

Light - Therapy In Space

by

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Abstract

This thesis will study the importance of natural light in the making of architectural spaces in relation to their site and orientation. It will explore the phenomenological aspects of natural lighting and the relationships that exist between the architecture and its human inhabitation, while developing a sequence of spaces that incorporate these discoveries. This thesis explores theories of phenomenology and environmental psychology, and formal precedents of light dependent architecture. In particular, the experiential and potentially therapeutic qualities of natural light will be the focus of the thesis project.

Specifically, the proposed project will explore the phenomenological aspect of natural light by understanding the relationships pertaining to human social rehabilitation, while developing an architecture that incorporates healing. By interpreting the Youth Justice Renewal Initiative, a federal penitentiary model for youth offenders, this project will develop a similar program adapted for the rehabilitation of juvenile criminals. In striving for a therapeutic approach, allowing light to become indispensable to the well-being and successful rehabilitation of the dwellers, the phenomenon of light is translated by process and by program into an architecture of light.

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Introduction

Natural light is present throughout all architecture. Some architecture embraces the qualities of natural light, resulting in an amelioration of the inhabitant's spatial experience. While certain architectural proposals consciously adopt the benefits of natural light with dramatic results, others are conceived with little attention to the infiltration of nature's free gift of warmth and illumination. Natural light, whether consciously or subconsciously perceived, evokes immeasurable phenomenological characteristics, which enrich the spatial and experiential qualities of architecture.

Of the innumerable characteristics of natural light, those that pertain to the articulation of form, the accentuation of colour and material, and the enhancement of the architectural experience are the focus of this architectural thesis. Specifically, this thesis explores the theories of phenomenology and environmental psychology, and the crucial relationships between natural light, human inhabitation, experience and well-being. By taking these factors into account, an architecture that integrates these experiential and therapeutic qualities is proposed.

These theories are explored in the context of a youth rehabilitation centre, where natural light becomes indispensable to the offenders' personal and social rehabilitation. Using natural light's therapeutic qualities, it becomes possible for youth offenders to obtain more than a simple second chance, but to develop a healthy, balanced lifestyle, with the natural light cycles as their compass. Further, the proposed project's program, orientation to sunlight, and form aid in directing the rehabilitation of young dwellers, facilitating a transition from offender to productive community member, healthy in body, mind, and spirit.

Throughout the different chapters, the theories of natural light will be developed toward an architectural proposal that frames human social interaction and rehabilitation. Natural light is essential to the maintenance of physical health, through an enlightened mind. Thus, a successful architectural project banishes gloom from both the structure, and the human spirit, through the conscious integration of the theories of natural light.

The first chapter, *Light and the Fragile State of Being*, deals with the physiological, psychological and emotional benefits of natural light. This section stresses the critical importance of natural light in maintaining positive mood through positive experiences. The recent research on the negative effects of light deprivation inspire conceptual ideas for the integration of natural light within architecture. This is further explored in chapter two, *Discovering Natural Light*, by the study of light infiltration in spaces, allowing for a measured formal exploration of light in architecture, with special attention to structure, material (colour and surface)

and surrounding site characteristics. This process involves the practical application of theory, as the site characteristics of the Mere Bleue Bog and particularities of the Youth Rejuvenation Centre program are explored in depth.

Chapter three, *An Architecture of Light*, follows a patient through the architecture and the experience of the various programmatic spaces. Described are the changing natural light conditions and the choreography produced by the spatial sequences designed in/by light. The narrative structure aims to evoke a whole body relationship with architecture, in which the nature of light is designed to inspire specific emotional responses while aiding in the healing process. The architecture in light is therefore meant to consciously and subconsciously guide the difficult process of the patient's rehabilitation.

Throughout this thesis it is proposed that light, essential to all living things, when employed in the making of architecture for rehabilitation can frame and support the successful rehabilitation of the patients.

I *Light and the Fragile State of Being*

1.1 **Essence of Light**

*"We are born out of light, ... I turn to light, the giver of all presences. By will. By law. You can say that light, the giver of all presences, is the maker of a material."*¹

Light is always present. Even during the darkness of the night does light appear via the stars and the moon to subtly illuminate things on Earth; giving them presence. Never are we completely without light.

This constant exposure to light nurtures the will to learn this natural phenomenon's implications on life. Life, here, makes reference to the human state of being. Hence, the nature of the following sub-sections of this chapter, *Light and the Fragile State of Being*, are meant to initiate the possibility of human social rehabilitation via the essence of light. Thus, it is proposed that light is essential to successful rehabilitation.

In the earliest of architectural treatises light figures predominantly. Vitruvius, for example, in book I, Chapter II, *The Fundamental Principles of Architecture*, describes light's benefits thus:

"... The revolution of this drum causes sometimes a larger and sometimes a smaller portion of the circle of the signs to indicate, during the revolutions, the proper length of the hours corresponding to their seasons. For in every one of the signs there are as many holes as the corresponding month has days, and a boss, which seems to be holding the representation of the sun on a dial, designates the space for the hours. This, as it is carried from hole to hole, completes the circuit of a full month. Hence, just as the sun during his passage through the constellations makes the days and hours longer or shorter, so the boss on a dial, moving from point to point in a direction contrary to that of the revolution of the drum in the middle, is carried day by day sometimes over wider and sometimes over narrower spaces, giving a representation of the hours and days within the limits of each month."²

Thus, natural light corresponds to the cycle of day and seasons, which influences its physical qualities. Louis I. Kahn, who is perhaps best associated with his explorations on the interrelationship of light and architecture adds: "A space can never reach its place in architecture without natural light. Artificial light is the light of night expressed in positioned chandeliers not to be compared with the unpredictable play of natural light."³

There exists a strong relationship between natural light and architecture; therefore, the following sections will focus on the essence of light through body, mind, and spirit.

1 Richard Saul Wuman. *What Will Be Has Always Been: The Words of Louis I. Kahn* (New York: Access Press Ltd., 1986), 16-55.

2 Vitruvius Pollio (Trans. Morris Hicky Morgan). *Vitruvius: The Ten Books on Architecture* (Boston: Harvard University Press, 1914), 275-6.

3 Wuman, *What Will Be Has Always Been: The Words of Louis I. Kahn*. 257.

1.2 Light – Essential to Life

This thesis proposes that there are two very different types of “healing” light, both fundamental to a greater understanding of healthy dwelling. These will be addressed on their own terms throughout this thesis to clarify their differentiation. In general terms however, perceptible light (corporeal) and imperceptible (divine) light both possess healing qualities either by its physiological presence or by spiritual association. The usage of both healing qualities will be employed in the definition and development of architecture and in the creation of spaces that will promote biophysical and emotional rehabilitation for the subject/dweller.

HEALING PHYSIOLOGICAL LIGHT

“I said that all material in nature, the mountains and the streams and the air and we, are made of Light which has been spent, and this crumpled mass called material casts a shadow, and the shadow belongs to Light. So light is really the source of all being.”⁴

The preceding statement by Louis I. Kahn makes one realize how important light is to everything to the experience that surrounds us. It even compels the mind to question the nature of a world without the interplay of ephemeral natural light and the material presence of matter. Would our world and its inhabitants change if natural light became scarce? The weight of this questions lies in the importance of natural light to human inhabitation and experience. If light is necessary to life, then the absence or scarcity of light would lead to ill health however defined. Hence, in theory, light possesses healing qualities. Some architects, such as Louis I. Kahn’s understand this phenomenon of light and make this light indispensable, even fundamental to their architectural project. To truly understand natural light’s physiological effects on inhabitation, Vitruvius, the most respected primary source of architectural documentation, and the environmental psychologist, Frank H. Mahnke⁵, will assist in proving the theory of light’s healing qualities.

Centuries before the existence of the study of environmental psychology, many architects understood the importance of natural light through mere observation. Vitruvius, understood the potential influences of light in architecture, and makes reference to the importance of natural light in buildings as it

4 John Lobell, *Between Silence and Light: Spirit in the Architecture of Louis I. Kahn* (Colorado: Shambhala Publication Inc., 1979), 22.

5 Frank H. Mahnke, the President of the International Association of Colour Consultant/Designers (IACC) since 1988 and permanent lecturer for the IACC on the psycho-physiological effects of color, light and the human reaction to the built environment, has dedicated his life to the study of color and how it can be used to create beneficial and healthy surroundings for human beings in the places they live, work, and heal from illness. The focus of his work emphasizes the importance of environmental conditions for medical and psychiatric health-care facilities, offices, industrial and manufacturing environments, educational facilities, and correctional facilities. Since 1977, many firms have retained him as an analyst for architectural environmental conditions regarding psycho-physiological, neuro-psychological, psychosomatic, and visual ergonomic factors in these and other built environments. (Biography: Frank H. Mahnke. *International Association of Color Consultant Designers*. 20 Apr. 2008. <<http://www.iaccna.org/iacceducation/biofrankhmahnke>>.)

relates to health and physical well-being. He emphasizes the reason why architects should select healthy sites for their buildings in relation to the sun's orientation.

“There will also be natural propriety in using an eastern light for bedrooms and libraries, a western light in winter for baths and winter apartments, and a northern light for picture galleries and other places in which a steady light is needed; for that quarter of the sky grows neither light nor dark with the course of the sun, but remains steady and unshifting all day light.”⁶

It is clear that the healthy site is one that is oriented to permit the introduction of natural light. Vitruvius believed that only then could the design of buildings prevent ill health.⁷ According to Vitruvius's beliefs, light should then possess the ability to transform a subject into a healthy inhabitant, biologically and emotionally, when the proper exposure to daylight is introduced into their respective spaces.

To further the significance of natural light in built environments, Frank H. Mahnke, a dedicated researcher in the study of natural light and healthy living, will assist in the revelation of light dependant rehabilitation. His thoughts are important to the physiological and psychological welfare of inhabitation.

The increase in illness has led to the research into the cause of the problem in question. A historical comparative study between the effects of natural light in comparison to the use of artificial light has revealed many physiological and psychological concerns in the overall health in human beings. “It seems clear that light is the most important environmental input, after food, in controlling bodily functions.”⁸ Yet, our way of inhabitation has led to an increase in lighting, mostly artificial, to take advantage of longer days during our twenty-four hour cycle. “In doing so, we lose our connection to the diurnal and seasonal variations of natural light. The amount of light that people are subjected to now is very different from that at the turn of the century.”⁹

Frank H. Mahnke's research indicates, “Constant exposure to ordinary, artificial light, is subnormal or abnormal. If sunlight, the balanced light, is essential for the growth and health of living things, including man, it seems logical to raise question about the effects that unbalanced (artificial) light may have on life, including the human organism.”¹⁰ Parallels have been drawn between the physiological effects of artificial lighting and the causes of headaches, tension, nausea and other disturbances, known as the Sick Building Syndrome (SBS).¹¹ This helps to illustrate the fundamental human need for natural light.

6 Pollio. *Vitruvius: The Ten Books on Architecture*. 15-16.

7 Derek Phillips. *Daylighting: Natural Light in Architecture* (New York: Elsevier Architecture Press, 2004) 207.

8 Frank H. Manke. *Color and Light in Man-Made Environments* (New York: Van Nostrand Reinhold Company, 1987), 36.

9 Ibid: 38.

10 Ibid: 44.

11 Ibid: 40.

Mahnke continues to say, that physiologically speaking, natural light when absorbed in buildings through any type of ordinary window glass, specifically UV-B¹², provides the radiation required by the human body to absorb vitamin D, which in turn, promotes the metabolism and calcium absorption. Vitamin D deficiency is most prominent in the winter months, especially in northern climates such as Canada's. UV radiation is also essential to psychological human welfare, and by completely protecting ourselves from any trace amounts; we risk creating a deficiency in life-supporting energy.¹³

Much of this century's architecture acts as a catalyst to this deficiency. This is best exemplified by the extreme examples of box-retail architecture. Our consumer-oriented world has led to the design of spaces that block the sun's rays, obstructing any physiological or psychological link to the time of day. In consequence, people continue to purchase without concern for time, which then creates a break between light and our desire as humans to be connected with our exterior surroundings. "Our lives are intimately bound up with light. We literally cannot live without it. It is one of the basic immutable forces of nature. Light is a primary element, animating life here on earth."¹⁴ This theory will further be engaged in the Cycle of Light section.

While the theories presented by Mahnke focus on the measurable physiological and biological relationships between living organisms and light, it is important to note that, like Millet, his theories aim at a greater understanding of 'well-being'. A healthy human inhabitant in their terms dwells in natural light to beneficial physical as well as emotional effects. Taken one step further, Millet would argue that within this state of emotional well being, a spiritual awareness is possible with light as the catalyst.

HEALING METAPHYSICAL LIGHT (REDEMPTION)

"Sacredness is expressed through many qualities: a major one among them is the quality of light. Light can lead us beyond the finite and temporal, beyond our known experience in space and time. Where it may lead us depends upon each individual, but it can lead us to wonder what lies beyond the world we know as mortals. When we are moved to wonder about our place in the universe, when we are pushed to ask what our role is in the greater whole that must exist, it may be a particular light that prompts us. It may be that beyond our personal experience lies universal truth, although we may not have personal experience of the light of known knowledge, we can desire to attain it. The divine itself changeless, but the representation of the divine through light can be seen to change through time. If one accepts the metaphor of a divine immortal light that approaches humanity, and an earthly mortal light (such as the light of reason) that approaches the divine, then the construction of sacred places in light symbolizes the meeting of these two lights: '...the eruption of sacred ... opens communication between the cosmic places...' The expression of these intersections – how one sees and experiences the revelation of divine light in earthly matter – depends upon

12 UV-B, which can be absorbed by ordinary window glass, induces the production of vitamin D in the skin and promotes the metabolism of phosphorus and calcium in the body. A deficiency of vitamin D might result in rickets or dental caries in children, or brittle bones in the aged. (Mahnke, *Color and Light in Man-Made Environments*, 40-49.)

13 Manke. *Color and Light in Man-Made Environments*. 47-8.

14 Marietta S Millet. *Light Revealing Architecture* (New York: Van Nostrand. 1996), 1.

the period, the culture, and the spiritual approach to life.”¹⁵

Without mention of religious affiliation, this quote by Marietta S. Millet¹⁶ evokes the representation of light, which symbolizes a spiritual mood, completely independent of the person’s religious background and beliefs. This notion of light revealing meaning has been used in architecture to associate a mystical experience that is invisible. Being part of everything earthly and divine, regardless of one’s spiritual association, light connects us all to each other.

The immutable relationship of light and life is the fundamental reason for its spiritual associations. This is revealed most powerfully through the religious and ceremonial architecture of our past civilizations. The imperceptible, the divine light, tends to be physically evoked by the dramatic bursts of light within darkened spaces (*Figure 1*). This descriptive light condition is best exemplified by the architecture of the Middle Ages, and the Gothic Cathedrals¹⁷. These buildings were built with intentions to represent the God’s divinity: God AS Light. Taking perceptible light from the exterior of the structure and filtering it through small openings of clear glass (*Figure 2*) or large openings of stained glass (*Figure 3*) created an association to and further, a representation of, God’s presence. Both images illustrate the ambiguity of the source of perceptual light allowing it to become a representation of something that is beyond the corporeal realm. The importance relies on the disconnection to the exterior to represent the divine, which is otherwise unknown or unrecognizable to us.

Otto Von Simson¹⁸, the author of *The Gothic Cathedral: Origins of Gothic*

15 Millet. *Light Revealing Architecture*. 149.

16 Marietta S. Millet is a University of Washington (UW) professor and a dominant figure in North America in the field of architectural lighting design. She has earned recognition as a professor, a practicing consultant, and as an author, all in the area of lighting. Her work as earned her numerous light-architecture related awards. Her recognizable book *Light Revealing Architecture*, which is used as reference in this thesis, illustrates the emotional and physiological impact of daylight in architecture. These are explored in each of the four chapters entitled: *Light Revealing Experience*, *Light Revealing Form*, *Light Revealing Space* and *Light Revealing Meaning*. The different components use many theories from Mahnke, Louis I. Kahn, as well as Otto Von Simson, whom is discussed in further in this section. (Lighting Design: Marietta s. Millet. *University of Washington*. 21 Apr. 2008. <<http://www.washington.edu/research/showcase/1976d.html>>.)

17 Gothic Cathedrals evolved from the Romanesque architecture to appear during the medieval period. They originated in the 12th century in France and lasted until the 16th century. This style of architecture is famous for its innovative characteristics, which include the pointed arch, the ribbed vault, and the flying buttresses. The flying buttress structure is the reason that light could start filtering through the dark interior space.

18 Otto Von Simson is a scholar of medieval and renaissance architecture, an art historian, and was a professor at the University of Chicago from 1945 to 1957. His book the *Gothic Cathedral: Origins of Gothic Architecture and the Medieval Concept of Order* explains that light in Gothic Cathedrals must be seen in the sense it would have been in the 12th century to capture its true metaphorical experience. (Simson. *The Gothic Cathedral: Origins of*



Figure 1-A
Burst of Light
St. Ignatius Church, Seattle
Steven Holl



Figure 1-B
Burst of Light
Chapel of the Holy Shroud,
Turin
Guarino Guarini



Figure 2
Clear Glass Opening
Chapel of the Holy Shroud,
Turin
Guarino Guarini

Architecture and the Medieval Concept, explains this symbolic representation through the meaning behind the bridging of the perceptible (corporeal) light to the imperceptible (divine) light: “The Medieval experience of filtered light, as we see for example in stained glass windows, was understood in analogical terms as a mediating realm between earthly matters and heaven.”¹⁹ This mediating function meant that light, in particular coloured light, served as a symbolic bridge between the eternal and ineffable realm of the divine spirit and the temporal world of human perceptual experience.

The faithful who came in contact with this symbolic light could visually observe the presence of God, and ask for his forgiveness. This 12th century religious experience suggested the idea of redemption through the light of God, allowing the people to leave their sins behind and be forgiven as they left the sacred space with healed souls. “The idea of redemption is meant to mend what is broken and to correct what is distorted, bringing together past and future into an eternal present experienced through an immanent chromatic totality of space.”²⁰ The broken and distorted, refers to sins that would darken the soul of the religious supporters and only with redemptive light could those sins be forgiven and the condemned soul rescued.

Redemptive light is achieved in Gothic Cathedrals when perceptible light changes its meaning when piercing through the building’s skin, then creating this new, redemptive light. This new light, as Otto Von Simson explains, is ‘The light’ that can assist in the act of redemption. This relationship between the divine (imperceptible) and the present experience of perceptible light unite to heal the souls of those who witness it.

This association to redemptive light, with or without the religious association, can be exercised in any architecture that requires soul-healing qualities. By employing the qualities of imperceptible light through perceptible light, one can filter sunlight through a space to represent a higher order, without specifically devoting the space to a particular religion. “Sacred light connects us with a higher order of things, with the essential, with the immutable truth. Sacred light is not tied to revelation of a particular deity, or to a particular religion, or even to a typical religious place, such as a church. Rather sacred light reminds one, whenever one comes into contact with it, that a higher order exists, whatever it may be called.”²¹ Within the proposed architecture that

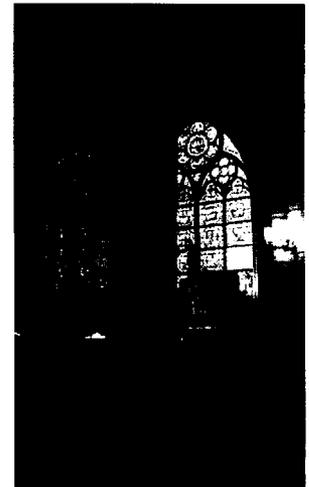


Figure 3-A
Stained Glass Opening
Chartres Cathedral, France
Image by author

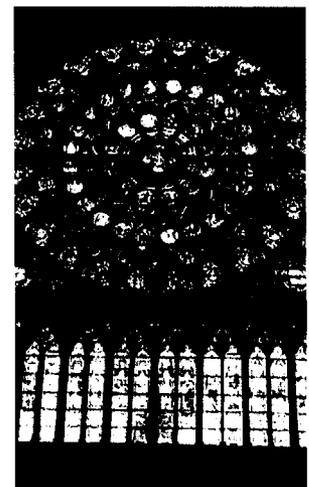


Figure 3-B
Stained Glass Opening
Chartres Cathedral, France
Image by author

19 *Gothic Architecture and the Medieval Concept of Order*. 1-2.)
Otto Von Simson. *The Gothic Cathedral: Origins of Gothic Architecture and the Medieval Concept of Order* (New York: Bollingen Series XL VIII Pantheon Books, 1965), 227-8.
20 Nicholas Temple. *Disclosing Horizons: Architecture, Perspective and Redemptive Space* (London: Routledge Taylor and Francis Group, 2007), 84.
21 Millet. *Light Revealing Architecture*. 160.

follows, a non-religious spiritual space has been drawn to capture, in a way similar to the Gothic Cathedral, redemptive light. This spiritual place will allow light to occupy the space dramatically by contrasting the ephemeral presence of light with the mass of the architecture's material. In doing so, all physical connections to the exterior will be obstructed, leaving only this ambiguous light to filter inside.

The relevance of this necessary ambiguity is that it allows the dwellers a personal association to the potential spiritual meaning associated with light. Dwellers who believe in different spiritual orders can occupy the space simultaneously without interfering with each other's reflective thoughts. "The church should be a place where everyone can feel comfortable and welcome, where everything is revealed and nothing is hidden. The divine light is there; it is up to each other to meet it."²² The spiritual space is merely framing the inner-spirit healing. Thus, the inhabitants control the ability to mend their broken spirits, no matter their beliefs.

1.3 Cycle of Light – Experience Architecture Through Time

Given that natural light is essential to maintain physical health, to enliven the mind, and to sustain life, understanding the cycle of light in relationship to the architectural spaces is necessary. Natural light is intrinsically connected to the rhythms of the day, the patterns of the seasons, and the fickleness of the weather, all of which initiate visible transformations of the architecture. The relationships between the cycle of light and the building's architecture give potential to varied moments of experience within spaces that are transformed as the light rotates through the building filling one space with light and later another. As light departs, a room is left in suspense until, in repeating its cycle; it again reappears to flood the room with its beauty.

The spatial experience brought by the presence of light expands beyond the confinement of one particular space. Alas, the returning and ever-changing light might not fill the space with the same intensity on subsequent days. In near-darkness under nightlight, or in changing seasons the angle of light is altered, creating new experiences within the same rooms. Acknowledging this cyclical reality presents many design possibilities allowing natural light to take on multiple roles throughout the architecture as it animates the spaces with different qualities. Only then can the dwellers understand the complexity of the influential daily and seasonal cycles of light in relation to the architecture they inhabit.

I believe that architecture should not challenge but rather embrace and reflect the natural occurrence of the different daily and seasonal cycles of light. Daylight as a natural phenomenon is coherent with nature, and architecture therefore, must enable its occupants to consciously appreciate and understand the importance of these cycles through the experience of differently lit spaces. To explain the complexity of the cycles of light, Vitruvius relates particular programmatically associated spaces to an optimal orientation. He writes:

“... Special purpose of different rooms requires different exposures, suited to convenience and to the quarters of the sky. Winter dining rooms and bathrooms should have a southwestern exposure, for the reason that they need the evening light, and also because the setting sun, facing them in all its splendour but with abated heat, lends a gentler warmth to that quarter in the evening. Bedrooms and libraries ought to have an eastern exposure, because their purposes require the morning light, and also because books in such libraries will not decay. ... Dining rooms for Spring and Autumn to the east; for when the windows face that quarter, the sun, as he goes on his career from ever against them to the west, leaves such rooms at the proper temperature at the time when it is customary to use them. Summer dining rooms to the north, because that quarter is not, like the others, burning with heat during the solstice, for the reason that it is unexposed to the sun's



Figure 4-A
Large Carved Void Opening
Exeter Library, New Hampshire
Louis I. Kahn

course, and hence it always keeps cool, and makes the use of the rooms both healthy and agreeable. Similarly with picture galleries, embroiderer's work rooms, and painter's studios, in order that the fixed light may permit the colours uses in their work to last qualities unchanged."²³

By engaging the dwellers in their awareness of time and place, architecture can frame the experience and the connection between natural light cycles leading to a better understanding of the purpose and use of each space. Further, the dwellers can begin to associate which space should be in use at particular times based on natural light cycles. The act of inhabitation therefore becomes allied with the sun: letting light guide the temporal as well as functional engagement with spaces.

The daily and seasonal cycles of light has one more influential layer of complexity as it relates to the phenomenon of passing time and the variations of light moods. While the daily and seasonal cycles of light are architecturally experienced as a whole, the less constant, the fickleness of the weather, is experienced suddenly and momentarily. These moments create varied and often dramatic moods with seemingly unpredictable duration. In the case of a sudden lightning storm for example, shifting natural light disappears and re-emerges to animate the architecture in a chiaroscuro effect. The ensuing experience of this space now reflects the time of year, the time of day, and the precise time of a momentary incident.

The experience of the unforeseen moment is filled with richness of moods created by a possible collection of raindrops, a cluster of snowflakes, a wall of clouds, or the movement of leaves dancing to the rhythm of the wind. In concert, architectural devices serve to animate the space of filtered light with the restrictive incisions in the building's envelope. The ensuing experience can differ in a direct relationship with the designed openings, which can range from a large carved void (Figure 4) to a small incision in the architectural fabric (Figure 5). With these different light characteristics, the resulting spatial moods also vary greatly. The spaces then, become unique experiences related to a specific moment in time and never will that same exact mood be re-created. "There will exist as many moods as there are moments in time, and never will a day be similar to the previous."²⁴

This concept of experiencing time through multiple moods visible in the architecture links the dwellers to their natural surroundings. As Frank H. Mahnke



Figure 4-B
Large Carved Void Opening
Assembly Hall, Bangladesh
Louis I. Kahn

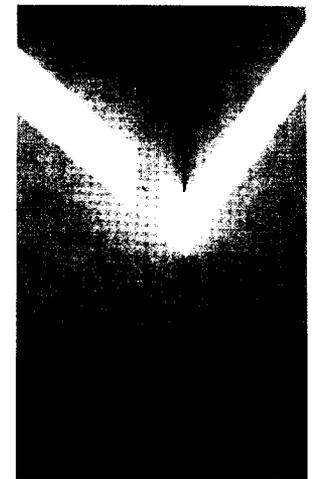


Figure 5-A
Small Incision in Architecture
Fabric
Exeter Library, New Hampshire
Louis I. Kahn



Figure 5-B
Small Incision in Architecture
Fabric
Assembly Hall, Bangladesh
Louis I. Kahn

23 Pollio. *Vitruvius: The Ten Books On Architecture*. 181-1.

24 Louis I. Kahn and Neil E. Johnson. *Light Is The Theme: Louis I. Kahn And The Kimbell Art Museum* (Texas: Encino Press, 1975), 16.

observed, a connection to nature allows the body to function better as our biological systems are made to coincide with daily cycles. Thus, in the development of the design proposition, it extends that in architecture natural light is indispensable to the well-being of its dwellers.

1.4 **Becoming Architecture**

“When you have all the answers about a building before you start building it, your answers are not true. The building gives you answers as it grows and becomes itself.”²⁵

Architecture does not develop uniqueness on its own but gets its personality from the allocation of physical relationships to natural phenomena. Of particular interest to this thesis is the planned relationship of architecture to imperceptible light, in the articulation of varied and enhanced experiences, namely poetic dwelling. The dancing light of the sun helps liven up the stillness of the darkened spaces, while giving them presence and qualities that are unique to the responsive architecture. These spaces of wonder were formerly conceived, designed, and built to dwell in light. Yet, how much of that sense of wonder was intentional? As an architect, the responsibility lies in bringing the architectural inspiration a physical reality through the process of conceiving by designing. The process of building belongs to the builders and the dwelling is left to the inhabitants, leaving the architect with the opportunity and the task of framing a suitable and inspired physical architecture.

Louis I. Kahn understood the limitations of conception and design and took control of this opportunity in framing spatial inhabitation. “In making an architectural drawing, he saw that the place where he made a line was where the light was not. When the building was built, the line became the wall, also where the light stopped.”²⁶ Hence, the walls become the creator of spaces and the barrier to light, leaving mystery to the fickleness of the weather to then reveal, by light, the architecture’s identity.

Architects are limited to their pens (graphical or digital) to convey design intentions, which are otherwise unintelligible until the physical space is constructed and inhabited. A drawing, a graphical representation of the architecture, can, with careful attention, help delineate the immeasurable, the possible. However, a drawing is merely a moment in time and by its abstract nature, allows one to focus on specific qualities given to particular spaces. These drawings, together or alone, can only initiate the projected silent stories and anticipated experiences of the final architecture.

The same sense of wonder and delight should be sought when selecting the architecture’s material palette. Based on Khan’s principles this is especially true when attributing to matter their characteristics in the absorption, reflection or manipulation of light in unique and very specific manners. “The first certitude to emerge is the discovery of our ignorance and inefficiency to predict the probable behaviour of materials and structures. Indeed, things never behave as we assumed they would from the reading of books. What we presumed negligible is not negligible, and the whole theory collapses.”²⁷ Only by material explorations can the use of different materials and finishes begin to manipulate light by reflection, refraction, diffusion and

25 Kahn and Johnson. *Light Is The Theme: Louis I. Kahn And The Kimbell Art Museum*. 53.

26 Lobell. *Between Silence and Light: Spirit In The Architecture Of Louis I. Kahn*. 64.

27 Wuman. *What Will Be Has Always Been: The Words of Louis I. Kahn*. 97.

absorption. Although these explorations may generate a series of possibilities, it is impossible to predict the moods of the imperceptible light and the natural surroundings, nor should they.

“A great building, in my opinion, must begin with the immeasurable, must go through measurable means when it is being designed, and in the end must be immeasurable. The only way you can build, the only way you can get the building into being, is through the measurable. You must follow the laws of nature and use quantities of brick, methods of construction, and engineering. But in the end, when the building becomes part of living it, it evokes immeasurable qualities, and the spirit of its existence takes over.”²⁸

Light is not only obstructed or connected to the architecture itself but is very much responsive and affected by the immediate surroundings, or site. Not only do the lines representing the walls and the materiality coincide with light, but natural surroundings of the site will always influence light; supplementing the uniqueness of the integrated architecture. The leaves in the nearby trees may quiver in the wind while the branches vibrate vigorously, consequently casting dynamic shadows into the spaces, thus creating different moods indispensable to the architecture’s identity and experience.

Similar to the leaves and branches of the trees, the inhabitants in constant motion throughout the architecture, engage the light while casting dancing shadows on the interior surfaces, yielding to a live theatrical production of shadow puppetry. The relationship that exists between the architecture and the inhabitants reveals a co-dependency. All influential components in the creation of spaces play a role in the becoming of architecture. The architecture alone, the frame, owns no identity until all physical, (architectural materials and site) and metaphysical (nature, light, inhabitation), attributes join in a cohesive manner. The personality of the architecture is oblivious to the eye prior to its inhabitation.

1.5 *The Continual Becoming of Architecture*

It can be argued that architecture takes on a particular beauty with time. By changing, physically, functionally, it is renewed. By the engagement of its inhabitants, it is continuously refined and redefined. As people engage the building, they embed new yet permanent markings upon the architecture, which hint at their passage, thus, contributing to the architecture's evolving state of change, of becoming.

There exists another parallel between the architecture and its inhabitants: The dwellers of the space personally influence the architecture as they create a space of their own. Reciprocally, the persona attributed to the architecture contributes to the well-being of the dwellers.

"In this drive to express through form and design, you make a distinction between existence and presences. When you give something presence, you have to consult nature, and that is where Design begins. ...Design gives the elements their shape, taking them from their existence in the mind of their tangible presence. Design is a circumstantial act. In architecture, it characterizes a harmony of spaces good for a certain activity."²⁹

In addition to the particular programmatic activities, the specific over-arching intention given to the proposed architecture is in its contribution to the well-being of the dwellers in the rehabilitation of their body and soul. The architecture's identity is therefore defined by its role in framing and supporting the rehabilitation of its inhabitants.

Before the process of rehabilitation can begin, the patients must strip away the personal demons that have taken over their lives and would otherwise lead them towards an uncontrollable self-destructive path. Metaphorically, the patients must submerge their body and soul into total darkness, orchestrated by the absence of light, to prepare for a life renewal – a rebirth. As the sun rises on the Eastern horizon, the body begins its new life just as the light commences its new daily cycle. Now ready for the daily battles of the rehabilitation process, the body fends off the self-destructing addictions until the sun is ready to disappear in darkness, leaving the body to rest until the new daily challenges begin once more. This ritual is then repeated through the complete rehabilitation program creating a relationship between the cycles of light and the rehabilitative living within the architecture.

This close physical connection to the cycle of light helps enliven the mind towards a healthy life. Frank H. Mahnke, environmental psychologist and expert on natural light in architecture, explains: "...a connection to the natural phenomenon of light is part of the most basic human needs, like socializing, washing, sleeping, eating. Without access to adequate natural light, a condition of malillumination affects the wellbeing of man, similar to the malnutrition that occurs when there is a lack of a proper diet."³⁰ By returning to the basic human needs, the patient learns to appreciate the simple but essential necessities of life – a life

29 Lobell. *Between Silence and Light: Spirit in the Architecture of Louis I. Kahn*. 28.
30 Mahnke. *Color and Light in Man-Made Environments*. 45.

in sync with the cycles of light is a healthy life.

Once the body adapts to the nurturing effects of the presence of light, the “soul” health can be addressed. The spiritual wellbeing of the patient depends exclusively on the patient’s desire to heal. This soul-healing journey is one battle that the patient must personally attempt. The architecture frames the divine light, but the act of redemption is left to the patient. Remorse and redemption cannot live simultaneously; therefore, the patient must be emotionally willing to heal in presence of the divine light. Just as the imperceptible light in Gothic Cathedral is indispensable to the spiritual wellbeing of the religious faith, divine light is indispensable to the rehabilitation of the spiritual core of the patients.

The act of healing through the phenomenon of light transpires through perceptible and imperceptible light. By allowing the architecture to coexist with natural light, the perceptible light (corporeal light) can start the rehabilitation through physical and psychological healing; leaving the imperceptible light (divine light) to instigate spiritual harmony. Together, both light phenomena give the patients the opportunity to nurture their physical and psychological well-being and mend their broken spirits to eventually sustain a life within society. The healing properties are supported by the architectural/spatial experiences, which frame the rehabilitation process enhanced by the phenomena of light.

1.6 Light In Architecture

The architecture of our time has become a retinal art of the eye; the building construction is often detached from matter, material logic, and human interaction. By contrast, "... a real architectural experience is not simply a series of retinal images; a building is encountered – it is approached, confronted, encountered, related to one's body, moved about, utilized as a condition for other things, etc."³¹

To understand how the human body interacts with architecture, one must understand the importance of phenomenology. "Phenomenology is the study of the essence of things, it is the study of intrinsic properties that characterize or identify something. Phenomenology is a method of describing the nature of our perceptual contact with the world and it is concerned with providing a direct description of human experience."³² Material phenomena can play a meaningful role in architecture, as a source of inspiration for architectural ideas. By the study and understanding of phenomena, the architecture evolves through the materials without engaging the rational part of our mind.

Phenomenologist Maurice Merleau-Ponty³³ suggests that allowing the mind to think freely from any pre-conceived ideas is necessary to discover the roots of rationality in new design ideas. By exploring materials for their true identity one can really engage in a new discovery that can lead to a unique system of design appropriate to the particular project. These discoveries are experienced through the body. For Merleau-Ponty, our body is our medium for the perception of the world while it interacts with things. Thus, the body is interwoven with phenomena.

"Every touching experience of architecture is multi-sensory; qualities of matter, space, and scale are measured equally by the ear, nose, skin, tongue, skeleton and muscle. Architecture involves seven realms of sensory experience, which interact and infuse each other. ... Every building or space has its characteristic sound of intimacy or monumentality, rejection or invitation, hospitality or hostility."³⁴

Using phenomena, such as light, as a basis for animating and engaging materials and in the creation of spaces thus promotes and understands how one can implement intentions into an architecture that includes the bodily experience within.

31 Juhani Pallasmaa. *An Architecture of the Seven Senses* (Japan: Architecture and Urbanism, 1994), 35.

32 Ibid. 35.

33 Maurice Merleau-Ponty is a French phenomenological philosopher and author of *Phenomenology of Perception*. This book illustrates his understanding of perception, bodily movement, habit, ambiguity, and relations with others. Phenomenology is a correlate of our body and its sensory functions. (Eric Matthews. *The Philosophy of Merleau-Ponty* (Chesham, Bucks: Acumen Pub., 2002), 186.)

34 Pallasmaa. *An Architecture of the Seven Senses*. 30-31.

2.1 Structure – Giver of Light

“Structure is the giver of light. When I choose an order of structure that calls for column alongside of column, it presents a rhythm of no light, light, no light, light, no light, light. A vault, a dome, is also a choice of a character of light.”³⁵

Louis I. Kahn says that light and structure are intertwined. If structure is the giver of light and light is the giver of presence, as discussed in the previous sections, both structure and light work concurrently to create architecture. The concept of the architectural frame, its form, and the penetration of light depend on the structure spatially, architecture also depends on light to reveal the otherwise darkened spaces. “Structure is the maker of light, thus, when you’ve decided on structure, you’ve decided on light.”³⁶ However, I would add that a measured decision on structure, and the ensuing penetration of light, should also hint at the spatial order within the architecture.

During the initial exploration process, a series of models evolved from the notion of releasing the structure from its rigid form in order to permit light penetration. Originally, this began with a very static and unyielding form resembling a box, which was then cut, split, and opened in order to release the structure from its rigidity. (Figure 6) Consequently, where light penetrated the inside of the models, where the incisions were made, a beautiful play of light and shadows created an animated and dynamic interior that evoked qualities of spaces that might contain a very particular part of the program in need of that particular light condition. The light thus became part of the structure as well as part of the architecture’s internal context.

These explorations then led to the creation of watercolour vignettes (Figure 7) to illustrate the spatial possibilities suggested by the observations of the preliminary models playing in different lit environments. The watercolour technique is important at this stage as I did not want to conform to one single, static moment in time since the vignettes can only suggest one mood in one particular instant. The fuzziness and intentional ambiguity of the watercolour technique helped

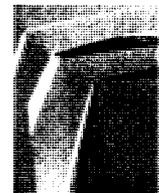
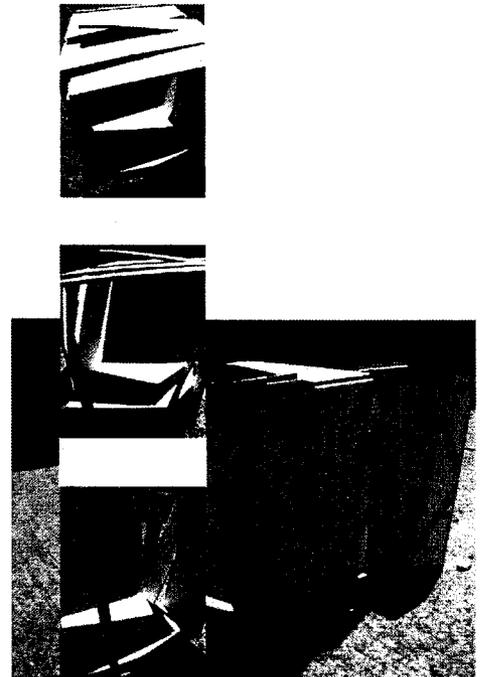


Figure 6-A
Releasing Structure
Light Penetrating Through
Incisions

35 Lobell. *Between Silence and Light: Spirit in the Architecture of Louis I. Kahn*. 34.
36 Millet. *Light Revealing Architecture*. 59.

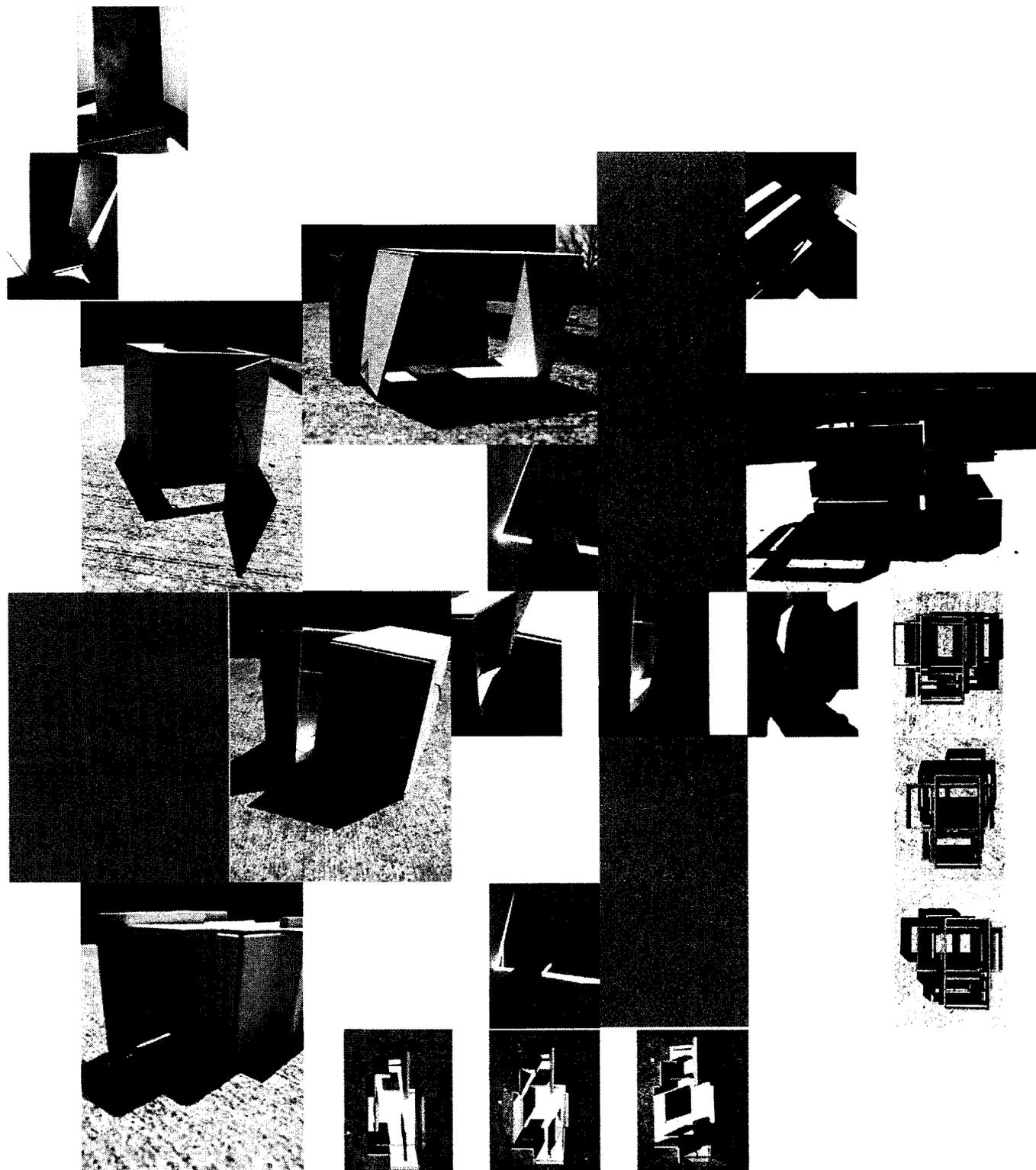


Figure 6-B
Releasing Structure
A Compilation of Illustrations of
Initial Models
Image by author

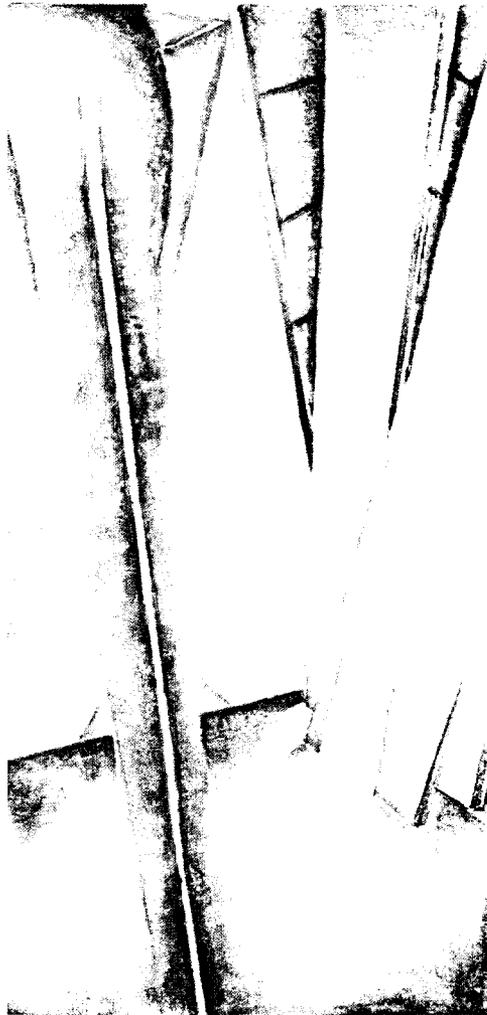


Figure 7-A
Spatial Moment
Watercolour Vignette
Image by author

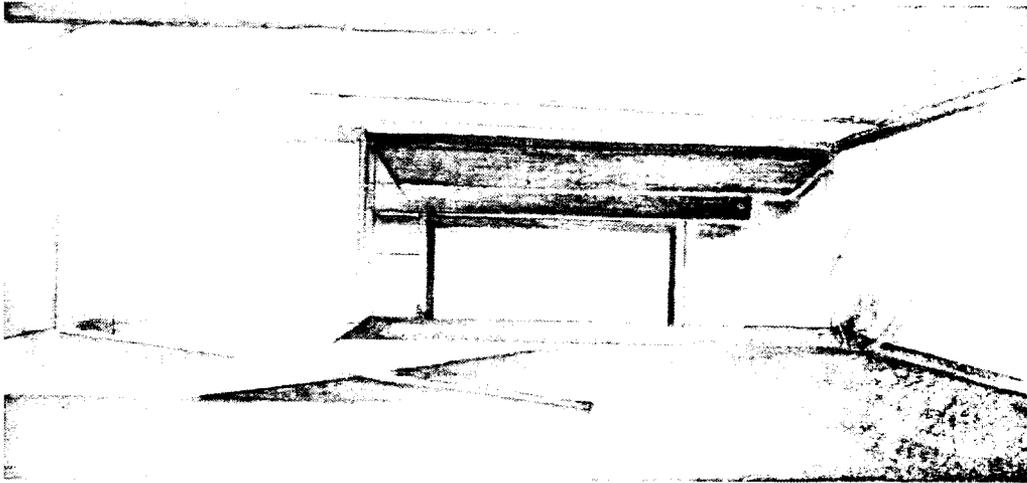
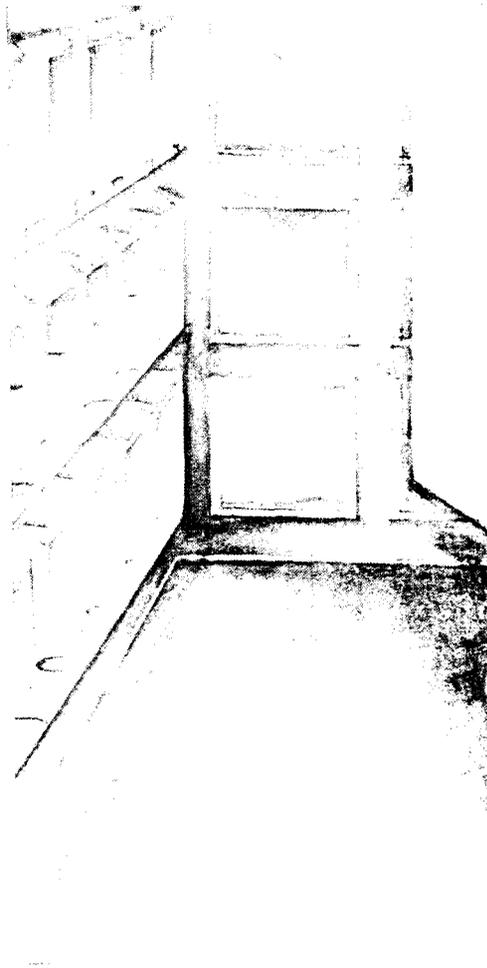
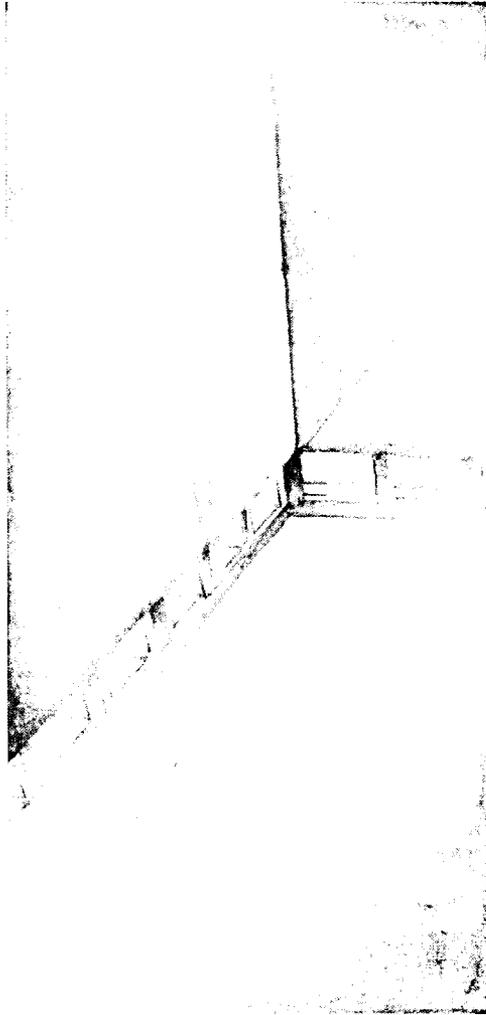


Figure 7-B
Spatial Moment
Watercolour Vignette
Image by author



Figuro 7-C
Spatial Moment
Watercolour Vignette
Image by author



Figuro 7-D
Spatial Moment
Watercolour Vignette
Image by author



Figure 7-E
Spatial Moment
Watercolour Vignette
Image by author

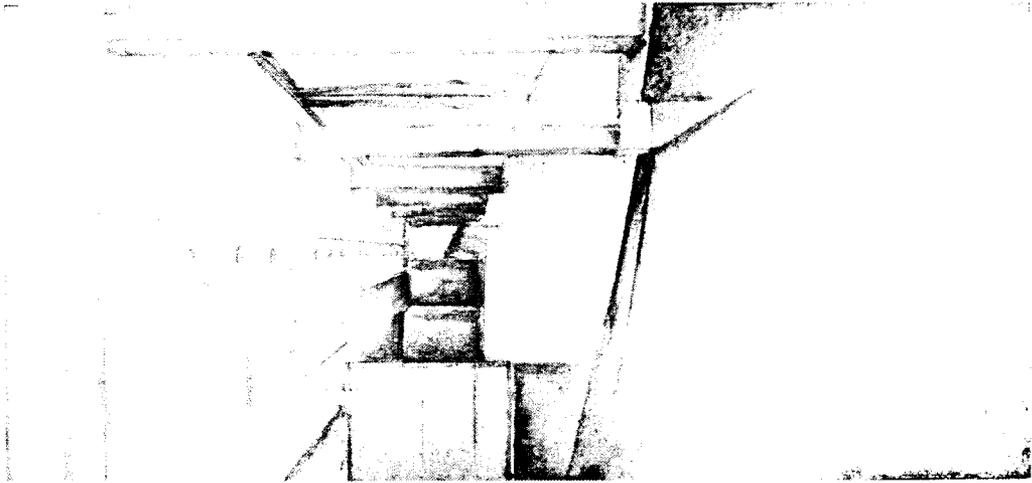


Figure 7-F
Spatial Moment
Watercolour Vignette
Image by author

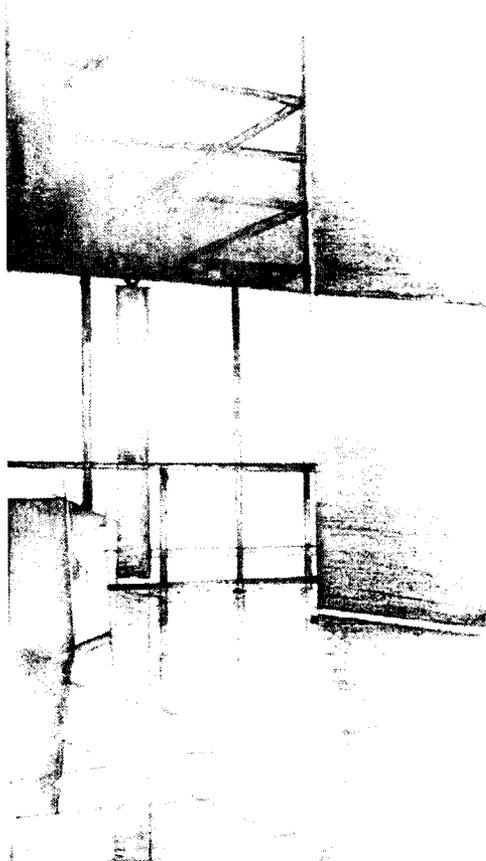


Figure 7-0
Spatial Moment
Watercolour Vignette
Image by author

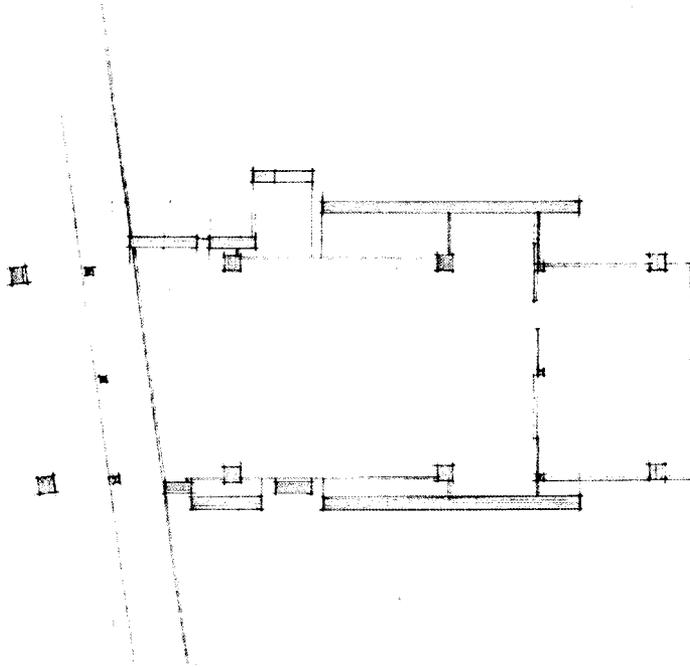
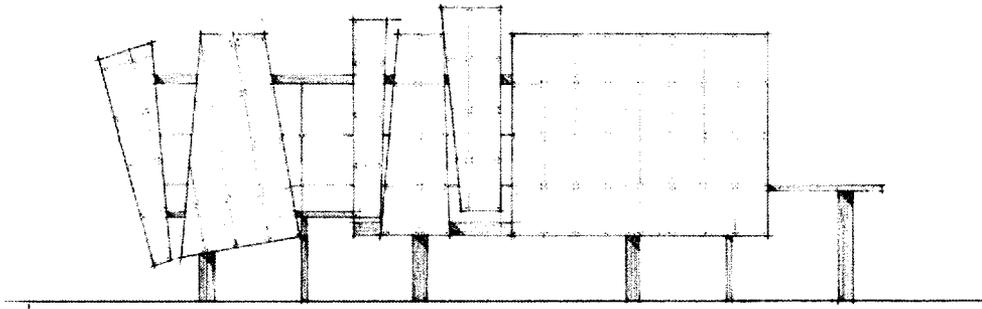
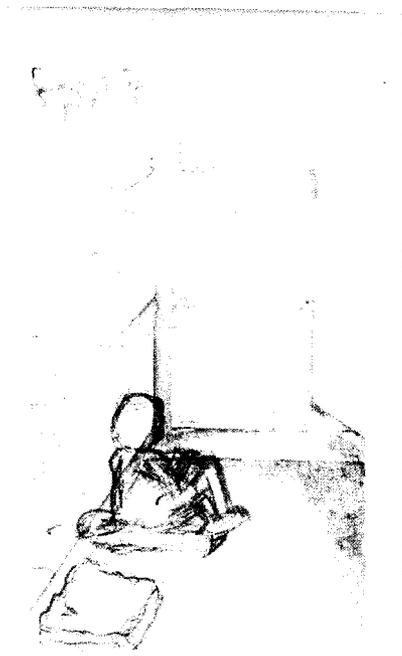
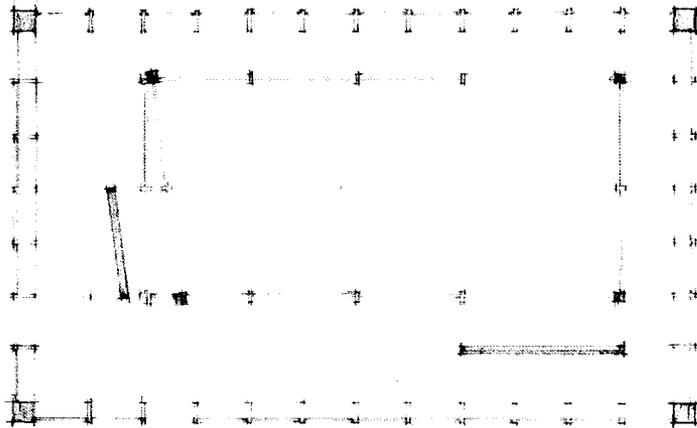
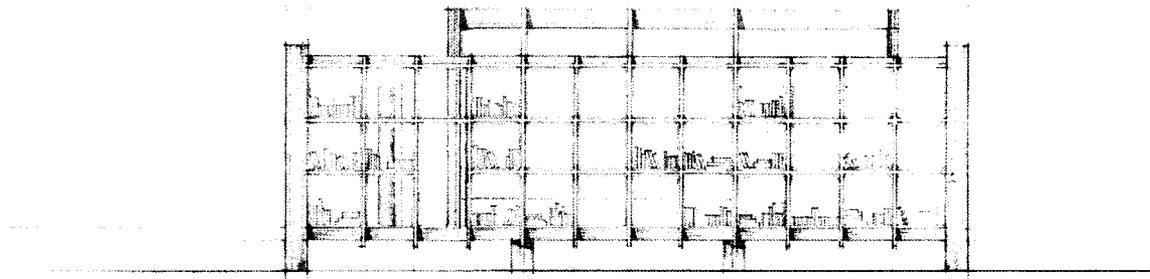


Figure 8-A
A Moment in Space
Elevation / Plan / Vignette
Graphite and Watercolour
Scale: 1:75



Figuro 8-B
A Moment in Space
Elevation / Plan / Vignette
Graphite and Watercolour
Scale: 1:75

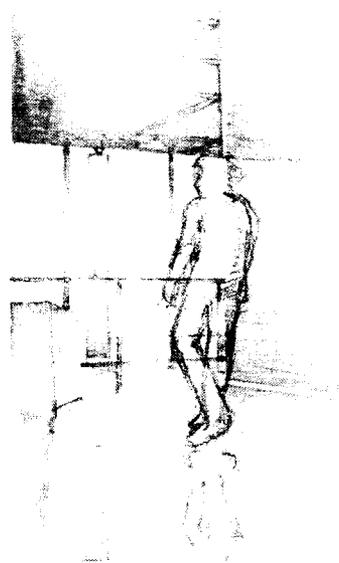
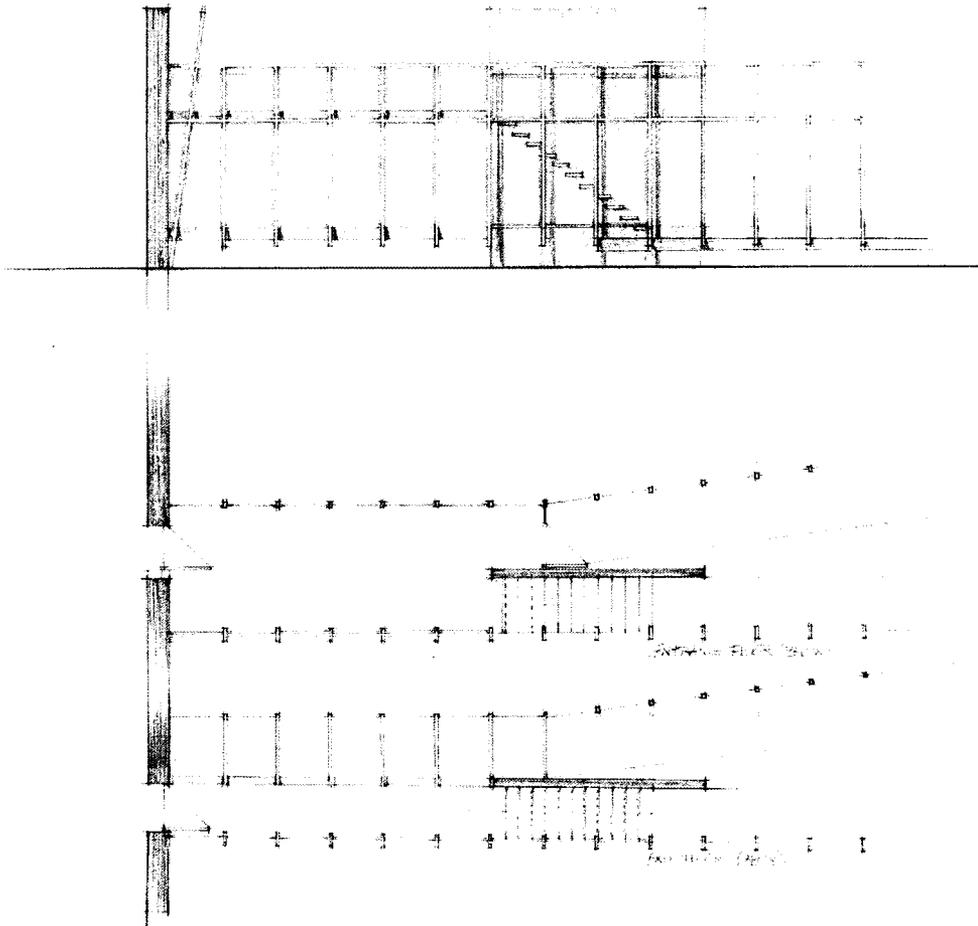


Figure 8-C
A Moment in Space
Elevation / Plan / Vignette
Graphite and Watercolour
Scale: 1:75

to break away from that inflexibility and suggest a possible moment in time in conjunction with light, without committing to an exact mood. As discussed in the section *Cycle of Light* and *Becoming Architecture*, the light reflects on many variables that will influence the space's mood, thus, a vignette is simply one potential spatial experience.

Within the architect's limitations to suggest lit environments in two-dimensional graphical representation, the plans and sections help define where the light might penetrate the structure's skin. The watercolour vignettes initiate a series of lighting conditions all pertaining to the limitations of two-dimensional representation. The watercolour technique, a blurred image defining dissimilar light settings, is then developed into liveable spatial areas by the design of a plan and section that instigates an option towards a related program that might benefit from the particular light condition (*Figure 8*). The plans and sections clearly illustrate the structure releasing the light in given instances. In Louis I. Kahn's words, "... a plan is a society of rooms. A real plan is one in which rooms have spoken to each other. When you see a plan you can say that it is the structure of the spaces in their light."³⁷ Just as Kahn suggests that structure is the giver of light, the structure pertaining to the plans and section graphically illustrate the release of the skin attached to the structure giving natural light the permission to permeate into the interior spaces.

Light qualities in architecture are invisible and temporary, making the phenomena of light-in-time very difficult to denote through two-dimensional representation. An image attempting to capture time is most powerful when compared with another, demonstrating, by sequencing, the time elapsed. "Artificial light is only a single, tiny, static moment in light and is the light of night and never can equal the nuances of mood created by the time of day and the wonder of the seasons."³⁸ For this reason, the multiple reoccurring images in *Figure 9* reveal the effect of time through the changes in light qualities as the day and year progresses. These images demonstrate how light can evoke different emotional responses in an otherwise static structure.

Although the incisions apparent in the initial series of models and drawings (*Figure 6-8*) initiate different light qualities and spatial organizations, I continued my investigation by the use of new models that would attempt to capture the concept of memory. Memory here is revealed by the traces that contain the original location of the structure before the appearance of incisions. Hence, the models began their journey as

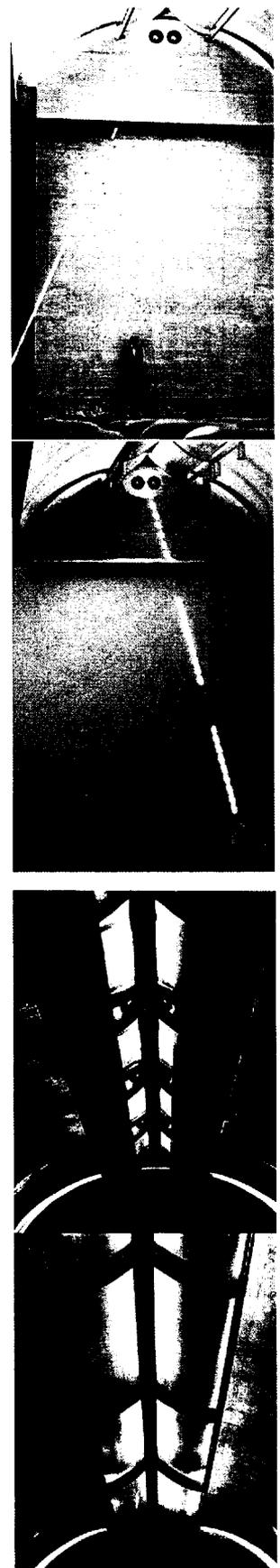


Figure 9
Spatial Experience Through Time
Kimbell Art Museum, Texas
Louis I. Kahn

37 Lobell. *Between Silence and Light: Spirit in the Architecture of Louis I. Kahn*. 36.
38 Wuman. *What Will Be Has Always Been: The Words of Louis I. Kahn*. 89.

closed objects, later incised to allow the interior spaces to receive bursts of light, while allowing the preliminary structure to remain.

This preliminary experiment led to the creation of a new series of study models that represent the entirety of this thought process. Although *Figure 10* relates to the initial exploration models, these symbolically represent the initial box-like structure by means of an orthogonal wood frame. The wall surfaces within the frame, represented by the fabric sown onto the structure, are displaced in order to let light infiltrate through the incisions. The boxed frames retain their presence from the rupturing of their original design, which represents the memory of the structure prior to the incisions. These models are intended for the observation of light diffusion, reflection, refraction, and absorption through the multitude of incision methods. They demonstrate the possibilities of spatial organization generated by light and structure dependant on their lit environment.

As captured by the multiple images in *Figure 11*, one structure can suggest several spatial experiences all dependant on the formal and material variables that influence the penetration of natural light. While the spatial mood is subjective, the incisions permitting light infiltration in the proposed architecture will not. Like the initial study models, the preliminary architectural form will be one resembling an orthogonal box-like structure. Subsequently, the structure will be cut, split and opened to permit light penetration to the interior spaces. Although light seems to be filtering illogically, the structure will only detach itself from its original position when a new programmatic element is introduced. Thus, leaving a memory of the incision in the architecture where the structure ruptured from its original form, which from this process gave light its presence.

A direct burst of light will penetrate through the incisions, creating a memory-trace of where the original structure once was. I believe that the initial form should not be lost as it emphasizes the meaning of light penetration within the architecture. If the structure did not rupture from its initial form, light would not give presence to the interior spaces, and all spatial experiences belonging to the phenomena of light would disappear. In addition, the anticipated architectural experiences generated by light, would fail in its mandate to rehabilitate the inhabitants. It is important therefore, to honour the structure that gave light its presence within the architecture.

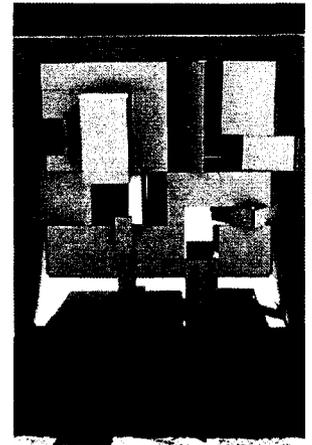


Figure 10-A
Memory of Structure
Infiltrating Light
Image by author



Figure 10-B
Memory of Structure
Infiltrating Light
Image by author

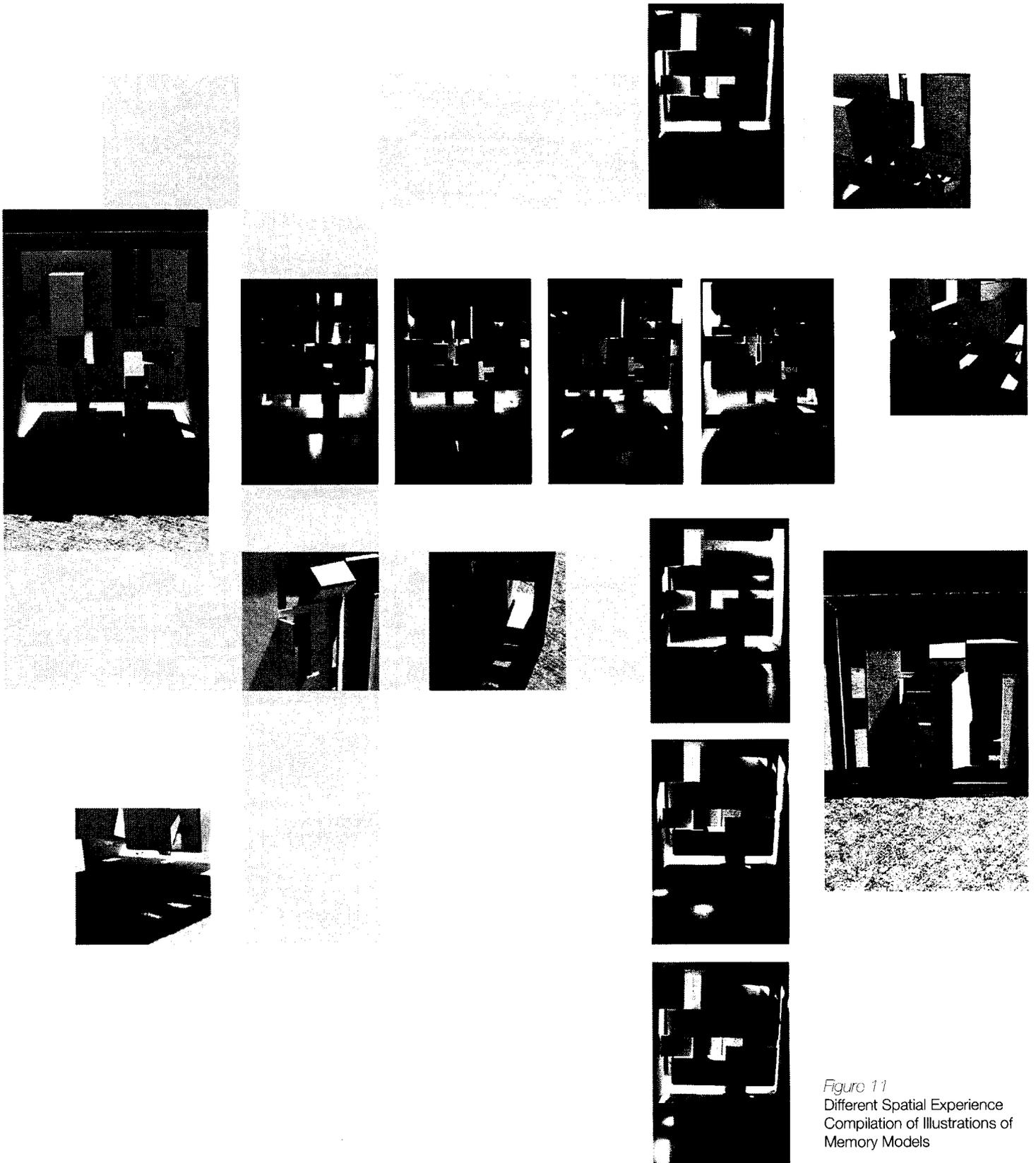


Figure 11
Different Spatial Experience
Compilation of Illustrations of
Memory Models

2.2 Control of Light

Although the incisions intended for light infiltration already possess rich conceptual meanings, they can further be employed in the realization of other architectural connotations. In addition to being a memory of the preliminary structure, a filter of light moods, and a giver of light, they control the natural light by their chosen type of fenestration and their selected materiality. Both new elements influence the light quality by refraction, reflection and diffusion and are dependent on the material palette in proximity to the incision. Their selection and implementation will ensure a lighting condition appropriate to the related programmatic space. In the company of diverse ambiances of light made possible by the incisions and the materials, the architecture can now contribute to a healthy inhabitation.

The nature of the incisions can impose a particular light phenomenon on the room by refracting, reflecting or diffusing the natural light; each light characteristic visible in *Figure 12*. These, in turn, help create spatial qualities within the space that can initiate a programmatic element deserving of that mood.

“And looking at the light and realizing that light, in the ambience of light, especially when you’re capturing it and following it through certain kinds of made places, that you get here a very particular place which is called a building. This idea of which you have that light which either inspires you or makes you sad, or makes you gay, or you want to greet somebody, or you feel that death is near, or that life is near, or something, you feel it in here.”³⁹

Of course, these moods and impressions will fluctuate depending on other light phenomena, the ambient weather, site conditions and vegetation, as well as the presence of dwellers, but the characteristics of light remain indifferent.

The material palette pertaining to the characteristics of light can be simplified by the use of natural materials. The reason behind the restricted material palette is that natural materials possess biological and psychological properties.

“Only natural materials such as untreated wood, brick, natural tile, and special glass, combined in a certain manner, allow the natural radiation to pass undisturbed into the body. Many man-made building materials and electronic and electric installations such as artificial light, by blocking these signals, create a deficiency of necessary frequencies (information). ... This affects an imbalance in the normal polarization of the body, reducing



Figure 12-A
Diffused Light
New National Gallery, Berlin
Mies Van der Rohe
Image by author

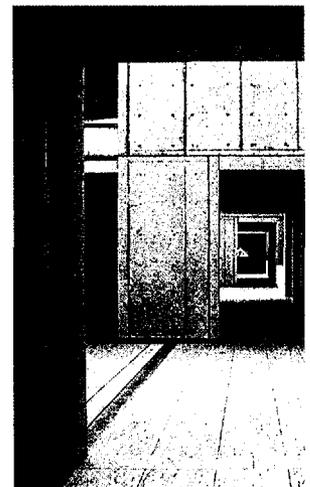


Figure 12-B
Diffused Light
Salk Institute for Biological
Studies, San Diego
Louis I. Kahn

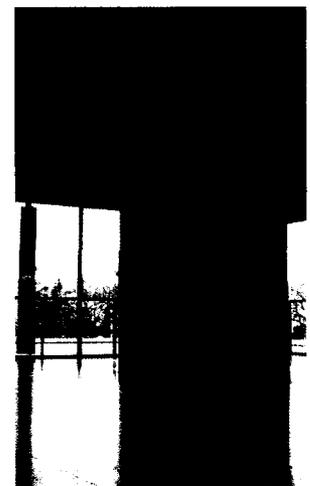


Figure 12-C
Reflected Light
New National Gallery, Berlin
Mies Van der Rohe
Image by author

39 Wuman. *What Will Be Has Always Been: The Words of Louis I. Kahn*. 87.

normal pulsations and causing stress, tension, and disease.”⁴⁰

To further emphasize the importance of natural materials in architecture, Frank H. Mahnke makes an interesting observation by comparing the use of natural materials and man-made materials to the health of dwellers prior to the industrial revolution. He explains:

“At the dawn of civilization, building materials, household items, and clothing were made only of natural substances and fibres. Housing was designed in an open, less dense format, using clay, wood, bricks, straw, earth, stone, and fibres. Man was more in resonance and in harmony with nature, and his housing, both in form and structure, permitted normal light as well as atmospheric and cosmic radiation to pulsate unimpeded through and around its inhabitants.”⁴¹

In the proposed architecture, building materials from minimal processing will be used, as these materials are indigenous to the selected site and compatible with the sensitive local environment. In my opinion, architecture should be harmonious with its environment, and the selection of more “natural” materials permits this without jeopardizing the well-being of the dwellers.

In addition to the physical and psychological benefits that natural materials provide, the natural colour palette and finishes of these materials also enhance the quality of natural light.

“Light and materials are mutually dependent on each other. Materials are key to understanding light in architecture because they directly affect the quantity and the quality of light. Two qualities of materials – their finish and their colour – are most important in this regard. Special materials, such as glossy finishes, reflect light as a mirror does, which result in reflected images and the light source being visible on the surface. Matte surfaces, such as natural stone, wood, and plaster, reflect light diffusing, equally in all directions.”⁴²

These different light characteristics were explored in a series of sectional models using abundant regional resources to evoke a relationship between natural light and natural materials: local woods, copper, and slate (*Figure 13*). Just as the previous quote suggests that light qualities are dependent on materials, the models share this same theory. Thus, a material palette is indispensable to lighting a space to induce wanted spatial qualities.

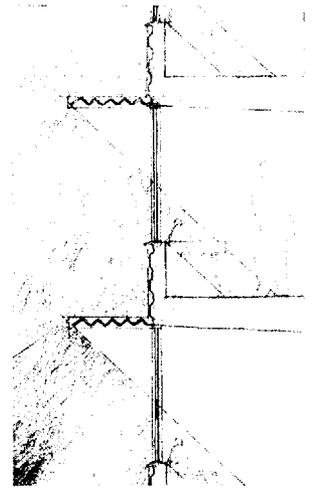


Figure 12-D
Broken Light
Carver Court Housing Develop-
ment, Pennsylvania
Sketch
Louis I. Kahn



Figure 12-E
Broken Light
Assembly Hall, Bangladesh
Louis I. Kahn



Figure 12-F
Broken Light
Salk Institute for Biological
Studies, San Diego
Louis I. Kahn

40 Mahnke. *Color and Light in Man-Made Environments*. 61.
41 Mahnke. *Color and Light in Man-Made Environments*. 61.
42 Millet. *Light Revealing Architecture*. 67.

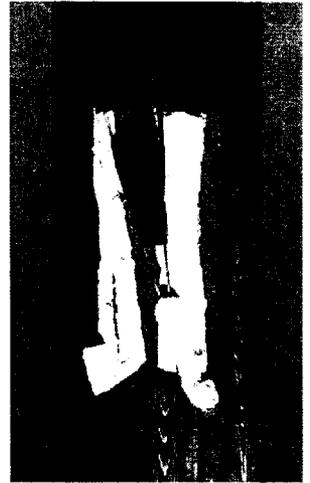


Figure 13-A
Sectional Models
Light and Materials

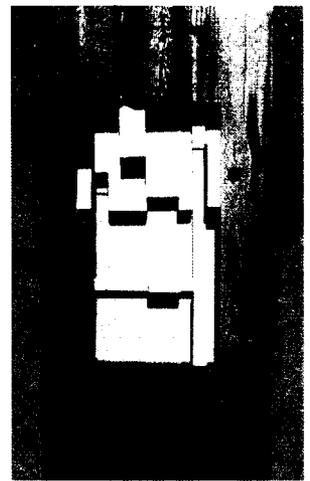


Figure 13-B
Sectional Models
Light and Materials



Figure 13-C
Sectional Models
Light and Materials

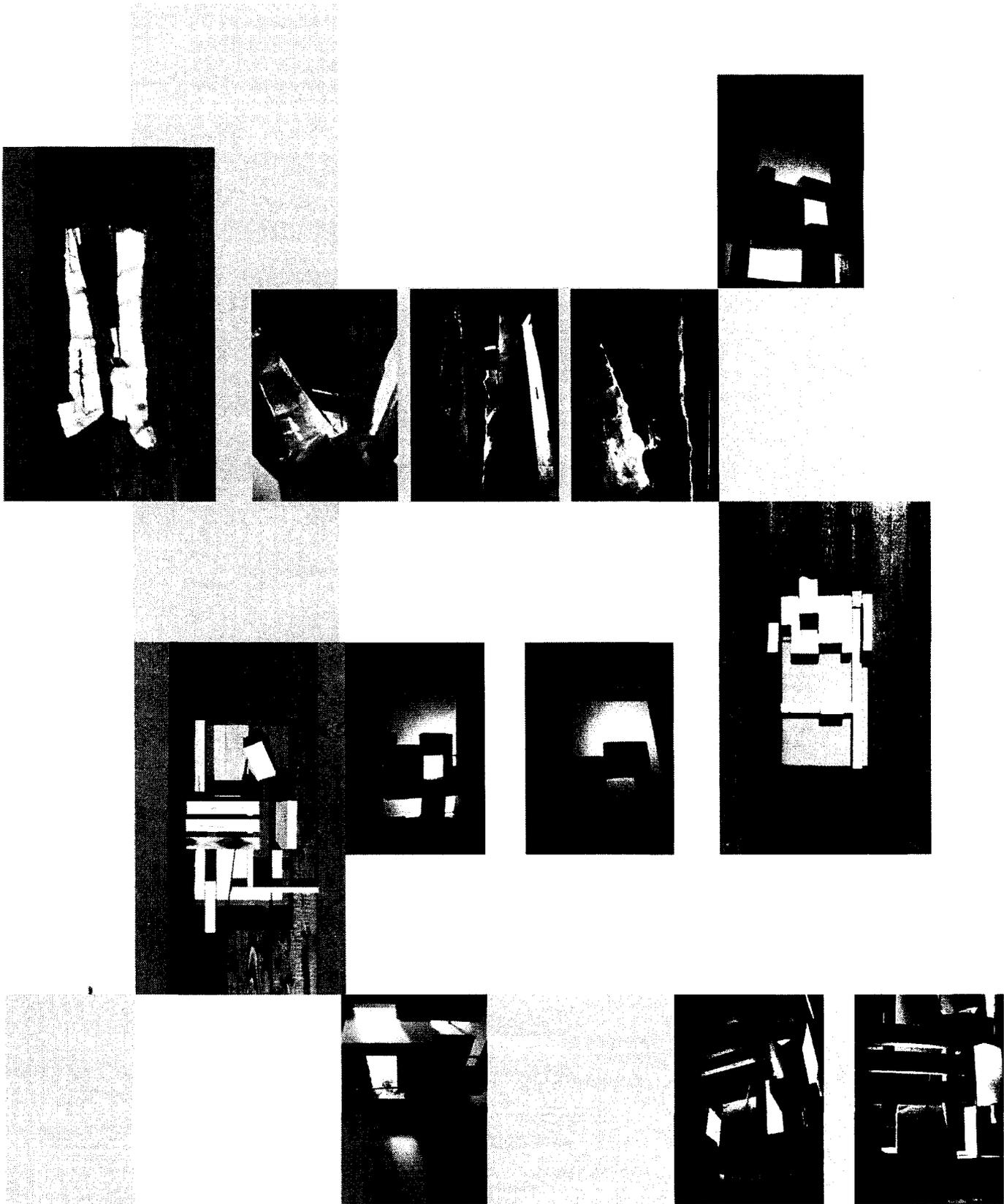


Figure 13-D
Sectional Models
Light and Materials
Compilation of Illustrations of
Sectional Models

2.3 A Program in Light

“One of the basic human requirements is the need to dwell, and one of the central human acts is the act of inhabiting, of connecting ourselves, however temporarily, with a place on the planet which belong to us, and to which we belong. This is not, especially in the tumultuous present, an easy act (as is attested by the uninhabited and uninhabitable no-places in cities everywhere), and it requires help: we need allies in inhabitation.”⁴³

Some youth lose their sense of home, lose their sense of belonging, and lose themselves through the difficult experiences brought on by adolescence. In the turmoil of these difficult years some occasionally fall from their nurturing society and into the cracks of criminality. Without any care for their world or for their own lives, they fall deeply into a world of crime until, in certain cases, they are retrieved and/or apprehended by the justice system. Once their lives have entered this stage, it is our responsibility as a society to allow them a chance to rehabilitate into law-respecting citizens. We, as the general public, act as allies in the process of rehabilitation through the implementation of youth rejuvenation centres and related programs. We must realize that these youth offenders have the potential to rehabilitate if given the right opportunity with the proper programmatic facilities and spaces that promote healthy living and a structure for self-betterment. A correctional facility is meant to help these individuals who often lack judgment and common sense, its architecture can frame and enhance this rehabilitation process.

Within the architecture, natural light, with its therapeutic qualities will take the lead role in rehabilitation towards healthy living. Hence, the youth offender will be in constant physical and spiritual connection with natural light in all various programmatic spaces. These spaces include most importantly a spiritual space for contemplation and redemption, a circulation vein that connects together all spaces, a workshop that will challenge their knowledge and enhance their skills, as well as other supporting programs.

SPIRITUAL SPACE

“In understanding the nature of a chapel, I said first you have a sanctuary, and the sanctuary is for those who want to kneel. Around the sanctuary is an ambulatory, and the ambulatory is for those who are not sure, but who want to be near. Outside is a court for those who want to feel the presence of the chapel. And the court has a wall. Those who pass the wall can just wink at it.”⁴⁴

In my opinion, the spiritual space is the most important programmatic area for the youth offenders. I believe that an offender requires healing of their soul to completely rehabilitate and accept their fate. Without remorse and redemption, the youth will fall again into a life of crime and possibly never again have the chance to live a healthy life.

43 Tanizaki, Jun'ichiro. *In Praise of Shadows*. Trans. Thomas J. Harper and Edward G. Eindensticker. (Stone Creek: Leete's Island Books, Inc., 1977) 1.

44 Lobell. *Between Silence and Light: Spirit in the Architecture of Louis I. Kahn*. 47.

For this reason, I am positioning the spiritual space in the centre of the architecture to symbolically represent the importance of the healing of the soul similar to the central area in Gothic Cathedrals, which are created by the intersection of the two bays into a cross (*Figure 14*). The juxtaposition of both the concept and Gothic Cathedral plan serves to explain the location of the spiritual space that connects all surrounding programmatic spaces, which led to the creation of the architectural plan (*Figure 15*). Without necessarily entering this room, the youth offenders will have constant visual connection to the spiritual heart of the architecture.

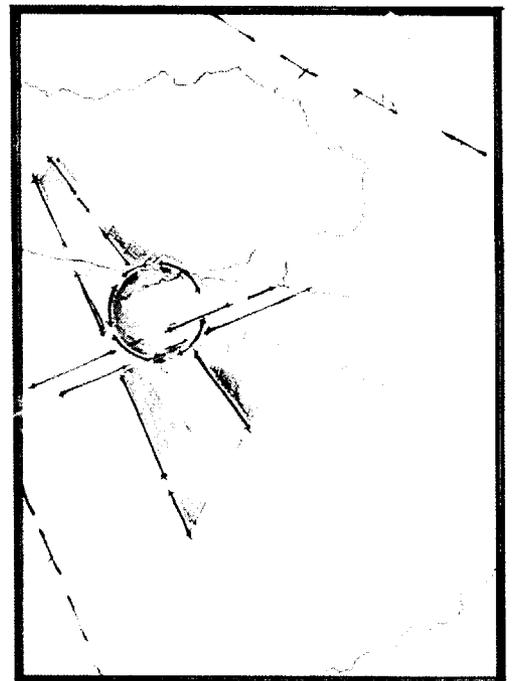
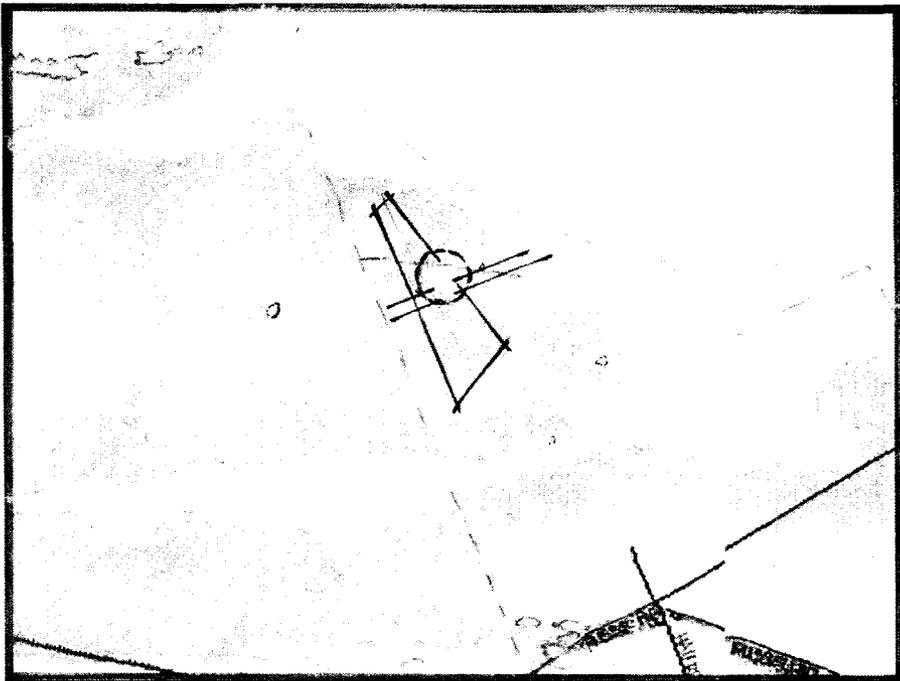
Conceptually, the spiritual space is initially trapped in the centre of all supporting program in the box-like structure and therefore in the absence of light. Reminiscent of the Gothic Cathedrals, light is important to redemption and important to this spiritual space. Thus, the structure, the giver of light, needs to be cut, split and opened to release the spiritual space from total darkness and be free to receive divine light, which is indispensable to the emotional rehabilitation of the dwellers. Although the possibilities of light characteristics permissible through the incisions are endless, the control of light in this room is necessary to initiate a light condition adequate for contemplation similar to the divine light of Gothic Cathedrals. This divine light will be achieved by an abstraction of the physical light and a disassociation to the surroundings, leaving the dweller alone with their thoughts while in the presence of divine light.

Consequent to the release of the spiritual space from darkness, many other spaces are created, concentric to and looking towards the spiritual heart of the architectural complex. Thus, the youth offenders are in constant visual connection with this space in the hope that they will realize the inner healing that is vital to their successful rehabilitation.

THE VEIN OF LIFE

*"The street is a room by agreement, a community of rooms, the walls of which belong to the donors, dedicated to the city for common use. Its ceiling is the sky. From the street must come the meeting house, also a place by agreement."*⁴⁵

As a result of the cutting, splitting and opening of the structure to liberate the spiritual space, the remnants of the initial box-like architecture are now scattered away from their original location and disconnected from each other. Left scattered, these architectural pieces must be mended in order to permit flow from one to the other. This was achieved by the creation of a circulation "vein". This vein becomes vital to the dwellers, as it is the connection to all available rehabilitation programs and spaces and where they are in the presence of others who, like them, may be suffering from physical, psychological, and emotional distress. The dwellers' emotional fragility is symbolically represented through the use of glass throughout



Figuro 14
Spiritual Space in Centre
Initial Sketch Plan
Graphite & Pastels
N.T.S.

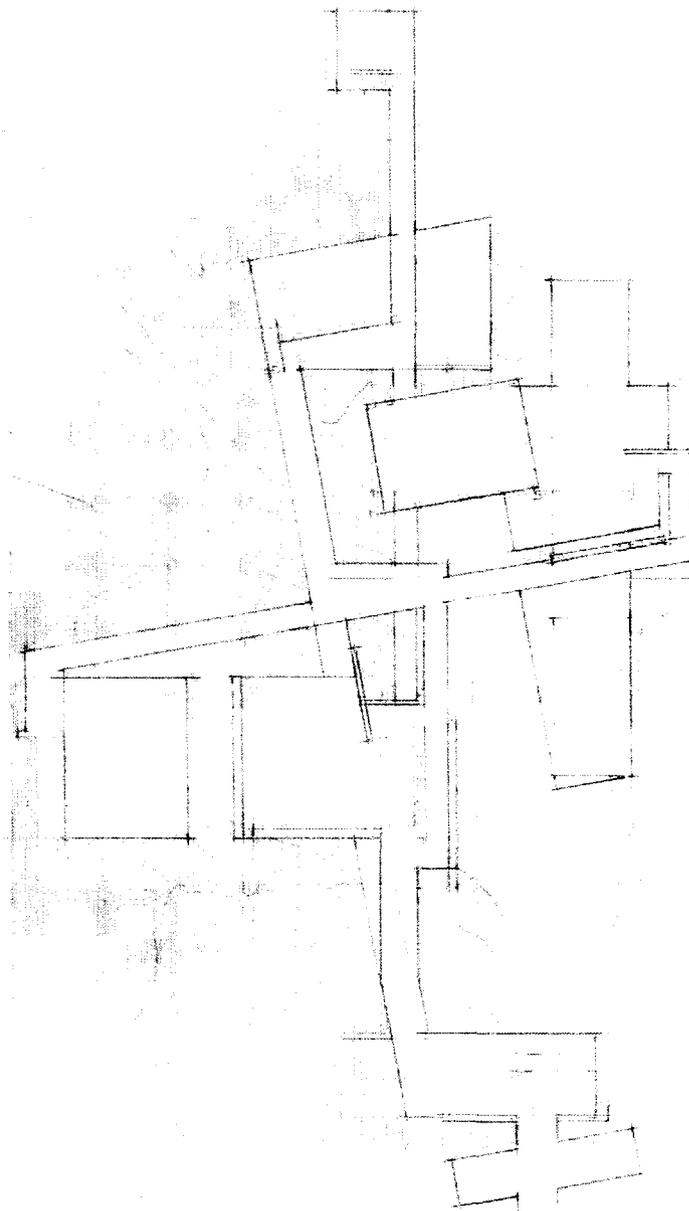


Figure 15
Spiritual Space in Centre
Inspirational Plan
Graphite & Digital
Scale: 1:500

the circulation veins, exposing their bodies and spirits to a flood of healing light. Thus the circulation vein becomes a vein of hope, a vein of life.

Positioned directly under the “vein of life”, which is reserved for the young offenders, is the circulation vein for all other dwellers, staff and guests that work or visit the facility (Figure 16). This adjacent vein mirrors the “vein of life” and only connects by means of ascension at specific intervals where both the youth offenders and other dwellers or guests may meet (Figure 17). Unlike the vein of life, this sister vein is left open to the site and only elevated a few centimetres from the ground, symbolic of the people who are grounded in society and have seized control of their lives. The “sister vein” is meant to be an inspiration to the dwellers, in hope that once rehabilitated they too can exit the youth rejuvenation centre via the “sister vein” and be reintegrated into society.

KNOWLEDGE - WORKSHOPS

“Knowledge does not belong to anything human. Knowledge belongs to that which has to do with nature. It belongs to the universe, but it doesn’t belong to eternity, and there is a big difference. ... There is no person without talent. Talent prevails everywhere, but the question is in what way your singularity can blossom, because you cannot learn anything that is not part of yourself. ... I revere learning because it is a fundamental inspiration. It isn’t just something which has to do with duty; it is born into us. The will to learn, the desire to learn, is one of the greatest inspirations.”⁴⁶

Although learning stimulates the mind, society’s conventional methods of teaching do not appeal to all youths. For this reason, a workshop pavilion gives the youths the opportunity to arouse their creativity through the act of making. Most importantly, this room forces the youths to join together to accomplish certain projects challenging them to develop their conversational and social skills.

This pavilion also provides the youths with knowledge that they can utilize as a therapeutic outlet when their rehabilitation process is complete. Instead of committing crimes out of boredom, the youth can now dedicate his time to woodworking and welding to escape the pressures of adolescence.



Figure 16-A
Vein of Life & Circulation Vein
Image from Final Model
Image by author

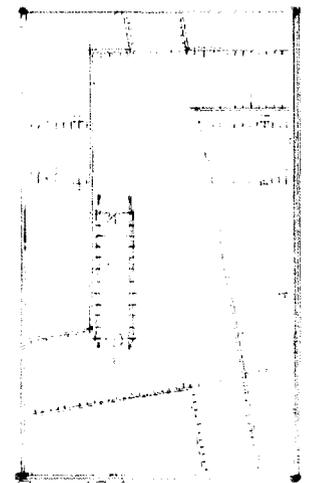


Figure 17-A
Vein of Life Joins Circulation
Vein
Plan Detail
Scale: 1:250



Figure 17-B
Vein of Life Joins Circulation
Vein
Image from Final Model
Image by author

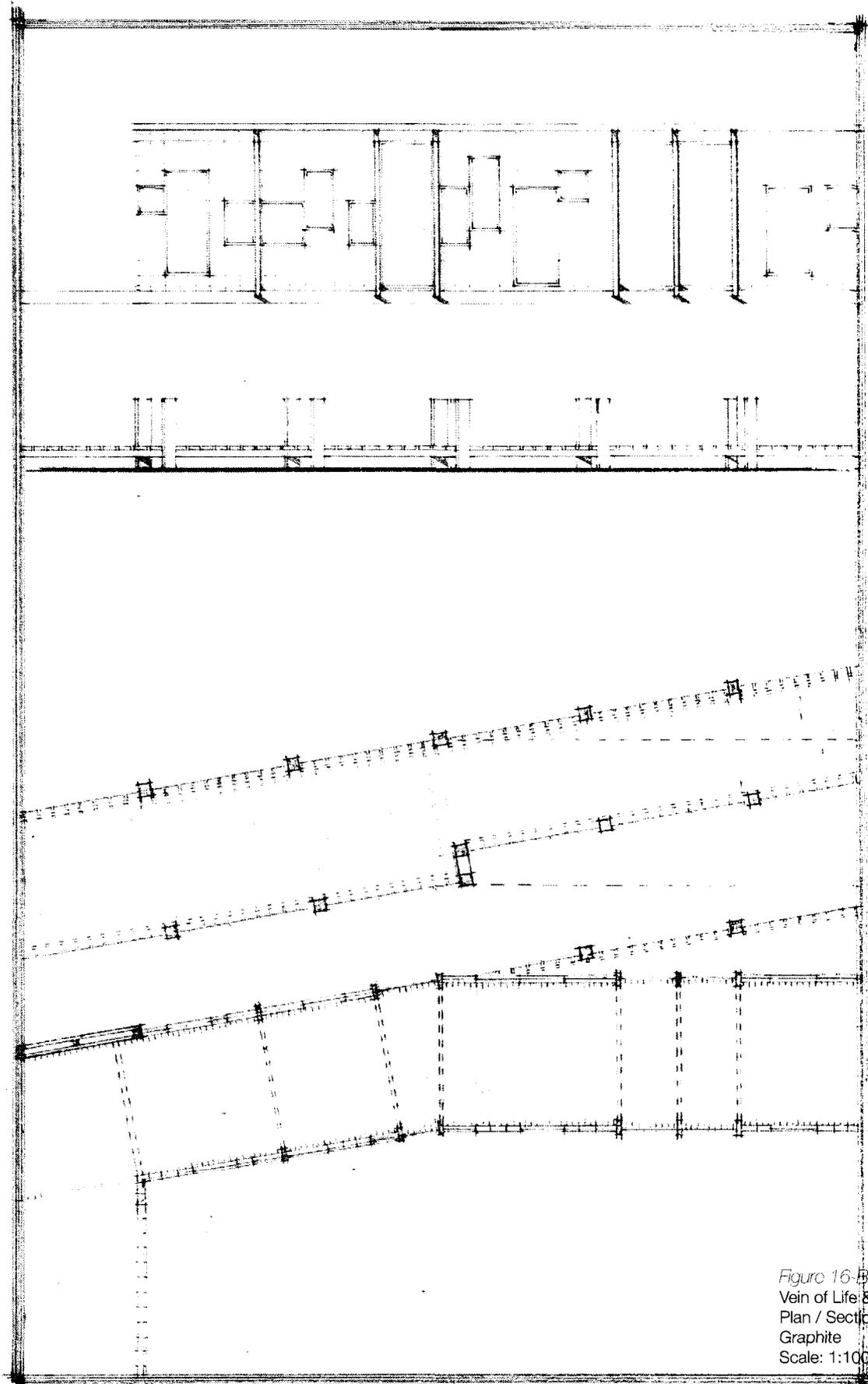


Figure 16-B
Vein of Life & Circulation Vein
Plan / Section Detail
Graphite
Scale: 1:100

By their formal and programmatic hierarchy, the spiritual space, the vein of life and the workshops are essential to the successful rehabilitation of these dwellers as well as to the appropriate formal articulation of the facility's architecture. The spiritual space is the catalyst of the architectural plan, the vein of life mends all programmatic spaces into a cohesive architecture, and the workshops designed to promote skills and knowledge onto the dwellers, is the formal anchor of the facility (*Figure 18*). All of these spaces designed in/ for the presence of light can support the youth offenders' journey into physical, psychological and spiritual wellbeing.

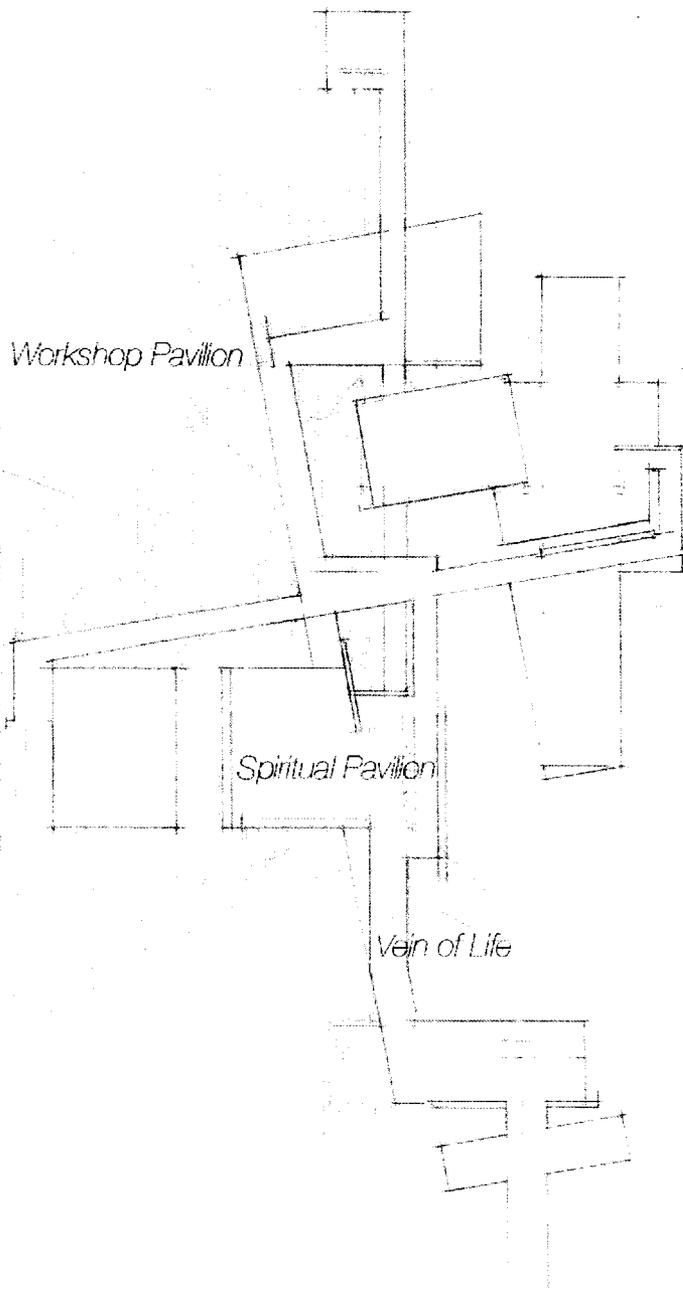


Figure 18
Key Plan
Catalysts of Architecture
Graphite
Scale: 1:500

2.4 Site Specific Light

Each space and each prospect from a place is defined uniquely due to the myriad of combinations of light that reveal it. The vegetation and the physical location of the architecture relative to the site play a role in how the sun will create light characteristics exclusive to this place. The site then becomes part of the architecture, sharing its unique light characteristics with its architecture and its dwellers. Thus, the relationship developed through design and inhabitation between the site and the architecture is one that is inseparable. This site context shapes the prospect for the experience of the building and modifies the light that enters the architecture.

To further shape an architecture of rehabilitation, the facility's site requires a feeling of isolation, in a place detached from the city that may promote a social detoxification. Further, a sense of fragility, similar to its dwellers' physical, psychological and emotional state would seem appropriate. The Mer Bleue Peat Bog⁴⁷, part of the National Capital Greenbelt, possesses all of these attributes as well as an ecological fragility and the light qualities conducive to the production of such an architecture.

The landscape of the Mer Bleue Peat Bog and the site's abundant natural light promise to complement the uniqueness of the facility's architecture. They do so by virtue of the natural elements of the site's surroundings and the filtered light that will penetrate and shape the exterior forms and the interior spaces of the architecture. The site's vegetation and its topography all play a role in creating spatial moods by their filtering of the ambient light as well as by the movement of the leaves dancing to the rhythm of the wind (*Figure 19*), by the vibration of the branches casting intense moving shadows on the walls of the architecture (*Figure 20*), and by the absence of obtrusive vegetative growth to greet the natural light without barriers (*Figure 21*). All of these belong, to the Mer Bleue Peat Bog and influence not only the moods and spatial qualities of the architecture, but also the positioning of the structure relative to the site and light orientation and filtration (*Figure 22*).

In consideration to the site's natural elements, the architecture bridges over dense foliage from areas of the bog with plant life nearer to the ground (*Figure 23*). As a result,

47 The Mer Bleue Peat Bog is located in a post-glacial channel system. Once the sea withdrew, the bog progressed from a wetland habitat to a dry land habitat and left behind partially decayed materials compressed due to the increasing weight of overlying material to, then, become peat. With over an accumulation of eight feet of peat, the bog is a spongy surface area home of many rare ecological species. As one of the largest bogs in southern Ontario, Mer Bleue is essential to the northern ecosystem. (Various authors. *Proceedings of the Mer Bleue Seminar* (Ottawa: 1974), 10-21.)



Figure 19
Shadows of Leaves
Kimbell Art Museum, Texas
Louis I. Kahn



Figure 20
Shadows of Branches
Image by author

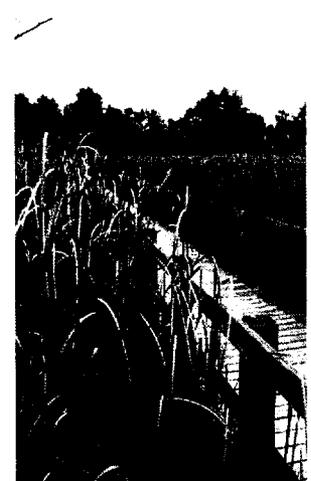


Figure 21
Marsh Area
Mer Bleue Bog, Ottawa
Image by author

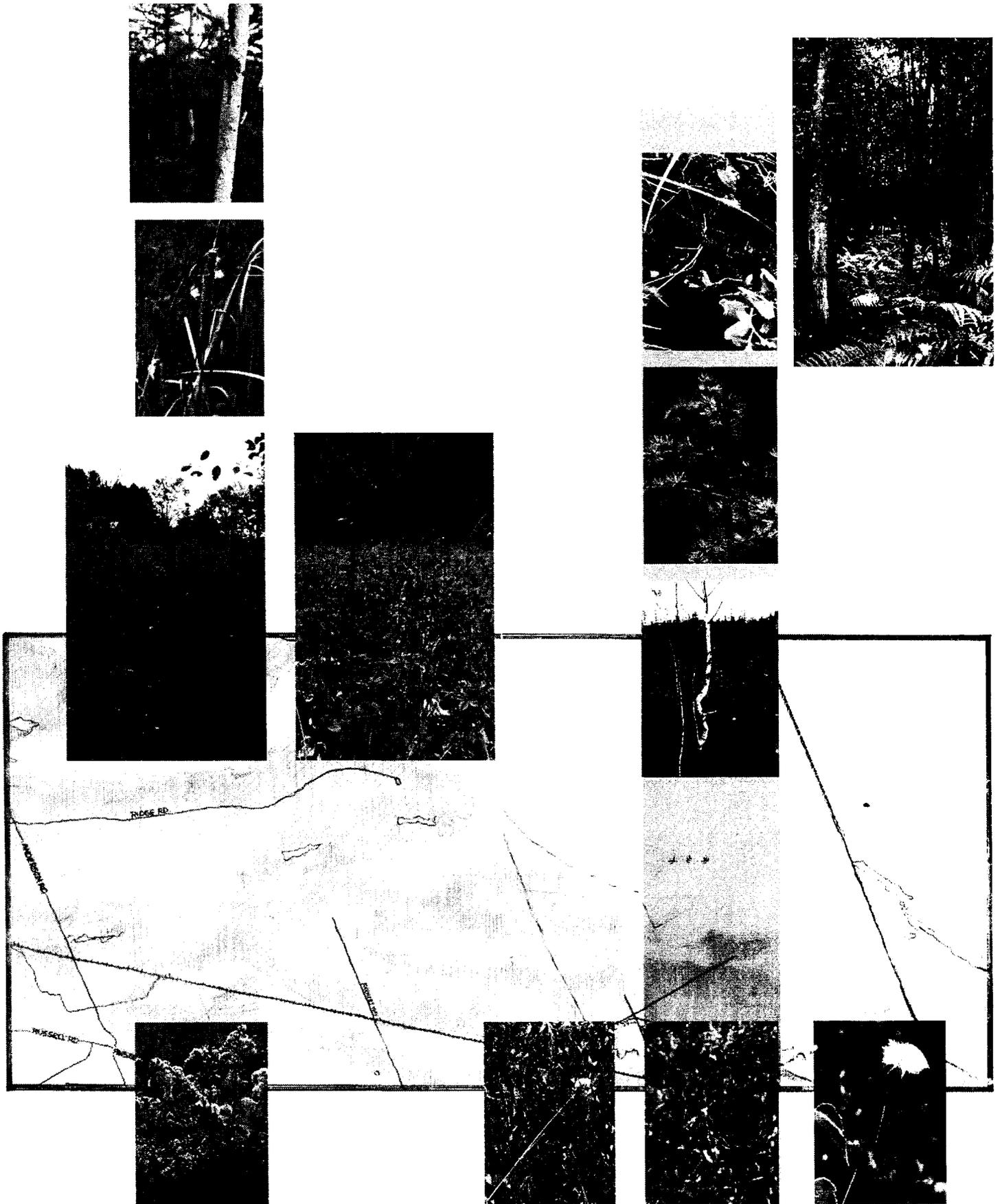
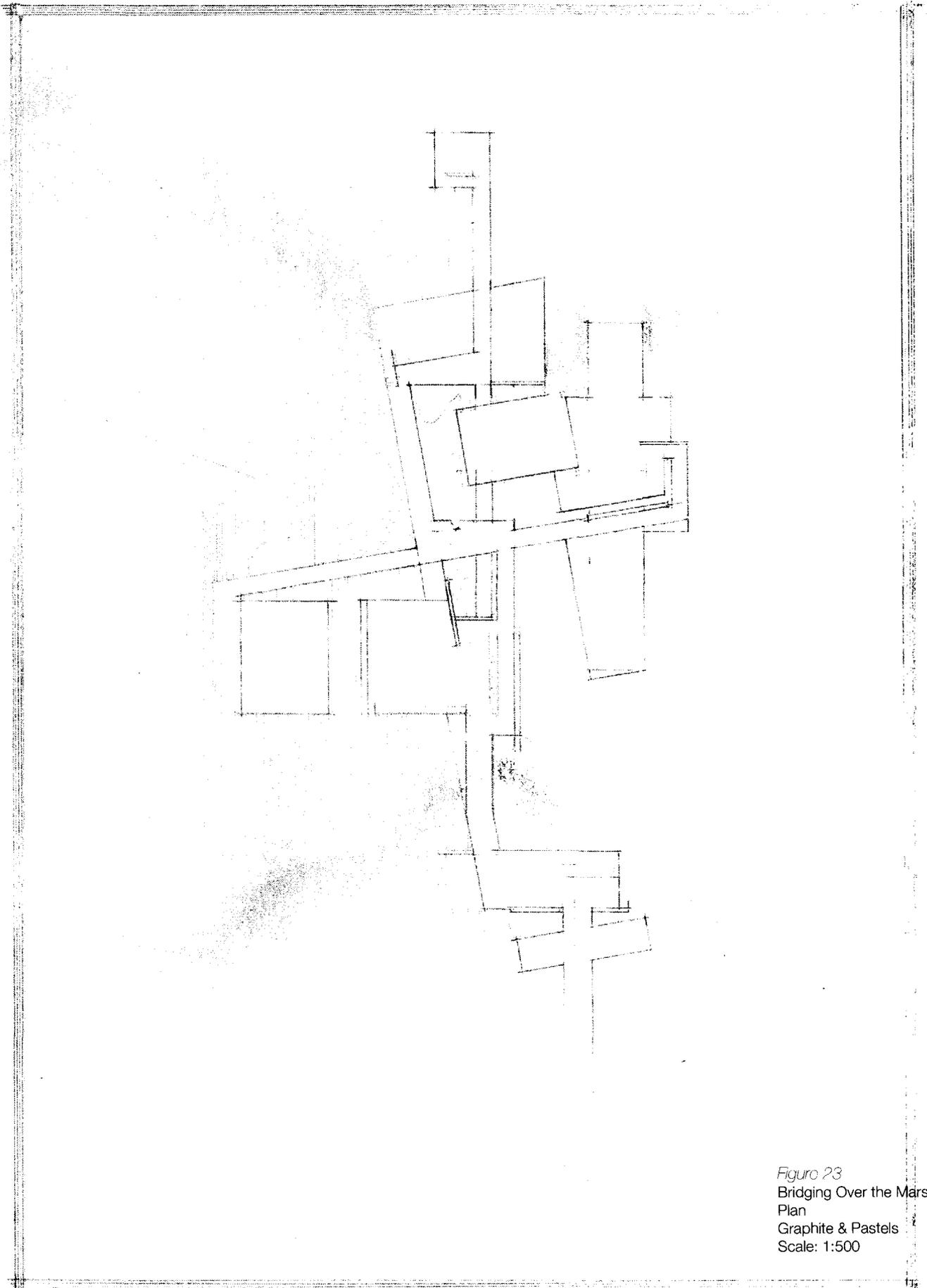


Figure ??
Compilation of Images of Mer
Bleue Bog & Sketch Site Plan
Pastels & Digital
Image by author



Figuro 23
Bridging Over the Marsh
Plan
Graphite & Pastels
Scale: 1:500

the different programmatic spaces can utilize the dissimilar site characteristics to benefit from each of its levels of privacy. For example, programs such as the social detoxification space, the resting space, and the spiritual space, which necessitate discretion and/or abstraction of the corporeal light, will reside within the foliage. The greeting space, the workshop space, and the therapeutic space, which require social interaction and/or direct light infiltration, will dwell above the marsh. Therefore, the architecture takes advantage of both floras' qualities to assist in the privacy levels and the different light characteristics of the different programmatic spaces.

In addition to the architecture's spatial arrangement on the site, the cycle of the seasons along with the phenomenon of light will pose a new influential layer on to the architecture. In particular, the spaces dwelling within the foliage will be subjected to different spatial moods as the leaves of the trees plummet to the ground at the sight of Autumn, leaving behind only the trunks and the branches as a privacy barrier. This site transformation will directly affect the infiltration of light into the architecture and create a new succession of spatial qualities and a stronger connection between the dwellers and the natural occurrence of seasons. Thus, this seasonal transformation becomes an ally to the psychological well-being of the dwellers.

The architectural metaphor as it pertains to the Mer Bleue Peat Bog is that of fragility, another site characteristic, which symbolically represents the fragile physical, psychological and emotional condition of the dwellers. For this reason, the proposed architecture rests delicately on the site by a structure of columns, avoiding a more abrupt or heavy-handed disruption of the bog's surface (*Figure 24*). The columns carefully penetrate the fragile layers of the marsh and foliage in only the required areas, keeping most of the soil and mosses undisturbed. This fragile structure is also symbolic of the temporary inhabitation of the dwellers. Without planting permanent roots on the site, the architecture is coherent with the dwellers' impermanence, therefore mimicking their transitional inhabitation during their rehabilitation.

The programmatic spaces are responsive to the natural ecological and light characteristics of the Mer Bleue Peat Bog allowing both the structure and the site to blend into a cohesive architectural composition. (*Figure 25*)

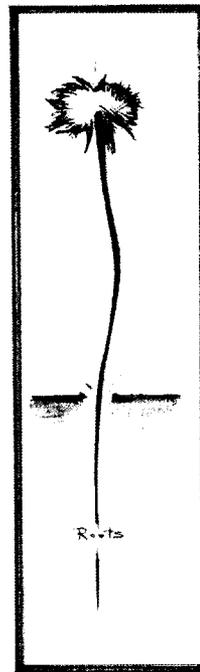
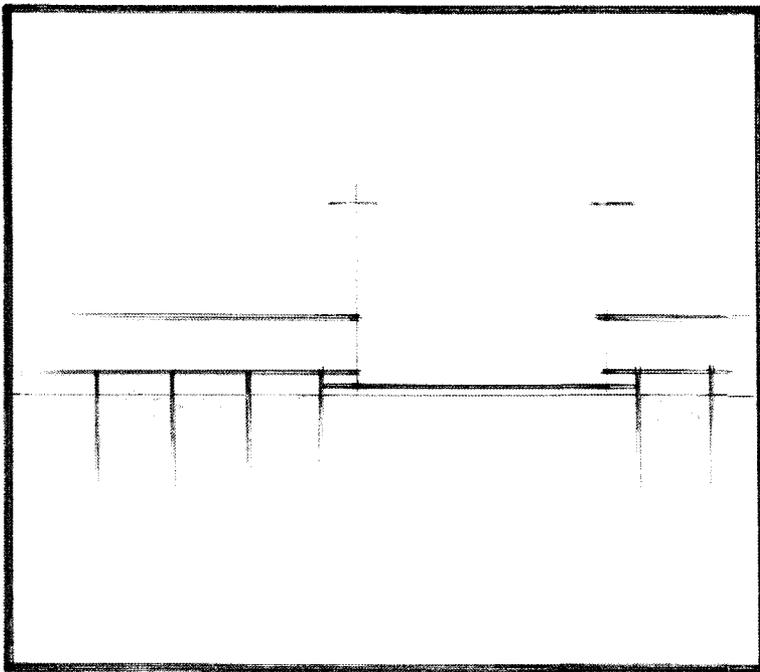


Figure 24
Architecture Rests on Columns
Sketch Section
Graphite & Pastels
N.T.S.



Figure 25
Conceptual Models
Site Specific Architecture
Image by author

III *An Architecture In Light*

INTRODUCTION

The physical, psychological, and emotional conditions of the youths are catalysts to the design of programmatic elements within this rejuvenation centre. All of the different pavilions accommodate the core curriculum of a youth detention centre developed by the Ministry of Children and Youth Services of Ontario, while borrowing from Aboriginal Federal Corrections concepts to include physical and spiritual activity.

The scheme, with a series of pavilions designed specifically for particular treatment approaches resembles the youth detention facilities in Ontario.

“The Ministry’s current campus-style design of youth facilities provides for residential daily activities to enhance youth opportunities for physical growth and rehabilitation in a normative environment. The design also provides for enhanced natural daylight, fresh air and individual courtyards for additional programming space. The design clearly differentiates itself from the adult correctional model.”⁴⁸

Throughout the campus-style design of this proposal, each pavilion includes important programs that tend to the inhabitants’ needs. The initial pavilion, the first exchange upon the youths’ admittance is a social detoxification space, and comprises of a health care facility, an administrative office, a storage room and a staff meeting space. Upon arrival, the atrium space parts into an area specific to the youths, which is accessible by a stairway, and to another for the personnel, which is connected by a direct path adjacent to the stairs (*Figure 26*). The youths’ personal pavilion, the dormitories (*Figure 27*), contains the sleeping area, the dining room, and the washrooms while the library pavilion provides for an educational area and therapy sessions. The workshop pavilion (*Figure 28*) is reserved for group therapy and the production of arts and crafts, in a secluded glass pavilion (*Figure 29*) within the marsh. This zone also provides for interaction between the youths and their outside contacts including their parents and lawyers.⁴⁹

Thus, this rejuvenation centre respects the Ministry’s guidelines and programmatic requirements. In addition, the design proposal looked to other precedents in order to emphasize the youth’s individual willpower and desire for healing within a community



Figure 26-A
Detoxification Pavilion
Image from Final Model



Figure 27
Personal Pavilion
Image from Final Model



Figure 28
Workshop Pavilion
Image from Final Model

48 Gilbert Tayles. Assistant Deputy Minister of Youth Justice Services. *Ministry of Children and Youth Services*. 1 Feb. 2008. Letter to author: 1.
49 Ibid: 2-3.

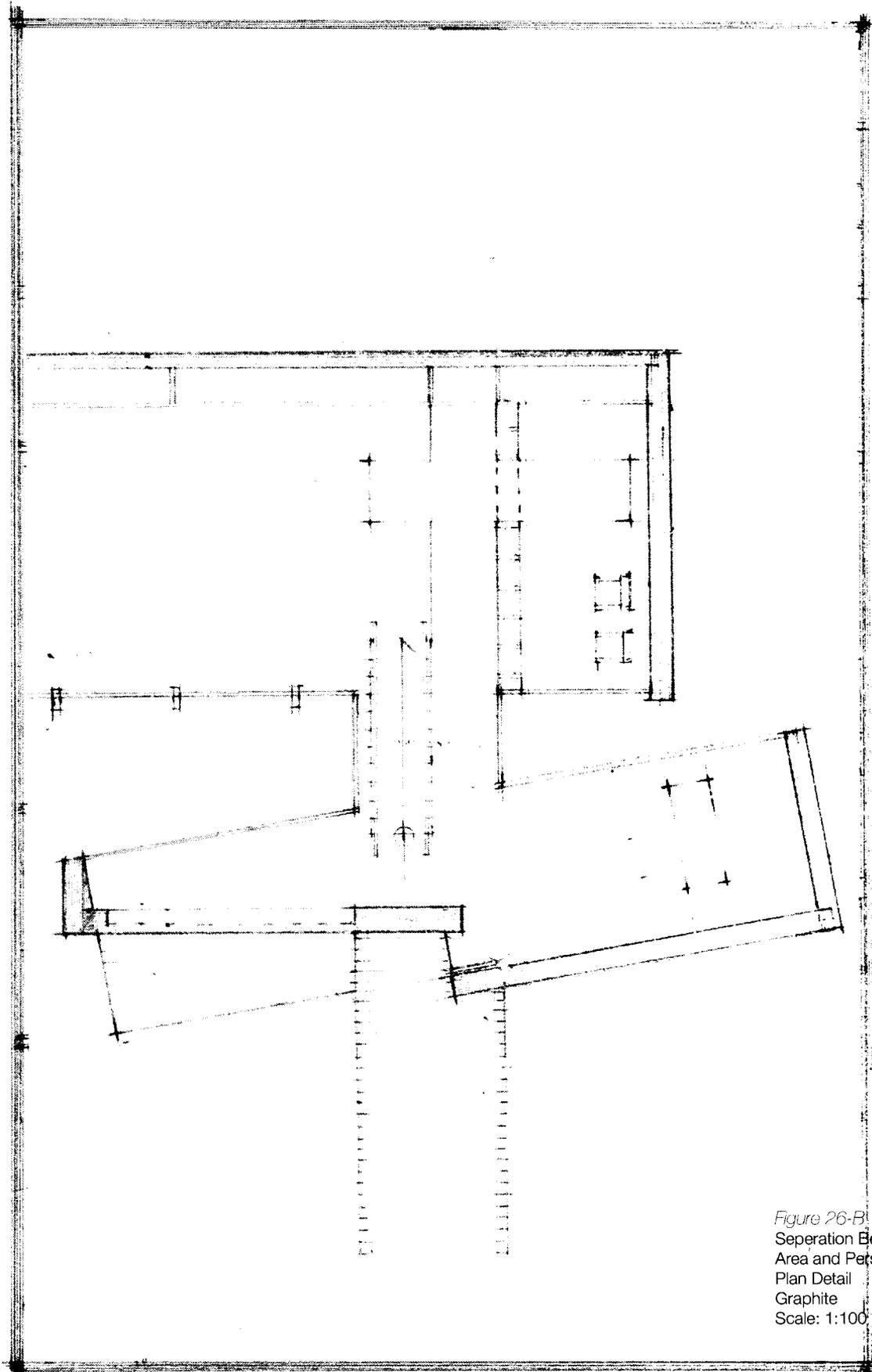


Figure 26-B
Separation Between Youth's
Area and Personnel Space
Plan Detail
Graphite
Scale: 1:100

support structure.

Based on this, the proposed rejuvenation centre includes spiritual activity resembling the Aboriginal Federal Corrections model, termed “Healing Lodges”. Correctional Service of Canada (CSC) introduced these lodges over the last five years as a new concept in federal corrections for Aboriginal offenders. The new program reflects the specifics of Aboriginal culture and incorporates their traditions and beliefs based on Aboriginal teachings and ceremonies, interaction with nature, spiritual leadership on value of life, delivered by the staff members who act as role models.

“The mission statement of the Spiritual Healing Lodges is to provide First Nations people with a solid grounding in their culture, values and customs: to address the mind, body, spiritual, and emotional needs of the individuals, to develop and increase the role and level of responsibility of First Nations in dealing with people who are in conflict with the law.”⁵⁰

The youth offenders may also experience a similar healing of the mind, body and spirit throughout the architecture by being grounded to nature in communal spaces that capture the phenomenological characteristics of natural light.

The spiritual pavilion is added to the Youth Justice Services model to include the process of inner healing. This space, with its central placement is similar in its program and programmatic relationships as the central Spiritual Lodge in the Aboriginal model. “The focal point is the Spiritual Lodge at the centre, where teachings, ceremonies, and workshops with Elders take place.”⁵¹ In this Rejuvenation Centre proposal, the spiritual pavilion will also be the central focus reminding the inhabitants of the importance of spiritual reflection (*Figure 30*). The programs at the Healing Lodges are based on the belief that Aboriginal spirituality is central to the healing process for Aboriginal offenders. Similarly, this principle is applied to the design and structure of the proposed youth rejuvenation centre.

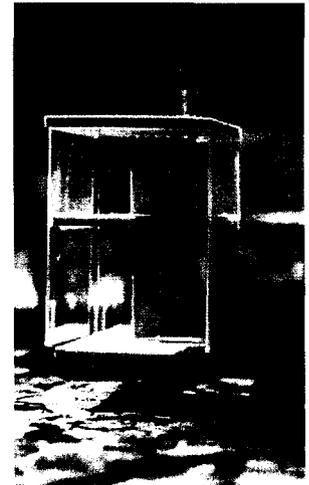


Figure 29
Secluded Pavilion
Image from Final Model



Figure 30
Spiritual Pavilion
Image from Final Model

50 Healing Lodges for Aboriginal Federal Offenders. *Correctional Service of Canada*. 17 May 2008. <<http://www.csc-scc.gc.ca/text/prgrm/abinit/challenge/ll-eng.shtml>>.
51 Ibid

PROLOGUE

The defendant sits with trembling hands, unable to hold them steady, and glances over his shoulder to seek comfort from his parents who are also anxiously waiting in silence in a large intimidating courtroom. The room is blanketed by a total stillness except for the noises coming from the old wooden benches creaking at the slightest movement as someone seeks a more comfortable sitting position. On the sidewall of the room, a massive door separates the courtroom from a chamber where the judge is contemplating the verdict he must announce within the next few moments.

The waiting is torturous for the defendant; his life will undoubtedly change within the few moments following the verdict. Just as the defendant believes he can no longer tolerate this anxiety, the massive door opens and the judge appears. At that moment everyone in the courtroom, including the defendant, rise to attention; the verdict is in.

The defendant is found guilty as charged and sentenced to twelve months incarceration at Mer Bleue's Youth Rejuvenation Centre. At the sound of the word 'guilty', both the defendant and his parents lower their heads in sorrow until the judge's gavel halts them to reality. The beginning of a new life is offered to the youth in the hope of a successful rehabilitation.

SOCIAL DETOXIFICATION

Within the city, yet in absence of near civilization, a cluster of small buildings resting within the marshes appears in the distance with only a wooden boardwalk leading to the structure (Figure 31). Left with no other option, the youth accompanied by his parents must venture onto the path towards the youth rejuvenation centre (Figure 32). With only thin wooden boards and a few centimetres of air separating the newcomers between the marsh's sensitive floras, they continue on their last excursion together.

Without ever departing from the wooden walkway, the path leads them directly through a small incision in the translucent façade and into the lobby; the parents' final destination (Figure 33). In this space of sadness, a gentle diffused southern light penetrates the thin and translucent walls as the parents and youth attempt to part. The



Figure 31
Youth Rejuvenation Centre
Appearing in the Distance
Image by author



Figure 32
Wooden Walkway Leading to
the Youth Rejuvenation Centre
Through the Marsh
Image by author

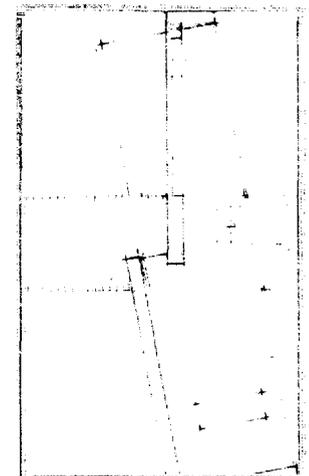


Figure 33
Wooden Walkway Leading Into
the Atrium Space
Graphite Drawing
Scale: 1:200

parents then exit into the burst of light created by the abrupt incision in the façade; while in the opposite direction, the patient ascends the stairs leading to a thick slate wall and into the absence of direct light to commence his social detoxification.

In the shadows of the two immense slate walls grounding the atrium, the patient focuses on the initial body, mind, and spirit health care in the nearest pavilion before continuing towards a shaft of light, which leads to an opening in the wall and into the main circulation vein. This transitional spatial area between the lobby and the entrance to the circulation vein, encompassing the entrance to the rehabilitation centre, allows the patient to part from his past and into the light where he will physically and emotionally prepare to participate in his rehabilitation process. A successful healing of the body, mind, and spirit depends solely on the patient's perseverance to charge through the dark space and into the vein of life to a new beginning. (Figure 34-35)

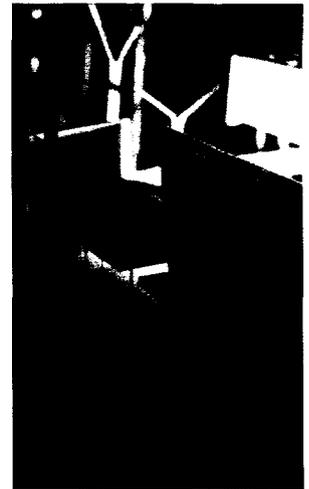


Figure 34
Burst of Light from
Detoxification Pavilion Into Vein
of Life
Image from Final Model

INTO THE VEIN OF LIFE

Standing in the vein of life's threshold, he admires in one glance the beauty of the rare flora, particular to this marsh, surrounding the cluster of small buildings. He can also notice the vein of life splitting into multiple veins further on the horizon, floating above the marsh, connecting the cluster of buildings to each other, and disappearing on occasion through the foliage (Figure 36). Even though each vein parts in their own direction, they all join together at one building that is still ambiguous to the patient and vaguely noticeable behind layers of leaves and branches. If the veins did not unite in a common vanishing point, this obscure building would be lost within the foliage, and hidden from the patient's gaze.

While curiosity seizes the patient's mind and body, he steps into the circulation vein, the transparent tunnel made of clear sheets of glass and glass blocks, exposing him to a flood of healing light. He enjoys the sun warming his body and illuminating his path especially after leaving the darkened detoxification space moments earlier. The warm sensation and the inundation of light alleviates the feeling of loneliness in the youth caused by the separation from his parents whom left him to battle his misdemeanor.

With his mind still focused on the ambiguous building further on, he allows his

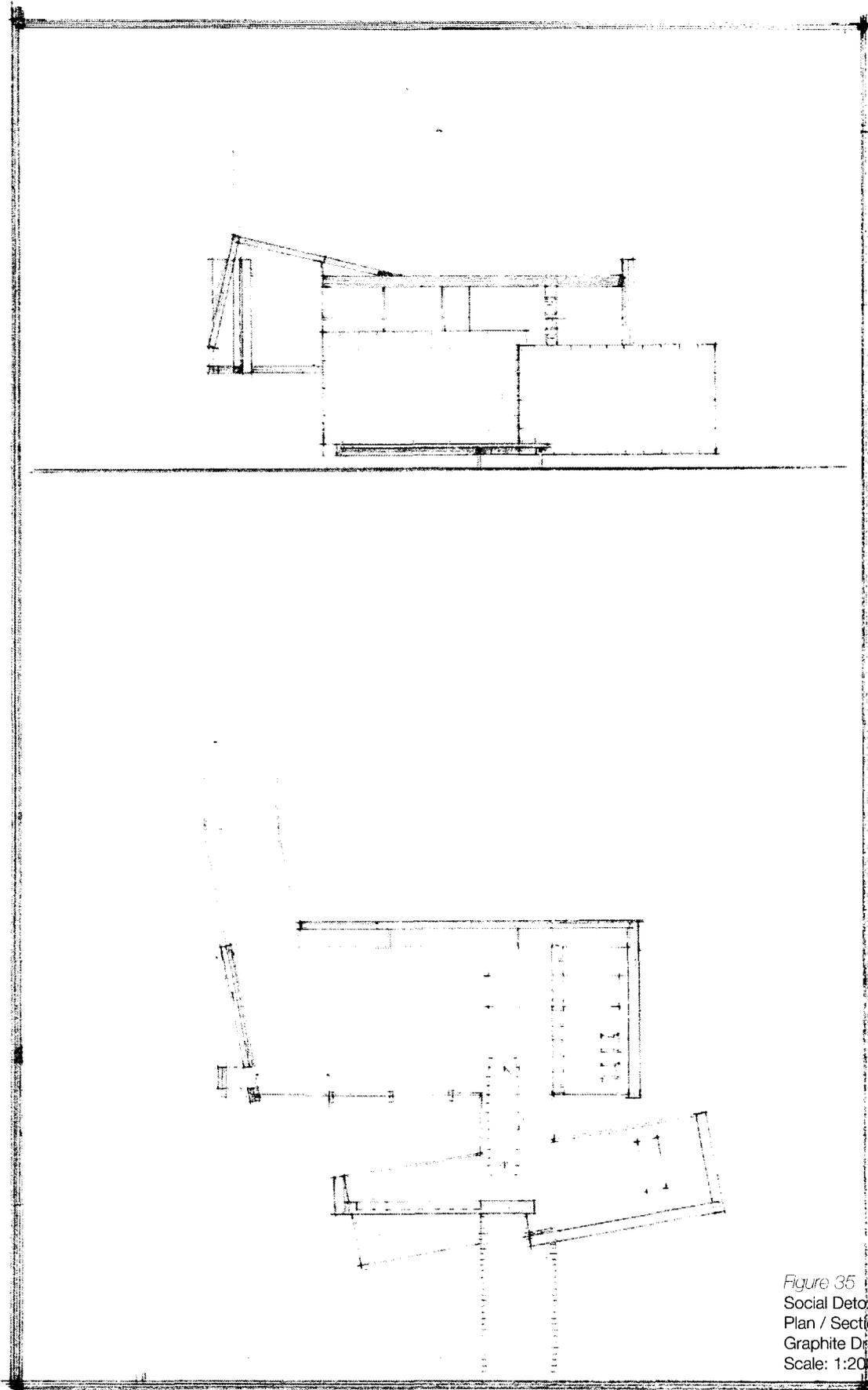


Figure 35
Social Detoxification Pavilion
Plan / Section Detail
Graphite Drawing
Scale: 1:200

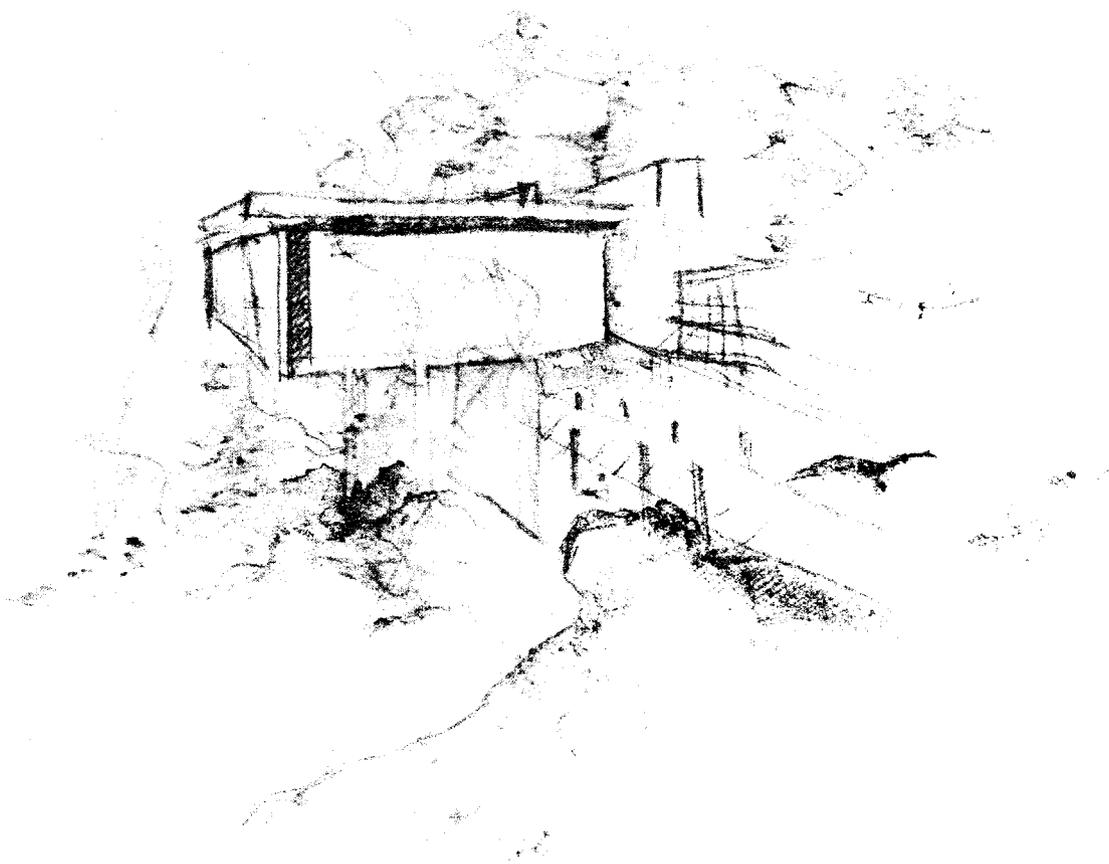


Figure 36
A Cluster of Buildings
Disappearing Through the
Foliage
Watercolour Vignette

eyes to momentarily gaze outside the clear glass wall at the spongy reddish ground located three meters beneath him (Figure 37). Unable to determine the substance emitting such strong beautiful colours, he redirects his eyes towards the building hidden within the foliage. Between his curiosity and the vibrant colours of the marsh, the patient continues towards his destination unaware of the presence of a sister vein directly positioned beneath him (Figure 38). Since his entrance into the vein of life, the supporting staff has accompanied the patient through this mirrored vein.

The patient still oblivious to this continues along his path to notice the light diffusing and his body cooling while penetrating the foliage's periphery. The shadows of trees have now merged with the patient's shadow on the light wooden floor of the vein of life causing a calming mood in the space, differing from the previous energetic mood caused by the flood of light (Figure 39). In the company of nature's shadows, the patient continues in the direction of the indistinguishable but interesting building, until all shadows and diffused light disappear behind the wall that creates a foyer to the building (Figure 40).

However unacquainted with the building's function, the patient glides his right hand along the cool surface of the slate wall until his fingertips drops into a small incision. The youth must remain patient while his pupils focus beyond the incision and into the mysterious dim space to hopefully discover the purpose of this ambiguous and peculiar building. In one momentary look, the patient discovers other youths sitting, standing, and laying in silence and gazing at a burst of sunlight penetrating the space where the union between the four orthogonal walls and ceiling should take place (Figure 41). The beam of light continues in a projected stream until it rests onto the surfaces of the space to reveal the warmth of the room. The once ambiguous space, now revealed in light, presents a new curiosity for the youth. He hopes to explore the ambiguous source of ambient light once the space becomes vacant.

Beyond the incision and within the ambiguous light, the patients are currently taking advantage of personal time to think and speak freely in the mysterious room, which some describe as spiritual and others as comforting. The mystery of that space will soon be revealed to the patient as a spiritual or comforting space that centres the cluster of buildings and grounds the body, mind, and spirit.

However, a collision of two tunnels of light exposing the sky deflects the patient's gaze towards the new light penetrating from above and illuminating the intersection ahead



Figure 37
Marsh Foliage
Mer Bleue Bog, Ottawa
Image by author

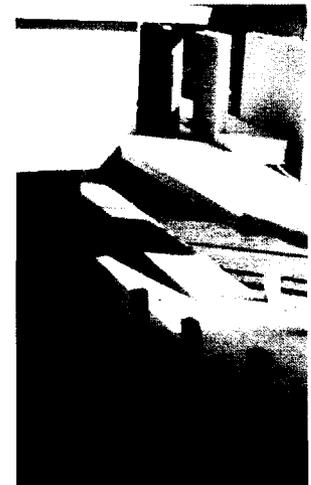
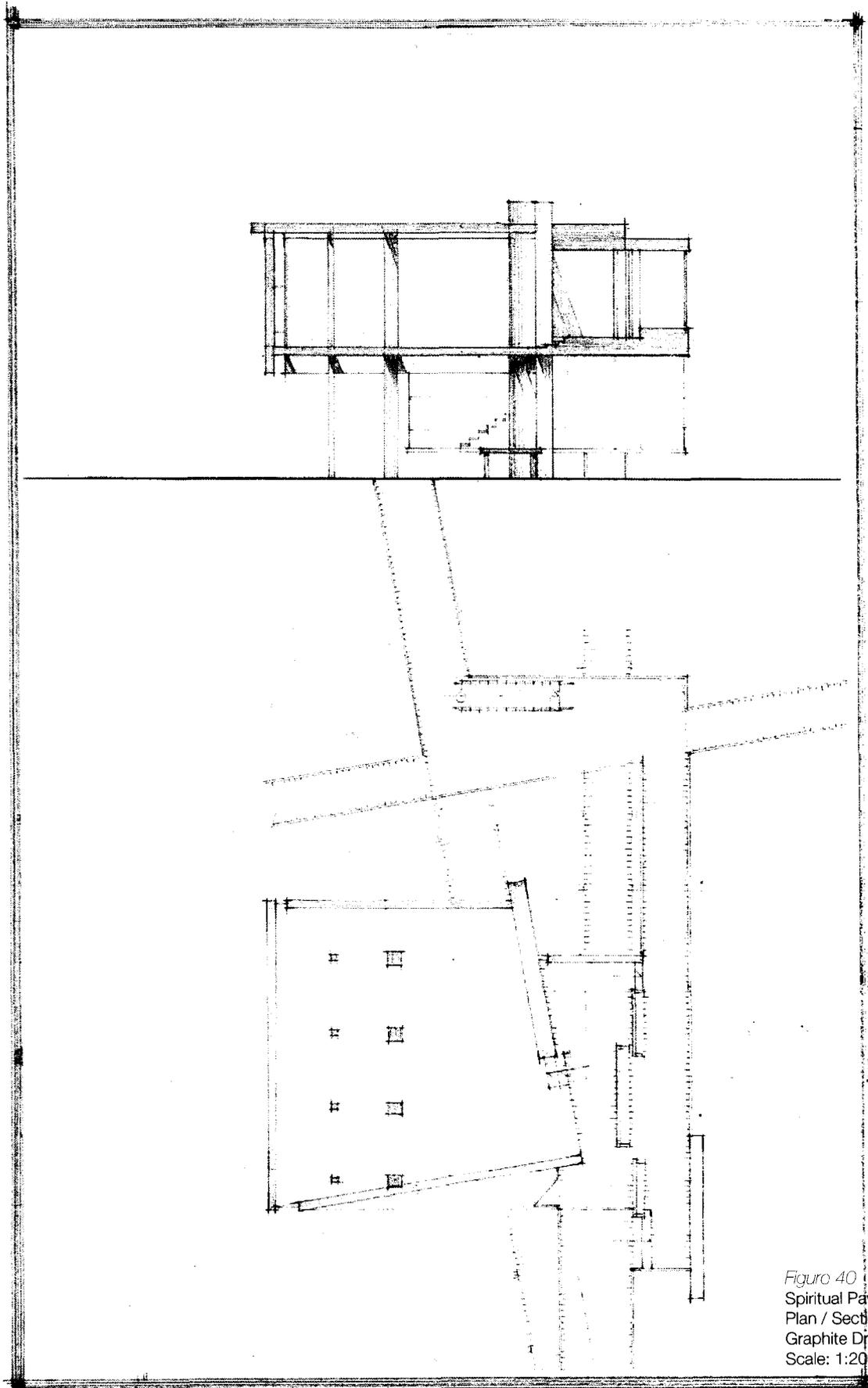


Figure 38
Sister Vein Directly Positioned
Beneath Vein of Life
Image from Final Model



Figure 39
Shadows of Leaves and Youth
Onto the Wooden Floor in Vein
of Life
Image by author



Figuro 40
Spiritual Pavilion
Plan / Section Detail
Graphite Drawing
Scale: 1:200

in a dramatically different mood. Ever since the vein of life has entered the foliage, the tunnel has been filled with dancing shadows produced by the sun filtering through the leaves and branches nearby, finding an occasional break in the foliage.

While still standing in the foyer at the heart of the cluster, the youth observes the two main circulation arteries, the vein of life and the vein of personal enlightenment, and ponders over the two paths leading in perpendicular directions (*Figure 42*). He could remain in the vein of life headed for what he perceives as another but larger break in the foliage or venture into the vein of personal enlightenment towards the silhouettes of neighbouring buildings. Yet again, curiosity directs his body and mind to the discovery of the strange spaces.

INTO THE VEIN OF PERSONAL ENLIGHTENMENT

As the silhouette of the nearby building reveals materiality and form, the patient persists on walking eastward until the vein pierces through a solid wall and into a familiar space; the housing pavilion (*Figure 43*). The youth walks through the dining and living areas to find the room where he will dwell throughout his days of rehabilitation. Still within the foliage, the patient observes the light rays shining through his eastern window animating the monochromatic white bed sheets and colourless walls with a collection of dancing leaf shadows vibrating in the delicate winds (*Figure 44*). Directly across the shadow-emitting screen, another window awaits its turn to perform a unique lighting routine in the room at sundown. Until then, the sun's last burst of eastern light exits the room compelling the shadows to disappear and the mood of the room to transform into a tranquil atmosphere. The shadow puppetry act now terminated, the youth exits the room to find new spaces in light.

IN SEARCH OF PRIVACY

The youth rejoins light in the vein of personal enlightenment and returns through the collection of light where the two veins intersect, passes alongside the spiritual space



Figure 41
Burst of Light Inside Spiritual Pavilion
Image from Final Model



Figure 42
Two Main Circulation Arteries
Vein of Life Meets Vein of Personal Enlightenment
Image from Final Model

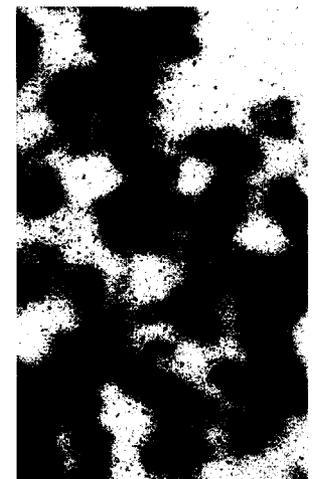
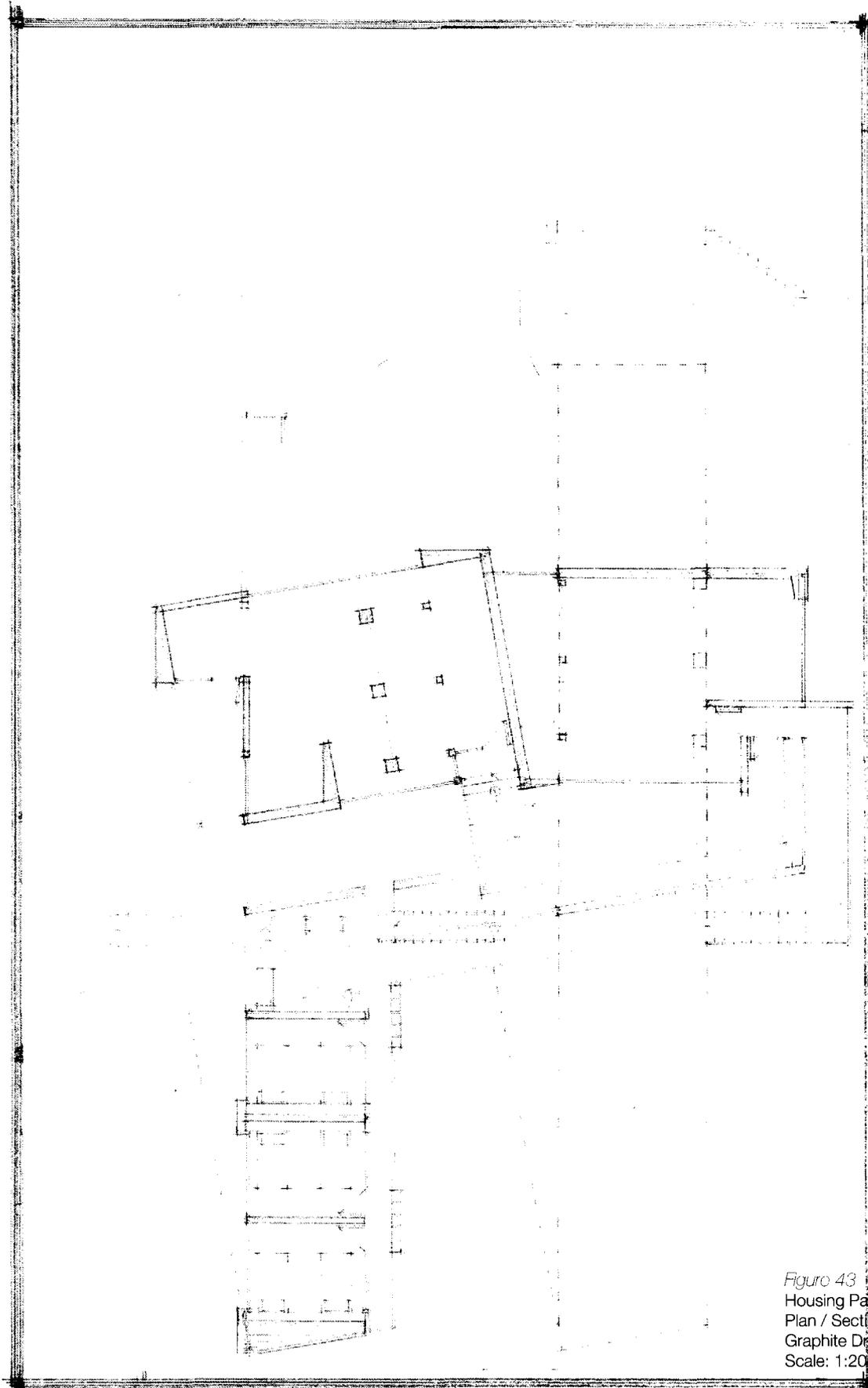


Figure 44
Shadows Onto the Youth's White Bed Sheets
Image by author



Figuro 43
Housing Pavilion
Plan / Section Detail
Graphite Drawing
Scale: 1:200

where for a moment the light in the vein disappears behind another slate wall. Here, time halts to permit reflection and awareness of the body, mind, and spirit, before he regains the company of light and arrives at another recognizable space. The books, which are forming light shelves filtering slivers of direct Eastern light through the spacing of missing books, informs the patient that this pavilion evokes knowledge and promotes stimulation of the mind. The broken light fills the space with patches of light interspersed with shadows projected by books on the shelves (*Figure 45*). After creating a symphony of light by removing and replacing a series of interesting books, the patient selects the preferred novel and exits the library in search for the perfect reading area.

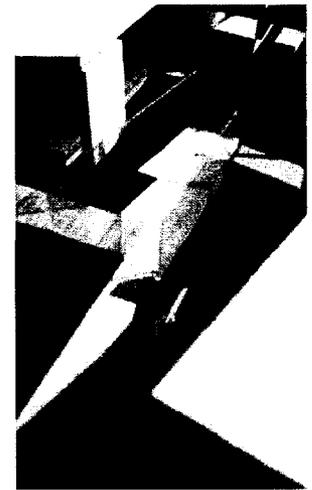


Figure 45
Broken Light from Spaces
Between the Books
Image by author

Given that the patient has explored both extremities of the vein of personal enlightenment, he chooses to venture into the last portion of the vein of life in the hope of finding a relaxing spot to read. Once again the patient passes by the spiritual pavilion and into the burst of light at the intersection of both veins (*Figure 46*). The patient then engages through the vein of life towards an open space; the marsh. The light of the marsh is uninterrupted and plummets directly into the vein of life, illuminating the path beyond and revealing the uniqueness and beauty of the rare flora.



Figure 46
Intersection of Both Veins
Image from Final Model

While the patient's eyes appreciate the beauty of nature's surroundings, part of the vein of life splits vertically to allow ascension by a stairway to the roof garden atop of the adjacent building. A beam of light fills the stairway and incites the patient to explore where the stairs might lead. Once at the top of the stairs, a glass door opens towards a beautiful roof garden that resembles, in colour and texture, the floor of the marsh (*Figure 47*).

Just as the patient rests upon a bench with his book, he notices a glass skylight protruding through the roof. He approaches the skylight to discover a few workbenches and a selection of tools sharing the floor space below. Beneath him, a workshop area is revealed (*Figure 48*).

Far into the distance, the patient notices a small glass room standing alone in the middle of the marsh supported by a few slender columns (*Figure 49*). The translucent skin exposes the silhouettes of another patient in company of his parents in the only space remote from the cluster of buildings. The obscurity of the small pavilion allows for the patient to discuss his successes and challenges of rehabilitation while looking back towards the profile of the cluster that frames the healing of the body, mind, and



Figure 47
Floor of Marsh on Roof Garden
of Workshop Pavilion
Image by author

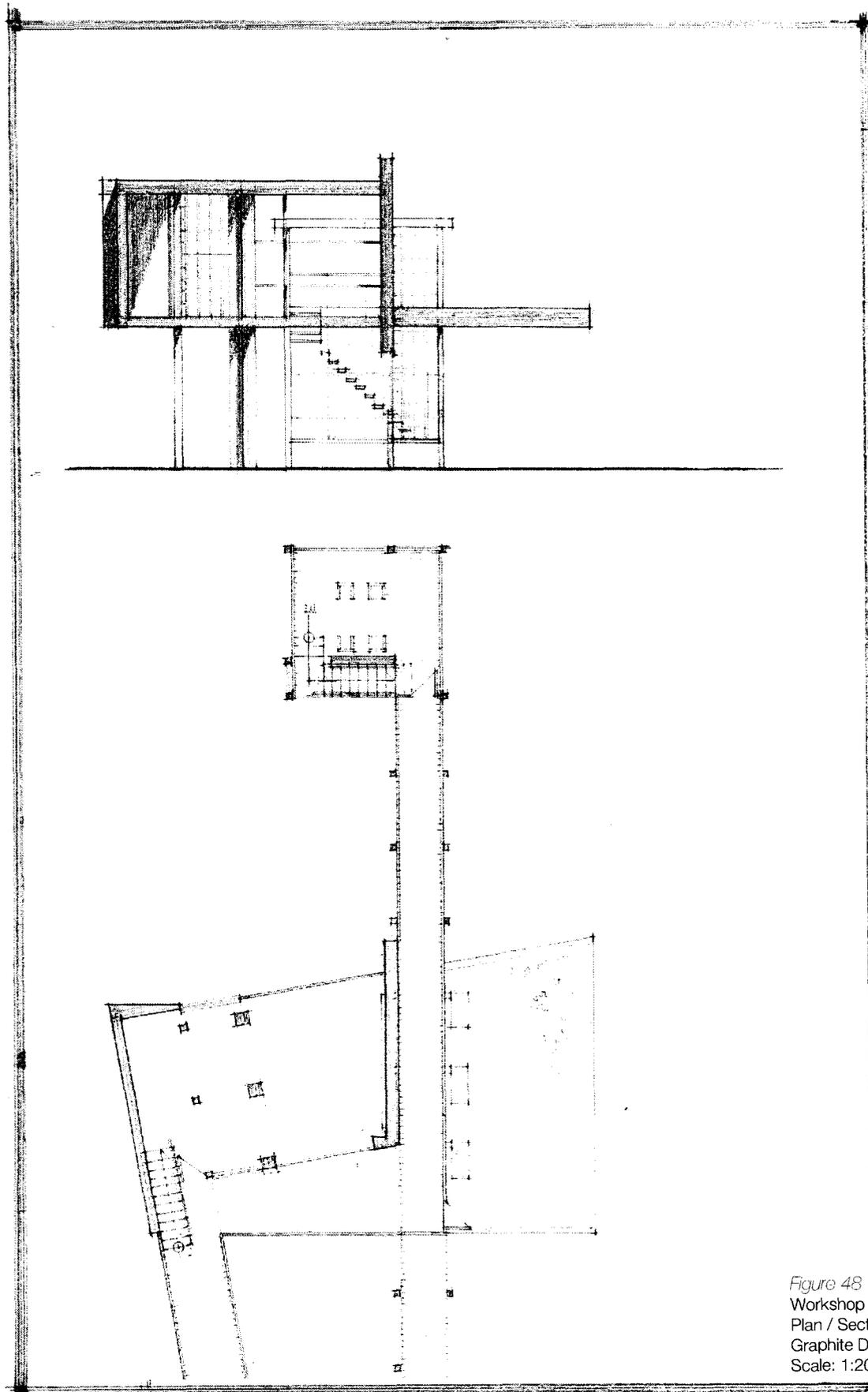


Figure 48
Workshop / Secluded Pavilion
Plan / Section Detail
Graphite Drawing
Scale: 1:200

spirit. After a chain of emotional gestures, the youth re-enters the vein of life en route for the cluster of buildings to continue the healing process, while his parents exit down the stairs and into the sister vein (*Figure 50*). The parents follow their son part of the way until the two veins split into their respective destinations and both parties continue their journey, now alone. Some day, the patient will follow his parents through the sister vein looking upwards for the very first time at the vein of life that has guided him through his rehabilitation of the body, mind, and spirit.

Still twelve months away from that moment, the youth carefully folds the corner of his book and re-enters the vein of life to withdraw into his room as the sun prepares itself for nightfall.



Figure 49
Glass Secluded Pavilion in
Marsh
Image from Final Model

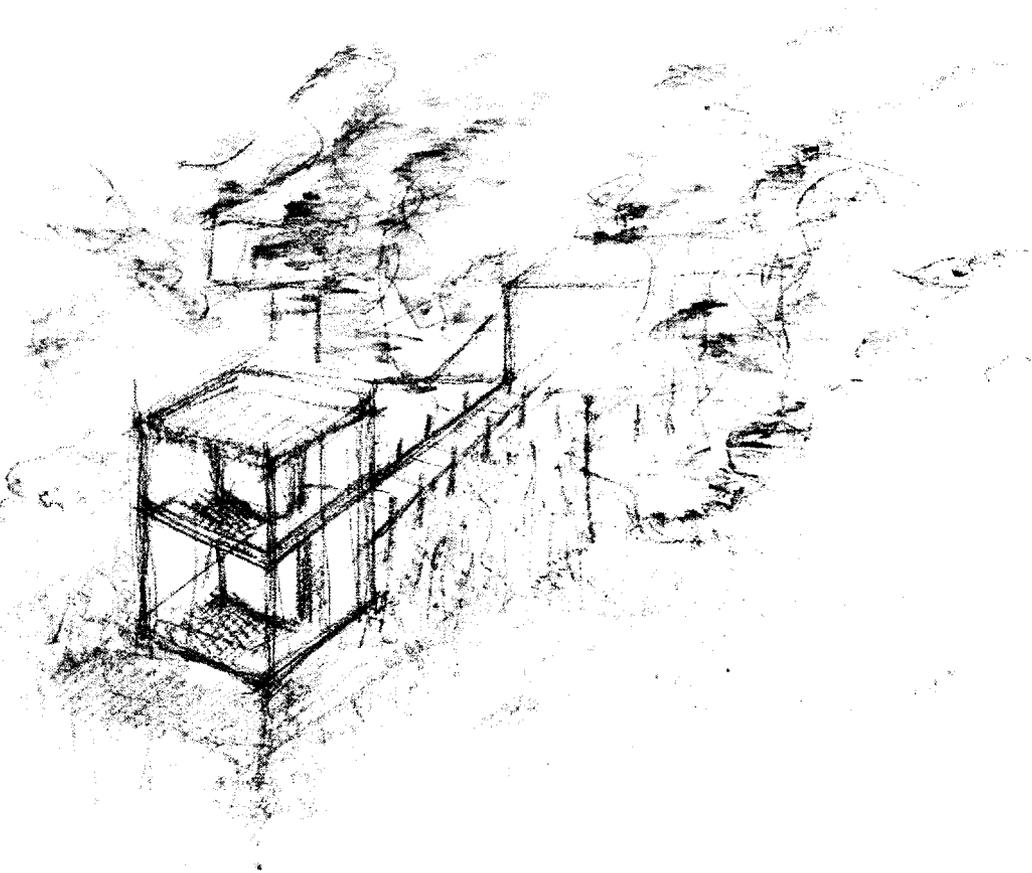


Figure 50
Secluded Pavilion in the Marsh
Looking Towards the
Rejuvenation Centre Within the
Foliage
Watercolour Vignette

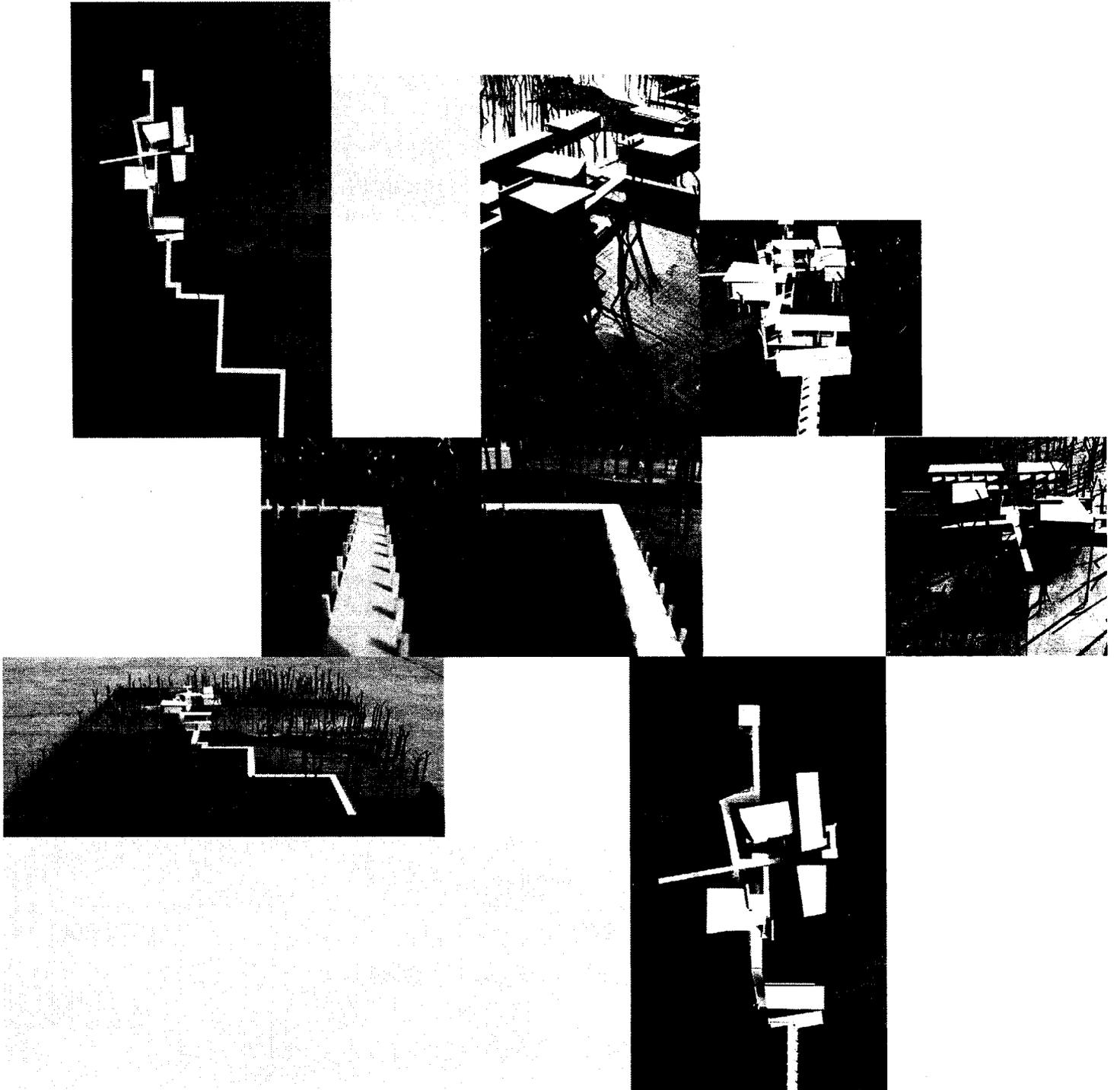


Figure 51
Compilation of Images from
Final Model

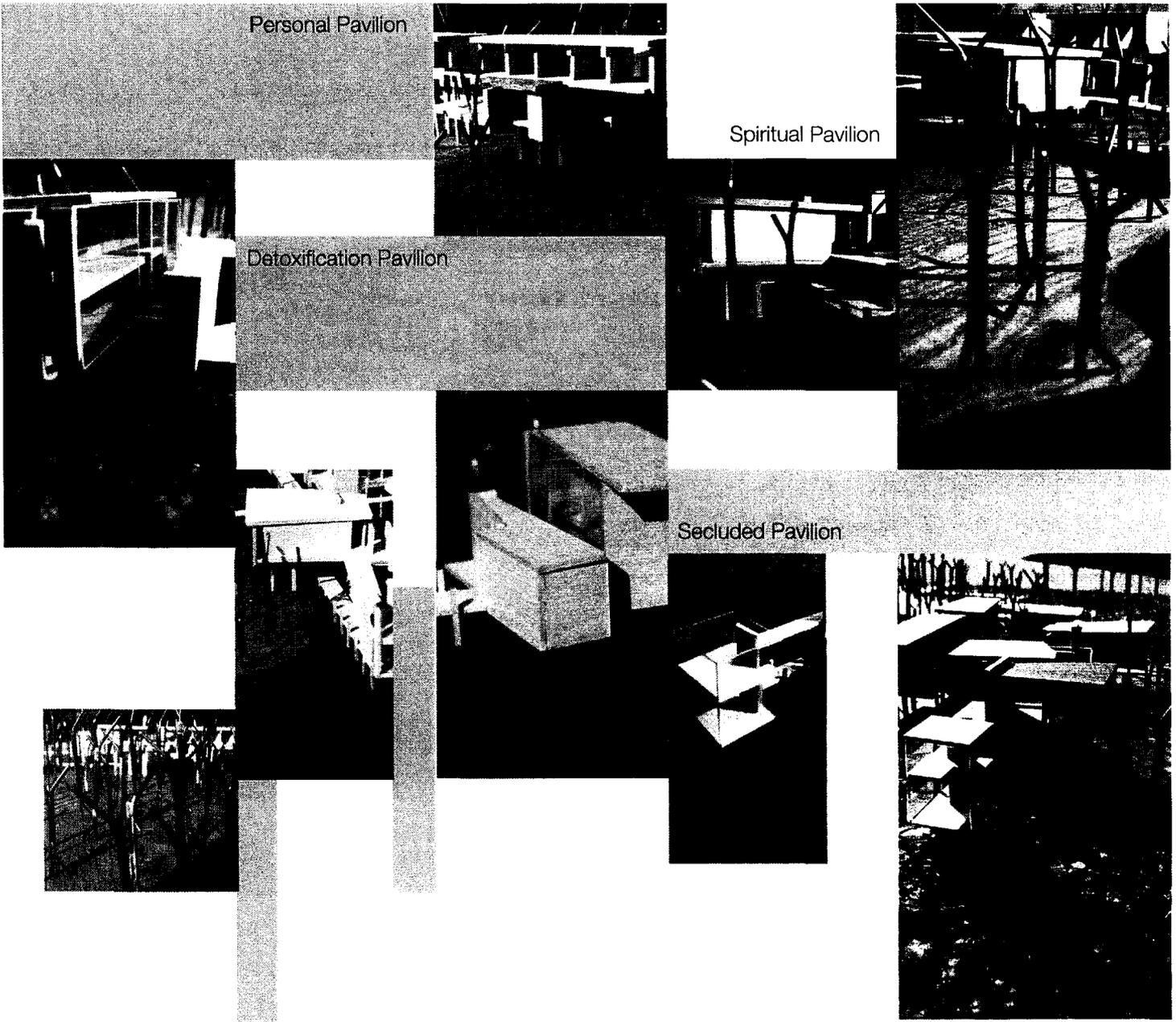


Figure 5?
Compilation of Images from
Final Model
Different Pavilions

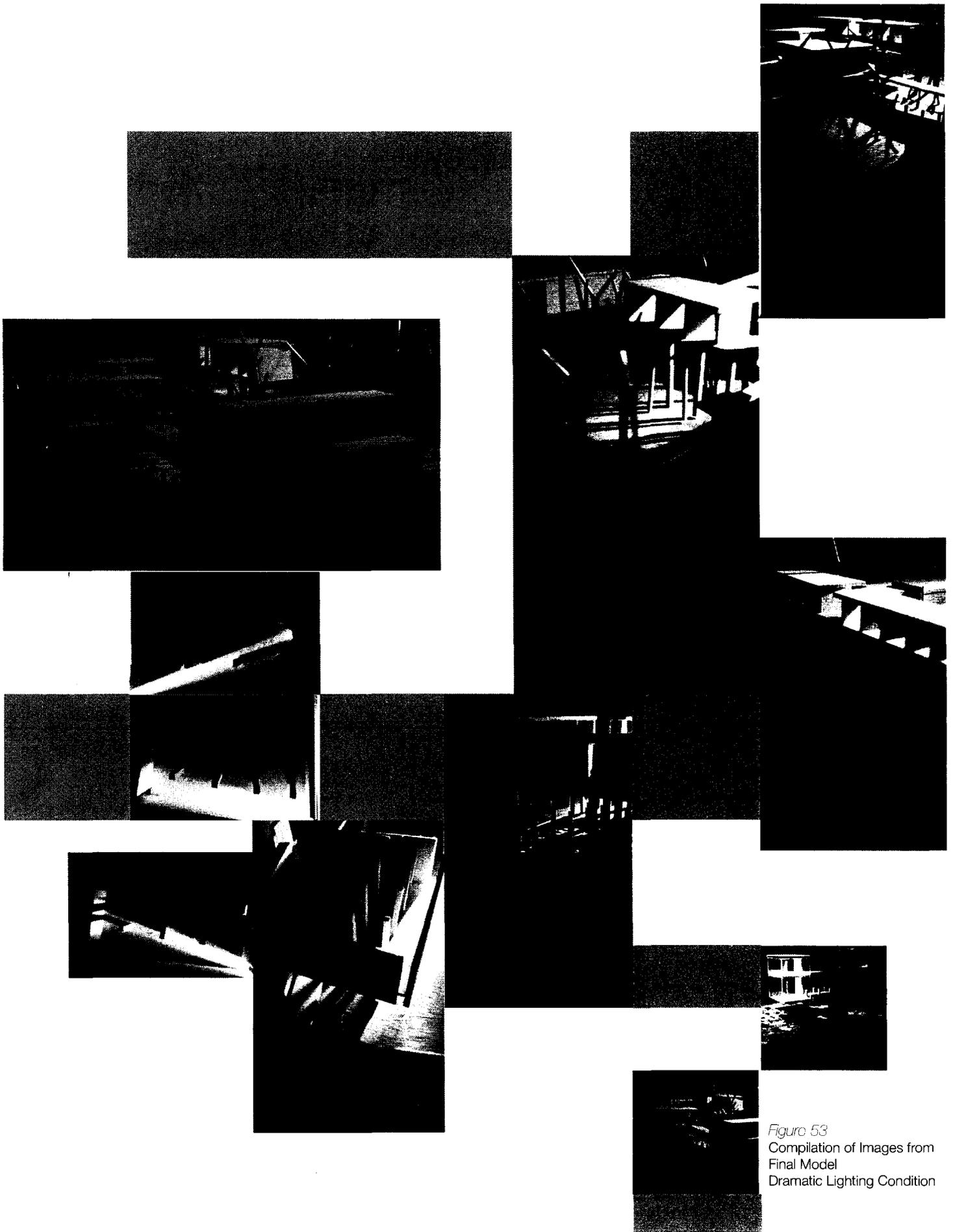


Figure 53
Compilation of Images from
Final Model
Dramatic Lighting Condition

Conclusion

Throughout this thesis, the phenomenon of light is exploited to create an architecture that frames the light for rehabilitation. By employing phenomenological theories and environmental psychology, this architecture can embrace natural light, providing a natural grounding for dwellers. I believe that architecture should be coherent with nature as opposed to an obstruction of natural characteristics. Buildings would not exist without their site; therefore, the building should embrace and respect the site utilizing its characteristics to mould the architectural framework. Natural light is one of nature's characteristics, which possesses therapeutic qualities through physiological, psychological, and emotional effects.

The architecture is merely a stage on which rehabilitation is learned, practiced, and enacted. I have designed spatial qualities that incorporate the theoretical phenomenology and environmental psychology of natural light, evoking a structure that can accommodate complex human activities while promoting many beneficial moods. This is further supported by the material palette and the decision to incise the building's skin allowing light to penetrate the environment in a controlled manner. Other influences of light that cannot be predicted or controlled by the architecture include the unpredictable occurrences, changing weather patterns, and nature of the dwellers; all contribute to the mood experienced in the architecture. These occurrences are the reason that a mere building becomes architecture - a living thing. Without interactions between inhabitants under the caring glow of natural light, an architecture possesses no identity.

The architecture is the frame that embraces the phenomenon of natural light and its variables, weather, materials, site, and dwellers, community interaction, to lead the youth offenders toward a healthy and sound physical, psychological, and spiritual state of well-being.

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