WEAK MATERIAL

: LIGHT, TIME, LOCATION AND THE **STUFF** OF ARCHITECTURE

by Jacob Shank

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Jacob Shank

To my friend and mentor

Gino Pin.

Abstract

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In the 1987 essay Weak Architecture the Spanish architectural theorist Ignasi de Sola-Morales asked the question "what role is accorded to architecture in the aesthetic system of contemporary weak thought?"(de Sola-Morales, 1996 [1987], p. 57). Given the increasing contemporary influence of weak ontology (thought) within the discipline of philosophy and the resulting spill over into architectural theory, this thesis asks a similar question repositioned from the viewpoint of the designer:

What impact does the philosophy of Weak Ontology have on the design of contemporary architecture?

By questioning the objective relationship between person and architecture (the ontological and the ontic), the plurality and incompleteness of architectural experience must be addressed. The project uses the relationship of light and architecture to reevaluate three foundational architectural elements: its materiality, its linear existence in time, and its fixed location. The role of light within architecture becomes the focus not of the investigation itself, but a demonstration of the accumulative and pluralized influences that overlay the Euclidean underpinnings of architectural tectonics.

Prologue: Embedded Vision

This design thesis must start with a caveat about the primacy of vision. As an investigation into the relationship between light, the body, and architecture this project will deal primarily with vision at the exclusion of the other senses. This focus is in no way intended to endorse the idea that architecture is fundamentally, or even primarily, a visual phenomenon. The over emphasis of vision within Western culture is worthy of critique, particularly the problematic alignment of vision with verifiable truth. This thesis does not engage with that critique. However, this thesis is intended as a counterpoint to a growing collection of literature that actively attempts to align vision solely with the production of architectural images and to discount the important role it plays within the embodied experience of architecture. Juhani Pallasmaa's statement that, "sight separates us from the world, while the rest of the senses joins us" (Pallasmaa, 2005, p. 16) is the antithesis of this project. This thesis is built on the understanding that architecture is experienced through an interconnection of all the active senses simultaneously.

Acknowledgements

This thesis project would not have been possible without the input of my supervisor Marco Polo. Our frequently meandering but always topical conversations gave me the freedom to pursue my interests as well as the structure to progress towards a tangible outcome. John Cirka and Baruch Zone also provided invaluable input and direction particularly regarding issues of clarity and accuracy. My fellow students in the Master of Architecture program were of constant support. The studio became a testing ground, and luckily a few bad ideas got squashed before too much time was wasted. My parents have provided me with support in countless ways. This thesis project could not have been completed without them. Any success I have is a testament to their good parenting. Finally, I would like to thank Maggy Chouinard who has put up with an absent boyfriend stricken with the emotional highs and lows that inevitably accompany a project of this kind. Her love and support got me through each day.

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INTRODUCTION

The human concept of reality is always bound to a *time* and *location*, and therefore our reality is an interpretive engagement with other *times* and *locations*. We qualify our momentary experience though our understanding of other experiences. This comparison is the backbone of contemporary ideas of existence. In different ways the idea is present within very different conceptions of reality: from relativity theory, where light and time bend around the observer's position, to phenomenology, where reality is constructed through our sensual engagement with the world. Our contemporary, globalized situation can be seen as defined by its plurality; cultures mix, people travel, opinions are shared. We are forced to deal with difference and contradiction on a daily basis and we constantly redefine ourselves by comparison to others. Certainty and stability have slipped through our fingers, but how do we respond to this reality?

This thesis project grew from an interest in the fundamental way we, as humans, understand and interact with architecture. It is concerned with the blurry, conflicted lines between solidity and change, quantitative exactness and interpretive subjectivity within which architects must operate. Architecture is commonly said to be both a science and an art; suggesting that architecture must engage with the *intangible* through very *tangible* methods. There is a dichotomy within the practice of architecture which must operate within strict professional parameters while simultaneously denying the existence of any limitations. Architecture is a profession of contradictions; architects *imagine real things,* they are built, and then their creations are re-imagined by the inhabitants. This inherent contradiction is what makes architecture both fascinating and infuriating.

This thesis project proposes that Gianni Vattimo's philosophical concept of *weakness* can provide a theoretical framework for understanding architecture's necessary contradictory nature. It can help architecture operate with conviction in a world without certainty. The notion of a *weak* ontology outlines a contemporary condition that is exemplified by a lack of conceptual and perceptual certainty and calls for an analytical engagement with that uncertainty. Vattimo emphasizes the *plurality* and *incompletenes*s of all knowledge and therefore the uncertainty of truth (Vattimo, 2012). His thinking is distinguished from other movements of post-modern relativism through its emphasis on the need
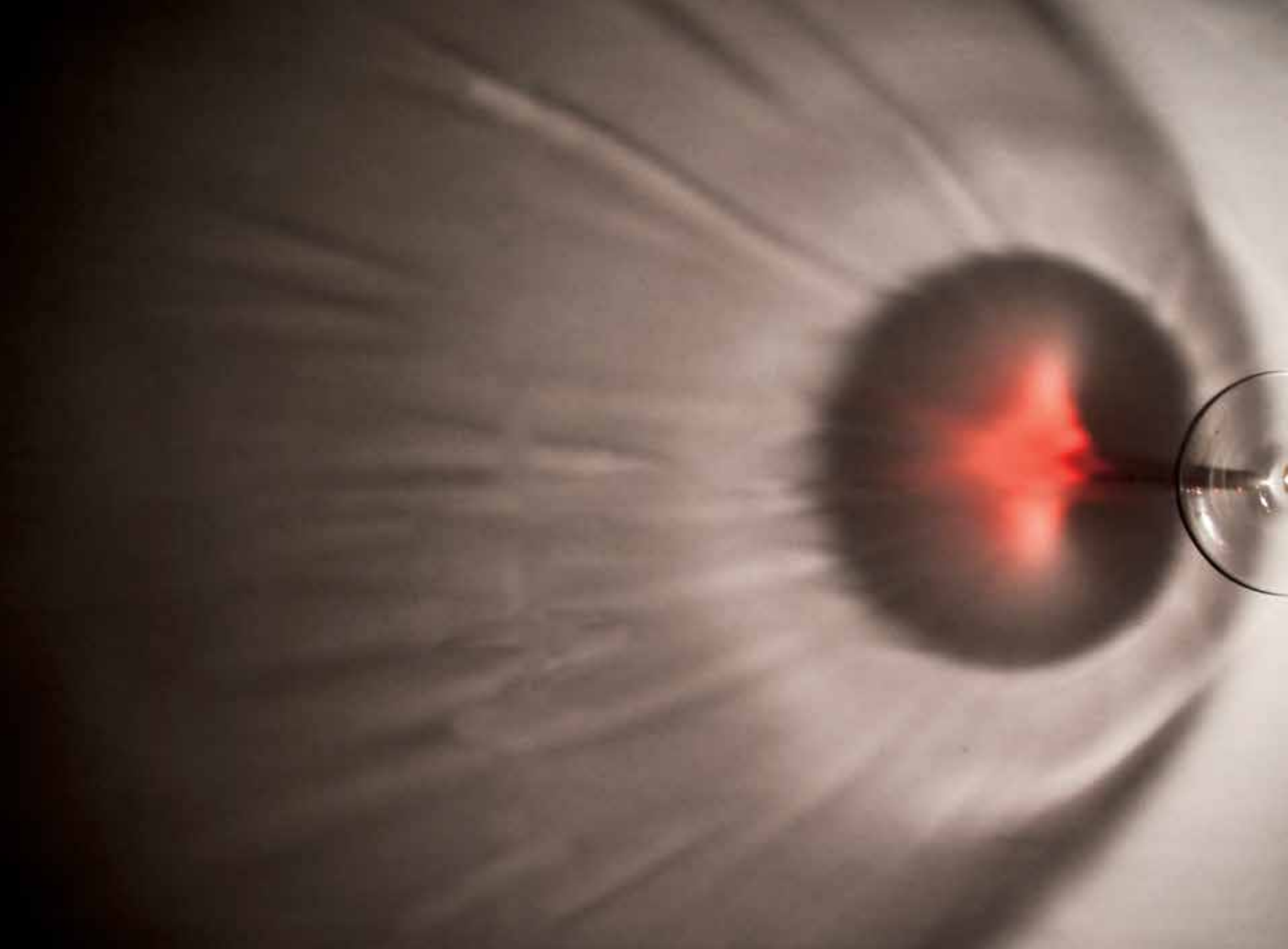
Figure 1: Candlelight through a wine glass. Light reveals more than pure truth!

to build systems of reference, but also to recognise the inherent fragility of the system within which we operate.

The idea of *weak architecture,* first developed by Ignasi de Solà-Morales in the mid 1980s, situates the work of Vattimo and other philosophers within architectural discourse. The essays collected in a book titled *Differences: Topographies of Contemporary Architecture* (Solà-Morales, 1997) outlines a contemporary architecture that is conceptually tied to the flexible influences of temporality and interpretation rather than absolute conditions. Following Morales's early inclusion into architecture ideas of weakness have spilled into the work of Juhani Pallasmaa, Peter Zumthor, Farshid Moussavi, Andrea Branzi, as well as a number of Japanese architects. This thesis investigates the influence that *Weak* ontology has had on architecture to date, and attempts to pull out the lessons which will help architecture move into an uncertain future.

As a means of grounding the ontological discussion of *weakness* within the material reality of architecture, the thesis focuses on the role light plays within architecture, presenting it as a uniquely variable element of architecture. The discussion concerning light is used to define what *Weak Architecture* is by introducing light as a *weak* architectural material. Light's unique interaction with form is used to illuminate architecture's temporal paradox; light, as a material, shows ontological fragility from moment to moment and person to person while having relative formal stability through time. The built environment is constructed of solids intended to remain unchanged, however, the variability of context, both physical and psychological, is constantly projecting difference onto the otherwise stable forms. An example of this is the wide range of spatial experiences one can have in a single room. A kitchen can feel open and exposed to the exterior with the bright morning sun, but the same space can feel like an intimate protected shell when a group of friends is collected around a candle lit dinner (Figure 1). This leads to the conclusion that the prepersonal form of architecture must be recognized as neither solid, nor absolute, but impressionable to the unpredictability of people and place through time; light makes solid architecture *weak*.

This Master of Architecture thesis draws on three methods of investigation: literature review and analysis, experimental projects, and an architectural design project.
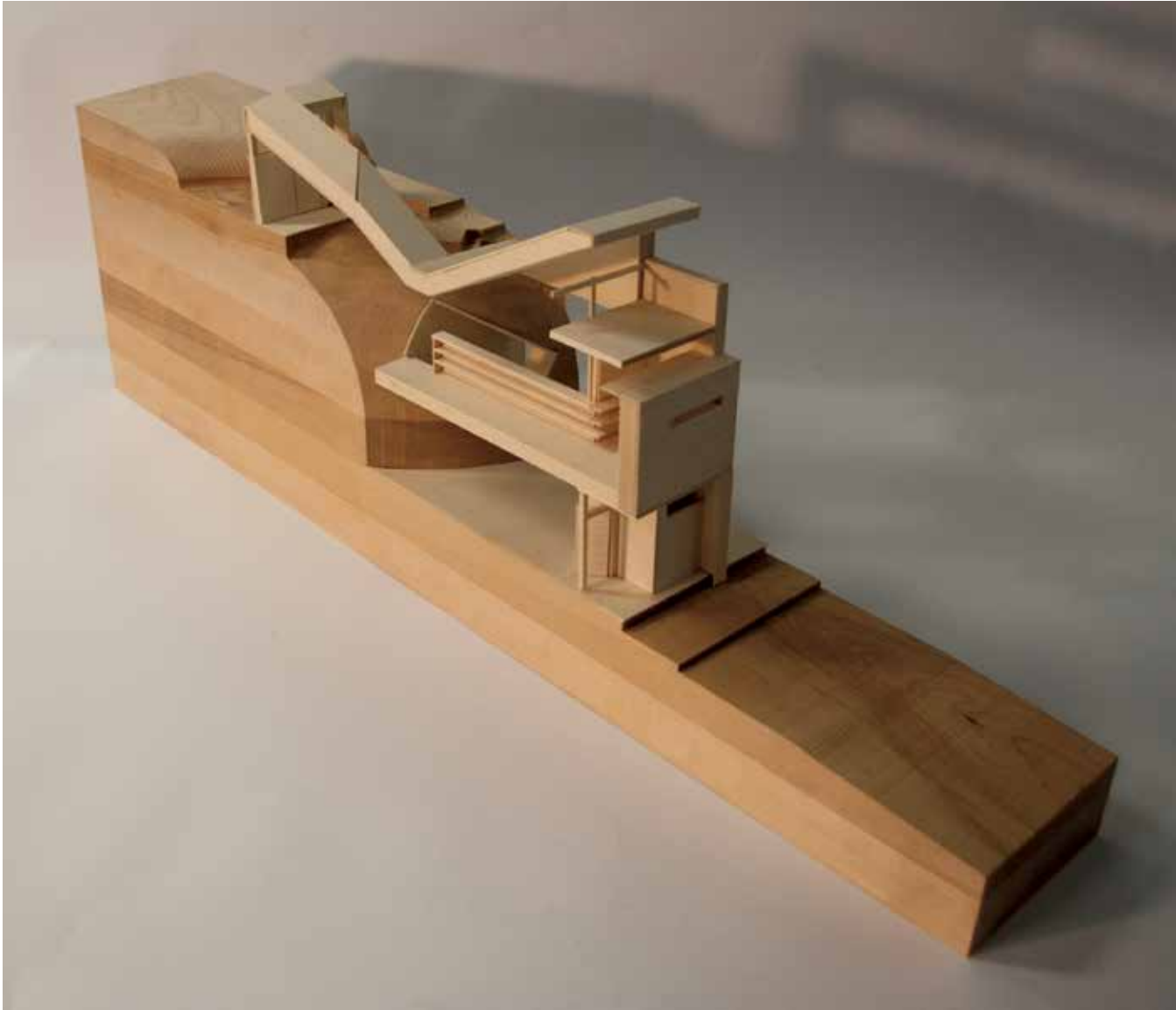
Figure 2: Housing Weakness sectional model. Final thesis design.

The thesis is divided into four parts. The first two deal with theoretical research including a literature review, part three with experimental projects, and part four with an architectural design. Part one, **Ideas of Weakness,** summarizes the key elements of "weak ontology" and tracks its influence within architectural discourse. The second part, **The "Weak" Tectonics of Light,** introduces the strange material properties of light. First it proposes that light should be understood as an additive architectural material in that it does not simply show what is, but influences the perceptual understanding of architecture. The section continues by outlining light as the architectural element which is most bound to time and location. Part three, **Materializing Light,** introduces a series of three design experiments. Each experiment is a built expression of some theoretical aspect covered in the preceding two parts. The first experiment was the creation of a camera which captures a layered contingent image of a location. The second was the development of a tool for testing light angles on physical models. The last experiment was the fabrication of a lens which creates caustic patterns of light.

The ideas investigated within the first three parts of the thesis culminated in part four with the design of a house located in Yellowknife, NWT. The house design is an attempt to draw architectural conclusions from the theoretical investigations and design experiments. It is therefore not a complete, conventional architectural proposal, but instead a collection of architectural ideas (Figure 2).

As an investigation into the architectural implications of *weak* philosophy, this thesis does not attempt to draw precise conclusions; instead it assembles guidelines and questions. These guidelines and questions become a system for architecture to situate itself within a *weak* context, because there is no "weak architecture" but rather all architecture must operate within *weak* ontological conditions. As architects we must choose how, not if, we build within these conditions.

PART 1:

ONTOLOGICAL WEAKNESS

"I discovered long ago… that what I found was closely intermeshed with how I felt at the moment. External reality has a way of being not so external after all."

(Steinbeck, 1997)

CHAPTER 1: WEAK ONTOLOGY

Vattimo and Weak Thought

The philosophical movement of Weak Ontology, which is often referred to as Weak Thought, has been in development by Gianni Vattimo and others[1] since the late 1970s. The *weakness* of Vattimo's philosophy engages with two main concepts: the *plurality* and the *incompleteness* of reality (D'Agostini, 2010). *Plurality* is epistemological in nature, implying the legitimacy of overlapping and contradictory "truths" derived from multiple interpretations of events. *Incompleteness* is historical in nature, implying the diachronic nature of "truth"; no account of the past can be exhaustive and therefore must have accompanying biases. What makes Vattimo unique within the epoch of postmodern philosophy, and increasingly relevant within our hyper-modern contemporary culture, is his engagement with a delicate middle ground between empirical

truth and total nihilistic relativism (Vattimo, 2010). Weak Ontology resists a totalizing relativism through its call for a "weakening" of *Modern* thinking without an abandonment of the questions and systems it creates. Vattimo's philosophical goal is that of "neither restoring metaphysics nor surrendering to the futility of a relativistic philosophy of culture" (Vattimo, 1992). Rather Vattimo outlines a conceptual engagement with the world where beliefs, discoveries, and creation can be firmly enacted "not derived from the world 'as it is', but from the world viewed as a production of interpretations throughout the history of human cultures"(Zabala, 2007, p. 15).

As will be discussed in later chapters it is this balancing act between empiricism and interpretation, the creation of weak truth, which I have found to be the most relevant to a discussion of architecture. To understand Weak Ontology's relevance within architectural discourse it is important to understand two fundamental aspects of the philosophy's underpinnings: the intertwined

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1 See the introduction to Weakening Philosophy: Essays in Honour of Gianni Vattimo (S. Zabala, 2006) for a detailed developmental history of Weak Ontology.

contributions of hermeneutics and nihilism, as well as the specificity of the term *difference*. Vattimo's focus on hermeneutics forces a "linguistic turn" (Zabala, 2006) on the philosophy of interpretation provided by Nietzsche. The application of linguistic theory to architecture in an attempt to *read* buildings as *text* has a problematic history. Weak ontology offers a new, less problematic way of analyzing architecture as interpretation. The philosophy provides a structure beyond pure subjectivity but avoids the misguided rigidity of applying semiotic interpretations to buildings. The term *difference* used within weak ontology tackles two areas of variation. First, it speaks to the difference between things as a generator of meaning for things. Second, it speaks to the distinction between the physical in and of itself (matter without meaning), and the thing, entangled with our interpretations, with which we must engage. This speaks to the troubling discrepancy between architectural intention, constructed form, and human engagement.

Hermeneutics and Nihilism

Vattimo's thinking is primarily derived through a cross-reading of the "holy trinity of Nietzsche, Heidegger, and Gadamer" (Grondin, 2007, p. 206). Heidegger's and Gadamer's contributions to Weak Ontology are primarily through hermeneutics. Hermeneutics was born from the problem of interpreting biblical text. The rise of secular influences expanded hermeneutics to text interpretation more generally. Heidegger and Gadamer shifted hermeneutics away from text towards a hermeneutic ontology where "Things make themselves understood in their interpretation"(Gadamer, 2004, p. 255). Hermeneutics provides the theoretical backbone of Weak Ontology by forcing the question of interpretation on all 'truth'.

Vattimo's hermeneutics is influenced by a reading of Nietzsche closely paralleling that of Gilles Deleuze in its *affirmative* interpretation of nihilism. This is explained succinctly by Franca D'Agostini while quoting Deleuze's 1980 book *Nietzsche and Philosophy*:

"Nihilism is not simply the shared acknowledgment of the end of all values, but rather the condition of science 'that dances with light feet', and the age of philosophers able to accept 'the dangerous maybe'." (D'Agostini, 2010, p. 37)

Vattimo diverges from Deleuze and other French neostructuralists by interpreting Nietzsche through hermeneutics instead of vitalism, and in the process also radicalizes hermeneutics through a nihilistic reading (D'Agostini, 2010, p. 39). This is illuminated clearly by Ashley Woodward (Woodward, 2008) through an investigation of Vattimo's translation of Gadamer's 1960 *Truth and Method*. The English translation accepted by Gadamer himself was: "Being that can be understood is language". However, when Vattimo references the line he maintains the commas present in (but changes the intended meaning of) the German text: "Being, that can be understood, is language". In so doing Vattimo radically links Being with language instead of delineating the restricted completeness of Being that can be understood through language. Using this translation Vattimo is reframing Gadamer's hermeneutics

through Nietzsche's statement "there are no facts only interpretations", while simultaneously subjecting Nietzsche's nihilism to linguistic confinement. For Vattimo Being *is* language in that language provides a changing structural metaphor within which we interpret Being. It is important to note that for Vattimo language is a much looser concept than for others concerned with the semiotic interpretation of reality, for example Jacques Derrida's Deconstruction. This can be understood through Vattimo's references to history using Heidegger. Heidegger's ideas concerning history are used to critique a notion of history as a given truth based on progress. Instead, history is understood through a slippery relationship with the past where the present is in a constant reinterpreted dialogue with the past. Ashley Woodward succinctly summarizes the Heideggerian viewpoint:

"Beings are revealed as what they are by virtue of particular 'disclosive openings' or events of Being, openings which change through historical time and which Heidegger calls epochs. The meaning of history is thus never given once and for all, since

as we move through historical time the changing nature of the disclosive opening in which we ourselves live governs the parameters of our interpretations of the past. Thus, the past is never given once and for all, as objectively factual, and the inheritance of tradition implies a necessary critical interpretation from the perspective of our current situation." (Woodward, 2008, p. 181)

This dense philosophical position is simply defined by Steinbeck as he muses to his dog in the book *Travels with Charley*:

"I feel there are too many realities. What I set down here is true until someone else passes that way and rearranges the work in his own style. In literary criticism the critic has no choice but to make over the victim of his attention into something the size and shape of himself."(Steinbeck, 1997, p. 76)

This Heideggerian relationship with history is adopted by Vattimo with one important exception: Vattimo denies the possibility of a critical interpretation of the past. Knowing the past is incomplete does not provide

the tools to complete it, or even to conceptualize it in an unbiased manner. This starts to get at the nihilism present within Weak Ontology, which is an epistemological nihilism instead of an ontological nihilism. However, by denying the posibility of complete knowledge, any practical engagement with a metaphysical ontology is weakened.

This leads us back to Vattimo's understanding of language. It is not tied directly to text or vocabulary, but instead to the interpretive structure of information, which allows for Being. This is a loose interpretive structure in constant renegotiation with the plurality of the present, and the incompleteness of the past.

Difference

The train of thought concerning *difference* leading to its use within Weak Ontology started within structuralism; primarily through the work of the linguist Ferdinand de Saussure and the anthropologist Claude Lévi-Strauss. The two structuralists argued that meaning can only be developed through the comparison of difference; that is to say that meaning is produced by

comparing an element within its distinct and differential place to other elements within an overarching structure. Derrida injected temporality into the structuralist idea of *difference,* creating his own term *différance*. He critiques the structuralists for their preoccupation with fixed, binary oppositions and instead argues that the differences upon which meaning is produced are not fixed but shifting over time and entangled with each other. Vattimo's *difference* parallels the temporality and instability of Derrida's *différance* but focuses on Heidegger's use of the word. For Heidegger difference indicates the divergence of *being* and *Being*, or similarly, the difference between the *ontic* and the *ontological*. Franca D'Agostini clearly delineates these two states concerning Heidegger's use of difference and illuminates the importance of methodology:

> "There evidently follows the distinction between two modes in which truth eventuates, the ontic (concerning the being of single individuated things 'at the disposal' of humans for use and manipulation) and the ontological (concerning Being as such). Hence an essential linkage arises between ontology and methodology, which leads

to a radical redefinition of both: ontic designates an analysis focused on the way of being of some present thing or other in front of me, while ontology is the understanding of 'Being qua Being'." (D'Agostini, 2010, p. 10)

It is important to note that for Heidegger difference does not indicate the comparison between multiple objects but takes on a neo-Kantian stance, concerning itself with the difference between a thing as it is in itself, and the meaning of a thing. (D'Agostini, 2010). The method of engagement with something contributes to its meaning as much as the thing itself. Vattimo differs from Derrida by adopting this ontic/ontological dichotomy. Vattimo takes the dichotomy and weakens it by emphasizing the temporality of the condition; revealing the constantly shifting dialogue between thing and interpretation. Within this shifting ontology of difference Vattimo emphasizes Heidegger's belief that difference has been forgotten within a metaphysical conception of reality:

"Difference has been forgotten: we have lost the static difference between Being and being, as well as the dynamic differing between Being and itself. Consequently, what we have lost is the very possibility of acting against this oblivion, the very possibility of constructing some alternative vision of Being that we might set against the tradition of metaphysical vision". (Vattimo, 2010, p. 113)

The forgetting of difference is the forgetting of plurality within interpretive (hermeneutic) endeavours.

Weakness and the Built Environment

Viewed together, and in the shadow of the scientific method, hermeneutics, nihilism, and difference outline the foundational ideas forming Weak Ontology. A nihilistic view of hermeneutics provides the weak framework for the manner in which we interpret the world. Difference outlines the importance of position within this shifting, subjective framework. This position is both in relation to other things and between multiple interpretations of the same thing. To reiterate, what is important to Weak Ontology, and missing in some other postmodern philosophy, is the existence of this framework similar to those found in metaphysical and empirical systems. However, the framework is weak; the philosophy suggests that one should grab hold of apparent truth, but always question its totality. It is this engagement with both structure and relativism that provides the greatest possibility of lessons for architects. For architecture inherently struggles with polarization, it must be both science and art, solid and pliable, static and changing, and address the plural while working with the singular.

In the next chapter I explore how the ideas of Weak Ontology have been adopted by Ignasi de Solà-Morales in his conception of Weak Architecture as well as more contemporary architectural theorists and architects: such as the "fragile architecture" of Juhani Pallasmaa, the "weak and diffuse" architecture of Andrea Branzi, and the affect driven architecture of Farshid Moussavi. I then develop my own understanding of *weak architecture* as an architecture of aleatoric impression primarily influenced by change.

Figure 3: Punta Della Dogana Museum,
Venice, Tadao Ando, Renovation 2009

CHAPTER 2: WEAK ARCHITECTURE

Differences

In his 1987 essay "Weak Architecture" Ignasi de Solà-Morales was the first to bring Weak Ontology into architectural discourse. The essay was part of a series that were compiled into the book *Differences* in 1996. The most important of these essays, other than "Weak Architecture", are "Architecture and Existentialism", "From Autonomy to Untimeliness", "Place: Permanence or Production", and "Difference and Limit: Individualism in Contemporary Architecture". Together the essays make an argument for architecture's conceptual instability, each delving more deeply into specific topics from "Weak Architecture". The essays were written in the late 1980s and early 1990s and need to be viewed within the context of architecture's struggle with and rejection of postmodernism. Although, as I will argue, Morales arrives at misguided conclusions, his analysis does engage with the architectural implications of Weak Ontology in a thoughtful manner. This chapter outlines the argument and conclusions found within *Differences*, while attempting to place it within its historical epoch. I then posit alternate conclusions based on a contemporary rereading of Morales's analysis. The alternate conclusion is expressed through analysis of the recent work of Alvaro Siza, Tadao Ando, and Frank Gehry, the few architects Morales names as producing examples of weak architecture (Solà-Morales, 1996[1991]).

Weakening Architecture

In his essay "Weak Architecture" Solà-Morales explicitly asks how architecture fits into the philosophy of Gianni Vattimo. He achieves this comparison primarily by reviewing the subject through aesthetic analysis. In the opening paragraph of the essay Morales states:

"It seems to me that what really lies behind the propositions of weak philosophy is an interpretation of our contemporary culture's international aesthetic situation. It is this subtext that leads to the question: What role is accorded to architecture in the aesthetic system of contemporary weak thought?" (Solà-Morales, 1996 [1987], p. 57)

Solà-Morales shifts away from Vattimo's concerns for hermeneutics to questions of aesthetics as an attempt to solidify the discussion of weakness within the confines of our experience with real things (art and architectural objects). Solà-Morales has a specific concept of aesthetics which involves a loosening of the rigidity of modern aesthetics:

"(Aesthetics) can no longer be founded on the basis of a system: not on a closed, economical system such as that of the classical age; not even on the *ilusión*[1] of a new system such as that which the pioneers of modern design sought to establish.

On the contrary, contemporary architecture, in conjunction with the other arts, is confronted with the need to build on air, to build within the void."(de Sola-Morales, 1996 [1987], p. 59)

It is this aesthetics without a system that for Solà-Morales:

"constitutes, in some sense, the most solid, the strongest model of – paradoxically, indeed – a weak construction of the true or the real, and thus assumes a privileged position within the system of references and values of contemporary culture." (Solà-Morales, 1996 [1987], p. 60).

It is the privileged view of aesthetics as a pathway to truth that I argue leads Solà-Morales to some problematic conclusions by allowing him to reject the importance of context and degrade the plurality needed for comparative positioning.

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1   The Spanish word *ilusión* is maintained within the translation as it indicates the English word *illusion* with the addition of a blind hopeful belief. So *ilusión* indicates a combination of hope and delusion.

The Need for Comparison

The essay "Weak Architecture" continues by tracing, and discrediting, two opposing reactions to the weak contemporary condition. The first reaction is one of modernist fundamentalism; a fervent revisiting of early modernist form in a manner that exaggerates the minimal, stark, and functional beyond that of the initial movement itself. This architecture is typified by the work of Richard Meier and is viewed by Solà-Morales as a call "for an established line of orthodoxy and correctness to counter the diversion and diversification of the time." (Solà-Morales, 1996 [1987], p. 62) Solà-Morales discredits the reaction as a romanticization of history, and as a denial of present conditions. The second reaction described in *Weak Architecture* is devoted entirely to Kenneth Frampton's essay "Toward a Critical Regionalism: Six Points for an Architecture of Resistance" (Frampton, 1983), which Solà-Morales presents in a somewhat positive light as a reaction to fundamentalism. This optimistic analysis is limited to the critical front end of Frampton's essay which he views as a positive resistant repositioning of architectural

assumptions. This is contrasted with a scathing analysis and dismissal of Frampton's simplified reading of Heidegger's essay "Building Dwelling Thinking" which leads him to promote regionalism:

> "What in Heidegger is a tremulous verification of the disappearance of an already endangered world becomes, in Frampton and in other theoreticians of contemporary architecture, a phenomenological ingenuous restoration that reveals little or no sense of the contemporary crisis." (de Sola-Morales, 1996 [1987], p. 65)

In many ways Solà-Morales's critique of Critical Regionalism is unfair to Frampton's intention as it separates the aspects of Criticality and Regionalism into discrete ideas. For Frampton the strength of Critical Regionalism was produced specifically from the interactions and contradictions inherent within the pairing. Although Frampton's essay must be read in the context of its time, Solà-Morales misses its important engagement with the comparative position. As explained in Chapter 1, a comparative position allows for a flexible framework of understanding our

plural and incomplete experience within architecture. By dismissing Frampton's call to connect architecture to time and place, Solà-Morales strips architecture of any chance of a conceptual grounding, as unstable and fractured as that grounding may be.

It is important to place Solà-Morales's critique of both neo-modernism and Critical Regionalism on a time-line between the 1982 *Parc de la Villette* competition, by Bernard Tschumi and Jacques Derrida, and the 1988 MoMA exhibition *Deconstructivist Architecture*, by Philip Johnson and Mark Wigley. Solà-Morales is writing at a time when Deconstructivism is gaining traction within the architectural community, a movement that engages with the philosophical peers of Gianni Vattimo. What becomes important is Solà-Morales's obviously purposeful and thoughtful avoidance of Deconstructivism as a style. By engaging with the philosophy of Vattimo and others, not as a generator of style but as a way of understanding human relationships to architecture, his writing has aged somewhat better. Although the specific examples provided in "Weak Architecture" are bound within the context of the late 1980s, they are representative of

general architectural reactions to our *weak* conditions. Solà-Morales's specific critique can be generalized into critiques of three contemporary architectural conditions: green fundamentalism, traditionalism, and hyper-criticality.

Contemporary fundamentalism is visible within the extreme ends of "green" or "sustainable" architecture movements, particularly concerning uncritical engagements with bio-mimicry and simulation. The goal and execution of sustainable architecture is needed within the current environmental crisis. However, the setting of performative parameters, creating the illusion of an objective right answer, disregards the plurality of appropriate responses. This is evident in the chronic underperformance of LEED certified buildings, which often perform, by their own standards, much worse than older buildings (Navarro, 2009). This contemporary environmental fundamentalism is certainly distinct from the modernist fundamentalism presented by Solà-Morales; however, both share the ambition to uncover foundational truths and unequivocal design at the expense of observing what is happening when the buildings are placed within the complexity of the real

world.

The second contemporary architectural reaction to the plurality of our time is a traditionalist, fervent concern for phenomenological experience, place, and history, at the expense of other architectural concerns. This traditionalism is grounded in a "blood and soil" reading of Heidegger, particularly "Building Dwelling Thinking". This traditionalism is exemplified by the work and writing of Juhani Pallasmaa and Peter Zumthor amongst others. The thinking behind this work is problematic because it is built on assumptions of a singular version of time and place and ignores the presence of variation.

A contemporary architectural moment presenting itself as the ideological opposite of fundamentalist green architecture is the hyper-critical, academically grounded work of some contemporary architects, such as Peter Eisenman. The work of these theorists is based on a constant questioning, layering, and deconstruction of information. Although the theoretical underpinning of this work was carried out through the 1980s and 1990s, it is only recently that built architectural works have been produced and experienced spatially. The layering

and fragmentation of form and information questions any meaningful engagement between architecture and body. This work is concerned with the narrative of complexity instead of experienced complexity.

Each of these contemporary architectural influences presents problems because they try to create a single narrative at the expense of other equally appropriate narratives.

Event, Fold, Decoration, Monument

The essay collection *Differences* proposes the existence of a group of architects who are not creating architecture of a single narrative, but instead are producing an architecture that responds to the plurality from our existence; a *weak architecture*. Solà-Morales describes this not as a single movement "but as an attempt to detect in apparently quite diverse situations a constant that seems to uniquely illuminate the present juncture."(Solà-Morales, 1996 [1987], p. 58) Solà-Morales specifies four characteristics or engagements that his *weak architecture* must contain or confront. They are: the event, the fold, the decorative, and the

monumental.

For Solà-Morales, the event deals explicitly with notions of time, or times, in a layered and plural way similar to that of Weak Ontology. Solà-Morales, referencing James Joyce, argues that art and literature throughout the modern period conceived of plural time, but that architecture of the same period remained grounded in notions of a singular linear time divorced from interpretation. By focusing on a "diversity of times", or events where "temporality does not present itself as a system but as an aleatory instant that, responding to above all chance, is produced in an unforeseeable place and moment" (Solà-Morales 1996 [1987], p. 68), Solà-Morales emphasizes the moment over its history, and problematically separates it from its incomplete and subjective place in time.

The least developed of Solà-Morales characteristics, the fold, referencing Gilles Deleuze, refers to an intertwining of the ontic and ontological where:

"Reality emerges as a continuum in which the time of the subject and the time of external objects go round together on the same looped tape, with the encounter of objective and subjective only occurring when this continuous reality folds over in the disruption of its own continuity." (Solà-Moraless, 1996 [1987], p. 69)

Decorative is the most architectural characteristics of Solà-Morales's weak architecture. It refers to the need for form to act beyond purely functional ambitions and allow for differences of interpretation and engagement. Solà-Morales speaks of the decorative "not in the sense of vulgarity, of triviality, of the repetition of established stereotypes, but as a discreet folding back to a perhaps secondary function". (de Sola-Morales, 1996 [1987], p. 70).

Solà-Morales's use of the word monumental is misleading and really refers to the lasting impact of architecture on memory. The recollection of architecture after it has been experienced and the accumulative effect that it has on the experience of architecture.

What is Weak Architecture?

Solà-Morales's architectural recommendations are poignant in themselves but together reveal a problem with his analysis of weak ontology. Where Solà-Morales sees Weak Ontology as a symptom of our contemporary time, Vattimo presents it as a *Metaphilosophy* which is an analysis of a timeless human condition, that of our plural and incomplete relationship with truth (D'Agostini, 2010). The fundamental difference is that the global contemporary condition for Vattimo reveals an existing condition and for Solà-Morales is the cause of that condition. The philosophy of Weak Ontology demands a renegotiation of our relationship to time, history, and location given their plurality and incompleteness, but also and most importantly, the unavoidability of this situation. Solà-Morales, understanding the problem as confined to the contemporary epoch, presents the solution of abandonment. His idealized *weak architecture* response to the contemporary lack of grounding through pure individuality and creativity, with no reflection or reference:

"Each (work) is an independent experiment, perfectly separable from the others. These are largely self-defining designs. They obey no context. They do not imitate tradition. If they refer to the local culture, they do so as absence, as void, as the cancellation of every affirmation. They are artefacts that we must experience psychosomatically in their reality. They are not served up to us through representation, or even through visual appearance. The event occurs at a point, in an instant. There is no sense in explaining them in terms of the before or the after."(de Sola-Morales, 1996[1991], p. 89)

The essay makes a number of analytical errors leading to this faulty conclusion. Solà-Morales disregards Vattimo's emphasis on the impact of time, history, and location on interpretation. Solà-Morales instead focuses on the aesthetic moment, the affect of architectural experience. The importance of the architectural moment should not be underrated. However, each moment is most important in comparison to other moments and Solà-Morales neglects to fit them into the complexity of moving time. The essay also assumes the need for an architecture that is itself *weak*, instead of developing an

appropriate response for architecture given the context of a weak ontological condition. Architecture must operate within weakness, not necessarily be weak itself.

Maintaining Solà-Morales's fou characteristics I would like to present a fifth, which relates to each and changes their position only slightly. This slight shift is important as it refocuses the discussion within a comparative context. It is that of an aleatoric impressionability. The intent is to recognize an uncertainty what is brought to a work of architecture over time. I do not intend this to mean new furniture or paint, although these can play a role. What is being referenced is the unintended, or uncontrolled, addition of both physical and mental contingent properties; an accumulation of physical and mental stuff. These properties are as variable as memory, mood, weather, or season. These properties imprint impressions onto the building that are not always permanent, or even shared, but are entangled within Vattimo's hermeneutics and difference, and therefore within the slippery reality of time and location. It is also important to note that the constructed architecture's physicality changes at a much different pace than the variation of its impressions.

The clump of constructed matter that is a building is absolute in its objective form and is weakened only with the inclusion of a human to experience it within a time and place. Architecture is constantly searching for a link between the ephemeral reality of architectural experience and the technical necessity of its execution. So what is necessary is not the development of a weak architectural style, but a realization that all architecture is weak; and then the development of a strategy for celebrating its necessary weakness.

Material and Immaterial Weakness

It is evident that the entirety of the body's relationship with the environment can be understood through interpretation. That is to say, we understand our surroundings through our senses, and the cognitive analysis thereof. Analysis of our interpretive understanding of our surroundings can go a long way to revealing the body/architecture relationship. However it is also important to understand that there is an aspect of *affect* within this relationship.

The anthropologist Clyde Kluckhohn is paraphrased

as saying, "each person is simultaneously like some other people, like all other people, and like no other people (Monaghan & Just, 2000)." This is no doubt true of our experience of our surroundings. There are universal, shared, and individual interactions with the built environment. Our experience of architecture is a multifaceted affair that is deeply entangled with our senses, our memories, our mood, and our physiology. *Affect* is concerned with that which is universal, however variable the *effects* it causes may be. Once we have dismissed architecture of a single narrative as a possibility the need to utilize affect to scratch at universality becomes important. Affect provide a focal point upon which interpretation can be built.

Spinoza initially developed the term *affect*, which has been further developed, in the contemporary context, by Deleuze and Guattari. The definition is elusive, and somewhat varying between users. However, it is fundamentally ubiquitous in its experience and automatic in its effect. Simon O'Sullivan states that:

"There is no denying, or deferring, affects. They are what make up life, and art . . . Affects are the

stuff that goes on beneath, beyond, even parallel to signification. But what can one say about affects? Indeed, what needs to be said about them? . . . You cannot read affects, you can only experience them." (O'Sullivan, 2001)

Thrift, in a similar manner, defines affect as the "sense of push in the world" (Thrift, 2004) and aligns it with particular emotions such as distress, anger, or enjoyment.

Affect's relationship to architecture is the antithesis of a hermeneutic understanding. It is not cognitive, but embodied and immediate. Farshid Moussavi, in her book *The Function of Ornament*, argues for the use of affect in architecture to overcome the communicative problems inherent when operating in a multicultural society. She states that buildings constructed with affect in mind:

"do not remain as pure acts of consumption, but rather are disassembled and reassembled to produce new sensations that remain open to new forms of experience. It is in this way that they are contemporary and committed to progress. Operating through direct sensation, they bypass the need for the codification of language and are

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Figure 4: Weisman Art Museum, Minneapolis, Frank Gehry, 1993

able to shift across space and time." (Moussavi & Kubo, 2006)

Affect and hermeneutics, or bodily reaction and our interpretation, are no doubt inseparable within our momentary architectural experience. Within the complexity of how we experience the world interpretation and affects are constantly trading signals.

Reevaluating Weak Architects

In his 1991 essay "From Autonomy to Untimeliness" Solà-Morales names Alvaro Siza, Tadao Ando, and Frank Gehry as creators of weak architecture. He finds "in all three the full and eloquent resonance of the condition of contemporary culture" because they "obey no context" (Solà-Morales, 1996[1991], p. 88). I paradoxically agree with Solà-Morales's selection of architects, particularly in light of their contemporary work. However, I disagree with his reasons for selecting them. What makes these architects relevant to a discussion of *weak architecture* is not their disengagement from context, what Solà-Morales praises as "self-defining designs" (1996[1991]),

but their engagement with the subjective, cumulative, and often contradictory aspect of context.

Ando's 2009 Punta Della Dogana Museum in Venice Italy is an example of a project that is deeply rooted within the historical context of its location (Figure 3). Seeing Ando's signature style nested into the historically dense site emphasized its contextual sensitivity. The new aspects of the renovation do not try to directly reference the history of the site but instead it has a dialogue with it. The renovation sits comfortably, both physically and emotionally, within its deeply historical context because of its difference. This is not a difference of denial; it is difference of comparison. Ando subtly brings his own context of intermingled modern and Japanese aesthetics to the aging Venetian storehouse. However, he does not impose his design will, he places it in juxtaposition to the existing building. The texture provided by the age of the site project its meaning onto the crisp concrete walls of the renovation.

Frank Gehry's shining and twisted Weisman Art Museum, in Minneapolis, is an example of his signature style which varies only slightly from project to project (Figure 4). Gehry's heavy handed use of an identifiable
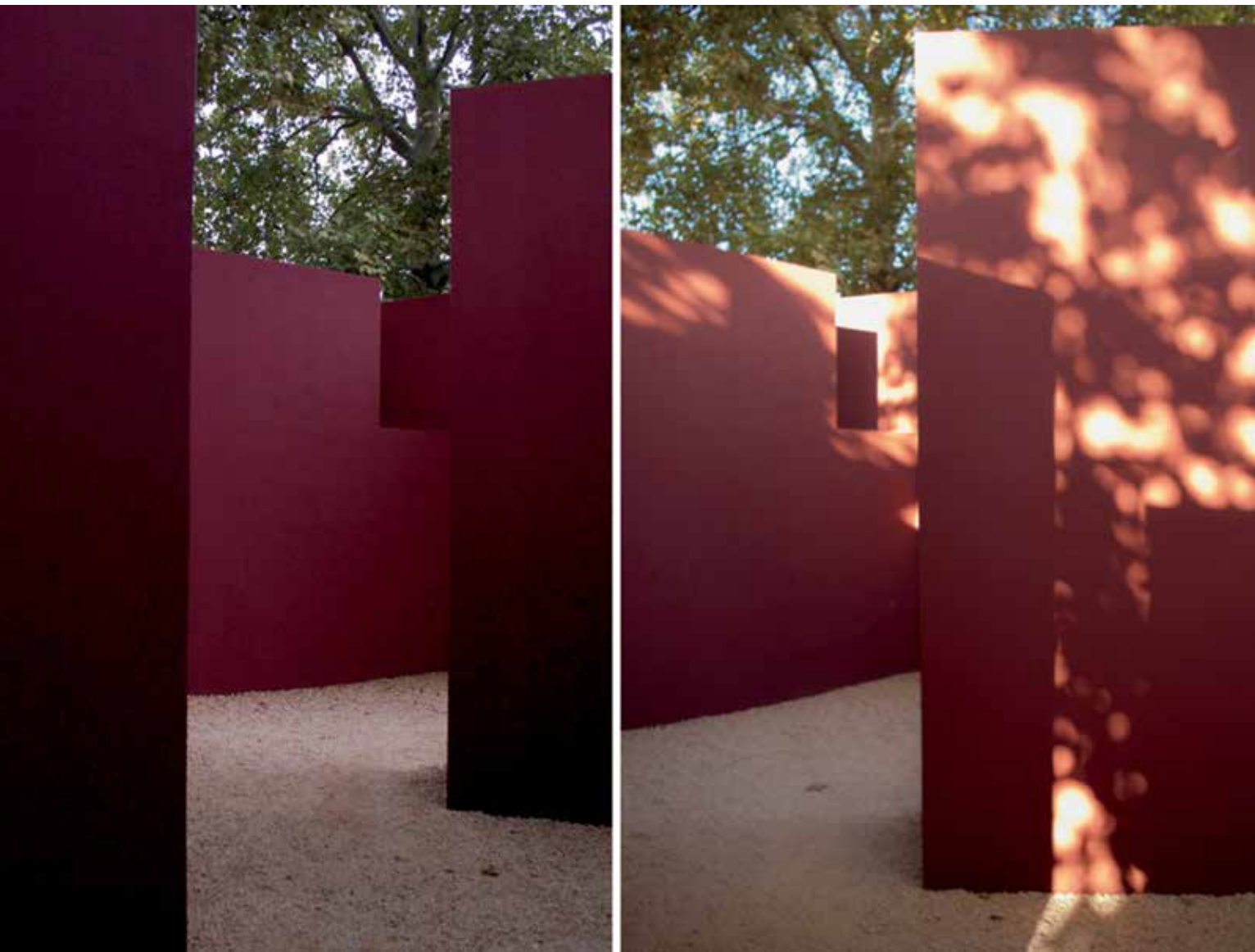
Figure 5: Installation Venice Architecture Biennale, Venice, Alvaro Siza, 2012

look seems to support Solà-Morales's notion of an architecture separate from its context. However, when analyzing Gehry's work it is important to start by looking at how his projects differ from one another. The bold metal forms are situated in relation to their site. Most of the exterior form of the Weisman Art Museum is of standard rectilinear tectonics. However, this completely changes at the end of the building near the river. At this point the facade explodes into shards of twisted and shining metal. The dramatic effect of this transition is as much emphasized by the reflections present within the facade as the form of the facade itself. Gehry's buildings, with the exception of some early work, do not reference site or history; but this does not mean they do not engage it. His sculptural buildings, through their distinctiveness and reflectivity, chop up and reconfigure the image of site, forcing people to look at their surrounding anew.

Alvaro Siza's relationship to site and context is notably different from either Ando or Gehry. Ando's and Gehry's architectural projects draw on the specifics of their sites while recognizing the plurality of the context, al of Siza's projects bring the context of Portugal with them. A Siza project is a bubble of Mediterranean conditions transposed onto another site. This is evident in his installation for the 2012 Venice Architecture Biennale (Figure 5). The project feels lifeless until the bright sun paints complex shadows onto its walls. The fact that clear sunlight is much less common in Venice than Portugal drastically changes the impact of the architecture. The project does not impose itself onto the site but instead the structure sits dormant waiting to fulfill its potential. Siza's projects embrace weakness by having a strong reference to another place that is fit into and alongside its physical context. They act as another quiet voice in the complexity of context.

PART 2:

THE WEAK TECTONICS OF LIGHT

"Light is more than just a medium; it evokes agency. Acknowledging that light, like sound, has a material dimension raises questions concerning the materiality and sociality of light." (Bille & Sorensen, 2007, p. 266)

Figure 6: 7: 8: Couvent Sainte-Marie de la Tourette, Eveux, France, Le Corbusier, 1956. Photographs - Hélène Binet, 2007

CHAPTER 3: ADDITIVE MATERIALITY

Lights Ubiquity

Light is not a material; it is a small spectrum of electromagnetic radiation acting simultaneously like a wave and a massless particle. It is unique and contradictory; experientially ubiquitous and conceptually enigmatic. We largely ignore light within our daily lives while depending on it for almost every aspect of our existence. Light acts physically on our bodies, passing into our eyes to provide visual perception. It sets our circadian rhythm, processes vitamin D, impacts mood, and encourages uncontrolled cellular growth causing skin cancer. It is suspected to contribute to countless other health issues, both positive and negative (Clegg, 2008). The energy from the sun powers the weather and fuels vegetation growth. In fact, "all life depends on sunlight; our technological lives are literally fuelled by its primeval distillation."(Robinson, 2011, p. 87)

Light plays many roles within our body and our environment and as a result there are many ways to understand it. The phenomenological experience of light is primarily of a passive medium, which occasionally steps out of its aloof presence to caress our body with warmth, sometimes pushing too hard and burning our skin. Many religions have worshiped light through celebration and fear, entangling its presence with existential metaphors. Science weaves its own story of light, one of immense speed, energy, and a counter intuitive relationship with time. This chapter seeks to establish one understanding of light; its tectonic relationship to architecture. After arguing that light is a tectonic element within architecture I will present two strategies for its tectonic use: that of an additive materiality, and that of graphic spectacle. The two strategies will be explored through comparative investigations of the Ryerson Image Arts Building by Diamond Schmitt Architects and St John's Abbey by Marcel Breuer.
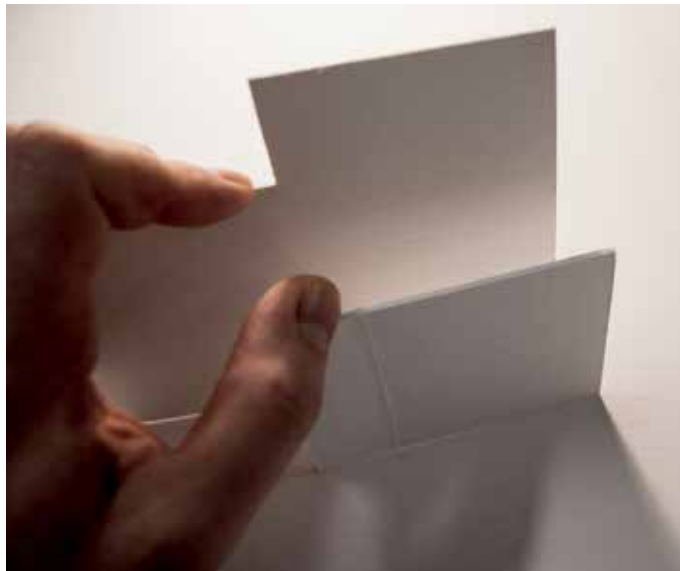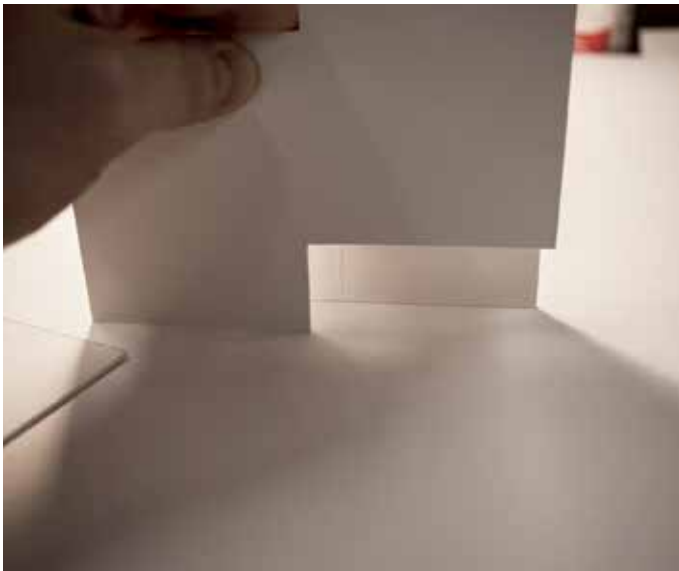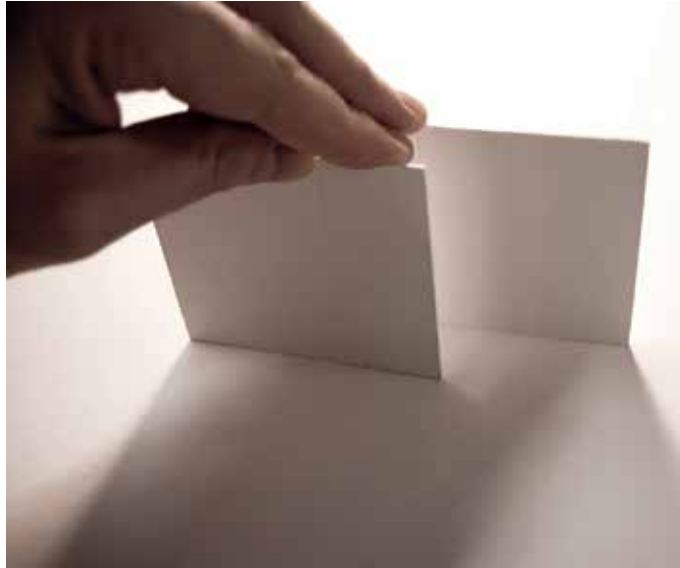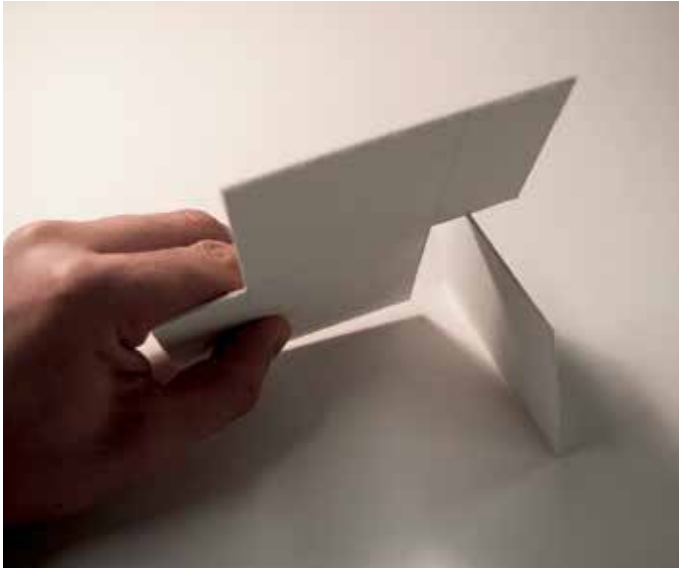
Figure 9: 10 :11: 12 Surface Shadow studies.

In his book *The Ecological Approach to Visual Perception* James Gibson divides our perceptual environment into three experiential categories: *medium, substance, and surfaces* (Gibson, 1979). *Substance* consists of the solid and semisolid materials through which we cannot pass. *Surface* is the very outer edge of *substance*, it is an infinitely thin conceptual fabric between *substance* and *medium* and is the only way our bodies experience the *substance* of the world. *Medium* consists of all the space that engulfs our bodies. It is the matter that supports the movement of life and our perception of surfaces. We cannot fill our lungs with nothingness; we breathe in the matter of air and strip it of its oxygen. Gibson's *medium* is the substance that allows the transmission of light onto surfaces that define our visual reading of the material world. *Medium* defines the material between architecture that light and shadow adopt as their own but opt to only reveal themselves when they interact with *surface*. This simplified definition of our environment demonstrates that light exhibits characteristics of materiality only when interacting with matter, or material. The act of light's *revealing* is a material one.

The idea of materiality can be understood as the *quality* that each material exhibits within its state of being material. While light is not in a material state itself, it contributes its own *qualities* when interacting with material objects. This is expressed within Peter Zumthor's more general statement:

> "Take a stone: you can saw it, grind it, drill into it, split it, polish it. It will become a different thing each time…. Then hold it up to the light – different again. There are a thousand different possibilities in one material alone." (Zumthor & Oberli-Turner, 1998, p. 102)

Light's materiality is to contribute possibilities through the impression of it distinct qualities. Stone, or any other architectural material, does not need anything other than itself to be material. The possibilities, or hermeneutic interpretations, can change but not the matter. Light's materiality is the antithesis of stone; its materiality can only be experienced through its interaction with other materials.

Through the eyes light is claimed as a material extension of the body opening the medium to our

Figure 13: Venice Architecture Biennale Installation, Mario Nanni, Venice, 2012

perception. Light reaches out through space to touch the surfaces of our surroundings, while almost simultaneously touching the rods and cones of the eyes, allowing a haptic reading before bodily contact. As Merleau-Ponty states, "to see is to have at a distance" (Merleau-Ponty, 1964). This is only half true; to see is to have light that has touched the distant. In this way we are able to touch the distant, but our vision is given only what light is willing to share.

The Tectonics of Light

Mario Nanni has developed eight rules that guide his architectural lighting practice. (Nanni, 2012) Four of Nanni's rules engage directly with light's materiality; they include: *The Thickness of Light, Tribute to Shadow, Light in Motion,* and most directly *Light as a Building Material*. Each of these rules relates to the complex material relationship that light has with architecture. The *Thickness of Light* refers to the way light fills the in-between, Gibson's *medium*, and manipulates the perception of depth and form. This presents light as a manipulator of our understanding of space. *Tribute to Shadow* celebrates the *strength* that comes from the shifting gradient between light and dark. Nanni argues that one should not "design light itself as much as the shadows cast by the objects it touches" (Nanni, 2012, p. 6). *Light in Motion* refers to both the natural movement of light through cycles, such as day and night, as well as the "poetry" created in the transformation of space by constant alterations to depth, colour, and clarity caused by shifting light. Nanni states:

"Light follows a tempo that goes from dawn to dusk, capturing architectural, symbolic, narrative and descriptive aspects linked to the city and its protagonists. Light in motion becomes story and poetry.... light modulates, transforming the surfaces it touches and altering the boundaries and depths of the façade itself."(Nanni, 2012, p. 11)

By introducing the problem of time Nanni confronts light's most interesting material quality, its ability to be totally ubiquitous and simultaneously in constant motion. Light has a dynamic materiality that can be understood as weak in its temporal uncertainty and

perceptual engagement. *Light as a Building Material* argues that "too often lighting is a post-construction consideration: it corrects, emphasizes and disguises what has already taken shape. But light, that which you cannot see yet perceive, is an integral part of the architecture it rests upon. So it is essential to build with light." (Nanni, 2012, p. 11)

Light's material relationship with architecture can be understood as weak in the same way that Gianni Vattimo's ontology is weak; it relies on perceptual interpretation (hermeneutics of sorts) and difference (its reliance on interaction to be revealed). Light can then be understood as a weak material within the tectonics of architecture. Light's dynamic and temporal nature is one of the elements that brings both uncertainty and recurrence to the constructed reality of architecture. What the weak material nature of light reveals is not the weakness of architecture itself, but the ontological weakness of the world within which architecture must reside. Light reveals architecture to be impressionable to the contingencies of context.

Engaging Light

A comparison of Marcel Breuer's 1961 St John's Abbey in Collegeville, Minnesota, (figure 14) with the Diamond Schmitt Architects Ryerson Image Arts Building in Toronto, completed in 2010, (figure 15) reveals two distinct approaches to working with light as a tectonic material. St John's Abbey engages with light's weak material properties while the Image Arts Building asserts its light without compromise. Each of the projects contains a light-based architectural feature; St John's Abbey has a large stained glass window and the Image Arts Building is clad in a programmable LCD façade. Both of these features inhabit the skin of the building, but it is only Breuer's project that engages with both the interior and exterior of the building. Throughout the day the sun shines through the glass, spilling colour into the nave, but at night the feature is reversed with interior lights illuminating the colourful façade from inside. This allows the single feature to transform the entirety of the church in reaction to the cyclical events of day and night. The Image Arts Building by contrast utilizes only the exterior of the façade and can only be activated when

Figure 14: St. John's Abbey, Collegeville
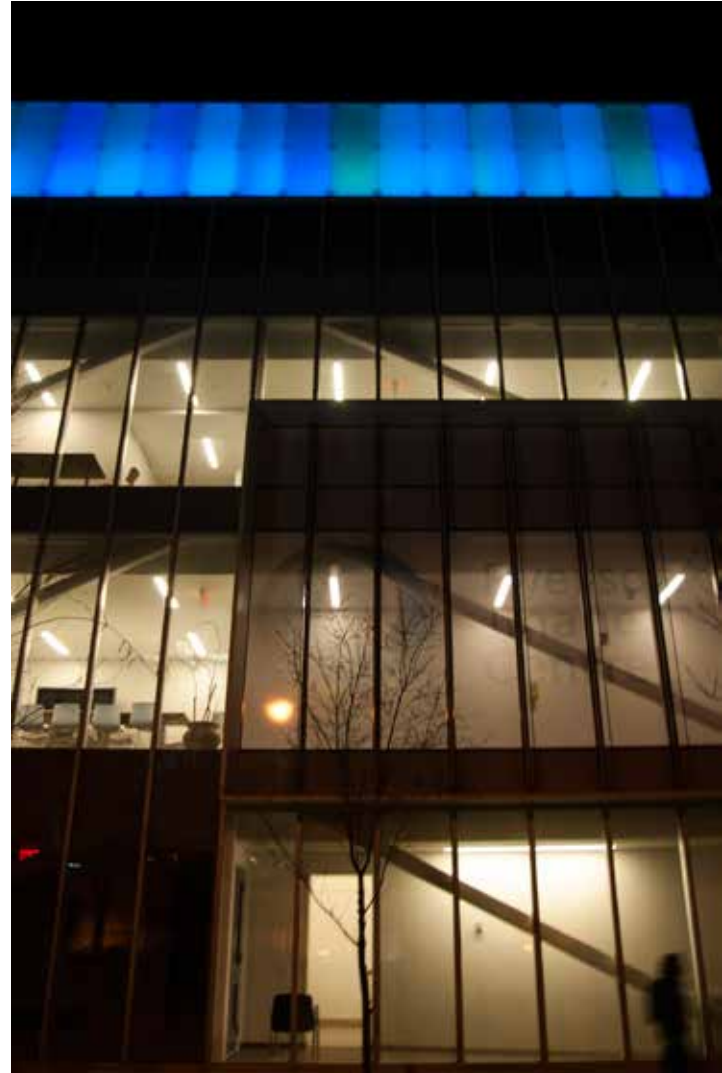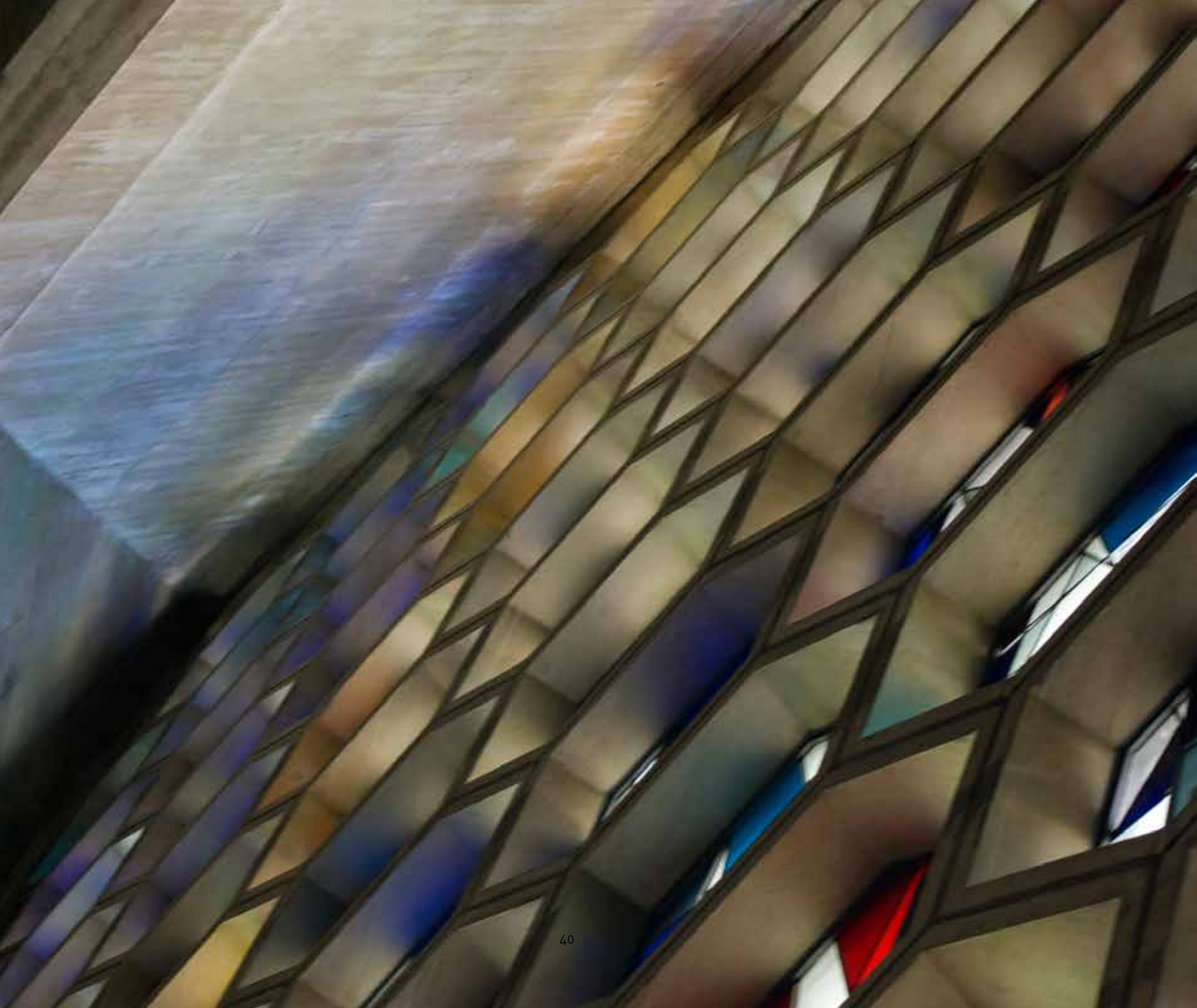Minnesota, Marcel Breuer, 1961

Figure 15: Ryerson Image Arts Building, Toronto Ontario, Diamond
Schmitt Architects, 2012

it is adequately dark. In tectonic terms, light within each project is addressed in an opposite manner. Breuer addresses light as an additive material that is used to enliven the otherwise Brutalist concrete structure (figure 16) The shifting reflected light which slips through the window allows colour to lightly bathe the thick concrete as though it has been soaking it up for years. The church is an instrument for light, manipulating what is already there into something new and spectacular. The façade of the Image Arts Building is equally, if not more, concerned with spectacle. However, it achieves this through disengagement from the remainder of the building's material presence (figure 17). The light facade contains a strong material presence in and of itself. However, it is literally and conceptually pinned onto the rest of the building and is intended to send its own message separate from the remaining architectural form. Its materiality is separate, not additive as it is in the Abbey. The last aspect that distinguishes the two projects' treatment of light is the time frame in which they operate. The Abbey engages with a much slower time scale. Change only occurs through the cycle of the day and the subtle shifts caused by weather. When the Ryerson building façade

is operating it utilizes a much faster time scale as the colour shifts occur as programmed typically every two to ten seconds. Viewing the two projects' differences it becomes clear that St John's Abbey engages with a material dialogue between light and form, while the Image Arts Building reverts to a one-sided statement. The Abbey is influenced by the aleatoric conditions of time and location, whereas the Ryerson building forces its own pace and attempts to sever its relationship to its location.

Figure 16: St. John's Abbey, Collegeville Minnesota, Marcel Breuer, 1961

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Figure 17: Ryerson Image Arts Building, Toronto Ontario, Diamond Schmitt Architects, 2012 The coloured light changes rapidly.
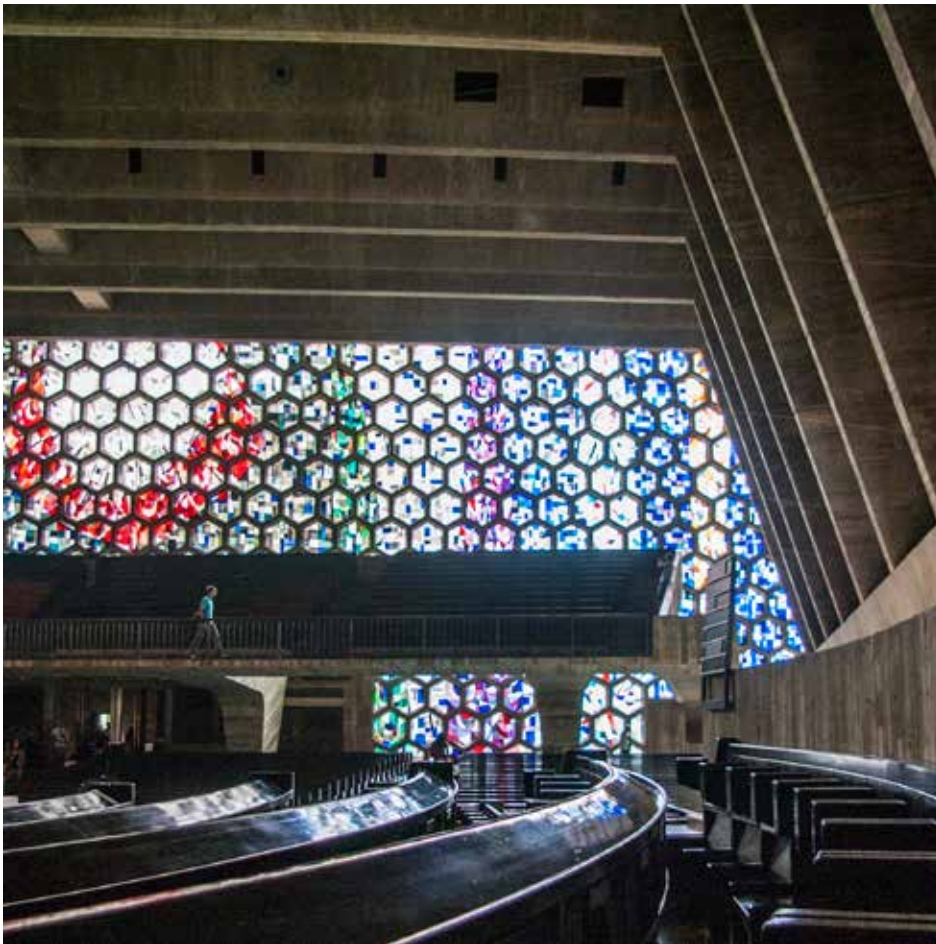
Figure 18: St. John's Abbey, Collegeville
Minnesota, Marcel Breuer, 1961. Interior

Figure 19: St. John's Abbey, Collegeville
Minnesota, Marcel Breuer, 1961. Exterior

"The idea of a monument that I want to bring in here is that which we might find in an architectonic object: for all its being an opening, a window on a more intense reality, at the same time its representation is produced as a vestige, as the tremulous clangor of the bell that reverberates after it has ceased to ring; as that which is constituted as pure residuum, as recollection."

de Sola-Morales, 1996 [1987], p. 71

"Place is not a ground, keeping faith with certain images; nor is it the strength of the topography or of archaeological memory. Place is, rather, a conjectural foundation, a ritual of and in time, capable of fixing a point of particular intensity in the universal chaos of our metropolitan civilization."

de Sola-Morales, 1996 [1992], p. 107

LIGHT, ARCHITECTURE, LOCATION AND DURATION

Time in the Pantheon

In his book *The end of Time* Julian Barbour argues that time is nothing other than the change of physical conditions and is only understood, or created, conceptually through a comparison of differences in those conditions. For Barbour change is not measured in time, but instead duration is measured in change (Barbour, 2001). This presents an interesting parallel to the philosophical use of *difference* and presents a compelling way to understand time within the context of architecture. If for Vattimo and his peers meaning is determined by comparative difference and light is a constantly changing parameter within architecture, then light can be understood to be a major contributing factor to the meaning of architecture through time.

This interrelationship of light, time, and architecture can be understood through a phenomenological analysis of my experience of the Pantheon in Rome, Italy. When I visited the Pantheon it was raining heavily, forcing me to ignore its exterior façade as I darted quickly across *Piazza della Rotonda*. I entered into a space that was overflowing with a feeling of downward pressure, like gravity had suddenly increased exponentially. Rain streamed through the oculus while the clouded sun flickered through individual drops blurring them into a heavy shaft of light which continuously crashed to the floor with its new found weight (figure 20). My body was overpowered by the relentless onslaught of light and water. Eventually the rain subsided and my focus drifted to the rest of the interior. The space had transformed from a submerged cavern into a weightless void that seemed to push lightly against the ephemeral skin of the dome, (figure 21). The diffuse sunlight cast an even gradient of shadow from the opening to the ground, exaggerating the height of the space and softening its materiality. The Pantheon transformed into a total space where an instant before the space had existed only to encapsulate

Figure 20: Pantheon, Rome, Italy, 126 AD.   The sunlight scatters through raindrops.

the shaft of rain and light. As I walked the perimeter of the interior admiring the statues, the clouds passed, allowing the intense sun to shine through the oculus. A disk of light emerged, clinging to the concrete halfway up the dome (figure 22). The intensity of the point of light seemed to darken the rest of the space. The rotunda, which had moments earlier felt like it might slip into the sky, now felt solid and protective. The light from the oculus seemed to reach into the structure to connect it to the heavens. My experience of the Pantheon consisted of three distinct moments bracketed only by changes to the weather conditions.

I was subjected to an incredible variation of powerful experiences during my visit to the Pantheon. Each had its own unique set of bodily affects and interpretive readings. The Pantheon exemplifies how light acts as a dynamic mediating element between person and environment. Light shapes the way we understand and live in architecture by communicating to us the ephemeral (weak) environment architecture must inhabit. Light, and therefore architecture, is never static, it is constantly shifting in direction, intensity, colour, and diffusion. Our understanding of our surroundings shifts in perspective right along with the light.

Each of my experiences at the Pantheon was powerful in its own right, but it was the accumulation of the successive experiences that far surpassed the individual. As my body[1] adjusted to its environment, the conditions shifted forcing me to see and feel the space anew. This is an extreme example of the way we experience our environment at all times: as a series of cyclical, overlapping, expected, and unexpected changes which layer on top of each other to create meaning.

Different Times

Much of architectural practice spends its time either attempting to negate light's dynamic nature through the homogenization of lighting conditions, or to turn it into a spectacle to be experienced as graphic entertainment (see Ryerson Image Arts Centre from chapter 4). A poignant counter experience to that of the Pantheon is the manner in which the Enzo Ferrari Museum, by Future Systems, engages with the temporal nature of

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1 By body I intend a reading of mind and body as a single inseparable entity.

Figure 21: Pantheon, Rome, Italy, 126 AD.   diffuse light causes the space to feel open and light.

light. The museum, constructed in 2012 in Modena, Italy, consists of a flamboyant yellow exterior and a curvilinear muted white interior. The interior is designed to showcase the cars in the best possible light. To do this the interior light is mostly diffuse with a series of point sources distributed from the ceiling. These points of light in a sea of ambient light create reflective points on the cars emphasizing their curvilinear forms (figure 23). The repercussion of this very specific lighting condition becomes a denial of light's variability; the interior space attempts to remain unchanged and thus stand static in time.

In his book *Color, Light, Time,* Steven Holl states that:

"The impermanence of contingency and circumstance are bracketed by architecture's material firmness. In a language of steel, concrete, and glass, architecture is a vessel for events. As a space of multiple durations, it forms the frame of measure for *lived time.*" (Safont-Tria, Holl, & Kwinter, 2012)

Lived time is experienced time; it's subjective and malleable but deeply intertwined with social interaction and event. Light is a major contributor of "impermanence and contingency" within the "firmness" of architecture. This thesis in interested in lights potential has to change our understanding of architecture from moment to moment. It seeks to find how shifting, heterogeneous, and immersive light can create dynamic architectural spaces that can tie people to experiences of duration and open opportunities for shifting use patterns.

Locating Light

The speed of electromagnetic radiation, of which visible light makes up a part, is 299,338 kilometres per second in a vacuum. Other than the fact that this is very fast, the speed seems unremarkable until one asks a further question. What is the speed relative to? It is then revealed this is a constant speed. Within our daily lives speed is always relative. For example, a pilot must keep track of an airplane's wind and air speed, as each is unique to the plane's relationship to that medium. If there is a headwind of 10 kilometres per hour then the land speed will be that much slower than the air speed. This is a simple and intuitive concept based on our bodies'

Figure 22: Pantheon, Rome, Italy, 126 AD. Sunlight through oculus becomes the focus of the interior.

relationship to surrounding objects. As you sit in a chair motionless you perceive yourself to be still because your velocity relative to the ground is zero. However, as the earth orbits the sun your velocity relative to the sun is about half a kilometre per second. All velocity is relative between two objects *except* for the velocity of light, which is constant under all conditions. If you used a flashlight to project a beam of light in a direction, then traveled along that beam at 100,000 kilometers per second one would intuitively think that the light would measure a speed of 199,338 kilometers per second (299,338 − 100,000 = 199,338). This is not the case; the light would measure the full speed of light 299,338km/s. The speed of light is inflexible. It is always relative to the observation of it. This fact is wildly counterintuitive compared to how we experience velocity in every other instance.

By dismissing the relativity of its own velocity, light places the instrument of measurement at the base point of the universe. That is to say, all light defines its speed from that point. Within this model of the universe everything can only be understood from one point at a time, because each configuration of momentary reality is different from every other point. So, in a way, each point of measurement is the center of its own version of truth; or conversely measurable reality within physics is inseparably tied to location.

The human body can be understood as a measuring device through its senses. We are constantly interpreting the world around us, or as Merleau-Ponty would say "the body is our general medium for having a world" (Merleau-Ponty, 1964). The phenomenological view that the body is at the center of our experienced world, which is the only world we can truly know, sits in unexpected alignment with this view of contemporary physics. Both phenomenology and physics tell us that our bodies (devices for measuring the world) are at a unique centre, but simultaneously, that we are not special because each measurement (body) makes its own centre. In his book *The Speed Of Light*, David A. Grandy states:

> "Light speed consistency is a consequence of the fact that upon measuring the speed of light, we are already complicit with light…. what emerges is a thought that in some sense light does not move at all: being indifferent to space and time, it cannot be plotted accordingly". (Grandy, 2009)

Light becomes the one constant in a universe whose relativism seems to have no boundaries and in so doing draws attention to the profound importance of location.

A similar conception of location becomes a central idea in the otherwise distinctive world views of physics, phenomenology, and Vattimo's Weak Ontology. This is not a static, objective location such as those provided by a Cartesian grid, but a fragmented and subjective location based on difference, its relative time and location in relation of other locations and times.

PTA Office and the Scotia Centre

I recently spent two years working in architectural offices in my home town of Yellowknife, NWT. The typical winter workday in a northern environment is a strange thing. I walked to work in the dark, got a glimpse of the sun over the horizon at lunch, and then walked home under the fullness of night. At the peak of winter, the sun is primarily experienced through the envelope of your office wall, and even then heavily aided by artificial light. Over the two years in Yellowknife, I worked at an office designed by Pin/Taylor Architects in 1986 to house their own firm as well as in the Scotia Centre, an eleven-story office tower completed in 1979, designed by Smith Carter Searle and Associates. The two buildings provided very different work environments typifying two polarized attitudes towards light and location.

The Scotia Centre consists of a typical concrete exoskeleton that was used extensively throughout North America at the time it was constructed (Douglas, 2004). The dropped ceilings are low, the windows small but numerous, and the interior partitions solid. My office was a small room with two small tall windows facing west. My office, and the rest of the 10th floor, was illuminated with fluorescent tube lights that provided an even cool light at every time of day and through each season. The light quality within the space was always of medium intensity and diffused almost to the complete elimination of shadows. This evenness contrasted dramatically with the world outside my window. In the winter the window became a black square as my sight was confined to the interior through its comparative illuminated intensity. This absence of exterior was only broken in mid-afternoon when the setting sun shot a beam of low light across the room at eye level. In the

Figure 23: Enzo Ferrari Museum, Enzo, Italy, 2004, Future Systems
Interior.

midst of the cold winter the office did not feel like a protective space defending me from the extremes of the northern environment, it instead was a portal to an interior with no existing exterior. My workday existed within a no-place where light had been eradicated through the complete denial of its absence.

Despite the abundance of sunlight present during a northern summer the fluorescent lights are just as necessary as they are in the winter. The deep floor plates and prevalence of solid interior partitions prevent the natural light from penetrating deeply into the building. The windows are narrow, but tall, starting at approximately waist height and finishing about a foot above my head. This allows the high sun to flood in only a few feet, but with incredible intensity. In the space adjacent to the windows the evenness of the fluorescent lamps is disrupted by glare to such a degree that the space is almost unusable.

The Pin/Taylor Architects office design consists of offset floor plates divided by a light shaft and extensive interior and a relatively high amount of exterior glazing. My office space was located almost at the center of the building but because of the minimal interior partitions and skylights, I received natural light from three sides and above. Working within the office is not a realization of a functionalist flooding of light but instead a constantly transforming interplay of exterior and interior, natural and artificial light. The interior lighting is limited, relying on localized task light when additional illumination is needed. In this way the experience inside the building is heavily influenced by the conditions outside (figure 24). The exterior conditions are intensely variable throughout the year. The office allows the experience of this variability to enter the space, while still protecting inhabitants from its undesirable consequences. In the summer the interior is filled with sunlight, but because of the sunlight's total penetration the eyes are adapted to its intensity and contrast does not become a major issue. In the winter the office reads as a series of protective alcoves created by light and separated by washes of shadows and darkness. The light from workspaces read like multiple hearths protecting you form your surroundings. You are visually exposed to the extreme climate and darkness, but the warmth of the building envelops your body.

Figure 24: Pin/Taylor Architects Office, Yellowknife, NWT, Gino Pin, 1986.

PART 3:
DESIGN EXPERIMENTS

This section of the thesis presents three design experiments which developed from the discussion in the preceding two sections. Each design experiment involves the construction of an object which showcases the material nature of light in a distinct manner corresponding loosely to the chapters in Part 2. The first object constructed was a pinhole camera that rotates to capture a 360 degree view of its location over an extended period of time. The intention was to capture the imperfect and accumulative imprint light has on our perception of the environment. The second object was a tool developed to recreate the sun angles of a given time and location when analyzing physical models. It was created both as a tool to aid in further design, and a physical expression of the quantitative exactness of some aspects of light. The third design experiment involved the creation of a lens which created caustic patterning of light as it washes across a surface. The creation of this lens attempts to overlay the uncertainty of the pinhole camera's extended accumulation with the quantitative predictability of the sun angle tool. The three design experiments each explore a different aspect of light's materiality, and together they start to expose the paradoxical weakness present within light's architectural contribution.

EXPERIMENT 1: CAPTURING UNCERTAIN LIGHT

"To say that I have a visual field is to say that by reason of my position I have access to an opening upon a system of being, visible being, that these are at the disposal of my gaze in virtue of a kind of primordial contract and through a gift for nature, with no effect made on my part; from which it follows that vision is prepersonal." (Merleau-Ponty, 1964, p. 216)

This design experiment started with two interests. First, the temporal nature of experienced vision, and second a disagreement with the idea that vision is prepersonal. Through the movement of the body and eye, vision is constantly in motion. It constructs a mental image of the world around it that consists of more than what is seen at that instant. Through the movement of the body and memory we understand the world *around* us. The light that is feeding our vision is prepersonal but acts on our bodies within the context of change and memory; contingent personal history, collective understanding, and subjective thoughts shape vision itself into something that is very personal.

The project entailed the construction of a camera that could capture a field of vision throughout a series of changes. The camera should look around over a period of time to map, or layer, a temporal image of its surroundings. It was important that the camera be in constant motion as opposed to a series of fixed positions as the speed of movement would greatly influence the outcome. It was also important that unexpected influences were allowed to disturb and imprint the image making process.

The camera consisted of an inner drum of photographic paper around which a pinhole camera rotates. The pinhole image is reflected through a mirror to return it to accurate alignment with its surroundings. The exposure time varies between twenty minutes and one hour over which time the camera is rotated by hand. Each time it rotates a new level of exposure is layered on top of the previous passes. In this way sections of time are accumulated onto the film. The use of a pinhole instead of a lens, and hand rotation instead of a motor, are important because they provide an additional level of uncertainty. The camera is not intended to accurately
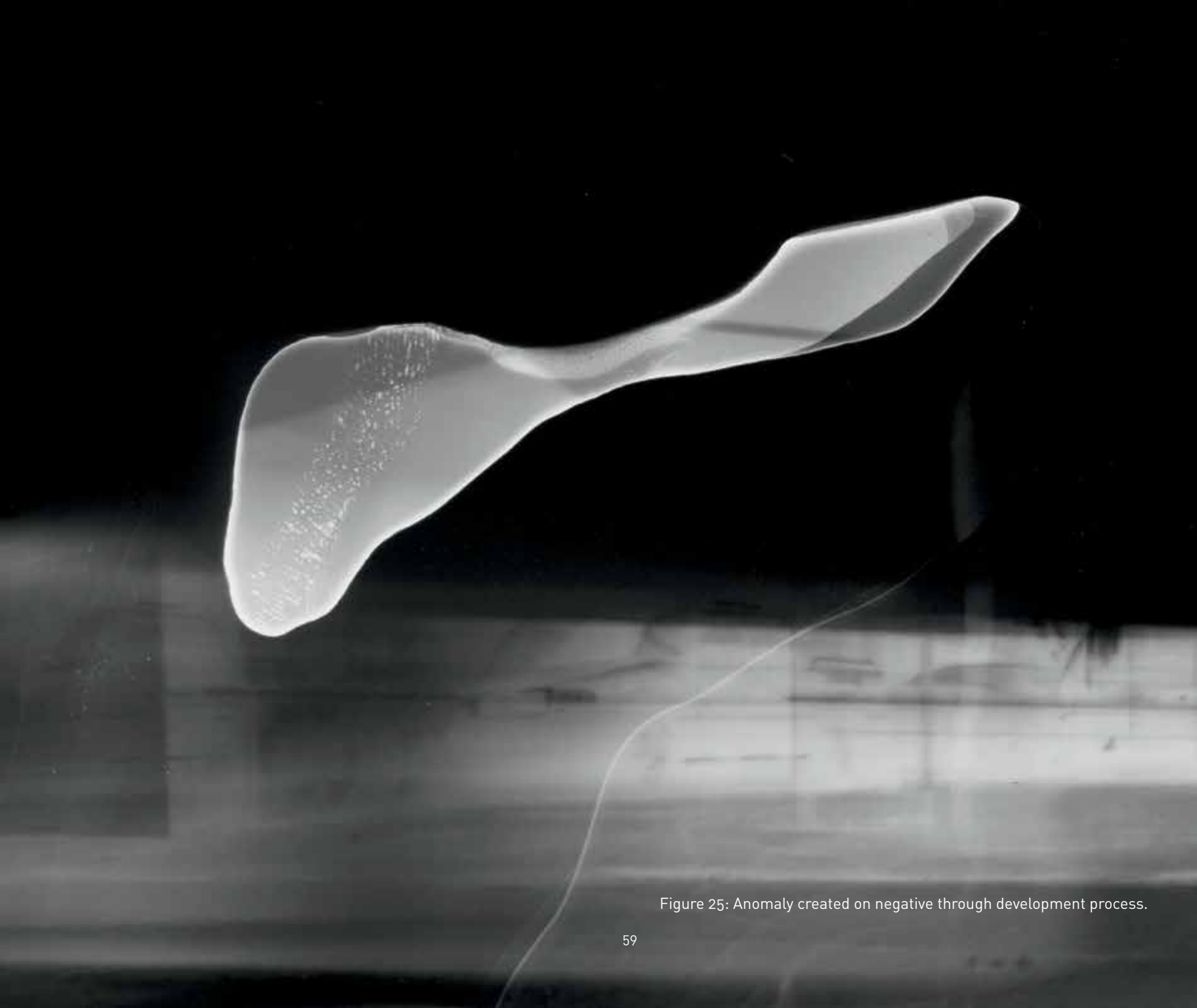
Figure 25: Anomaly created on negative through development process.

record its environment at an instant as most cameras are. It is instead intended to capture a contingent recording of a time period that becomes its own inaccurate memory of the past event. Architecture is experienced as a series of such events, and our understanding of it is a series of such memories.

The camera was used to produce two images (figures 32 and 33). Each image has its own distinct character created by the space, time, and change present within the photographic event. However, it is what they share that is most interesting. Instead of layering images of changing events over time as I had expected, the images instead predominantly edit change out. The Gladstone Library photo was taken when there was heavy foot traffic, and the Gladstone Alley photo was taken in an almost deserted space. Given this it is interesting that the alleyway image seems to be more dynamic and have logged more moments of change. The library image by contrast shows very few signs of temporal recording. This resulted from the few changes that occurred within the alley having the time and space to have an impact on the film. The constant foot and automobile traffic present on Bloor Street blended into an even impact across most of the image causing its own disappearance.

The photographic experiment reveals a truth about our experience of change within the built environment. The impact of change, motion, and all temporal events are relative to the situations around them. When moving through a crowded subway station the writhing mass of bodies blends into a single, almost static, mass. However, the movement of a mouse darting across your floor demands every unit of your perception. Our affect from and reading of change within architecture is also relative to its total situation. The poetic impact of sunlight creeping across a floor is only present if the rest of the room is motionless and silent.
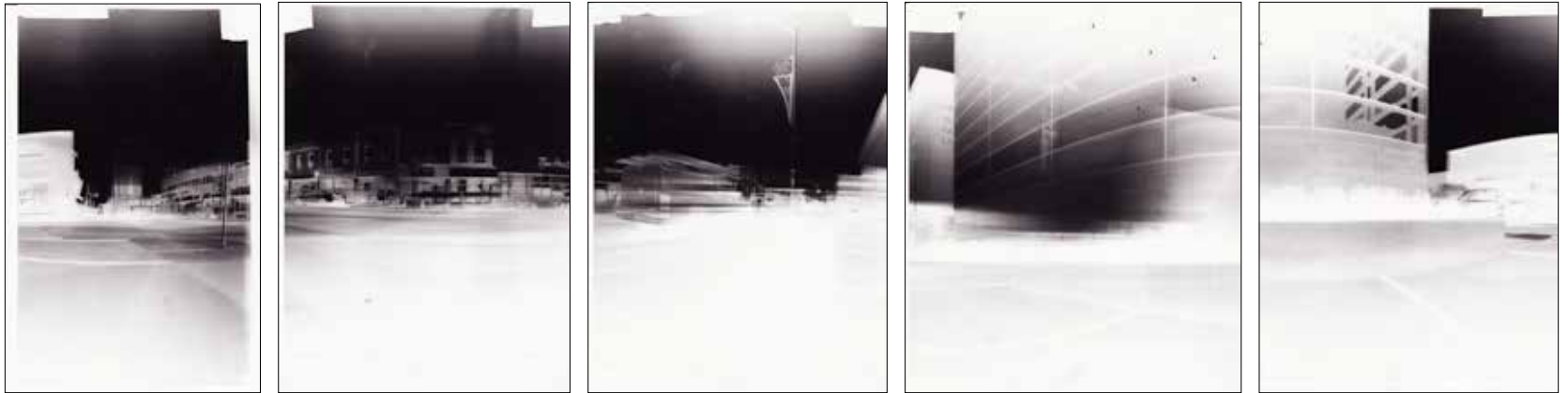
Figure 26: 27: 28: 29:
Camera details

Figure 30: Photographic paper is connected into a loop and becomes the 360 degree negative.

Mirror

Negatives
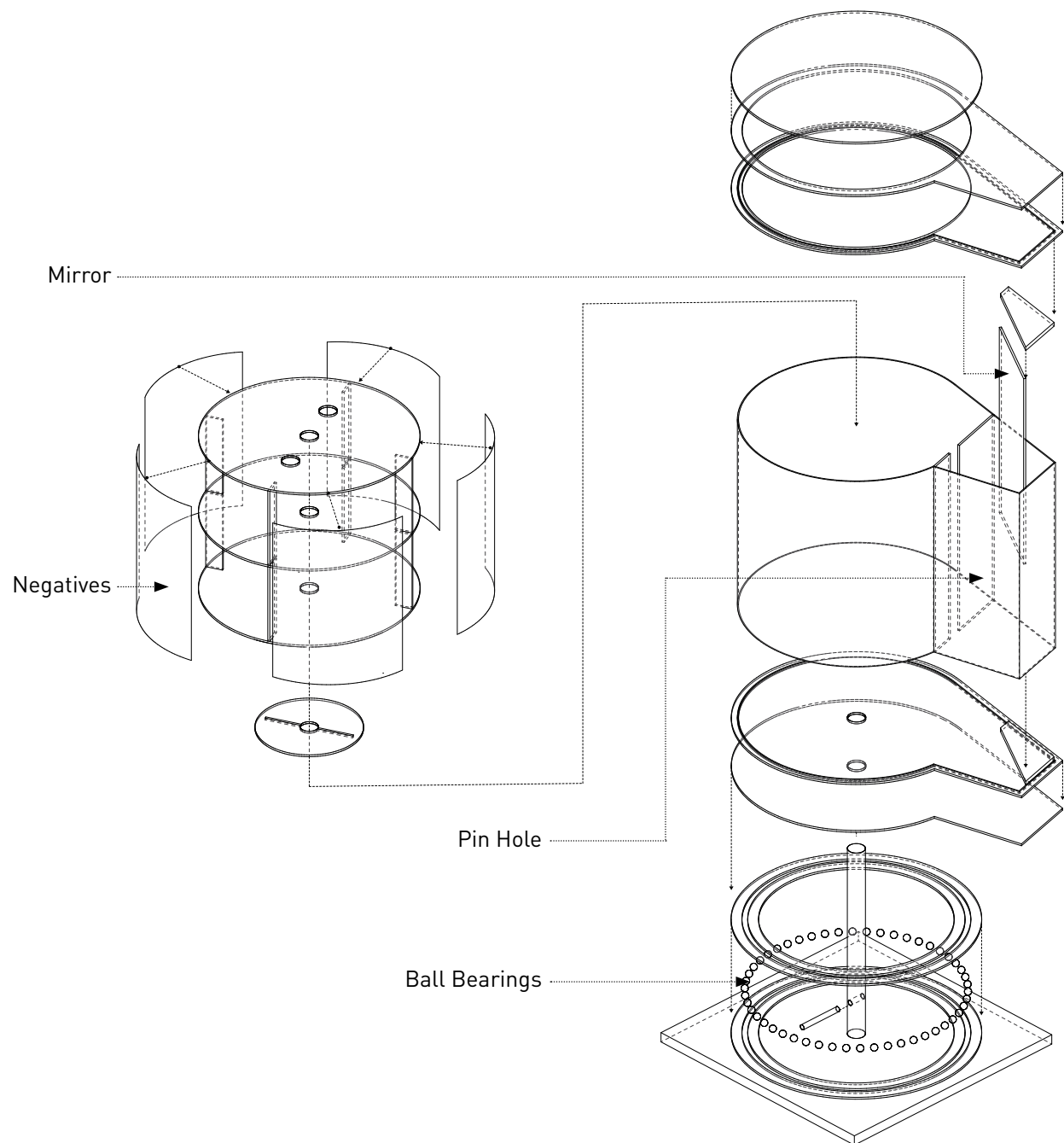
Pin Hole

Ball Bearings

63

Figure 31: Camera assembly
exploded axonometric drawing.

Figure 32: Photograph from *Capturing Uncertain Light* camera. Alley between Gladstone Avenue and Dufferin Avenue, 2012.

Figure 33: Photograph from *Capturing Uncertain Light* camera. Gladstone Library, 2012.

EXPERIMENT 2: SUN ANGLE TOOL

The second design experiment involved the design and construction of a tool for carrying out sun angle studies on physical models. The tool consisted of an adjustable base which rotated on two axes. The set-up is carried out by comparing the sun angles of a given time and location to your current time and location. The difference then determines the setting for each axis of the tool. By placing the model on top of the tool sun studies can be undertaken for any time and location.

The sun angle tool was developed for this thesis with two intentions, one practical and one poetic. First, it was created as a useful tool for the rapid testing of sketch models throughout the design process. In relation to this intention is was only partially successful. The tool works, and does provide valuable feedback on how light will act. However, it is very slow to set up and does not lend itself to multiple readings in one session. As a result the tool became more useful for verification than rapid physical prototyping. Through the design process the sun angle tool was used as a way to physically test the lighting conditions developed through computer simulation.

The second, and less practical, intention was to celebrate light's predictability. Much of the thesis focuses on the variable and contingent nature of light, but this is only half of lights' complicated situation. The cycles of light tied to days and years is fantastically precise and structures our understanding of time.

The action and aesthetic of experiment two is a counterpoint to the uncertainty of experiment one. Together these two objects, the camera and the sun tool, start to reference the dichotomy which is present in light's materiality and architecture more generally. It is the boundary between the measurable and the immaterial that Vattimo successfully blurs with weak ontology.

Figure 34: Sun angle tool. Side view.

Figure 35: Sun angle study. Three moments one hour apart.
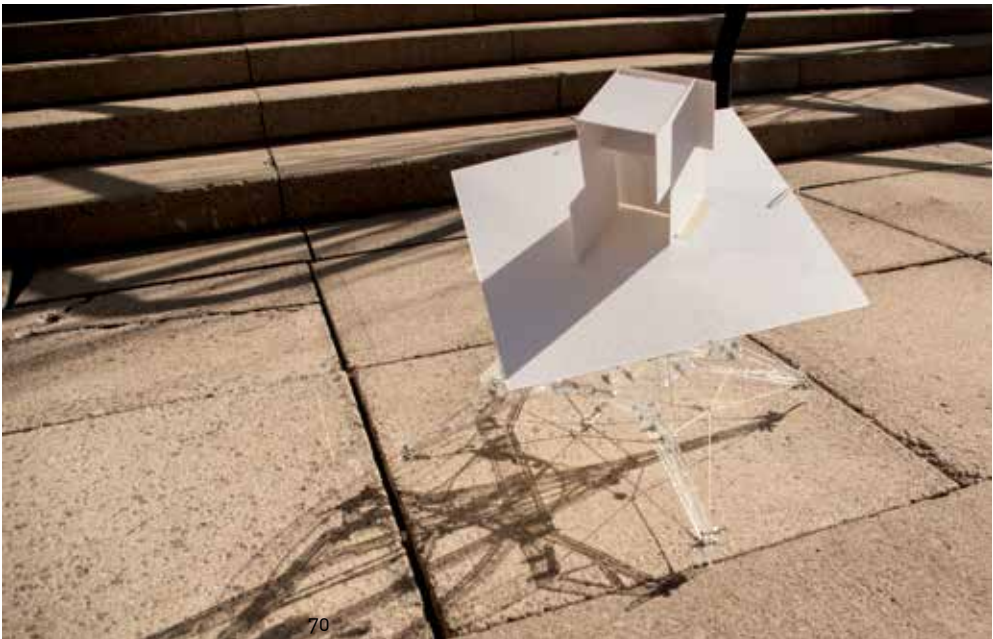

Figure 36: Sun angle study.

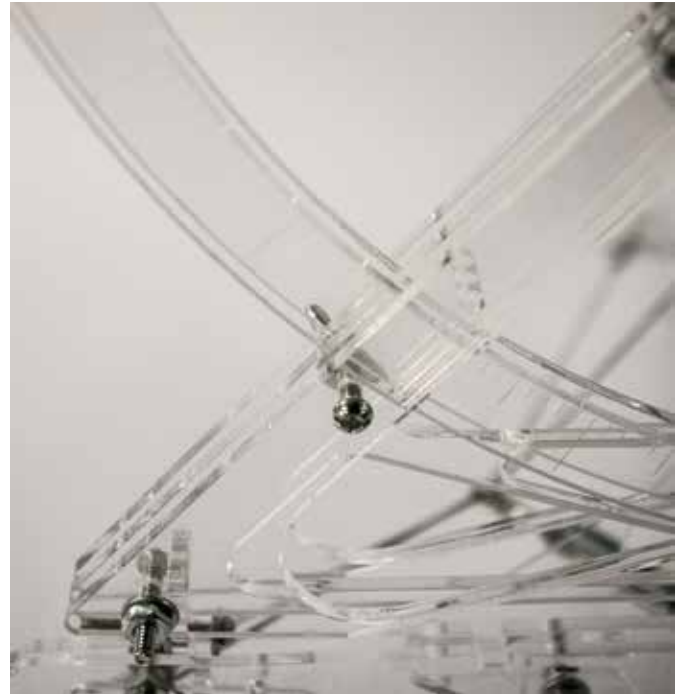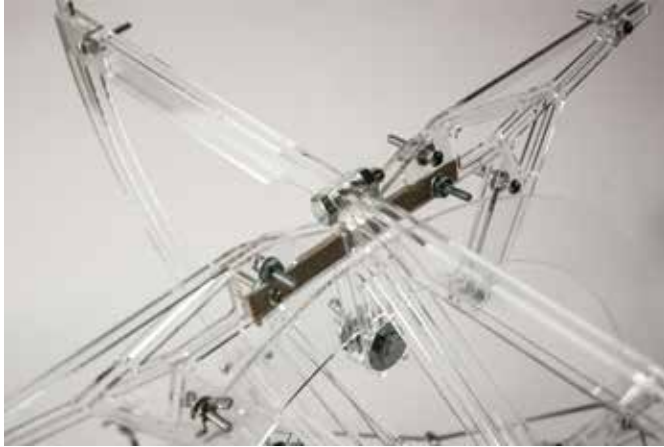Figure 37: Study model on sun angle tool.

Figure 38: 39: 40: 41: Sun angle tool details.

EXPERIMENT 3: CAUSTIC PATTERNING

Experiment one and two are representative of the poles of a tangible - intangible dichotomy which is ever present within our lives. As we have discovered in parts one and two, the plurality and incompleteness of truth reveal this dichotomy as a blurry transition. Experiment 3 draws on elements from the previous two experiments and melds them into an object that is in many ways exact and predictable, but in others uncertain and contingent.

Figure 42: Plexiglas geometry bends light into an image of light and dark.

The 2012 study outlined in the article "Architectural Caustics: Controlling Light with Geometry" (Thomas Kiser, 2013) demonstrates the ability to control caustic light patterning through the manipulation of material geometry. Caustics are a "pattern of light on a (mostly diffuse) surface that is created by focusing and diverting light through a reflective or refractive object" (Thomas Kiser, 2013, p. 95) (figure 42). We encounter caustics on a daily basis, for example, the pattern projected onto a table as candlelight refracts through a wine glass or the ripples reflected on the side of a boat from the water. What makes the work of Thomas Kiser and team so unique is the high level of control achieved through the computational power of digital simulation as well as precision CNC fabrication. The team started with a black and white image that was used as a base image for the creation of a caustic pattern. A reengineered light partial renderer was used to determine the geometry of plexiglass that would generate the image in caustic
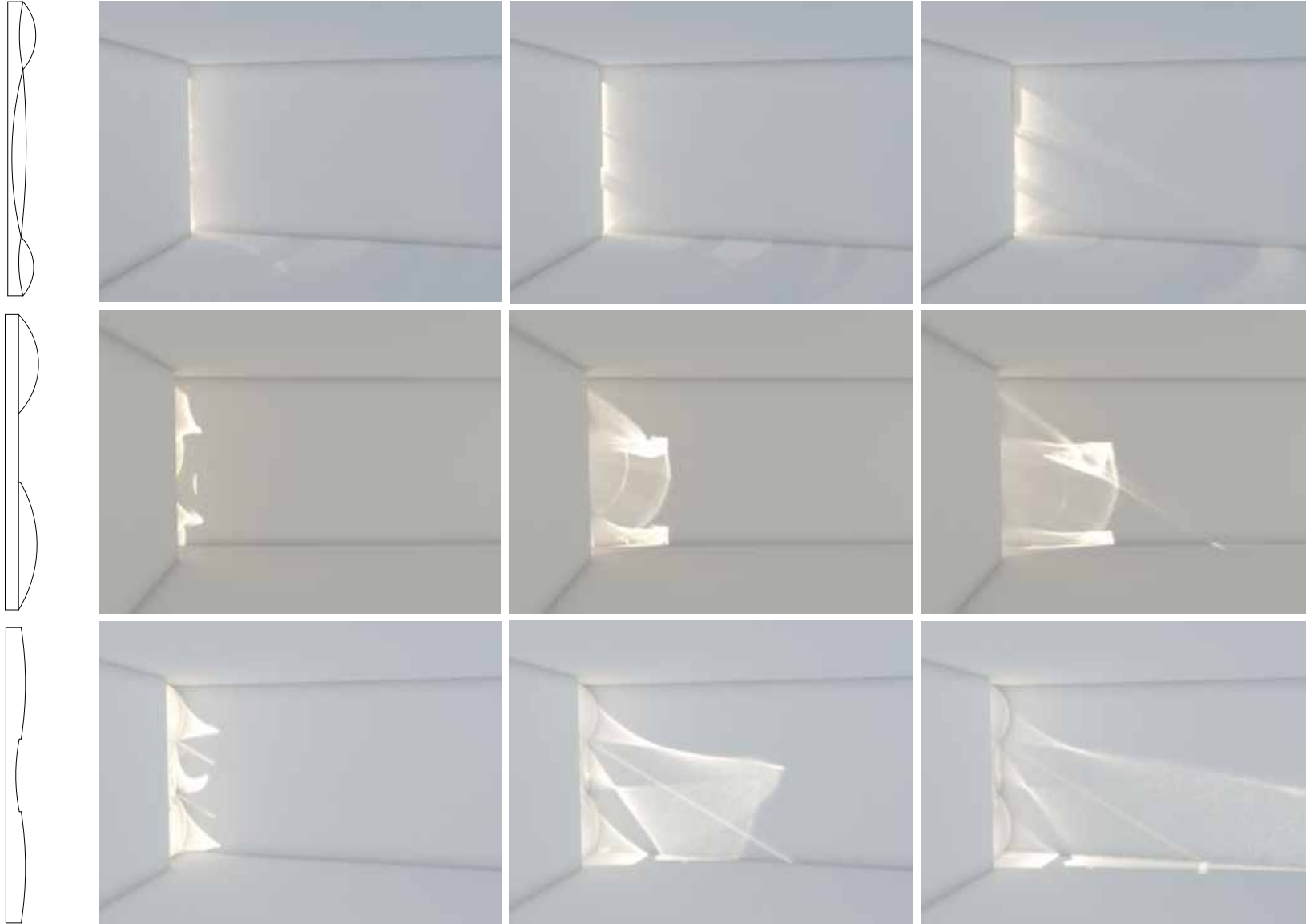
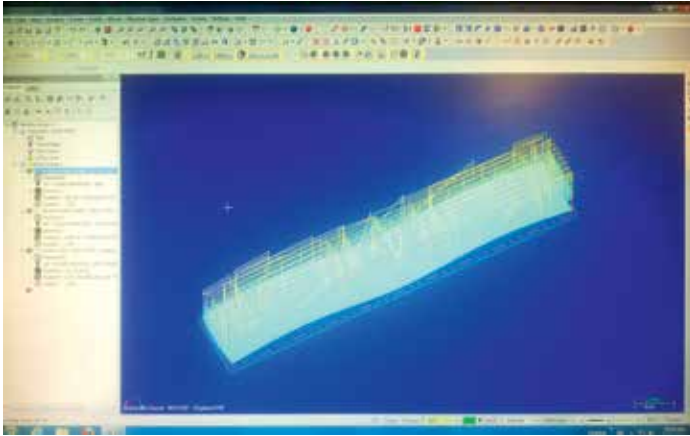Figure 43: Computer simulation of patterning caused by different lens shapes.

Figure 44: MasterCAM machining path.
Figure 45: CNC milling plexiglas into a lens.
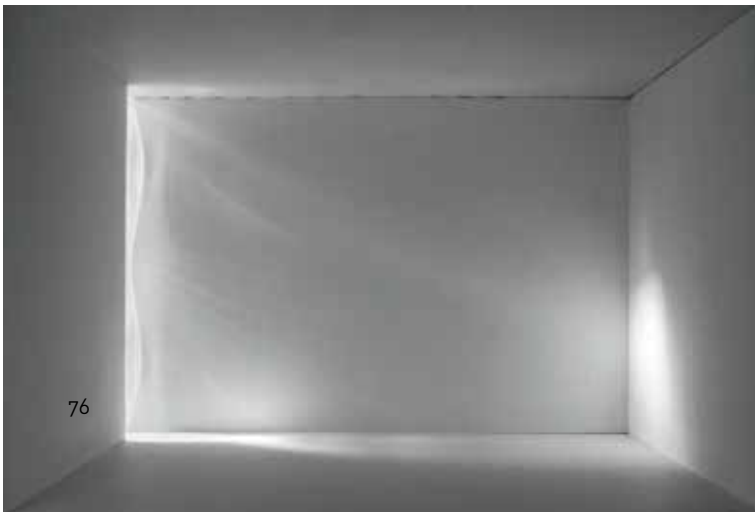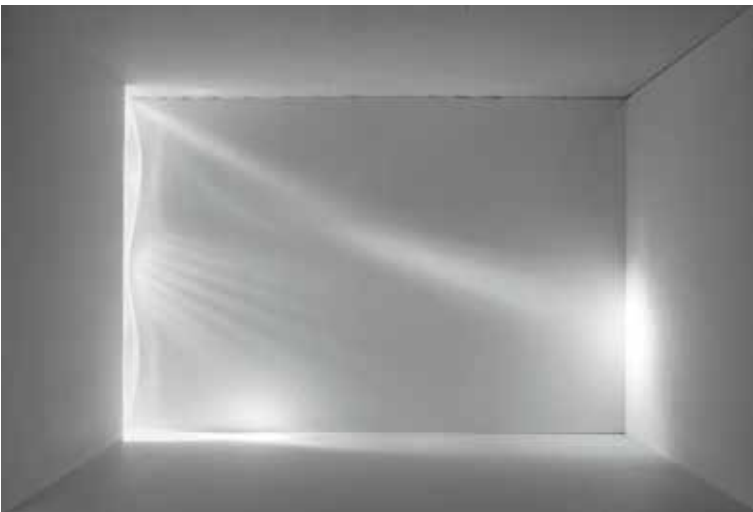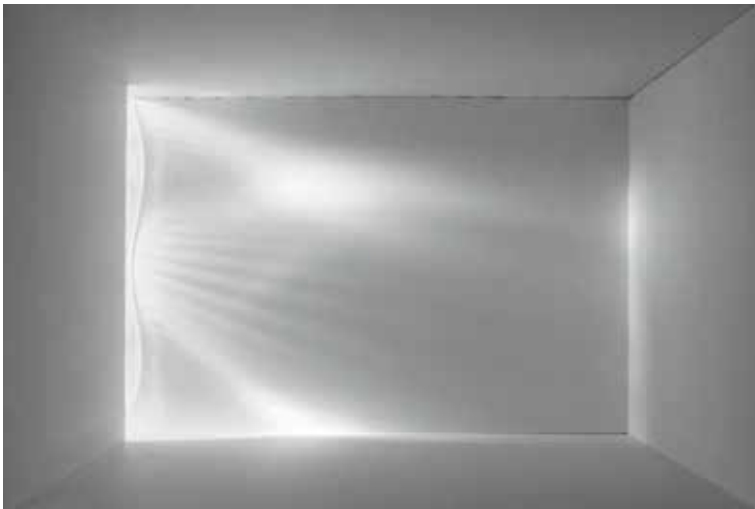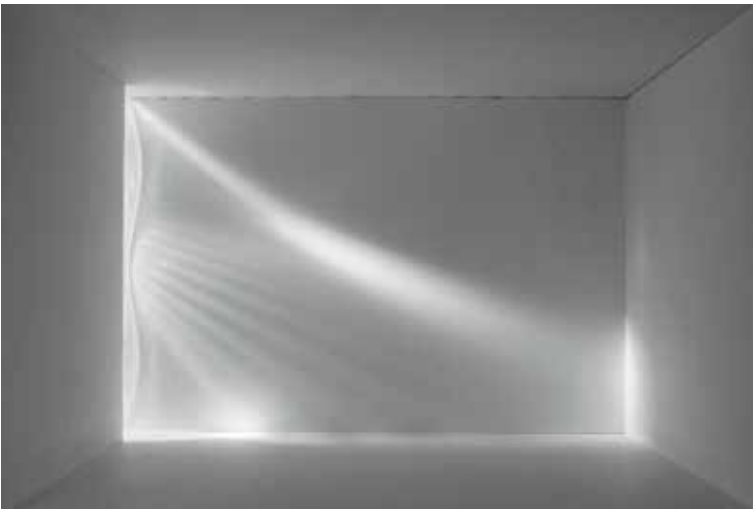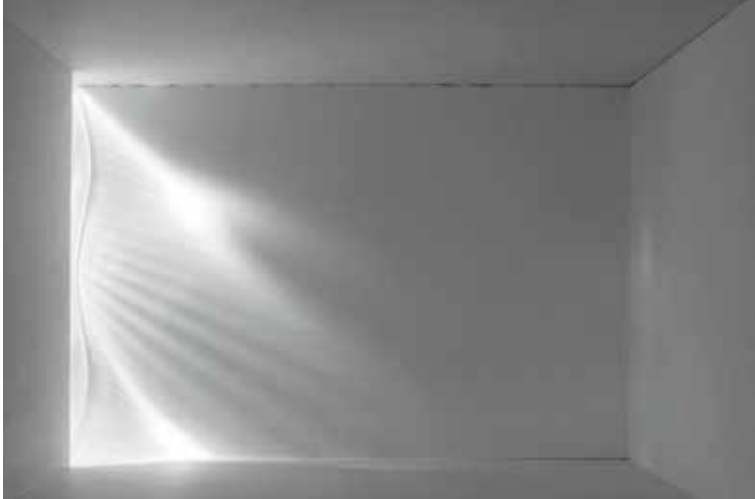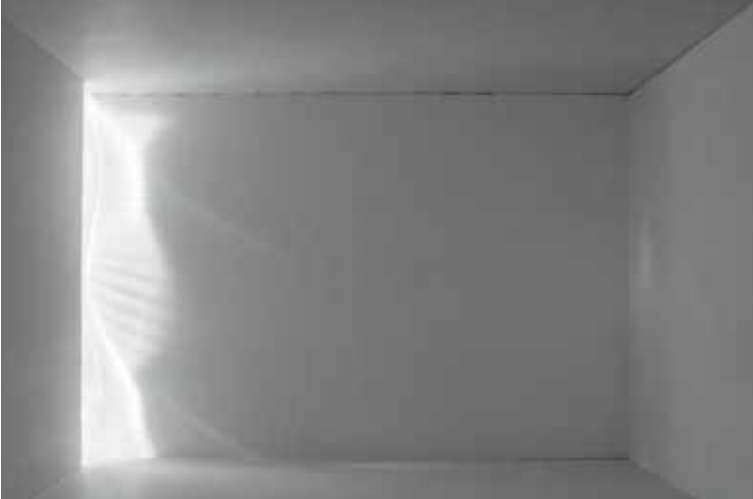Figure 46: Tool marks must be sanded off.
Figure 47: Final polish on a buffing wheel.

pattern. A CNC milling machine was then used to generate the plexiglass lenses (figure 44 to 47). The image is only visible at one specific angle of light; as the angle of interaction varies from this, the image disintegrates into randomness.

Using the process developed by Thomas Kiser to simulate geometry to achieve a given pattern and then to CNC the pattern for a physical prototype, the investigations focus the possibility of using caustic patterning to demonstrate the material quality of light within architecture. The experiments look at caustic patterning created by passing sunlight through undulating glass over the course of a day and indicate an increasing level of patterning and complexity.

Figure 48: Lens prototype.

On Event
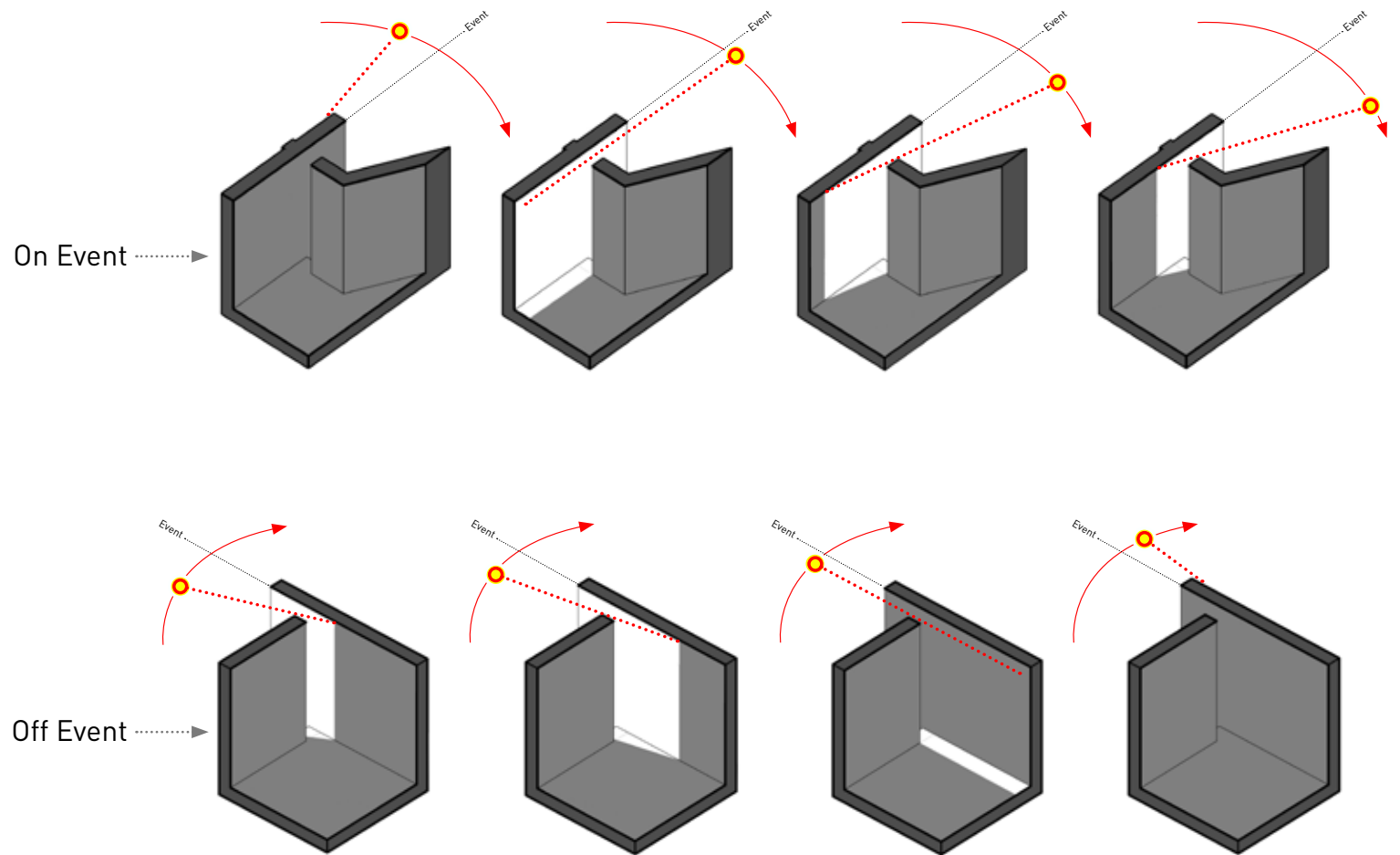
Off Event

Figure 50: On and off event wall wash diagrams.

Figure 49: Patterning from prototype lens into a simple modeled room.

Caustic Patterning above the bed becomes
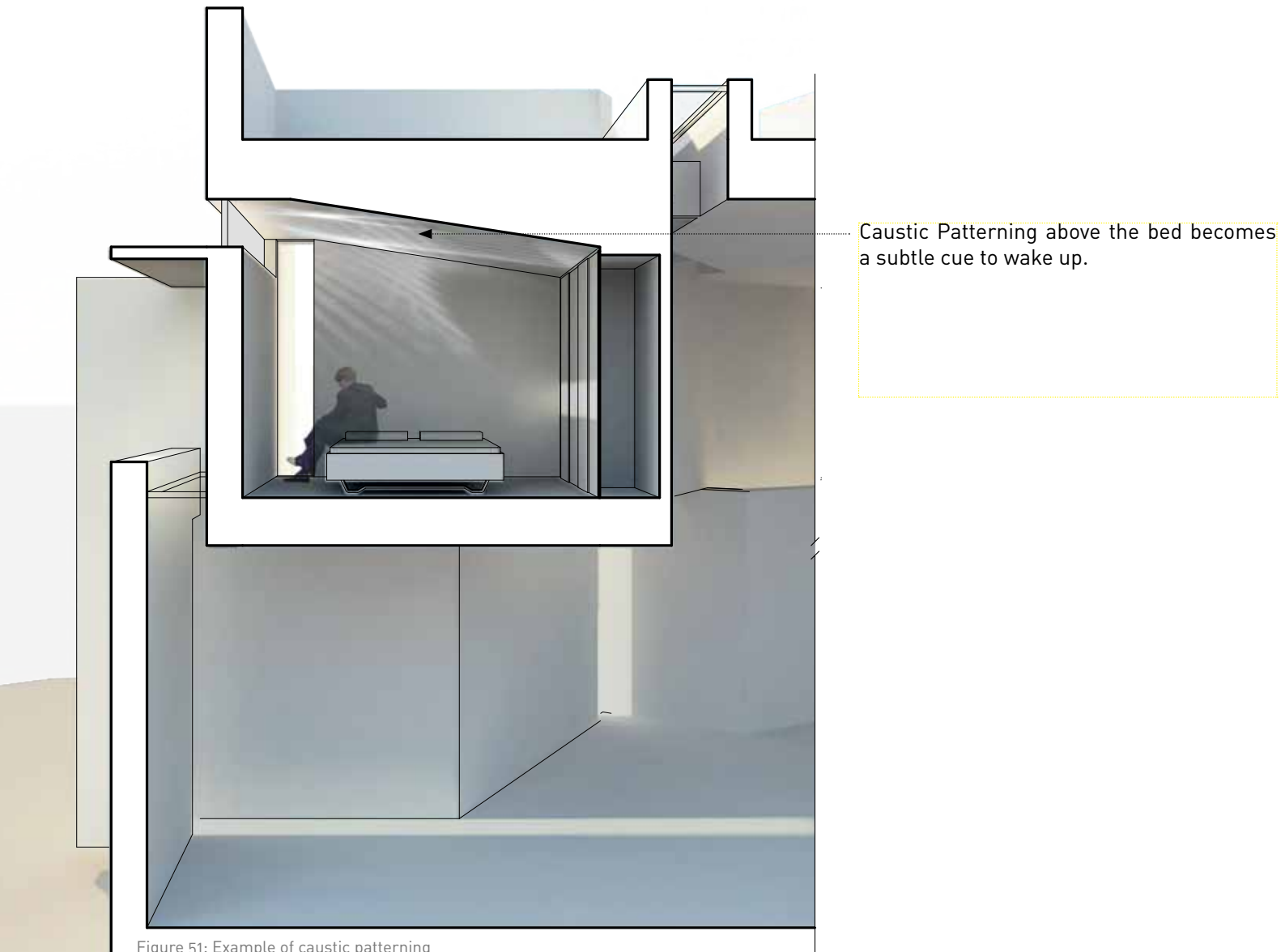a subtle cue to wake up.

Figure 51: Example of caustic patterning
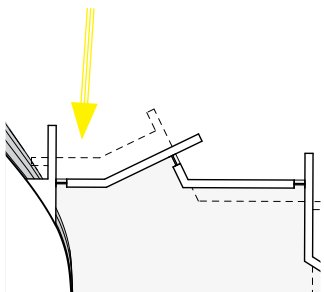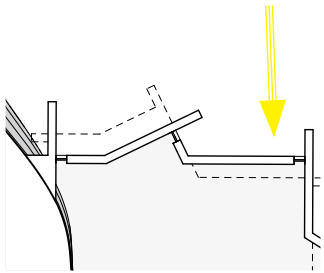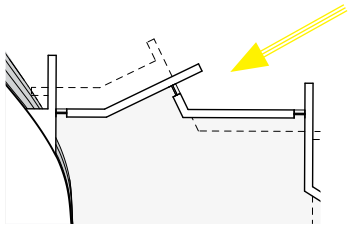within an architectural situation.

Figure 52: Shifting patterns wall washes throughout the day.
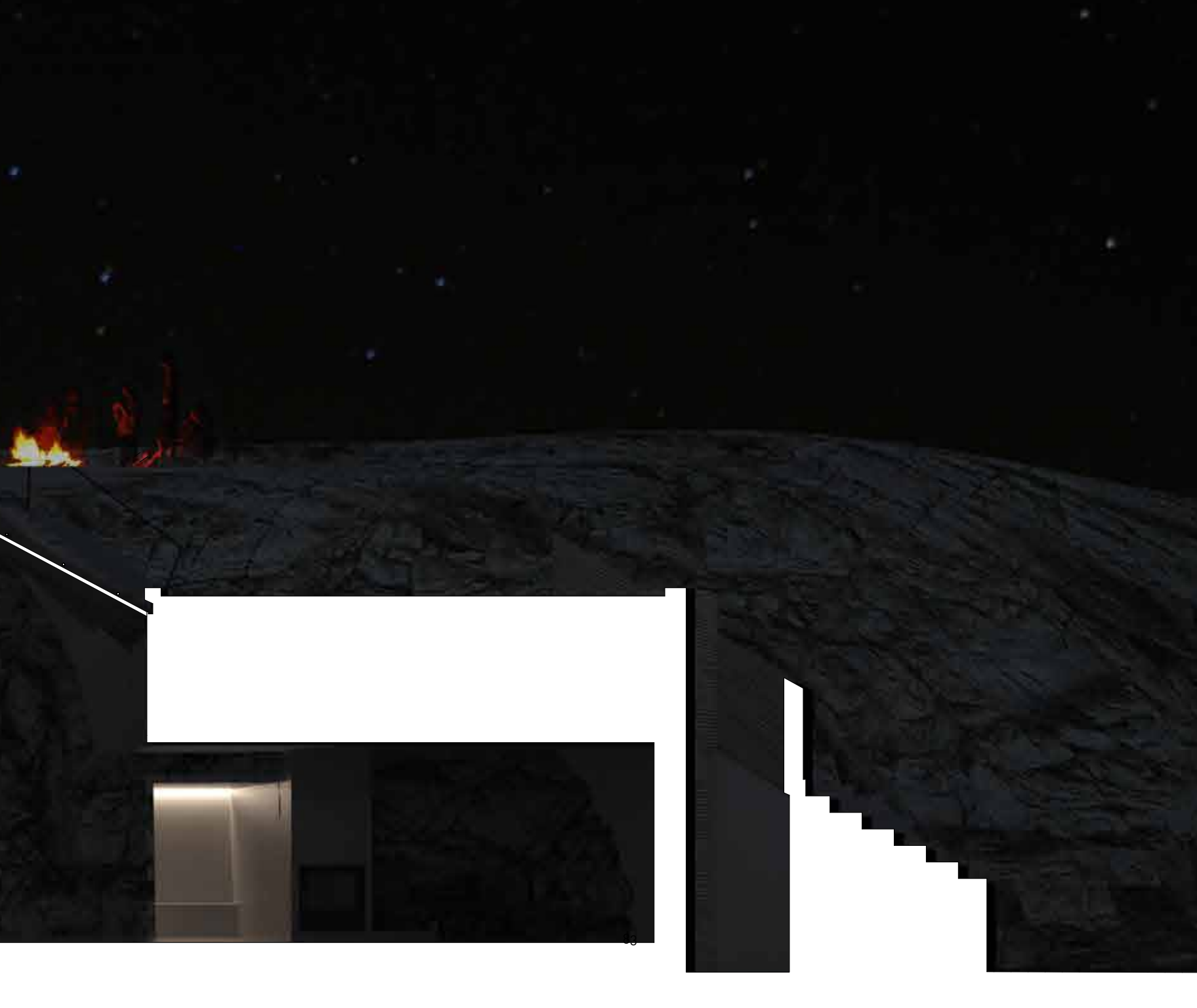
Figure 53: Section Looking East

PART 4:

HOUSING WEAKNESS

81

Figure 54: Section looking east at night.

62.4439° 114.3964° Yellowknife, NWT

Building for Weakness

The thesis investigation culminated with the design of a house located in Yellowknife, Northwest Territories. The simple program of a house was chosen to allow for as much design flexibility as possible, following in the tradition of Peter Eisenman and others who have worked extensively with houses as testing grounds for architectural ideas. Through its engagement with light, the design, entitled "Housing Weakness", explores the idea presented in parts 1 to 3 within an architectural project. The design directly addresses ideas of location, additive materiality, and duration discussed in parts one and two, as well as borrowing concepts and formal

aspects from the design experiments presented in part three.

The *Housing Weakness* project attempts to design for a weak ontological condition through a constants engagement with temporality. Every aspect of the house is designed with the expectation of temporal variation. The design is best understood through three areas of investigation: the sites uniqueness, the relationship of light and material, and the balancing of affect and interpretation. Each of these design aspects must be thought of within the context of duration.

The project plays extensively with the shifting contrast of dark and light to change spatial interpretation over time. A single space can read very differently throughout

Site ....

Figure 55: Aerial photograph with site indication, Old Town Yellowknife, NWT

Figure 56: Site viewed from North West corner.

the day, and year, depending on the lighting conditions. This allows the same space to be utilized for a variety of programs. For example the space near the fireplace shifts dramatically from an outward looking area with a low ceiling to a protected nook as day turns to night (figures 69-73).

Location Uniqueness

The site for the project is located in Yellowknife, NWT, Canada, on Latham Island, just across a short bridge from the mainland (figure 53). It consists of a flat corner property wedged between a southwest facing rock outcrop on its north edge and two narrow streets on its south and west sides. On the far side of the south street

Figure 57: Site viewed from South West corner.

is a band a trees separating the road from the water. The rock outcrop rises approximately nine meters above the road level and allows for almost full panoramic views of the surrounding town and landscape (Figure 56). The house is situated hugging the rock on the flat section of the site allowing the rock to invade the structure on the north east side forming a large portion of the interior wall.

A site was chosen in Yellowknife, NWT, for two reasons. First, I grew up in Yellowknife and have spent most of my life there. This allowed for an in-depth understanding of complex conditions, which is not possible without spending a considerable amount of time in a place. All understandings of, in architectural terms, site, or general terms, place, are tied to ones personal understanding of it. I chose a location that is

rich with memories and stories from my past not because this thesis project engages with my history directly, but because my understanding of the site more closely aligns with our actual experience of architecture. It is personal, nuanced, often contradictory, and always layered. I have, in Heidiggerian terms, dwelt in the place. This is not important for any individual design outcomes, but sets the attitude taken by this thesis towards a given site. Site must include all the intangibles, as well as tangibles associated with a location and therefore must always be recognized as plural and incomplete to the designer.

Second, the northern latitude creates unique and variable lighting conditions throughout the year. The shortest day of the year has a sunrise of 10:25am and sunset of 3:05pm. The longest day of the year rises and sets at 3:35am and 11:40pm. However, the sunrise and sunset times do not tell the entire story as the winter sun stays low in the sky, and giving little light. This is

Site

contrasted by the summer sun that dips only slightly below the horizon providing plenty of light after sunset. This summer/winter contrast is the most extreme and predictable variation within northern light, however there is also a lot of random variation caused by weather conditions. Figure 57 shows a series of photos taken at noon on eighteen random, evenly spaced, days over the course of one year.

The uniqueness of the site allows individuals viewing the project to easily compare it to what they are used to. The extremes of variation within the site conditions allow it to be clearly compared to itself at different times. In this way the site becomes an extreme version of our typical interactions with architecture. We are always comparing our environment to different places and times.

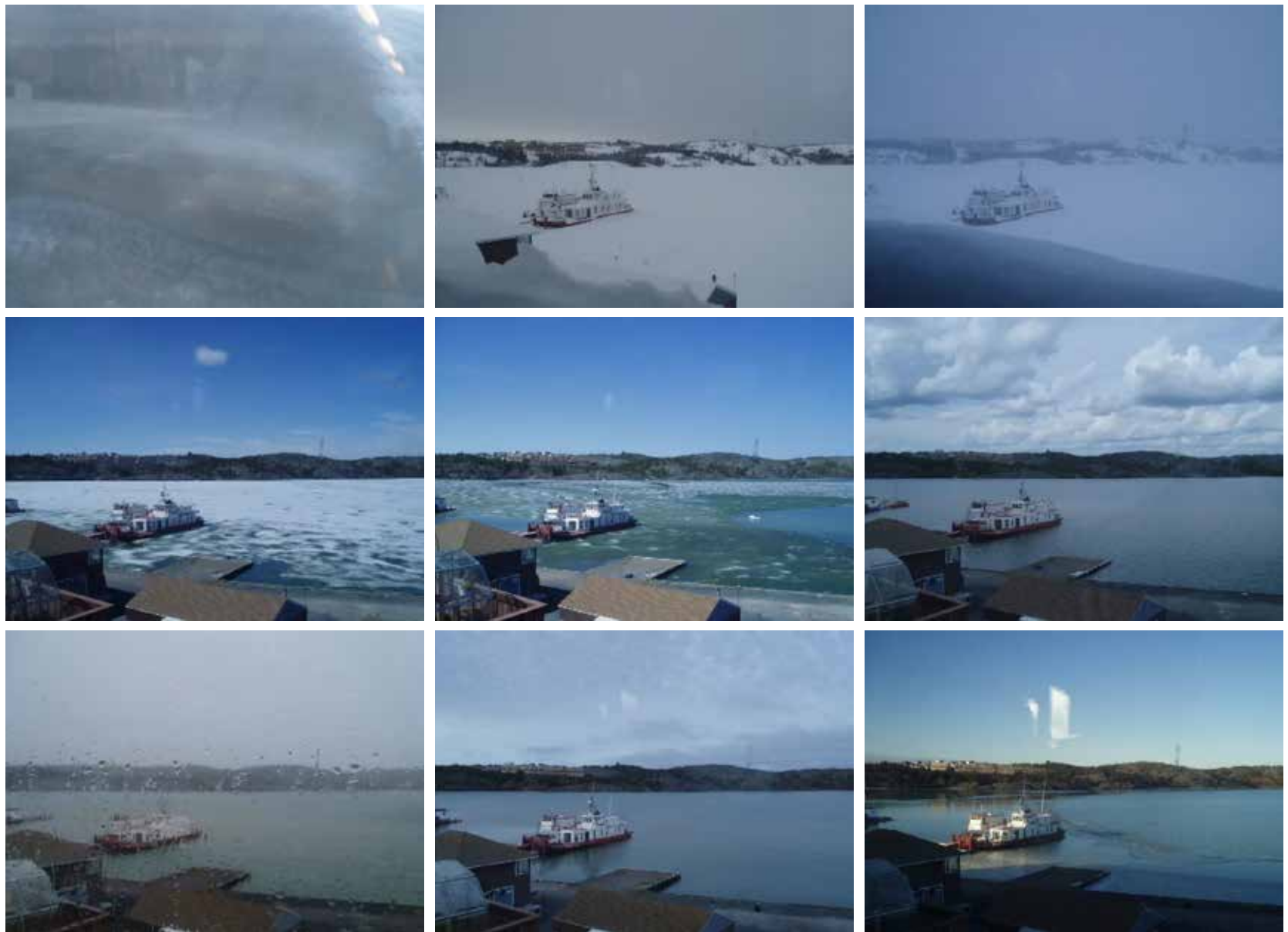Figure 58: View facing south from rock above site.

Figure 59: Eighteen photos taken from the window of Pin/Taylor Architects over the course of one year. Photographs - Svetlana Kaznacheeva and Vance Fok, 2009
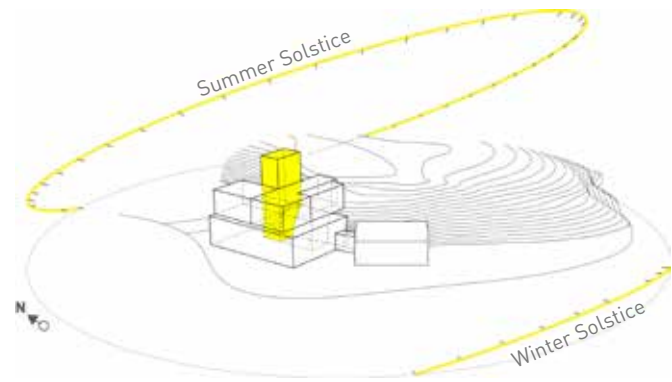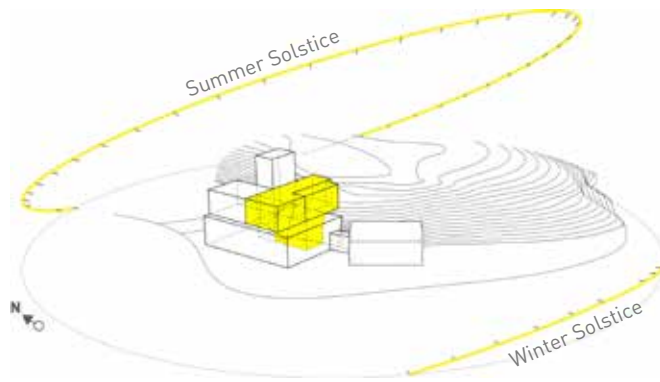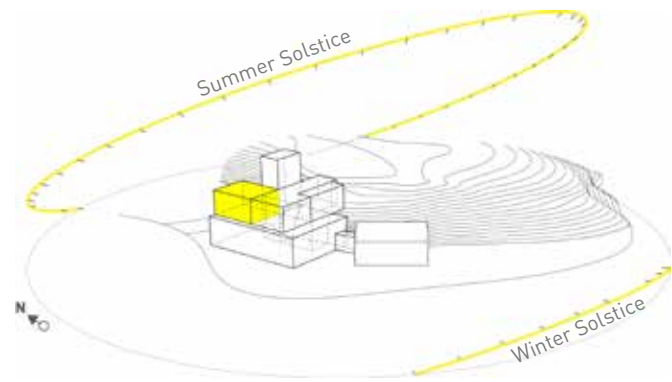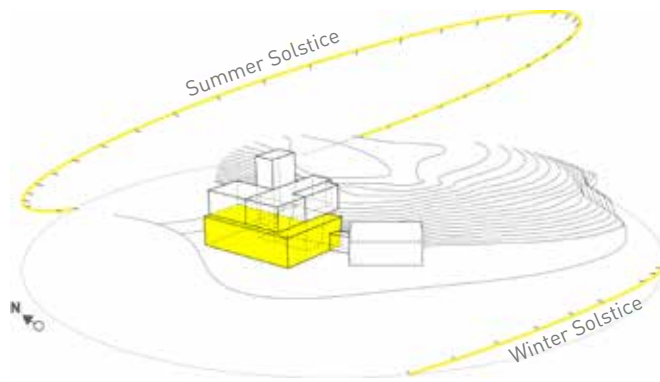
Figure 60: Early programmatic distribution diagrams.

Massing

The house is placed on the site parallel to the rock face causing its orientation to be twenty degrees off of a north-south axis. This orientation maximizes sun exposure throughout the day.

The design has four basic massing strategies related to light (figure 60). The first strategy is to keep the first floor very open. This allows light to penetrate deep into the floor-plate and allows for different lighting conditions to be observed simultaneously. The first floor of the final design uses minimal partitions and instead is spatially divided by changes in the height of the ceiling. The varying height overhead further accentuates variation within lighting conditions. Second, an element would protrude above the rock capturing early morning light and directing it into the back of the floor-plate. This strategy is more about the timing and quality of light than the quantity, and determined the final roof-plane. The roof of the house is shaped like a V, with one side folding up to meet the rock and the other reaching out toward the lake (figure 66). These two planes

reflect light into the building lighting the space from above. The third strategy is to dedicate a section of the south facade to acquiring and filtering the strong south sunlight. This was executed in the final design through a large swath of translucent glass which runs from the ground floor and along the southeast facing facade. The section of translucent glass casts a diffuse light into the kitchen and library but not into the dining room and fireplace area which are protected from* the low ceiling*. The diffuse light fills most of the house with a lighting condition similar to the one outdoors, but is kept out of some spaces to emphasis the effect of moving from one space to another. The fourth strategy is to keep the sleeping space at the north end of the structure and to use minimal penetrations through the facade. With this, the sleeping space becomes a dark counterpoint to the rest of the house.

Materials

The material palette was kept minimal with the primary element being light. The five materials included

in the project were selected for their unique interactions with natural light. The project is constructed using: smooth white painted walls, the on-site granite bedrock, polished concrete, wood, and glass.

Matte white walls are used extensively on both the interior and exterior of the project. The white walls would be constructed of butted and sanded wood siding painted with an exterior quality paint. This wall construction allows for a subtle texturing caused by the wood grain and joints between boards that would not be present in a continuous planar material such as drywall. The durability of the wall also allows the same finish to be used inside and out, creating a unbroken material quality throughout the project.

The white wall is the most immaterial element within the project and is primarily used as a surface upon which light can project its own qualities. It is a material without depth and is contrasted within the project by the existing granite bedrock. The rock is highly textured allowing the viewer to almost feel its depth with his or her eyes. Light falling on the white walls becomes an element separate from the wall, but light falling on the rock is soaked up by its texture and can only emphasise

qualities of the rock itself. The thickness of the rock is further emphasized by a staircase which penetrates into it and emerges on the second floor. Beyond the practical need to move between floors the stair becomes a journey away from the light and into the substance of the rock. This feeling is emphasized by a slight descent before one turns to climb the stairs back into the light (Figure 63).

Polished concrete is used on the floor of the ground level, to construct the fireplace, kitchen counters, and to line the staircase as it penetrates the rock. The concrete has a matte polish and contains a lightening agent so that at first glance it blends shamelessly into the white walls. However, up close the concrete has much more depth and texture than the paint allowing it to act as a mediating material between pure white and thick stone. Lighting and adjacent materials allows the concrete to be perceived as both immaterial surface and immovable solid.

Three types of wood are used within the project; wax polished birch, ash flooring, and cedar siding. The polished birch is used for tactile detailing such as handrails and provides a material warmth where human

Figure 61: ground Floor

Water and Mechanical

Kitchen

Dining

Bath

Living

NORTH

95
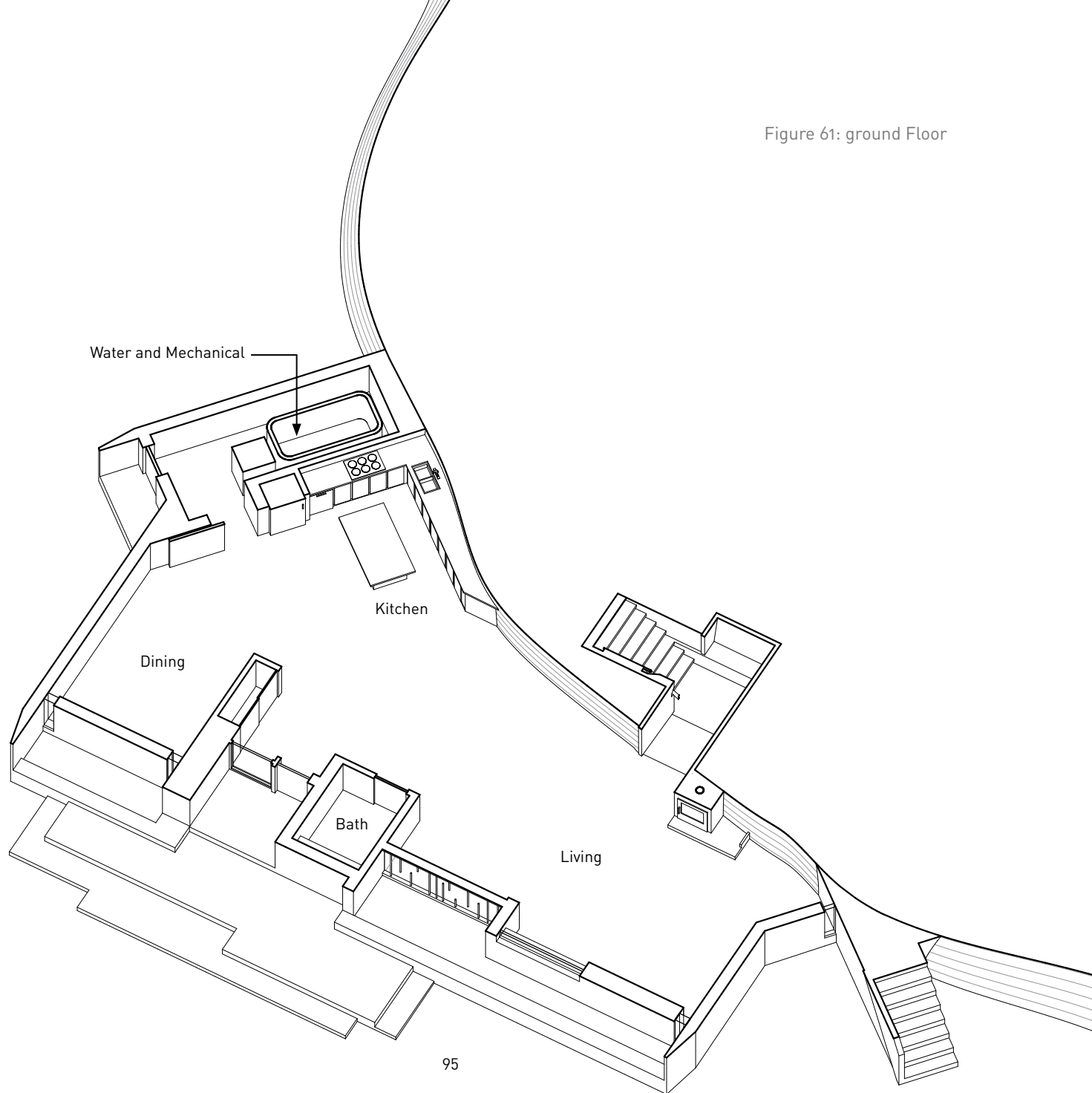
contact occurs. The same material is used as the base of a model shown in figures 66-68. A light ash flooring is used throughout the second floor to create a warm contrast for the private space from the more public area on the ground floor. Thin horizontal strips of cedar are used as siding on parts of the exterior. The narrow gap between strips creates a shadow reveal that subtly shifts the façade's appearance throughout the day. Cedar is also used because it ages gracefully into a resilient finish that can shift from sparkling silver to mute gray depending on the weather conditions. In all instances wood is used where a warmer, natural finish can be used in contrast to the inorganic coolness of the other materials.

Insulated translucent glass panels as well as triple pane windows are used within the project. A large section of translucent glass runs through the centre of the house. This allows a muted version of the outside lighting conditions to be drawn into the interior of the house. The panels are held in place by wood mullions which have rods protruding from them near the exterior surface of the glass. These rods trap blowing snow in the winter creating a changing pattern of light and dark seen from the interior.

Windows with clear glazing are used sparingly throughout the house. Clerestory windows are utilized in the dining room, living room, and above the back entry. This is done to draw light in without providing views out allowing the phenomenon of the light inside the structure to be the primary focus. Views out are provided but only in controlled circumstances. The windows allowing views are long and horizontal placed at a specific height to only allow views at certain moments. For example, the window located above the desk in the library is at standing height, so as an individual walks to the desk they are supplied with a view of the lake, but as they sit down they are in a focused environment lit from above. This is contrasted by the window located across from the fireplace which is at sitting height so that a person is provided with a view when they settle in comfortably by the fire.

This limitation of views is contrasted by the lookout located at the front of the building on the third floor (figure 65). As one climbs the steep stairs up to the small room they are met with views on three sides and above allowing for a complete view of the surroundings and the sky.

Sauna

Bath

Bedroom

Library

Study

Green Roof
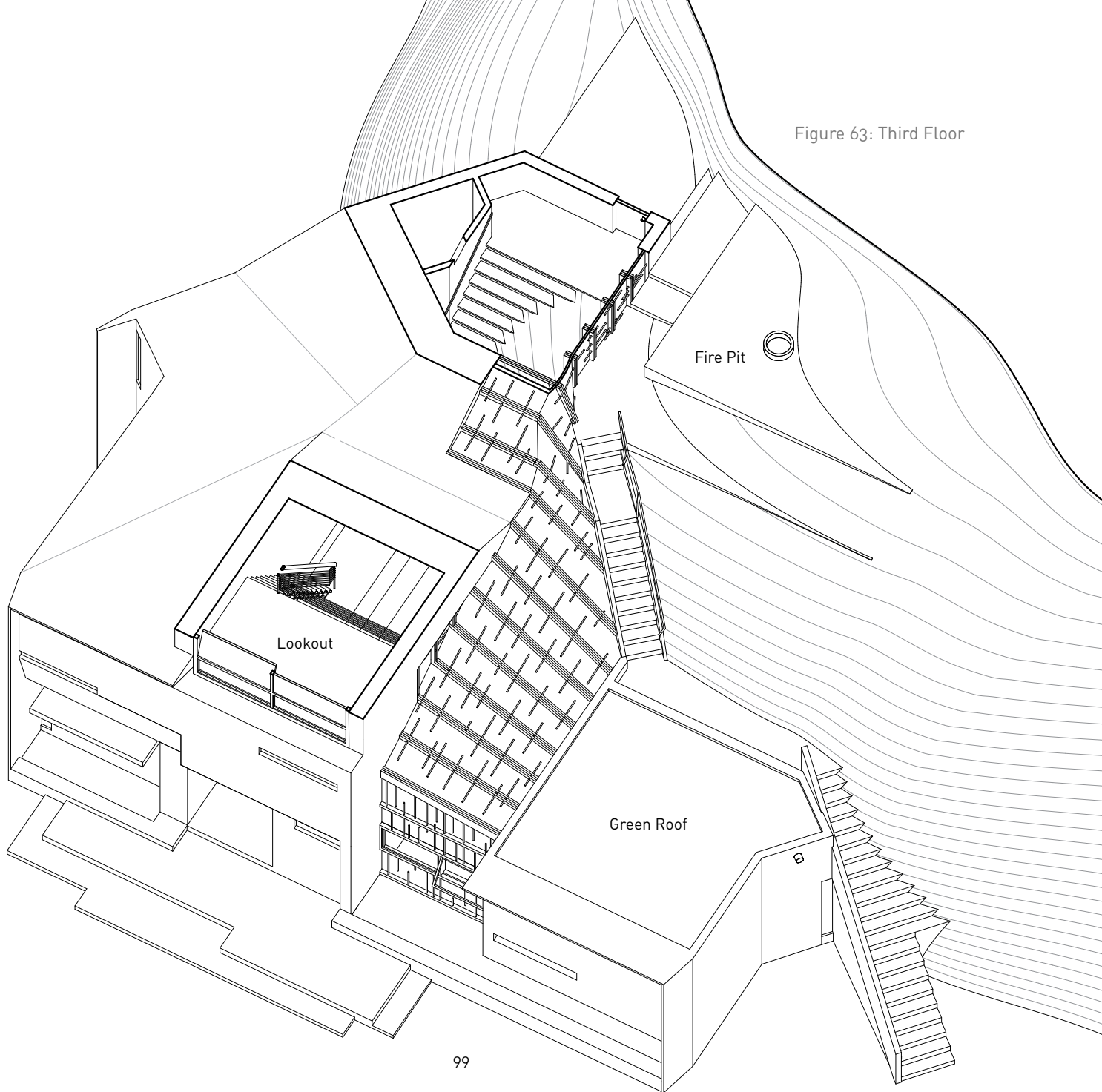
NORTH
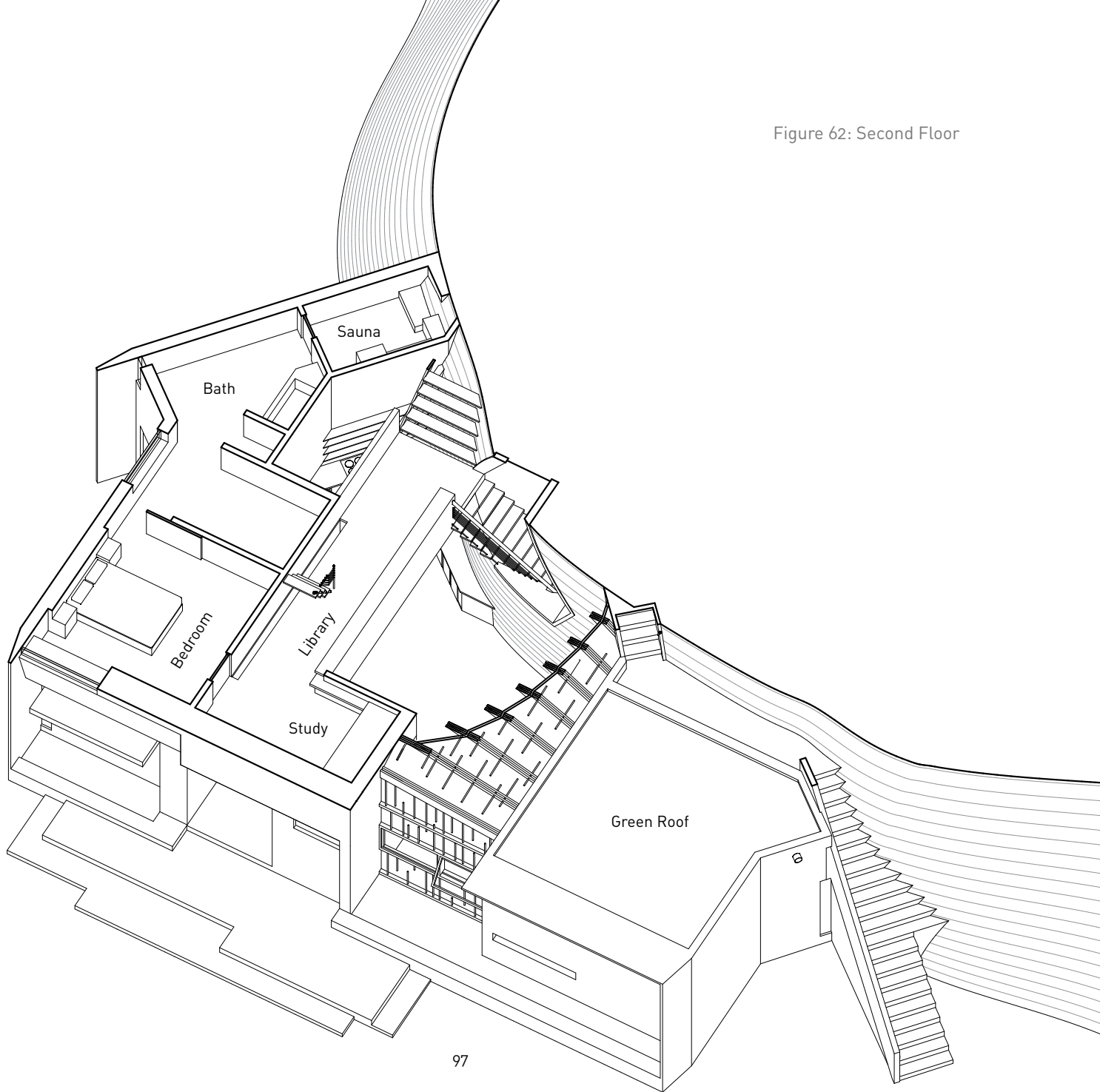
Affect and Interpretation

As discussed in parts one and two, creating architecture appropriate to our weak ontological condition involves balancing specifics and openness of interpretation. A design that tries to rigidly control its users will always fall short as full control is not a possibility. Likewise, a building that abandons any hope of universal engagement has no starting point, or as Sola-Morales has stated, is forced to conceptually "build on air" (Sola-Morales, 1996). In part one I talk of the need to bracket the looseness of interpretation with the prepersonal engagement of affect. This is by no means intended to be an attempt to create a shared universal experience, but a point of reference upon which shared experiences can be focused.

The primary way affect is used to bracket interpretation in the design is through the inclusion of caustic wall washes. The wall washes are a scaled up version of the lenses developed in design experiment three. The large shaped lenses are located in four locations on the ground floor and two locations on the second floor. Each wall wash event happens over one derivational period of the day and are not present most of the time . The events become a subtle background decorative element which is always shifting and rarely appears the same between two views.

The caustic patterning used within the house is related architecturally to both traditional two dimensional decorative elements, such as patterned wallpaper, as well as the commonly used natural lighting technique of washing a wall with light. The implementation within the design uses elements from each to reconstruct the other within our architectural   experience. The two dimensional pattern is injected with temporality, and the light is materialized into a pattern. By reconfiguring the expected, and therefore pre-interpreted, the unexpected element forces a re-engagement between body and architecture of the most fundamental kind; a pre-personal interaction with affect. This must be recognized not as the primary way of understanding the house, but as an element to create shared experience.

Figure 63: Third Floor

Fire Pit

Lookout

Green Roof

NORTH

99

100
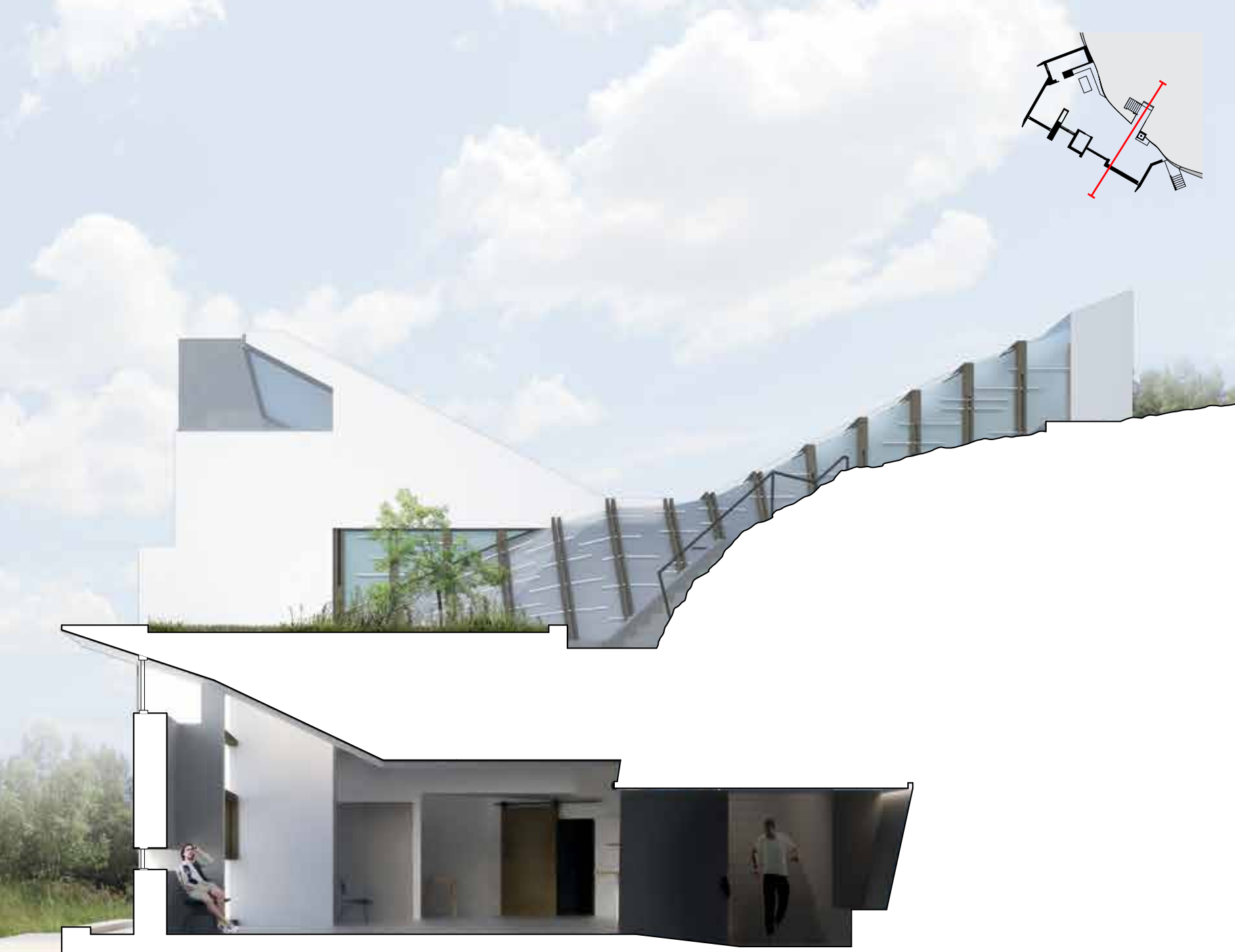
Figure 64: Section Looking North

Figure 65: Section Looking South
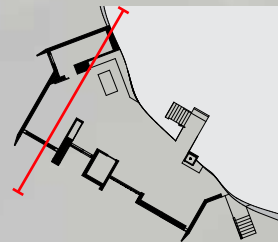
Figure 66: South section through library.
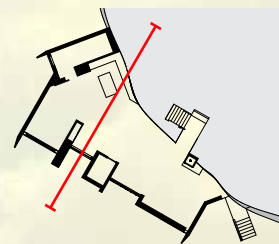
Figure 67: Housing Weakness sectional model. The model is constructed of the same wood as will be used for tactile detailing within the house.

Figure 68: Housing Weakness sectional model. The concrete lined stair penetrates through the rock.

Figure 69: Housing Weakness sectional model. Library and entry.

Figure 70: Sunny summer afternoon.

Figure 71: Sunny winter evening.
Figure 72: Overcast Day
Figure 73: Night with artificial lights.
Figure 74: Night with firelight only.

Figure 75: Interior rendering. View from top of stair into library.

Figure 76: Exterior night rendering.

Figure 77: Exterior day rendering.

CONCLUSION

This thesis asks the question: What impact does the philosophy of *weak ontology* have on the design of Architecture?

The philosophical movement, first developed by Gianni Vattimo, is a dense theory of existence, heavily convoluted by inaccessible jargon. After wading through, and sometimes drowning, in the philosophical texts concerning weakness, its relationship to architectural design started to emerge. The philosophy is primarily concerned with the plurality and incompleteness of truth and certainty. Arguments are made at times that a singular, underlying truth does not exist, and at others that ontic truth does exists, but is separate from our experience. The answer to these larger philosophical questions matter little to architecture. What is gravely important is that, in a practical sense, certainty and universality are inaccessible to the architect. Where weak ontology becomes helpful is its assertion that one must create a system for understanding the world, but that it must be a weak system, always ready to shift and reassemble when new information, or perspectives, are introduced. Architects must know that their system

and truth, are not *the*, but instead *a* system and *a* truth. Architects must leave room for layers of systems and truths. This is not a new idea, and is applied clearly to large-scale networks and infrastructure by Andrea Branzi in his 2006 book *Weak and Diffuse Modernity: The World of Projects at the Beginning of the 21st Century* (Branzi, 2006). This thesis, in comparison to Branzi's sweeping project, is interested in the smaller human scale. This project purposefully limits itself to the repercussions of weak ontology on the individual architectural project.

The interaction of light and architecture, or more accurately the inclusion of light as an architectural material, leads to three main conclusions about the weakness of architecture. First, architecture is defined by change through time. This is to say that architecture can only be experienced through a series of rolling moments bracketed between the influence of one's history and the expectation of one's future. Light with its shifting and fleeting materiality is a constant reminder of architecture's temporal dependence. Second, the solid materials of architecture are added to by circumstance. A concrete wall is experienced as a completely different entity on a warm sunny day or a cold rainy one. This

additive dynamic of architectural material is exemplified by the nature of light's interaction with architecture. The third conclusion is that architecture is always rooted in a location, but this location is as much defined by the plural intangibles as the tangibles associated with a place. In the context of our globalizing planet, communication, networks, and uniformity are replacing the importance of location. Although buildings of a similar style are being built all over the world, the experienced reality of these changes drastically in relation to their context. It should instead be understood that this context is not a static and universal entity, but instead plural and incomplete. The location of a building should be understood to have a weak context.

The design of architecture is not a science; its goal is not to systematically find possible truths, but instead to make an appropriate environment within which people can live. The failure of the modernist project has shown us that the potential for architects to build new worlds through universal ideas is limited. What architects are instead left with is the responsibility to make places for other people to build worlds. An architectural design will never function as planned once it is released into the wilds of the real world, it will always become much more.

If these architectural conclusions derived from weak ontology are true, how should we make architecture? How can we design without certainty, and build without consistency?

Three design guidelines emerge from my conclusions. The first deals with the conviction of architectural gestures; architecture should act in the background instead of as a confrontational spectacle. This is exemplified by the comparison of the Ryerson Image Arts Building to Marcel Breuer's St. John's Abbey in Collegeville, Minnesota. The use of natural light in the Abbey versus the shifting artificial lights of the Ryerson campus building reveals the greater impact of the natural without the force of spectacle.

The second guideline addresses the need for architectural passivity to have a shared focal point, a containment of architectural nihilism with affect. This is the inclusion of an architectural element that cuts to the core of prepersonal human experience. The effects,

or emotional outcomes, of affects are not universal but a strong affect can create a shared starting point upon which interpretation is layered. These elements should not slip into acting as entertainment, but instead consist of unexpected changes and events evolving in the background of experience. Within the thesis design project, Housing Weakness, patterned wall washes, which appear, disappear, and change through time, are used to create subtle shifts in the architecture and affect the inhabitants.

The third guideline posits that, during the design process, light should be considered an architectural material. The strange and contradictory properties of light can be understood as a material parallel to the plurality and incompleteness of our ontological condition. When considered from the start of the design process, light, through its uniqueness and inconsistency, forces a weakness on architecture through an engagement with time, material, and location.

I do not intend these conclusions, and the resulting guidelines, to be set in stone. In fact, that would cause them to contradict themselves. The foundational lesson for me is that architects should question themselves.

Each should ask him or herself:

What makes me believe what I believe to be true about architecture?

How permanent is that truth?

Is there room for other truths within my work?

By asking these questions we can release architecture from our personal grasps and let it be in the complicated and contradictory world. Instead of attempting to build on the fractured and slippery foundation of certainty, we can build on the shadows of it; the shadows that dance in and out of existence; the shadows of truth that embrace the plural present and indeterminate future.

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