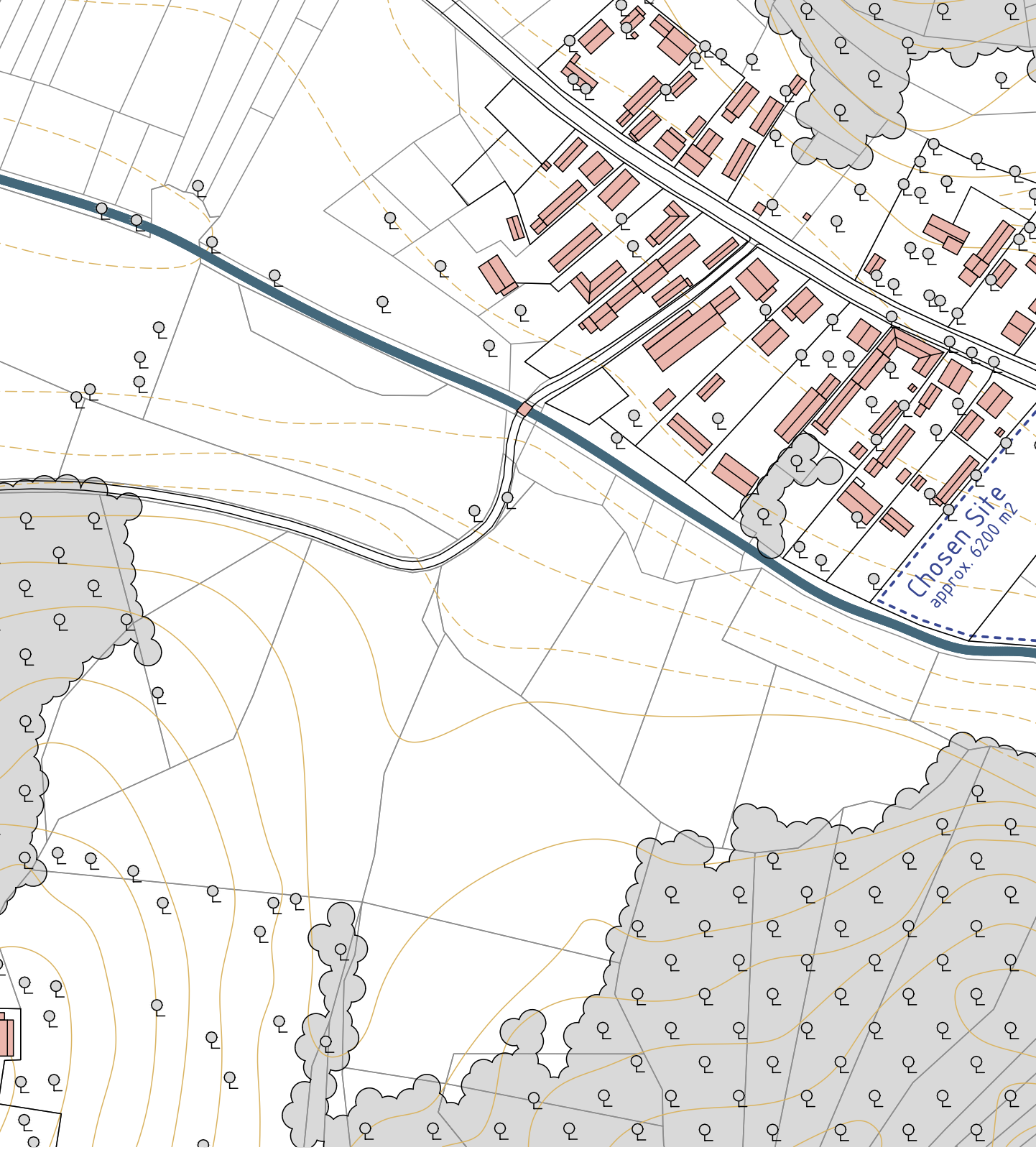
The chosen site for the case study architectural project is located in the village of Selnica It is a small village located along a regional road traversing a river valley. The site is located centrally within the village structure and has several existing houses on it. Selnica is a complex settlement with a specific rural pattern. It has developed gradually throughout the late 19th century and 20th century.

Today's village structure is the result of three separate house clusters growing and merging over time. A consequence of this development is the large unbuilt parcel located right in the middle of the village. Where traditional villages would have a school, church, or similar public function, Selnica has an empty space. From a structural standpoint, this presents an unusual opportunity to add new functions right in the very middle of an existing settlement. Apart from being located in the center of Selnica, the site has several notable qualities. It is directly connected to a regional road to the north, which is perfect for accessibility. A stream runs along its southern edge and its natural bank can be integrated into the building's landscaping. Across the stream, directly south, the site looks onto the picturesque rural landscape.

Generally, Selnica lacks public functions. The local volunteer firefighter's community home seems abandoned, and the only shop is located at the very edge of the village. Without any public functions or public spaces, Selnica has no spatial framework for the development of a common identity. By adding new public spaces to the village, its existing residents and any newcomers could be integrated in a more meaningful way. This ties into the goal of using the retirement home as a tool for strengthening the rural context.

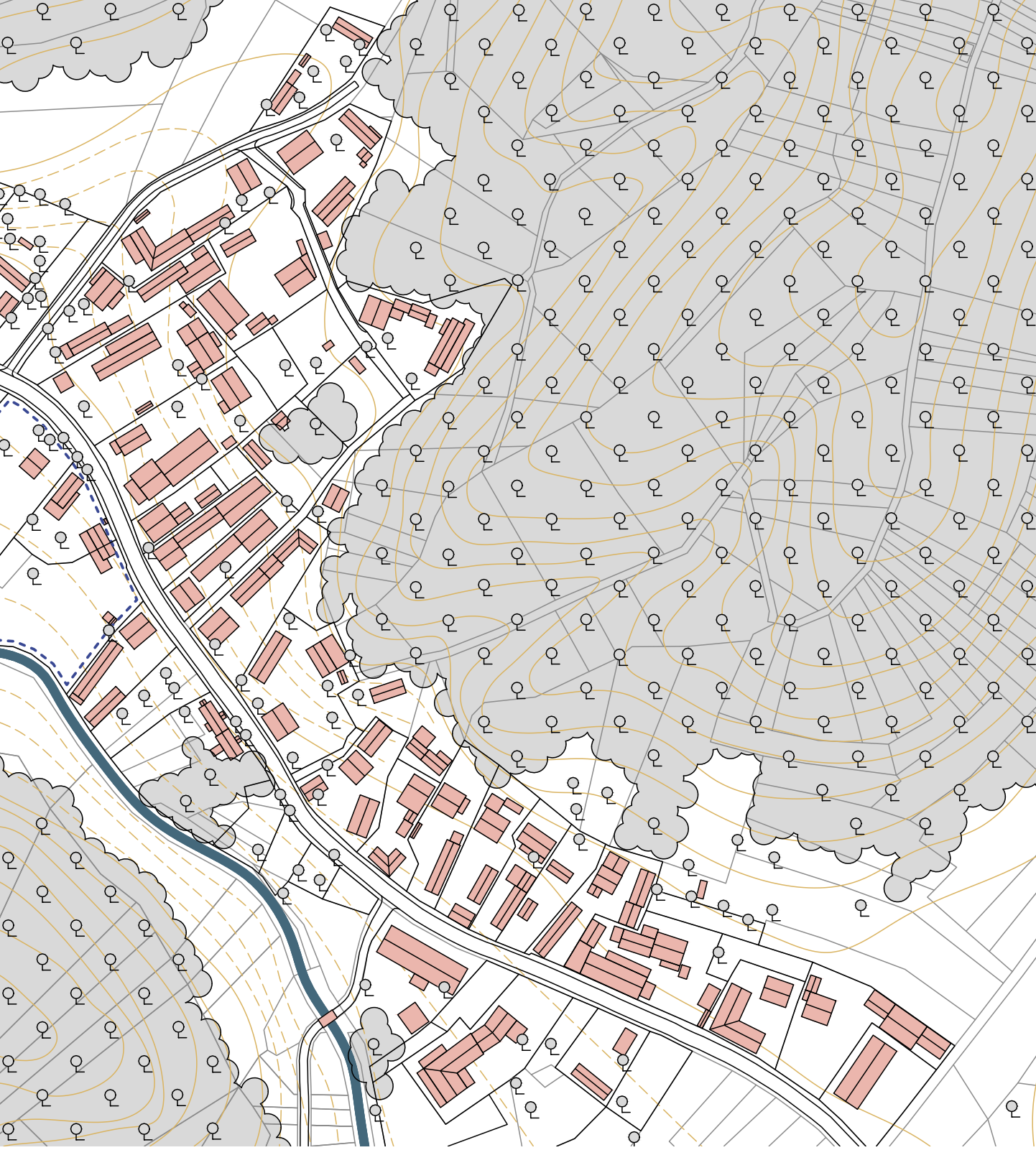
Many of the houses in Selnica are abandoned. The village is impacted by the process of depopulation characteristic for all of Krapina-Zagorje. However, many residents remain in Selnica, guaranteeing a continuity in rural life that can be built upon. Many of the abandoned homes in Selnica are in relatively adequate condition, which is a further potential for the process of revitalization. Employees of the future retirement homes could acquire houses close to their workplace very cheaply. The presence of the retirement home's public functions could invite others to move to Selnica. Generally, unlike the many dying or already extinguished rural communities in Krapina-Zagorje, Selnica presents a good opportunity to build upon the existing population structure.

The project site itself is around 6200m2. As mentioned previously, it has several existing abandoned houses on it. Two of these houses are examples of traditional rural architecture, and they should be preserved as part of Selnica's history. The last building is unfinished and of low architectural quality, so it is safe to assume its demolition. The parcel is composed of several smaller cadastral units, which have common ownership and can be merged into a unified project site.



village of Selnica and surrounding context

1 : 2000 scale; on underlay:
cadastral zones Selnica and Dubovec
(originally in 1 : 5 000 scale)



cadastral map
site boundaries
buildings
river bed
roads and paths
elevation lines
individual tree
forest area

overview of legal framework in Croatia

In the legal section, a series of croatian laws and bylaws are presented in the extent that they are deemed relevant to the degree project. The overview contains legal documents from the fields of healthcare, hospitality, fire protection, noise protection and general building codes. The relevant provisions were finally compiled in a table which can serve as orientation in the architectural design phase.

Social Welfare Act and related bylaws

The Regulation on Standards for Categorisation of Nursing Homes (SCNH 2000) is the most specific legislation passed by the Croatian Government concerning retirement homes. It defines metrics used to categorize retirement homes into one of three categories. Homes in the first category are of the highest quality, and homes in the third category represent the minimum acceptable standards of care. While a retirement home can remain uncategorized, it has to fulfill third-category standards within a defined time frame or face losing its license as per article 48.

Apart from the standards themselves, the regulation also defines various procedures for categorization and relevant administrative bodies. The regulation itself belongs to the jurisdiction of Croatia's Ministry of Labor and Social Welfare.

The regulation has been passed in the year 2000, meaning it represents a somewhat outdated set of standards. However, because it is a valid legal document in Croatia, its standards will be used to form the final architectural program for this thesis project. Specifically, the aim is to design a retirement home of the first category.

The metrics for categorization include types, scopes, and qualities of offered services, numbers of employees according to profession, dimensions, qualities, and uses of various spaces, as well as mandatory installed appliances and equipment (article 1).

Chapter III, including articles 4 to 17, define the standards of first-category retirement homes. Articles 4 to 7 and 9 define required services and have no direct spatial requirements. Article 8 (SCNH 2000) requires the retirement home to have an infirmary where primary health care services are offered. It also calls for guaranteed transport to secondary and tertiary healthcare providers, implying the need for a vehicle to be permanently parked on-site.

Articles 11 to 15 (SCNH 2000) define the required number of employees according to profession. These metrics are defined for different brackets of retirement homes defined by the number of residents.

The first relevant bracket is retirement homes with up to 50 residents (article 11). These need to employ: one social worker, 5 nurses, 5 caretakers, a physiotherapist, a house economist/driver/handyman, a stockman/handyman, 3 cooks, 2 assistant cooks, 3 servers, 2 laundry washers and one cleaner per 400 m2 of residential space. The other relevant bracket is retirement homes with between 50 and 100 residents (article 12). Required employees are: one social worker, 5 nurses per 50 intensive care beds, 9 caretakers per 50 intensive care beds, one physiotherapist, one cleaner per 400 m2 of residential space, a house economist/driver/handyman, a stockman/handyman, 4 cooks, 2 assistant cooks, 3 servers and 3 laundry washers. Employees work in shifts as organized by the retirement home's director. The architectural programme within this thesis will comfortably fit all employees belonging to the same shift. Employee requirements are plotted on a graph to determine the most economical ratio of users to employees.

Article 16 (SCNH 2000) defines the dimensions, qualities, and uses of various spaces, as well as other technical requirements. This article states that 50 % of the home's capacity must be dedicated to intensive care residents and the other half to regular (non-intensive care) residents. It requires at least 60% of regular (non-intensive care) bedrooms to have only one bed and otherwise limits the maximum number of beds per room to two. Every regular bedroom is required to have its own bathroom equipped with a shower or bathtub. In the intensive care unit, bedrooms are also limited to two beds maximum. Here, bathrooms can be shared, but also need to be gender separated. One fully-equipped bathroom is required per 6 users. Everywhere, the minimum area of a bedroom is 8 m2 per user. As mentioned earlier, an infirmary for primary health care is required, and the intensive care unit needs to have a nurse's room.

The dining area can be a unified space or several separated rooms but must house at least half of the retirement home's residents at the same time and have a floor area of 2 m2 per resident. A bathroom is required alongside the dining area. It must be gender separated. For every 30 beds, one kitchenette is to be made available to the home's residents. The living area can also be a unified space or several separated rooms, but its total floor area must equal 2 m2 per resident. An occupational therapy room is required, and it must house at least 40% of the residents at the same time. A physical therapy room is also required and must have a floor area of 25 m2.

A disinfection room is required, and it must have 6 m2 of floor area. Adequate space needs to be secured for a main laundry room, as well as a separate resident's laundry room. The home must have a morgue, only used for the temporary storage of deceased residents. Doors in residential areas need to be at least 100 cm wide, and hallways need to be at least 180 cm wide. The required residential floor area per bed has been plotted onto a graph as a reference for further architectural programming.

Article 17 (SCNH 2000) further defines the dimensions of various elements, mandatory installed appliances and equipment, and other technical requirements. Resident's beds must be no smaller than 90 x 200 cm and they must measure between 50 and 60 cm vertically. Bunk beds are not permitted and the distance between beds must be at least 65 cm. In the intensive care unit, the space between beds must be at least 120 cm and the bedrooms need to be equipped with furniture and equipment adapted to residents with impaired movement: bed tray tables, handrails and bars around the bed, special chairs, and walkers. Also in the intensive care unit, bathrooms need to feature bathtubs or showers accessible from three sides, wheelchairs, and other specialized equipment for residents with impaired movement. Regular bedrooms need to be equipped with: a separate wardrobe for each resident, a table, a chair, a nightstand, a vanity, an armchair, and adequate electrical appliances.

All hallways, bathrooms, and toilets need to have handrails. The nurse's room must have: a table, a chair, a closet, a safe for medication, an examination table, and adequate electrical appliances. The occupational therapy room must have: a table, chairs, and adequate closet space. The physical therapy room needs to be fitted with a massage bed, various specialized therapy equipment, and workout equipment.

A detailed description of required appliances and furniture is provided for the kitchen, dining room, and laundry, but these requirements will not be listed as they are highly logical. Additionally, for every 50 residents, the home must have one washing machine and dryer set up for use by the residents. The resident's kitchenette must have an oven, fridge, sink, and adequate kitchen counter surface. The living room must have chairs, tables, and a TV set, with adequate storage space nearby. If the building has more than one floor, an elevator is mandatory. The entrance must be at least 100cm wide, and the depth must be adequate for a stretcher.

The rest of the Regulation's articles either refer to second- and third-category retirement homes or describe administrative issues of no architectural consequence.

Regulation on Ensuring Building Accessibility

Accessibility requirements for most types of buildings in Croatia are governed by the Regulation on ensuring building accessibility for people with disabilities and reduced mobility (EBA 2013). This bylaw is within the jurisdiction of the Ministry of Physical Planning, Construction and State Assets. It is a well-written and detailed legal document that integrates most

contemporary standards on accessibility. It was adapted from German regulations during the

1990s and further adapted to European Union technical standards. The regulation is binding for all public-use and commercial buildings, whilst it also serves as a guideline for most residential and other buildings with accessibility requirements.

Whilst the legal text is very extensive, only specific requirements will be presented in this overview. Firstly, described here are only those conditions relevant to the thesis topic (retirement home for around 50 residents). Secondly, only requirements relevant at the early architectural design stage are taken into account, such as dimensions of openings or rooms and the placement of accessibility aids and structures. Detailed technical specifications for electrical appliances (buttons, lights, etc.), signage, aids for the visually impaired, and similar elements are omitted, as they are only relevant in later design stages.

Article 6 (together with the adjoined graphic) defines the dimensions required for the uninterrupted movement of people using a wheelchair or walker. For linear movement, a minimum corridor of 90 cm is required in interiors or 120 cm in exteriors. For turning, a free circular area with a radius of 150 cm is needed. For persons walking with crutches a corridor of 120 cm is mandatory.

Several possible accessibility elements for vertical movement are defined and regulated in article 10: ramps, stairs, elevators, and special platforms. Interior ramps can be used for a height difference of up to 120 cm (unlimited if outside). Their maximum incline is 5% (8.3 % if the height difference is no more than 76 cm) and they must be no less than 120 cm wide (exterior) or 90 cm wide (interior). For every 6 meters of incline, a level landing of at least 150 cm in length is mandatory. Handrails are required at heights of 60 and 90 cm, and they must extend 30 cm from the ends of the ramp. An accessible staircase must have a vertical interval of 15 cm or less, and a depth of 33 cm or more. The width of a staircase can be no less than 120 cm (110 cm in the interior). Stairs wider than 250cm must have one or more central handrails. Accessible elevators must have a cabin with at least 110 cm by 140 cm free space inside. The elevator's door must be at least 90 cm wide and has to be either telescopic or has to open towards the exit. If there are two or more elevators next to each other, only one of them has to be accessible in accordance with this regulation.

According to article 16 (EBA 2013), the building's entrance must have a single door 110 cm wide or a double door 2 x 90 cm wide. The entrance's height must be a minimum of 210 cm. Doors must be either sliding, telescopic, or openable towards the exterior. The entrance's threshold must be no higher than 2 cm. A vestibule with a minimum depth of 240 cm is required to prevent heat loss. Article 17 regulates hallways and other horizontal communications. The minimum width of hallways is 150 cm. Interior doors should be at least 90 cm wide and must have no thresholds (except when leading to a hallway, when a 2cm threshold is permitted).

Accessible toilets are defined in article 18 (EBA 2013). Detailed dimensions for all fixtures, including the toilet and sink, are given as part of an attached graphic. A free circular area with a radius of 150 cm is mandatory for wheelchair maneuverability. Free spaces of 90 cm are needed in front of the sink and toilet. Article 19 goes on to define similar conditions for bathrooms.

Conditions for an accessible kitchen are mostly derived from standard good practices for kitchen design (article 20). The only exception is wheelchair accessibility, where the above-mentioned maneuvering areas are required. Most kitchen surfaces should have free space underneath them, also for reasons of wheelchair accessibility.

Conditions for an accessible room and apartment, found in articles 20 and 21 (EBA 2013), can be applied to rooms in a retirement home. Apart from the already mentioned radius for wheelchair accessibility, several other restrictions are put forward. Entrance doors should be 110 cm wide, while all other doors should be no narrower than 80 cm. Hallways need to have a minimum width of 120 cm, while no spaces should be narrower than 90 cm.

Article 23 (EBA 2013) details conditions for restaurants and cafes, applicable to the dining room of a retirement home. At least 20% of tables should be arranged in an accessible manner. The distance between these tables (including seating places) must be at least 100 cm

Article 38 (EBA 2013) deals with accessible parking spaces. They must be located closest to an accessible entrance. A single accessible space must occupy at least 370 cm x 500 cm, and a pair of such spaces can be a minimum size of 590 cm x 500 cm with a central corridor 150 cm wide. According to article 50, 5% of parking spaces on a public parking lot must be accessible, with a minimum of 1 accessible parking space per lot.

Article 44 (EBA 2013) provides a comprehensive list of buildings that have to adhere to accessibility requirements based on their usage (and the number of users). According to section 5, which lists health, welfare, and rehabilitation buildings, all retirement homes with more than 20 residents are required to adhere to any relevant accessibility requirements. This is expanded upon in article 46, which defines the total number of accessible rooms required in a retirement home. For the first 20 rooms, one accessible room is needed, while for every further 10 rooms, another is to be made accessible. With regards to shared bathrooms, article 47 calls for one accessible bathroom for every 10 rooms.

Articles that have been omitted either deal with accessibility aids or issues not deemed relevant for the scope and/or topic of this thesis, or which concern administrative or legal problems with no direct impact on the architectural design.

work safety legislation

In Croatia, work safety is primarily regulated under the Work Safety Act (WSA 2018), which is in the jurisdiction of the Ministry of Labor, Pension System, Family and Social Policy and is passed by the Croatian Parliament. Again, legislation in this field is complex and broad, mostly well without any immediate impact on the design of buildings. However, some specific regulations regarding work safety have a defining impact on how buildings are designed. These regulations will be presented as part of this chapter.

According to Article 3 of the Work Safety Act (WSA 2018), a workplace is any place where workers have to be or have the ability to access during work performed for an employer, as well as any space or room that the employer uses for work activities under his direct or indirect supervision. As a result of this definition, the entire area of a retirement home is considered a workplace and falls under work safety legislation. Work at a retirement home varies and includes typical office work, medical work related to primary and specialist health care, cooking, and cleaning. The exact number of workers in a shift will be defined at the programming stage, but for a home with 50-70 residents, it can be assumed that the busiest shift will have no more than 30 workers.

While the Work Safety Act (WSA 2018) itself has no requirements that could impact the architectural design of a retirement home, in Article 42, a key bylaw is defined to regulate physical conditions at workplaces. This bylaw is called Regulation on Work Safety for Workplaces (RWSW, 2020), passed by the Ministry of Labor, Pension System, Family and Social Policy. It covers topics applicable to all workplaces, such as evacuation paths, stairs, windows, lighting conditions, air quality, and fire safety. Some topics covered in the regulation are irrelevant to this thesis in terms of building scale or use. Others are overridden by other more specific legislation presented elsewhere in this thesis. As in previous chapters, only specific requirements relevant to the thesis topic (building scale, building use, design stage) will be presented as part of this overview.

Article 11 of the Regulation (RWSW 2020) defines interior dimensions. Any room in the workplace needs to have 2m2 of floor space per worker, unless it is a temporary workplace. All rooms need at least 2,8 m distance between the floor and the ceiling. As an exception, offices, storage spaces, smaller workshops, and temporary workspaces are allowed to

be 2,5 m high, as long as no dangerous substances are handled in these spaces.

In Article 13 (RWSW 2020), evacuation pathways are regulated. However, the restrictions imposed in this bylaw are very general and do not define any specific dimensions, metrics, or escape path layouts. The restrictions defined by fire safety regulations are much stricter. One exception is the ban on sliding and revolving doors for emergency exits. Article 14 (RWSW, 2020) is similar in the sense that it provides general definitions regarding fire safety but without any specifics, which are left in the jurisdiction of actual fire safety legislators.

Article 15 (RWSW 2020) concerns pathways inside the building. The minimum width of primary hallways is set at 1.5 meters, the minimum width of secondary hallways at precisely 1 meter, and paths between furnishings inside rooms can not be narrower than 0.8 meters. Furthermore, the article regulates vehicle traffic on the building's site. Roads must be adequately distanced from any doors and at least 0.75 meters from any of the building's exterior walls. Whenever a vehicle path goes through a building, the opening has to be 0.5 meters taller than the vehicle's maximum height and 0.5 m wider than the vehicle's maximum width on both sides. Any transport paths on the site have to be adequately marked. Such paths must be at least 1.8 meters wide or 0.8 m wider than the transport vehicles, including any cargo.

Article 16 (RWSW 2020) concerns doors. Entrance/exit doors must be at least 0.7 m wide, and the difference between floor levels on either side of such doors must not be larger than 20 centimeters.

Article 18 (RWSW 2020) is one of the most consequential parts of the bylaw. It deals with interior and exterior staircases. Any staircase that connects overground levels with underground levels has to indicate the ground floor, either using a door or barrier or using other cues. Staircases may not get narrower in the direction of evacuation. In and around staircases, it is forbidden to place furniture, decorations, unmarked barriers, or other objects that could limit the staircase's usable areas or confuse the user as to which direction leads towards the exit. An interior staircase's usable width (measured from wall to handrail) can be no smaller than 1.1 meters.

A flight of stairs must have between 3 and 18 stairs. The landing of a staircase must not be narrower than the flight and can not be shorter than 1.1 meters. The height of the risers must be between 13 and 19 centimeters, while the depth of a thread must be between 25 and 37 centimeters. All the risers and steps in a single staircase must have the same height and depth. Spiral and curved staircases can only connect to areas with a capacity of up to 20 users. In such staircases, the narrowest part of a thread can not be narrower than 13 cm. Exterior staircases must have a railing that is at least 1.2 m tall.

Article 19 (RWSW 2020) concerns protective railings. Any usable area featuring a height difference of 1 meter or more must have a protective railing installed. The height of the protective railing must be no less than 1.0 meters. Protective railings must also be at least 1 meter tall at staircases, and this height is measured starting from the middle point of a stair's outer edge. If the protective fence features vertical bars, they must be no more than 14 centimeters apart. In the case of horizontal bars, they must be no more than 25 cm apart. Other surfaces are also permitted, such as various meshes or safety glass.

Article 20 (RWSW 2020) regulates ramps and similar walkways. Ramps must be at least 1.1 meters wide. Ramps with up to 10% incline do not need landings for rest. Ramps with more than a 10% incline must feature a landing intended for rest at every 4 meters of vertical rise. The maximum incline for a walkway is 17%, and the incline must be constant between landings. A protective railing must be installed if the height difference of any point on a ramp to any surrounding surface is more than 1 meter.

Article 28 (RWSW 2020) specifies the need for securing adequate services for employees, including changing rooms, bathrooms, toilets, dining areas, and similar rooms. The required amenities must be secured in workplaces, depending on the work carried out.

Article 29 (RWSW 2020) is about changing rooms. Any workplace where workers are expected to wear work clothes must feature adequate changing rooms adapted to the type of work. Changing rooms can be omitted if another space within the workplace can provide adequate conditions to be used as a changing room. Changing rooms must be separate for men and women. No detailed requirements for changing rooms are put forward for a relatively clean workplace such as a retirement home.

Article 30 (RWSW 2020) regulates bathrooms, showers, and washing areas. Any workplace where workers are expected to get dirty while performing their work must have adequate amenities for personal hygiene. The cooking staff and medical workers of a retirement home qualify in the aforementioned category, and as such, a retirement home must feature bathrooms for employees. These bathrooms must be separate for male and female workers. The strictest requirement of one shower per 5 employees will be referenced. Because of the requirement for gender separation, a minimum of two showers is necessary, which covers 10 employees.

As prescribed in the Regulation on Standards for Categorisation of Nursing Homes (SCNH 2000), retirement homes with around 50 to 100 users won't exceed 10 workplaces that require showers. Consequently, only two showers are required for the planned retirement home. Further, in Article 30 of the Work Safety Regulation (RWSW 2020), the minimum floor area of a shower space is required to be 90 cm x 90 cm. Additional space for storing clothes is required adjacent to the showers.

Article 31 (RWSW 2020) concerns toilets for employees. It starts by emphasizing that all bathrooms have to be gender separated. In multi-story buildings, every floor with a non-temporary workplace must have toilets. No workplace must be at a distance of more than 100 meters from a toilet. The minimum number of toilets is one per 20 workers. The minimum floor space of a toilet stall is 90 cm x 120 cm. Toilet stalls must have an entrance area separating them from other spaces in the building, containing at least one sink per 4 toilets.

Article 32 (RWSW 2020) is about workers' break rooms. There must be at least one break room in the building, and it must be equipped with chairs and tables. Article 33 (RWSW 2020) regulates first-aid rooms. Because there are no high-risk workplaces in a retirement home, a first-aid room for workers is unnecessary. However, this type of room programmatically overlaps with the mandatory healthcare facilities for residents, and as such, it is technically included in the final building's program. A similar case arises with workers' eating rooms, as defined in article 34 (RWSW 2020). Programmatically, they overlap with the user's dining areas of a retirement home (SCNH 2000) and break rooms mentioned earlier in this regulation. These cases will be added to the building's program as separate rooms but will be merged in the final design proposal. Worker's eating rooms have to be located close to toilets.

Of the total 40 articles in the Regulation (RWSW 2020), 14 mentioned articles had repercussions on the early design phase of a retirement home. Articles 1, 39, and 40 are purely legal provisions, while other articles deal with building scales, building uses, and design stages irrelevant to this thesis.

other relevant legislation

Apart from the primary legal documents defining the planned retirement home, several other bylaws must be considered at the preliminary design stage. Because of the large amount and specific nature of these regulations, all of them will be concisely presented in this chapter and divided into two categories: bylaws governing functions and bylaws governing technical specifications.

The first bylaw governing a specific functional aspect of the proposed building regulates the cooking and dining area of the proposed retirement home. Because of the tourism-oriented nature of Croatia's economy, hospitality services are well-regulated, and the legal framework is detailed (Croatian Government 2013). Typically, the Hospitality Services Act

(HSA 2021) does not apply to food preparation and accommodation within retirement homes, as stated in Article 6 (HSA 2021). However, in this degree project, as part of the retirement home's extended functions, the kitchen and dining area are planned as a restaurant that can serve external customers. In this regard, these facilities are not exempt from the Hospitality Services Act. The main bylaw governing restaurants and restaurant kitchens is the Regulation on the Classification and Minimum Conditions of Hospitality Establishments From the Group "Restaurants," "Bars," "Catering Establishments," and "Simple Service Establishments" (RCMR 2021). The Ministry of Tourism passes this regulation according to Articles 7 and 14 of the Hospitality Services Act (HSA 2021). The retirement home's kitchen and dining area can be classified as a restaurant according to Article 4 of the Regulation (RCMR 2021).

Article 9 (RCMR 2021) states that a restaurant must have a dining area, kitchen, bar, and adequate storage space. If the restaurant's capacity is more than 100 people, it must have a waiters' service area. Article 46 (RCMR 2021) regulates toilets. Toilets must be gender separated. Toilet stalls must have an entrance area separating them from other spaces in the building, containing at least one sink. Article 47 (RCMR 2021) defines the minimum number of toilets depending on the restaurant's capacity. For up to 80 people, one male and one female toilet stall is required. For up to 160 people, two female toilet stalls are required, and one male toilet stall with two urinals in the entrance area. Article 52 (RCMR 2021) gives detailed restaurant kitchen requirements. Because the functional organization of a restaurant kitchen is outside the scope of this degree project, these regulations will be omitted. Articles 54 to 56 (RCMR 2021) regulate the dining areas but contain no restrictions relevant to early design stages. Article 62 governs worker's facilities. A restaurant must feature changing rooms for employees. If up to 5 workers are in a shift, only a single toilet must be secured. For restaurants with 6 to 15 workers in a shift, one female toilet and one male toilet with a urinal are required for employees.

The Health Care Act (HCA 2023) governs healthcare facilities in any retirement home. Article 30 (HCA 2023) defines that such facilities fall under primary health care and the subcategories: general preventive health care, health care for seniors, occupational therapy, patient transport, and pharmacy. Additionally, physical therapy facilities within retirement homes belong to the secondary health care category. The Health Care Act deals mainly with legal and organizational provisions that do not impact architecture. It prescribes a series of bylaws dealing with functional layouts and other physical features of healthcare facilities. Two such regulations can guide the organization of a retirement home, and they will be presented here. In practice, the regulations do not seem to be binding (Zagreb Institute of Physical Planning 2022).

The Regulation on Norms and Standards for the Practice of Healthcare Activities (RNSH 2020) provides detailed information on dimensions and equipment for different healthcare facilities. According to Article 5 (RNSH 2020), all interiors must be at least 260 cm tall, and all doors must be at least 90 cm wide.

Article 11 (RNSH 2020) defines minimum standards for a general medical clinic. It must have an examination room with a floor area of at least 12 m2, a waiting room of at least 9 m2, a nurse's room of at least 12 m2, and an adequate amount of toilets separately for workers and patients. Article 28 (RNSH 2020) defines the functional organization of a general inpatient healthcare facility. While not binding in the context of a retirement home, this Article can be taken as a guideline due to typological similarities. A nurse's room of at least 12 m2 and a 12 m2 examination room are required. A clean type storage room of 9 m2 and a dirty type storage room of 9 m2 are also required. Finally, a cold room for storing deceased patients (morgue facility) is required, with a floor area of 6 m2.

Article 30 (RNSH 2020) regulates facilities for physical therapy. The main physical therapy room can be no smaller than 20 m2. Changing rooms with adequate storage for clothes and a 9 m2 waiting room must be secured nearby. Furthermore, a combined reception area and documentation archive is needed, and it must have at least 6 m2 of floor area. Finally,

toilets must be provided separately for staff and patients. Article 31 (RNSH 2020) is about occupational therapy facilities. The main room must also be at least 20 m2, and an accessible kitchen, accessible bathroom, and accessible toilets have to be secured nearby for patients. As with the physical therapy room, a 6 m2 combined reception area and documentation archive room is needed together with a 9 m2 waiting room.

An older regulation, the Regulation on Minimums of Space, Workers and Medical-Technical Equipment for the Practice of Healthcare Activities (RMSH 2018), is helpful as a guideline for designing some facilities. However, it is not legally binding anymore. According to Article 11 (RMSH 2018), examination rooms and waiting rooms can not be narrower than 3 meters at any point. Article 26 (RMSH 2018) regulated mandatory nursing facilities in a retirement home's intensive care unit. The main room must be 12 m2 and connected to a 9 m2 waiting room. Neither of the rooms can be narrower than 3m. Next to the nursing room, toilets have to be provided separately for patients and workers. In contrast to the previously presented legally binding regulation, Article 27 (RMSH 2018) regulated morgues as rooms that should be no smaller than 20 m2 and no narrower than 4 meters.

Apart from legislation related to specific functional blocks of the degree project, several other regulations govern specific technical aspects of buildings. The whole legal body of applicable technical regulations is broad and falls way outside this thesis's scope. However, a selection of regulations that are relevant at early design stages will be presented in a concise and systematic manner. These regulations are mostly cited from secondary sources, predominantly from compendiums created by teachers at the University of Zagreb. This chapter's two main technical topics are thermal energy efficiency and noise protection.

Regarding energy efficiency, most restrictions stem from the Technical Regulation on Rational Use of Energy and Thermal Protection in Buildings (TETP 2020). This regulation is passed by the Ministry of Construction and Physical Planning and is legally based on Articles 17 and 20 of the Construction Act (COA 2019). It is a detailed bylaw covering all aspects of rational energy use in buildings, including insulation materials, overall building geometry, construction details, heat generation, and ventilation systems.

The Regulation (TETP 2020), as summarized by Veršić (2020a), deals with technical specifications which are relevant in later design stages of a building. However, it becomes much easier to fulfill energy efficiency requirements by making correct design decisions earlier in the process, such as adjusting the building's layout or facade geometry (Veršić 2020a). A building should have roughly 10 to 20 centimeters of insulation on outside walls. This insulation should be placed on the outside face whenever possible. Light construction materials will require additional insulation to prevent excessive summer heat gain. The outer geometry of a building should be as simple as possible to reduce the area for heat transfer. Thermal bridges should be avoided and, if present, adequately insulated. The outer walls of a building should be airtight to minimize heat loss via ventilation. The building's windows should be oriented towards the south to maximize solar gains in the winter. Propper dynamic sun protection has to be installed to prevent excessive insolation in the summer. The overall layout of a building should be compact, minimizing the ratio of facade surface to usable interior floor area.

The most important aspect of a building's energy efficiency is its heating and ventilation systems. Although architectural design decisions can impact overall efficiency, sustainable energy sources and high-efficiency heating are the primary methods of achieving a good energy rating. Croatia's most relevant sustainable energy sources are solar energy and sustainable biomass (Veršić, 2020a), as emphasized in a separate compendium by the Cabinet for Building Installations (2021), which outlines the main strategies for achieving a zero net energy rating for buildings located in the continental part of Croatia. For a building with around 3500 m2 of usable floor space, around 300 m2 of solar panels is needed in conjecture with fossil fuel boilers. The configuration requires a 10 m2 transformer room and a 30 m2 boiler room. If biomass boilers are used, a 30 m2 boiler room

and 20 m2 of storage space are required. If electricity is used alongside high-efficiency heat pumps in an air-water configuration, a 200 x 300 x 240 cm external unit, and a 30 m2 room for backup fossil fuel boilers are required. Although the recommendations presented by the Cabinet for Installations represent only rough guidelines, they are beneficial for determining approximate dimensions for utility rooms at early design stages.

Noise protection in Croatia is regulated by the Noise Protection Act (NPA 2021) and the bylaws stemming from it. The most relevant regulations are the Regulation on the Permissible Noise Levels with Regard to the Noise Source, Time and Place of Occurrence (RPNL 2021) and the Regulation on the Protection of Workers From Exposure to Noise at the Workplace (RPEN 2008). As with energy efficiency legislation, these legal documents will be presented through secondary sources. Even more so than the previously presented technical regulations, noise protection requirements are relevant later in the design process. They, therefore, do not have a defining effect on this degree project.

In his lecture, Veršić (2020b) clearly differentiates airborne and structure-borne sound transmission. Apart from limiting noise sources, these two methods of sound transmission are the primary concerns in building design. The main sources of noise in buildings are occupants and machinery. While ventilation and heating devices can be distanced or put into specially insulated utility rooms, the building's users are unpredictable, and care must be taken to avoid them from disturbing each other. This is particularly important in a residential environment for the elderly, who are easily disturbed by unexpected sounds. To limit airborne sound propagation, walls and ceilings must achieve adequate absorption properties, either by the element's high mass or utilizing special elastic wall structures (Veršić 2020b). Structure-borne sound transmission is much more challenging to manage. Once a structural element is impacted, it propagates sound throughout the building. Mitigation strategies include insulating floor surfaces from ceiling slabs and special structural connections, which lessen the transfer of impact sound (Veršić 2020b).

Another concern is spatial acoustics, defined by the amount of echo in interiors. Acoustics depend significantly on a room's size and the material used for finishings. Generally, metals and other flat panels should be avoided, while wood and plaster work towards pleasant acoustics. For larger halls, acoustics can be calculated in great detail (Veršić 2020b). In any case, solutions for noise protection vary depending on the building's layout, function, structure layout, and structural materials. Veršić (2020b) emphasizes that it is vital to develop an overall strategy for noise mitigation, even at early design stages, so that no costly or complex solutions are needed as the building is further developed.

In this chapter, topics irrelevant to this thesis in terms of building scale or use have been ignored. Some articles are overridden by other more specific legislation presented elsewhere in this thesis and have also been omitted. This overview presents specific requirements relevant to the degree project (building scale, building use, design stage).

Marija Bistrica Municipality Physical Development Plan

The chosen project site is located within the bounds of Marija Bistrica Municipality. Officially, several levels of spatial plans apply. (PPA 2013) The broadest relevant physical planning document is the State Physical Development Plan, passed by the Croatian Parliament (state level). Marija Bistrica Municipality is located within Krapina - Zagorje County, which means the Krapina - Zagorje County Physical Plan also applies (regional level). Finally, the municipality itself passes the Marija Bistrica Municipality Physical Development Plan, which belongs to the most specific, local level.

As the site is not located within a protected area or an area of state interest, no special plans apply at the state level or regional level. The Municipality has passed an Urban

Development Plan, but the project site is not located within its bounds. Thus, no special plans apply at the local level either.

In Croatia, all lower-level spatial plans have to be in accordance with higher-level ones. For this reason, it is only necessary to consult the lowest-level applicable plan to get all the relevant conditions for a given site. The lowest level applicable plan at the chosen project site is the Marija Bistrica Municipality Physical Development Plan (PDP 2017).

The contents of a Municipal Development Plan in Croatia are highly standardized under relevant legislation and bylaws (PPA 2013). The main part consists of a legal text with associated drawings in 1:25 000 and 1:5000 scales. According to drawings 1.A, 2.A to 2.D.2, 3.A.1 to 3.B and 4.A, the project site is located within a developable zone marked as mixed-use. No special protection is applied to the chosen site, nor are there any major infrastructural corridors passing through it or nearby. This means that few restrictions apply to the site, most of them stemming from its defined land use category.

The Municipal Development Plan (article 3) classifies retirement homes as "Public and/or Civil use buildings", also called category "D". According to article 5, the planning of buildings in this category is permitted on all developable parcels marked as mixed-use, as long as they have a total area no larger than 1.0 hectares.

Article 17 (PDP 2017). specifies that only one building can be built per parcel (except for buildings defined as supplementary), and article 18 (PDP 2017).defines the minimum parcel size of a freestanding building as 300 m2. The width of the parcel at the point of vehicle access needs to be a minimum of 4.0 m. Other minimum dimensions are also defined, but these are not relevant to the chosen project site. There are also no maximum dimensions defined for buildable parcels. A recommended parcel size is given as three times the minimum parcel size for a given building. A freestanding building can occupy a maximum of 40% of the site's total area, although exceptions can be granted to this requirement. The maximum total height of a building is 2 floors and a loft floor (including the ground floor) which should correspond to a maximum height of 9 meters for the roof cornice. For a freestanding building. the maximum gross floor area can be no more than 1.2x of the site's total area. At least 30% of the developed parcel needs to be planned as green space.

Article 20 (PDP 2017). contains detailed requirements for medium-sized residential buildings. Although these are not binding for a retirement home, they offer a good reflection of the planner's general vision for larger residential buildings in a rural context. Thus, these definitions will be taken into account as guidelines. The minimum parcel area for a detached building needs to be 600 m2. The building's shorter side should be oriented towards the street. For a freestanding building. the maximum gross floor area can be no more than 1.8x of the site's total area.

Article 21 (PDP 2017). concerns street lines, which are defined as the distance of street-facing facades from the property line separating publicly-owned parcels from privately-owned ones. The Development Plan states that existing street lines must be respected when intervening in an existing built environment. In the village of Donja Selnica, where the chosen site is located, building facades are either located on the property line or within a 1-meter distance from the property line (as shown in the context photographs and drawings).

Permitted building distances from neighboring parcels are defined in article 22. Freestanding buildings have to be at least 1 meter away from the edges of neighboring parcels. If a building's wall is at a distance of fewer than 3 meters from a neighboring parcel, it can not have windows with transparent surfaces larger than 0.4 m2 (only one such facade is permitted). South-facing walls with windows have to be at least 5 meters away from neighboring parcels. Concerning residential buildings, they have to be at a distance of half their height from neighboring parcels (taken as a guideline).

Articles 23 and 24 (PDP 2017) define the materials and geometry of buildings with regard to the area's long-term rural traditions. Plaster, natural stone, wood, and brick are

recommended materials for walls, while artificial stone cladding is forbidden. Roofs can be either flat or slanted. Slanted roofs need to have an incline between 33 and 45 degrees, although an exception is made for buildings of the "D" category, where the smallest permitted incline is 5 degrees. Otherwise, flat rooves are only permitted in areas without planned heritage protection and as part of a building with a contemporary architectural expression, which is to be specially elaborated on by the architect. Suggested roof cladding includes roof tile, sheet metal, or, in special circumstances, glass. Wavy cladding (metal or polycarbonate) is explicitly forbidden. The maximum length of eaves is 60 cm. According to article 4, the placement of solar panels on any building within the Municipality's area is unrestricted.

Article 27 (PDP 2017) concerns fences. A maximum height of 1.5 meters is defined for fences facing public spaces, and 1.8 meters for fences facing neighboring parcels. Furthermore, these fences have to be partially transparent (wire, wooden planks, hedge, etc.) and the full (concrete or brick) part of the fence can not be taller than 0.5 meters. Article 28 concerns waste disposal. On the site, a space must be secured for waste containers. This space must be easily accessible from a public road but otherwise hidden from plain sight.

Articles 37 and 38 (PDP 2017) define binding restrictions for "Public and/or Civil use Buildings" (category "D"), which includes retirement homes. These buildings can be planned on mixed-use parcels, and have to be designed in a way that fits into the existing rural landscape without disturbing its traditional ambiance. The parcel for buildings in this category has to be directly connected to an existing public road. Up to 50 % of the site can be built up. The maximum height is 3 levels (including the ground floor) or 13 meters at the highest point (except for chimneys and similar building elements). The minimum distance from neighboring parcels is 3 meters. All kinds of roofs are permitted, except slanted roofs with an incline of more than 45 degrees. Adequate parking must be secured on the site. Some restrictions specifically concern retirement homes: at least 35% of the site must be planned as landscaped green space, while fences facing a public street can be up to 0.5 m tall and have to be made of brick or concrete.

Article 39 (PDP 2017) further elaborates on measures for protecting the traditional rural ambiance of existing villages. It states that contemporary materials must be used in a way that doesn't disturb the environment. Metal roofs, large glass surfaces, and similar expressions are discouraged. Visual elements belonging to Mediterranean or Oriental architectural styles are forbidden. Only traditional and/or local plant species are to be planted as part of the landscaping. Existing foliage is to be preserved to the maximum extent.

Parking spaces and garages are defined in article 58 of the Municipal Development Plan. For non-residential buildings, the amount of parking space is defined per 1000 m2 of gross floor area. For "D" category buildings (including retirement homes), 10 parking spaces are required per 1000 m2 of gross floor area, while "Hospitality Buildings" (such as restaurants) require 50 parking spaces per 1000 m2. Alternatively, "Public and/or Civil Buildings" need at least 1 parking space per 3 employees in a shift, and "Hospitality Buildings" require 1 parking space per 4 seating or standing places (such as chairs in a restaurant).

At least 5% of spaces at a public parking location must be accessible. In parking locations with less than 20 spaces, at least 1 must be accessible. Parking spots belonging to a building can either be located on the building's parcel, on an adjacent parcel, or on a separate shared parking location.

Articles 68 to 78 (PDP 2017) refer to measures for the protection of cultural heritage. They are cited from a separately written Cultural Heritage Protection Study. Core principles include the protection of cultural landscape, revitalization of traditional village structures with all their original architectural and natural features, and protection of the villages' natural surroundings as an integral part of their historical identities. Importantly, article 68 states that all new development should be aimed at interpolations inside existing village structures, as opposed to the expansion of

category	sub-category	requirement	necessity	source

urban parameters

parcel	connections	directly connected to a public road	mandatory	PDP (A37)
	size	minimum 300 m2	mandatory	PDP (A18)
		minimum 600 m2	guideline	PDP (A20)
		4.0 m wide at vehicle access	mandatory	PDP (A18)
		three times the recommended size	recommendation	PDP (A18)
	landscaping	at least 35% as green surfaces	mandatory	PDP (A38)
		only traditional and/or local plant species	mandatory	PDP (A39)
		existing foliage is to be preserved to the maximum extent	recommendation	PDP (A39)
	fences	facing a public street can be up to 0.5 m tall and must be made of brick or concrete	mandatory	PDP (A38)
		facing neighboring parcels can be up to 1.8 m tall	mandatory	PDP (A27)
	vehicle paths	at least 75 cm away from the walls	mandatory	RWSW (A15)
		distanced from exits/entrances	mandatory	RWSW (A15)
		if going through a building, the opening has to be 50 cm taller and 100 cm wider than the expected vehicle	mandatory	RWSW (A15)
	transport paths	at least 180 cm wide and/or 80 cm wider than transport vehicles	mandatory	RWSW (A15)
		must be adequately marked	mandatory	RWSW (A15)
	parking	secured parking for home's transport	implied	SCNH (A8)
		at least 5% of spaces must be accessible	mandatory	PDP (A58) and EBA (A50)
		if less than 20 spaces, at least 1 must be accessible	mandatory	PDP (A58)
		accessible spaces must be closest to an accessible entrance	mandatory	EBA (A38)
		can either be located on the building's parcel, on an adjacent parcel, or on a separate shared parking location	mandatory	PDP (A58)
	parking (retirement home)	minimum 10 spaces per 1000 m2 of gross floor area	mandatory	PDP (A58)
		and/or		
		minimum 1 space per 3 employees in a shift	mandatory	PDP (A58)
	parking (hospitality use)	minimum 50 spaces per 1000 m2 of gross floor area	mandatory	PDP (A58)
		and/or		
		minimum 1 space per 4 seating or standing places	mandatory	PDP (A58)
	waste disposal	space must be secured on-site for	mandatory	PDP (A28)

		waste containers		
		must be easily accessible from a public road	mandatory	PDP (A28)
		must be hidden from plain sight	mandatory	PDP (A28)
	restrictions	restricted zone 5.0 meters from the edge of Pinja stream's bed	mandatory	PDP (A82)
building	layout	maximum 1 building per parcel, except supplementary buildings	mandatory	PDP (A17)
	footprint	maximum 50% of parcel area	mandatory	PDP (A37)
	floor area	gross floor area no more than 1.2 times the parcel area	mandatory	PDP (A18)
		gross floor area no more than 1.8 times the parcel area	guideline	PDP (A20)
	height	maximum 3 levels (including ground floor)	mandatory	PDP (A37)
		highest point below 13 m (except chimneys and similar)	mandatory	PDP (A37)
	geometry	short side oriented towards the street	guideline	PDP (A20)
		street line (facade) aligned with regulation line or within 1 meter	mandatory	PDP (A21) + analysis of context
		minimum 3 m distance from neighboring parcels	mandatory	PDP (A37)
		distance to neighboring parcels at least half of the building's height	guideline	PDP (A22)
		slanted roofs can not have an incline of more than 45 degrees	mandatory	PDP (A37)
		footprint should be rectangular, with a maximum width of 7 meters	guideline	PDP (A68)
		buildings should be elongated and L- or T- shaped floor plans are encouraged	guideline	PDP (A77)
		the building should have a compact layout if possible	guideline	Veršić, 2020a
		thermal bridges should be avoided	guideline	Veršić, 2020a
	orientation	windows should face towards the south for solar energy gains	guideline	Veršić, 2020a
	appearance	has to fit into the existing rural landscape without disturbing its traditional ambiance	mandatory	PDP (A37)
		elements that are not found within the region's traditional architecture (such as cantilevered balconies, arched terraces, and similar) are forbidden	mandatory	PDP (A68)
		the building must form an adequate backdrop along Pinja stream	mandatory	PDP (A82) + analysis of context

functional programme

residential unit	bedroom	8 m2 floor area per bed	classification	SCNH (A16)
		60% must be single-bed	classification	SCNH (A16)
		maximum 2 beds per bedroom	classification	SCNH (A16)
		distance between beds minimum 65 cm	classification	SCNH (A17)

		required equipment: separate wardrobe for each resident, table, chair, nightstand, vanity, armchair, and adequate electrical appliances	classification	SCNH (A17)
	bathroom	one per bedroom	classification	SCNH (A16)
		equipped with shower or bathtub	classification	SCNH (A16)
		required equipment: bathtub or shower, sink and toilet	classification	SCNH (A17)
intensive care unit	bedroom	at least 50% of the total home's capacity	classification	SCNH (A16)
		8 m2 floor area per bed	classification	SCNH (A16)
		maximum 2 beds per bedroom	classification	SCNH (A16)
		distance between beds minimum 120 cm	classification	SCNH (A17)
		required equipment: bed tray tables, handrails and bars around the bed, special chairs, and walkers	classification	SCNH (A17)
	bathroom	one unit per 6 users	classification	SCNH (A16)
		gender separated	classification	SCNH (A16)
		required equipment: bathtub or shower accessible from three sides, wheelchair and lifting device	classification	SCNH (A17)
	nurse's facilities	required equipment: table, chair, closet, safe for medication, examination table, and adequate electrical appliances	classification	SCNH (A17)
		minimum 12 m2 examination room, not narrower than 3m	guideline	RMSH (A26)
		minimum 9 m2 waiting room, not narrower than 3m	guideline	RMSH (A26)
(accessible)	(bedrooms)	1 for every 10 rooms	mandatory	EBA (A46)
		minimum of 1	mandatory	EBA (A46)
	(bathrooms)	one for every accessible room	mandatory	EBA (A47)
		if shared, one per 10 rooms	mandatory	EBA (A47)
common areas	living room	2 m2 per resident	classification	SCNH (A16)
		required equipment: chairs, tables, and a TV set, adequate storage space nearby	classification	SCNH (A17)
	kitchenette	one per 30 residents	classification	SCNH (A16)
		required equipment: oven, fridge, sink, and adequate kitchen counter surface	classification	SCNH (A17)
	toilets	gender separated	classification	SCNH (A16)
		1 accessible toilet	mandatory	EBA (A49)
restaurant block	dining area	must fit 50% of residents at the same time	classification	SCNH (A16)
		2 m2 per resident	classification	SCNH (A16)

		accommodating external customers	mandatory	RCMR (A9)
	kitchen	-	classification	SCNH (A17)
		accommodating external customers	mandatory	RCMR (A9)
	bar	accommodating external customers	mandatory	RCMR (A9)
	service area	required if restaurant capacity is more than 100 external customers	mandatory	RCMR (A9)
	storage space	-	mandatory	RCMR (A9)
	toilets	gender separated	mandatory	RCMR (A46) and SCNH (A16)
		1 accessible toilet	mandatory	EBA (A49)
		stalls must have an entrance area separating them from the rest of the building, containing at least one sink	mandatory	RCMR (A46)
		(C) one male and one female toilet stall	mandatory	RCMR (A47)
		or, depending on capacity,		
		(D) two female toilet stalls and one male toilet stall with two urinals in the entrance area	mandatory	RCMR (A47)
healthcare facilities	physical therapy room	minimum 25 m2 floor area	classification	SCNH (A16)
		minimum 20 m2 floor area	guideline	RNSH (A30)
		required equipment: massage bed, various specialized therapy equipment, and workout equipment	classification	SCNH (A17)
	physical therapy block	min. 9 m2 waiting room	guideline	RNSH (A30)
		min. 6 m2 reception and archive	guideline	RNSH (A30)
		changing rooms with clothes storage	guideline	RNSH (A30)
	occupational therapy room	must fit 40% of residents at the same time	classification	SCNH (A16)
		minimum 20 m2 floor area	guideline	RNSH (A31)
	occupational therapy block	min. 9 m2 waiting room	guideline	RNSH (A31)
		min. 6 m2 reception and archive	guideline	RNSH (A31)
	disinfection area	minimum 6 m2 floor area	classification	SCNH (A16)
	medical clinic	for primary (general) healthcare	classification	SCNH (A16)
		minimum 12 m2 examination room, not narrower than 3 m	guideline	RNSH (A11) and RMSH (A11)
		minimum 12 m2 nurse's room, not narrower than 3 m	guideline	RNSH (A11) and RMSH (A11)
		minimum 9 m2 waiting area, not narrower than 3 m	guideline	RNSH (A11) and RMSH (A11)
	toilets	separately for patients and staff	guideline	RNSH (A11) and RNSH (A30 - A31)
	storage	minimum 9 m2 clean type storage room	guideline	RNSH (A28)
		minimum 9 m2 dirty type storage room	guideline	RNSH (A28)

	morgue	-	classification	SCNH (A16)
		minimum 6 m2 cold storage room	guideline	RNSH (A28)
		minimum 20 m2	guideline	RMSH (A27)
		minimum 4 m wide	guideline	RMSH (A27)
utility	laundry room	requires equipment for washing, drying and ironing laundry	classification	SCNH (A17)
	resident's laundry	requires equipment for washing, drying and ironing laundry	classification	SCNH (A17)
	storage spaces	-	implied	SCNH (A17)
	entrance vestibule	-	mandatory	EBA (A16)
employee	offices	-	implied	SCNH (A4)
	changing room	must be gender separated	mandatory	SCNH (A4), RCMR (A62) and RWSW (A29)
	showers	one shower per 5 employees	mandatory	RWSW (A30)
		must be gender separated	mandatory	RWSW (A30)
		minimum 90 x 90 cm floor area	mandatory	RWSW (A30)
		requires additional space for clothes	mandatory	RWSW (A30)
	toilets	one per 20 workers in a shift	mandatory	RWSW (A31)
		must be gender separated	mandatory	RWSW (A31)
		minimum 90 x 120 cm floor space for a individual toilet stall	mandatory	RWSW (A31)
		toilet stalls must have an entrance area with at least 1 sink per 4 stalls	mandatory	RWSW (A31)
		mandatory on every floor with a non-temporary workplace	mandatory	RWSW (A31)
		no workplace must be farther than 100 meters from the nearest toilet	mandatory	RWSW (A31)
	break room	equipped with chairs and tables	mandatory	RWSW (A32)
	eating room	-	guideline	RWSW (A34)
	first aid room	-	guideline	RWSW (A33)

functional dimensions

interior height	minimum of 280 cm between floor and lowest point of ceiling	mandatory	RWSW (A11)
	as an exception: minimum of 250 cm between floor and lowest point of ceiling for offices, storage spaces, smaller workshops, and temporary workspaces with no dangerous substances	mandatory	RWSW (A11)
	in healthcare facilities: minimum of 260 cm between floor and lowest point of ceiling	mandatory	RNSH (A5)
room as non-temporary workplace	2 m2 of floor area per worker	mandatory	RWSW (A11)
door width in residential areas	minimum 100 cm	classification	SCNH (A16)
door width in healthcare facilities	minimum 90 cm	mandatory	RNSH (A5)

hallways		minimum 180 cm	classification	SCNH (A16)
utility hallways	primary	minimum 150 cm	mandatory	RWSW (A15)
	secondary	minimum 100 cm	mandatory	RWSW (A15)
passage inside a room		minimum 80 cm	mandatory	RWSW (A15)
entrance		minimum 70 cm wide opening	mandatory	RWSW (A16)
		maximum 20 cm difference between floor levels	mandatory	RWSW (A16)
accessible entrance		double door 2 x 90 cm x 210 cm	mandatory	EBA (A16)
		threshold must be no higher than 2 cm	mandatory	EBA (A16)
		vestibule depth at least 240 cm	mandatory	EBA (A16)
accessible bedroom		radius for maneuverability 150 cm	mandatory	EBA (A20)
		entrance door 110 cm wide	mandatory	EBA (A20)
		other doors 80 cm wide	mandatory	EBA (A20)
		hallways minimum 120 cm wide	mandatory	EBA (A20)
		furniture minimum 90 cm apart	mandatory	EBA (A20)
accessible bathroom		detailed requirements, see attached graphic with dimensions	mandatory	EBA (A19)
accessible kitchen		detailed requirements, see attached graphic with dimensions	mandatory	EBA (A20)
accessible dining area		minimum 100 cm space between tables (including seating)	mandatory	EBA (A23)
elevator		entrance 100 cm minimum	classification	SCNH (A17)
		adequate depth to fit a stretcher	classification	SCNH (A17)
		cabin at least 110 cm x 140 cm	mandatory	EBA (A10)
staircase	general	if connecting upper floors to underground floors, the ground (exit) floor must be clearly indicated	mandatory	RWSW (A18)
		must not get narrower in the direction of evacuation	mandatory	RWSW (A18)
		disruptive or disorienting furniture and decorations are forbidden	mandatory	RWSW (A18)
		must have 120 cm tall protective railing in exterior	mandatory	RWSW (A18)
		protective railing at least 100 cm tall	mandatory	RWSW (A19)
	flight	at least 120 cm wide in interior	mandatory	RWSW (A18)
		must have between 3 and 18 stairs	mandatory	RWSW (A18)
	landing	must not be narrower than adjacent flights	mandatory	RWSW (A18)
		must be at least 110 cm long	mandatory	RWSW (A18)
	risers	must be between 13 and 19 cm tall	mandatory	RWSW (A18)
	threads	must be between 25 and 37 cm deep	mandatory	RWSW (A18)
spiral or curved staircase		can only connect to areas with a capacity of up to 20 users	mandatory	RWSW (A18)
		narrowest part of a thread can not be	mandatory	RWSW (A18)

		narrower than 13 cm		
accessible staircase		maximum 15 cm riser interval	mandatory	EBA (A10)
		minimum 33 cm tread depth	mandatory	EBA (A10)
		flight at least 120 cm wide (or 110 cm in interiors)	mandatory	EBA (A10)
		stairs wider than 250 cm must have one or more central handrails	mandatory	EBA (A10)
ramp		minimum 110 cm wide	mandatory	RWSW (A20)
		a landing is required for every 4 meters of vertical rise if incline is more than 10%	mandatory	RWSW (A20)
		maximum incline is 17%	mandatory	RWSW (A20)
		incline must be consistent between landings	mandatory	RWSW (A20)
accessible ramp	general	maximum incline 5% (or 8.3% if height is less than 76 cm)	mandatory	EBA (A10)
		a minimum 150 cm level landing for every 6 meters of incline	mandatory	EBA (A10)
		handrails at 60 and 90 cm	mandatory	EBA (A10)
		handrails must extend 30 cm from the ends of the ramp	mandatory	EBA (A10)
	interior	maximum total height 120 cm	mandatory	EBA (A10)
		at least 90 cm wide	mandatory	EBA (A10)
	exterior	at least 120 cm wide	mandatory	EBA (A10)
accessible parking space dimensions		370 cm x 500 cm single space	mandatory	EBA (A38)
		590 cm x 500 cm double space with a central corridor 150 cm wide (only for right angle parking)	mandatory	EBA (A38)

technical requirements

residential unit bed	90 x 200 cm with a height between 50 and 60 cm	classification	SCNH (A17)
	no bunk beds	classification	SCNH (A17)
handrail	in all hallways, bathrooms and toilets	classification	SCNH (A17)
protective railing	must be installed in any usable area featuring a height difference of 1 meter or more	mandatory	RWSW (A19)
	at least 100 cm tall	mandatory	RWSW (A19)
entrance	doors must be either sliding, telescopic, or openable towards the exterior	mandatory	EBA (A16)
emergency exit	sliding and revolving doors are prohibited	mandatory	RWSW (A13)
elevator	mandatory if more than one floor	classification	SCNH (A17)
noise protection and acoustics	distance and/or insulate noise sources	guideline	Veršić, 2020b
	walls and ceilings must have good airborne noise absorption properties	guideline	Veršić, 2020b
	structure-borne noise propagation must be limited	guideline	Veršić, 2020b

		spatial acoustics must be taken into account when designing interiors	guideline	Veršić, 2020b
energy efficiency	insulation	between 10 and 20 cm	guideline	Veršić, 2020a
		located on the outside face	guideline	Veršić, 2020a
		thermal bridges must be insulated	guideline	Veršić, 2020a
	shading	dynamic sun protection should be installed on transparent surfaces	guideline	Veršić, 2020a
exterior properties	general	metal roofs, large glass surfaces and similar elements are discouraged	recommendation	PDP (A39)
		visual elements belonging to Mediterranean or Oriental architectural styles are forbidden	mandatory	PDP (A39)
	walls	must be adapted to the area's traditional architecture	mandatory	PDP (A23)
		artificial stone is forbidden	mandatory	PDP (A23)
		plaster, natural stone, wood and brick	suggestion	PDP (A23)
	roof	roof tile, sheet metal, or, in special circumstances, glass	suggestion	PDP (A23)
		wavy cladding (metal or polycarbonate) is forbidden	mandatory	PDP (A23)
		the placement of solar panels on any building is unrestricted	mandatory	PDP (A23)
		the maximum length of eaves is 60 cm	mandatory	PDP (A23)
heating installations (E)		300 m2 of solar panels with a 10 m2 transformer room and 30 m2 fossil fuel boiler room for backup	guideline	CBI
		or		
		30 m2 biomass boiler room with adjacent 25 m2 of fuel storage	guideline	CBI
		or		
		300 x 200 x 240 cm external air-water heat pump with a 30 m2 room for backup fossil fuel boilers	guideline	CBI

required employees

administrative	director	1	implied	-
	accountant	1	implied	-
specialist	social worker	1	classification	SCNH (A11-12)
	nurse	5 per 50 intensive care beds but no less than 5 (A)	classification	SCNH (A11-12)
	caretaker	9 per 50 intensive care beds but no less than 5 (A)	classification	SCNH (A11-12)
	physiotherapist	1	classification	SCNH (A11-12)
support	house economist/driver/ handyman	1	classification	SCNH (A11-12)
	stockman/ handyman	1	classification	SCNH (A11-12)
	cooks	3 (A) or 4 (B)	classification	SCNH (A11-12)

	assistant cooks	2	classification	SCNH (A11-12)
	server	3	classification	SCNH (A11-12)
	laundry washer	2 (A) or 3 (B)	classification	SCNH (A11-12)
	cleaner	1 per 400m2 of residential space	classification	SCNH (A11-12)

their borders. The formation of new residential and commercial zones outside of existing villages and towns is strongly discouraged.

Parts of the wider Selnica village areas are protected as cultural heritage sites, either as individual buildings or as rural patterns. However, none of these protection zones extend onto the chosen project site. As such, no special restrictions apply mandatorily. However, some of these will be listed as guidelines.

For interpolations within protected village structures, several requirements are laid forward. The location, volume, and materials of a building should not clash with the existing qualities of the village's environment. The footprint of a building should be rectangular, with a maximum width of 7 meters and a slanted roof with an incline between 35 and 45 degrees. Traditional materials mentioned earlier are repeated here, and colors on the facade should be earth tones. Elements that are not found within the region's traditional architecture (such as cantilevered balconies, arched terraces, and similar) are forbidden.

Article 74 (PDP 2017) permits two separate residential buildings on a single parcel when preserving historic architecture, especially in the case of traditional wooden houses. A new building may be constructed next to the old, while the traditional house can be used for permanent or temporary residence, commercial uses, or tourism/ hospitality. New buildings must respect the micro-ambiance of the existing settlement, especially in terms of their primary geometry.

Article 77 (PDP 2017) further elaborates on good practices when constructing new buildings within existing rural settlements. The building's geometry and external materials must follow the main principles of the traditional rural architecture of Hrvatsko Zagorje. Buildings should be elongated, as opposed to compact shapes not traditionally found in the region. L- or T- shaped floor plans are also encouraged.

Concerning the protection of natural landscapes, article 79 (PDP 2017) stresses the need to preserve all existing forest patterns and natural rivers and streams within the municipality. Reduction in forest coverage is strongly discouraged. All waterscapes are to be kept in or restored to their natural flows. While these imperatives have no direct consequence on the chosen project site, they guarantee that the quality natural landscape surrounding it is protected in the long term.

Article 82 (PDP 2017) prescribes special restrictions that apply to buildings located next to waterways. These apply to the project site, as it is located next to the Pinja stream. A 5.0-meter protective corridor is defined starting from the river bed's edge. Within the protective corridor, fences and other barriers are not permitted. Buildings erected along waterways must form a quality backdrop to the waterscape. Building sites along waterways need to feature a fence, adequate landscaping, and, if applicable, a promenade along the waterway.

All the articles not mentioned in this overview have no requirements directly or indirectly associated with the chosen project site or building type. As such, together with all the relevant state laws and bylaws, this overview is a thorough light of all applicable legal conditions to be taken into account when designing a retirement home on the chosen project site.

note all legal documents have been cited using provisional abbreviations
see references for detailed information

collection of reference projects

To guide the design process, a concise selection of reference projects was assembled. The chosen projects are similar in program and size to the planned design proposal, but otherwise represent a diverse collection of architectural projects that highlight the many possibilities of designing retirement homes. The collection is assembled in a chronological manner, tracing the typologies development in the last 70 years.

criteria for selecting references

Reference projects are an integral part of the architectural design process. The selection of such projects has a profound impact on later design stages, as they set a frame of reference for design decisions. The insight into an array of buildings belonging to the same architectural category can greatly aid the understanding of the category, no matter if the subject matter is functional or aesthetic. This is especially important when dealing with a highly specific building typology such as a retirement home. Programming an unusual and hybrid functional layout doesn't let the architect leverage much of the experience gained from other typologies.

There are countless different stages in the historical development of retirement homes. It is important to approach the selection of references in a systematic manner. When selecting reference projects, several guiding principles were taken into account to ensure a consistent and useful catalog. Firstly, the references were required to be buildings of a similar architectural program and user capacity as the envisioned final design proposal. As such, only residential retirement homes were taken as references, as this specific typology doesn't have a lot in common with other dwellings or healthcare buildings. Regular healthcare buildings, such as day hospitals, feature similar challenges in terms of a complex heterogeneous program, they do not feature the residential capacity which is the defining element of a retirement home. Similarly, apartment buildings and co-living arrangements do not have a structure of amenities comparable to the facilities of a retirement home.

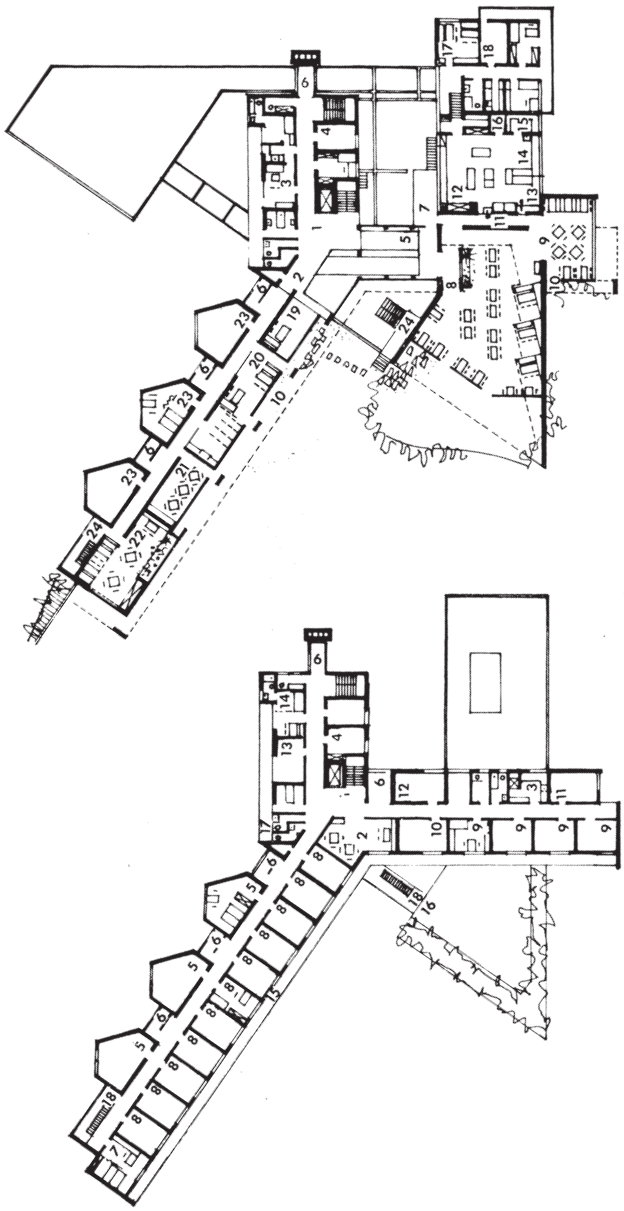
Buildings designed for 50 to 200 residents were deemed relevant as reference projects. Smaller retirement homes tended more toward individual living spaces, while homes with more than 200 residents adopted more complex organizations of shared facilities. Homes organized in the form of a skyscraper, which was popular in the fifties, were also not taken into account, as they have specific organizational aspects not relevant to this degree project. A vertical organization would be overly invasive in a rural context.

Another important principle for references was the ambition to get an overview of the chronological development of retirement homes. If only contemporary references are observed, the background of certain architectural design conventions might be unclear. However, if past and present references are studied comparatively, the development of a typology can be evaluated. This approach provides a critical insight into all the different design decisions governing contemporary retirement homes. Those design elements that are a result of long-term collective experience should be respected or at the most reinterpreted. Meanwhile, those conventions which depend only on style and artistic preference can be safely questioned and modified according to the needs of a given context.

To select reference projects from an abundant array of possibilities, the decision was made to focus only on built projects and to discard unbuilt proposals or purely theoretical models. Unbuilt projects lack a meaningful evaluation and reflection, which is only available when users move into a space. Furthermore, reference projects were selected only from influential professional publications or from nominees for prestigious architectural awards. Of the 7 selected projects, 4 were nominated for the Mies van der Rohe award, while the remaining 3 were sourced from influential magazines published in the mid-20th century. This strict set of criteria guaranteed that the chosen references adhered to the highest standards of architectural quality, as judged by members of the profession.

The final overview of references gives a concise but meaningful insight into the development of retirement homes for the last 70 years. Starting with a relatively simple modernist conception, over more complex typologies introduced in the 70s and 80s, all the way to more formalistic contemporary buildings. All the chosen buildings share a similar rural or suburban context, similar height, and comparable capacity.

vintage exterior photograph showing the building from the south



Home in Kressbron am Bodensee

architect	Wilfred Beck-Erlang
location	Baden-Württemberg, Germany
year finished	1958
source	Fengler (1964)

The retirement home in Kressbron am Bodensee is a classic example of modernist architecture applied to a healthcare typology. The organisation is highly rational, focusing on quality orientation of the rooms and common spaces, while the secondary functions have a clearly defined lower level in the organizational hierarchy. The building has three residential floors and one service floor at the ground level. Its common areas are grouped around the main dining and living rooms, with very few semi-private spaces available. According to the standards of its time, most of the rooms are two- or thre-bed units. The rooms are relatively shallow, as this building predates many of todays thermal efficiency requirements.

plans in 1:850 scale

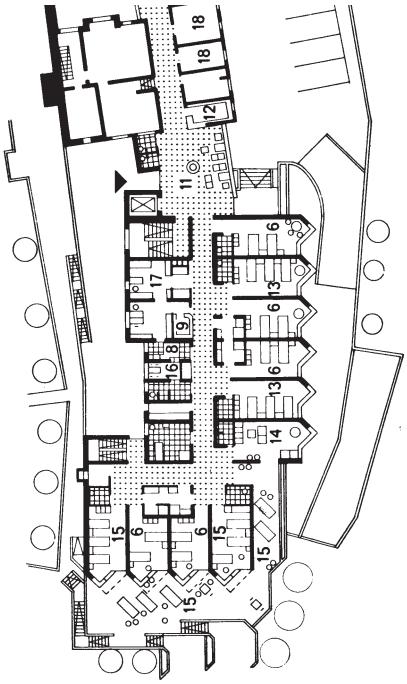
left, top	common "Terrace Level"
left, bottom	typical residential level

Home for the Elderly in Wildberg

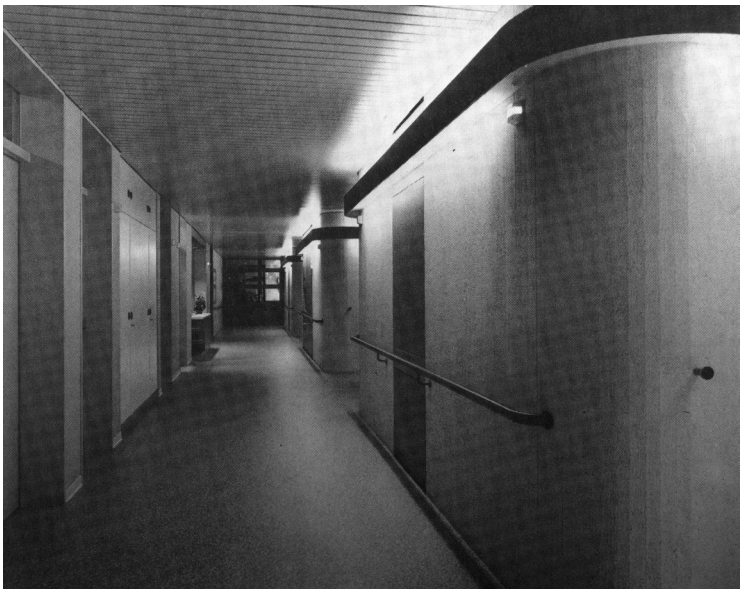
architect	Otto Nussbaum Sibylle Nussbaum
location	Baden-Württemberg, Germany
yeas built	1975 - 1977
source	Deutsche Bauzeitschrift (1979)

The retirement home in Wildberg is primarily defined by its specific context. Located on a very prominent hilltop and concieved as an extension of a monastery structure, its outside appearance was pivotal in defining the organization. Functionally, it is assembled around a L-shaped central corridor. The architecture is still predominantly governed by function, as the rooms extend outside of the buildings mass in order to maximise solar gains. The rooms are again mostly shared, but some semi-private spaces can be observed on the higher floors. Many of the shared spaces are located within the old monastery building, which extends towards the north. The entrance block is located at the very boundary between the new and the bold building.

plan in 1:750 scale
entrance floor with typical residential layout



typical central hallway



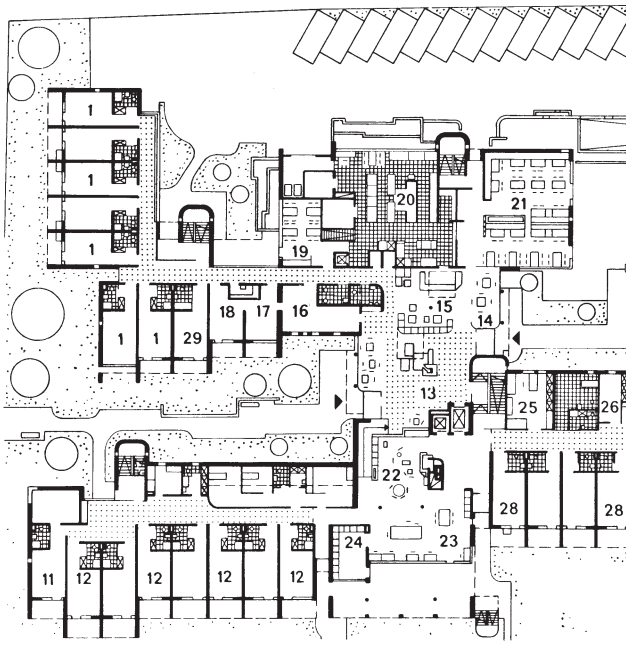
aerial photograph
from the south-west

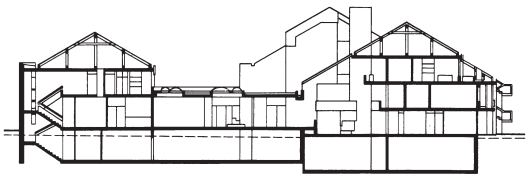
Old People's and Nursing Home in Weiningen

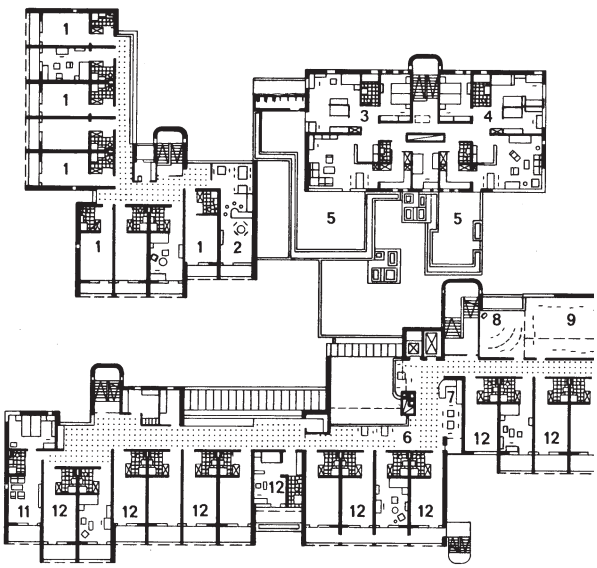
architect	Otto Glaus, Bert Allemann, Ernst Bringolf and others
location	Zürich, Switzerland
years built	1976 - 1978
source	Deutsche Bauzeitschrift (1979b)

interior photograph showing common areas

The nursing home in Weiningen exemplifies the increase in complexity which is typical for buildings designed during the seventies. Although it is still technically a corridor organisation, the building isnt a linear mass but rather a complex shape serving to make the best use of the site. All the rooms have their own bathrooms and terraces, showing the increase in standard of care. The corridors have windows twoards some of the courtyards, and they for complex shared spaces in the buildings interrior. This is especially visible in the sections through the living room. The main common spaces are located centrally, and extend into a series of semi-private hallway areas. The home in Weiningen is an example of a very thoughtfully organized retirement home, where all organizational aspects work together.







drawings in 1:750 scale

left, top	ground floor plan
left, bottom	first floor plan
above	section through common areas

Home for the Elderly in Alcácer do Sal

studio	Aires Mateus e Associados
location	Setúbal District, Portugal
years built	2009 - 2011
source	Fundació Mies (2013)

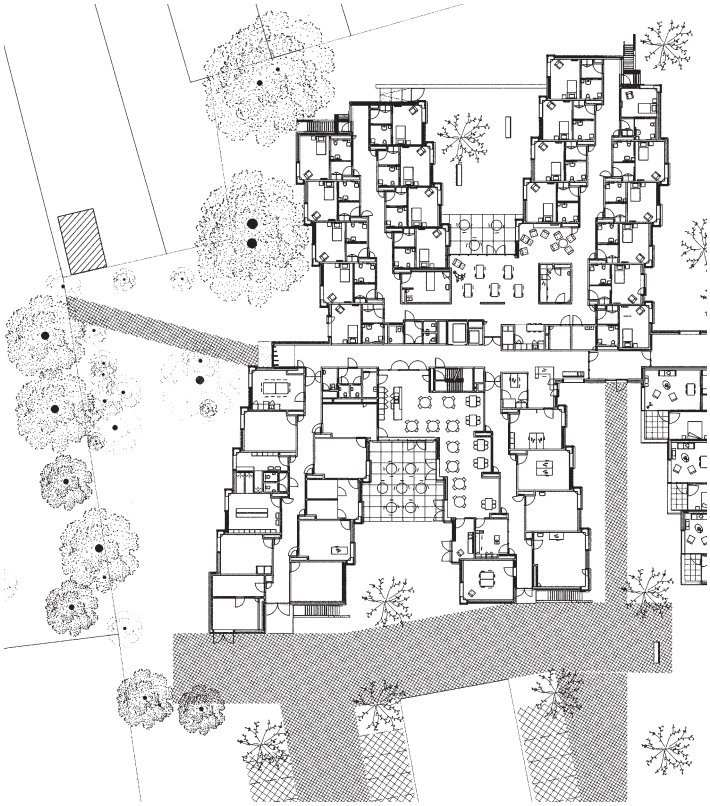
The retirement home in Alcacer do Sal shows how the organisation of retirement home increasingly adapts to architect's creative visions. Obviously the long songle-sided corridor oganisation isnt the most rational option, but it enables an interesting dialogue between building and site. All of the building's elements are subject to radical design decisions. The buildings aesthetical appearance is finely crafted to the point where it becomes a sculpture or land-art intervention. The rooms feature a unusual wedge shape, with windows oriented towards the inaccessible terraces. This design is in line with the building's location, where excessive insolation could be an issue. The common areas are located at the lowest level, away from the buildings center of mass. Overall, this reference is an example of an formalistic approach.

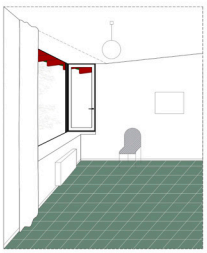
above, top	exterior from the north-west
alove, bottom	photograph of a typical room

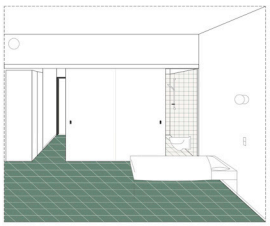
plans in 1:750 scale

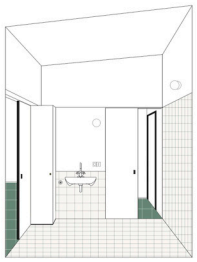
below, left	extrance floor
right	typical floor

ground floor plan in 1:750 scale









above
exterior, south side

left
sketch drawings of
a typical room

Residential Care Center Kapelleveld

studio	architecten de vylder vinck taillieu
location	Ternat, Belgium
years built	2016 - 2017
source	Fundació Mies (2019)

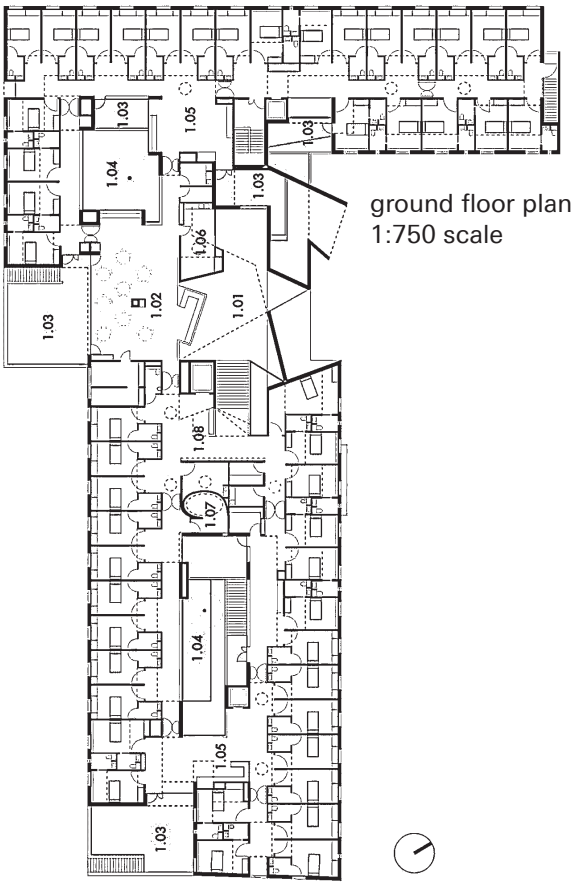
The care center in Kapellveld features a similar layout to the nursing home in Weiningen. A central corridor acts as the buildings axis, while secondary corridors with rooms branch from it. The exterior space is divided up using the buildings complex mass, creating private courtyards onto which the rooms are oriented. Unlike the building in Weiningen, there are no semi-private spaces, as the architect chose to concentrate all common areas in the ground floor. These shared spaces are located next to the central vertical axis, enabling short distances to the rooms. In this refrence, the rooms showcase a high contemporary standard of residential care. All rooms are individual and feature private bathrooms. The window layout guarantees optimal insolation, while the overall choice of materials is premium.

exterior photograph from the north-east showing the building in its natural surroundings

Nursing Home in Pont-sur-Yonne

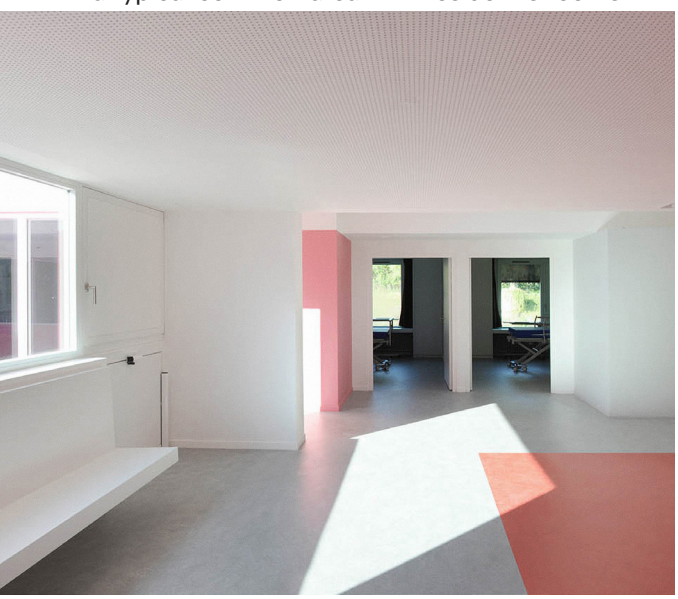
studio	Dominique Coulon & associés
location	Yonne, France
year finished	2014
source	Dominique Coulon (2014)

The nursing home in Pont-sur-Yonne can be seen as an example of medium-large contemporary nursing homes. Its organisation works towards simplifying the otherwise complex program. The architects adopted a hybrid layout based on elongated central corridor slabs which

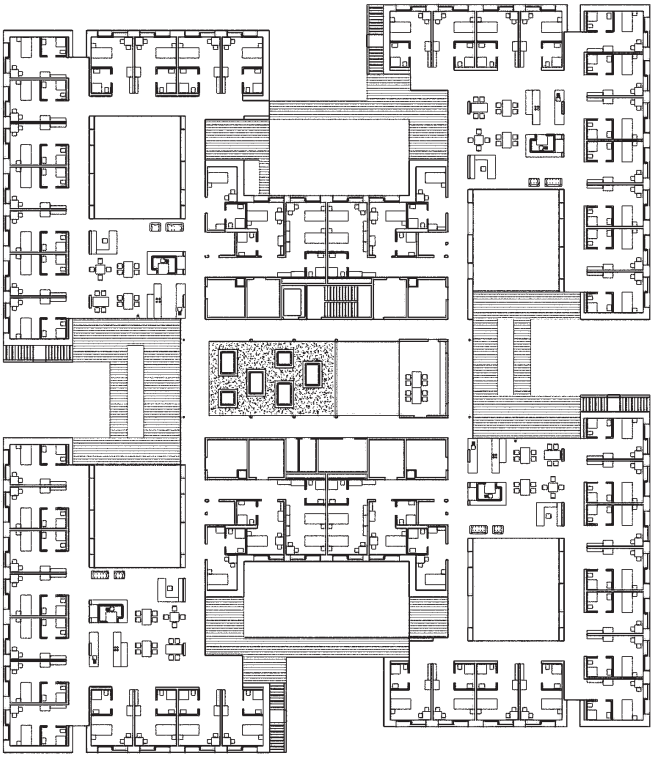


ground floor plan
1:750 scale

a typical common area with resident's rooms



are expanded to include courtyards. These courtyards enable a much higher architectural quality in the hallways. This is leveraged to turn the hallways into semi-private spaces for residents and their visiots. The rooms are of a contemporary and rational standard. They are single-bed with individual bathrooms, but with limited flexibility and a very economcial layout which aims to maximise building depth.



ground floor plan in 1:750 scale

Residential Care Home Erika Horn

studio	Dietger Wissounig Architekten
location	Graz, Austria
years built	2014 - 2015
source	Fundació Mies (2017)

The residential care home Erika Horn is an example of the latest tendencies in the development of the retirement home typology. While the organisation is essentially still based on a corridor layout, it has been converted into closed loops forming several enclosed courtyards. These courtyards have now become the main organisational elements of the building, with the common spaces fully oriented onto them. Living areas have been split into individual clusters and there is no central common area uniting all the residents. The decentralisation of common areas enables a clearer functional organisation. The materiality plays a big part in the buildings final appearance. The choice of materials is oriented towards natural surfaces with calming properties coupled with simple geometry.

exterior photograph of the building

photograph showing the relationship between rooms, hallways and common areas

conclusions based on references

By comparing reference projects, it was possible to gain insights that were very useful for shaping the final design proposal. The design process is based on facts and positive insight, which includes direct input of good architectural segments from references. This of course doesn't mean the references are to be copied, but that their qualities should be reinterpreted or applied when they offer a tried and tested solution to a tangible architectural problem.

With regards to the overall layout, almost all of the observed homes adopt a variation of a hallway typology. This is especially true for early modernist projects like the home in Kressbron am Bodensee, which are designed as a composition of linear slabs. Although the overall building layout depends heavily on the home's capacity and the size and shape of the building site, the corridor typology seems to be an optimal choice. If site conditions permit it, the use of a central hallway can guarantee a rational organization of rooms with equal qualities in terms of orientation and views. Alternatively, the linear corridor can be bent up to establish a more dynamic relationship to the site, like the example of Alcacer do Sal.

Most examples of retirement homes adopt an interior corridor layout, which is beneficial for efficiency but significantly lowers the quality of the shared corridor space. The best example of this is the home in Kapellveld. In this case, extra care is needed to preserve the quality of building communications in terms of light, views, and air. The most successful examples in this regard are contemporary hybrid solutions that blend a central corridor with a courtyard typology. It is a good compromise between efficiency and interior quality, as can be observed in the Care Home Erika Horn. If it's impossible to use an efficient interior corridor, the gallery corridor should be expanded when possible, turning it into an active space that justifies its access to the facade and maximizes its qualities.

In all of the reference projects, common areas are organized on the ground floor, with residents' rooms appearing on the upper floors. In all of the non-linear organizations, the common areas are grouped around a central location, usually near the entrance and near the main vertical communications. This facilitates shorter walking distances and a more optimal organization of outside visitors, as can be seen in the example of the home in Weiningen. When designing a retirement home, common areas should be planned near the geometrical center of the building, on its ground floor, and near the entrance zone. Such a layout can guarantee the shortest possible distances between the most used zones and the residents' rooms. As the elderly are less mobile, shorter walking distances within the building are a relevant quality. There is a great deal of variation in the dispersion of shared areas. Some examples feature a strong separation of public areas into smaller clusters, which then form smaller communities within the retirement home. This is apparent in the Residential Care Home Erika Horn, where common areas serve only smaller units of rooms. Other references cluster all the common areas together, featuring large shared spaces that act as gathering points for everyone living in a retirement home. An example is the home in Kapellveld with its large living areas located near the entrance zone.

The most successful approaches are, again, hybrid typologies. These designs offer strong central shared species supplemented by smaller meeting points along corridors. This is especially visible in the home in Weiningen, where a gradient ranges from private spaces through semi-private areas, all the way to the shared spaces. Ideally, the final design should incorporate a gradient of privacy both in outdoor and indoor spaces. This is especially true if outside users are to be invited into the retirement home, in which case the separation of public and semi-private spaces becomes very important. The organization of individual rooms is mostly defined by legislation and standards outside of the architect's influence. Older retirement homes feature shared bathrooms, especially in intensive care units, while newer buildings

exclusively feature private bathrooms for every room. The separation between intensive care rooms and regular resident rooms is usually not apparent on the floor plan, as a unified typical room boosts the retirement home's flexibility. Usually, rooms do not have access to terraces or doors that lead directly to the site. The exterior spaces are accessed through the common areas, and as such they represent shared spaces as opposed to private areas. In the design proposal, the number of single and double rooms should be defined according to relevant standards in Croatia. A certain number of rooms can be designed with direct access to the exterior, as this can help immobile residents to spend adequate time in the exterior.

There doesn't seem to be an optimal choice in terms of facade layout and window sizes. These would normally depend on climate and orientation. In the observed examples, the windows are governed more by the architects' aesthetic preferences than by design conventions. The same goes for interior materials, colors, and aesthetic elements. There doesn't seem to be much convention, so every architect follows his principles while still making sure to use adequate materials in terms of hygiene and robustness. For the design proposal, it seems much more important to properly integrate the design into its context as opposed to following a certain predetermined set of aesthetic guidelines.

The building must establish a connection with its environment in terms of views. All existing nature around the building must be integrated whenever possible. In this way, exterior qualities are pulled inside the building, providing a connection to the outside environment even for residents who have to spend most of their time in the rooms. Successful aesthetic choices are based on the use of neutral materials rooted in nature. Wooden finishes are especially welcome, as well as stucco and fine concrete. An addition of color can help tie various materials together, while also improving orientation in the building.

design process

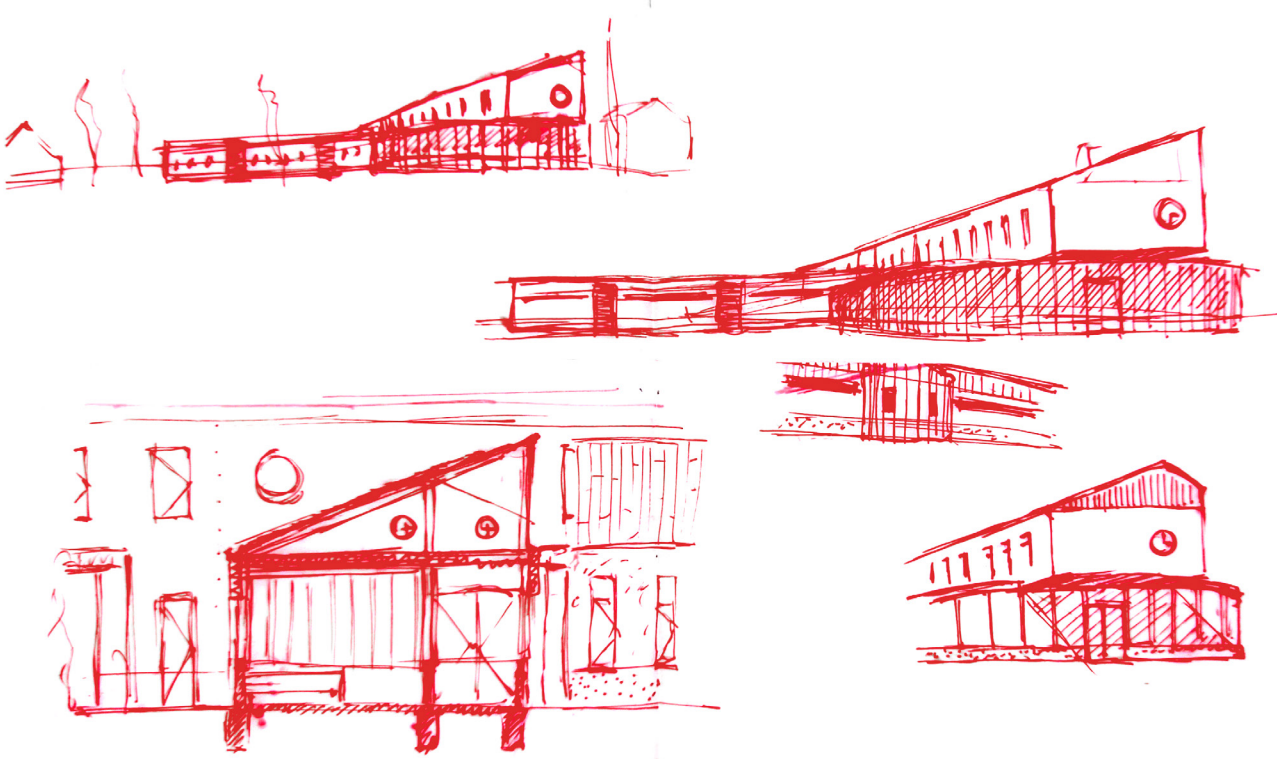
The architectural design process is linear, where decisions are made in accordance to information gained from the various investigations. Once an element of the design is finalized, other aspects are built on top of it in order of importance. The process was heavily based on investigative hand sketches, which served to freely explore design concepts before drawing them out precisely..

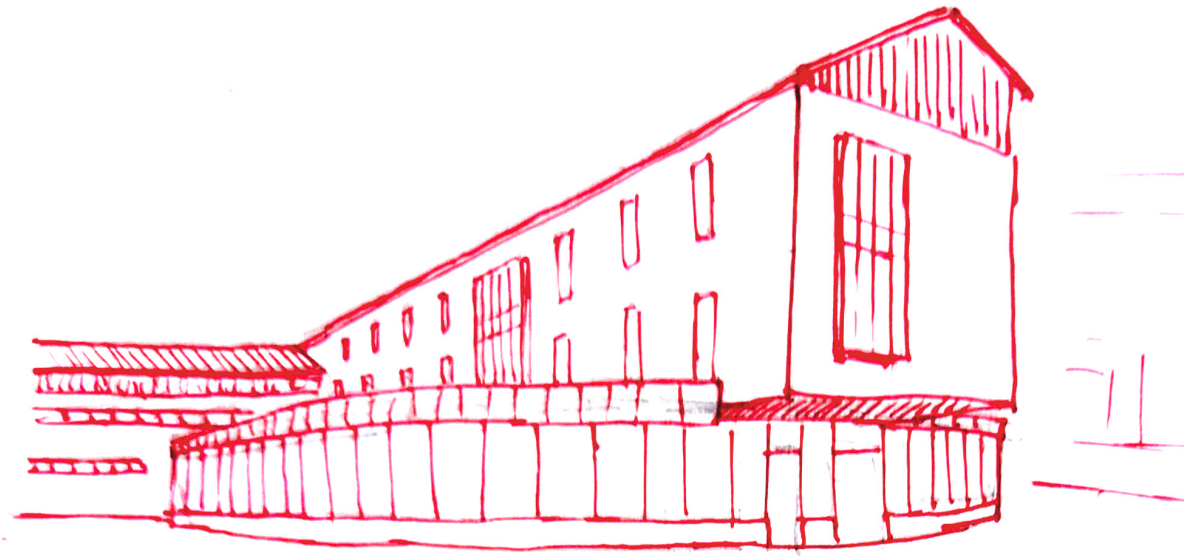
process overview

As defined in the introduction, the architectural process is based on a linear development of ideas according to information gained from various investigations into the subject matter. The first phase of work on the degree project was fully dedicated to several of the investigations. As these investigations progressed and matured, conclusions started turning into design ideas. That is when the sketch design was first drawn up. Initial sketches were fully abstract and referred to an imaginary rural environment. However, as soon as the design proposal site was defined, the sketches also dealt with solving site-specific issues.

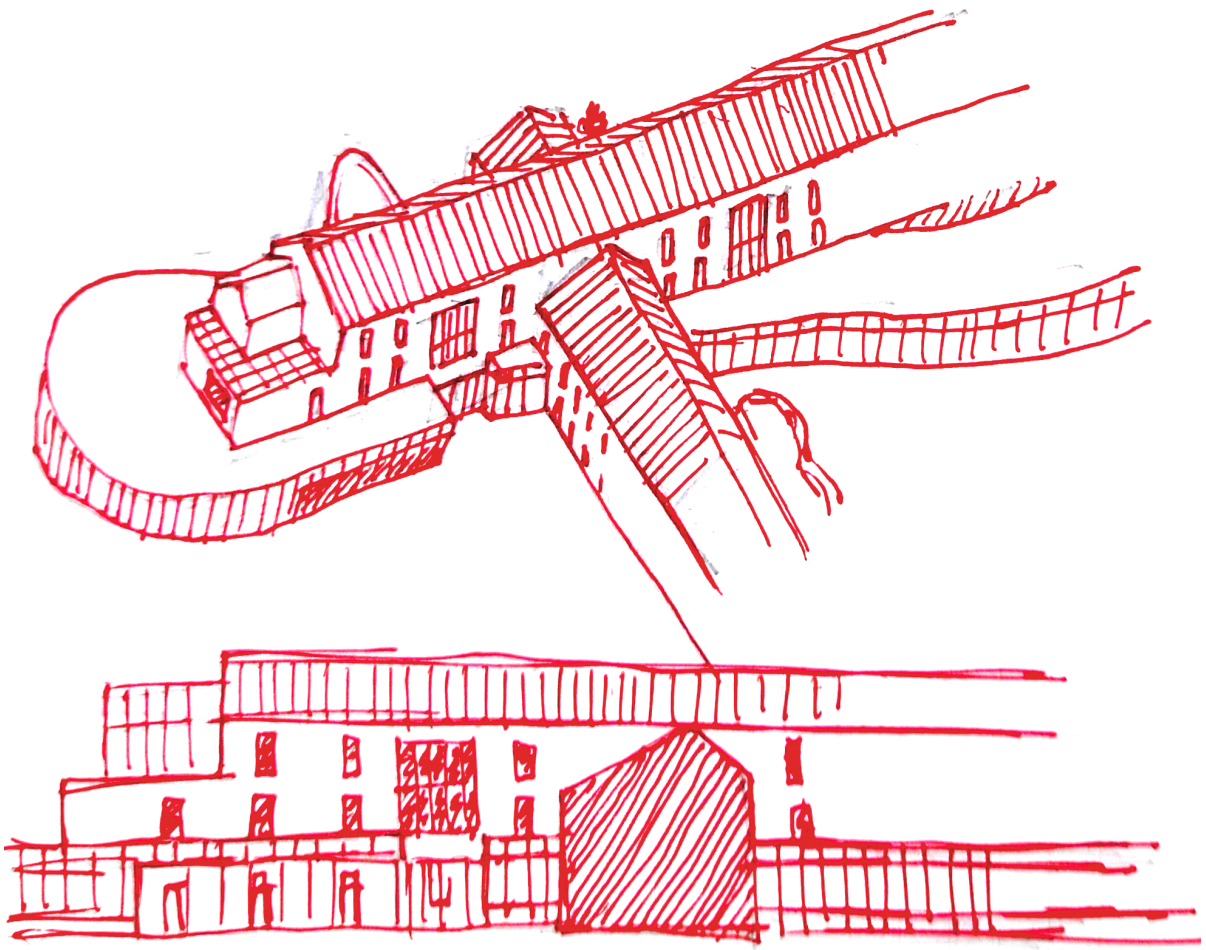
The final building layout was settled relatively early in the process, as it was primarily influenced by the site conditions and context. By defining the layout in time, a lot of early iteration was avoided, freeing up more time for the chosen typology to be suitably developedThe main design language was developed through a lot of iteration with hand sketches. The building's outside and inside appearance relies on the separation of private and shared spaces into clearly readable volumes with different properties. The rooms occupy two crossed rectangular slabs which guarantee equal orientation and rational multiplication of the units. Meanwhile, the shared spaces occupy free, organic shapes that adapt to spatial needs and define a flexible area. As such, the main aesthetic element of the project is not defined by an aesthetic goal, but by a search for harmony between the functions and their spatial representation. The facade treatment follows this separation, guaranteeing a consistent visual language that follows the building's logic. While the rough outlines of the building were still being defined, certain elements of the building were drawn on a detailed scale. The individual rooms had to be defined in detail before placing

early sketches of the building before the addition of the third floor

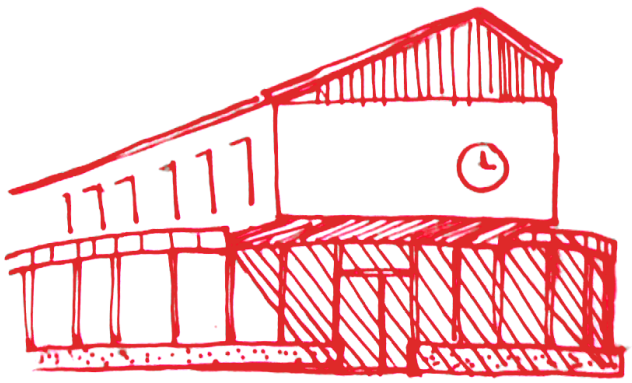


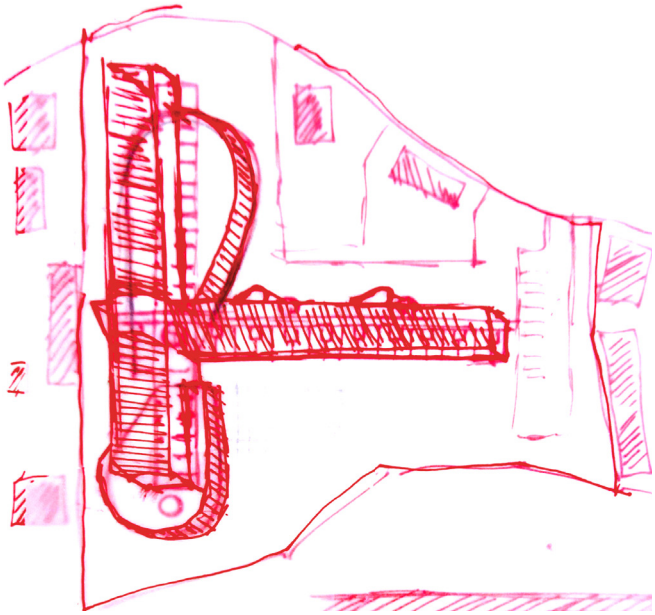


detail sketches from the final design stages

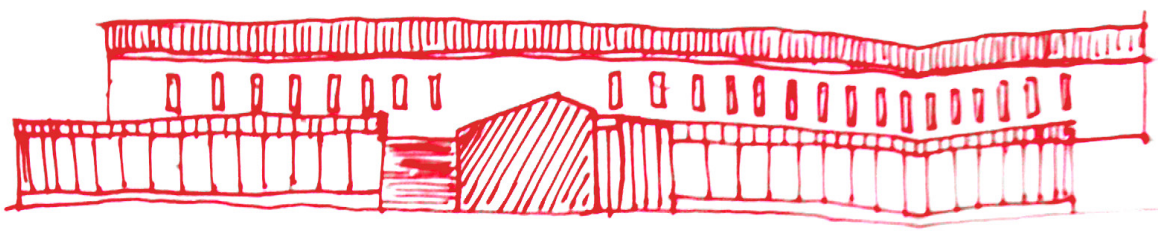


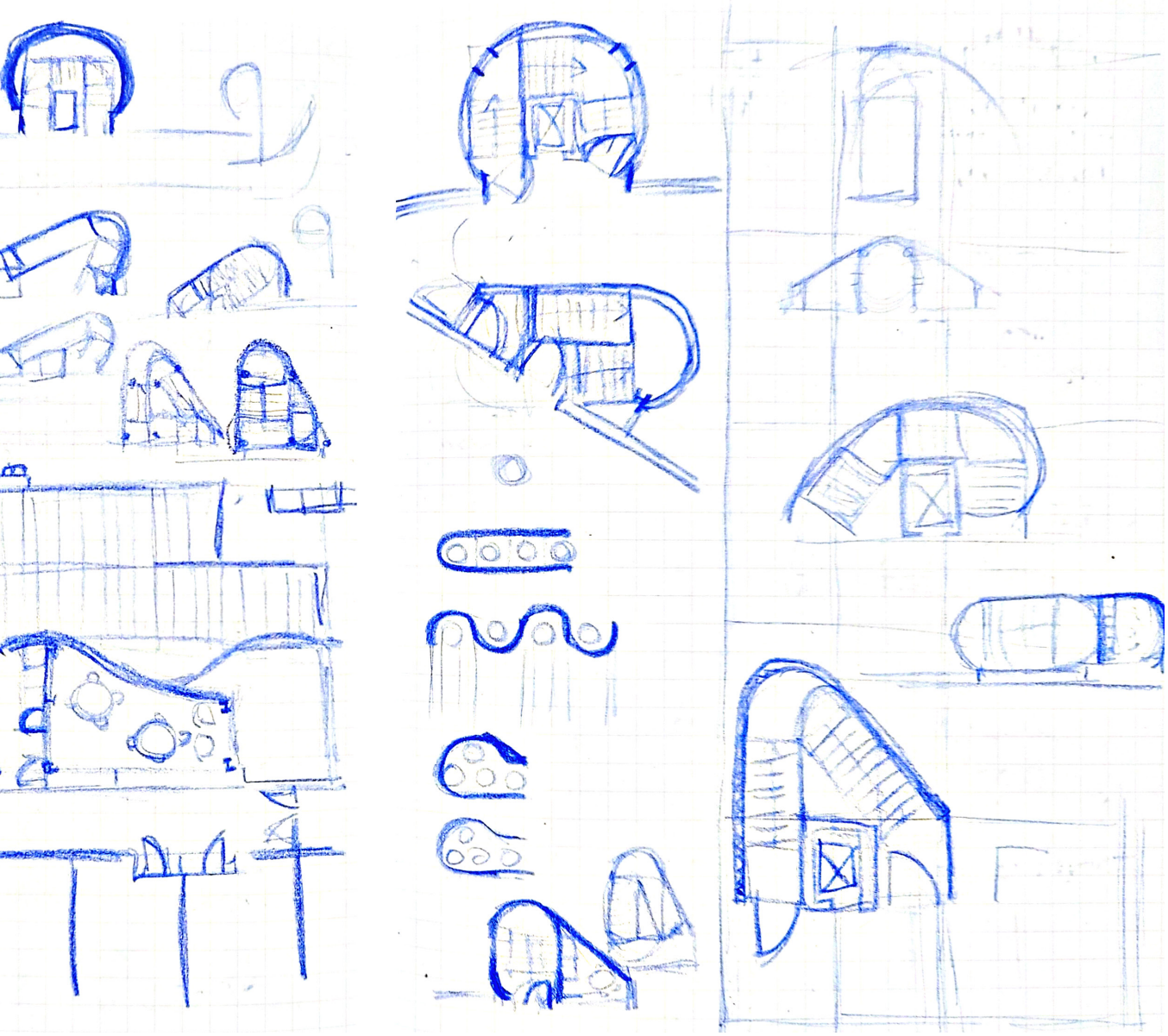
sketch studies for the
organic shared spaces





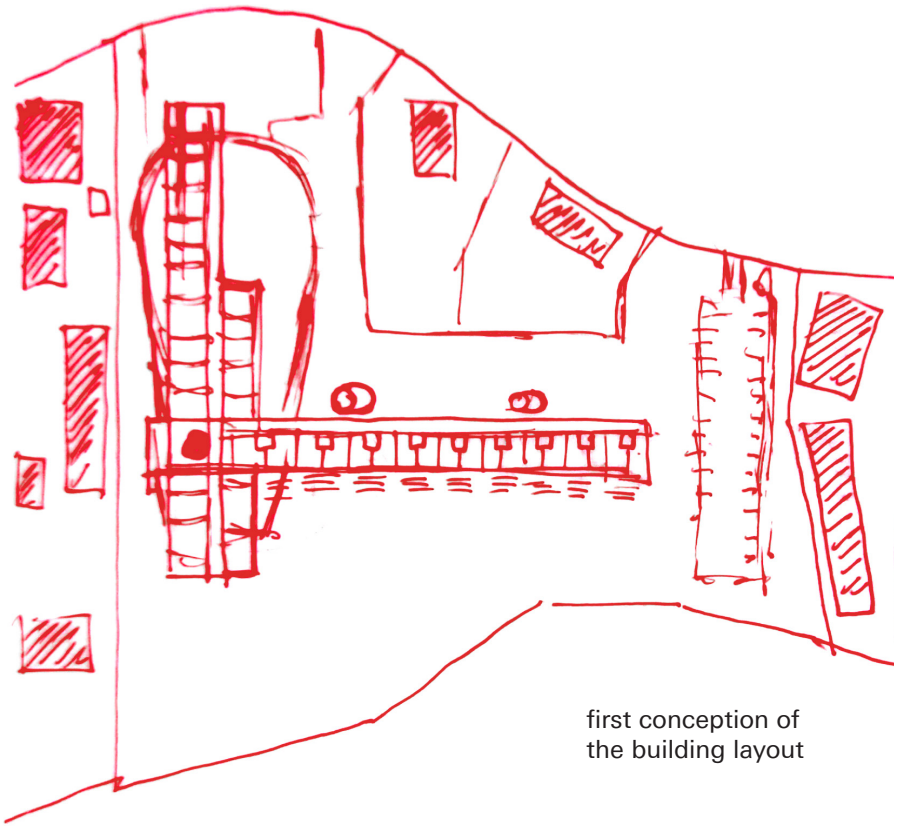
early design sketches



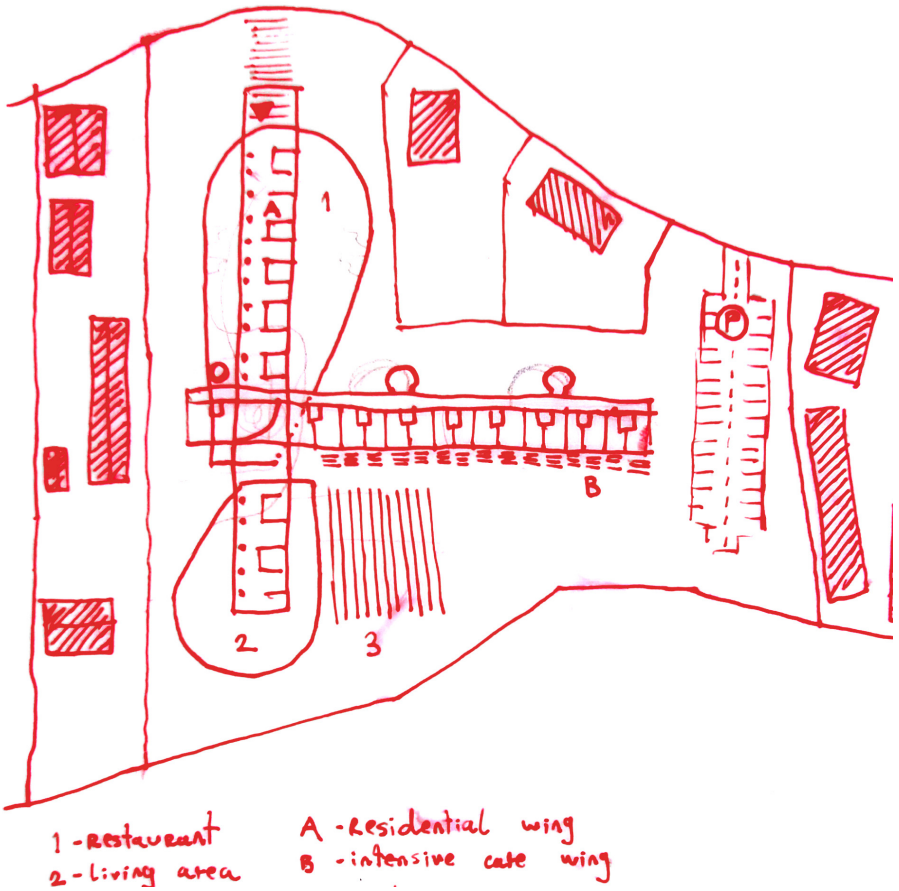


the building on site, as their multiplication defines the final volume. By making sure the modules comply with standards and offer a quality living space, they could later safely be used as a base for other important decisions such as the construction grid and ground floor support layout. Another element defined in detail was the vertical section through the residential wings. Because the repetition of windows is an important aesthetical element, it was necessary to ensure the window layout was realistic and ergonomic on a detailed scale

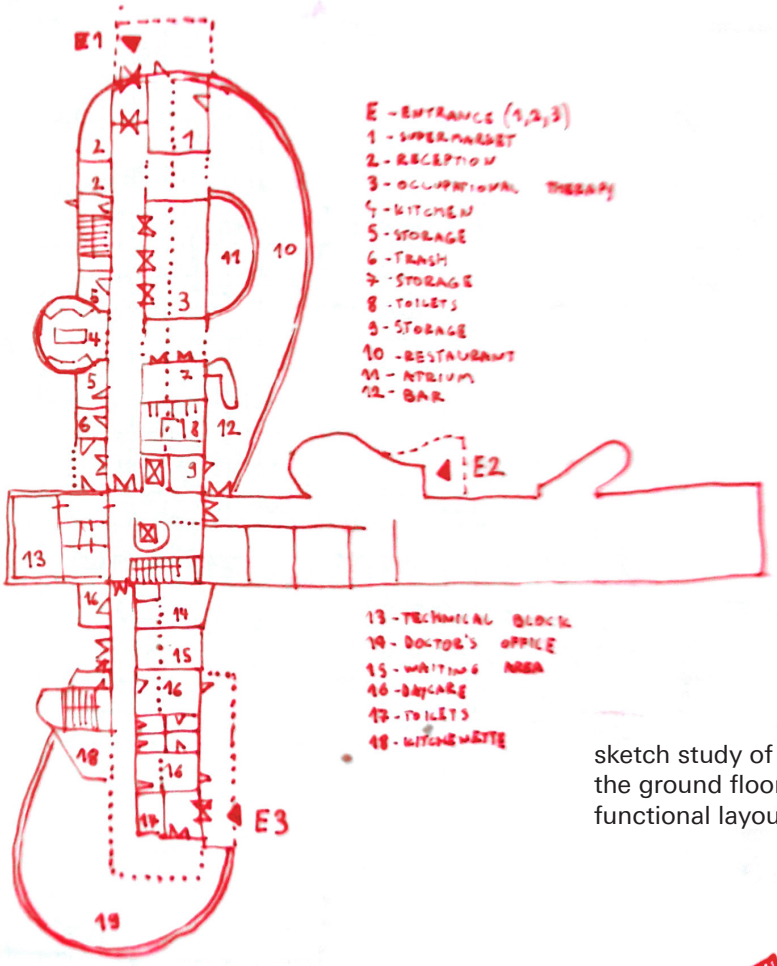
The characteristic residential floor was drawn up first. This reflects the desire to maximize the quality and rationality of individual living spaces. Knowing the rooms are properly organized, all the remaining energy could safely be put into the common spaces. The characteristic floor was primarily shaped by the individual units and their multiplication. The corridors and vertical communications followed. Finally, the semi-private common areas along the hallways were designed. With the characteristic floor drawn up, all the primary elements of the building were set in place. The design of the other floors was based on an efficient distribution of the program, with the early sketches serving as guidelines. However, the ground floor was pivotal in realizing the building's potential. Housing all the shared functions and aiming to invite outside users, a lot of careful planning was required to reconcile the needs of all users. The initial idea of an organic boundary for shared spaces proved very useful, as it enabled a lot of iterations on the final shape of the restaurant and living room areas.



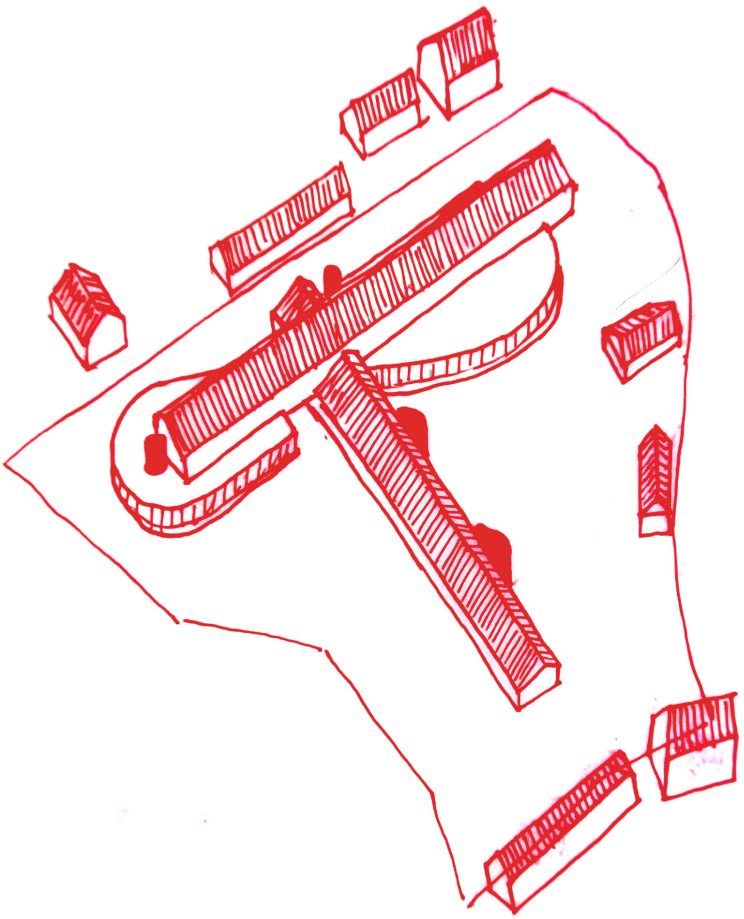
first conception of
the building layout



sketch of developed
building layout



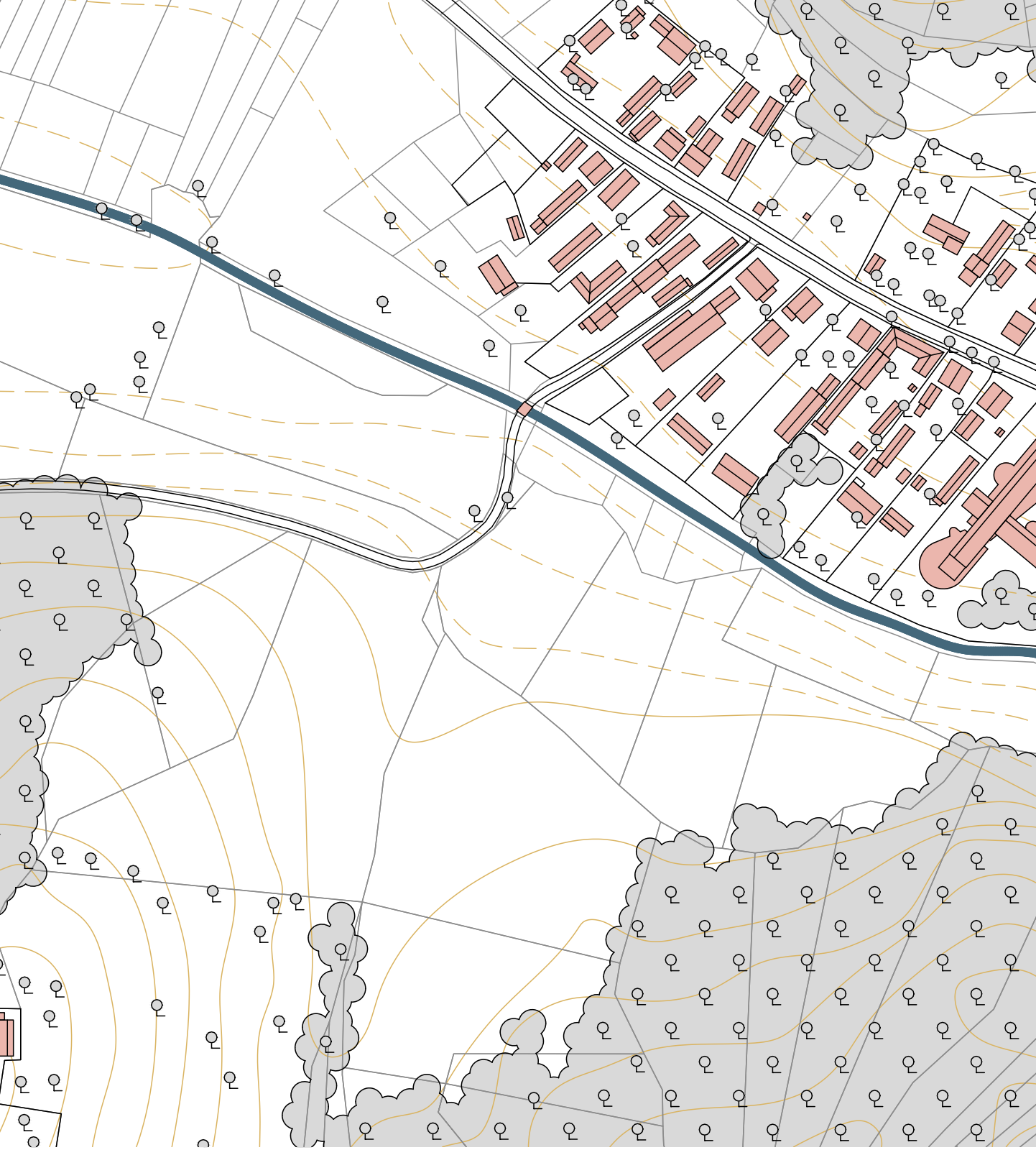
sketch study of
the ground floor
functional layout



early sketch
axonometric of
the building

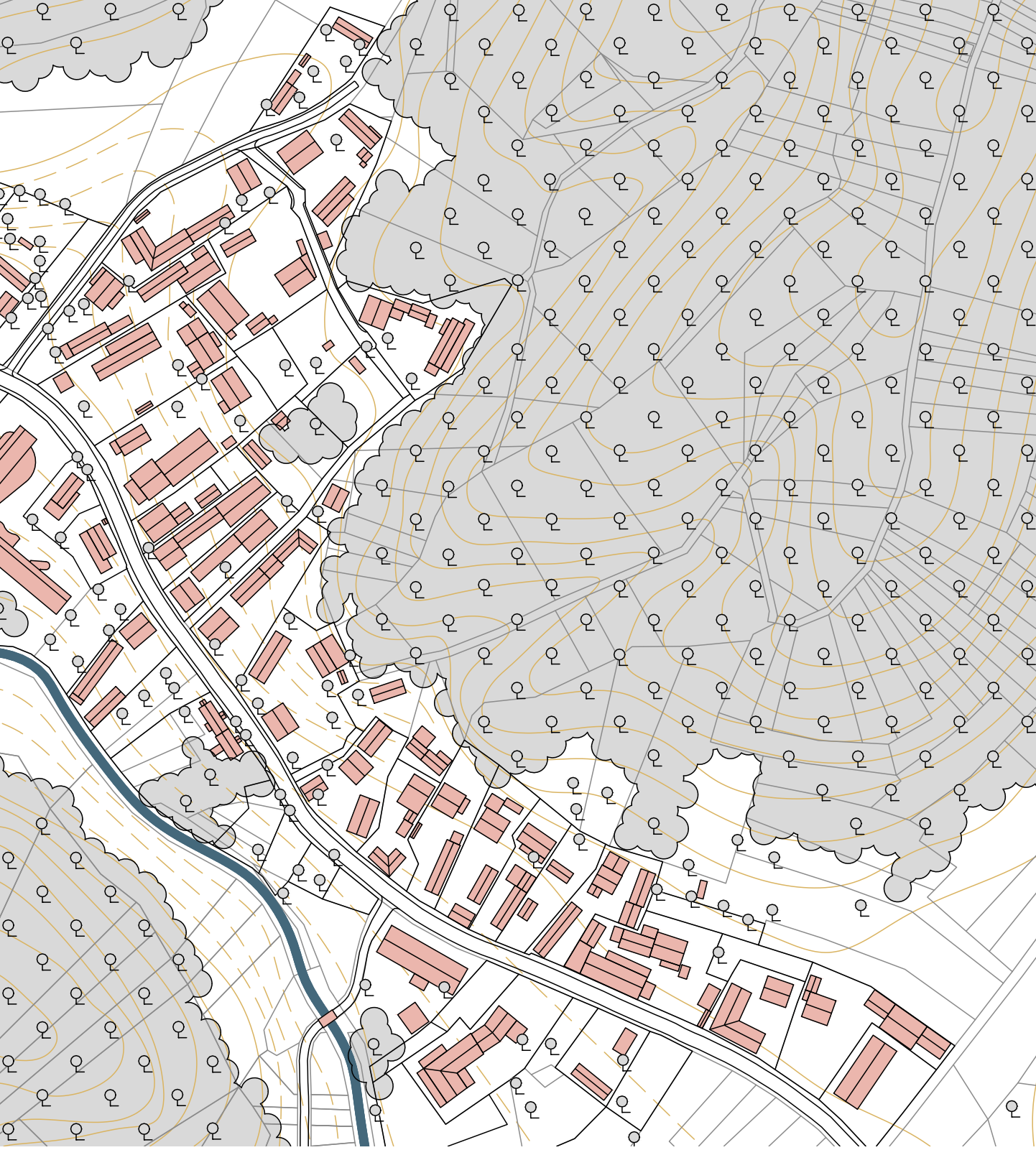
final architectural project with drawings

The final design proposal is presented as a series of drawings aiming to highlight qualities of the architectural concept. The technical drawings include site plans, detailed floor plans and facades. The perspectives are the most representative part of the design proposal. They are drawn in a manner that makes them accessible for non-architects to understand.

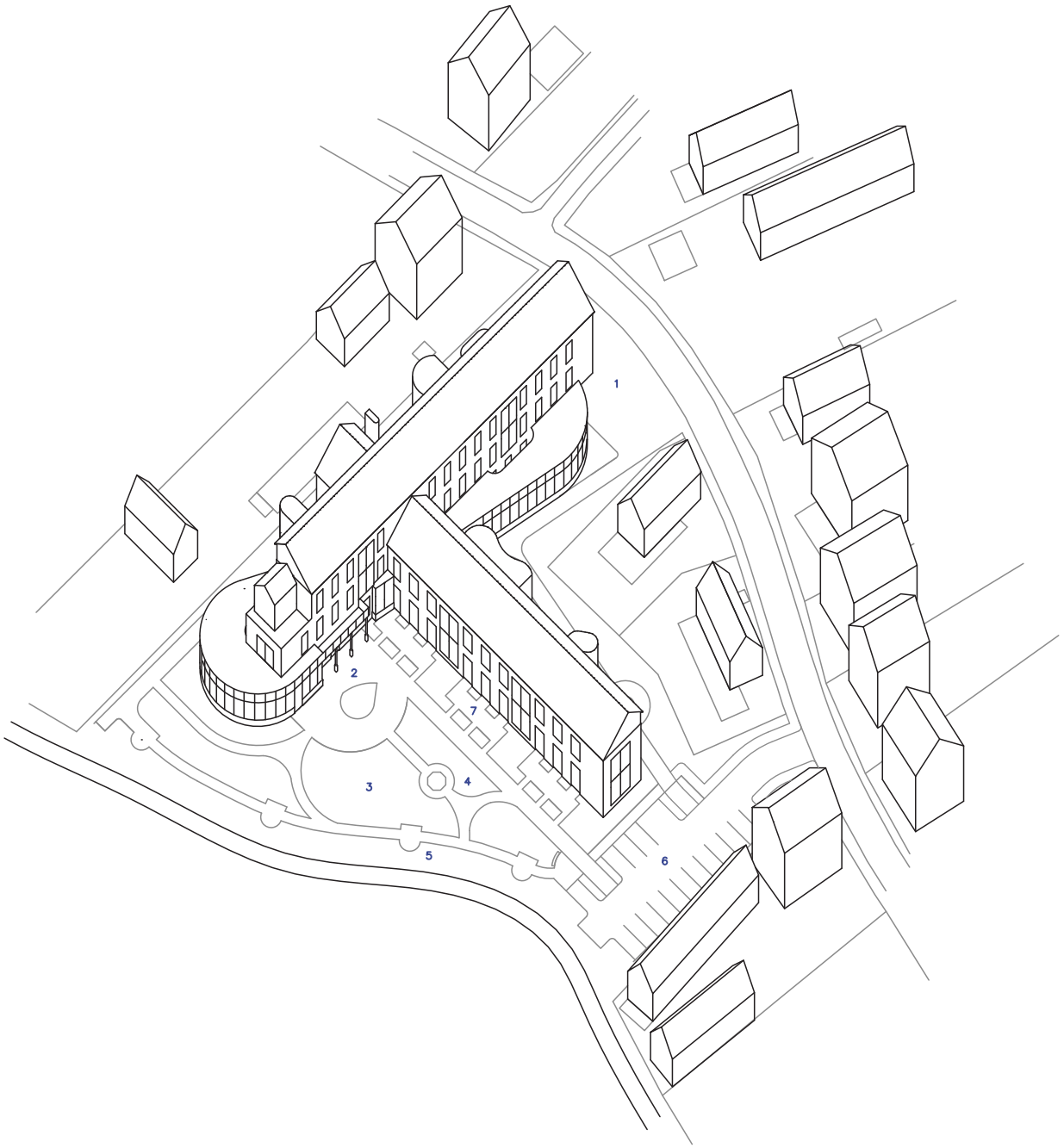


situation within broader context

1 : 2000 scale; on underlay:
cadastral zones Selnica and Dubovec
(originally in 1 : 5 000 scale)



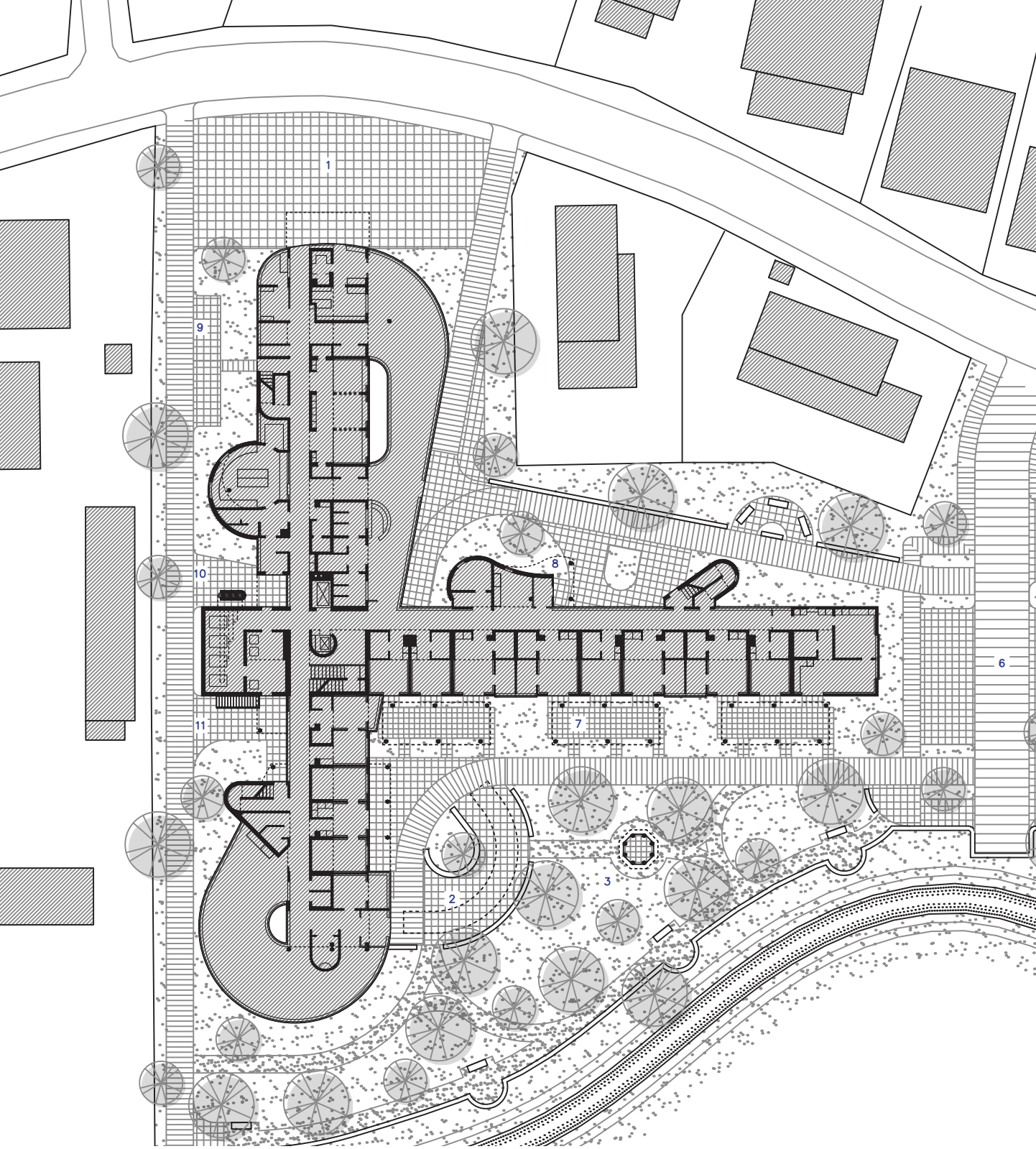
cadastral map
site boundaries
buildings
river bed
roads and paths
elevation lines
individual tree
forest area



axonometric diagram

1 : 1000 scale

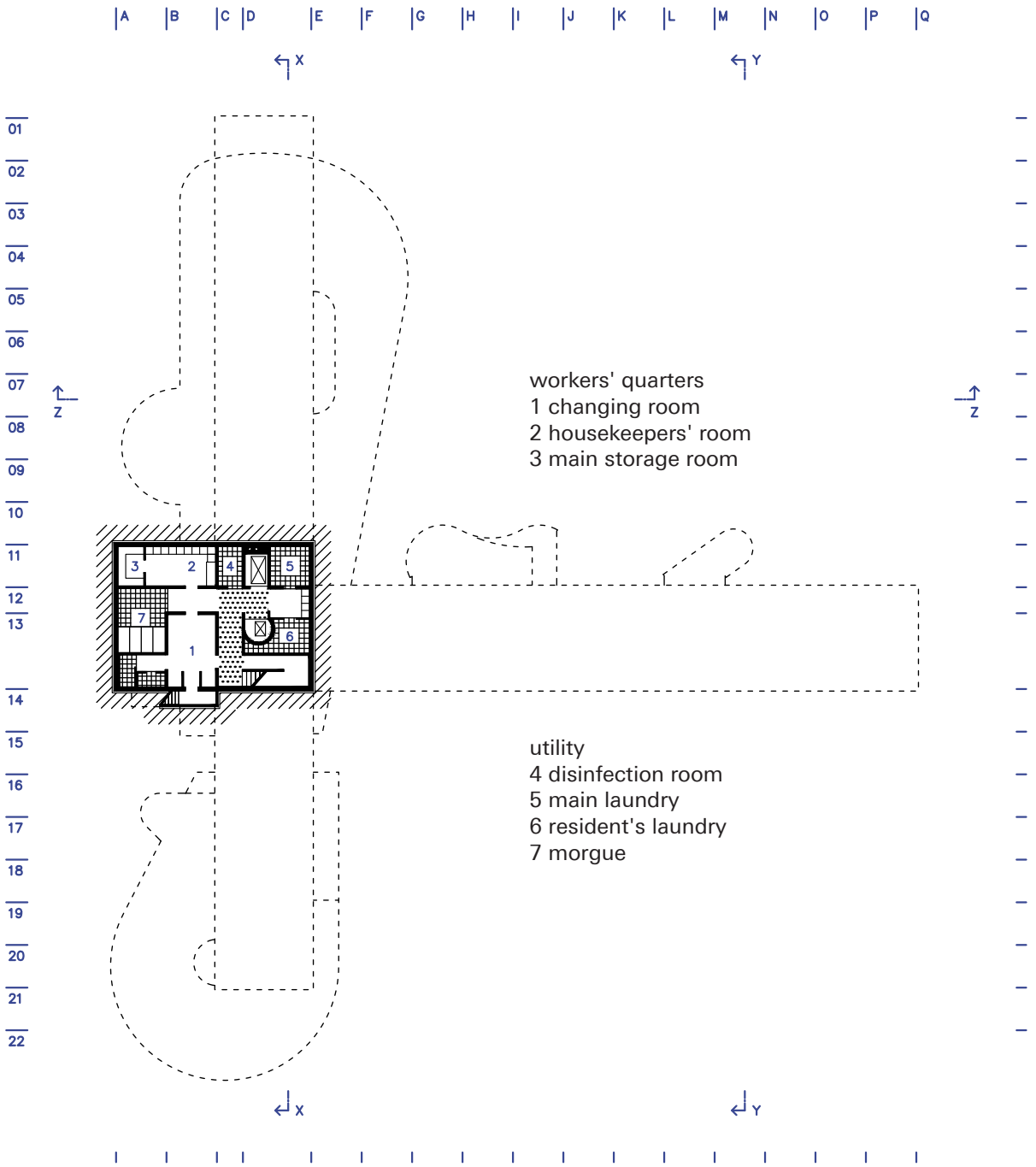
1 public square
2 secluded square
3 backyard park
4 park pavilion
5 river promenade
6 parking area



site layout

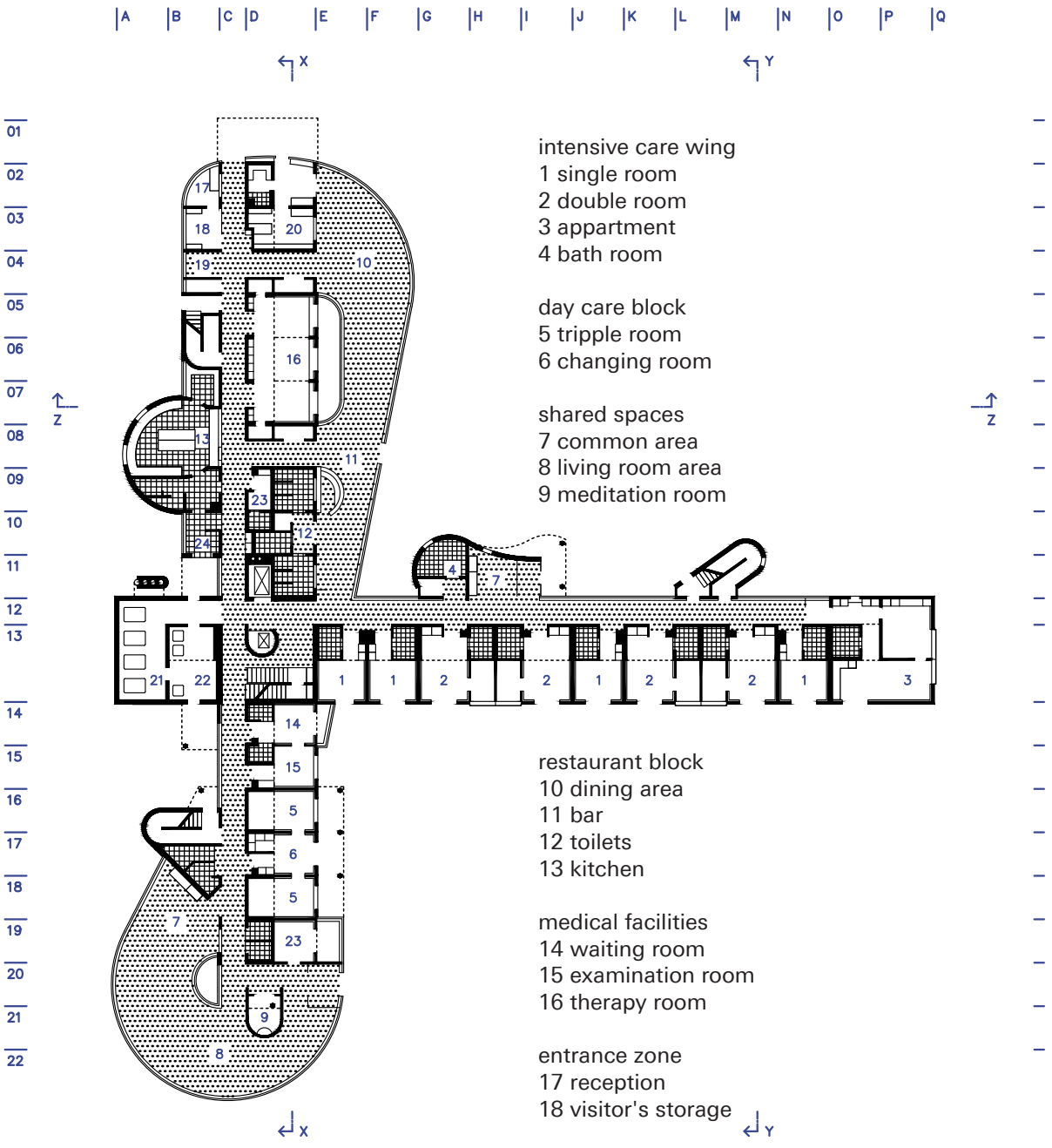
1 : 500 scale

7 private terraces
8 secondary entrance
9 service parking
10 waste yard
11 service yard



plan of basement

1 : 500 scale



intensive care wing
1 single room
2 double room
3 appartment
4 bath room

day care block
5 tripple room
6 changing room

shared spaces
7 common area
8 living room area
9 meditation room

restaurant block
10 dining area
11 bar
12 toilets
13 kitchen

medical facilities
14 waiting room
15 examination room
16 therapy room

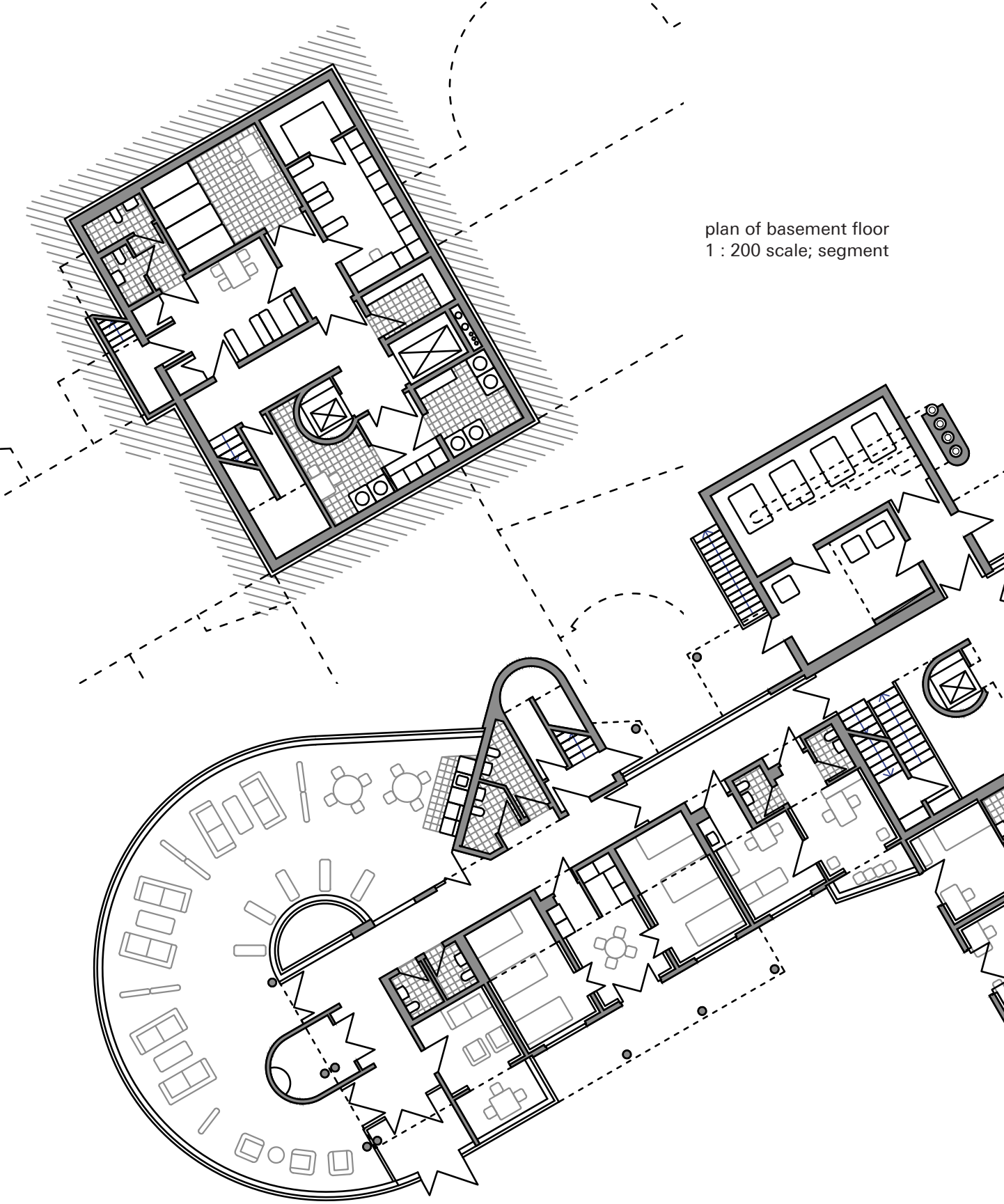
entrance zone
17 reception
18 visitor's storage

19 waiting space
20 general goods store

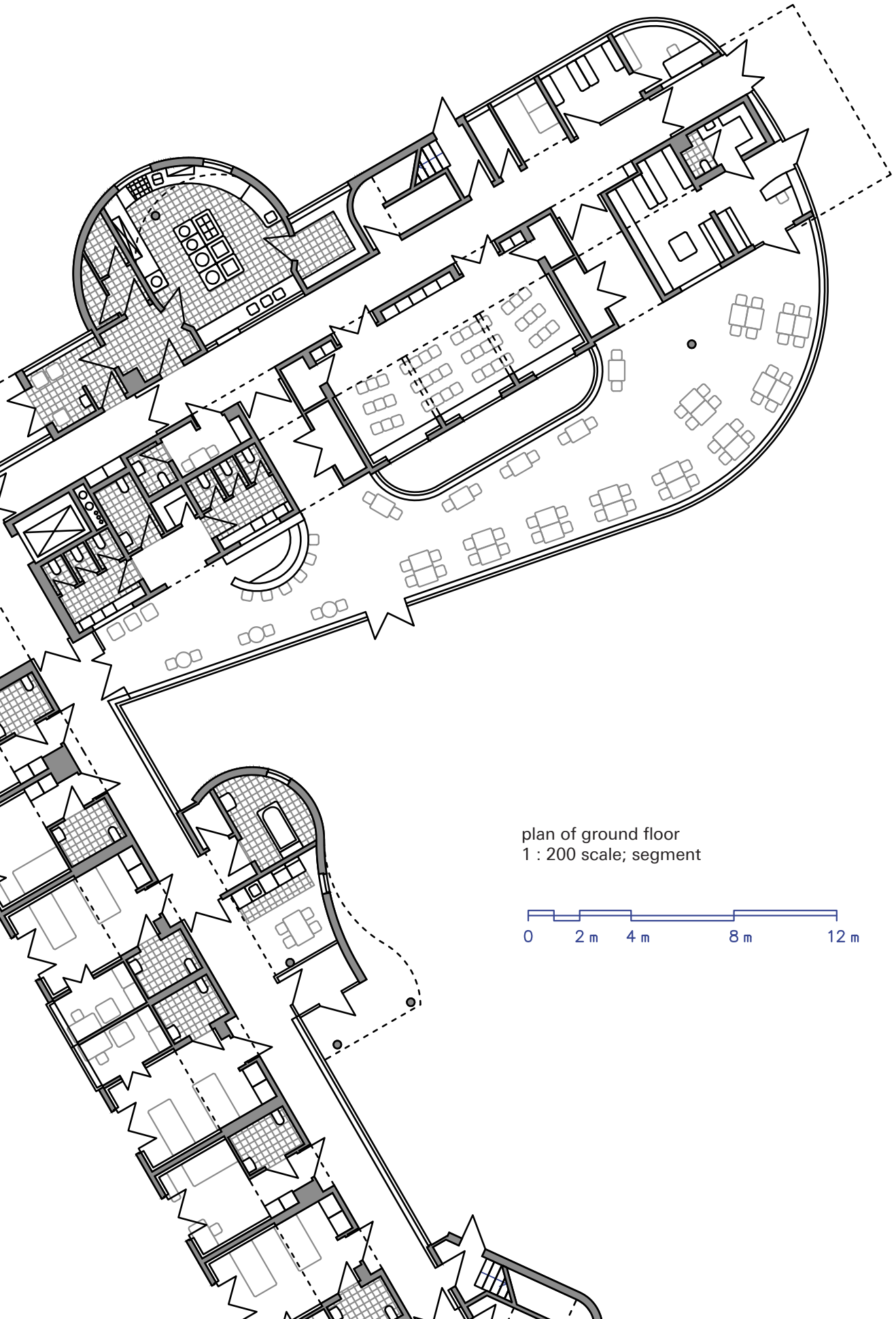
utility
21 heating room
22 utility room
23 worker's room
24 trash storage

plan of ground floor

1 : 500 scale

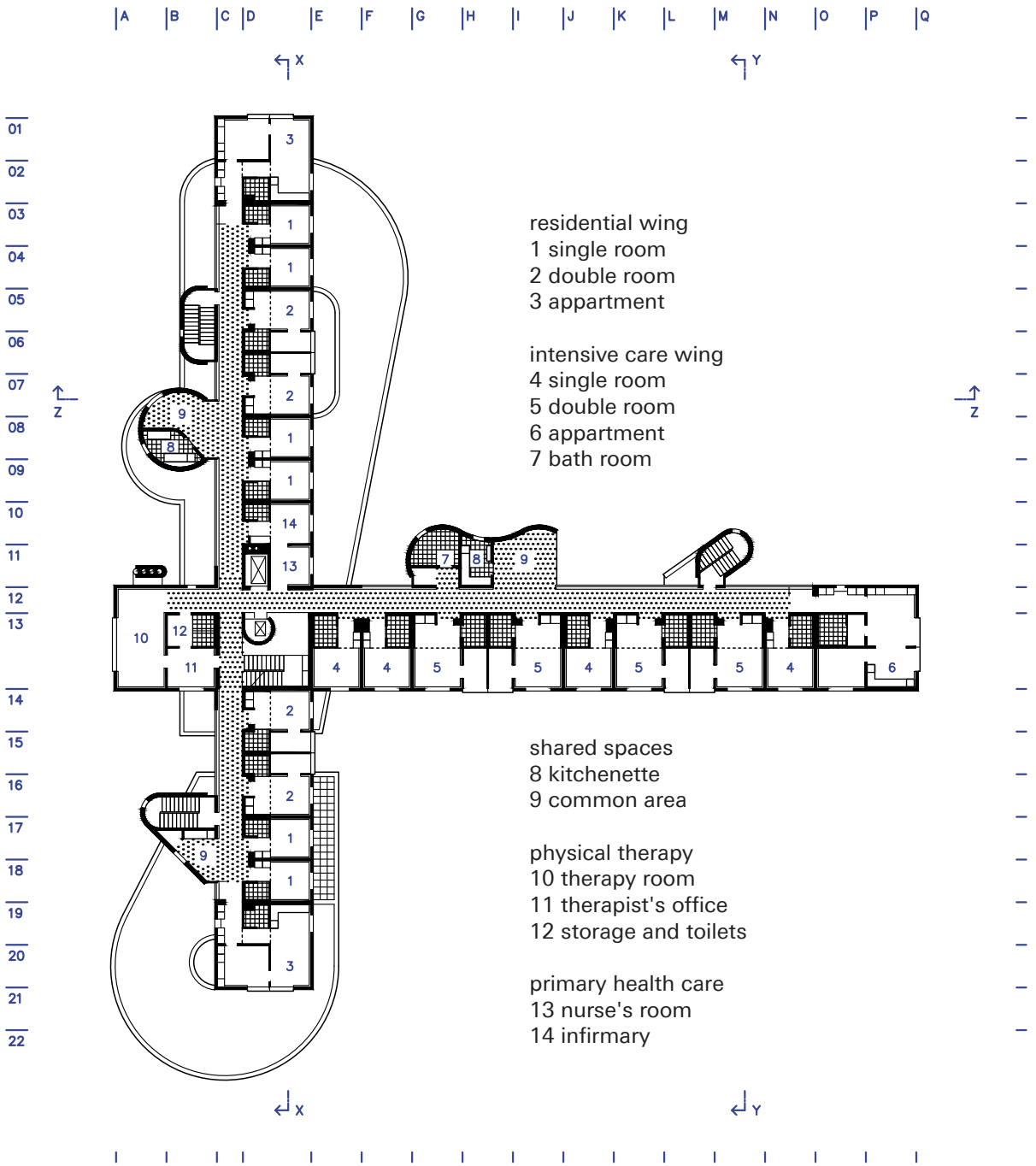


plan of basement floor
1 : 200 scale; segment



plan of ground floor
1 : 200 scale; segment

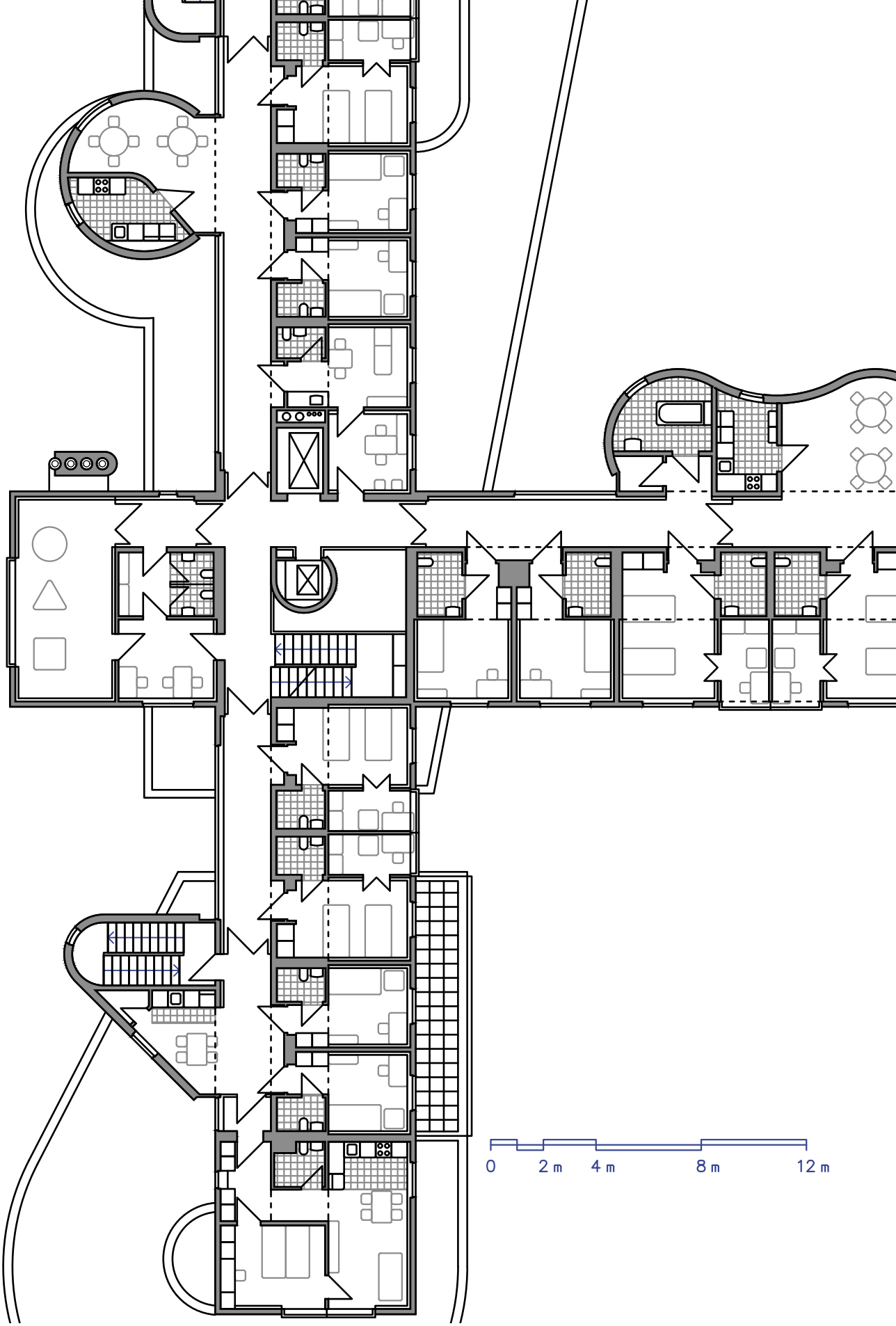
0 2 m 4 m 8 m 12 m

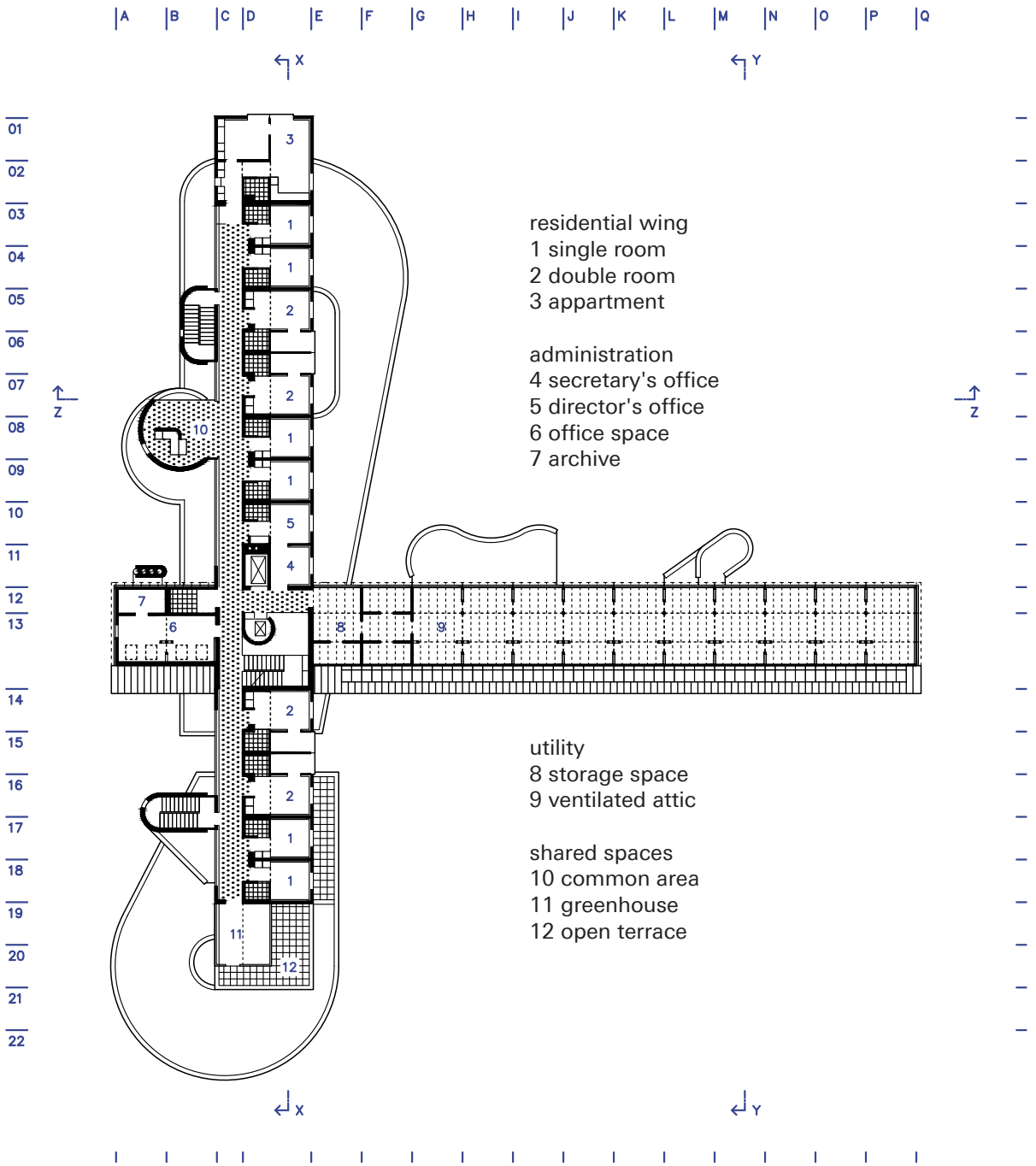


plan of first floor

above
1 : 500 scale

right
1 : 200 scale; segment

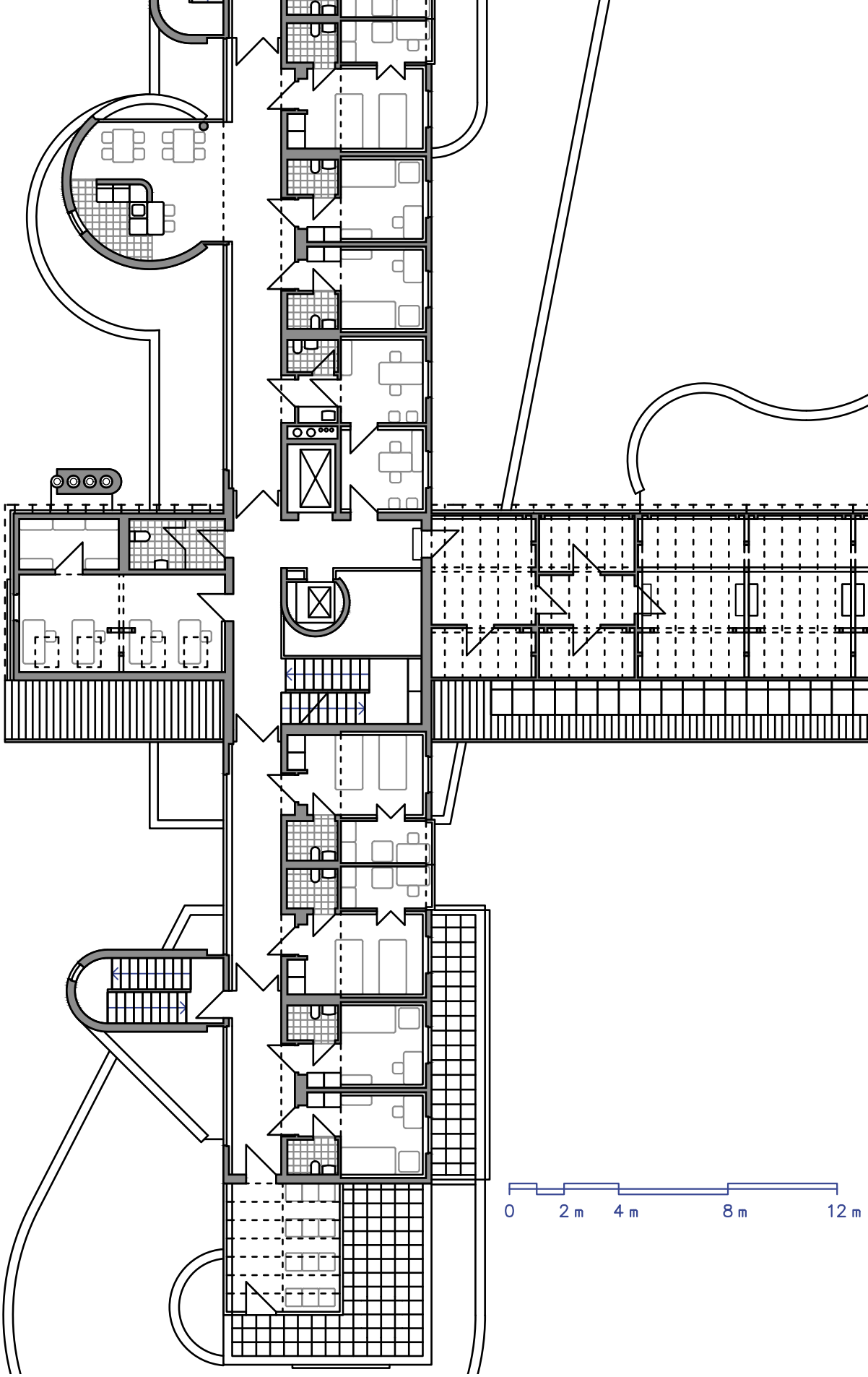

0
2 m
4 m
8 m
12 m



plan of second floor

above
1 : 500 scale

right
1 : 200 scale; segment


0
2 m
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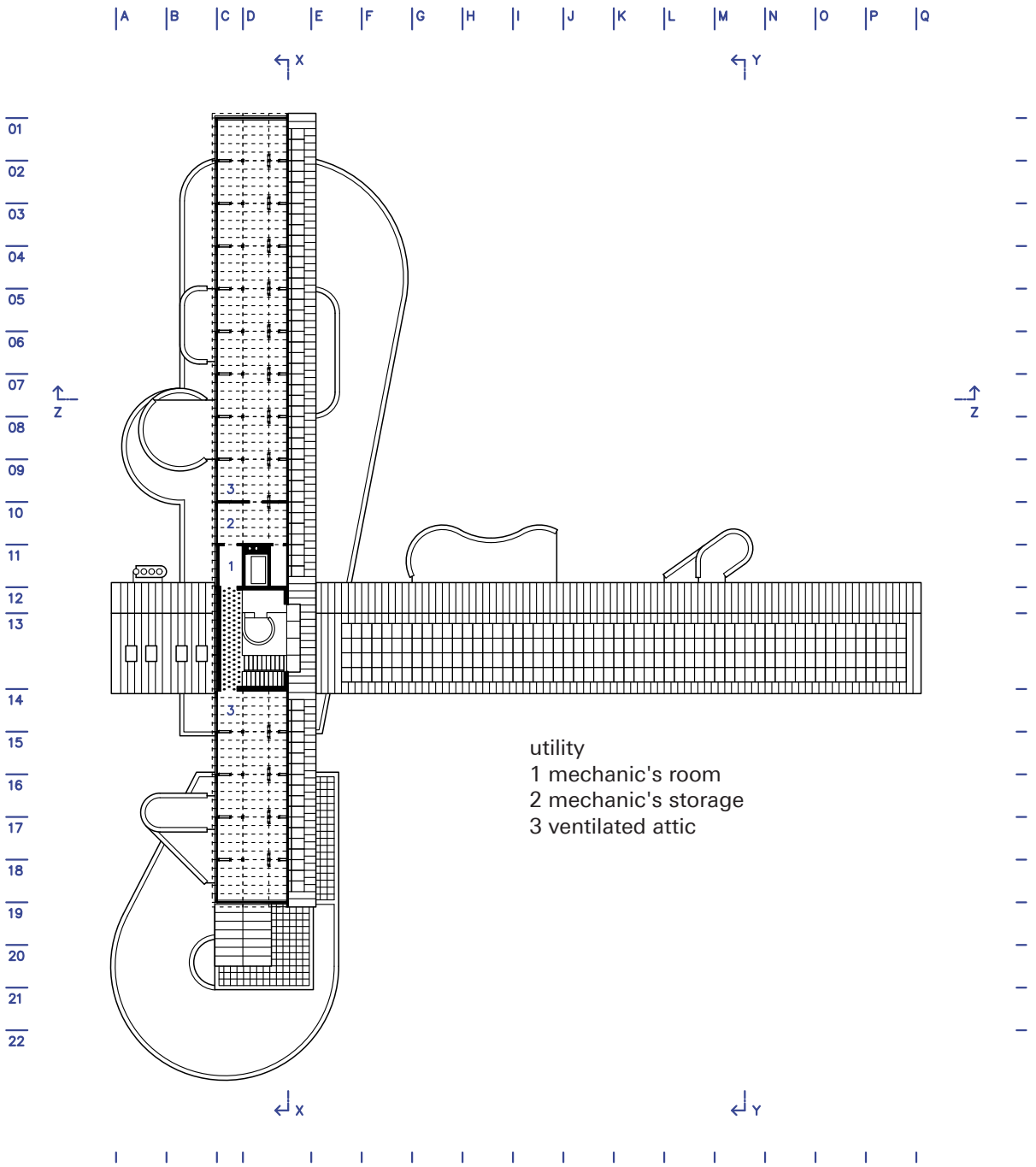
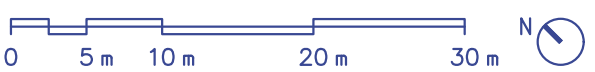
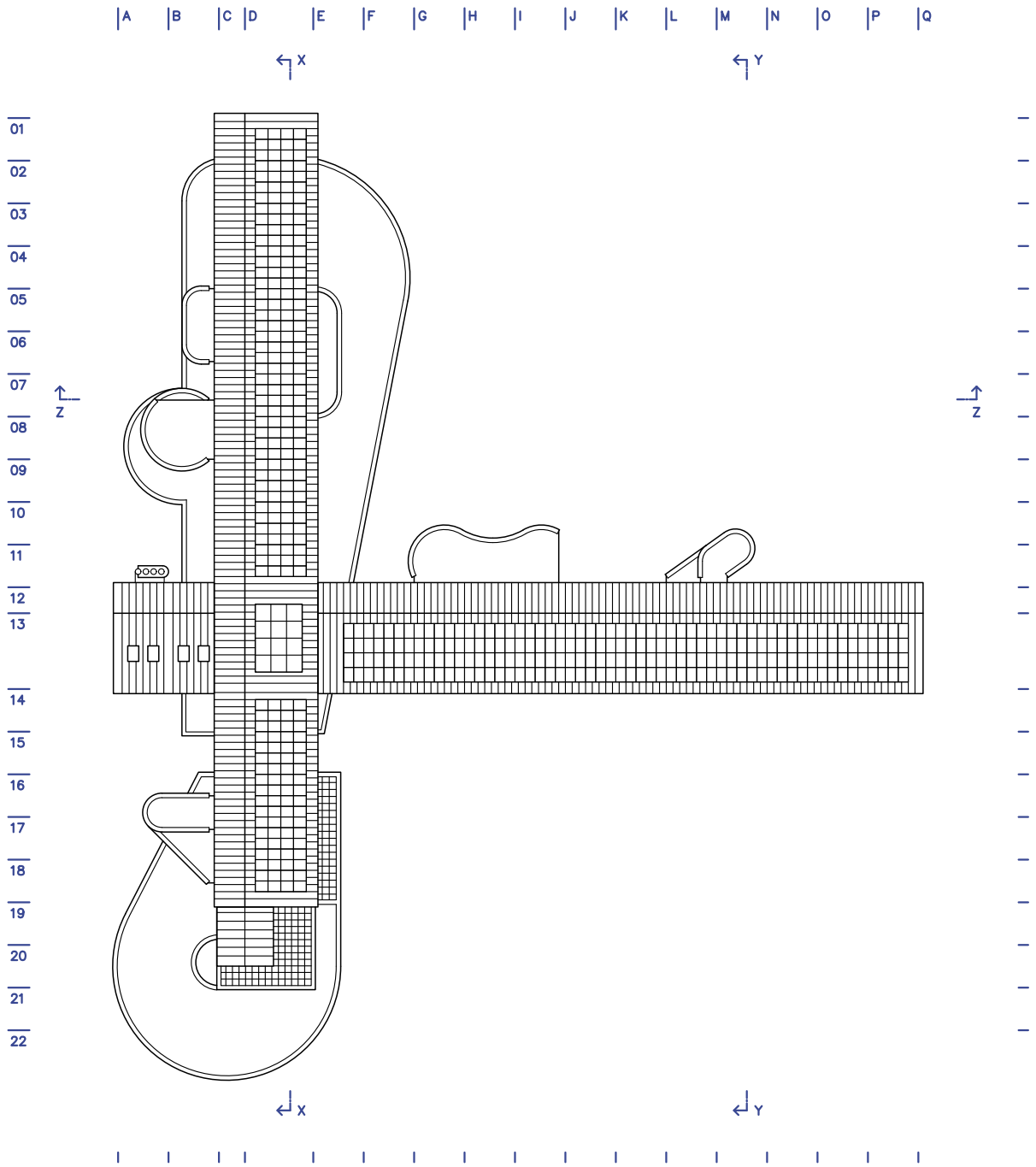
12 m



plan of third floor

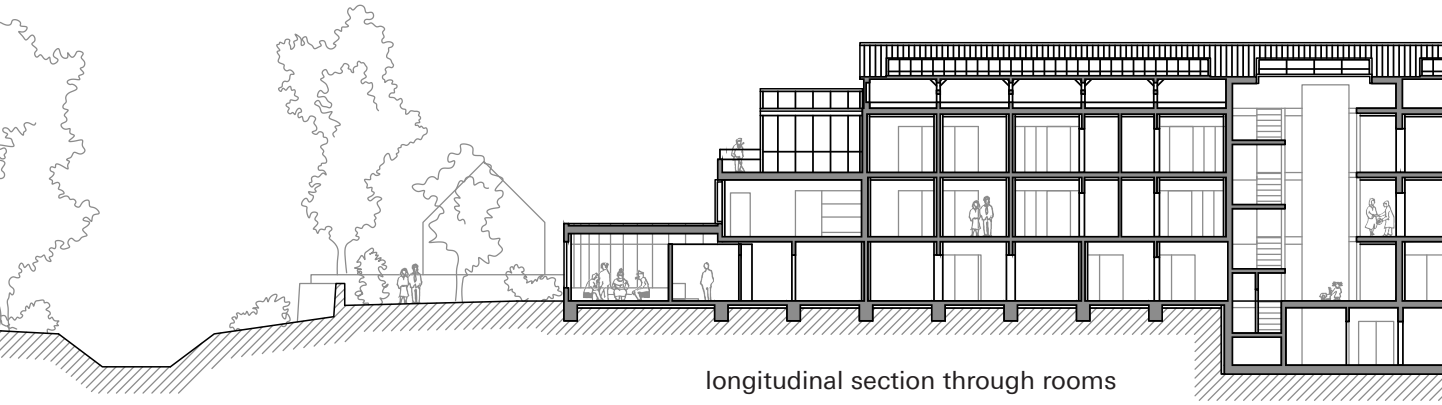


1 : 500 scale

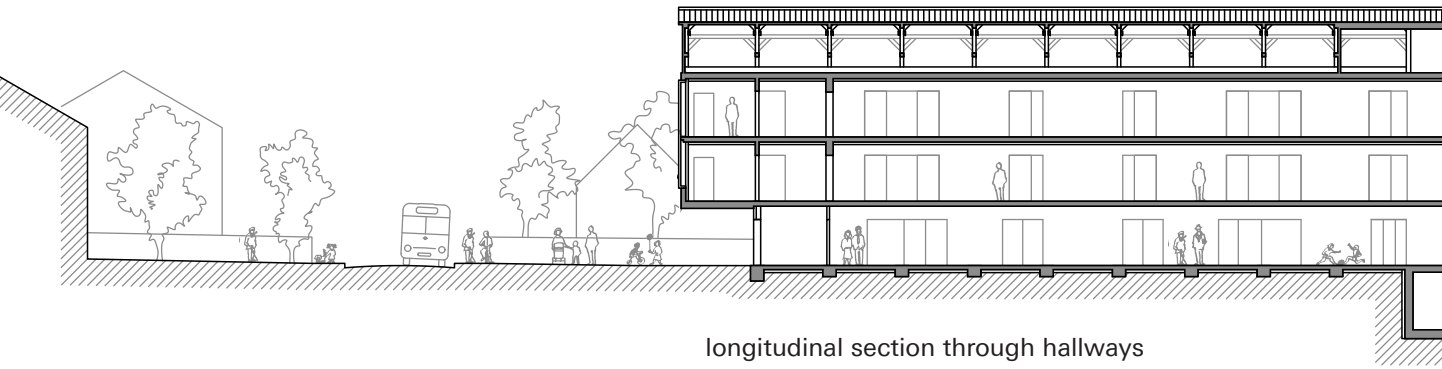


plan of roof

1 : 500 scale



longitudinal section through rooms

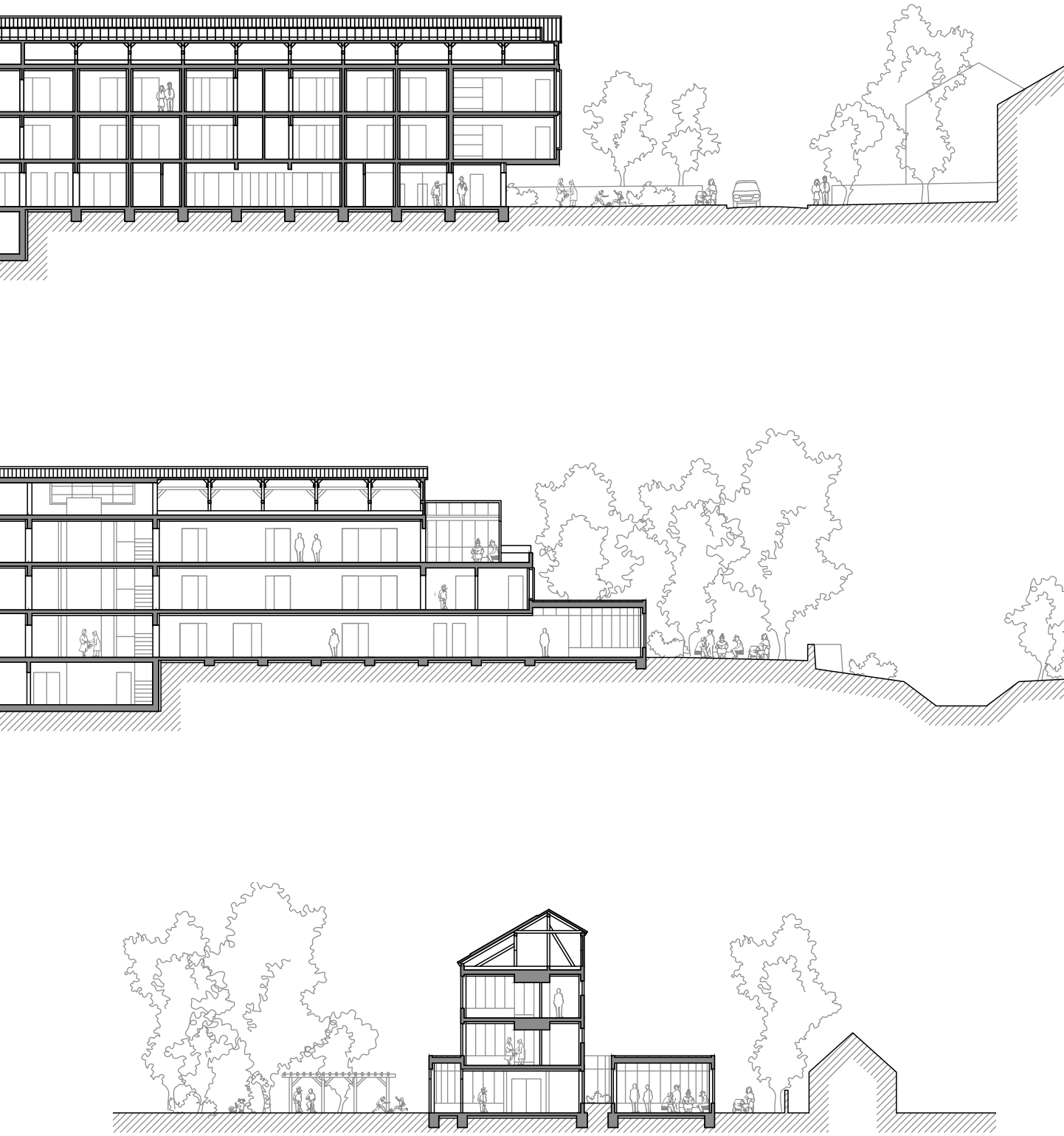


longitudinal section through hallways

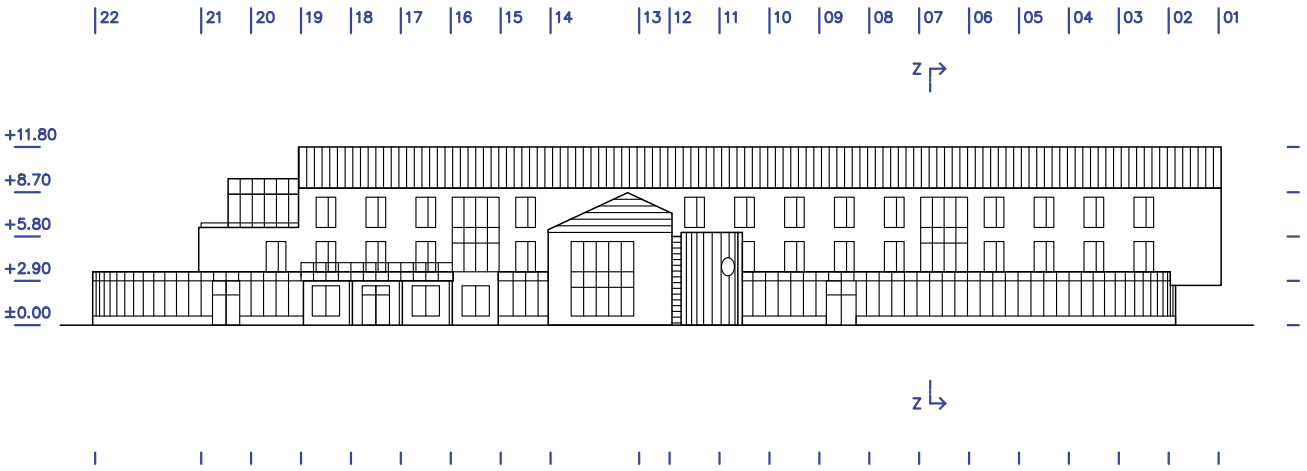
contextual sections

1 : 333 scale

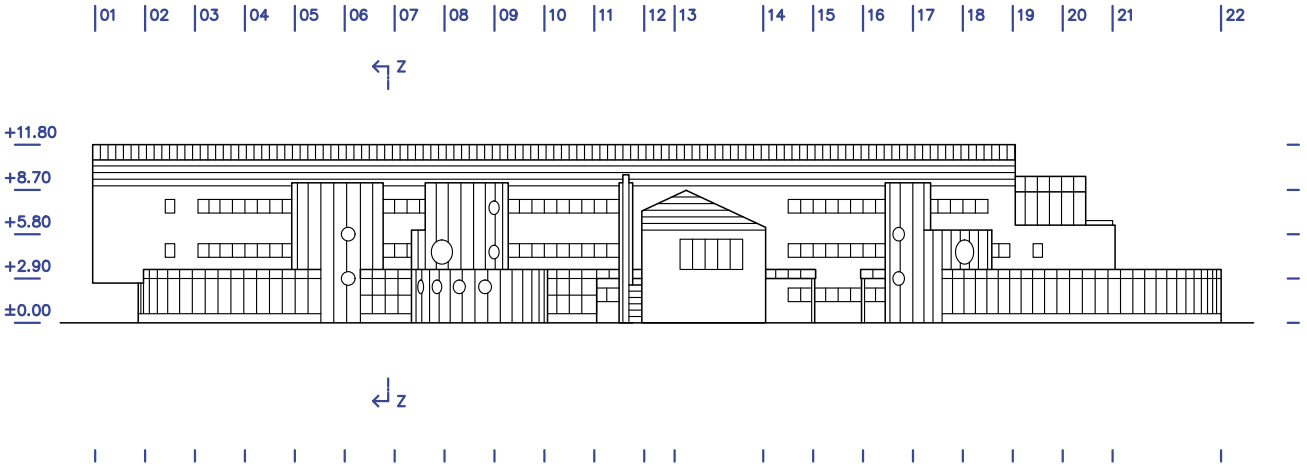
cross section through street side



cross section through backyard side



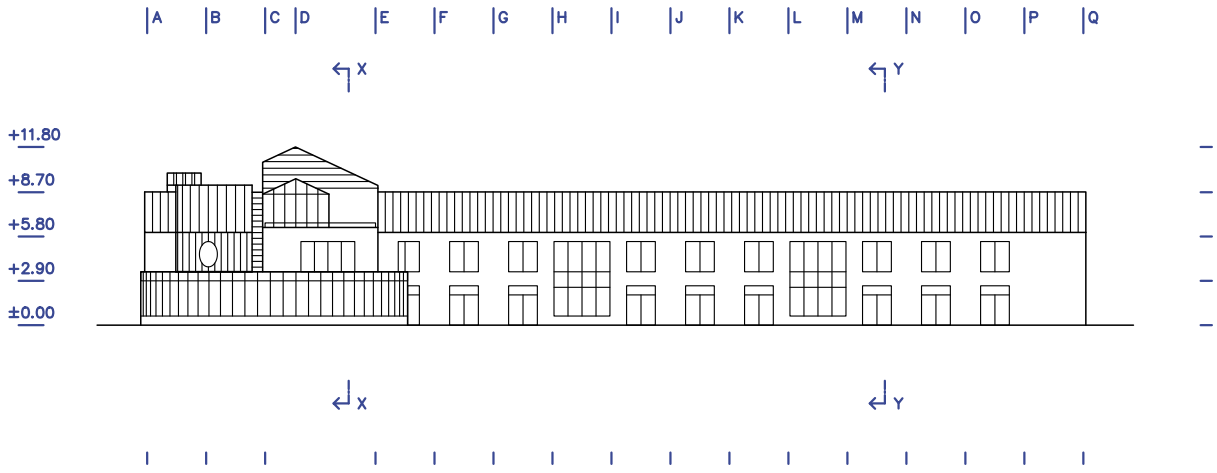
south-east



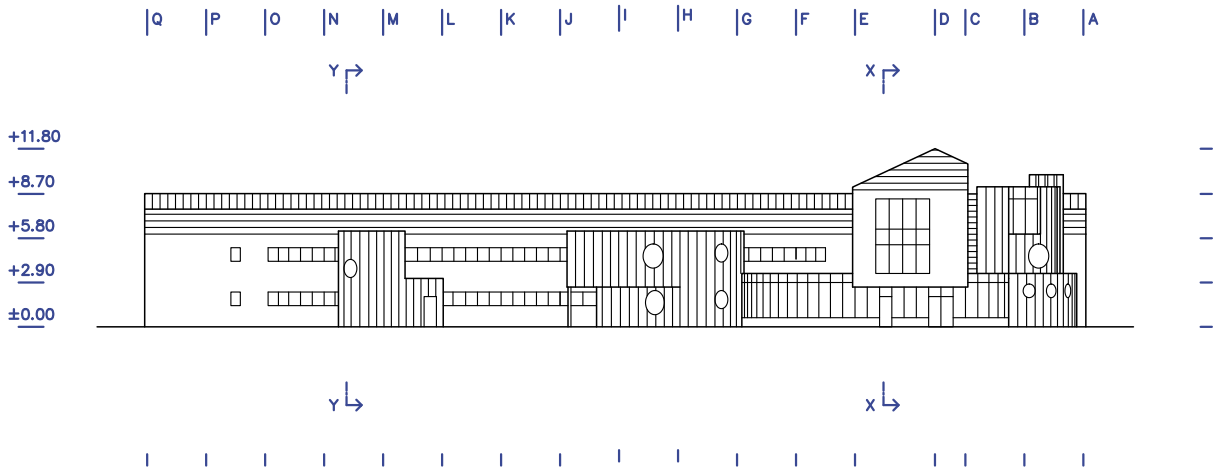
north-west

elevations

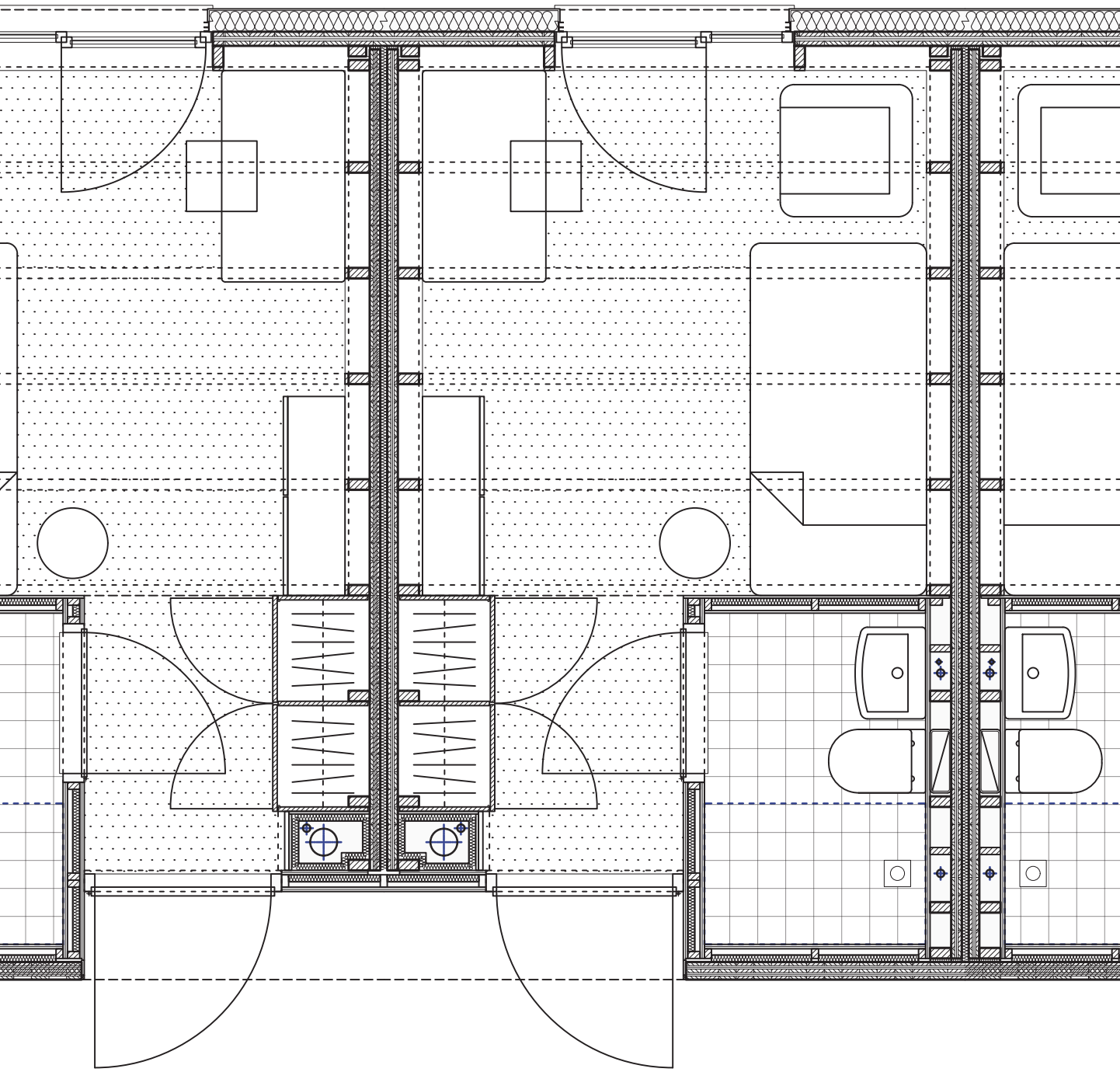
1 : 500 scale



south-west



north-east



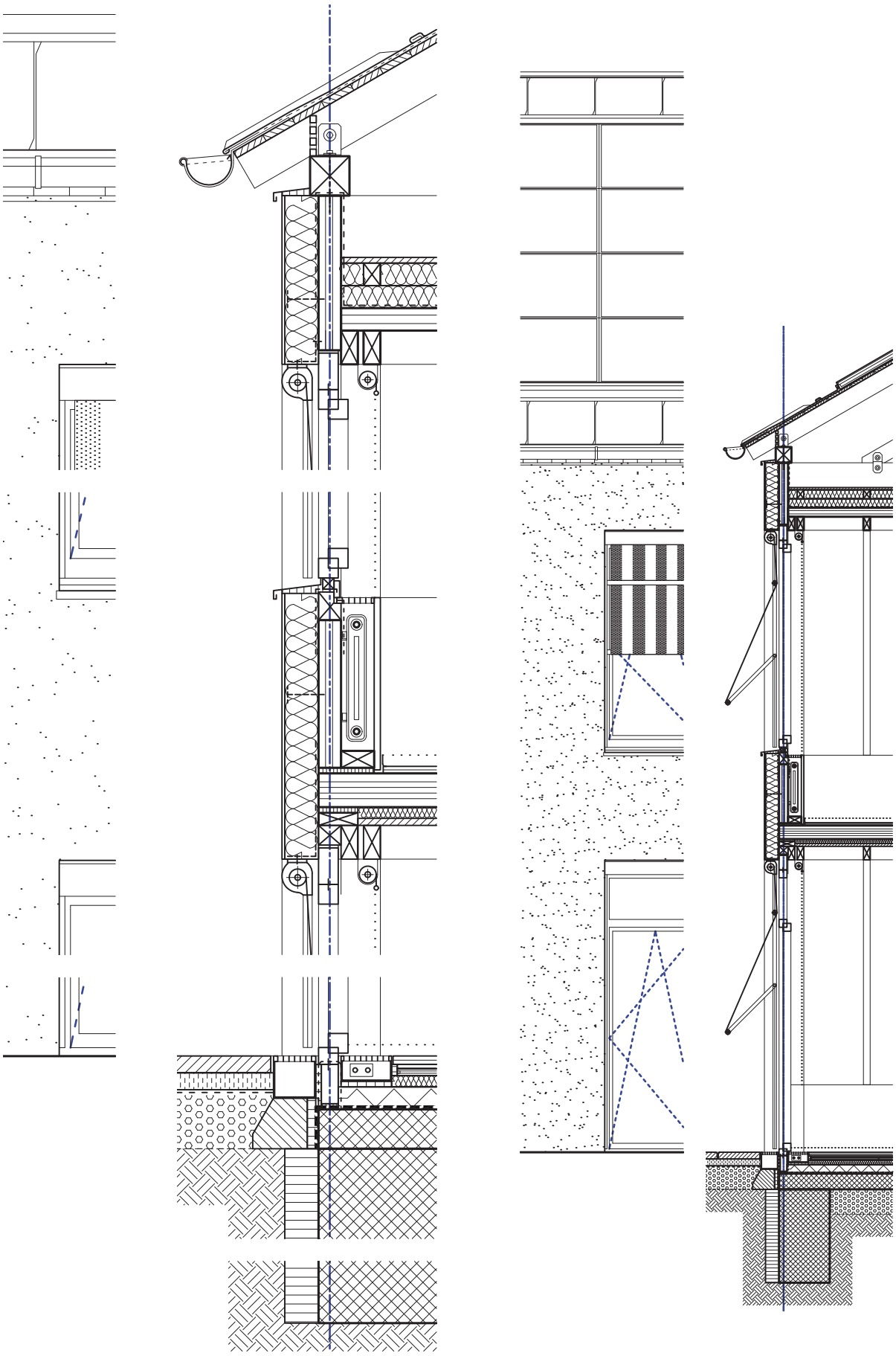
detail plan of typical room

1 : 33 scale

detail section of residential wing

1 : 20 scale

1 : 50 scale



exterior perspective of front entrance

eye level view from the regional road to the north

exterior perspective of south garden

eye level view from within the garden

interior perspective of main corridor

2nd floor of the residential care wing

conclusion

The degree project's outcomes are presented and described in a concise manner. Afterwards, the results are further elaborated on in the reflection, where the different key decisions are weighted based on their influence on the design proposal as well as the quality of the design proposal itself. The final paragraphs emphasize the wider impact of the thesis topic.

overall process outcome

A series of investigations was conducted successfully, forming the knowledge base for an architectural design proposal. Starting with the site visit, the chosen region of Krapina-Zagorje was evaluated to define optimal conditions for a development site. Three site visits were conducted by car, exploring the predefined wider area of interest. A collection of interesting locations was put together and further tested according to spatial qualities. The narrowed-down list of five potential sites was again evaluated, this time based on spatial plans and cadastral maps. A final site was chosen, embodying most of the qualities expected of an ideal design site for a retirement home in Krapina-Zagorje County.

A wide array of legal documents was surveyed, enabling a good insight into applicable requirements for the architectural proposal By keeping focus on requirements that apply specifically to retirement homes, it was possible to lay out a concise overview. It includes provisional translations of key articles for chosen legal documents and a composite table summarizing all the requirements into systematic categories. As part of the investigations, a series of reference projects was presented. The references were selected from various influential magazines and winners of international architectural awards. When choosing the references, care was taken to trace the development of retirement homes from the middle of the 20th century to contemporary examples. References were presented concisely, showing characteristic floor plans and perspective views. The resulting catalog was a good starting point for the development of the architectural proposal, showing different possibilities regarding functional organization and general appearance.

The architectural design process was in line with the strategies outlined as part of the introduction. The conducted investigations defined the final proposal, as the process focused heavily on a linear fact-driven approach. The conclusions of the site analysis defined the building's disposition, while the legal provisions and architectural references heavily defined the functional layout. The creative element of the design was most apparent in reconciling and integrating all the different requirements in an aesthetically pleasing and stimulating building.

The final architectural proposal was illustrated traditionally, while making a clear distinction between technical drawings on one hand, and visualizations of the final proposal on the other. Because architects and non-architects perceive the project differently, the separation served to best adapt the documentation to the two different groups of readers. The plans and sections are technical and straightforward, as it only has to show information relevant to architects. The perspectives are more developed artistically, as they showcase concepts important for the wider public. For the sake of efficiency, only essential drawings were created, showing key functional or conceptual elements that were developed during the design process. The drawings aim to emphasize the values of the proposal, while more generic elements aren't as architecturally developed.

reflection on final design proposal

Despite requiring a lot of time and effort, the in-depth investigations proved to be a valuable and worthwhile contribution to the degree project. The extra time spent preparing ahead of the architectural design phase enabled later decisions to be made more quickly and decisively.

The site visits and context investigations emerged as by far the most useful preparatory step. As originally intended, the wide search for a real project site resulted in a very specific set of criteria. These insights weren't only useful for selecting a site for the degree project, but present an overall useful insight into the problem

of integrating retirement homes into a rural context. The legal overview was useful to ensure the architectural proposal remains realistic. By obeying relevant legislation, the design process is steered toward rational decisions. While the legal overview did not contribute greatly to the overall architectural quality of the design itself, it greatly helped strengthen the overarching purpose of the degree project. It justified the case study approach by showing the proposal is by the standards applicable to real buildings.

The reference catalog proved very beneficial for the development of the final architectural proposal. Having an overview of different architectural projects dealing with the same typology was useful in itself. However, the chronological selection of references was especially insightful, as it highlighted the changes appearing in certain elements of the retirement home as architects and other stakeholders gradually learned from past experiences.

A linear approach to design allowed for the complex program to be put together relatively quickly. Instead of ideating several different solutions to individual problems, which exponentially increases the number of design variations, decisions are made in order of perceived importance and fixed in place. Those aspects of the design that are most defined by external factors (such as context or law) are defined early on and remain unchanged throughout the design process. Other less important or more vague aspects of the design are locked in later in the process, where more creative liberties can be taken. The result is a logical proposal that can easily be justified using facts gathered throughout the investigations.

The dual approach to project drawings was worthwhile. Keeping the technical drawings simple and readable also saved time and enabled extra hours to be spent on the perspectives, which arguably communicated the project in the most relatable manner. .

future prospects for rural retirement homes

An important initial goal of the degree project was an architectural contribution to the overall problem of rural depopulation. By presenting the project as more of a case study and less of a highly individual architectural design, there was a lot of opportunity for generalized conclusions with a potentially broad impact.

The features of the final design proposal embody many of the concepts essential for successfully housing seniors in a rural context. The building's relatively large mass is broken up and integrated into the rural context. Its supporting functions are extroverted, aiming to serve the local community as well as the home's residents. The organization is rational and adheres to contemporary standards. Most of the qualities are only achievable through a close architectural dialogue with the local context. Rural communities have always been a sensitive spatial phenomenon. In today's context of depopulation, they require an even more thoughtful approach. I believe this degree project highlights the possibilities offered by retirement homes (and collective housing in general) for the development of rural areas.

The degree project can be seen as a series of guidelines for integrating the retirement home into rural communities. It surpasses the context of Krapina-Zagorje, although it is fully dedicated to it. Alternatively, the degree project can be seen as a template, offering a safe and tried approach towards architectural intervention in a wider European context of depopulation and an increase in median age. Whichever way it is read, the qualities embodied in the resulting design proposal primarily highlight the need for a sensitive and informed approach to architecture, where spatial decisions must be based on more than just intuition.

architecture as the art of organisation

In an ever more complex professional field, there is more uncertainty than ever regarding the role of an architect and, consequently, the very essence of architecture as a discipline. Is architecture an art or a science? Is the architect a creative or an engineer? Is he a master of science, engineering, or the arts? This debate is, of course, not a new occurrence. It is likely to haunt the profession for as long as it exists.

At the beginning of the 20th century, the debate of art versus science in architecture reached a peak. The academic architects of the past were taken head-on by the new generation. They advocated for highly rational principles of organization, often describing new buildings as machines. Ironically, the modernist movement itself ended up being more based on aesthetic principles than on research. The few true functionalists ended up mostly forgotten, while the star architects of the time leveraged the avant-garde visual language without the original positivist principles. Postmodernism presented itself as a reaction to the rigid and scientific architecture of the postwar period, yet it ended up primarily as a reaction to the aesthetics of modernism without a deeper theoretical root. As such, postmodernism faded and left the debate about the essence of architecture largely unresolved. At the same time, in the sixties and seventies, there was a renaissance of scientific research into topics such as the sustainability of buildings and the livability of cities. The one conclusion to be drawn from the past is that architecture will forever be lodged somewhere between art and science.

Funnily enough, the word 'architecture' is derived from the name of a structural element, rather than from a principle of space or aesthetics. But at the time of its invention, the arch was far from just a regular structural element. Its invention stems from ancient builder's desires to create grand spaces that were impossible up to that moment. Furthermore, the arch is as much an organizational element as it is a structural member. It defines patterns within a building as well as the widths and heights of passages and rooms. And just as it cuts and defines space, it defines masses and rhythms, becoming the defining aesthetic element of countless architectural styles.

The arch, thus, defines the very essence of architecture as a profession. Just as the ancient architect had to have an equal understanding of the arch as a structural, organizational, and aesthetic element, contemporary architects must understand the building as a unity of complex factors from an ever wider array of different fields. The contemporary tendency towards specialized roles is largely pragmatic. The economy of the building sector requires everyone to stick to their jobs. However, this tendency goes directly against the very heart of architecture as an integrative profession. Of course, architects have their area of expertise, but they also shoulder a broader responsibility of ensuring the final quality of a project goes beyond just economic interest, benefitting society as a whole. To achieve such ambitious goals, architects must be able to have an overview of the whole design and construction process, and not shy away from it.

It is my sincere belief that the architect is neither an artist nor a scientist or engineer, but a link between these categories. Architects lack the freedom exercised by artists, as architecture has an immense social responsibility that goes far beyond any that of any other art. Similarly, architects can not be scientists, as they do not deal with variables that can be quantified. Architecture is as metaphysical as it is physical. Just as the ancient architect could not design spaces without taking structure into account, the contemporary architect can not just design ambiances and let other professions independently define how to populate, support, assemble, light, heat, or ventilate them. Contemporary architecture can only exist at the very meeting point between countless different disciplines. It is forever at the center of an ever-growing Venn diagram. And the architect is the professional who has to be able to balance all the stakeholders. His knowledge must always go beyond his field. How else would he hold his own at the negotiating table? How else will he safely transfer the qualities of his design from paper into reality for people to enjoy?

It is wrong to say that one element of a building is more important than the other. A beautiful yet poorly engineered building will be abandoned, as was the Villa Savoye, while a shallow yet functional building will oppress its users, just as any monotone housing block. The sculptor is just as bad of an architect as a structural engineer. The one true role of the architect is that of an organizer and a moderator. The architect takes the client's wishes, the realities of a spatial and social context, and the scientific advances of his time and unifies them into something beautiful - a building. This beauty can manifest itself in different ways. Sometimes the spaces themselves express a beauty, while at other times a building's functional organisation can be just as beautiful in itself.

In my worldview, architecture never exists in a vacuum. Its adaptation to different challenges is exactly the factor that defines its quality. These challenges can be aesthetic, societal, physical, and also legal. Consequently, an important goal of this degree project was to showcase the architectural process in its entire complexity. This included deep research into the spatial context as well as the legal framework surrounding it. While designing the final architectural proposal, the reality of the laws surrounding a building was just as important as the dimensions of the building site or the load-bearing capacity of timber. Such self-imposed restrictions are not an arbitrary choice. As has been written earlier, balancing various requirements is at the very heart of architecture. Architecture must create pleasant and beautiful places to be enjoyed by people. A plan drawn on paper is a tool, never the ultimate goal. Success in architecture always has to be measured by its positive impact on people, and not by arbitrary aesthetic or formal values. Consequently, a beautiful design that can not be built is hardly worth a lot of effort. While realities such as laws matter less in an academic setting, they are very real outside of it. This is why I aim to design architecture that adheres to restrictions. Designing in this manner will always be more difficult. The outcome will always be less impressive than a utopian architecture breaking free from conventions. However, the knowledge and experience gained will be more useful once I am in a professional environment, where I expect myself to eventually work with these very same restrictions that I now adopt voluntarily. While my work might suffer now, It is for the benefit of my future ability to create spaces that benefit the communities inhabiting them.

In the course of this thesis, a lot of effort has been put into subjects that don't necessarily fit into the architects' field of work. However, these investigations were always done to enrich the final architectural output, and never to conform it to a lesser standard. By increasing the amount of parameters affecting the architectural design process, the resulting architecture doesn't lose its autonomy. In other words, while the complexity of legal documents, context studies, and references heavily impacted the design process, it by no means defined the final output. Even within the chosen parameters, infinite possible building variations exist, and the final proposal of this degree project is first and foremost a result of architectural design. If it doesn't impress, conform, or amaze, the fault lies exclusively with my own design decisions and aesthetical capabilities. Had I released myself from any of the self-imposed restrictions, I believe there would be no increase in architectural value. In parallel, any the of positive qualities found in the resulting architecture are far more than just the sum of the chosen design parameters, as they result from a creative approach to the identified problems.

In conclusion, I believe architecture is an art of organization. What separates design from art is our obligation to adapt to various realities limiting our creative vision. By properly organizing these restrictions, we can discover new ways to benefit society. The art of organization can be beautiful in itself if it forms a base for pleasant and stimulating spaces. Finally, by being aware of restrictions, such as legal ones, we can assume a bold position in the broader professional discourse, which enables us to realize meaningful spaces with greater effect. My previous education emphasized architecture as an holistic discipline, and this is the context in which the degree project has been framed.

references

For organisation, the reference list is divided between the different sections of the thesis. If a refernce repeats between multiple sections, it will be found in the section of its first appearance.

introduction references

Akrap, A.(2004)
'Zapošljavanje u inozemstvu i prirodna depopulacija seoskih naselja',
Društvena istraživanja, issue 12, July 2004

Čipin, I., Klusener, S., Recano, J., Ulceluse, M. (2020)
'A Long-Term Vision for the Development of Rural Areas in Europe',
Population and Policy Brief, issue 27, September 2020

Hrvatski sabor (2017)
'Strategija regionalnog razvoja Republike Hrvatske za razdoblje do kraja 2020. godine',
Narodne novine, issue 65/17, October 2017

Schnaidt, C. (1965)
'Hannes Meyer - Buildings, projects and writings',
Verlag Arthur Niggli, Switzerland, 1965

Živić, D. (2003)
'Neka obilježja diferenciranog demografskog razvoja urbanih
i ruralnih naselja, područja Istočne Hrvatske',
Migracijske i etničke teme, issue 3/4, June 2003

Županijska skupština Krapinsko-zagorske županije (2011)
'Strategija ruralnog razvoja Krapinsko-zagorske županije 2011.-2013.',
Službeni glasnik Krapinsko-zagorske županije, issue 06/11, March 2011

Županijska skupština Krapinsko-zagorske županije (2002)
'Prostorni plan Krapinsko-zagorske županije'
Službeni glasnik Krapinsko-zagorske županije, issue 02/02, July 2002

context exploration references

Općina Gornja Stubica (2014)
'Prostorni plan uređenja Općine Gornja Stubica, II. Izmjene i dopune'
Službeni glasnik Krapinsko-Zagorske Županije, issue 14/04, September 2014

Općina Donja Stubica (2021)
'Prostorni plan uređenja Općine Donja Stubica, V. Izmjene i dopune'
Službeni glasnik Krapinsko-Zagorske Županije', issue 08/21, February 2021

Općina Marija Bistrica (2019)
Prostorni plan uređenja Općine Marija Bistrica, IV. Izmjene i dopune
Službeni glasnik Krapinsko-Zagorske Županije', issue 12/19, August 20,9

Google Maps
(1) www.google.com/maps/@45.9911259,15.9677344,3a,60y,23.14h,85.04t/
data=!3m6!1e1!3m4!1s_9xcNU4VwzAfN__QtXv5mQ!2e0!7i16384!8i8192
(2) www.google.com/maps/@46.0265375,16.0445759,3a,75y,260.96h,90.73t/
data=!3m6!1e1!3m4!1s0i3wMyuCuZFEKhoIW6feRg!2e0!7i16384!8i8192
(3) www.google.com/maps/@45.9987845,16.0106786,3a,60y,90t/
data=!3m6!1e1!3m4!1sA1l5fCW9ya1VldthrKhQqA!2e0!7i13312!8i6656
(4) www.google.com/maps/@46.005512,16.0890819,3a,75y,29.62h,91.94t/
data=!3m6!1e1!3m4!1sxnMf0VazcW4M_-Y6nfH1EQ!2e0!7i16384!8i8192
all accessed in March 2023

legal framework references

SWA - Social Welfare Act
(Zakon o socijalnoj skrbi, "Narodne novine", issues 18/22 and 46/22)
Hrvatski sabor (Croatian Parliament), 28.1.2022

MSSS - Regulation on Minimal Standards for Social Services Providers
(Pravilnik o minimalnim uvjetima za pružanje socijalnih usluga, "Narodne novine", issues 40/14, 66/15, 56/20, 28/21 and 144/21)
Ministarstvo rada i socijalne skrbi (Ministry of Labor and Social Welfare), 27.12.2021

SCNH - Regulation on Standards for Categorisation of Nursing Homes
(Pravilnik o mjerilima za razvrstavanje domova za starije i nemoćne osobe, "Narodne novine", issue 121/00)
Ministarstvo rada i socijalne skrbi (Ministry of Labor and Social Welfare), 6.12.2000

COA - Construction Act
(Zakon o gradnji, "Narodne novine", issues 153/13, 20/17, 39/19 and 125/19)
Hrvatski sabor (Croatian Parliament), 20.12.2019

EBA - Regulation on ensuring building accessibility for people with disabilities and reduced mobility
(Pravilnik o osiguranju pristupačnosti građevina osobama s invaliditetom i smanjene pokretljivosti, "Narodne novine", issue 78/13)
Ministarstvo prostornoga uređenja, graditeljstva i državne imovine (Ministry of Physical Planning, Construction and State Assets), 26.6.2013

FPA - Fire Protection Act
(Zakon o zaštiti od požara, "Narodne novine", issues 92/10 and 114/22)
Hrvatski sabor (Croatian Parliament), 3.10.2022

CBCFP - Regulation on Categorisation of Buildings by Complexity of Fire Protection Measures
(Pravilnik o razvrstavanju građevina u skupine po zahtjevnosti mjera zaštite od požara, "Narodne novine", issue 56/12)
Ministarstvo unutarnjih poslova (Ministry of Interior), 17.5.2012

CFA - Regulation on Requirements for Fire Approaches
(Pravilnik o uvjetima za vatrogasne pristupe, "Narodne Novine", issues 35/94, 55/94-correction and 142/03)
Ministarstvo unutarnjih poslova (Ministry of Interior), 10.9.2003

FROFSC - Regulation on Fire Resistance and Other Fire Safety Conditions for Buildings
(Pravilnik o otpornosti na požar i drugim zahtjevima koje građevine moraju zadovoljiti u slučaju požara, "Narodne novine", issues 29/13 and 87/15)
Ministarstvo unutarnjih poslova (Ministry of Interior), 7.8.2015

FPHB - Regulation on Fire Protection of Hospitality Buildings
(Pravilnik o zaštiti od požara ugostiteljskih objekata, "Narodne novine", issue 100/99)
Ministarstvo unutarnjih poslova (Ministry of Interior), 4.10.1999

WSA - Work Safety Act
(Zakon o zaštiti na radu, "Narodne novine", issues 71/14, 118/14-correction, 94/18 and 96/18-correction)
Hrvatski sabor (Croatian Parliament), 24.10.2018

RWSW - Regulation on Work Safety for Workplaces
(Pravilnik o zaštiti na radu za mjesta rada, "Narodne novine", issue 105/20)
Ministarstvo rada, mirovinskoga sustava, obitelji i socijalne politike (Ministry of Labor, Pension System, Family and Social Policy), 25.9.2020.

Croatian Government (Vlada Republike Hrvatske), 2013, 'Prijedlog strategije razvoja turizma Republike Hrvatske do 2020. godine' (Proposal of Croatian tourism development strategy by 2020), Zagreb: self-published

HSA - Hospitality Services Act
(Zakon o ugostiteljskoj djelatnosti, "Narodne novine", issues 85/15, 121/16, 99/18, 25/19, 98/19, 32/20, 42/20 and 126/21)
Hrvatski sabor (Croatian Parliament), 24.11.2021

RCMR - Regulation on the Classification and Minimum Conditions of Hospitality Establishments From the Group "Restaurants", "Bars", "Catering Establishments" and "Simple Service Establishments"
(Pravilnik o razvrstavanju i minimalnim uvjetima ugostiteljskih objekata iz skupine „Restorani“, „Barovi“, „Catering objekti“ i „Objekti jednostavnih usluga“, "Narodne novine", issues 82/07, 82/09, 75/12, 69/13 and 150/14)
Ministarstvo turizma (Ministry of Tourism), 27.12.2021

HCA - Health Care Act
(Zakon o zdravstvenoj zaštiti, "Narodne novine", issues 100/18, 119/22 and 33/23)
Hrvatski sabor (Croatian Parliament), 24.3.2023

RNSH - Regulation on Norms and Standards for the Practice of Healthcare Activities
(Pravilnik o normativima i standardima za obavljanje zdravstvene djelatnosti, "Narodne novine", issue 52/20)
Ministarstvo zdravstva (Ministry of Health), 29.4.2020

RMSH - Regulation on Minimums of Space, Workers and Medical-Technical Equipment for the Practise of Healthcare Activities
(Pravilnik o minimalnim uvjetima u pogledu prostora, radnika i medicinsko-tehničke opreme za obavljanje zdravstvene djelatnosti, "Narodne novine", issues 90/04, 38/08, 61/11, 128/12, 124/15, 8/16 and 77/18)
Ministarstvo zdravstva (Ministry of Health), 29.8.2018

Zagreb Institute of Physical Planning (Zavod za prostorno uređenje Grada Zagreba), 2022, 'Program za provedbu javnog natječaja za idejno rješenje novog objekta Doma za starije osobe Dubrava', Zagreb: self-published

TETP - Technical Regulation on Rational Use of Energy and Thermal Protection in Buildings
(Tehnički propis o racionalnoj uporabi energije i toplinskoj zaštiti u zgradama, "Narodne novine", issues 128/15, 70/18 and 102/20)
Ministarstvo graditeljstva i prostornog uređenja (Ministry of Construction and Physical Planning), 16.9.2020

Veršić, Z., 2020, 'Racionalna uporaba energije i toplinska zaštita kod zgrada' (edition 20/21), Zagreb: self-published

Cabinet for Building Installations (Kabinet za instalacije zgrada), 2021, 'Smjernice za postizanje nZEB standarda zgrada obrazovne namjene', Zagreb: self-published

NPA - Noise Protection Act
(Zakon o zaštiti od buke, "Narodne novine", issues 30/09, 55/13, 153/13, 41/16, 114/18 and 14/21)
Hrvatski sabor (Croatian Parliament), 12.2.2021

RPNL - Regulation on the Permissible Noise Levels with Regard to
the Noise Source, Time and Place of Occurrence
(Pravilnik o najvišim dopuštenim razinama buke s obzirom na vrstu izvora
buke, vrijeme i mjesto nastanka, "Narodne novine", issue 143/21)
Ministarstvo zdravstva (Ministry of Health), 24.12.2021

RPEN - Regulation on the Protection of Workers From Exposure to Noise at the Workplace
(Pravilnik o zaštiti radnika od izloženosti buci na radu, "Narodne novine", issue 46/08)
Ministarstvo rada, mirovinskoga sustava, obitelji i socijalne politike (Ministry
of Labor, Pension System, Family and Social Policy), 23.4.2008.

Veršić, Z., 2020, 'Zvuk u arhitekturi' (edition 20/21), Zagreb: self-published

PPA - Physical Planning Act
(Zakon o prostornom uređenju, "Narodne novine", issues 153/13, 65/17, 114/18, 39/19 and 98/19)
Hrvatski Sabor (Croatian Parliament), 18.12.2013

PDP - Marija Bistrica Municipality Physical Development Plan
(Prostorni plan uređenja Općine Marija Bistrica, IV. Izmjena i dopuna,
''Službeni glasnik Općine Marija Bistrica'', issue 9/17)
Općina Marija Bistrica (Marija Bistrica County), 20.12.2017

reference projects references

ArchDaily (2013)
'Houses for Eldery People in Alcácer do Sal / Aires Mateus'
www.archdaily.com/328516/alcacer-do-sal-residences-aires-mateus,
February 2013, accessed May 2023

Fengler, M. (1964)
'Heime: Studenten-, Berufstätigen-, und Altenheime'
A. Koch, 1963, pages 204 - 207

Deutsche Bauzeitschrift (1979)
'Altenheim Wildberg'
Deutsche Bauzeitschrift, issue 9/79, September 1979

Deutsche Bauzeitschrift (1979b)
'Alters- und Pflegeheim in Weiningen/CH'
Deutsche Bauzeitschrift, issue 9/79, September 1979

Dominique Coulon (2014)
'Pont-sur-Yonne'
coulon-architecte.fr/projet/499/pont-sur-yonne, 2014, accessed in May 2023

Fundació Mies van der Rohe (2013)
'Nursing Home'
www.miesarch.com/work/2942, 2013, accessed in May 2023

Fundació Mies van der Rohe (2017)
'Residential Care Home Erika Horn, Andritz'
www.miesarch.com/work/3279, 2017, accessed in May 2023

Fundació Mies van der Rohe (2019)
'Residential care center Kapelleveld'
www.miesarch.com/work/3958, 2019, accessed in May 2023

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Zagreb, Croatia
Zlatar Bistrica, Croatia

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LUND UNIVERSITY

LTH
FACULTY OF ENGINEERING

Retirement home in Krapina-Zagorje, Croatia
degree project in architecture

author
Leon Ladišić

supervisor
Elin Daun

examiner
Jesper Magnusson

course
AAHM10 - Degree project in Architecture

Master's Programme in Architecture
Advanced Architectural Design Specialisation

School of Architecture
Faculty of Engineering, LTH
Lund University

Lund, Sweden
spring semester 2022 / 2023

excerpt from summary
Krapina-Zagorje is a region severely impacted by the shrinking and aging of its population. This thesis approaches depopulation from an architectural viewpoint. The retirement home typology is leveraged to address senior care needs while improving the long-term sustainability of rural communities.

The retirement home as a typology was found to have great potential to act towards revitalisation of rural areas, which was demonstrated in the design proposal. However, for this potential to materialize in other projects, a committed and meaningful architectural interaction with the building's wider context is always necessary.