



Research Article

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Village Living: Exploring Local Design Futures of Intergenerational Housing in a Belgian Village

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Abstract: Since the Second World War, Belgian housing culture has promoted private ownership of single-family houses. However, this housing typology has become increasingly problematic when confronted with contemporary societal challenges such as providing housing for an aging and increasingly diverse population, specifically in rural areas that are often characterized by widespread urban sprawl and disappearing basic services. Recent architectural policy has therefore shifted attention from densification in urban centers to densification taking into account the intrinsic qualities of village architecture. Through research-by-design with third bachelor architecture students, this study explores how multigenerational housing models can be imagined, taking into consideration intergenerational living, not-building and village architecture. This study presents 18 multigenerational housing typologies for a specific Belgian village. Four of these typologies are discussed in detail through axonometric projections and perspective sections. The knowledge produced by the design studio is considered as situated design futures which imagine how architecture can promote older inhabitants' wellbeing through historical embeddedness, transitions between residential and public space, and combining diverse housing types within intergenerational housing projects.

Keywords: Intergenerational housing; Village architecture; Design futures; Research by design<https://doi.org/10.59528/ms.jaud2025.1122a7>

Introduction Belgian Housing Culture

Belgian housing culture has been characterised by a preference for privately owned single-family houses [1, 2, 3]. Especially in the northern Dutch-speaking region of Flanders this housing typology is coupled with widespread urban sprawl. These conditions contribute to a contemporary housing landscape (see **Figure 1**) which has been argued to pose significant risks to older inhabitants' wellbeing [4]. The contemporary Belgian housing landscape stems from a combination of historical, political and cultural developments whose effects still linger in Belgian housing culture today.

Firstly, the Belgian government's response to the housing crisis following the Second World War was characterised by promoting private ownership and limited investment in

social housing [5]. The need for new housing was tackled mainly by stimulating the construction of private homes through tax incentives [3]. The De Taeye Act of 1948 played a major role in shaping Belgian housing culture by offering subsidies to private builders and installing a mortgage system, allowing homeowners to borrow up to 90 percent of the value of their property. In the first five years after its implementation, this act contributed to the construction of 20.000 new houses per year, equating to about 75 percent of all new homes [3]. These homes mostly resembled large, detached houses of multiple floors inspired by rural architectural styles, accompanied by a driveway, a garage and a large garden, and were constructed predominantly in semi-rural areas [5, 6].

Secondly, the growth spurt of these private homes took place within the absence of an overarching regional spatial planning strategy, as such policies were only adopted in Belgium towards the late 1970s [5]. As a result, local authorities lacked a clear vision concerning cohesive architectural styles and land development, resulting in a dispersed scattering of private dwellings and increasing sub-urbanisation of the Belgian territory [5].

Thirdly, the dominance of privately owned housing was further reinforced by a lack of other viable rental alternatives. Belgium has long been characterised by a lack of a reliable legislative framework concerning private rent [7]. In addition, social housing made up only 5.6 percent of the total housing stock in 2023 [1], which is significantly lower compared to neighbouring countries such as France (16%) or The Netherlands (38%) [8]. These conditions contributed to a culture in which home ownership is seen as the only sustainable housing solution and renting is often considered only as a secondary choice and less favourable option [5].

Figure 1. Belgian Housing Landscape. Aerial Photo of Glabbeek Taken in 2010. Source: Lieven Smits, CC BY-SA License (https://commons.wikimedia.org/wiki/File:Glabbeek_aerial_view.jpg) (provided by the authors).





Figure 2. Inhabitant in Front of a Single-Family House in Flanders (taken by researchers of the HOUSE research project in 2022).

Contemporary Challenges

The historical developments described above have contributed to a situation in which the Belgian housing stock predominantly exists out of single family detached housing in suburban areas [1] (see **Figure 2**). This housing typology has raised concerns in relation to contemporary societal challenges [2, 4, 9]. In the following paragraphs, we highlight two specific aspects of these challenges; housing for an ageing population's wellbeing and detrimental effects on rural areas and villages.

Housing for Older Inhabitants' Wellbeing

The Belgian population is growing and ageing. The total Belgian population is expected to grow from 11.7 million inhabitants in 2024 to 12.9 million in 2070 [10]. While growth of the younger population (0-66 years) is predicted to remain relatively stable, the older population (67+) is expected to grow more strongly than ever before. The Belgian Statistical Office defines the "dependency rate" as the number of inhabitants of retirement age (67+) per 100 inhabitants of working age (18-66). This rate is expected to grow from 37 percent in 2024 to 47 percent in 2070 [10]. The increasing ageing of the Belgian population poses several challenges in relation to housing, and specifically in relation to the dominant housing typology of single family houses [4].

Firstly, as in many other countries, the Belgian government promotes the ideal of “ageing in place,” a preference for growing old within a familiar environment [4] and many older adults also express the wish to do so. Having often lived in the same dwelling for a long time, this place becomes a collection of memories, providing feelings of stability, intimacy and certainty [11]. However, the same dwelling might also become a financial and physical burden in older age [12]. Specifically in the case of Belgium, the dominance of houses designed to be occupied by families causes older adults to find themselves in an excessively large house after children have moved out. A large house, combined with declining physical abilities can make everyday tasks increasingly difficult [13]. The ideal of “ageing in place” might thus create tensions when coupled with the unsuitability of the house that older adults find themselves in.

Secondly, with limited alternative housing options in Belgium, older adults often find themselves in the difficult position of having to choose between continuing to live in an excessively large private home or moving to an institutionalised residential care facility. Older adults generally prefer not to move to such a facility [14]. This form of housing disconnects inhabitants, both spatially and socially, from communities, which can contribute to social segregation and stigmatisation of older persons [15]. Furthermore, following efforts for privatising public services by the Belgian government, these care facilities have become increasingly operated according to for-profit business models [16, 17]. This has contributed to a contemporary situation in which the monthly cost of living in residential care facilities exceeds average Belgian pensions [18, 19, 20], rendering access to this housing option, and affordable care in general, difficult for groups with more limited socio-economic possibilities [21]. Therefore, recently there has been increasing interest in the development of alternative housing options for older adults, often in the form of community-based housing [22, 23]. These collective housing models could offer an alternative option to the traditional binary choice between aging at home or moving to an institutional care facility [24].

Disappearance of Services and Invasive Densification in Villages

Besides negative consequences for ageing inhabitants’ wellbeing, the dominance of single family detached housing in Belgium also has negative consequences for the spatial quality and character of rural areas and village centers. “Urban sprawl” is a term used to indicate a wasteful method of urbanisation caused by the spread of suburban development and increasing car-dependency [25]. Belgium is one of the regions in Europe in which this phenomenon is most strongly present [26]. Specifically in Flanders, urban sprawl takes the form of ribbon development, that is, long straight connection roads flanked by residential buildings which break up natural and agricultural landscapes and put pressure on mobility [27, 28]. As open space becomes fragmented, the borders between urban and rural areas are increasingly blurred and rural places lose their identity as urbanisation slowly spreads over the entire region.

Recently, Belgian architects have raised attention to the invasive intrusion of unfit forms of housing densification in village centers [29]. Suburbanisation has turned villages in Flanders from autonomous settlements to residential villages [30] as essential functions

such as local cafés, shops, bakeries and schools have disappeared over time. Spatial policy, in combination with land speculation and loose regulation, has pushed the densification of village centers over the last two decades. This has led to an increase of apartment buildings in villages [31], which could be argued to offer a much needed alternative housing typology. However, the resulting architectural quality is often out of tune with the architectural and social character of the village. Today, Flemish villages are invaded by residential buildings of excessive height, deep floor plans causing insufficient daylight and anonymous plinths of blind walls with permanently closed shutters [30]. These forms of densification disconnect housing from public space and fail to respond to the qualities a village offers; ground-bound houses, open spaces and informal encounters [32].

1. Methodology

1.1. Research Aim

As described above, the Belgian housing stock is dominated by privately owned single-family detached houses. This typology is a stubborn part of Belgian housing culture, as it has become entrenched in a complex entanglement of individual preferences, real estate values and housing legislation [2]. However, these developments have been shown to pose challenges for an ageing population's wellbeing, especially in rural areas and villages where essential services have disappeared over time. The aim of our study is therefore to explore which housing models, other than the single-family house and the apartment, can be imagined in a typical Belgian village while taking into consideration the wellbeing of older inhabitants and village architecture.

1.2. Research-by-Design

Architectural knowledge is produced through research-by-design by exploring spatial solutions for a specific site. It's driven by an iterative, critical and contextualised design process [33], generating a form of knowledge which is specific, situated and tacit [34]. The architectural design studio is the backbone of architectural education but today the studio also serves as a place to generate research [35]. In research-by-design, knowledge is generated through the design process and inscribed in the designed outcomes [34, 36]. It can be said that these are forms of tacit knowledge, which can be challenging to verbalise and describe [37].

This study uses research-by-design in collaboration with the third bachelor architecture design studio course of Hasselt University during the first semester of the academic year 2024–2025. In total, 49 students and four teachers participated. The first and second author were part of the teachers and were thus involved in deciding upon the real-world location and assignment that the design studio would engage with. As research-by-design deals with wicked problems for which no tailor-made solutions exist, the process is unpredictable but nevertheless generates new insights relevant to the studio's issues [36]. In this process, the borders between teaching and learning blur and the distinction between teacher and student become irrelevant, as they are both involved in a common process of knowledge generation [36]. In the context of our course we have framed the design studio as a fictional

architectural office with the teachers as senior designers and the students as junior designers, who collaborate to explore solutions to the assignment. Thus, the first and second author simultaneously take up the roles of teachers, designers, researchers and authors.

1.3. Studio Themes

Several themes were introduced to orient the design studio towards the issues of housing for older inhabitant's wellbeing in Flemish villages: (1) intergenerational collective housing, (2) not-building and (3) village architecture.

Firstly, we introduced the theme of intergenerational collective housing. The studio assignment was to design collective housing for intergenerational and lifelong living in Uikhoven. As changing family structures have led to a change in living patterns, students had to aim for including a diversity of age groups of inhabitants, such as young families, older persons or single households. Through intergenerational collective housing, we sought to stimulate informal care as a self-evident characteristic of living in community and to counter social segregation of older members of society [38, 39].

Secondly, we introduced the theme of not-building. More than half of all single-family houses in Flanders are underused [40, 41], meaning that they are inhabited by less people than their size and number of rooms could allow for. Despite this underuse, new buildings continue to be added, contributing to even more inefficient development and waste of financial, spatial and ecological resources [42]. Not-building is a strategy of spatial development defined by the Belgian architecture office RE-ST. The strategy primarily finds solutions to spatial needs within already existing building stock before considering the need for new buildings [43].

The third theme encompassed village architecture. Because of the specific slow and incremental growth of villages in Belgium, individual architectural projects can become carriers of innovation and spatial transformation [44]. Inviting students to work on this theme of village architecture corresponds to the plea of the Flemish Master Architect to investigate how the qualities of village architecture can be integrated in forms of collective housing [32]. This implies imagining new ways of collective housing which integrate village morphology and architectural language characterised by limited height and sloped roofs, spatial patterns of informal social relationships and a gradual transition between public space and private residential spaces [39].

Following these themes, the studio's assignment was to design intergenerational collective housing projects on one of four pre-defined locations in a specific Belgian village (Uikhoven). These locations were chosen by the studio teachers based on their relation to the landscape and the village, and the presence of emblematic buildings with a historical value on these sites. They are discussed in further detail in the results section. As a design strategy, the reuse and adaptation of existing buildings was encouraged before purposefully considering the need for new buildings. Other details, such as the number of housing units, building programme or required square meters, were deliberately not specified. Students were encouraged to formulate an appropriate answer to these details as part of the design process.

1.4. Phases of the Design Studio

1.4.1. Phase 1: Understanding the Village

The first phase of the design studio consisted of analysing and understanding the village. Students were divided in groups of 3 to 5 persons to analyse and document the local context. Each group focused on a specific topic such as interviewing locals, mapping typologies of buildings and public spaces and researching the village's history. For each of the four project locations a group was dedicated to measuring and building a digital 3D model to be shared with the entire studio. The progress of these analyses were iteratively presented to teachers and discussed on a weekly basis. Students were encouraged to make multiple visits to return to the village.

1.4.2. Phase 2: Exploring Transformation Strategies

The second phase consisted of exploring transformation strategies for the four designated project locations. In this phase students were free to work as groups or individually. The exploration of this phase primarily focused on exploring potential future designs in terms of building volumetry. Specific attention went to the future designs' relation to surrounding buildings and public spaces, the potential for organising a combination of housing typologies (cohousing, apartments, studios, ...) and inclusion of public functions in the project.

Figure 3. Photo of the Presentation of Results from Phase 1 and 2. This Photo Shows Context Analysis Presented in the Form of Maps, Sketches and Photos (taken by Sander Lambrix).





Figure 4. Photo of the Presentation of Results from Phase 1 and 2. This Photo Shows Scale Models of Transformation Strategies (taken by Sander Lambrix).

The first and second phases overlapped across six weeks, after which the results of both phases were shown in a single-day exhibition to the teachers, other students and guests including researchers and local experts (see **Figures 3 and 4**). The goal of this exhibition was to share the results of the first two phases with all participants of the design studio while also receiving feedback on the analysis and transformation strategies in preparation of the next phase.

1.4.3. Phase 3: Architectural Design

In the third phase, each student chose one of the four project locations and designed their own individual architectural project. This phase included designing the dimensions of specific spaces, structural systems, façade openings, materiality and amenity of outdoor spaces. In this phase, students were divided in four groups with a designated teacher which would consult each student concerning their project on a weekly basis. This phase consisted of nine weeks, followed by two weeks of winter break and then a two-day jury moment in which students presented the results of their project individually to a jury consisting of the studio teachers, researchers and local policy makers.

Additionally, complementary activities were organised throughout the semester. Lectures were given by researchers concerning housing design and the influence of housing on older inhabitants' wellbeing. Furthermore, local experts were invited to provide lectures

concerning local housing policy and the historical context of the village. Finally, a group of researchers was invited to provide the students with a set of personas representing a diversity of older inhabitants as an inspirational tool for designing for older adults' subjective wellbeing.

In terms of expected output material, students were requested to draw at least one perspective section of their project. This representation technique was inspired by the drawings made by Atelier Bow wow in the book "Graphic Anatomy" [45], which cut through a building and add perspectival projection to reveal at once the spatial context, architectural elements and interiors of living spaces. By doing so, these drawings help to imagine how these spaces can be occupied by future inhabitants [46, 47]. Besides this perspective section, the expected outcomes were deliberately not specified so students were free to determine which architectural representation techniques they would use to communicate the specifics of their project in the most appropriate way.

1.5. Additional Analysis

In addition to the tacit knowledge generated through the design process, two analysis steps were conducted to help explicate and communicate the knowledge generated by this study. However, we do emphasize that while these steps help to verbalise and communicate the insights, the knowledge remains primarily tacit and generated through the engagement with the project site and studio themes as part of the design process.

Firstly, for each of the project locations, we have organised the designed projects into housing typologies (see **Figure 7**). For example, if multiple projects were designed around the principle of a courtyard, these were grouped under the category "courtyard housing." In total 18 typologies were identified. The process of identifying and naming these typologies was inspired by the publication "Toolbox dorps architectuur" by AR-TUR [44].

Secondly, for each typology one exemplary project was analysed by using re-drawing as an analysis method. During the design process, drawing is used by architects as a medium for design and representation of the design outcome. Re-drawing inverts this process, and replicates the knowledge inscribed in the project as a form of analysis [48]. In this study, projects have been redrawn by the first author in two specific ways. Firstly, as an axonometric projection of the project on the site (see **Figures 6, 8, 11, 14 and 17**). This drawing shows each project in its context and provides an homogeneous overview in which multiple projects can be compared to each other. Furthermore, diagrams are derived from these axonometric drawings to highlight the transformation process from the existing situation to the new housing projects (see **Figures 9, 12, 15 and 18**). Secondly, the perspective sections of these projects were retraced by the first author and annotations were added to these sections (see **Figures 10, 13, 16 and 19**). Retracing these drawings serves to present the perspectives in a uniform way, while adding annotations helps to describe the tacit knowledge inscribed in the design spaces.

In the results section of this paper, we will discuss one of these typological housing solutions for each of the four project locations in detail, ensuring that each project location is discussed and a variety of housing projects is shown.



Figure 5. Analysis of Uikhoven. Map Showing Currently Present Housing, Public and Tourism Commercial Buildings in the Village of Uikhoven (drawn by Sander Lambrix).

2. Results

Uikhoven is known as a “Maas village.” The term refers to a string of villages situated along the banks of the Maas river where the river forms the border between Belgium and The Netherlands. Uikhoven is situated especially close to the river and therefore has a long history of floods, eventually leading to the construction of a concrete dike separating the village and the river.

The centre of Uikhoven is made up of two main streets (see **Figure 5**). These have branched out of the village into the landscape in the form of ribbon development, lined with detached single-family homes with fences, driveways and long reaching back gardens. Occasionally, the space between some of these houses offers a glimpse of the agricultural

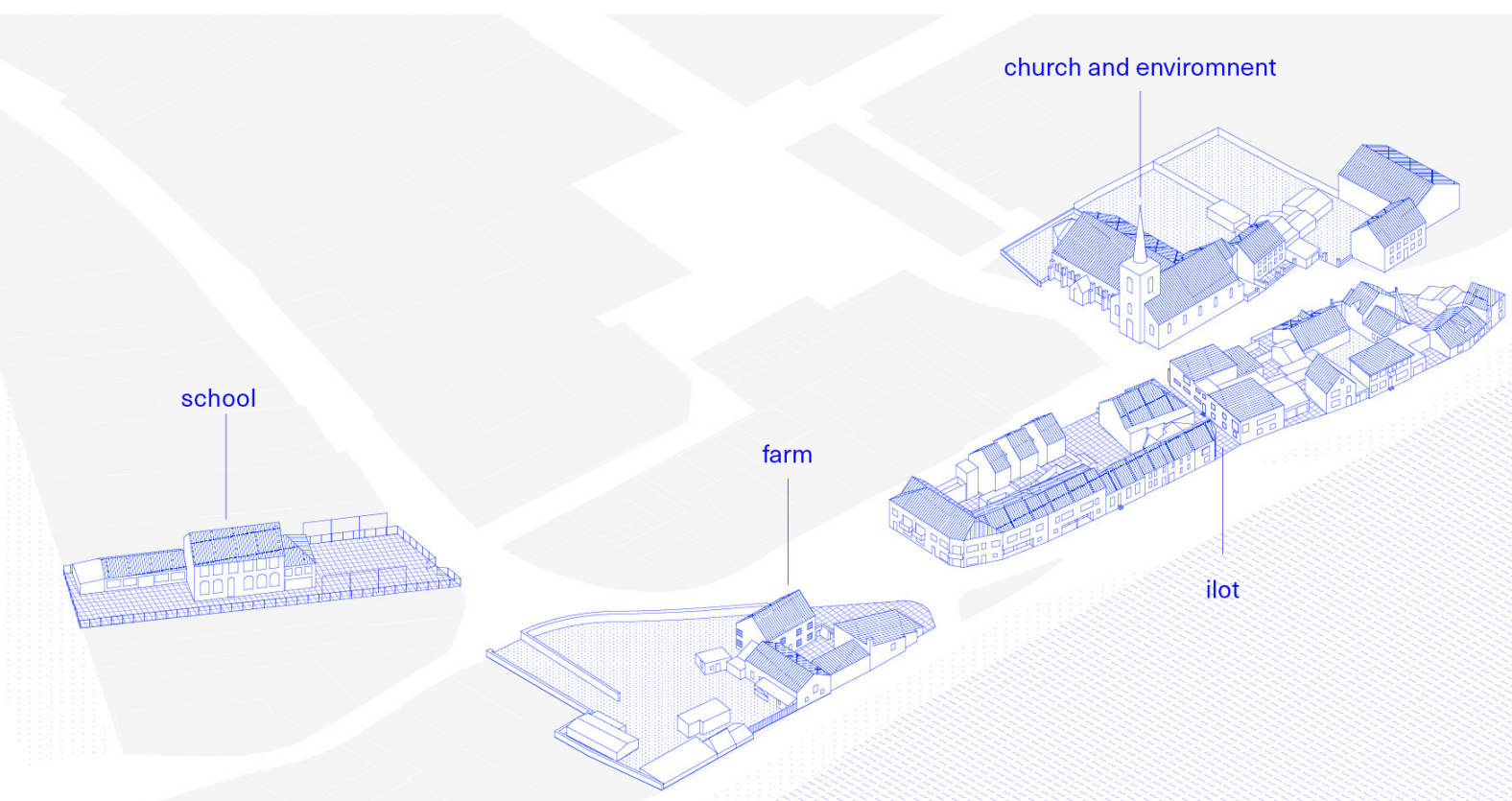
landscape, but much of it remains hidden. Apartment buildings can be found among these single family houses on rare occasions.

Uikhoven has a limited number of public buildings, primarily consisting of sport facilities and the church. Basic amenities in support of everyday life, such as a local bakery or grocery store, have disappeared in the course of time. Commercial functions today mostly exist out of small independent businesses run from private homes and hospitality establishments in support of the region's tourism. Notably, Uikhoven lacks public spaces which are clearly dedicated to community life. The space in front of the church is a passageway and other open spaces in the village have been converted to parking space. The local primary school closed in 2020, but a newly built kindergarten has opened in 2024 at another site.

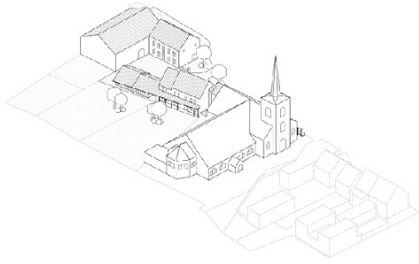
Uikhoven is a village which clearly shows signs of disappearance of basic amenities. The village has transformed into a residential village, lacking basic services in support of the local community. This is especially problematic for older inhabitants which are forced to be car-dependent in later life. In terms of housing, Uikhoven seems to be spared of radical forms of densification for now. However, more subtle signs of densification can be found in the form of open space being converted to parking spaces, public spaces being sacrificed for incremental private development and hardening of soils.

Four locations in Uikhoven were defined as project locations (see **Figure 6**). These locations include (1) the church and its surroundings; (2) the ilot, a block of houses in between the two main roads making up the village center; (3) the farm, an 18th century farm house at the entrance of the village; and (4) the school, an unused school building in-between several houses.

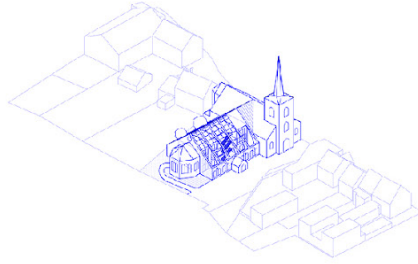
Figure 6. Project Sites. Axonometric Projection of the Village Center Showing the Four Designated Project Locations in the Village. The River Is Illustrated on the Right Hand Side of the Drawing (drawn by Sander Lambrix).



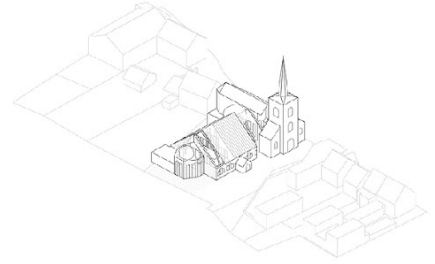
1.1 – connecting the church and rectory



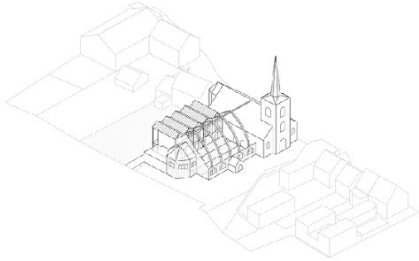
1.2 – housing in the church



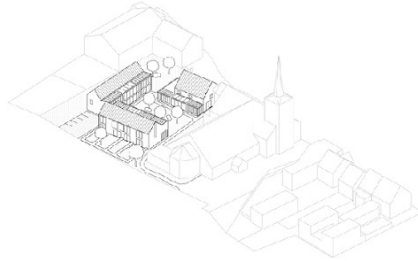
1.3 – housing through the church



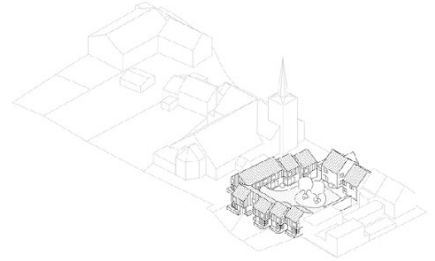
1.4 – housing against the church



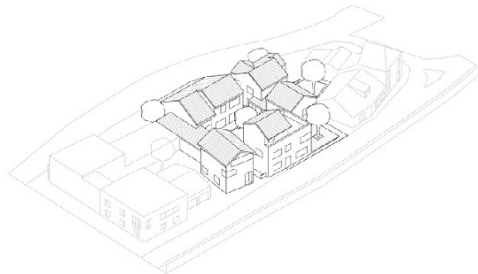
1.5 – church garden yard housing



1.6 – housing opposite the church



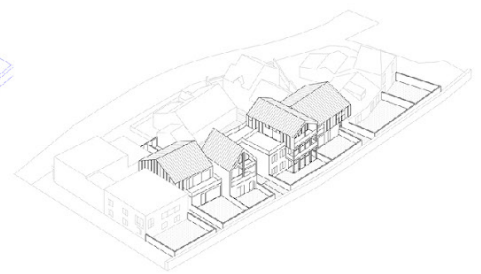
2.1 – small courtyard housing



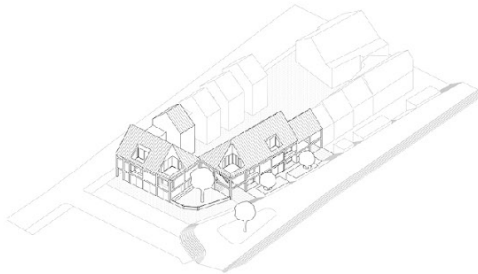
2.2 – traversing gardens



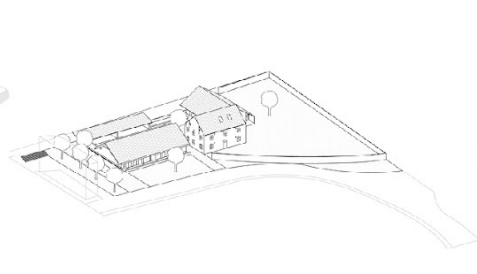
2.3 – housing at the riverside



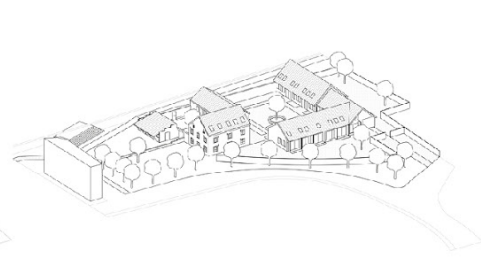
2.4 – housing at the square



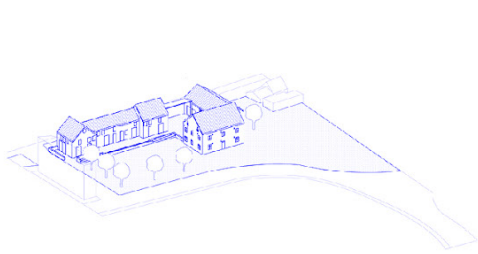
3.1 – courtyard farm



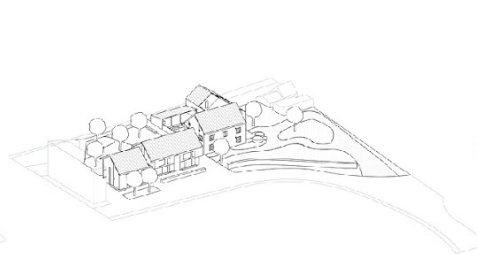
3.2 – double courtyard farm



3.3 – riverside farm



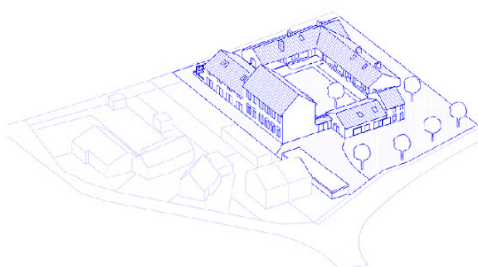
3.4 – the square as yard



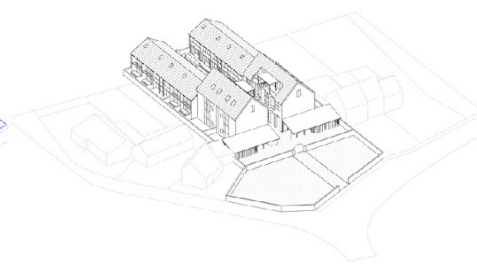
3.4 – transversal farm



4.1 – courtyard housing



4.2 – symmetric *beluik* housing



4.3 – longitudinal housing

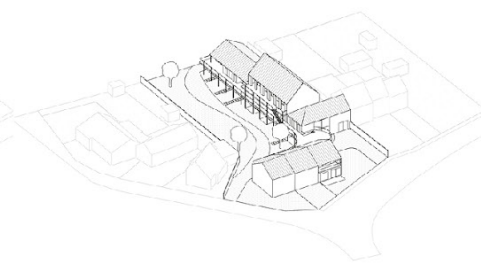


Figure 7. Overview of Typological Housing Solutions. Projects Highlighted in Blue Are Discussed in Detail Below (Axonometric Projections Drawn by Alexander Dvalishvili and Febe Makowski).

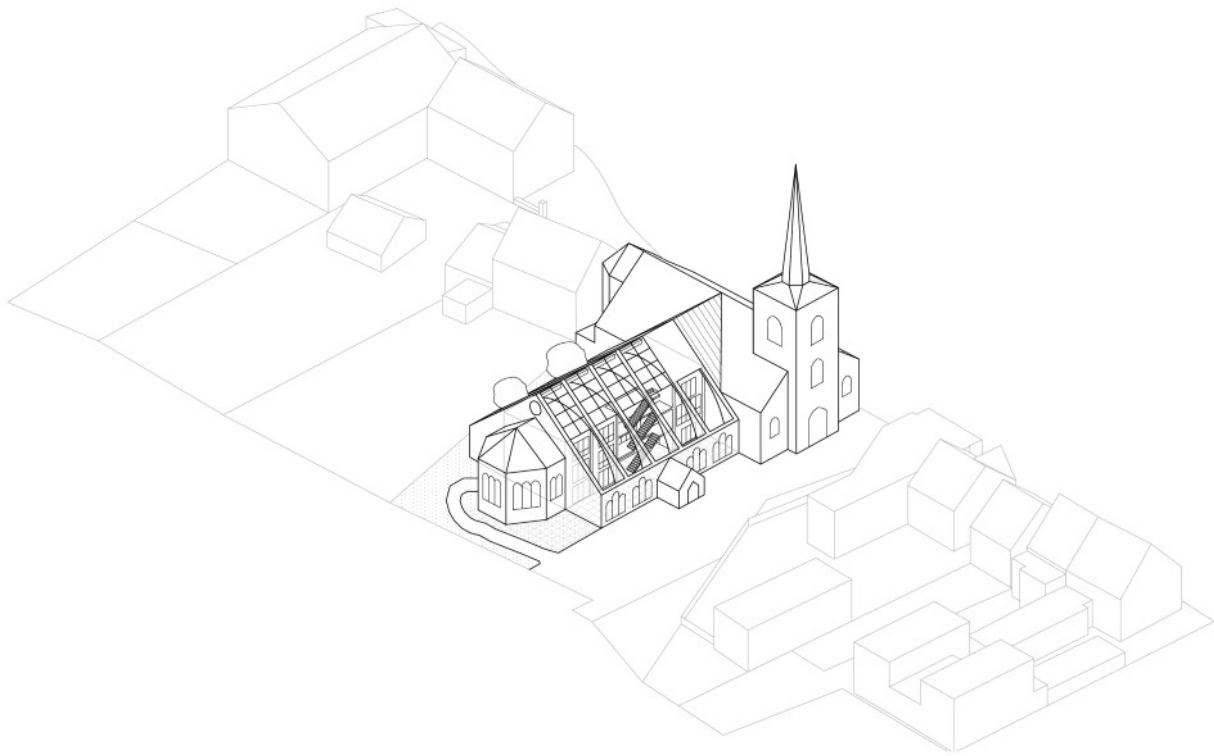


Figure 8. Housing in the Church. Axonometric Projection of the Housing Typology for the Church Project Site (Project designed by Mirte Jansen; Axonometric projection drawn by Alexander Dvalishvili).

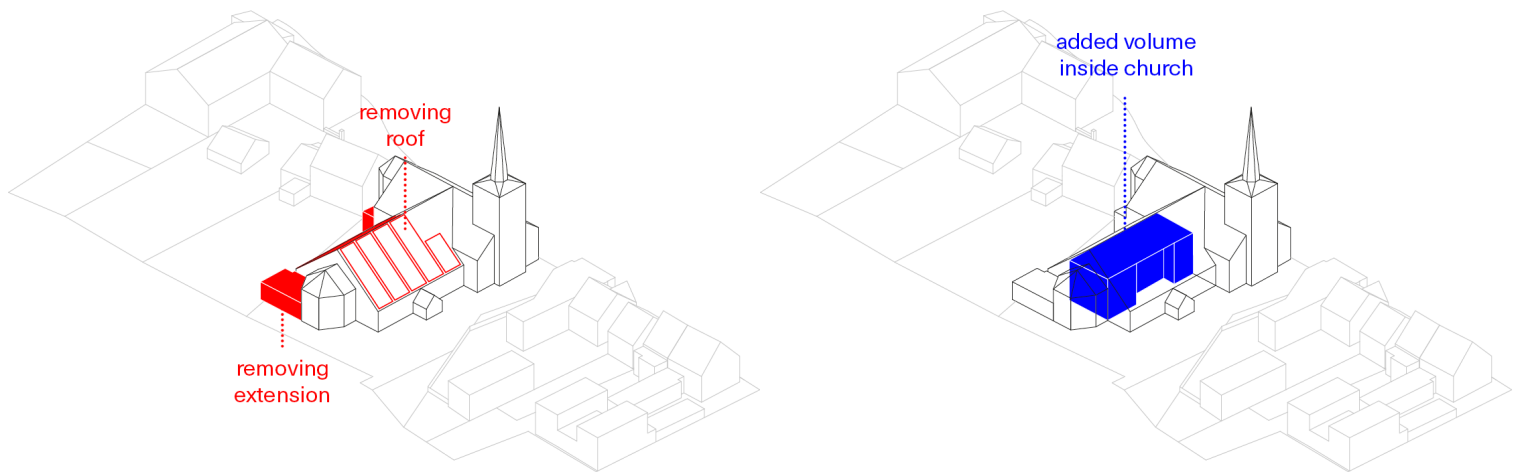


Figure 9. Church Diagrams Showing Removed Parts of the Building in Red and Added Parts in Blue (Project designed by Mirte Jansen; Diagrams drawn by Alexander Dvalishvili; Annotations added by Sander Lambrix).

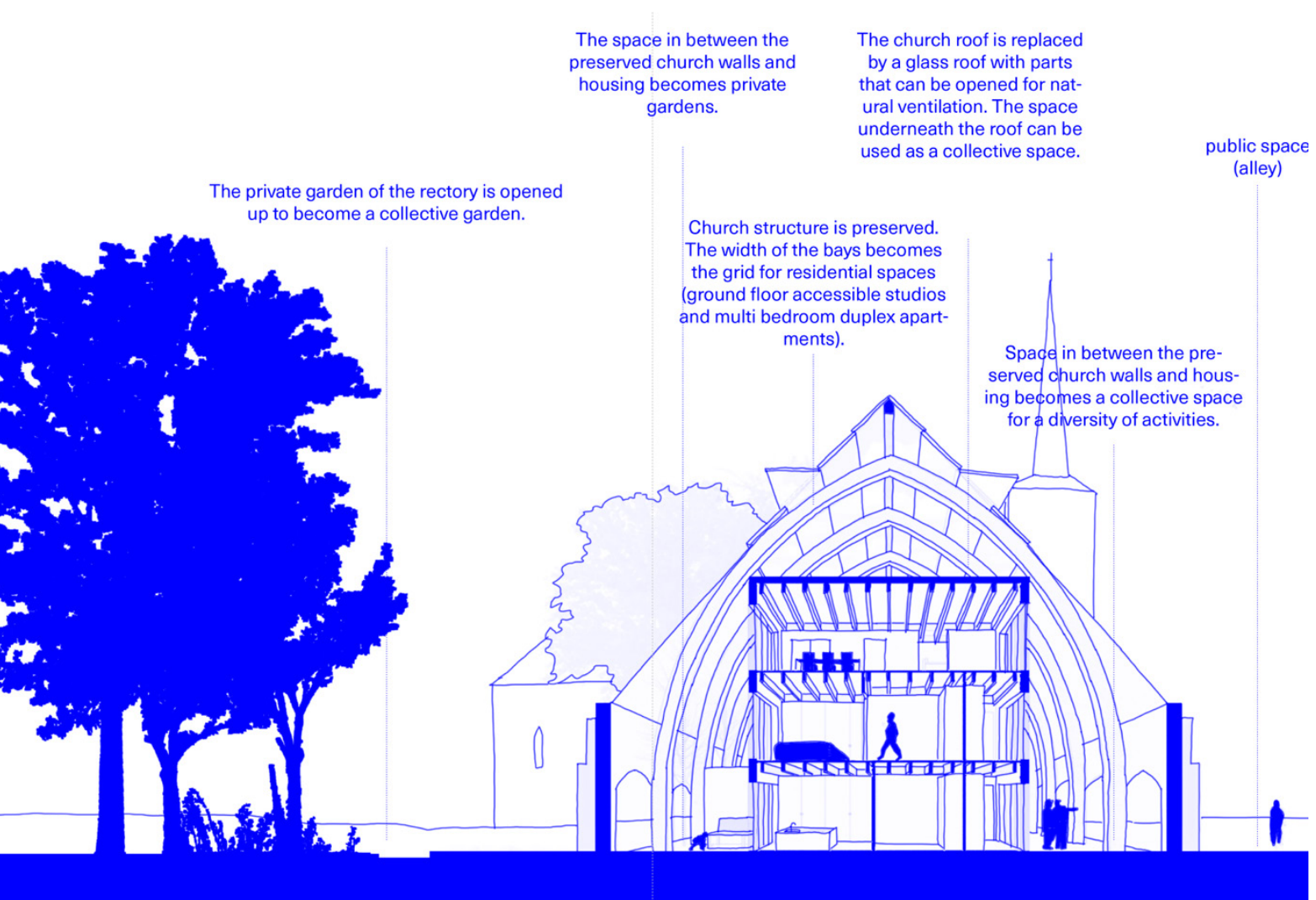
2.1. The Church: Housing in the Church (Typology 1.2)

Churches are emblematic buildings which used to play a central role in community life in Belgium. Churches in villages are often accompanied by village squares, cemeteries and

local commercial functions. Today they have mostly lost their religious function but maintained their central location in villages. However, they remain important points of orientation. This project offers a design future for a moment when the local community is ready to say goodbye to the church as a religious site.

This housing project is designed in the empty space of the nave. As shown in **Figure 9**, this housing project only needs a limited amount of elements to be demolished (shown in red) and added (shown in blue). The project thereby successfully utilised the space offered by the church building. For example, the new housing project is designed using a brick and wooden structure which follows the grid of the church's arches, thereby adopting the rhythm of the church's structural grid as a new spatial structure for several different housing types (see **Figure 10**). By positioning the new housing project in the middle of the nave, a residual space is left open in between the housing and the inside of the church walls, resulting in residual space which can be as collective space shared by all inhabitants or as small private gardens which extend into the large shared garden which used to be the church garden (see **Figure 10**).

Figure 10. Church Perspective Section (Project Designed by Mirte Jansen; Original Section Drawn by Mirte Jansen, Traced and Annotations Added by Sander Lambrix).



2.2. The Ilot: Traversing Gardens (Typology 2.2)

The ilot is the central building block situated in between the village's two main roads. Historical analysis revealed that this building block used to be permeable and open space flowed in between the buildings. Today, the ilot has become clogged up by private fences and a wild growth of backyard sheds. Furthermore, the surfaces of the gardens have been covered by impermeable materials, inhibiting the important infiltration of rain water into the ground. This project offers a design future in which the ilot is once again opened up and reconnected to the public space of the village.

The ilot's heart is opened up and the resulting open space rethought as a series of public passages and collective courtyards, which serve as collective transition spaces for private houses (see **Figure 11**). By doing so, the ilot becomes permeable, strengthening at once space found inside the ilot itself as the public space that it connects to in the rest of the village (see **Figure 13**). Over the years, the ilot has grown into an eclectic ensemble. Therefore, the new housing project imagines removing certain buildings and parts of buildings and adding roof structures to once again create a harmonious whole, fitting with the volumetric language of the village (see **Figure 12**). Architectural details on eye level, such as the size and height of windows, become increasingly important as this housing project offers a spatial quality in the proximity between private houses and public spaces.

Figure 11. Traversing Gardens. Axonometric Projection of the Housing Typology for the Ilot Project Site (Project Designed by Luca Cajot; Axonometric Projection Drawn by Alexander Dvalishvili).



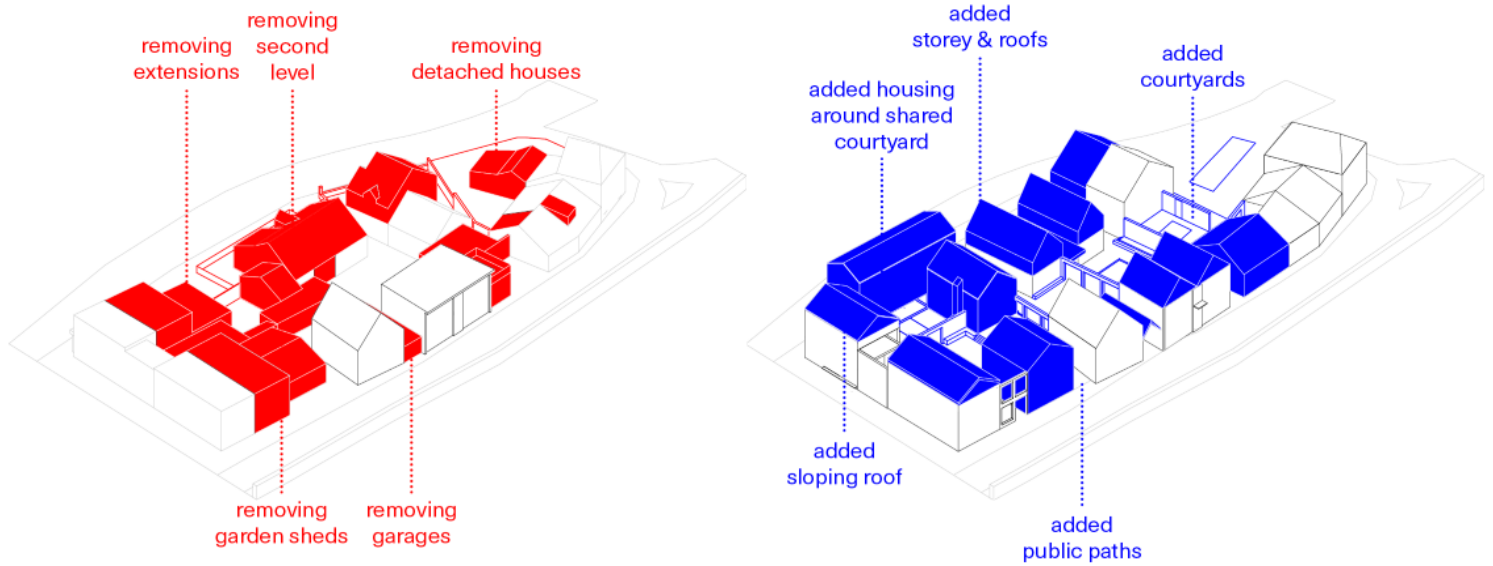
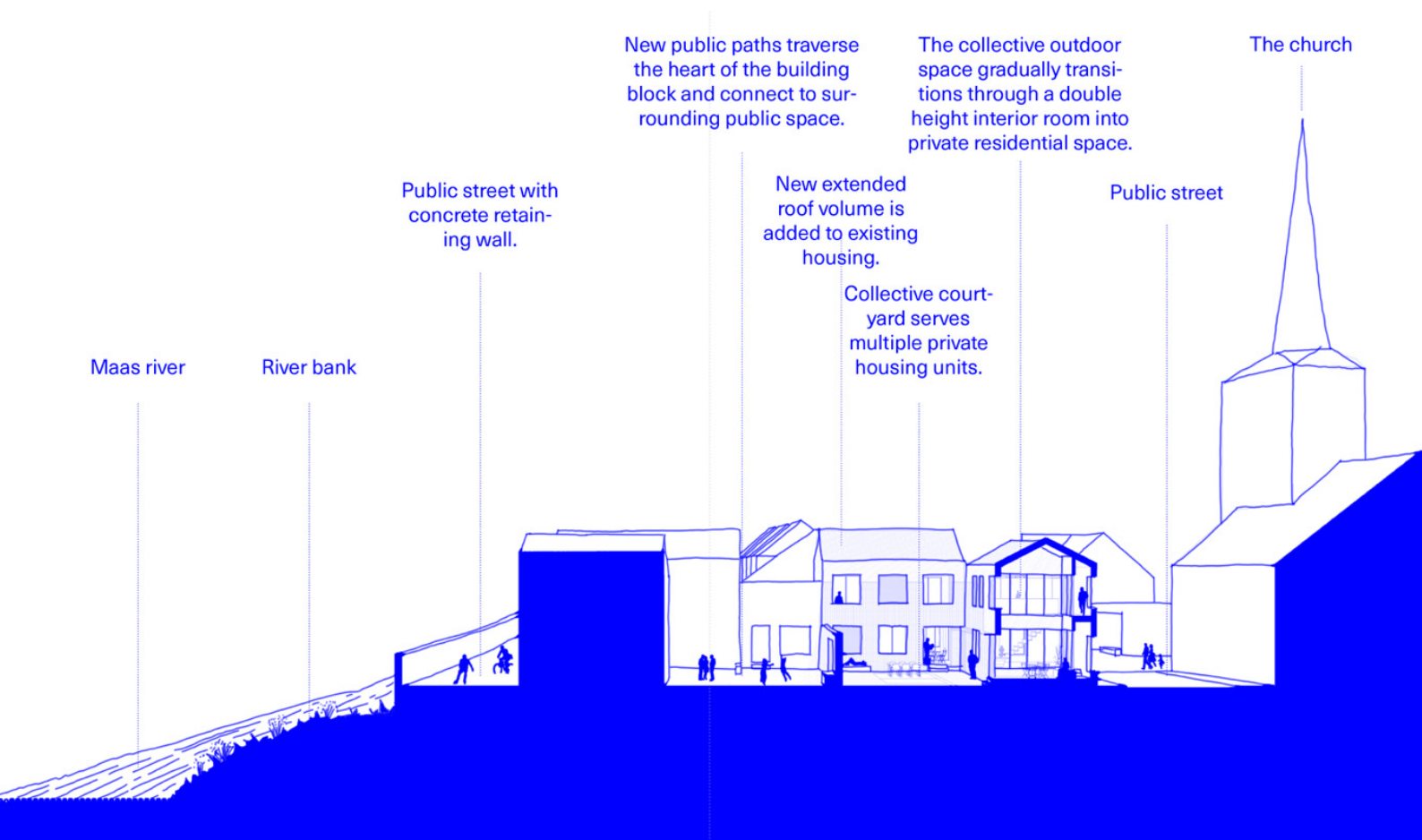


Figure 12. Traversing Gardens Diagrams Showing Removed Parts of the Buildings and Site in Red and Added Parts in Blue (Project Designed by Luca Cajot; Diagrams Drawn by Alexander Dvalishvili; Annotations Added by Sander Lambrix).

Figure 13. Traversing Gardens Perspective Section (Project Designed by Luca Cajot; Original Section Drawn by Luca Cajot; Traced and Annotations Added by Sander Lambrix).



2.3. The Farm: Riverside Farm Housing (Typology 3.3)

The farm indicates an ensemble of farm buildings located at the entrance of the village and in close proximity to the river. Centrally on the site stands an 18th century house registered as architectural heritage by the Flemish Government. The site borders one of the few open public spaces in the village center, which is currently being used as a parking lot. Today the site is used as the terrain of a single-family house, but historical analysis revealed that the garden was once an orchard open to the village. This project offers a design future for a moment in time when public space is no longer defined by the dominance of cars and becomes available as a common good.

The project firstly removes several garage boxes to extend the courtyard of the farm into a collective outdoor space for multiple houses (see **Figure 15**). A new wing of low houses is added in between the river and the open public space. The impressive facade of the 18th century house, together with the new wing of small housing, define clear boundaries to the open space and suggest the use of a village square rather than a parking lot (see **Figure 14**). Architectural details such as a subtle difference in floor level marks the boundaries between public space and private terrace (see **Figure 16**). The ground floor of the 18th century house is redesigned to offer space for public functions while the upper floors are transformed into a family apartment. The barn is converted into a space offering a collective kitchen of all inhabitants of the site and a studio apartment specifically tailored for a single person with limited mobility. The large garden can be opened to the public at certain moments, thereby restoring its function as a product orchard of fruit trees (see **Figure 14**).

Figure 14. Riverside Farm. Axonometric Projection of the Housing Typology for the Farm Project Site (Project Designed by Aurélie Moens; Axonometric Projection Drawn by Febe Makowski).



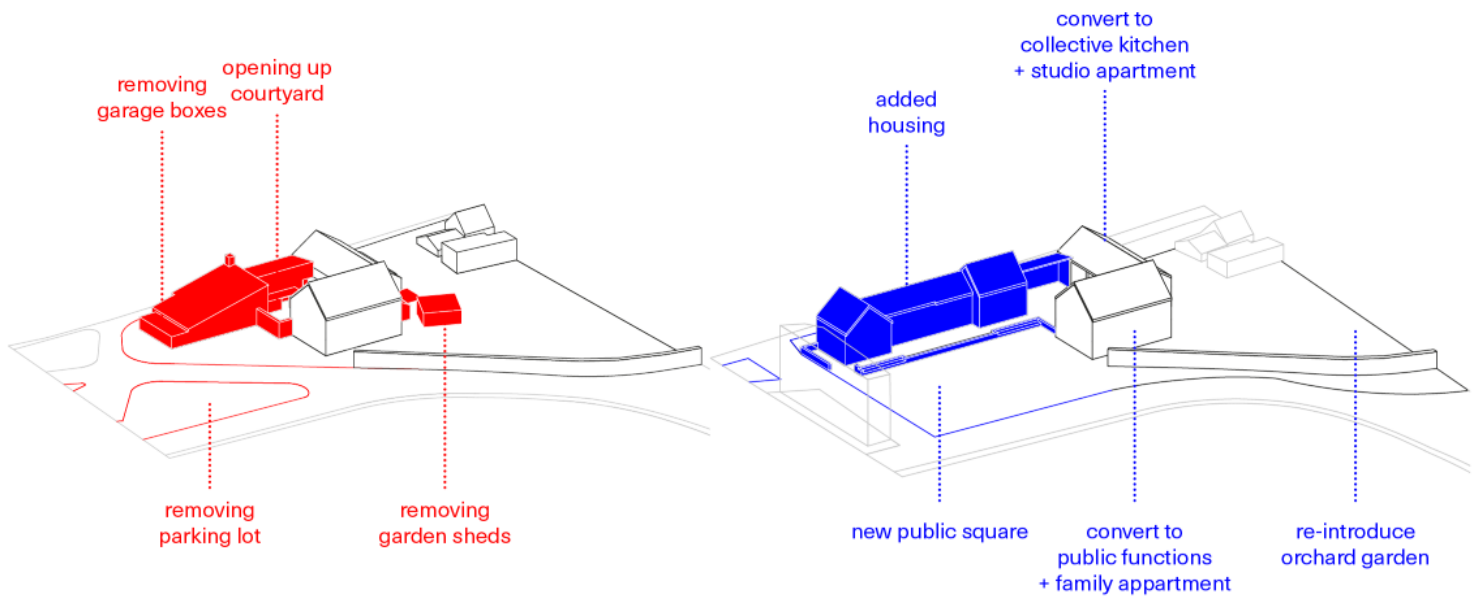
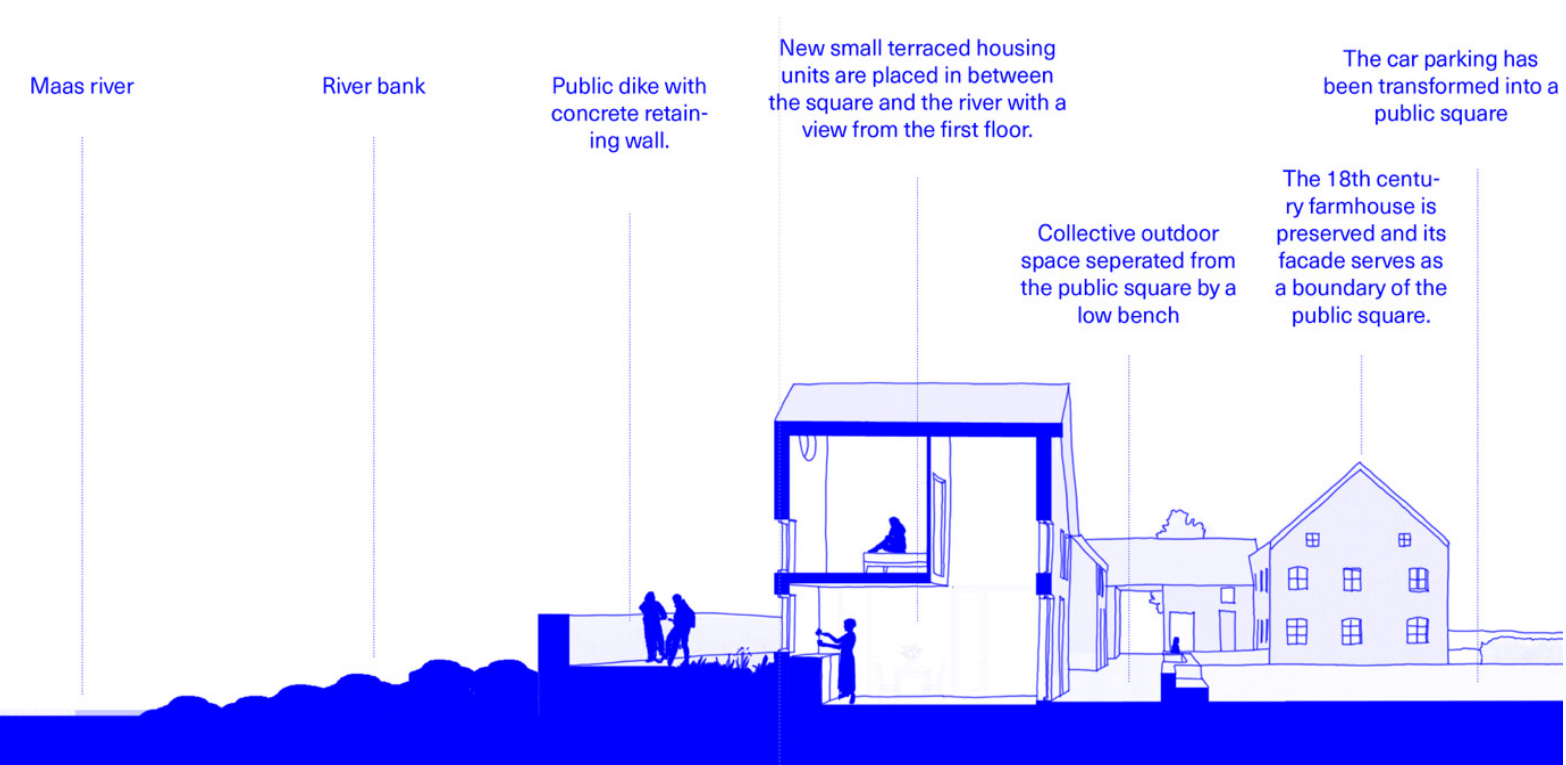


Figure 15. Riverside Farm Diagrams Showing Removed Parts of the Buildings and Site in Red and Added Parts in Blue (Project Designed by Aurélie Moens; Diagrams Drawn by Febe Makowski; Annotations Added by Sander Lambrix).

Figure 16. Riverside Farm Perspective Section (Project Designed by Aurélie Moens; Original Section Drawn by Aurélie Moens; Traced and Annotations Added by Sander Lambrix).

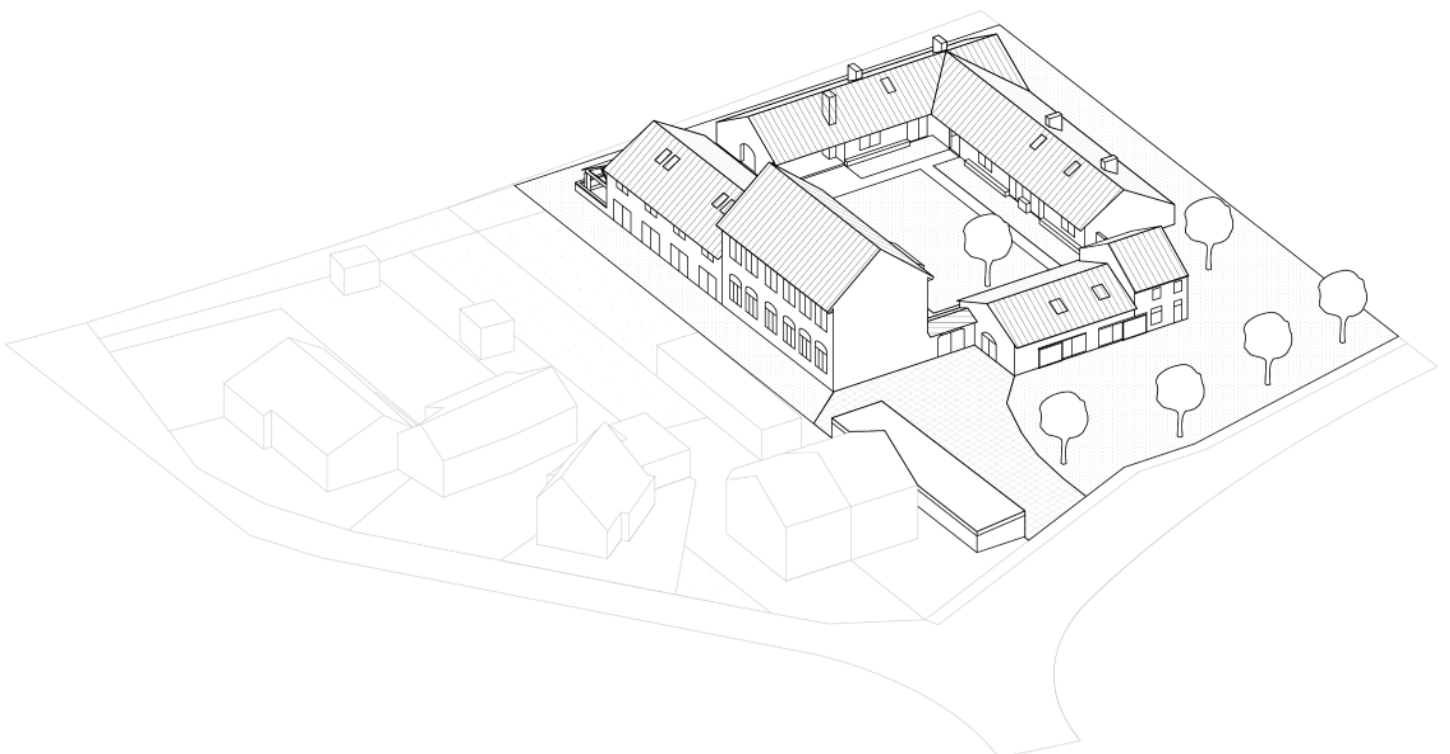


2.4. The School: Courtyard Housing (Typology 4.1)

The empty school building in Uikhoven is a symbol of the disappearance of basic services in villages. The now empty building finds itself nestled in between houses. Through historical analysis, it was discovered that one of the neighbouring houses used to be part of a farmstead around a courtyard. The dominant housing typology when the village was agricultural and autonomous. This project is a design future for a moment in time when neighbours are ready to rethink boundaries of private property in favour of collective forms of living.

The school building and the old farm building give an incentive to reintroduce living around a courtyard in the village (see **Figure 17**). Gardens are joined to form a courtyard and multiple volumes are added while carefully considering their size and height (see **Figure 18**, in blue). The result is a contemporary courtyard typology which combines a diversity of housing types. The large school building is transformed into a building containing public functions and small housing units. A volume added to the back of the school building serves as family housing of multiple levels while a lower volume at the back of the site is designed as accessible ground floor housing for couples or single households (see **Figure 19**). Recently added apartment buildings between the school building and the farm house are replaced by buildings with a smaller volume and form which fit better in the context of the village.

Figure 17. Courtyard Housing. Axonometric Projection of the Housing Typology for the School Project Site (Project Designed by Ruben Verla; Axonometric Projection Drawn by Febe Makowski).



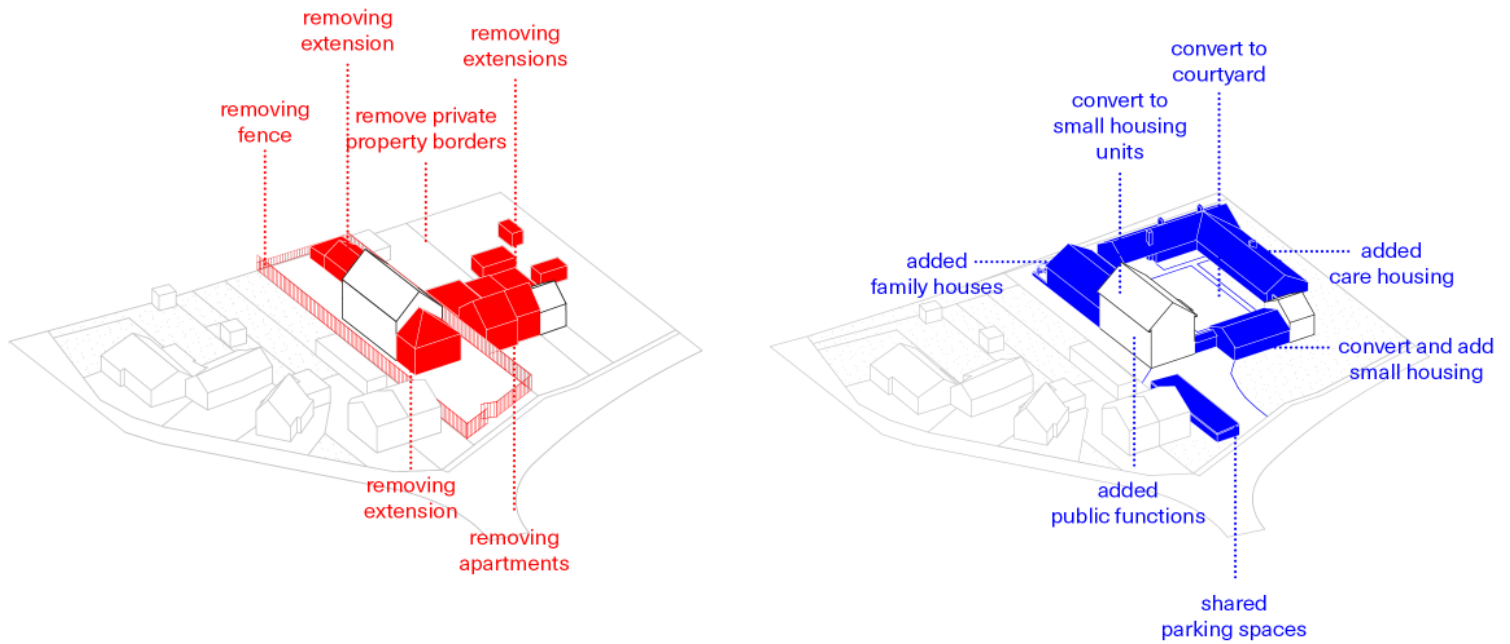
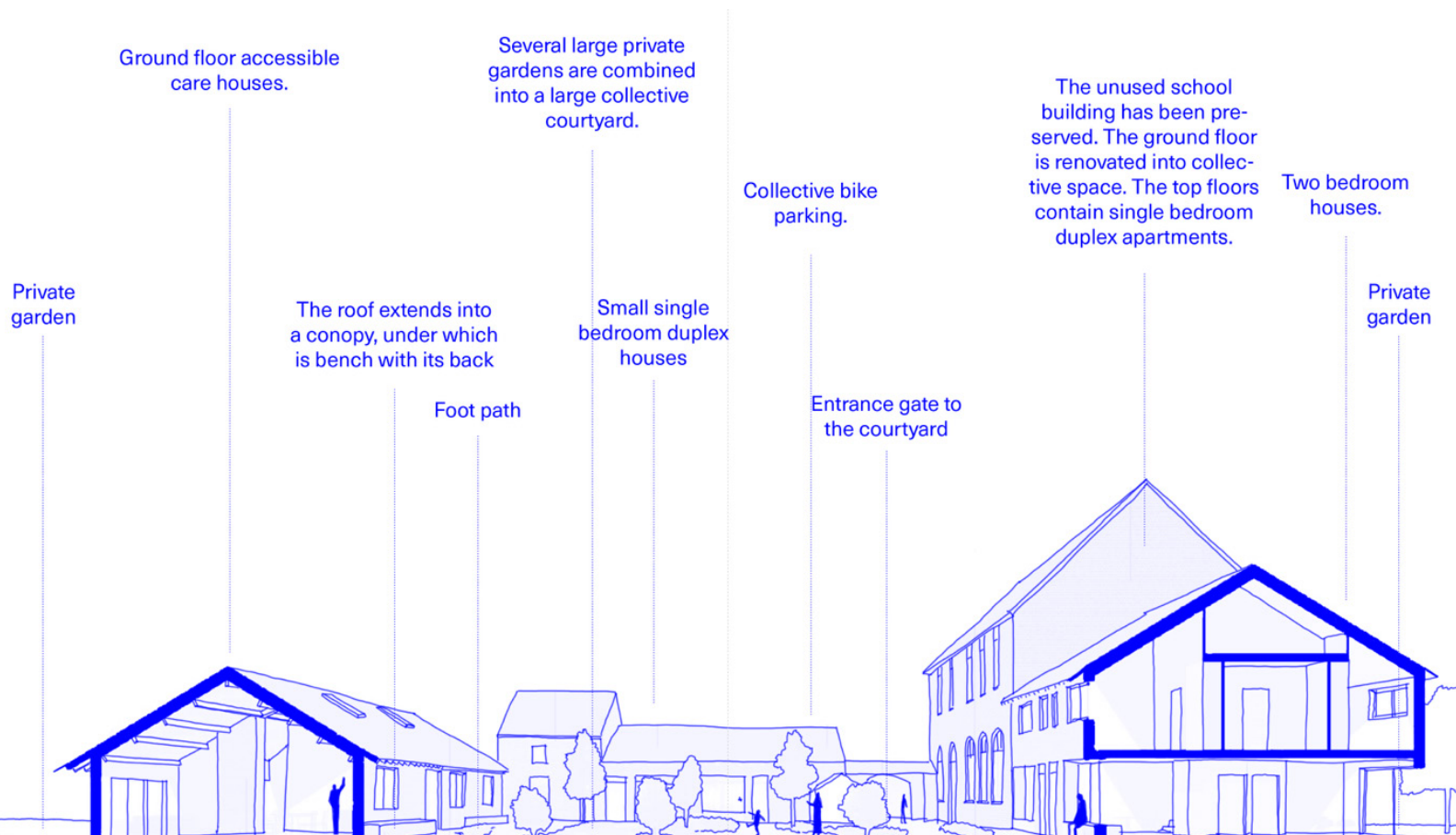


Figure 18. Courtyard Housing Diagrams Showing Removed Parts of the Buildings and Site in Red and Added Parts in Blue (Project Designed by Ruben Verla; Diagrams Drawn by Febe Makowski; Annotations Added by Sander Lambrix).

Figure 19. Courtyard Housing Perspective Section (Project Designed by Ruben Verla; Original Section Drawn by Ruben Verla, Traced and Annotations Added by Sander Lambrix).



3. Discussion

The results show different possibilities to imagine intergenerational collective housing models which could simultaneously contribute to older inhabitant's wellbeing and the quality of village architecture. The designs we discussed are a consequence of each designer's sensitivities in reaction to the specific characteristics of the site and its relation to the requested programme. In the following section we will discuss several common strategies which have emerged from the design process and are embedded in the design outcomes.

3.1. Connection to History

All design projects have grown out of a historical analysis of the site and the village. This analysis offered a base for the design projects to inscribe themselves in the historical process of the place. Through their historical embeddedness, these housing projects could foster feelings of place attachment, social embeddedness and familiarity for older inhabitants [49, 50]. Historical connections appear in diverse forms. For example, local historical housing typologies might be reintroduced in the village in contemporary ways, such as housing around a courtyard. In a more direct form, historical connections might also appear in the form of adopting the structure of existing buildings directly as the structure for new housing projects. In this way, a direct link is made between the rhythm of spatial structures of these historical buildings and those of the new housing projects. Furthermore, inspiration can be found in the past of a specific site and the roles it used to play in the village, for example by opening up an orchard or by removing borders to recreate public spaces. Existing characteristics of the built environment provide fertile ground for housing densification projects in villages. In this regard, designers need to be trained to develop a sensitivity to approach and read an existing built situation and its historical context. It requires a shift in attitude from constructing new buildings to not-building, in which solutions to spatial needs are found in existing (built) heritage [43]. We argue that this attitude can be seen as a form of mental and spatial "ageing in place," as it creates connections between new housing projects and the history of a place, thereby possibly fostering feelings of identification and belonging [51, 52].

3.2. Transition of Spaces and Collective Space

The design projects are all rooted in a deep spatial analysis of the site and the way these sites are embedded in the village. This analysis forms a foundation for carefully designing transitions and sequences from public village space to private residential space. Villages are characterised by a spatial structure which encourages informal and spontaneous contact between inhabitants [32]. All projects have been designed with careful consideration of the kinds of spaces that are needed to support these interactions. We specifically distinguish three important kinds of spaces in this regard. Firstly, collective space plays a pivotal role. We understand collective space as distinct from public space and private space. Collective space is space which is accessible and can be used by all inhabitants of a housing project, but not (always) by the general public. These spaces, such as a collective outdoor space which needs to be traversed to reach front doors, can foster spontaneous social interactions

and contribute to the wellbeing of inhabitants [52, 53]. Secondly, the impact of the housing project on the public domain requires careful consideration. Even when public domains are not part of the project itself, the new housing projects often play a role in redefining the identity of the public spaces that they border. For example, a facade could become a clear border which defines a public space as a square. Finally, by allocating a part of the project to other than residential functions, many of these projects provide space for use by commercial or public functions. Although the disappearance of essential services is related to many societal developments, such as austerity logics and efficiency thinking [4], these housing projects can give a spatial incentive to bring back essential functions to village centers, thereby possibly contributing to community embeddedness [54].

3.3. Combining Diverse Housing Types

Each housing project combines diverse ways of living together by offering a multitude of housing types. Combining a variety of housing types in the same project invites a multigenerational group of inhabitants to live together [55]. Several projects designed ground floor units with specific attention to accessibility to cater for the needs of older inhabitants. These accessible units were mixed with other housing types such as co-housing studios with a shared kitchen and living spaces, and larger units which could cater to families. When a diversity of housing types are combined within the same project, it was important to promote recognisability of individual units within the same project, as housing could become a source of expression and self-identity [56]. Recognisability and readability of the housing project usually happened through careful consideration of added volumes in relation to the historical buildings which already existed on the site. New volumes were carefully proportioned in relation to the existing buildings and in coherence with the architectural style found in the village, including brick materials and sloped roofs. These strategies integrate the housing projects within the village while establishing a spatial hierarchy and recognisability of individual housing units within the project. Another way of catering to the needs of future generations is by embedding flexibility in the housing project [57]. Several projects anticipate future needs by offering the possibility to combine or separate units based on their spatial organisation. Another way of catering to flexibility is by distinguishing between infill walls and structural elements of the building, making it possible to adapt the internal organisation of spaces within a building with relative ease in the future.

Conclusion

We have shown that the housing preferences promoted by Belgian housing culture pose challenges for older inhabitants' wellbeing and the quality of life in villages. Our study offers alternatives for dominant housing models, which take into account older inhabitants' wellbeing and village architecture. Furthermore, based on the themes of not-building, village architecture and intergenerational housing, we have identified several design strategies which can serve as a foundation for similar projects.



Figure 20. Exhibition of the Design Results in the Local Church (provided by the authors).

Architecture as Design Futuring

As a conclusion, we reflect on the role of architect, and by extension the architecture design studio. In our study, the role of the architect goes beyond the traditional idea of providing a design service to a client. Instead, architects criticise and propose alternatives to a dominant housing culture, which has been shown to be problematic, and thereby take a position in the context of broader social challenges [58]. Design in our study can therefore be considered an act of Design Futuring [59]. In this sense, design becomes a redirective practice, as it seeks to offer counter narratives to current day normative approaches to housing in Belgian culture. It is an act which seeks to steer the future towards more sustaining forms of housing by cultivating design principles from an in-depth understanding of the local and historical housing context. The designed projects therefore anticipate several shifts in mentality which are required before they could become a reality, such as rethinking private property borders or reintroducing historical courtyard typologies. Additionally, the sharing of knowledge produced by our study also moves beyond the academic educational and research context by sharing these design futures with local inhabitants through the organisation of an exhibition in Uikhoven's church (see **Figure 20**). Through this act, our goal was to inspire local inhabitants and policy makers by showing potential housing models that could be achieved. Framing design as Design Futuring, acknowledges that catering to older inhabitants' wellbeing can happen through

direct and indirect ways. Direct ways understand design as a service, which meets the current needs of a target group, while indirect ways understand architectural design as propositions which seek to influence the broader societal context and housing culture expressed in the architecture of our housing landscape.

Policy Recommendations

Finally, we formulate three policy recommendations following the strategies found in our study. Firstly, to impose the provision of space for essential public functions when housing projects are developed which envision a certain number of units, as a way to re-introduce essential services in villages to contribute to age-friendly environments and reduce car-dependency. Secondly, to impose that housing for older inhabitants should be combined with other housing types within the same project to ensure a diverse group of inhabitants and to counter social segregation of older adults. Thirdly, to impose an in-depth analysis of the existing site and its context as a starting point of each housing project, as a way to connect new housing projects to the historical fabric of the village.

Limitations and Future Research

Our study offers Design Futures for a specific spatial, historical and cultural context. However, the results are embedded in specific Western historical developments and Western architectural theory. Future research could explore how generalisable the strategies presented in this study are by applying them to different housing cultures. This can be done, for example, by applying research by design in an intercultural parallel design studio in which two (or more) educational design studios from different universities collaborate in tackling the same research issues but within different cultural contexts [60].

Secondly, our study happened within an educational context and is bound to the planning and curriculum of that context. Some real-world complexities, such as affordability or policy limitations, had to be restricted in this regard. While we have shared the knowledge created by the studio with the local community in the form of an exhibition, research could seek to explore the real-world applicability of our results. One future direction could be to include participatory methods into the design process. Another future direction is to explore the opportunities and limitations of local housing policy that need to be tackled in order for these design futures to become more of a reality.

Author Contributions:

Sander Lambrix: Conceptualisation, Investigation, Methodology, Visualization, Writing (Original Draft Preparation), Writing (Review & Editing); Tim Vekemans: Investigation, Writing (Review & Editing); Jan Vanrie: Funding Acquisition, Validation, Writing (Review & Editing); An-Sofie Smetcoren: Funding Acquisition, Project Administration,

Supervision, Validation, Writing (Review & Editing); Ann Petermans: Funding Acquisition, Project Administration, Supervision, Validation, Writing (Review & Editing).

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The authors declare that they have no conflicts of interest related to this research.

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