EXTRACT. REFLECT.

-Understanding the Architectural Model

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Department of Architecture and Civil Engineering

Examinator: Morten Lund
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Master's thesis 2020

CHALMERS

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ABSTRACT

This work investigates how the architectural model and the act of making the model can be used as tools for generating knowledge and, at the same time, communicate that knowledge. This thesis asks what properties more than to represent a building the architectural model has.

The architectural model is one of the fundamental instruments in a design process. Together with plans and drawings it forms the foundation of tools on which architects materialize and communicate their ideas and visions. Even though students in the architectural school are encouraged to build models, the full potential of what the architectural model can achieve is rarely discussed and even more rarely exhibited.

The architectural model can be divided in to two main categories. The representative scale model, which represent a building, and the sketch model, which represent thoughts or ideas.
This work will focus on the sketch model and aims towards an understanding of what this model is and investigate its performative properties. In what ways can the architectural model help us to understand and communicate what we are doing? The architectural model has got the ability to operate at a variety of levels. Not only as a representation of a future yet to come. But as embodiment of process, thoughts, knowledge and ideas.

With an artistic approach, this work is positioned in a theoretical and practical discourse where the process of making the model and its performative aspects are seen as drivers for understanding and communication.

By conducting a process that is limited in the way that the same model is made over and over again, with a variety of techniques, approaches, scales, etcetera, studies and reflections upon the different properties of the model will be enabled. First by making several models, and then by studying how the different models inform each other, and how the different approaches and outcomes from each process generates knowledge. Together the different models will form a base for understanding and reflections of the properties of the architectural model. And by that, embody and present the state between an idea and a physical model.

CLAIM

The architectural model can achieve more than represent a building. It can inhabit unforeseen properties that allows us to gain knowledge.
By making the same model over and over again, unforeseen properties will be revealed.

THESIS QUESTIONS

What properties more than represent a building lies within the architectural model?

In what way do these properties appear?

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BACKGROUND AND DISCOURSE

The model can at first glance seem simple, accessible, and ravishing. One might think that making a model is a part of presenting a project, a proposed scheme of a future yet to come (Brejzek, Wallen, 2018). A tool for representing what could be called a built reality. I believe that these aspects are just a small fraction of what the architectural model can be, or more important, do.

In the introduction to the book Architectural Model As Machine, Albert Smith (2004) tells a story about a human who discovers a marvellous stick which the human cannot resist to pick up. The human then uses the stick as an extension of the human's abilities, reach fruits from high branches, use as a defence against animals, measure things and create a sundial to understand the universe to mention a few. As the story goes on the humans discover more and more properties of the marvellous stick. To Albert Smith that stick is the architectural model. A tool to extend our mind and explore what we might not understand or even knew we could understand. If the architectural model has got that ability, is it then possible to use that to find out what other properties the model might have?

The architectural model is one of the fundamental instruments for architects. Projects are often presented together with models. In a school environment the model is often seen as a part of the end result of a project. Exhibited as a presentation model with a set scale. From experience at school, the model is often the last thing the student does when everything else is developed through plans, sections, diagram and what other tools considered necessary for the student to explain a vision of a future yet to come. As presentations models often are time consuming to make, they are often made at the end of a process. When all decisions regarding a project already have been made. Therefore, the presentation models that often are the ones kept rarely are used as tools in an early process.

A way to work with models early in a process is with sketch models; often simple models that are built relatively fast with the intention to test and evaluate different ideas. The sketch model is rarely seen as a tool to present a final result (Brejzek, Wallen, 2018).

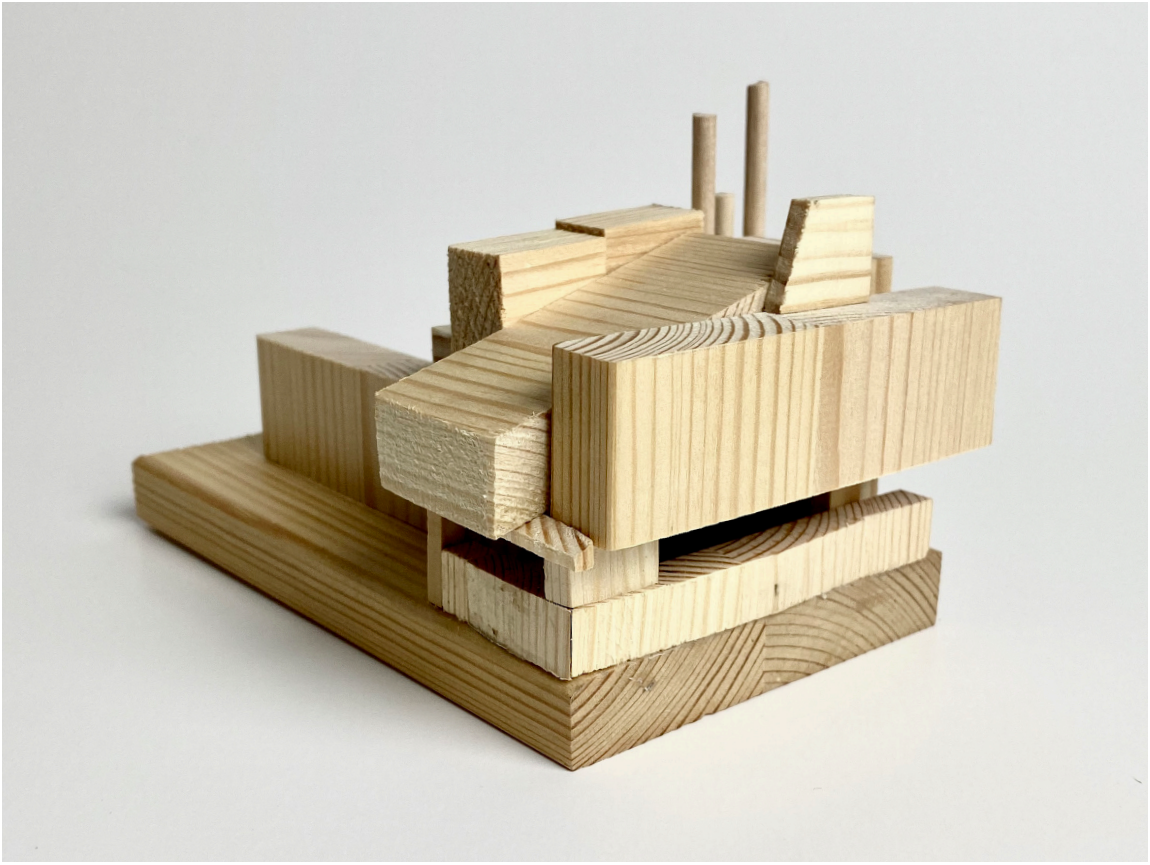
More common these days are the digital tools that allow us to get fast and picture like results. Depending on which software that is being used the models almost build themselves from the data put into the program. This field is constantly evolving and is broadening the perspective of what role the architectural model can take on in a process and how the relationship between the physical and digital model looks like. This thesis will focus on the physical architectural model and its properties in its physical presence.

Model from fall -18

This work is sprung from a fascination of the architectural model and what it can achieve in a process. What I have found interesting is that I, when building a model, often have experienced several surprising discoveries about the project that I was not aware of before I made the model. When building models, a problem can be seen in a new perspective. Things I was not aware of were being revealed in the model. In a way that to me was very direct.

The first time I really encountered a different way of dealing with the architectural model was in the Matter Space Structure studio in the fall of 2018 where I presented a model which represent a built structure connecting to the remaining parts of the soon to be torn down Göta Älvbron. Even though the model did not look like a miniature version of my proposal I felt that it commutated what I was looking for. It was full of information, free for me to extract and develop.

As my interest for a more abstract model began to grow, I came across the work of Petra Gibb. She is working in an inspiring way with her models. They are often abstract and can sometimes be hard to understand. Yet they are rich of information and stories. In her models she expresses her own approach toward architecture, and I like the way that she talks about traces of ideas that are embodied in the model. Gipp (2018) writes about a phenomenon of the plaster. How it contains traces from

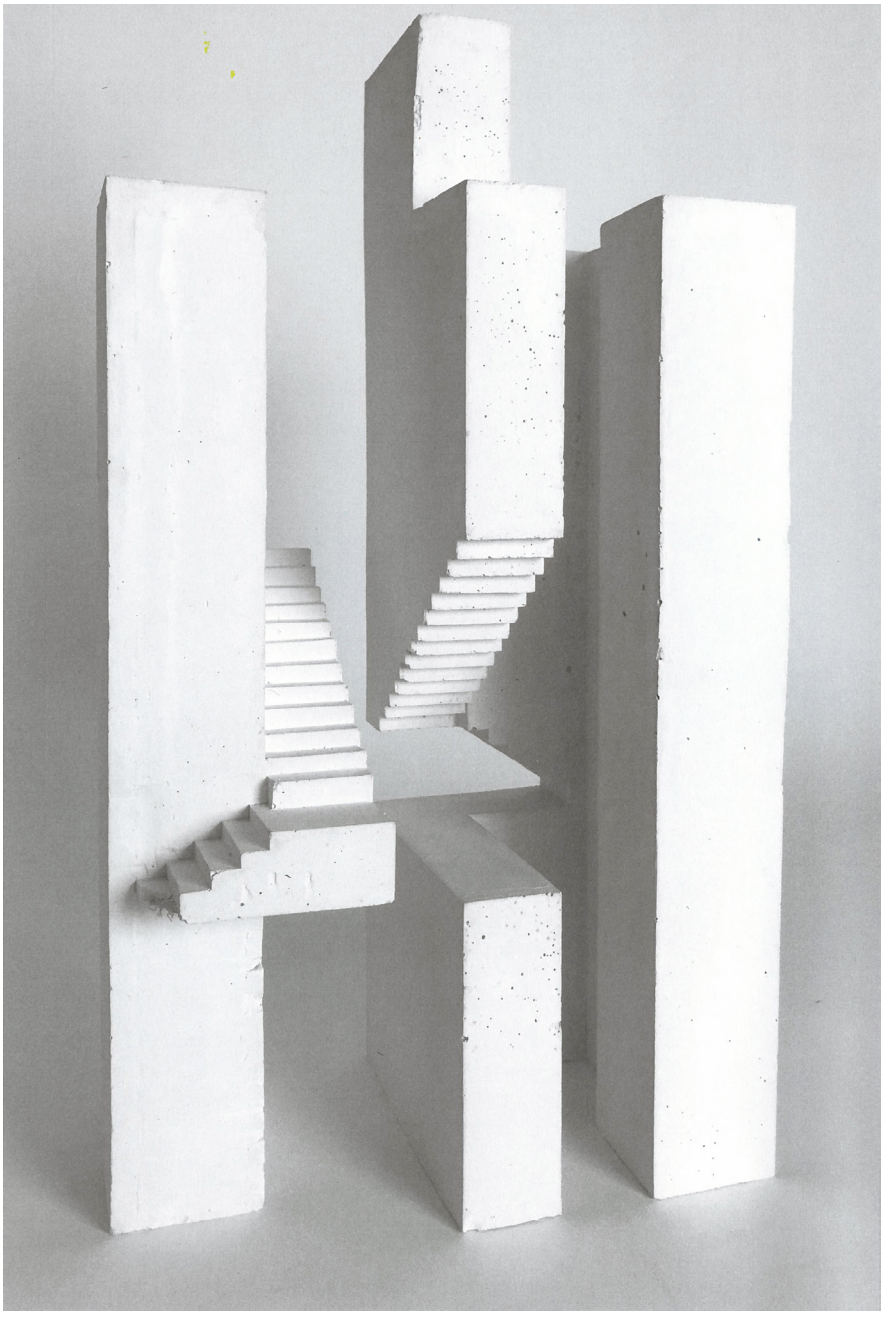


Model of memory, Fall -19

a process, the moment where an idea takes place. The plaster has got the ability to capture those phenomena. The photos of her models often highlight details of cracks, imperfections, shadows. She argues that even though her models often are abstract, not miniature buildings, she can use them as a very effective communication tool. That her models have the ability to bring out the essence of what she wants to accomplish. Her models can be seen as sketch models, models that are meant to point us in a direction, a moment in the process of making a building. Still they are relevant in their own body. Ideas of architecture embodied. Just as present as in a built reality. Her models are framing what she wants to talk about.

I started to explore different aspects of the architectural model during the autumn of 2019 in the explorational course in the Matter Space Structure studio. I started to make models of memories. And what I found interesting with this those models, where that I experienced that the models where in a way communicating with me. Both by making them and interact with them. The models helped me to remember and also suggested that I was working with different kind of memories. I came to the conclusion that if I had not done them, I would not have that knowledge from the memories.

Even though often representing something else the model is direct. It does not take detours, allowing for disruptions of what is what. The



Petra Gipp
Passage/schakt/nisch/fodring/nav - vandring #18
Passage/schakt/nisch/fodring/nav - vandring #19

model is what it is and does not only represent certain qualities or properties. It has the ability to possess the same qualities and properties that it represents. For instance, the light that hits a wall in model is not a representation of light, the light is there. Or as Olafur Eliasson had put it: The model is real.

Eliason (2017) argues that models are more than representations aiming towards a further artefact. One of his major claims regarding his work is that models are real. And by that his models are not representations of something else but rather ideas embodied in reality.

As banal that it might seem I find the claim important for my work. To me that claim is to be understood in a way that the act of models and the outcome from that process, is real. The model is not only a representation of ideas and phenomena, it can inhabit those ideas and phenomena. The model is something more than just a tool of representing something else. The architectural model is a tool for me to see. Just as the sketch drawing can be used as a tool to see. One might think that is the result, the drawing that is what the main aspect is.

I want to use the model as a tool to try to see the process of making it. I believe that it can reduce the chance of missing anything and also, try not take anything in the process for granted. My goal is to use the outcome to talk about and communicate what I am experiencing when I make models. If I can see it, I can point it out, explain it and talk about it.

Peter Zhumtor (2006) describes a design process as if you have an idea, and by sketching and using different tools, the idea becomes more clear and different consequences appear. I would like to link that way of thinking to the way I work with models. When working with models I can find myself almost have a conversation with the model. The model can respond to my intentions of what I am doing. Telling me what might be right or misunderstood with my intentions. Helping me to see the problem in a new perspective.

In the book The Reflective Practitioner (Schön, 1991) there is an in-depth description of how a tutoring session looks like in a typical architectural school environment. How the tutor presents new ways of approaching a task by formulating problems in a different way in order to proceed a process in a productive way. From my experiences the architectural model can in a way take on that role of the tutor in a process. Suggesting new questions and approaches and looking at a problem in a different way if that is necessary.

Working with the architectural model with an open-ended result, not knowing what might come out from the process of making it, will put high demands on how to demonstrate a model later presented. Anne Holtrop is a Dutch architect who works very conscious with models in an open-ended manor. Through working with models, he is exploring the essentials of materials and their gestures. He works with a process that is driven by consequences rather than executing a predefined idea. In the Batara

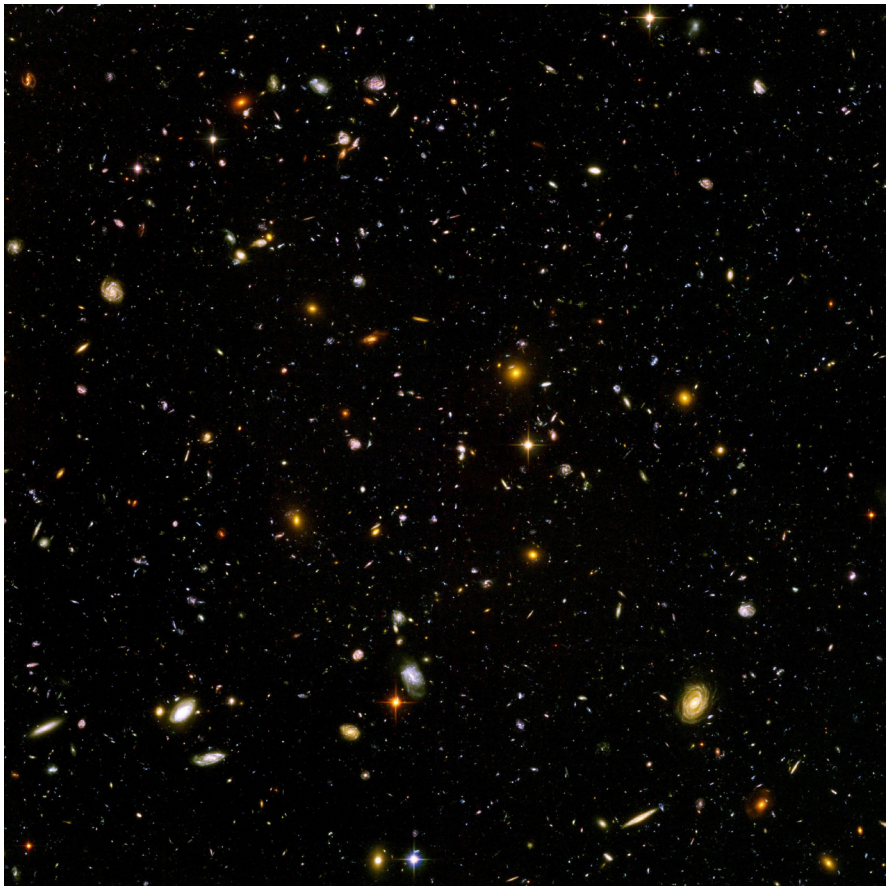
Olafur Eliasson, Model Room

Richard Serra, Verb List

projectthe process of casting pigmented concrete in sand is essential for the outcome of this project (Holtrop, 2016). The way I see it the architectural model has got the ability to communicate much more than a building, a proposed scheme. And it does so by embody many of its properties. By being embodied it can inform, surprise, propose, communicate.

In the work Verb List from 1967 by sculpture artist Richard Serra, a list of all the action one can take on to a matter is written down on two pieces of paper. I would like to say that each verb is a possible model in the sense that depending on what I do, the outcome and the process of making the model will be different. The list very much captures the approach towards the architectural model in this work. The vast amount of possible ways a process can take through the model.

Method

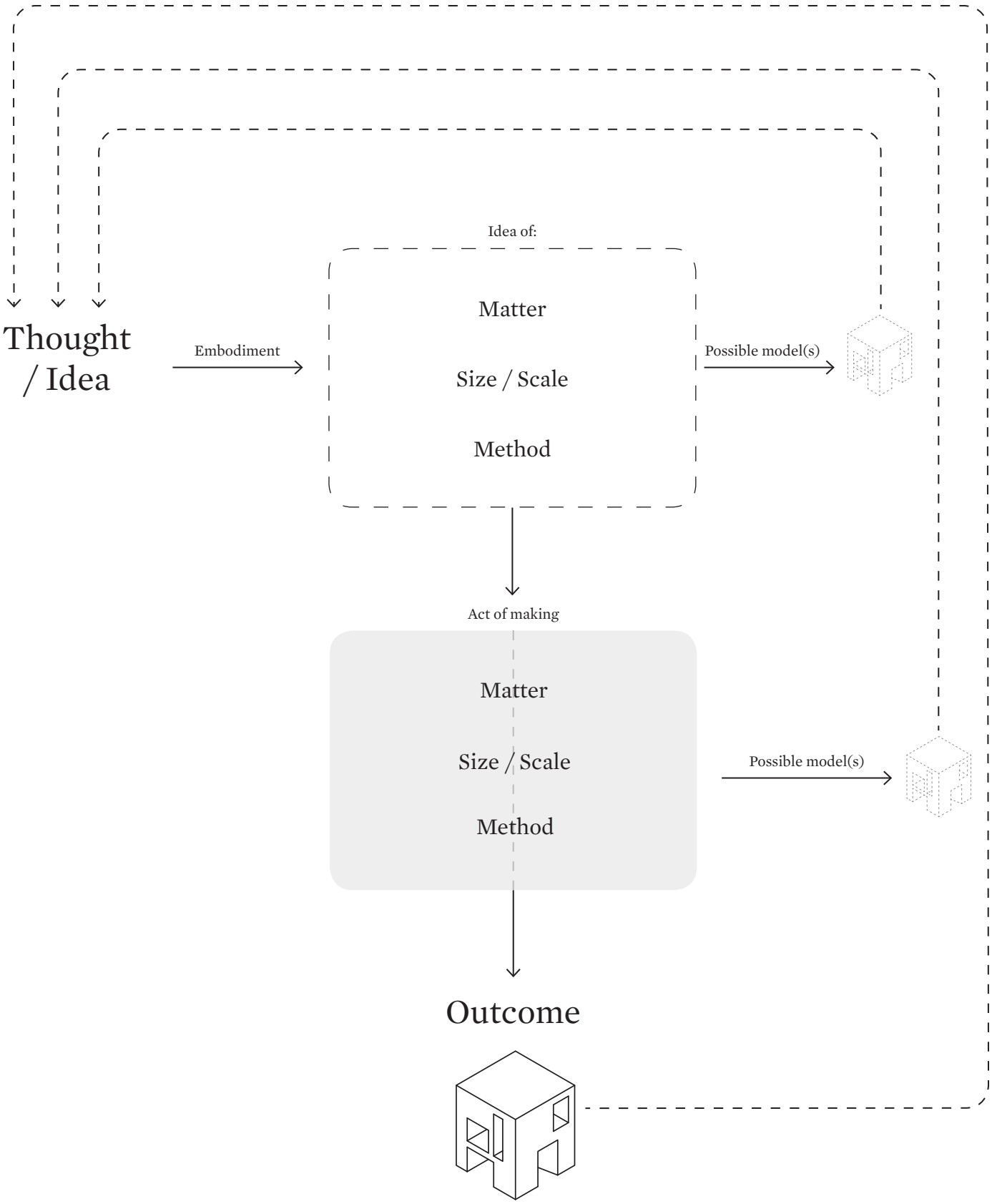


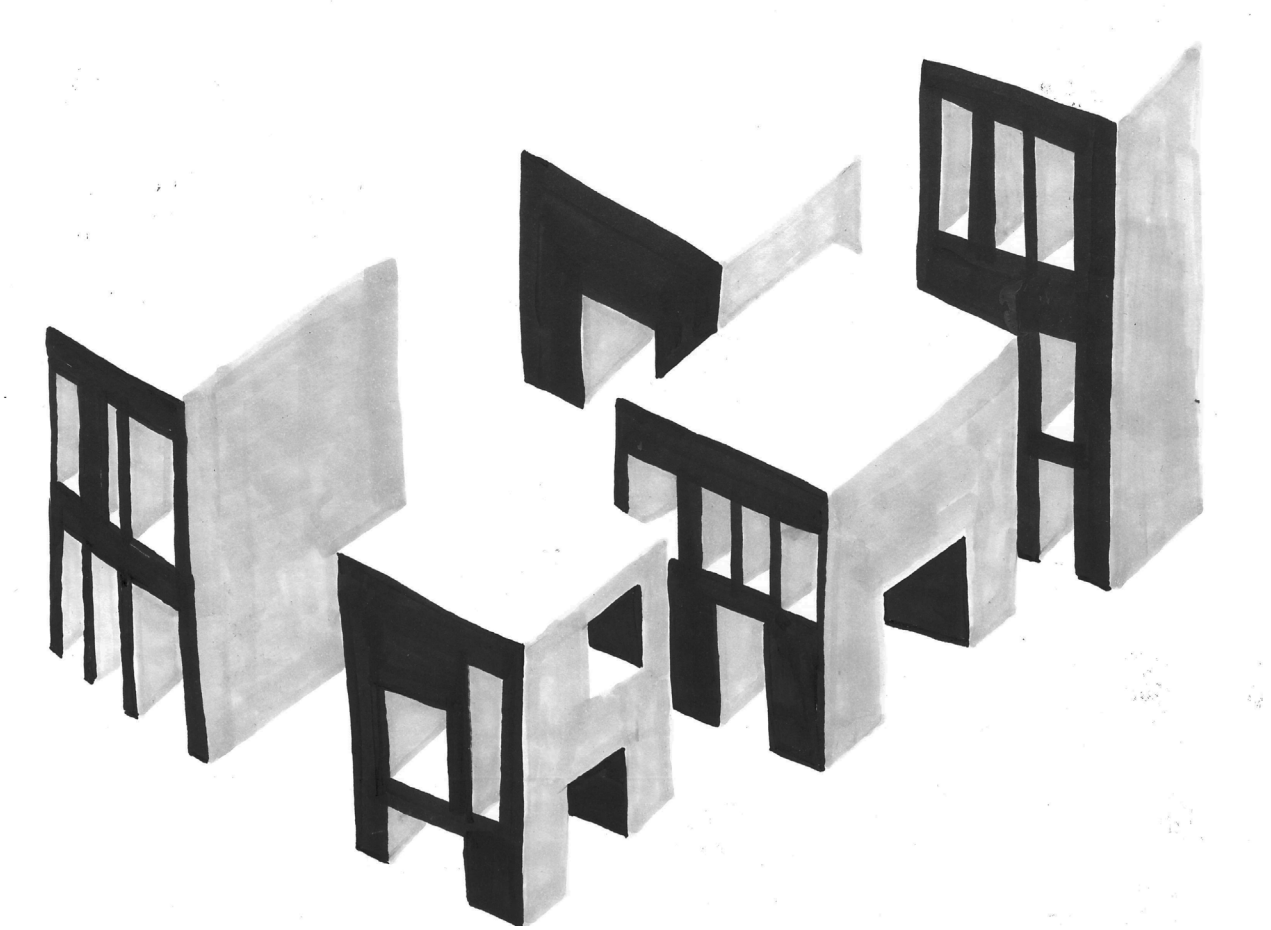
Hubble Ultra Deep Field

In 2004 scientist from Nasa used the Hubble telescope to zoom in on a dark spot on the star map to find out what the universe looked like in its early age. To be able to capture the light from the distant universe the telescope was aimed at the same spot for several days resulting a in millions of seconds long exposure time. From this seemly dark spot, scientist could now see almost ten thousand galaxies from the beginning of the universe (”Hubble’s Deepest View,” 2014). Just by starring long enough into space.

I would like to argue that the method presented here has similarities to the Hubble deep field project. In this case the architectural model is the telescope which I use to focus on the act of making. The more models I make the more ideas of other models will be generated.
It can be explained in the diagram to the right. It describes the state between an idea and a physical model. The idea of how the model will be made contains different decisions that will affect the outcome. The act of making the model also contains situations where decisions that affect the outcome are being made.

It should be mentioned that this loop that feeds the process is not as linear as described in the diagram. The more models that are being made the more different cross contaminations will be made as the work goes on. But it gives a clue of how the limitation in the process works as an engine to drive the process further.


Thought
/ Idea
Embodiment
Idea of:
Matter
Size / Scale
Method
Possible model(s)
Act of making
Matter
Size / Scale
Method
Possible model(s)
Outcome



Drawing from notebook

To be able to focus on the architectural model I started off by make a model of a drawing I found in one of my old notebooks. The drawing looks like a group of different volumes. I picked out the one I found the most interesting. The model that was made originated from that drawing and became the first model, from which the following models all origins from. In this way the models that are being made, inform each other. There are no predefined results or answers. The information that is being revealed and extracted through the process is leading the way.

When making the first model my intentions was to gather scrap pieces from the wood workshop at school and let the pieces inform the form. I had an idea that the outcome would both be imperfect, in the way that the pieces would not fit exactly to each other, and perfect since I planned to sand each piece carefully and furbish the model with linseed-oil. But the situation in the workshop started to play a role in the process. I was using precise tools when cutting and grinding the pieces. The process, now informed by the situation in the workshop, proposed another model than the model I intended to do when entering the process. I was now making an exact volume consisting of different pieces of wood joined perfectly together. At the same time, there was still a part of coincidence involved in how the pieces were assembled. The parts of the volume that was not visible in the drawing revealed themselves

The hack

as a result from how the pieces of wood were shaped. Especially the inside of the model is a result of this relationship between material and known/unknown form.
There are traces from my first intentions of the of the first model. There are two pieces of wood glued together in an imperfect way. The meeting is quite sloppy, and a hack is clearly visible. The pieces do not seem to fit together. I Could not fix it in the first model since it was already glued together in way that made it impossible to fix it. Instead I deleted the hack in the following models.

When I consider all the actions that where made in making of the first model, each action can affect the process and the outcome. If I do like Richard Serra and create a list of verbs it becomes clear that the act of making and the actual situation contains a large number of paths that the process can take on. There are also different levels of complexity in the list of verbs. The more I analyse the process the more verbs comes to mind.
In this context the limitations of making the same model over and over again is understood as letting the process work as an important driver for the project.

The first model









List of verbs from the first model

Combine it

Cut it

Glue it

Sand it

Furbish it

Gather it

Select it

Imagine it

Cut it

Group it

Test it

Trim it

Sharpen it

Glue it

Combine it

Fail it

Fix it

Assamble it

Grind it

Sand it

See it

Test it

Consider it

Leave it

Learn it

Furbish it

Feel it

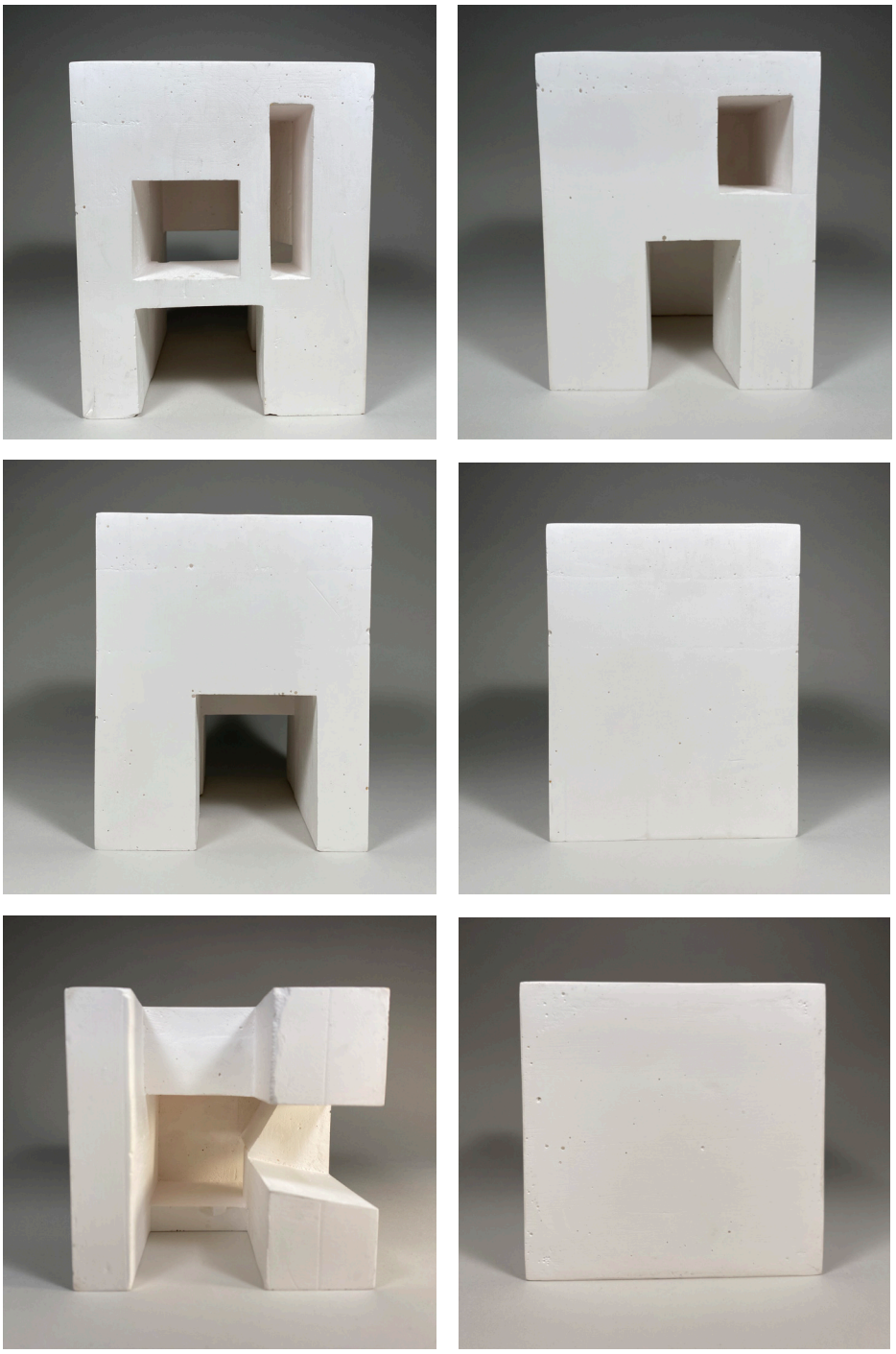
Handle it

Scale comparison

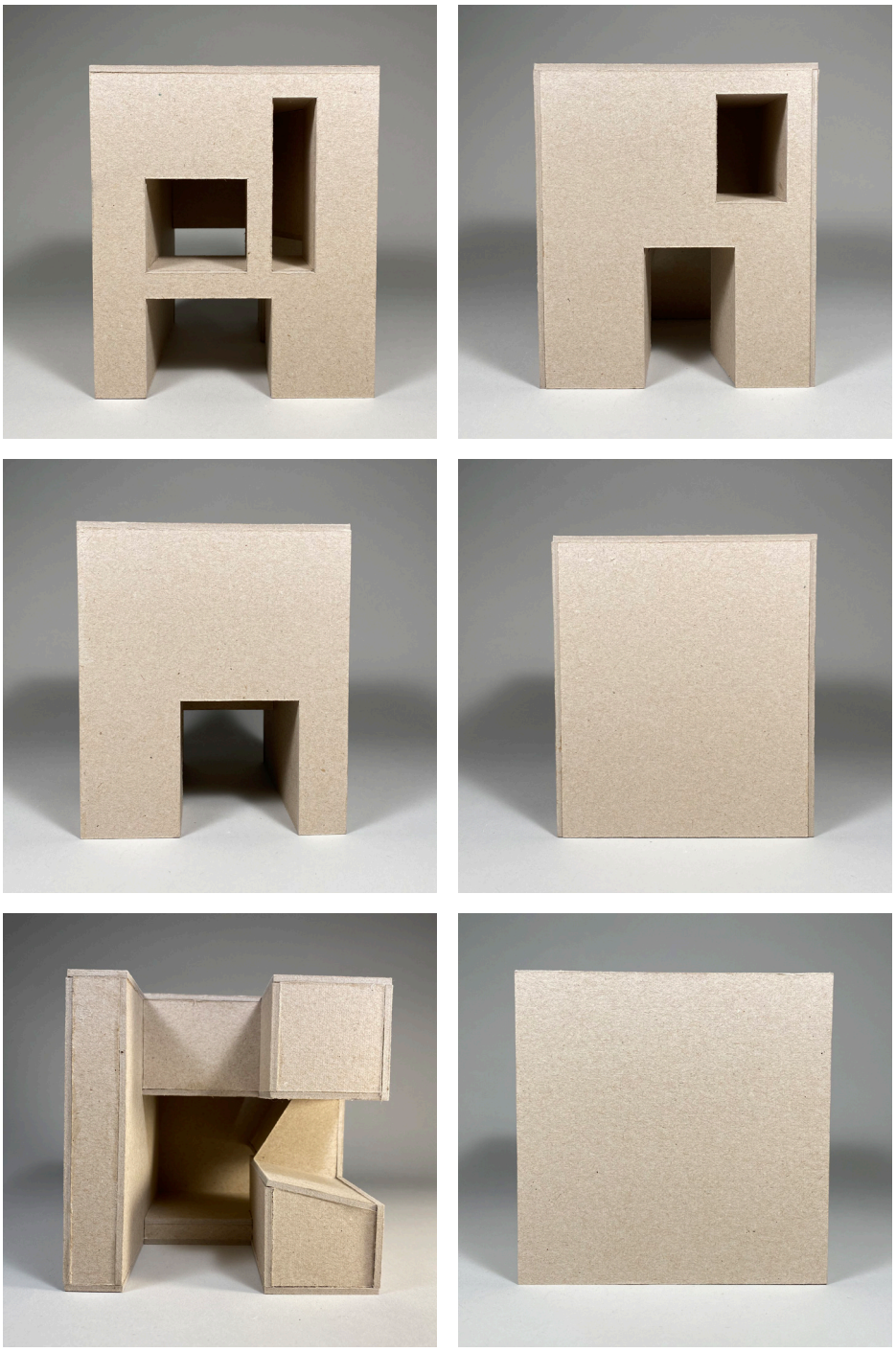
MODELS IN CHRONOLOGICAL ORDER

The First Model

Wooden Solid

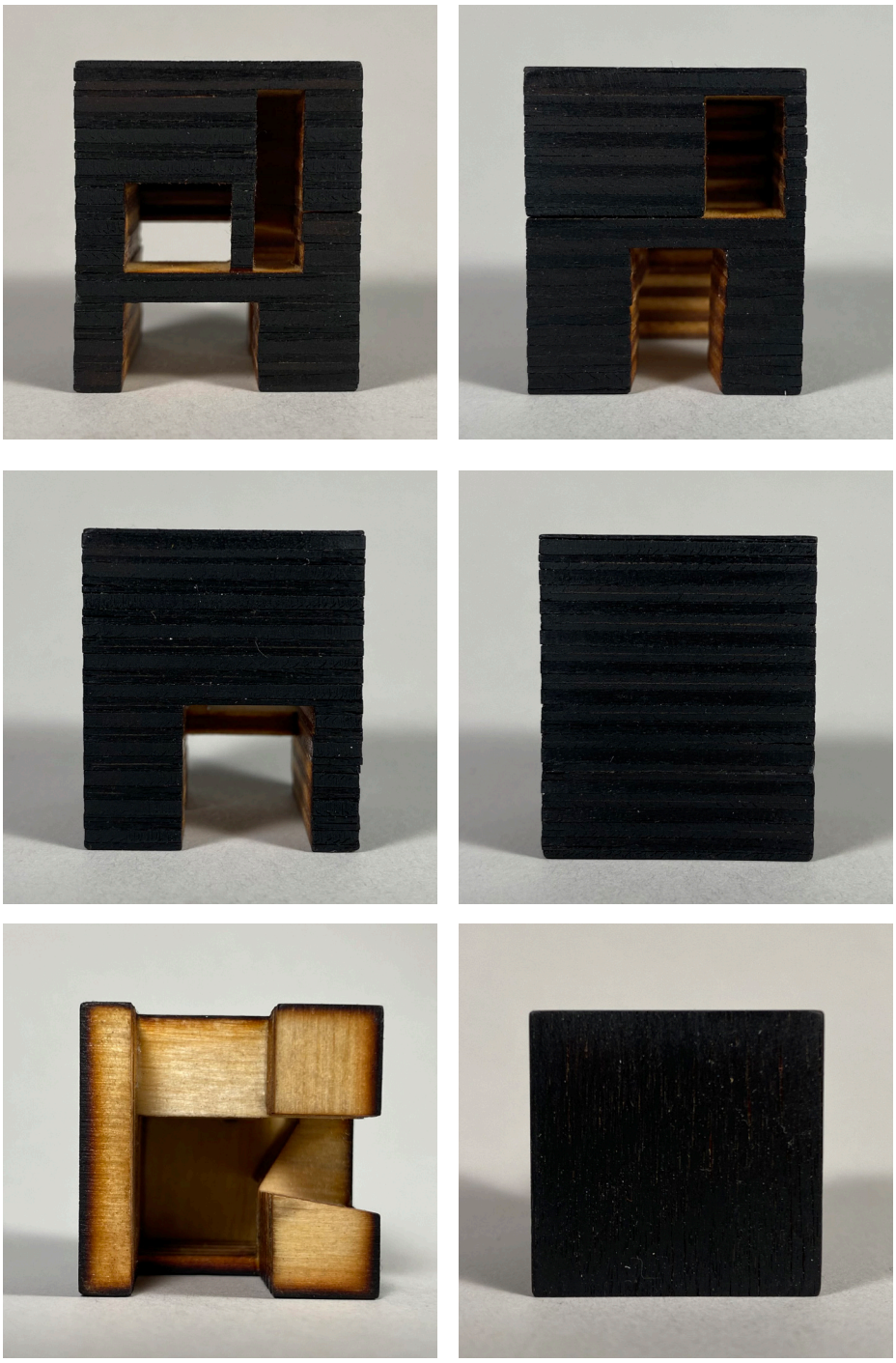


High-end plaster

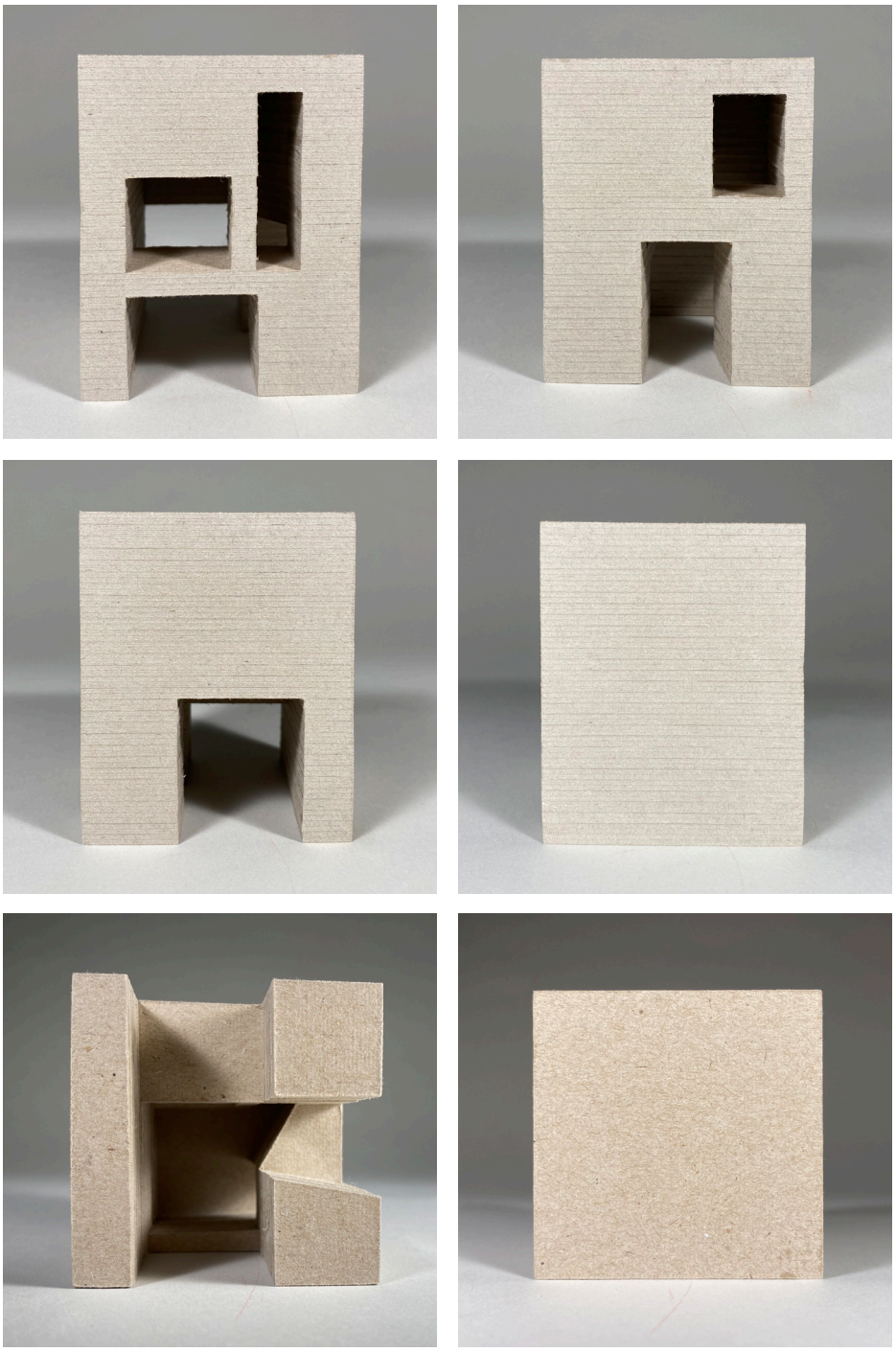


Cardboard planes

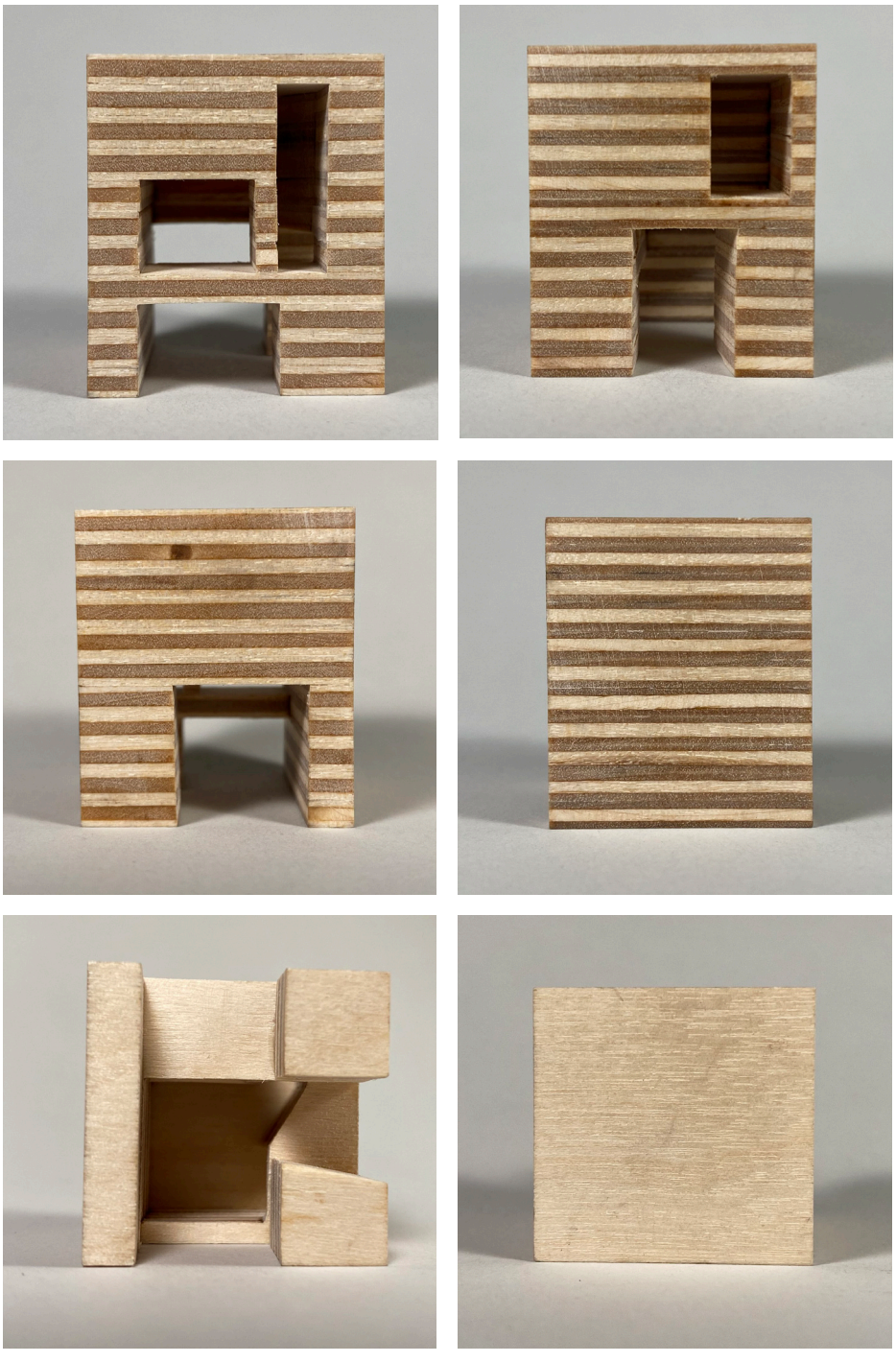
Stacked plywood solid



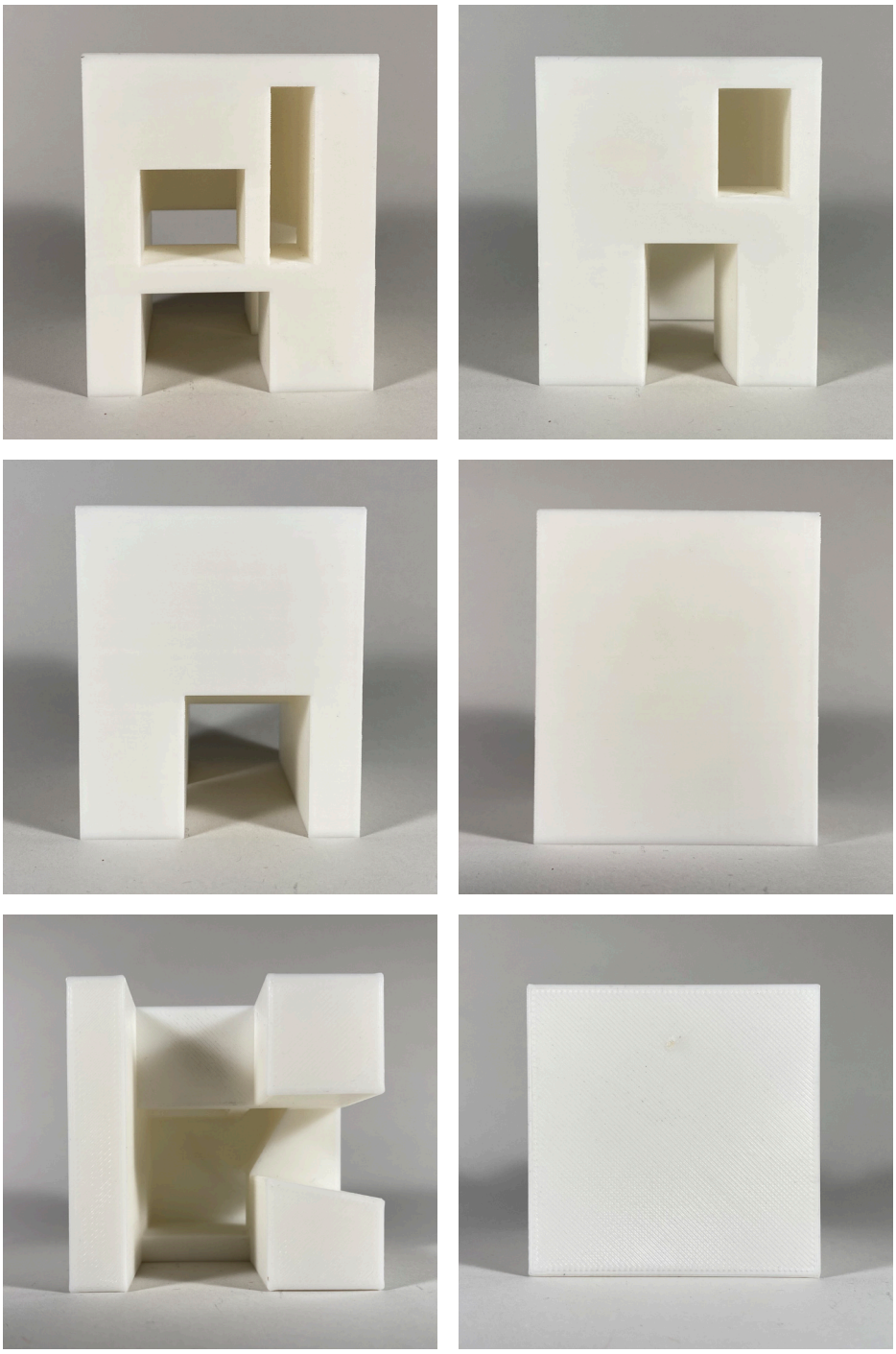
Burned plywood solid



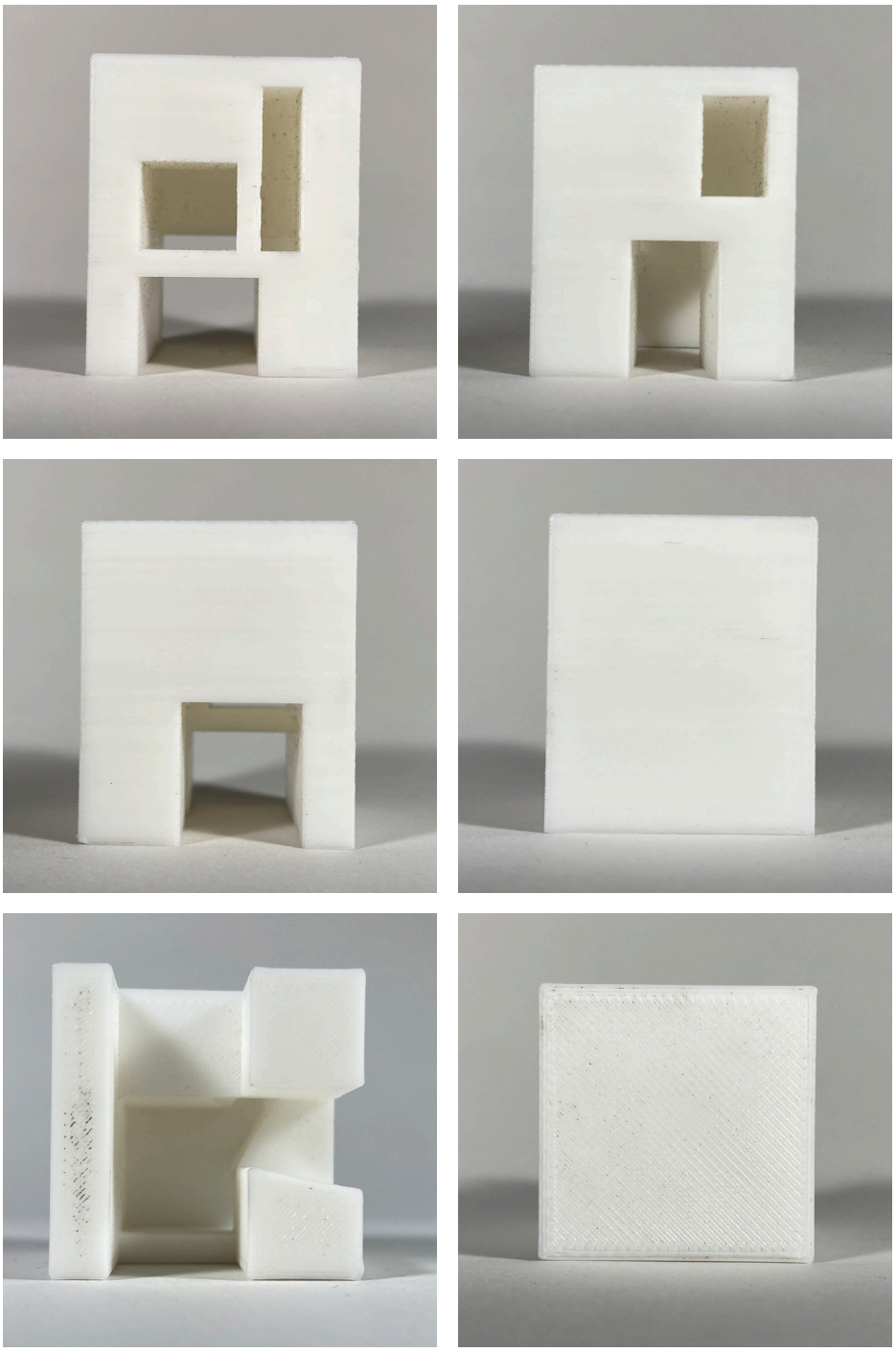
Large stacked cardboard solid



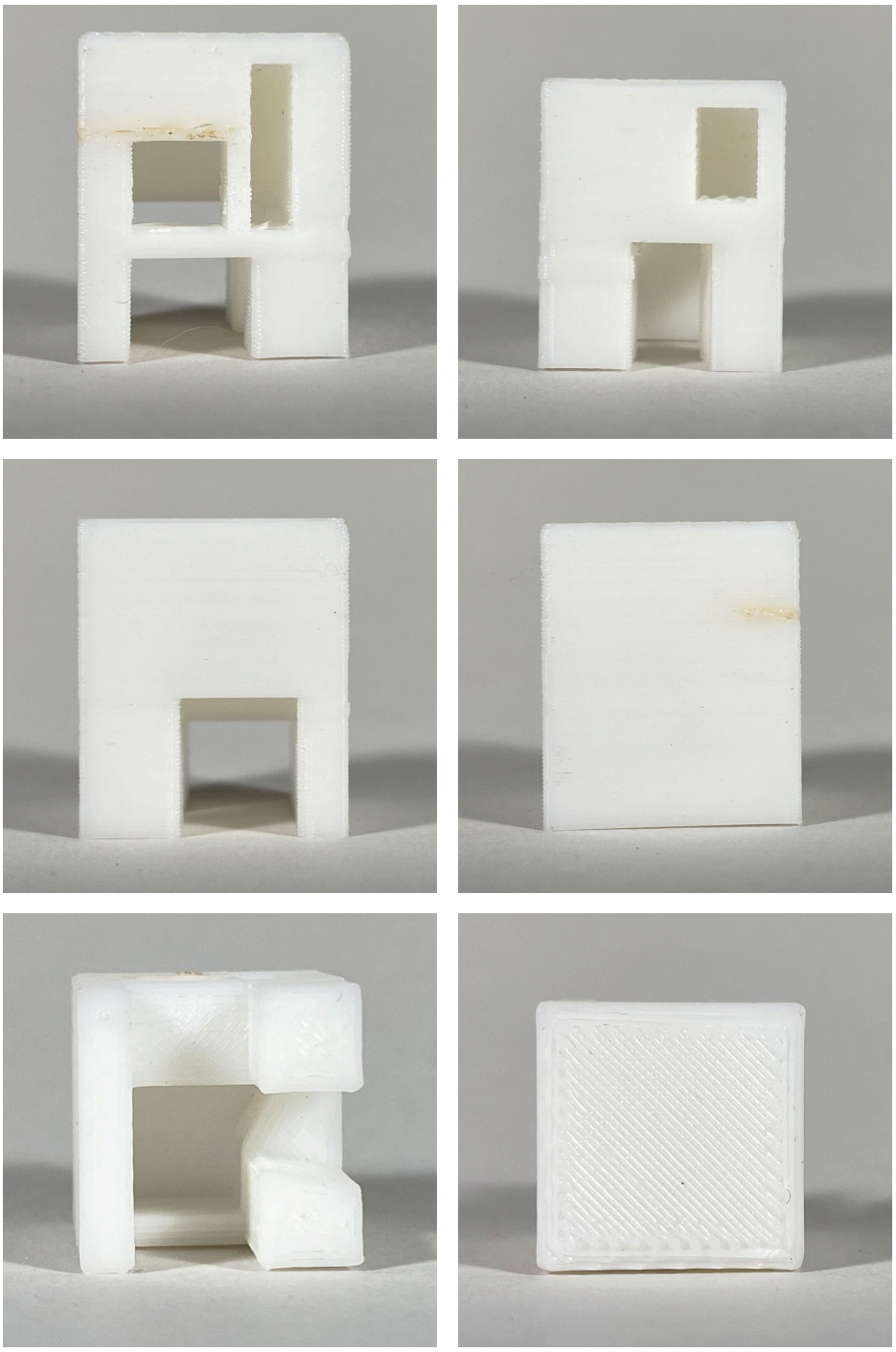
Sharp stacked plywood solid



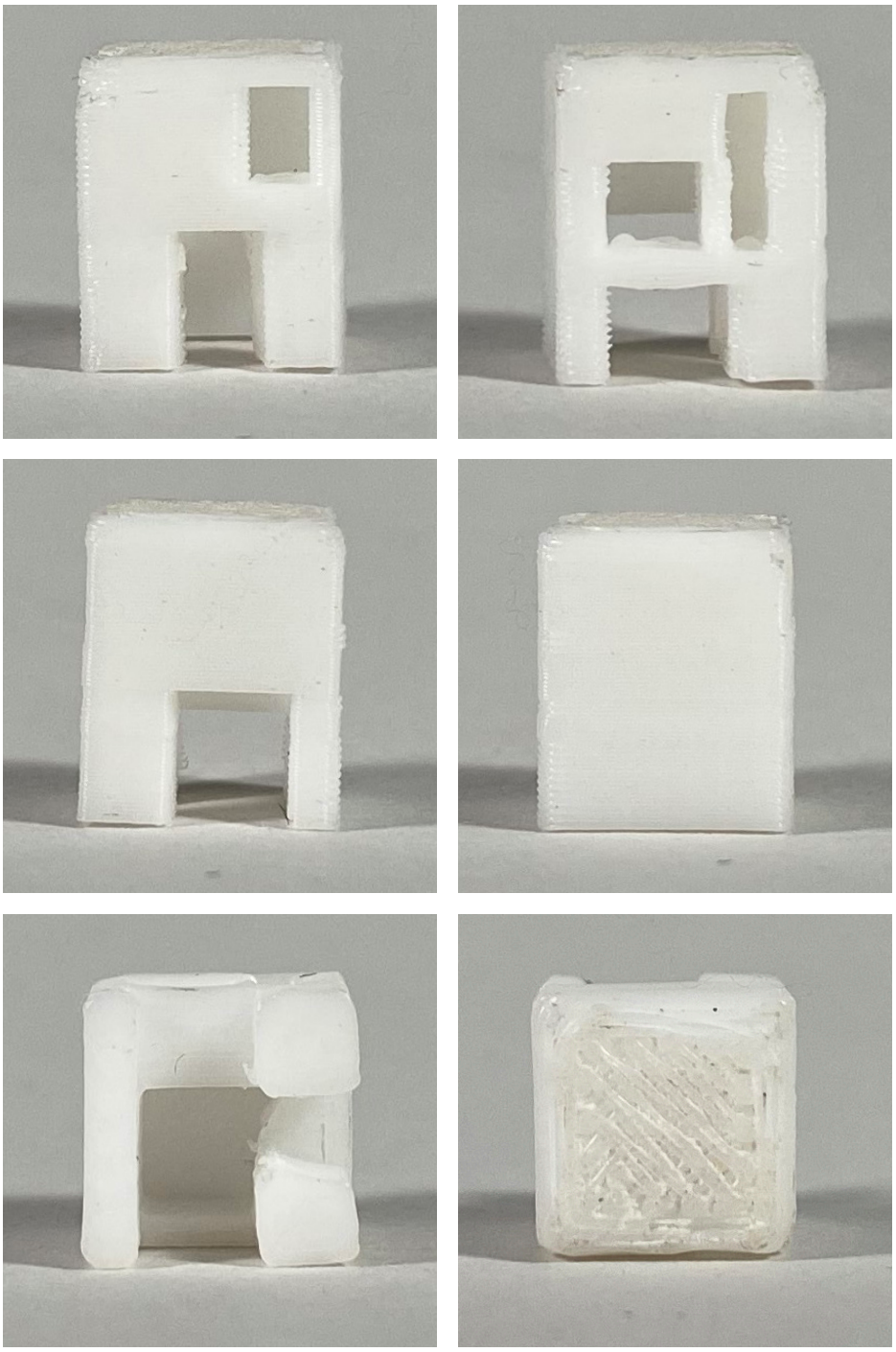
Large fine 3d print



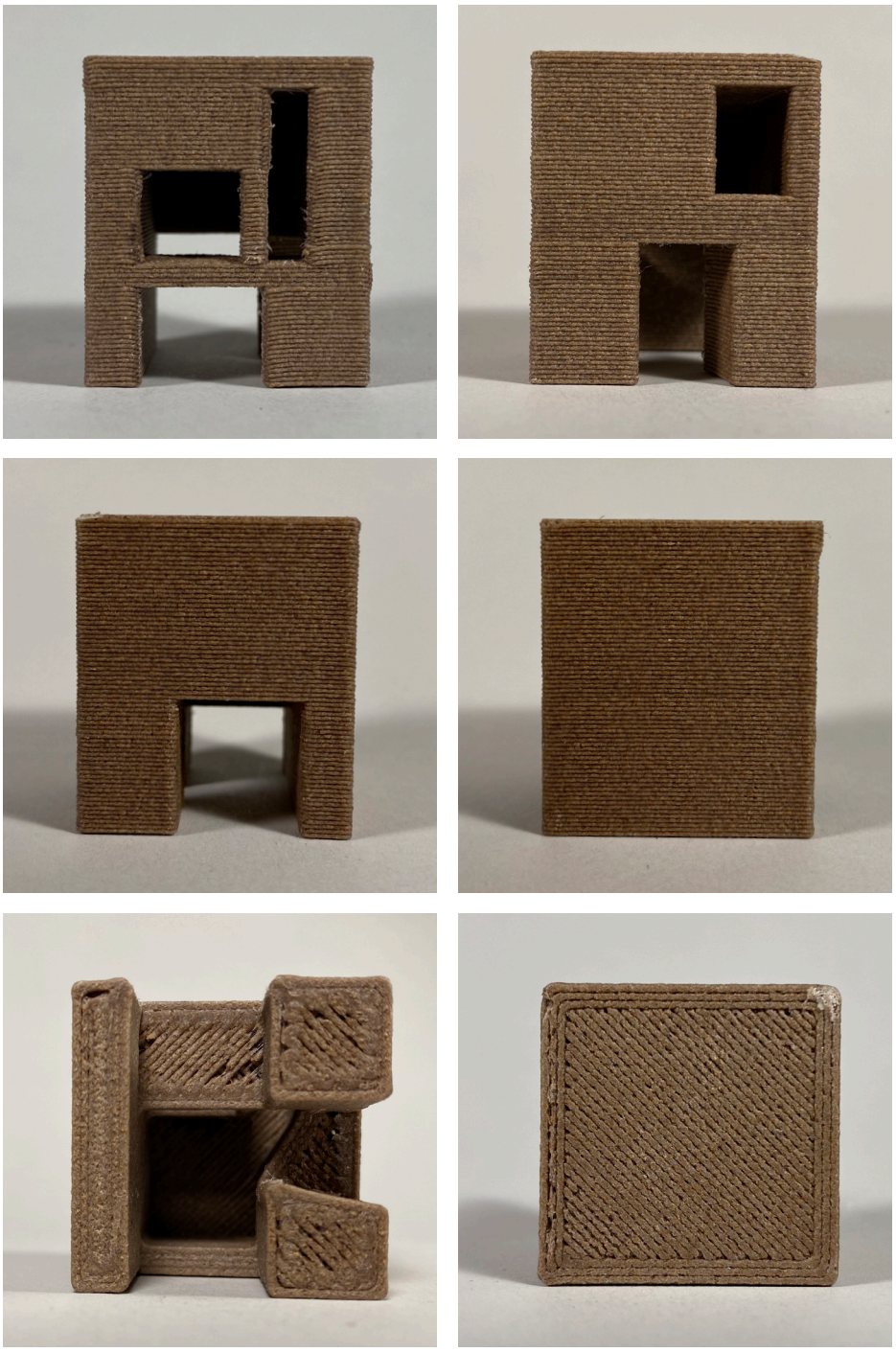
Medium fine 3d print



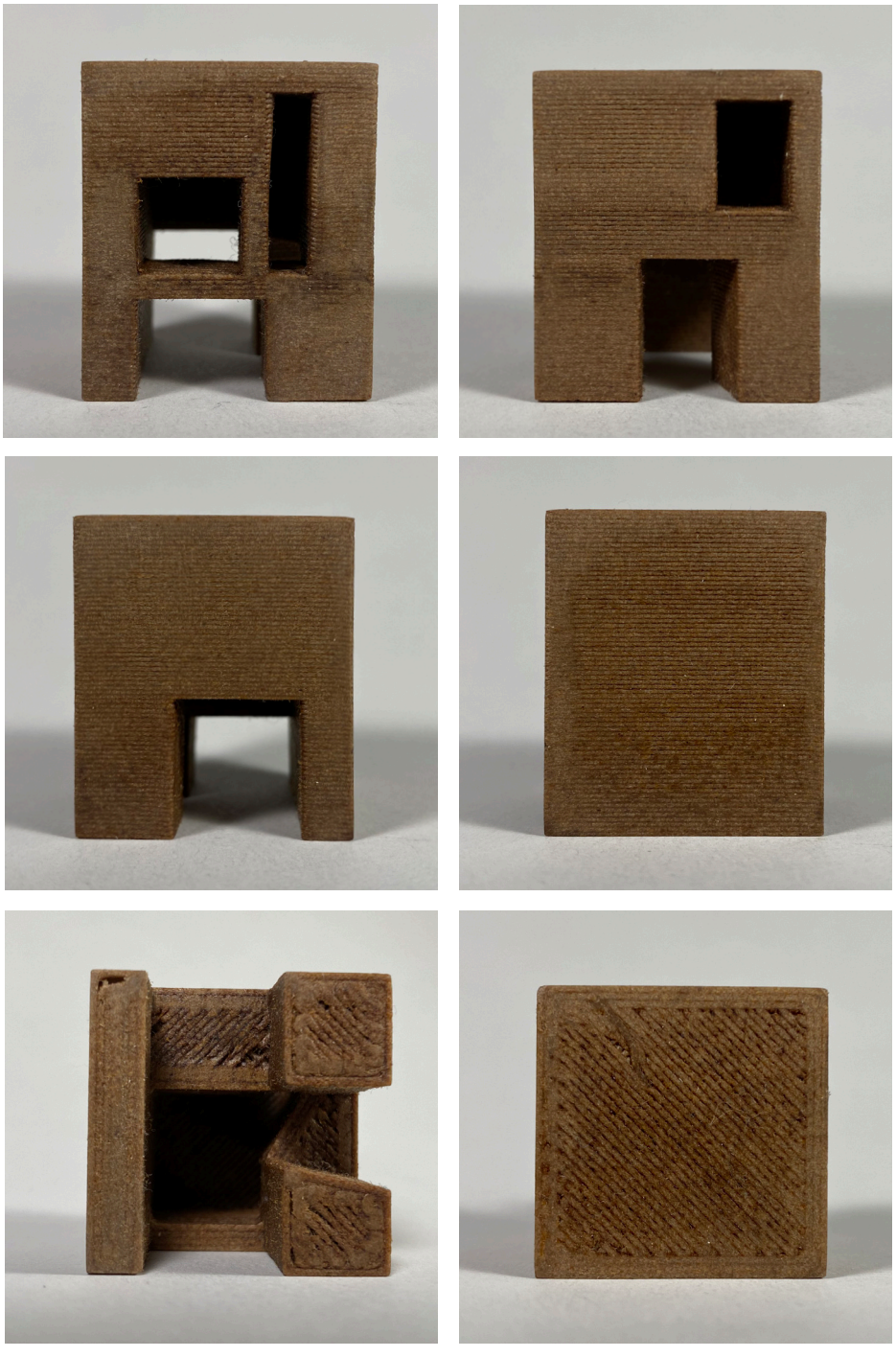
Small fine 3d print



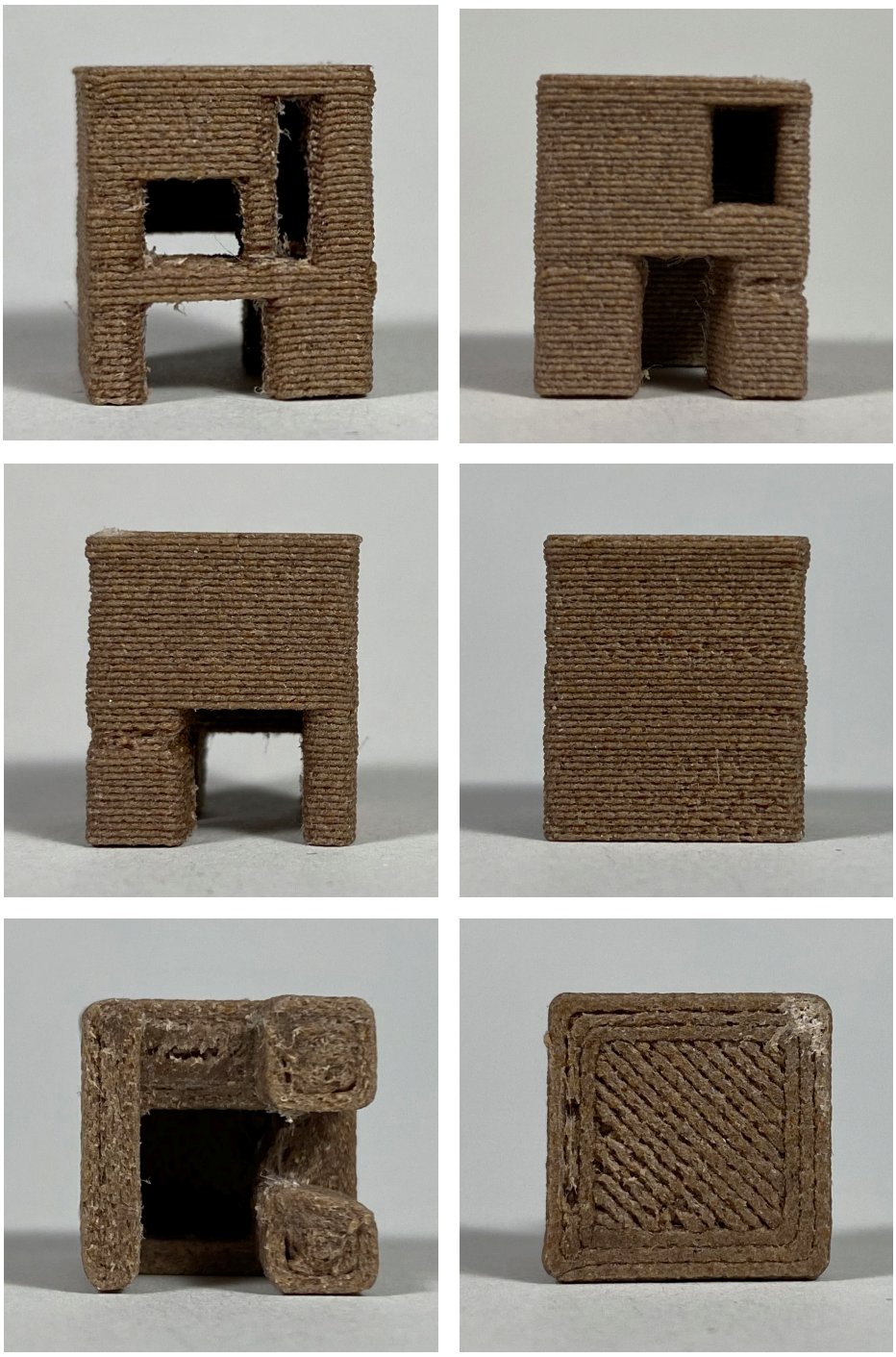
Extra small fine 3d print



Medium rough 3d print



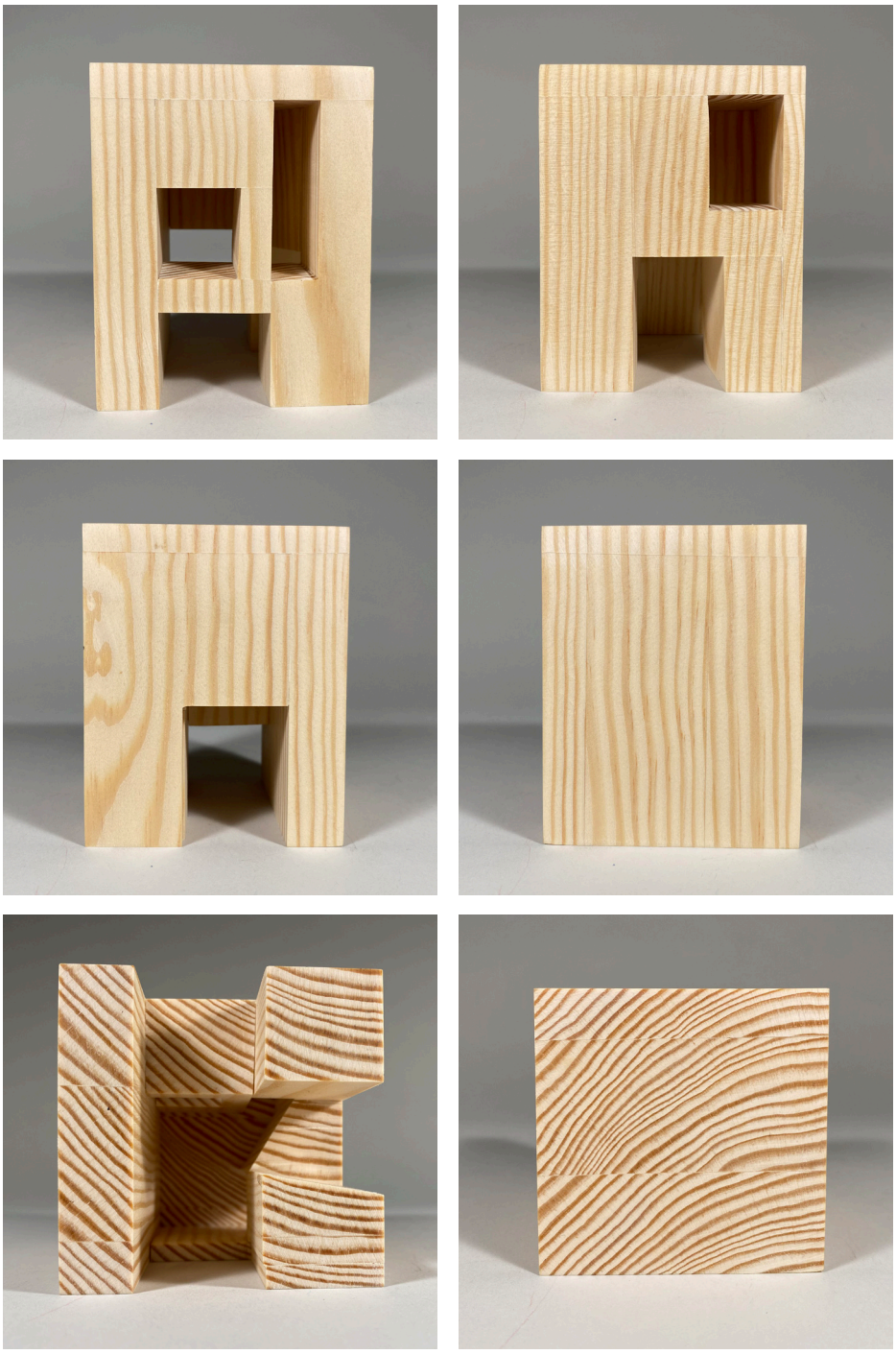
Tarred medium rough 3d print



Small rough 3d print

Extra small rough 3d print

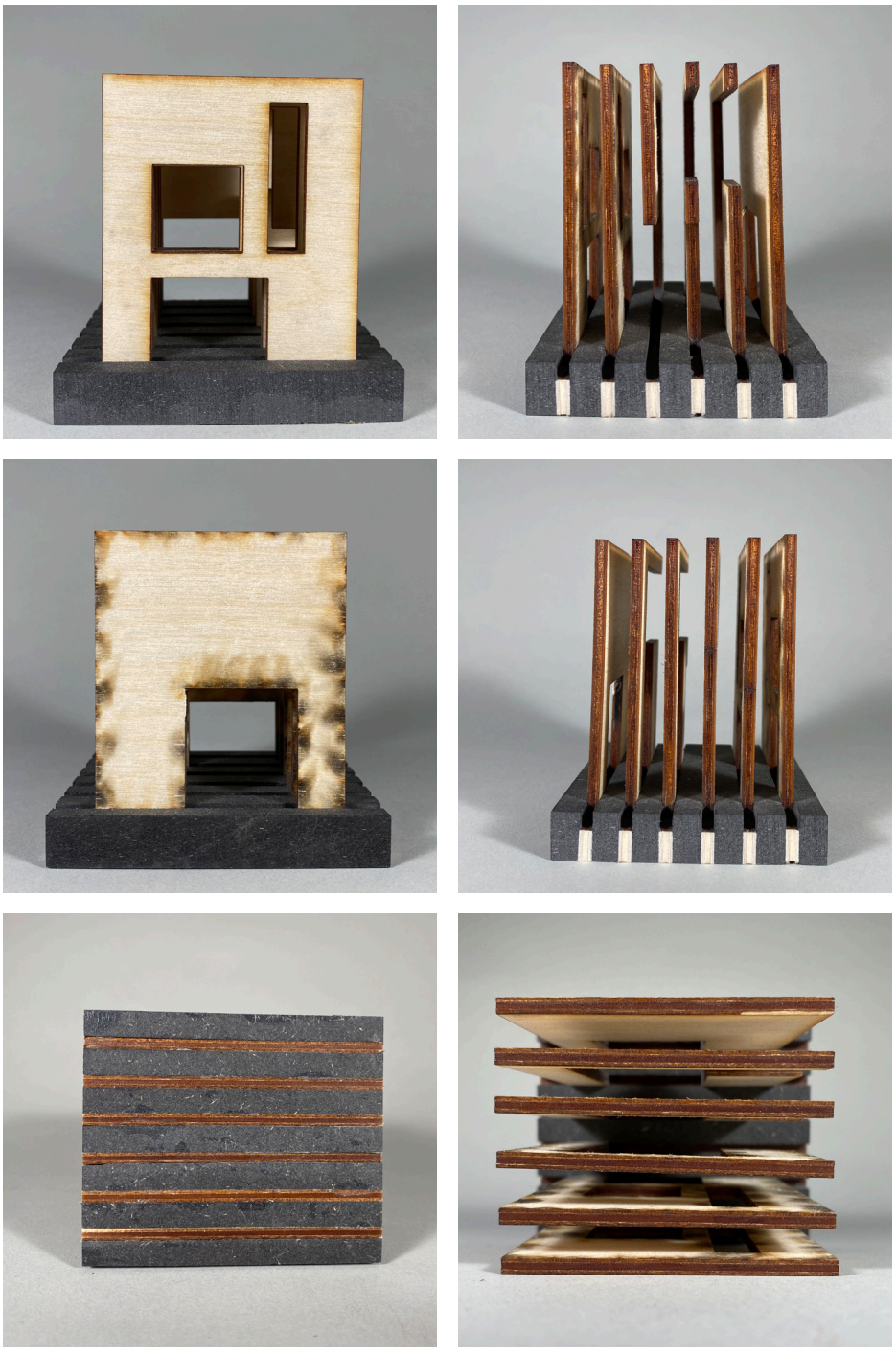
Plus plus



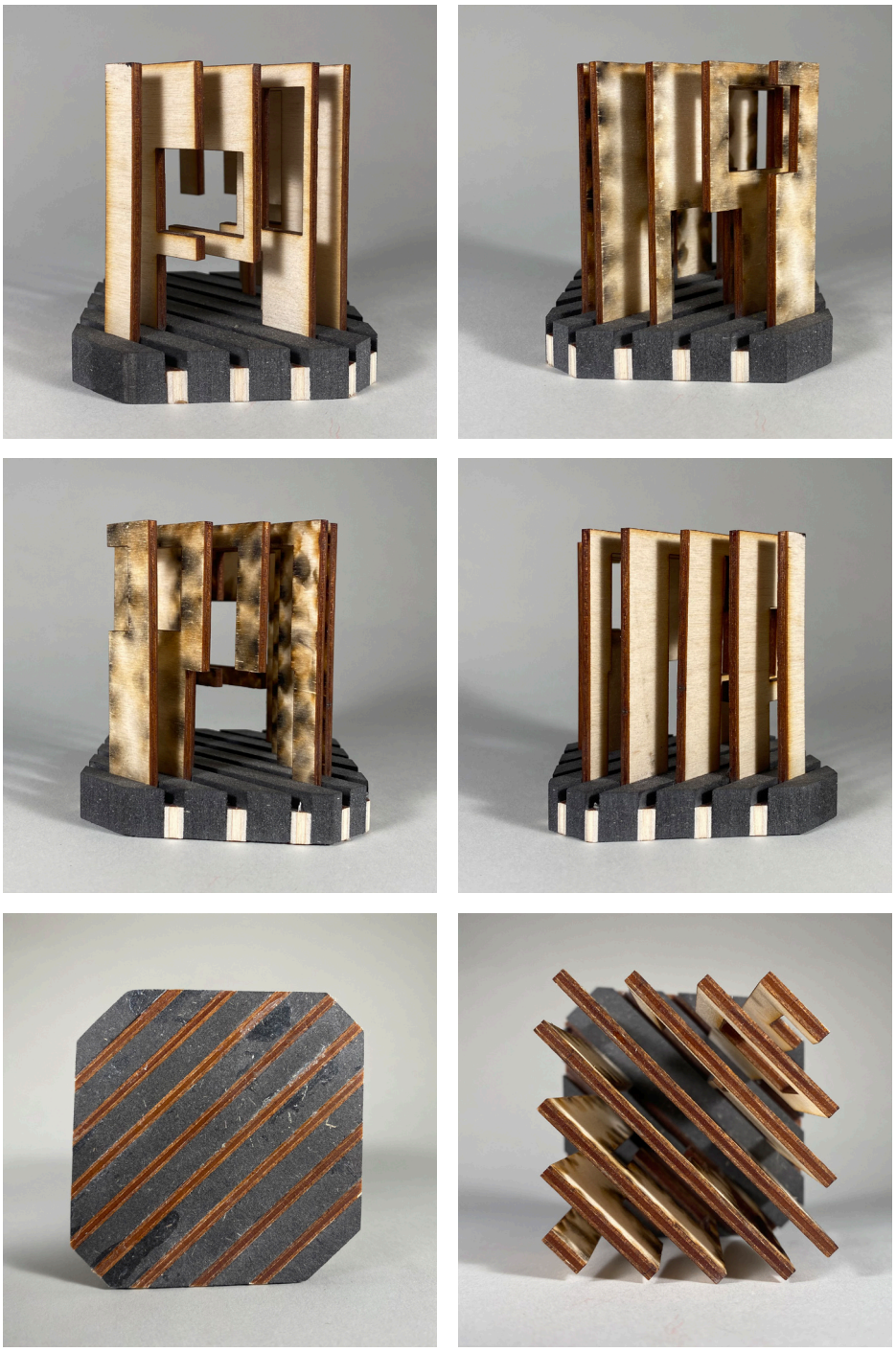
Sharp constructed wooden solid

Burned rough solid

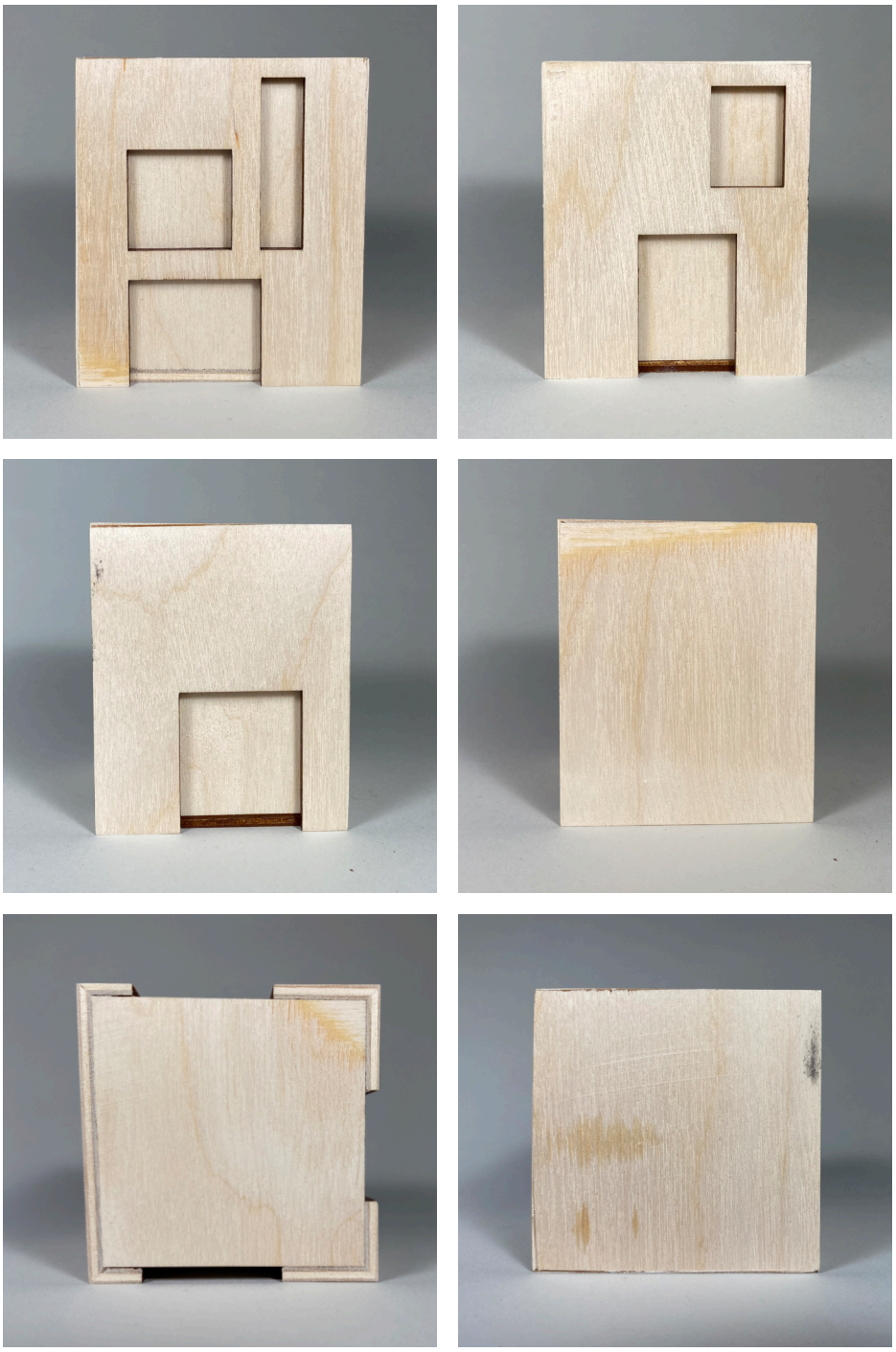
Black blinds



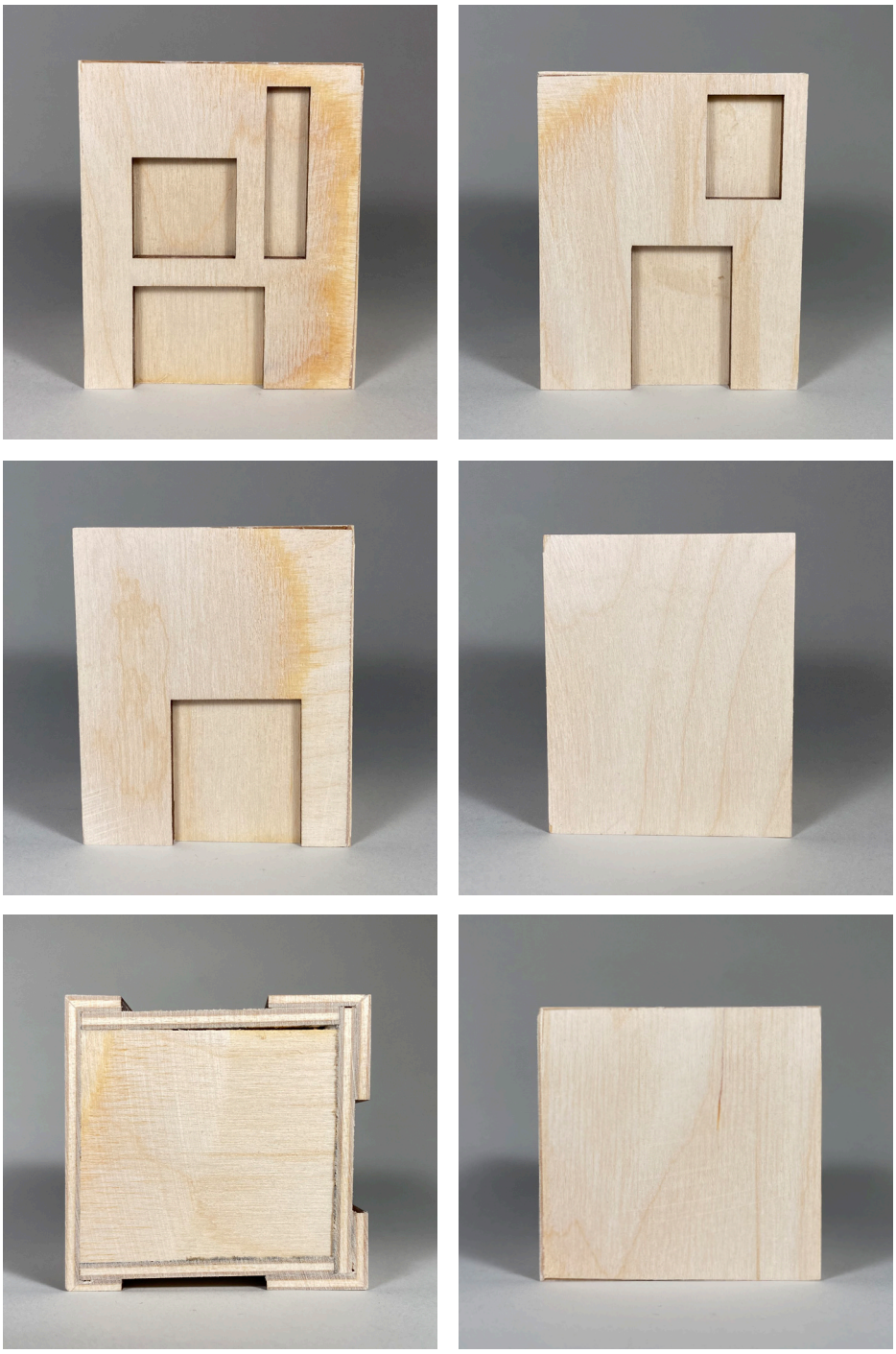
Laser cut blinds



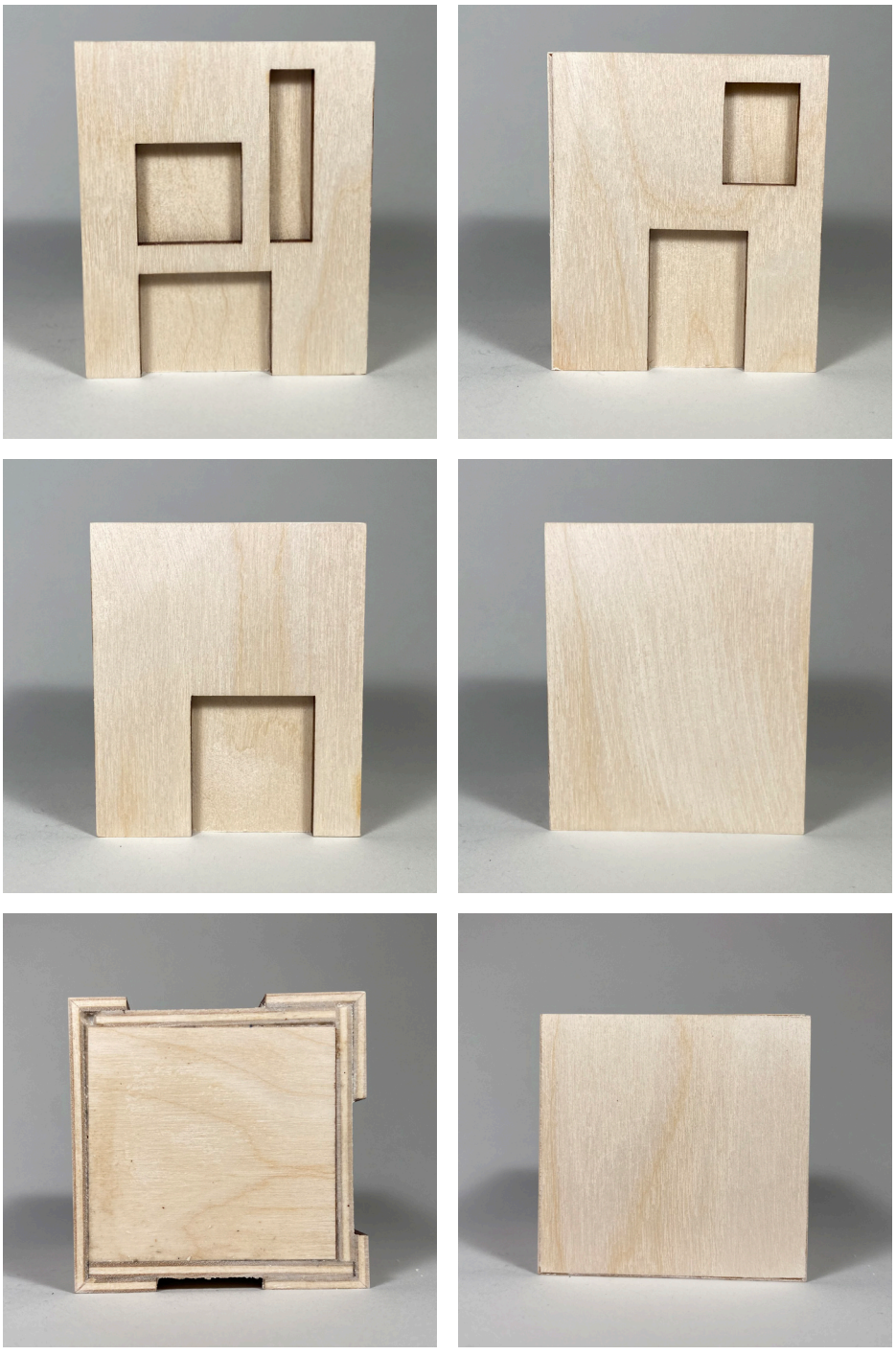
Angled laser cut blinds



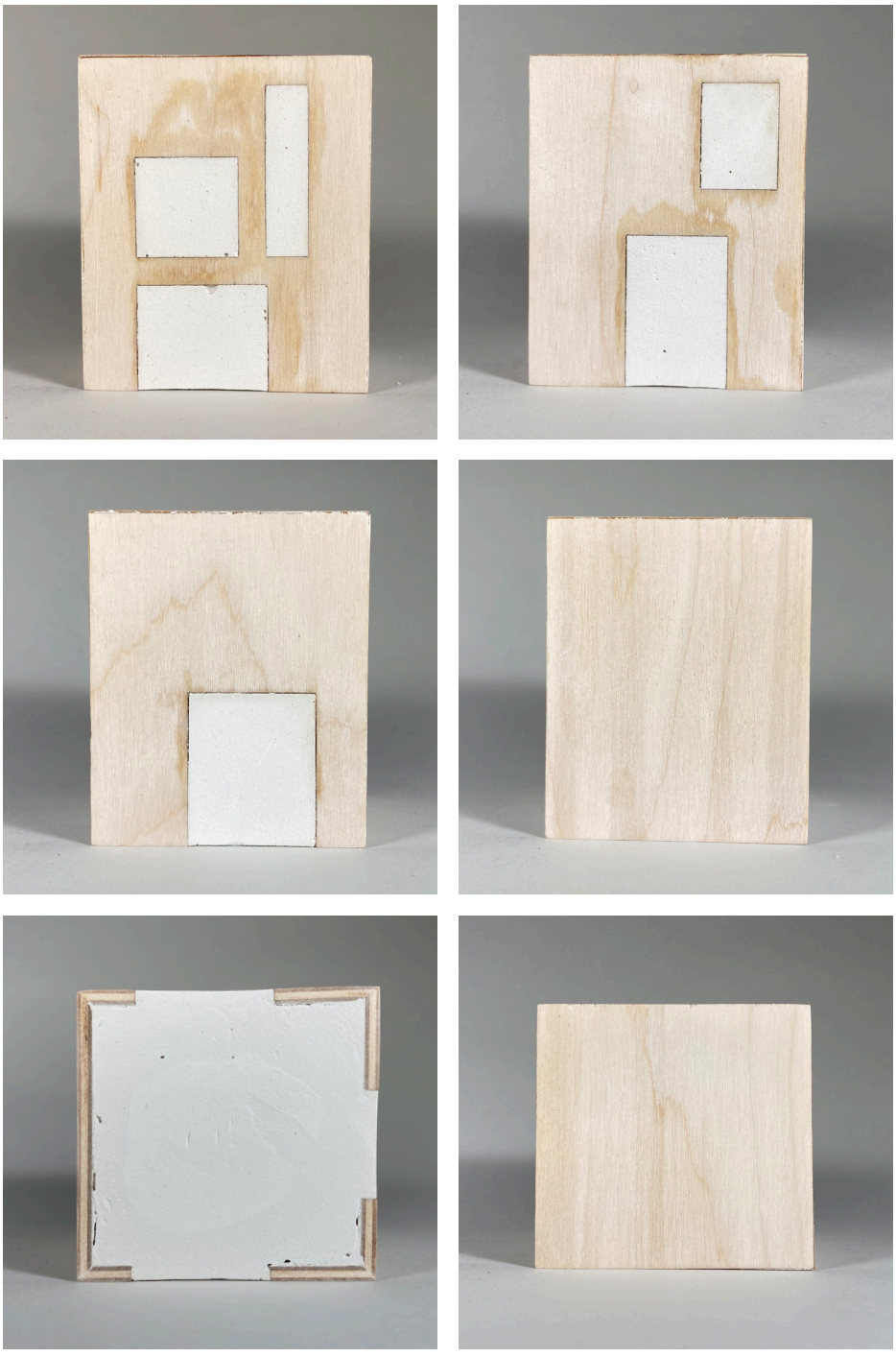
Walls with holes 1



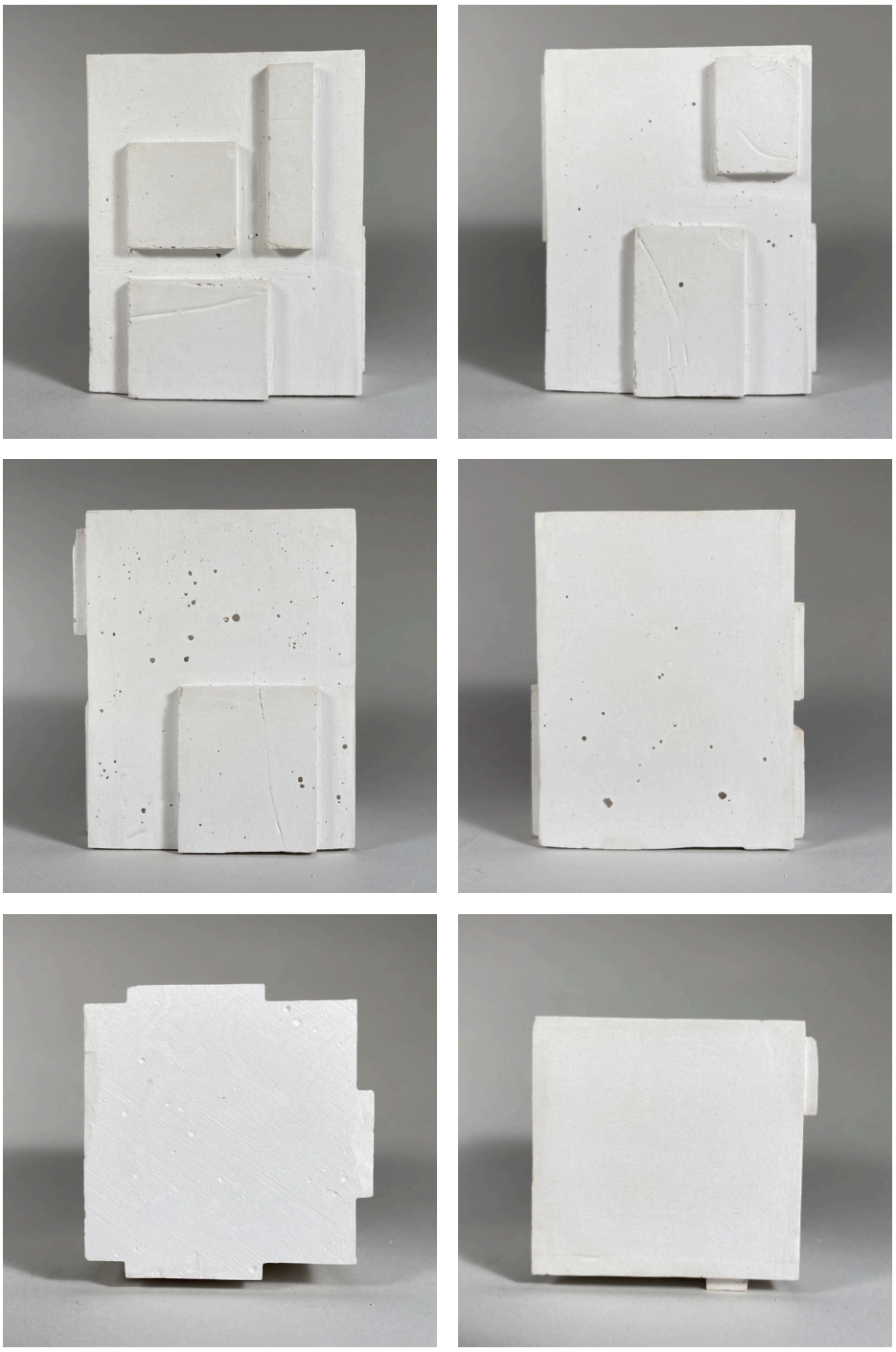
Walls with holes 2



Walls with holes 3

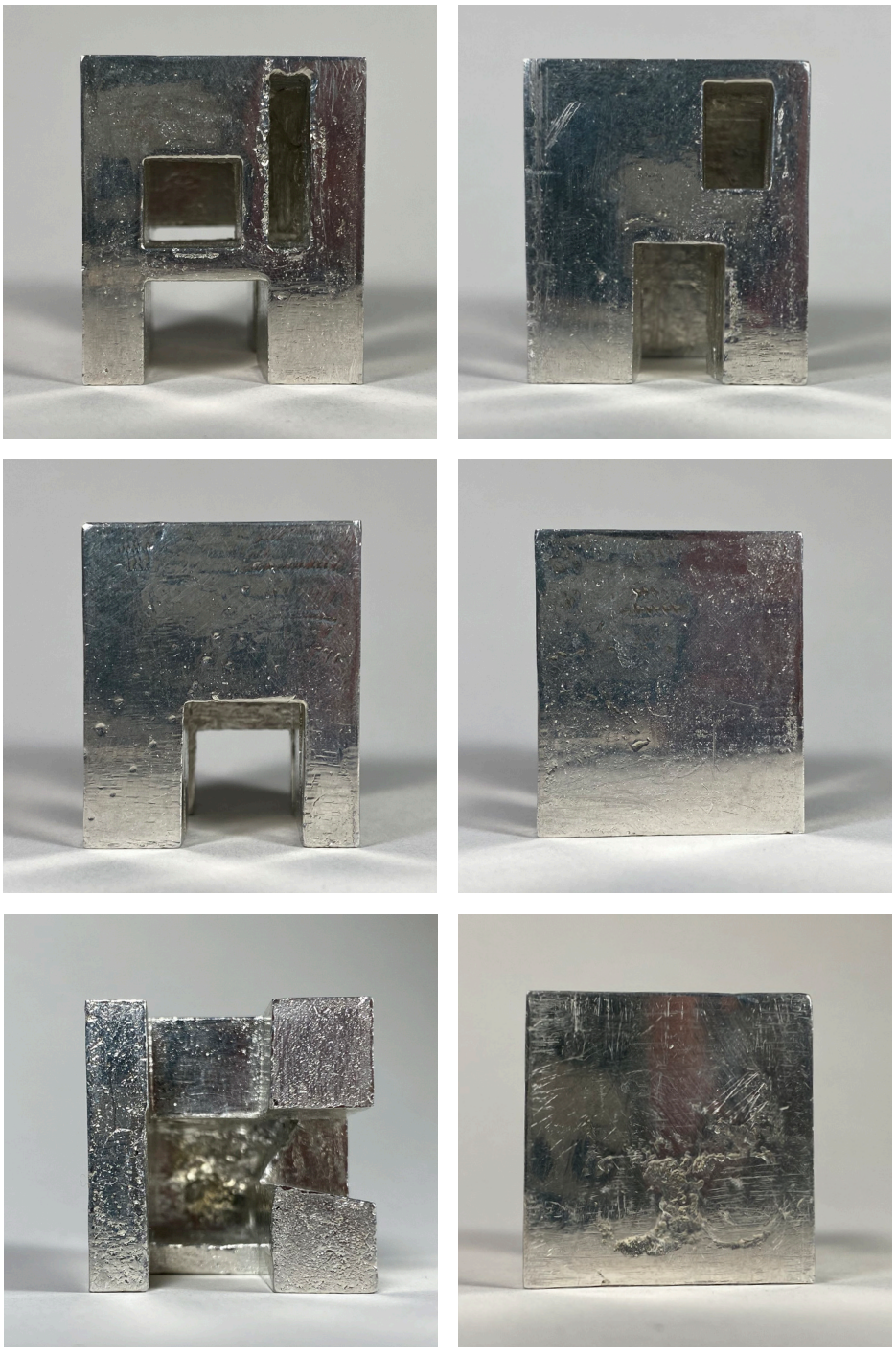


Merged mould



Shrinking void

Distorted model

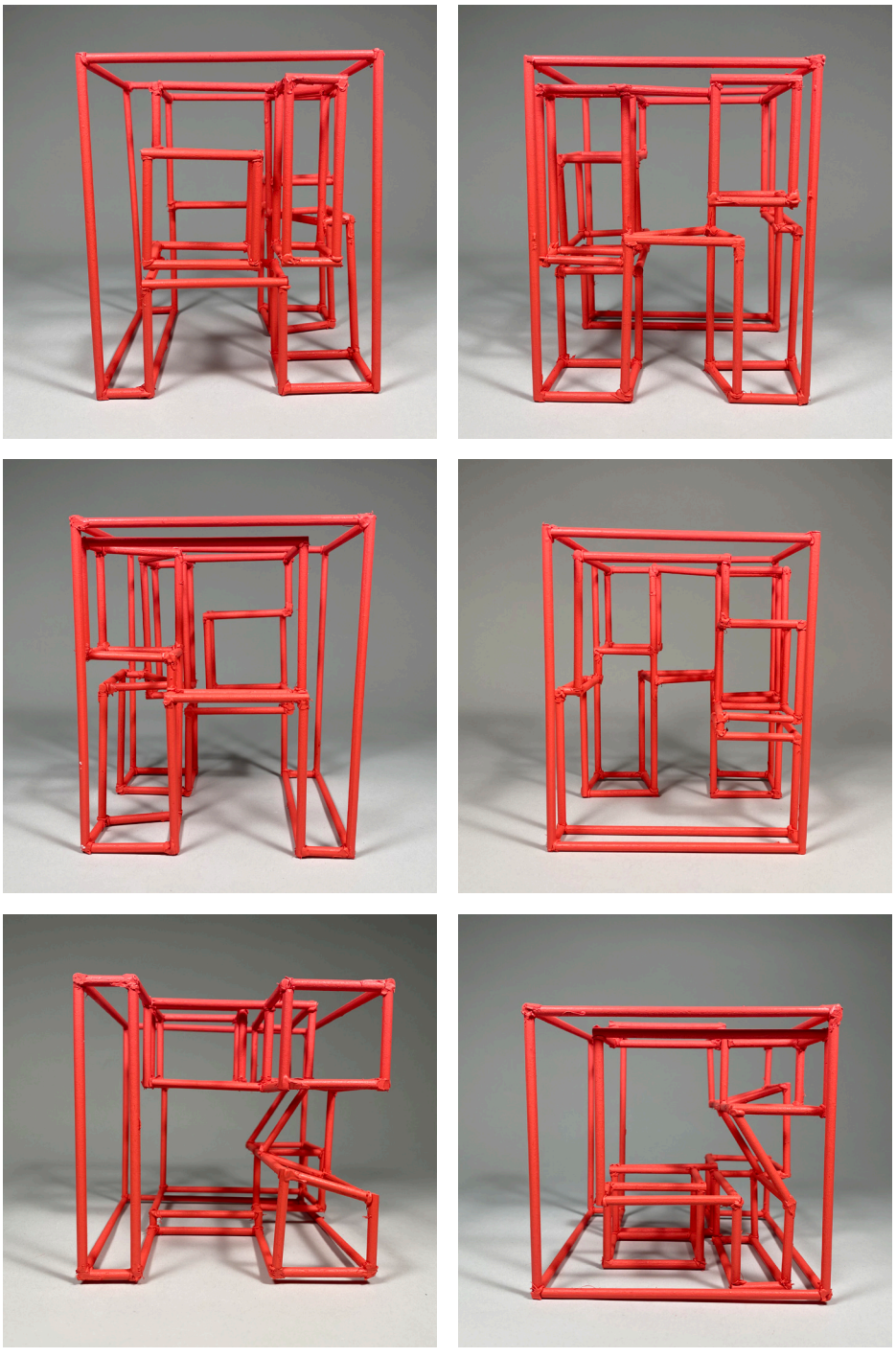


Moulded tin

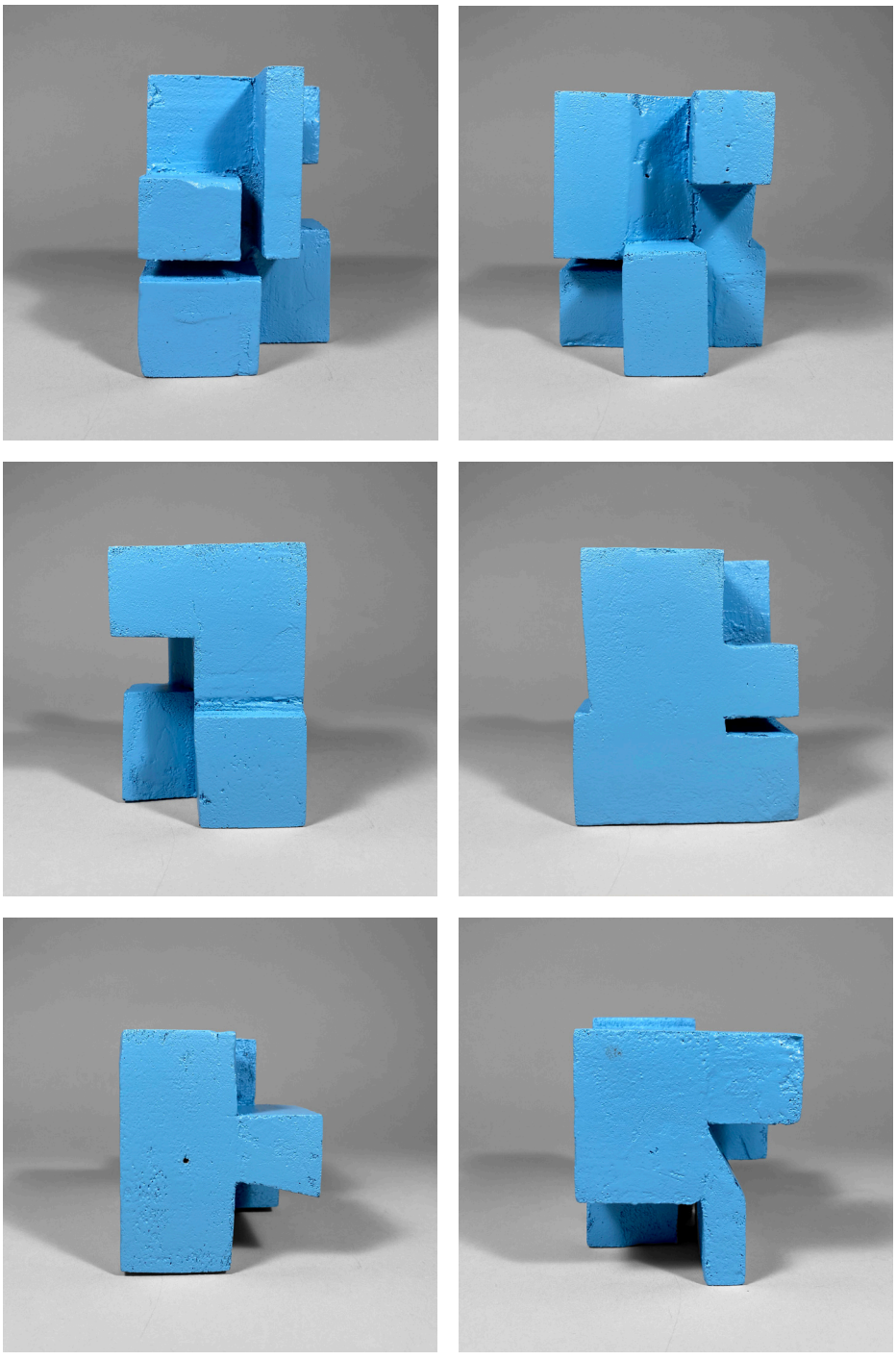





Random connectors



Edges



Negative

RESULT

Revelations of unforseen properties

Real light

The light that occurs is real. A reflection of circumstances. Intentionally or not. The light is there.

Sidetrack?

I know that each of these models has got their own story. But together they show how I simultaneously developing a technique. Still the model is to simple. I am missing the inside and its complexities. It is not there. Only walls with holes.

Trace in space

The casting is not only a story of whats is present but also what is not there. The mould. The negative. The creation of something to create something else. What is left is a trace.

Reflections in pause.

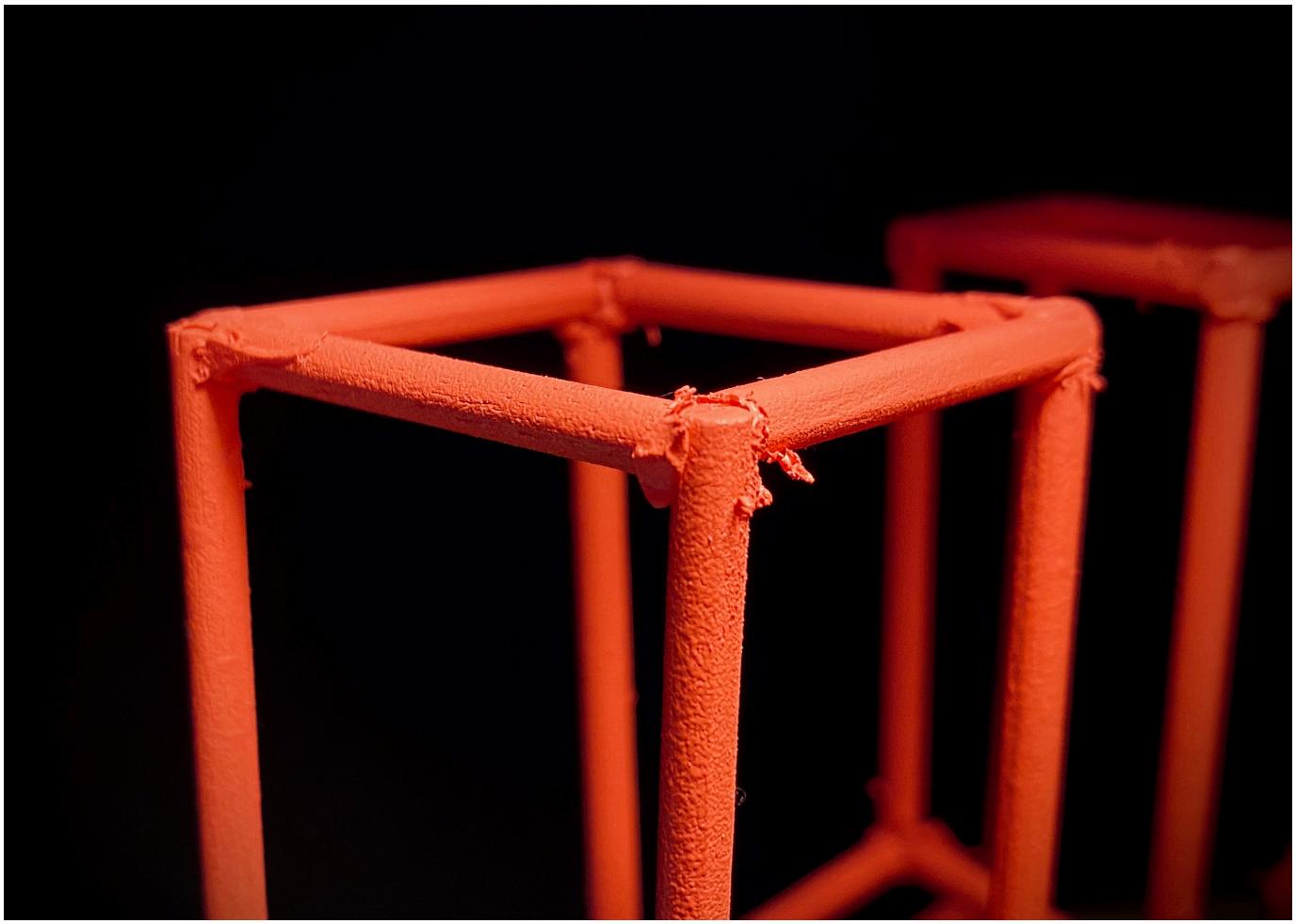
The model is abstracted, unfulfilled.
The strange combination of plaster and wood.
Wood cut with burning laser leaves stains in the plaster.
Wet plaster soaked up by wood.
Between wood and plaster, thin lines.
The mashed up sound somewhere between soft wood brittle plaster.
Is this model an indication of how to take the next step in the making of it?
It could still be in the act of making.
It is beautiful as it is.
My experiences and knowledge from the process makes it beautiful.
I could make it again and take the next step. It will not be the same.
I must sacrifice either this model or the possible model.

Looking at this model I realize that the line, that I identified, has been ignored. I cannot find it, it's barely there. The method of making this model has taken away the focus of this particular part. Making this model made me focus on other parts. The openings, the pillars, the mute wall. Make them fit together, not fall apart. Still I can find the line. It is there. It is not straight, it is broken almost dissolved. Just like the model itself. But with earlier models in mind I can orient myself in the model. I wonder if I could improve the line by making the model again, using the same method but with a more experienced mind. What direction would the model take then?

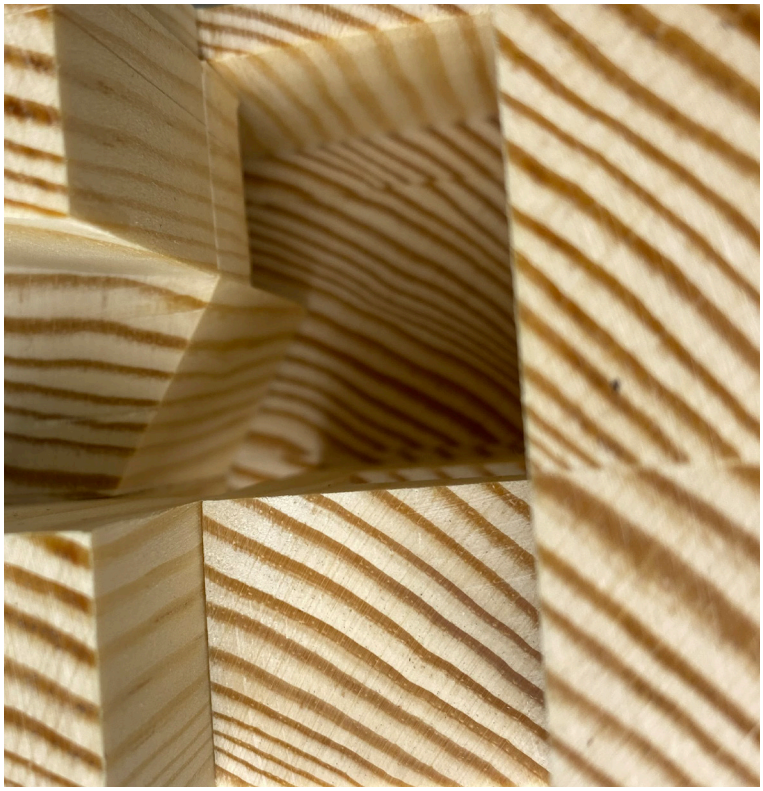
Find the line

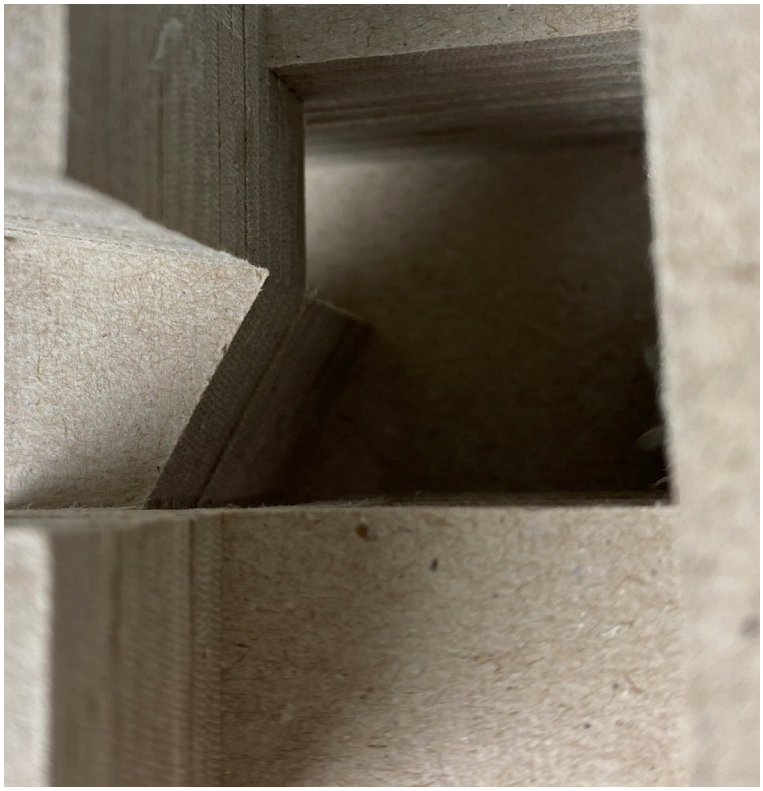
An opening for perfection. I could make the joint far more precise. The experience from building the model lets me now that would take time. Develop a technique, fail, learn. The model is a prototype of what this model demands

Unruly joints



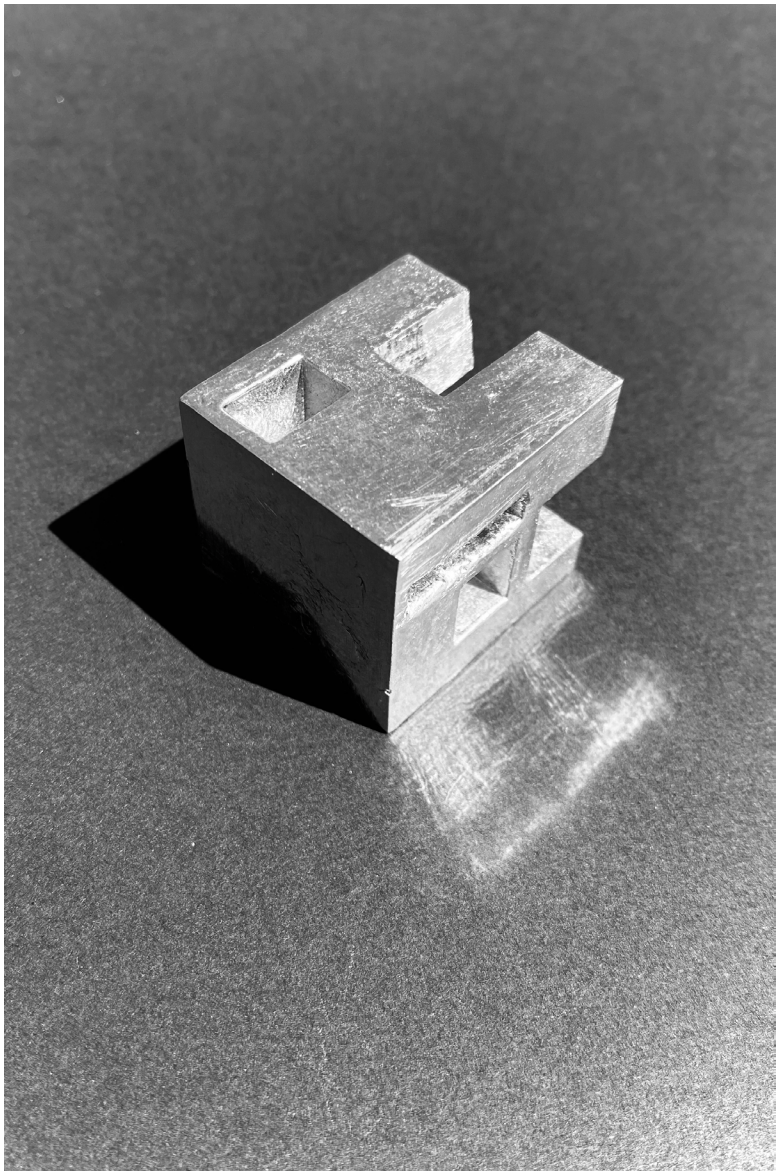
Recurent revelations





The moment where the model reaveals itself.
Embodied.

Reflections



The reflections from the model gets me thinking of what is reflecting what. The casting is a reflection of the mould. The mould is a reflection of series of steps, each one is a reflection. The model is a reflection of verbs. The model can reflect.

Grasp

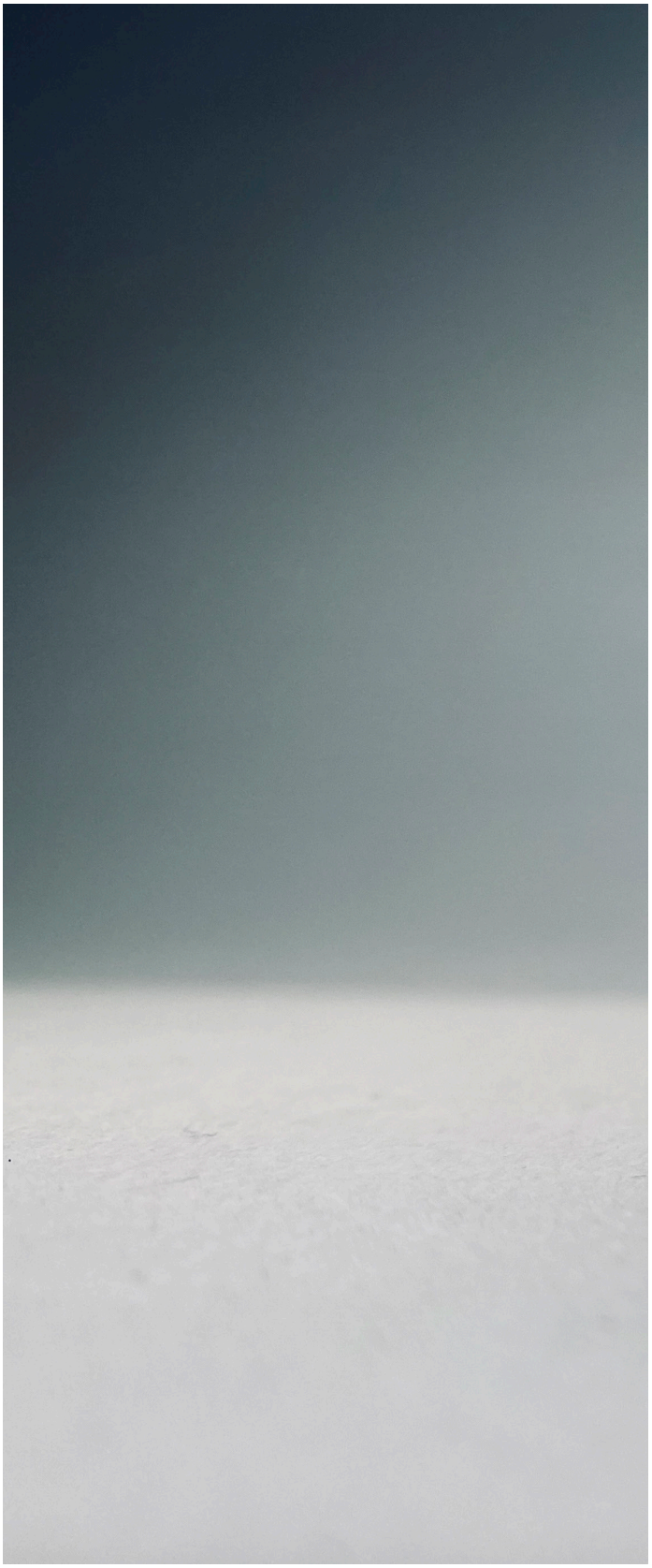
The impatient search for perfection is found in the imperfections. The small notch is a reflection of me conducting and searching in the technique of making the wood appear as a solid. It helps me to remember and put pieces from the process together. I can through the notch reach intangible moments of thoughts and reflections in the act of making.
The eager to get further on in a process I am unfamiliar with. How the answer around the corner calls for action.
I recognize how I think about this issue, but I have never been able to communicate it. The model embodies that and makes it possible for me to grasp.

Stop the flow

Applying linseed oil on a model made in wood is
a way stop the making of it. At least it is a high
threshold. Take a step back. Reflect.
I do not like to do unnecessary work. I do not like
to demolish work done.
Linseed oil puts value on work done.
Just as an exhibition can.

Bits and pieces

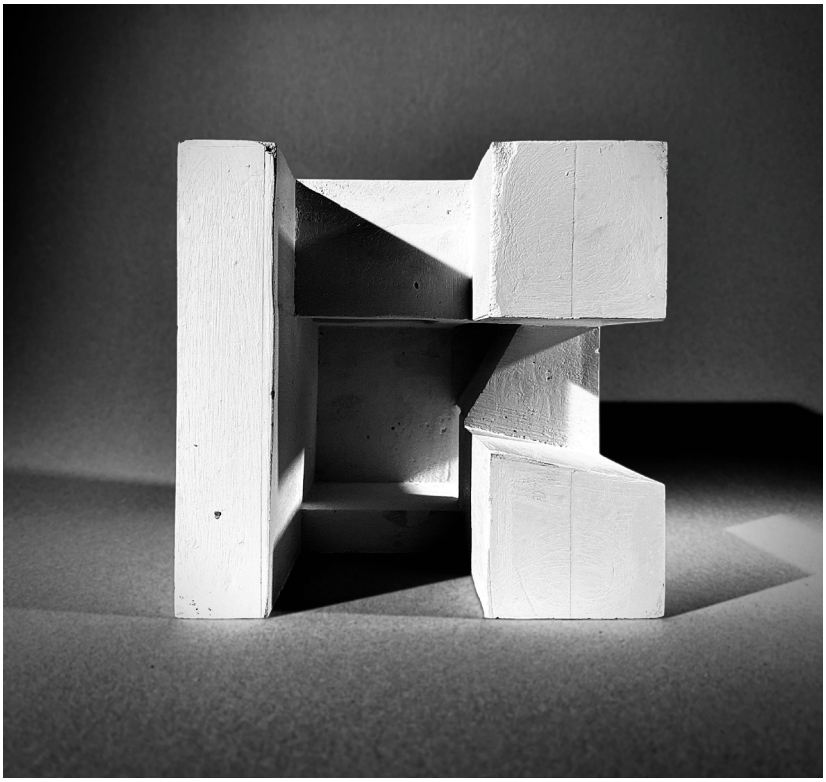
The smallest piece and how that functions tells me about the shape of the model. The limitations of the building piece combined with its size.
A new perspective.



A reminder of the big process. What I have found.
Compressed into one small piece.

A piece of a process

DISCUSSION



Working with the kind of models that I have done in this process, has forced me to point out the aspects of the model that I have found important. Hence, the work is seen from a most personal view. What I consider interesting and important in a certain model can to the viewer seem irrelevant. If I do not set the scene the model can be anything or nothing. The architectural model is a tool to strengthen my abilities, at the same time the model needs just that to be understood – my abilities. The models have a need to be filtered through my personal experiences.

If one sees this work to be personal I would, at the same time, like to argue that what is presented in this thesis has a universal theme. Proposing that the models can embody a world that is vast and full of information. If one does not build models this world will never be encountered with, thus it can only be encounter through the act of making models.
There are no right or wrong answers in the model when conducting this process where any information the model inhabits is considered important.

Entering a process like this, creates an urge for a proper curation of the model. Rather than release all the possible information that the models contain, I have been forced to set it in to context. I believe photography has been an important tool to fulfill the urge for curation. The photos let us rest for a brief moment when the different models can take us in almost any direction. Together with reflections from the process I have been able to lead the way through the process presented as the result. The process and models from it are in many ways personal and therefore dependent of me sharing my

personal experiences.

The act of making models reveals unforeseen questions and answers that often has come up by coincidence. Questions or answers that has driven the process further. The models together with photos and reflections has become representations of the knowledge extracted from the process. Knowledge that reveals itself in the process of making a model. The process has become the result.

The models are helping me to find out what I did not know I knew. The photos are framing that. Trying to communicate that often brief moment of revelation.
As the work has progressed the models has always helped me to develop thoughts and arguments. Just as some sort of guide in the unknown territories of making a master's thesis.

As we are entering a new era, where the digital environment merges into the physical world, the knowledge of the process of making models is more than ever relevant and crucial. If we do not know what we might sacrifice on the digital altar, we risk missing the opportunity to enter a state where we have to encounter ourselves and the matter we take on.

Just as the marvelous stick in the introduction of *Architectural Model As Machine*(Smith, 2014) needs a human being to achieve its full potential, the architectural model needs a human being to put it into a context. And from that be able to be understood. We just need to stop and as The Hubble telescope allow ourselves to see what we do not know.

Student background

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Education
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BIBLIOGRAPHY

Brejzek, T., Wallen, L. (2018). *The Model as performance*. London: Bloomsbury

Eliasson, O. (2007). Models are Real. Retrieved from: https://olafureliasson.net/archive/read/MDA109975/models-are-real

Gipp, P., Jäderlund, A., Bjerrum, P., Mattson, H., Nordgren, S.W (2018). *Passage/Schakt/Nisch/Fording/Nav – Vandring*. Stockholm: Arvinius + Orfeus.

Holtrop, A., Lauwaert, M., Borasi, G., Olgiati, V. (2016). *Studio Anne Holtrop*. London: Koenig Books.

NASA. (2004). Hubble's Deepest View Ever of the Universe Unveils Earliest Galaxies. Retrieved from https://hubblesite.org/contents/news-releases/2004/news-2004-07.html#section-id-2

Schön, D. A. (1991). *The Reflective Practitioner*. Aldershot: Ashgate Publishing Ltd

Smith, A. (2004). *Architectural Model As Machine: A New View of Models from Antiquity to the Present Day*. Abington: Routledge.

Zumthor, P. (2006). *Thinking Architecture*. Basel: Birkhäuser.