

AN INVESTIGATION OF LINE

by

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DEDICATION

I would like to dedicate this book to my parents, John and Katherine. Thank you for supporting me, without too many questions, on my many adventures. But especially to my father, who started me down this path many years ago. I am sure he would have enjoyed seeing me complete this effort.



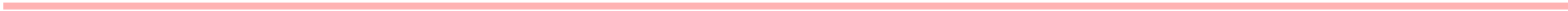


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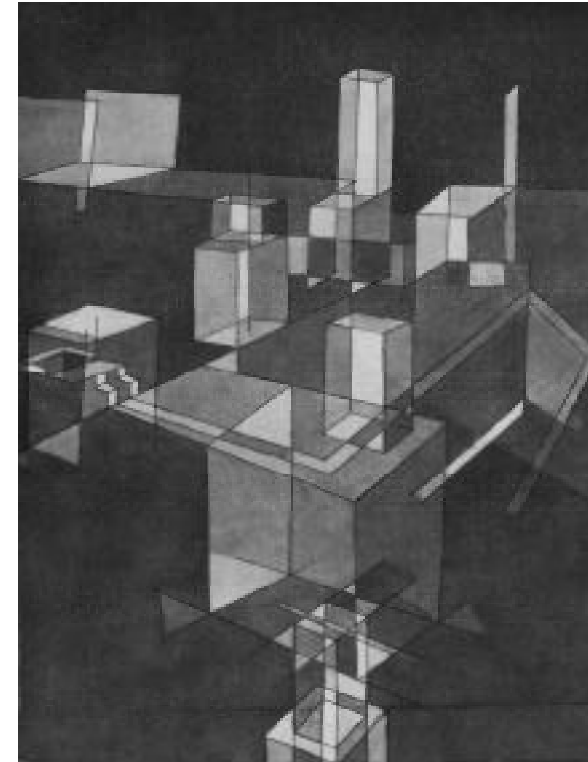
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AN INVESTIGATION OF LINE

The line is the basic element of design. Some would argue that the most basic element would be the point, but in order for anything to be defined by that point, another point would have to be referenced. The connector, whether real or perceived, is the line.

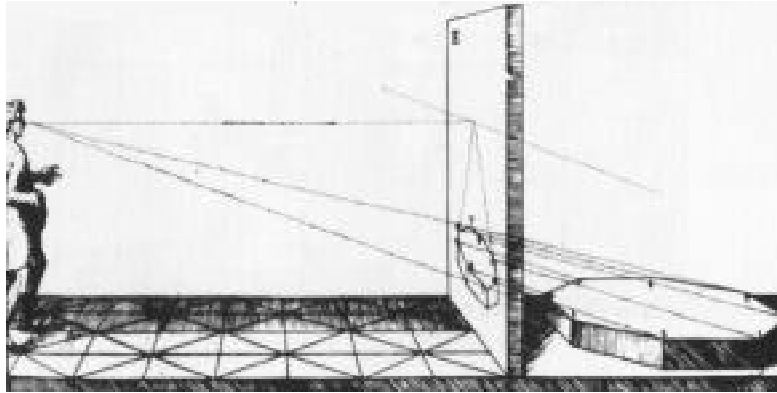
As designers, when marking a surface with a line, there is an intuition at work. Nothing that a skilled designer would do could be considered an arbitrary stroke. But often we do not consider the depth of meaning that the line brings to our work. This inquiry investigates several dimensions that “line” can generate in enlivening architecture and presents the use of these thoughts in the development of a Montessori school.



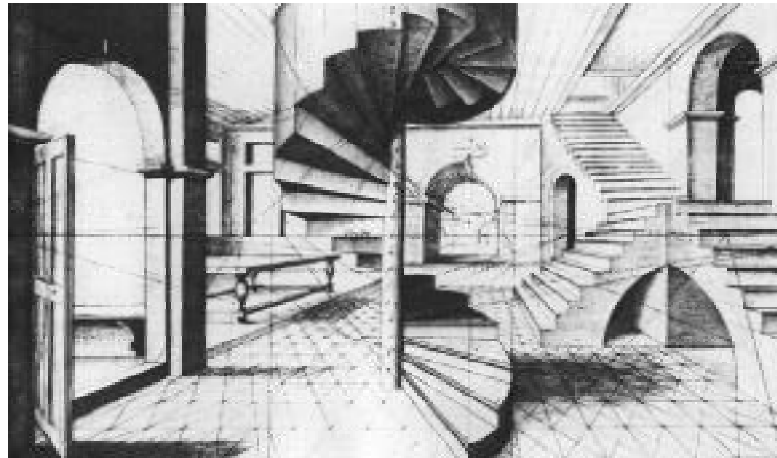
A

ABSTRACT

A - Klee, P., *Italian City*,
1928.



B



C

VARIATIONS OF LINE

Any space that is designed is made up of an infinite number of lines. What creates the hierarchy within these multiple lines? Are we able to separate these lines from one another to reveal the essential ones? By distilling the many lines into the essential, a more careful thought process can occur as we scribe these lines.

Lines that create connections have a greater value. The joining of line can be accomplished in a variety of manners and it is where these connections occur that spaces begin to form.

Lines that create a proportional and regulatory system also carry more weight. These lines carry the added importance of establishing a unity to the design and creating a hierarchy to spaces and forms.

The marriage of a building to a site is one of the most delicate acts of the architect. To improve the site through building requires revealing the lines that characterize the earth.

Lines that connect the human body to the form stand out from others. The experiential connections, through scale, make a statement regarding the function of the building to its users.

Lines that have a varying weight from the norm create emphasis. Heavy, thick lines or thin, light lines can speak to the intent of the space.

INTRODUCTION

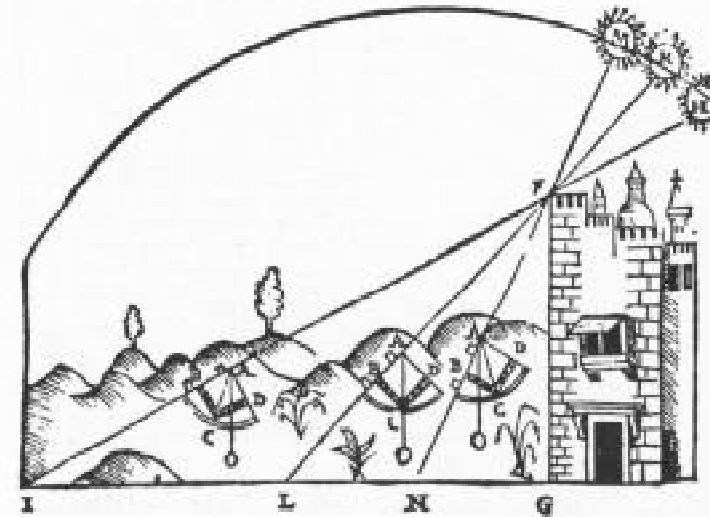
B - Vignola, J.,
1583.

C - De Vries, H.,
1604.

INTRODUCTION

The last two thoughts in this study are not physical lines that can be drawn, but are created by relationships within a form. Line of sight and line of movement or pathways are very important elements to the design. The manipulation of both sight and motion are major components that make for a rich architectural experience.

D - Bartoli, C.,
1564.



D



E



F

THE JOINING OF LINE

There are three conditions that create the joint. The three conditions in which lines meet are:

- The intersection of lines where the motion of the line continues past the connection.
- The physical touching of one line to another, resulting in the termination or initiation of either line.
- The perceived connection, where the lines are in proximity to one another, but the energy extends from the lines so that one senses the connection. This relationship is the hardest joint to manage. The question that arises: when is the line too far away before the continuity is lost?

Along with the idea of connection comes the geometry by which the lines will be joined. The standard in most of our design is ninety degrees connections. Within the pursuit of deconstruction these right angles are being challenged with the use of the obtuse and the acute. A less-used and developed geometric connection is the use of tangency. The tangential connection provides a unique set of circumstances that can offer an interesting variety of junctions.

With the understanding of the range of connections that are at the disposal of the designer, this variability provides tools that can lead to multiple options within

CONNECTIONS

E - Baeza, C., *Casa Gaspar*.

F - Barragan, L., *Casa Egerstrom*.

CONNECTIONS

the design. This knowledge can give the architect a direction away from the default of the orthogonal norm and allows for unique spatial conditions to exist.

G - Ambasz, E.,
*Financial Guaranty
Insurance Company.*



G

H - Barragan, L.,
Casa Egerstrom.



H

REGULATING LINES



I



J

There is a set of lines that establishes the limits of a design. By limits, it is understood that the designer establishes the guidelines within which the question of form is dictated. Without limits the creative thought has no basis for operation. This does not mean that limits are the extent of the design, merely the format that the designer chooses to work within or extend beyond. These regulating lines become the guidelines from which all decisions are made.

There are three types of systems that can impose scale on a building:¹

- Proportional systems
- Physical scale
- Human scale

One type of a line system that can be developed is a proportioning model. Proportions can be developed to bring a sense of hierarchy and unity to a design. Choices are made in relation to mathematical calculations. The golden section is an example of the use of this kind of model. Regulating lines are established using mathematical formulae and the design decision is based upon where intersections occur or patterns exist.

1. *Architectural Scale*,
Licklider, H., G.
Braziller, Inc., New
York, 1966.

LIMITS

I & J - Le Corbusier,
A House.

LIMITS

K & L - Hertzberger, H.,
Apollo Schools.

Another type of proportioning system is the physical scale, the use of materials that have a predetermined form or size. A predetermined construction material can provide an order to the design, the use of steel girders and columns can lead to the development of a grid. The use of a grid provides a rigor upon a design. With the establishment of an overlay of lines to form a base, decisions of placement can be articulated from the regulation of the lines. Once again, deviation from, as well as adherence to the grid, are possibilities provided by this formation of limits.

The last system is the use of the human body as the measuring device for the regulation of a design. The development is based on the orientation of the body within the space; how it uses the space, where it comes in contact with the space and how it appears in the space.

It seems incongruent to state that overlaying some sort of regulation upon a design actually provides a freedom to the designer, but limits need not be a constriction. These very limits can be the liberating tool that provides the freedom to the designer.



K



L



M

LINES FROM THE EARTH

The study of the earth and the lines that such a study reveals can provide abundant clues to the placement of the building in relation to the site. Sensitivity regarding environmental issues and the continual shrinking of the earth's available sites force the architect to proceed with much caution when wedding a building to a site.

Natural boundaries such as rivers, hills and vegetation form limitations upon our process. Designers must look to work within these barriers and to understand the relationship between construction and the surface it dwells upon.

The topographic lines reveal a wealth of information to the architect. Elevation changes, drainage and wind are a few of the variables that can tell the story of the site. Although the earth can be manipulated to some degree, the nature of the site is determined by these lines. Architects must contend with the forces that have already shaped the land.

Another line that comes into consideration is the path of the sun upon the surface of the earth. The ability to introduce or moderate the amount of light and heat into buildings is an important aspect in a design. Designers must aesthetically understand the experiential quality that light and shadow can produce. It is another material to be used and controlled.

SITE

E - Otaniemi University, Helsinki, Finland.

The most constricted of sites requires the most creative of solutions. Man can no longer mold the earth to his liking without suffering injury to a valuable resource both physically and aesthetically. Also, without proper acknowledgment of the physical forces generated by the earth, man's designs will eventually succumb to these forces.

N - Bohlin Cywinski
Jackson, *Ledge House*.



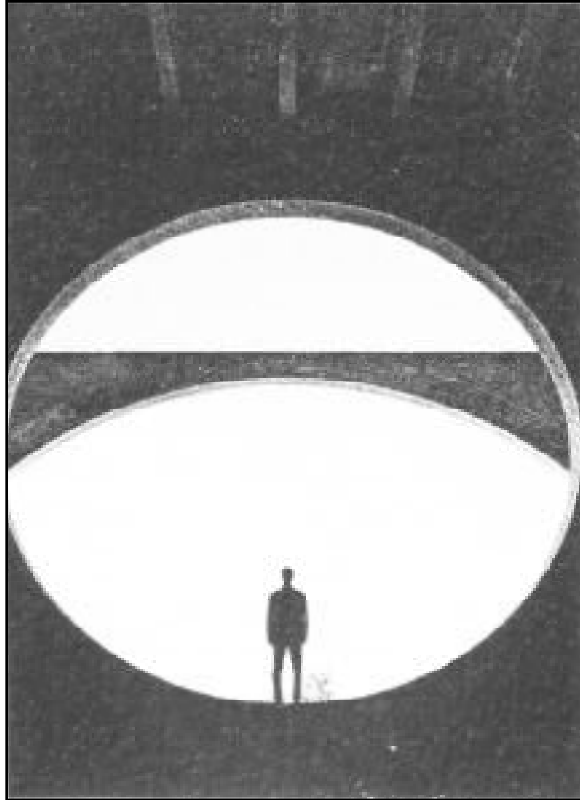
N

O - Ambasz, E., *House for Leo Castelli*.



O

SITE



P

ESTABLISHING SCALE WITH LINE

Understanding the use of scale through line generates the experiential quality of the design. Massive government buildings dwarf the user and signal the larger importance of the whole to the individual. Conversely, small and more intimate spaces can encourage communal interaction.

Each building should speak the language of its inhabitants. A building for pre-schoolers should not speak to the size of the adult. The primary occupant should be accommodated in the spaces provided. While conversely, large buildings should understand their role in providing an adequate solution to the scale question.

No matter what the type of building being designed, accommodation to the human form and senses cannot be ignored. Where the building comes in contact with the person, the design needs an attention to detailing that acknowledges the user.

Understanding scale and knowing what it will feel like to inhabit the space is an important aspect of design. Obviously the hallway or ceiling height for a small school would not meet the same requirements that a large arena would need. But in both instances the occupant should feel at ease with the use of the building.

The building is not usually an isolated object. It has functional responsibilities and the success of its

P - Kahn, L., *Governmental Centre*.

SCALE

function rests solely upon the designer's ability to understand the experience of living within the form. A major step in the success of a building is acknowledging the individual or group and creating the desired experience through the understanding of the human response.

Q - Hertzberger, H.,
Montessori School.

SCALE



Q



R

VARYING THE WEIGHT OF LINE

The thickness or thinness of the line reveals the intent of the form it represents. It can also suggest the materiality, components and characteristics of the form.

For example, a very thin line implies a lightness to the form. This implication could indicate a form that cannot carry much of a load. A thin line can also suggest materials. From an experiential standpoint, thinness can suggest a transparency or translucency to the form. A sense of connection can be established through such a barrier.

The thicker line, by contrast, gives a feeling of heaviness. This line can reflect the ability of this form to carry a greater amount of weight. A completely different set of materials is suggested, maybe even a layering of materials. This thickness creates a more formidable barrier. The opacity of the form is emphasized and could contribute to a sense of isolation to the inhabitant.

The use of varying tools to draw the line can provide stronger clues in the design process. An interrelationship can be established between varying forms; the use of material and construction methods can be studied earlier in the design process. Clues to the “feeling” of the buildings can be derived throughout the process.

LINE WEIGHT

Q - Moura, E.,
Alcanena House.

SIGHT LINES

Understanding how the eye sees and how the form of a building will unfold to the eye needs to be understood in the mind of the designer. Few occupations require the anticipation of an idea as does the architecture profession. The architect must develop a “mind’s eye” so that the building is “seen” in small vignettes as well as large vistas. With this ability the design can more closely resemble the conceptual thought.

The knowledge of the perspectival nature of the eye leads the design to a more realistic development. The convergence of line to a single point should be a design consideration at all times. This fact can allow a design to unfold the building in a pace and manner that manipulates the viewer. Vistas can be framed; views and scenes can be brought into focus; the user can become aware of the relationships within and without the building.

Also, understanding the height of the focal point and the width of the focal plane can allow the designer to understand the real vantage point of the viewer. Thus the space can be experienced as drawn.

With the sense of sight being such a dominant factor in our culture, the importance of how a space or form is seen cannot be ignored. Thinking about how the eye can be directed is a most important part of the experiential existence of design.

S - Holl, S., *Saint Ignatius Church.*

THE EYE



S



T

LINE OF MOVEMENT

The ability to control movement and develop paths within the building is an often neglected development in architecture. Controlling the pathways allows the designer to enrich the experience at the proper places, and insures interaction between the user and the building.

The path leading to the building is an opportunity to prepare a person for the experience that the interior will provide. Preparation along the entrance path can act as a foreshadowing for the building, but it can also serve as a opportunity to alter the state of the traveler. If, for example, the building is a church, the entry path can work to reinforce the spirituality that the church conveys for the faithful.

The entrance itself is an important statement. It serves as the portal into a new environment. It is the transition point from the out-of-doors to the interior space.

How the users move through the space will determine the manner in which the building will be used. The designer can manipulate the walker to slowdown or to speed up, depending on the requirements of the space. Are there shortcuts available to people familiar with the building? Can people easily find where they need to go without having to ask directions?

The exit is often forgotten in the design process. If the entrance is a very important detail, so is the exit as it

PATHWAY

T - Students at the
Unite d' Habitation.

U - Pueblo Bonito

PATHWAY

releases the user to the outdoors, a transition that is worthy of attention.

The importance of the pathway cannot be an underestimated item in the tool box of the designer. This line, even though it is not drawn by the architect, is one that must be acknowledged and accounted for by the architect. The user traces an indelible mark on a space and anticipation of this movement creates an experiential line. This experiential line enhances the contact of the inhabitant with the building.



U



A red L-shaped graphic element consisting of a horizontal line at the top left, a vertical line extending downwards, and a horizontal line at the bottom right.

THE PROJECT

A MONTESSORI SCHOOL

THE MONTESSORI SCHOOL



The Montessori School is a unique and often controversial education program. Begun in 1906, Maria Montessori opened her first school, Casa dei Bambini, in a slum area of Rome called San Lorenzo. The founding principles of the school were:

- To provide a pleasant environment where the children felt no restraint.
- The teacher was not to interfere with the children's effort to learn.
- The children must work with materials that provide an education for the senses.²

The Montessori program continues with primarily the same direction as its founder established in 1906.

The environment within the school allows for no individual desks and chairs. The children do have several work tables, but generally they roll out a piece of carpet and create their own work space. The hierarchy of students desks all aligned and facing a teachers desk has been abandoned for a less structural and more liberating environment.

Areas within the classroom have been set aside for certain activities. Art, language and mathematics, for example, have their own assigned spaces. This allows for learning materials to be specifically referenced to that area, with tables and bookcases assigned to the

PHILOSOPHY

2. *Montessori Today*,
Orem, R. C., G.P.
Putnam Sons, New
York, 1971.

V - Students at the
Unite d' Habitation.

study of that one activity.

The teacher in this type of school acts as a monitor to the students progress in the program. Many choices lay within the student's domain. The teacher may set a program of study, but the students choose what part of the day they will devote to a certain subject. The students are encouraged to study in groups and help each other with their tasks. The teacher acts as a facilitator.

An important aspect of the Montessori experience is to educate through the involvement of all of the student's senses. The classroom environment and learning materials engage all the senses; this broadens the learning experience of the student and also provides a stimulating arena for education. The incorporation of nature into the learning process is an important aspect of this program.

This type of program for education challenges the typical program of design for schools. The space must be fully adaptable to a variety of individual and group activities. The building itself must be engaging to all the senses of the inhabitants. It must provide access to the out-of-doors. Adequate bookshelves and accessible storage areas are a necessity. The space does not force the mass regimentation of group learning but must liberate the individual discovering the excitement of learning.



20

W

A SCHOOL

The Montessori system is becoming more popular in the public realms of schooling. The Roanoke School District (Roanoke, Virginia), for example, is offering a Montessori option for parents in their public school system beginning in the Fall of 1999. The School of Education at Virginia Polytechnic and State University is to develop a pilot program for research and teacher development at their Blacksburg campus. The program is to find a suitable site on campus and design a building that would house this pilot program.

This program will allow for:

- Individual classrooms to house students from Kindergarten to the Sixth grade level.
- A general purpose meeting area that could allow for full student body meetings and after school events.
- Outdoor playground.
- Each classroom must be flexible in scope and use to fit the requirements of the Montessori program.
- Offices for administrative and support personnel.
- A controlled egress for student security.

PROGRAM

W - Students at the
Unite d' Habitation.

SITE

The site chosen for the Montessori school is on the northwestern corner of the Virginia Tech Campus. This site is a pastoral setting containing vast grass fields, a pond and wooded hillsides. It is situated at the end of the main campus. The site has easy access from Prices-Fork Road and is isolated from the main campus activities.

This site holds many interesting “places:” a large outdoor theater that is embraced by a stand of tall trees, a small grotto that is overgrown by flowering bushes, but has a “skylight” through those plants, the Duck Pond, an historic campus attraction, a gazebo that is located on the southern edge of the pond, and an early settlers cabin is on display on the eastern edge of the pond.

This area has been developed as a park that serves as a refuge from the intensity of the campus. Picnic tables and grills are located throughout the park area. A wide variety of wild life: fish, geese, ducks, turtles and squirrels, inhabit the park.

The site as location for a school is ideal. The isolation from campus, its strong connection to nature, the many secreted spots within the site, and its strong attraction creates a magical place for children. The site could also benefit from a building complex that could strengthen certain elements and bring life to some of the ignored elements in the park, such as the large theater area.

X - Outdoor Theater

Y - Site, facing North

Z - Site, facing South

THE SITE



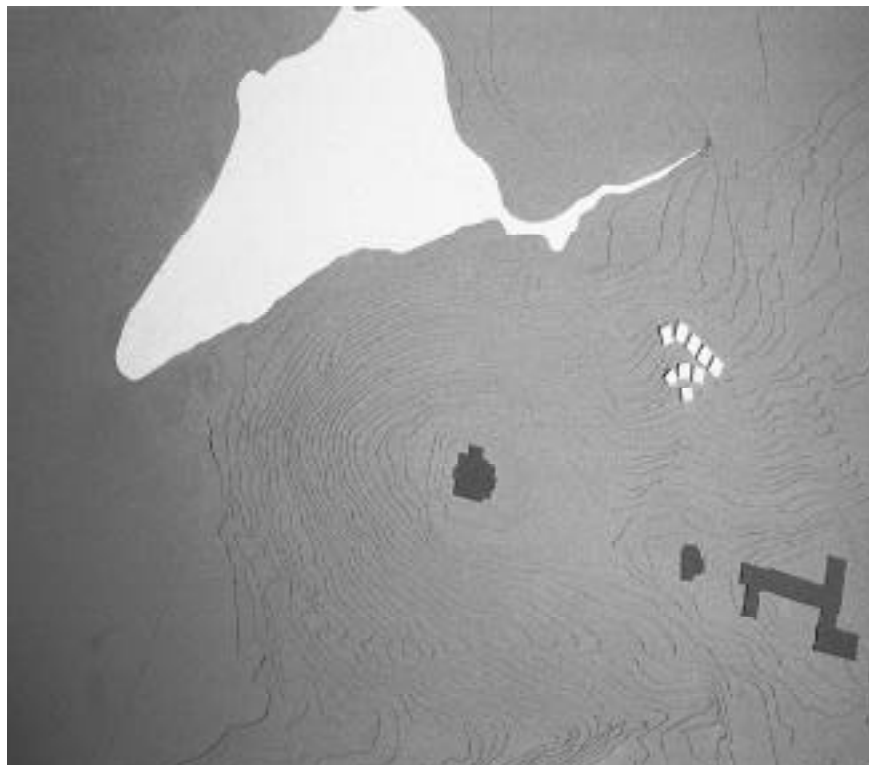
X



Y



Z



AA

PLACEMENT

The evaluation of the site led to situating the building on the southeastern corner of the park. The site is bordered by West Campus Drive and Grove Lane, providing automobile access to the building without infringing on the park. This area is adjacent to the theater space and will put the building in a remote place that will not disrupt normal habitation of the park.

Several other considerations led to this placement. In reviewing this site, it was noted that the theater space on this site is generally ignored. It is hoped that with careful orientation and connection to the new building the theater would be “discovered”. The park lacks a strong entry from the campus side. This provides the new building with the opportunity to link the campus with the Duck Pond with some sort of portal. The open space at the foot of the selected site provides a possibility to add an additional attraction to enhance the park.

This choice will not only provide an excellent site for the school but the opportunity exists for the site to become enhanced and improved with the placement of this building.

THE SITE

AA - Park Study Model

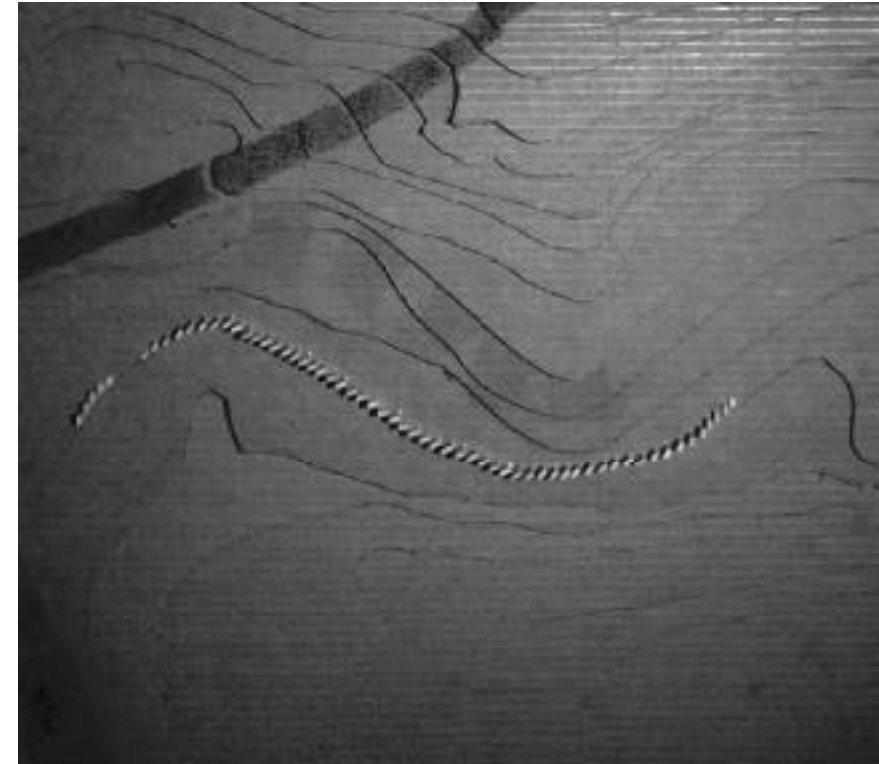
PLAN ORIENTATION

The topographic lines of the site provided a clue to the placement of the building. The 'S' shaped lines started parallel to West Campus Drive, curved back through the building site then back again to pull in the theater. It was apparent that a fully orthogonal plan might be unreasonable.

Taking the lead from the topo, a line was generated that became the base line for the design. A refinement was made by defining the axes of two circles whose arc segments created a tangency that closely approximated the original sketched curve. By establishing a proportional module resonating curves were drawn. This resonance would serve as boundaries throughout the design.

The last step in the orientation of the building came after it was decided that the classrooms should become separate entities. The line that described the tangency and passed through the axes became the center line of one of the classrooms. By using the same module as the space separating the buildings, rays were drawn from the axis of a circle. These rays defined the classroom placement.

The analysis of the site revealed the flexible spine of the building. Through use of geometric limits, the vertebrae of that spine were defined and grounded.



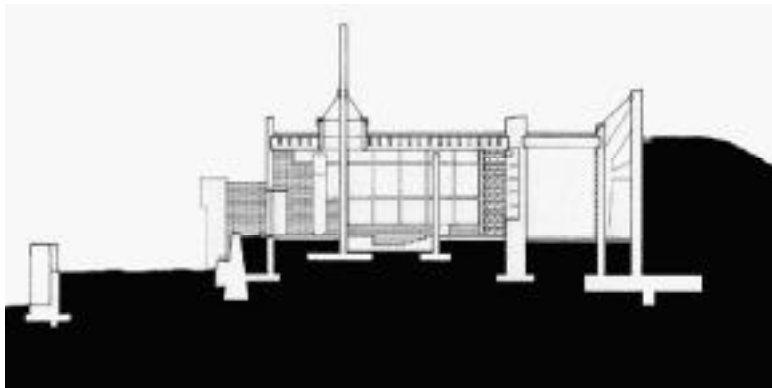
BB

BB - Site Model

THE SITE



CC



DD

SECTION ORIENTATION

The site slopes downward and towards the basin of the pond. By investigating the site through section, it was decided to take advantage of the slope. To place the building completely on one level would have required a great deal of earth moving and would have altered the nature of the site dramatically.

Three levels were defined for the entry, classrooms and play areas. The width of the three levels were determined by the use of module once again. By halving, doubling and tripling the module, variations of space could be taken into account.

It was evident that retaining walls would become a major design element. Incorporating these walls into the design became the impetus to the unification of the design.

These walls became the defining element. Varying wall systems were used to describe the modules. The layering of walls, perceived connections created by walls and the thickening and dissolving of walls were the melodies in this composition. Along with the extension of major walls through the roof line, the importance of the line was reinforced through the motif of the wall.

The site, in section, inspired the multileveled design of the building. By reading the land, an agreement was established between the building and the site.

CC - Retaining
Wall Section

DD - Classroom
Section, Hand
Drawn

THE SITE

PROPORTIONS

A twelve foot by twelve foot module was chosen as the basic unit for the school. The idea of a modular size was developed for several reasons.

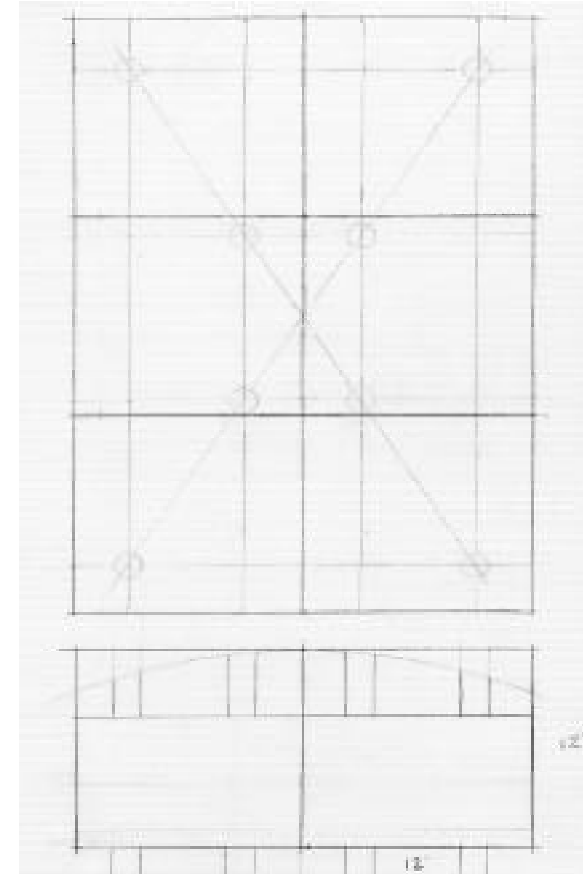
The average height of the occupants, adults at six feet and children of three to four feet, were considered. As multiples of twelve, this unit could be harmonically divided to accommodate a variety of heights within one space.

Conformity to harmonic division, $1/2$, $1/3$, $1/4$, $1/6$ and $1/12$, provides a broad range of uniformity in material and component choices. The twelve foot module is neatly broken down into any number of uniform inch and foot divisions.

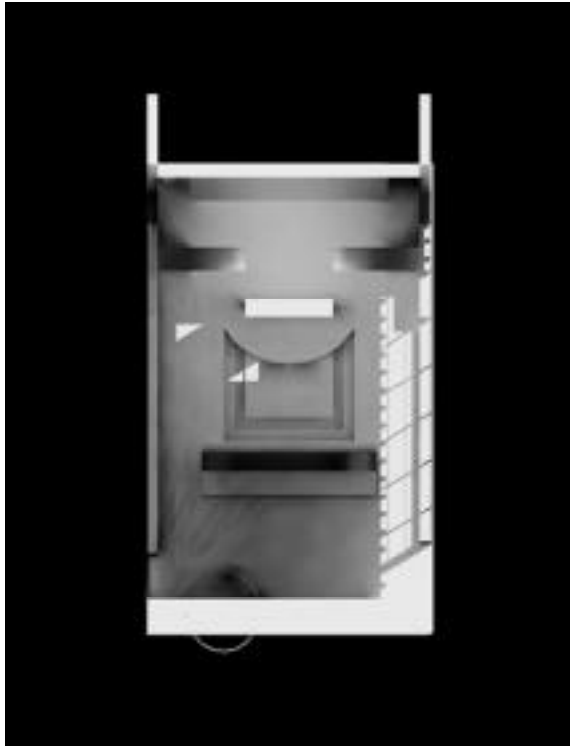
The ease of division and marking of surfaces both horizontally and vertically, in section and in plan, made the twelve foot module the logical choice.

EE - Proportioning
Sketch

PROPORTIONS



EE



FF

CLASSROOMS

The classrooms need three distinct spaces:

- A wet area, where messy projects like art and cooking could take place.
- A group meeting area, where the class could comfortably meet.
- A private area, where individual students could study away from the activity of other projects.

This tri-part program led to the division of the room into a twenty four foot wide by thirty six foot long by twelve foot high space.

The linking of the thought of public to private and the use of the room, inspired the direction of flow within the space. The egress would be contained in the first third, within the wet area. Lockers would be located in this space so that changing and storing of backpacks, jackets and aprons could be facilitated. Also, the bathroom and all the plumbing would be isolated to this section.

The semipublic space would become the middle section. Included in this area is the small theater and stage.

The private study area would be the last segment. This would incorporate small nooks that could be used by multiple individuals to study.

CLASSROOM LEVEL

FF - Classroom plan
in Lightscape

COURTYARDS

CLASSROOM LEVEL

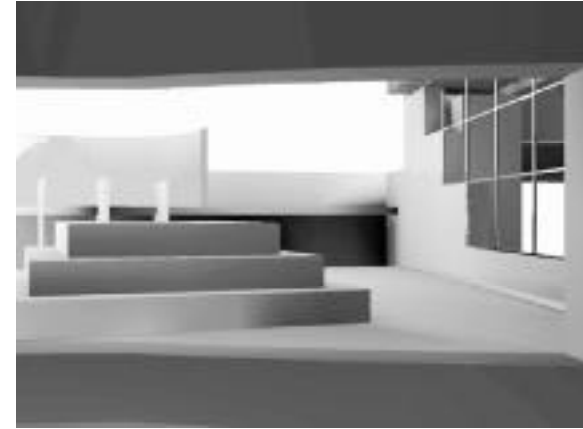
GG - Courtyard
through hallway
window in Lightscape

HH - Courtyard from
theater in Lightscape

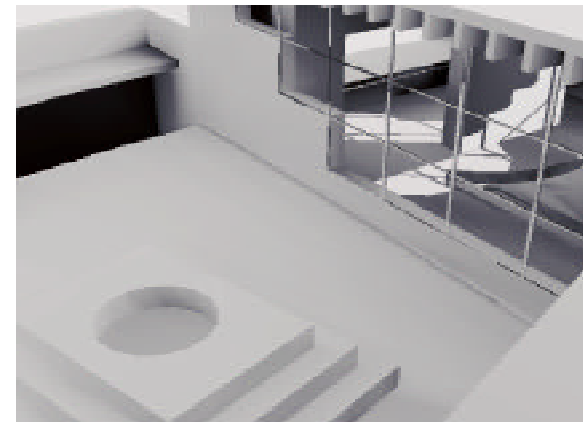
The importance of a connection to the outdoor is developed with the individual courtyards for each classroom. Egress, from the classroom, is only through the wet area and each courtyard is embraced by the consecutively placed classrooms.

The courtyard is a flexibly designed space so that many activities can occur out-of-doors. The center piece is a three level platform that can serve as an impromptu theater or meeting place. At the top of this platform is an area where a sand pile, water, or plantings can be inserted.

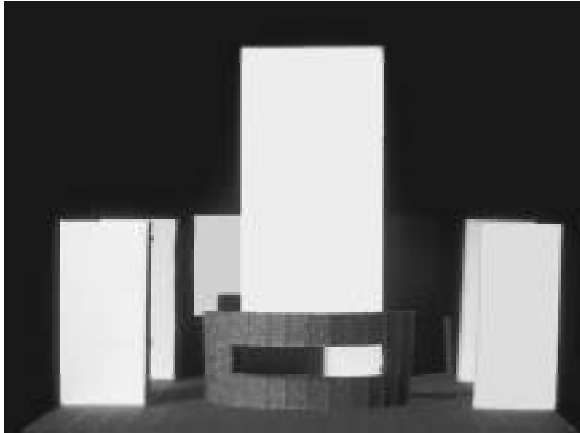
At the far end of the courtyard is a two level alcove and viewpoint. The top level is a walkway for viewing beyond the school and over the courtyard. The lower level is a covered alcove that contains the egress to the school play area.



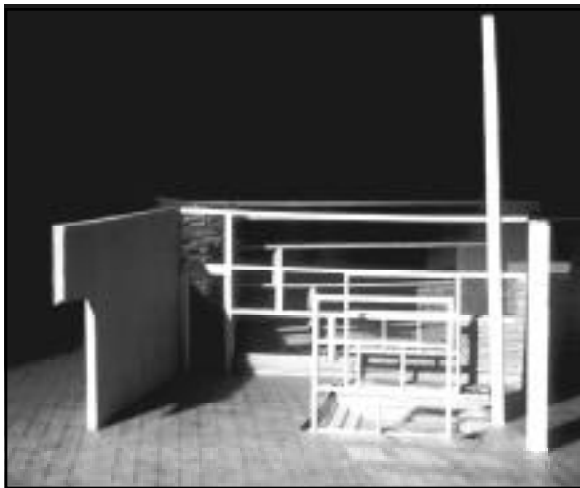
GG



HH



II



JJ

TRANSPARENCY VERSUS OPACITY

In developing the idea of a school it was decided that each classroom was a vessel for discovery, but that the student would still need to have the concept of belonging to a greater “ship.”

To facilitate the learning within the classroom a concept of opacity was prescribed. Walls defined each segment and created portals within the classroom. The movement from north to south is manipulated so that the view was controlled and blocked. In the major axis of the room, there is no view to the exterior of the space.

Conversely, the concept of transparency was the connective device through the school. The east and west walls are almost completely transparent. This not only brings the courtyard into the classroom, but the vista beyond incorporates the rest of the school. The student can see the entire school through these walls.

This line of sight reinforces the curvature of the topographic lines through the building. The viewer is connected through the building by the movement of the earth.

CLASSROOM LEVEL

II - Longitudinal Study Model

JJ - Axial Study Model

MAIN HALLWAY

CLASSROOM LEVEL

The hallway is the unifying element of the school. It is the spine that connects the classrooms as well as the upper, egress level to the lower, classroom level. The hallway curves to follow the topographic shape of the hill that it is imbedded within.

The walls of the corridor are a roughly textured stone. This stone work is only interrupted by the smoothly defined wall of the classroom on the northern side of the walkway, along with windows into the courtyard.

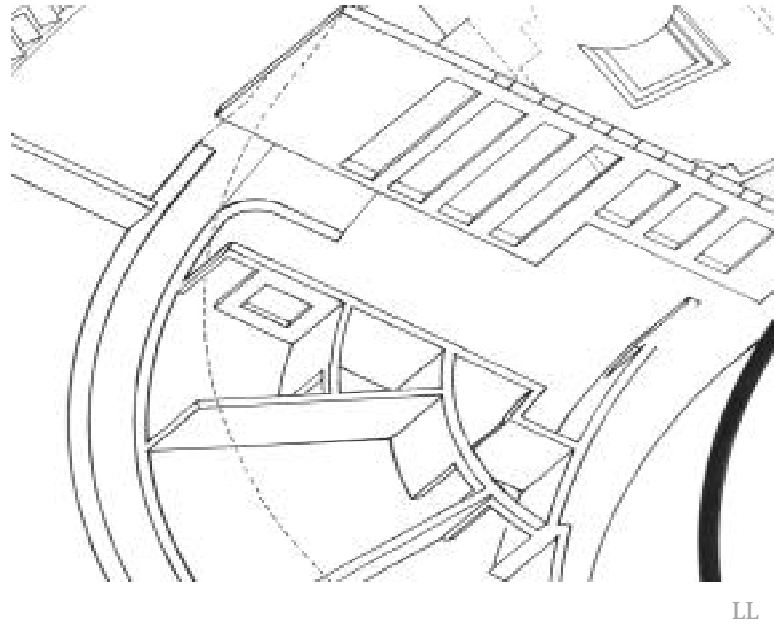
The southern side is a double-walled, skylighted, buttressed retaining wall. The inner wall is punctured with viewing and pathway portals, making this a brightly lit, accessible secondary passage. Carved into these walls are niches and seating alcoves. The egresses into the double wall are aligned with the entrances to the classrooms. This allows for light to spill out across the hall and mark the entrance to the classroom.

This double wall also contains the stairway from the upper level to the lower level. Using the stairs allows the user to experience the importance of this wall.

KK - Double Walled
Hallway



KK



JUNCTION

Directly under the upper story is space reserved for storage, mechanical, a nurse's office and a teacher's lounge. Adjacent to this is a two-story communal space.

This interior courtyard is formed at the intersection of the upper and lower levels. Where the stairs and the ramp descend from the upper level, a small piazza is formed. This junction, at the eastern end of the corridor, is a gathering place at the entry to the classroom wing.

This space is large enough that it could act much like a city block can serve as a playground. The children could adapt this space to a playground on a rainy day or simply as a meeting place for students from other classes.

CLASSROOM LEVEL

LL - Indoor Courtyard

THEATER LEVEL

The upper level is a two story cylindrical drum that contains the administrative office, clerical space, access through stairs and a ramp to the lower level, as well as a theater for large school events.

This upper level serves as the drop-off and pickup spot for the students. A porte cochere provides the students protection when entering and exiting the building. This entrance circles in off of Grove Lane, providing a safe, one way access for cars or buses. A small lobby is situated so that students can remain indoors and watch out the windows to wait for their rides.

To enter the building, one must pass through the double wall spine of the building. A clerical space is established so that movement through the building can be monitored.

Access to the lower classroom level is achieved by turning to their right and entering the double wall that contains the stairwell. Turning to the left allows entrance to a handicapped accessible ramp that follows along the exterior wall of the cylinder.

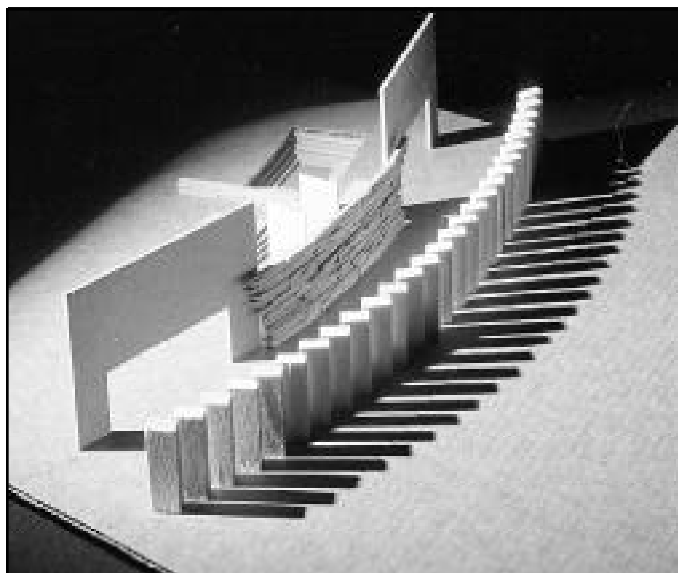
Entry to the theater is gained by moving straight into the circular space. A formal lobby precedes the entry into the theater.



MM

MM - Theater Level in
Lightscape

THEATER LEVEL



NN

GROUNDS

The first act of design with this project was to select and mark a main topographic line with a serrated line. This line was composed of rectangular elements oriented in a forty five degree angle to the topo line. This led to the discovery of the base line for the project. But this line continued to live throughout the project. One question that stayed ever present was: how could the introduction of the circles on the site be experienced and enhanced?

The composition of these could be concrete precast or more likely a row of topiary. The serrated boundary is used to describe the territory of the school and is placed along the resonating circles. This boundary is also extended to enclose an entrance to the theater on the western side of the project. On the eastern side, an open air grotto is formed to celebrate and connect with the small grotto near the Duck Pond. This new grotto also serves as an entrance to the park from the upper campus.

On either side of Grove Lane, a segment of this boundary marks a circle that passes through the street. This serves as an entrance marker to the school, by car.

This first act of trying to understand the site led to an element that enlivened the project and recognized the previous history of the site. The understanding of geomancy³ led to the new form that acknowledged and improved the site.

EXTERIOR

NN - Study Model

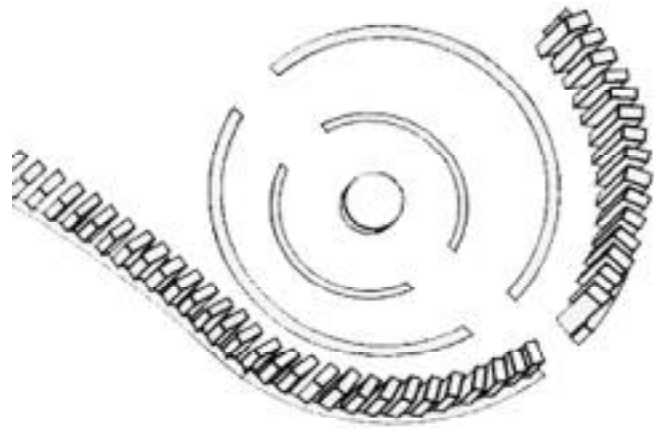
3. Frampton, K., *Architectural Digest*, 1990, pages 19-25, The Case for the Tectonic.

PLAYGROUND

The play area runs the full length of the building. It is bounded on the southern side with the courtyard and classroom complex. The northern boundary is a serrated row of rectangular forms atop the last retaining wall.

The playground is comprised of a grass and cut outs with sand inserts for playground equipment. This area has limited access from the park area and can be entered from all the courtyards in the school complex. This area is meant to be a full school activity area as opposed to the courtyards.

EXTERIOR



OO

OPEN AIR GROTTTO

This open air grotto is to complement and acknowledge the smaller, enclosed space already on the site. It is marked by the serrated line which is broken on axis through the center of the grotto on to the pond. This graduated, sequential break acts as the entrance to the grounds from the upper campus area.

The center of this grotto is the axis point for the circles that describe the eastern half of the project. This center point is marked by a small, elevated stage. The ground in this grotto is sculpted as if a sphere imprinted a depression on the landscape.

The complementary axis is marked by the turnaround that provides access to the school by automobile. A garden, in the shape of a top of a sphere, occupies this axis point.

OO - Outdoor Grotto

EXTERIOR

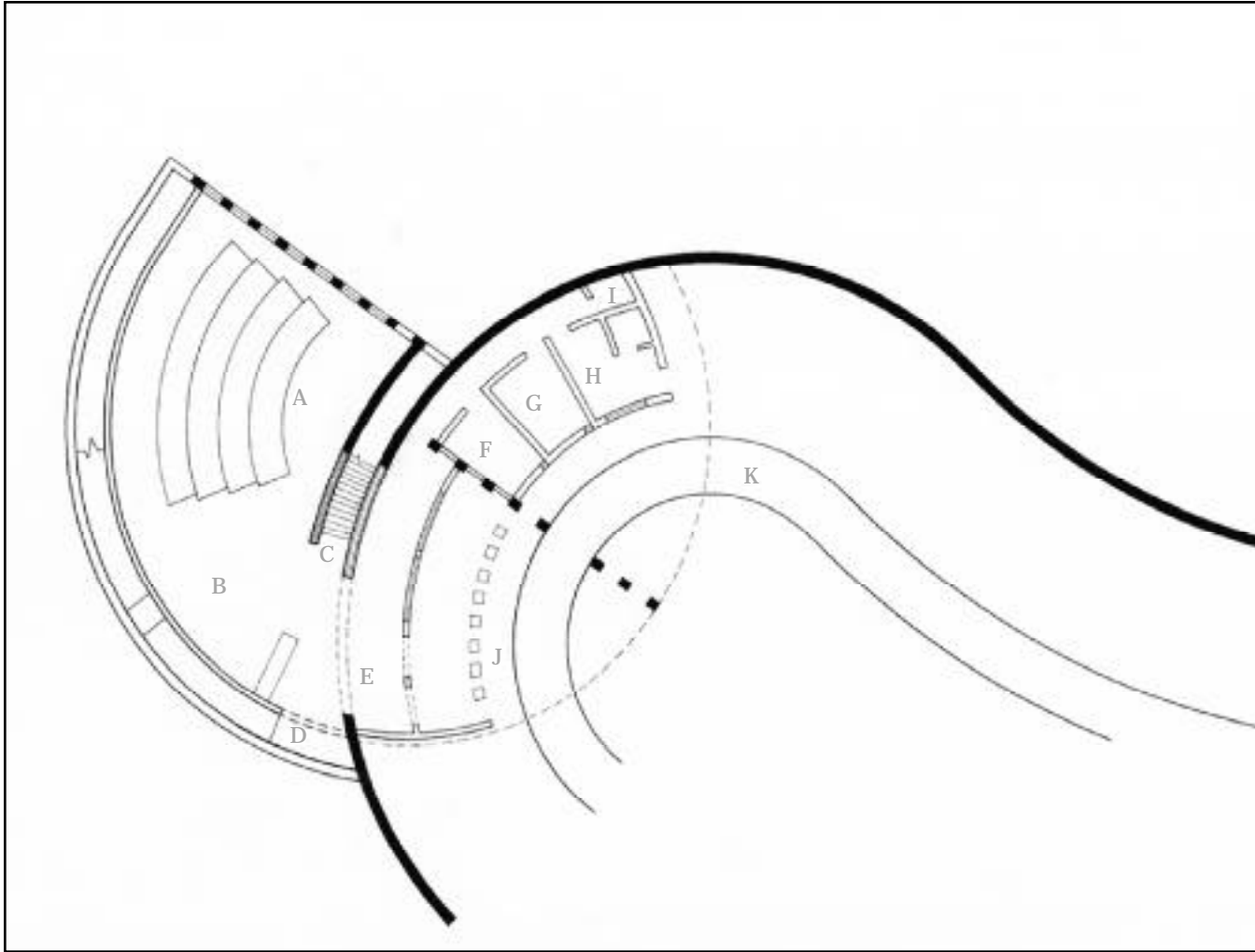
CONCLUSIONS

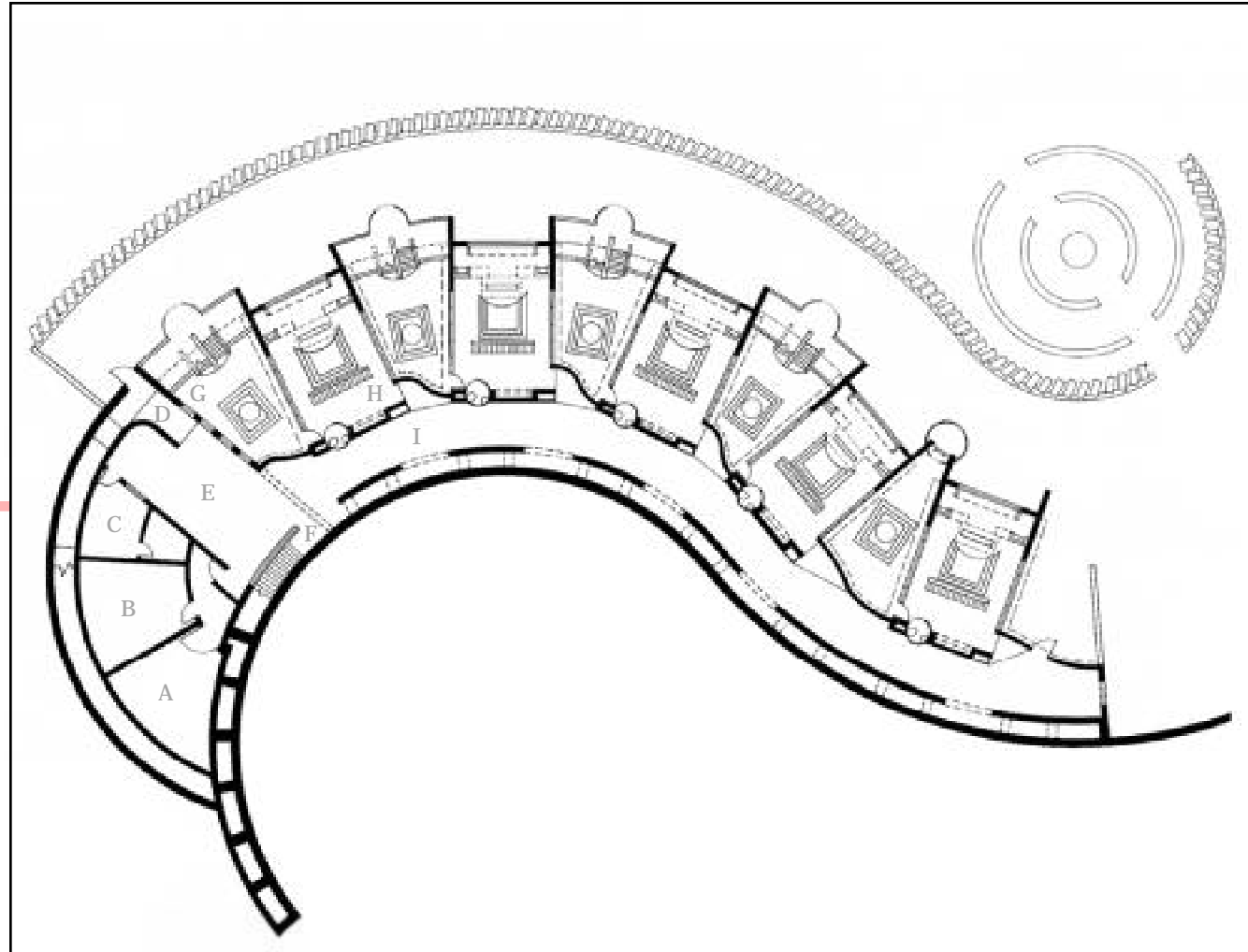
When I began my thesis, I thought the process entailed posing questions and finding the answer to those questions. What I found was that my investigation led me to more questions, better questions, but nonetheless, questions. Any answers that I discovered seemed incomplete and led directly to a whole new set of questions. Quite possibly the answers lie in wait for me, but for now, I am armed with some very good questions that will serve as a springboard into my career.

Second Level Plan
Hand Drawn

Theater Level

- A Theater
- B Lobby
- C Stairway
- D Ramp
- E Entry
- F Mens Room
- G Womens Room
- H Office
- I Janitorial
- J Drop off
- K Driveway



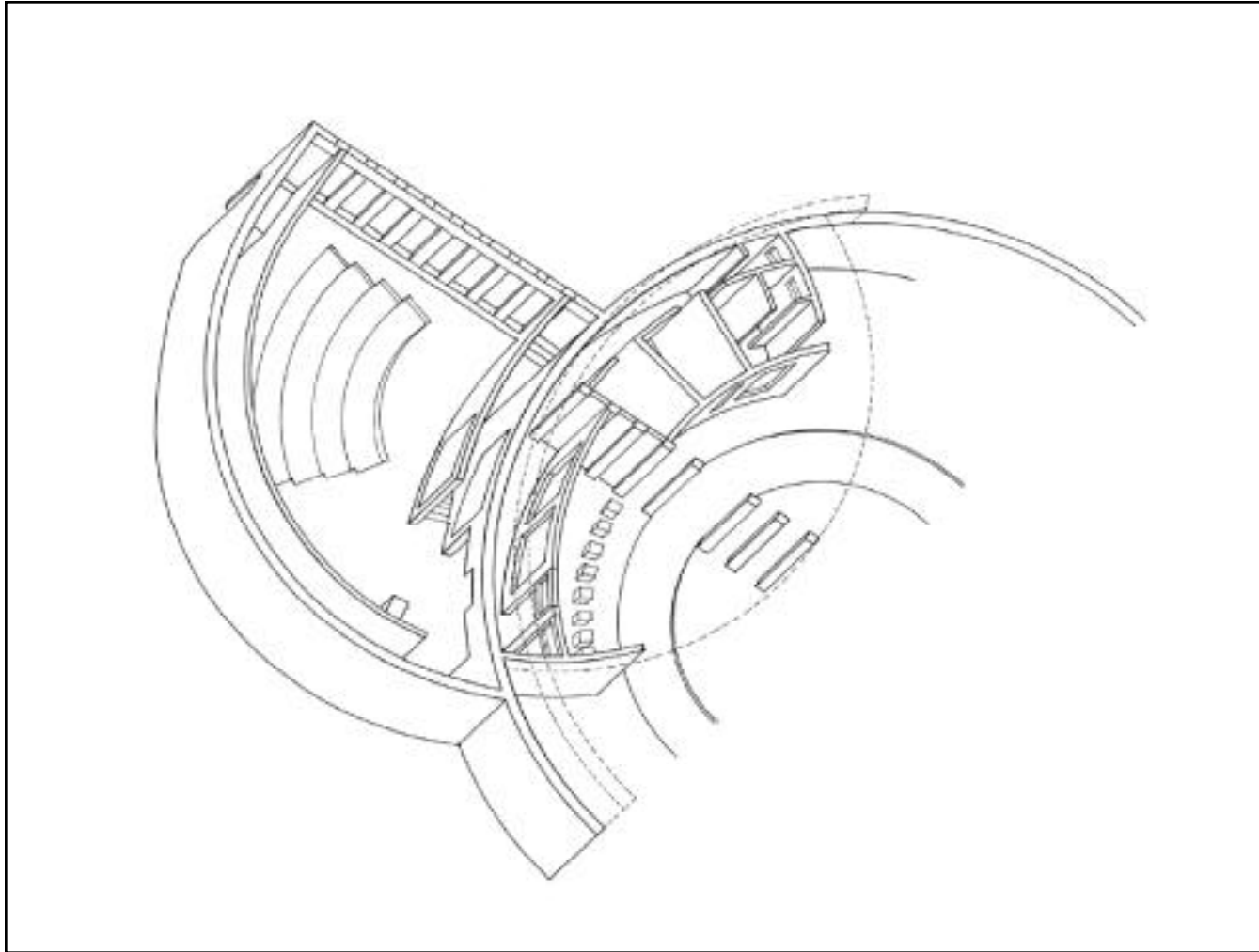


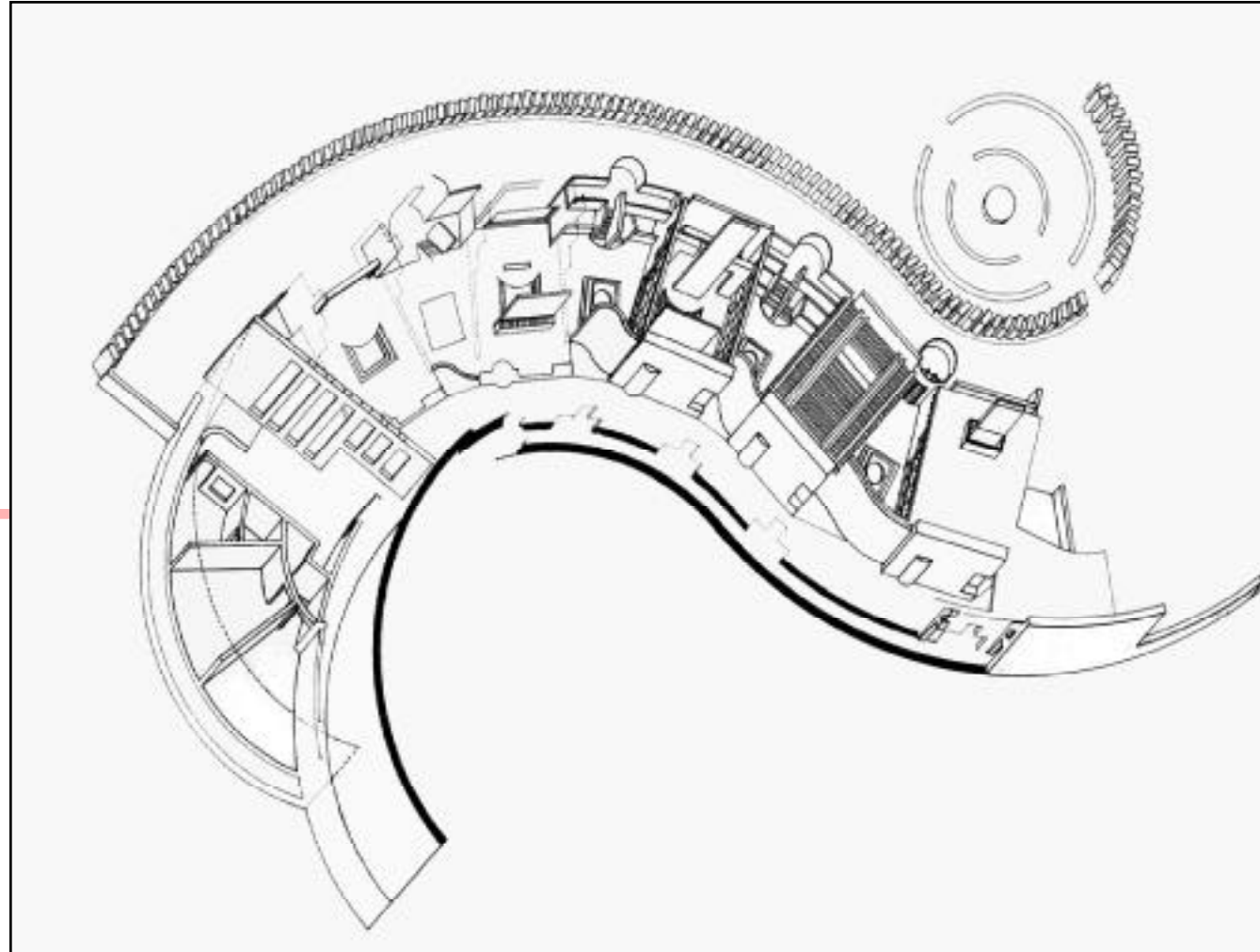
First Level Plan
Hand Drawn

Classroom Level

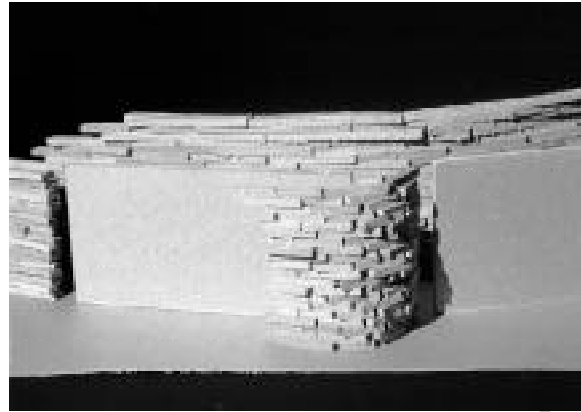
- A Storage
- B Lounge
- C Nurses Office
- D Ramp
- E Indoor Court
- F Stair
- G Outdoor Court
- H Classroom
- I Hallway

Second Level Axon
Hand Drawn

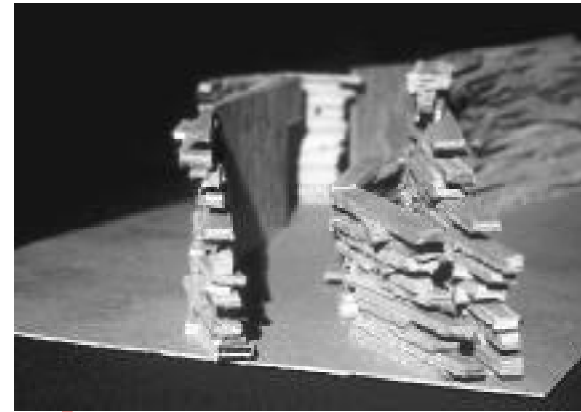




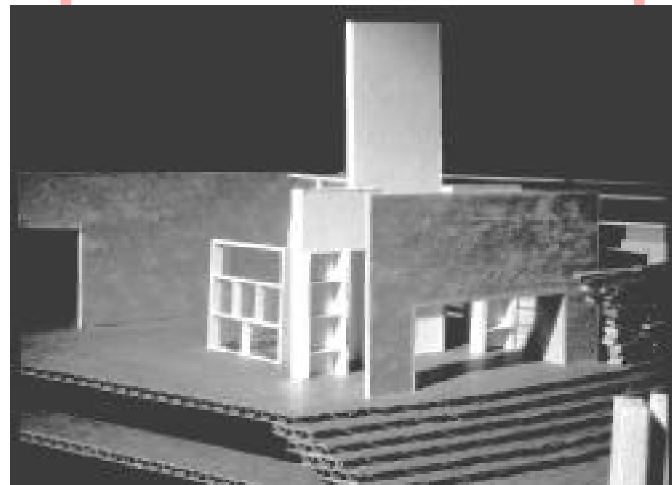
First Level Axon
Hand Drawn



Classroom Entrance

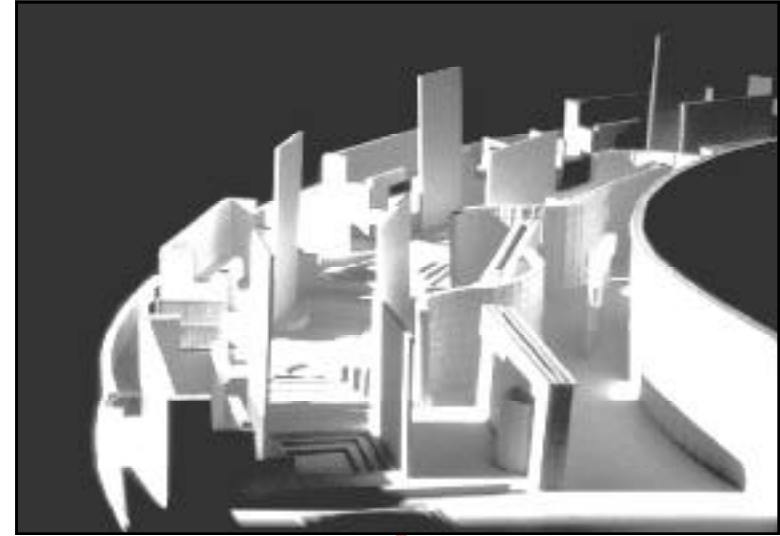


Classroom Wall versus
Hallway Wall





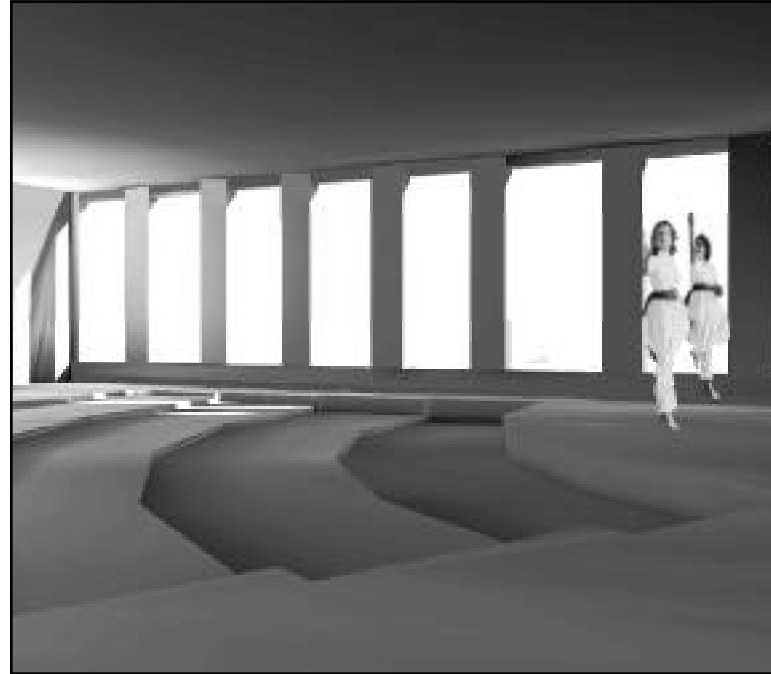
The Condition of Line in
Plan



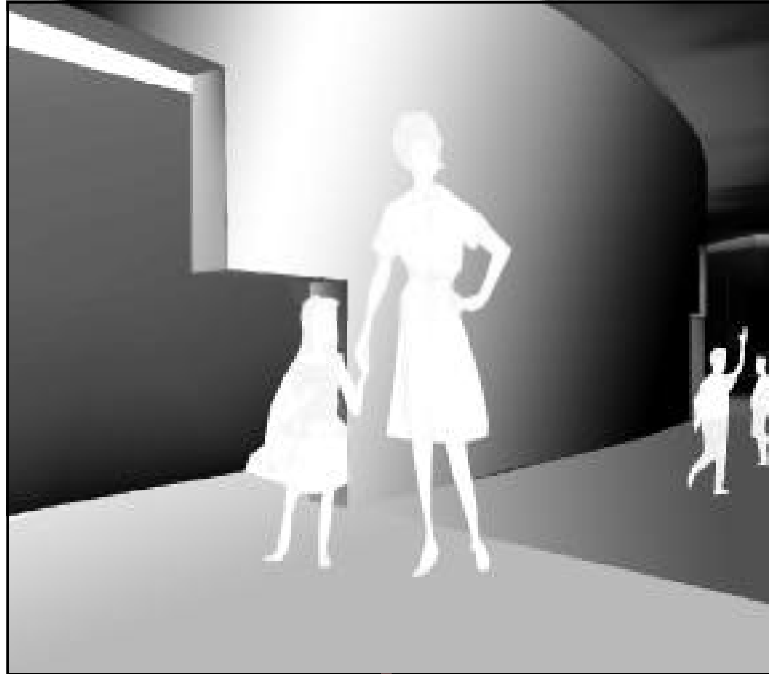
The Condition of Line in
Elevation



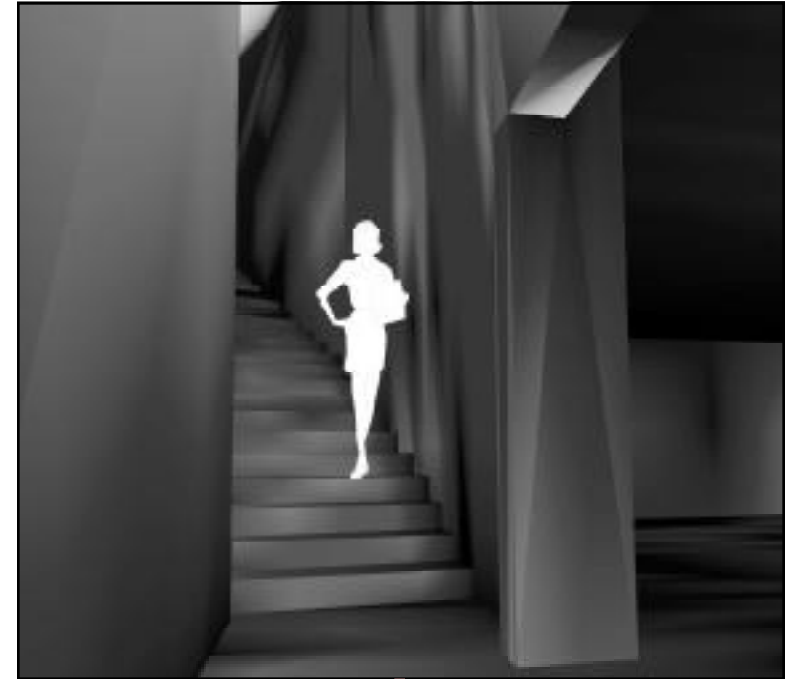
Theater to Stage from
Back Wall



Theater to Windows
from Lobby



Hallway - Entrances
are scaled to the adult
and child



Stairway from Entry
Level within the
Double Wall

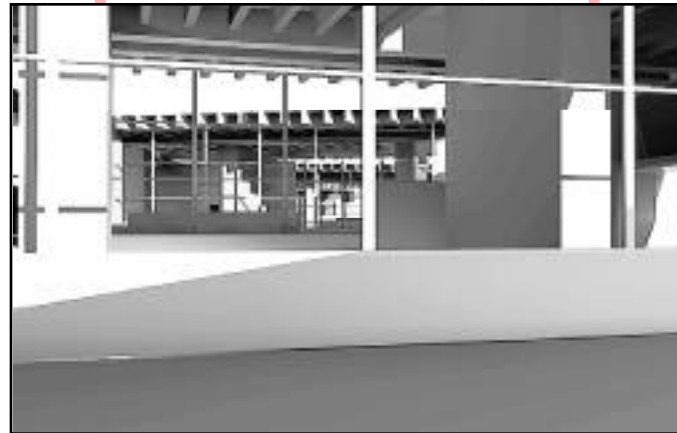


Skylight Condition on Stage Wall



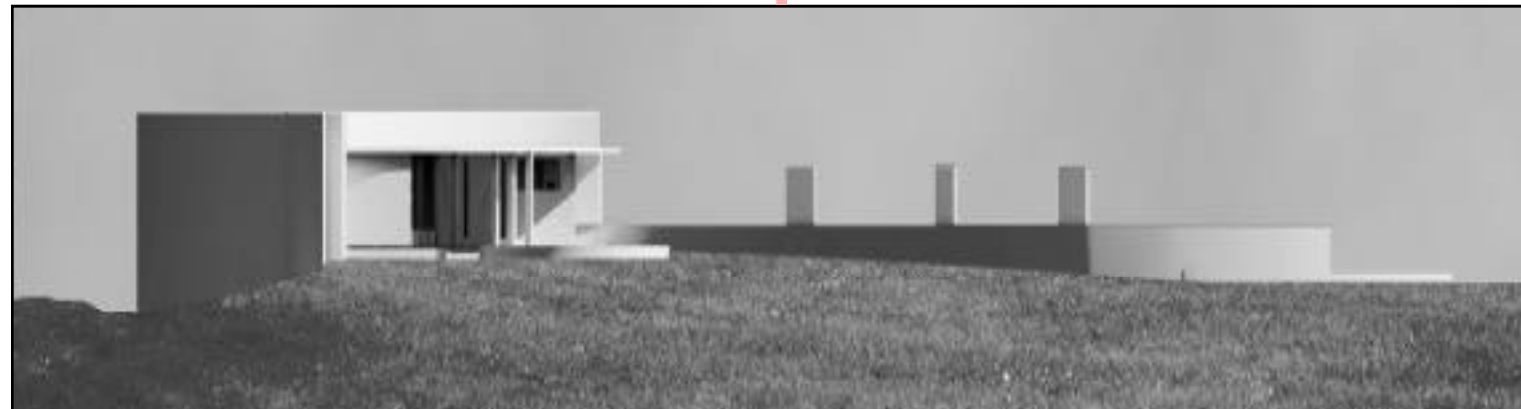
Opaque end in Classroom

Classroom Transparency

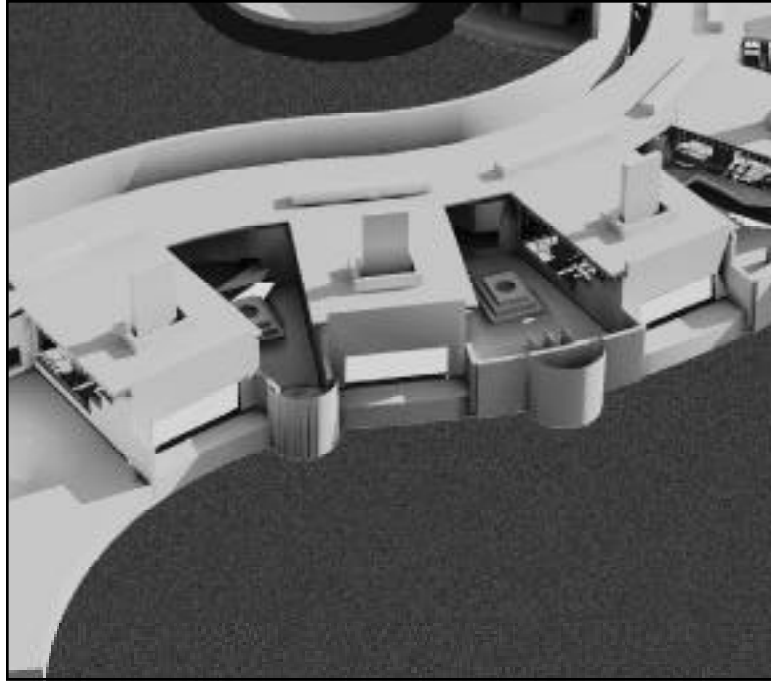




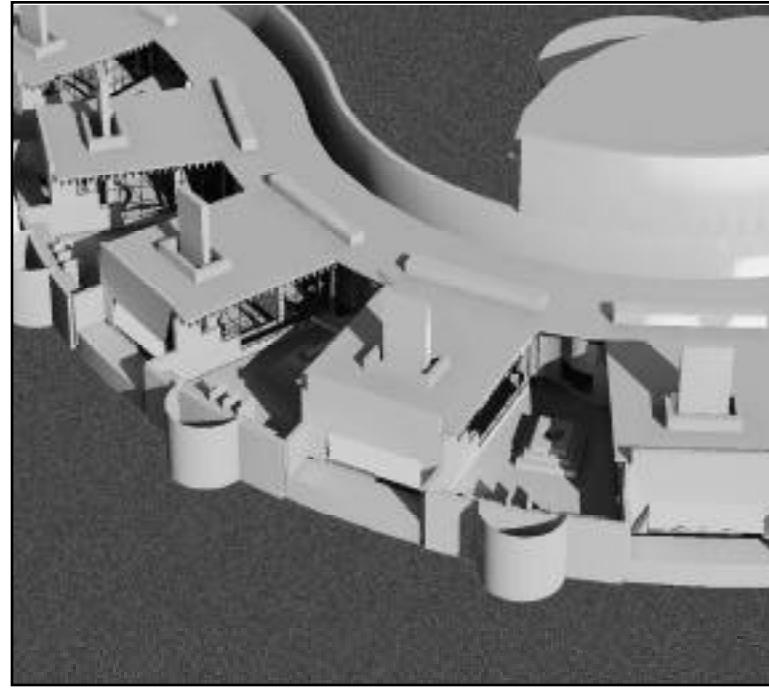
Western Elevation



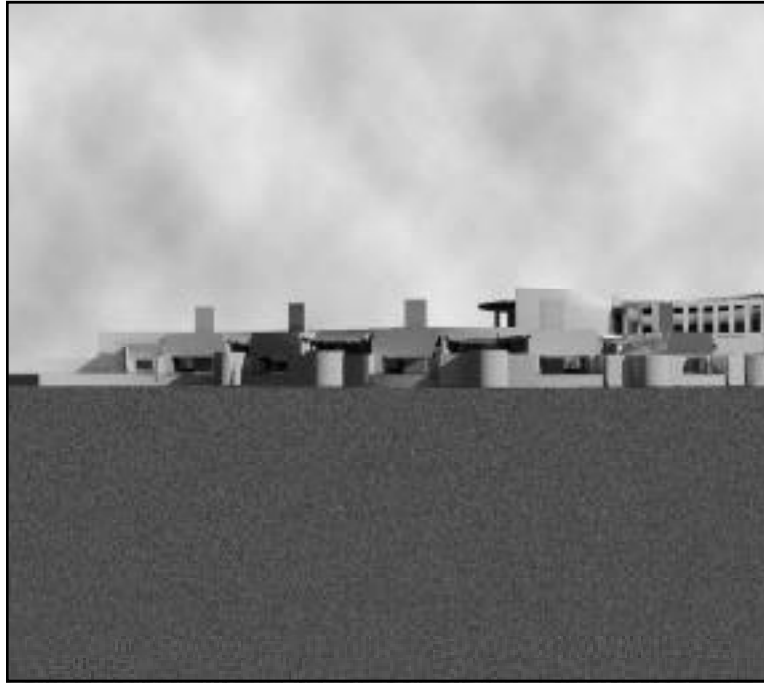
Southern Elevation



Birds eye from Northeast



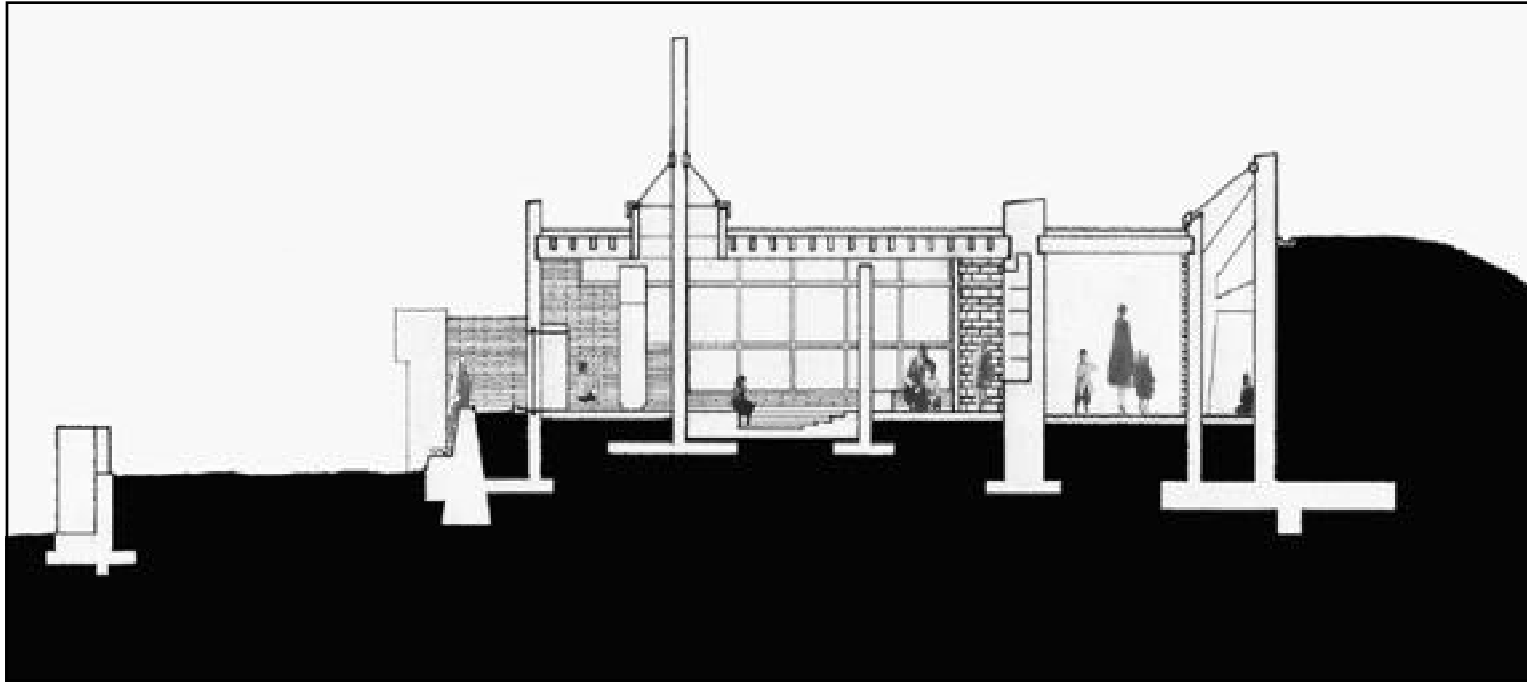
Birds eye from Northwest



Northern Elevation



Entrance Elevation



Classroom Section



Northern elevation on
Site

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All other photographs were taken by the author.

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