

Demi te Linde

aE grad. studio

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Title: *Tijdloos* : A Kit-of-Parts System for Self-Assembled Temporary Housing
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Foreword

In 2021, I graduated from the Academy of Arts Utrecht. At that time, I had already been preparing for further studies for two years, with the clear ambition of obtaining a master's degree in Architecture at TU Delft. It was not an easy journey, but I remained determined. Architecture is a beautiful profession, yet it has many shortcomings. Delft University confronts you with the facts: the building sector being a major consumer of raw materials, energy and water. However, it was not these challenges that unsettled me most, but rather the architecture bubble itself; a culture in which high workloads are normalized and the profession is often portrayed as elite and detached from everyday life. It took me a while to find a routine that kept me grounded, one where I did what felt right. Not merely producing aesthetically pleasing architecture, but designing in a smart and responsible way. During this graduation project, I want to engage with what brings me the greatest motivation as a (future) architect, while simultaneously creating work that has the potential to contribute to today's society.

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Reading guide

This report is structured to investigate the potential of self-assembled, temporary housing as a circular response to the housing shortage in the Netherlands, using Eindhoven as a test case.

Part 1. Introduction outlines the context and urgency of the research. It highlights the need for the building sector to transition from a linear to a circular economy. In parallel, the Dutch housing shortage is discussed, emphasizing its social implications and inherent uncertainties. This section concludes with the project's objective and motivation, research questions, and scope.

Part 2. Approach describes the methodological framework of the graduation project. It explains the applied research methods, including literature reviews, precedent studies and research by design, with prototyping as a key method. The theoretical framework introduces key concepts related to temporary housing, Product-as-a-Service and kit-of-parts systems.

Part 3. Results presents the outcomes of the full process through text, images, and drawings. It begins with a concise overview of relevant precedent studies, followed by a site analysis of Kanaalzone-Zuid in Eindhoven. This is followed

by an introduction to the catalogue and building sequence, which are further illustrated through images and text.

Part 4. Conclusion presents the final conclusions and reflection on the project outcomes, discussing the potential of circular temporary housing and its relevance for future housing strategies in the Netherlands.

Part 1. Introduction / problem statement

The circular economy is a system in which materials never become waste and nature is regenerated. In contrast, the current dominant economic model is largely linear: resources are extracted to make products that eventually end up as waste and are thrown away. This model is also referred to as take-make-waste model (Ellen MacArthur Foundation, n.d.).

Within this linear system, the building sector throughout the world is a major consumer of raw materials and a significant producer of waste. The Dutch program 'Nederland circular in 2050' estimates that construction in the Netherlands account for an estimated 50% of raw material consumption, 40% of total energy consumption, and 30% of total water use (Transitieteam Circulaire Bouweconomie, 2021). In addition, construction and demolition waste (C&D) is generated, defined as the waste produced during the new construction, renovation, and demolition of buildings and structures (Kofoworola et al., 2008). Factors contributing to high levels of C&D waste include design and construction detail errors, frequent design changes and change orders and waste from cutting uneconomical shapes (Polat et al., 2017).

The Netherlands is facing a severe housing shortage

caused by a complex interplay of factors. Over the past few decades, too few homes have been built in the Netherlands, while the number of households has increased considerably. As a result, many people struggle to find affordable and suitable housing in this current housing market. In addition, the existing housing supply often does not match the needs of today's Dutch demographic profile and is increasingly unaffordable (OECD, 2025). This has significant consequences for citizens, especially young people. More than half of young people between 12 and 29 are currently looking for a home. Without access to a home, they feel limited in their freedom and social development (Nederlandse Jeugdinstituut, 2025).

But demographic forecasts and estimates of the housing shortage are inherently uncertain. Because both demographic and housing market processes are influenced by many factors, it is impossible to clearly determine their future development. In particular international migration has fluctuated significantly in the past. As population growth in the Netherlands is increasingly migration-driven, future trends are difficult to predict (ABF Research, 2025). In the first half of 2025, the Dutch population experienced a natural decrease (more people died than they were born), meaning the population grew solely as a result of migration (Centraal Bureau voor de Statistiek [CBS], 2025).

Relevance

The relevance of this problem lies in the intersection of two major challenges facing the Netherlands: the transition to a circular economy and the urgent need to address the national housing shortage. The current dominant economic model remains largely linear, following a take-make-waste logic. The construction sector represents a critical domain for implementing circular economy principles.

At the same time, the Netherlands is experiencing a significant housing shortage. Despite ambitious national targets, the Dutch housing system currently lacks the speed and adaptability required to respond to urgent shortages of (affordable) housing. However, predicting future housing demand remains challenging. This uncertainty complicates long-term housing planning and highlights the importance of flexible and sustainable housing strategies. In a context where land in the Netherlands is scarce and population dynamics fluctuate, continuously constructing permanent housing may not represent the most sustainable long-term strategy.

Moreover, the challenge does not lie solely in construction speed or affordability - viable technical and financial

models already exist. Rather, bureaucratic procedures and regulatory processes often slow down implementation. This raises an important question: what if greater initiative were taken by stakeholders themselves?

Objective and motivation

The objective of this graduation project is to design a kit-of-parts for temporary housing that is collectively assembled within a pre-engineered framework.

This project aims to design with the next use-phase in mind - for an as-yet unknown future. The goal is to develop a closed-loop material cycle in which the value of building materials is preserved and secured over time. By doing so, the project seeks to prevent construction materials from becoming waste after the initial deployment period of the building. To strengthen this ambition, the project reconsiders the construction process itself. By involving future residents in the guided assembly of the housing system, the project aims to encourage careful handling of components and promote a sense of stewardship. This is achieved through a Product-as-a-Service (PaaS) model, in which building components are not treated as one-time sold products but as services that remain under the ownership of a provider throughout their lifecycle.

Several circular design strategies support this objective, including Design for Disassembly (DfD), the creation of material passports, and *reduction of trace*. Timber is considered the primary construction material due to its relatively low carbon footprint and its adaptability

for modification. Steel assumes a supportive role. Standard measurements will be applied to maximise the future potential of the components; these are the measurements that recur throughout building cycles.

Temporary housing is often perceived as a solution of lower quality. However, this project is motivated by the belief that temporariness can be an architectural quality. Designing a temporary housing system offers an opportunity to respond more quickly to urgent demand, while remaining resilient to future change. By treating logistical aspects - such as material sourcing and on-site assembly - as key parameters, the project aims to ensure both feasibility and credibility.

The motivation for this research stems from the recognition that addressing the housing shortage should not come at the expense of environmental sustainability. Instead, the current housing challenge may provide an opportunity to accelerate the transition toward more circular construction practices. By examining potential circular building approaches, this research aims to contribute to the broader discussion on how the Dutch housing sector can simultaneously address social needs and environmental objectives.

Research and design questions

How can a circular self-assembly kit-of-parts system for temporary housing be designed to address housing demand while ensuring the retention of material value beyond its initial deployment?

Sub questions

How can Kanaalzone-Zuid in Eindhoven function as a testing ground for circular temporary housing strategies?

How can temporary housing design meet the needs, preferences, and lifestyle of young adults and starters entering the housing market?

How can timber be used in a way that minimises material modification whereby its potential for future reuse maximizes?

How can steel connectors facilitate disassembly and reuse within a timber-based housing system?

How can a kit-of-parts housing system be designed to enable ease of assembly and disassembly by non-professional users?

Evaluation

How can lessons from circular temporary housing inform future permanent housing strategies in Eindhoven and the Netherlands?

Scope

The Municipal Executive decided in 2015 that the canal zone in Eindhoven must undergo a major transformation. This decision led to the adoption of the introductory memorandum on July 5, 2016. One of the key initiatives within the entire canal zone is the redevelopment of the Campina site, *De Caai*, where construction is almost completed. For Kanaalzone-Zuid, the vision is to develop a mixed-use environment combining housing, work spaces, and recreation, with opportunities for high densities.

The area north of the canal is currently designated as an industrial park and peripheral retail establishment location, characterised by a concentration of hardware and furniture stores. Whether this designation will (partially) change in the future remains uncertain (see figure 2).

The development of Kanaalzone-Zuid will take place in phases, allowing for flexibility and the possibility of spatial adjustments over time. In addition, the framework emphasises a step-by-step approach based on a continuous learning process, in which the evolving

context and experiences inform the development of the plan. Building structures are therefore designed to be as flexible as possible, enabling alternative uses in the future. The development strategy also allows for multiple starting points, meaning that sub-areas can evolve organically, systematically, and in parallel.

Figure 1 presents the area framework map that visualises the ambitions, preconditions, and opportunities for the site. It outlines the intended development of the area, while simultaneously leaving room for further



Figure 1 - area framework map, indicative (OpenEindhoven, 2025)

elaboration in a future urban development plan.

So-called 'brandpunten' or 'smaakmakers' (focal points) shape the main programmatic and spatial framework of the area, which include Koppark, the design cluster, the Design Academy Eindhoven, and the innovation and food cluster. Based on an explanation by an expert from OpenEindhoven, it can be stated that the Design Academy Eindhoven is one of the first developments to take place (see figure 3). A newly developed, purpose-built school building will be realised in Kanaalzone-Zuid. The possibility of accommodating part of the academy

in converted halls at De Caai is also being explored. In addition to the academy, there is an opportunity to provide student housing for academy students within the area.

Target group

Eindhoven is known for its two universities: the Technical University of Eindhoven and the Design Academy Eindhoven. Both institutions are hubs of young, smart, and creative people. This project therefore focuses on the following target group: starters and recent graduates between the ages of 21 and 30. They are among those most affected by the housing shortage, and the temporary character of the homes aligns well with their current life phase. This group is generally characterized by a limited budget, but a high degree of flexibility.

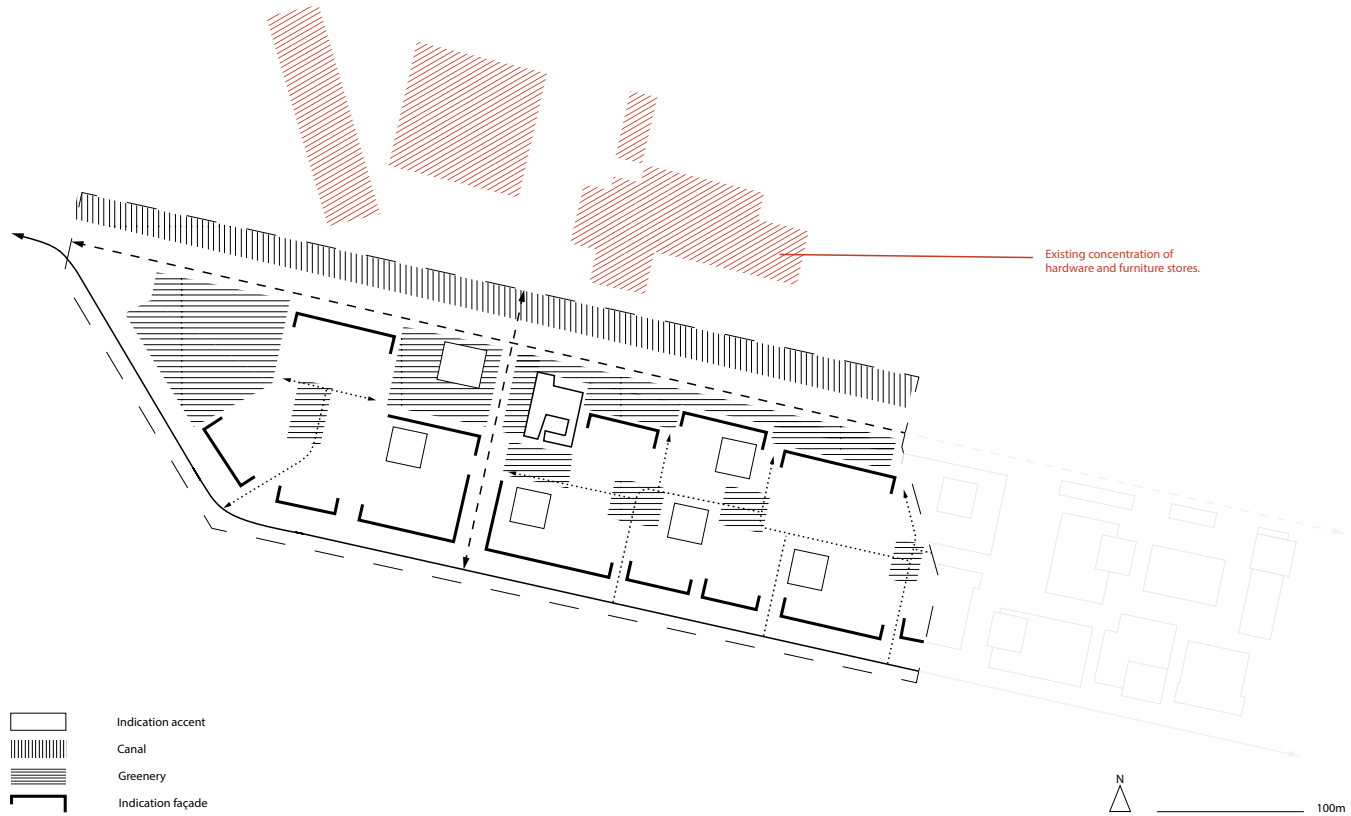


Figure 2 - Abstracted area framework map incl. indication hardware and furniture stores (own work, 2026)

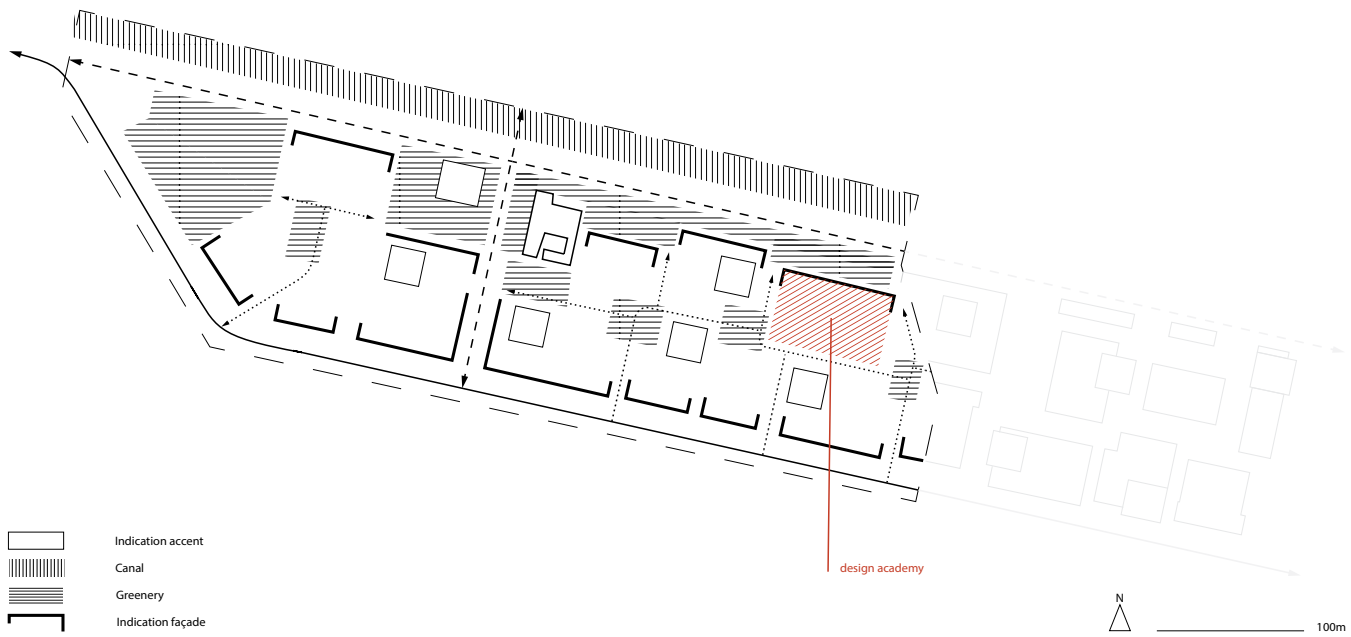


Figure 3 - Abstracted area framework map incl. indication Design Academy Eindhoven (own work, 2026)

Part 2. Approach / methods

Literature reviews provide the foundation for a theoretical framework, focusing on circular economy principles, Product-as-a-Service, Design for Disassembly and concepts of ownership and stewardship. In parallel, precedent studies of existing circular and temporary projects are conducted to identify successful design approaches, structural systems, and assembly methods.

A site analysis of the development Kanaalzone-Zuid in Eindhoven is carried out to get better sense of the spatial and urban context of the area. This includes examining development plans and opportunities for temporary use within the site's transformation process, as well as speaking with an expert.

The design phase focuses on the development of a kit-of-parts housing system, with particular attention to self-assembly, joinery, and assembly processes. Timber and steel components are explored to enable disassembly, reuse, and minimal material modification. The design is iteratively tested - through section drawings, construction detailing, 3D modeling and practical prototyping - evaluating aspects such as ease of assembly, circular

material flows, spatial quality, and demountability.

The evaluation question will be addressed through reflective analysis of the design outcomes, evaluating how lessons learned from temporary housing can inform future permanent housing strategies.

Theoretical framework / temporary housing

In the report prepared by the House of Representatives (Tweede Kamer der Staten-Generaal, 2023) on temporary housing, it is stated that temporary housing is either built at a temporary location or according to the *Besluit Bouwwerken Leefomgeving* (Bbl) requirements for temporary housing. This implies that a temporary home must be relocated (or demolished) after a certain period, for which the maximum duration is 15 years. Government policy is based on the assumption that temporary housing functions as flexible shell that complements the regular housing market, allowing for more flexibility towards growth and decline in housing demand. The report distinguishes two types of temporary housing: *flex* housing and transformation housing. The former refers to buildings that are movable, stackable or adaptable, in which either the home, the location or the occupancy is temporary in nature. The latter refers to vacant buildings, such as offices, schools or care institutions, that are transformed into temporary housing. It is flex housing that is examined in this graduation project.

Therefore, temporary housing is best understood as pressure-reduction tool (Tweede Kamer der Staten-Generaal, 2023). It has the ability to deliver fast, primarily due to smart building methods, such as prefabrication and modularity. In addition, the Bbl imposes less stringent

requirements on temporary housing, resulting in faster approval of construction procedures (Planbureau voor de Leefomgeving, 2022). Another important characteristic is that temporary housing projects can stimulate innovation in industrialised and circular construction methods; they encourage solutions that allow homes to be dismantled easily. Despite these opportunities, the number of temporary homes built remains relatively low, with an estimated 4 thousand units per year (Tweede Kamer der Staten-Generaal, 2023).

Temporary homes, user preferences and sharing

Dwelling design is often based on how much space is needed and what type of space (e.g. level of privacy) is required for certain activities. Design guidebooks frequently assume that activities are performed in the most space-efficient way. As such, it fails to capture the complexity of everyday living.

“There is more to an activity than the activity itself.” Preferences for a space vary when different meanings of *home* are valued. Additionally, a study on a temporary changeable homes for students showed that engaging in social activities can increase a sense of attachment to the dwelling, even when the stay is temporary. The concept of *affordances* further supports this idea: individuals perceive and use space differently depending on their personality, experiences, and physical characteristics. Designers could consider how spaces can be arranged to accommodate different types of activities – especially receiving guests – without interference (Overtoom et al., 2023).

At the same time, housing preferences are strongly influenced by life stage and household composition. For instance, Kim et al. (2020) argues that young single-person households and couples tend to prefer neighbourhoods with good access to jobs and cultural amenities. Within this context, shared housing - which provides private rooms for each tenant and shared community spaces for all housemates - can be a viable and affordable housing option. While affordability is often a primary motivation, some young people also value the flexibility and social advantages it can offer, although these are often conditional and depend on the balance between privacy and community (Kim et al., 2020).

Circularity within the building sector

“Circular construction entails the creation, utilisation, and repurposing of buildings, construction elements, products, materials, spaces, and infrastructure, all while minimising the depletion of natural resources, environmental pollution, and negative impacts on ecosystems.” (Build Up Team, 2024). In short, when a building adopts a circular structure, it maximises resource utilisation while minimising waste throughout the building’s entire lifespan; the end-of-use phase is already taken into account. The circular economy system diagram (The butterfly diagram, figure 4) illustrates the continuous flow of materials, distinguishing two cycles: The technical cycle keeps materials in circulation through reuse, repair, and recycling, whereas the biological cycle circulates biodegradable materials that return to the Earth (Ellen MacArthur Foundation, 2021).

Today, a linear economy (take-make-waste economy) is still dominant. It is a system in which resources are extracted to produce goods that eventually become waste and are thrown away (Ellen MacArthur Foundation, 2021). According to the *Circular Buildings and Infrastructure* report by the European Circular Economy Stakeholder Platform (2021), the main aspects of circular construction include: design for deconstruction (dismountability); material reuse and recycling; resource efficiency (e.g.

through efficient design that minimises material waste); circular business models; digitalisation and data management, which support better tracking and management of materials and inform decision-making.

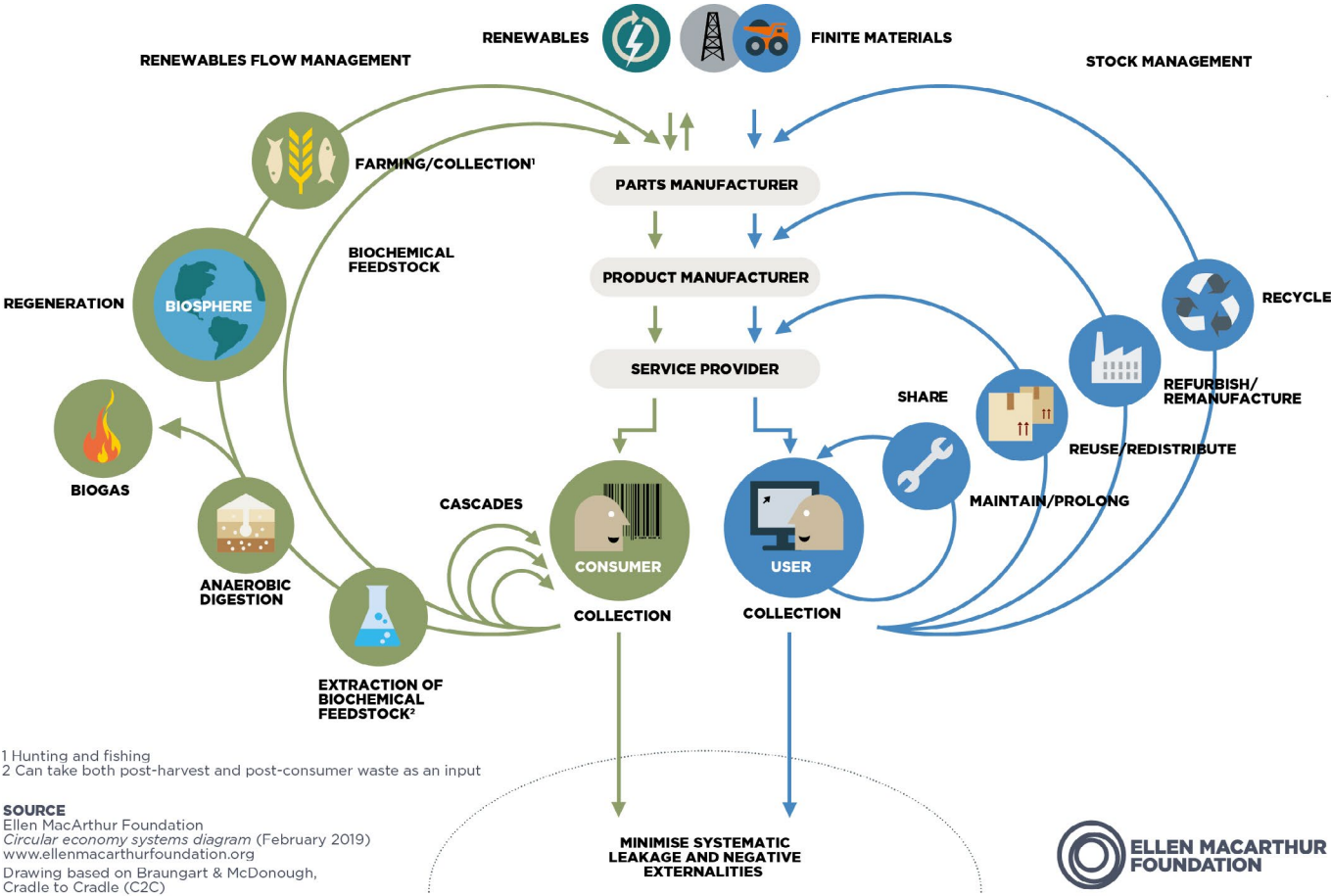


Figure 4 - The butterfly diagram (Ellen MacArthur Foundation, 2021)

Product-as-a-Service

A concept that goes hand in hand with the notion of technical nutrients would be the concept of Product-as-a-Service. In a PaaS-scenario, customers effectively purchase the service provided by a product for a defined period of use. Designing products as products of service implies designing them for disassembly. Maybe we want our thing to live forever, but what do future generations want? While we may wish for products to last indefinitely, future generations may have different needs. Manufacturers would, however, retain permanent responsibility for storing and - where possible - safely reusing any potentially hazardous materials contained in their products (Braungart et al., 2008).

Self-assembly, ownership and stewardship

Robins (2019) argues the following: *“For the circular economy to be adopted as quickly as it needs to be, designers must be at the forefront of the movement. The task is twofold: to ensure that all new materials, products and services fit the new economy; and to guide and facilitate the change in public attitude. The design of products and materials must look past the consumer/user dichotomy and advance to one of stewardship, where the value of an item is not just on how it looks and functions at the time of purchase but on its longevity, the sustainability of the materials used, and how easily it can be maintained, adapted and valued by future generations.”*

It is not enough to be merely an engaged user of a product in a circular world; purchasing a product must come with the responsibility to be an active caretaker of that product, maintaining it and valuing the resources that go into making it, as Robins (2019) argues. The shift towards stewardship demands a reconsideration of our relationships and interactions with everyday objects. In this context, repair and maintenance should become a normalised part of the transition to a circular economy. The skills and knowledge required to ensure such longevity can be developed through communities of practice, where people come together to learn and share (Lave et al., 1991).

Sanding belt-effect and reduction of trace

Destructive connection types will (slowly) reduce the reusability of components by leaving traces and causing forms of damage (a phenomenon I refer to as the “sanding belt-effect”^{*}). Over time, this can harm the structural or aesthetic performance of the component or material. In this sense, the reuse potential of components depends on the flexibility of their connections (Durmisevic, 2019). Non-destructive yet complete connection types provide adequate fixation without altering any member or requiring additional fasteners. Examples include forms of binding, clamping, or the use of gravity.

“Trace” can refer not only to marks left during construction, but also to those resulting from design choices. Today, it is common for materials to be customized, specially fabricated, and uniquely designed to meet the specific demands of a single project. However, when these demands result in unique components that cannot be easily adapted to other contexts, their reusability becomes limited by their design trace. Therefore, components should be designed with universality in mind, meaning they can be applied across multiple projects. As such, traces resulting from overly specific design choices should be minimized (Baldwin, 2023).

** Student note: Sanding belt-effect*

An anecdote I would like to share: when working at my father's workshop in my hometown, I always loved using the sanding belt. It could smooth even the roughest or most heavily glued pieces of wood. Whenever my father was around, he would say - in an eastern Dutch dialect: *"Weet je dat zeker? Hij gaat hartstikke snel en weg is weg."* ("Are you sure about that? It goes very fast, and once it's gone, it's gone.").

I therefore refer to 'reduction as trace' as the sanding belt-effect: every time a piece of material is customised, its future potential is reduced because it decreases in size, takes on custom shapes, or contains perforations.

Kit-of-parts

“A kit-of-parts is a set of prefabricated and standardized elements that are easy to manufacture and assemble using standardized connections” (Taylor et al., n.d.). Kit-of-parts architecture involves organizing the millions of individual parts in a building into assemblies of standard, easy-to-manufacture components, sized for convenient handling or according to shipping constraint. Consequently, the construction of the building is generally carried out at the assembly level rather than the individual part level. This approach requires considerably more thought at the architectural conceptual design phase, as well as close coordination between architect, engineers, manufactures and builders. Howe (1999) further explains that a kit-of-parts construction is a special form of prefabrication because it allows repeated assembling and disassembling according the need. Prefabrication techniques arose from three basic needs that traditional building methods could not meet: rapid construction with minimal effort, the ability to produce unusually large numbers of buildings at low cost, and the need for periodic renewal.

Part 3. Results / introduction

This chapter presents the outcomes of the research-by-design process, combining insights from precedent studies, site analysis and technical exploration into a proposal for a kit-of-parts system for temporary housing.

- 3.1 Precedent insights
- 3.2 Site analysis: Kanaalzone-Zuid
- 3.3 Spatial design and housing typology
- 3.4 Pilot site
- 3.5 System development
- 3.6 Catalogue
- 3.7 Building sequence
- 3.8 1:1 model

3.1 Precedent insights

In the course of this research, several case studies were examined to identify a project that could serve as a meaningful precedent for circular, temporary housing. The selection focused on key parameters including demountability, the use of timber structures, and strategies for material retention. In this chapter, a selection of these cases is briefly discussed, highlighting aspects that play a major role in subsequent design steps.

At the end of this report - in Appendix I: *System Development (prologue)* - the reader will find a detailed analysis of a selected case study: Wisperweide (Circlewood & ABT & OMA & Studio A Kwadraat). This document maps the components of its kit-of-parts approach.

Wisperweide school completed in 2025, represents a realized project for circular, adaptable architecture. Its foundation lies in a 3,6x3,6x3,6 meter grid, establishing a clear modular system that enables flexibility in layout and future transformation. The use of dry connections reinforces this approach, allowing components to be assembled and disassembled without loss of material value, supporting reuse.



Peter Zumthor / Swiss Sound-box pavilion (2000)

The pavilion measured 50x50x9 meters and showcased an innovative use of timber. After demounting, the value of the lumber increased, as every piece remained unscathed. The structure relied solely on springs and steel tensioners for fastening, making it a fully dry assembly without permanent fixings.

However, as a pavilion, the project did not account for building regulations, limiting its applicability as a conventional or long-term structure.



IF_DO / The Hithe (2021)

The project was realised on a modest budget, transforming a redundant site into a productive *meanwhile use* for 11 years. It functioned as a social hub and landmark, with a demountable design intended to ensure long-term adaptability. The structure minimised new concrete by reusing the existing foundation, and its timber frame and services were left exposed, emphasising both honesty in construction and material efficiency.

No end-of-life plan was established, and securing funding proved difficult, as the structure held little value without ownership of the underlying land. Meanwhile use meant it could not serve as a permanent community fixture. Demountability still needs to be proven.

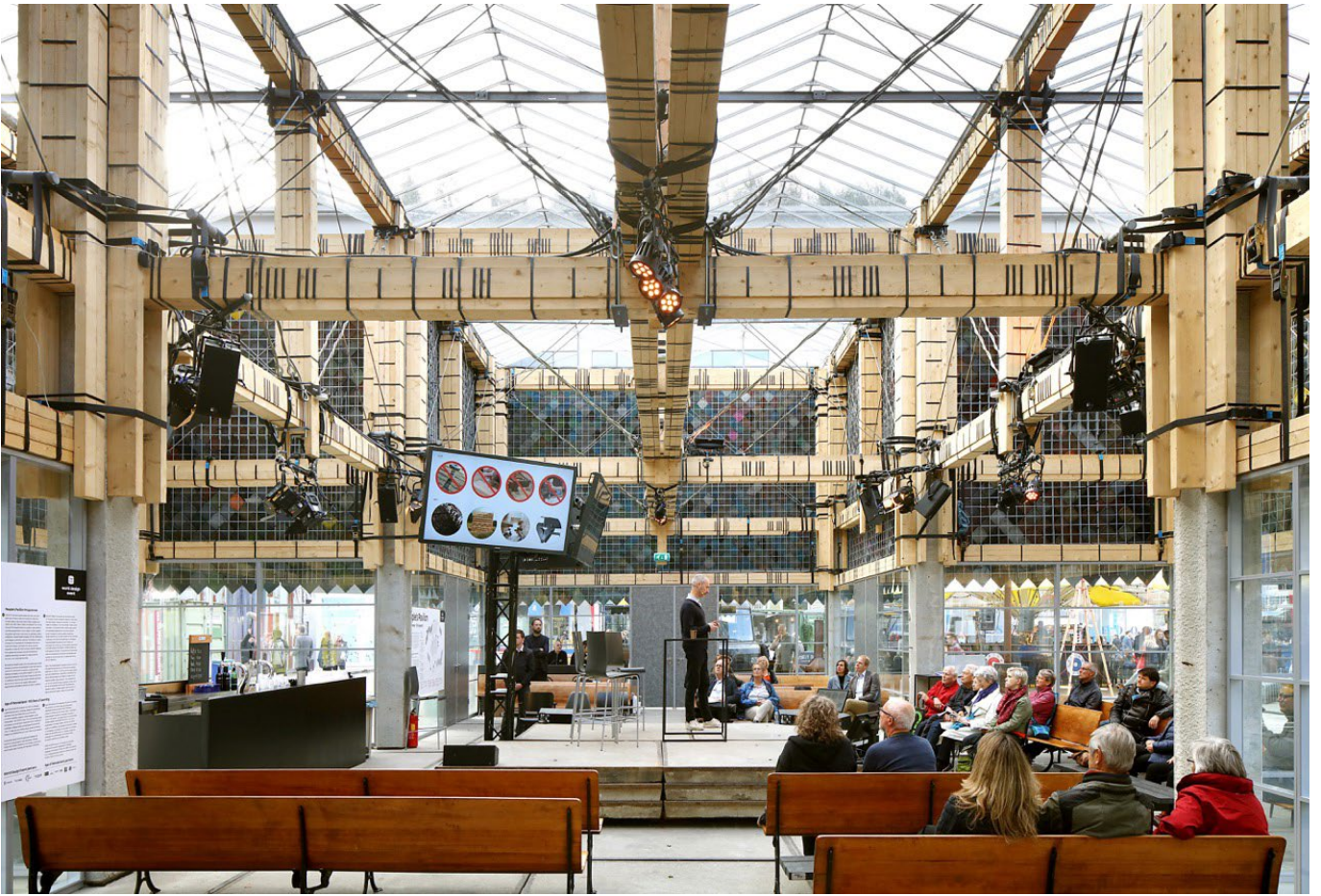


Thermobau GmbH / Austrian imported houses (1949 -)

Geschiedenis Kijkduin (n.d.)

Each house *package* was delivered on two train wagons. Once the terrain and basic infrastructure, such as foundations and sewage, were prepared, a house could be assembled in just two to three days.

However, the design required generous spacing between units due to fire safety concerns. These '*thermowoningen*' made only a modest contribution to post-war reconstruction, but they now have protected status.



Overtreders W & bureau SLA / People's Pavilion (2018)

Image by Jeroen van der Wielen and Filip Dujardin

The pavilion was 100% borrowed, meaning all connections were fully dry and materials unscathed. As a pavilion, building regulations were not taken into account. Traditional suppliers were involved, often located at considerable distances. Since most materials were returned after its nine-day deployment, the transportation impact was effectively doubled, indicating that a smaller sourcing radius would have been preferable. Finally, the tension straps used for assembly were cut during disassembly and could not be reused.



Cepezed / Temporary Court (2016-2021, 2025-today)

Image by Léon van Woerkom

The building was dismantled and rebuilt in Enschede, where it serves as a university facility. Its structure allows for repositioning of interior walls, and its temporary nature does not detract from its quality. Approximately 95% of the materials were reused and all components and assembly were recorded in a 3D model.

However, the materials have been stored for four years in between the locations. The structure also incorporates concrete and synthetic fabrics.



Segal Houses (*Walter Segal self-build method*)

Image by John McKean

In 1962, the German Walter Segal needed temporary accommodation for his family in London. To achieve this, he developed a housing system on paving-slab foundations in just two weeks on a modest budget. His aim was to ensure that after use, the house could be easily dismantled and the materials recycled or sold. Subsequent projects arose by private clients, who were impressed by the speed and economy of the system.

The method involves simply-constructed timber frames (post-and-beam) with bolted connections, requiring no wet trades. Most of the work can be carried out by a single person with basic carpentry skills, although assistance may be needed for the roofing and installation of services. This also means that only simple tools are required (e.g. hammer, saw, drill). Additionally, readily available materials in standard sizes are used, minimizing cutting and waste. The system has proven to work for buildings up to three floors (Grahame et al., 2021).

The houses could be improved mainly in terms of energy efficiency, acoustics, moisture protection and fire safety to meet modern building standards.



Natrufied Architecture / De Warren (2023)

Image by editors ArchiNed

De Warren is one of the best-known recent examples of collective and cooperative housing in the Netherlands. Located on Centrumeiland in IJburg, Amsterdam, it was developed by the future residents themselves and is considered Amsterdam's first self-build housing cooperative. Approximately one third of the total floor area is dedicated to communal functions, including a shared living room, co-working space, silent room, maker space, music studio, and guest rooms. As a result, the apartments could be designed very compactly. However, none of the dwellings include dedicated entrance halls or night halls, which increases the risk of noise disturbance between spaces. Some units also feature narrow, elongated living rooms of approximately 2,8 meters in width.





3.2 Site analysis: Kanaalzone-Zuid

Although the area framework created by OpenEindhoven is very elaborate, there is still considerable room for speculation. Through a quick analysis and discussions with an expert, a pilot site was selected for testing the graduation project.

A few options were considered: the use of in-between spaces, green spaces, or building sites under development (see figures 5-7).

Inspired by the precedent The Hithe (p. 38), the latter is particularly interesting because projects such as The Hithe demonstrate how meanwhile-use plots can accommodate temporary housing interventions. In addition, these sites often already contain (underground) infrastructure and foundations that can be reused, saving both time and costs. The temporary character of these sites also aligns well with the temporary nature of the kit-of-parts system. As development progresses, the kit-of-parts can be disassembled and relocated elsewhere (see figure 8); for a second round of collective housing or - when demand changes - the materials can be returned to the building material cycle.

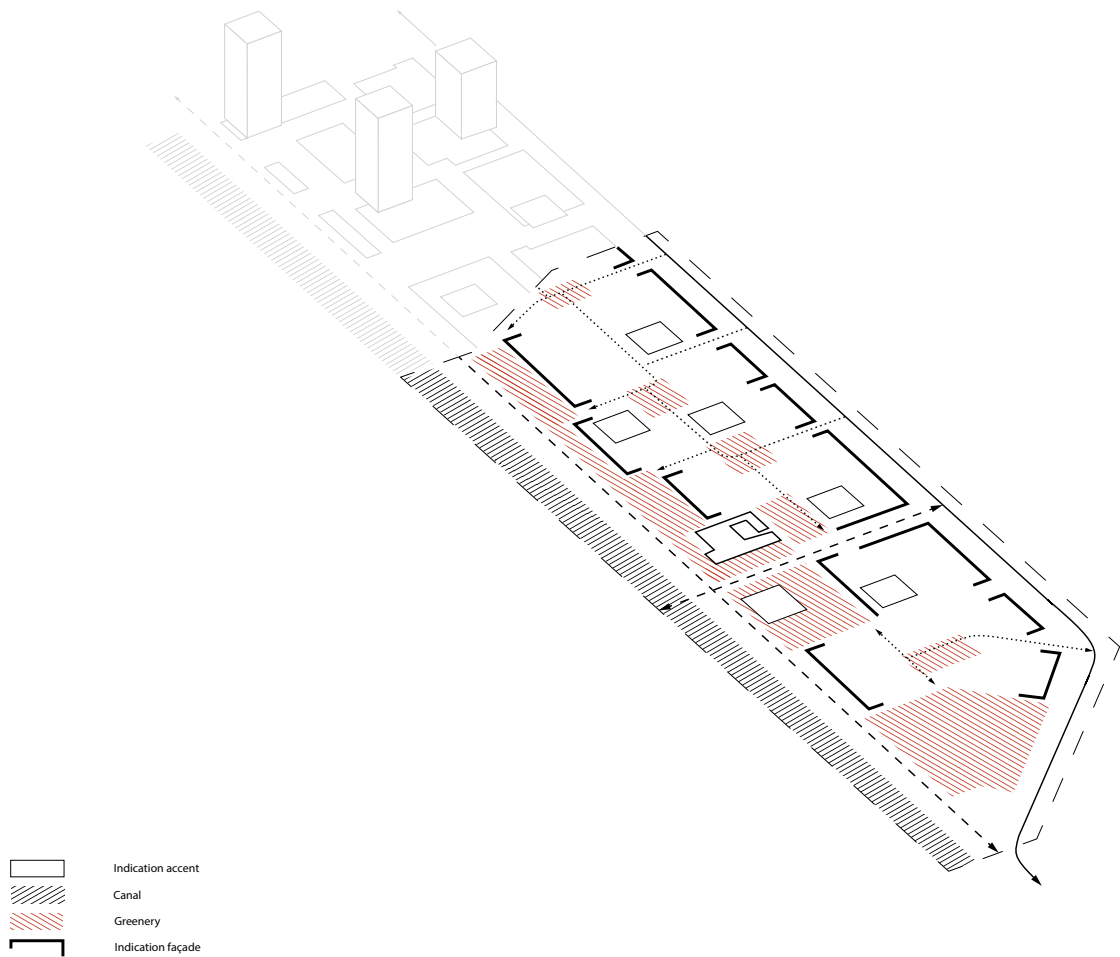


Figure 5 - Isometric: area framework map highlighting planned greenery (own work, 2026)

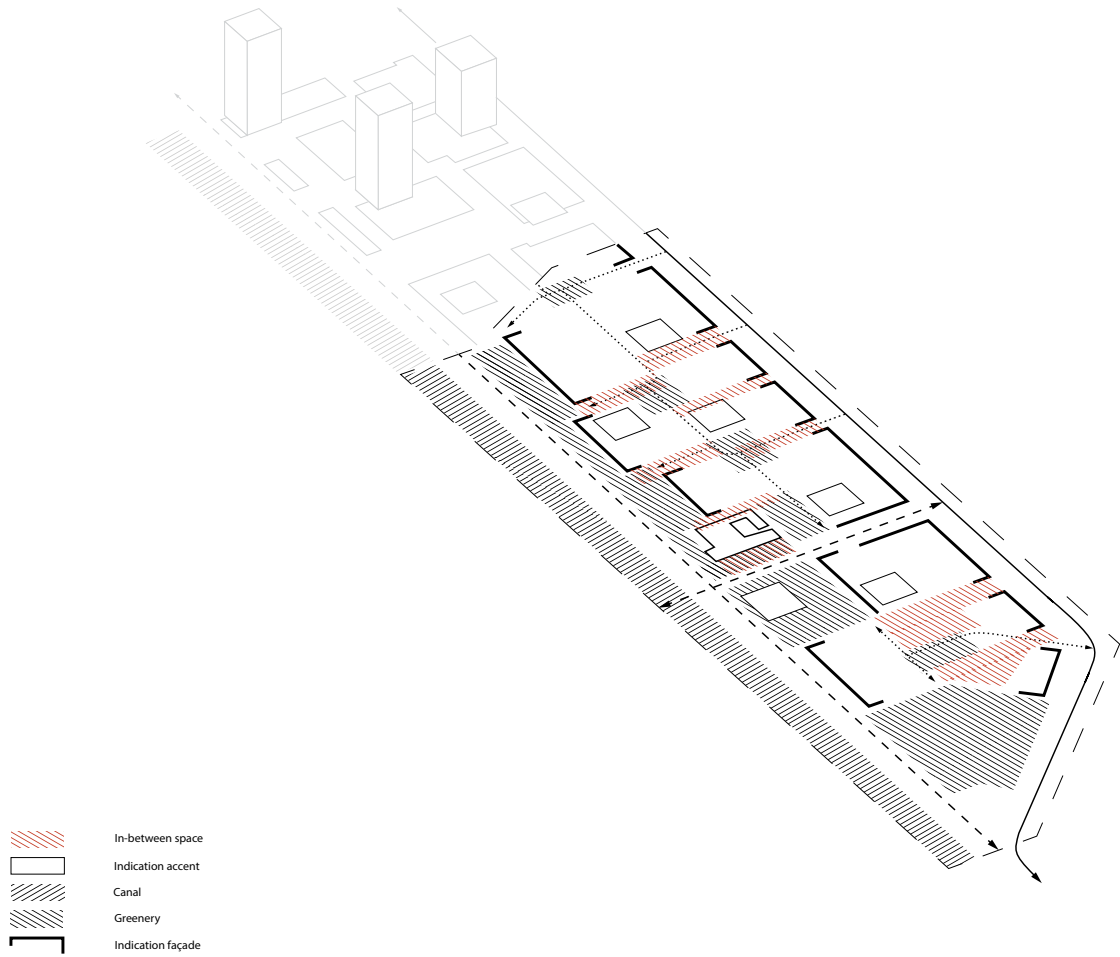


Figure 6 - Isometric: area framework map highlighting in-between space (own work, 2026)



Figure 7 - Isometric: area framework map indicating square meters per plot (own work, 2026)

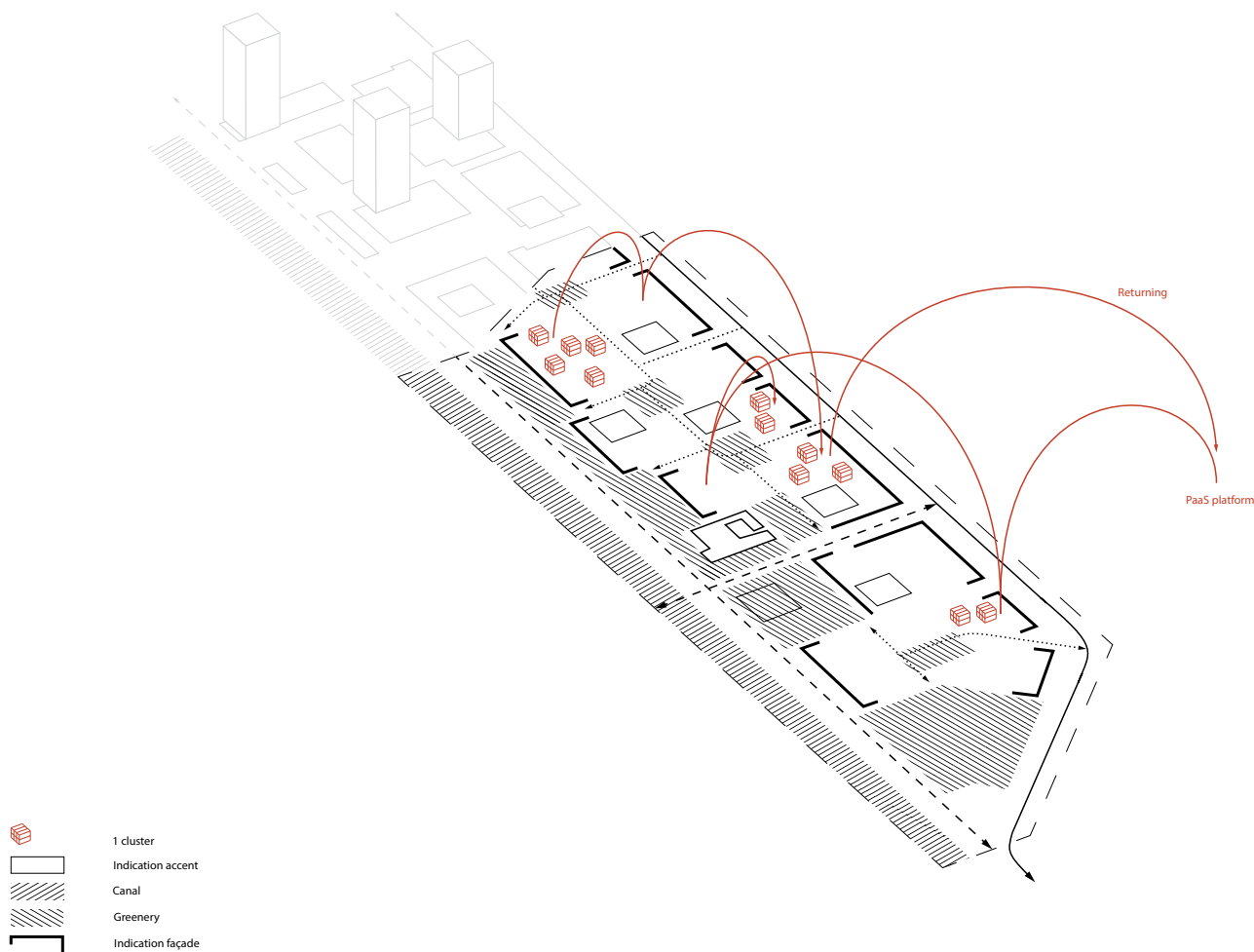


Figure 8 - Isometric: area framework map indicating 'moving' (own work, 2026)

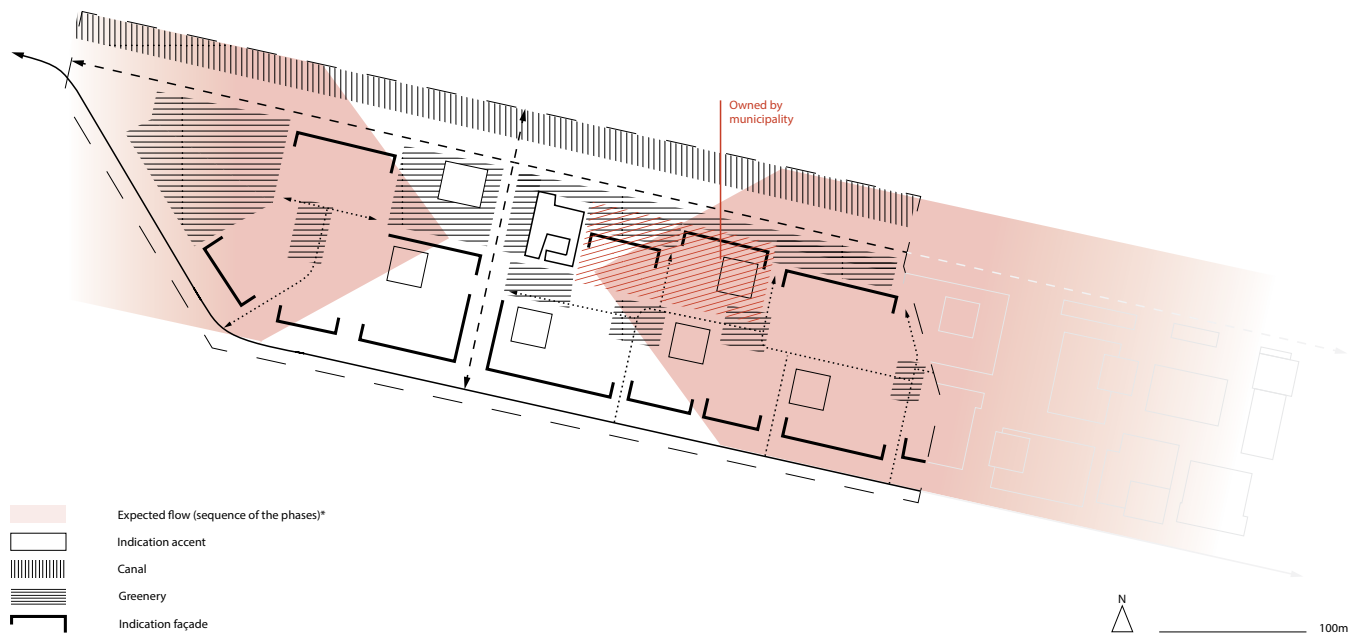


Figure 9 - Area framework map indicating 'flow', based on speculation by an expert (own work, 2026)

3.2

/ pilot site

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The chosen site for testing the kit-of-parts is 4,200 m² in size, approximately 70m in depth and 60m in width. As indicated in figure 10, most of the area is occupied by office- and shed-like buildings, whose existing cast concrete floor will be reused during the occupation of the kit-of-parts. Chosen due to its easy access via both Lucas Gasselstraat and Gabriël Metsulaan. The latter will be transformed into a pedestrian and bicycle lane, including a canal bridge, providing easy access to the industrial park to the north.

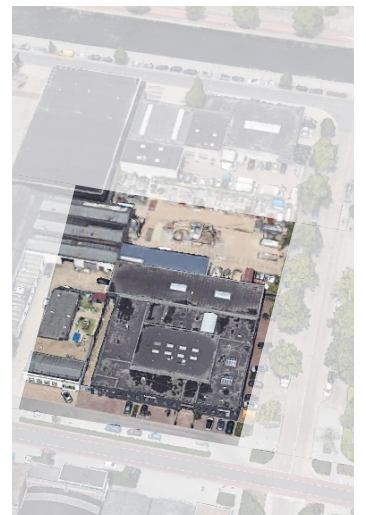


Figure 10 - (pilot) site today (Google Maps 3D)

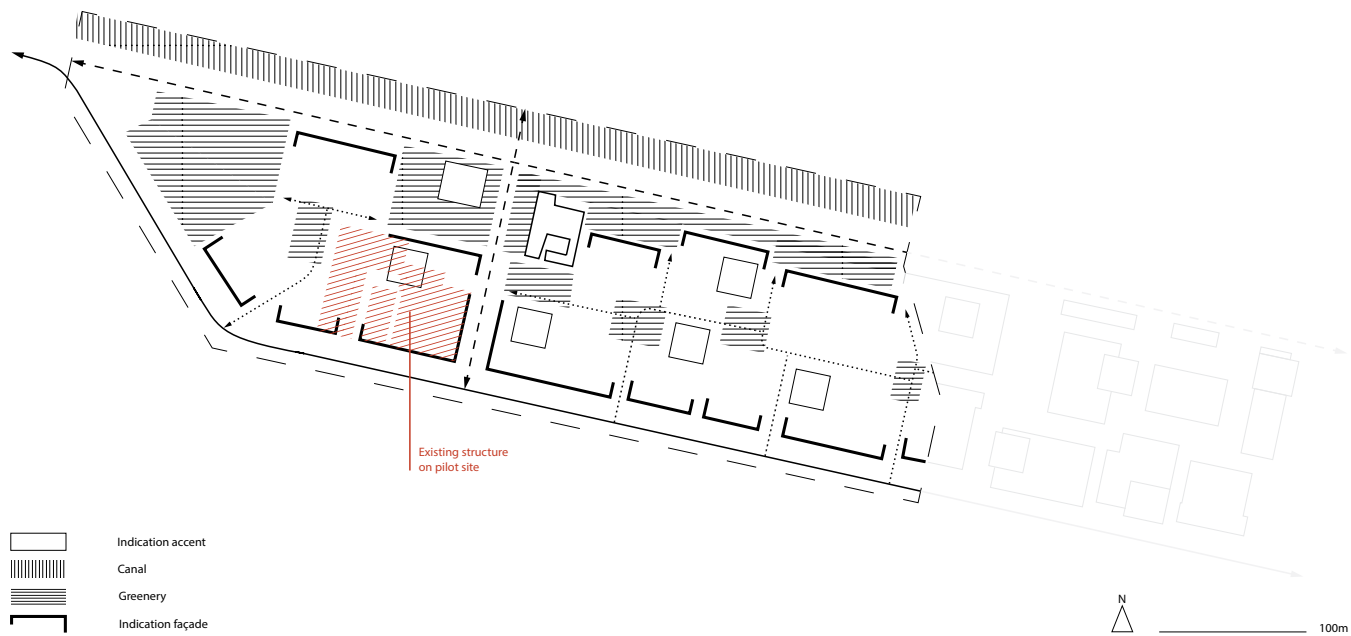


Figure 11 - area framework map indicating pilot site / existing foundation (own work, 2026)



Gabriël Metsulaan (own image, 2026)



de Caai (own image, 2026)

3.3 Spatial design and housing typology

The Wisperweide School is based on a structural grid of 3,6x3,6 meters. The first step was to determine which beam section could achieve this span without becoming excessively heavy.

According to the Dutch Working Conditions Decree, the maximum weight that may be lifted manually by one person is 25 kg, and 50 kg when lifted by two persons. However, the decree also advises that manual handling should be avoided wherever possible. Within this project, a limit of 20 kg per person (40 kg for two persons) was adopted to provide additional safety margins and improve ease of handling.

A spruce beam (C24) with a cross-section of 75x250 mm is sufficient to span the required distance. Following further advice, a rectangular grid of 3,6x2,4 meters was developed instead of a square grid. The 2,4 dimension is derived from standard building measurements of 400 and 600mm width, improving material efficiency.

Collective housing and assembly

The kit-of-parts system is designed to be assembled collectively. As discussed on p. 25 (*Temporary housing - Temporary Housing – Temporary Homes, User Preferences*)

and Sharing) and p. 29 (*Self-assembly, ownership and stewardship*), this approach is considered valuable for several reasons. First, self-assembly can foster a greater sense of responsibility and ownership towards the components. Second, collective construction enables participants to share knowledge, skills, and experience, allowing expertise to circulate within the group and making more complex tasks achievable through collaboration. Third, collective forms of building and living can provide both social and economic advantages, particularly during certain stages of life.

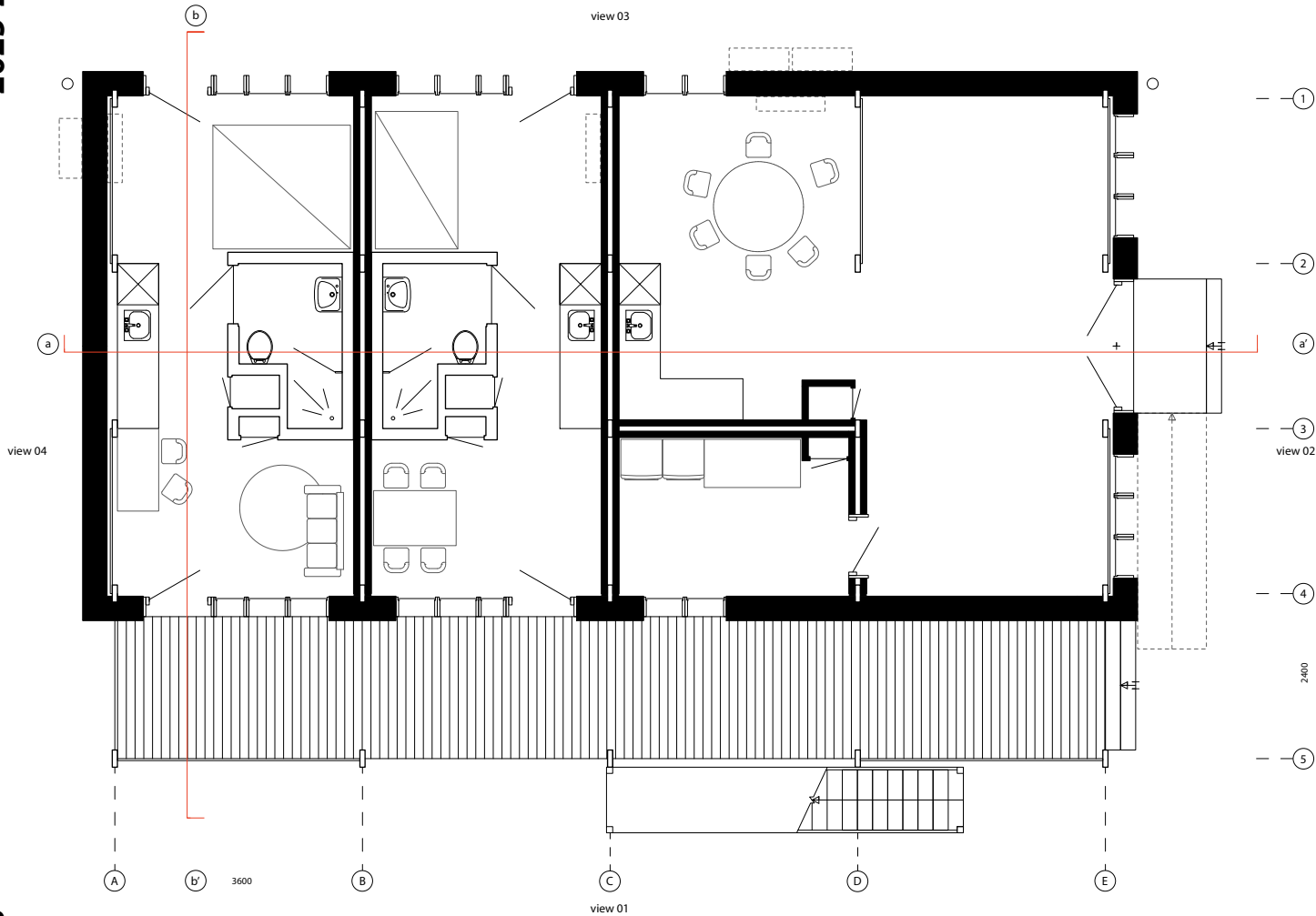
Based on the ideas of De Warren (p. 44), a building program was developed consisting of compact studios designed for an even number of residents, in which 30% of the total floor area is allocated to collective space. The choice for an even-numbered configuration is based on the assumption that building activities can consistently be organised in pairs, thereby aligning with manual handling weight restrictions.

The collective spaces include a spacious shared kitchen, while the remaining areas are intentionally left flexible for self-infill and user-driven preferences. This approach corresponds with the ideas of Overtoom et al. (2023) as discussed on p. 25 (*Temporary Housing – Temporary Homes, User Preferences and Sharing*), in which it is argued that spatial preferences vary when different meanings of *home* are valued. Each collective housing will therefore develop its own specific set of needs and priorities

The result is a cluster of six 26m² studios and one 52m² collective space, which includes a kitchen and a separate space for amenities. The nave is reserved for kitchens and sanitary facilities. Because of these volumes, the studio is 'separated' into a front (living) and back (sleeping) space; emphasising privacy (see figure 12). The outdoor space also serves as circulation, keeping the whole compact.

Bathroom and kitchen-unit

The design is intended for self-assembly by non-professionals. Given this target group, it has been decided to accommodate users by providing the bathroom and kitchen units as fully prefabricated elements. These units are therefore delivered as complete modules, reducing on-site complexity and ensuring consistent quality.



1:100 plan 0 (own work, 2026)

1:100 plan +1 (own work, 2026)

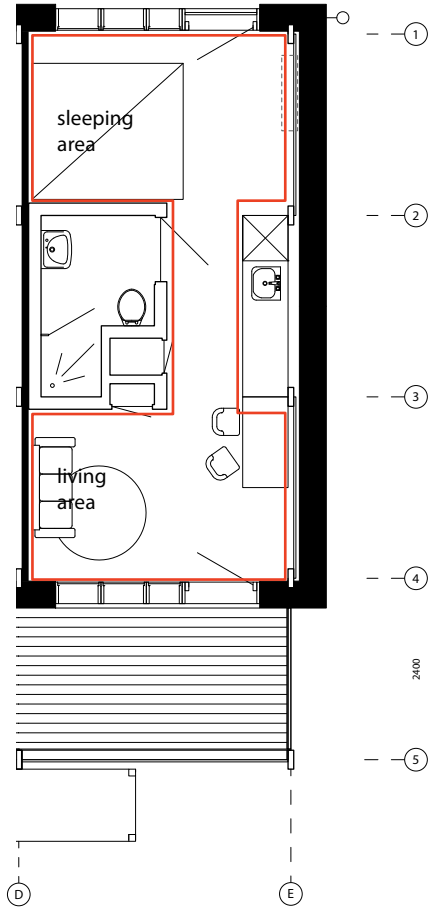
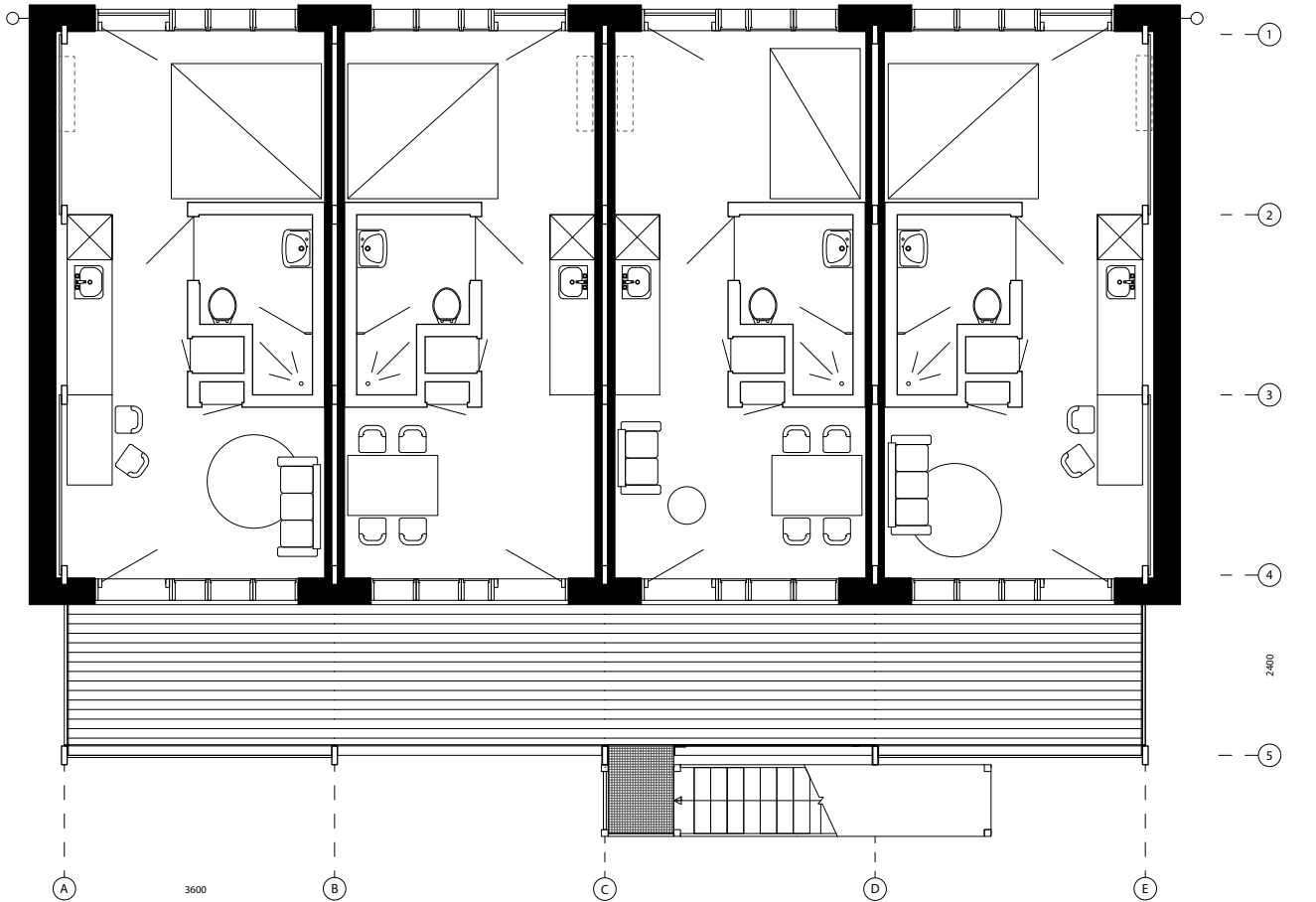
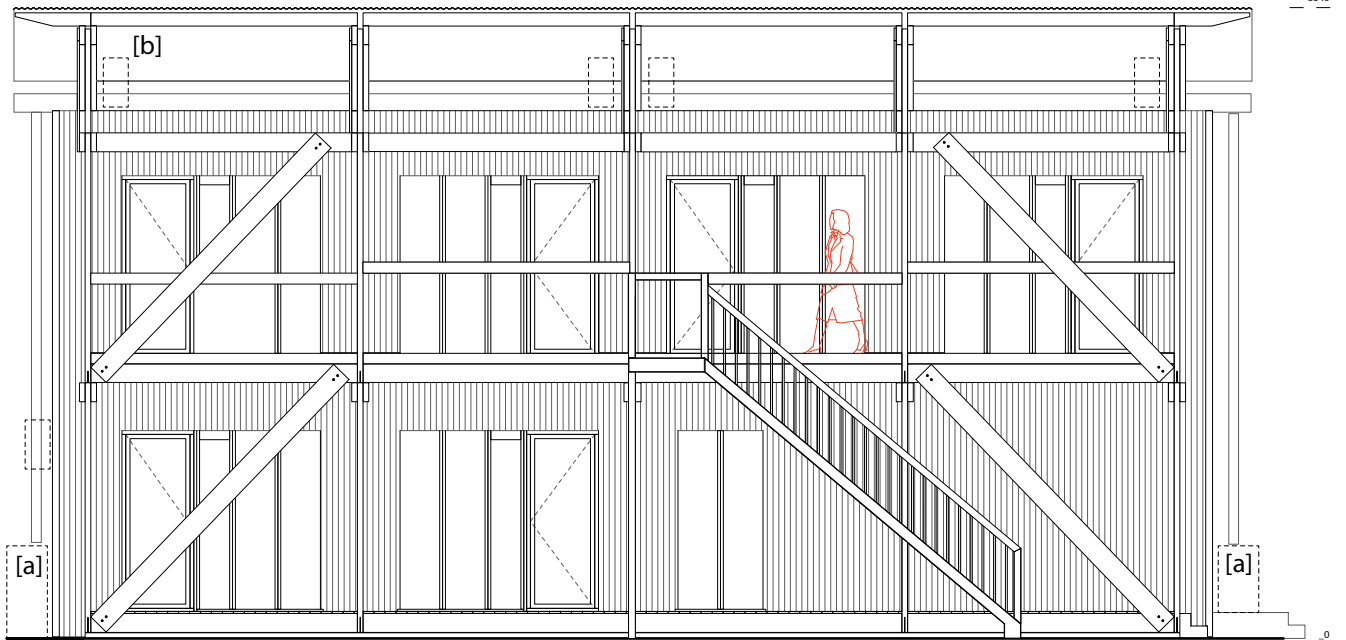


Figure 12 - 1:100 studio plan (1) (own work, 2026)



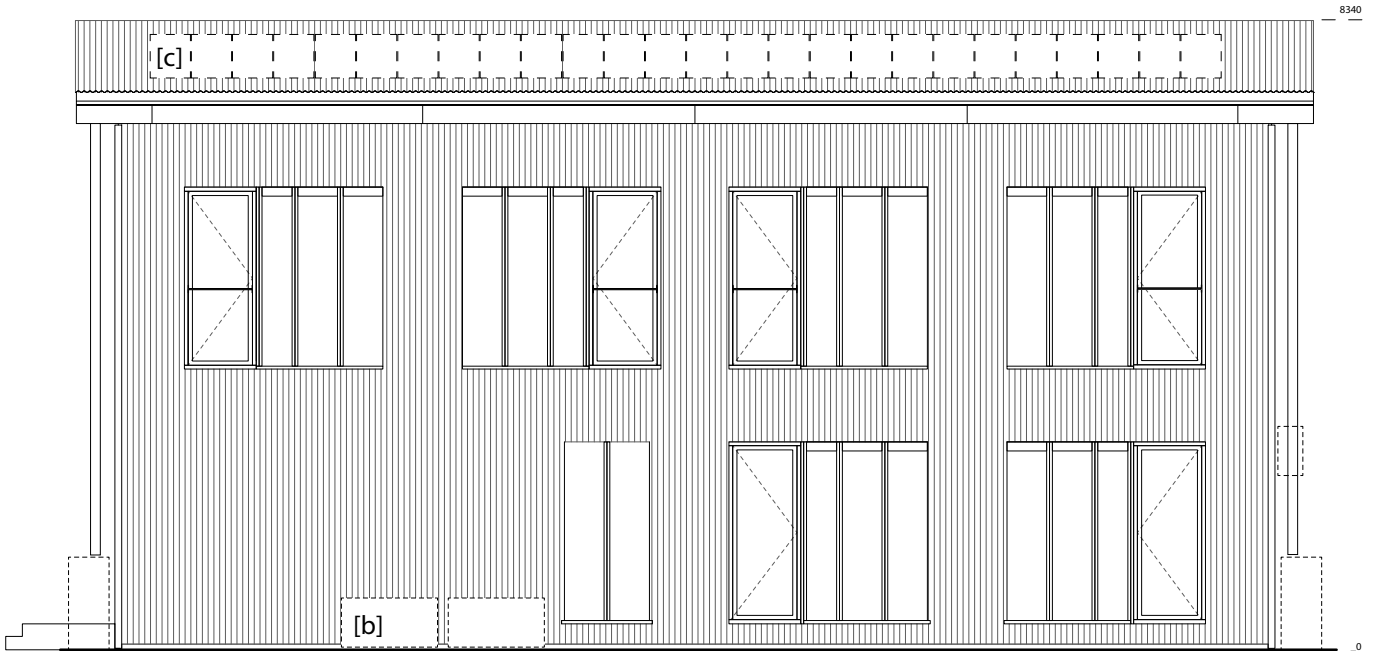
Visual - interior (own work, 2026)





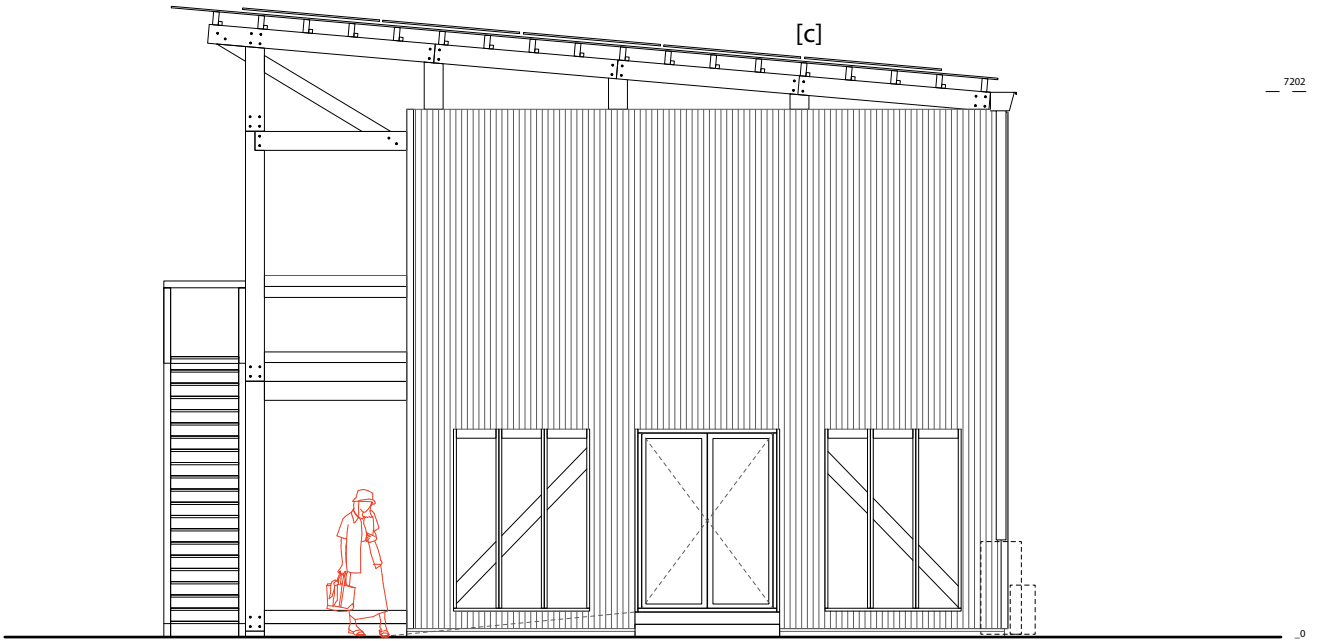
[a] rainwater barrel, [b] aircondition units (standing/hanging), [c] solar panels

1:100 view 01 (own work, 2026)



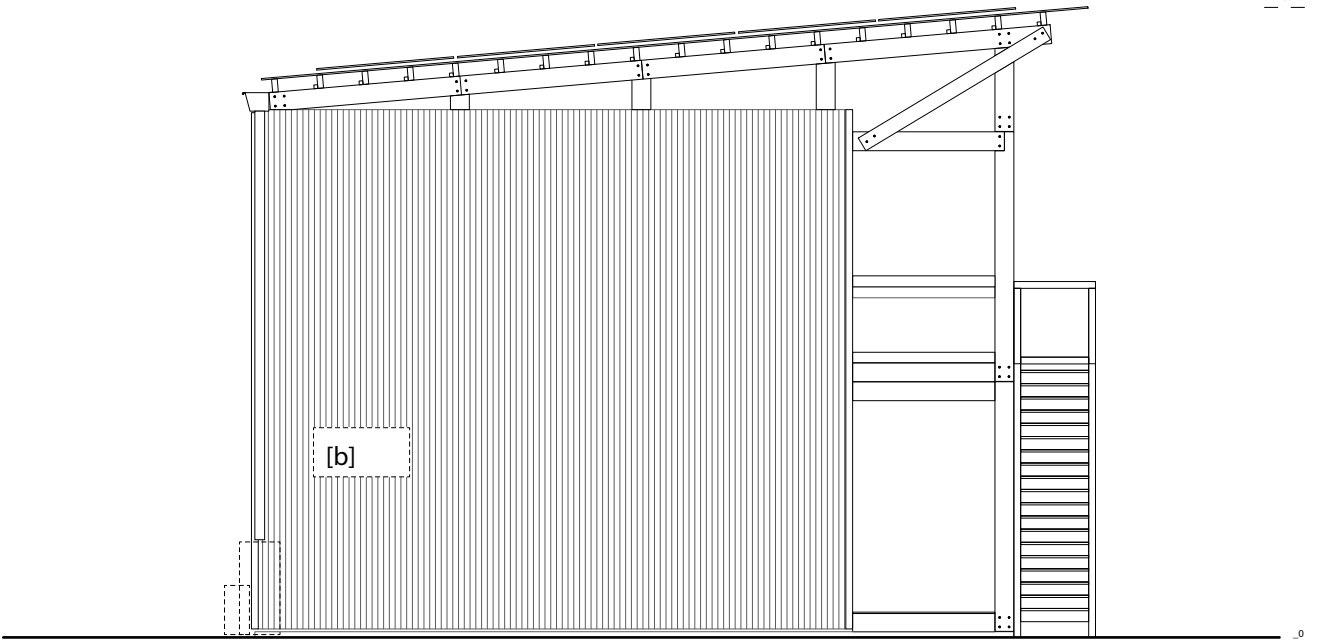
[a] rainwater barrel, [b] aircondition units (standing/hanging), [c] solar panels

1:100 view 03 (own work, 2026)



[a] rainwater barrel, [b] aircondition units (standing/hanging), [c] solar panels

1:100 view 02 (own work, 2026)



[a] rainwater barrel, [b] aircondition units (standing/hanging), [c] solar panels

1:100 view 04 (own work, 2026)

3.4 Pilot site

The assembly of the clusters is inspired by a CPO project in Vredeoord, Eindhoven, characterised by a friendly and coherent composition of collective housing (see figure 13). Several design principles have been taken into account:

1 Logistical flow

The design considers the dimensions of a small crane truck with a container system. As the collective space functions primarily as a workplace during construction and assembly, this side of the cluster must remain easily accessible. The truck can enter the site via Lucas Gasselstraat.

2 Private orientation

The private side (sleeping) of the clusters is oriented away from the plot, minimising visual exposure and enhancing individual domestic privacy. Due to densification, an exception had to be made; however, this unit (a) has also been carefully positioned to safeguard privacy as much as possible.

3 Collective orientation

The collective side (living) of the clusters is oriented towards the interior of the plot, reinforcing a shared spatial focus and strengthening the sense of community.

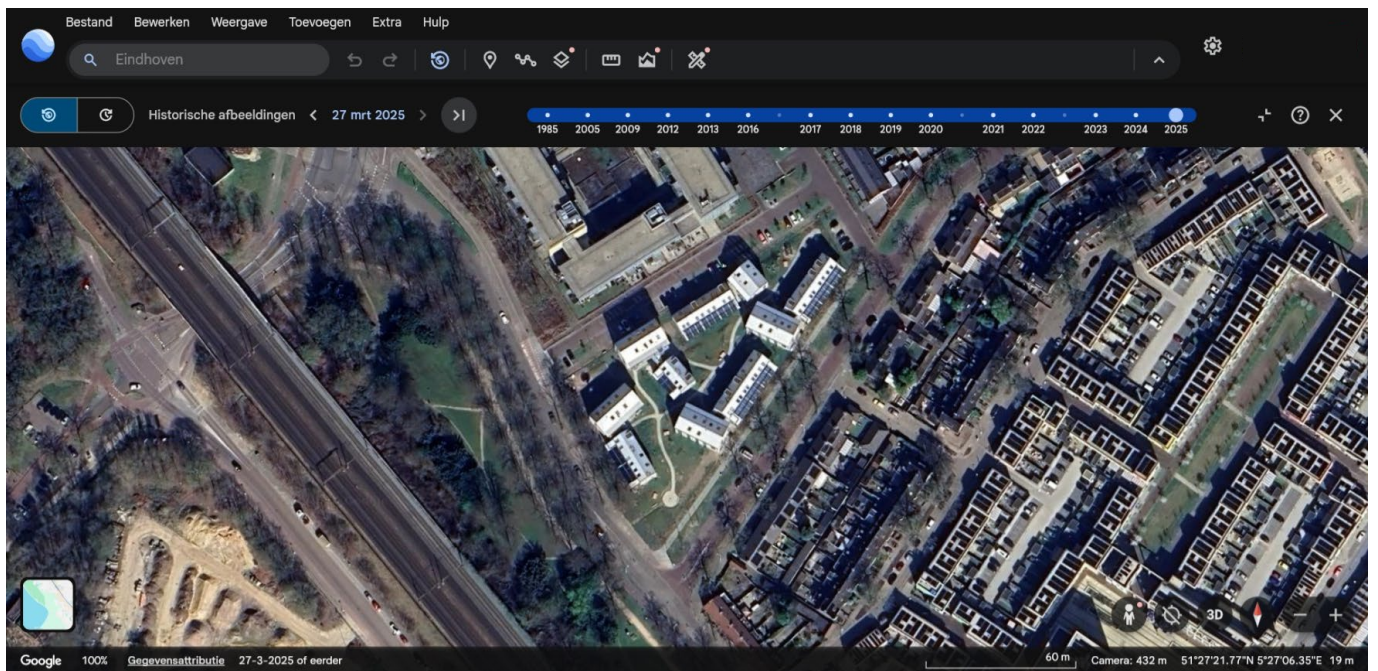
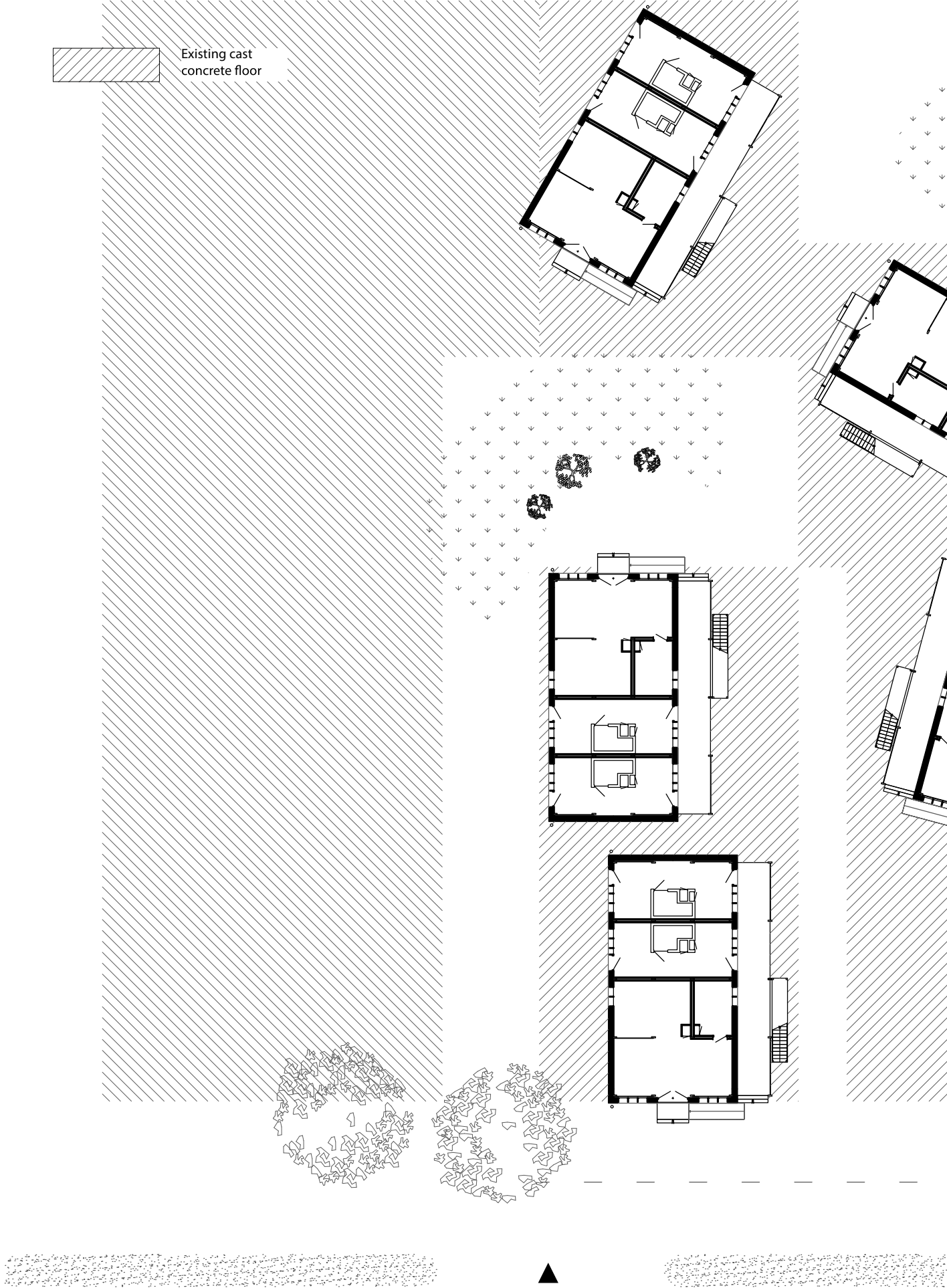
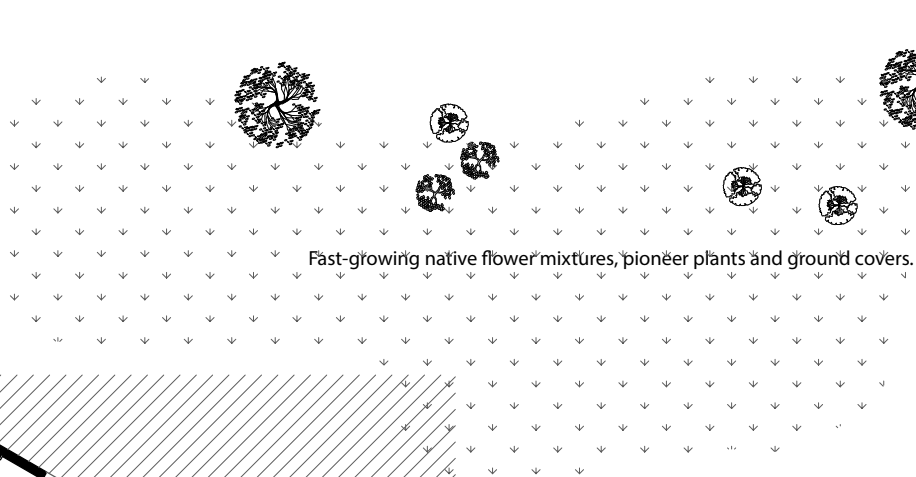


Figure 13 - aerial view of CPO Meer&Deel, Vredeoord, Eindhoven (Google Earth, 2026)

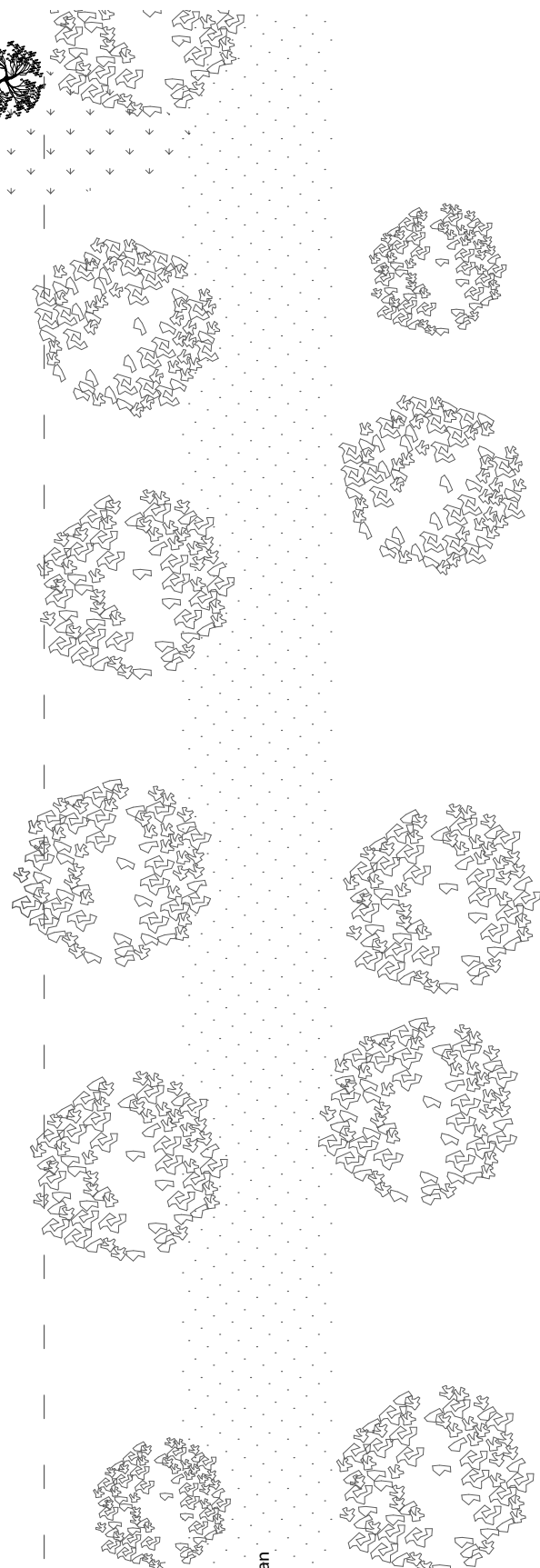
The *randomness* of the assembly may not be the most space-efficient solution for the pilot site, but it is a consciously made choice. When it comes to placemaking, I believe creating an assembly like this will provide great value for the residents, fostering a sense of community and independence.



1:300 (scaled down)
pilot site
(own work, 2026)



Fast-growing native flower mixtures, pionier plants and ground covers.



Gabriël Metsulaan



3.5 System development

After the grid (3,6x2,4 meters) was established, the first design step focused on the floor system. In Wisperweide, CLT slabs were used. However, a 100 mm thick CLT element weighs approximately 5 kN/m², meaning that a single grid module already weighs nearly 1,000 kg. Given the strict handling limit of 40 kg (for two persons), it quickly became clear that the floor would need to be composed of separate, lightweight elements.

A brief exploration was conducted into the development of modular floor component, with the aim of reducing the number of assembly steps, based on the premise that minimizing assembly steps may improve the efficiency and simplicity of the construction process. However, due to weight constraints, this approach proved unsuccessful in the context of the floor design (see figure 14).

Throughout the building sequence, a stacked construction logic is applied. This choice is based on the intention to establish a legible assembly sequence and to enable a high degree of repeatability within the kit-of-parts system, following the logic of Walter Segal's method (p. 42). As a result, each building layer - as

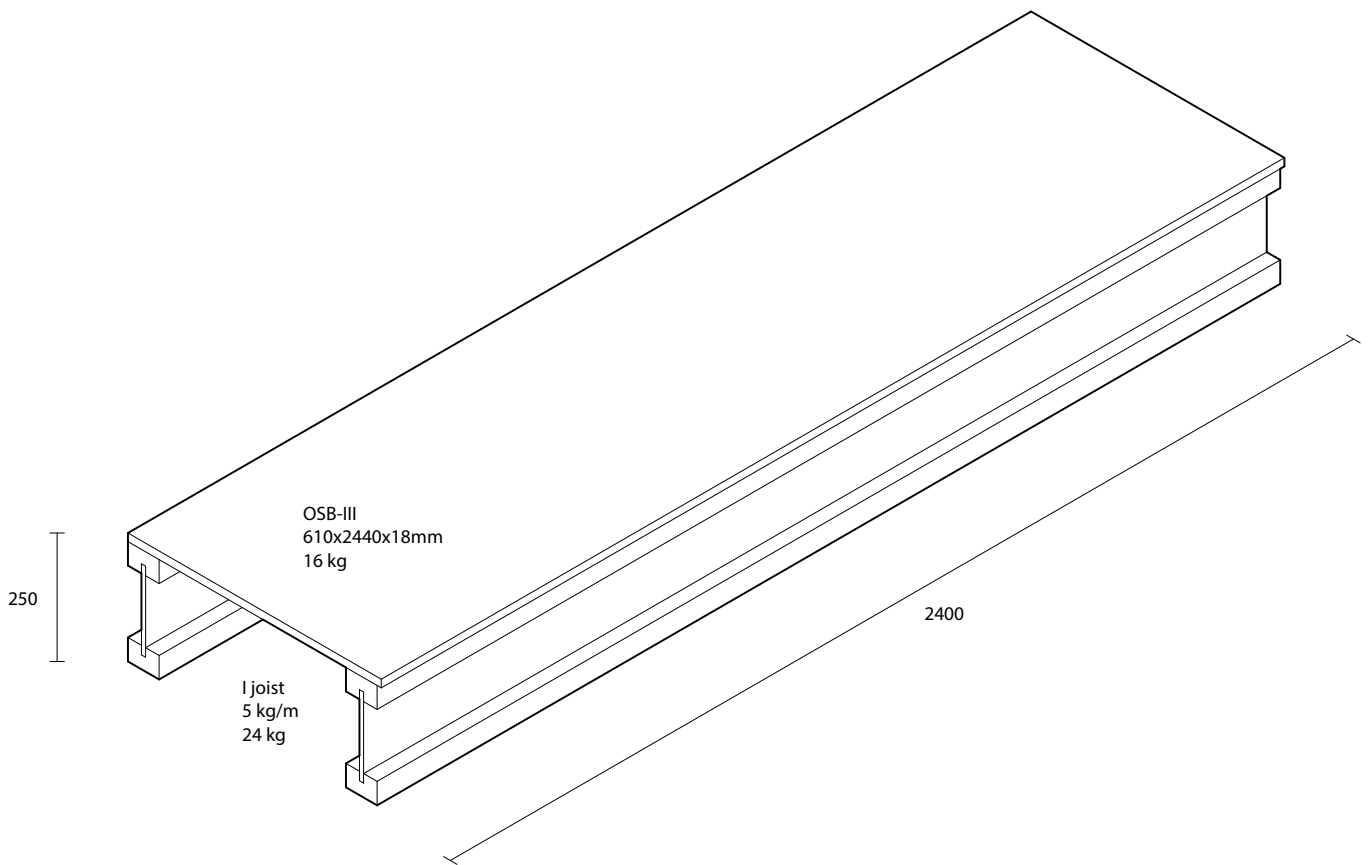


Figure 14 - Exploration floor module (own work, 2026)

69

understood through the concept of “Shearing Layers” introduced by Stewart Brand (1995) - is treated as an independent system throughout the design process.

This results in a post-and-beam structure in which, in one direction, two beams are connected to either side of the column, after which the floor beams are placed on top in a stacked configuration. This logic is repeated throughout the entire structure, with the aim of applying as few exceptional principles as possible.

During the design of the façade, a exploration was conducted into the development of modular components. To, once again, aim on reducing the number of assembly steps. The result is a box-like module (see figure 15), measuring 3,3 meter in height and weighing 40 kg. The module consists of an interior layer, insulation, an exterior layer, and two I-joists.

The box is based on the principle of the sandwich-panel: a lightweight yet strong construction panel consisting of two rigid outer layers (typically steel or aluminium) with an insulating core (PIR, PUR, or EPS) in between, commonly used for roofs, façades, and walls.

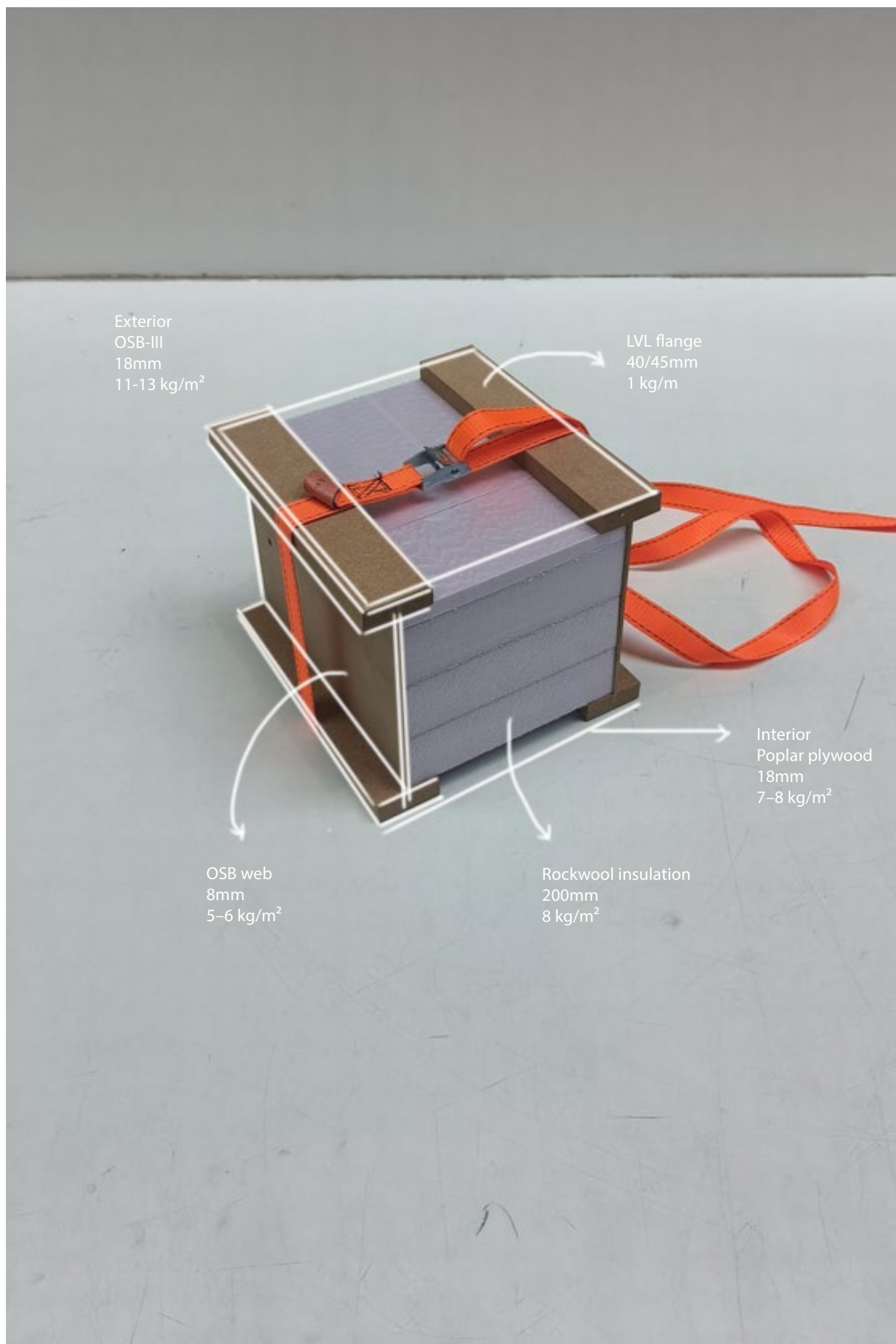


Figure 15 - Prototype façade module (own work, 2026)

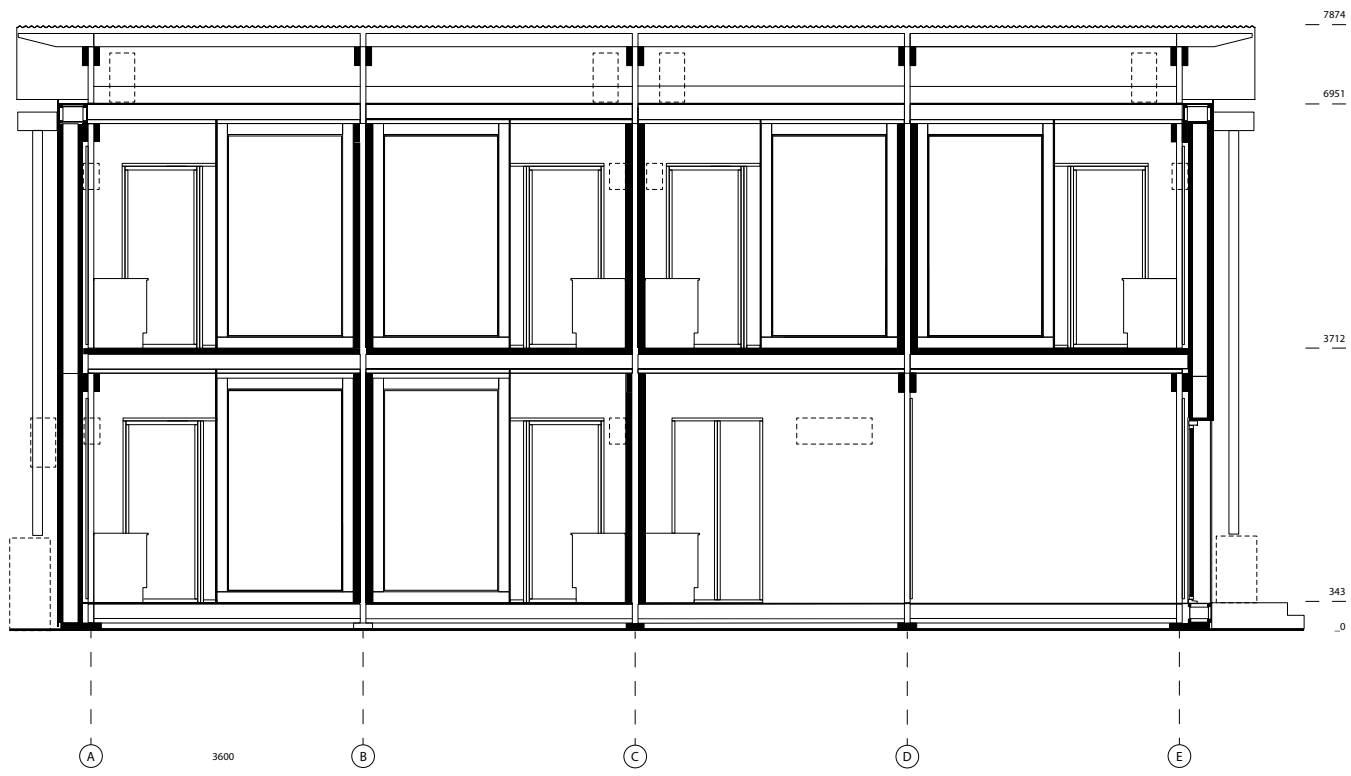
However, sandwich-panels proved insufficient in terms of sound insulation, flexibility for integrating electrical and plumbing infrastructure, and complex detailing. In addition, an important consideration concerns circularity. Due to their bonded structure, the recycling of the panels remain limited. Therefore, the following design principles were adopted in the reinterpretation of the sandwich-panel. First, lightweight materials are used. Second, materials are dry-connected rather than bonded. Third, a more sustainable insulation material is applied.

Standard measurements were considered throughout the entire design process. The width of the module is based on the subdivision of standard timber sheet dimensions. The exterior of the box is clad with 18mm OSB-III, selected for its structural performance and durability. In contrast, poplar plywood is applied to the interior. Compared to OSB-III, 18mm poplar plywood is significantly lighter in weight, although also softer. Nevertheless, it contributes to a calmer and more serene interior atmosphere within the relatively compact living spaces, whereas OSB surfaces tend to create a visually busy appearance. Rockwool insulation is clamped to the inner side of the box. The choice for Rockwool is based on its wide availability (e.g. through hardware stores) as well as its favourable weight-to-insulation-value ratio.

I-joist

Knowledge derived from previous design research on modular assemblies informed the use of I-joists in this project. Compared to solid C24 timber beams, timber I-joists provide a more material-efficient solution due to their lower self-weight and higher stiffness-to-weight ratio, enabling larger spans and easier integration of services. However, solid C24 beams offer advantages in terms of robustness, simplicity in detailing, and ease of assembly. An I-joist is constructed from two flanges and a web.

To replicate each studio throughout the cluster, a roof-under-roof logic has been applied. A pitched roof was recommended to ensure proper water drainage. By treating the roof as a separate element, the required roof angle can be achieved without introducing complex detailing (see figure 16). In addition, a prefab, steel



1:100 section aa' (own work, 2026)

1:100 section bb' (own work, 2026)

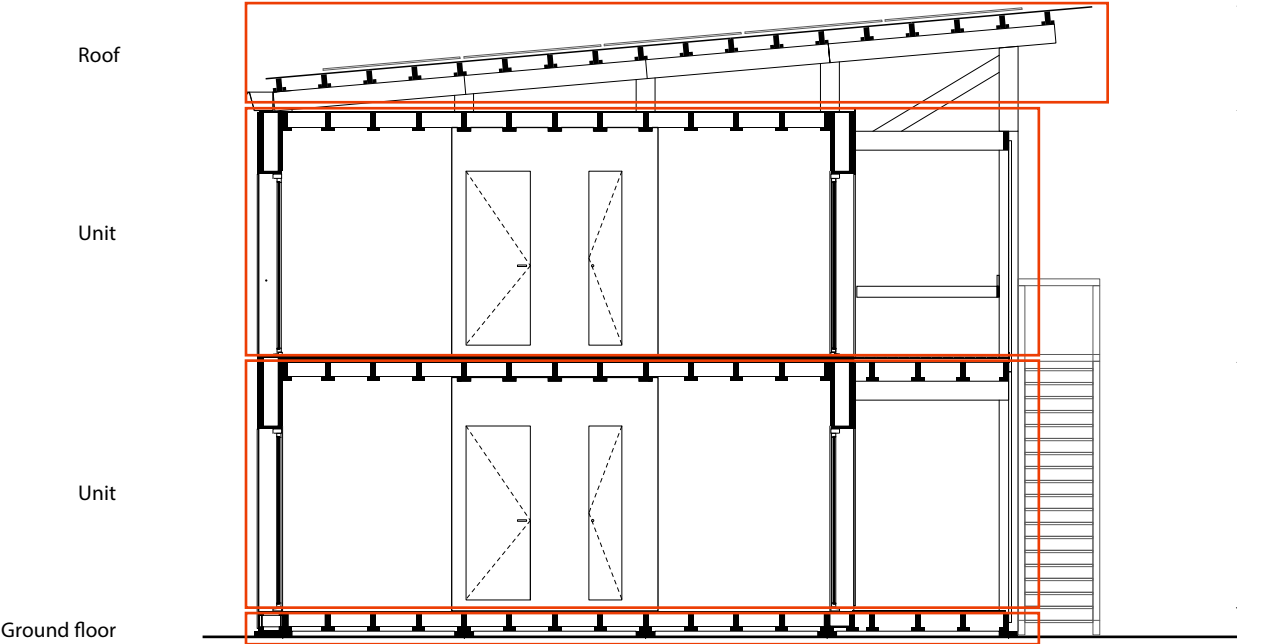


Figure 16 - Roof-under-roof logic (own work, 2026)

staircase is positioned just outside the gallery in response to fire regulations and emergency escape requirements.

Refined locking bolt

Continuing the development of the box, a connection detail had to be designed to attach the box to the timber structure. A solution was sought in which the box could 1) arrive on site as a complete element, and 2) remain perforated as little as possible. The first objective relates to the intention of minimizing the number of assembly steps, while the latter refers to the concept of “reduction of trace,” as discussed on p. 30.

Several possibilities were explored. Figure 19 shows a diagram of an open-box solution, which ultimately proved unsatisfactory. Figure 20 illustrates a diagram of what is referred to here as a refined tool clamp. This option reduced the number of open boxes by allowing adjacent boxes to be connected to one another. The clamp was inspired by a simple tool clamp found in a hardware store* (see figure 17). However, this solution applied clamping forces to the most vulnerable part of the I-joist: perpendicular to the web, from web to web.

Figure 21 presents the option that was ultimately implemented in the further development of the design. Inspired by a standard locking bolt commonly available in hardware stores, this solution allows the boxes to remain closed while requiring only minimal perforation. The head of the bolt clamps two boxes against the timber structure, after which the connection is secured using an M10 nut.

** Student note: Hardware Store*

The project draws on the logic of the everyday hardware store, where available standard materials form a reference for a more immediate and accessible construction culture within existing material flows.



Figure 17 - Tool clamp (GAMMA®)



Figure 18 - Locking bolt (GAMMA®)

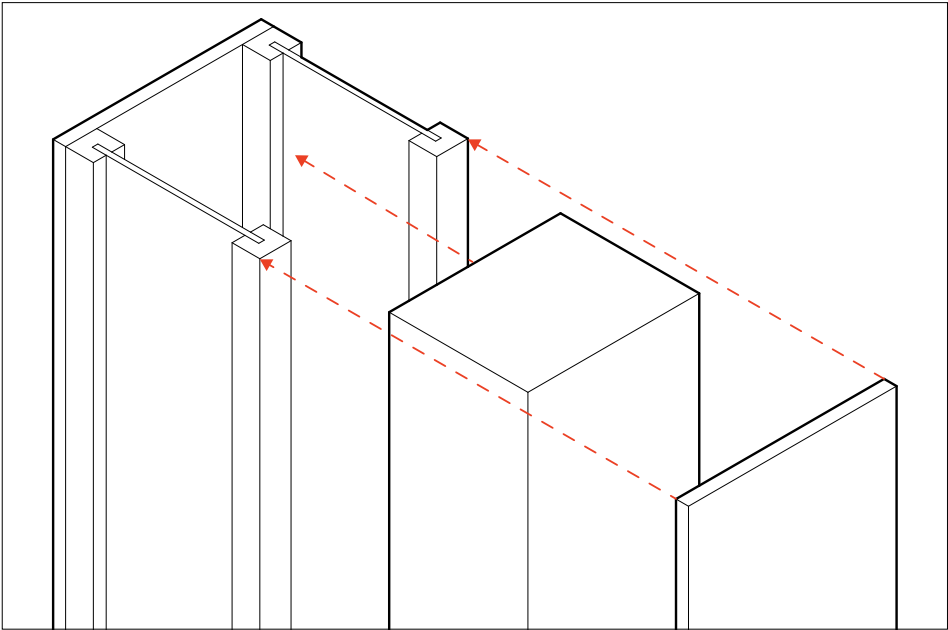


Figure 19 - Open box (own work, 2026)

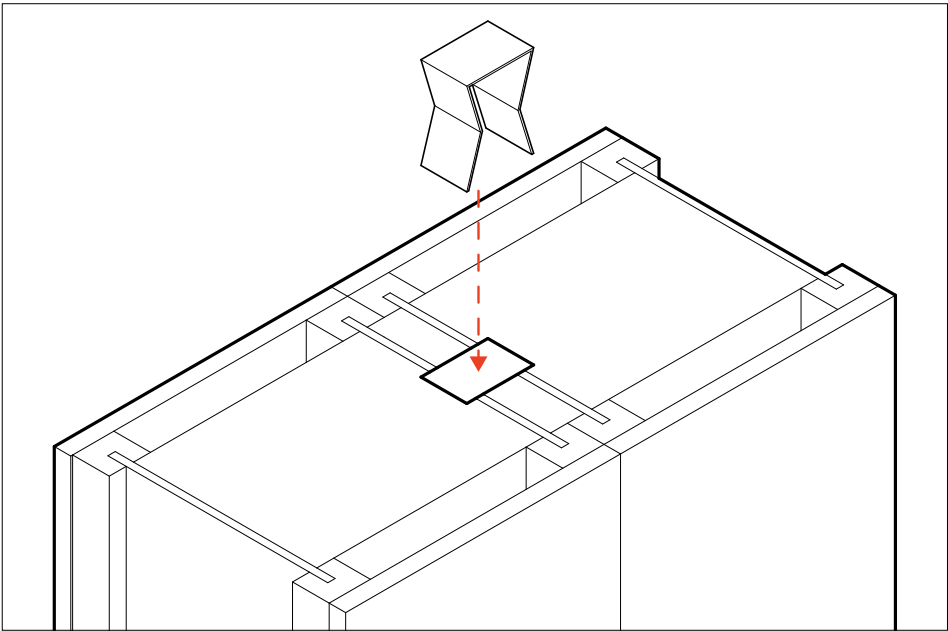


Figure 20 - Refined tool clamp-concept (own work, 2026)

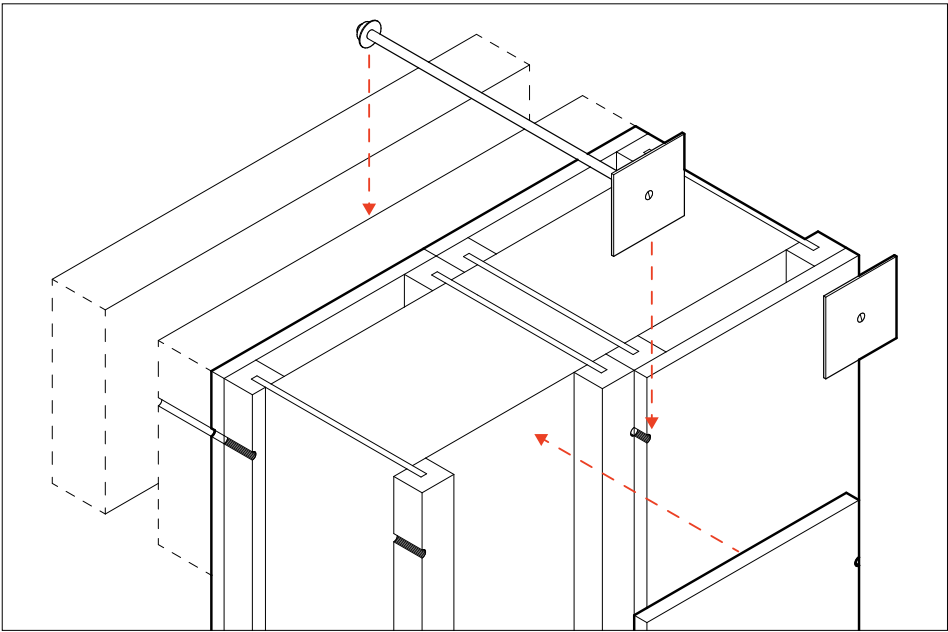
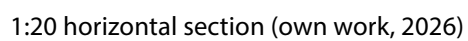
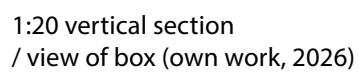
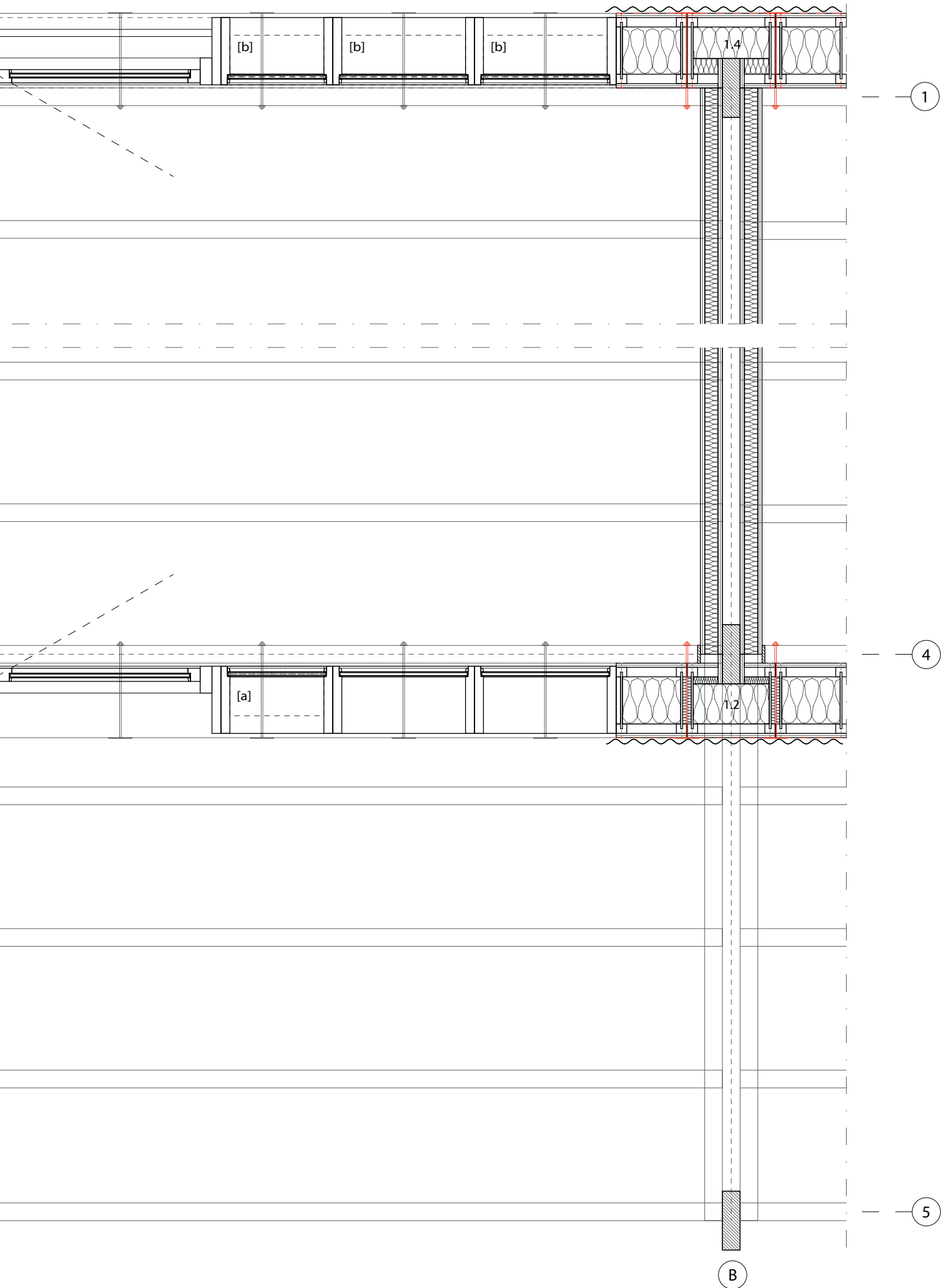
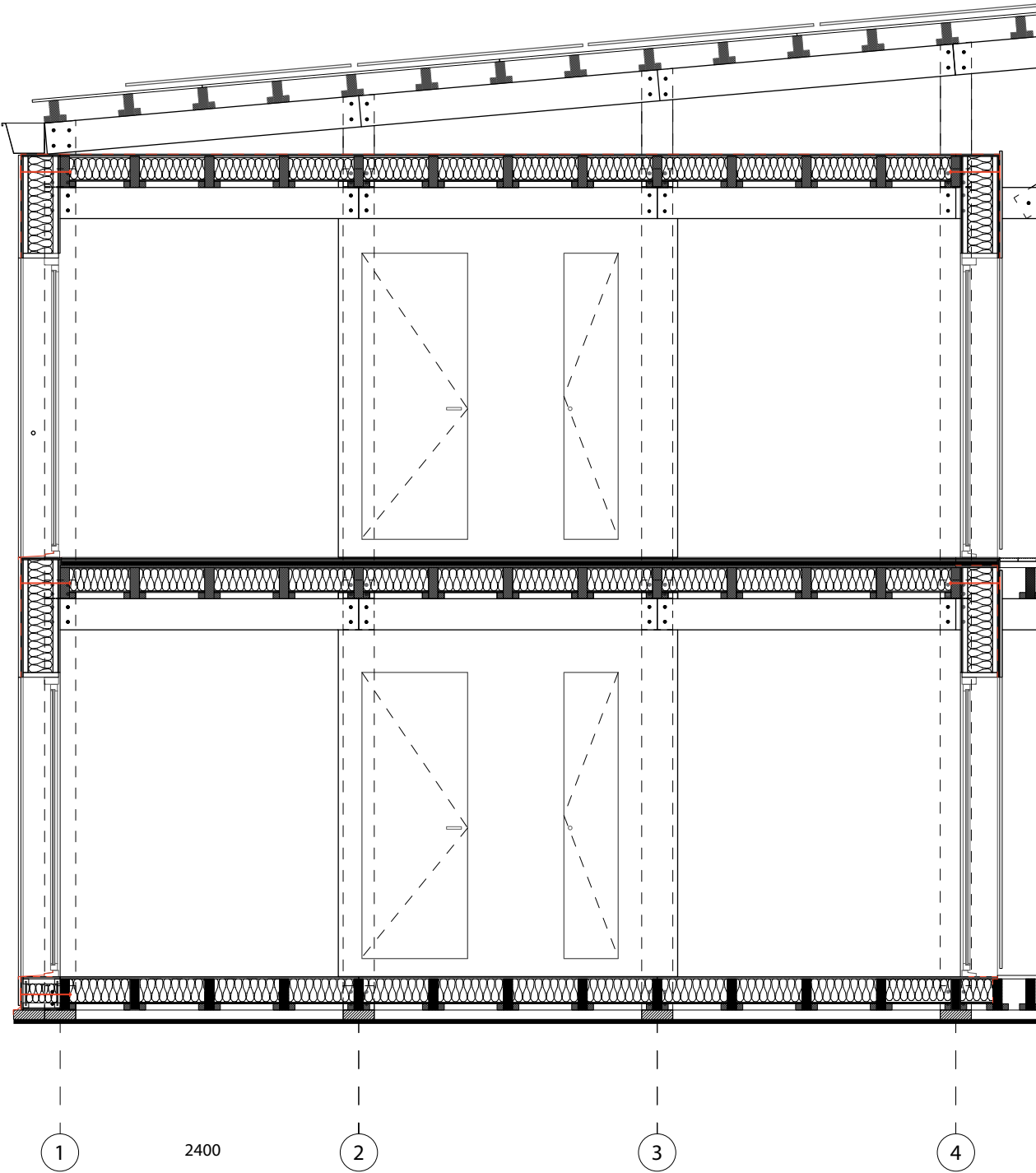


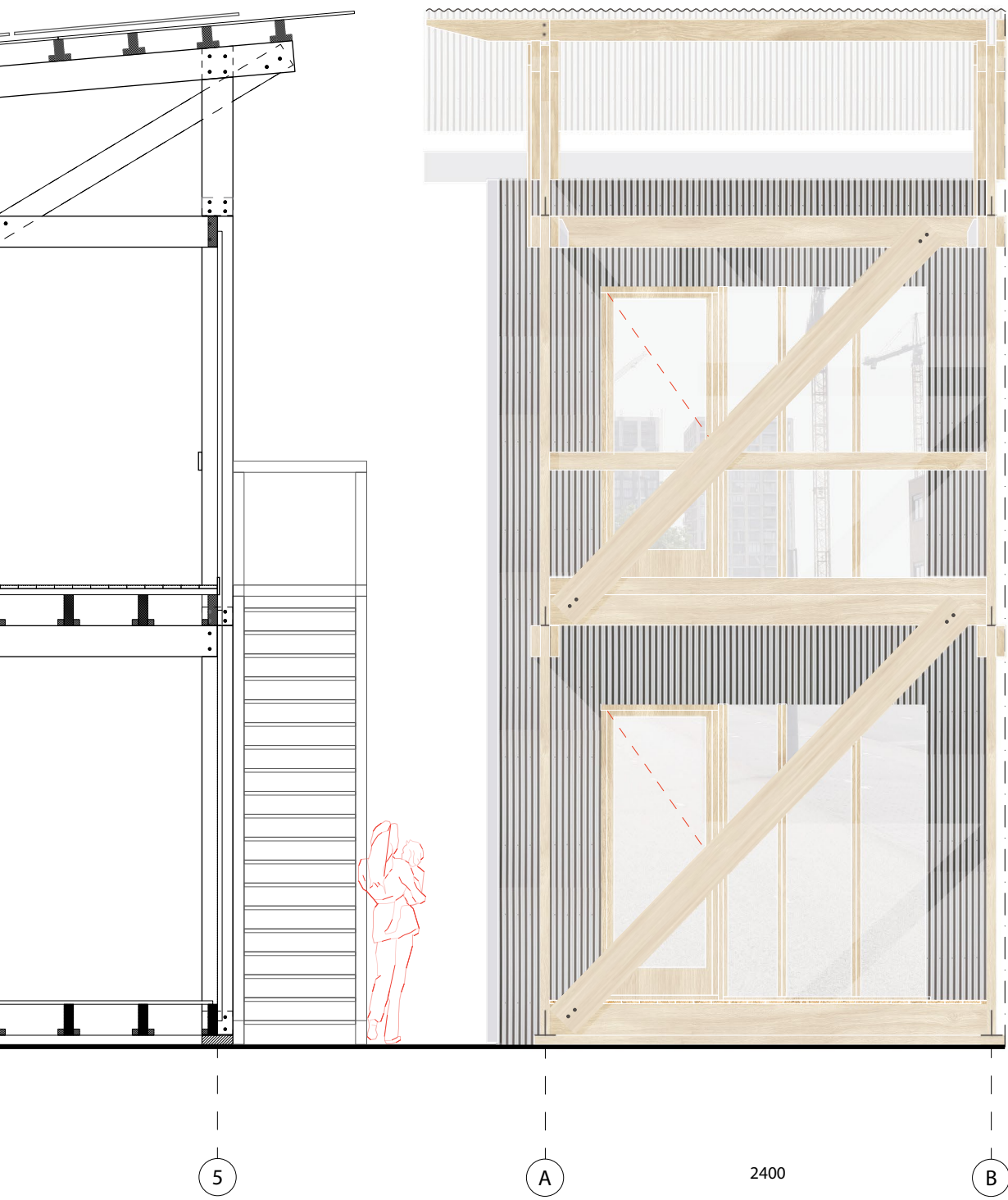
Figure 21 - Refined locking bolt (own work, 2026)

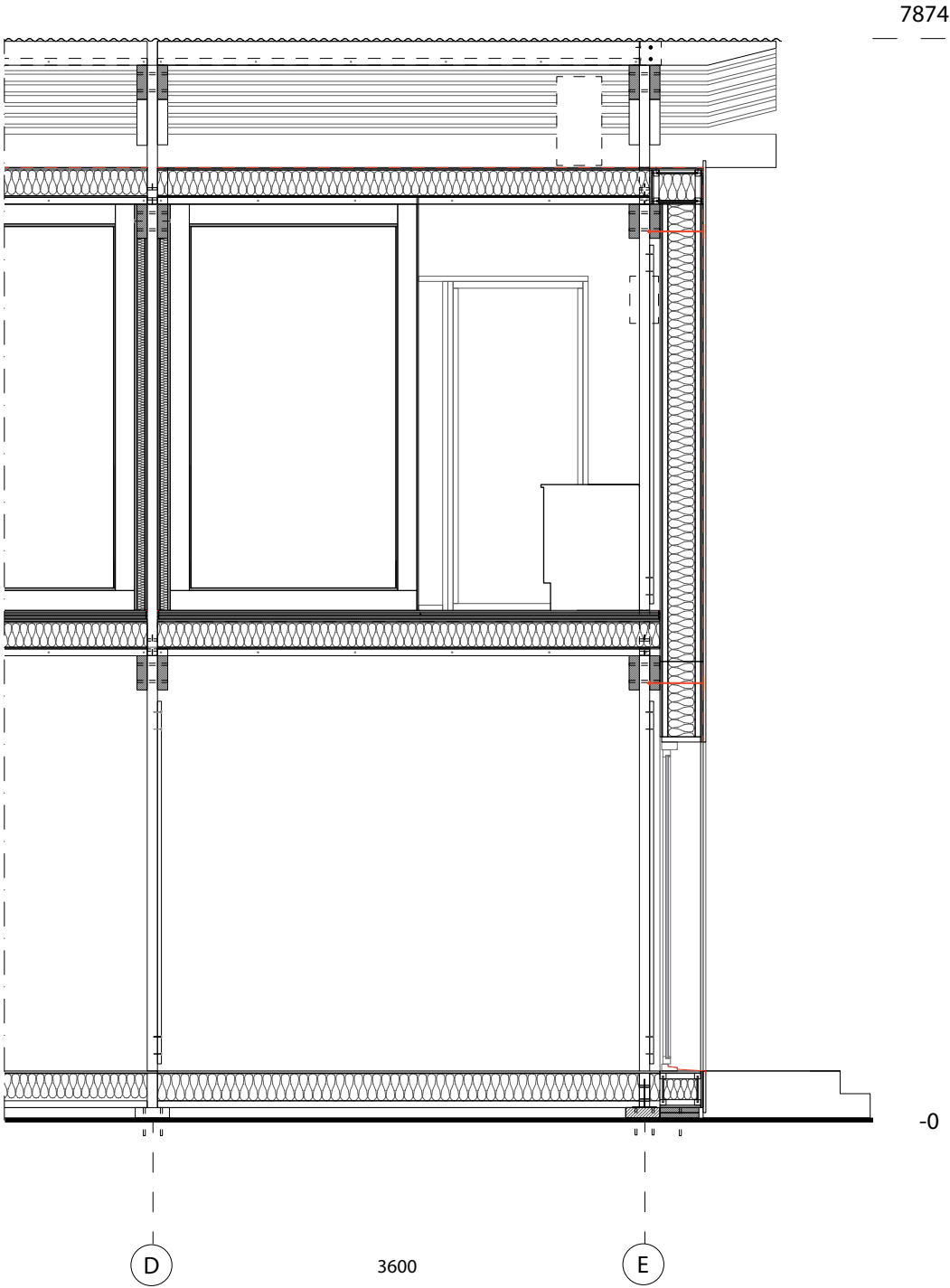






1:50 section bb' + fragment (own work, 2026)





1:50 section aa' (own work, 2026)

3.6 Catalogue / introduction

In Appendix II: *Catalogue*, the complete catalogue of components is presented. This catalogue documents the collection of elements that together form the temporary housing system developed within this project. It functions as an inventory which - as discussed on p. 27 - increases the potential for reuse. The elements are organised chronologically, following their order of application within the building sequence.

Each element is assigned a coordinate (e.g. 1a), which refers to the building sequence presented in the following chapter, 3.7 *Building Sequence*. For each element, the dimensions, weight, quantity, and costs are specified. The stated quantities refer to the entire housing cluster, whereas the listed costs correspond to a single element or set.

3.7 Building sequence

A self-assembly project requires a clear and understandable manual. In this chapter, the building sequence of the proposed housing system is presented step by step. The sequence illustrates how the kit-of-parts can be assembled using standardized timber elements and reversible steel connections within a pre-engineered framework. By visualising the construction process, this chapter tests the feasibility of the self-assembly approach while demonstrating how the system supports circular principles such as disassembly.

On p. 28, the concept of PaaS (Product-as-a-Service) is introduced. PaaS is relevant to this project because it supports the idea that building components remain in circulation beyond the first use phase. Instead of treating materials as one-time sold products, components remain under the ownership of a provider and are temporarily deployed within the housing system. In figures 22 and 23, this concept is illustrated. The PaaS location includes temporary storage space, a pick-up and return point, and a workspace to refurbish and repair elements when needed.

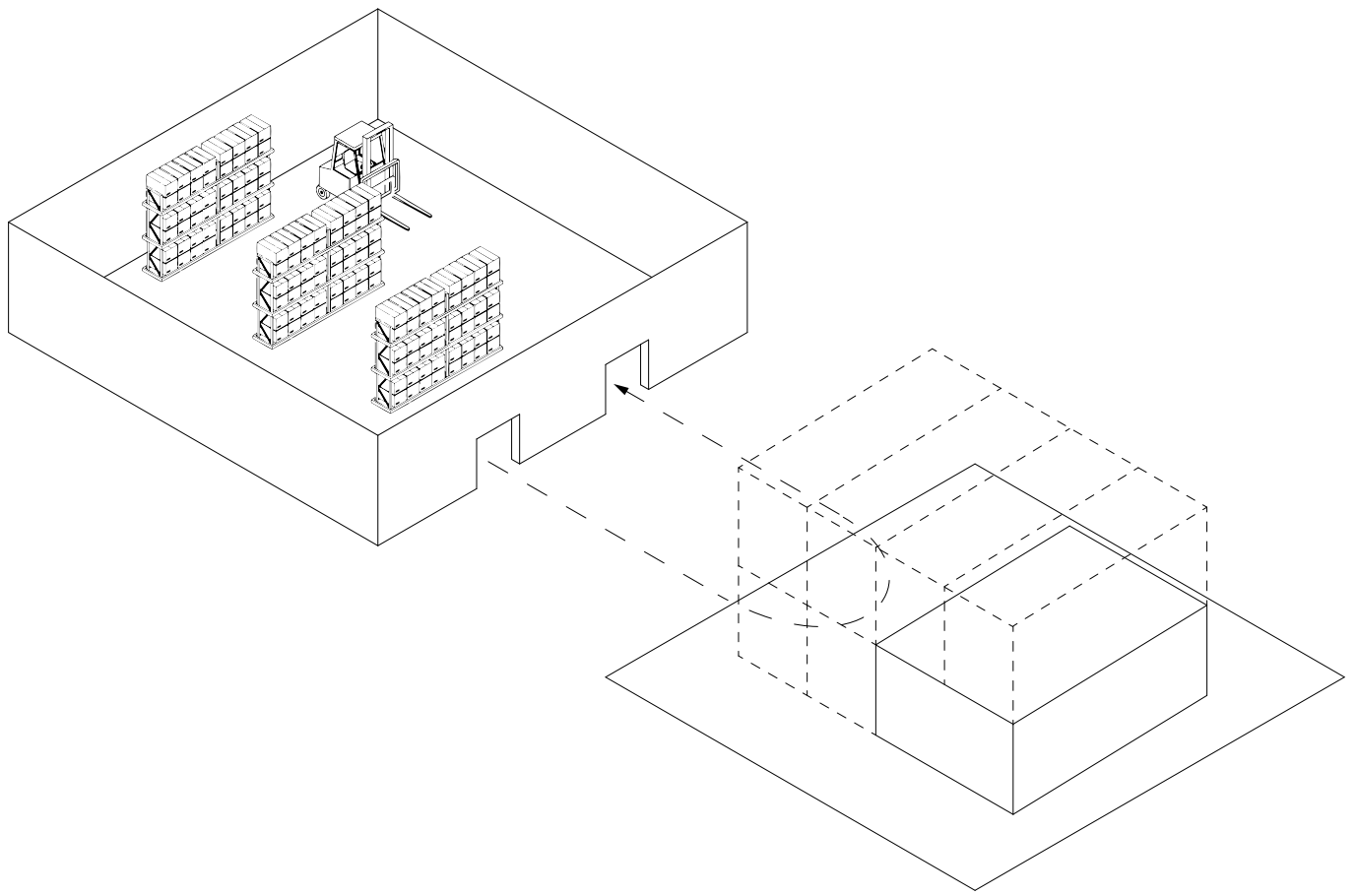


Figure 22 - PaaS diagram + cluster (own work, 2026)

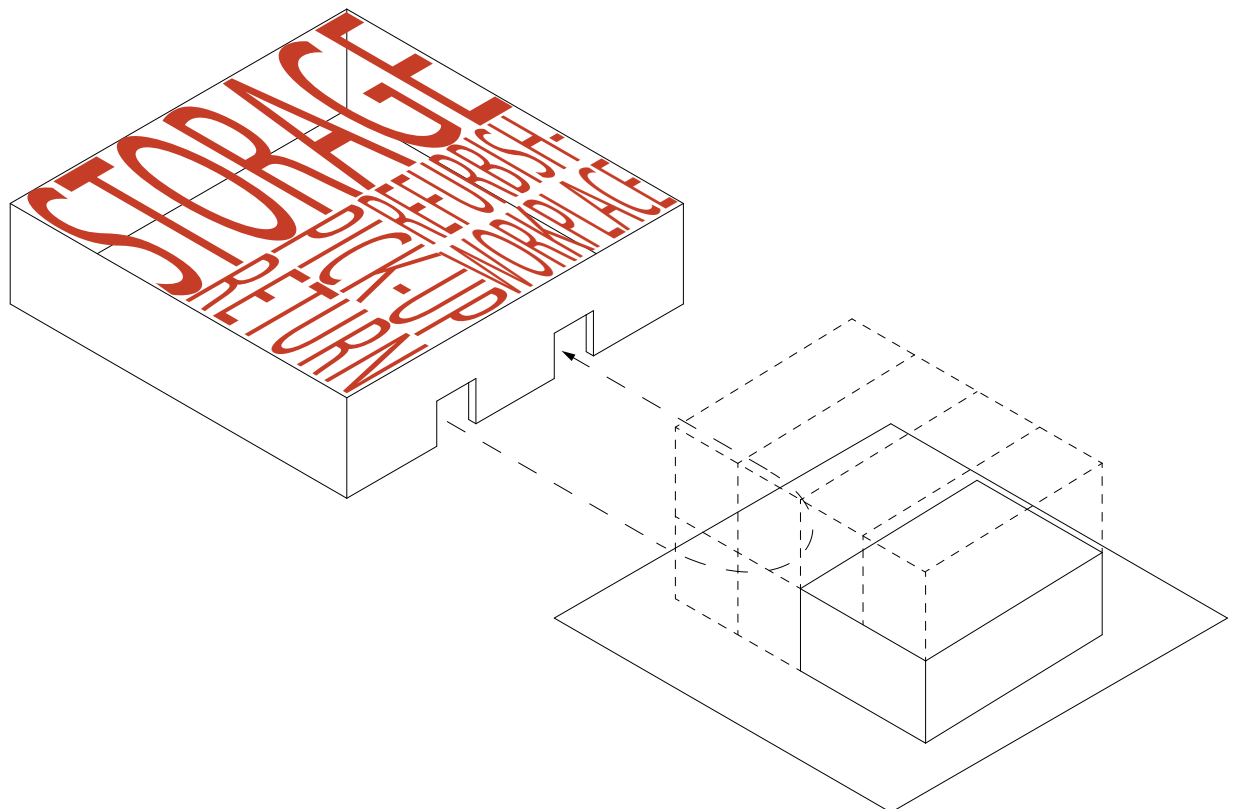


Figure 23 - PaaS diagram + program (own work, 2026)

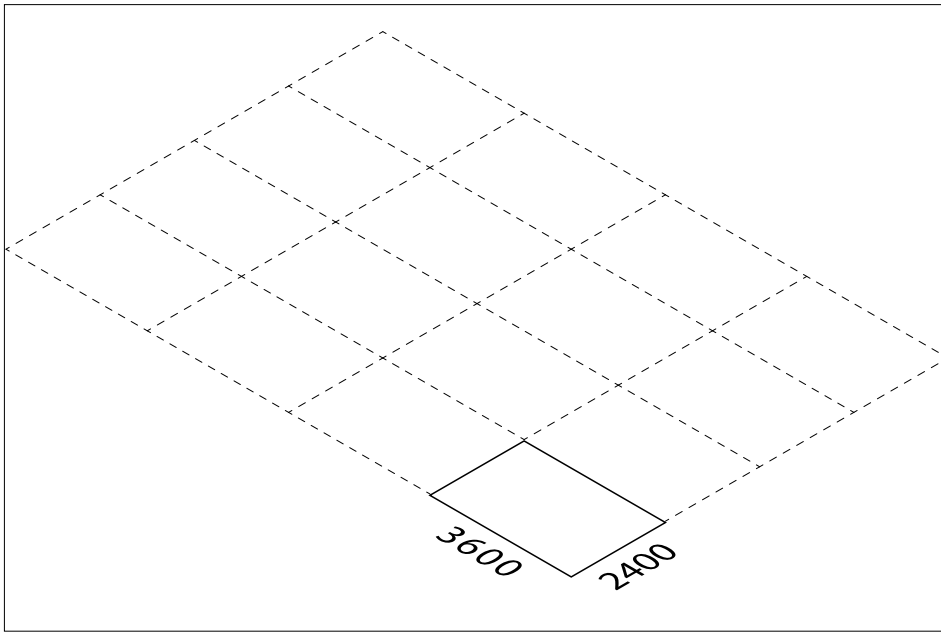


Figure 24

1. Lay out the gridlines.

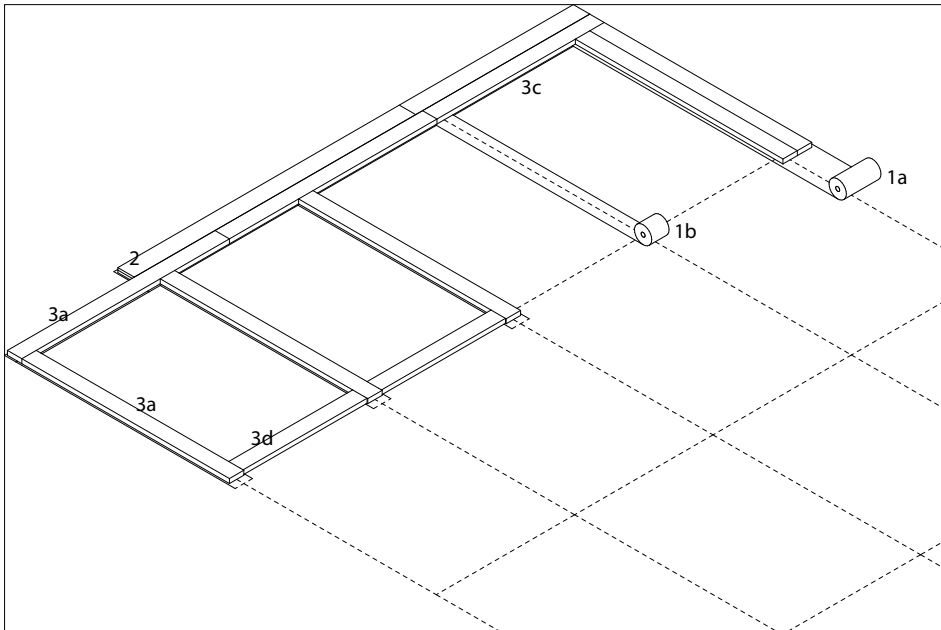


Figure 25

1. Cover the gridlines with DPC foil (1) to provide moisture protection;
3. Ensure the DPC foil overlaps by at least 100 mm;
2. Lay the beams (2 and 3) on the gridlines.

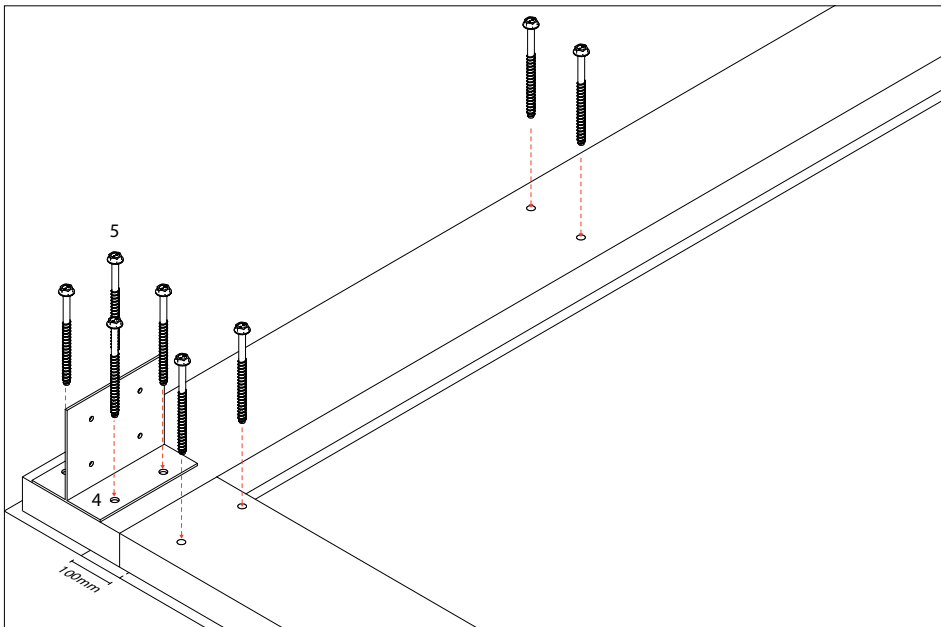


Figure 26

1. Place the steel base (4) at the grid corners and intersections;
2. Secure the steel bases and beams to the existing cast concrete floor using threaded screw anchors (5).

Tool 1: impact driver (heavy-duty model)

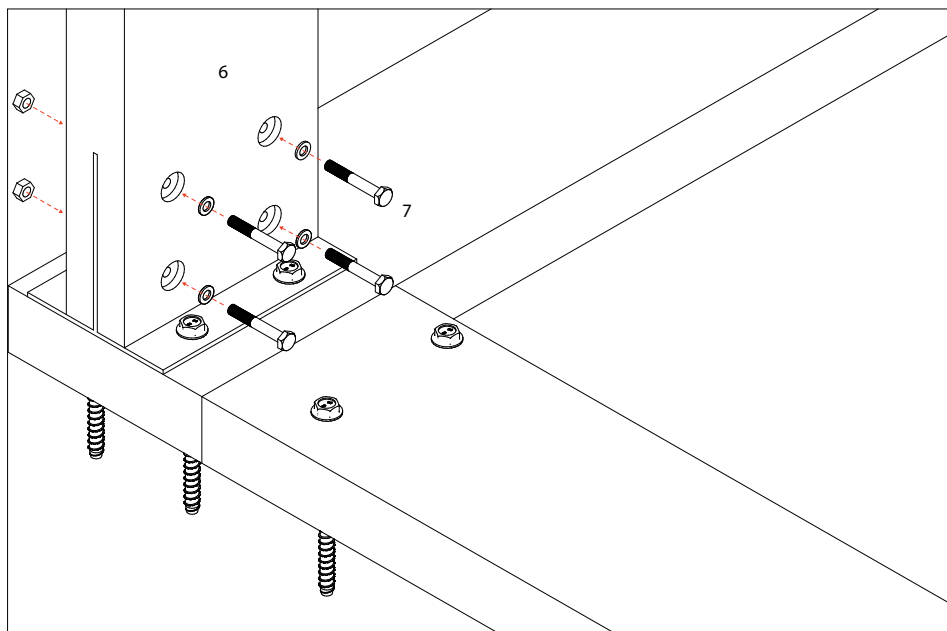


Figure 27

1. Secure the column (6) to the steel base using a bolt, locking ring and nut (7).

Tool 2: impact driver

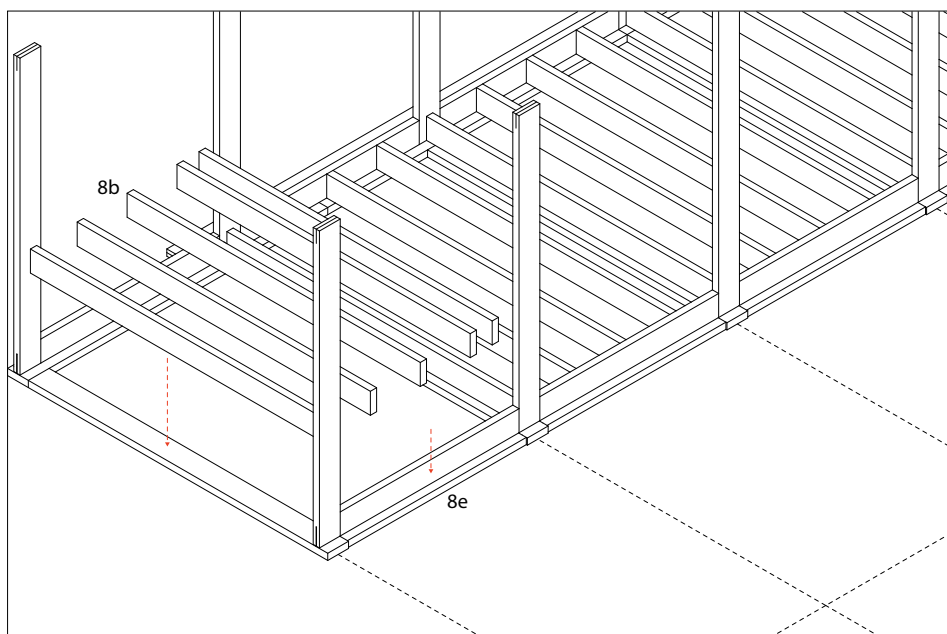


Figure 28

1. Place the floor beams (8) on top of the beams (3) and between the columns (6).

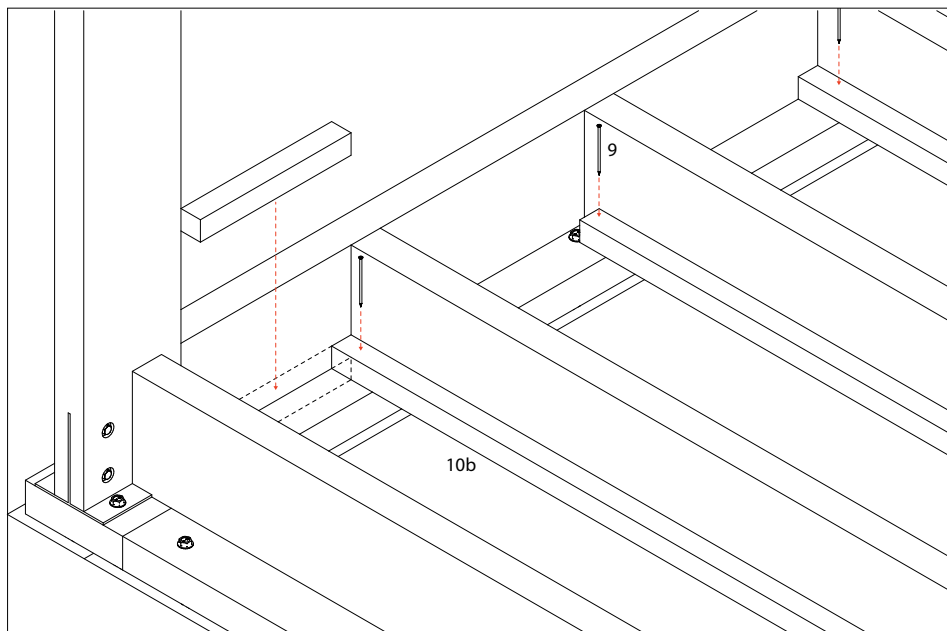


Figure 29

1. Lock the floor beams (8) by placing battens (10) on both sides;
2. (Re)use a spacer tool to ensure equal spacing between the beams;
3. Fix battens with screws (9).

Tool 3: drill (torx bit)

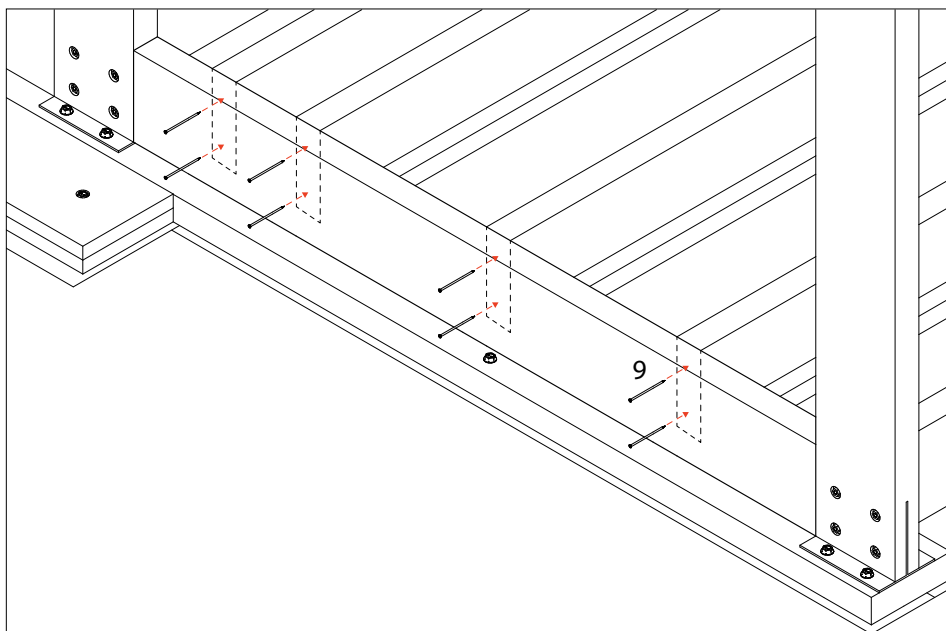


Figure 30

1. Secure the floor beams (8) laterally with screws (9).

Tool 3: drill (torx bit)

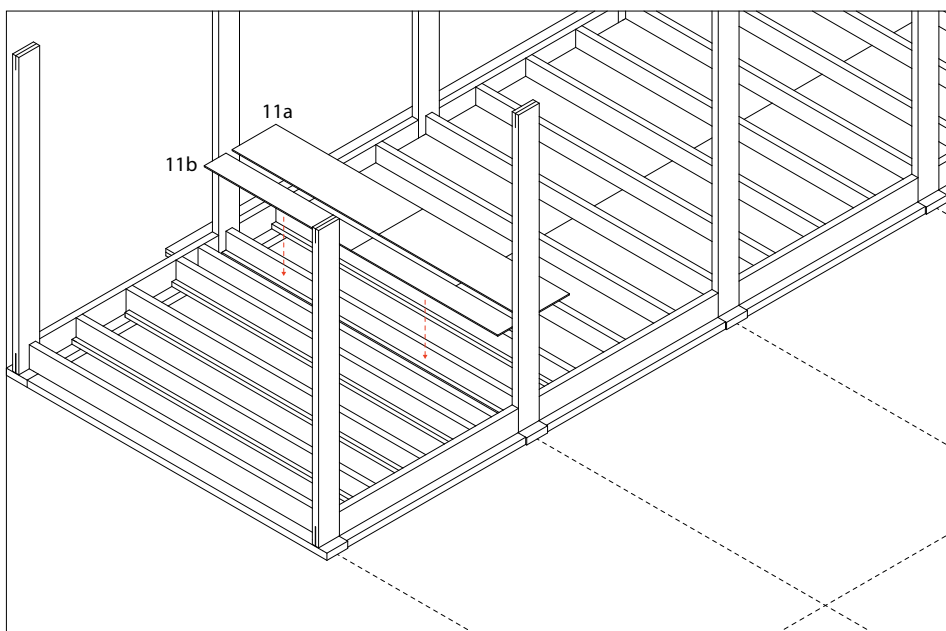


Figure 31

1. Lay the OSB-III boards (11) between the floor beams (8), resting them on top of the battens (10).

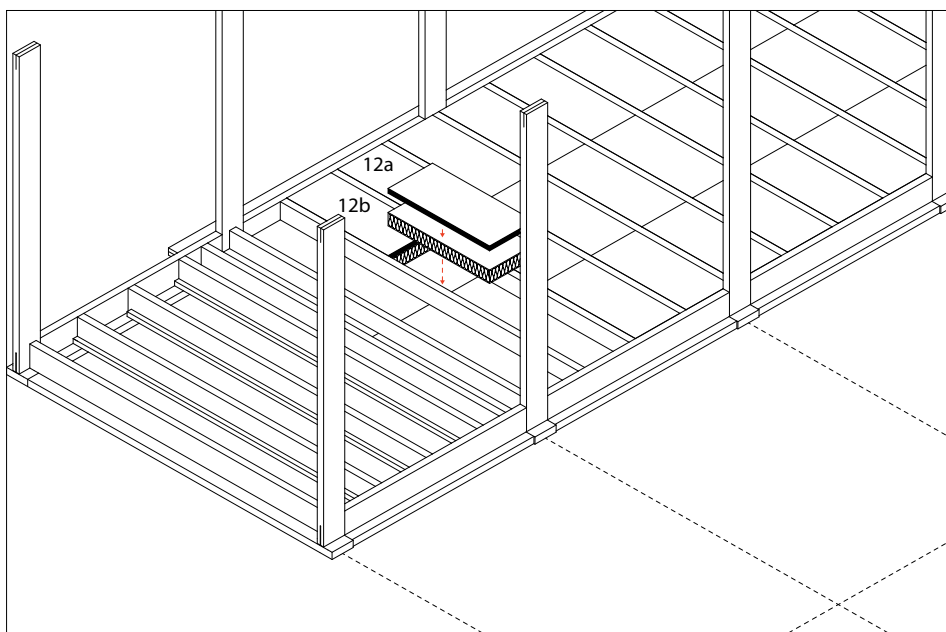


Figure 32

1. Fill the floor cavity with insulation (12);
2. The insulation is supplied in a standard size; if necessary, cut off the excess using a handsaw.

Tool 4: handsaw and gloves

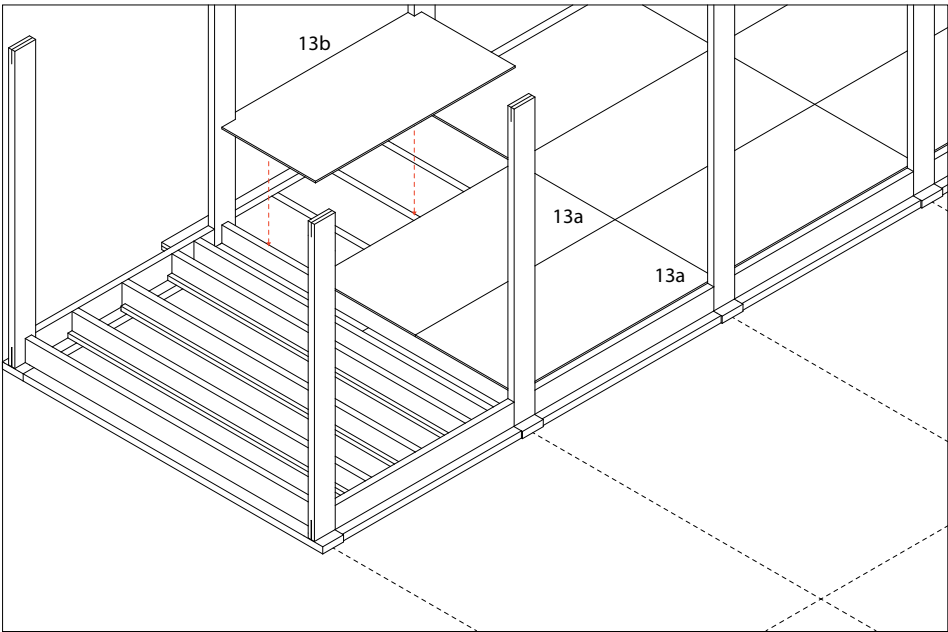


Figure 33

1. Finish the ground floor with OSB-III board (13).

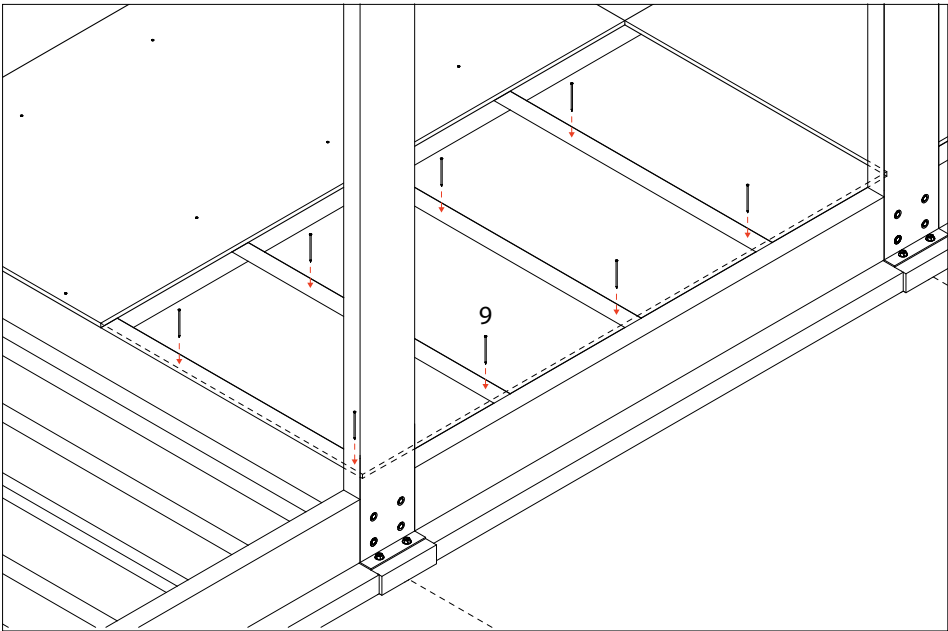


Figure 34

1. Secure the OSB-III boards (13) using screws (9).

Tool 3: drill (torx bit)

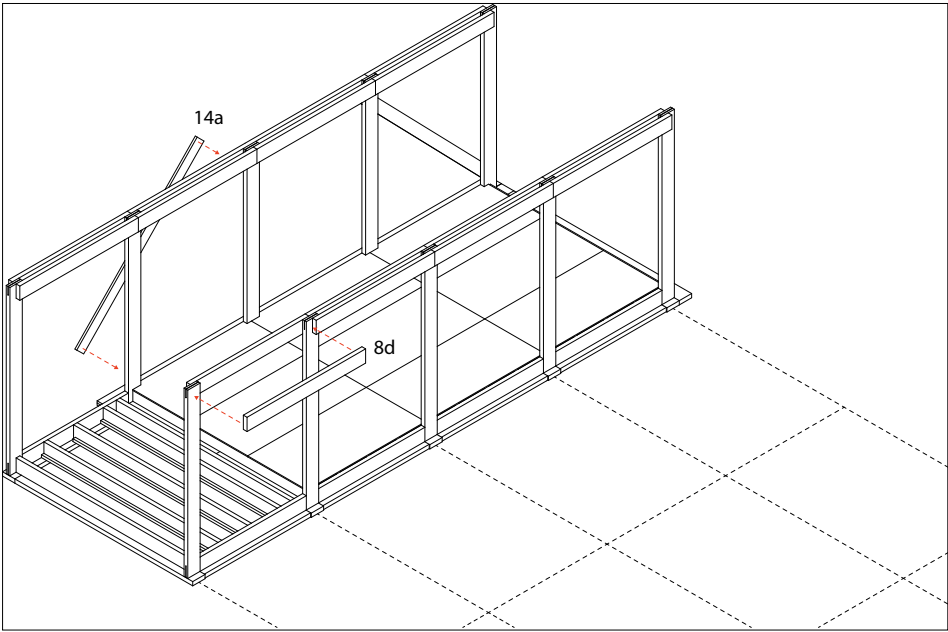


Figure 35

1. Connect the beams (8) to the columns (6).
2. Stabilise the vertical structure by adding bracing (14).

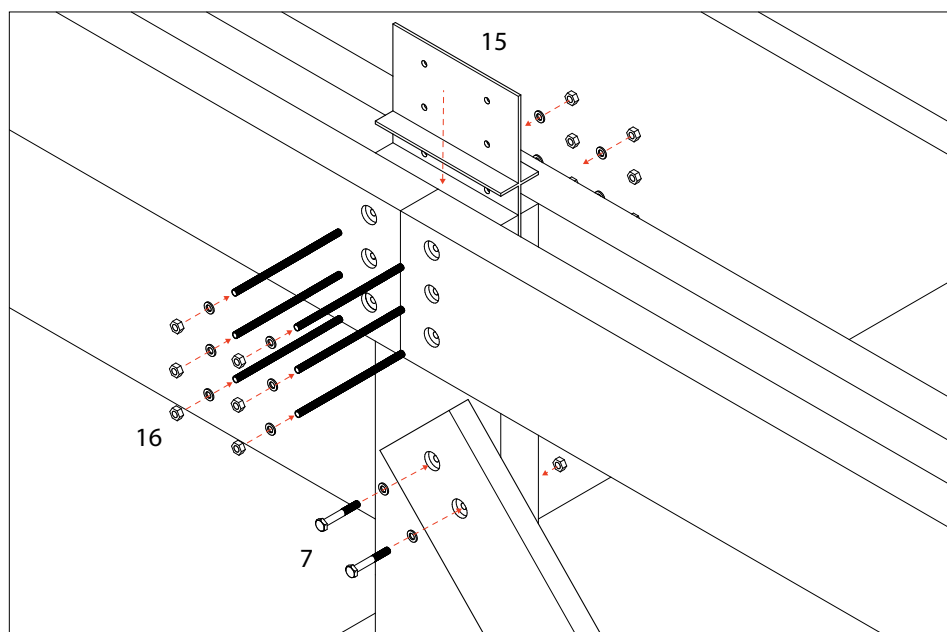


Figure 36

1. Place the steel base (15) on top of the column (6);
2. Secure the beams (8) using threaded rod, locking ring and nut (16);
3. Fix the bracing (14) using bolt, locking ring and nut (7).

Tool 2: impact driver

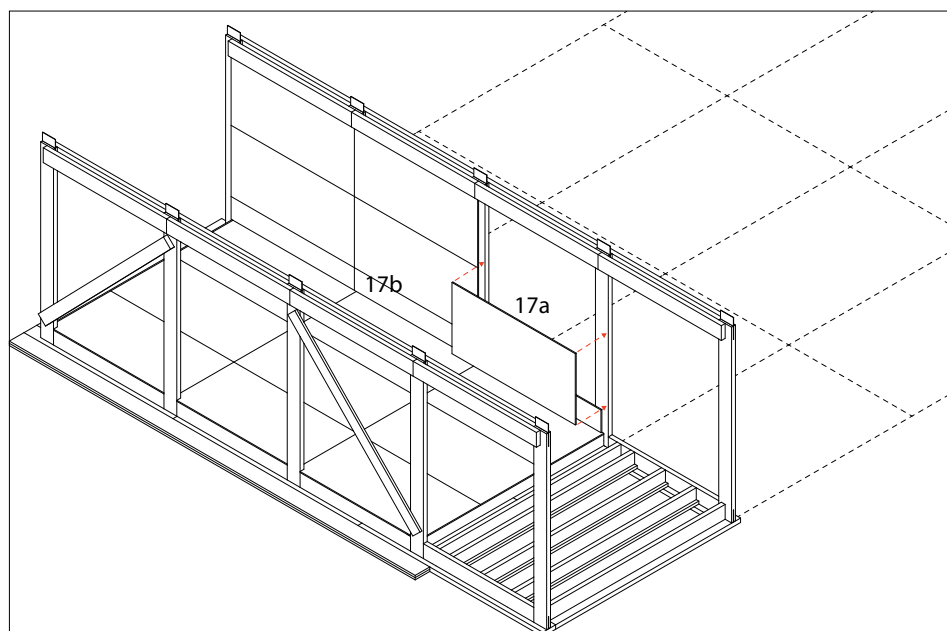


Figure 37

1. Place the OSB/3 board (17) against the columns on top of the floor, starting with the bottom panel (17b);
2. Fix the board (17) to the columns using screws (9).

Tool 3: drill (torx bit)

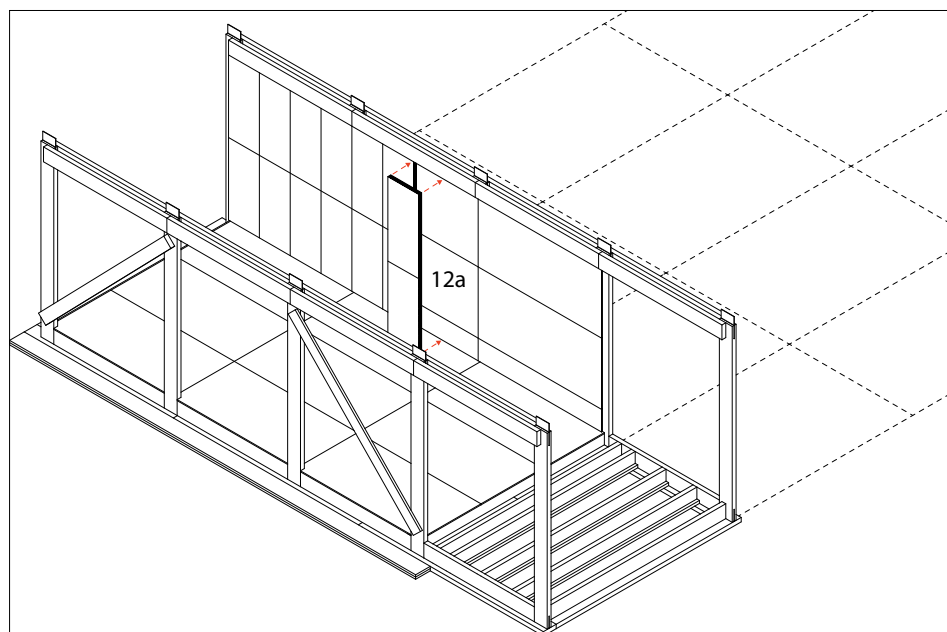


Figure 38

1. Place the insulation (12) against the OSB-III board (17).

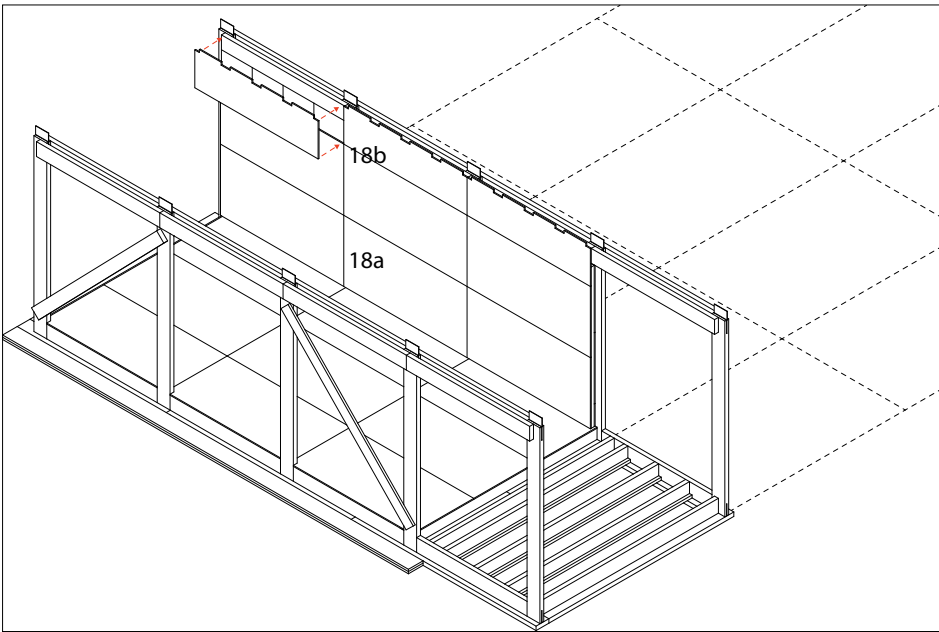


Figure 39

1. Secure the insulation by placing the poplar plywood panels (18), starting with the bottom panel (18a);
2. Fix the poplar plywood panels (18) to the columns using screws (9).

Tool 3: drill (torx bit)

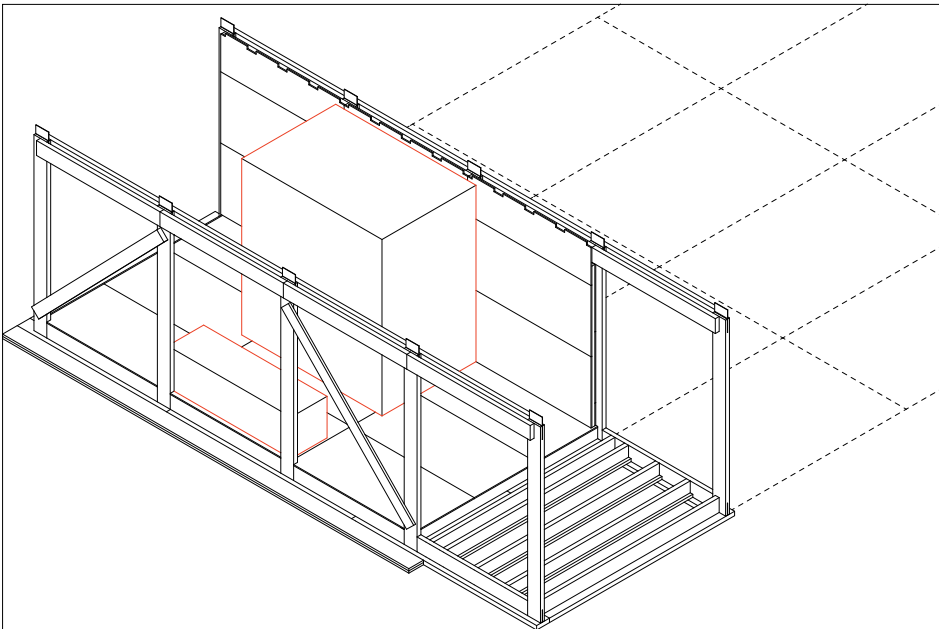


Figure 40

Service 1: bathroom- and kitchen unit placement by small crane(truck).

[The following steps repeat the ground floor assembly sequence]

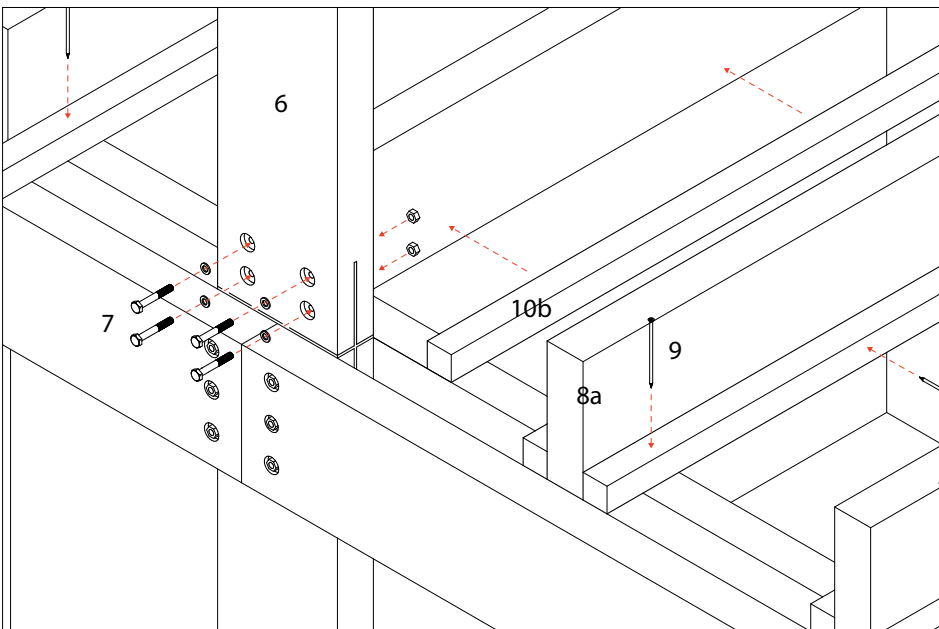


Figure 41

1. Place the columns (6) on the steel base (15);
2. Place the beams (8a) on top of the beams (8d) and in between columns (6);
3. Lock the floor beams (8a) by placing battens (10) on both sides;
4. (Re)use a spacer tool to ensure equal spacing between the beams;
5. Fix the battens with screws (9).

Tool 2: impact driver
Tool 3: drill (torx bit)

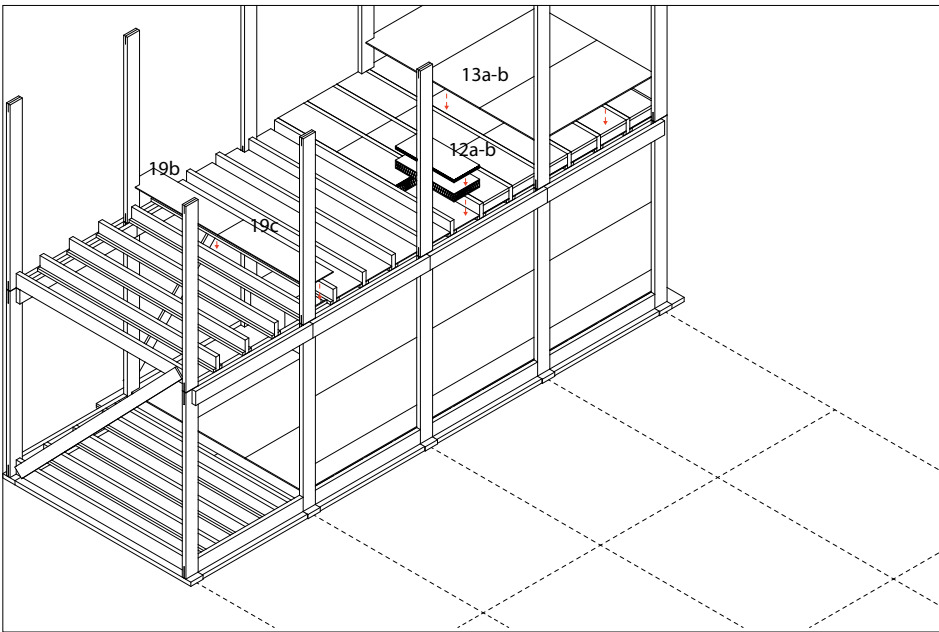


Figure 42

1. Lay the poplar plywood (19) between the floor beams (8) on top of battens (10);
2. Fill the floor cavity with insulation (12);
3. Finish the floor with OSB-III boards (13).

Tool 4: handsaw and gloves

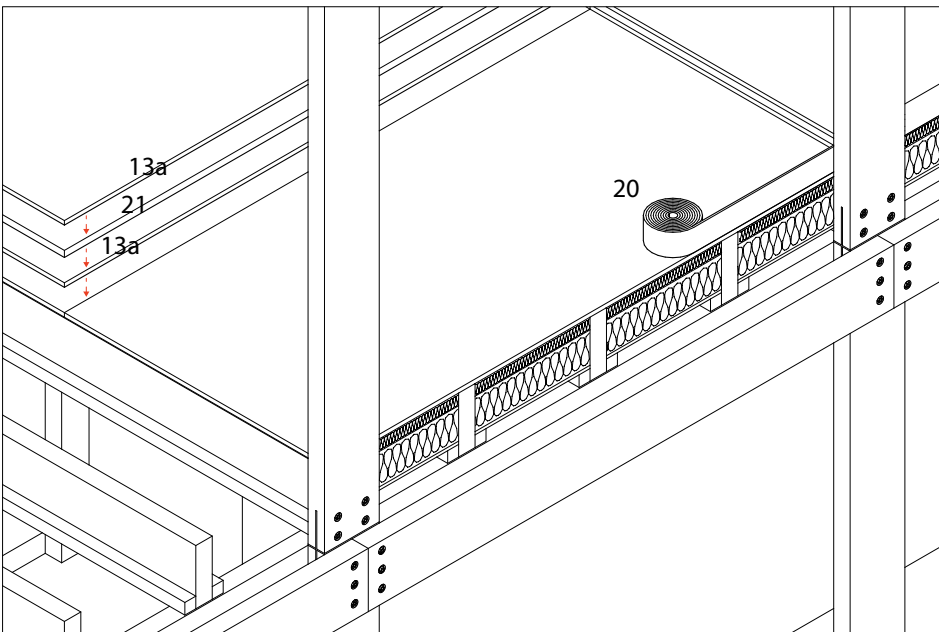


Figure 43

1. Apply the edge insulation strip (20) around the entire first floor;
2. Cover the floor with an additional layer of OSB-III board (13), FERMACELL panels (21) and OSB-III board (13).

[This step improves acoustic insulation between floors]

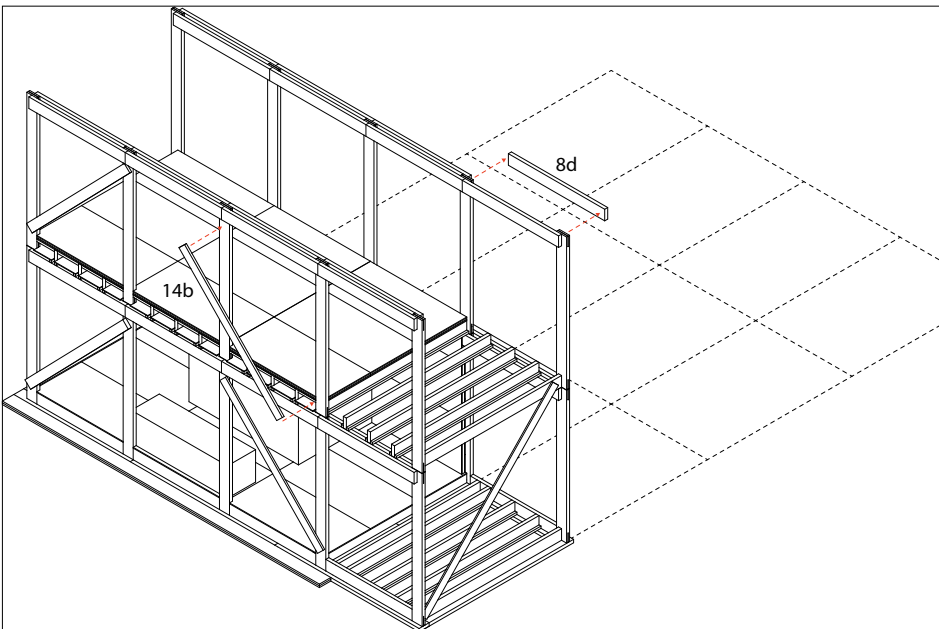


Figure 44

1. Connect the beams (8) to the columns (6);
2. Stabilise the vertical structure by adding bracing (14).

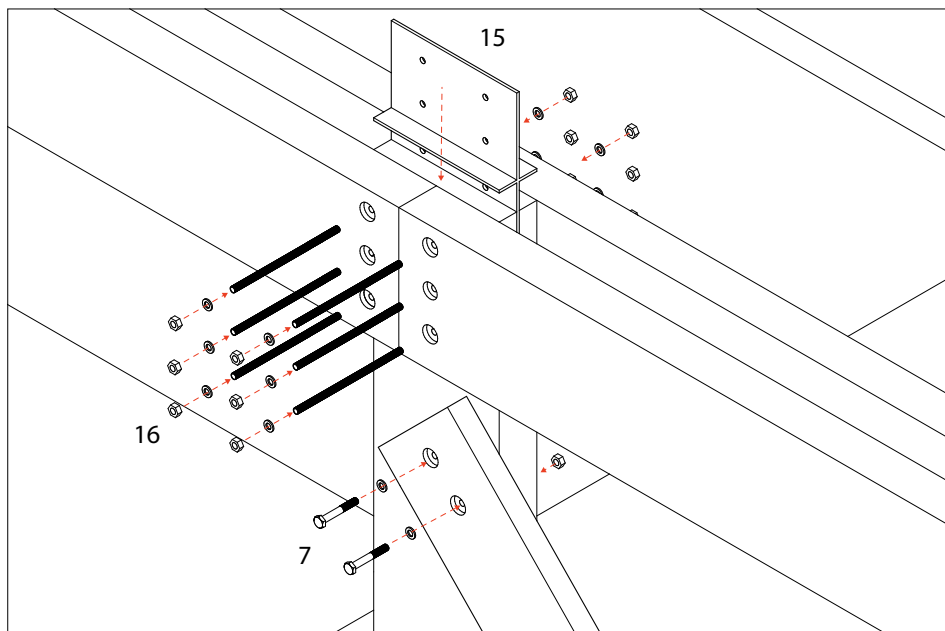


Figure 45

1. Place the steel base (15) on top of the column (6);
2. Secure the beams (8) using threaded rod, locking ring and nut (16);
3. Fix the bracing (14) using bolt, locking ring and nut (7).

Tool 2: impact driver

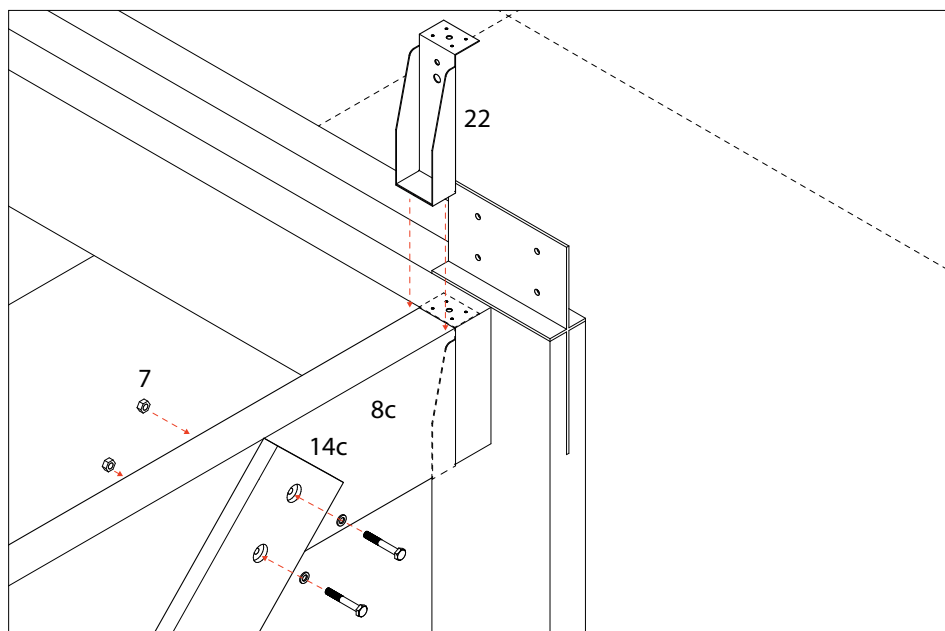


Figure 46

1. Hang the beam carrier (22) at the end of the beam (8) and secure it with screws (9);
2. Place the beam (8) in the beam carrier (22);
3. Fix the bracing (14) to the beam (8).

Tool 3: drill (torx bit)

Tool 2: impact driver

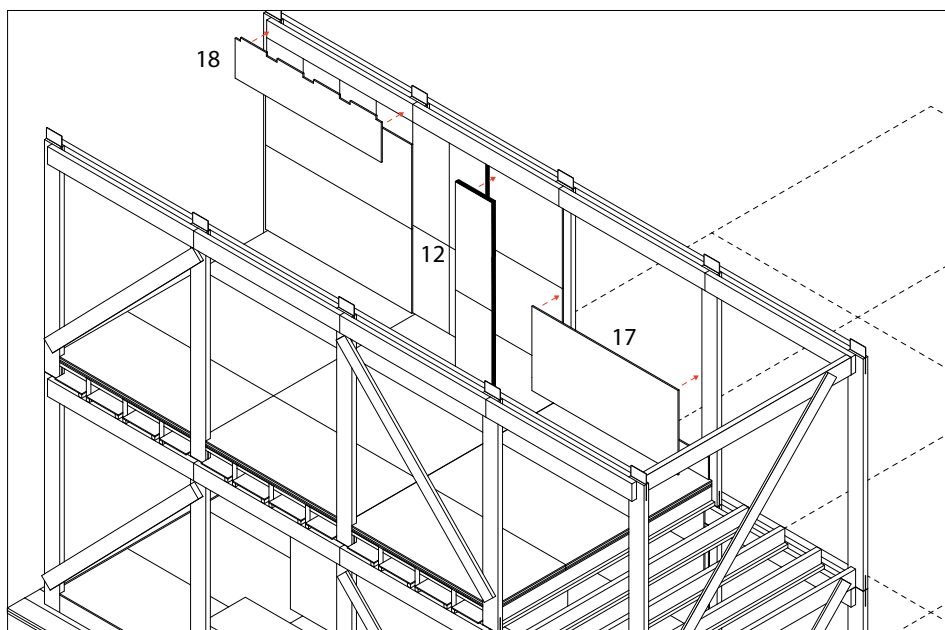


Figure 47

1. Place the OSB-III board (17) against the columns on top of the floor, starting with the bottom panel (17b);
2. Fix the board (17) to the columns using screws (9);
3. Place insulation (12) against the OSB-III board (17);
4. Secure the insulation by placing the poplar plywood panels (18), starting with the bottom panel (18a);
5. Fix the poplar plywood panels (18) to the columns using screws (9).

Tool 3: drill (torx bit)

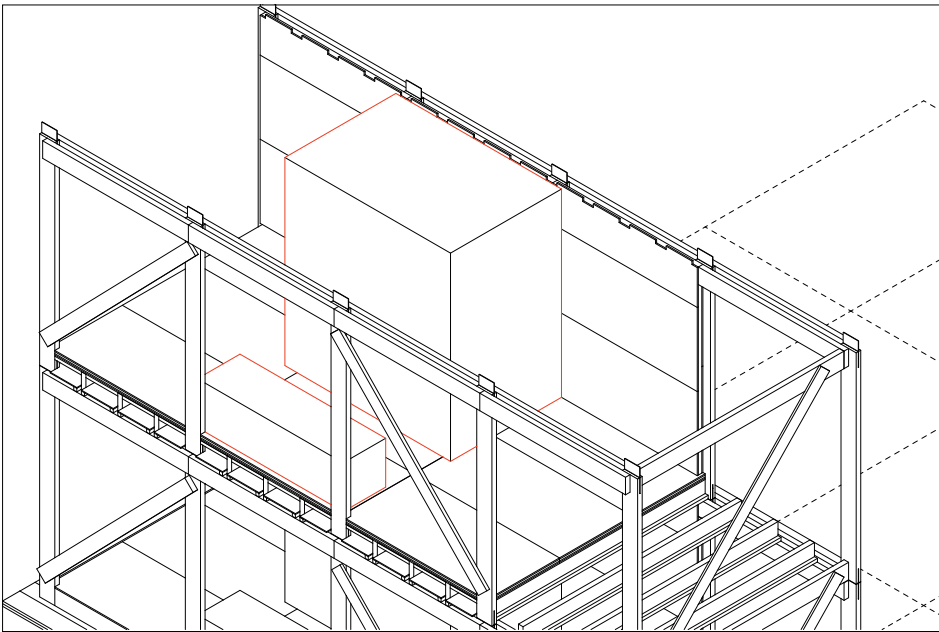


Figure 48

[The following steps repeat the first floor assembly sequence]

Service 1: bathroom- and kitchen unit placement by small crane(truck).

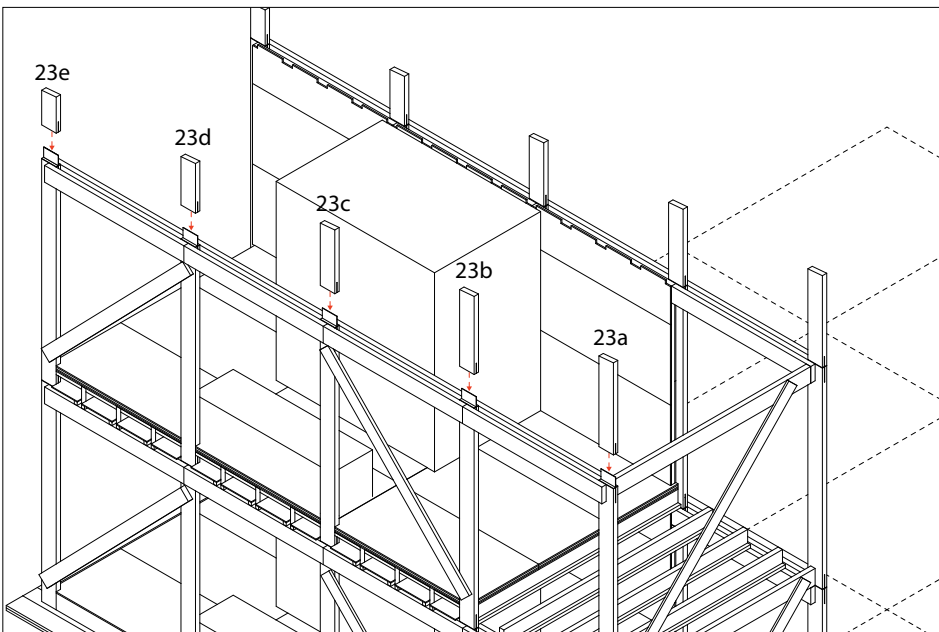


Figure 49

1. Place the columns (23) on top of the steel base (15).

Tool 2: impact driver

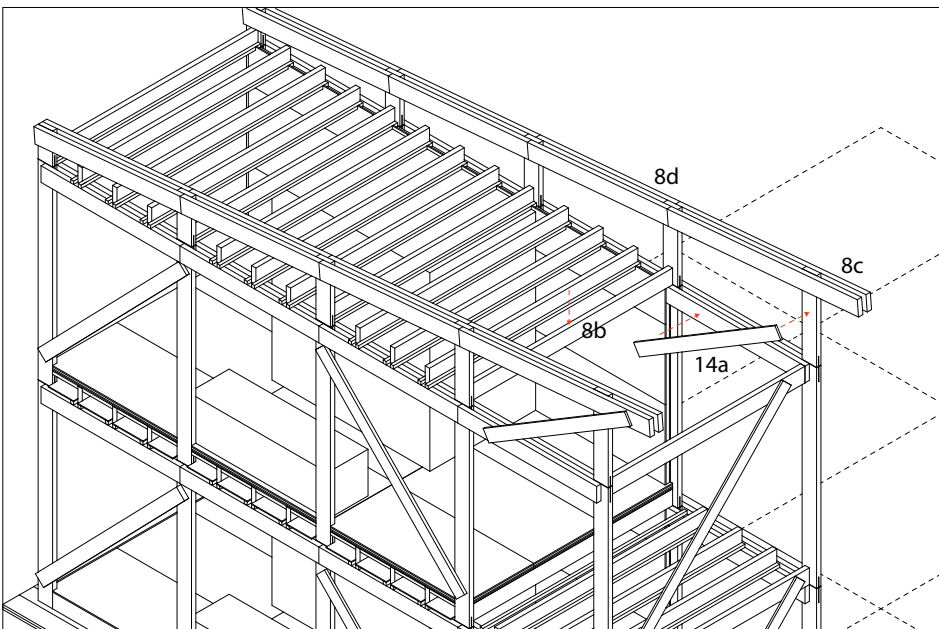


Figure 50

1. Place the floor beams (8) on top of the beams (8);
 2. Secure the floor beams (8) with the battens (10) using screws (9);
 3. Connect the beams (8) to the columns (23);
 4. Stabilise the vertical structure by adding bracing (14).

Tool 3: drill (torx bit)

Tool 2: impact driver

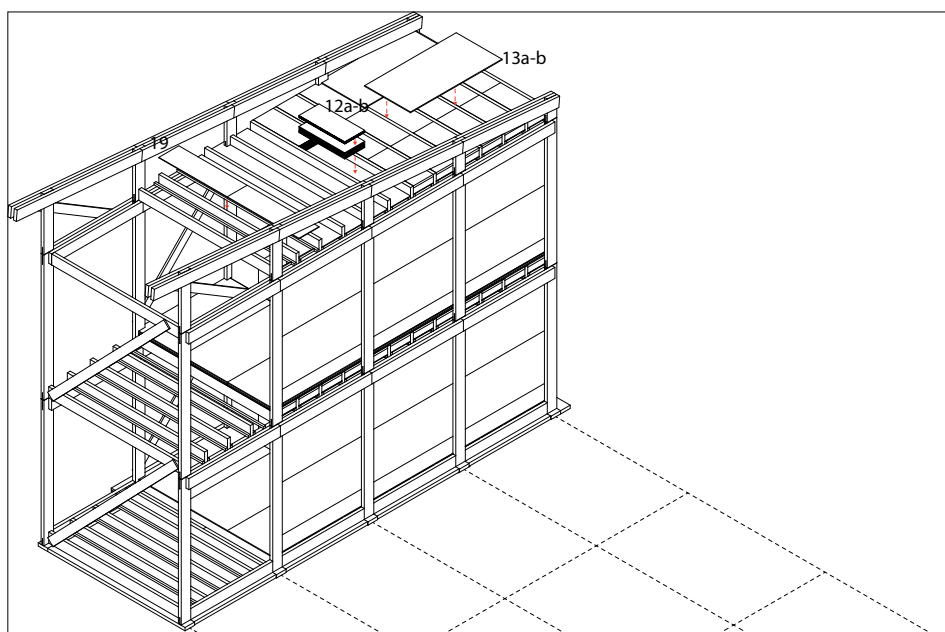


Figure 51

1. Lay down poplar plywood panels (19) in between the floor beams (8) on top of battens (10);
2. Fill the floor cavity with insulation (12);
3. Finish floor with OSB-III board (13) and secure with screws (9).

Tool 3: drill (torx bit)

Tool 4: handsaw and gloves

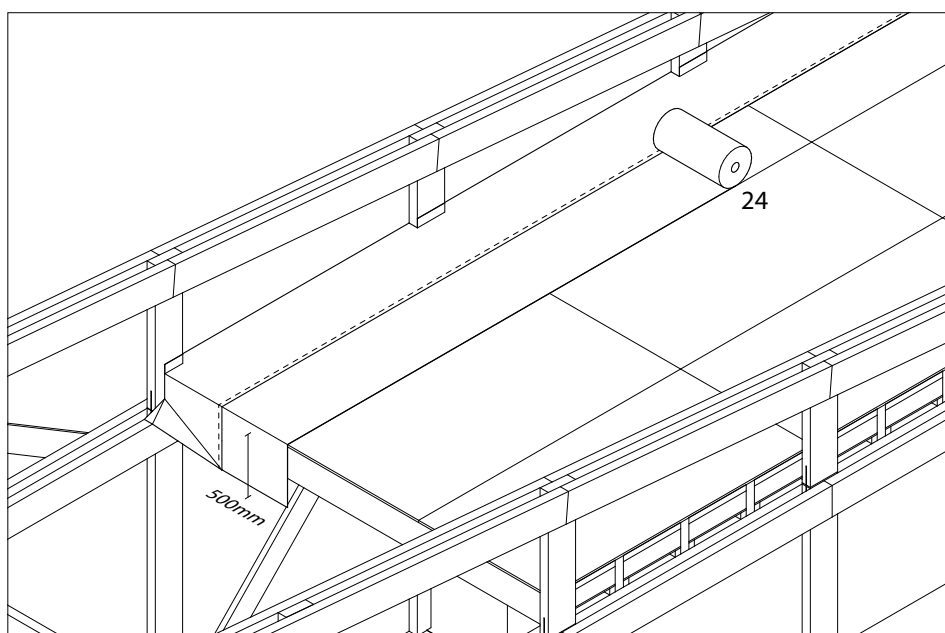


Figure 52

1. Cover the OSB-III board (13) with a vapor-permeable, water-repellent foil (24);
2. Ensure that you leave generous length on all sides of the building;
3. Let the foil overlap by at least 100mm;
4. Secure the foil with (stainless steel) staples.

Tool 5: stapler

[This step prevents moisture slipping in, but allows breathing during evaporation.]

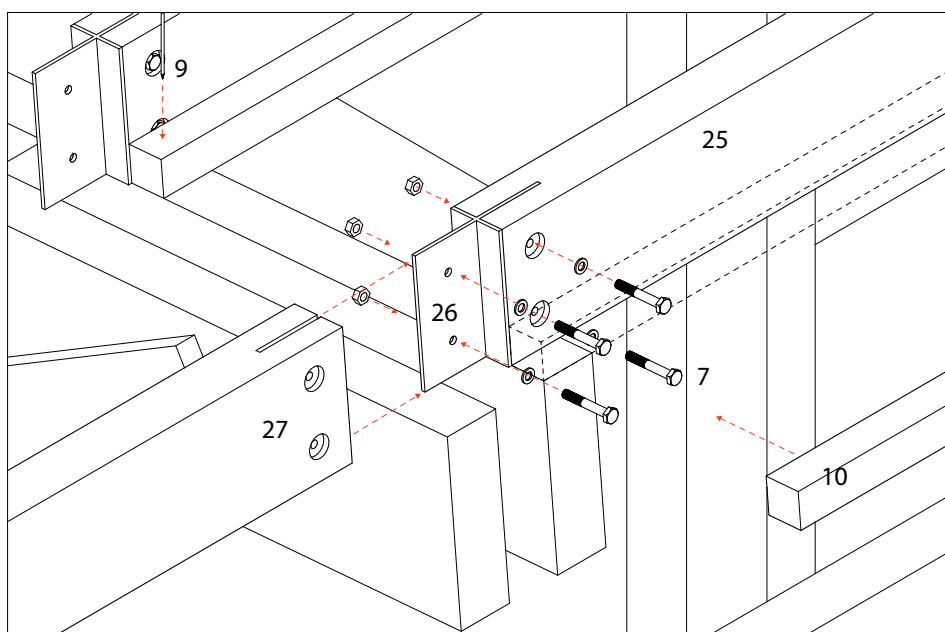


Figure 53

1. Place the roof beams (25) on top of the beams (8);
2. Attach the steel connector (26) to the roof beams using bolt, locking ring and nut (7);
3. Lock the roof beams (25) with the battens (10) using screws (9);
4. Place and connect cantilever (27) to the steel connector (26) using bolt, locking ring and nut (7).

Tool 3: drill (torx bit)

Tool 2: impact driver

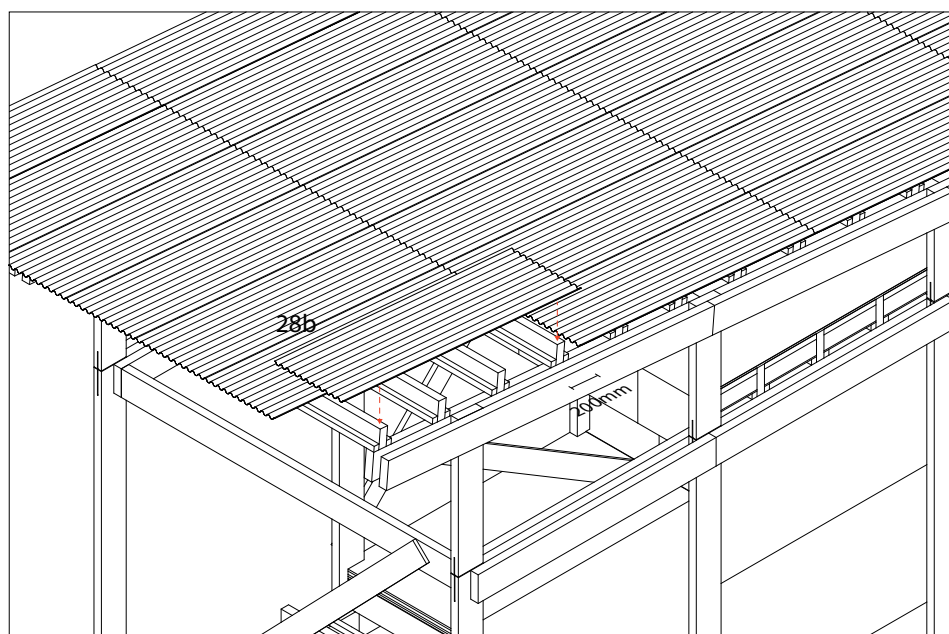


Figure 54

1. Lay the corrugated sheets (28) on top of the roof beams (25), positioning them from low to high;
2. Ensure the sheets overlap by a minimum of 200 mm;
3. Secure the sheets (28) with screws - with an EPDM layer - at the lowest point of the wave.

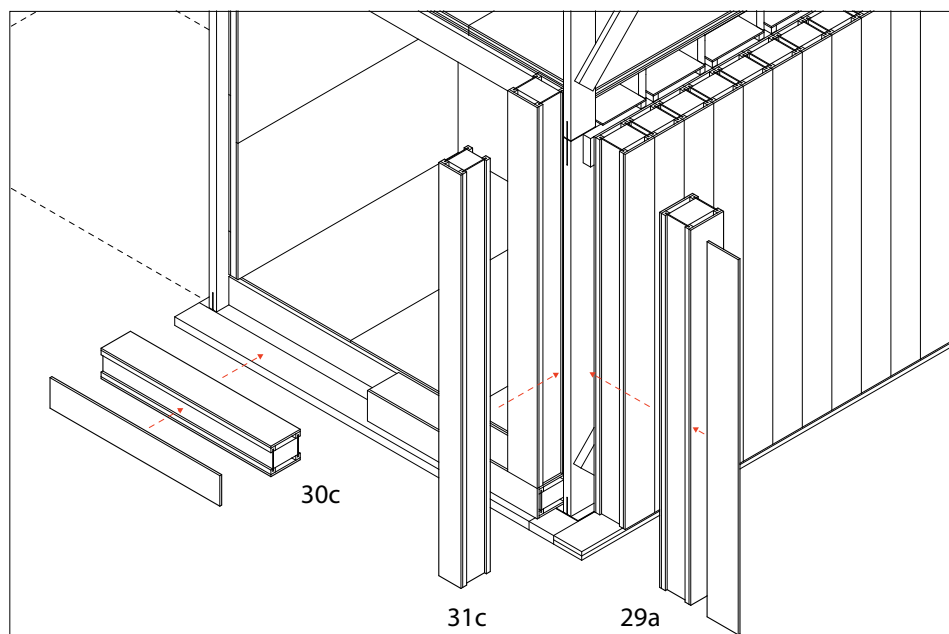


Figure 55

1. Place the façade boxes (29, 30, and 31) on top of the floor beams (2 and 3) and against the beams (8).

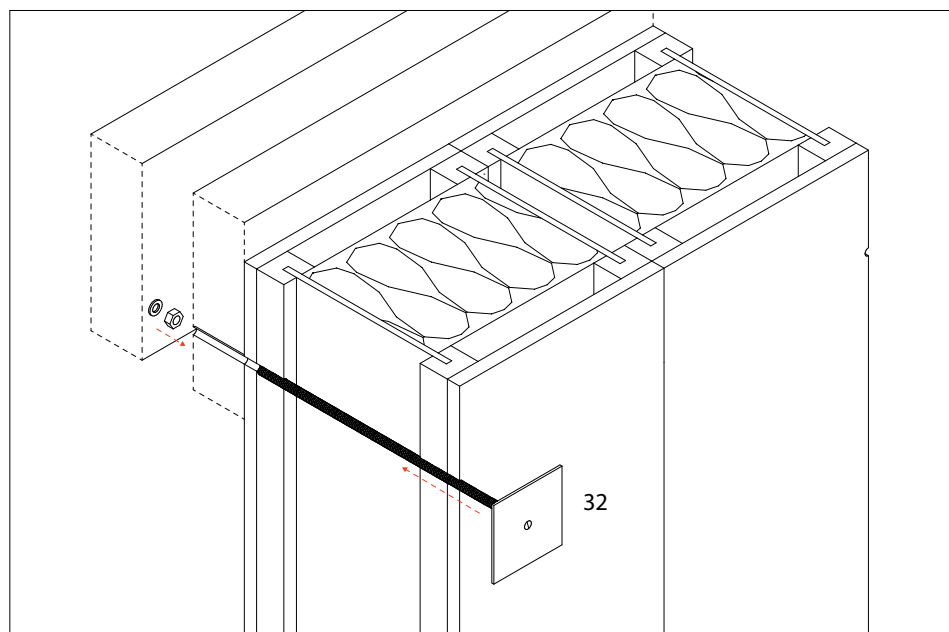


Figure 56

1. Secure the façade boxes to the structure using anchors (32) per pair of boxes.

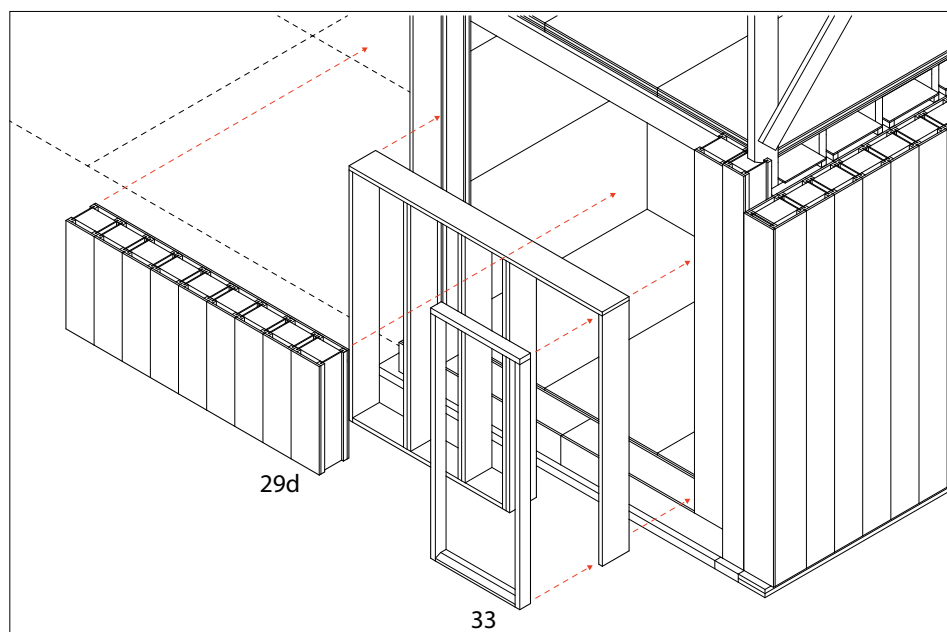


Figure 57

1. Place the door and window frame (33) on top of the horizontal façade boxes (30);
2. Place the façade boxes (29) on top of the frame lintel (33) and connect with anchors (32).

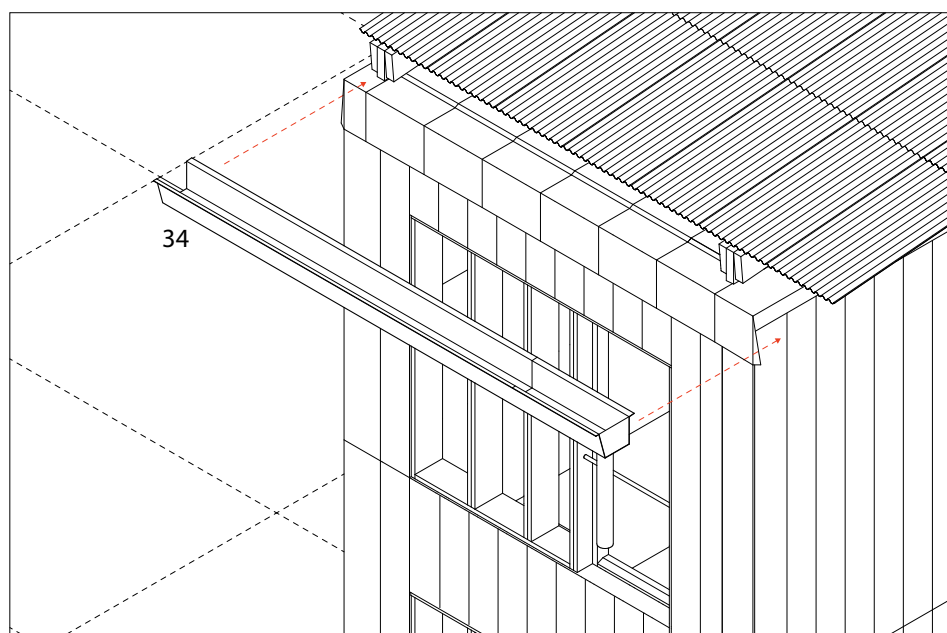


Figure 58

1. Place the gutter (34) on top of the boxes (29).

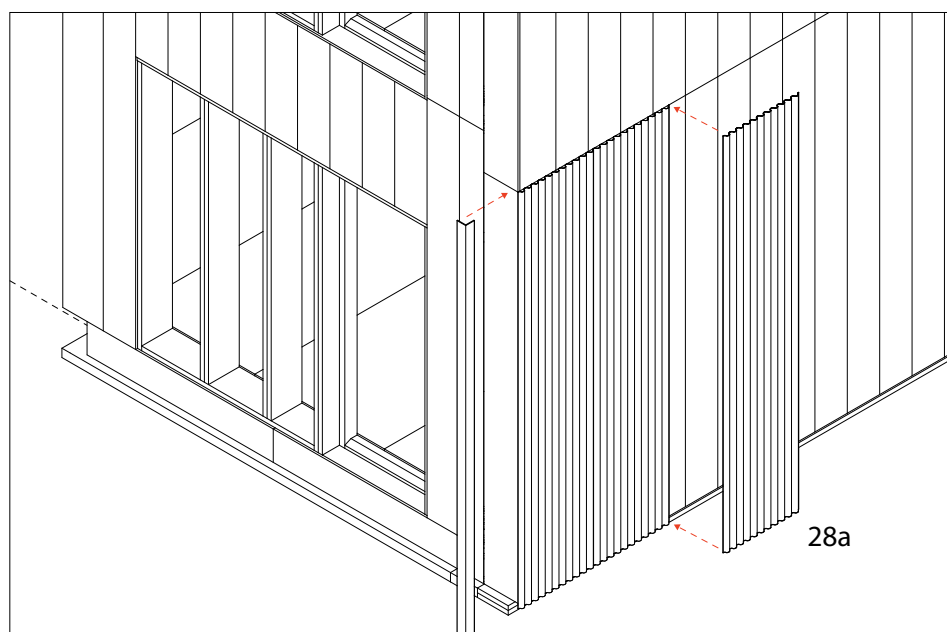


Figure 59

1. Place the corrugated sheets (28) against the boxes (29), positioning them from bottom to top;
2. Ensure the sheets overlap by a minimum of 200 mm;
3. Secure the sheets (28) with screws - with an EPDM layer - at the lowest point of the wave;
4. Place the corner profile against the corrugated sheets to close off the façade.

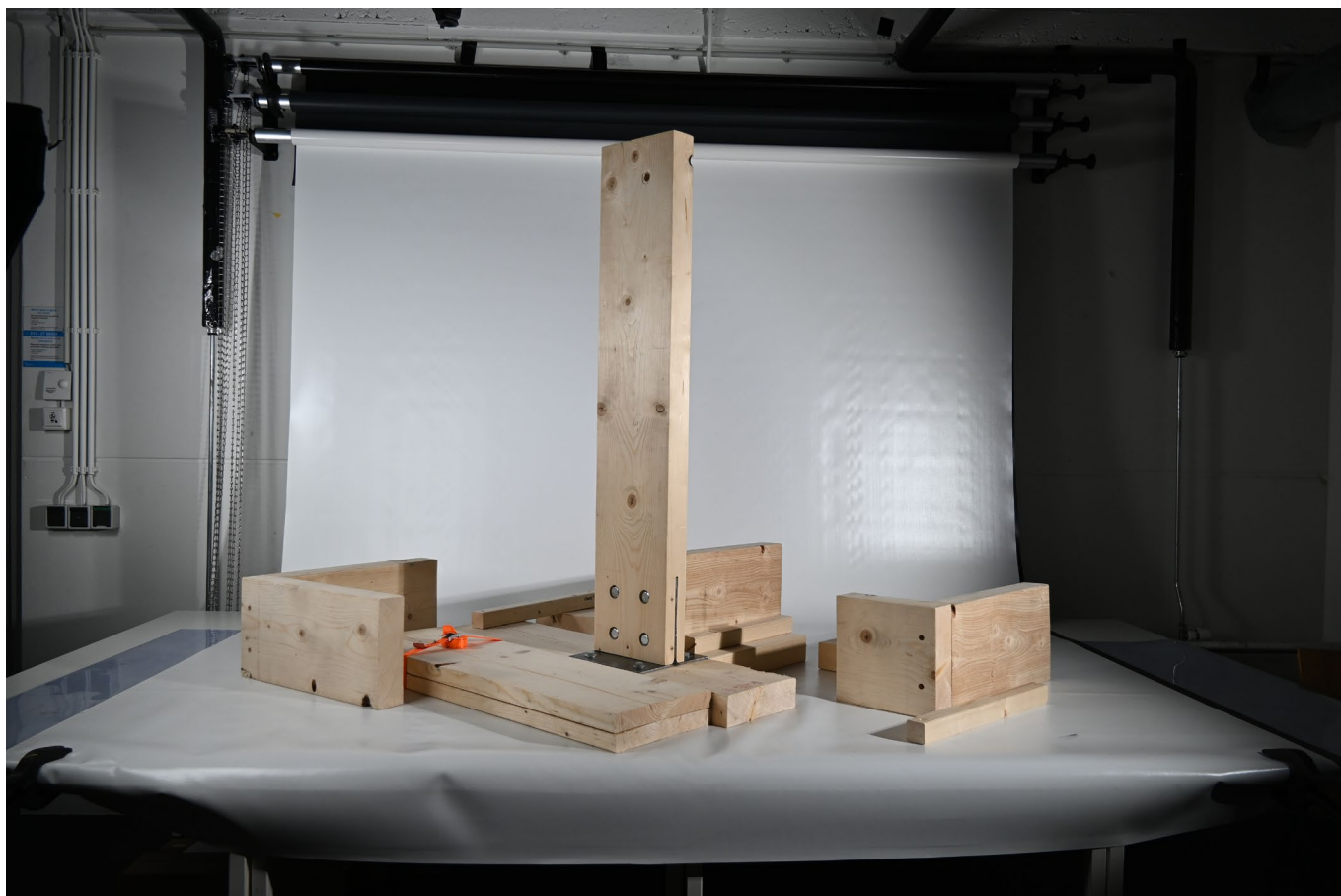
3.8 1:1 model



(own image, 2026)



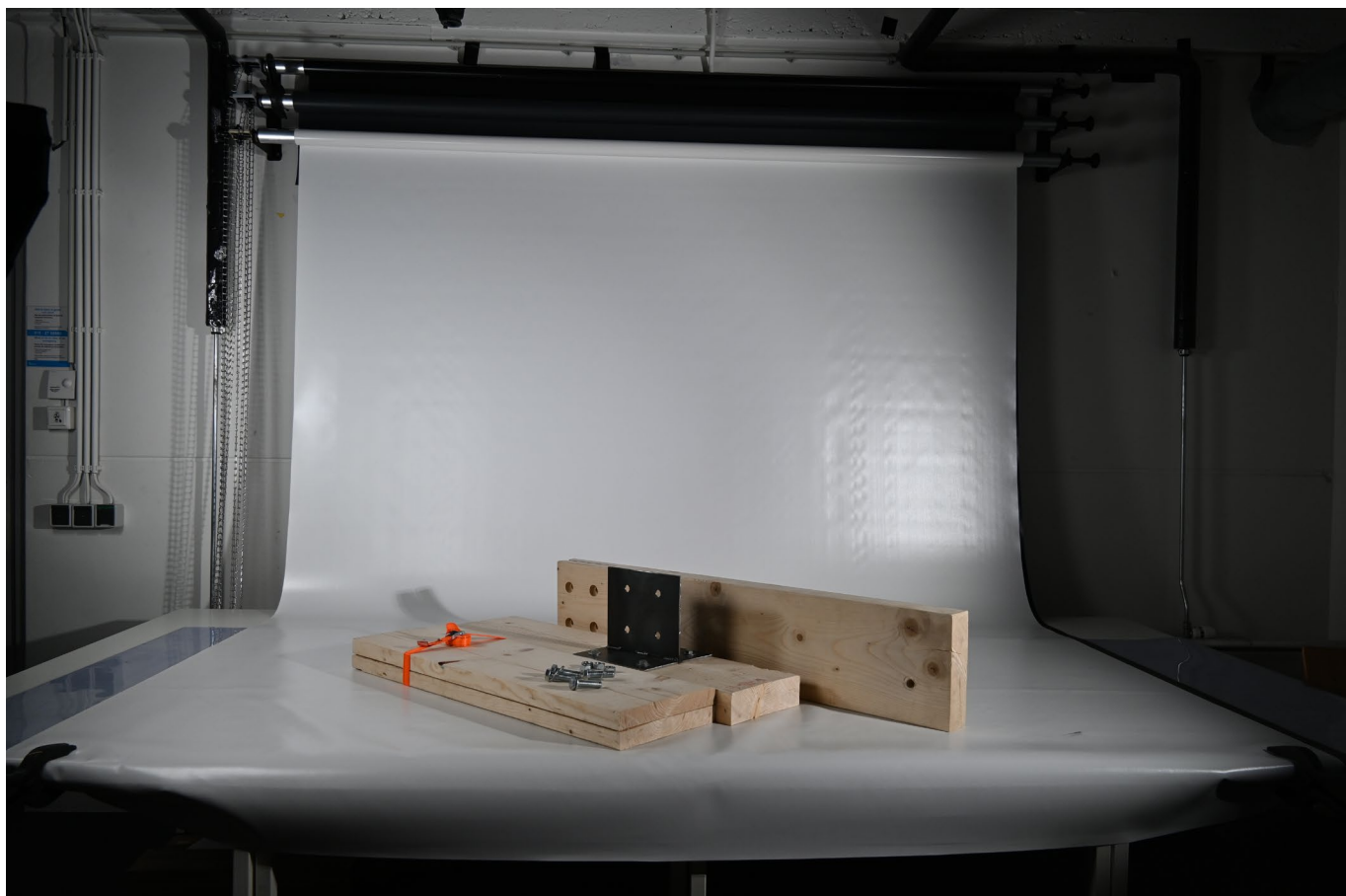
(own image, 2026)



(own image, 2026)



(own image, 2026)



(own image, 2026)



(own image, 2026)



(own image, 2026)

Part 4. Conclusion

This aE. graduation project illustrates how a circular self-assembly kit-of-parts system for temporary housing can address housing demand while ensuring the retention of material value beyond its initial deployment. By integrating principles of Product-as-a-Service, Design for Disassembly, and self-assembly, the project reframes housing as a reversible system rather than a fixed object.

The introduction of self-assembly shifts the role of the user from passive occupant to active participant, strengthening awareness of material value and fostering a sense of stewardship. It also establishes a clear design framework in which every decision becomes intentional, with parameters such as weight, ease of handling, and simplicity directly informing the system its logic.

The project responds to the needs of young adults and starters by combining affordability (e.g. through reduced outsourcing costs) with opportunities for social interaction. A balance is sought between privacy and shared space, resulting in a housing typology that supports both individual and collective living. Within this framework, the act of building together becomes

more than construction alone; it becomes a process of knowledge exchange, shared responsibility, and the creation of social relations.

The use of standard dimensions played a key role in this system. By working with standard dimensions, the design reduces material modification and supports the principle of 'reduction of trace', allowing components to remain valuable across multiple cycles of use. This positions each element not as a site-specific solution, but as part of a wider and continuous material cycle.

Although the system is deliberately generic, its application within the Kanaalzone-Zuid development required consideration beyond the system itself, towards spatial quality and spatial planning. Within this transitional urban context, temporary interventions can respond to evolving spatial and societal demands over time. The development its experimental framework allows for adaptation and gradual development. The graduation project may even function as a manifesto in a development such as this - positioned opposite to planned high-rise development and densification strategies.

The architecture is a product of the design principles self-assembly, standardisation, and design for disassembly. The result is a system that is practical, and therefore both timeless and engaging in its simplicity. By visualising a step-by-step building sequence and creating a 1:1 model, the makeability of the design is demonstrated.

Tijdloos positions temporary housing not as an end product, but as part of a continuous material cycle in which buildings are assembled, used, disassembled, and reintroduced into new contexts. Rather than treating buildings as static objects, housing is understood as an evolving system of reusable components embedded within a circular economy.

Ultimately, every building can be understood as a prediction, and as Steward Brand (1995) argues, all predictions are wrong. What if the most sustainable building is the one that does not need to be built at all? However, within the context of an ongoing housing crisis, the need to build is unavoidable. Rather than resisting this reality, this project translates it into a circular material

system, in which buildings are designed as temporary contributions within a continuous cycle of assembly, use, disassembly, and reuse. In this sense, *Tijdloos* demonstrates how a kit-of-parts system, supported by principles of PaaS and Design for Disassembly, can transform construction from a linear act into a reversible process embedded in a Cradle-to-Cradle logic.

Reflection

In this reflection, I look back at the research and design process of my aE. graduation project. The project concerns a kit-of-parts system for self-assembled temporary housing.

The aE. graduation studio focuses on themes such as circularity, climate design, digital manufacturing, and material research, and encourages students to develop innovative technical responses to contemporary challenges through prototyping.

I have a strong interest in how things are built: what the sequence is, how detailing works, and the possibility of building it myself. From early on, this led to a process-oriented approach to design - thinking through building sequences. A key challenge was translating existing definitions into my own design position (e.g. low-tech, kit-of-parts approaches) and identifying the need for innovation. Initially, the ambition to explore multiple directions simultaneously resulted in broad and less clearly defined problem statements. Through precedent research and discussions with experts and (post-) graduates, the project gradually gained focus. A major turning point was the adoption of self-assembly as a central design principle, which provided both direction and coherence to the system.

Initially unconvinced of its impact, it gradually developed into a concept that gained both relevance and value within the project.

One of the strategies I used was a comparative analysis of Wisperweide (Appendix I), with the Walter Segal self-build method as a counter-case. Through both detailed drawings and quick sketches, both precedents were reviewed, allowing key principles to be extracted and translated into the ongoing design process.

As a result of the framework being defined at a later stage, design decisions had to be made within a relatively short timeframe, prioritising simplicity and coherence over a wider exploration of alternatives. The design choices throughout the project were made with clear intention and awareness, which also revealed one of the most compelling aspects of self-assembly as a design principle. While the process remained relatively linear, a more iterative exploration could further expand the design space in future development, particularly in relation to alternative configurations and variations of the system.

Prototyping primarily took place through drawings, digital modelling, and system studies, while full-scale prototyping was positioned towards the end of the project. Translating the design from drawing to full scale evaluated the practical feasibility of the design and highlighted the value of (1:1) prototyping as a design method within aE. graduation studio.

Reflection was written before the A3 presentation.



Concept model - pressure cooker (own work, 2026)

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