THE CRAIGSLIST CABIN: An Architectural Palimpsest

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UBC SALA Graduate Project
Appendix E

The Craigslist Cabin
An Architectural Palimpsest

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Abstract

During my childhood, my family and I went to neighbourhood houses slated for demolition to salvage hardwood flooring, baseboards, and lumber, and haul them back to our house. Today my parents use Craigslist to acquire their used building materials. Call them hoarders, or call them environmentalists either way, they inspired this project. Over the years our family has collected hundreds of used building materials, diverting them from landfills or incineration. In terms of architectural sustainability, building reuse, material reuse, and waste reduction my belief, which is exhibited in this thesis, is that a building should simply be a temporary resting place for materials, before they move onto their next use.

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Chapter 1: Introduction

"The house that my parents bought when I was 3 years old is almost like a sibling to me. Even though my father works full time as an accountant, every spare hour he has is spent on our house. When we bought it, it was a rundown arts and crafts style house built by the owner's father in 1915. There were broken windows, cat urine stained carpets, and heaps of garbage in the back yard. My siblings and I have participated every step of the way; the process has been long and tedious and is still ongoing. I remember nights when I was 8 years old: my father would scout out heritage homes in our neighborhood which were scheduled for demolition, consult with the owner, and then my family would gut the house of its original hardwood flooring, door jambs, windows, baseboards, moldings, etc… All of these building materials have been reused or repurposed in our home and have been saved from a lifetime of rotting in a landfill. Although my personal manifesto has been inherently passed onto me from my parents, it is something that I cherish and look forward to building towards in the future. I look forward to the construction of my new family cabin, my father and I am working on plans to use every piece of wood from our existing log cabin (built in the 1970's) to construct our new cabin. From the metal sheet roofing, to the windows, we aim to create a beautiful house for our family to share by using everything that already exists on the site, while improving the energy efficiency of the new cabin."

- Erin Saucier (2009)

The above is an excerpt from a piece I wrote in my undergraduate degree in 2009. I've had this dream for a decade now, yet the seed was planted long before that. I've been imagining a construction industry with no demolition waste decaying in landfills and a culture that values the lifetime of a building and its individual components. I've been influenced by the highly personal relationship I have with my family home – a relationship based on connections to individual materials. This thesis explores that dream by drawing a link between three unique components: Material Reuse, Material Based Design, and Log Cabins.

02 Material Reuse - [Field of Inquiry]

Figure 1: Vancouver residential deolition
Sourced from: Vancouver Sun

Chapter 2: Material Reuse - [Field of Inquiry]

2.1. Material Reuse

2.1.1. The Death and Utility of Buildngs

What prompts the end of life of a building? Why are some destroyed, and some treated as artifacts? In Material Architecture, John Fernandez writes that there "is an aspect to historical preservation that speaks to the value of the building, not as functional architecture but as unique historical artifacts with a value that extends well beyond any reasonable use of their spatial volumes or building systems."[1] A study conducted by Daniel Abrahamson concludes the key criteria that determine a building's death are "causes outside of the physical condition of the building itself."[2] Therefore, if constructed values of obsolescence are the greatest influence of the lifetime of a building, can functionality or materiality still play a role in determining a building's end of life? Perhaps this suggests a surface understanding of buildings—their assemblies, structure, and materials—by owners. If consumers do not understand the functional and material driven value of buildings, then do they understand the material consumption required to construct them? Socially driven concepts of obsolescence drive the need for a shift towards redefining a building's utility and worth. Material reuse is at the core of this shift, as it re-examines the value of the individual parts that make up the whole and opens up the discourse of building value and lifetime.

2.1.2. Material Reuse: Definition

Reuse comes in three main forms in the architecture and construction industry: adaptive reuse, building relocation, and material or component reuse. Adaptive reuse is identifying an existing building that either is of heritage value, or its core/shell is of architectural or structural value.[3] This type of reuse extends the life of a particular building, usually by a change of program and a deep retrofit. Building relocation is the movement of most or all of an existing building to a new location.[4] This type of reuse pertains to industrial buildings, warehouses, and temporary buildings. Lastly, and most significant to this project, is material reuse. Structural, non-structural, and decorative elements are extracted from a building in order to preserve historical components for economic savings.[5] Material reuse is receiving increased recognition as it reduces extraction of raw material resources, greenhouse gas emissions, and ultimately, society's impact on the environment.[6] Unfortunately material reuse occurs a small fraction of the time, with demolition being the default procedure for a building's end of life. The main barriers preventing material reuse are unfamiliarly and inertia. A strong commitment from the client, along with material reclamation knowledge and expertise from the design and construction team, is crucial.[7]

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1 Ferdinand, John. Material Architecture. Taylor & Francis Group, Abingdon, 2017.
2 Abramson, D.M. (2005) Discourses of Obsolescence. A talk delivered as part of the seminar: The Culture and Politics of the Built Environment in North America, delivered at the Charles Warren Center for Studies in American History, Harvard University on February 14, 2005 as part of the tenure of Mr. Abramson as a Warren Center Fellow.
3 Gorgolewski, Mark. "Designing with Reused Building Components: Some Challenges."Building Research & Information, vol. 36, no. 2, 2008, pp. 175-188.
4 Gorgolewski, Mark. "Designing with Reused Building Components: Some Challenges."Building Research & Information, vol. 36, no. 2, 2008, pp. 175-188.
5 Gorgolewski, Mark. "Designing with Reused Building Components: Some Challenges."Building Research & Information, vol. 36, no. 2, 2008, pp. 175-188.
6 Addis, William, and Taylor & Francis eBooks A-Z. Building with Reclaimed Components and Materials: A Design Handbook for Reuse and Recycling. Earthscan, London;Sterling, VA;, 2006;2012;.
7 Addis, William, and Taylor & Francis eBooks A-Z. Building with Reclaimed Components and Materials: A Design Handbook for Reuse and Recycling. Earthscan, London;Sterling, VA;, 2006;2012;.

Figure 2: Arch of Constantine

The Arch of Constantine of ancient Rome is full of reused pieces from earlier monuments. The reused decorations include reliefs of Marcus Aureliusbon the attic, reliefs of Trajan in the passageway of the arch, roundels of Hadrian on the face of the arch, and the columns, capitals, and architraves.
Sourced from: Grove Art Online. . Oxford University Press,. Date of access 5 Dec. 2018, http://www.oxfordartonline.com.ezproxy.library.ubc.ca/groveart/view/10.1093/oao/9781884446054.001.001/oao-9781884446054-e-8000015117

An annual average of 900 homes are demolished[8] and 241,000 tonnes of construction waste is generated in the metro Vancouver area alone.[9] It is estimated that construction and demolition waste account for 22% of the global waste stream[10] and the building industry alone accounts for up to 40% of the total energy consumption.[11] These statistics provide evidence for the importance of moving from a demolition based construction industry to a deconstruction based industry.

2.2. Reuse: Past, Present, Future

2.2.1. History of Reuse

Building material reclamation and reuse is not a new concept. Until the 19th century it was practiced throughout the world for economic means. Stone, iron and steel have experienced centuries of reuse. In ancient Egypt, Greece, and Rome, the large well-carved stones were reused from building to building as structures were destroyed by earthquakes or war.[12] Iron was widely used in ancient Rome, yet it is not discoverable in ruins because of its constant reclamation and reuse within the building industry and transition into weapons and other goods.[13] Since the 1900s steel was manufactured using a portion of scrap steel to reduce costs. But consumers did not appreciate this process, and underestimated the quality of steel due to its recycled content. Despite the rich history of material reuse throughout architectural history, we eventually moved away from a tradition of material reuse.[14] The Industrial Revolution provided the ability to mass produce, which was furthered by North America's post-war consumer lifestyle. Material reuse has historically depended on the economy, labour, technology and style. Today material reuse is still heavily practiced in developing countries where economy and resources do not allow for constant novelty.[15]

Current studies are beginning to show the importance of revisiting the process of material reuse. Data has shown that the potential energy saved from reusing materials is about 20-40%.[16] Additionally, case studies have shown that when reused materials are utilized in a single-family building, the embodied energy can decrease by as much as 50%.

2.2.2. The Material Graveyard: Landfills

The final resting place for Metro Vancouver's solid waste is either at the City of Vancouver

8 City of Vancouver, 2018. "Demolition Permit with Recycling Requirements" Retrieved from: https://vancouver.ca/home-property-development/demolition-permit-with-recycling-requirements.aspx
9 Budge, Graeme. 100-Mile Home : Deconstruction and Material Reuse as Source and Sink of Single-Family Home Building Materials. , 2013.
10 Gorgolewski, Mark. "Designing with Reused Building Components: Some Challenges."Building Research & Information, vol. 36, no. 2, 2008, pp. 175-188.
11 Pal, Sudip K., et al. "A Life Cycle Approach to Optimizing Carbon Footprint and Costs of a Residential Building." Building and Environment, vol. 123, 2017, pp. 146-162.
12 Addis, William, and Taylor & Francis eBooks A-Z. Building with Reclaimed Components and Materials: A Design Handbook for Reuse and Recycling. Earthscan, London;Sterling, VA;, 2006;2012;.
13 Addis, William, and Taylor & Francis eBooks A-Z. Building with Reclaimed Components and Materials: A Design Handbook for Reuse and Recycling. Earthscan, London;Sterling, VA;, 2006;2012;.
14 Gorgolewski, Mark. "Designing with Reused Building Components: Some Challenges."Building Research & Information, vol. 36, no. 2, 2008, pp. 175-188.
15 Addis, William, and Taylor & Francis eBooks A-Z. Building with Reclaimed Components and Materials: A Design Handbook for Reuse and Recycling. Earthscan, London;Sterling, VA;, 2006;2012;.
16 Thormark, C. "Conservation of Energy and Natural Resources by Recycling Building Waste."Resources, Conservation & Recycling, vol. 33, no. 2, 2001, pp. 113-130.

Landfill, Cache Creek landfill, a Waste to Energy Facility in South Burnaby, one of Metro Vancouver's six transfer stations, or a privately owned solid waste facility that recycles construction waste.[17] Alternatively, there are also privately owned companies that sell reused or reclaimed construction and demolition waste, and overstock of construction supplies. Both the City of Vancouver Landfill and the Cache Creek Landfill accept residential and commercial waste from the Metro Vancouver Area. The City of Vancouver Landfill accepts demolition and construction waste that is in accordance with Materials Specifications. They also accept and recycle (with specific fines attached to particular materials): "clean wood wastes (includes solid wood, plywood, particle board, and oriented strand board that is unpainted, unstained & untreated- can have nails & metal fasteners attached), mattresses and box springs, as well as gypsum drywall that contains no asbestos, wire, concrete, electrical outlets, or mixed with other garbage".[18]

These antiquated resources do not work to promote a wasteless construction industry, but maintain the status quo by not questioning the future of building materials.

2.2.3. The Present of Reuse - Current Initiatives

We will look at some systems in place in The City of Vancouver, which promotes the reuse of materials. Vancouver has pursued several initiatives to encourage deconstruction and material reuse in order to archive their "2020 Greenest City Action Plan". Vancouver has targeted single family homes as the largest source of wood waste generated, having lower diversion rates than larger commercial and multi-unit residential buildings.[19] One of their initiatives includes the Advanced Deconstruction Permit. The permit is voluntary and requires the homeowner to divert no less than 75% of all building material (excluding hazardous materials) from the landfill. The advanced permit speeds up the permitting process in an attempt to incentivize the process of deconstruction to contractors and homeowners, who normally lean on demolition for its swift pace. Two pilot deconstruction projects undertaken by the city reached 93% diversion rates, proving that this goal is achievable. In the first two years of implementation in 2012 and 2013, the city issued 12 deconstruction permits which reported diversion rates ranging from 86%–91%, with an average of 200 tonnes diverted per house.[20]

Additionally, a new Vancouver company called Unbuilders was started earlier this year. Founded by Adam Corneil and Tony Pantages, their concept is to "replace demotion machines with humans and creates employment for skilled tradespeople who use reverse engineering to unbuild a house".[21] They state that Vancouver discards 22,000 tonnes of wood in its annual demolition waste – a resource they regard as particularly salvageable. Their aim is to deconstruct to allow these used materials to re-enter the supply chain. Since starting their business, Unbuilders has saved over 100,000 board feet of lumber and 250 tonnes of garbage from being thrown in landfills. Once materials are deconstructed and salvaged, there are donated to Re-use charities such as Habitat for Humanity (later explored in this Chapter).[22]

17 City of Vancouver, 2012. "City of Vancouver: Rates and disposal information". Retrieved from http://vancouver.ca/engsvcs/solidwaste/landfill/rates.htm
18 City of Vancouver, 2012. "City of Vancouver: Rates and disposal information". Retrieved from http://vancouver.ca/engsvcs/solidwaste/landfill/rates.htm
19 City of Vancouver, 2012. "City of Vancouver: Rates and disposal information". Retrieved from http://vancouver.ca/engsvcs/solidwaste/landfill/rates.htm
20 City of Vancouver, 2012. "City of Vancouver: Rates and disposal information". Retrieved from http://vancouver.ca/engsvcs/solidwaste/landfill/rates.htm
21 Daily Hive, 2018. "Unbuilders". Retrieved from: http://dailyhive.com/vancouver/vancouver-based-unbuilders-homes-demolished-2018
22 Daily Hive, 2018. "Unbuilders". Retrieved from: http://dailyhive.com/vancouver/vancouver-based-unbuilders-homes-demolished-2018

2.2.4. Current bylaws and fees for Vancouver Landfills

According to the waste management section of The City of Vancouver's 2020 Greenest City Action Plan, 80% of construction waste is to be deferred from the landfill in either a recycling or reuse manner.[23] Additionally, Metro Vancouver has implemented a disposal ban on clean wood waste. The goal of targeting single family homes aligns with the clean wood waste ban, as wood is the dominant building material in single family homes. Wood waste makes up 10% of overall construction and demolition waste generated in Vancouver in 2015 (including commercial and domestic).[24] The disposal ban means that wood is required to be recycled. Otherwise, a 50% surcharge is applied to all loads of regular garbage containing clean wood when the quantity of clean wood exceeds 10% of the garbage load.

The Advanced Deconstruction Permit, Unbuilders, and Landfill fees are small steps in the right direction. Significantly larger steps need to be taken to initiate a cultural shift towards respecting the current material resource that sits dormant in our building stock. The future of our environment demands such a drastic shift.

2.2.5. Future of Reuse - Desirability of Reuse

In 100-Mile Home: Deconstruction and Material Reuse as Source and Sink of Single-Family Home Building Materials, Graeme Budge puts forward three direct actions that must be implemented by municipalities in order to increase material reuse. He suggests: Demonstration, Communication, and Rewarding. Budge describes the process as:
"…civic demonstration of materials reuse in new community and institutional buildings; quantifying and communicating success and engaging this knowledge within the community; offering tax credits to those practicing materials reuse, and implementing extended producer fees on new materials in order to highlight the financial benefit of salvaged materials."[25]

Currently the four material reuse center in Metro Vancouver sell only 3% of the waste generated by residential construction and demolition– showing potential to expand the market of used building materials.[26] If the actions put forward by Budge are implemented, an increase in material reuse would decrease waste and relieve current pressures on landfills. Budge goes on to suggest a deconstruction hub paired with an online materials inventory to accompany the implementation of material reuse system.[27]

In addition to the systems already in place in Metro Vancouver, there are other measures in place to continue to promote and develop deconstruction. Vancouver has highlighted two key strategies to drive material reuse:

1. Training programs to build contractor capacity to provide deconstruction services

23 Budge, Graeme. 100-Mile Home : Deconstruction and Material Reuse as Source and Sink of Single-Family Home Building Materials. , 2013.
24 City of Vancouver, 2018. "Demolition Permit with Recycling Requirements" Retrieved from: https://vancouver.ca/home-property-development/demolition-permit-with-recycling-requirements.aspx
25 Budge, Graeme. 100-Mile Home: Deconstruction and Material Reuse as Source and Sink of Single-Family Home Building Materials. , 2013.
26 Budge, Graeme. 100-Mile Home: Deconstruction and Material Reuse as Source and Sink of Single-Family Home Building Materials. , 2013.
27 Budge, Graeme. 100-Mile Home: Deconstruction and Material Reuse as Source and Sink of Single-Family Home Building Materials. , 2013.

2. Market development for used materials

The City of Vancouver website states that:
"Deconstruction is an emerging area where more capacity needs to be built within the ranks of demolition contractors. Training workers in specific deconstruction techniques is available in the Cascadia region (BC, Washington, Oregon). More work in this area is required in order to realize the potential waste reduction opportunity. Also, further refinement of specific deconstruction techniques is warranted to confirm whether a hybrid deconstruction approach makes the most economic sense, where a building is partially deconstructed manually, and partially by machine."[28]

As deconstruction becomes more prevalent in the building industry, we will learn from the process of deconstruction and this will further inform the notion of design for deconstruction (DfD). Building materials come in standard sizes, and perhaps these sizes will be reconsidered in terms of re-usability. The concept of material reuse and DfD would bring into question the "optimum size" of modules and materials used in the construction industry.[29]

Lastly, the way of looking at waste needs a new lens. An early mentality regarding the waste problem was to find new uses for waste or treat waste as the ever-mounting enemy. A different way of approaching waste is to understand its lifecycle and question the need to produce it in the first place.[30] If reducing is not an option, a closed loop reuse system is the next alternative; a cyclical flow of materials that sequences through uses in different buildings.[31]

2.3. Reduce/ Reuse/ Recycle: A Hierarchy

"The greenest building is the one that is already built."

Carl Elefante

The Reduce, Reuse, Recycle slogan organizes its calls to action in order of environmental impact. Cities such as Vancouver boast about their amount of recycling, when recycling should be a last resort, right before the landfill. According to the Reduce, Reuse, Recycle motto we should first attempt to reduce our consumption. If reducing is not possible, we should look to reuse products, and lastly resort to recycling products when they come to the end of their life. The core of architecture is one of making, and therefore contends with the base of the pyramid: Reduce. As Carl Elefante puts it, the existing building stock can and should be reused.

Recycling can be split into three different categories: Secondary waste, Post industrial waste, and Post-consumer waste. Secondary waste are the waste products from the source of extraction of a material, like the small branches of trees left over during logging.[32] Post-industrial waste is leftover from manufacturing procedures, for example sawdust.[33] Post consumer waste

28 City of Vancouver, 2018. "Demolition Permit with Recycling Requirements" Retrieved from: https://vancouver.ca/home-property-development/demolition-permit-with-recycling-requirements.aspx
29 Thormark, C. "Conservation of Energy and Natural Resources by Recycling Building Waste."Resources, Conservation & Recycling, vol. 33, no. 2, 2001, pp. 113-130.
30 Addis, William, and Taylor & Francis eBooks A-Z. Building with Reclaimed Components and Materials: A Design Handbook for Reuse and Recycling. Earthscan, London;Sterling, VA;, 2006;2012;.
31 Addis, William, and Taylor & Francis eBooks A-Z. Building with Reclaimed Components and Materials: A Design Handbook for Reuse and Recycling. Earthscan, London;Sterling, VA;, 2006;2012;.
32 Thormark, C. "Conservation of Energy and Natural Resources by Recycling Building Waste."Resources, Conservation & Recycling, vol. 33, no. 2, 2001, pp. 113-130.
33 Thormark, C. "Conservation of Energy and Natural Resources by Recycling Building Waste."Resources, Conservation & Recycling, vol. 33, no. 2, 2001, pp. 113-130.

"The greenest building is the one that is already built."

– Carl Elefante

is what is recycled after consumers no longer need a product, such as incinerating wood waste for energy.[34] Out of the three, William Addis concludes in Building with Reclaimed Components and Materials: A Design Handbook for Reuse and Recycling that:

"it is more environmentally beneficial to use post-industrial waste as the material has not progressed as far along the cradle-to-grave life cycle as post-consumer waste. Similarly, it is better from an environmental point of view to reuse components or equipment rather than to use recycled materials that have already progressed further along the material life cycle."[35]

Implementing material reuse over material recycling has greater positive impacts for the environment, yet can provide challenges for the design process. Recycling used materials allows the material to be fed back into the manufacturing process either as the same material or a different material.[36] Either way, they are produced as new consumer goods. New materials with recycled content still have a nominal dimension and meet manufacturing standards, while used materials might have impurities and imperfections.

2.4. Construction Industry

The construction industry in North America today is geared towards the practice of demolition. The fast paced, budget-oriented nature of the construction industry, especially in single family homes, has cemented demolition as a favourable option. Deconstruction and DfD can be misunderstood as costlier upfront, yet cost savings from reuse and environmental impact can outweigh the initial savings from demolition.[37] If deconstruction is adopted on a large scale, the standardization and development of infrastructure would enable a larger cost savings for homeowners and contractors. The processing costs of preparing used building materials for resale could be expedited with training and knowledge. Also, the implementation of deconstruction hubs would provide the infrastructure to compete with the convenience of the landfill.

34 Thormark, C. "Conservation of Energy and Natural Resources by Recycling Building Waste."Resources, Conservation & Recycling, vol. 33, no. 2, 2001, pp. 113-130.
35 Addis, William, and Taylor & Francis eBooks A-Z. Building with Reclaimed Components and Materials: A Design Handbook for Reuse and Recycling. Earthscan, London;Sterling, VA;, 2006;2012;.
36 Gorgolewski, Mark. "Designing with Reused Building Components: Some Challenges."Building Research & Information, vol. 36, no. 2, 2008, pp. 175-188.
37 Gorgolewski, Mark. "Designing with Reused Building Components: Some Challenges."Building Research & Information, vol. 36, no. 2, 2008, pp. 175-188.

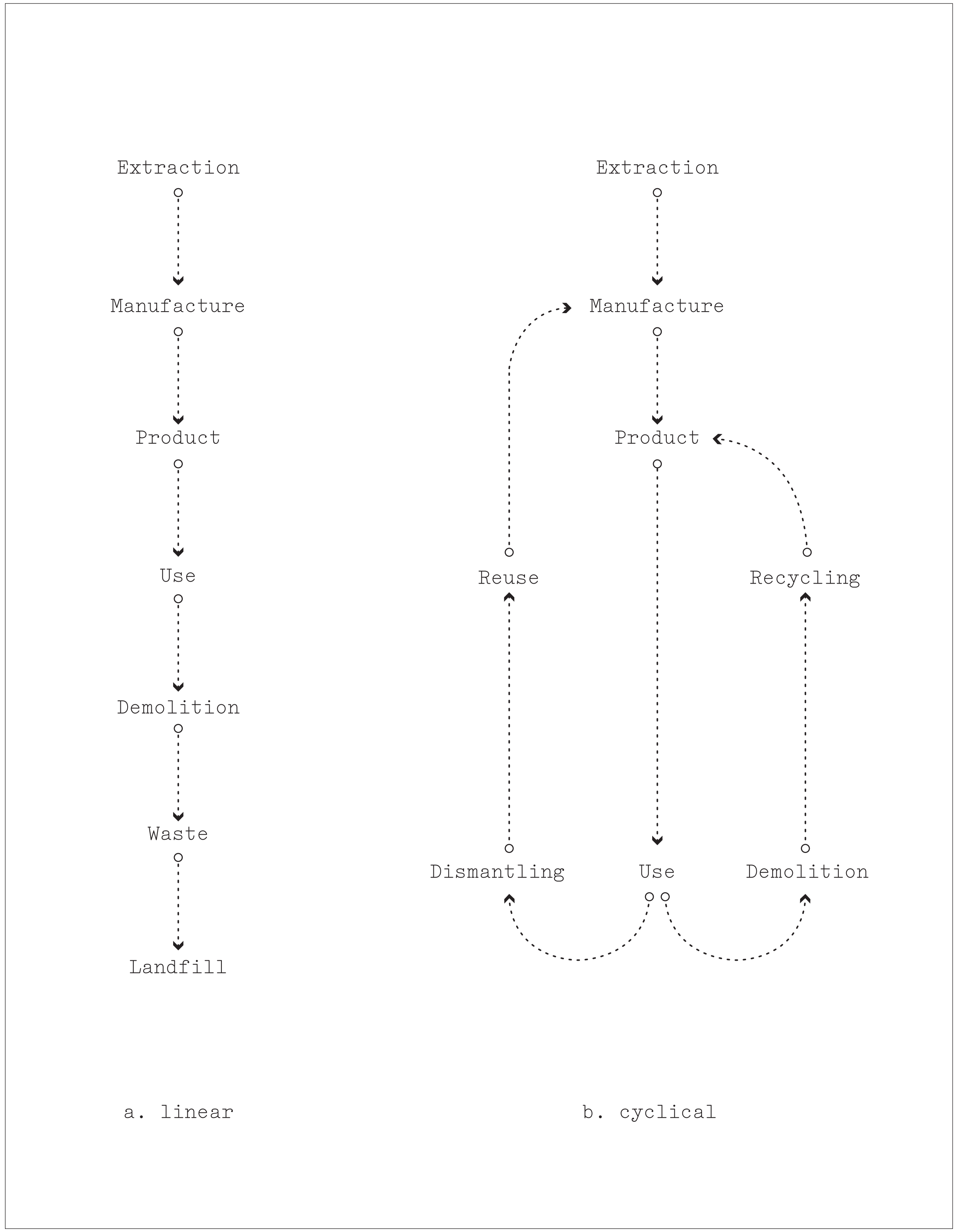

Figure 3: Linear vs. cyclical design approach
Graphic inspired from "Building with Reclaimed Components and Materials"
Addis, William, and Taylor & Francis eBooks A-Z. Building with Reclaimed Components and Materials: A Design Handbook for Reuse and Recycling. Earthscan, London;Sterling, VA;, 2006;2012;.

2.4.1. Design and Construction Process

The current building timeline is linear. The process includes: design, construction, use, demolition.[38] The linear nature of the process is economical and efficient, not environmental. Approaching design with the intent of material reuse is represented as a more cyclical process. The cyclical nature hinges on the reuse step, the process includes: design (or DfD), construction, use, deconstruction/dismantling, component reuse and material recycling – cycling back to design.[39] When approaching design with the intent to reuse materials, the design process is no longer standard or conventional. The typical design process changes to one that is much more material driven. According to Addis in Building with Reclaimed Components and Materials: A Design Handbook for Reuse and Recycling, the design process when using reused materials is as follows: outline design, identify potential material needs, identify likely sources, revise design, purchase or secure materials (optional: find alternatives, refurbish materials, and store materials), detail design, then finally construction.[40] In addition to shifts in the design and construction processes, Addis recommends a strong commitment and understanding from the client and entire project team as to what the cost and time investment will be.

2.4.2. Wood Frame Construction

Wood frame construction is prevalent in North America, and specifically British Columbia, Canada, as lumber is a plentiful local resource. Cities such as Vancouver grew as logging towns, exporting BC's timber globally. The unique history of lumber in BC combined with the intrinsic qualities of wood that allows for reuse and positions it well as our main material for this thesis (Further information on history of wood construction in Chapter 5: Log Cabin). Of the 241,000 tonnes of construction waste generated in Metro Vancouver, a large percentage is wood waste: "The three major components of this are wood waste (50%), mineral aggregates (concrete; 30%), and metals (5%)."[41] Wood is a natural material which requires simple processing and minimal energy inputs to convert it from a raw material to a building product. Other than some impregnated solutions invented to prevent rot or fasteners secured into lumber, after wood's useful life in a building it can deteriorate and simply return to the natural environment.[42] Because wood is a plant-based material it stores carbon until it rots or is burned. In the Ecology of Building Materials, Berge explains that:

"One kilogram of dry timber contains about 50 per cent carbon, which in turn binds 1.8 kg of carbon dioxide). In an average-sized timber dwelling, which contains about 20 tons of timber, there are 36 tons of carbon dioxide effectively bound in. The products must be durable and preferably recyclable."

Wood: Potential for Reuse

In British Columbia spruce, pine, or fir is commonly used for dimensional lumber for residential framing. The inherent qualities of these species allow them to be reused over several genera-

38 Addis, William, and Taylor & Francis eBooks A-Z. Building with Reclaimed Components and Materials: A Design Handbook for Reuse and Recycling. Earthscan, London;Sterling, VA;, 2006;2012;.
39 Addis, William, and Taylor & Francis eBooks A-Z. Building with Reclaimed Components and Materials: A Design Handbook for Reuse and Recycling. Earthscan, London;Sterling, VA;, 2006;2012;.
40 Addis, William, and Taylor & Francis eBooks A-Z. Building with Reclaimed Components and Materials: A Design Handbook for Reuse and Recycling. Earthscan, London;Sterling, VA;, 2006;2012;.
41 https://vancouver.ca/home-property-development/demolition-permit-with-recycling-requirements.aspx
42 Berge, Bjø, Filip Henley, and Taylor & Francis eBooks A-Z. The Ecology of Building Materials. Routledge, New York;Florence;, 2001;2007;, doi:10.4324/9780080504988.

Figure 4: Traditional Japanese wood joint.
Photo by Blaine Brownell sourced from: https://www.architectmagazine.com/technology/the-history-of-wood-and-craft-in-japanese-design_o

tions; used in a sheltered application outside. Spruce can last up to 120 years, pine 75 years and fir 50 years.[43] The natural qualities of wood make it easily recyclable or reusable. The reuse of wooden log structures is ever-present in Scandinavian design. In addition, traditional Japanese construction employed techniques of wood construction that could be easily assembled and dismantled without any waste.[44] Wooden construction in North America today is reliant on nails and screws, which can be removed with trained labourers, yet the recent addition glue and surface treatments added to timber has diminished its reusability.[45]

Infrastructure to Promote Reuse

In Metro Vancouver, Habitat for Humanity's ReStore is the leading retailer for salvaged materials. ReStores are building supply stores run by Habitat for Humanity that accept and resell quality new and used building materials. ReStore intercepts building materials that were landfill bound and sells them to generate revenue to support Habitat for Humanity homebuilding projects. Common items that are gathered and sold by ReStore are: lumber, drywall, windows, doors, trim, siding, flooring, plumbing and electrical fixtures, cabinets and furniture, and other items including simple objects such as nails and screws. Retailers are encouraged to donate returned products, or discontinued samples that would have ended up in a landfill. "In 2010, ReStores across Canada diverted 20,000 tonnes of material from landfills".[46]

2.5. Building + Material Lifecycle

"When one considers the compounding effects of the long life of buildings (and infrastructure) and their large and material intensive bulk, it is not surprising that construction has resulted in sprawling landscapes of assembled mineral resources. The extraordinary efforts of previous societies to mine and process the mineral wealth of the world have left us with a huge bounty of material embodied within the structure, skin and internals of our buildings."[47]

- John Ferdinand in Material Architecture

2.5.1. Life Cycle Assesment

In the past few years, the sustainability conversation has come to include the energy use and life cycle of buildings. Energy use is prioritised by certification systems such as LEED and Passive House, creating buildings that demand less from conventionally supplied energy. Some certification systems such as LEED and Cradle-to-Cradle also introduce the notion of the lifecycle of a building. The lifetime of a building isn't simply the time that humans occupy it, it also includes the extraction of raw materials, their processing, transportation, the erection of the building, its operation and maintenance, and finally its demolition (or deconstruction).[48] Unfortunately it is seldom that a single owner sees a building from construction to demolition,

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43 Berge, Bjø, Filip Henley, and Taylor & Francis eBooks A-Z. The Ecology of Building Materials. Routledge, New York;Florence;, 2001;2007;, doi:10.4324/9780080504988.
44 Berge, Bjø, Filip Henley, and Taylor & Francis eBooks A-Z. The Ecology of Building Materials. Routledge, New York;Florence;, 2001;2007;, doi:10.4324/9780080504988.
45 Berge, Bjø, Filip Henley, and Taylor & Francis eBooks A-Z. The Ecology of Building Materials. Routledge, New York;Florence;, 2001;2007;, doi:10.4324/9780080504988.
46 Habitat For humanity, 2011. "About ReStore". Retrieved from http://www.habitat.ca/en/community/restores
47 Ferdinand, John. Material Architecture. Taylor & Francis Group, Abingdon, 2017.
48 Thormark, Catarina, et al. "A Low Energy Building in a Life cycle—its Embodied Energy, Energy Need for Operation and Recycling Potential." Building and Environment, vol. 37, no. 4, 2002, pp. 429-435.

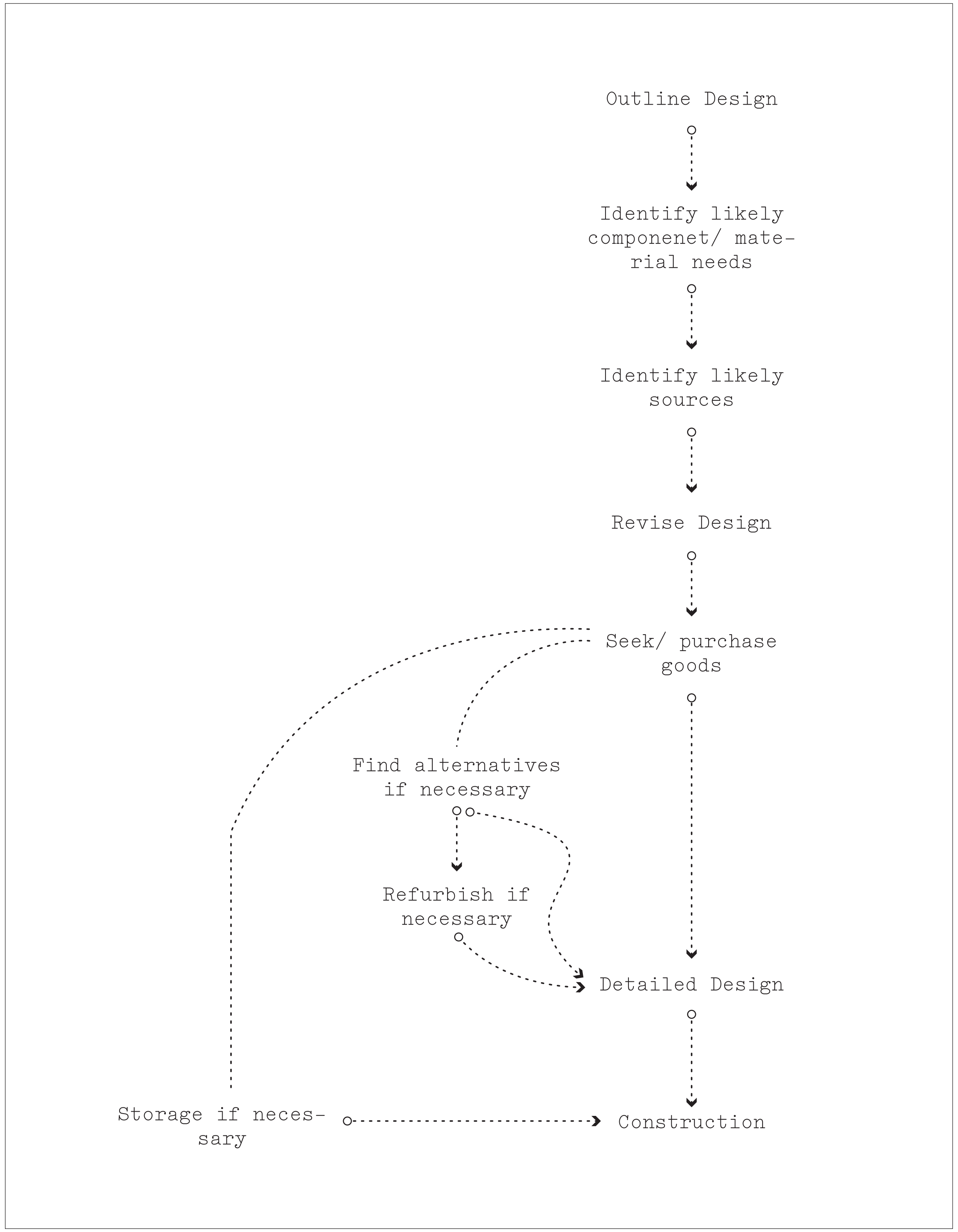

Figure 5: Reused Material - design process
Graphic inspired from "Building with Reclaimed Components and Materials"
Addis, William, and Taylor & Francis eBooks A-Z. Building with Reclaimed Components and Materials: A Design Handbook for Reuse and Recycling. Earthscan, London;Sterling, VA;, 2006;2012;.

therefore their interest in the building lifecycle dwindles as profit proves to have greater weight. This can deter closed-loop thinking about building design and operation.[49]

2.5.2. Deconstruction

Deconstruction is defined by Greer in Building the Deconstruction Industry as the "reverse construction of a building - an environmentally and economically conscious alternative to demolition".[50] Deconstruction is the means to realizing material reuse. According to Ferdinand in Material Architecture, Deconstruction is "a broad effort to bring into being a culture and industry of reclamation of the valuable materials and components that reside in the existing building stock."[51] Therefore, the practice of deconstruction and the value and use of reused materials are inherently linked. Deconstruction doesn't have limitations in terms of scale; it can be applied to a small hut or civil infrastructure. Significant benefits of deconstruction are energy savings and landfill diversion.[52] Hudge argues in 100-Mile Home : Deconstruction and Material Reuse as Source and Sink of Single-Family Home Building Materials, that these benefits can come at an economically viable price when all aspects of the equation are considered. He writes that:

"…the net cost of deconstruction [can be expressed] in an easily understood equation: (Deconstruction + Disposal + Processing) – (Contract Price + Salvage Value) = Net Deconstruction Costs. On a basic level, this equation demonstrates that decreased spending on disposal and the revenue from salvaged materials has the potential to make a deconstruction project more cost-effective than demolition."[53]

The net cost of deconstruction has been found to be from 10% to 50% less than demolition, based on the revenue of salvaged materials.[54] Additionally, the process of deconstruction can create a job market for skilled labourers and specialized training and education.[55]

2.6. Material Reuse – The Project

The following figures are an except from the catalogue of used building materials that my parents have collected over the years. These used materials are quantified and modeled, prepared for their next life in this project.

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49 Addis, William, and Taylor & Francis eBooks A-Z. Building with Reclaimed Components and Materials: A Design Handbook for Reuse and Recycling. Earthscan, London;Sterling, VA;, 2006;2012;.
50 Greer, Diane. (2004). Building the Deconstruction Industry. BioCycle, 45(11), 36-42.
51 Ferdinand, John. Material Architecture. Taylor & Francis Group, Abingdon, 2017.
52 Budge, Graeme. 100-Mile Home : Deconstruction and Material Reuse as Source and Sink of Single-Family Home Building Materials. , 2013.
53 Budge, Graeme. 100-Mile Home : Deconstruction and Material Reuse as Source and Sink of Single-Family Home Building Materials. , 2013.
54 Guy, B., & McLendon, S. (2003). Building Deconstruction: Reuse and Recycling of Building Materials. Center for Construction and Environment at the University of Florida. Gainesville, FL.
55 Budge, Graeme. 100-Mile Home : Deconstruction and Material Reuse as Source and Sink of Single-Family Home Building Materials. , 2013.

Figure 6: Storage of used materials at White Lake
Own Graphic

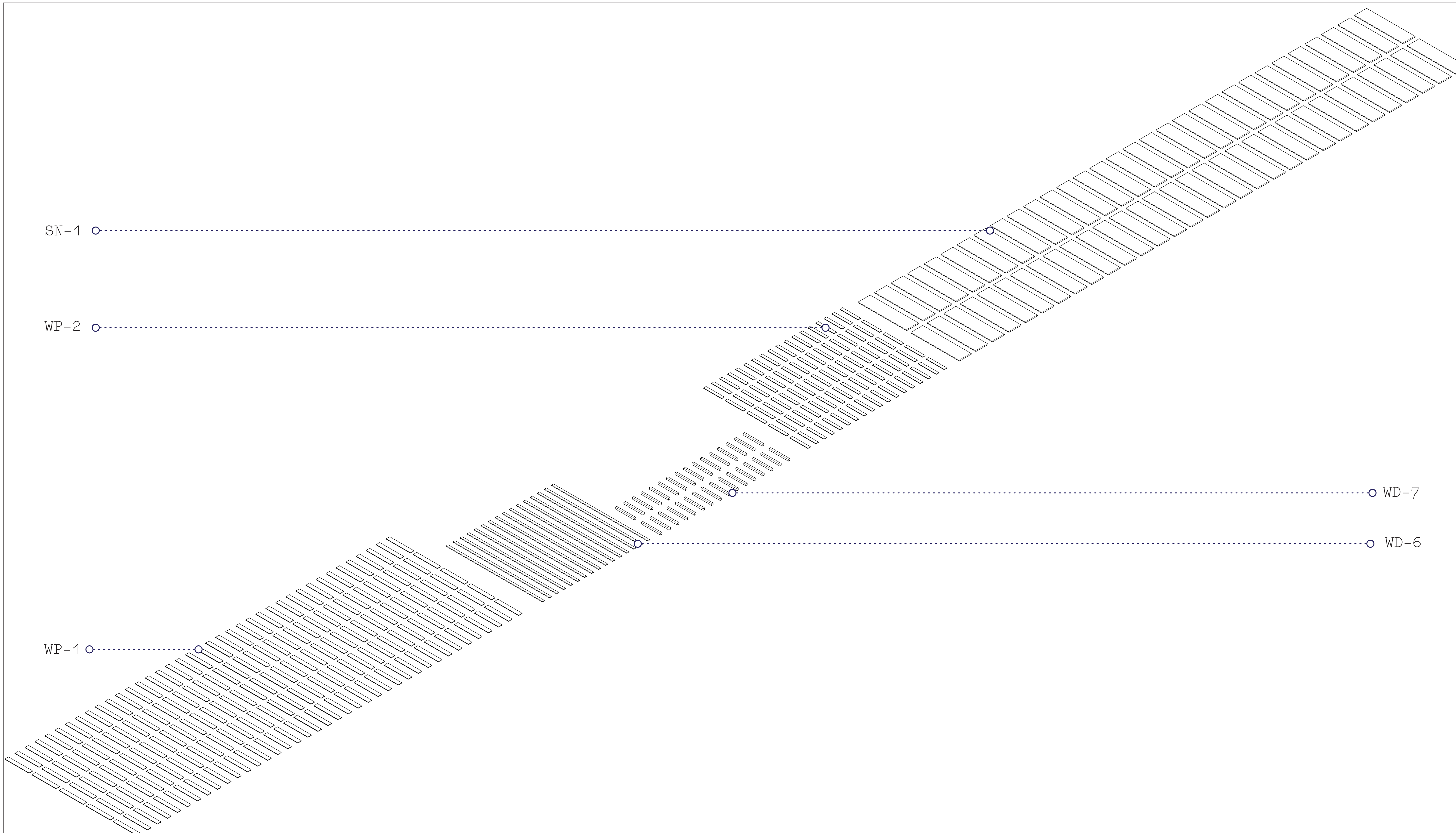


Figure 7: Catalogue of used materials at White Lake
Own Graphic

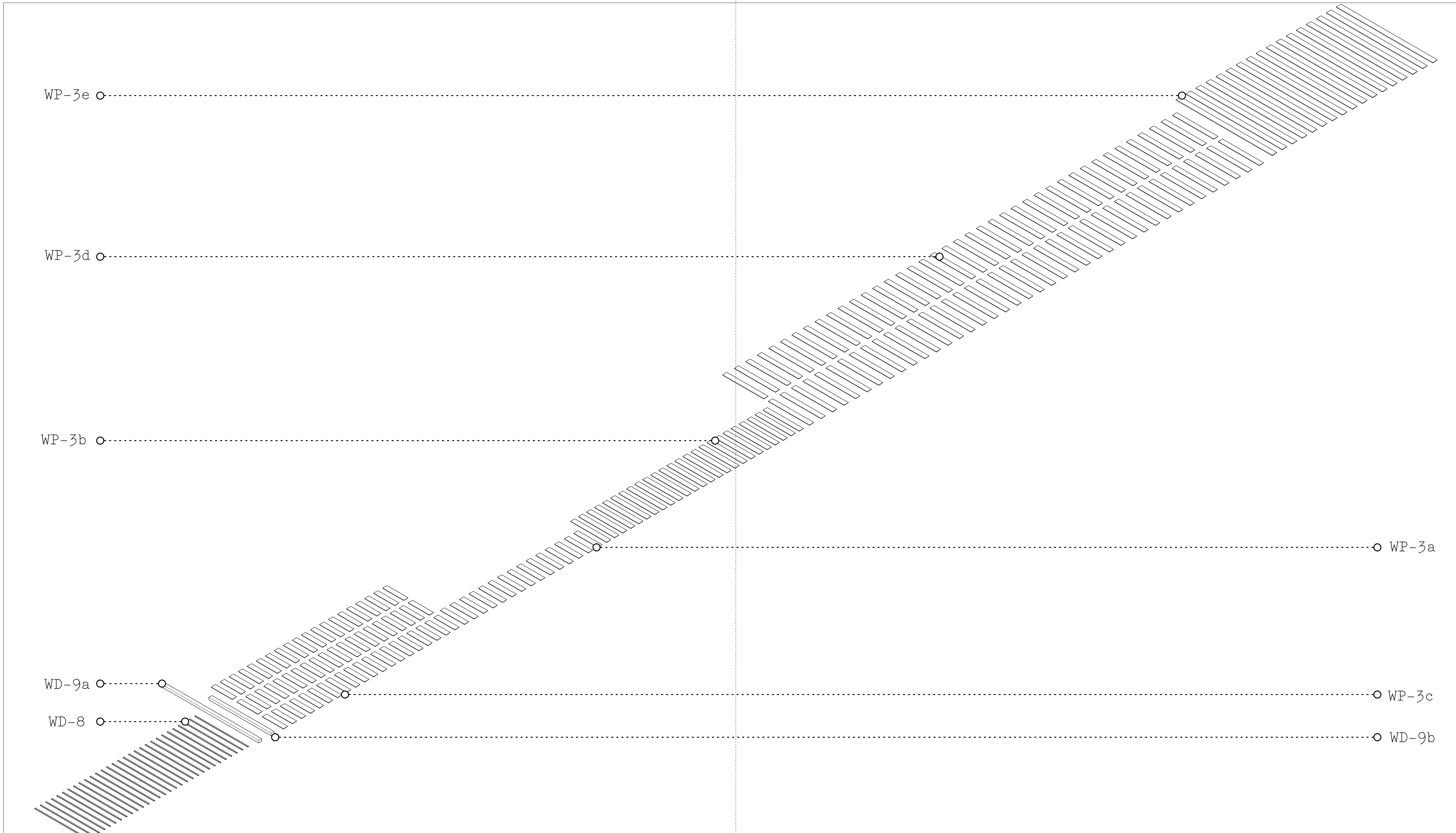


Figure 8: Catalogue of used materials at White Lake
Own Graphic

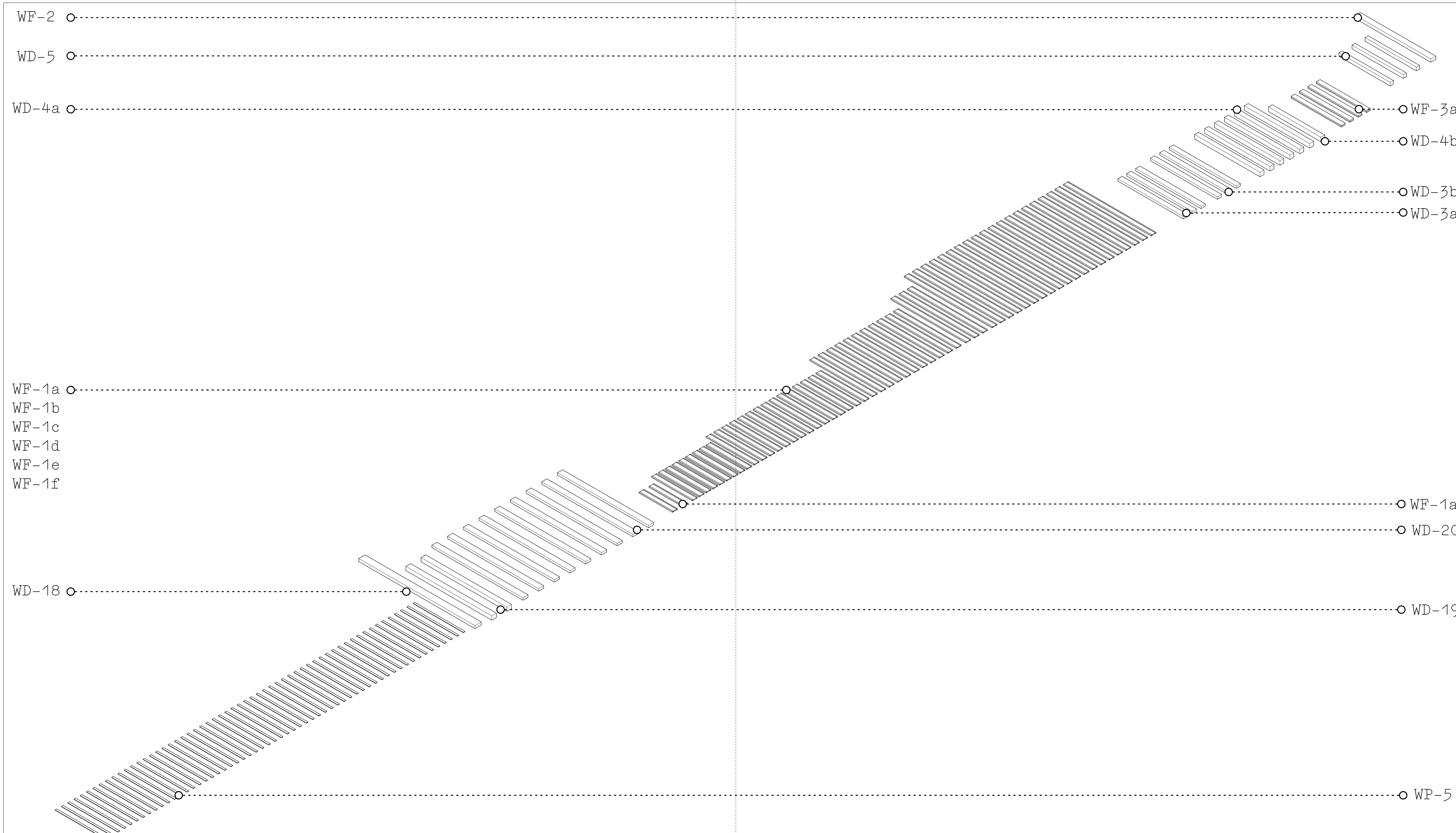


Figure 9: Catalogue of used materials at White Lake
Own Graphic

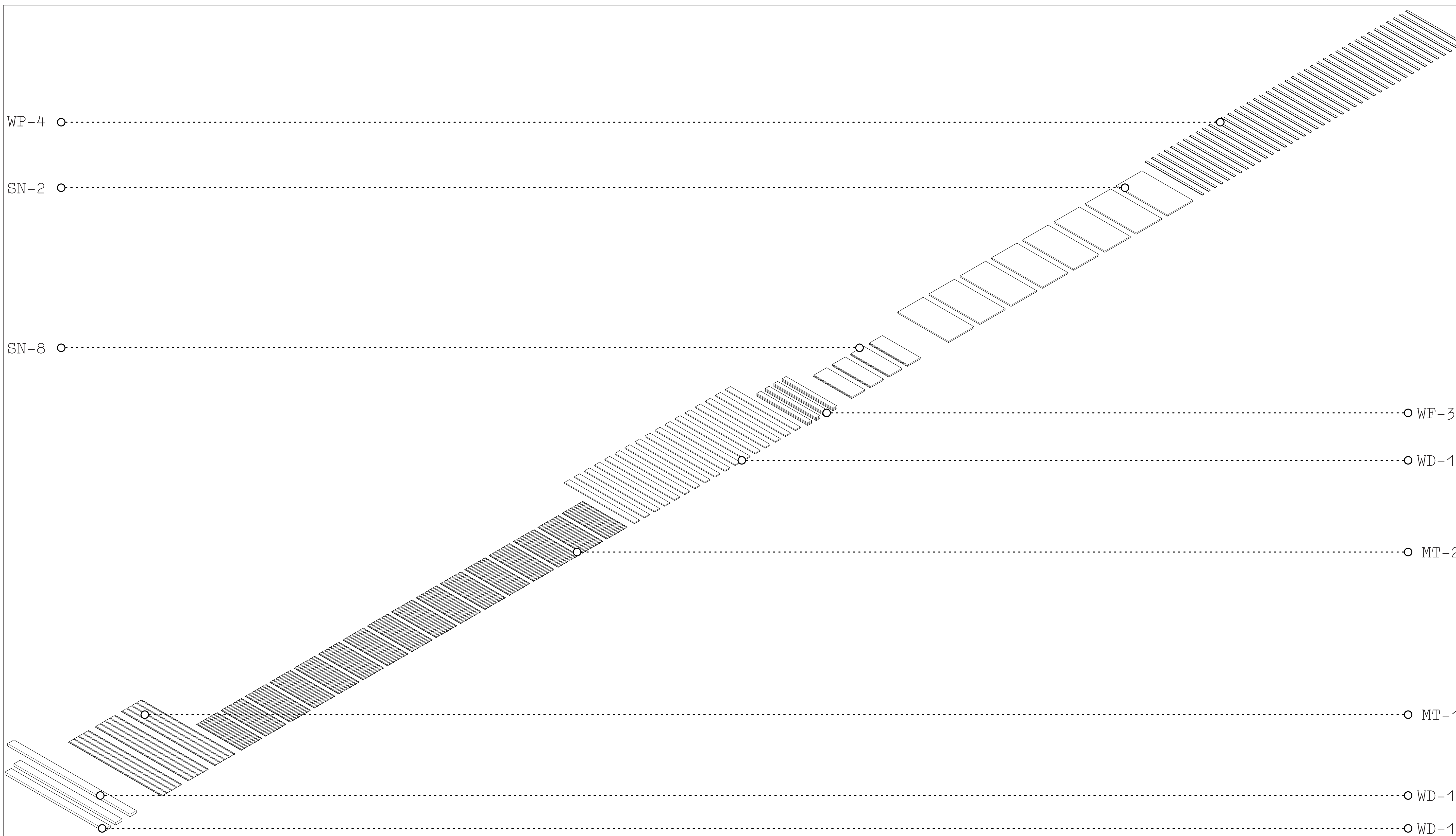


Figure 10: Catalogue of used materials at White Lake
Own Graphic

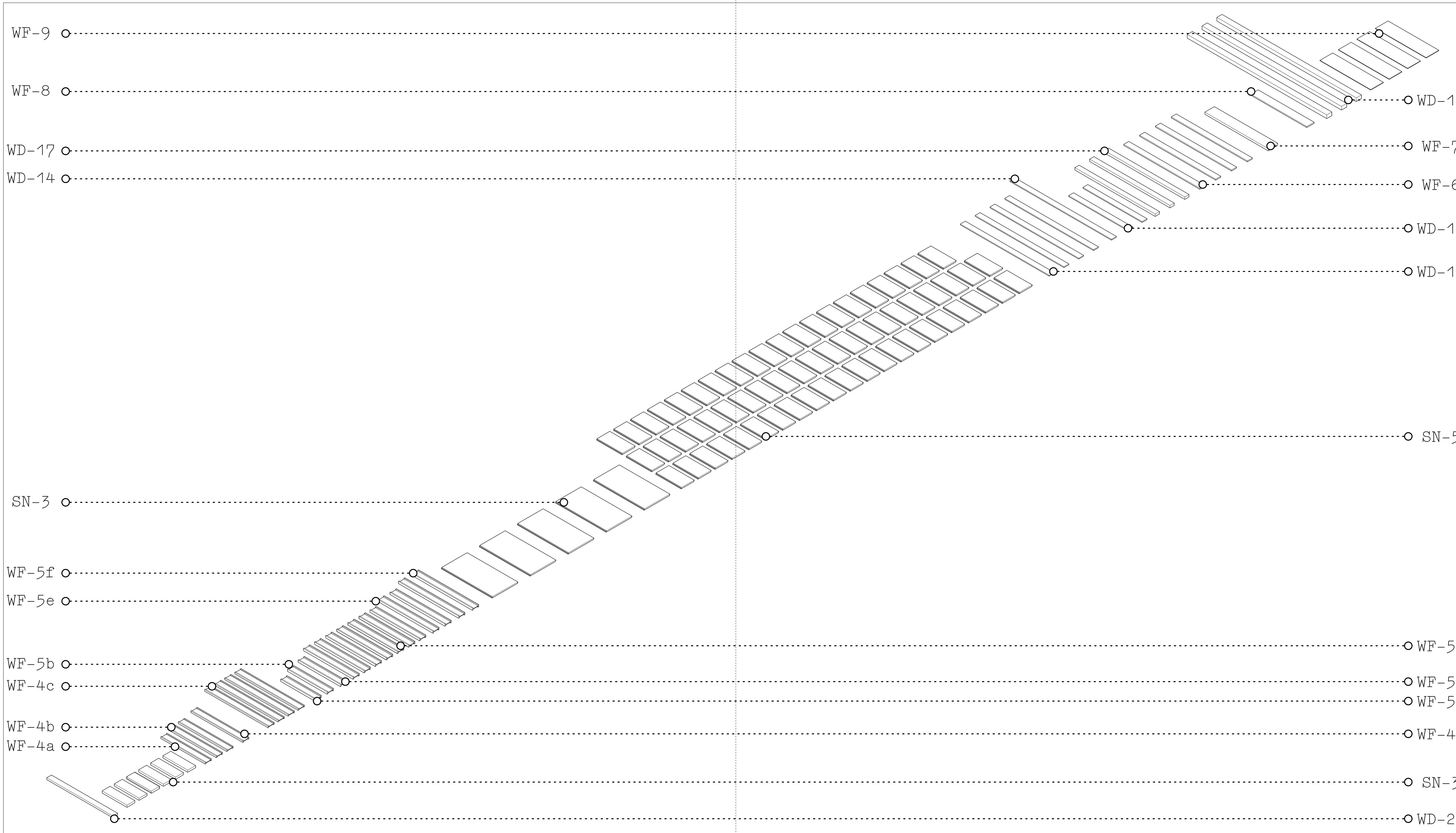


Figure 11: Catalogue of used materials at White Lake
Own Graphic

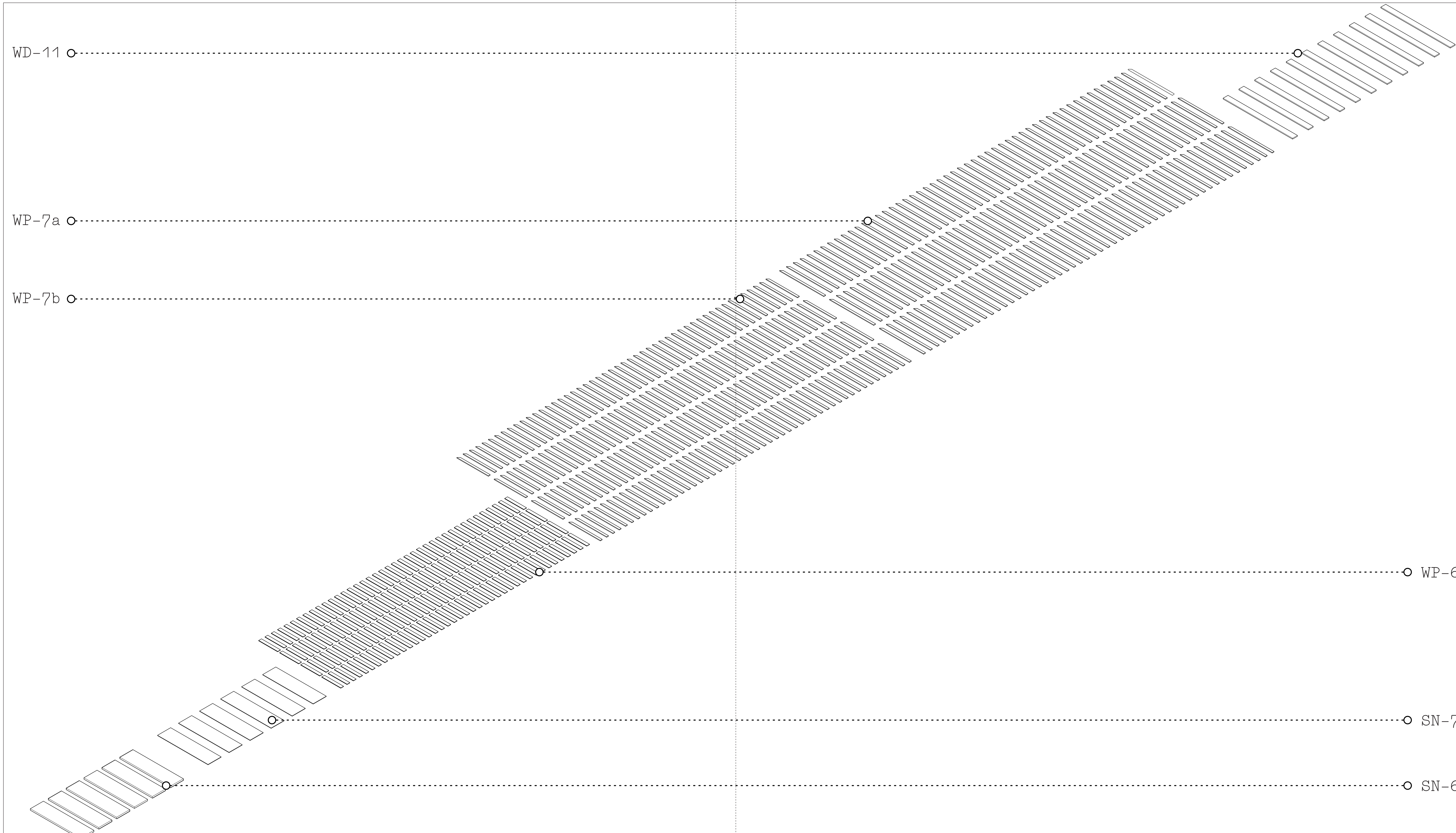
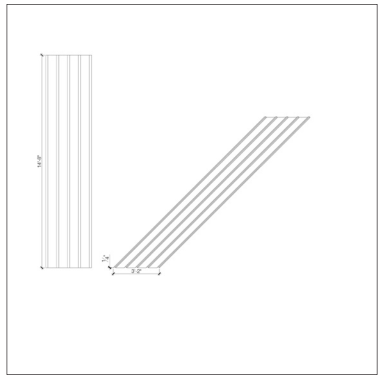


Figure 12: Catalogue of used materials at White Lake
Own Graphic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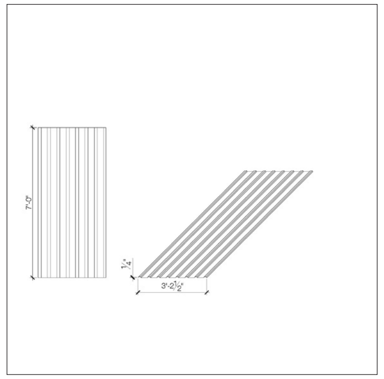
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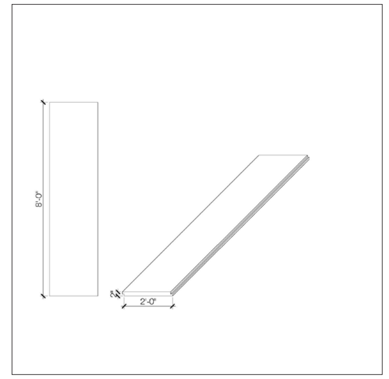
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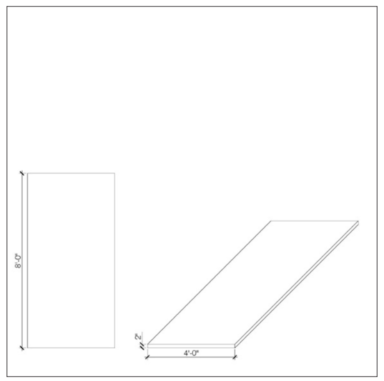
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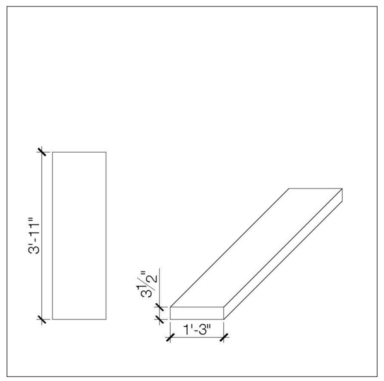
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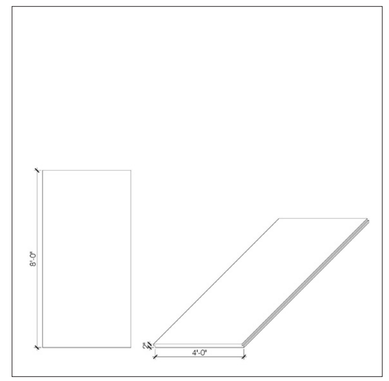
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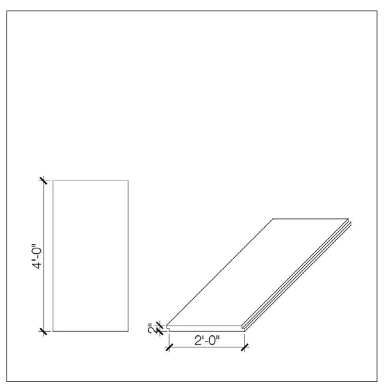
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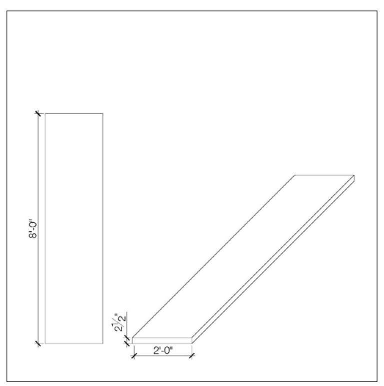
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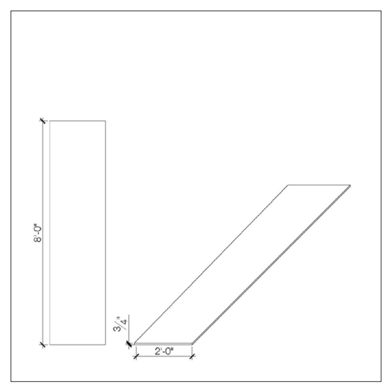
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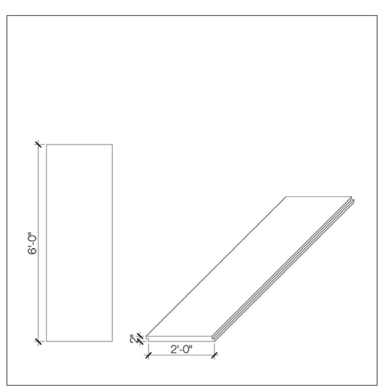
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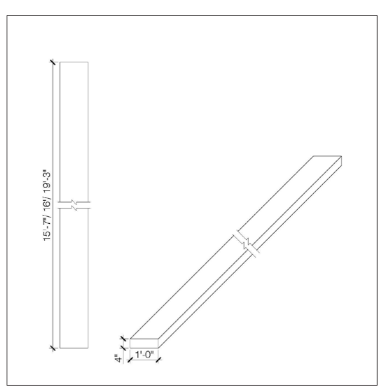
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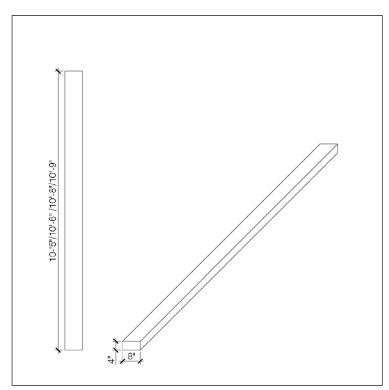
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Figure 13: Catalogue of used materials at White Lake
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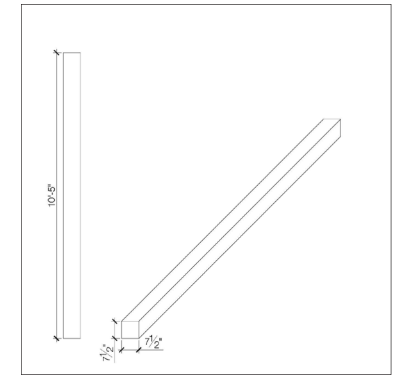
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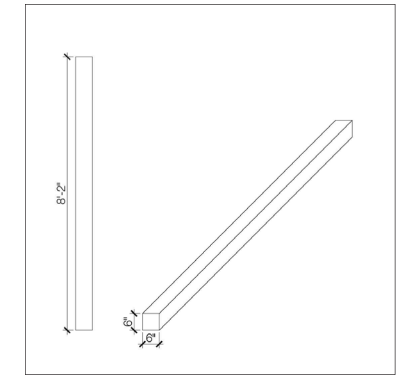
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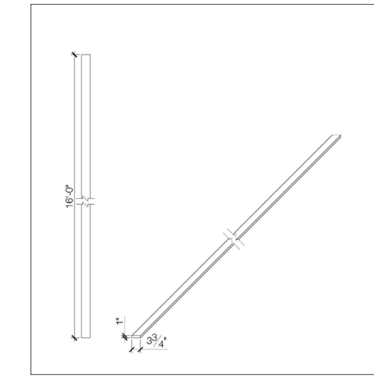
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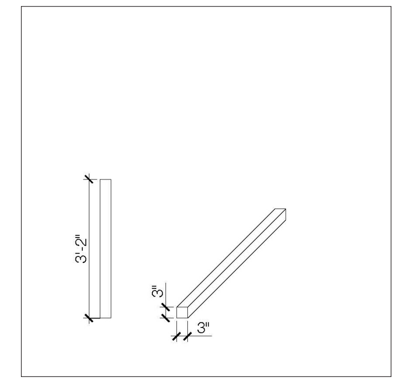
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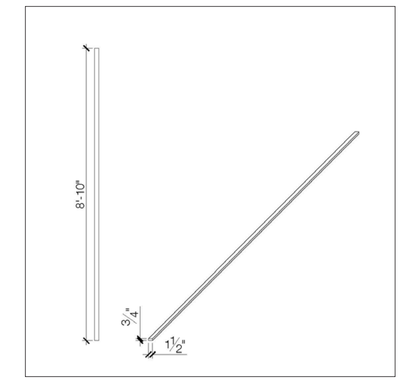
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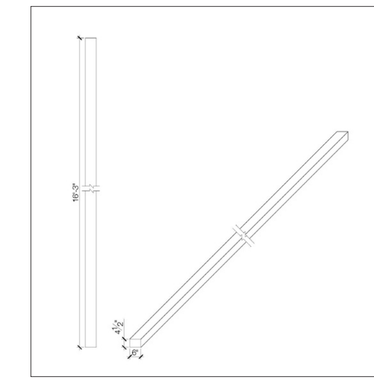
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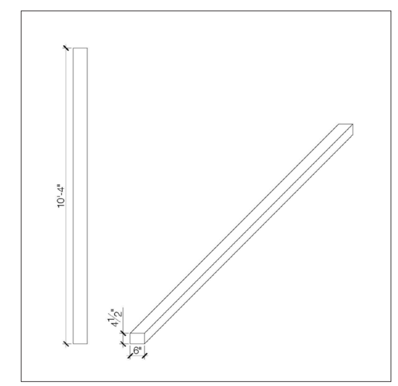
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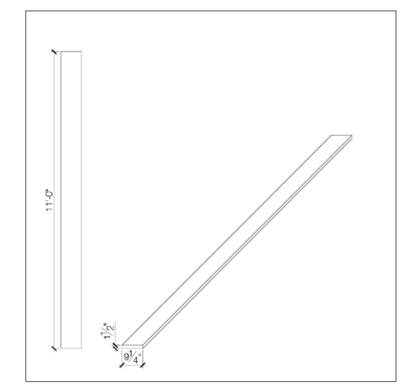
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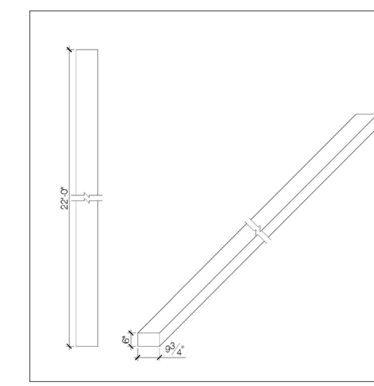
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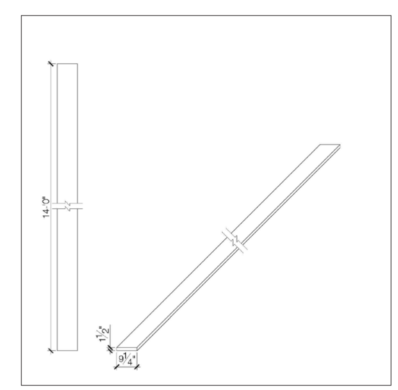
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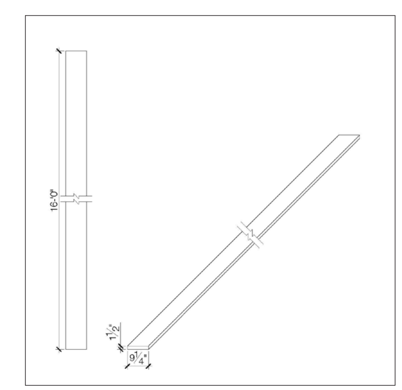
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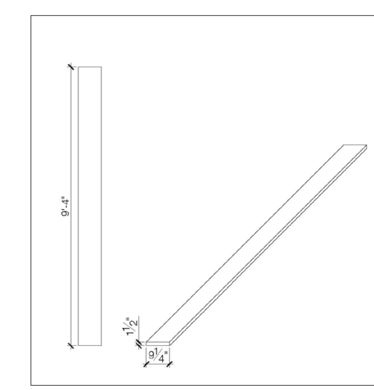
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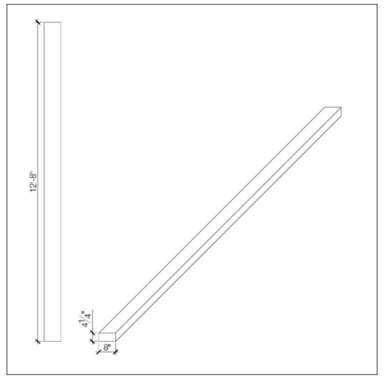
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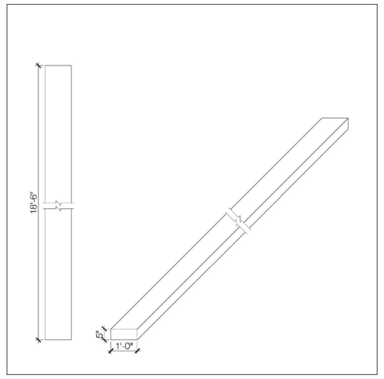
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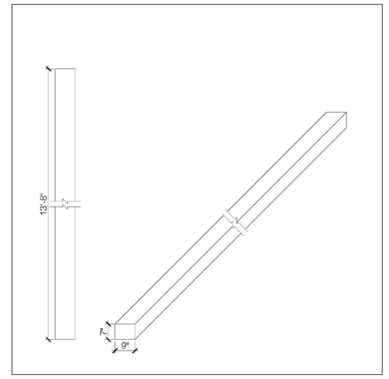
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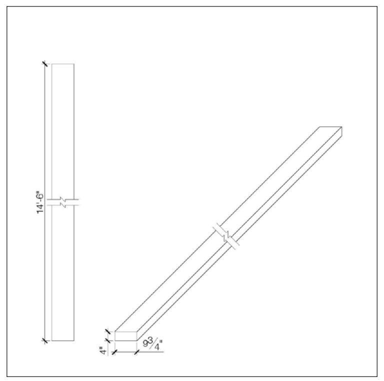
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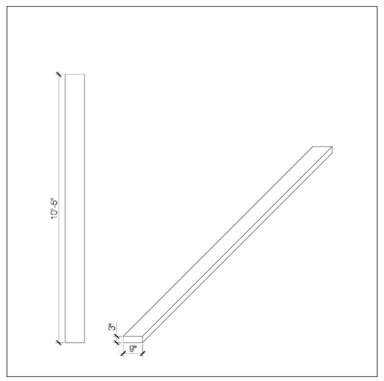
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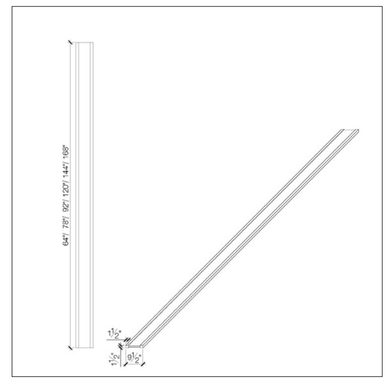
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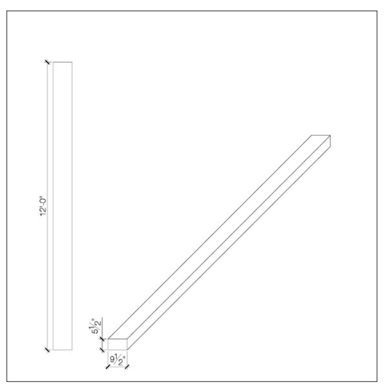
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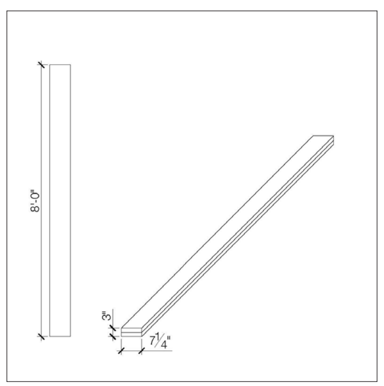
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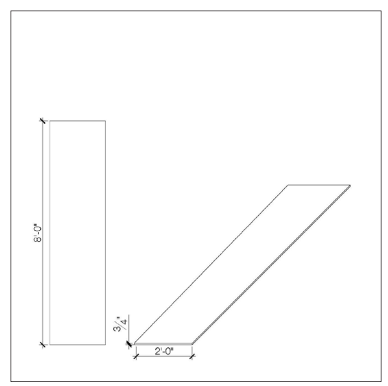
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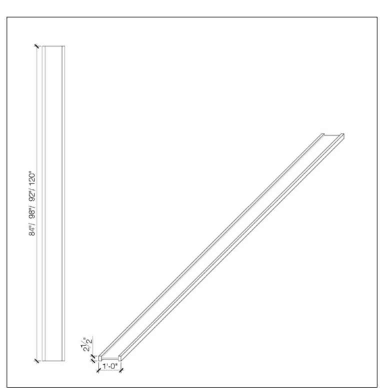
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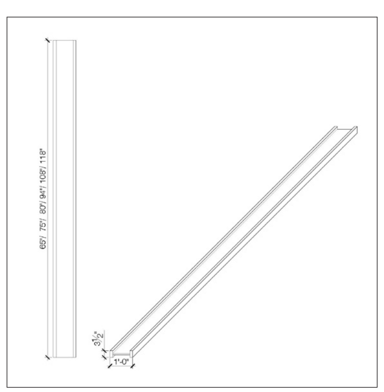
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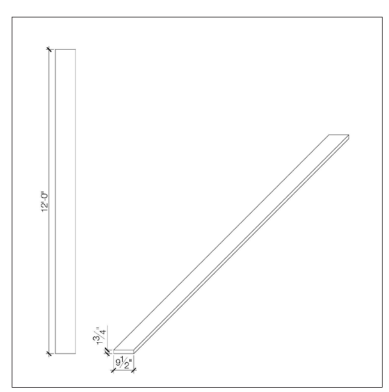
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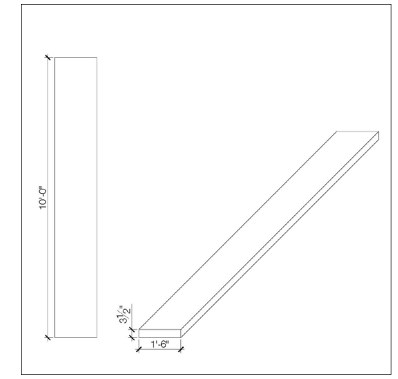
Figure 14: Catalogue of used materials at White Lake
Own Graphic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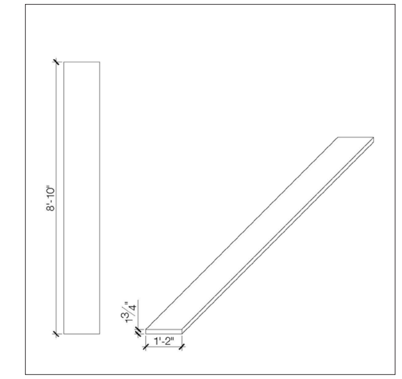
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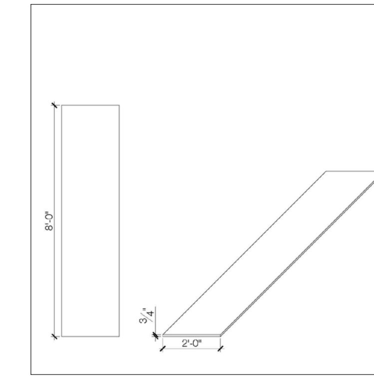
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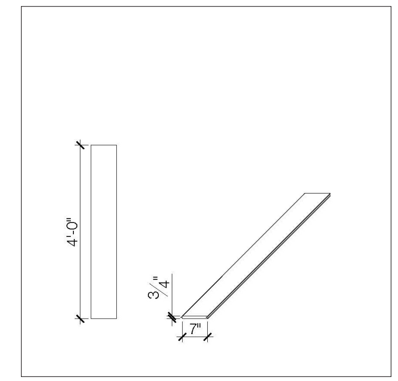
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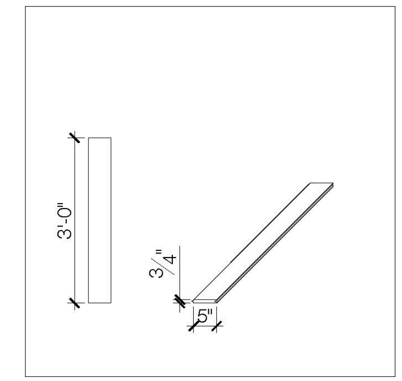
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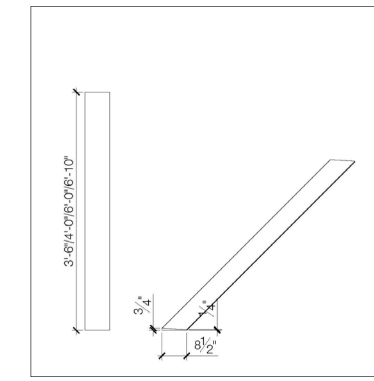
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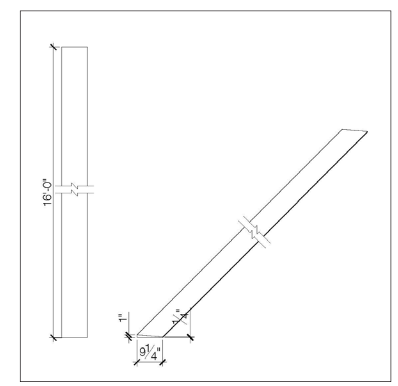
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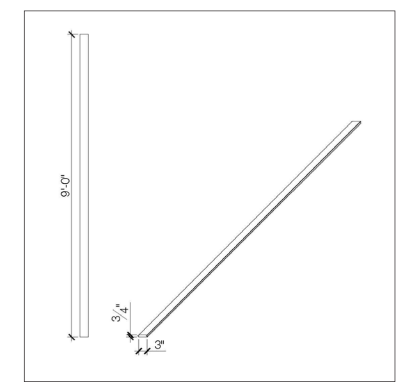
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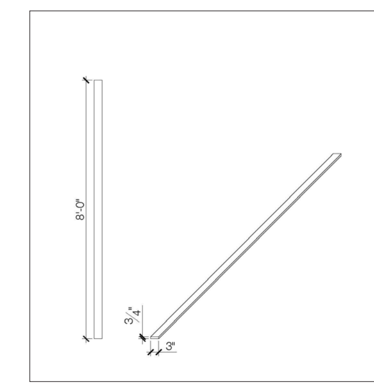
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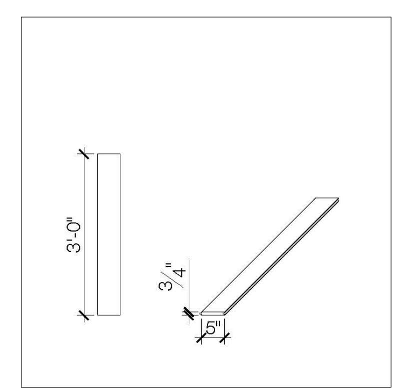
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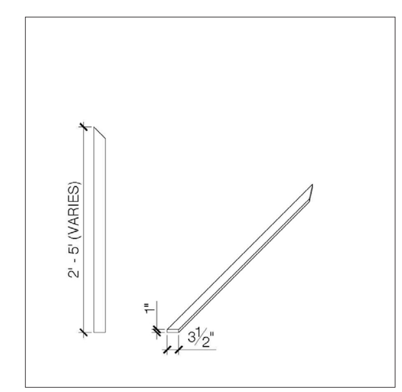
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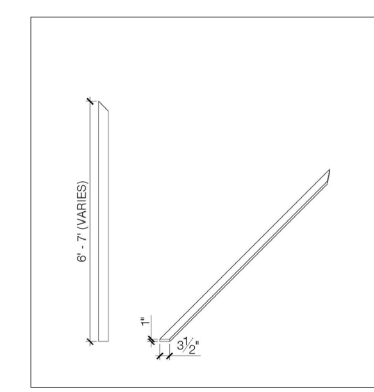

WP-7b

03 Material Based Design - [Project Approach]

Chaper 3: Material Based Design - [Project Approach]

3.1. Paving the way for Material-Based Design: Post-Modernism & Deconstructivism

Despite the similar diction of Deconstruction and Deconstructivism, the former is the practice of dismantling a building, as described in Chapter 2: Material Reuse, and the latter is a reaction to the Modernist design movement. Yet, Deconstructivism is explored in this Chapter because of its role in architectural history, bridging the gap between Modernism and Material Based Design. The components which make up Material Based Design are unpacked to better understand the design approach I intend to undertake in the design portion of this thesis.

3.1.1. Post-Modernism

Post-Modernism is a direct reaction to Modernism and Structuralism. The architectural movement of Post-Modernism is commonly known for its aesthetic reintroduction of surface application after the stripping of ornamentation during the Modernism movement. Yet, the architectural movement was in fact responding to the social utopian ideals of Modernism and philosophical beliefs of thinkers such as Martin Heidegger. Instead of resorting to one International Style for a technology-driven, modern world, Post-Modernists reject the idea of a universal, perfect style. They embraced all the colours, materials, and forms that the modernists had deemed impure.

3.1.2. Deconstructivism

Deconstructivism under the umbrella of Post-Modernism, yet explores specific ideas of disrupting the structure of a building. Deconstruction, or poststructuralism, is a philosophical movement developed from Jaques Derrida's reaction to Ferdinand de Saussure's Structuralism. Derrida's argument questions Saussure's theory and begins to propose that meaning in language is based solely on the relationship, and by questioning this relationship we create uncertainty and indeterminacy. In Deconstruction the signifier does not refer to a definite signified but produces other signifiers instead.[56] Speaking architecturally: Johnson and Wrigley write in Deconstructivist Architecture that "Deconstruction itself, however, is often misunderstood as the taking apart of construction".[57] Wrigley emphasises that Deconstructivism is "an architecture of disruption, dislocation, deflection, deviation, and distortion, rather than one of demolition, dismantling, decay, decomposition, or disintegration. It displaces structure instead of destroying it".[58] Similar to the way Derrida questioned the core structure of language by interrogating the relationship between signifier and signified, Deconstructivist architecture questions the core of architecture: structure. The disruption is from within – an interrogation of the structure. This interrogation started in Russia's 1920's Constructivism and was pursued further by Deconstructivists after experiencing the International Style of Modernism. Therefore, it is said by Wrigley that: "[deconstructivist] projects employ the aesthetic of high modernism but marry it with the radical geometry of the [Russian] pre-revolutionary work."[59] Derrida's theory turned into a spatial experiment when his text Speech and Phenomena was translated from French to English is 1973. He captured the interest of Architects such as Rem Koolhaas, Zaha Hadid, Bernard Tshumi, Peter Eisenman, and Frank Gehry.

56 Guillemette, Lucie and Josiane Cossette "Deconstruction and Differance." Signosemio – Theoretical Semiotics on the Web, April 2006. http://www.signosemio.com/derrida/deconstruction-and-differance.asp. Accessed February 24 2018.
57 Johnson, Philip, Mark Wigley, and Museum of Modern Art, New York. Deconstructivist Architecture. Museum of Modern Art, New York, 1988.
58 Johnson, Philip, Mark Wigley, and Museum of Modern Art, New York. Deconstructivist Architecture. Museum of Modern Art, New York, 1988.

3.1.3. Movement Towards Material Based Design (Post-Post-Modernism)

Adolf Loos writes in Regarding Economy that the "old love of ornament should be replaced by a love of material". Although known as a pioneer in the Modernist movement, Loos describes a reaction that was repeated 50 years later when Material Based Design responded to Post-Modernism. He was proposing a celebration of inherent qualities of materials, a philosophy that has faded and emerged throughout the last century as design movements came and went. Material Based Design (or Post-Post-Modernism) is the ultimate embodiment of a celebration of materials; an expression of materiality that hasn't been present since pre-modernism. Material Based Design is as much a response to ornamentation as it is to formalism.

Deconstructivists ranked materiality as subservient to the formal expression of the building, allowing the structure to act as the ornament and serve all aesthetic needs. An example of this is Peter Eisenman's Cardboard Architecture. Eisenman explains the explorations in cardboard architecture with: "cardboard is connotative of less mass, less texture, less color, and ultimately less concern for these. It is closest to the abstract idea of plan."[60] Put simply, the idea is to make a building seem like a model, or a representation of form. This approach to architecture clearly does not prioritize materiality or matter.

In the 1990's Peter Zumphor was one of the forefathers of the Material Based Design[61] and he defended his case for materiality in several successful projects such as Shelters for Roman archaeological site, and Saint Benedict Chapel. Following Zumphor's lead, a stronger relationship with materiality was forged within the architectural community. Architects like Herzog and de Meuron and Kengo Kuma emerged, also designing with form subservient to material.

3.2. Definition of Material-Based Design

Following suit of the architectural movements before it, Material Based Design is a reaction to its predecessors: Post-Modernism and, more specifically, Deconstruction. Material Based Design combats the philosophies of the previous movements, which prioritized formal ornamentation and formal direction based on structural interrogation and disruption. In Matter: Material Processes in Architectural Production, Borden and Meredith describe Material Based Design's reactionary philosophy as:

"If materiality was at one point the enemy of the formal, humanist project, it is not any more. It is probably closer to an avantgarde trajectory, that is to say, materiality is now used to find new methods of non-composition through rethinking the part to whole relations of "tasteful" compo-

59 Johnson, Philip, Mark Wigley, and Museum of Modern Art, New York. Deconstructivist Architecture. Museum of Modern Art, New York, 1988.
60 Peter Eisenman's Cardboard Architecture. Arch League November 17 2014. https://archleague.org/article/200-years-peter-eisenman/. Accessed April 12 2018.
61 Borden, Gail P., and Michael Meredith. Matter: Material Processes in Architectural Production. Routledge, New York, 2012.

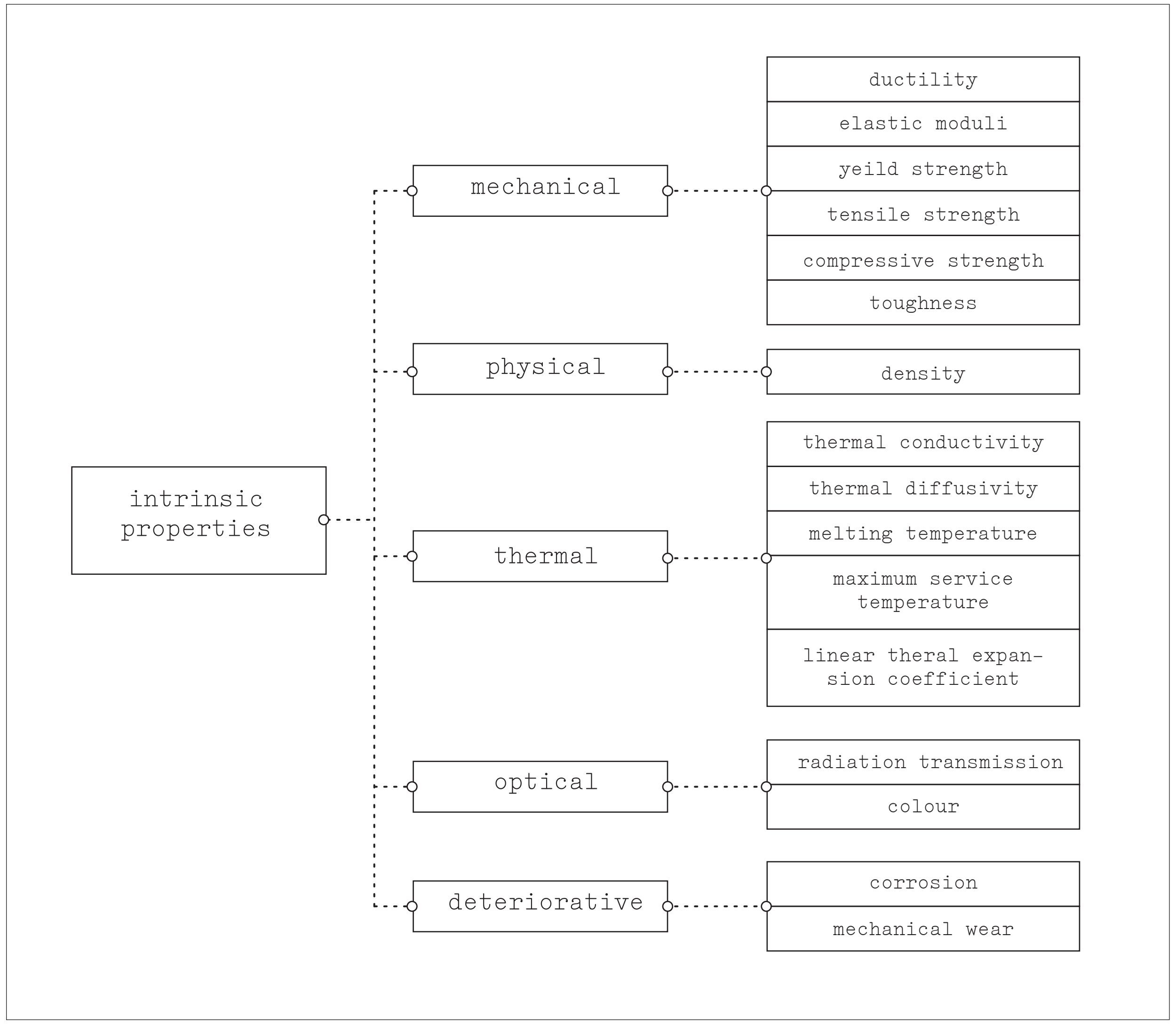


Figure 15: Intrinsic material properties
Graphic inspired from "Material Architecture"
Fernandez, John. Material Architecture. Taylor & Francis Group, Abingdon, 2017.

"If materiality was at one point the enemy of the formal, humanist project, it is not any more. It is probably closer to an avantgarde trajectory, that is to say, materiality is now used to find new methods of non-composition through rethinking the part to whole relations of "tasteful" composition. Materiality provides ways to destroy the objectness of architecture."

- Gail P. Borden

sition. Materiality provides ways to destroy the objectness of architecture."[62]
In this thesis, my definition of Material Based Design is: a method of approaching design in which one allows the material's inherent physical properties, including emotive and sensory qualities, to guide the design of a building. The formal nature of the building is derived from the study and understanding of the material, opposed to form dictating the choice and application of materials. This redirection of design drastically jumps in scale from the macro to the micro, allowing small matter such as material to inform the massing.

3.2.1. Materiality

Materiality in architecture is the use and exploration of materials in built form. Materials are the components that, once assembled, make up the buildings we reside in. Materiality is often loosely and inaccurately described as the "soft facts", opposed to the "hard facts" of a material. A quick, untrained reader of Material Based Design might suppose the ephemeral quality of successfully designed buildings are attributed to material selection based on aesthetics and haptic qualities. This is not the case. Material Based Design of successfully designed buildings emanates an emotive response because of it's layered approach to materiality. Materiality also involves the deep scientific and rigorous testing of natural and engineered materials. Material data collected by Material Engineers is vast and comprehensive. Although incredibly helpful, the contemporary emerging architect may not be able to interpret this data in order to take advantage of this beneficial resource. Therefore, the emotive qualities of the material identified by the designer are often driving material choices. In Material Architecture, Fernandez writes about the definition of the term materiality and how it has shaped material use and discussion:

"A keystone of this self-compromised discourse is the use of the word "materiality"; a term that has gained a stubborn foothold in schools of architecture and come to encapsulate all too well the many indistinct notions of the physical "character" of a design proposal. Not surprisingly absent from inclusion in the Oxford English Dictionary, the word has persisted and spread like a mild cold, not enough to cause fatal illness, but enough to muddle the mind."[63]

Sensory and emotional inspiration is derived from materials, which then gets translated into built form. This process of approaching materiality is overlooking the years of data collected

62 Borden, Gail P., and Michael Meredith. Matter: Material Processes in Architectural Production. Routledge, New York, 2012.
63 Fernandez, John. Material Architecture. Taylor & Francis Group, Abingdon, 2017.

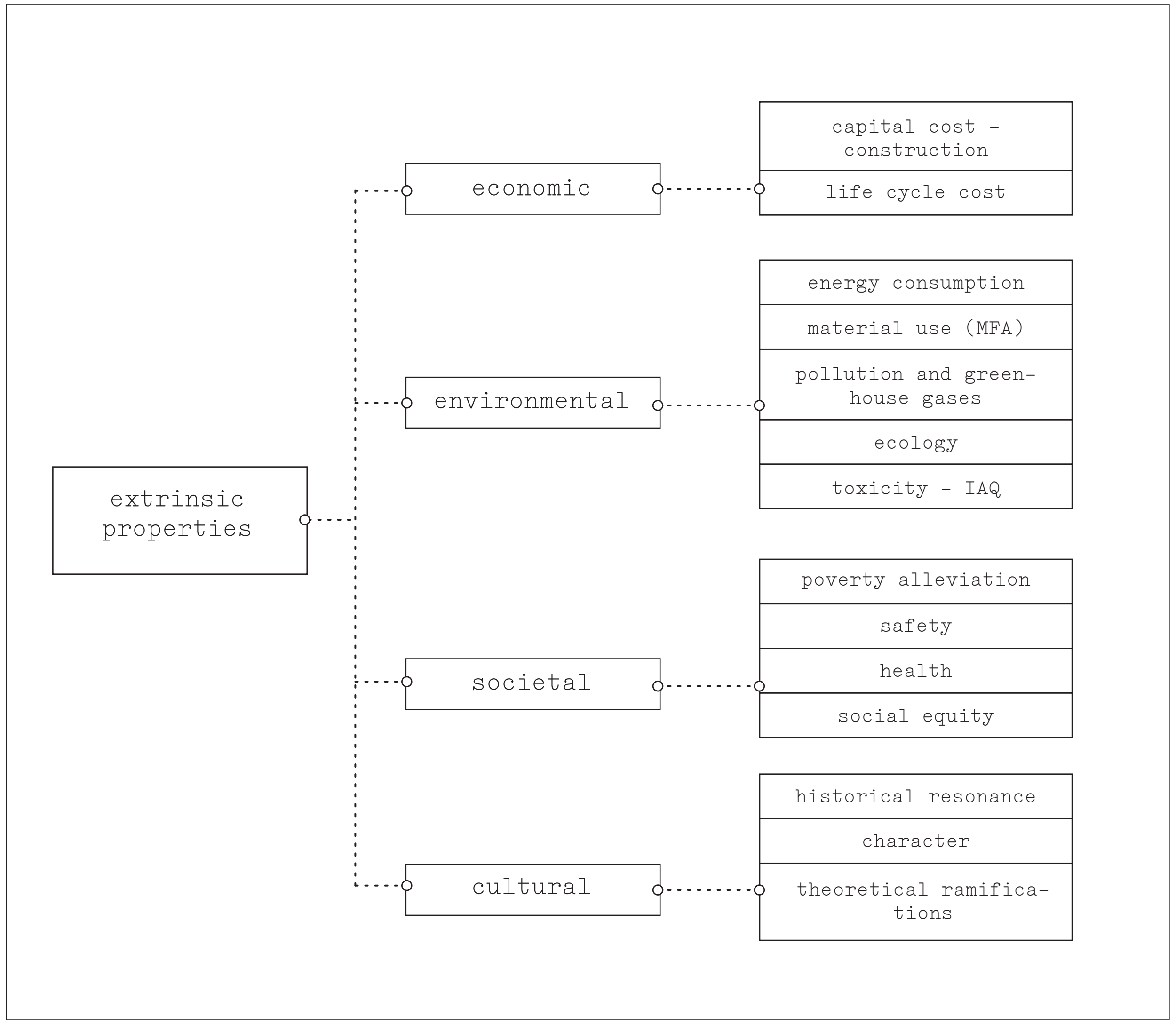


Figure 16: Extrinsic material properties
Graphic inspired from "Material Architecture"
Fernandez, John. Material Architecture. Taylor & Francis Group, Abingdon, 2017.

"When you are designing in brick, you must ask brick what it wants or what it can do. Brick will say, I like an arch. You say, but arches are difficult to make, they cost more money. I think you could use concrete across your opening equally well. But the brick says, I know you're right, but if you ask me what I like, I like an arch."

- Louis Kahn

by Material Scientists and Material Engineers that can provide information on inherent properties of materials. Dependence on the emotional approach to material selection is worrying for Taylor and Francis, who write that: "…a significant swath of contemporary designers are not able to discuss a material in terms that extend beyond the general and immediately sensory-oriented. The haptic and visual aspects of materials clearly dominate discussions of materiality and while these discussions may be rich, useful and inspirational, they are limited in the coverage of the topic in light of its potential."[64]

For the purpose of this thesis, my definition of Materiality will include the "soft" and "hard" facts. The current ubiquitous nature of the term Materiality has eroded the scientific pillars on which Materiality once stood. I argue that the physical properties of materials define their sensory and emotive read. I am emphasising the importance of Material Research during design to enhance innovation and exploration throughout the process.

3.2.2. Material Research

Material Research combined with haptic and emotive responses to materials make up the core of Material Based Design. The branch of Material Engineering is a field of its own based solely on studying properties of existing materials, and Material Scientists further this research by learning from these properties to develop new materials. For the purpose of my thesis I define Material Research as the Study of Material Properties. I will borrow from Callister's definition of Material Properties as:

"[…] the attributes by which a substance is defined. These attributes are the useful conventions of scientific disciplines, intent on analyzing behavior, formulating theories and synthesizing models that correlate the atomic and molecular composition of materials with the properties that are exhibited. While properties define the behavior of the material, molecular and atomic arrangements determine these properties."[65]

In Material Architecture, Fernandez split Material Research into two broard categories: intrinsic and extrinsic. The intrinsic properties of a material are of the object or thing itself, and are independent of all other things, including its context. Taylor and Francis have five subcategories: mechanical, physical, thermal, optical, and deteriorative. These subcategories are further

64 Fernandez, John. Material Architecture. Taylor & Francis Group, Abingdon, 2017.
65 Callister, W.D. Materials science and engineering an introduction. John Wiley & Sons, New York. 2003

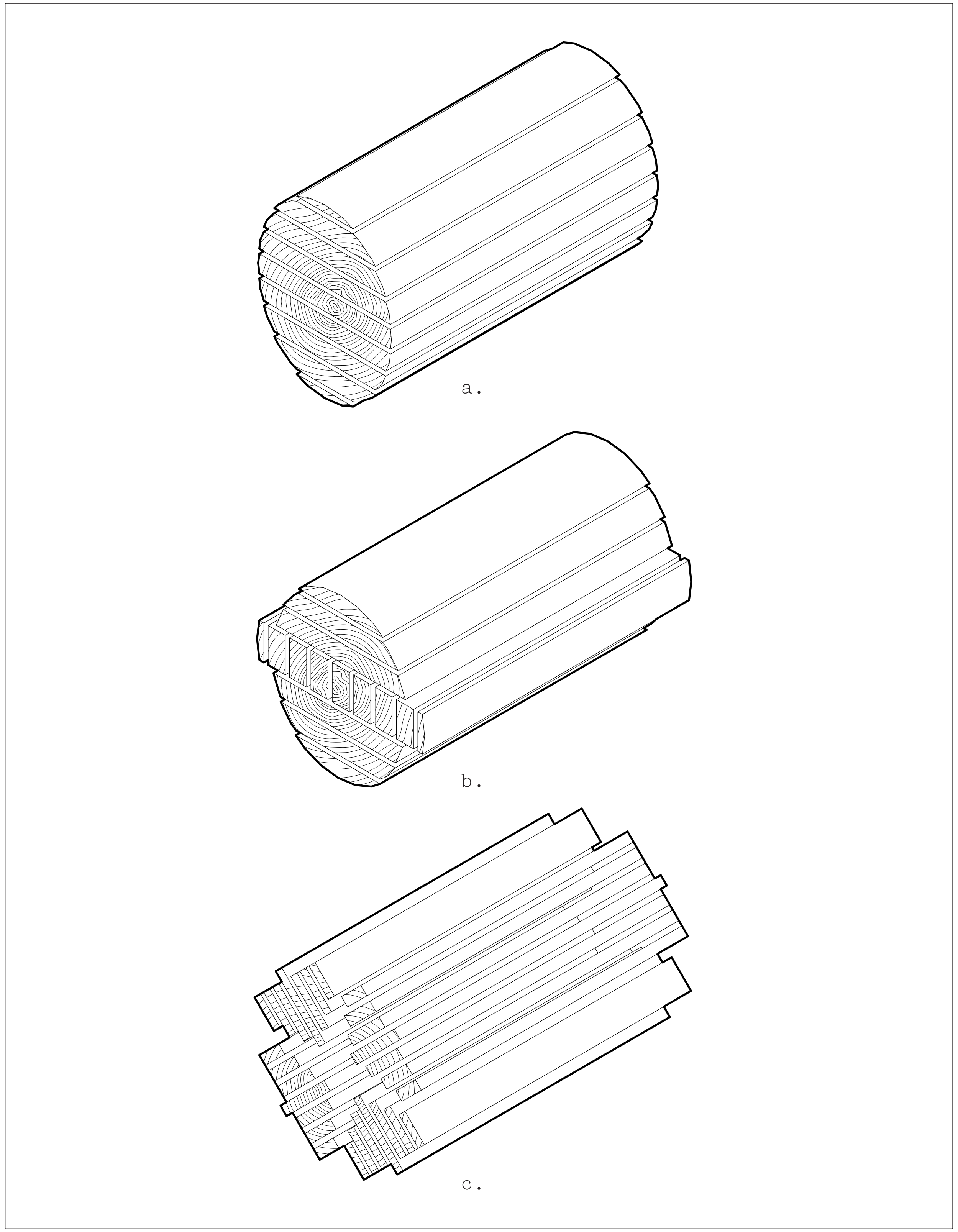


Figure 17: Image showing mechanical Intrinsic properties of wood grain
a. plain sawn b.flat sawn c. rift sawn
Own graphic

split into recordable individual properties. Under mechanical, they have highlighted: ductility, elastic moduli, yield strength, tensile strength, compressive strength, and toughness.[66] The extrinsic properties are comprised of the opposite characteristics, they look to the material in relation to external forces. For extrinsic properties, they propose four subcategories: economic, environmental, societal, and cultural.

Being an architect means being the conductor of all the parts – the connection between the idea and the materials.[67] Having this immense responsibility requires a deeper understanding than simply the sensory qualities one attaches to materials. A scientific understanding of what kind of manipulation each material can support before breaking is required. In Material Design: Informing Architecture by Materiality Erwin Viray writes in his forward that a knowledge in: "what they can hide, what they can emit, what they can keep, what they can stimulate, and in the final instance what they can create and what they can destroy" is necessary for the architect. The abilities Viray writes about are only possible to tease of out a material with rigorous scientific testing. One can speculate or hypothesise, yet the "hard" facts that are produced from Material Research are unforgiving and unwavering.

3.3. Material Integrity + Expression

In Material Integrity and Expression, I discuss the importance of allowing a material to live up to its best traits and not forcing it to be something it isn't. Listening to what the material wants to be is an important concept in Material Based Design. A study into Material Research as previously mentioned will reveal what properties the material holds that allow it to physically achieve certain architectural and structural feats. Technology has expanded the limits of our standard paint box of materials, creating endless malleable options for how materials are manipulated to suit our imaginations.[68] Yet, this results in architects forcing materials to sometimes reach physical limits that they are not intrinsically made for. In Material Based Design, designers listen to the material to aid in important early decisions in terms of form, structure and materiality.

3.3.1. Material's Inherent Potential

"When you are designing in brick, you must ask brick what it wants or what it can do. Brick will say, I like an arch. You say, but arches are difficult to make, they cost more money. I think you could use concrete across your opening equally well. But the brick says, I know you're right, but if you ask me what I like, I like an arch."[69]

- Louis I. Kahn

Following the "hard fact" argument set up in previous sections on Materiality and Material Research, I must reassert the importance of the complementary duality of both hard and soft material observations. Armed with the Material Research emphasised in the earlier section, I am now going to address getting to know your material personally and listening to its strengths and challenges. In Material Integrity, I discuss the importance of allowing a material to live up to its best traits and not forcing it to be something it isn't. The Louis Kahn quote speaks directly to this concept – celebrating the expression and personality of the material. Half a century

66 Fernandez, John. Material Architecture. Taylor & Francis Group, Abingdon, 2017.
67 Schröpfer, Thomas, and James Carpenter. Material Design: Informing Architecture by Materiality. Birkhäuser, Basel, 2011.
68 Borden, Gail P., and Michael Meredith. Matter: Material Processes in Architectural Production. Routledge, New York, 2012.
69 Kahn, Louis. Space and Inspirations, in Louis I. Kahn, Writings, Lectures, Interviews. Alessandra Latour, ed. Rizzoli, New York, 1991.

ahead of the Material Based Design movement, Kahn went beyond a material approach, and developed a material obsession with brick. In addition to the intrinsic properties he studied on the material, he also exploited its extrinsic social properties and explored the value of humbleness placed upon brick when used in public buildings. Kahn's designs embodied the hard and soft duality the designer must explore when working with materials. In Material Architecture, Fernandez emphasizes the importance of both aspects of material research:

"Obsession without knowledge makes unimportant, misguided and sometimes dangerous buildings. I strongly believe that a simple allure of contemporary materials is not only superficial at best but, in light of the enormous material expenditure of construction, critically irresponsible at worst. Equally, I hold to the ideal that technical knowledge of contemporary materials without a foundation of values to guide a passionate viewpoint for design is no better. Materials, in and of themselves - however novel - will never make us better designers."

A scientific listing of properties alone will not bring about Material Based Design. As Fernandez writes in Material Architecture, "the hint of the full range of creative possibilities in any design situation cannot reasonably be perceived through a mere listing of the mechanical and physical properties alone."[70] It requires the emotional interpretation that the architect has of the material characteristics and the articulation of that concept into and assembly of materials – built form. Studying the delicate balance between hard and soft material observations is the process of understanding a material's potential and is the backbone of Material Based Design.

3.4. Environment, Culture and Society: Shaping Craft + Materials

In this section I discuss the fundamental links between material and craft, craft and architecture. The role that environment, culture, and society play in altering extrinsic values of materials over time changed at an exponential pace in the last century. The quote below from Borden in Matter: Material Processes in Architectural Production exemplifies the subverting of the historical material to craft to architecture relationship:

"Over and above our fundamental socio-ecological shift, new fabrication and construction technologies have severed the equally illusory tie between the "natural," so-called inherent properties, and architectural applications. In other words, compressive strengths, bendability, tensile limits and other "innate" physical properties no longer define our relationship to a dwindling material palette. The mediation of fabrication technologies has multiplied and fragmented what had seemed to be stable application-traditions: when tree trunks cease to be automatically understood as cylindrical fibrous bundles and can instead be conceived as stacks of veneer sheets laminated without consideration of wood grain, or sawdust molded and pressed together with chemicals to achieve dimensional stability, we find that our nostalgic default material understanding has been fundamentally destabilized."[71]

What should also be noted is the temporal and transient nature of extrinsic values and fabrication and processing technology. New materials have been created, yet wood, stone, and ceramics have endured thousands of years. Materials and their extrinsic properties are the constant and the way we use and shape them is the variable.

70 Fernandez, John. Material Architecture. Taylor & Francis Group, Abingdon, 2017.
71 Borden, Gail P., and Michael Meredith. Matter: Material Processes in Architectural Production. Routledge, New York, 2012.

"By dramatically altering the processes by which materials are worked, the material itself changes its characteristics, not simply in its appearance and function, but also in its cultural meaning and significance. Much material innovation emerges not in the making of new materials but in transforming the way in which we handle them."

- Thomas Schröpfer

3.4.1. Cultural Material Associations

Material Based Design also includes understanding any personal or cultural associations tied to a particular material. It often includes awareness of those connections, followed by a questioning and sometimes a rejection. To remove a material from its architectural or non-architectural association and study its inherent properties is to reconsider its perceived cultural value. Cultural associations of material values adapt with environmental, historical, and social influences. Arguably, materials cannot be studied in isolation, because cultural bias will always influence experimentation. The best approach to strip away cultural connotation would be to begin with a scientific approach, as seen in such material catalogues as Materiology: The Creatives Guide to Materials and Technologies or Harvard GSD's Material Collection Database. Both take an approach that explores the physical properties of the material separate from its architectural associations, allowing the user to use the library or catalogue with as little past architectural connotations as possible.

Fabrication processes have a significant role on the cultural associations placed on materials. The book: Materiology: The Creatives Guide to Materials and Technologies highlights conventional fabrication processes for common resources such as wood, concrete, and metal. Use is heavily tied to fabrication process as the process shapes the second form of the raw resource. Therefore, historical and conventional fabrication processes should be understood, but not emphasised when approaching material-based design.

3.4.2. Material and Craft – a Symbiotic Relationship

Craft differs from fabrication processes in several ways. Craft originates from years of cultural, environmental, and social influences. Fabrication processes are affected by industrial standards shaped by efficiency, and ultimately financial and capitalistic agendas. Craft is strongly tied to the haptic qualities of the material, and what its material properties guide it towards. Conversely, finely tuned industrial methods govern fabrication processes. Craft differs from industrial fabrication in its distancing from the maker and the hand. In Material Matters Katie Lloyd Thomas writes that "Within this type of practice the commercial manufacturer develops the process to ensure cost effectiveness, and the quality and similarity of the reproduced articles. The article itself loses its status and a distance is created between the manufacturer and their product."[72] I argue that craft is of the vernacular. Its process and product are formed by local environment and culture, tying the product and process to the place. The same definition is applied on a large scale to buildings: vernacular building design is formed by and for the local.

The personal connection of material and craft is symbiotic. Material would not be as useful to humans without the development of craft to alter materials from their raw state. Thomas Schropfer writes in Material Design - Informing Architecture by Materiality: "The perceived value of a material is not always inherent in itself, but in the care, difficulty, and craft of its treatment within a culture." Wood as a material exemplifies this statement. Wood is a natural material with physical properties that derive strength in one direction and not in another, shrinkage in cold weather and expansion in warm weather, and bending or tension depending on orientation. These characteristics inform the way the maker approaches the craft. The maker chooses the tree(s) to turn into the object based on its physical traits and the maker's level of expertise.

The process includes a mental tug-of-war, with craft informing material selection and material informing craft. Eventually as the maker forms the wood into a useful product, he increases the wood's value to himself and other people by means of craft.

Within the context of this thesis, working with used building materials should not be seen as a process but a craft. The unique nature of used material's characteristic flaws and impurities categorize their treatment and assembly as craft. The outcome of their assembly into a new building should be of the vernacular; the stories and properties of materials should inform the architecture.

3.4.3. From Craft to Architecture

The relationship between craft and architecture has been severed by advances in technology. I argue that the Industrial Revolution spurred the separation and eventual divorce between craft and architecture. Before the Industrial Revolution, the choice of material and rate of extraction were constrained by expense, distance of transport, and skill of local craftsmen. Vernacular design based on culture and environment determined the resource needs. In turn, the available resources shaped the vernacular design. Craftsmanship adds value to a material and makes it useful architecturally, and this irreplaceable symbiotic relationship tied the two together for centuries. The scale and speed at which materials could be manufactured and processed after the Industrial Revolution forged a new relationship between materials and architecture and a disengagement with craft. Following this, the Modern era brought about increasing efficiency in material processing technology, driving architecture further from its dependency on craft and personal relationship with materials. Architectural options were endless as the selection of materials and efficacy of fabrication increased. The change in how materials were handled, from craftsmen to machines, altered their material properties, social and economic values, and emotive qualities. Therefore, creating a brand-new material by process of processing. In Material Design: Informing Architecture by Materiality, Schröpfer describes the effect of advances in fabrication and processing technology as altering the material to a point of material creation:

"By dramatically altering the processes by which materials are worked, the material itself

72 Lloyd Thomas, Katie, et al. Material Matters: Architecture and Material Practice. Routledge, London;New York;, 2007.

changes its characteristics, not simply in its appearance and function, but also in its cultural meaning and significance. Much material innovation emerges not in the making of new materials but in transforming the way in which we handle them."[73]

3.4.4. Vernacular Design

Vernacular design is born from a basic need for shelter combined with resources available naturally to a particular climate and geography. The term is tossed around loosely in architecture theory as a notion to strive for when the foreign is designing for the local. But its relationship to material and basic shelter are more relevant for this thesis. Vernacular design is heavily tied to materials and basic shelter; the main example explored by this thesis is the Log Cabin. In Chapter 5: Log Cabin – Program, research exposes the reliance on the typology of cabin in the harsh climate experienced by settlers. I also explore the relationship between wood, the log, and the log cabin – a relationship based on the intrinsic qualities of certain species of wood. Vernacular design is in fact, an architecturally glamorized term to describe the creation of shelters for survival.[74]

73 Schröpfer, Thomas, and James Carpenter. Material Design: Informing Architecture by Materiality. Birkhäuser, Basel, 2011.
74 Fernandez, John. Material Architecture. Taylor & Francis Group, Abingdon, 2017.

04 Precedents - [Project Approach + Field of Inquiry]

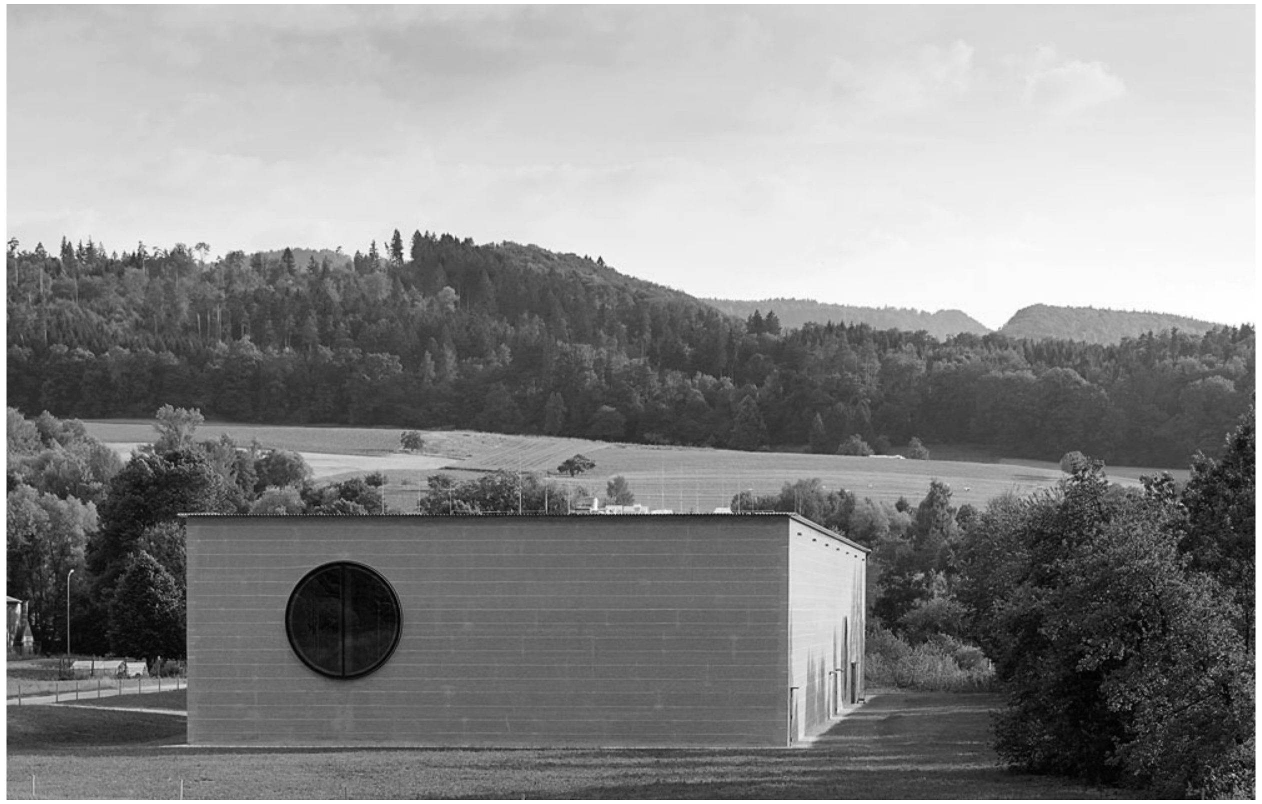


Figure 18: Ricola Storage Center
Sourced from: https://www.archdaily.com/634724/ricola-krauterzentrum-herzog-and-de-meuron

Figure 19: Ricola Storage Center
Sourced from: https://www.archdaily.com/634724/ricola-krauterzentrum-herzog-and-de-meuron

Figure 20: Ricola Storage Center
Sourced from: https://www.archdaily.com/634724/ricola-krauterzentrum-herzog-and-de-meuron

Chapter 4: Predents - [Project Approach + Field of Inquiry]

4.1 Ricola Storage Center

One of the Material Based Design precedents I am studying is Herzog and De Meuron's Ricola storage center in Switzerland. The function of the building as a herb processing and storage facility is suitably matched with the construction material choice: earth. The earth is locally sourced from which the herbs grow, additionally, earth's intrinsic properties of climate and humidity control contribute to the success of the material-based design.

Figure 21: Meme experimental House
Sourced from: https://www.archdaily.com/322830/meme-experimental-house-kengo-kuma-associates

Figure 22: Meme experimental House
Sourced from: https://www.archdaily.com/322830/meme-experimental-house-kengo-kuma-associates

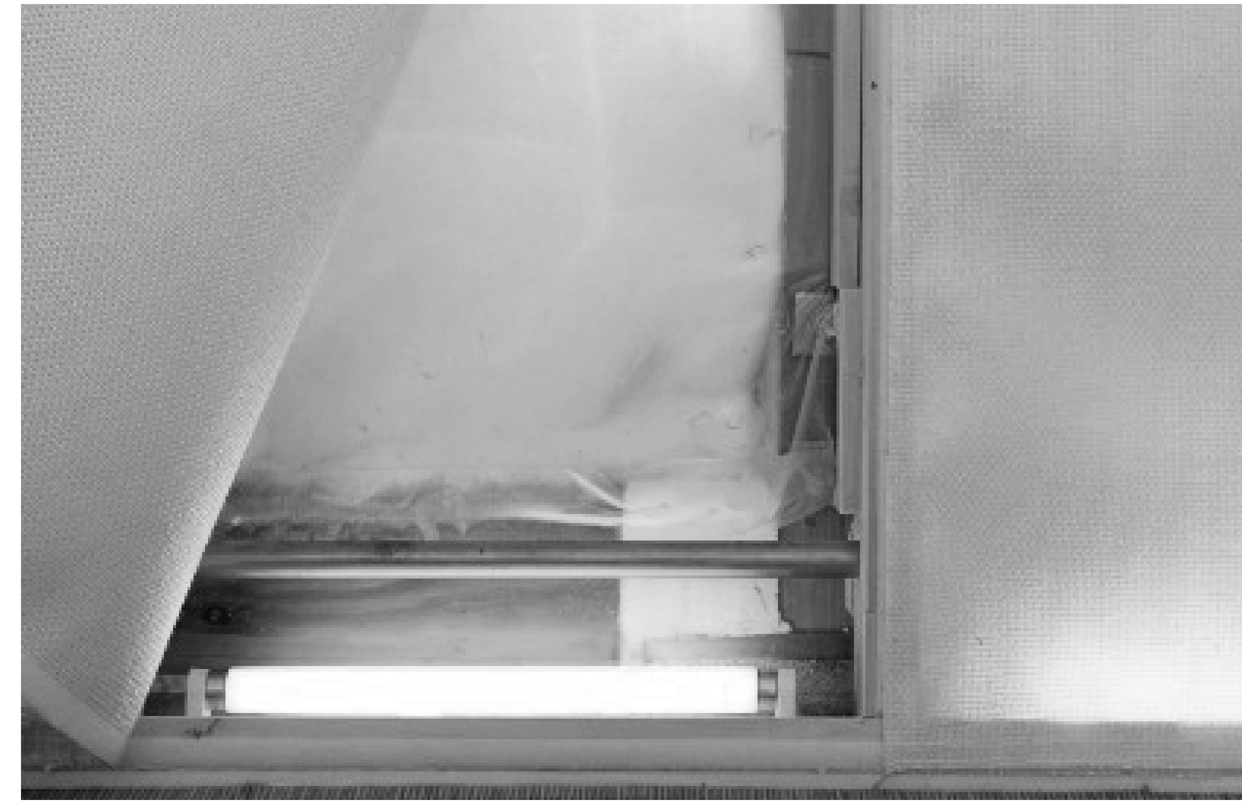


Figure 23: Meme experimental House
Sourced from: https://www.archdaily.com/322830/meme-experimental-house-kengo-kuma-associates

4.2 Meme Experimental House

A second precedent I will highlight is Kengo Kuma's Meme experimental house. A double skin membrane is composed of a polyester tarp on the outside and a Fiber glass cloth membrane on the inside. The idea is not to create the thickest, most solid insulation possible, but rather to use the material properties to perform in the desired way allowing light to create a diffuse day-lit glow.

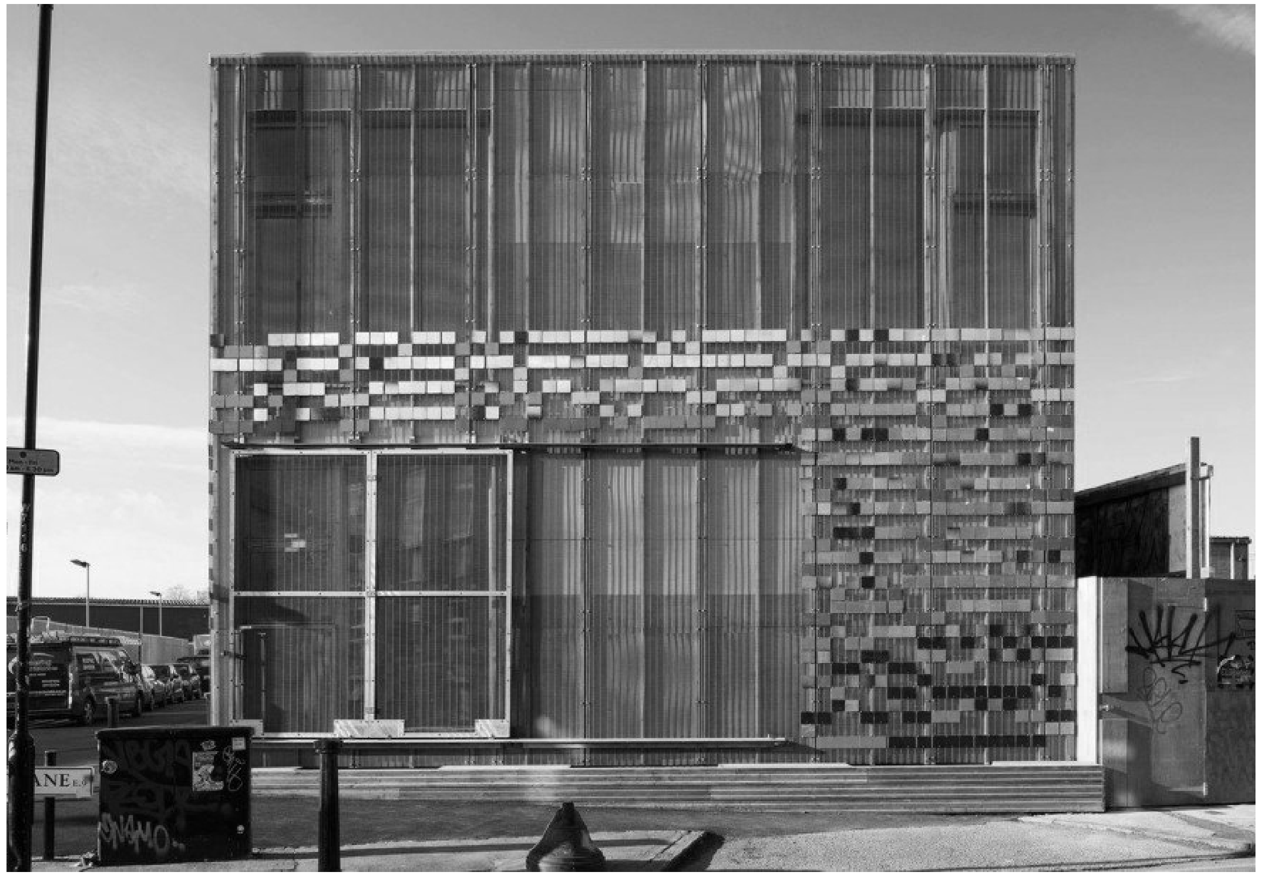


Figure 24: Hub 67
Sourced from: https://inhabitat.com/hub-67-lyn-atelier-builds-a-colorful-community-center-from-recycled-materials-from-the-london-olympics/hub-67-lyn-atelier-8/

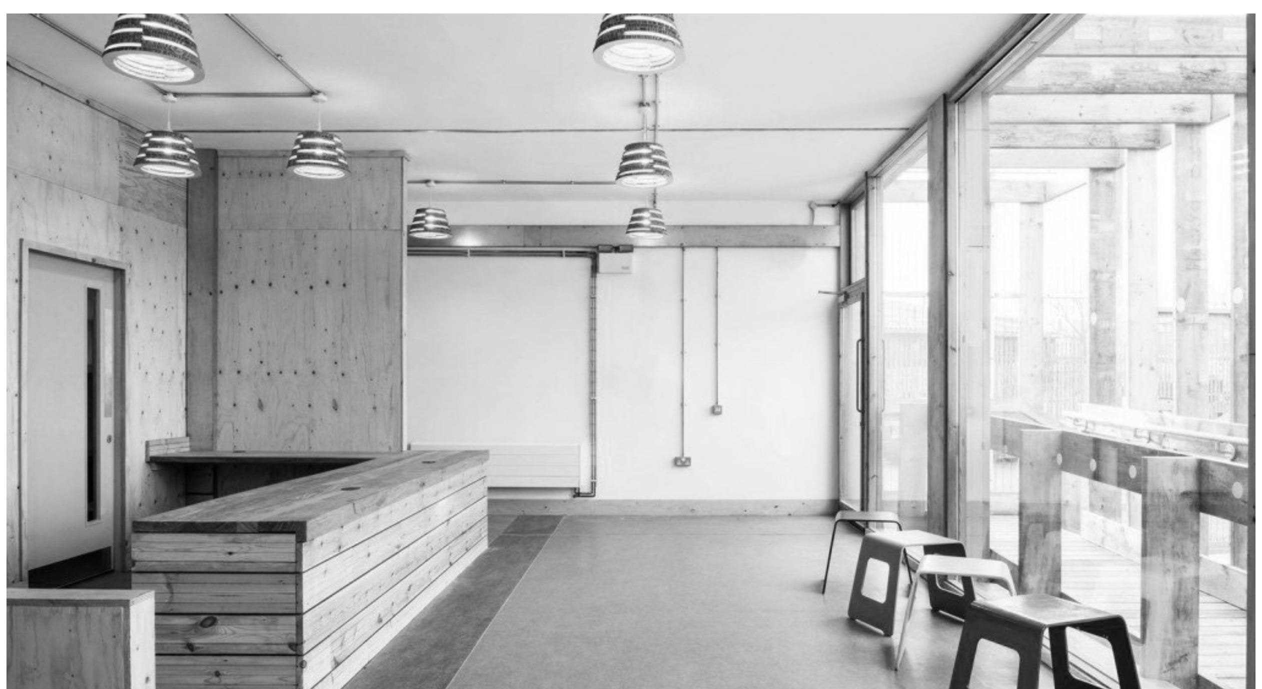


Figure 25: Hub 67
Sourced from: https://inhabitat.com/hub-67-lyn-atelier-builds-a-colorful-community-center-from-recycled-materials-from-the-london-olympics/hub-67-lyn-atelier-8/

Figure 26: Hub 67
Sourced from: https://inhabitat.com/hub-67-lyn-atelier-builds-a-colorful-community-center-from-recycled-materials-from-the-london-olympics/hub-67-lyn-atelier-8/

4.3 Hub 67

LYN Atelier designed the community center HUB 67 in London out of 80% re-used materials sourced on site from London's 2012 Olympic and Paralympic Games. It is designed to last 5 years, after which it is meant to be deconstructed and the materials are to be re-used elsewhere.

Figure 27: Repurposed Cabin
Sourced from: https://mymodernmet.com/nick-olson-lilah-horwitz-glass-cabin/

Figure 28: Repurposed Cabin
Sourced from: https://mymodernmet.com/nick-olson-lilah-horwitz-glass-cabin/

Figure 29: Repurposed Cabin
Sourced from: https://mymodernmet.com/nick-olson-lilah-horwitz-glass-cabin/

4.4 Repurposed Cabin

Located in West Virgina, this micro cabin cost its designer/owners $500. The cabin's materials were salvaged from a nearby barn, featuring a large wall of repurposed windows. The purposed of the window wall was to position the users amongst nature and take advantage of the view.

05 Log Cabin - [Program]

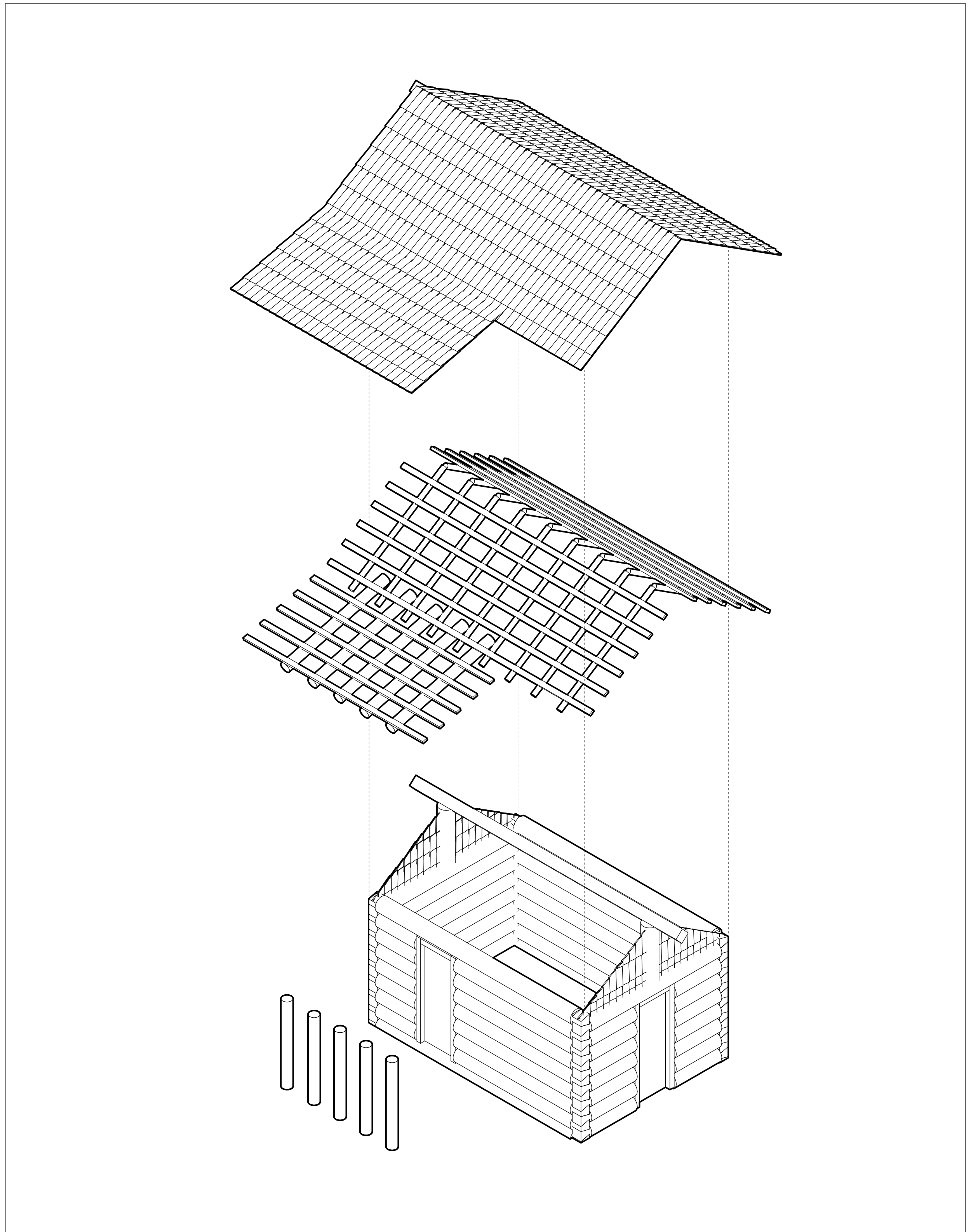


Figure 30: Exploded axon - typical log cabin
Own graphic

Chapter 5: Log Cabin - [Program]

5.1. Material Use

"To choose to live in a cabin is to give up all ties to the consumer society, since any self-respecting cabin has neither water nor electricity and its furniture is limited to a table, a chair, a stove, a kettle, a Lilliputian-sized burner. But the interior may be basic, the exterior demonstrates an unheard-of variety of materials. The favorite is wood: logs, branches, storage pallets, builders' timber, railway sleepers, flotsam and jetsam. Then there is corrugated iron for the roof or for the whole construction, with empty petrol-cans to block up the holes. Or cardboard, corrugate paper, tarpaulin, oilcloth, plastic, bits of cars, buses or trams, salvaged doors and windows, earth, clay, mud, cob, palm, fern, broom, gorse, ivy, cane, bamboo, wire mesh, and the lids of metal boilers."[75]

- Marie-France Boyer

Theoretical cabin research describes the making of a log cabin as a collection of found materials; a practice of bricolage. Fortunately for the pioneers in Canada, and particularly British Columbia, the most convenient found materials came from the plentiful forest surrounding their homesteads. Wood as a material, and the inherent properties of the tree species available, contributed to creating the Log Cabin as a Typology in Canada.

5.1.1. Wood – A Plentiful Resource

The early economy and growth of Vancouver and New Westminster depended on the timber industry to create what we recognize today as the Lower Mainland. The exporting of BC's timber worldwide continues to fuel our economy in today's market. BC Mill Timber and Trading Company had a large role in shaping the timber industry. Started in 1889 by the pioneer and lumberjack John Hendry, BC Mill Timber and Trading was the largest lumber manufacturer in BC with mills in New Westminster, Hastings (Vancouver) and North Vancouver. Despite the fact that BC is still the largest producer of softwood in North America, the logging and lumber industry has changed dramatically since the days of BC Mill Timber and Trading Company. Although old-growth/first-growth forests are now treated as protected parks, they once were the backdrop to BC's landscape, ripe for the picking. The lumber industry today survives off second growth forests and emphasises the importance of sustainable forest management and resource extraction.

Old Growth Forests

Old-growth forests spur a dichotomy of progress and conservation. The sad truth that less than 10% of BC's forested areas are old-growth becomes clouded by the very purpose of architecture: to continue to build. Most of what is experienced in British Columbia's landscape today is second growth, yet when the log cabin typology was migrating West and acclimatizing to British Columbia, Old Growth was plentiful. Despite the over-logging of BC's old-growth forests, it did give birth to the log cabin. The unique characteristics of old-growth wood informed

75 Boyer, Marie-France. Cabin Fever: Sheds and Shelters, Huts and Hideaways. Thames and Hudson, London, 1993.

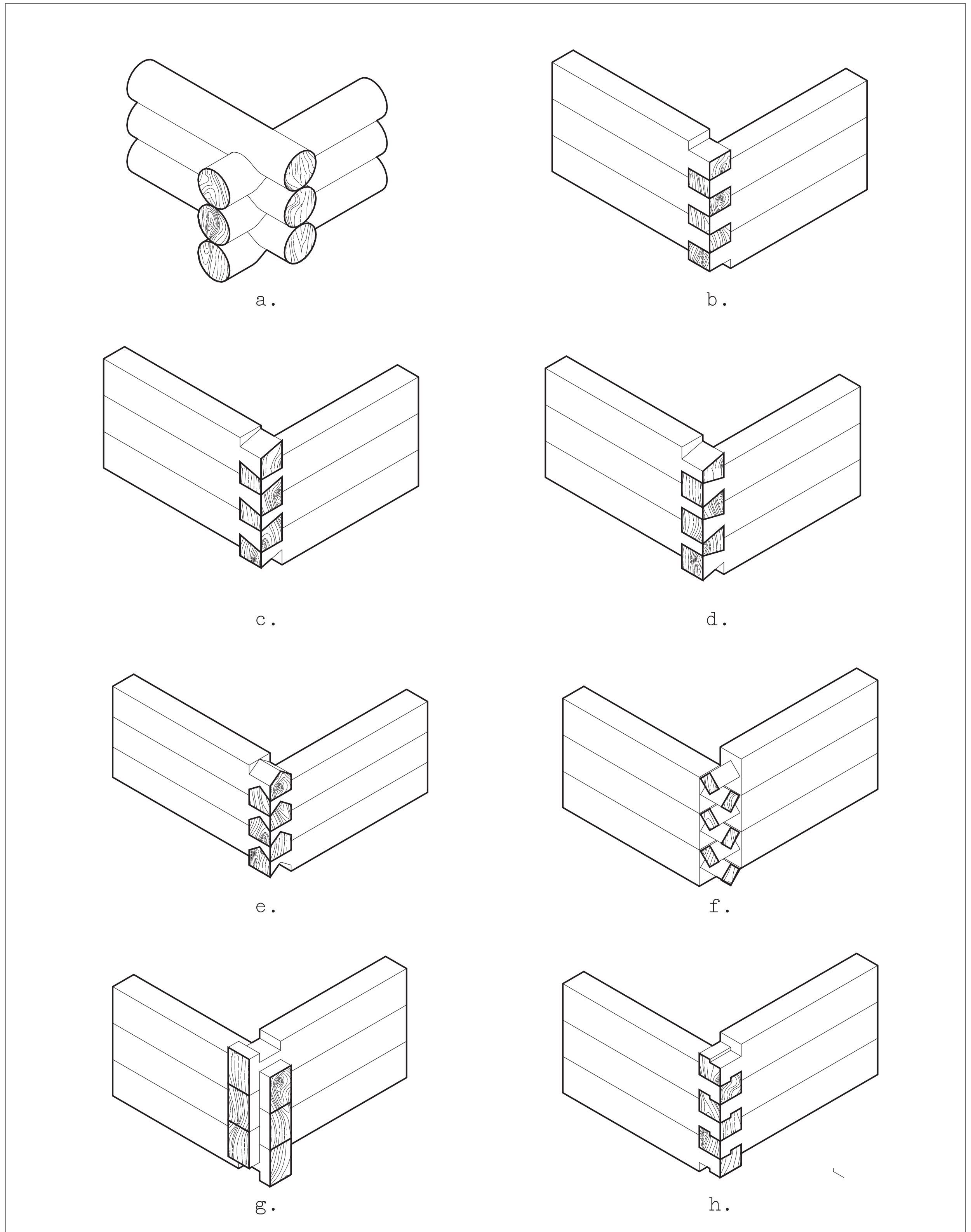


Figure 31: Log Cabin notch details
a. saddle notch b. square notch c. half dovetail notch d. dovetail notch e. V notch f. diamond notch g. lock notch h. tooth notch
Own graphic

the construction techniques used by the early pioneers. Tall and straight trunks from old-growth trees provided the ideal building materials for the pioneers. Once the tree was stripped or hewn, the archetypical log dimension was 12-14" square or diameter.[76] These dimensions and characteristics were easy to come by in old-growth forests, but this type of log is rarer to locate in a second-growth forest. The width of the log combined with the skill of craftsman contributed to the airtightness and thermal mass, and therefore the energy efficiency of the cabin.

Species Available & Their Properties

Softwoods such as pine, spruce and western red cedar were used by pioneers to construct early log cabins. According to Daniel Beard in Shelters, Shaks, and Shanties, cabins built with harder woods such as yellow pine will seldom be made as tight as one built with first-growth spruce trees.[77] Choosing pine could result in cracks between logs, which would require mudding to prevent breezes. At Pioneer Log Homes in British Columbia they exclusively use western red cedar to build log homes because of natural properties including oils and resins which repel insects and prevent decay. Additionally, the western red cedar grows very tall with a straight grain, contains less moisture when cut, and takes less time to completely dry out than other species.

5.1.2. The Log as an Incremental Module

The process of selecting and preparing the logs became more refined as the community grew and skills developed. Trees were selected for log cabins based on straightness and smoothness of their trunks, as well as a generally uniform diameter. The builder would select trees from the same species for at least the four walls of the cabin frame. Log cabins were 12'-15' long, measured by the handle of the axe.[78] Bark was sometimes stripped from the log to prevent what Daniel Beard describes in the log cabin field guide Shelters, Shacks, and Shanties as: "inviting fibrous and threadlike cousins of the toadstool to grow on the damp wood and work their way into its substance."[79] He explains that: "The bark also shelters all sorts of boring insects and the boring insects make holes through the logs which admit the rain and in the end cause decay, so that the first thing to remember is to peel the logs of which you propose to build the cabin."[80] The builder would lay out the logs and notch the ends to secure a connection without the aid of fasteners. Different notch techniques immigrated along with the pioneers from the European version of the log cabin. Common notching types include Saddle notch, Square notch, Diamond notch, V-notch, dovetail, half dovetail, Double notch, and Tooth notch.[81] Selection of notch type was based on cultural traditions, species of wood available, skill of the builder, and, most importantly, time. Next, a foundation of fieldstones or earth provided the base for the first four logs. Walls were built up by stacking the logs on top of each other, creating a structural connection through the corner notches. Jennifer Vollard explains in Cabin Fever that: "Each log was held in place by its own weight, reinforced by the weight of the log above and supported by the log below."[82]

The Log Wall: A Typology

76 Beard, Daniel C. Shelters, Shacks, and Shanties. C.Scribner's sons, New York, 1914.
77 Beard, Daniel C. Shelters, Shacks, and Shanties. C.Scribner's sons, New York, 1914.
78 Volland, Jennifer M, Bruce Grenville, Stephanie Rebick. Cabin Fever.Vancouver Art Gallery, Vancouver, Canada, 2018.
79 Beard, Daniel C. Shelters, Shacks, and Shanties. C.Scribner's sons, New York, 1914.
80 Beard, Daniel C. Shelters, Shacks, and Shanties. C.Scribner's sons, New York, 1914.
81 Hoagland, Alison K. The Log Cabin: An American Icon. University of Virginia Press, Charlottesville, 2018.
82 Volland, Jennifer M, Bruce Grenville, Stephanie Rebick. Cabin Fever.Vancouver Art Gallery, Vancouver, Canada, 2018.

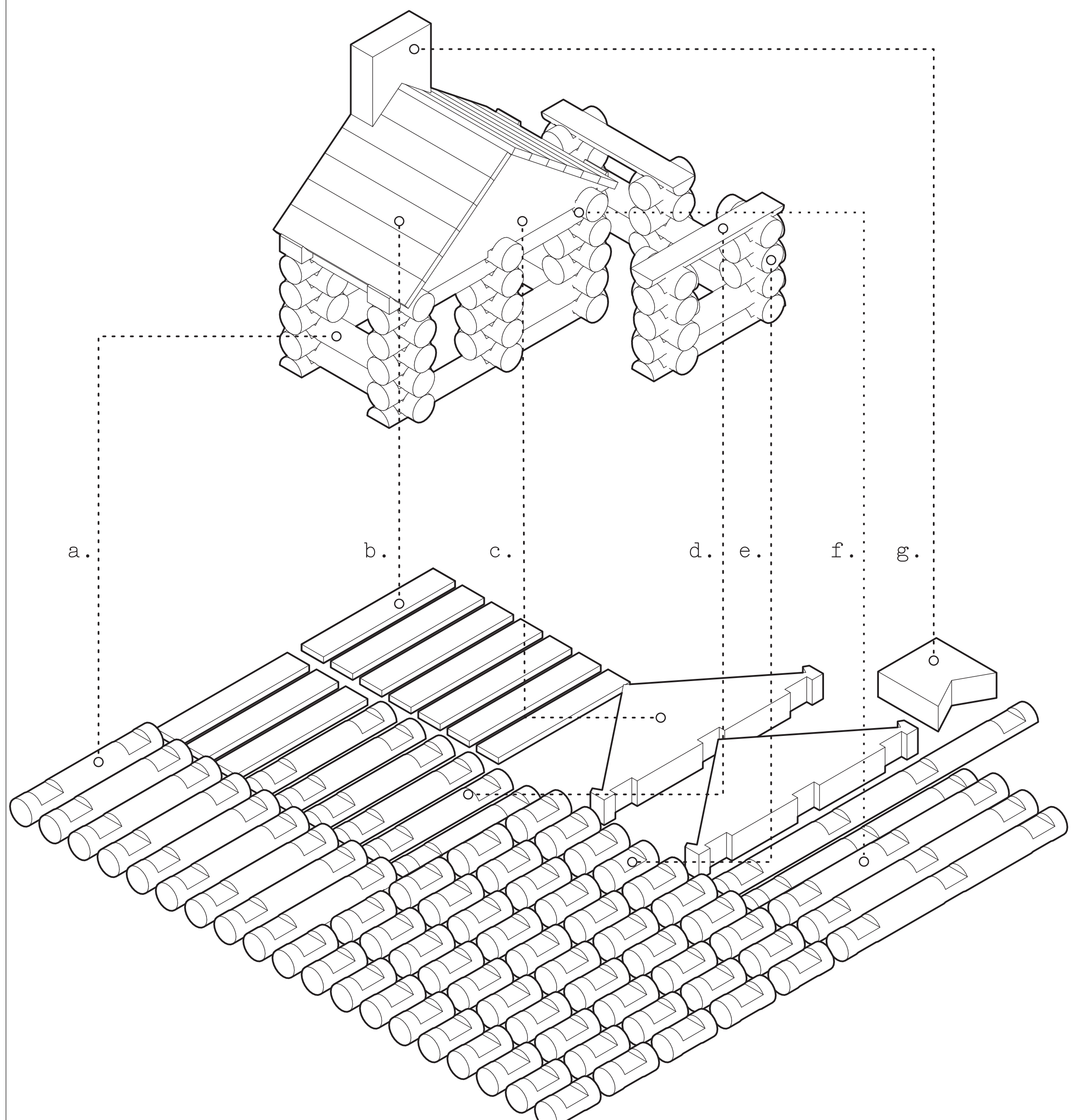


Figure 32: Lincoln Log deconstruction
a. 2 notch log b. roof rafter c. roof gable d. flat 2 notch log e. 1 notch log f. 3 notch log g. chimney
Own graphic

Walls making up log cabins were primarily exterior walls, as space was limited and privacy was not a priority. The exterior walls of a log cabin were meant to be structural and to improve living conditions and environmental comfort for its occupants. The typology of the log wall was of utmost importance to the pioneers; it provided basic shelter, made use of a plentiful resource, and allowed for development of skill and cultural expression. Cabin builders could either maintain the round profile of the log or hew the logs to a square or rectangular profile; either way, both were considered “log cabins”. Some argue a hewn log is timber, and only considered a log when used in a horizontal, notched construction.[83] As mentioned previously, bark was often stripped to preserve the logs, yet it was sometimes left on in a very expedient structure. The straightness of the tree trunk selected and the skill of the craftsman determined the need for chinking between the logs. Chinking is the process of filling the spaces between the logs to create a degree of air-tightness and weather proofing for the cabin. It included the use of pieces of wood or stones wedges into the gaps between then logs, then caulked with moss, wet clay, or even animal hair. Chinking was required mostly when using whole round logs to fit between the imperfectly straight logs. But, if a craftsman wasn’t apt at hewing, chinking was necessary to fill the gaps.

Lincoln Logs: An Architectural Toy

The caricaturing of the (American) log cabin by toys such as Lincoln Logs emphasized its creation as a typology. Created in 1917 by John Lloyd Wright, the son of Frank Lloyd Wright, the children’s toy embodied the aesthetic of the pioneer log cabins and accentuated the modularity of the log. Jennifer Vollard writes in Cabin Fever that “toys invariably reveal assumptions made by adults about the culture in which they live of the values they think desirable”.[84] The political push at the time for a simpler life and his father’s use of interlocking wood in his reconstruction of Tokyo’s Imperial Hotel highly influenced the generating of Lincoln Logs. This romanized version of the cabin typology revered the pioneer settlement and log cabins as an icon for America’s democratizing liberation. America was deep into WWI when the toy was created, and Wright was embodying a simpler time that spoke to his country’s unique heritage. Political influences and agendas aside, Lincoln Logs are still popular with children today, and the toy generates up to $1 million in sales annually. The logs are ¾” in diameter and 1 ½” – 7 ½” long, and were scaled to represent the dimensions of logs in a real life cabin. The toy was originally made out of western red cedar. The manufacturer briefly attempted to make sets out of plastic, yet the backlash forced them to return to wood. Lincoln Logs are made to resemble whole round logs and use the double-notch to secure a connection at the ends. Beginner sets come with the pieces to construct a basic log cabin, allowing for children to learn the basic structural concepts and efficiency of a log cabin design. Similar to a real log cabin, the double-notched ends that interlocked these children’s creations allow for a sturdier structure than regular building blocks. The toy’s marketing in 1923 read: “Lincoln Logs: Interesting Play Things Typified ‘The Spirit of America’”.[85]

5.2. History

5.2.1. Early Cabin History in North America

“The log cabin is something special, it exists in other places in the world, but nowhere else but

83 Volland, Jennifer M, Bruce Grenville, Stephanie Rebick. Cabin Fever.Vancouver Art Gallery, Vancouver, Canada, 2018.
84 Volland, Jennifer M, Bruce Grenville, Stephanie Rebick. Cabin Fever.Vancouver Art Gallery, Vancouver, Canada, 2018.
85 Hoagland, Alison K. The Log Cabin: An American Icon. University of Virginia Press, Charlottesville, 2018.

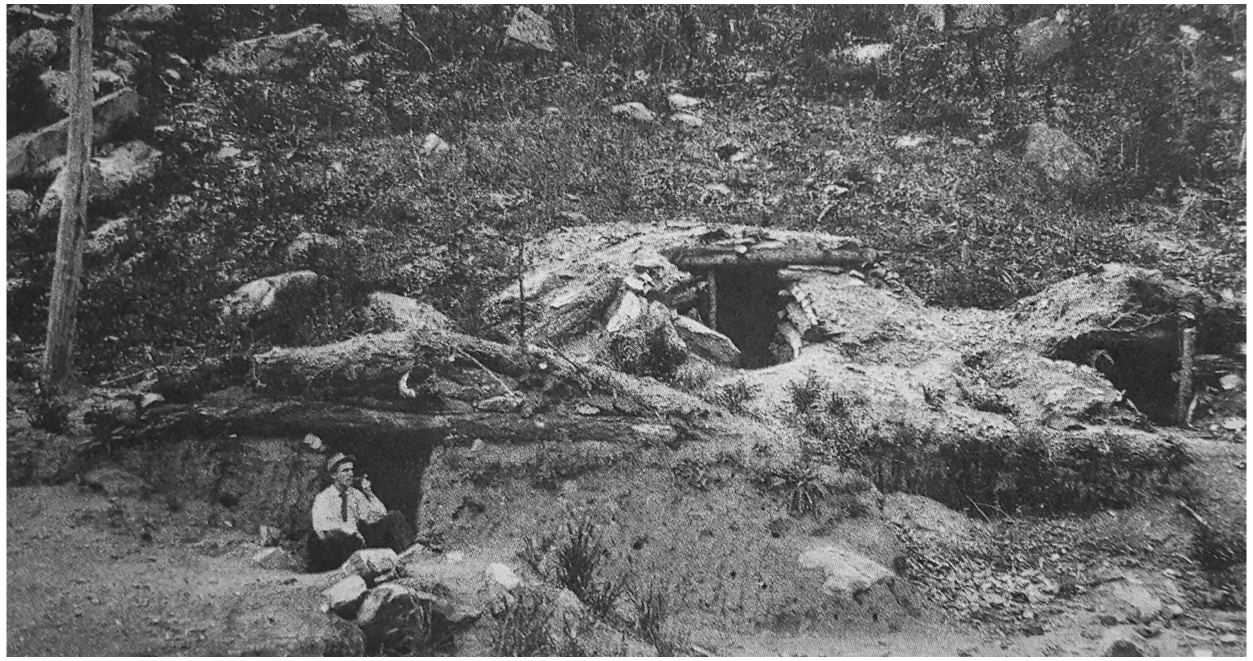


Figure 33: English settler earthen dug-outs
Sourced from: Belonsky, Andrew. The Log Cabin: An Illustrated History. The Countryman Press, a division of W.W. Norton & Company, New York, NY, 2018.

Figure 34: German settler log cabin
Sourced from: Belonsky, Andrew. The Log Cabin: An Illustrated History. The Countryman Press, a division of W.W. Norton & Company, New York, NY, 2018.

America is it as elemental, as much a cultural force."[86]

History paints a picture of the English having a drastic influence over the development of cabin typology in North America during early migration from England to the East Coast of Canada and America. Yet, this is not the case: the architectural typology of the log cabin that originated in Northern Europe migrated with early Finnish, Swedish, and German immigrants. In 1638, early Swedish and Finnish immigrants were deployed to colonize present day New Jersey. The Swedes and Finns adapted their native vernacular to the "New World" and utilized the surrounded spruce, pine, and oak to recreate the log cabins they were accustomed to building at home in Northern Europe.[87] These structures were built hastily and did not employ the craft that the Scandinavians were known for. Despite their rugged appearance, these log cabins were considered an extreme advancement in environmental comfort compared to the earthen dug outs the English were residing in.[88] Few Englishmen learned from the Swedes and Finns, and instead resided in houses made from clapboard siding. They associated the typology of the cabin with poverty, lower class, and the Swedes and Finns who they overtook in 1655. As Andrew Belonsky puts in The Log Cain: An Illustrator History: "Custom, it seems, trumped comfort."[89] Later, in 1710, a large immigration of Germans arrived in America and reintroduced the typology of the cabin. The Germans were accustomed to living in a similar wooded landscape and resorted to the familiar method of modest building. In 1717 another flood of immigrants poured into America: the Scots-Irish. Unlike the English, they were happy to embrace the log cabin, and their vast numbers and hunger for cheap land helped spread the typology. The first generation of immigrant cabins were distinct to each culture. As time passed, the following generations lived in cabins that amalgamated cultural features and looked more to function and personal skill to determine the cabin's aesthetic and form. Eventually as the homestead laws drove settlers West, a unique "American character" emerged in the blended aesthetic of the immigrant's cabins, creating the recognized American log cabin.

5.2.2. Early Pioneer and Settler Homes

Government & Homesteader Acts

By the mid 1800s the American government intervened with the unofficial claims to land and developed bills such as Indiana's "Log cabin bill", which allowed settlers to take up to 320 acres on credit per the condition they "cultivate" it and "raise a log-cabin thereon."[90] The Homestead Act of 1862 dramatically shaped the landscape and spread the cabin typology further West. The Act prioritized fostering of the pioneer mentality and disregarded the Indigenous peoples who had lived on the lands for thousands of years. The act stated that:

"Any person that headed a household or was at least 21 years of age – including newly arrived immigrants, single women and formal slaves – to claim a 160-acre parcel of land. Upon paying a filing fee of $18, homesteaders were required to live, build a home or cabin, and farm and improve the land for five years to be eligible for legal possession."[91]

86 Belonsky, Andrew. The Log Cabin: An Illustrated History. The Countryman Press, a division of W.W. Norton & Company, New York, NY, 2018.
87 Belonsky, Andrew. The Log Cabin: An Illustrated History. The Countryman Press, a division of W.W. Norton & Company, New York, NY, 2018.
88 Belonsky, Andrew. The Log Cabin: An Illustrated History. The Countryman Press, a division of W.W. Norton & Company, New York, NY, 2018.
89 Belonsky, Andrew. The Log Cabin: An Illustrated History. The Countryman Press, a division of W.W. Norton & Company, New York, NY, 2018.
90 Horace Greenly, in Robert C. Williams, Horace Greenly: Champion of American Freedom. New York: New York University Press, 2006.)
91 Volland, Jennifer M, Bruce Grenville, Stephanie Rebick. Cabin Fever.Vancouver Art Gallery, Vancouver, Canada, 2018.

Similarly, in Canada, the Dominion Lands Act of 1872 was modeled off the American Homestead Act. The Canadian government entered into treaties with Indigenous peoples in Western Canada to populate the land with settlers, ultimately creating irreversible effects on the Indigenous communities. These homestead cabins were built quickly and cheaply; they were thought of as temporary structures until the family had more time and money. The Homestead Act specified:

"A minimum of ten by twelve feet and one glass window; most were a single room that served as the kitchen, dining, living, sleeping and working quarters."[92]

5.2.3. History in Western Canada

In Canada, the geography of settlement was the same as in America – initial settlements along the East coast gave way to eventual movement West with the promise of more land. Horizontal log construction was common in Quebec from the 1750s to the late 1800s. Eventually settlements developed in Red River, Manitoba, as early as 1813 and employed the construction techniques seen in early Quebec log houses. The French Canadian builders who worked for the Hudson's Bay Company spread West with the fur trade and brought their building techniques. Known as the Red River or Hudson's Bay style, the log cabins had hewn logs without notched corners.[93] This allowed for quick and unskilled construction that accommodated future expansion. As the pioneers moved to the great plains of Saskatchewan and Alberta, the natural resources did not lend themselves to log cabins, and sod houses were more appropriate. Regardless, the pioneers adhered to their known methods and relentlessly built log cabins throughout the prairies.

From Craft to Crude – An un-refinement of building skills

The craft that was imported with Swedish, Finnish, and German immigrants to the East coast diminished as the pioneers moved West. The existing settlements in the East provided a community to help build a log cabin and allowed for family support. Log cabin techniques were developed, and craftsmen's skills were honed. Migrating West meant pioneers were claiming large parcels of land and managing with solely their nuclear family to depend on. Structures had to be erected quickly to provide shelter from the elements and often needed to be fabricated and assembled by the man of the family and his eldest children. These pioneers viewed their initial log cabins as temporary and envisioned a more permanent house being built when money and time permitted.

Log Cabins – Temporary Structures

"The log cabin was by-and-large an interstitial abode meant to be abandoned when better accommodation could be afforded. The structure would then be dismantled for firewood, converted into a barn or corncrib, or simply left to rot."[94]

The cabin as a typology was seen by its occupants as something to be replaced, not something to be protected and treasured. Nostalgia and cabin romanticism has prolonged the log

92 Volland, Jennifer M, Bruce Grenville, Stephanie Rebick. Cabin Fever.Vancouver Art Gallery, Vancouver, Canada, 2018.
93 Hoagland, Alison K. The Log Cabin: An American Icon. University of Virginia Press, Charlottesville, 2018.
94 Hoagland, Alison K. The Log Cabin: An American Icon. University of Virginia Press, Charlottesville, 2018.

cabin's lifetime, in a way not originally intended by the pioneers. Log cabins were, as Dwight described in 1798 "universally intended to be a temporary habitation, a mere retreat from the weather, till the proprietor shall be able to build a better."[95] In addition to some log cabins being converted into barns, others were deconstructed and the timber members moved with them as they explored West.[96] Sill others were added onto, enhancing comfort with a wooden plank floor or augmenting the footprint with renovations. Compared to stone construction, wood naturally lends itself to a temporary nature, with the inevitable rot always silently threatening. As settlements became towns, log cabins were replaced by brick buildings; the log cabins served their purpose as a temporary architectural stepping stone.

The Log Cabin – An Enduring Nostalgia

As more settlers arrived in the West, lumber mills became established, and the lands became deforested. The concept of a log cabin no longer made economic sense; using whole logs to construct a basic shelter became cost prohibitive and inefficient. With the introduction of fasteners such as nails, the technology of balloon-framed wood houses spread throughout North America. These boxed houses were constructed from milled lumber, planks surrounding framing replaced the function of the whole logs.

Although log cabins proved to be inefficient and too demanding on resources as technology provided more functional and economic alternatives, the typology persisted. In post-war North America, middle-class families began to have an unprecedented quality of life that allowed for a second home. From 1950 onwards, cabins began reappearing along lake shores all over Canada and the US. Although technology in the construction industry had advanced so that the vernacular typology of the log cabin was no longer necessary, it was in fact desired. Qualitative adjectives such as cozy, rustic, and natural were sought when acquiring a cabin in the woods for your family to enjoy on vacations. In Chapter 6: White Lake – Site and Site Analysis, site photos of the existing Saucier cabin show that the typical log cabin typology was pursued, even in 1976.

"You're Really Living When you Have TWO Homes"

The luxury of a second home calls to question points raised in Chapter 2: Material Reuse. If the first step of sustainable design is to Reduce, then a second home achieves the exact opposite. Many cabins built today are a manifestation of excess and middle-class wealth. This positions the log cabin as the perfect typology to spatialize this thesis's field of inquiry and project approach. The proposed exploration of material reuse exposes conventions of today's construction industry and culture. This thesis takes a typology that has morphed into a modern-day indulgence and questions the disposable approach society has bestowed upon materials.

Chapter 6: White Lake - [Site + Site Analysis]

95 Hoagland, Alison K. The Log Cabin: An American Icon. University of Virginia Press, Charlottesville, 2018.
96 Hoagland, Alison K. The Log Cabin: An American Icon. University of Virginia Press, Charlottesville, 2018.

06 White Lake - [Site + Site Analysis]

White Lake	
Location + Size	
Location:	British Columbia, Canada
Nearest City:	Salmon Arm
Coordinates:	50°53′20″N 119°15′51″W
Access Via:	Trans Canada Hwy + White Lake Rd.
Size	660 acres
Dimensions:	4km long x 1km wide
Elevation:	1542 ft.
Population Data	
Established:	1965
Population:	656
Private dwellings:	321
Avg. Household Size:	2.5
Population density/square km:	37
Avg. Total Income:	$36,609
Climate + Biodiversity:	
Bio geoclimatic Ecosystem Classification (BEC) Zone:	Interior Cedar – Hemlock (ICH) + Englemann Spruce – Subalpine Fir (ESSF)

Common Tree Species:	Western Red Cedar Spruce Western Hemlock Douglas-fir Paper Birch Black Cottonwood
Rare and Fragile Plants:	Loesel's liparis (Liparis loeselii) Giant helleborine (Epipactis gigantea) Yellow lady's slipper (Cypripedium parviflorum) Mountain lady's slipper(Cypripedium montanum)
Endangered Species:	Western Painted Turtle (*Chrysemys picta bellii)*
Community / Culture + Government:	
Governing Body:	BC Parks + Columbia-Shuswap Regional District
Primary Language:	English
Secondary Language:	German
Indigenous Peoples:	Secwepemec First Nations peoples (Shuswap First Nation) Little Shuswap, Adams Lake and Neskonlith bands
Archeological Sites:	2 - EfQt5, EfQt6
Amenities:	Community Hall, Fire Hall, Marina, campgrounds, and community based park
Popular Recreation:	Fishing Rainbow Trout and Ice Fishing

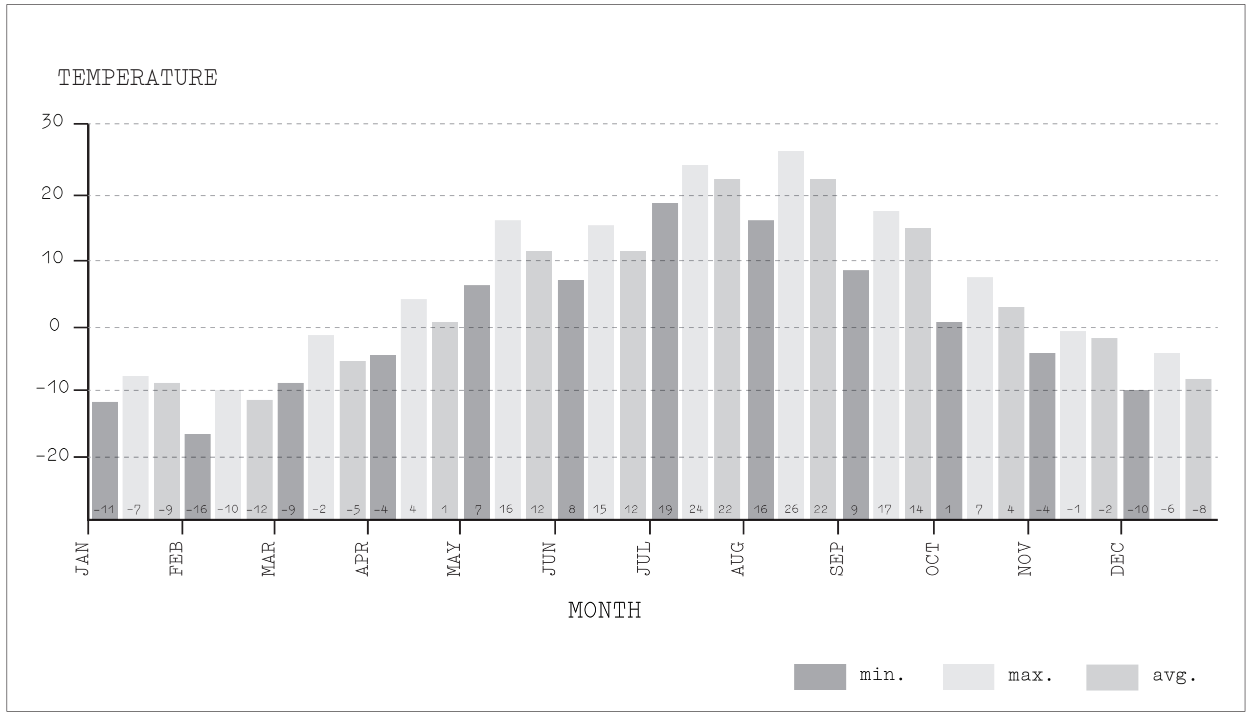


Figure 35: Annual White lake temperature
Own graphic

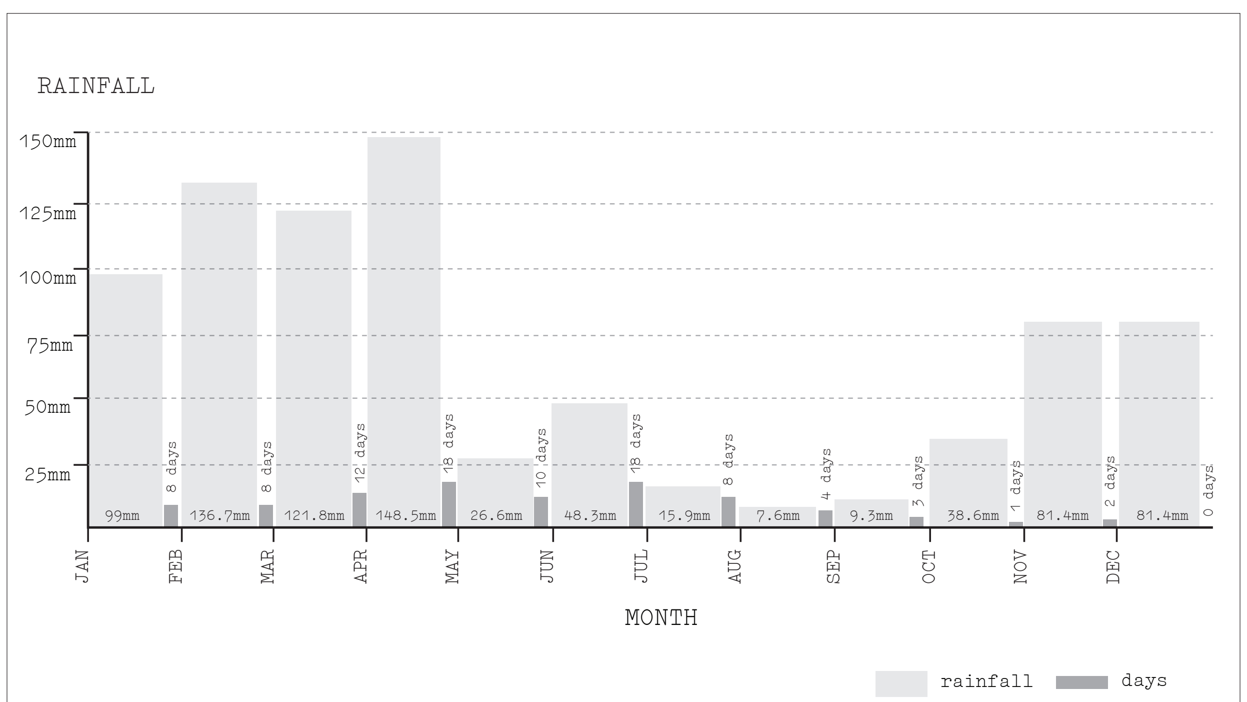


Figure 36: Annual White lake rainfall
Own graphic

6.1 General

Nestled between two arms of the Shuswap Lake, White lake is known for Rainbow Trout Fishing and Ice Fishing in the winter. One of the top three fishing lakes in BC, many attribute the success of its fishing to the lake shoal shores which makes up over 100 acres of shoal. Shoal is prime breeding ground for aquatic bugs, which is the main source of food for trout.

6.2 Climate

Weather data is recorded from the closest location of historically recorded data, which is Sorrento, BC. Sorrento, BC is only 16km from White lake, but is located on the Shuswap lakes that foster a slightly different climate than the Project Location. Sorrento, BC, also sits at 1299 ft elevation, which is 243 ft below the elevation of White Lake. Although recorded highs in July are 24° and in August are 26°, these are not reflective of the temperatures experienced at White Lake. White Lake is elevated above the Shuswap lakes within a carved-out valley. This valley tends to trap the heat and therefore temperatures up to 31° can be experienced in July and August. The particular project location has remained relatively wooded, which provides enough shade to temper the high temperatures experienced during the summer. A drastic change is felt compared to neighbouring land, where the sites trees have been clear-cut. The surrounding yard has one large tree providing shade, therefore from 11am-2pm the current cabin gets warm without direct shade overheard. The surrounding shield of trees block out the majority of morning and afternoon sun to prevent overheating during those times.

6.3. Settler History

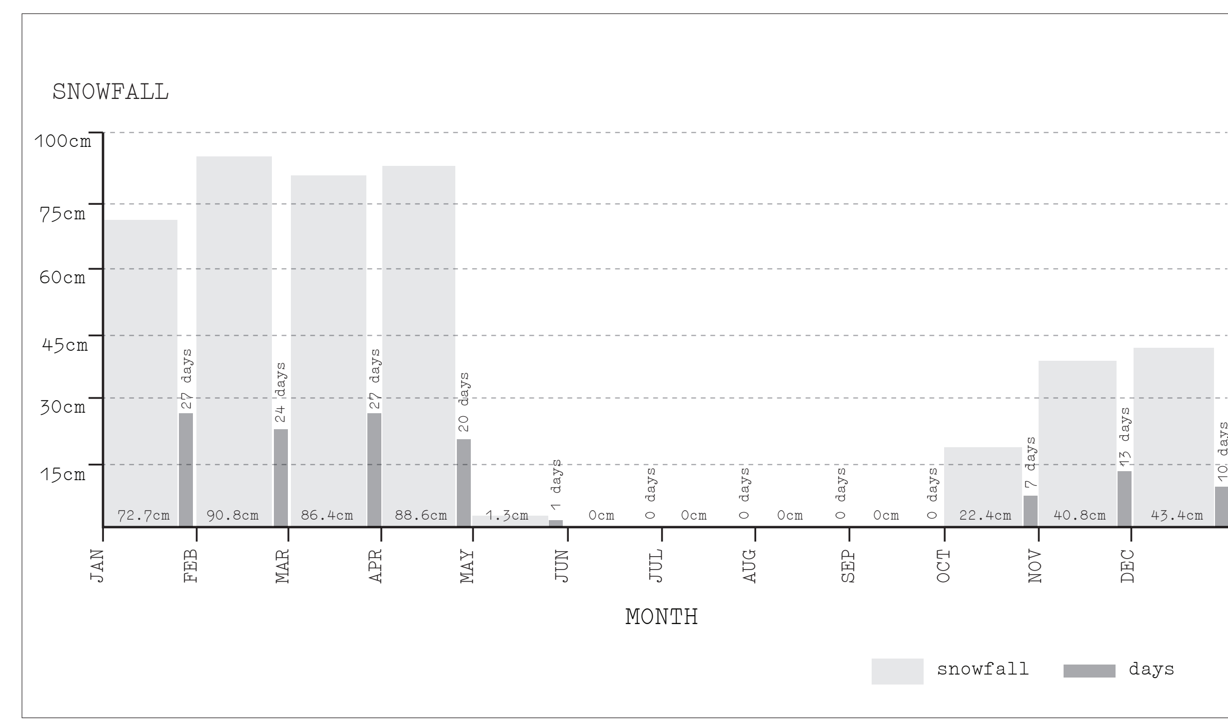


Figure 37: Annual White lake snowfall
Own graphic

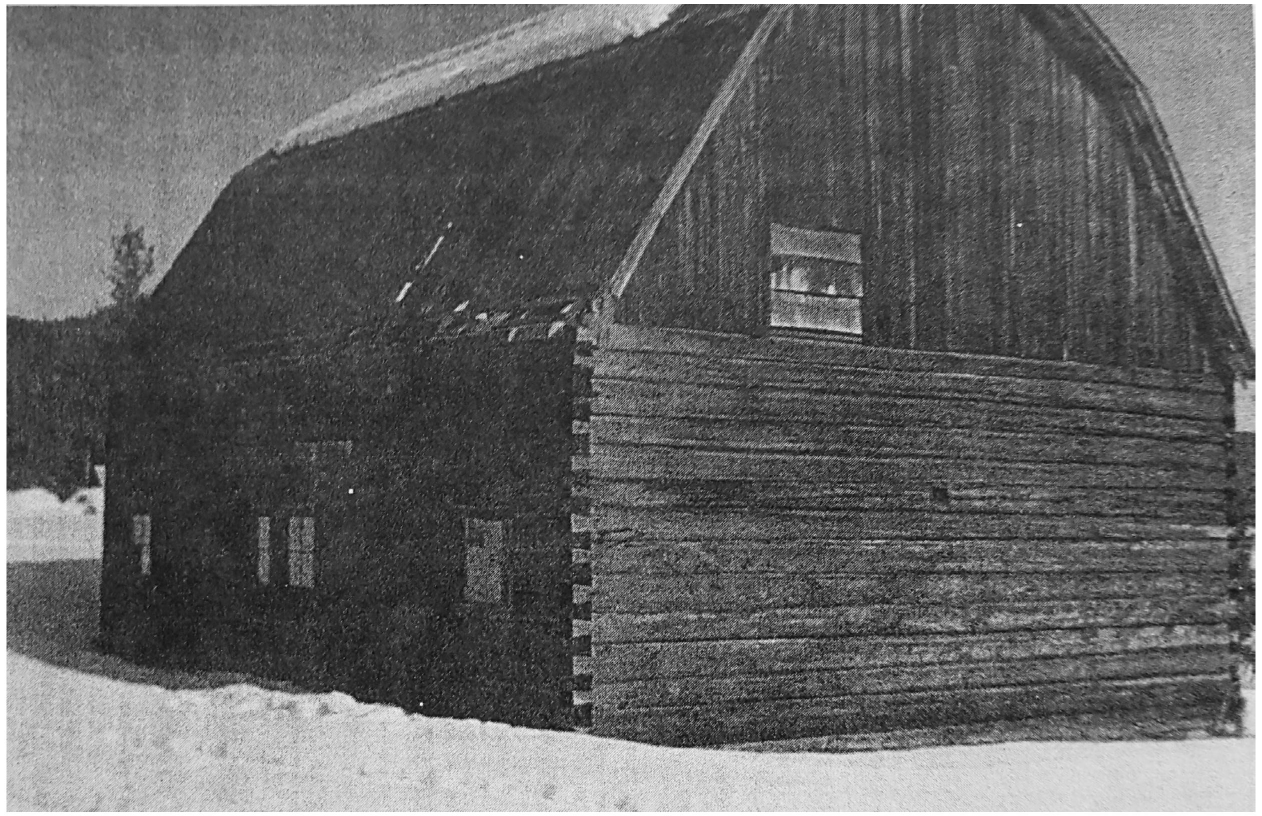


Figure 38: White Lake Koski wood barn
Sourced from: White Lake Pioneers: Milk Pails and Winding Trails

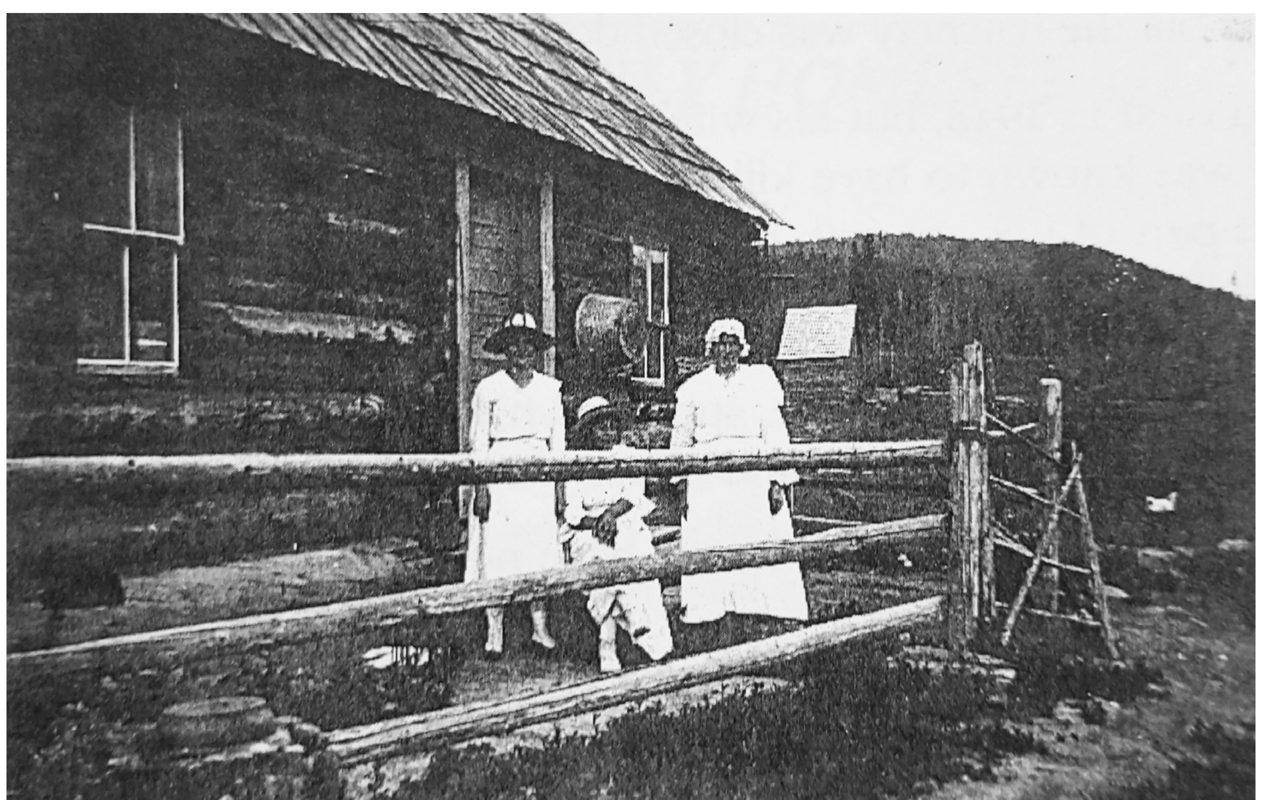


Figure 39: White Lake Osma homestead
Sourced from: White Lake Pioneers: Milk Pails and Winding Trails

This section contains research sourced from a local assemblage of White Lake family histories. All information is sourced from: "White Lake Pioneers: Milk Pails and Winding Trails"

In 1910 a group of young Finnish miners who had been making their home in Washington decided to try farming in British Columbia. Making inquiries in the land office in Kamloops, they were told of the land available in the White Lake area. At first sight, they fell in love with the area that reminded them so much of their homeland. Following this, the Finnish miners sent for their families to come join them in Canada. Each family took a quarter section of land and set about developing it. The first European families to settle the White Lake area were the Bergstroms, Rivers, Harjus, Makis, Karlsons, Hills, Kuoppalas, Koskis, Nayki, and Wests.

The Finnish men were initially disappointed to discover they couldn't file for a homestead, as the White Lake timber berth was held by a large timber company. Despite this, the settlers squatted on the land and illegally built temporary cabins for their families. Eventually, each settler was given the ability to stake out 40 acres under squatter's rights. According to "White Lake Pioneers: Milk Pails and Winding Trails" a forest fire roared through the area after the Finnish acquired the land and destroyed some of the best timber in the area, which forced the timber company to let the timber berth lapse. Legally, it wasn't until 1917 that White Lake was open to homesteads.

The Finnish settlers brought with them expert woodsmen skills, quickly clearing farmland from the dense bush and building log houses and surrounding outbuildings. Trees were felled and hewn by axe and used to build the log houses featuring dovetails corner details, also done by axe. Often all the lumber for the cabins was from on the homestead – the rafters, joists, and shakes all came off each family's stand of timber. The first evening for most settlers in the area was spent under a lean-to made of boards propped against the house of a neighbor, before eventually making their own humble log house. The architectural settlement was a slow process, beginning with a log cabin of one to three rooms; and often adding a lean-to, log barns, and sometimes even a chicken house. As the years went on and the settlement developed, the two-room log cabins gave way to larger homes and barns. When families had enough money, they would either add on to the existing building; or tear down the original and build anew. Some men in the settlement were particularly skilled with dovetail joints and would be asked to help on a neighbour's house. As money increased, interior detailing on larger houses would sometimes be finished by Finnish craftsmen living as far away as Eagle Bay Valley. Additionally, some cabins had summer kitchens that were set apart from the main house, and used for activities such as canning, cooking, and washing. It is reported that some of these original log cabins are still in the area, yet they have been re-clad with modern siding – maintaining the original logs yet covering them in contemporary siding. Large log houses cost around $100.00 to contract, including splitting of the shakes for the roof. Logs for larger houses were skidded from surrounding area via wooden flumes and axe-hewn. One settler, Ernest Koski built an earlier house at Engineer point. Once he secured land at White Lake, Koski disassembled the house, put it on a hand-built raft and floated it across the Shuswap Lake. Once on land, a truck transported it the rest of the way to their farm. The wood construction of the log cabins made them prone to fire, and unfortunately several families lost their homes due to devastating fires.

The families financially survived off farming in the summer months and the young farm men returned to work in the various British Columbia mines during the winter months. This left the women alone to tend to the houses and land. Children attended the log schoolhouse in Carlin until a schoolhouse was built in White Lake in 1915. The schoolhouse stood on the grounds now used as the White Lake Ball Park. The settler families depended on each other in the

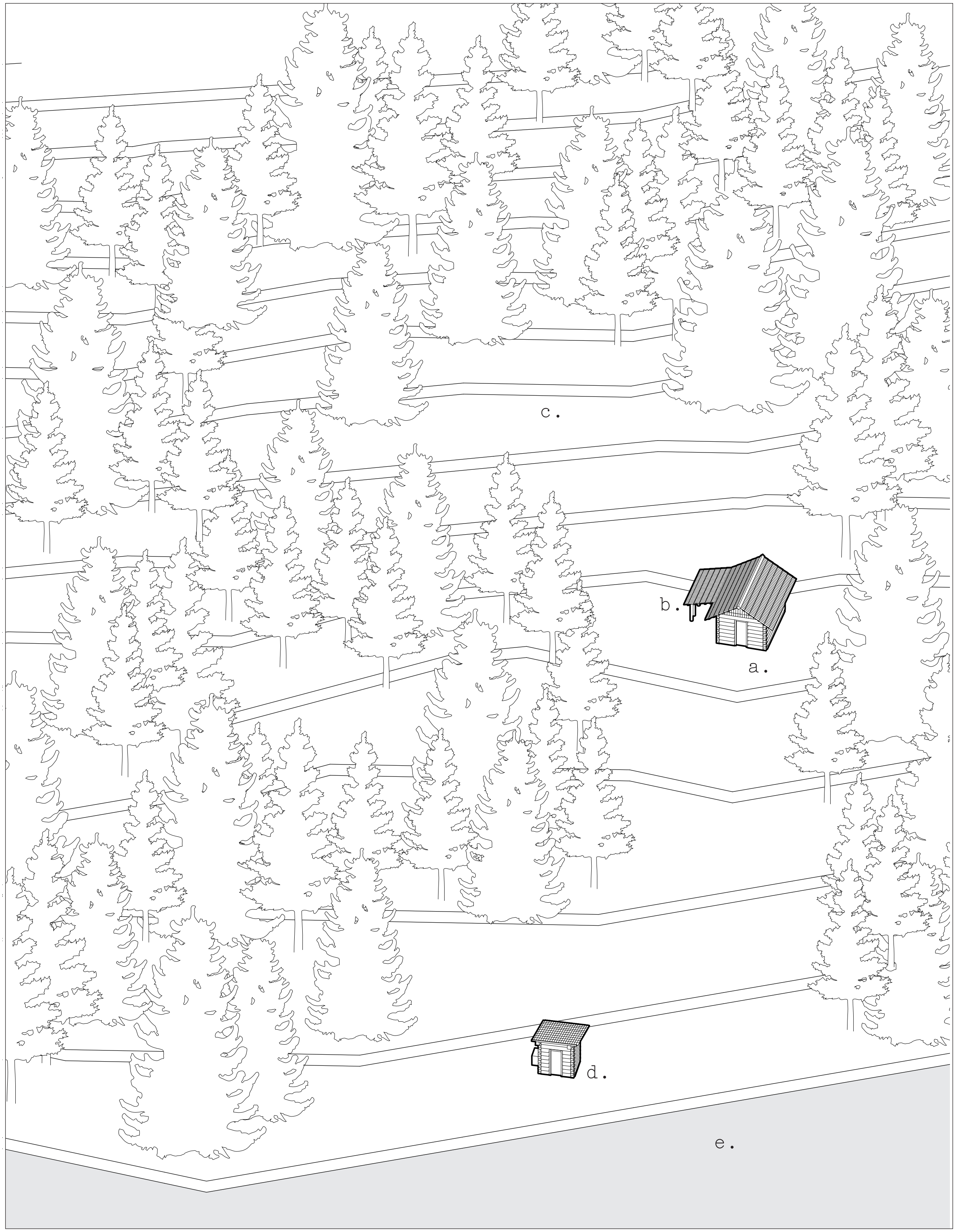


Figure 40: White Lake - typical location of building in relation to the lake
a. log cabin b. outdoor kitchen c. clearing d. sauna e. lake
Own graphic

winter months for companionship and support, often wading knee deep in the snow to visit a neighbour.

The closest store was 7km away in Balmoral, right off the TransCanada Highway. The original operator of the Balmoral store, W.W.Greer was helpful to the early pioneers and ensured they received provisions weekly, regardless of the weather conditions. There was also a store 13 km away in Blind Bay. Both the Blind Bay and Balmoral stores would trade groceries for farm produce the settlers grew on their homesteads. The pioneers would regularly walk to either of these stores when supplies were needed.

White Lake gets its name from the white, silty material lining the bottom of the lake. During settler years the lake bottom was mostly white. Today, only the shallow periphery remains white, where invasive lake weed is unable to grow. The pioneers built their log houses surrounding the lake, providing them access to water and fish. The lake also helped keep their Finnish tradition of sauna and bathing alive. In addition to the log house, each family built their own sauna house. The sauna building was built from axe-hewn logs from surrounding trees cleared for their homesteads. These buildings also featured the elaborate dovetail corner joints executed by axe as well. The sauna buildings featured the fireplace on the exterior, with a portal for rocks to be placed inside over the fireplace. Water from the lake would be thrown on the hot rocks to produce steam, and the Finnish pioneers would sit or lay in the sauna for an hour before running into White Lake for a cold plunge. The sauna process was a Saturday night ritual for the Finnish pioneers.

The early Finnish settlers were described as efficient famers and skilled woodsmen who contributed to the development of the White Lake area. Although White Lake is no longer a Finnish settlement, many descendants still live there, and roads such as Nayki Road are named after some of the earliest European families to settle the area.

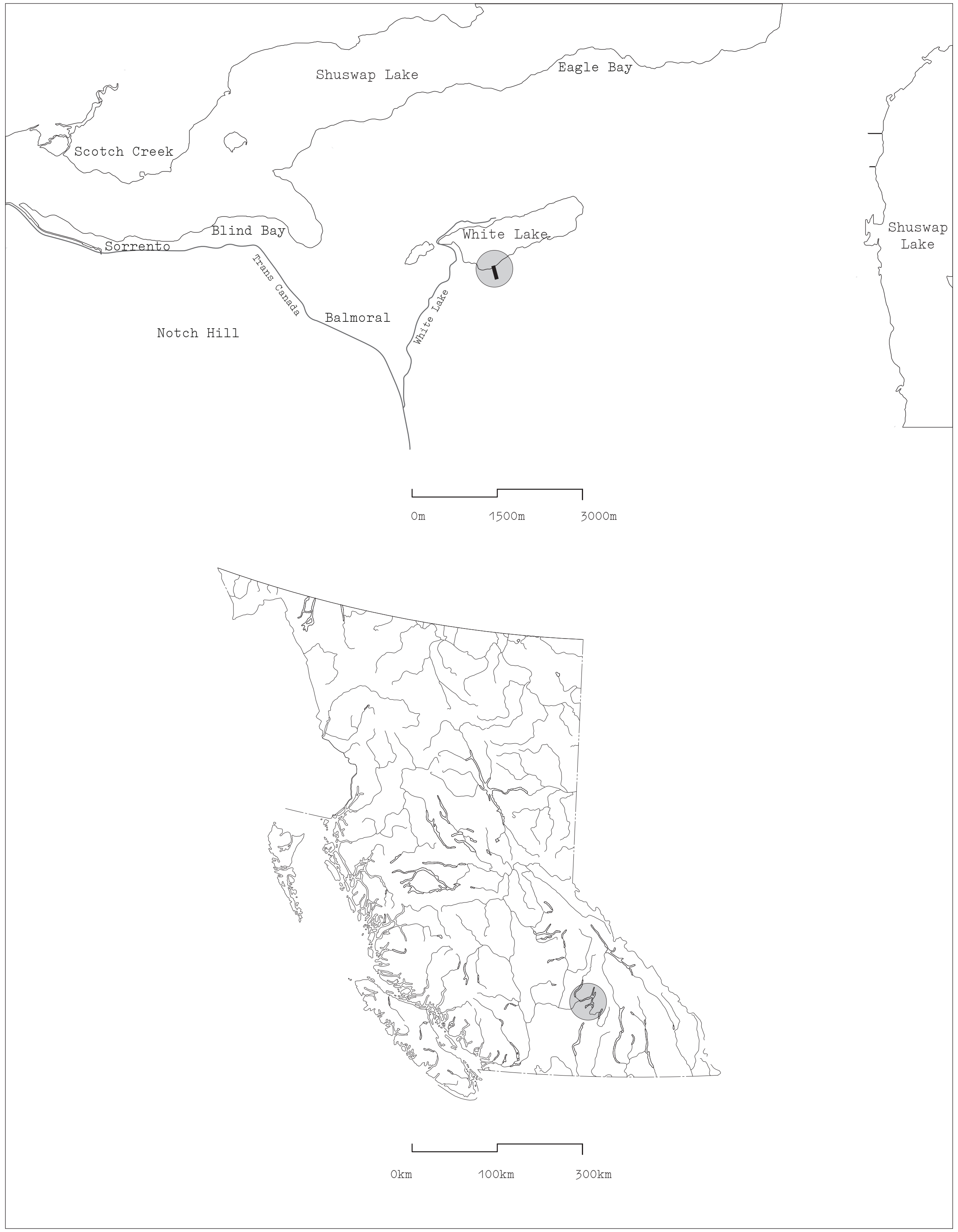


Figure 41: White Lake - Context maps
Own graphic

(opposite page) Figure 42: White Lake - Site Plan
Own graphic

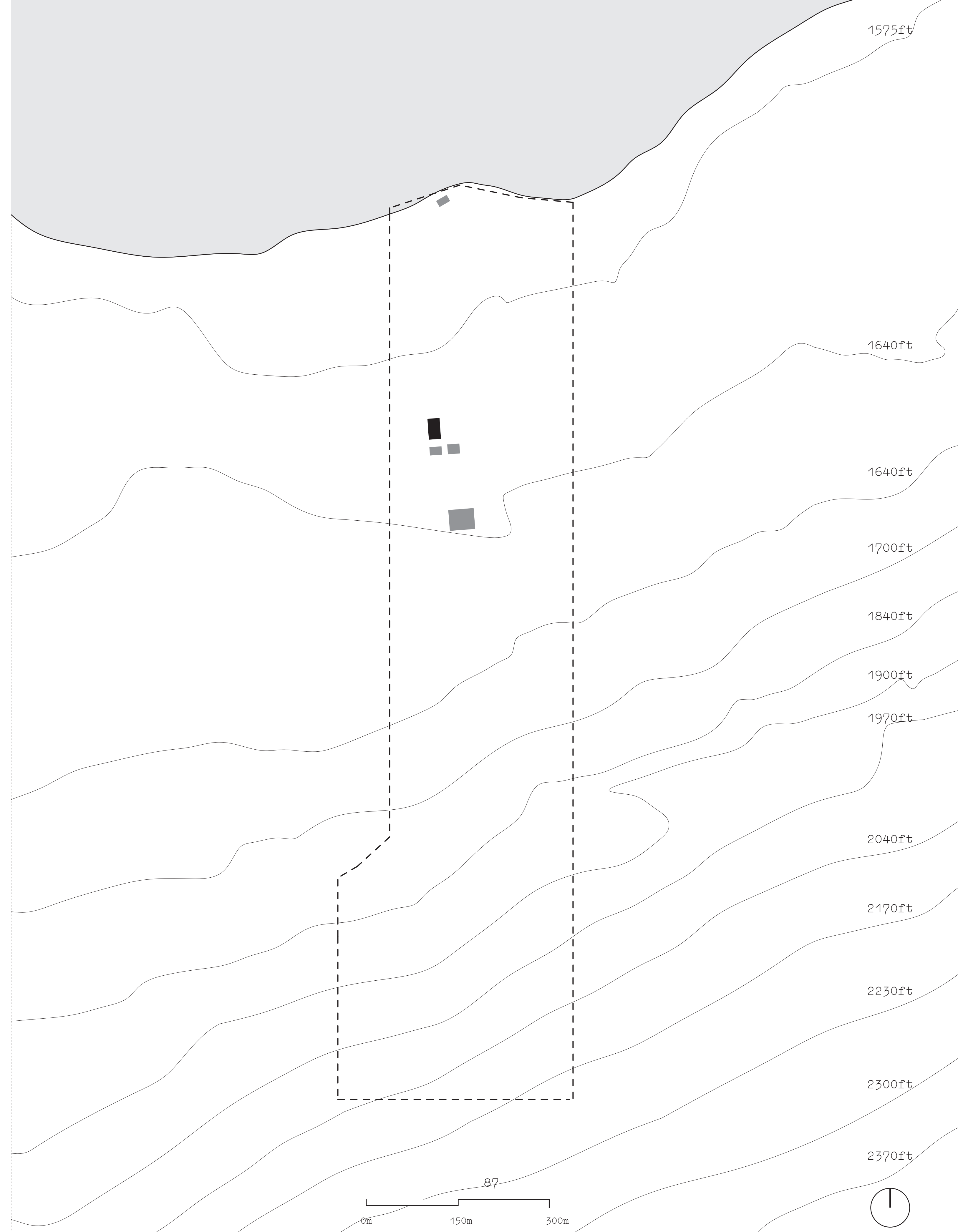


Figure 43: White Lake - 1976
Sourced from parent's photo album

Figure 44: White Lake - 1976
Sourced from parent's photo album

6.4. Saucier History

The Saucier property at White lake has been in the family since 1971 when my Nana Joan Saucier and Poppa Bert Saucier bought the 11-acre lot. My father Alan Saucier started building the existing log cabin in 1976. He camped out on the property for several years as he built The Log Cabin from felled fir trees. The fir trees were from Eagle Bay area, located between Shuswap lake and White Lake, 10km from the site. The process was long, as my father worked on the cabin in between working full time. As the years progressed a trailer was purchased in 1978 for my father to sleep in instead of a tent. The cabin roof went on in 1981, and it was habitable in 1982. Eventually, in 1986 a canopy was needed to provide shelter for the trailer. The canopy grew in mass and concept and transformed into The Structure. The Structure is a 3-storey building intended to replace the Log Cabin. On the first floor there is an open living/dining area, 2nd floor contains 3 bedrooms and 2 bathrooms, and 3rd floor contains an open sleeping loft area. Never complete, The Structure now houses a large colony of bats, chipmunk families and decades of collected building materials. Smaller projects took precedence, and therefore the Structure has remained untouched since 2000. In 2000, we started building a treehouse near the lake. Although it started as a project for my siblings and I, my father took over and began creating a luxury tree house with a king size bed for my parents to sleep in. The Tree House has had several additions over the years, coming to completion in 2016. In 2003, we converted the wood shed behind the cabin into a sleeping room for my Nana to stay in. Initially, the physical separation was to contain her snoring, yet it became a nice sanctuary over the years for visiting couples. The Sleeping Room is a single-story building with a bedroom, washroom, outdoor shower, and tool storage. A wood shed was needed to replace the one that turned into the Sleeping Room, and my father started building the Wood Shed adjacent to the Sleeping Room in 2016. Construction is ongoing; the slightly subterranean ground floor stores wood, and the 2nd floor is a small sleeping area with a washroom. The smaller buildings such as the Sleeping Room, Tree House, and Wood Shed are meant to simply sleep guests. The main cabin building would require a programmatic overhaul instead of the typical cabin program. It would mostly serve as a gathering and cooking space with a small portion for sleeping.

6.5. Program - Occupant Use

The primary occupants are my mother and father, who spend 80% of weekends at the cabin from May – October and live there full-time during July and August. Secondary occupants include myself, my siblings, and our partners. Tertiary occupants include visiting relatives and friends. Winter use has historically been restricted due to excessively high heating costs and length of time required to heat the building.

I observed and recorded my findings of a typical day for the primary occupants: my parents. I observed during spring/summer, on May, June, and July weekends and my graphs show the average use. It is to be noted the extended periods of absence from the cabin are because of the warm weather. The graphic shows a typical summer day, each greyed out person is representational of 15 minutes of time spent in that location. As the grey darkens, it shows an extended period of time spent in that location.

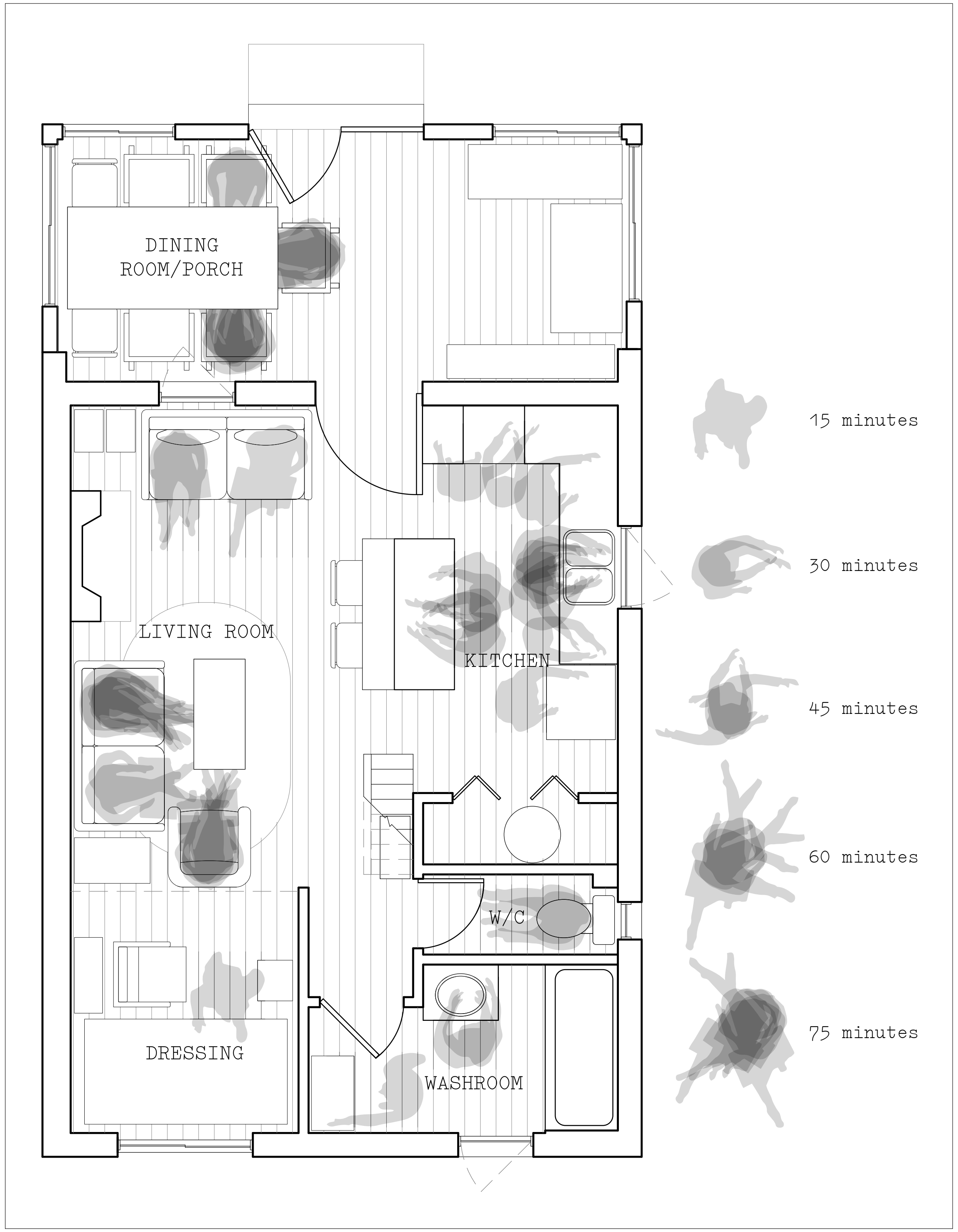


Figure 45: White Lake current cabin occupant use
Own graphic

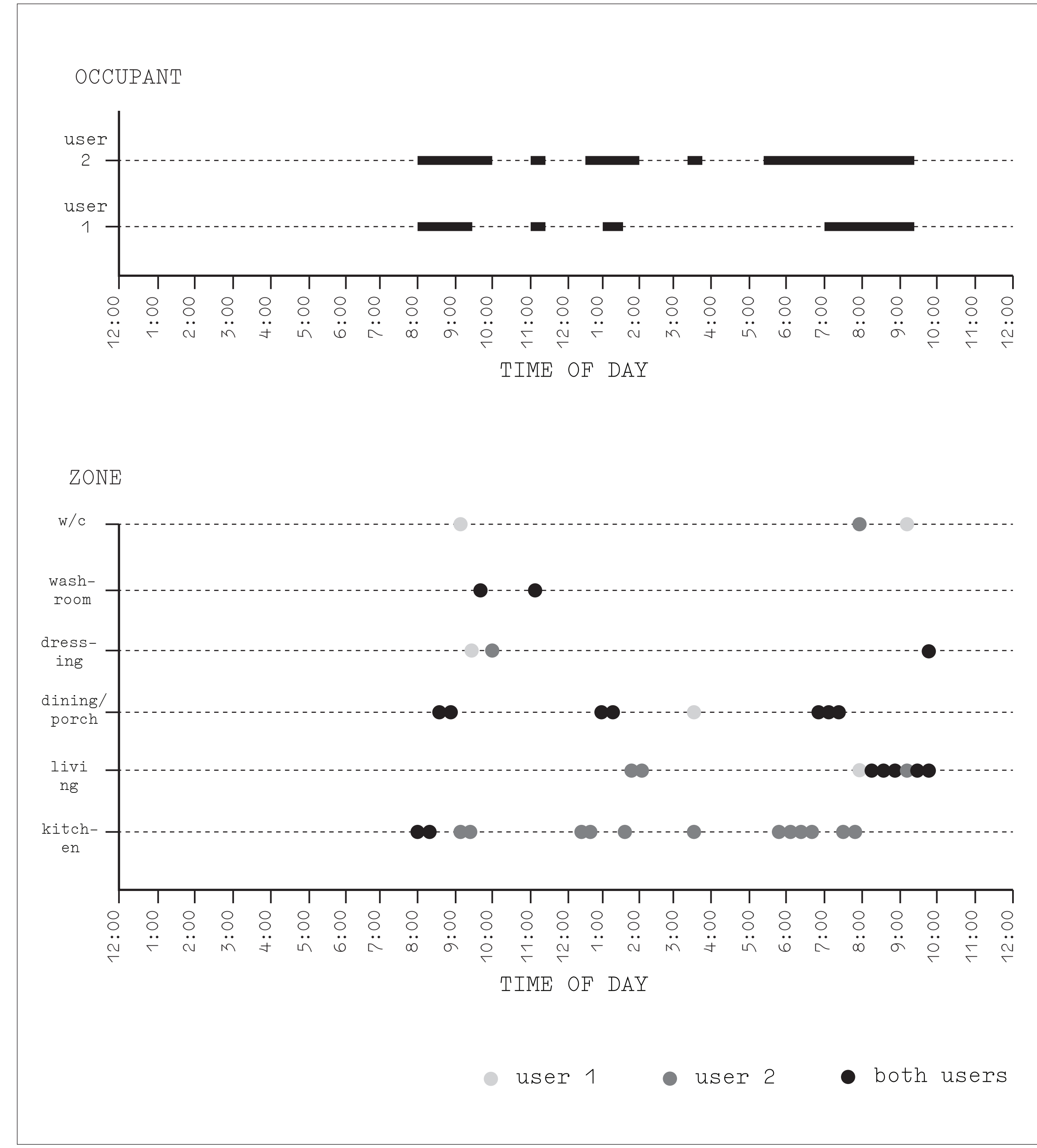


Figure 46: White Lake current cabin occupant use
Own graphic

Figure 47: White Lake 2018
Own graphic

07 "The Craigslist Cabin" Design

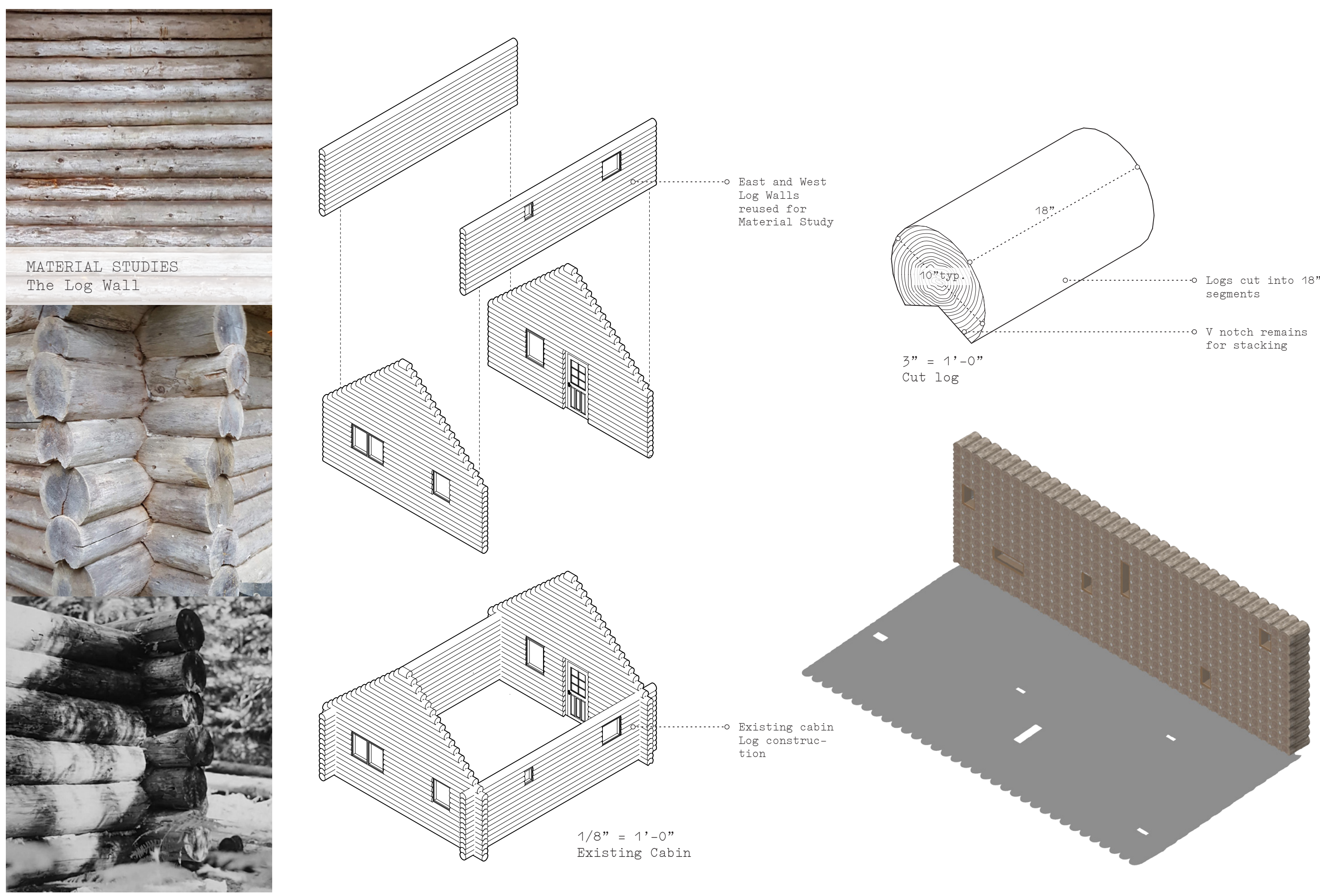
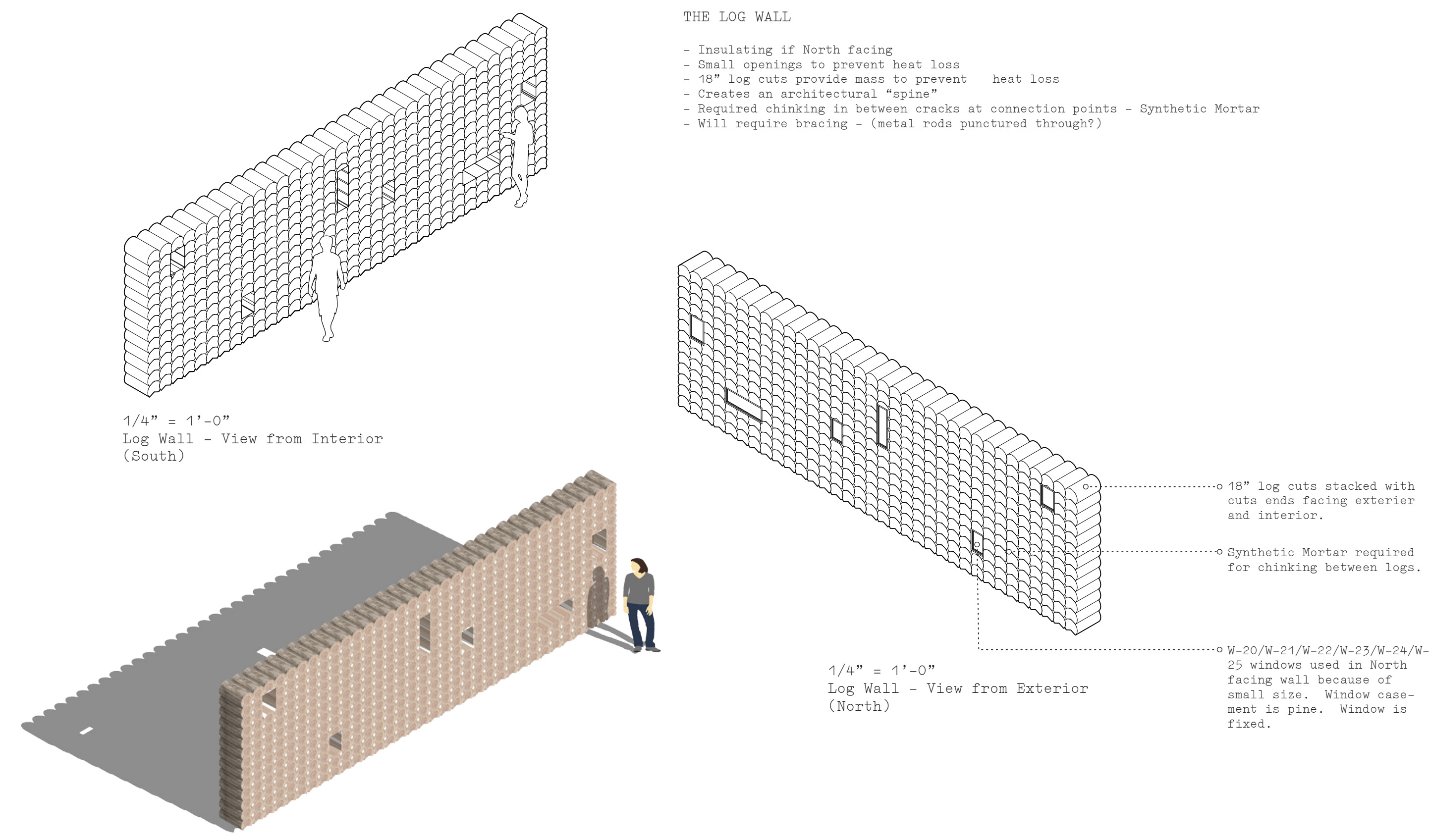
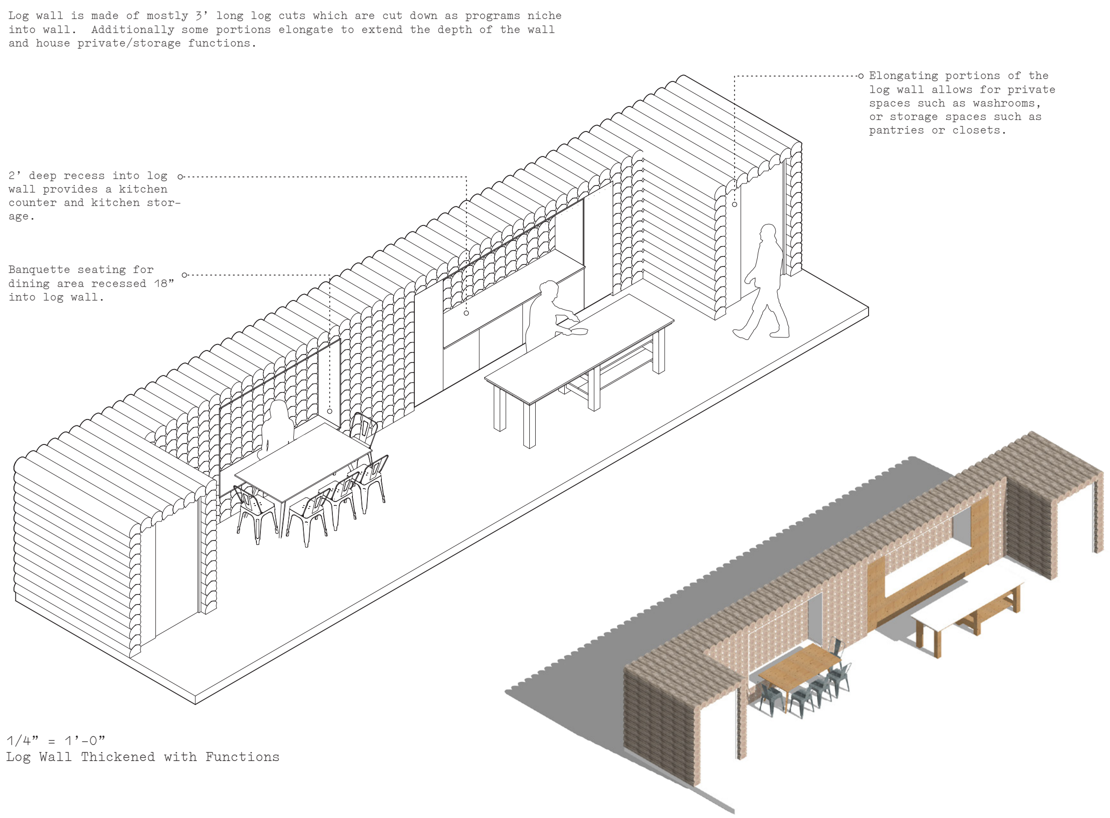


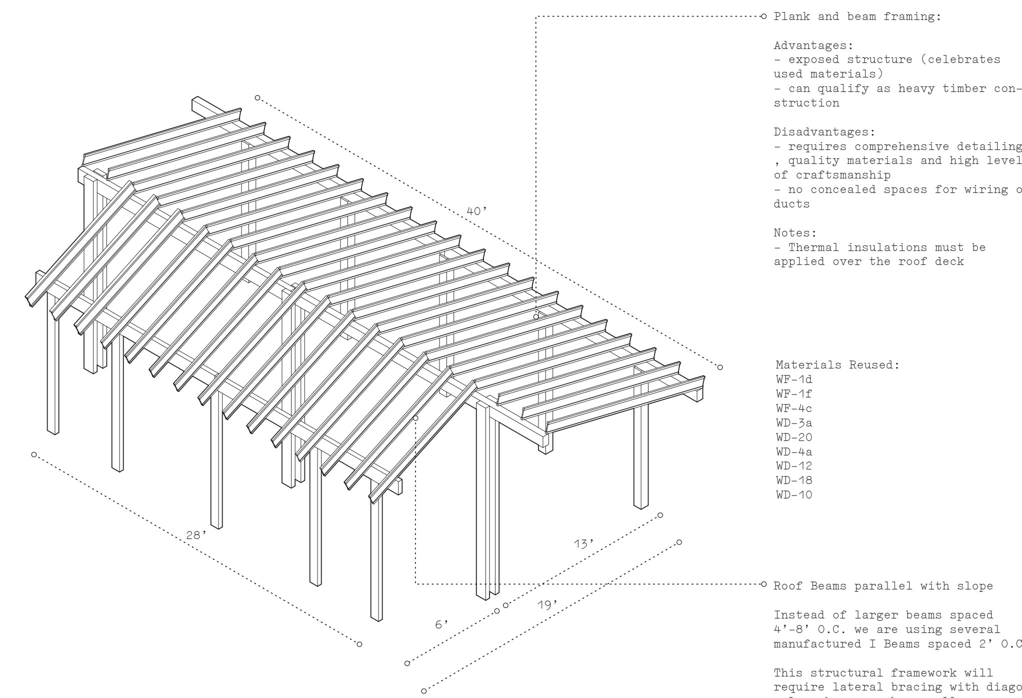
Figure 48: Material Studies : The Log Wall
Own Graphic





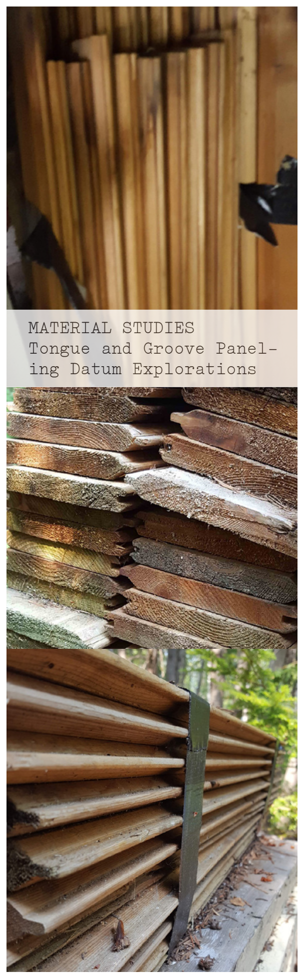
1/4" = 1'-0"
Log Wall Thickened with Functions

Figure 49: Material Studies : The Log Wall Thickened
Own Graphic



3/16" = 1'-0"
Possible structural and roof assembly

Figure 50: Material Studies : Roof and Stucture Explorations
Own Graphic



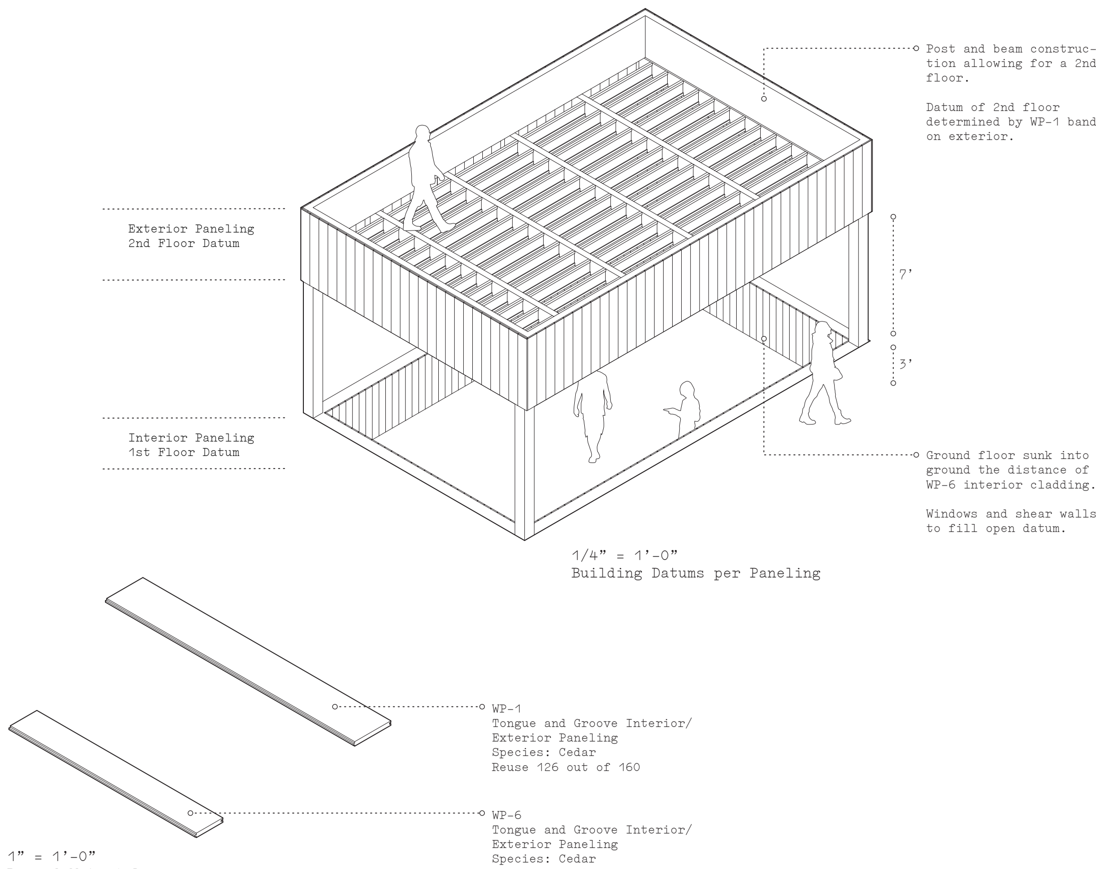


Figure 51: Material Studies : Tongue and Grooce Paneling Datum
Own Graphic

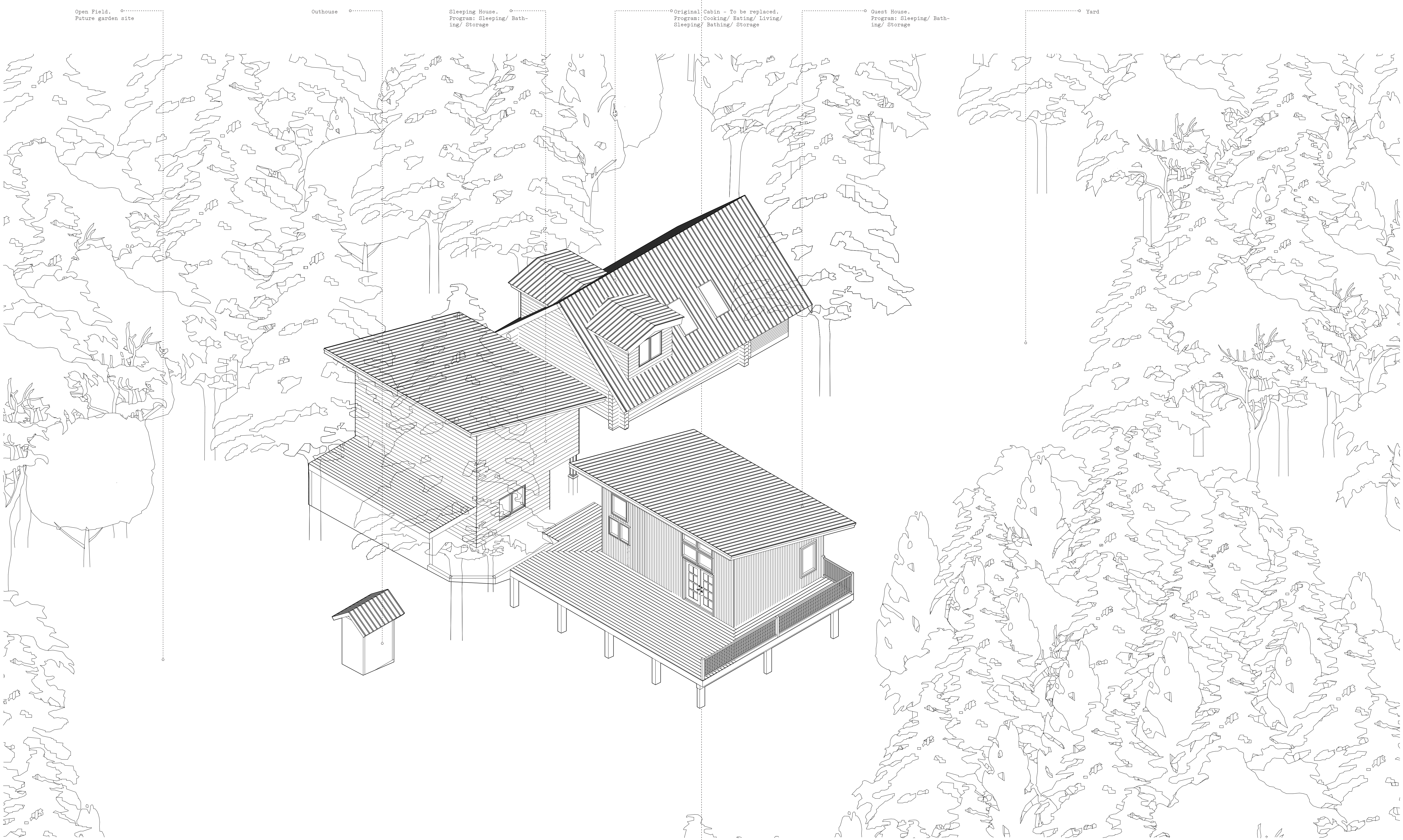
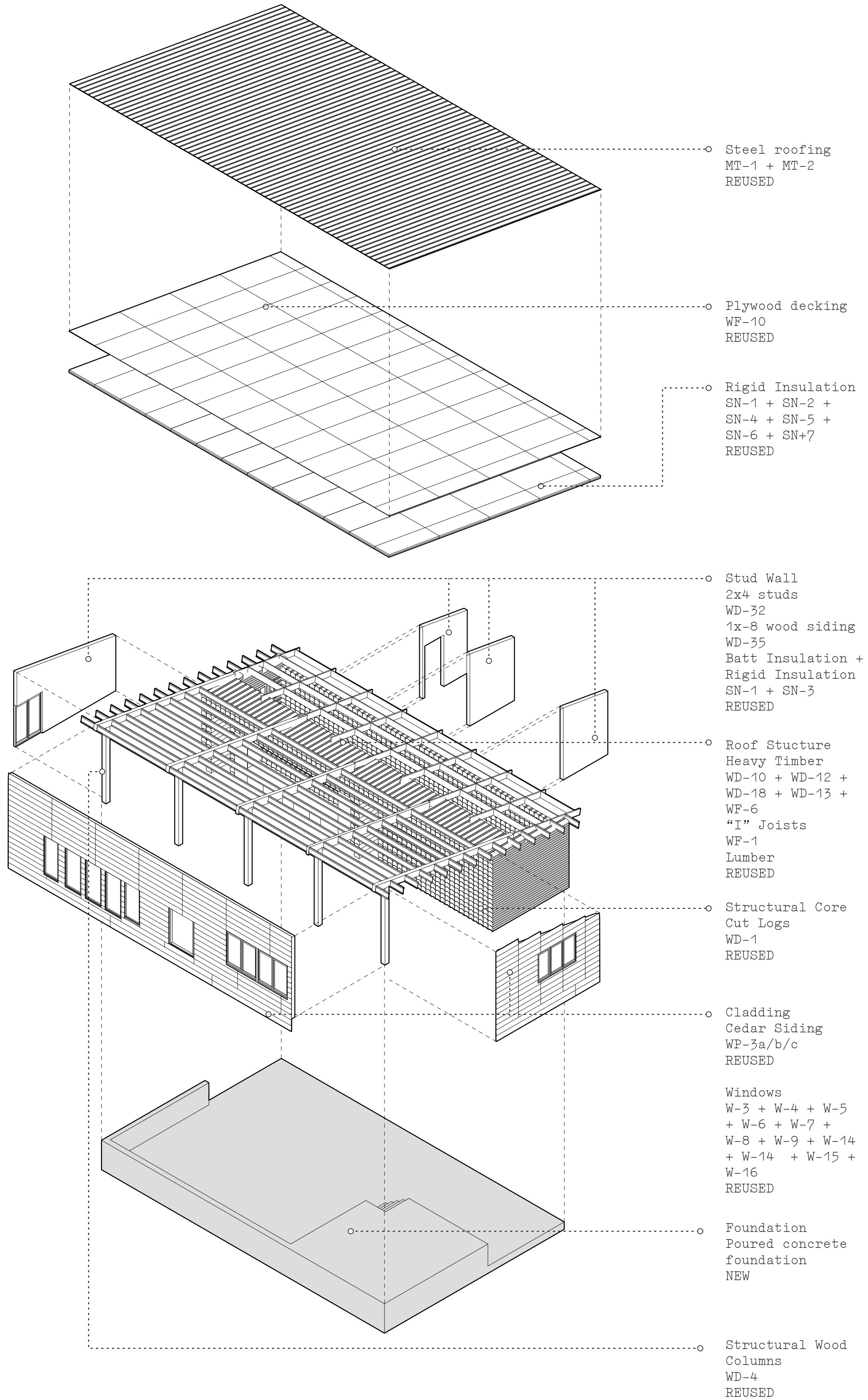


Figure 52: Axonometic - Existing site
Own Graphic



ITERATION 1

Figure 53: Exploded Axonometric - ITERATION 1
Own Graphic

Chapter 7. Craislist Cabin Design

7.1 Iteration 1

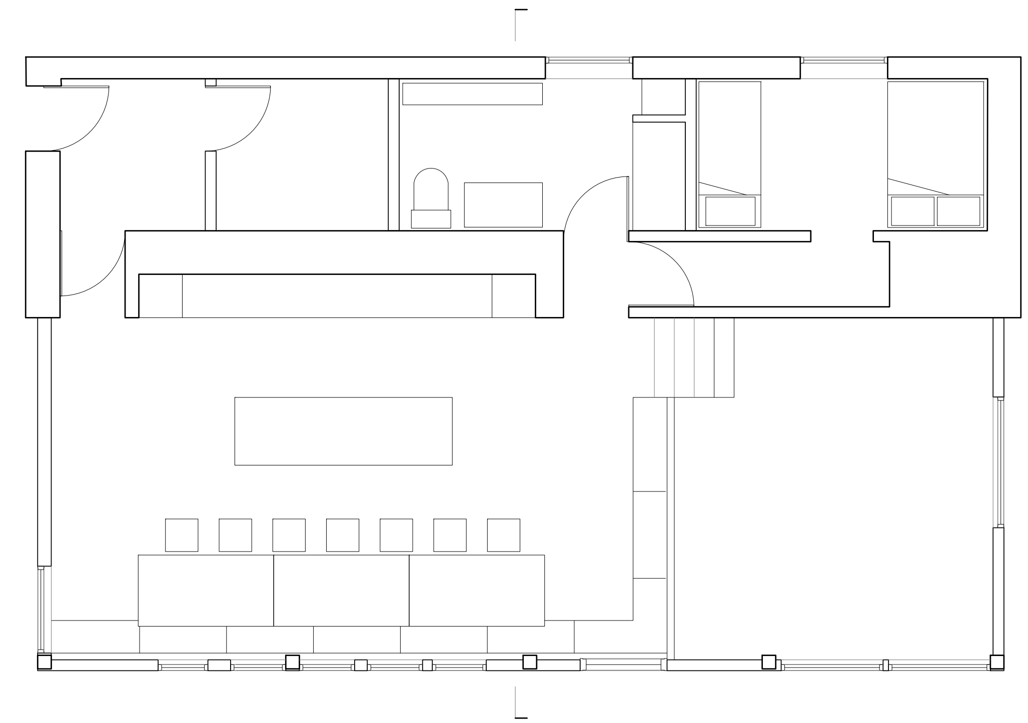


Figure 54: Plan - ITERATION 1
Own Graphic

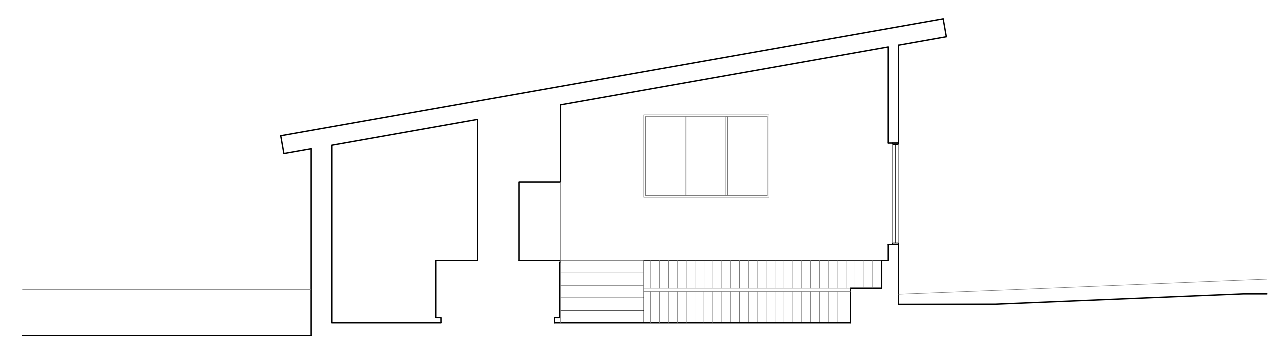


Figure 55: Section - ITERATION 1
Own Graphic

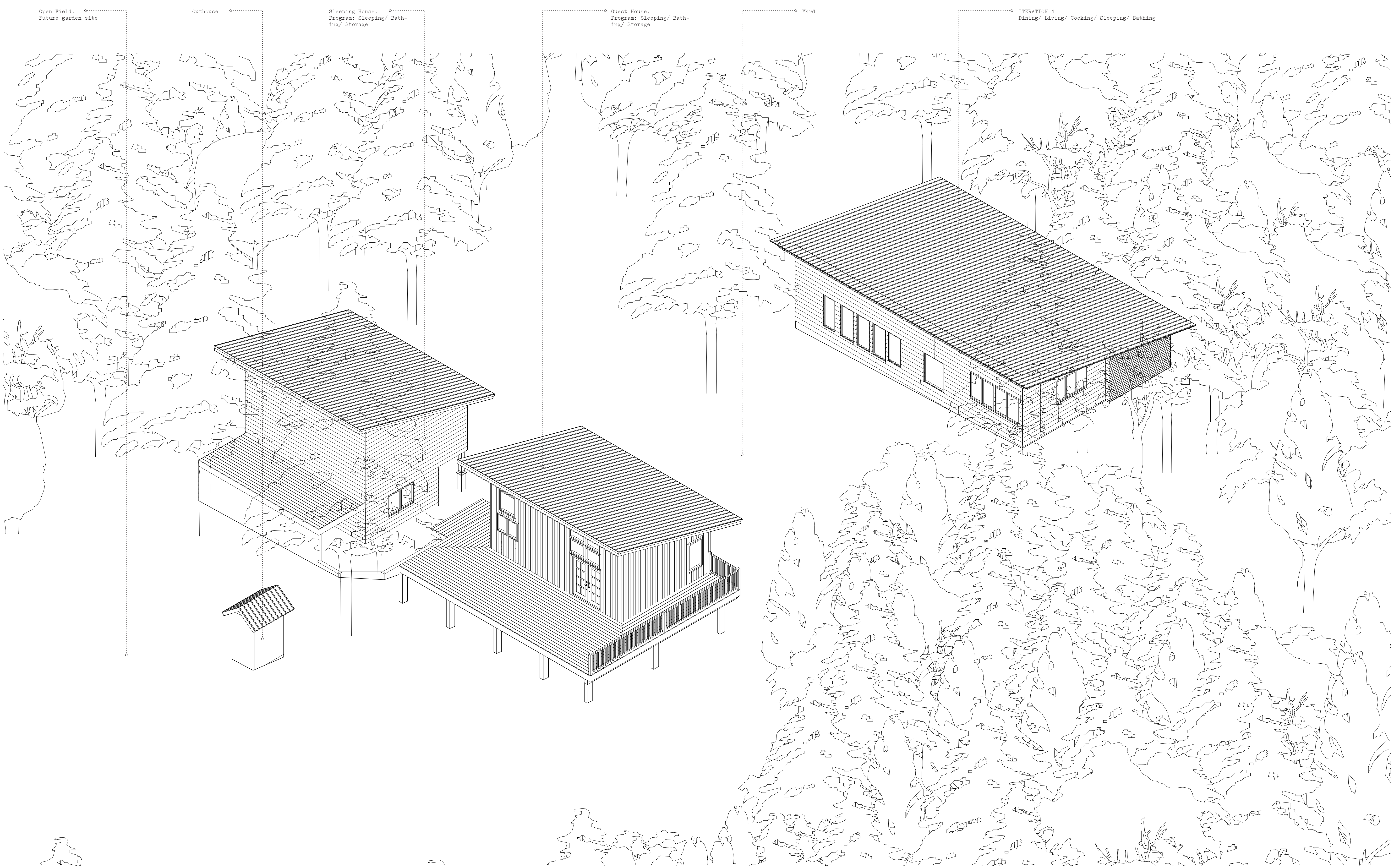


Figure 56: Axonometic - ITERATION 1
Own Graphic

7.2 Iteration 2

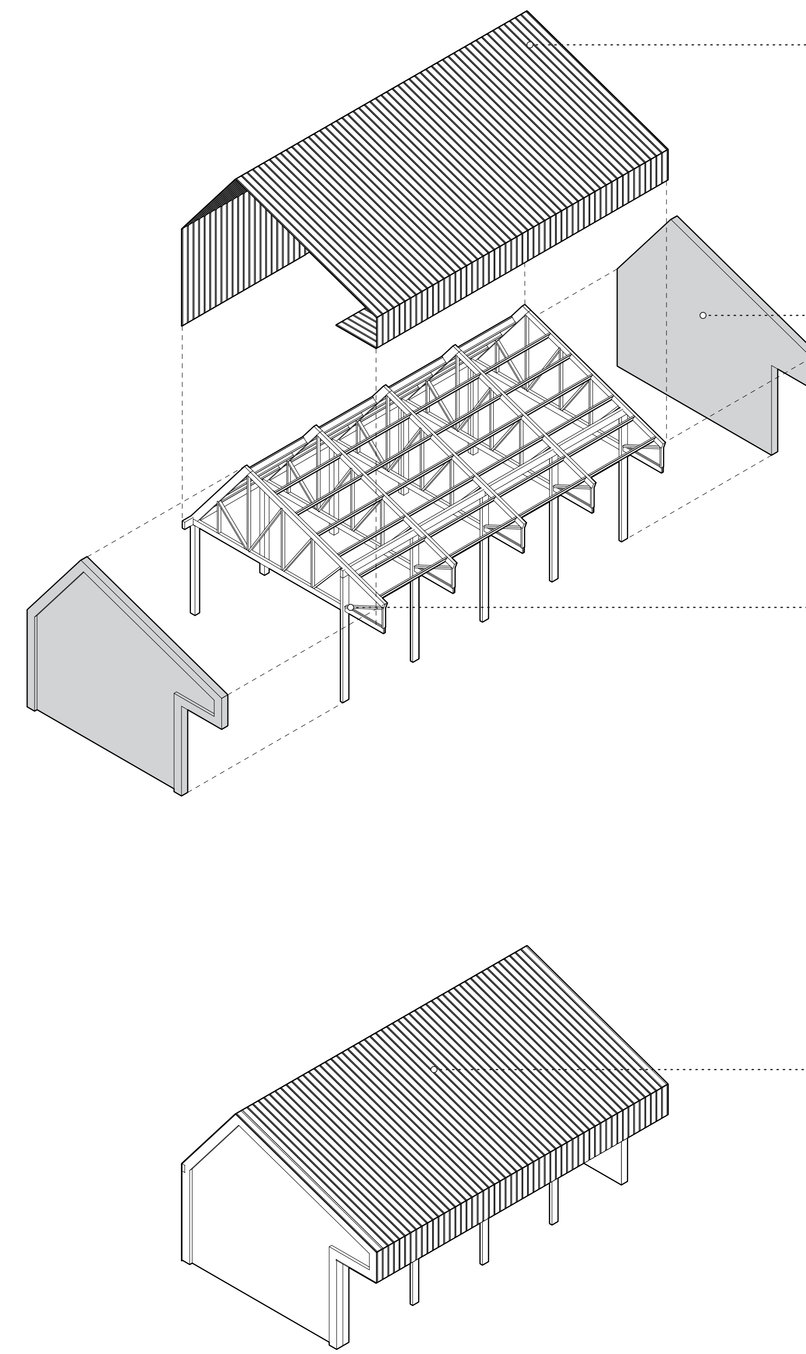


Figure 57: Exploded Axonometic - ITERATION 2
Own Graphic

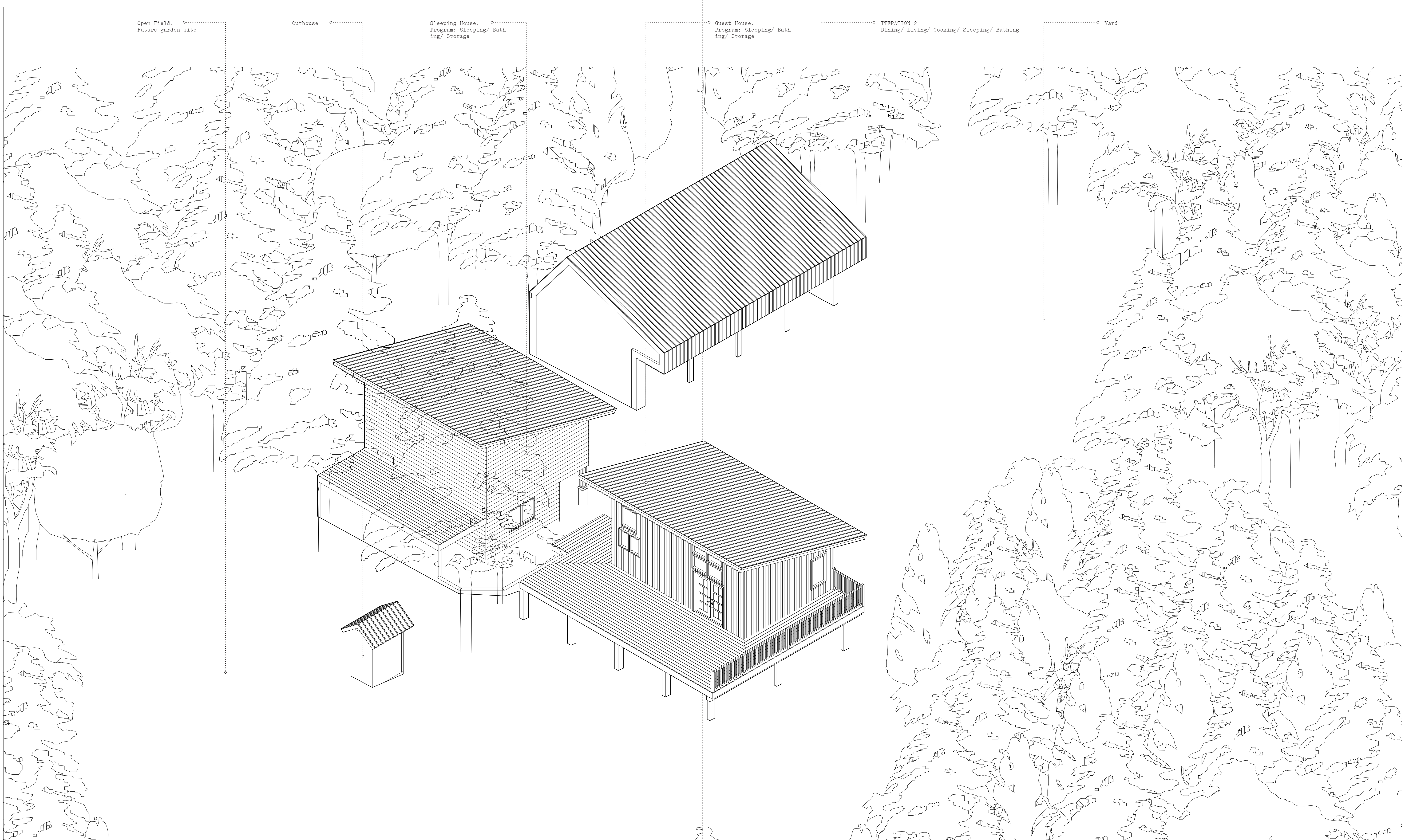


Figure 58: Axonometic - ITERATION 2
Own Graphic

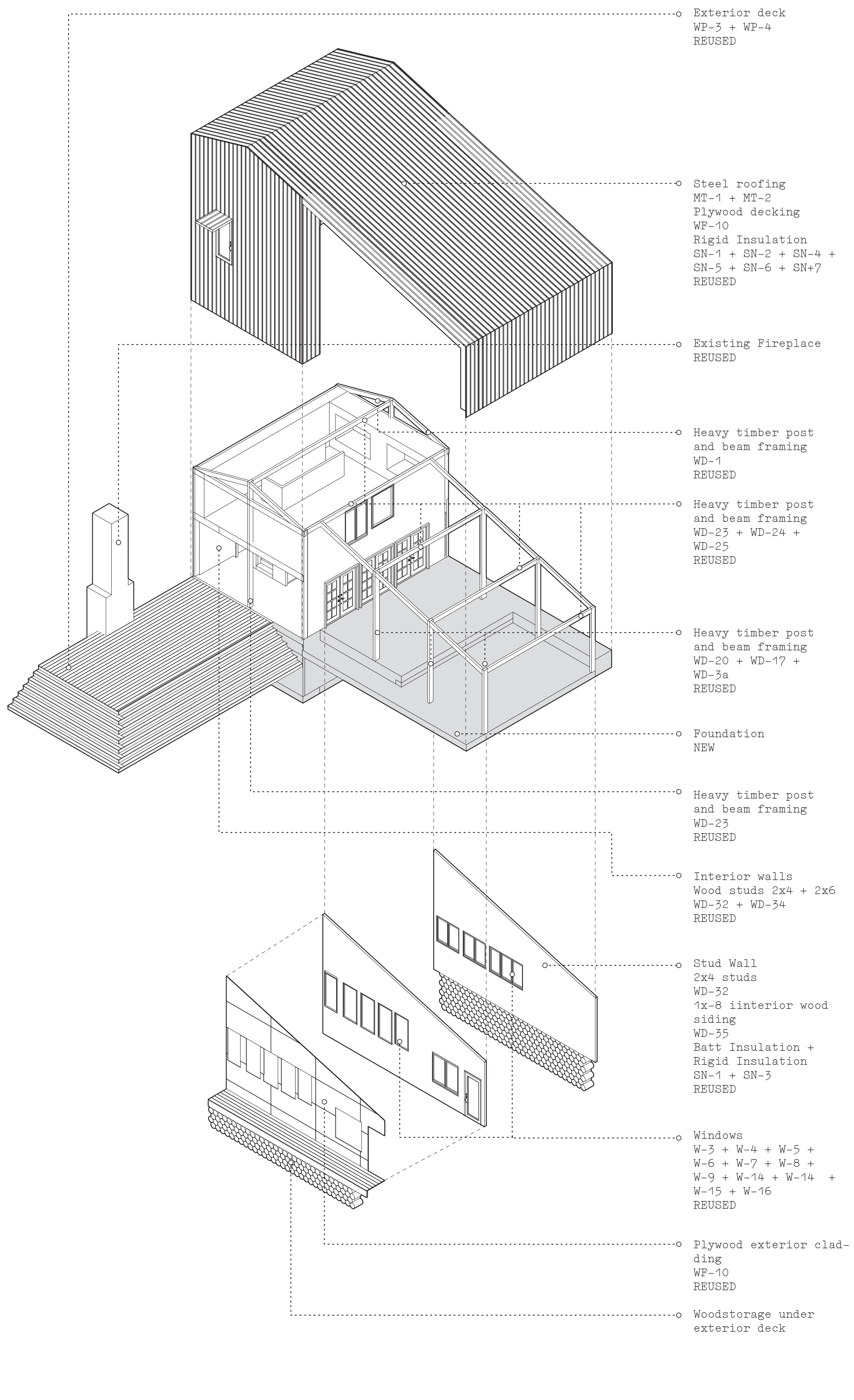


Figure 59: Exploded Axonometric - ITERATION 3
Own Graphic

7.3 Iteration 3

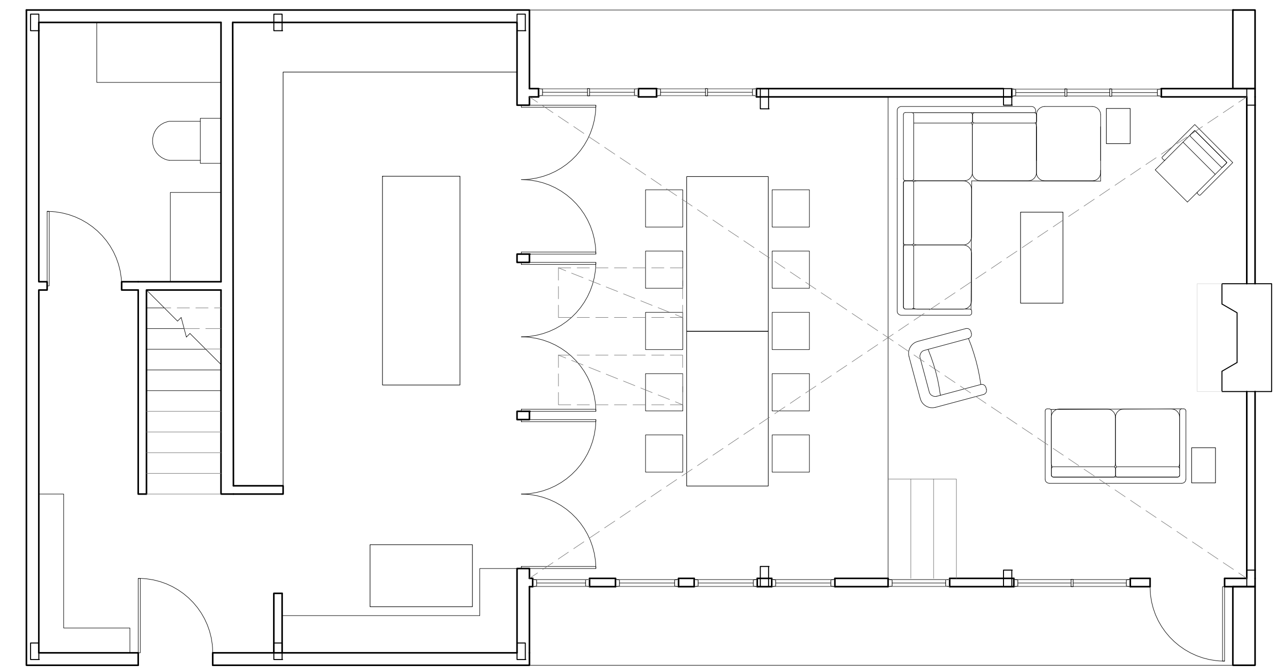


Figure 60: Plan - ITERATION 3
Own Graphic

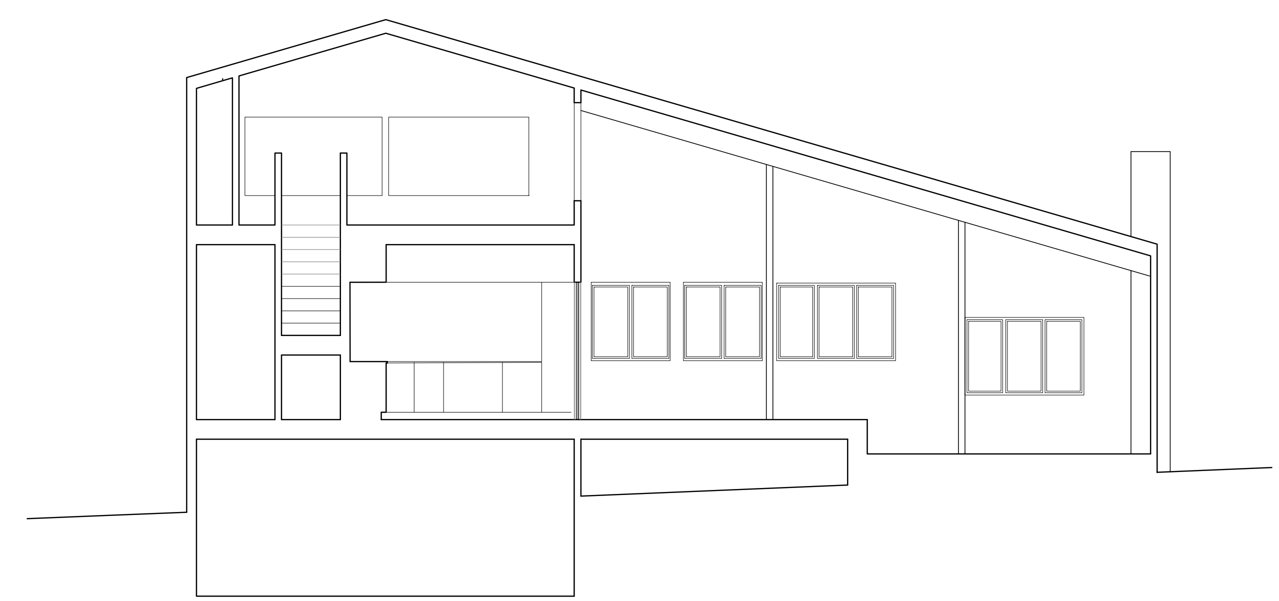


Figure 61: Section - ITERATION 3
Own Graphic

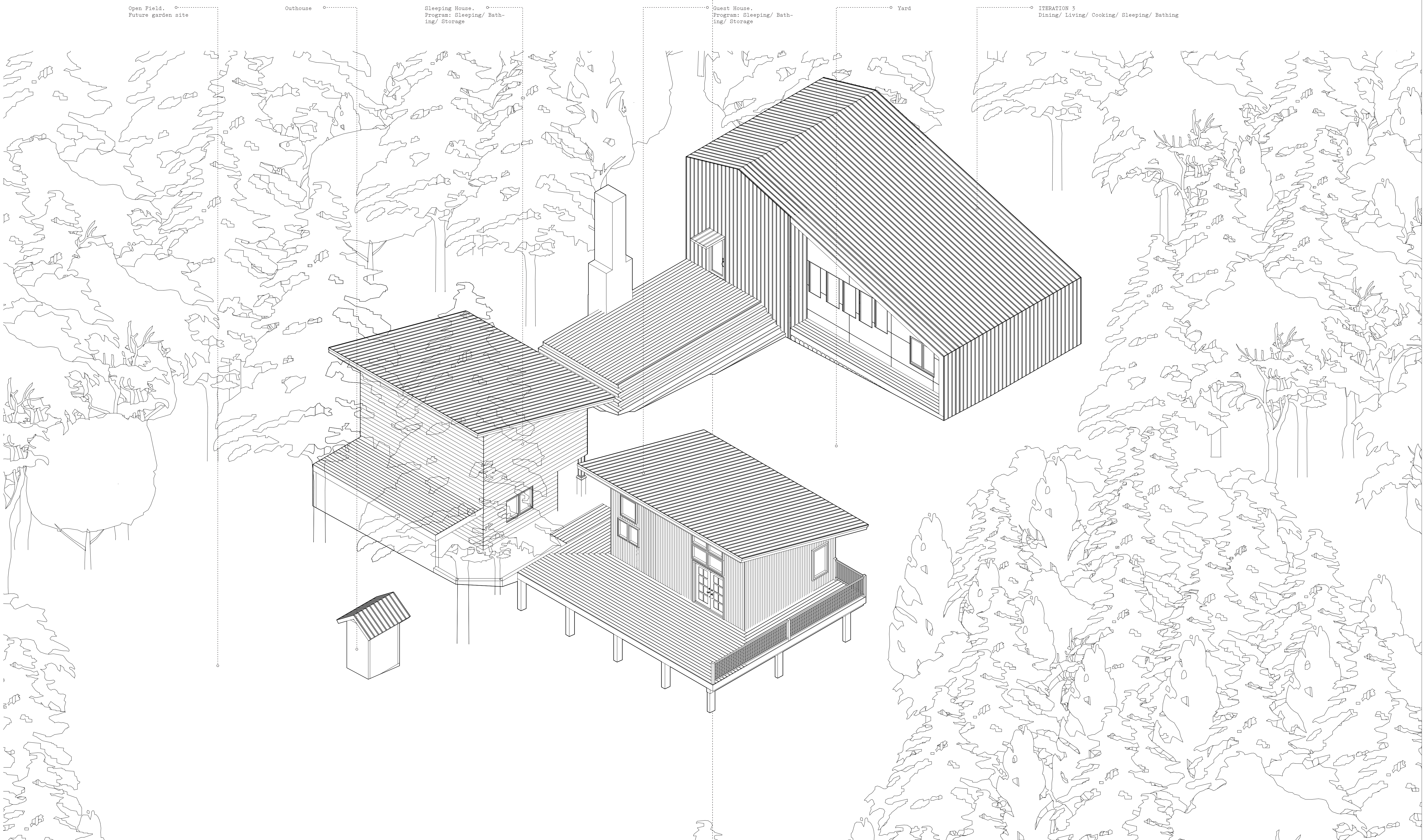


Figure 62: Axonometic - ITERATION 3
Own Graphic

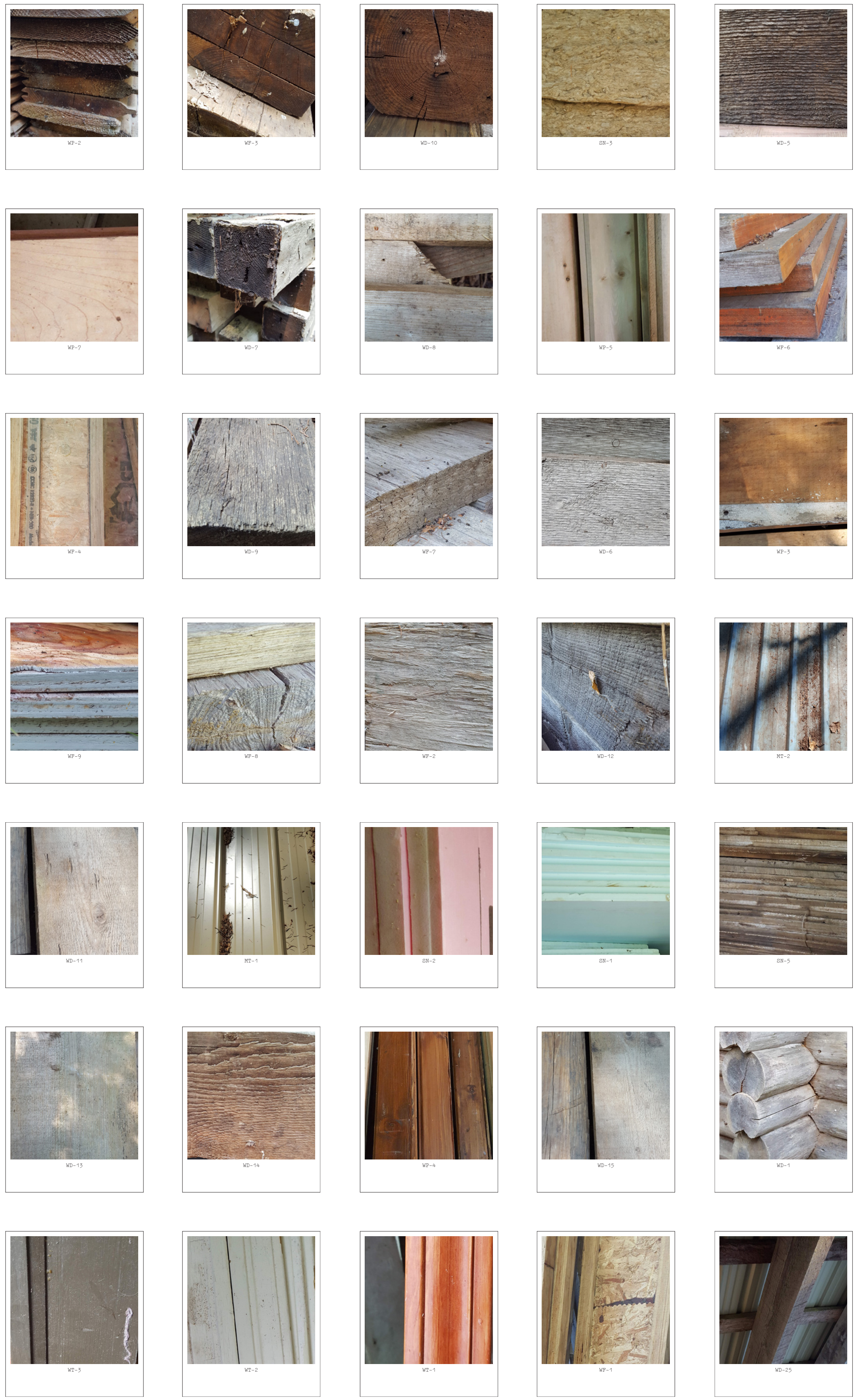


Figure 63: Example of Collected Materials
Own Graphic

7.4 Proposed Design

This thesis is one of sourcing, collecting, curating, and then assembling inputs while maintaining a narrative and evidence of palimpsest. When I refer to inputs I mean building materials, the bits and pieces that once assembled form buildings. Yet the particular materials I am referencing are not bought at home depot, they are acquired through salvage, scavenge, bargaining, and deconstruction. These reused materials are at the heart of this project. The proposal is to stitch together the used materials to quilt a new home for them, one that celebrates their storied past.

The proposed project is the replacement of my family cabin. The cabin acts as a prototype, attempting to use and celebrate used building materials, in not what I consider their final resting place, but simply a stop along the way. The cabin is located on White Lake, which is a small fishing lake surrounded by the Shuwap Lakes in the interior of BC.

The Saucier property at White lake has been in the family since 1971 when my Nana Joan Saucier and Poppa Bert Saucier bought the 11-acre lot. My father Alan Saucier started building the existing log cabin in 1976. He camped out on the property for several years as he built The Log Cabin from felled fir trees. He enlisted the help of family, friends, boy-scout troups, and several girlfriends before my mom came on the scene. As the years progressed a trailer was purchased in 1978 for my father to sleep in instead of a tent and an outhouse was constructed. The cabin roof went on in 1981, and it was habitable in 1982. Eventually, in 1986 a canopy was needed to provide shelter for the trailer. The canopy grew in mass and concept and transformed into The Structure. Never complete, The Structure now houses a large colony of bats, chipmunk families and decades of collected used building materials. Smaller projects took precedence, and therefore the Structure has remained untouched since 2000. In 2000, we started building a treehouse near the lake. Although it started as a project for my siblings and I, my father took over and began creating a luxury tree house with a king size bed for my parents to sleep in. The Tree House has had several additions over the years, coming to completion in 2016. In 2003, we converted the wood shed behind the cabin into a sleeping room for my Nana to stay in. The Sleeping Room is a single-story building with a bedroom, washroom, outdoor shower, and tool storage, and the eventual plans to add a second floor for additional sleeping space. A wood shed was needed to replace the one that turned into the Sleeping Room, and my father started building the Guest House adjacent to the Sleeping Room in 2016. Construction is ongoing; the slightly subterranean ground floor stores wood, and the 2nd floor is a sleeping area with a washroom. The smaller buildings such as the Sleeping Room, Tree House, and Guest House are meant to simply sleep guests. As you can see the property is a collection of programmatic spaces that are constructed to meet immediate needs of our family as it grows. The proposed project is to replace the original cabin as the foundation is sinking, it is poorly insulated, and is infested with mice.

I started my iterative journey the first week of this semester. Iteration 1 was a design that was semi subterranean, located on the gradual sloping clearing on the yard. The design employed a thickened log mass that was programmed for more private functions with public functions opening up to the southern facade. A week after this design my dad came home with 20 4x10 beams at 20' long. As I discarded my initial iteration and embarked on a design that incorporated my new found spans, I realised this project wasn't static. The inputs would vary as my dad continued to source materials. My 3rd iteration was in response to a detailed client interview in which we outlined some non negotiable requirements. The non-negotiable requirements include: flexibility to seat 2 to 20 people for dinner, the need for a service basement and

Figure 64: Site Plan
Own Graphic

compartmentalization to keep a core warm throughout the winter, keeping the family built stone fireplace, and absolutely no cutting down trees.

These early iterations were achieving 75-90% reused material, the materials which were yet to be sourced were predominantly for foundations and insulating. These iterations were finished products, they begged to be photographed, airbrushed, and grace the homepage of cabin porn.com. The more i talked with my family, i realised this isn't what our family needed and wasn't what this project is about. The project is born out of material collection, and terminating the material sourcing in the cumulation of this cabin wasn't the answer. The proposed cabin requires the ability to grow, with material stock, with seasons, with nature, and with family.

The proposed design was initially formed by a study of site constraints. I worked with my father to map out existing power lines, plumbing, septic field and trees. Guiding forces such as my families non-negotiable requirements also influenced the current siting and massing. The need for a service basement, prompted me to take a parasitic approach to existing buildings instead of pouring a new foundation, and the "kill no trees" commitment influenced me to navigate through an existing narrow clearing. Additionally, I took advantage of the steep incline of the site to employ a single story living space that could assist with potential aging in place for my parents. Finally, the proposed building enjoys a parasitic view. My neighbors to the west subdivided their lot in the last 5 years and the new owners bought the narrow strip of land and clear cut as much as the agricultural land reserve allowed. Therefore, without clear cutting, or breaking any ALR water adjacency bylaws, the building's orientation capitalizes on our neighbors clearing and allows us to enjoy sunsets over the lake.

An image that continually appeared to me was the memory of used wood piled neatly under a blue tarp, and that is how i envision the aesthetic concept of the massing, the roof which wraps down to envelope the exterior walls is the blue construction tarp, simply keeping the used materials dry until they find their next home. Except these aren't just used building materials, they are a collection of memories. Each piece has a story, and as I sat and interviewed my parents about where the used materials were sourced from, i began to map out their narrative. Joists that were sourced from an I-beam manufacturer which closed down in Salmon arm, beams that were bought from an old architect in North Vancouver who was tearing down his house, hardwood flooring that was scavenged when our neighborhood gym decided to replace it with rubber flooring, the proposed building is a layering of memories on top of memories, stitching together a nostalgia of our lives. This drawing curates the collection by highlighting this narrative. The location, means of acquiring, quantity and description is noted in addition to positioning their narrative along the drive to my cabin, to stitch together the story of past, present, and future.

The bar shaped cabin physically divides program (the wood), yet visually unifies it under one roof (the tarp). The kitchen/ dining function is placed on top of the existing sleeping room. This positions it as the main core of the cabin. The ground floor programs of the existing building as previously mentioned includes a bedroom, washroom, storage area, and outdoor shower. This parasitic move allowed me to utilize existing plumbing, electrical, and avoid creating another building footprint. I benefit from the existing storage area by morphing it into a service "basement". And the ground floor bedroom allows the cabin to be inhabited in the off season, employing the idea of a warm core with surrounding seasonal programs.

The bedroom and living room on the first floor are therefore seasonal, as heating large square footage for weekend trips in the fall is not sustainable or cost effective. These 2 programs instead act as nodes along the promenade through the linear cabin.

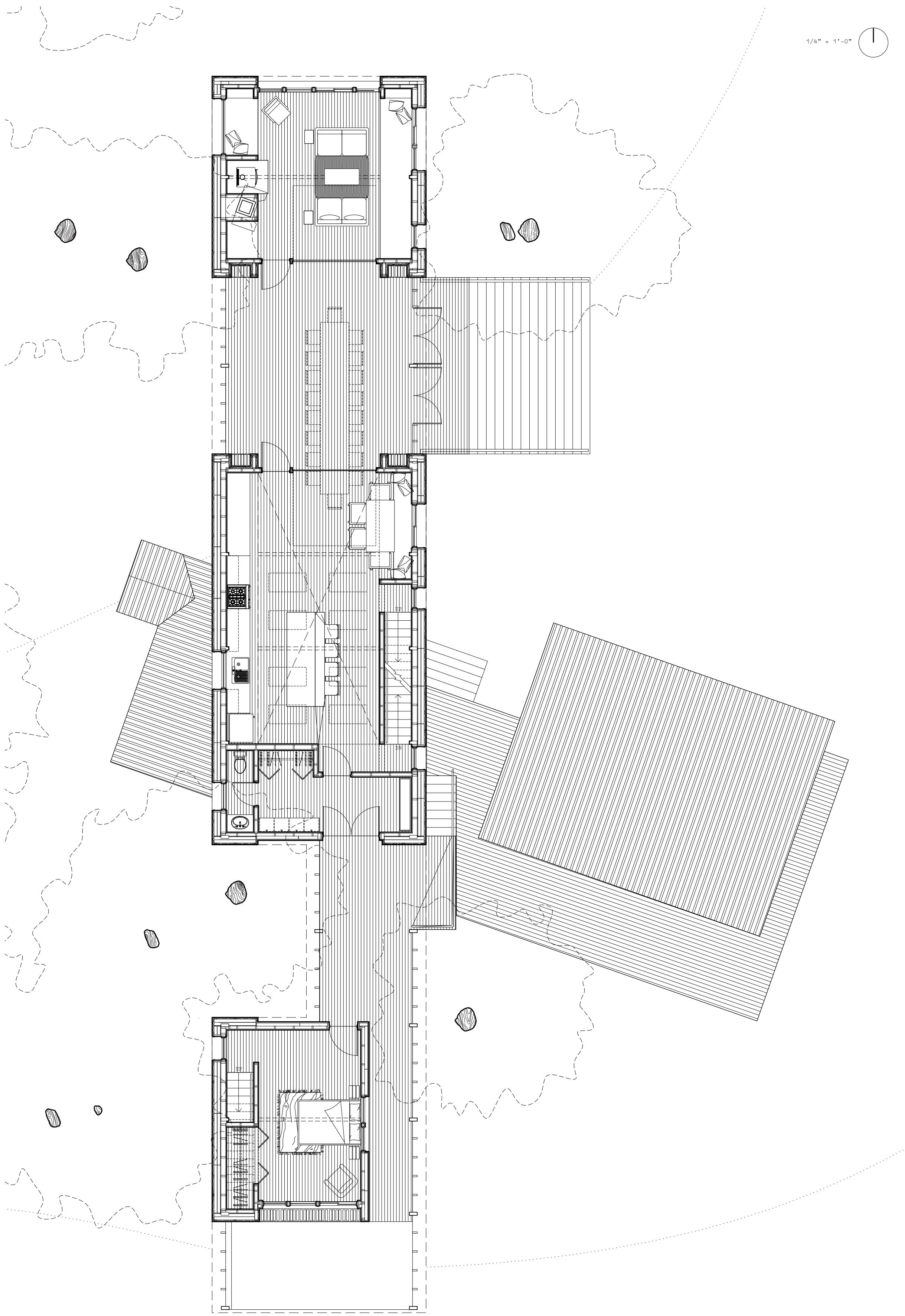


Figure 65: First Floor Plan
Own Graphic

The bedroom is the most southern program, first approached by pulling up a car adjacent to the bar shaped building. The bedroom is pulled away from the Eastern facade for shading in summer, yet will benefit from a lower south eastern morning light in the off season. A large southern Window wall is also pulled away from the facade with an overhang to prevent overheating in the summer. A frame around the window wall provides an area to stack wood, this wall acts as a register of season, with wood piling high in the summer months providing shading mass and a privacy barrier, and the wood depleting going into fall, allowing southern thermal gain, and exposing the private program of the bedroom when the occupancy drops down to only my parents. The bedroom has an internal connection to a second floor which is programed for storage and potential growth. With growth of the family, the 2nd floor acts as a sleeping area for the next generation.

A bridge directs people towards the main program - kitchen, living, dining. Upon entry, a interior vestibule houses a powder room, outdoor clothing storage and seating to de-boot. The vestibule ceiling height is 9 feet as there is a loft above. The loft above can be used for a living area in the off season when heating the living program is not sustainable, or can used for additional sleeping. The loft connects through an exterior bridge to the 2nd floor of the bedroom program, creating a continuous upper floor - with the vision of family growth in the next generation. Entering the main space, the room opens up to the 25' double story ceilings with exposed roof trusses. Continuous with the rest of the building, storage and circulation is slid to the side jowls of the bar, allowing more flexibility in the interior. This also allows for built in seating accompanied with deep window openings created by the wall assembly. Descending to the ground floor gives access to the existing sleeping room and full washroom.

Garage doors allow for a small dining table to expand to the open air porch which is clad in mosquito netting. The porch creates an outdoor living space which increases the cabin area significantly in the summer months. The roof and mosquito netting make the porch resistant to the elements, yet the skylights and open framing allows for light and connection to the trees and views. The porch leads down to a grand staircase connecting the elevated floor area to the lawn.

The most northern program is the living area. This is positioned on top of the existing fireplace, to create an outdoor fireplace under the elevated building and it is paired with a new wood burning stove in the living area to recognize the palimpsest of the original fireplace. The living area also makes use of a garage door to capitalize on the outdoor seasonal porch. The east/west jowls in the living area contains carved out seating nooks paired with windows. The eastern built in seating is wide and long enough to line up two single mattresses, and the open space is large enough to have both pull out couches pulled out into beds. The northern facade is a similar window wall that is employed on the southern end of the building. Yet this window wall frames the view through the neighbors clear cut out to the lake.

Overall, the plan which is statically showing sleeping for 2, accommodates growth and could a sleep up to 12 people. The framework of the building also allows for infill. The elevated building provides growth opportunities on the ground plane. If the seasonal porch isn't meeting the need, that space could also be infilled, or an arm could be added to create a connected 2nd floor on the guest house.

The proposed design is cannibalistic towards the surrounding buildings on site. The structure has sat dormant for decades, the lack of sun from the tree coverage and topographic incline combined with its isolation from the rest of the buildings and distance from the lake has per-

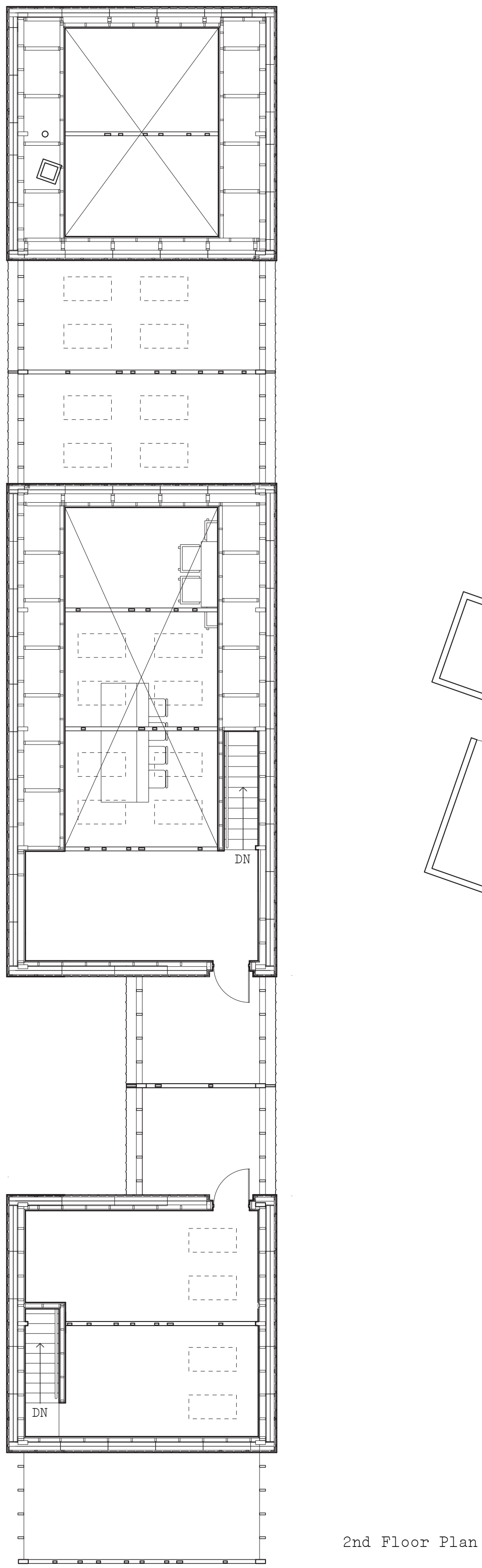


Figure 66: Second Floor Plan
Own Graphic

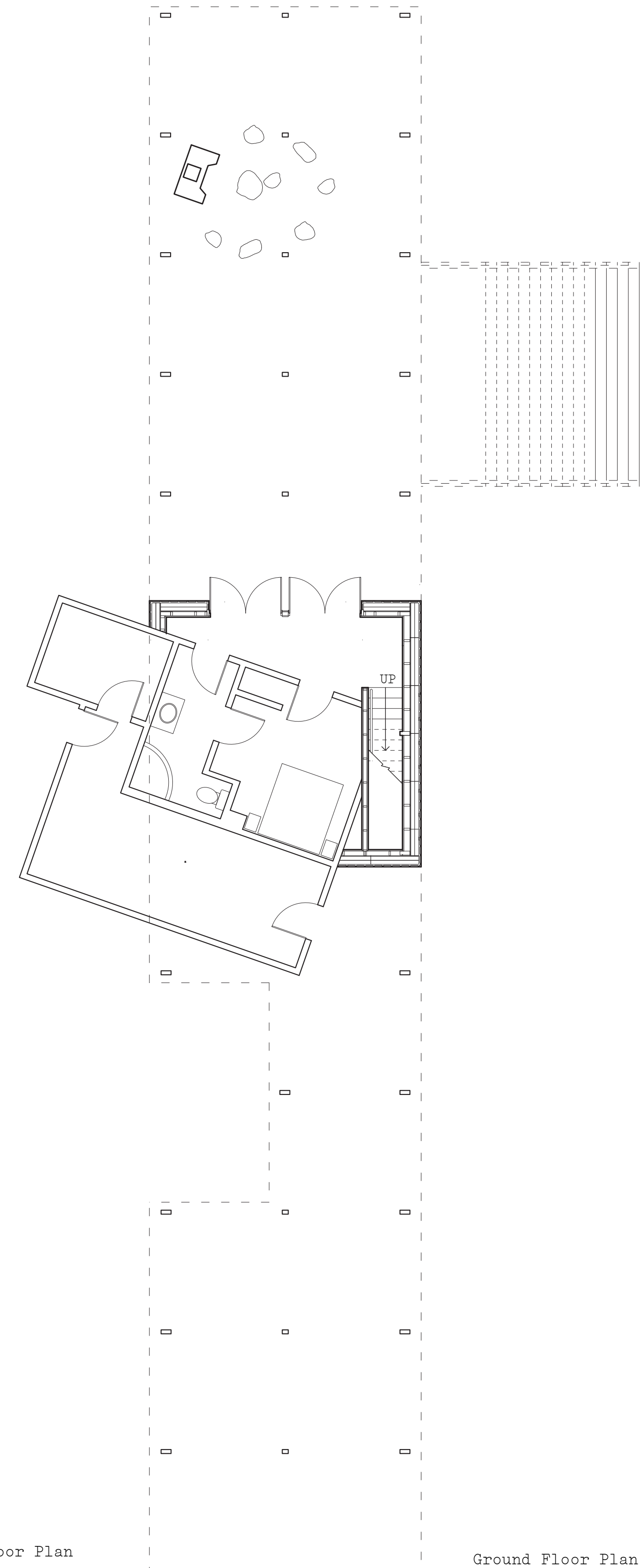


Figure 67: Ground Floor Plan
Own Graphic

haps contributed to its neglect. I began to view the structure as more than just a shelter for the used building materials inside of it. I started to see value in its rough cut 2x4s and 2x6s, its 2x10 long roof members and its metal roofing stock. The proposed design assumes a deconstruction of not just the existing cabin, but also the structure. Even with the added building stock, there is still material that needs to be sourced. Half way through this project i gave up the notion of designing a building with everything we already had collected, where is the fun in that? If this project can make use of what we already have but also outline some craigslist shopping items, then the narrative is ongoing. Who knows where we will get the additional rigid insulation that is needed for some areas of walls, or the additional sheets of OSB needed for the roof, but I'm sure there will be a story.

To quote Carl Elefante: "The greenest building is the one that is already built." This project is an experimentation in material reuse, and although highly personal and domestic, it opens up the conversation of how materials and therefore entire buildings can be crowdsourced from platforms like craigslist or an even larger, more global network while pulling from existing stock instead of manufacturing anew. And on a more micro, familial scale, this project is about finding a new home for the materials that my family and I have collected together, emphasising the palimpseste instead of erasing their storied past.

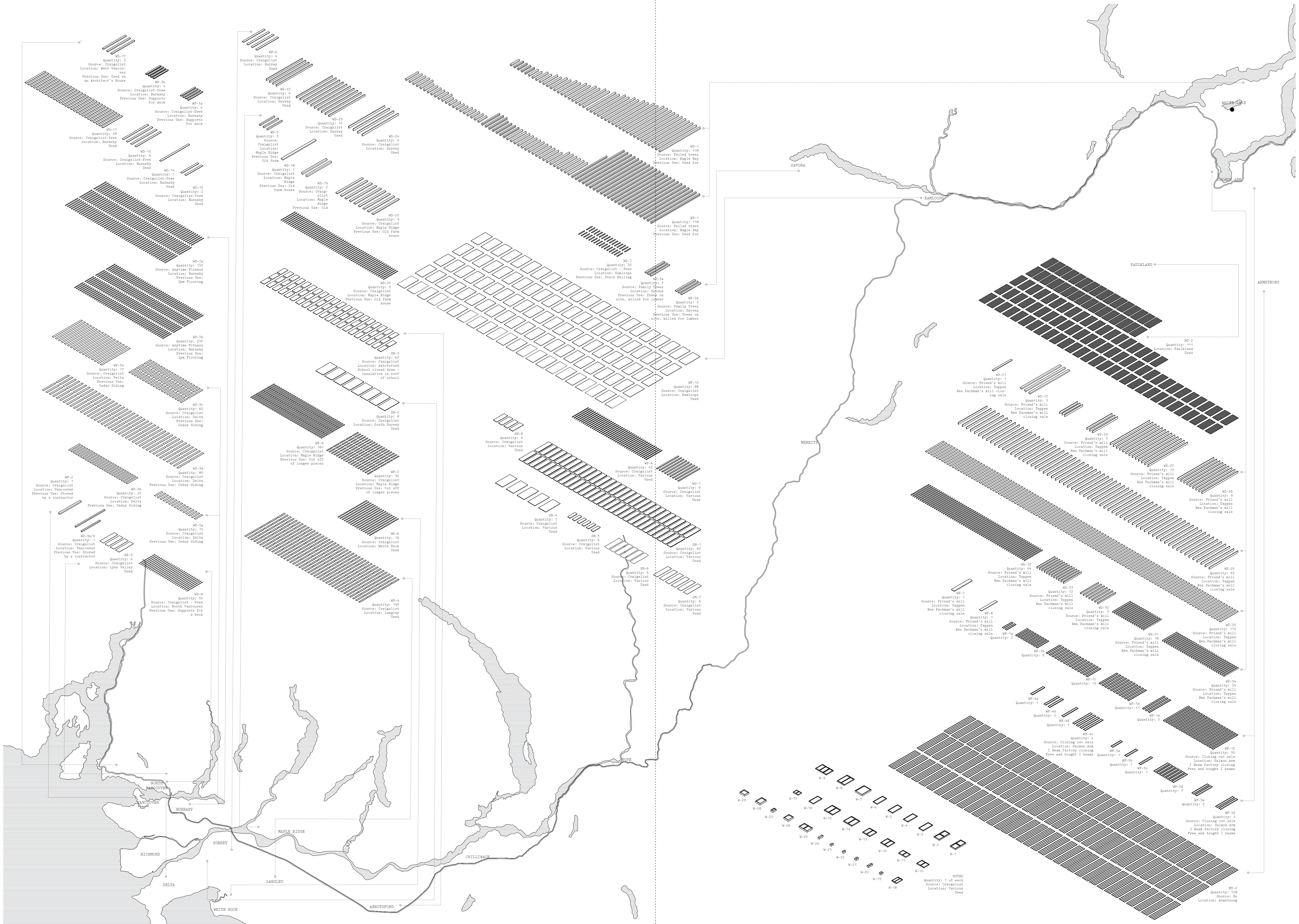


Figure 68: Material Map - displays the narrative of each used building material
Own Graphic

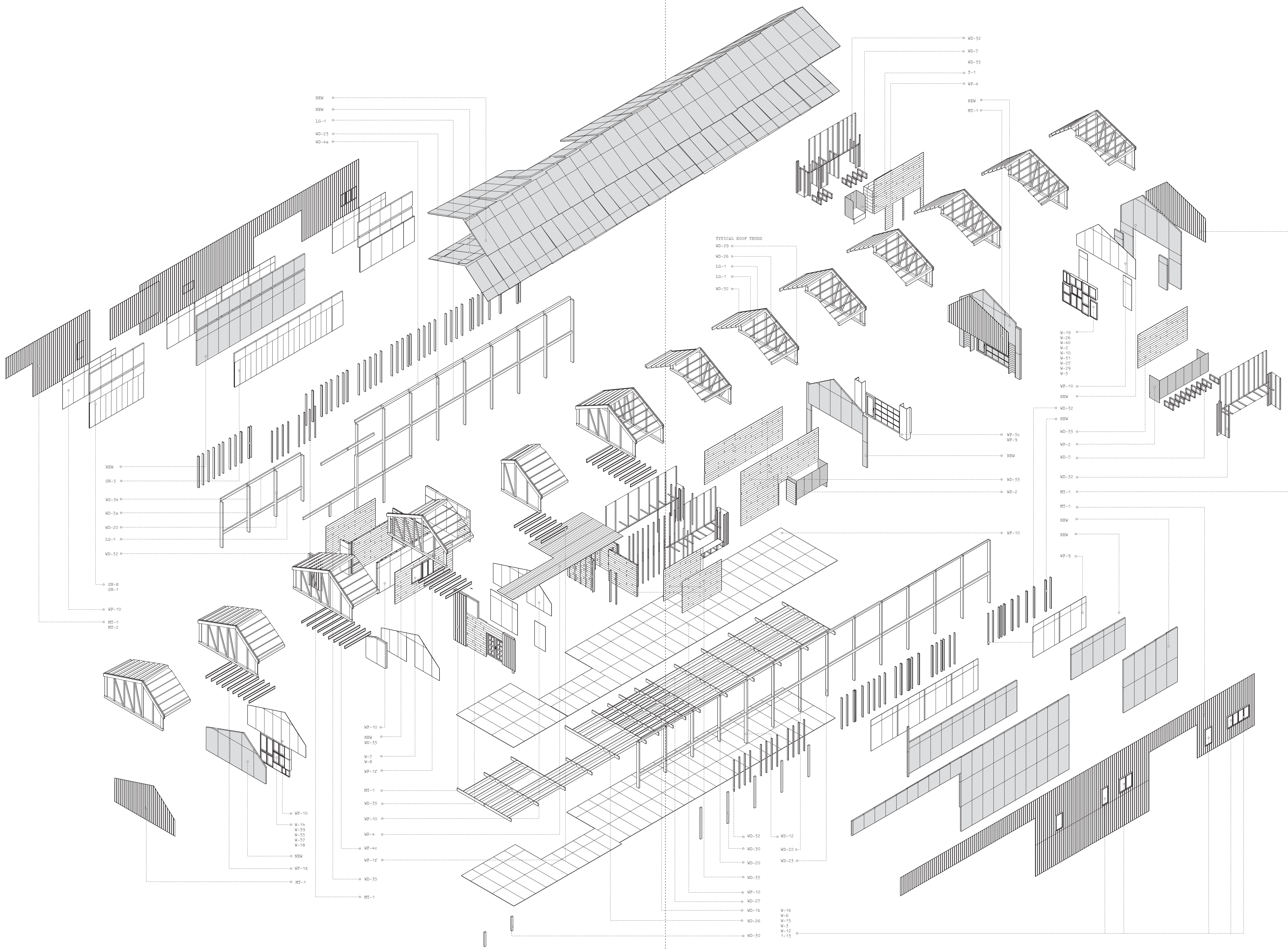


Figure 69: Exploded Axonometric - shows where each material finds a new home in the proposed cabin
Own Graphic

Figure 70: 1/32”=1’-0” Model
Own Graphic

Figure 71: 1/8”=1’-0” Model
Own Graphic

Figure 72: 1/8”=1’-0” Model
Own Graphic

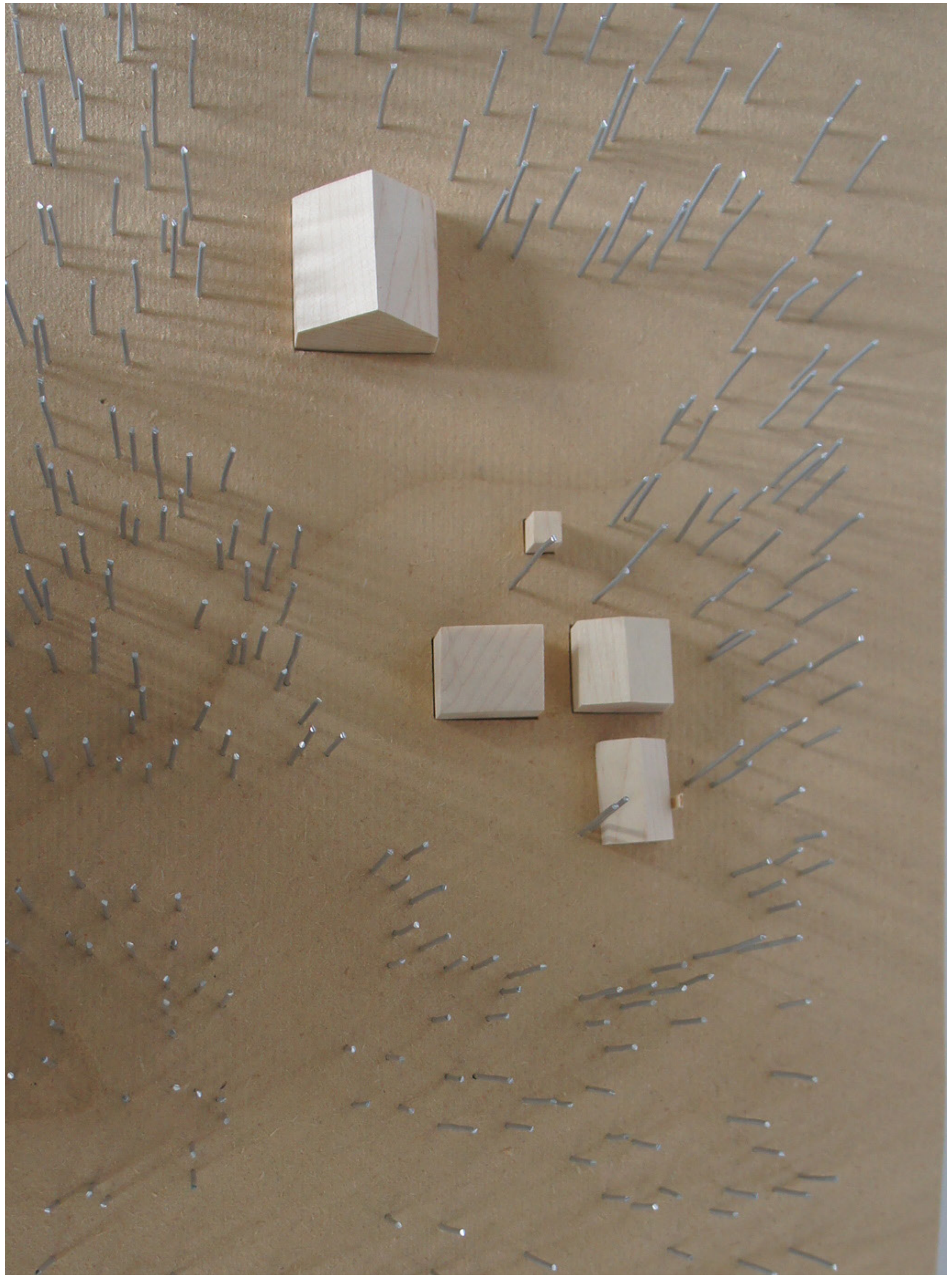


Figure 73: 1/32"=1'-0" Model - Existing Site
Own Graphic

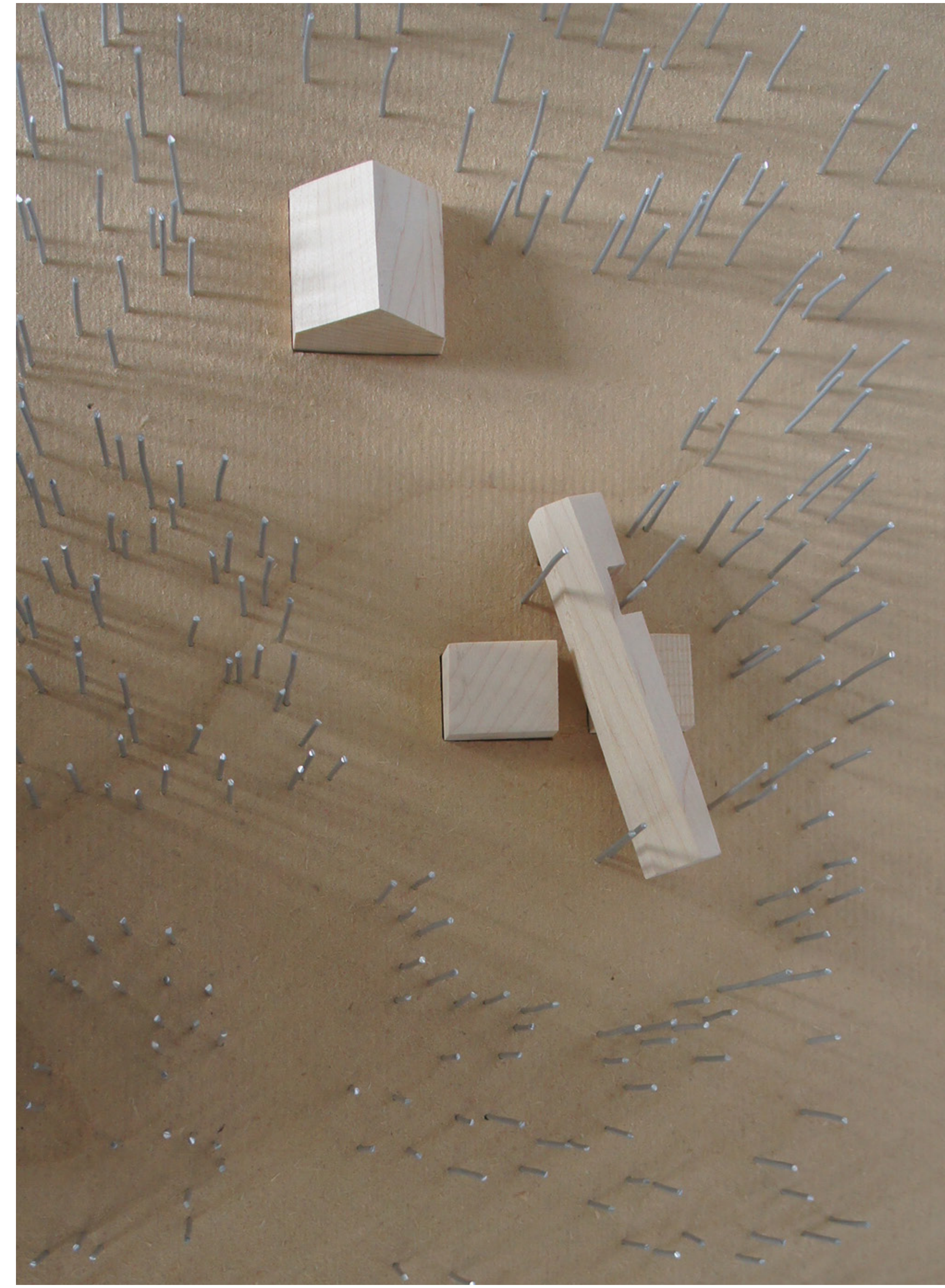


Figure 74: 1/32"=1'-0" Model - Proposed Site
Own Graphic

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