[ephemeral roots]

07.11.2024
Research Plan
Ayris Findik | 6086292 | AE Graduation Studio 24/25

intro

philosophy & theory

design

thematic research

contents

00 Info 2

01 Keywords 3

02 Introduction and General Problem Statement 4

Research Plan Diagram 5

03 Theoretical Framework 7

04 Overall Design Objective 11

05 Design Question 12

06 Reflection on the Relevance 12

07 Thematic Research Objective 13

08 Thematic Research Question(s) 13

09 Methodology and the Relevance 14

The Permanence Matrix 15

The Case Study Projects 16

10 Outcome 17

Planning Diagram 19

11 Literature References 21

00 info

Personal Information

Name:	Ayris Findik
Student number:	6086292

Studio

Name of studio:	Architectural Engineering Graduation Studio 24/25
Design tutor:	Ir. Thomas Offermans
Research tutor:	Ir. Mo Smit

Argumentations of choice of the studio

The ability to shape my design proposal around a topic of personal interest and create my own assignment was a key reason for choosing the Architectural Engineering studio. I was also particularly drawn to the opportunity to work with timber, a material I am deeply passionate about, while benefiting from the studio's technical expertise in this area. Furthermore, the studio provides the freedom to seamlessly integrate theoretical exploration with practical, technical design, offering a comprehensive and balanced approach to developing my project.

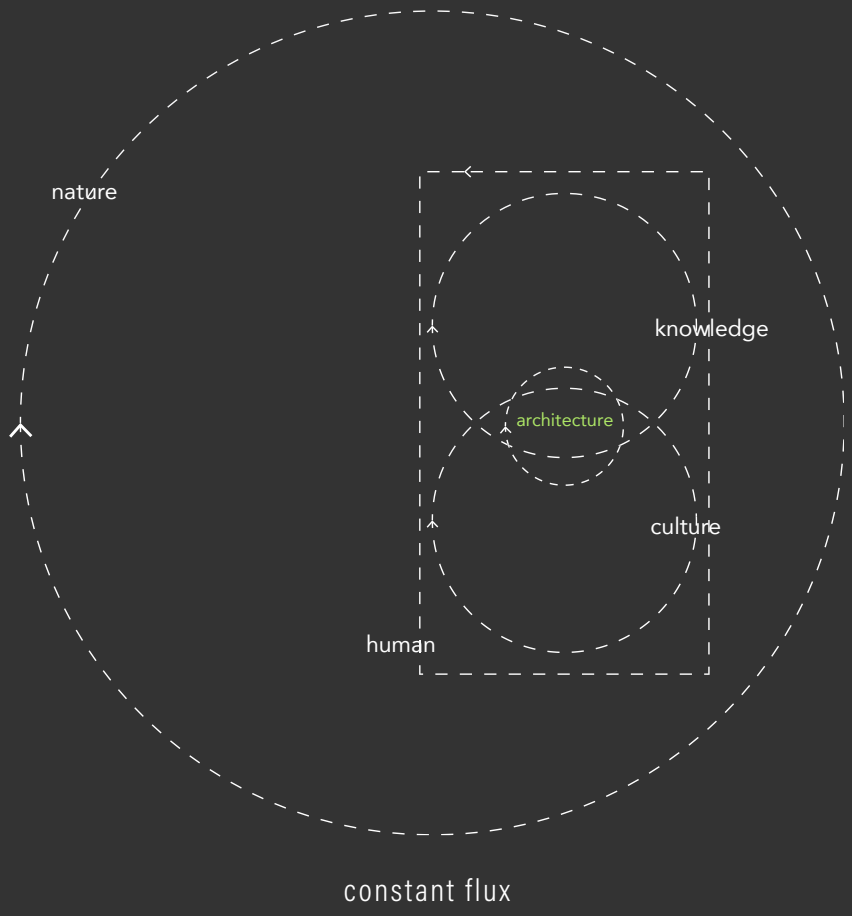


Figure 1 Continuity of Nature
Own drawing.

01 keywords

Redefined (contemporary) Permanence
Continuity
Lifecycle-based Architecture
Timber Architecture
Maintenance
Craftmanship
Knowledge transmission
Wooden joinery techniques

02 introduction & general problem statement

The main characteristics of our nature is constant flux. We continuously produce, construct, destruct, preserve, discover and improve. Cultural values find new shapes at the speed of societal change. In this dynamic world, we are in a constant hustle to adapt ourselves to new realities and seek solutions to the problems we have created.

When discussing the built environment, we are now all aware of the construction industry's negative impact on our world. According to the UN Environment Programme, the buildings sector accounts for "37 per cent of energy and process-related carbon dioxide (CO2) emissions", significantly impacting climate change (United Nations Environment Programme, 2024). In light of this, it is crucial not only to use environmentally responsible materials but also to build cleverly and, ideally, less.

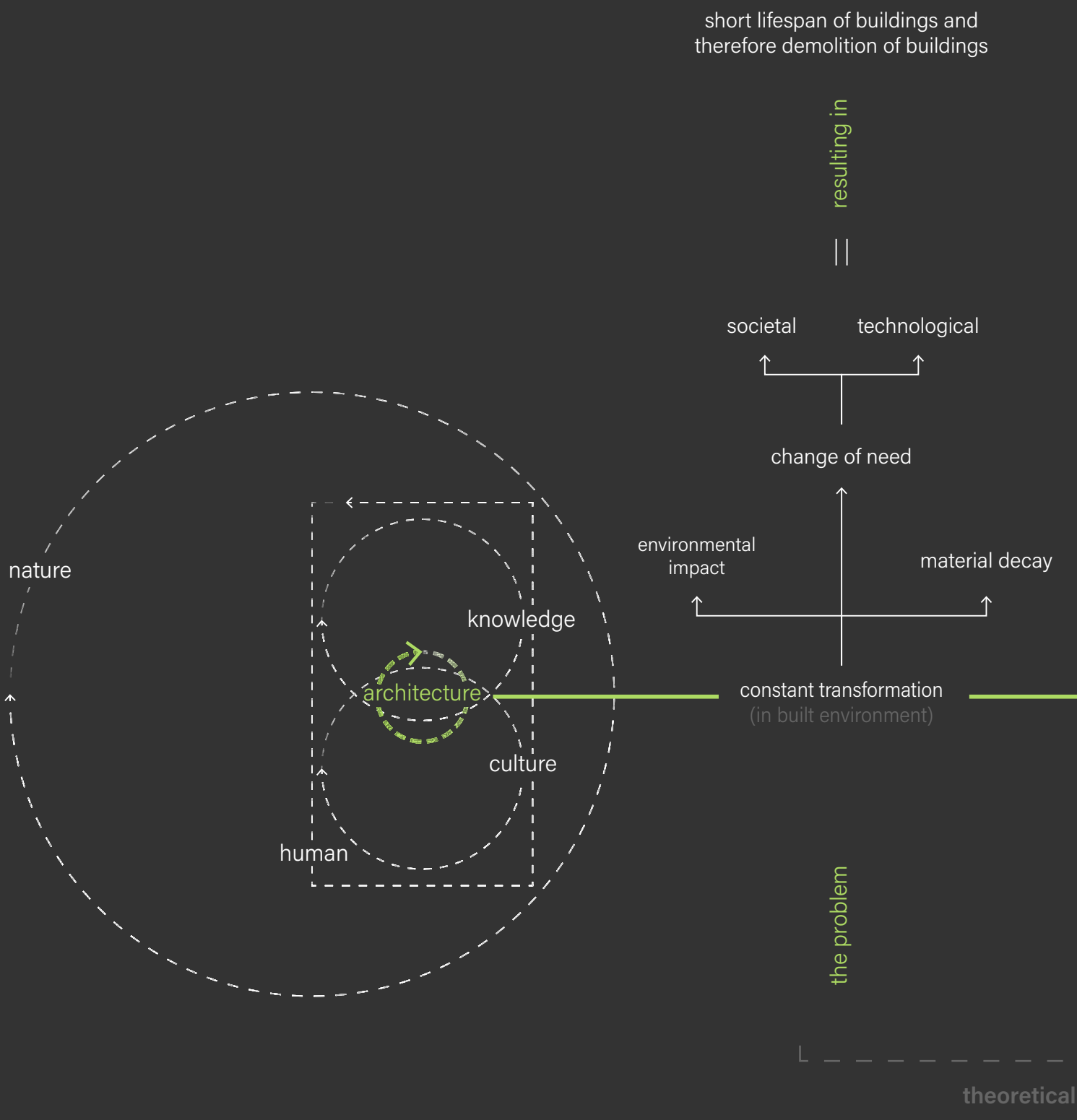
In Western architecture especially, there is growing interest in concepts like material passports and an emphasis on the lifespan of buildings. Building lifespan can be understood through three broad categories: (1) physical lifespan, determined by the technical durability of major building components; (2) social lifespan, influenced by human demand, and legal requirements; and (3) functional lifespan, defined by the period before a building loses its functional value due to changes in societal or lifestyle needs (Ji et al., 2021).

New buildings designed under these principles often serve as material banks, facilitating component reuse and incorporating careful planning for shearing layers—a concept popularized by Stewart Brand (1994). Within this framework, the longest lifespan typically belongs to the structure, which is predicted in Life Cycle Assessment (LCA) and Life Cycle Costing (LCC) studies to last between fifty and one hundred years, depending on the type of structure (Ji et al., 2021). However, studies show a tendency toward declining lifespans, with newer buildings—those constructed within the last thirty years—having significantly shorter lifespans than the average across all construction periods (Andersen & Negendahl, 2022).

These facts raise the question of what will happen to the building once it reaches the end of its predicted lifespan. Given the many unpredictable scenarios for the future, we cannot ignore either the natural deterioration of materials or the possibility of new demands emerging for the building's use. Therefore, it is essential to consider the continuity of the building and its components from the very beginning of the design process.

With this thesis, I aim to redefine our understanding (specifically western understanding) of "permanence" as a solution to the problem of disposability.

research plan diagram



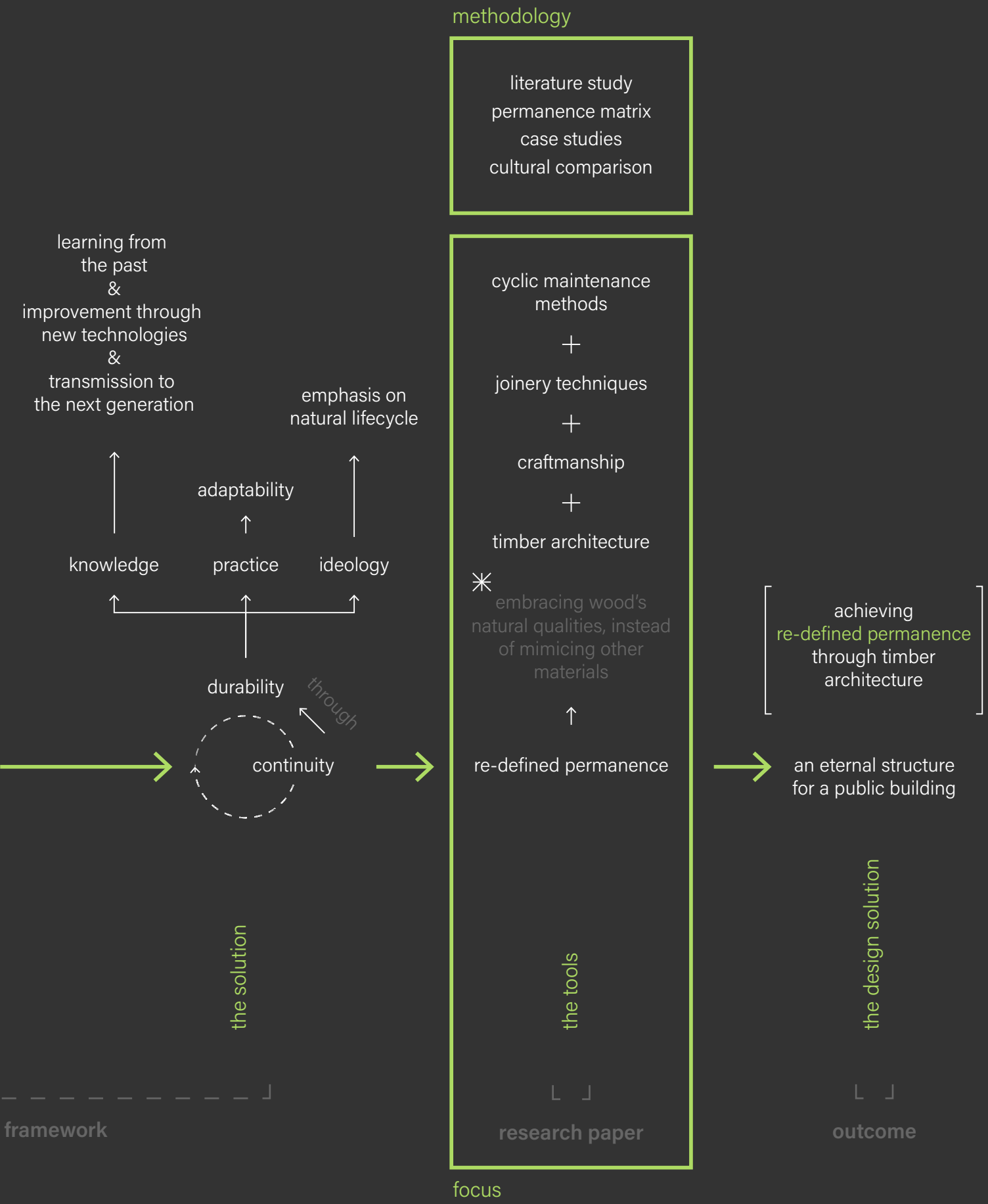


Figure 2 The Research Plan Diagram

Own drawing.

03 theoretical framework

Architecture fundamentally lies in the act of fixing elements in time and space. (Pavlidis, 2018). This act unfolds across different temporalities, which can be categorized into permanence and transience. In Latin, the state of permanence "permanent" finds a translation as permanēns, present participle of permanēre, per- (throughout), + manēre (to remain). It represents what remains through (time).

In contrast to the short and dynamic human life, there has long been a drive to transcend our temporal limitations by creating something that lasts. In the built environment, this understanding of permanence often stays within the boundaries of materiality, which can never be identified as eternal. In the face of material decay, to what extent can we stay connected to the material world? Although it may not immediately evoke associations with permanence, the question of a building becoming obsolete or requiring a change in use is just as significant as material decay when discussing the realm of permanence.

Architecture often has the potential to outlast the human lifespan. However, people tend to consider architecture only within the limitations of their own lifetime, rarely thinking beyond these boundaries. This approach results in buildings closely tied to the immediate needs of their era. As a result, architecture is sometimes designed with limited foresight, lacking consideration for what may come next.

One way architecture begins to transcend these temporal limitations is when it connects to collective memory, as seen in monumental buildings that carry shared history and identity. This connection to memory raises an important question posed by architect Edward Ford (1997): "Is modern architecture less durable than traditional architecture, and if so, is this a result of ideology, practice, or both?" Ford's question triggers a critical inquiry into the values and methods that influence the longevity of architecture today, highlighting how different perspectives and priorities can shape a building's future.

Cultural differences are, of course, unavoidable when defining durability and longevity, as each culture brings its own understanding of permanence, shaped by tradition, environment, and collective memory. For instance, in Western contexts, permanence is often associated with preserving a building's original form as an "eternal image," as exemplified by the Parthenon, even though it has undergone multiple maintenance procedures. In contrast, Japanese culture embraces the ephemeral qualities of materials and values the natural cycle of renewal, as demonstrated by the Ise Shrine, where periodic rebuilding becomes a ritual that grants the structure lasting significance.

Figure 3

Parthenon, Athens, GR

Maintenance work is visible on the back side of the Parthenon. Additionally, many original pieces from the building and its surroundings have been relocated to the nearby Acropolis Museum. Personal photograph, 2024.

Figure 4

Ise-Jingu, Ise, JP

The Ise Shrine in Japan, which has been rebuilt every 20 years for over 1,400 years (Rose, 2019).

Vitruvius' The Ten Books on Architecture is widely recognized as one of the foundational texts shaping Western notions of permanence in architecture. He identifies the essential qualities for lasting architecture through his Vitruvian Triad: firmitas (durability), utilitas (functionality), and venustas (beauty). For Vitruvius, the structural integrity of buildings is embodied in firmitas, linking material durability with a sense of eternity. This perspective on permanence aligns with what Katrina Touw (2006) describes as an "absolute" concept in her thesis. However, in a world where absolutes have been replaced by relativities, the concept of an absolute cannot be fully embraced or discussed without additional layers of interpretation. To address this, Touw unfolds the concept of permanence into different layers through realms and modes, allowing it to resonate within a contemporary context and providing a useful framework for analyzing architecture. She identifies two realms of permanence, "absolute" and "relative," and two modes, "static" and "dynamic."

According to Touw's distinction, the difference between absolute and relative realms lies in their orientation: while memories, images, and timeless ideals fall under absolute permanence, "our connection with natural cycles of life processes" (p. 11) characterizes relative permanence. As Touw notes, "Acknowledging that architecture requires a continuous influx of energy, in the form of maintenance, is critical towards understanding the relative permanence of architecture" (p. 11).

The distinction between static and dynamic permanence lies in their approaches to longevity. Static permanence reflects traditional qualities, such as "continuity, stability, a tangible record of history, and a measurement of time" (p. 13). In contrast, dynamic permanence embraces "flexibility of location" (p. 13), allowing components to endure in new applications and locations. Through this adaptability, parts are integrated into other cycles, extending their relevance beyond their original context.

The different levels of permanence can therefore be redefined by location, function, material and form.

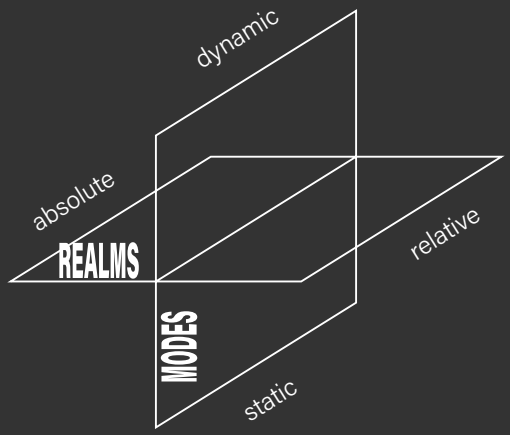


Figure 5 Contemporary concept of permanence
Created following the thoeory of K. Touw (2016).

Etymology

permanence[1]	The fact, condition, or state of being permanent; continued existence or duration; continuance, abiding.
absolute[1]	1. Absolute in quality or degree; perfect. 3. Absolute or detached in position or relation; independent. 4. Free from condition or mental limitation; unconditioned.
relative[1]	2.a. Having a mutual relationship; related to; or connected with, each other. 4.a. Arising from, depending on, or determined by, relation to something else; comparative 4.b Constituted, or existing, only by relation to something else; not absolute or independent.
absolute material permanence[2]	The property of being able to exist for an indefinite duration, independent of entropy; an abstract concept where eventual material deterioration is denied.
relative material permanence[2]	The property of being able to exist for an indefinite duration subject to entropy; eventual material deterioration is accepted.
static permanence[2]	Permanence rooted in a fixed location producing stability and continuity in the built environment.
dynamic permanence[2]	Permanence through a flexibility of location and, potentially, of function; involving all scales from building parts to entire buildings.

1. Simpson, J. A., & Weiner, E. S. C. (Eds.). (1989). The Oxford English Dictionary (2nd ed., Vols. 1–20). Clarendon Press.
2. Touw, K. (2006). Firmitas re-visited: Permanence in Contemporary Architecture. http://etd.uwaterloo.ca/etd/kltouw2006.pdf

04 overall design objective

The objective of this design is to explore how a public building can adapt to a range of potential future scenarios and conditions, using the natural qualities of timber architecture. This particular type of building was chosen due to its increased possibility of requiring changes in response to evolving societal needs.

At the heart of this exploration is the idea of embracing the transient nature of wood and designing for redefined understanding of permanence. The approach focuses on using timber's inherent capacity for continuous cycles of maintenance and renewal, aiming to create structures that endure indefinitely—not by resisting change, but by embracing it through repair, renewal, and adaptation, rather than being discarded or repurposed after a few centuries.

Traditional timber techniques, such as joinery and maintenance cycles, provide a pathway for buildings to evolve over time. This research seeks to push the boundaries of materiality, designing buildings that last not by remaining static, but by continuously adapting to the forces of time. Additionally, by accepting that buildings need to be part of the constant change, this project explores how architecture can remain relevant and functional in evolving contexts—whether driven by environmental, urban, or cultural shifts.

Figure 6

The Hōryū-ji Pagoda, Nara, JP

Personal photograph, 2022.

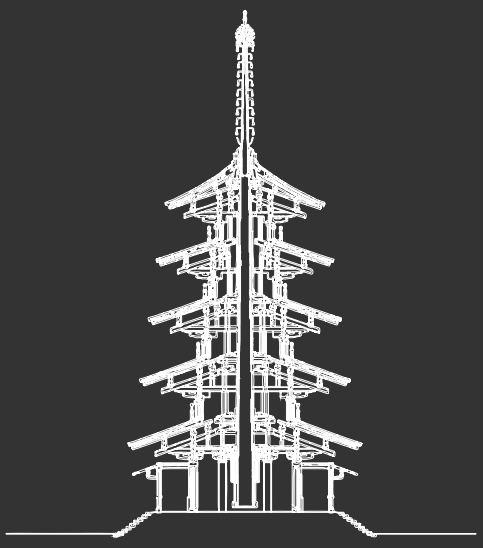


Figure 7

The Section Drawing

The central column is 1430 years old. Recreated section drawing of the pagoda in Horyu-ji (Maddock, R. (2023).

05 design question

The core of the design stems from the question of how to redefine permanence in a public building through the integration of traditional and modern techniques in timber architecture.

06 reflection on the relevance

Given the considerable environmental impact of the construction industry, it is essential to rethink building design with a focus on extending lifespans well beyond what is typical in modern timber construction. This approach aligns with the growing need for sustainable, resilient buildings. While timber is not the only solution to this challenge, it holds great potential to extend the physical, social, and functional lifespans of buildings, serving as a tool to redefine permanence and ensure the continuity of building components.

Why timber?
Compared to other construction materials, sustainably sourced timber offers substantial environmental advantages. Using wood from sustainably managed forests helps reduce greenhouse gas emissions and minimizes lifecycle energy consumption (United Nations Economic Commission for Europe, 2023), making timber a compelling choice for lowering the ecological footprint of construction projects.

Modern timber construction techniques can be seen as a translation of qualities from other materials into timber. For example, cross-laminated timber (CLT) replicates the qualities of concrete, allowing timber to perform similarly to concrete slabs. However, timber's potential extends beyond merely imitating other materials. By emphasizing and enhancing its natural qualities, timber can unlock further possibilities in the construction field, leading to sustainable and innovative design solutions.

07 objective

The aim of the thematic research is to redefine the concept of permanence in a contemporary architectural context, drawing on the realms and modes identified by Katrina Touw (2006) to promote sustainable and considerate design. Central to this redefinition is an emphasis on the natural lifecycle of materials and the acceptance that the only true permanence lies in embracing impermanence itself. This research aims to establish a foundational framework and outline principles that will inform a design solution, integrating sustainability with the evolving needs and contexts of the built environment.

08 research question(s)

How can a redefined understanding of permanence be integrated into contemporary timber architecture to establish the continuity of the building and its components?

Sub: What are the different layers of permanence within this redefined concept, and how can they inform the foundational principles of architectural design?

Sub: How do these layers of permanence interact with sustainable design principles specific to timber architecture?

Sub: In what ways do traditional craftsmanship, joinery techniques, and maintenance practices contribute to the contemporary understanding of permanence and its layered approach?

09 methodology and the relevance

The methodology for this research centers on developing a "Permanence Matrix," drawing from Katrina Touw's concepts of contemporary permanence, to analyze and categorize architectural case studies. This matrix will serve as a foundational tool, enabling the systematic positioning of each case study based on its permanence qualities, particularly within the realm of timber architecture, which aligns with the intended focus of the final design proposal.

The matrix itself is structured along two axes: the x-axis, representing the realms of permanence from absolute to relative, and the y-axis, capturing the modes of permanence from static to dynamic, both as defined by Katrina Touw (2006, p.7). Inspired by a similar framework used by Hanlin Stuer, a former TU Delft student, this matrix allows each architectural case to be situated within these defined parameters. This positioning will highlight each case study's relationship to various layers of permanence and their alignment with circular building strategies (Askar et al., 2021), offering insights into sustainable design practices within timber architecture. In addition to analyzing case studies, a literature review on circular building strategies and both traditional and modern timber construction techniques will also be conducted, along with a cultural comparison to examine how different societies approach permanence in architecture.

The selected case studies will be carefully analyzed to understand their design principles, with particular focus on their lifecycle strategies, adaptability, and maintenance practices. Each building will be examined in terms of its service life in comparison to its anticipated end-of-life scenario, as well as its ability to accommodate changes in location, function, material, and form. The case studies were chosen for their diverse design intentions and strategies, resulting in varied positioning on the matrix. This diversity makes it possible to assess and learn from different perspectives on permanence.

The Tamedia Office is an excellent example of synthesizing traditional Japanese joinery with modern technology. From the same architect, Shigeru Ban, the Nomadic Museum explores permanence differently; it is constructed using standardized shipping containers, allowing it to be relocated to various locations around the world. The Mediateket building represents a knowledge transfer from furniture to building scale, striving for functional longevity through adjustable components. Matrix One, in contrast, serves as a material bank for future use, designed from the outset for easy disassembly and reuse. Finally, the unique case of Ise embodies an ongoing tradition of rituals and cyclic renewals, giving the building a distinct sense of permanent character through continuous renewal.

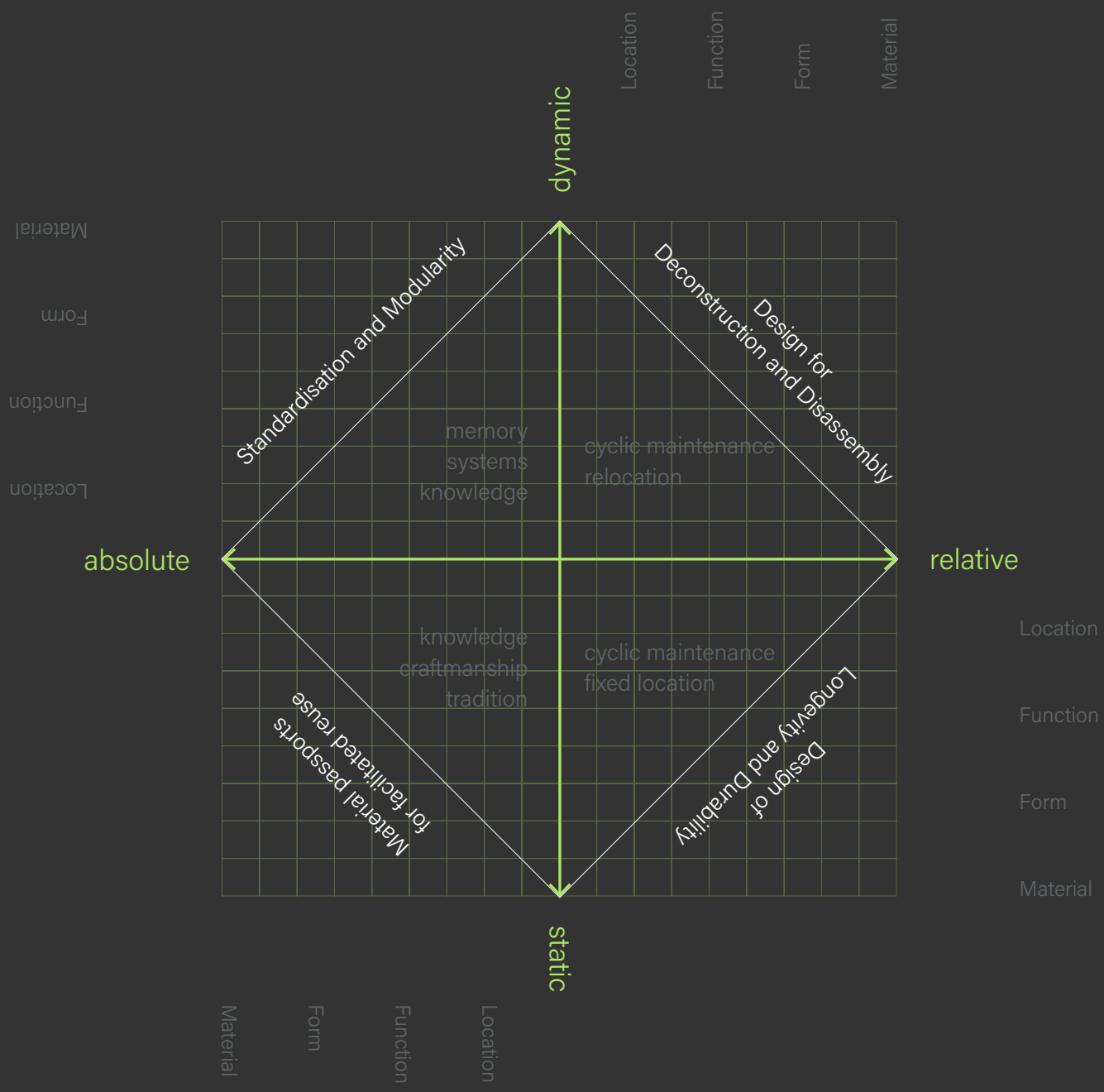


Figure 8 The Permanence Matrix

Own drawing.

Figure 9 The Time Line

Own drawing.

Figure 10

Nomadic Museum, Tokyo, JP

Source: Shigeru Ban Architects, 2007.

Figure 11

Tamedia Office, Zurich, CH

Source: Dezeen, 2023.

Figure 12

Mediateket, Aarhus, DK

Source: Metsä Wood, 2021.

Figure 13

Ise-Jingu, Ise, JP

Source: Rose, 2019.

Figure 14

Matrix One, Amsterdam, NL

Personal photograph, 2024.

?

Figure 15

initial design solution

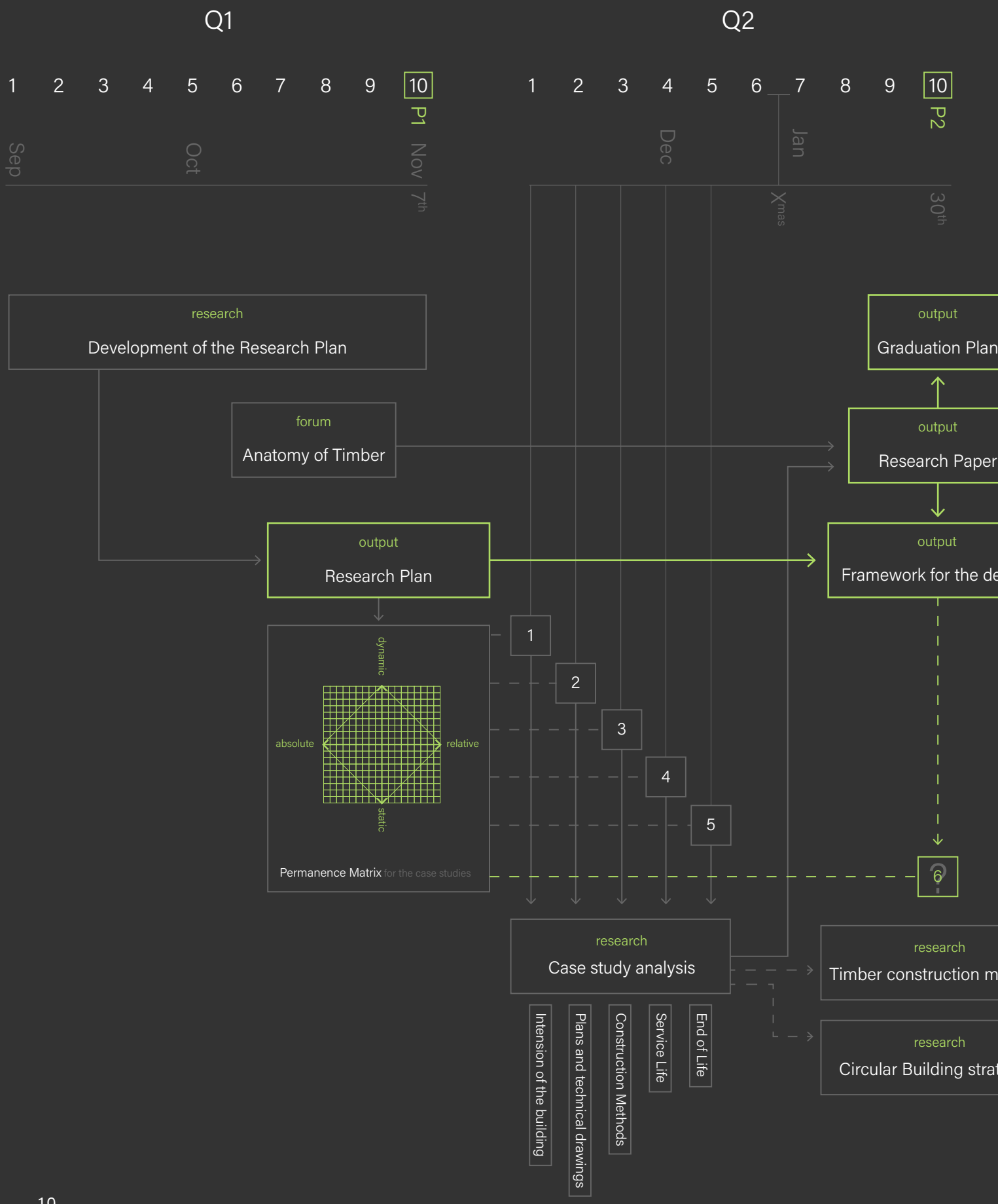
10 Output

Through the permanence matrix, the research will assess the qualities of permanence and continuity in each case study, allowing for a comparative understanding of the principles that support sustainable architectural design. By learning from these case studies, the matrix will provide a set of guiding principles and outline a framework for developing a timber-based design solution that embraces continuity, renewal, and sustainable material cycles.

The literature review, conducted in parallel with the case study analysis, will deepen the understanding of timber, as well as traditional and modern techniques within this field. This dual approach will help build an inventory of timber-based design strategies, forming a foundation for the next, detailed design phase.

Definitions of permanence introduced in the theoretical framework will offer critical context for this analysis. The overarching aim of this methodology is to reimagine permanence in a way that aligns with natural lifecycles and embraces impermanence, creating a model that can be effectively integrated into contemporary architectural design.

planning diagram



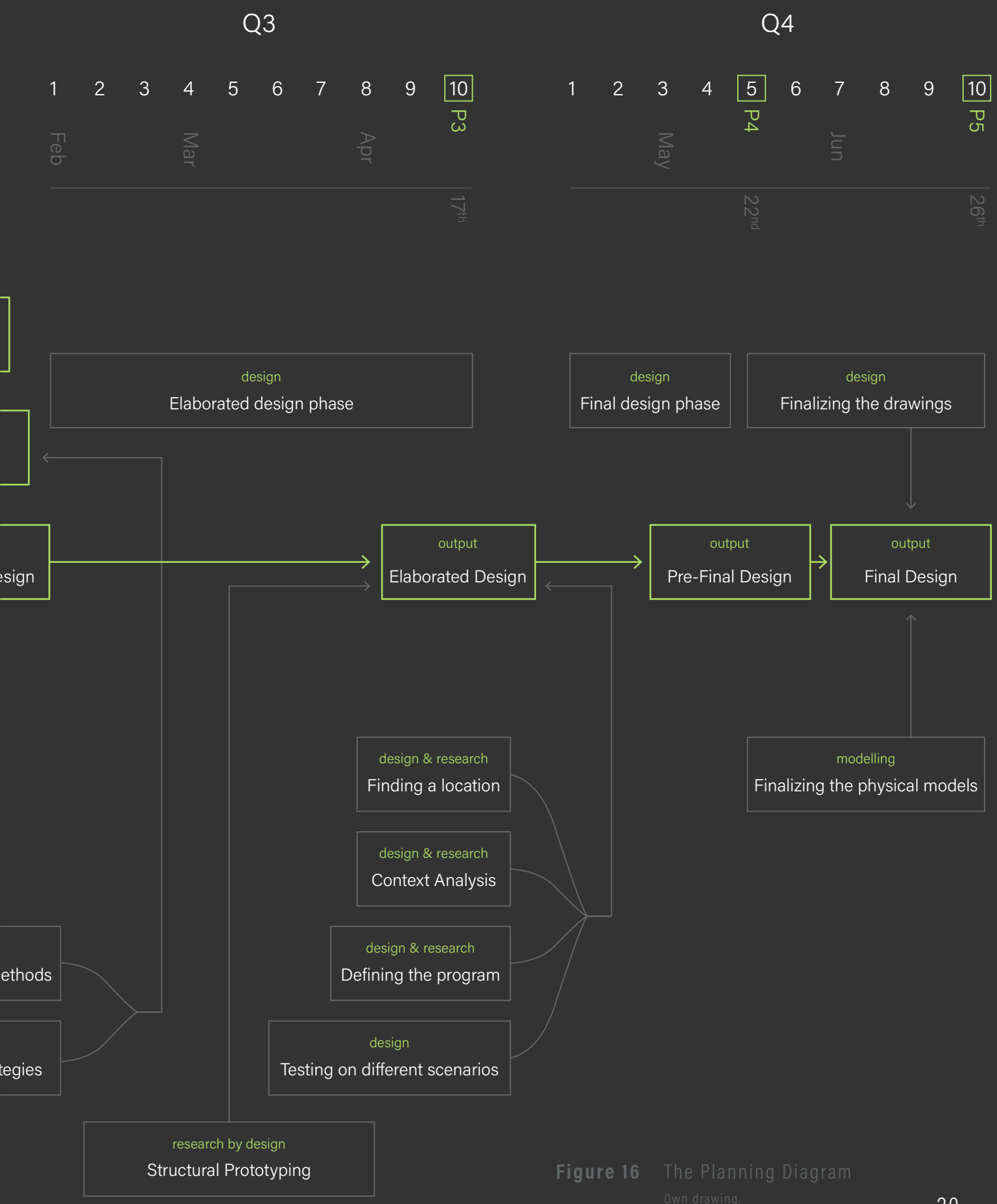


Figure 16 The Planning Diagram

Own drawing.

11 references

Andersen, R., & Negendahl, K. (2022). Lifespan prediction of existing building typologies. *Journal of Building Engineering*, 65, 105696. https://doi.org/10.1016/j.jobe.2022.105696

Askar, R., Bragança, L., & Gervásio, H. (2021). Adaptability of buildings: A critical review on the concept evolution. *Applied Sciences, 11*(10), 4483. https://doi.org/10.3390/app11104483

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

Dezeen. (2023, March 17). Shigeru Ban's timber-skeleton Tamedia building left engineers "incredulous" [Image]. *Dezeen*. https://www.dezeen.com/2023/03/17/tamedia-office-building-shigeru-ban-timber-revolution/

Ford, E. R. (1997). The theory and practice of impermanence: The illusion of durability. *Harvard Design Magazine*, (Autumn). https://www.harvarddesignmagazine.org/articles/the-theory-and-practice-of-impermanence/

Interior view of the Mediateket library at Århus School of Architecture [Image]. (2021, April 12). *Metsä Wood.* https://www.metsagroup.com/metsawood/news-and-publications/references/arhus-school-of-architecture/

Ji, S., Lee, B., & Yi, M. Y. (2021). Building life-span prediction for life cycle assessment and life cycle cost using machine learning: A big data approach. *Building and Environment*, 205, 108267. https://doi.org/10.1016/j.buildenv.2021.108267

Maddock, R. (2023). The AV Jennings Churchill Fellowship, *To explore the use of traditional Japanese wood-only joints in modern robotic building construction* (Report). The Churchill Trust. https://www.churchilltrust.com.au/vic/project/the-av-jennings-churchill-fellowship-to-explore-the-use-of-traditional-japanese-wood-only-joints-in-modern-robotic-building-construction/

Pavlidis, A. (2018). *Architecture: The art of permanence* (Master's thesis). École Polytechnique Fédérale de Lausanne. https://infoscience.epfl.ch/handle/20.500.14299/149211

Rose, A. (2019, September 12). Long-term building in Japan [image]. *The Long Now Foundation*. https://medium.com/the-long-now-foundation/long-term-building-in-japan-796c4f0ad3e7

Shigeru Ban Architects. (2007). *Nomadic Museum – Tokyo* [image]. Shigeru Ban Architects. https://shigerubanarchitects.com/works/cultural/nomadic-museum-tokyo/

Simpson, J. A., & Weiner, E. S. C. (Eds.). (1989). *The Oxford English Dictionary* (2nd ed., Vols. 1–20). Clarendon Press.

Touw, K. (2006). *Firmitas re-visited: Permanence in Contemporary Architecture*. http://etd.uwaterloo.ca/etd/kltouw2006.pdf

United Nations Economic Commission for Europe. (2023). *Circularity concepts in wood construction. Geneva Timber and Forest Study Papers*. https://doi.org/10.18356/9789210024174

United Nations Environment Programme (2024). *Global Status Report for Buildings and Construction: Beyond foundations:Mainstreaming sustainable solutions to cut emissions from the buildings sector.* Nairobi. https://doi.org/10.59117/20.500.11822/45095.