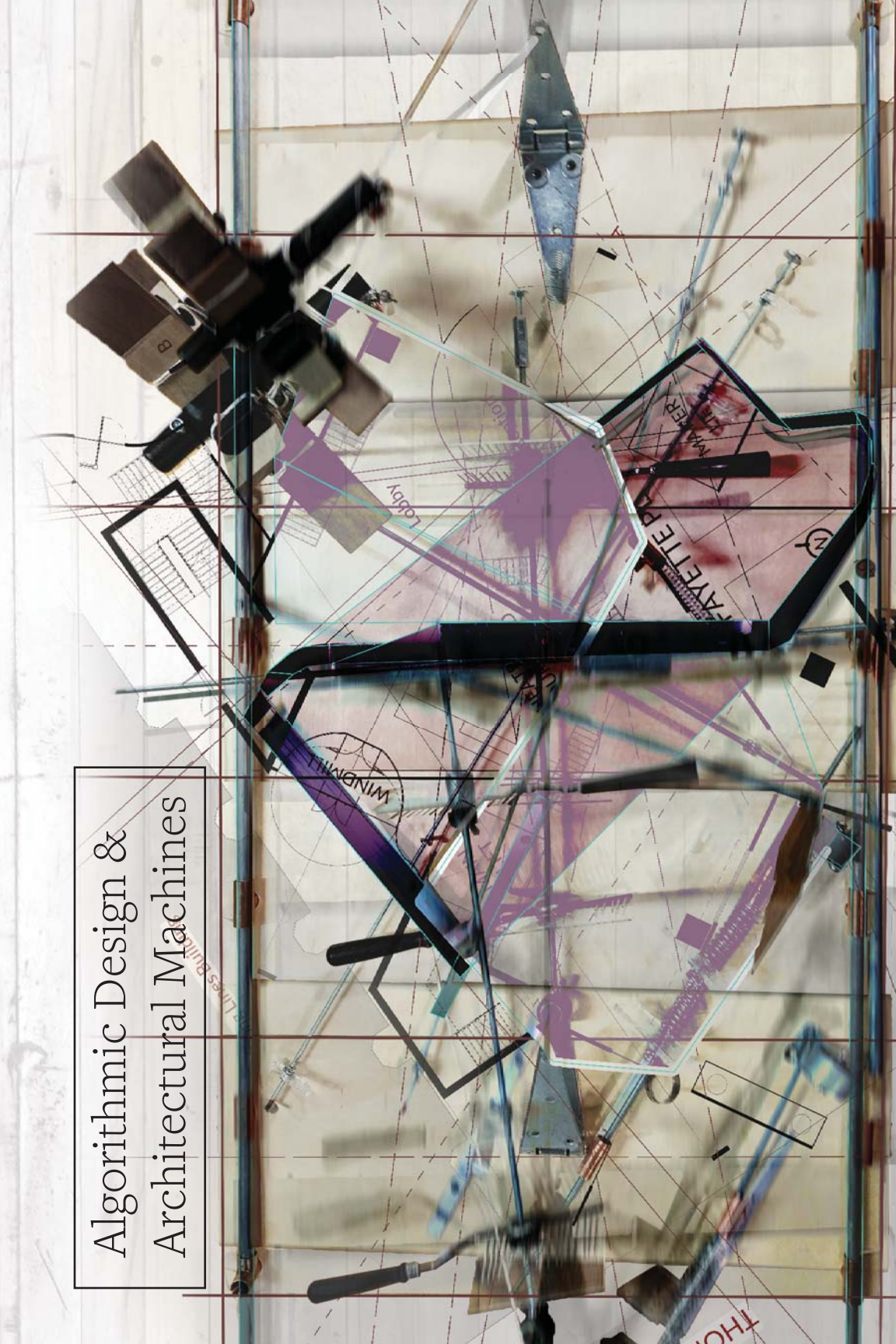Algorithmic Design &
Architectural Machines

A Pataphysical Urban Maker's Studio and Artist's Workshop for Upper Tribeca

Algorithmic Design &
Architectural Machines

A Design Thesis Submitted to the
Department of Architecture and Landscape Architecture
Of North Dakota State University

By
Hannah Langr

In Partial Fulfillment of the Requirements
For the Degree of
Master of Architecture

_____
Primary Thesis Advisor

_____
Thesis Committee Chair

May 2018
Fargo, North Dakota

[Contents]

[List of Tables & Figures]

PART I

[THESIS ABSTRACT]

What is our relationship with technology? As designers, we sit on the precipice between the abstract and the alien; between meaningful imagination and reductive otherness. With the permeation of algorithmic software in the architectural profession, are we able to design algorithmically with meaning? How can digital means aid poetic architecture?

This thesis opens a less examined side of algorithmic thinking within the dialogue between designers and the technology we use. Language, humor, and pataphors become building materials in this architectural translation of 'Pataphysics, a rebel, absurdist science created by playwright Alfred Jarry. A dense prospection and oscillation through philosophy, history, art, and architecture all work to consider this design of a playful memory machine. Enter, the Urban Maker's Studio and Artist Workshop. This story of machines, in both a fictional and a literal context, brings humans back into the fold through the linguistic dimension of algorithmic storytelling. It values the historical and cultural memory latent in ourselves over abstracted, generalized and reductive information.

The project is situated in contention and alliance with the AT&T Long Lines Building, a foreboding idol of modern technology, in upper Tribeca New York.

Algorithms and their use in the design process are growing ever more within the practice of architecture. Sophisticated software enables architects to hybridize modeling and scripting for easy incorporation into a design process. It's crucial to examine the role of this technology as more practices assimilate this specialty field into their work.

The concept of an algorithm is often associated with the programming found in computer science. Software like Grasshopper is a mediator between the programming languages and graphically represents the parameters and creative components in the process.

If we go all the way back to the word's origins in the 8th or 9th century, we find that its first recorded use was by Persian mathematician Al-Khwarizmi. His term, *algorism*, and the Greek *arithmos* (number) have a fundamental relationship with computation. Therefore, algorithms can be understood as a series of logical steps taken in a speculative exploration to address a problem. They can present ambiguous and interpretive results that unfold according to the user. It's not only about precise solutions to problems but also a revealing of the unknown.

For architecture, algorithmic design software has served as a tool for reducing qualitative experience into data so that it can be regurgitated into abstract form. This way of working strays from recognizable connections between the architecture and ourselves. Shown here is a snapshot of a programming script for Grasshopper, a modeling software. It uses icons to represent actions and steps the designer has taken to model digitally. When we are presented with alien form so removed a surrounding context and culture, it's difficult to relate and find meaning with anything but the thing itself.

Arithmos
Algorism
Allo

} Algorithm

Fig.001 Grasshopper script

Fig. 002 Tower designed for drones

Number of Circle A Segments ◇ 4

0.032

250

Offset — Extr — Cap — Solid 2

Divide — Item — YZ — Polygon — Revolution A — Difference 1

Item
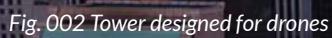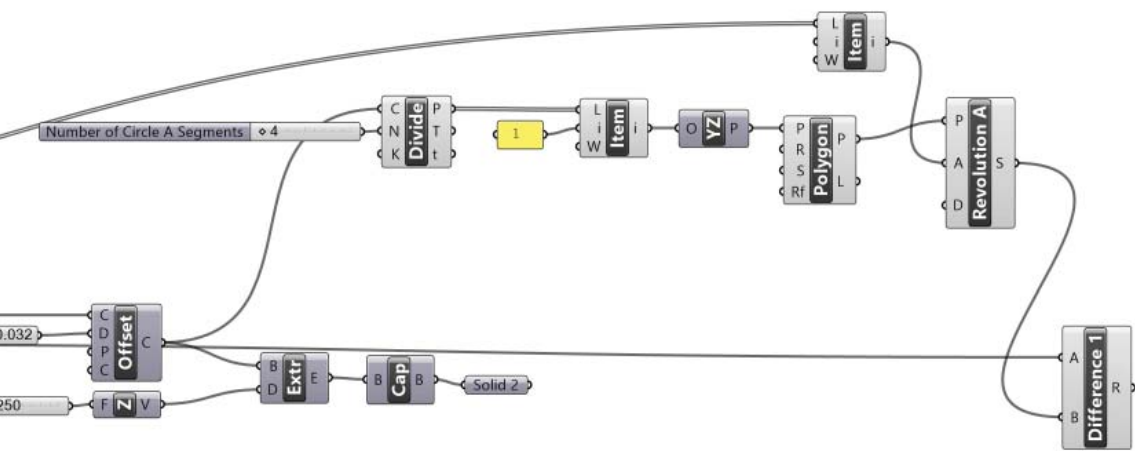
What tends to get built using algorithmic methods are unfamiliar representations of technological advancement. We're creating a version of "otherness" that doesn't allow our imaginations to relate and our perceptions don't form cultural or emotional meaning anymore. One culprit is found in Blob architecture which uses computational algorithms to design buildings. Typically, the outcome is a mere one-dimensional object that doesn't situate the user in a sphere of cultural relevance. Formal, and aesthetic objectification becomes the tendency than a deeper perceptual experience of architecture.

In a philosophical and architectural contemplation of our relationship with technology, I explore how the linguistic dimension of allegorical storytelling awakens poetic algorithmic design. In doing this, I aim to offer another understanding of algorithms and how they're used in architecture. The resulting building will foster artists, professionals, and hobbyists in an Urban Maker's Studio and Artist Workshop situated in contention with the AT&T Long Lines Building in New York. I'll extend my metaphors through historical and theoretical research, the creation of an artefact, drawings, language, models, and design process. It will show the value of human perception, interpretation, and judgement in the design process over the will of algorithmic software as it relates to our worldview.

[USER/CLIENT DESCRIPTION]

The client would be the owner of the site, AT&T. Currently the land is part of a secured facility. This theoretical project exists within a specific vacuum of reality that applies schematic design to issues addressed in this document. Who this is designed for then becomes the people using the building and the residents or visitors of New York.

Potential users would be anyone in need of a space to create or those exploring their creative potential. From serious artists to the occasional hobbyist would be able to use the facilities. The building would be programmed for facilitating communal use in which the only requirement is a membership.
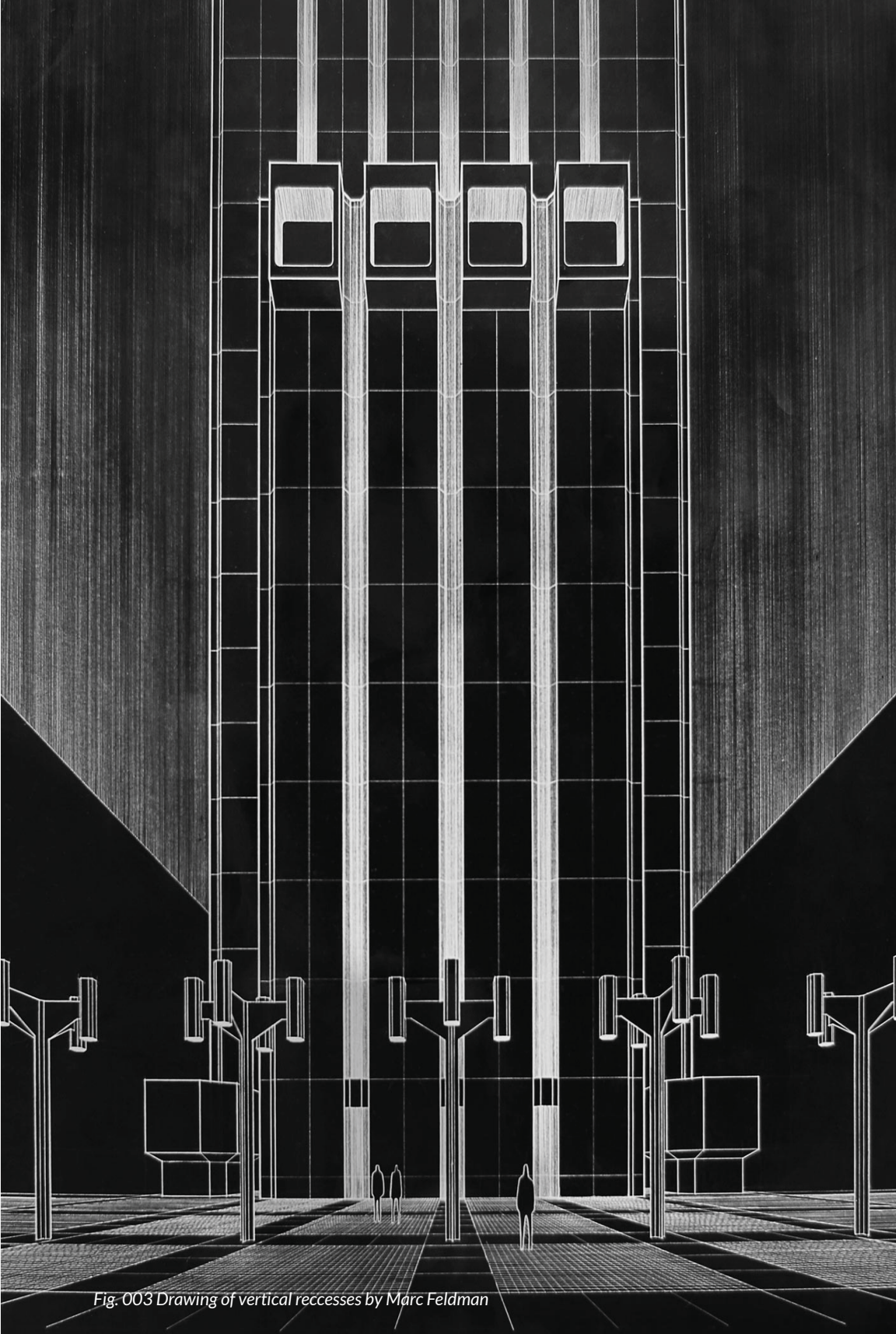
Fig. 003 Drawing of vertical reccesses by Marc Feldman

[SITE]

New York itself is a crucial hub of technological activity and innovation at a global scale. Its storied past mingles with the mechanical industries of printing, textile, and shipping to name a few. This project aims to design a building where there is an existing plaza next to another major technological sphere in telecommunications. The AT&T Long Lines Building, in particular, is a curious enigma.

Because it was made for machines, windows were deemed unnecessary and so the building becomes a hidden sentinel at night. Built to withstand an atomic blast, the building is autonomously equipped with enough generators and resources to sustain, people for two weeks. It stands at 550 feet tall but only has 29 stories. Each floor is around 16,000 s.f. yet on some of them the human capacity is a maximum of three people. This staple of the Tribeca area is clad in granite to subvert the eye and recede into the background. It's caught in this in-between state around the domination of mechanical power and an ever-present banality of technology.

10' 20'   50'   100'

Fig. 004 Still from Project X

[PROGRAM OF INHABITATION; TYPOLOGY]

- B occupancy under 'training and skill development not in a school or academic program'.

Similar types of "maker spaces" have existed all around the world. New fabrication studios are being built in Brooklyn to try and fulfill the need within the city. However, there are virtually no buildings that combine the types of spaces this project proposes. Typological case studies are limited in what they can offer to this type of research.

The program of my building also operates in the participatory engagement of the imagination. It is to be a place where members of all different skill levels and artistic inclinations can gather, work, and "play" within the urban fabric of lower Manhattan. The building's structure frames a combination of shared studios for fabrication and art. Spaces for discussion, production, and display are also necessary for the process of creating or making. Classes, lectures, and a central gallery will be curated around a temporary artist in residence. Galleries offer the display and celebration of the member's work.

Memory is carried out into the city through the things people make and the experiences created around the building. An emphasis throughout the building will be the open display and connection of spaces in a contrast to the looming leviathan next to it.

Artefact, program, and building revolve around playfully framing our connection to the world through technology and making. Built-in architectural components are the kit of parts that form a tectonic language implemented in constant transition. Cyclical memory snakes through the entire structure. I treat art as a building material and welcome in artists in residence to influence the experience of the spaces.

Fig. 005 1st 1ESS telephone swithcing room

Fig. 006 Data servers in the Long Lines Building

New Lab (BLDG 128)
By Marvel Architects

Concept Design & Interior Design By:
Macro-Sea

Location:
Brooklyn Navy Yard; Brooklyn, NY

Around 161,000 Sq. Ft.

Completed in 2017, this renovation of an existing industrial building in Brooklyn's Navy Yard is very pertinent for programmatic studying. Its core concept is to provide the space and means for innovative tech companies in a city that hasn't been conducive to such a community. It can handle 100+ companies and 500+ members in a non-collaborative capacity.

The relationship of the community's creators and users to the spaces and technological means are the main concern for this thesis. Work tables, circulation, and lounge clusters occupy that axis and are flanked by two stories of private, rentable studios. A section cut of the building reveals the immense open clerestory areas. This grants a sense of vastness to the open work areas.

Fabrication shops are found on both levels and are managed by the facility's staff. New Lab's major fabrication spaces include an electronics lab, 3D printing shop, wood shop, metal shop, and a CNC shop among others.

The intention behind New Lab's concept is to help build a community of innovators and entrepreneurs. This execution shows a positivist and functionalist approach to technology. Perhaps part of the problem is that the program is business oriented which would indicate the capitalist driven side of technology. It is in this mindset that "new" is better and will be profitable. This is exactly the kind of innovation Terzidis corrects in Algorithmic Architecture. He uses the analogy of a tree to describe this reductive attitude. "Innovation may be seen as a process of adding one more leaf to the tree, whereas originality can be seen as the process of adding one more root" (Terzidis, 3). This case study is simply promoting the advancement of technology either for capital gain or for the sake of advancement.

Fig. 007 Interior view of New Lab

Fig. 008 Section view of BLDG 128

Fig. 009 One of New Lab's Workspaces

Fig. 010 New Lab's Atrium

[PROJECT EMPHASIS]

The emphasis will primarily consist of a metaphorical articulation of space that reconnects the site with the area's historical and cultural context. The design process that I create through the algorithmic lens will serve as my personal interpretation in finding a solution to addressing how a meaningful structure might exist in this area.

A secondary emphasis will be in the way a makerspace could fill a creative need in the area. At the same time, the existence of such a space could also bolster and encourage those in the area to further lend themselves to creative pursuits. These will be the main products and examples of a philosophical and conceptual critique of the relationship we have with technology in an architectural framework.

This thesis is focused on the perceptual experience of architecture. Rather than expound on abstract ideas with data, it tries to make metaphorical connections primarily through language and the theoretical design of a building. Assertions are informed by history, the building site, the program, and a critique of culture. Any marked success should result in topical discussions that relate the project (and perhaps ourselves) to the greater whole. This could be modern society or our history as a people. Subjectivity rules over any objective checklist regarding this project.

For the building itself, it will be successful if it can use algorithmic design to create a playful, pataphysical building that engages its users and the people who encounter it. The building program should illustrate a response and a solution to the critique in a contextual manner. To perform well hinges upon the preceptor and the convincing presentation of my research and design.

The success of which ultimately lies in how it makes the preceptor feel. Figuratively, the dialogical space created amidst the atmosphere of the design and artifact will create a perceptual realm. Theory with history to back the critical edge should culminate in a built world. It should raise more question than it answers.

[GOALS]

• To examine how algorithmic design could contribute to critical and poetic architecture

• To relate a site back to its local culture of the past, present, and future.

• To articulate an experience of memory throughout representational modes of architecture

PART II

Many issues arise when algorithmic design as "input data outcomes form". Of the two main ones, the first is that creative judgement may no longer lay with the designer. The second is the lack of interpretive engagement with modern algorithmic products. Machines can't process sensory experience, space, time, or memory like humans can. These abilities intertwine when we're presented with a work of art. When we are in this "space of interpretation" so to speak, we can view the "other" and self-reflect.

There's an existential element to architecture and that extends to machines. Since we are woven to the world through technology, we can see that we haven't always used machines to enframe nature. The term enframing was coined and popularized by philosopher Martin Heidegger to explain man's treatment of technology onto the world. Which is to say, we produce for the sake of producing and that machines are mere tools at our disposal. In "Questioning Concerning Technology" Heidegger made a salient point when he said the essence of technology isn't technology. I assert that it's less about the tools and the technique. Since tools are physical things that help us achieve our goals, desire and what we put out into the world lay at the center.

There is a dialogue between us and technology; it ties us to the world. It's been integral to our past as much it will be to our future. Ancient humans, for example, had a very different relationship with it than we do now. Medieval machines intended to demonstrate the wondrous workings of nature. The machine as *thaumata* spoke to how the machine could be a miraculous or wondrous object. It began with divine geometry. Geometry and proportion served as a correspondence between the heavens and the earth (Tzonis, 19). To them, a circle was a significant figure, an Ideal form. It could resolve two contrary motions and was without a beginning or end (Olshavsky, 184). People devised machines incorporating the circle into instruments that made a reversal of power possible. The Archimedean screw on the right draws water from a source and upwards toward the shore in a reversal of the natural order.

It often appeared as if the machine operated miraculously. Hero's aeolipile, on the right, is an early conception of a steam engine. Fire would heat the water container, and the eventual steam would escape through the pipes to spin the turbine. A machine like this could seduce people with its ingenuity. On the other hand, there could be suspicion regarding its inner workings. By hiding its modes of operation, the inability to understand a machine [felt] as if one's "power of vision" were stolen.

Fig. 011 Hero of Alexandria's Aeolipile
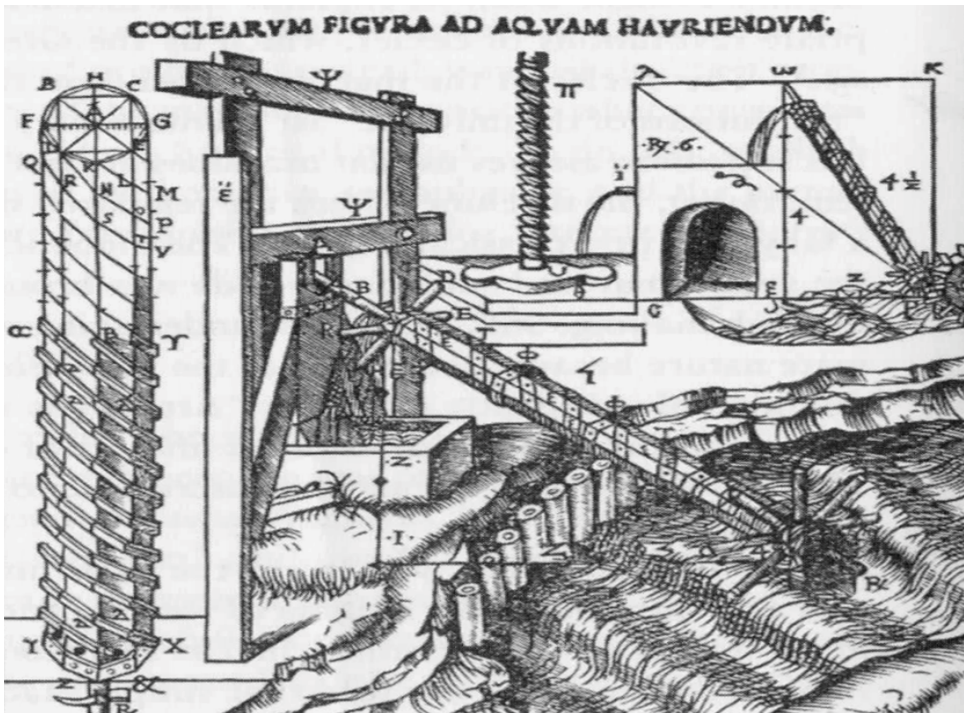
Fig. 012 Archimedean Screw
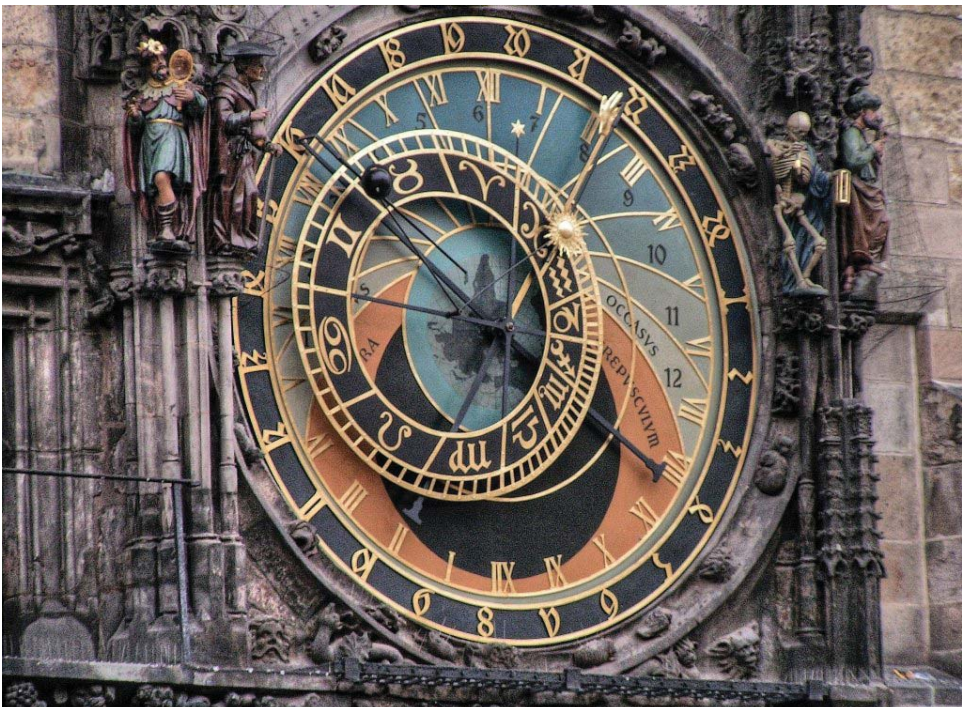
Fig. 013 The Prague orloj (astronomical clock)

Another such machine was the astronomical clock built for Prague around 1490. To this day it demonstrates the movement of the heavens and the earth. Through dials for eclipses, moon phases, sunrise, sunset, and three separate ways of telling the time of the day, lay people could gather in the square and learn about the world and the beyond. Even the four automatons, or moving puppets, featured in the picture on the right offer mythological interpretations about death. Ancient people experienced wonder through the machine itself. In general, thaumaturgic machines of this age aimed to "overwhelm the spectator with awe in the contemplation of the hidden powers at work in the world" (Tzonis, 18).

We've drifted away from this view of machines because of our relationship with technology and the way objective thinking developed. During the Renaissance, Galileo offered an idea of space versus the actual experience of it. The world could then be understood by abstract logic. Human experience could be boiled down to geometric measurements. The image on the right exemplifies the paradigm shift in architectural thinking by using an abstract theory to understand the limits of a material. In this example, the study of statics can describe the stability of a cantilevering wood beam. The desire to understand the workings of nature in mathematical theory opened the way

for the industrial revolution. More and more tasks became mechanized with an emphasis solely on efficient production. Our world view underwent a transmutation, so that lived experience could be described abstract numbers over metaphysical explanation. Mechanization began to overwhelm our everyday experience with the world around us. Machines participated in the world so that we didn't have to. We can see the effects today in the digitized society. Now we are enmeshed in a way that our perception and our being in the modern world is incomplete without digital technology.

I believe we can't completely forgo technology and go back to the myths of ancient times. We must live in the time of our own. By learning from the past, it can be a time of inspiration through works that take us deep within ourselves and show us the world. This thesis and the machine it works through, i. e. the building, will be modern interpretations that also create a space in our minds where the dance of imagination is situated. This participatory engagement with the architecture should relate back to the world through a compromise of efficiency, play, and artful wonder for the possibility of self-reflection.
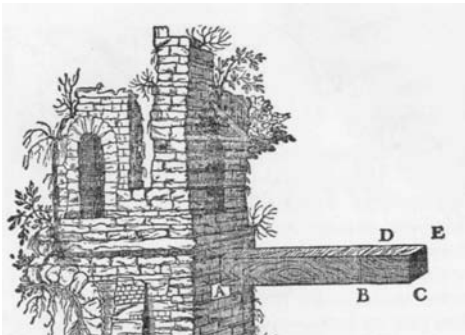
Fig. 014 Galileo's material analysis using statics
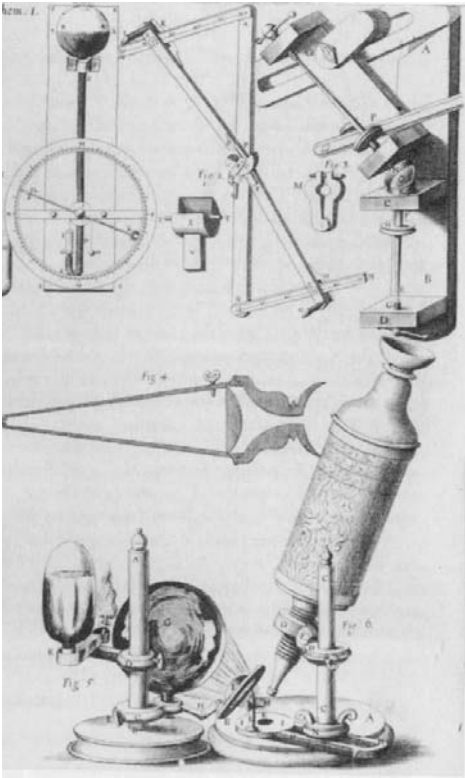
Fig. 015 Microscope by Robert Hooke
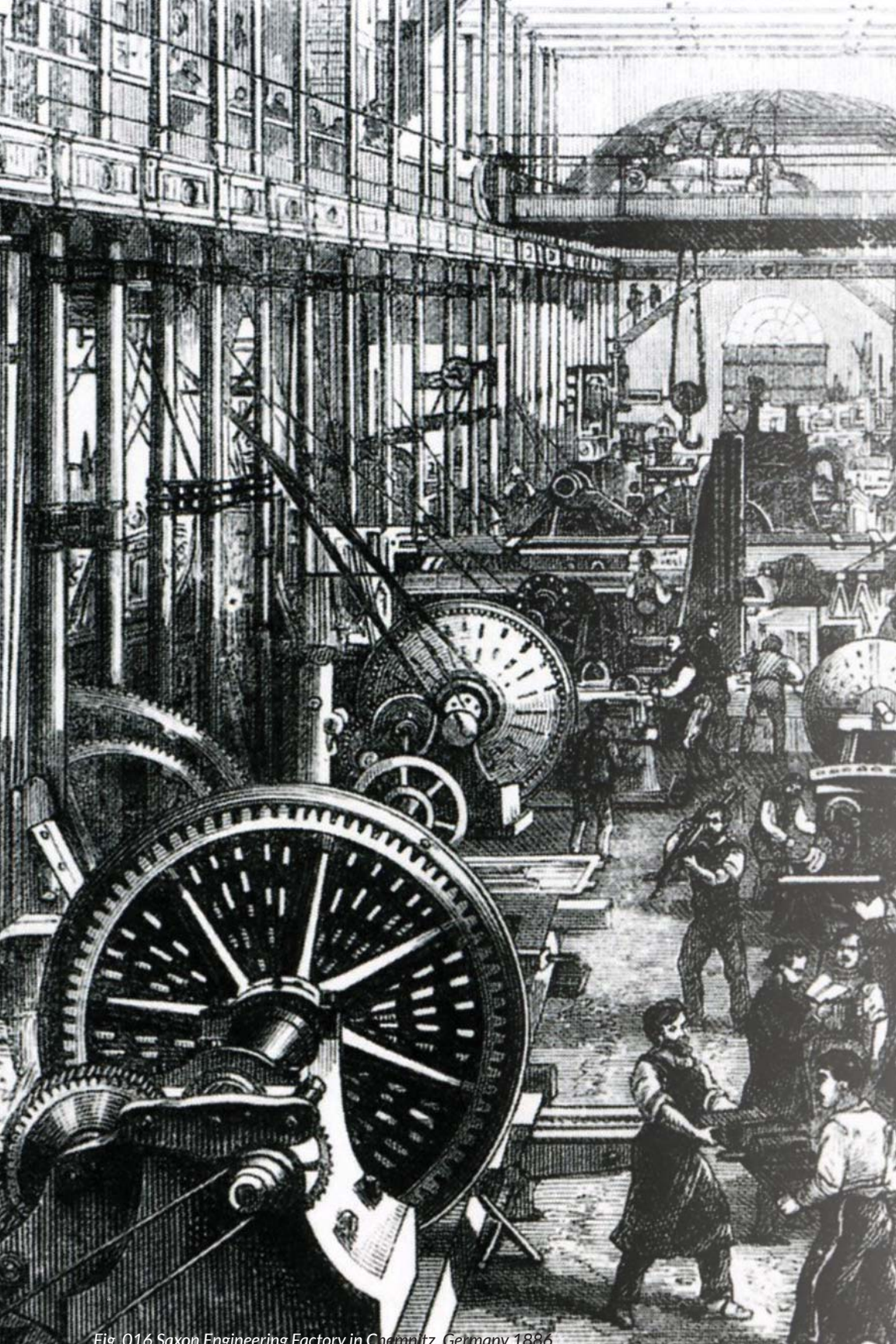
Fig. 016 Saxon Engineering Factory in Chemnitz, Germany 1886

UBU ROI, d'Alfred JARRY

créé à "l'OEuvre" passe le 17 Février (Retenir ses Places)

Musique d'Orchestre de Claude TERRASSE, dirigée par M. CADOU

Mise en Scène de M. VERMEIL (Ex-Directeur de la Scène à la "Chauve-Souris")

Une Pièce interprétée par M. René Fauchois — La Mère Ubu par Mᴸᴸᴱ Pierly

VOITURIN À PHYNANCE

F-5000

Fig. 017 Poster for the opening of Ubu Roi
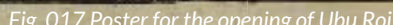
'Pataphysics

The first step is to create a "playful" machines that can bring back the wonder ancient humans first saw. The idea of "play" and a playful machine situated critically originated in the works of Alfred Jarry. 'Pataphysics originated as a response to Jarry's experience of the scientific Will. He saw how technology was full of instrumentalized contrivances and that metaphysics was more concerned with "planetary technology and a completely mechanized science" (Olshavsky, 200). Everything he saw wrong he represented plays featuring Ubu Roi, or King Ubu. It's him sticking his middle finger up to society's logical frameworks. Originally based off a school teacher of Jarry's, Ubu became the mascot for the failures of technology's willful domination which is to say greed and self-gratification. What's more, he could also be considered Jarry's first pataphysical machine. Like science, Ubu wants to "erect his will as sovereign law" just as the scientific method seemed like the only way to prove what's true. Ubu came to be the utilitarian machines that prioritized efficient functionality and replaced the role of the arts in technology with science.
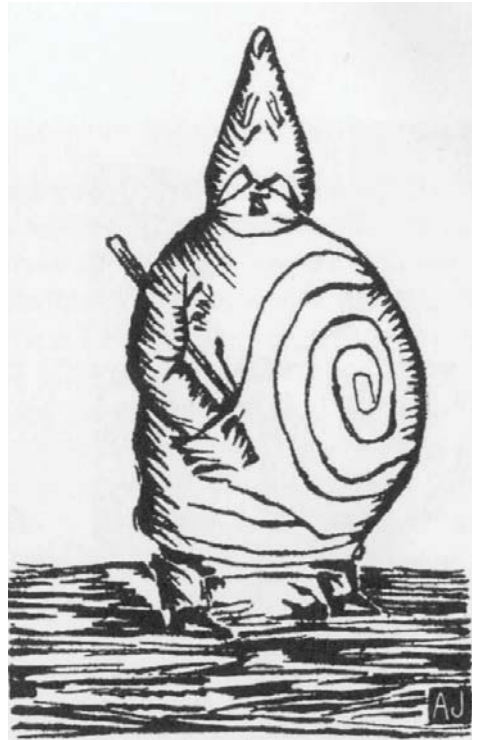
Fig. 018 Ubu Roi by Alfred Jarry

His fake science was embodied in pataphysical machines that at first seemed useless. They're meant to be semblances of machines you'd see in dreams, in cinema, or in the theater. Here, Peter Olshavsky imagines a skiff made of was, oars, a sieve, and a bed as once described by Jarry. They also create a sense of play between the machine and the viewer through an interweaving of symbolic connections. These machines' surreal, almost nonsensical, presentation requires a preceptor's input into an inventive process with the objects. They hint at varied meanings and connections to a variety of feelings or memories are brought out. "Pataphysics is the sciences of imaginary

solutions, which symbolically attributes the properties of objects, described by their virtuality, to the lineaments" (Olshavsky, 200). His pataphysical machines embodied specific uselessness, dysfunction, and pataphorical absurdity. It emphasizes connections between objects and how the play of those objects is a form of self-representation. For architecture, interweaving symbolic connections in ludicrous representation allows us to experience play between us and the machines.
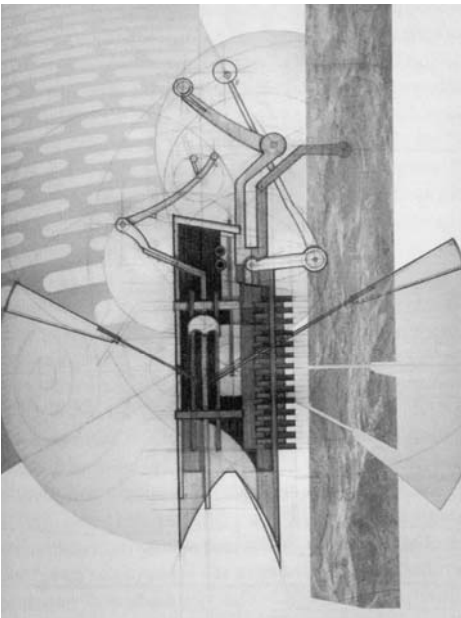
This is important because rather than mimesis, Pataphysical machines rely on a "process of "exomosis:" a form of play in which spaces swell in the presence of a work or character, and they "congeal their surroundings into their own image and erect palaces of space around themselves (Olshavsky, 201). This congealing is our perception digesting all the sensory experience in the chaos created. There's an anterior chaos within which we can find that space and substance like that of the chora; Chora being the poetic distance where the space of imagination lies. The chaos that's formed out of a pataphysical machine's acceptance of contingent accidents, unpredictability, chance, and play therefore could counter the Newtonian reduction and mechanics of today's world (Olshavsky, 203).

Fig. 019 Peter Olshavsky's Mixed Media Skiff
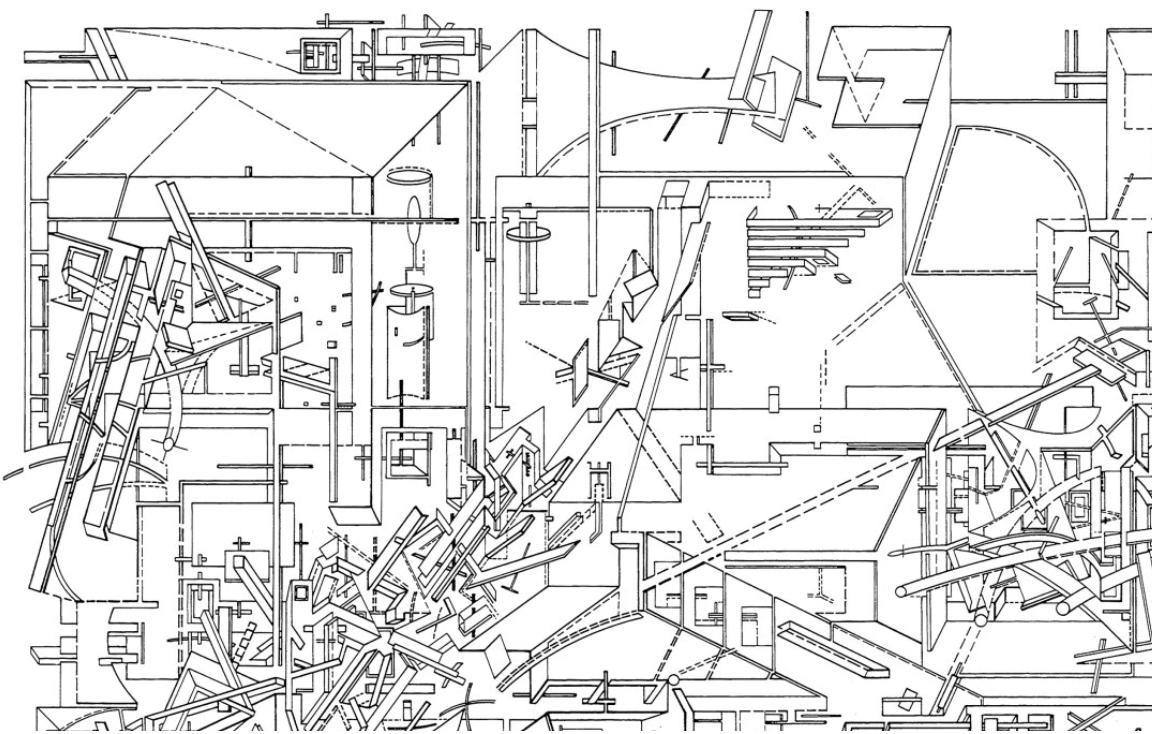
Fig. 020 "Dance Sounds" from Daniel Libeskind's Micromegas series

Micromegas

Where the near surrealist exploration of realities cross over with architecture can here be represented by Giovanni Battista Piranesi and M. C. Escher. Piranesi and his Carceri etchings demonstrate the spatial distortion through geometries that would be physically impossible were they to be realized. A stone arch somehow spans between two columns that are appear as if side-by-side and in front or behind each other simultaneously.

This concept of impossible geometry was popularized by M.C. Escher in the mid-20th century. His "Waterfall" carries water through a wheel that's made into a perpetual motion machine. The water keeps falling on itself so that it also creates its own flow upward.
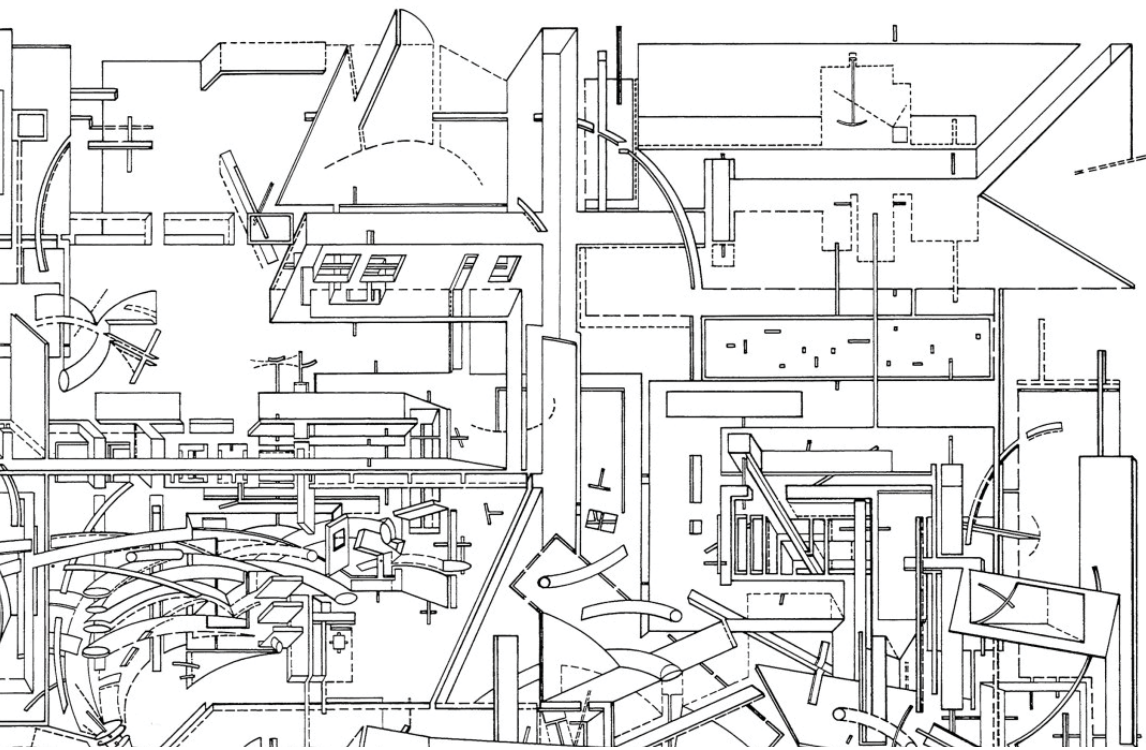
Fig. 021 Carceri Etchings, Plate 14

Fig. 022 Floor plan of the Dresden History Museum
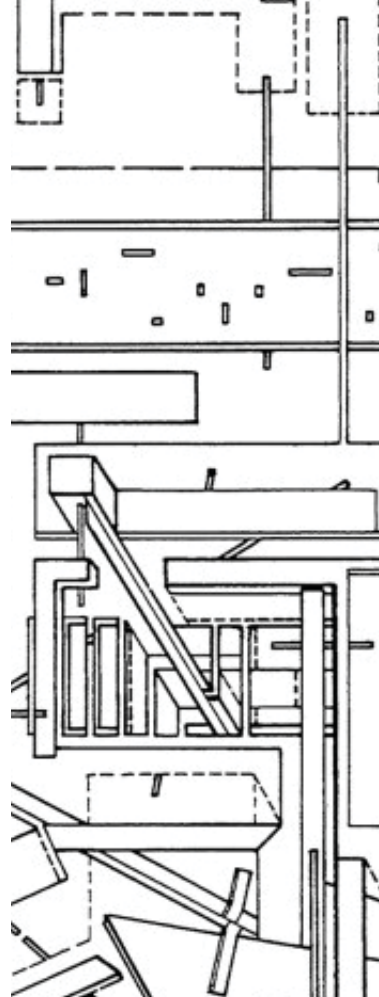
Fig. 023 Close-up of "Dance Sounds"

What we have today are drawings that don't intend to disrupt. We draw to be rid of too much interpretation. The central image is part of a construction drawing for Studio Libeskind's Military History Museum. It shows the outcome of our standardized graphical symbols where spaces can be equated through their position on a grid. It's an abstract idea of a regulating system made concrete by our adherence to its rigid interpretation. The expanded portion of "Dance Sounds" are abstract symbols that upend the conventions

we're used to. We can no longer receive that concrete concept of space anymore. While necessary for construction, standardized drawings have led to the reduction of how we perceive space and time. If we are to be inspired within a sphere of culture, we must engage our imaginations and interpret.

Dance Sounds is part of a series of drawings Daniel Libeskind created in working through some of his projects. They're also his reaction to drawings being reduced in a top-down,
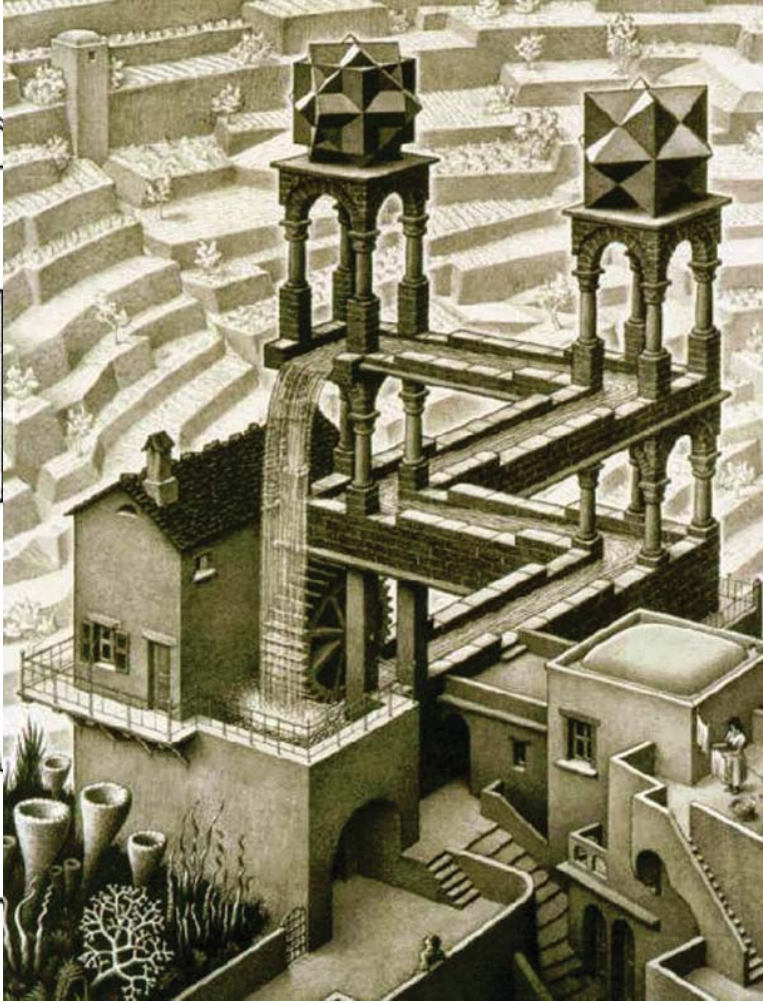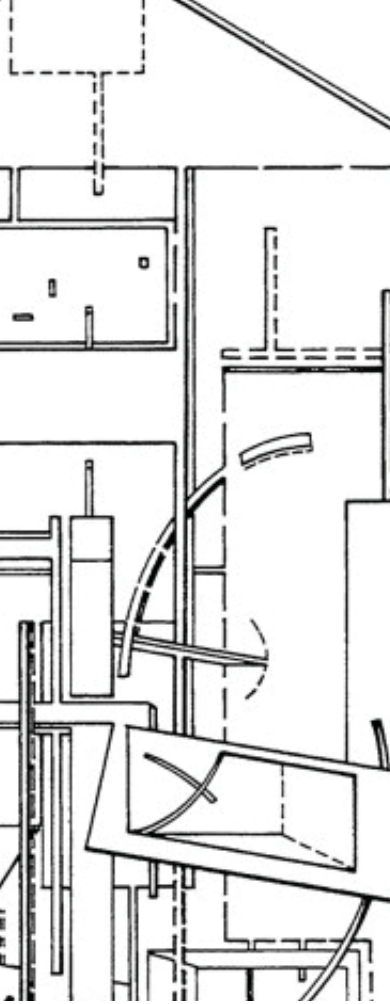
Fig. 024 M. C. Escher's "Waterfall"

abstract to concrete manner. An idea of a grand lobby described simply as four lines, or walls for instance. This is why he exploded and morphed architectural drawings to disrupt the standardized drawing conventions to get back to the nature of architectural drawing. To him, an architectural drawing should unfold future possibilities through the artist's interpreted intentions.
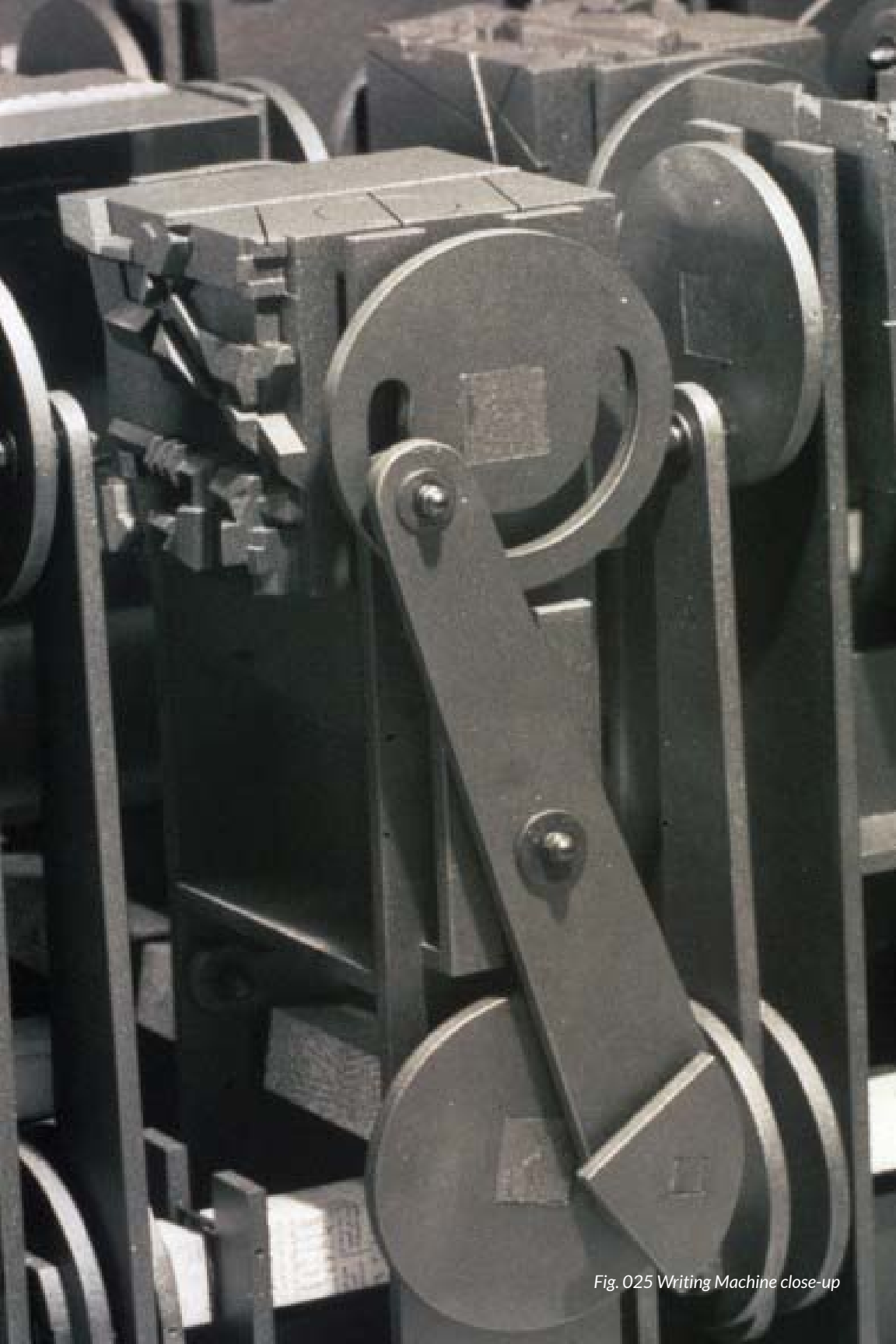
Fig. 025 Writing Machine close-up
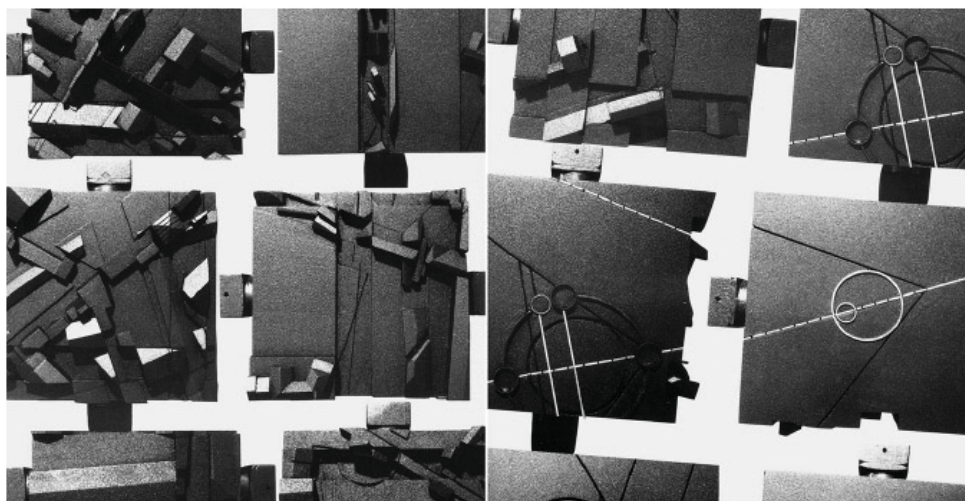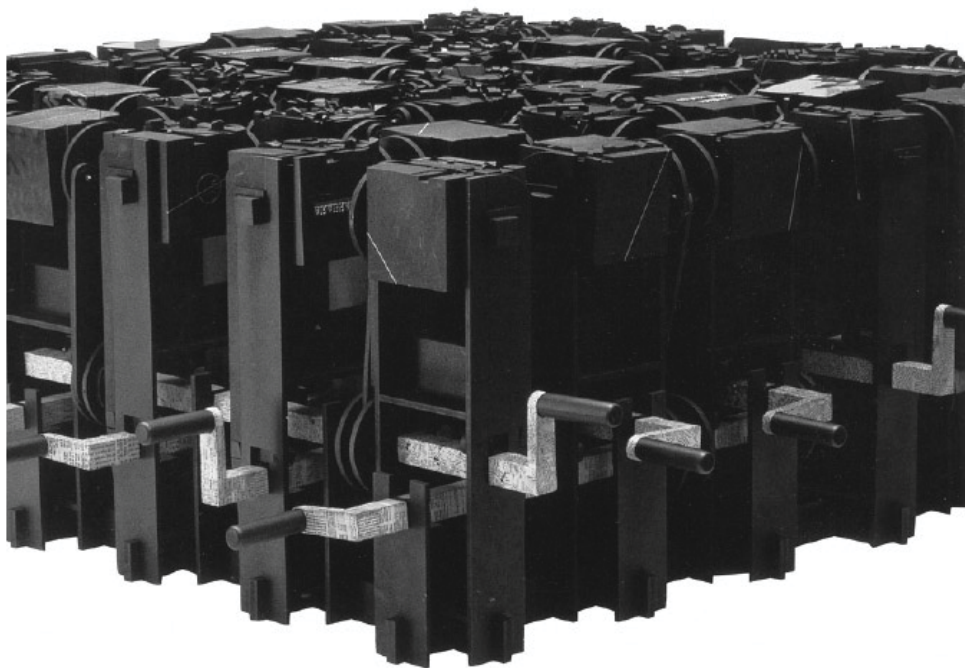
Fig. 026 Detailed view of Libeskind's Writing Machine

Writing Machine

Daniel Libeskind's Writing Machine offers a valuable example of a machine disrupting convention to engage the user. When putting together an installation for the city of Palmanova in Italy, Libeskind and his grad students at built a set of three machines. This series' final piece, the Writing Machine, is an industrial exploration of mechanical reproduction and linguistic representation or text. The aim was to make books from nonsensical combinations of text

that could encapsulate all the wisdom of the arts, sciences, and culture. The 7x7 grid of cubes forms a book or a text that changes by the turn of a handle. Of the four sides each show a blank, reflective metallic face that break up the mathematical order of the text and one side is of geometrical signs or as Libeskind calls it, an architectural horoscope. Another represents a saint inspired by the poem *Impressions of Africa* by Raymond Roussel. The last is from Mondrian's *Broadway Boogie Woogie* projected onto the Italian city for which the series was made, Palmanova. The painting itself tells about the syncopated rhythm of a city inspired by jazz. Symbols of contextual significance then appear and disappear unpredictably to form new texts.

Libeskind considers each side to be one of four new languages. Without getting to in depth on the concept of a language, he essentially created a system of symbols to communicate with the reader via the machine. It's possible that someone could take the time and try to decipher or reveal something from a generated text but unfortunately, his machines for the Biennale were mysteriously destroyed soon after they were presented.

The way he uses a machine to disrupt and critique communication is quite pertinent to this project. The destabilized, perhaps fragmented, technology of the cubes is made stable by the handles, representing the manner in which we wield technology. More importantly, the "flight path" of our perception is not direct and our active participation is required to "pilot" the unstable text. Through a machine that rationalizes unpredictable contextual elements, the user must engage their imagination and peer through the chaos. "Because now one is making something useful, not just for those who are alone in the many, but to the many in one" (Libeskind, 193).
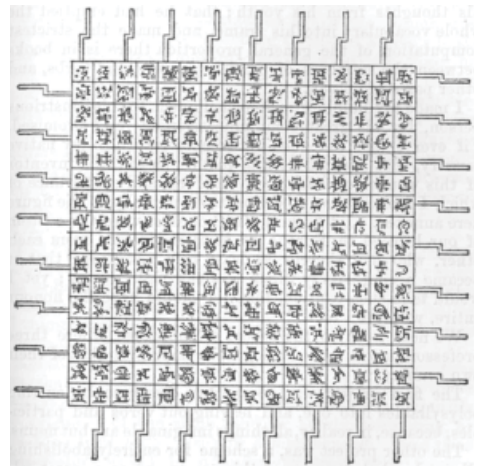
Fig. 027 Engine from Guliver's Travels
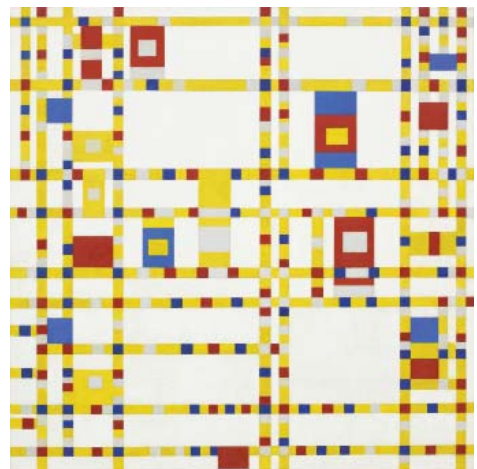
Fig. 028 Mondrian's Broadway Boogie Woogie

Fig. 029 "In Advance of the Broken Arm"

Fig. 030 "Bicycle Wheel"

Readymades

Building my own pataphysical machine to work through began with the art of Marcel Duchamp. In his Readymades, everyday objects are framed in a way that critiques the existence of art. He creates the opportunity for poetic interpretation and contemplation of the things around us with "Bicycle Wheel" by rendering two parts "useless". He coerces interpretation by inviting the viewer to question the circumstance of the readymade's being with thought provoking titles and presentation of something as being art.

Fig. 031 *The Bride Stripped Bare by Her Bachelors, Even (The Large Glass)*

THE BRIDE'S DOMAIN (upper half of the glass):

1. The Bride (*Pendu femelle*, arbor-type)
   a. Wasp or Sex Cylinder
2. Top Inscription or Milky Way (the cinematic blossoming)
3. Draft Pistons or Nets
4. Nine Shots
5. Bride's garment
6. Region of the Gilled Cooler (isolating plates)
7. Horizon
8. Region of the picture of cast shadows
9. Region of the mirror image of the sculpture of drops
10. Juggler of Gravity (also called the Trainer, Handler, or Tender of Gravity)

THE BACHELOR APPARATUS (lower half of the glass):

11. Nine Malic Molds (or Eros's Matrix) forming the Cemetery of Uniforms and Liveries
    a. Priest
    b. Delivery Boy
    c. Gendarme
    d. Cuirassier (cavalryman)
    e. Policeman
    f. Undertaker
    g. Flunky (liveried servant)
    h. Busboy
    i. Stationmaster
12. Capillary Tubes
13. Sieves or Parasols (within are the Drainage Slopes)
14. Chocolate Grinder
    a. Louis XV chassis
    b. Rollers
    c. Necktie
    d. Bayonet
    e. Scissors
15. Region of the Waterfall
16. Glider (Chariot or Sleigh)
    a. Water Mill Wheel
    b. Runners sliding in a groove
17. Oculist Witnessess
    a-c. Oculist Charts
18. Region of the Butterfly Pump
19. Toboggan (or Corkscrew or Slopes of Flow)
20. Region of the Three Crashes (or Splashes)
21. Weight with nine holes
22. Mandala (a magnifying glass to focus the splashes)
23. Marbles
24. Boxing match
    a. First ram
    b. Second ram
25. Region of the sculpture of drops
26. Region of the "Wilson-Lincoln effect"
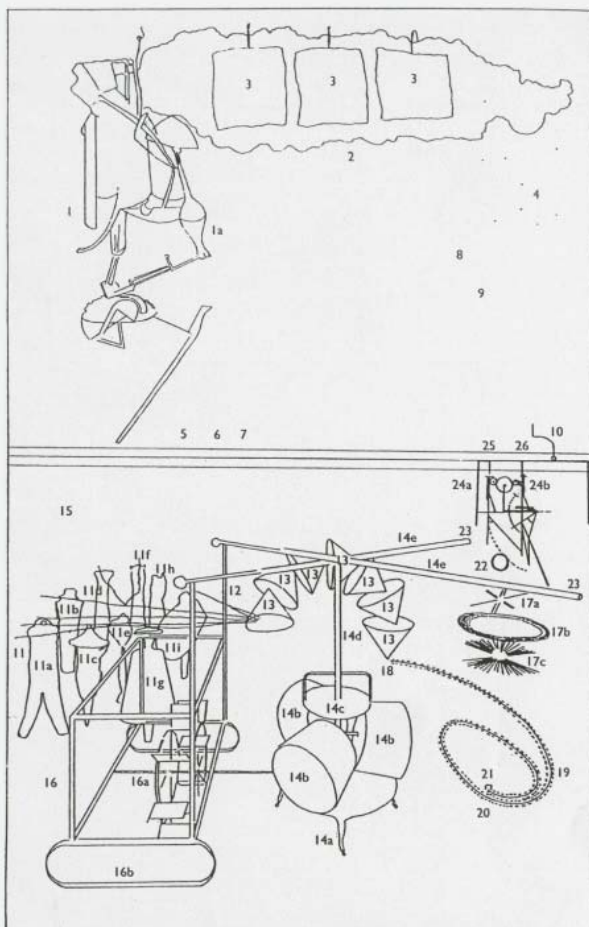
The diagram is based on Marcel Duchamp's etching *The Large Glass Completed* (1965). Numbers 10 and 18-26 are elements that were not completed in *The Large Glass* (1915-23).

Fig. 032 The Large Glass Diagram

The Large Glass

Duchamp's masterpiece, the Large Glass, also offers a treasure trove for a work dependent upon cultural, contextual elements in built form. Octavio Paz, a Nobel Prize winning poet, refers to it as a symbol machine. Relations, connections, and propositions are offered rather than explicit references to humanity. Duchamp's attitude maintains mechanisms that produce their "own antidote, meta-irony. The element of laughter doesn't make the machines more human, but it does connect them with their center, which is man, with their source of energy, which is contradiction. [There is a] "Beauty of precision" in the essence of indetermination: [in the form of] contradictory machines" (Paz, 12).

He combines materiality, space, and time by painting ideas in an intellectual and linguistic fashion where meaning is read through multiple works. Paired with his curated notes in the Green Box and the White box, he established imagery and a context of elements present in the work itself. Duchamp explicitly stated titles for the individual components of The Bride Stripped Bare by Her Bachelors, Even. Without the language provided in Duchamp's Boxes, it is unclear what images the work produces in us.

"The name of each part [including the title itself] also has a meaning - or rather, several meanings - and these complete the sense of the plastic composition...They are signs that orient and disorient us (Paz, 1968, p. 33)". That's why this building, like the large glass, is also a plastic composition that has a specific elasticity.

The title refers to the bride figure in the upper left (in a simplistic sense) being objectified by the nine bachelor machines below her. The "malic molds" as Duchamp calls them in the Green Box are at the same time being controlled or manipulated by the bride. By creating a physical division between the female realm in the upper pane and the male realm in the lower pane, a spatial quality is brought to the piece. There is an additional criticism found in framing the work in a window like struc-ture. This shows how the presentation of a story can be part of the critique and narrative as well.

Paz goes on to describe the many elements and their relationships with one another. Eventually he arrives at the cloud like form with three rectangular voids in the upper left hand of the piece. Many things come to pass. In one sense, it represents the bride's sensations, commands, or blossoming. Its proximity and specific positioning to the bride hints at an erotic sentiment for some. Paired with the thee voids in the cloud, the bride both beckons to the bachelors and dismisses them.

When regarding the title *The Bride Stripped Bare by Her Bachelors, Even*: "the use of the word 'bachelor' (célibatarie), instead of the seemingly normal "fiancé" or "suitor," sets up an unbridgeable separation between feminine and masculine; the bachelor is not even a suitor, and the bride will never be married. The plural ("bachelors") and the possessive adjective heighten the inferiority of the males; they bring to mind the image of a herd, rather than polyandry" (Paz, 1968, p. 32). Duchamp considered the title of a work to be a part of the work itself. With the Large Glass we already have an awareness of the concepts presented in the work perhaps before we even see the work itself. Language is intrinsically tied to the experience.

"Like the boards used in stadiums to mark up the scores or in airports to indicate the arrivals and departures of planes, the Pistons hang from three nails. Their other name is Nets...They are also called Top Inscription because their function consists of transmitting to the Bachelors and to the Juggler of Gravity the discharges - her sensations, her commands (Paz, 1968, p. 43). For Duchamp, there is a change in name or form but not a change in essence. In this universal anamorphosis, pistons become the "deformed image" of Nets, an Inscription, or a Milky Way.

Fig. 033 1884 Manhattan V.1 Plate 35 Sanborn map

5

BEACH ST.

41

NORTH MOORE

STREET

STREET

37

VARICK

ST.

BROADWAY

189

F. H. LEGGETT & CO.
WHOLESALE GROCERS

N.Y. CITY S. C. O.
Stove House

COOK & BERNHEIMER COMP.
WHOLESALE LIQUOR
DEALERS & COMPOUNDERS

CONTINENTAL COLOR &
CHEMICAL CO.

WESTERN UNION TEL. CO.

BORDENS CONDENSED
MILK CO.

189

FRANKLIN

Factory

ST.

179

POLICE
STATION
5TH PRECT.

H. B. CLAFLIN CO.

Cells

LEONARD

ST.

H. B. CLAFLIN CO.

179

H. B. CLAFLIN CO.

WEST

HARRISON

HUDSON

STAPLE ST.

JAY ST.

WORTH

ST.

GARNER
WHOLESALE DRY GOODS

144

CATLIN

THOMAS

ST.

16

16

SCALE OF FEET

I've found my own Ubu in the cultural epicenter that is New York City. This technological hub hybridizes an illustrious past of old mechanical industries like printing and communications with the allure of the new digital age.

This project aims to design a building where there is an existing plaza next to the AT&T Long Lines Building in Lower Manhattan. The area immediately surrounding the project site has an existing arts culture. There isn't a lack of gallery space but there's a need for workshops and studios throughout the city. The density and land costs in Lower Manhattan is more suited to mixed use residential but such development has led to the gentrification issues plaguing New York already. Similar typologies have been developed recently in the Brooklyn Navy Yards where there is presumably more space and less expense.

A map of land uses shows an appropriate zoning for the project.

• Commercial C6 District

Fig. 034 Related spatial typologies near site

PRECAST CONCRETE WITH GRANITE
FACING – ALL PRECAST AS A PANEL

TERRA COTTA TILE

CONCRETE

EXTERIOR WALL – CABLE DUCTS

Fig. 035 Wall detail for the Long Lines building

OPEN TO SKY

R.A. DUCT

SMOKE TOWER

F.A. FILTERS

E.A. FILT

COOLING TOWER

AIR HANDLING EQUIP.

COOLING TOWER

STATIONARY SATELLITE
ANTENNAS ABOVE

MICROWAVE ANTENNAS
ABOVE

SUPPLY

F.A. FILTERS

ELEV. MACH. RM.

STACK
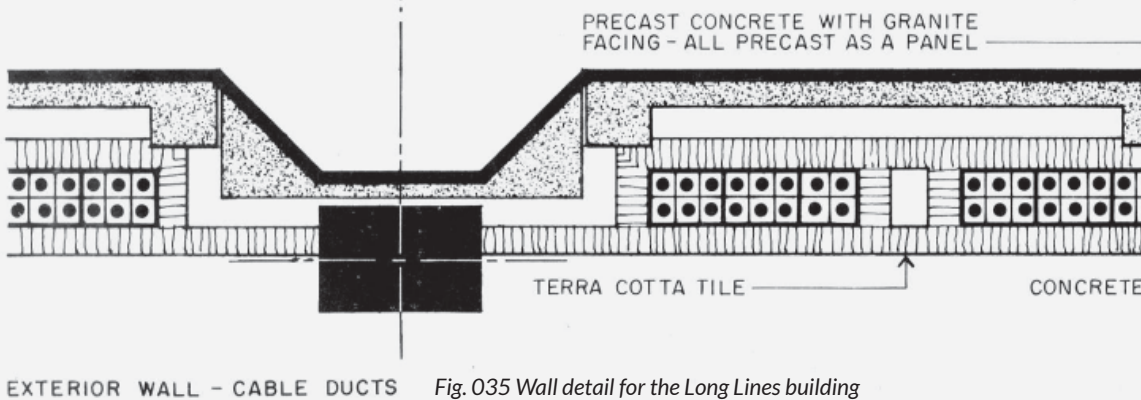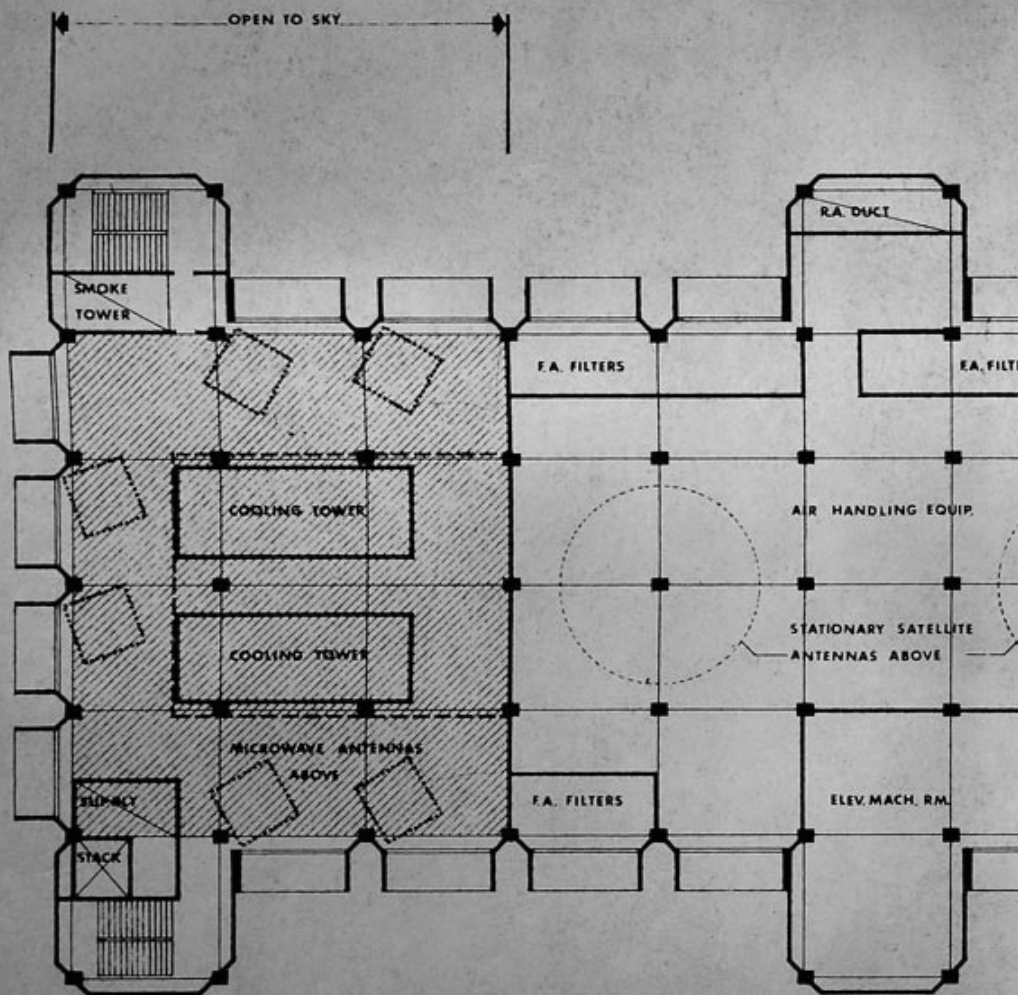
Fig. 036 Mechanical Floor plan for Long Lines building

TOWER MECHANICAL EQUIPMENT FLOOR

CABLES — GRANITE FACING —

BLOCK —

COLUMNS →

℄

℄

R.A. DUCT

ELEC. CLOS.

HIGH RISE FREIGHT

TOILET EXH

SUPPLY

PHASE 1
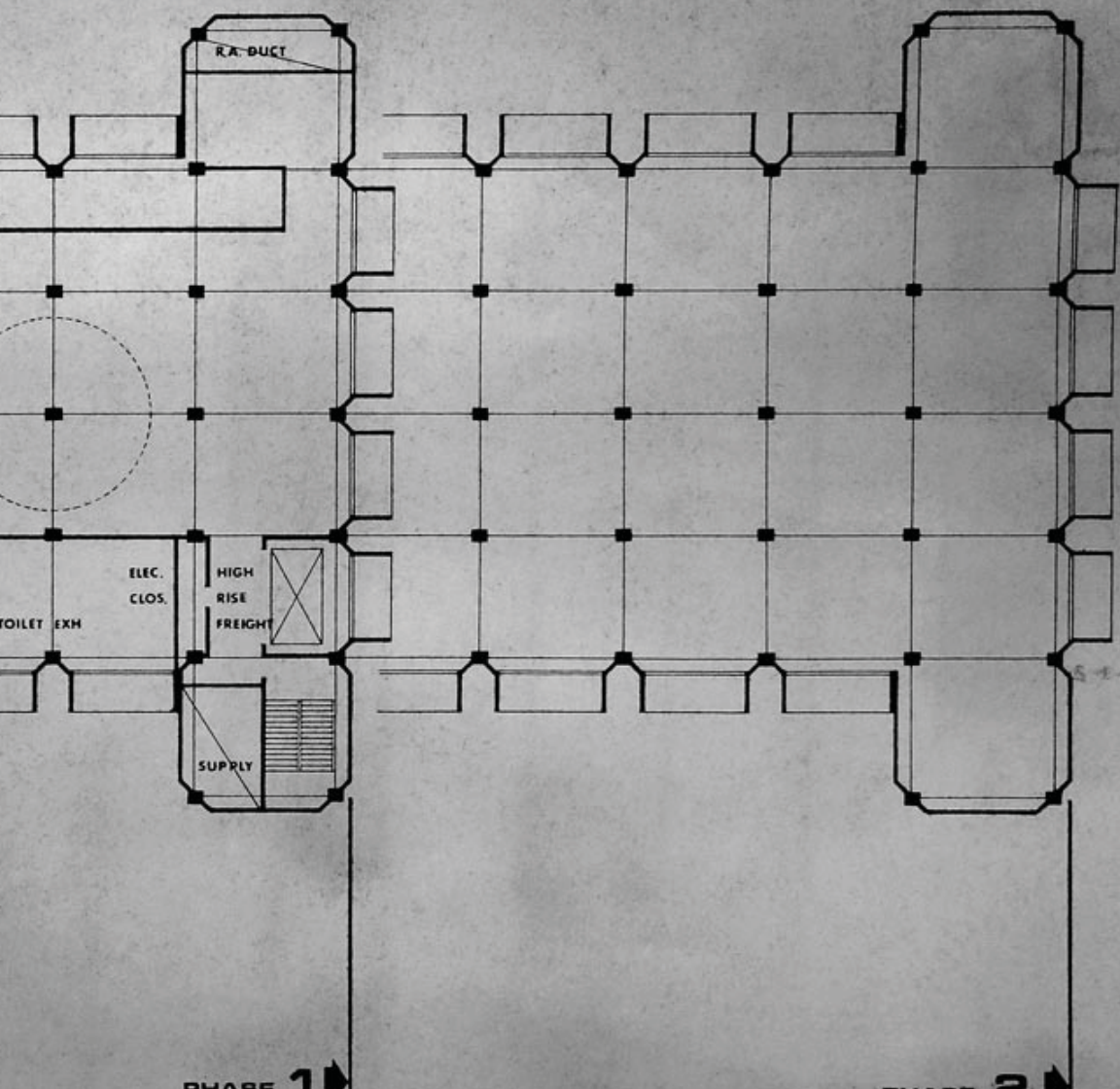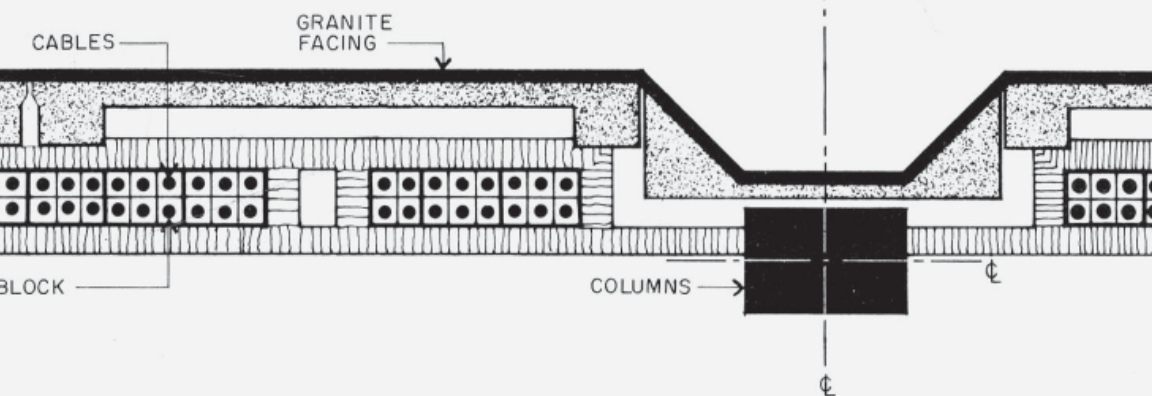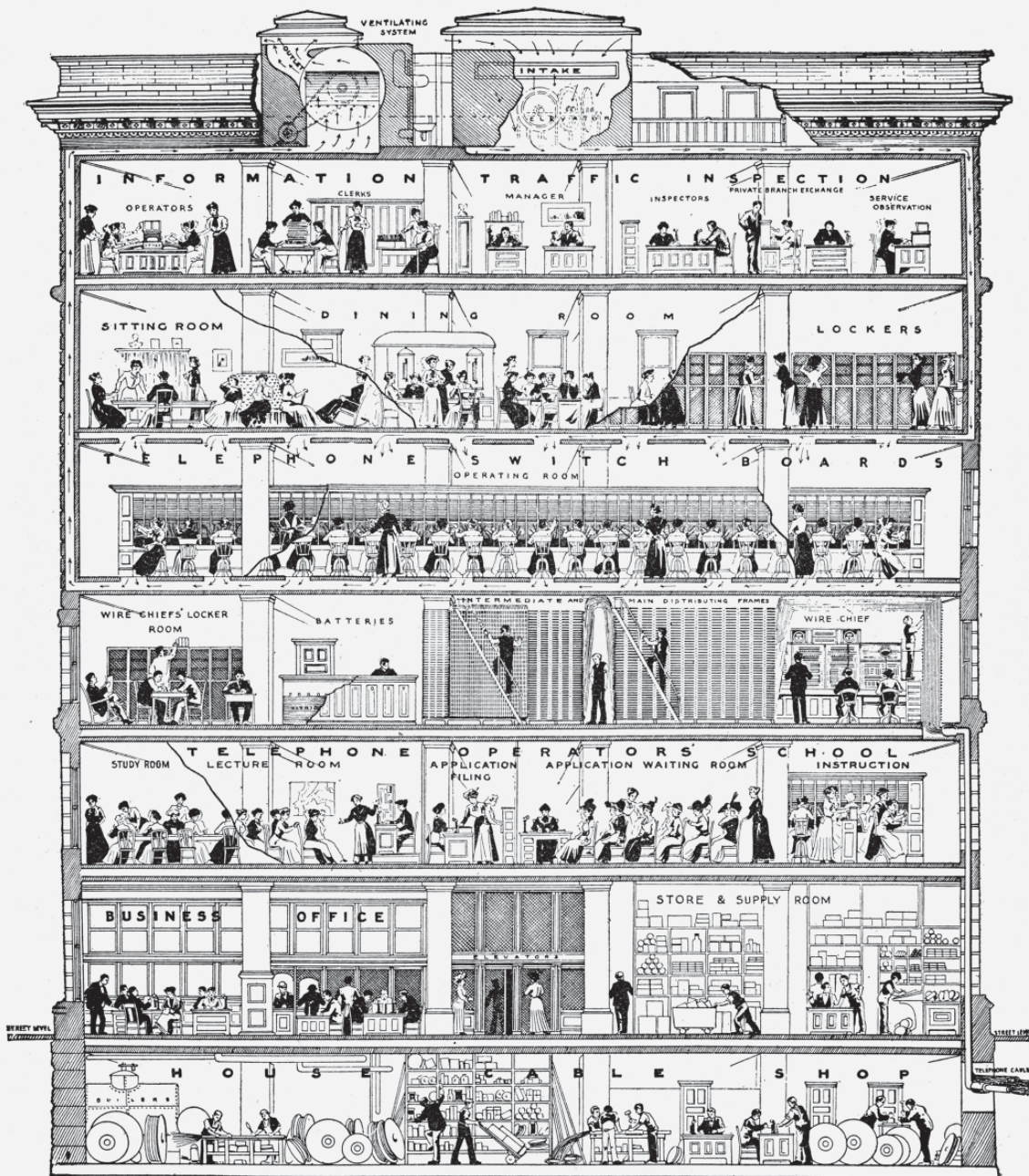
SECTIONAL VIEW OF A TELEPHONE BUILDING

A TYPICAL AMERICAN CENTRAL OFFICE BUILDING, SHOWING THE EFFICIENT ARRANGEMENT OF THE VARIOUS DEPARTMENTS

Fig. 037 Design influence for the Long Lines building

NEIGHBORING BUILDING USES

CHURCH ST.

DUANE ST

THOMAS ST

LAFAYETTE PL.

WORTH ST

LEONARD ST

BROADWAY

- MULTIFAMILY
- MIXED USE & RES.
- COMMERCIAL & OFFICE
- PUBLC INSTITUTION
- UTILITY

30' 60' 150' 300'
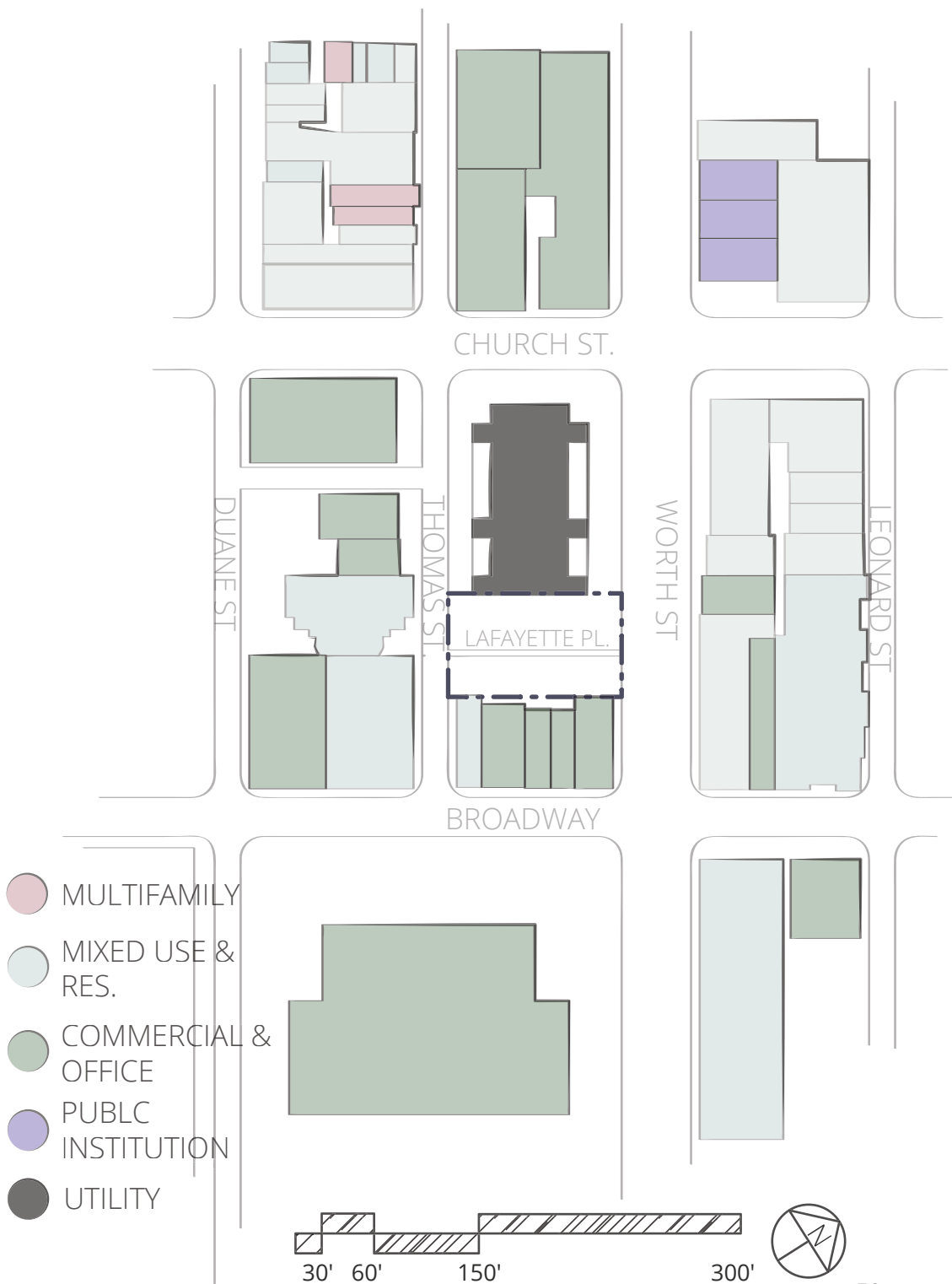
NEIGHBORING BUILDING HEIGHTS

CHURCH ST.

DUANE ST

THOMAS ST

LAFAYETTE PL.

WORTH ST

LEONARD ST

BROADWAY

- >39 STORIES
- 15-39 STORIES
- <15 STORIES

30' 60'   150'   300'
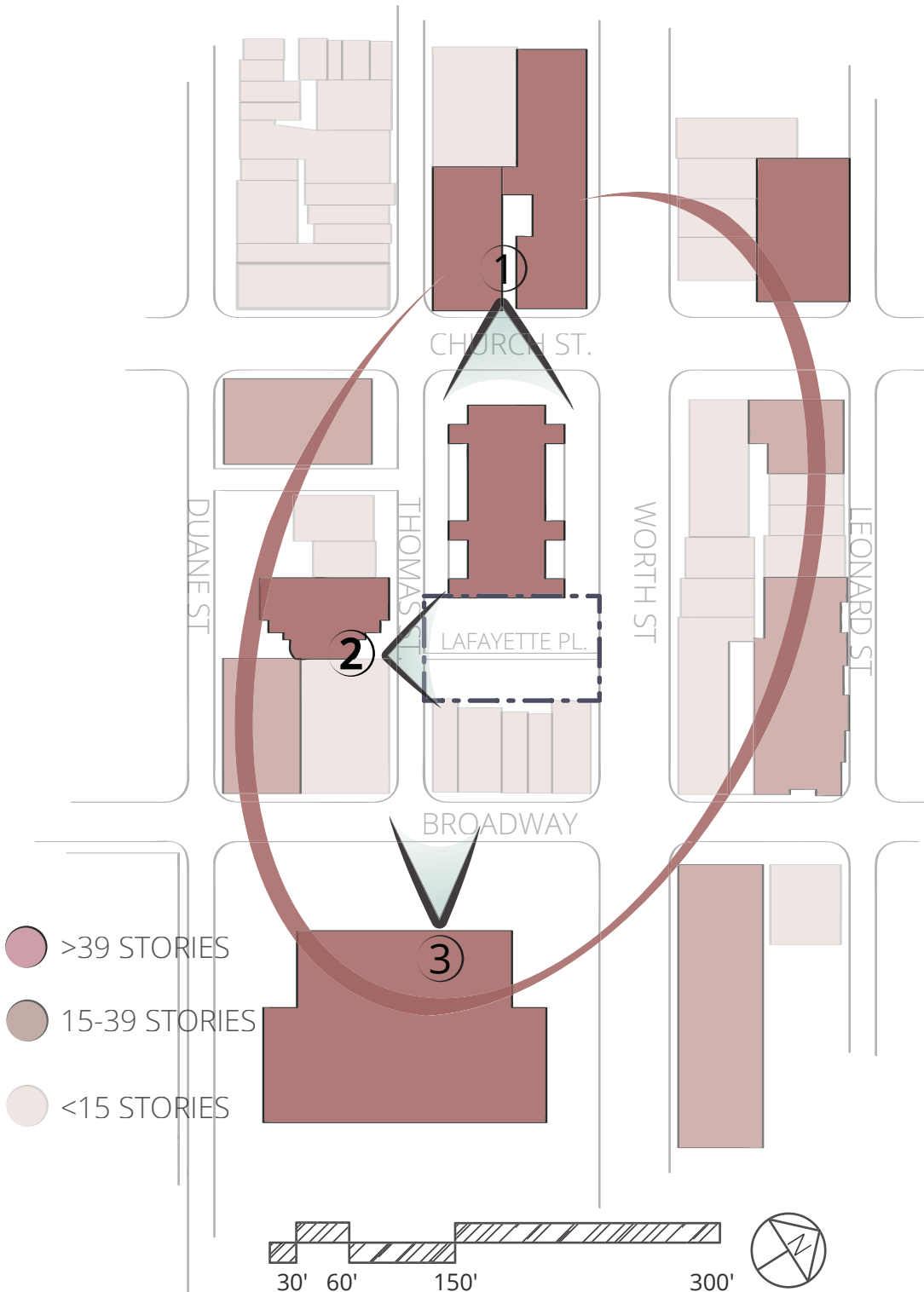
In an examination of building heights, it seems the prospective building will be affected by shadows from three sides. It is expected to receive far less direct sunlight in the winter. However, there may be enough exposure on the eastern and southern sides for viable reliance of direct gain in some areas of the building. There's no clear valley effect or obvious tower height tapering in the area. This leaves the FAR and skyplane requirements to be the dominant form regulators.

1A.   Shows the featureless monolith among an ordinary mix of styles. Some are more traditional than others. Recent historical preservation efforts succeeded in maintaining the block of brick buildings (located in the far right of the image) like its original state.

2A.   The plaza is the site itself and it's a regular desolate, hardscaped outdoor space. It lacks any "corporate art" and other items of interest. The metal gates define it separately from general public space. Compared to the plaza for the Federal Building to the east, it's green space is poor.

3A.   There is very little draw for people to interact with the building or each other at ground level as well. It has value in habitable outdoor space in a public setting. This aspect will most likely be maintained for the final design as it can still benefit the public. It is noted that safety is always a concern and so any public atrium or gallery may not be suitable for 24-hour access.

Summer winds tend to come from the south and winter from the northwest. The city's density and the site's varied heights keep wind tunnels somewhat in check. Soil and other wind load issues shouldn't be too prohibitive either. As an urban infill project, a majority of the concern is to avoid disrupting existing structures. It's also important that this project walks the line between fitting in and standing out amongst its neighbors. Since the project is also a critique of the AT&T building which shares its site, there will be key contrasts and comparisons made with special regard to its exterior and street level experience.

The adapted plaza sits above a few stories of underground parking so there would be significant foundational changes. Depending on where the line between feasibility and theory lies, the existing parking could remain as is.

The site is at a decent near 45-degree angle to the sun. This means it isn't blocked too often. Careful light studies could ensure that the natural fall of sunlight moves through the building. This potential natural experience of time could impact many aspects of the building program, artifact, and design.

ONGOING CONSTRUCTION

LAFAYETTE PL.

180'

SUN PATH

115'

THOMAS ST.

10' 20'   50'   100'
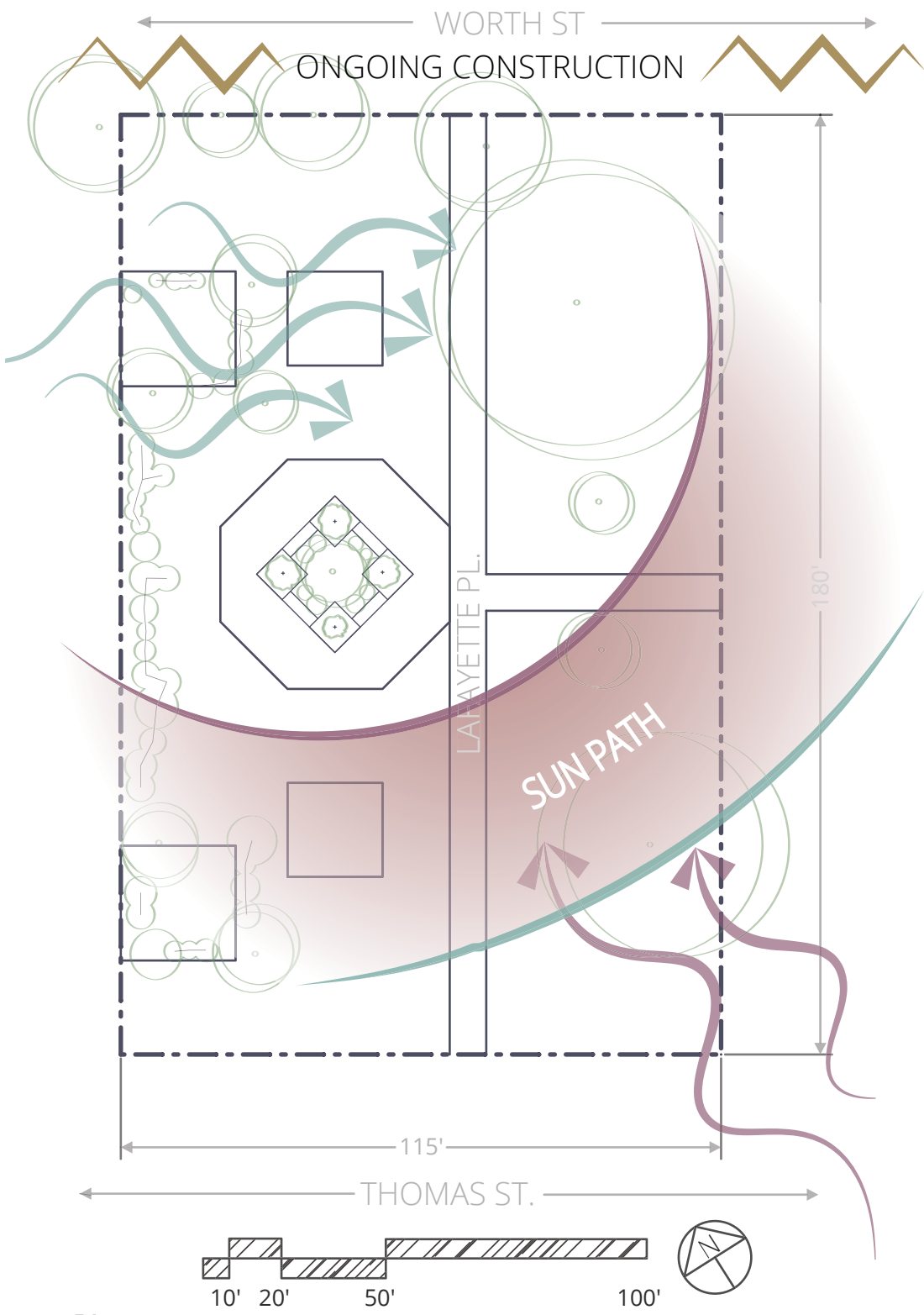
1B.   From the center of the plaza, both the AT&T Long Lines building and adjacent apartment building frame the One World Trade tower.

2B.   Vegetation against the bare wall and chamfered bays show the smidgeon of humanistic touches found in the brutalist structure. Some 1969 critics thought this sort of balance was a celebration of efficient, humanist design. For this project, it's an opportunity. The minimalism is less restricting and gives a definitive stance to oppose.

3B.   Industrial remains at the back of the 19th century brick buildings lay along the rest of the block. The modern design will be sandwiched between two different eras and attitudes. Both tied through their relationship with technology. The brick buildings don't "speak" as loudly as the Long Lines building so any connection between the three buildings may be somewhat diminished.

4B.   The existing plaza is all hardscape dotted with rectilinear planters. These double as seats positioned in isolation from each other. Privatizing communication extends down from the building's original function to the organization of the gate plaza's benches. A more inviting atmosphere with an interpersonal emphasis is needed instead.

Fig. 038 [3A] Long Lines Building compared to nearby apartment tower

WORTH ST

LAFAYETTE ST.

180'

① ② ③ ④

10' 20' 50' 100'
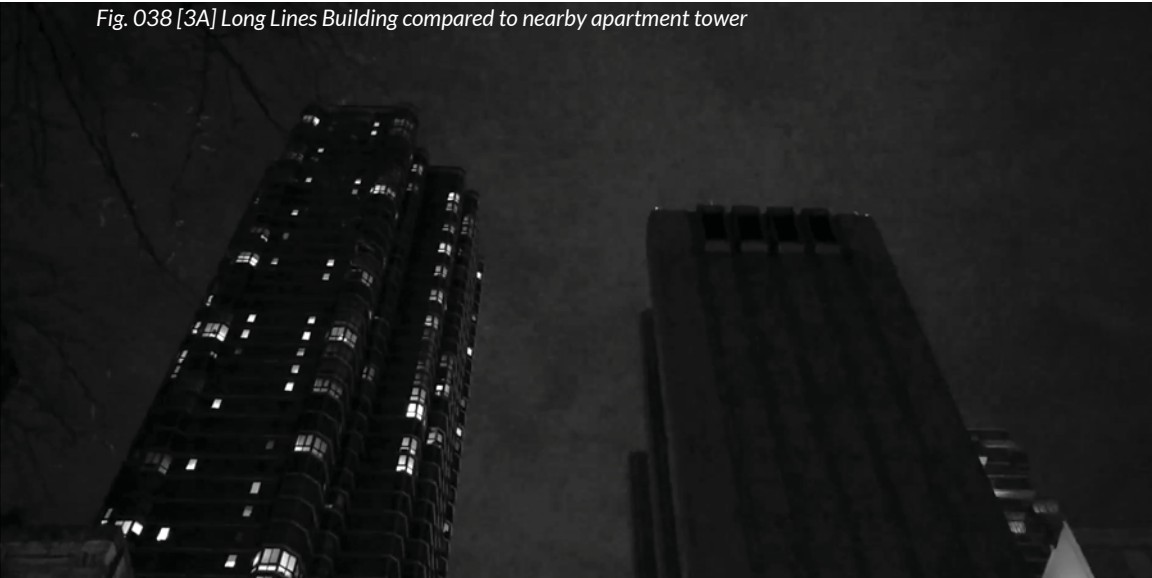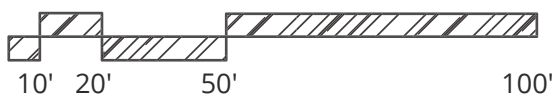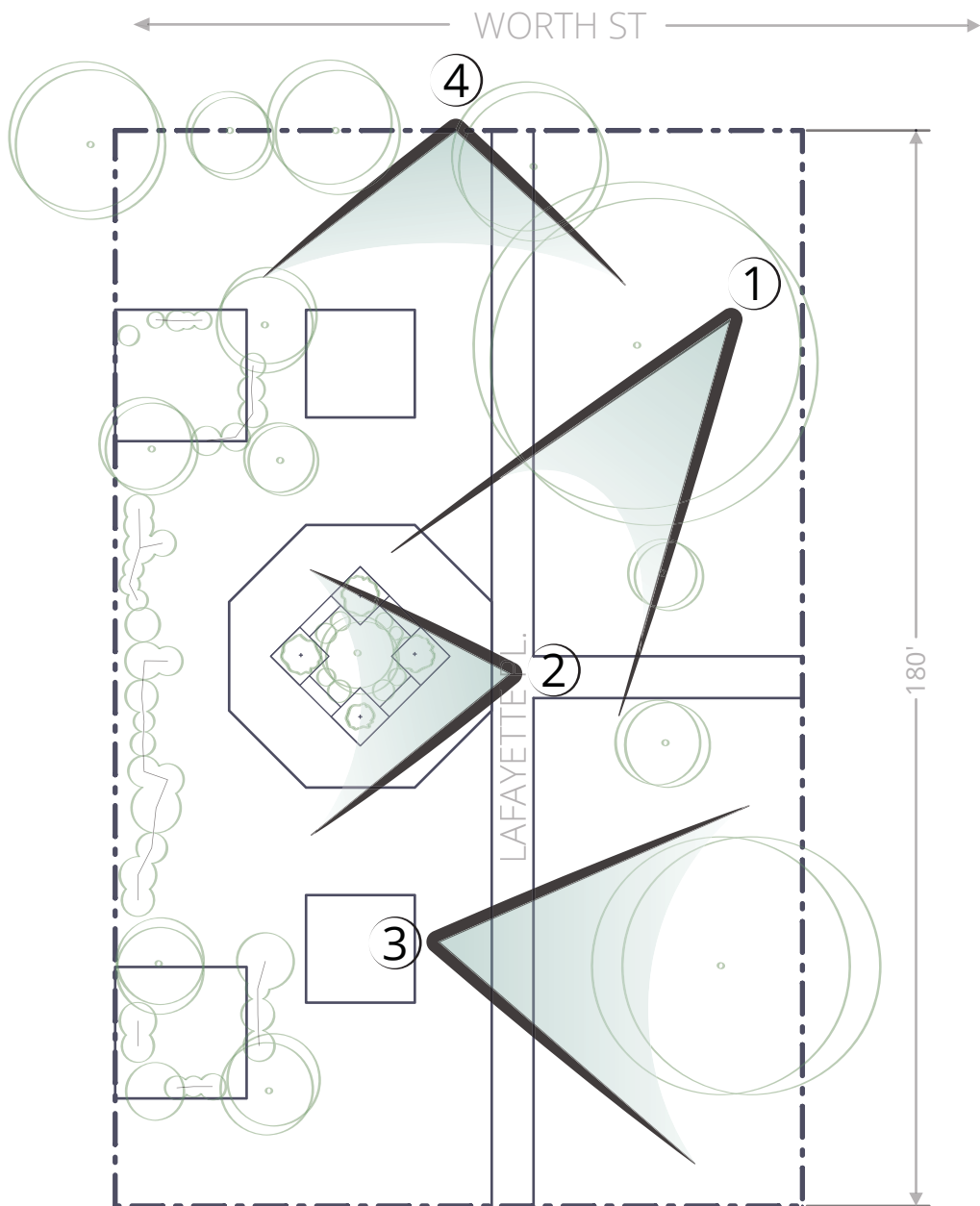
Fig. 039 [1A] View looking up the Long Line building

Fig. 040 [2A] Onsite plaza to be adapted

Fig. 041 [1B] Framing view from onsite

Fig. 042 [2B] Brutalist plaza space

Fig. 044 [4B] Plaza vegetation

Fig. 043 [3B] Historically preserved buildings on site

[APPENDIX]

Perceiving Technological &
Human Memory in Architecture

Perception is crucial in the practice and experience of architecture. It is much more than our five major senses. Perception involves the taking in processing of stimuli, so it requires interpretation, our imagination, and our memory. Through whichever forms we perceive, we take in the world. With design and creativity, we can show a world, real or fiction, to others.

"The timeless task of architecture is to create embodied and lived existential metaphors that concretize and structure our being in the world. [...] Architecture is the art or reconciliation between ourselves and the world, and this mediation takes place through the sense" (Pallasmaa, 2012, p. 76-77).

We can no longer create the future without the aid of technology. It shapes what we're able to do and how we think. While it amplifies our abilities, it can also withhold us from creating meaningful works. With our modern machinery, it's easy to lose sight of human creativity and its value. Human creativity, here, is the impossibly complex mix of imagination and uncertainty that goes into telling a story.

"Instead of dictating a thought, the creative process becomes an act of listening, collaboration, dialogue, and patient waiting. The object of one's work is inside the space of the mind while the mind is simultaneously projected out into the work; the inside and outside space constitute a moe-

**The Memory Theatre
of Giulio Camillo
based on
L'Idea del Theatro**
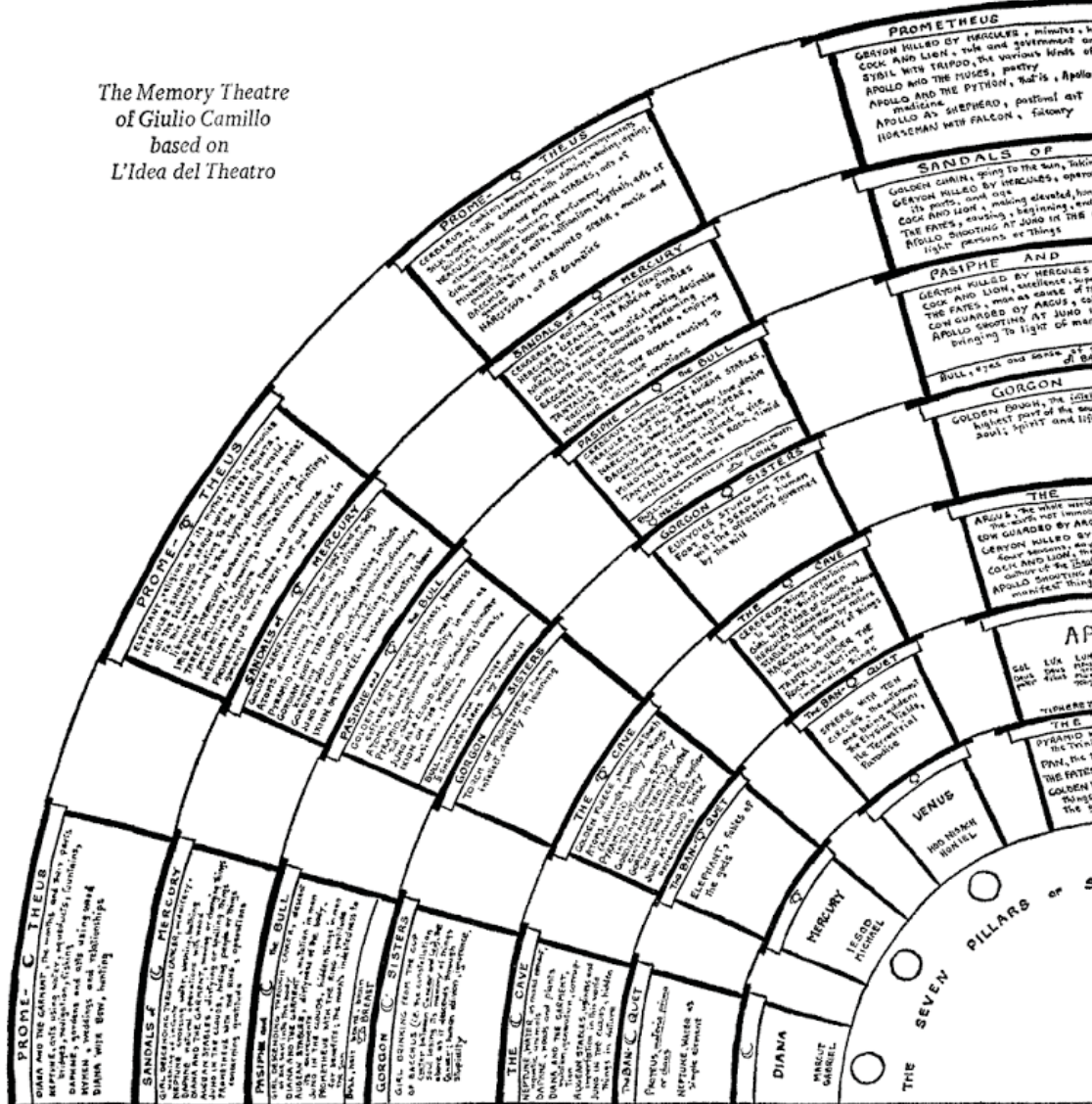
Fig. 045 Memory Theater Plan

bius strip with one single surface. The work then becomes a journey that may expose visions and ideas that one has never before conceived, or whose existence has been unknown prior to having been guided there by the work of one's own hand and imagination, as well as one's combined attitude of hesitation and curiosity, fused together by genuine uncertainty" (Pallasmaa, 2010, p. 235)

Machines and technology can mimic creativity but not quite replicate what makes a work of art "art". It also doesn't necessitate a meaningful and culturally relevant product. With technological or digital memory, for example, a sophisticated machine could hold immense amounts of data and information. It can delete, rewrite, and recall files as if to simulate a process of forgetting and remembering. Though the
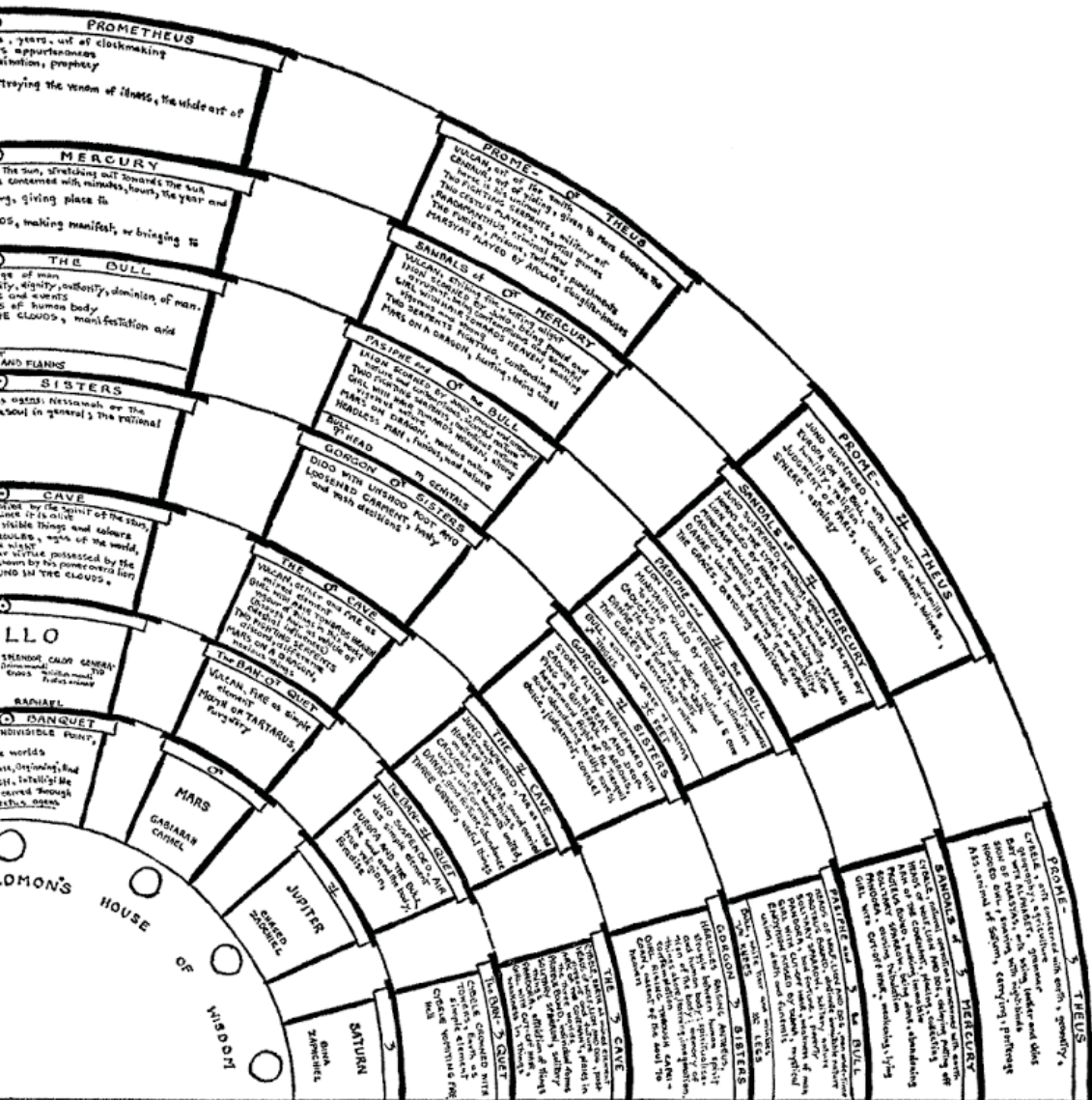
human mind and body can also do these things, our process and the way our memory functions is vastly different.

There is value in this difference, and one of the uncompromisable barriers is our subjective human perception. In a lecture on vagueness and diffuse perception, Juhani Pallasmaa described a specific inarticulate quality within our minds. We seem to operate with a level of vague unconscious thought that is "undefined, formless, and [is an] involuntarily interacting medley of images, associations, and recollections. [It] seems to be exactly the necessary mental ground for creative insight, as well as for the richness and plasticity of artistic expression" (Pallasmaa, 2010, p. 227). For us, non-direct stimulation opens up a horizon of possibilities. Rather than narrowing an interpretation to one an-

63

swer or solution, it expands to other concepts, stories, ideas, etc. Machines lack the "innate structural vagueness of human consciousness" (Pallasmaa, 2010, p. 231) because they function on direct commands and clarity. It is up to the humans to input or design the uncertainty.

Another thing machines can't reproduce is the way human memory functions. Memory is crucial to perception. It can't functionally be separated from the other modes of perception, so we can't perceive without memory. It's difficult to even perceive without movement.

"...Unconscious eye movements are not merely aids to clear vision, but an absolute prerequisite of vision altogether. When the subject's gaze is experimentally forced to remain completely fixed on a stationary object, the image of the object disintegrates and keeps disappearing and reappearing again in distorted shapes and fragments" (Pallasmaa, 2010, p. 226).

Our eyes must shift their focus around something to closely examine it. Our mind then composes the fixed object from our memory of it. Visual perception is made up of these integrated haptic snapshots. Memory allows us to make sense of the chaos to form an image and our plasticity helps makes it a profound image.

Memory also gives a framework for expectations and perception. We're able to forget and re-experience something from another perspective or new frame of mind. When we re-write the memories we've forgotten, we participate in a sort of clouded consciousness. This is similar to psychologist William James and his statement about human thought. "Every definite image in the mind is steeped and dyed in the free water that flows around it. [...] The significance, the value of the image, is all in this halo or penumbra that surrounds and escorts it" (Pallasmaa, 2010, p. 227).

Memory Devices & Constructions

Memories in the human mind are more easily formed through spatial, personal, physical, and humorous information than abstract and impersonal information. A particular date and time might stick our in your mind because there was a significant event. In this case, memories are formed naturally. Artificial memory formation takes place when one makes a conscious effort to store, encode, and recall information. Before the printing press was invented, mastering this human ability was a necessary skill for many people. Ancient mnemonics were devised to remember more and to some operated like inner talismans. These objects were rendered magical by astral spirits within the highly subjective and imaginative practice.

Various permutations and methods of mnemonics form the basis of the art of memory we know today. Named after the Greek titaness, Mnemosyne, early mnemonics were techniques that associated an image (*imagines*) with a place (*loci*). The ancient Greeks were the first to formalize the attachment of a memory or abstract idea to a place. Already architecture and our built world had a strong connection to our formation of memories. In one case, they would take a house and, on each floor, room, and piece of furniture, then they would place their abstract concepts or memories to each one. The ground level might be associated with a person, your aunt for example. In the kitchen is a recipe she gave for making bread. The table might hold the memory of the dough's texture when it has been worked enough. Chairs might represent the serving size. Mnemonics like that require ordering and structure so that one can find their way back to where the memory is easily held.

Architecture was central to Giulio Camillo's Memory Theatre. It was a theoretical space in the style of a Greek amphitheater where seven ascending rows, or grades, were divided by seven radial axes of "seats". The seats operated as drawers within which to store information for later retrieval. He situates the theatre near the edge of the woods on a slope that reaches a hill overlooking the forest. From the in-ferior world of humans (the woods) we must ascend the slope (the heavens) to reach the hill (the super celestial world). He believed we may then be able to understand things of the inferior world by escalating to that of the superior.

Camillo claimed his theatre could show someone all the knowledge in the world. At one glance, "all that the mind can conceive and all that is hidden in the soul" (Yates, 1974, p. 158) would be open to you. This was possible because it eternally stored "the eternal nature of all things which can be expressed in speech and assigns them eternal places" (Yates, 1974, p. 144). He believed the non-metaphysical, non-emotional methods of storing memory at the time were "frail". His solution involved images and places that were concrete or "eternal". Such eternal places take the form of the celestial measures of the planets or gods.

"The affective or emotional appeal of a good memory image [is present in] the tranquility of Jupiter, the anger of Mars, the melancholy of Saturn, the love of Venus [for instance]" (Yates, 1974, p. 144). Camillo found the planets easier to relate to perhaps because of their narrative character and what they represent in their myths. He then used emotions as an undercurrent through each respective grade from the divine realm of the gods to the more human realm symbolized by Prometheus.

"Camillo's Theatre represents the universe expanding from First Causes through the stages of creation. First is the appearance of the simple elements from the waters on the Banquet grade; then the mixture of the elements in the Cave; then the creation of [humans] in the image of God on the grade of the Gorgon Sisters; then the union of [human] soul and body on the grade of Pasiphe and the Bull; then [come] the whole world of [human] activities; [our] natural activities on the grade of the Sandals of Mercury; arts and sciences, religion and laws on the Prometheus grade" (Yates, 1974, p. 144).

The subject matter at each grade is then caused by its planetary god. "Saturn's association with time is expressed under the cave in the image of the heads of a wolf, lion, and dog, signifying past, present, and future. The association of this planet with ill fortune and poverty is expressed in the images of Pandora" (Yates, 1974, p. 143). From her vessel, sometimes in the form of a box, came all the evils of humanity. These images occur in the grades labelled the (Homeric) Cave, Pasiphe and the Bull, and Sandals of Mercury. The gods alluded to stories and symbols which related to papers, or various speeches related to the subject matter of its image, stored in the drawers.

A take away from Camillo's structuring is "the Idea of memory or-

ganically geared to the universe" (Yates, 1974, p. 145). Through mythology and the narratives they bring, emotions and motifs arise naturally. Our imaginations are engaged, and it requires our interpretation of the story which actively pulls us in. All are instinctive triggers for memory formation. The richness of the Greek myths not only explained the world (to ancient Greeks/Romans) they formed lessons in a way that could resonate with every individual. They could lead the perceiver to a state of self-reflection this way.

Today, we are putting our modern information not into a divine realm, but a technological one known as the "Cloud". Machines that can replicate human functions, like the data servers that make up the "Cloud", pervade our world. They can mimic human perceptual and interpretive functions but fail to perform them identically to the ones innate in humans. There's more vagueness, uncertainty, and subjective intertwining within our perceptual experience. Meaningful, artistic endeavors arise out of unconscious inclinations that can't be matched with machines and technology. It is then crucial that we maintain, value, and practice the human aspects of perception. We need the gray areas of the mind to "root us in the complexities and mysteries of perception and the real world, instead of confining us in an alienating, constructed artificiality" (Pallasmaa, 2010,

p. 231). Camillo's Memory Theatre demonstrated how a structure might engage and show us the world through myths. It necessitated the interpretative gray areas of our mind. But it was designed for a different time. To create a structure that similarly captivates our existential reality, we need to embrace and compromise with modern technology. It can be our partner in the dance of the imagination.
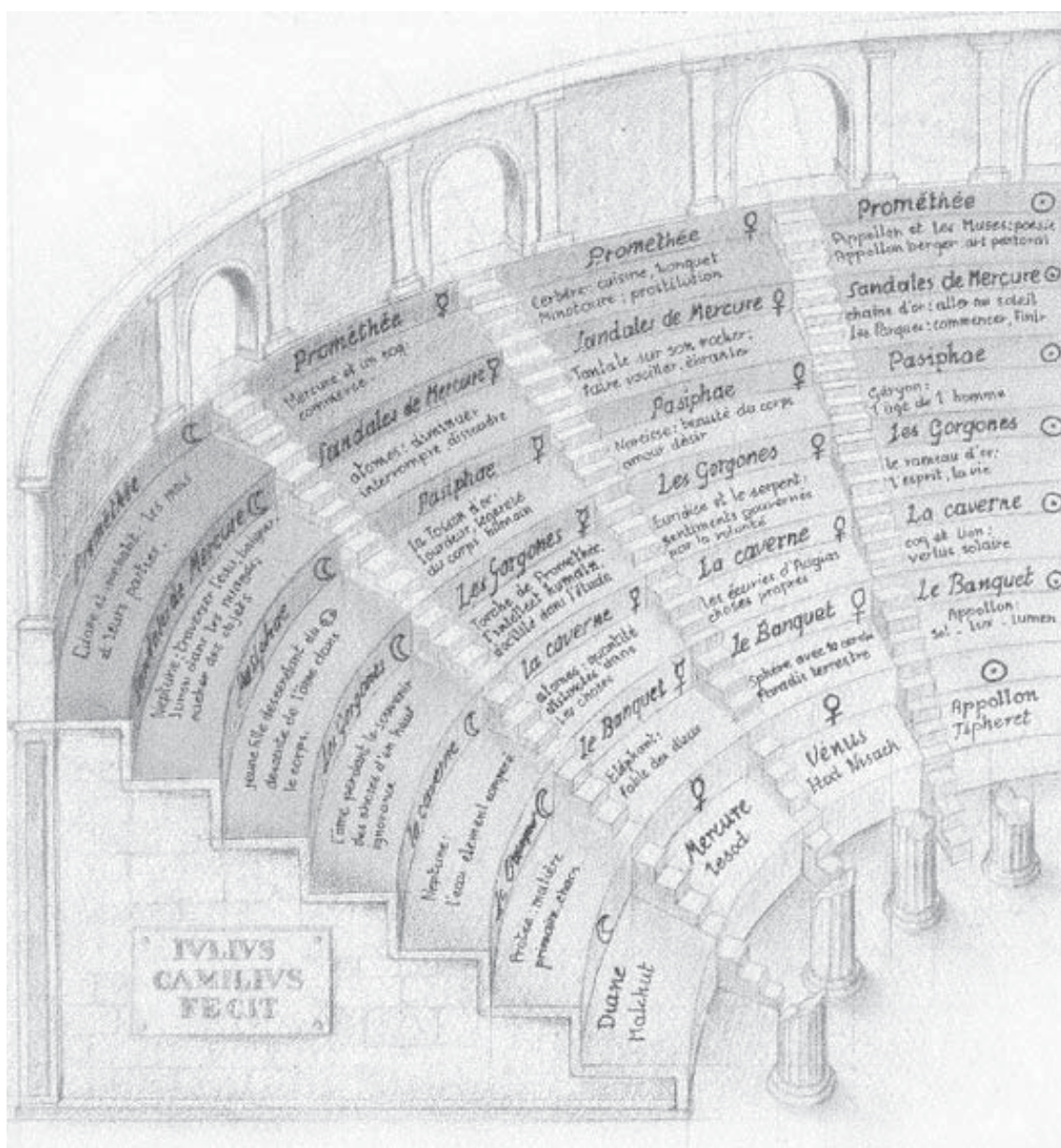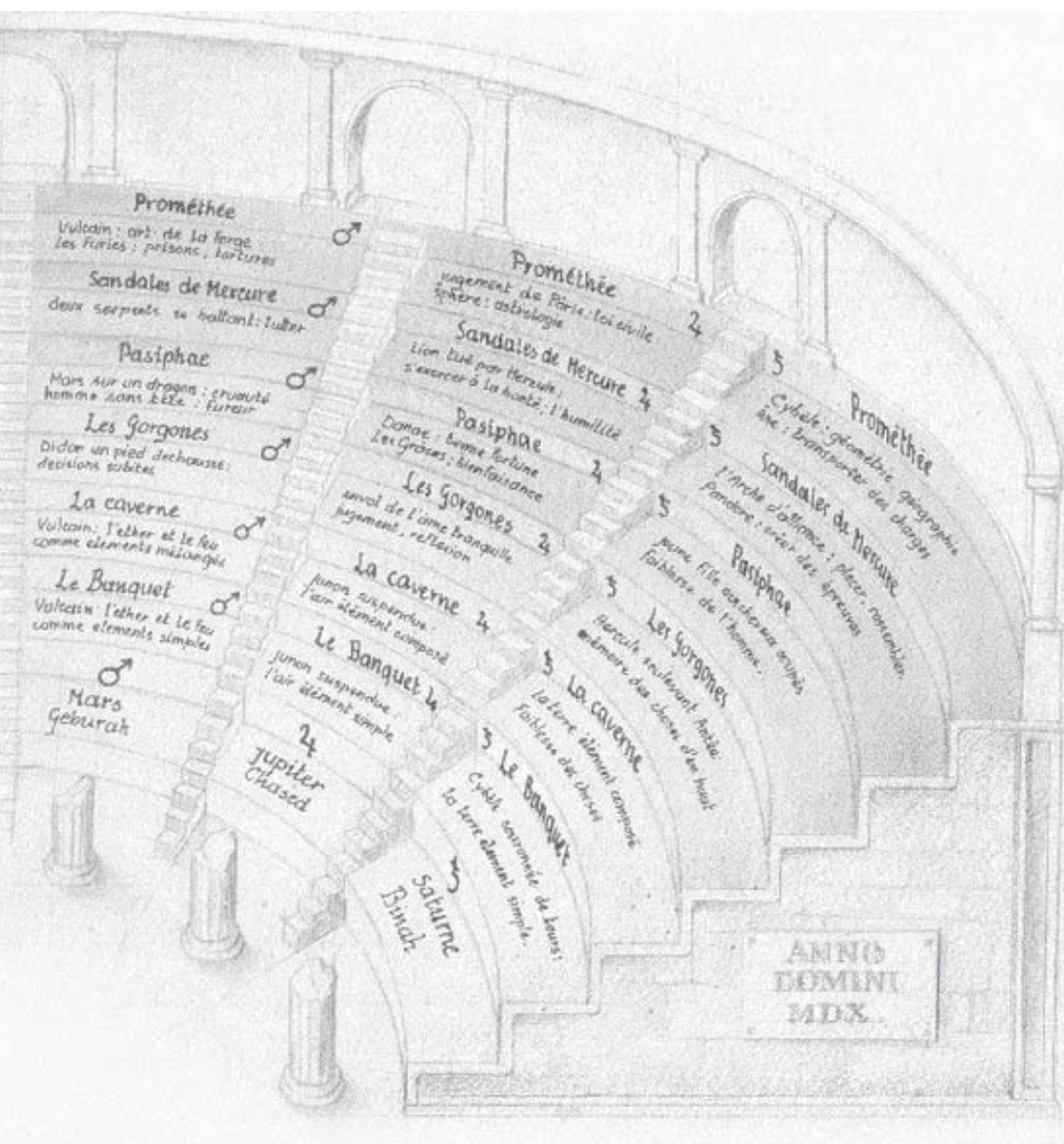
Fig. 046 Memory Theater Imagined

Prométhée
Vulcain : art de la forge
Les Furies : prisons, tortures ♂

Sandales de Mercure ♂
deux serpents se battant : lutter

Pasiphae ♂
Mars sur un dragon : cruauté
homme sans tête : fureur

Les Gorgones ♂
Didon un pied déchaussé :
décisions subites

La caverne ♂
Vulcain : l'éther et le feu
comme éléments mélangés

Le Banquet ♂
Vulcain : l'éther et le feu
comme éléments simples

♂
Mars
Geburah

Prométhée
jugement de Pâris : loi civile
sphère : astrologie   2

Sandales de Mercure 2
Lion tué par Hercule :
s'exercer à la bonté : l'humilité

Pasiphae
Danaé : bonne fortune   2
Les Grâces : bienfaisance

Les Gorgones   2
envol de l'âme tranquille
jugement, réflexion

La caverne 2
Junon suspendue
l'air élément composé

Le Banquet 2
Junon suspendue
l'air élément simple

2
Jupiter
Chesed

2
Prométhée

3
Sandales de Mercure

3
Cybèle : géométrie, géographie
âne : transporter des charges

Sandales de Mercure
3
l'arche d'alliance : placer, manier
Pandore : ouvrir des épreuves

Pasiphae
pomme fille aux cheveux serpents
faiblesse de l'homme.

Les Gorgones   3
Hercule soulevant Antée
mémoire des choses d'en haut

La caverne
3
la terre élément composé
faiblesse des choses

3
Le Banquet
Cybèle couronnée de tours :
la terre élément simple.

Saturne
Binah

ANNO DOMINI MDX.

References

Pallasmaa, J. (2010). In Praise of Vagueness [pdf]. Retrieved from: http://archdesign.vt.edu/events/lectures/images/pallasmaa-in_praise_of_vagueness.pdf

Pallasmaa, J. (2012). The Eyes of the Skin: Architecture and the Senses. Chichester: John Wiley & Sons Ltd.

Yates, F. (1974). The Art of Memory. Chicago, Illinois: The University of Chicago Press.

Yates, F. (1974). The Memory Theatre of Guilio Camillo. Chicago, Illinois: The University of Chicago Press.
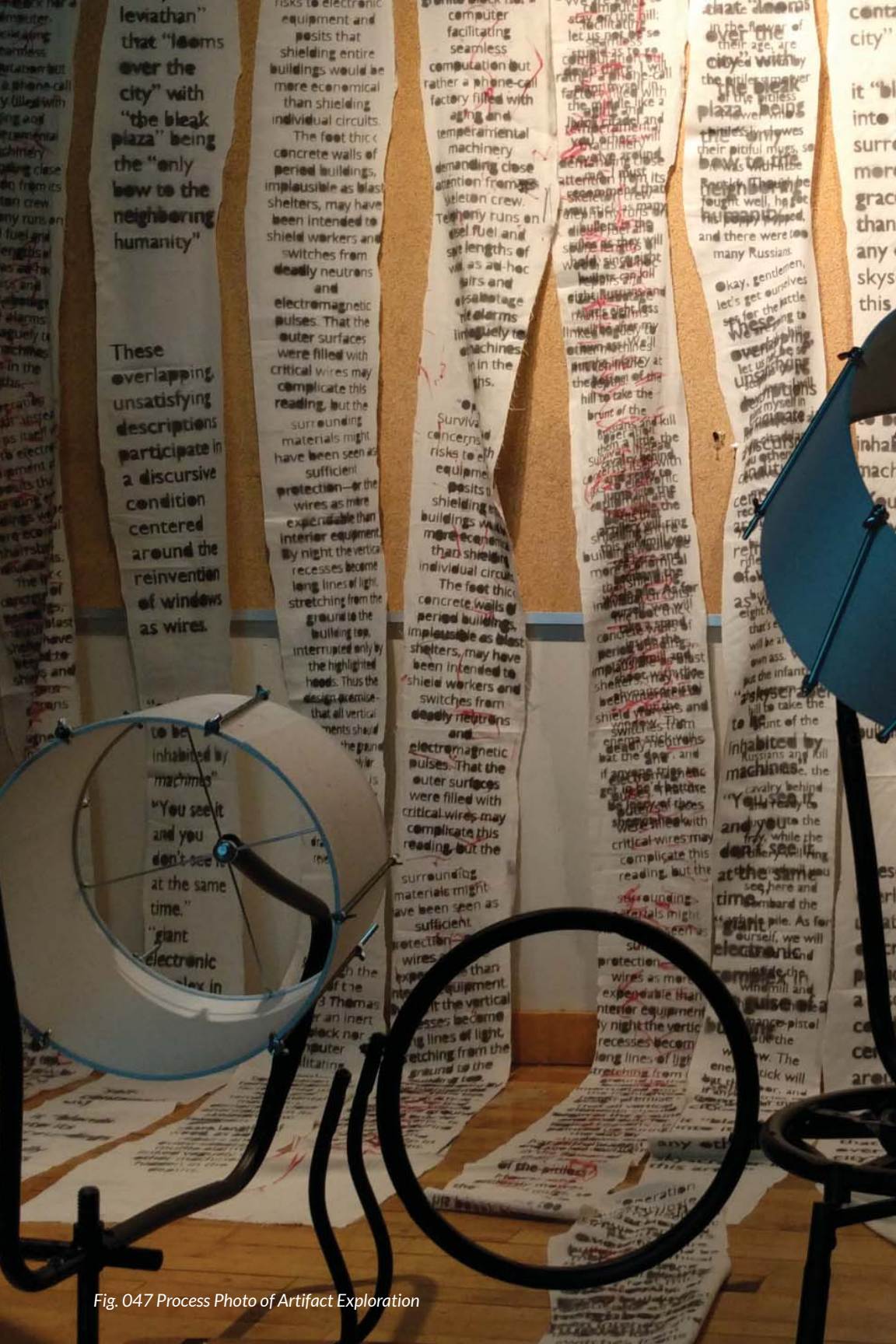
PART III

Fig. 047 Process Photo of Artifact Exploration

...men, let's get ourselves set for the battle. We are going to stay on the hill; let us not be so stupid as to go down there. I will plant myself in the middle like a living citadel and you others will revolve around me. I must recommend that you stick as many bullets in the rifles as they will hold, since eight bullets can kill eight Russians and that's eight less will be after my own ass. We'll put the infantry at the bottom of the hill to take the brunt of the Russians and kill them a little, the cavalry behind and ready to jump into the fray, while the artillery will ring this windmill you see here and bombard the whole pile. As for ourself, we will take a stand inside the windmill and shoot with the phynance-pistol out the window. The enema stick will bat the door, and if anyone tries to get in he'd better be leery of the sheeyit-hook.

Just as the poppy and the dandelion, in the flower of their age, are mowed down by the pitiless mower who pitilessly mows their pitiful mugs, so it was with little Ronsky. Though he fought well, he got his poppy popped, and there were too many Russians.

"self-contained city"

it "blends into its surroundings more gracefully than does any other skyscraper in this area."

"a skyscraper to be inhabited by machines"

"You see it and you don't see it at the same time."

"giant electronic complex in the guise of a building"

These overlapping, unsatisfying descriptions participate in a discursive condition centered around the reinvention of windows as wires.

a "stylish leviathan

Artefact

In the creation of an artefact, I'm able to explore and demonstrate a critique of technology where it specifically relates to an architectural experience of memory.

The concept occurs in a play. Together with a backdrop, a prop, a script and actors, a scene is created. Add in a narrator and a story is told. The most concerning aspect is the machine. It's an apparatus created to mock a process focused on mass assembly and direct interpretation. This pataphysical printing machine balances function and dysfunction, remembering and forgetting. Ribbons describing Ubu and the Long Lines building become twisted loops. They run through the machine's two rollers.

Power is generated through humans as people are required to man the equipment. Three people are required for its operation. As the handle is cranked the ribbon flows and the operators must respond to the unexpected. One person controls the handle, pushing down and turning clockwise to move the ribbon and lifting up and counterclockwise to ratchet. A second person attempts to interpret the rolling text by sketching upon the ribbon itself.

74　　　　　　　*Fig. 048 First Ribbon 1/3*

Seen through the events of the outage, 33 Thomas is neither an inert granite block nor a computer facilitating seamless computation but rather a phone-call factory filled with aging and temperamental machinery demanding close attention from its skeleton crew. Telephony runs on diesel fuel and spare lengths of wood, as ad-hoc repairs and quasi-sabotage muffle alarms linked vaguely to other machines hidden in the depth

"Operation Survival" instead concerns itself with risks to electronic equipment and posits that shielding entire buildings would be more economical than shielding individual circuits. The foot thick concrete walls of period buildings, implausible as blast shelters, may have been intended to shield workers and switches from deadly neutrons and electromagnetic pulses. That the outer surfaces were filled with critical wires may complicate this reading, but the

A third person is needed to continuously unbind the fabric to make it readable.

The machine operates on a pataphor rather than metaphor. It's basically figurative language distilled from the linguistic structure of 'Pataphysics. If metaphors are reality to the second degree, pataphors are one degree further. The first page in the booklet further describes the main parts of the machine. One of the most important is the Ouroboros, a symbol of introspection that guides the project.

Reality to the Third Degree

Phenomenon:
Architectural Artefact

Metaphor:
Memory Machine

Pataphor:
3 Person Amnesia Machine

Fig. 049 First ribbon 2/3

As the machine runs, metal grinds against metal and joints groan in discomfort. Bolts may fall off, the lights will extinguish, and the ribbon itself may go astray. Uncertainty and self-consciousness likely stirs within the operators. The mood is then lightened by a dry delivery of the machine's ridiculous specifications. In these heightened moments, we create memories for the gathering and interpretation of a greater cultural knowledge. We are writing over the past in the context of the present for remembrance in the future.

surrounding materials might have been seen as sufficient protection—or the wires as more expendable than interior equipment By night the vertica recesses become long lines of light, stretching from the ground to the building top, interrupted only by the highlighted hoods. Thus the design premise - that all vertical elements should begin at the ground and end only for logical reasons - is pointed up during the day by shadows, and drastically seen in reverse by night.

Fig. 050 First ribbon 3/3

Fig. 051 Artefact mid-demonstration
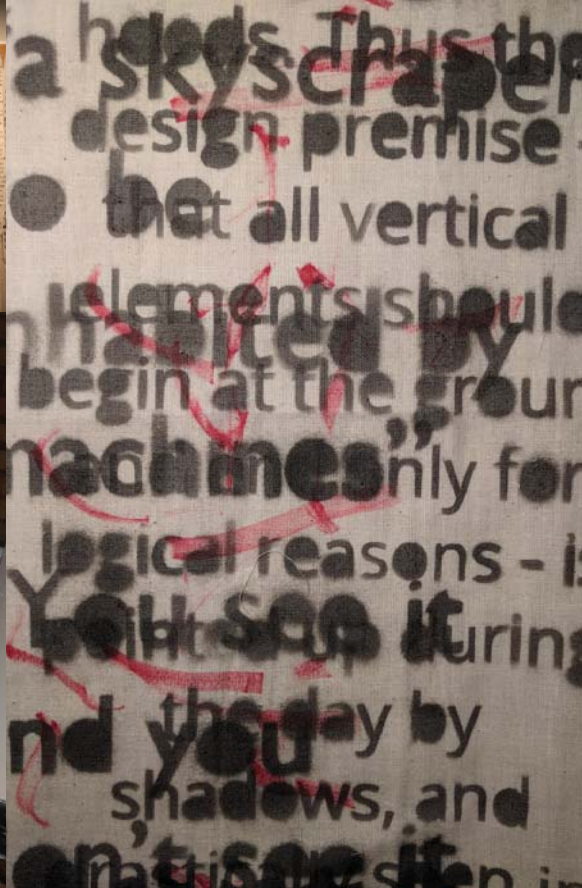

Fig. 053 "Drum" in process

Fig. 052 Layered ribbon iterations

Fig. 054 3 Person Amnesia Machine, emitting

What is left is evidence of the disparity between technological memory and human memory. The machine itself, the language on the ribbon, and the representation of a specific memory offer varying levels of interpretation. Like the human memory thoughts and feelings are written and rewritten. Our imagination is contingent on remembering memories and more importantly, forgetting them. With forgetting, our perceptions change and so changes our experience. We can discover new worlds within ourselves by letting the old break down. Through the artefact's sensory, linguistic, and comedic experience, many cultural markers may interface. Rearticulated chair pieces form a skeletal body. Lamp shades and bicycle wheels spin ribbons of fractured memory. Hyper serious descriptions oscillate us between reality and the surreal.

Fig. 055 Hung ribbons for gallery installation

Fig. 056 Spud model with kinetic spaces
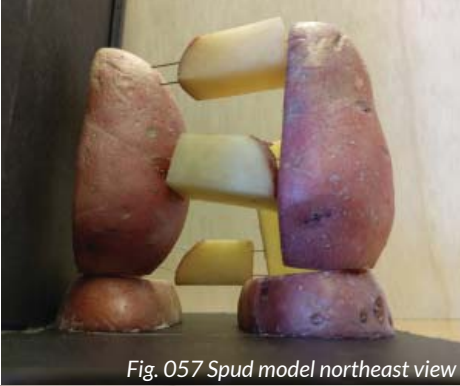
Fig. 057 Spud model northeast view

There is a dialogue between us and the technology. This machine parallels the relationship we have to a design process based in algorithms. What may be perceived as randomness as an outcome from an algorithmic software is the result of an abstracted purpose in isolated exploration. Design software and data servers can hold a playful process captive. Spheres of culture imbued with the artefact are anything but isolated.

Fig. 058 1/8th Scale model

Fig. 059 "Drum" close-up

Fig. 060 View toward ground through building layers

Fig. 062 "Drum" gallery installation

Fig. 061 View through workspaces through building layers

Fig. 063 Spatial wrapping and catwalk through theatrical core

Fig. 064 Fraction of "Playful Model, Not to Scale"

[PROJECT DOCUMENTATION]

1/8th Scale Model:

Developed as a response to contextual elements, spatial planning and movement, and program. It suggests a vierendeel frame structure in three stacked tiers of three floor each. Two major lifts act as moving workspaces that expand and contract spaces throughout the building.

Machine Specifications:

For both the artefact and the building, 'pataphysical specifications were written and incorporated to each model's design. These round out the physical structures with immersive language and a playfully dry humor that evokes self-consciousness. In the demonstration of the artefact, when the machine is run, a narrator delivers the specs when only the creaking and friction from the machine are the only

other sounds. The building specs are layered into the "Playful Model, Not to Scale".

"Object-Subject Box":

An exploration of cultural and character driven programming. Based off of the subject to object relationships found in John Hejduk's "Victims", the booklet is an addendum to the models and drawings. The way each artist sees the building demonstrates the figurative language based on the Three Declensions of 'Pataphysics and the structureless structure of pataphors. The entirety of the contents are not unlike Marcel Duchamp's Green Box in the way it allows for the reading and discovery of the work.

"Playful Model, Not to Scale":

This abstract representational model works to express and evoke an experience of the building and memory in a process similar to the construction of the artefact machine. Once I established a palette of materials, parts, and connections, the spaces came together through the act of play. Just like the members of the city in need of tools and space, the model functions to wind and unwind a thread through its course. This memory trace links the spaces together. The moving panels collaborate in expansion and contraction. This perpetual disintegration and reanimation is a familiar feeling I'm come across in my own process of design. It's a feeling of concealing a moment in confusion and revealing it again through an 'Aha!'. This comes naturally to us as our own memory oscillates between forgetting and remembering once again.

Fig. 065 Program development

Fig. 066 Representational developemnt

Fig. 068 3 Person Amnesia Machine and backdrop of ribbons
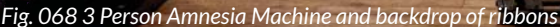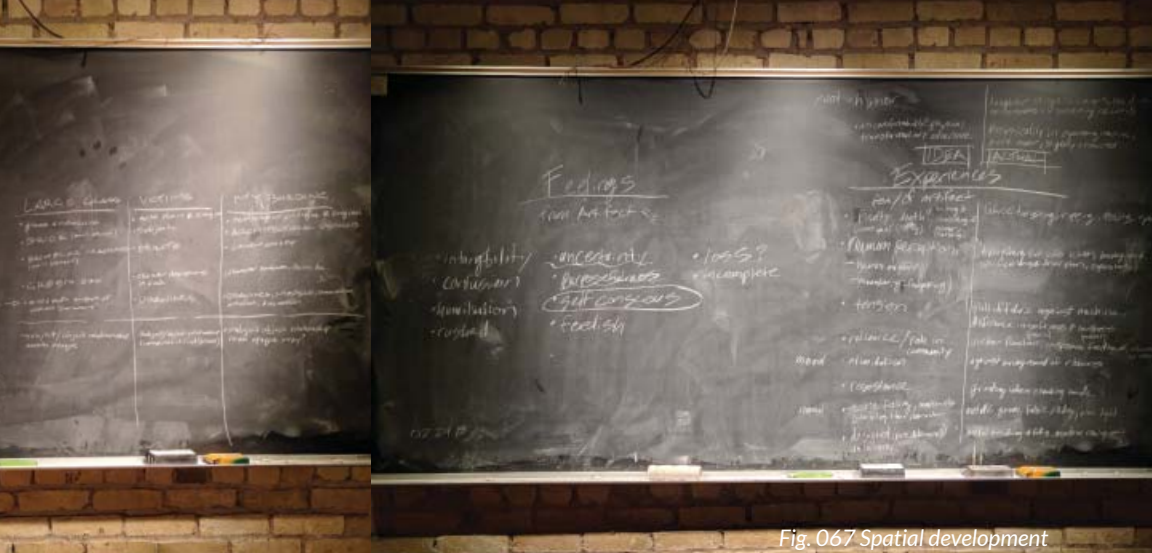
Fig. 067 Spatial development

Amnesia Machine Specifications:

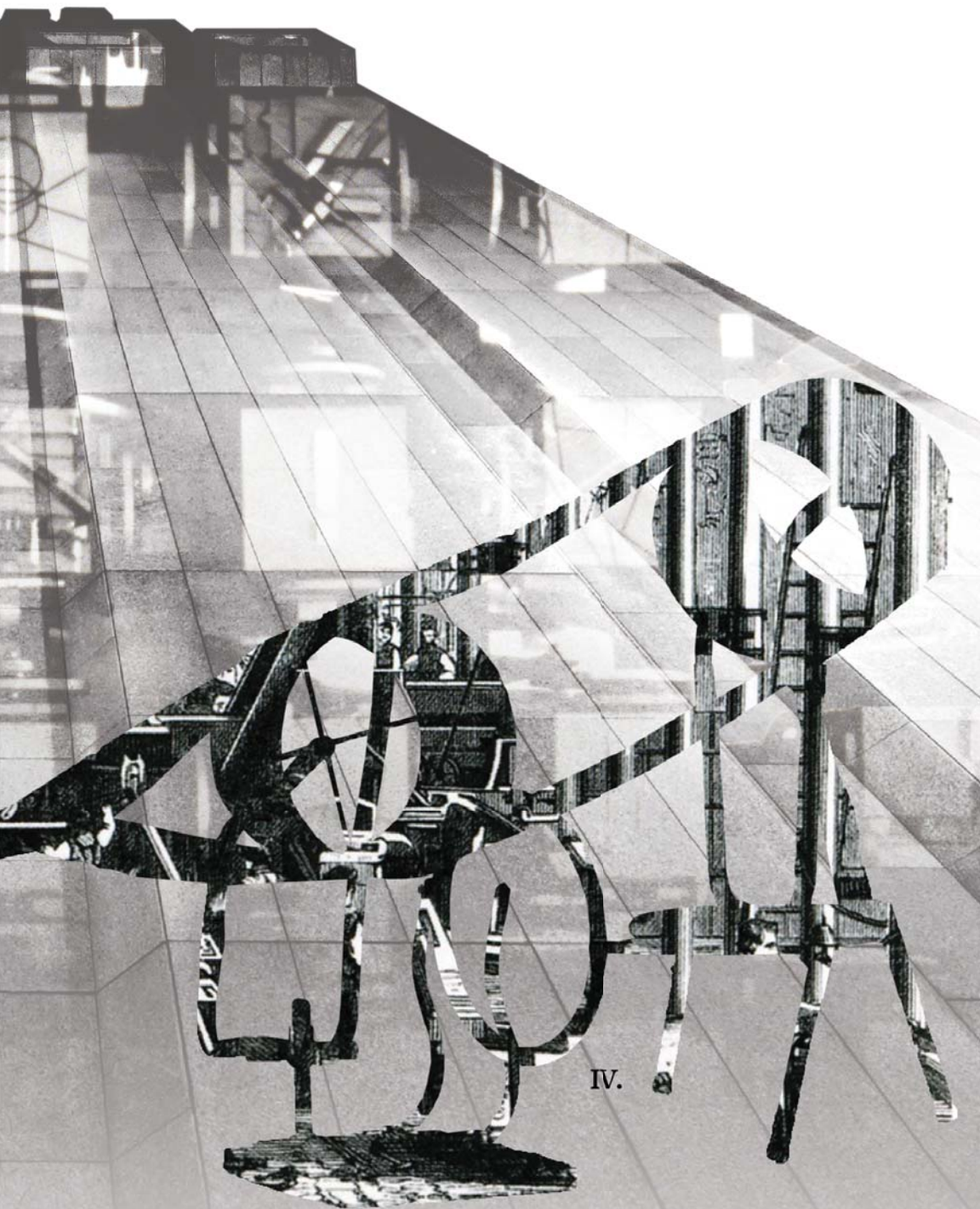An average range of motion is precisely 167.333384 degrees clockwise when turning.

A topspeed of one human arm per second which is equivalent 1/4th of a plate in a microwave set on defrost.

It weighs about as much as a very stiff adult cat and less than a go-kart chassis filled with hopes and dreams.

II.

III

I.
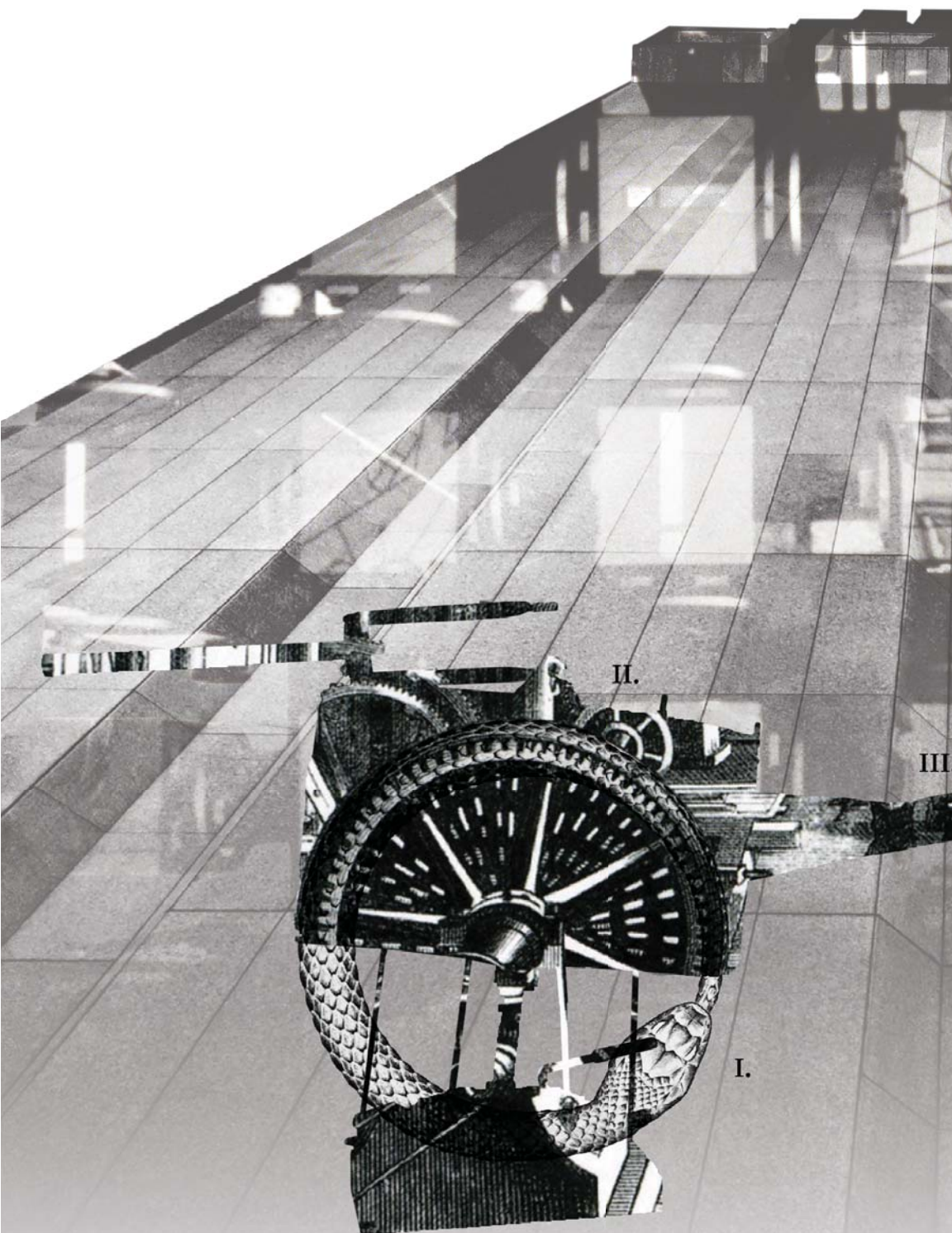
IV.

Fig. 069 Amnesia machine components, refer to page 88

OBJECT-SUBJECT BOX

Linguistic Algorithms in the Design Process

Algorithm: a series of logical steps taken in a speculative exploration to address a problem.

In the linguistic exploration of storytelling and design; the creative mind constructs the building with concretized fractures of memory and play. It is the interchange between architectural representational mediums.

An algorithmic process can present ambiguous and interpretive results that unfold according to the user. We can explore these open ended possibilities by creating "playful" machines and by bringing back the wonder that ancient humans first saw in machines. It's not only about precise solutions to problems but also a revealing of the unknown.

I.   **Ouroboros**
      Mechanical cycle of memory, forgetting in
      order to remember

II.   **Drum**
      Oscillating stream of consciousness, that
      allows people in

III. **Ribbon**
      Fractured memory, spun and reformed in the
      member's work

IV.   **Skeleton**
      Kit-of-Parts forming a tectonic structure

Resident Artist: Eta (**H**) To her, the residence is a bridge. It's made of an exploded music box and the scales of a large fish.	She grew up in New York and often gives her spare change to buskers. Her parents struggled with poverty throughout her childhood. Her experimental sculptures use all different kinds of media. Because she's deaf in one ear, she pays closer attention to the way her work is heard. Her favorite meal is crab cooked over a fire.

Resident Artist: Mu (**M**) The artist moved into a maze where the beginning meets the end. It's constructed it of puppet theaters and bicycles.	Mu is a graphic designer who moved from Israel. Often dreams of the games played with family as a child. Mu is close to relatives and loves to attend christenings, and mikvahs. This artist will stop all work to make time for funerals, and shivas.

Resident Artist: Gamma (Y) He lives in a cavern made of a whale's rib cage, a capsized ocean liner cut into 4ths and wrapped in tree bark.	His work mixes sculpture and performance and is adamant on wanting an additional 6 months of residenwce. When he was 14, he was forced to move to a chaotic city called Lorentz. At times, he misses the countryside so much that he'll take week long excursions to bike through the scenery. He's terminally ill but he hides this from his wife and five children. When they have freeform jazz sessions he's reminded of the careless days of his youth.

Fig. 070 Process for Eta's installation

Fig. 071 Process for Mu's installation
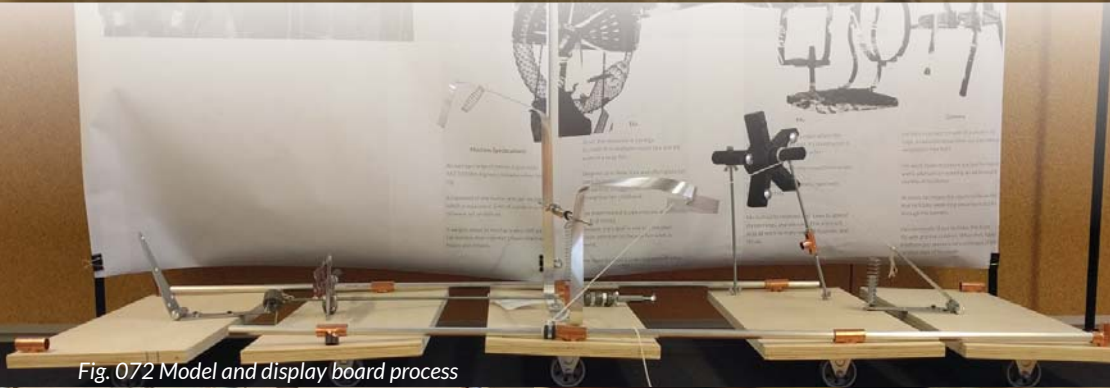

Fig. 072 Model and display board process

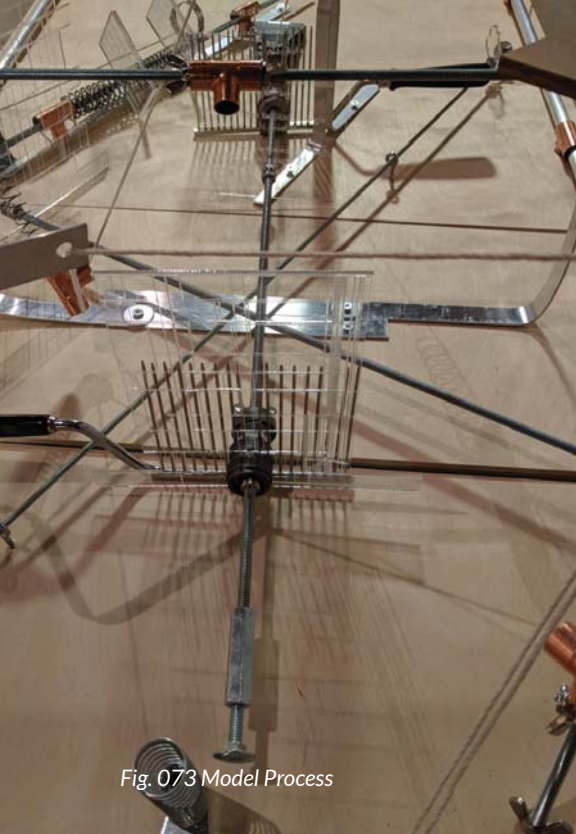Fig. 073 Model Process

Fig. 074 Model Process

Memory Machine Specifications:

Capacity of 1000 memories per square foot.

Amnesia cloud connection included for on-demand sinking.

Each space can facilitate a single big-horned RAM indefinitely.

CAUTION: Mechanical grinding will occur. The machine may like it.

Fig. 075 Model Process

96
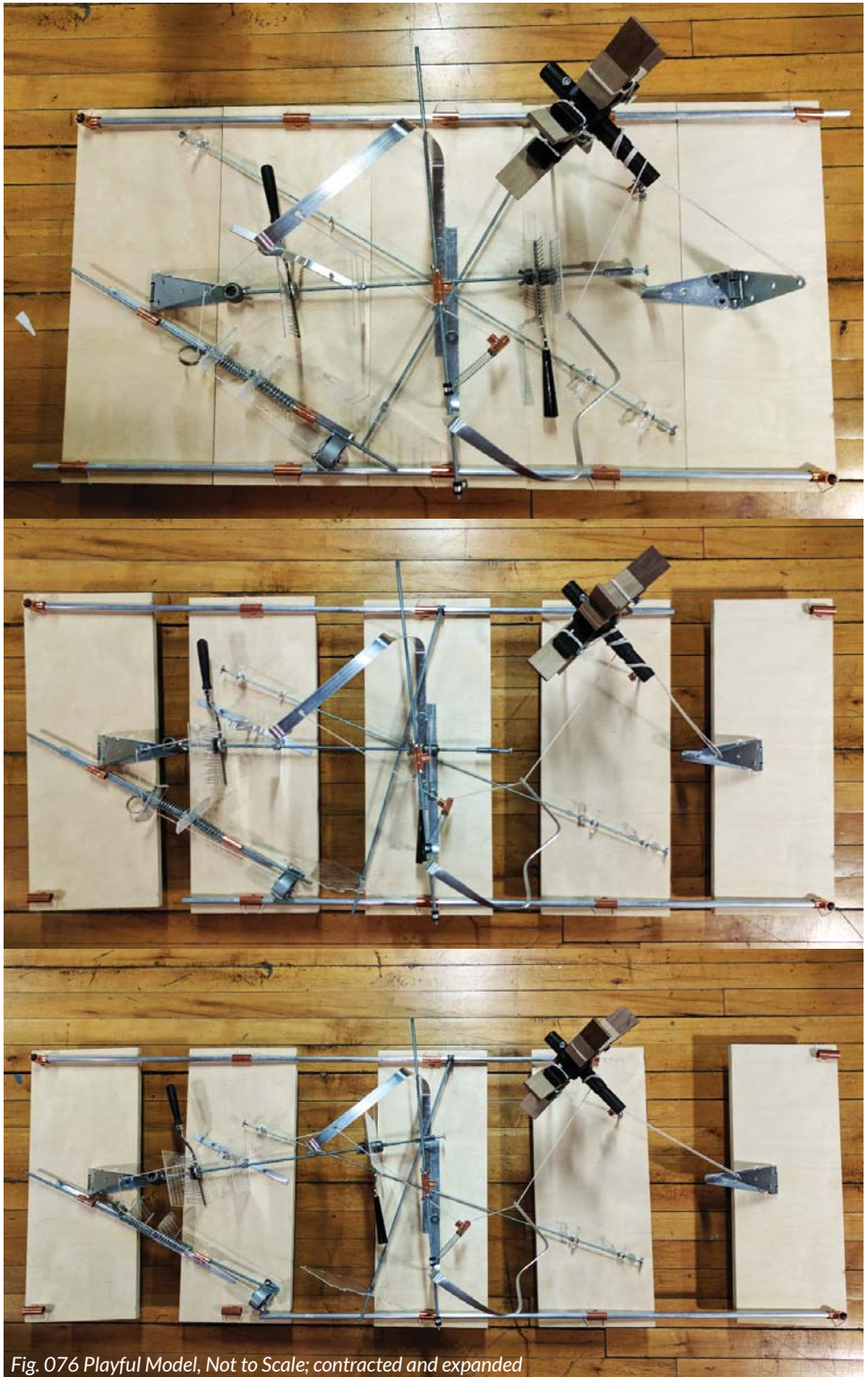
Fig. 076 Playful Model, Not to Scale; contracted and expanded

Project Exhibit:

A display of the project was installed in a 6'x6'x8' space alongside other thesis installations. While setup to create a space for play, most people didn't.
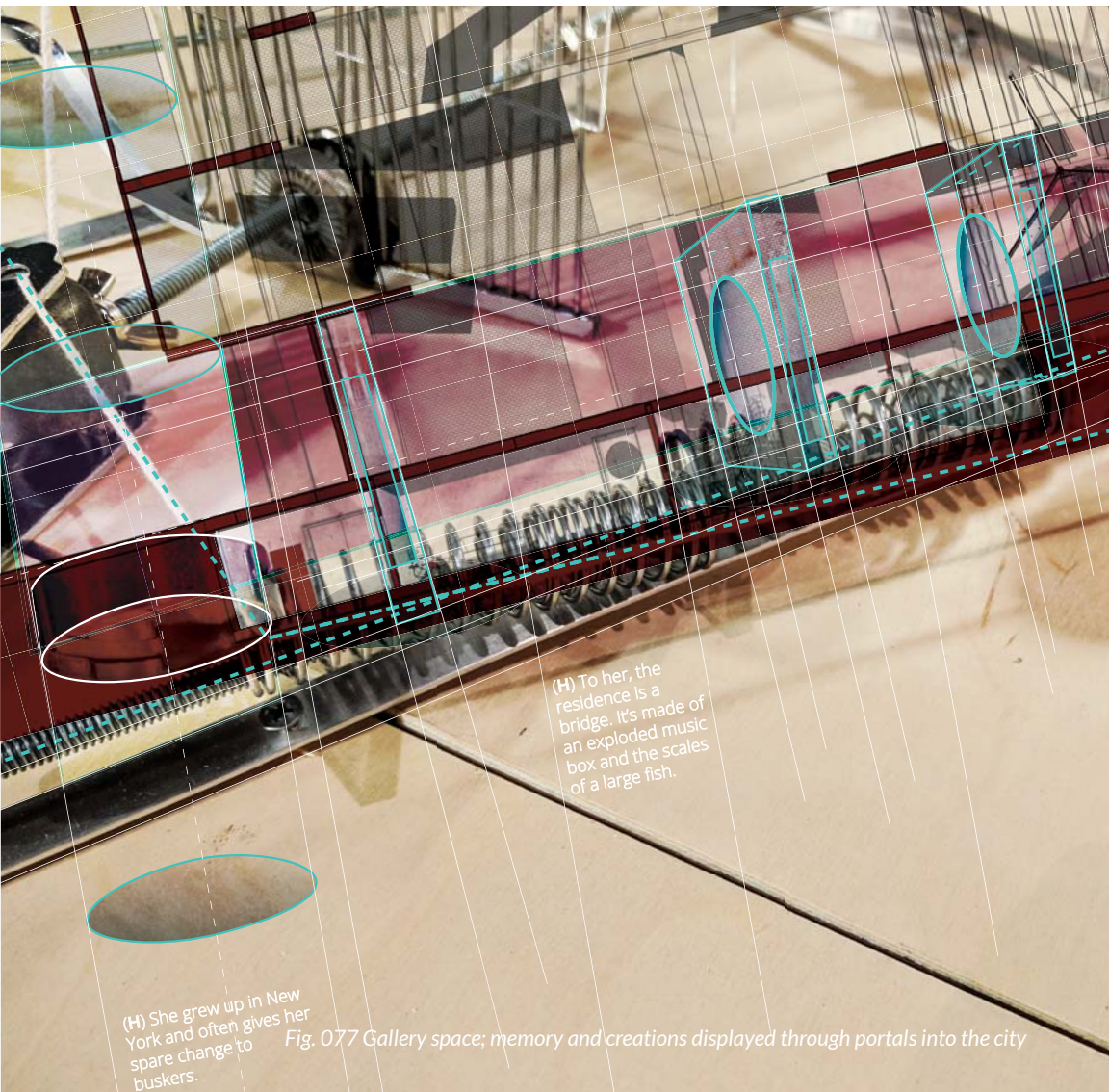
(H) To her, the residence is a bridge. It's made of an exploded music box and the scales of a large fish.

(H) She grew up in New York and often gives her spare change to buskers.

Fig. 077 Gallery space; memory and creations displayed through portals into the city
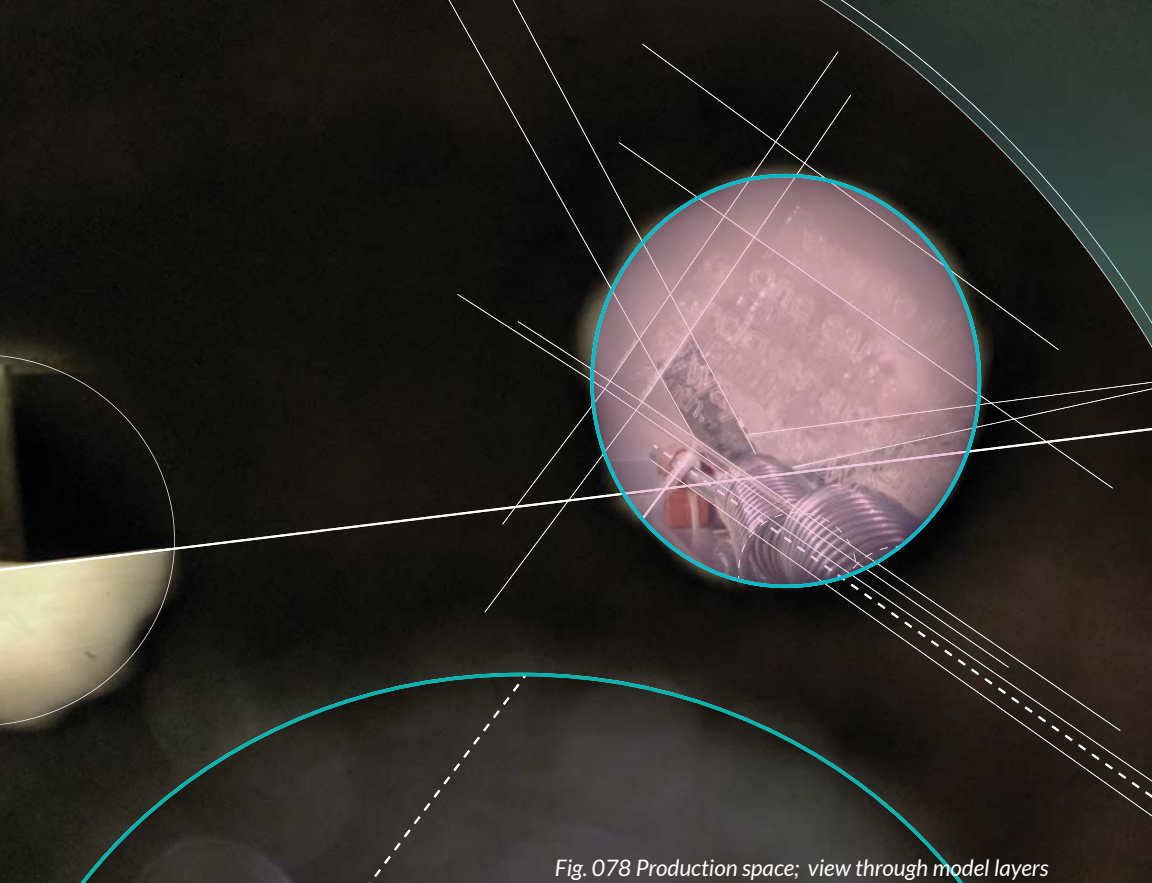
Fig. 078 Production space; view through model layers
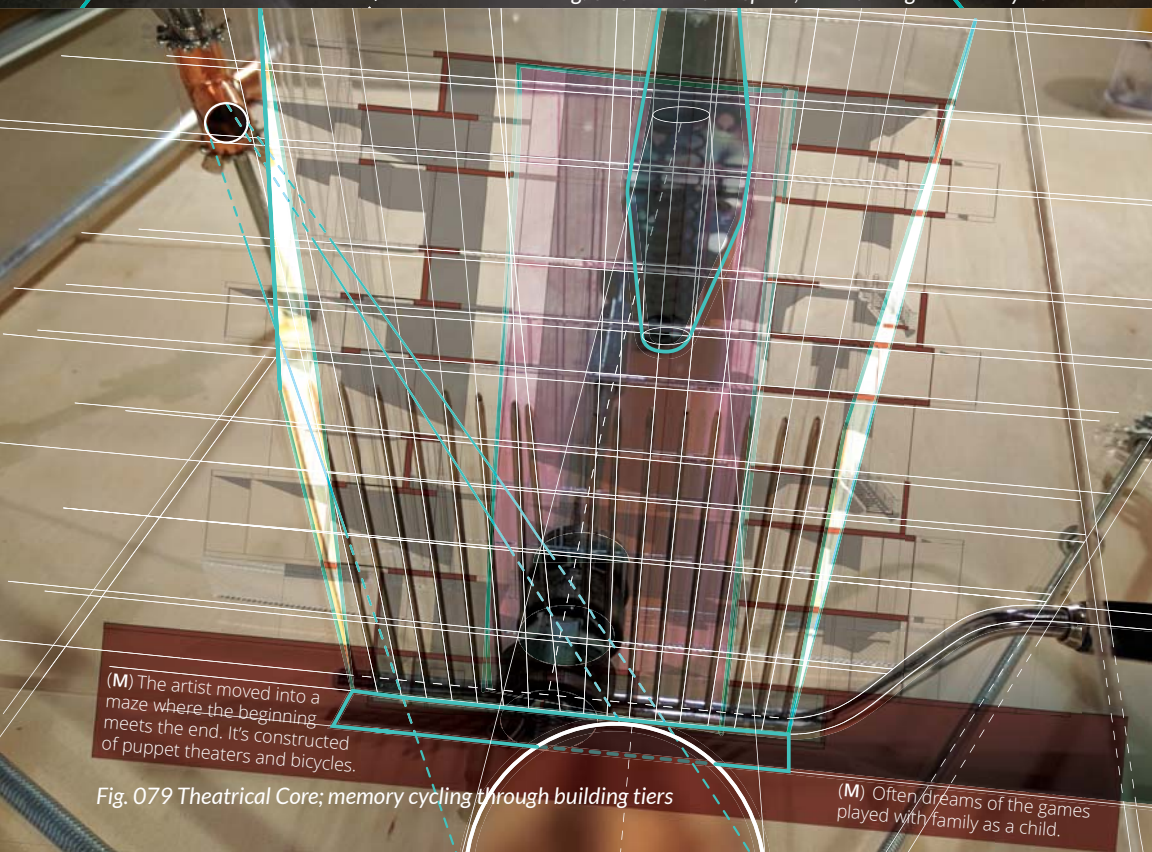
(M) The artist moved into a maze where the beginning meets the end. It's constructed of puppet theaters and bicycles.

Fig. 079 Theatrical Core; memory cycling through building tiers

(M) Often dreams of the games played with family as a child.
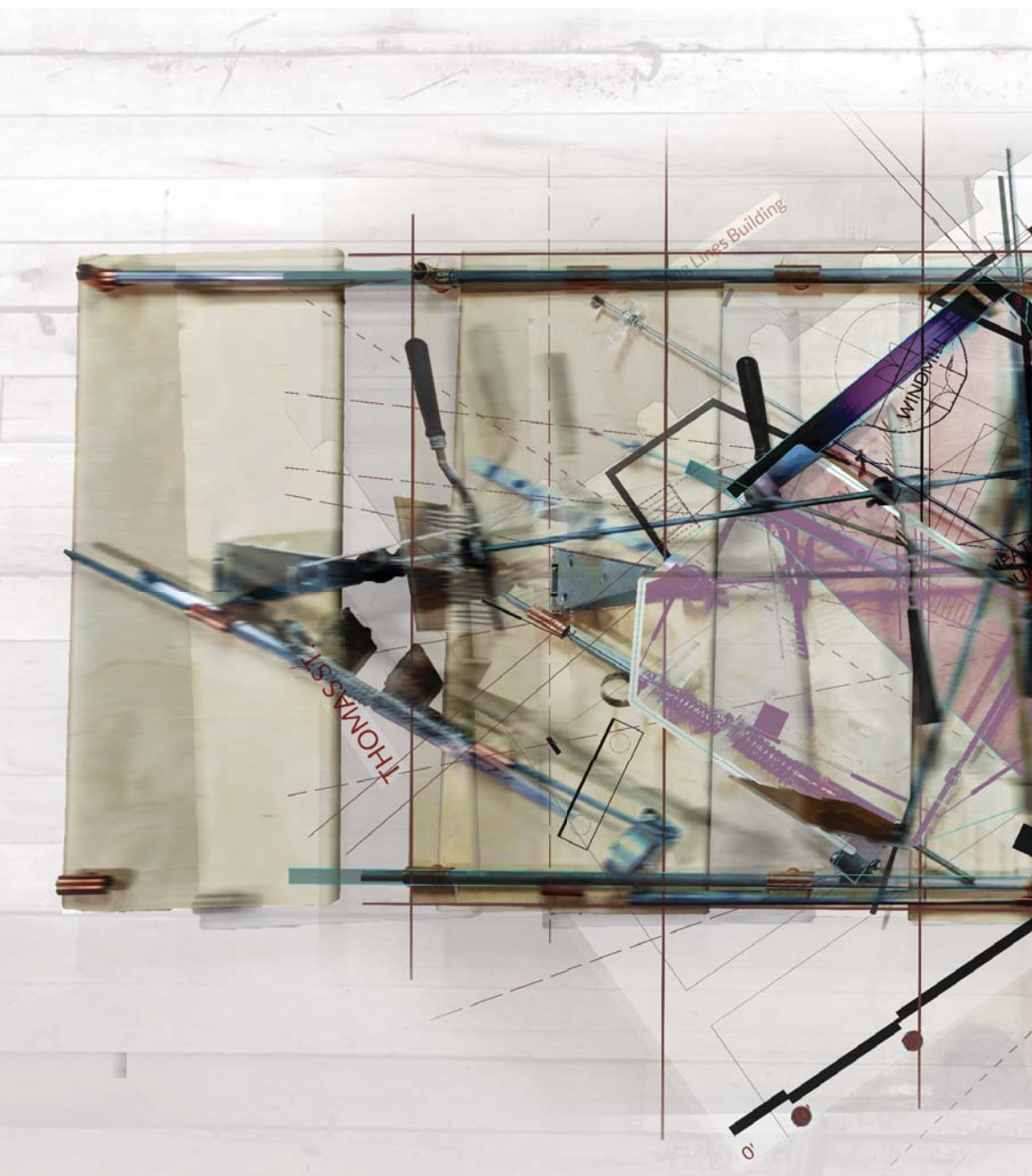
Fig. 080 Playful Model, Not to Scale; creation of spaces in plan
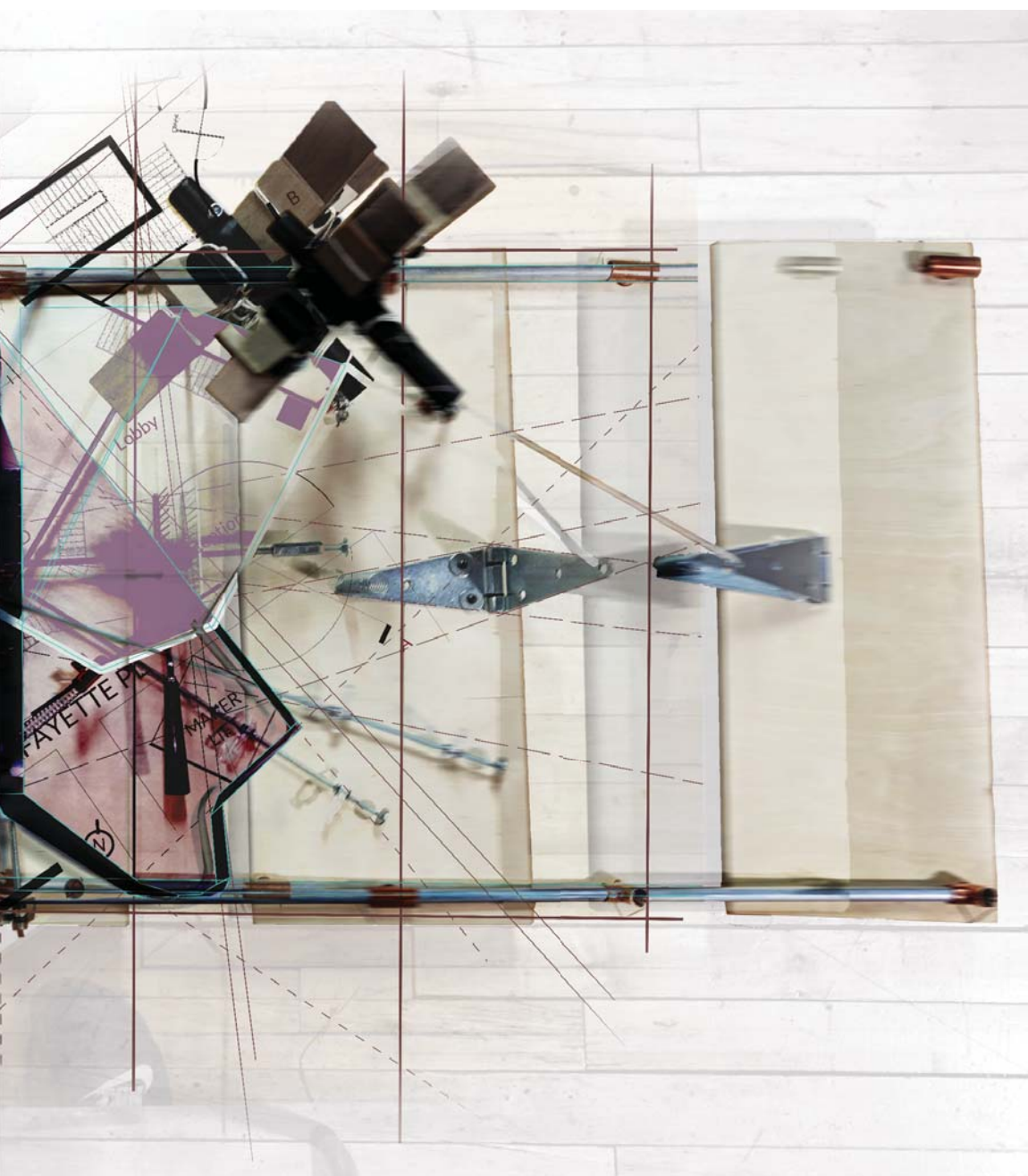
Fig. 081 Site plan; standard representation

THOMAS ST.

WORTH ST.

VORTEX

Long Lines Building

WINDMILL

MAIN
LIFT

B

THEATRICAL
COURTYARD

Lobby

Reception

LAFAYETTE PL

MAKER
LIFT

A

0'   10'   20'   40'

N

Fab Lab

Printing Lab

Theatrical Core

Metal Shop

Technological
Spaces

Production
Spaces

Studio

Studio

Display Spaces

Conf.
Room

Member Gallery - Artist Residence   Section A Through Entry
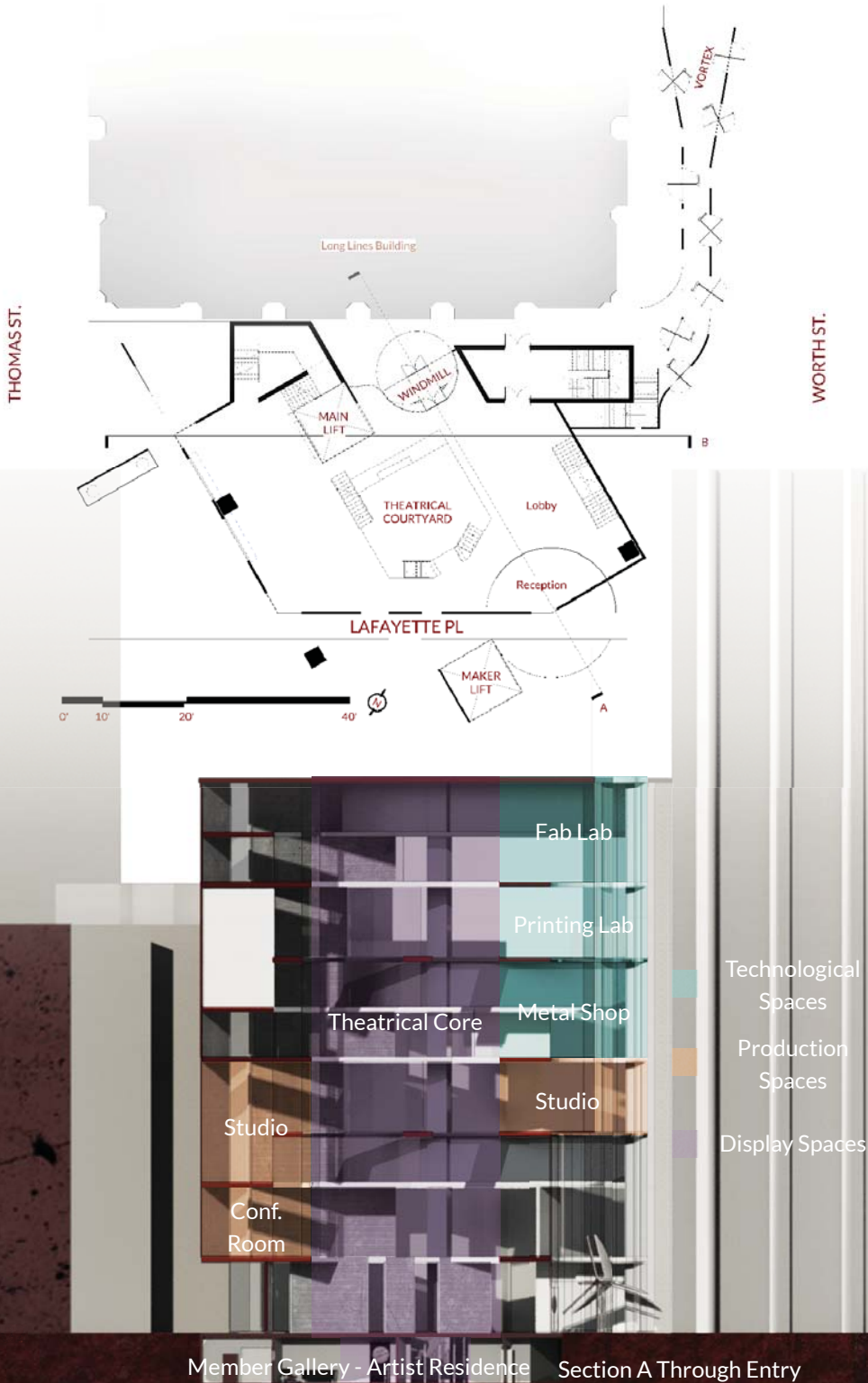
Fig. 082 Level 1 plan; standard representation

Long Lines Building

WINDMILL

MAIN LIFT

PORT-HOLE

Office

Office

THEATRICAL CORE

Conference Room

Work Space

Lecture Room

PORTAL

B.R

B.R

MAKER LIFT

Mech.

Fab Lab

Fab Lab

Printing Lab

Wood Shop

Work Space

Theatrical Core

Studio

Studio

Event Space

Offices

Theatrical Courtyard - Repception

Member Gallery - Artist Residence

Section B East to West
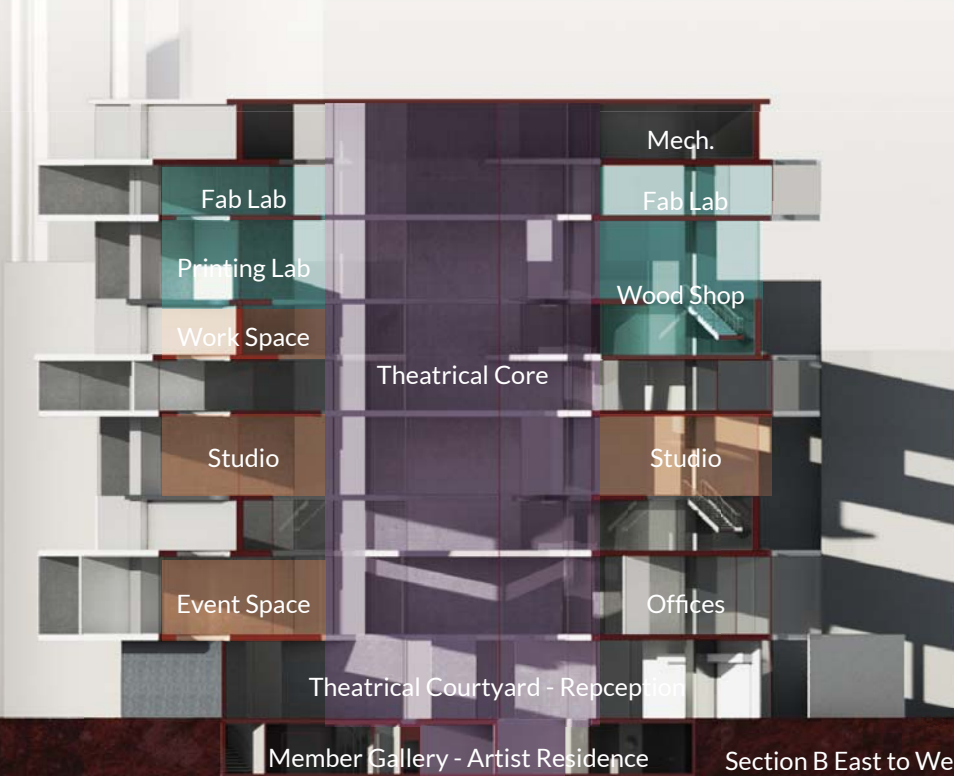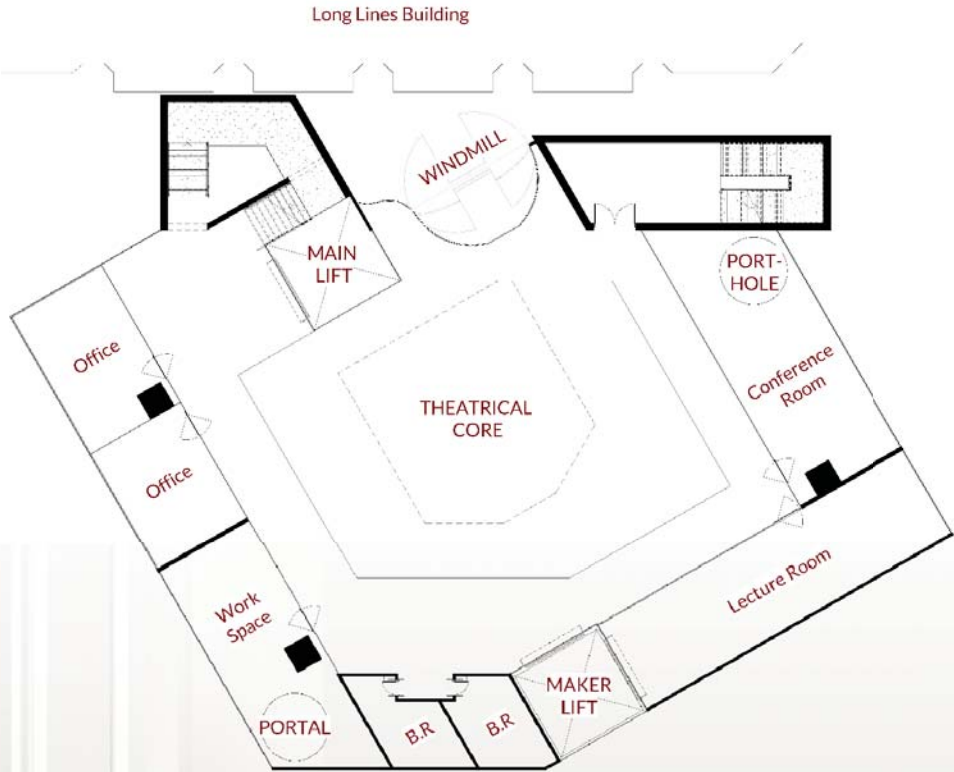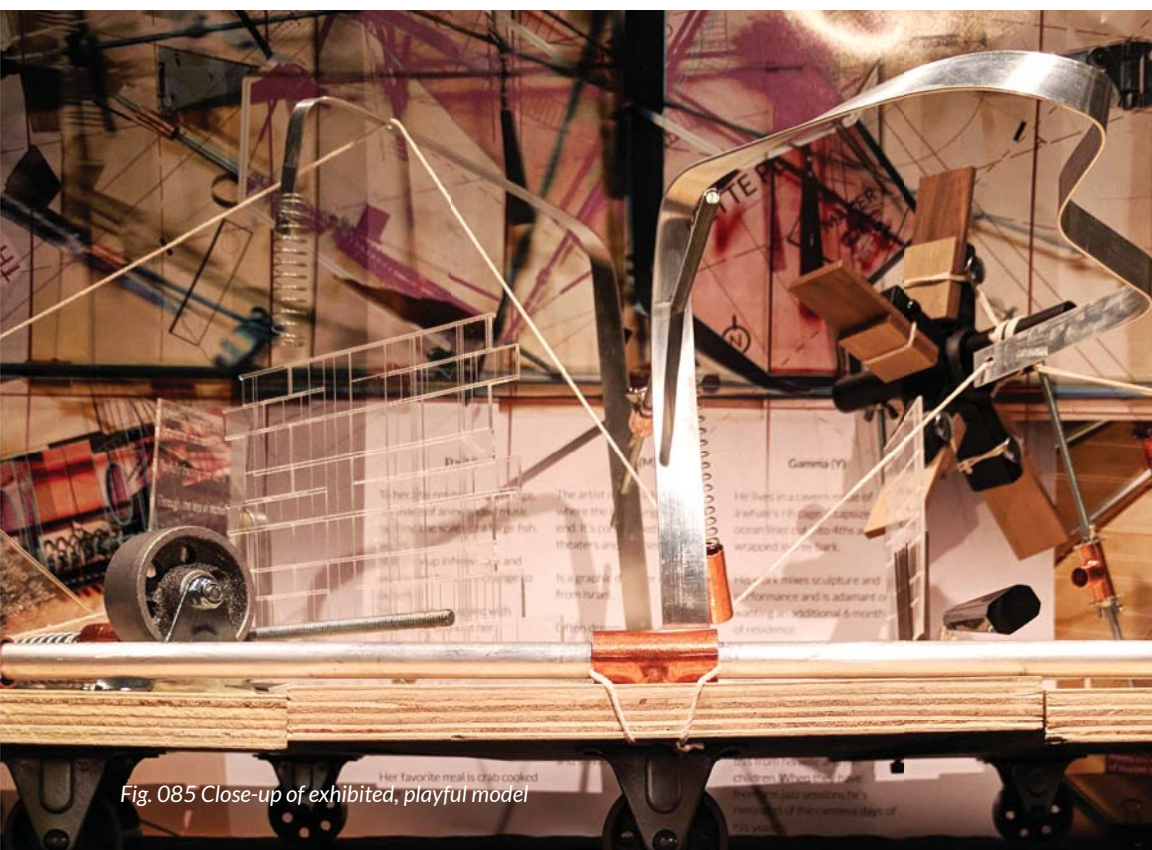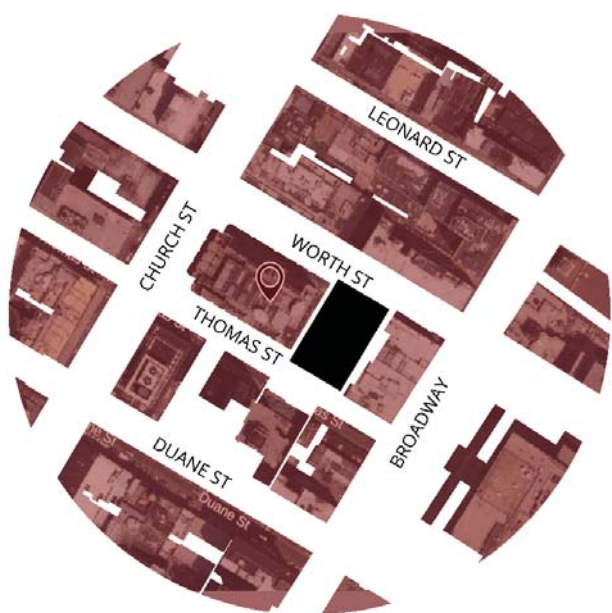
Fig. 085 Close-up of exhibited, playful model

Fig. 087 Scaled context model; 1" = 60'

Fig. 088 Full project exhibit

PART IV

[THESIS JUSTIFICATION]

This thesis is a critical look into the role of technology in society and specifically its role in the architectural profession. Design technology has been utilizing algorithmic software for decades, but digital capabilities have reached a point to where designers using the software are at an apex for algorithmic design exploration. More and more firms are incorporating algorithmic software into their workflow. This means we are seeing an increase in algorithmically designed projects. Because of the way people influence technology and vis versa, I argue that the way we use algorithmic software in design is flawed. The design and architectural artifact that arises out of this thesis will show how and why these flaws can be addressed. It will also offer a design solution through its execution and resulting way it's presented.

From a professional and academic standpoint, this subject matter is not only relevant but it's important because there is not a lot of discussion about algorithms contributing to rich, cultural applications in a poetic way. The resulting critique is not simply an opinion. It may be a thoroughly researched opinion, but its goal is to influence other's opinions, world views, and algorithmic practices.

I call into question the meaningfulness of modern technology, how it affects our creative process, and what we make as architects. In the linguistic exploration of storytelling and design; the creative mind constructs the building with concretized fractures of memory and play. Language becomes the interchange between architectural representational mediums. That's why this story of machines, in both a fictional and a literal context, brings humans back into the fold. It values the historical and cultural memory latent in ourselves over abstracted, generalized, and meaningless information. It praises immersion into the absurd. In these heightened moments, we create memories for the gathering and interpretation of a greater cultural knowledge.

[DESIGN METHODOLOGY & DOCUMENTATION]

Initial methodology consisted of multiple points of inspiration in conjunction with the development of an artifact, a metaphorical object. Critical peer discussion and review played a key role in developing the design to ensure clarity and quality of thought.

Case studies guided the development of the program requirements. Material, spatial, and graphic analysis

of major projects will serve to guide the aesthetic and design focused areas of the project. Qualitative data will be most of information utilized. It will come into play as needed to reinforce arguments, but the focus will again be about perception.

A majority of the research itself is philosophical in nature and is explored through theoretical and conceptual language. Physical manifestation through an architectural artifact and the design itself will best convey all the ideas laid out in this book and then some.

Designing and communicating ideas through different modes resulted in an interweaving of iterative processes. The simultaneous design and execution of a presentation as architectural discourse informed the playful development of modeling, drawing, and writing. Working through different modes expanded the horizon of worlds.

"Models in turn provide us with the most accurate account of what we have attempted to describe as productive reference…if the metaphorical process is the key to the transfer of meaning proper to all displacement of concepts, the work of the model shows the way in which poetic fictions themselves effect the metamorphosis of reality" (Ricoeur, 1979 p. 141).

[REFERENCES]

Agkathidis, A. (2015). *Generative Design.* London, UK: Laurence King Publishing.

Benjamin, W. (208). The Production, Reproduction, and Reception of the Work of Art. In W. Benjamin, *The Work of Art in the Age of Its Technological Reproducibility, and Other Writings on Media* (pp. 19-42). Cambridge, Massachusetts: Harvard University Press.

Heidegger, M. (1977). *The question concerning technology and other essays.* New York City: Garland.

Lefaivre L., T. A. (1985). The Machine in Architectural Thinking. *Daidalos: Berlin Architectural Journal*, 16 - 26.

Libeskind, D. (2001). Endless Spaces or Histories (Not Yet) of Architecture. In D. Libeskind, *Daniel Libeskind : the space of encounter* (pp. 65 - 83). London: Thames & Hudson.

Libeskind, D. (2001). Micromegas: The Architecture of Endspace. In D. Libeskind, *Daniel Libeskind : the space of encounter* (pp. 84-87). London: Thames & Hudson.

Member Benefits. (2017, October 13). Retrieved from New Lab: https://newlab.com/member-benefits/

New Lab at the Brooklyn Navy Yard. (2017, October 13). Retrieved from Marvel Architects: http://marvelarchitects.com/project/brooklyn-navy-yard-new-lab/

Olshavsky, P. (2011). Situating Pataphysical Machines: A History of Architectural Machinations. In S. P. Alberto Pérez-Gómez, *Chora, Volume Six: Intervals in the Philosophy of Architecture* (pp. 181 - 210). Montreal, Quebec: McGill-Queen's Press - MQUP.

Paz, O. (1978). *Marcel Duchamp: Appearance Stripped Bare.* Seaver books.

Terzidis, K. (2006). *Algorithmic Architecture.* Oxford: Architectural Press.

[IMAGE SOURCES]

1.   Grasshopper script by author

2.   Tower designed for drones [Digital Image] (2016, March 23) Retrieved December 14, from http://www.evolo.us/competition/the-hive-drone-skyscraper/

3.   Drawing of vertical recesses by Marc Feldman [PDF] (1969, July) New York: Architectural Record

4.   Still from Project X Lab [Digital Image]. (2017). Retrieved December 14, from https://fieldofvision.org/project-x

5.   1st 1ESS telephone switching room [Digital Image] (2017, May) Retrieved December 14, from http://atlasofplaces.com/filter/Architecture/Long-Lines-Building-John-Carl-Warnecke

6.   Data servers in the Long Lines Building [Digital Image] (2016, November 10) Retrieved December 14, from https://theintercept.com/2016/11/19/nsa-33-thomas-street-att-new-york-photos-inside/

7.   Interior view of New Lab [Digital Image]. (2017). Retrieved December 14, from http://marvelarchitects.com/project/brooklyn-navy-yard-new-lab/

8.   Section view of BLDG 128 [Digital Image]. (2017). Retrieved December 14, from http://marvelarchitects.com/wp-content/uploads/2015/08/NEW-LAB-MACRO-SEA1.png

9.   One of New Lab's workspaces [Digital Image]. (2017). Retrieved December 14, from http://marvelarchitects.com/project/brooklyn-navy-yard-new-lab/

10. New Lab's Atrium workspaces [Digital Image]. (2017). Retrieved December 14, from http://marvelarchitects.com/project/brooklyn-navy-yard-new-lab/

11. Hero of Alexandria's Aeolipile [Digital Image] (2013, January 21) Retrieved December 14, from https://en.wikipedia.org/wiki/Aeolipile#/media/File:Aeolipile_illustration.png

12. Archimedean Screw [PDF] (2011). McGill-Queen's University Press: Chora, Volume Six: Intervals in the Philosophy of Architecture

13. The Prague orloj [Digital Image] (2015, October 9) Retrieved December 14, from https://www.traveltipy.com/pragues-astronomical-clock-orloj-celebrates-its-605-anniversary/

14. Galileo's material analysis using statics [PDF] (2011). McGill-Queen's University Press: Chora, Volume Six: Intervals in the Philosophy of Architecture

15. Microscope by Robert Hooke [PDF] (2011). McGill-Queen's University Press: Chora, Volume Six: Intervals in the Philosophy of Architecture

16. Saxon Engineering Factory [Digital Image] (2008) Retrieved May 9, from https://commons.wikimedia.org/wiki/File:Hartmann_Maschinenhalle_1868_(01).jpg

17. Poster for opening of Ubu Roi [Digital Image] (2006, November 5) Retrieved December 14, from https://commons.wikimedia.org/wiki/File:Premi%C3%A8re_Ubu_Roi.jpg

18. Ubu Roi by Alfred Jarry [PDF] (2011). McGill-Queen's University Press: Chora, Volume Six: Intervals in the Philosophy of Architecture

19. Peter Olshavsky's Mixed Media Skiff [PDF] (2011). McGill-Queen's University Press: Chora, Volume Six: Intervals in the Philosophy of Architecture

20. "Dance Sounds" [Space of Encounter] (2001) London: Thames & Hudson

21. Carceri Etchings, Plate 14 [Digital Image] (2014, September 15) Retrieved December 14, from https://www.cooper-hewitt.org/2014/09/15/the-interior-of-nightmares/

22. Floor plan of the military history museum by Studio Libeskind [Digital Image] (2011, October 14) Retrieved December 14, from <https://www.archdaily.com/172407/dresden%25e2%2580%2599s-military-history-museum-daniel-libeskind/> ISSN 0719-8884

23. "Dance Sounds" [Space of Encounter] (2001) London: Thames & Hudson

24. M.C. Escher's "Waterfall" [Digital Image] (2017, May 25) Retrieved December 14, from https://en.wikipedia.org/wiki/File:Escher_Waterfall.jpg

25. Cranbrook Machine C [Digital Image]. (2017). Retrieved December 14, 2017, from https://libeskind.com/work/cranbrook-machines/

26. The Writing Machine [Digital Image]. (2009, November 24). Retrieved December 14, 2017, from https://lebbeuswoods.wordpress.com/2009/11/24/libeskinds-machines/

27. Engine from Gulliver's Travels [Digital image]. (2015, June 15). Retrieved December 14, 2017, from https://www.gutenberg.org/files/829/829-h/829-h.htm

28. Mondrian's Downtown Boogie Woogie [Digital Image]. (2016, January 2). Retrieved November 14, 2017, from https://commons.wikimedia.org/wiki/File%3APiet_Mondrian%2C_1942_-_Broadway_Boogie_Woogie.jpg

29. "In Advance of the Broken Arm" by Marcel Duchamp [Digital Image] (2017) Retrieved December 14, from https://www.moma.org/learn/moma_learning/marcel-duchamp-in-advance-of-the-broken-arm-august-1964-fourth-version-after-lost-original-of-november-1915

30. "Bicycle Wheel" by Marcel Duchamp [Digital Image] (2017) Retrieved December 14, from https://www.moma.org/learn/moma_learning/marcel-duchamp-bicycle-wheel-new-york-1951-third-version-after-lost-original-of-1913

31. The Bride Stripped Bare by Her Bachelors, Even (The Large Glass) [Digital Image]. (2017). Retrieved December 14, 2017, from https://www.philamuseum.org/collections/permanent/54149.html

32. The Large Glass Diagram [Digital Image]. (2017). Retrieved December 14, 2017, from https://www.philamuseum.org/collections/permanent/54149.html

33. Lionel Pincus and Princess Firyal Map Division, The New York Public Library. (1884-). Manhattan, V. 1, Plate No. 35 [Map bounded by North Moore, West Broadway, Thomas St., Hudson St.] Retrieved from http://digitalcollections.nypl.org/items/96e7ad32-1ea2-5c64-e040-e00a18064991

34. Spatial Typologies by author

35. Wall detail for the Long Lines building [PDF] (1969, July) New York: Architectural Record

36. Mechanical floor plan for the Long Liens building [PDF] (1969, July) New York: Architectural Record

37. Design influence for the Long Lines building [PDF] (2013) MIT Press: Grey Room

38. - 44. Photos by author

45. Memory theater plan [Digital Image] (1974). Chicago, Illinois: The University of Chicago Press.

46. Memory theater imagined [Digital Image] Retrieved May 9, 2018, from https://melinafaka.hotglue.me/?de+la+m%C3%A9moire.head.146347160970

47. – 88. Photos and artwork by author

[PREVIOUS STUDIO EXPERIENCE]

2nd Year Fall | Joan Vorderbruggen
- A Place for Tea | Tea House
- MN Rowing Club House | Boat House

2nd Year Spring | Cindy Urness
- Fargo Montessori School | Early Childhood Educational Building
- A Place for Birds | Bird House
- Tiny House Community | Small Residential Dwelling

3rd Year Fall | Ronald Ramsey
- Feline Mausoleum | Monument or Spiritual Structure
- Chamber Music Hall | Adaptive Reuse
- Fargo Jewish Temple | Religious Building

3rd Year Spring | Bakr Aly Ahmed
- Fargo Culinary College | Post- Secondary Education Building
- Chattanooga Health Center | Health and Wellness Facility

4th Year Fall | Don Faulkner
- SOMA High-Rise | Comprehensive Multi-Story Design

4th Year Spring | Paul Gleye
- Brussels Canal Redevelopment | Urban Renewal

5th Year Fall | Stephen Wischer
- Design Thesis Research | Mixed-Use Fabrication Studio

[PERSONAL IDENTIFICATION]

Hannah Langr

Phone: 612-454-8189

Permanent Email: hjlangr@gmail.com