



INTEGRATING SENSORY EXPERIENCE IN PARAMETRIC ARCHITECTURE THROUGH A PHENOMENAL LENS

BY YIRAO LEE

Integrating Sensory Experience in Parametric Architecture through a Phenomenal Lens

by

Yirao Lee

A thesis submitted in partial fulfillment of the requirements for the degree of

Master of Design

at

Victoria University of Wellington

June 2010

Under the supervision of

Associate Professor Daniel K. Brown

ACKNOWLEDGEMENT

I would like to show my deepest gratitude to the individuals who afforded this research to develop. I am profoundly grateful to my supervisor Daniel K. Brown; for his expertise, generous guidance and encouragement without which this thesis would not have been possible. His enthusiasm and thoughtful feedback has provided a strong role model for my work and inspired me everyday throughout the year while working on this research. One simply could not ask for a better teacher and friendship.

Many thanks also go to the helpful and enthusiastic Victoria University Architecture Reception and Library staff. The library facilities and computer facilities have been indispensable.

I am also incredibly fortunate to have the friendships of Tane Moleta, Mizuho Nishioka, Tiew Tung Ting, Nazia Kachwalla, Jack Thomas, Cissy Zhang, Adam Alexander and Stefanie Sim, for their support and shared with me the endless breakthroughs in my research.

Finally, special acknowledgement needs to be made to my family. My parents, Kong Yip Lee and Judy Tan, for their financial support and encouragement to pursue this degree. Their never ending patience, care and love have instilled confidence in me endlessly and will be a continuous joy and treasure. To my sisters, Kuan Shin and Jiun Yih for being supportive and caring siblings. To them I dedicate this thesis.

TABLE OF CONTENTS

ABSTRACT	9
1. THESIS FORMAT	11
2. THEORETICAL ARGUMENT	14
I. Introduction: Looking Beyond Aestheticism	16
II. Phenomenology in Architecture	21
III. Multi-Sensory Experience	24
IV. Gibson's Five Sensory System	27
V. Arguing for the Intergration of Phenomenal Properties in Parametric Architecture	35
VI. Architecture as Collaboration	52
VII. Conclusion	56
VIII. Reference	58
IX. List of Illustrations	63
X. Design Matrices	66
3. SITE ASSESSMENT	68
I. The Archive of Memory	70
II. Urban context - Wellington Central City, NZ	72
III. Immediate Context - Thorndon	82
IV. Building Analysis - Archives New Zealand	86
4. EXPERIMENTAL DESIGN	98
I. Introduction	101
II. Concept Manifestation	102
III. Conceptual Design	104
IV. Experimental Design	110
V. Conclusion	149
VI. References	150

ABSTRACT

'Parametricism' has come to play a major role in contemporary architectural design and is now considered the dominant style for avant-garde practice. This thesis argues that despite parametricism's unique capacity to articulate programmatic complexity, visual and intellectualized imperatives at the loss of experiential imperatives have limited parametricism as a medium through which architecture is produced, promoted, and evaluated. Architect Juhani Pallasmaa believes that this leads to the deprivation of vital human existential questions that enable us to relate to our built environment and that provide meaning to that environment. This thesis explores how parametric architecture can further develop by addressing the deficiencies that Pallasmaa has described, to further incorporate a sense of temporality, experiential depth and personal belonging.

Based on these critical examinations, the second half of the thesis includes design experiments which test the integration of sensory experiences within parametric design. Archives New Zealand has been selected as the vehicle for this design exploration because throughout history, archives have symbolically represented important spaces in cities to express the re-connection of our history and culture. Today, however archives are often perceived as little more than secular storage for objects and documents. The thesis tests how the interior design of a nation's archives can be conceived through parametricism, while also incorporating symbolic and phenomenological imperatives.

This thesis concludes with five interior design experiments that are each derived from this experimental design process. The five interiors illustrate the mediation between parametric and phenomenal imperatives. These experiments conclude that through critical application of sensory imperatives, we may reconnect our human existence within the parametric world.

1

THESIS FORMAT

I. THESIS FORMAT

This chapter is the introduction to my research. It organizes and outlines the focus and argument of my thesis. The objective of the research is to integrate sensory experiences within parametric architecture through experimental designs which involve revealing and defining the fundamental essence of phenomenal spaces in terms of sensory responses. The structure of the thesis is comprised of two primary components: An essay addressing the urgent need for parametric architecture to look beyond aestheticism and experimental formalism to engage our senses and human identification, and a series of design experiments that tests the integration between irreconcilable opposites of parametric and phenomenological imperatives.

- Chapter 1 summarizes the format and objectives of my research, and the chapters that follow represent the study and outcomes of the research work.
- Chapter 2 is the theoretical argument central to my thesis. The chapter firstly introduces parametric architecture and justifies the imperative to incorporate human engagement within parametric environments. The chapter then provides an understanding of phenomenology as an approach to looking at architecture from within the consciousness experiencing it. The chapter examines five different sensory systems that Juhani Pallasmaa argues are able to heighten phenomenal experiences. Subsequently, the chapter highlights the fundamental elements that function to stimulate all the five sensory systems discussed previously. It further addresses three fundamental architectural qualities which distinctly differentiate parametricists from phenomenologists: weight / weightlessness, light / shadow, and materiality / time. Finally, the chapter concludes by outlining potential solutions for integrating both “opposites”. The essential qualities of phenomenal experiences that are explored in this chapter offer a foreground to my thesis and lead to a series of design experiments in the following two chapters.
- Chapter 3 is the introduction to and analysis of the chosen site for an experimental design. The chapter is divided into four sections. The first section introduces Archives New Zealand as the vehicle for design exploration, highlighting its inherent capacity to express itself as a symbolic architecture for existential experiences. The following sections are assessments of the site, beginning with the urban context of

Wellington City, to the immediate context of Thorndon district, and finally to the Archives New Zealand building. The objective of the analysis is to uncover potentials and contextual opportunities for developing a parametric interior intervention in the following chapter.

- Chapter 4 incorporates the experimental designs and conclusion to the thesis. The objective of the chapter is to test the integration of sensory experiences within a parametric environment, mediating “irreconcilable opposites” of parametric and phenomenological imperatives. The chapter is divided into three sections. The first section establishes the concept manifestation and its designing guidelines, highlighting possible methods for integrating these diverse imperatives. The second develops an overall conceptual design for Archives New Zealand illustrating the design initiations and the evolution to the interior visualizations. The third and final section of the chapter serves as a conclusion for both the chapter and the thesis. The section tests the results of the integrated imperatives in plan as well as 3-dimensions (spatially), using five interior design experiments that embody realizations of a final robust hybrid resolution.



2 REALIZING A POETIC VISION IN PARAMETRIC ARCHITECTURE THROUGH SENSORY EXPERIENCES

The current over-emphasis on the intellectual and conceptual dimensions of architecture further contributes to the disappearance of the physical, sensual and embodied essence of architecture. Contemporary architecture posing as the avant-garde is often more engaged with the architectural discourse itself and mapping the possible marginal territories of the art, than responding to human existential questions.

Juhani Pallasmaa, *The Eyes of the Skin: Architecture and the Senses* (1996)

I. INTRODUCTION: LOOKING BEYOND AESTHETICISM

This section outlines the hegemony of parametric architecture within avant-garde architectural practice today and why it claims to succeed as the new style, highlighting the defining heuristics of parametric architecture that aim to deliver complex order for complex social institutions. This section outlines how these parametric design methodologies lead to an over-intellectualized and visual/intellectual-dominant approach to the built environment. In this context the section introduces Juhani Pallasmaa and his concerns that the dominance of aestheticism and experimental formalism in contemporary architecture leads to the deprivation of human existential questions. This section outlines the main areas of dispute concerning the urgent need to address a meaningful order in human life and integration of sensory response mechanisms in parametric architecture. This section establishes the elements that Pallasmaa believes need to be incorporated in order to achieve a sense of temporality, experiential depth and belonging.

Architecture, as with all art, is fundamentally confronted with questions of human existence in space and time, expressing and relating man's being in the world. Architecture is deeply engaged in the metaphysical questions of the self and the world, interiority and exteriority, time and duration, life and death.¹

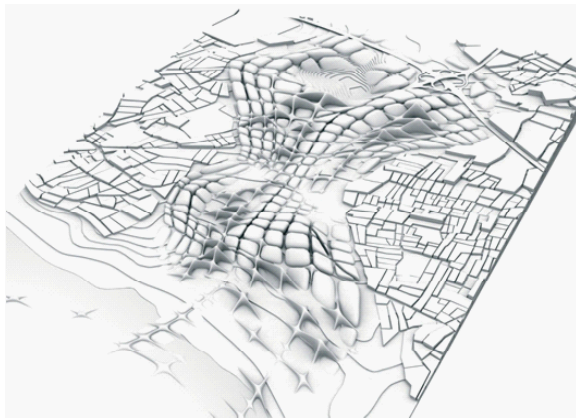


Figure 2. Zaha Hadid Architects, Kartal-Pendik Masterplan, Istanbul, Turkey, 2006

In the past 2-3 decades, digital technologies have had a significant influence on architectural design. From the early use of digital drafting applications to the more experimental contemporary use of generative design tools, parametric design has now come to play a major role in architectural development. So pervasive is the application of its techniques that parametric design is now evidenced at all scales from architecture to interior design to large urban design applications. In July/Aug 2008 Patrik Schumacher, a partner at Zaha Hadid Architects, wrote an article "Parametricism: A New Global Style for Architecture and Urban Design" that proclaimed parametricism as the new profound style for architecture and urbanism. Schumacher believes that parametricism is establishing hegemony within avant-garde architectural practice today due to its creative exploitation of parametric design systems to articulate increasingly complex social processes and institutions.² Instead of reliance on rigid

1 Pallasmaa [The Eyes of the Skin: Architecture and the Senses](#) p8

2 Schumacher "Parametricism: A New Global Style for Architecture and Urban Design" p16

geometrical figures, parametricism is in favor of architectural elements that are considered to be parametrically malleable, which Schumacher believes “delivers complex order for complex social institutions.”³ The potential for such complexity is reflected in its methodological rules:⁴

Negative Principles

- Avoid rigid forms (squares, triangles and circles)
- Avoid simple repetition (lack of variety)
- Avoid collage of isolated, unrelated elements (lack of order)
- Avoid rigid functional stereotypes
- Avoid segregative functional zoning

Positive Principles

- All forms must be parametrically malleable (soft)
- All systems must be differentiated gradually (gradients) and interdependent (correlations)
- All functions are parametric activity scenarios
- All activities communicate with each other

The terms “elegance” and “continuous differentiation” are the products of these parametric negative and positive principles. Ali Rahim and Hina Jamelle in “Elegance in the Age of Digital Technique” describe the concept of elegance as a concern for “...refinement, precision and formal opulence. It integrates an aesthetic desire, unleashing a visual intelligence pertinent for all design fields at all scales.”⁵ Despite parametricism’s unique capacity to articulate programmatic complexity, this thesis argues that a critical deficiency in parametricism involves the prioritization of aestheticism rather than personal experience as the medium through which archi-

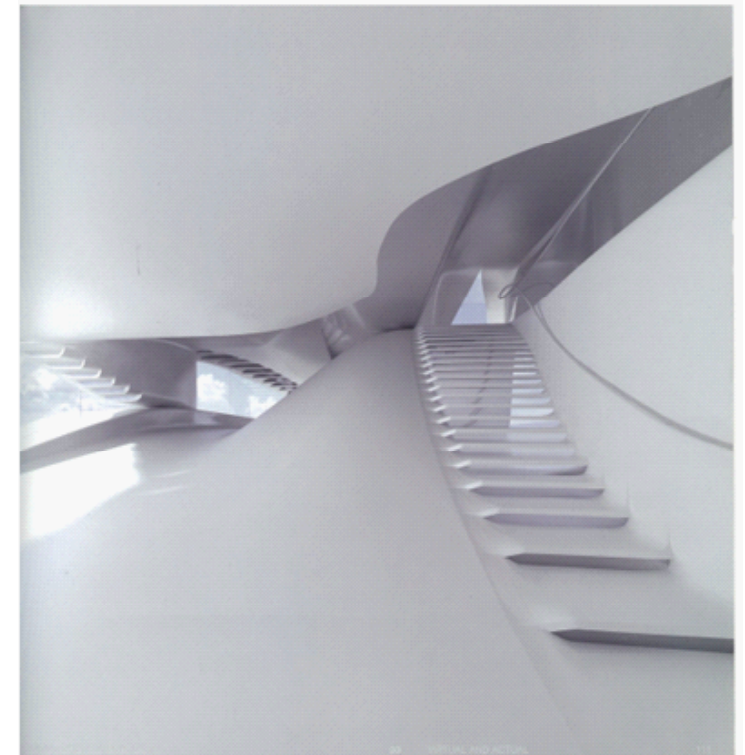


Figure 3. Ali Rahim. Residence for a Fashion Designer, London, UK. 2002

3 Schumacher “Patrik Schumacher on Parametricism - ‘Let the style wars begin’” unpaginated

4 Ibid

5 Rahim and Jamelle “Elegance in the Age of Digital Technique” p6

texture is produced, promoted, and evaluated. Schumacher speaks of parametricism's aim for visual amplification: "Aesthetically, it is the elegance of ordered complexity and the sense of seamless fluidity, akin to natural systems that constitute the hallmark of parametricism."⁶

Juhani Pallasmaa is a Finnish architect and scholar whose focus on the phenomenology of architecture has consistently addressed concerns about this predominantly non-tectonic architecture of our time:

The current industrial mass production of visual imagery tends to alienate vision from emotional involvement and identification, turning imagery into a mesmerizing flow devoid of focus and participation... The cancerous spread of architectural imagery devoid of tectonic logic and materiality is clearly part of this process.⁷

In one of his essays, "Geometry of Feeling: The Phenomenology of Architecture", he argues that "the buildings of our time may arouse our curiosity with their daring or inventiveness, but they give us little sense of the meaning of our world or our own existence."⁸ He further adds that, "Design has become so intensively a kind of game with form that the reality of how a building is experienced has been overlooked."⁹ He believes contemporary architecture has often been over-intellectualized leading to the deprivation of human existential questions:

The current over-emphasis on the intellectual and conceptual dimensions of architecture further contributes to the disappearance of the physical, sensual and embodied essence of architecture. Contemporary architecture posing as the avant-garde is often more engaged with the architectural discourse itself and mapping the possible marginal territories of the art, than responding to human existential questions.¹⁰

He argues that "We make the mistake of thinking of, and assessing, a building as a formal composition, no longer understanding that it is a metaphor, let alone experiencing the other reality that lies behind the metaphor..."¹¹ In addition to practical objectives, architectural structures have a significant existential and experiential task. Pallasmaa's writings are important in this thesis argument because he critically

6 Schumacher "Parametricism: A New Global Style for Architecture and Urban Design" p16

7 Pallasmaa [The Eyes of the Skin: Architecture and the Senses](#) p14

8 Pallasmaa "The Geometry of Feeling: The Phenomenology of Architecture" p242

9 Ibid

10 Pallasmaa [The Eyes of the Skin: Architecture and the Senses](#) p22

11 Pallasmaa "The Geometry of Feeling: The Phenomenology of Architecture" p243



Figure 4. Daniel Libeskind. Jewish Museum, Berlin, Germany. 1999

evaluates why architecture needs to inform a direct expression of existence, of human presence in the world, in the sense that architecture needs to consider the integration of sensory response mechanisms and base itself on the language of the body (haptic memory). Most importantly he believes that contemporary architecture has been over-intellectualized and aesthetically emphasized leading to a sensory deprivation and detachment from emotions and identification. Parametric architecture is lacking these essential qualities because of its defining methodologies and aesthetical aspirations. Pallasmaa believes that consideration of structure and weight, light and shadow, materiality and time, are all necessary to stimulate a multi-sensory experience that will “enable us to structure, understand and remember the shapeless flow of reality and, ultimately, to recognize and remember who we are.”¹²

It is not the aim of this thesis to express a conservative view towards parametric architecture; rather the thesis seeks opportunities to further enhance parametric architecture through engagement to our sensory and perceptual experience in architecture. Thus, the ultimate objective of the thesis is to explore how parametric architecture, with its capability of articulating programmatic complexity, can further advance by addressing the deficiencies that Pallasmaa has described to achieve a sense of temporality, experiential depth and sense of belonging. Kent C. Bloomer and Charles W. Moore also acknowledged this deficiency in their book *Body, Memory, and Architecture*: “What is missing from our dwellings today are the potential transactions between body, imagi-

12

Pallasmaa *The Eyes of the Skin: Architecture and the Senses* p50

nation, and environment.”¹³ They note that there appeared to be an assumption that “architecture is a highly specialized system with a set of prescribed goals rather than a sensual social art responsive to real human desires and feelings.”¹⁴

Pallasmaa asserts that it is possible to identify two different types of architecture in our age: “the architecture of essence and the architecture of form. The architecture of essence perceives the metaphysical and existential problem of being human and tries to reinforce man’s foothold on earth. The architecture of form aims at capturing the viewer’s attention and approval through its voluble language of expression or through an appeal to indolence.”¹⁵ Thus the comment by Vincent Scully: “The stuff all of us are consuming seems less and less nourishing. It is not surprising that our architecture reflects that condition.”¹⁶

Parametric architecture needs to rethink its over-intellectualized and visual-dominant methodology by engaging our senses and human identification. Architectural historian and theorist (McGill University School of Architecture) Dr. Alberto Pérez-Gómez in “The Space of Architecture: Meaning as Presence and Representation” states, “...we simply cannot afford to give up our quest to identify what constitutes a meaningful order for human life, the promotion and perpetuation of which has been the inveterate concern of architecture... Fully to address the dangers of aestheticism, reductive functionalism and either conventional or experimental formalism, architecture must consider seriously the potential of narrative as the structure of human life, a poetic vision realized in space-time.”¹⁷ A re-emphasis on these qualities will enrich parametric architecture with existential meanings, as Pallasmaa claims, “[enabling] us to perceive and understand the dialectics of permanence and change, to settle ourselves in the world, and to place ourselves in the continuum of culture and time.”¹⁸

13 Bloomer and Moore Body, Memory, and Architecture p44

14 Ibid pix

15 Pallasmaa “The Limits of Architecture” p293

16 Scully “Buildings without Souls” p116

17 Pérez-Gómez “The Space of Architecture: Meaning as presence and Representation” p23

18 Pallasmaa The Eyes of the Skin: Architecture and the Senses p50

II. A PHENOMENOLOGICAL APPROACH

This section begins with a review of phenomenology and the different phenomenological approaches to architecture as discussed by philosophers Edmund Husserl (the founder) and Maurice Merleau-Ponty and by architectural theorists Alberto Pérez-Gómez, David Seamon and Juhani Pallasmaa. The principal aim of the section is to highlight the ways in which a phenomenological approach is able to respond to the metaphysical and existential issues of human measure in response to visual experiences within a building.

Phenomenology concerns the study of essences; architecture has the potential to put essences back into existence.¹⁹

Phenomenology analyzes basic human sensory responses; it acknowledges the state of being fully conscious of, or aware of, individual experience and its method has become an important means of examining architecture. The first philosophical movement of phenomenology was founded in the early twentieth century by philosopher Edmund Husserl [1858-1938].²⁰ Husserl defined phenomenology as “the reflective study of the essence of consciousness as experienced from the first person point of view”.²¹ Following in the footsteps of Husserl, French phenomenological philosopher Merleau-Ponty [1908-1961] in *Phenomenology of Perception* defined phenomenology as “the study of essences: and according to it, all problems amount to finding definitions of essences: the essence of perception, or the essence of consciousness, for example.”²² His philosophy is based around the imperative that the human body is at the centre of the experiential world. “Our own body is in the world as the heart is in the organism: it keeps the visible spectacle constantly alive, it breathes life into it and sustains it inwardly, and with it forms a system.”²³ Pallasmaa [1936-] later applied this concept to architecture as a means of “pure looking at” the phenomenon, or “viewing its essence.”²⁴ According to Pallasmaa, phenomenology is opposite to the analysis of the physical proportions and properties of the building or a stylistic frame of reference. Phenomenology of architecture is instead “looking at” architecture from within the conscious experiencing of it, through architectural experience as a metaphor for human existence. Phenomenological conditions are able to

19 Holl [Intertwining](#) p11

20 Husserl [The Idea of Phenomenology](#) p19

21 Husserl [Phenomenology and the Crisis of Philosophy](#) p

22 Merleau-Ponty [Phenomenology of Perception](#) pvii

23 Ibid p203

24 Pallasmaa “The Geometry of Feeling: The Phenomenology of Architecture” p244

influence the basic emotions associated with the images a building creates. A phenomenological approach is crucial to the thesis argument because it allows for the recognition of collective similarities, identities, and differences in the continuum of our experience.²⁵ According to Alberto Pérez-Gómez, "Phenomenology has revealed common 'referents' underlying languages, and a shared basis can also be found for the social enterprises we call art and architecture."²⁶ Additionally, David Seamon, an environment-behavior researcher and Professor of Architecture at Kansas State University points out that phenomenology has become important in the literature of both environmental-behavior research and design. "Architects and other designers have become interested in phenomenology largely because of a practical crisis: the frequent failure of both architectural formalism and functionalism to create vital, humane environments."²⁷ Phenomenology offers a more realistic way of understanding daily environmental experiences and behaviors.²⁸ The aim, he says, is understanding, a search for meanings rather than a search for causes.²⁹

25 Pérez-Gómez Built Upon Love: Architectural longing after ethics and aesthetics p140

26 Ibid

27 Seamon "Phenomenology and Environment-Behavior Research" p4

28 Ibid p6

29 Seamon "The Phenomenological Contribution to Environmental Psychology" p123



Figure 5. Inside the Pantheon. Rome, Italy

III. MULTI-SENSORY EXPERIENCE

This section focuses on a phenomenological approach that incorporates multi-sensory experience. The section examines five different sensory systems categorized by J.J. Gibson that he argues provide a critical understanding of how these senses are able to strengthen and articulate our experience of reality. The aim of this section is to critically consider the importance for parametric architecture of engaging these sensory systems in order to heighten phenomenal experience.

Many prominent contemporary architects/theorists such as Maurice Sauzet, Steven Holl, Peter Zumthor, Daniel Libeskind and Tadao Ando have adopted a phenomenological approach to architecture, an approach that incorporates a multi-sensory experience of place-making, striving towards a methodology of creating existential spaces through sensory and sensual qualities. In “Questions of Perception – Phenomenology of Architecture”, Holl argues, “Architecture holds the power to inspire and transform our day-to-day existence... To see, to feel these physicalities is to become the subject of the senses.”³⁰ He believes that, “Architecture, more fully than other art forms, engages the immediacy of our sensory perceptions.”³¹ When “Sensory experience is intensified; psychological dimensions are engaged.”³² Likewise, Tadao Ando states, “In architecture, there is a part that is the result of logical reasoning and a part that is created through the senses. There is always a point where they clash.”³³ American philosopher David Abram, whose work is informed by Maurice Merleau-Ponty, points out that unlike the mathematics-based sciences, phenomenology seeks not to explain the world objectively but to describe the manner in which the world makes itself evident to awareness through direct, sensorial experience.³⁴ French architect Maurice Sauzet writes: “Between the inhabitant and his dwelling there is a dialogue... I tried to make use of sensory phenomenology in my projects. To imagine places to be lived in, and for the relationship of the occupant to his dwelling in which every space tends towards an awakening of the deepest recollections of the self.”³⁵ It is from such a phenomenological approach that Pallasmaa proclaims in his polemical statement *The Eyes of the Skin: Architecture and the Senses* that the human body is equipped with sensory systems which we identify with space, place or moment, and he adds that these

30 Holl “Questions of Perception: Phenomenology of Architecture” p40

31 Ibid p41

32 Holl “Questions of Perception: Phenomenology of Architecture” p91

33 Jodidio Ando: Complete Works p9

34 Abram The Spell of the Sensuous p35

35 Sauzet “Sensory Phenomena as a Reference for the Architectural Project” p153

dimensions reflect our existence:

Sensory experiences become integrated through the body or rather, in the very constitution of the body... Our bodies and movements are in constant interaction with the environment; the world and the self inform and redefine each other constantly. The percept of the body and the image of the world turn into one single continuous existential experience – there is no body separate from its domicile in space, and there is no space unrelated to the unconscious image of the perceiving self.³⁶

Pallasmaa's central argument is strongly based around the imperative to integrate all our sensory responses rather than to prioritize any one over the other. He argues that, "Every touching experience of architecture is multi-sensory; qualities of matter, space and scale are measured equally by the eye, ear, nose, skin, tongue, skeleton and muscle."³⁷ Our experience in architecture does not merely rely on a single sensory experience, but rather on a collective environment fusing and stimulating all our senses. Pallasmaa states, "One's sense of reality is strengthened and articulated by the interaction of the senses."³⁸ In "Emotional and Cognitive Responses to Sensory Information" Sally Augustin writes, "The effects of our sensory experiences are additive – that means that we need to total up the various influences of each of our individual sensations to determine our final psychological state."³⁹ Most experiences of articulated space in parametric architecture have been reduced to a single experience of sensory mode; with architecture that prioritizes aestheticism, reductive functionalism and experimental formalism, sensory and bodily experiences have been disregarded. Pallasmaa describes how our experience of architecture involves more than just mere vision or any one of the five classical detached senses; instead, it involves a fusion between senses to form different sensory systems. Pallasmaa refers to the work of psychologist J.J. Gibson, who has taken the five classical senses and reformulated them into active, highly inclusive systems that he categorizes as: haptic system, auditory system, taste-smell system, visual system, and basic-orienting system.⁴⁰ Gibson's categorization regarded the senses as aggressive, seeking mechanisms instead of merely passive sensation receivers. In accord with Bloomer and Moore, Gibson described these five sensory systems as "perceptual 'systems' capable of obtaining information

36 Pallasmaa [The Eyes of the Skin: Architecture and the Senses](#) p27

37 Ibid p28

38 Ibid

39 Augustin "Emotional and Cognitive Responses to Sensory Information" p39

40 Gibson [The Senses Considered as Perceptual systems](#) p32

about objects in the world without the intervention of an intellectual process.”⁴¹ The feeling of buildings and our sense of identification with them are more significant to our architectural experience than the information they give us. Gibson’s model of perception allows us to better understand some of the fundamental elements that generate phenomenal experience in architecture.

Name	Mode of Attention	Receptive Units	Anatomy of the Organ	Activity of the Organ	Stimuli Available	External Information Obtained
The Haptic System	Touching	Mechano-receptors and possibly Thermo-receptors	Skin (including attachments and openings), Joints (including ligaments), Muscles (including tendons)	Exploration of many kinds	Deformation of tissues, Configuration of joints, Stretching of muscle fibers	Contact with the earth, Mechanical encounters, Object Shapes, Material States, Solidity or viscosity
The Auditory System	Listening	Mechano-receptors	Cochlear organs with middle ear and auricle	Orienting to sounds	Vibration in the air	Nature and location of vibratory events
The Taste-Smell System	Smelling	Chemo-receptors	Nascal cavity (nose)	Sniffing	Composition of the medium	Nature of volatile sources
	Tasting	Chemo- and mechano-receptors	Oral cavity (mouth)	Savoring	Composition of ingested objects	Nutritive and biochemical values
The Visual System	Looking	Photo-receptors	Ocular mechanism (eyes, with intrinsic and extrinsic eye muscles, as related to the vestibular organs, the head and the whole body)	Accommodation, Pupillary adjustment, Fixation, convergence exploration	The variables of structure in ambient light	Everything that can be specified by the variables of optical structure (information about objects, animals, motions, events, and places)
The Basic Orienting System	General Orientation	Mechano-receptors	Vestibular Organs	Body Equilibrium	Forces of gravity and acceleration	Direction of gravity, being pushed

Figure 6. The perceptual systems, 1966. From James J. Gibson, *The Senses Considered as Perceptual Systems*

41 Bloomer and Moore *Body, Memory, and Architecture* p33

IV. GIBSON'S FIVE SENSORY SYSTEMS

1. Haptic System

The haptic realm of architecture is defined by the sense or memory of touch, which includes our perception of weight and materiality. When the materiality of the details forming an architectural space become evident, the haptic realm is opened up. Sensory experience is intensified; psychological dimensions are engaged.⁴²

Gibson referred to the haptic system as a sense of touch that includes temperature, pain, pressure, and kinesthesia, encompassing both body sensation and muscle movement. It is a system in which human beings are literally in contact with their environment. Pallasmaa emphasizes the haptic experience as the key to a multi-sensory spatial experience. A sense or memory of touch arises from the experience of directly touching the elements and components of space by way of body and use. In essence, all of our senses are extensions of touch, since ears, nose, mouth and eyes are specializations of the skin, the most sensitive of our organs. Pallasmaa states that "Touch is the sensory mode that integrates our experience of the world and ourselves. Even visual and other perceptions are fused and integrated into the haptic continuum of the self; my body remembers who I am and how I am located in the world."⁴³ There is evidence that haptic perception is enhanced when combined with visual information. In *Town and Square, from Algora to the Green Village*, German-born architect Paul Zucker comments: "Space is perceived by the visualization of its limits and by kinesthetic experience, i.e., by the sensation of our movements. In the state of 'visual tension,' kinesthetic sensation and visual perception fuse most intensely."⁴⁴ Besides active touch, kinesthetic perception is also an important aspect of the



Figure 7. Herzog & De Meuron. Dominus Winery, California, USA. 1998

42 Holl "Questions of Perception: Phenomenology of Architecture" p91

43 Pallasmaa *Tangible Light: Integration of the senses and Architecture* p10

44 Zucker *Town and Square, from Algora to the Green Village* p6

haptic system. Kinesthetic perception specifically refers to the information that we derive from the movement of the muscles. Joy Monice Malnar and Frank Vodvarka in *Sensory Design* write, "The important aspect of kinesthesia is that the muscle response is highly informative; it tells us how far away objects are, the composition of materials, and the distance we have traveled. When kinesthesia is coupled with active touch, the information is increased, allowing us to become aware of the surface qualities of the path we are on."⁴⁵

2. Auditory system

Buildings do not react to our gaze, but they do return our sound back to our ears... [S]ound often provides the temporal continuum in which visual impressions are embedded.⁴⁶

Gibson believed that the function of the auditory system is not merely to permit hearing. He states, "Its exteroceptive function is to pick up the direction of an event, permitting orientation to it, and the nature of an event, permitting identification of it."⁴⁷ The size and quality of space is not only visual, it can also be manipulated with sound. Every building or space creates its characteristic sound of intimacy or monumentality, rejection or invitation, hospitality or hostility.⁴⁸ It is crucial to understand that sound has its own spatial quality. The reverberation time speaks about the shape and size of a space while the tone provides us information about the softness and structure of the materials. According to Holl, "The live reflection of echo and re-echo within a stone cathedral increases our awareness of the vastness, geometry and material of its space... Sound is absorbed and perceived

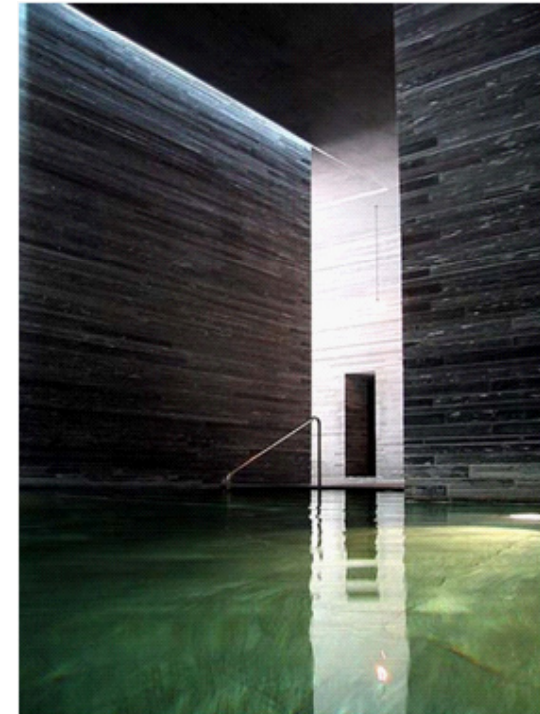


Figure 8. Peter Zumthor. Vals Thermal Bath, Graubünden, Switzerland. 1996

⁴⁵ Malnar and Vodvarka *Sensory Design* p146

⁴⁶ Pallasmaa *The Eyes of the Skin: Architecture and the Senses* p34

⁴⁷ Gibson *The Senses Considered as Perceptual systems* p57

⁴⁸ Pallasmaa *The Eyes of the Skin: Architecture and the Senses* p35

by the entire body.”⁴⁹ Similarly, Pallasmaa tells us that “A space is conceived and appreciated through its echo as much as through its visual shape, but the acoustic percept usually remains an unconscious background.”⁵⁰ Sight makes us solitary, while hearing creates a sense of connection and solidarity. The sense of sound is also understood by Pallasmaa in terms of silence, time and solitude. The architectural experience of silence, whether in a church or any space, focuses attention on one’s very existence. It makes one aware of one’s fundamental solitude. According to Pallasmaa, “The silence of architecture is a responsive, remembering silence. A powerful architectural experience silences all external noise; it focuses our attention on our very existence, and as with all art, it makes us aware of our fundamental solitude.”⁵¹

3. Taste-smell System

...blandness makes for undifferentiated spaces and deprives us of richness and variety in our life. It also obscures memories, because smell evokes much deeper memories than either vision or sound.⁵²

Gibson combined taste and smell, as they usually function in concert and can be regarded as alternative ways to experience similar phenomena.⁵³ The taste-smell system has the innate capability to facilitate our memory and imagination of place. A certain scent can bring us back to just about every significant event in the past with the same scent. The sense of smell as



Figure 9. Tadao Ando. Chichu Art Museum, Naoshima, Kagawa, Japan. 2004

49 Holl “Questions of Perception: Phenomenology of Architecture” p41

50 Pallasmaa The Eyes of the Skin: Architecture and the Senses p35

51 Ibid p36

52 Hall The Hidden Dimension p45

53 Gibson The Senses Considered as Perceptual systems p152

Pallasmaa describes makes us knowingly re-enter a space that has been erased from the memory of sight; the nostrils stimulate a forgotten image; the nose makes the eyes remember.⁵⁴ The most persistent memory of any space comes from the odor. Pallasmaa recognizes that, "Fishing towns are especially memorable because of the fusion of the smells of the sea and of the town; the powerful smell of seaweed makes one sense the depth and weight of the sea, and it turns any prosaic town into the image of the lost Atlantis."⁵⁵ Taste of stone, as Pallasmaa calls it, is explained through subtle transition between tactile and taste experiences. "Vision becomes transferred to taste as well; certain colours and delicate details evoke oral sensations. A delicately coloured, polished stone surface is subliminally sensed by the tongue. Our sensory experience of the world originates in the interior sensation of the mouth, and the world tends to return back to its oral origins."⁵⁶ We do not need to add smell or taste to a built environment but it is crucial to understand that we carry memories of these things which affect our relationship to spaces.



Figure 10. Gable Wall with door to hay loft, Videm

54 Pallasmaa [*The Eyes of the Skin: Architecture and the Senses*](#) p38

55 Ibid

56 Ibid pp41-42

4. Visual System

Vision reveals what the touch already knows. We could think of the sense of touch as the unconscious of vision.⁵⁷

In *The Perception of the Visual World*, Gibson noted that one could describe the visual world as “extended in distance and modelled in depth; it is upright, stable, and without boundaries; it is coloured, shadowed, illuminated, and textured; it is composed of surfaces, edges, shapes, and interspaces; finally... it is filled with things that have meaning.”⁵⁸ All the senses, including vision, are extensions of tactility, the visual world is never flat like a surface on which a picture is painted or projected.⁵⁹ According to Pallasmaa, “Even the eye touches; the gaze implies an unconscious touch, bodily mimesis and identification.”⁶⁰ As we look at a surface of a material, we immediately sense its weight, density, temperature and moistness. Tactility can be regarded as the unconsciousness of vision, and without these sensory interchanges our visual world would be lifeless, a mere picture, instead of projecting a sense of a lived and continuous world. According to Pallasmaa “our eyes stroke distant surfaces, contours and edges, and the unconscious tactile sensation determines the agreeableness or unpleasantness of the experience.”⁶¹ The eye offers us a sense of separation and distance, whereas touch offers the sense of nearness, intimacy and affection.⁶²

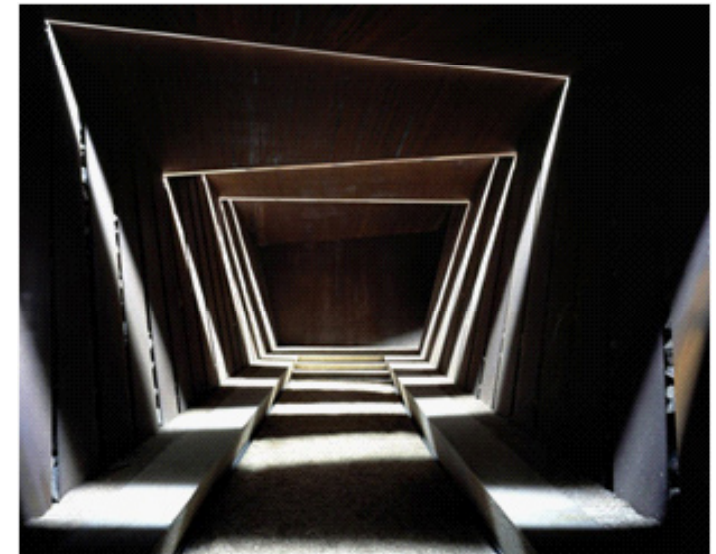


Figure 11. RCR Arquitectes. Bell-Lloc Cellars, Girona, Spain. 2005-07

57 Pallasmaa *The Eyes of the Skin: Architecture and the Senses* p29

58 Gibson *The Perception of the Visual World* p3

59 Ibid p42

60 Pallasmaa *The Eyes of the Skin: Architecture and the Senses* p29

61 Ibid pp29-30

62 Ibid p32

5. Basic-orienting System

The body knows and remembers. Architectural meaning derives from archaic responses and reactions remembered by the body and the senses.⁶³

Gibson theorized that the basic-orienting system is based on the relationship between the horizontal ground plane and our vertical posture, “the direction up-down and to the plane of the ground”.⁶⁴ He stated that the resulting orientation leads us to seek a symmetrical balance, and that our senses are always directed to that end.⁶⁵ Similarly, Bloomer and Moore assert, “A consequence of this postural orientation is our need to symmetrize frontally the stimulus impinging on the senses of sight, sound, touch, and smell.”⁶⁶ It is an orientation that involves a total body balance. Additionally, Pallasmaa stated, “when experiencing our structure, we unconsciously mimic its configuration with our bones and muscle... [T]he structure of a building is unconsciously imitated and comprehended through the skeletal system.”⁶⁷ Movement, balance and scale are felt unconsciously through the body. Thus, understanding architectural scale stimulates the unconscious measuring of the building with one’s body.⁶⁸ We are constantly interacting with the environment through our bodily sensations.



Figure 12. Louis Kahn. The Salk Institute, California, USA. 1966

63 Pallasmaa [The Eyes of the Skin: Architecture and the Senses](#) p43

64 Gibson [The Senses Considered as Perceptual systems](#) p59

65 Ibid p71

66 Bloomer and Moore [Body, Memory, and Architecture](#) p34

67 Pallasmaa [The Eyes of the Skin: Architecture and the Senses](#) p47

68 Ibid p47

Only by reconnecting our bodies to our surroundings through the integration and recognition of all our senses may we restore our sense of human identity within the larger context of the built environment. It is crucial for architecture to offer a phenomenal experience which successfully engages our senses, the common denominator that certain fundamental elements share to stimulate these senses and create an awareness of being. Contemporary architects such as Tadao Ando, Peter Zumthor and Steven Holl are known for creating spaces that bring phenomenological experiences to visitors or observers. These phenomenal spaces are able to slow down our sense of experience or even bring us to a pause while invoking our imagination and reinforcing awareness of our own unique existence. For Merleau-Ponty, space is one of the structures which expresses our being in the world: "We have said that space is existential; we might just as well have said that existence is spatial."⁶⁹ Peter MacKeith describes in "A Full and Dignified Life", "It is the slowed passage of time that allows the tactile experience to resonate within one's consciousness long after departing from the design..."⁷⁰

Ultimately, the challenge for parametric architecture is to express these experiences by stimulating the sensory systems: "to heighten phenomenal experience while simultaneously expressing meaning".⁷¹ Pallasmaa believes, "Architecture is the art of reconciliation between ourselves and the world, and this mediation takes place through the senses."⁷² Merleau-Ponty concurs that the task of architecture is "to make visible how the world touches us."⁷³



Figure 13. Merx + Girod Architecten. Selexyz Dominicanen Bookstore, Netherland. 2005- 07

69 Merleau-Ponty *Phenomenology of Perception* p293

70 MacKeith "A Full and Dignified Life" pp222-223

71 Holl "Questions of Perception: Phenomenology of Architecture" p42

72 Pallasmaa *The Eyes of the Skin: Architecture and the Senses* p50

73 Merleau-Ponty "Cézanne's Doubt" p9



Figure 14. Tadao Ando. Chichu Art Museum, Naoshima, Kagawa, Japan. 2004

V. ARGUING FOR THE INTEGRATION OF PHENOMENAL PROPERTIES IN PARAMETRIC ARCHITECTURE

The objective of this section is to further elucidate the importance for parametric architecture of integrating phenomenal properties without losing its intellectual and conceptual strengths – a collaboration between the two opposites. The section begins by addressing three fundamental architectural qualities which distinctly differentiate parametricists from phenomenologists: weight / weightlessness, light / shadow, and materiality / time. These qualities are imperative to phenomenologists yet purposefully eliminated by parametricists. The thesis argues that these qualities are essential to achieving a human sense of temporality, and parametric design imperatives such as ‘continuous differentiation’ and ‘elegance’ can remain even once these phenomenal qualities are applied.

The authenticity of architectural experience is grounded in the tectonic language of building and the comprehensibility of the act of construction to the senses. We touch, listen and measure the world with our entire bodily existence and the experiential world becomes organized and articulated around the centre of the body.⁷⁴

A memorable experience in architecture can be distinguished when all our senses are engaged simultaneously due to phenomenological imperatives during the design process. According to Pallasmaa, “Every act of construction has its unconscious motives and reflects a meta-physical position – a specific understanding of the world.”⁷⁵ The architectural experience of temporal depth is reinforced by a number of design choices that are frequently being addressed through phenomenological studies in architecture. The sensual use of weight and gravity, deep dark shadows, and the transformative qualities of materiality over time are phenomenal properties generally considered as essential by phenomenologists to establish an experiential continuum. These elements have been constantly projected, observed and analyzed by phenomenological architects such as Alvar Aalto, Tadao Ando, Peter Zumthor and Steven Holl to prioritize meaningful sensory interaction over idealization and intellectualized manifestations. Additionally, these elements have been considered important aspects for deep understanding of human sensitivities in architecture of the past. The late 19th century English art and architecture critic John Ruskin wrote, “I do not believe that ever any building was truly great, unless it had mighty masses, vigorous and deep, of shadow mingled with its surface. And among the first habits that an architect should learn, is that of thinking in shadow... conceiving it as it will be when dawn lights it, and dusk

74 Pallasmaa [The Eyes of the Skin: Architecture and the Senses](#) p46

75 Pallasmaa “Constructing Essences” p6

leaves it; when its stones will be hot and its crannies cool...⁷⁶ Here again, what was of primary importance is that these fundamental elements are able to create a sense of temporality, experiential depth and sense of belonging when they all fuse into one complex phenomenal experience of architecture. Pallasmaa asserts,

In moving architectural experiences, space, material, and time seem to unite into a single dimension that penetrates our awareness. In these experiences, space takes on more gravity, as it were – the character of light becomes tangible, time seems to stop, the space, this moment, and they all become part of our body and consciousness. The experience of place returns the experience to ourselves: at bottom it is an experience of the self. An architectural space touches something deep and familiar in us.⁷⁷

Opposing the phenomenal and sensory concern of phenomenologists, a radically different, alternative mode of design is afforded by the principles of parametric architecture towards a dominant aspiration of elegance and ordered complexity. Parametric architecture generally aspires toward qualities of lightness and fluidity, sensual use of light to outline continuity of surface, and the perfection of materiality for a parametrically malleable form. These properties establish conditions of elegance that are able to create systems, functions and activities that are gradually differentiated to enhance smooth circulated flow. Schumacher states that arguing for elegance in a parametric built environment “allows for an increased programmatic complexity to coincide with a relative reduction of visual complication by means of integrating multiple elements into a coherent and continuous formal and spatial system.”⁷⁸ He believes that elegance has the, “capacity to articulate complex life-processes in a way that can maintain overall comprehension, legibility and continuous orientation within the composition.”⁷⁹

The inherent differences between both forms of architecture have already been described. Yet, the dissimilarities must be acknowledged with equal emphasis. A closer examination of their diverse approaches to weight /weightless, light / shadow, and materiality / time establishes how the metaphysical grounding of the human experience might also occur within a parametric built environment.

76 Ruskin *The Seven Lamps of Architecture* par. 13

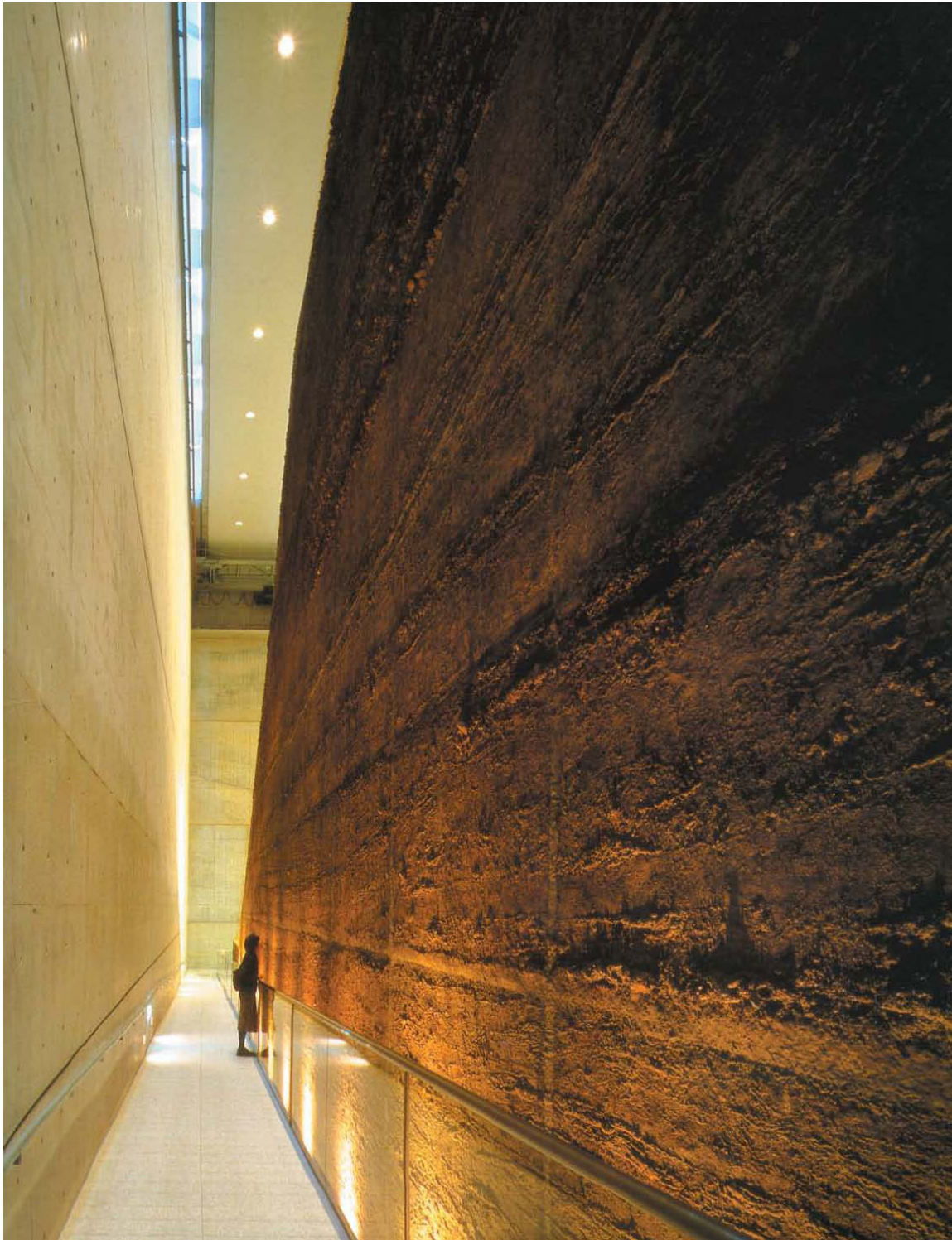
77 Pallasmaa “The Place of Man” p75-76

78 Schumacher “Arguing for Elegance” p35

79 Schumacher “Arguing for Elegance” p35



Figure 15. SANAA. Rolex Learning Center, Switzerland. 2010



1. Weight and Weightlessness (The Aesthetics of Gravity)

A phenomenal architecture calls for both the stone and the feather. Sensed mass and perceived gravity directly affect our perceptions of architecture.⁸⁰

Figure 16. Tadao Ando. Sayamaike Museum, Osaka, Japan. 2001

The comprehension of weight and structure are critical in enabling the inhabitant to achieve a sense of belonging. Structure in a space gives the sense of freedom, openness and choice to its inhabitants, while weight brings the sense of gravity to its inhabitants. Parametricist principles, however, push in a distinctly different direction, in the course of establishing visual amplification and complex variegated spatial orders. Parametric architecture defies traditional notions of gravity in its pursuit of 'elegance' and ordered complexity. Parametric elegance is defined by David Goldblatt in "Lightness and Fluidity: Remarks Concerning the Aesthetics of Elegance" as "an aesthetic quality that presents itself in varying degrees of intensity and self-evidence, it emerges from the further aesthetic properties of lightness and fluidity."⁸¹ Elegance is often associated with a kind of fluidity, smoothness of surface and style. Goldblatt adds that parametric "... elegance is a thin, bare-boned quality of refined organization and efficiency and even in its complexity exhibits an appearance of lightness that is intensified by its suggestion of forms on the move."⁸² In an elegant composition, lightness is defined as an anti-gravitational sense in which forms are created to seemingly defy gravity. Goldblatt argues that, "The presence of elegance helps to deconstruct architecture's traditional essence of solidity, strength and weight, and with the shedding of the appearance of architecture's gravity comes a move towards a popular notion of elegance."⁸³ Schumacher in "Arguing for Elegance" describes how elegance in architecture suggests sophistication and articulates complexity.⁸⁴ "The elegance being promoted here instead thrives on complexity, and

81 Goldblatt "Lightness and Fluidity: Remarks concerning the Aesthetics of Elegance" p12

82 Ibid

83 Ibid p17

84 Schumacher "Arguing for Elegance" p30



Figure 17. Moshe Safdie. Holocaust History Museum, Jerusalem, Israel. 2005

achieves a visual reduction of an underlying complexity that is thereby sublated rather than eliminated."⁸⁵ Similarly, Schumacher believes "elegance is certainly a much more clever choice than the traditional theoretical heavyweight 'beauty'".⁸⁶ Ultimately, according to Rahim and Jamelle, the pursuit of elegance in parametric architecture produces a built environment of refinement, precision and formal opulence. It integrates an aesthetic desire, unleashing a visual intelligence applicable for all design fields at all scales.⁸⁷ They believe that "The concept of elegance has the ability to push forward the discourse of contemporary architecture by accepting that complex architectural compositions require an accompanying visual aesthetic as sophisticated as the current techniques used to generate form."⁸⁸

While elegance in parametric architecture is the driving force of aesthetic demand, this thesis argues that it should still aim to realize the strong phenomenal properties of gravity and structure. Our inherent understanding of gravitational forces in a building is necessary for a connection to the human experience, allowing for emotional involvement and identification. According to Pallasmaa, "The sense of gravity is the essence of all architectonic structures and great architecture makes us conscious of gravity and earth. Architecture strengthens verticality of our experience of the world. At the same time that architecture makes us aware of the depth of earth, it makes us dream of levitation and flight."⁸⁹ By losing our awareness of gravity in an architectural structure, we potentially lose our bodily identification as well. In 1924

85 Schumacher "Arguing for Elegance" p30
86 Ibid
87 Rahim and Jamelle "Elegance in the Age of Digital Technique" p6
88 Ibid
89 Pallasmaa "An Architecture of the Seven Senses" p37

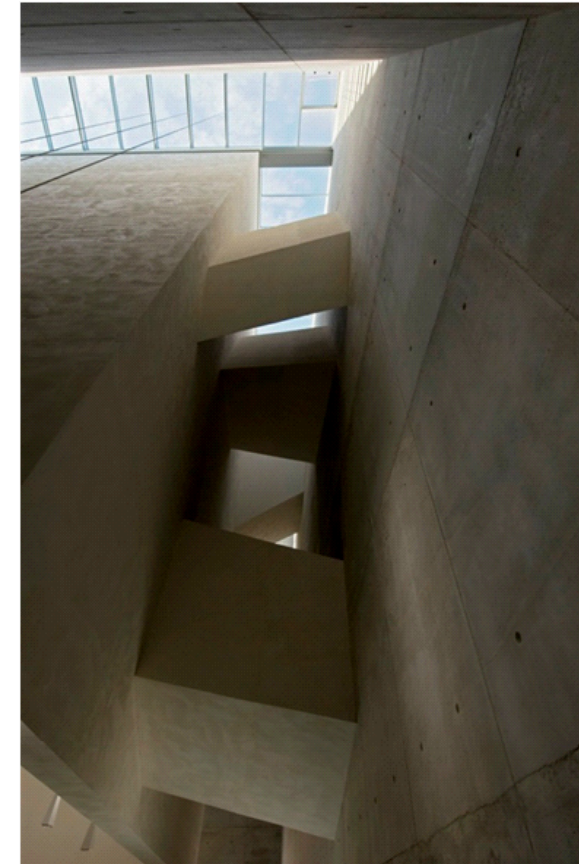


Figure 18. fuksas architects. New Church in Foligno, San Paola, Italy. 2009



Figure 19. Alberto Campo Baeza. Caja General Headquarters, Granada. 2001

Geoffrey Scott in *The Architecture of Humanism* wrote that because weight, pressure, and resistance are part of our habitual body experience, our unconscious mimetic instinct impels us to identify ourselves with these characteristics in the forms we see.⁹⁰ Scott stated: “In any building three things may be distinguished: the bigness which it actually has (mechanical measurement), the bigness which it appears to have (visual measurement), and the feeling of bigness which it appears to have (visual measurement). The last two have often been confused, but it is the feeling of bigness which alone has aesthetic value.”⁹¹ In contrast to a singular, monistic philosophy, Italo Calvino mused in one of his last texts, “Six Memos for the Next Millennium”, “we should remember that the idea of the world as composed of weightless atoms is striking just because we know the weight of things so well...”⁹² It is in this sense that parametric architecture’s pursuit of elegance could be further enhanced by incorporating a sense of weight that enables it to be responsive to the human condition. A phenomenal architecture, as Holl states, calls for both “the stone and the feather” – that being his notion of how both weight and weightlessness are best understood in the presence of one another. He compares architectural weight expression to the orchestration of musical instruments:

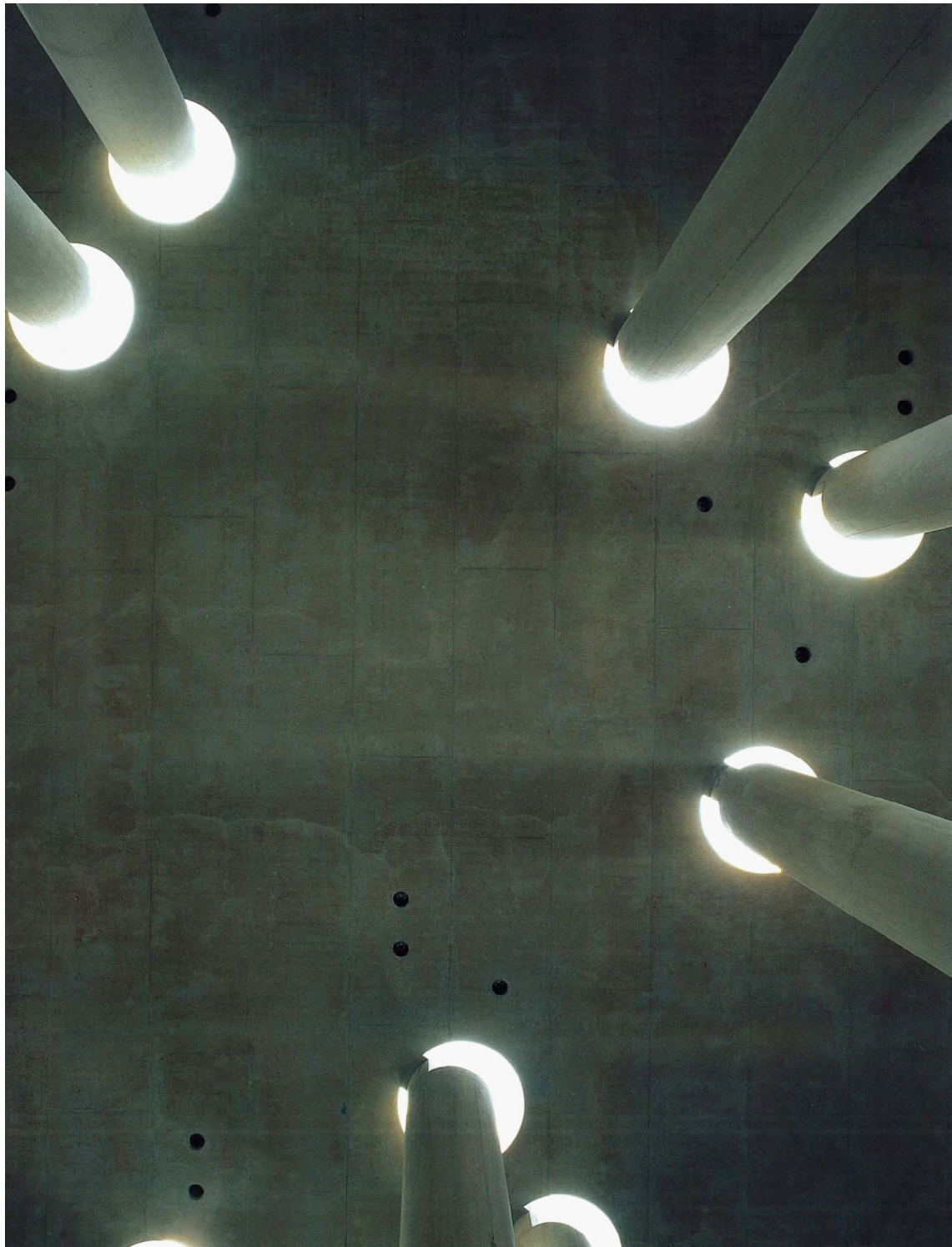
Architecture’s expression of mass and materials according to gravity, weight, bearing, tension, torsion, and buckling – like the orchestration of musical instruments – is made more dynamic through the contrast of heavy (bass, drums, tuba) and light (flute, violin, clarinet)... A heavy and light materiality is likewise conveyed via the structure, material, and spatial experience of architecture.⁹³

90 Scott *The Architecture of Humanism* p95
 91 Ibid p173
 92 Calvino *Six Memos for the Next Millennium* p
 93 Holl *Parallax* p255

Japanese architect Toyo Ito, known for aggressively exploring potentials of new forms, now embraces architecture as a bodily experience and speaks of the importance in contemporary architecture of dealing with the challenge of gravity. "Before, I tried to hide the price of withstanding gravity. Now I feel I can expose these materials, have them out in the open, and still create modernity that responds to what is going on today. That's a major change. We architects have to provide bodily experience through our creations. In the past I tried to construct something that's weightless. Like society itself becoming increasingly weightless. Nowadays, I feel that even in this information society we still have gravity, we still have to feel it, so we have to reopen and establish the awareness of gravity again."⁹⁴ Without falling into the prioritization of aestheticism, parametric architecture can be further enhanced to create transactions between body, imagination, and environment by addressing the apparent contradiction of weight and weightlessness in its built architecture. In the face of sophisticated and elegant forces, parametric architecture must remain reflective of the metaphysical and existential nature of being human, "while in architecture one force – gravity – is inevitable."⁹⁵

94 Ito "Interview with Toyo Ito, #31, 2005" unpaginated

95 Holl [Intertwining](#) p14



2. Light and Shadow (Significance of shadow)

...Such is our way of thinking - we find beauty not in the thing itself but in the pattern of shadows, the light and the darkness, that one thing against another creates...⁹⁶

Figure 20. Schultes & Frank. Baumschulenweg Crematorium, Germany. 1998

96

Tanizaki *In Praise of Shadows* p30

Of all the materials and means to express existential qualities in architecture, light is the most emotive and sensuous. Light has the ability to influence our emotions; it communicates melancholy and sorrow, as well as joy and ecstasy.⁹⁷ It is through light that we mainly experience the sensation of our bodies in space. Nonetheless, light cannot be defined without the presence of shadow. Tadao Ando is notable as an architect of light through his sensuous use of natural light and shadow in his architecture. According to Ando, "Light, alone, does not make light. There must be darkness for light to become light – resplendent with dignity and power. Darkness, which kindles the brilliance of light and reveals light's power, is innately a part of light."⁹⁸ Shadows play an important role in his body of work, in which he believes areas of darkness are critical as they relate to "deep metaphorical levels of creation".⁹⁹ Most of his work tends to contain the brilliance of a shaft of light that penetrates through the profound silence of darkness in a manner that informs a space with depth that Ando feels "enabled man, who dwelt inside, to understand his own being, relative to his surroundings."¹⁰⁰

Light, whose beauty within darkness is as of jewels that one might cup in one's hands; light that hollowing out darkness and piercing our bodies, blows life into 'place'.¹⁰¹



Figure 21. Tadao Ando. Church of Light, Osaka, Japan. 1989

In parametric architecture, homogenous light, rather than sharply contrasted light and shadow, is often sensually utilized to complement the fluidity of surface. According to Rahim and Jamelle, parametricists such as Greg Lynn often suggest 'continuous differentiation' as the term

97 Pallasmaa Tangible Light: Integration of the senses and architecture p13

98 Ando "Light" p471

99 Auping Seven Interviews with Tadao Ando p53

100 Ando "Light" p471

101 Ibid

to tie organizational, spatial and aesthetic features through continuity in surface and material in a parametric built environment.¹⁰² They describe two of Lynn's parametric designs in which, "Spatiality is transformed by the fluidity of a continuous surface that gradually rises from the ground, comprising a family of interrelated forms... The complex formal relationships that are provided in these designs yield a range of moods that are further enhanced by the careful modulation of direct and indirect light to complement the fluidity of the forms."¹⁰³ Unlike the forceful shadows etched out by direct sunlight, lighting in parametric architecture creates a soothing effect that renders the fluid surface vague and misty. Shadows generally do not stand out in a hard and dry manner, but are rather imperceptibly submerged. The focus of light and shadow in parametric designs is primarily modulated to enhance the seamless integration between surfaces in order to produce a single, sinuous form. The parametricists' definition of 'elegance' ultimately resides in the smooth transition of all these factors as they are brought together in a continuous change and transformation.



Figure 22. Daniel Libeskind. Denver Art Museum, Colorado. 2006

As a consequence of the pursuit of an overall sense of seamless fluidity, parametric designs have significantly disregarded the metaphor and depth of the shadow; lighting is considered solely as an aesthetic medium for establishing form continuity. Deep dark shadows are purposefully neglected, as they disrupt the sense of continuity and aesthetic fluidity in surfaces. Devoid of darkness, parametric architecture becomes a world of homogenous light. Ando argues however "As we grow less aware of darkness, we forget spatial reverberations and the

102 Rahim and Jamelle "Surface Continuity: An Elegant integration" p40

103 Ibid

subtle patterns created by light and shade. When this happens, everything is uniformly illuminated; and object and form are limited to simple relations.”¹⁰⁴ Similarly, Pallasmaa believes:

Homogenous bright light paralyses the imagination in the same way that homogenization of space eliminates the experience of place.¹⁰⁵

He argues that, “Deep shadows and darkness are essential because they dim the sharpness of vision, make depth and distance ambiguous and invite conscious peripheral vision and tactile fantasy... In great spaces of architecture, there is a constant, deep breathing of shadow and light; shadow inhales, and illumination exhales, light.”¹⁰⁶ Similarly, in his book *In Praise of Shadows*, Junichiro Tanizaki describes the beauty of shadow in the Japanese house:

The quality that we call beauty... must always grow from the realities of life, and our ancestors, forced to live in dark rooms, presently came to discover beauty in shadows, ultimately to guide shadows towards beauty’s ends. And so it has come to be that the beauty of a Japanese room depends on a variation of shadows, heavy shadows against light shadows – it has nothing else... This was the genius of our ancestors, that by cutting off the light from this empty space they imparted to the world of shadows that formed there a quality of mystery and depth superior to that of any wall painting or ornament.¹⁰⁷



Figure 23. Le Corbusier. La Tourette, Evieux-sur-Arbresle, France. 1960

The richness of a phenomenal space lies in the presence of both light and shadow, along with other qualities we perceive by means of light: surfaces, volumes, textures, and colors. Ahmet Gülgönen relates in an interview (2008) that “We don’t create shadows, as we do not create light. By using materials one way or the other, we orient and control light, we let it come inside or not. Using surfaces and volumes, we

104 Ando “Light, Shadow and Form” p458

105 Pallasmaa *The Eyes of the Skin* p32

106 Ibid pp32-33

107 Tanizaki *In Praise of Shadows* p17-20

create filters and obstacles for light. But light is there, it enters into a dialogue with surfaces. By doing so it becomes part of our being, of our joy or sadness.”¹⁰⁸ The quality and shape of light and shadow that drives the perceptual spirit and metaphysical strength of architecture are subjected to the careful interplay of volumes, details and materials.

This thesis argues that fluidity of form does not necessarily require the presence of light. Le Corbusier’s latter work often engaged fluidity. According to Le Corbusier, “Architecture is the masterly, correct and magnificent play of masses brought together in light.”¹⁰⁹ Instead of being used only to outline form and fluidity, light and shadow in parametric architecture should convey something in connection with the deeper levels of human sensation; the metaphors behind light and shadow are often even more important than the form that contains them.

108 Gülgönen “Light, Space and Architecture” p39

109 Corbusier Towards a New Architecture p31



3. Materiality and Time (Perfection and Imperfection)

"You converse with material through the pores of your skin, your ears, and your eyes. The dialogue does not stop at the surface, as its scent fills the air. Through touch, you exchange heat and the material responds immediately. Speak to a stone and it renders a mystery in resonance. Speak to a mountain ledge, and it holds up a mirror to sound. Listen to a snow-covered forest, and it proffers the language of silence. The great master in the use of wood as a material is a musical instrument maker. His ear gives each piece its dimension."¹¹⁰

Figure 24. Mario Garzaniti. Housing in Brussels, Belgium.

Materiality plays an important role in the integration of sensory experience into architecture. Building materials provide the essential building blocks which bring out feelings and understanding that are rooted in our past. In his book *Thinking Architecture* Peter Zumthor is convinced that a good building must be capable of absorbing the traces of human life, responding to both materiality and time, and thus taking on a specific richness.¹¹¹ He writes,

... I think of the patina of age on materials, of innumerable small scratches on surfaces, of varnish that has grown dull and brittle, and of edges polished by use. But when I close my eyes and try to forget both these physical traces and my own first associations, what remains is a different impression, a deeper feeling – a consciousness passing and an awareness of the human lives that have been acted out in these places and rooms and charged them with a special aura.¹¹²

Every material has an identity, language, and sense of aging of its own. Natural materials such as stone, wood or brick speak about the region they come from, as well as, their age and history. These materials, Pallasmaa believes “allow our vision to penetrate their surfaces and enable us to become convinced of the veracity of matter... All matter exists in the continuum of time; the patina of wear adds the enriching experience of time to the materials of construction.”¹¹³

In the case of parametric architecture, the discourse of ‘continuous differentiation’, elegance, and ordered complexity has almost completely neglected the expression of materials and aging. Parametricism at large has been primarily concerned with form where materials are primarily selected to enhance the overall organic integration and continuity of surfaces, aiming to achieve transparency and a sensation of weightlessness and fluidity. When form becomes too much of the primary concentration in a design process it could potentially deny the presence of its material. Ando understood that form has significant impact on maintaining the identity



Figure 25. Tadao Ando. Chichu Art Museum, Naoshima, Kagawa, Japan. 2004

111 Zumthor *Thinking Architecture* p24

112 *Ibid* pp24-26

113 Pallasmaa *The Eyes of the Skin* p21

of materials. His works of concrete are thoughtfully constructed to preserve the identity of its material. He argues, “Concrete can take almost any form, there can be a tendency to create forms that are too elaborate. When this happens we lose the presence of the material itself, and it becomes just manipulated design. You lose a sense of the weight and surface of the material...”¹¹⁴ Similarly, French art historian Henri Focillon points out that “form does not behave as some superior principle modeling a passive mass, for it is plainly observable how matter imposes its own upon form.”¹¹⁵ Thus, it is clear that materials actively contribute to the determination of form. Parametric design also has the popular tendency to identify architecture with qualities of technical perfection. Kivi Sotamaa in “Frozen Void: The Elegant Affect of the Evolved Object” writes, “Elegant projects do not reveal the process of their formation. The complexity and depth of their formal and material articulation is such that they cannot be ‘read’... [T]hink of staring at a cloud.”¹¹⁶ In acknowledging this weakened awareness of materiality in our age, Pallasmaa writes, “the machine-made material of today – scaleless sheets of glass, enameled metals and synthetic plastics – tend to present their unyielding surfaces to the eye without conveying their material essence or age.”¹¹⁷ He argues that “Buildings of this technological age aim at ageless perfection and do not incorporate the unavoidable and mentally significant processes of aging.”¹¹⁸



Figure 26. Tadao Ando. Water Temple, Hompuki, Japan. 1991

114 Auping [Seven Interviews with Tadao Ando](#) p74

115 Focillon [The Life of Forms in Art](#) p96

116 Sotamaa “Frozen Void: The Elegant Affect of the Evolved Object” p25

117 Pallasmaa [The Eyes of the Skin](#) p21

118 Ibid

As a consequence of the weakening sense of materiality, the smoothness of surface in parametric architecture appears only as what Pallasmaa calls a “stage set for eyes, devoid of the authenticity of material and tectonic language”.¹¹⁹ As Holl claims, the haptic realm can only be opened up when the materiality of the details forming an architectural space become evident.¹²⁰ This thesis is not suggesting that the technical perfection of parametric qualities would in any way be an obstacle to architectural quality, rather perfection has the tendency to close imagination and prohibit participation. Instead of structures that reduce the presence of matter, parametric architecture should incorporate time and aging, moving towards a new orientation of materiality in architecture that sensitizes to the richness of life.

119 Pallasmaa “An Architecture of the Seven Senses” p29

120 Holl Questions of Perception: Phenomenology of Architecture p91

VI. ARCHITECTURE AS COLLABORATION

The section elucidate the potential solutions for integrating both “irreconcilable opposites”, particularly by reflecting on relevant theoretical observations of Alvar Aalto. Sensory charts are used to illustrate possibilities for achieving the elegant properties of parametric in conjunction with phenomenal imperatives.

Architecture’s task – to integrate irreconcilable opposites – is impossible, fundamental, and necessary.¹²¹

In this thesis, the irreconcilable opposites are: an architecture regarded as an experiential, embodied, and existential act, on the one hand, and an architecture seen primarily as a rational engagement with aestheticism and intellectualization on the other. The thesis seeks to further enable the formal and aesthetic strengths of parametric architecture, while understanding its limitations as visually formalistic architecture. The thesis argues that the two oppositions are not antithetical or hostile to one another, but rather are the result of the way we perceive architecture with different eyes and aspirations. Thus, the essential task of this thesis is to negotiate an alternative that invites integration of these differing categories and oppositions. Pallasmaa believes, “Architecture is conceivable in this contradictory task only through understanding any design as a poetic manifestation; poetic imagery is capable of overcoming contradictions of logic through its polyvalent and synthetic imagery.”¹²² While Alvar Aalto wrote: “In every case [of creative work] one must achieve the simultaneous solution of opposites. Nearly every design task involves tens, often hundreds, sometimes thousands of different contradictory elements, which are forced into a functional harmony only by man’s will. This harmony cannot be achieved by any other means than those of art.”¹²³

Alvar Aalto was an architect in favor of multi-sensory engagement who made a distinct step towards the “image of matter”. His architecture is connected with a general sense of time and place, rather than with any specific style. His architecture was not particularly dictated by any dominant conceptual idea; rather his work grew through separate architectural scenes, episodes, and detail elaborations. Instead of an overpowering intellectual concept, the whole is held together by the constancy of an emotional atmosphere. The collaboration between the two opposites ultimately requires applying balance within architecture where no one or the other should totally dominate in the

121 Pallasmaa “Landscape Architecture: Architecture and the Influence of Other Fields of Inquiry” p340

122 Ibid

123 Aalto “Taide ja teknikka [Art and Technology]” p87-88

process of design. Rather than relying on a singular overpowering concept or image from the beginning of a design, architecture can be conceived through a sequence of human situations and encounters developing from experiential events towards an architectural form. In his description of the design process of the Paimio Sanatorium, Aalto formulates a design philosophy progressing from the identification and articulation of experiential situations: "...a building has to be conceived from inside outwards, that is, the small units and details with which a person is engaged form a kind of framework, a system of cells, which eventually turns into the entity of the building. At the same time as the architect develops a synthesis from the smallest cells onwards, the opposite process exists and the architect keeps the entity in his mind."¹²⁴

It is in this sense that parametric principles and phenomenal properties can potentially exist within one another. This approach allows for certain spaces to be principally defined by the positive principles of the parametric while other spaces principally respond to human awareness through phenomenal properties; design suitability would be determined in response to the particularities of site, programmatic area, and circumstance. This architecture grows from within and opens up, instead of adhering to the traditional design process that proceeds from an outer conceptual image moving inward. The composition of such architecture can establish a dialogue between concept and making, visuality and hapticity, elegance and phenomenal (sensorial) experiences, where its strength does not rely on a singular form of architecture but sequences of linked architectural scenes, episodes and events. In this sense, the threshold between scenes becomes a critical design element.

The design suitability of such thresholds may be initially examined by a sensory experience chart (shown on the following page) of an entrance, in order to critically rationalize when parametric principles or phenomenal properties might be most appropriately encouraged to dominate.

124 Aalto "Problemi di architettura" p3

Encountering an Entrance (Threshold)

Sensory systems	Experiential Encounters	Design
Haptic System	<ul style="list-style-type: none"> - Does it resist my body with its very weight? - Does it invite my body with its weightlessness? - Does the door handle polished to a sheen by long use, gives a welcoming handshake? 	<ul style="list-style-type: none"> - Transition in the texture of materials - Softness or hardness of surface qualities - Change of humidity - Cold or warm between entry and after entry in temperature to indicate transition between spaces
Auditory System	<ul style="list-style-type: none"> - Does it act as a barrier to noise giving an image of isolation? - Does it make me anticipate the rooms behind it with sound? 	<ul style="list-style-type: none"> - Entrance made of materials that emit certain qualities of tone when walking through - Space echoes or absorbs the sound of opening and closing - Mechanical sound introduced into enclosed entrances
Taste/Smell System	<ul style="list-style-type: none"> - Does it invoke my memories of re-entering a place I have been before? - Does the smell creates a sense of alienation/curiosity? 	<ul style="list-style-type: none"> - Change of smell to signify approach, entry and behind entry
Visual System	<ul style="list-style-type: none"> - Projects an image of welcome/temptation/security/hesitation/desire? 	<ul style="list-style-type: none"> - Pattern - Qualities of light and shadow projected - Colour - Size of entrance - Shape of entrance - Location of entrance - Open or enclosed
Basic-Orientation System	<ul style="list-style-type: none"> - Does it ritualize entry? - Does it provide the sense of elevation and flight during entry? - Does it provide the sense of depth and sinking during entry? - Does it pushes us away or open towards the other side? 	<ul style="list-style-type: none"> - Light and fluid defying gravity or solid and vertically grounded with the forces of earth - The direction which it swings outwards/inwards - Entering forward/backward/left/right/up down - The orientation of the entrance

While individual elements such as entry, stairs, walls, and windows may be sensorially considered, each element gradually participates in a wider architectural experience interpreted as an experiential sequence (narrative), with a beginning, middle, and end, each with its own sensory implications and imperatives as considered in the chart below, created by Marina Panos, an architecture student from architectural

design studio at UIUC. This approach suggests potential approaches to designing a parametric / phenomenal sequence of spaces, including full sensory system interpretation of the architectural environment.

Sensory Chart ...Journey of Space <small>Architecture can be interpreted as a story, with a beginning, middle, and end. There are various haptic clues to aid one in differentiating qualities of space. This chart is intended to provide the occupant with questions pertaining to the five sensory systems of sensual appreciation. These questions will lead to answers that can help the occupant gain a full sensory interpretation of the architectural space at hand.</small>					
	Approach	Entry	Interior Space 1. 2. 3.	Exit	Path Out
Haptic System	<ul style="list-style-type: none"> - is ground hard/soft - is ground one/many surfaces 	<ul style="list-style-type: none"> - did the ground surface change - what materials enclose you - what did you touch upon entry 	<ul style="list-style-type: none"> - do the materials want to be touched - are the surfaces hard/soft/edges/curves 	<ul style="list-style-type: none"> - does the ground prepare you for exiting the space - are there new materials 	<ul style="list-style-type: none"> - is ground hard/soft - is ground one/many surfaces - is the ground like the interior/exterior
Auditory System	<ul style="list-style-type: none"> - are sounds in open/close space - where are keynote sounds - what are the soundmarks 	<ul style="list-style-type: none"> - what sound signify enclosure - can you sense new scale 	<ul style="list-style-type: none"> - are the sounds contained/disperesed - are there new keynote sounds 	<ul style="list-style-type: none"> - is there a blend of interior/exterior sounds 	<ul style="list-style-type: none"> - is the path out similar to the approach - can you sense what direction to proceed
Taste/Smell System	<ul style="list-style-type: none"> - is the air salty/dry/wet - is there nostalgia in the smell - why is the smell specific to the place 	<ul style="list-style-type: none"> - is the air manmade/natural - did the taste change - are smells eliminated/enhanced 	<ul style="list-style-type: none"> - does the air taste different room to room - is there a different smell in each room 	<ul style="list-style-type: none"> - is the air closer to inside or outside smells - is it distinctive 	<ul style="list-style-type: none"> - is the air like the approach - why is the smell specific to the space
Visual System	<ul style="list-style-type: none"> - what colors surround the space - what shapes do you see - what scale is the space - is there manmade intervention 	<ul style="list-style-type: none"> - what colors surround the space - what shapes do you see - what scale is the space - is there manmade intervention - what signifies a change in space 	<ul style="list-style-type: none"> - what objects are included - are the objects part of the space or an addition to the space 	<ul style="list-style-type: none"> - what colors surround the space - what shapes do you see - what scale is the space - what symbols identify the exit - what leads you out 	<ul style="list-style-type: none"> - what colors surround the space - what shapes do you see - can you see where to go next
Basic-Orientation System	<ul style="list-style-type: none"> - are you facing the north/south/east/west - is the ground high/low - is the space near the edge of land/inland 	<ul style="list-style-type: none"> - what elements direct - are you higher/lower than at the approach 	<ul style="list-style-type: none"> - are the spaces aligned with the north/south/east/west - do you feel lost - is the space/warm/cold 	<ul style="list-style-type: none"> - are you facing the same direction at the beginning - do you know what is next 	<ul style="list-style-type: none"> - are you north/south/east/west - is the ground high/low - is the space near the edge of land/inland - where are you in relation to the traveled space

Figure 27. Marina Panos, Sensory Experience Chart, 2001. Courtesy of Marina Panos, Chicago

Using this method of analyzing experiential situations, a designer has the potential to engage the elegance of parametric architecture while ensuring the design remains firmly rooted in human experiential reality; the whole is held together by the conditions of a sensory environment.

VII. CONCLUSION

The Re-enchantment of Architecture

“Our age has lost the awareness that the act of building inevitably involves a metaphysical message, a reflection of a view of the world and man’s relationship to the world. Buildings and other human acts are not dictated by purely practical needs – they always constitute a dialogue with the world and contribute to forming the relationship of the individual ego or the collective identity of a cultural community to time and the world.”¹²⁵

The experiments in the following chapter question what sort of parametric architecture will grow from this attention to our entire human awareness and sensory capacities. What would a parametric built environment be like if sensory response, sentiment, and memory were critical design factors, just as critical as the elegance of ordered complexity of parametric architecture? The experiments explore an alternative to the prevalent reductive style and aesthetics of parametric architectural thought. As Thomas Sieverts has written regarding the means for understanding and working in the metropolitan landscape: “It is not a matter of style (there are many different aesthetics), but of emotional ties to the environment as the prerequisite of deeper interest, responsibility, and care. It is this deep, fundamental connection to care and responsibility, which makes aesthetics so important.”¹²⁶

What architecture can and should bring to mind are the transactions between body, imagination, and the human environment. While there is significant appeal in the seemingly endless possibilities that parametric architecture offers, the over-emphasis on the intellectual and conceptual is troubling. Bloomer and Moore in the course of their research have found that sensory information are rarely central to design decisions. As a result, “reference was seldom made to the unique perceptual and emotional capacities of the human being.”¹²⁷ Architecture reflecting this condition becomes a dry calculated art that is best appreciated cognitively but not sensorially. Pallasmaa believes: “Any art, however, that engages itself too explicitly with form turns into formalism, any art that searches for novelty loses its roots, and any art that obsessively grasps for beauty becomes sentimental.”¹²⁸ Because of the dangers of drifting towards aestheticism, reductive functionalism and

125 Pallasmaa “The Two Languages of Architecture” p41

126 Sieverts “Metropolitan Landscapes: Attitudes, Research and Practice” p18

127 Bloomer and Moore Body, Memory, and Architecture pix

128 Pallasmaa “Melancholy and Time” p317

experimental formalism, parametric architecture should aim to realize a built environment that integrates the intrinsic values of sensory response and strong phenomenal properties. The following design experiments explore how parametric architecture can remain experimental and open to new forms and aspirations, without disregarding metaphysical and existential references.

In order for such an approach to become viable in parametric design, the following chapters test the integration of sensory experiences as well as phenomenological imperatives within the parametric through an experimental design.

VIII. REFERENCE

Aalto, Alvar. "Problemi di architettura" Quaderni ACI (Turin: Edizione Associazione Culturale Italiana, 1956)

Aalto, Alvar. "Taide ja Teknika [Art and Technology]" lecture, Academy of Finland, October 3, 1955, in: Schildt, Göran. Alvar Aalto Luonnoksia trans. Pallasmaa J. (Helsinki: Otava, 1972)

Abram, David. The Spell of the Sensuous (New York: Vintage Books, 1997)

Ando Tadao. "Light" Tadao Ando: Complete Works ed. Dal Co, Francesco (London : Phaidon, 1995) pp470-471

Ando, Tadao. "Light, Shadow and Form" Tadao Ando: Complete Works ed. Dal Co, Francesco (London : Phaidon, 1995) pp458-459

Augustin, Sally. "Emotional and Cognitive Responses to Sensory Information" Place Advantage: Applied Psychology for Interior Architecture (Hoboken, N.J.: John Wiley & Sons, c2009) pp37-68

Auping, Michael. Seven Interviews with Tadao Ando (Fort Worth, TX: Modern Art Museum of Fort Worth, 2002)

Bloomer, Kent C. and Moore, Charles W. Body, Memory, and Architecture (New Haven : Yale University Press, 1977)

Calvino, Italo. Six Memos for the Next Millennium (Cambridge, Mass: Harvard University Press, 1988)

Corbusier, Le. Towards A New Architecture (London: The Architectural Press, 1959)

Fehn, Sverre. Fjeld, Per Olaf. "Has a Doll Life? [conversation between Sverre Fehn and Per Olaf Fjeld]" Perspecta 1988, no.24, pp40-49

Focillon, Henri. The Life of Forms in Art trans. Hogan, Charles Beecher. and Kubler, George. (New York: Zone Books, 1989)

Gibson, J. J. The Senses Considered as Perceptual systems (London: Allen & Unwin, 1968)

Gibson, J. J. The Perception of the Visual World (Boston: Houghton Mifflin, 1950)

Goldblatt, David. "Lightness and Fluidity: Remarks Concerning the Aesthetics of Elegance" Architectural Design (July/Aug 2009) v. 77, n. 1, pp10-17

Gülgönen, Ahmet. "Light, Space and Architecture" Daylight & Architecture Magazine by Velux Issue 07 (Winter 2008) pp36-39

Hall, Edward T. The Hidden Dimension (N.Y.: Anchor Books, 1969)

Holl, Steven. "Questions of Perception: Phenomenology of Architecture" Questions of Perception: Phenomenology of Architecture ed. Holl S., Pallasmaa J., Pérez-Gómez, A. (Tokyo: (Architecture and Urbanism) a + u Pub. Co. 1994) pp39-42

Holl, Steven. Intertwining (New York: Princeton Architectural Press, 1996)

Holl, Steven. Parallax (New York: Princeton Architectural Press, 2000)

Husserl, Edmund. Phenomenology and the Crisis of Philosophy (New York : Harper & Row, 1965)

Ito, Toyo. "Interview with Toyo Ito, #31, 2005" Archidea (June 2010) <http://www.archidea.com/archidea/backissue.html?no=31>

Jodidio, Philip. Ando: Complete Works (Köln; London : Taschen, 2007)

Leach, Neil. "Digital Cities" Architectural Design (July/Aug 2009) v. 79, n. 4, pp6-13

MacKeth, P. "A Full and Dignified Life" Archipelago: Essays on Architecture (Helsinki: Rakennustieto, 2006) pp214-224

Malnar, Joy. M. and Vodvarka, Frank. Sensory Design (Minneapolis: University of Minnesota Press, 2004)

Merleau-Ponty, M. Phenomenology of Perception trans. Smith, C. (London: Routledge & Kegan Paul, 1962)

Merleau-Ponty, M. "Cézanne's Doubt" Sense and Non-Sense (Evanston: Northwestern University Press, 1964)

Pallasmaa, Juhani. "The Two Languages of Architecture" Encounters: Architectural Essays/ Juhani Pallasmaa ed. MacKeith Peter (Helsinki: Rakennustieto Oy, 2005) pp23-44

Pallasmaa, Juhani. "The Limits of Architecture: Toward an Architecture of Silence" Encounters: Architectural Essays/ Juhani Pallasmaa ed. MacKeith Peter (Helsinki: Rakennustieto Oy, 2005) pp280-294

Pallasmaa, Juhani. "Melancholy and Time" Encounters: Architectural Essays/ Juhani Pallasmaa ed. MacKeith Peter (Helsinki: Rakennustieto Oy, 2005) pp307-319

Pallasmaa, Juhani. "Landscape Architecture: Architecture and the Influence of Other Fields of Inquiry" Encounters: Architectural Essays/ Juhani Pallasmaa ed. MacKeith Peter (Helsinki: Rakennustieto Oy, 2005) pp334-349

Pallasmaa, Juhani. "Architecture of the Seven Senses" Questions of Perception: Phenomenology of Architecture ed. Holl S., Pallasmaa J., Pérez-Gómez, A. (Tokyo: (Architecture and Urbansim) a + u Pub. Co. 1994) pp27-37

Pallasmaa, Juhani. "Constructing Essences" Gravity ed. Cathart, J. Fantuzzi, F. Van Elslander, T. (New York: Princeton Architectural Press, 2003)

Pallasmaa, Juhani. The Eyes of the Skin: Architecture and the Senses (Great Britain: Academy Group Ltd, 1996)

Pallasmaa, Juhani. "Geometry of Feeling: The Phenomenology of Architecture" The Architecture Reader: Essential Writings from Vitruvius to the Present ed. Sykes, A. Krista (New York: George Braziller, Inc., 2007) pp172-177

Pallasmaa, Juhani. "Mankind and Architecture: Tangible Light" Daylight & Architecture Magazine by Velux Issue 07 (Winter 2008) pp36-39

Pallasmaa, Juhani. "Space, place, memory, and imagination: the temporal dimension of existential space" Spatial Recall: Memory in Architecture and Landscape ed. Treib M. (New York; London: Routledge, 2009) pp16-41

Pérez-Gómez, A. "The Space of Architecture: Meaning as presence and Representation" Questions of Perception: Phenomenology of Architecture ed. Holl S., Pallasmaa J., Pérez-Gómez, A. (Tokyo: (Architecture and Urbansim) a + u Pub. Co., 1994) pp7-25

Pérez-Gómez, A. Built Upon Love: Architectural longing after ethics and aesthetics (Cambridge, Mass.: MIT Press, 2006)

Rahim, Ali. and Jamelle, Hina. "Surface Continuity: An Elegant integration" Architectural Design (Jan/Feb 2007) v. 77, n. 1, pp38-43

Ruskin, John. "The Seven Lamps of Architecture" Works, vol.8, chap. 3, par. 13

Sauzet, Maurice. "Sensory Phenomena as a Reference for the Architectural Project" Architecture and Behavior 5, no.2 (1989)

Schumacher, Patrik. "Arguing for Elegance" Architectural Design (Jan/Feb 2007) v. 77, n. 1, pp28-37

Schumacher, Patrik. "Parametricism: A New Global Style for Architecture and Urban Design" Architectural Design (July/Aug 2009) v. 79, n. 4, pp14-23

Schumacher, Patrik. "Patrik Schumacher on Parametricism – 'Let the style wars begin'" Architects' Journal 2010, May 6, v.231, n.16, p41-45

Scott, Geoffrey. The Architecture of Humanism: A Study in the History of Taste (Gloucester, Mass: Charles Scribner's Sons, 1965)

Scully, Vincent. "Buildings without Souls" New York Times Magazine, 8 September (1985)

Seamon, David. "Phenomenology and Environment-Behavior Research" Advances in Environment, Behavior and Design, ed. Zube, Ervin H. and Moore, Gary T. vol. I (New York: Plenum Press, 1987)

Seamon, David. "The Phenomenological Contribution to Environmental Psychology" Journal of Environmental Psychology 2 (1982)

Sieverts, Thomas. "Metropolitan Landscapes: Attitudes, Research and Practice," Places (2007) Vol. 19:1

Sotamaa, Kivi. "Frozen Void: The Elegant Affect of the Evolved Object" Architectural Design (Jan/Feb 2007) v. 77, n. 1, pp24-27

Tanizaki, Jun'ichiro. In Praise of Shadows trans. by Thomas J. Harper and Edward G. Seidensticker (New Haven, Conn: Leete's Island Books, c1977)

Zucker, Paul. Town and Square, from the Agora to the Village Green (Cambridge: MIT Press, 1970)

Zumthor, P., Schelbert, C. Thinking Architecture (Berlin: Birkhäuser, 2006)

IX. LIST OF ILLUSTRATIONS

Figure 1. Tadao Ando. Sayamaike Historical Museum, Osaka, Japan. 2001

Source: Philip Jodidio Tadao Ando at Naoshima: Art, Architecture, Nature

Figure 2. Zaha Hadid Architects, Kartal-Pendik Masterplan, Istanbul, Turkey, 2006

Source: Patrik Schumacher "Parametricism: A New Global Style for Architecture and Urban Design" p.20

Figure 3. Ali Rahim. Residence for a Fashion Designer, London, UK. 2002

Source: Ali Rahim Catalytic Formations Architecture and Digital Design p.111

Figure 4. Daniel Libeskind. Jewish Museum, Berlin, Germany. 1999

Source: <http://www.ecomanta.com/2009/11/libeskind-jewish-museum-embodies.html>

Figure 5. Inside the Pantheon. Rome, Italy

Source: <http://www.melissajill.com/blog.cfm?postID=378>

Figure 6. The perceptual systems, 1966. From James J. Gibson, The Senses Considered as Perceptual Systems

Source: James J. Gibson The Senses Considered as Perceptual Systems

Figure 7. Herzog & De Meuron. Dominus Winery, California, USA. 1998

Source: Henry Plummer The Architecture of Natural Light p.134

Figure 8. Peter Zumthor. Vals Thermal Bath, Graubünden, Switzerland. 1996

Source: Peter Zumthor Works p.146

Figure 9. Tadao Ando. Chichu Art Museum, Naoshima, Kagawa, Japan. 2004

Source: Philip Jodidio Tadao Ando at Naoshima: Art, Architecture, Nature

Figure 10. Gable Wall with door to hay loft, Videm

Source: Detail Magazine Jan/Feb 2004 p.11

Figure 11. RCR Arquitectes. Bell-Lloc Cellars, Girona, Spain. 2005-07

Source: <http://www.designboom.com/weblog/cat/9/view/3777/venice-architecture-biennale-08-preview-spanish-pavilion.html>

Figure 12. Louis Kahn. The Salk Institute, California. 1966

Source: <http://openmindgr.wordpress.com/2010/04/08/transforming-spaces-creating-places-the-effects-of-architecture/>

Figure 13. Merckx + Girod Architecten. Selexyz Dominicanen Bookstore, Netherland. 2005- 07

Source: Philip Jodidio Architecture Now! 6 p.353

Figure 14. Tadao Ando. Chichu Art Museum, Naoshima, Kagawa, Japan. 2004

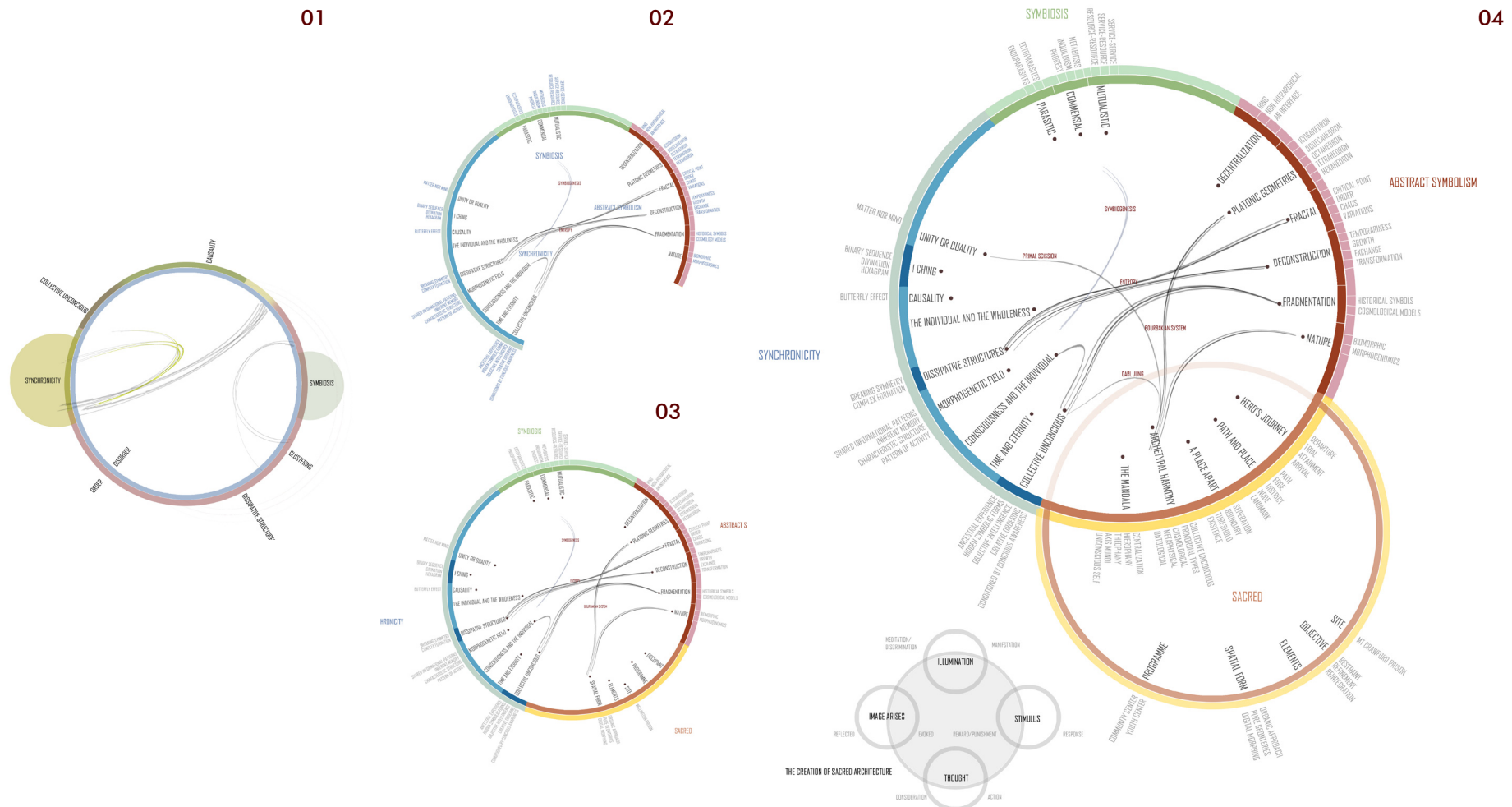
Source: Philip Jodidio Tadao Ando at Naoshima: Art, Architecture, Nature

- Figure 15. SANAA. Rolex Learning Center, Switzerland. 2010
Source: http://www.pedrokok.com.br/en/2010/05/rolex-learning-center-lausanne-suica/rolex_4/
- Figure 16. Tadao Ando. Sayamaike Museum, Osaka, Japan. 2001
Source: *Domus* October 2002 p.83
- Figure 17. Moshe Safdie. Holocaust History Museum, Jerusalem, Israel. 2005
Source: *Architectural Record* July 2005 p.119
- Figure 18. fuksas architects. New Church in Foligno, San Paola, Italy. 2009
Source: <http://plusmood.com/2009/04/new-church-in-folignosan-paolo-parish-complexs-fuksas-architects/>
- Figure 19. Alberto Campo Baeza. Caja General Headquarters, Granada. 2001
Source: *A+U* #394 July 2003 p.29
- Figure 20. Schultes & Frank. Baumschulenweg Crematorium, Germany. 1998
Source: Henry Plummer *The Architecture of Natural Light* p.197
- Figure 21. Tadao Ando. Church of Light, Osaka, Japan. 1989
Source: <http://y-w-e-n.blogspot.com/2009/03/light-space-circle-path-concrete-wall.html>
- Figure 22. Daniel Libeskind. Denver Art Museum, Colorado. 2006
Source: http://www.colorful-colorado.com/images/Denver_Art_Museum_Daniel_Libeskind_Interior_window.jpg
- Figure 23. Le Corbusier. La Tourette, Eveux-sur-Arbresle, France. 1960
Source: *Le Couvent De la Tourette* p.70
- Figure 24. Mario Garzaniti. Housing in Bussels, Belgium.
Source: *Architectural Review* Oct 2005 p.71
- Figure 25. Tadao Ando. Chichu Art Museum, Naoshima, Kagawa, Japan. 2004
Source: *Hatje Cantz Chichu Art Museum* p.26
- Figure 26. Tadao Ando. Water Temple, Hompuki, Japan. 1991
Source: <http://www.floornature.it/progetto.php?id=4043&sez=30>
- Figure 27. Marina Panos. Sensory Experience Chart. 2001
Source: Joy M. Malnar and Frank Vodvarka *Sensory Design* p.281

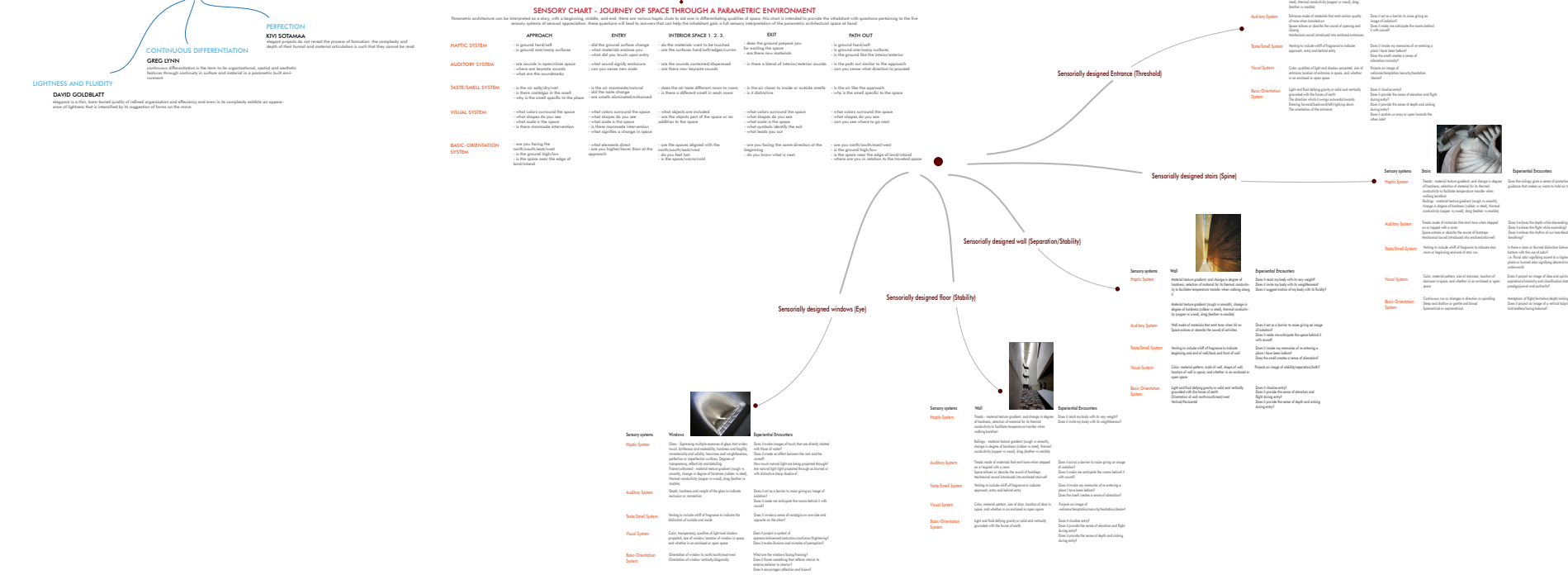
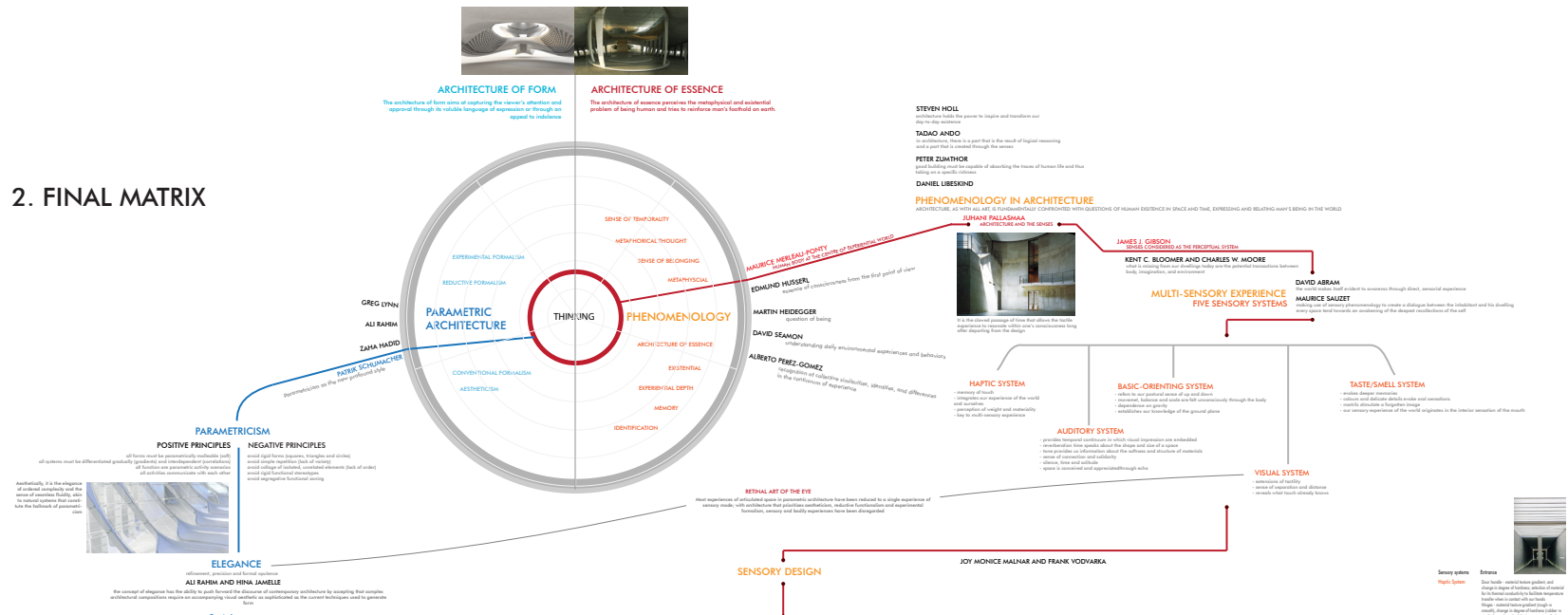
X. DESIGN MATRICES

1. INITIAL MATRICES

Throughout the evolution of the thesis, matrices have been used as tools to guide and connect ideas. These matrices show the development and alteration from the initial theoretical ideas to the final argument.



2. FINAL MATRIX





3

SITE ASSESSMENT

The city, even more than the house, is an instrument of metaphysical function, an intricate instrument structuring action and power, mobility and exchange, societal organizations and cultural structures, identity and memory.

Juhani Pallasmaa, "City Sense: The City as Perceived, Remembered and Imagined" (1996)

I. THE ARCHIVE OF MEMORY

This section introduces Archives New Zealand as the chosen vehicle for design experimentation, highlighting its innate capacity to express itself as a symbolic architecture for existential experiences. It establishes the opportunity for engaging narrative and emotional responses integrated with its functionality. The objective is to elucidate its potential for an integration between sensory response mechanisms and parametric elegance.

*"Authentic architecture is always about life. Man's existential experience is the prime subject matter of the art of building. To a certain degree, great architecture is also always about architecture itself, about the rules and boundaries of the discipline itself. But today's architecture seems to have abandoned life entirely and escaped into pure architectural fabrication. Authentic architecture represents and reflects a way of life, an image of life. Instead, today's buildings frequently appear empty and do not seem to represent any real and authentic way of life."*¹

Archives New Zealand in Thorndon, Wellington was selected as the vehicle for design exploration to test the integration of sensory experiences within parametrics. Throughout history, archives have been important spaces in cities to express the re-connection of our history and culture. Archives have the innate capacity to express themselves as a container, the shell, for a nation's identity. Archives are not merely an object or a building, but a diffuse and complex condition, integrating memories and images, desires and fears, the past and the present. Today, archives are often perceived as little more than a secular storage for objects and documents. The obsessively functionalized archive has turned too readily legible, too obvious, leaving no opportunity for memory and imagination. One of the reasons why contemporary archives are so alienating is that they do not embrace the potential of narrative; their structure and contents are perceived at a single glance. An archive cannot be shaped at once; it has its time dimension and continuum, and it is a gradual product of a culture and individual's adaptation to the world. A reflection on the essence of an archive takes us away from the physical properties of the archive, bringing us into our deepest mental dimension, allowing us to engage issues of identity and memory, consciousness as well as the unconscious. Pallasmaa's detailed description of a city's capacity for human description and imagination can be closely compared to the essence of an archive:

*"The city, even more than the house, is an instrument of metaphysical function, an intricate instrument structuring action and power, mobility and exchange, societal organizations and cultural structures, identity and memory. Undoubtedly the most significant and complex of human artifacts, the city controls and entices, symbolizes and represents, expresses and conceals. Cities are inhabited excavations of the archeology of culture, exposing the dense fabric of societal life."*²

1 Pallasmaa "Identity, Intimacy and Docimile: Notes on the Phenomenology of Home" p125

2 Pallasmaa "City Sense: The City as Perceived, Remembered and Imagined" p142

Great archives have the potential of giving us the possibility of existence; they allow us to reflect upon what is general and shared in the human existential experience. Shelves and drawers for example, symbolically represent the function of putting away and taking out, storing and remembering. The inside of a drawer expresses intimacy and secrecy, and it is not supposed to be opened by just anybody. The ability to imagine and daydream must be considered the most human and essential of our capabilities. Thus, Archives New Zealand opens up opportunities for a series of design experiments to engage sensory response mechanisms that perceive the metaphysical and existential issues of being human while integrating with experimental and intellectualized parametric architecture to create an authentic architecture of elegance.

References

Pallasmaa, Juhani "City Sense" Encounters: Architectural Essays/ Juhani Pallasmaa ed. MacKeith Peter (Helsinki: Rakennustieto Oy, 2005) pp141-146

Pallasmaa, Juhani "Identity, Intimacy , and Domicile" Encounters: Architectural Essays/ Juhani Pallasmaa ed. MacKeith Peter (Helsinki: Rakennustieto Oy, 2005) pp111-126



Thorndon Block

Archives New Zealand

Te Aro Block

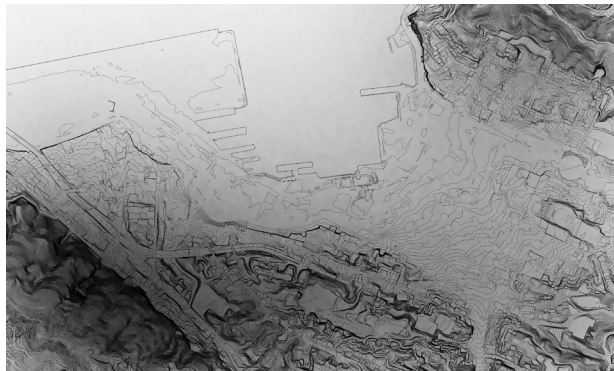
Central Business District Block

Rendered map of Wellington City

II. URBAN CONTEXT - WELLINGTON CENTRAL CITY, NEW ZEALAND

1. BACKGROUND

Wellington is New Zealand's capital city, and is located at the south-western tip of the North Island on the Cook Strait. The earliest Maori name for Wellington was Te Upoko-o-te-Ika-a-Māui, which means 'the head of Maui's fish'. With a latitude of 41° 17' S, Wellington is the southernmost national capital city in the world. Wellington is dominated by its central business district (CBD), cultural and nightlife venues concentrated at the inner city suburb of Te Aro, and Thorndon district which is home to the government Parliament. Wellington is a cultural city and it accommodates many museums, theatres and art festival venues. Wellington has a reputation for its scenic natural harbor and green hillsides. The CBD is situated near Lambton Quay, a division of Wellington harbor. It lies along an active geological fault, which has caused the land to the west to rise abruptly leaving many of Wellington's suburbs elevated above the centre of the city.



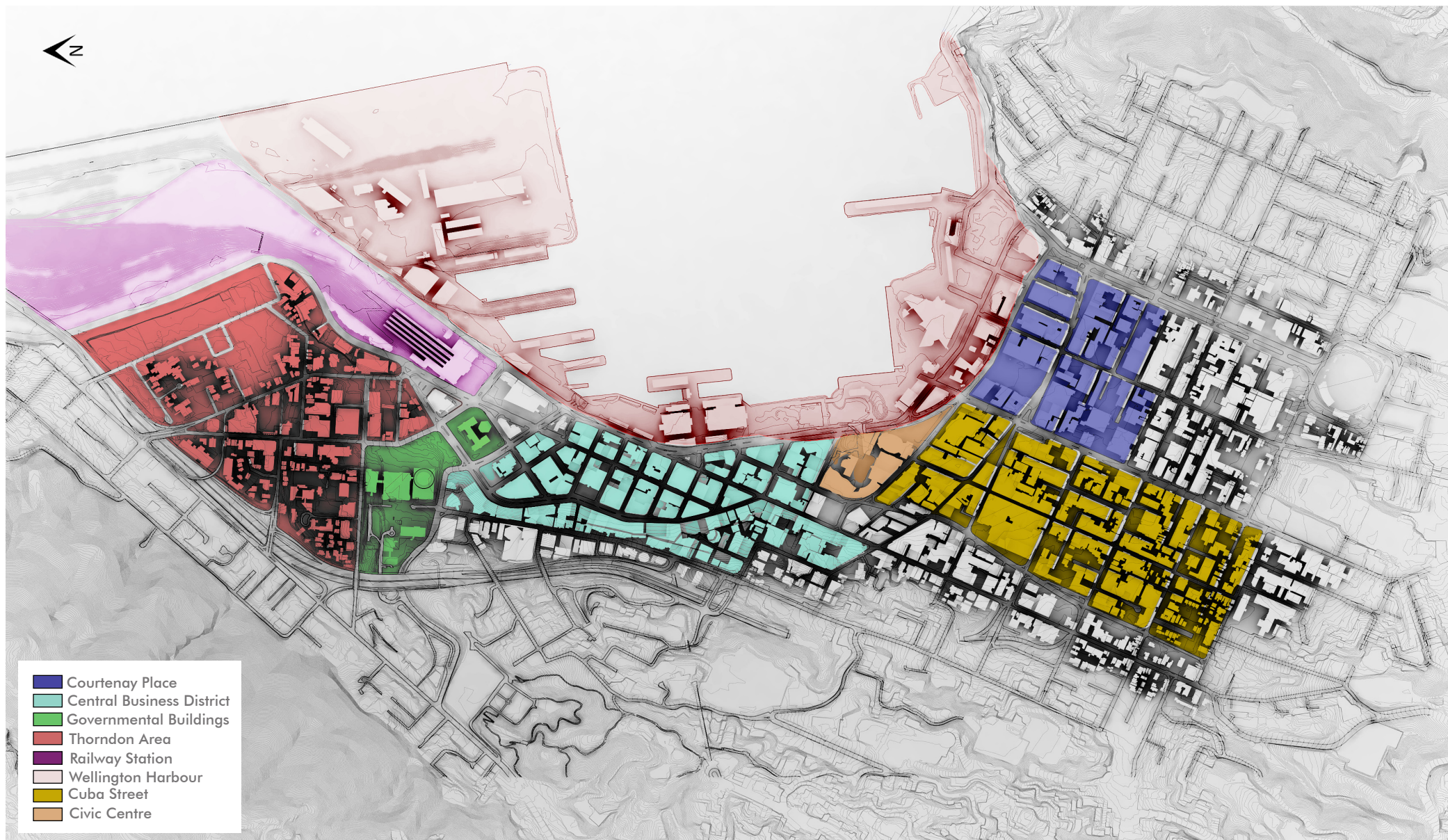
City Contour



City Grids

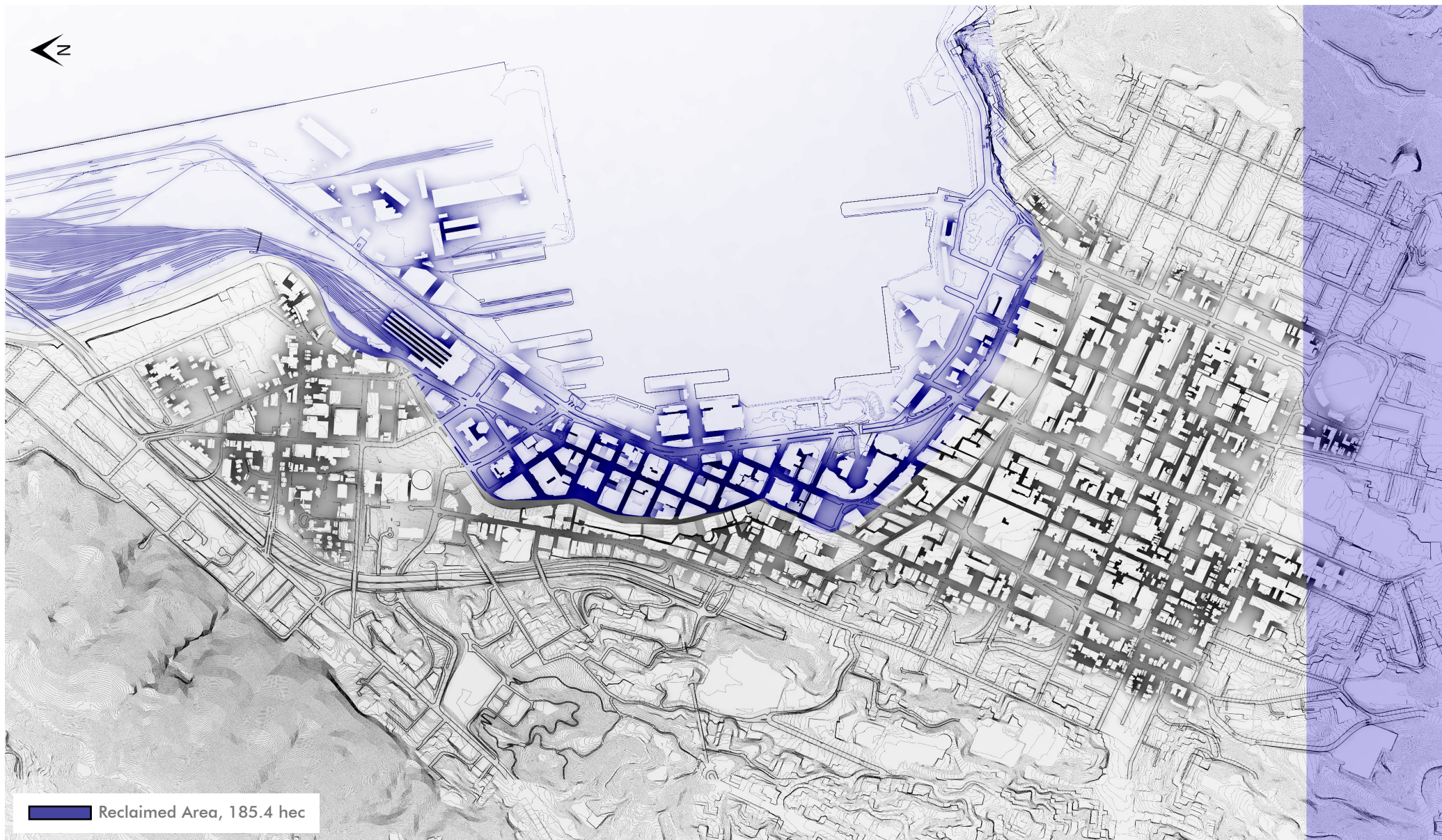


City Building Footprint



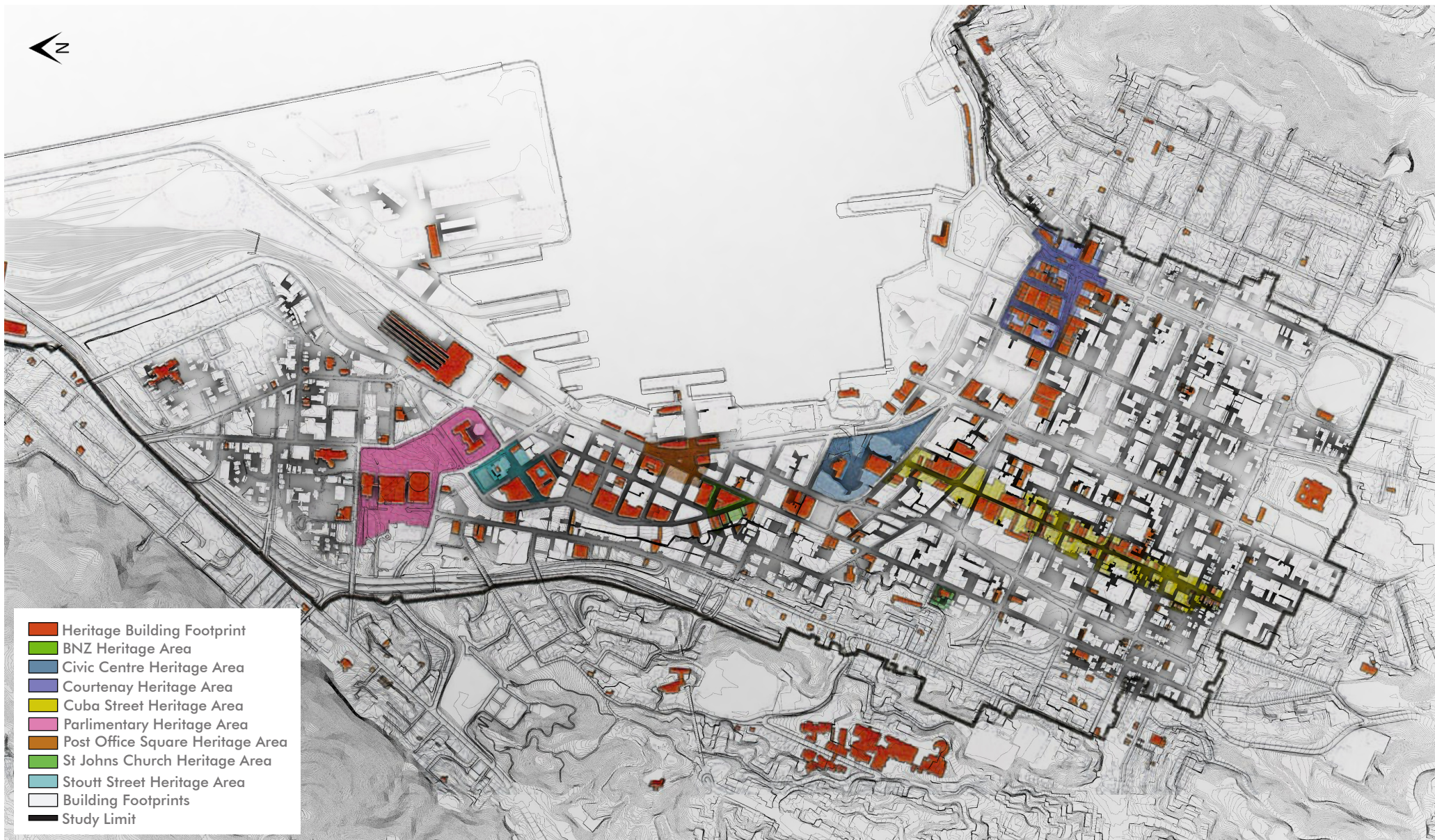
The divided districts signify different growing ranges and sizes of the creative and cultural sectors

City Division



The reclamation of Wellington Harbour constitutes an important externalization of the city's expansion for human activities

City Reclaimed Land



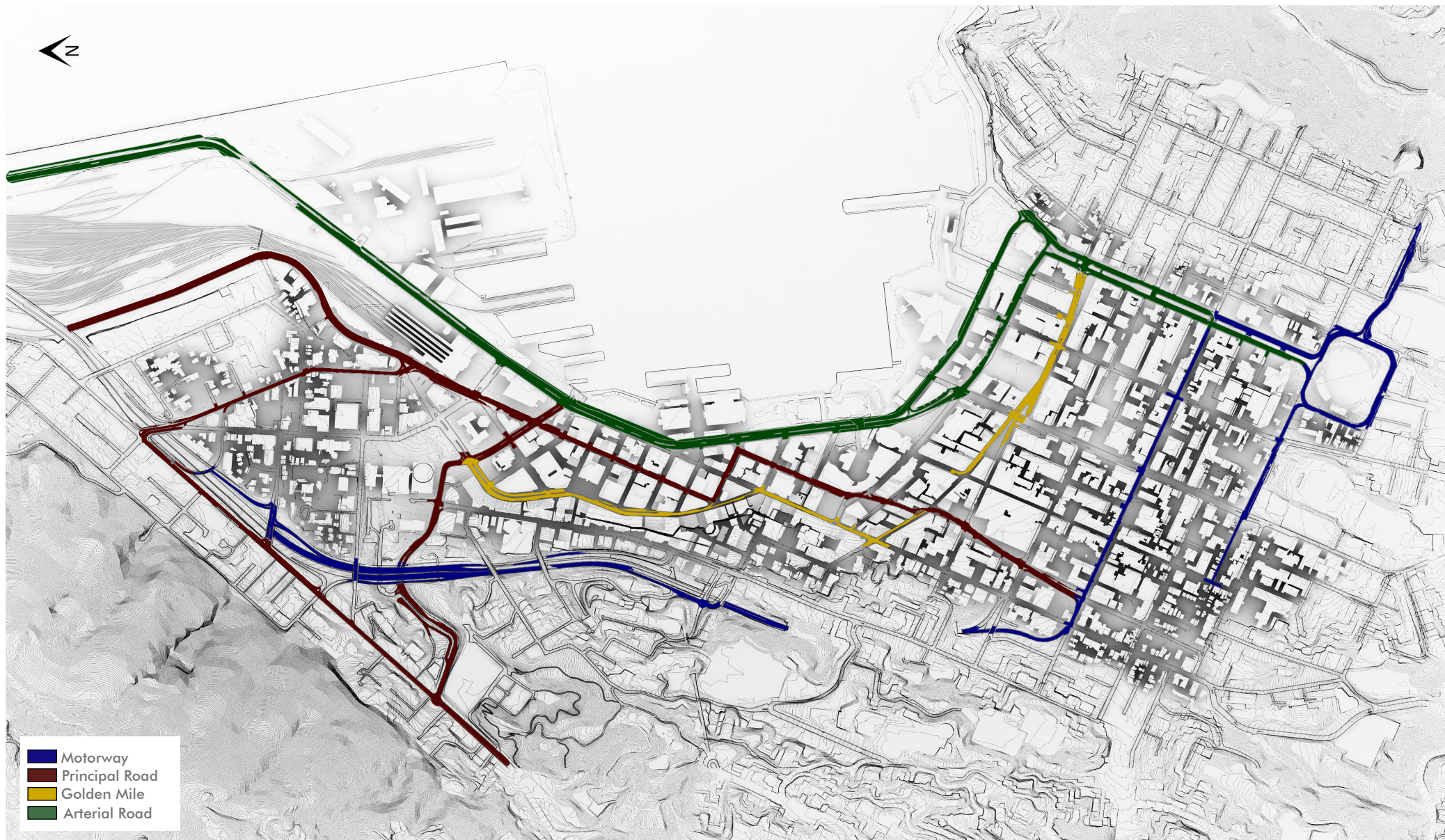
Heritage buildings afford reflection on the characteristic, status and birth of the city, establishing time and cultural identity.

Heritage Buildings



The building age reveals the change and continuity of construction in the city, indicating growth movement concentrating from the outskirts towards the harbour

Building Age



Street hierarchy indicates main transition paths within the city

City Street Hierarchy



Gridlike pattern of road structure acts as the spine for the city, penetrating through connecting districts within the city

City Street Pattern



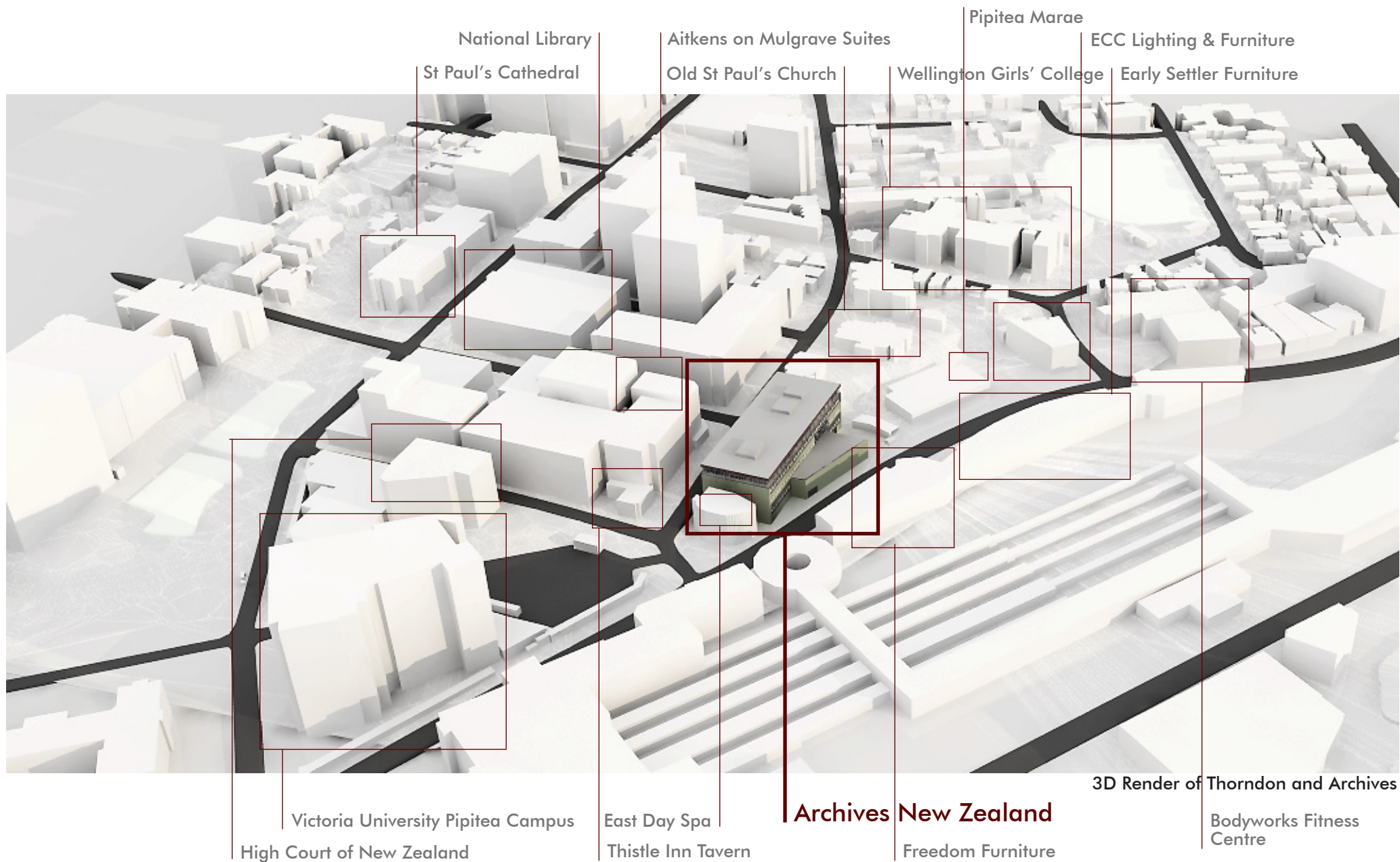
Six active fault lines are located below the city; they project the past creation of the city landscape

City Fault Lines



Located in a River of Wind, the wind zone defines diverse intensity created by a single natural element within the city

Wind Zone



III. IMMEDIATE CONTEXT - THORNDON

1. BACKGROUND



Thorndon is an inner city suburb and is located upon the northern plain that makes up the heart of Wellington. It is the backbone of New Zealand's governmental parliament sector which resides in the centre of Thorndon between the green hills of Wadestown to the west and the port facilities of Wellington Harbour to the east. The suburb is surrounded by a major transportation hub including the urban highway, terminal of the ferries linking the North and South island, and the Wellington Railway Station. New Zealand's top sporting venue, Westpac Stadium, is situated near the edge of the Wellington harbor. A number of embassies, schools and colleges are also located in the Thorndon area.

The reclamation of Wellington Harbour constitutes an important externalization of the city's expansion for human activities, which creates attractive design opportunities to explore. In contrast, the Heritage buildings afford reflection on the characteristics, and historic status of the city, establishing its unique identity. They reveal the anthropology of growth and continuity of construction in the city. The six fault lines that divide the area into planar fractures or discontinuity serve as a "contradiction" in generating design anomalies.

As illustrated on the previous page, the archive is near the center of the Thorndon area. The adjacent building to the north is the Old St Paul's church which serves as an axial orientation point. The densely crowded commercial buildings largely dominate the west side of the archive. In contrast, the east side is more exposed, revealing the railway stations and the harbor. It creates an interesting design opportunity by relating the contrast of openness and enclosure between the two sides.

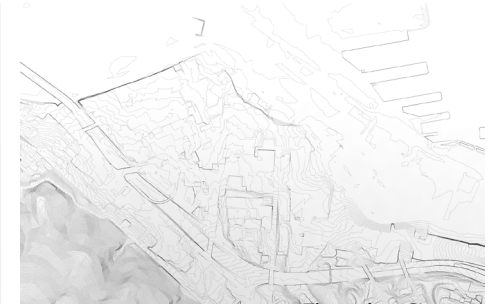
III. IMMEDIATE CONTEXT - THORNDON

2. GRID AND CONTOUR ANALYSIS

Archives New Zealand



Plan Render of Thorndon



Thorndon Contour



Thorndon Building Volumes

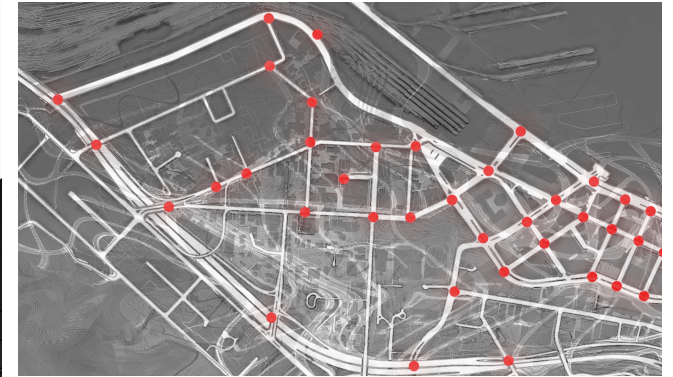


Thorndon Central Grids

Analysis of contour, building volumes and central grids in response to the Thorndon area.



Networks

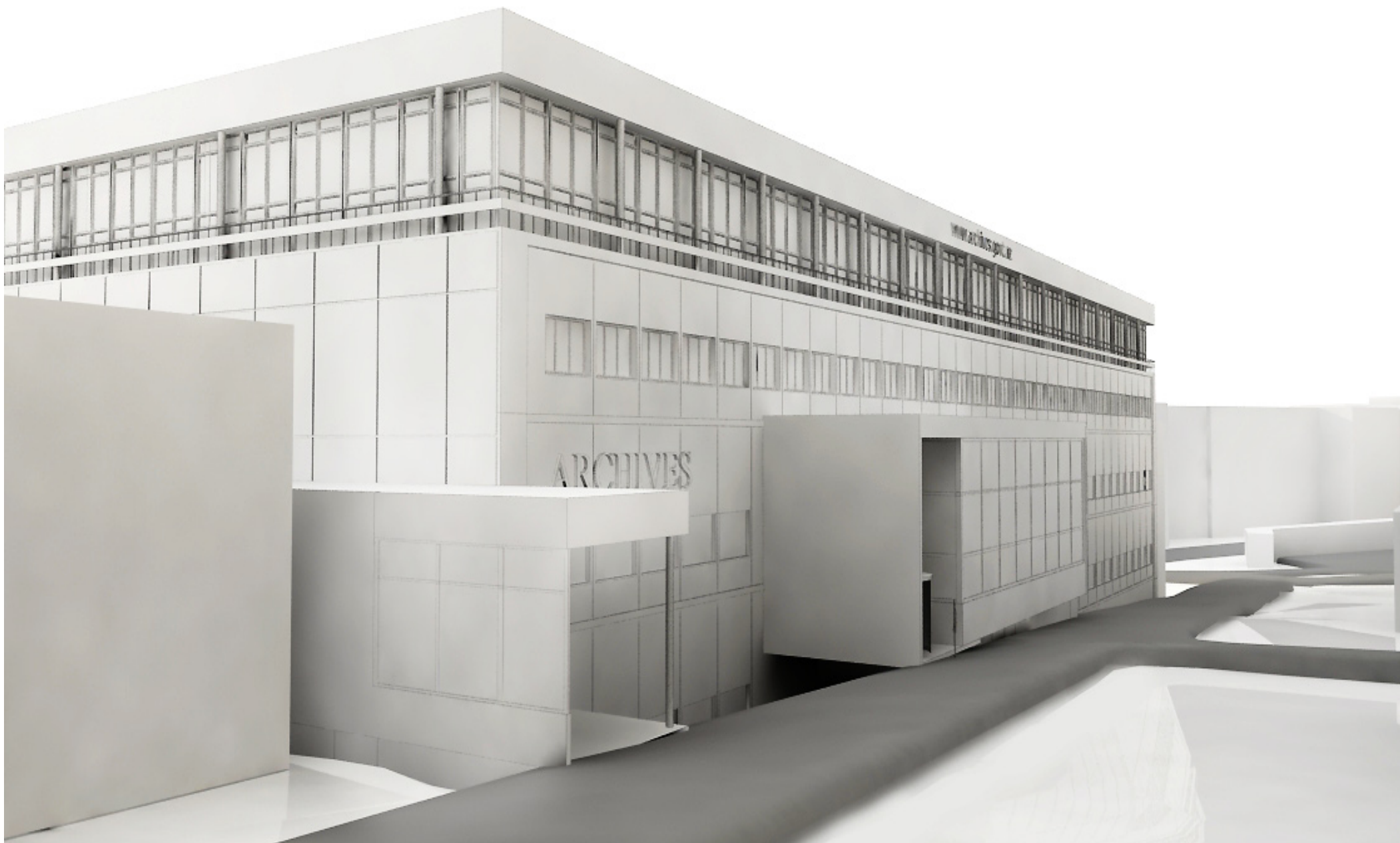


Nodes



Movements

The city grid within the business district area starts with linear and orthogonal patterns and as it radiates toward the Thorndon area, it aligns and follows the topographic contour changes. The building volumes also branch out resulting in a clustered organization. The Thorndon area's non-compact geometrical regularity is defined by the central grid of the city. Symmetry and axial conditions are analyzed as means to unify part of the clustered organization. The grid shifts from the linear organization (business district) to the clustered organization (Thorndon area) to create an interception of nodes that form a continuous network path resulting in a cohesive and unique narrative footprint reflecting the characteristics of the city.



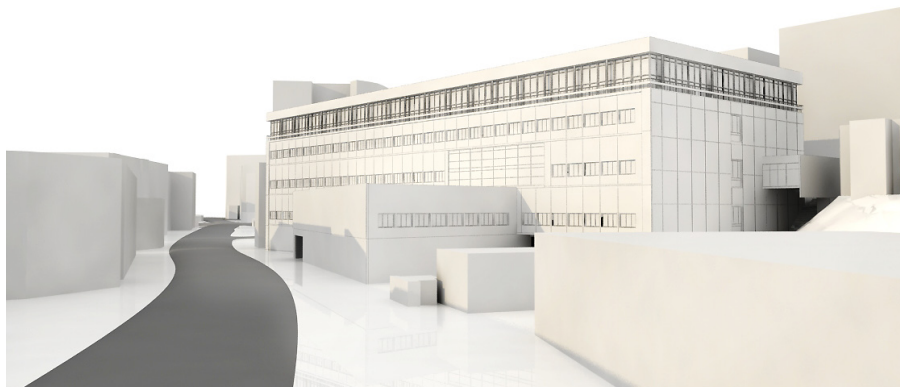
Archives New Zealand Entrance View

IV. BUILDING ANALYSIS - ARCHIVES NEW ZEALAND

1. BACKGROUND

Archives New Zealand is part of the New Zealand government's public service department with overall responsibility for government record keeping and community archives. It was formed in 2000 after the separation of National Archives from the Department of Internal Affairs. Due to the nature of cultural, historical and genealogical records that are available to the people of the nation, it symbolically represents the memory of a nation.

The main public entrance of the archive is located on the west facade at Mulgrave Street. The site slopes dramatically from Mulgrave Street down to Thorndon Quay on the east elevation of the archive. The east entrance is for private use by way of the loading bay. The typical visitors are families, historians, academics, professional historians, government officials, documentary researchers and genealogists. The archive stores more than 80 kilometers of New Zealand government records, which occupy two-thirds of the archive space, dating from the early 19th to the early 21st century. The record types include documents, letters, seals, emails, digital images, sound recordings, films, photo negatives, web pages and art works. In addition to its principal program of archival storage, there are offices, exhibition gallery, loading bay, lobby, café, reading room, and processing and packaging room. One-third of the ground floor consists of public space, and the rest is used for private area. The Treaty of Waitangi is on display in the Constitution Room on the ground level within the archive.



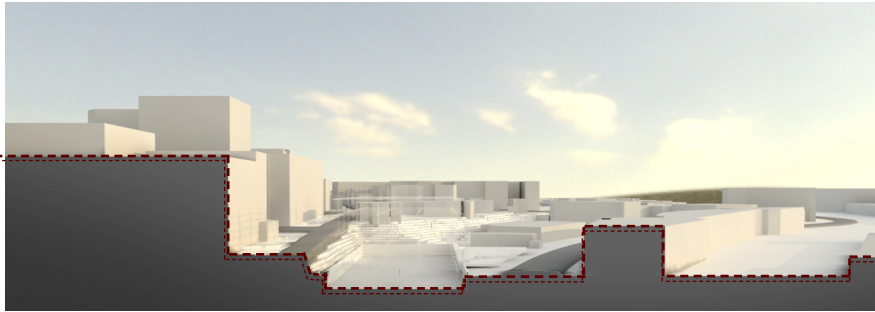
Thorndon Quay View



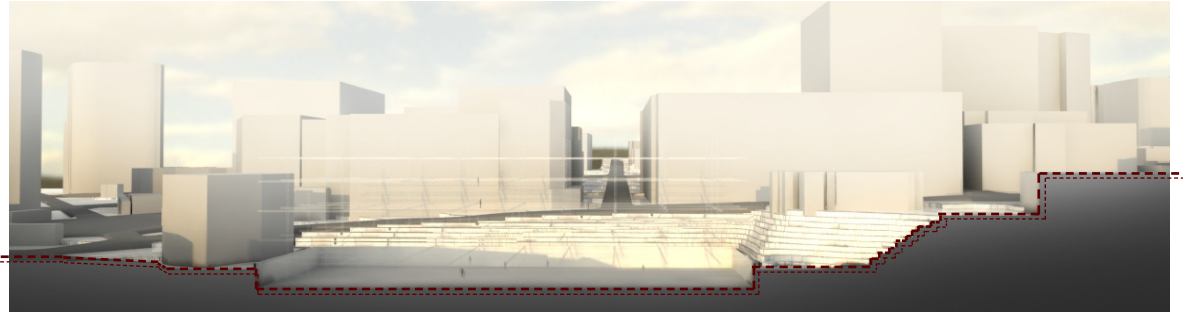
Mulgrave Street View

IV. BUILDING ANALYSIS - ARCHIVES NEW ZEALAND

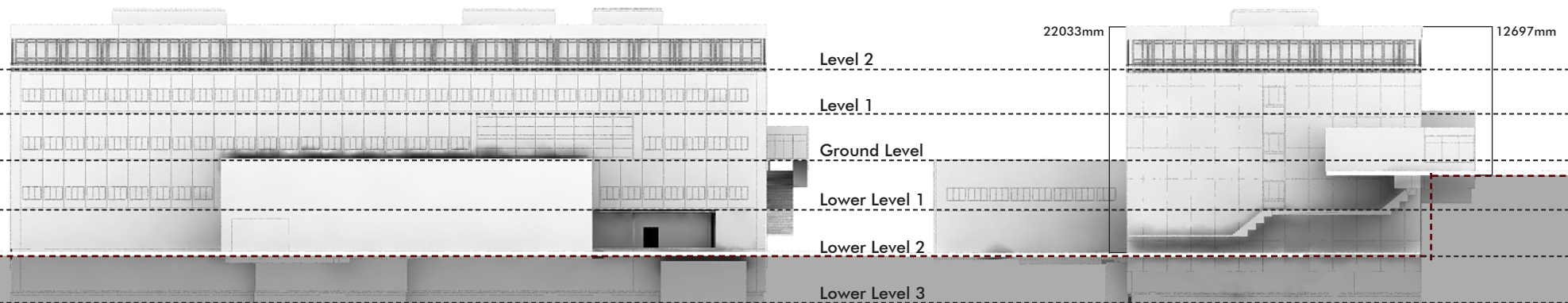
2. BUILDING ELEVATIONS



Section of site facing North



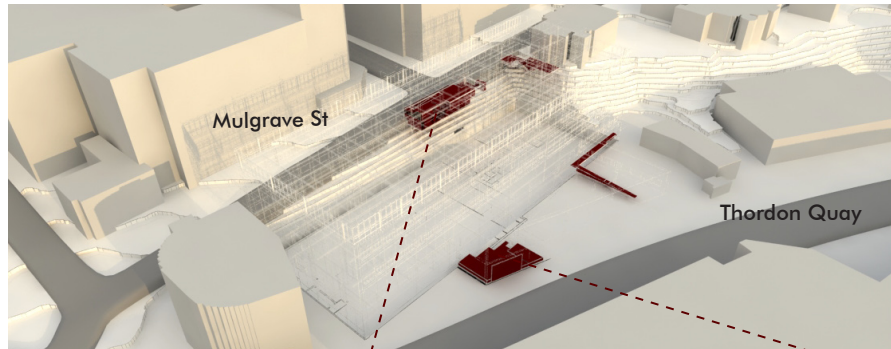
Section of site facing West



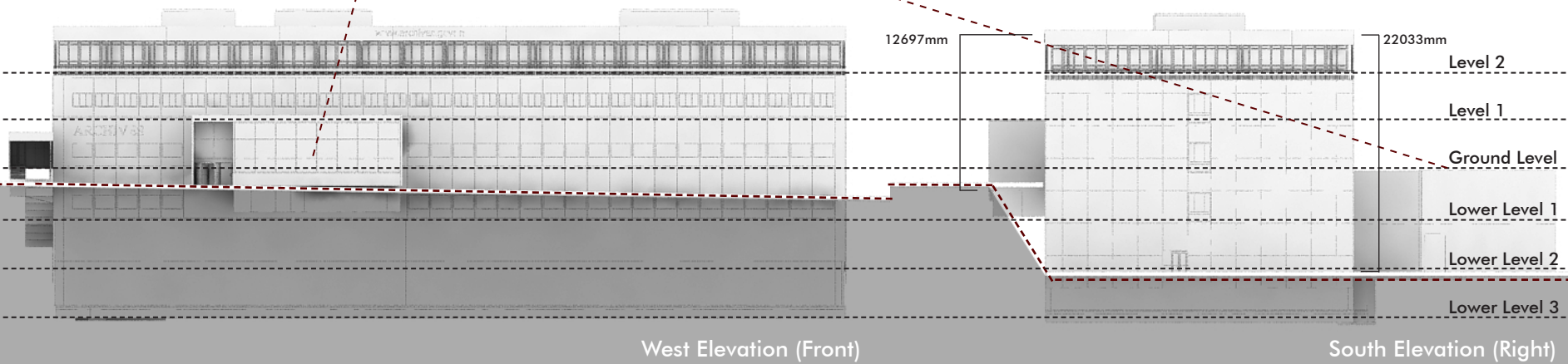
East Elevation (Back)

North Elevation (Left)

The public entrance of the archive is located at Mulgrave Street which is the west elevation of the building. The site slopes dramatically to Thorndon quay on the east elevation of the archive. The east entrance is the loading bay for private uses. As illustrated above, the lower level 3 is submerged below ground, while lower level 2 to level 2 is exposed as the west facade of elevation.

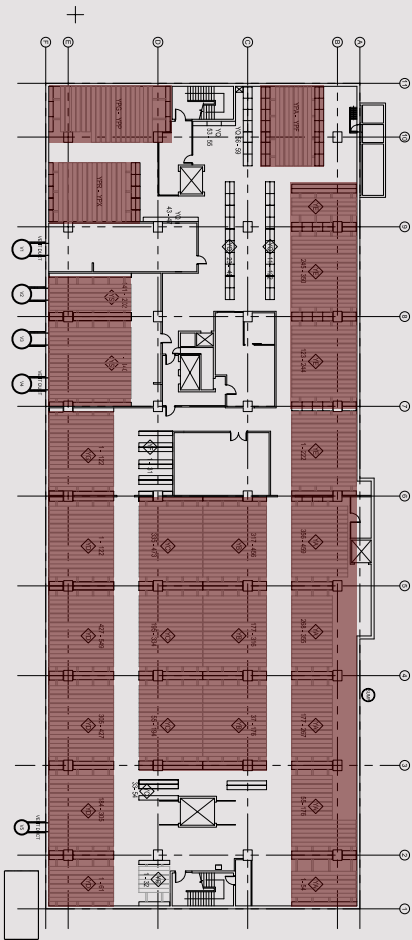


Entrances

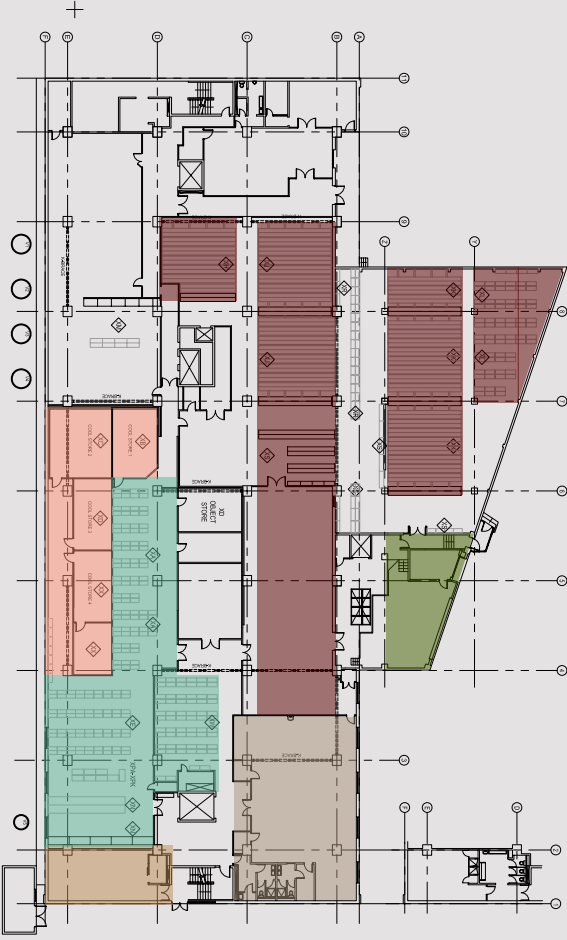


Facade on the west is the main entrance on Mulgrave Street; lower level 1 to lower lever 3 are hidden from view.

IV. BUILDING ANALYSIS - ARCHIVES NEW ZEALAND 3. EXISTING FLOOR PLANS

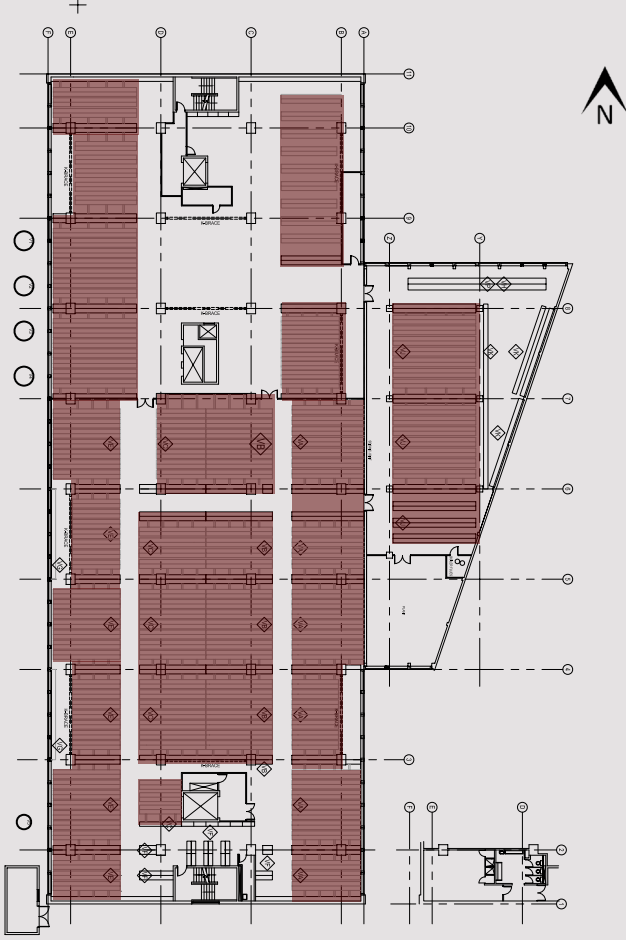


LL3
Archival Storage (Maps & Documents)

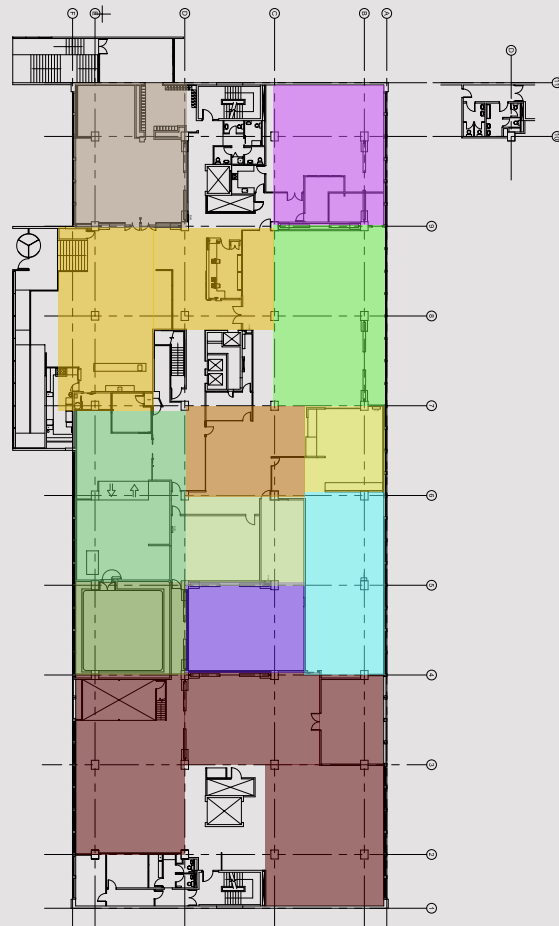


LL2

Archival Storage	Loading Dock
Carpenter Room	Art Works & Film Stocks
Cool Storage	Processing & Packaging Room

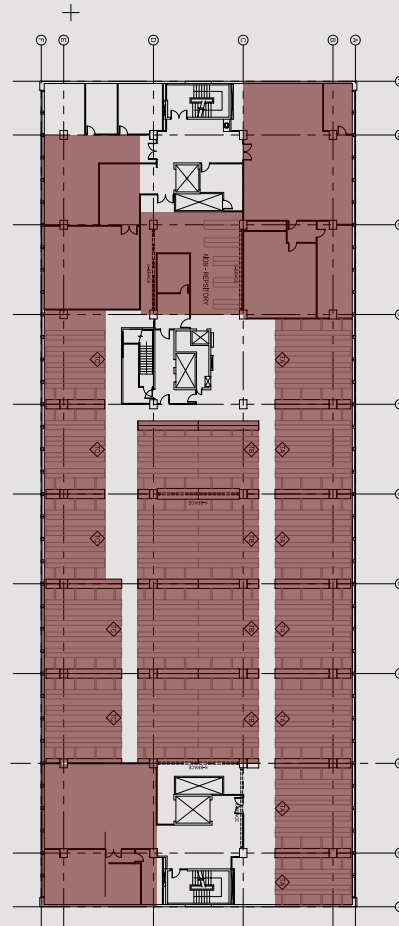


LL3
Archival Storage (Maps & Documents)



G

- | | |
|-------------------|--------------------------------------|
| Repository | Main Exhibition Gallery |
| Constitution Room | Main Reading Room |
| Lobby & Cafe | Secure Reading Room |
| Register Room | Finding Aids Area |
| Repographic Area | Audio Visual Display & Foyer Gallery |
| Training Room | |



L1

- | |
|-------------------------------------|
| Archival Storage (Maps & Documents) |
|-------------------------------------|



L2

- | | |
|--------------|-------------------------|
| Plant Room | Conservation Laboratory |
| Library | Head of Section Office |
| Head Offices | Open Plan Office Area |
| Staff Room | Regulatory Office |
| Meeting Room | |

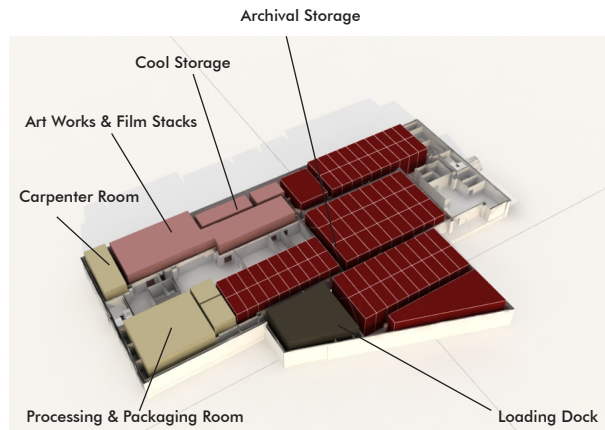
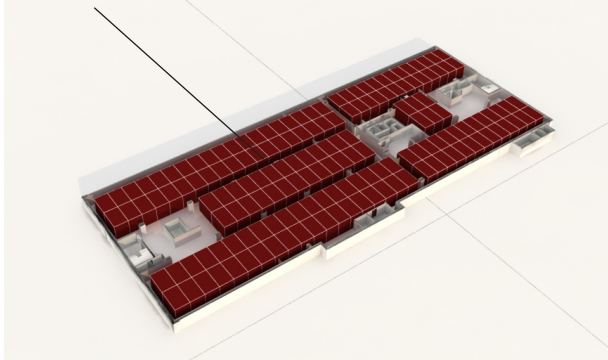


IV. BUILDING ANALYSIS - ARCHIVES NEW ZEALAND

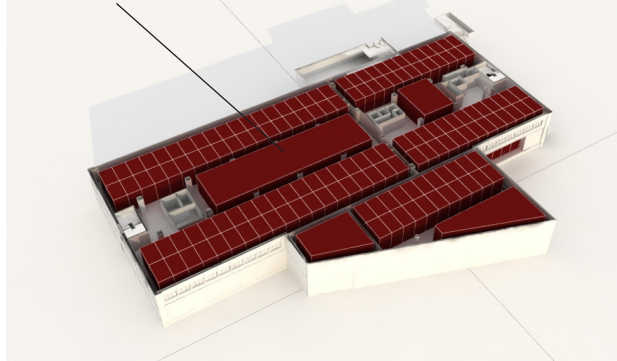
8. PROGRAMME LAYOUT AND CIRCULATION

PROGRAMME

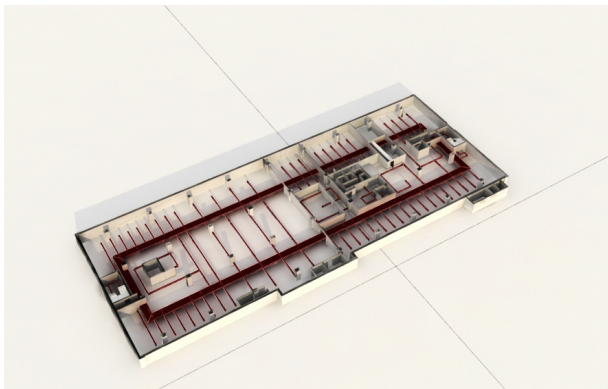
Archival Storage (Maps & Documents)



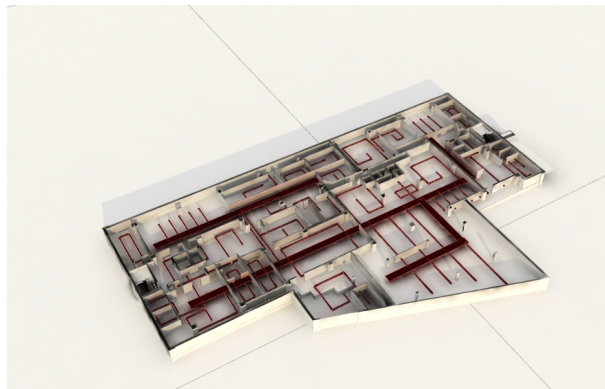
Archival Storage (Maps & Documents)



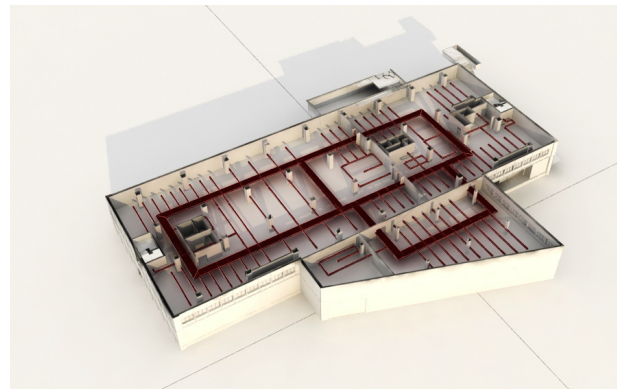
CIRCULATION



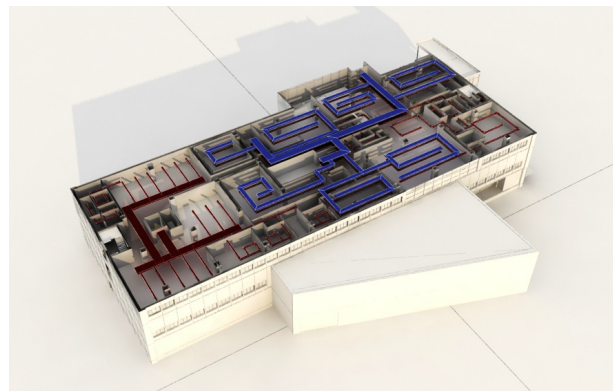
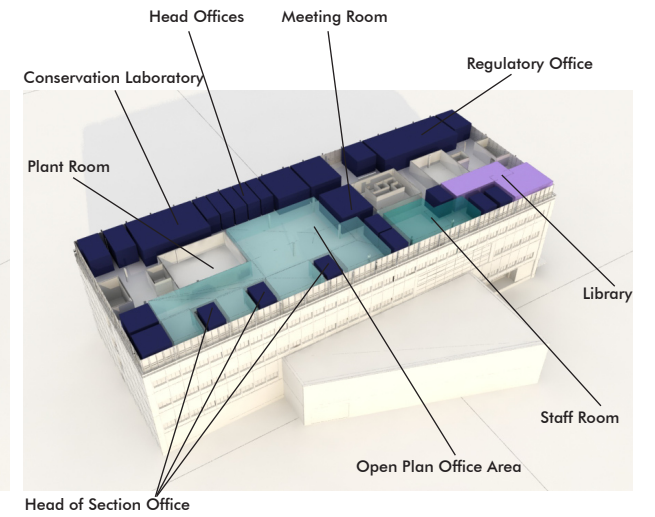
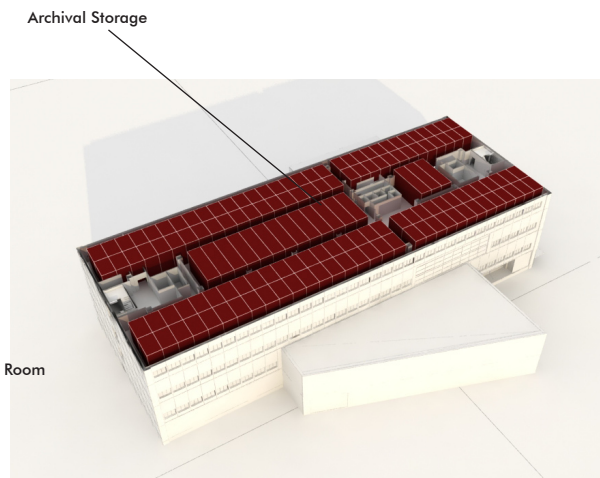
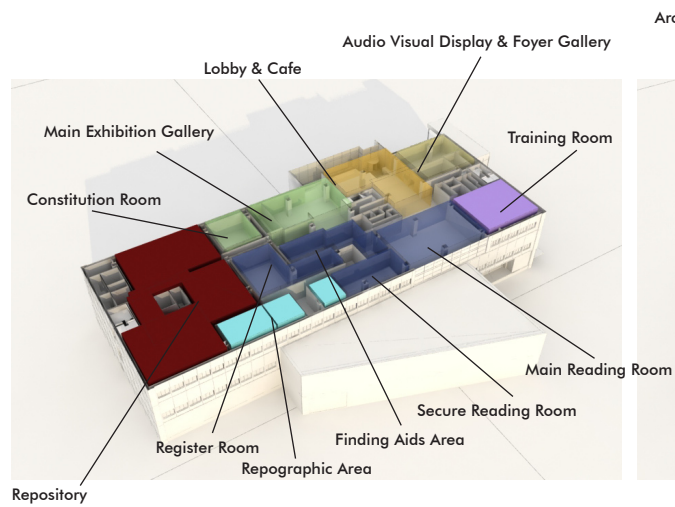
Lower Level 3



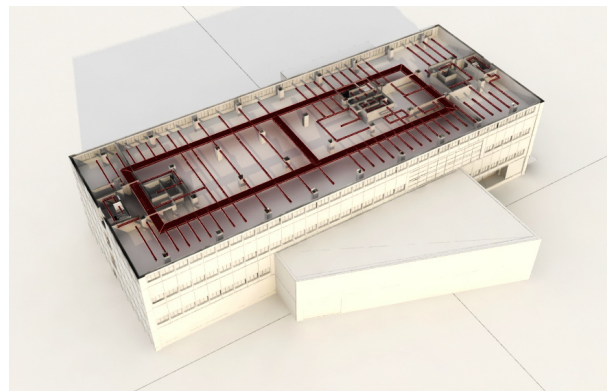
Lower Level 2



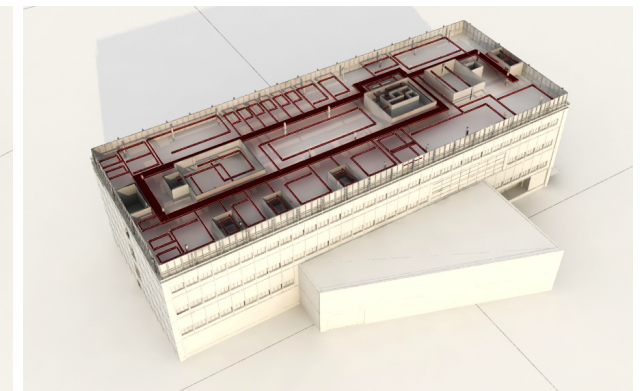
Lower Level 1



Ground Level



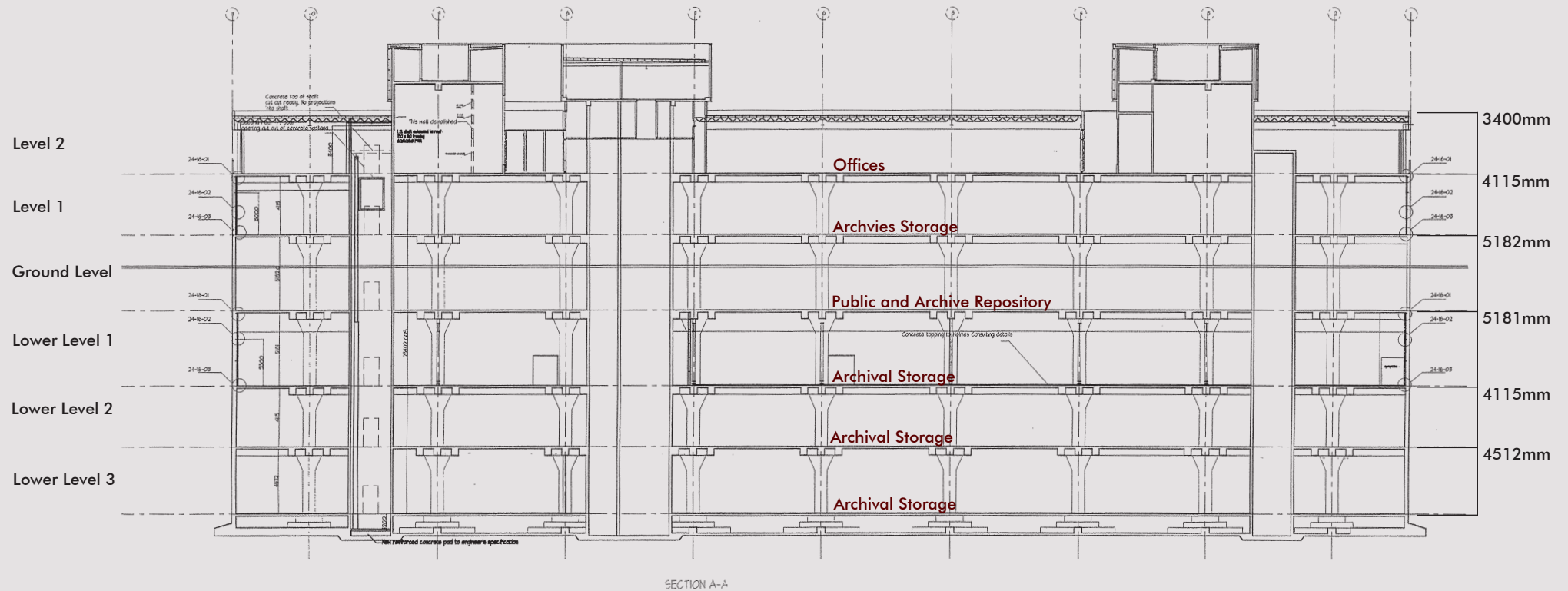
Level 1



Level 2

IV. BUILDING ANALYSIS - ARCHIVES NEW ZEALAND

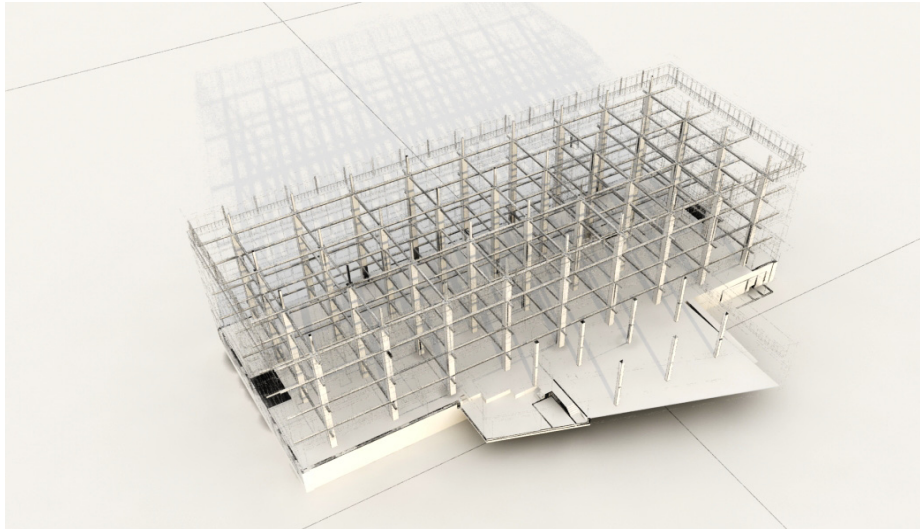
4. EXISTING SECTION FACING EAST



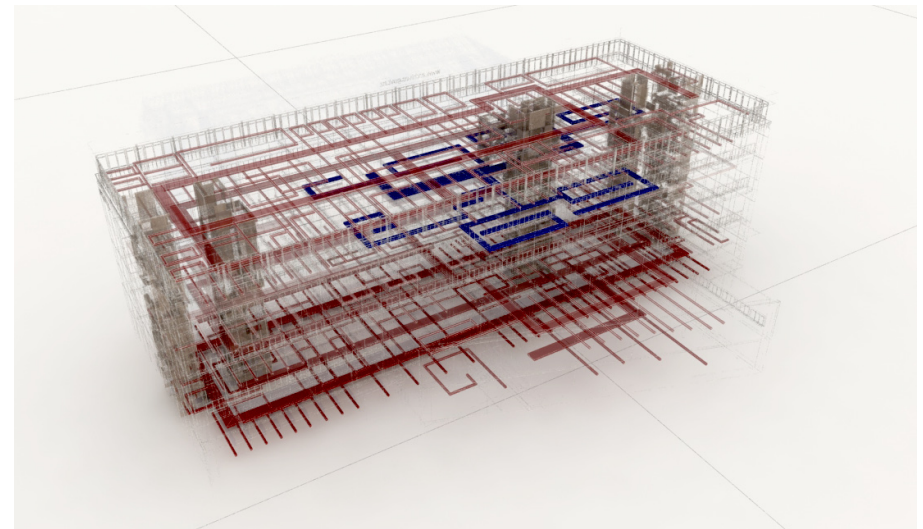
The section shows the general programme distribution on all floors and their floor height. The archival storage area occupies lower level 1 to lower level 3. Ground level is the public area and archive repository. Offices are situated on Level 2 to manage the entire archive.

IV. BUILDING ANALYSIS - ARCHIVES NEW ZEALAND

5. EXISTING STRUCTURAL SYSTEMS AND CIRCULATION



Grid Structures

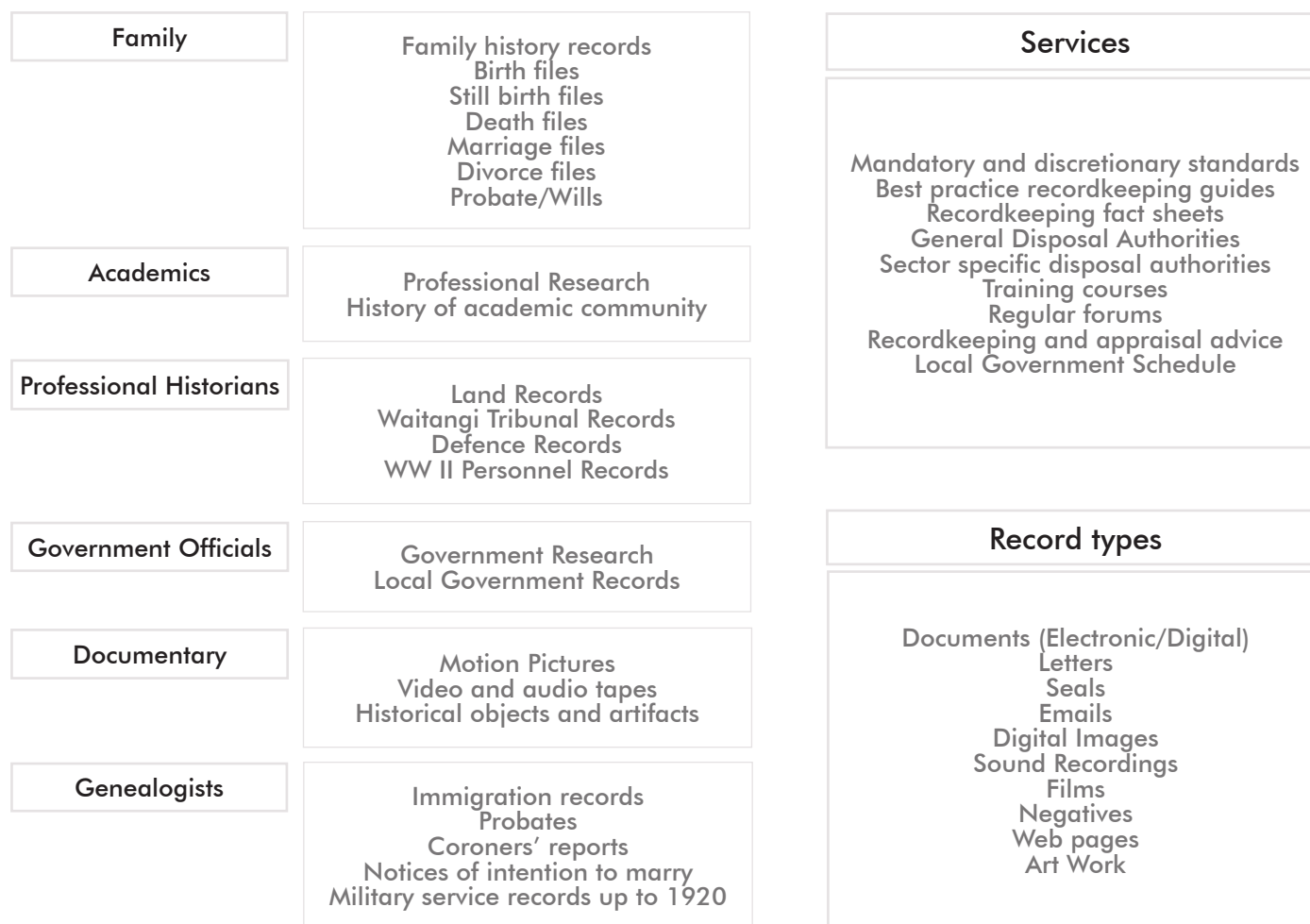


Circulation of Public and Private Spaces

The structural grids of the building are orthogonally rectangular. The three-dimensional horizontal and vertical structural elements are interconnected perpendicularly, suggesting a rigid and robust “persona” to the building. In terms of circulation path, the archive uses a simple and linear approach. The path-space relationships consist of symmetrical nodes and terminations of path, evenly distributed forming a rhythmic and sequential orientation of space. The regular layout and movement in the archive create opportunities to explore the relationship between “presumed anticipation” of space and the interplay of opposing elements that “redefine expectation” as participants move in time through a sequence of spaces. Subsequently, the grid structure of columns and beams can serve as a restriction and regular guidance for distribution of spatial experiences.

IV. BUILDING ANALYSIS - ARCHIVES NEW ZEALAND

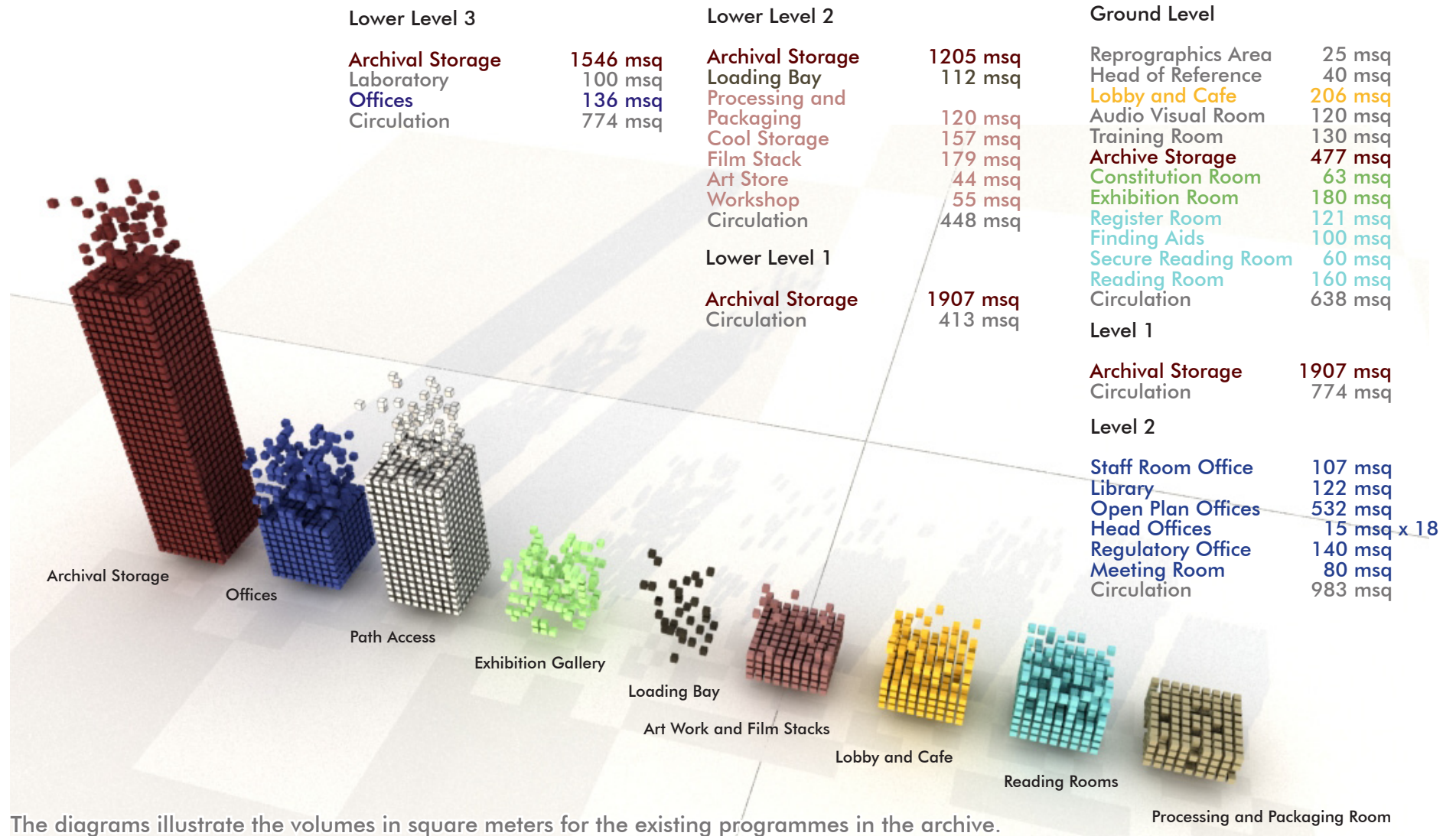
6. VISITORS, SERVICES AND RECORDS



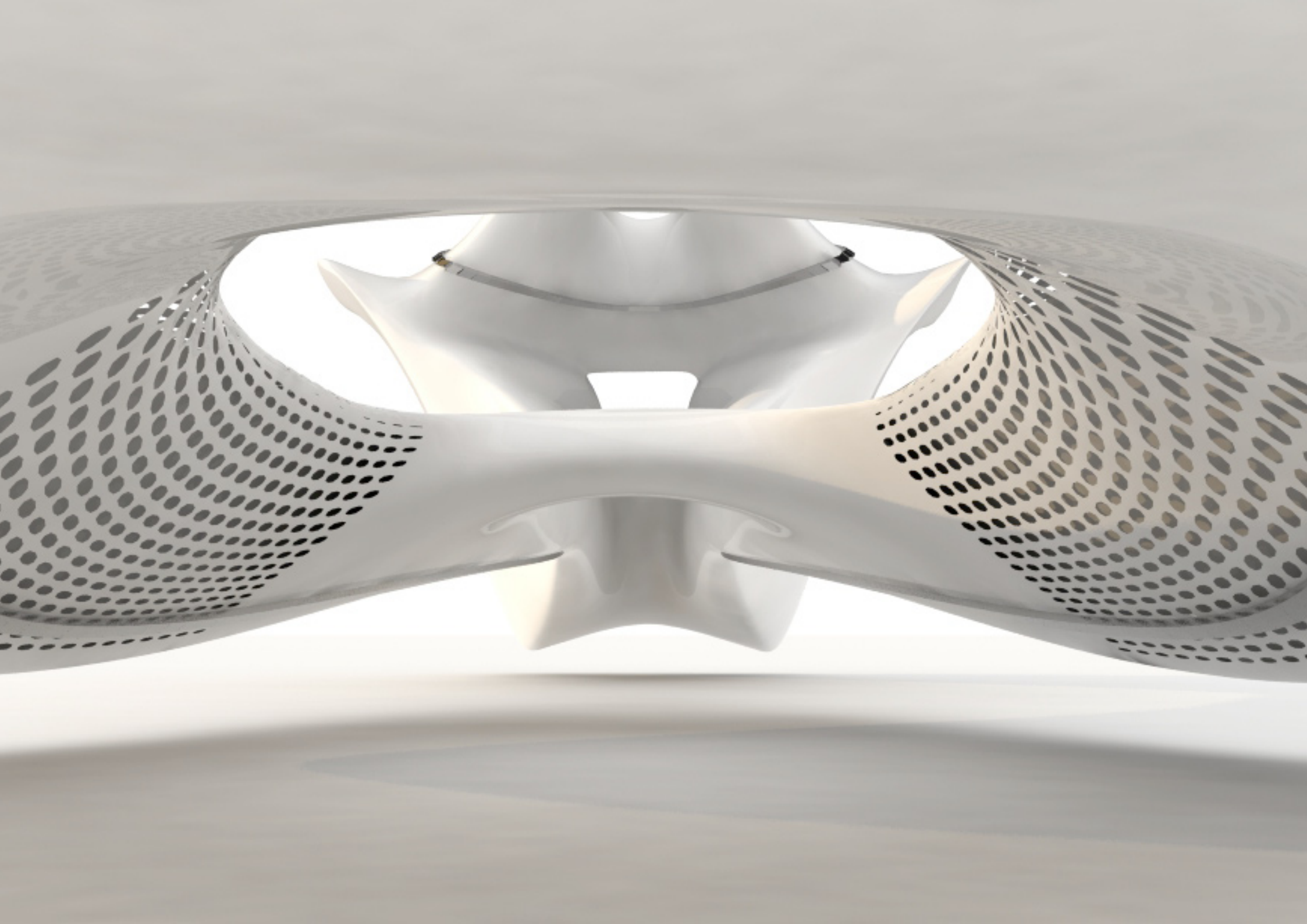
The charts show the different types of visitors, services provided and the record types stored in the archive.

IV. BUILDING ANALYSIS - ARCHIVES NEW ZEALAND

7. EXISTING PROGRAMMATIC REQUIREMENTS



The diagrams illustrate the volumes in square meters for the existing programmes in the archive.



4 EXPERIMENTAL DESIGN

... haptic and multi-sensory architecture makes the experience of time healing and pleasurable. This architecture does not struggle against time; it reifies the course of time and makes its acceptable. This architecture seeks to accommodate rather than impress, to evoke domesticity and comfort rather than admiration and awe.

Juhani Pallasmaa, "Hapticity and Time" (2000) p326

I. INTRODUCTION

1. MULTI-SENSORY NARRATIVE APPROACH

The research design experiments illustrated and discussed in this chapter test the integration of sensory experiences within a parametric environment. The experimental designs propose solutions to a parametric architecture, enabling it to engage our entire human awareness and sensory capacities. Sensory responses, phenomenal experiences, and symbolic narrative intentions are critical design factors, just as essential as incorporating the elegance and aesthetics of parametric architecture. Rather than proposing an absolute answer, these experiments research opportunities to both transcend and exploit sensory responses within a parametric environment. The research objective is to integrate multi-sensory and phenomenal experiences within a parametric environment that are as consistent as possible.

This chapter is divided into three sections. The first section establishes design guidelines while highlighting possible methods to integrate “irreconcilable” opposites. The second section proposes a conceptual design illustrating the design initiatives and their evolution toward interior visualizations. The third and final section of the chapter serves as a conclusion for both the chapter and the thesis. This section tests the dual integrated imperatives of phenomenological and parametric in both plan and three-dimensions (spatiality), within five final interior spaces: Entrance, Reading Area, Transition Space, Archive Entry, and Archive. Each space is used to explore hybrid resolutions of the dual imperatives.

II. CONCEPT MANIFESTATION

1. THEMATIC STATEMENT

Architecture's task - to integrate irreconcilable opposites - is impossible, fundamental, and necessary... Architecture is conceivable in this contradictory task only through understanding any design as a poetic manifestation...¹

In order to test the integration of sensorial, phenomenal and parametric properties, the design experiments employ narrative to help negotiate between contradictory categories and oppositions. Poetic and narrative imagery enable seeming contradictions to be overcome through polyvalent and synthetic imagery.² The design experiments grow through separate architectural scenes, episodes, and narration that are reflected by a sequence of human situations and encounters. Instead of being external spectators of the narrative, inhabitants journey and progress through the events.

Story telling myths and legends have been important in early cultural traditions in New Zealand. Particularly in Maori culture, these myths are often passed through descendents to tell stories of origins of how the world and everything within it were created. They represent an explanation to cultural existence and the characteristics of its cultural nature. The Maori understanding of creation of the universe was expressed in genealogical form. Maori stories reflect universal myths shared by many other cultures. Creation myths reflect rituals of growing up and gaining wisdom, as in the sequence "the beginning, the searching, the growth, the desire, and the knowledge." Thus, five experiential situations have been chosen to symbolically adapt these sequential narrative ritual events. The five chosen experiential situations are sequentially entrance, reading area, transition, archive entry and the archive. The essential aims of these five programmes are to test opportunities for mediation and reconciliation between phenomenal and parametric properties.

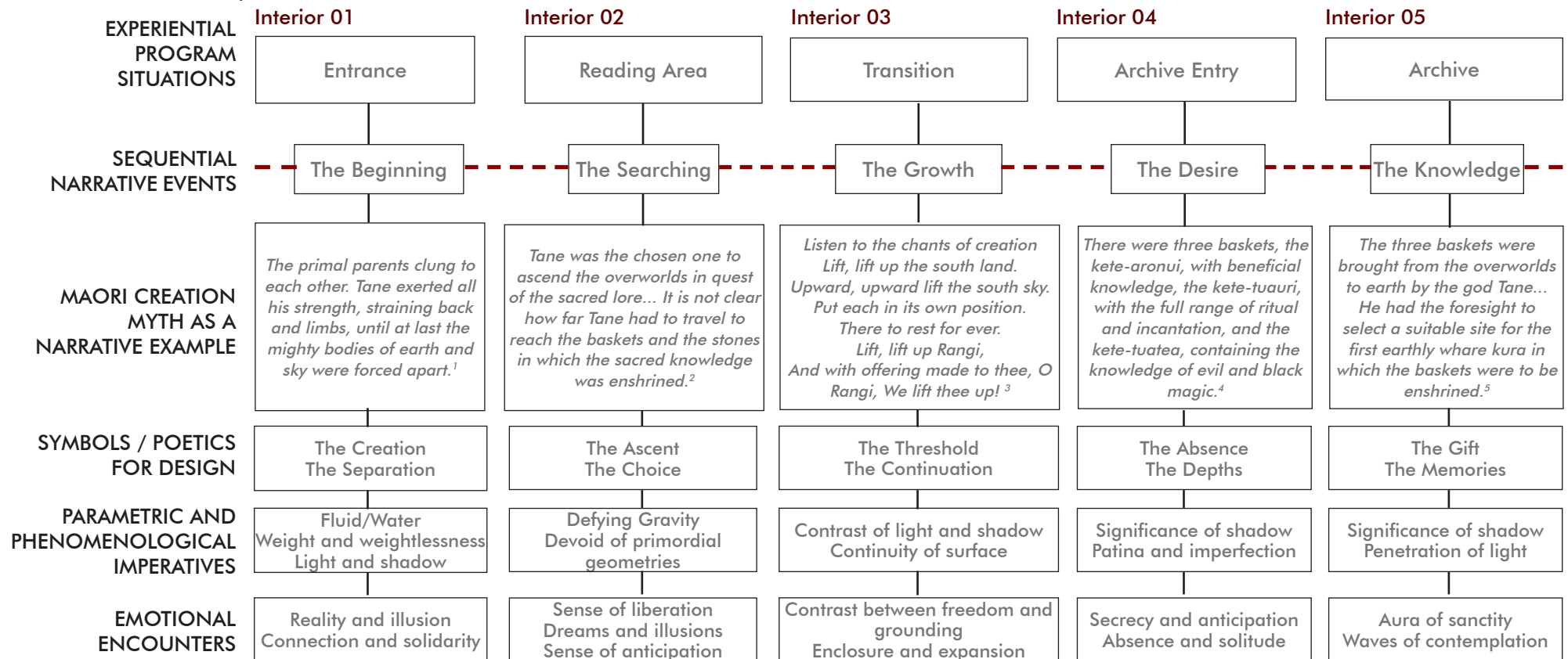
1 Pallasmaa "Landscape Architecture: Architecture and the Influence of Other Fields of Inquiry" p340

2 Pallasmaa "Landscape Architecture: Architecture and the Influence of Other Fields of Inquiry" p340

II. CONCEPT MANIFESTATION

2. IDENTIFICATION OF EXPERIENTIAL SITUATIONS

This section outlines the relationships within the 5 design experiments to the 5 chosen experiential program situations and 5 events relating to a “universal narrative” sequence.



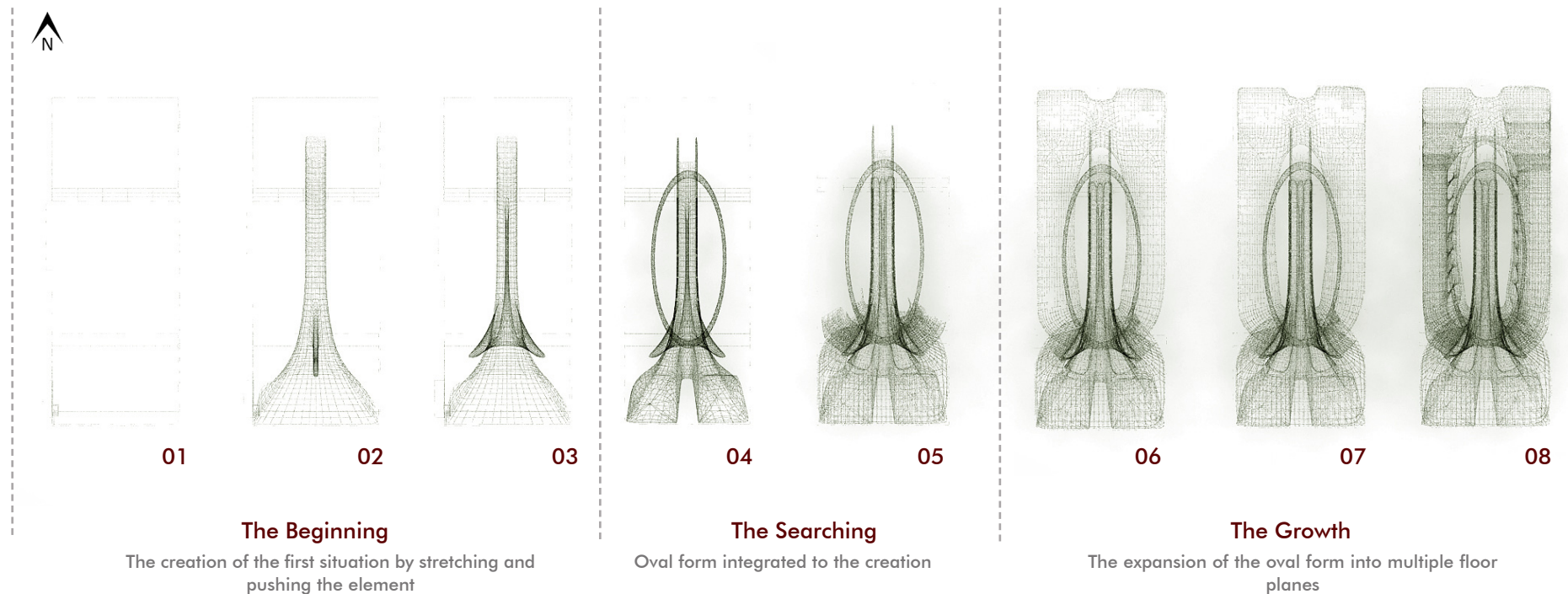
The experiential situations brings into play the ritual of growing up which is evident in universal myths but is also clear in many versions of the Maori myths. The chart above outlines the five chosen experiential situations into subsequent conceptual designing guidelines.

- 1 Reed, A. W. *Maori Myth and Legend* p11
- 2 Reed, A. W. *Maori Myth and Legend* p13
- 3 Reed, A. W. *Maori Myth and Legend* p9
- 4 Reed, A. W. *Maori Myth and Legend* p13
- 5 Reed, A. W. *Maori Myth and Legend* p13

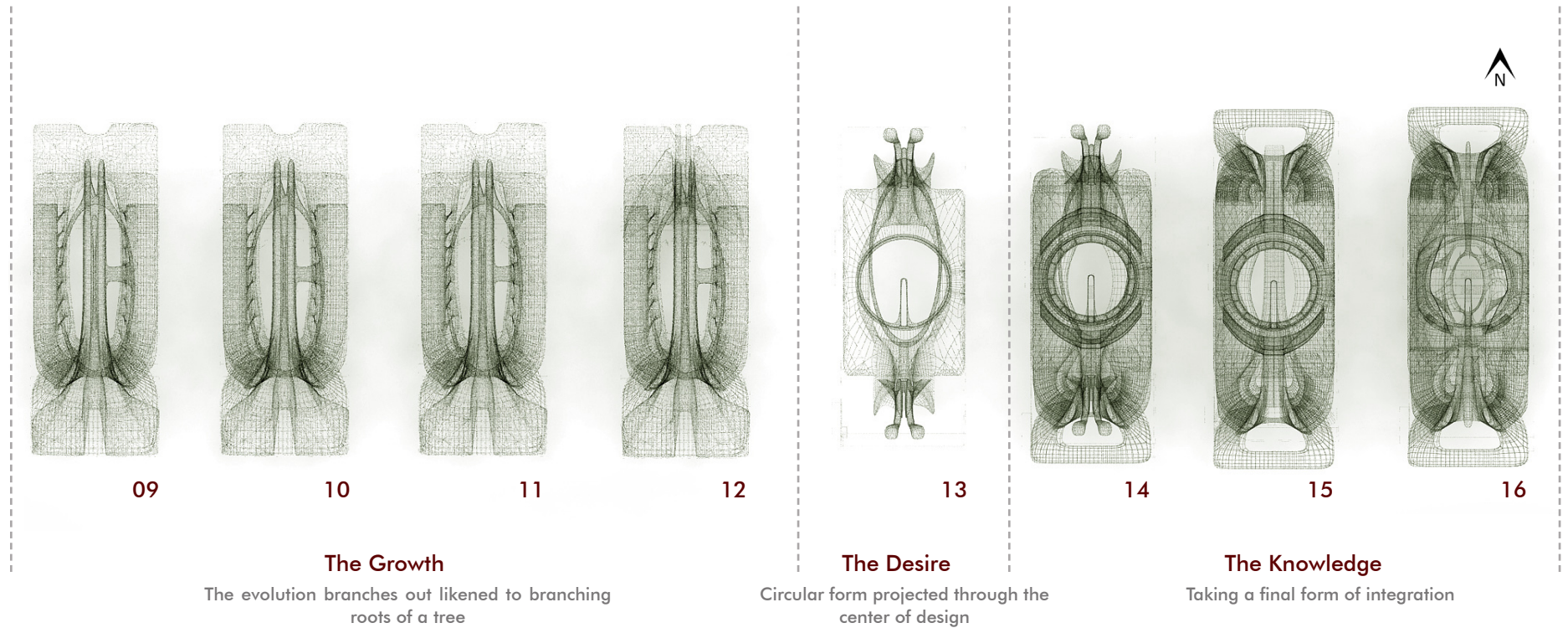
III. CONCEPTUAL DESIGN

1. ARTICULATION OF FORM

This first section of the conceptual design describes the starting point and evolutionary sequence of the form articulation for the overall design. It explains the decision-making as derived from existing conditions that helped initiate evolution of the design such as: primary building axes, hierarchies, programmatic proportions, daylight orientation and the asymmetrical nature of the context in response to narrative and phenomenal considerations.



In the process of articulating a preliminary form, the St Paul's Church on the north side of the archive is used as an axial orientation point. The alignment of axes to the church creates a strong regulating device while implying sacred relationships and symmetry in the design. The initial symmetrical arrangement must ultimately confront and resolve the asymmetry of the site, such as the unbalanced nature of the east and west sides of the axis. An oval was introduced to reflect daylight orientation while embedding a fluid form contradicting the existing structural context. The ellipsoidal form follows the rhythmic movement of the context by elongating along the axis. The grid shifts in the city



footprint are emphasized by planar elements with a regulated range of intensity from south to north. These additive forms result from the accretion of discrete elements characterized by their ability to grow and merge with other forms, achieving a unified composition of form. A complete circle evolving from the center serves as a symbolic entity representing the unity of form and creating hierarchical order unifying the oval and orthogonal.

III. CONCEPTUAL DESIGN

1. ARTICULATION OF FORM

These 3-dimensional forms are directly generated from the sketch drawings of the previous page. (page104-105)

The Beginning



01



02

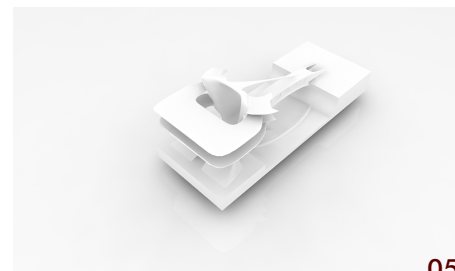


03

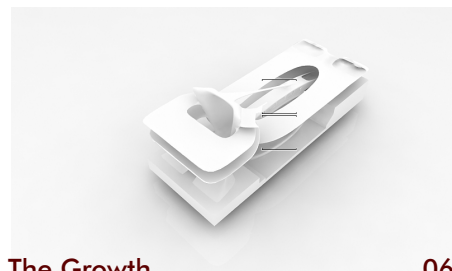
The Searching



04



05

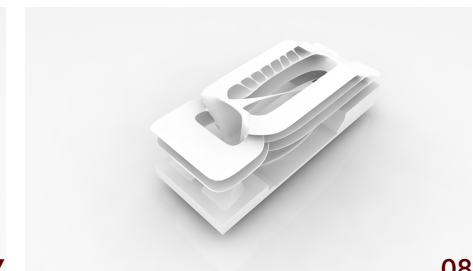


06

The Growth



07



08

Taking into account the axes, design form of the daylight orientation, additive forms and the symbolic circle, the final integration of the form is based on the programmatic proportion of the archive. The three lower level floors serve as an anchor point grounding the vertical structure and as an archival storage space that demands enclosure and thereby produce intimacy in space. The ground floor acts as a neutral datum plane as it is the only floor with public access, ultimately becoming the mediator towards the lower levels and the upper levels. Levels one and two have more additive forms that branch out, creating a series of junctures between mass and space. The existing columns

The Desire



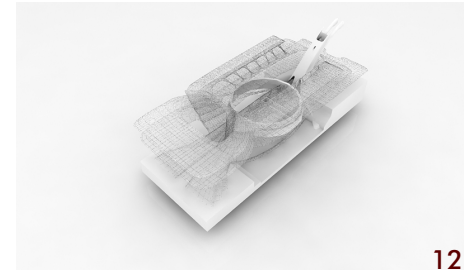
09



10



11



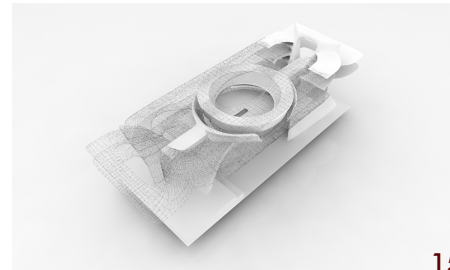
12



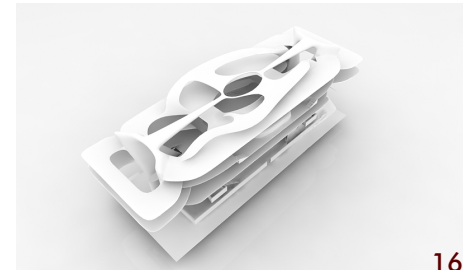
13



14



15



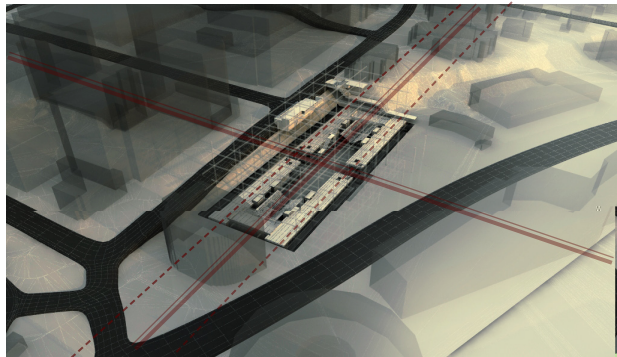
16

The Knowledge

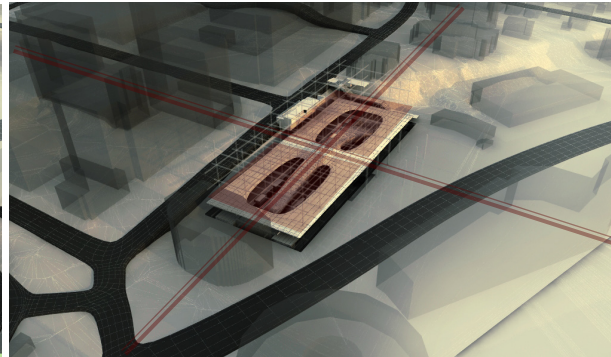
act as a spatial field and interact with the horizontal elements creating spatial enclosures which produce private spaces such as offices and archival storage. The existing orthogonal column grids as an archetypal element effectively defines the edge and boundaries of the spatial volume, while allowing visual and spatial continuity between the space and its surrounding. These design opportunities are regulated based on function, existing context and structural context; at the same time, these opportunities can be exploited to reflect intricate narrative architectural forms.

III. CONCEPTUAL DESIGN

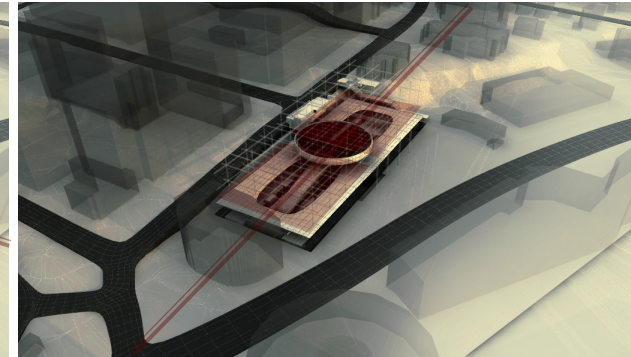
1. ARTICULATION OF FORM



01



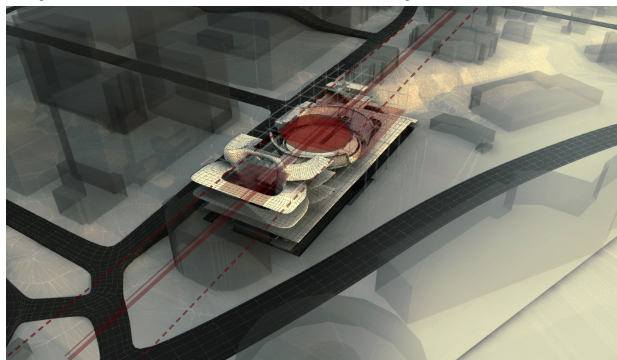
02



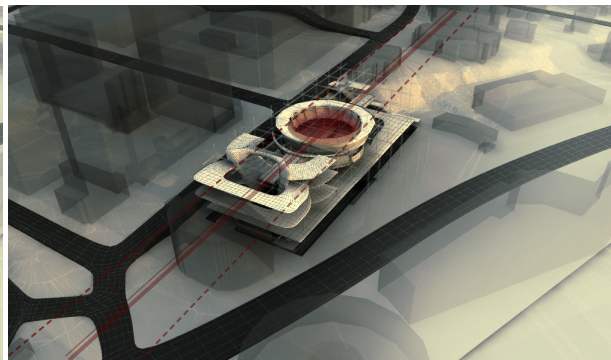
03

Diagrams showing the articulation of form in response to the existing context:

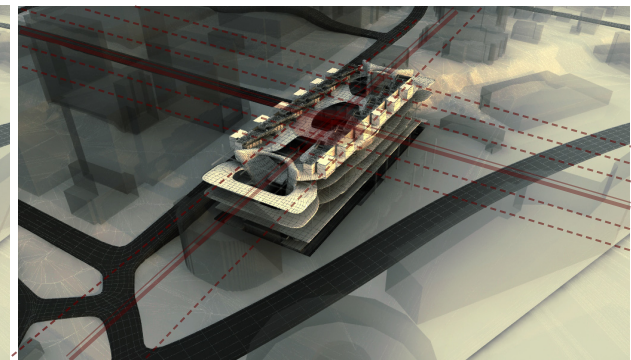
1. The archive is aligned along the axis of the church thus creating a strong regulating device, while implying sacred relationships and symmetry in the design.
2. The floor planes define the limits and boundaries of the volume while creating habitable space.
3. The oval form integration imitates the daylight orientation while creating a fluid form contradicting the existing structural context.
4. The ellipsoidal form follows the rhythmic movement of the context by elongating along the axis.
5. The central circle serves as symbolic entity representing the unity of form and creates hierarchical order unifying the oval and orthogonal elements.
6. The existing columns act as a spatial field and interact with the horizontal elements creating spatial enclosure. Additive forms branch out creating series of junctures between mass and space.



04

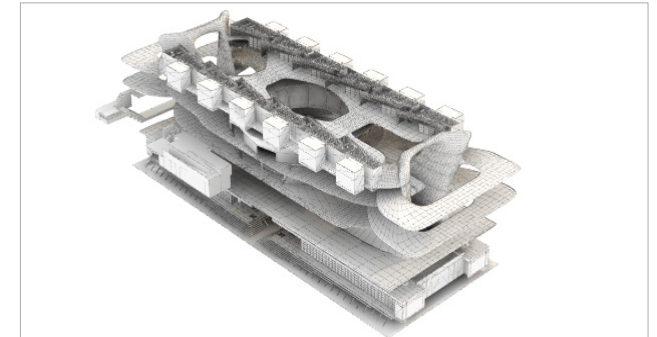
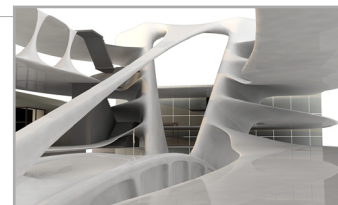
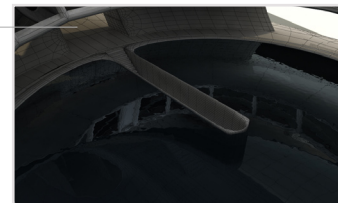
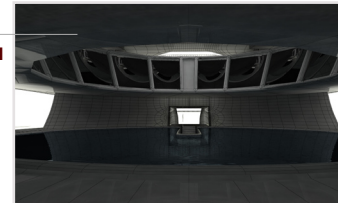
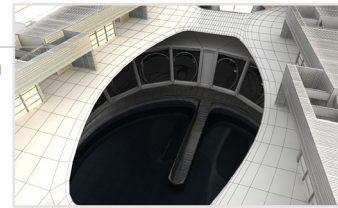
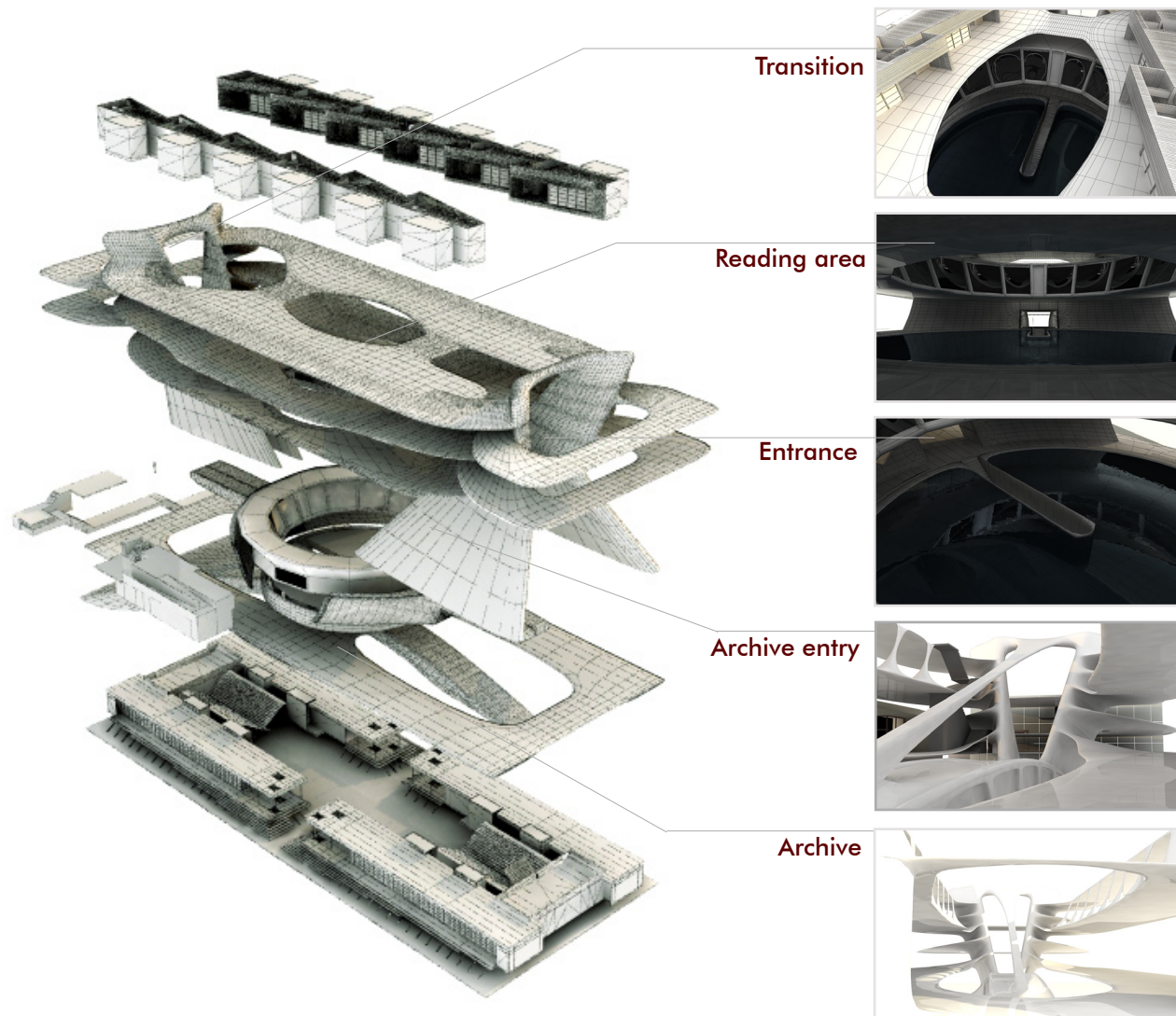


05



06

2. INITIAL INTERIOR VISUALIZATION

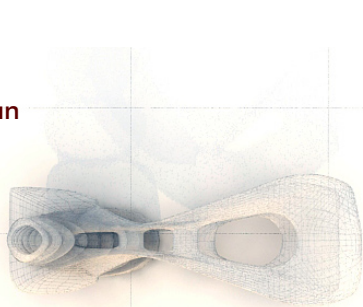


The design engages water as an element that has a long historic use in architecture to symbolically evoke self-reflection. It can readily inhabit the parametric or non-parametric elements, since it is fluid. A circular pool is situated in the center of the design as a symbolic “beginning” connecting both upper and lower levels. Archival records are contained beneath lower level 3; inhabitants descend down to the depths to acquire knowledge. The main objective for the initial conceptual design was to observe how each of the 5 experiential situations can coexist perceptually in a unified whole in response to symbolic relationships based on the ritual of the stages of life leading to gaining wisdom.

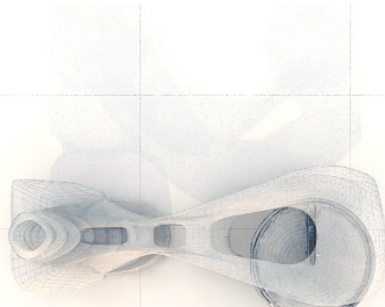
IV. EXPERIMENTAL DESIGN

1. FORM EVOLUTION

Plan



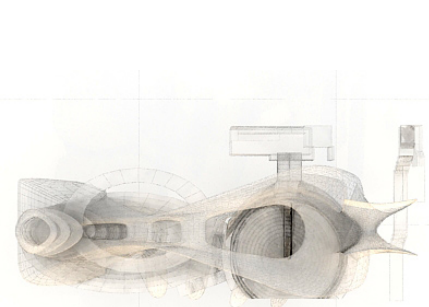
01



02

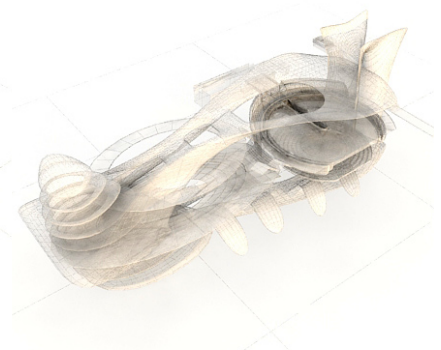
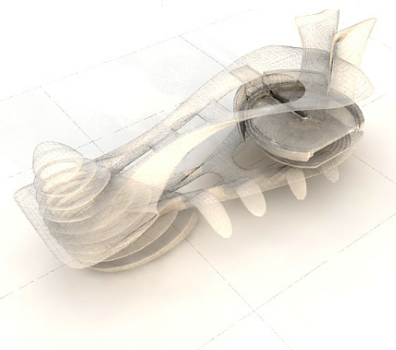
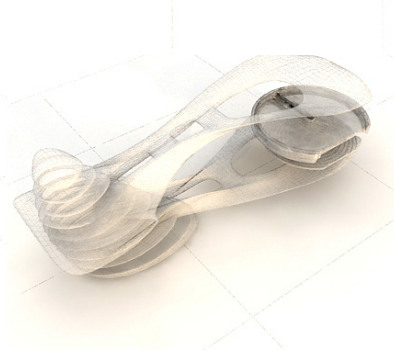
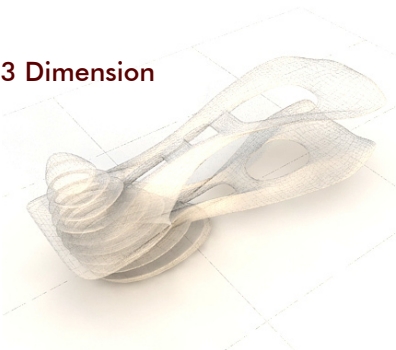


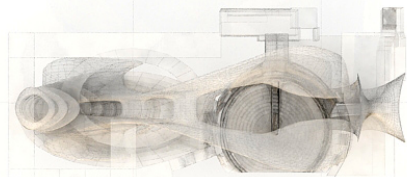
03



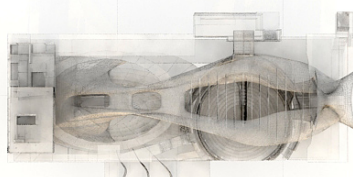
04

3 Dimension

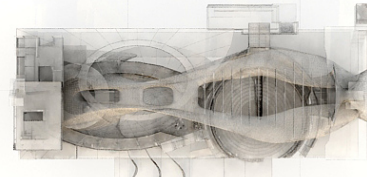




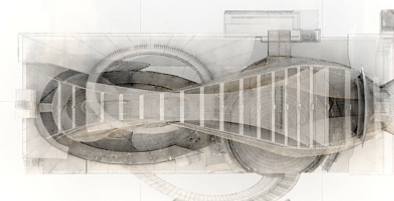
05



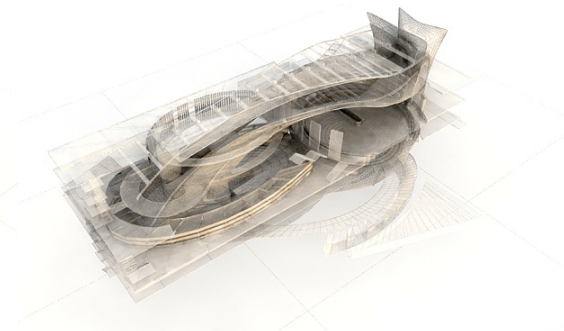
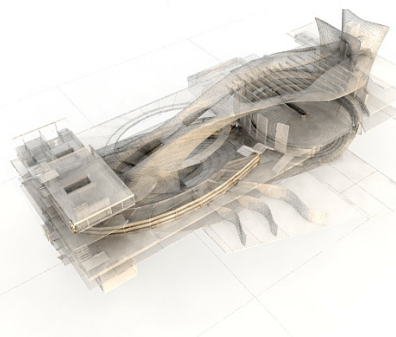
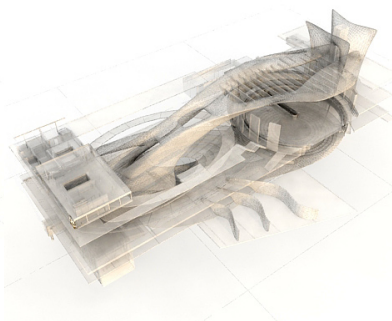
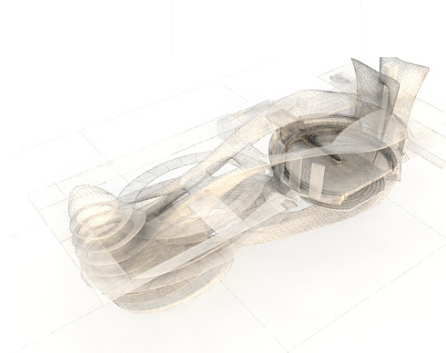
06



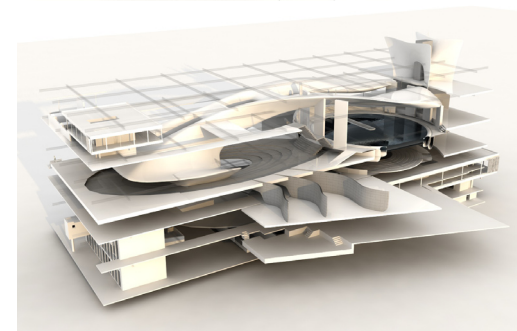
07



08



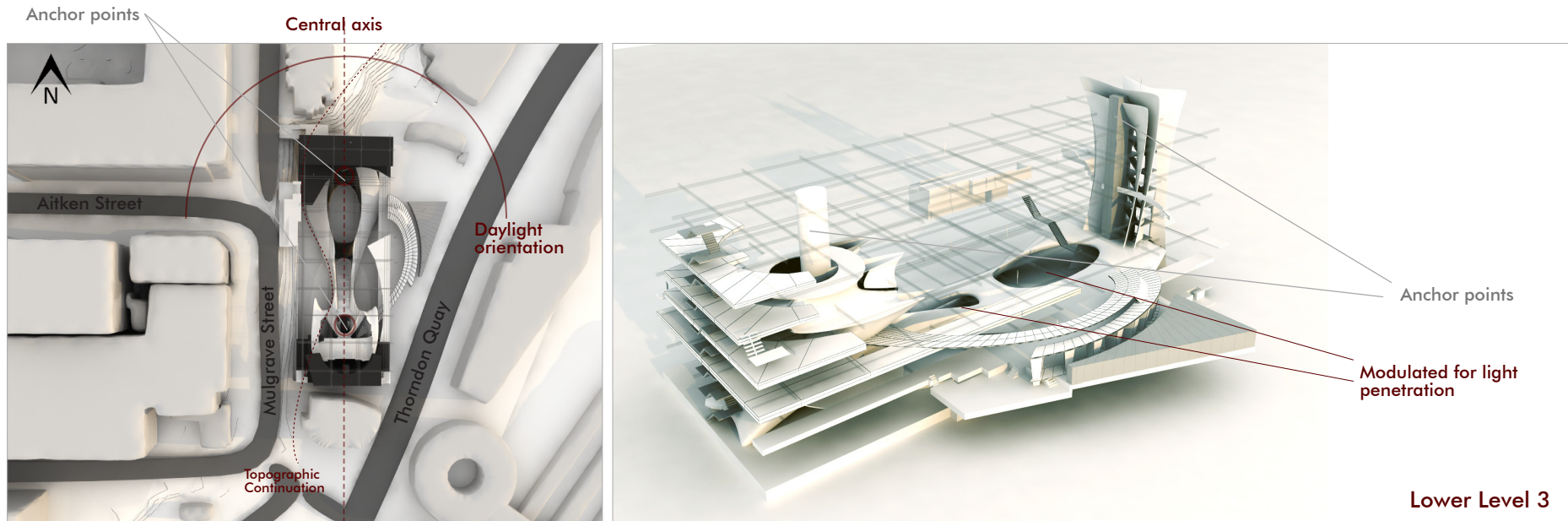
As the design developed, forms evolved to become more parametrically malleable while at the same time engaging a more in depth sensorial experience. Each form was developed with its symbolic purposes as well as responding to contextual anomalies, as discussed further in the following pages.



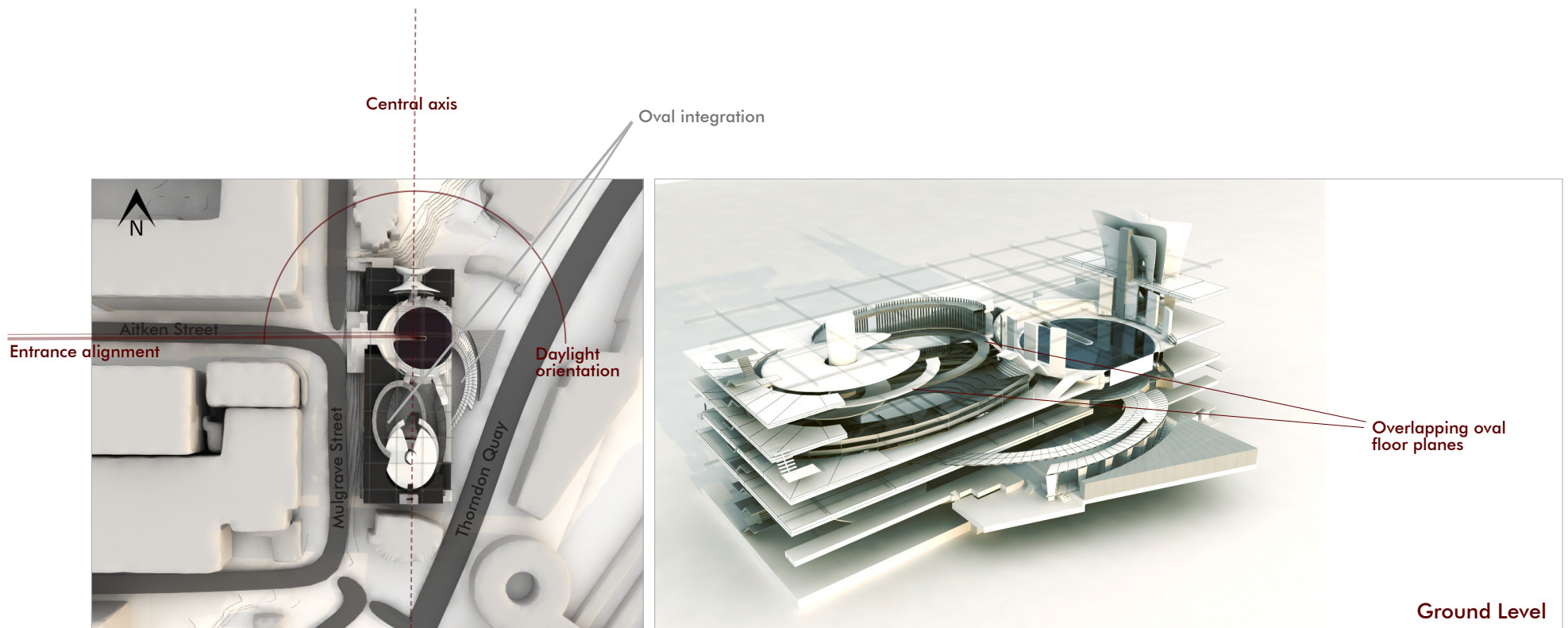
IV. EXPERIMENTAL DESIGN

2. RESPONDING TO CONTEXTUAL ANOMALIES

This section further describes the evolution of the articulation and form of the design. It discusses the parametric and phenomenological imperatives that are taken into consideration in response to the topographic landscape and the urban and structural grids.



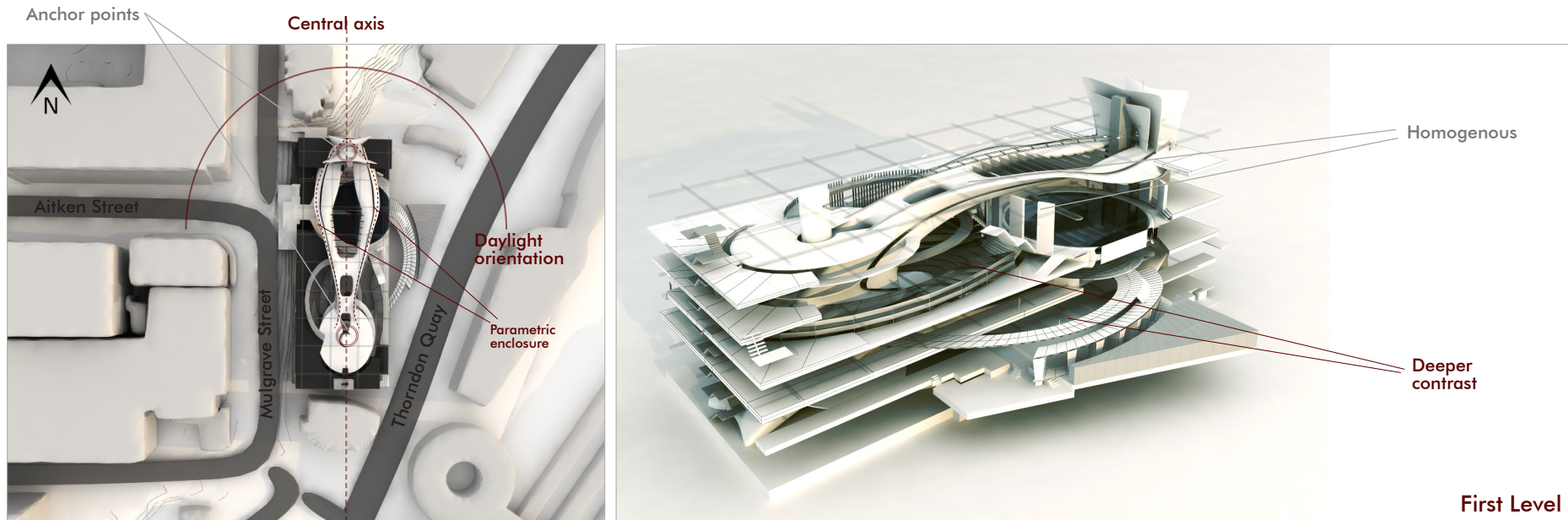
The nature of the fluid form exhibits a three-dimensional mass and volume that suggests a continuation of the existing topographic contour. Anchor points positioned through the central axis on each end of the form mark the termination and discontinuity of the fluid form. At the same time, both anchor points serve as a vertical threshold to upper floor planes. Meanwhile, voids are carefully modulated to allow different ranges of light penetration. The intention is to create a phenomenon of contrast between light and shadow through different levels.



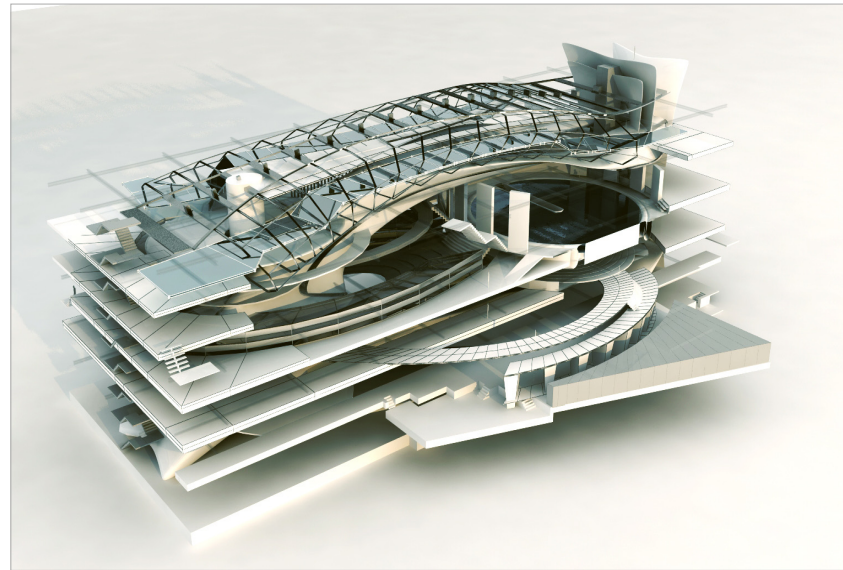
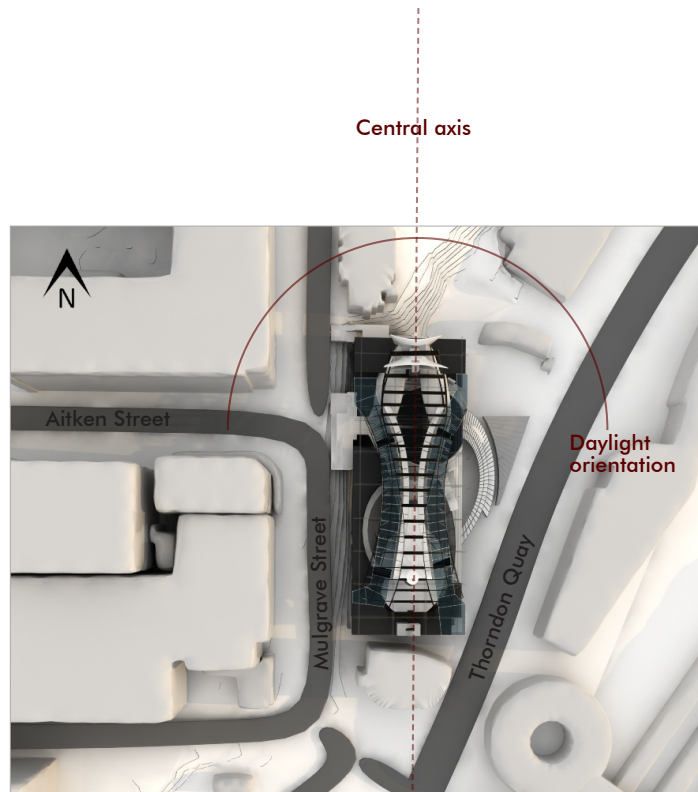
The design utilizes the rule of third to produce hierarchical volumes based on the existing structural grid. The reason for observing the rule of thirds is to discourage placement of elements in the centre of the context. The circular pool is symbolically shifted from the center and aligned to the axis of the entrance while the integration of the overlapping oval forms is influenced by the orientation of daylight. Each element on a level relates to adjacent element, allowing for integration and separation of particular dimensions of each form in response to symbolic intentions.

IV. EXPERIMENTAL DESIGN

2. RESPONDING TO CONTEXTUAL ANOMALIES



As the next evolution of the design, the circular and oval geometrical volumes are spatially transformed by the fluidity of a continuous surface that gradually rises above them, again projecting from one vertical anchor point to another at the end of the building. The shape of the form is also suggesting a continuation of the existing landscape topography that is being brought into the orthogonal grids of the building, denying the typical uniform grid pattern. The forms are modulated to allow constant penetration of natural daylight into the center of the space in which homogeneous light could be utilized to outline the surface of parametric forms. While phenomenal imperatives such as deep shadows are enhanced by the overlapping floor planes within the parametric enclosure.

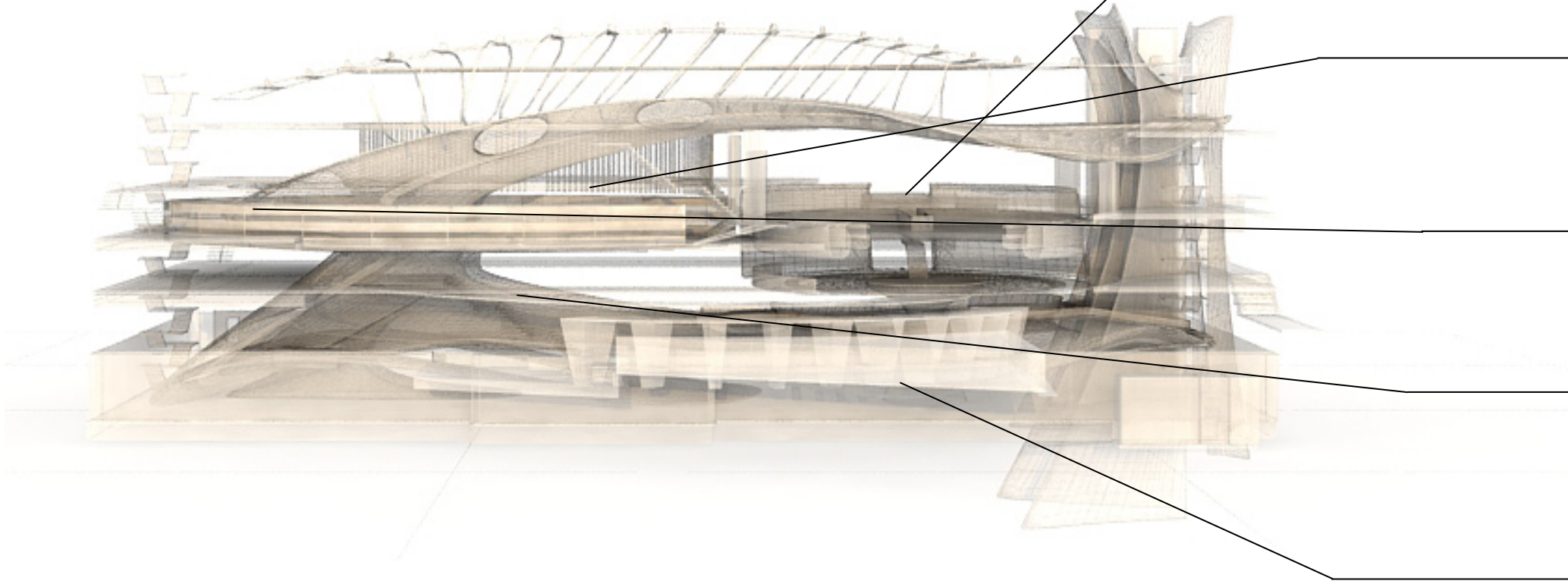


Second Level

The orthogonal skeletal structure on the second level is used to reinforce and support the design intervention. It responds to the existing structural grid to create functional modulated office spaces on the second level. The thin bare-boned quality of the element exhibits a sense of rhythm and lightness.

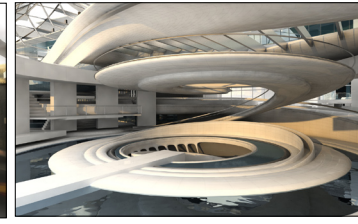
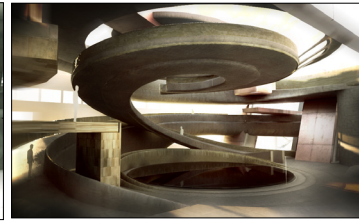
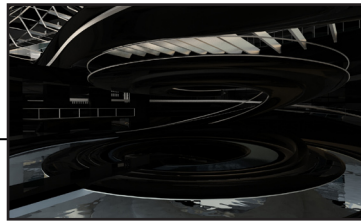
IV. EXPERIMENTAL DESIGN

3. EXPERIMENTAL INTERIOR VISUALIZATIONS



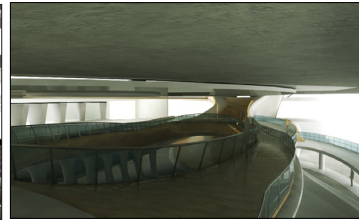
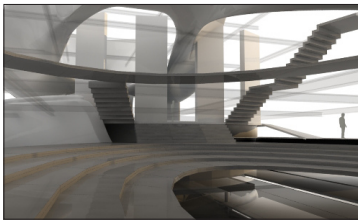
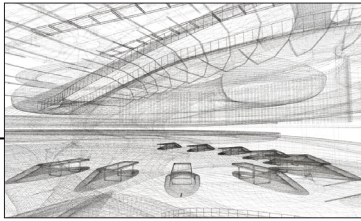
Within the overall design, a series of 5 detailed spatial experiments were undertaken to articulate inhabitation within the 5 selected experiential situations. The 5 spatial experiments illustrate the results of integrating both phenomenal and parametric experiences. Each experiential situation reflects specific phenomenal and parametric imperatives that are based upon its symbolic nature. An in-depth discussion of each final integrated interior occurs in the following sections, as listed on the next page.

The Entrance
(pages 128-131)



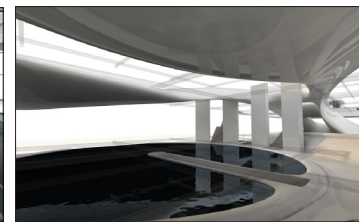
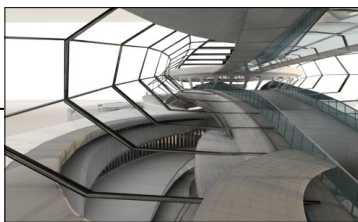
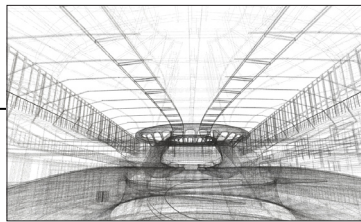
- Phenomenological Imperatives**
- Significance of Shadow
 - Presence of Water / symbolic
 - Symbolic Circle
- Parametric Imperatives**
- Defiance of gravity

The Reading Area
(pages 132-135)



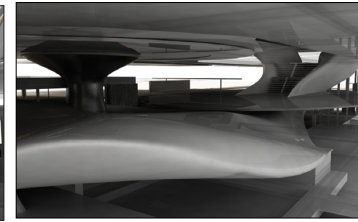
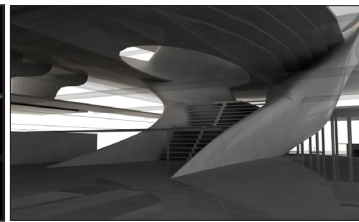
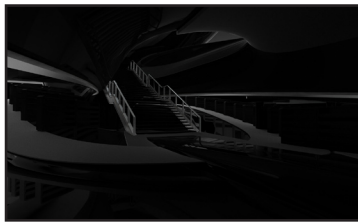
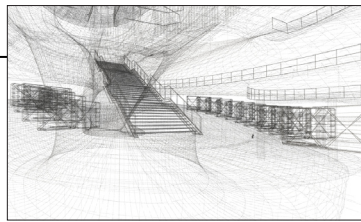
- Phenomenological Imperatives**
- Presence of Water / symbolic
- Parametric Imperatives**
- Defiance of gravity
 - Parametrically Malleable
 - Integration of Perfection and Imperfection
 - Presence of water / Fluid

The Transition
(pages 136-139)



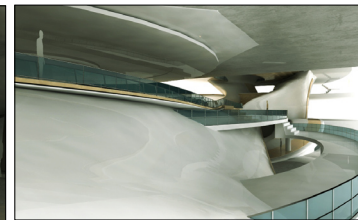
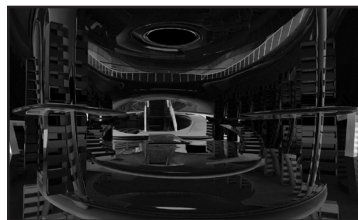
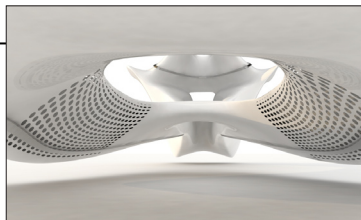
- Phenomenological Imperatives**
- Extreme contrast of light and shadow
- Parametric Imperatives**
- Defiance of gravity
 - Parametrically Malleable
 - Fluid Continuity
 - Perfection of Materiality

The Archive Entry
(pages 140-143)

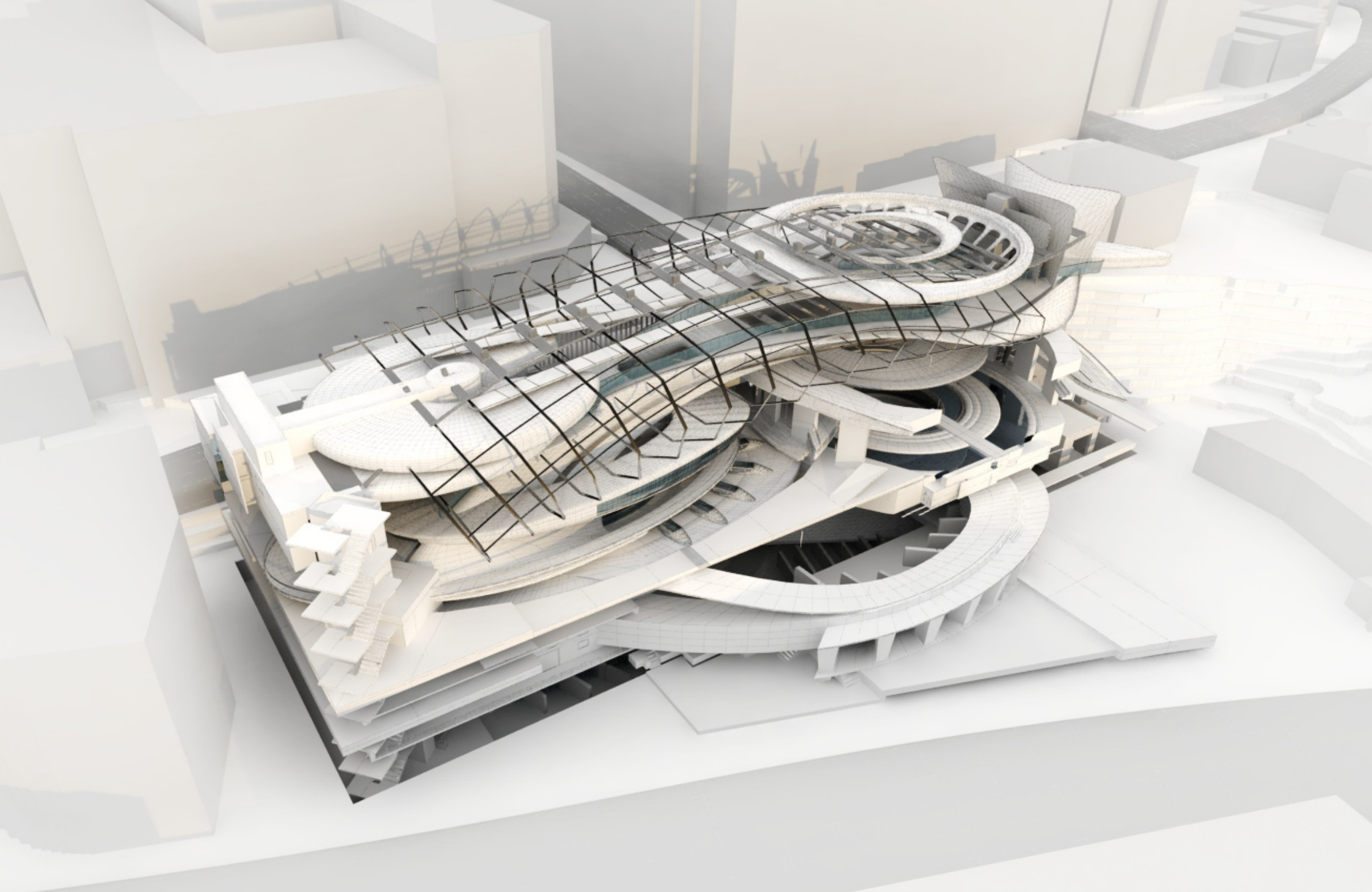


- Phenomenological Imperatives**
- Significance of Shadow
 - Weight
- Parametric Imperatives**
- Fluidity
 - Ageless perfection
 - Continuity

The Archive
(pages 144-147)



- Phenomenological Imperatives**
- Significance of Shadow
 - Aging of Materiality
- Parametric Imperatives**
- Defiance of gravity
 - Parametrically Malleable

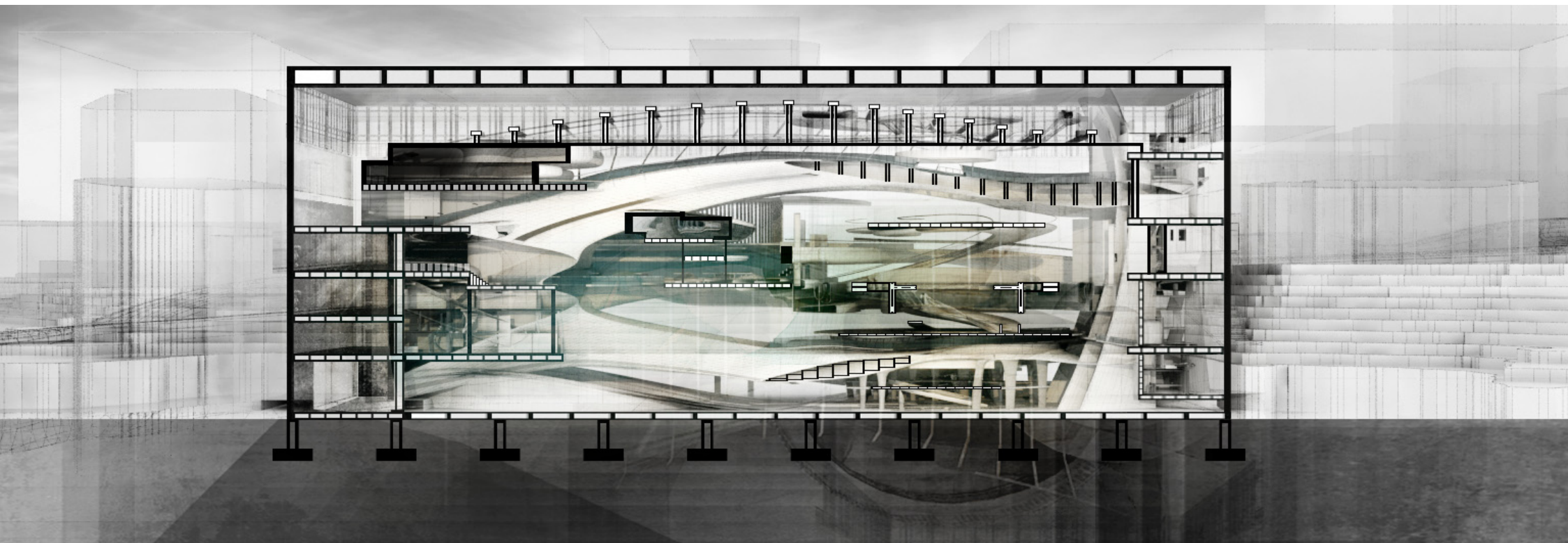


EXPERIMENTAL DESIGN

IV. EXPERIMENTAL DESIGN

4. INTEGRATING SYMBOLIC, PHENOMENOLOGICAL AND PARAMETRIC IMPERATIVES

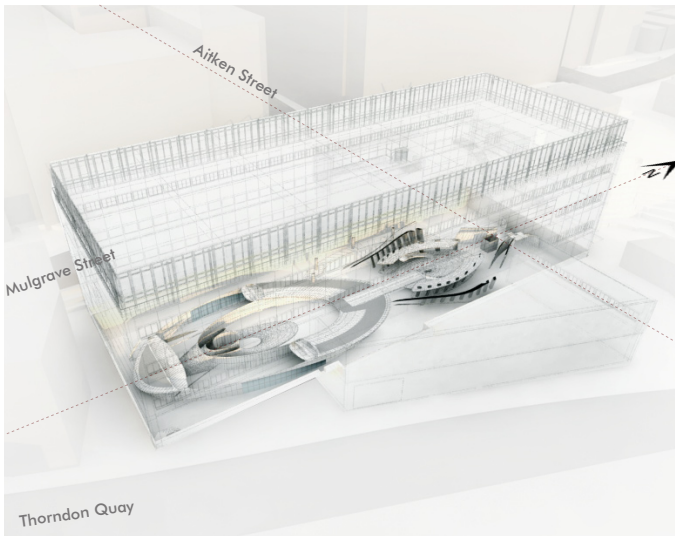
This section elucidates the integration of symbolic, phenomenological and parametric intentions. It begins by illustrating the parametric malleability of the entire design, exhibiting the overall parametric qualities of continuity and fluidity. Subsequently, the section discusses the significant symbolic, phenomenological and parametric imperatives engaged on each of the floor levels. The objective is to understand how all these imperatives can mediate between one another to unify as a whole while maintaining their own identity. Ultimately, visualization of interior experiences are illustrated and discussed in conjunction with a sensorial chart as a designing guideline, to present the co-existence and reconciliation between “contradictory” imperatives of phenomenological and parametric spatiality.



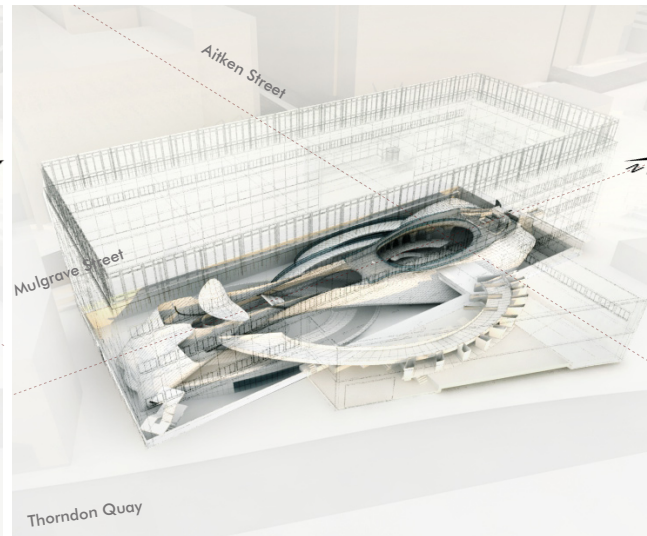
Longitudinal Section facing west

IV. EXPERIMENTAL DESIGN

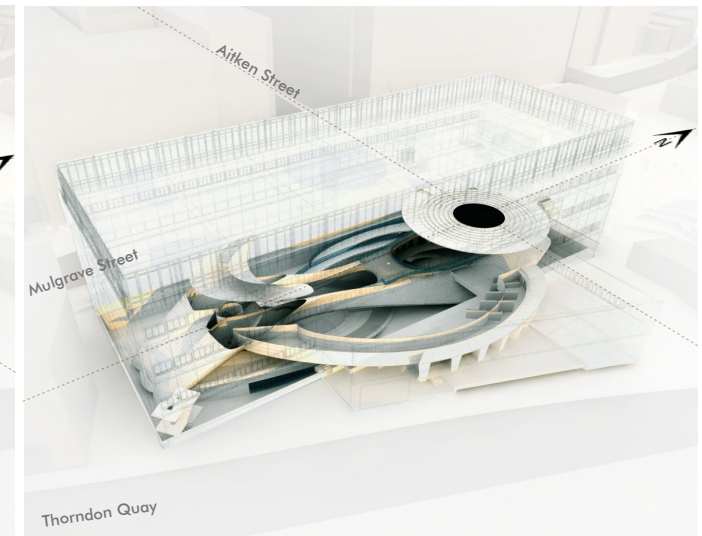
5. PARAMETRIC MALLEABILITY



Lower Level 3

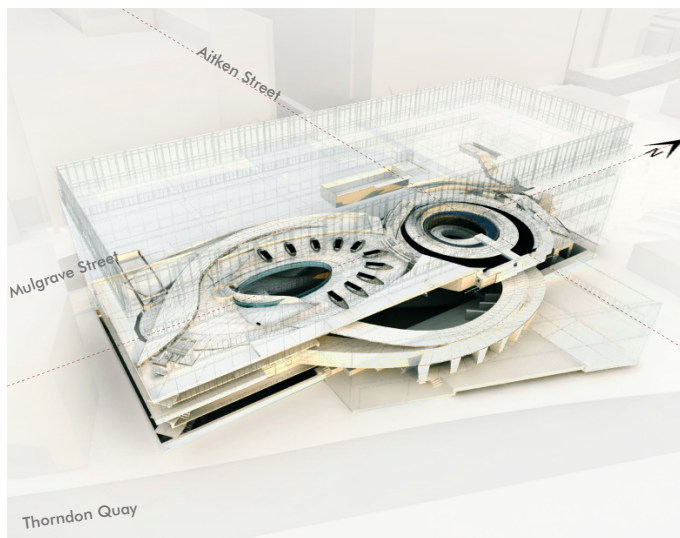


Lower Level 2



Lower Level 1

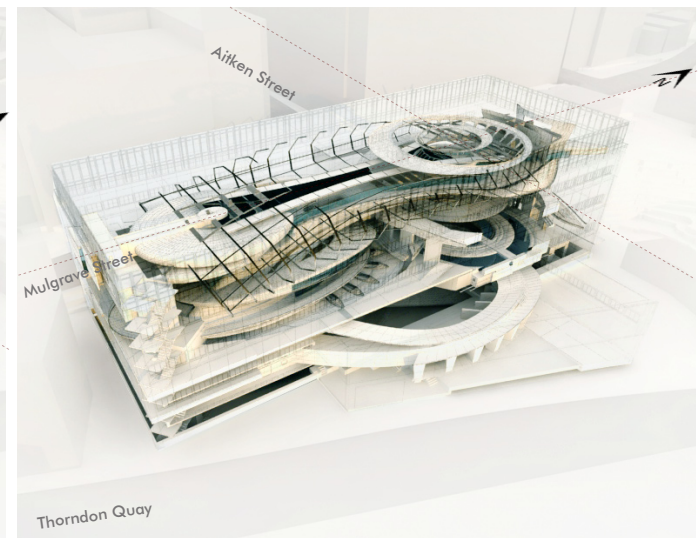
Each floor level is a family of related forms that grows in complexity as the forms gradually rise from the lowest levels to produce a “continuity” incorporating differences. Parametric elegance is maintained in the organizational, spatial and aesthetic fluidity of the design. The elegance specifically resides in the seamless integration of all these factors to bring together a single, sinuous form. By comprising a family of interrelated forms, this allows for the integration and separation of particular experiential situations in response to specific symbolic intentions, and also for the careful modulation of each



Ground Level



Level 1

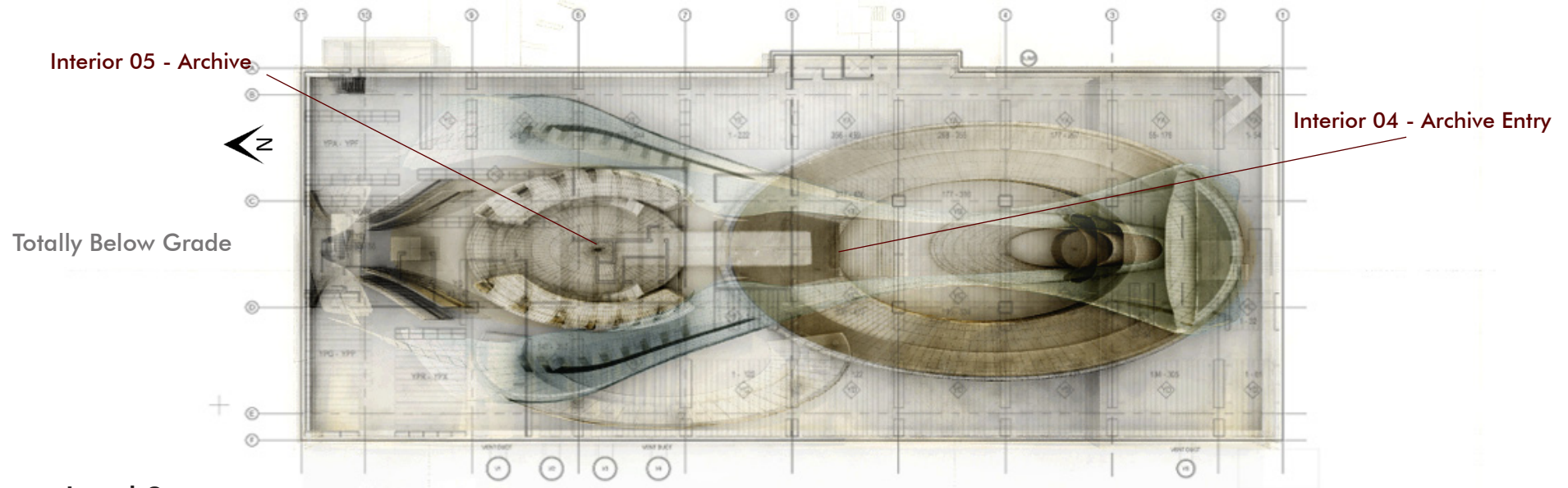


Level 2

form's curvature in order to contain phenomenal experiences. While there is an organic continuity to the interior surfaces of the design, each space simultaneously retains its own unique qualities defined by the integration of phenomenal properties. The complex formal and existential relationships that result in the design enable a range of moods that further enhance the integration of sensorial sensibility, as illustrated in the following pages.

IV. EXPERIMENTAL DESIGN

6. INTEGRATING SYMBOLIC, PHENOMENOLOGICAL AND PARAMETRIC IMPERATIVES IN PLAN

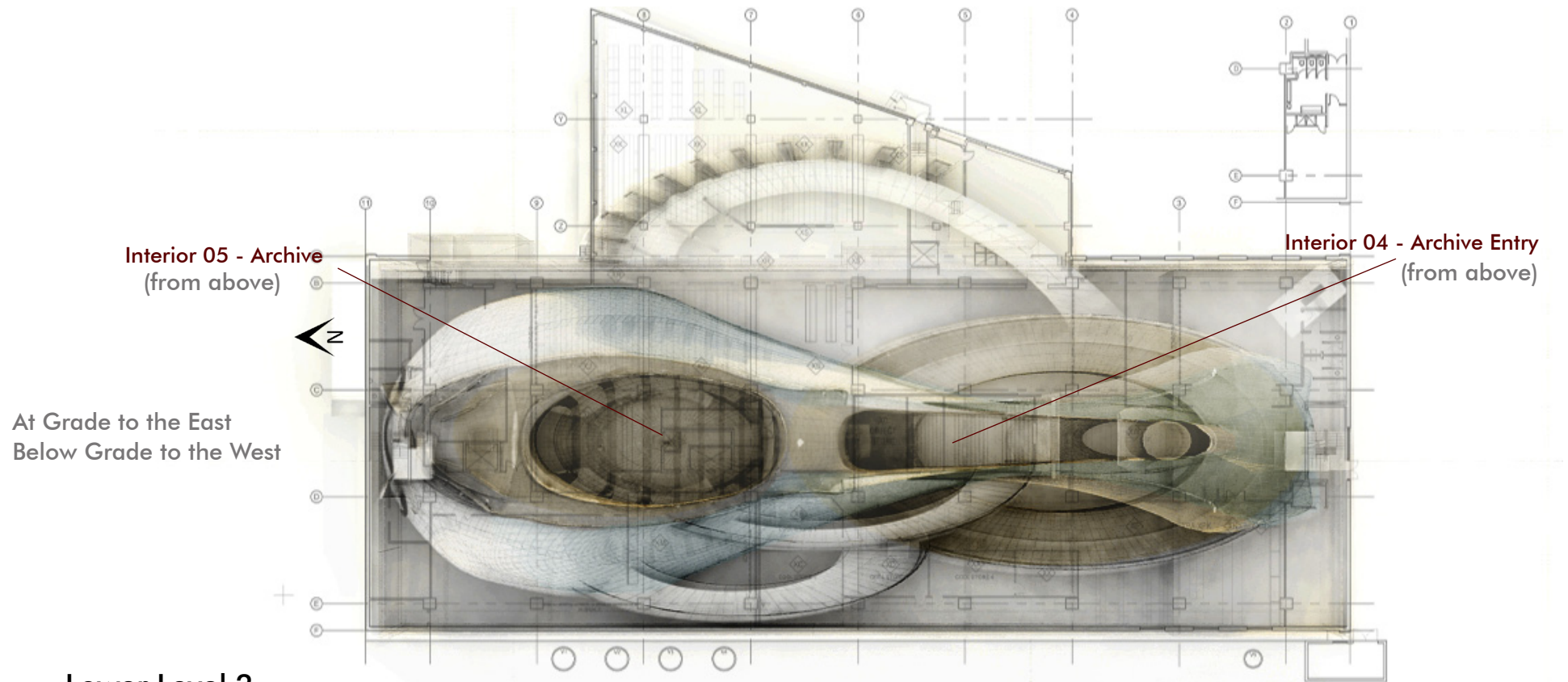


Lower Level 3

Parametric intentions: At the lowest level, the parametric form projects itself forward to lead to a focal point of an oval form that is the core of the intervention, the destination of the journey, the archive. Fluidity and dynamism are expressed by the thin, bare-boned quality of organic form that interpenetrates with the geometric oval, to create a subtle transition from one experiential situation to the other, the archive entry to the center of the archive.

Phenomenological intentions: Contained within the organic form, phenomenal elements are exhibited through the dramatic contrasts of dark and light filtering through the organic concave pillars. Due to the level totally below grade, dark shadows are invited to inhabit the spaces.

Symbolic narrative intentions: The space is symbolically encircled by concave pillars descending from above to mark the containment of knowledge. The oval form is also a direct reflection positioning vertically to the pool above, seen at the entrance, presenting an opportunity for self-contemplation and revelation.



Lower Level 2

Parametric intentions: Spatiality is transformed vertically by the continuous surface that gradually rises from the previous level in which spatial atmospheres subtly transform but still bear the same traits.

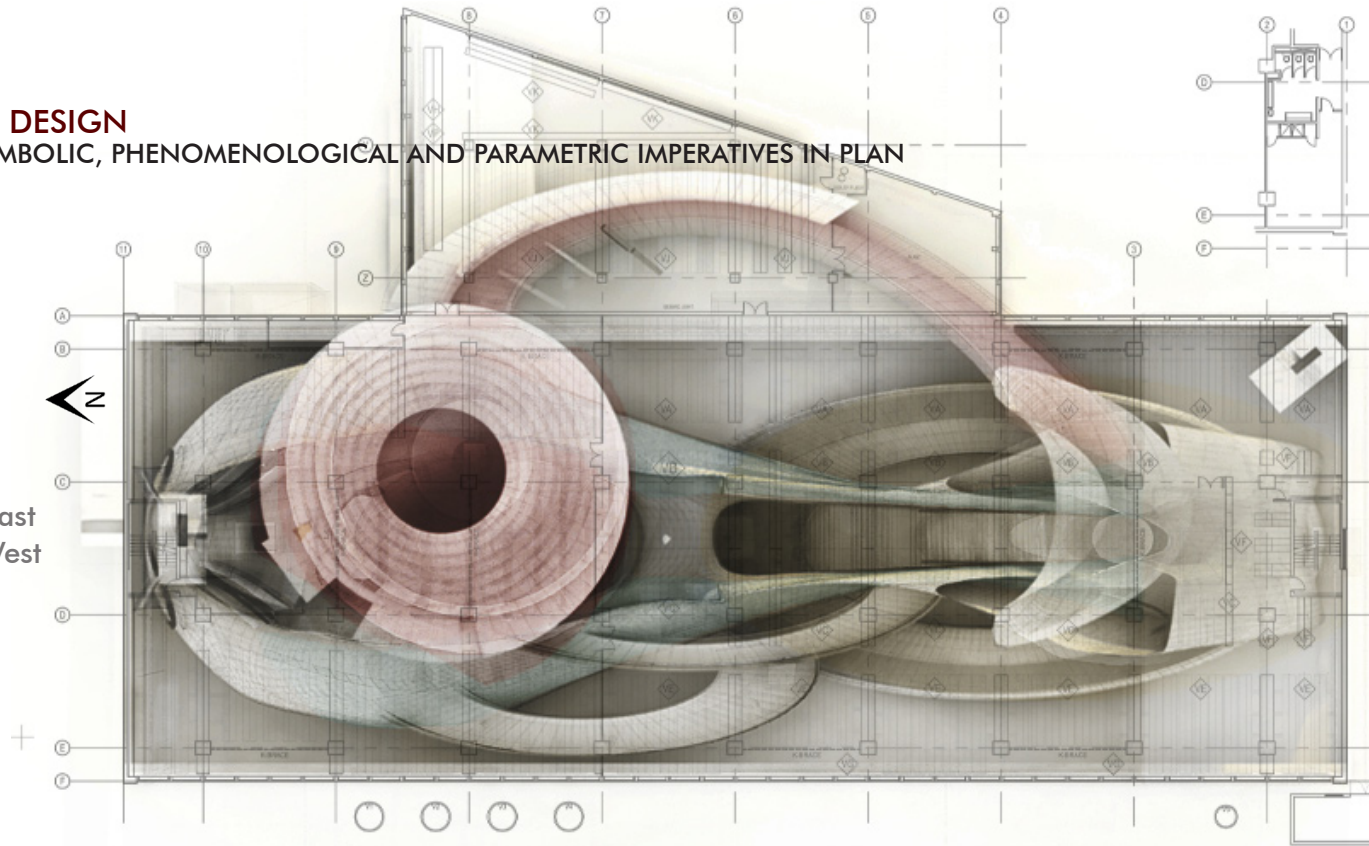
Phenomenological intentions: Phenomenal experiences are stimulated by the contrast of the upper and submerged levels creating and provoking a sense of anticipation. The surreal quality of light seemed mysteriousness and ambiguous which are phenomenologically intertwined. Additionally, the level is at grade to the east and below grade to the west, thus spaces are articulated to homogenous light on the east and deeper contrast to the west.

Symbolic narrative intentions: The archive submerged at the very bottom level of the building becomes an opportunity for being the resting place of archival memories. Knowledge of the protection offered by the underground is as old as humanity itself, it symbolizes the human heart as the spiritual 'centre'. The journey is experienced on a broad stairway descending from the upper surface to the submerged depths. This symbolizes the echoes of time from past to present, a symbol of consciousness, reflecting the formal duality between the profane and the sacred.

IV. EXPERIMENTAL DESIGN

6. INTEGRATING SYMBOLIC, PHENOMENOLOGICAL AND PARAMETRIC IMPERATIVES IN PLAN

Above Grade to the East
Below Grade to the West

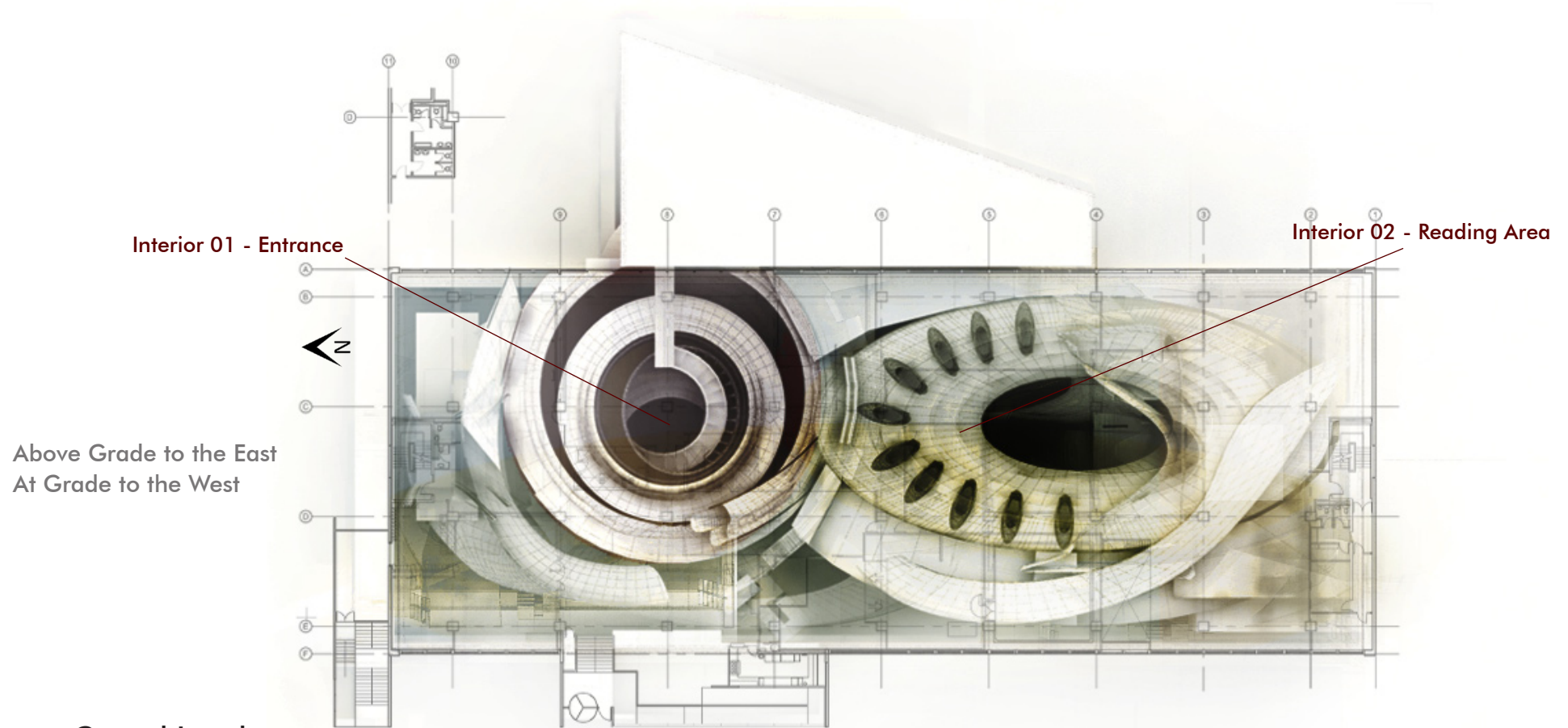


Lower Level 1

Parametric intentions: A curved path (shown in red above) branches out in continuity from the primary parametric form, precisely modulated with light to complement the fluidity of its form.

Phenomenological intentions: Lower level 1 does not contain of the five sequential events; therefore, it acts as a threshold to connect the sequences together. Forms are articulated to an open floor plan to introduce shafts of light into the archive entry.

Symbolic narrative intentions: Descending from the spiral stairway of the pool entrance above, one arrives at a corresponding circular platform and is directed along an extended curved path. The path serves to prolong the sequence of the transition and emphasizes the three-dimensional form of the design as inhabitants move around its perimeter. The journey invites meditation, introspection, and reflection while descending to the depths of the archive.



Gound Level

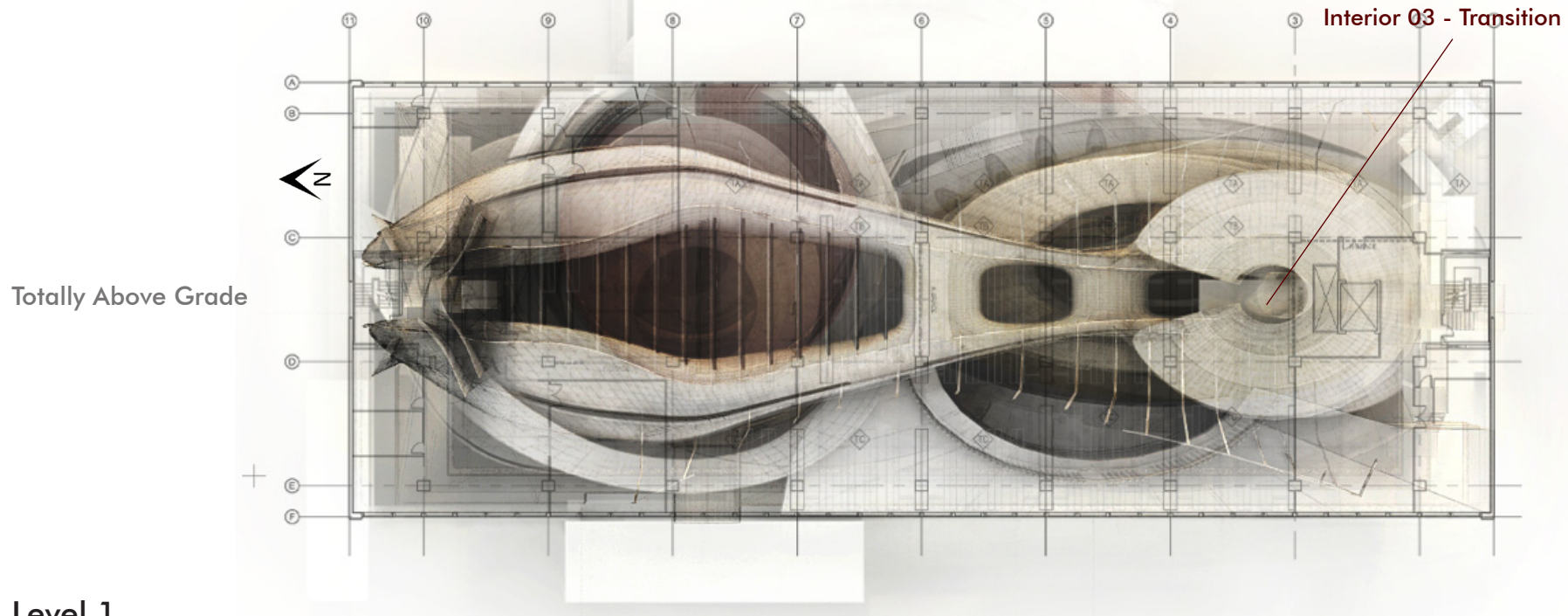
Parametric intentions: Denying the uniform orthogonal grid pattern of the archive, transformation continuity is achieved through the relations of scale between the circular and oval forms.

Phenomenological intentions: The circular pool is designed with the epitome of eloquent simplicity; aligning itself to the axis of the entrance, it acts as the threshold to the archive beneath. Water is specifically being used as a phenomenal lens to create refraction phenomena, bringing attention to the transformation of rays of light within the space.

Symbolic narrative intentions: By means of a spiral staircase cutting through the pool, inhabitants descend to the serene archive underground. The path taken by the inhabitants "through the water" liberates them from daily preoccupations and prepares them for the transcendental. Juxtaposed to the pool is a flow of path that leads to an oval form of descending steps. The inward, enclosed quality invites the inhabitants to retreat inside.

IV. EXPERIMENTAL DESIGN

6. INTEGRATING SYMBOLIC, PHENOMENOLOGICAL AND PARAMETRIC IMPERATIVES IN PLAN



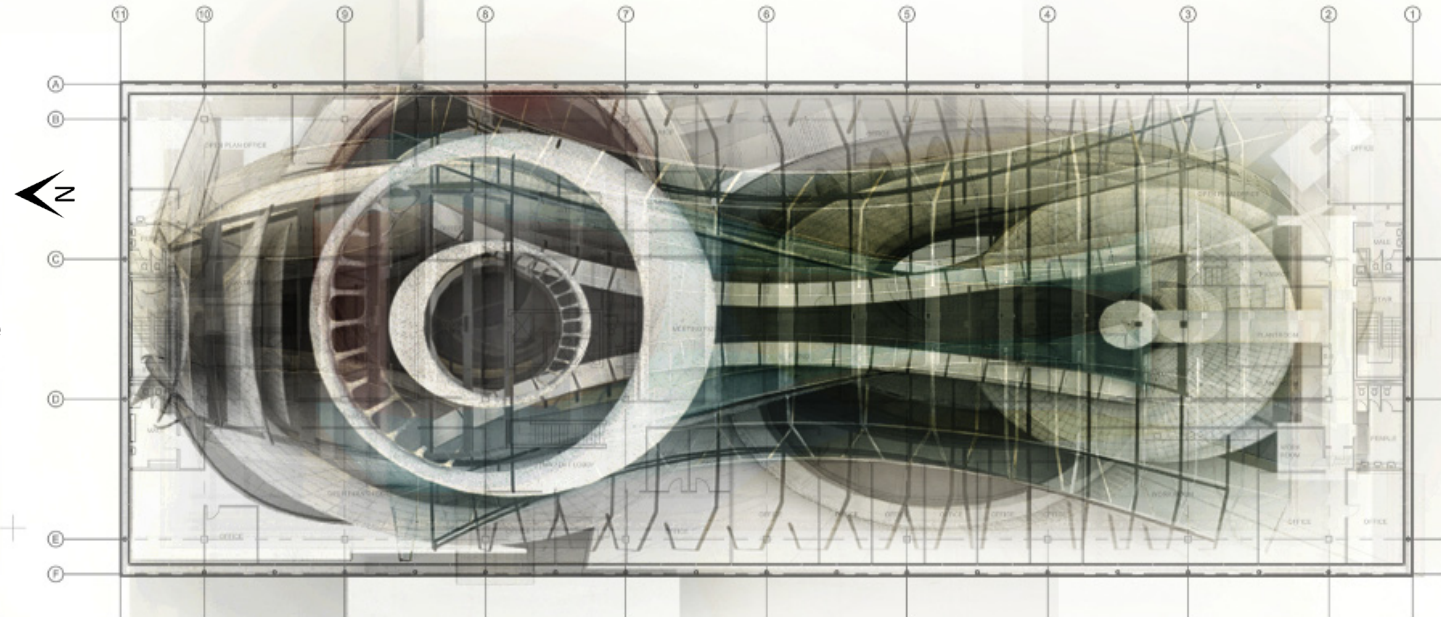
Level 1

Parametric intentions: Level 1 is totally above grade and exposed to natural sunlight from all orientation. Thus, the structure and materiality of the parametric formation is carefully modulated to enhance light and shadow effects passing through to the lower level. The experience generated in this level involves motion conceptions governed by gravity, which is created by the fluidity of parametric formation.

Phenomenological intentions: Interior 03 is located at the south end of the building, it is the transition point in which the parametric form is beginning to integrate phenomenological conditions through to the lowest level. The forms are manipulated to prepare the inhabitation of darkness and shadows to the lower levels, admitting light in a way that simulates a night sky.

Symbolic narrative intentions: The symbolic planes of underground, earth and sky are evoked by the vertical transition of darkness into light. The anchor point that contains interior 03 is like a cosmic monolith rising from the bottom level through to the top like an axis mundi.

Totally Above Grade



Level 2

Parametric intentions: Attached to the roof is a lattice frame that serves to contain the office and managements of the archive. The frame follows the fluidity of form from the level beneath it, it helps to reinforce and support the structure of the building.

Phenomenological intentions: Totally exposed to all orientation of daylight, the structural lattice of the ceiling helps spread rays across the bottom levels. Different directions and overlapping each other, light is granted the power to cut and etch on solid forms. Throughout the day, it is like a sundial, revealing the passing of time.

Symbolic narrative intentions: The skeletal lattice frame is the very symbol of open space, bearing the characteristics of lightness, it is dynamic, continuous, and ever-growing. It is like a frame that holds the sky to separate it off the ground.





INTERIOR 01 - ENTRANCE (THE BEGINNING)

Parametric Imperatives

The spiral ramp in the center of the space exhibits a sense of lightness that contrasts sharply with its own inert condition, creating an anti-gravitational illusion. The elegance of the space is specifically intensified through the suggestion of fluidity and dynamism of parametric form passing above. It implicates a coherent continuity from an adjacent space that is not visible from this perspective. Smooth transitions are displayed by material suppleness and enhanced by the seamless integration.

Phenomenological Imperatives

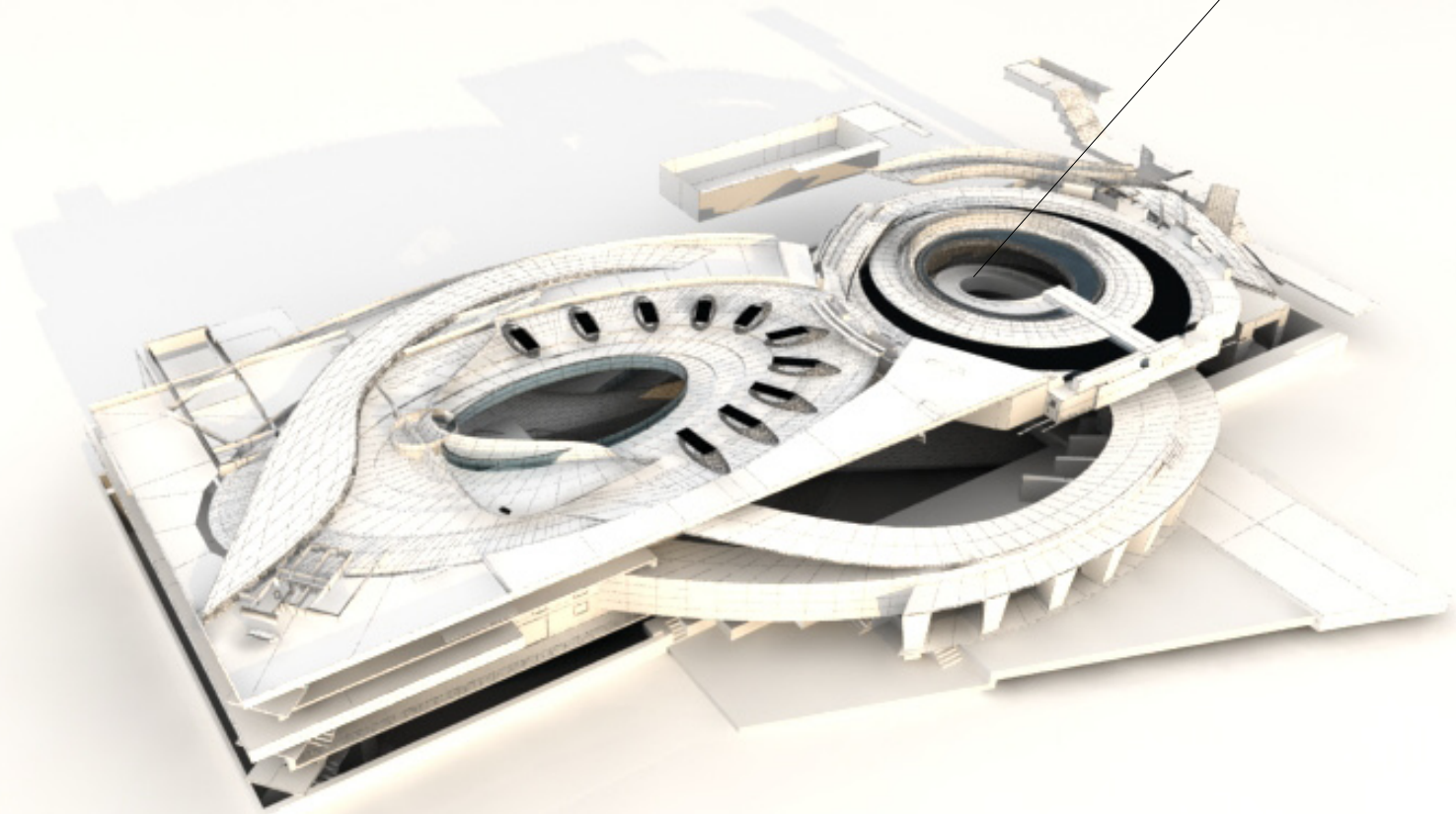
The existential and temporal quality of the interior is mediated by the presence of the water. The water from the pool serves as a phenomenal lens with transformative strength that reflects patterns of movement on the smooth and shiny parametric surfaces. It provides a sense of purity and renewal to its inhabitants. Additionally, a sense of gravity is projected through the sinking aspect of the spiral stairway into the center of the pool; the depth expresses a phenomenon that creates a sense of secrecy and anticipation.

Integration

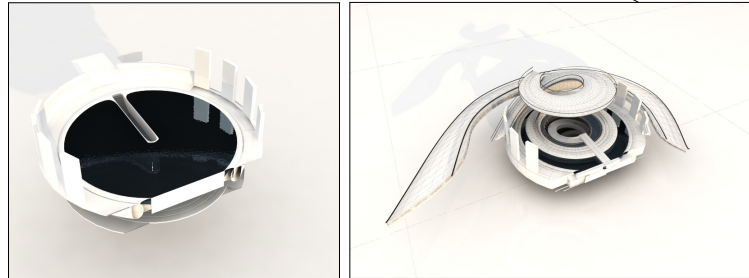
This interior is largely dominated by parametric imperatives while phenomenal properties are subtly introduced as static elements in the scene. The articulation of sunlight in the interior is the main source that integrates both opposites. Direct sunlight (which defines the phenomenological) enters from the north while diffuse light (which defines the parametric) enters from the south. The haptic experience of the space transforms over time depending on the orientation of sunlight that is articulated into the interior. The clarity or dissolving of form in the interior is animated by the refraction of the water, reflective surface and shifting patterns of sunlight. These sensations all merge into one complex transformative experience.

IV. EXPERIMENTAL DESIGN

7. INTEGRATING PHENOMENOLOGICAL AND PARAMETRIC IMPERATIVES IN 3-DIMENSIONS (SPATIALLY)

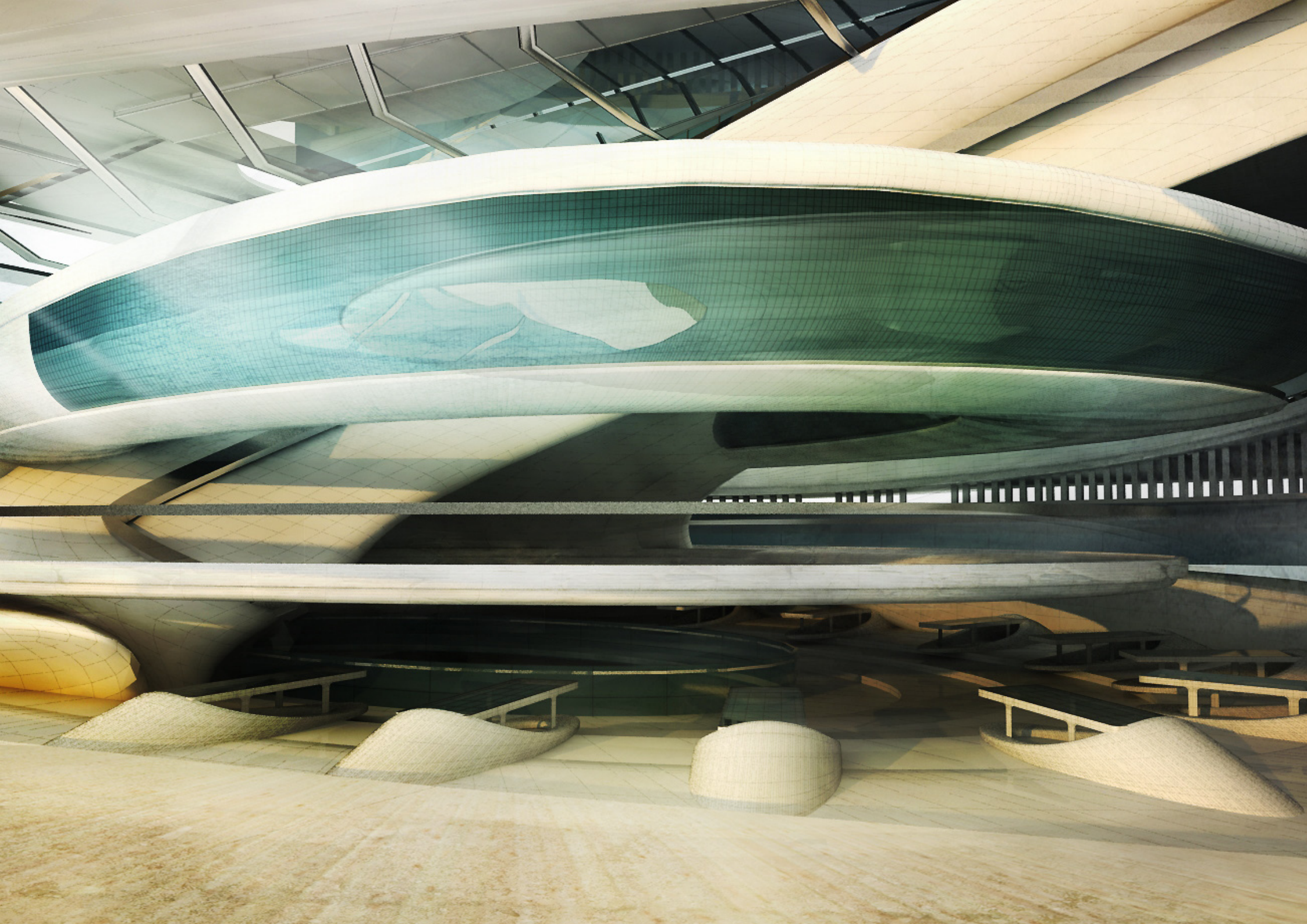


INTERIOR 01 - ENTRANCE (THE BEGINNING)



PHENOMENOLOGICAL IMPERATIVES RELATING TO THE 5 SENSORY SYSTEMS

Sensory Systems	Design	Experiential Encounters
Haptic System	<p>Smooth plaster employed to mirror the many states and transformative properties of water</p> <p>The closure effect of the massive form has the characteristic of a liquid: dynamic, continuous, and ever growing</p>	<p>The reflecting surfaces create a mirrored effect that allows for an enclosed space between reality and illusion</p> <p>A sense of containment arises from the sheltered form. Simultaneously, the stairway down to the depths creates a sense of secrecy, a sense of expectation</p>
Auditory System	Relies on silent and contemplative nature of water	Silencing all external noises and focusing attention to an individual's existence, creating a sense of connection and solidarity
Taste/Smell System	High mineral concentration that produces a salty metallic smell in water	Salty smell recalls the depth of the ocean
Visual System	The powers of reflection, refraction and the transformation of rays of light through water	A sense of movement through the reflective pattern of water on the static parametric surface, a sense of purity and renewal
Basic-Orientation System	Gravity and the rising/sinking aspect of the ground. In one way, it is heavy and sinking, on the other, it is defying gravity rising up from bottom	Experiencing a sensation of accelerating speed governed by gravity to free ourselves while the other encounter is with underground phenomena that bring us back to the depth





INTERIOR 02 - READING AREA (THE SEARCHING)

Parametric Imperatives

The elegance of the interior emerges from the qualities of lightness and fluidity of each parametric form. The furniture on the ground encourages a sense of continuity by gradually rising from the ground radiating outwards, while the oval form suspended in the center of the space yields a sense of weightlessness. Each form exhibits relations between parts and the whole. Simultaneously, multiple effects result from diffuse light falling on the layered curved surfaces, allowing the space to evoke different moods and emotions.

Phenomenological Imperatives

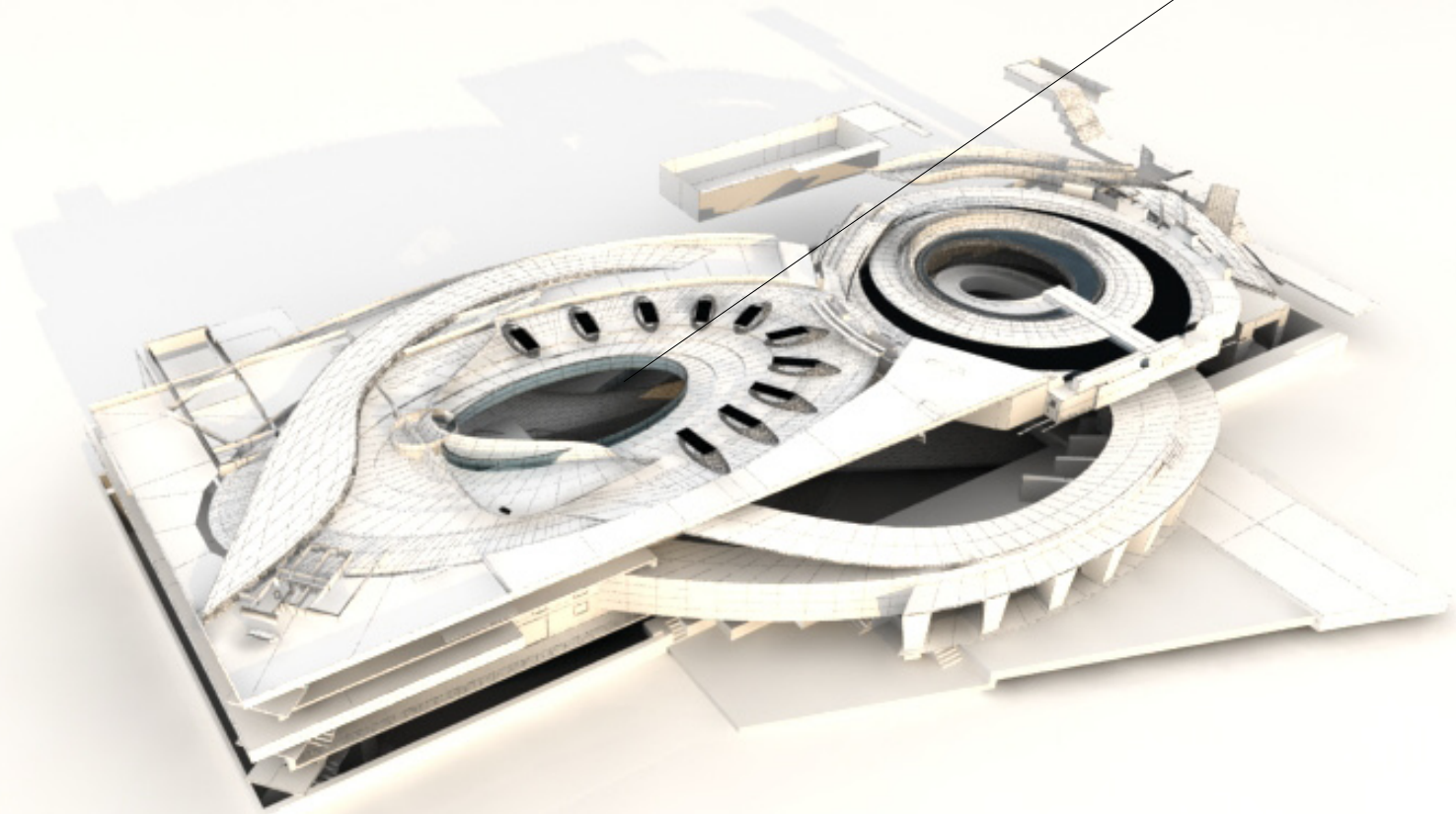
Sensorial experiences are projected through the fusion of diverse materials, from a coarse stone concrete in the background to a smooth reflective surface in the foreground. The contrast provides a sense of containment of lightness within the heavy boundaries, opposites of weight and weightlessness. A gravitational pull can be observed by the downward spiraling movement of the ground plane, creating an effect that guides inhabitants into the space.

Integration

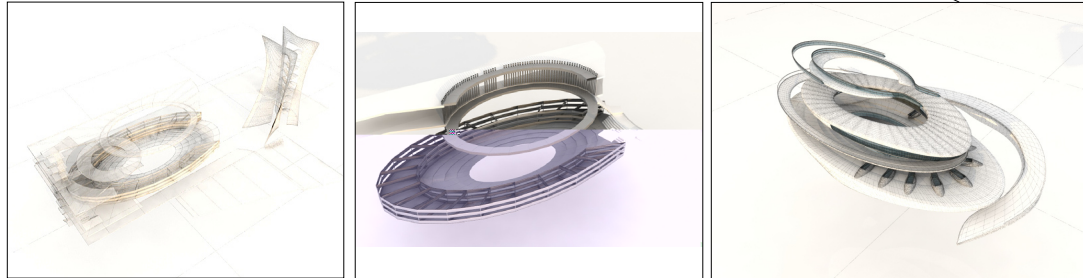
While the interior is dominated by parametric qualities in the foreground, the background offers tactile sensations of textured concrete surfaces that create a unifying perspective. The color of the glass from the parametric form seemingly blends in with the background. The possibility of variation between light and dark, smooth and rough is intensified depending on the viewer's position. While approaching the interior, the oval parametric form generates effects from translucency to fluidity but as one moves beneath the form, darkness and contrast begins to dominate the perception. Light, shadow, translucency, texture and fluidity all participate in a complete experience of the interior.

IV. EXPERIMENTAL DESIGN

7. INTEGRATING PHENOMENOLOGICAL AND PARAMETRIC IMPERATIVES IN 3-DIMENSIONS (SPATIALLY)



INTERIOR 02 - READING AREA (THE SEARCHING)



PHENOMENOLOGICAL IMPERATIVES RELATING TO THE 5 SENSORY SYSTEMS

Sensory Systems

Design

Experiential Encounters

Haptic System

Fusing different qualities of material from a coarse stone concrete in the background to a smooth plaster in foreground

The layering effect in which planes 'lie' upon one another is seen through holes and openings, creating difference in depth between dark and light areas

The contrast of materials provides a sense of containment, of lightness within the heavy boundaries, evoking a liberated sense of natural duration

The contrast of light and darkness projects a sense of shelter

Auditory System

Sound absorbent acoustical tiles are used for the parametric form while rough concrete is used for the outer layer to project subtle echoes

Sense of awareness created by subtle echoes that penetrate through the silence of the reading area, encouraging unconscious gathering of information

Taste/Smell System

Negligible component

Negligible component

Visual System

The use of glass to evoke images that are directly related to water

Encouraging experiences of illusions and dreams, glass floating in the space references a dense deep cloud-like sense of expression

Basic-Orientation System

The sunken floor creates a downward spiraling movement inward. Simultaneously, the furniture creates a radiating motion that expands outwards

Creating a gravitational pull that guides people into the space





INTERIOR 03 - TRANSITION (THE GROWTH)

Parametric Imperatives

Parametric implications are less dominant in the interior as the symbolic narrative intention requires a significant sense of contrast in its architectural experience. Thus, the visibility of parametric qualities are in turn minimized to carry out a stronger dialogue and interaction with the environment. The surface continuity of the ground plane is discontinued by an abrupt change of material, a distinct soft to hard transition. This discontinuity enhances an awareness of the haptic and visual experience.

Phenomenological Imperatives

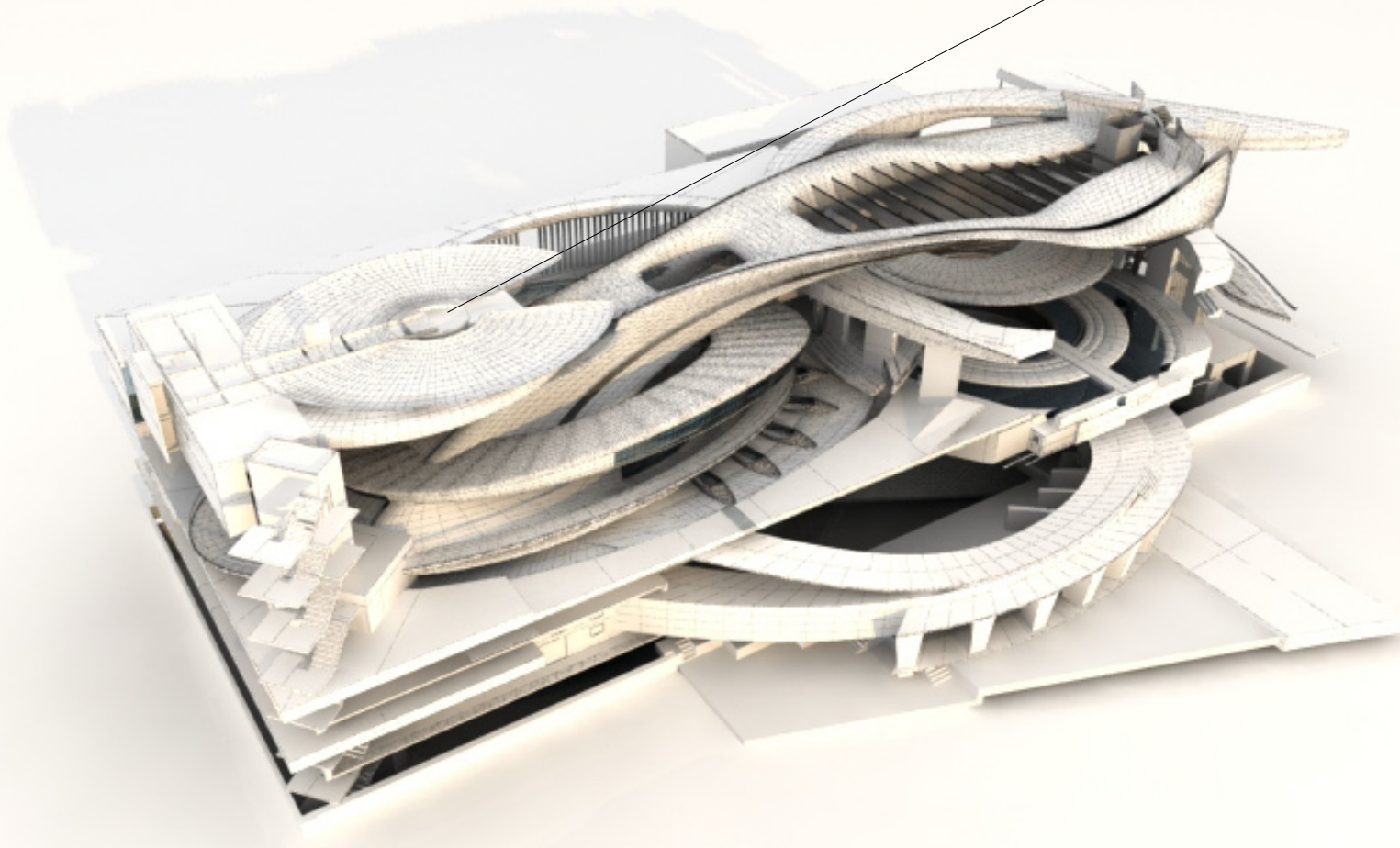
The negative space has in turn become the dominant form in the scene that reinforce the senses. Deep, dark, metaphorical shadows are created in contrast to the intensity of light coming through the skylight subsequently creating a sense of mass and weight in perception. The symmetry and directional path carry an image of fundamental order, balancing and maintaining the force of gravity.

Integration

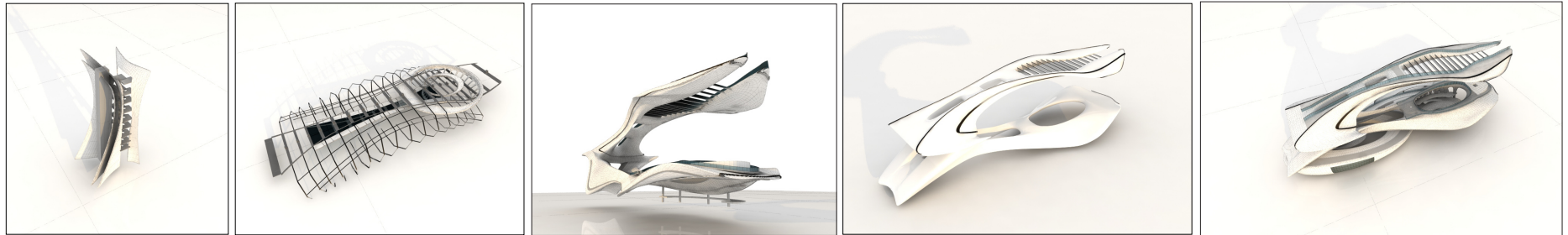
The opposites are unified by the distinct contrast of the atmosphere, positive and negative elements. Together they form an inseparable reality in which their relationship visually switches identities back and forth almost simultaneously. This interior symbolically signifies the transition point between earth and sky. Thus, surface openings on the upper levels are designed to maximize the range of light conditions that allows parametric dominance, where diffuse light can be utilized. On the other hand, lower levels begin to invite phenomenological to dominate where higher contrast and deeper shadows are utilized.

IV. EXPERIMENTAL DESIGN

7. INTEGRATING PHENOMENOLOGICAL AND PARAMETRIC IMPERATIVES IN 3-DIMENSIONS (SPATIALLY)



INTERIOR 03 - TRANSITION (THE GROWTH)



PHENOMENOLOGICAL IMPERATIVES RELATING TO THE 5 SENSORY SYSTEMS

Sensory Systems

Design

Haptic System

Hard concrete with patina is used in contrast to soft shiny reflective tiles, indicating transition of a threshold

Auditory System

Hard surfaces used to project bouncing sound waves to indicate clearly defined boundaries

Blending between interior and exterior sounds signifying change of position

Taste/Smell System

A whiff of floral when moving up the ramp to indicate a change of space

Visual System

Deep dark contrast between light and shadow to indicate separation. Additionally, material colour is used to influence the directional path

Basic-Orientation System

Two symmetrical paths penetrate out of the void of the oval slab

Symmetry and directional path carries an image of fundamental order, balancing and maintaining the force of gravity

Experiential Encounters

The contrast of texture influences different moods of the inhabitants. The coarse concrete is more energizing while the reflective tiles are more relaxing

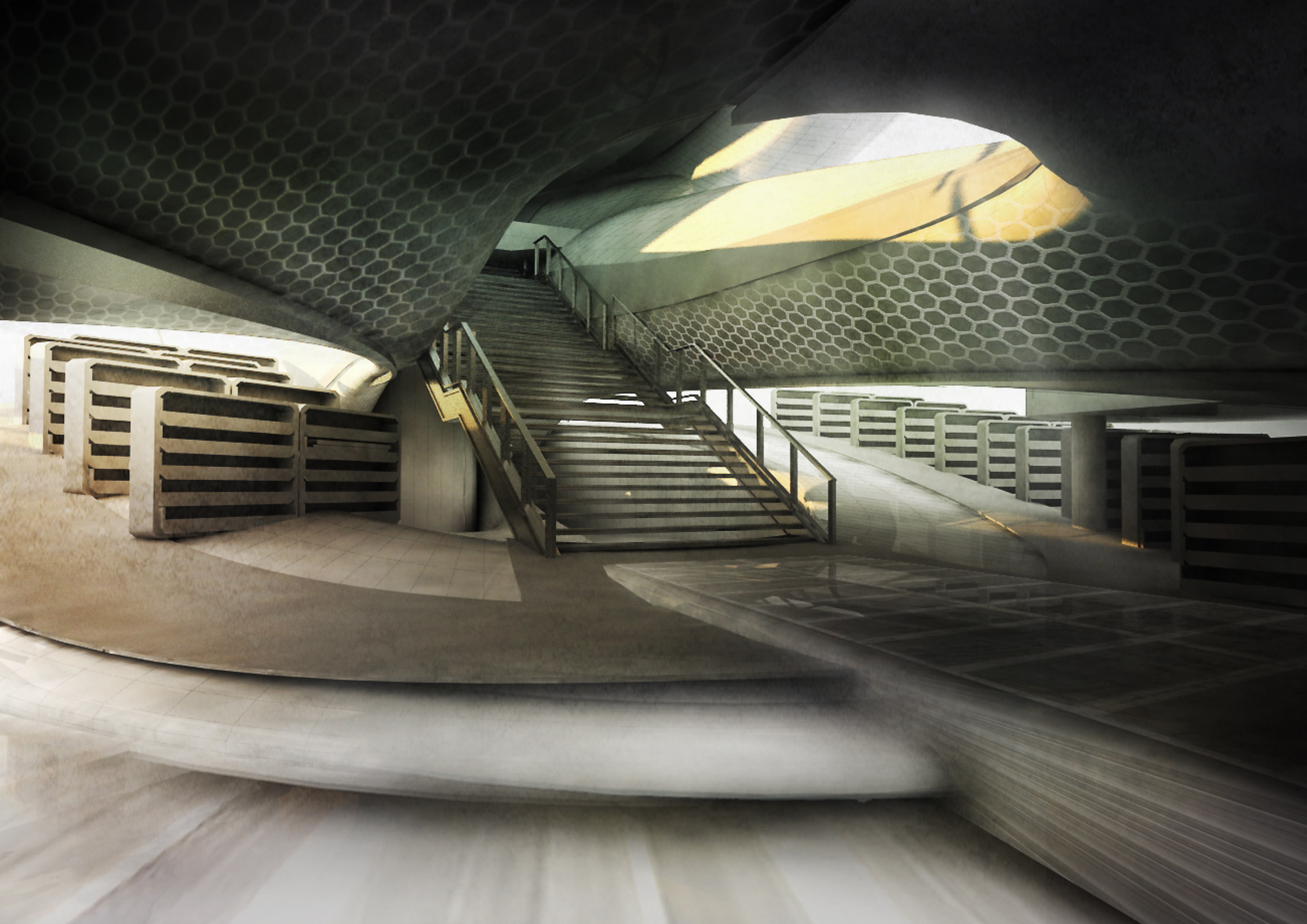
Hard surfaces send sound waves in every direction, making space quieter, a sense of tranquility. The open area blends with exterior sounds to create a feeling of liberation from enclosure

The alteration of smell expresses contrast of open and closure

A sense of freedom is created by the brightness and lightness of the upper level, while a sense of grounding and weight is created by the darker surface below.

Creating a sense of power that wells up from beneath.

A sense of movement inward and outward is displayed while expressing both enclosure and expansion





INTERIOR 04 - ARCHIVE ENTRY (THE DESIRE)

Parametric Imperatives

The parametric forms exhibit both weight and weightlessness, heightened by the choice of contrasting materials. The parametric form become progressively rougher and articulated as it descends from the upper to the lower level. The continuity of forms serves to signify the beginning of a spatial path, directing visitors towards the subsequent spatial experience. The malleability of the curving slope establishes a continuity between the form and the rigid shelves, creating a sense of dynamic flow.

Phenomenological Imperatives

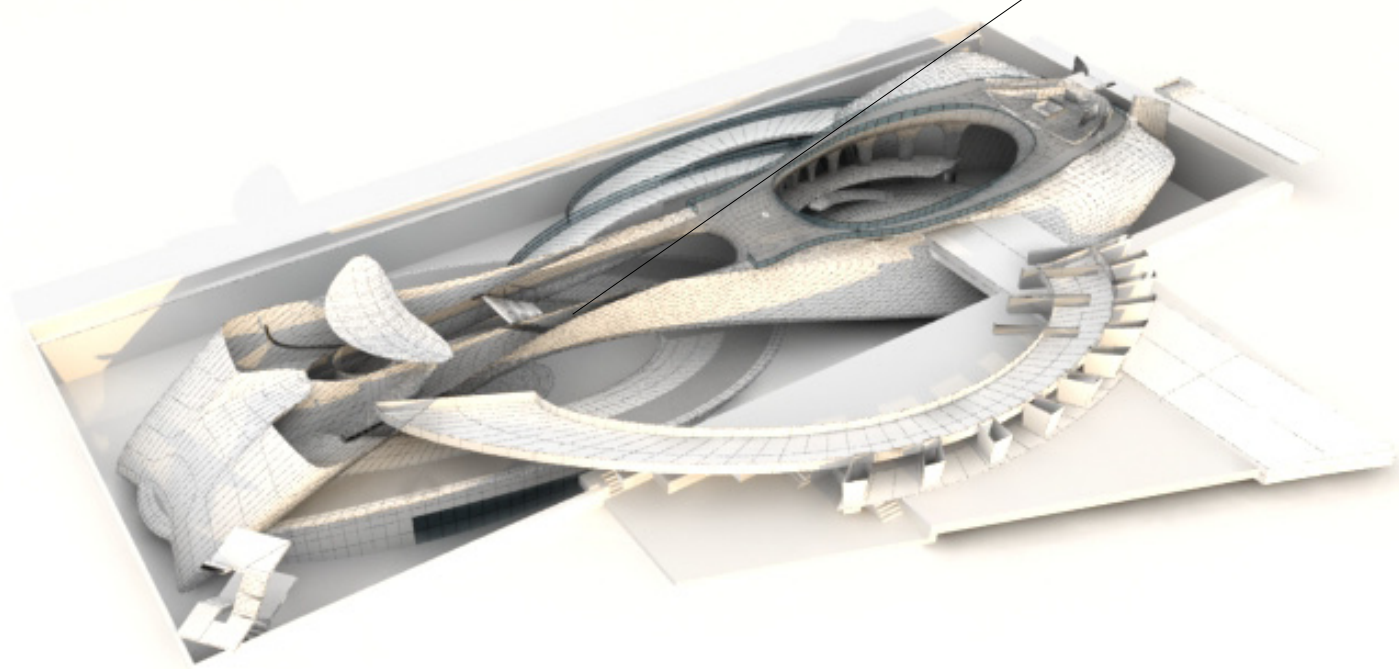
The perceptual and existential strength of the interior is driven by the quality of light and shadow shaped by solids and voids of this space. Instead of being utilized to outline form, the shadows serve as means to decompose and blur the textured materials on the ceiling. Simultaneously, the interplay of light and shadow emphasizes the path that leads to the following interior. Haptic and visual experiences are stimulated by the contrast of materials on the ceiling and ground plane. On the other hand, basic-orientation system is heightened by the rising aspect of the ground and the feeling of a spontaneous sensation of accelerating speed.

Integration

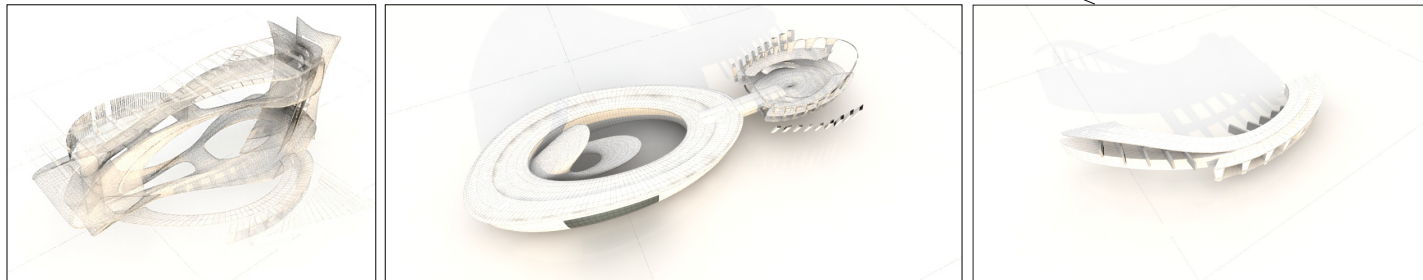
The movement in space and time creates a unique atmosphere, evocative of anticipation. The opposite imperatives allow a range of dynamic lighting, revealing and concealing simultaneously. The interior belies a sense of elegance that emerges from overlapping spaces, materials, light and shadow, forming a complete perception. The opposites are brought together by the interplay of coarse and fine textures. Rough textures runs through the fluid parametric ceiling while the rising floor plane become increasingly geometric and delicate. Thus, one is faced with a mental state dictated by two types of experience: one involves parametric fluidity governed by weight; the other involves a sense of lightness that wells up from beneath. The contrast results in a conflict between balance and dynamism.

IV. EXPERIMENTAL DESIGN

7. INTEGRATING PHENOMENOLOGICAL AND PARAMETRIC IMPERATIVES IN 3-DIMENSIONS (SPATIALLY)



INTERIOR 04 - ARCHIVE ENTRY (THE DESIRE)



PHENOMENOLOGICAL IMPERATIVES RELATING TO THE 5 SENSORY SYSTEMS

Sensory Systems

Design

Experiential Encounters

Haptic System

Change of temperature to cooler in relation to the upper level

Rough texture is projected out on the ceiling to contrast the smooth surface on the ground

Annihilating clear and solid reality, provoking inhabitants into quiet waves of reverie and daydream

Evoking a gap of time where the reality lies suspended between waking states

Auditory System

Sound absorbent materials on ceiling used to remove all external noise

Mood of contemplation making inhabitants aware and sounding the depths of the inhabitants' own inner space

Creates a chilling mood of absence and solitude

Taste/Smell System

Whiffs of aged paper

Recalling a space of memories and thought

Visual System

Shadows act to blur and decompose finished materials and are imperceptibly submerged

The removal of light source to washed shadows obscures enclosure and containment, creating a sense of mystification, and sacred in nature

Penetration of a stronger light source to the depths of the shadow

Evokes an aura of sanctity

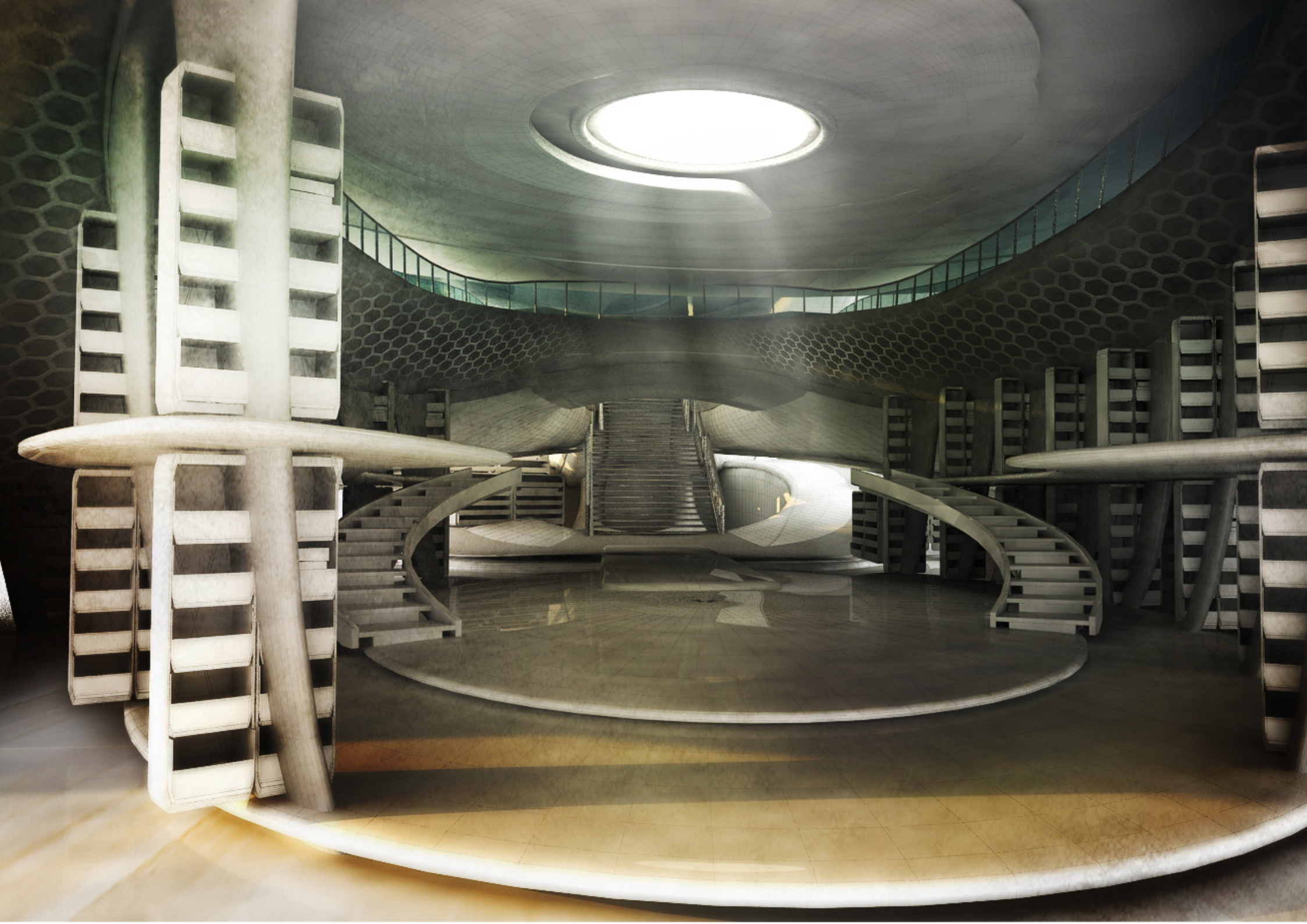
Basic-Orientation System

The detached floor frees the path allowing inhabitants to symbolically encounter a representation of water

Mysterious and provoking hidden depths of the unconscious

Stairway intersects the parametric form and acts to separate the upper and lower levels

Conveys a feeling of being one with the cosmic roots, at the bottomless depth of a cave





INTERIOR 05 - ARCHIVE (THE KNOWLEDGE)

Parametric Imperatives

While there are still indications of continuity in form and surface transitioning from the prior interior, parametric imperatives are less dominant in the scene. The intention for an experience of solitude and of isolation requires a discontinuity and termination to the space in which the fluidity of the form is gradually submerged into the surrounding shadows. The symbolic purposes aspire to create a dialogue of imperfection and time, hence, parametric articulation is such that they are perceptually incomplete.

Phenomenological Imperatives

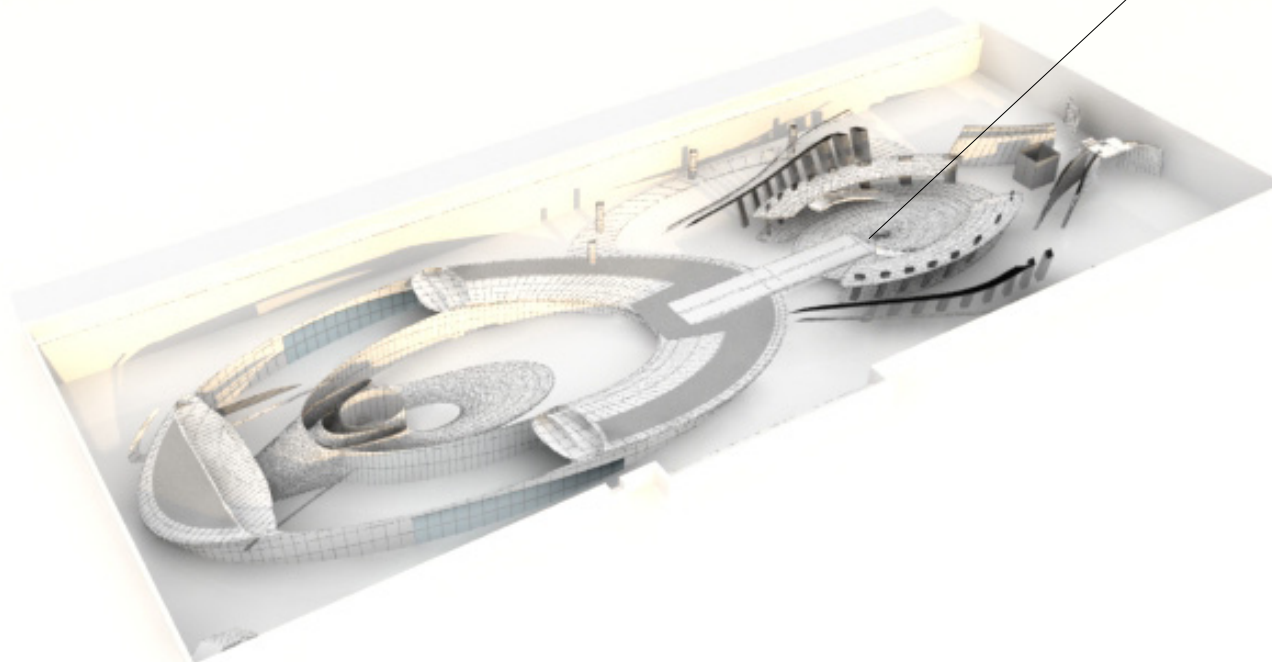
The authenticity of architectural experience in the interior is grounded in the isolation and separation from the prior experiential interiors. The feeling of place and the definition of space and focus is achieved by the remoteness of beams of artificial light thrown into the scene. A sense of place is generated through the contrast of deep significant shadow that surrounds the central void. The basic-orientation system is triggered by the position of the space which is vertically beneath the pool at the beginning of the sequential interiors, signifying the closing stages of the journey.

Integration

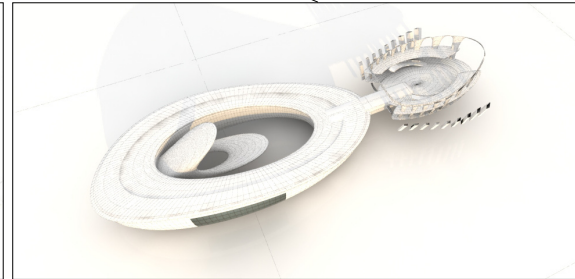
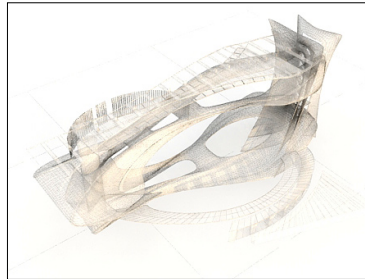
The strength of light and shadow acts to mediate both opposites; the continuity and fluidity of a parametric form is present, but light is used as a corroding agent in which the shadows created wear away what is solid, deforming the visual impression of parametric volumes. The shadows dissolve the form sufficiently to divorce it from the purely visual, yet never quite destroying the form. Thus, both imperatives seemingly negotiate with one another.

IV. EXPERIMENTAL DESIGN

7. INTEGRATING PHENOMENOLOGICAL AND PARAMETRIC IMPERATIVES IN 3-DIMENSIONS (SPATIALLY)



INTERIOR 05 - ARCHIVE (THE KNOWLEDGE)



PHENOMENOLOGICAL IMPERATIVES RELATING TO THE 5 SENSORY SYSTEMS

Sensory Systems

Archive

Haptic System

Warmer colours are employed in the centre of the space in relation to the surrounding forms

Reflective and shiny surfaces on the floor symbolically mirror the hard surface of the cave-like ceiling, like water

Auditory System

Hard materials are used to echo every move of the inhabitant in the center while sound absorbent materials are used within its surrounding to remove external noise

Taste/Smell System

Whiffs of aged paper

Visual System

Admitting a penetration of artificial light that stimulates the darkness of the archive

Basic-Orientation System

Position of an individual is directly under the pool from "the beginning"

The detached floor frees the path allowing inhabitants to symbolically encounter a representation of water

Experiential Encounters

The surrounding blackness brings an oceanic feeling with the central space, slowly healing the separation between inner and outer space

Mood of contemplation makes inhabitants aware of and sounding the depths of the inhabitants' own inner space

Creates a chilling mood of absence and solitude

Recalling a space of memories and thought

Mythical planes of earth and underworld are evoked by the transitions of darkness into light

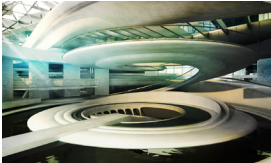
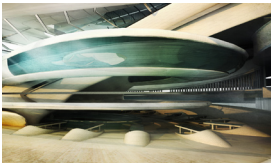
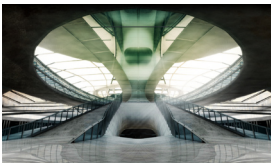


Signifying the end of a journey

A departure from reality and a sense purification

IV. EXPERIMENTAL DESIGN

8. INTEGRATIVE CHART

H = High
M = Medium
L = Low

		Experiential Imperatives						Symbolic Imperatives				Sensorial Interaction				Phenomenological Imperatives						Parametric Imperatives								
		Connection	Silence	Existential	Belonging	Intimacy	Interiority	Cultural Sense	Metaphorical	Progression	Narrative	Basic-Orientation System	Visual System	Taste/Smell System	Auditory System	Haptic System	Axial	Detail	Discontinuities	Isolation of light	Imperfection of material	Weight and gravity	Immersion of shadow	Lightness	Elegance	Parametrically Malleable	Ageless Perfection	Homogenous light	Continuity	Fluidity
																														
																														
																														
Interior 01 Entrance	H	H	H	H	M	H	H	H	M	H	H	H	M	H	H	M	M	H	M	L	L	L	H	H	H	H	H	H	H	
Interior 02 Reading Room	M	M	M	H	M	M	L	M	M	M	L	H	L	M	H	L	M	L	M	M	M	M	H	H	H	H	H	H	H	
Interior 03 Transition	H	H	H	H	M	H	M	H	H	H	H	H	L	H	H	H	H	H	L	H	H	H	M	M	L	L	L	L	L	
Interior 04 Archive Entry	H	H	H	H	H	M	M	M	H	H	H	M	H	L	H	H	M	L	H	M	M	H	L	M	M	M	L	M	M	
Interior 05 Archive	H	H	H	H	H	H	M	H	H	H	H	M	H	L	H	H	H	H	H	M	M	H	L	M	H	L	L	M	M	

The chart above illustrates a comparison of the imperatives within each interior scene. Divided into five different categories, the intensity of each imperative in the interior is indicated from low, medium to high depending on the particularities of the space.

V. CONCLUSION

Based on the series of 5 detailed design experiments conducted, the thesis concludes that the dual existence of the parametric and phenomenological can take place within the contingency and particularities of experience. The act of mediating both phenomenological and parametric imperatives offers different opportunities with every circumstance, situation and motivation. The coexistence of both opposites is like the interplay between objective and subjective, thought and feeling. The dominance between parametric and phenomenological conditions are transferred from upper to bottom level through natural light, textures, gravity, fluidity and continuity. In response to the exposed east facade above grade on the ground level, range of light conditions are maximized to generate homogenous qualities thus inviting parametric dominance. On the other hand, the archive at the lower levels are totally below grade, inviting the encounter with an underground phenomena, drawing significance of shadows, silence, weight and roughness; interpreted as earth's primeval forces. The upper levels want to be independent, whereas to be down at the bottom is confining. While there is an inherent dominance to either parametric or phenomenological imperatives for each interior, both are always apparent in a complex experience.

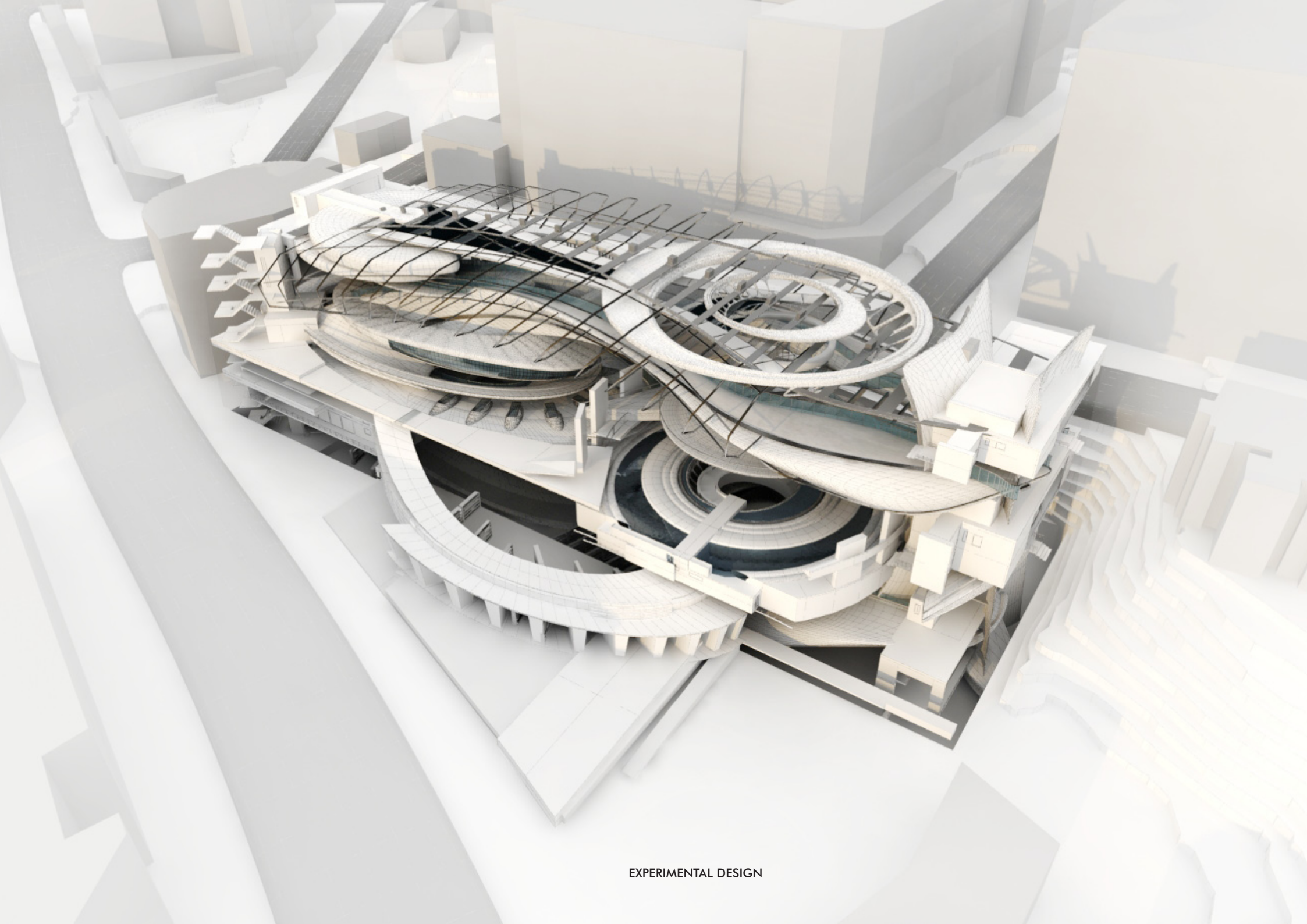
In a particular situation, light can be controlled to hold both imperatives together. The orientation of natural daylight that penetrates into the interior can simultaneously transform the form and surface to suggest fluidity and continuity or static and discontinuity. Unity may emerge from extreme contrasts that run through a spatial sequence. Interplay of light and material allows positive and negative elements to visually switch identities back and forth concurrently, creating a multiplicity of visual and haptic phenomena. Deep dark shadows can be controlled as mediators that gradually dissolve a parametric form, deforming its solid volumes while never really destroying the form. Depending on the position of an individual, the possibility of experience generated can vary between light and dark, smooth and rough, loud and quiet, weight and weightlessness, and continuity and discontinuity.

The phenomena juxtapose two "incongruous" imperatives together to yield a dynamic tension that heightens sensorial response, while simultaneously expressing aesthetics and phenomenal experience. Each experiential situation is unique and by considering the engagement of the five sensory systems, we are able to manipulate this duality in response to the particularities of space. Ultimately, these sensations will combine within one complex experience to heighten and transform our awareness of our unique existence in space.

VI. REFERENCES

Pallasmaa, Juhani. "Landscape Architecture: Architecture and the Influence of Other Fields of Inquiry" Encounters: Architectural Essays/ Juhani Pallasmaa ed. MacKeith, Peter (Helsinki: Rakennustieto Oy, 2005) pp334-349

Reed, A.W. Maori Myth and Legend Illustrated by Hart, Roger; Foreword by Stafford, Don (Auckland: Reed, 2007)



EXPERIMENTAL DESIGN