The Journey of Light:
A Rehabilitation Center of Inhabited Light, NYC.

by John Lai Yen Louie Jr.
Bachelors of Arts in Design Studies
University of Buffalo SUNYAB, Buffalo, New York 1987

Submitted to the Department of Architecture in partial fulfillment for the degree of
Masters of Architecture at Massachusetts Institute of Technology June 1991.

© John Lai Yen Louie Jr., 1991. All rights reserved.

The author hereby grants to M.I.T. permission to reproduce and distribute publicly copies of this document
in whole or in part.

Signature of the Author
John L. Y. Louie Jr.

Certified by
Imre Halasz, Thesis Advisor
Professor of Architecture

Accepted by Jan Wampler
Associate Professor
Chairman Departmental Committee on Graduate Students

JUN 06 1991
I would like to thank...

My advisors and critics
Julie for all her support,
Frank for kicking me in down the stairs,
and Imre for the talks on life and architecture, life and architecture and fine spirits.
Thank the three of yous for an exciting time.

My thesis buddies for keeping it going...
you know who you are (MJ, RM, EH, etc.)

Kairos for the writing and also kicking me down the stairs.
Chin for the darkroom.

my Posse from New York City, “Peace!”

and Arjun “Keep the Faith”.

beyond thanks...

for all the love and support which I can never repay
this thesis is for my family,
[snip]
I love you guys.

“Look mom no hands!”
- collective light
- municipal building NYC
Abstract

The Journey of Light: A Rehabilitation Center of Inhabited Light, N.Y.C.

by John L. Y. Louie Jr.
Submitted to the Department of Architecture on June 15, 1991
in partial fulfillment of the requirements for the degree of
Master in Architecture at the
Massachusetts Institute of Technology

Abstract
The primary intention of this thesis is to explore the tectonic qualities of light through the design of a building. In addition to addressing some of the more general questions concerning light raised in the design process, the design attempts to demonstrate how light can define a multiplicity of places and generate the physical architectural order of a building. The investigation of light is conducted through studies with the various physical and spatial components of the building. The primary goal of these explorations with light is to enrich a personal understanding of light in architectural terms for the purpose of design.

In addition, the program of a drug rehabilitation center examines how the intangible qualities of light in a building can serve to inspire and contribute to the process of healing physically as well as emotionally. The significance of the program ensures that the studies with light are not just generic and formal, but recognizes that any formal understanding of light must be applied to broader ends in order for it to be meaningful.
The thesis itself is organized in five chapters:

- Chapter One introduces the basic questions regarding light which prompted this design investigation. It specifies the intention and the scope of this thesis and discusses the method of the investigation.
- Chapter Two describes the context of the design. It reveals why an urban rehabilitation center was chosen for the design and points out the role of the program in the explorations with light. There is also a description of the site and a discussion of some of the most important advocacies which operated throughout the design process.
- Chapter Three presents the design through plans, sections, and vignettes of the building as a “Journey of Light”.
- Chapter Four is a collection of some of the studies conducted during the design process. These studies are grouped under two sections. The first group includes the more analytically oriented studies which are based on observations connected to the city, the site and the room. The second section consists of the qualitative explorations with light and a list of the questions regarding light which these studies attempt to address. The latter group of studies are organized in terms of the volume, wall and frame of the building.
- Chapter Five summarizes the most important lessons gained from this study and offers an assessment of the value of this investigation.

Thesis Supervisor: Imre Halasz
Title: Professor of Architecture
Thesis Critics: Julie Moir Messervy, Frank Miller
Contents

1 Title Page
5 Acknowledgements
7 Abstract
10 Contents

13 Chapter 1: Introduction
15 1.1 Primary Questions Concerning Light
19 1.2 Intentions and Objectives
21 1.3 Method

23 Chapter 2: Context of Design
25 2.1 Program
27 2.2 An Urban Rehabilitation Center and its Role in the Design of Light
29 2.3 Site
35 2.4 Other Design Issues of an Urban Rehabilitation Center
37 2.4.1 Context
37 2.4.2 Construction
38 2.4.3 Community

41 Chapter 3: An Urban Rehabilitation Center
42 3.1 Design
52 3.2 "A Journey of Light" —Vignettes of the Building
Chapter 4: Design Studies

4.1 Organizational Studies and Analytical Observations of Light

4.1.1 The City
i. Light and the Form of Urban Buildings
ii. Light as a Collective Force in the Urban Environment
iii. Some Physical Patterns of the City

4.1.2 The Site
i. The Direction of Light
ii. The Orientation of the Blocks in the Neighborhood
iii. The Direction of the Streets
iv. Geometric Studies

4.1.3 The Room

4.2 Studies of Light

4.2.1 Volume and Shape
4.2.2 Walls
4.2.3 Frame

Chapter 5: Conclusions and Reflections

Bibliography
Chapter One
Chapter One:
Introduction and Questions
1.1 Primary Questions Concerning Light

This thesis started with some general questions about light. How does light affect the way we perceive and experience architecture? How can we take light into account when we design? Most important, how can we "build" and design with light in the same way that we can with physical building material? Or to put in another way, how can we manipulate light effectively towards architectural ends?

These questions about light are implicit in the design of any building, however, light is seldom considered the primary issue in building design because other more tangible and practical concerns such as construction and function often take precedence. Questions concerning light are difficult to address because there is no easy or standard way of describing or understanding how light "works" architecturally. This is further complicated by the fact that the physical phenomena of light is dynamic and ever changing depending on weather, seasonal and geographical conditions.
light and water
It must be stated from the onset that this investigation is primarily concerned with light as a "natural" phenomena as opposed to artificial light or illumination. Although the technology of lighting has developed to the point where the physical qualities of natural light can virtually be created under any conditions, this ability to control artificial light has not been able to replace the basic human desire for real daylight or natural light. Unlike artificial light, natural light does not follow the rules set by the architect, it has its own order and logic. Furthermore, there are some fundamental, perhaps even primordial, associative qualities of natural light which cannot be artificially generated. For example, the feeling one gets during sunrise is associated with an innate sense of renewal and rebirth, while the sense of the sacred and sublime is often connected to certain spectacular occurrences of light in the natural and built environment. These sensations are emotional and psychological and although they are intimately connected to the physical attributes of light, they also transcend the physical.
light among nature
"The architect is concerned almost entirely with uncontrollable source of energy; while all design of every kind is concerned in part with gravitational energy."
David Pye, The nature of design

1.2 Intentions and Objectives
The primary intention of this thesis is to explore the tectonic qualities of light through the design of a building. It tries to address how light in architecture can define a multiplicity of places. In addition, the program of a drug rehabilitation center examines the issue of how the tangible and real phenomena of light can serve to direct and inspire the design of a building metaphorically, associatively as well as physically. This thesis proposes that light can be the generator of architectural order and organizational structure of the building. By way of the specific design of a building, some of the more general questions concerning light in architecture are also addressed.
"..shadows on the hills, sketch the trees and the daffodils, catch the breeze and the winter chills, in colors on the linen land..." Don Mclean, "Vincent"
1.3 Method
Although the design is concerned with light, the investigation of light is conducted through explorations of the various physical and spatial components of the building. This is because light itself cannot be easily modelled independent of the other more tangible physical components of the building. Therefore, these studies deal directly with the organization and construction of the building while particular attention is given to the way in which these architectural and formal decisions affect the quality and behavior of light.

The design uses conventional modelling and drawing techniques extensively. Other less conventional and subjective forms of investigation, such as various kinds of concept models, painting, and collages are used as means of clarifying the spatial concept of the building as well as a way of understanding and interpreting the less tangible qualities of light. These studies are documented in chapter 4.
Chapter Two
Chapter Two:  
Context of Design
2.1 Program

The program for the design is a substance abuse rehabilitation center. The scope of the issue of substance abuse is complex and far reaching. This thesis does not attempt to address the full extent of the issues, but instead focuses on the way of life that is part of the process of rehabilitation.

The motivation behind designing a rehabilitation center has to do with a desire to work with a building in which the social issues of life in the city are an important consideration. More specifically, the decision to work with a rehabilitation center is a reaction to one of the most pressing social problems in the communities of lower Manhattan as well as a critique of existing medical institutions of this kind.

As a native New Yorker I have experienced the urban problems that are associated with the problem of substance abuse. Nonetheless, the rehabilitation center is not seen as a means of extending strict public control over the abuser but stems instead from a desire to address the issue of living with and recovering from substance abuse and exploring the role of architecture in supporting recovery.
This idea of how architecture can begin to contribute qualitatively to the process of rehabilitation is not generally addressed in conventional institutions of the same nature. People who are in these institutions are not inspired by the physical environment because of the lack of associative qualities of the place. While conventional hospital design standards now recognize the positive effects of daylight on patients by suggesting a window for each room, this guide line is quantitative and functional and is often mechanically translated in its architectural form. As a result many hospitals are slab buildings with double loaded central corridors and rooms along the edges. Although there is a consideration for the amount daylight in each room, very little attention is given to the quality of that light. When this functional formula is used to resolve the distribution of light it is often uniformly applied, consequently there is very little variation in the quality of light in the building. This kind of monotonous environment does not exploit the associative and intangible impact that varying conditions of light can have in an environment of healing. This thesis attempts to propose an alternative attitude towards light in an institutional setting.
2.2 An Urban Rehabilitation Center and its Role in the Design of Light

The subject of healing and renewal, which is an integral part of a rehabilitation program, not only provides some focus and meaning to the design, but is particularly appropriate for a study of light since it recognizes that the physical manipulation of light in architecture affects the psychological and social understanding and working of a place.

It is a well known fact that the problem of substance abuse is not only a medical and physiological addiction but also a psychological dependence. In fact, the process of curing the physiological dependence on drugs is often much less difficult than curing the mental and emotional dependence that accompanies any addition. This thesis proposes that a sensitivity towards the quality of light in a rehabilitation center can make a positive contribution to the healing program.

The psychological effects related to light are most easily understood metaphorically. For example, because light is a source of energy and growth in the physical world, it is by association understood as a vital component to psychological and emotional rejuvenation. Although this proposition of seeing light as a element of rejuvenation is appealing in abstract terms, the question remains how it can be translate into architectural terms.
2.3 The Site

The site for this design exploration is a corner lot at the intersection of Spring Street and Mulberry Street. The site belongs to a “limbo” neighborhood in lower Manhattan roughly defined by Bowery on the east; Broadway on the west; Broome street on the south; and Houston Street on the North. This neighborhood lies between Little Italy, Greenwich Village and The Lower East Side and is easily accessible from any of these surrounding areas. This neighborhood is referred to as “limbo” because it has no clearly defined ethnic, social, economical or political cohesiveness or identity. At present, the lot is a public playground maintained by the city. The De Silva Playground is currently occupied by derelicts of the “Bowery Bum” fame, who are at the park from when it opens at sunrise till when it closes.
on Spring St. looking west
on Mulberry St. looking north
- the sign
- Judson's Health Center and site
The lot is roughly 9,000 square feet, which is approximately double the size of the lot occupied by a typical local tenement buildings. The site is open on the north and west sides with the open corner at the street intersection. The other two sides of the park are bounded by existing structures. The lot backs up against a three storey party wall of a garage on the south and a two story health center on the east. Except for the 60 foot long skylight along the roof of the Judson’s Health Center, there are no windows that face the park.

Although the park itself is level, the streets which run along its sides are sloping from the corner that meets the health center to the northwest corner of the park. The change in the street levels helps to define the boundaries of the park. These edges are reinforced by a cast-iron fence that runs the entire length of the open sides of the park. The fence acts as a barrier against vandals at night. The sloping streets and the fence help to define the territory of the park as well as maintaining the continuity of the street edges to the corner of the block.

Programmatically, this site is ideally located for a substance abuse rehabilitation center since it is adjacent to an existing health center. From the point of view of the design, a corner lot with unobstructed access to light along two street edges make it well suited for the study of light.
2.4 Other Design Issues of an Urban Rehabilitation Center

The design of the rehabilitation center cannot be exclusively derived from a special concern for light. The design explorations with light are inseparable from the study of the various physical and spatial components of the building. Although, they are not always explicitly stated, there are a number of important advocacies that operate throughout the design process which contribute to decisions about the site, program, organization, construction, social character and image of the building.
2.4.1 Context

Site and organizational studies of the local neighborhood provide some understanding of the existing urban pattern. These studies help determine the kind of physical framework the building has at the larger sizes as well as its relationship to the city.

In general, there is an attempt to integrate the new building into the existing urban framework. This does not mean that the project is designed in the neighborhood style. Instead, the building takes into consideration the continuity of the street and its dimensions are related to the sizes of existing structures of the neighborhood. The organization of the building and its external collective space is based on a geometric and spatial interpretation of the existing conditions.

2.4.2 Construction

The physical framework of the building is not singular or uniform. The structure provides a wide range of sizes in order to accommodate a variety of spatial demands of the program. Furthermore, the structure builds the light since the various structural configurations correspond to different understandings of the light. In general, the design advocates a variety of physical definitions as a way of exploring the many spatial aspects of light.
2.4.3 Community

The rehabilitation center is first and foremost a community since the process of rehabilitation cannot be easily achieved individually. It requires individual courage and determination as well as the strength and support of friends. A community of people who share the same plight and hope can often provide a greater sense of group purpose and offer the most understanding and supportive environment in which they can regain their independence and personal dignity. The building in turn reflects the kind of life and community that occurs in it. In other words, the image and form of the building and its components “speak” about its function and meaning. The spaces are also defined in such a way that it reflects a clear interpretation of the institutional purpose of the rehabilitation center.

This design experiments with light as a way of “building” a collective environment. The building provides a variety of collective spaces and other physical support to encourage social interaction between the patients themselves as well as between the patients and the outside world. The sharing of these public collective places give their users a common identity which distinguishes them from other social groups which in turn fosters a sense of community. Although collective spaces are generally among the most socially desirable physical settings, there are very few reasonable precedents for common spaces designed for large groups of socially "undesirable" people like substance abusers.
Chapter Three
An Urban Rehabilitation Center
Floor Plan (ground floor)

1. lobby
2. reception
3. administrative offices
4. administrative offices
5. doctor's office
6. bathrooms
7. doctor's office
8. doctor's office
9. conference room
10. stairs
11. elevator
12. exterior collective space
13. interior collective space
Floor Plan (second floor)

1. lounge
2. classroom
3. bathrooms
4. collective space
5. bathroom
6. patient's rooms
7. patient's rooms
8. patient's rooms
9. stairs
10. stairs
11. elevator
- elevation light screen
sketch interior collective space
Layers of the north elevation
west elevation at dusk
3.2 "A Journey of light"
The intention of this section is to tell a story about a journey through the rehabilitation center and the life that goes on there through vignettes of the building.
One begins the journey to the building in the open from the street.
A curving of the screen indicates the opening of the entrance.
At the point of the entrance, one encounters several low walls where one can sit to contemplate before moving further on this journey.
The screen wall does not filter the light but reflects it down from above.

At the bottom of the screen at ground level, water lines its edges. This detail further redefines the edge of the site at a small size.
The large double screen acts as an unobtrusive transition between the interior collective space and the park area outside. It allows space to flow freely between the interior and exterior collective areas.
One enters directly into the interior collective space. It is an open space defined by the building's most enclosed section—the rooms of the patients.

Light expresses and delineates the use and meaning of each space.

The main access space of the building not only speaks about the movement into the heart of the building—the living areas—but also has a symbolic significance since the patients travel through the length of this space only at the time when they enter the rehabilitation program and when they leave. During their stay the patient moves along this central space—in the direction of the morning light—from their rooms to the activity areas. The central core of light is a constant reminder of their goal, to be able to leave restored.
Chapter Four
collage interpretation of Manhattan
4.1 Organizational and Analytical Studies of Light

Although the design studies specifically examining light are generally qualitative in nature, other analytical studies are conducted throughout the design process. These studies serve to clarify the understanding of light connected with the city, the site, and the program. They are based on observations of the behavior and quality of light in existing settings at various sizes. Some of these studies are diagrammed and collected below according to their size of reference.

4.1.1 The City
i. Light and the Form of Urban Buildings

In a densely packed city like New York where there are many tall buildings, light is an important urban issue. Ever since the 1920's there have been a series of legislations to limit the physical impact of shadows cast by buildings by regulating building heights and setbacks. These laws seek to maintain a minimum standard of light at the street level by specifying some minimum number of hours of unobstructed daylight that must be available at the street level at certain times of the year. More important, natural light in the city is seen as a public right and is protected by law. These laws acknowledged that the quality of light, its intensity and duration, in the streets is determined in large part by the form of the surrounding architecture.
*typical row house showing light wells and proportions of facade*
The effect of this legislation can be seen in the form of many of the high-rises as well as in the tenement housing in lower Manhattan. In both cases, the buildings step back as they rise. The high-rises that have no set backs are allowed by law since its footprint does not occupy the entire lot. In the tenement houses, regulations require that there be natural light within thirty feet of the front and back edges of the building. Although this legislation has been effective in maintaining the quality of life at some arbitrary level, it has dealt with light on a quantitative level only. The law does not specify the quality of the light, only how much of it and for how long. In other words, the law treats light as a commodity and necessity, and ensures that citizens get a fair share of it. Likewise, designers confronted with this kind of legislation merely dealt with it as another mathematical requirement that has to be satisfied. In other words, they often design “for” light and not “with” light.

The most innovative interpretations of these setback legislations were made by Hugh Ferris, who made drawings of visionary high rises according to the setback laws, e.g. in *Metropolis of Tomorrow*. Ferris, however, was primarily concerned with the form and mass of the building as opposed to the form and quality of the light. In general, there has been no significant reinterpretation of these laws that consider the qualitative, social, and psychological value of light in the urban environment and how it might transform urban architecture.
aerial view of Manhattan
ii. Light as a Collective Force in the Urban Environment

In the urban environment, light marks and creates energetic places where people gather. Light is a source of energy and warmth which draws people towards it. In general, it encourages social interaction and promotes collective activities. Light does not constrain the location or the nature of the action, instead it suggests a multiplicity of possible activities and places for them. This is because the places that light illuminates in the city are not static; physical constraints that define them are ever changing. In contrast to artificial illumination which acts as a consistent backdrop, light in the city cannot be understood apart from dark. Shadows and dark places have the opposite effect on human behavior and play an equally significant role in shaping the life and character of the city.

iii. Some Physical Patterns of the City

The city follows a street grid that is hard to break. At points where this grid is disrupted, such as points of intersection between Broadway and the grid, the special character of these places is acknowledged as nodes of light because they correspond to open spaces which are not in the shadow of buildings.

The more typical condition within the city grid consists of continuous street edges which are defined by buildings with a continuous facade zone which raps all the way around the perimeter of the block. This continuous facade, however, is not monotonous because the individual buildings occupy this zone with their own distinctive configuration of recessed entries, split level entry steps and fire-escape stairs. The different combinations of these building elements generate a variety of light effects along the street.
diagram of continuous facade as light element
diagram of discontinuous facade as light element
site map
Mulberry Street, 1888
4.1.2 The Site

The following site analyses provided some important information for the design.

i. The Direction of Light

ii. The Orientation of the Blocks

iii. The Direction of the Streets

iv. Geometric Studies
- shadow study
-sit is usually in shade
-view of existing playground
- building orientation study
- buildings are oriented toward Spring Street
- typical tenement facade
edge study
continuity is kept by fence
view down Spring Street
By developing a geometric system at the block size, the spatial decisions of the design take into account existing urban conditions beyond the boundaries of the lot, including the dimension and angle of the grid of the city block. This system of geometry also provides a dimensional and proportional structure that defines the range of sizes that regulate and order the spaces in the building and site. The variety of sizes in the building provides rhythm and a sense of scale. For example, the movement along the main access not only corresponds to the largest dimension of the site, but also to the largest dimension of the light.

Although the geometric structure does not determine the form or position of the actual structure, such as the location of the columns and walls of the building, it does generate some structural relationship which is the basis for spatial decisions. Therefore, in the final design, the geometric ordering is reflected in the deployment of the physical structure.
Closer yet I approach you,  
Whst thought you have of me now, I  
had as much of you-I laid in my  
stores in advance, I consider'd long  
and seriously of you before you were  
born.”
Walt Whitman “Crossing Brooklyn Ferry”

“The street is one of the first institu-
tions of a city, where the buildings  
opposite each other talk to each  
other.”
Louis Kahn
*geometry generated by site conditions
*geometry generating building
"Van Gogh's Bedroom" 1888
Van Gogh
iii. The Room

The room is the most private and personal area within the building and therefore provides the most tangible spatial unit for understanding the life of a rehabilitating individual in this institution. The studies at this size focus on the issue of individual identity within the community of this institution and the role light plays in this definition.

How does the character and quality of light of the room affect the behavior of the individual? How does the individual experience with light differ from the corresponding collective experience?

The zones of privacies should be clearly delineated from the collective zones by light. However, the relationship between the individual and the light is consistent throughout the building. In other words, the collective area of different activities and many individuals correspond to a larger spatial zone as well as a more active range of light qualities. By the same token, a private place for a single individual corresponds to a smaller space with a more singular, less intense and introspective kind of light.
4.2 Studies of Light

The goal of these light studies is not quantitative or technical. Their purpose is not to understand the precise scientific behavior of light. Instead, they are much more qualitative and subjective in nature since they are directed primarily towards enriching a personal understanding of light in architectural terms. These studies are therefore not conducted as isolated experiments to catalog and measure the behavior of light, rather they respond to questions about light which are raised specifically in the design process.

It is important to bear in mind that all the studies are conducted as part of the design of a rehabilitation center. Therefore, they are all in one way or another trying to address the question of how a building can contribute to the process of healing. More importantly, the significance of the building program ensures that the manipulation of light in the various studies are not just generic and formal, but recognizes that this formal understanding of light must be applied to broader ends in order for it to be meaningful.
light of interior collective space
The following is a collection of some of the questions about light raised in the course of this design:

i. How can light be used to provide a clearer understanding of the multiplicity of spaces in our environment?

ii. How can light be qualitatively manipulated to physically define a space and territory? Can this definition of place by light be modulated so that it can also inform the quality of the inhabitation of that place?

iii. Can light provide architectural order?

iv. How much of our perception of light in architecture is affected by what it illuminates? What are the roles of texture and shadow in our understanding of light?

v. How can the manipulation of light begin to give coherence and meaning to the program of the building? Can there be a real physical relationship between the type, function and meaning of a space and the quality of light of that space?
the light in the screen clearly delineates the public and private levels of the interior spaces behind it.
The following presentation of the studies with light are organized to address just one of the central questions regarding light from a design perspective: How does light modify and enhance the perceptual and spatial qualities of architectural elements such as the volume (space), walls (surfaces) and frame (lines) of the building?

4.2.1 Volume and Shape
The source, direction, intensity and evenness of the light determines the perception of volume and shape. Consequently, the location and density of the light source is a primary consideration in the understanding of space.
• study of light as solids
• carving as a technique of introduction light
study of light as collective form
• light collector reaches up above surrounding buildings for light
• light is collected and transferred down
• light shafts define points of light within the ground form

• first image of the collecting light form

• light concept model in placed in site
Three elements of the light concept model
a. the collector
b. the concentrator
c. the receiver

"The piston rod, connecting rod, and crank pin are the device, the wheel is the object."
David Pye, Nature of Design

the light collector literally provides collection, but its swooping form also provides the image of collection which talk about the collective nature of the rehabilitation center.
study of light as volume
study of continuous wall
4.2.2 Walls
Light is introduced into the surface of a solid wall by a process of carving. The quality of the light depends largely on the form of the section and the thickness of the wall.
layering of the surface to define zones of activities
floors as horizontal surfaces of light
geometry and light
4.2.3 Frame

The density and quality of light in the skeletal frame of the building structure can be modified by an additive process. The attachment of screens and panels of different material to the frame controls the nature of the light.
study of relationship between frame and wall
Chapter Five:
Chapter Five:
Conclusions and Reflections

In the course of this design I have realized that light is even more complex than I had previously imagined. When this thesis was first conceived, it was seen as an opportunity to make clear the relationship between the behavior of light and the physical measurable components of architecture. However, the study itself has shown that no simple relation of this kind exists. Quite unlike other architectural elements, light does not have any constant physical dimensions that allow for a standard and clear way of describing its behavior. Furthermore, there is no definite correspondence between how light behaves and how it is perceived. All these inherent characteristics of light have contributed to the difficulty that this study encountered.

Despite these difficulties, this thesis has still provided some very valuable experiences. Most important it has raised my consciousness about the expressive power of light when it is properly manipulated. The studies were rewarding in terms of increasing my understanding of the specific behavior and qualities of light. In particular the qualitative studies with volume, wall and frame started to reveal the material and tectonic implications of light. They also demonstrated how the perception and feeling of the material qualities of the building elements themselves are affected by the quality of the light. The explorations with the frame...
and the wall were able to convey, in terms of light, the feeling of lightness of the frame and cladding and the corresponding heaviness of the concrete and masonry.

Other studies suggested new ways of manipulating light. For example, the experiments that work with light as a solid suggested that light can be understood not just in terms of its spatial aspects. Similarly, the different processes of designing with light such as carving the wall as a way of bringing light into a surface introduced me to many alternative ways of “building” light other than glazing. The discovery of these different methods of light construction had a dramatic impact on the final design.

In the end, this thesis is much more about the design of a rehabilitation center than a study of light. Although this design exploration has enriched my own personal understanding of light, it is unlikely that the studies with light can be continued apart from the design because they are based on subjective premises with design specific objectives. None-the-less, this document might be useful to others who are interested to learn more about the architectural qualities of light since it begins to point out some of the more important questions concerning light from a design perspective. In the least, it shows some of the difficulties that are intrinsic to this kind of study.
BIBLIOGRAPHY


Boud, John, “Lighting Design in Buildings”, Peter Peregrinus Ltd. 1973

Clausen, Meredith L., “Frank Lloyd Wright, Vertical Space, and The Chicago School’s Quest for Light” Society of Architectural Historians’ Journals March 1985 p66-74


Holl, Steven. "Rural & Urban House Types in North America" Pamphlet Architecture No. 9 1982


Rowe, Colin & Koetter, Fred. “Collage City”, Cambridge, MIT Press


Rub, Timothy. “Lighting up the town: Architectural illumination in the Jazz Age” Architectural Record August 1986 p72-77


———“Tadao Ando” The Japan Architect May 1982 v.57 No. 5 (JA 301)


ROBOTMAN by Jim Meddick