

falsework: staging construction

by

Thuy T. Le

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SUBMITTED TO THE DEPARTMENT OF ARCHITECTURE IN PARTIAL
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MASTER OF ARCHITECTURE
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SUBMITTED TO THE DEPARTMENT OF ARCHITECTURE ON JANUARY
16, 2020 IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE
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ABSTRACT

In a reality at once distant and imminent, the *Lost Languages and Other Voices* exhibit features stories of stone, tree, and jig. Suspended between a zero-waste utopia where out-of-commission buildings are efficiently stripped for parts, pulverized, and recast into new buildings and a preserved world where the size of climate-controlled wunderkammers get ever larger, these material narratives pull one into perspectives vastly distinct from one's own. At times longer-lived, other times more slowly developed, and oftentimes involving subtle sensibilities, the tales of these matter characters enumerate the point that mass can neither be created nor destroyed, although it may be rearranged in space, or its associations may be changed in form.

This thesis proposes *falsework* as a support structure for architectural transformations that renders un-building a lot more kindred to unfurling than demolishing. Designed as a process governed by both material and notional instructions, *falsework* selectively subtracts and reconfigures parts of built form to reveal indeterminate spaces that had always been (possible) there, thereby enabling reflective, mournful, or prospective activities. "Staging" refers to both the performance itself and the act of setting the stage for what comes next, prioritizing the procedure of construction over or adjacent to its resulting artifacts. This expanded notion of "construction" challenges the supremacy of architectural objects as well as the obsession with their creation and relative indifference towards their life and ultimate demise.

In a world filled with perpetually moving matters, *falsework* sustains possibilities open, for things to collapse or for an eventual repair.

Thesis Supervisor: Rosalyne Shieh
Title: Marion Mahony Emerging Practitioner Fellow

my thanks to...

Rosalyne

for your invaluable insights regarding both this project and the larger scheme of knowledge, the discipline, and life. Your faith and encouragement gave me motivation to bring clarity to my enthusiasm and instincts.

Axel

for the time you generously devoted to the project. Your patience and nurturing feedback enabled me to explore many different strands of idea.

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for the immensely helpful discussions and for the kind notes.

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for the friendship and intellectual stimuli these past couple years.

Angeline, Carol-Anne, Charlotte, Emily, Kevin, Lucas, Stella, Xio
for the assistance and encouragement during the final push.

CRON

for unfailingly coming to the rescue.

my family

for the continued support throughout all these years.

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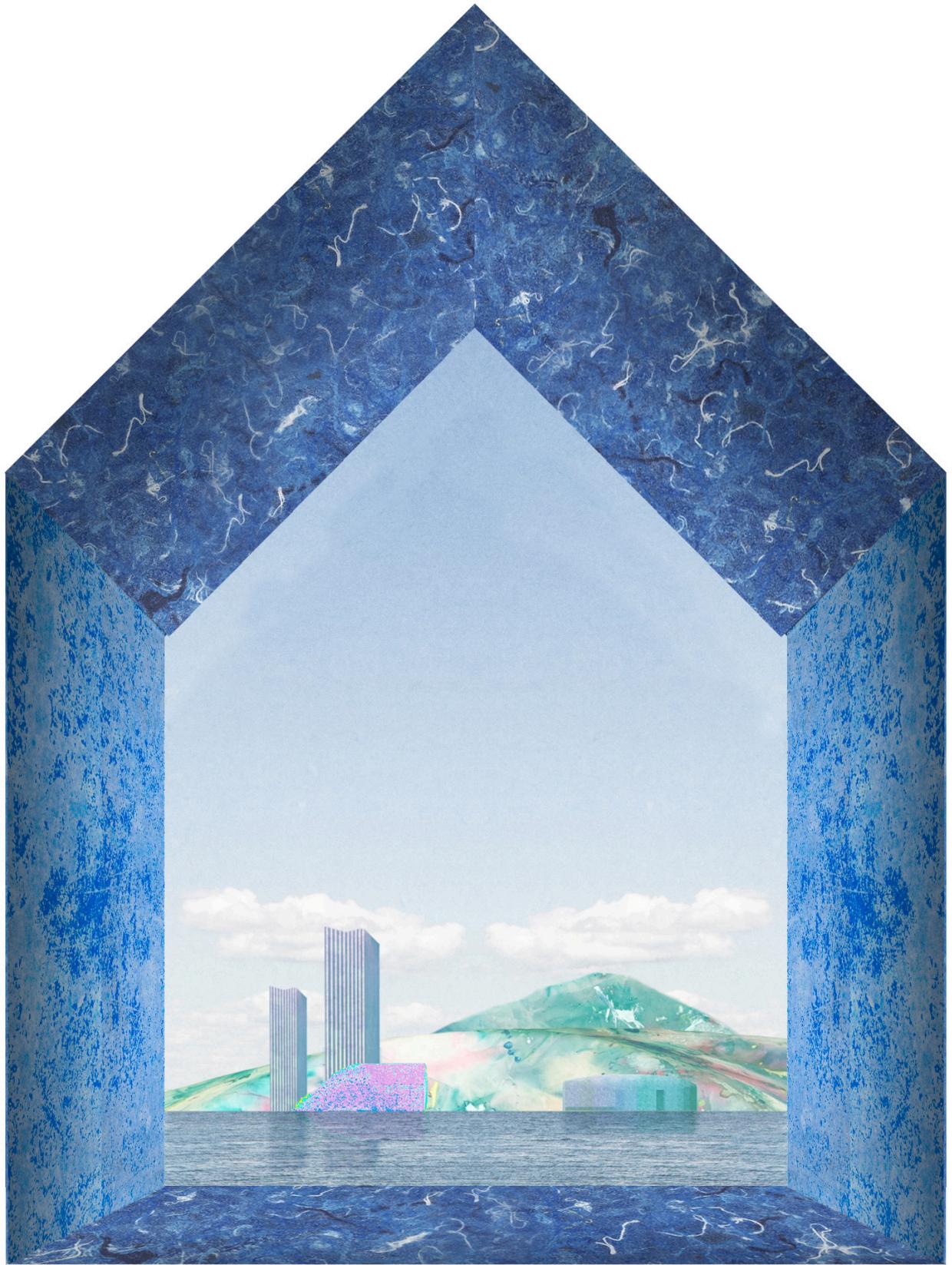
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DOCENT:
(enthusiastic)

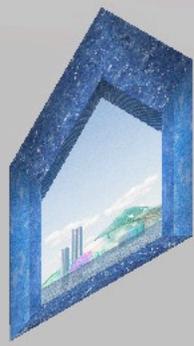
Welcome to the *Lost Languages & Other Voices* exhibit.

I will be your guide today.

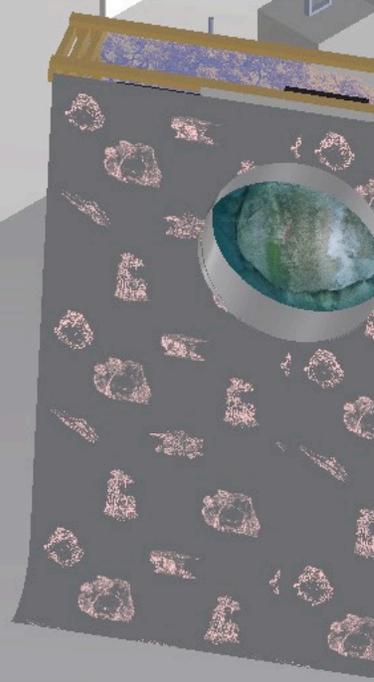
Before we begin, I just want to note our privileged view of the Boston Harbor. The day has come, all our discarded gadgets from ever-shortening cycles of planned obsolescence, idle possessions that never see the lights outside the self-storage units, various rubbles that often end up across state-lines where the tipping fees are lower, are now the substance of the new city. No longer does the construction industry 'wastes,' any rubble produced is pulverized and mixed with shredded plastic debris to be melted and recast into new architecture.

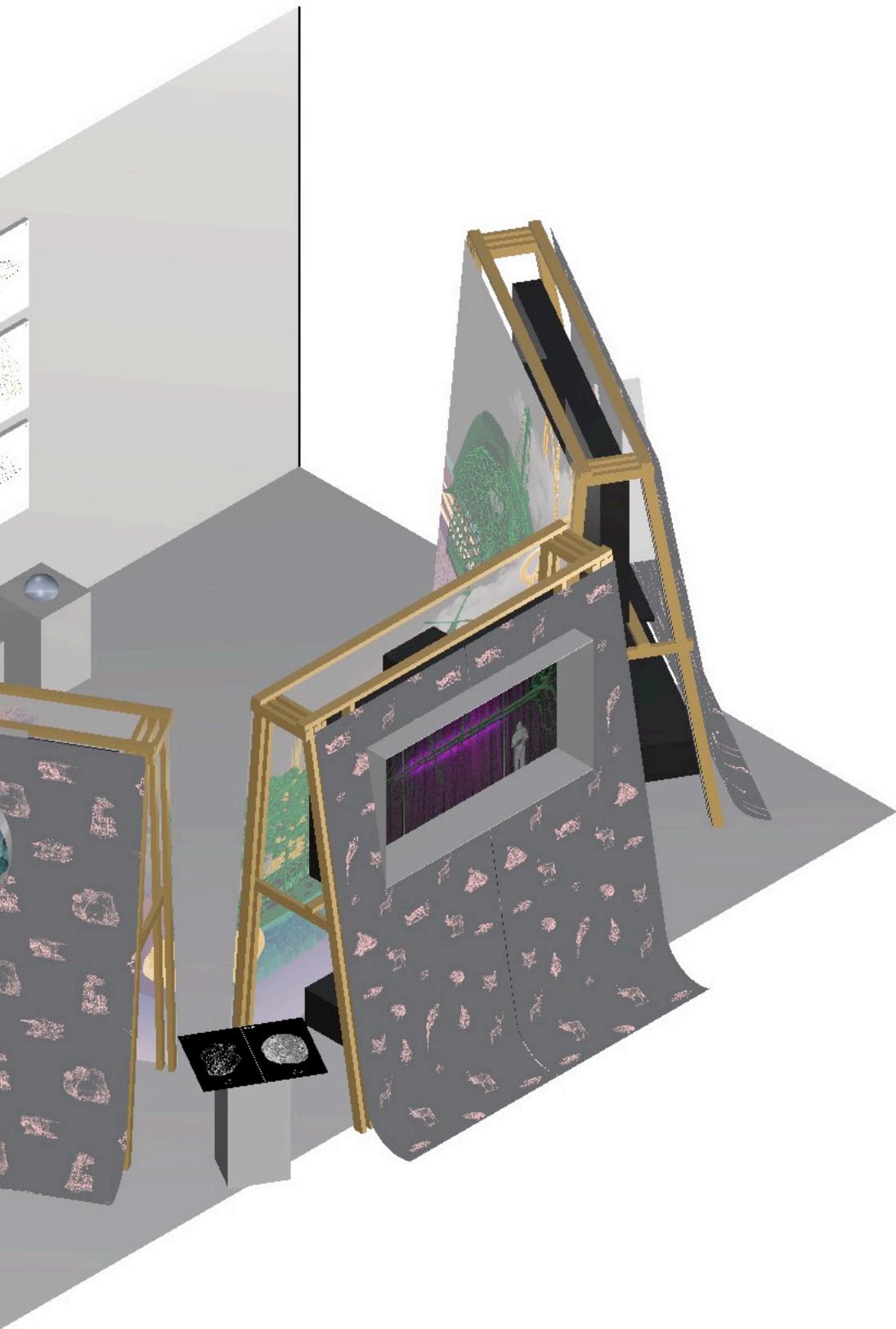


LOST LANGUAGES
& OTHER VOICES



YOU ARE HERE









DOCENT:
(dignified)

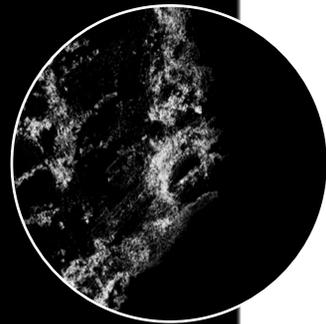
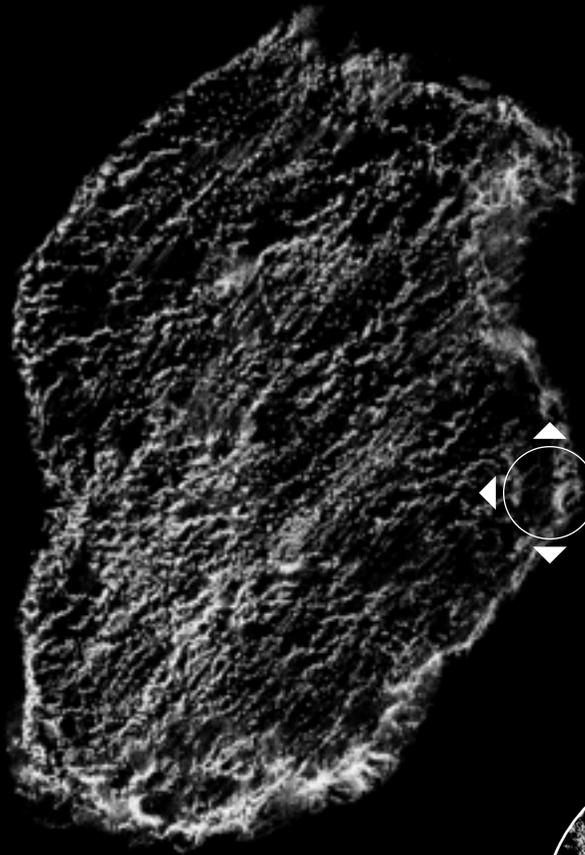
We are now looking at an exceptionally round rock entirely immersed in the shallow end of East Boston harbor where it is protected from extreme temperature fluctuations, air pollutants, and biodeterioration, especially that by lichens and ivy. All of its pores have been filled with freshwater to a saturated state prior to its immersion in the sea which prevents seawater from being drawn into the block.



DOCENT:
(hesitant)

The grain size of the rock ranges from 1-10 millimeters...

granite
from Sudbury, MA

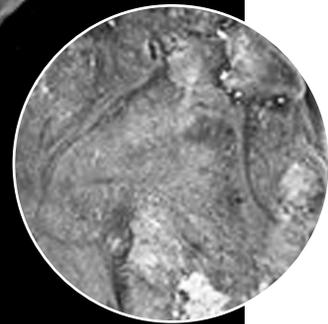
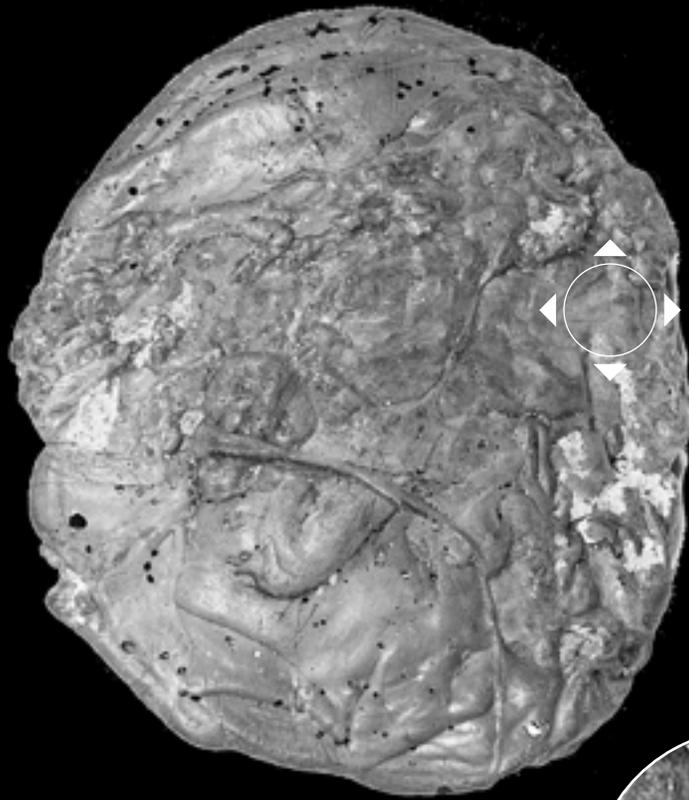


grain size: 1-10mm
magnified 10x

DOCENT:
(informative)

...This is distinct from our plastiglomerates, whose microbead and microfiber matrix falls in the grain spectrum of 10 micro-meters to less than 1 millimeter.

plastiglomerate
from Kamilo Beach, HI



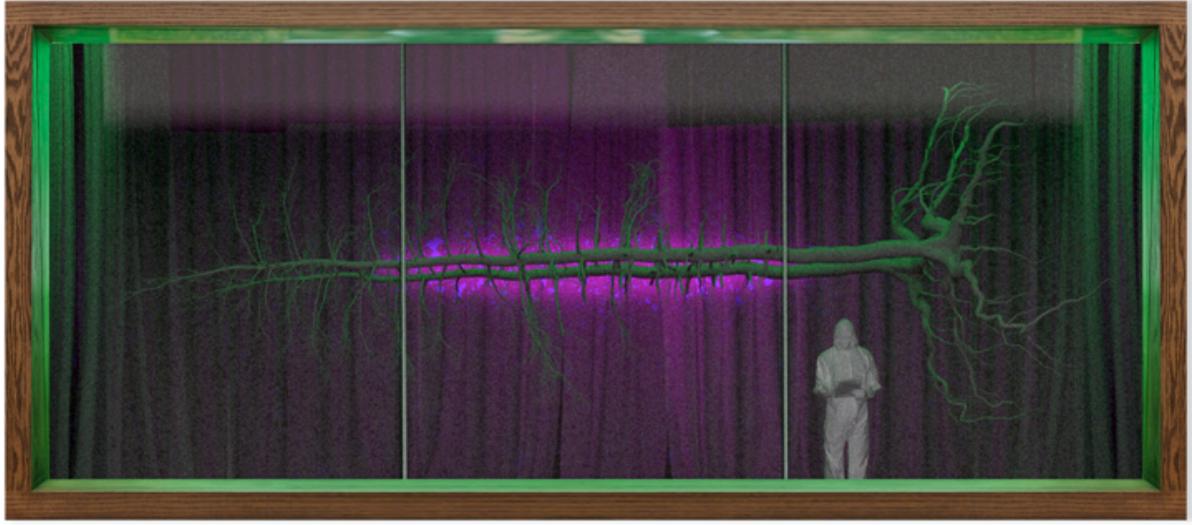
grain size: 10 μ m - 1mm
magnified 100x

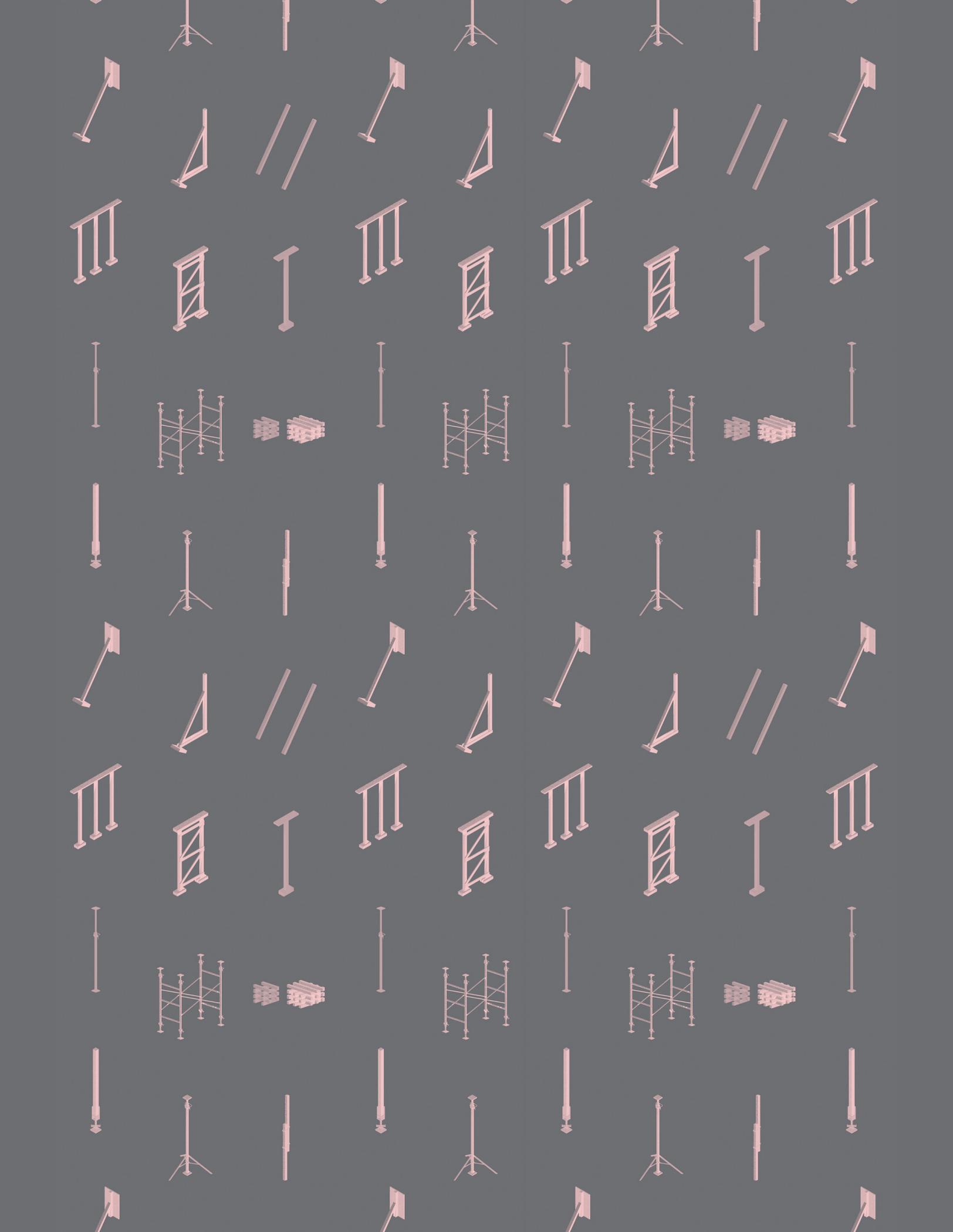


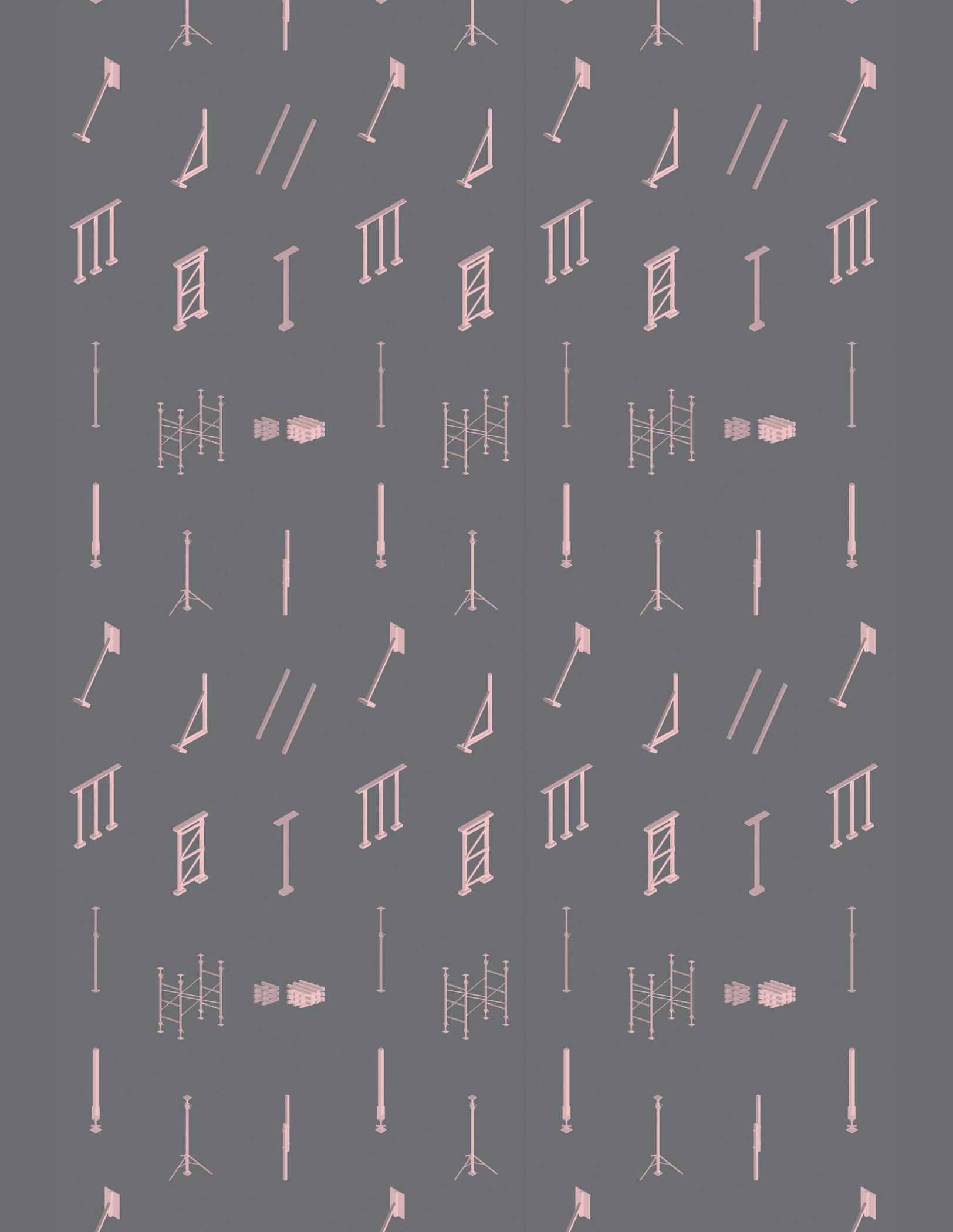


DOCENT:
(intimate)

Here, we are looking at a 60-foot nurse log within an incredibly complex specialty-designed system of air, humidity, water, and soil enhancement to simulate old-school decomposition in the forest floor. The use of tree tops and limbs that fall to the ground after a timber harvest in biomass energy plants and the urge to reduce wildfire hazards in forests as well as the wonderful emergence of whole-timber construction ushered in the practice of whole-tree harvesting. Studies were done prior to this large-scale adoption, but mainly focused on observable impacts to young regenerating tree stands for future harvest. The side-effect was the disappearance of insects, fungi, lichens, and other organisms that had habitually inhabited fallen trees. This simulation is conducted with a recovered timber pile, likely old-growth long leaf pine, that has been spliced with found stump and tap root relics in order to recreate the ecosystem without exposing our trees to any potential epidemic that they are no longer resistant to.

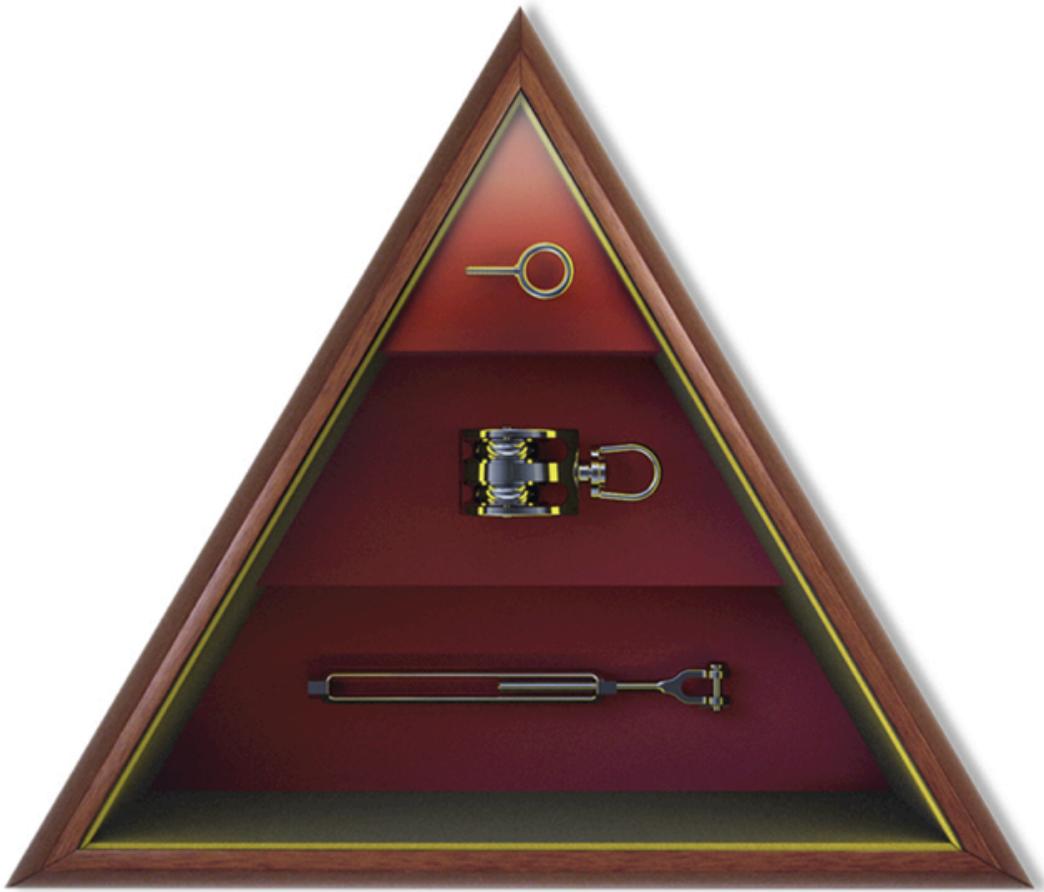






DOCENT:
(playful)

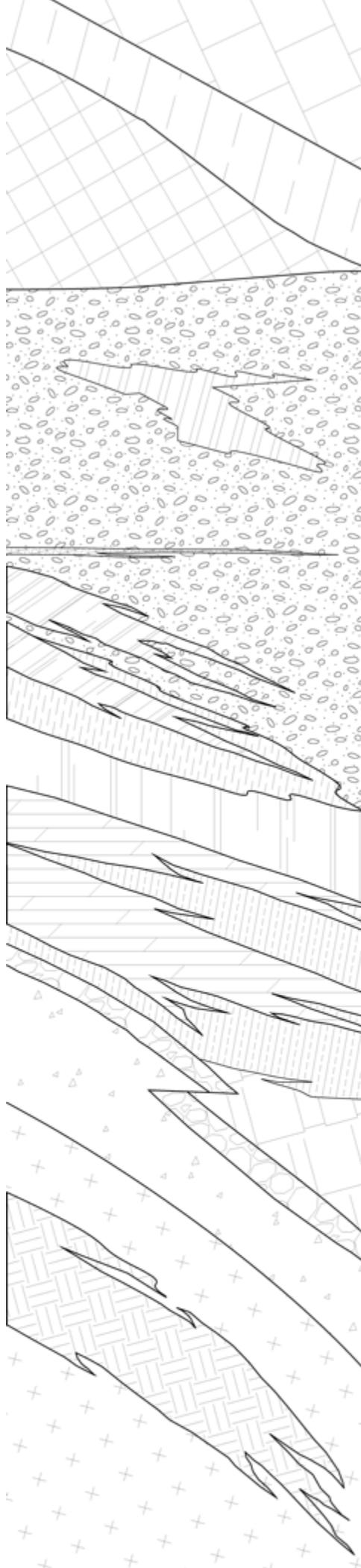
In front of us are a few curious rarities that belong to our J.I.G. (Just Inexplicable Gadgets) collection. We cannot be entirely sure what they were used for but we have confirmed they were made by homo sapiens, specifically anatomically modern humans. The most viable theory so far speculates that these were part of a larger arrays of steelware employed in material handling and erection of dwellings and edifices prior to the deployment of autonomous printing vehicles. Printed construction logics eliminated the necessity for falsework essential in the case of discrete-element assemblies. We are in the process of digitizing these artifacts to add to the creative mode of our open world virtual reality.



STONE:

570 million years ago, there was a subduction zone along the edge of the ancient continent of Gondwana. A great deal of volcanic activity led to the formation of the volcanic Avalon mountain chain. Avalon drifted North-West and landed near the South Pole.

190 million years later, Avalon collided with early North America. While happening slowly, it was by no means gentle. Each microcontinent smashing into North America was like a jam-up on a conveyor belt. Somewhere between all of these, I came to being.



STONE:

Eventually, all the continents came together, forming the giant supercontinent of Pangaea. Avalon, where Boston is, was smooshed between Baltica and Africa on one side, and North America on the other side. This formed the Appalachian Mountains, the remains of which are still in existence.

Where I am is right about the Bloody Bluff Fault that separates the Avalon Terrane from the rest of the continent.



STONE:

Nothing on the Earth's crust lasts forever, and Pangaea started to break apart.

Slowly, the violent volcanic activity of earlier years quieted. The continents began their movement towards their present locations.

It is very still for a little while. I close my eyes and take a nap.

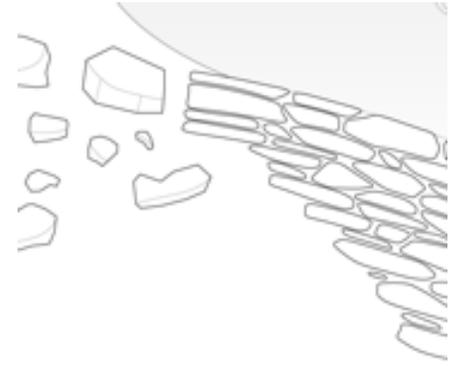


STONE:

There was a mason crew that arrives around 1920.

Suddenly all kinds of commotion started to happen. They drilled holes into me, then put these cold things they called wedges and feathers in and started tapping. At first I felt tickled but there was not really anything to do so we just sat there, hoping they would lose interest after a while. We overheard one of the men telling another:

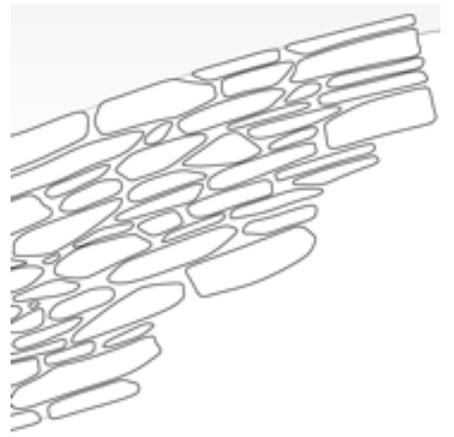
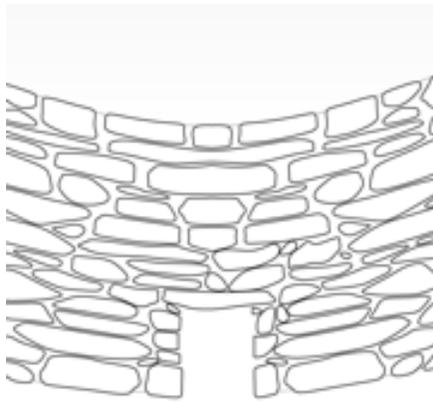
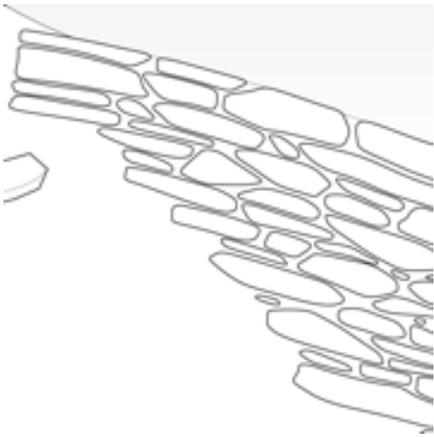
“You start with number one, just a light tap – you take your time slowly driving the wedges down. You try to keep the same tension on every set so that the push is equal on all of them... You will see if one is tighter than the other, but you can hear it too. Listen: (audio).”



BOULDERS:

Oxen-driven carts hauled slabs of us down single-lane dirt roads. We heard that they were going to use us build a water dam. Apparently, someone named Henry Ford wanted to build a historic village and museum as a splendid example of Colonial America in Sudbury, MA.

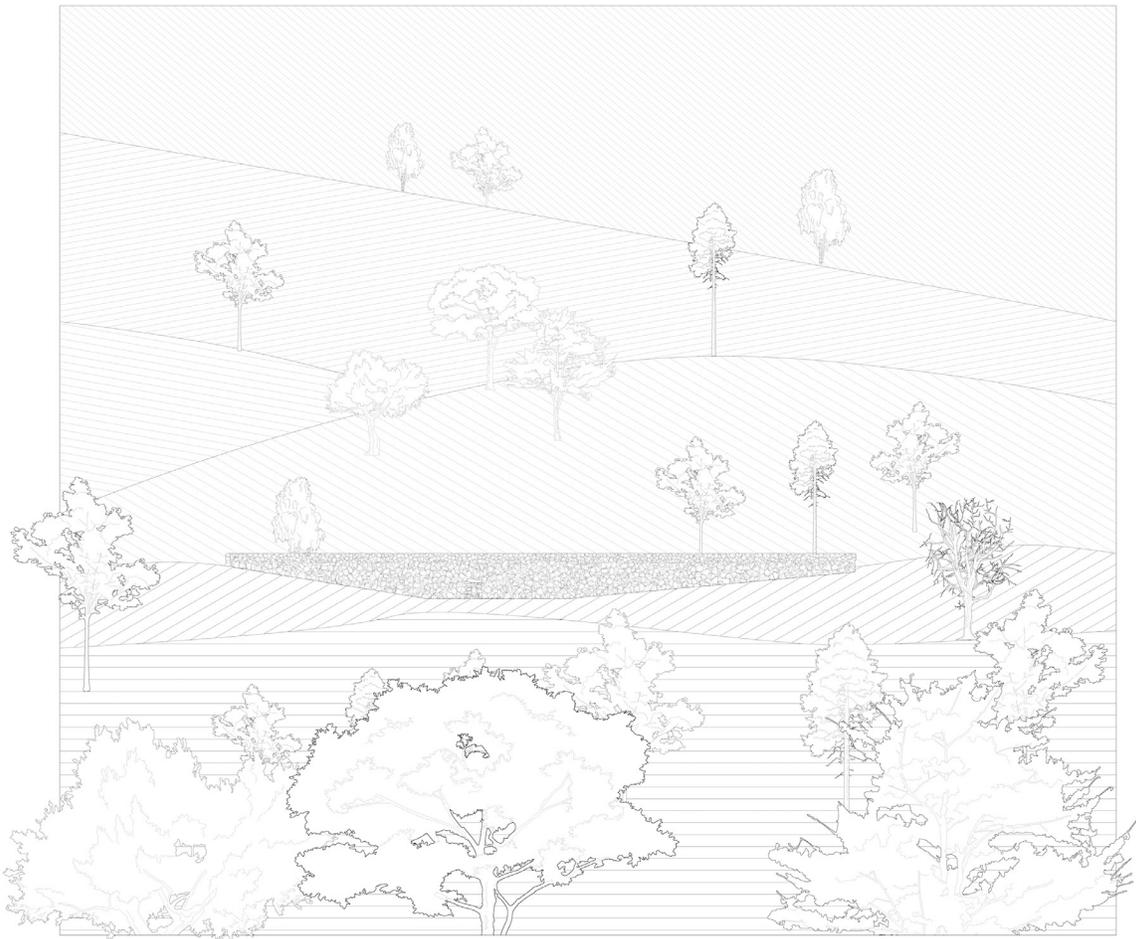
He wants us to trap water from a small stream running down the side of Nobscot Hill for fire-fighting. Now we know why the crew were spending so much time on us with hand tools and oxens even though the man that hired them made automobiles mainstream. Ford wanted the complex to be constructed “in the traditional manner” for so called historical accuracy.



BOULDERS:

Unfortunately for them, the long dam was sited on “incompetent” fractured rock. Incompetent bedrock tends to be relatively weak and, in this case, porous. That meant despite the fact that they stacked us 30 feet tall and 900 feet long, we simply refuse to hold the reservoir we were designed to create.

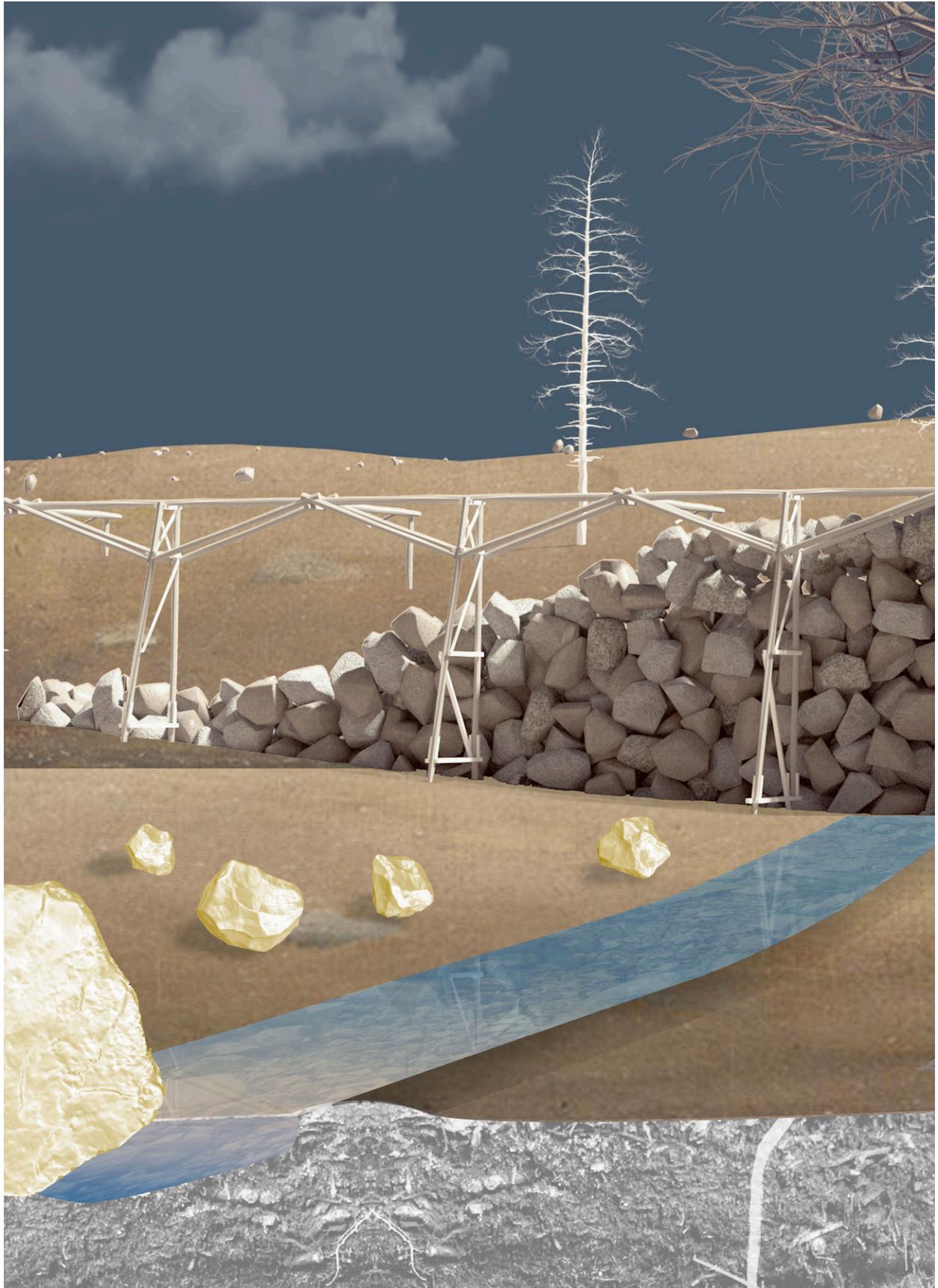
So, for a while now, here we stands: a dam without water in the middle of the woods.



BOULDERS:

The displacement was imperceptible at first but then picked up, still very gradually but you can feel the weight shifting. Must have been late spring, snow has ceased but the trees were yet to bring out leaves, still cautious for last frost.

Each offloading came with a quiver, but the rest of us were well, standing our ground and leaning into the generous embrace of wooden logs stringing across the face of the dam.



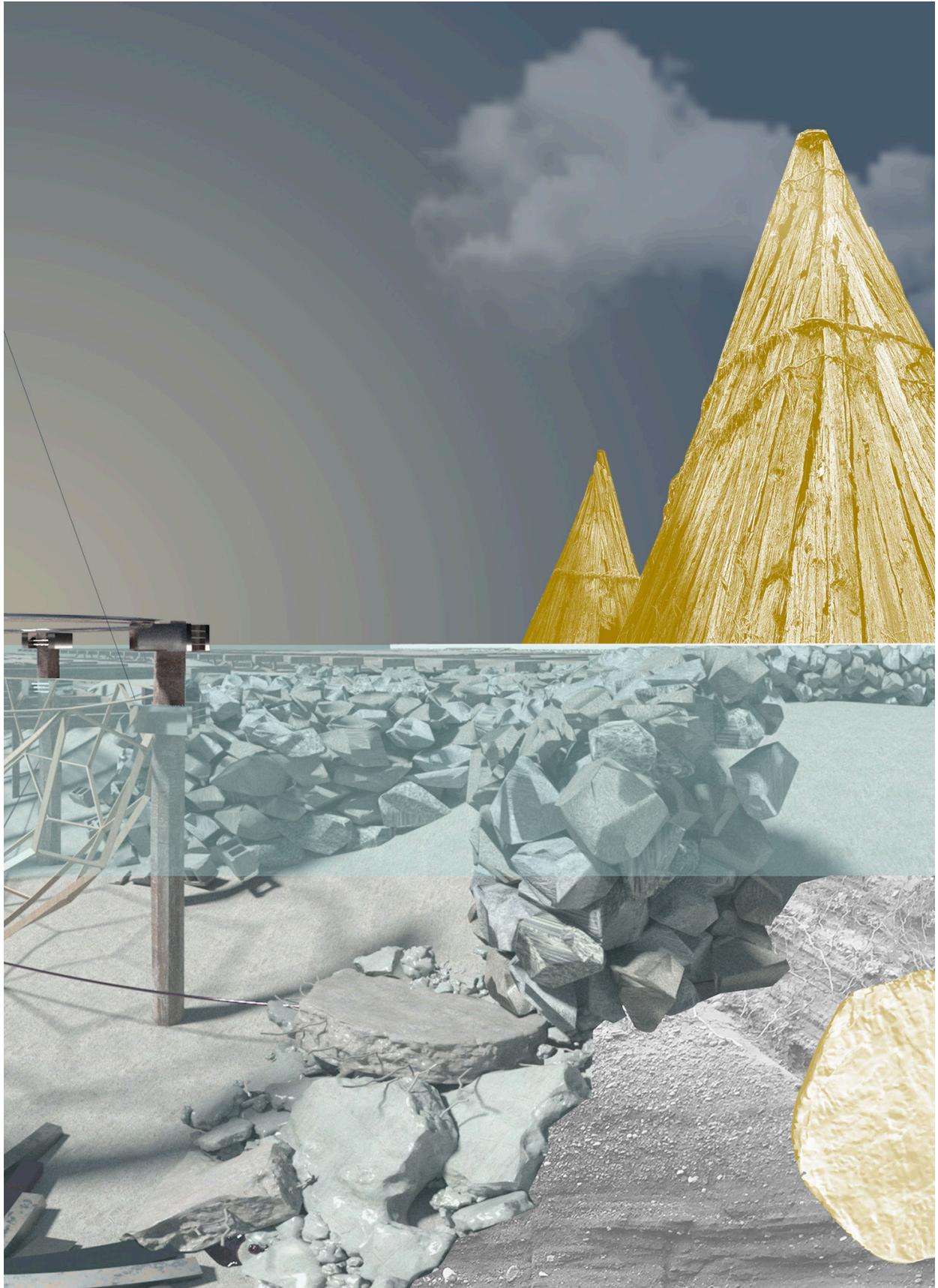
BOULDERS:

Slowly but surely, a host of creatures (came), sea stars, snails, little hermit crabs exchanging shells. Half jetty, half tide pools, we developed an odd affinity for these accumulations; intertwined memories of spring tides and neap tides advancing and receding carved into the scrapes and cracks and splits.

FALSEWORK:

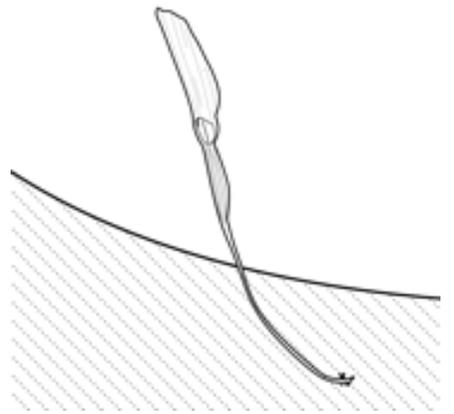
A thin film of water reflects the sky, prompting the sensation of floating above the sea. The space opens up to vastness associated with the sea, while offering a microclimate – refreshing in the summer heat, encrusting patterns like ant hills during the first frost, lacing rituals with the everyday. People walk atop us barefoot, sometimes with timid steps that tremble ever so slightly, other times vigorous beats in tempo with the waves crashing in.

Such strange dream, or perhaps it was a memory, equally reliant on chance and imagination.



LONG-LEAF PINE:

Roughly every seven years, a immense yield of cones. By October, dry winds unfurl the cones, dispatching winged seeds to earth. A little smaller than a sunflower seed and sought after by almost every seed-eating creature in the forest, I need to germinate quickly. About a month later, I latched down roots in the moist, mineral-rich soil.



LONG-LEAF PINE:

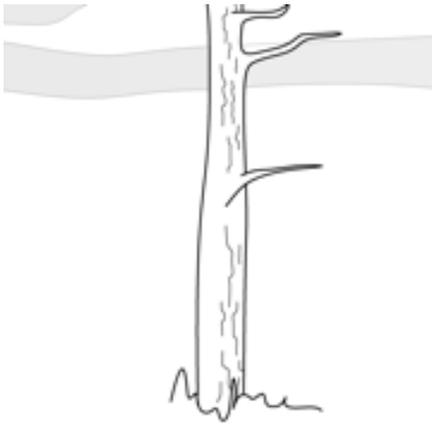
For several years, growth happens underground, where the grass-stage taproot penetrates three feet down, with lateral roots of similar strength.



LONG-LEAF PINE:

Eventually, with favorable conditions, I enter the rocket stage of growth, reaching twenty feet in height in as little as five years. I do not bother to grow limbs. The starches I have been storing power me upward in adolescent spurts of overflowing green hair.

I begin to expand in girth, developing branches signature of our family, intricate wrought-iron curls across a flat open crown.



LONG-LEAF PINE:

A couple hundred years into my maturity, an ivory-billed woodpecker bored into a cavity in my old-growth trunk for insects beneath the bark.

At times, strong gusts pass through my canopy with a roar.

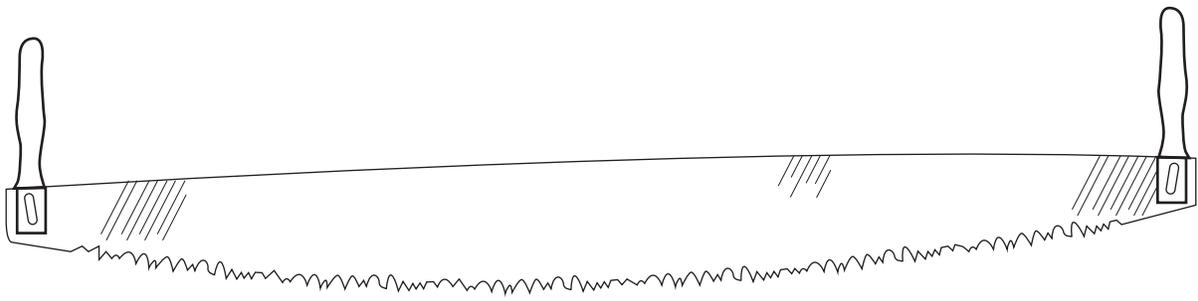
Hunters in deerskin go by under me. Quite a while later, the distant guns of the Civil War. I am now 330 years old, feeling as vigorous as the younger trees. My sapwood pulses with life. I continue to add fine rings to my trunk and it looks like I could go on forever...



LONG-LEAF PINE:

There was a logging crew that arrives around 1880.

At the time I was felled, I was twenty inches in diameter and one hundred and twenty feet tall. Had it been a couple of years earlier, the loggers would have come with axes. But something much more efficient was now available – the two-man crosscut saw.



LOGS:

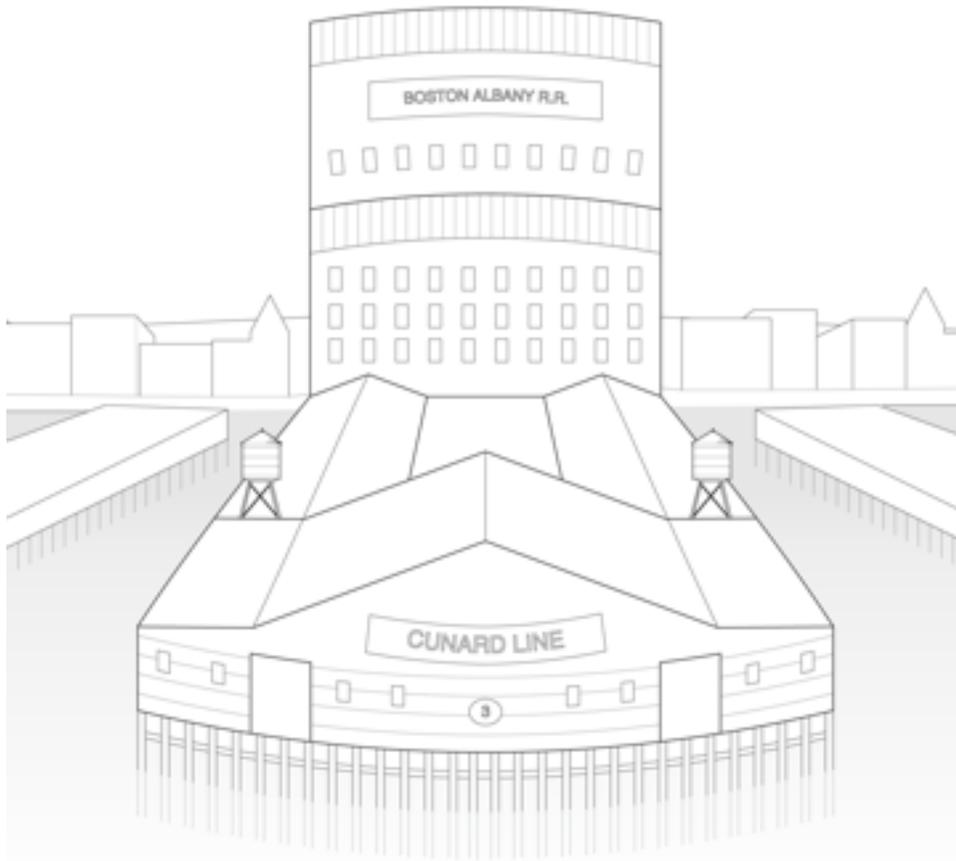
Coming up on the bank of Red Creek, we were solded, stamped, and set for rafting. They claimed running logs was the best doted of all the loggers' tasks, bringing an ethos of adventure for the young and old. Jam poles and peaveys steered us down fast currents from the creek to the river and the sorting booms adjacent to the mills.

We were part of a sizeable load at 12 cents per cubic foot, rammed on rollers into the hull of a great schooner. After sailing through the Gulf of Mexico and then up the East Coast, she docked at a pier in the Boston Harbor. There, we were stacked high, side by side our distant cousins from Georgia, Florida, and the Carolinas.



PILINGS:

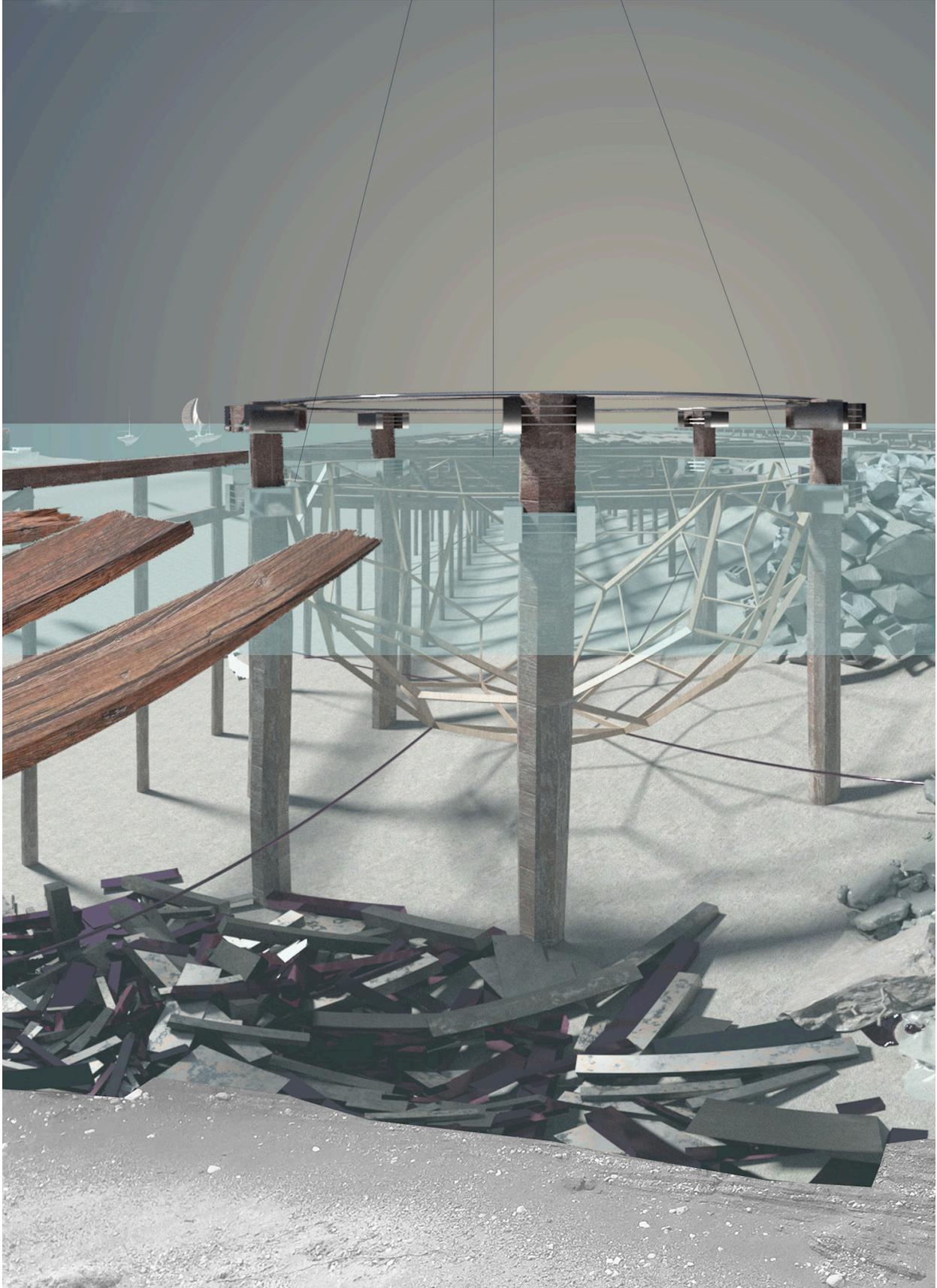
On an October morning 1909, perhaps, we were brought down cobblestoned streets covered with horse manure to Marginal Street in East Boston. They dropped weight on us, driving each one of us into the ground underwater – we do not understand why. We dig out heels into a lot of mud and sand at first, then the texture gets smoother and smoother, through silt and then clay. And there I stand for a long time now, watching railroad cars and ships come and go, oftentimes from as far as Europe.



PILINGS:

We are woken up by this steady vibration, which loosens the grip of sediments on our skin. It is just before dawn, the tides have mostly receded. In a place where there is no true dry season like Boston, this is as low as the water gets in the harbor, which turns out to be just enough for us to wiggle free with a pull from above.

Some of us that remained rooted in the floor of harbor, were dressed up with new tight collars, offering up a circular trestle to which a strange structure that fell out of the sky was anchored.



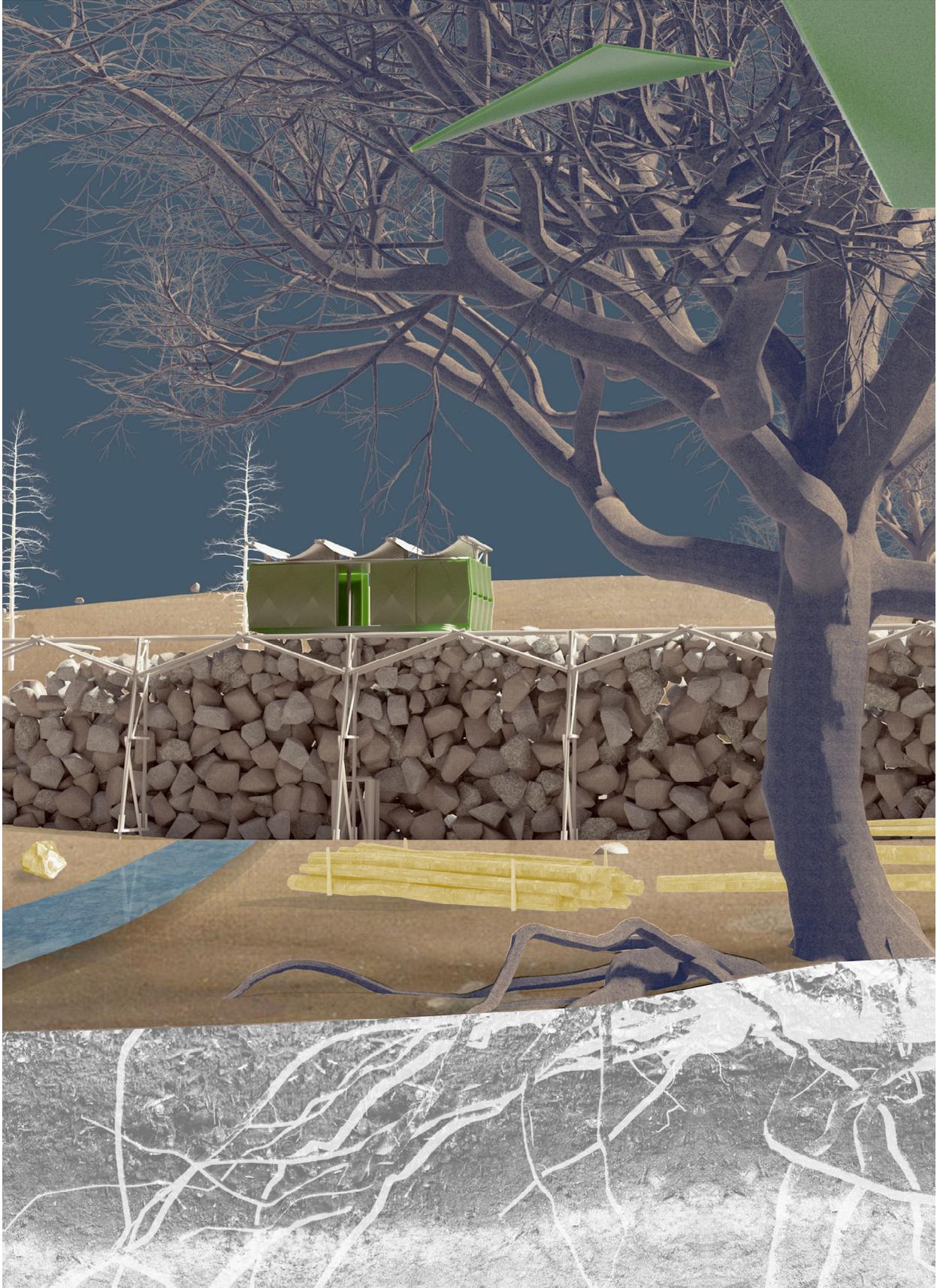
PILINGS:

Many others of us embarked on a little journey west. We move through bright cities until they become dense forests. You blink and you are elsewhere. Each flicker of light reveal a different map and with it, an unending echo of emotion, shaping our recollections. One day we were brought up a humble hill to where the woods thinned out and stones, in all sorts of shapes, scatter the ground. We spied a structure there, all rocks standing over each other all the way to the top where some chain link fences have slumped under the pressure from adjacent oak trees.

FALSEWORK:

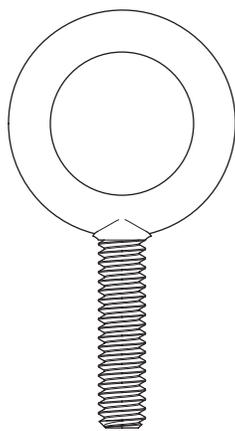
Soon enough we were lashed up to form a row holding hands all the way along the stone structure. So there we stand, proud like trees, extending our support.

This remembrance, so erratic and ephemeral, twined around the past and reaching imperceptibly into what is yet to come. It is possible that the forgetting brought on by decay has eased up our demand for evidence and explanation, allowing for a different form of recollection.



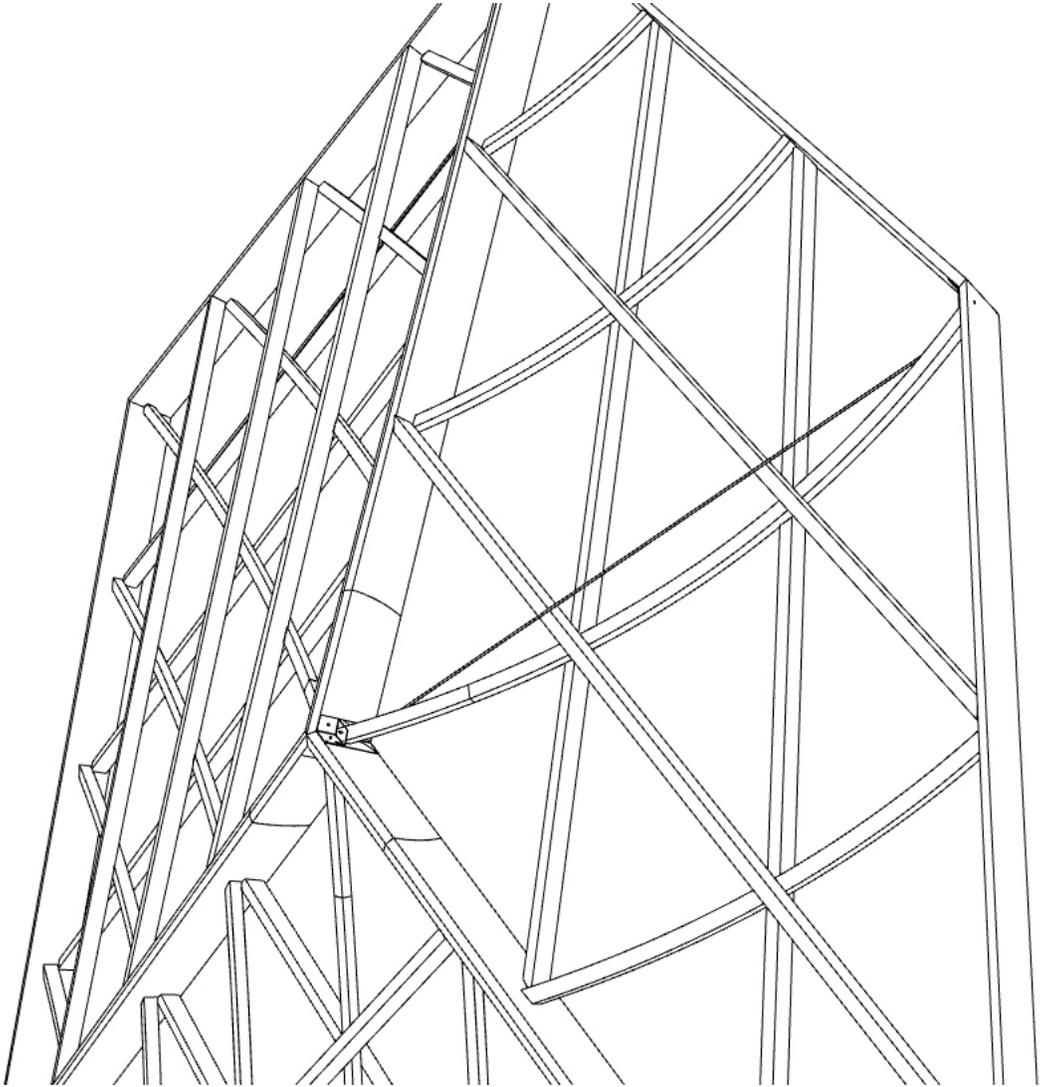
STAINLESS STEEL:

Imagine a film that captures every instance and every other frames features fire. That is how we were born. Molten, molded into rods, blasted in the furnace until red hot, forged into loops, buried in hot coals, welded, and then hammered.



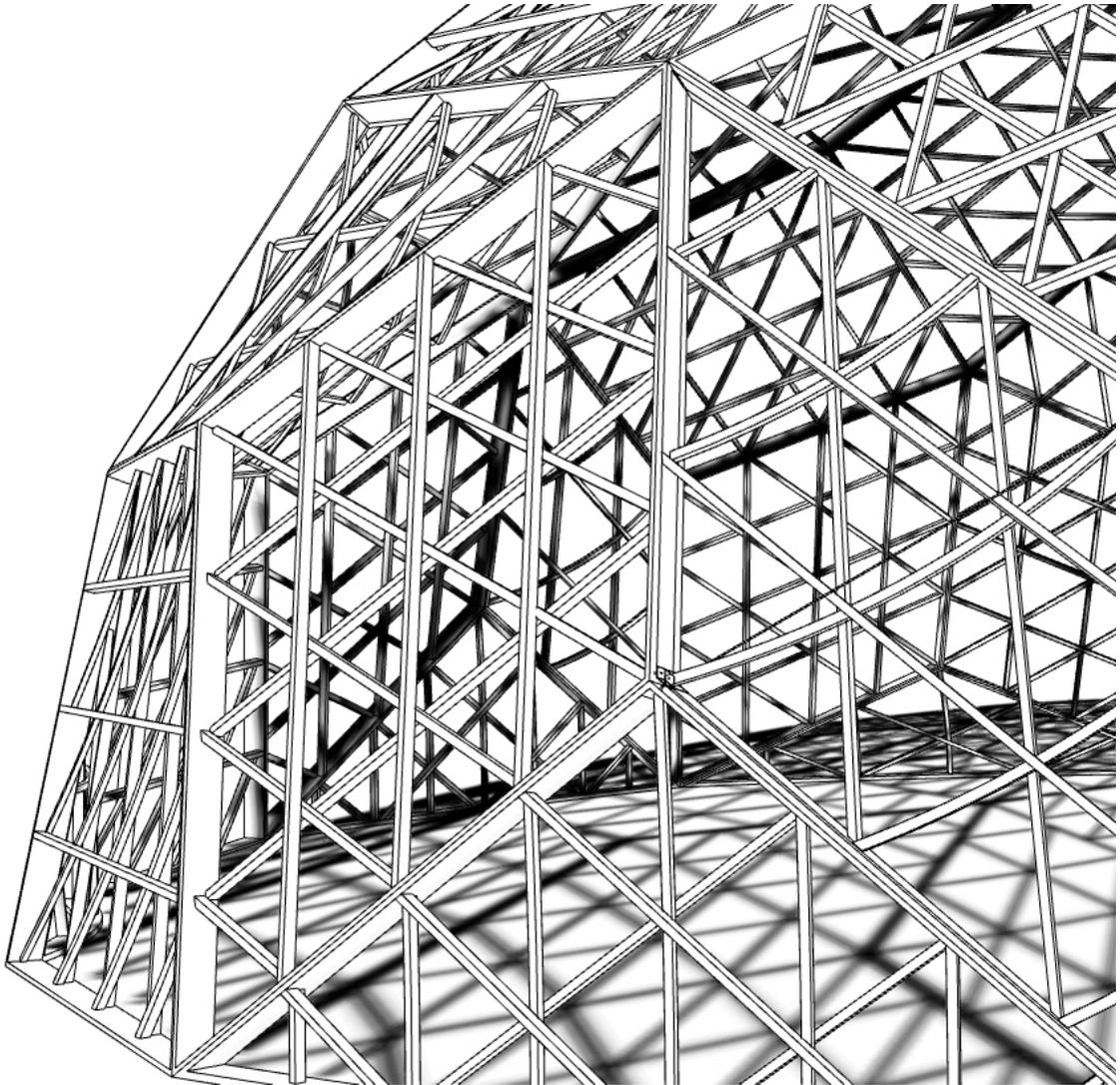
EYEBOLTS:

A rhombus is any parallelogram with equal sides, including a square. It can be divided into two stable triangles by a strut connecting opposite corners or vertices. But this isn't the case at the Wood Hole Dome. Instead we were employed to hold the shape of the rhombic hypar panels before the full dome structure was complete. Affixed to the interior corners of the panels, we held onto temporary tension cables, holding the members that formed the perimeter of the panel in place while they were bolted together.



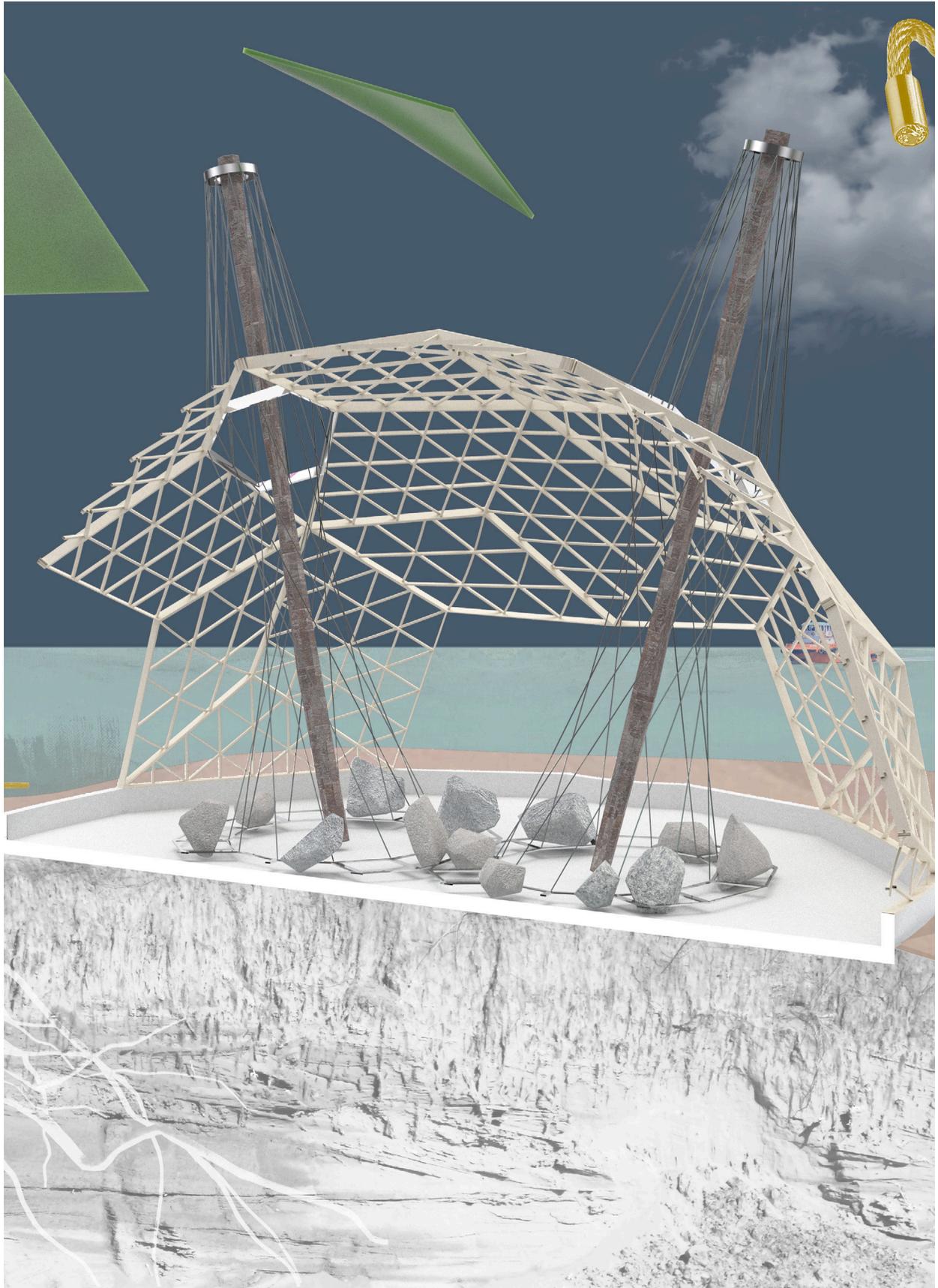
EYEBOLTS:

After these exciting moments, we sat idle, listening to the changes in the temperature, tasting the force of the big storms that come every few years.



EYEBOLTS:

After spending what seemed like a long while in oblivion, we were tied up again to reign in the rhombic shapes we have come to be so well acquainted with. This time, they are hoisted down instead of up. First the skinny panels. In each of their places, a hexagonal ring that echoes the geometry of the original struts, pulling on strings that prop up a brawny tall log, which in turn support the rest of panels.



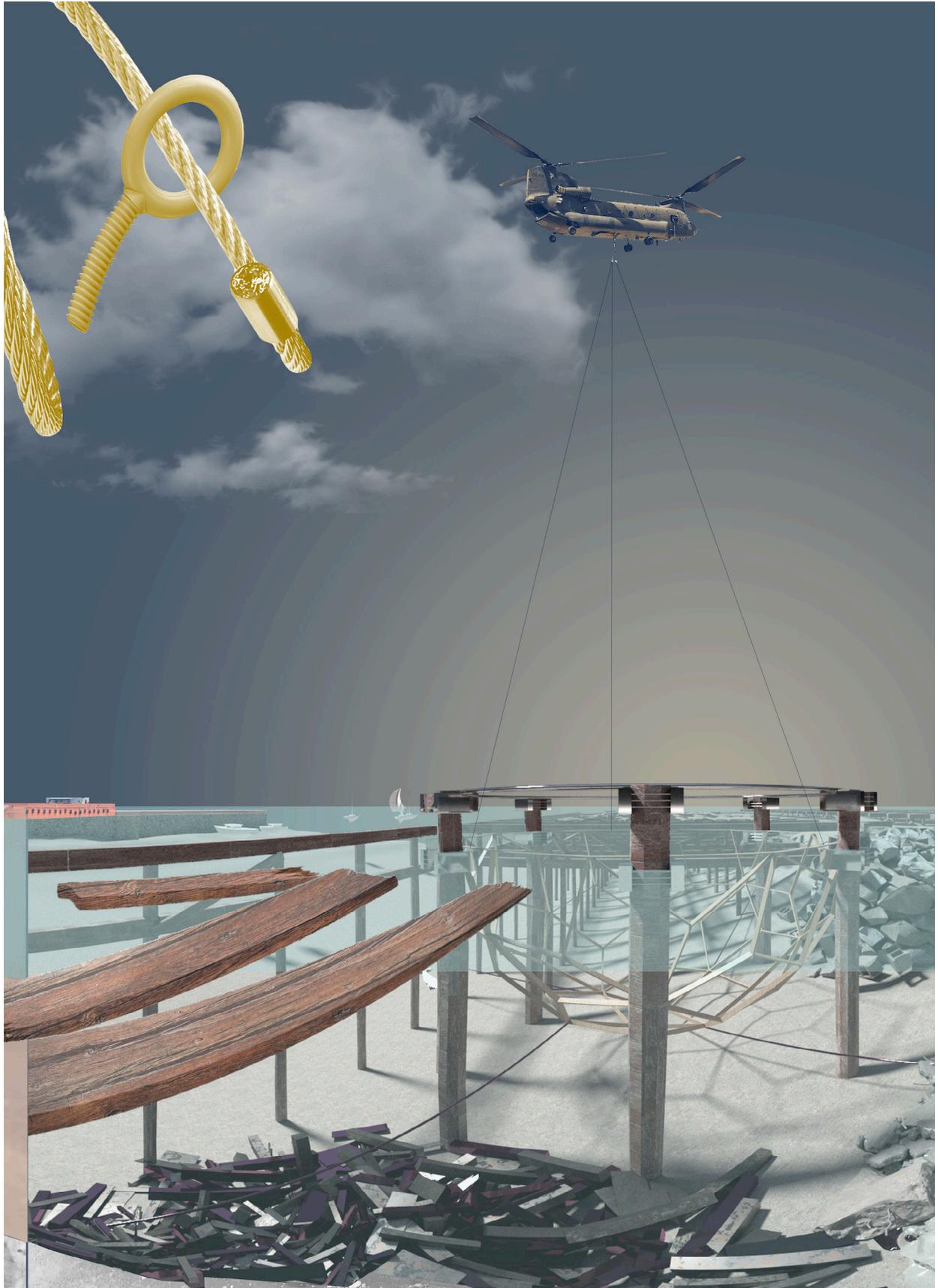
EYEBOLTS:

The unpeeling happened gradually in a season, letting enough time lapse for many barbeques to be held by locals under the shade of the summer canopy.

FALSEWORK:

Farewells were exchanged and we were on our way up the cape to a new adventure, one that involves fish and divers and being anchored to a forest in under water in the Boston harbor.

One movement created another movement and then another, with all of them being endlessly related. The journey never ends and the memories will be with you, forever.



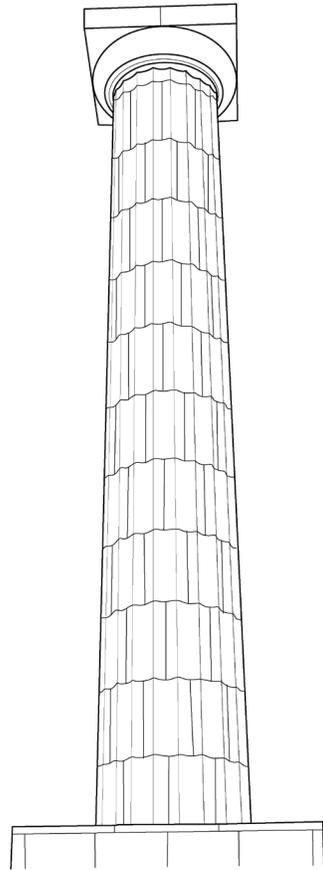


first edition

FOREWORD

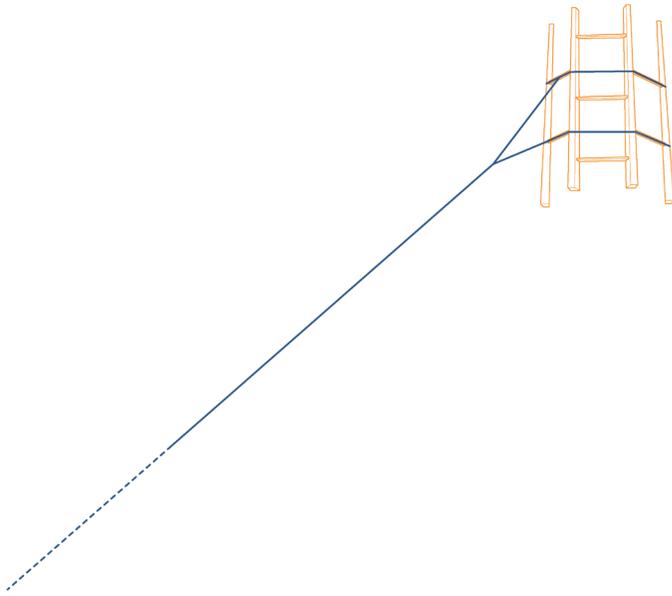
You are holding the first edition of the *FALSEWORK exercise book*. This volume has been prepared by the *falsework* crew as a primer for those interested in slow and/or performative deconstruction. The following exercises are centered around elemental, abstracted structures to build up aptitude and passion for creative alternatives to demolition.

EXERCISE 1
column

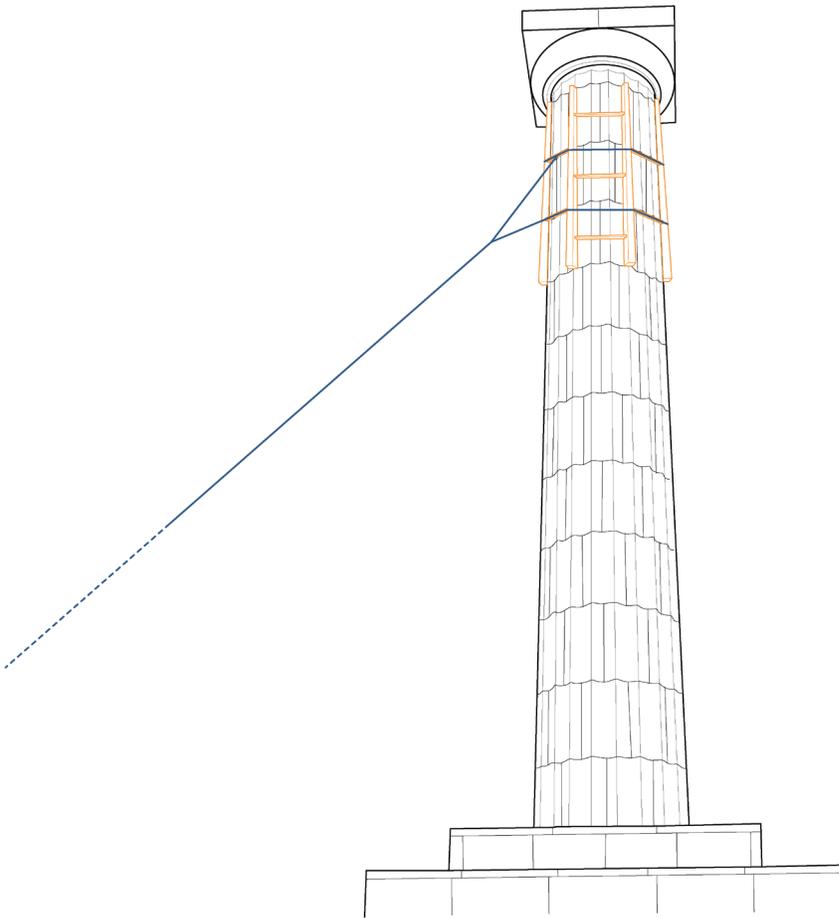


1' = 3/16"

demolition by toppling

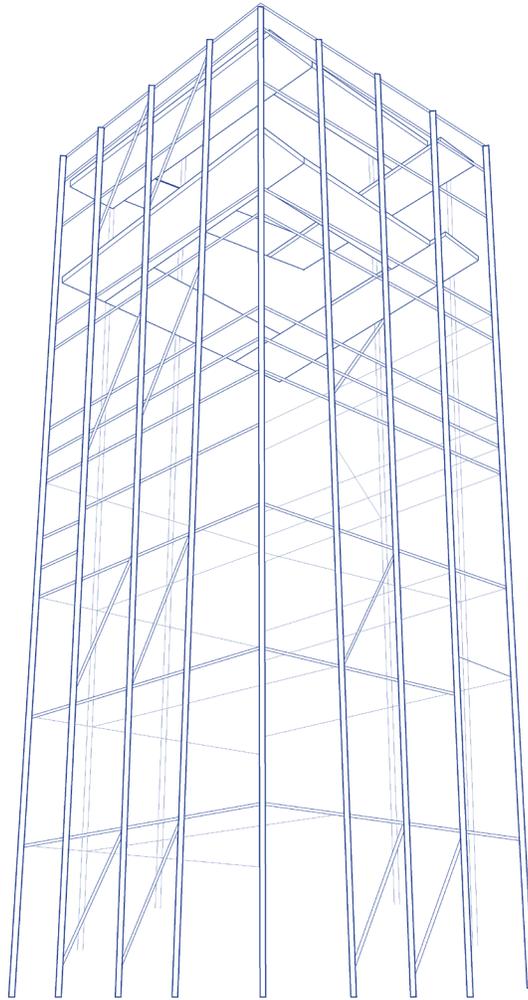


1' = 3/16"

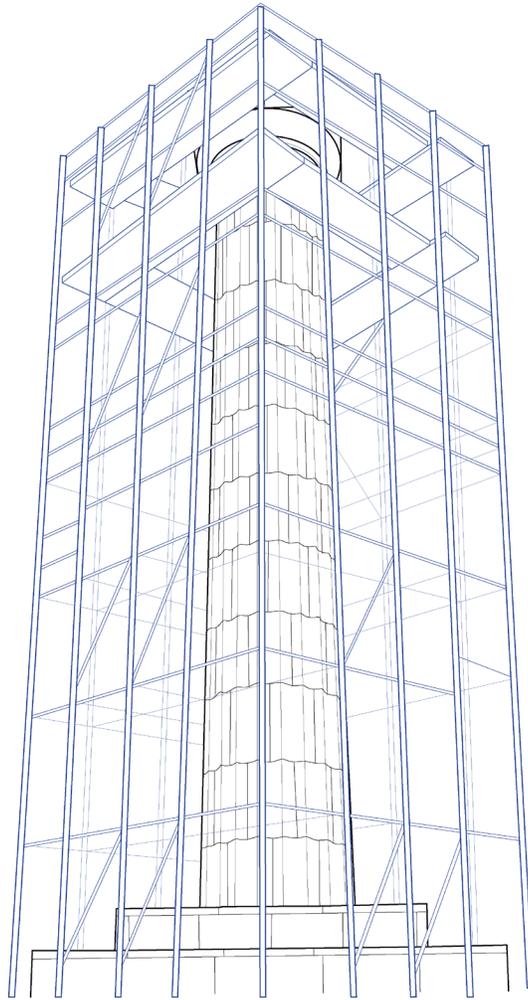


1' = 3/16"

deconstruction by reversal

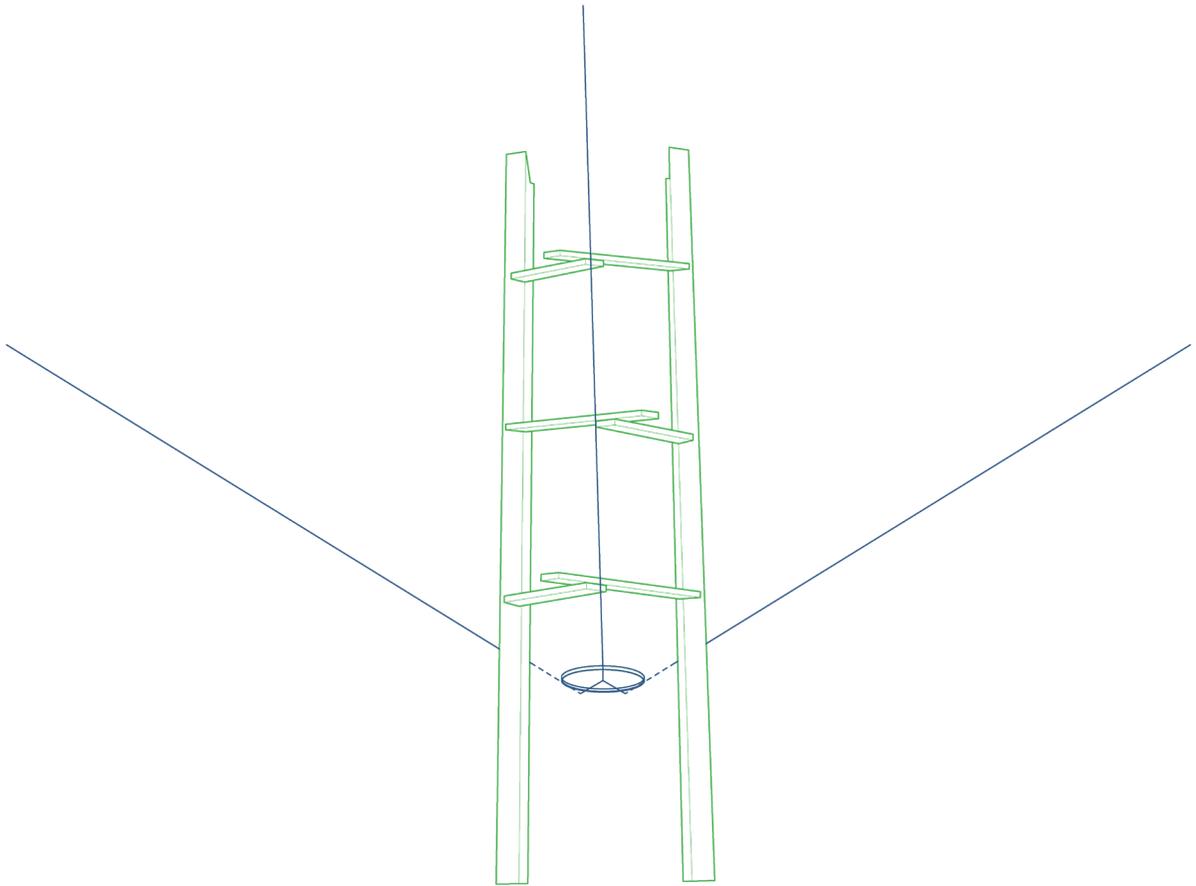


1' = 3/16"

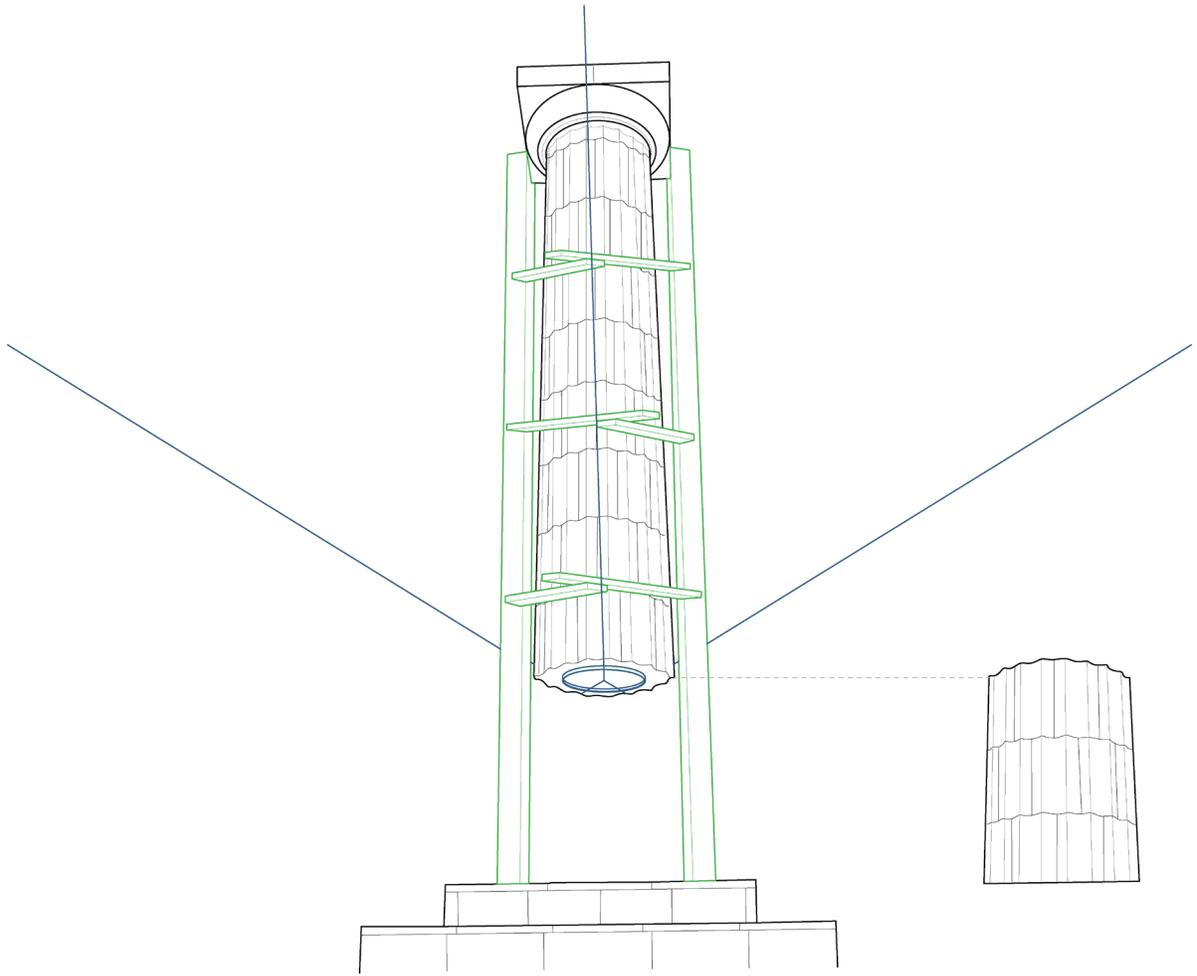


1' = 3/16"

performative deconstruction

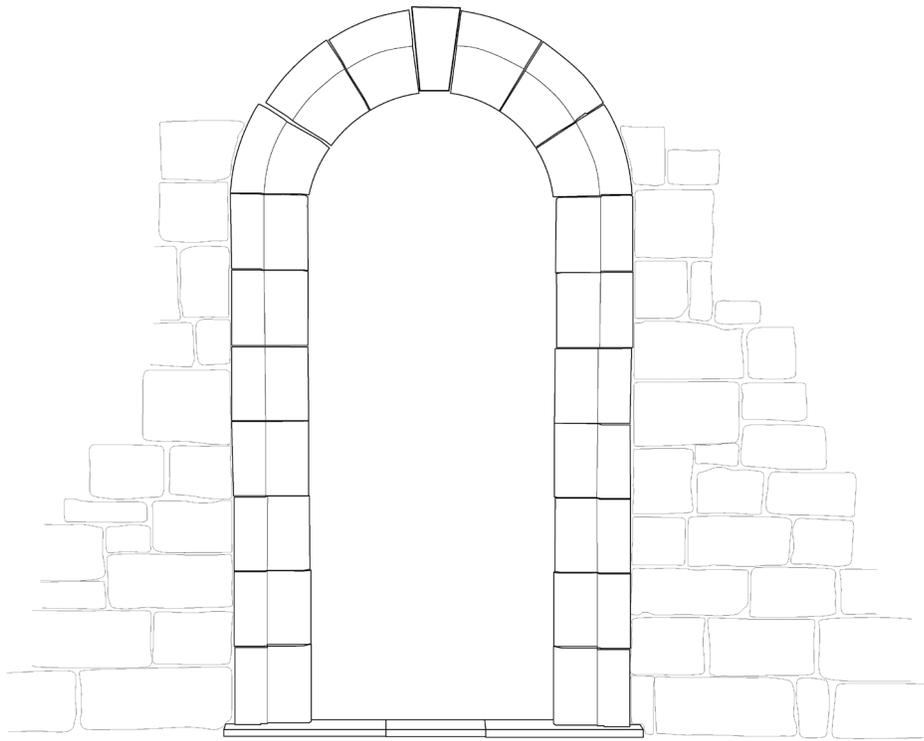


1' = 3/16"



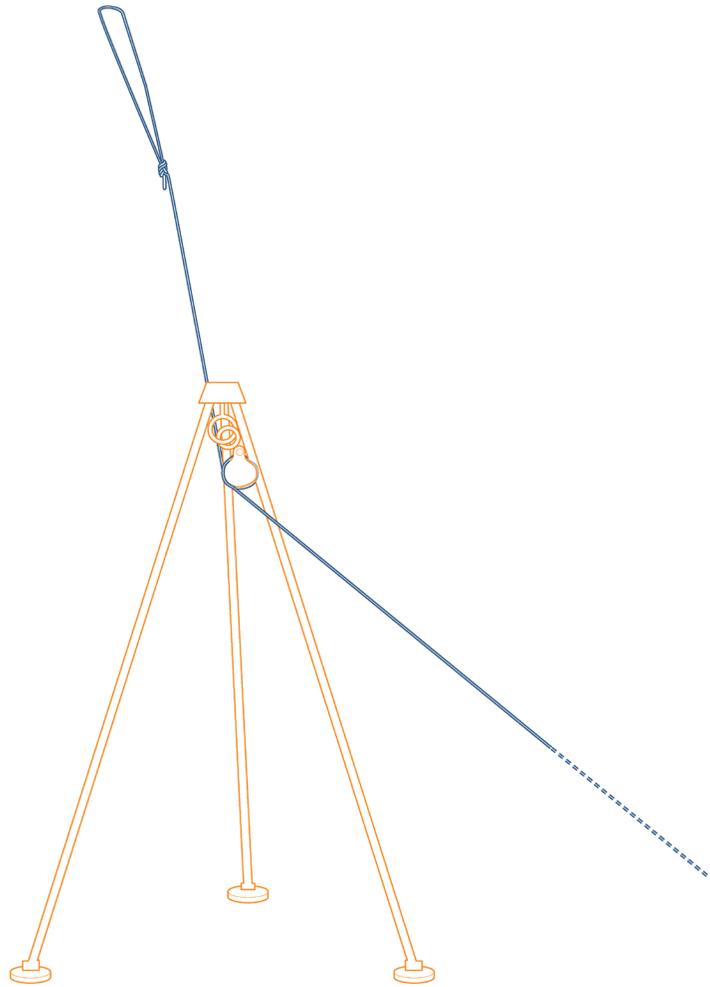
1' = 3/16"

EXERCISE 2
arch

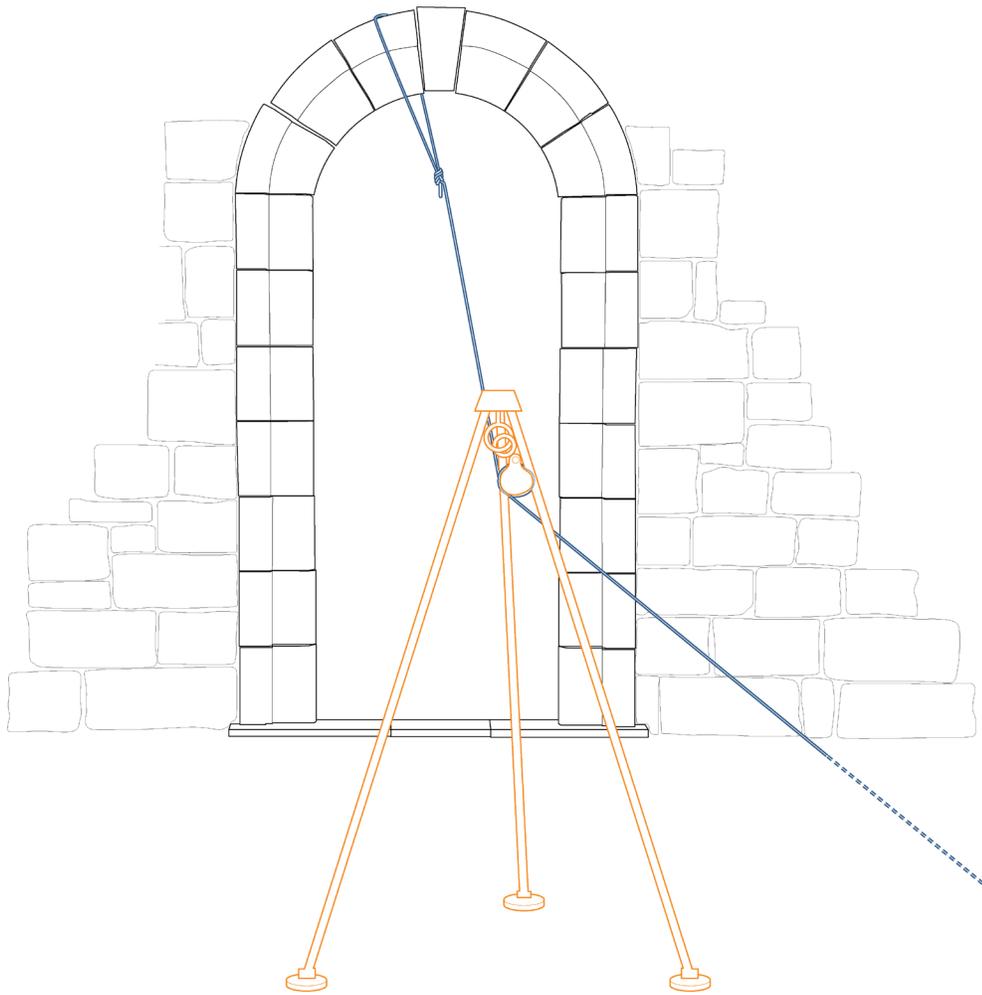


1' = 1"

demolition by toppling

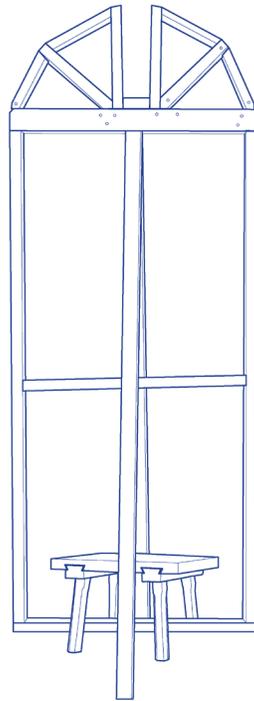


1' = 1"

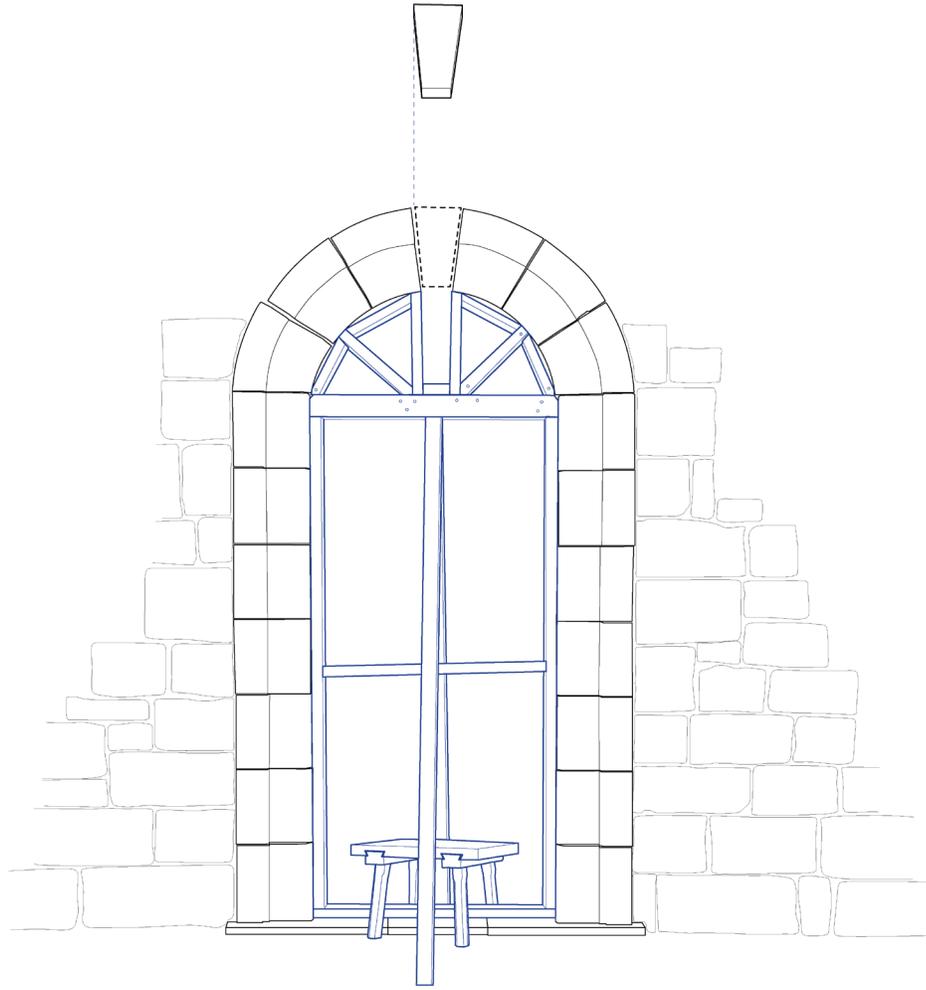


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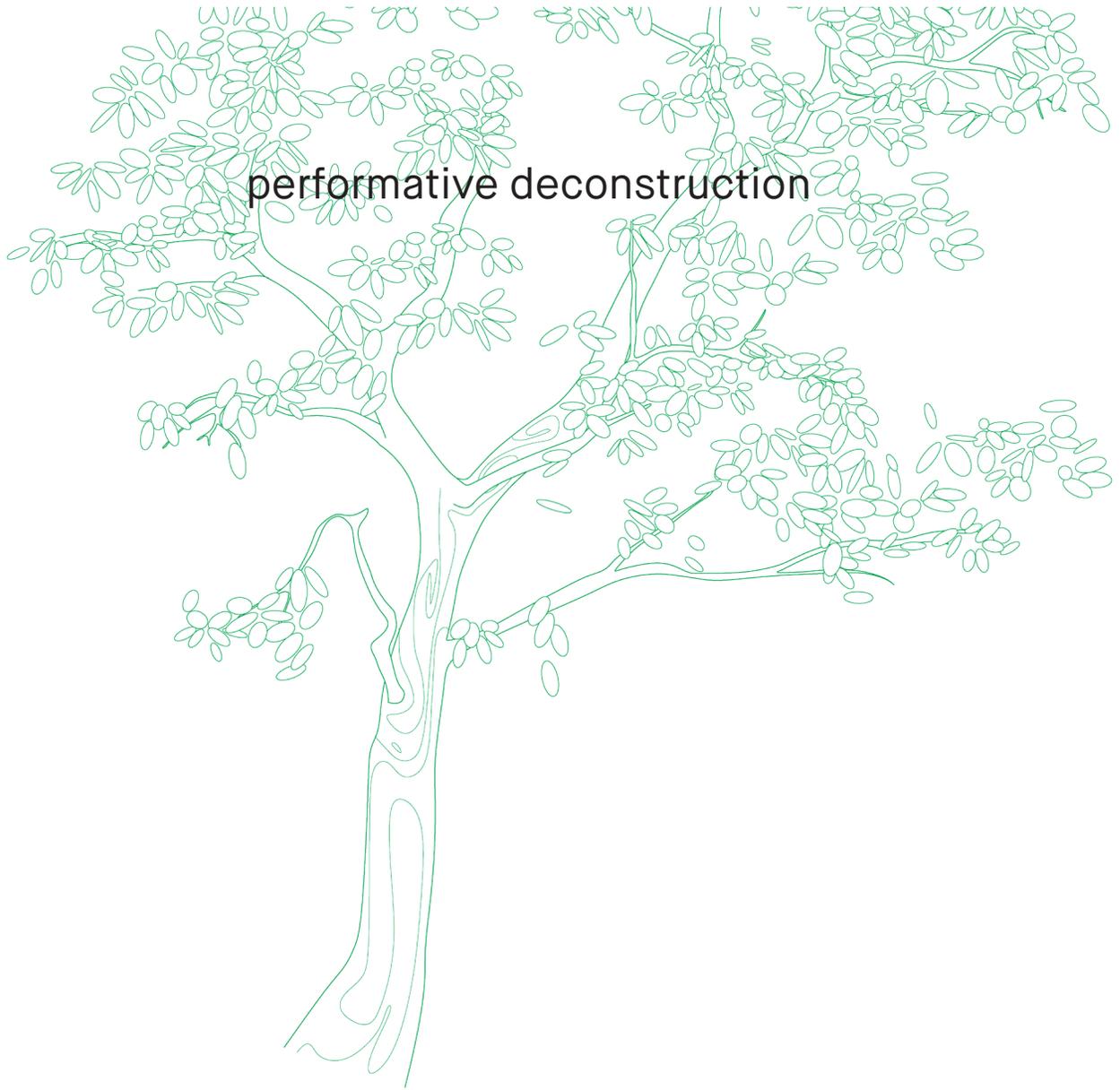
deconstruction by reversal



1' = 1"



1' = 1"

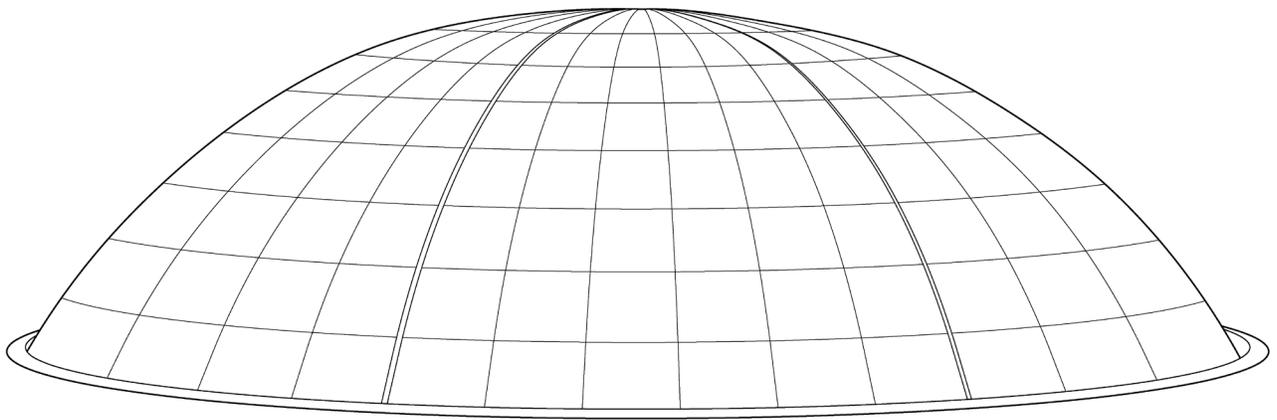


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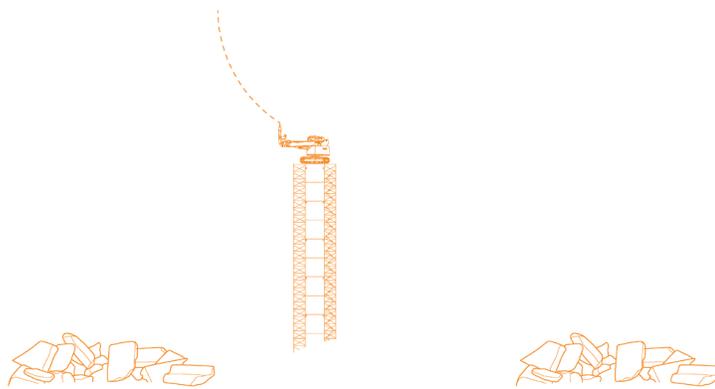
1' = 1"

EXERCISE 3
dome

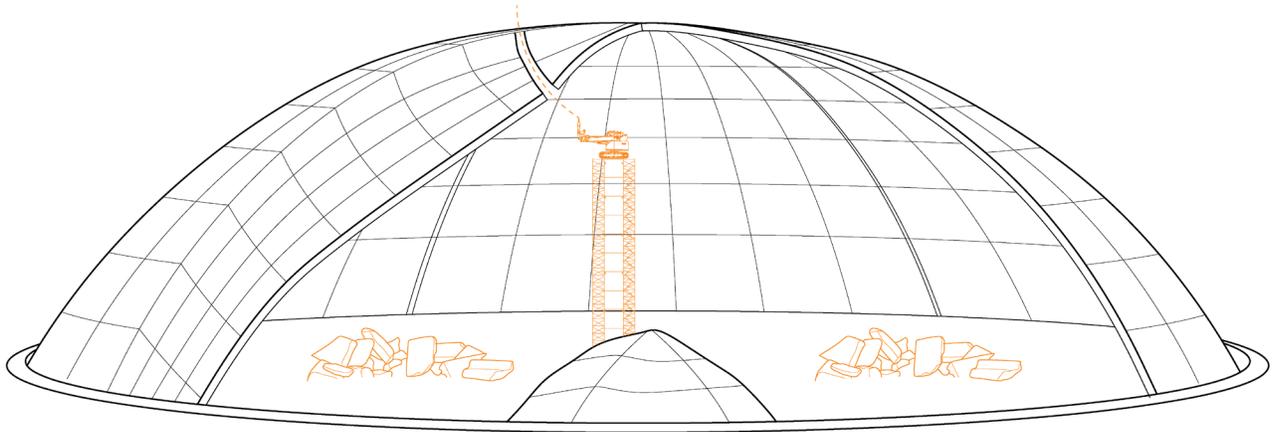


1' = 3/64"

demolition by toppling

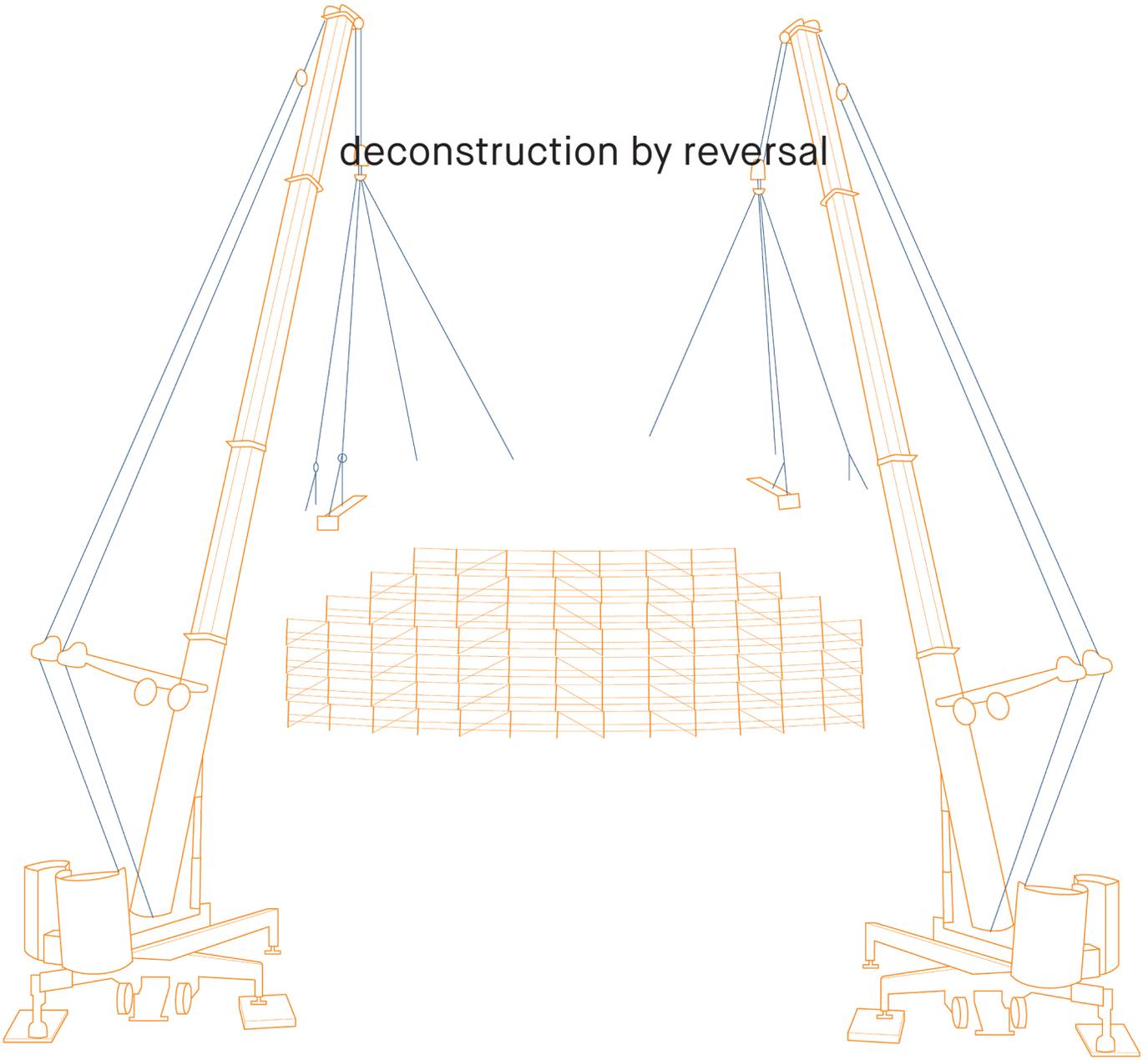


1' = 3/64"

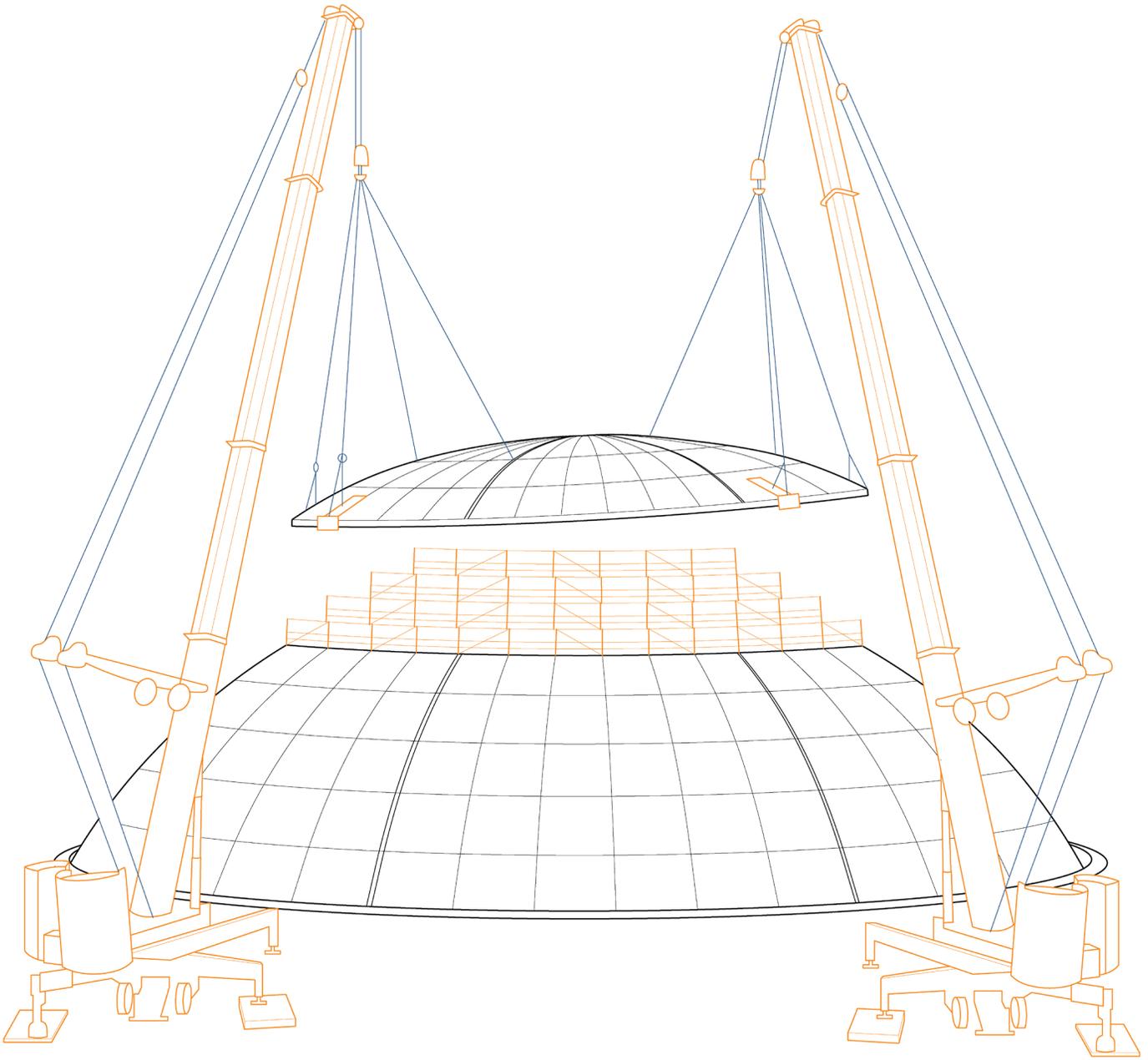


1' = 3/64"

deconstruction by reversal

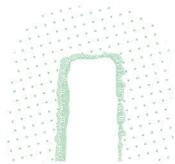
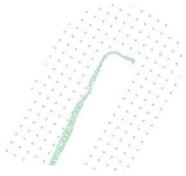
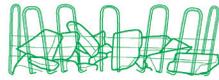


1' = 3/64"

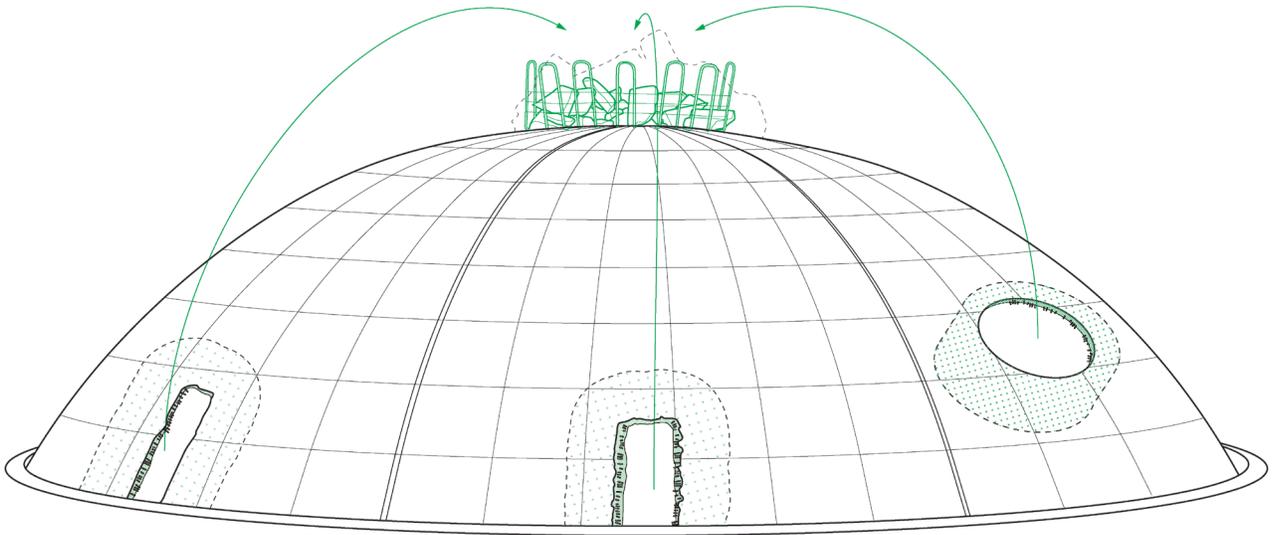


1' = 3/64"

performative deconstruction



1' = 3/64"



1' = 3/64"

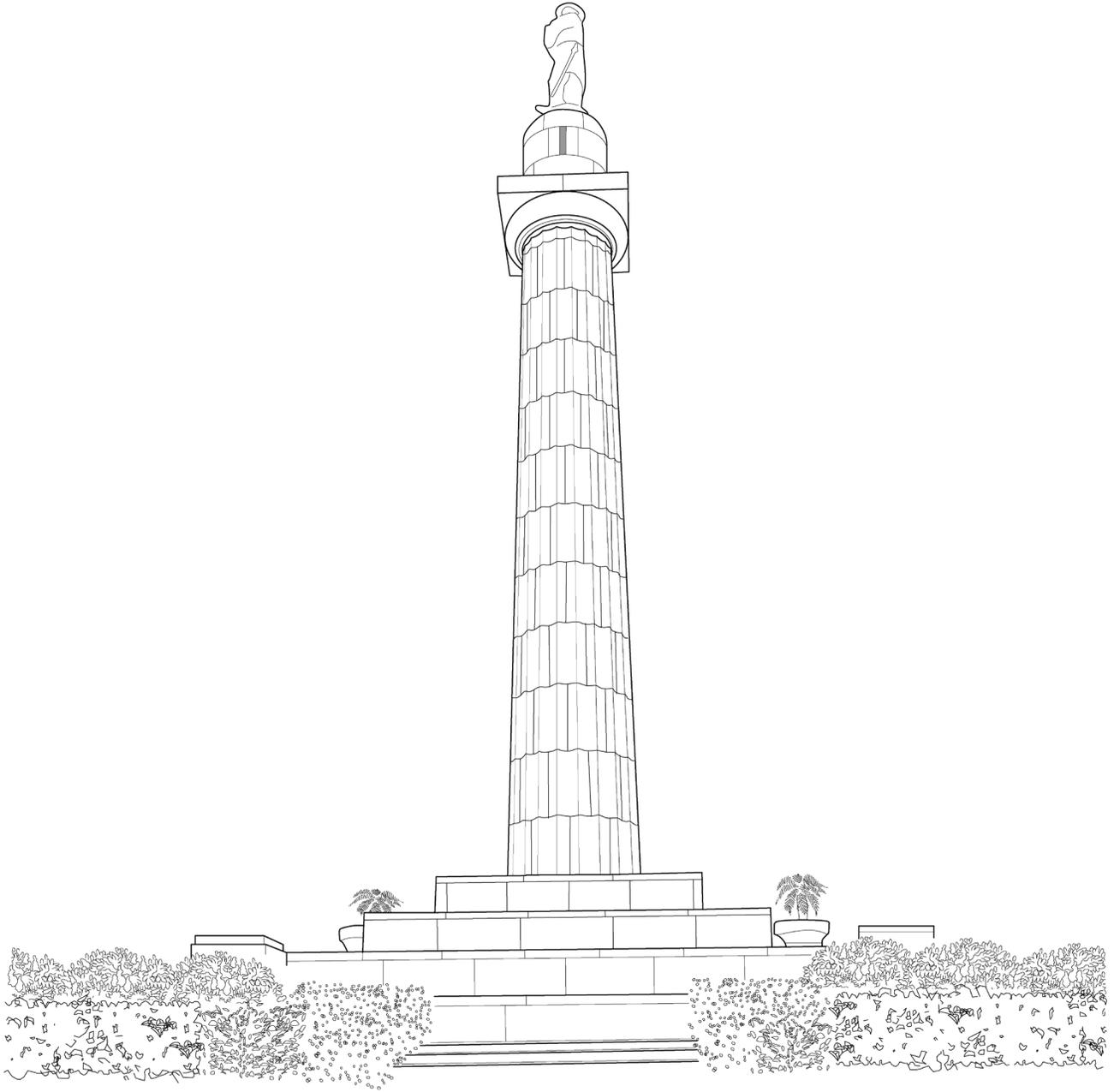
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May 19, 2017

just after 6 p.m.

New Orleans, LA

statue of Robert E. Lee to be removed
from Lee Circle



1' = 3/16"

13 June 2011

14:20 NZST (02:20 UTC)

Christchurch, New Zealand

6.0 Mw earthquake damaged this **B&B**
(arch)

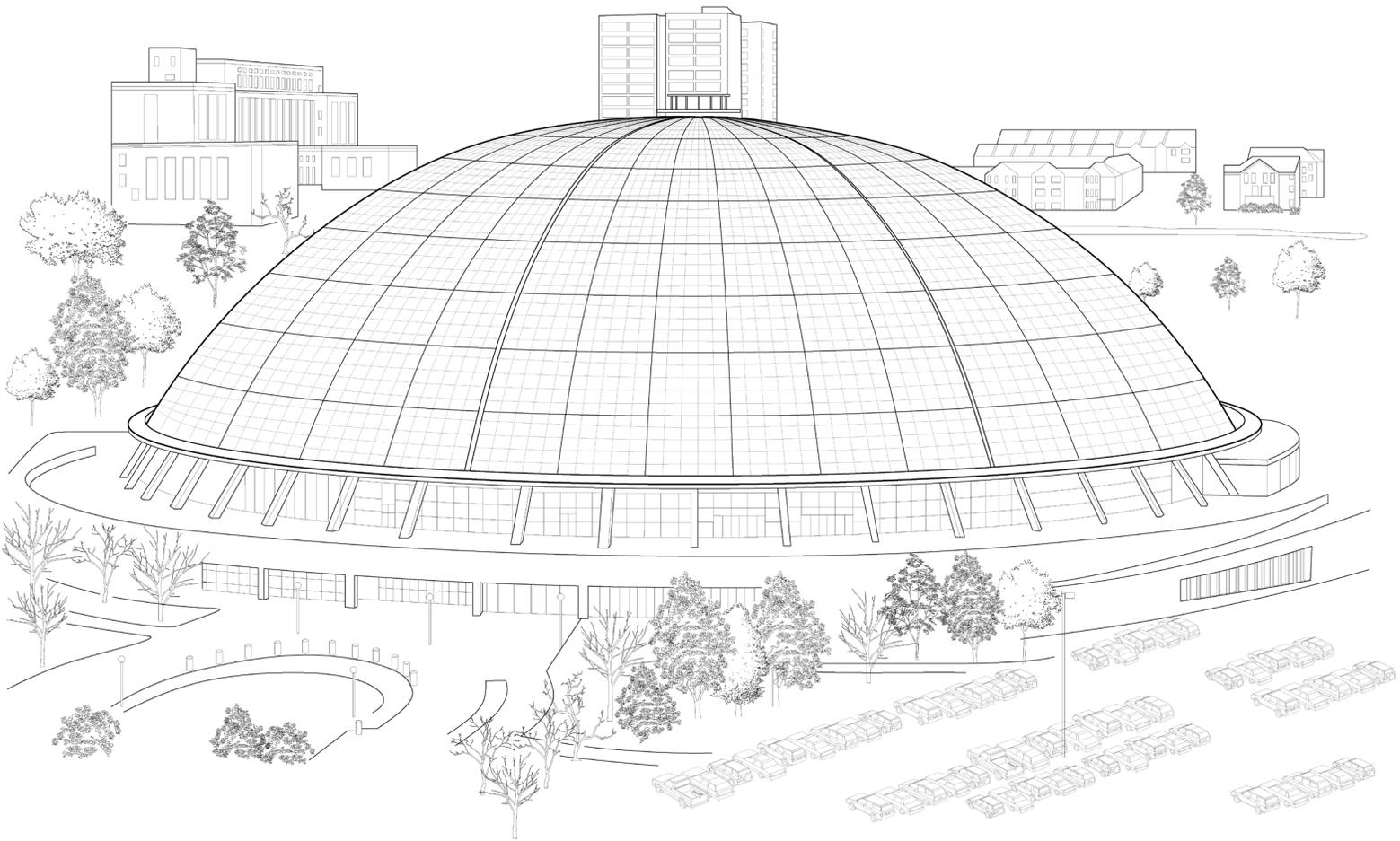


1' = 1"

2010–11 NHL season

Pittsburgh, PA

Pittsburgh Penguins relocated to PPG
Paints Arena from **Civic Arena (dome)**



1' = 3/64"

There are various reasons for a structure to go out of commission. Slow/performative deconstruction alleviates the stigma and fetishization of such structure by allowing the transitional process to become as joyous, accessible, and meaningful as the advent of the structure rising from the ground up.

APPENDIX

artifacts

Photo Courtesy of Andy Ryan

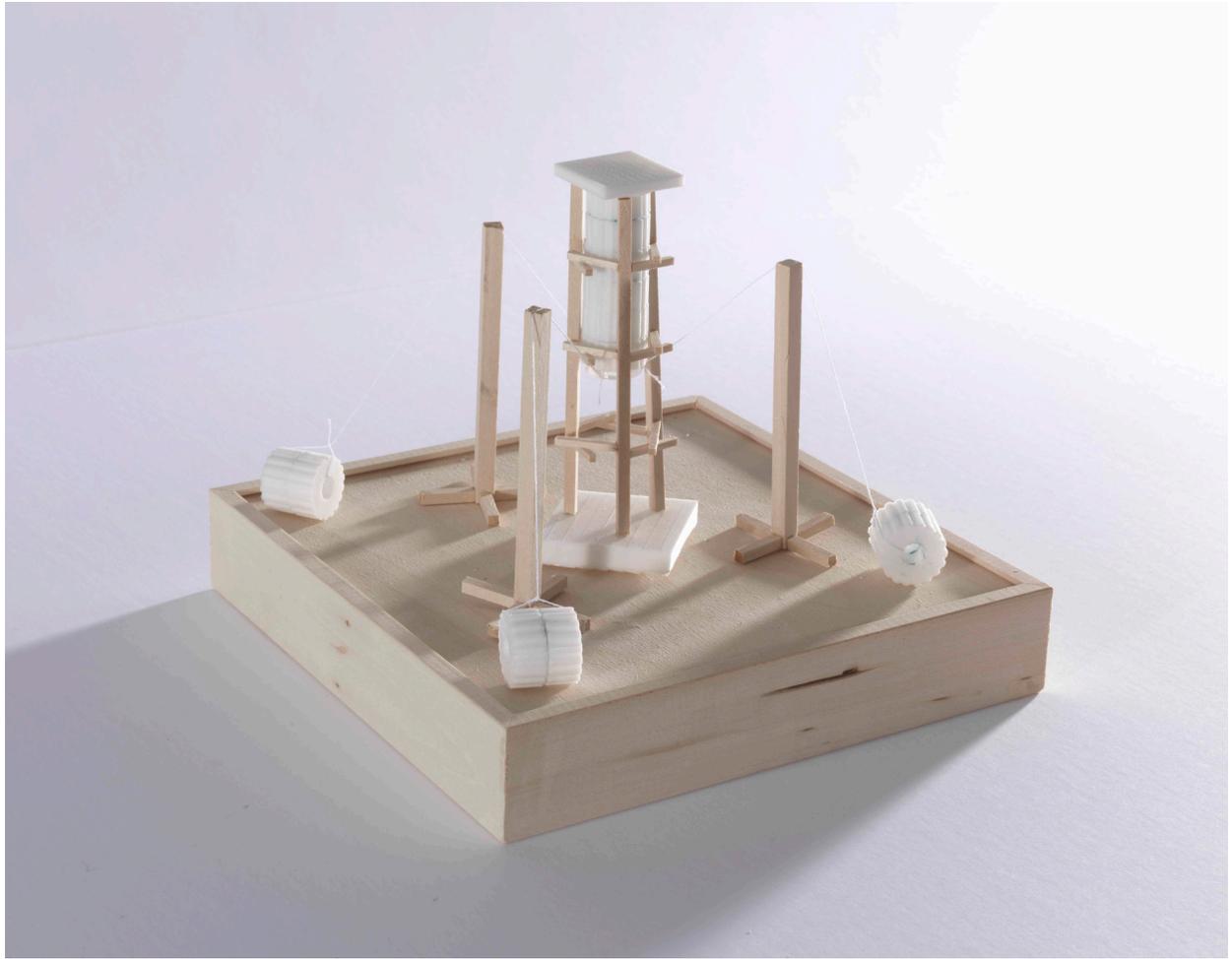


Photo Courtesy of Andy Ryan

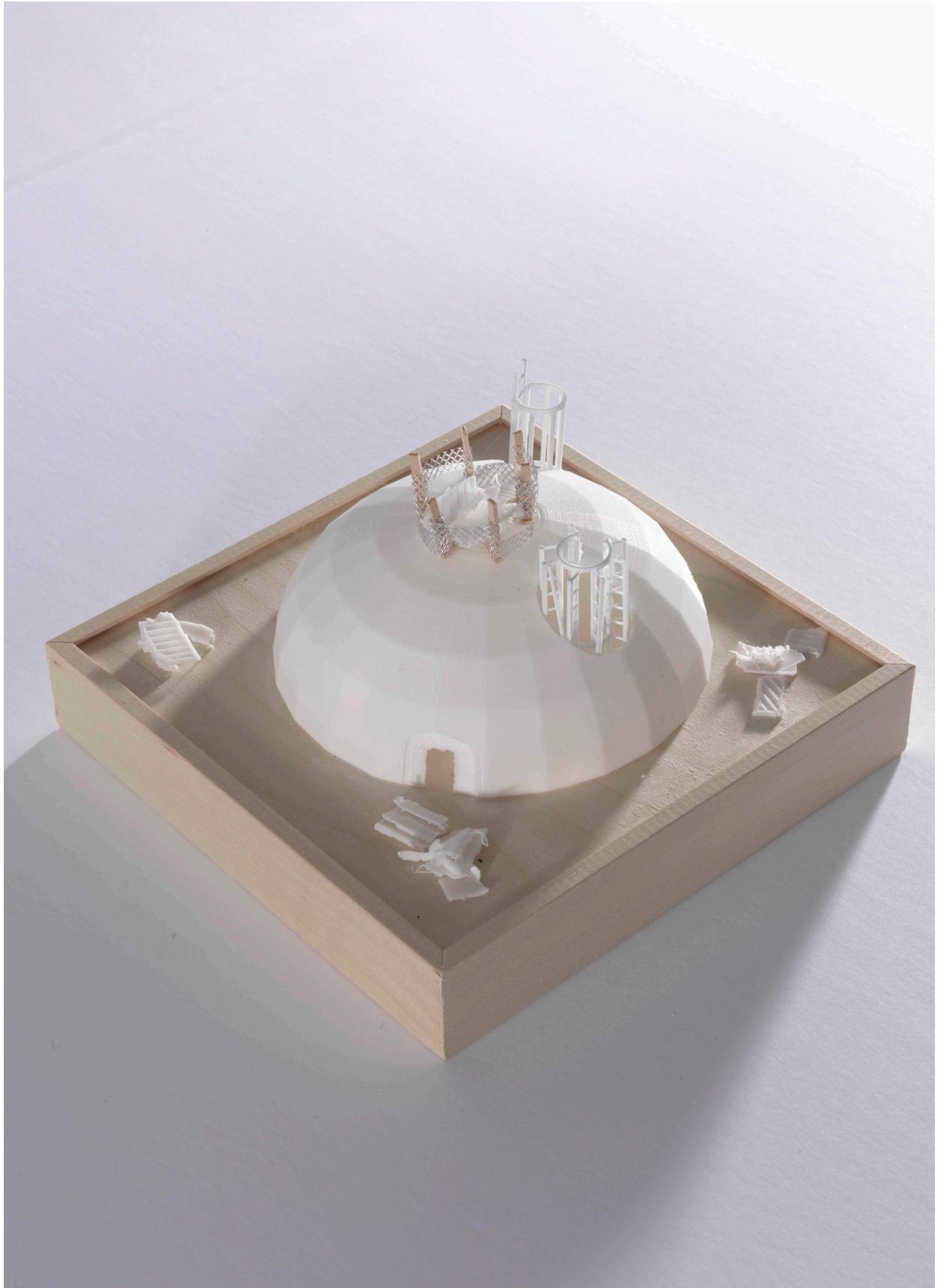
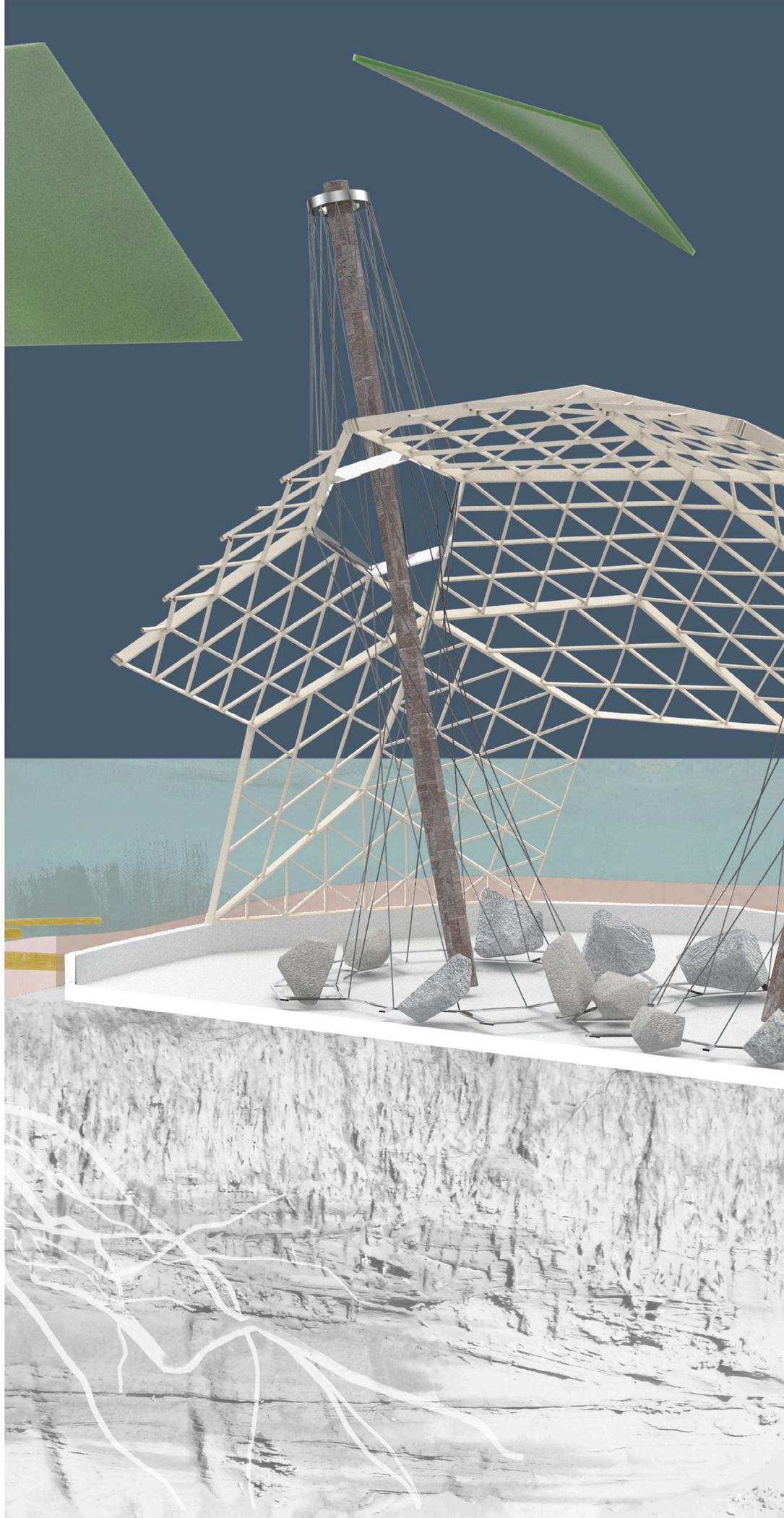
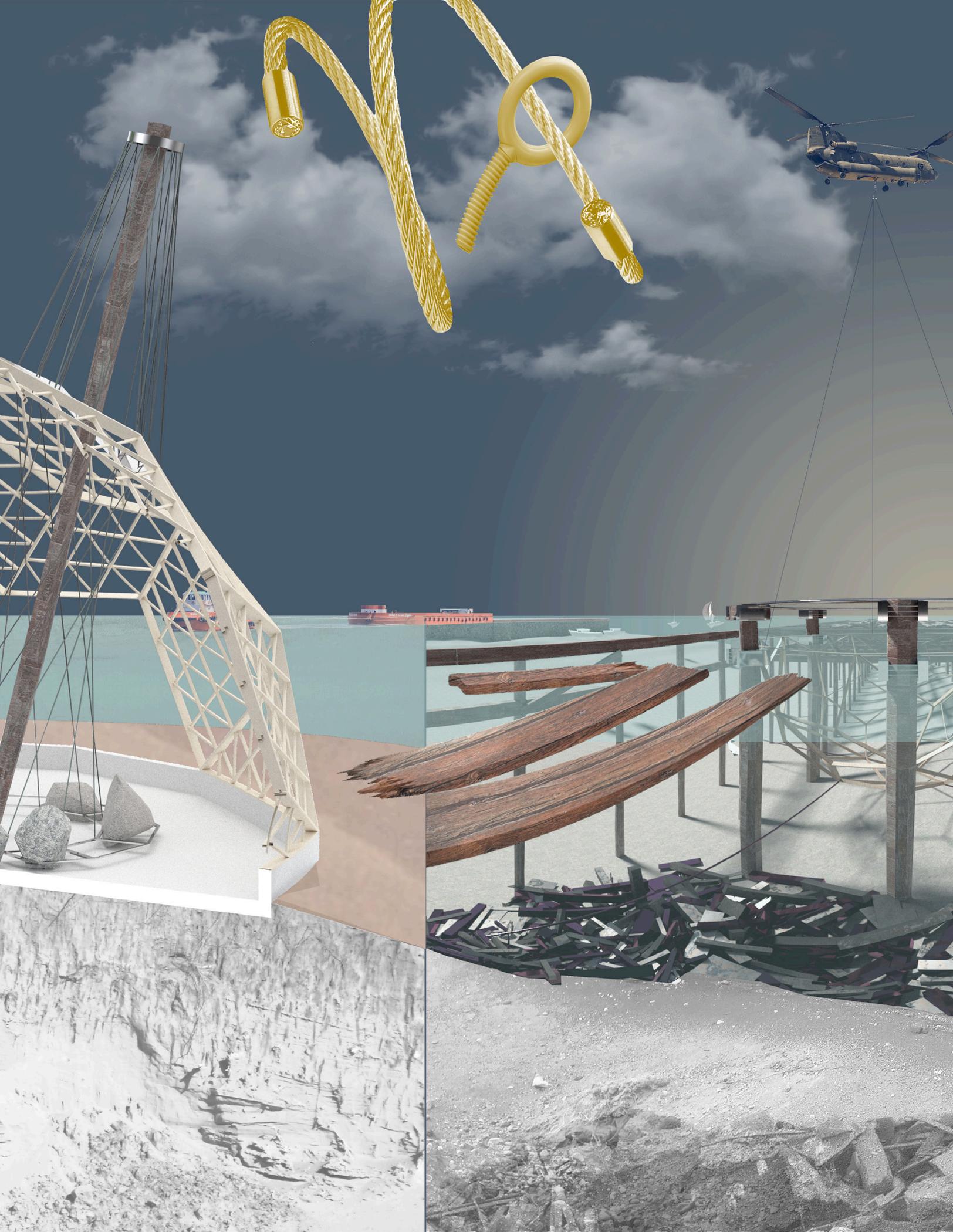
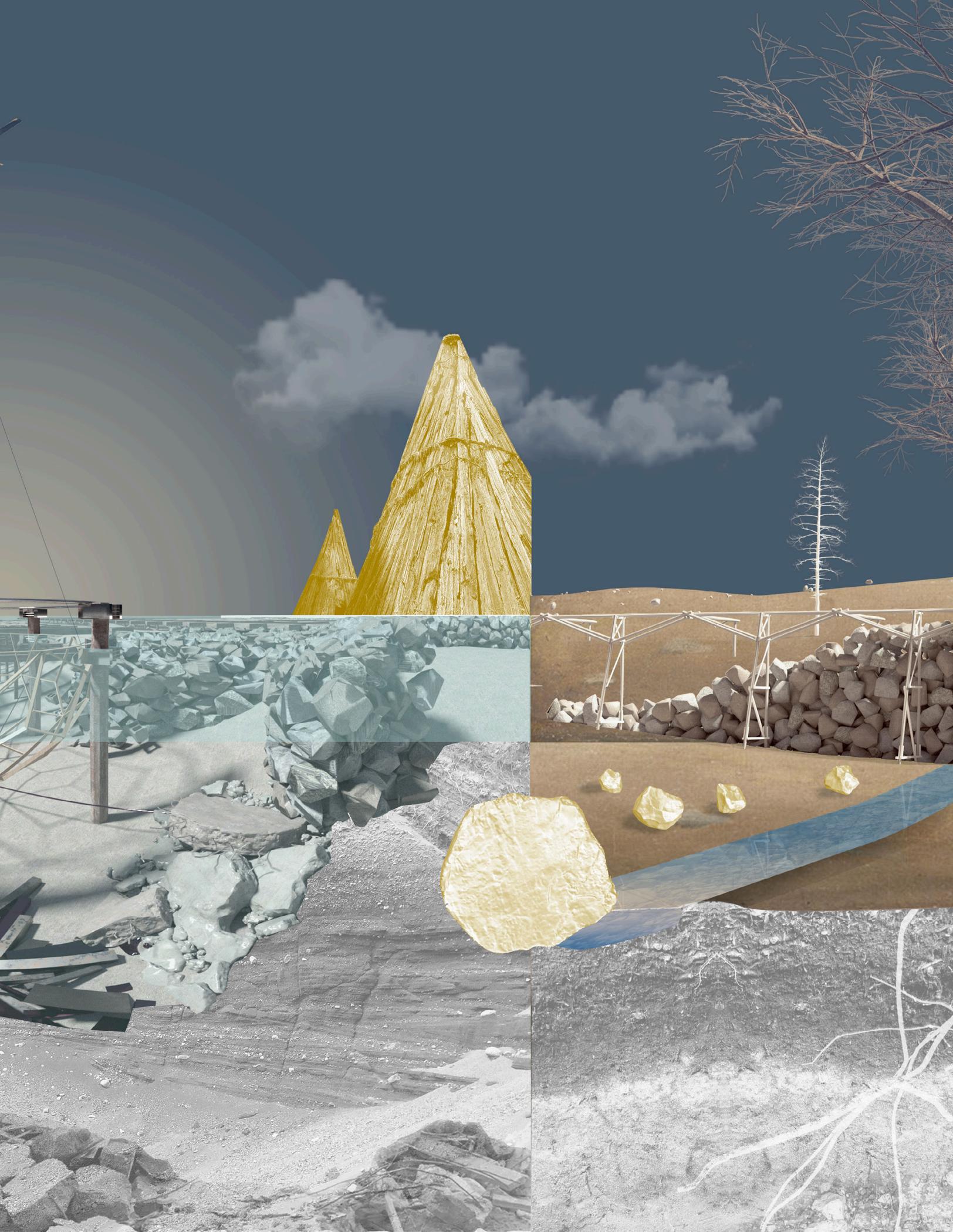


Photo Courtesy of Andy Ryan

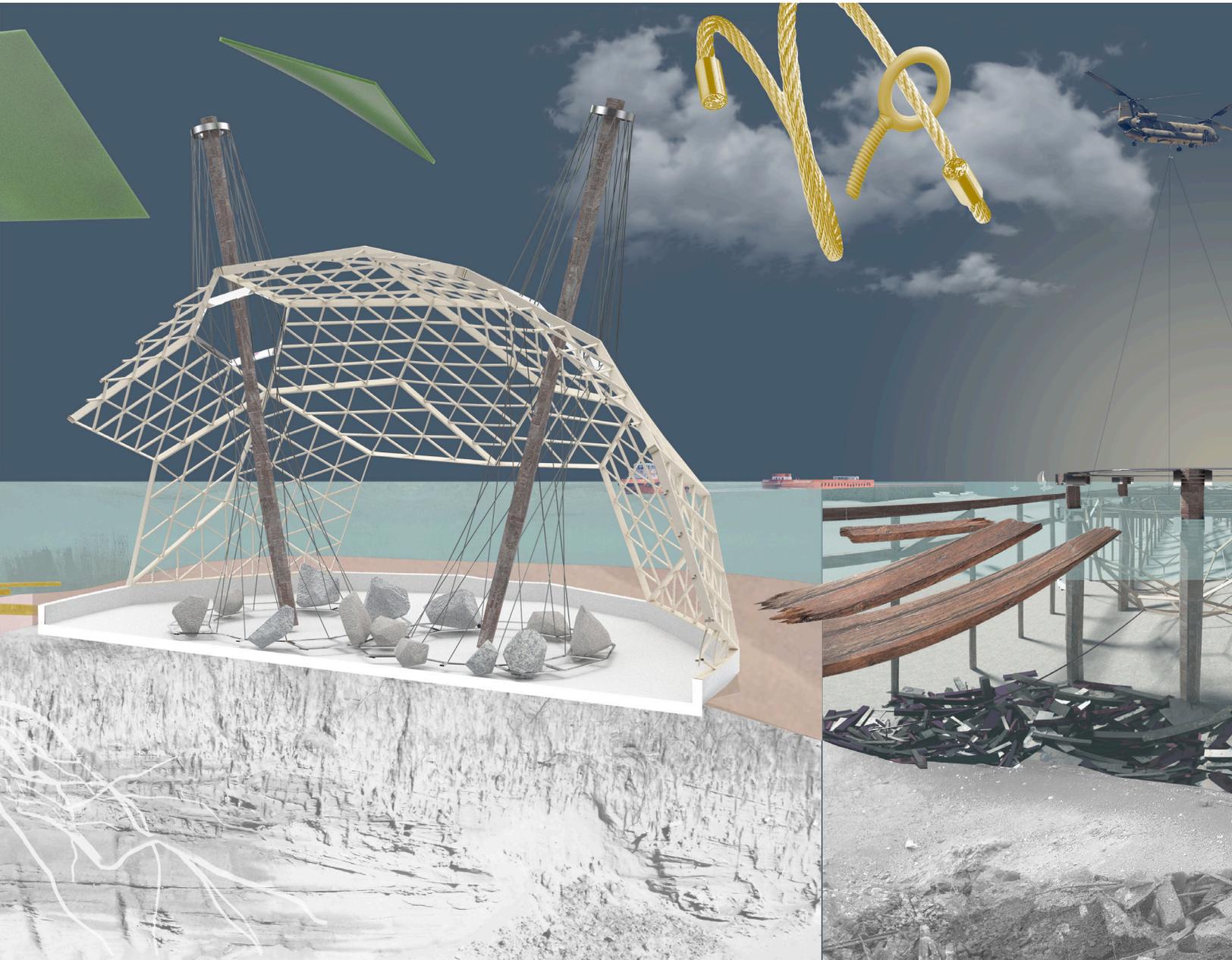


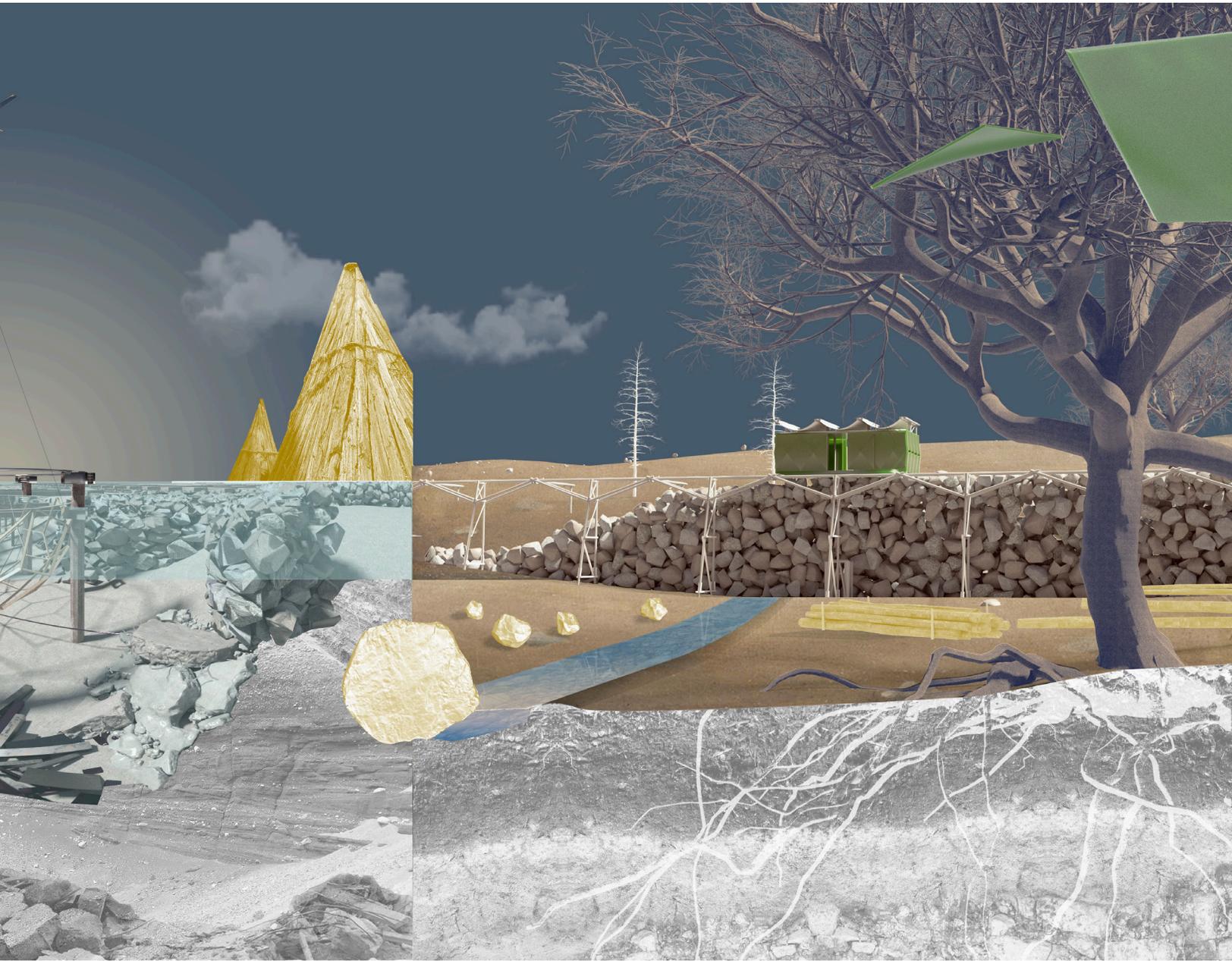












final review

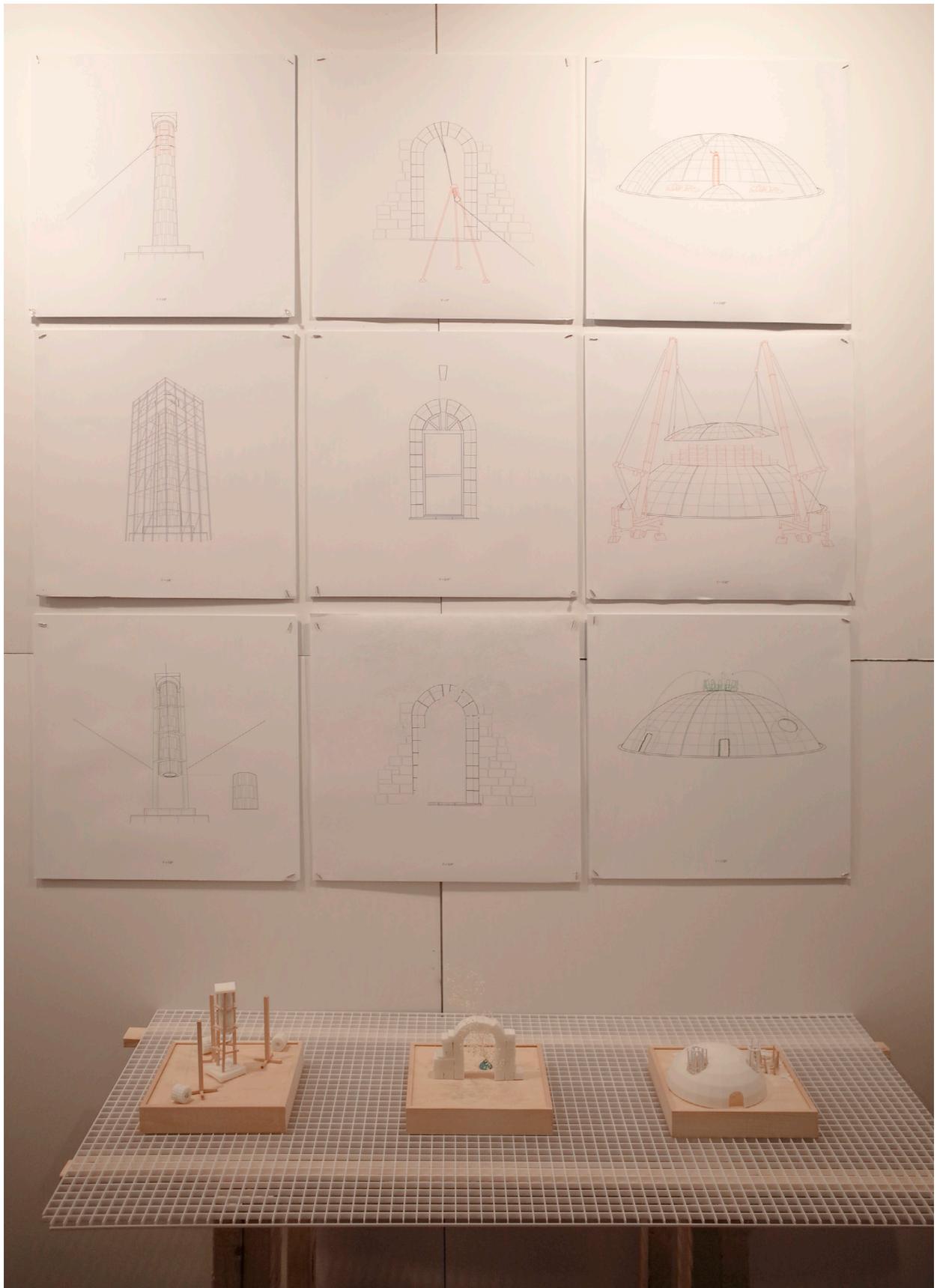
Photo Courtesy of April Gao.



Photo Courtesy of April Gao.



Photo Courtesy of April Gao.





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CCA, *The Other Architect: Another Way of Building Architecture*. CCA: Montreal, 2015.

Exhibition catalogue of the 2015 exhibit at Canadian Center for Architecture which surveys a set of varied approaches of “the other architect”: searching for different operating models, aiming for collaborative strategies, introducing strange concepts, and experimenting with new kinds of tools.

Condorelli, Céline, Gavin Wade, and James Langdon. *Support structures*. Sternberg Press, 2009.

This publication registers and collects reference projects in a new archive of support structures, highlighting potential methodologies, inspirations and activations for practice, and addresses important questions for art and architecture practices on forms of display, organization, articulation, appropriation, autonomy, and temporariness, and the manifestations of blindness towards them.

de Arce, Rodrigo Pérez. *Urban transformations and the architecture of additions*. Routledge, 2014.

This essay was published during the formative stages of Post Modernism. Having explored the adaptation process in history, de Arce explored how such a process might be simulated in contemporary cities, using additions and layers to change buildings from objects to part of a rich urban fabric. He used housing schemes by James Stirling, new government centres in Chandigarh and Dacca and more prosaic 60's housing blocks as examples.

Easterling, Keller, Markus Miessen, and Nikolaus Hirsch. *Substraction*. Sternberg Press, 2014.

Keller Easterling's volume in the Critical Spatial Practice series analyzes the urgency of building subtraction. She argues, often treated as failure or loss, subtraction—when accepted as part of an exchange—can be growth.

Hollein, Hans. “Everything is architecture.” Discourse on Practice in *Architecture Reader* 459461: 1968.

“Everything is architecture”, Hans Hollein announced in the 1968 (1/2) edition of the Bau journal. This was not simply a reference to his work but a manifesto for a whole new generation of the 60s and 70s who were keen to expand the definition of contemporary architecture to its limits. The magazine became a means of exploring experimental ideas which questioned the pre-war doctrine of function that defined modern architecture.

Isozaki, Arata. "City Demolition Industry, Inc." *A New Wave of Japanese Architecture: Catalog 10* (1962): 51.

Exhibition catalogue of the 2017 exhibit at Serralves Museum which surveys the constructive and destructive verbs that defined his relation to art and architecture, featuring correspondence, drawings, photographs, notebooks, and films related to the artist's key projects, drawn from the archive of the Canadian Centre for Architecture, Montréal.

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The text looks at the common practices of building alteration, reconsidering established ideas and methods. Scott expands and builds on the ideas of Viollet-le-Duc, structuralism and others to layout criteria for an art of intervention and change. He also examines in-depth case studies of interventional design from architectural history across the world – examples discussed are taken from the States, Europe and Japan.

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Till, Jeremy. *Architecture Depends*. Vol. 55. MIT Press, 2009.

Architect and critic Jeremy Till offers a proposal for rescuing architects from themselves: a way to bridge the gap between what architecture actually is and what architects want it to be. Till's writing mixes anecdote, design, social theory, and personal experience, moving freely between high and low registers, much like his suggestions for architecture itself.

Woods, Lebbeus. *Radical Reconstruction*. PAPress: New York, 2001.

The publication contains projects that address the relationships between architecture and war, political revolution/reaction, and natural disasters. Three projects for Sarajevo, Havana, and San Francisco define new approaches to the reconstruction of buildings and urban fabric damaged by unpredictable and largely uncontrollable forces of both human and natural origin. Such transformations are not only of physical structures and spaces but, more significantly, of the ways of living they sustain.

