# PRIME MOVER

## MOVING BEYOND THE LANDSCAPE

by

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of

Architecture

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# ABSTRACT

This thesis rethinks architecture's role in representing, managing and transforming tectonic and seismic forces in the context of ever-changing natural landscapes.

Conventional architectural representation is an illusion of stability, knowledge and confidence - an illusion which can leave people and place ill prepared for cataclysm. The ground, as the generator and participant of many architectural endeavors, is often misrepresented as secure, stable and definite. While designed architectural environments typically communicate safety and stability, they do so without recognizing the inherent uncertainty, fraughtness and unsettled natures of landscapes as dynamic, tense and kinetic; and none more so than those terrains along the pacific rim.

Using tectonic and seismic forces as provocation and inspiration, the thesis reflects on the possibilities of architectural representation and experience that embrace processes of instability.

# ACKNOWLEDGMENTS

I would like to thank my thesis advisor Professor Ozayr Saloojee for instilling in me the confidence and joy to approach and imagine an expression of architecture that is personal, productive and ever fruitful.

I would like to thank my parents, Alvin and Alvina, and my sister, Lavinia, for being the silent pillars that have allowed me to build, to fail, and to rebuild in the pursuit of my dreams.

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# Chapter 1:
# Land and Representation

## INTRODUCTION

We all have an idea of landscape, be it natural or urban, that is something to be protected or to be designed. Architects typically have an active relationship with landscape, as we partake in affecting it internally or externally. Landscape is the first consideration for most projects or interventions. What is the topography? What already exists out here? What are the characteristics of the land? We might position our structures to optimize light and shadow or we might celebrate, accentuate or protect certain natural conditions like micro-climates or found ecologies. However, it is not often that this relationship is subverted. What questions could we ask when the land itself expresses its own creative and destructive energies upon us? How would we act when indiscriminate natural processes respond in unequal turn?

Landscape begs to be understood beyond its static and isolated representation. The land hidden from view is rich in complexity; its materiality and structure are eternally shifting, being formed and reformed by the dynamic expression of plate tectonics. While such processes are not a mystery to us, with 100 years of seismology behind us, they raise questions in the architectural context: why is the land, the inspiration and main driver for architectural design and planning, expressed in such a static convention? What does it communicate when the greatest physical threat to both architecture and its inhabitants is represented so plainly?

This thesis is not about designing seismic proof buildings, or about the specificities of seismic effects and consequences. It is about finding a means to understand and come to terms with an unpredictable event and our built environment, and to attempt to push the limits of architectural design thinking when it comes to defining and representing the qualities of something unpredictable, unstable and sudden.

The condition generated by the land through which architecture and its representation is being examined, uses the seismic as a proxy to manifest a greater theme. The seismic embodies qualities of unpredictability, instability, and suddenness, an overarching theme of uncertainty. What the seismic embodies are qualities and conditions that are antithetical to architecture itself - architecture being of balance, structure, stability, safety, planning, programming, place, order, etc. Not all seismic activity is necessarily catastrophic nor completely unforeseeable, however any moment of seismic violence is an opportunity to rethink the relationship between architectural representation and the fraughtness of the land.

Architectural representation, namely sketches, drawings, renders, models and their digital equivalents, have served as the material metric for architectural design thinking. The careful and critical cultivation of knowledge, understanding and wisdom, is demonstrated through iterative production. It is the refinement and testing of ideas, expressions, and methods, that as they accumulate, layer to create densities and patterns of information, and the body of work, takes the place of thinking, and itself becomes auto-reflective. Representation is thinking. However, the architect relies heavily on drawing conventions due to it profession's technical and litigiously-prone nature. Architectural drawing conventions, such as line-weights, views, scales, annotation, and other graphical standards, have the property of never being the same between architects around the world and yet, can be universally understood amongst their typical audience. Conventions are not prescribed in training nor education and yet we have universal reading.

Architectural training is one of refining a sense of order. Having a hierarchal sensibility is what defines a core competency of the architectural profession: in drawing, we employ line weights to differentiate distances and importance; in delivering documents, it is the sequencing of plans and details that guide construction; in planning, it is the programming of space and circulation to inform experience and create a spatial narrative, etc. It is this sense of order that allows architectural representation, in a myriad of expressions and styles, to be universally understood amongst its participants. Orderliness can be idiosyncratic, and yet universally read.

However, universality stultifies creativity when its purpose, that being the refinement of hierarchical sensibility, is no longer questioned and the conventions are simply adopted. This is a form of standardization. We standardize to protect our selves from the litigiousness of the profession and to achieve efficiency in an already complex industry. When we forfeit idiosyncratic universality for universal standardization, abandoning our refinement of orderliness for an adopted orderliness, we diminish our ability to represent or challenge more complex ideas in architecture such as movement, failure or adaptability. To be explicit, using architectural conventions that give us our universality is not what creates irresponsible architectural representation, it is the non-critical adoption of conventions that limits our understanding of how we as architects embrace the world and its phenomena. Whenever the standardized architectural idea is built, what is reified are the illusions of understanding created through adopted conventions. Irresponsibility is creating an environment that fails to communicate the true nature of its place. When unchallenged ideas of architecture become embedded lines in the built form, they become the most vulnerable.

## A PRIMER IN SEISMOLOGY

We can call it by a myriad of names: land, landscape, terrain, topography, ground, earth, etc.; whatever we want to call it, it is the primary anchor with which architectural intent is tied to. Architecture's relationship to the ground is direct and physical, and it is one that serves to provide as much stability and certainty as possible. The ground also provides the context, the material and the vistas for the architect to celebrate, emphasize and frame. The ground, for the architect, is the first source of inspiration and guidance.

However, not all grounds are equal. Some terrains are crowded and mountainous, some are loose and sandy, others more liquid than mass. The variety of topography which to draw upon is infinite. The typical architectural relationship with the ground pales in comparison when we have such diversity and expressive qualities of the ground. To expand upon the relationship to ground is to better push architecture where it is unlikely to go. To understand the non-typical ground, an unwanted ground, is to ask what causes such disturbances in the first place.

Seismology, the study of earthquakes and seismic waves, explores and measures the interactions and consequences of plate tectonics. Consequences, such as earthquakes, soil liquefaction, landslides, tsunamis, and volcanoes, are what create the land. No land is ever a found thing but it is one that is actively being created and destroyed.

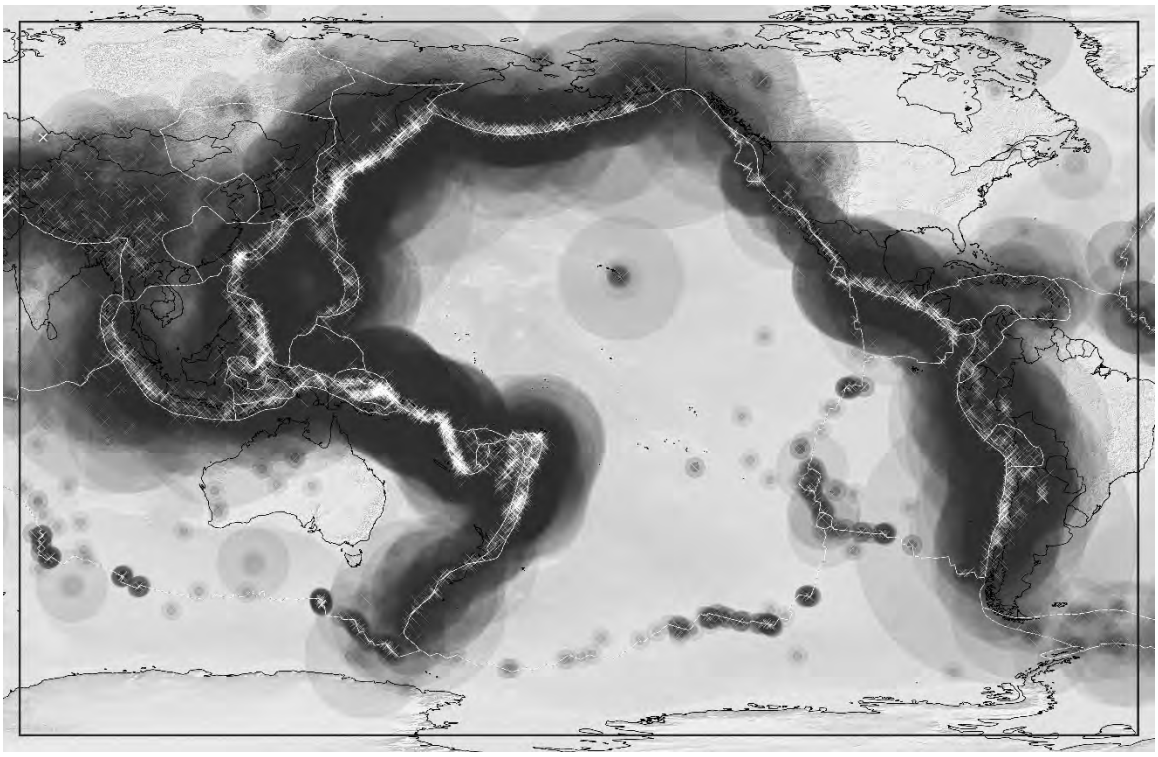


**Figure 1. Map: The Ring of Fire**

Along the perimeter of the Pacific Ocean lies the tectonic boundary of the Pacific Plate. This boundary is the origin of 90% of the world's earthquakes, and 80% of the world's largest earthquakes[1]. It is also the location of 25 of the world's largest volcanic eruptions in the past 10,000 years. The seismic activity is a result of plate tectonics, the being the movement and interaction of lithospheric plates. The incredible intensity along the perimeter of the pacific plate is why it is known as the the Ring of Fire. It is in this boundary where earthquakes, landslides, liquefaction, tsunamis or volcanoes, simultaneously create and destroy terrain and environment.[2]

[1] (National Geographic)
[2] (Kious and Tilling)

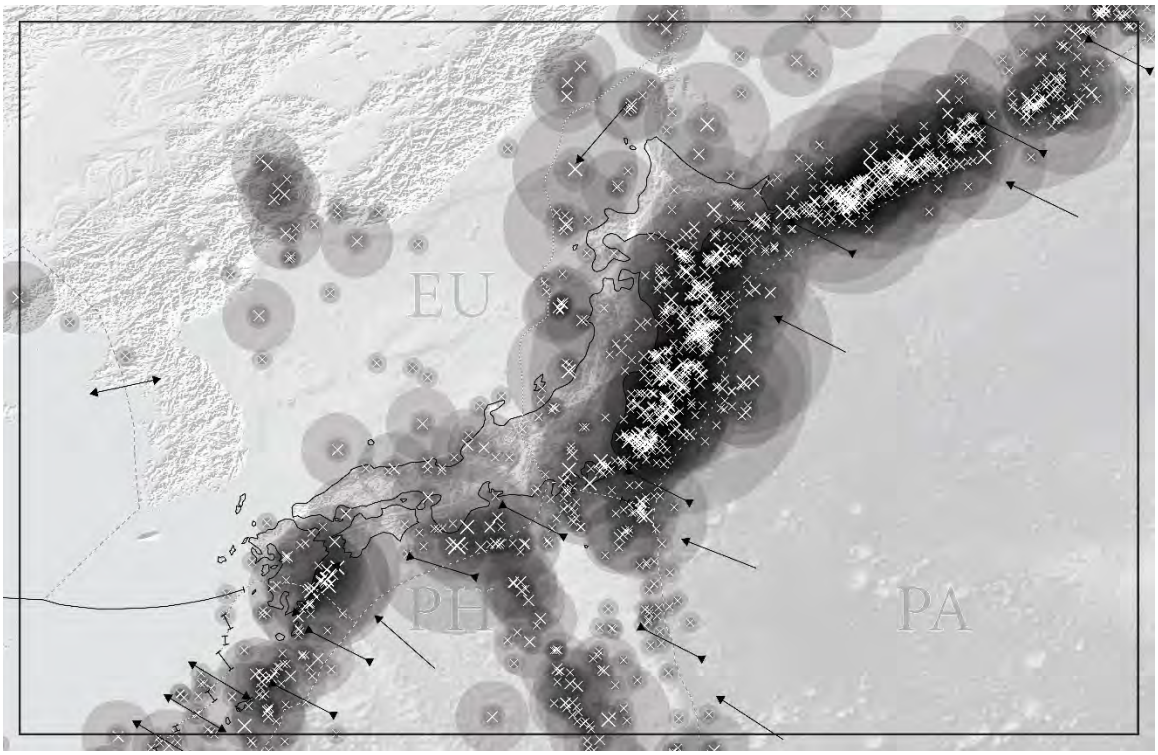



**Figure 2. Map: Japan**

Japan experiences ~1,500 earthquakes per year, and magnitude 4~6 events are not uncommon.[3] Along the coast of Japan is a convergent tectonic boundary that comprises the Philippine's Sea Plate [PH], the Eurasian Plate [EU], and the Pacific Plate [PH]. Their proximity is the cause of intense plate interactions of the land.[4] A magnitude 9 event known as the 2011 Tōhoku Earthquake is considered Japan's most powerful earthquake ever recorded, and the world's 4th largest since 1900. The epicenter was 72km east of the City of Sendai and produced tsunamis 40m high and moved inland 10km. The event was so powerful that it shifted the earth's axis by 10cm~25cm and increased the planet's rotational speed by 1.8μs.[5]

[3] (Reid)
[4] (U.S. Geological Survey)
[5] (Free)

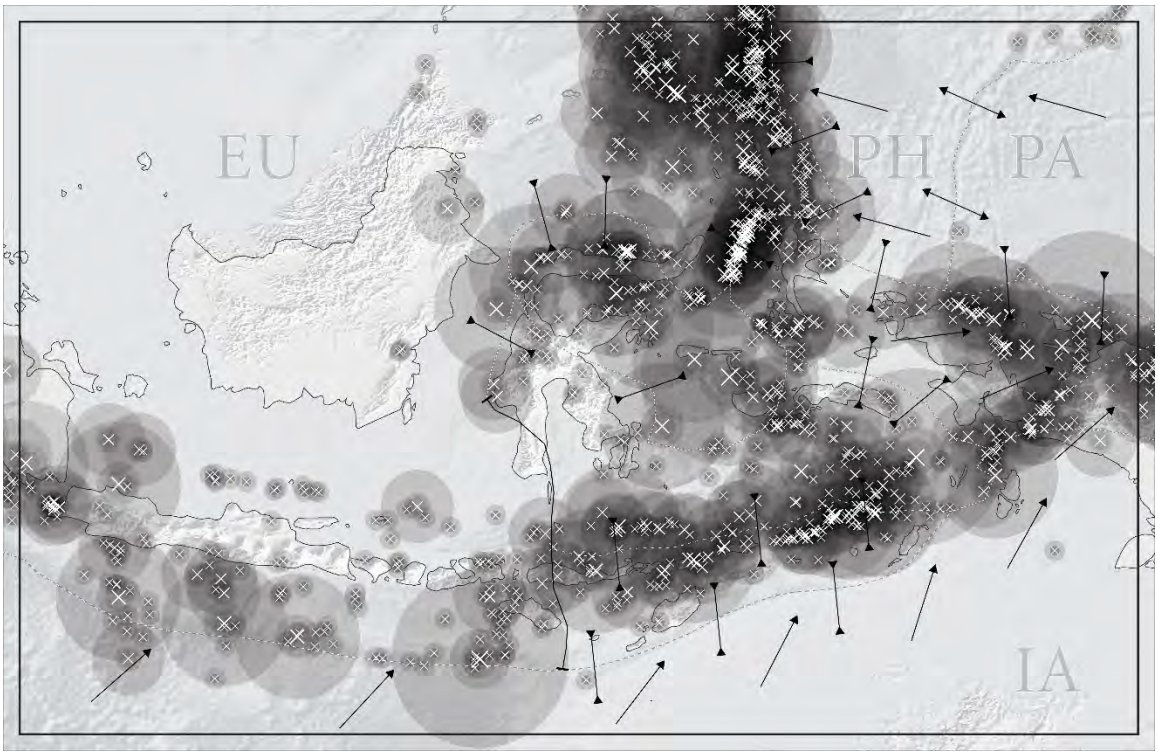



**Figure 3. Map: Sulawesi, Indonesia**

On September 28th, 2018, Sulawesi Island of Indonesia experienced a 7.5 magnitude earthquake which triggered a tsunami, a landslide, and as well as instances of liquefaction that took thousands of lives and displaced hundreds of thousands of people[6]. Indonesia has experienced the world's largest magnitude earthquakes 3 times since 1900 and rank in 3rd (9.1 magnitude), 10th (8.6 magnitude) and 11th (8.6 magnitude) place.[7] Aftershocks of the September 28th event continued into November.[8]

[6] (UN Office for the Coordination of Humanitarian Affairs)
[7] (U.S. Geological Survey)
[8] (World Vision)

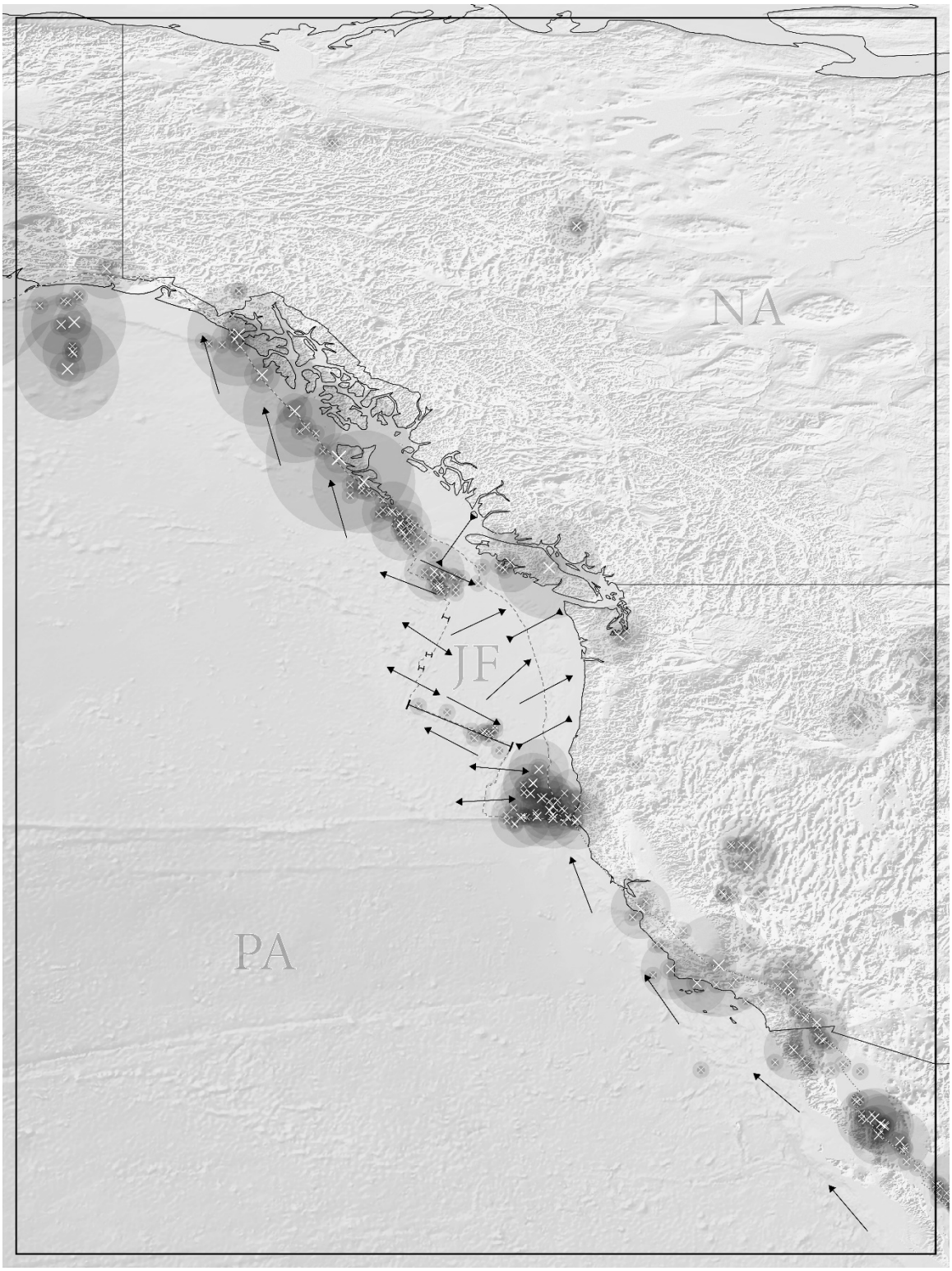



**Figure 4. Map: North American West Coast**

The entirety of the North American West Coast is haunted by the Big One, an anticipated megathrust earthquake.[9] Two major geological structures, the San Andreas Fault, which spans the length of California, U.S.A., and the Cascadia Fault, which runs along the coast of British Columbia, Canada, have reached enough stress to allow for a magnitude 7 or greater event to occur.[10]

The San Andreas Fault condition is a transformation fault, where the northwesterly Pacific Plate [PA] moves parallel of the southwesterly North American Plate [NA], creating many intense points of friction. The Cascadia Fault condition is a result of a subduction comprised of the Pacific Plate [PA] moving northwest, and the Juan de Fuca Plate [JF], diverging from the PA, which drives itself underneath the southwesterly North American Plate [NA].[11]

As each fault moves, the other responds.

## *Reflection*

My foray into seismology was a means to understand the conditions that create the varied earth across the planet. What it revealed were patterns of activity and types of movement in the planet. The mapping of the Ring of Fire drew attention to just how populated areas of high seismic activity were. While I was able to create a base of understanding of the seismological event, what I was overwhelmed by were their consequences. My study of seismology was purely data driven but did not speak to its spatial implications.

[9] (City of Vancouver)
[10] (Natural Resources Canada)
[11] (Caltech: Southern California Earthquake Data Center)

# Chapter 2:
# Drawing, Events, and Implications

To think through architecture's relationship to the fraught landscape is to address representation itself. Typical architectural representation consists of a range of skills such as modeling, rendering, and their digital equivalents but it is the drawing that is most fundamental to the architect. The architectural theoretician Marco Frascari suggests that drawing guides architects to understand architecture as something to be both constructed and construed, because drawings intrinsically convey an understanding of architectural things, concepts, conditions and events in the human world: "Real architectural drawings are not illustrations, but pure expression of architectural thinking."[12] In addition, architectural drawings also have the unique burden of conventions, an unspoken set of rules to allow for universal reading. Architectural thinking, as expressed through architectural drawings, demands a condition of limits but it is also defined by its directness and expediency. To reflect upon Frascari's suggestion of a "real" architectural drawing, what is drawn should not simply represent a thing but to reveal to us why a thing is.

Kendra Schank Smith, Professor of Architectural Sciences at Ryerson University, and author of *Architect's Drawings*, addresses the distinction between the sketch and the drawing:

> The word 'drawing' presents a general term, whereas 'sketching' focuses on a specific technique. Both can take the form of an action or object, verb or noun, as each can imply movement. The Oxford English Dictionary defines a sketch as a brief description or outline 'to give the essential facts or points of, without going into details.' Sketches document the primary features of something or are considered 'as preliminary or preparatory to further development' (1985) (2).[13]

[12] (Frascari, Drawing as Theory)
[13] (Smith)

If the sketch refers to preparation, in comparison, the drawing implies completion or greater intellectual development. To appropriate the definition of the sketch for all exercises of representation would allow for an adaptable and generative practice. In *Theory After (After-Theory)*, Ashley Schafer describes the approach as an operative practice that "…ask what an architecture does, not what does it mean, and are more interested in what a project works-like rather than what it looks like."[14] This approach prevents an architectural drawing from becoming determinant and rigid and therefore diminishes representation as communication rather than presentation.

Attention should also be brought to the contention between the analog drawing and the digital drawing. For Frascari, he recognizes that in the "[Digital drawing] is faster, more precise, but in the digital mode, drawings become purely documents of description completely meaningless from an architectural way of thinking. . . . These digital drawings by merely mimicking the visual makeup of traditional architectural drawings can communicate only conscious intent and do not perform any mediation."[15] In the exploration of instability and its representation, the drawing should employ a variety of lines in the digital and analog. The commonality between the two modes is two-dimensional expression of movement.

With that being said, the fundamental drawings produced in the exploration of instability and its representation, employs a variety of lines in the digital and analog. It is the commonality between the two is what should take precedent, that being the two-dimensional expression of movement. For Smith, the line is inherently about movement as its production requires the hand to drag the tool from one location to another.

> A line, or mark, made with the bodily action of the hands, demonstrates its ability to cause reflective action, as it attracts the human eye to follow it. This cognition spurs associative thoughts, as the line suggests new forms (qtd. Lauer, 1979). Much of the 'motion' of a sketch comes from the physical action of the hand; in

[14] (Schafer)
[15] (Frascari, Drawing as Theory)

> this way, the tool becomes an extension of the body and reflects the human body. (2)[16]

Therefore, the act of mark making is not simply leaving behind a trace but that the trace itself is reflective of a physical condition and in this case, the condition of movement. As the hand is required in the creation of the line, the drawer physically imparts intent. If the definition of the sketch is about expressing only the most essential traces, what is left behind is full of intent, what is created is a deeply intimate and personal expression of thinking.

The conditions that are antithetical to architecture are defined as the unstable, unpredictable and sudden. Architectural instability can be described as a condition of compromised geology where what lies above it is subject to the movement underneath it. We possess the knowledge to hazard where such instances of instability may occur, yet we lack enough information that they remain in the realm of the unpredictable. This certainty of event, combined with an incomplete knowing, creates an anticipatory relationship with the landscape. We understand the ground as something fraught and lingers with tension. The landscape is an event that haunts, and like any scare, it will be its suddenness that shakes us.

Drawing as a method of thinking can be used to analyze the dynamic quality of the landscape by tracing its topography and by bringing attention to the disruption in the constructed environment. This is the process of drawing in the reverse where it isn't the intent that leads to an outcome but to have the outcome reveal its the intent. To trace is to have draw forth the intent of something otherly.

[16] (Smith)

IMPLICATION DRAWINGS

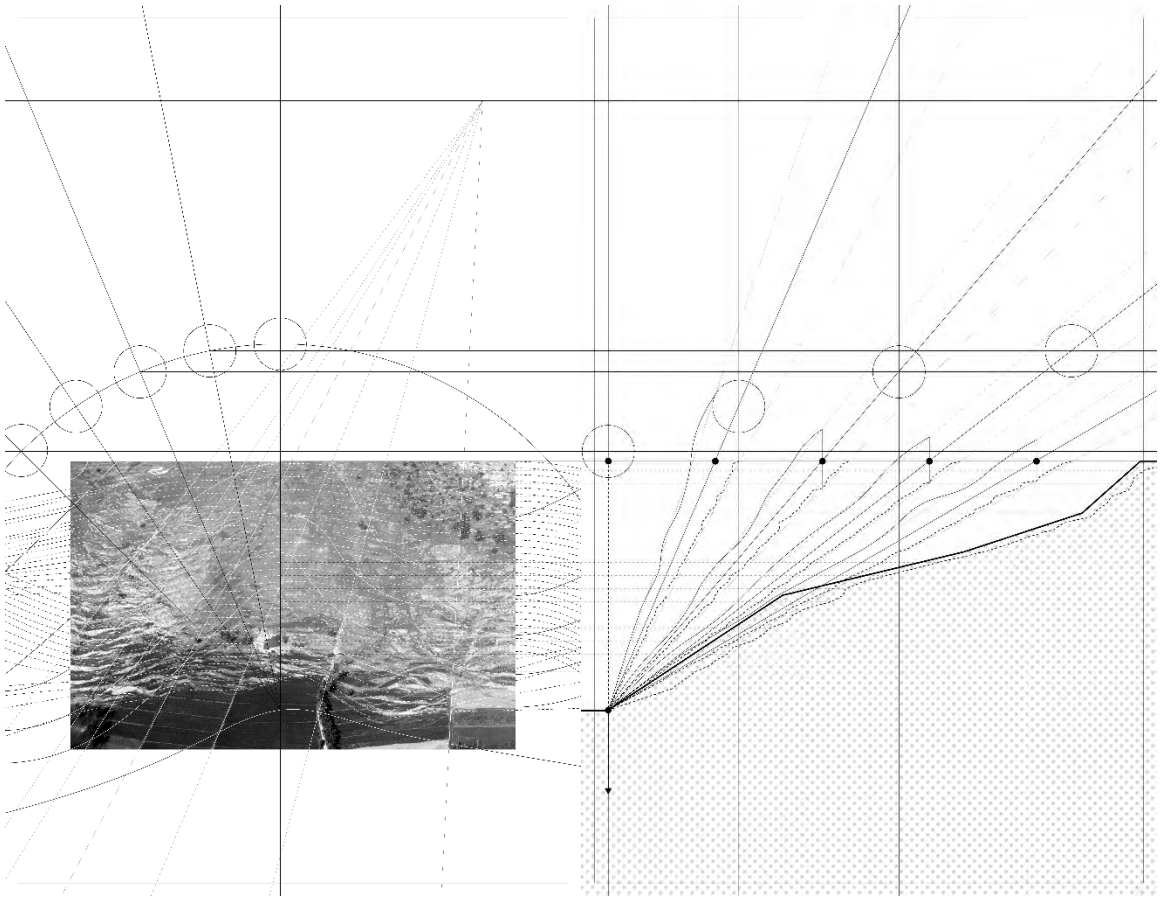


**Figure 5. Implication Drawing: Sulawesi, Indonesia, Landslide**

The photo used in this analysis is of an agricultural field after the effects of a landslide in Sulawesi, Indonesia.[17] By using the perspectival technique, a horizon was drawn by tracing the angle of small agricultural buildings still visible in the photograph. Once perspectival lines anchored the photograph in a two-dimensional space, contours of the landscape were drawn to create topography. The topography was then cut and drawn in section on the image to the right. The section is cut down the center of a curving valley, so the circles of the left image indicate the certain points in the valley as it wraps around the section line.

[17] (Antara Foto/Reuters)

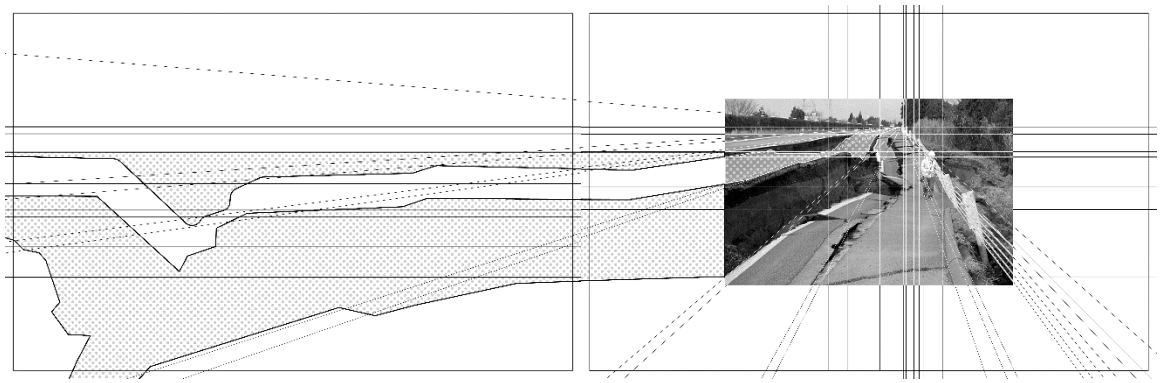


**Figure 6. Implication Drawing: Tohoku Region, Japan, Earthquake**

The geometry in civic structures are typically straight and therefore simpler to rebuild as a drawing. For road construction topography is flattened so the character of the site is buried. The analysis begins with a photograph[18] that consists of a clear horizon and perspectival space. By comparing lines of geometry to the photograph post-event, we can recognize and measure the degree of change and destruction. The image on the left is an attempt at creating an orthogonal mirror of the fissure captured in the photograph.

[18] (AP Photo/Nexco East Japan)

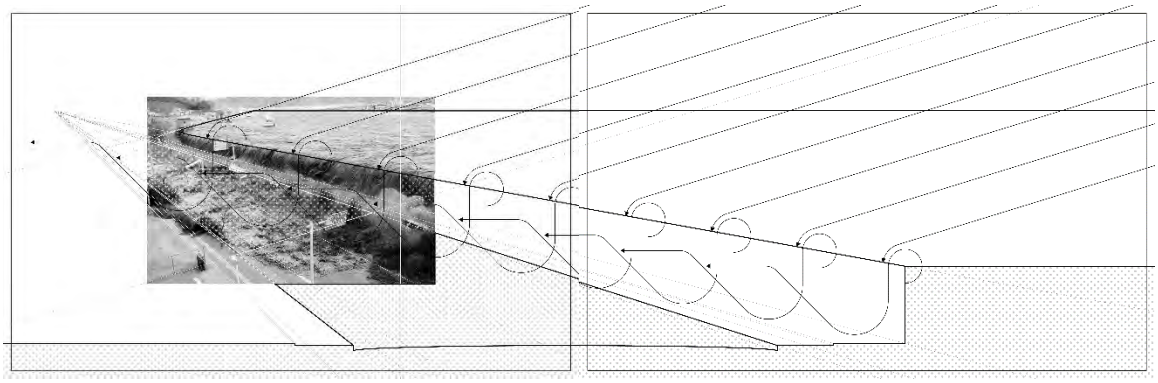


**Figure 7. Implication Drawing: Tohoku Region, Japan, Tsunami**

The photograph[19] is an image of a tsunami making it past the hard flood barrier. The perspectival technique is used to expand upon the space with which the event takes place. What separates this analysis from the others is the active change in environment captured by the photograph. The accuracy of the physics of the water is not the concern but it is the challenge to communicate of movement, where it comes from and where it's going that speaks to what implication is.

## *Reflection*

These drawings are an analysis of photographs of post-seismic events. They are reconstructions of space utilizing architectural drawing techniques to reveal to us the intent of something other than the architectural. While spatial consequences can be illustrated and abstractly measured, it is the forcefulness of movement that changes the environment and that is difficult to capture. What has been moved can be easily identified but what is the mover less so.

[19] (Mainichi Shimbun/Reuters)

# Chapter 3:
# Stability Machines: Limiting Events

Architects and consultants together deal with movement in structures, but the drawing, the primary index of architectural intent, fails to represent movements caused by unpredictable and powerful events.

The tools and technologies that manage and mitigate seismic events sit in between the unpredictable event and the architecture. If it is the machine that mediates event and architecture, then perhaps it is in the deconstruction of the machine that we rethink a uniquely architectural way in dealing and representing the seismic.

The following methods and strategies deal directly with unwanted movement in structure. Cataloging these technologies, these stability machines, reveals a vernacular in which movement is transformed or deflected; however, insofar as that they strive only to mitigate the consequences of seismic events, they also expose the limits of architectural interpretation of landscape. These limitations in turn provide opportunities for misinterpretation and mis-use of technology.

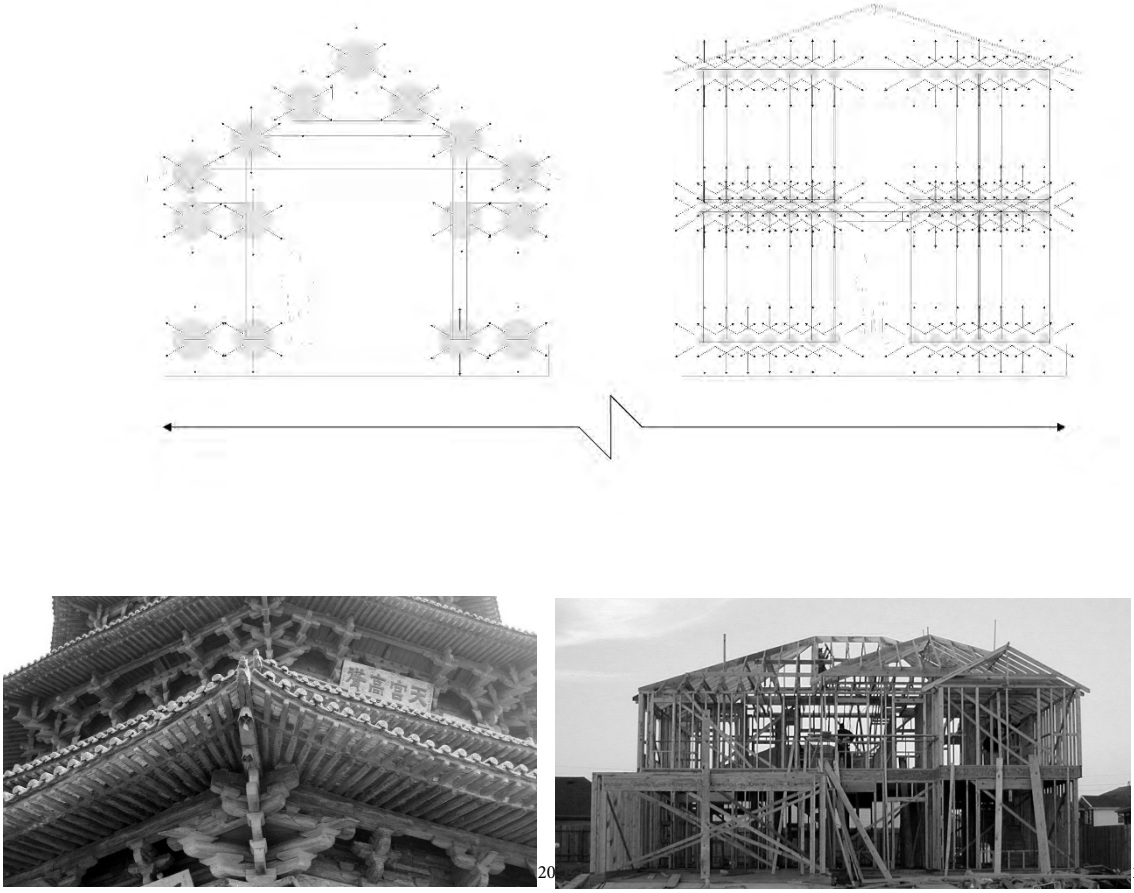
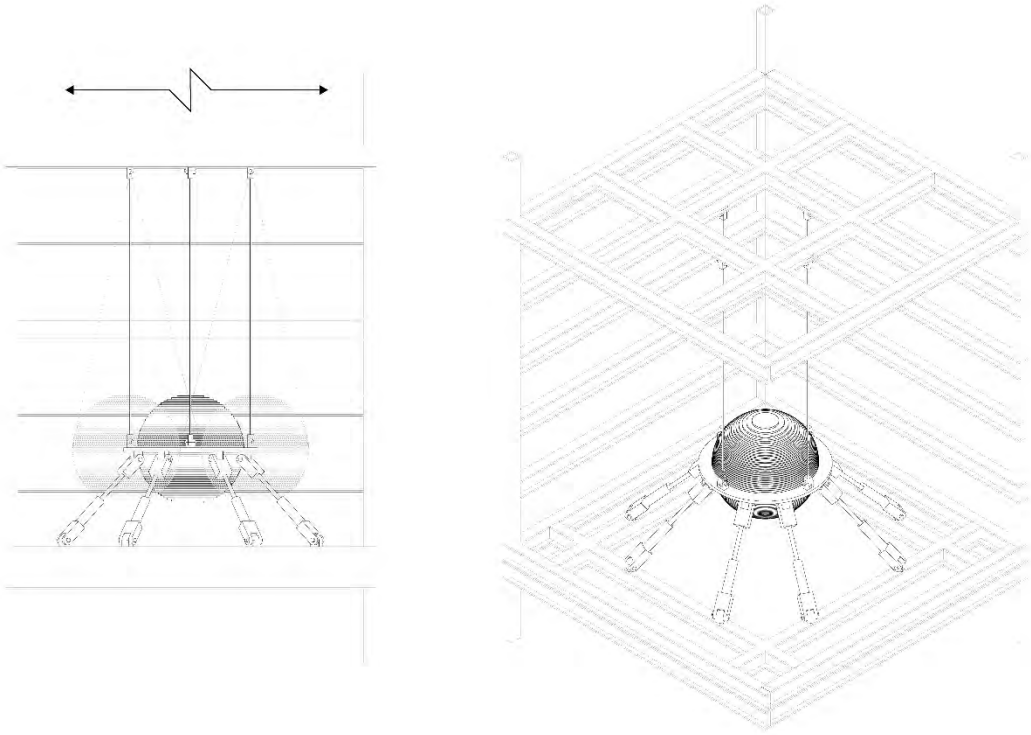


**Figure 8. Machine Diagram: Absorption**

Traditional joinery techniques of East Asian architecture developed without the use of fasteners. Without fasteners, the structure relied on complex joints to hold itself together. The extravagant tectonics also had the unique benefit of dissipating seismic energy through its many connections. In North America, modern stick-frame construction also allows for seismic dissipation. Though studs are mechanically fastened, the many joints still allow for a degree of flexibility.

[20] (Dougong structure used in Yingxian Wooden Pagoda)
[21] (Jaksmata)



 [22]

 [23]

**Figure 9. Machine Diagram: Dampening**

The tuned mass damper, also known as a harmonic absorber, is mounted within a structure to reduce the amplitude of vibrations. Dampers move in opposition to the seismic oscillations of the structure.

[22] (Geoffrey Morrison/CNET)

[23] (Taipei Financial Center Corporation/CTBUH)

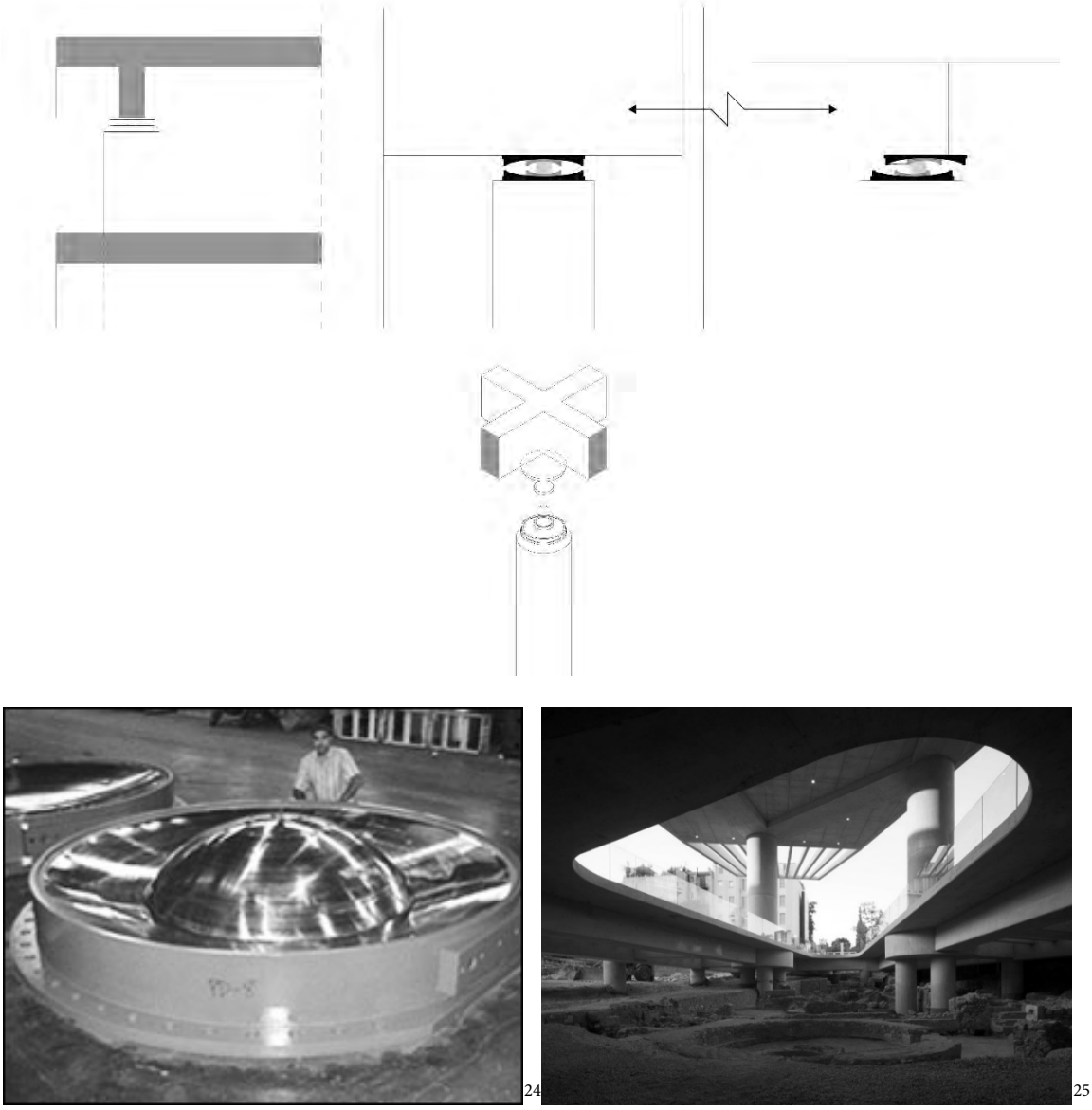
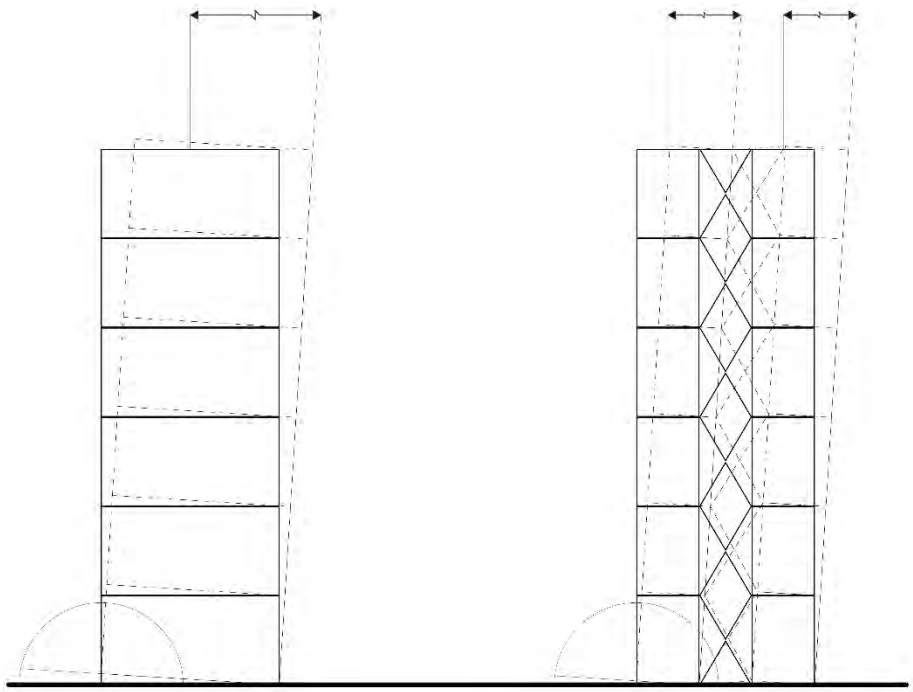
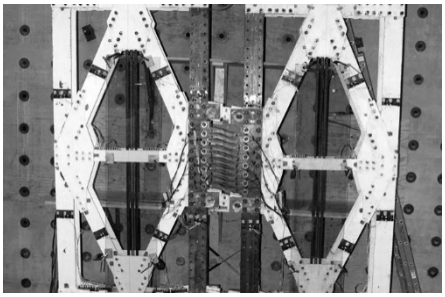


**Figure 10. Machine Diagram: Isolation**

Seismic base isolation essentially decouples the superstructure, the building, from its substructure, the foundation. This allows for the ground to shake without disturbing what rests above it. Isolation units are typically slip and slide systems, such as minimal friction plates, shock-absorbers or elastomer foundations.

[24] (Sakhalin Concave and Slider)
[25] (Bernard Tschumi Architects)



 [26]

 [27]

**Figure 11. Machine Diagram: Rocking**

To address the inelasticity of conventional building systems we can introduce controlled rocking in to a steel braced structure. The system incorporates vertical post tensioning strands that pull the structure down and tight so when a seismic event happens, the unfastened steel frame on both sides can rock back and forth.

[26] (Controlled Rocking of Steel Braced Frames with Replaceable Energy Dissipating Fuses)
[27] (Eatherton)

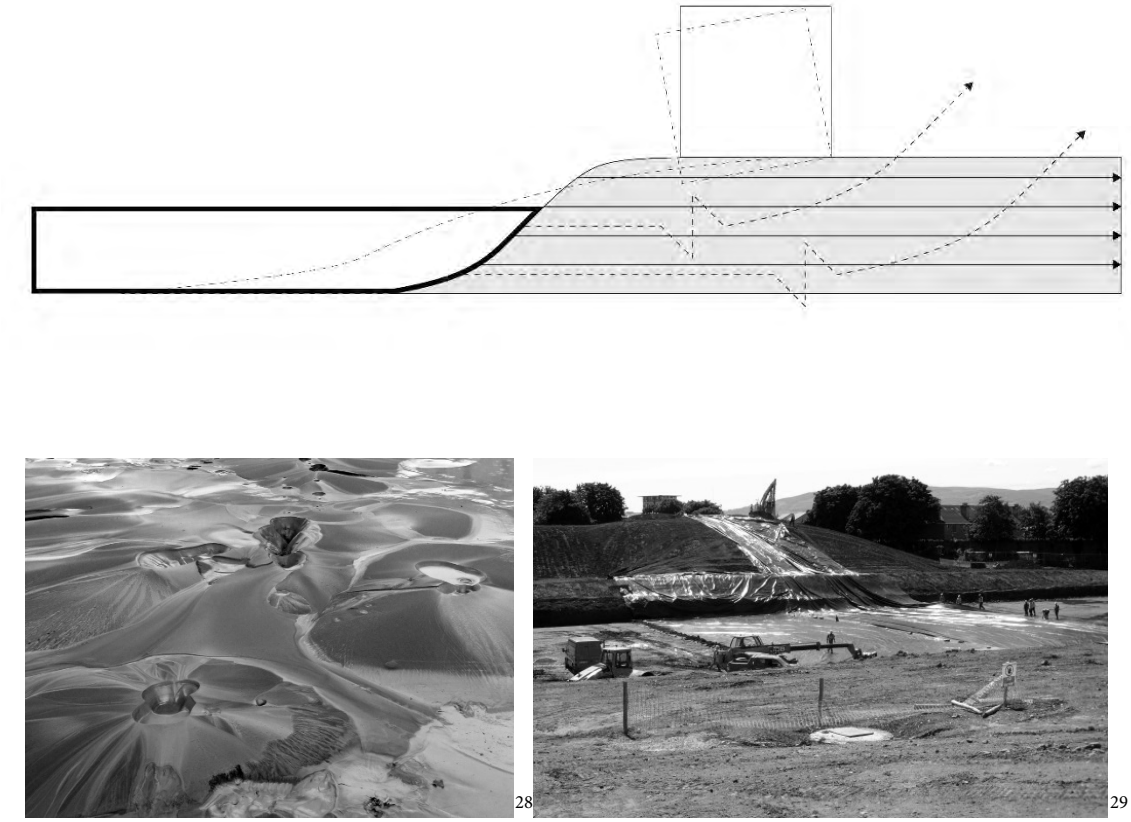
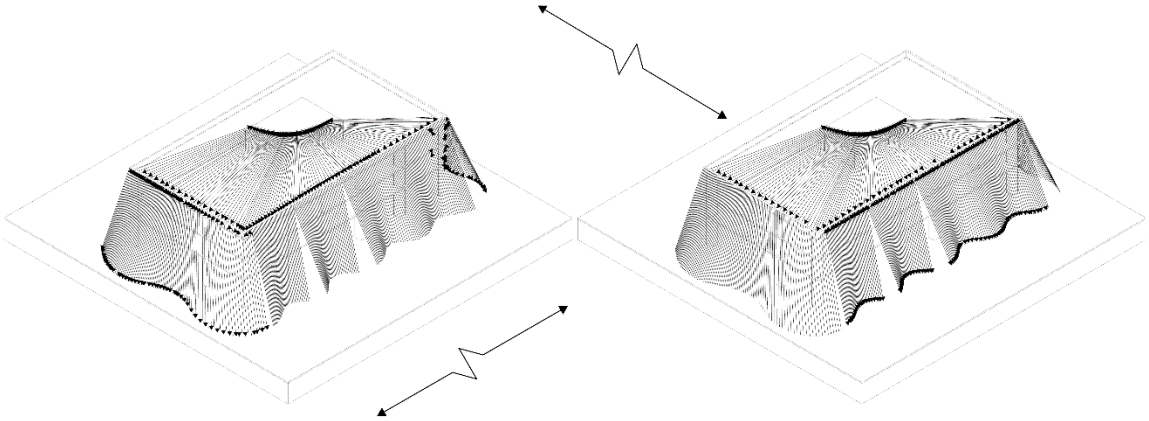


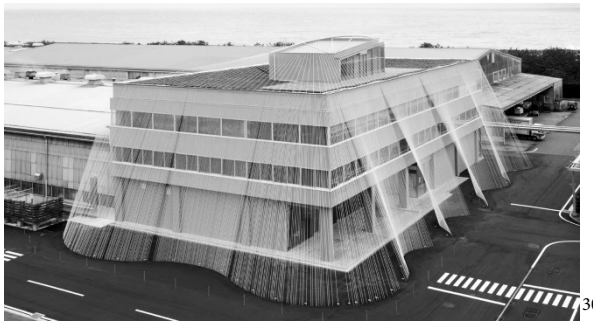
**Figure 12. Machine Diagram: Reinforcement**

For events such as soil liquefaction or landslides, geotextiles can provide more structure to the earth. Geotextiles separate, filter, and allow for water to drain from the land to prevent the substrate from becoming unstable. Geotextiles can also include digital sensors that provide early warning data for seismic events, as well as provide information on soil nutrition for agricultural purposes.

[28] (Musson)

[29] (Japanese Knotweed & Root Barriers)



 [30]

 [31]

**Figure 13. Machine Diagram: Tension**

Carbon fiber rods anchor the structure to allow for lateral and or transverse absorption of seismic activity. In this case, the technology is celebrated by being outwardly seen. The expression of the technology brings attention to the fraughtness of the land.

[30] (Takumi Ota/Shinkenchiku)
[31] (Takumi Ota/Shinkenchiku)

*Reflection*

The collection of diagrams illustrate how seismic activity is managed and dissipated, and while the exercise has increased my knowledge of the use of these technologies, it hasn't expanded my relationship to the fraught landscape. Perhaps I am examining the relationship too literally.

To abstract the relationship between stability and instability is to address the machine at the center. There is a stability machine that mediates and translates uncertainty in to something concrete. Perhaps by some reverse logic, instead of making a stability machine that transforms, I create an instability machines that expresses.

# Chapter 4:
# Instability Machines: Creating Limits

The spirit of architecture has always been about working within confines, be it of measurement, program, or finance, but it is often the coming-to-terms with ours limits that tells us where we are most free. To identify our limits is to know where to push, prod and innovate. It is our limits that give us character.

The relationship between architecture and the ground is mediated by some seismic mitigation apparatus; this machine is at the center of the relationship between the unpredictable ground and the unsuspecting structure. Thus, it is through a machine that we isolate and illustrate the dynamic negotiation between ground and structure.

Upon reflection of the stability machines, it is often their failure that instability occurs meaning that the seismic mitigation apparatus has reached a limit. The capacity of the machine to deflect and mitigate is its defining character, however everything beyond its capacity is a pure expression of what can not be captured. To embrace the ideas of the unpredictable or unstable is not to attempt to represent it directly but to reveal it through the limits of something else.

To reveal the unstable is to reverse the relationship of the stability machines. If their purpose is to mediate architecture, and its antithesis, then perhaps we can think of movement and event as something other then being deflected or dissipated but instead concentrated and directed. To give form to the antithetical architectural qualities is to have these instability machines draw as they work. Through their own drawings they define their own limits.

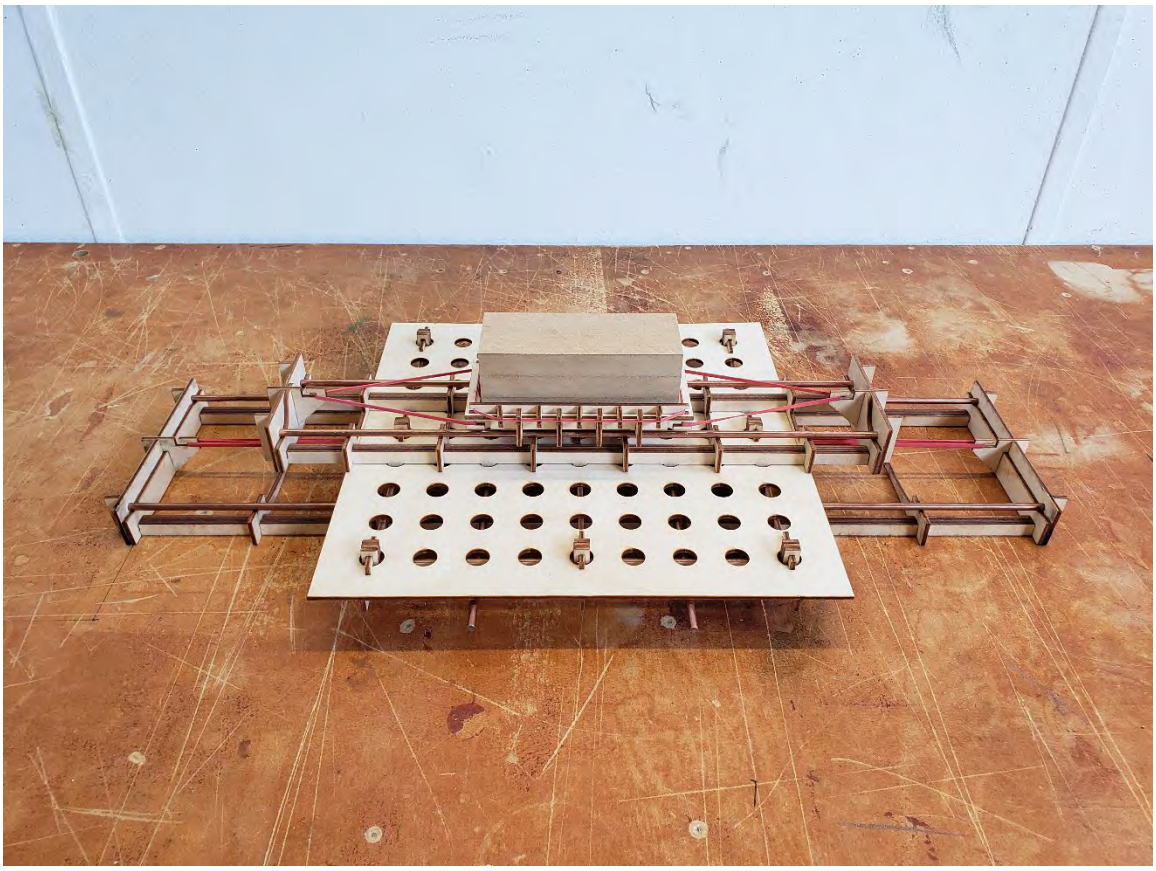
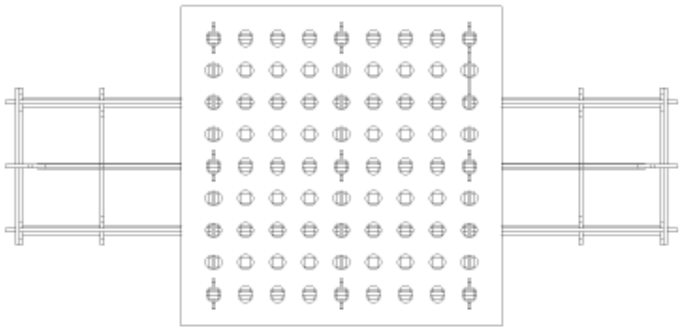
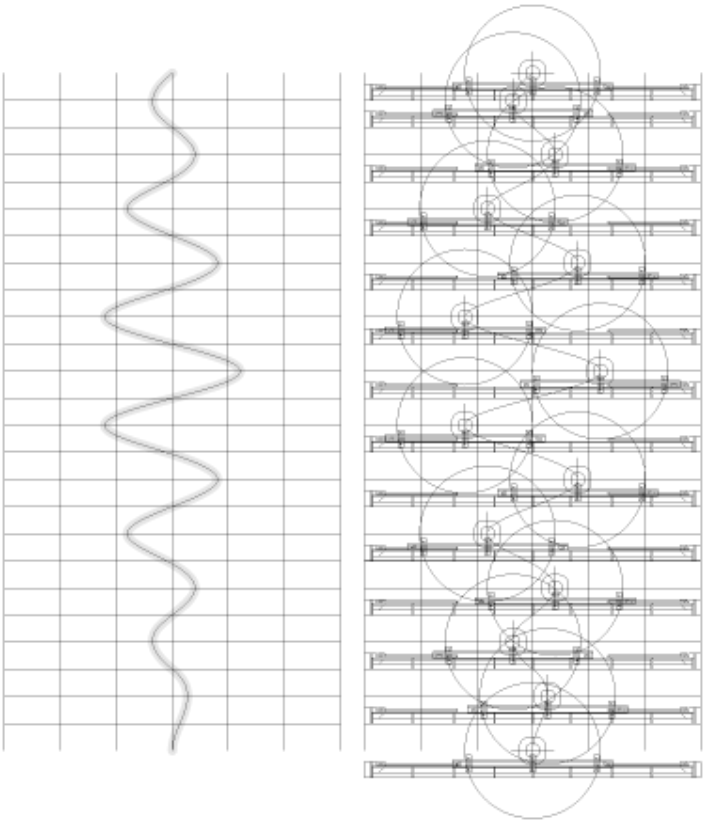


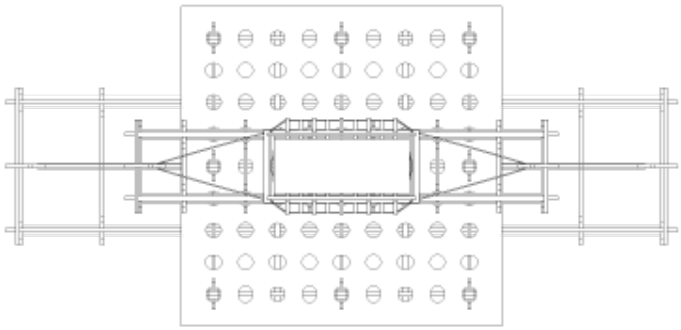
**Figure 14. Instability Machine: The Shake Table**

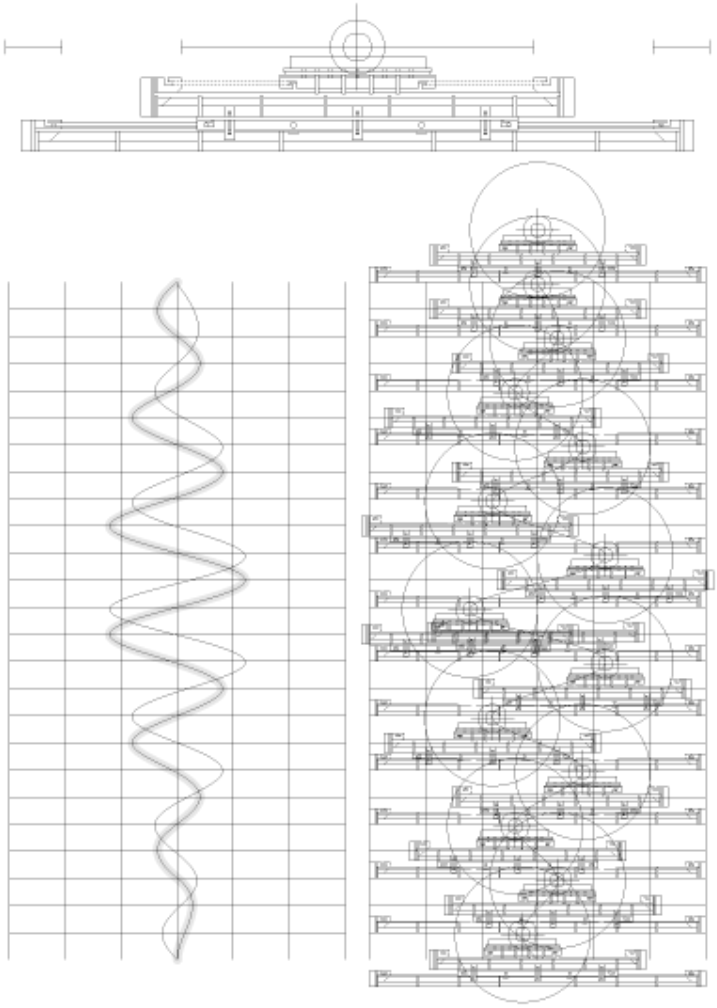
The first instability machine is a typical seismological tool used to study earthquakes. It is a machine designed to adapt different anti-seismic concepts such as dampening and flexibility. The drawings produced, such as the table in movement, the table dampened, and the table that flexes, are compared and overlaid on top of one another to measure their effects. The haptic feedback provided by shaking the table allows the user to time their interaction with it. What we experience is the ability to tune by touch, and in a way, we discover equilibrium born from instability.



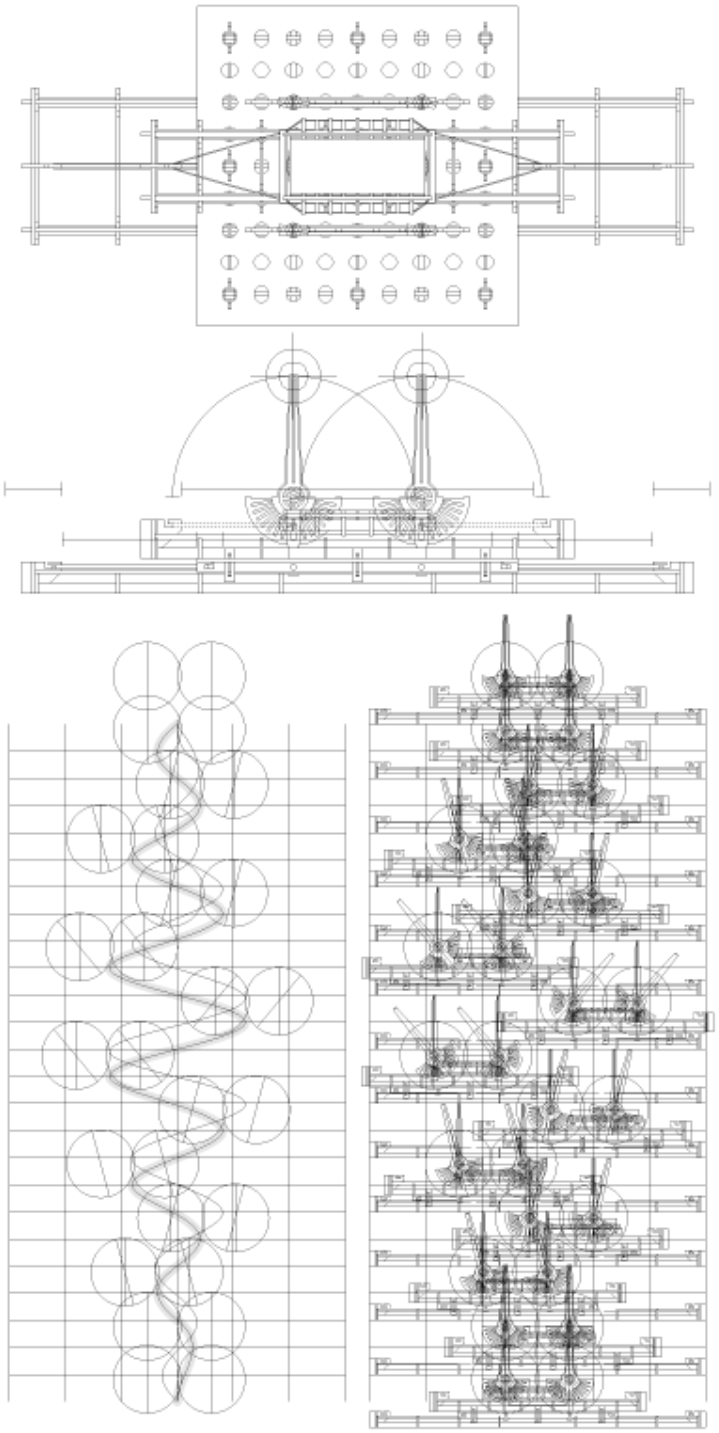


In this drawing, the Shake Table is devoid of any apparatus and only the back and forth of the table is captured.





A counterweight and sled is attached to the Shake Table. What this captures and emulates is the dampening force of the counterweight going in opposition of the table itself. In ideal conditions, the tracing of the table and the counterweight would be mirror images of each other.



Flexion created by the momentum of the Shake Table is measured by the degrees with which the minaret travels.

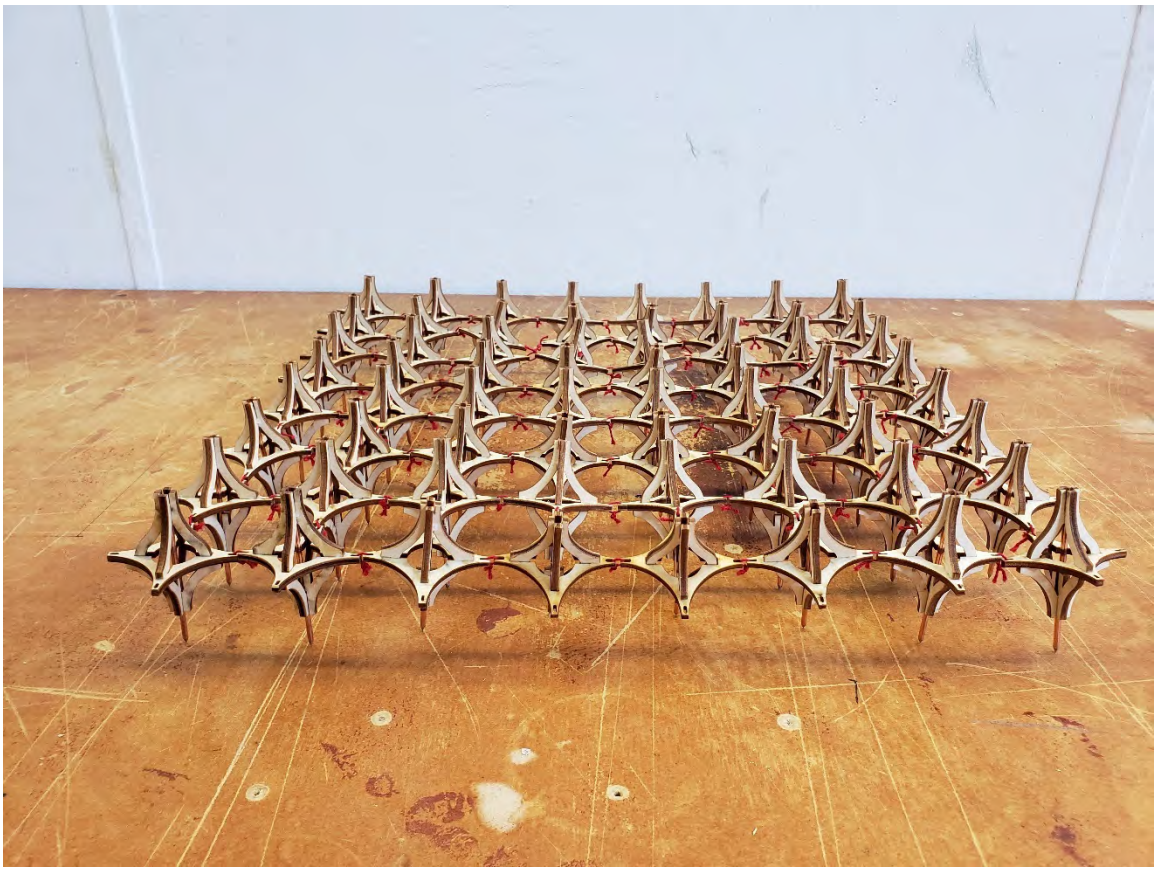
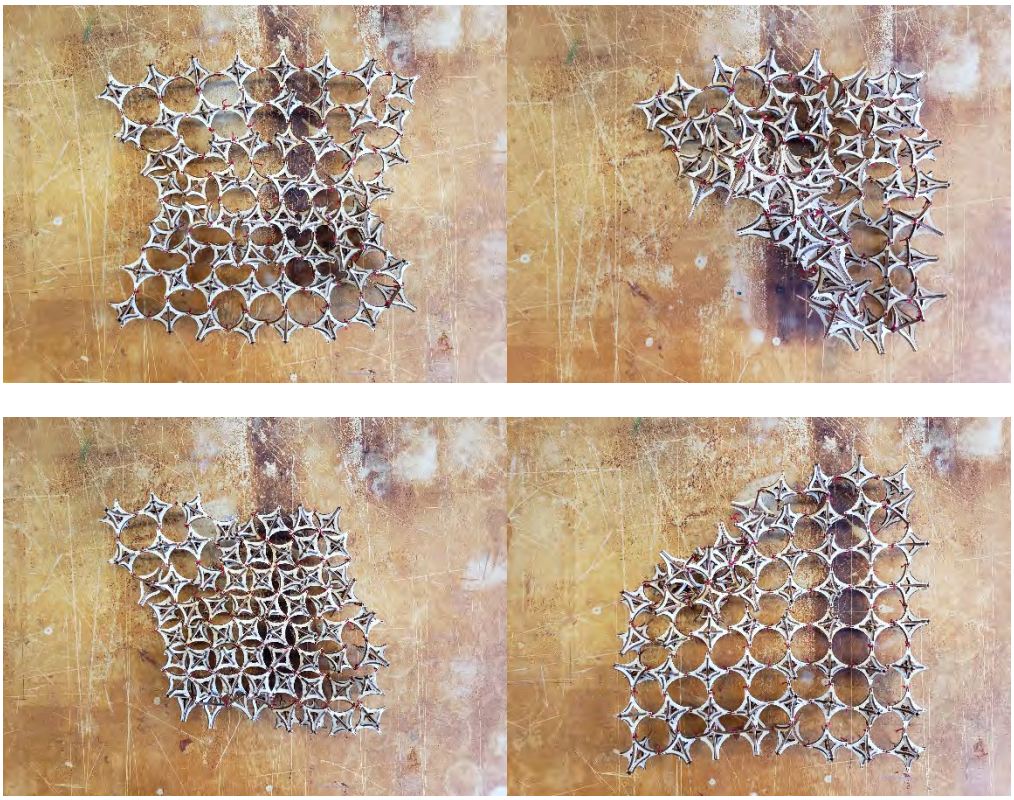
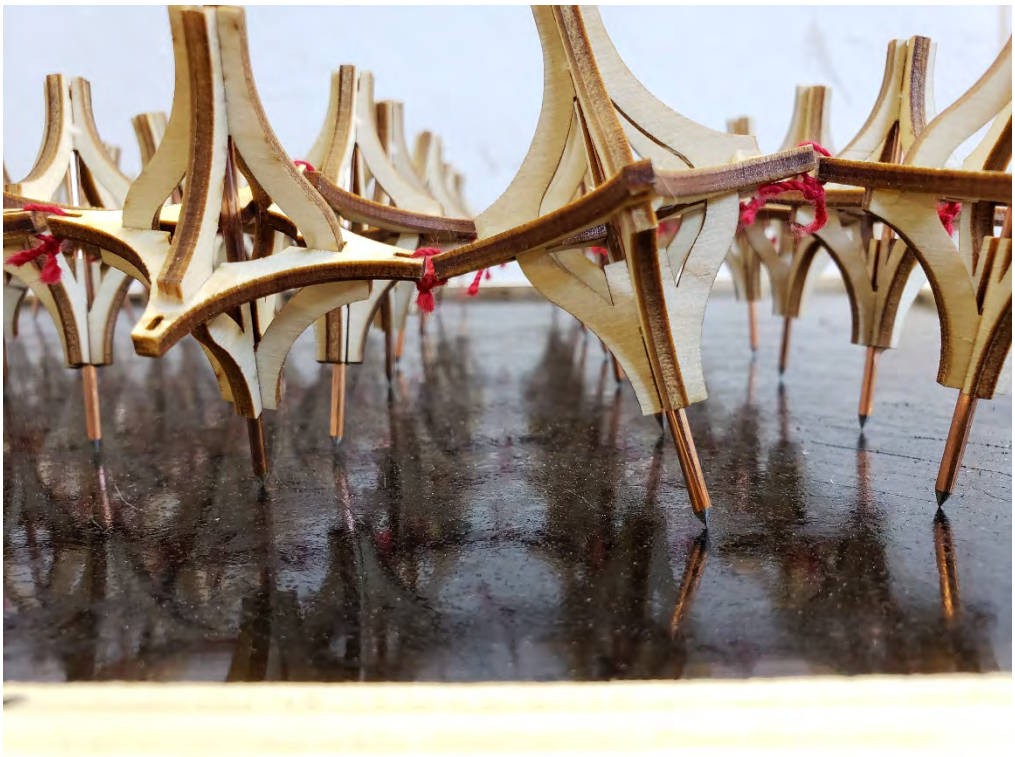


**Figure 15. Instability Machine: The Tectonic Fabric**

The Tectonic Fabric explores the varied motions of plate tectonics. This was built to examine something that is simultaneously fluid and dense, rigid but porous. To explore how each interaction between points subverts, contracts, and transforms another in the fabric, the tips of each module is sharp metal point for the purpose of leaving a mark as it drags across a surface. The tracing is a play of multiple interactions all simultaneously related. One point does not move without another.



The drawing is a collection of marks that reveal the physical interactions of a field that collides, slips, lifts and rises. It is analogous to the interactions of plate tectonics where its activity consists of convergence, transformation, and subduction.



The surface of the tracing board is coated in black ink to allow for the scraping of the modules to leave behind traces of their movement.

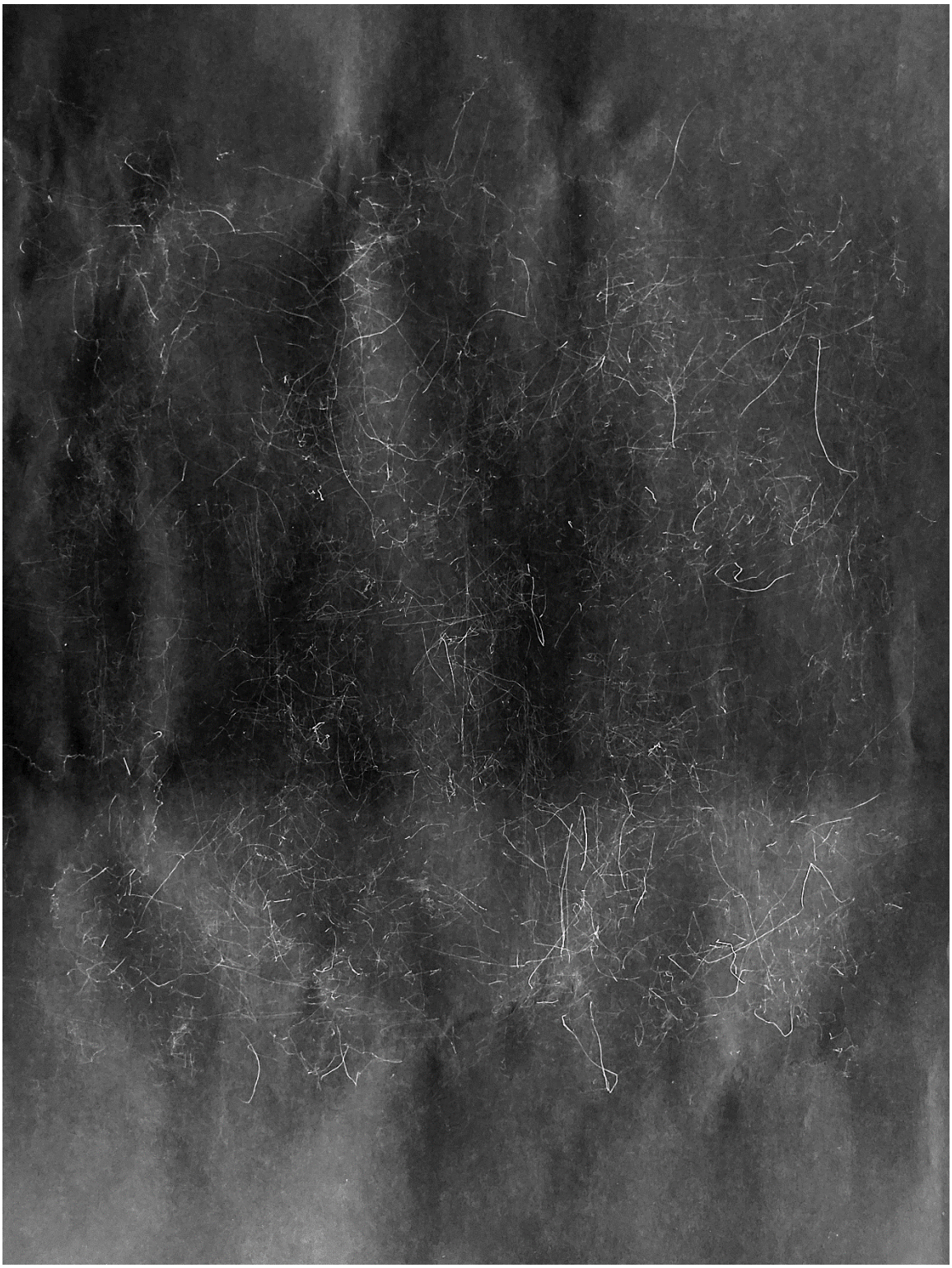
Drawing with Metal Tips (Close-up)

Drawing with Metal Tips (Close-up)

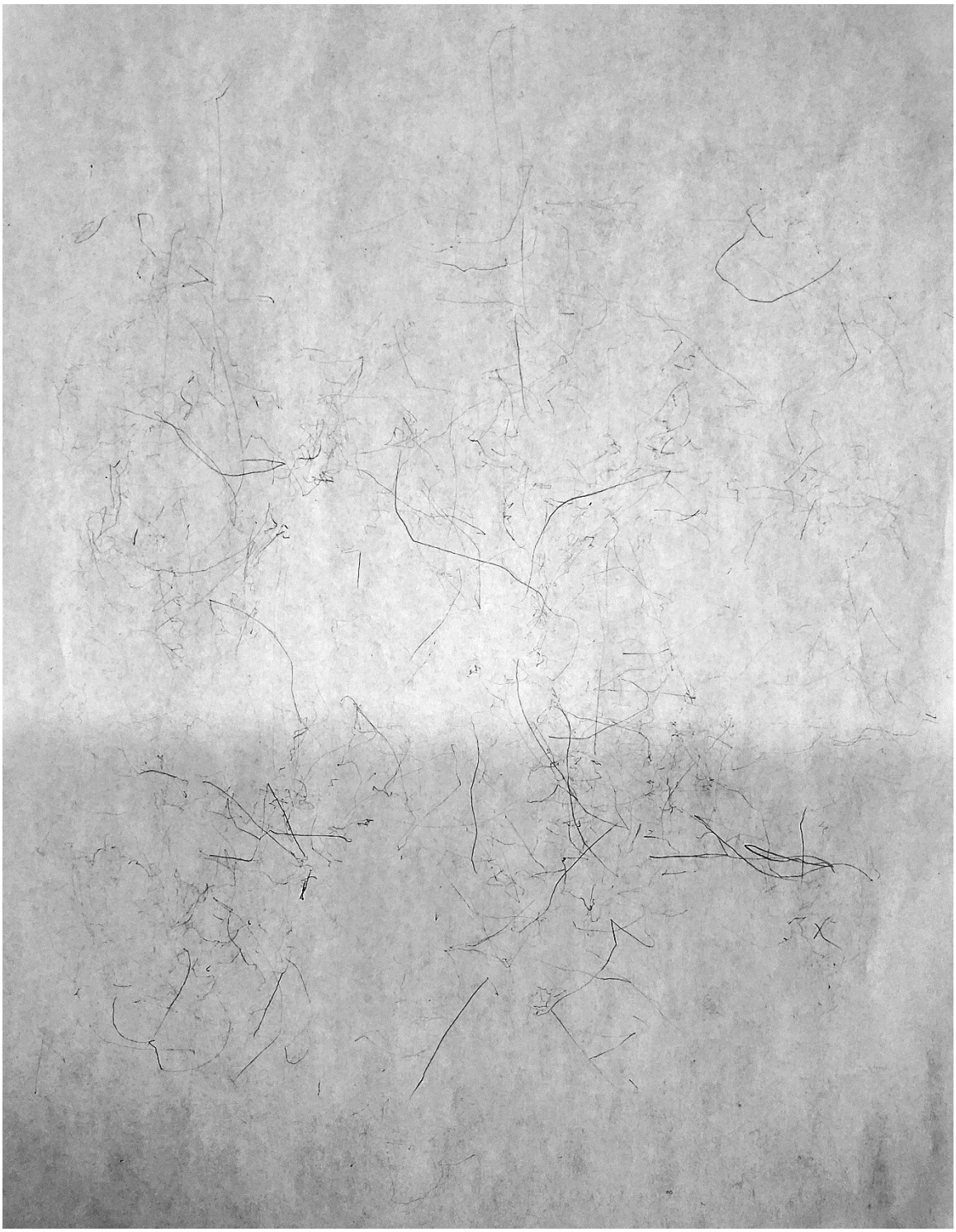
Drawing with Metal Tips (Close-up)

Drawing with Metal Tips (Close-up)

Drawing with Graphite Tips #1

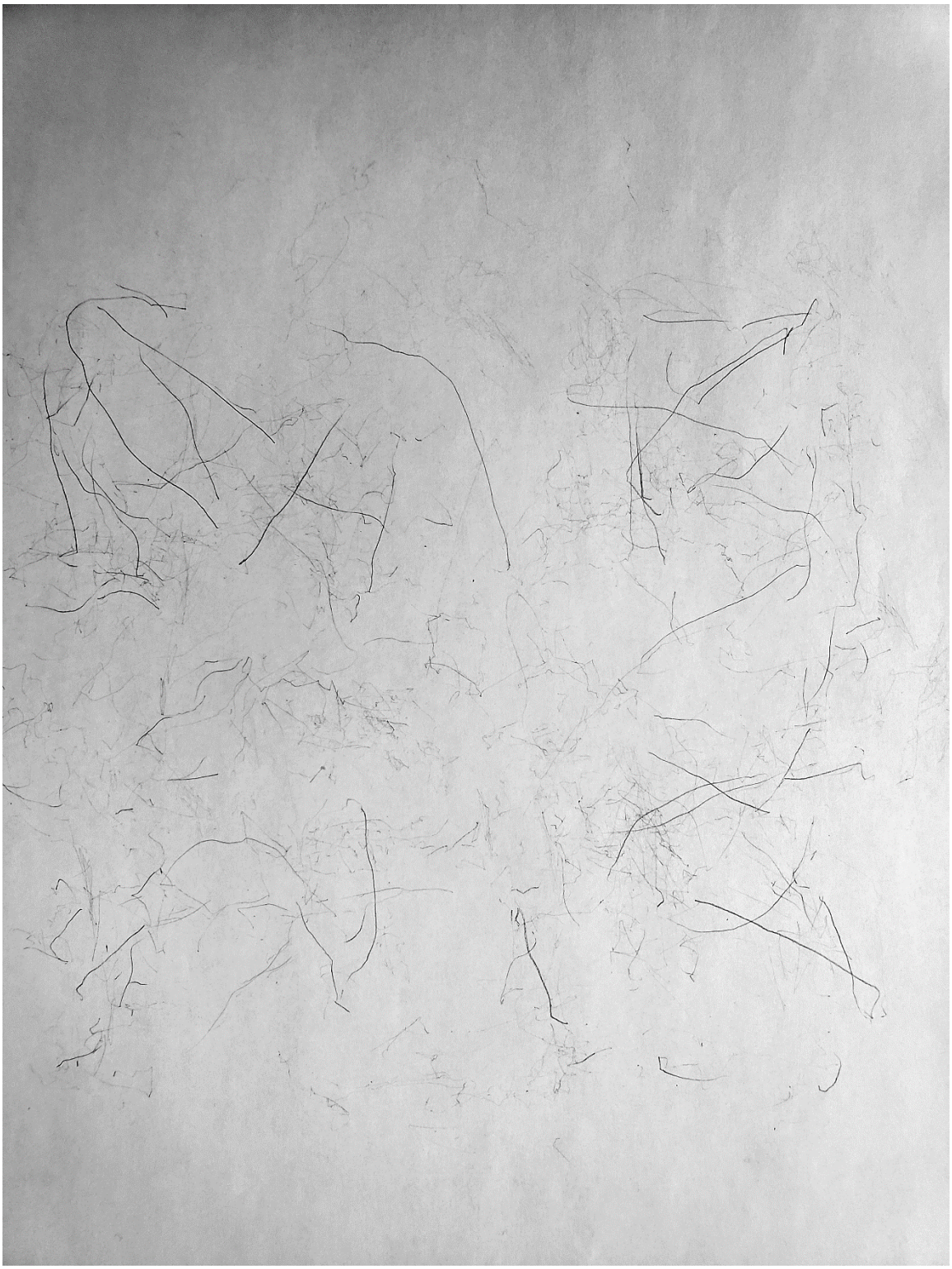


Drawing with Graphite Tips #2 (Inverted)

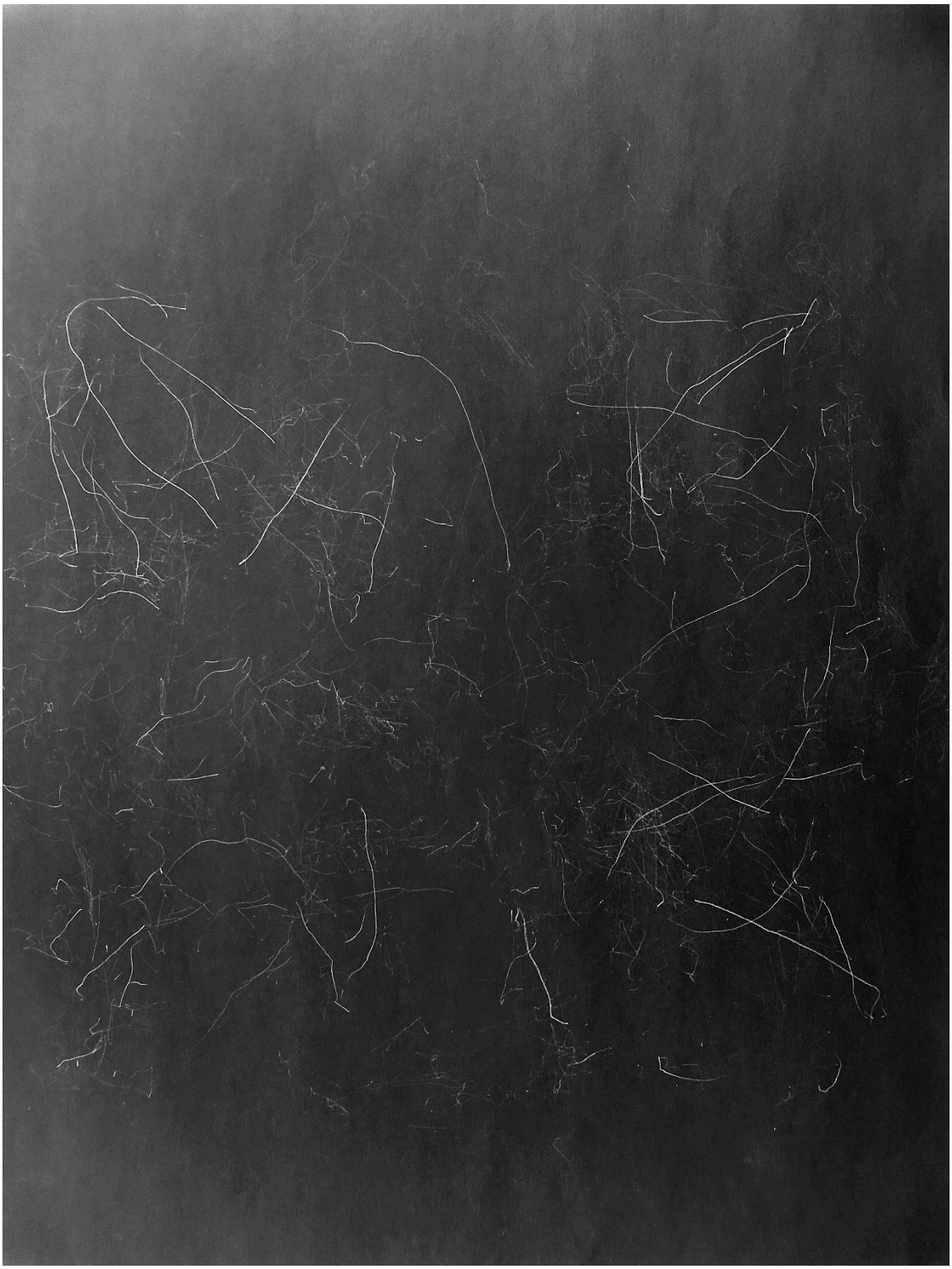


Drawing with Graphite Tips #2

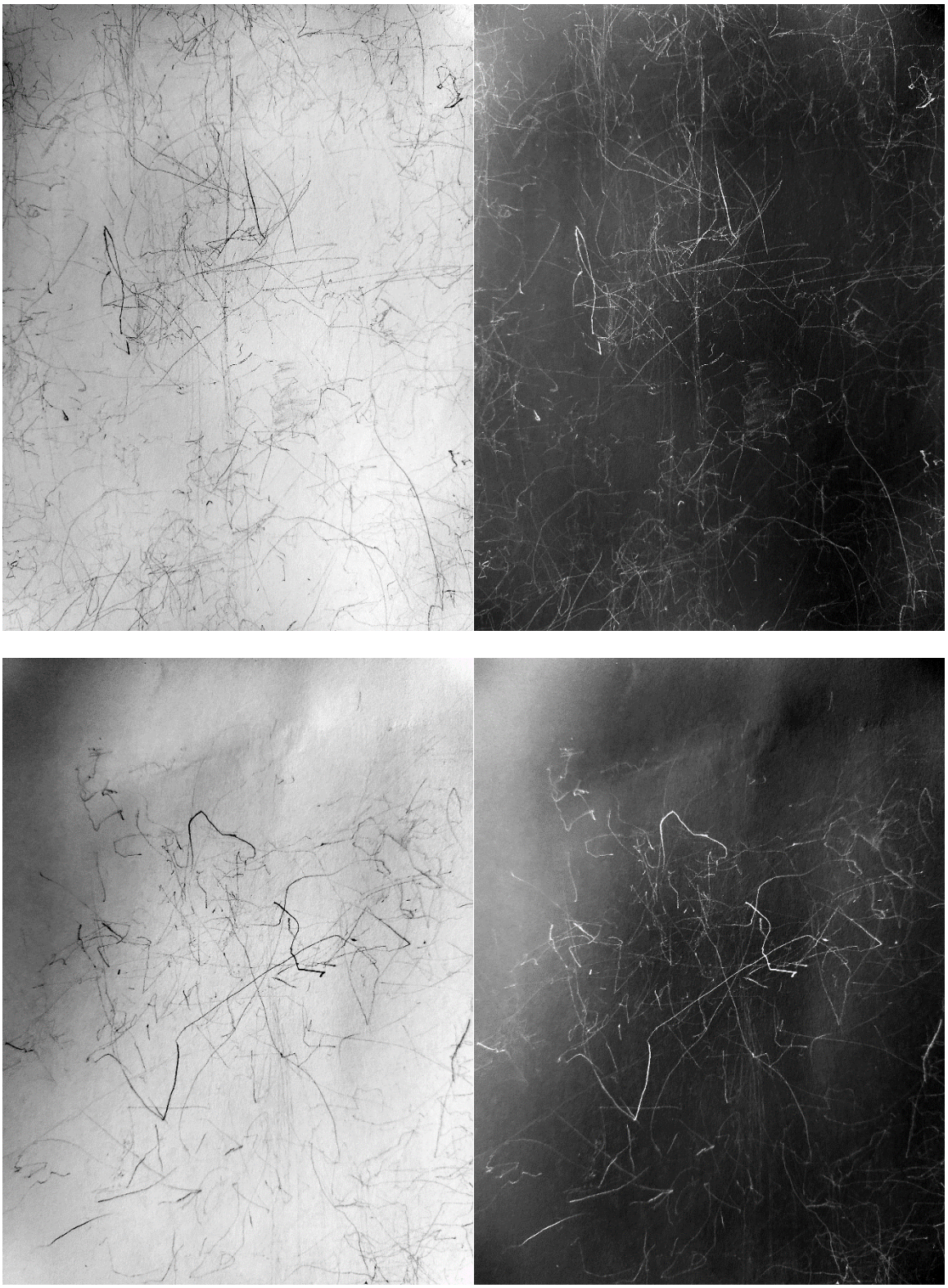
Drawing with Graphite Tips #2 (Inverted)



Drawing with Graphite Tips #3



Drawing with Graphite Tips #3 (Inverted)

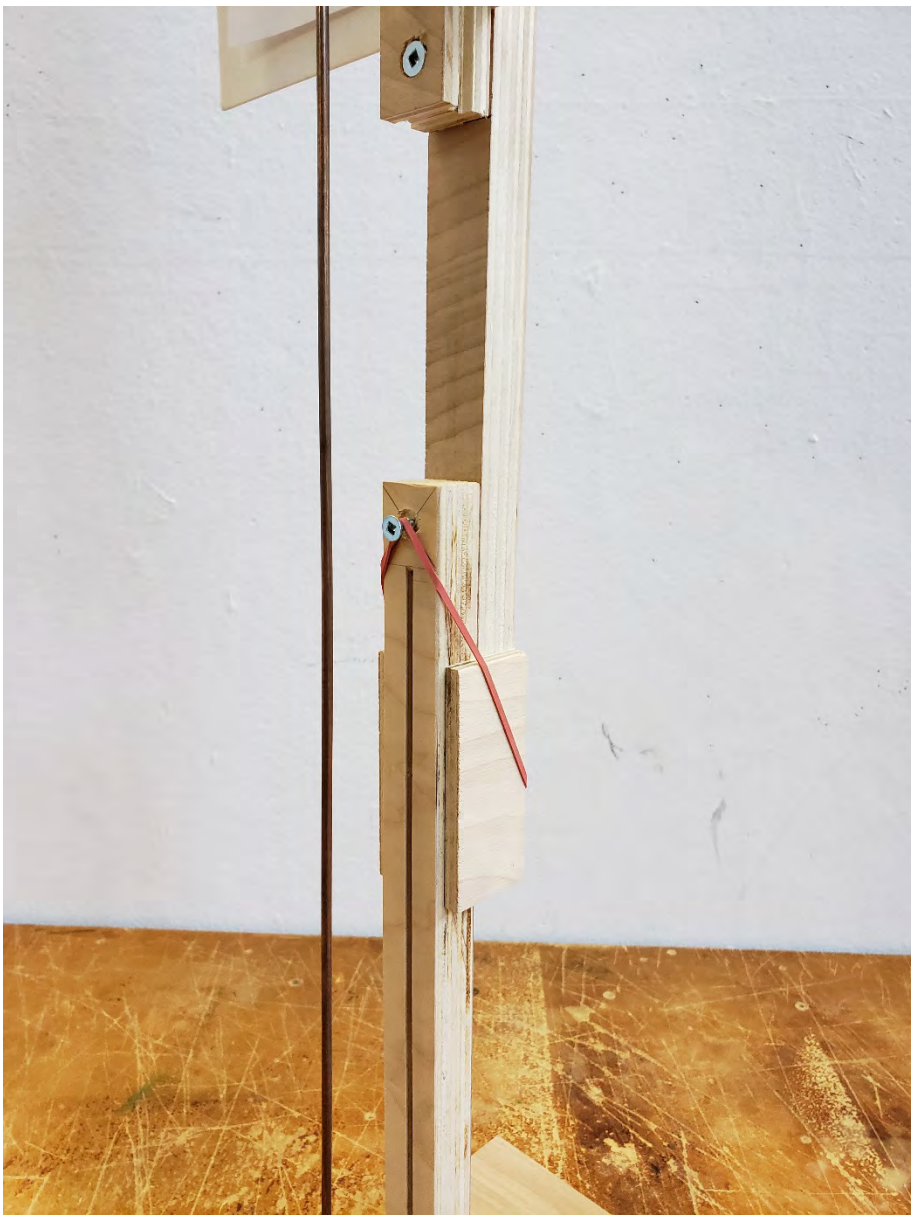


Drawing with Graphite Tips (Close-up and Inverted)

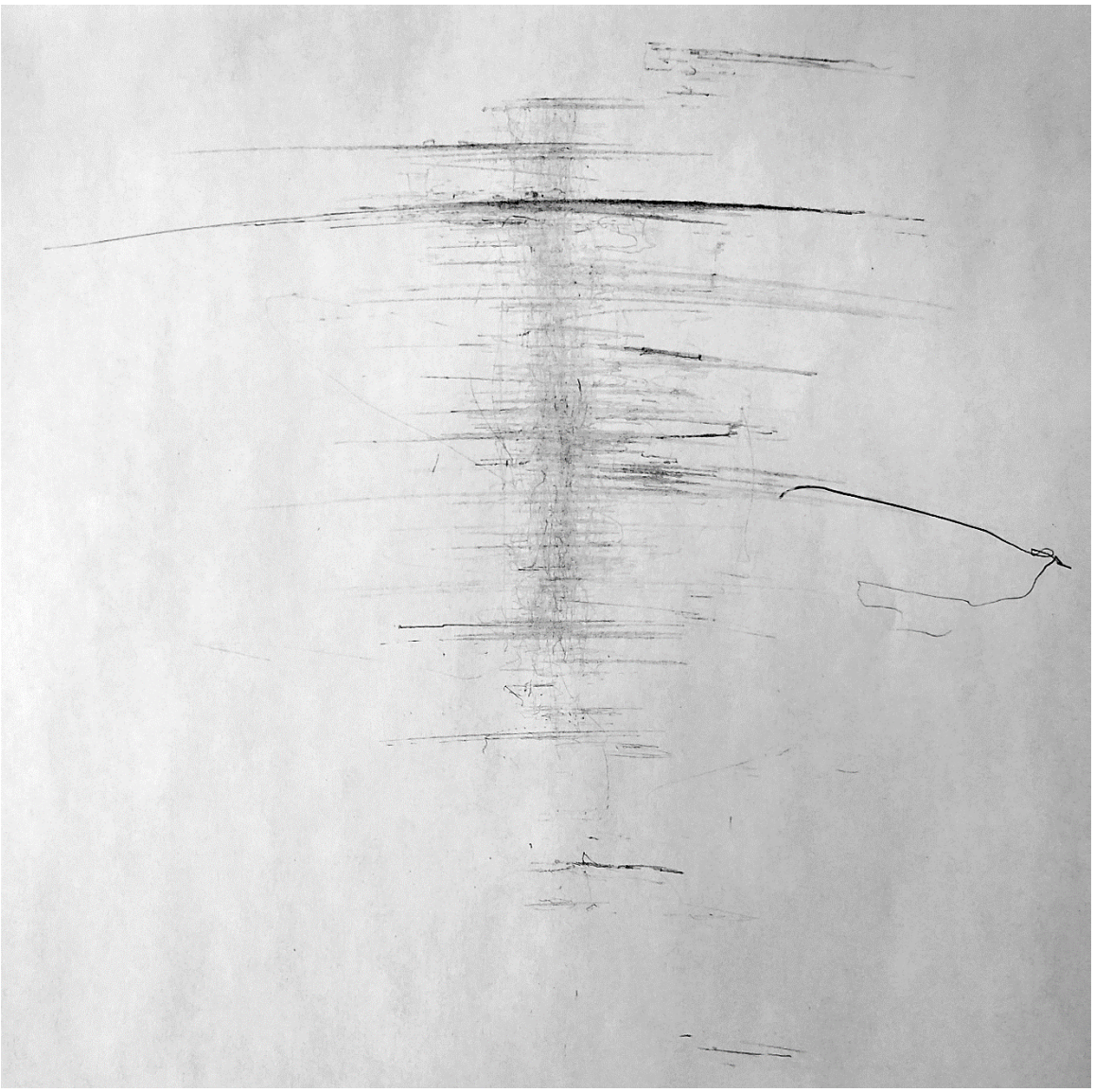
**Figure 16. Instability Machine: The Pick Up**

The Pick-Up records the vibrations of activity mediated by the architecture itself – the drawing speaks to a specific place in a room, to the materials the space is comprised of, and captures the energy of local activity. This drawing is a translation of that activity through the building itself. Does the concrete corner absorb or deflect the presence of people? Does the wooden subfloor undulate as the passerby fleets across? The drawing is the translation of the logic and limits of material, construction, and activity.

The Pick-Up relies on the flexion of the metal rod to create lateral markings. This is typically some indication of movement passing by.

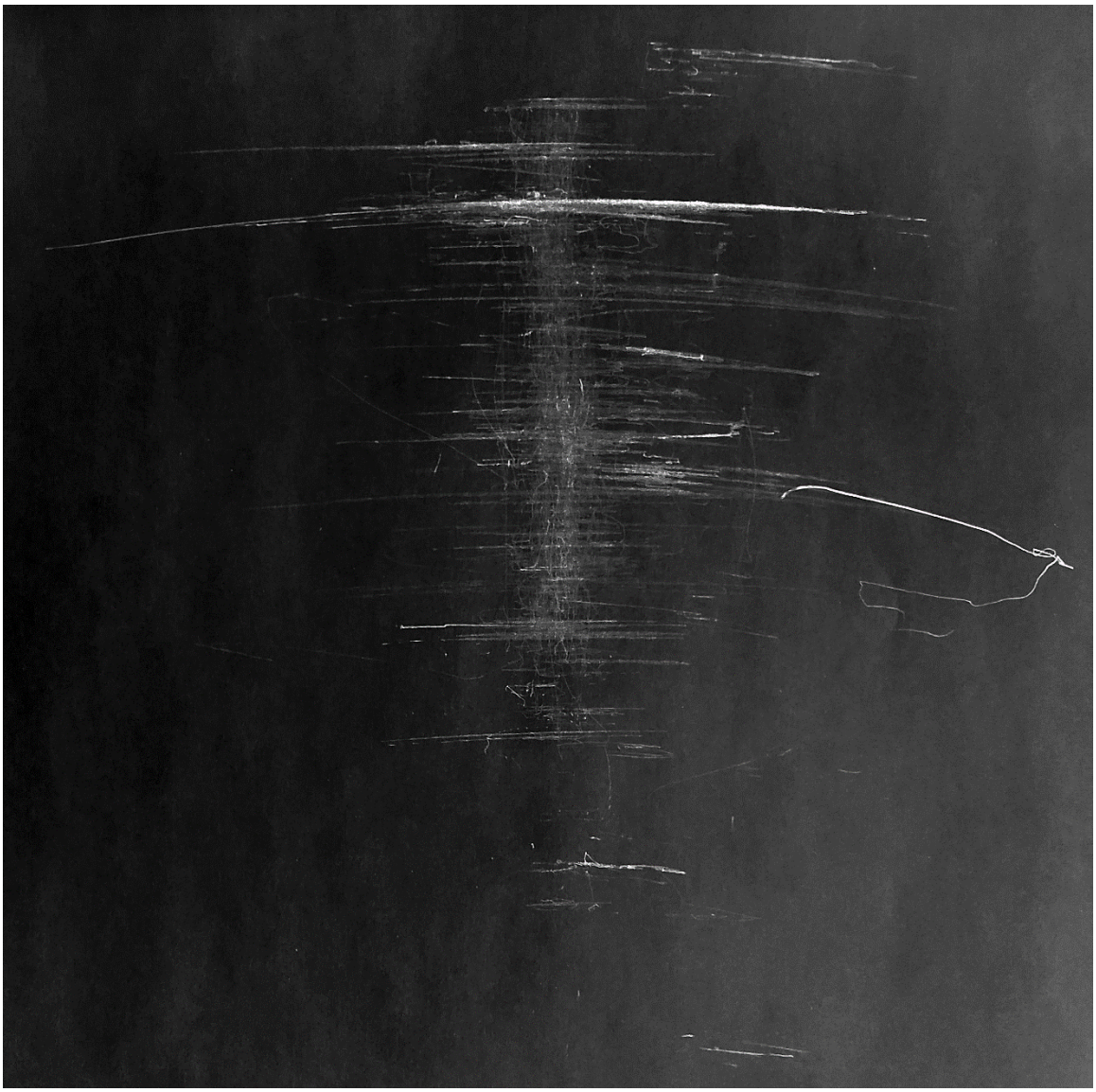


The rubber band transforms vertical forces and moves the drawing surface up and down in a spring-like fashion.



The Pick-Up Drawing #1

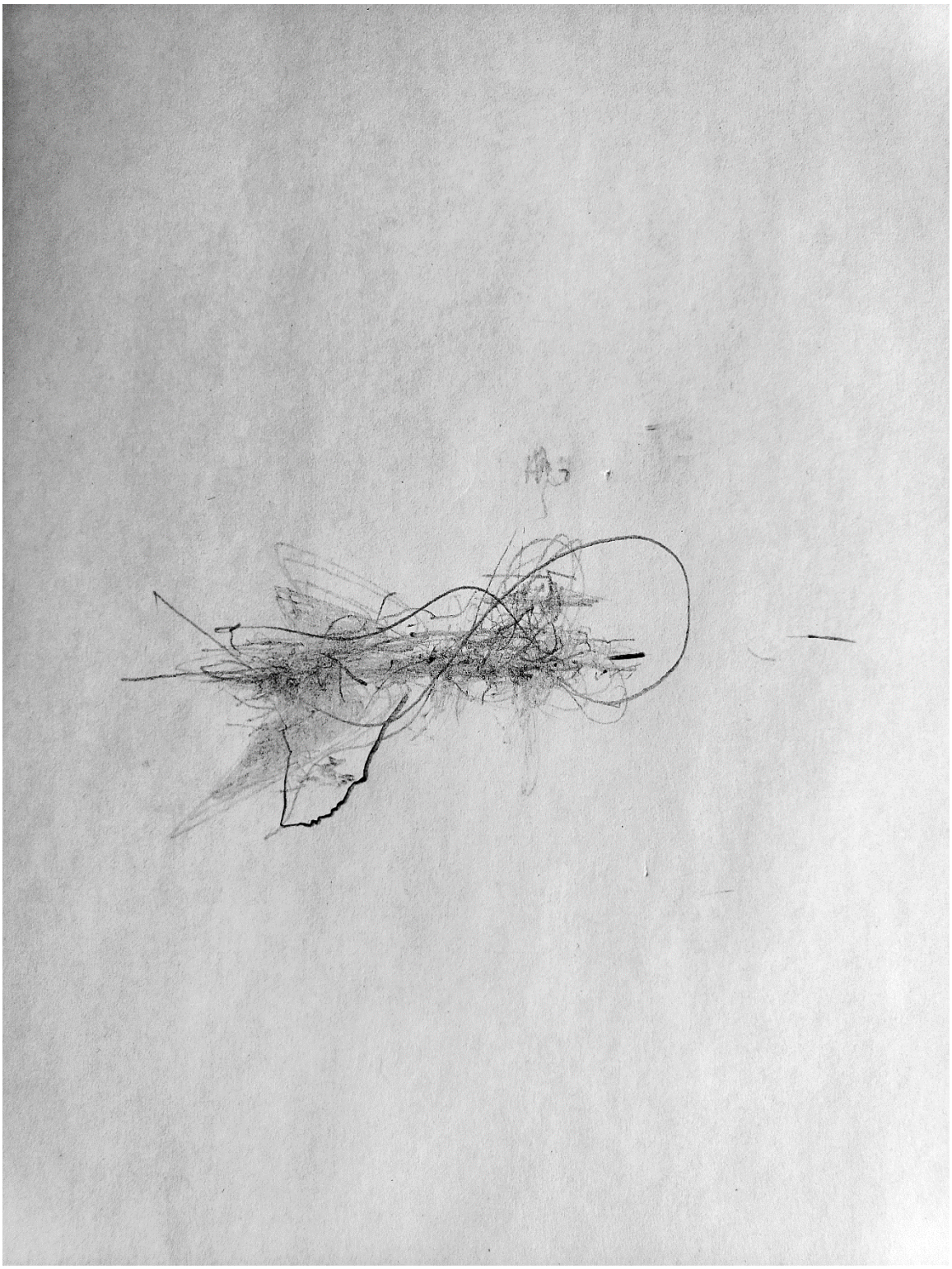
The Pick-Up was stationed in the corner of room and left to record on its own. The rubber band which was originally intended to absorb shock and keep the drawing centered on the page, began to degrade and lose its elasticity. The final drawing is a result of a slowly stretching rubber band over a period of three months. The most recent of activity is indicated at the top of the page.



The Pick-Up Drawing #1 (Inverted)

The Pick-Up Drawing #1 (Close-up and Inverted)

The Pick-Up Drawing #1 (Close-up and Inverted)

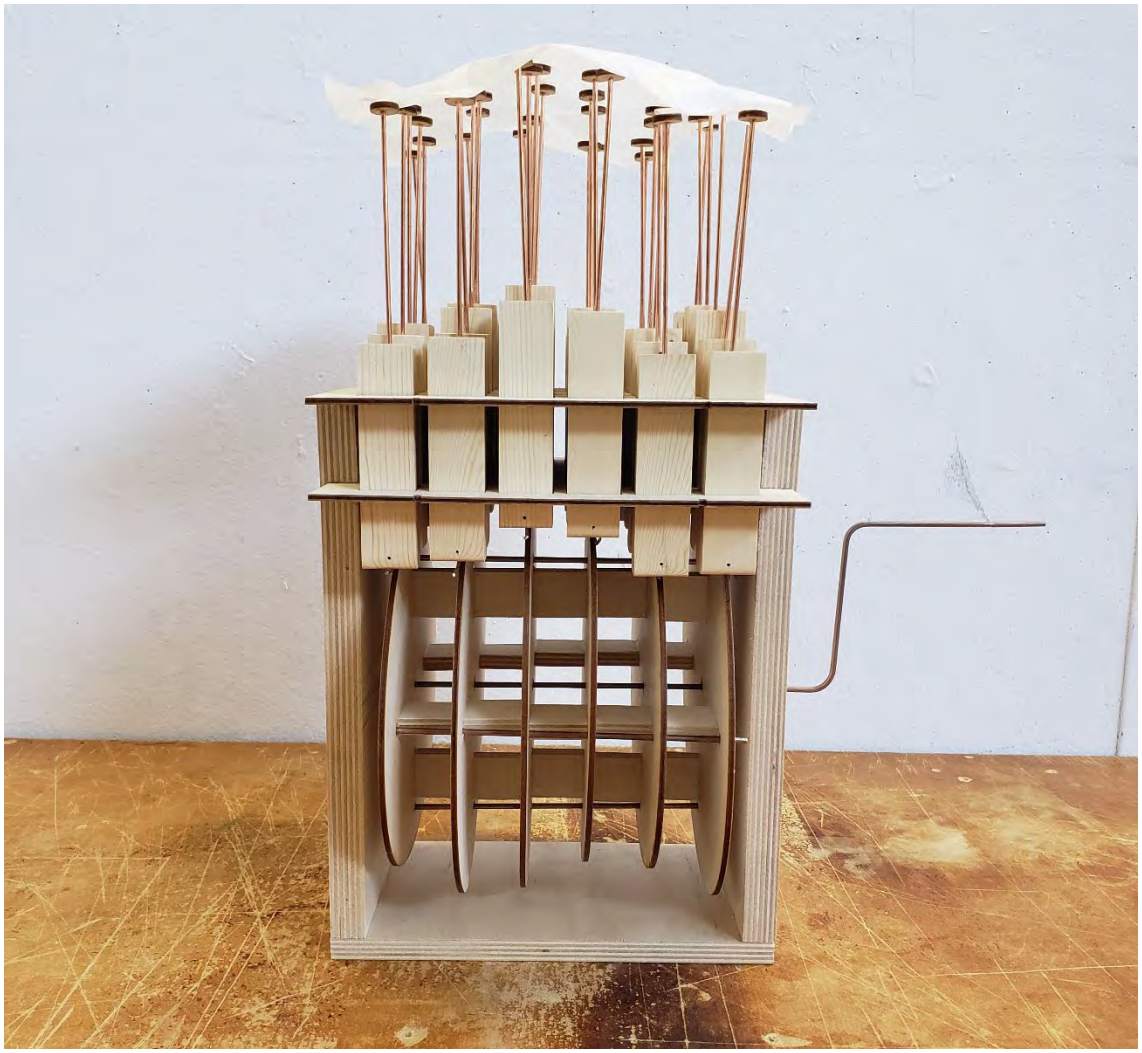


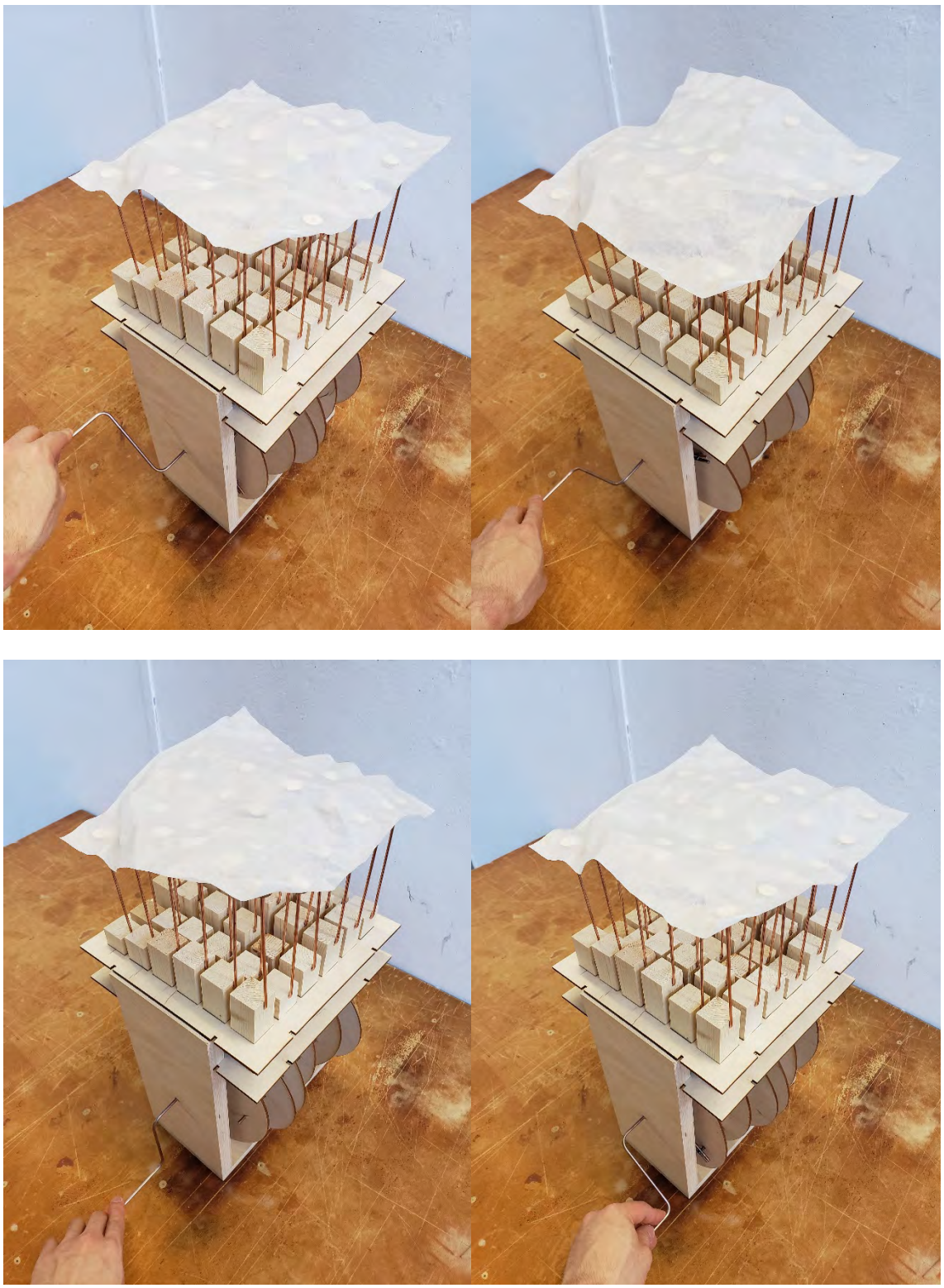
The Pick-Up Drawing #2

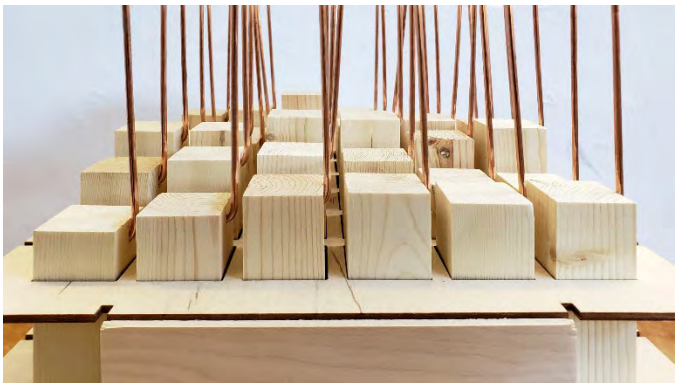
The Pick-Up Drawing #2 (Inverted)

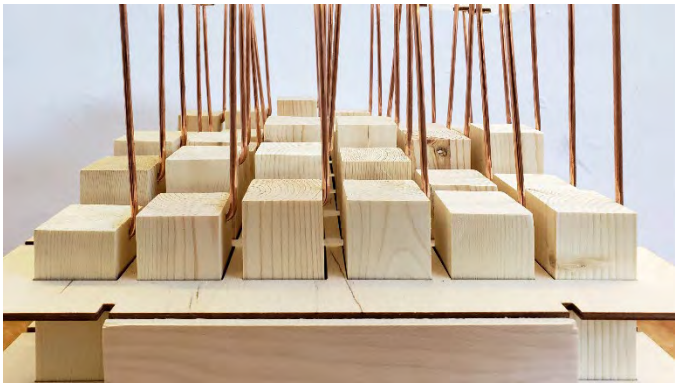
**Figure 17. Instability Machine: The Seismic Engine**

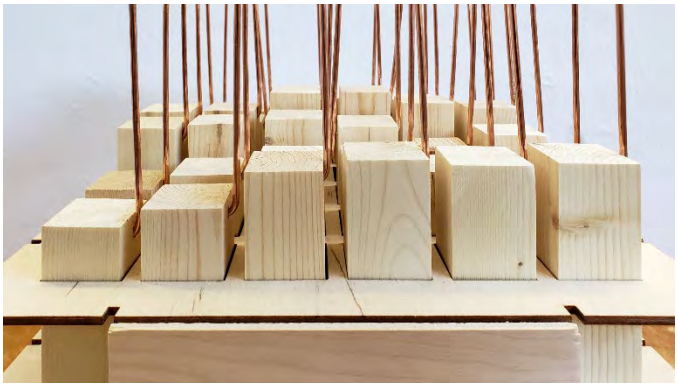
The Seismic Engine is an abstraction of surface wave – a type of wave that travels slowly across the surface of the earth. It is the one that is felt and the one that transforms our environment. The undulations of this wave are what defines the profiles of each cam. The logic of the machine is 3 parts: starting from the bottom, the abstraction of the undulations of the wave, translated into a kinetic diagram and ending at a literal representation of an undulating terrain. As a meditation on drawing, this is about reverting the relationship of pen to paper. This is where paper applies intent against the pen. A drawing is not made but the drawing surface is challenged.

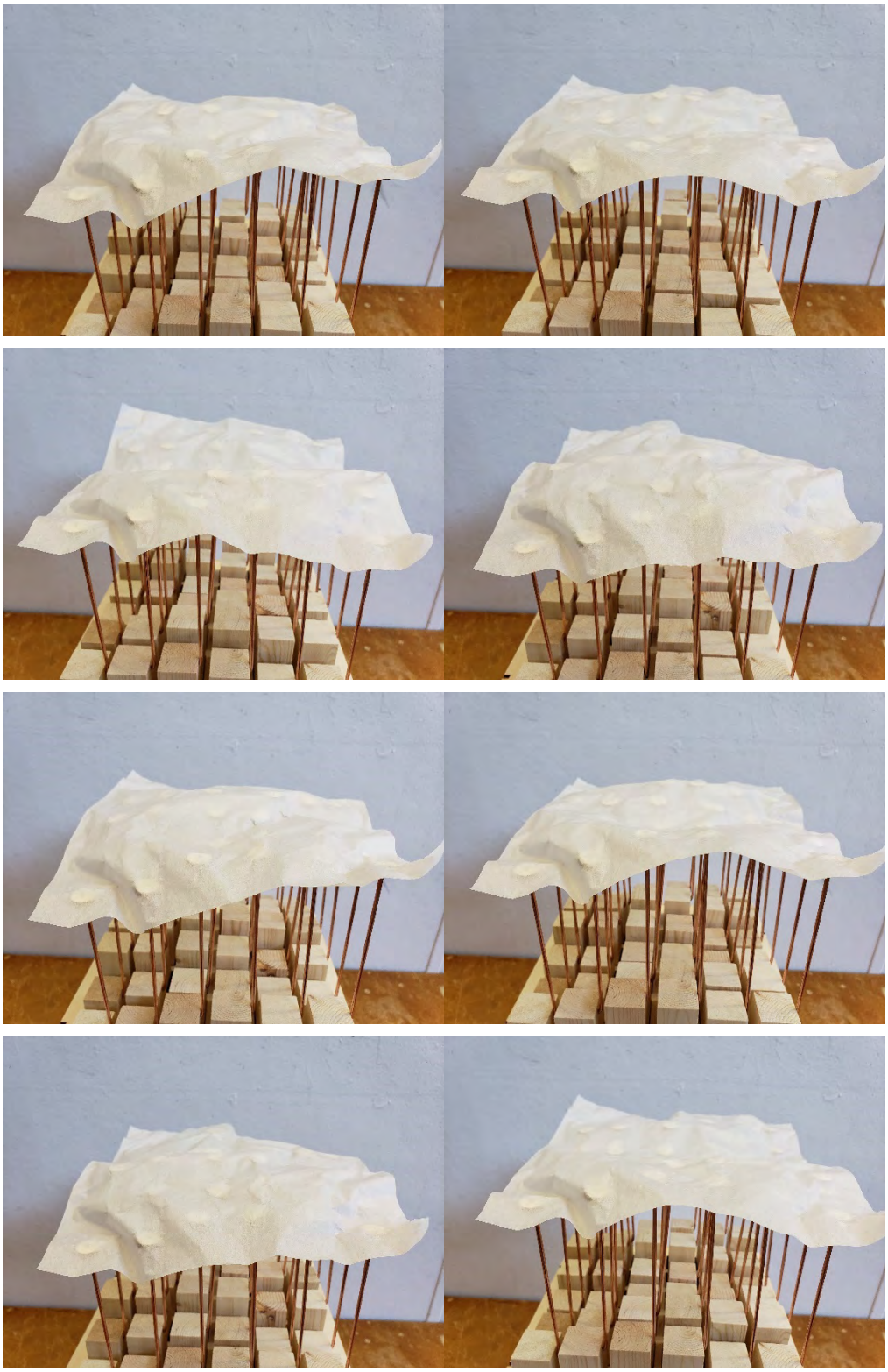


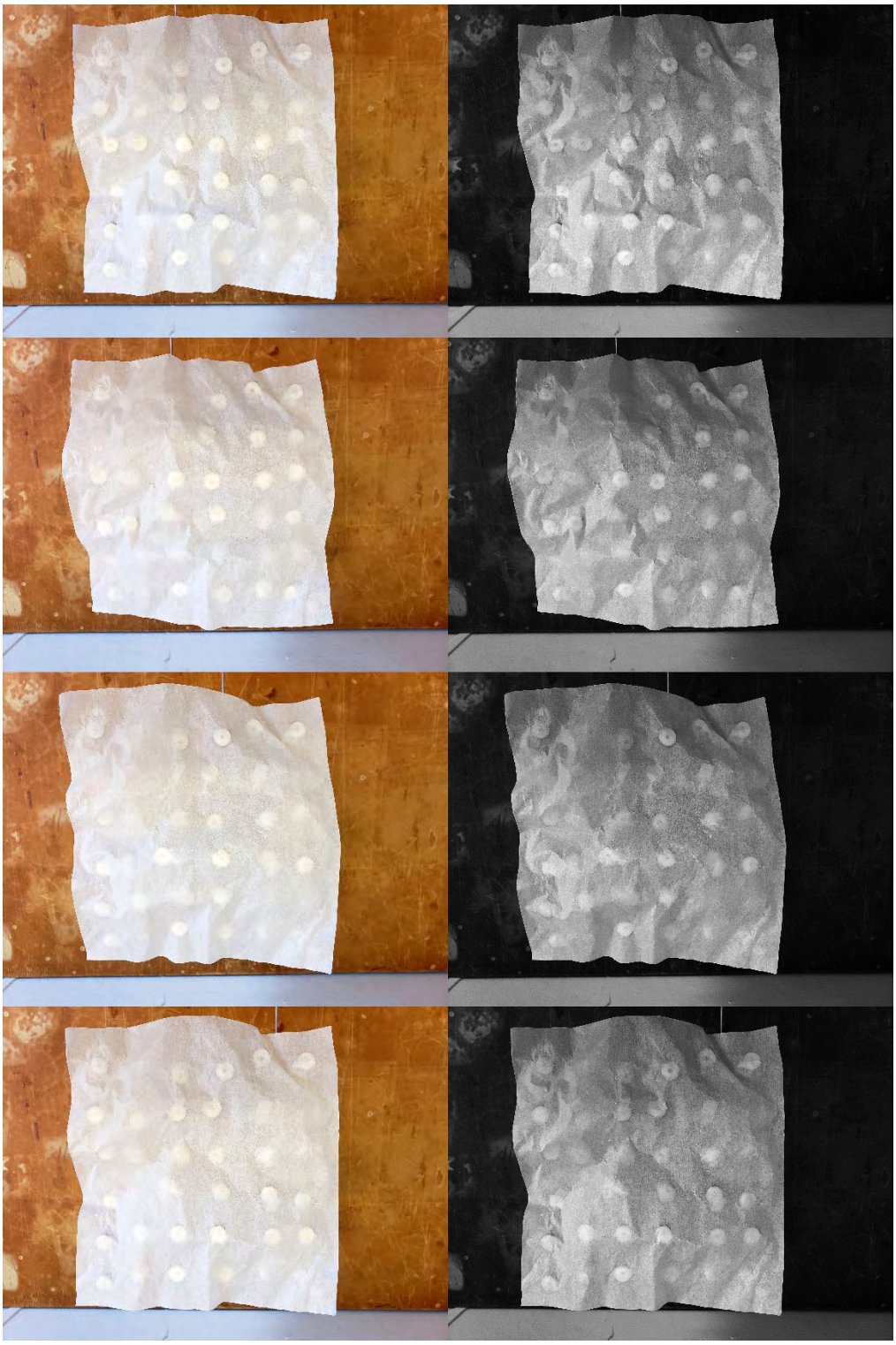












The Seismic Engine produces hills and valleys by warping and pulling at the logic of the surface – the weave, the fiber and its material.

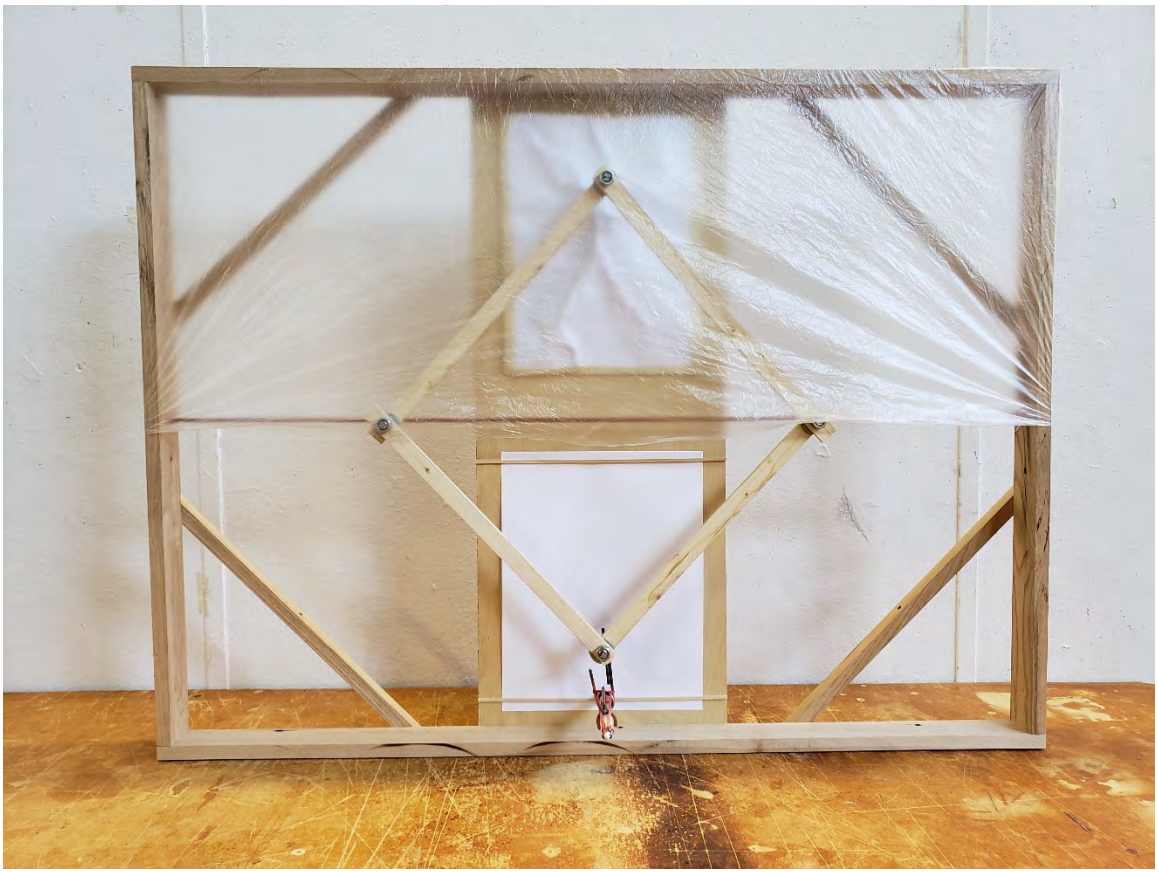
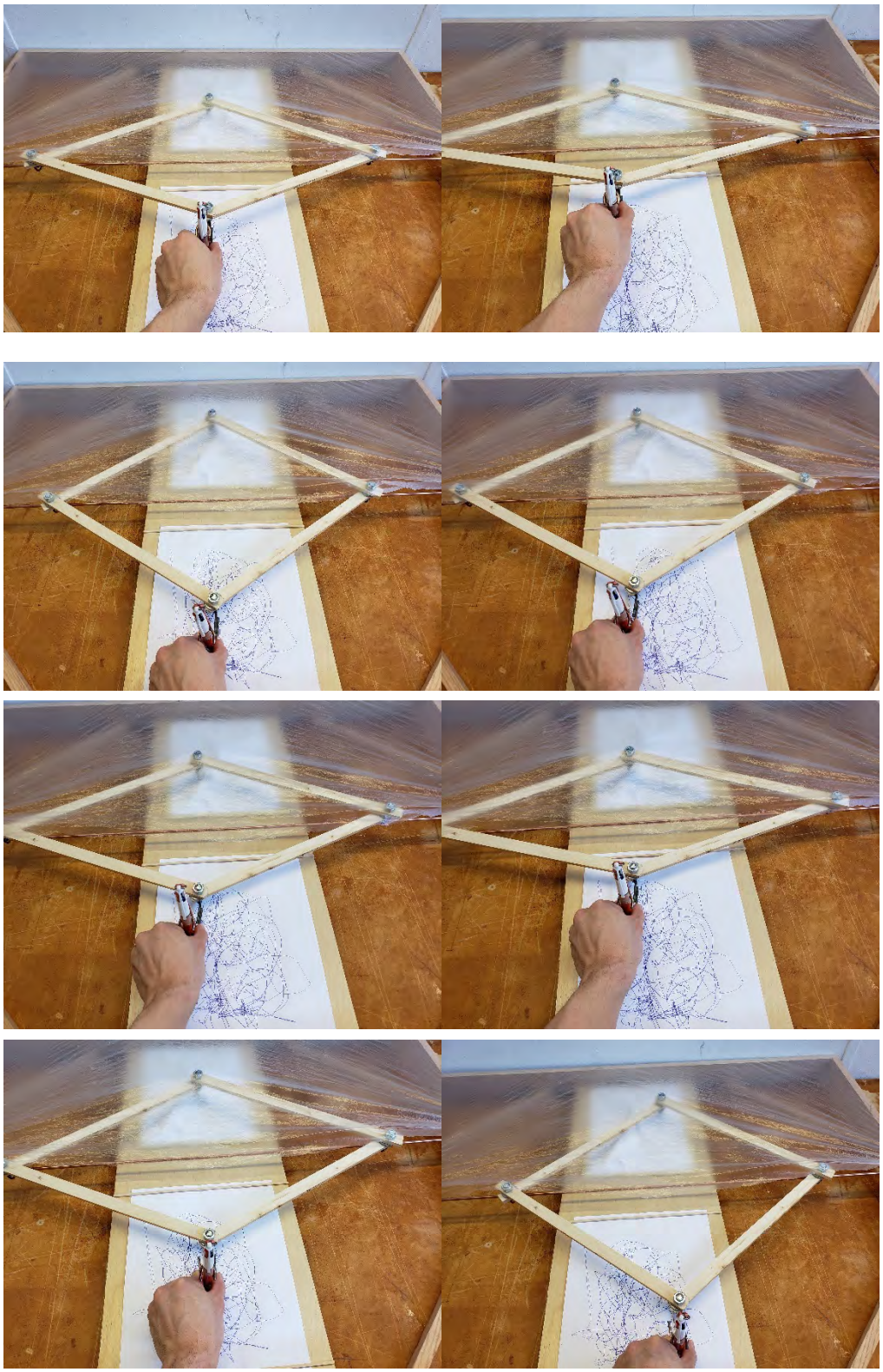
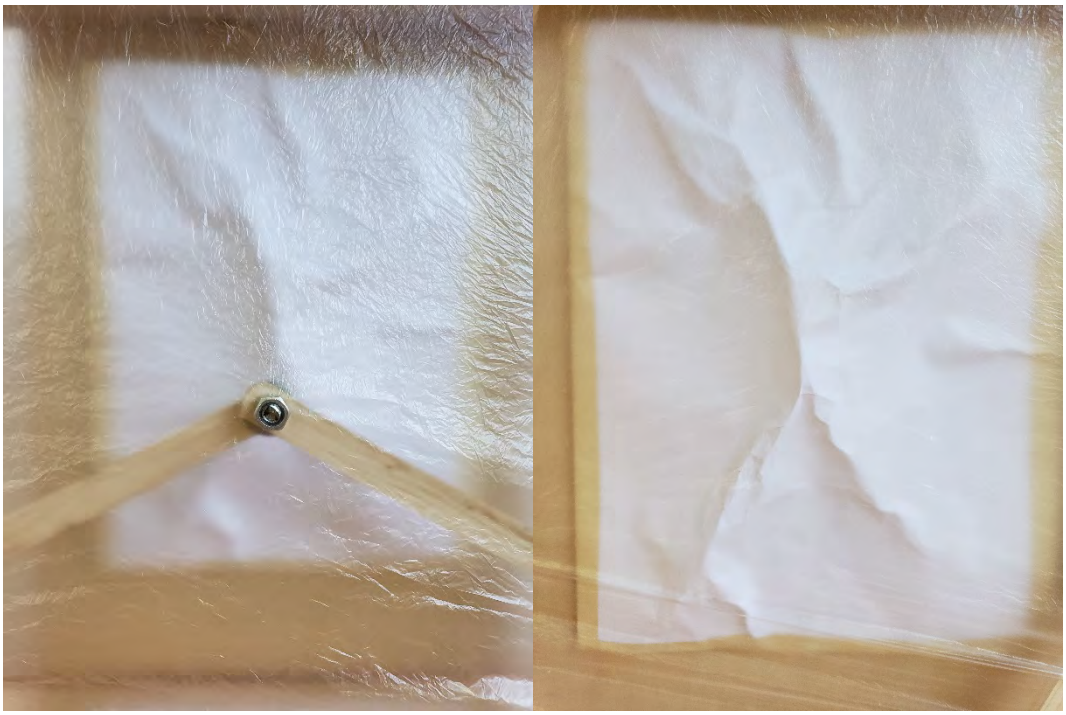


**Figure 18. Instability Machine: The Circum-Fracture**

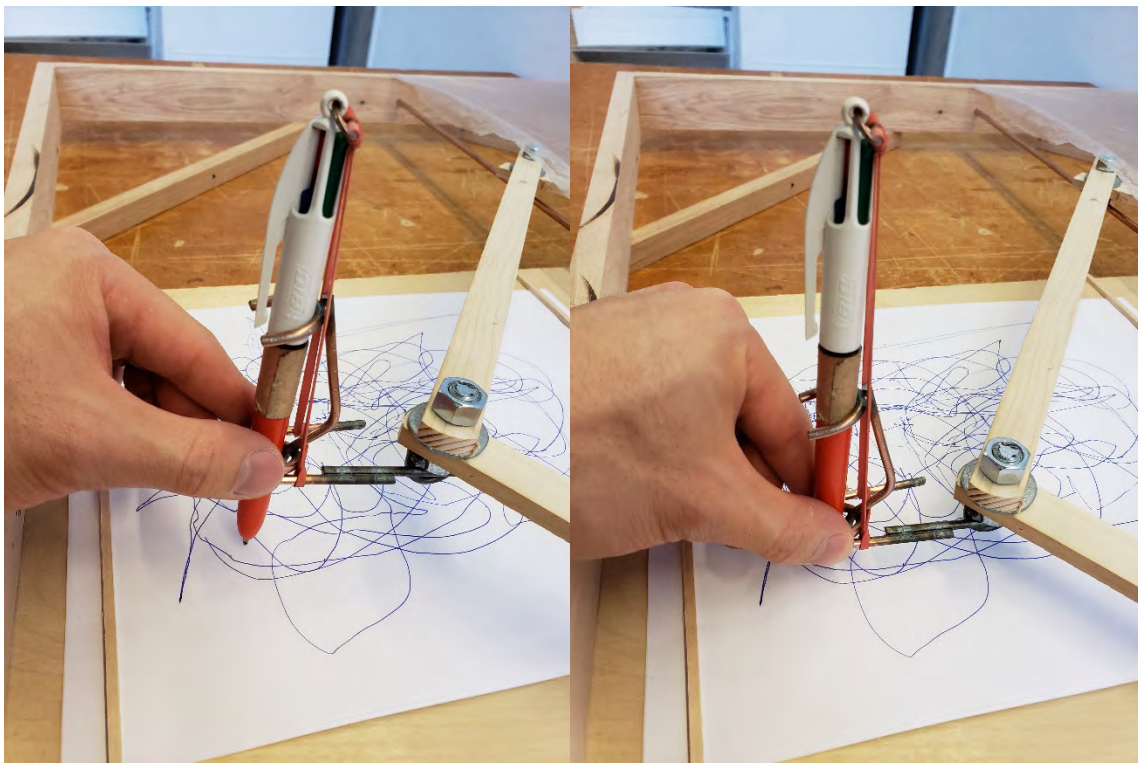
This is an instability machine that explores the experience of uncertainty. While this machine doesn't produce instability, it is a machine that mediates the production of a drawing of an unknowable subject. The drawing, regardless of how it looks like, will always be a viable and true interpretation of its subject.



The device employs a lever that prods at a hypothetical landscape on one end and leaves behind a trace on the other.

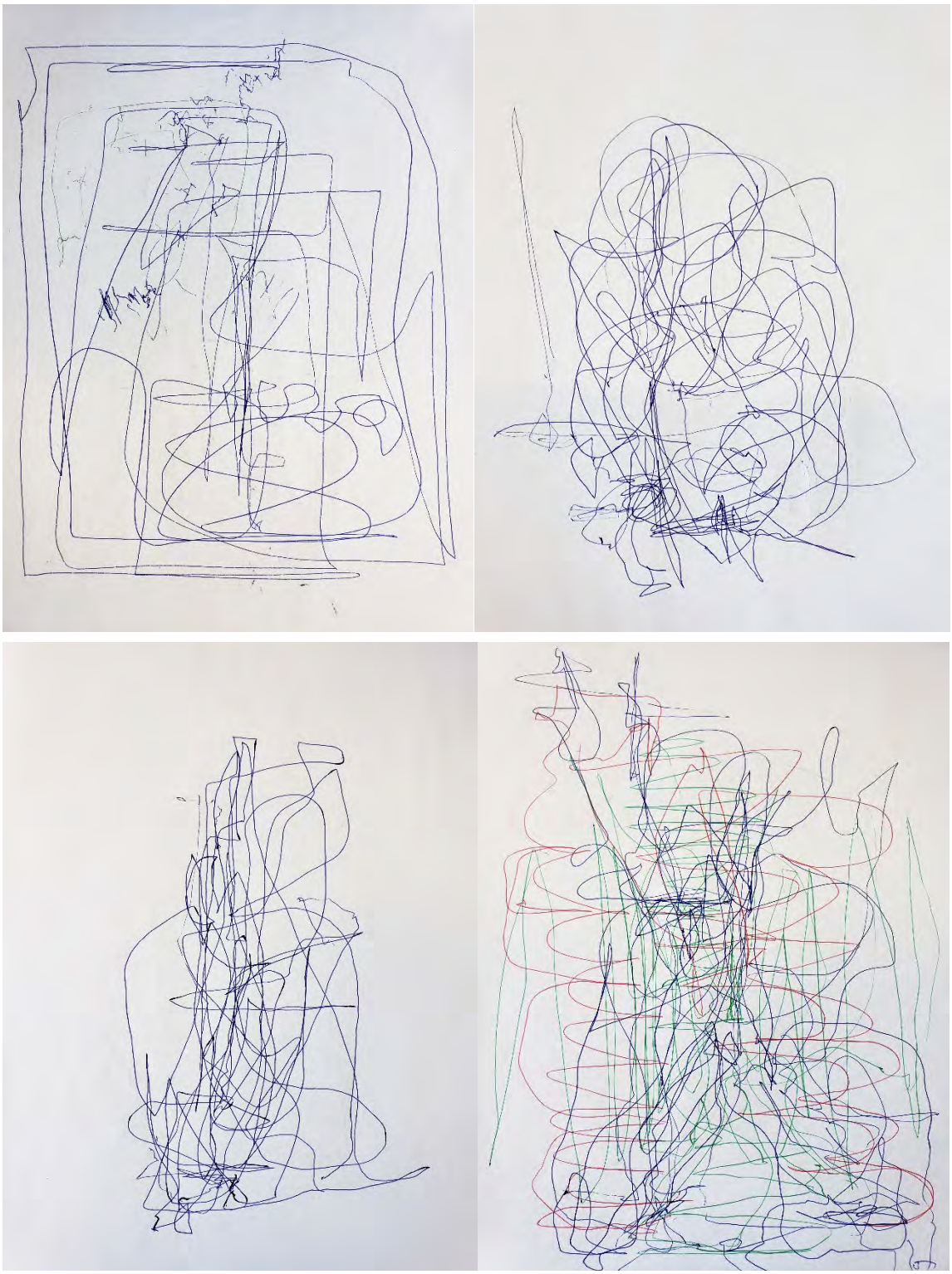


Every ridge, valley and hill leaves behind a drawing that is an idiosyncratic expression of how the user navigates the obstacles in the unknown.

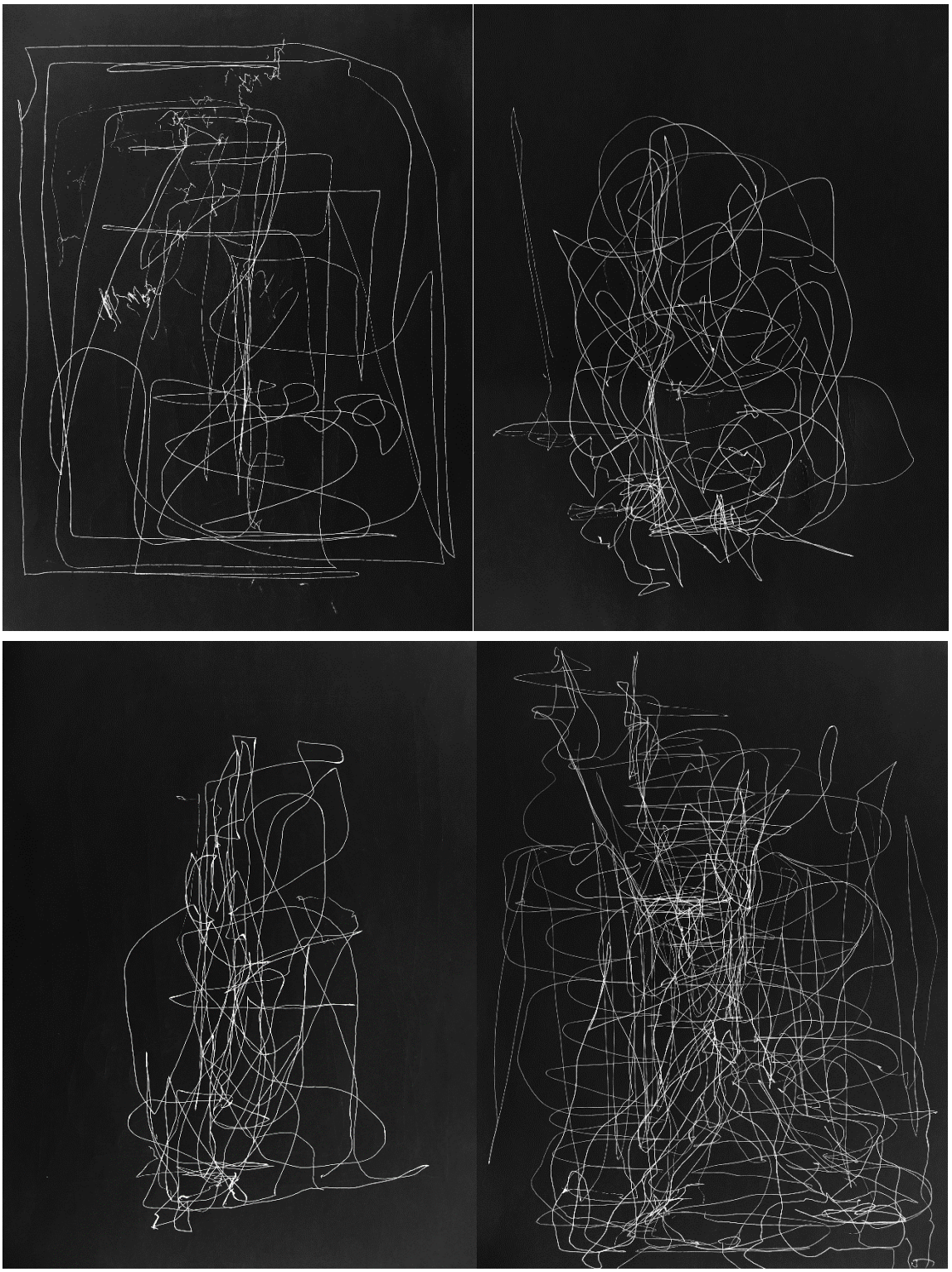


The variety of line weights are a result of how the user navigates the obstacles in the unknown. The greater the pressure applied to the pen; the more vertical freedom is given to the prod on the other side of the lever. The heavier line weight the greater the ease to travel across the terrain.

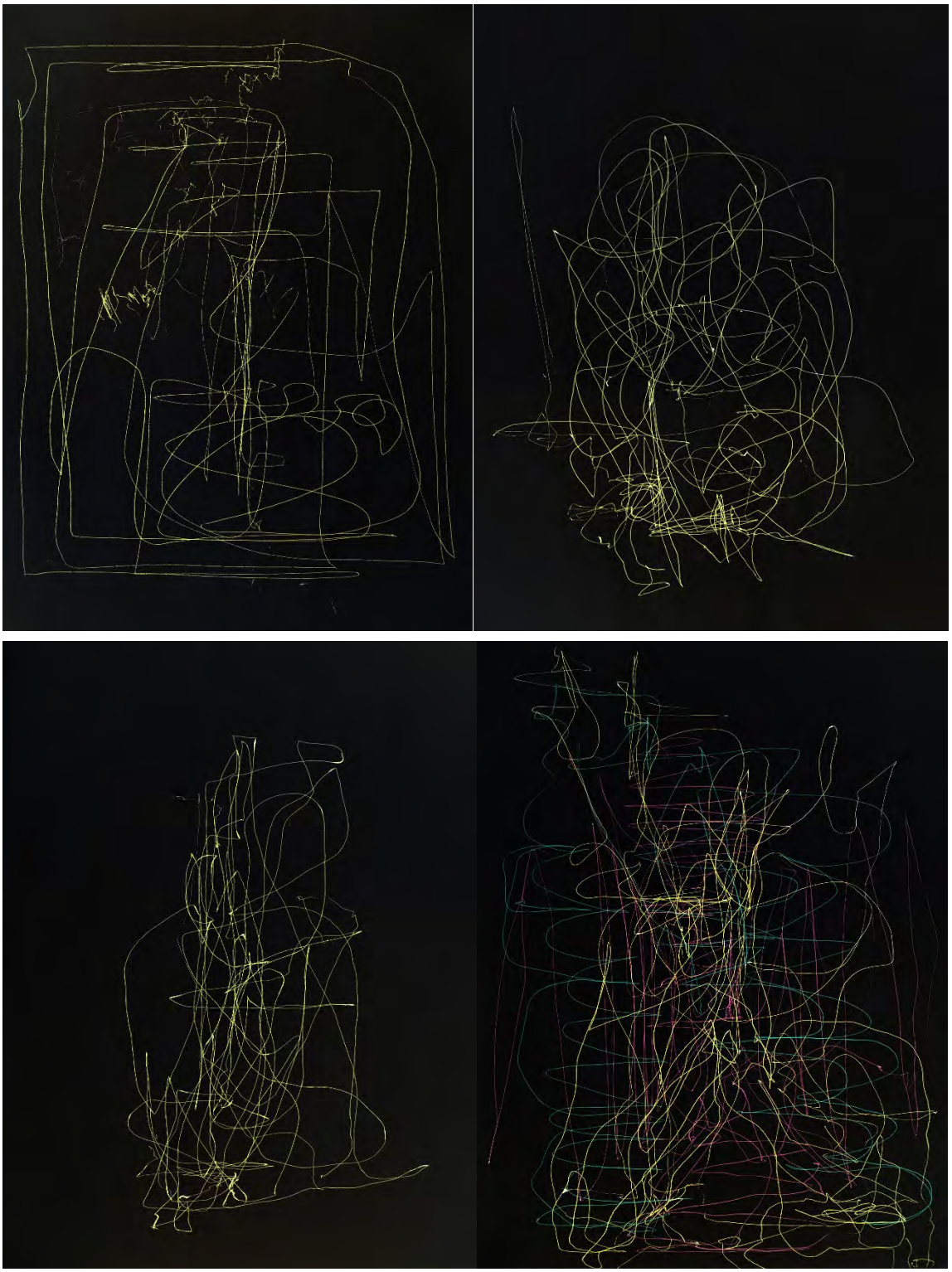
The exercise is one about speaking to something by revealing what it isn't. To define the edges of the unknown still provides us a silhouette.



Circum-Fracture Drawings #1 - #4



Circum-Fracture Drawings #1 - #4 (Desaturated and Inverted)



Circum-Fracture Drawings #1 - #4 (Inverted)

The intensity of the line weights are deeper where obstacles are being confronted.

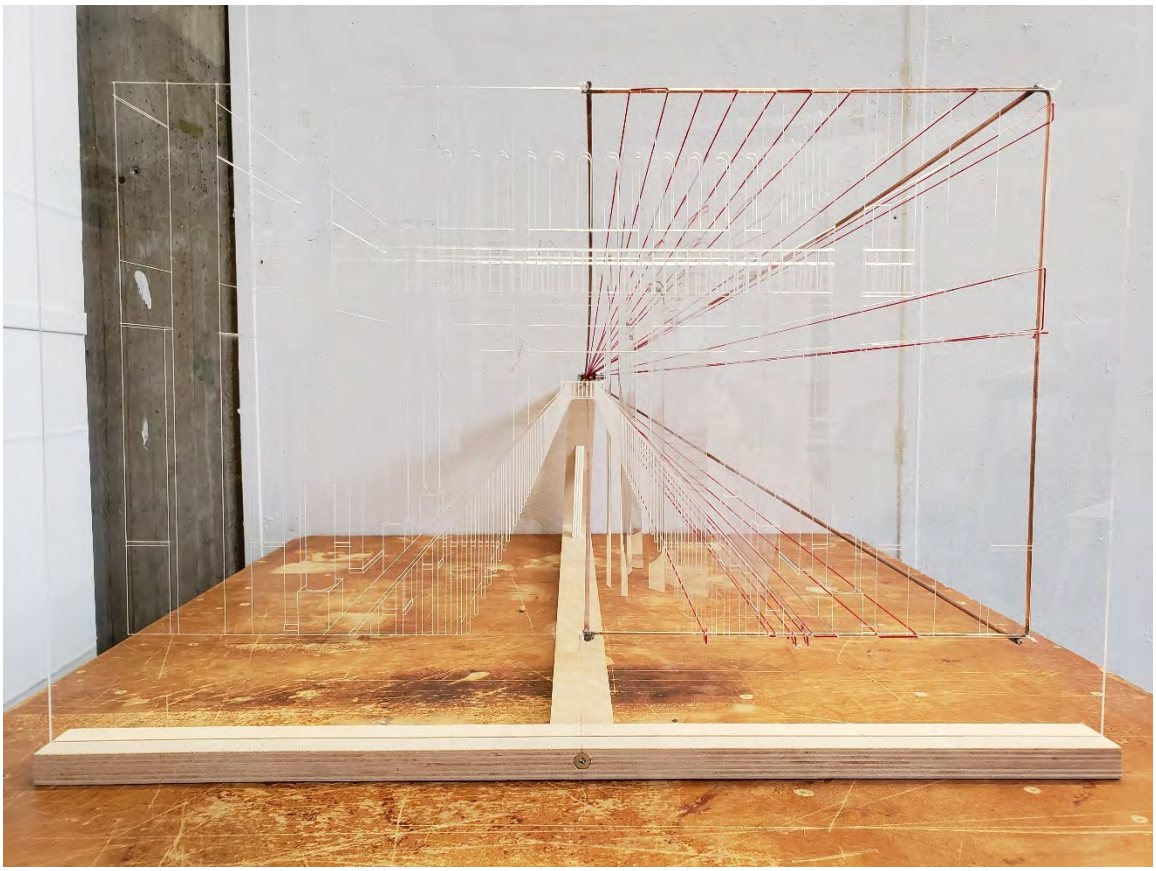
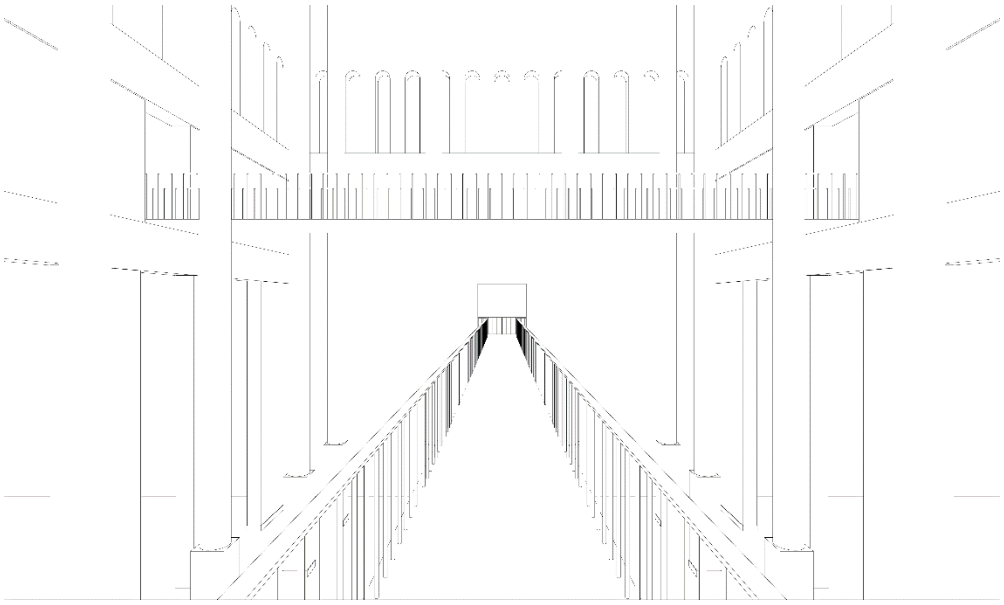
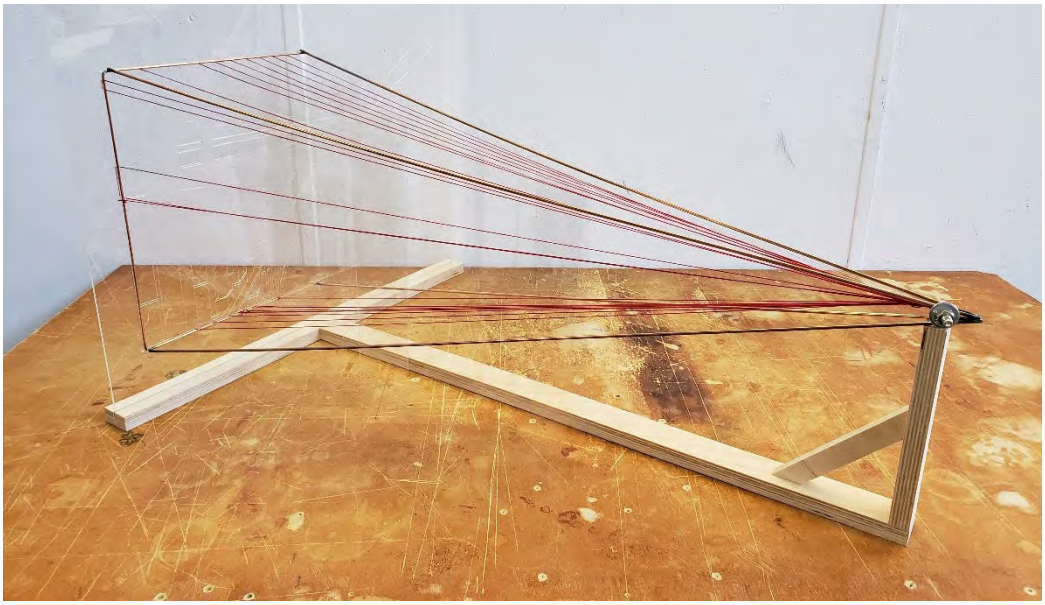


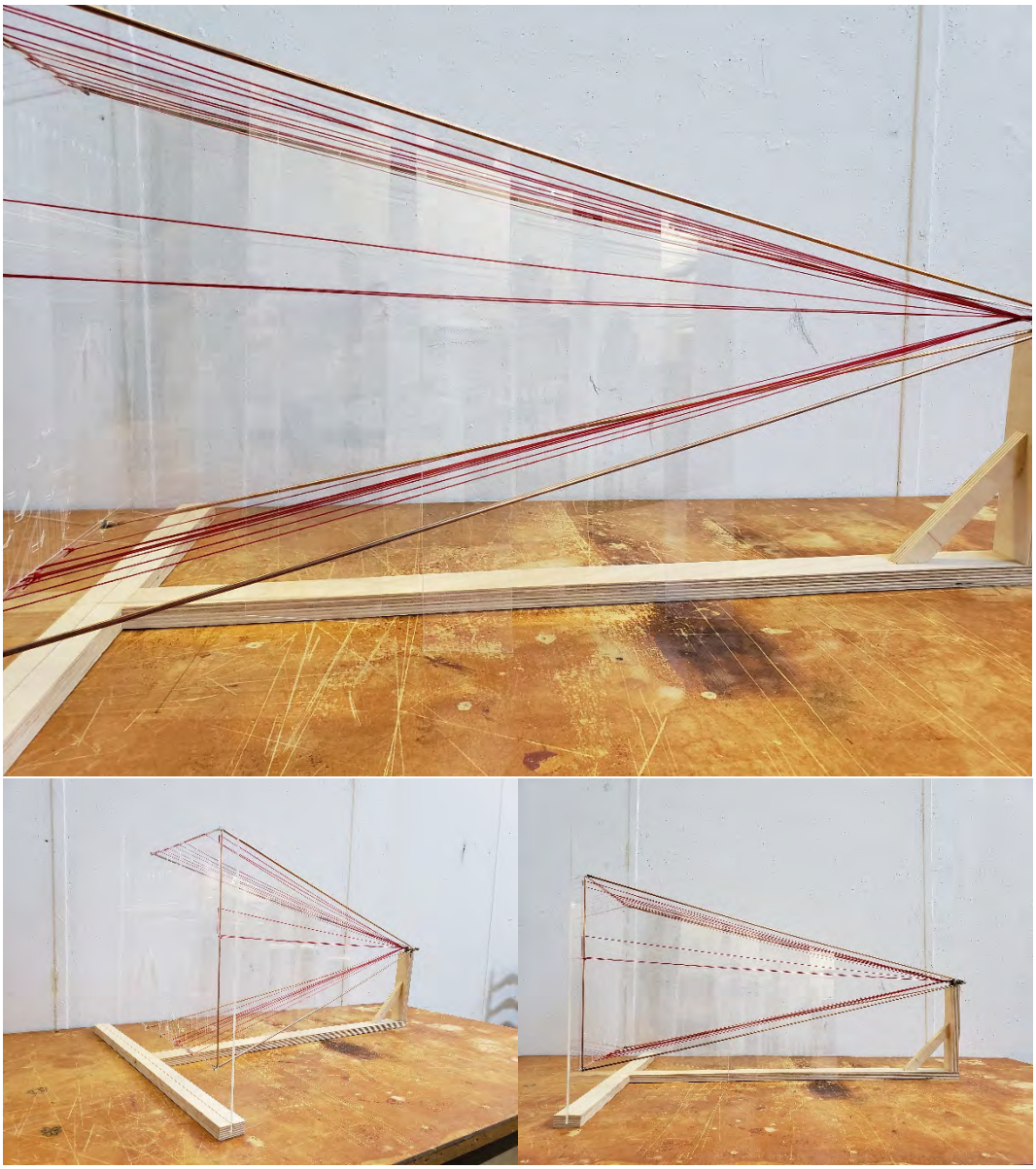
**Figure 19. Instability Machine: The Deconstructed Perspective**

The Deconstructed Drawing is a tangent into drawing itself. What we have been taught to do is draw a building, but this is an instance where we build the drawing. This machine reverses the projection of the perspective drawing and into its spatial components. The perspective planes are extracted and placed where they might align to the corresponding planes in the image itself.

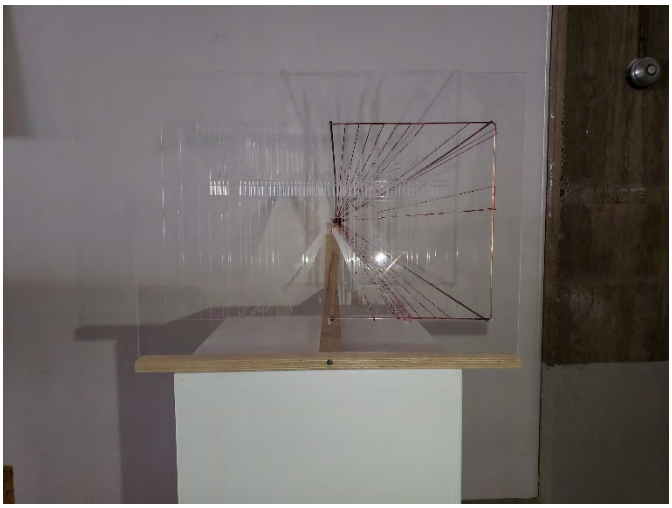


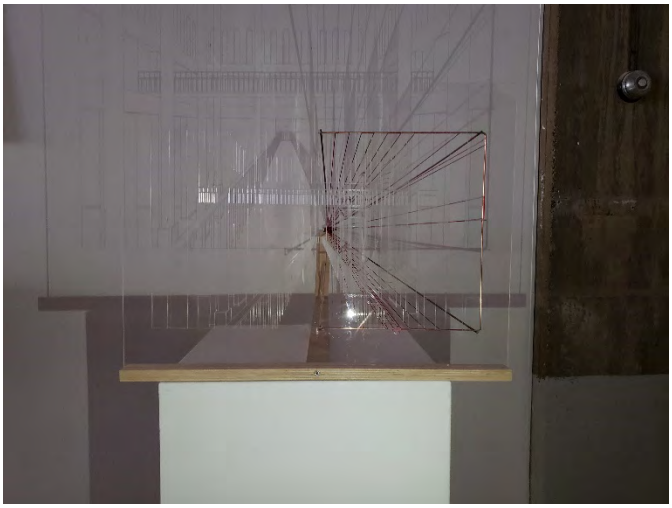


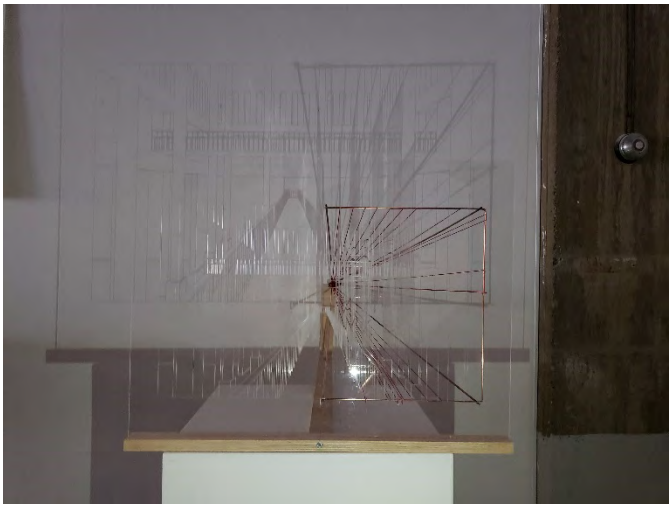
The initial drawing consists of a single point perspective drawing where perspectival lines are given a physical origin point.



Once the perspectival lines are drawn out, clear acetate planes hang within the perspectival space to be aligned with the planes within the drawing.







By shining a light through the center of the deconstructed drawing, the clear perspectival planes should cast shadows on the drawing's projected linework. If aligned correctly, the drawing of space has gained its spatial dimensions.

# Chapter 5:
# Drawing, Limits, and Opportunity

## A REFLECTION ON DRAWING

For Frascari, to read and draw the architectural drawing is to approach it 'line by line' and to read 'between the lines' in order to foster the architectural imagination and thinking:

> Architecture is not represented directly; rather, it is that which lies between the lines that appears most directly as it is able to manifest itself, reveal itself, give itself, exhibit itself, arise and materialize. That which occurs in this invisible realm is not 'somewhere else', it is 'in' the drawing itself: the architecture that is able to be discerned in-between is not elsewhere. (6)[32]

Frascari likens the approach to drawing to an observance of lovers in the park, to look beyond their casual speech but to take notice in their slight gestures, their pointed postures, and subtle movements that cue into the synesthetic articulations of their relationship. In this analogy, the act of reading and drawing the architectural image is a psychophysical expression where what doesn't need to be said can be left out of the conversation but still contain all its experiential, emotional and intellectual powers.

The tracings left behind by the instability machines are simple expressions of physical movements activated by a participant. In 'between the lines', they are the testing of boundaries defined by the machine - its dimensions, its material, its capacity for work, they are the captured event between an author and a mediator. It is a drawing removed of agency, of our determinacy over form. The relationship to these mediated drawings is like that of being caught in a seismic event, where our agency has been superseded by the logic of another, where its duration leaves us only in uncertainty. We become limited until we've return to stability and to gain control of our thoughts again. Once the event is over, we can survey its affects and define what was and what has changed.

[32] (Frascari, Models and Dawings - The Invisible Nature of Architecture)

To revisit the Frascari's analogy, the lovers in the park, it is not so important how they have come together or where they end up being, but it is their intimacy that gives significance over any other interaction. What goes unsaid speaks loudest. To draw what is unstable would only be representational.

To draw through a machine, to mimic the relationship between fraught landscape, and architecture, is to bring awareness to the event. The event is the emergences of the happening. In the pursuit of embracing instability, it would be too late to if all we had left was the happened. What delivers us from rigid thinking, from irresponsible representation, is to accept what we do not know but to employ the techniques that we do know so that they become the lines to read in between.

# Conclusion:
# Land, Methodology and Embrace

At the beginning of this thesis, the landscape was something to be feared. The ground was more than just a formal consideration in the architectural design process, it embodied destructive and tumultuous qualities antithetical to architecture. The relationship between the ground and the built environment, the unstable and stable, spoke to an imagination of a more dynamic or adaptable form of architecture. The dynamism is what haunts the urban fabric and it is also what creates the conditions of site but can this tension be brought to the present, not as dreaded anticipation but as a design attitude that celebrates and designs for tension, trepidation and fraughtness.

How should an architect address or approach an inherent quality of the land that is both foundation and danger to architecture? To understand something that is a threat to architecture and what architecture represents, begins with examining the limits of our knowledge and our forms of communication. Architectural representation and its varied techniques, such as sketching, drawing or modeling, is more than just a means to impart ideas. Drawing, as note-taking, sketching, or final form communication, functions as an extension of our memory, our thinking, and our intent. Drawings serves as an analogue between intent and space through pen and paper. The experimentation and examination of representation is not to find better ways to assert more forms of determinacy but to affirm drawing an active mode of learning, testing and thinking. To question the ways we make and read a drawing, we learn of our limits and biases with which we employ and approach the world as designers.

This thesis is a method of methods - it reflects upon a myriad of tools, technologies and conventions that have determined how we read and represent ideas but alters their typical workings so to say something different while questioning the lens with which we see things. The use of the seismic as provocation to explore ideas of unpredictably, instability and suddenness in architecture requires the rearticulation of architectural materials, tectonics and verbiage. A manipulation of conventions and

building technologies keep all the experimentations within the theoretical and practical boundaries of architecture while its ruminations allows the imagination to expand upon what architecture and architectural drawing can be. It is a method that takes from what is within the realm of architecture and refashions its constituent knowledges to explore what it isn't.

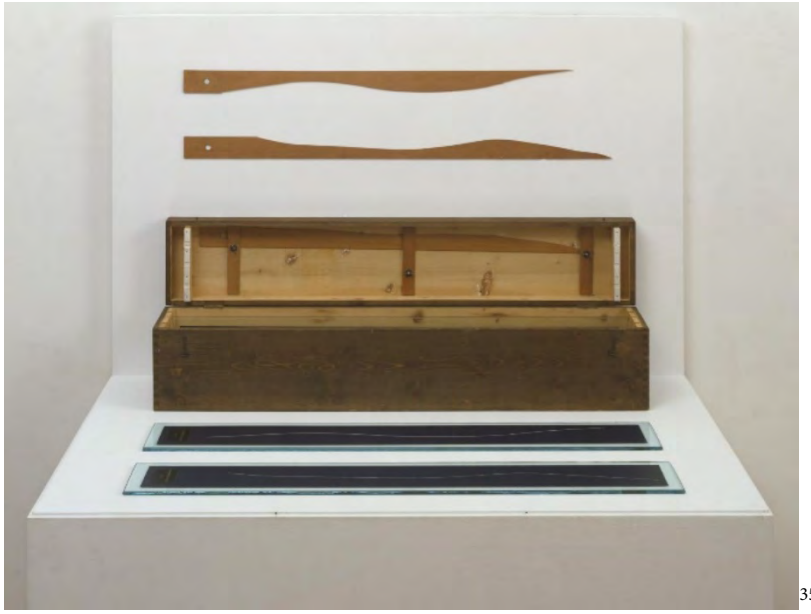
As a method of creative practice, a method of methods challenges the history of the tools and conventions that we employ. It is the intentional disruption and unsettling of what we know that reframes and refreshes what we see. It is the active and productive mode of revisiting conventions with the total purpose of challenging and reinforcing what is worthwhile and what has been forgotten. The instability machines, at their core, are tectonic and sculptural expressions with kinetic or mechanical functions that translate intentional gestures into unintentional gestures. The outcomes or drawings produced by the instability machines are translations between intent or activity, mediated by the limits of a logic or technology. The translations embody a logic not placed in the cold defined edge of rationality but one of unpredictable certainty – we know paper wrinkles but we do not know when; we know a fabric bunches and buckles but we can not guess where; momentum travels but we do not know how far. The user engagement, the hand that expects, engages the mechanical that pushes the material logic until something moves or breaks in the path of least resistance. The value in this type of drawing, this type of translation, is in the knowing that what is produced is equally as valuable as its rationale counterpart but in a more intimate and personal relationship to it. This is a method does not impose rigidity in expression or in understanding but requires the personal confrontation of knowledge and thinking to be tested. It is this introspection but not necessarily in resolution, that is the most productively engaged with the uncertain site or uncertain mind. To embrace the uncertain, the unstable and the sudden, as demonstrated by the machines and drawings, is to get involved, to become equally dynamic, and to revel in what is unsettled because that is where one will always uncover new ground.

# APPENDICES

## First Appendix: Impetus of Art

Representation is a means of understanding and thinking. In an architectural context, the primary mode is that of drawing, which typically concerns itself with ideas of space and order. For artists, they have not only made work to express similar ideas through a greater variety of mediums, but they also challenge and critique the nature and relationship of these ideas. This appendix is an exercise in refinement and curation and consists of a variety of artworks that have informed how this thesis might better envision and represent ideas that antithetical to architecture.

 [33]  [34]

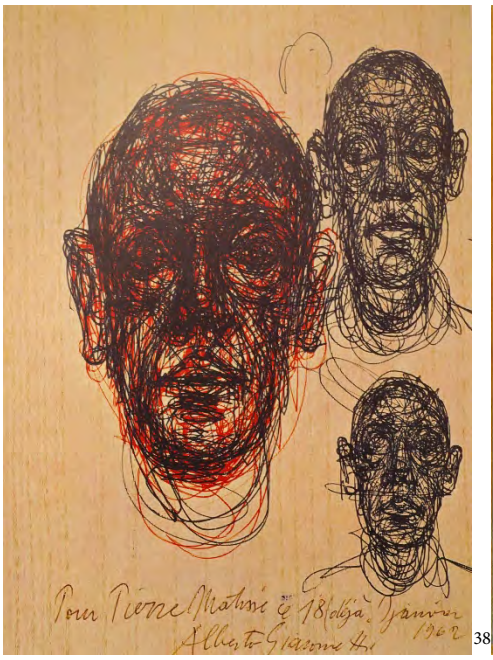
 [35]

Duchamp subverts instrumentality by rethinking the rationale within systems. In the *3 Standard Stoppages,* Duchamp takes a meter-long string and drops it onto a plane of glass. Where ever it landed, it would be adhered permanently and recreated into a ruler. It became a measure of a meter without a rational basis.

[33] (Duchamp, Nude Descending a Staircase (No. 2))
[34] (Duchamp, The Bride Stripped Bare by Her Batchelors, Even)
[35] (Duchamp, 3 Standard Stoppages)

36

37



38

39

Personal psychological trauma underlined Giacometti's work since 1935. His human forms would take on a "thinness", an increasing attenuation of the figure.

---

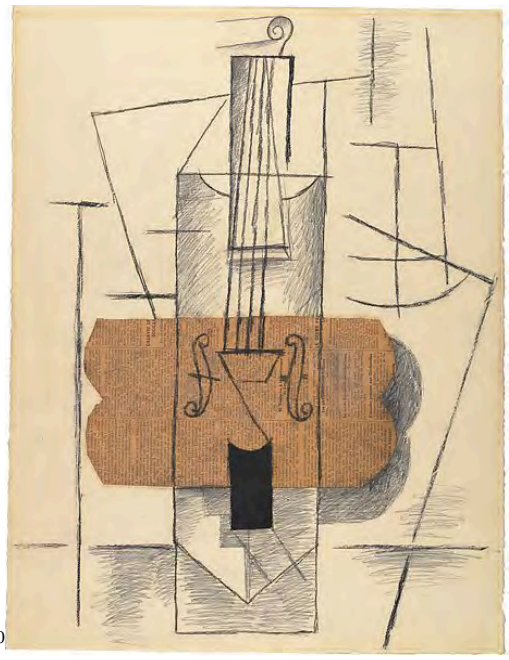
[36] (Giacometti, Nu debout)

[37] (Giacometti, Grande Figure)

[38] (Giacometti, Sketches from Notebook)

[39] (Giacometti, The Artist's Mother)


[40]


[41]


[42]

The cubist movement was a collaboration between Picasso and Braque. A means to represent a single reality from different perspectives in space. What parts were missing the viewer could fill in.

[40] (Picasso, Standing Female Nude)
[41] (Picasso, Composition of Violin)
[42] (Picasso, Still Life with a Bottle of Rum)


[43]


[44]

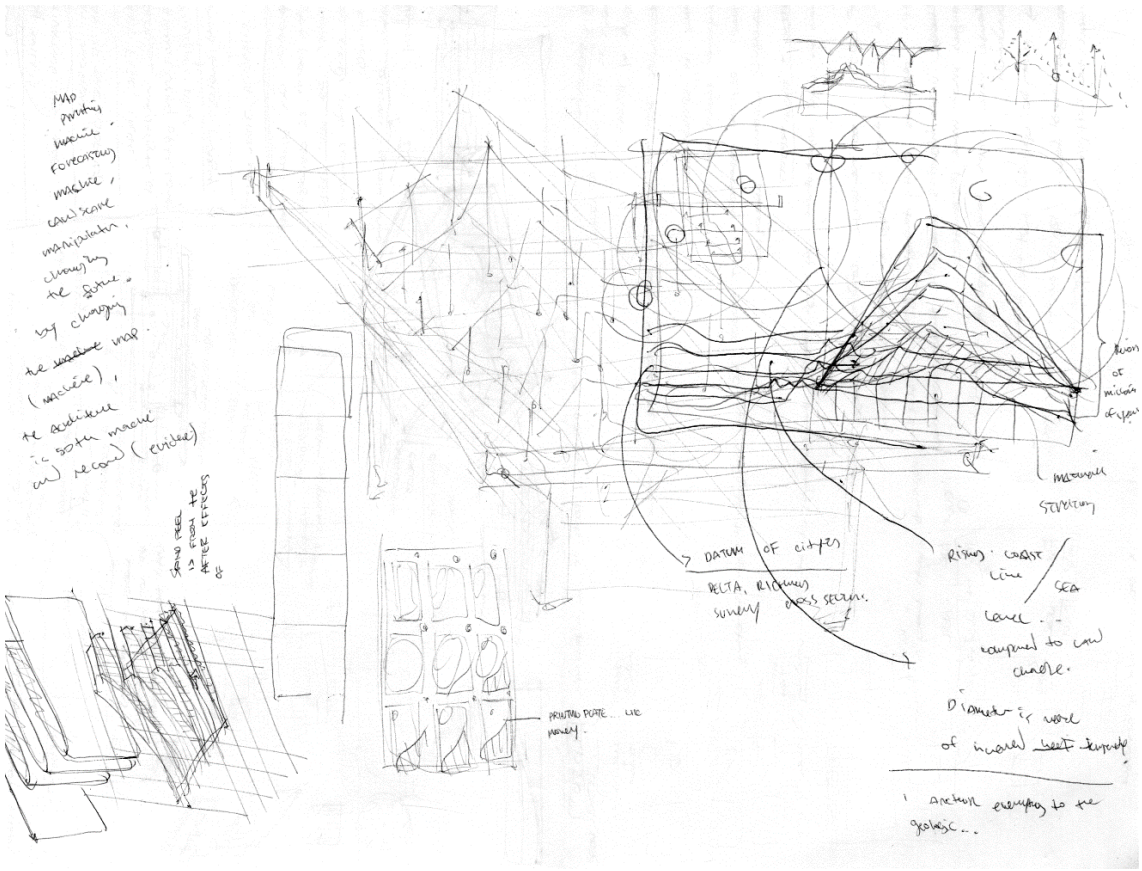

[45]

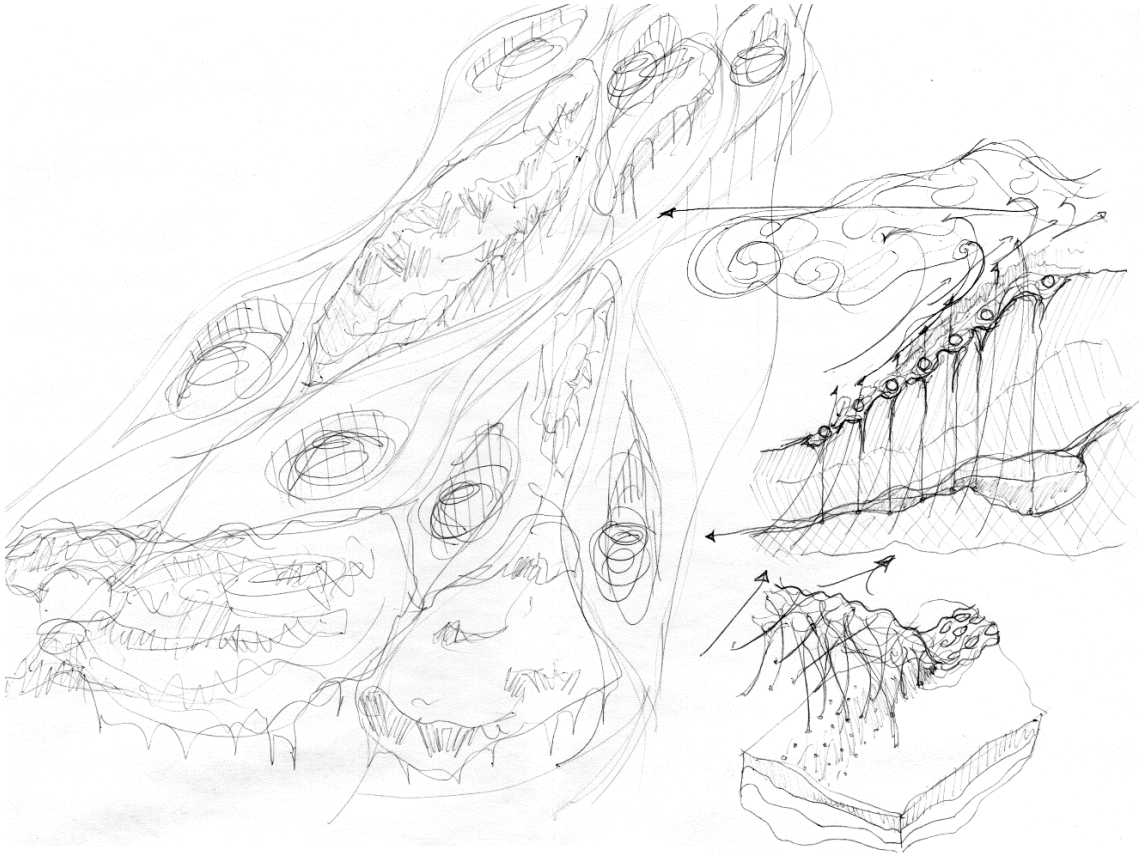
Brancusi recalls a story form his youth where his aunt would bring home a live fish for dinner. The fish was left in the basin awaiting preparation and young Brancusi would watch the fish in case it escaped. He was mesmerized by vitality, as it twisted and turned violently, and its scales would catch the light and shimmer.

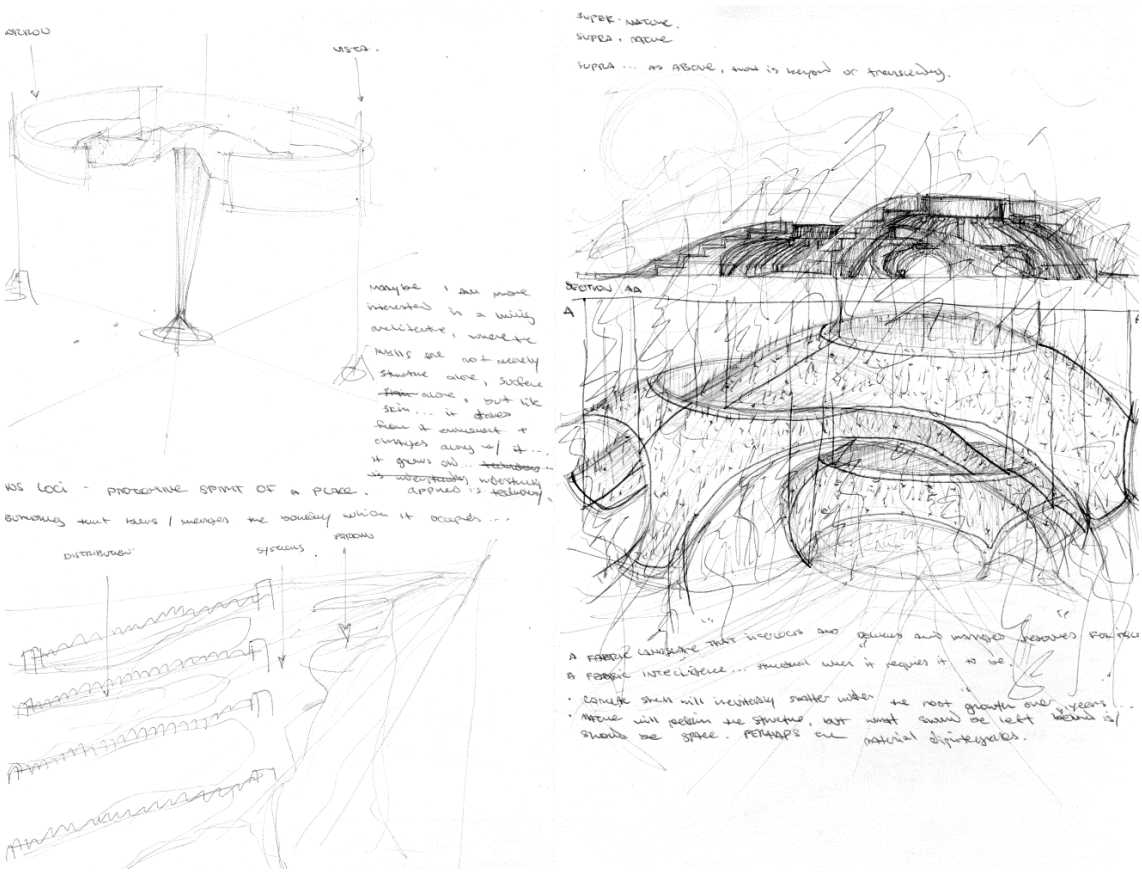
[43] (Brancusi, Bird in Space)
[44] (Brancusi, Fish)
[45] (Brancusi, The Gate of Kiss)

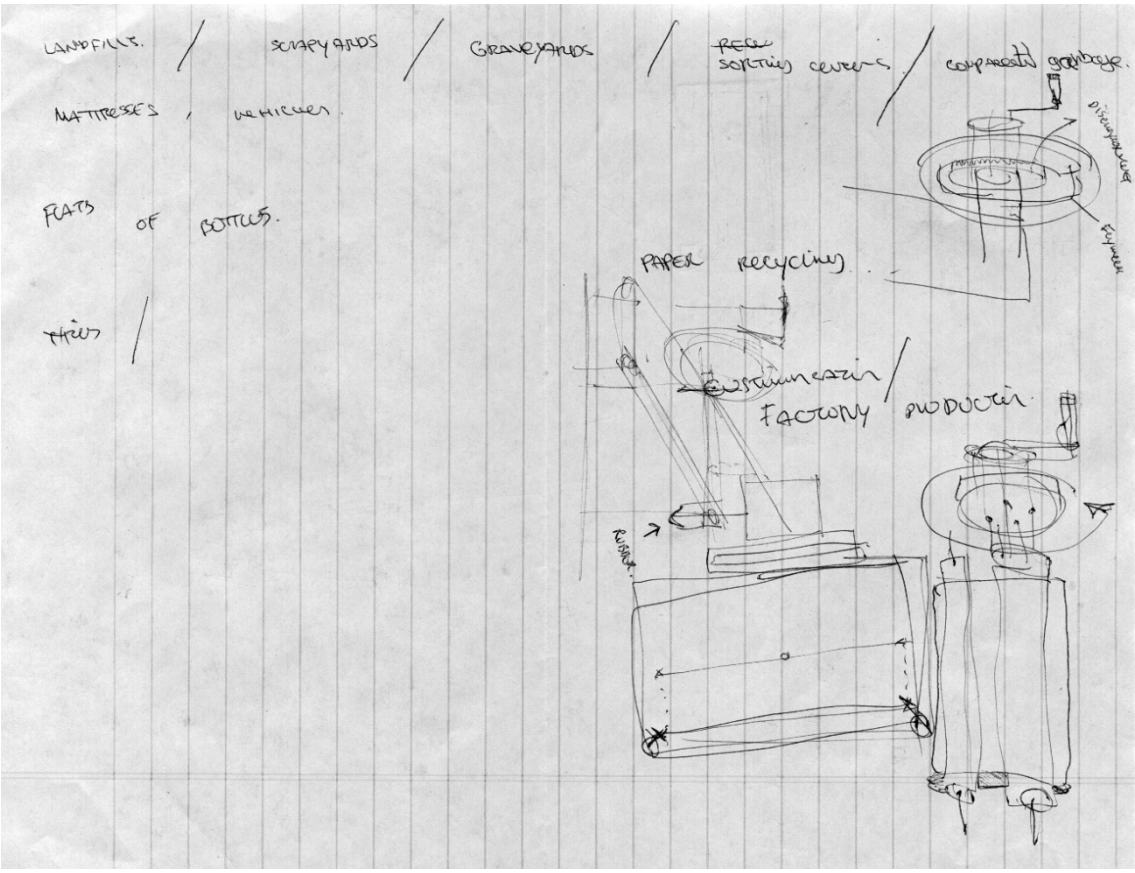
# Second Appendix: The Motive Sketches

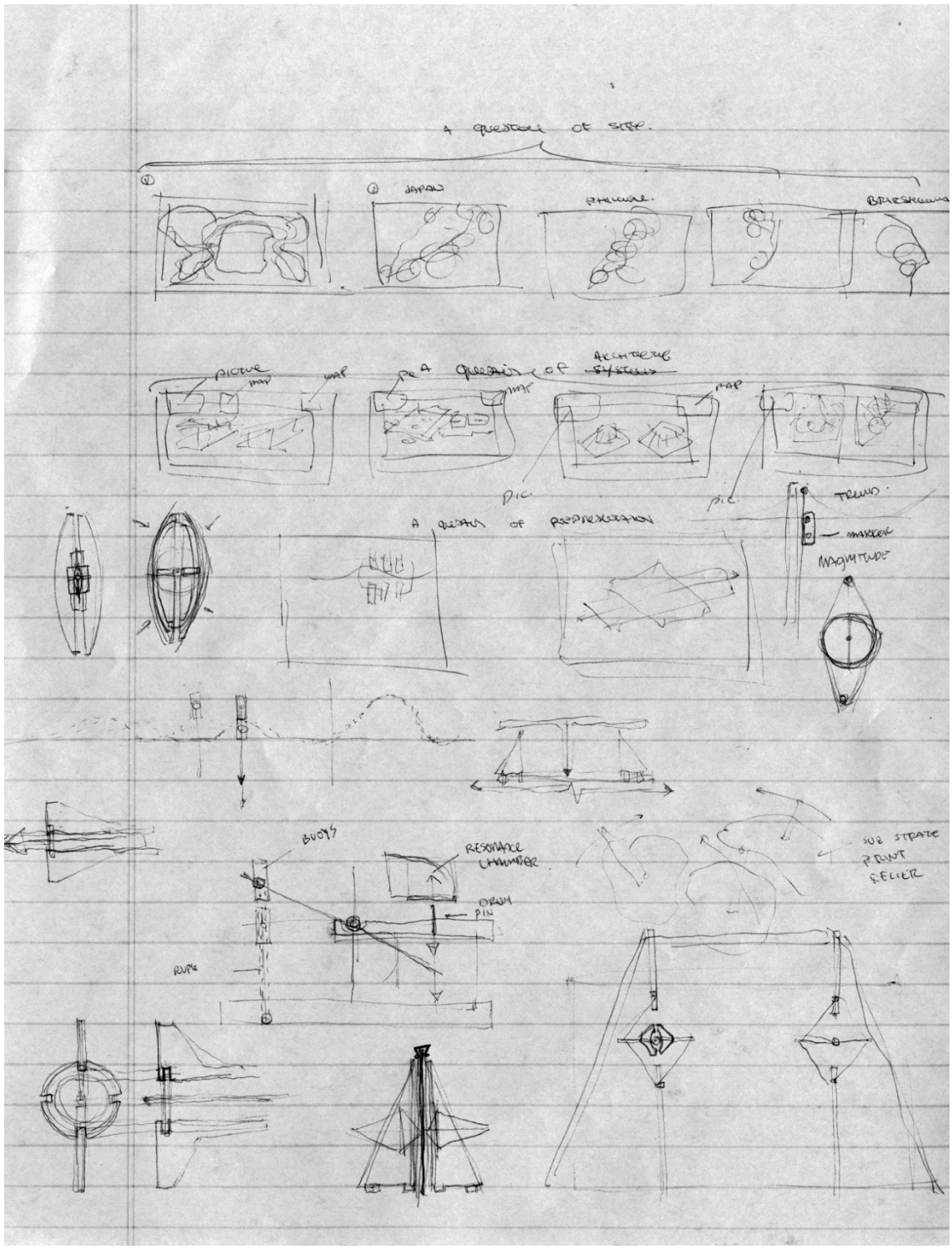
Through the sketch, the exploration of movement and uncertainty were modeled. Drawings of landscapes, machines and vectors were tested against each other over many iterations. These sketches, in all their uncertain and unfocused energies, are the real foundation of this thesis.

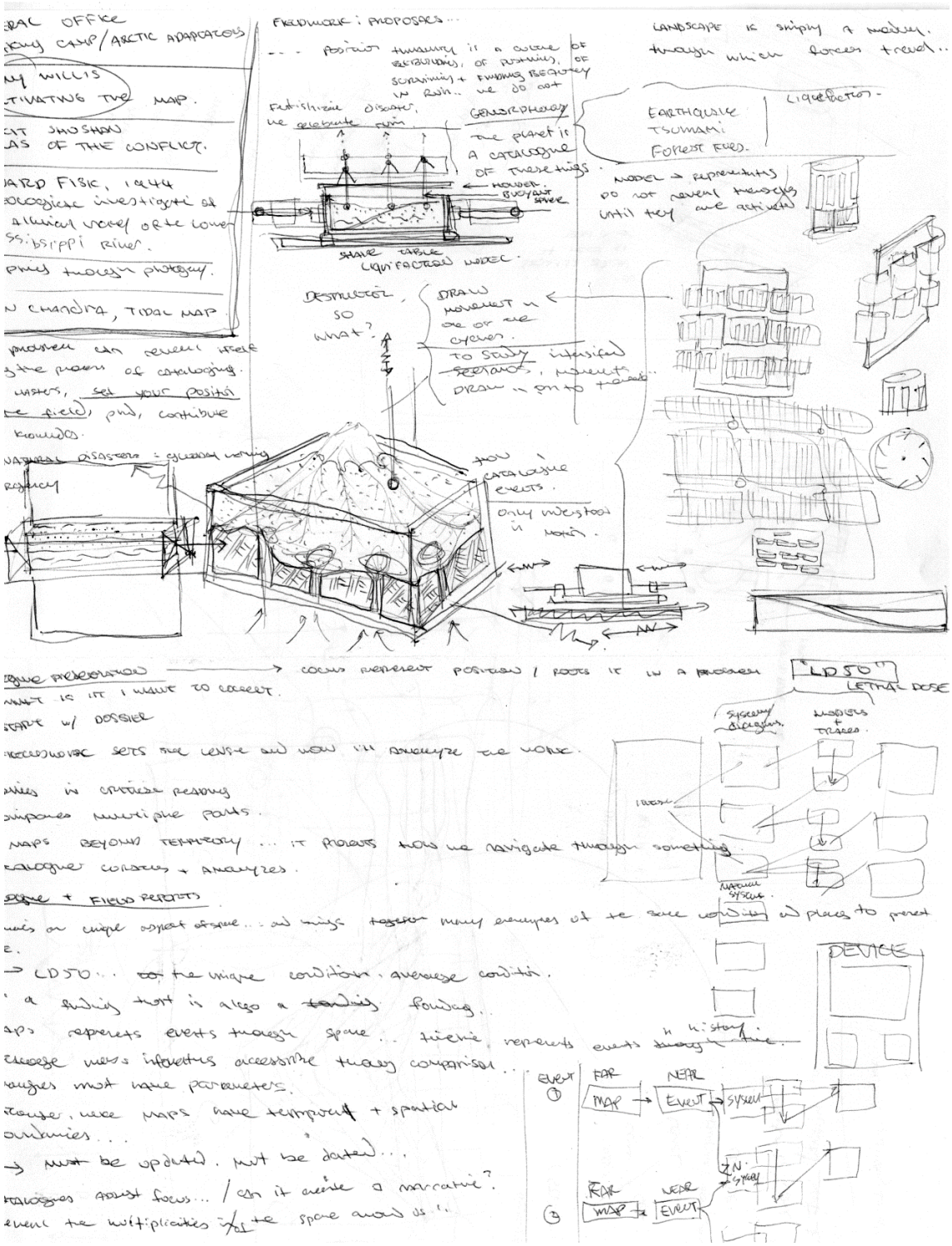

Map
printing
machine.
Forecasting
machine,
can have
manipulation,
changing the future.
by changing
the map.
(machine),
the audience
is both machine
and record (child)
DATUM OF CITIES
DELTA, RIVERS
SURVEY
RISING COAST
LINE
SEA
LEVEL..
compared to cow
chewing.
Diameter is more
of inward heat temperature
Anchor everything to the
galaxy...
STATION

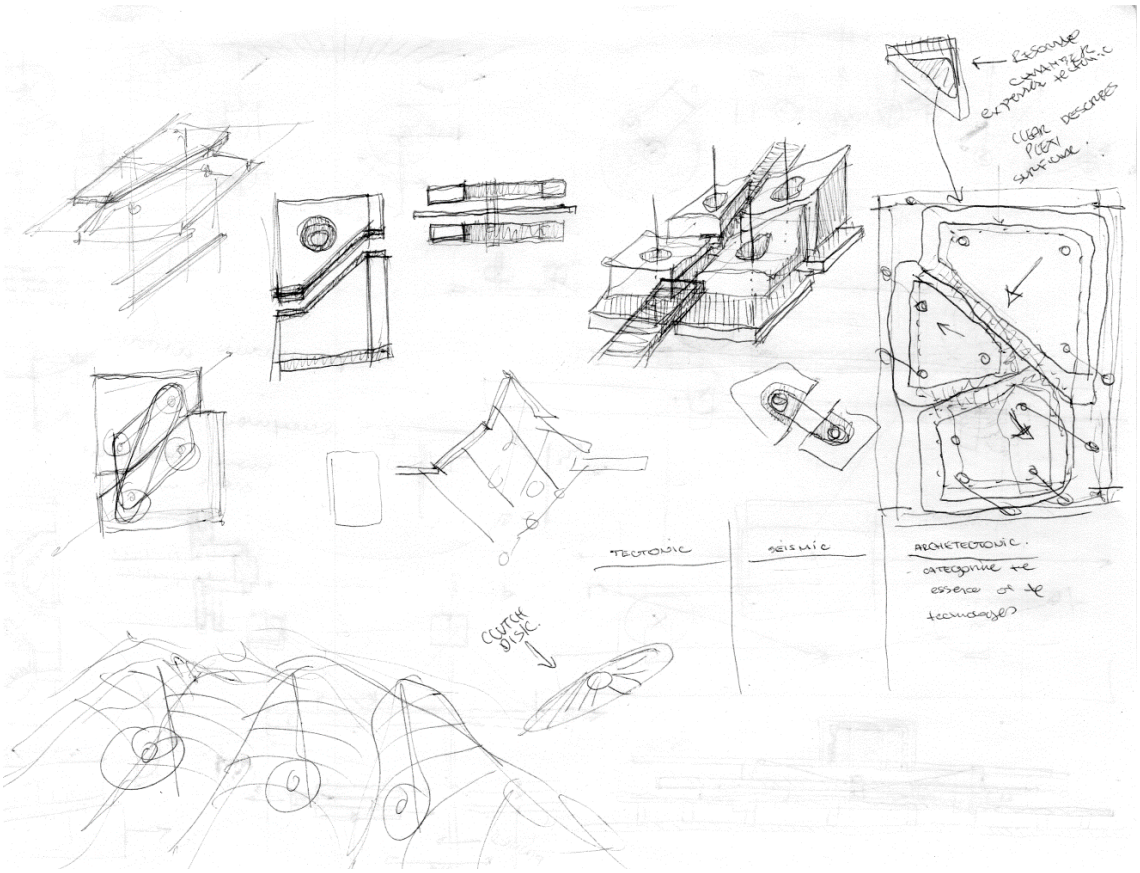


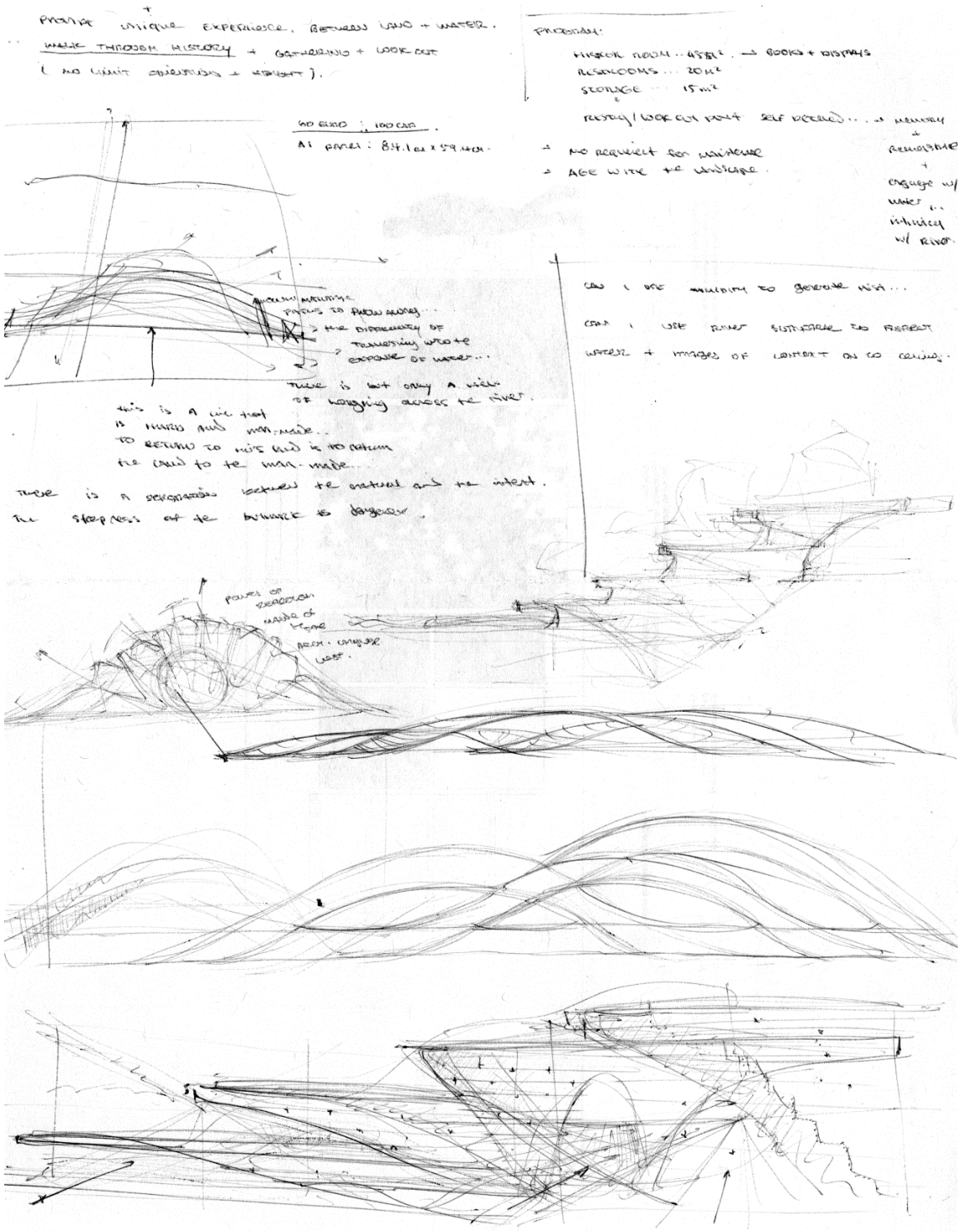

SUPER - NATURE.
SUPRA, NATURE
SUPRA ... AS ABOVE, THAN IS BEYOND OR TRANSCENDING.
SECTION AA
A FABRIC LANDSCAPE THAT INFORMS AND DEFINES AND MANAGES SERVICES FOR YOU
A FABRIC INTELLIGENCE ... ANIMATED WHEN IT REQUIRES IT TO BE.
· CONCRETE SHELL WILL INEVITABLY SHATTER WITH THE ROOT GROWTH OVER 50 YEARS ...
· NATURE WILL REGAIN THE STRUCTURE, BUT WHAT SHOULD BE LEFT BEHIND IS/ SHOULD BE SPACE. PERHAPS EVEN MATERIAL DIGITALISATION.
MAYBE I AM MORE INTERESTED IN A WILDLY ARTICULATE, WHERE THE WALLS ARE NOT MERELY STRUCTURE ALONE, SURFACE ALONE, BUT LIKE SKIN ... IT GROWS OVER & ENVELOPS & CHANGES ALONG W/ IT ... IT GROWS ON ... WITH WHATEVER APPROACH IS REQUIRED.
AS LOCI - PROTECTIVE SPIRIT OF A PLACE.
SOMEWHERE THAT HEALS / MERGES THE SOCIETY WHICH IT OCCUPIES ...
DISTRIBUTION
SYSTEMS
PATHWAYS

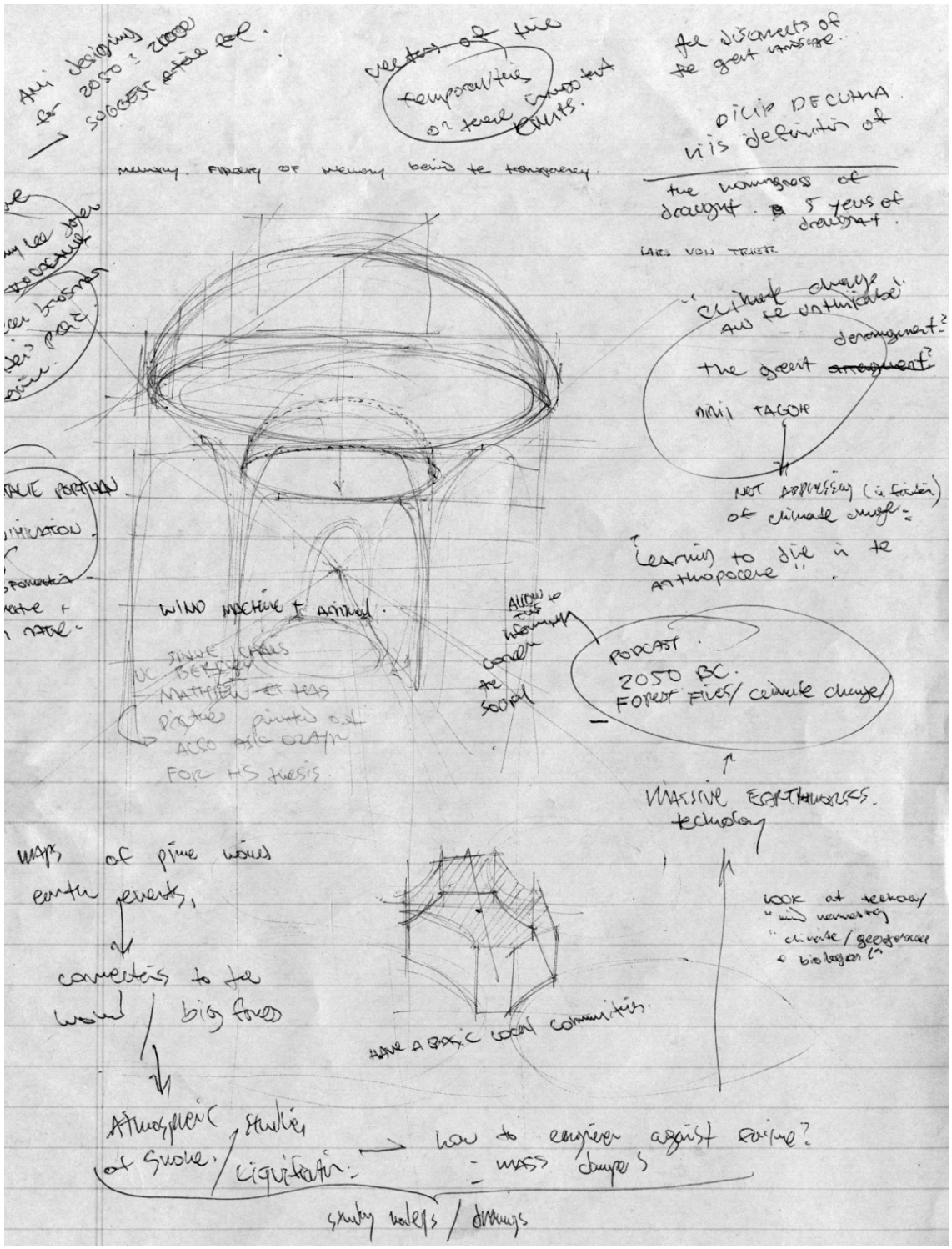

LANDFILLS.
SCRAPYARDS
GRAVEYARDS
SORTING CENTERS
COMPOSTING GARBAGE.
DISCHARGE
FLAKES
MATTRESSES
VEHICLES.
FLATS OF BOTTLES.
PAPER RECYCLING.
CONSTRUCTION
FACTORY PRODUCTION.
RUBBER.

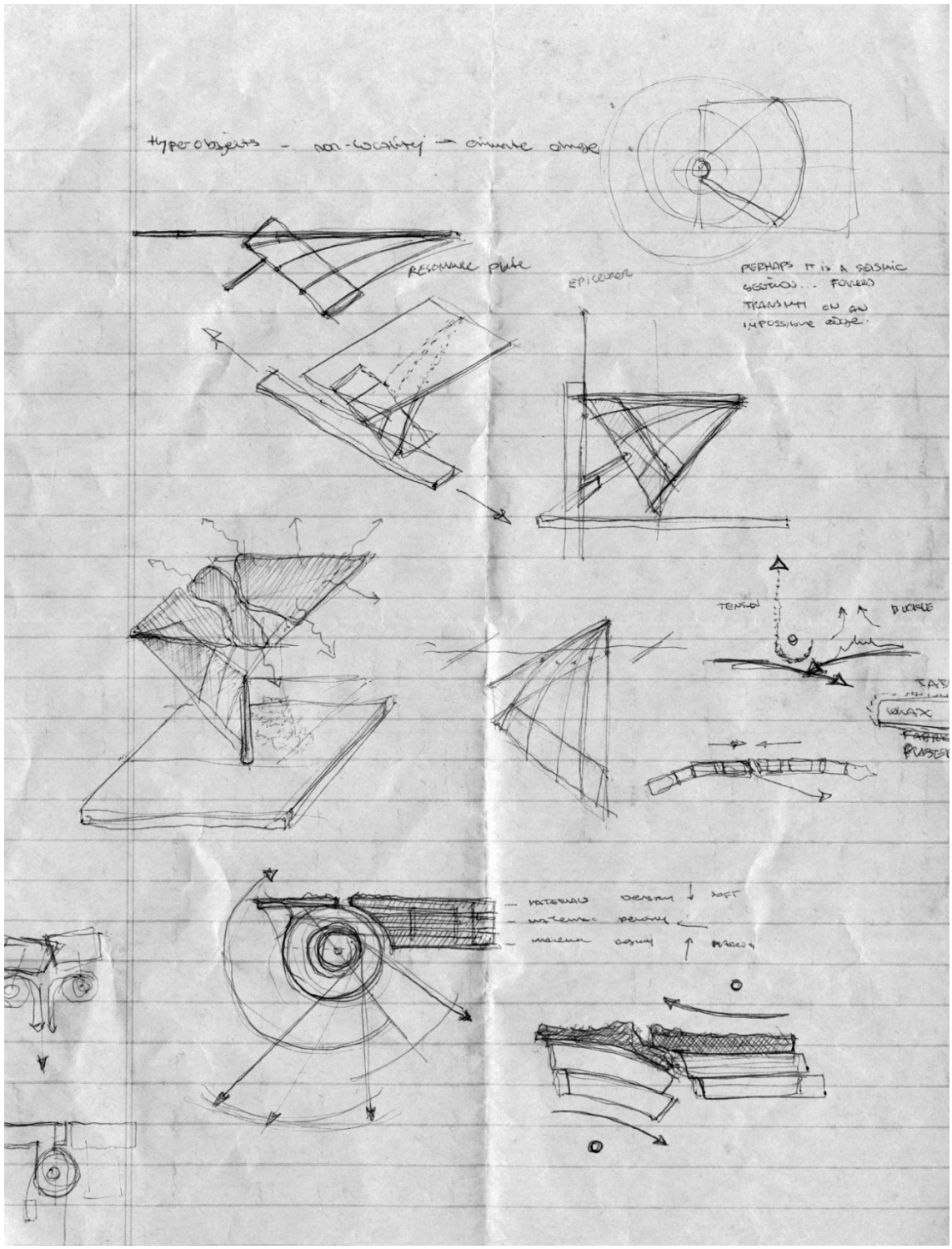

A QUESTION OF SCAR.
JAPAN
PICTURE
MAP
A QUESTION OF ARCHITECTURE SYSTEMS
MAP
PIC.
TRENDS
MARKER
MAGNITUDE
A QUESTION OF REPRESENTATION
BUOYS
RESONANCE CHAMBER
DRUM
PIN
RUPE
SOB STRATE
PRINT
FELLER


FRAMEWORK : PROPOSES...
LANDSCAPE IS SIMPLY A MEDIUM, THROUGH WHICH FORCES TREND..
EARTHQUAKE
TSUNAMI
FOREST FIRES.
LIQUEFACTION -
MODEL → REPRESENTATIONS DO NOT REVEAL THEMSELVES UNTIL THEY ARE ACTIVATED
SHAKE TABLE LIQUIFACTION MODEL.
DRAW MOVEMENT IN ONE OF THE CYCLES.
TO STUDY INTENSIFIED SCENARIOS, MOMENTS
DRAW IN ON TO TIMELINE
NOW A CATALOGUE EVENTS.
ONLY UNDERSTOOD IN MOTION.
"LD50"
LETHAL DOSE
SYSTEMS DIAGRAM.
MODELS + FRAMES.
NATURAL SYSTEMS.
DEVICE
MAP
EVENT
SYSTEM
FAR
NEAR


TECTONIC
SEISMIC
ARCHITECTONIC.
CLUTCH DISC


PROGRAM:
MIRROR ROOM .. 45 m² → BOOKS + DISPLAYS
BEDROOMS .... 20 m²
STORAGE .... 15 m²
SLEEPING / WORK ON PORT SELF CONTAINED ... → MEMORY + REMEMBRANCE + ENGAGE W/ WATER ... INTIMACY W/ RIVER
→ NO REQUIREMENT FOR MAINTENANCE
→ AGE WITH THE LANDSCAPE.
AI PANEL: 84.1 cm x 59.4 cm.
PATHS TO FOLLOW ALONG...
→ THE DISCREPANCY OF TRANSITING WITH THE EXPOSURE OF WATER...
THERE IS NOT ONLY A VIEW OF LONGING ACROSS THE RIVER.
this is a line that is natural and man-made...
TO RETURN TO NATURE IS NO RETURN
THE CALL TO THE MAN-MADE...
THERE IS A SEPARATION between the natural and the intent.
THE STEEPNESS OF THE BANKS IS DANGEROUS.
CAN I USE WATER TO GENERATE NOISE...
CAN I USE RIVER SUBSTRATE TO REFLECT WATER + IMAGES OF LIGHT ON TO CEILING.
POLES OF REFLECTION MADE OF STONE
REFLECTING LIGHT.


temporalities
DICIP DECUNHA
his definition of
the roundness of drought
5 years of drought
LARS VON TRIER
climate change are the antithesis
the great disengagement?
NAVI TAGORE
NOT ADDRESSING (i.e. fiction) of climate change
"Learning to die in the anthropocene"
WIND MACHINE + animal
PODCAST
2050 BC.
FOREST FIRES/ climate change
MASSIVE EARTHQUAKES.
technology
MAPS of pine cones
earth events,
connections to the world / big forest
HAVE A BASIC LOCAL COMMUNITIES.
Atmospheric studies of smoke, liquification
how to engineer against fire?
mass changes
sunday walks / drawings


RESONANCE plate
EPICENTER
PERHAPS IT IS A SEISMIC
TRANSLATE ON AN
IMPOSSIBLE EDGE.
TENSION
DUCTILE
WEAK
PLASTIC

FROM ABOVE...

- THE PERMA FROST,
- THE ICE FLOW,
- THE GOLF,
- THE FLIGHT OF CANADIAN, FLITTERING, FLUTTERING, CHASSING, THE CANADIAN AS, REWARDING, DIVINING.

GHOSTS OF SNOW AND SKY,

- EVERYTHING REMINDED IN A CONSTANT STATE OF PRESERVATION.

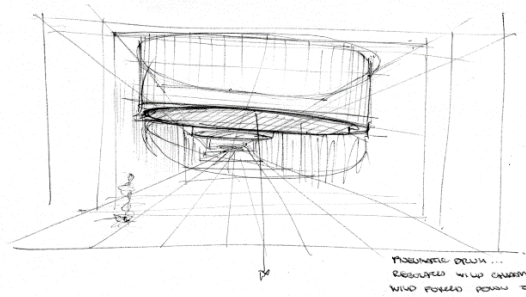
S OUT LIFE IN OUR QUEST... ~~[illegible]~~ COMING OFF FROM THE LANDSCAPE.
THE NORTHERN... (NEVER TURN AROUND THE NORTHERN).

TOWNSHIP IS IN ~~PERPETUAL~~ THE ILLUSION OF CLIMATE... WORKING...
IMPLIED / ENTERED / ORDERED TO RESSEMBLE SOMETHING FAMILIAR
S / COVERS...

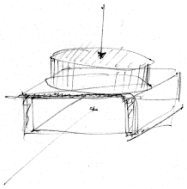
WHAT NOTHING BUT CHAMBERS SCATTERED ACROSS THE FROZEN LANDSCAPE...
EXTREME OF LIGHT BEAMS, OF
- SUNSHINE ALREADY AND STARS FROM BEHIND.
~~TOWERS~~ FAMILIAR TRAILS...
CAN NEVER BE LOST WHEN YOU'RE ALWAYS HOME.
S EVERY MAN IS A NORTHERN. BEHIND EVERY INDIVIDUAL, OR THE
OF THEIR BEING IS A WITNESS, A WITNESS THE NORTHERN...

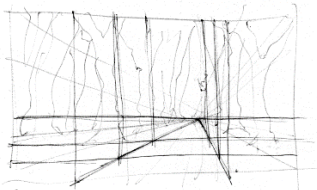
IS A CITY IN A STATE OF PRESERVATION.
IN THIS LANDSCAPE, ALL MEN BECOME SHADOWS...
FRONTIERS IS ONE WHERE WE STEP INTO THE FRONTIER...
IS A CULTURE WHERE EVERY MINUTE IS NEW AND ... OF
WE + CONSTANT LEARNING + REVERSING.
THE PERMANENCY, NOT THE GREATEST REMINDER OF THE MATTER
WITH OUR RELATIONSHIP TO NATURE... IT REQUIRES EXTREME
SYMPATHY + COURAGE NOT ~~OF~~ ONE OF GREAT DELICATENESS + SENSITIVITY.

I WAS ALONE TO CROSS THE HORIZON...
WHAT HAVE I LEARNED OR GAINED, OR REMINDED?
REMINDED BY THE LANDSCAPE, NOT ONE OF THE MAIN ... OF
OF THE PEOPLE... OF THIS IS ~~THAT THAT FORGOT BEHIND~~.
SCHOOLMINDS FORGOT THE PEOPLE...
LOOK PEOPLE IN A FRENZIED COMMUNITY.
+ PLANS / THOUGHTS LEFT BEHIND BY MEN BECOME NO DIFFERENT THAN THE MAPS
... TO SAME

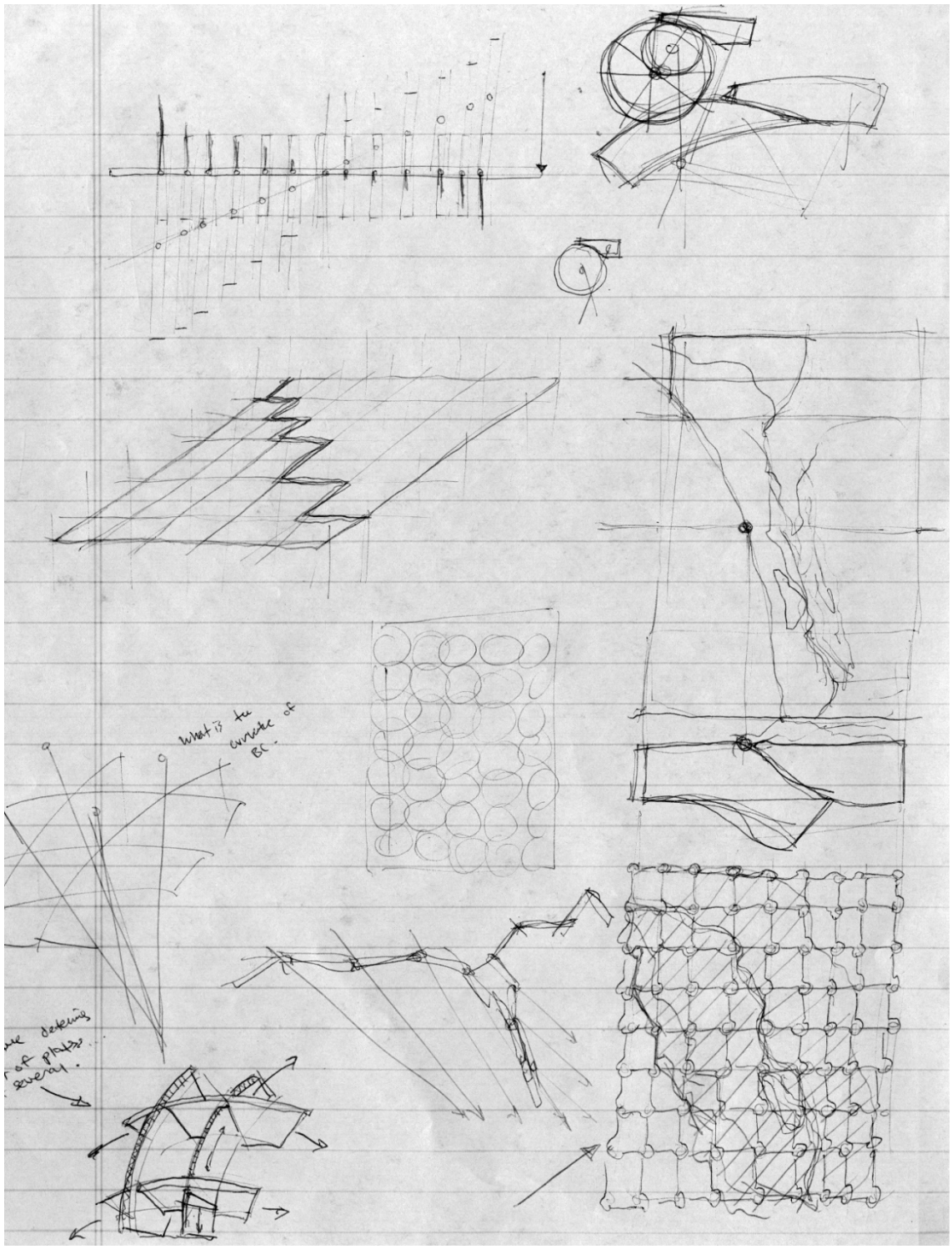


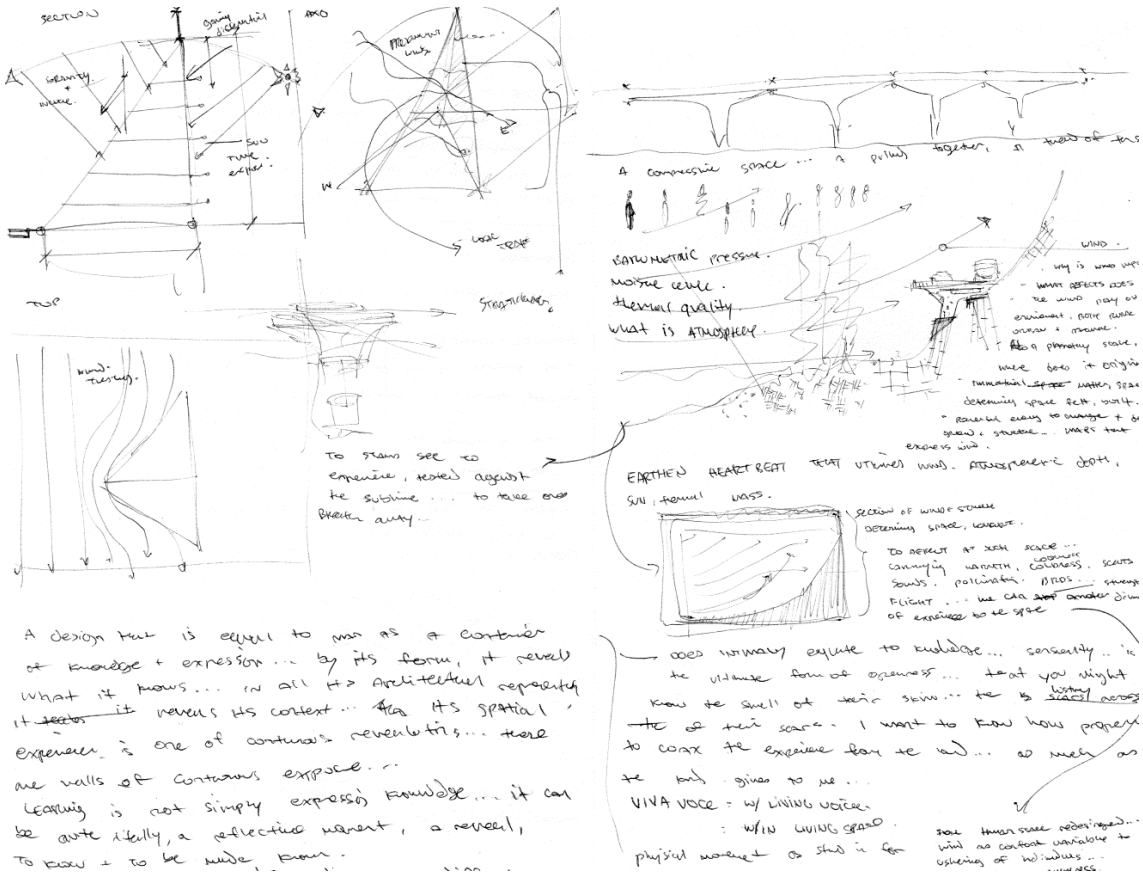
PHENOMENOLOGICAL DRAWING...
REDUCED WITH CONTRASTS.
WIND POWER DOWN THE
CANYONS (ABOVE THE STRUCTURE).
WITH MASSIVE KINETIC PRESSURE

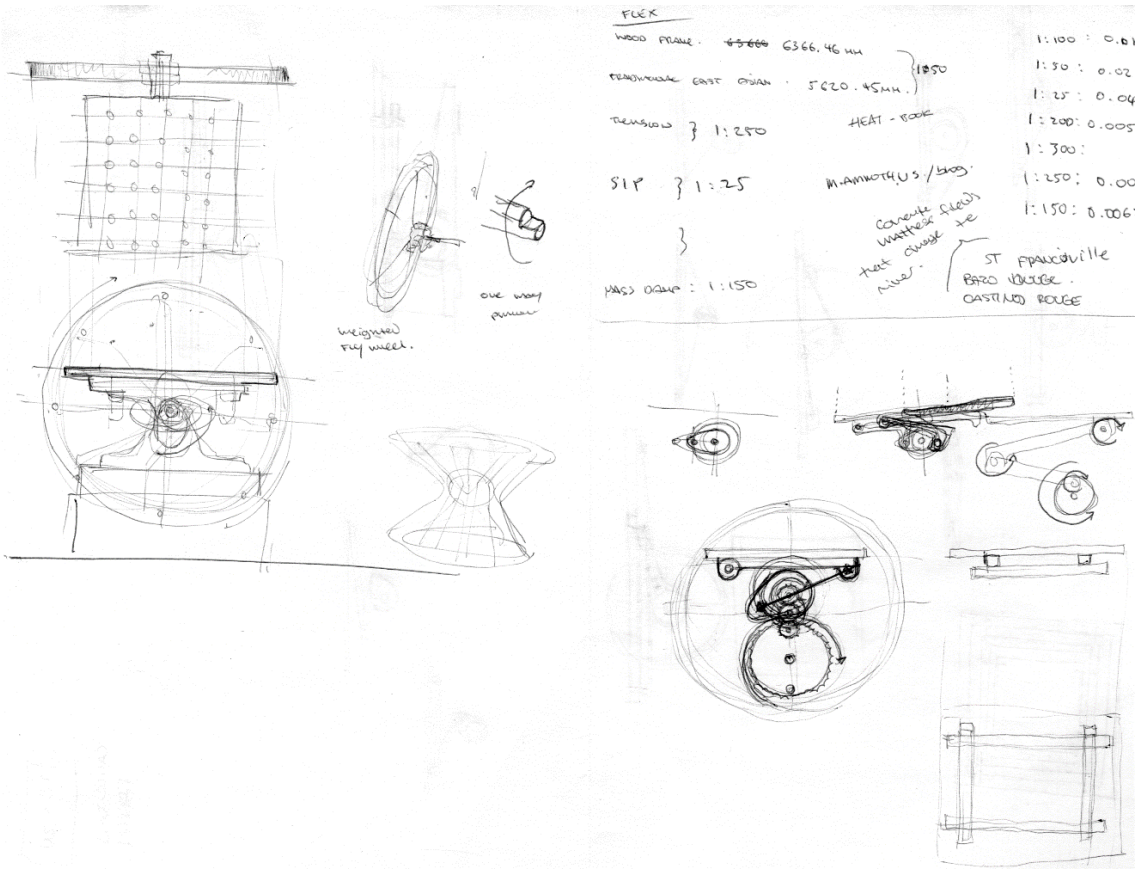


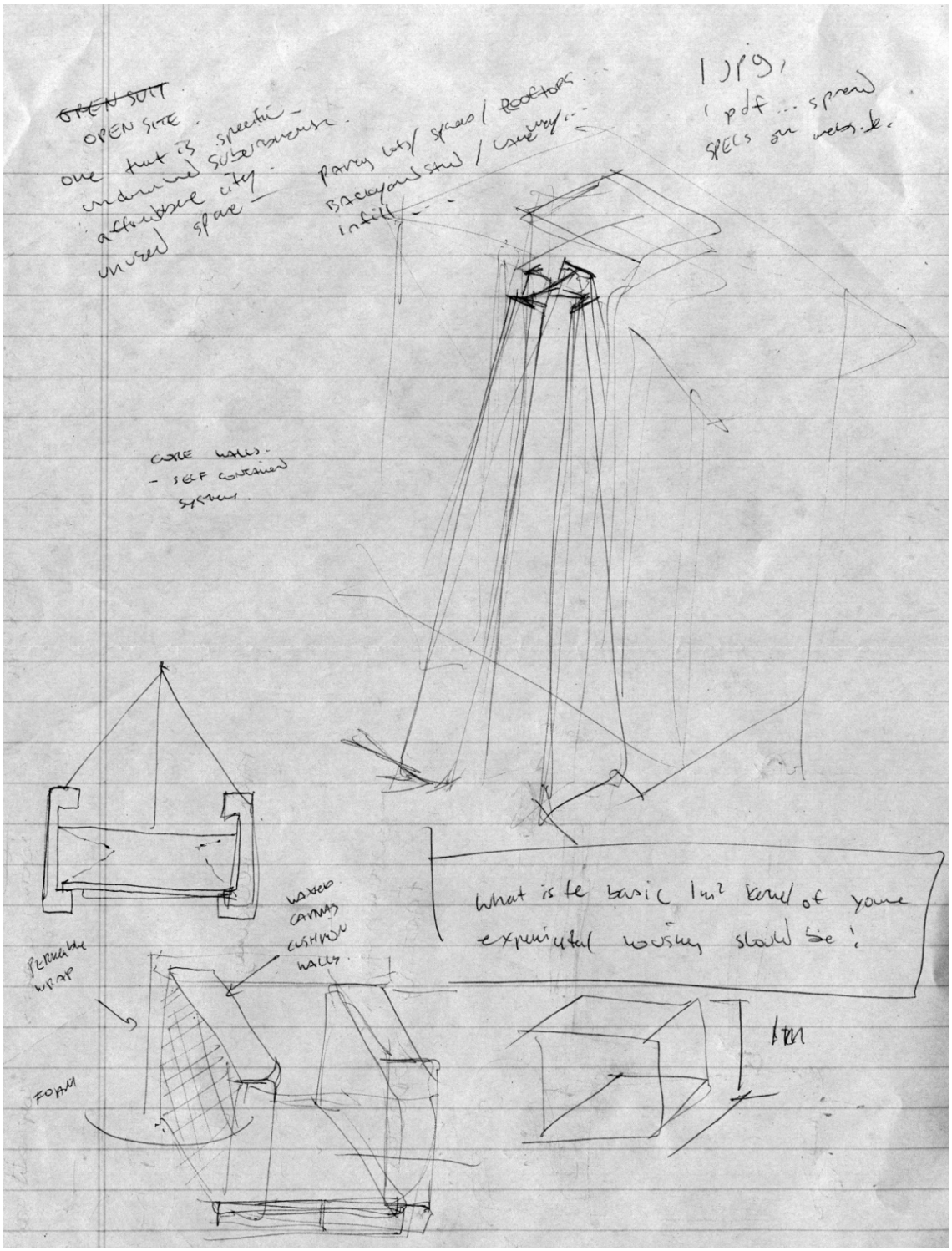


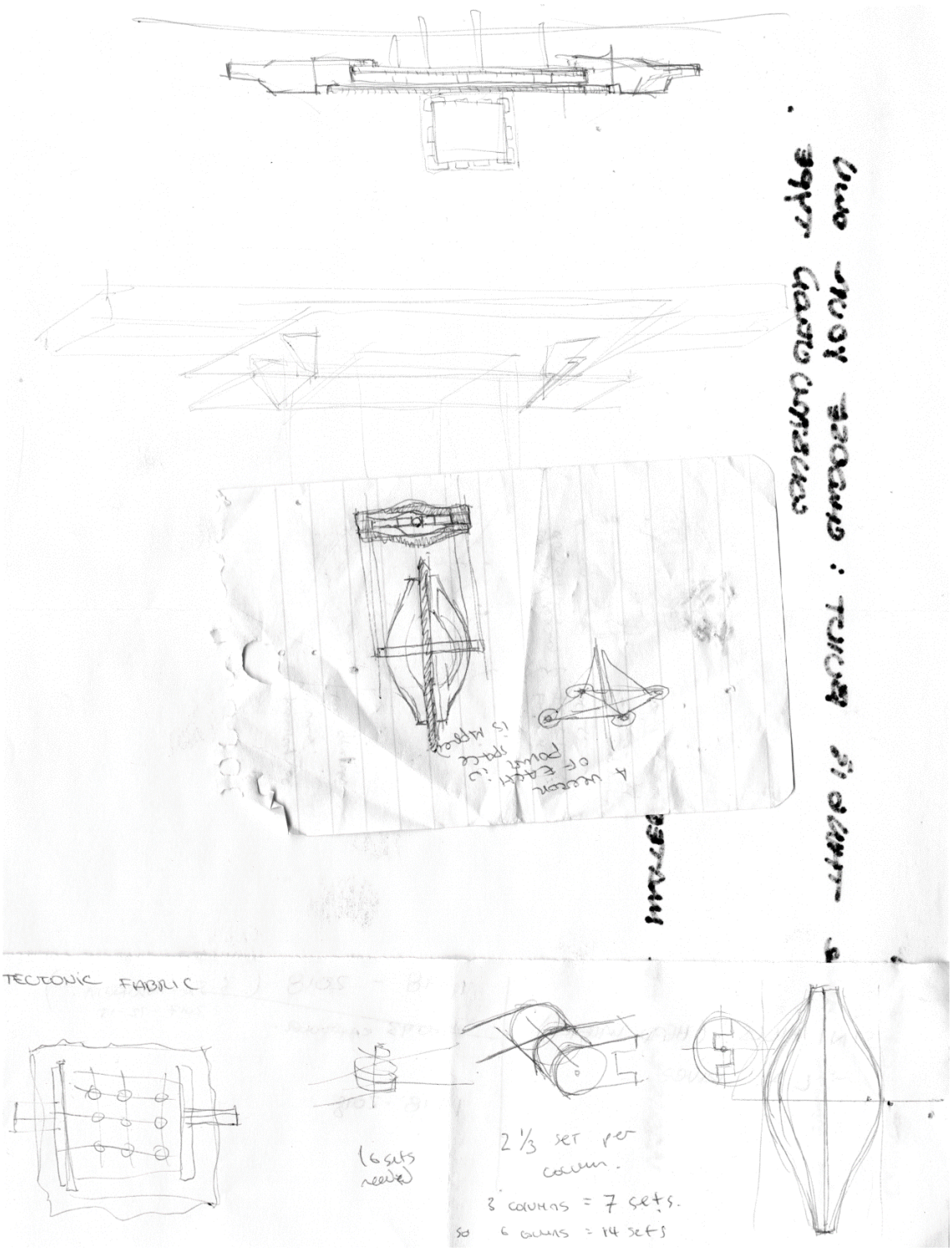
OVERLAY PERSPECTIVAL GRID. (WINTER SUN).
+ ALLOW IT TO FRAGMENT THE IMAGE IN BLOCKS.

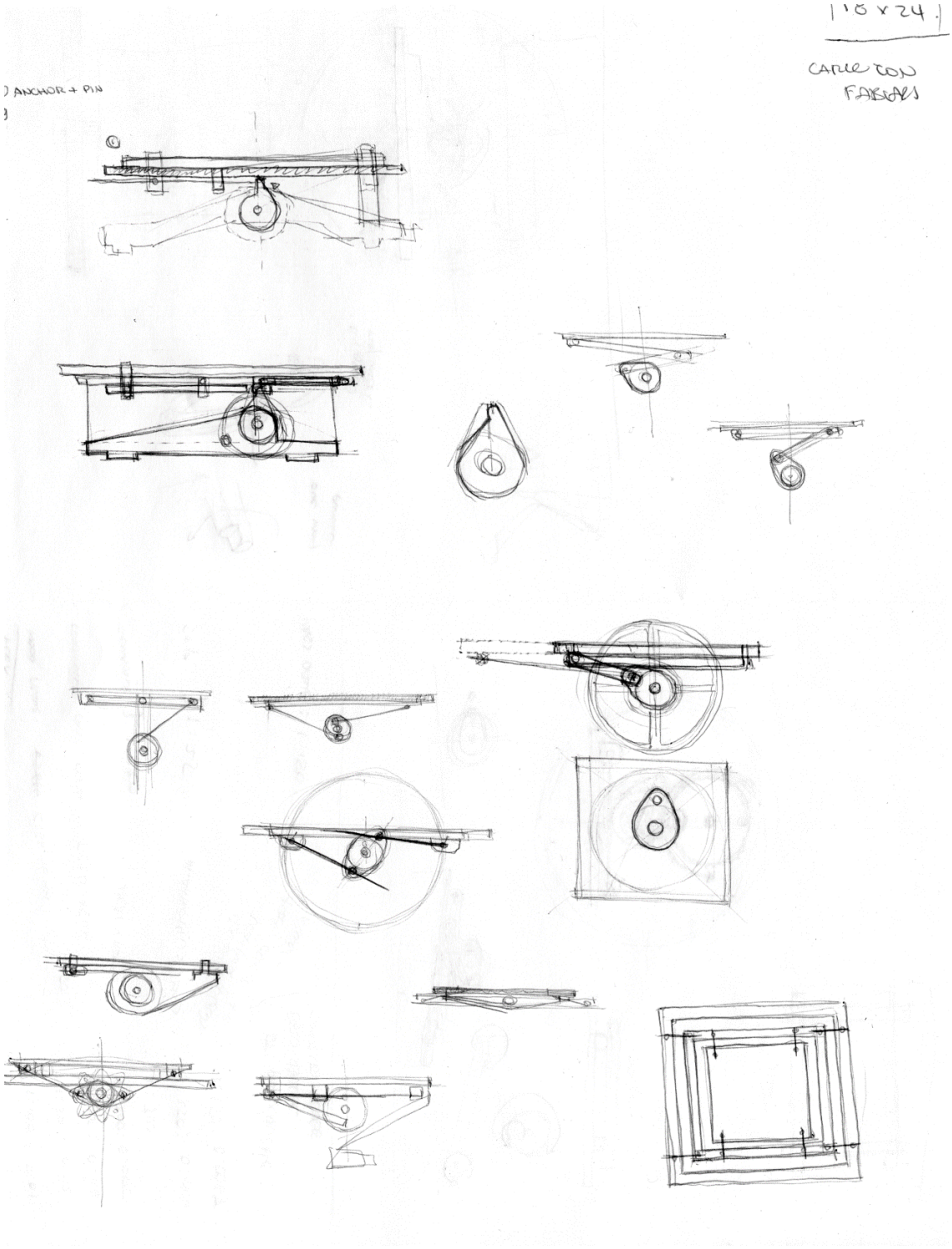

What is the curvature of BC.

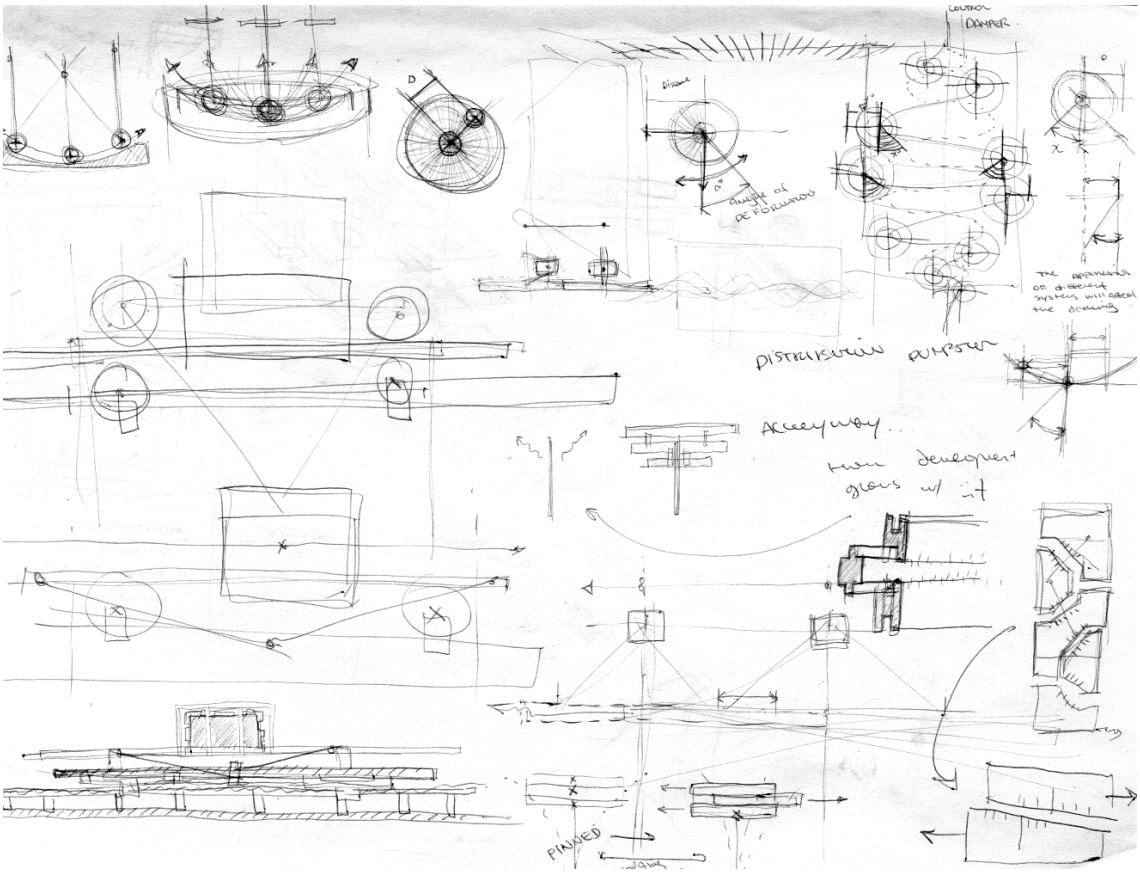

SECTION
AXO
TOP
A comprehensive space ... a pulling together, a sense of ...
BAROMETRIC PRESSURE.
MOISTURE CONTENT.
THERMAL QUALITY.
WHAT IS ATMOSPHERE.
WIND.
EARTHEN HEARTBEAT THAT DRIVES WIND. ATMOSPHERE-it DEPTH,
SUN, THERMAL MASS.
SECTION OF WIND STORM
DETERMINING SPACE, MOVEMENT.
TO REPEAT AT SCALE ...
CARRYING WARMTH, COOLNESS, SOUNDS, POLLINATION, SEEDS ... FLIGHT ... WE CAN ANOTHER DIM OF EXPERIENCE TO THE SPACE
TO STARTS SEE TO EXPERIENCE, RESTED AGAINST THE SUBLIME ... TO TAKE EVER BREATH AWAY...
A design that is equal to man as a container of knowledge + expression ... by its form, it reveals what it knows ... in all its architectural separately it reveals its context ... its spatial experience is one of continuous revelations ... there are walls of continuous exposure ...
LEARNING is not simply expression knowledge ... it can be quite literally, a reflective moment, a reveal, to know + to be made, known.
does normally equate to knowledge ... sensuality .. is the intimate form of openness ... that you might know the smell of their skin ... the ... of their sorrow. I want to know how properly to coax the experience from the land ... as much as the land gives to me ...
VIVA VOCE - W/ LIVING VOICE.
: W/IN LIVING SPACE.
physical movement as study is for
WIND AS CONTEXTUAL VARIABLE TO OPENING OF INDIVIDUALS ...

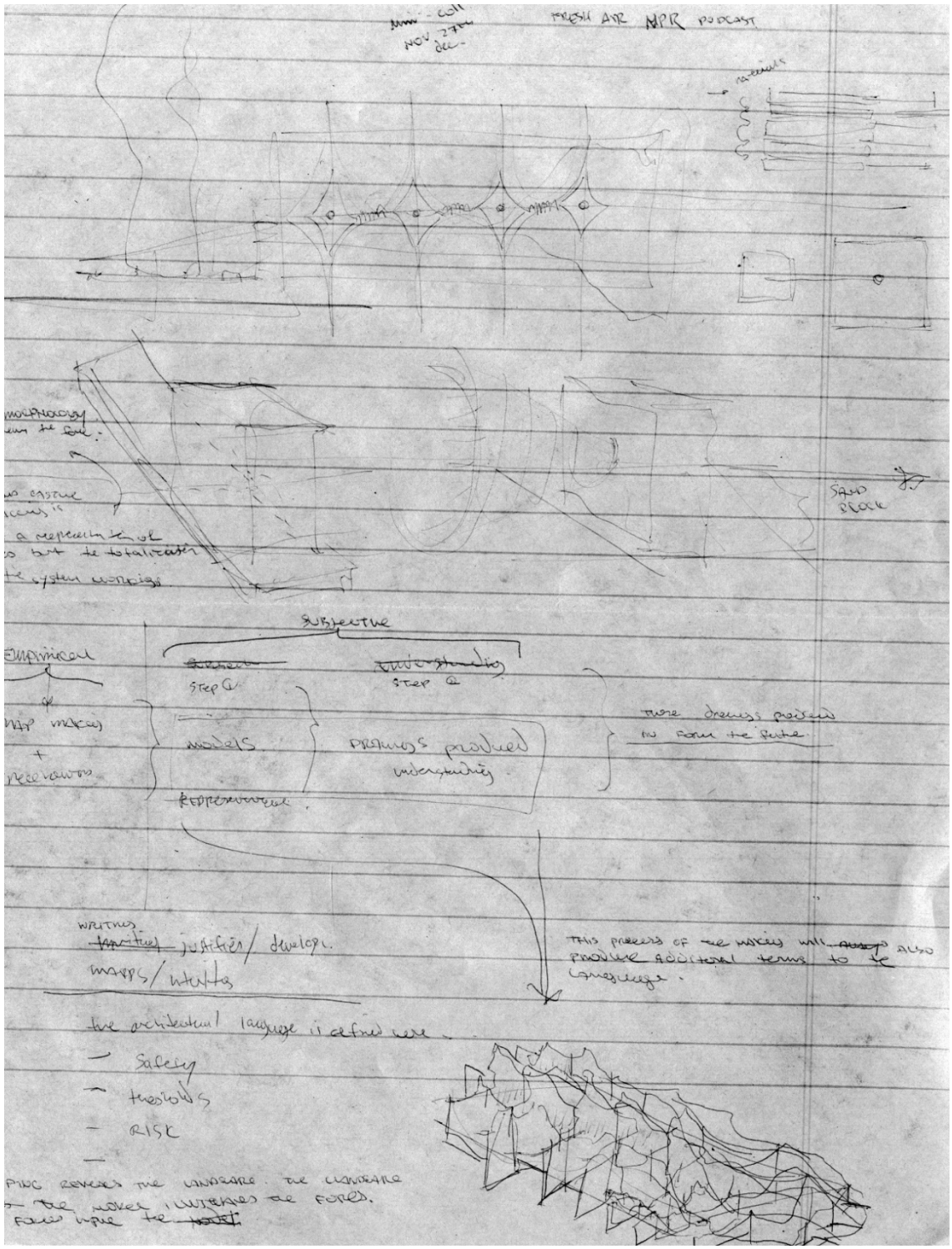

FLEX
WOOD FRAME. 6366.46 MM
TRANSMISSION CAST IRON . 5620.45MM.
TENSION } 1:250
HEAT - ROOF
SIP } 1:25
M.AMMOTHUS / LOG.
MASS DAMP : 1:150
1:100 : 0.01
1:50 : 0.02
1:25 : 0.04
1:200 : 0.005
1:300 :
1:250 : 0.00
1:150 : 0.006
ST FRANCIVILLE
BATON ROUGE .
CASTLAND ROUGE
weighted fly wheel.
one way pulley

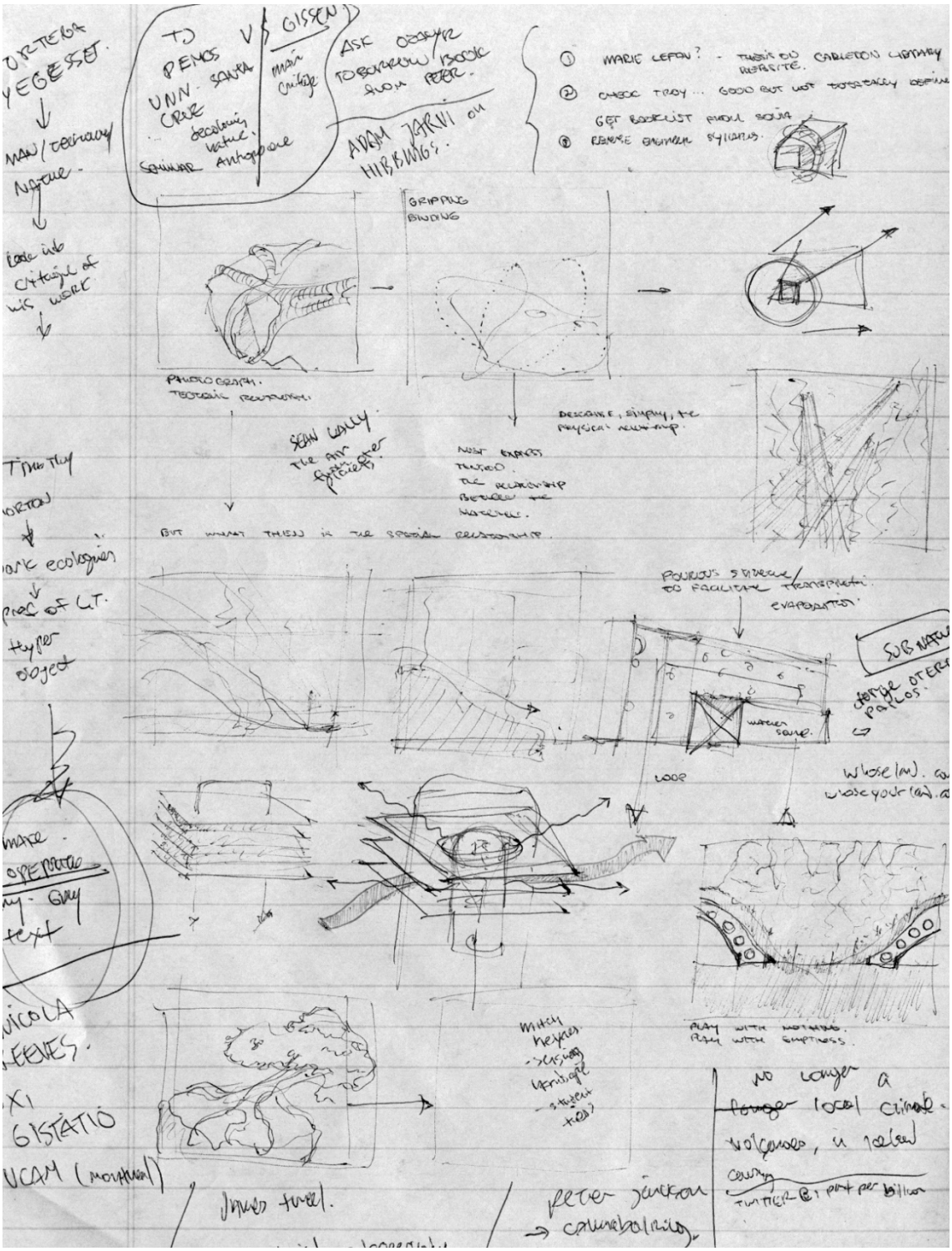

~~OPEN SITE~~
OPEN SITE
one that is specific
underused subbasements
affordable city
unused space
parking lots / spaces / Rooftops
Backyard shed / carport
infill
1 pdf ... spread
specs on website.
CORE walls -
- self contained
system.
waxed
canvas
cushion
walls
permeable
wrap
foam
What is the basic 1m² kind of your
experimental housing should be?
1m


TECTONIC FABRIC
16 sets needed
2 1/3 set per column.
3 columns = 7 sets.
so 6 columns = 14 sets


1'0 x 24.
CABLE CON
FABRICS
ANCHOR + PIN


DAMPER
DISTRIBUTION PUMPS
PINNED


FRESH AIR NPR PODCAST
SAND BLOCK
Subjective
Empirical
STEP 1
STEP 2
models
patterns provided
interpreting
REPRESENTED
WRITING
justifies / develops
maps / intuitions
THIS PROCESS OF THE MAKING WILL ALSO PROVIDE ADDITIONAL TERMS TO THE LANGUAGE.
the architectural language is defined here.
Safety
thresholds
RISK
PING REVEALS THE LANDSCAPE. THE LANDSCAPE
THE NOVEL INTERACTIONS ARE FORED.

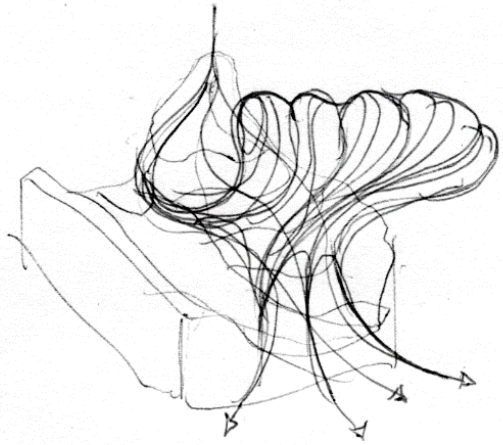

TO PENOS
UNN. SOURA CRUZ
GISSEN
ASK OCCYPR TOMORROW BOOK FROM PETER.
ADAM JARVI on HIBISWOS.
MARIE LEFON?
GET BOOKLIST FROM SOURA
GRIPPING BINDING
PANORO GRAPH.
SEAN LALLY.
THE AIR
NOT EXPRESS THINGS.
THE RELATIONSHIP BETWEEN THE
BUT WHAT THISS IS THE SPECIAL RELATIONSHIP.
POURON'S SYRINGE/ TO FACILITATE TRANSPIRATI. EVAPORATION.
SUBNATU
WATER SAME.
LOOP
WHOSE(M). CO
WHOSE YOUR(M). C
TIMOTHY
NORTON
PROF OF LIT.
hyper
project
NICOLA
KEENES.
XI
GISTATIO
UCAM (MONTREAL)
MATCH
OPENING
MY - GREY
text
WITCH
hexes
PLAY WITH NOTHING.
PLAY WITH EMPTINESS.
NO LONGER A
~~longer~~ local climate.
volcanoes, in isolen
country
TWITTER @ 1 post per billion
Jones tunel.
peter jenkins
→ columbalnity.

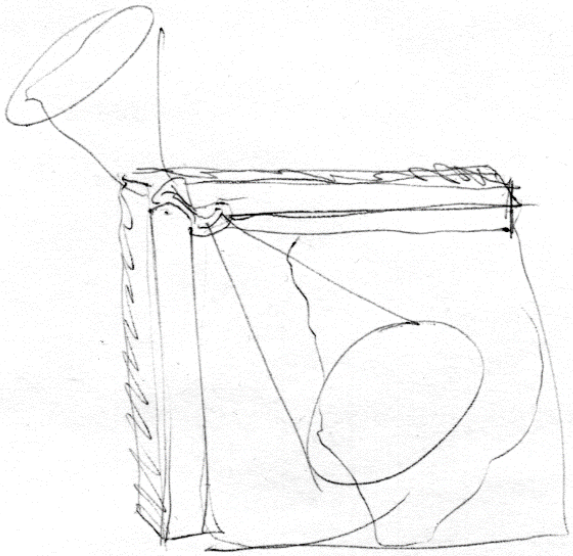
FACILITATING A NEW SPACE ... OF DENIAL OF SPACE OF VOID - interstitial, NULL SPACE.

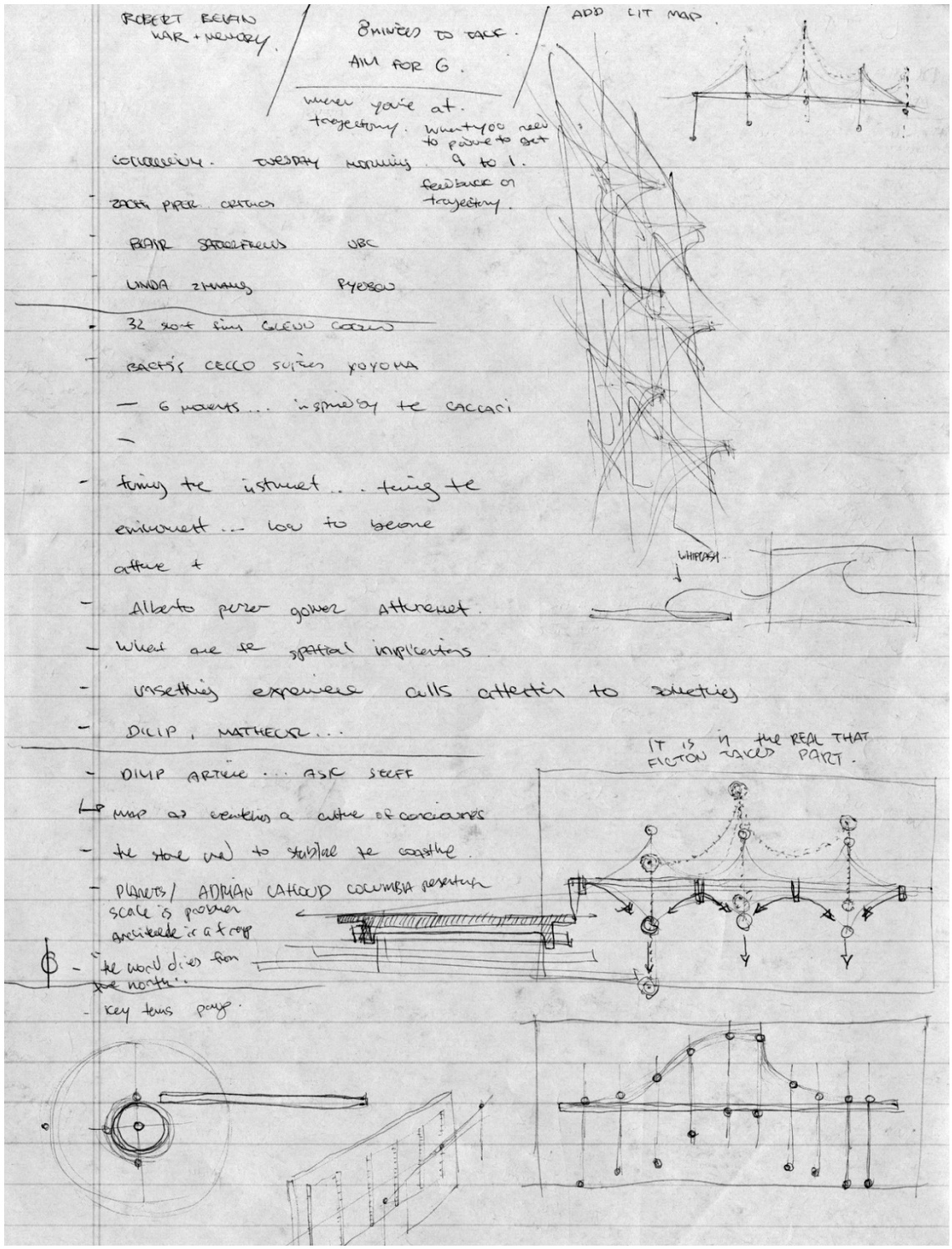
- Climate change not enough in popular culture ..

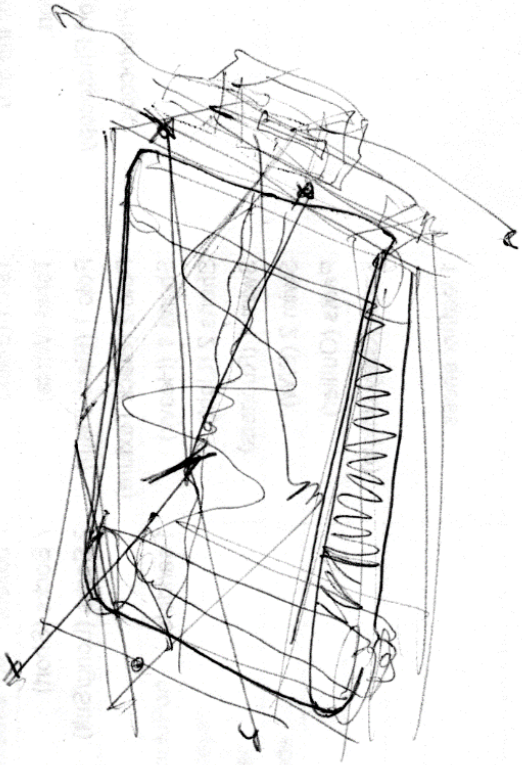
- ARCHITECTURE as PROTECTOR. OR NONE LIKE THE LEAD in POWER.

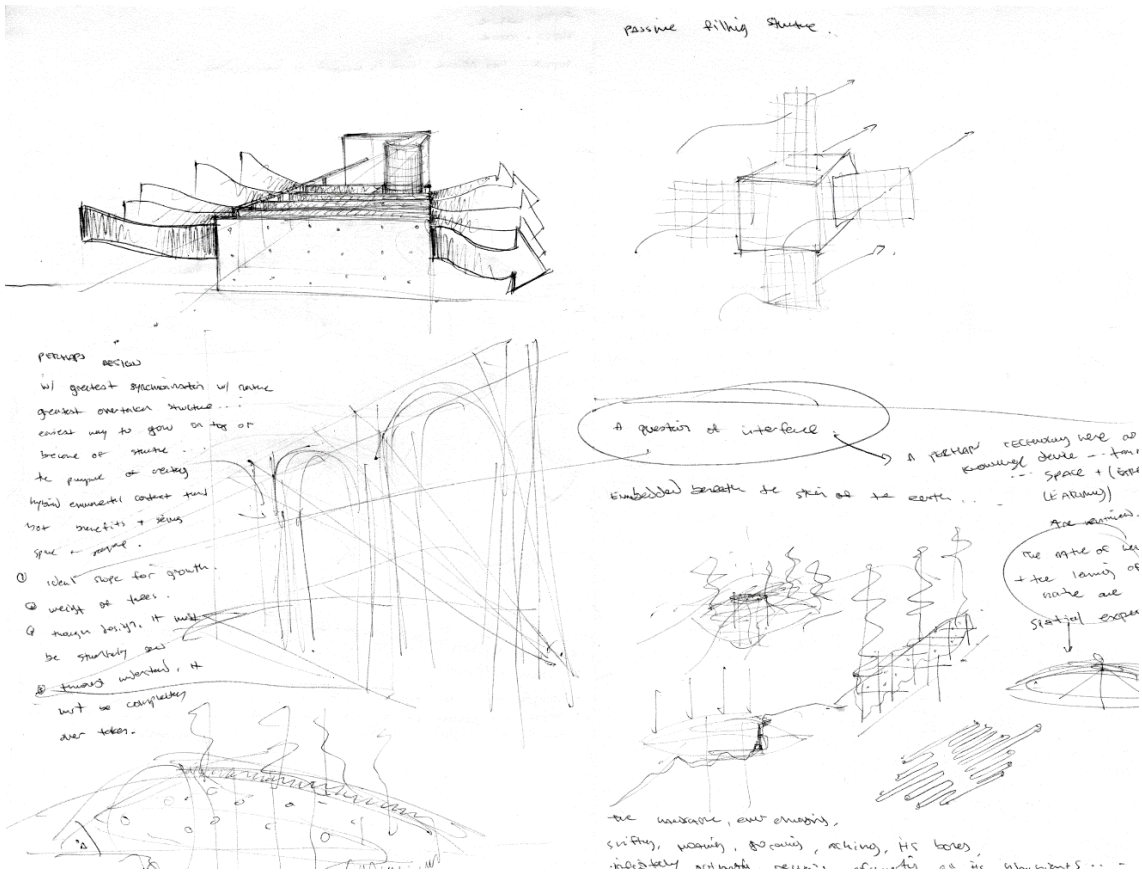
- snow packs?



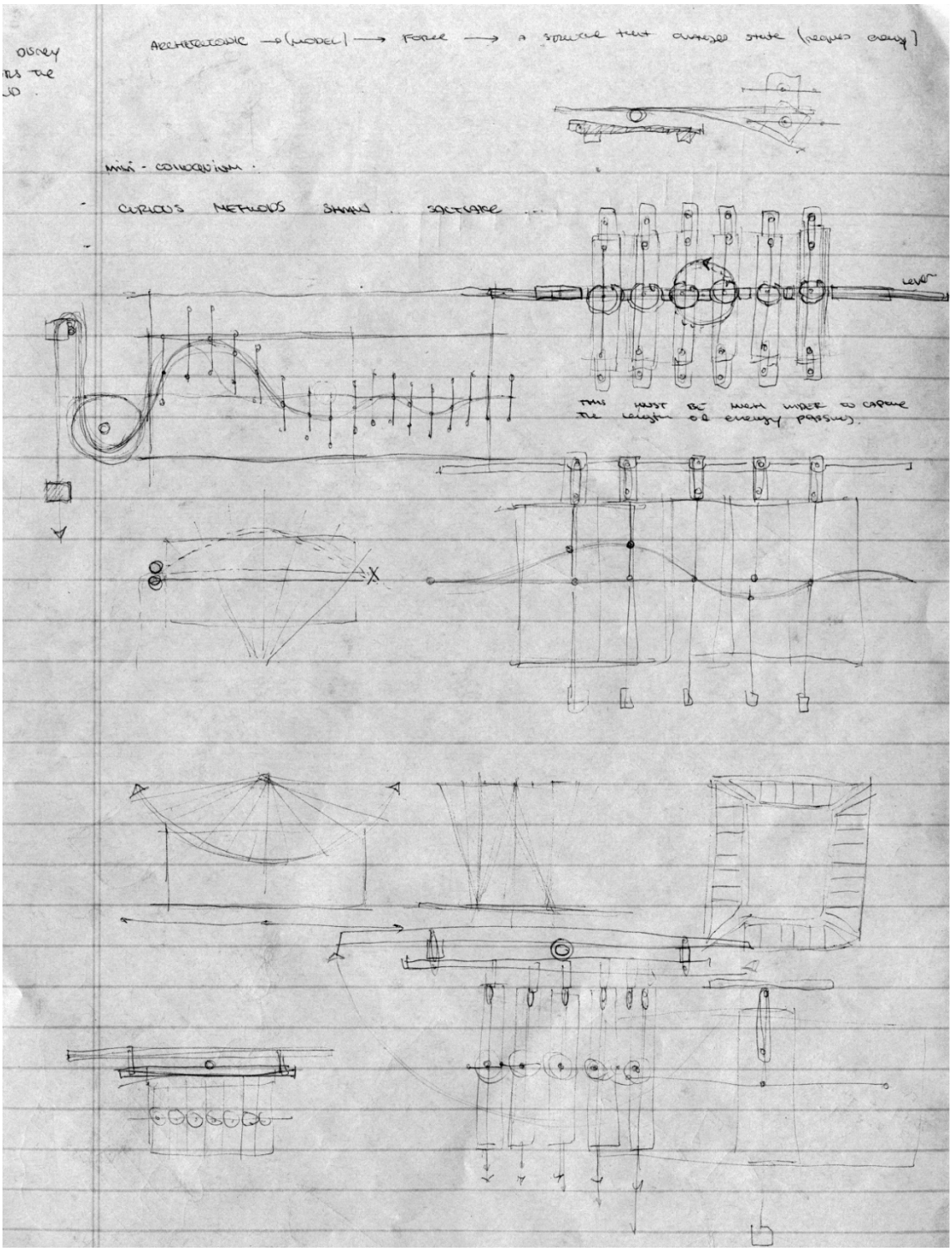



ROBERT BEVIN
WAR + MEMORY.
8 MINUTES TO TALK.
AIM FOR 6.
ADD LIT MAP.
where you're at.
trajectory. what you need to point to get feedback on trajectory.
TUESDAY MORNING 9 to 1.
ZACH PIPER CRITICS
BRIAN SCHOENFELD UBC
LINDA ZHANG PYEONG
32 not fine GREEN COLLEGE
BACH'S CELLO SUITES YOYO MA
— 6 movements... inspired by the CACCIA
tuning the instrument... tuning the environment... how to become attuned
Alberto perez power attunement.
what are the spatial implications.
unsettling experience calls attention to something
DILIP, MATHEWSR...
DILIP ARTIE... ASK STUFF
map as creating a culture of conversations
the stone used to stabilize the construction.
PLANETS / ADRIAN CATHOUD COLUMBIA presentation
scale is proximate architecture is a fragment
"the world dies from the north".
key terms page.
WHIPLASH.
IT IS IN THE REAL THAT FICTION FAILED PART.




passive filling structure.
perhaps
w/ greatest
greatest
easiest
because of
the purpose of
hyper environmental
that
spaces + spaces
space + space
① ideal
② weight of trees.
③ though
be structurally
④ twisting
must be completely
over taken.
A question of interface.
embedded beneath the skin of the earth
the landscape, environment,
shifting, warming, flowing, acting, HS bones,


of TWIN RIVER.
A PORTE WITHIN A FOREST.
A TOWER WITHIN A CAVE.
The place of refuge is
better for designed for people,
we encounter beside it. always
& a variety of emerging environments
to it. this are high emphasis, even
more what exists. this is second nature (what feels natural)
is built.
second nature.


ARCHITECTONIC → (MODEL) → FORCE → A STRUCTURE THAT CONTAINS STATE (REQUIRES ENERGY)
mini - COMMONIUM.
CURIOUS METHODS SHAMAN SOFTWARE
lever
THIS MUST BE WORK UNDER TO CAPTURE THE length OF ENERGY PASSING.
X

IF WHAT I FEAR IS THAT OF EARTHQUAKES ... PERHAPS I SHOULD DELVE DEEPER INTO WHAT THAT FEAR ENTAILS... THE LOSS OF LIFE, THE DESTRUCTION OF MY HOME, OF THE CITY SCAPE THAT SERVED AS THE BACK DROP TO MY YOUTH, THE PENT UP FEAR / CORNER OF PEOPLE FASHED BY THE VALUE OF THE SEA SIDE...

OR KNOWINGLY BUILT ON SAND AND THE COMPOUNDING DEVESTATION OF THE ACCUMULATED HISTORIES OF SUCCESSES AND STRUGGLES ALL LOST AT ONCE DEVESTATE ME... BUT THIS IS TRUE OF ALL SITES BY THE RING OF FIRE..

---

COMBINATION OF LANDSCAPE + KNOWLEDGE (BEING + LIVING)....

LANDSCAPE PARTICULARLY MEANINGFUL, EMPOWERING, GOBBLING...

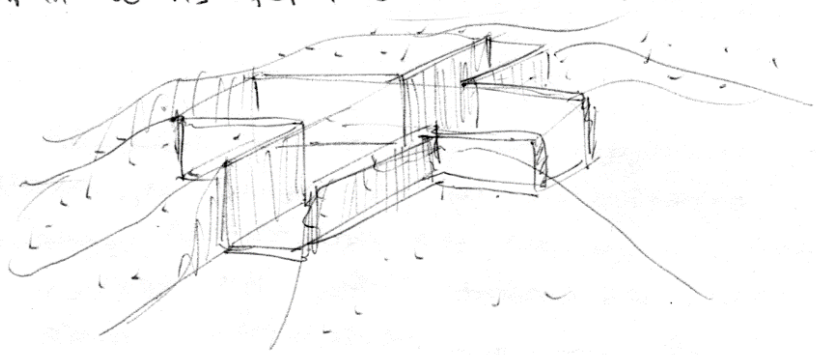
KNOWLEDGE (EXPERIENCE) BEING THE ONLY THING WHERE ONE TRULY FEELS THE HAVE SOMETHING, EARNED, OR GAINED, SOMETHING NEVER LOST, SOMETHING ALWAYS GROWING + USEFUL...

TO EXPERIENCE THE LANDSCAPE IS TO KNOW IT...

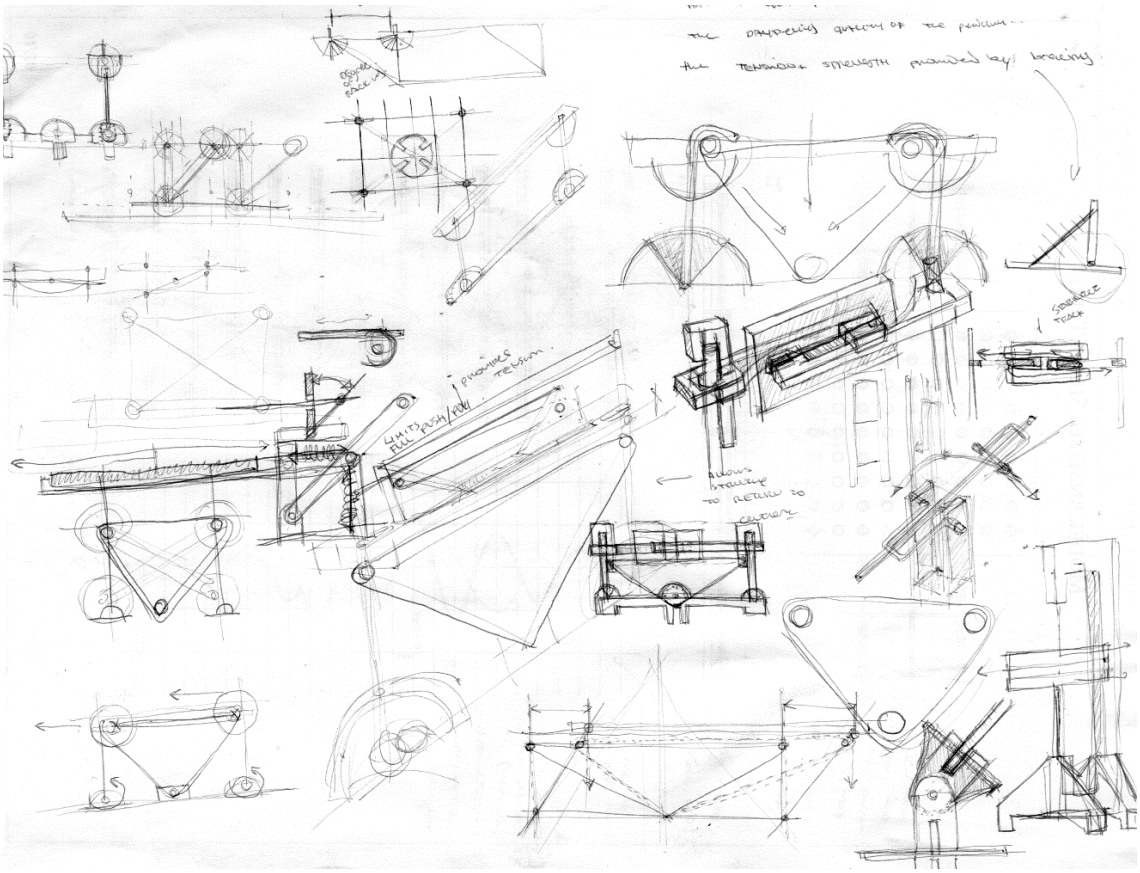
TO KNOW THE EXPERIENCE IS THROUGH THE WILD?

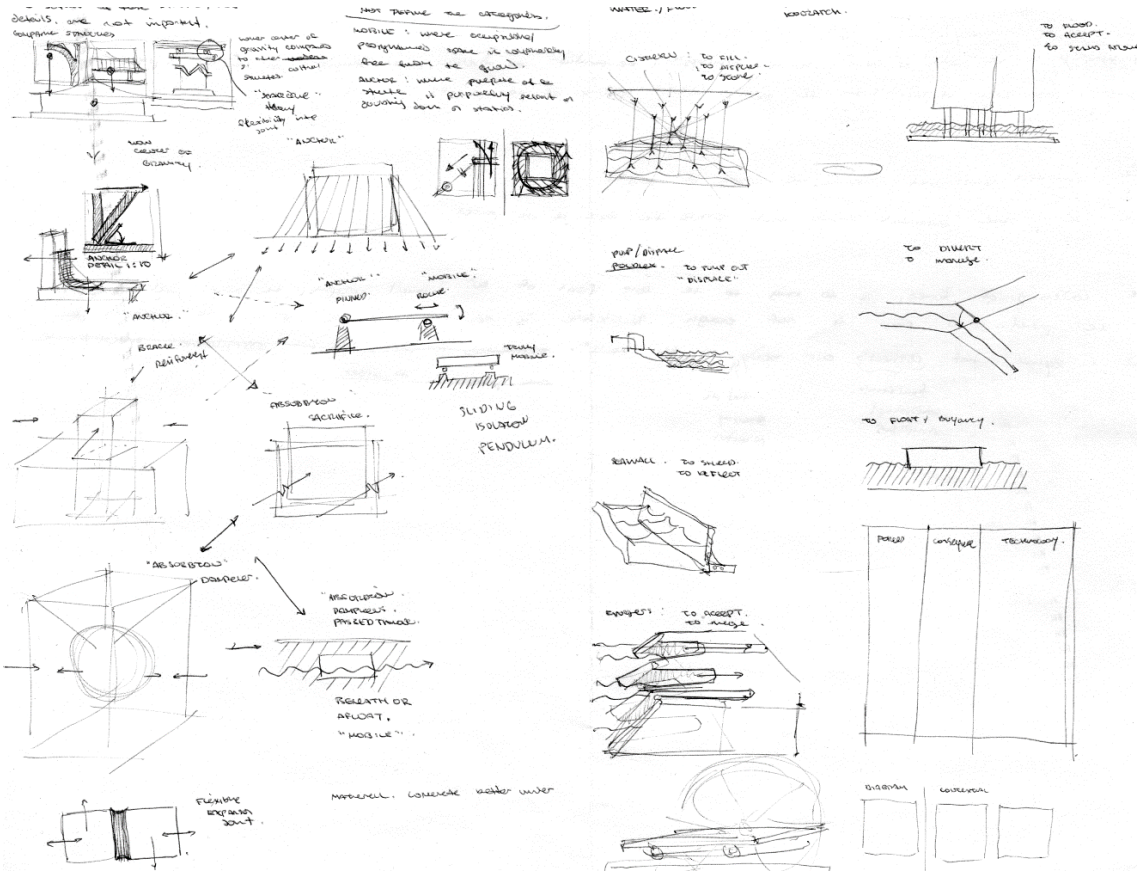
---

ARCH. AS AN INSTRUMENT TO KNOWING... + TO GROW, THE SITE SPECIFICALLY... ITS CONTEXT IN NOT ONLY GIVES BIRTH TO ITS FORM BUT INFORMS? DEPENDS ON IT...



ARCH BUILT PURELY, OR ~~IN TRIBUTARY TO~~ RELEVANT ENTIRELY, OR PHYSICAL FORCES PROVIDED BY SITE.


the DAMPENING quality of the pendulum..
the TENSIONING STRENGTH provided by bracing.
SQUARE TOOL
PROMOTES TENSION
UNITS PUSH/PULL
ALLOWS STRUCTURE TO RETURN TO CENTER


"ANCHOR"
"MOBILE"
ABSORBTION
SACRIFICE.
SLIDING
ISOLATION
PENDULUM.
"ABSORBTION"
DAMPERS.
"RESOLUTION"
DAMPERS.
PASSED TIMBER.
BREATH OR
AFLOAT.
"MOBILE".
TO FILL.
TO DISPERSE.
TO STORE.
TO BLOCK.
TO ACCEPT.
TO SEEMS FLOW
TO DIVERT
TO MANAGE.
TO FLOAT / BUYANCY.
SEAWALL. TO SHEED.
TO REFLECT
ENERGIES: TO ACCEPT.
TO MANAGE.
POWER
CONSUMER
TECHNOLOGY.
DIAGRAM
CONCEPTUAL

# BIBLIOGRAPHY


Antara Foto/Reuters. "An aerial view of liquefaction, or shifting ground, following the earthquake in Palu, Central Sulawesi, Indonesia." *Sulawesi tsunami devastates coast in Indonesia – in pictures*. Palu, 2 October 2018. <https://www.theguardian.com/world/gallery/2018/sep/29/sulawesi-tsunami-devastates-coast-in-indonesia-in-pictures>.

AP Photo/Nexco East Japan. "In this photo released by Nexco East Japan, a worker inspects a caved-in section of the Joban Motorway near Mito, Ibaraki Prefecture, after one of the largest earthquakes ever recorded in Japan slammed its eastern coast Friday, March 11, 2011." *Japan earthquake: how big was it?* Mito, 11 March 2011. <https://www.cbsnews.com/news/japan-earthquake-how-big-was-it/>.

Bernard Tschumi Architects. "New Acropolois Museum." Athens, n.d. <http://www.tschumi.com/projects/2/>.

Brancusi, Constantin. *Bird in Space*. The Solomon R. Guggenheim Foundation Peggy Guggenheim Collection, Venice. Polished brass.

Brancusi, Constantin. *Fish*. Mueseum of Modern Art, Paris. Marble.

Brancusi, Constantin. *The Gate of Kiss*. Târgu Jiu. Marble.

Caltech: Southern California Earthquake Data Center. *Significant Earthquakes and Faults: San Adreas Fault Zone*. 1 January 2013. 4 December 2018. <http://scedc.caltech.edu/significant/sanandreas.html>.

City of Vancouver. *Earthquake facts: Learn the risks*. n.d. 4 December 2018. <https://vancouver.ca/home-property-development/earthquake-facts.aspx>.

"Controlled Rocking of Steel Braced Frames with Replaceable Energy Dissipating Fuses." July 2011. <https://www.eatherton.cee.vt.edu/controlled-rocking-of-steel-braced-frames-with-replaceable-energy-dissipating-fuses/>.

"Dougong structure used in Yingxian Wooden Pagoda." *2,500-year-old Chinese wood joints that make buildings earthquake-proof*. 24 July 2017. <https://archinect.com/news/article/150019184/2-500-year-old-chinese-wood-joints-that-make-buildings-earthquake-proof>.

Duchamp, Marcel. *3 Standard Stoppages*. The Museum of Modern Art, Paris. Wood box, three white Strings (1m), glued to three painted canvas strips, each mounted on glass panel, three wood slats shaped along one edge to matchhe curve of threads.

Duchamp, Marcel. *Nude Descending a Staircase (No. 2)*. Philadelphia Museum of Art. Oil on canvas.

Duchamp, Marcel. *The Bride Stripped Bare by Her Batchelors, Even*. Philadelphia Museum of Art, Philadelphia. Oil, varnish, lead foil, lead wire, and dust on two glass panels.

Eatherton, Matt. "Energy Dissipating Fuse Plate Tested at the University of Illinois at Urbana-Champaign as part of the controlled rocking self-centering seismic system. This fuse plate is designed with butterfly shaped links that plastic hinge and then undergo lateral tor." n.d. <http://www.ssrcweb.org/>.

Frascari, Marco. "Drawing as Theory." *Paradoxes of Progress*. Ed. Thomas Fisher and Christine Macy. Association of Collegiate Schools of Architecture, 2001. 39.

Frascari, Marco. "Models and Dawings - The Invisible Nature of Architecture." *From Models to Drawings*. Ed. Marco Frascari, Jonathan Hale and Bradley Starkey. New York: Routledge, 2007. 6.

Free, Kathryn. *How did the 2011 Tohoku Earthquake Change Earth's Rotation?* Ed. Shireen Frederico. 11 March 2017. 4 December 2018. <https://earthobservatory.sg/blog/how-did-2011-tohoku-earthquake-change-earth%E2%80%99s-rotation>.

Geoffrey Morrison/CNET. "Taipei 101's tuned mass damper." *Taipei 101: Exploring one of the tallest buildings in the world*. Taipei, 25 August 2018.

<https://www.cnet.com/news/taipei-101-exploring-one-of-the-tallest-buildings-in-the-world/>.

Giacometti, Alberto. *Grande Figure*. Bronze.

Giacometti, Alberto. *Nu debout*. Collection Fondation Marguerite et Aimé Maeght, Saint-Paul-de-Vence. chalk on paper.

Giacometti, Alberto. *Sketches from Notebook*. 1962. Ink on paper.

Giacometti, Alberto. *The Artist's Mother*. Mueseum of Modern Art, New York. Oil on canvas.

Jaksmata. "A wooden-frame house under construction – in this example of platform framing the location of the upper floor is readily discerned by the wide joists between the floors, and the upper structure rests on this platform." 22 May 2008. <https://commons.wikimedia.org/wiki/File:Wood-framed_house.jpg>.

"Japanese Knotweed & Root Barriers." n.d. <https://www.hbbgeosales.co.uk/view-product/japanese-knotweed-root-barriers/>.

Kious, W. Jacquelyne and Robert I. Tilling. *This Dynamic Earth: The Story of Plate Tectonics*. February 1996. Online Book. 4 December 2018. <https://pubs.usgs.gov/gip/dynamic/dynamic.html>.

Mainichi Shimbun/Reuters. "The tsunami's wave crashed over a street in Miyako in northeastern Japan after an earthquake struck the area on Friday." *Seawalls Offered Little Protection Against Tsunami's Crushing Waves*. Miyako, 11 November 2014. <https://www.nytimes.com/2011/03/14/world/asia/14seawalls.html>.

Musson, Timothy. "St Andrews College, Papanui Road. Liquefaction, causing water and silt to squirt up from underground." 22 February 2011. <https://commons.wikimedia.org/wiki/File:Christchurch_quake,_2011-02-22.jpg>.

National Geographic. *Encyclopedic Entry: Ring of Fire*. 6 January 2015. 4 December 2018. <https://www.nationalgeographic.org/encyclopedia/ring-fire/>.

Natural Resources Canada. *Plate Tectonics Shape (and Shake) British Columbia*. 2011. Digital Poster. 4 December 2018. <http://www.earthquakescanada.ca/pprs-pprp/pubs/GF-GI/GEOFACT_plate-tectonics_e.pdf>.

Picasso, Pablo. *Composition of Violin*. Metropolitan Museum of Art, Paris. Cut-and-pasted newspaper, graphite, charcoal, and ink on white laid paper; subsequently mounted to paperboard.

Picasso, Pablo. *Standing Female Nude*. Metropolitan Mueseum of Art. Charcoal on paper.

Picasso, Pablo. *Still Life with a Bottle of Rum*. Metropolitan Museum of Art. Oil on canvas.

Reid, Kathryn. *2011 Japan earthquake and tsunami: Facts, FAQs, and how to help*. 7 May 2018. 4 December 2018. <https://www.worldvision.org/disaster-relief-news-stories/2011-japan-earthquake-and-tsunami-facts>.

"Sakhalin Concave and Slider." n.d. <http://kpigroup.co.nz/Seismic_Protection.html>.

Schafer, Ashley. "Theory After (After-Theory)." *Perspecta: Architecture after All* 38 (2006): 107-124.

Smith, Kendra Schank. *Architect's Drawings*. Burlington: Elsevier, 2005.

Taipei Financial Center Corporation/CTBUH. "TAIPEI 101." n.d. 4 December 2018. <http://www.skyscrapercenter.com/building/taipei-101/117>.

Takumi Ota/Shinkenchiku. "Komatsu Seiren Fabric Laboratory fa-bo." November 2015. <https://kkaa.co.jp/works/architecture/komatsu-seiren-fabric-laboratory-fa-bo/>.

U.S. Geological Survey. *20 Largest Earthquakes in the World*. n.d. 4 December 2018. <https://earthquake.usgs.gov/earthquakes/browse/largest-world.php>.

—. *The M9.0 Great Tohoku Earthquake (northeast Honshu, Japan) of March 11, 2011*. 12 April 2011. Earthquake Summary Map. 4 December 2018.

<https://earthquake.usgs.gov/archive/product/poster/20110311/us/1481142094043/poster.pdf>.

UN Office for the Coordination of Humanitarian Affairs. *Central Sulawesi Earthquake Response Plan (Oct 2018 - Dec 2018)*. 5 October 2018. 4 December 2018. <https://reliefweb.int/report/indonesia/central-sulawesi-earthquake-response-plan-oct-2018-dec-2018>.

World Vision. *2018 Indonesia quakes and tsunamis: Facts, FAQs, and how to help*. 27 December 2018. 27 March 2019. <https://www.worldvision.org/disaster-relief-news-stories/2018-indonesia-earthquake-facts>.