



Temporal Additions

Transforming Existing Structures into Adaptable Systems

Contents (reading guide)

Part 0

(WHY)

Introduction

- Problem Statement
- Relevance

(WHAT)

- Objective & Motivation
- Design Question
- Scope

(HOW)

- Method
- Theoretical Framework

Part 1

THE STRATEGY

Part 2

THE DESIGN

- Conclusion & discussion
- Recommendations
- Reflection
- References

Supervisors

Anne Snijders
Stephan Verkuijlen

Foreword

This thesis explores architecture through the lens of temporality. By treating existing structures as permanent frames rather than obsolete objects, it investigates how buildings can become systems capable of accommodating continuous change over time.

Part 1 proposes a transformation strategy based on a realistic and repeatable approach that enables long-term adaptation while minimising complexity and intervention. The strategy focuses on direct reuse of existing structures, reversible additions, and the use of standard components.

Part 2 tests this strategy through the transformation of a post-war office building into a school for practical education. The design explores how adaptability can be translated into architecture through reversible interventions, layered systems, and component-based design.

Part 0

WHY

Introduction: on temporality & obsolescence

Introduction: Global Problem Statement

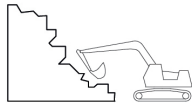
Temporality > Obsolescence

There is a continuous demand for new buildings, including housing, offices, schools, and commercial spaces. At the same time, large quantities of existing buildings are being demolished. In 2025 alone, more than 3 million square meters of buildings were demolished in the Netherlands, an area comparable to the size of a city like Delft (CBS, 2025).

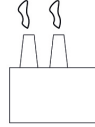
This reveals a fundamental contradiction: we continue to construct new buildings while simultaneously discarding existing ones, despite the significant environmental and economic impact of construction, including resource extraction, waste production, and emissions (World Green Building Council, n.d.). This process not only results in the loss of embodied environmental value stored in existing materials, but also in the loss of architectural character and the memory of different periods embedded in the built environment.

However, the issue is not simply one of demolition versus construction. It is rooted in how buildings are conceived in relation to time. While society, technology, and user needs continuously evolve, buildings are often designed and built as fixed entities, tailored to specific conditions at a specific moment. As these conditions change, buildings become outdated, not because their structure fails, but because they no longer provide the spatial, environmental, technical, programmatic or aesthetic qualities that are expected, eventually leading to obsolescence and demolition.

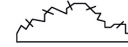
GLOBAL ENVIRONMENTAL IMPACT CONSTRUCTION



50 billion tonnes of material



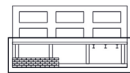
11% of global CO2 emissions



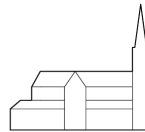
1/3 of total waste production

1.

LOSS of VALUE THROUGH DEMOLITION



embodied material value & character

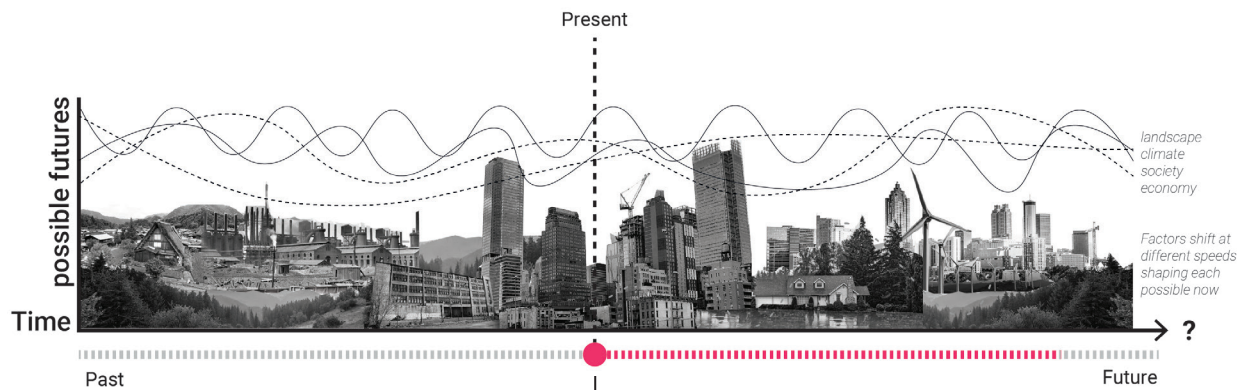


architectural character & memory

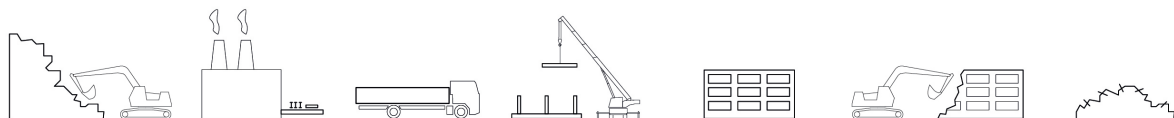


2.

TEMPORALITY of NEEDS



3.



CYCLE of OBSOLESCENCE

4.

Vision

Towards Adaptable Architecture

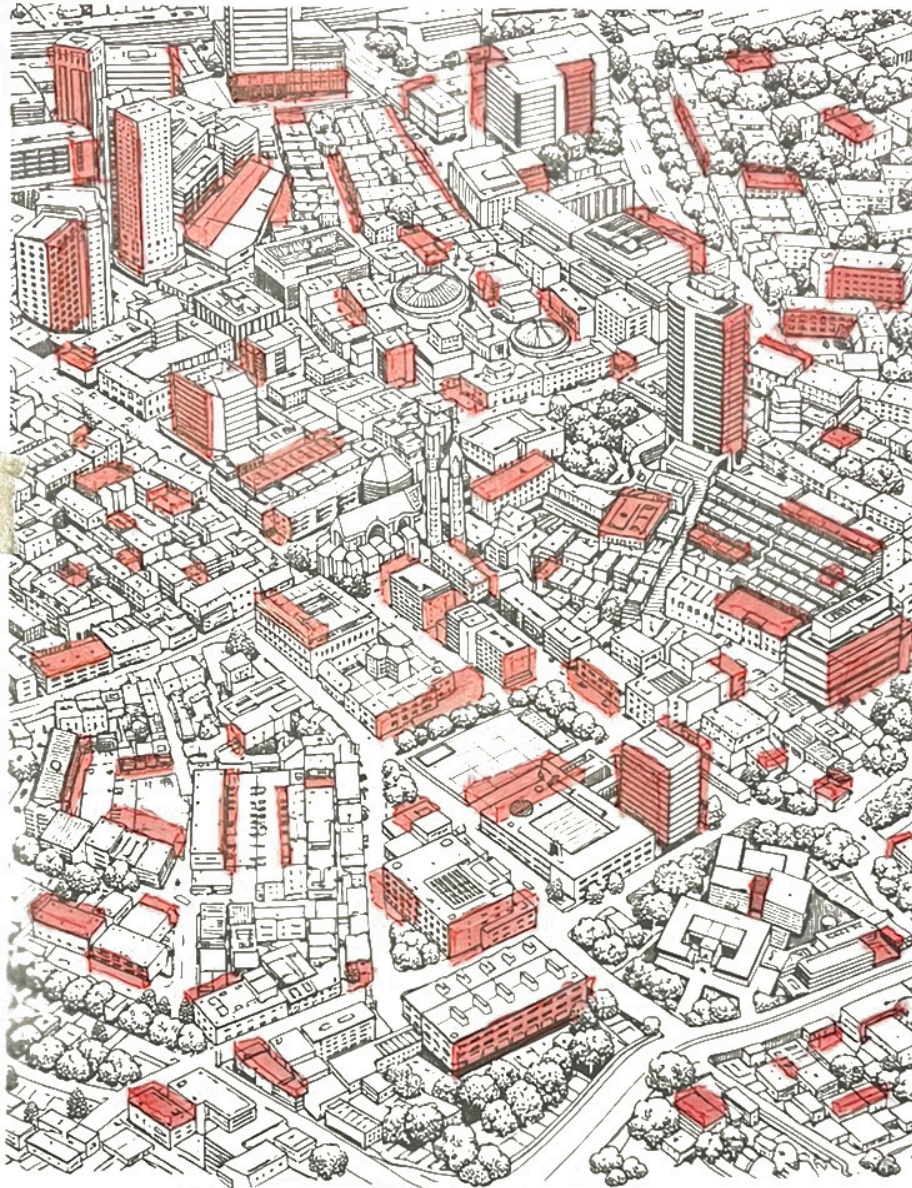
The environmental impact of the construction industry and the disadvantages of demolition are well-established topics and form the basis for many contemporary 'sustainable' design approaches. Yet an important question remains: what is left of a building's sustainable ambition when future change requires major intervention or even demolition once again?

This research therefore approaches time as the critical framework through which architecture can be reconsidered.

Rather than treating outdated buildings as obsolete objects to be replaced this project proposes an alternative vision:

What if we use existing structures as the permanent base and turn them into systems, capable of accommodating change over time. By introducing temporal and adaptable layers onto existing structures.

The question therefore becomes not only how existing buildings can be reused, but how they can remain adaptable without resulting in another static outcome.



current = permanent frame
adding a temporal changeable layer

5.

The drawing consists of a black-and-white base map of the existing Eindhoven city centre, generated with the assistance of ChatGPT, combined with a hand-drawn overlay highlighting imagined additions in red.

(WHAT)

Towards an Adaptable Transformation Strategy

Problem Statement

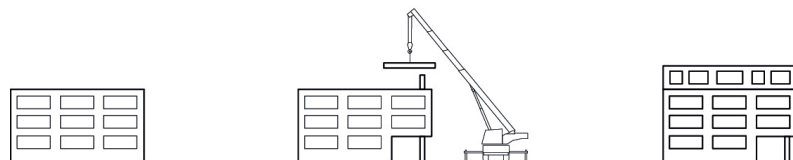
Transformation Practices

One might argue that reusing existing structures as an alternative to demolition is something we already do successfully through transformation and adaptive reuse, and to a certain extent this is true. While these approaches can effectively extend the lifespan of buildings, they often rely on project-specific and custom interventions. As a result, they frequently produce another fixed state of the building, requiring new large-scale interventions once future demands change again.

This cycle can be further exemplified with a perhaps familiar example at the domestic scale. When people move into a house, renovation often begins with demolition to suit new preferences and lifestyles. Future occupants frequently repeat the same process. In this way, buildings continuously undergo cycles of replacement and reconstruction.

This project aims to challenge that pattern by developing a strategy that enables buildings to change more easily over time.

FIXED TRANSFORMATION



new static outcome

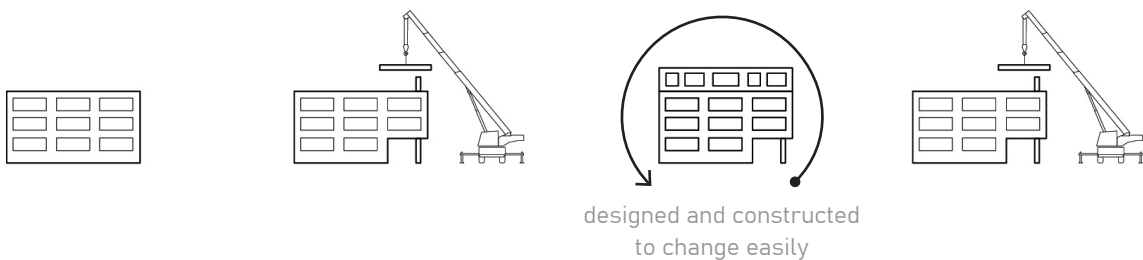
Relevance

Architectural Relevance

While changeability and adaptability are widely discussed within architectural discourse, their translation into practical and scalable design and construction strategies often remains limited. This project contributes to that discussion by investigating how existing structures can support long-term change.

In doing so, the research aims to expand current transformation practices beyond project-specific solutions and contribute to a broader understanding of architecture as an evolving system rather than a fixed object.

PROPOSAL



Objective

The objective of this project is to:

Develop and test a realistic and repeatable strategy that transforms outdated buildings into adaptable systems capable of accommodating change over time through minimal, reversible, and practical interventions.

Guiding Principles

The project is guided by three core principles: **Minimal**, **Practical** and **Reversible**.

Interventions should only occur where necessary, reducing the use of materials, energy, labor, and construction effort. The design approach prioritizes straightforward systems, clear construction logic, and standardised components to improve affordability, scalability, and ease of execution. At the same time, the project focuses on reversibility through demountable components and reversible connections, enabling future adaptation, maintenance, disassembly, and reuse.

Research Question

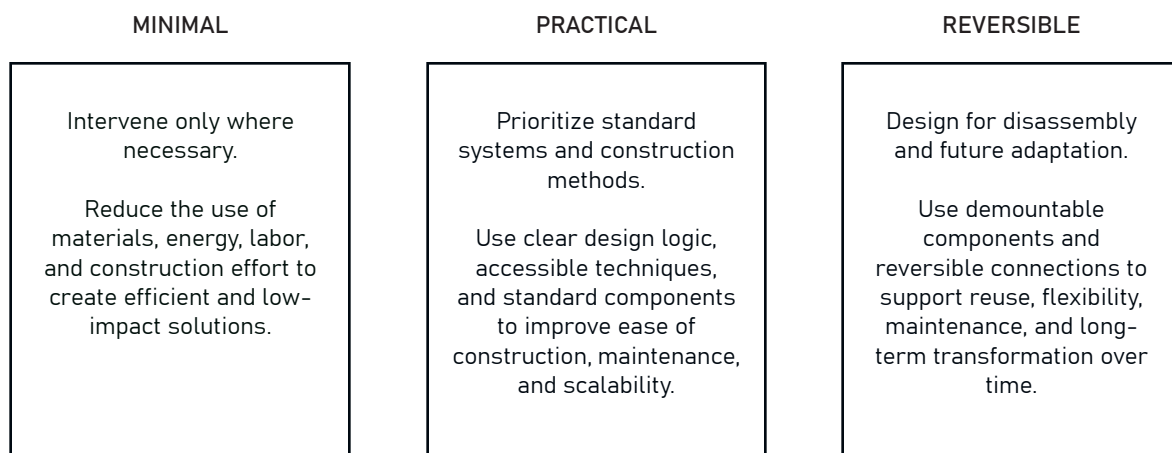
How can existing buildings be upgraded through reversible component-based interventions in a way that enables continuous adaptation over time?

Motivation

Architectural Ambition - Construction Reality

The focus on practical application originates from personal experience working on construction sites during the realization phase of architectural projects at a contracting company. It became evident how architectural ambition can diminish once confronted with technical, financial, and construction-related constraints. While ambitions often remain strong at the conceptual level, they can weaken during the translation into built reality.

The motivation behind this research is therefore to strengthen the position of the architect not only as a conceptual designer, but also as a coordinator capable of translating ambition into feasible and buildable proposals. By integrating realistic construction principles from the beginning of the design process, the project aims to bridge the gap between architectural ambition and practical realization.



8.

(HOW)

on Methodology and Scope

Methodology

The methodology of this research consists of two interconnected parts: the development of a transformation strategy and its application within a design case study.

Part 1: Strategy

The first part focuses on developing a repeatable strategy for adaptive reuse, ensuring the research extends beyond a single transformation project. The strategy is formed through the study and reinterpretation of literature related to time-based architecture, adaptability, and reversible construction, combined with lessons from relevant case studies.

Part 2: Design Case (prototyping)

The second part tests the strategy through a design case study. The process begins with an analysis of the existing building and its context using archive drawings, model making, analytical drawings, and digital modelling tools to understand the qualities and possibilities of the existing structure.

Based on the analysis, strategy and program a set of necessary additions and interventions is determined. Design proposals are explored across different scales and layers through sketching and digital modelling in Rhinoceros.

To strengthen the translation from architectural ambition to practical application, the research is further informed by field studies on construction sites. These studies focus on identifying simple, standardised, and practical construction components and techniques that support adaptable and reversible interventions.

Scope

Context, Location & Scalability

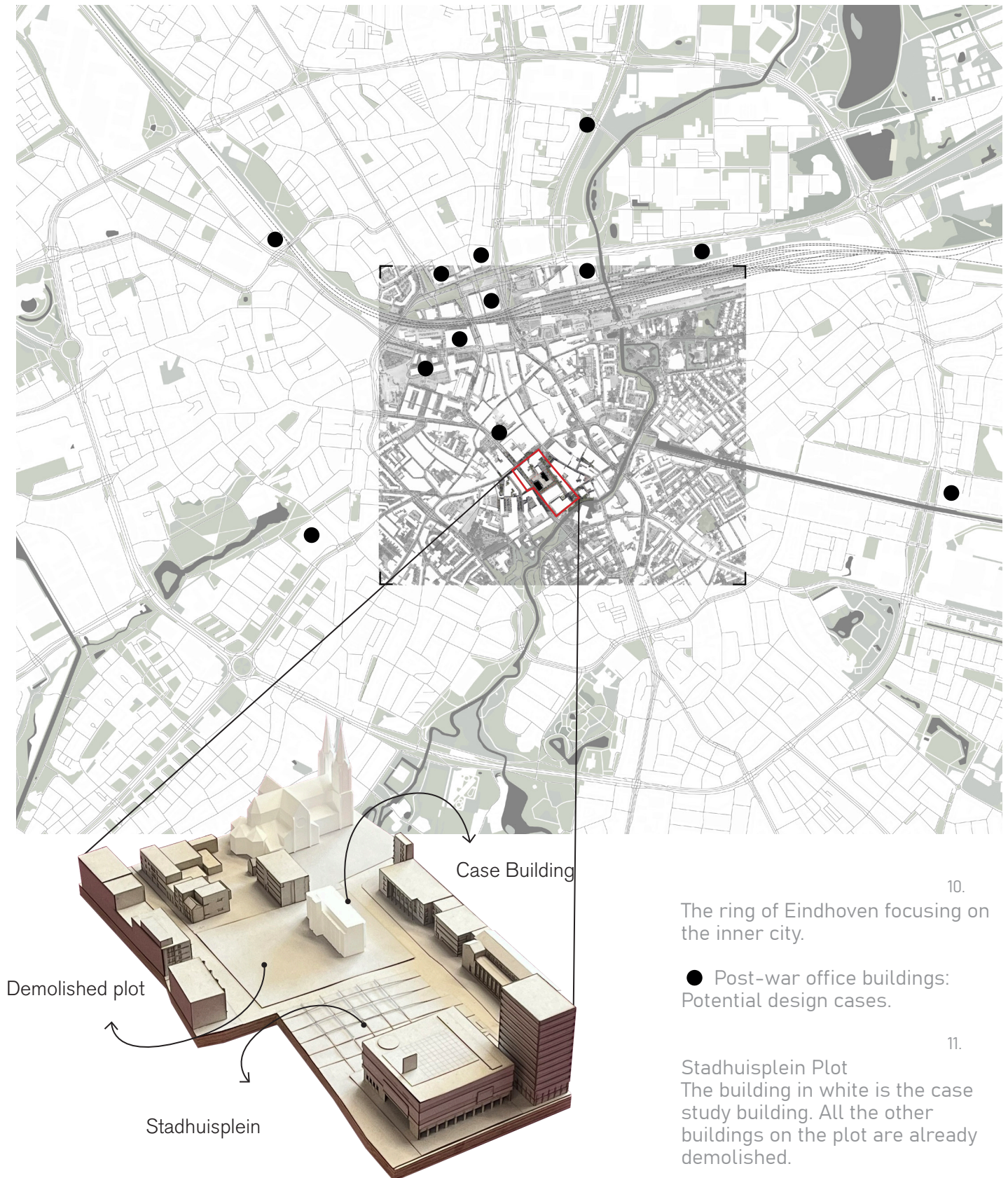
This project applies the proposed transformation strategy to a case study in Eindhoven, a city strongly shaped by post-war industrialisation and the growth of companies such as Philips. During this period, many monofunctional office buildings were constructed according to modernist planning principles and functional separation. (Eindhoven Municipality, n.d.)

Today, a large part of this post-war office building stock has become obsolete, particularly buildings from the 1960s 1970s and 1980s. While often considered outdated, many of these structures remain technically durable due to their robust concrete frameworks. This makes the post-war office typology a relevant case for investigating transformation as an alternative to demolition.

The project focuses on Begijnhof 12, a planned to be demolished office building from mid 1970s located at Stadhuisplein in Eindhoven, a central yet currently underperforming urban area undergoing major redevelopment. Many surrounding buildings from the same period are already demolished or are planned for demolition and replacement. The project uses the existing office building as a design case to test the adaptable and reversible transformation strategy. At the same time, similar office buildings across Eindhoven demonstrate the potential scalability and wider applicability of the approach. (Open Eindhoven, n.d.)

Program

The design assignment centres on transforming the building into a school for practical education. In an increasingly digitalising society, the demand for practically educated professionals within the construction industry continues to grow. Current shortages within technical and construction-related professions demonstrate the need for educational environments that focus on practical skills. (Techniek Nederland, 2025)



Theoretical Background

Building as Layered System

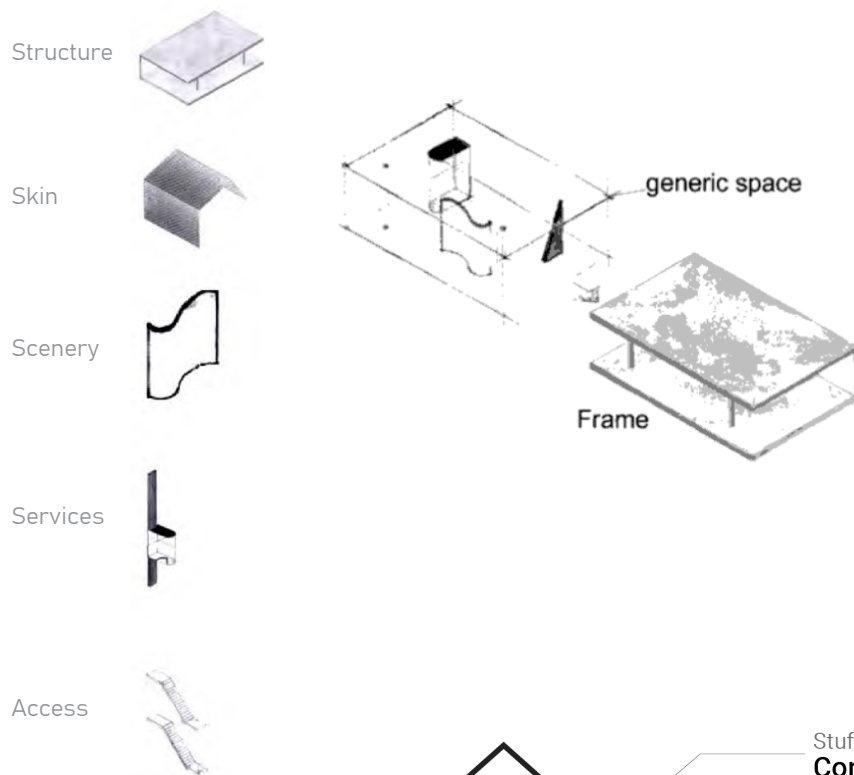
Flexibility, adaptability, and changeability all lie within a field of design that attempts to respond to the formulated problem. However, designing for change can be tricky, as it requires predicting uncertain future scenarios. On the other hand, leaving a building completely open can result in a lack of specificity. As Aldo van Eyck argues, “a structure flexible to this degree leads to an unacceptable neutrality: like a glove that doesn't suit anybody because it suits everybody.” (van Eyck, 1960)

To better understand what designing for change means, this research builds on the understanding that buildings are not static objects, but layered systems that evolve over time. Stewart Brand describes this through the concept of Shearing Layers, in which different parts of a building change at different speeds. (Brand, 1994) Similarly, Bernard Leupen introduces the idea of the frame as the part of the building that defines its long-term spatial structure and capacity for other layers to be placed more flexibly. (Leupen, 2006)

In both theories, the structure is considered the most permanent layer, while elements such as services, skin, and interior (program) are more prone to change. These concepts establish an important hierarchy between what remains and what can evolve over time.

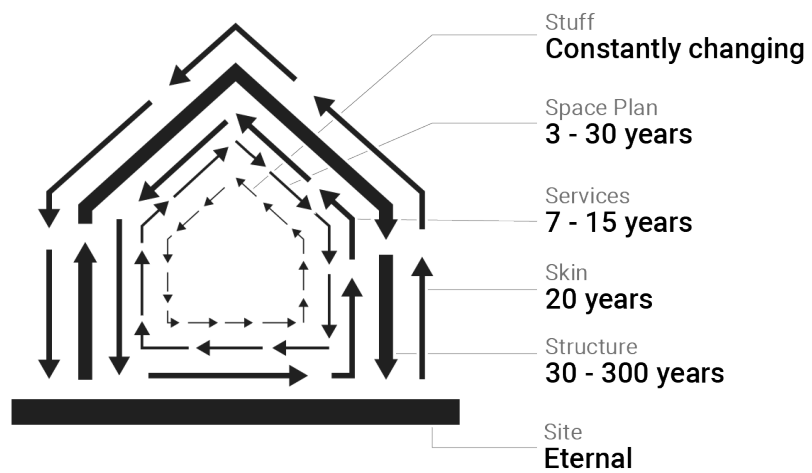
However, while these theories describe the relationship between permanence and change, they remain largely conceptual and do not translate into concrete strategies for designing and constructing adaptable interventions.

Frame & Generic Space, Bernard Leupen



12.

Leupen (2006)

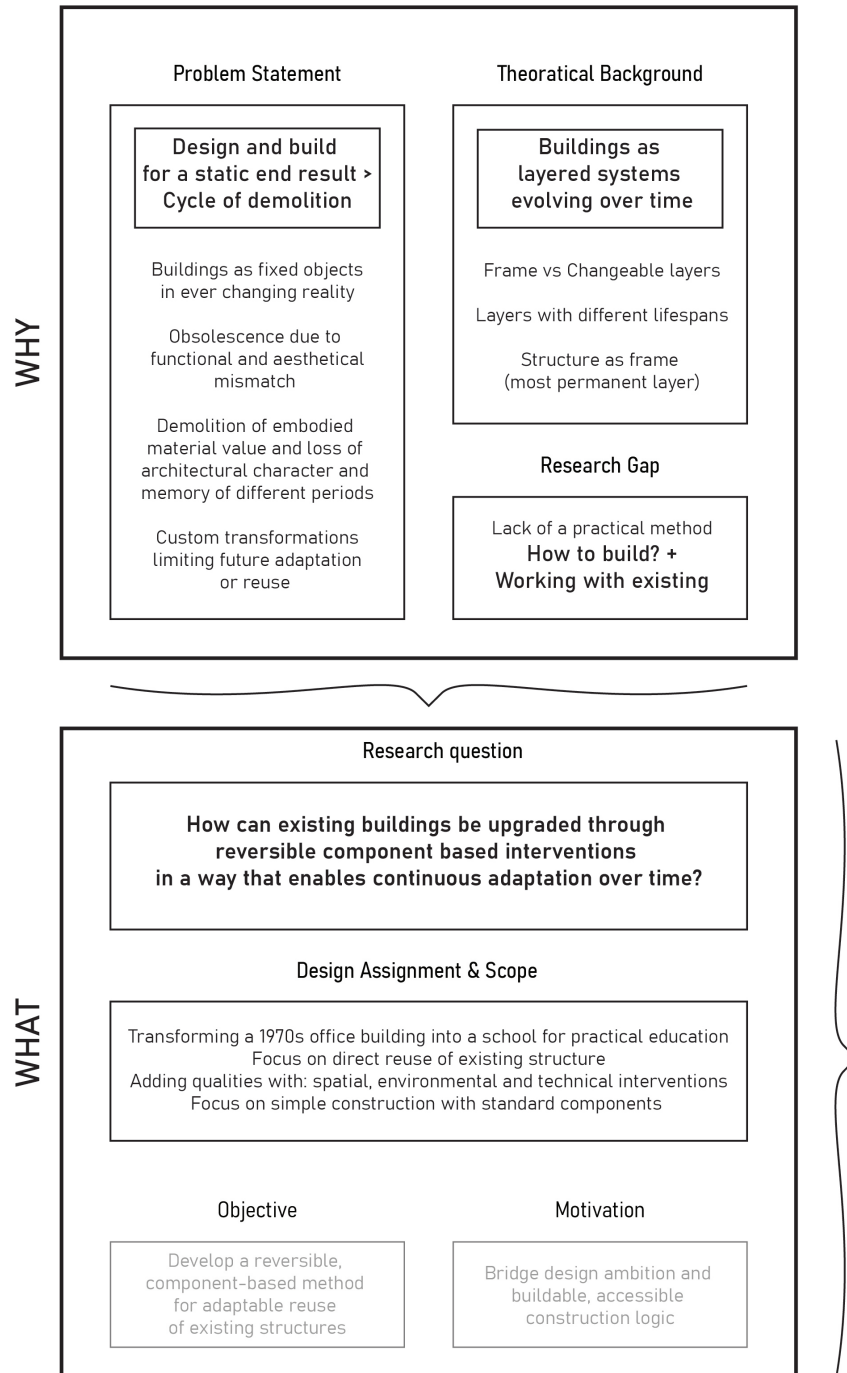


13.

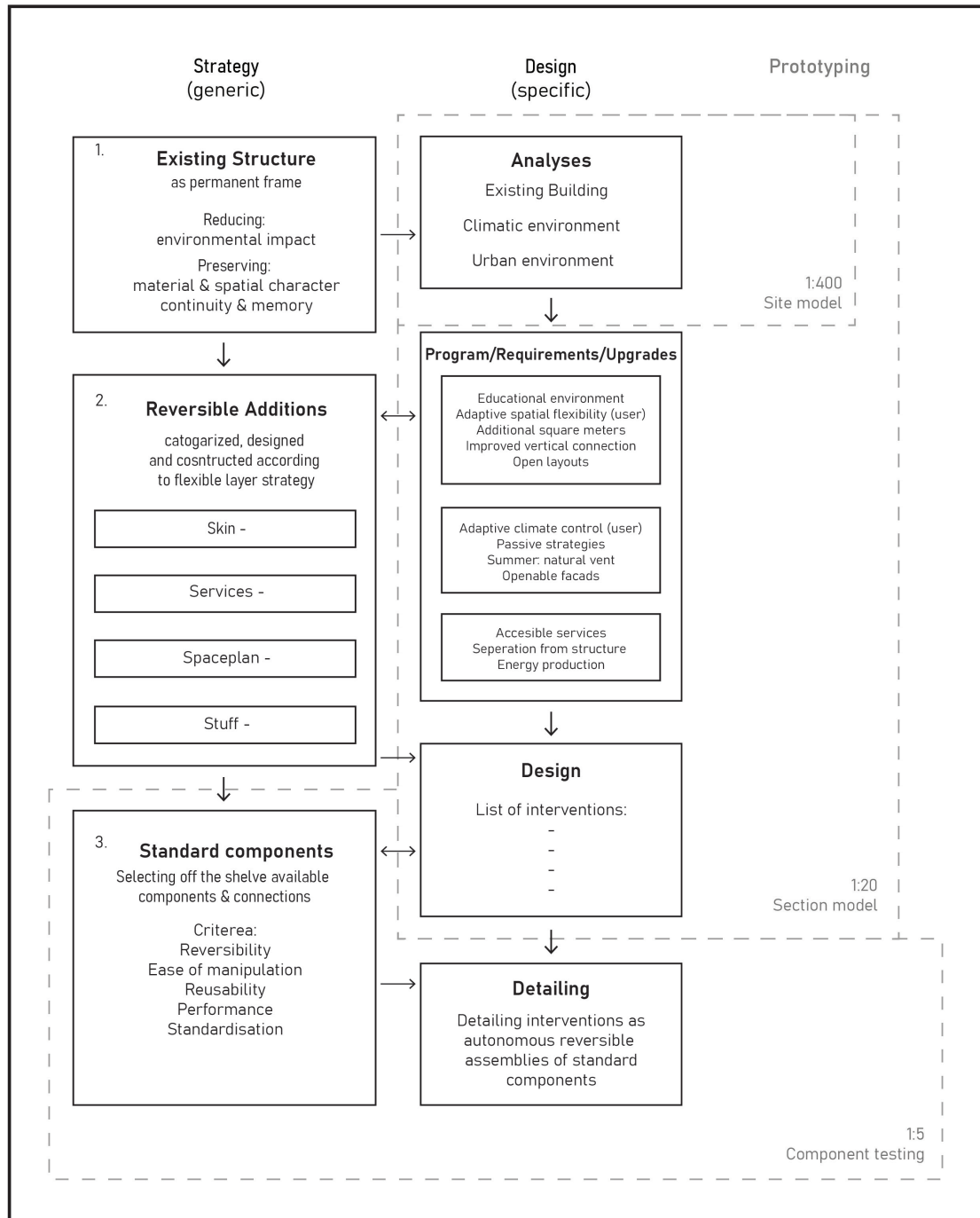
Brand (1994)

How Buildings Learn, Stewart Brand

Proces & Relations



HOW



Part 1 THE STRATEGY

Introduction

The starting point for the transformation strategy is formed by the project objective and guiding principles. Together, they define the approach to transformation throughout the project.

The objective: transform outdated buildings into adaptable systems through a realistic and repeatable strategy. The approach aims to enable buildings to be reused and continuously adapted over time while minimizing unnecessary complexity, cost, and intervention.

The three core principles: minimal, practical, and reversible. These principles function as the foundation for decision-making throughout the design process.

The formulated transformation strategy consists of three parts:

- 1. Existing Structure**
- 2. Additions**
- 3. Standard Components**

Each part is approached and elaborated individually, while together they form the overall transformation strategy.

Theoretical Framework

To gain greater control over adaptability as a design objective, Stewart Brand's shearing layers theory is used as a theoretical framework, dividing buildings into layers with different expected rates of change over time:

Site - eternal

Structure - 300y

Skin - 20y

Services - 7-15y

Space plan - 3-30y

Stuff - 1 day

The site layer is excluded from the strategy, as it is considered a given condition rather than a physically constructed layer. The remaining layers are reinterpreted and adjusted where necessary to develop a clearer strategy for adaptability on short- and long-term change. To improve clarity within the strategy, each layer is assigned a specific colour.

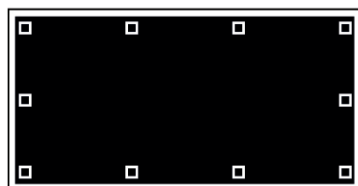
1. Existing Structure

The first part of the strategy focuses on the existing structure, the most permanent layer within the shearing layers theory. In this approach, the existing structure is treated as a given condition and forms the permanent framework for transformation.

The main objective is to preserve and directly reuse as much of the existing structure as possible while minimizing intervention. This approach is not only driven by environmental and economic considerations, but also by the intention to preserve the physical character and material traces of different periods in time.

Treating the structure as permanent also requires an attitude of acceptance towards the existing. Rather than correcting or concealing imperfections, the strategy aims to recognise the qualities, limitations, and character already present within the building, including imperfections that emerge over time or during construction.

The first step of the strategy therefore focuses on thoroughly analysing and understanding the existing structure in order to identify its spatial qualities, structural potential, constraints, and opportunities for future adaptation.



Analysing the existing structure to minimize intervention and maximise efficient reuse.

Reference

Lacaton & Vassal, Palais de Tokyo

Source: Lacaton & Vassal, n.d.

The approach of treating the existing structure as a permanent and valuable base can be illustrated by projects such as Palais de Tokyo by Lacaton & Vassal. By stripping away unnecessary additions and accepting exposed and aged materials as qualities rather than imperfections, the existing building is approached almost as a contemporary ruin.

The project demonstrates how minimal intervention and direct reuse can preserve the character of the existing while allowing new use and activity to bring the building to life.

GAFPA, G1817 & G1203

Source: GAFPA, n.d.

The work of GAFPA shows how careful analysis of the existing can form the starting point of a project. By studying the structure and spatial qualities of a building, interventions can remain minimal and precise. Rather than imposing a completely new order, the design grows from what is already there.

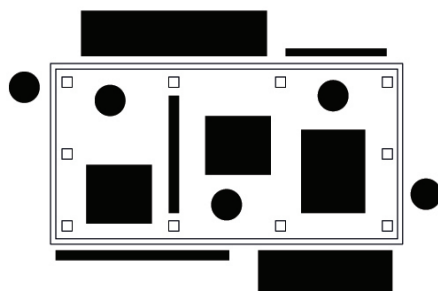
2. Additions

The second part of the strategy focuses on the additions: the new and more changeable layers added onto the existing structure. Within this approach, the additions are treated as separate intervention layers that improve the building while remaining adaptable and reversible over time.

These additions include the remaining shearing layers: skin, services, space plan and stuff. Together, they provide the spatial, environmental, and technical upgrades necessary to accommodate new use and improve the performance of the building.

Because these layers are expected to change over time, the strategy focuses on ease of adaptation and manipulation. Each layer should be individually accessible, detachable, and replaceable without requiring major intervention to other parts of the building. Reversible connections and independent systems therefore play an important role within the strategy.

Rather than becoming permanently integrated into the existing structure, the additions are approached almost as furniture-like elements placed within and around the permanent frame.

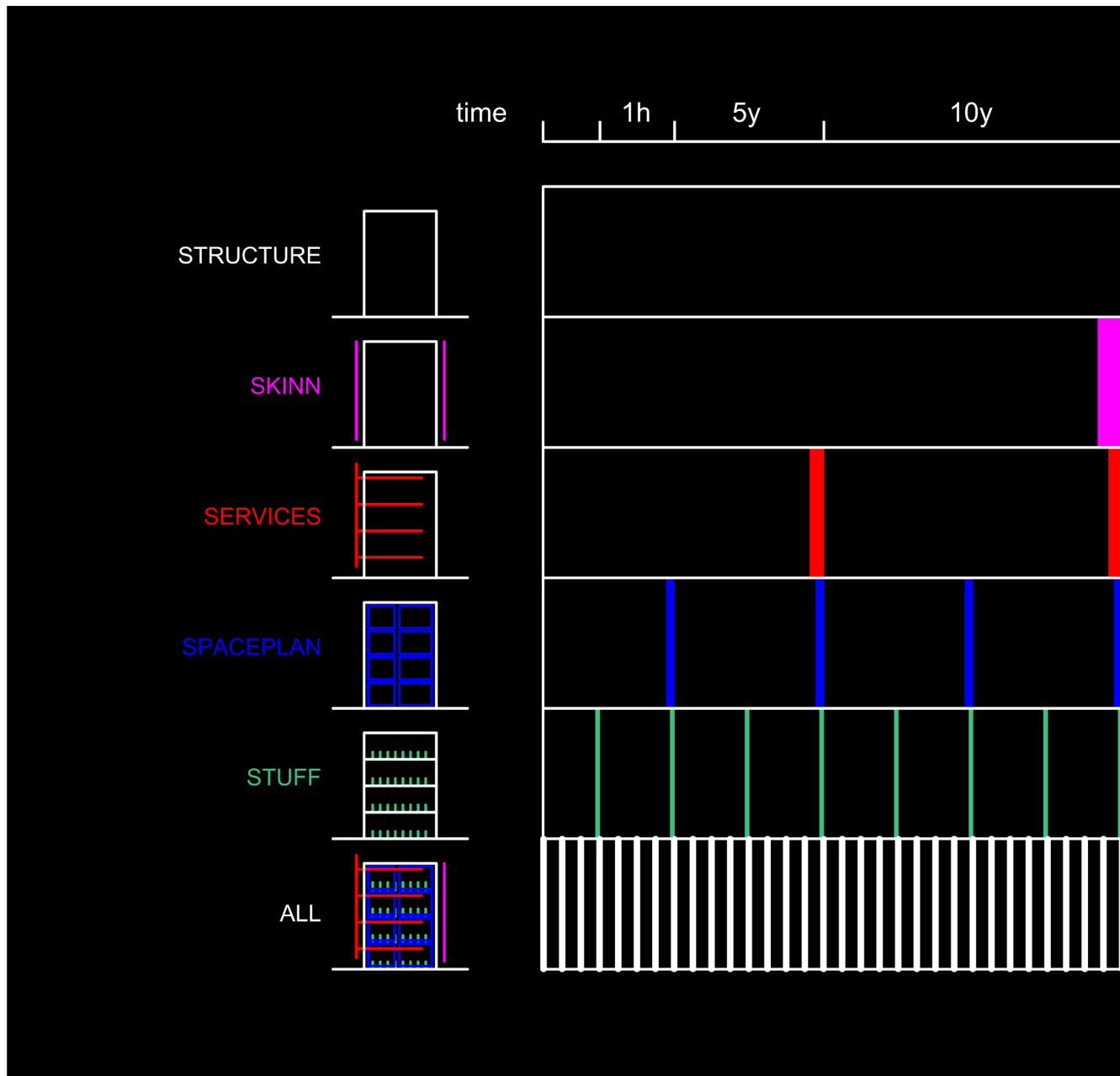


Adding new interventions as reversible layers that function as independent elements and can be easily adapted, removed, or replaced over time.

Diagram

Adaptability Framework

The additions are categorised according to the shearing layers theory. However, while the theory describes different rates of change, it provides less insight into how adaptability can be translated into practice. Therefore, an alternative diagram is developed to define more clearly which layers need to adapt, to what extent, and by whom. In addition to long-term replacement and transformation, the diagram emphasises that all layers should remain easily accessible for maintenance, repair, and minor adjustments throughout their lifespan.
(The diagram is shown on the following page)

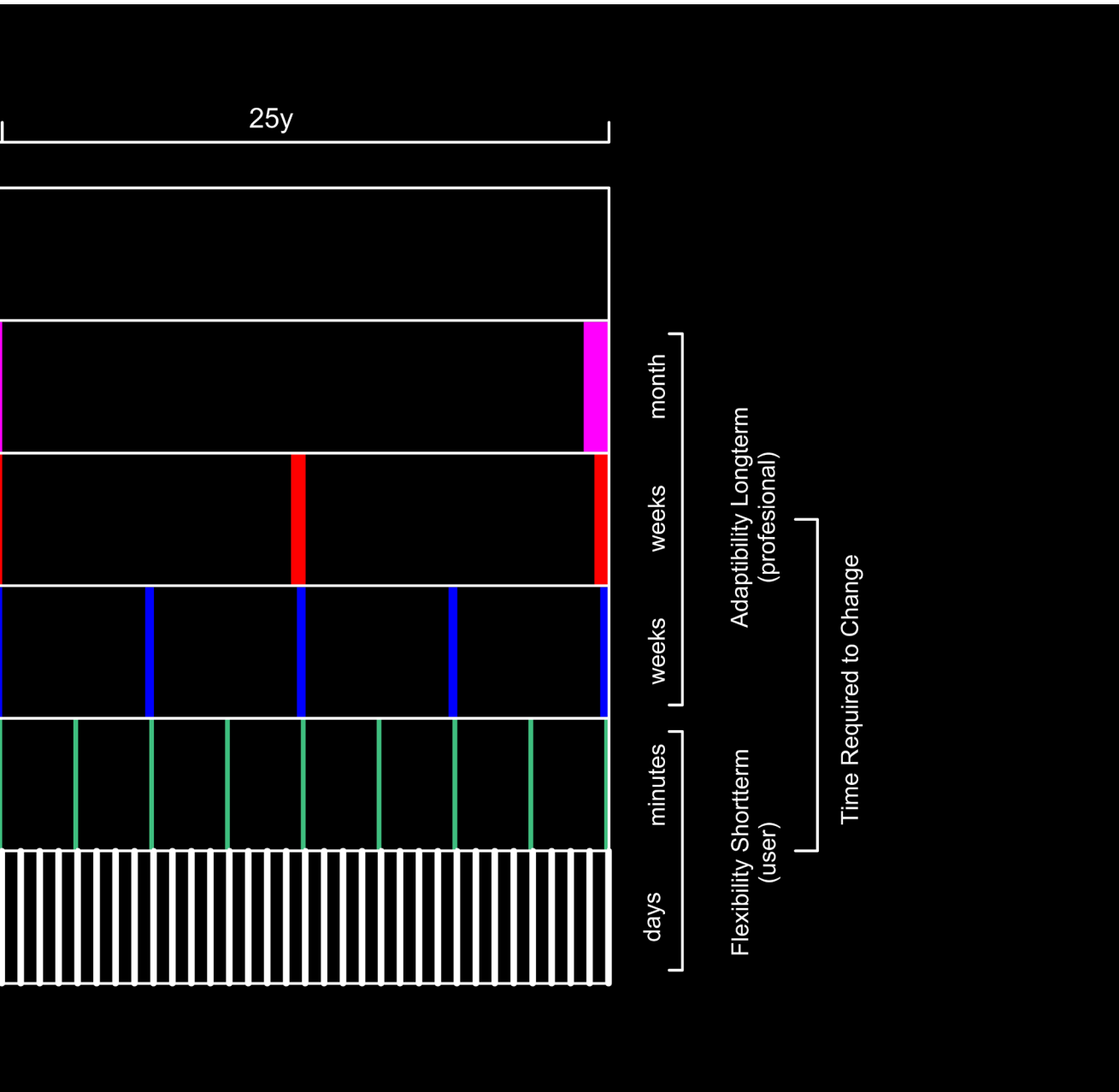


SKIN

The skin consists of both short- and long-term adaptable elements. Long-term components should be detachable and replaceable when needed, while short-term elements allow users to adjust shading, ventilation, privacy, and protection according to changing conditions and preferences.

SERVICES

Services should remain fully accessible at all times to allow easy maintenance, repair, replacement, and adjustment. Installations are therefore kept separate from the main structure and should never become permanently integrated.



SPACEPLAN

The main space plan should consist of large and open spaces that allow multiple interpretations over time. Spaces can be subdivided when needed, while remaining flexible enough to support changing programs and daily user appropriation.

STUFF

The stuff layer changes continuously and consists mainly of furniture and interior elements. These elements should be modular, movable, and easily adjustable, allowing maximum flexibility and user control within the space.

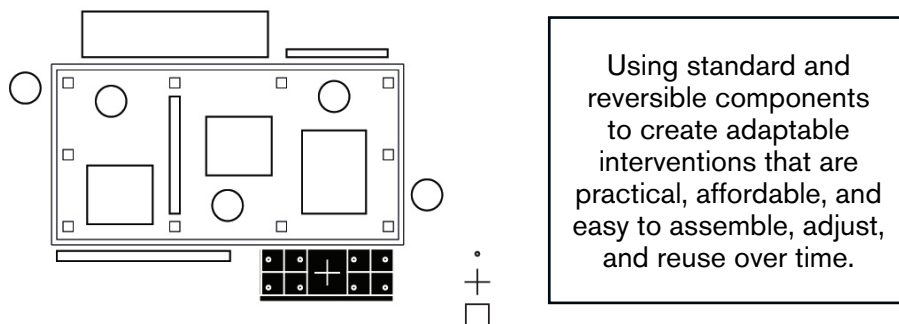
3. Standard Components

The third part of the strategy focuses on the components used to create the interventions and additions (the how). Rather than relying on custom-made elements, the strategy works with standard and widely available components assembled in a reversible way.

Each addition requires its own selection and curation of suitable components. By using standard products as a starting point, the available components themselves begin to inform the construction methods, possibilities, and architectural expression of the building.

This approach aligns with the project's guiding principles of being minimal, practical, and reversible. Standard components reduce complexity, require less specialised labour, and increase the potential for future reuse due to their generic and widely applicable nature.

Using standard components therefore helps make adaptability more realistic and accessible. Interventions can be easily modified, maintained, expanded, or dismantled over time with minimal resources and effort. Within the context of the school program, this approach could even allow students to participate in maintaining, adapting, or constructing parts of the building themselves.



Inspiration

Construction Site

The construction site offers a direct view of how buildings are put together, with components, connections, and systems still exposed before they disappear behind finishing layers.

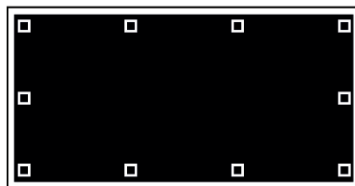
Field studies on construction sites revealed an interest in the logic of temporary low-tech structures used to support the building process. Elements such as formwork, temporary bridges, and structural supports are assembled from standard components, designed for functionality, reversibility, and ease of use. These temporary construction systems form an important source of inspiration for the additions within the project.



Summary

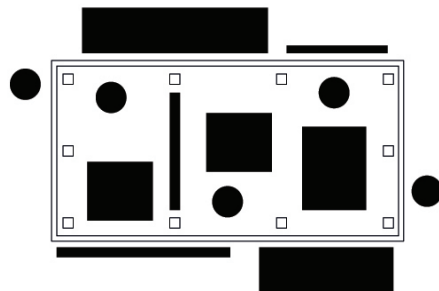
TRANSFORMATION STRATEGY

1. Existing Structure



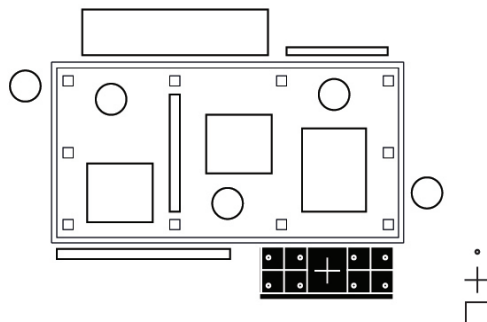
Analysing the existing structure to minimize intervention and maximise efficient reuse.

2. Additions



Adding new interventions as reversible layers that function as independent elements and can be easily adapted, removed, or replaced over time.

3. Standard Components



Using standard and reversible components to create adaptable interventions that are practical, affordable, and easy to assemble, adjust, and reuse over time.

Part 2 THE DESIGN

Introduction

Within the design phase, the proposed strategy is put to the test through the transformation of an outdated office building. The strategy acts as a guideline to ensure this ambition is implemented in a realistic and practical way.

The primary goal of the design is to create a well-functioning, spatially clear, and architecturally engaging building. The additional ambition is to develop a building capable of adapting over time through reversible and easily adjustable interventions.

The design process moves from analysis towards architectural and technical elaboration, continuously testing how the strategy translates into spatial quality, construction logic, climate performance, and adaptability.

Contents

Analysis

- Context
- Existing Building
- Design principles

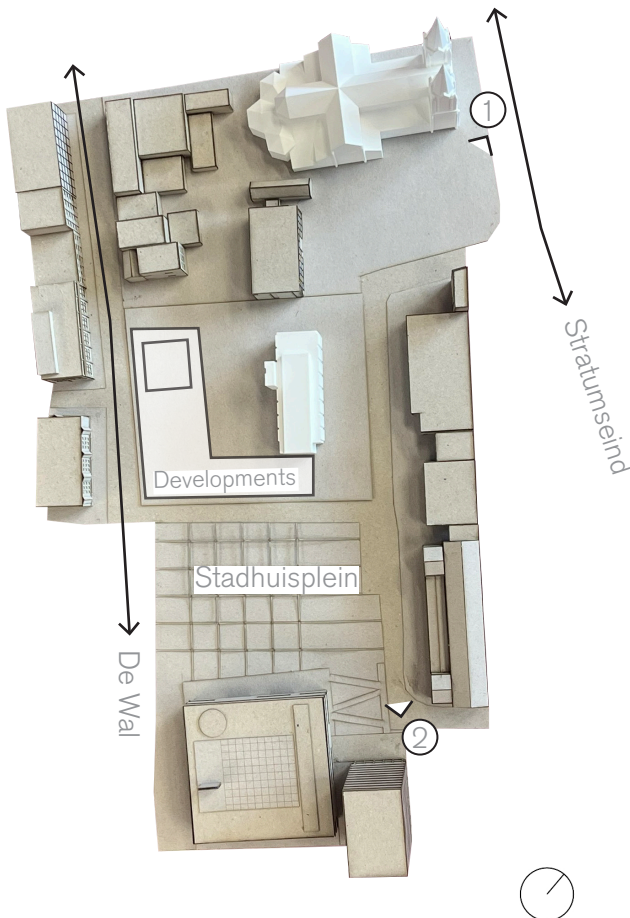
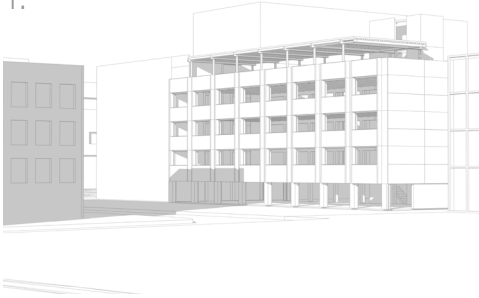
The Design

- floorplans
- sections
- impressions

The Strategy in Design

- skin
- services
- spatial
- stuff
- + components and detailing

1.



Site Analyses

The building is located on an inner-city site at the Begijnhof, forming a passage between two important urban spaces in Eindhoven, Stadhuisplein and Stratumseind. The relatively large public space in front of the building makes it clearly visible when approached from both sides.

Due to the demolition of surrounding buildings, the building currently stands relatively isolated on the site, although major developments are planned both at the Stadhuisplein side and behind the building along De Wal, which are taken into account within the design.

This creates a clear distinction between the public and visible front of the building and the more enclosed courtyard at the rear.

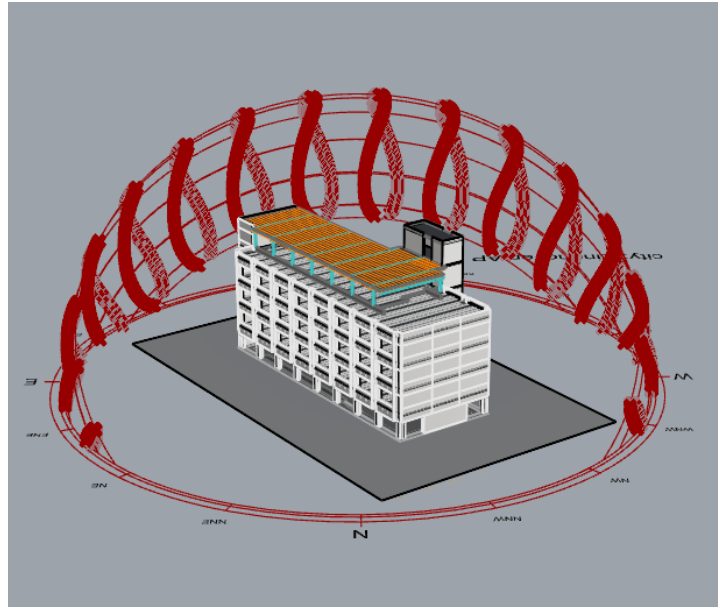
2.



Sun Analysis

The front façade of the building is oriented towards the north-east, creating the need for shading and protection against direct morning sunlight.

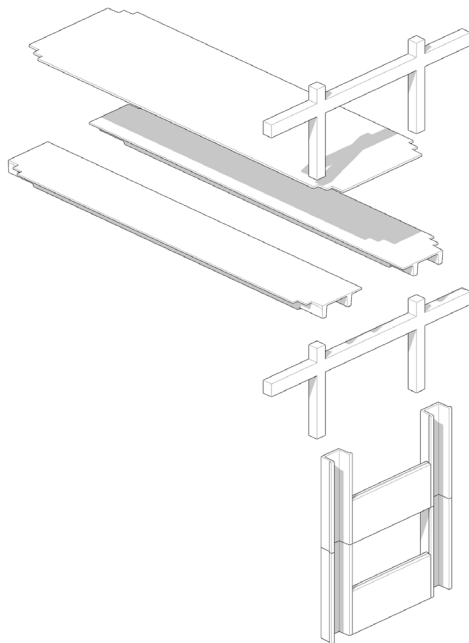
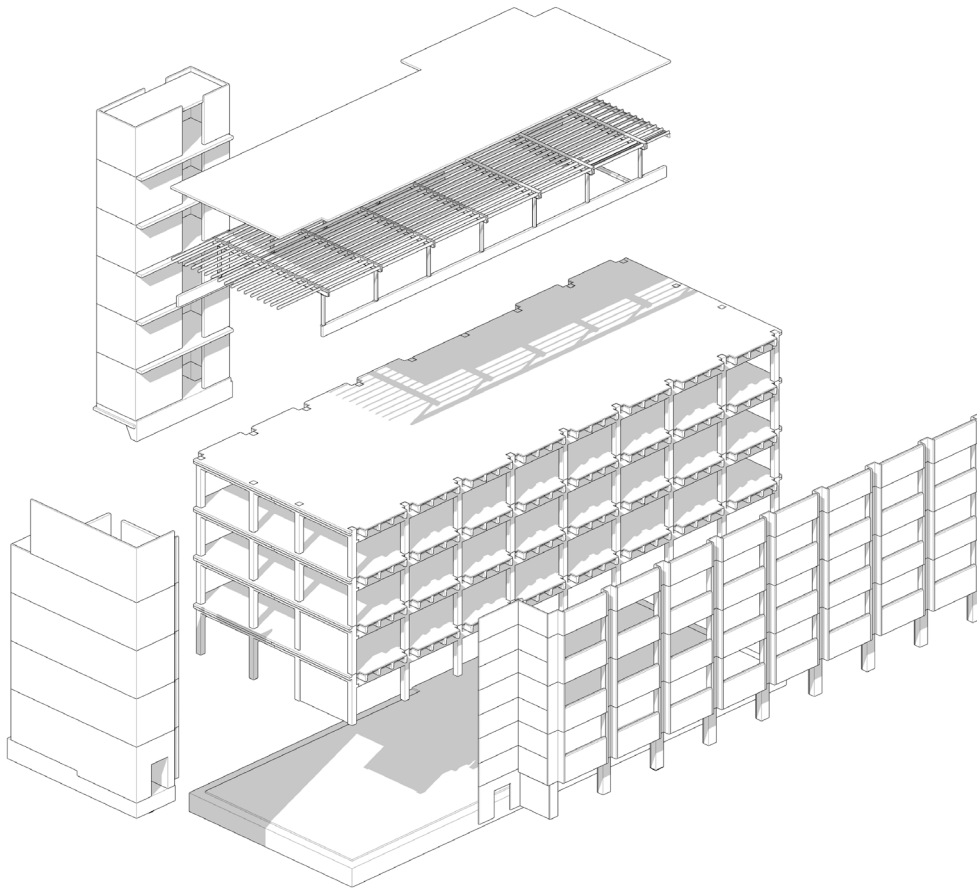
The rear façade receives the highest amount of sunlight throughout the day, creating opportunities for solar energy generation while also requiring protection against overheating. Future surrounding developments and their shadow impact are taken into account within the design.



Appearance

The building has a sober and repetitive concrete façade on both the front and rear.

Its closed appearance limits the relationship with the public space and lacks a contribution to the surrounding city.



Structural Analyses

The building consists entirely of prefabricated concrete elements, poured together on site, making it function as one solid structural system.

The structure can be divided into five main parts:

1. A primary load-bearing structure of concrete columns and beams, organised within a straightforward 4.8 metre grid.
2. T-shaped floor elements spanning 13 meters between the main structure.
3. Concrete stair cores providing the building's overall stability.
4. An additional roof structure consisting of steel, wood, and concrete elements.
5. Prefabricated concrete façade panels suspended from the floor structure.

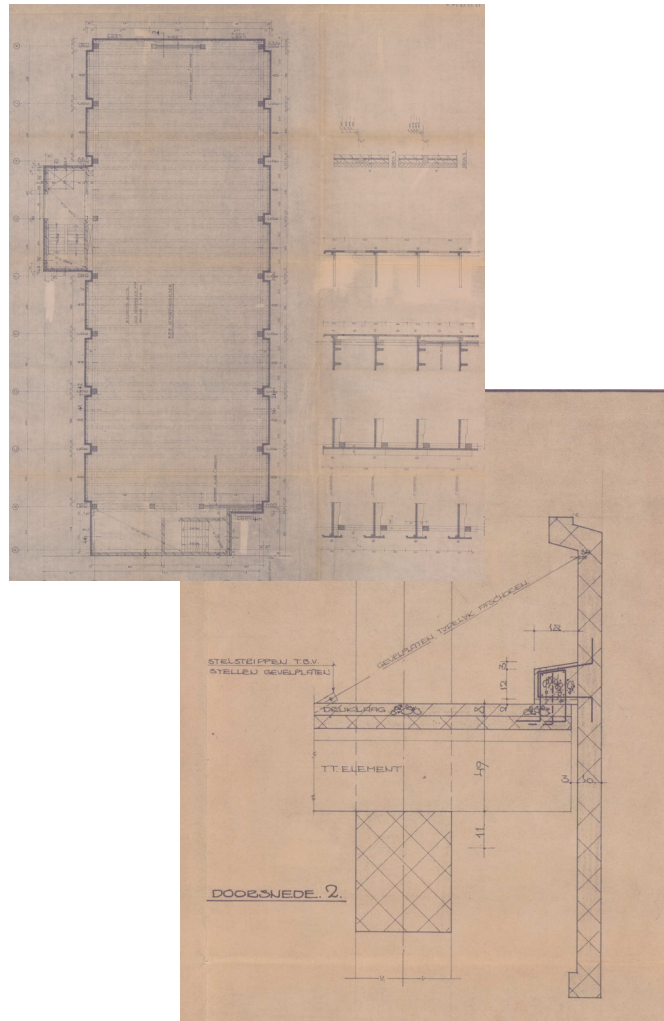
Properties & Layout

Similar structures from this period show that the building has approximately 30% overcapacity, providing additional potential for transformation.

The large floor spans create open and column-free plans, allowing for a flexible spatial organisation.

Since the building was designed as an office, the layout is primarily organised horizontally, with users typically occupying and working on a single floor.

The archive detail illustrates how the floor elements, load-bearing structure, and façade panels meet.



Model & Structural Character

The model is made to better understand the potential of the structural elements. The floor elements create spaces with an interesting raw character.

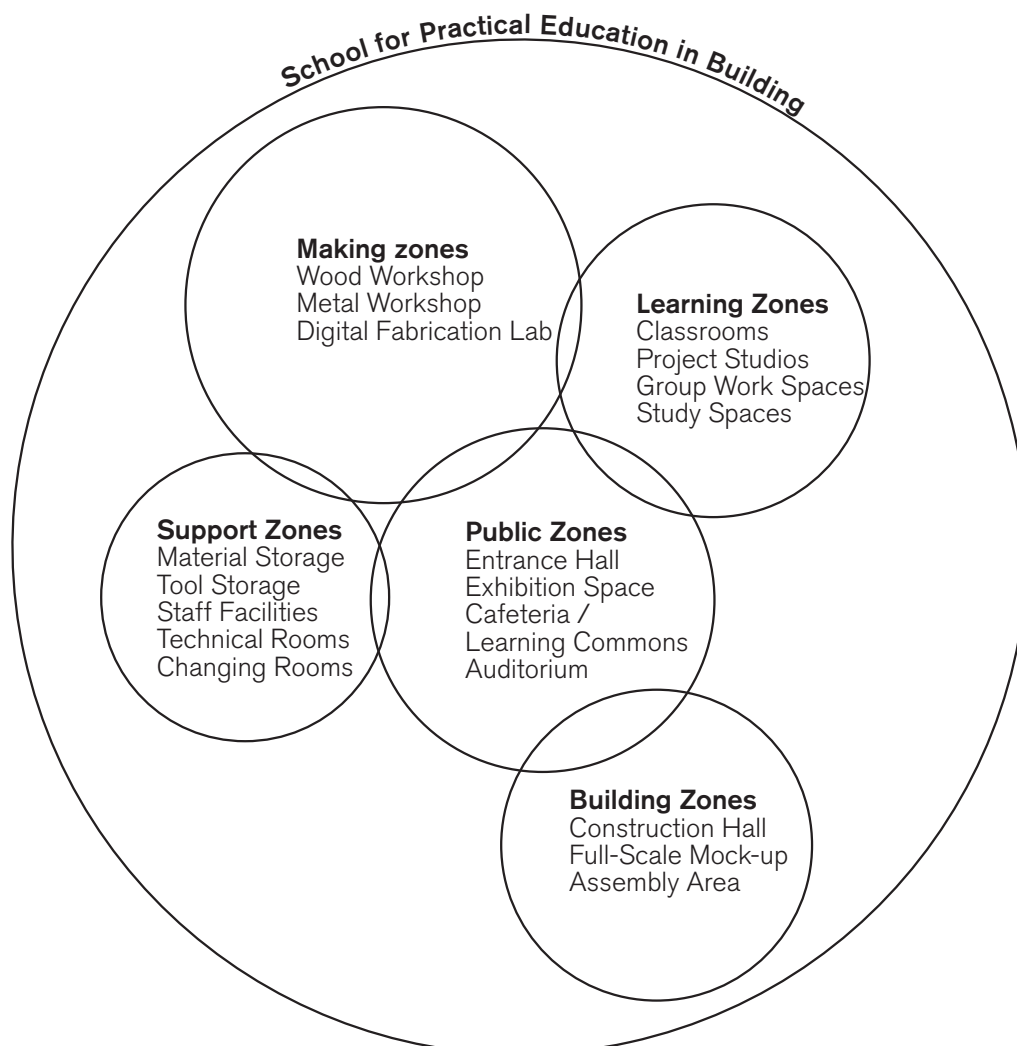
The model is made using a similar approach to the strategy, working with available components and accepting imperfections and traces on the materials as part of their character.

Program of Requirements

The school functions as a practical faculty of construction, where learning, designing, making, and building take place in one continuous environment. This allows students to learn through direct engagement with materials, tools, and real building processes.

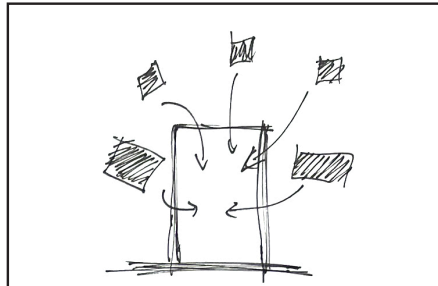
The school is designed to accommodate approximately 300 students. This increases the structural loads and places the building in a higher occupancy category, requiring design loads that are 20% greater than those of an office building. The existing structure can accommodate this increase due to its estimated 30% structural overcapacity.

Based on the educational concept and spatial requirements, the following Program of Requirements was developed:

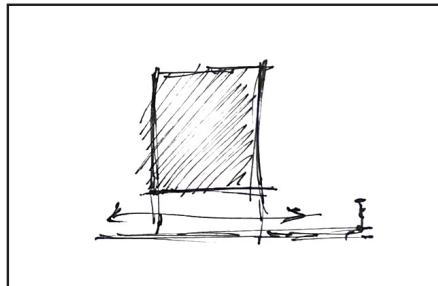


Design Goals

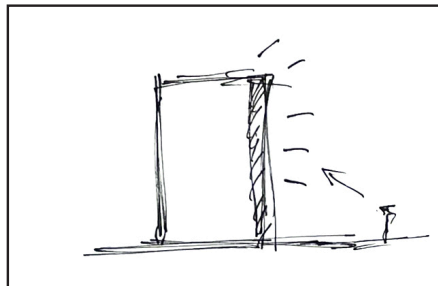
Accommodate the new program



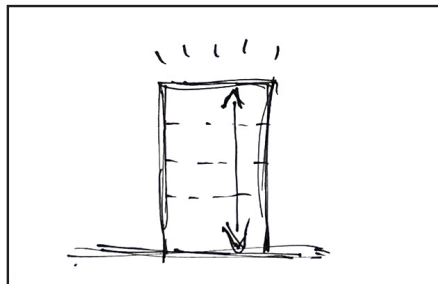
Strengthen the relationship with the public space

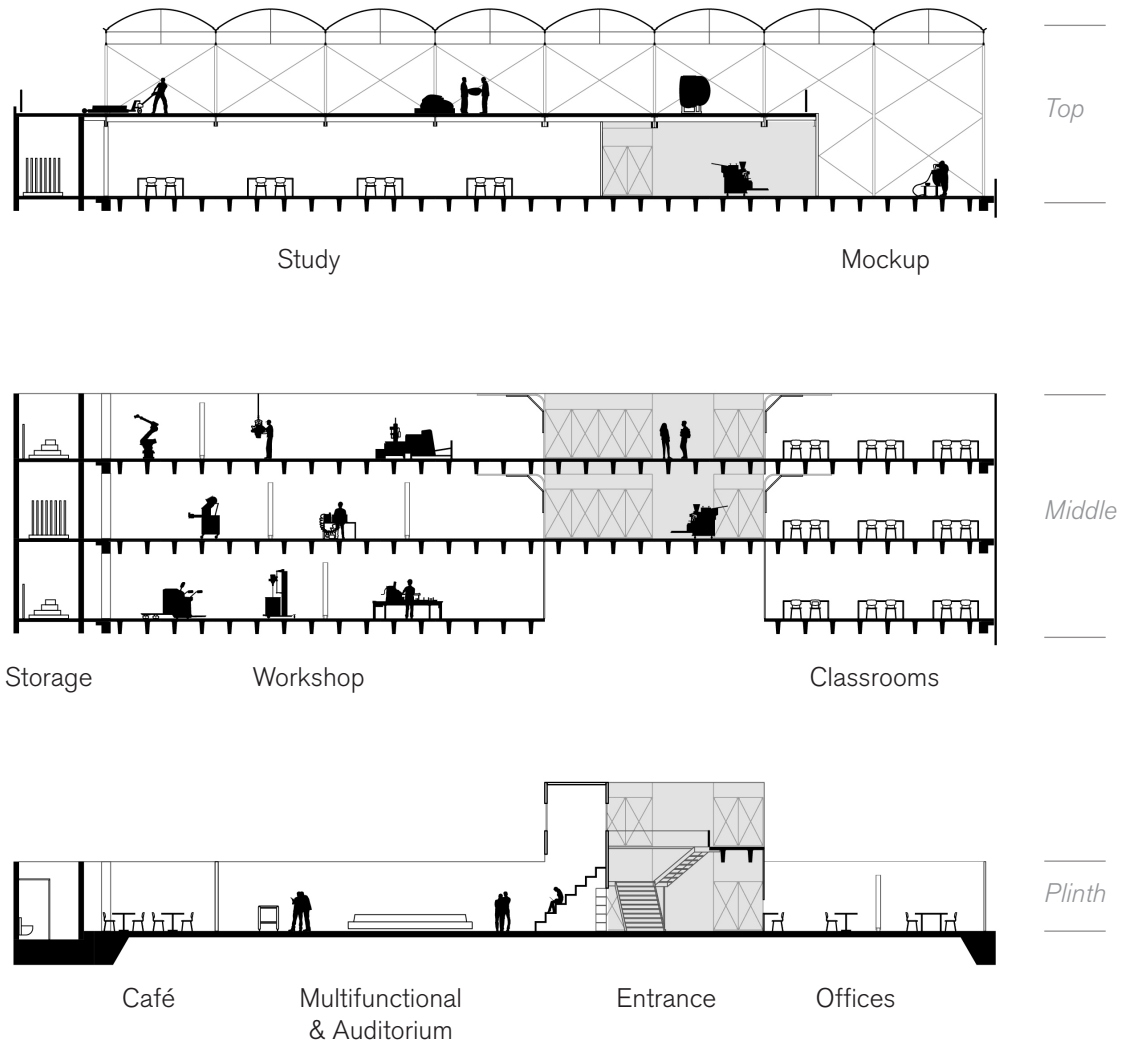


Improve the appearance of the building



Improve vertical circulation





Spatial Organisation

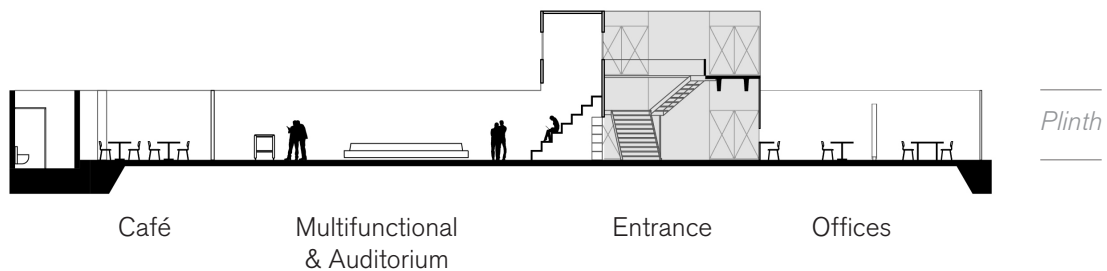
The spatial organisation of the building can be broadly divided into three horizontal parts with on each level a central circulation space that connects the spaces left, right, below and above.

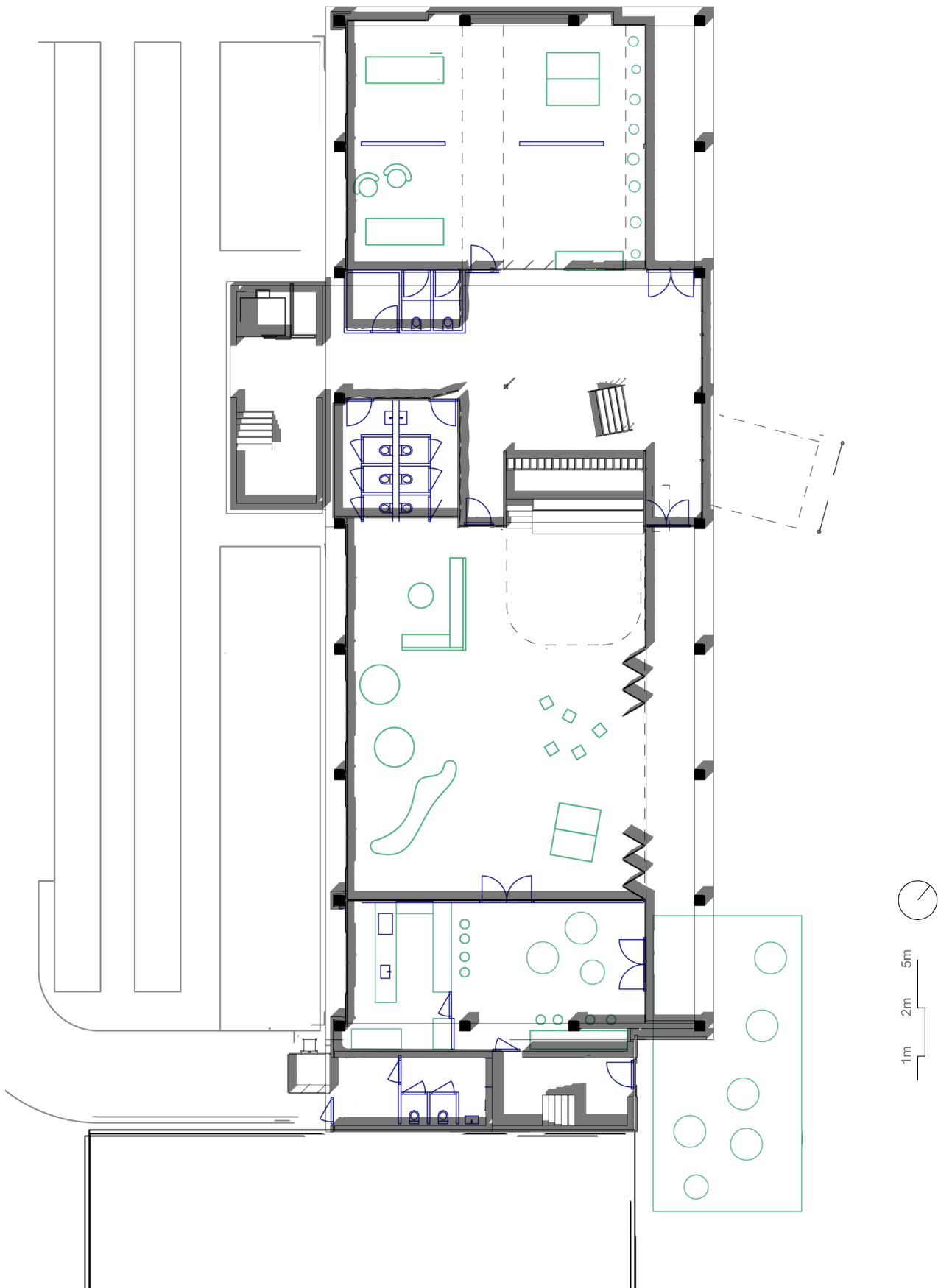
The Plinth

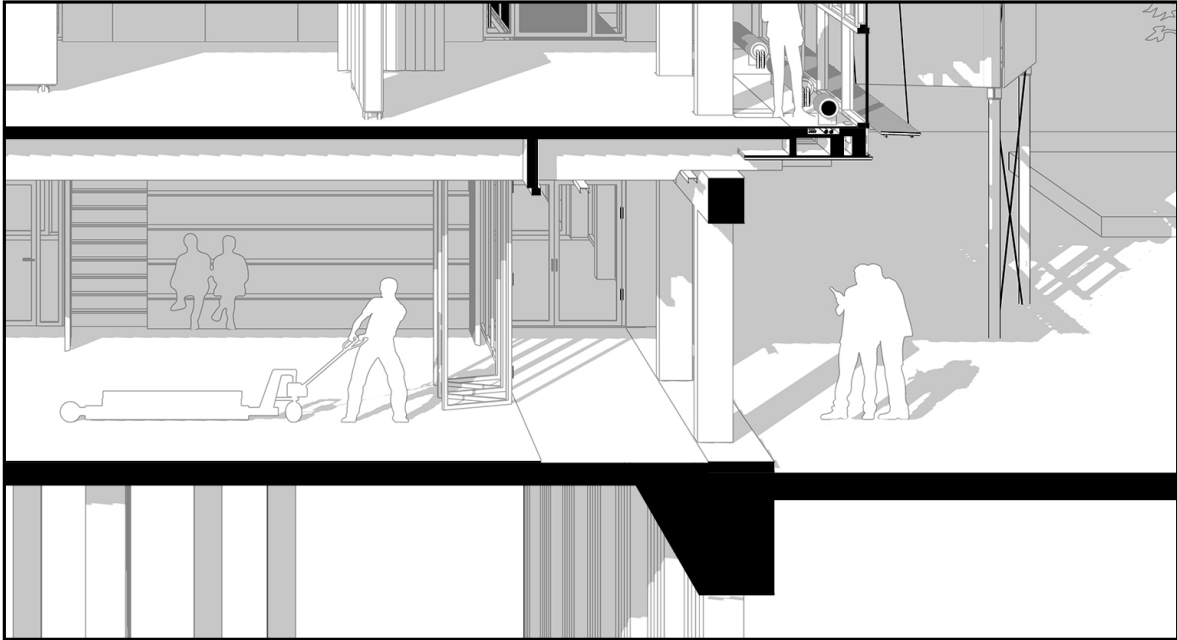
The plinth forms the public part of the building and contains a multifunctional auditorium for events and informal use during breaks, as well as a café that is open to the public and activates the corner of the site.

To strengthen the relationship between the building and the public space, the façade is set back into the building, creating a covered passage that exposes the existing concrete structure and draws people inside. Large opening elements allow the interior to open up during summer, blurring the boundary between inside and outside.

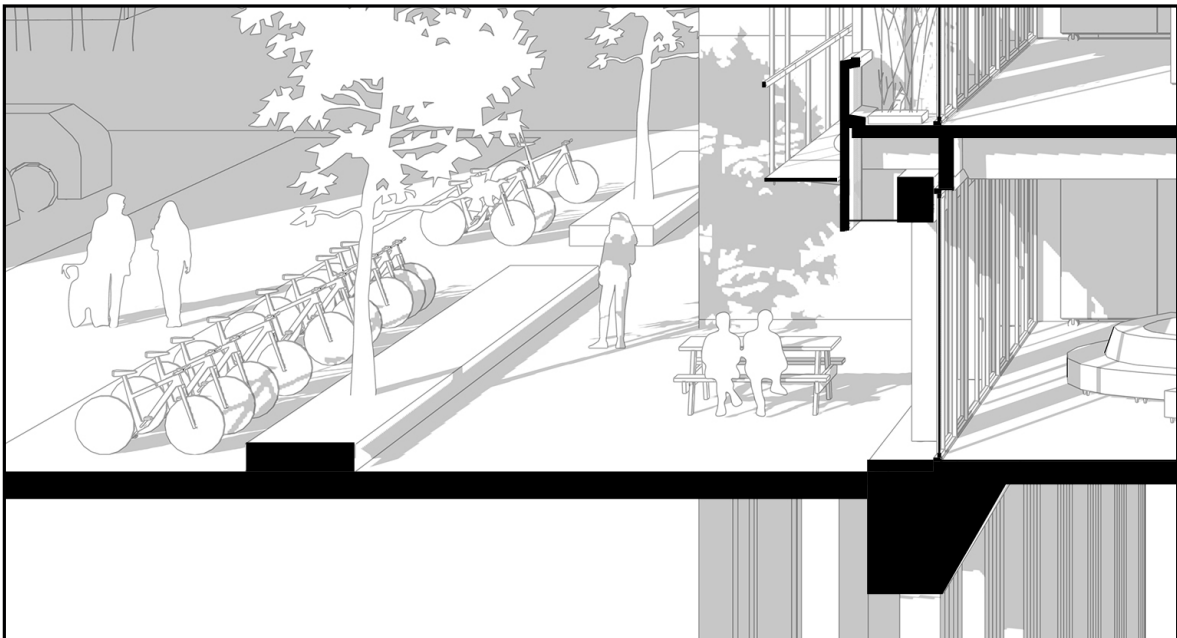
The entrance is clearly expressed and accessible from three sides, while bicycle and car parking are located at the rear of the building, out of sight.



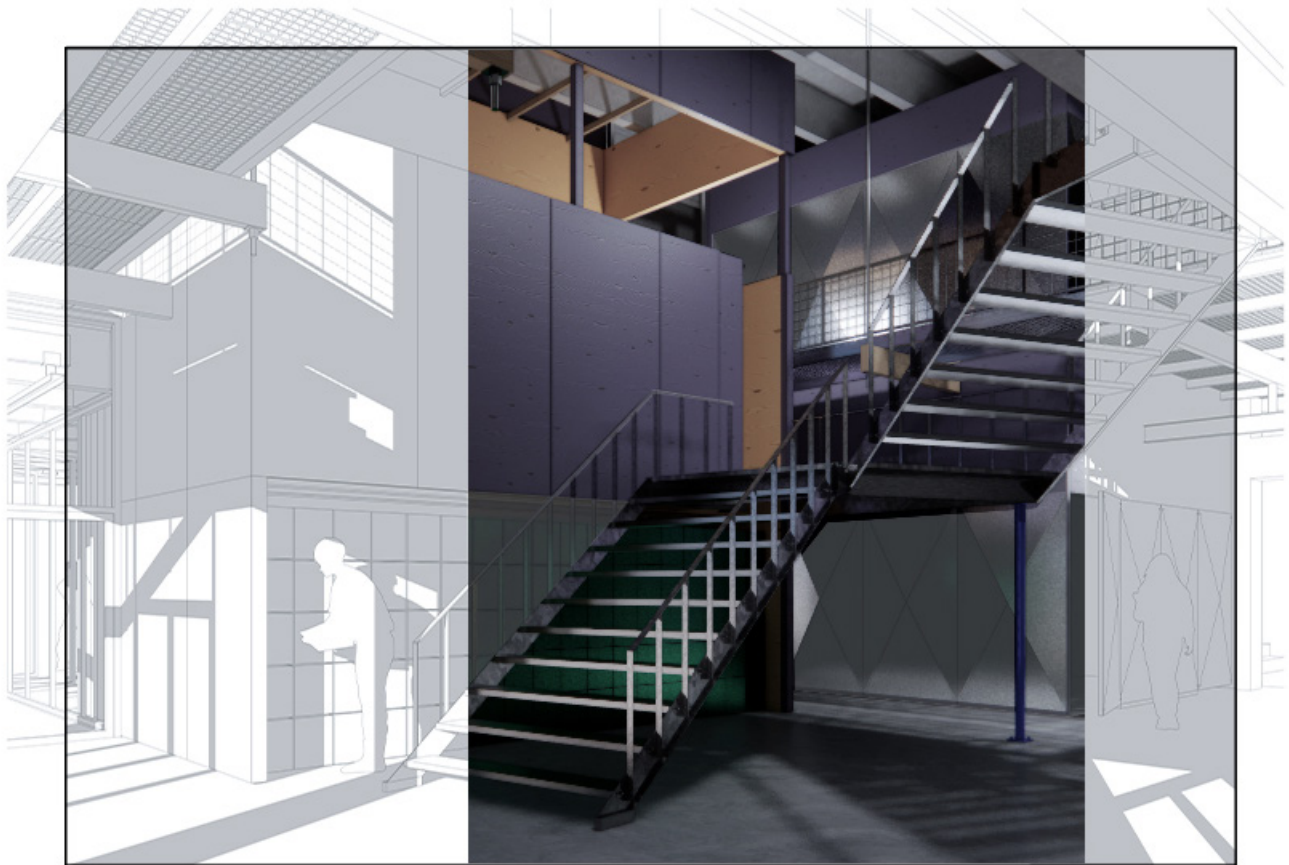




The passage at the front of the building, combined with the openable façade of the multifunctional auditorium space. When opened, the auditorium can extend into the passage and become part of the public realm.



Bicycle and car parking are located at the rear of the building and separated from the building by greenery. Seating areas create an extension of the interior and provide places for students to spend time during breaks.



The double-height entrance hall acts as a connector between spaces. The auditorium, WC block, and staircase are designed as clearly recognisable interventions that land within the existing structure. Their contrast is emphasised through material, colour, and slight rotations relative to the existing grid. Colours are assigned according to the different layers, reinforcing their adaptable nature.

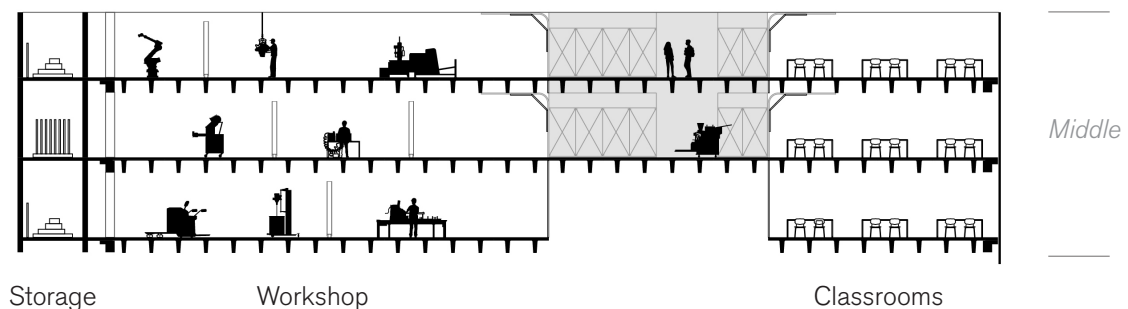
Middle

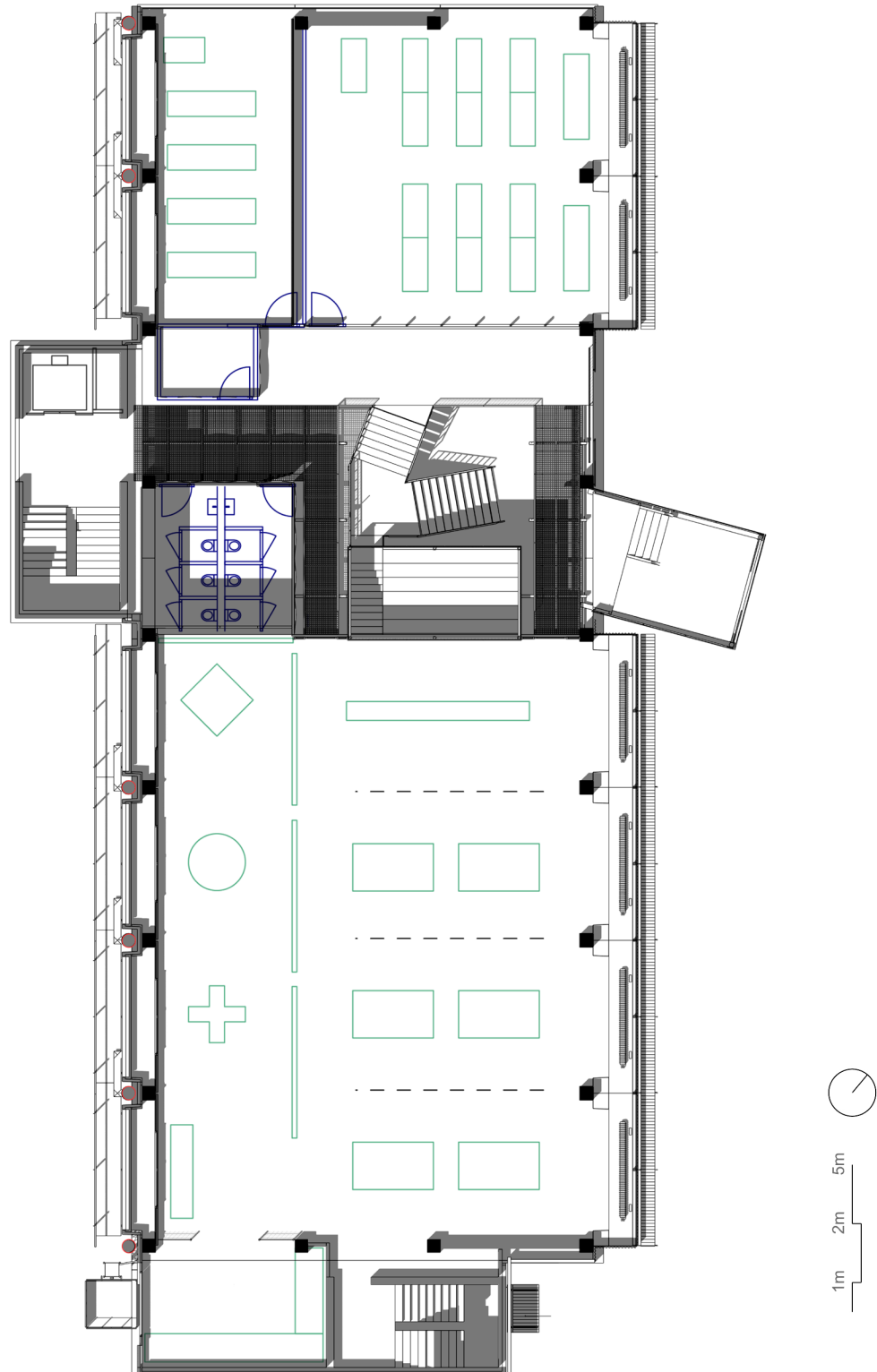
The middle part of the building consists of workshop spaces on the left and learning spaces, such as classrooms and project rooms, on the right.

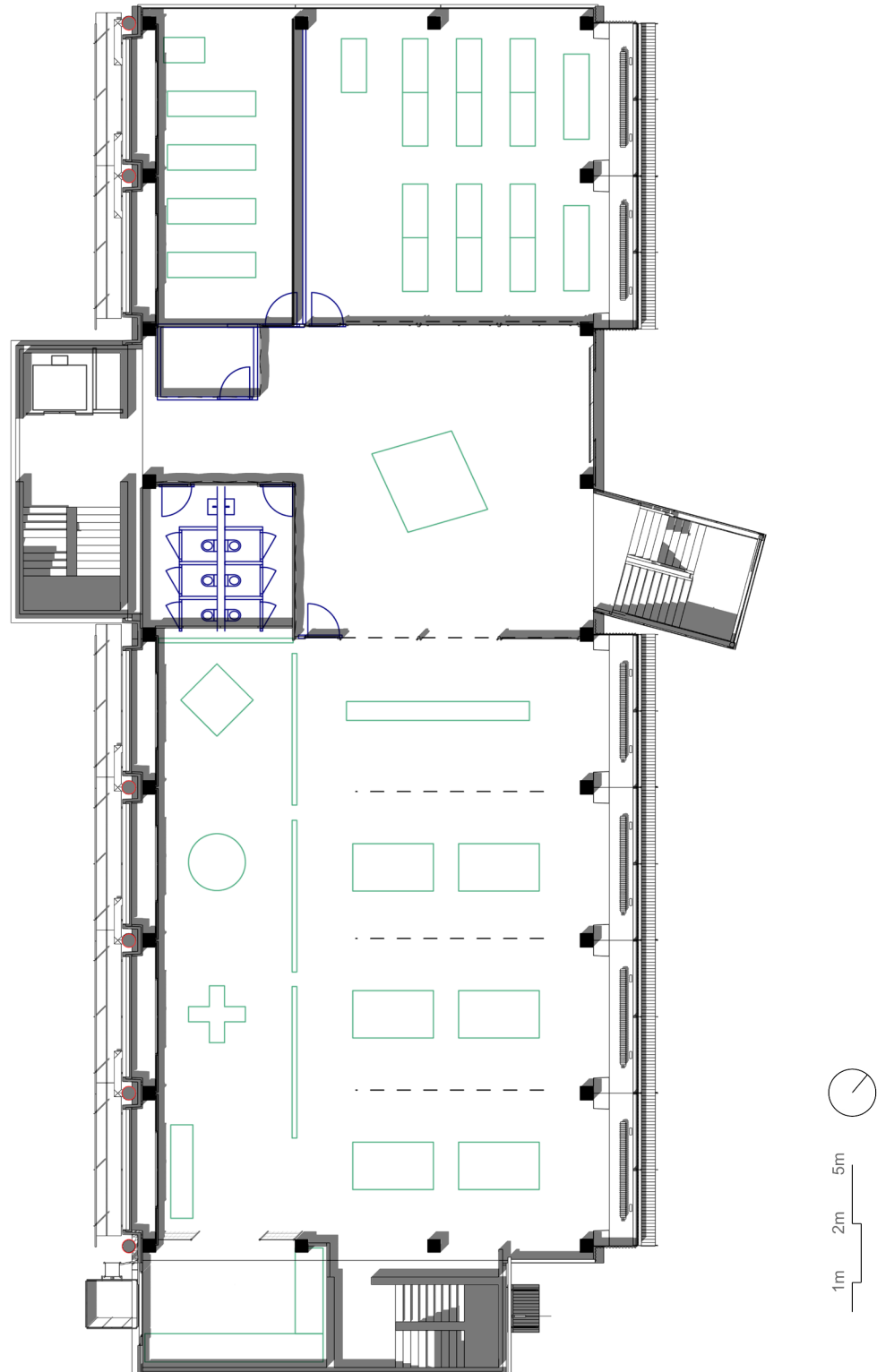
The partition walls between these spaces are transparent garage doors, allowing both sides to be connected into one large space when needed.

The central circulation space acts as the connector. Its generous dimensions allow it to function not only as a circulation area, but also as a place for breaks, informal gatherings, and the exhibition of student projects.

An external staircase is added to improve vertical circulation between the central spaces. By placing it on the exterior, movement through the building becomes visible and contributes to the activity expressed to the public, creating a more transparent relationship between the building and its surroundings.

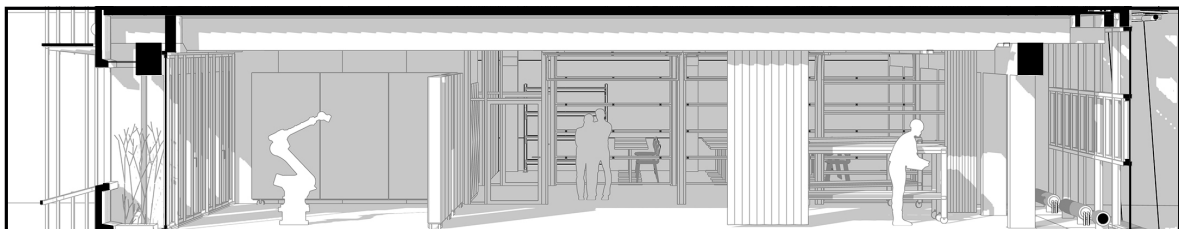








A highly open and flexible layout is created for the workshop spaces, which will be further explained later in the project. The spatial character is defined by the raw expression of the exposed T-shaped floor elements.



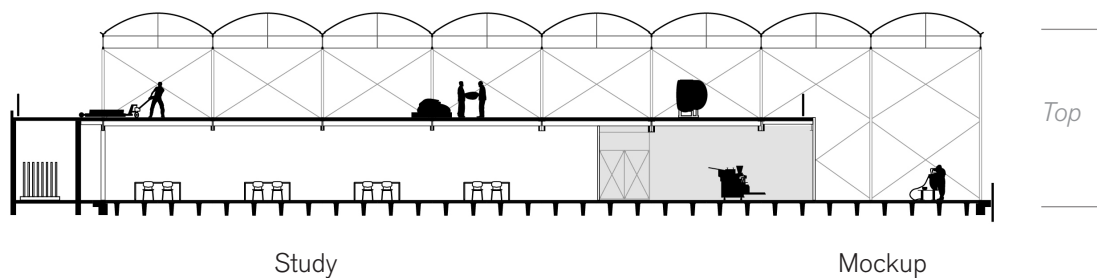
The front façade on the right is set back from the existing structure, allowing the original concrete frame to become a visible layer in its own right. On the rear façade, sliding doors are placed behind the existing structure, creating a similar separation between existing and new. When opened, the small gardens become an extension of the interior.

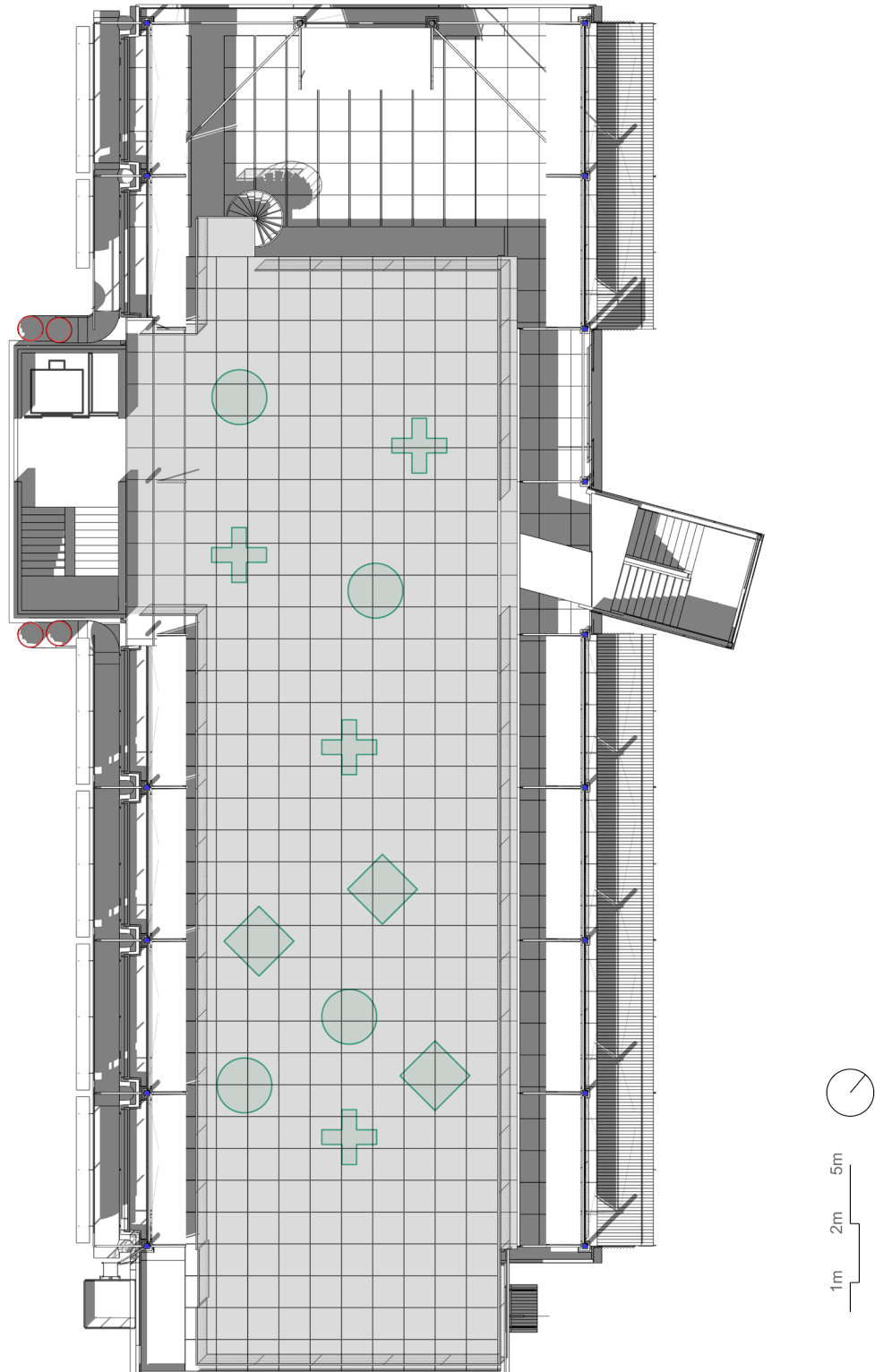
Top

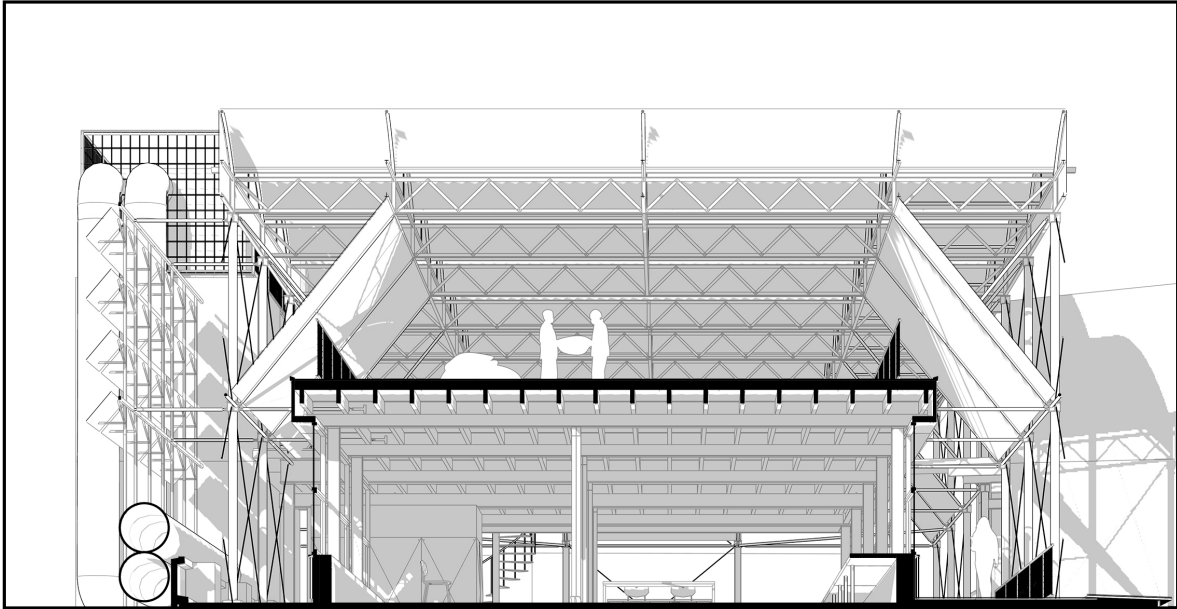
The first level on top of the building contains study spaces connected to terraces on both sides.

The former roof is transformed into a building simulation space for mock-ups. The space functions as a covered outdoor environment, exposed to the outdoor climate while protected from the elements.

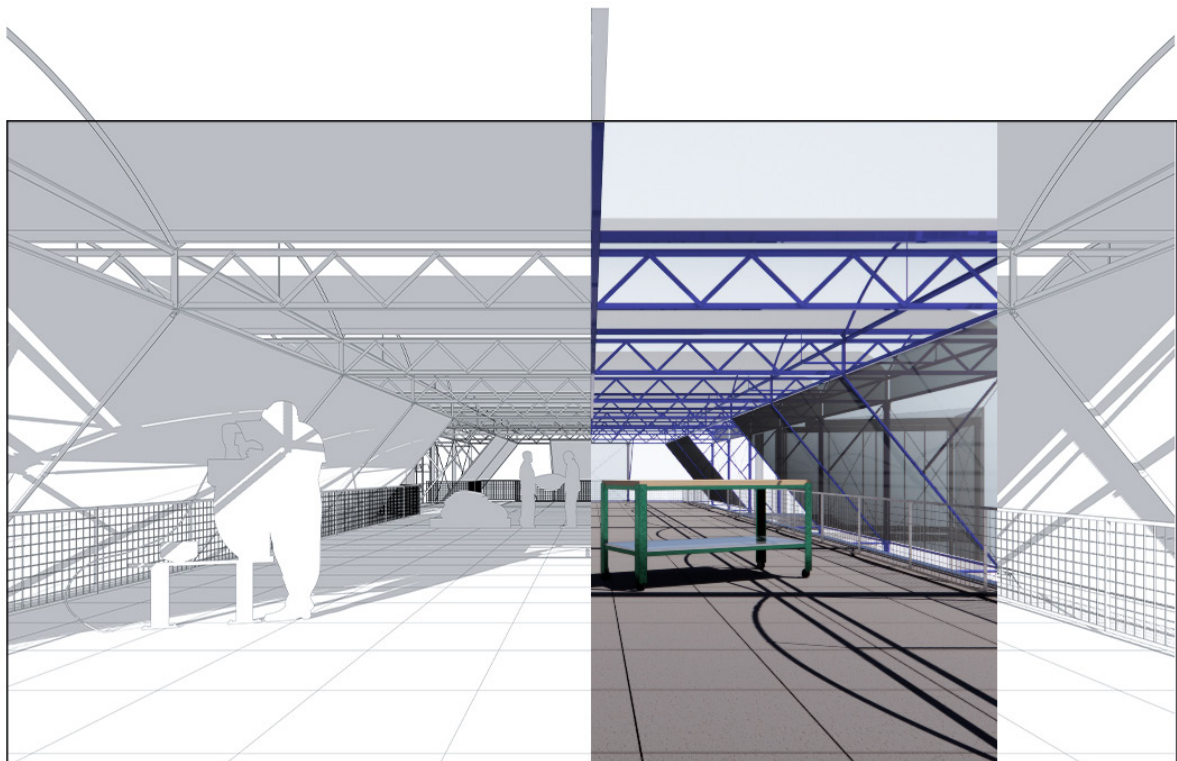
An external goods lift at the rear of the building enables the vertical transport of materials and mock-ups.



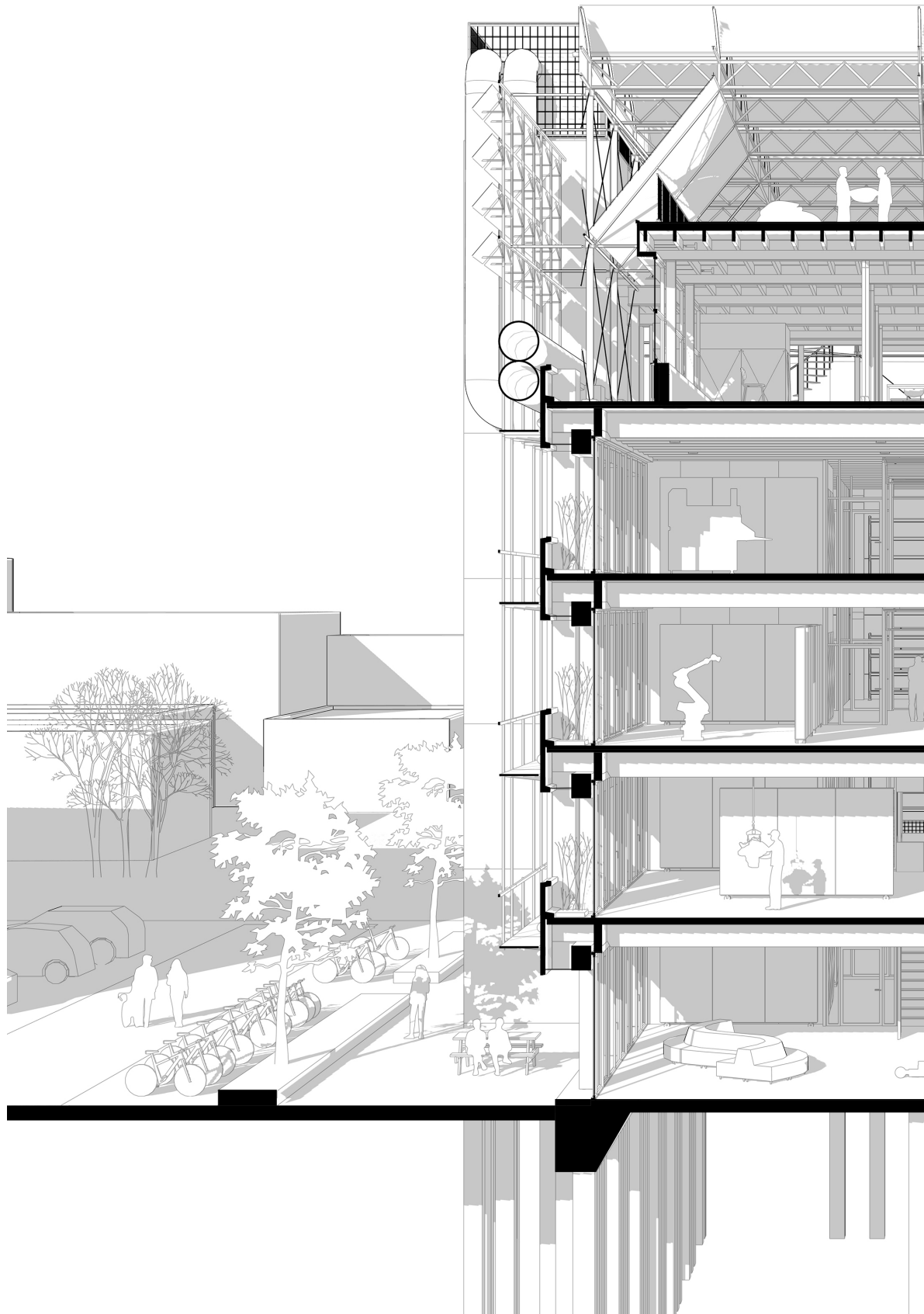




The existing steel and timber roof structure is enclosed by a new outer layer, allowing the original structure to remain visible and define the character of the study space on the inside.



The additional tent structure on top of the building is designed as a lightweight construction. Its bracing system defines the spatial character, while a removable PVC membrane articulates and encloses the space, providing protection from wind, rain, and direct sunlight.





Climate Concept

The climate concept is based on providing a robust climate system combined with adaptable elements that allow users to respond to changing conditions and preferences.

Ventilation

Ventilation is achieved through a hybrid system. During winter, mechanical ventilation ensures a stable indoor climate, while in summer large openable façades enable natural cross ventilation throughout the building.

Sun & Energy

Solar protection is tailored to the orientation of the building. On the north-east façade, adjustable shading elements protect against direct morning sunlight.

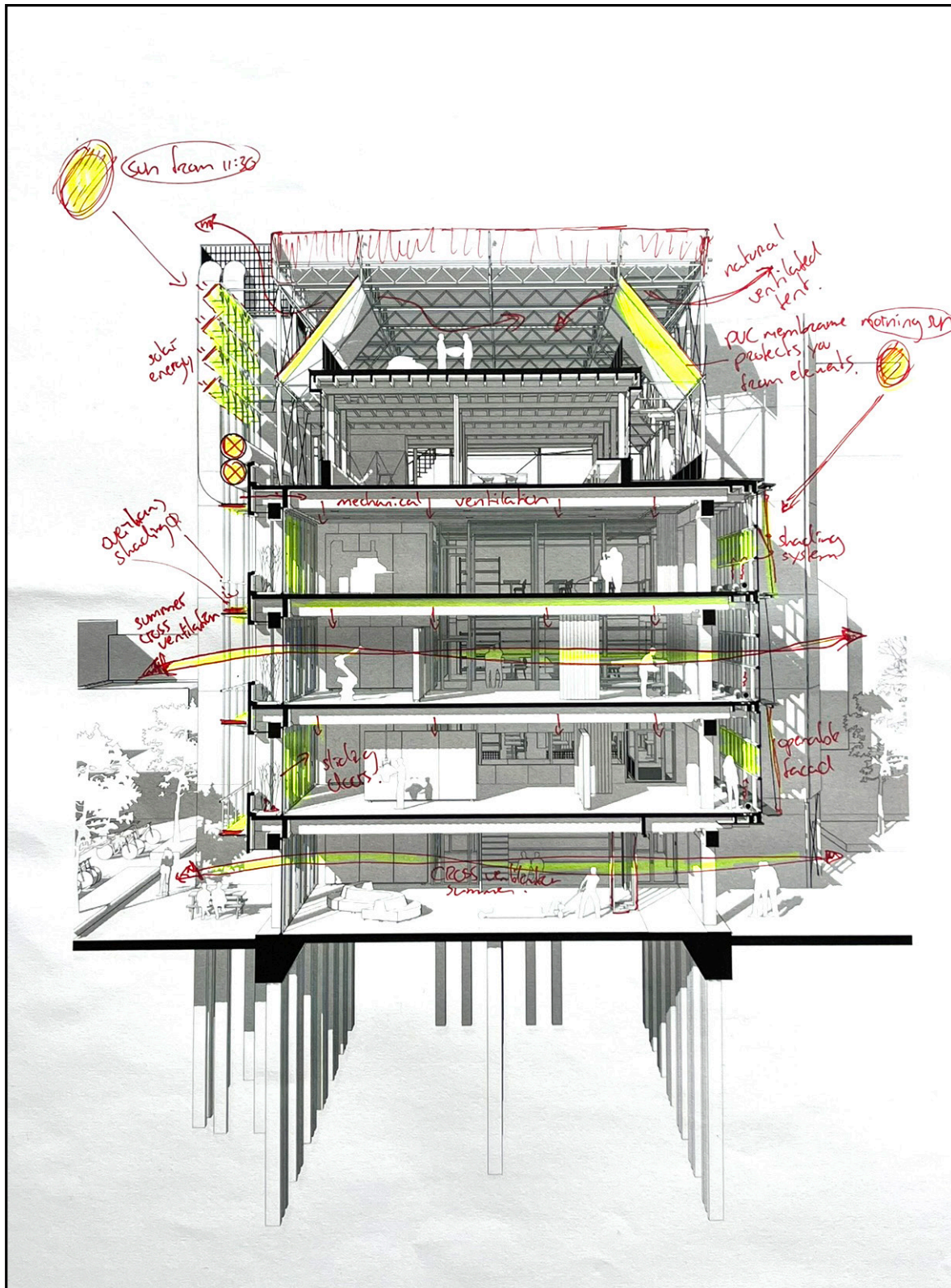
To reduce overheating, the façades are set back behind the external structure, creating overhangs that provide additional shade.

Solar panels are placed on an elevated structure on the roof, positioned outside the shadow of surrounding buildings. This structure also provides additional shading for the tent space below, helping to prevent overheating.

APPENDIX:

Field Case Study: Climatic buffer spaces.

FRAC, Lacaton & Vassal

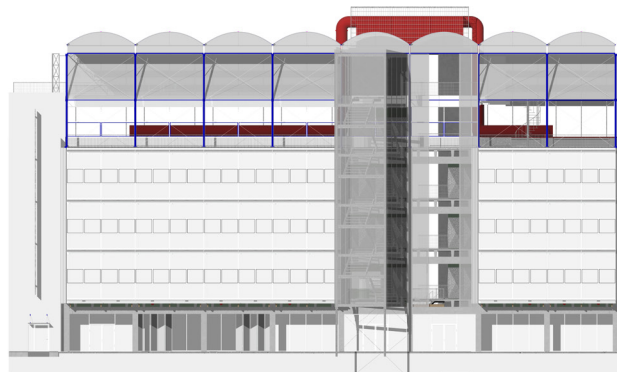


Facades

The front and rear façades of the building are clearly distinguished.

The front façade expresses the spatial organisation of the building (plinth, middle, top and vertical circulation) and contributes to a stronger architectural identity and relationship with the public space.

The rear façade is more functional in nature. The existing concrete façade elements are retained, and technical facilities are placed on the exterior. This makes the service layers visible and turns functionality into part of the architectural expression.





Google Street View image of Begijnhof, showing its current condition.



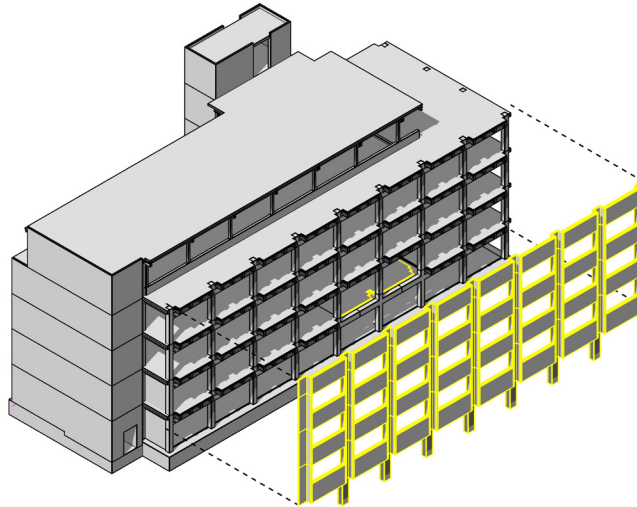
Approaching from either side, the building presents a completely new appearance. Its architectural expression is shaped by making the spatial organisation, construction, and technical systems visible. The added layers are clearly distinguishable from the existing structure and define the renewed identity of the building.



The Strategy in Design

Now that the design has been explained, the focus shifts back to the strategy. How has the building been designed to accommodate change over time? And how are the principles of the strategy translated into the architectural design?

1. Existing



Interventions to the Existing Structure

According to the strategy, the existing structure is preserved as much as possible. However, two major interventions were necessary to accommodate the new program and improve the building's performance.

1. Removal of three floor elements to create double-height spaces for the auditorium and entrance hall.

2. Removal of the front façade to create possibilities for a new and open appearance, while reducing structural weight and allowing for additional program and structure on top of the building.

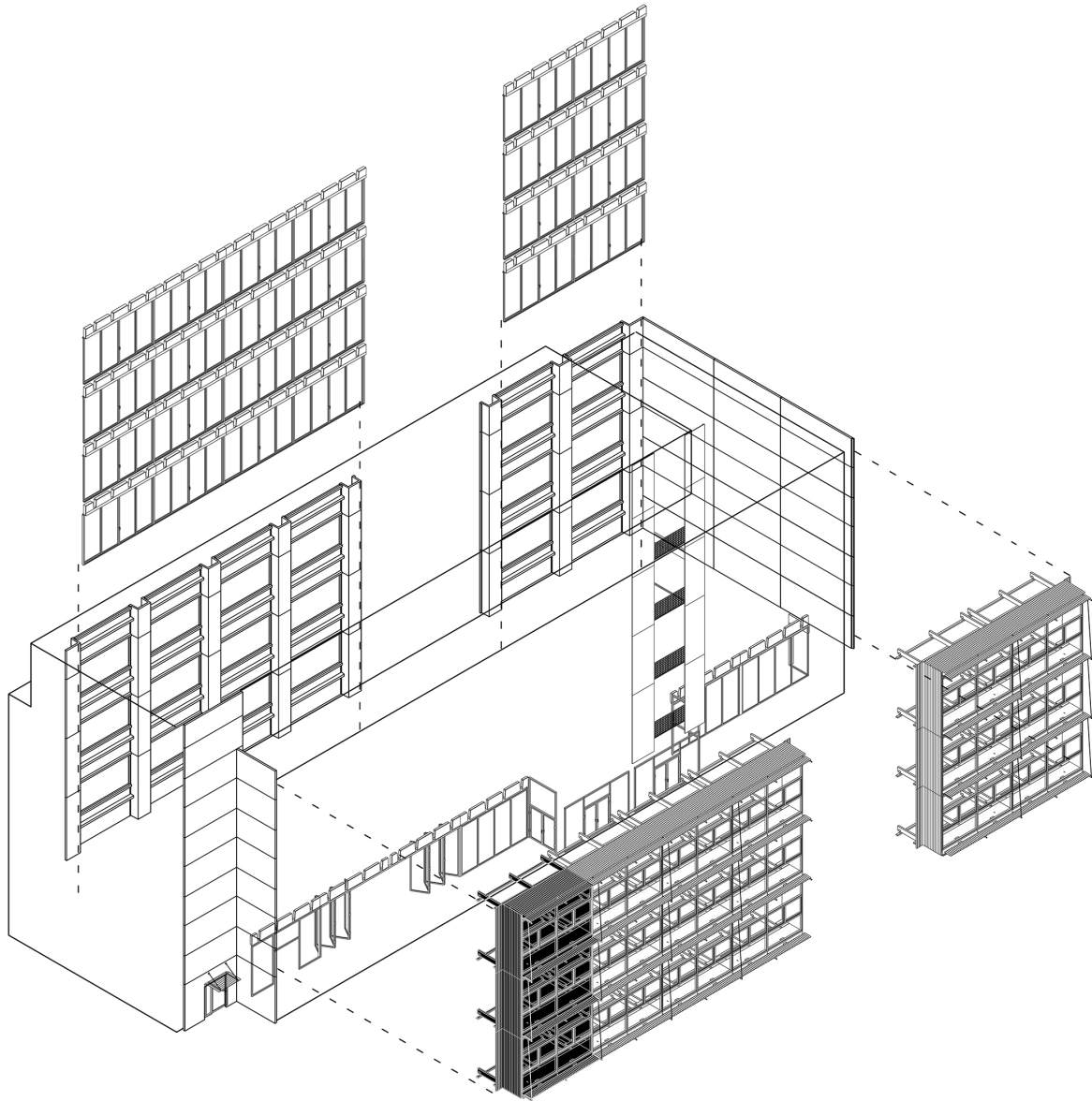
The remaining structural carcass is used as a permanent frame and its character and quality are emphasised.

2. Additions

SKIN

The skin is designed as a durable yet replaceable layer with an expected lifespan of approximately 25 years. Solid but reversible connections provide a robust attachment while allowing maintenance, alterations, upgrades, or replacement to take place without affecting the existing structure.

A clear distinction is maintained between the existing concrete structure and the added lightweight skin. At the front, the façade cantilevers from the load-bearing structure, creating a visible offset from the existing frame. At the rear, standard sliding door elements are reversibly attached to the existing floors. This allows the skin to be adapted or replaced independently from the permanent structural frame over time.



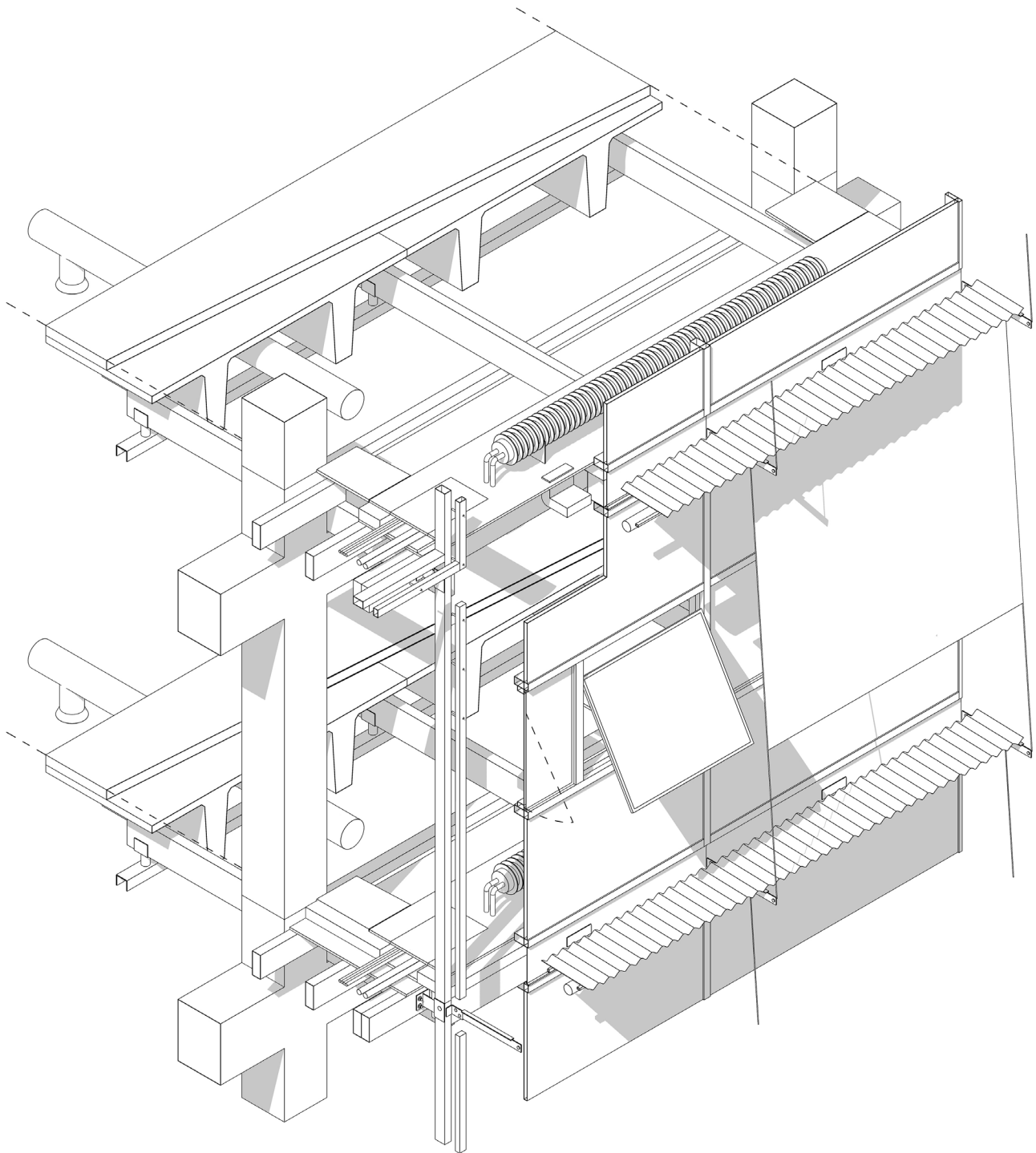
3. Components

SKIN detail

This detail shows one module of the cantilevering façade. All connections are designed to be reversible, allowing components to be removed, replaced, or reused when necessary.

The façade cantilevers from the existing structure to minimise structural intervention. Rather than relying on extensive drilling into the concrete frame, the loads are distributed over two floor elements through a clamping action.

The façade itself is a modular aluminium curtain wall system that can be fully disassembled into individual components. Adjustable shading elements are mounted between brackets and protected by a simple corrugated steel canopy.



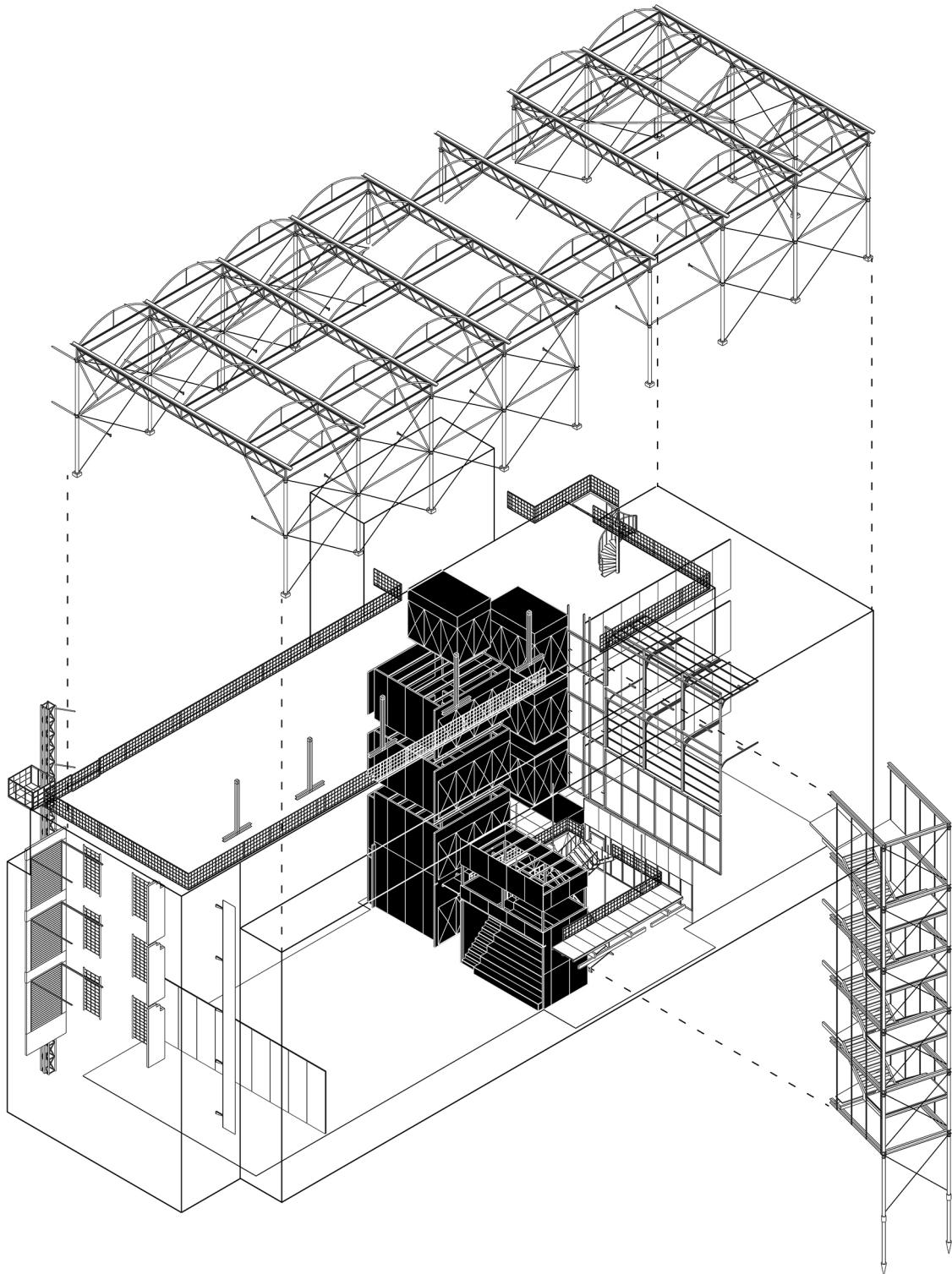
2. Additions

SPACEPLAN

The existing structure forms the permanent framework for the spatial organisation. Within this frame, five main additions define the spatial plan:

1. External staircase
2. Roof structure
3. WC blocks
4. Auditorium
5. Partition walls

Each addition is designed and detailed as an individual element, acting like a piece of furniture placed within or on the existing structure. Because these additions remain separate from the structural frame, they can be adapted, removed, or replaced when future needs change. The existing structure remains intact, allowing the spaces to be reinterpreted over time.



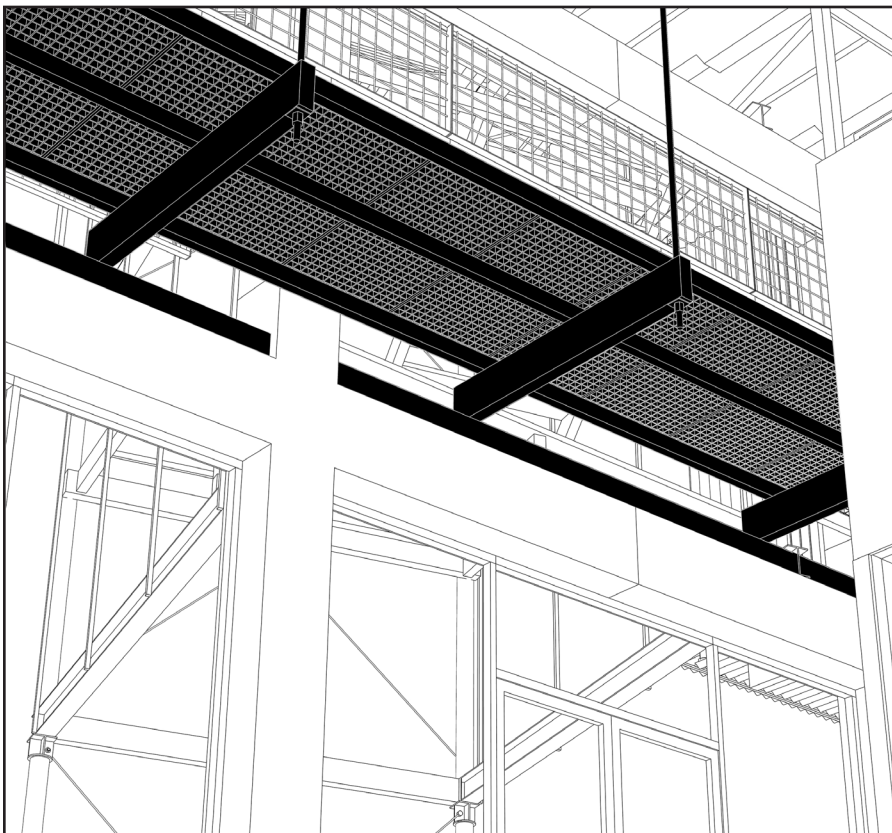
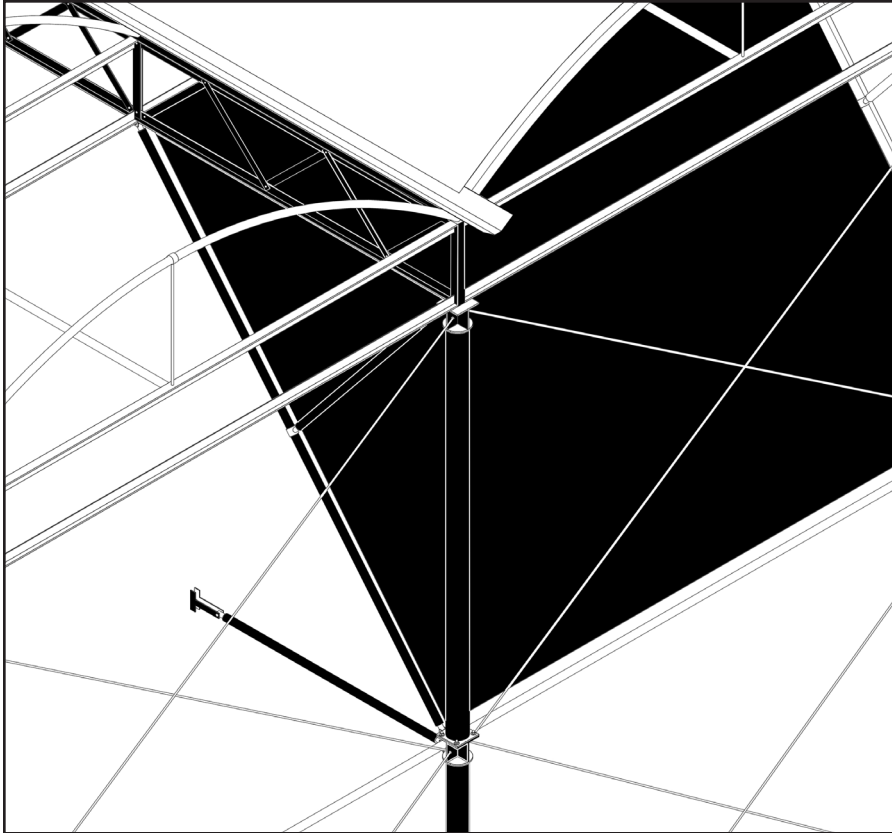
3. Components

SPACEPLAN detail

The roof structure is designed as a lightweight steel construction. Additional bracing reduces the effective span from 13 metres to approximately 9 metres, allowing for a more efficient and lightweight structure.

The main structural elements consist of a combination of scaffolding components and adjustable push-pull bracing components. The structure is enclosed with a PVC membrane.

The close-up of the entrance hall shows how standard components are used in the staircase and internal bridges. The bridge incorporates a tension rod system typically used to tie formwork elements together, demonstrating how existing construction components can be applied in a new context.



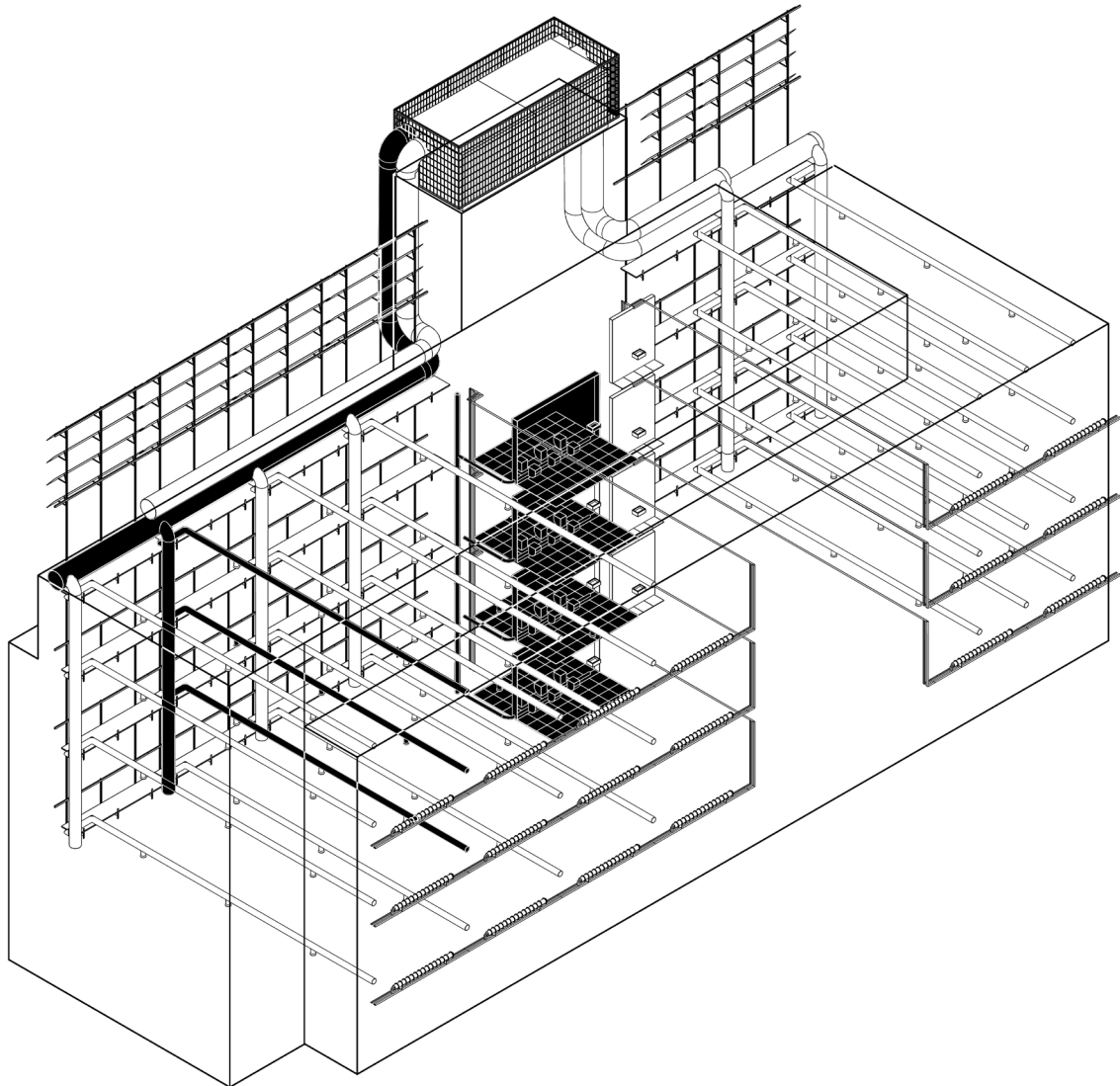
2. Additions

SERVICES

The services are designed to remain fully accessible for maintenance, repair, replacement, and future adaptation. To achieve this, the installations are kept separate from the main structure.

Ventilation ducts run through the pockets between the T-shaped floor elements, maximising floor height while avoiding unnecessary interventions in the structure. Vertical and cross-building services are routed along the exterior, where an additional structure provides both shading and access for maintenance.

The offset front façade creates space for heating, data, and electrical services, allowing them to remain accessible without altering the existing concrete frame.

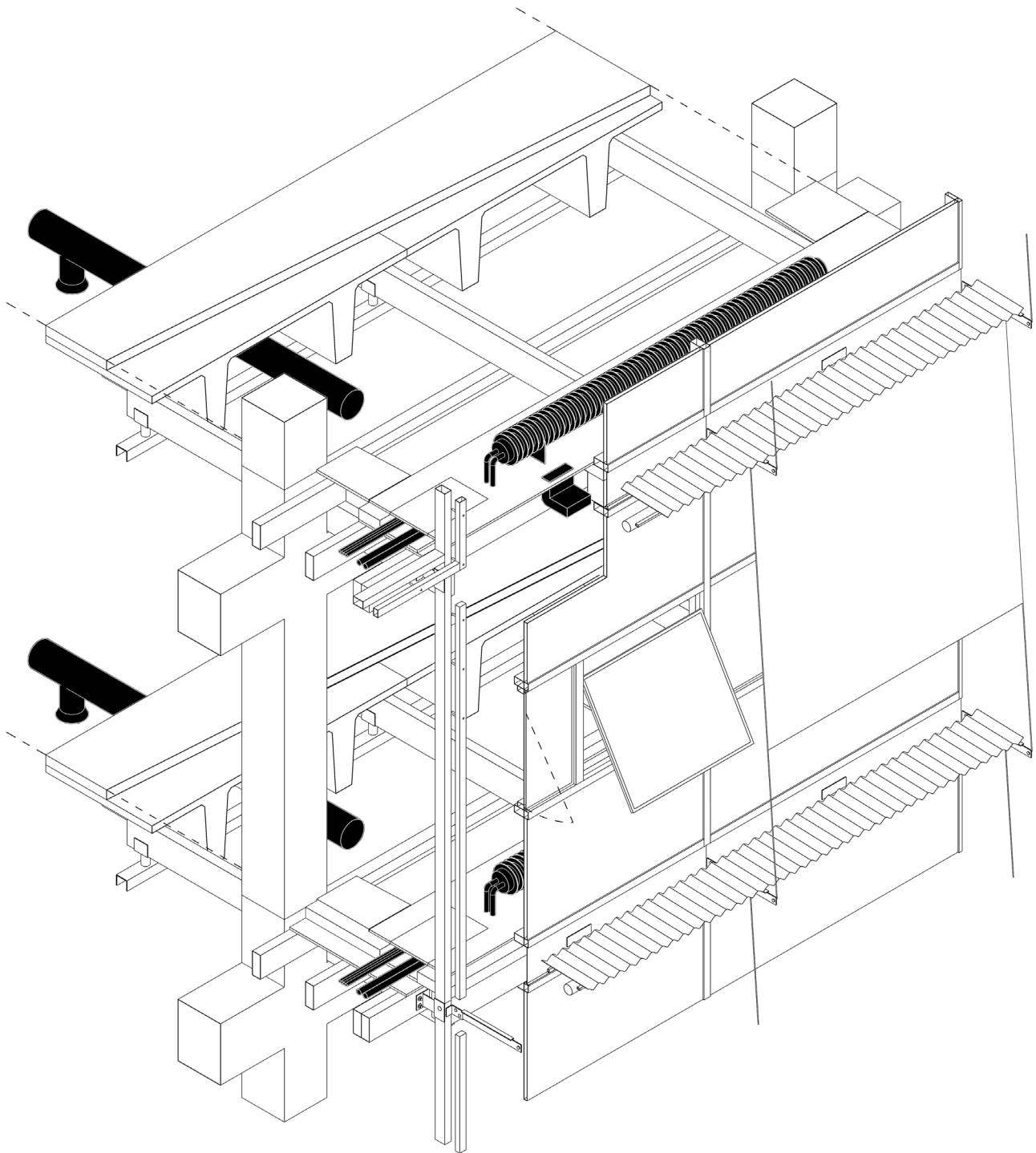


3. Components

SERVICES detail

The offset between the existing structure and the new façade creates space for services such as cabling and heating, avoiding the need for penetrations through the existing concrete.

The pockets between the T-shaped floor elements provide space for ventilation ducts, lighting, electrical installations, and other building services, while maximising floor heights.



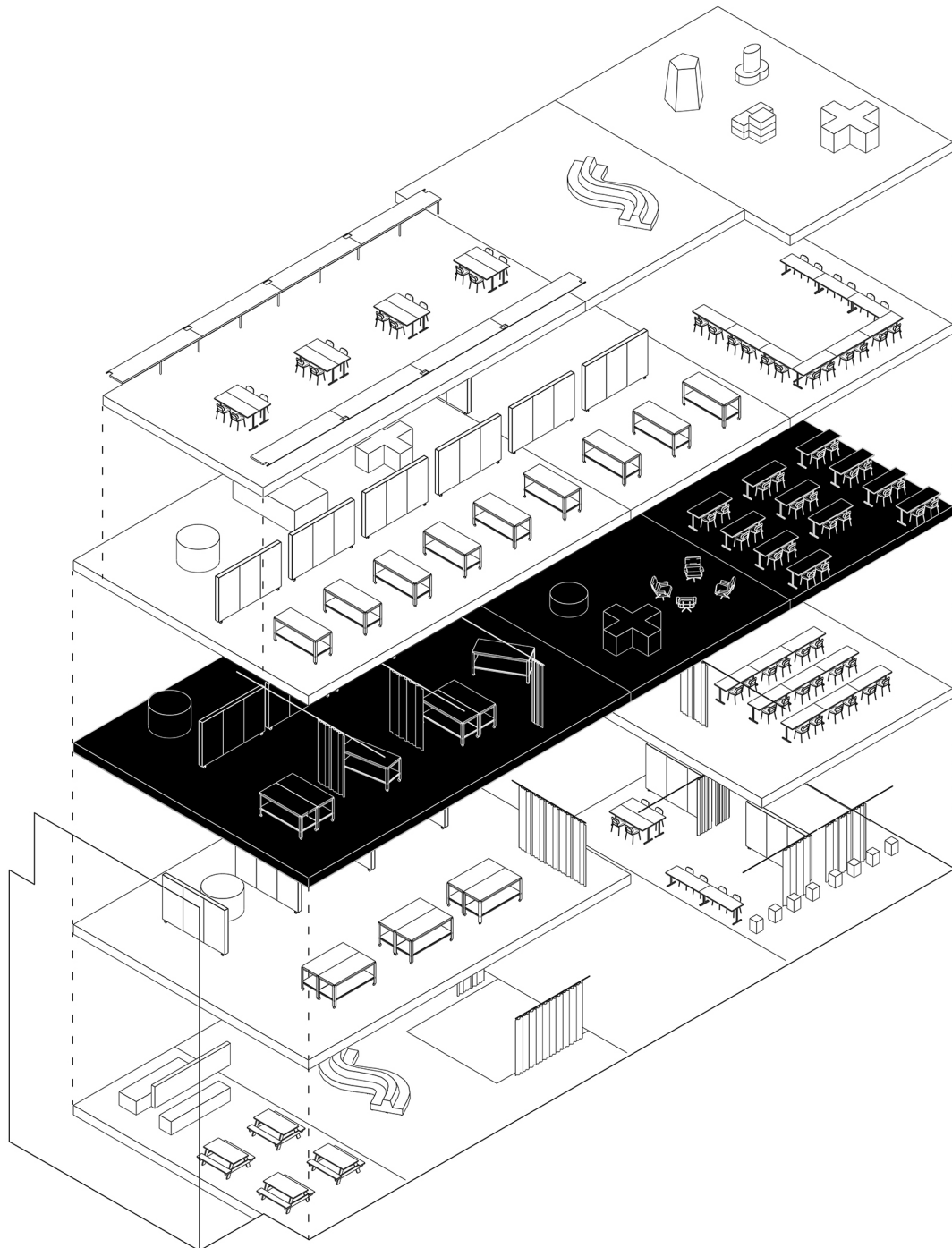
2. Additions

STUFF

The stuff layer remains the most flexible part of the building and is subject to the highest rate of change.

The open spatial layout provides a framework in which furniture and interior elements can be arranged freely. The large open spaces allow for a variety of configurations depending on changing user needs.

To support this flexibility, a set of three interior elements is developed. Together, they enable spaces to be reconfigured quickly and efficiently for different activities and uses over time.



3. Components

STUFF detail

The interior follows the same approach to detailing with standard components as the building itself. This creates reversible pieces that allow for the reuse of parts..

1. Moveable partition wall

This partition wall can be placed in between activities that need more privacy. The wall has acoustic insulation and can also be used as a presentation wall.

The wall sits on wheels to be moved around quickly and is constructed from modular components. Multiple walls can be connected.

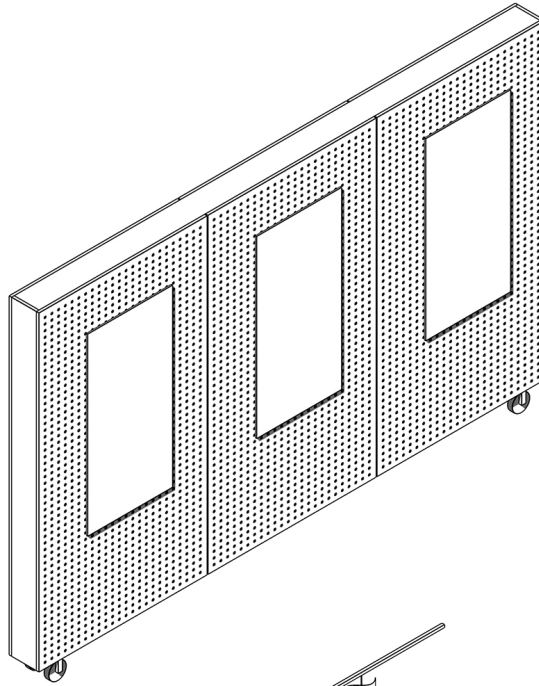
2. Curtain dividers

Curtains are strategically placed within the larger spaces, allowing them to be divided into smaller and more intimate areas when needed, for example for group work or focused activities.

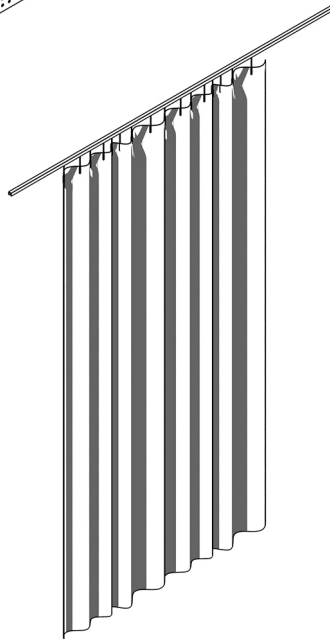
3. Moveable furniture

All furniture is modular and movable. Rather than relying on integrated solutions, the spaces are furnished with independent elements that can be arranged and reconfigured according to changing user needs.

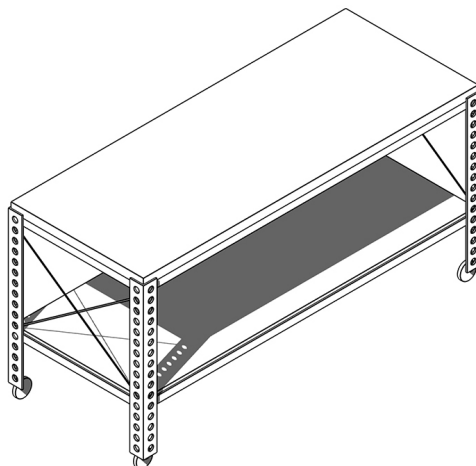
1.



2.



3.



Conclusion

To conclude, time as a driving force for change is inevitable. Change itself is not the problem. Rather, it is the way buildings are designed and constructed that often turns temporality into obsolescence.

This thesis takes the position that existing structures should be treated as permanent frames rather than obsolete objects. Together with the ambition to create buildings that are able to adapt to change over time, this led to the following research question:

How can existing buildings be upgraded through reversible, component-based interventions in a way that enables continuous adaptation over time?

The proposed strategy demonstrates that adaptability can be approached as a practical design and construction challenge rather than solely a theoretical ambition. By maximising the reuse of existing structures, introducing reversible additions, and working with standard components, the project explores how buildings can remain open to future change while reducing the need for major intervention.

The transformation of the office building into a school for practical education shows how this strategy can be translated into a concrete architectural proposal. While the project does not claim to provide a universal solution, it demonstrates that the strategy offers a possible approach towards a more adaptable architecture, one that sees buildings not as fixed objects, but as systems capable of evolving over time.

Recommendations

Although the proposed strategy is intended to be generic, its success will likely vary from one case to another.

The chosen design case is particularly suitable for this approach. The robust concrete structure can be treated as a permanent frame with relatively little maintenance, while the large open floor plates provide significant freedom for reinterpretation and adaptation over time. The educational program also allows for a more flexible spatial organisation than typologies such as housing.

For this reason, it would be valuable to further test the strategy on different building typologies, structures, and programs. Other cases may present different challenges, such as more restrictive structural systems, buildings with lower adaptability potential, or programs that require greater intervention to function effectively.

The research also highlights the importance of the relationship between the existing building and the proposed program. Not every program is suitable for every building, and not every building is capable of accommodating long-term adaptation in the same way. Therefore, careful consideration of the match between building and program remains essential for the successful application of the strategy.

Reflection

Looking back on the process of this thesis, and more broadly on my architectural studies, several recurring thoughts might be interesting to share.

One of the aspects that continues to fascinate me about architecture is its versatility. Throughout my studies, I have enjoyed exploring the many different lenses through which buildings can be understood. From architecture as a creative and artistic discipline, to it being part of a long tradition of building that carries its own history, knowledge, and culture.

Personally, I have always been drawn towards the practical side of architecture: the translation of ideas into built reality. Understanding how buildings are made, how materials come together, and how architectural ambitions are ultimately translated into construction.

Within that interest, the research-driven nature of academic architecture was sometimes challenging, particularly during this thesis. Ultimately, my primary motivation was to design a well-functioning, beautiful, and practical building. However, I am happy that the research process pushed me to think beyond the design itself and encouraged me to engage with broader questions of relevance, adaptability, and the future of the built environment.

References

Brand, S. (1994). *How buildings learn: What happens after they're built*. Viking.

Centraal Bureau voor de Statistiek. (2025). *Dwellings and non-residential stock, 2012–2025* [Data set]. CBS. <https://www.cbs.nl/en-gb/figures/detail/81955ENG>

Eindhoven Municipality. (n.d.). *De geschiedenis van Eindhoven*. <https://www.eindhoven.nl/stad-en-wonen/stad/erfgoed/de-geschiedenis-van-eindhoven>

European Commission. (n.d.). *Construction and demolition waste*. European Commission. https://environment.ec.europa.eu/topics/waste-and-recycling/construction-and-demolition-waste_en

GAFPA. (n.d.-a). G1817. <https://gafpa.net/g1817/>

GAFPA. (n.d.-b). G1203. <https://gafpa.net/g1203/>

Lacaton & Vassal. (n.d.). *Palais de Tokyo, site de création contemporaine*. <https://www.lacatonvassal.com/index.php?idp=20>

Leupen, B. (2006). *Frame and generic space*. 010 Publishers.

Open Eindhoven. (n.d.). *Herontwikkeling Stadhuisplein en omgeving*. <https://www.openeindhoven.nl/projecten/centrum/binnenstad/herontwikkeling-stadhuisplein-en-omgeving>

Open Eindhoven. (n.d.). *Nieuwbouwplannen Stadhuisplein*. <https://www.openeindhoven.nl/projecten/centrum/binnenstad/nieuwbouwplannen-stadhuisplein>

Techniek Nederland. (2025, July 22). *Technieksector heeft komende vijf jaar 121.000 nieuwe vakmensen nodig*. <https://www.technieknederland.nl/pers/technieksector-heeft-komende-vijf-jaar-121000-nieuwe-vakmensen-nodig>

United Nations Environment Programme. (2022). *Sand and sustainability: 10 strategic recommendations to avert a crisis*. UNEP. <https://www.unep.org/resources/report/sand-and-sustainability-10-strategic-recommendations-avert-crisis>

van Eyck, A. (1960). *De milde raderen van de reciprociteit*. *Forum*, (5), 205–206. Reprinted in *Architect Year Book* (1962, Vol. 10, pp. 173–178).

World Green Building Council. (n.d.). *Embodied carbon*. <https://worldgbc.org/climate-action/embodied-carbon/>

Appendix

Model Making Proces

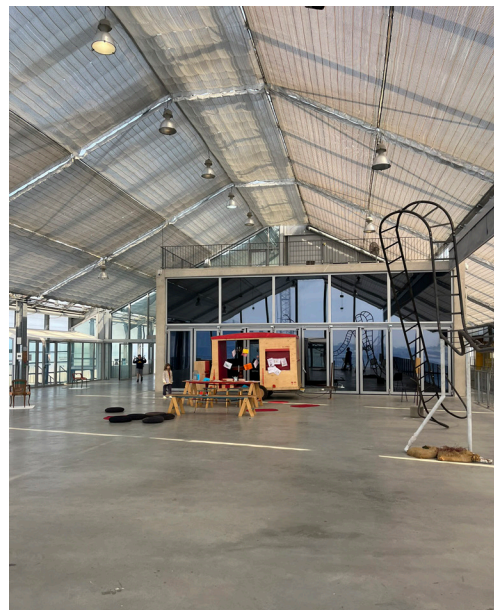


Appendix



Appendix

Field study: FRAC, Lacaton & Vassal

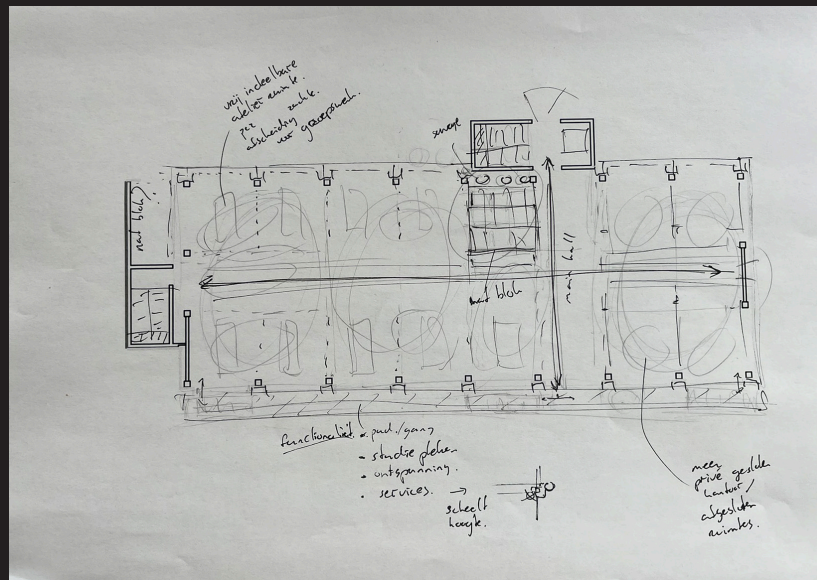
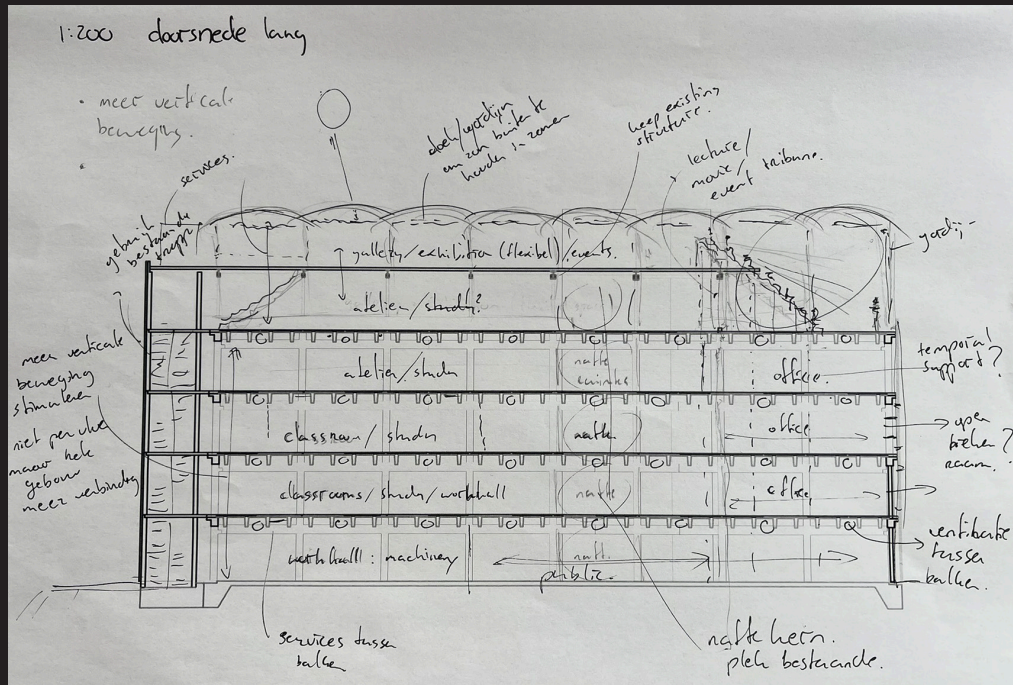


The field study to FRAC focused on understanding the usability and climate of the buffer space on top of the building. The space works like a greenhouse, with a transparent shell, openable roof elements, and shading to reduce overheating. This principle was interesting for the additional roof space in my own project.

However, during the visit, the space turned out to be very hot. Since the main goal for my roof space is protection from wind, rain, and sun, rather than creating a fully enclosed buffer climate, the decision was made to use a lightweight tent structure instead.

Appendix

Sketches



Appendix

Detail Variations

