Breaking the Mold:
Low cost, environmentally friendly forming for arcitecture

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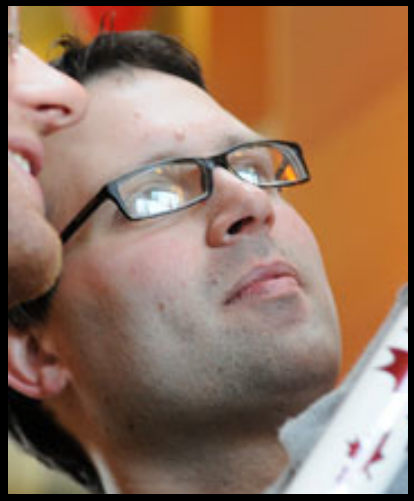
houminn practice



C. W. Sinclair
Department of Materials Engineering

OSHouse > resolution > function

Air Intake

Water Heater

Wifi

Solar

Climate Sensor

Purifier

B. Satterfield


"Construction works best when it is premised on a strategy of economy and repetition"

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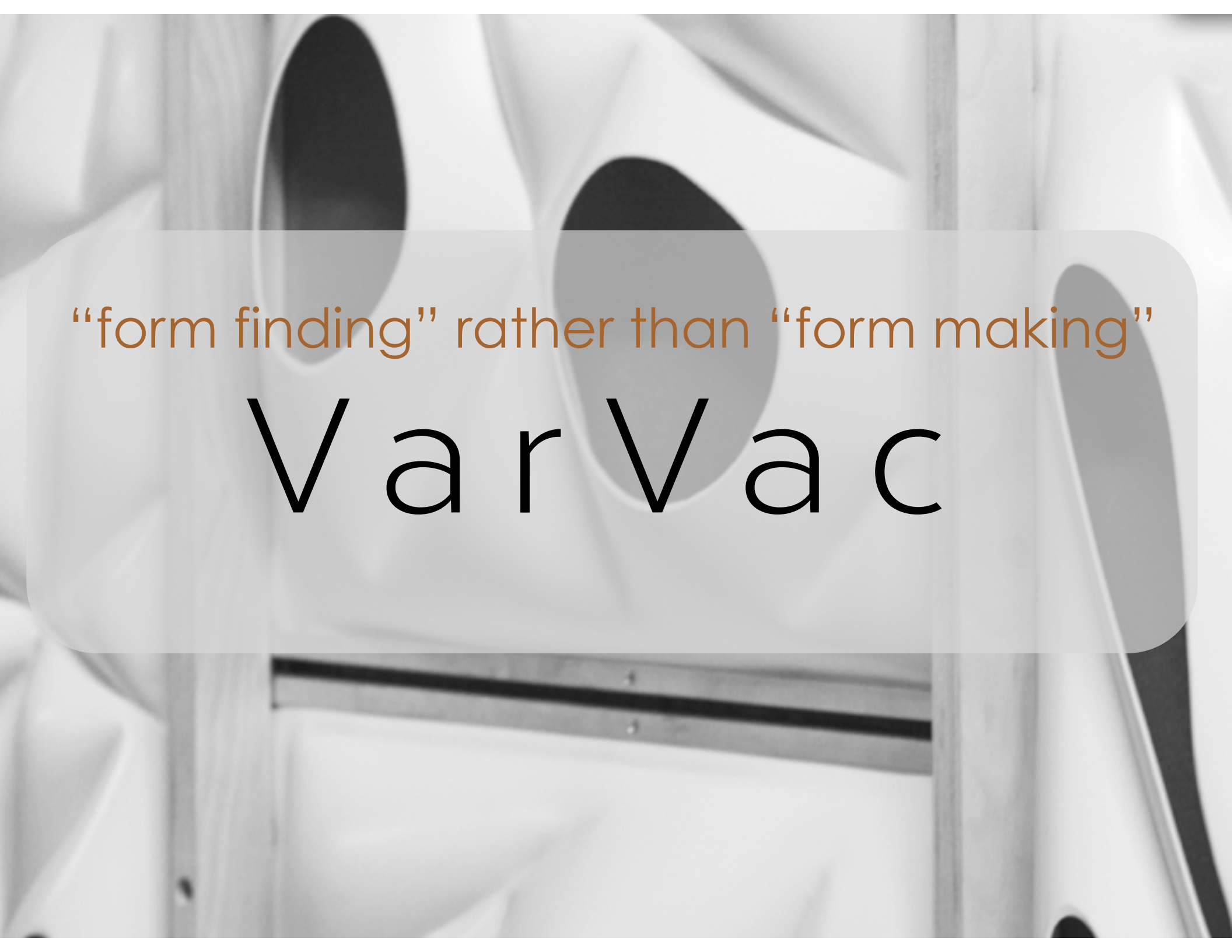
"Construction units are produced and distributed as repetitive components that reduce in cost based on volume and standardization"

OSHouse > resolution > function

"Cost-reduction through standardization dramatically limits the architect's ability to creatively respond to sophisticated sets of forces acting on a building"

B. Satterfield


"form finding" rather than "form making"
VarVac

ARCHITECT THE MAGAZINE OF THE AMERICAN INSTITUTE OF ARCHITECTS

Technology

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2014 R+D AWARDS

Award: Breaking the Mold

HouMinn Practice creates one-off panels with minimal waste, energy, and material.

By Gideon Fink Shapiro

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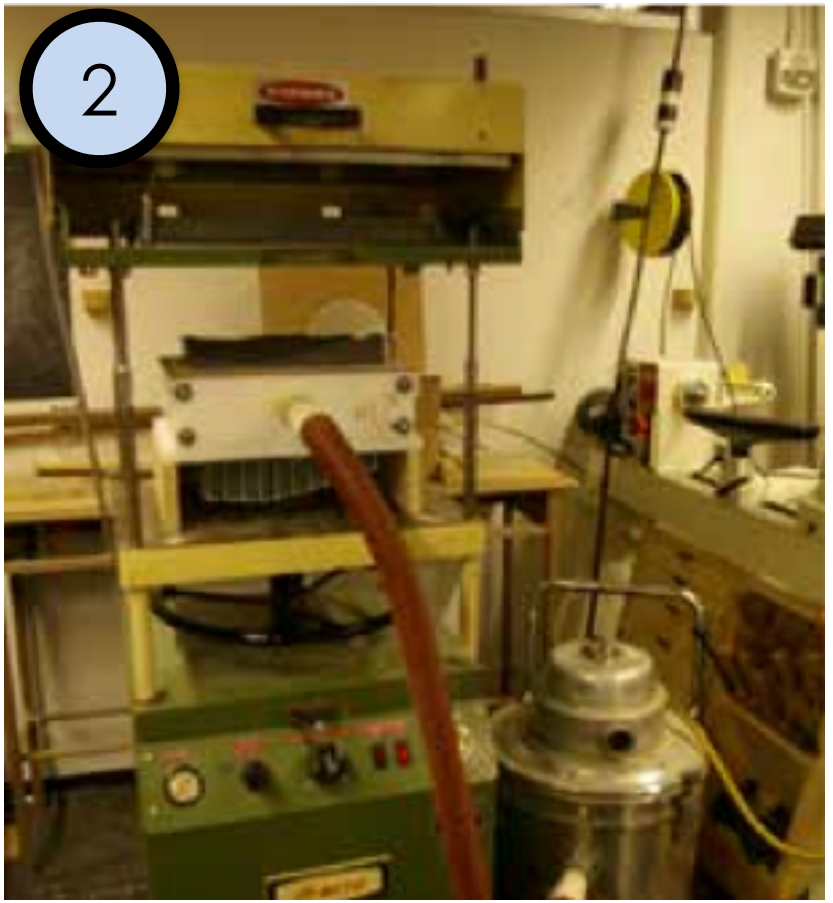
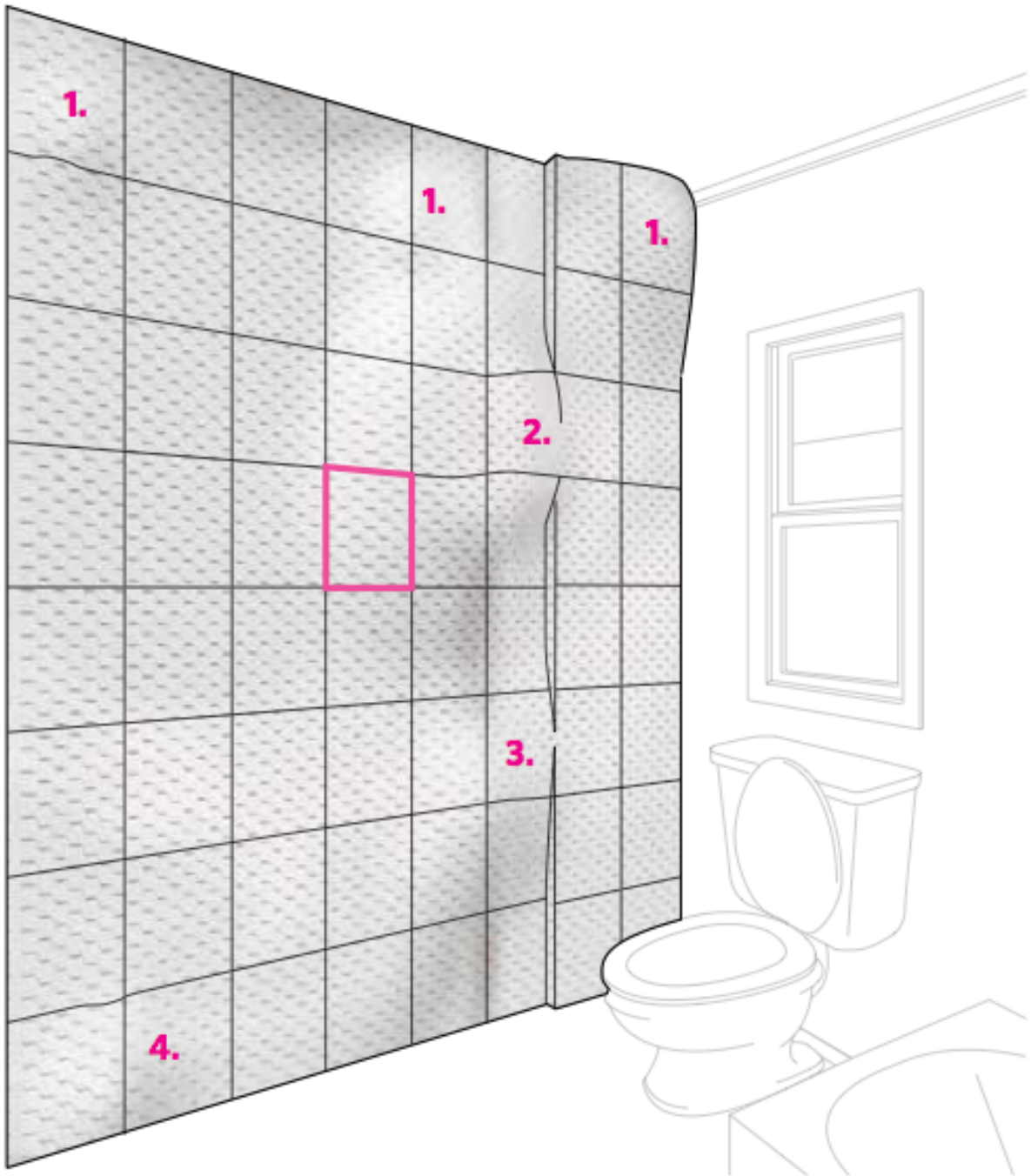


1. Subtle curves and low height for light shelves.

2. Pronounced curve and greater height at wall inset.

3. Subtle curve with more height for paper roll/seating.

4. Sharper Bezier curve to create "door stop."



Final Scheme | Tiling of Surface

A series of custom made 14"X14" tiles generates this topography.

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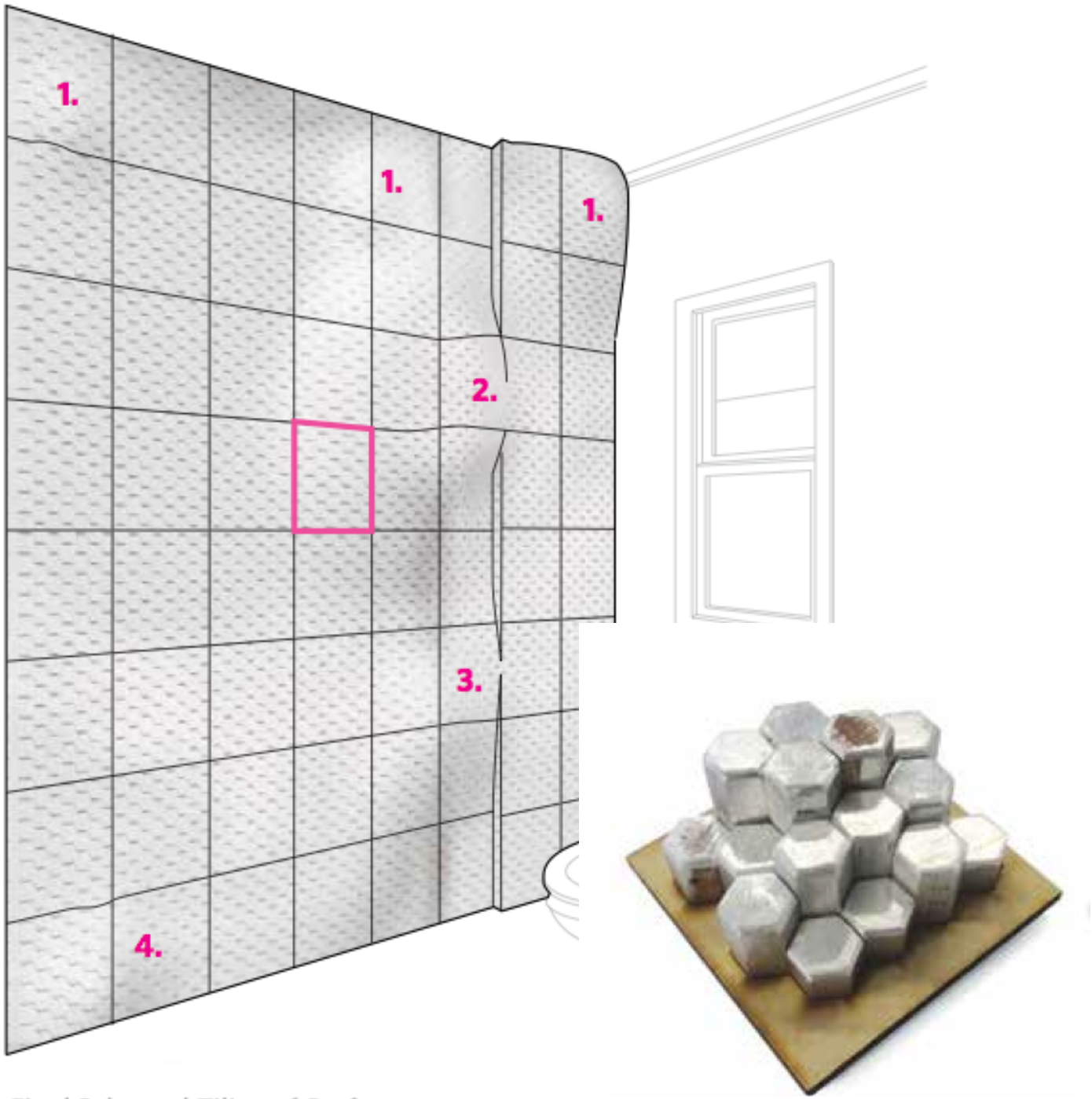

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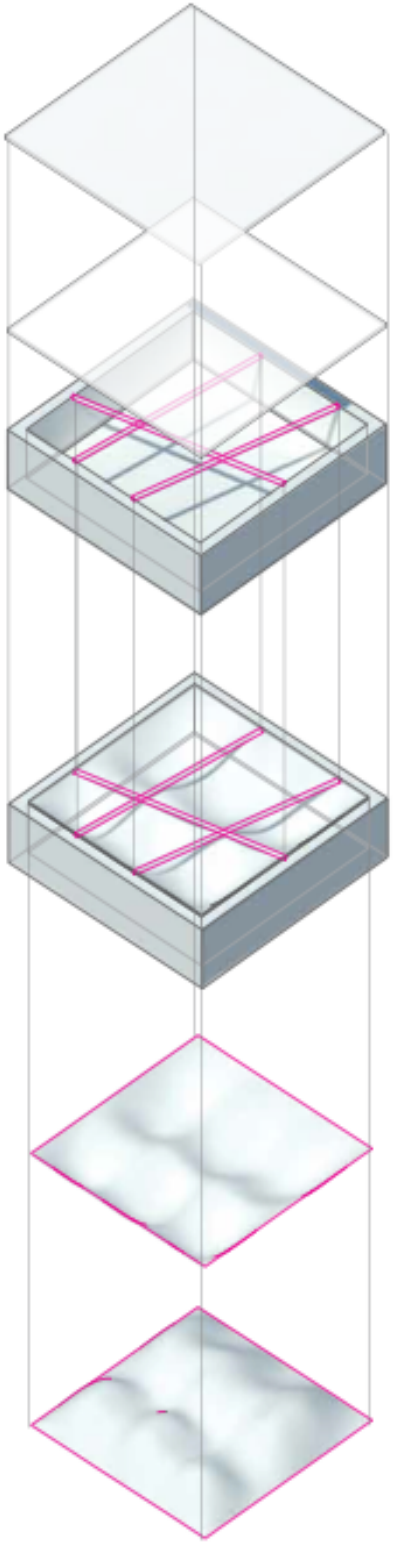
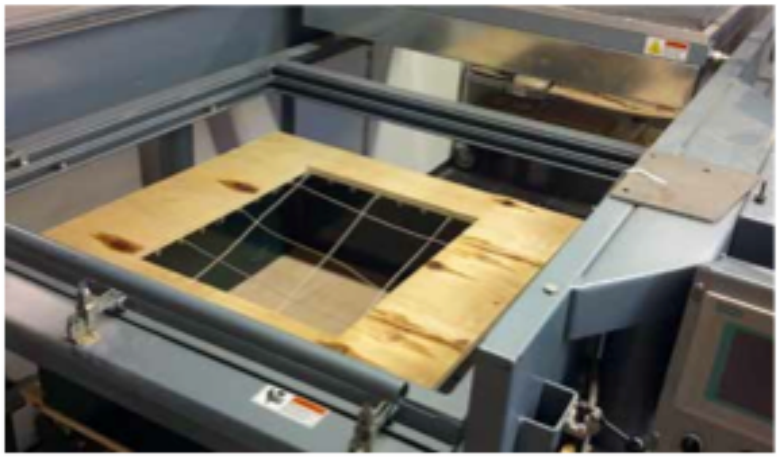
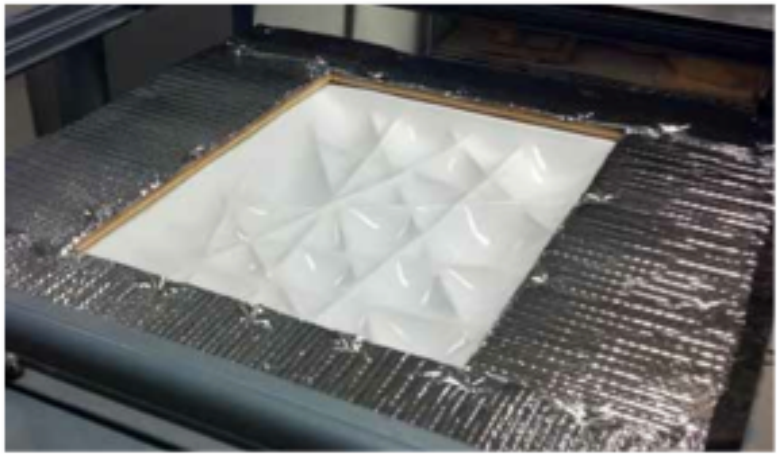


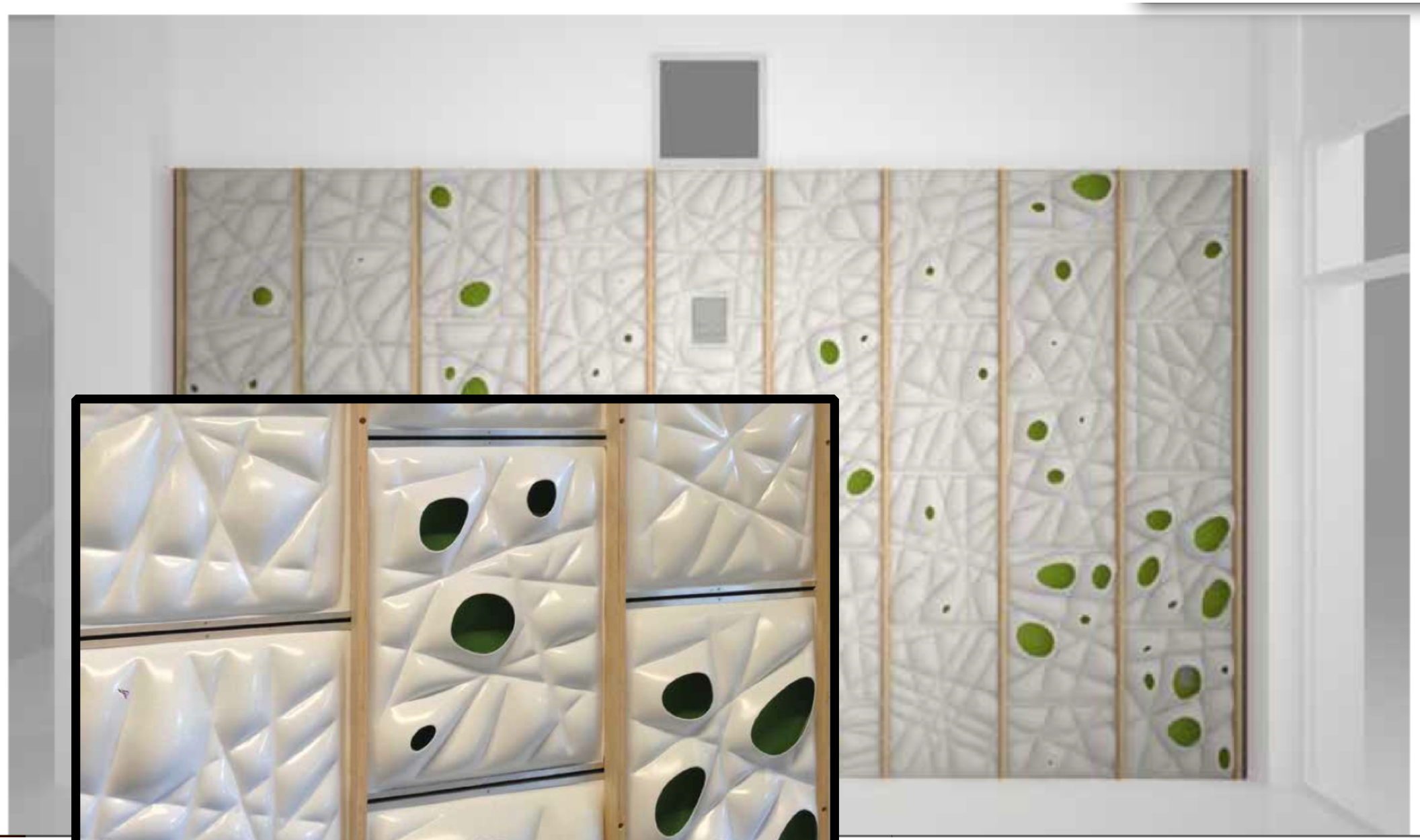
The Mold

Example Forming Tests
Parallel Loose (L)
Crossing (R)

A crude "varied cable mold" made of wire and plywood **(Below)** generates a formally complex pillow-like sheet of formed material. **(Bottom)** Images provided by the authors.







Goals

1. Simplify manufacturing – can we remove the mold? Vacuum? Simplify heating?

Concept: points and lines, heating only where needed

Use the inherent properties of the material

Goals

2. Provide processing (design) guidelines:

Concept: Develop processing window (temperature, time, load)

Material Thickness (in): **0.06**
Time Under Heat Lamp (sec): **90**
Max Bubble Height (in): **3.0**

Material Thickness (in): **0.06**
Time Under Heat Lamp (sec): **120**
Max Bubble Height (in): **5.5**

Material Thickness (in): **0.06**
Time Under Heat Lamp (sec): **180**
Max Bubble Height (in): **6.5**

Material Thickness (in): **0.06**
Time Under Heat Lamp (sec): **210**
Max Bubble Height (in): **10.75**

Material Thickness (in): **0.08**
Time Under Heat Lamp (sec): **90**
Max Bubble Height (in): **3.75**

Material Thickness (in): **0.08**
Time Under Heat Lamp (sec): **120**
Max Bubble Height (in): **3.75**

Material Thickness (in): **0.08**
Time Under Heat Lamp (sec): **120**
Max Bubble Height (in): **4.0**

Material Thickness (in): **0.08**
Time Under Heat Lamp (sec): **150**
Max Bubble Height (in): **6.5**

Material Thickness (in): **0.08**
Time Under Heat Lamp (sec): **180**
Max Bubble Height (in): **9.5**

Material Thickness (in): **.118**
Time Under Heat Lamp (sec): **240**
Max Bubble Height (in): **6.0**

Material Thickness (in): **.118**
Time Under Heat Lamp (sec): **270**
Max Bubble Height (in): **11.0**

Goals

3. Select the best material

Concepts: Life cycle analysis, form finding ability, economics