

UMBAU



a graduate thesis by

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Abstract

This thesis begins by transposing two specific architectural design approaches upon the design of residence quarters for a school of architecture. There are numerous approaches in design conception. Any one of these can assist in an architects' building design, from the organization of the spaces inside, to how the form is generated. However many of these are confined to the architectural type in which they are derived. This project explores the possibility of transposing two approaches in museum design toward a different "type" of building.

The Labyrinth is a design approach which focuses on the intent of the architect to direct the patron through a museum building on a designated path. The building is conceived as a container to house the art and give the patron a defined path of movement through space. Although, from the outside, the building would appear simple the path on the inside increases in complexity through a series of interconnected spaces. The "white box" approach is based upon an idea of creating a building as a palette for the artist. The building lends itself to giving the artist boundaries that they must explore in order to express their individual work. The artist uses the space to portray their artwork as they wish the patron to encounter it. The building doesn't exist as a silent landscape, but creates a dialogue between the artist, the work, and itself.

From these thoughts, the design of the residence building began. The intent is to design a structure which allows the students to discover a new interaction with their residence. The concept of the "transformation of a line", questions the depth of space that can be created by the cut and shift of a single line in a two-dimensional plane. The form quickly evolved into complexity, making the architecture a frame for a dynamic quality of life.



Dedication

With sincere gratitude, I wish to acknowledge those people whose support, knowledge, guidance, and love have made this experience possible. To my committee, my colleagues, my family, and Craig.

“Only those who will risk going too far can possibly find out how far one can go.”
- TS Eliot



3 ABSTRACT

10 THE SCHOOL

17 THE SITE

39 THE BUILDING

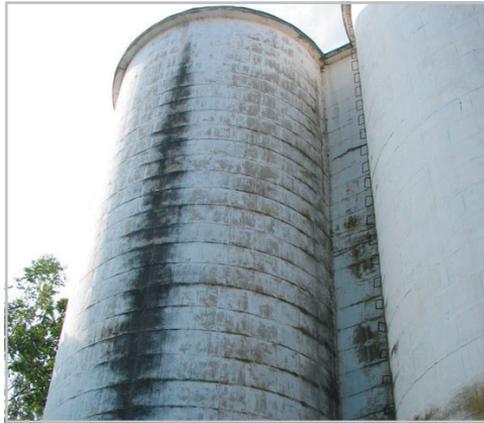
53 THE ROOM

61 THE STRUCTURE

63 THE ROOF

74 CONCLUSION

76 SOURCES



The School

Umbau is a new school of architecture that is taking shape in Staunton, Va. It is the vision of a man who believes in the fulfillment of the play and possibilities in architecture. The school endeavors to generate a new layer in the education of an architect by manifesting a new paradigm in design education of the architectural student. The beginnings of the program lie initially in an intensive foundation year, in Staunton, Virginia. Following the foundation year, students leave for an educational architectural exploration of Vienna & Sarajevo through extensive travel and apprenticeship programs

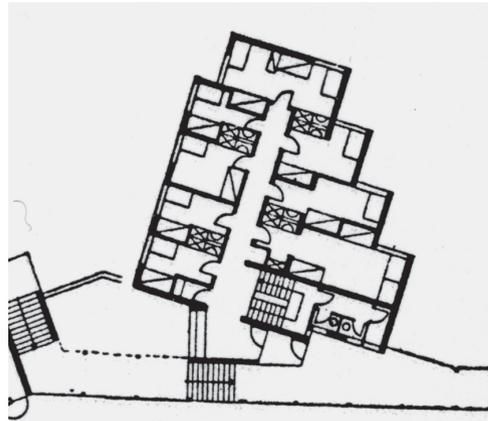
However, for this movement to transition into a reality from its initial manifestation, it must first have a built environment. The original master plan for the school includes the acquisition of White Star Mill in Staunton, VA. Previous design study of UMBAU's needs, by the founder of the school, gives the studio space to the lofts of the Mill & then pushes for a connection to the Silos for a Library. From this proposed arrangement of the school comes a program to offer the students a residence within the institution.

A place to live.

A place to exhibit.

A place to form a community.

A place to transition from being immersed in architectural design exploration to smaller spaces of inspiration, quiet and solitude. The path is the building, and the students are layers propel the innate movement of the building into life.



Ulm - Student Housing Plan

In the typical university dormitory, the relationships of the rooms tend to focus on two forms of organization: the “suite” and the “hall”. Both of these are utilized in many architecturally noteworthy buildings which tend to focus upon the form of the building. In Chicago, Murphy/Jahn recently completed a dormitory which utilizes the “suite” system. Although it’s an architecturally fascinating form, the interaction of the students with the building is typical. The building does offer a change in the material palette and roof terraces which are screened by the curvature of the buildings’ skin, but the buildings organization does not engage a tactile relationship with the students. When Max Bill designed the student housing quarters for ULM, his design utilized the relationship between the building and the topography as a lead in the design. The rooms were offset to articulate the functions of the interior and the separations of the room, but the organization is still basically a “hall” system. The ideas that ULM brought to architectural education, which emphasized creating an architectural live/work community are vital ideas that architecture schools like Umbau seek to reinvigorate.

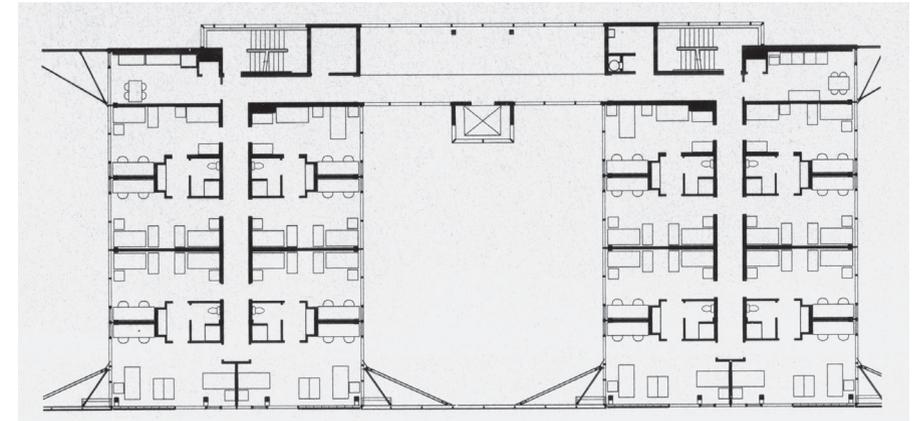
By integrating approaches to organization that are used commonly in museum design, I think that the interaction of the students with the building and each other will create a dynamic energy to everyday living. It allows the student to engage in the way that they live, but also allows for there to be degrees of privacy from the corridor to the room on a daily basis. In typical university housing the room is the stationary and furniture is freely moved about the interior. Each student portrays themselves in the arrangement of the furniture and the décor. In the rooms designed for Umbau, the quality of the room that each student can change isn’t the arrangement of the bed or the desk, but the walls that face the labyrinth.

“There is no such thing as total freedom in a museum. A “white box” even creates something with the art that it shows. Museums determine what happens with the art. The museums that don’t ask anything of the artist are not usually great pieces of architecture.”

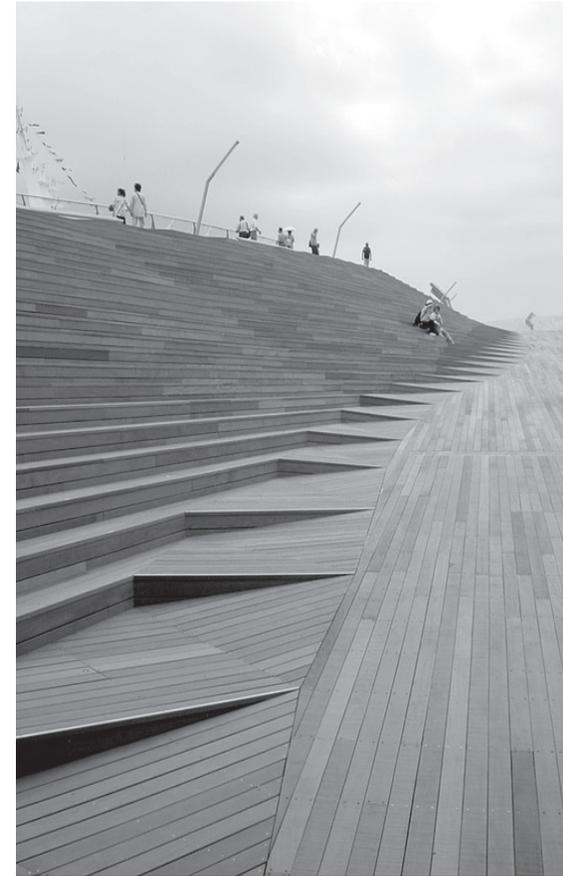
Each student has the opportunity to open up the walls to create a porch or to display their work. It is an open forum for interaction with the building and how you portray your room to other members of the community. By allowing the students to have this control over the relationship of the room to the labyrinth, hopefully it will challenge the resident to utilize the room as a frame; offering a glimpse into themselves as an artist... an architect.



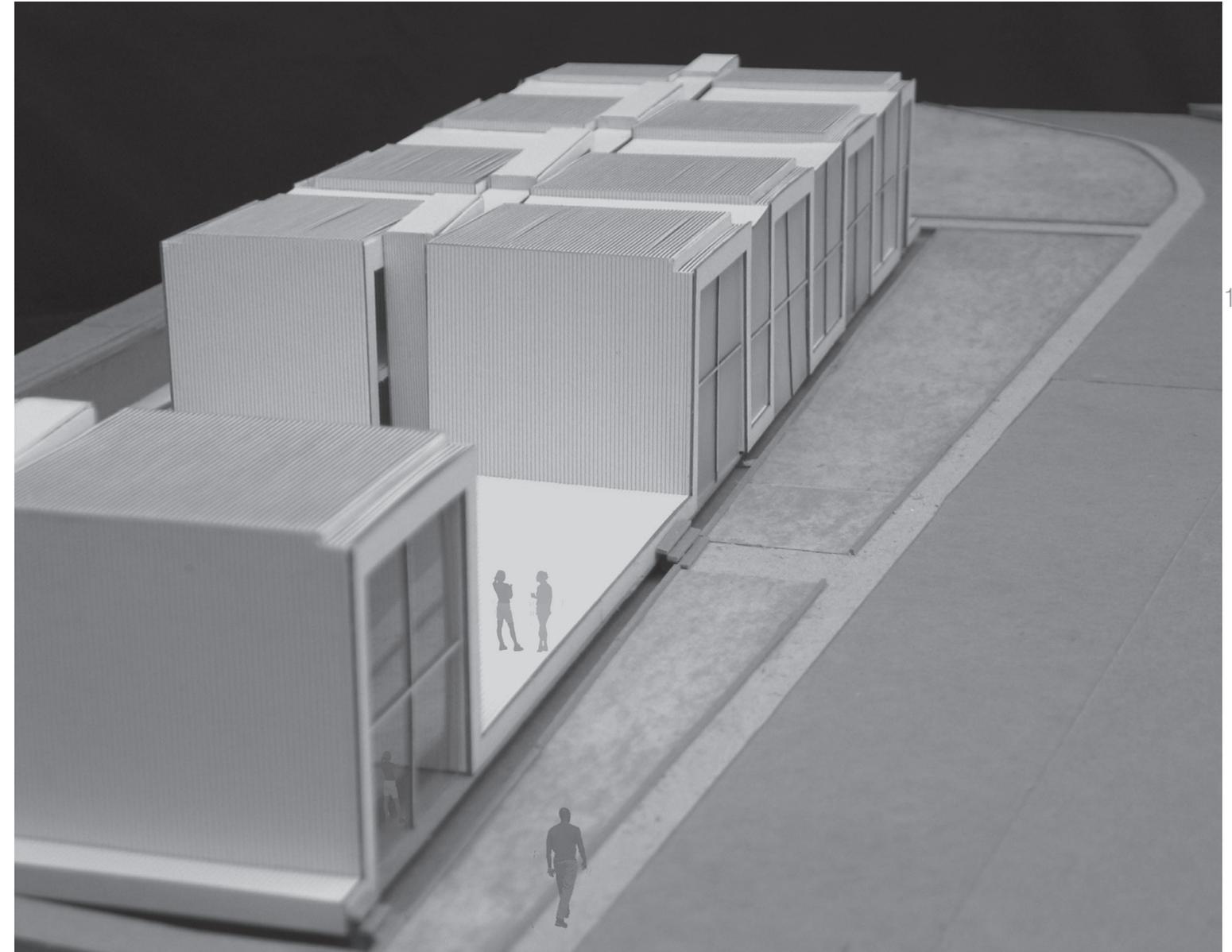
State Street Village at IIT - Chicago, Illinois

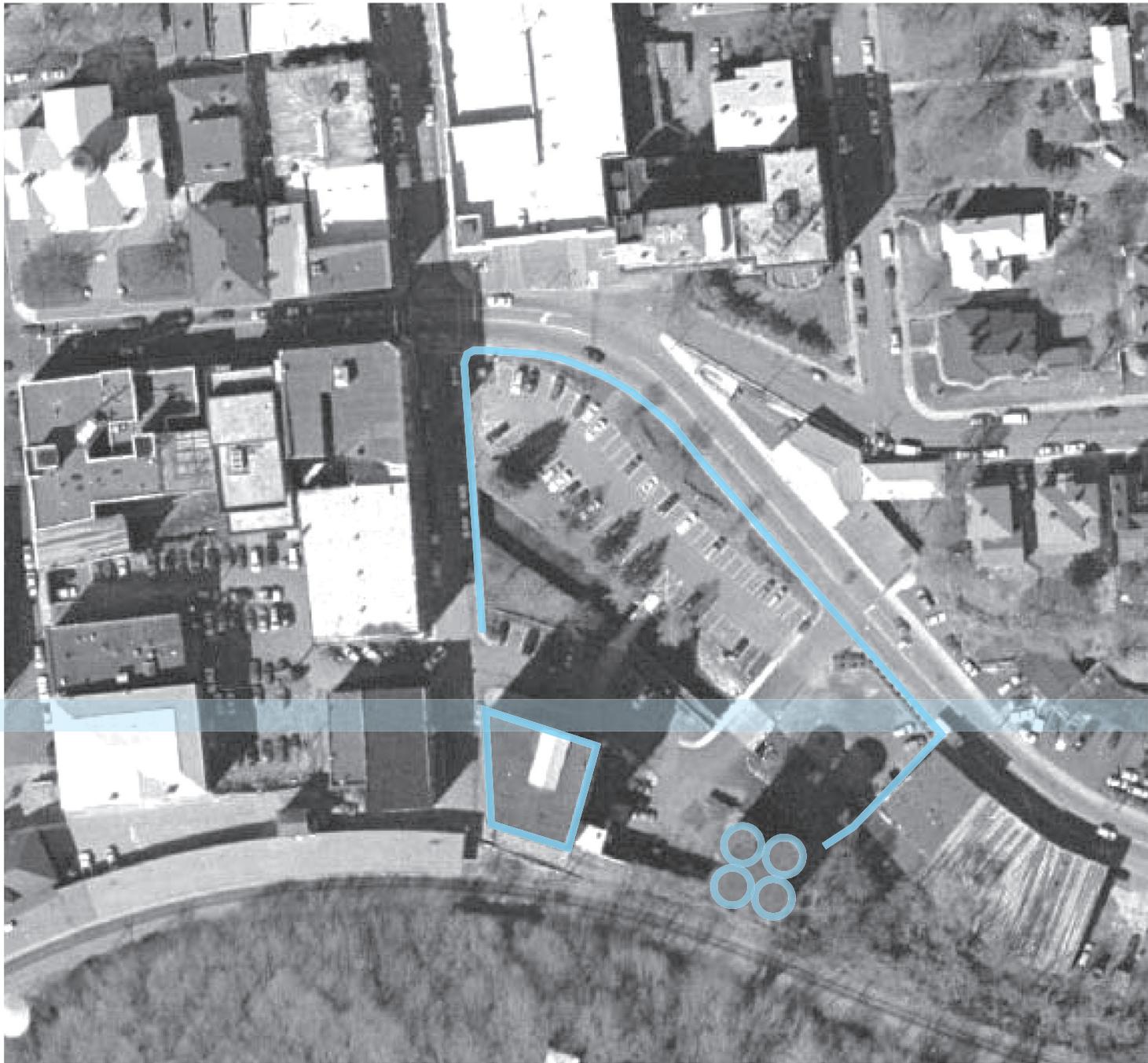


The Yokohama Ferry Terminal, by Foreign Office Associates provides the city with an identity because of the wooden landscape with a distinct identity. This project was an inspiration for this thesis because of its unique articulation of the surfaces on the building, and its offering as a public architectural landscape. The architect paid enormous attention to the details of the building in order to create an interior which serves the programmatic needs, and an exterior environment for the citizens of Yokohama. The roof of the building is not left as an unattractive wasted space, but instead provides the community an extension of the nearby park. The building's design offers new possibilities to the surrounding area and to the architectural community.



The language of the building is based upon the simple idea of a line that moves through the building as a plane. As the plane splits and folds it creates the form of the building. From the alterations to the plane, the order of the building is derived. It becomes a series of interconnected spaces along a single path. The path is singular, however not necessarily a straight path. When inside, the path of the residents' alters each time they enter or exit a section of the building. In the center of the building, the split creates a corridor interwoven with the southern half the building. It provides openings which force the user to not only change direction but also step up or down. The complexity is simple; its a series of movements other than the normative straight walking path of the corridor. These very simple planar changes are the form of the building.

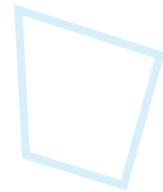




Staunton - Virginia

Mill = Studio Space

Silos = Library



The site is located just SW of the heart of Staunton and is bordered to the north by Greenville St a main corridor into downtown; which leads you to the core of the town.

To the north, a hill, on which Mary Baldwin College and Stonewall Jackson Hotel are located.

To the west, the Wharf District, which marks the presence of the Railroad in the city's history.



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b



c

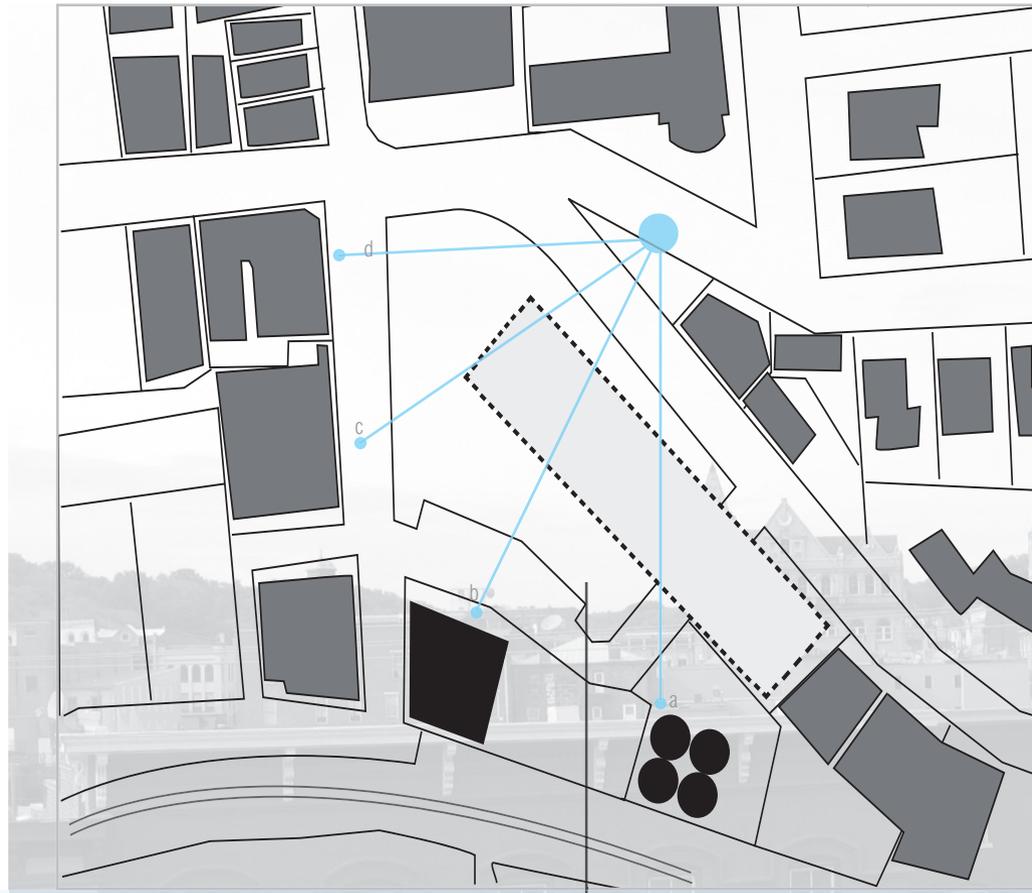


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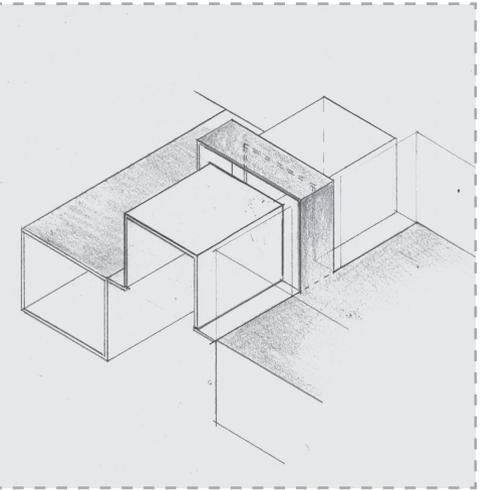
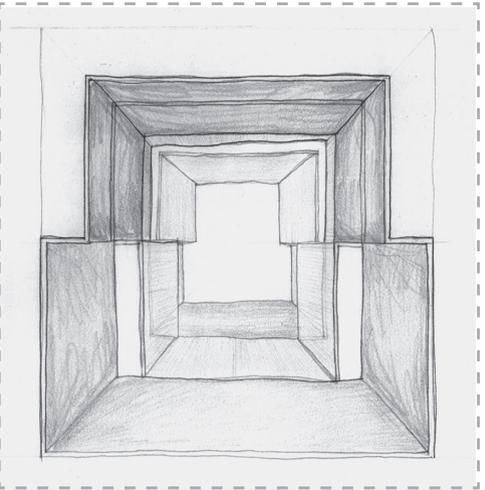
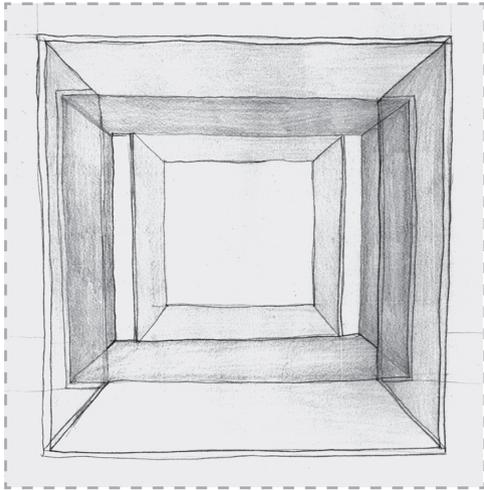
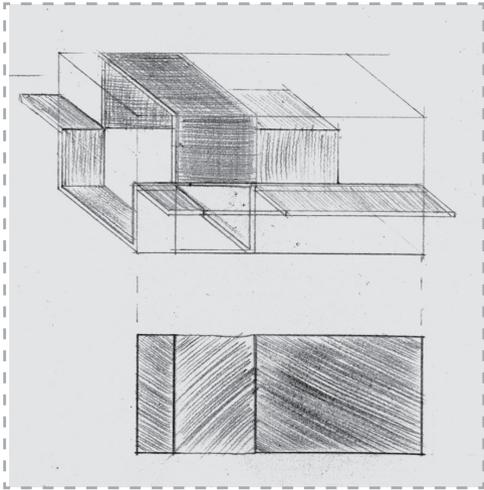
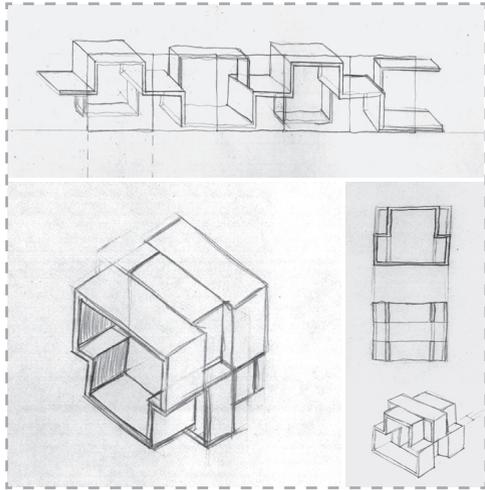
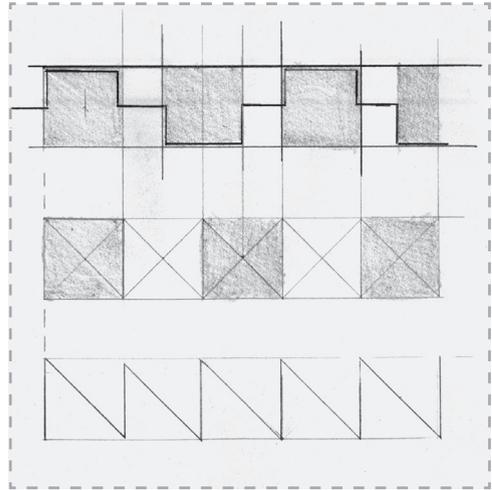
'The Queen City' of the Shenandoah Valley

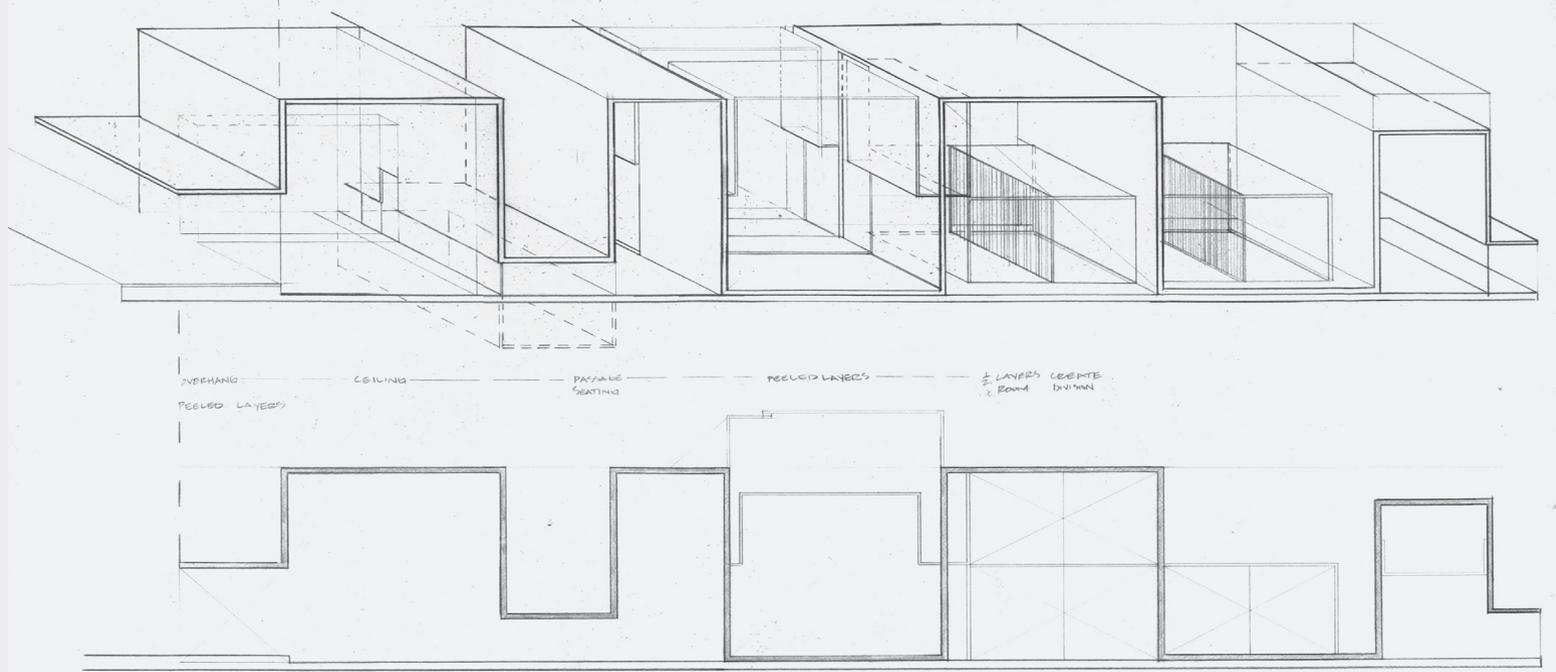
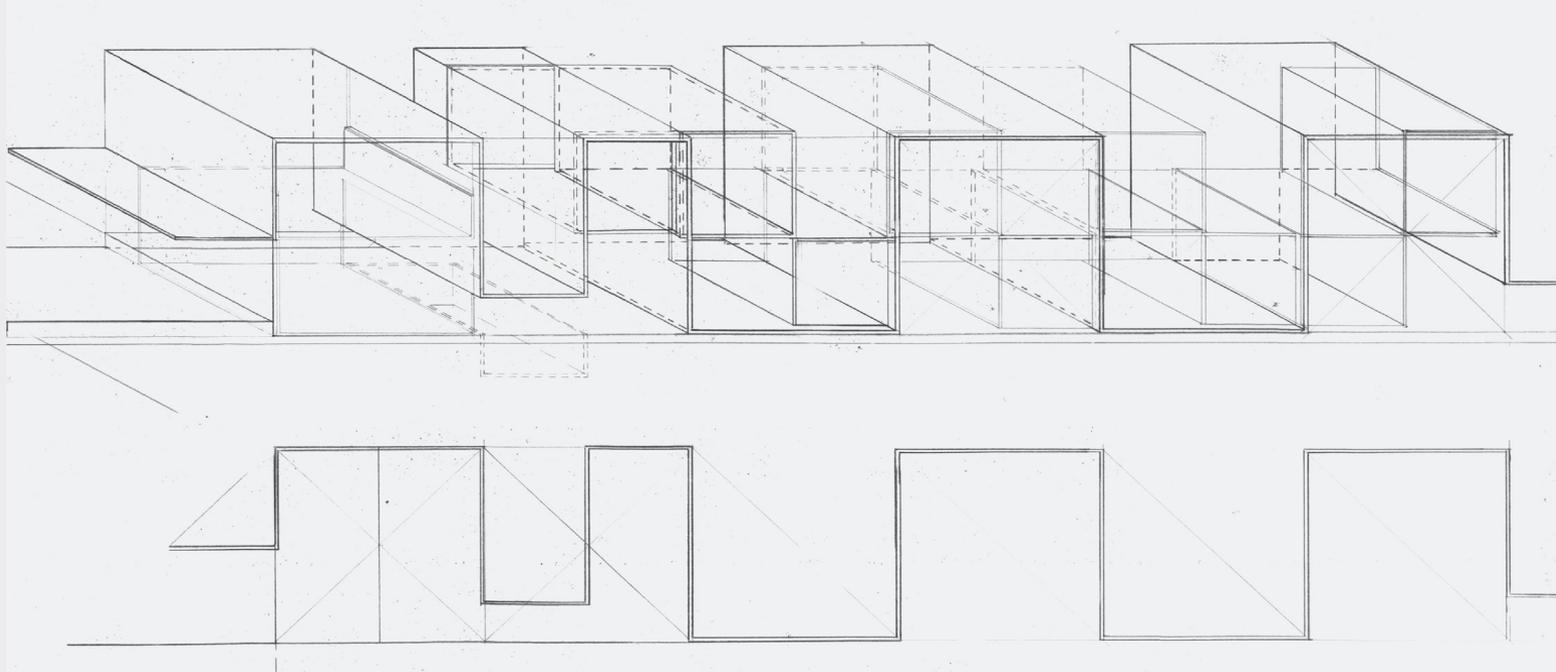
The town of Staunton has expended a large amount of effort in the past few years in the revitalization of the historic downtown area. Proprietors have been encouraged to take advantage of the buildings downtown and to embrace the potential for the area's growth. In the last year, construction finished on a new parking facility, renovations began on two area hotels and the Black Friars Theaters opened for business, along with two coffee shops. This was a big change for a small town, but the citizens embraced the successful transformations

The location of the new Umbau building will support the town's effort to renovate the downtown area, along with helping to establish Umbau's Identity with the area.



Building Location



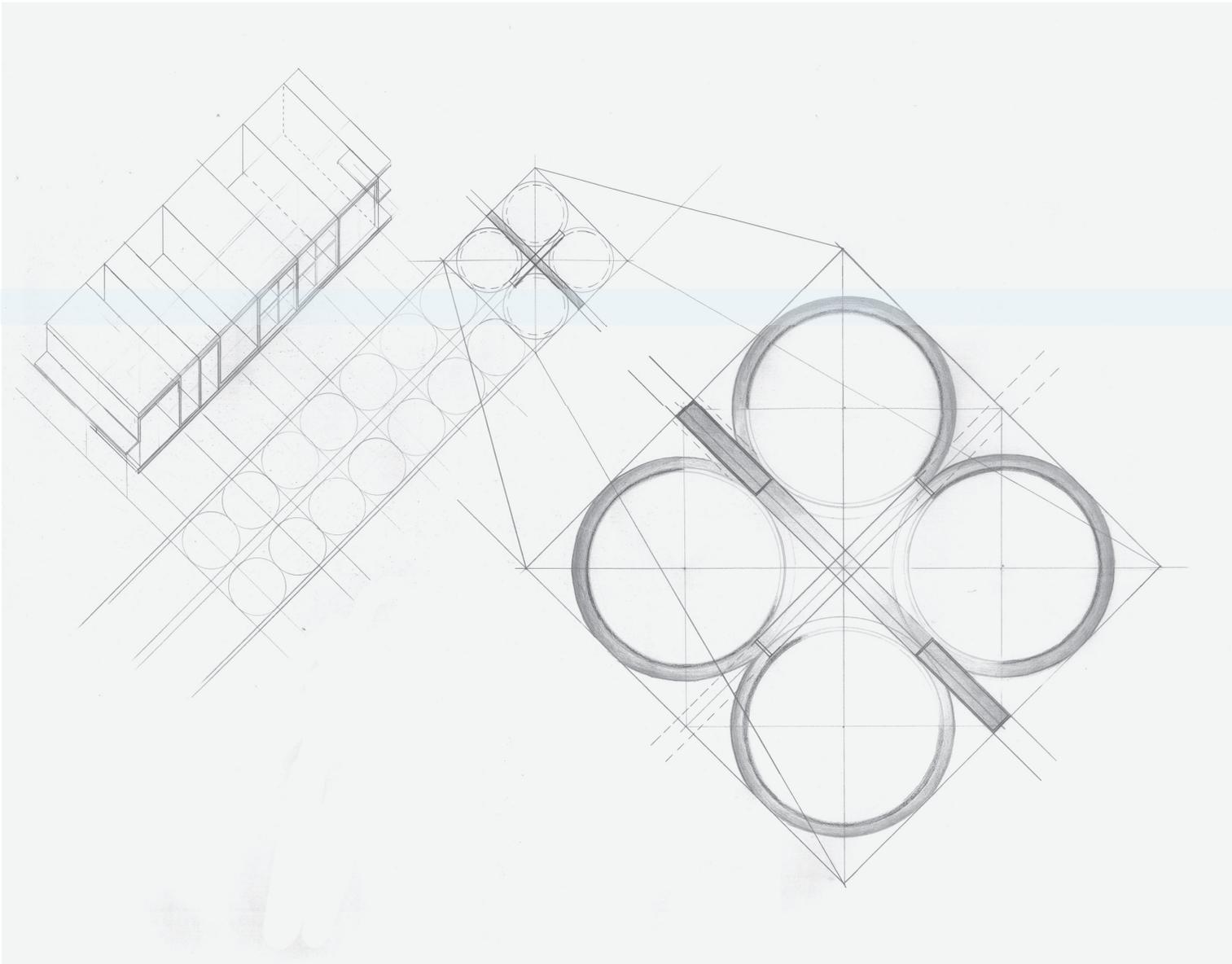


The form of the building should be a suggestion of the architectural relationship of the design to the movement of the paths inside.



'... the architect should conceive buildings not as monuments but as receptacles for the flow of life which they have to serve, and that this conception should be flexible enough to create a background fit to absorb the dynamic features of our modern life.'

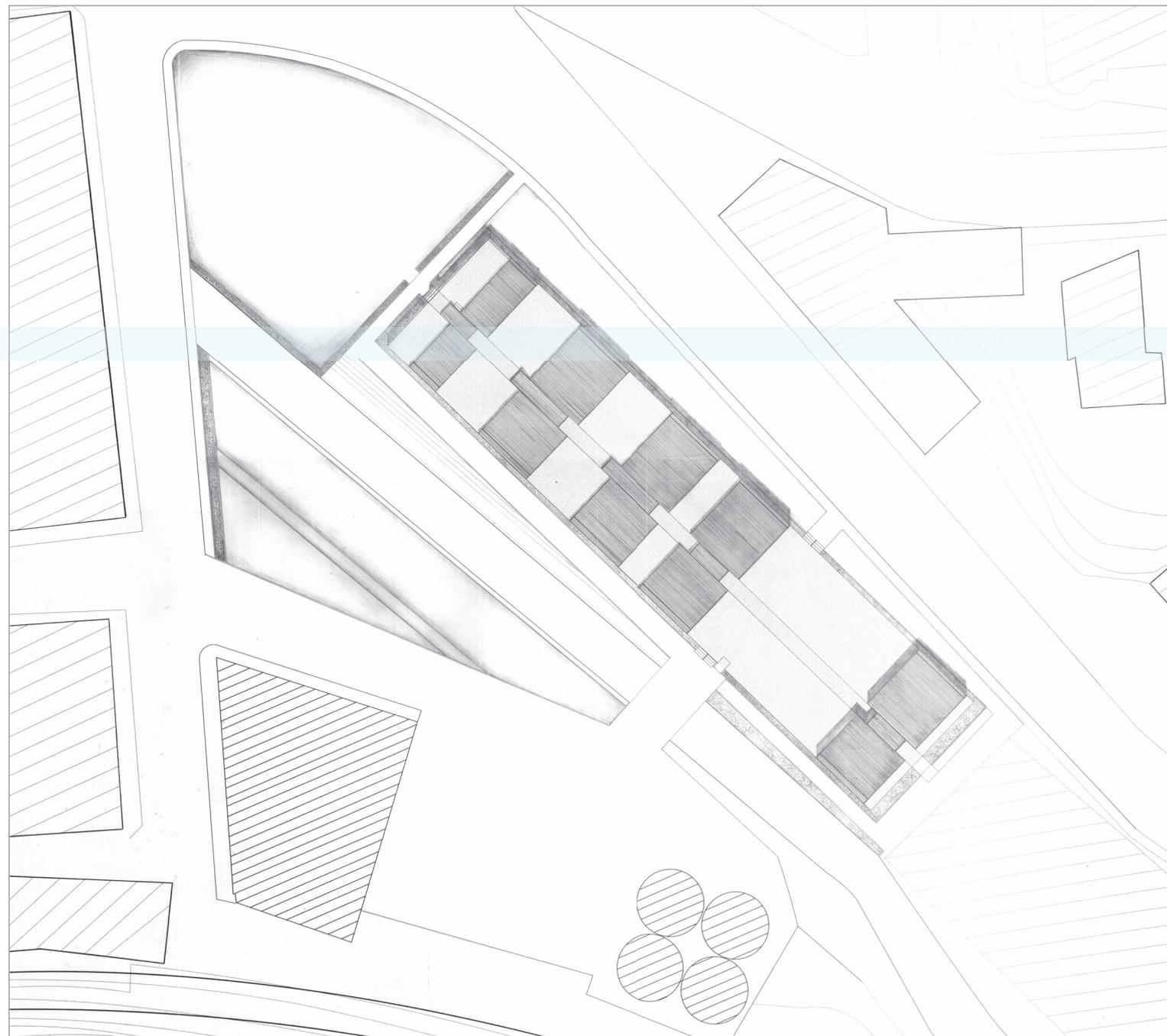




The scale of the new building is founded in the existing conditions. On the site, the dominant structure is the silos and therefore became the natural inclination of the proportion to the new building. The inside diameter of the grain silos is 25 feet and upon studying the scale of the average human within the such a volume, this dimension became the distance with which to measure the building. Further investigation of the relationship between the silos and the building helped to explore the possibilities of the volume within the movement of the plane.

The site design is a suggestion of how to allow the area surrounding the building to interact with the creek, while creating a campus atmosphere for Umbau to grow. Originally the small street in front of the Mill served as parking for the Mill Street Café, leading vehicles through from New St to Greenville St. The new site, reconfigures the movement through the site and designates it for primarily pedestrian use. The building creates a barrier for vehicles and leaves the area south of the creek to be cultivated into a green space for the campus.

The boundaries of the landscape are defined not by guardrails, but distance between the individual and the edge. On the northern bank it is with a bed of greenery and on the southern bank with water. As the steps on the northern bank descend closer to the creek, the view becomes the water falling over the southern bank. It's subtle. The creek is not a river; the falling water will only add to the quiet sounds of flowing water and keep the moment alive when the water is scarce.





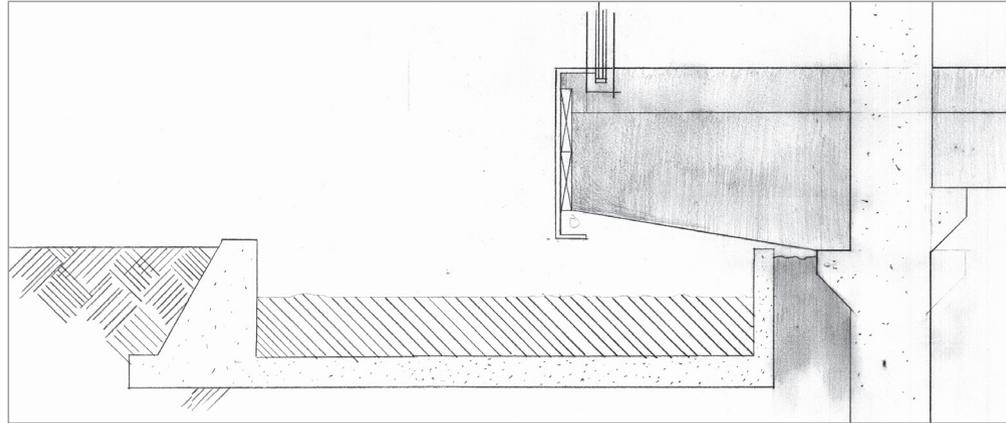
View of Mill

View of Silos

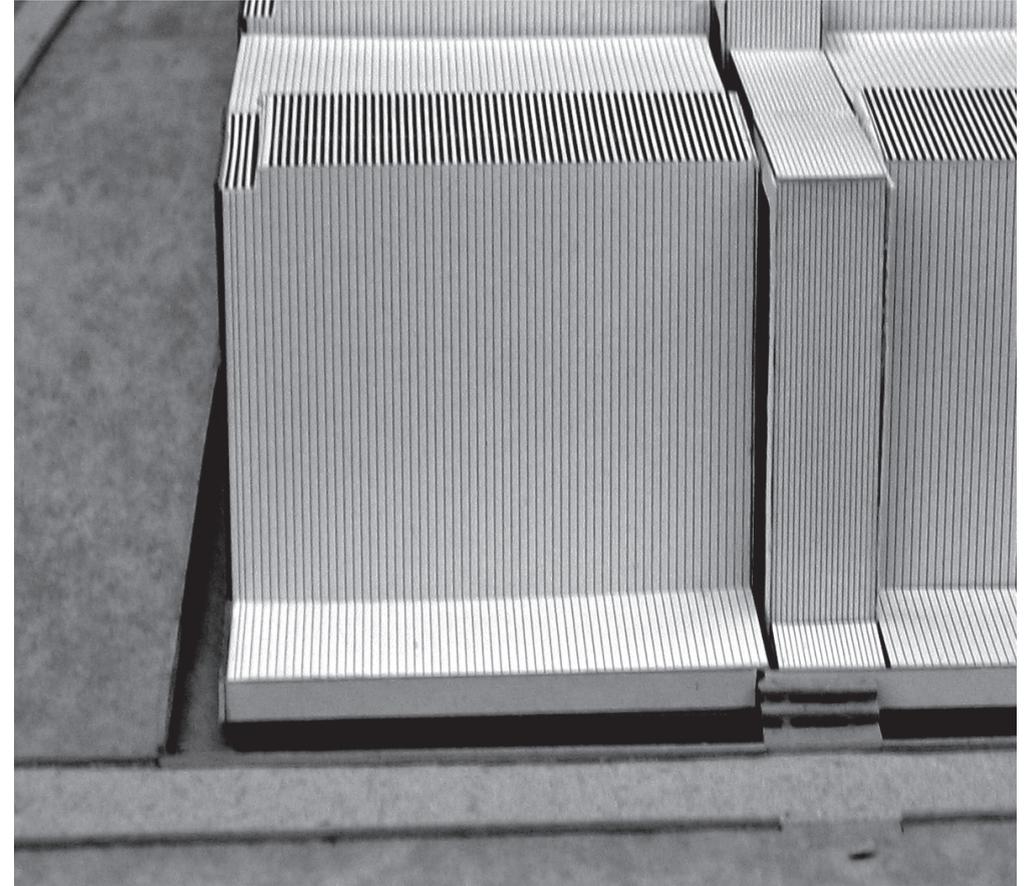
Since White Star Mill has been a fixture in the town for many years, the design of the building was intended to help preserve the primary views of importance. The building is sited at a slight angle to the street in order to open itself to the center to the downtown area. By keeping the building from reaching the corner of the site; the view from New Street toward the Mill is unobstructed. When driving toward the center of downtown the plaza between the Exhibition Building and the Residence Building also preserves the view of the Mill.





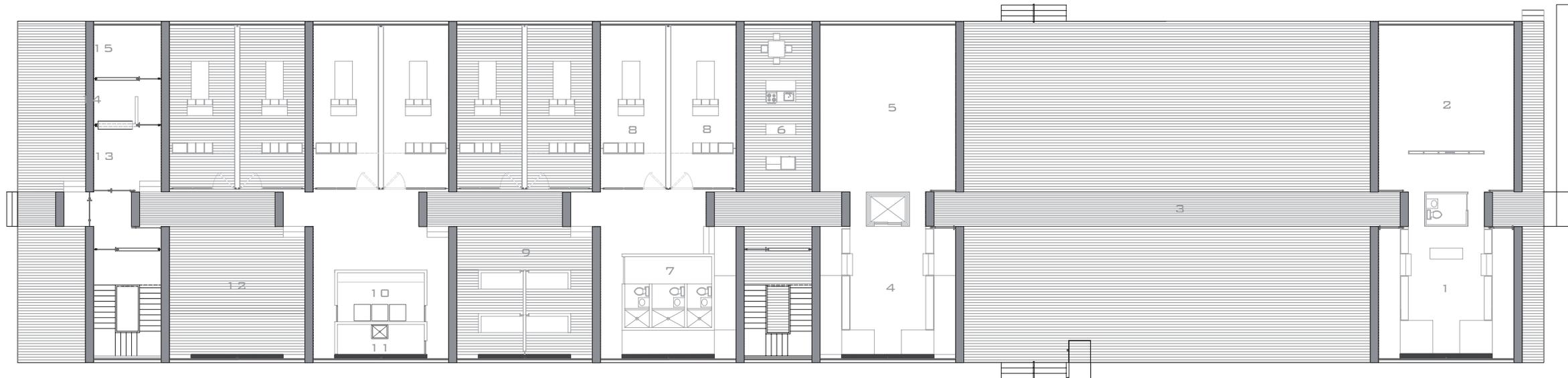


The landscape around the building is designed to emphasize the line on the façade, and enforce the space between site and building. In the places where the plane makes the floors the visual continuity was unclear, by the landscape receding slightly into the ground, a shadow line gives the building a place to reside. The perception of the line on the facade of the building now remains constant. A boundary, in the form of a bed of greenery fills in the gap, surrounding all four sides.



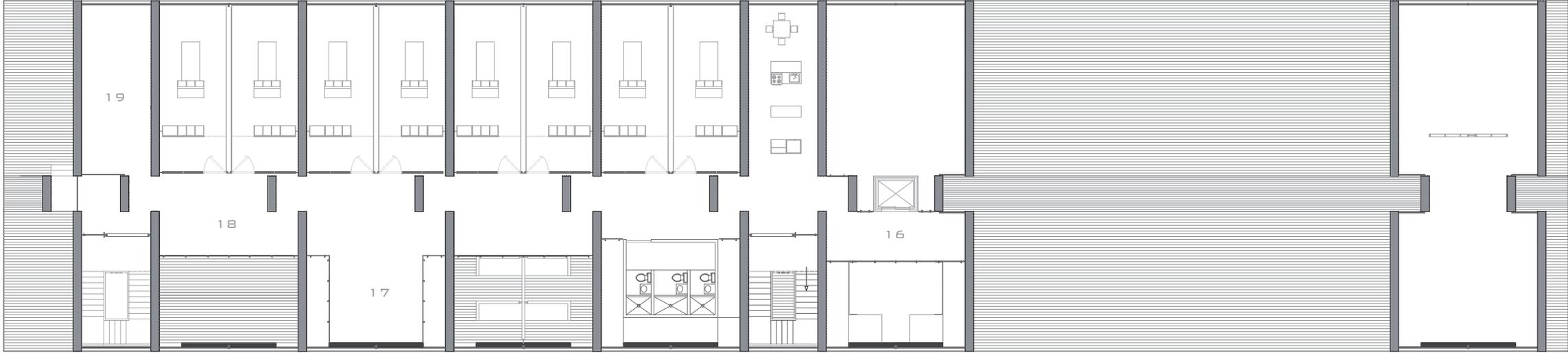
First Floor

- 1 EXHIBITION LOBBY
- 2 EXHIBITION GALLERY
- 3 PLAZA
- 4 RESIDENCE LOBBY
- 5 COMMUNITY ROOM
- 6 KITCHEN
- 7 BATHROOM
- 8 RESIDENT ROOM
- 9 STUDY CAROLS
- 10 LAUNDRY
- 11 JANITORS' CLOSET
- 12 LOUNGE
- 13 REAR ENTRANCE
- 14 MAILROOM
- 15 OFFICE



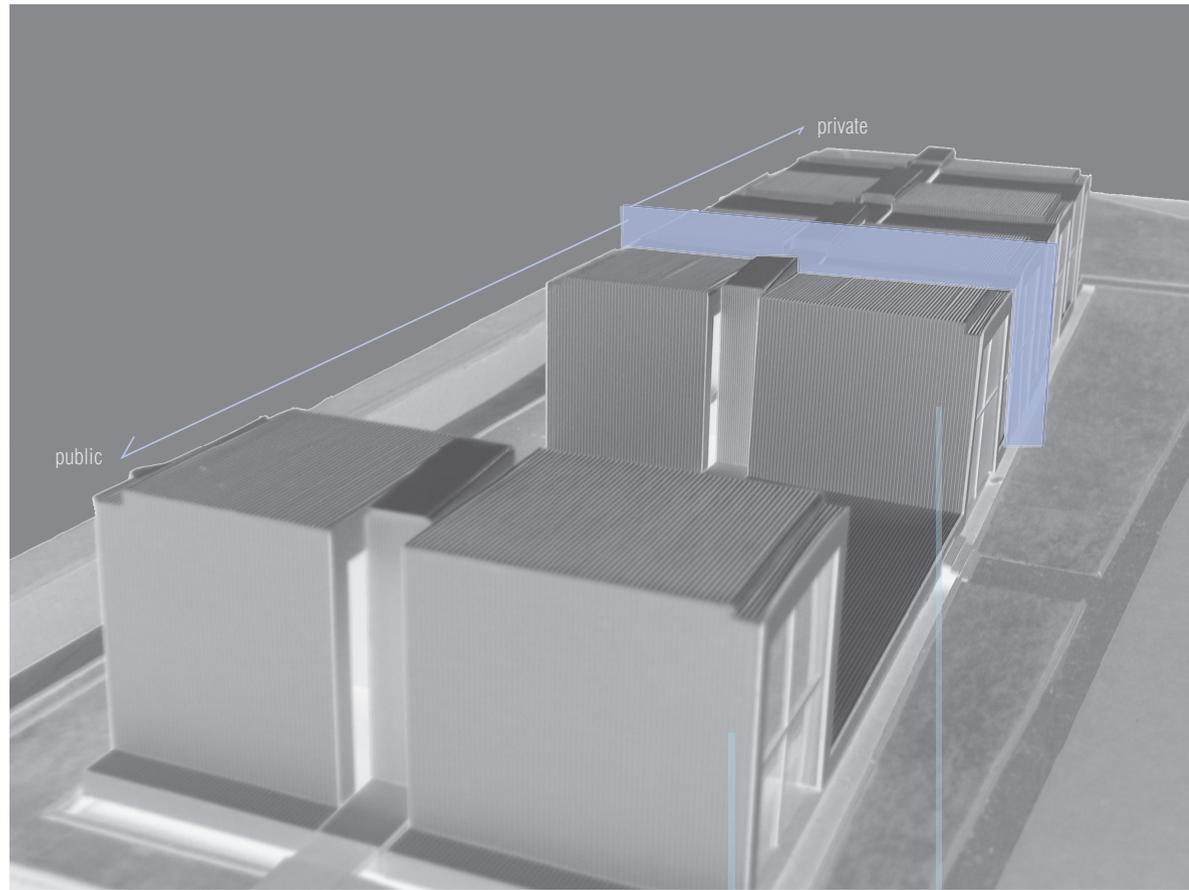
Second Floor

- 16 LOBBY BALCONY
- 17 LOUNGE BALCONY OVERLOOK
- 18 BALCONY LOUNGE
- 19 MEETING ROOM



The exhibition hall is the space for the school to directly integrate itself into the new building. It provides the students a place to formally display work, and defend their theses. Outside artists could also be invited to exhibit their professional work for the school and the community to enjoy. Unlike the other facades on the northern side, the glass in this building remains transparent so that the passerby may view the activities occurring on the inside. By allowing the level of privacy to be decreased, a glimpse opens into the life of the school. Perhaps that moment will intrigue members of the community enough to pursue future involvement in the school. The separation between the Exhibition Building and the Residence Building offers a promenade to the entrance from the main stairs. Following events in the exhibition space, patrons have only a short walk across the plaza to the community room for celebrations of the exhibits.



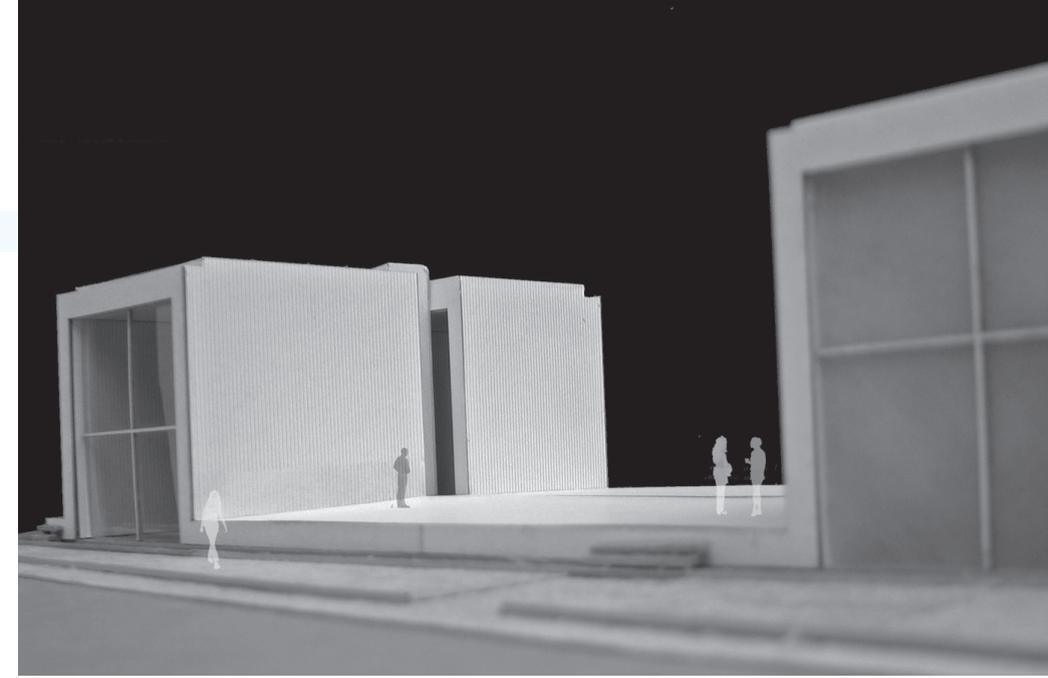


Exhibition Building

Community Room



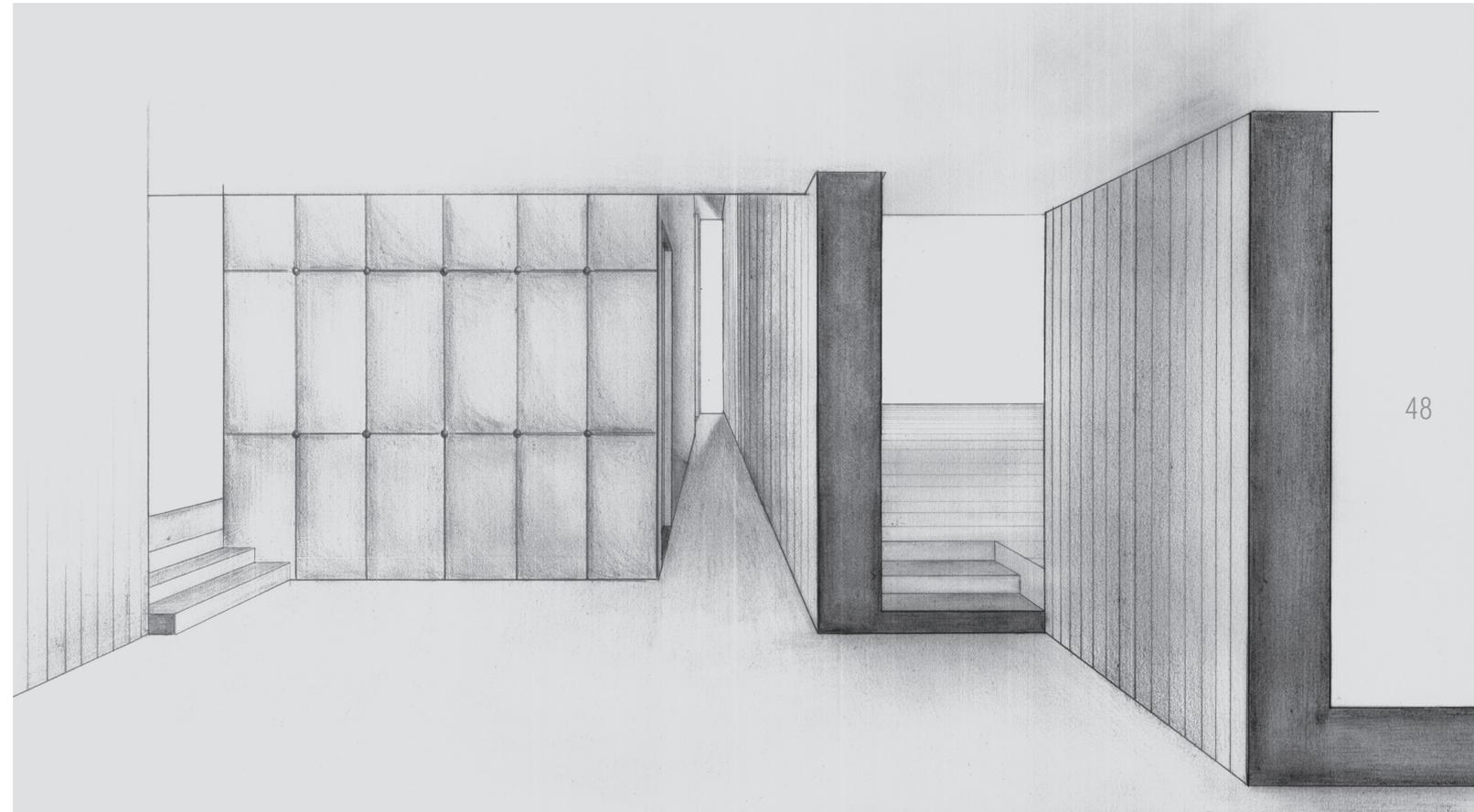
By designing the Exhibition Hall in close proximity to the community room and kitchen of the Residence Building, it gives definition to the public and the private areas. The residents can still maintain their privacy, yet the interaction of the two buildings defines the importance of the plaza in the connection of the buildings. The distance allows for separation during the daily exhibition cycle, yet it gives a place for expansion when the attendance of events pushes the limits of the building.

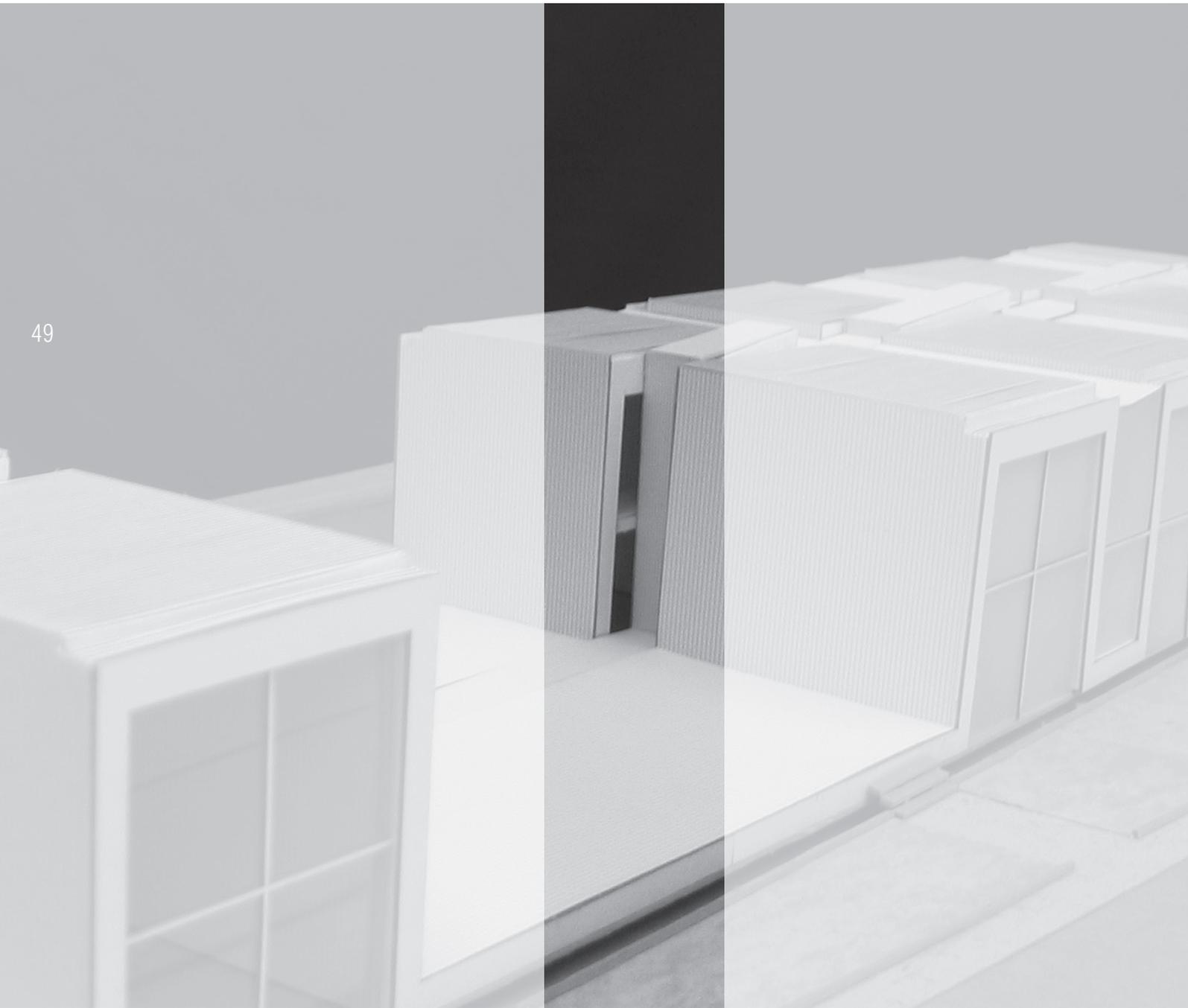


'The order of making the wall brought about an order of wall making which included the opening. Then came the column, which was an automatic kind of order, making that which was opening, and that which was not opening. A rhythm of openings was then decided by the wall itself, which was no longer a wall, but a series of columns and openings. Such realizations come out of nothing in nature. They come out of a mysterious kind of sense that man has to express those wonders of the soul which demand expression.'

– Louis I Kahn

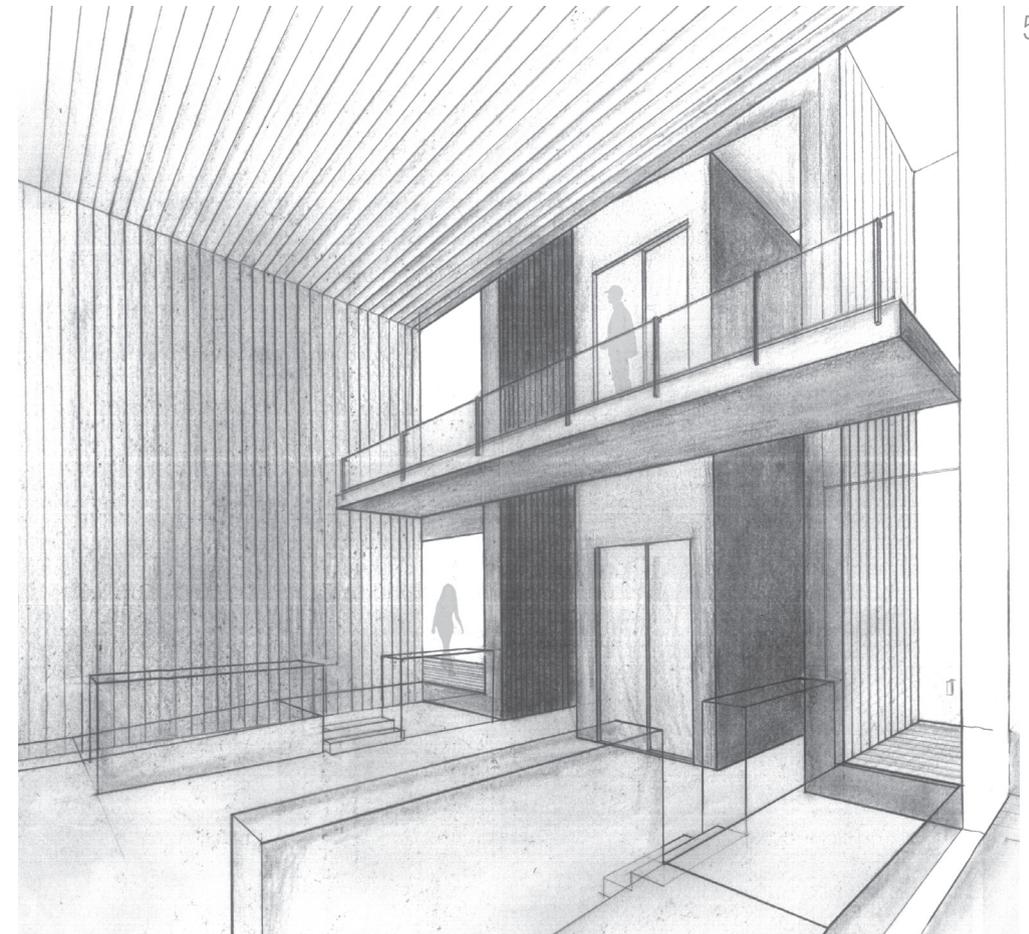
The openings in the building are not a result of punched openings, but they are direct result of the form. The building is the path of a plane that moves through the building. As it moves the length of the building all of the openings are created. The center slice of the building is where the path interweaves with the utility spaces. When a person moves through the corridor, the thickness of the plane is the threshold from one section to the next.

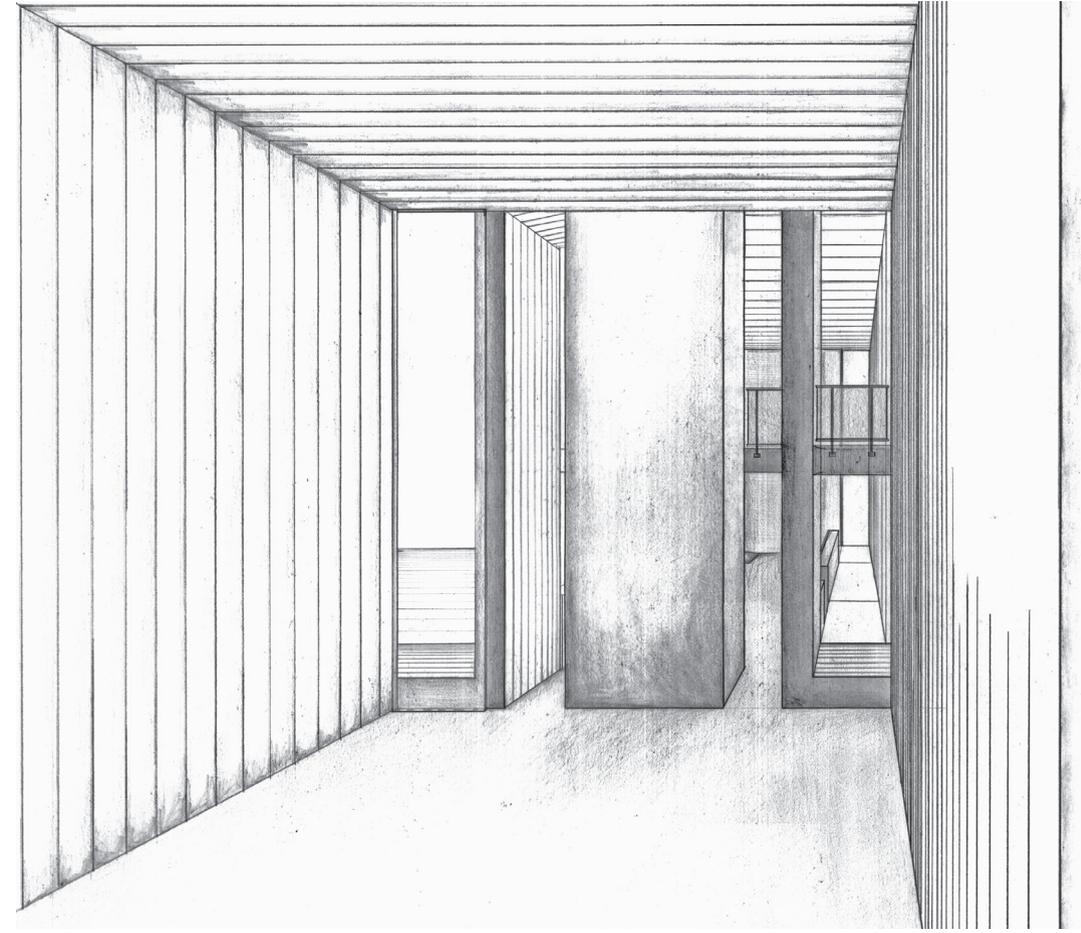
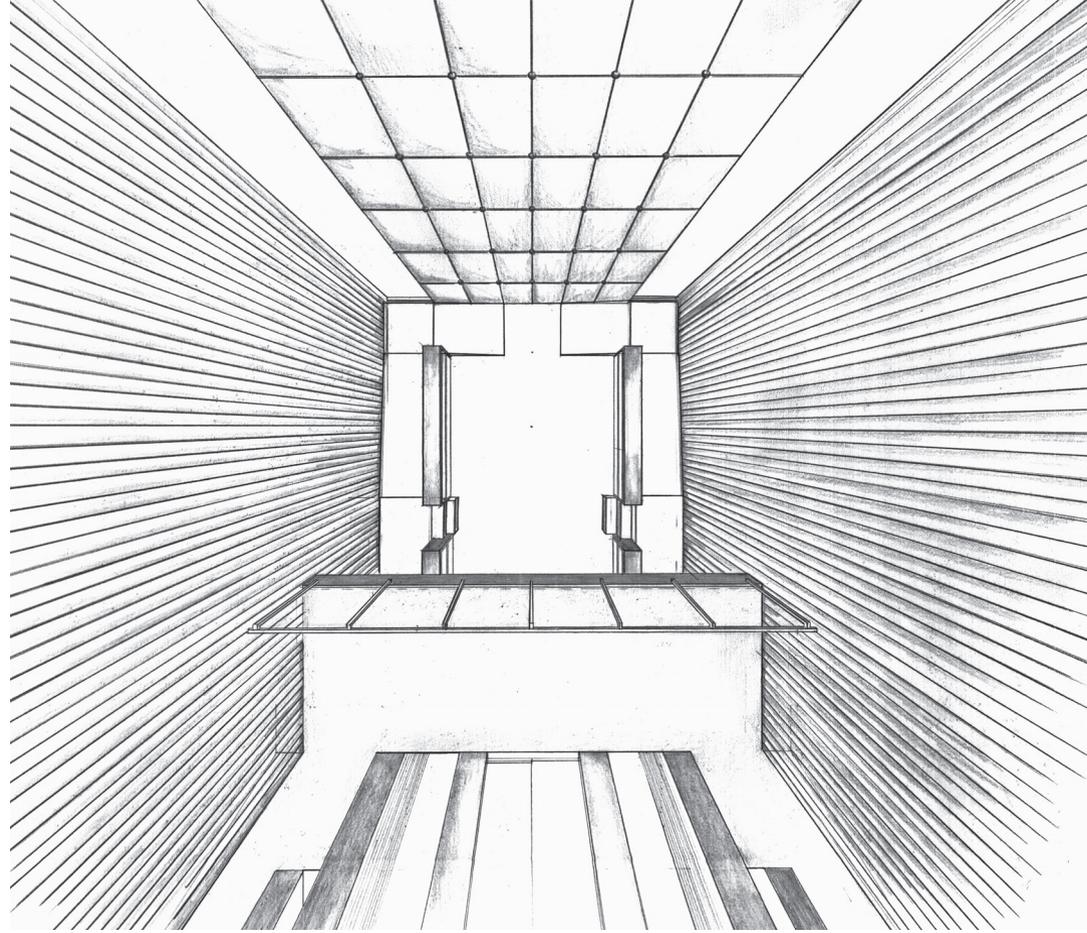


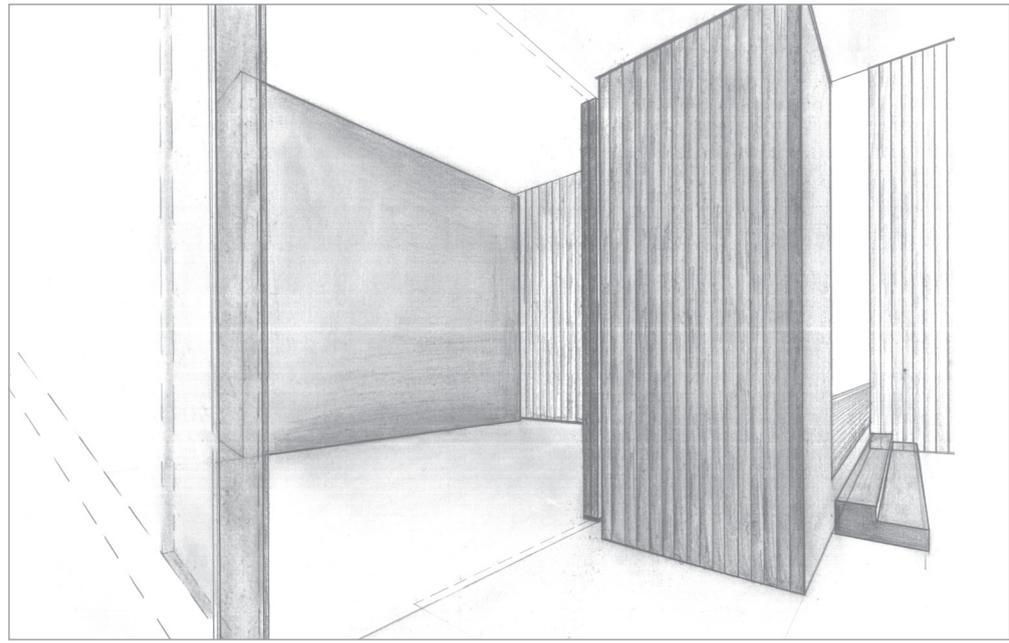


The main entrances on the plaza are shaped by the corridor which recedes into the volume of the building. An immediate introduction of the thickness of the plane at threshold of the door draws attention to the buildings' form.

Once inside, the presence of the corridor plane invites the resident to continue their path by creating another opening. The shift of the corridor plane inward allows separation of the lobby from the community room, providing some privacy from activity in the Lobby.







a
b



a - View of the Front Wall

b - photograph of the Kimball Art Museum

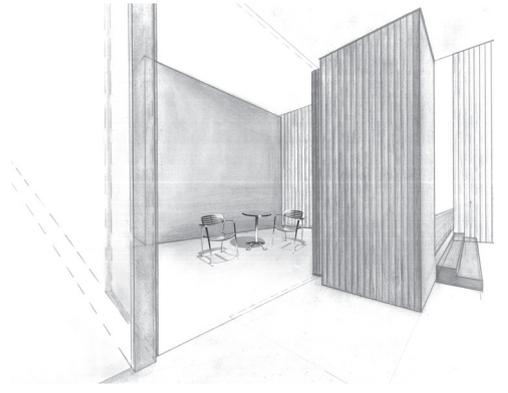
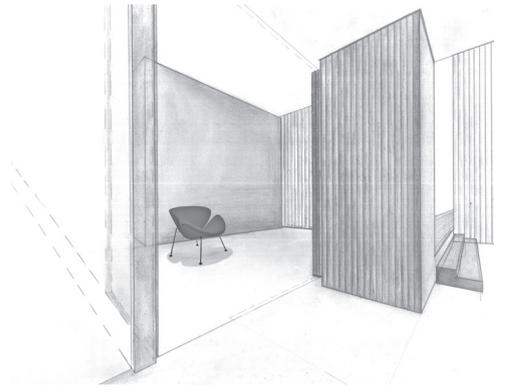
When Kahn was designing the Kimbell Art Museum he examined the program and designed a building to serve programmatic needs of the museum; but he also gave the museum something unrequired. He called the portico an offering. Each visitor to the museum is escorted from the hot Texas sun to the door through the grove of trees and then under the vault of the portico.

In the same spirit this building offers to the student an opportunity to alter the face of their unit to the community. Each student is given a space without a specific purpose.

An Entrance, a porch, a connection to the Labyrinth

An interior "portico" of the building, giving a intimate space between the dynamics of the community living to one of self imposed privacy of the individual room.

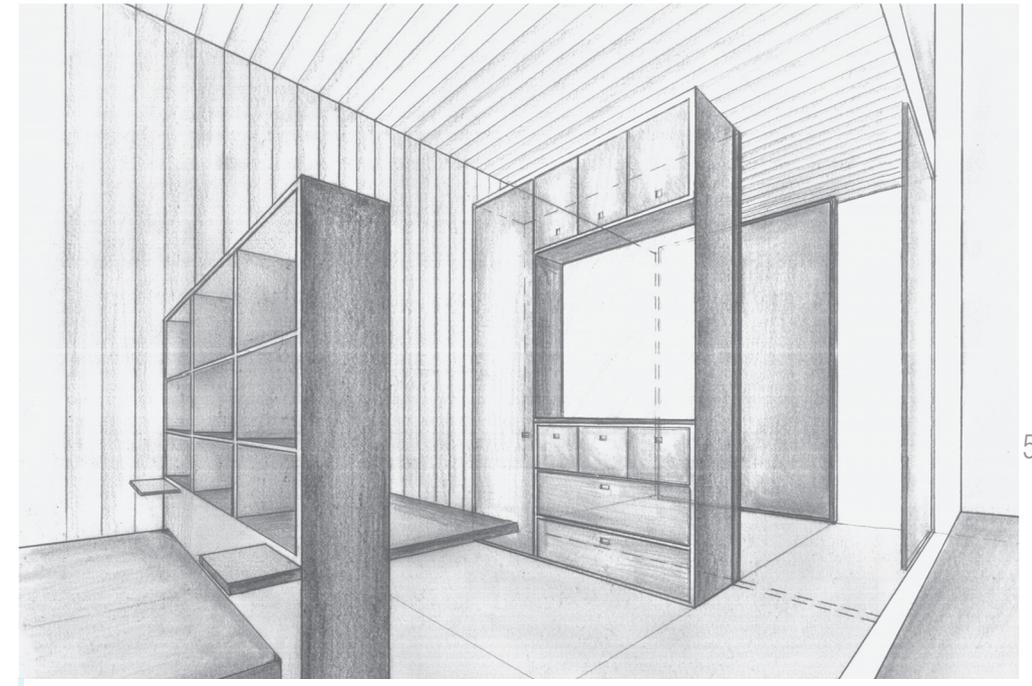
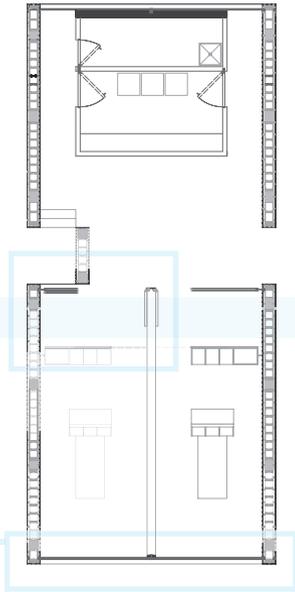
55



Interference with the wall is minimized for two reasons. To create a fluid transition in the relationship among all three spaces, and to let the plane of the wall pass uninterrupted in the individual room. It is important to allow the resident to view the consistency of the plane as it appears, and disappears within the smaller volumes of the building.

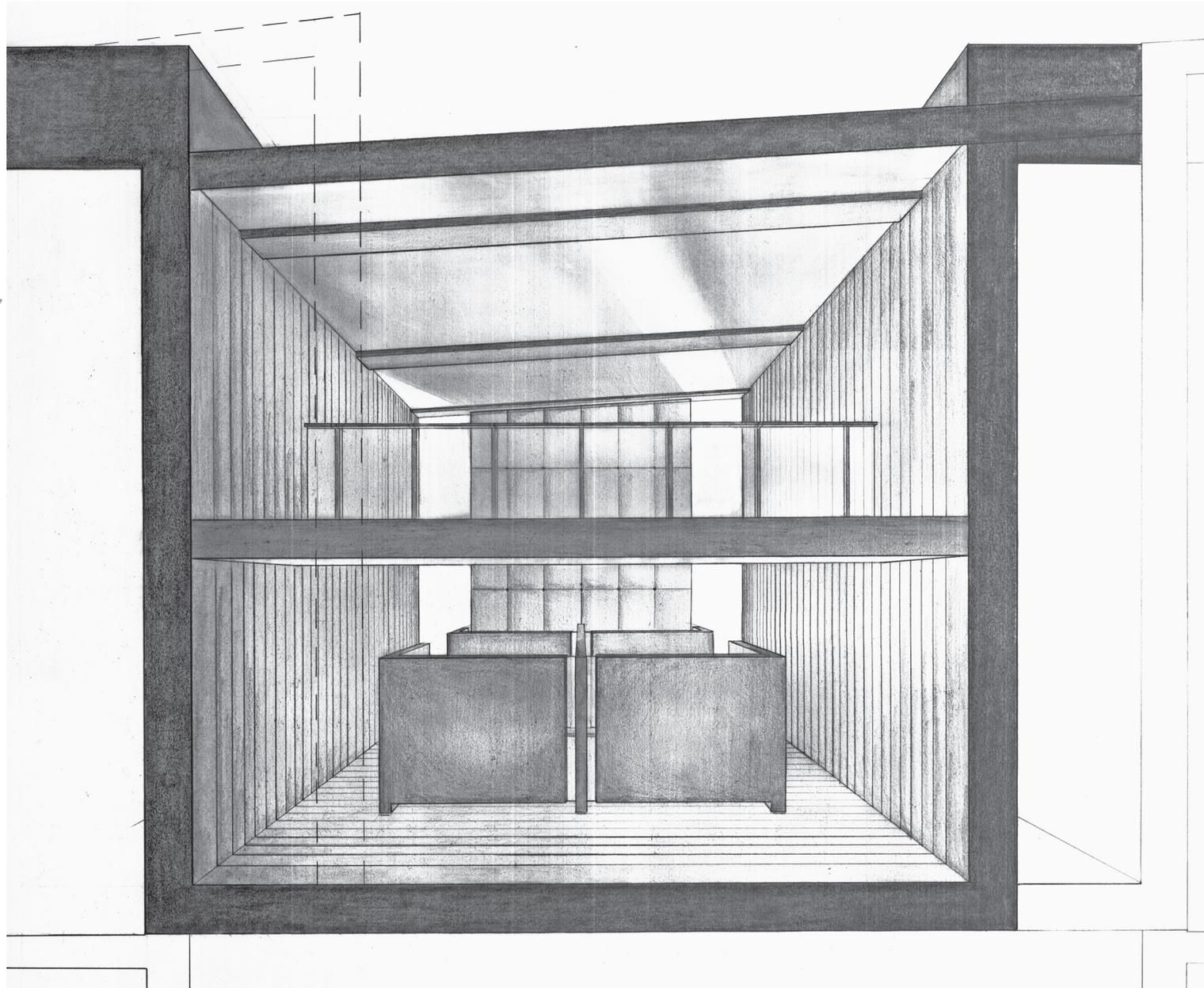
When the second door is opened, it is concealed within the wardrobe. In order to continue the reduction of interference with the wooden wall, the door frame on the opposing wall is taken away. The door glides on an internal track, and the lock for the door is given to the wardrobe instead of to the frame

In the residence rooms, the exterior wall is north facing translucent glass. The individuals who reside in these rooms will be greeted by a subtle glow produced throughout the day by natural light penetrating through the wall



56

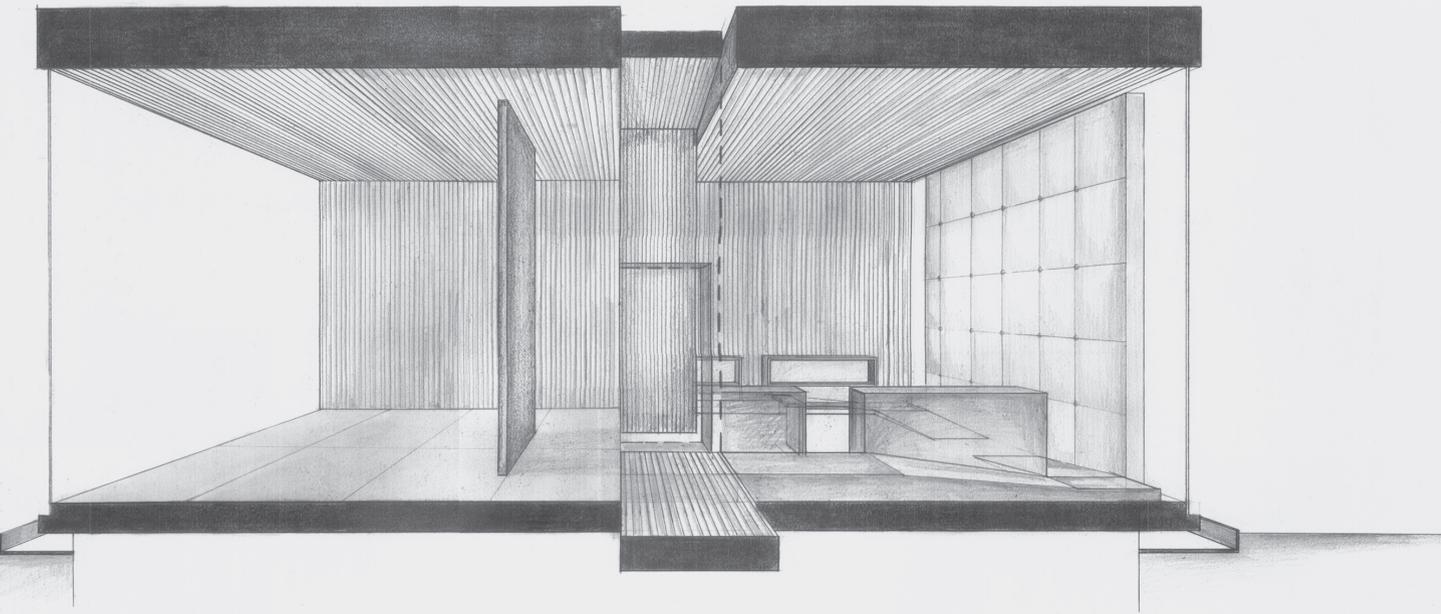
view of room toward the labyrinth



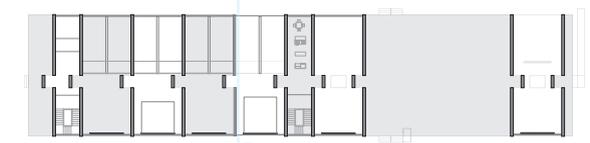
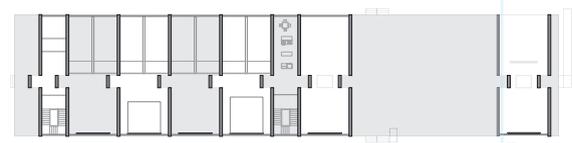
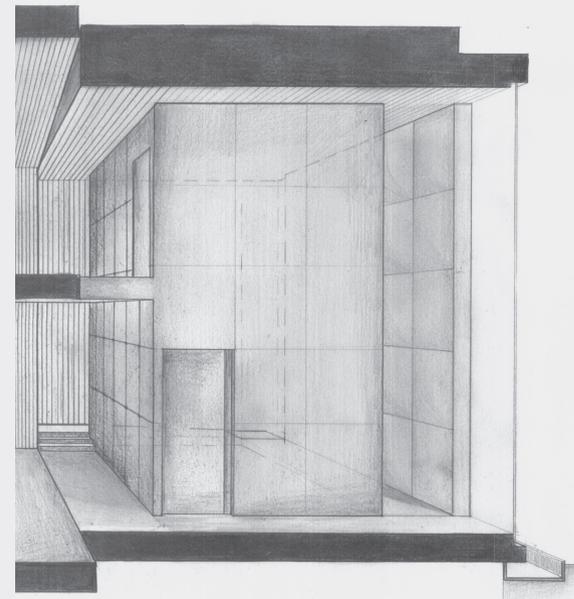
The sections of the building do not differ in structure, but they do in the type of activities. The activities that occur within the utility portion of the labyrinth are directly informed by the location of the plane. When the plane moves to the ceiling and the floors are made of concrete, the needs of the building which require water become the "utility" of the section. When the plane moves to the floor the space is given to activities of conversation and study.

Each section also offers the students with a different way of viewing due to the interaction of the second floor. In some cases the floor reaches across the volume to directly interact with trombe wall, and in others the second floor is only an interruption in the two story volume enough to provide for adequate circulation. In the image to the left, the study carrels give privacy to the students from those passing by on the first floor, but can be overlooked by students passing on the second floor. The variety helps to give each section its own character and unique qualities.

59



60



In a stressed-skin structure the components of the building are smaller than typical construction methods because the sheathing of the building only covers. The internal components of a typical frame structure resist the entire load placed on the building, while in a stressed-skin structure building the skin contributes to the capacity of the structural system by resisting a portion of the load. As mentioned in publications by the Canadian Wood Council

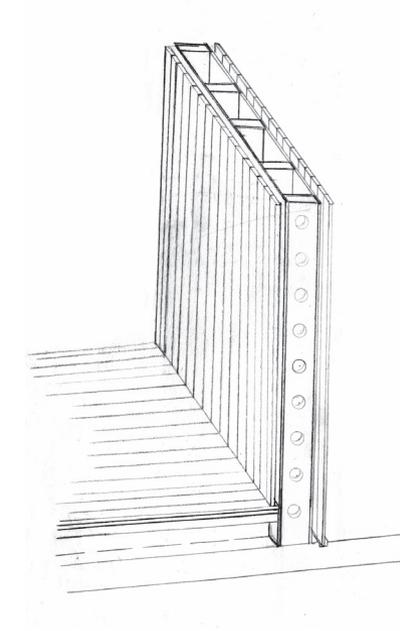
“Wood can be used in many structural forms from the light duty repetitive small structure to the larger and heavier framing systems use in commercial projects. Wood has a high strength to weight ration and therefore the dead load is a smaller component of the total factor than for heavier materials.”

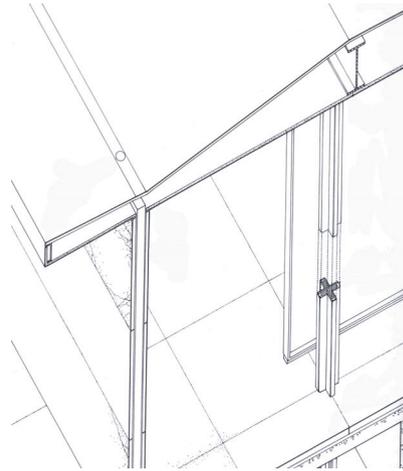
When a stressed skin panel system is spanning, the tension and compression from bending are resisted by the top and bottom plywood faces, while the shear is resisted by the framing.

Stressed-skin panels consist of plywood facing bonded with adhesives under heat and pressure to lumber stringers, and cross bracing. The plywood facings and lumber stringers act as a series of I-beams with the plywood distributing the concentrated loads and resisting nearly all bending stress. The panels integrate thermal insulation, conduit and a vapor retarder into one single unit, which also increases efficiency.

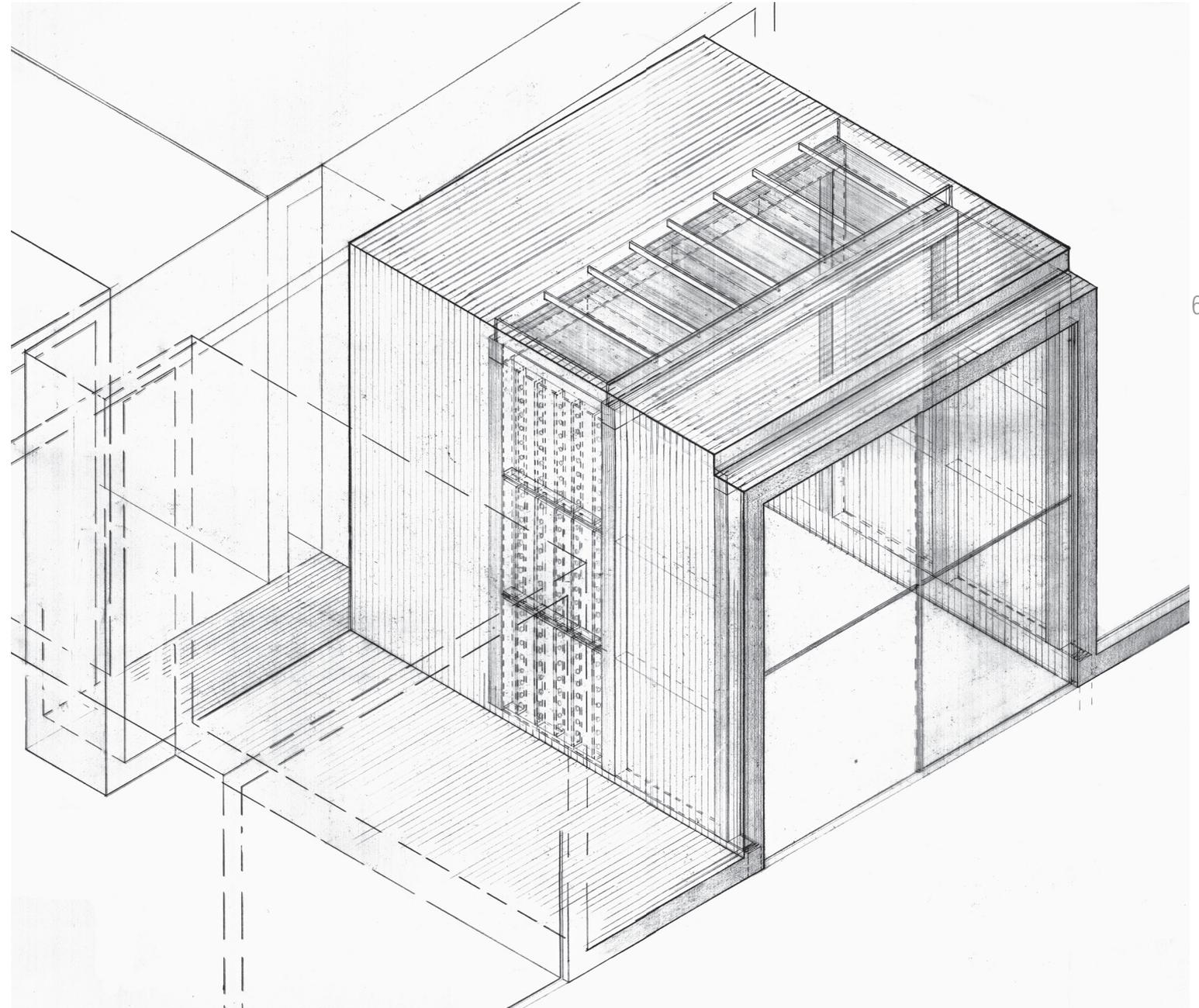
By using the stressed skin panel system the line of the façade is allowed to remain constant, emphasizing the form of the building. The plane is the integral to the structural capacity of the building, reinforcing its presence as a defining characteristic in the space.

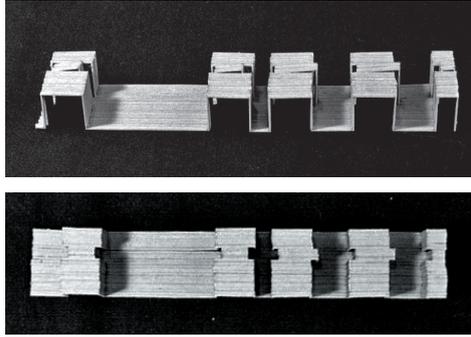
“...from the smallest characteristic space harbored in the construction itself, the larger & still larger spaces would unfold. This pattern of spaces, if inherent in a construction system would closely approximate what the architect thought the space “wanted to be” & how they could be made. - Louis I Kahn





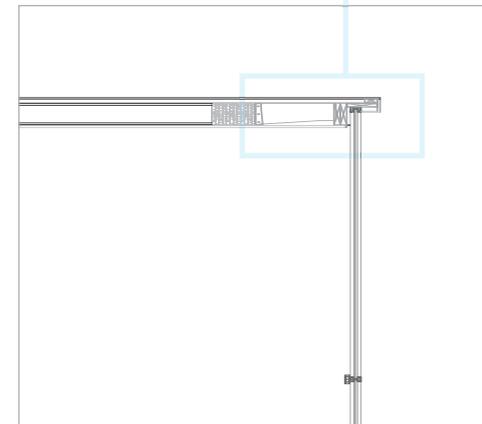
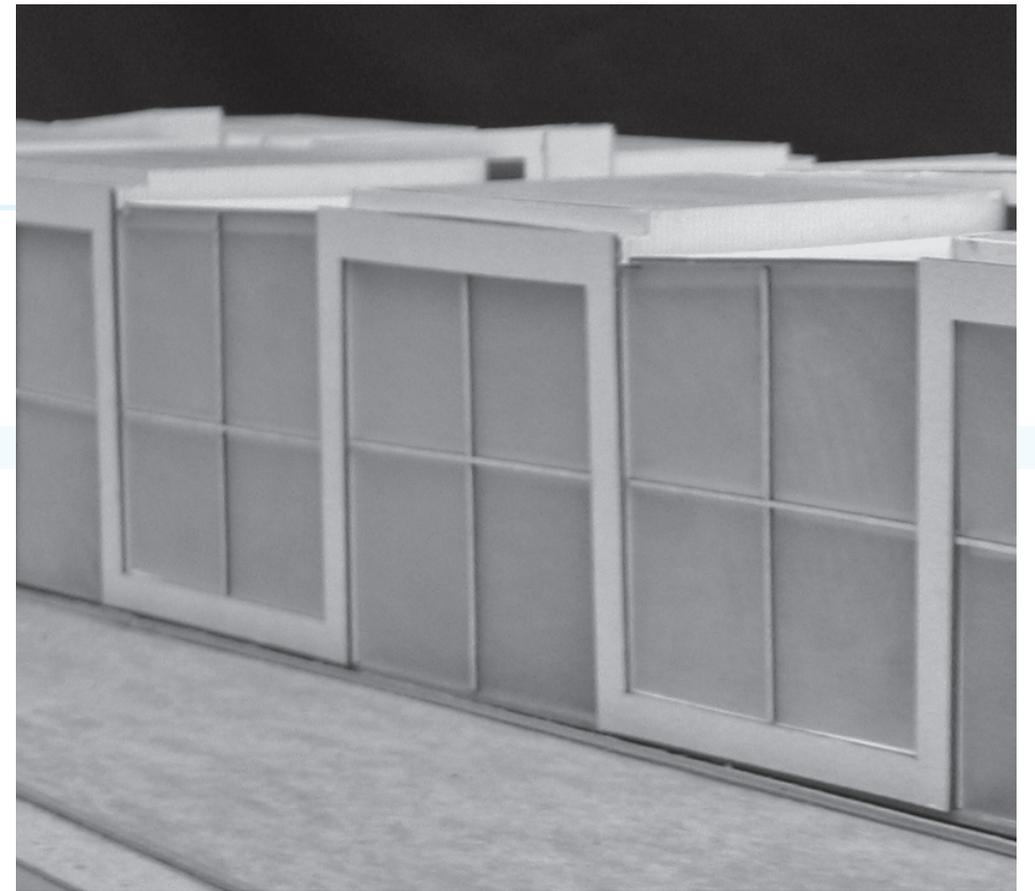
The roof of the building is a flat roof system, which allows the planes' movement to be articulated not only the elevation of the building, but also continuously in the roof. Since the building's site is located in small valley of the town, the roof is constantly visible from various locations. From higher elevations the roof remains uninterrupted by the typical parapet and gravel roof system. Using ideas found in the Yokohama Ferry Terminal, the roof is designed to allow the roof structure to be concealed under the perforated wood surface. Due to the complexity of the roof design however, the thickness of the roof exceeded the actual depth of the typical walls in the stressed skin structural system. By pulling the thickness of the roof away from the front edges, the line on the facade remains constant. In elevation, the change is slightly visible; however from the street level the full depth is concealed from the pedestrian views. The solution is an adaptation of the roof construction for the Barcelona Pavilion by Mies Van der Rohe. Although the thickness of the roof is actually greater than it appears, the edges are thin to emphasize the illusion of the flat roof.





The angle in the corridor roof derives from the need to design a roof above the areas that the folded planes' path did not already provide. The roof of this open piece became a delicate proposition between the need for a roof and the reduction of interference with the line of the plane on the facade. In order to preserve the integrity of the line, one end of the corridor was raised, acknowledging the movement occurring on the inside. The projection of this angle, discovered in the corridor roof, extended across the gap, forming the roof of the open sections.

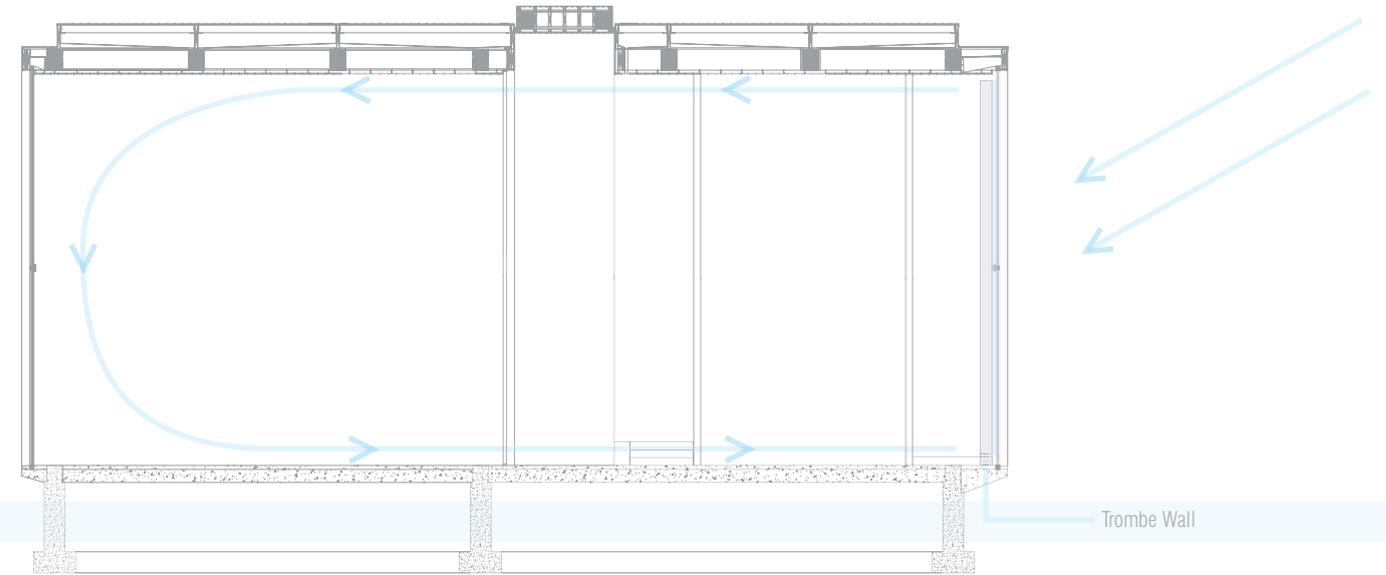
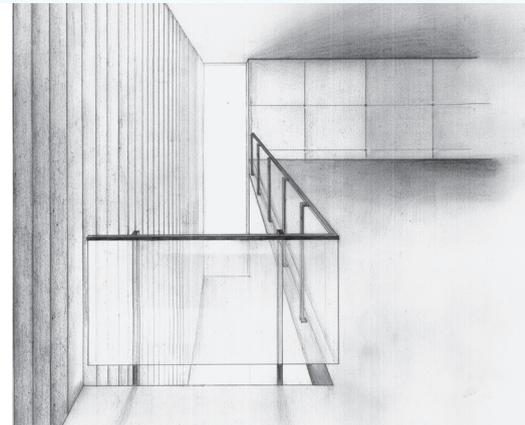
In order to minimize the appearance of the slanted roof sections in the façade, the glass is brought past the bottom of the roof beams, leaving only a minimum thickness for the roofing material. The visible portion which remains has a decreased physical presence and reduces any competition with the plane.



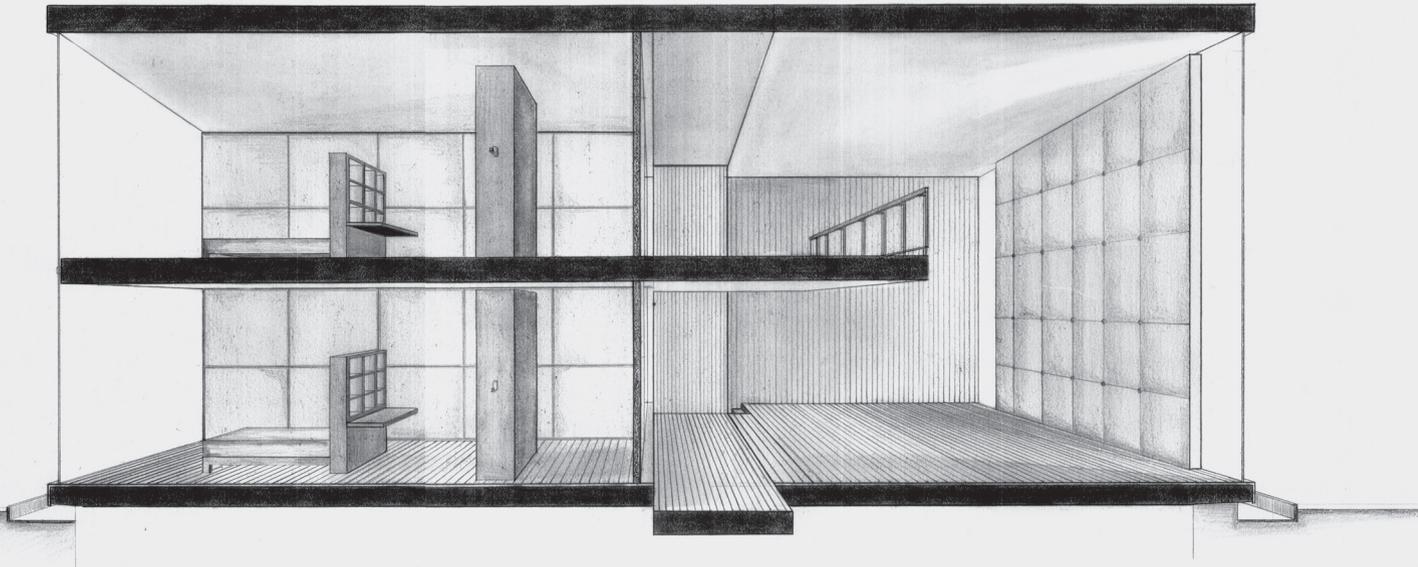
The trombe wall, which is located on the southern side of the building is a solution to the control overexposure of the building to heat gain from the large expanses of glass. By designing a trombe wall as a part of this façade, the low angle penetration of the sun will be captured and utilized in temperature regulation of the interior. During the day the sun warms the dark surface of the wall, causing energy to be stored in the thermal mass of the wall, trapped between the wall and the glass of the exterior. When evening approaches and the building cools the vents are opened, creating a convection current. The heated air is slowly released into the building and as it cools it falls and returns to the wall due to the current movement. This system allows the building to use passive solar techniques, instead of relying completely on the mechanical systems.



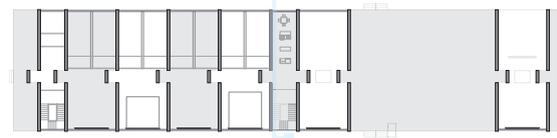
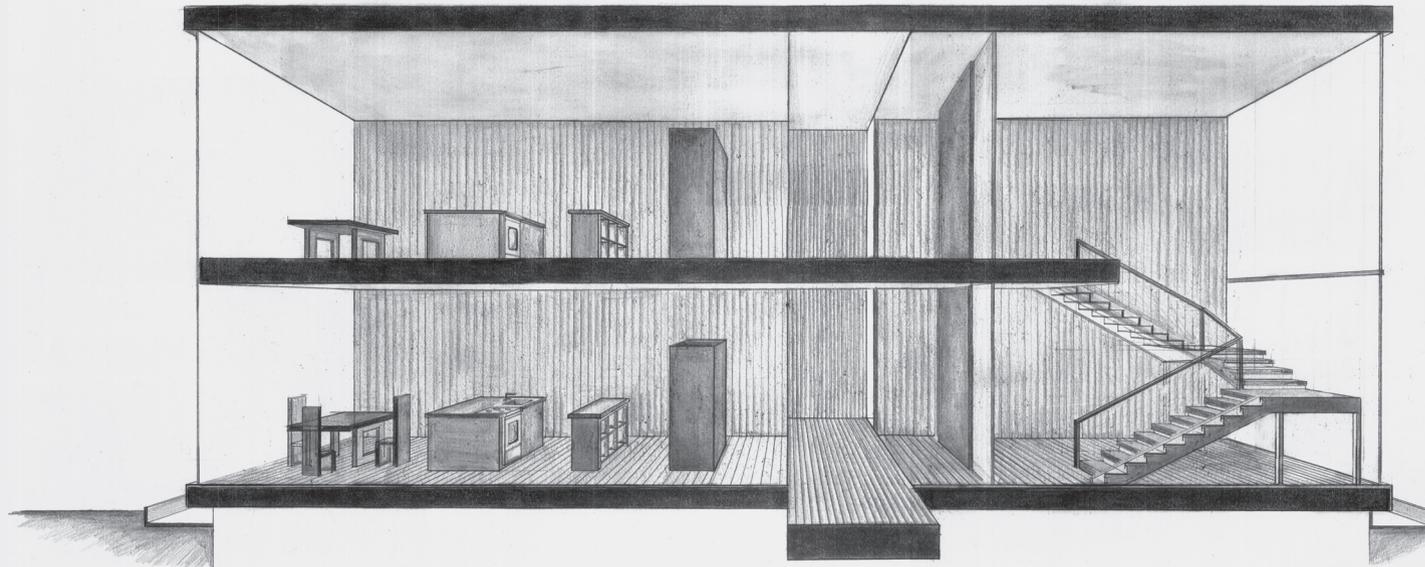
The wall also helps to re-enforce the movement of the Labyrinth. As an individual turns into each section of the building they are given a slice of view to the outside, and then quickly directed to continue by the interruption of the view by the appearance of the wall.



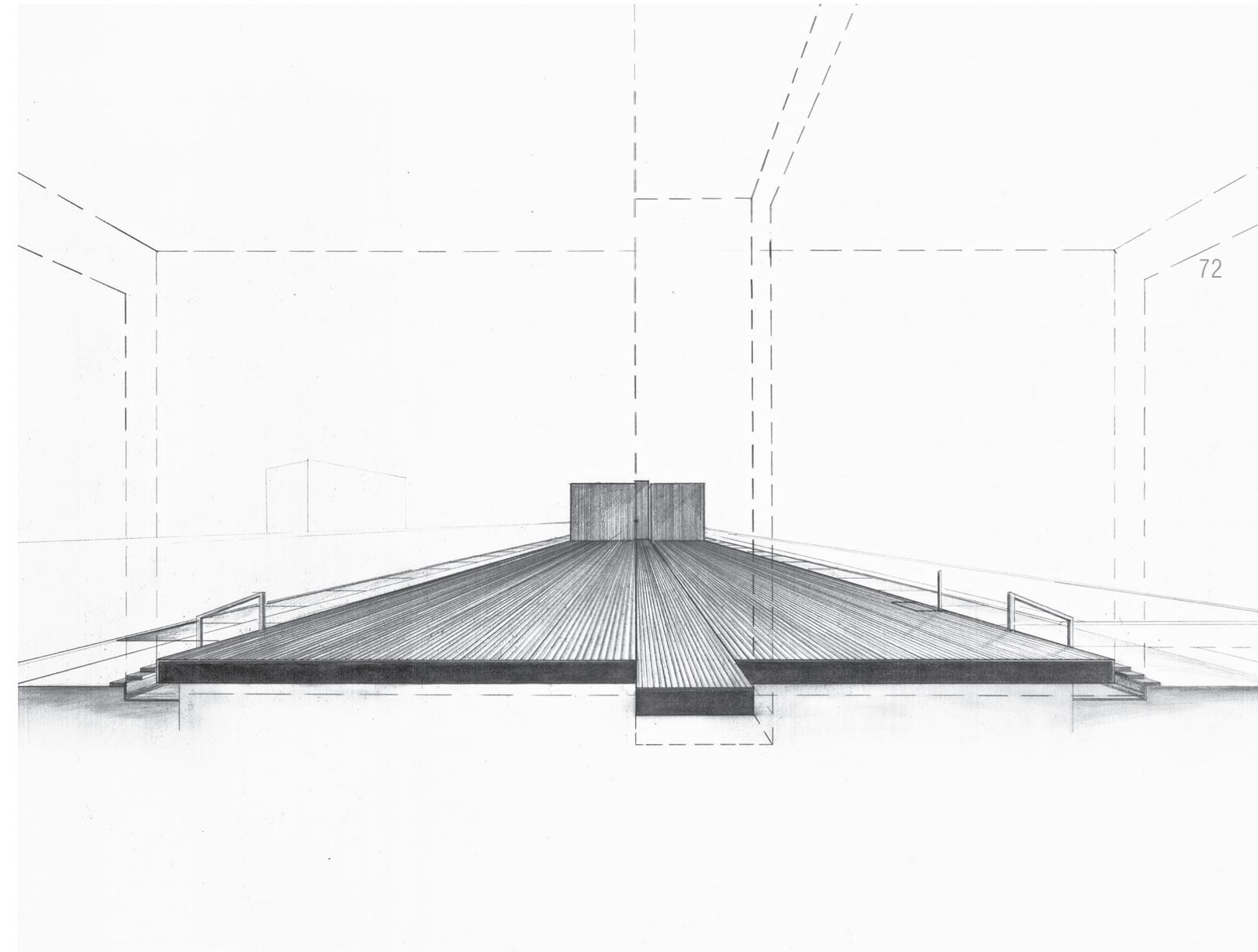
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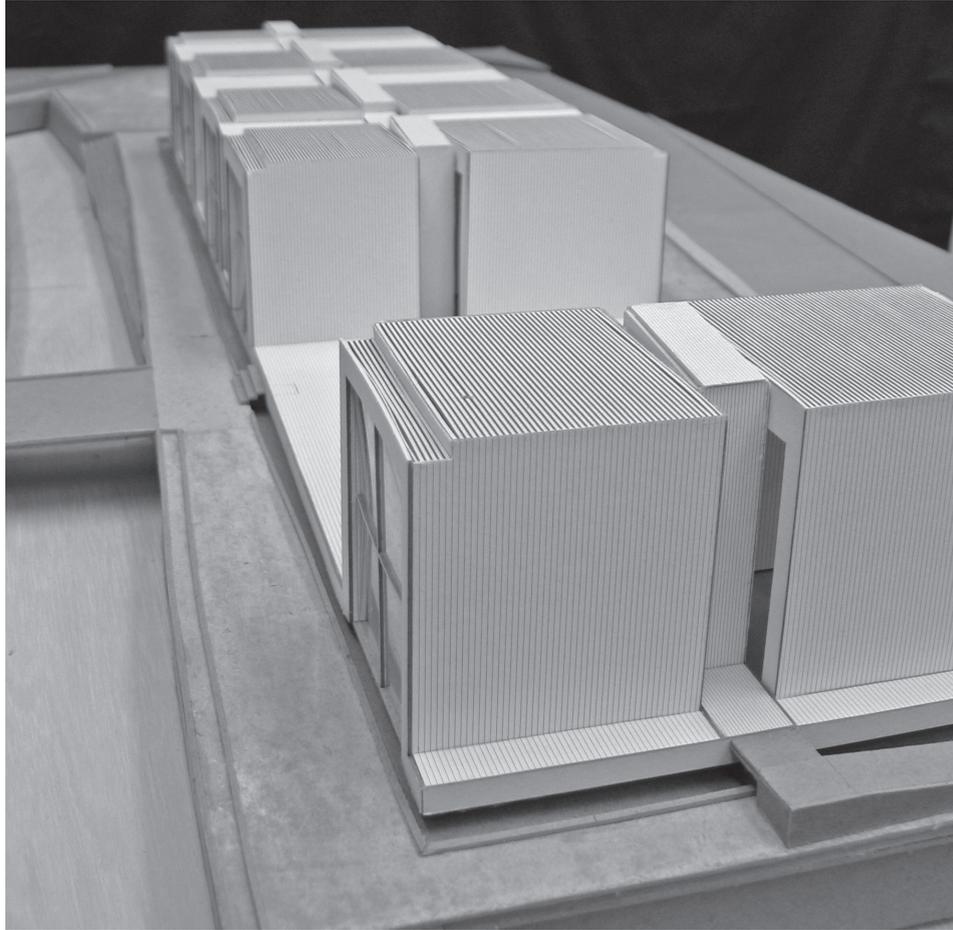


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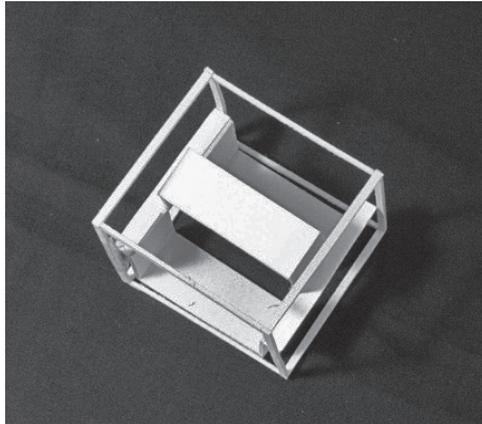


The plane creates a ribbon of continuous space as its wooden surface moves through the building. As the primary surface of the building the type of wood chosen required many premium qualities. Iroko is a durable species of wood from Africa. It holds many of the same weather resistant properties common in Teak. Overtime the finish of the wood will darken on the interior due to the aging and interaction with the individuals, just as on the exterior the finish will change due to its interaction everyday with the elements in nature.





From the beginning of the project, I sought to create a space which invited the students to live actively within the walls of the building. By pursuing an organization of the building that differs from the typical approaches to “dormitory” design, the resulting interconnected spaces challenge the “path of living”, by a rhythm created in the movement of the plane. In this building which utilizes a labyrinthian design for the main corridor, the complexity forces the students who inhabit it to pay a higher degree of attention to everyday movements. The path that you take on a daily basis forces a movement which requires interaction with not only the thresholds from space to space, but also recognition of those to who pass through simultaneously. In this thesis, by taking a building typology approach found in museum design it alters the manner in which the students to interact with their living quarters. Perhaps this approach also gives the students constraining boundaries which elicit a new creativity in the way they live within this building, and potentially after they leave Staunton.



Sources

MacDonald, Angus
Structure and Architecture
 Avon, Great Britain : The Bath Press, 1994

Grieco, Douglas; Wendy Ing, Nina Rappaport
CAC : Contemporary Art Center, Zaha Hadid Studio
 New York: The Monacelli Press, 2001

Ockman, Joan
Architecture Culture 1943-1968 : a documentary anthology
 New York: Rizzoli International Publications, 1993
 - Gropius, Walter. Eight Steps toward a Solid Architecture. pg 159-162.
 - Bill, Max. Education and Design. pg 177-180.

Marsh, Andrew; Caroline Raines.
SQUARE ONE research
<http://www.squ1.com/site.html>

Latour, Alessandra
Louis I. Kahn: Writings, Lectures, Interviews
 New York, New York, U.S.A.: Rizzoli Int'l Publications, 1991.

Images

pg 11
 Gimmì, Karin; Stanislaus von Moos; Hans Frei; Arthur Ruegg; Jakob Bill' Georg Aerni.
Max Bill – Architect
 Barcelona: 2G N. 29/30, 2004. pg 31

pg 12
Architectural Record Magazine
 May 2003, v. 193, n.5, pg 130-135.

pg 14
 Yokohama Ferry Terminal, Japan by Foreign Office Associates
A weekly dose of Architecture.
<http://www.archidose.org/Jul02/070802.html>

pg 17
 Staunton, VA - GIS Mapping
<http://www.staunton.va.us/>

pg 61
 Ford, Edward R
The Details of Modern Architecture
 Cambridge, Massachusetts: The MIT Press, 1997. pg 270

All other photos by author

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