

03 - CASE STUDY RESEARCH



Case Study Research

Author

Jasper Sterrenburg - 5653673

Tutors

Olv Klijn - design tutor

Ruurd Kuijlenburg - building technology tutor

Alejandro Campos Uribe - research tutor

Graduation Studio

Architecture & Dwelling - AR3AD100 - Advanced Housing Design

Date

2 July 2024

Abstract

This case study research is used to generate information that will lead to input for the design of a demountable hospice in the Dutch Peat Polders. This specific design brief results in three types of cases being researched, that can be later combined or taken inspiration from. Demountable and easy-to-build structures are analyzed, followed by small-scale hospices in rural settings, and natural-based care environments. Methods used for the case study research are the analysis of drawings and floor plans, extracting the needed information for a certain topic.

The result of this study is most importantly programming related, usable to inform the building brief based on two precedents of hospice designs. Beyond the programming, the study made clear that the target group should be well chosen, because of the temporary nature of the project. Often temporary buildings stay permanent, which should be avoided in the case of building in peat polders. Further results point out that a visual and if possible physical connection with nature helps make the patients comfortable.

Keywords

Case studies, Hospice, Biophilic Design, Programmatic research

Table of Contents

Abstract	02
Introduction	06
Selected Cases	08
SCAL Demountable Building	09
Building Assembly manual . . . . .	.11
Manufacturing drawings . . . . .	.15
Facade elements . . . . .	.19
Floorplan . . . . .	.20
Building elements . . . . .	.21
U-Build Box House	23
Flat pack architecture . . . . .	.25
Participatory Housing	29
Principles of the Segal Method . . . . .	.31
Foundations and Ground floor structure . . . . .	.33
Framing and roof . . . . .	.35
The permanently non-permanent	37
Hospice “De Liefde”	39
Private Living Quarters . . . . .	.41
Public Spaces . . . . .	.42
Service . . . . .	.43
Circulation . . . . .	.44
Program . . . . .	.45
Hospice “Het Tweede Thuis”	47
Private Spaces . . . . .	.49
Public Spaces . . . . .	.50
Service . . . . .	.51
Circulation . . . . .	.52
Program . . . . .	.53
Tuberculosis Sanatorium Finland	55
Healing Through Nature . . . . .	.57
Khoo Teck Puat Hospital	59
The Datsja	61
Discussion	66
Bibliography	68

Introduction

Inspiration for a design can be taken in many ways and is often required to discover the needs of a certain design brief or target group. In this document inspiration and information are collected by looking at architectural precedents, eventually to be used to feed into the design of a demountable hospice in the Dutch Peat Polders. The specifics of this design brief result in a clear direction to research relevant cases. In total three types of cases will be researched, categorizing them into, demountable cases, smaller-scale hospices, and natural healing-based buildings. For each of them, two relevant cases will be selected and researched.

Each category will have a different objective to be researched, within the demountable cases systems that are easy to build and relatively lightweight are looked for. The two hospice designs are compared on their program and the areas of the rooms, which will serve as input for the formulation of the building program later on. Finally, the buildings that are designed based on natural aspects will inform the design, showing that the incorporation of nature and the view on nature are important aspects when designing care-related buildings.

The research starts with an introduction of the selected case studies, expressing the designs and why they were chosen. Then the buildings will be researched one by one followed up by a discussion in which implementations by the author are mentioned.

Selected Cases

This case study research is aimed to feed the design project in three ways, firstly the design project will be partly self-build, using a demountable structure. Three cases were selected based on their demountability in different ways. The first case is the SCAL demountable building, designed by Jean Prouvé and Pierre Jeaneret. The second building is selected on its self-build DIY concept, named the U-build structures, designed by Studio Bark. Finally, the participatory Housing projects designed by Walter Segal are explored, looking into how an architect enabled people to embark on a self-build adventure. Additionally, one page will be allocated to criticize some modern buildings as being permanently impermanent.

The second type of cases that are going to be researched are two based on hospices or palliative care. Both based in the Netherlands the project represents good ways into how to design such a project. The first project was awarded Best Care Building of the Year by Architectenweb and was designed by Studio AAAN and De Keuvel Architecten. It is a mid-scale center with an affinity to the rural landscape, despite being located in Rotterdam. The second case is truly situated in the landscape and a rural setting, also incorporating an old farmhouse into the design. The project was designed by Marc Pronsmann Architecten and was recently completed in 2023.

The third type of case is aimed at buildings that use the presence of nature for mental healing or in some cases physical healing. The first project is an architectural classic, designed by Alvar Aalto, his Tuberculosis Sanatorium. A more recent project inspired by biophilic design is the second case, albeit being in the city, this project still incorporates many types of greenery. The Khoo Teck Puat Hospital in Singapore is thus the second case. Finally, the last project is a precedent of a polder retreat, the Datsja, which was a conceptual project meant to be a holiday home for the ones living in the city.

SCAL Demountable Building

Architects:	Jean Prouvé & Pierre Jeanneret
Location:	Various locations over time
Year:	1940
Program:	Multiple functions over time
GFA:	40 m²

Project Description

This project made Jean Prouvé able to use his axial frame constructive system for the first time. Working in collaboration with the SCAL factory and Pierre Jeanneret, both the architects were able to show that buildings prefabricated in a factory could be immediately placed and assembled on site. All the elements of the building were structural and covered the envelope of the building as well, making for a lightweight structure.

Because of the simple constructive language, the building could be adapted in many ways to suit various needs. The building could thus not only be used for dwelling, but could also house other functions. This whilst still keeping the required standards in terms of building quality and user comfort.

Source: Seguin and Seguin, *Jean Prouvé Scal Demountable Pavilion, 1940, 9'*.

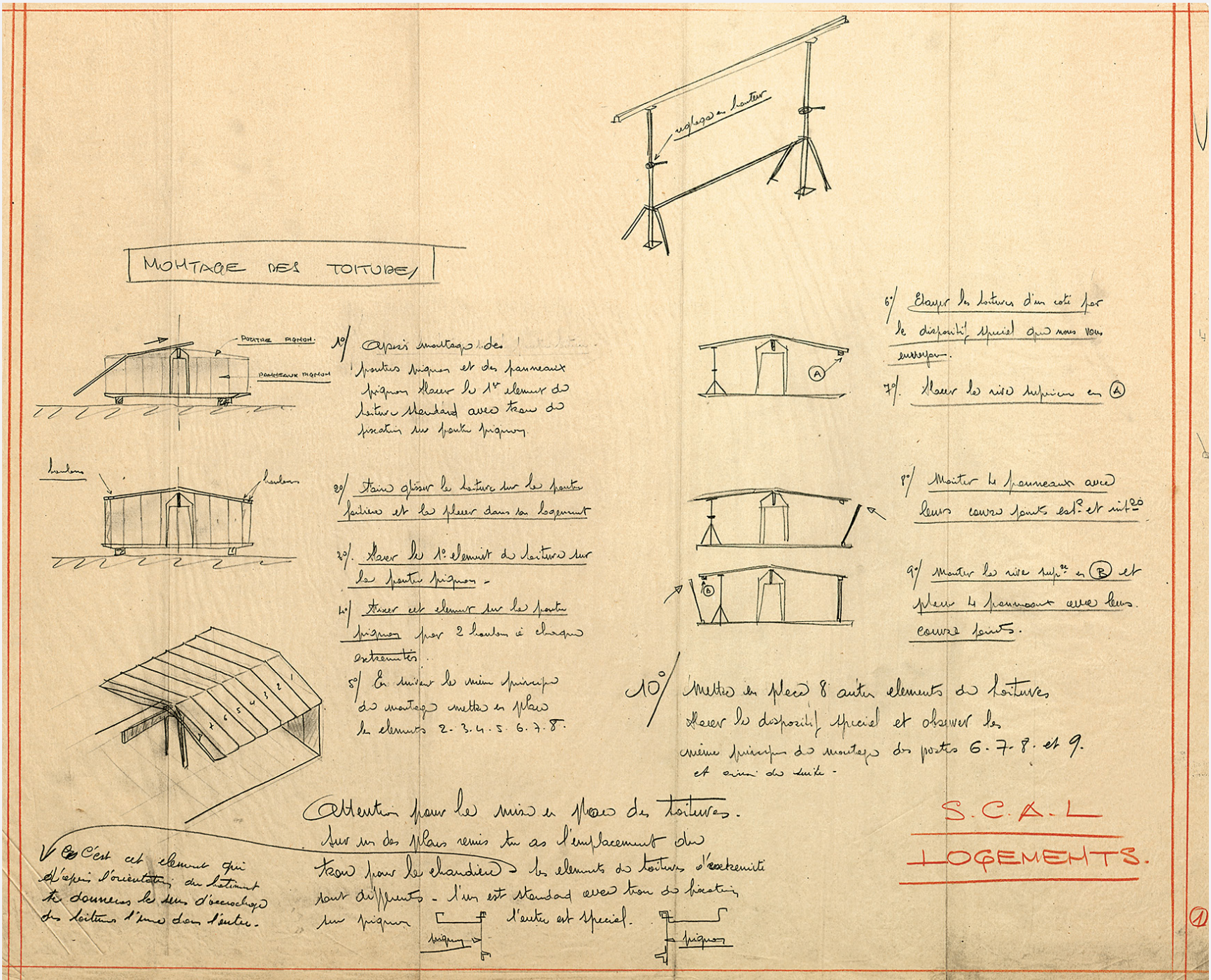


The SCAL building was realized by a combination of Jean Prouvé, Pierre Jeanneret, and the journalist Georges Blanchon. When the first commission for the pavilion was placed the tasks were already clearly divided. Prouvé would sketch the building elements, which would be further detailed by the office of Jeanneret, whilst Blanchon would manage and schedule the building supplies with the steel manufacturer.

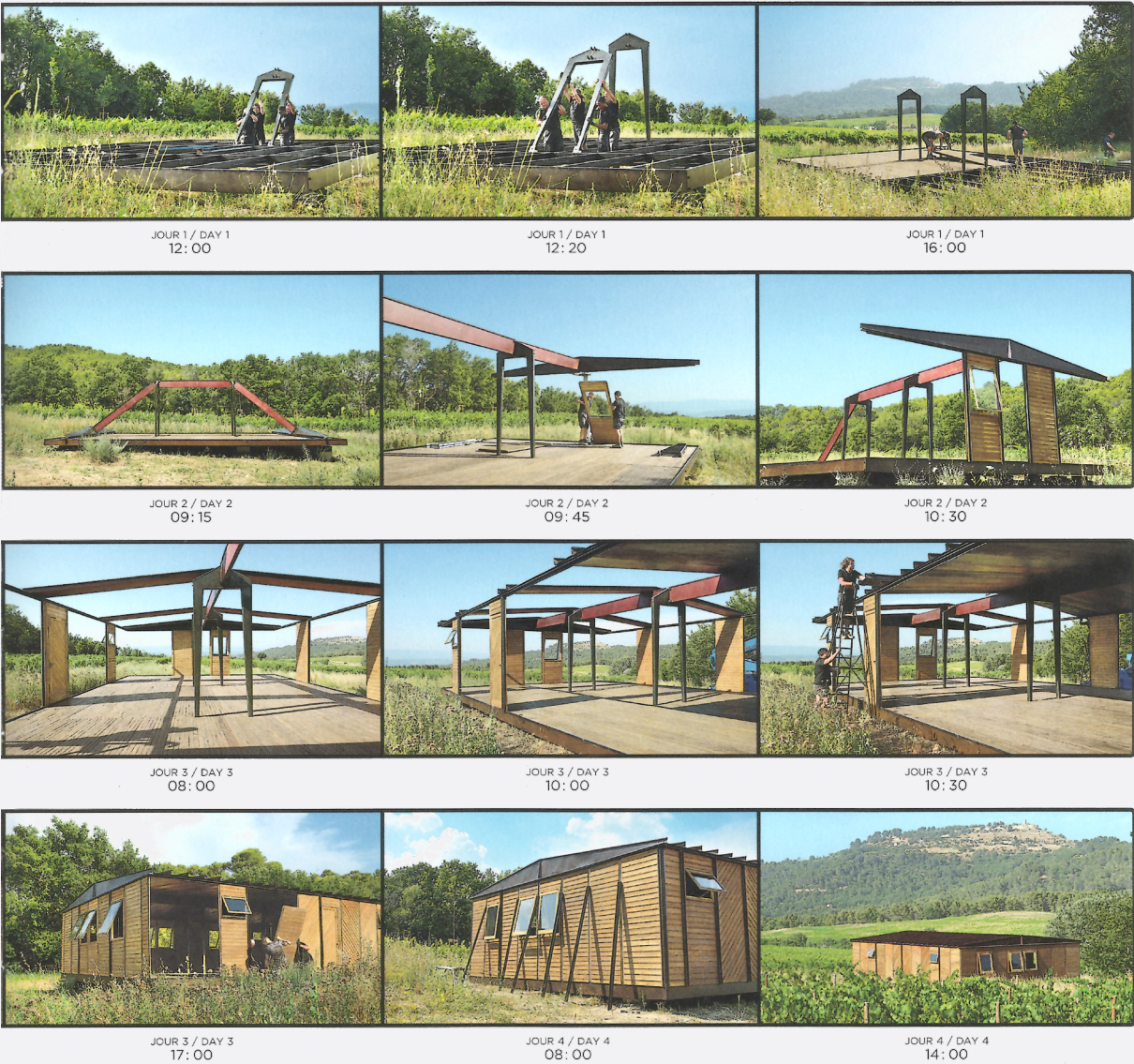
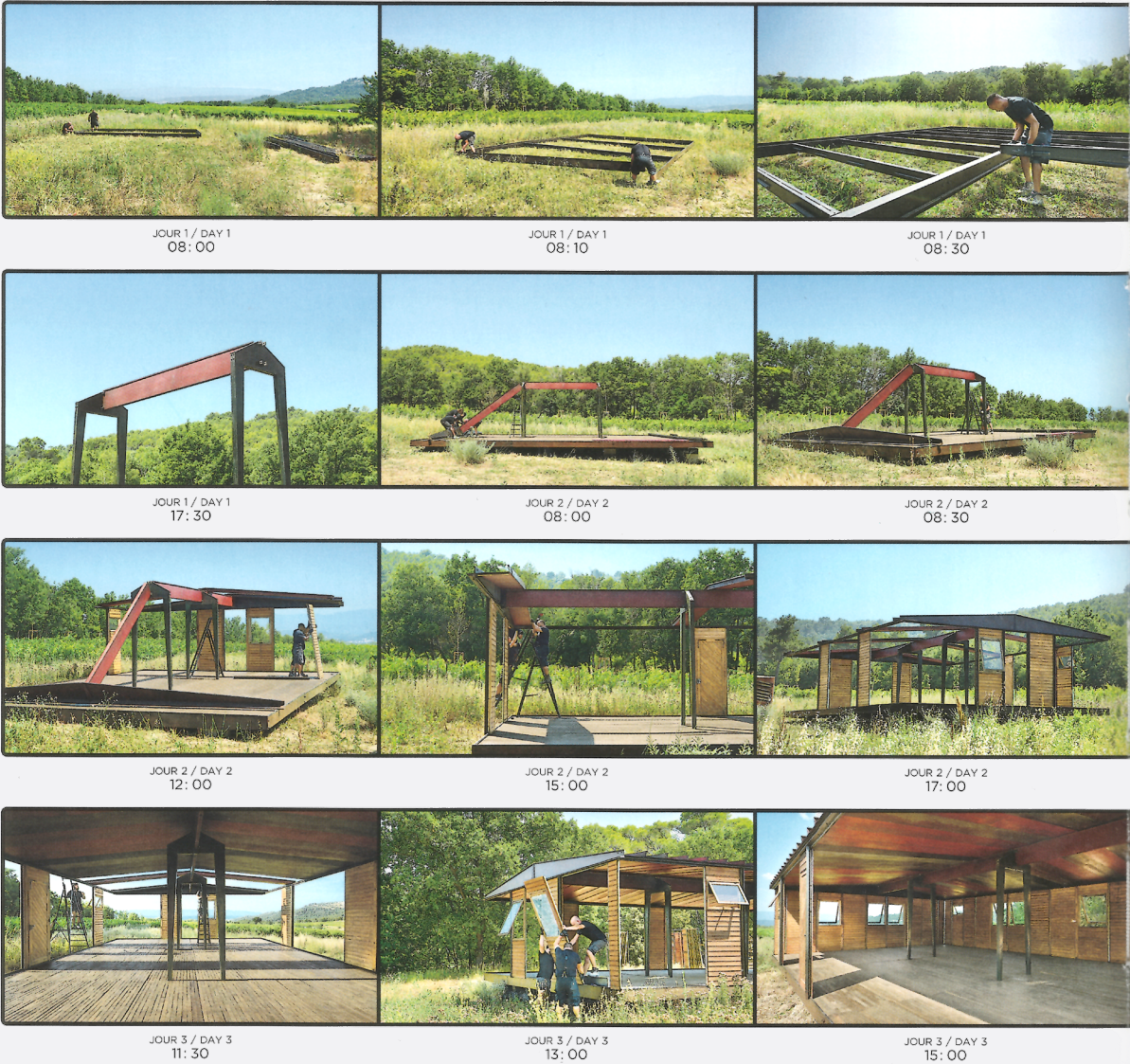
When Prouvé finished the sketches for the needed elements he would continue to draw the building into further detail, focussing on the assembly. Drawings were made showing how the building should be assembled in a step by step way, like the one shown on this page.

The drawing on the right illustrates the installation of the roofing panels. They were first slid over the portal frame, and then connected to one wall element. After which the panel was pulled into tension by the wall panel on the opposite side.

Source: Seguin and Seguin, Jean Prouvé Scal Demountable Pavilion, 1940, 92.



Building assembly

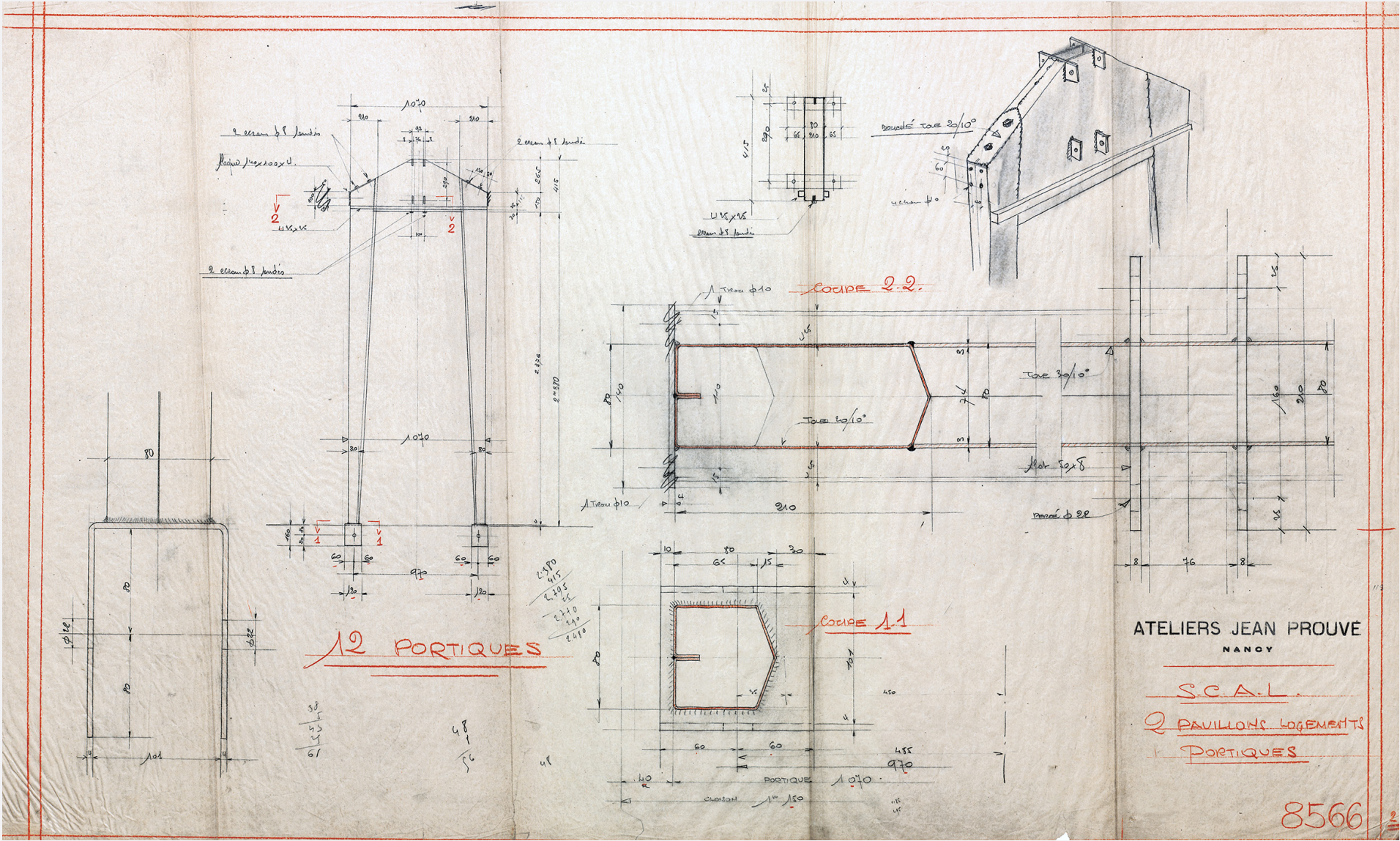


Manufacturing drawings

The skeleton frame, and especially this portal structure is the main architectural language or constructural vocabulary of Jean Prouvé. The portal frames varied from compass like elements to inversed Us or Vs depending on the type of structure Prouvé needed to complete.

As seen on the working drawings made by the ateliers of Prouvé the elements were made out of folded sheet metal plates welded together. The feet of the portal were made so that they are able to be lowered over the steel foundation beams and fixed in place without the need of bracing. At the top of the portal frames fixtures for the ridge beam were welded onto the metal plates, with a bar on the bottom side to rest one end of the beam to for easy assembly.

Source: Seguin and Seguin, *Jean Prouvé Scal Demountable Pavilion, 1940, 9³*.

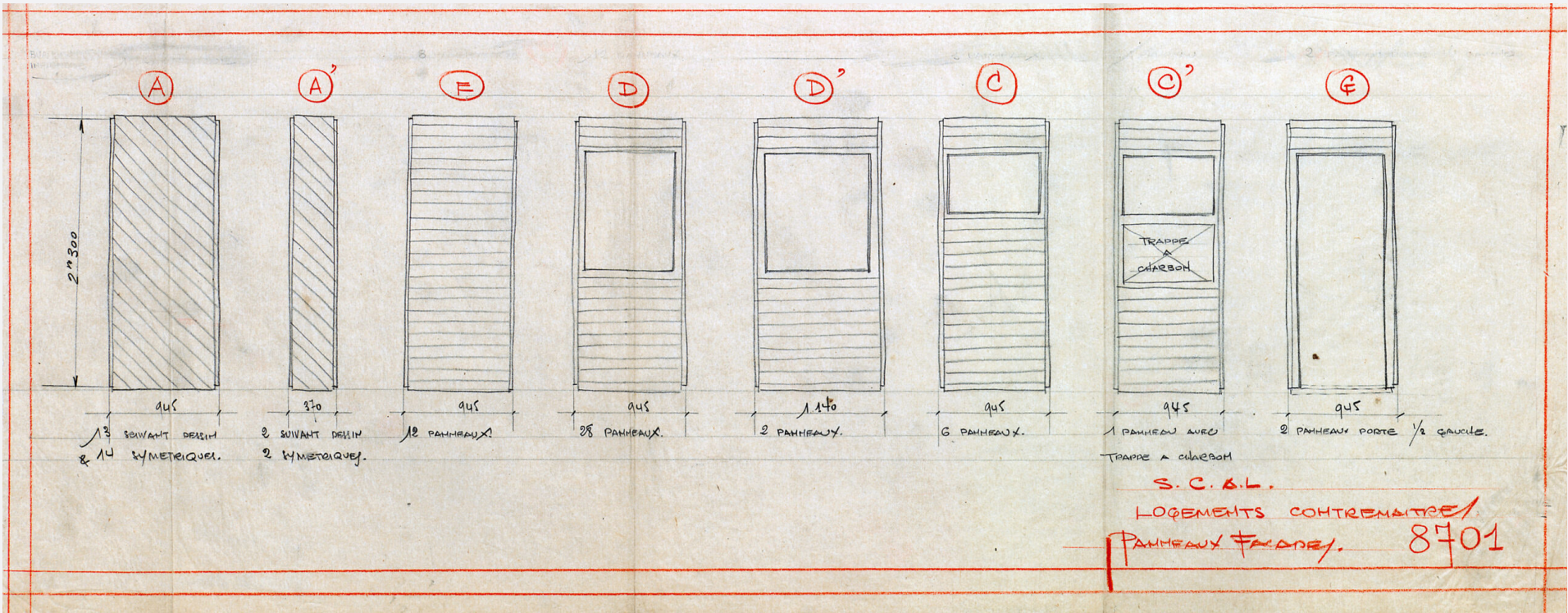


Manufacturing drawings

Once the engineering phase was completed the required elements were drawn and put into a table containing all resources needed.

Due to the restrictions on materials during the period of war, modular steel framed walls were replaced by cheaper and more readily availability pine wooden elements.

Source: Seguin and Seguin, *Jean Prouvé Scal Demountable Pavilion, 1940, 9⁴*.



PAVILLON LOGEMENTS									
	PLANS H ²	TRANSISE A BLANCHON	EN ATTENTE DE DEVIS	DEVIS DU	A CORRIGER	N ^o DE CDE	MENUISIER	OBSERVATION/	
FACADES	J.P.	X				4812 20/1/40	BLANC-T. ^R	EXPOSITION DE 21-3-40	
PLANCHERS	8621 8634	X		27-2-40 MREDER	X		MREDER		
SOLIVES	J.P. 17/1/40	X			X	4924	ORSET MREDER	92 SOLIVES - EXP. LE 10-5-40 8 SOLIVES	
PLAFONDS	8628 ^A	X	X						
CLOISONS INTERIEURES	8623 ^A	X	X						
PORTES INTERIEURES	8624	X		21-3-40 BLANCHON			BLANC-T. ^R		
FACADES INTERIEURES	8626					4910 7/3/40	VAUCOMMANT		
	8626					4910 7/3/40	VAUCOMMANT		
	8628	X	X	19-3-40 VAUCOMMANT		7/3/40			

Facade elements

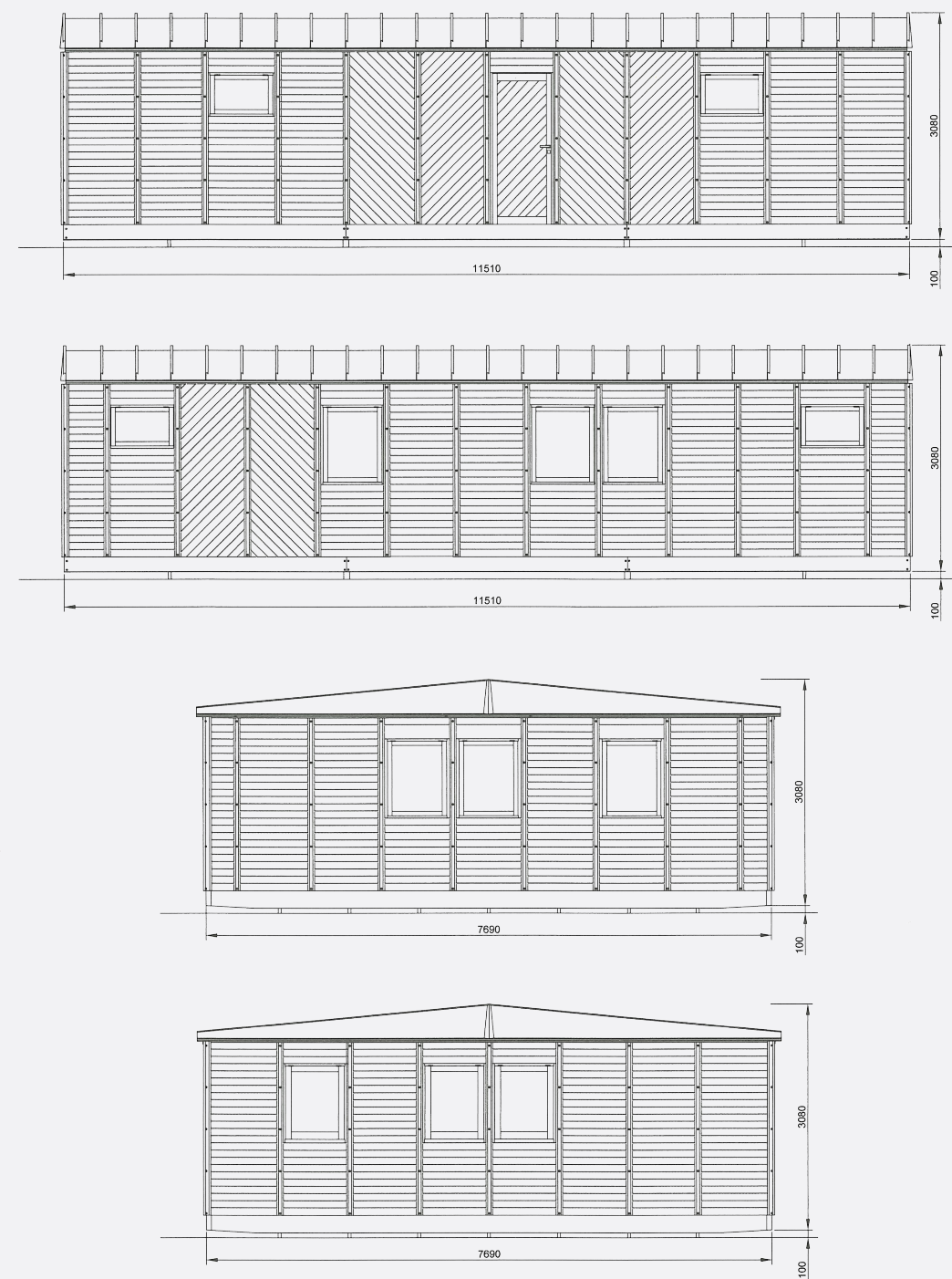


figure 08 - Facades of SCAL

Floorplan

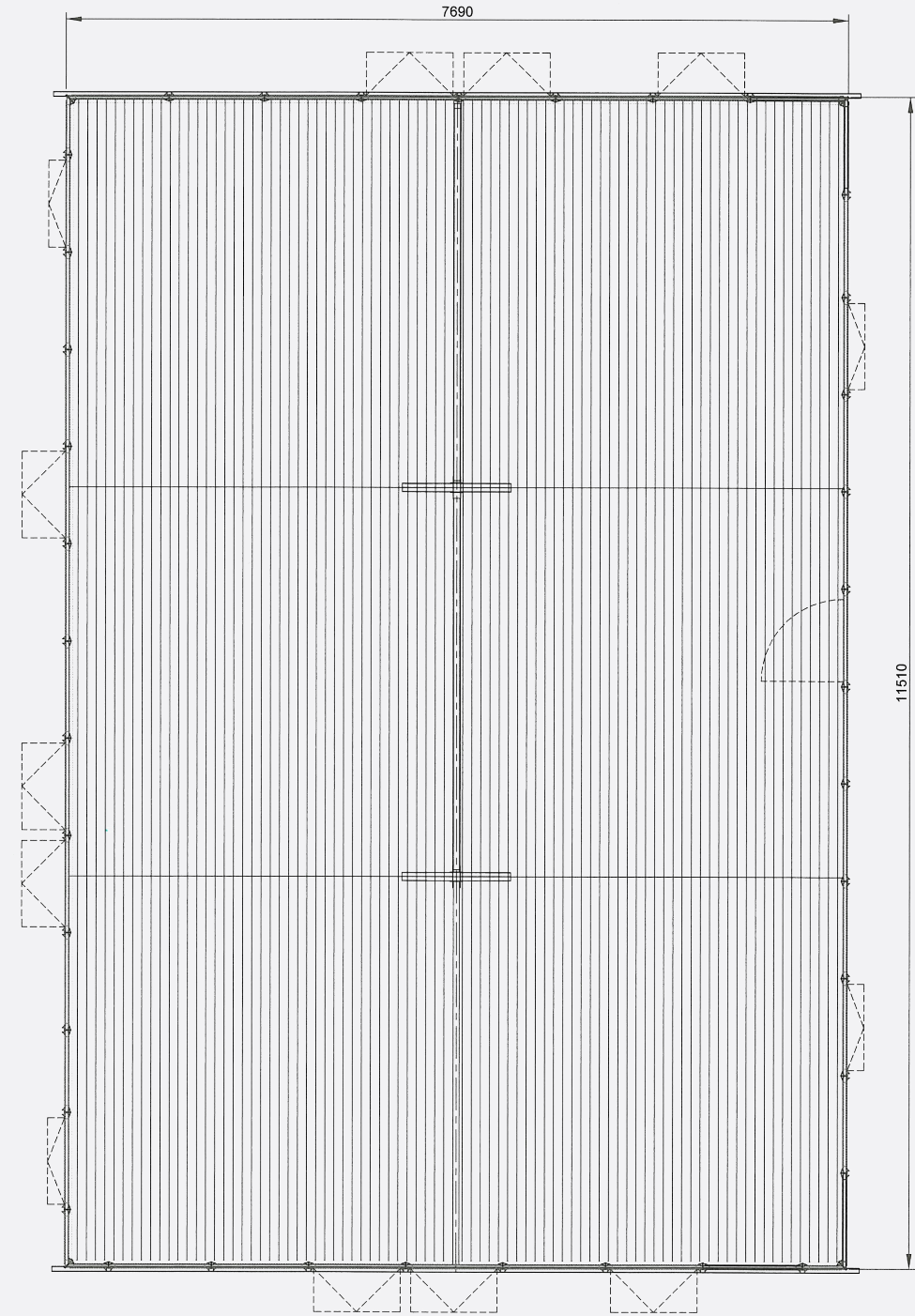
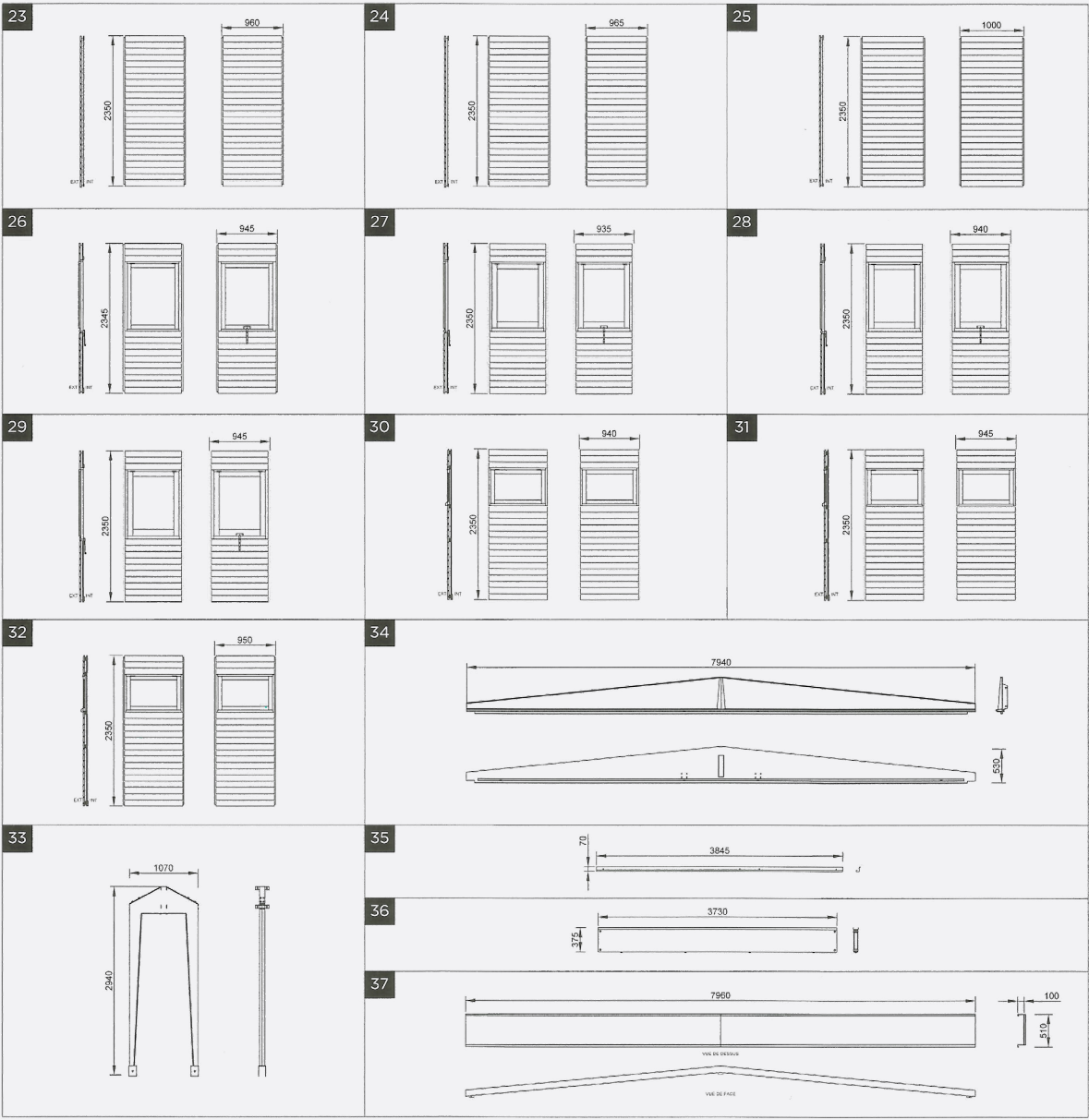


figure 09 - Floorplan of SCAL



U-Build Box House

Architect:	Studio Bark
Location:	Bichester, United Kingdon
Year:	2017
Program:	Dwelling
GFA:	90 m²

Project Description

As part of 10 pilot houses, the Box house is one of the first projects realized with the U-build system. This system was developed by request of the owners of this house, they did not have the money for an external contractor, but still wanted a home suited to their needs, which they could self-build. Through the box construction, all the hassles of the traditional building process were removed, and the owners were able to build their homes, with assistance from architecture students in just four weeks. The interior fit-out took another 8 weeks after the general construction was completed. In the meantime, specialized contractors installed mechanical and electrical services, and the green roof.

U-Build aims to make construction as simple as possible, making 1-2 people able to assemble all of the boxes they produce. Using standard connections, the boxes are connected to create a rigid frame, which can be a floor, wall, or roof.

Source: Studio Bark, “Box House.”⁵



Flat pack architecture

The house is constructed using U-builds flat pack building system. This system makes use of CNC-cutting technology to form the plywood elements that will make up boxes, which will in their term be combined to form the main structure of a building, art piece, or anything else desired.

Because of the simplicity of the system, just a minium amount of tools is needed for the building process. The boxes are hammered into their groves and fastend by screws on each corner. All holes are pre drilled, and do not have to be aligned, this prevents mistakes during the building process. The boxes are then bolted together to make up the building elements, such as walls, floors, or roofs.

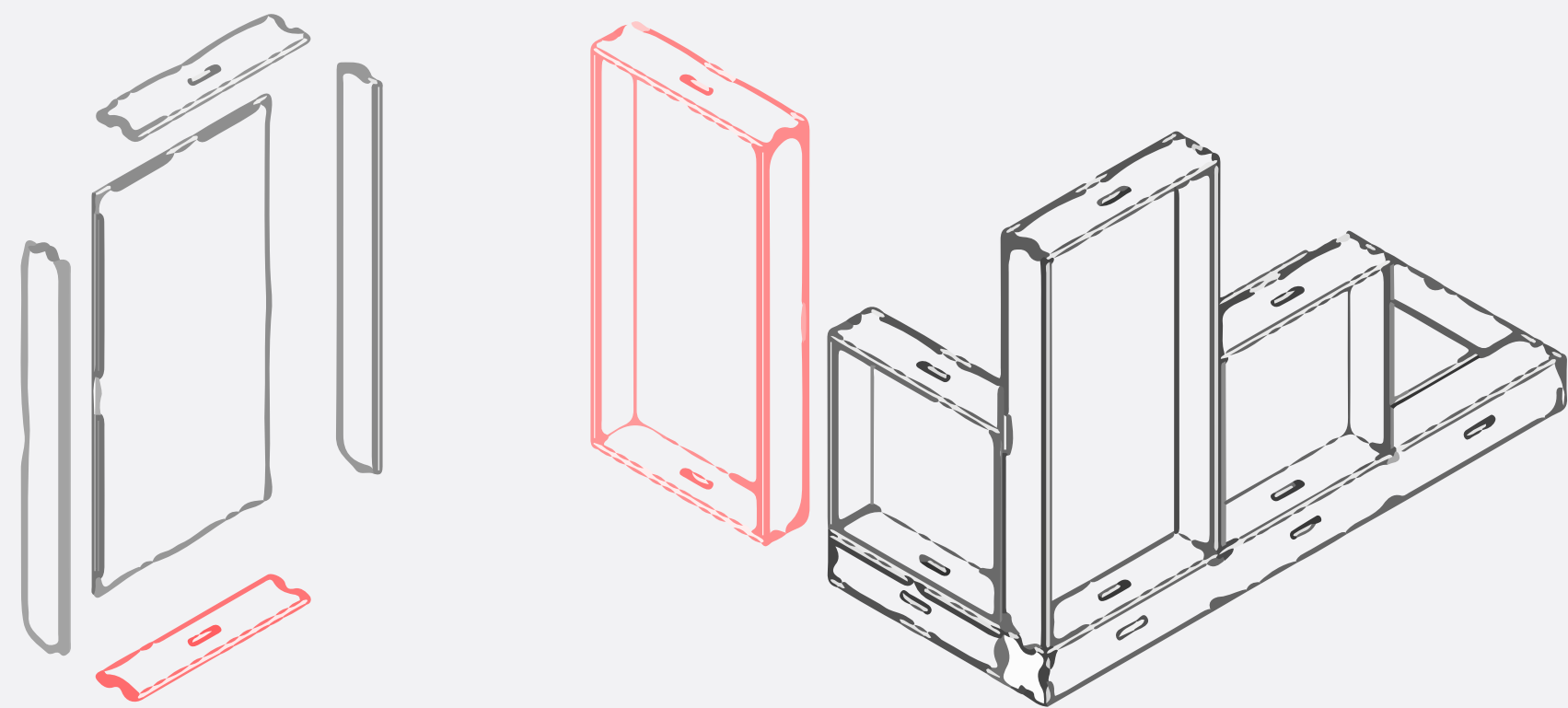
Almost all elements of the building are installed by the end-users, except technical installations, such as heating, HVAC and solar systems.



Flat pack architecture

As seen on this page the U-Build system in basic works with plywood sheets that are assembled to the form of a box. The assembled boxes are then independently connected with one other to form walls, floors, and roof structures.

The open side is then filled with insulation and clad on the outside with a facade material. If a window is desired one box is able to be removed to leave a hole in the wall for the assembly of a window.



Participatory Housing

Architect:	Walter Segal
Location:	London, United Kingdom
Year:	1976
Program:	Dwelling
GFA:	90 m²

Project Description

During the 1960s Walter Segal developed a self-build method, enabling ordinary people to participate in the design of their dwellings and build their own houses in a cheap and relatively quick way. The method made use of readily available materials in standard sizes, making the build even more approachable. Additionally, Segal made working drawings, calculated the structure, and even went as far as ordering the materials. Furthermore, he even gave workshops in the building to future homeowners, making them comfortable with the idea of building the structure. During the late 1970s, the method was allowed and adopted by the Lewisham Council for having this kind of experimental houses on 4 sites.

Source: ArchDaily, "Walter's Way: The Self-Build Revolution.⁶" & Hilmer, "Participatory Housing: Segal's Self-Build Method.⁷"



Principles of the Segal Method

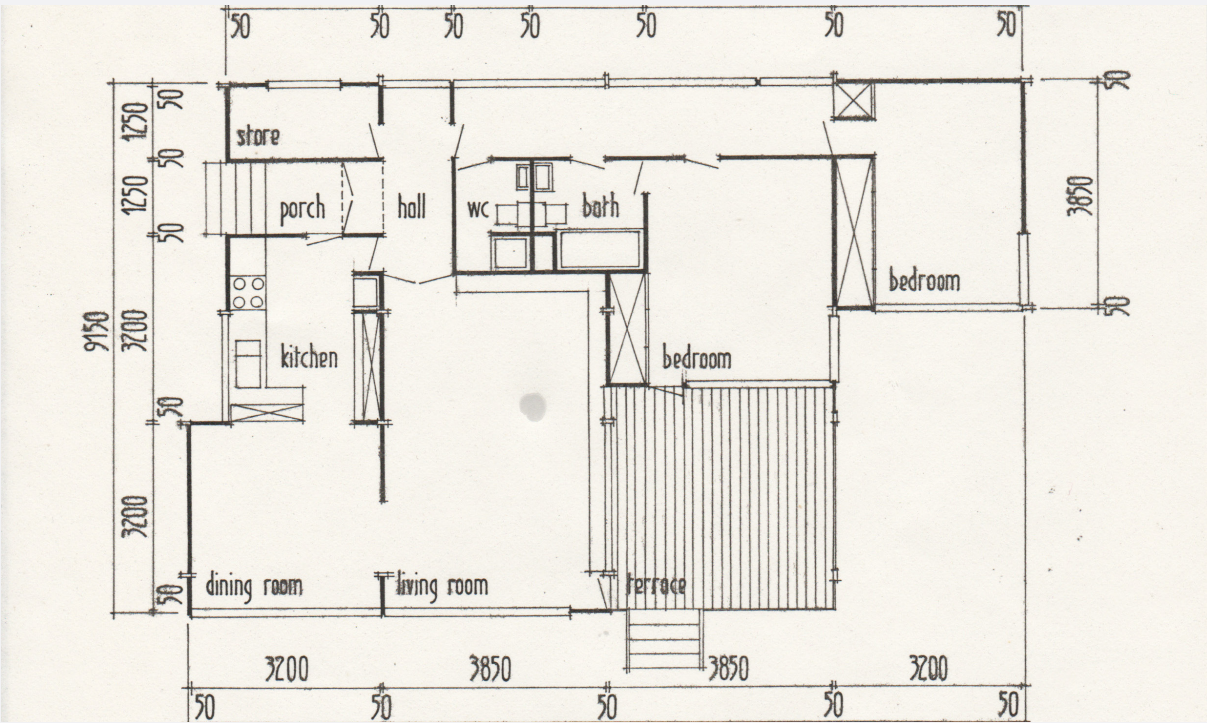
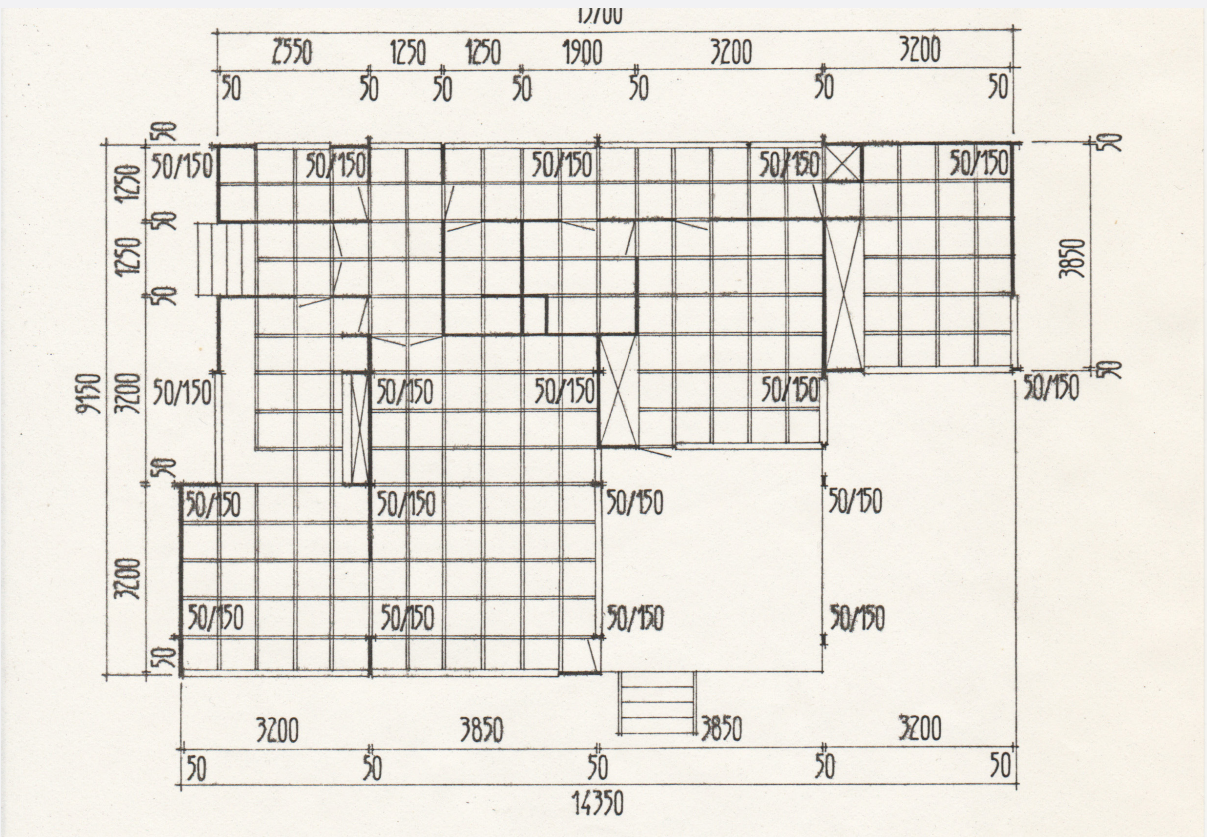
To make the structure as affordable as possible Walter Segal used simply constructed timber frames with bolted connections, these structures were designed to ensure that potentially problematic construction issues such as thermal movement were accommodated without complex details. The principles that are described below eventually resulted in a total cost of 800 pounds for the houses that were built.

In summary, the Segal Method was based on a rigorous simplification of the structure, resulting in a Timber bolt-together, post-and-beam-based construction. This also resulted in one person with basic carpentry skills being able to undertake the majority of the work. Almost all work can be done, with some assistance on the roofing and building services. The simple structure also required basic tools, such as a hammer, saw, plane, spade, drill/ driver, tape measure, etc.

The structure is primarily made up of readily available materials in standard sizes, resulting in minimal cutting and waste. For the foundation for instance standard 600 x 600 mm concrete tiles were used for foundations under the posts, making the use of strip foundations unnecessary, whilst also limiting the amount of concrete being used. In addition, the building process does not require wet trades, such as bricklaying or plastering.

Speaking in terms of reinventing the structure in this day and age, improvements can be simply added to the concept of the building. Higher insulation values can for instance be incorporated in this structure. Furthermore, the building is easy to extend both horizontally and vertically, able to reach a maximum of three layers. This makes the Segal Method a worthwhile inspiration for sustainable self-build dwellings.

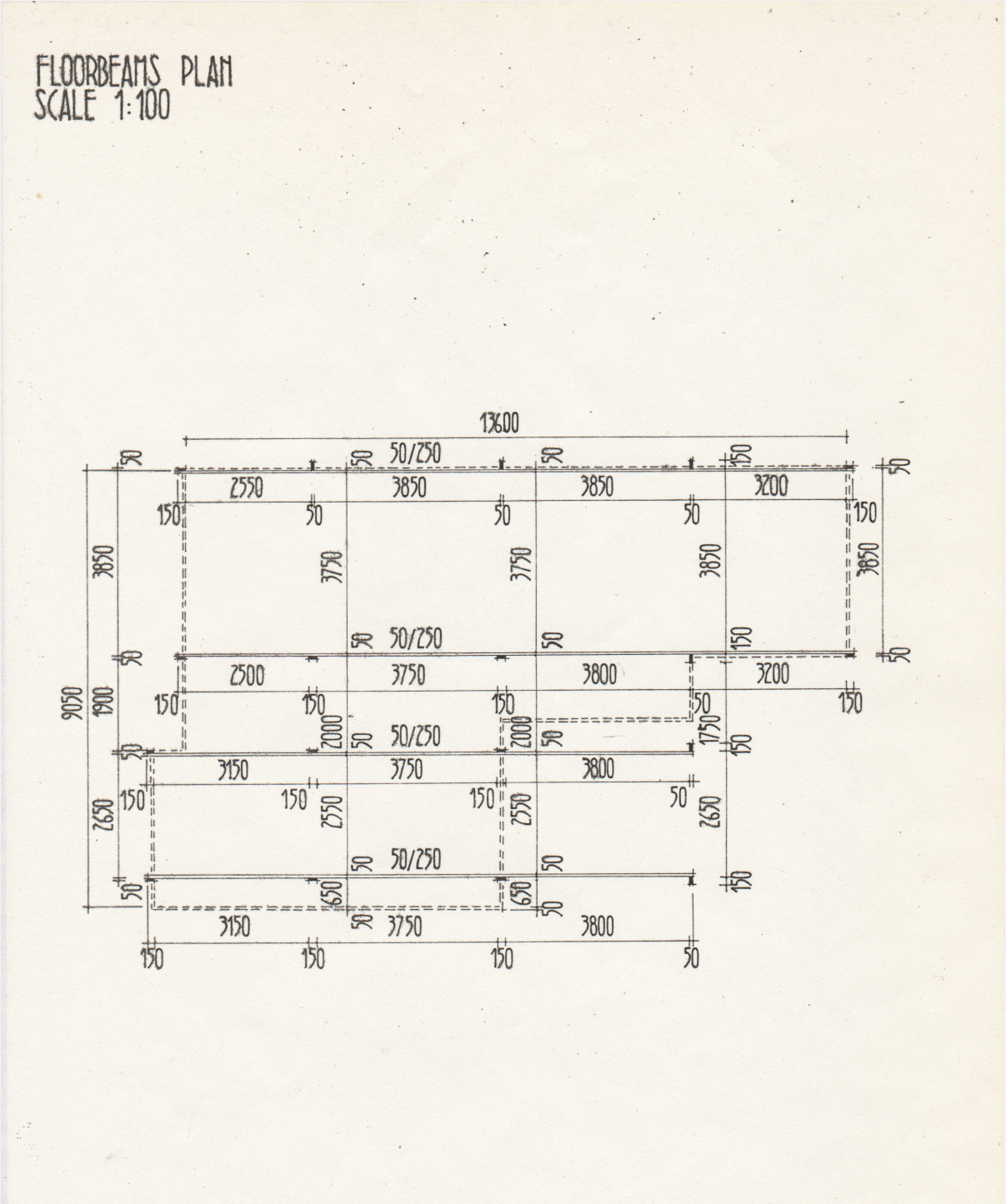
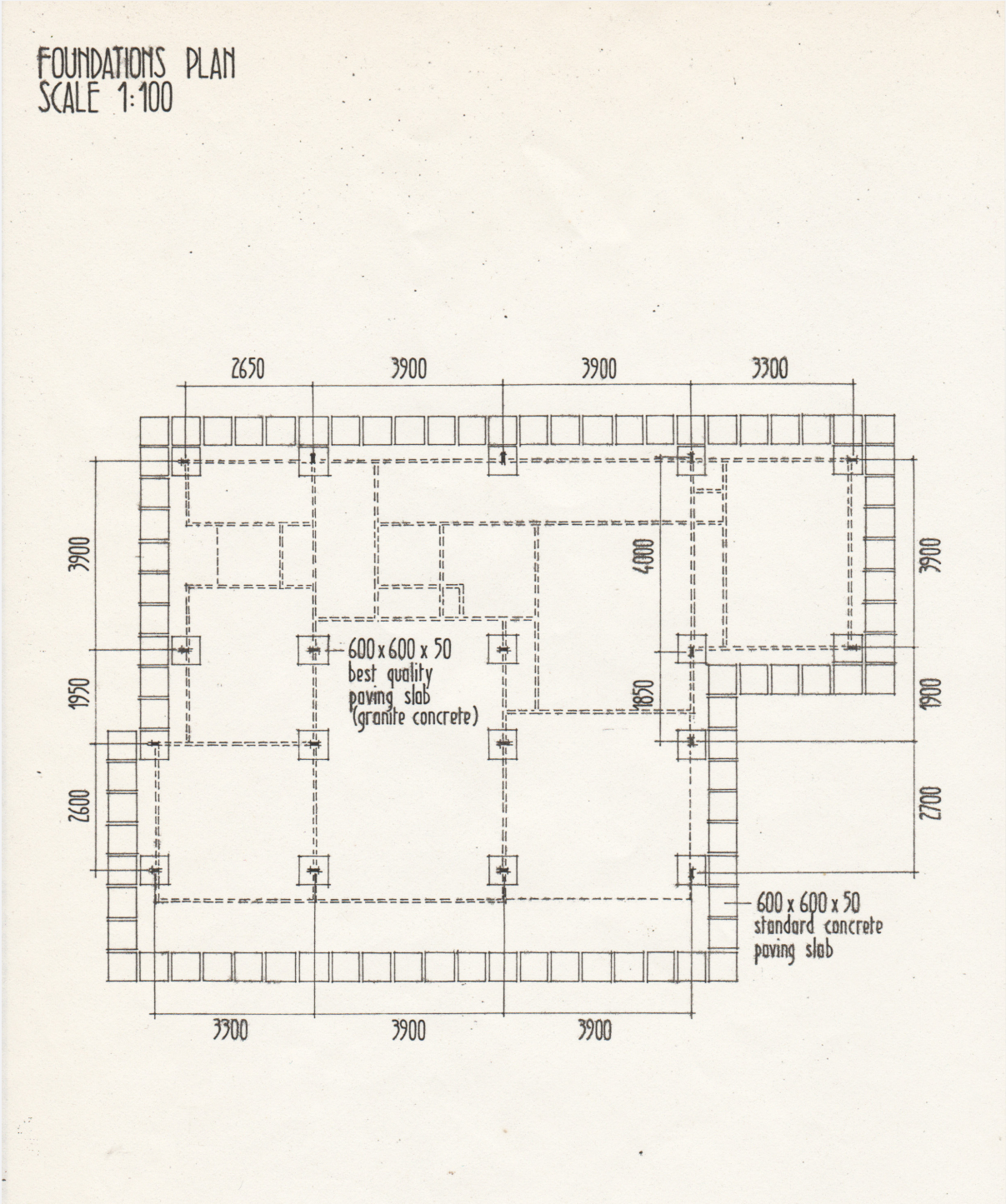
Source: Designing Buildings, "Segal Method.8"

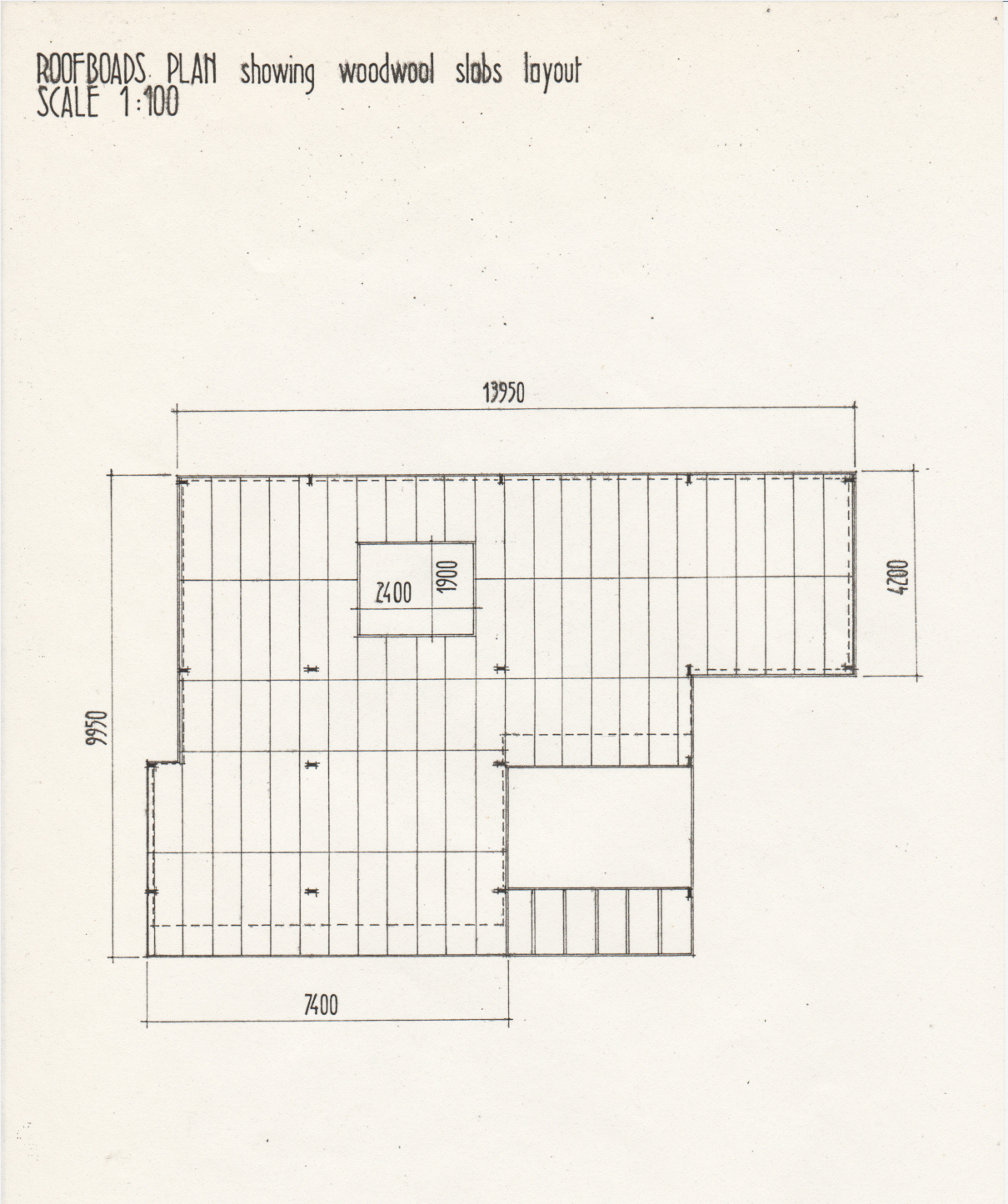
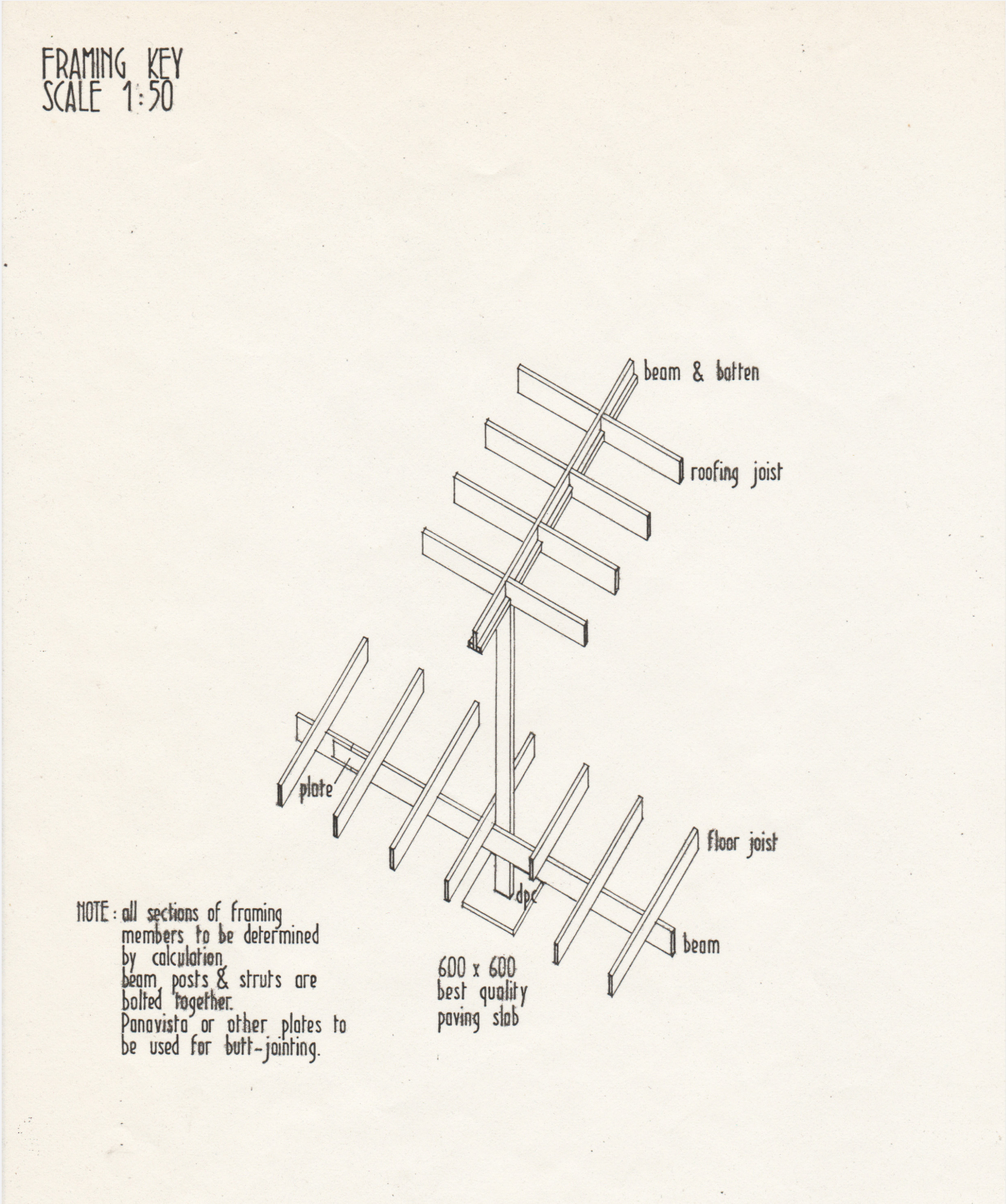


T-figure 17 - Modular floorplan 600 x 600 mm

B-figure 18 - Ground floor

Foundations and Ground floor structure





The permanently non-permanent

Architect:	(t) Einszueins Architektur (b) Ignacio Rojas Hirigoyen Architects
Location:	(t) St. Andrä-Wördern, Austria (b) Near Casablanca, Chile
Year:	(t) 2022 (b) 2022
Program:	(t) Dwellings (b) Dwelling
GFA:	(t) 35 - 115m² (b) 85 m²

Project Criticism

During the research, many projects are claimed to be able to be demountable or have a non-permanent stance on the plot they have been built on. This most presumably has to do with the target groups or clients that have been the initiators of the projects. Die Auenweide for instance is lifted off the ground whilst also enabling the buildings to be demounted. In this case, the owner is a CPC (Collective Private Commission) which probably won't demount the building in the too distant future.

A similar thing can be stated for the second project, a modular prototype house, set in a beautiful location by a private client. This again won't be demounted unless it has to be forced to do so. This is also the case for the Prouvé building covered earlier in this chapter.

Good care should thus be given in selecting the right target group for temporary housing.



Hospice “De Liefde”

Architect:	Studio AAAN & De Keuvel Architecten
Location:	Rotterdam, The Netherlands
Year:	2020
Program:	Hospice, Palliative Care
GFA:	1.150 m²

Project Description

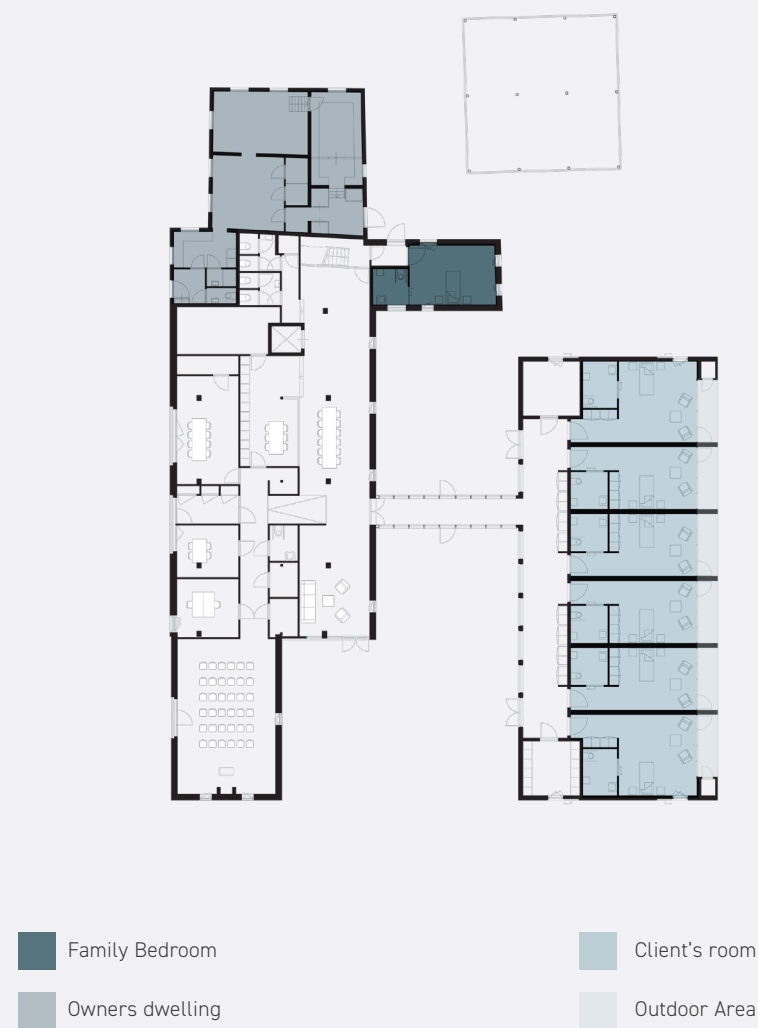
On the Southern edge of the city of Rotterdam a monumental thatched farm ‘De Kapel’, a national monument, houses the hospice De Liefde. After a large renovation in 1992 unit 2017, the farm was used as a care farm for adults with a light mental disability. From 2017 to 2020 the farm was renovated and expanded to house the new palliative facility.

The old farm and stable were used to house public functions, such as the kitchen, communal living room, offices, and other public facilities. The tallest space of the farm, covering two floors, is reserved for saying goodbye to deceased loved ones. Due to regulations on sound, light, ventilation, and insulation, the living quarters of the clients are placed in a new addition to the ensemble. The aesthetics of the new building are based on the black stables and storage units that are still found near farms around the area.

Source: De Kovel Architecten, “Hospice de Liefde.”

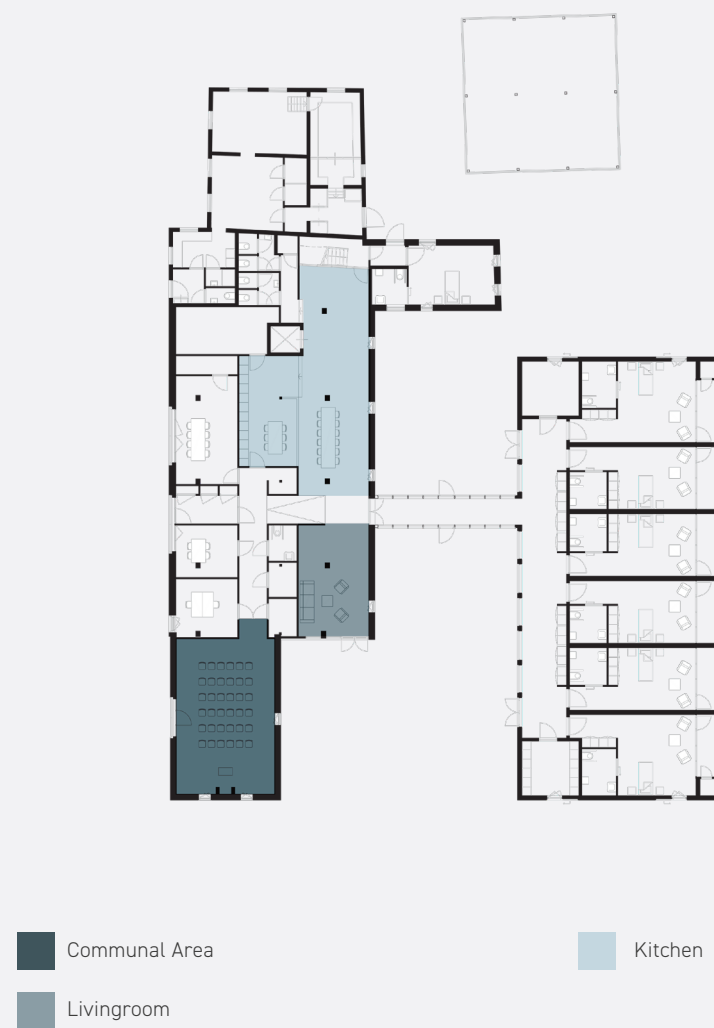


Private Living Quarters



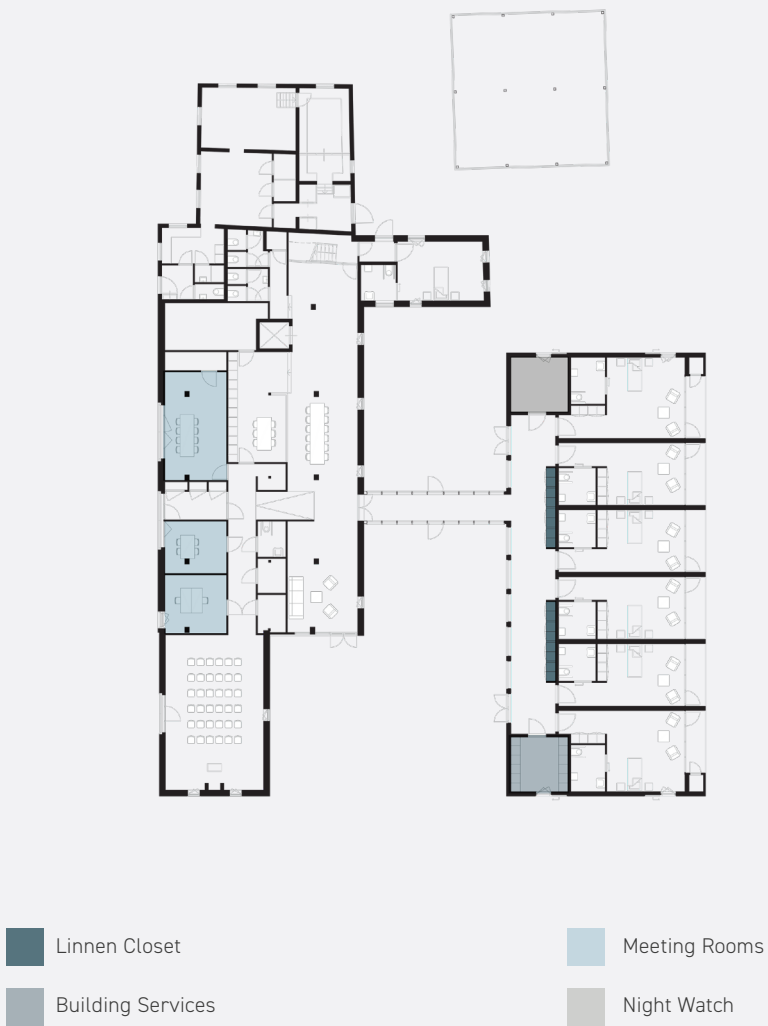
In total the hospice has 8 bedrooms, of which 6 are for the clients in a separate volume, offering privacy and intimacy when the clients need it. The client rooms are equipped with a private bathroom and outdoor space. If needed there is an extra bedroom available for family that wants to stay close to their relatives in the old farm building. For the owner of the hospice a separate dwelling is realized.

Public Spaces



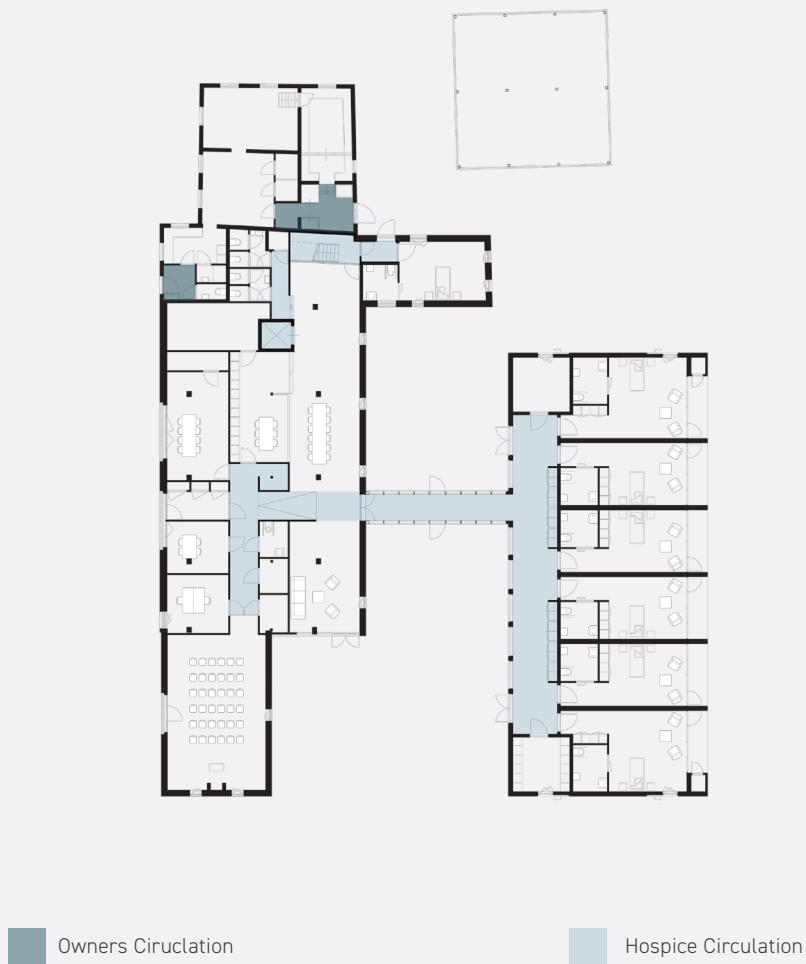
The hospice has multiple area's in which the clients are able to meet each other or relatives. All of the public spaces are located in the old farmhouse, overlooking the patio and the private area's are the shared livingroom and diner. A communal area, for larger meetings borders the meeting rooms and hallway to the kitchen.

Service



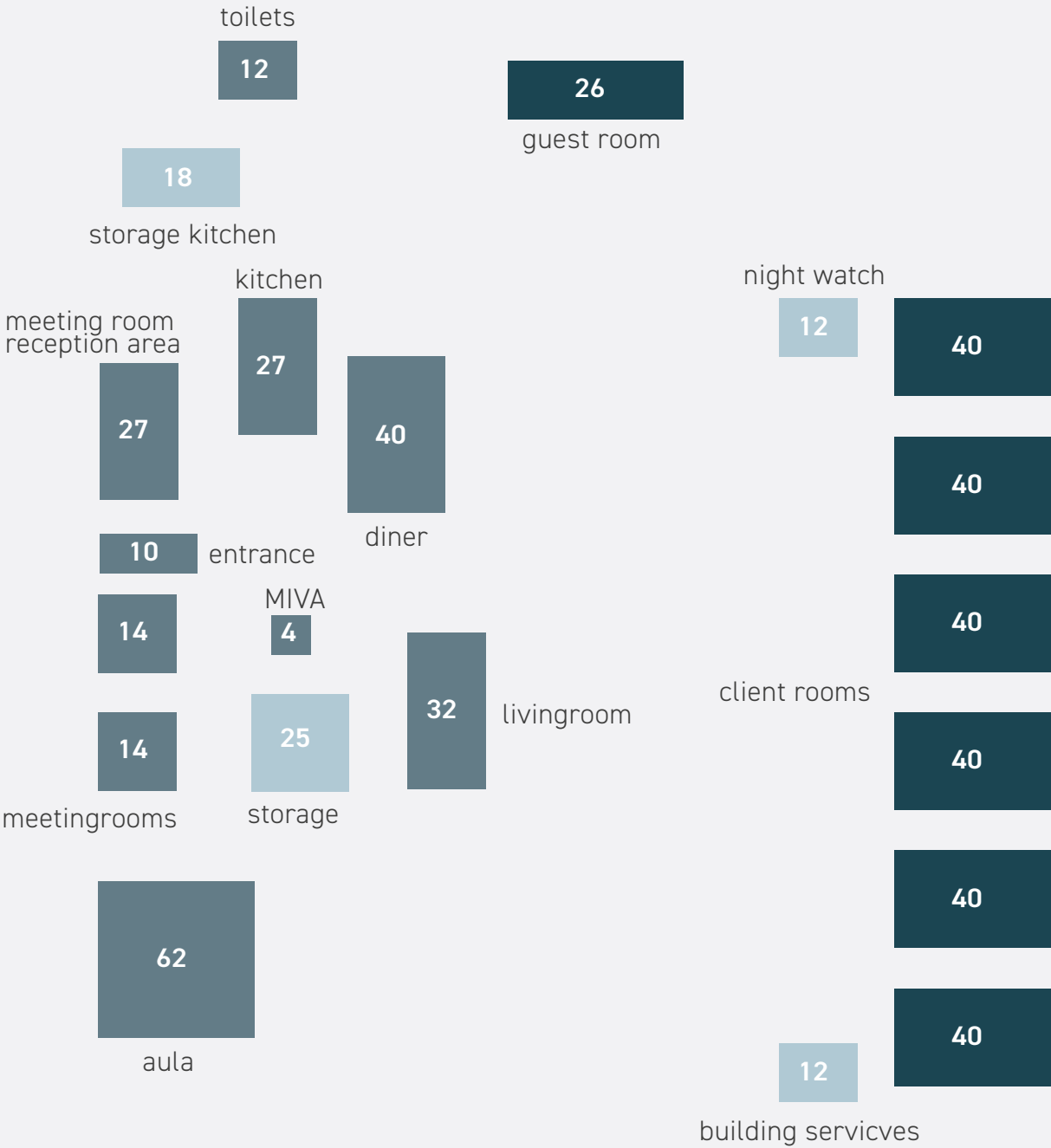
In the old farm side of the building there are two meeting rooms and one bigger meeting room. This is also the room where people arrive. Building services are located in the new volume together with the night watch and the storage of freshly washed linnen close to the rooms.

Circulation



The ensemble for this hospice exists out of two separate volumes, which results in a corridor between the two volumes to allow the clients to move between them without going outside. The public side of the building is set up as a open plan, also making the kitchen a circulation area in some way.

Program



575 m²



Hospice “Het Tweede Thuis”

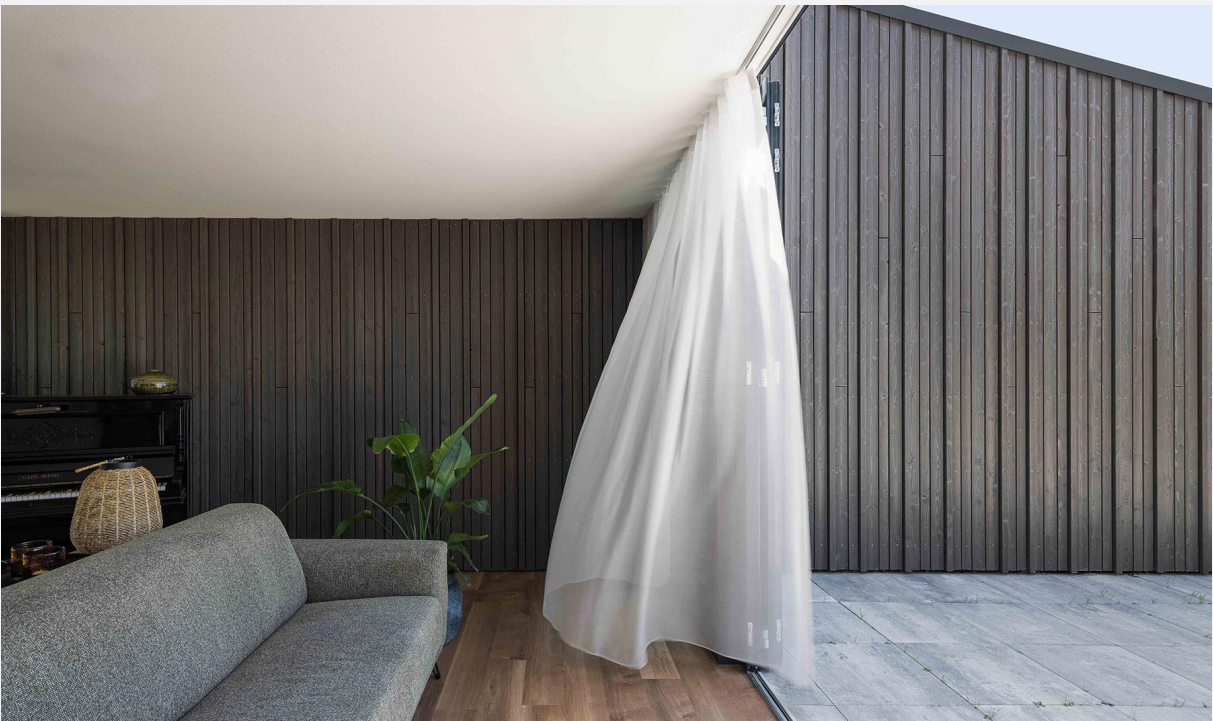
Architect:	MPA, Marc Prosman Architecten
Location:	Westerland, The Netherlands
Year:	2023
Program:	Hospice, Palliative Care
GFA:	675 m²

Project Description

Bordering the meandering Westerlandseweg an authentic farmhouse (Stolpboerderij) is making its presence, flanked by trees and a garden. The farmhouse offers a view over the farmlands and in the distance the Amstelmeer, making it suitable for the design of a hospice. Around the farm, three volumes are added referring to the old sheds, two of which house individual apartments and one houses a special building for saying goodbye to loved ones.

The old farmhouse functions as the public center of the ensemble, housing the communal living room, kitchen, and family room. A spacious glass hallway connects the old farm to the new buildings, offering a view of the landscape in all directions. The Aula in the hayshed is situated on the second floor, offering a view over the landscape, designed for quietness and reflection.

Source: De Architect, “Hospice Het Tweede Thuis Westerland: Marc Prosman Architecten.”¹⁰



Private Spaces



figure 34 - Private living quarters

Public Spaces



figure 35 - Public spaces

Service



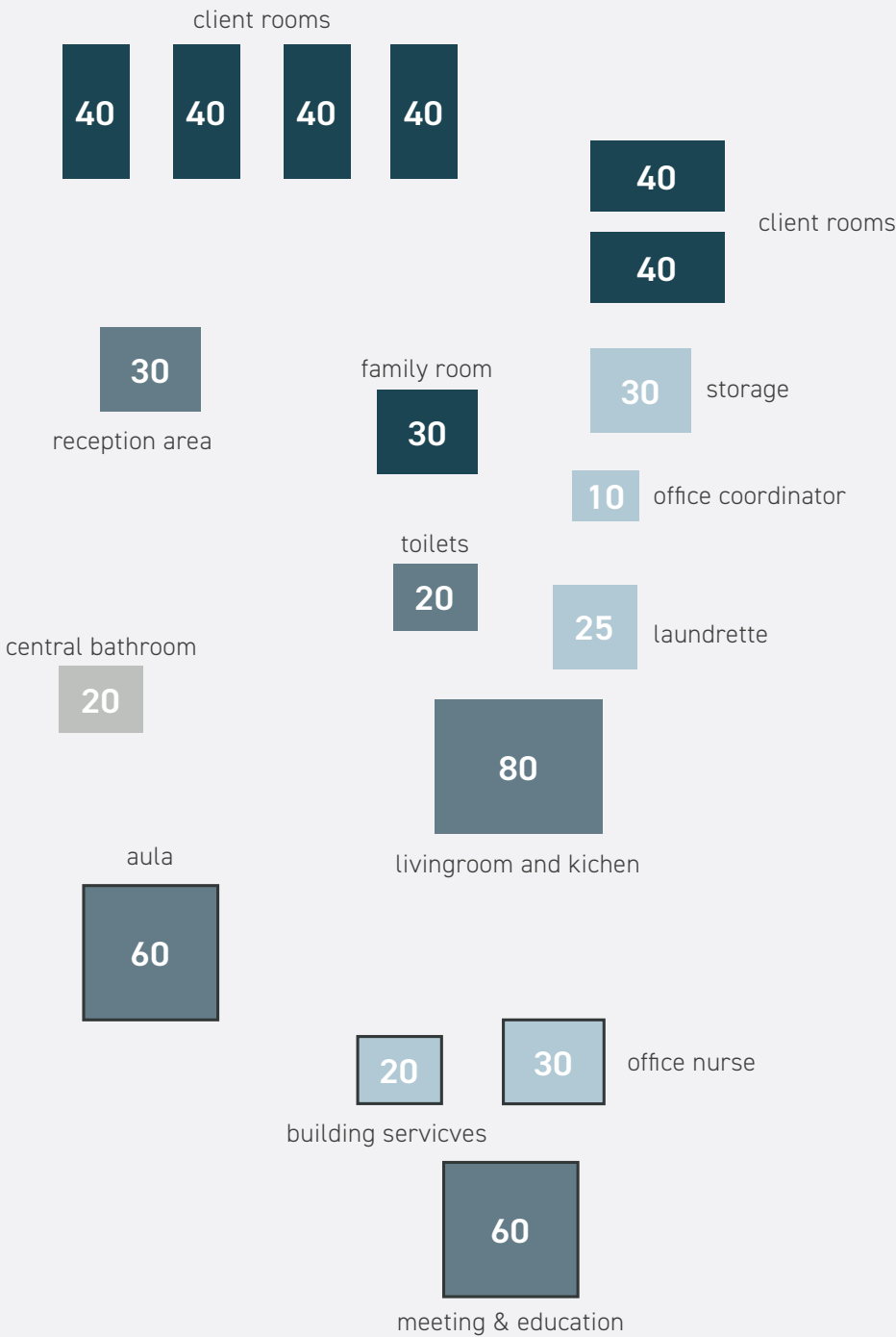
figure 36 - Service spaces

Circulation



figure 37 - Circulation Area's

Program



Tuberculosis Sanatorium Finland

Architect:	Alvar Aalto
Location:	Paimio, Finland
Year:	1928-1933
Program:	Sanatorium
GFA:	ca. 10.500 m²

Project Description

Just as the rest of the world Finland was in a battle against tuberculosis before the Second World War. In 1928 a competition was announced for the planning of a tuberculosis sanatorium in Paimio, in the South-west of Finland. The year after, Aalto won the competition with a building design of 4 divided building parts centered around an entrance area. The four elements consist of a patients' wing, a resting wing, a social and administrative wing, and the service wing.

The six-story patients' wing opens southward to the light and the resting ward wing is diagonally connected to it. These two elements make up the largest elements of the building, with the administrative and service wing being smaller elements.

Source: Lahti, *Alvar Aalto 1898-1976: Paradise for the Man in the Street¹¹*.



Healing Through Nature

During the first years after the discovery of the Tuberculosis virus, there was a strong belief that there was a rehabilitative effect achievable by exposing the patients to light and air. This is also why outdoor areas were created for patients to truly take in the natural light and air.

Despite the best intentions the success of the treatment was not proving to be that effective, there was a likelihood of 50 percent of death within five years. The discovery of the antibiotic streptomycin in 1946 finally brought an effective cure to TBC.

Source: Woodman, "Revisit: 'Aalto's Paimio Sanatorium Continues to Radiate a Profound Sense of Human Empathy.'"¹²



Khoo Teck Puat Hospital

Architect:	RMJM Architects
Location:	Singapore
Year:	2009
Program:	Hospital
GFA:	102.190 m²

Project Description

In the colonial days buildings were designed around natural ventilation, which was getting more and more advanced, resulting in comfortable buildings. Specifically arranged leaf covers, flow-through ventilation, light-wells, and breezeways were all contributing to natural ventilation. With the rise of the aircon, the interest in this kind of natural ventilation became less used. Due to climate change, the architect decided to reintegrate the original technologies back into the design.

Not only the technical aspects of the building take reference from traditional building techniques, but also the health-related elements are inspired by nature. Healthcare institutions now understand that they need to create a calming atmosphere, which natural materials have a big effect on.

Source: RMJM Architects, "The Architect's Perspective: Khoo Teck Puat Hospital."¹³



The Datsja

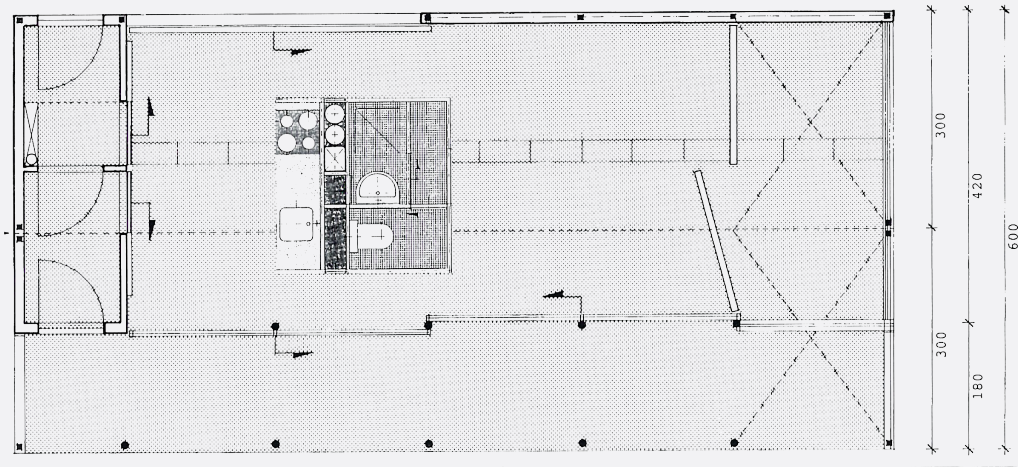
Architect:	Various architects
Location:	Polders near the Randstad, The Netherlands
Year:	1994
Program:	Holiday homes
GFA:	40 m²

Project Description

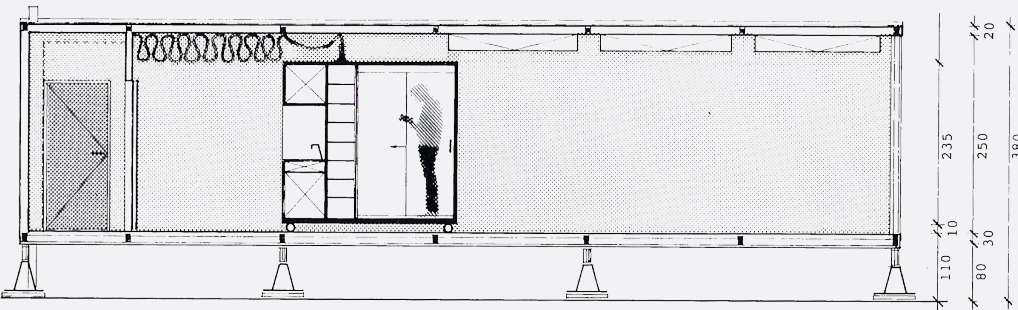
Back in 1994, there was already talk of redeveloping some agricultural lands to production forests or natural environments. These 'green stars' within the Randstad would add a vast area with a high recreational value close to the cities. The concept of the plan is to eliminate the need for dwellings with a garden in the city by allowing those dwellers an additional dwelling in these areas.

The result of these constraints was the Datsja, a self-supporting holiday or weekend home, of around 40 m² with a garden of 100 m². Contact with nature was one of the most important elements of the building incorporating much glass in the design. The buildings should be founded on prefabricated concrete plates, and have a free plan with a movable core inside.

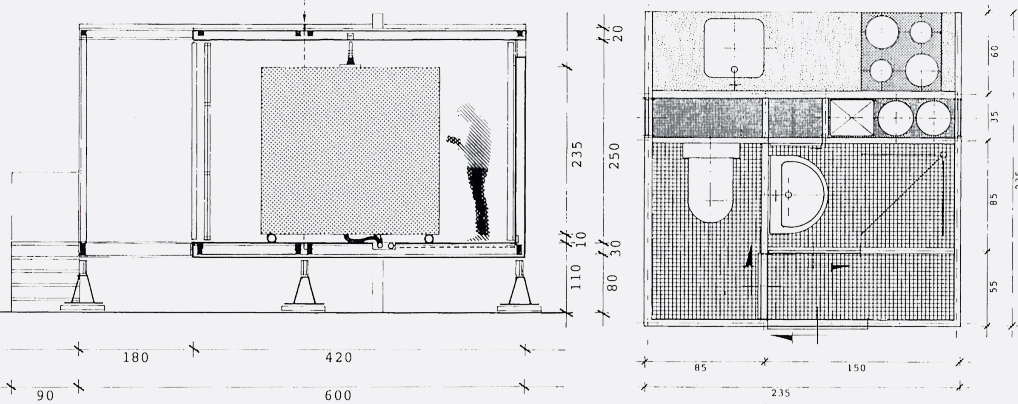
Source: NWR and STAWON, *Ontwerpend Aan Holland: Inspirerende Schetsen En Projecten Voor Het Wonen in de 21e Eeuw*, 92–101¹⁴.



Plattegrond



Langsdoorsnede



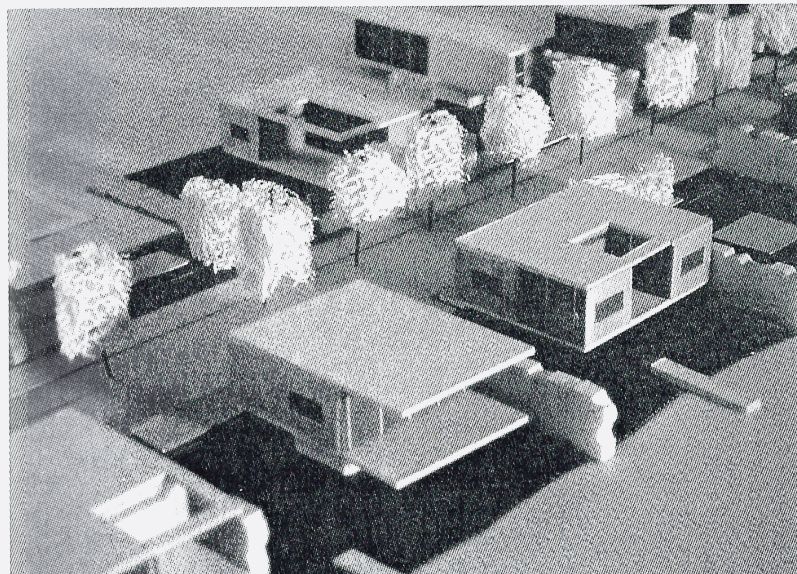
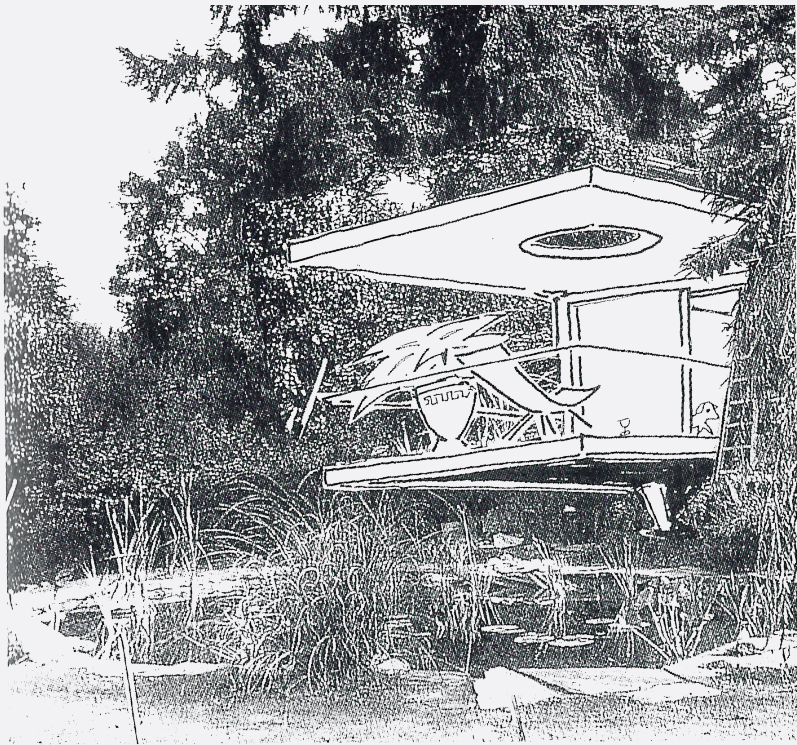


figure 45 - Datsja design by DKV Architecten

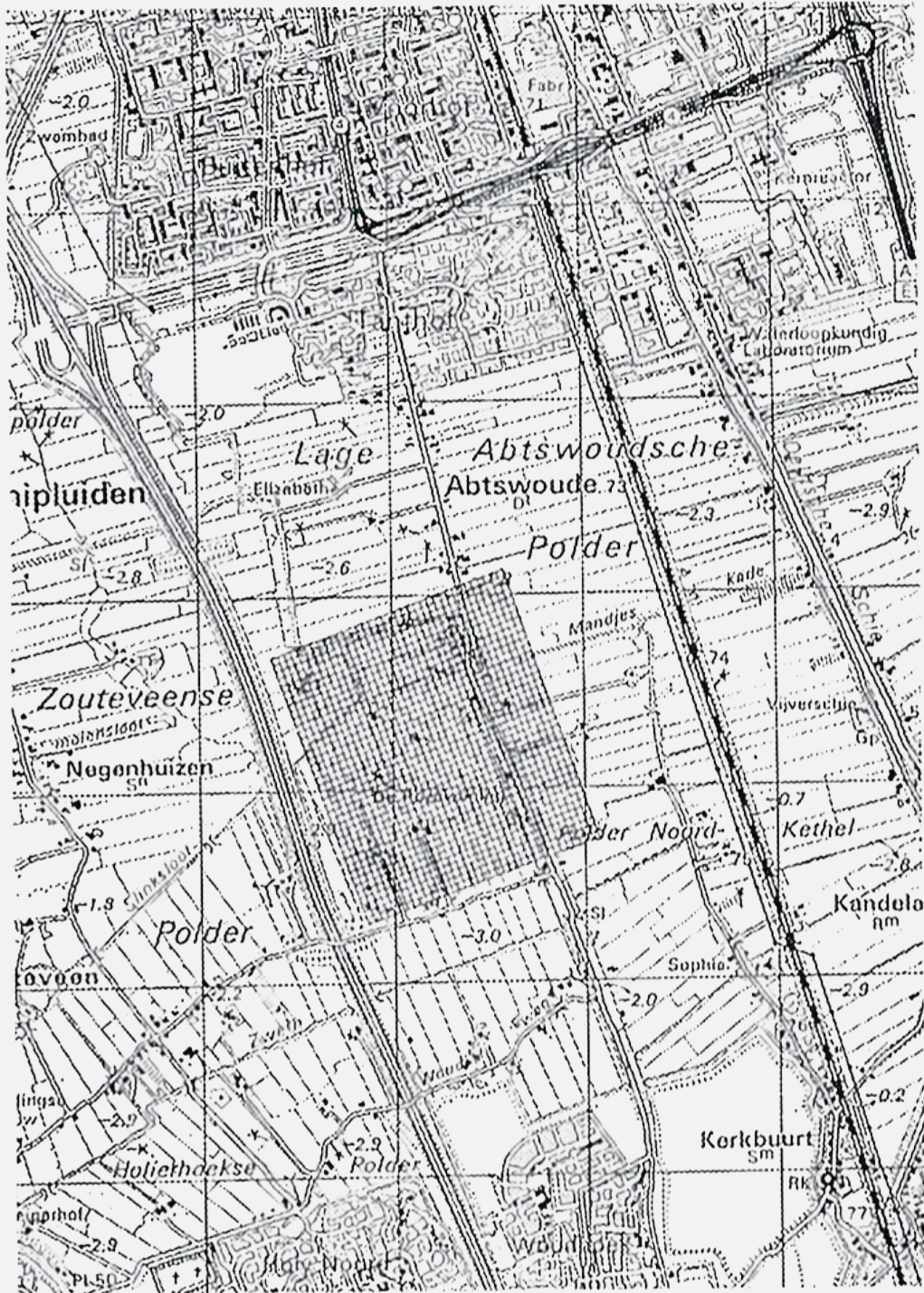


figure 46 - Datsja planning in Midden-Delfland

Discussion

Although there is a difference between all of the case study projects that have been selected for this research, they can still be linked together as input for the final design of a hospice. That being said, there are still some remarks on most of the case study projects, which will be discussed in this chapter.

First, there are the two demountable cases designed by Prouvé and Studio Bark, of which both projects can be assembled by less experienced people. Starting with Prouvé, the project has a stamp of demountable, but one has to question if that is the case. In many cases, temporary housing that was put there to be removed often ends up being permanently placed on a site. It is therefore essential that the correct target groups are chosen for temporary housing, and if possible an agreement will be made with the municipality, to ensure temporary will be temporary.

Secondly, in the two hospice cases by Prosman and De Keuvel it is to be noted that both buildings are partly situated in an existing building. The buildings are thus partly new built and partly adaptive reused buildings. As a result for both buildings some parts of the existing buildings are used less extensively, maybe once a week. To make the hospices more financially sustainable a completely newly built structure can take multifunctional spaces into account.

Third, the nature-based healing cases designed by Aalto and RMJM are good examples of how nature positively affects human comfort. Good inspiration can be taken from the biophilic design movement, which is also implemented and mentioned in the RMJM-designed hospital. A natural setting in the Dutch Peat Polders could be par excellence a good location for a hospice design.

Bibliography

1. Laurence Seguin and Patrick Seguin, *Jean Prouvé Scal Demountable Pavilion, 1940*, 2020, 9.
2. Seguin and Seguin, *Jean Prouvé Scal Demountable Pavilion, 1940*, 20.
3. Seguin and Seguin, *Jean Prouvé Scal Demountable Pavilion, 1940*, 23.
4. Seguin and Seguin, *Jean Prouvé Scal Demountable Pavilion, 1940*, 33.
5. Studio Bark, "Box House," n.d., <https://studiobark.co.uk/projects/box-house>.
6. ArchDaily, "Walter's Way: The Self-Build Revolution," January 8, 2016, <https://www.archdaily.com/780083/walters-way-the-self-build-revolution>.
7. Luisa Hilmer, "Participatory Housing: Segal's Self-build Method," *Proceedings of Participatory Design Conference 2020 - Participation(S)* 2, no. 20 (June 15, 2020): 68–71, <https://doi.org/10.1145/3384772.3385156>.
8. Designing Buildings, "Segal Method," January 21, 2024, https://www.designingbuildings.co.uk/wiki/Segal_Method.
9. De Kovel Architecten, "Hospice de Liefde," De Kovel Architecten, n.d., <http://www.dekovelarchitecten.nl/portfolio/hospice-de-liefde/>.
10. De Architect, "Hospice Het Tweede Thuis Westerland: Marc Prosman Architecten," October 27, 2023, <https://www.dearchitect-nl.tudelft.idm.oclc.org/285146/hospice-tweede-thuis-in-westerland-marc-prosman-architecten>.
11. Louna Lahti, *Alvar Aalto 1898-1976: Paradise for the Man in the Street* (Köln, Germany: TASCHEN, 2015), 22–27.
12. Ellis Woodman, "Revisit: 'Aalto's Paimio Sanatorium Continues to Radiate a Profound Sense of Human Empathy,'" *The Architectural Review*, November 17, 2016, <https://www-architectural-review-com.tudelft.idm.oclc.org/buildings/revisit-aaltos-paimio-sanatorium-continues-to-radiate-a-profound-sense-of-human-empathy>.
13. RMJM Architects, "The Architect's Perspective: Khoo Teck Puat Hospital," RMJM, September 28, 2015, <https://rmjm.com/the-architects-perspective-khoo-teck-puat-hospital/>.
14. Nationale Woningraad (NWR) and Stichting architecten Onderzoek Wonen en Woonomgeving (STAWON), *Ontwerpend aan Holland: Inspirerende schetsen en projecten voor het wonen in de 21e eeuw* (Amsterdam, Netherlands: Jan Mets & Schoenmakers Communicatie-projecten, 1994), 92–101.

List of Figures

figure 01 - Exterior photograph	10
"Jean Prouvé | 1940," n.d., https://www.jeanprouve.com/en/fiche/1940-5 .	
figure 02 - Interior photograph	10
"Jean Prouvé | 1940," n.d., https://www.jeanprouve.com/en/fiche/1940-5 .	
figure 03 - Assembly instructions	11
"Jean Prouvé | 1940," n.d., https://www.jeanprouve.com/en/fiche/1940-5 .	
figure 04 - Building assembly process	13
Laurence Seguin and Patrick Seguin, Jean Prouvé Scal Demountable Pavilion, 1940, 2020, 56-57.	
figure 05 - Detailed manufacture drawings	15
"Jean Prouvé | 1940," n.d., https://www.jeanprouve.com/en/fiche/1940-5 .	
figure 06 - Drawing of facade elements	17
"Jean Prouvé | 1940," n.d., https://www.jeanprouve.com/en/fiche/1940-5 .	
figure 07 - List of Required elements	18
Laurence Seguin and Patrick Seguin, Jean Prouvé Scal Demountable Pavilion, 1940, 2020, 31.	
figure 08 - Facades of SCAL	19
Laurence Seguin and Patrick Seguin, Jean Prouvé Scal Demountable Pavilion, 1940, 2020, 52.	
figure 09 - Floorplan of SCAL.	20
Laurence Seguin and Patrick Seguin, Jean Prouvé Scal Demountable Pavilion, 1940, 2020, 53.	
figure 10 - All building elements of SCAL.	21
Laurence Seguin and Patrick Seguin, Jean Prouvé Scal Demountable Pavilion, 1940, 2020, 54-55.	
figure 11 - Exterior Photograph.	24
Crook, Lizzie, and Lizzie Crook. "Studio Bark's Flat-Pack U-Build System Lets Anyone Self-Build." Dezeen, February 11, 2022. https://www.dezeen.com/2019/05/10/ubuild-studio-bark-modular-architecture/ .	
figure 12 - Interior Photograph	24
Crook, Lizzie, and Lizzie Crook. "Studio Bark's Flat-Pack U-Build System Lets Anyone Self-Build." Dezeen, February 11, 2022. https://www.dezeen.com/2019/05/10/ubuild-studio-bark-modular-architecture/ .	
figure 13 - Tools needed for construcion	25
Crook, Lizzie, and Lizzie Crook. "Studio Bark's Flat-Pack U-Build System Lets Anyone Self-Build." Dezeen, February 11, 2022. https://www.dezeen.com/2019/05/10/ubuild-studio-bark-modular-architecture/ .	
figure 14 - Assembly of an U-build wall	27
Crook, Lizzie, and Lizzie Crook. "Studio Bark's Flat-Pack U-Build System Lets Anyone Self-Build." Dezeen, February 11, 2022. https://www.dezeen.com/2019/05/10/ubuild-studio-bark-modular-architecture/ .	
figure 15 - Exterior Photograph.	30
The Modern House, "What We're Seeing: Walter's Way – The Self-Build Revolution | Journal | The Modern House," 2016, https://www.themodernhouse.com/journal/what-were-seeing-walters-way-the-self-build-revolution/ .	
figure 16 - Interior Photograph	30
The Modern House, "What We're Seeing: Walter's Way – The Self-Build Revolution | Journal | The Modern House," 2016, https://www.themodernhouse.com/journal/what-were-seeing-walters-way-the-self-build-revolution/ .	
figure 17 - Modular floorplan 600 x 600 mm	32
Designing Buildings, "Segal Method," January 21, 2024, https://www.designingbuildings.co.uk/wiki/Segal_Method .	
figure 18 - Ground floor.	32
Designing Buildings, "Segal Method," January 21, 2024, https://www.designingbuildings.co.uk/wiki/Segal_Method .	
figure 19 - Foundation plan.	33
Designing Buildings, "Segal Method," January 21, 2024, https://www.designingbuildings.co.uk/wiki/Segal_Method .	

figure 20 - Floorbeams	.34
Designing Buildings, "Segal Method," January 21, 2024, https://www.designingbuildings.co.uk/wiki/Segal_Method .	
figure 21 - Framing diagram	.35
Designing Buildings, "Segal Method," January 21, 2024, https://www.designingbuildings.co.uk/wiki/Segal_Method .	
figure 22 - Roofboards	.36
Designing Buildings, "Segal Method," January 21, 2024, https://www.designingbuildings.co.uk/wiki/Segal_Method .	
figure 23 - Exterior photograph Die Auenweide	.38
"Die Auenweide - einzueins," Einszueins, January 19, 2023, https://www.einszueins.at/project/auenweide/ .	
figure 24 - Exterior photograph	.38
Benjamin Zapico, "Prototype Industrialized Construction System / Ignacio Rojas Hirigoyen Arquitectos + The Andes House," ArchDaily, November 29, 2023, https://www.archdaily.com/1010364/prototype-industrialized-construction-system-ignacio-rojas-hirigoyen-arqui-tectos-plus-the-andes-house .	
figure 25 - Exterior Photograph	.40
ArchitectenWeb, "Hospice 'De Liefde,'" Architectenweb, June 30, 2020, https://architectenweb.nl/projecten/project.aspx?id=39971 .	
figure 26 - Interior Photograph	.40
ArchitectenWeb, "Hospice 'De Liefde,'" Architectenweb, June 30, 2020, https://architectenweb.nl/projecten/project.aspx?id=39971 .	
figure 27 - Private living quarters	.41
De Kovel Architecten. "Hospice de Liefde." De Kovel Architecten, n.d. http://www.dekovelarchitecten.nl/portfolio/hospice-de-liefde/ .	
figure 28 - Public spaces	.42
De Kovel Architecten. "Hospice de Liefde." De Kovel Architecten, n.d. http://www.dekovelarchitecten.nl/portfolio/hospice-de-liefde/ .	
figure 29 - Private living quarters	.43
De Kovel Architecten. "Hospice de Liefde." De Kovel Architecten, n.d. http://www.dekovelarchitecten.nl/portfolio/hospice-de-liefde/ .	
figure 30 - Public spaces	.44
De Kovel Architecten. "Hospice de Liefde." De Kovel Architecten, n.d. http://www.dekovelarchitecten.nl/portfolio/hospice-de-liefde/ .	
figure 31 - Facade of Additonal volume	.45
AAAN. "Hospice de Liefde," n.d. https://aan.nl/portfolio/hospice-de-liefde/ .	
figure 32 - Exterior Photograph	.48
MPA, "Project: Hospice Tweede Thuis in Westerland," Prosman, 2023, https://www.prosman.nl/wonen-met-zorg/project-westerland .	
figure 33 - Interior Photograph	.48
MPA, "Project: Hospice Tweede Thuis in Westerland," Prosman, 2023, https://www.prosman.nl/wonen-met-zorg/project-westerland .	
figure 34 - Private living quarters	.49
MPA, "Project: Hospice Tweede Thuis in Westerland," Prosman, 2023, https://www.prosman.nl/wonen-met-zorg/project-westerland .	
figure 35 - Public spaces	.50
MPA, "Project: Hospice Tweede Thuis in Westerland," Prosman, 2023, https://www.prosman.nl/wonen-met-zorg/project-westerland .	
figure 36 - Service spaces	.51
MPA, "Project: Hospice Tweede Thuis in Westerland," Prosman, 2023, https://www.prosman.nl/wonen-met-zorg/project-westerland .	
figure 37 - Circulation Area's	.52
MPA, "Project: Hospice Tweede Thuis in Westerland," Prosman, 2023, https://www.prosman.nl/wonen-met-zorg/project-westerland .	
figure 38 - Hallway with view over the Amstelmeer	.53
MPA, "Project: Hospice Tweede Thuis in Westerland," Prosman, 2023, https://www.prosman.nl/wonen-met-zorg/project-westerland .	
figure 39 - Exterior Photograph	.56
ArchEyes Team, "Alvar Aalto's Paimio Sanatorium: A Landmark of Modern Architecture," ArchEyes, August 8, 2023, https://archeyes.com/paimio-sanatorium-alvar-aalto/ .	

figure 40 - Interior Photograph . . . . .	.56
ArchEyes Team, "Alvar Aalto's Paimio Sanatorium: A Landmark of Modern Architecture," ArchEyes, August 8, 2023, https://archeyes.com/paimio-sanatorium-alvar-aalto/ .	
figure 41 - Outdoor Balcony viewing woods and gardens . . . . .	.57
ArchEyes Team, "Alvar Aalto's Paimio Sanatorium: A Landmark of Modern Architecture," ArchEyes, August 8, 2023, https://archeyes.com/paimio-sanatorium-alvar-aalto/ .	
figure 42 - Exterior Photograph . . . . .	.60
RMJM Architects, "The Architect's Perspective: Khoo Teck Puat Hospital," RMJM, September 28, 2015, https://rmjm.com/the-architects-perspective-khoo-teck-puat-hospital/ .	
figure 43 - Interior Photograph . . . . .	.60
RMJM Architects, "The Architect's Perspective: Khoo Teck Puat Hospital," RMJM, September 28, 2015, https://rmjm.com/the-architects-perspective-khoo-teck-puat-hospital/ .	
figure 44 - Datsja design by KAW Architecten . . . . .	.62
Nationale Woningraad (NWR) and Stichting architecten Onderzoek Wonen en Woonomgeving (STAWON), Ontwerpend aan Holland: Inspirerende schetsen en projecten voor het wonen in de 21e eeuw (Amsterdam, Netherlands: Jan Mets & Schoenmakers Communicatie-projecten, 1994), 97.	
figure 45 - Datsja design by DKV Architecten . . . . .	.63
Nationale Woningraad (NWR) and Stichting architecten Onderzoek Wonen en Woonomgeving (STAWON), Ontwerpend aan Holland: Inspirerende schetsen en projecten voor het wonen in de 21e eeuw (Amsterdam, Netherlands: Jan Mets & Schoenmakers Communicatie-projecten, 1994), 95.	
figure 46 - Datsja planning in Midden-Delfland . . . . .	.64
Nationale Woningraad (NWR) and Stichting architecten Onderzoek Wonen en Woonomgeving (STAWON), Ontwerpend aan Holland: Inspirerende schetsen en projecten voor het wonen in de 21e eeuw (Amsterdam, Netherlands: Jan Mets & Schoenmakers Communicatie-projecten, 1994), 94.	

