

**House(s) on a Slope:  
Reciprocity in Architecture**

**Jean-Yu Chen**



# **House(s) on a Slope: Reciprocity in Architecture**

**by Jean-Yu Chen**

Thesis submitted to the faculty of the  
Virginia Polytechnic Institute and State University  
in partial fulfillment of the requirements for the  
degree of

Master of Architecture  
in  
College of Architecture & Urban Studies

Frank H. Weiner, Committee Chair

Donna W. Dunay

William U. Galloway

May 5, 1998  
Blacksburg Virginia

Keywords: reciprocity, methodology, topography, intuition, expression

Copyright © 2010 Jean-yu Chen



## **Reciprocity in Architecture** by Jean-yu Chen

### **Abstract**

#### **What is reciprocity?**

**The quality or state of being reciprocal 1: mutual dependence, action, or influence 2: a mutual exchange of privileges; specifically: a recognition by one of two countries or institutions of the validity of licenses or privileges granted by the other**  
<http://www.merriam-webster.com/dictionary/reciprocity>

The word reciprocity describes the multi dimensional relationship between architecture and its site. The definition of reciprocity is commonly understood as mutual exchange and dependence. As “site” provides a place for architecture, architecture bears the social responsibility to provide comfort, protection, function and connectivity to the site and its environment.

Harmony in architecture is a result of reciprocity; it is the result of the reciprocity between the nature and artifice. When architectural form adopts and supports each element on the site, the site will be enhanced from the establishment of architecture. In a macro sense, architectural forms become icons, landmarks, or spiritual backgrounds for culture and events. These activities of exchange and dependency assist in holding culture values and integrating society.

It is the architect’s social responsibility to cultivate this experience and to disseminate this idea. Fundamentally, architects must consider the user needs and establish proper connections between the architecture and its site.

**Reciprocity confirms the existence of architecture.**

## ***Abstract: Reciprocity in Architecture***





## Content

### **Abstract:**

Reciprocity in Architecture.....v

### **Methodology:**

Finding Ways of Making.....5

### **A Tree is a Leaf is a Tree:**

Mutual dependence of Site and Object(s).....8

Transformation: Shaping the Site.....10

    Topography and Architecture.....14

### **XS: A Room**

    Language of Architecture and  
    Idea of Home.....20

### **The Potential of Reciprocity in Scale/ Geometry**

**S: A Leaf = One House** House No. 1.....26

**S: A Leaf = One House** House No.2.....32

**L: A Tree = A Community:** Houses On a Slope...46

*Dedication*.....63

*Acknowledgement*.....65

*Illustration Credits*.....67

*Curriculum Vitae*.....68

*the big seed list*.....70



**The working process of a creative mind, the 'creative' process itself, is an illusive yet fascinating domain of inquiry. Descriptions of the creative process typically rely on the use of metaphor in order to approximate that which remains ephemeral, that which is expressed in action alone.** (van Bergeijk, Herman. Notation of Herman Hertzberger. 31)

Architects' ideas evolve and become objects. The transformation of ideas to drawings show the architect's thought processes<sup>1</sup>. Drawing, as a medium, combines precedence, knowledge, and experience.

To establish a methodology of architecture, one often begins with the study of history seeking precedence. However, I believe intuition is what ultimately drives change. Intuition leads to exploration and experimentation which often results in new ideas and paradigm shifts. New design unfolds through the processes of self evaluation and decision making without the boundary of precedence. This belief can be best illustrated with an example in culinary art, one could always follow the existing recipes and expect a certain result that is controlled and proven; or, one can take risks with different material, change the processes and produce unlimited possibilities.

1. Processes: engage and appropriates objects transforms it into memory.  
(Aristotle, Nicomachean Ethics)





*So start with this; make a welcome of each door  
and a countenance of each window.*

A.V. Eyck

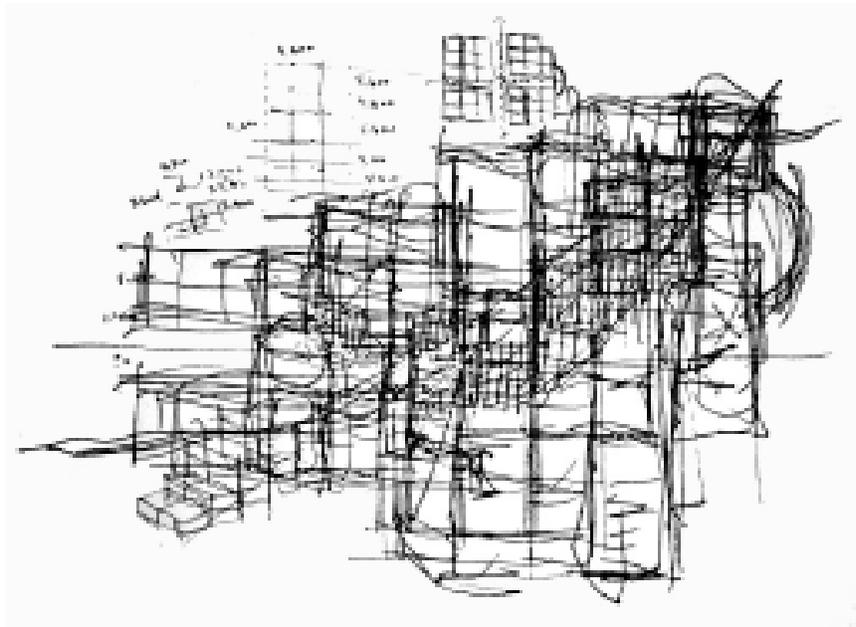




*The presence of works of art, like those of nature, makes us restless. We wish to express our feelings and judgements in words, but before that, we must recognize, by intuition and understanding, what we are looking at; so we begin to identify, classify, differentiate. But then we find that this, too, if not impossible, is very difficult, so in the end we return to a wordless beholding.*

*Johann Wolfgang Goethe, Italian Journey April 1788*

## **Methodology: Finding Ways of Making**



**Figure 1** Ando, Sketch of Rokko Housing



The architectural methodologies of Ando, Kahn and Gian Carlo De Carlo were my precedence; these diagrams represent their design philosophy in which each phase validates the next. The detailed factors and relationships of the program motivated me to find what inspires them to create architecture.

“Where do we begin in the process of becoming an architect?”

The search begins prior to the conscious decision of becoming an architect. The “precedence” studies, which include: literature, science, history, mathematics...etc, forms a composite experience that fuels intuition. Design starts with the desire to change, to find new solutions and innovations.

Intuition is your most exacting sense, it is your most reliable sense. Intuition stems from the inspiration to live (L. Kahn).

There isn't a set equation for architecture. The architecture which pleases our senses also demonstrates respect and consideration for nature. They give back more to the site, the user, and the community. A design principle is the derivative of organized senses with respect to nature. Architecture must work at a societal level, in terms of its function, environment, and economics.

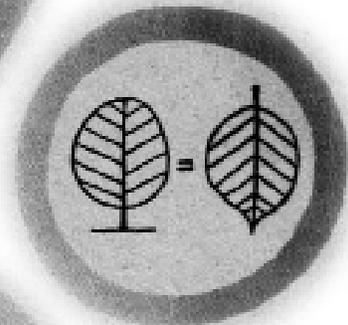
The diagrams of L. Kahn and Anne Tyng were found in the book, Louis Kahn to Anne Tyng. Similarities in both of their diagrams are evidence of strong belief in history and precedence. Kahn's challenge is also in the program and the function. Program in his diagram derived from history and precedence. Intuition is mostly the response and the result of memory and history.

To be intuitive, architects have chosen a world of defining. Intuition is not rational knowledge which is perceived by in a logical way. Intuition bares intricate layers of Erkenntnis, Wissen, Erfahrung (Hans, 1st Year design studio). It is a composite of all knowledge that is rational and empirical. Layers are filter out in a certain order, so they can be perceived and understood as close to what the creator intended.

“Design means order in human feeling and thought and the varied activities in which that thought and feelings is expressed”. Deman W. Ross

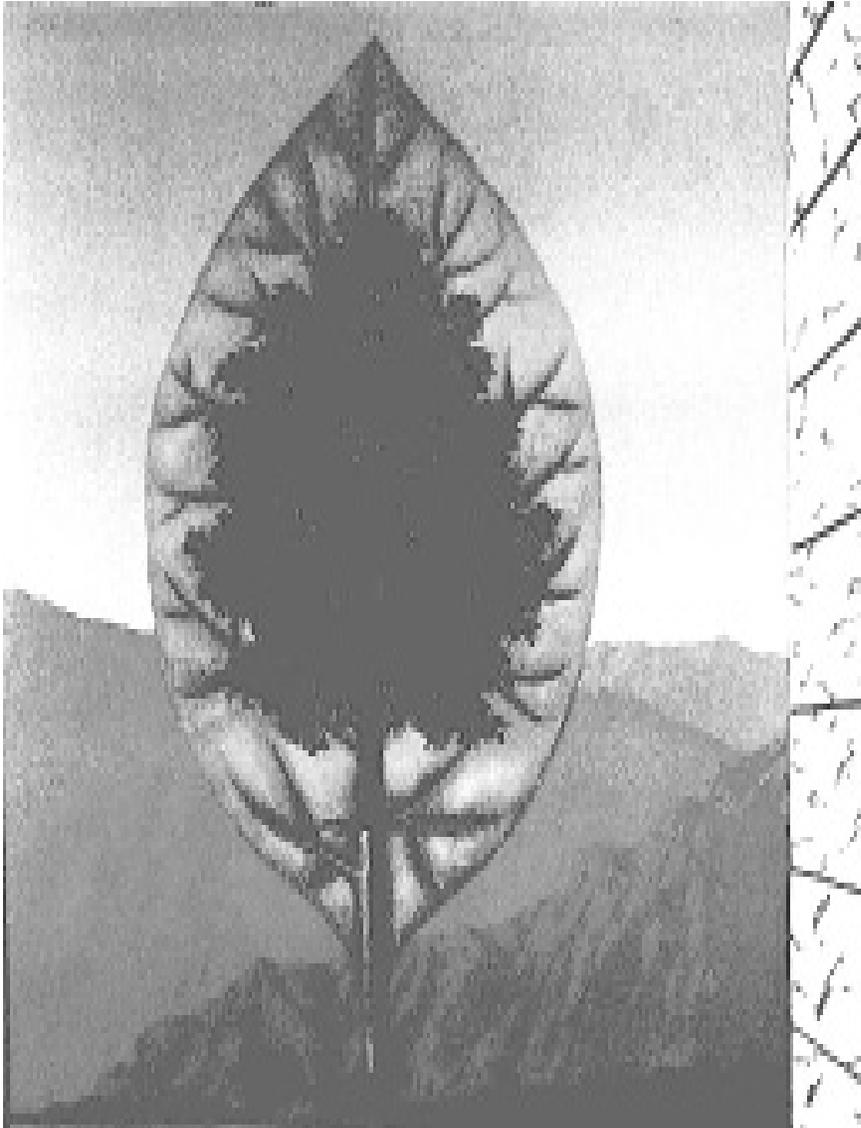
***A Tree is a  
Leaf  
is a Tree  
Mutual  
Dependence  
of Site and  
Object(s)***

tree is  
leaf and leaf  
is tree - house is  
city and city is house  
- a tree is a tree but it  
is also a huge leaf - a  
leaf is a leaf, but it is  
also a tiny tree - a city  
is not a city unless it  
is also a huge house -  
a house is a house  
only if it is also  
a tiny city



say leaf - say tree  
say a few leaves still and  
many leaves gone - say leafless tree  
- say heap of leaves - say the tree  
when I grow up and that tree when  
I was a child - say one tree, lots of  
trees, all sorts of trees, trees in the  
forest - say forest (beech, dark leaf,  
oak, pine, fern, owl's nest (owl's nest,  
tiger, timber) - say orchard, apples,  
apple pie - say fig tree - say fig leaf  
- say NUTS! - say house - say  
city - say anything - but  
say PEOPLE!

Figure 4 Aldo Van Eyck, Tree is leaf and leaf is tree.



**Figure 5**  
Le Dernier Cri(1967), Rene Magritte,  
Foundation De L'Hermitage, pp 125

*Mutual  
Dependence  
of Site and  
Object(s)  
A Tree is a  
Leaf  
is a Tree*

## Transformation: Shaping The Site



Nature as the site: the sun, air, and water begin to involve and interact with our intuition. This information becomes the resource for architectural order. The view and the gradual slope, are primary elements that influences this thesis.

In addition to nature, the paintings of Degas were also influential because of their topographical character. The interpretation of earth as a human rising, swimming, or dancing relates to paintings of human movements. The arms of Degas' dancers relate to the topography of the site. The slope is surrounded by the rising hand that reaches out with certainty and fluidity of movement.



149A

10 E

P65

Visitor 313

Shoemaker

Southgate Dr.

Miller-Johnson Track

P62

Small

Soccer field

Stadium

Southgate Center

English Baseball Field

185

187B Jamerson Athletic

187C

187D

187E

187F

187G

187H

187I

187J

187K

187L

187M

187N

187O

187P

187Q

187R

187S

187T

187U

187V

187W

187X

187Y

187Z

187AA

187AB

187AC

187AD

187AE

187AF

187AG

187AH

187AI

187AJ

187AK

187AL

187AM

187AN

187AO

187AP

187AQ

187AR

187AS

187AT

187AU

187AV

187AW

187AX

187AY

187AZ

187BA

187BB

187BC

187BD

187BE

187BF

187BG

187BH

187BI

187BJ

187BK

187BL

187BM

187BN

187BO

187BP

187BQ

187BR

187BS

187BT

187BU

187BV

187BW

187BX

187BY

187BZ

187CA

187CB

187CC

187CD

187CE

187CF

187CG

187CH

187CI

187CJ

187CK

187CL

187CM

187CN

187CO

187CP

187CQ

187CR

187CS

187CT

187CU

187CV

187CW

187CX

187CY

187CZ

187DA

187DB

187DC

187DD

187DE

187DF

187DG

187DH

187DI

187DJ

187DK

187DL

187DM

187DN

187DO

187DP

187DQ

187DR

187DS

187DT

187DU

187DV

187DW

187DX

187DY

187DZ

187EA

187EB

187EC

187ED

187EE

187EF

187EG

187EH

187EI

187EJ

187EK

187EL

187EM

187EN

187EO

187EP

187EQ

187ER

187ES

187ET

187EU

187EV

187EW

187EX

187EY

187EZ

187FA

187FB

187FC

187FD

187FE

187FF

187FG

187FH

187FI

187FJ

187FK

187FL

187FM

187FN

187FO

187FP

187FQ

187FR

187FS

187FT

187FU

187FV

187FW

187FX

187FY

187FZ

187GA

187GB

187GC

187GD

187GE

187GF

187GG

187GH

187GI

187GJ

187GK

187GL

187GM

187GN

187GO

187GP

187GQ

187GR

187GS

187GT

187GU

187GV

187GW

187GX

187GY

187GZ

187HA

187HB

187HC

187HD

187HE

187HF

187HG

187HH

187HI

187HJ

187HK

187HL

187HM

187HN

187HO

187HP

187HQ

187HR

187HS

187HT

187HU

187HV

187HW

187HX

187HY

187HZ

187IA

187IB

187IC

187ID

187IE

187IF

187IG

187IH

187II

187IJ

187IK

187IL

187IM

187IN

187IO

187IP

187IQ

187IR

187IS

187IT

187IU

187IV

187IW

187IX

187IY

187IZ

187JA

187JB

187JC

187JD

187JE

187JF

187JG

187JH

187JI

187JJ

187JK

187JL

187JM

187JN

187JO

187JP

187JQ

187JR

187JS

187JT

187JU

187JV

187JW

187JX

187JY

187JZ

187KA

187KB

187KC

187KD

187KE

187KF

187KG

187KH

187KI

187KJ

187KK

187KL

187KM

187KN

187KO

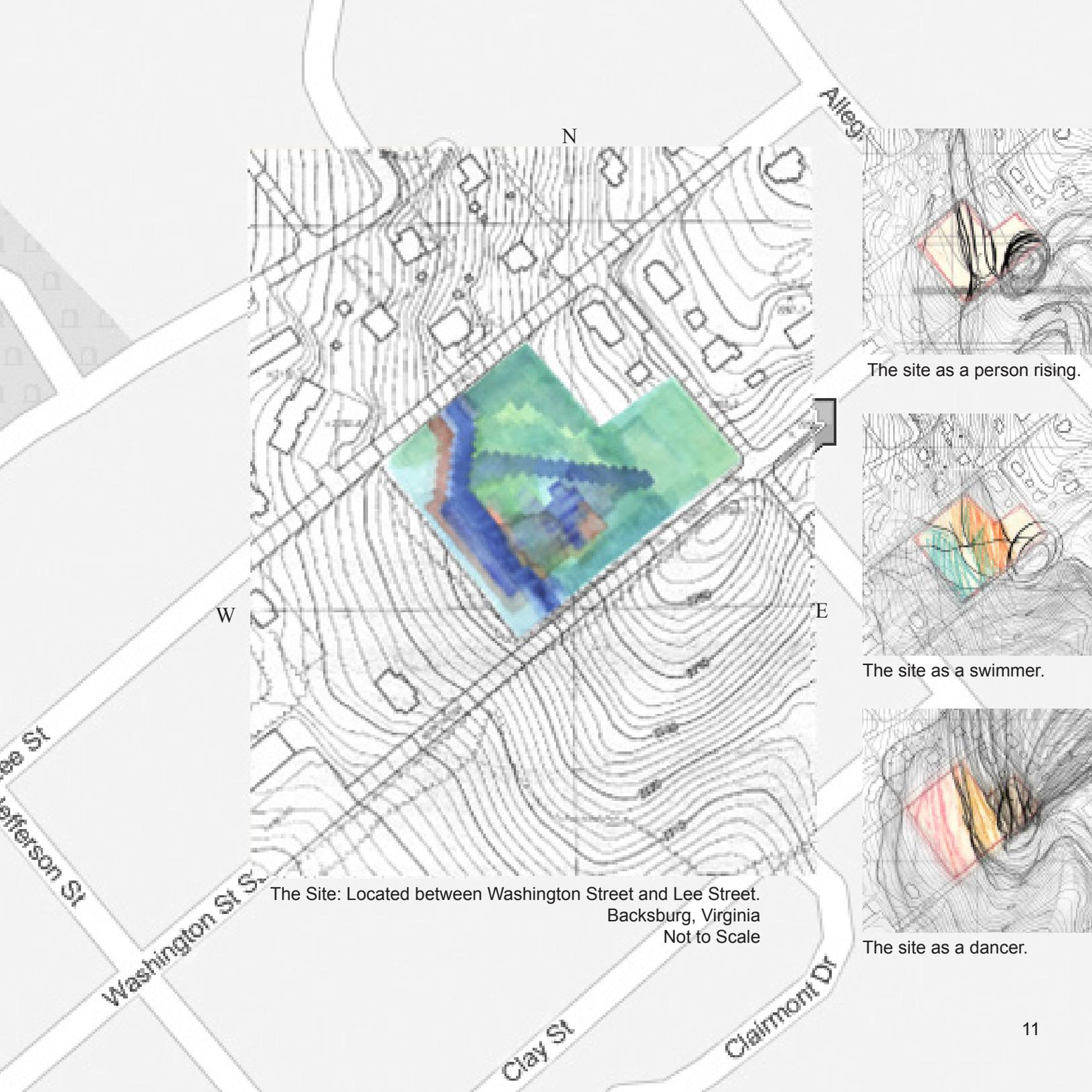
187KP

187KQ

187KR

187KS

187KT



N

W

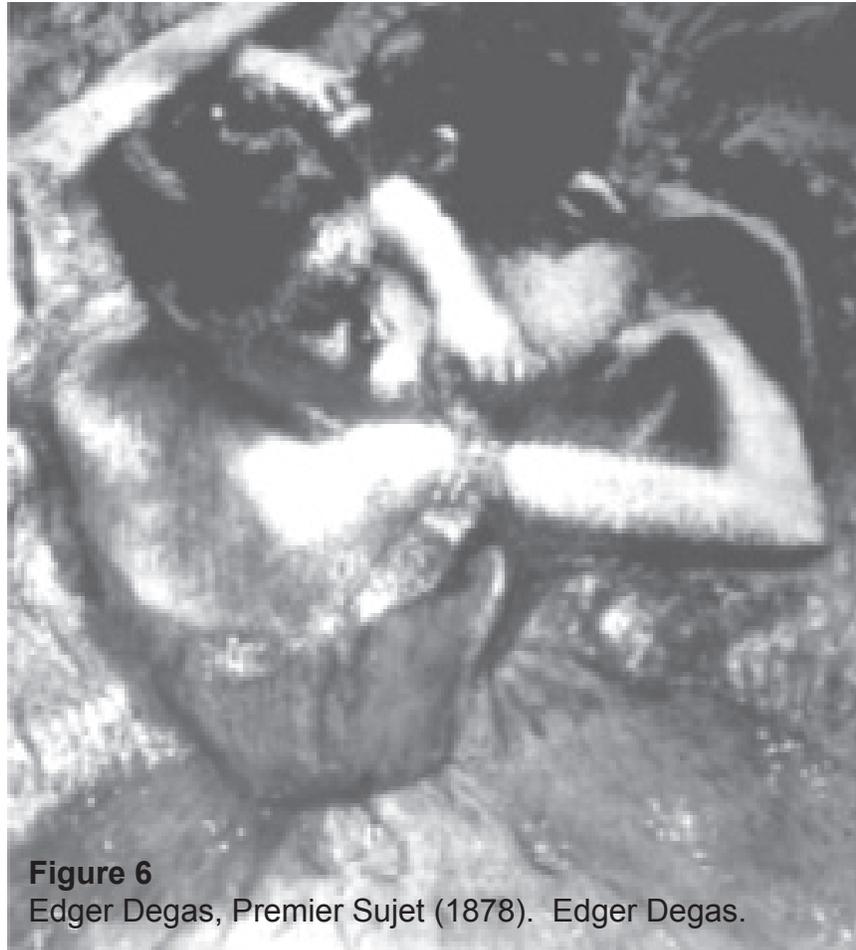
E

The Site: Located between Washington Street and Lee Street.  
Backsburg, Virginia  
Not to Scale

The site as a person rising.

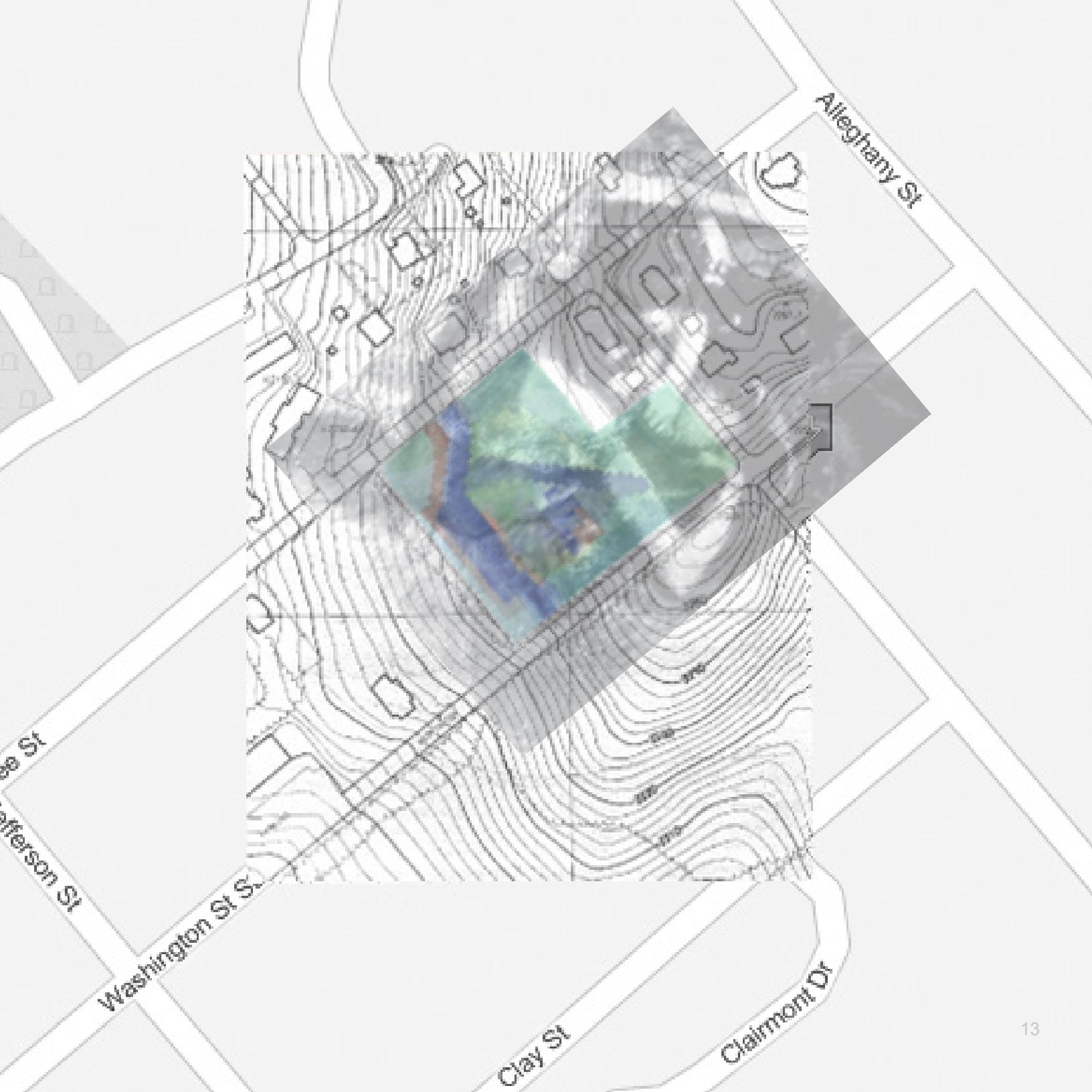
The site as a swimmer.

The site as a dancer.

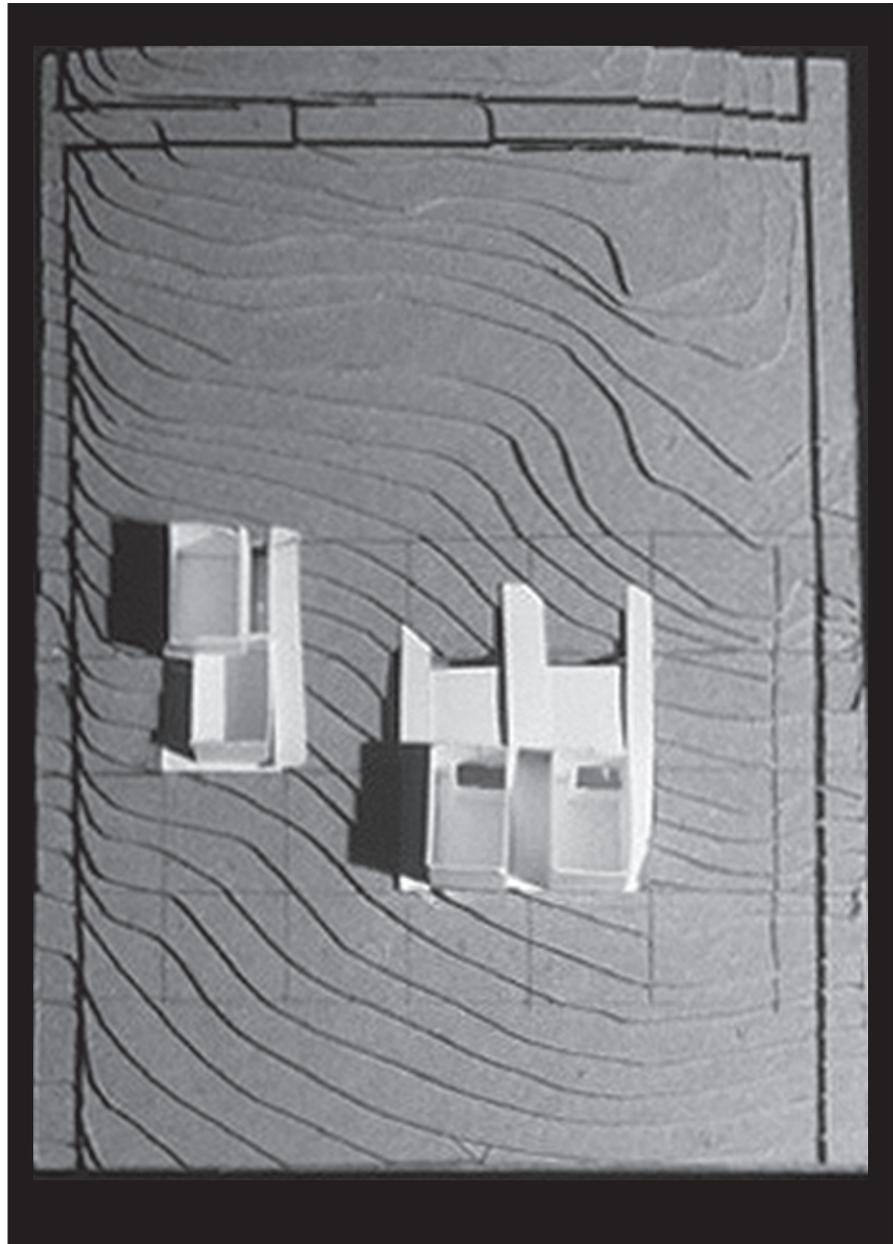


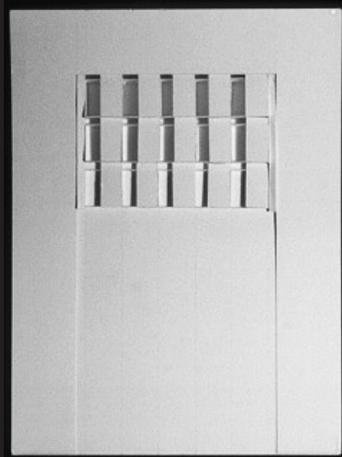
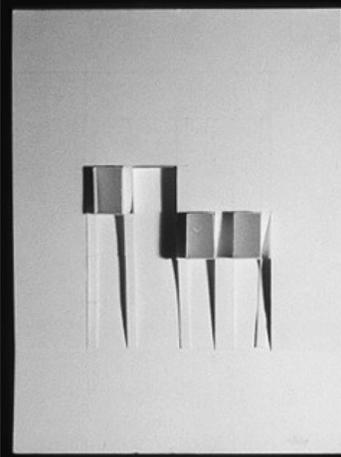
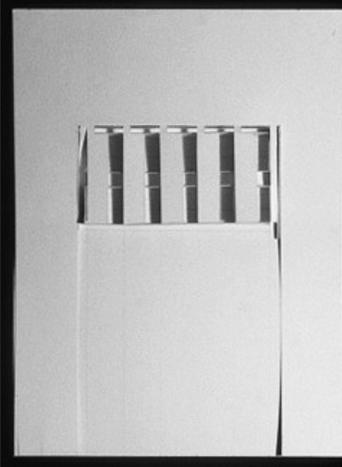
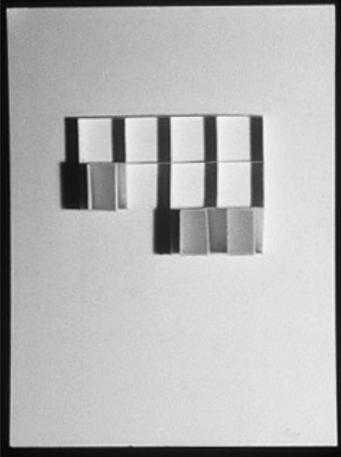
**Figure 6**  
Edger Degas, Premier Sujet (1878). Edger Degas.

The paintings of Degas can be observed from different perspectives. These paintings express a change in scale and an increasing complexity. The quantitative relationship among the subjects on canvas (one dancer, two dancers, to a group of dancers), eventually extends beyond both the painter and the viewer. This is analogous to the site embracing life and releasing it. Like Degas' art, architecture has the ability to hold the attention of a viewer and also the ability to liberate him/her.



*Topography  
and  
Architecture*





*Topography  
and  
Architecture*

A set of models experimenting slope and geometry.



## The Site

“Topography”: the word combines the Greek word *topos*, place, with the Greek word *graphein*, to write. I speak above as though the word names solely the contours of a given place, but “topography” is in fact a complex word. Etymologically, it means the writing of a place. The English word “topography” has three meanings, one obsolete. The obsolete meaning is the most literal: “the description of a particular place.” Now the word means either “the art or practice of graphic and exact delineation in minute detail, usually on maps or charts, of the physical features of any place or region,” or, by metonymy, “the configuration of a surface, including its relief, the position of its streams, lakes, roads, cities, etc.”...

“Topography” originally meant the creation of a metaphorical equivalent in words of a landscape. Then by another transfer, it came to mean representation of a landscape according to the conventional signs of some system of mapping.

Miller, J. Hillis, (1995). *Topographies*, 3.

An understanding of the site involves the investigation of nature, which follows the change of seasons and time throughout the day.

Among the best examples of architecture relating to site are the works of Tadao Ando’s Rokko Housing One; and Aurelio Galfetti’s Castelgrande in Bellinzona, Switzerland. The slope and the building are gracefully unified; the site accepts the design and holds it in place without losing its character. The architecture becomes part of nature and nature becomes part of architecture.

Architecture is independent from the site but also harmonious with the site.

The challenges of this thesis were to frame the views and to create moments of pause in the circulation to enjoy them.

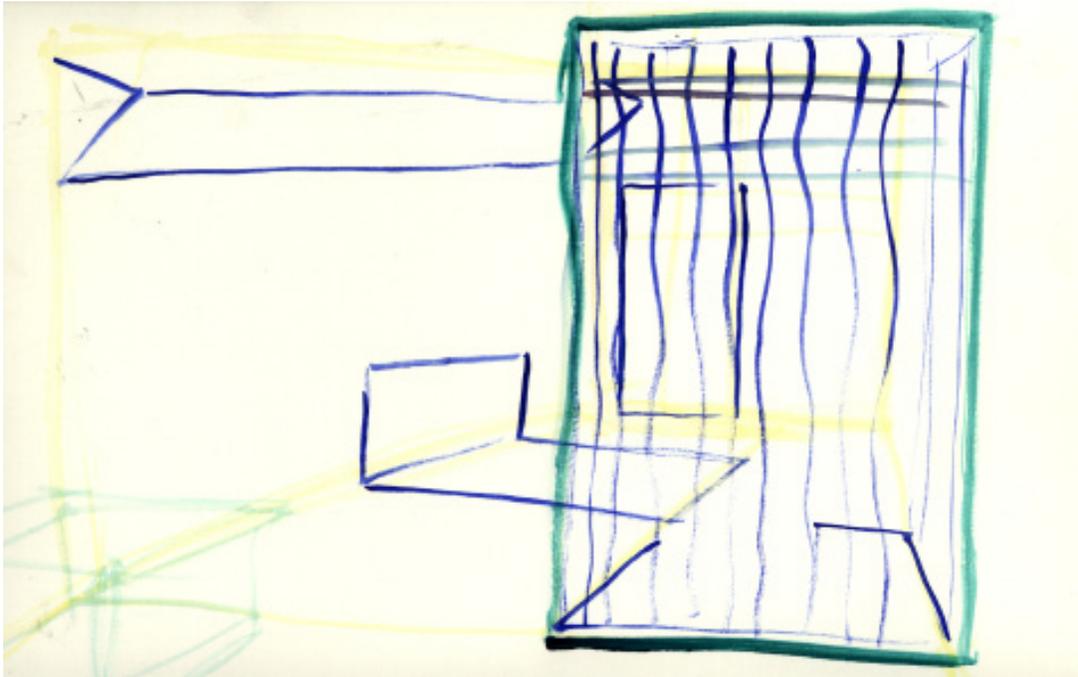


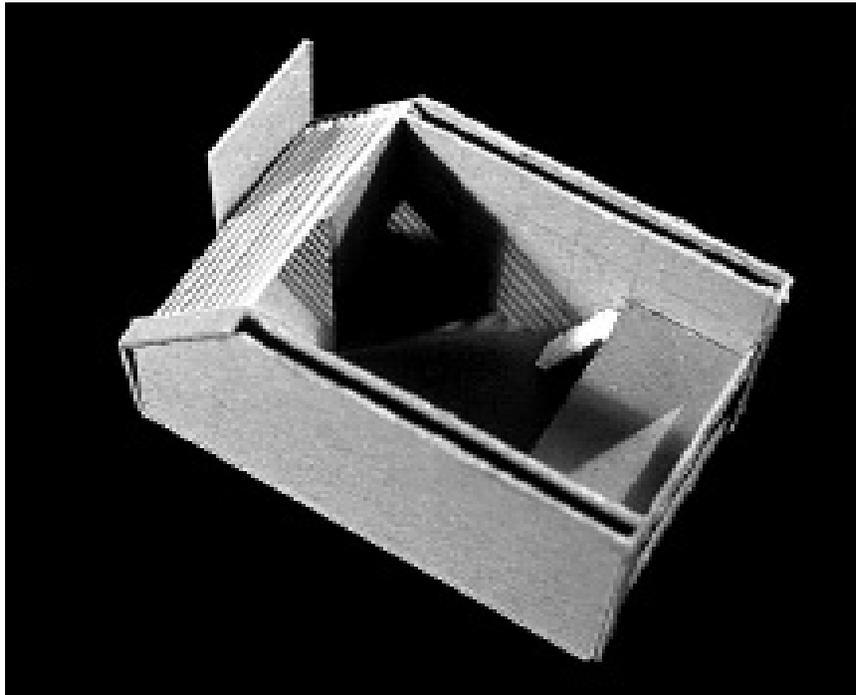
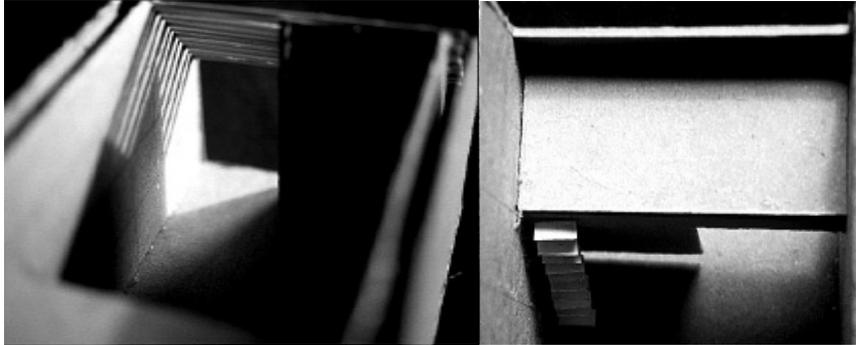
*These photos were taken before digital cameras. I stood there and watched the sunset*



*for several days. This is the views from the site. I want people to indulge in these views.*

**XS: A Room**  
**Language of Architecture and Idea of Home**





***XS: A Room***

***S: One House***

***L:COMMUNITY***

***Reciprocity in  
Architecture***

***Introduction:***

***Reciprocity***

***The Beginning***

***Methodology***

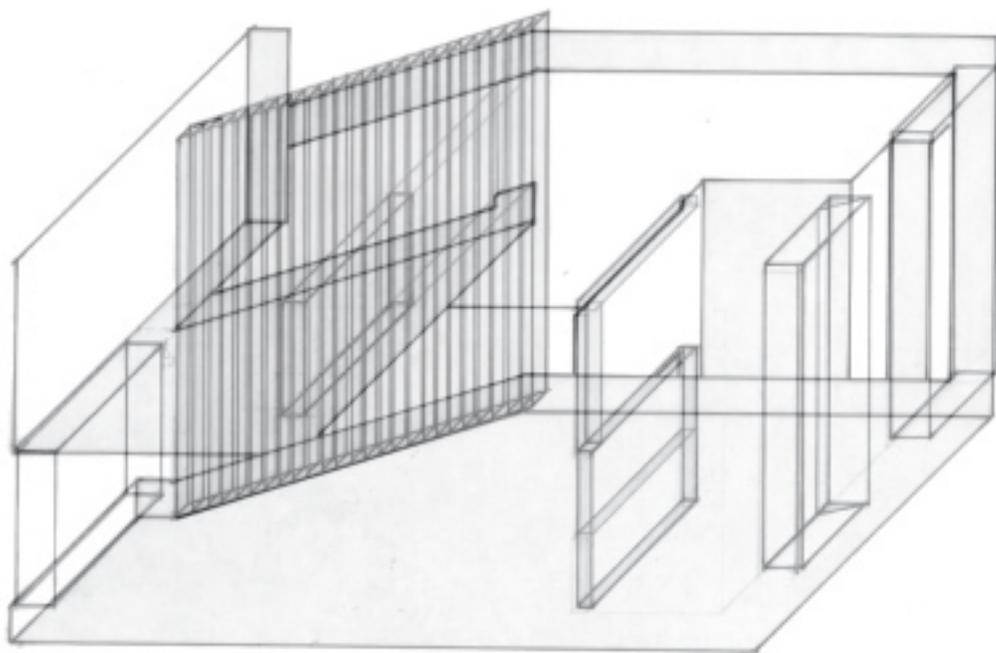
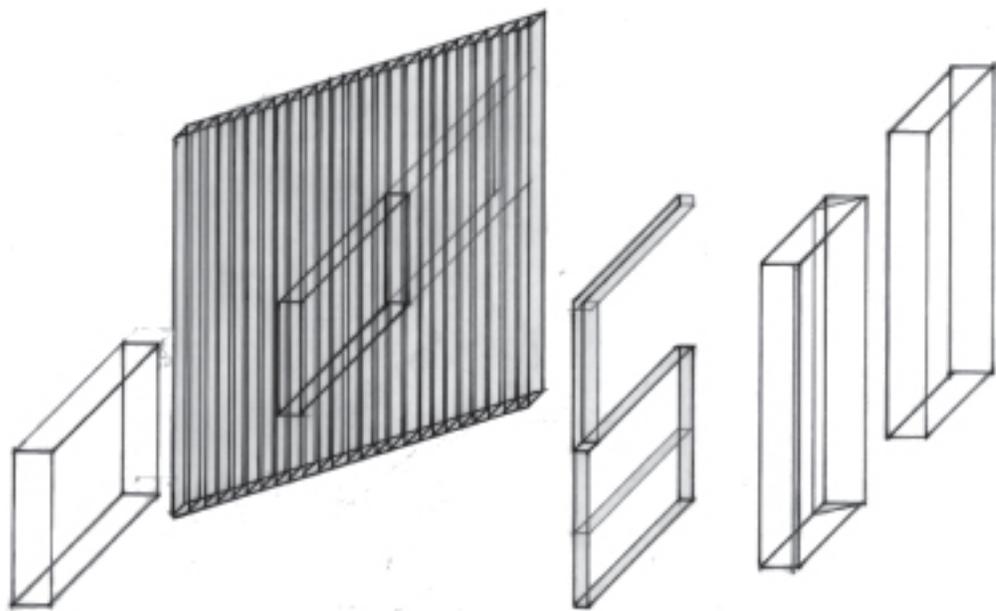
***A Tree is a***

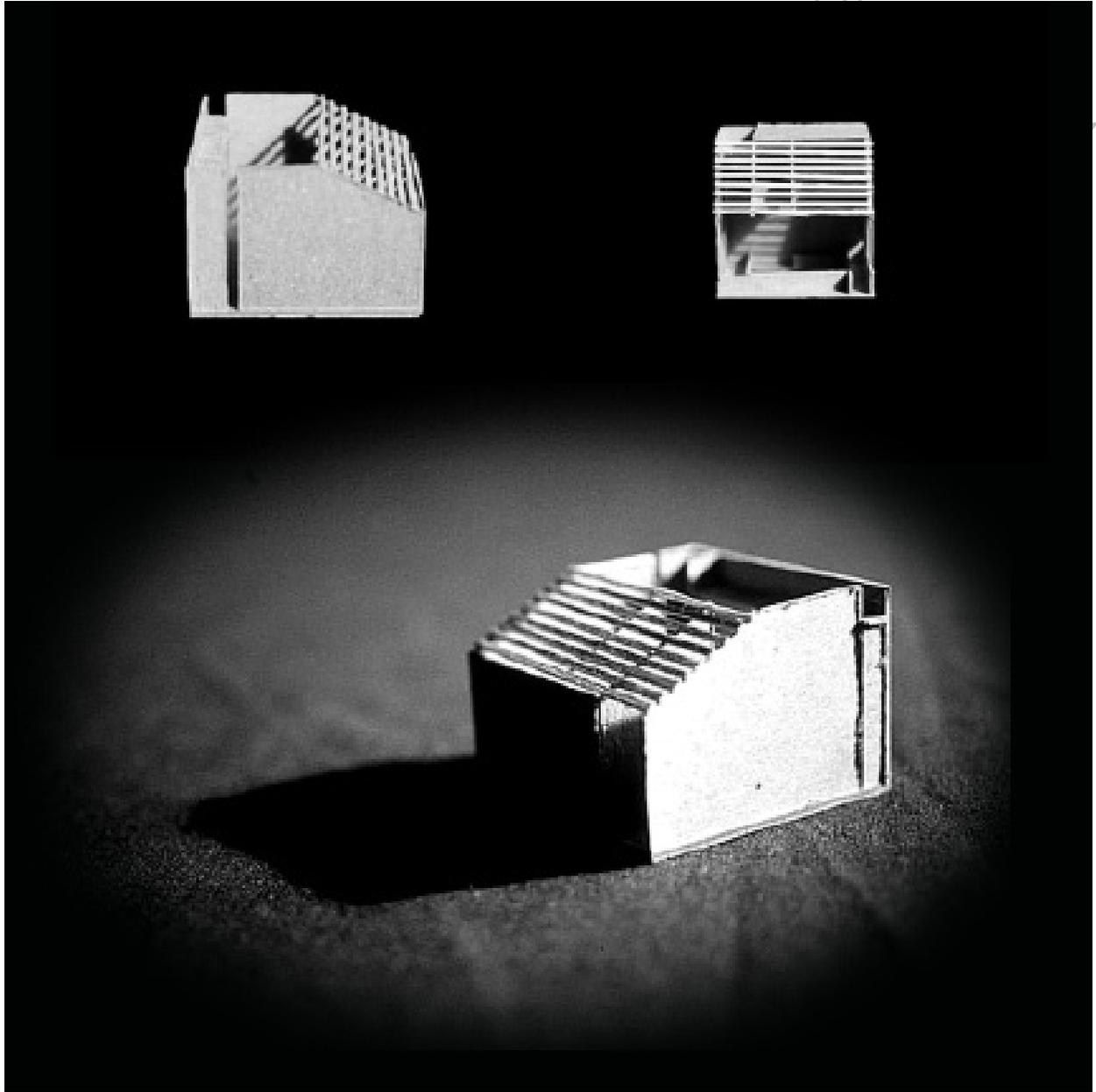
***Leaf***

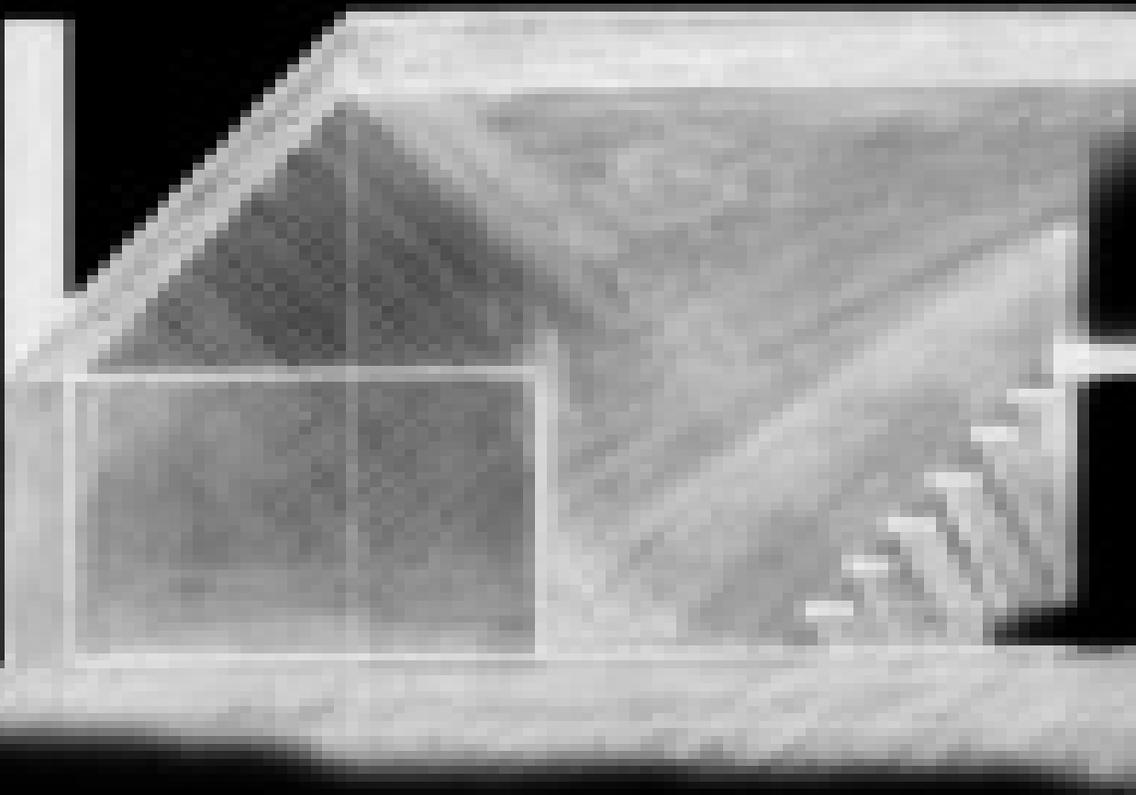
***is a Tree***

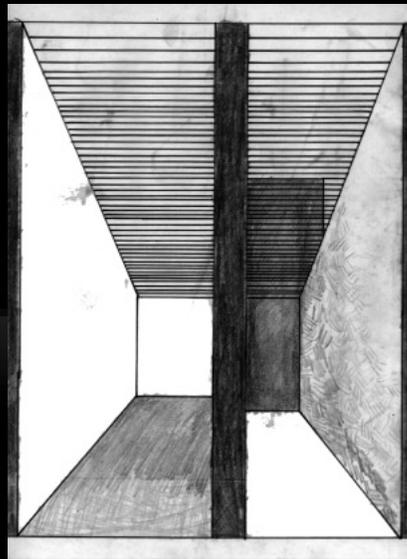
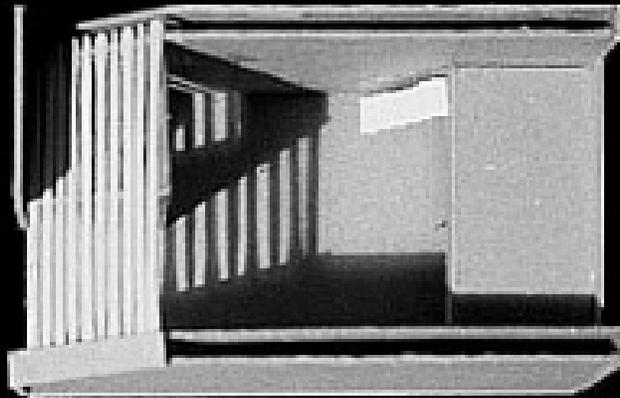
***The Site***

***Topography***









***XS: A Room***

*S: One House*

***L:COMMUNITY***

*Reciprocity in  
Architecture*

*Introduction:*

*Reciprocity*

*The Beginning*

*Methodology*

*A Tree is a*

*Leaf*

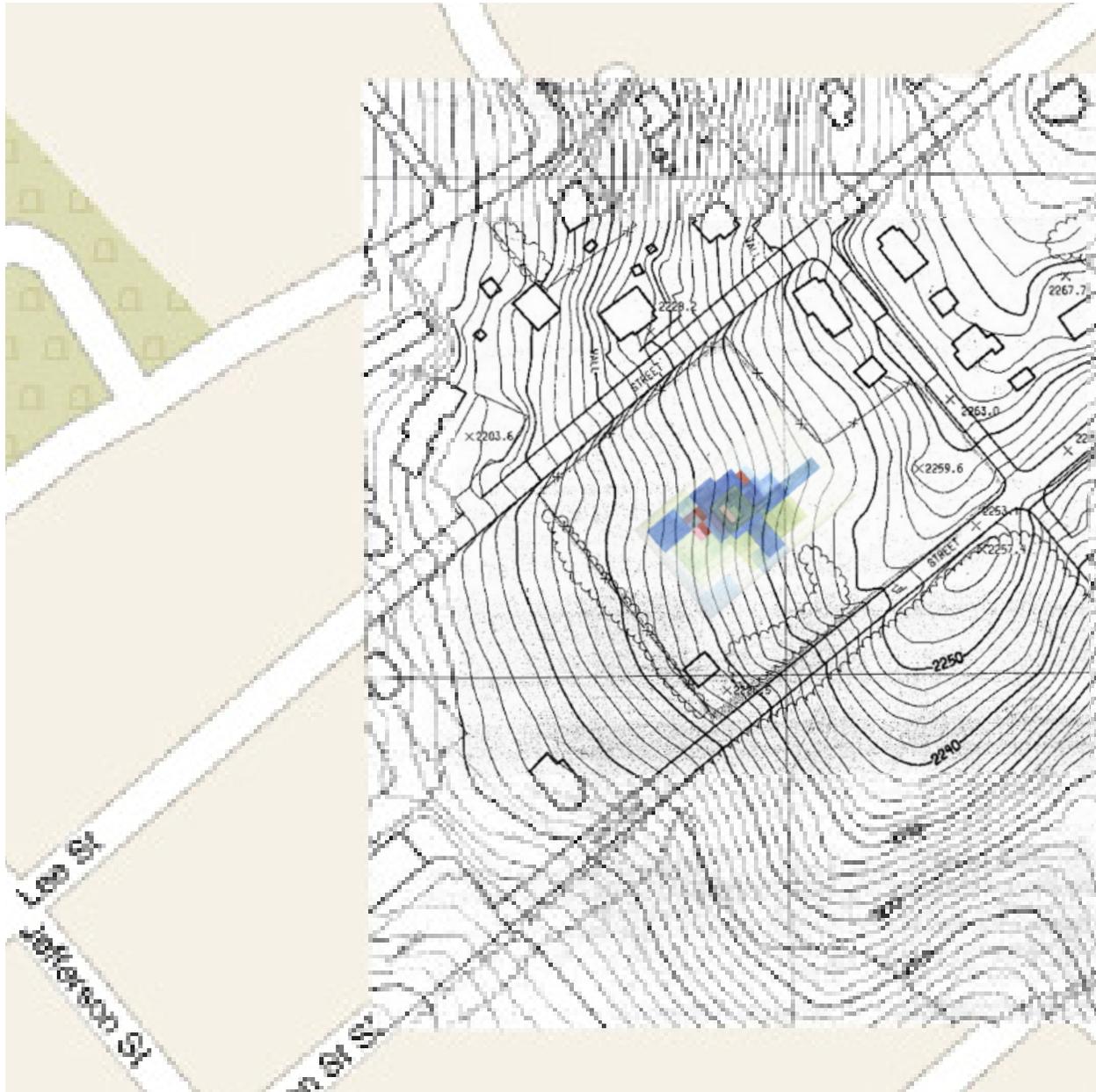
*is a Tree*

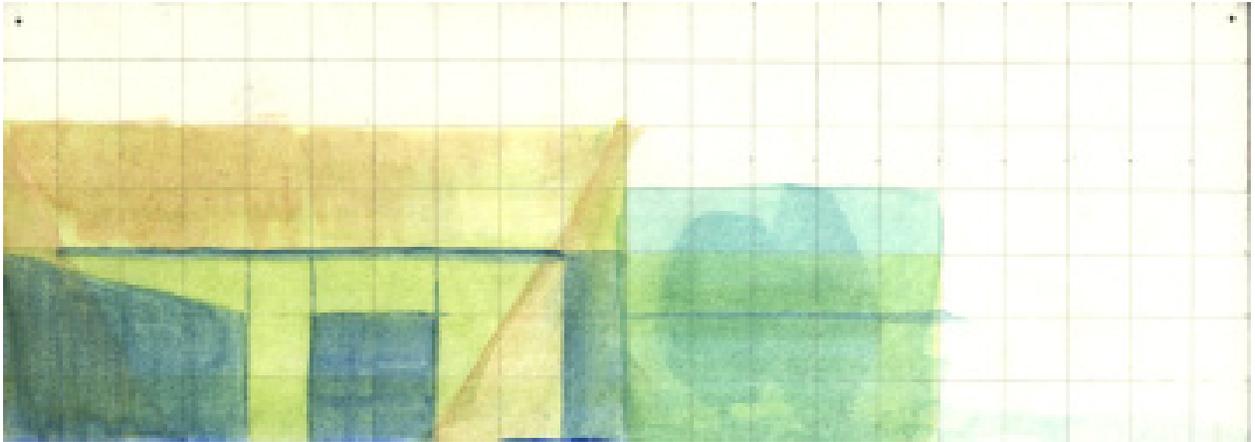
*The Site*

*Topography*

# *The Potential of Reciprocity in Scale/ Geometry*

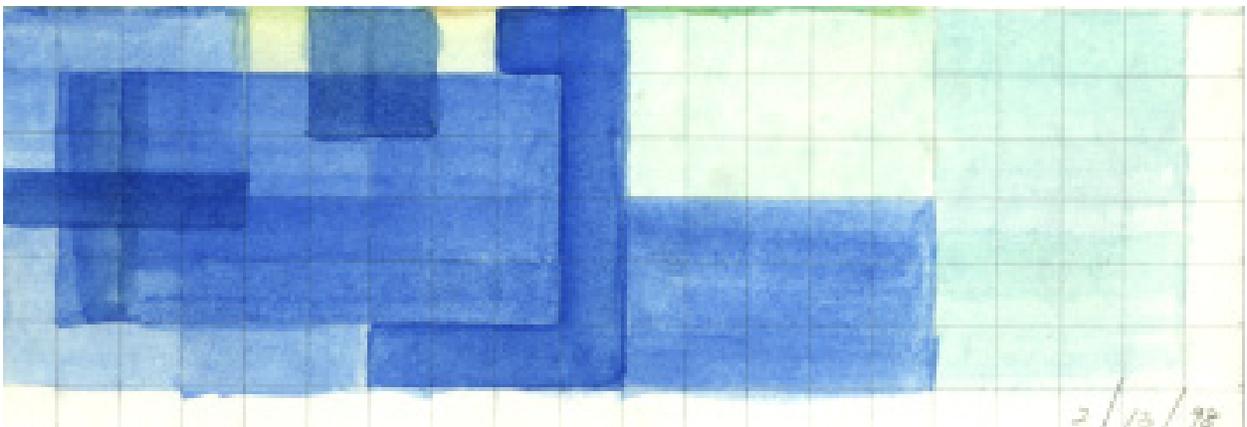
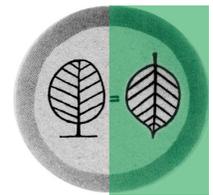
**S: A Leaf = One House House No. 1**

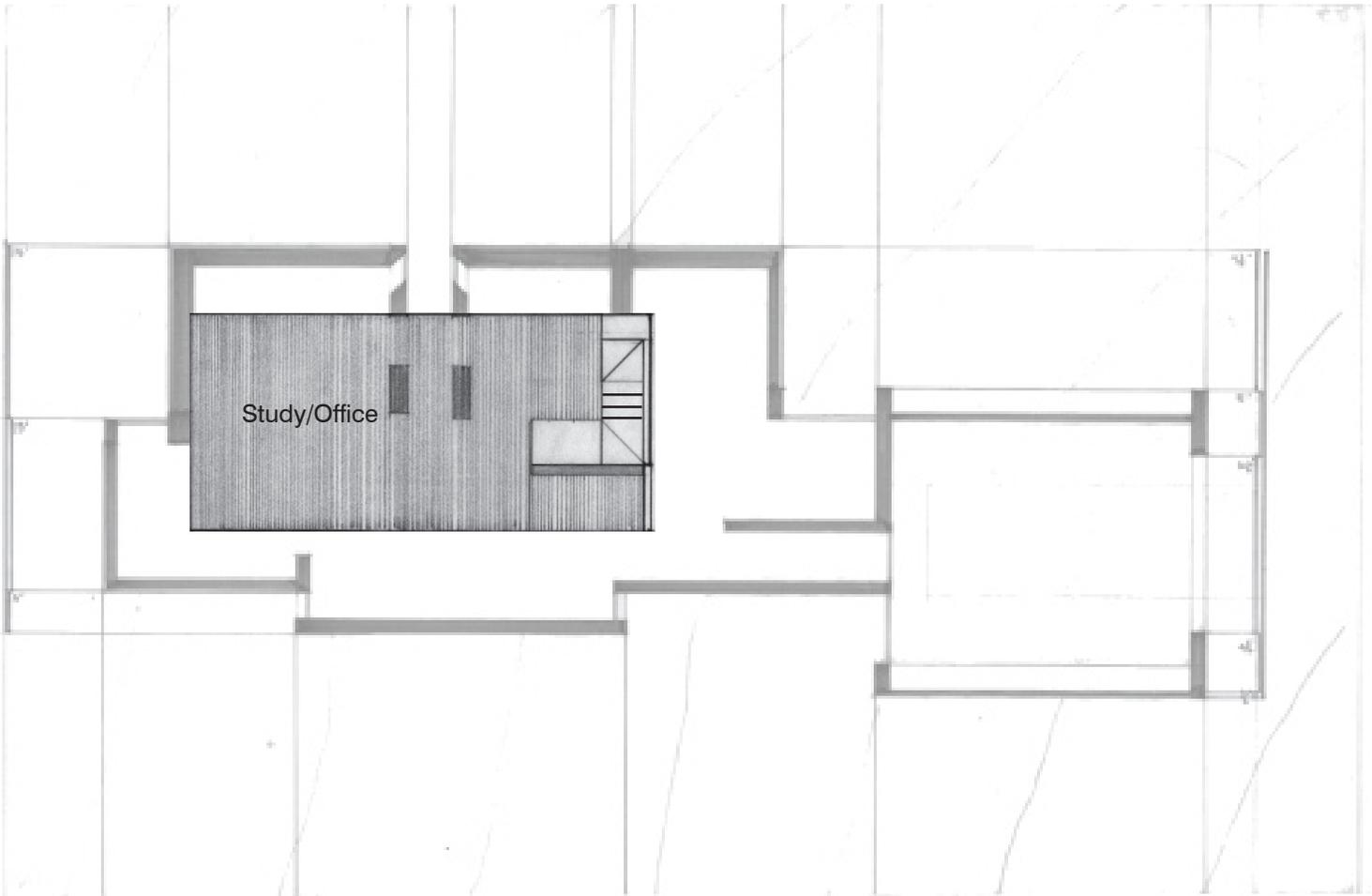




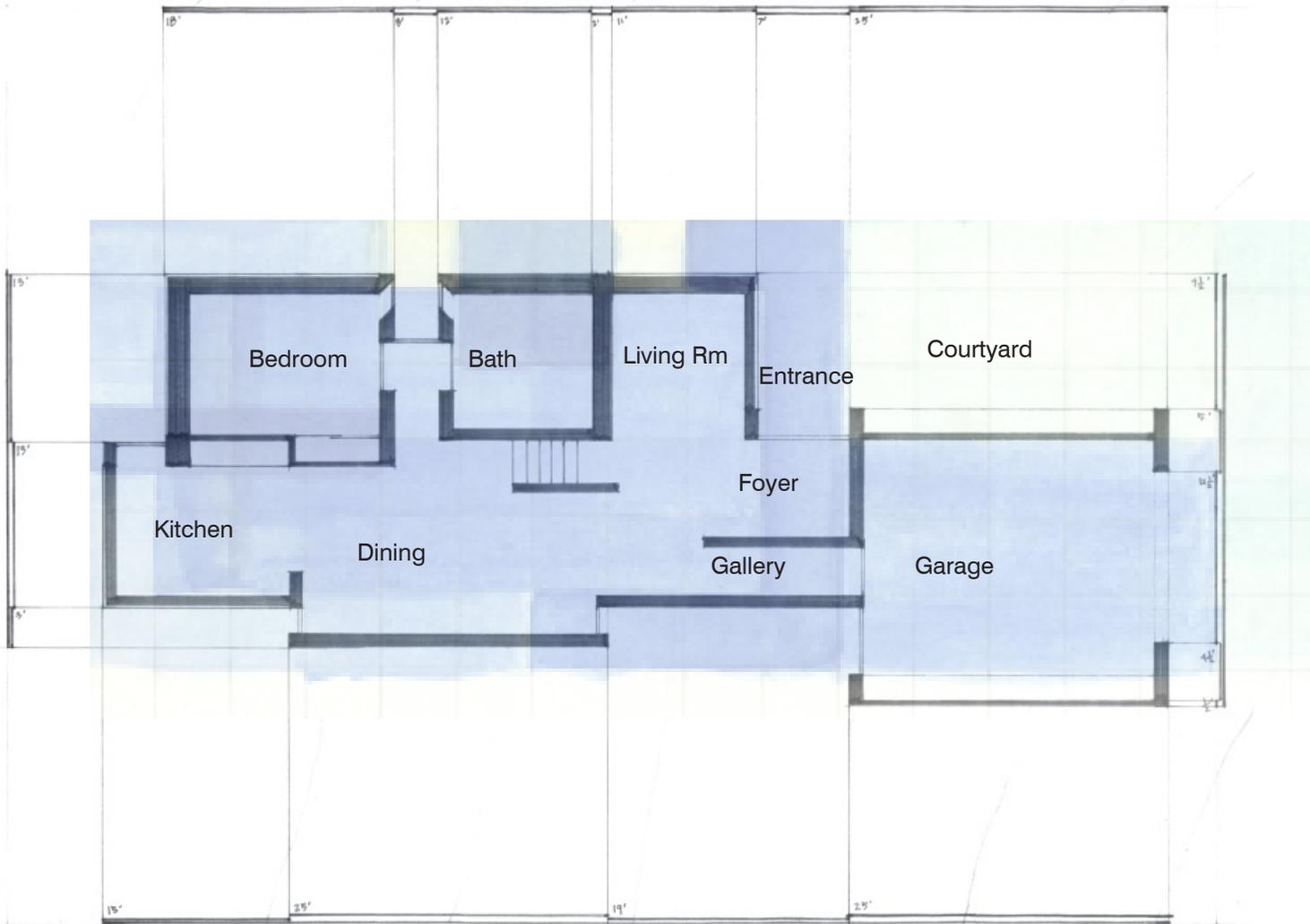
***S: A Leaf = One House***

***House No. 1: Bigger than a room***

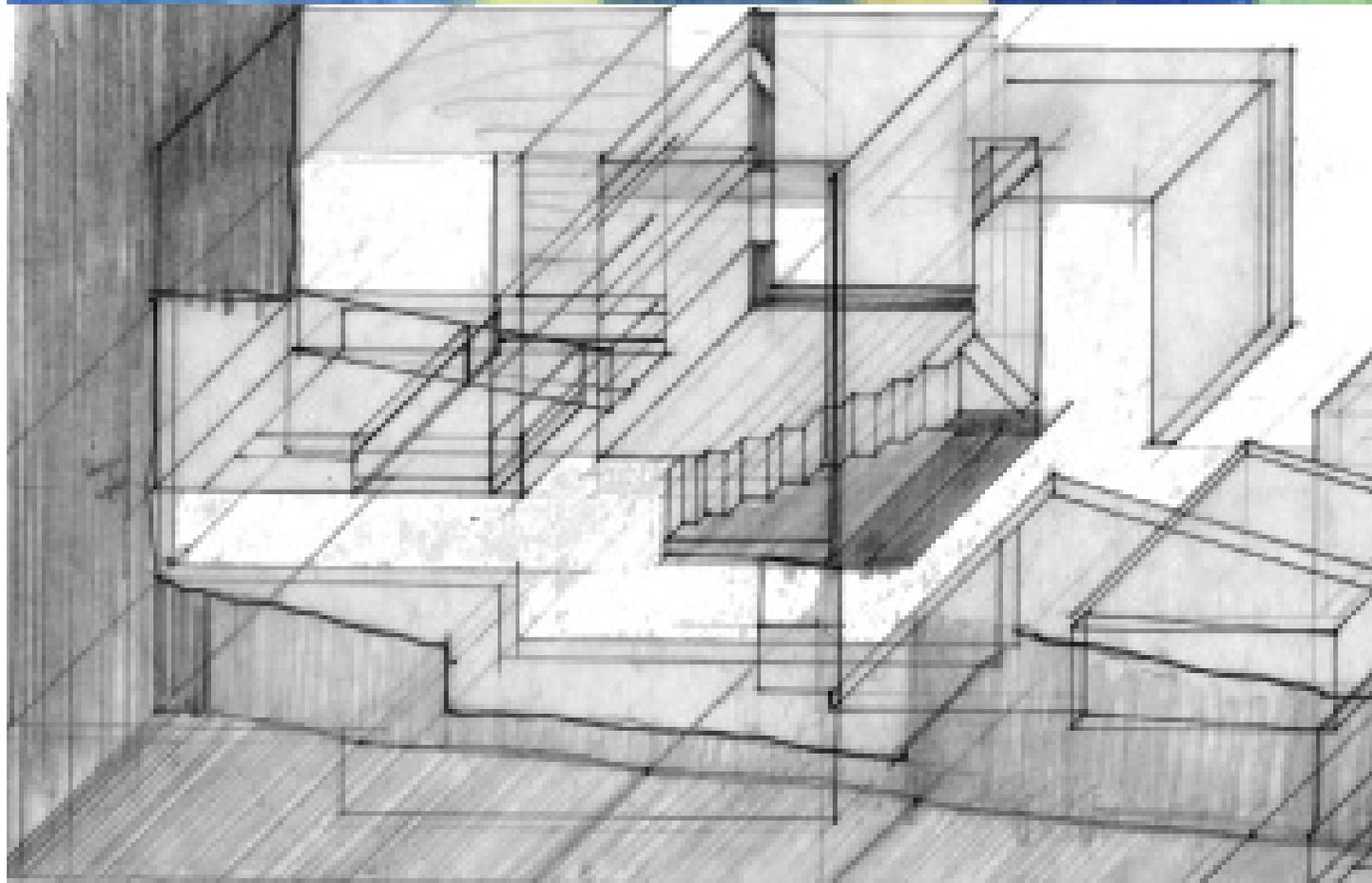
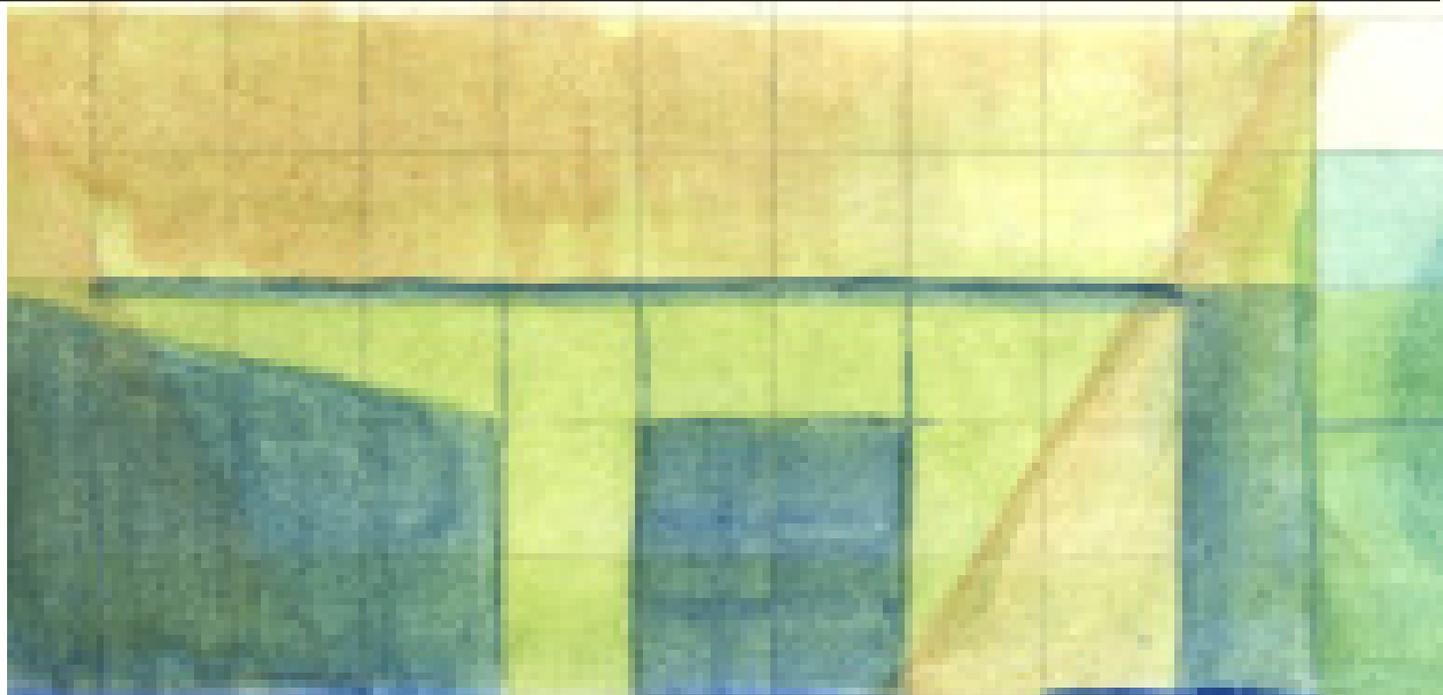


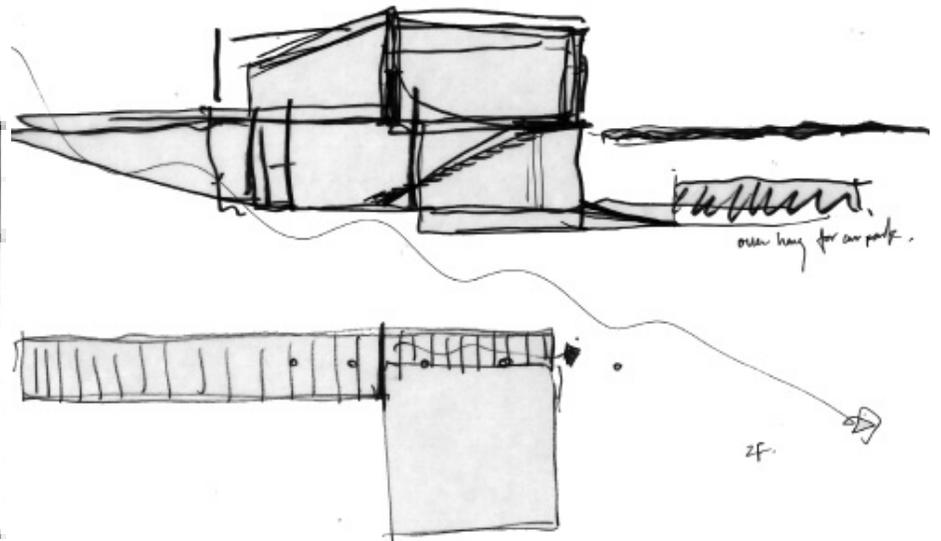
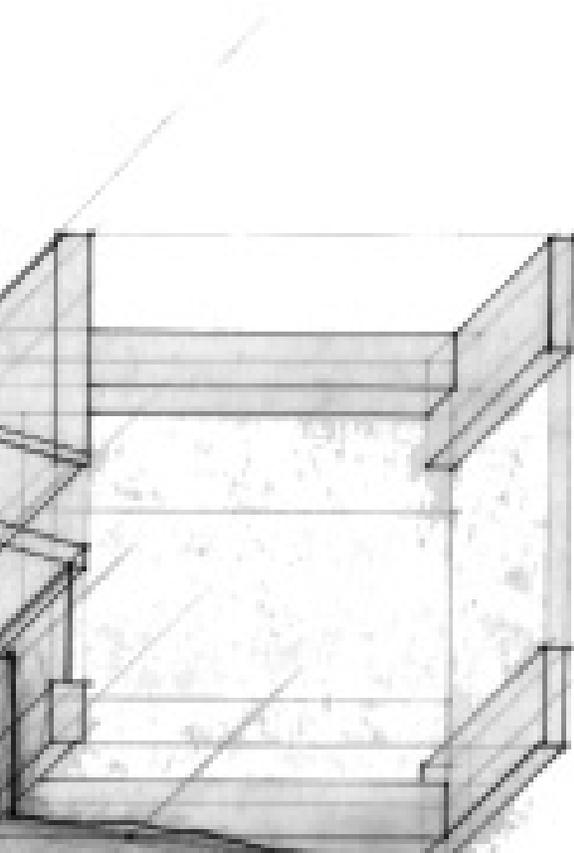
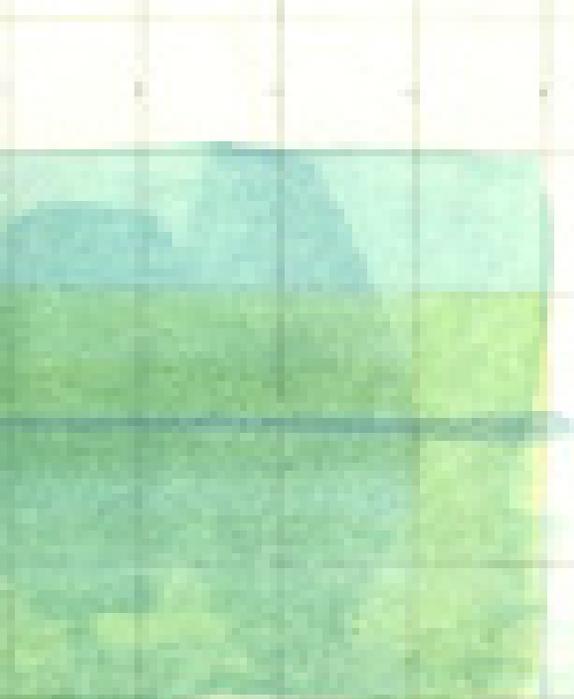


Second Floor Plan



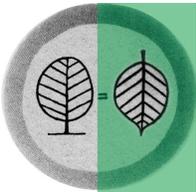
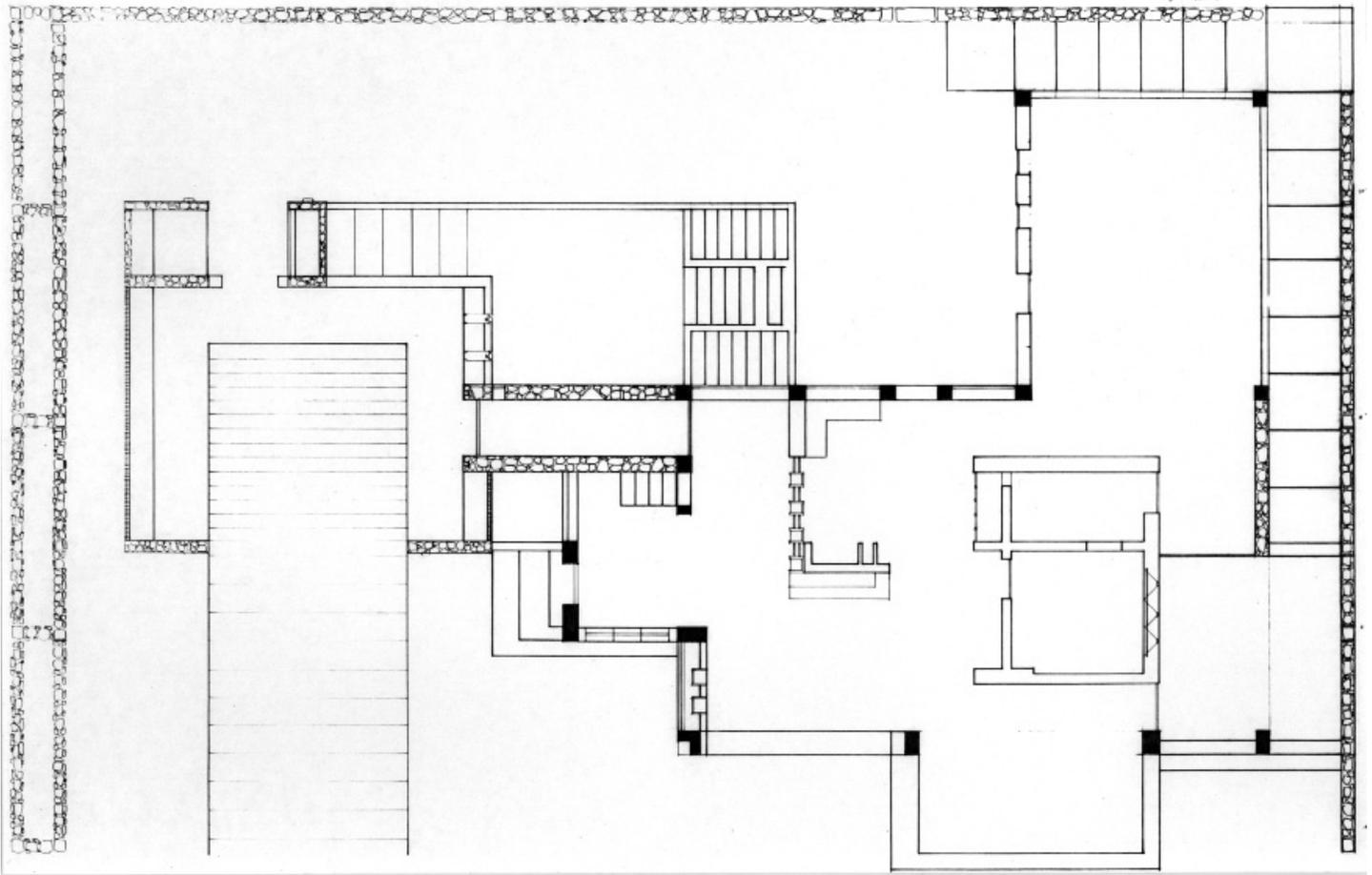
First Floor Plan



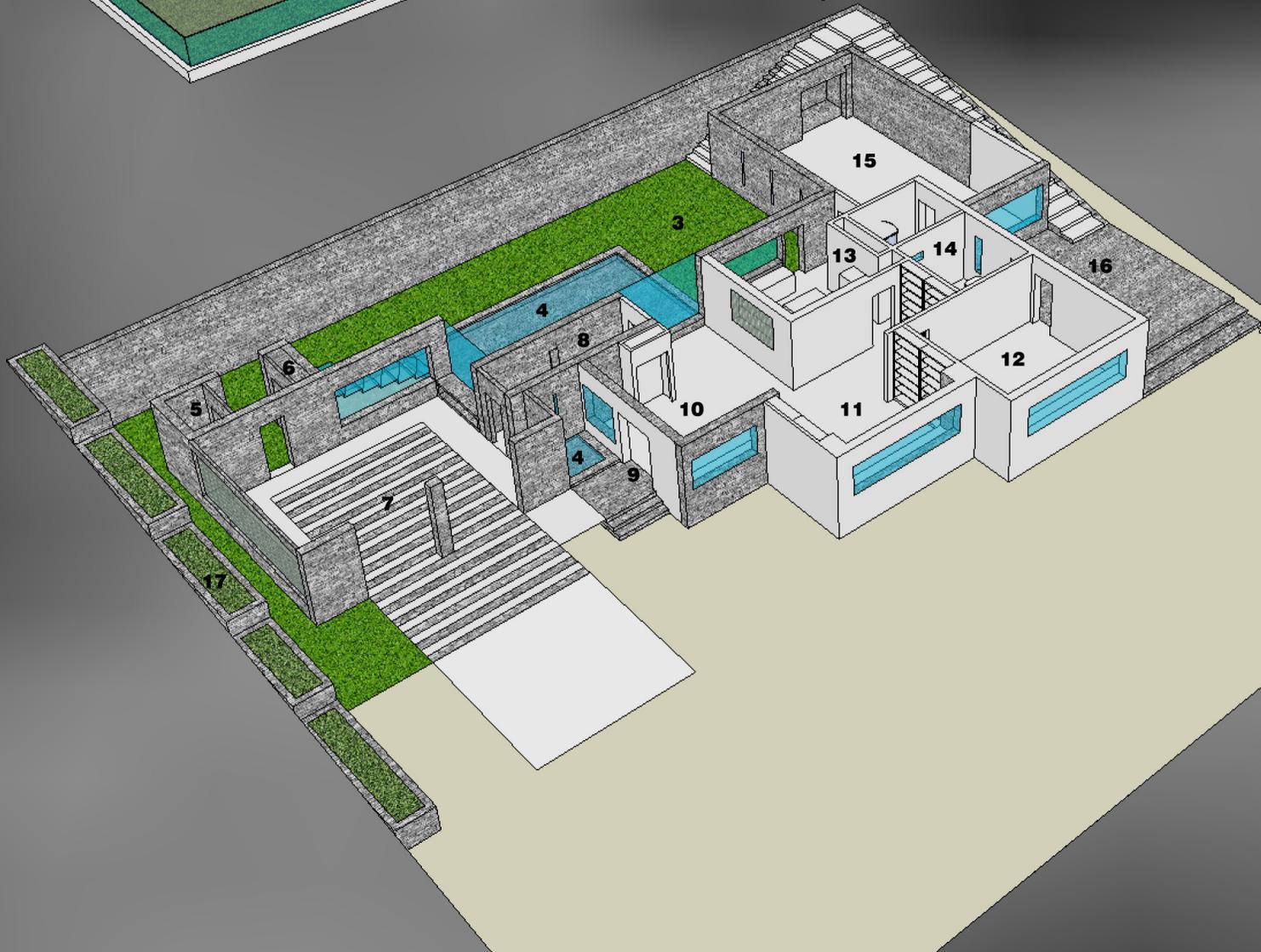
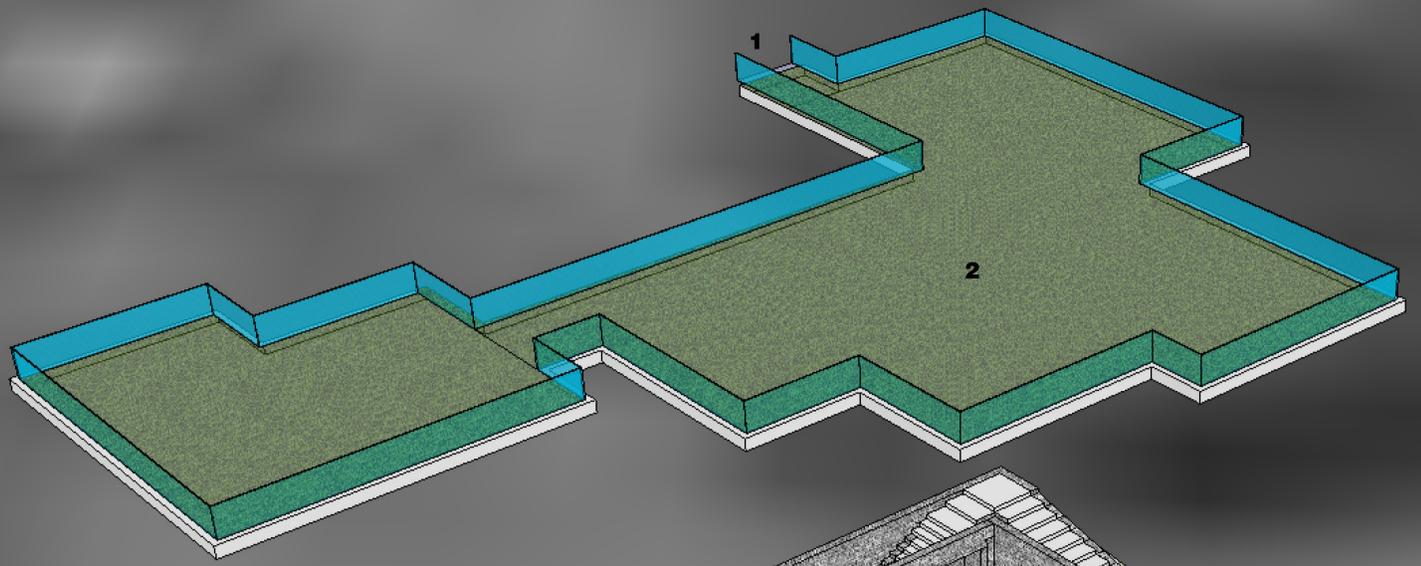


***S: A Leaf= One House***

***House No.2***







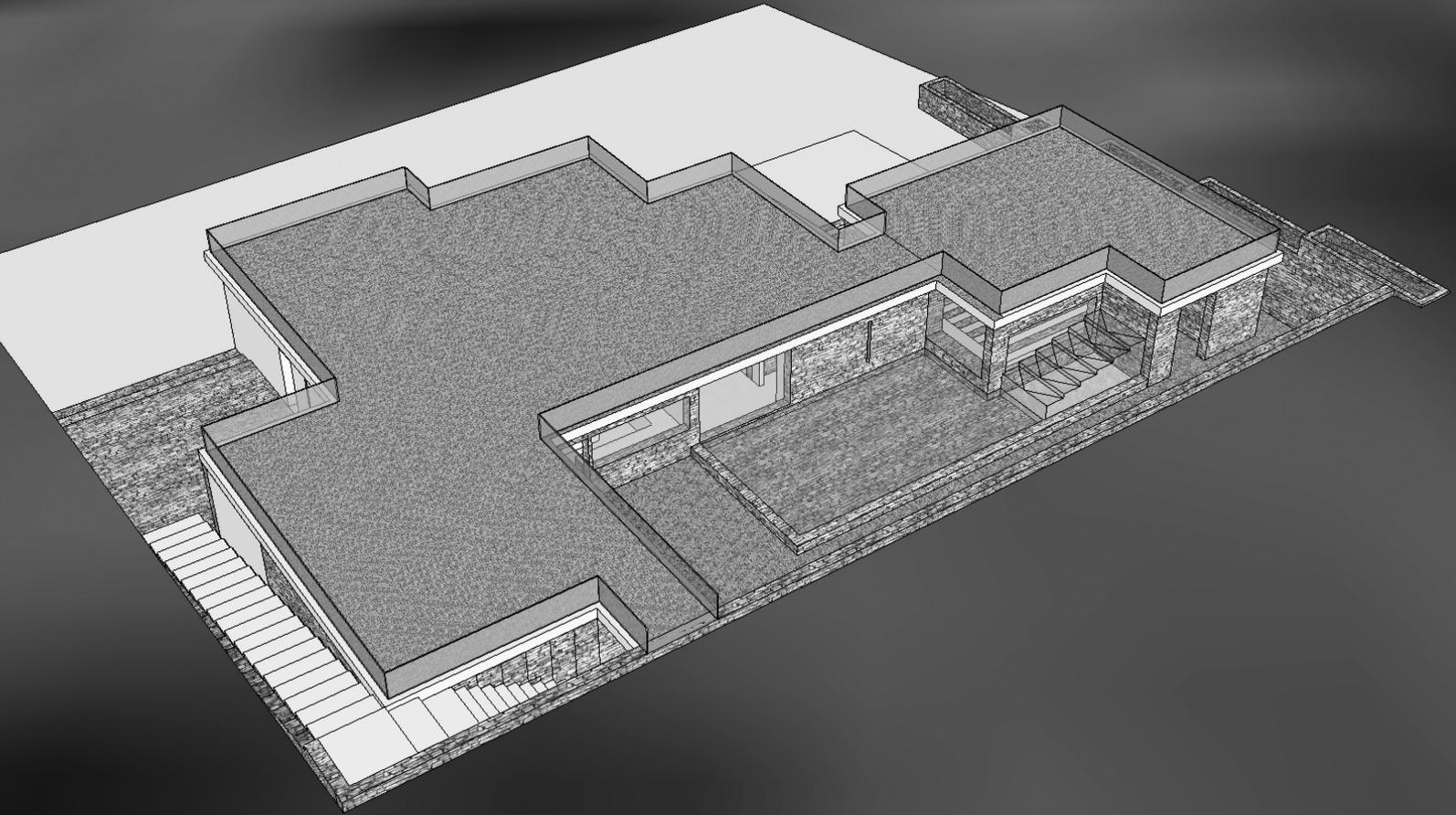
### **Outdoor Space**

1. Connection to the Slope
2. Roof Garden
3. Courtyard
4. Reflection Pool
5. Storage
6. Mechanical Room

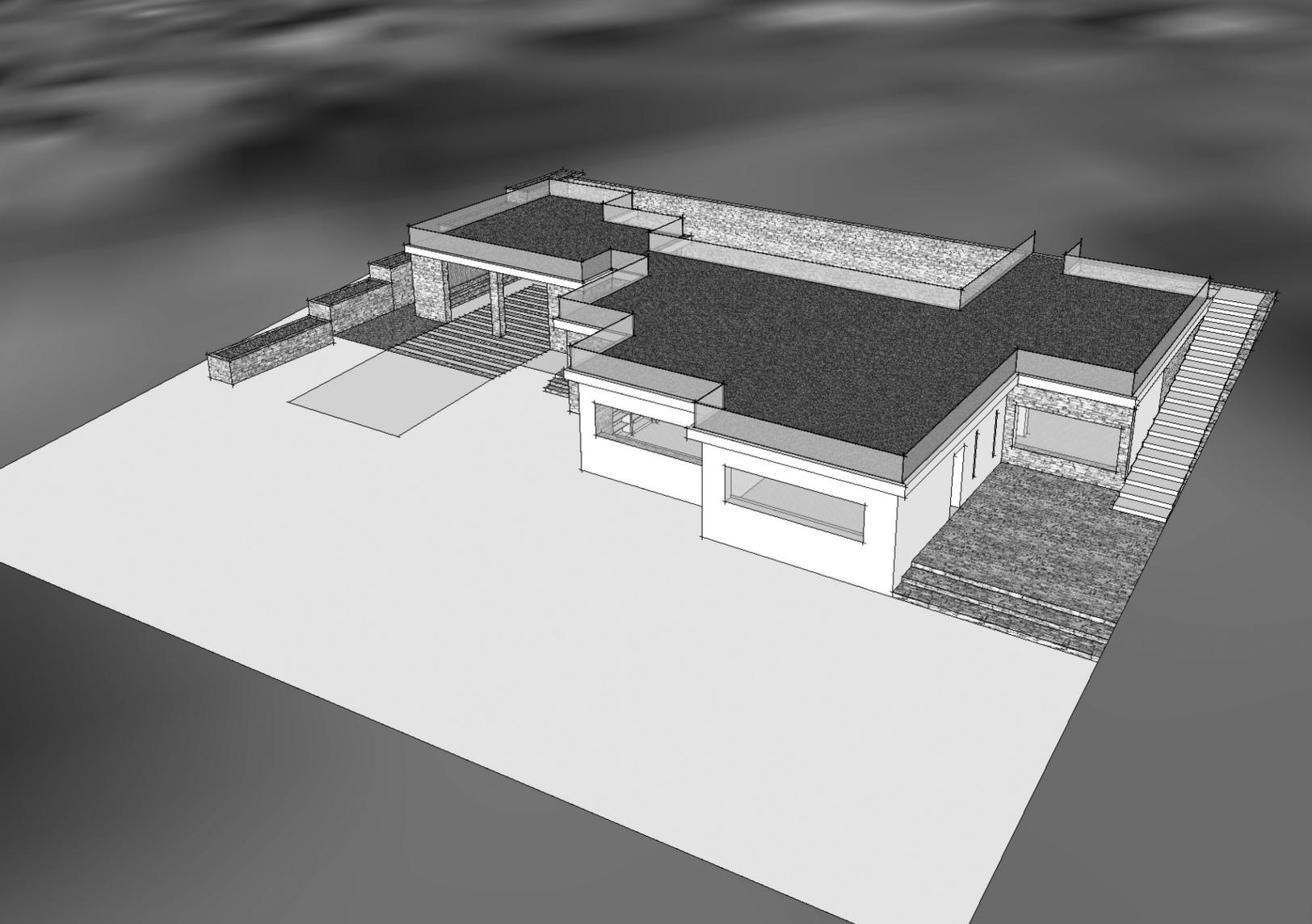
### **Indoor Space**

7. Garage  
with Textured Floor
8. Gallery  
Bridge Connects Garage  
and Living space
9. Entrance to House
10. Foyer
11. Living/Library
12. Bedroom
13. Kitchen
14. Bathroom
15. Master Suite with Bath
16. Patio

The design of one house is metaphorically protected and surrounded by the site and open to the field. The first floor plan is clarified by the motif of being protected and the second floor is clarified by the motif of an island. The second floor interacts with the site using a bridged connection to the slope. The synthetic is being protected by the natural. Nature is something that can never be conquered, but rather that with which we must communicate. To place a man-made object within nature, it's placement has to be harmonious.



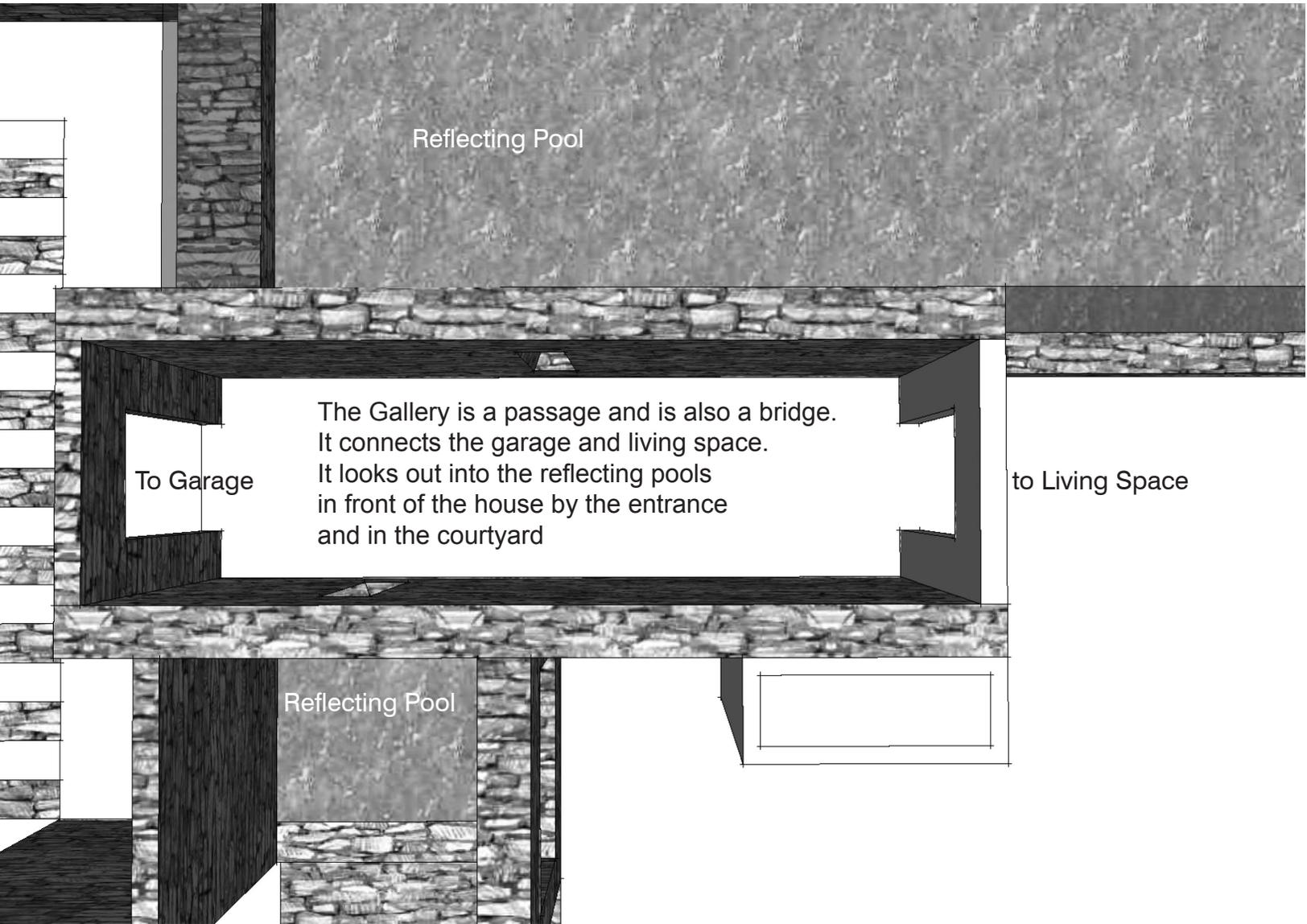
Rear view  
Showing connection of roof garden and the slope

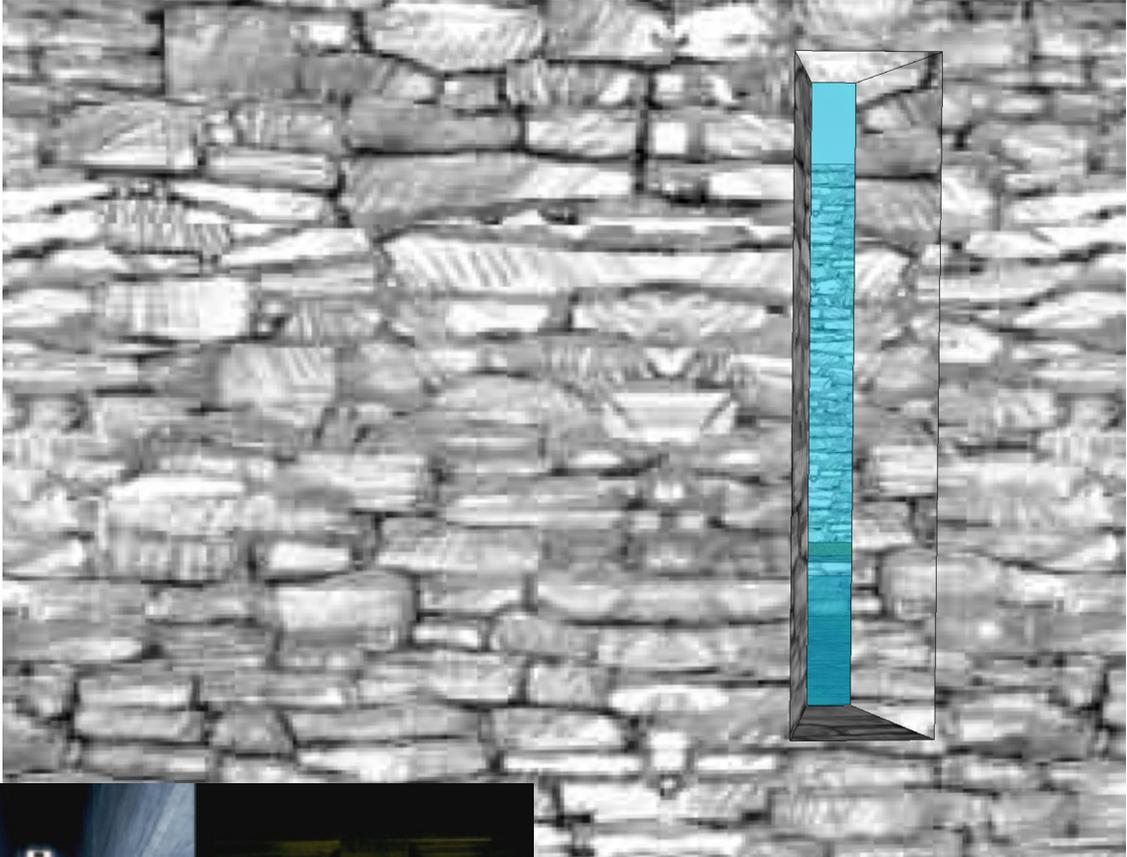


Front view

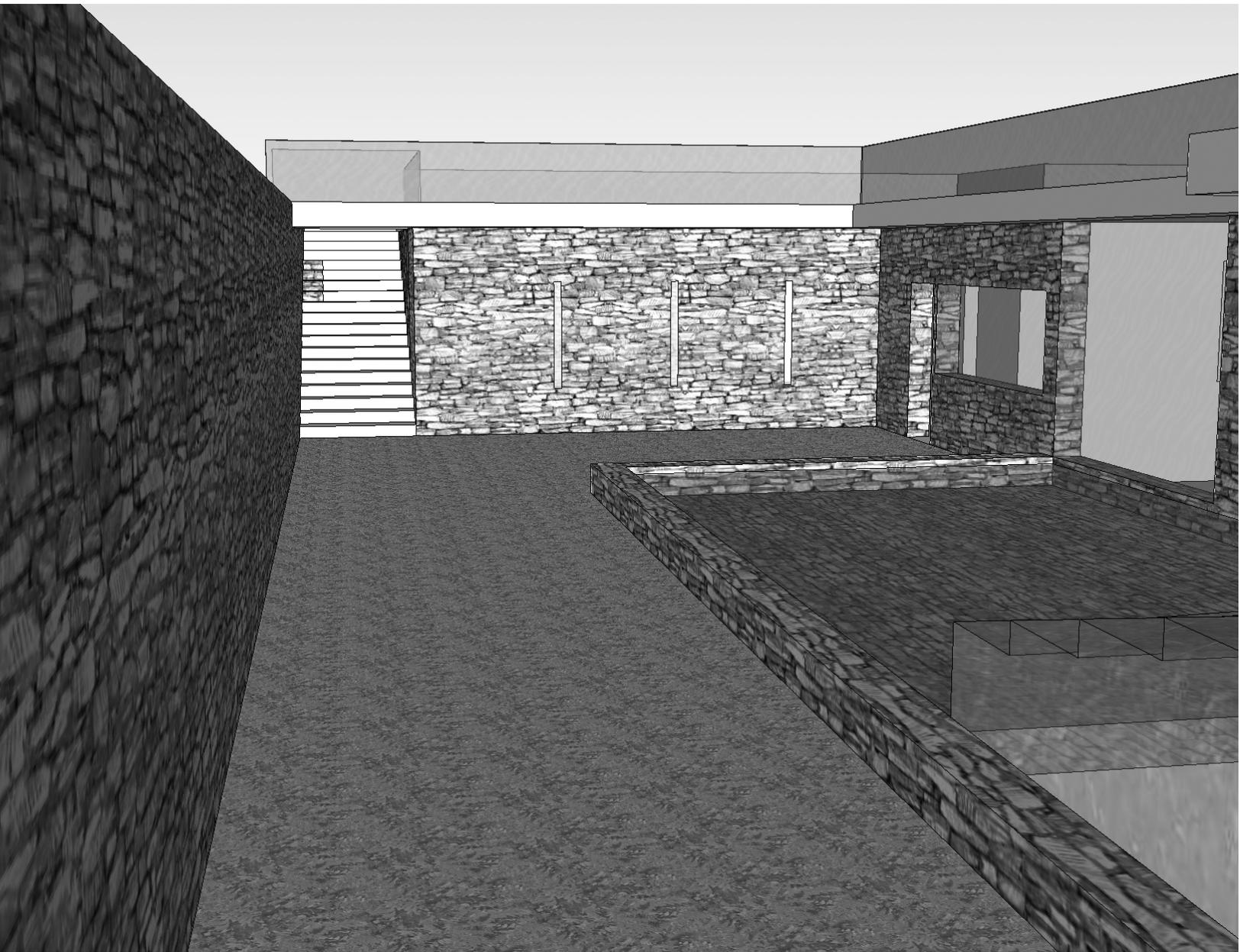








Window in the Gallery

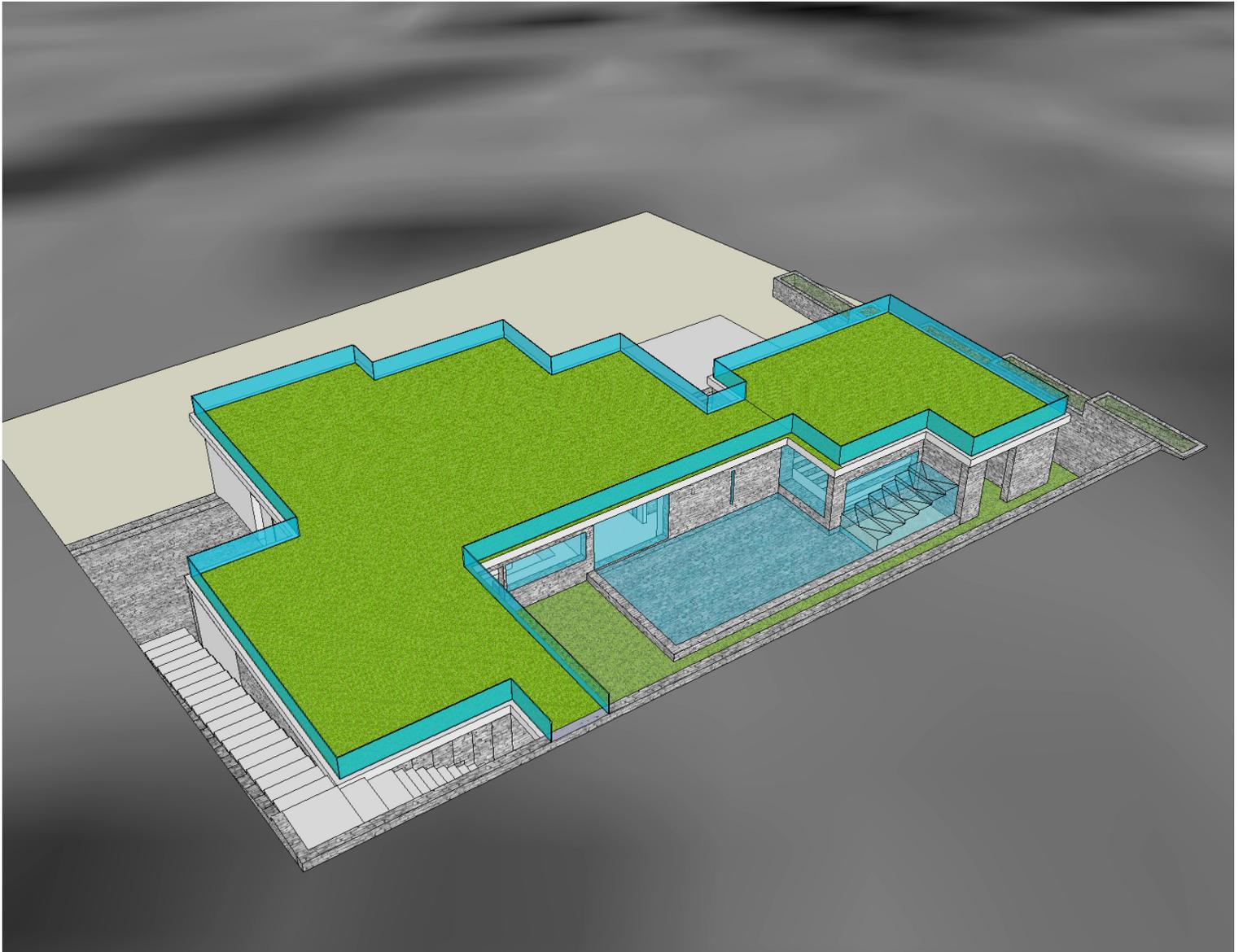


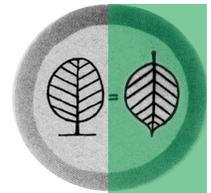
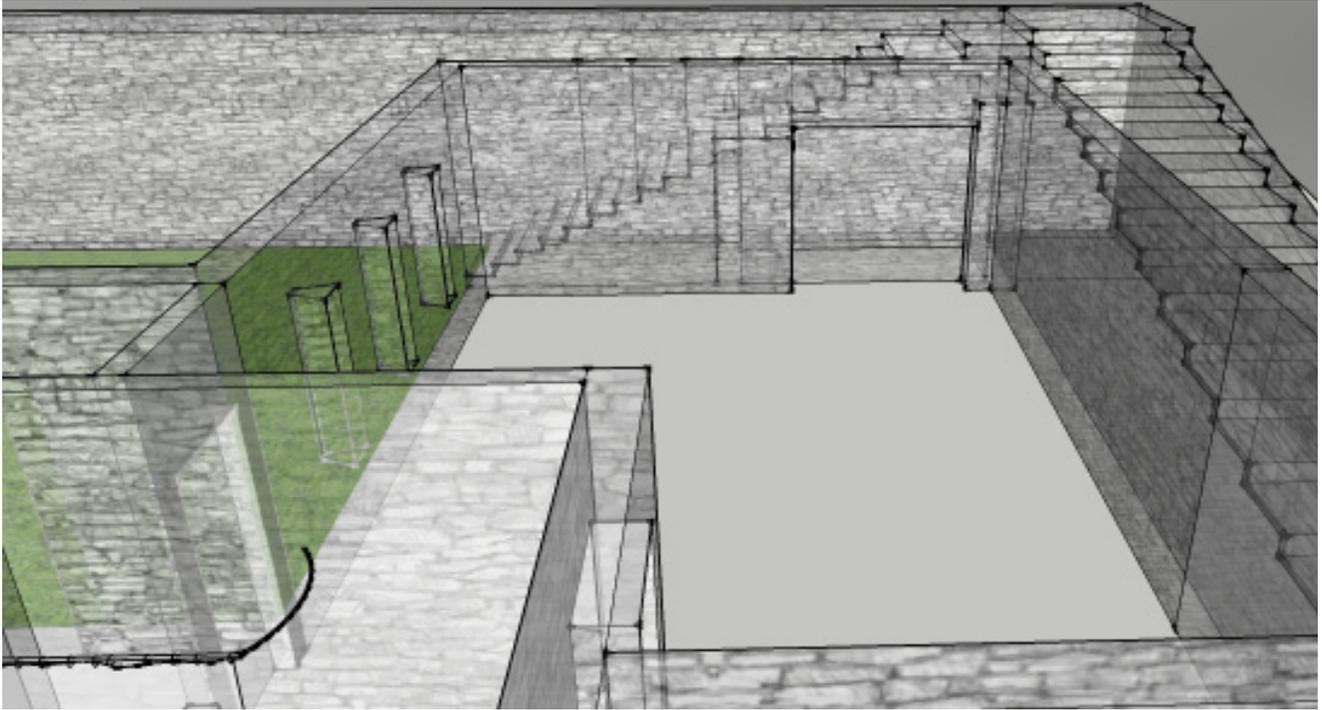


Garage Entrance



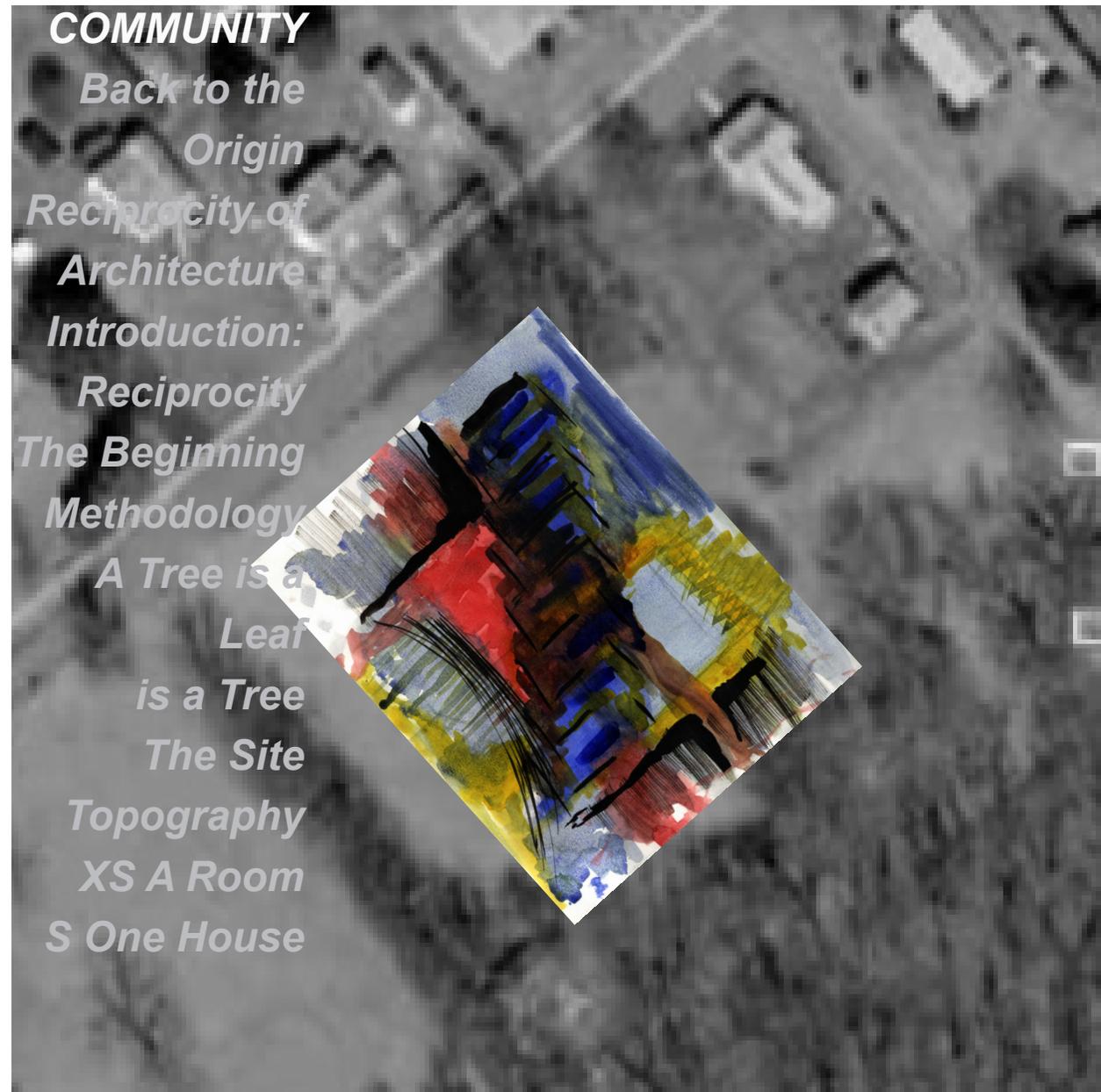
Corner of Garage looking out into Courtyard

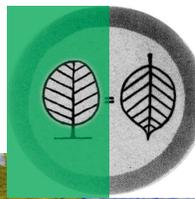




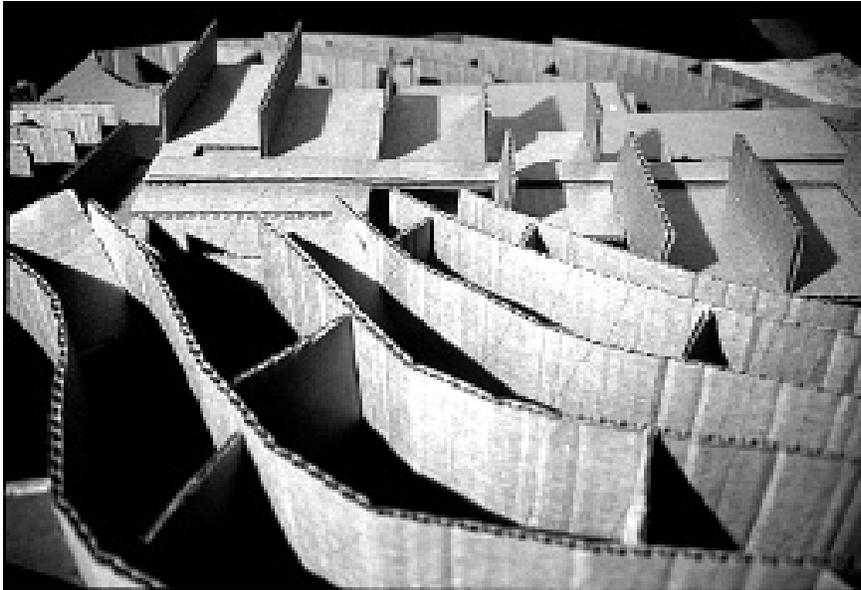
# L: A Tree = A Community:

# Houses On a Slope

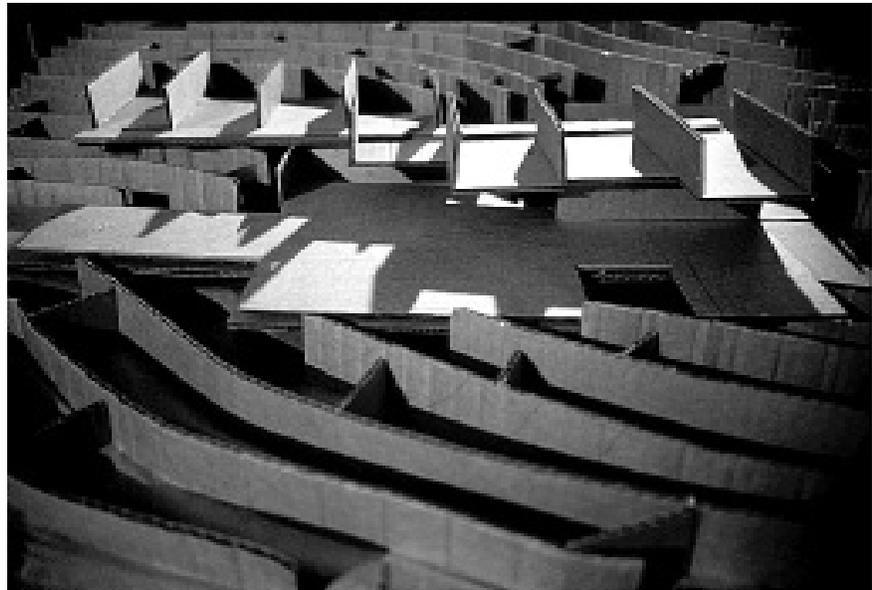




*Handwritten signature* 3-7-98



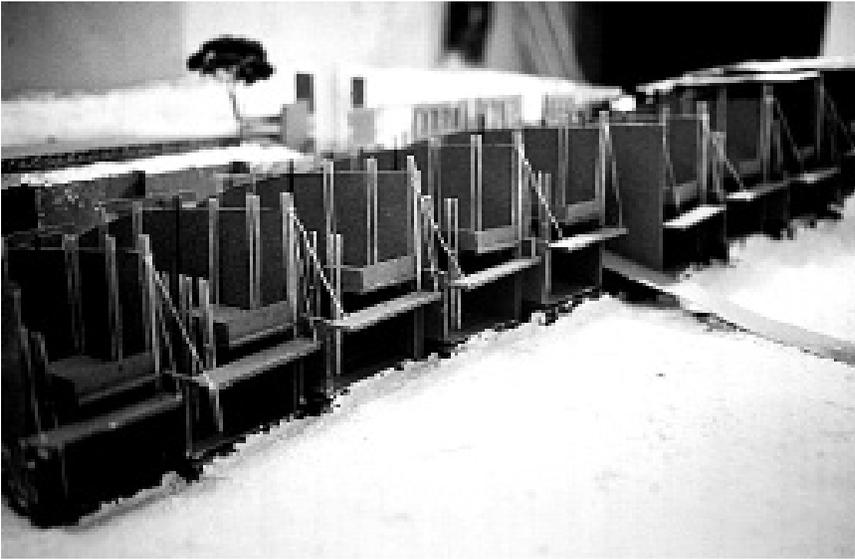
MODEL VIEWING  
DOWN THE SLOPE



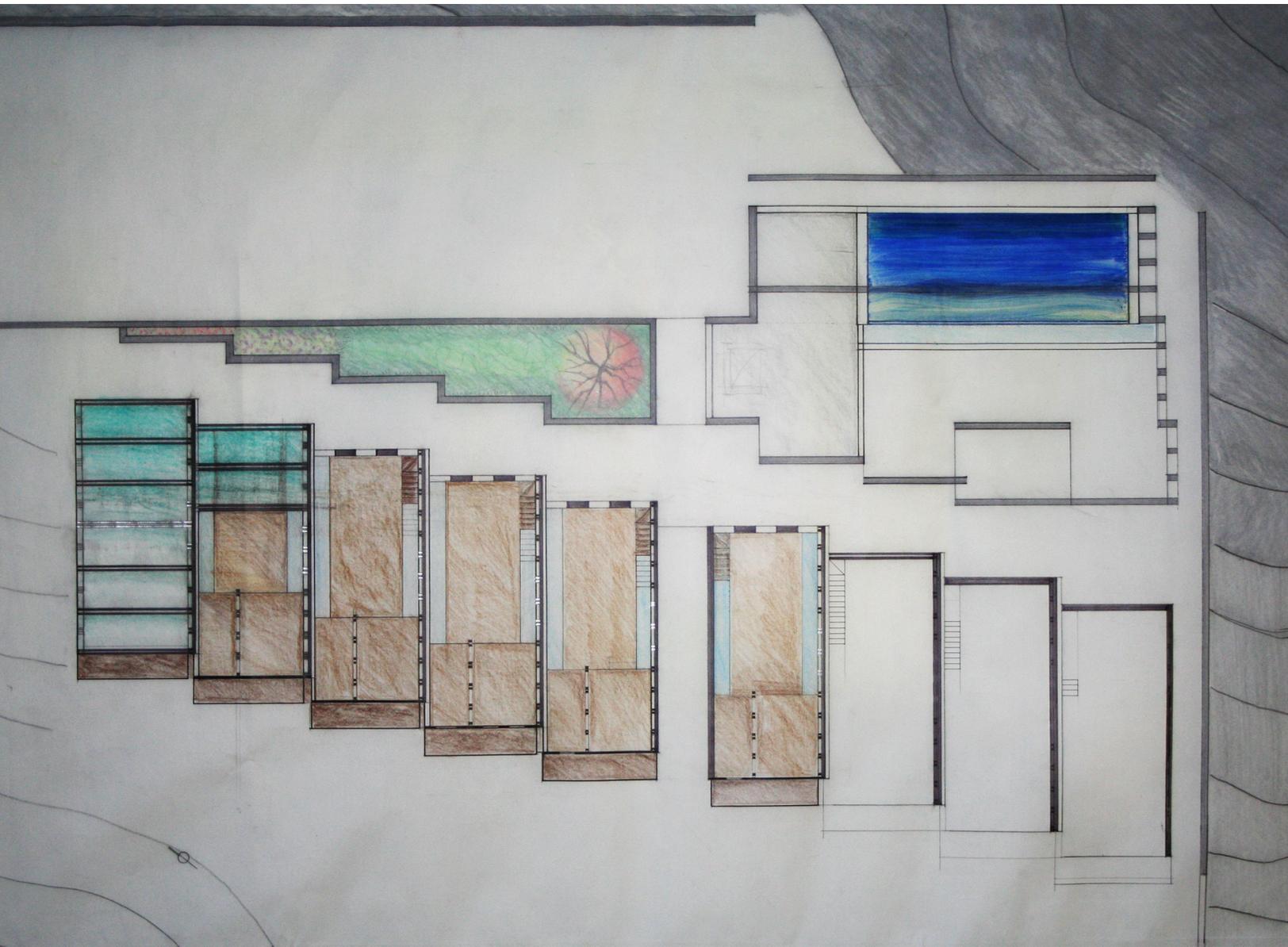
MODEL VIEWING UP  
THE SLOPE

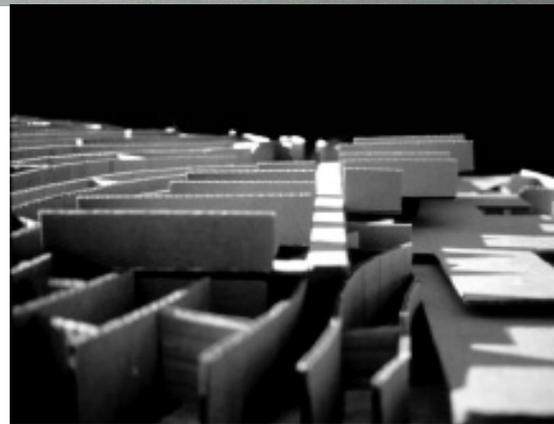
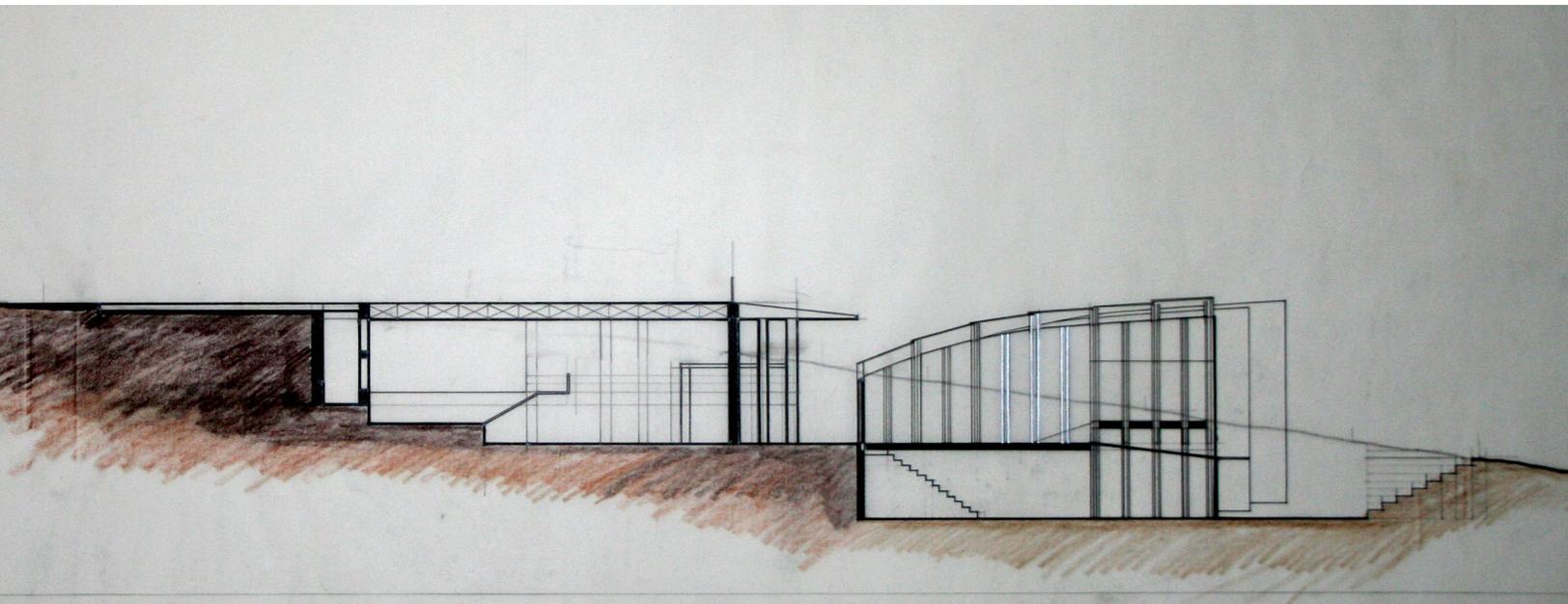


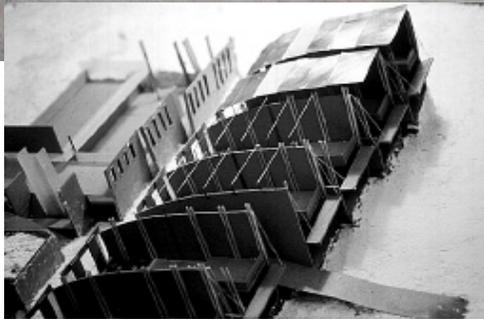
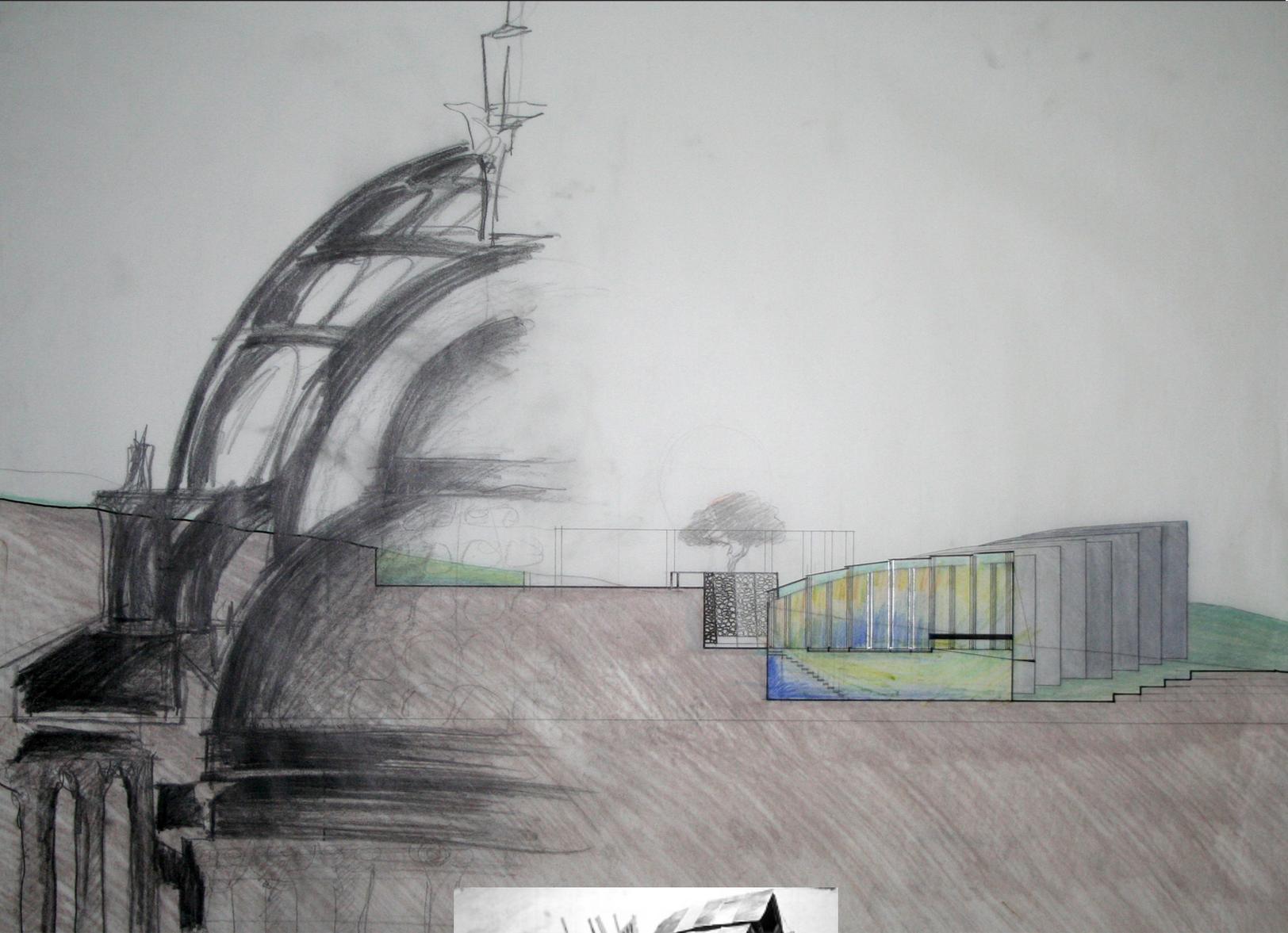
Image © 2009 Commonwealth of Virginia

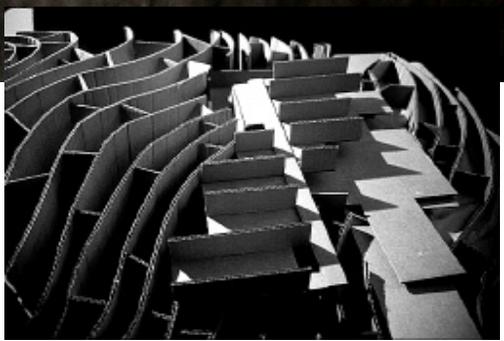
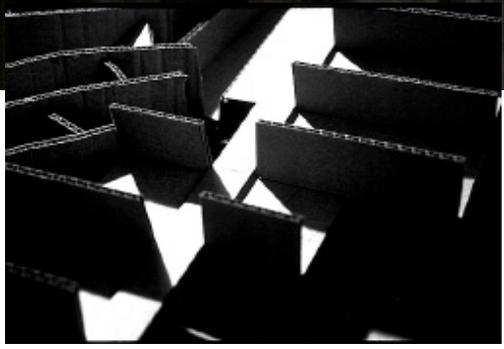
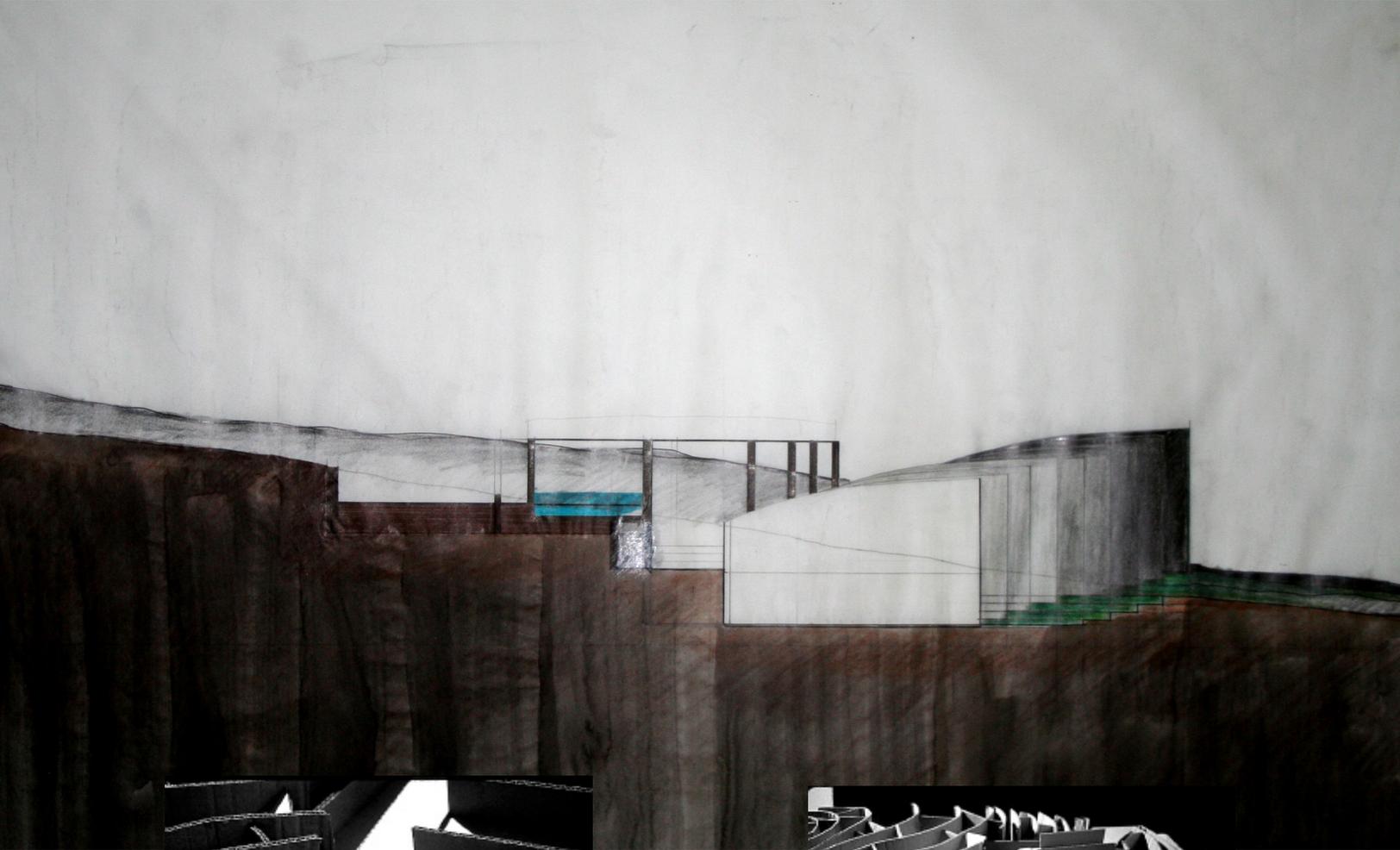
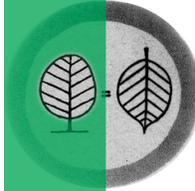


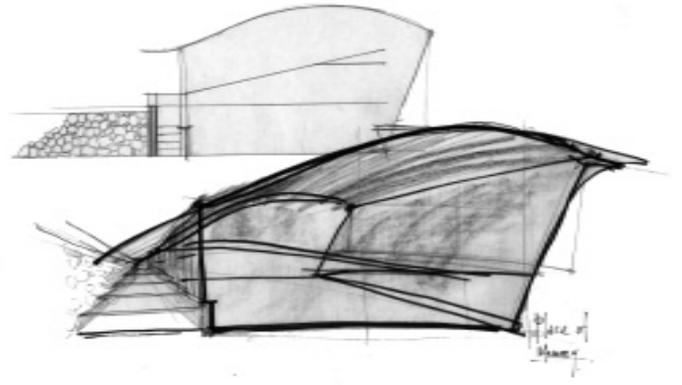
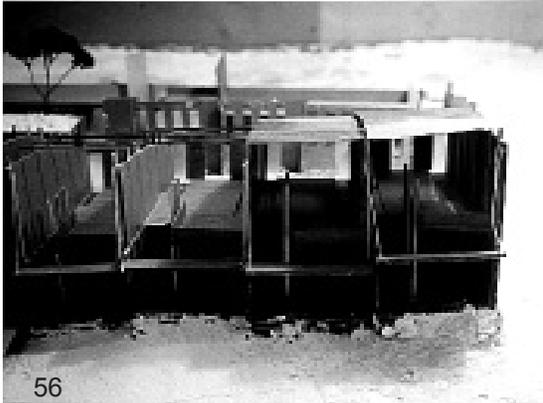
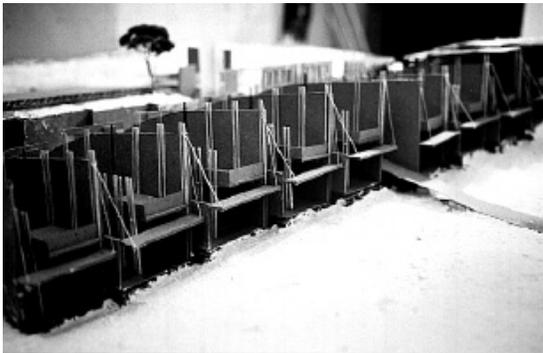
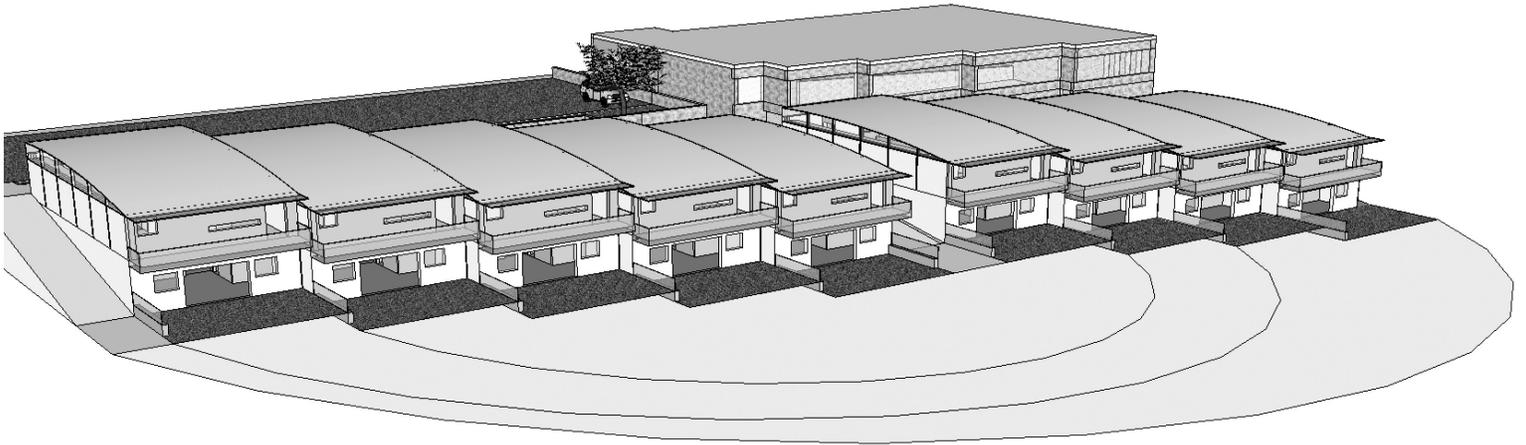


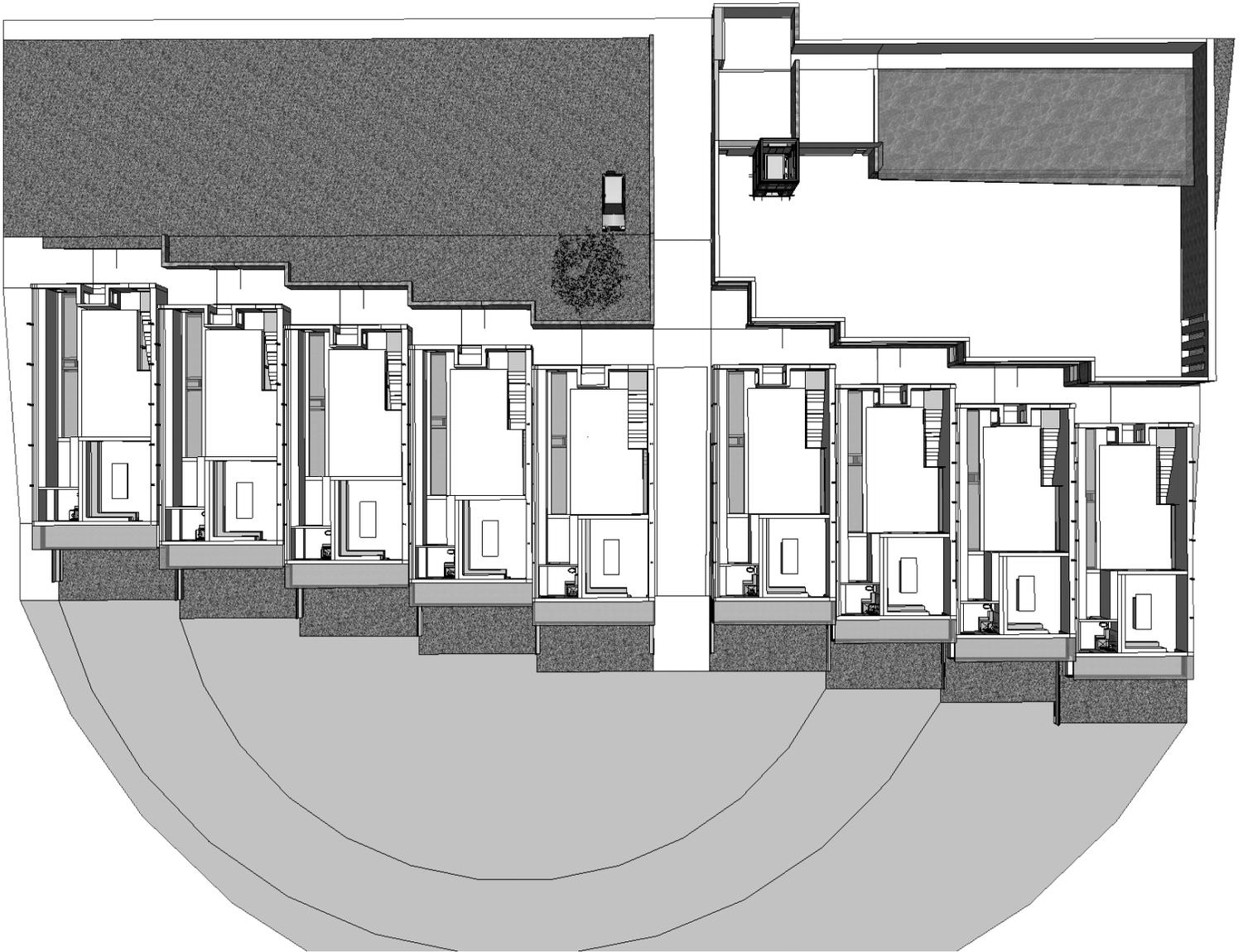


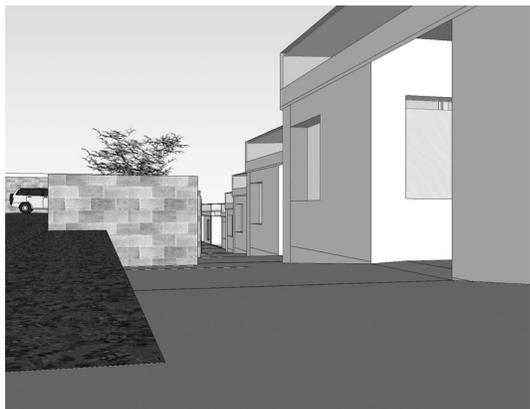
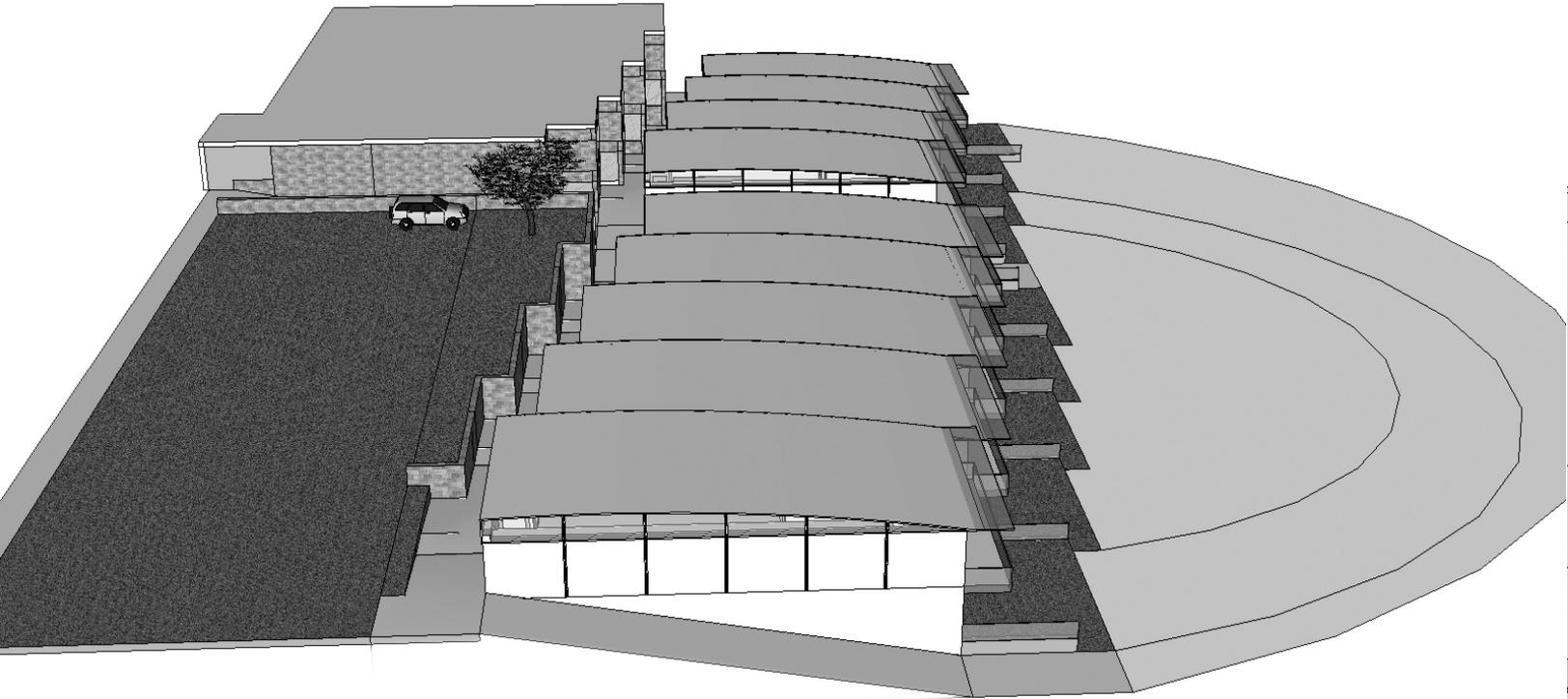


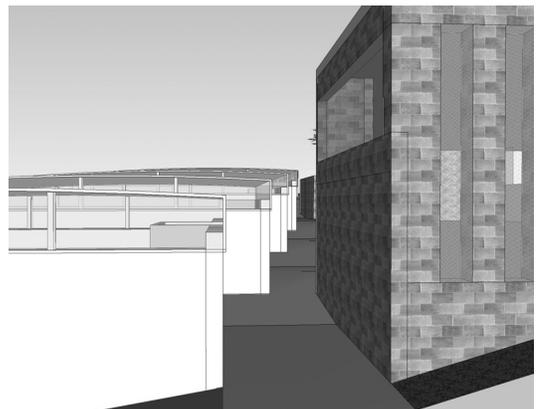
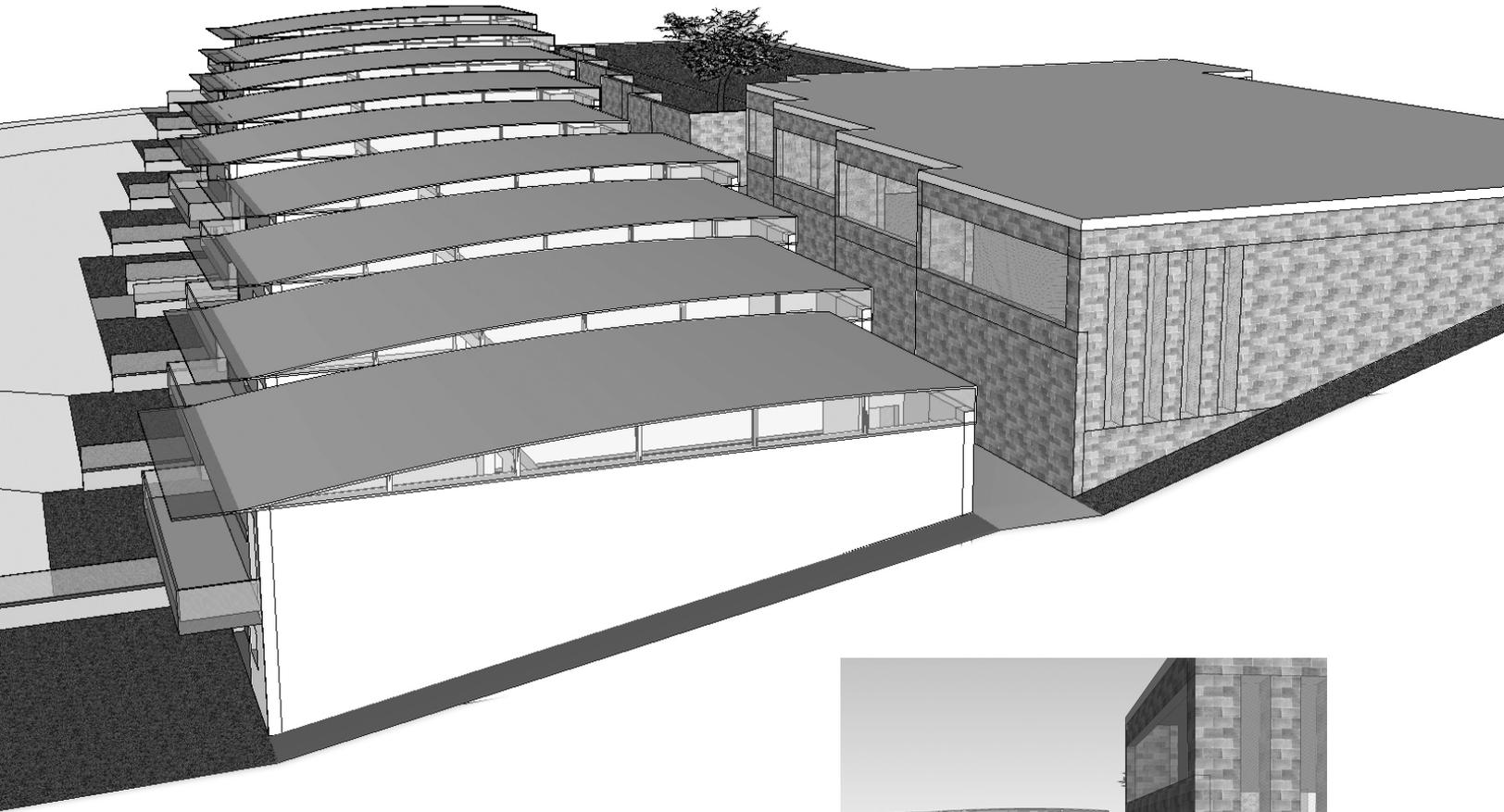


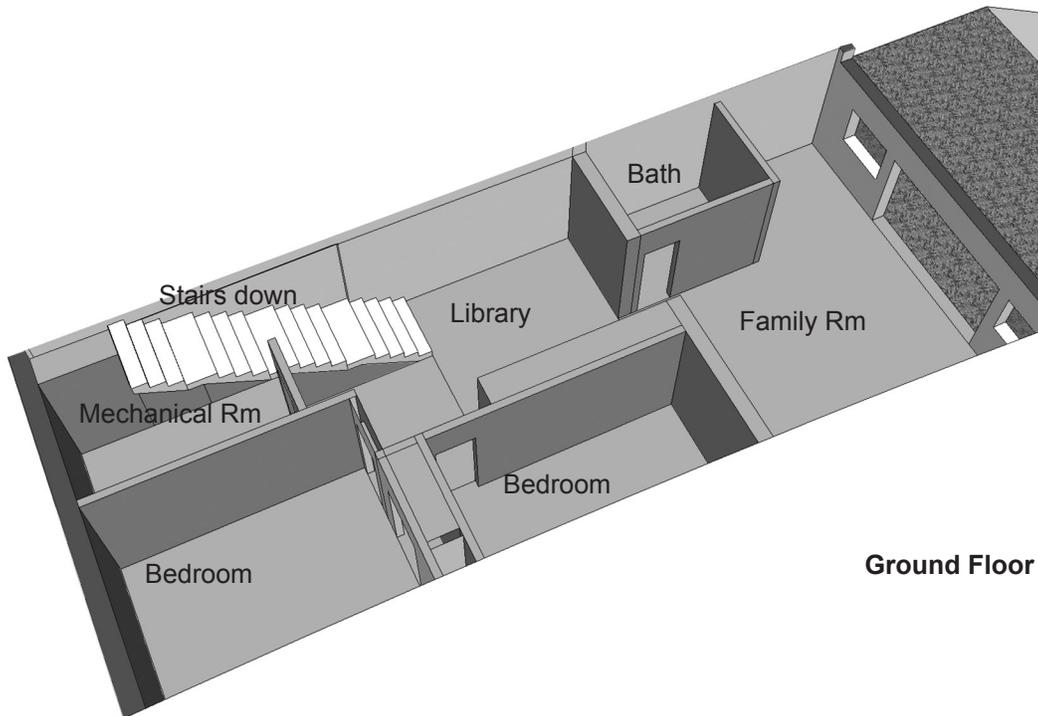
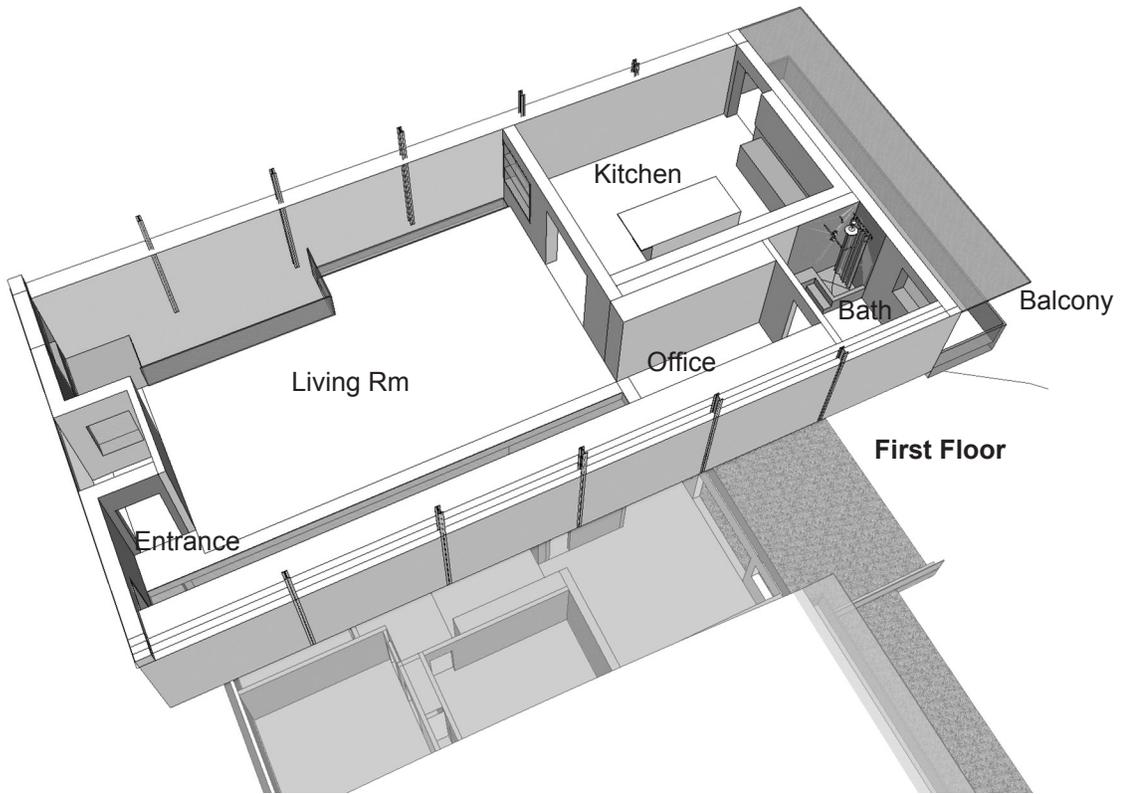


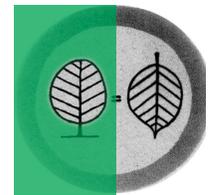
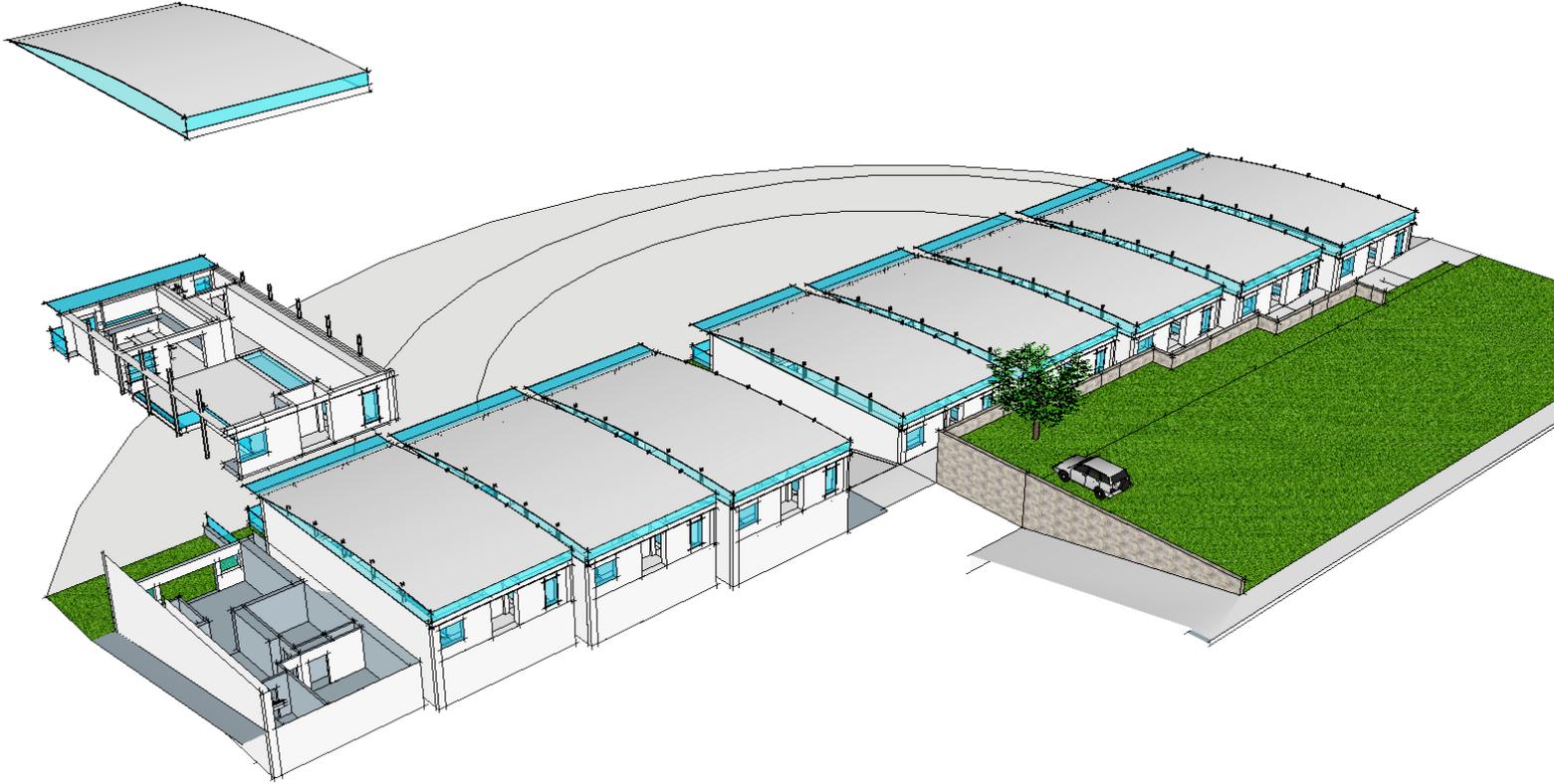














## **Dedication**

*I would like to dedicate this book to the  
independence of Taiwan in the near future*

*to the spirits that enchanted my life,*

*and to my grandfather,  
a wise man who believed that the earth is worth  
far more than gold, who lived through two  
colonizations and survived.*





## **Acknowledgement**

*My gratitude to my parents,  
for one poetry a day,  
faith in unlimited possibility and  
strength in self reliance*

*To my family,  
Eric M. Shieh,  
Nicholas D. Shieh and  
Julius S. Shieh*

*My thesis committee advisors  
William W. Brown,  
Frank H. Weiner, for the Horizon of Hope  
Donna W. Dunay,  
William U. Galloway,  
Whom I respect as guidance of my architectural thinking*

*Fredi Kölliker,  
for Giedion*

*to Dr. Y. W. Chein,  
Tim Castine,  
Micheal O'Brien,  
Hans C. Rott,  
For opening the doors of Architecture*



## ***Illustration Credits***

Unless otherwise noted, images are reproductions of original graphic prints, drawings, renderings or photographs by the author.

p. 5 [fair use] Figure 1

Ando, Tadao. Sketch of Rokko Housing [sketch]. 1981-1983. JA Library 3, Tokyo, Japan: Japan Architect, 1993.

p. 6 [fair use] Figure 2

Kahn, Luis. Kahn's three-phase theory of creative process and Tyng's four-phase cycle of creativity [diagrams]. Luis Kahn to Anne Tyng. By Anne Griswold Tyng. New York: Rizzoli International Publication Inc., 1997, p. 212.

p. 6 [fair use] Figure 3

De Carlo, Giancarlo. Diagram of Design Method [diagram]. Giancarlo De Carlo. By Benedict Zucchi. Oxford, Great Britain: Butterworth Architecture, 1992, p. 37.

p. 8 [fair use] Figure 4

Aldo Van Eyck, Tree is leaf and leaf is tree [drawing]. Giancarlo De Carlo. By Benedict Zucchi. Oxford, Great Britain: Butterworth Architecture, 1992, p. 80.

p. 9 [fair use] Figure 5

Rene Magritte, Le Dernier Cri (The Last Word) [painting], p125.

p. 12 [fair use] Figure 6

Edger Degas, Premier Sujet 1878. Edger Degas. By Pierre Cabanne, trans. Michel Lee Landa, New York: Universe Books, Inc., 1958.

Statement of Use: These materials are included under the fair use exemption and are restricted from further use.

# Curriculum Vitae

**Jean-yu Chen LEED AP, Associate AIA**

7 Fox Run, Denville, NJ 07834  
p.973.886.0788 email:cjysocean@gmail.com

## EDUCATION

- 12/2009 Rutgers Mini-MBA, Business Essentials
- 5/2010 Virginia Polytechnic Institute and State University, Blacksburg, VA.  
Master of Architecture. Courses completed 05/1998.
  - Spring 97, Study Abroad in Riva San Vitale, Switzerland, Center for European Studies and Architecture, Virginia Polytechnic Institute.
- 5/1995 Rutgers University, New Brunswick, NJ. Bachelor of Art in German
  - Summer 95, Study Abroad in Tours, France. Landscape Architecture Program, Rutgers University.
  - Summer 93, 91 Study abroad in Konstanz, Germany with German Department, Rutgers University

## EXPERIENCE

**Brinkman Architecture LLC, Montclair, NJ**  
Various residential projects in Northern NJ.

Contract PM, Present- Feb 2009

**ASA Architectural Design, Madison, NJ**  
Various residential projects in Madison area, NJ  
Ann Taylor Stores, Nationwide

Project Manager, Feb. 2009- June 2008

**Hoffman Architects, Summit, NJ**  
Various residential projects in Summit and Short Hills area, NJ.

Project Manager, June 2008- 2007

**Radius Inc, Rockaway, NJ**  
Denville Health Care and Rehab Center, Denville, NJ  
Rockaway Retail Village, Rockaway, NJ (300,000 sq ft)  
Various residential projects in Alpine, NJ.

Project Architect, 2000-2001

**Gensler Architecture Worldwide, NJ**

Architectural Designer, 1999-2000

Evaluate and redesign Gensler's marketing publications templates which enhance and reinforce corporate identity/branding. Member of the Green Building Task Force.

Architectural Projects include Konica Corporate Headquarters (132,000 sq ft), ITT Avionics (1,000,000 sq ft), Panalpina (276,000 sq ft), DPC Cirrus (150,000 sq ft), Tumi, GAP, SwissRe and Mont Blanc. Lucent Next Generation Network showrooms in Brazil, Hong Kong, and France.

**Affiliation**

American Institute of Architects

Present-1998

USGBC

Present-2008

Parsippany Parents for the Gifted &amp; Talented

Present-2009

**Volunteer**

North America Taiwanese Woman's Association Book Project

Present-2006

Boy Scouts of America

Intervale School Library

Present-2009

## the big seed list

Aalto  
Architecture  
Ando  
Benisch, Güter  
Brancusi  
Bodensee  
Botta, Mario  
Camus  
Chopin  
DeBovior, Simone  
DeCarlo, Giancarlo  
Degas  
Door  
Dumas, Mont of Count Christos  
Earth  
Escher, M. C.  
Fehn  
Frisch  
Garage  
Gropius, Walter  
Hollien, Hans  
Holl, Steven  
Intuition  
Joint  
Kafka  
Kahn  
Katsura  
Klimt  
Loire  
Le Corbusier  
Mies  
Mondrian  
Noguchi  
Odenberg, Claus  
Rembrandt  
Passage  
Pietilä, Reima  
Place  
Precedence Study  
Quiet  
Rilke, R. M.  
Rodin  
Scarpa, Carlo  
Soufflot, Ste-Geneviève  
Site  
Sterling, James  
Tectonic  
Takaezo, Toshiko  
Taiwan  
Typography  
Utzøen  
View  
Walker, Alice  
Wall  
Wright  
X in the Exeter roof  
Y  
Zumthor, Peter Chapel Sonn Benedeg

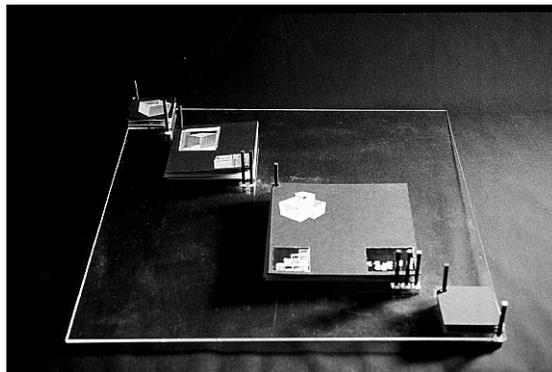


Project with Prof. Shelley Martin and Prof. Chris Risher, where we read *Seeing Is Forgetting the Name of the Thing One Sees: A Life of Contemporary Artist Robert Irwin* by Lawrence Weschler. We were to make photograph of a wall closely and translate it into color pencil drawings and a sculpture.



*Once we enter (the labyrinth), ordinary time and distance are immaterial, we are in the midst of a ritual and a journey where transformation is possible; we do not know how far away or close we are to the center where meaning can be found until we are there; the way back is not obvious and we have no way of knowing as we emerge how or when we will take the experience back into the world until we do. There are no blind ends in a labyrinth, the path often doubles back on itself, the direction toward which we are facing is continually changing, and if we do not turn back or give up we will reach the center to find the rose, the Goddess, the Grail, a symbol representing the sacred feminine. To return to ordinary life, we must again travel the labyrinth to get out, which is also a complex journey for it involves integrating the experience into consciousness, which is what changes us.*

*-Jean Shinoda Bolen, Crossing to Avalon*



**Precedence Study** Project and Image by the author 1998