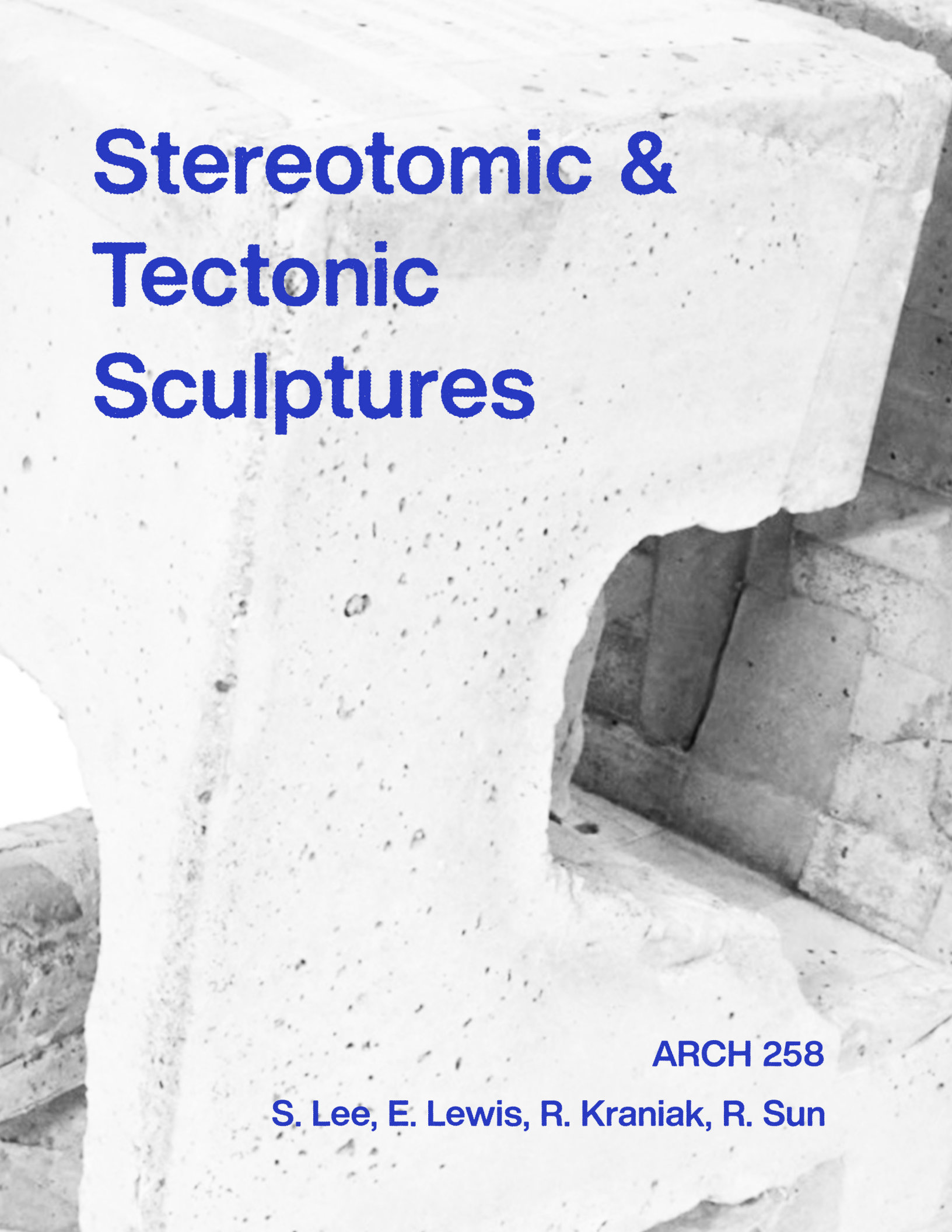
Stereotomic & Tectonic Sculptures



ARCH 258

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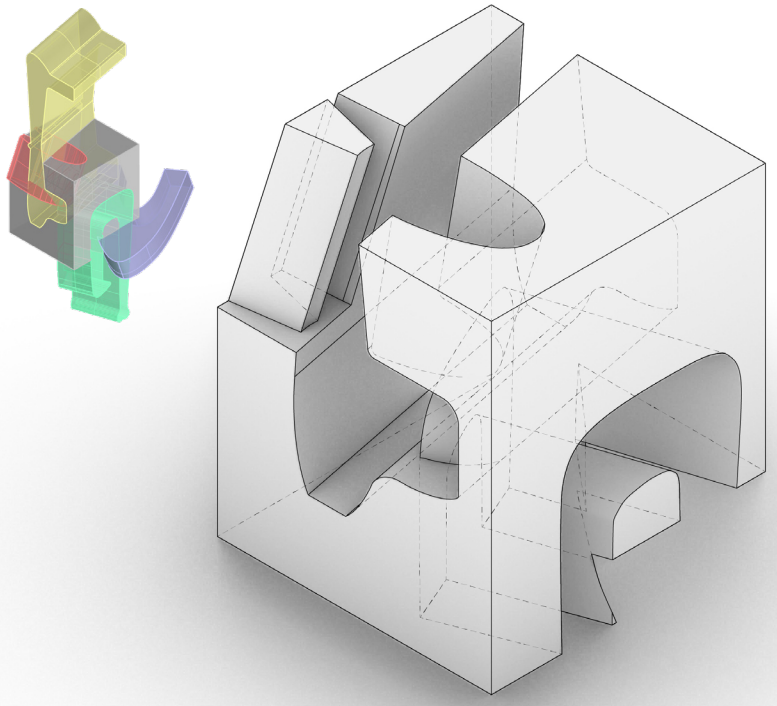
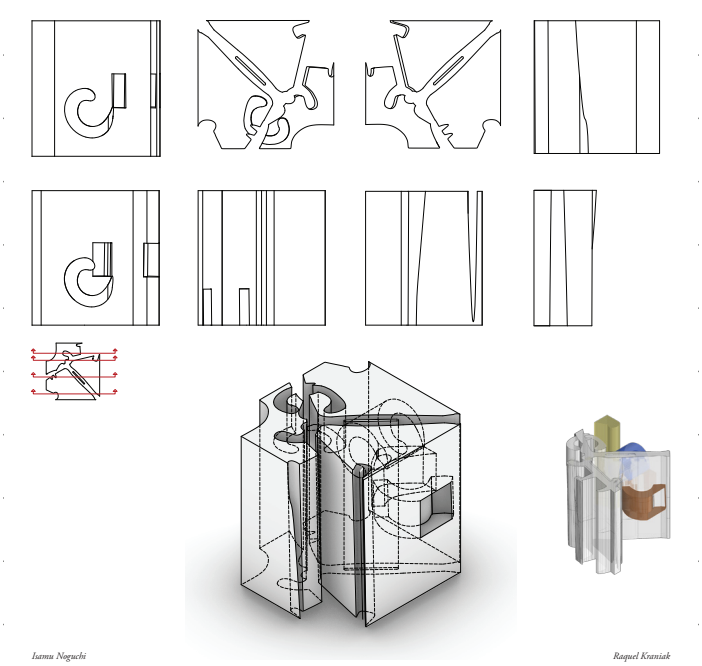
Introduction

The project is an exploration of opposite procedural techniques in model making through the concepts of stereotomic and tectonic. The exploration consists of two sectional models. One is built through the process of concrete casting, representing stereotomic form. The other is built with wooden square dowels and vellum paper, representing tectonic form. In both procedures, the concepts of stereotomic and tectonic are embodied completely, from the process of creating the models to the final result.

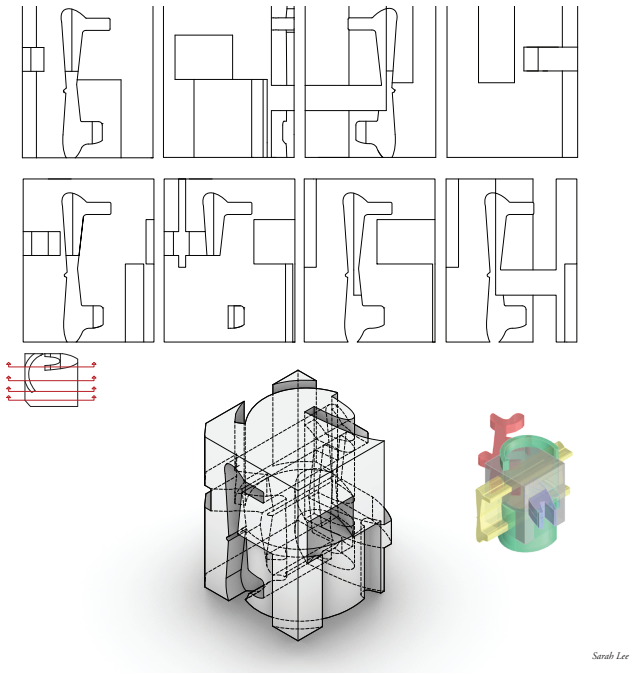
Our precedent had a heavy emphasis on fragility, therefore, we decided to present the contradictory nature of the two terms through choice of material. The stereotomic model utilizes concrete, emphasizing strength, stability, and weight. Whereas the tectonic model was delicately constructed using wood dowels and vellum paper, creating a fragile form comparable to a paper lantern.



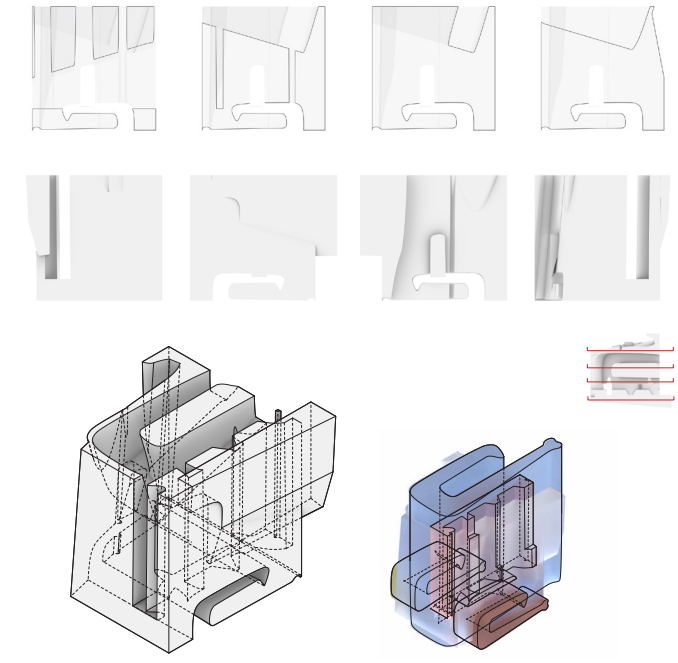
The model design is derived from a preceding project, which required the nesting of positives extruded from Isamu Noguchi's sculptures (Humpty Dumpty, 1946, Kouros, 1945, and Figure, 1946) for resultant negatives. The excavation creates two central caves, which share a form that acts as a ceiling for the ground-level cave and a platform for the upper-level cave.



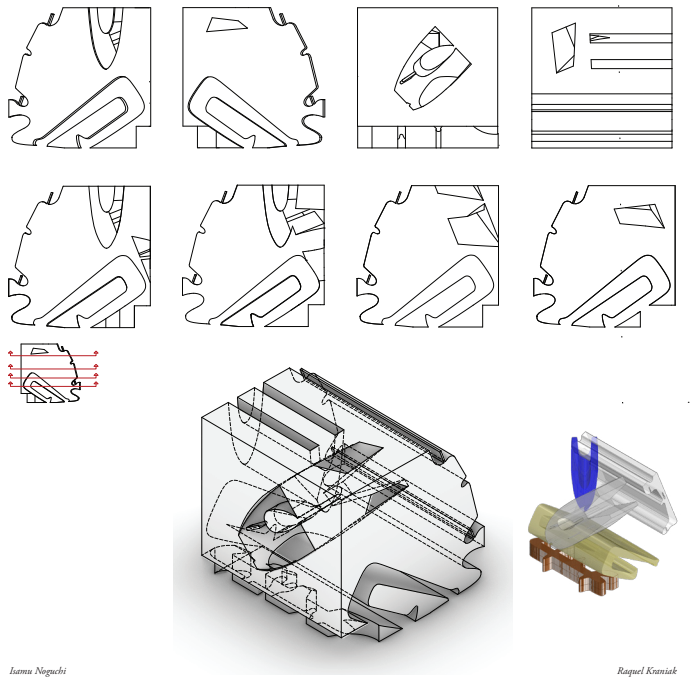
Isamu Noguchi *Raquel Kraniak*



Cling *Sarah Lee*



Isamu Noguchi ARCH 258 | Translation | Project 2 Ruoyao (Rebecca) Sun



Isamu Noguchi *Raquel Kraniak*

STEREOTOMIC

Stereotomic

Definition

Stereotomic is defined as the art or science of cutting solids.
The term comes from the Greek words stereós (solid) and tomē (cut).

Architect Gottfried Semper originally explored the concepts of the opposing methods, stereotomics and tectonics. He defined elements of building materials as lightweight tectonics of the frame or the heavy/stable stereotomics of the earthwork. Through the stacking of heavy units, a compressive mass is formed; almost earthbound through natural material use and its weight grounding it into the Earth's surface.

Approach

We molded the digital model through carving XPS foam, and casted the final sculpture using concrete mix.

To create the negative layers of the selected form, the 3D form was cut into a 2D series of planes (cut one inch vertically apart) that form the consecutive faces of the model.

These faces were then used as templates to cut from foam that, when assembled, replicated the negative void in the interior of the form.

The foam was used to create a bounding box for the exterior faces of the sculpture; Inside sat the negative, layered foam unit. While foam is a lighter material, the process of stacking many layers of mass to create one final form models the techniques of stereotomy.

Concrete was then poured into the mold to fill the positive forms of the sculpture. This manipulation of liquid mass further reflects the stereoatomic technique of intentionally shaping heavy mass.

When removing the concrete form from the foam mold, a section of the form broke off. This reveals the possible limits of stereotomic techniques; While the form is strong in its solid, grounding mass, thin sections of the form become vulnerable to breakage.

Steretomy may be more useful for larger compact forms than forms with various thicknesses throughout.

Lastly, through our process, a central element of the form was neglected. To replace this positive form, clay was sculpted over foam to mock the color and texture of the concrete.

While this introduced a new method of model making, the clay was more forgiving and able to attach to the concrete by forming around its corners.

The rigidity and fragility of the stereometric concrete process introduce challenges for the development of forms when adding on positives or carving away negatives.

The resulting concrete model, once removed from the mold, has heavy, compressive, and massive qualities of stereotomic form. The form appears stonelike, resembling a natural quality, while its mass embeds it into the Earth.

In a dim-lit setting, the candlelight casts shadows on the stereotomic model, further emphasizing the rough textures of concrete. The tectonic model acts as a filter of light, creating a soft and diffused atmosphere.

Comparison of stereotomic model under different lighting conditions

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Tectonic

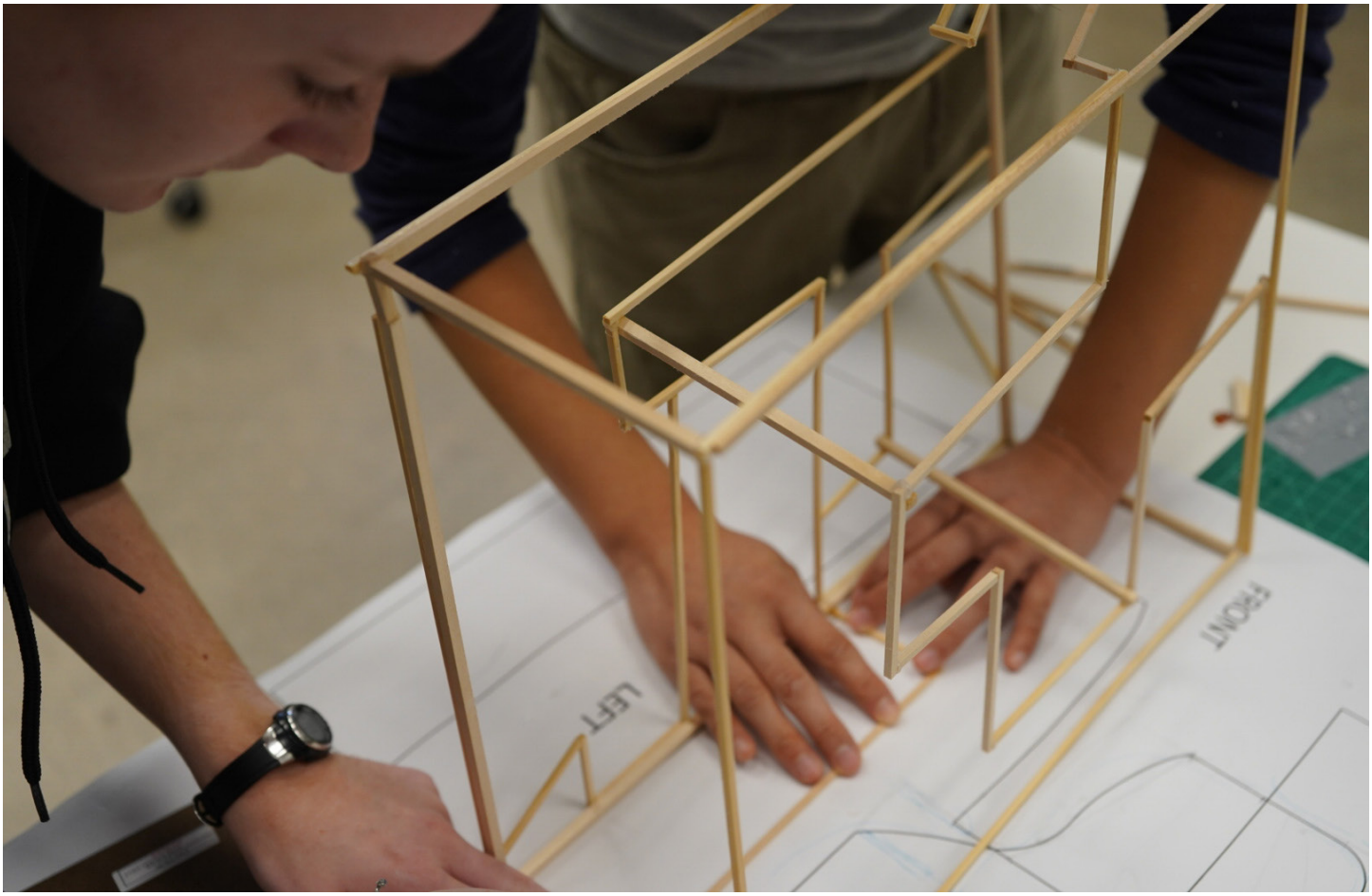
Tectonic

Definition

Tectonic is defined as the art of construction and the expressive qualities of a building's structure.

The tectonic concept refers to an assembly based on parts. It emphasizes where these parts connect, paying particular attention to joints and framing. The tectonic model uses wooden dowels as a frame, simplifying complex shapes into geometric figures.

Vellum paper is added on each face to represent the true curves and add dimension to the piece. The paper implies interior spaces that interact with light and shadow. The delicacy of the frame contrasts the heavy mass of the stereotomic model.

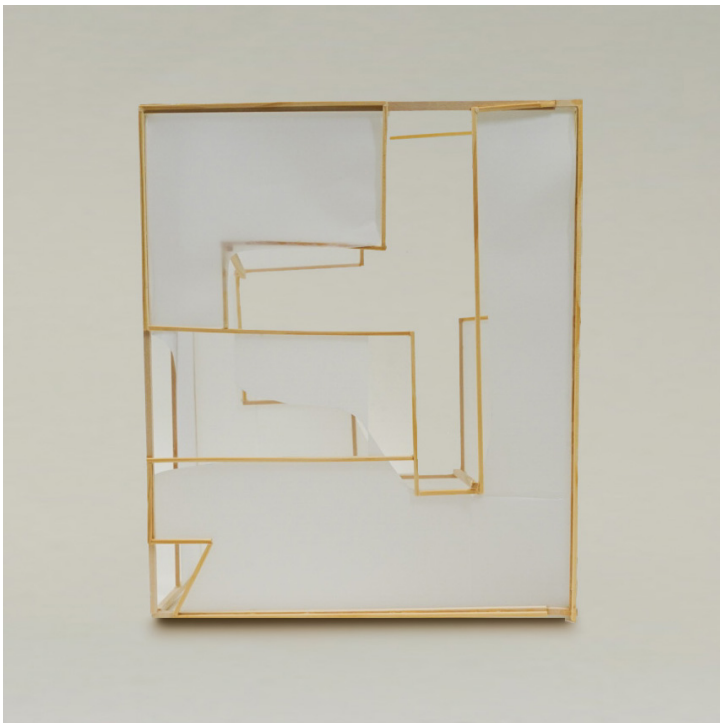


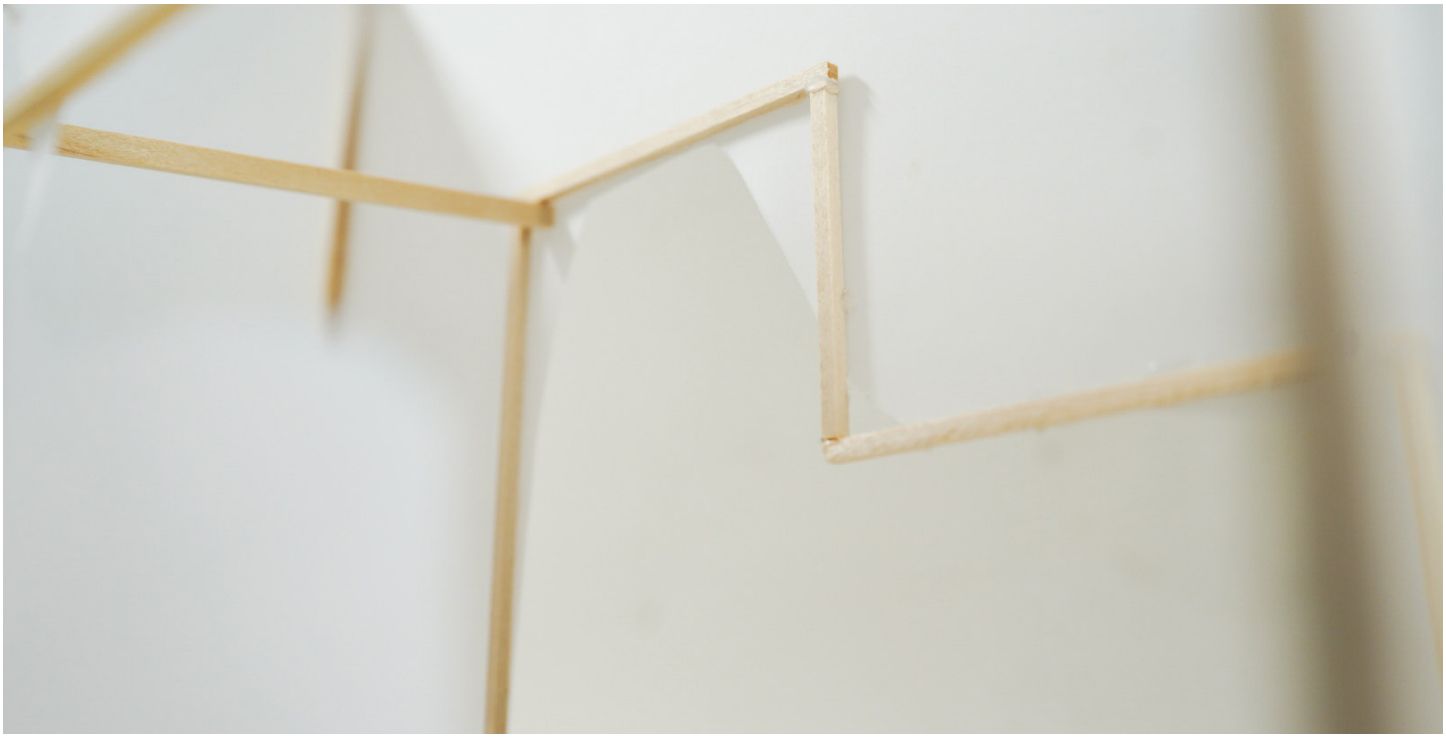
Approach

The tectonic model started with a template of each face, printed on 24x36 in paper. We used the template to measure lengths of wooden dowels, which we then cut and laid out.

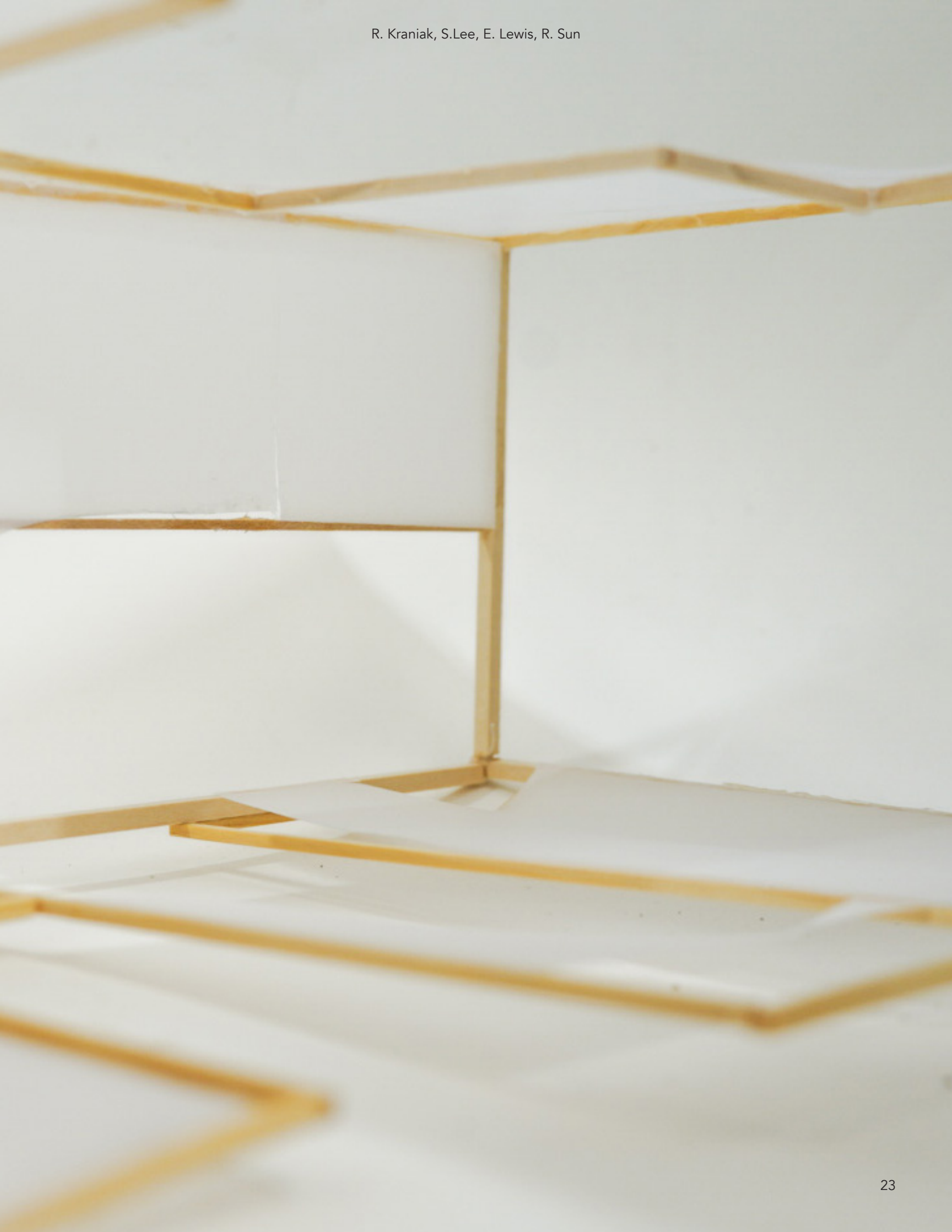
We assembled each face individually then glued the dowels together. The joints in particular required special attention so that the overall structure was not compromised. Once done, each face was arranged into the 3D shape, and dowels were added between the front and back faces for added stability and dimension.

When the frame was complete, vellum paper was cut using the same template. The paper was added over the wood frame.

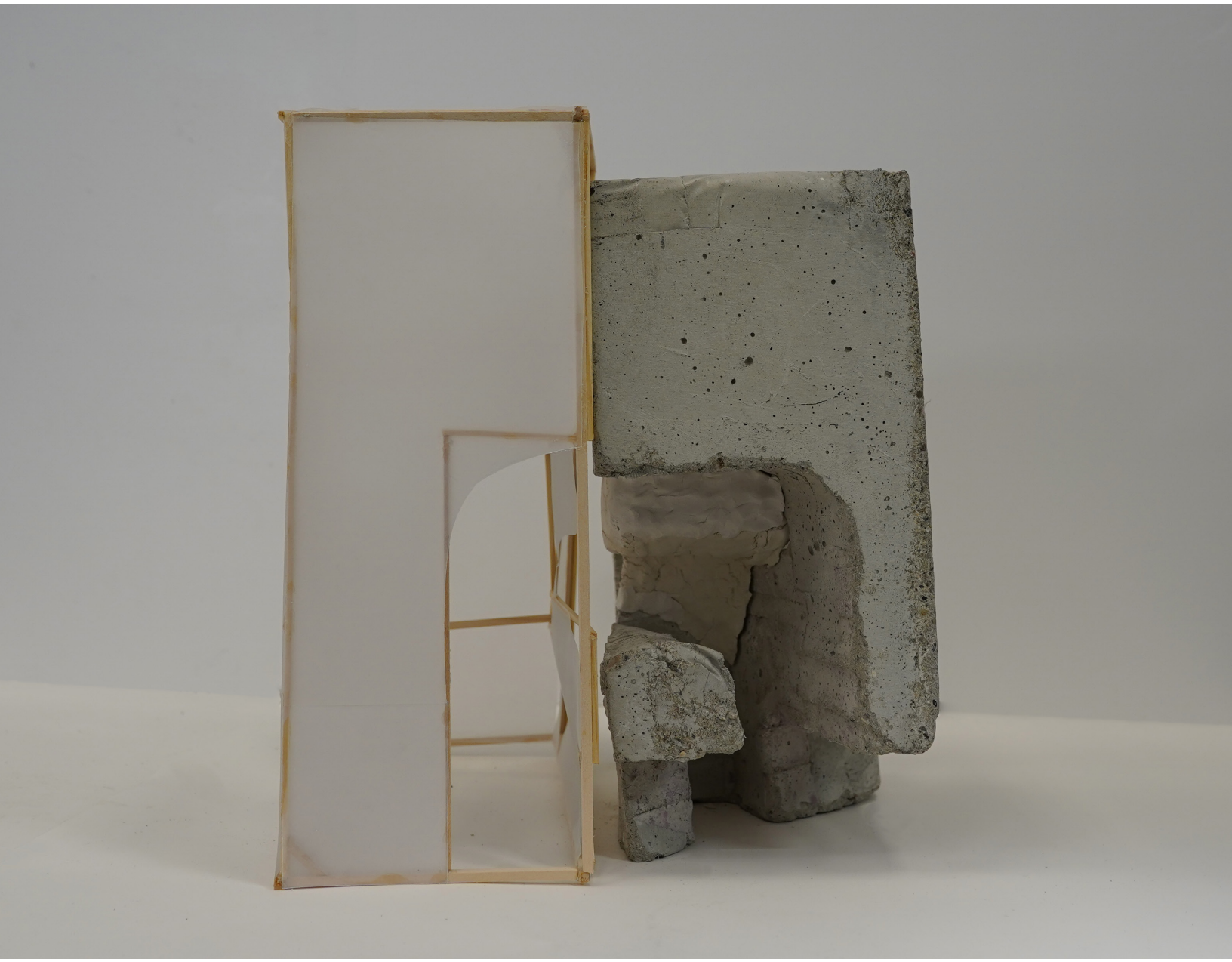




The final dowel and vellum model expresses a delicate lightness through its open structure and transparent surfaces. The implied curves add intrigue and dimension.



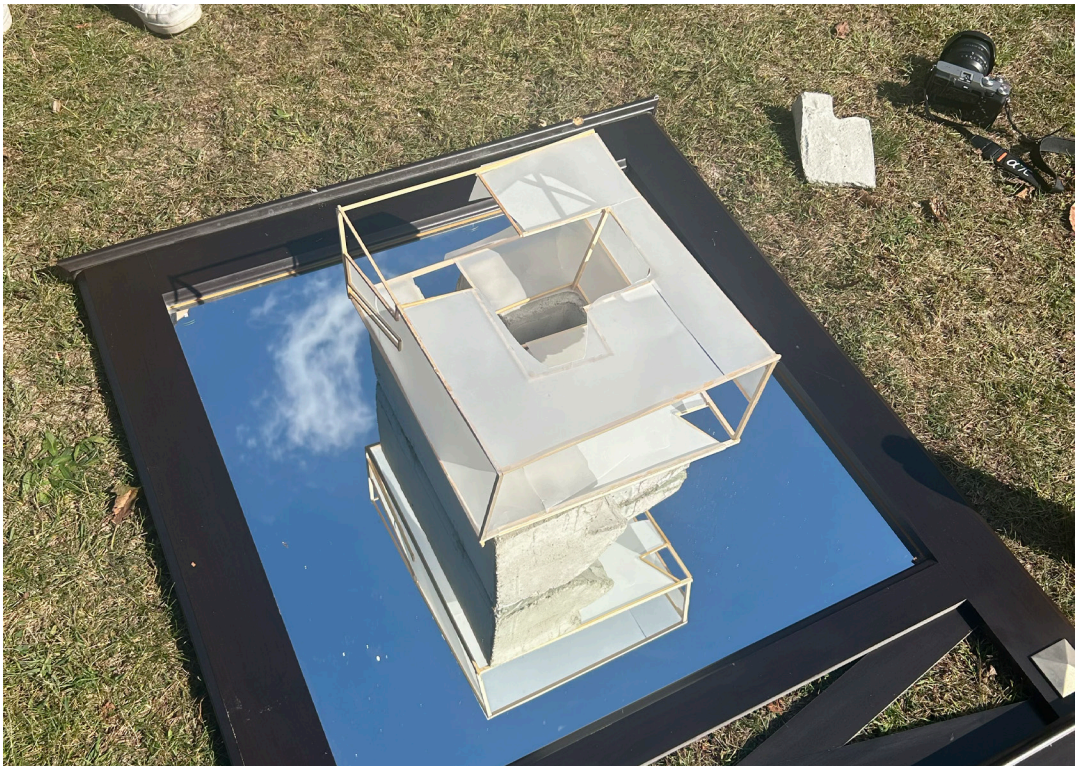
Dichotomy



Fire

Earth

Water



Air