

Color Light Form & Sound |
A New Religious Building for Common Ground Church

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COLOR LIGHT FORM & SOUND
A NEW RELIGIOUS BUILDING FOR COMMON GROUND CHURCH

A Design Thesis Submitted to the
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By

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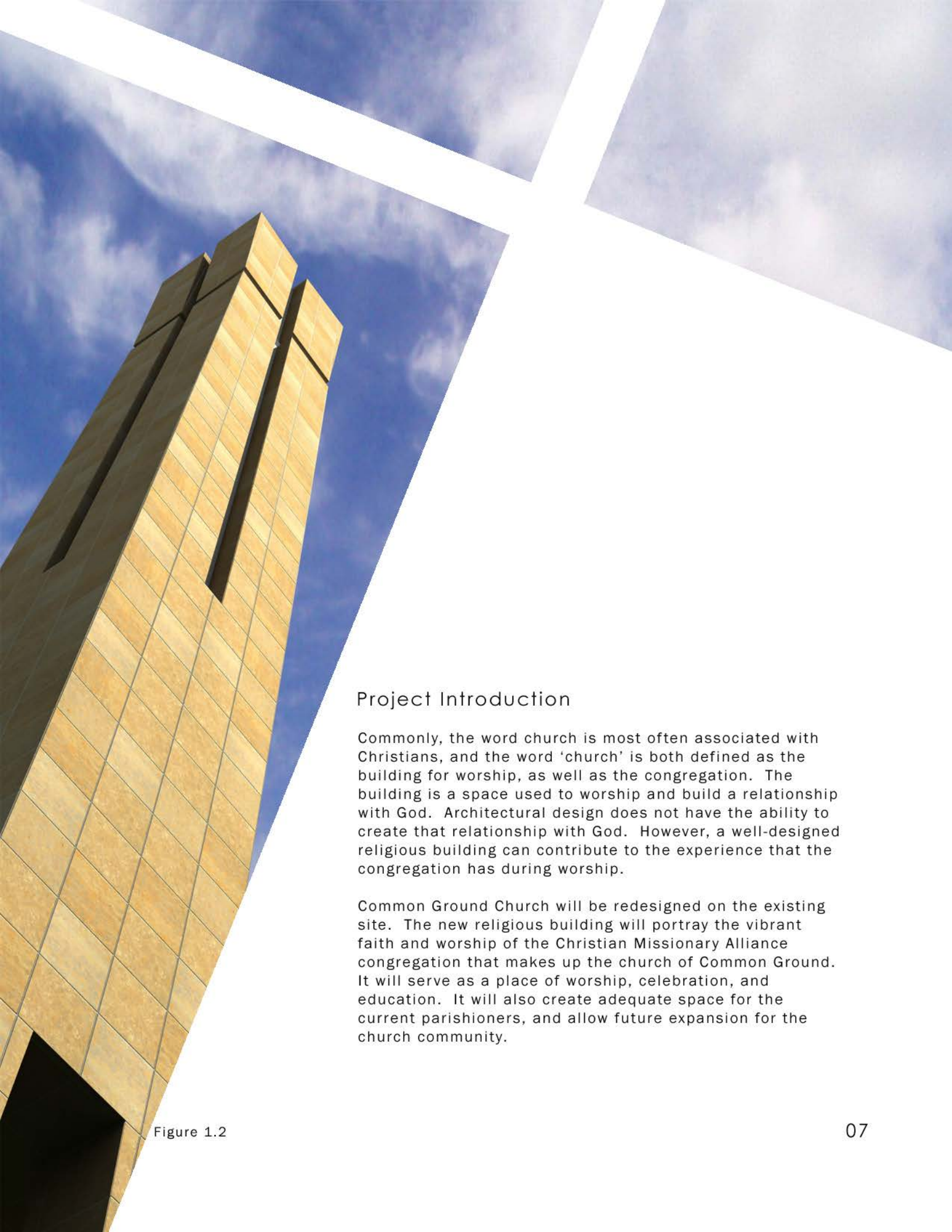
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Color, Form, Sound & Light A New Religious Building for Common Ground Church

Commonly, the word 'church' is most often associated with Christians, and the word 'church' is both defined as the building for worship, as well as the congregation. The religious building is a space used to worship and build a relationship with God. Architectural design does not have the ability to create that relationship with God. However, a well-designed religious building can contribute to the experience that the congregation has during worship.

In Lake Elmo, MN, Common Ground Church is in need of a new religious building. The conceptual basis for the new design is that color, form, sound, and light can stir human emotions toward a higher level of worship. Our perceptual response to these factors in our surrounding built environment can influence our psychological and physiological well-being. Each of the four factors will serve as an effective design tool for the new Common Ground Church.

Figure 1.1



Project Introduction

Commonly, the word church is most often associated with Christians, and the word 'church' is both defined as the building for worship, as well as the congregation. The building is a space used to worship and build a relationship with God. Architectural design does not have the ability to create that relationship with God. However, a well-designed religious building can contribute to the experience that the congregation has during worship.

Common Ground Church will be redesigned on the existing site. The new religious building will portray the vibrant faith and worship of the Christian Missionary Alliance congregation that makes up the church of Common Ground. It will serve as a place of worship, celebration, and education. It will also create adequate space for the current parishioners, and allow future expansion for the church community.

Project Introduction

Project Location

Lake Elmo is an upper middle class town east of the Twin Cities metro area in Minnesota. The area is comprised mainly of residential development and open rural land. Almost sixty percent of the land is vacant or being used for agricultural needs. All surrounding suburbs provide the essential commercial needs for the city, allowing it to maintain the small town character.

Lake Elmo has a population of 7,507, a median age of 34.4, and an average family size of 2.88 people. Almost three out of four homes are married households with a median income of \$78,000. Forty percent of the city has a college or higher education, and ninety-five percent of the city is Caucasian.

Theoretical Premise

The theoretical premise is that color, form, light, and sound can stir human emotions toward a higher level of worship. Our perceptual response to these factors in our surrounding built environment can influence our psychological and physiological well-being. These four factors will be used as the design tools for the new religious building.

General History

Lake Elmo originated as a resort stop for the wealthy individuals of St. Paul. It started out as Bass Lake Village, a small village on a stagecoach trail between Stillwater and St. Paul in the late 1800's. In 1900, it began developing stores and offices, and it became incorporated in 1925 as a substantial shipping point and dairy village. In 1969, Lake Elmo officially became a city when it split from an existing township with Oakdale (Goodman 6).

The Common Ground Church site was originally farmland until purchased as a three-parcel, 13-acre lot. Construction began on the Lake Elmo Baptist Church in 1979, and the building remains there today. The building is a small masonry structure surrounded by trees, prairie land, and a busy highway. It is most often confused for a small office building, because it is nothing more than a single story block with punched-in windows and a clerestory.



Figure 2.1

Common Ground Church began in 1999 as a worship group based out of Pastor Gary Johnson's home. Prayer, songs, and sermons were held as a weekly Sunday service until the church moved into the existing building in 2000.

Conceptual Basis

The conceptual basis of color, form, light, and sound is driven by our perceptions. As we move, the appearance of the world changes; our minds are interpreting and sorting what our sense take in, filtering only the crucial information to our direct attention. We constantly assess our surroundings for basic biological needs, and are consciously and subconsciously affected by the environment due to our natural expectations and developed experiences. The four factors have the ability to alter our moods, emotions, and physical health.

Sites, buildings, and rooms can be designed to display the most optimal setting through careful programming, planning, and attention to principles and proven scientific knowledge. Spaces are not only defined by the furnishings or equipment used within them; hues can accent specific emotions, lighting can focus attention, forms can facilitate function, and sound can create ambience. These four factors are essential to every design project, in order to respond to the health, safety, and welfare of each individual.

Major Project Elements

The three major activities of the church are worship, celebration, and education. The project elements in Common Ground Church required to fulfill each activity include these spaces:

- Sanctuary
- Main Entrance
- Coat Room
- Reception
- Offices
- Pastoral Study & Library
- Meeting Room
- Fellowship Hall
- Kitchen
- Classrooms
- Nursery
- Storage
- Custodial
- Mechanical/Electrical
- Parking

Project Description

Client / User Description

Staff of Common Ground

- Pastor Gary Johnson
 - o Main client
 - o Founder of the church/ Owner
 - o Runs all major operations of the building
- Assistant Pastor
- Secretary

Users of Common Ground

- Worship Team
 - o Ten members of the congregation that lead worship music during the service
 - o Require adequate performance space for a variety of musical instruments
- Congregation
 - o 250 people
 - o Attends service on Sunday
 - o Regularly cleans and maintains the building during the week
 - o Serves as all other staff on a voluntary basis
 - Children's Ministry Director
 - Nursery Coordinator
 - Jr. / Sr. High Youth Staff
 - College / Career staff
 - o Uses building for
 - Worship
 - Bible study
 - Celebrations
 - Social events

Figure 2.2

Christian Missionary Alliance

Christian and Missionary Alliance is a protestant denomination that began in 1887 by Dr. Albert Benjamin Simpson, and has since grown to over two million people spreading throughout 75 countries. The true principle of the church is to know Jesus Christ as the Savior, Sanctifier, Healer, and Coming King. According to the Christian and Missionary Alliance website, their missions include evangelizing and incorporating persons into a Christ-centered, community-focused congregation, and mobilizing them to begin churches in unreached locations worldwide.



Figure 2.3

The Christian and Missionary Alliance Doctrinal Statement is located in Appendix A.

Perception

According to Lam (1977), Perception is “an active information seeking process directed and interpreted by the brain” (p. 35). We compare visual information with our other senses, and relate them with experiences in order to comprehend the proper stimulus. In the realm of perception, “we pay more attention to biologically important factors than we do to other factors that are less relevant to our physical, intellectual, and emotional well-being” (p. 21). Our visual awareness, both conscious and unconscious, is our innate primary concern. Any changes in our perceived status of these aspects of the surrounding environment trigger warning signals in our brain that demand attention (p. 21). The following eight categories are the most important issues that we perceive when introduced to a new environment:

Figure 2.4

Location – in regards to where we are from water, heat, food, sunlight, escape routes, destination, etc.

Time – environmental conditions that relate to our biological clocks such as night or day

Weather – as it relates to the need for clothing, heating, cooling, and shelter

Enclosure – safety of the structure, location and nature of environmental conditions

Presence of other living things – search for other people, plants, or animals

Territory – boundaries and other possibilities available for us to personalize within a given space

Opportunities for relaxation and stimulation – searching for comfort in regards to our mind, body, and senses

Places of refuge – shelter in time of perceived danger

Design Methodology

Form & Light

Many of our perceptions evolve from a common expectation that we are familiar with, produced by experiences throughout our lives. Lam (1977) explains that we produce needs within or at a space, based from our innate attention to the specific biological factors.

Need for orientation

We require an awareness of our location and movement. We instinctively seek a horizon line because it serves as a reference point. Without a grasp of when we are standing perpendicular to our ground plane, we become disoriented and uneasy. Two examples include walking along a path while looking straight up, or moving along a sloped surface, such as the Guggenheim Museum in New York by Frank Lloyd Wright (p. 21).

Need for time orientation

Our biological rhythms are in constant check of our immediate surroundings. Our internal clocks respond to the conditions around us, based upon our expectations and experiences from the past. This need is connected to luminance levels such as daylight or nighttime. When we experience alternative conditions in spaces, such as a gloomy afternoon or interior tinted glass, discomfort is our normal reaction. The cause of the discomfort is not by the actual low levels of light that we experience, but upon the expectations of how dark or bright the outdoor environment should be (p.23).

Need for consistency in light and form

There is a biological expectation of how all three-dimensional objects should appear. All three-dimensional objects should appear. Light gradients and shadows help us define volume and form, and how shapes should be rendered by light. This is a result dating back to our ancestors when the sun was the only light source. When lighting becomes inconsistent with our subconscious expectations, our perception is altered and unpleasant (p. 24).



Need for contact with sunlight

This satisfies a basic biological need because it provides us with information about the form and orientation of our environment. As long as the sunlight does not interfere with our activities, such as unwanted glare or solar heat, we appreciate it in interior spaces (p. 25).

Need for view

Daylight is always desirable, based upon the illumination it provides and the view that it produces. The connection we make with the outdoors creates a comforting effect, and solar-control devices should not alter that view. This is why north-facing windows can produce a very high quality experience for users, because there is not a need for providing protection from direct sunlight (p.26).

Need for focus on activities

Besides the proper need for knowing our location and orientation, there is also a need to have the appropriate focus for the activities in a general workspace. Lighting in an area should emphasize focus in a working environment. In general, "relaxation and comfort will be enhanced by clarity of biologically important information such as circulation patterns, the nature of structure, views, evidence of sunlight, etc" (p. 28).

Need for definition and personalization

There is a tendency to personalize spaces that we live and work in. Personal control on lighting and arrangements within a space, for example, allows users to create a personal place out of the general public area. This factor "can make a tremendous difference in the extent to which people feel at home and in control of the public spaces they use" (p. 29).

Design Methodology

Color

All of life on earth is determined by the radiation of the sun. Some of the electromagnetic radiation emitted from the sun is visible light that can be seen by the human eye. Generally, we perceive sunlight as white light. However, when the visible white light is passed through a prism, it is broken down into individual wavelengths that produce six different colors - violet, blue, green, yellow, orange, and red. Therefore, Mahnke (1996) states that "color is actually a wavelength of light that an object either generates or reflects; it is the sensation caused by certain qualities of light that the eye recognizes and the brain interprets" (p. 2).

"Color exists only in our brain. Color is actually the result of different wavelengths of light stimulating certain pairs of the brain. The experience of color depends on the intensity of light, the way it is reflected from a surface, and the color surrounding objects" (p.95).

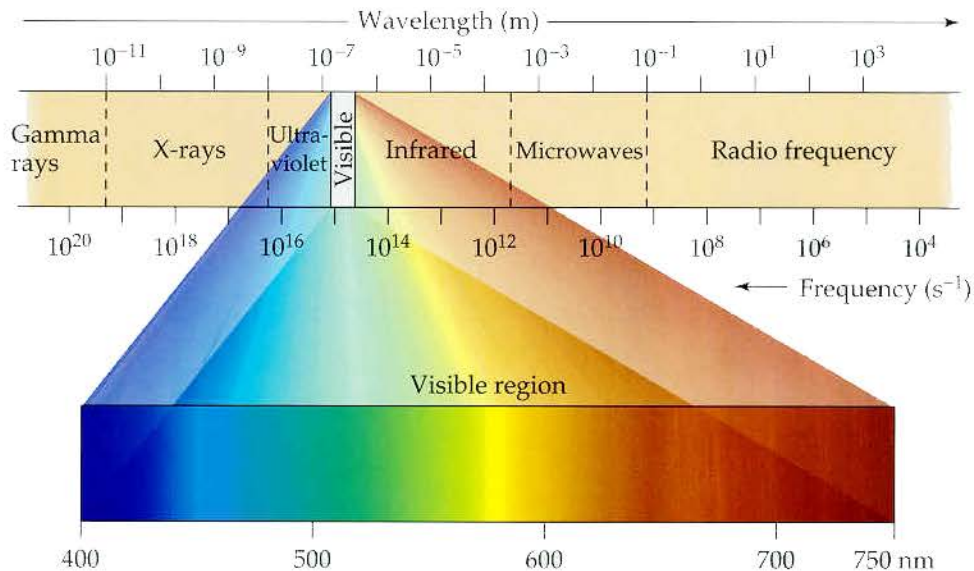


Figure 2.6

Light and color are inseparable, and when it comes to the design of the built environment, equal attention must be devoted to the psychological, physiological, visual, aesthetic, and technical aspects of both. It is part of a conscious, subconscious, and unconscious experience of human behavior and it is essential to life.

To actually see a color is a much more complex process than the physical sense of sight. Our bodies experience color when we become aware of our surroundings. It is essential that we interpret our natural and built environment. According to Mahnke (1996), "the perception of color always carries visual, associative, aesthetic, symbolic, emotional, and physiological effects on humans (p.10). Six factors influence this experience:

Figure 2.7

Biological Reactions

Neural paths in the human brain carries light and color to our pineal and pituitary glands. These glands control the production and release of hormones into our bodies, which in turn affect our psychological mood, and physiological well-being. This reverts back to our ancestors, where it became necessary for our survival biologically to have total color vision. It is a perception level that is beyond our control since it outside the scope of how we think or feel about color.

Collective Unconscious

The collective unconscious refers to the fundamental images formed in our development as a species. It is not related to conscious or unconscious reactions based upon our own personal experience, but rather a collection of images and predispositions from our ancestral history, inscribed in us from our human and pre-human ancestors.

Conscious Symbolism

The associations, impressions, and symbolism that is made on a conscious level, such as blue with water and green with nature. This is where we perceive spaces as friendly, warm, cold, inspiring, sad, dirty, etc.

Cultural Influences and Mannerisms

Color associations derived from specific culture and groups. Various countries choose different qualities of color, such as the bright colors used in Indian arts, the significance that green plays in Islamic religion, and the gentle colors of water, sky, and wood common to Japanese culture.

Influences of Trends, Fashions, and Styles

Trends of color combinations used on a short-term basis. This is done more in the marketing realm to reduce boredom and increase activity and sales among humans. It is dangerous to follow color trends rather than pay attention to the long-term lifespan of a building when designing.

Personal Relationship

Our personal likes and dislikes of certain colors. This is the subjective decision on color choice and preference, based on our conscious and unconscious psyche.

Figure 2.8

Design Methodology

Color Perception

Although everybody has personal preferences and predisposed conceptions of how a color affects them, scientific research has found commonalities in the basic human perception of color. The following is Mahnke's (1996) list of colors (pp. 61-70).

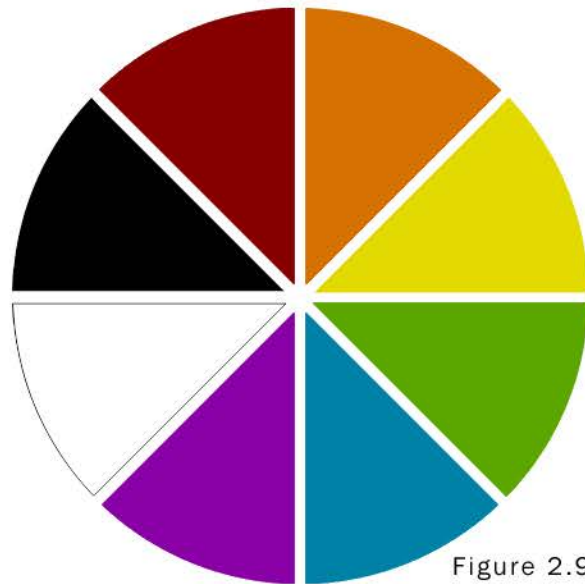


Figure 2.9

Red – Most arousing, exciting, stimulating and dynamic color. It has positive associations with strength, activity, and warmth. Negative impressions include aggression, rage, and blood. It also symbolizes love and passion. Christian religion interprets red as the blood of Christ. Christianity also interprets red as love.

Orange – In lighter forms, it carries impressions of joy, liveliness, energy, and positive social interaction. When darkened to brown, it represents the natural world, including earth and wood.

Yellow – Considered happiest of all colors. It represents cheerfulness, future, hope and wisdom. Yellow also stands for communication, representing Mercury, messenger of the gods. It means mental and spiritual enlightenment. If yellow is too strong, it can become egocentric.

Green – Positive associations include nature, growth, and relaxation. Negative include mold and sickness.

Blue – Calmness, security and comfort are all positive associations with the color. It can also be considered frightening, depressing, and cold.

Purple – Regal, dignified, and exclusive. Priests wear it because it suggests the integrity of blue and the strength of red. On the other side of the spectrum, purple can be interpreted as pompous and strict.

White – Represents light, cleanliness, hope and innocence. In a chromatic realm, white is good and holy. However, it is least preferred as a potential color choice, because we do not choose white over a color. It also represents sterile, empty, unemotional, and lacks any psychotherapeutic effect.

Black – Ominous, fear, grief, death. Generally holds a negative connotation, often opposing white.

Other Realms of perception affected by color

Estimation of Time

Various colors of rooms can alter perception of time elapsed.

Perception of Volume

Light and Dark colors increase and decrease the apparent size of a room.

Perception of Weight and Size

Darker colors appear heavier, while lighter seems less dense.

Perception of Temperature

Color holds the power to suggest warm or cold environments, such as cold blue or green rooms and warm red, orange and yellow rooms.

Perception of Noise and Sound

Brighter colors can emphasize loud sounds, while muffled noises are perceived in darker-hued surroundings.

Associations of Odor and Taste

Sent and taste can be skewed according to color relationships. Sweet red tones and sour yellow hues can change an experience with food and scents.

Tactile Associations

Colors can also present impressions of texture. Red appears solid, while violet has a velvety appearance.

Sound

Our evaluation of sound has many characteristics that apply. As reported by Siebein, we initially recognize clarity, intimacy, envelopment, balance, reverberation, loudness, overall impression, background noise, and echoes (p.248). In regards to perception, Forrester says that “our experience of listening to sounds in everyday life is in terms of the sources that produce them, the whirring of a fridge; rustling of leaves on the road and so on” (p.2). He states that when you hear a sound, you are actually hearing the cause of a sound, such as the wind with a swinging door or leaves on the ground. The characteristics, clarity, loudness, etc., are often associated with experiences or expectations we have already formed.

The most unique attribute that sound has over the other senses is that we are always at the center of our perceptual experience. That means that although our visual experience is always in front of us, our audible experience can happen from any direction around us – a sound from behind us is almost more audible to us because it catches our other senses off guard.

Project Emphasis

Project Emphasis

The main project emphasis of the new religious building is the four perceptual foci – color, form, sound and light. These individual perceptions carry different associative, symbolic, emotional, and physiological cues, both conscious and unconscious. Utilizing the best combinations of the four, Common Ground Church will develop based upon my understanding of how the human psyche perceives each focus. Along with those four principles in every step of the design, three other major points of the project are important for a successful solution.

Goals

1 | the design will provide a religious building that upholds the mission statement of Common Ground Church and the Christian Missionary Alliance denomination. This involves an understanding for the doctrine of the denomination, and understanding the individual mission statement for the church. The beliefs and values of a church is what define the congregation, so it should also help define the space that houses the congregation.

2 | the design will create an identity for Common Ground church that will not only stir the emotions of the current congregation, but also develop interest for those who are not a part of the church. A dynamic form that expresses a religious structure as an aid for a fulfilling worship experience and conveys a strong community at the heart will accomplish this.

3 | all issues of the project will consider the basic principles of sustainable design. Creating an efficient and effective environment for a religious building includes renewable resources for energy, earth-friendly materials, natural lighting considerations, and passive heating and cooling systems. The integration of these elements is essential to a successful project.



Figure 2.10

Site Information

Environmental Issues

The macroclimate of Lake Elmo is cool, with mild summers and cold winters. Summer temperatures range from 60.3 and 83.1 degrees, and winters range from 3.6 and 23.9 degrees, on average. It has an average of 32.6 inches of rain a year.

	Temperature (° F)						Rel Humidity		Wind (kts)			Sky Cvr	Mean # days w/ temp (° F)			
	means			extreme			(percent)		prevail		max		max	min	min	
	max	min	ave	max	min	6 am	3 pm	dir	spd	gst						
												90	70	32	10	
Jan	21	4	13	57	-34	75	65	NW	12	58	OVR	0	0	31	17	
Feb	27	9	18	60	-28	76	62	NW	12	48	OVR	0	0	27	12	
Mar	39	22	31	83	-32	77	58	NW	11	52	OVR	0	1	25	3	
Apr	56	36	46	95	2	75	48	NW	12	53	OVR	#	7	11	#	
May	69	48	59	96	18	75	47	SE	9	58	OVR	1	20	1	0	
Jun	78	58	68	102	34	79	50	SE	9	57	OVR	3	28	0	0	
Jul	83	63	73	105	43	82	50	S	9	55	SCT	6	31	0	0	
Aug	81	61	71	102	39	84	52	SE	8	62	CLR	4	30	0	0	
Sep	71	50	61	98	26	85	53	S	10	47	OVR	1	22	#	0	
Oct	59	40	50	89	15	81	52	NW	12	46	OVR	0	10	7	0	
Nov	40	25	33	74	-17	80	63	NW	12	57	OVR	0	1	23	2	
Dec	26	11	19	63	-29	79	68	NW	11	42	OVR	0	0	30	11	
Ann	54	36	45	105	-34	79	56	NW	11	62	OVR	15	151	156	44	

Figure 3.1

Solar Orientation

The site maintains major south exposure to the sun year round, with few trees serving as the only shading devices.

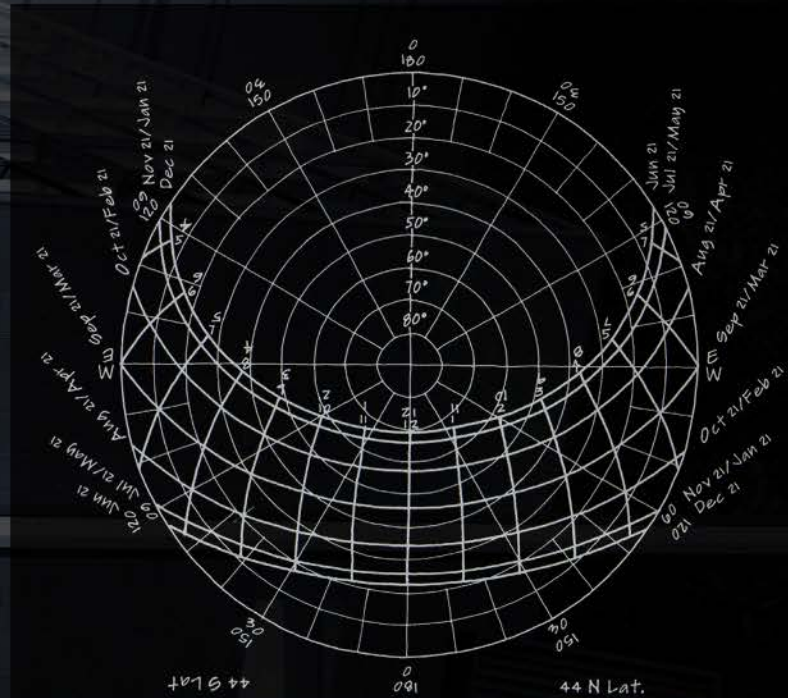


Figure 3.2

Figure 3.3

Site Information





Site Area

■ Three parcels totaling 13 acres

Major Landmarks

- 1 | Sunfish Park
- 2 | Lake Elmo Elementary School
- 3 | City of Lake Elmo
- 4 | Downtown Lake Elmo

Transportation Links

- Highway 5
- Streets and Avenues
- Railroad

Site Topography

The two parcels of land west of Kelvin Ave are relatively flat, with minor drainage contours forming the only elevation changes of the site. To the east of Kelvin, rolling hills occur in the retention pond.

Vegetation

The site has an abundance of trees, with younger trees serving as parking shade devices to the south, and mature trees forming walls to the north and west of the site. Gardeners maintain a large vegetable patch to the west of the existing parking lot and structure. Wild grass grows in the retention pond on the east side of Kelvin Ave.

Views

Besides the highway, nature surrounds the site. Sunfish Lake is to the Northeast of the site, and to the South are rolling valleys of trees and wild grass.

Existing Structures

The existing church is a compact building of 6800 square feet. The parking lot currently holds space for 104 automobiles.

Acoustic Environment

Automobiles on Highway 5 and the railroad serve as noise pollution to the site.

Figure 3.4

Site Information

Winds

The wind comes from the northwest during the winter months, and the southeast during the summertime.

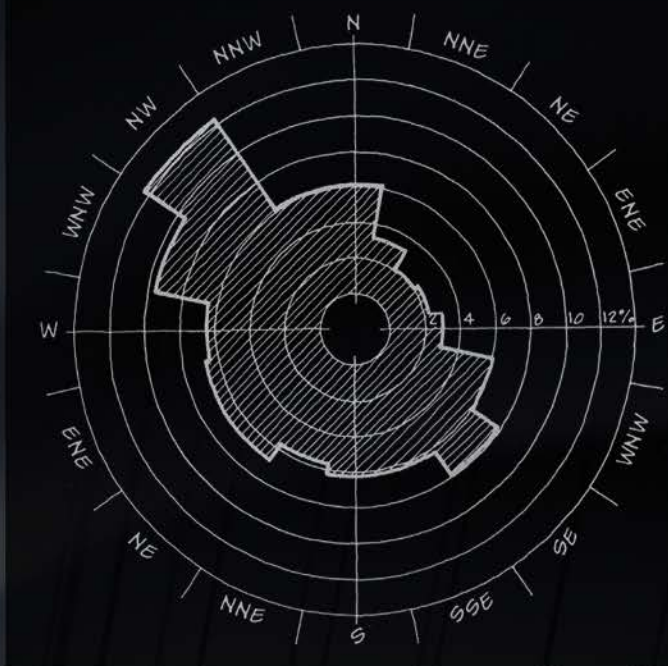


Figure 3.5

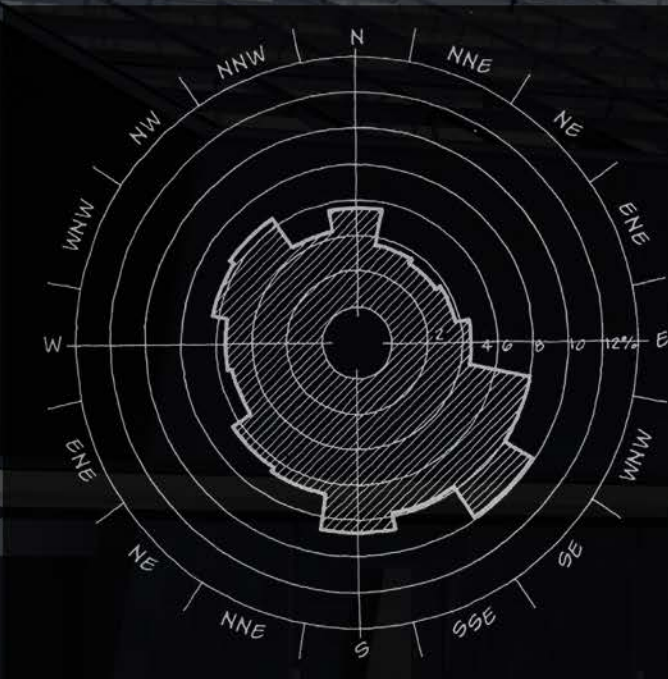


Figure 3.6



Case Study One

Figure 4.1.1

“Architecture’s main duty is to innovate. It is not to pander to trivia. It is not to destroy or supercede randomly. Its mission presently would seem to be one of regeneration. Consolidate and cultivate the garden of the future”

-Harry Weese (Weese 7)

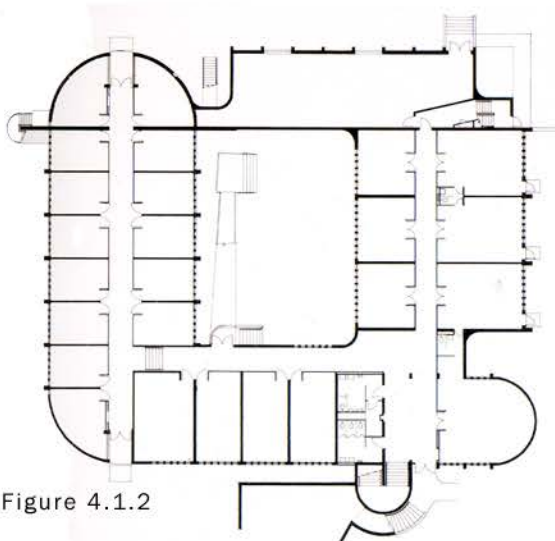


Figure 4.1.2

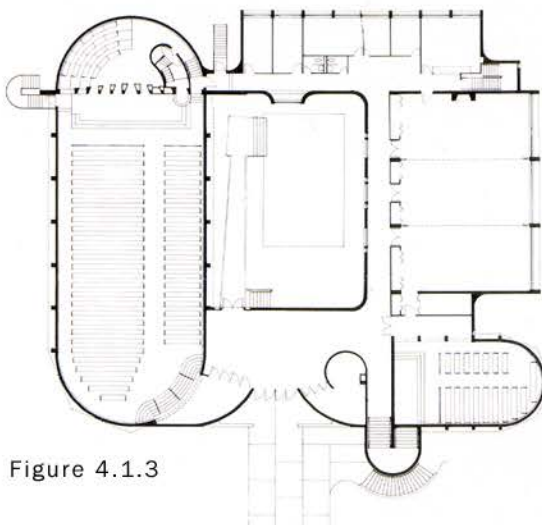


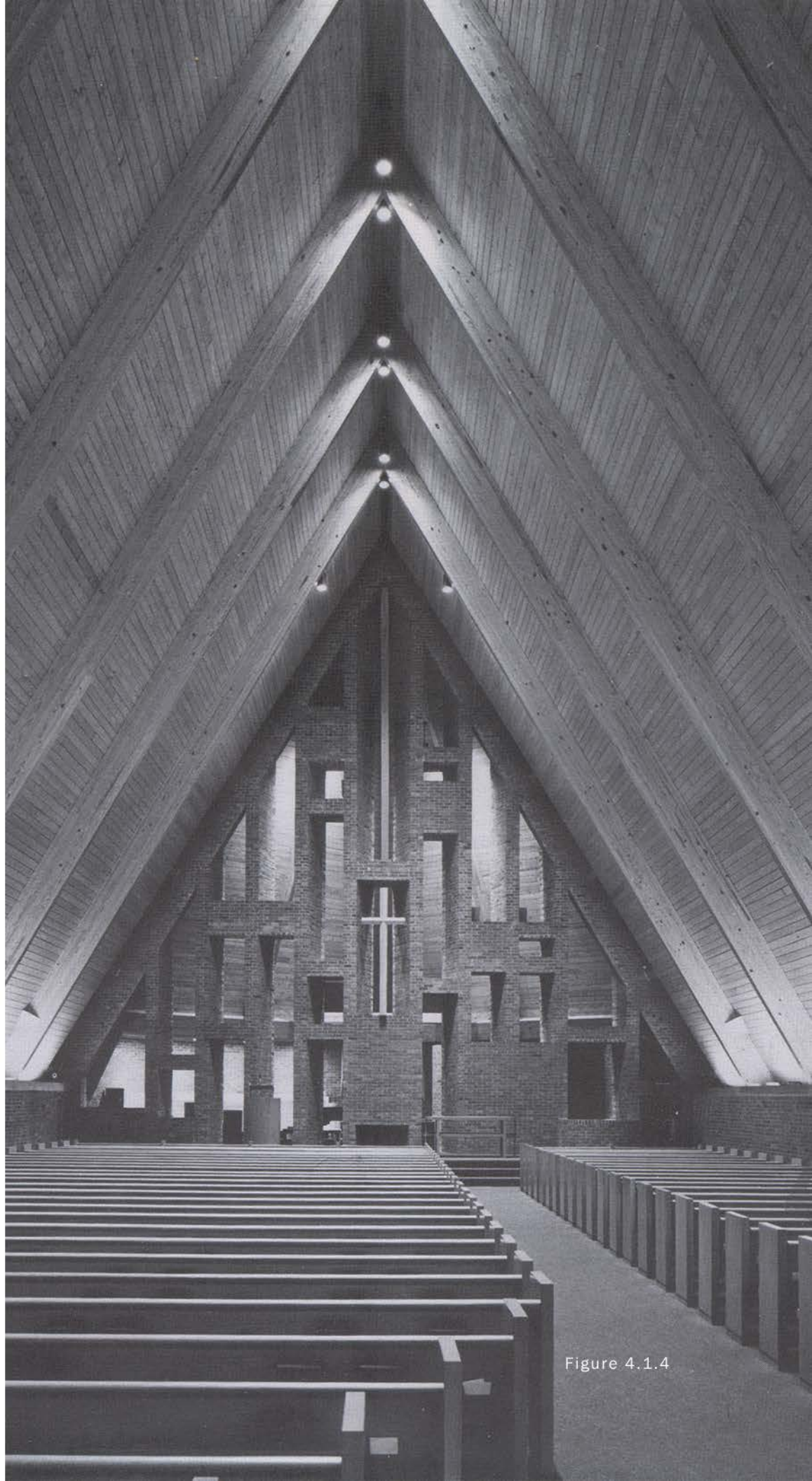
Figure 4.1.3

First Baptist Church

Architect **Harry Weese**
 Location **Columbus, Indiana**
 Year Completed **1965**
 Square Footage **28,000**

The First Baptist Church is set in a rural part of Columbus, Indiana. Harry Weese strived to design architecture with the belief that function is what is important. (Knight 105). He took the principle functions of a church and assigned basic forms to them. The dramatic shapes included steeply pitched slate roofs over a curving brick base. The sanctuary and chapel became the definitive ends of the church. Weese chose to do this in order to permit the worship spaces to dominate the building as a whole (Knight 102). Both took on an elongated angular conical form, accented by an almost two-dimensional triangle standing straight up into the air. “The church, with its soft curves and hard angles, is an example of Weese’s assemblage of volumes to create a sense of scale in a structure” (Knight 102). Because of the natural ventilation and simple finishes, Weese successfully put the emphasis on form rather than on material (First Baptist Church 32).

The sanctuary is a long, rectangular space that seats 500 people; it has an off-center aisle that puts focus onto the communion table and cross. A screen wall behind the altar, composed of brick, separates the choir and organ from the congregation (First Baptist Church 32).



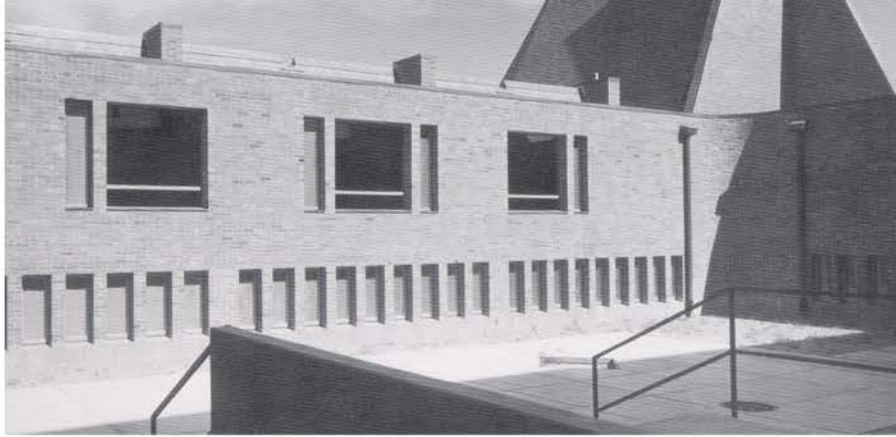


Figure 4.1.5



Figure 4.1.6

The church has two levels with the sanctuary, chapel, community hall, and offices on the upper floor. The lower floor consists entirely of classrooms. There is an open-air courtyard in the center of the First Baptist Church that “provides relief from the self-containment of the worship spaces, and acts as a fair-weather classroom or meditation area” (First Baptist Church 32). This allows natural light to penetrate many of the interior walls of the church. However, the only natural lighting within the sanctuary is found at the sides of the altar, hiding any descent exterior views from the congregation. This allows focus on the service, and removes the potential for glare or any other form of wanted sunlight.

A lot of the design for the church was adapted from a mixture of LeCorbusier – Monastery of La Tourette in Eveux, France and Notre Dame du Haut at Ranchamps, France. However, Weese completed his work in a more-ordered fashion, using brick instead of poured concrete. (Knight 102).

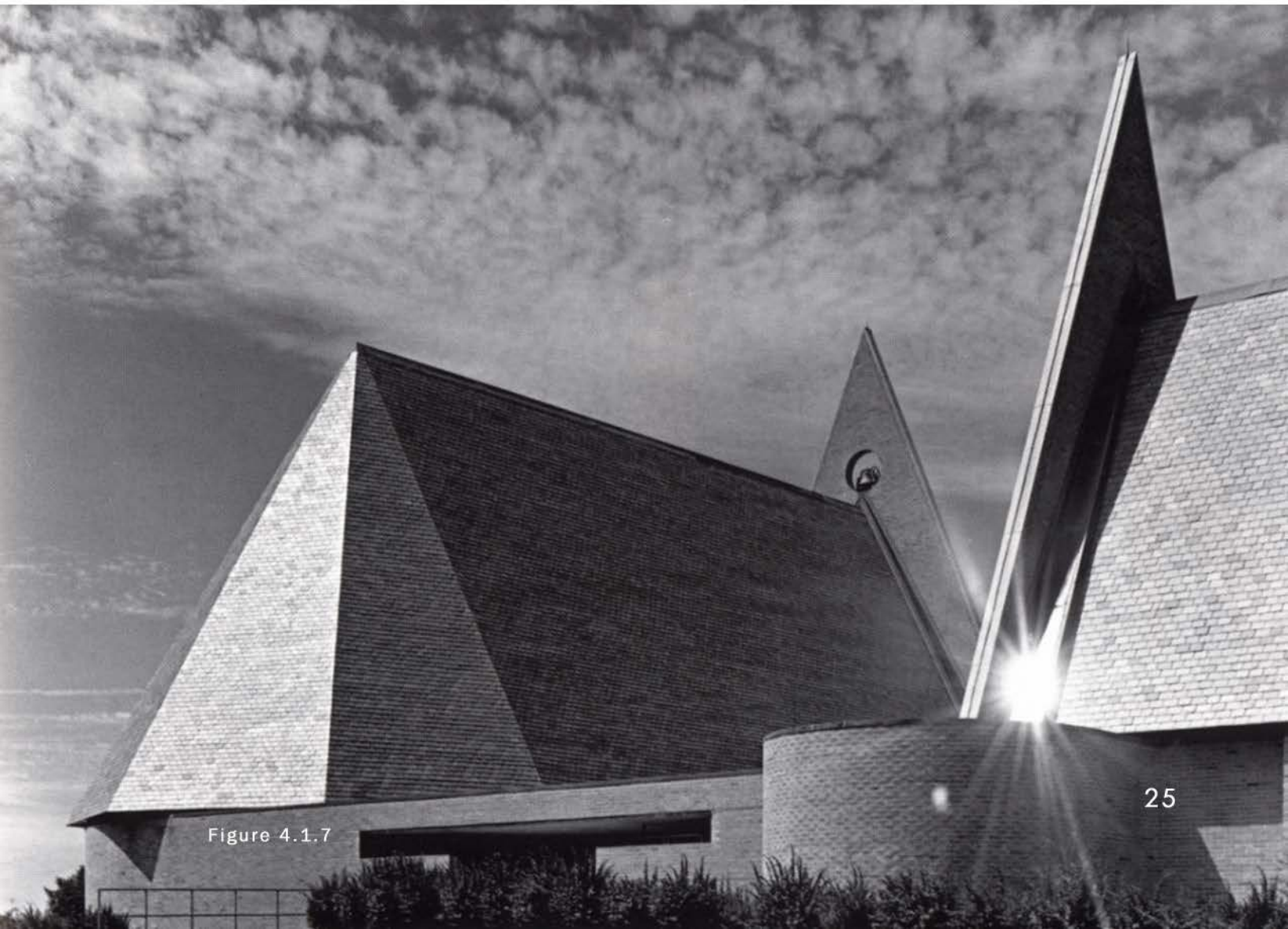


Figure 4.1.7

Case Study Two

St. Mary's Catholic Church

Architect Douglas Cardinal
Location Red Deer, Alberta
Year Completed 1968
Square Footage 13,150



Figure 4.2.1

In the 1960s, Douglas Cardinal was given “the opportunity to fulfill an architect's dream of building a church in his own community. Intrinsic architectural elements draw the eye and the spirit toward heaven in St. Mary's Catholic Church, designed in the spirit of the new liturgy (<http://www.djcarchitect.com>). It was, at the time, an unconventional religious building because the design did not call for stained glass or a cross. The church is located in Cardinal's hometown of Red, Deer Alberta, resting in the suburban area outside of the city.

“The entire structure - the walls, the roofline, even the roof itself - is curved. The arcs of the long west wall, the vertical curves of the bell tower, the rounded towers of the confessionals, everything about the building seems organic and melded to the prairie landscape and its tall skies” ((<http://www.djcarchitect.com>).



Figure 4.2.2

Inside, the church sanctuary is built in a round form, showing the exterior materials on the interior. The floor slopes toward the center, and a pair of deep skylights in the ceiling that follow the same graceful curves as the floor slope illuminates both the altar and pulpit. By directing the sun and daylight directly onto the altar, it is Cardinal's way of showing that the altar is the source of life. Essentially, the entire church derives from the main altar, because it is the "centre of the composition and the most important element in the church: it symbolizes Christ and is the central element in the celebration of the mass" (<http://www.djcarchitect.com>). From that point of reference, the curves and slopes of the modern church not only emphasize the organic nature of the building, but they also offer quiet ambience and remarkable acoustics in the sanctuary.



Figure 4.2.3

From a perceptual standpoint, curves and cylinders convey stable elements in architecture, such as columns or spheres. They also break the standard corner, distilling the mystery from what is on the other side, for example. In addition, the decision of selecting brick as the exterior material manipulates our basic expectation that stone and masonry can only form hard and angled surfaces, since they are rectangular in form as individual units. Overall, Cardinal's ability to carry the concept through the building results in a successful organic, modern piece of architecture.

Case Study Three



Figure 4.3.1

Galvin Family Chapel

Architect William Rawn Associates
Location Wellesley, Massachusetts

The original program for the Galvin Family Chapel was to provide a spiritual place at the center of Babson College in Wellesley, Massachusetts. The building's main form is an almost perfect cube, resting at the top of the site at the campus. This allows for an ascending path that forms the relationship of nature and spirit.

The Chapel has a thirty-foot high non-denominational sanctuary that is large enough for fifty people to attend. Two of the four walls are large stained glass windows that are set up views of the surrounding natural landscape. "The walls of the building are a balance of solid and void. The two transparent walls face the uphill woods, and offer a sense of landscape, peace, and contemplation" (Crosbie 56).

The adjacent two walls of the sanctuary are of Deer Isle granite. They face the rest of campus, screening the views into the sanctuary, providing a sense of mystery, protection, and solitude.



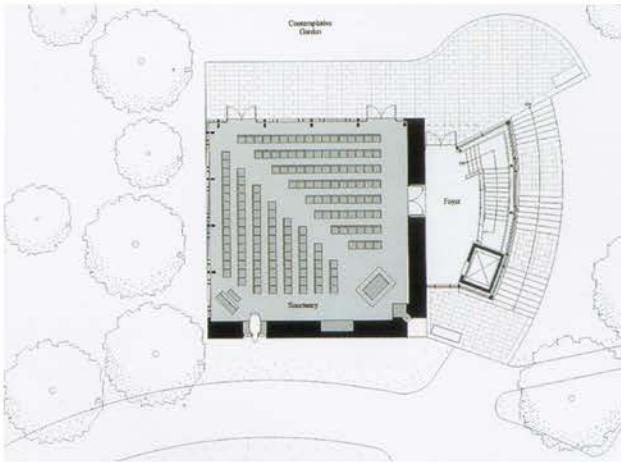


Figure 4.3.3

The interior solid walls, ceiling, and floor are clad with wooden paneling. The ceiling is reminiscent of a vessel, which serves as Christian imagery and as a nod to the founder of the college. The free-moving seating of the sanctuary provides multiple settings for service; facing the windows offers a direct connection with nature while facing the solid wood focuses the attention to the speaker or service.



Figure 4.3.4



Figure 4.3.5



Figure 4.3.6

Case Study Four

Riola Parish Church

Architect **Alvar Aalto**
Location **Riola, Italy**
Year Completed **1978**

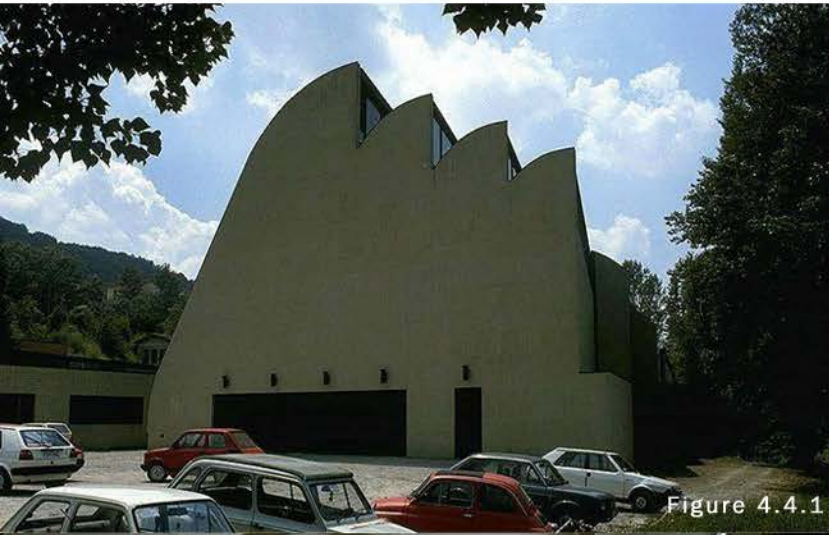


Figure 4.4.1



Figure 4.4.2

Riola Parish Church was one of the original reformed Roman Catholic churches that used architecture as a means to express themselves (Fleig, 171). Located in the rural city of Riola, Italy, the building uses a small palette of materials, constructed with a concrete form that is clad in stone and copper. The most notable exterior feature of the religious structure is the massive tiered arches extruding from the roof of the church. The asymmetrical forms are playful and majestic. The skylights look like sails from a vessel, which is a form of Christian imagery. They direct natural light into the vaulted sanctuary, highlighting the altar with sunlight. The interior was designed to create a close relationship with each part of the sanctuary. The altar, choir, and organ fit together inside the asymmetrical basilica. The interior is unadorned, allowing the large structural members in the sanctuary to form the interest of the space. When the weather permits, the front wall can actually be opened so that the building can be extended to connect with the natural outside environment (Fleig 171).

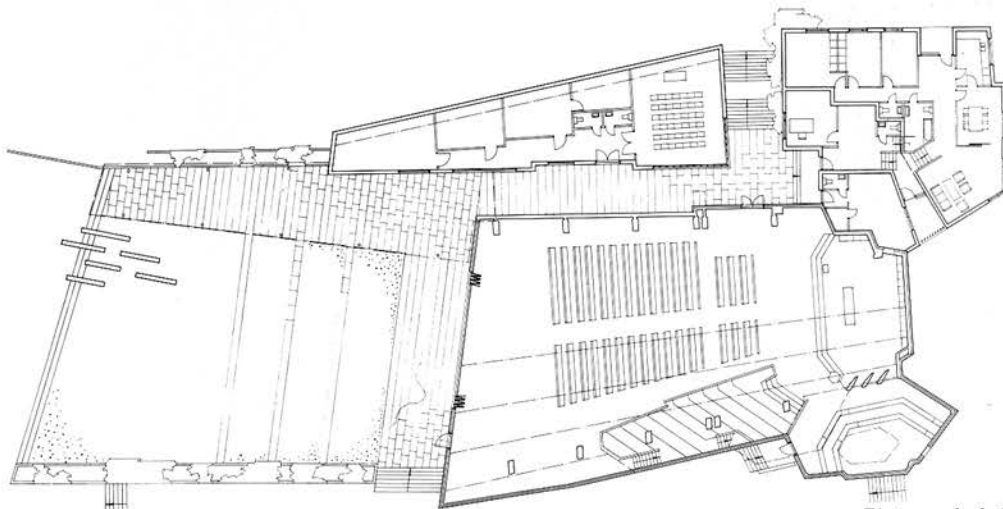


Figure 4.4.3



Case Study Five

Figure 4.5.1

"All spaces need natural light. That is because the moods which are created by the time of day and seasons of the year are constantly helping you in evoking what a space can be if it has natural light and can't be if it doesn't. Artificial light is a single tiny static moment in light and can never equal the nuances of mood created by the time of day and the wonder of the seasons."

-Louis I. Kahn

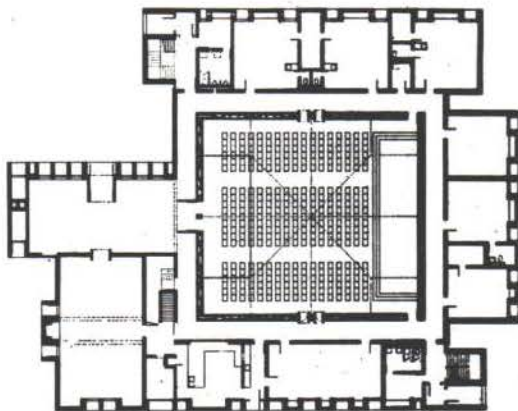


Figure 4.5.2

First Unitarian Church

Architect Louis Kahn
Location Rochester, New York

In designing the First Unitarian Church of Rochester, Kahn began by discussing his concept with the congregation. It occurred to him that the sanctuary was the center of questions and that the school, which was integral to the church, was that which raised the question. From that idea, "Kahn drew a question mark, chosen to represent the sanctuary, at the center of the building, surrounded by a circle to serve as an ambulatory representing the shades of belief possible in a Unitarian congregation" (France).



Figure 4.5.3

You can see elements that grew from the initial concept sketch by Kahn. The sanctuary is at the center of the building, first surrounded by a corridor and then by the school. The initial problem that Kahn ran into was how to bring natural light into the sanctuary, since the rest of the building surrounded it. As the Kahn quote shows his belief in the power of natural light, Kahn designed four towers to rest at each corner of the sanctuary. As for the remainder of the building, Kahn removed the possibility of glare from sunlight by setting the windows into deep masonry reveals (France).

The interesting feature with the form of First Unitarian is that each exterior elevation evolves according to the interior. From this aspect, the exterior is a representation of the function within; that is, the function creates the form. The overall building has an asymmetrical rectilinear form, simplistic in shape and materials. However, close attention has been paid to the small details, for it is difficult to achieve the actual goal of simplicity. Kahn paid attention to how walls were put together, where in the building exposed connections were to be made, and even the selection of wood used to build the forms for the poured concrete. The only true breaks in the wall are functional, with the “concrete block of each wall parts to show its ‘bones,’ the long concrete pillars that support the roof” (France).

All of the materials used in the church did require additional finishes after construction. A range of brick, concrete block, poured concrete, and wood was chosen to decorate the structure. The exterior is faced in masonry, while the sanctuary and most of the interior is concrete. White Oak doors offset the raw, cold materials surrounding them and serve as a beacon for attention. The only adornments in the sanctuary are woven hangings spaced on the side walls were designed by Kahn and woven by Jack Lenor Larsen, made from the three primary colors (France).



Case Study Six

St. Peter's Lutheran Church

Architect **Ralph Rapson**
Location **Edina, Minnesota**
Year Completed **1956**

The congregation of St. Peter's Lutheran Church in 1956 had outgrown the space they were currently using, and they had to decide whether to expand their current facilities, or to start over. When Ralph Rapson assessed the situation, the new design for St. Peter's Lutheran church began. Because of the proposed site, a long and rectangular nave was not considered due to limitations and boundaries. Therefore, Rapson tried to design according to the client/user group, and developed an octagonal sanctuary.

The new plan reflects the congregation's "liturgical philosophy of the family of man gathered around the Lord's Table." Eight steeply pitched, glass-filled gables form a star-shaped roof that rests over the altar in the center of the worship space. The clear glass gables allow so much natural light into the sanctuary that parishioners often run into the problem of too much light, sometimes causing large levels of glare. The seating wraps around the altar in a 300-degree arch, leaving some seating behind the pastor. However, Pastor Harold Schweigert praised the design as 'remarkable for the degree to which it expressed symbolically our theology - a unique kind of sensitivity on the part of the architect' (Hession 64).



Figure 4.6.1

Case Study Seven

“White is in fact the color which intensifies the perception of all of the other hues that exist in natural light and in nature. It is against a white surface that one best appreciates the play of light and shadow, solids and voids.”
 —Richard Meier (Meier 8)

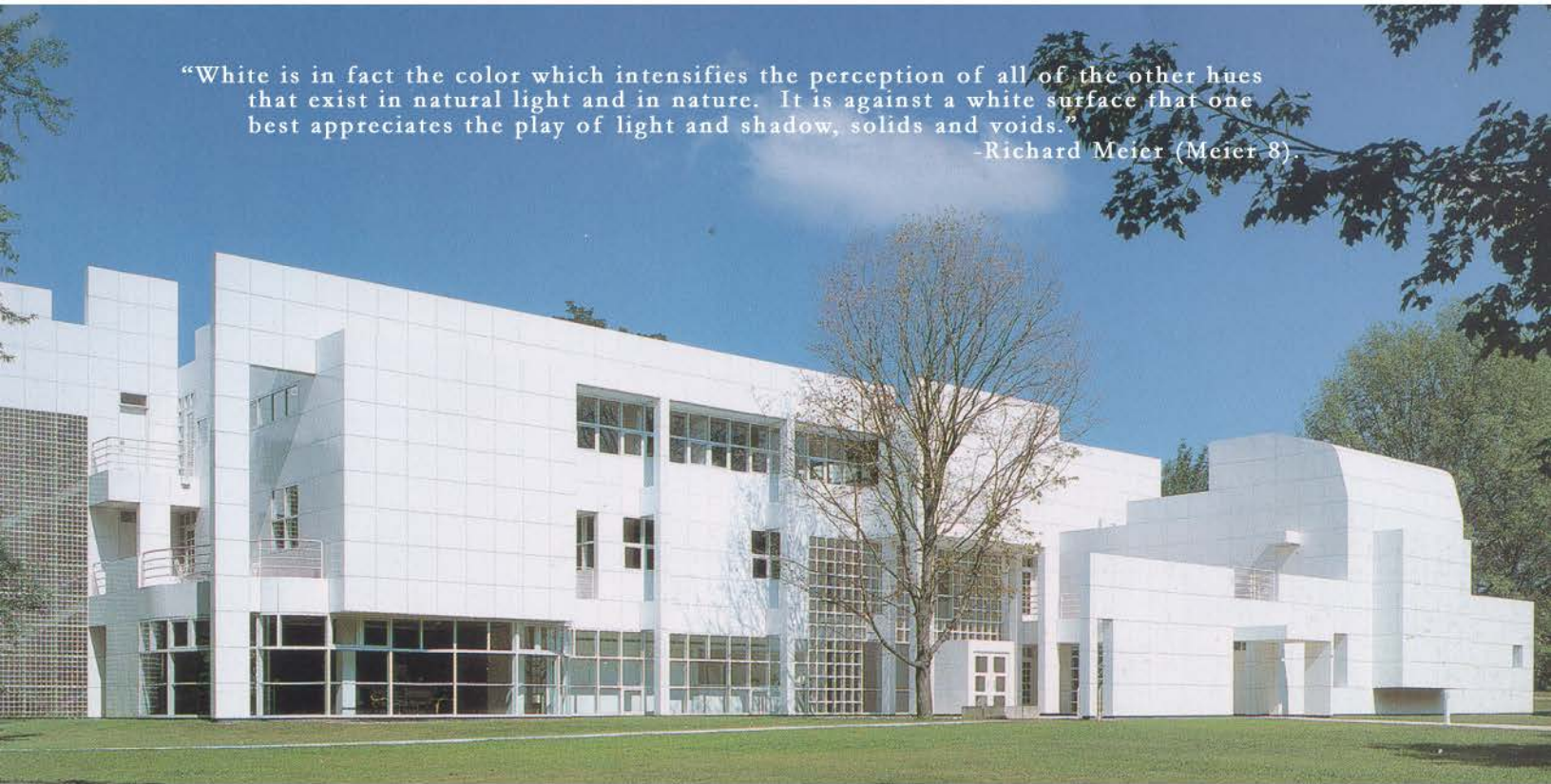


Figure 4.7.1

Hartford Seminary
 Architect: Richard Meier
 Location: Hartford, Connecticut
 Year Completed: 1981
 Square Footage: 27,000



Figure 4.7.2

In 1972, the Hartford Seminary relinquished its role as a traditional residential divinity school for the Protestant ministry and established itself as an interdenominational theological center” (Meier 239). The seminary decided to sell its existing campus to start with a new image and to rebuild in order to support all its activities. The new building includes a large meeting room, a chapel, a library, a bookstore, classrooms and areas for faculty, as well as workrooms and offices (Meier 239).

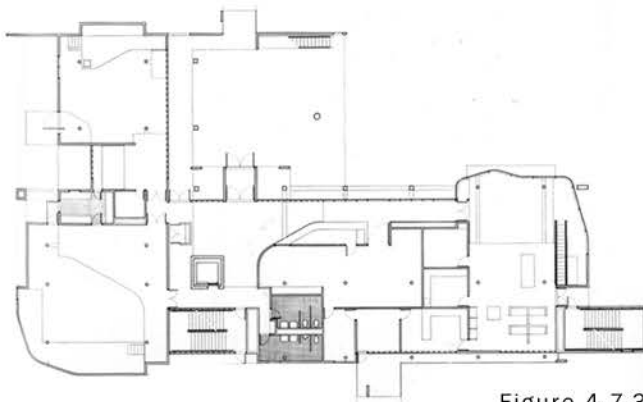


Figure 4.7.3

The corner site for Hartford Seminary is flat, located in a residential suburban area. The building’s bright white façade conveys an image of openness for the center. Most of the building follows the grid, extruding or subtracting its form on set integers. The southeast corner of the building gently curves, being the only section of the building to step away from the orthogonal scheme.

The front façade of the building has a 'screen like' wall that separates the main entrance walkway from the courtyard. This was done so the visitors have a gradual entrance sequence, where they are led into the building through the various openings and paths outside. Three spaces have entrances that convene at the courtyard - the chapel, meeting room, and library (Meier 249). The courtyard is reminiscent of some early Christian churches.

The building's main intent is to glorify natural light, causing the building to become a place of intellectual and spiritual illumination. The play of natural light onto curved white wall surfaces guides visitors throughout the building. "The projecting volume of the chapel not only accentuates the independence of that space, but also functions to allow natural light to enter from above" (Meier 246). The light cast on the altar in the sanctuary comes from a piece of blue glass that is in a recessed window above. It provides a soft glow of blue to play against the otherwise white walls and floor.

"The spirit of the building as a religious center is evoked by the luminosity and pristine qualities of its architecture - by the pure configuration of light and space (Meier 249).



Figure 4.7.4

Case Study Eight

Set on a 130-foot high basalt cliff, the Marilyn Moyer Meditation Chapel provides a panoramic view of both the urban and wilderness. The small non-denominational public building offers solace for anybody that seeks it. Built on part of a 58-acre Catholic sanctuary, the chapel serves as more of an artwork than a formal functioning building.

The long approach to the entrance of the building and the dramatic form of the building itself convey the spiritual nature of the chapel. Each side of the walking path is surrounded by shallow water, forming a moat around the south end of the structure, and conveying the sense of walking on a bridge toward the chapel.

Inside, the chapel has a 28-foot tall curving glass structure that provides the visitor with a dramatic view to the north. The only element of the interior that is not part of the chapel itself is a small sculpture of a mother and child that rests at the end of the central axial path. Built into the chapel walls, pews and two writing surfaces extrude at the entrance and along the sidewalls. They form a function directly connected from the building to visitor. Each sitting area still presents the visitor with a view to the glass wall at the north, overlooking the edge of the basalt cliff and the urban sprawl below.

When viewing the chapel from the north side, the main structural beam and column form a large white cross, with the base carving itself out of the basalt cliff. The form of the building takes precedence over the materials used. Large, smooth stone slabs provide an elegant sense outside and within. The color palette is muted natural hues, putting emphasis on the view of the sky from the interior, and the surrounding nature around the exterior.

Marilyn Moyer Meditation Chapel
Architect Thompson Vaivoda & Associates
Location Portland, Oregon
Year Completed 1991

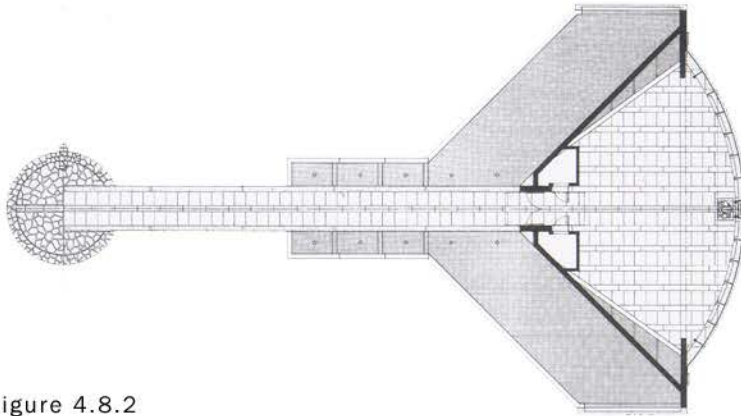


Figure 4.8.2



Figure 4.8.3



Figure 4.8.4

Case Study Nine

Gateway Center

Architect **Antoine Predock**
Location **Minneapolis, Minnesota**
Year Completed **2000**

As though the building is rising out of the ground from shifting tectonic plates, the University of Minnesota Gateway Center is located in downtown Minneapolis, Minnesota. It sits at a major entrance to the campus, serving as a ceremonial gathering space and as an office building for four departments associated with the campus. The Gateway center has three distinct forms that define the building as a whole.

The true highlight of the building is the dramatic memorial hall that consists of granite, glass, and a wooden interior. The shape of the hall is an “irregular polyhedron of colliding granite planes and glazed fissures that allow sunlight into this large open gathering space” (Predock). It is Antoine’s way of connecting the visitors’ with the true essence of Minnesota – it is an expression of nature and our geological history. The use of granite reflects the granite strata in Minnesota.

The interior of the Hall is as exciting as the exterior by the addition of hemlock planking clad along the interior faceted walls and the lively copper wall. Stairs project out into the space, as do balconies along the copper faced wall that makes up the second form of the Gateway Center. Predock uses additive and subtractive principles with the wall as a means of expressing different areas and various levels of the building. The final form of the Gateway center is the office building that houses four major Minnesota businesses. The office buildings design allows each company to keep their privacy, while also allowing them to connect with one another at the Memorial Hall.

The abnormal shape of the Memorial Hall is paradoxical – it appears to be a unique structure architecturally, with a multitude of angles and facets, but it is derived from a natural element of our environment. The appeal lies in the form because from a perceptual standpoint, our conscious mind may interpret the shape as being unusual, but our subconscious or unconscious mind relates the shape to our expectations of how a rock formation would appear in a natural setting.



Figure 4.10.1



Figure 4.9.1

Overlooking a Southern California freeway, the 72-acre hillside campus is laid out in cascading terraces. The hillside had been dismissed as impractical, if not impossible, to build on. Two years of grading preceded building construction (Kimm). At the top of the hill are football fields; at the bottom, soccer fields and tennis courts. Sandwiched in between are two lines of buildings with a pedestrian street running down the middle.

The two rows of school buildings are divided into clusters, each having its own set of classrooms separated according to discipline, as well as its own courtyard. The breaking up of the linear mass into functional units also has the effect of creating various types and sizes of communal spaces. This design element successfully follows the overall concept that Morphosis was trying to encapsulate for this project - to cure social ills, to participate in a communal effort to improve the world (Kimm).

Diamond Ranch High School

Architect Morphosis
 Location Pomona, California
 Year Completed 2002
 Square Footage 150,000

One enters the school at the east end and begins a procession defined by distorted roof lines overhead. The corrugated steel panels fold, twist, and bend, taking on the forms of nearby mountains. In some places the roofs become more than planar. "They transform into volumes to suggest the inhabitation of hidden souls. Collectively, the roofs form a new horizon, emblematic of the gift of education to expand the recipient's breadth, to fill one with the desire to scale the unknown" (Kimm).

At the same time that the roofs strive to break free of all constraints, they also refer to the shifting plates of the region's unstable geology. This architecture speaks simultaneously to earth and sky; it is able to remind students that they should always aim for the infinity while also remembering how unstable our ground sometimes is.

At Diamond Ranch, the details are well thought out but not overly articulate. No expensive connections call attention to themselves; they just do the job. The structure is a simple steel frame. In the gymnasium, for instance, the ceiling structure impresses one as impossibly light (Kimm). Morphosis successfully created a well-designed school, maintaining within the \$28 million budget assigned to them.

Figure 4.9.2

"Buildings, athletic fields, parking lots, and open spaces are so successfully melded with the rolling topography that the school's organization emanates from the site. Cantilevered volumes project dramatically into space, and roofscapes fold and bend like shifting geologic plates. The plan defines three schools within the whole, facilitating more intimate teaching environments"

- Jane F. Kolleeny (Kolleeny 141). 39



Case Study Eleven

On a 900-year old vineyard an hour west of Vienna, Steven Holl designed a modern and idiosyncratic wine center and visitors' facility. He refused to design a structure resembling the baroque buildings common to Langenlois countryside, and provided the area with a strong and distinctive style to accent the vineyard that rested on top of a hill overlooking the city.

Starting with the form of a basic cube, Holl applied an aluminum metal paneling onto the reinforced concrete structure, preserving a bright sheen. With the panels attached at slight angles, the building has a dented appearance. This produces angles and various levels of sunlight to bounce off each wall, creating a variety of shades and sheens. Holl also carved narrow windows out of the cube that allow sun and daylight to flow into the interior, while concealing some of the views of the surrounding vineyard. A choice of windows has green glass attached to them, suggestive of wine bottles, making a literal connection with the daylight and the wine center.

Loisum Visitor Center
Architect Steven Holl
Location Langenlois, Austria
Year Completed 2003
Square Footage 13,000





Figure 4.11.2

A special feature of the wine center is that the building tilts at a 5-degree angle, staying perpendicular to the slight slope of the vineyard. "The tilt, giving the structure a subtle thrust of potential energy, was the suggestion of artist Solange Fabiao, Holl's wife" (Lefaivre 119). This also allows the new building to connect to the old wine vaults underneath the vineyard with a 65-foot tunnel. A reflecting pool with underwater portholes rests over the top of the tunnel and allows daylight to stream in.

Because of the concrete shell of the visitors' center, the building has a relatively open plan. He uses the space to accent stairs and other forms of promenades, following in the footsteps of Le Corbusier. A wine tasting café and wine shop dominate most of the open space, with very high ceilings and minimal furniture (Lefaivre 119). The form, lighting and coloring of the Loisum visitors' center conveys a joyful experience to the patrons visiting.

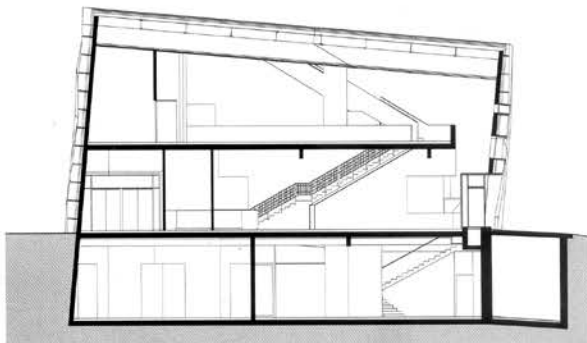


Figure 4.11.3

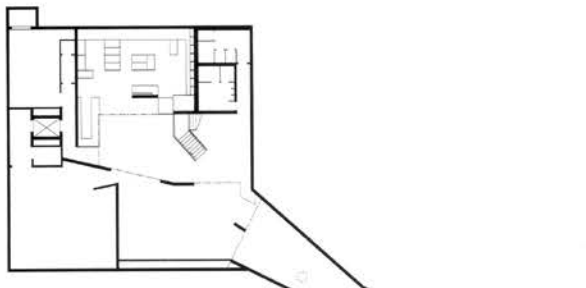


Figure 4.11.4

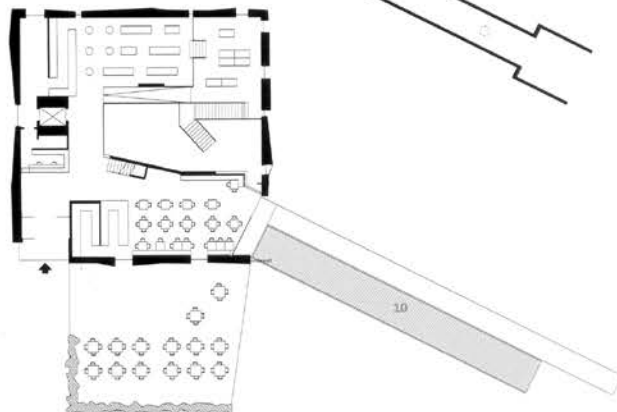


Figure 4.11.5



Figure 4.11.6



Figure 4.11.7



Figure 4.11.8

Case Study Twelve

Before building the Walt Disney Concert Hall, it was already a legend. The building spent over 16 years moving from concept to concert, and outgrew the original budget by over five times as much – totaling \$274 million. The whole process began when Lillian Disney, widow of Walt Disney, offered a \$50 million donation to the Philharmonic to build a new orchestra hall across from their existing facility, the Chandler Pavillion, as long as they had groundbreaking by 1992. They quickly moved through options and selected Frank Gehry out of a list of four competing architects as the lead designer. Dworsky Associates accepted the offer to produce the working drawings for the entire project (Russell 135).

The original competition model that won Gehry the opportunity to design the concert hall was a large glass greenhouse that served as a 'living room for the city,' according to Gehry (Russell 136). It offered less seating than the current concert hall that was being used by the orchestra. As design progressed and costs climbed, Gehry replaced the glass shell with four large wedges that surrounded the hall. He then manipulated the hard shapes into curved forms clad in limestone. The patterns took forms that honored Lillian Disney, the original donator, who had an interest in gardening and flowers. However, the design was nearing the deadline, and the failure of the construction documents made the possibility of a successful concert hall minimal.

Walt Disney Concert Hall
Architect: Frank Gehry
Location: Los Angeles,
California
Year Completed: 2003

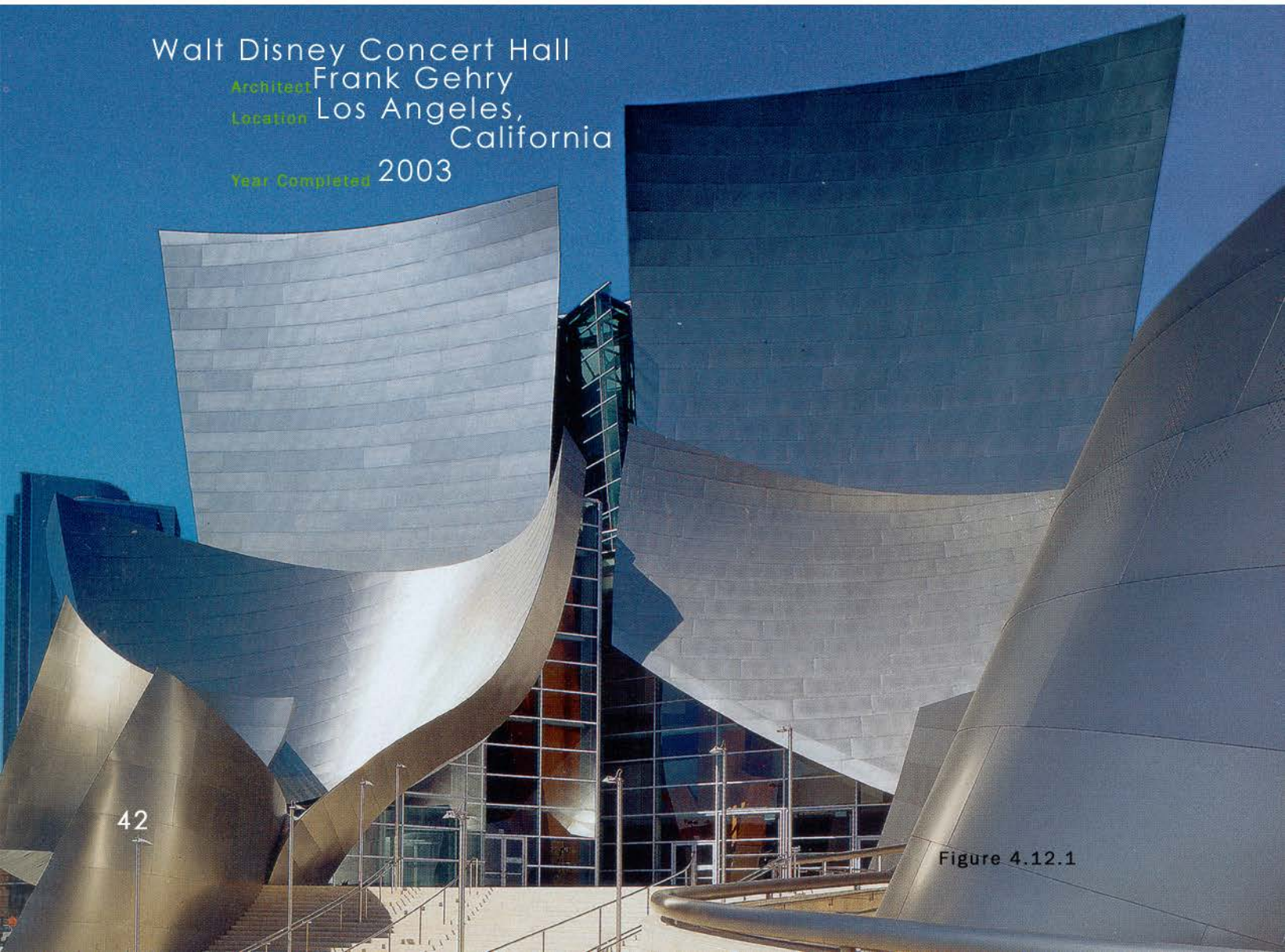
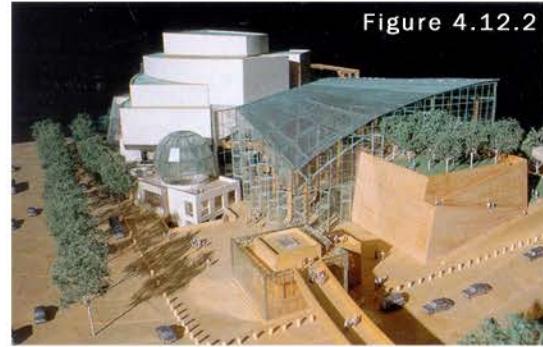




Figure 4.12.3



The project spent the next few years up in the air, with a low period in the economy and a lack of interest from the city to complete the project as designed. In 1997, a design-build team was going to replace Gehry and move him into a consultant role. Diane Disney Miller, daughter of Lillian, insisted that Gehry finish the project, awarded a donation to the Philharmonic, and the project was put solely into the hands of Frank Gehry's firm.

The metal paneling of the exterior form, reminiscent of his Guggenheim Museum in Bilbao and the Weismann Art Museum in Minneapolis, Minnesota, is a trademark. The interior space has large and open lobbies, with sweeping forms and wooden sculptures wrapping themselves throughout the entire building. The main entrance lobby massive wooden tree forms clad that contrast against the vast white walls. The trees, as well as the bright floral carpet throughout the concert hall are also a nod to Lillian Disney for her efforts to make the project a reality. Curves and other non-traditional forms shape the whole interior, creating an organic experience for all of the patrons.

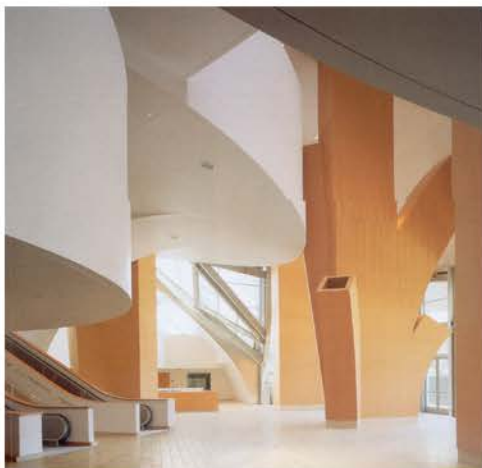


Figure 4.12.4

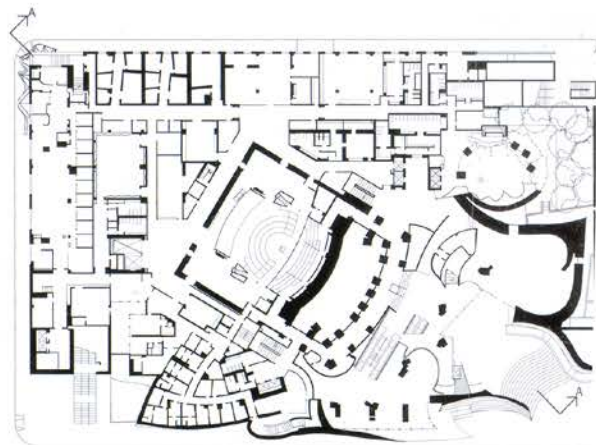
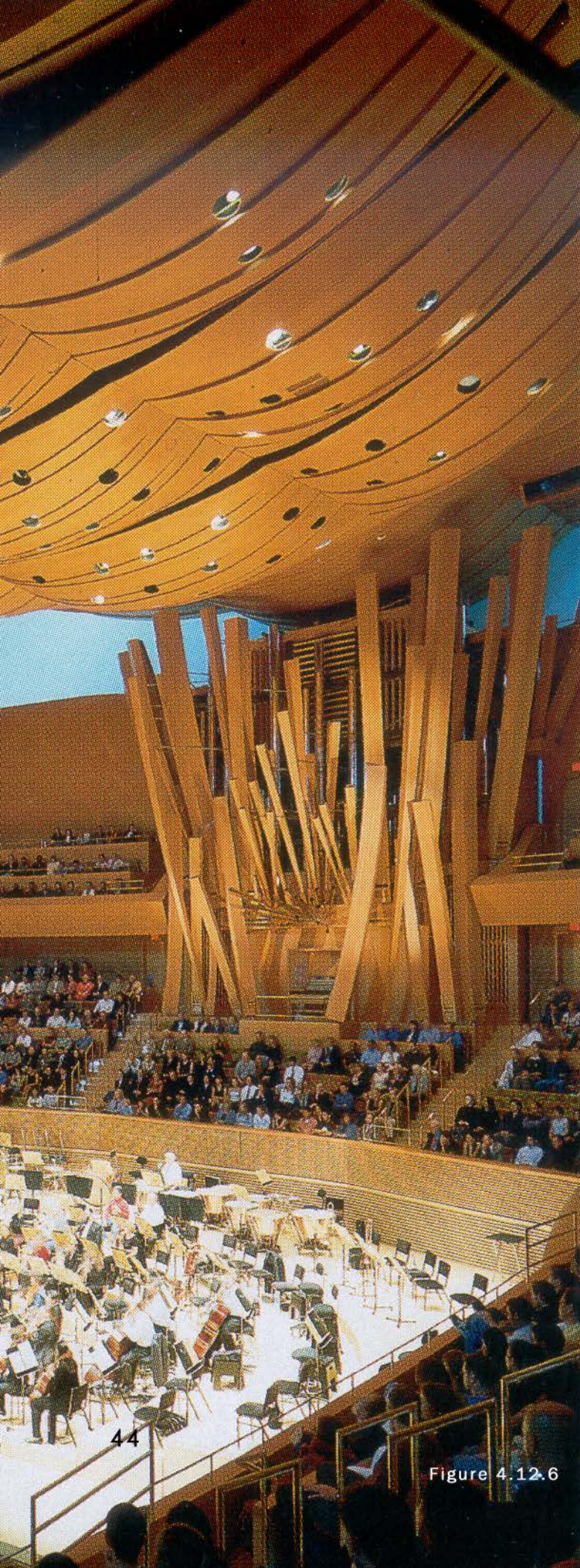


Figure 4.12.5



After building 82 separate 1/16" models of various successful concert halls around the world, Gehry and Yasuhisa Toyota modeled a 360-degree concert space that held the orchestra in the middle of the room. The shape of the concert hall is the most important aspect, because the majority of sound heard by the audience is not coming directly from the orchestra. Much of the clarity and warmth heard by the audience bounces from the swelling walls, sloping floors, and variety of materials chosen within the space. The warmth of wood is used for the majority of the space, including the very sculptural organ that Gehry designed. Adding to the experience, there is only a single skylight at the north end of the concert hall. This allows only daylight, not sunlight, to fill the space with natural light.

An important impact that Gehry felt integral to the design was the experience of the audience. The hall pays careful consideration to the arrangement of seating, including steep levels that increase the visual intimacy of the audience. Yasuhisa Toyota also brought the “largely unscientific yet common-sense notion of ‘psycho-acoustics’ – if people feel comfortable and like the visual quality of an auditorium, they’ll like the sound better” (Russell 136).



Figure 4.12.7

Programmatic Elements

Sanctuary

Size - 6,000 sf

Users - Entire congregation and staff

Hours of Use - Sunday morning service, weekday evenings, Saturday events

Relationship - Connected to main entrance

Furnishings - seating for 300 - 350 people, altar for pastor, separate worship team area

Equipment - sound system, multiple lighting rigs, projector and screen

Color - Inviting, upbeat

Light Quality - Multiple setups for various services varying from large levels of natural light to specific spotlight highlighting

Sound Quality - Highest quality sound system for speech and music, omnipresent, 1.8 - 2.0 second reverberation, concert hall atmosphere

Description - The highlight of Common Ground Church, the sanctuary is the most important space in the building. It is used for the Sunday services and any other large programs throughout the week. Consideration of color, light, sound and form are of the utmost importance in this space. Not only should it capture the essence of the church, it must portray the vibrant faith and worship of the Christian Missionary Alliance congregation. The space will provide the church with various configurations of seating, light and sound, based upon the type of service or program held in the sanctuary.



Main Entrance

Size - 600 sf

Users - Entire congregation and staff

Hours of Use - Sunday morning service, weekday evenings and Saturday events

Relationship - Central gathering space, connected to sanctuary, fellowship hall, bathrooms and church offices

Furnishings - Minimal Seating

Equipment - Speaker system

Color - Welcoming, exciting

Light Quality - Standard artificial and abundance of natural light

Description - The initial entrance of the church, this space is a central area that guides the congregation to various locations within the building. It is important that this space hold a positive first impression, welcoming new guests.

Reception

Size - 300 sf

Users - secretary and congregation

Hours of Use - Weekdays, Saturdays and Sunday afternoons

Relationship - Main entrance, Pastoral Study & Library, Offices

Furnishings - Office furniture and seating

Equipment - Computers and other forms for communication

Color Quality - Relaxing, warm, and secure (pale orange, green, blue-green)

Light Quality - Standard artificial and natural light

Description - the secretary, dealing with church related issues and all building operations, uses the space throughout the week.

Church Offices

Size - 500 sf - (two offices @ 250 sf)

Users - Pastor and associate pastor

Hours of Use - Weekdays, Saturdays and Sunday afternoons

Relationship - Main entrance, Pastoral Study & Library, Reception

Furnishings - Office furniture and seating

Equipment - Computers and other forms for communication

Color Quality - Relaxing, warm, and secure (pale orange, green, blue-green)

Light Quality - Standard artificial and natural light

Description - The two offices are for the pastor and associate, dealing with church related issues, small meetings or mediation, and all other building operations needed for Common Ground.

Programmatic Elements

Pastoral Study & Library

Size - 350 sf

Users - Pastor, associate pastor

Hours of Use - Minimal; same as office hours

Relationship - Church Offices

Furnishings - Desk & chair, lounge furniture

Equipment - none

Color Quality - Tranquil, meditative passive colors to enhance quietness and concentration (pale or light green)

Light Quality - indirect artificial, natural light

Description - This space is used for the two pastors as a confined space that would allow them to research and prepare for sermons. A collection of religious books is stored as the church library.

Fellowship Hall

Size - 4,000 sf

Users - Entire congregation and staff

Hours of Use - Weekday evenings, Saturdays and Sunday afternoons

Relationship - Main entrance, Kitchen

Furnishings - seating for 300-350 people, serving area

Equipment - A/V system

Color Quality - Clean, pleasant (warm red, warm orange, clear green)

Light Quality - Standard artificial and natural light

Sound Quality - Lively with low reverberation

Description - The large fellowship hall will host all meals provided through the church, as well as provide space for reunions, parties, and other festivities related to Common Ground. Directly connected to the fellowship hall is the kitchen, where all of the food is prepared.

Kitchen

Size - 400 sf

Users - Church staff

Hours of Use - Scheduled weekdays, Saturdays and Sunday afternoons

Relationship - Fellowship Hall

Furnishings - Adequate storage space

Equipment - Sink, dishwasher, oven, stove, microwave, refrigerator, deep freezer

Color Quality - Clean, pleasant (warm red, warm orange, clear green)

Light Quality - Direct artificial

Sound Quality - Quiet space

Description - The kitchen will be suitable for the preparation of all meals used in the Fellowship Hall, as well as any snacks provided after the Sunday service.

Classrooms

Size - 1,800 sf (six classrooms @ 300 sf)
Users - Youth congregation and volunteer Sunday school teachers
Hours of Use - Sunday mornings
Relationship - Main Entrance
Furnishings - Desks and chairs for youth and adult, adequate storage units for supplies
Equipment - Audio and visual equipment transportable between classrooms
Color Quality - Dependent upon age; young classrooms warm, bright, and secure (warm yellow, coral, peach), older classes light and passive to enhance concentration (pale blue or green, beige)
Light Quality - Standard artificial and natural light
Description - Six classrooms for various age groups, the rooms are divided based on preschool to early middle school students for Sunday school lessons.

Nursery

Size - 250 sf
Users - Young children and nursery volunteers
Hours of Use - Sunday mornings
Relationship - Classrooms
Furnishings - Cribs and children furniture
Equipment - Changing station
Color Quality - brighter light coloring for infants and toddlers
Light Quality - Standard artificial and natural light
Description - The nursery is primarily used during service for infants and toddlers that need proper care.

Meeting Room

Size - 200 sf
Users - Church staff, congregation committees
Hours of Use - Weekdays, Saturdays and Sunday afternoons
Relationship - Church offices
Furnishings - Office furniture and seating
Equipment - Audio/Visual equipment
Color Quality - Calming and concentrating
Light Quality - Standard artificial and natural light
Description - The conference room is for committee meetings that are small, but require the proper seating and equipment of a formal meeting or presentation.

Programmatic Elements

Coat Room

Size - 100 sf

Users - Entire congregation and staff

Hours of Use - Weekdays, Saturdays and Sunday afternoons

Relationship - Main entrance

Description - The coat closet has enough space to serve as temporary storage for all coats, boots, and other items that the congregation brings into Common Ground.

Storage

Size - 600 sf (two storage rooms @ 300 sf)

Users - Church staff

Hours of Use - minimal; used when moving items in or out

Relationship - Fellowship Hall, Sanctuary

Description - Used to store tables and chairs inside of the Fellowship Hall, and chairs and other equipment in the Sanctuary

Restrooms

Size - 1000 sf

Users - Entire congregation and staff

Hours of Use - Weekdays, Saturdays and Sunday afternoons

Relationship - one set for Main Entrance, one set for Fellowship Hall, one for Nursery

Equipment - sinks, toilets, urinals, changing stations

Color Quality - Clean, pleasant (warm red, warm orange, clear green)

Sound Quality - Quiet space

Mechanical / Electrical

Size - 500 sf

Users - Church staff

Hours of Use - minimal; only when maintenance is required

Equipment - all mechanical and electrical equipment necessary

Sound Quality - Quiet space

Description - Space contains all of the necessary equipment used throughout the building, including HVAC, plumbing, networking, and all other equipment.

Parking

Size - 150 spaces

Users - Entire congregation and staff

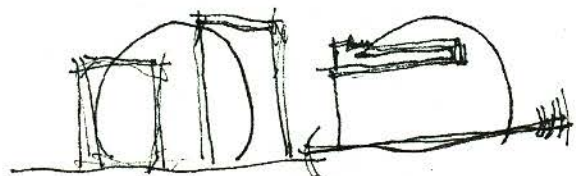
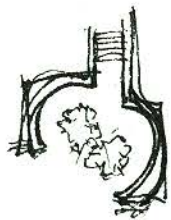
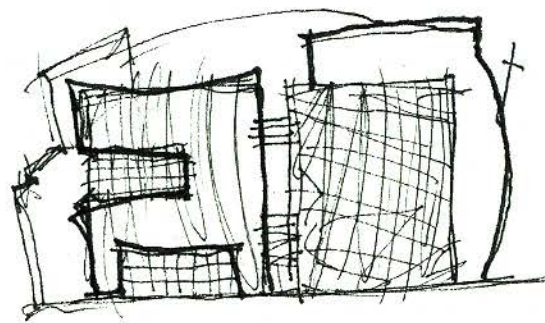
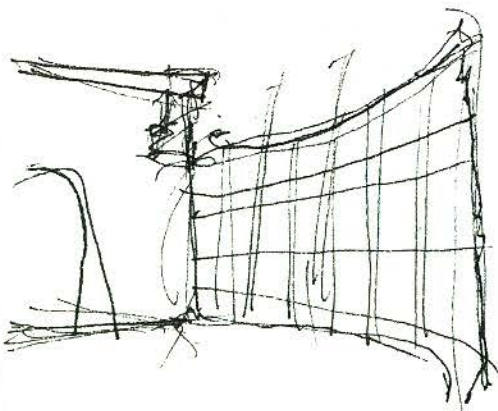
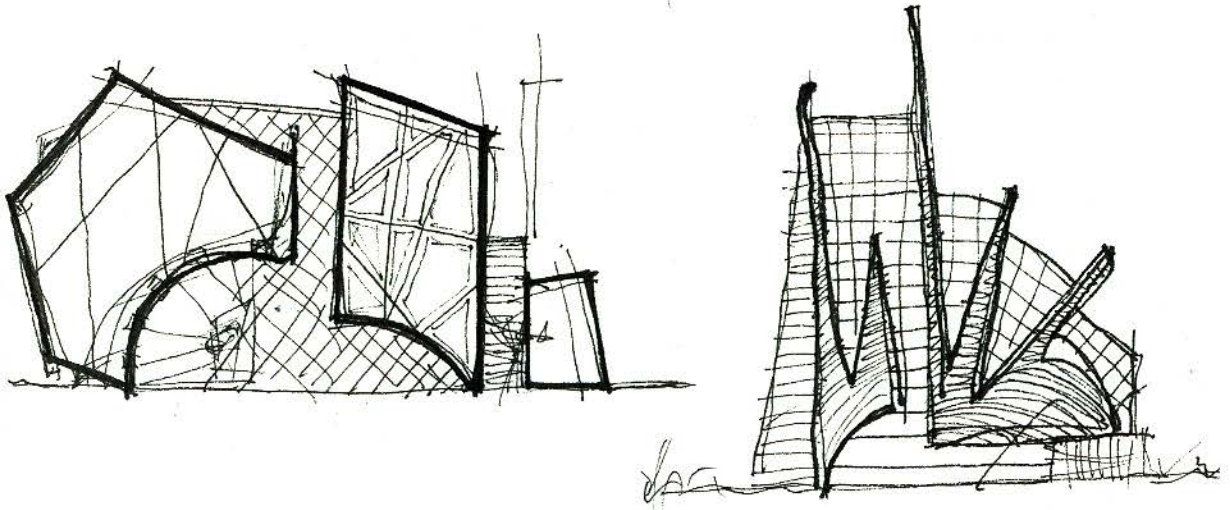
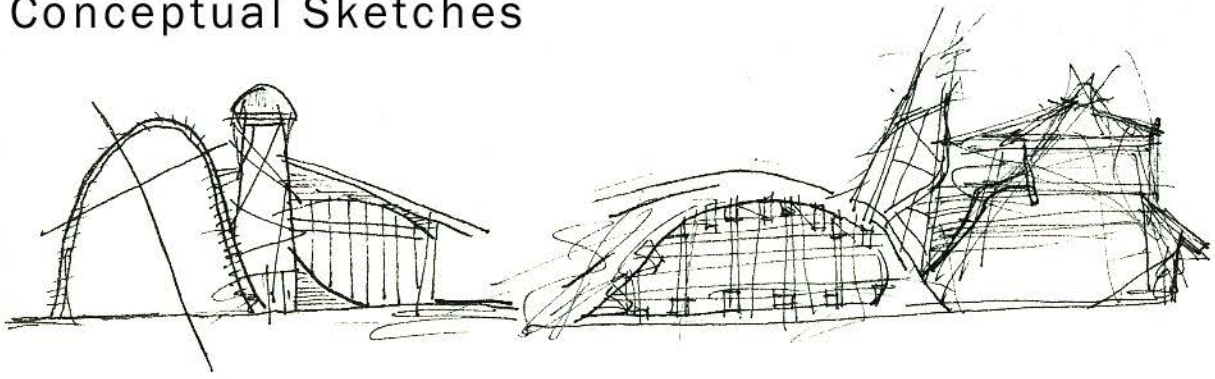
Hours of Use - Weekdays, Saturdays and Sunday afternoons

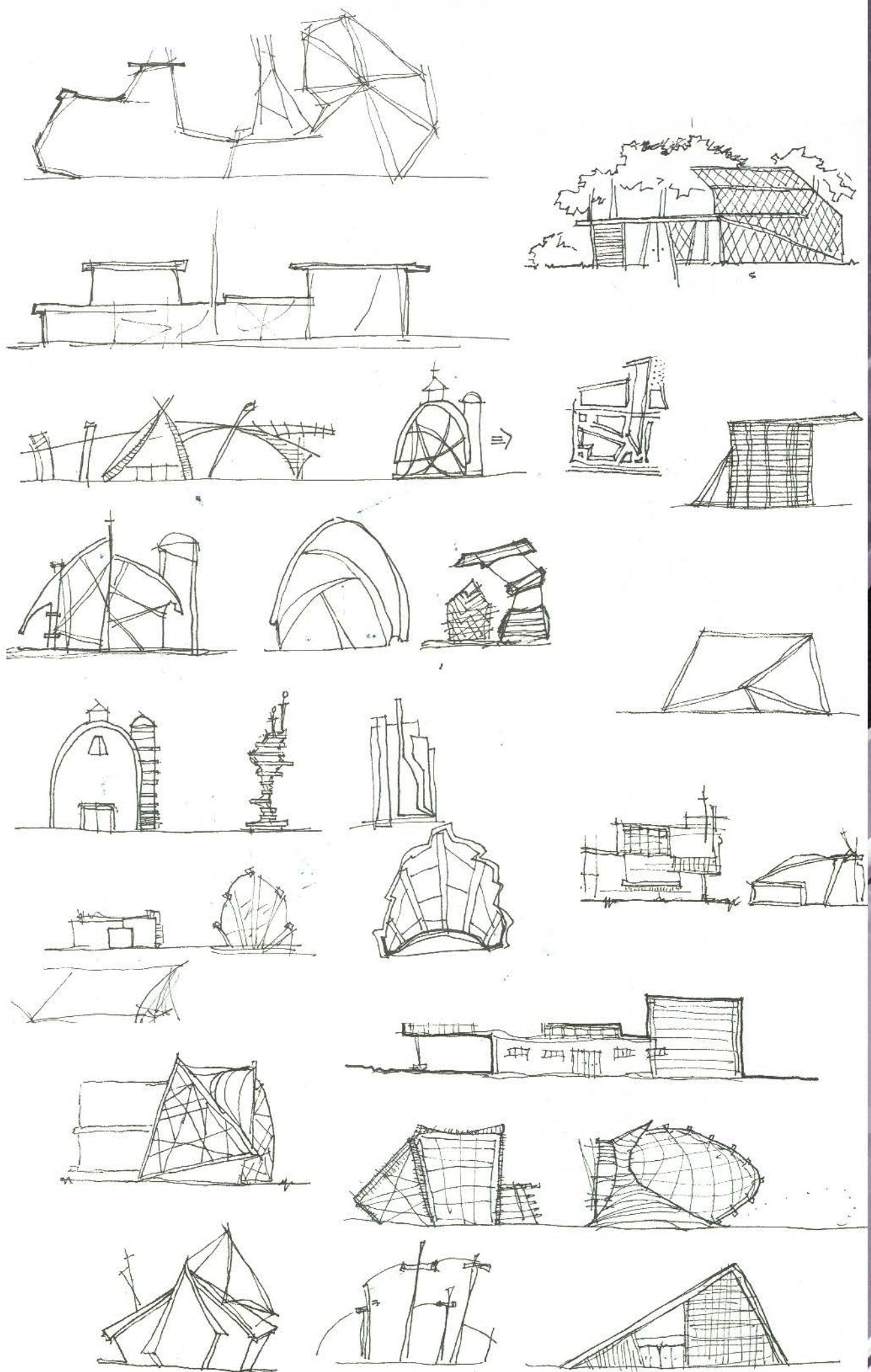
Relationship - Main entrance

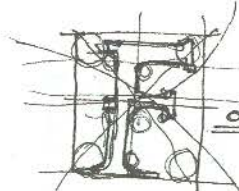
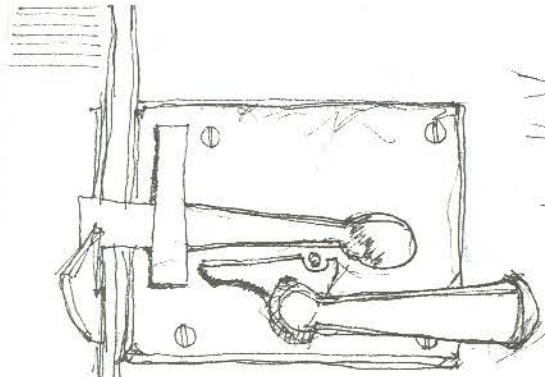
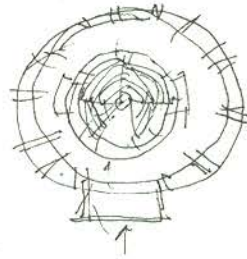
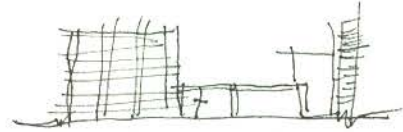
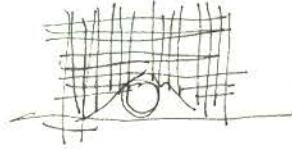
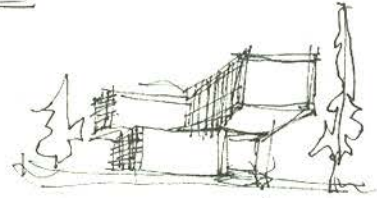
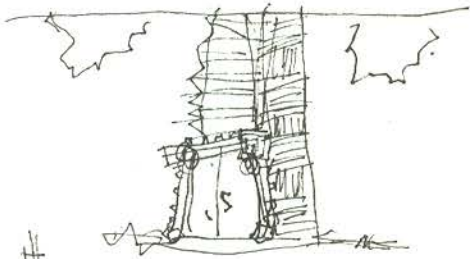
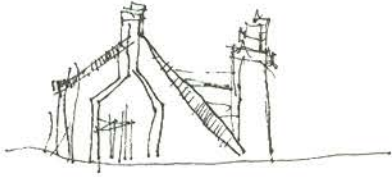
Process Documentation



Conceptual Sketches

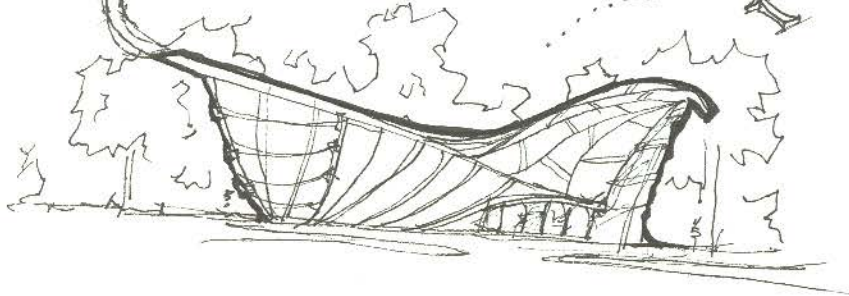
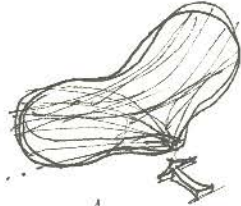




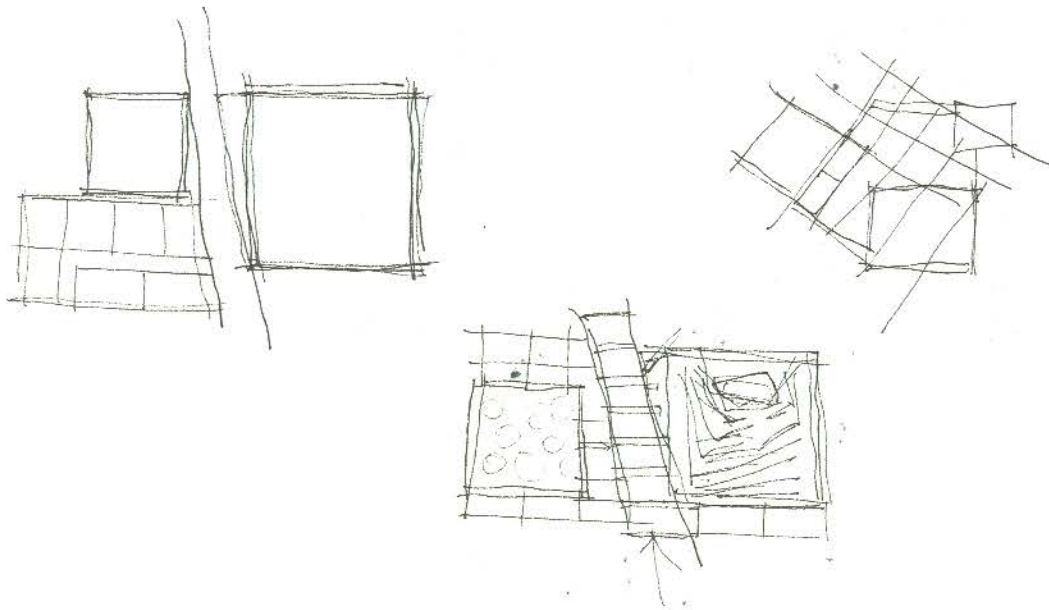
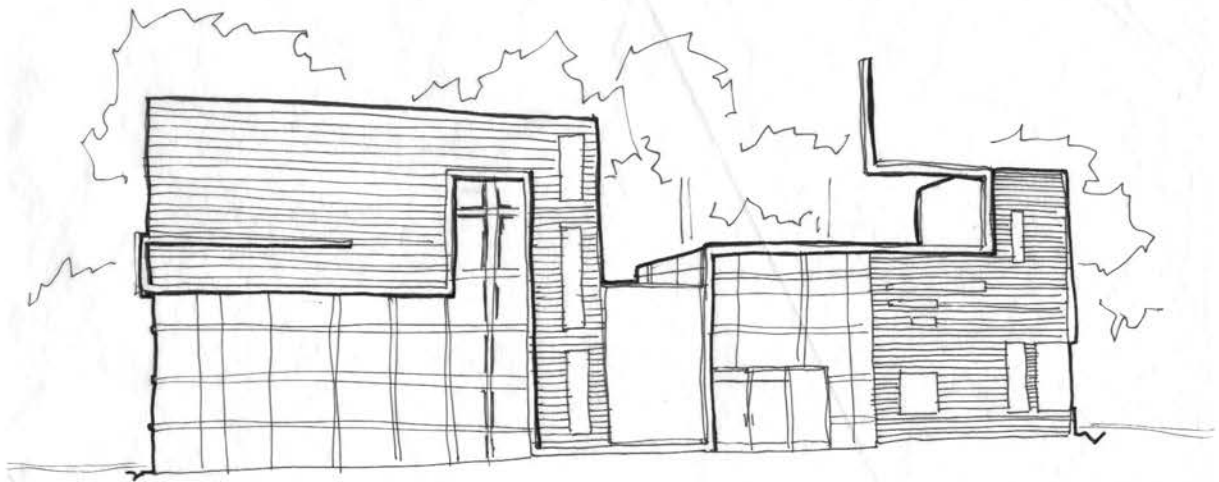


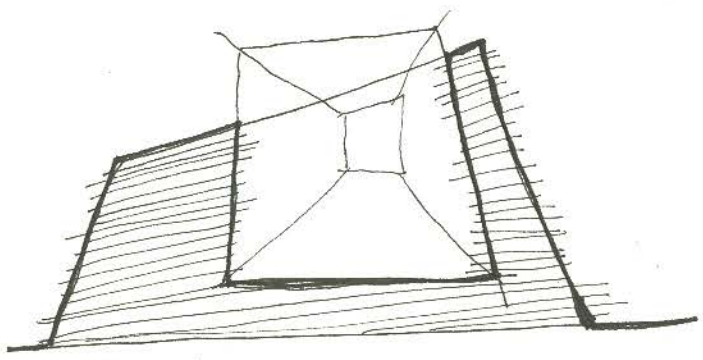
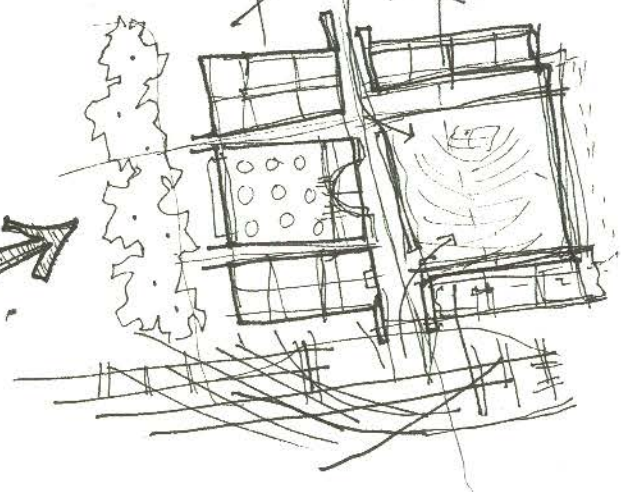
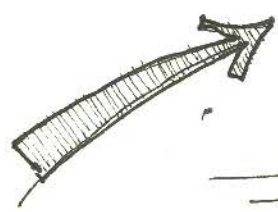
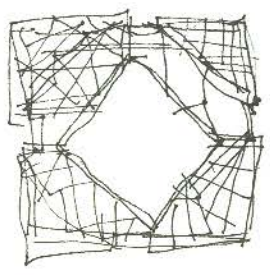
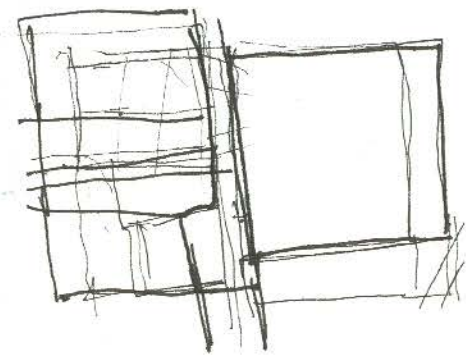
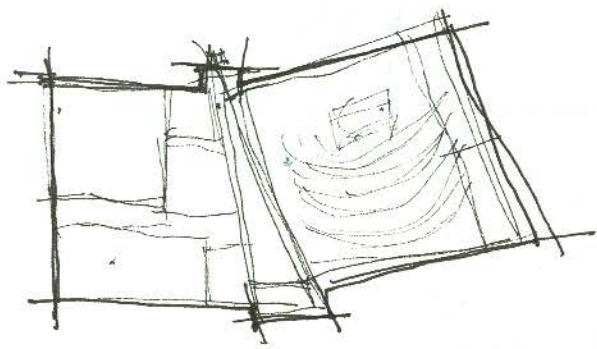
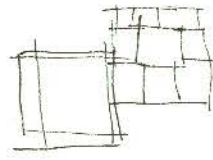
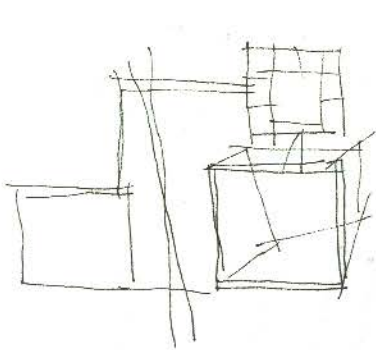
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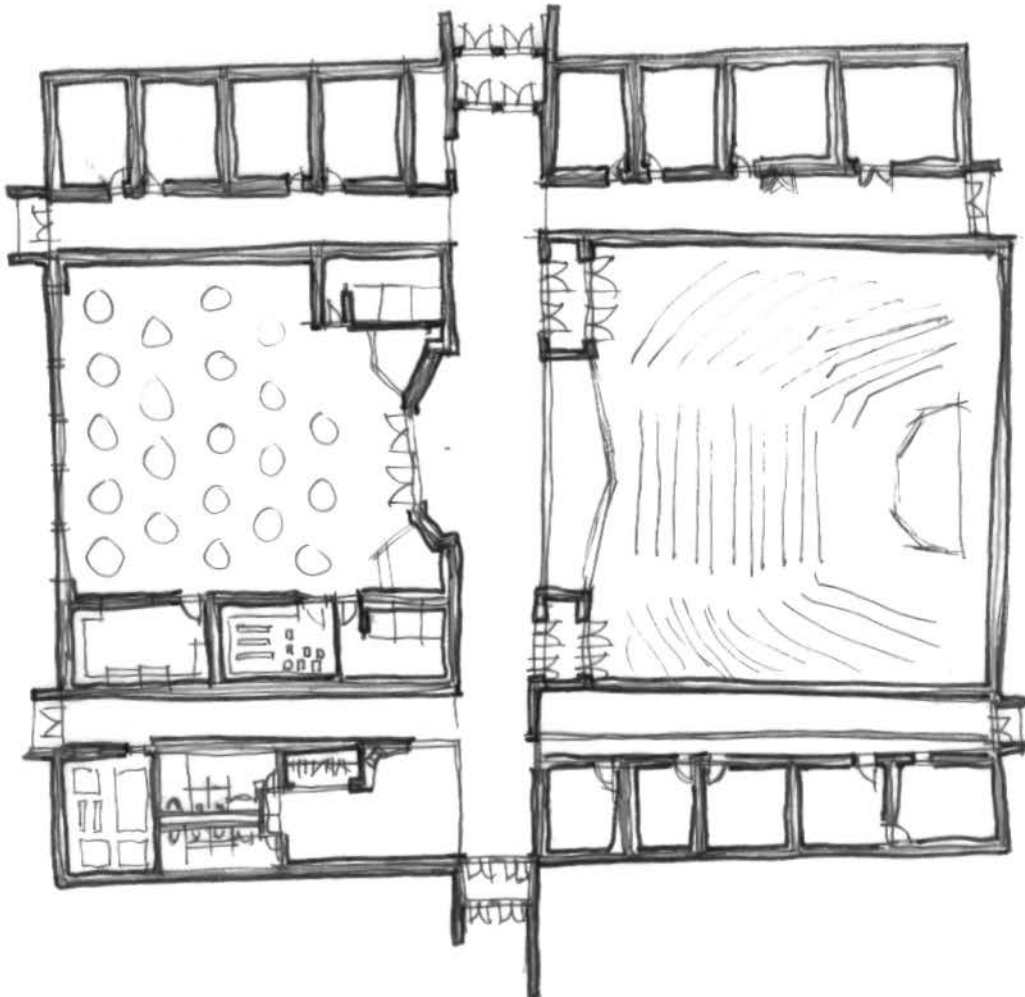
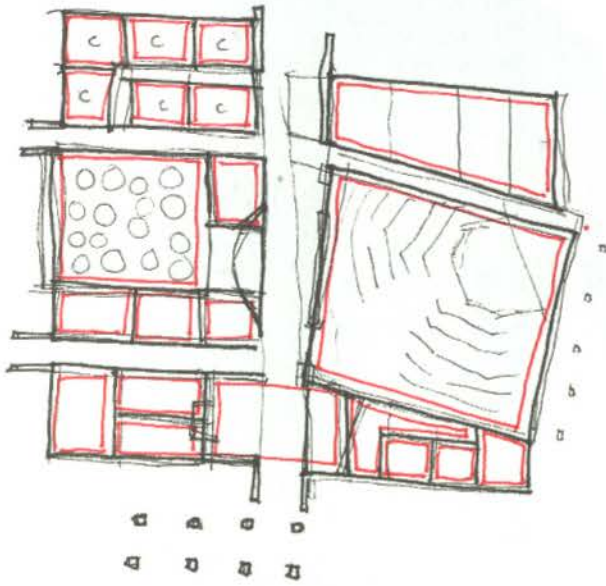
FOLLOWS
FUNCTION?



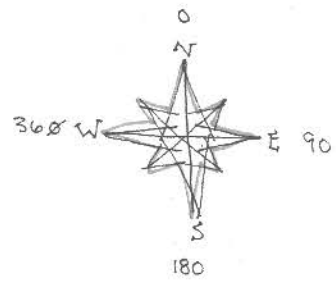
Schematic Design



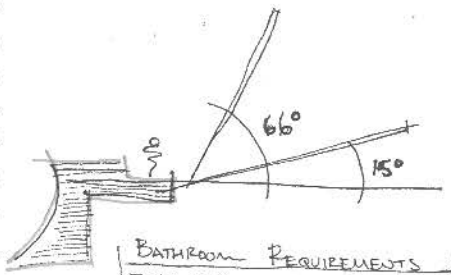
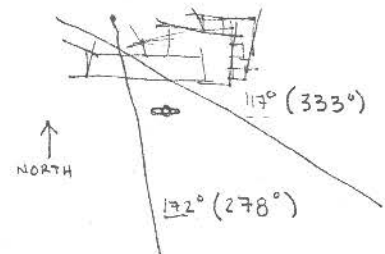




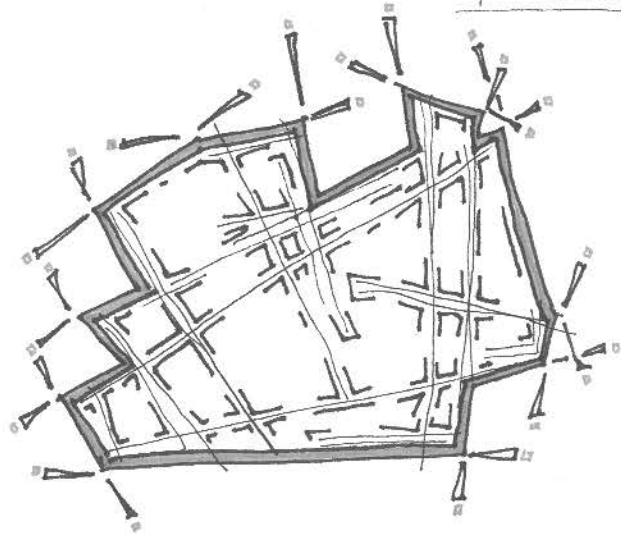
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FEB	143	19	2
MAR	138	28	3
APR	133	40	4
MAY			
JUN	127	49	5
JUL	120	55	6
AUG	→117	54	7
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SEPT	132	■43	9
OCT	142	34	10
NOV	149	24	11
DEC	150	17	12

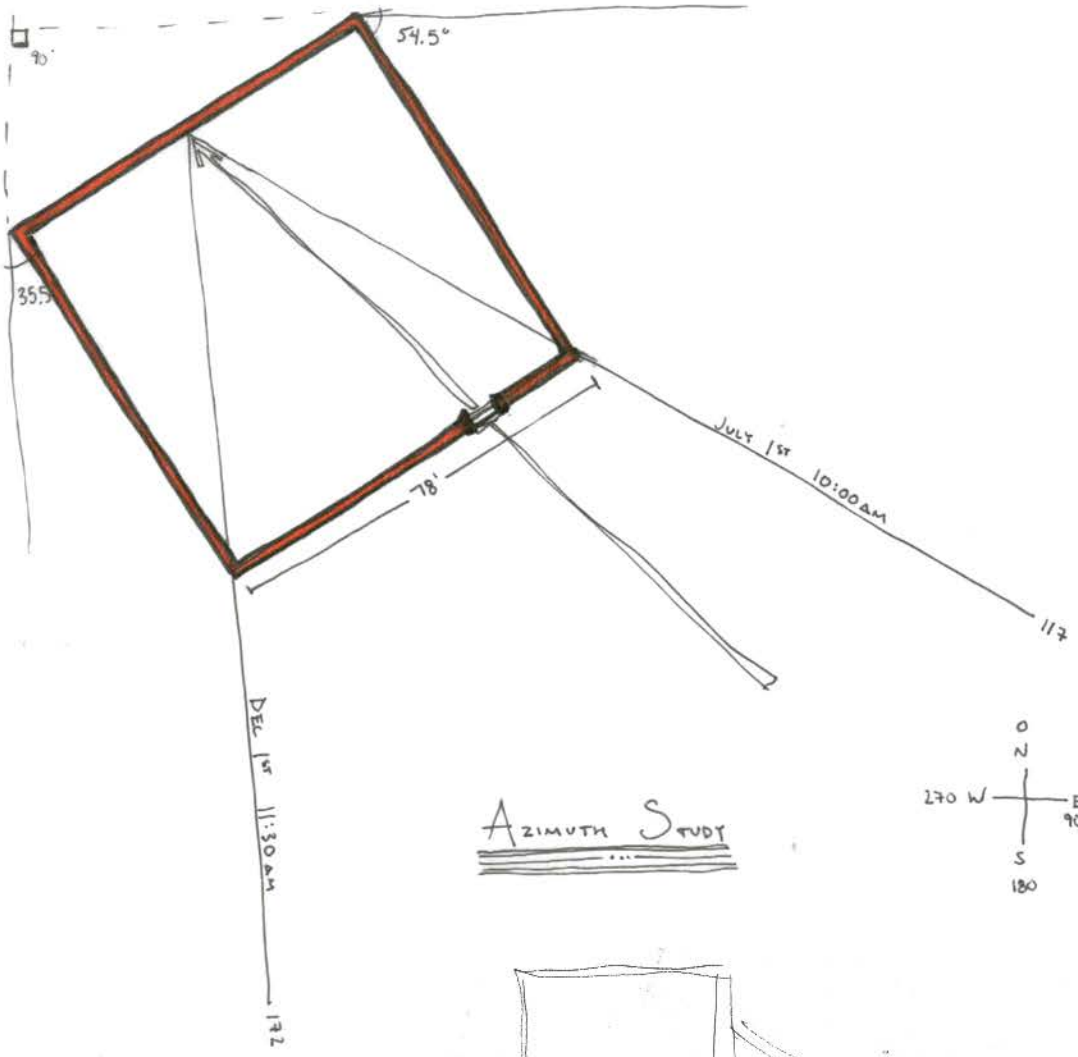


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APR	162	48	4
MAY			
JUN	161	59	5
JUL	156	65	6
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NOV	172	29	11
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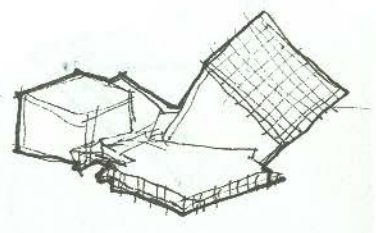
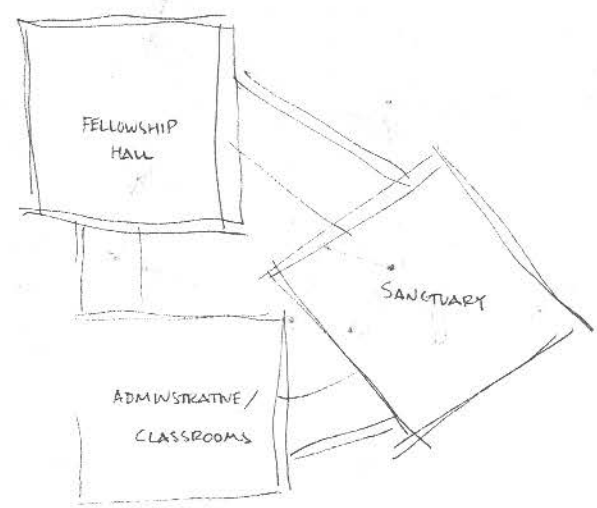
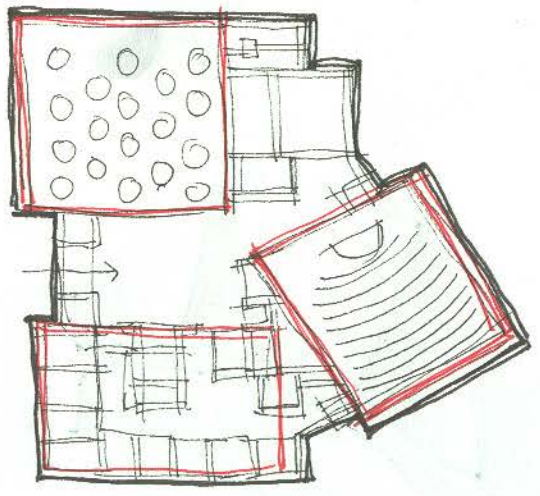
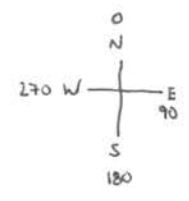


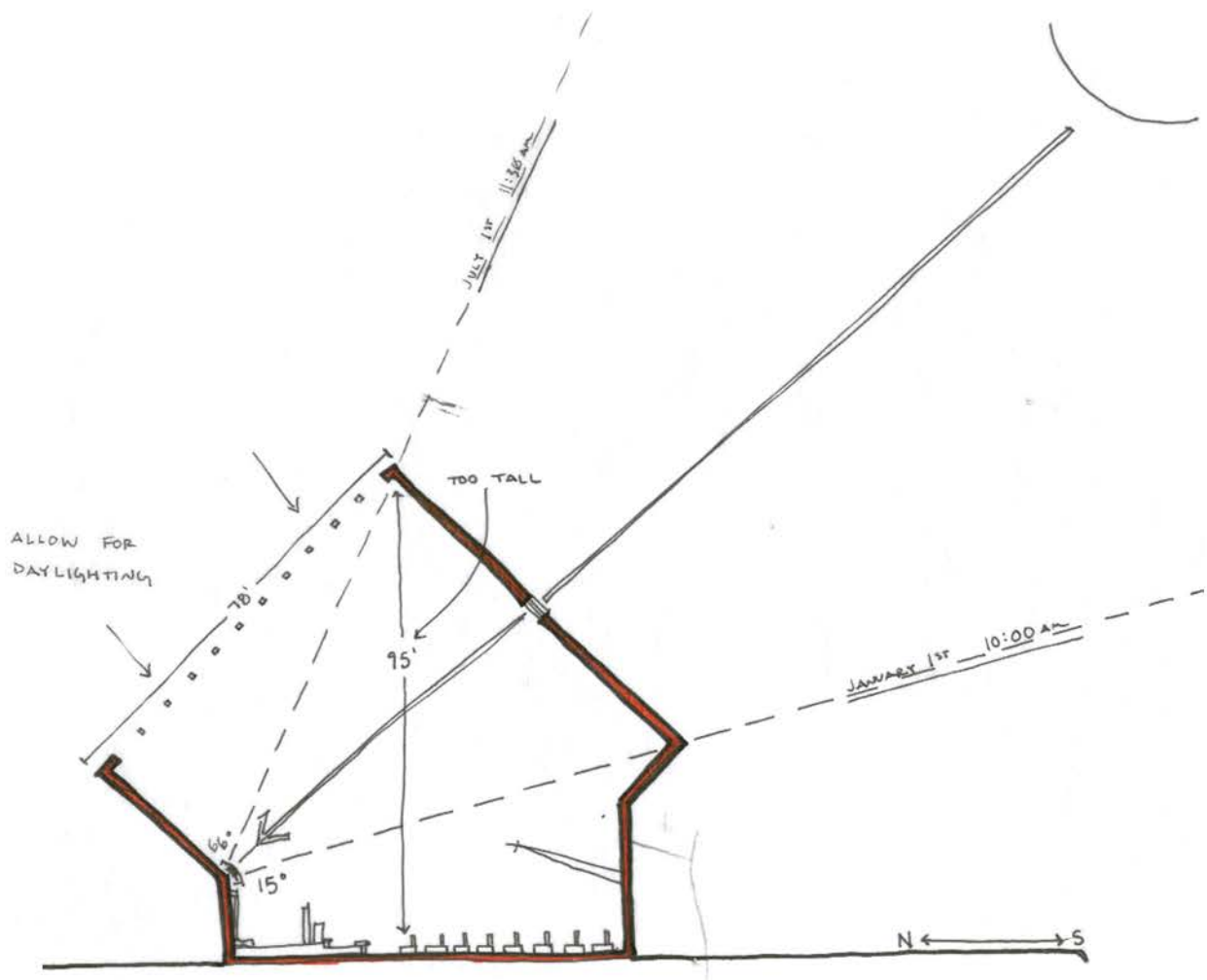
BATHROOM REQUIREMENTS			
300-350 PEOPLE			
W.C.	URINALS	CLOSET	
MALE 2 1/2	1	2	
FEMALE 4	0	2	
DRINKING FOUNTAIN 1			



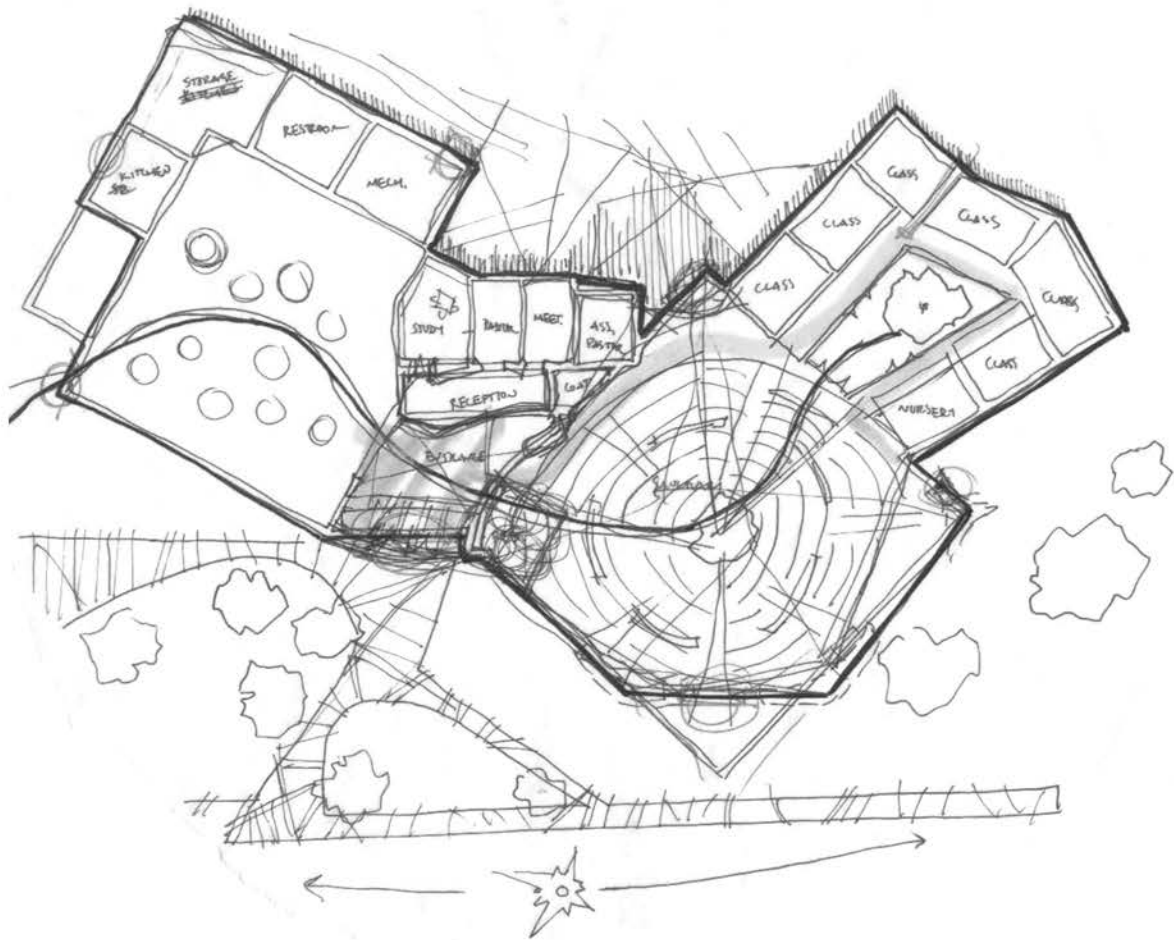
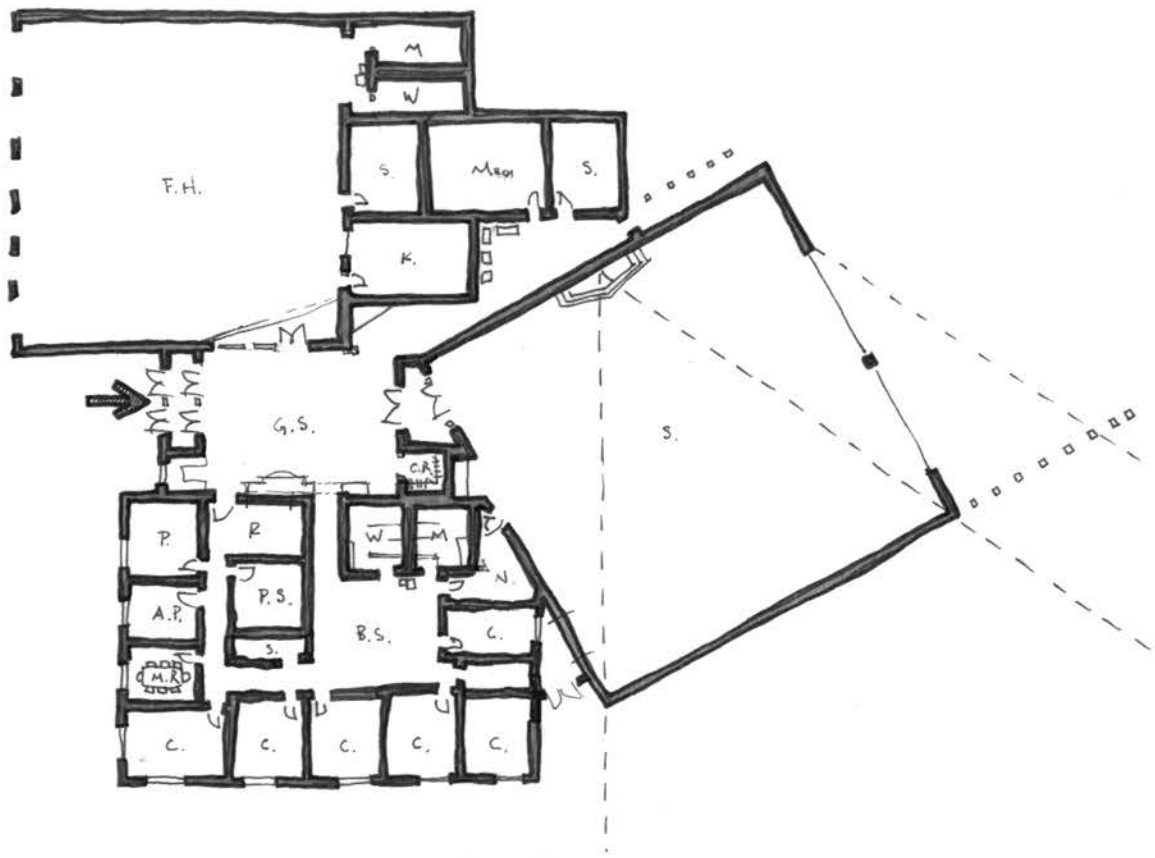


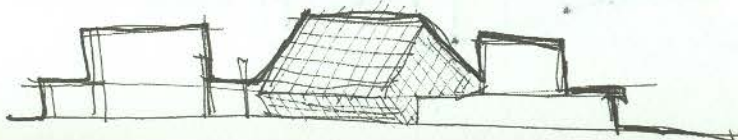
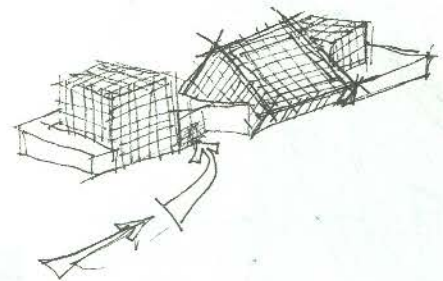
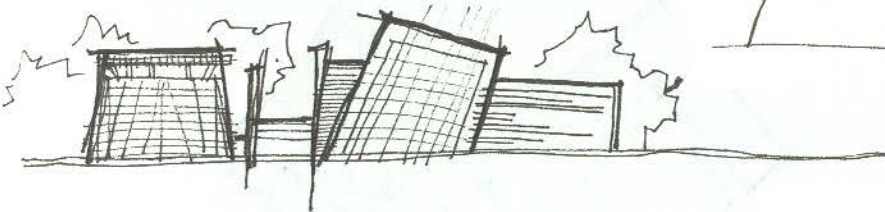
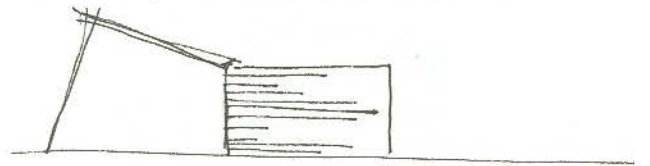
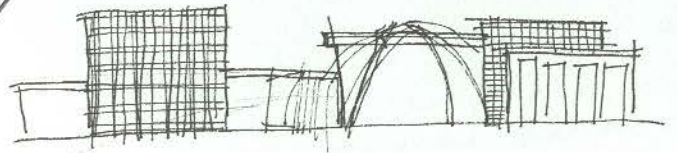
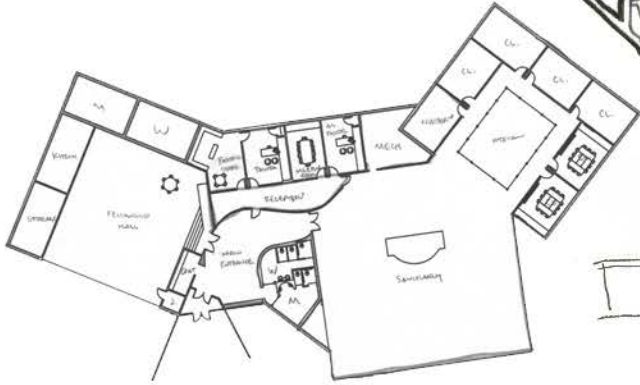
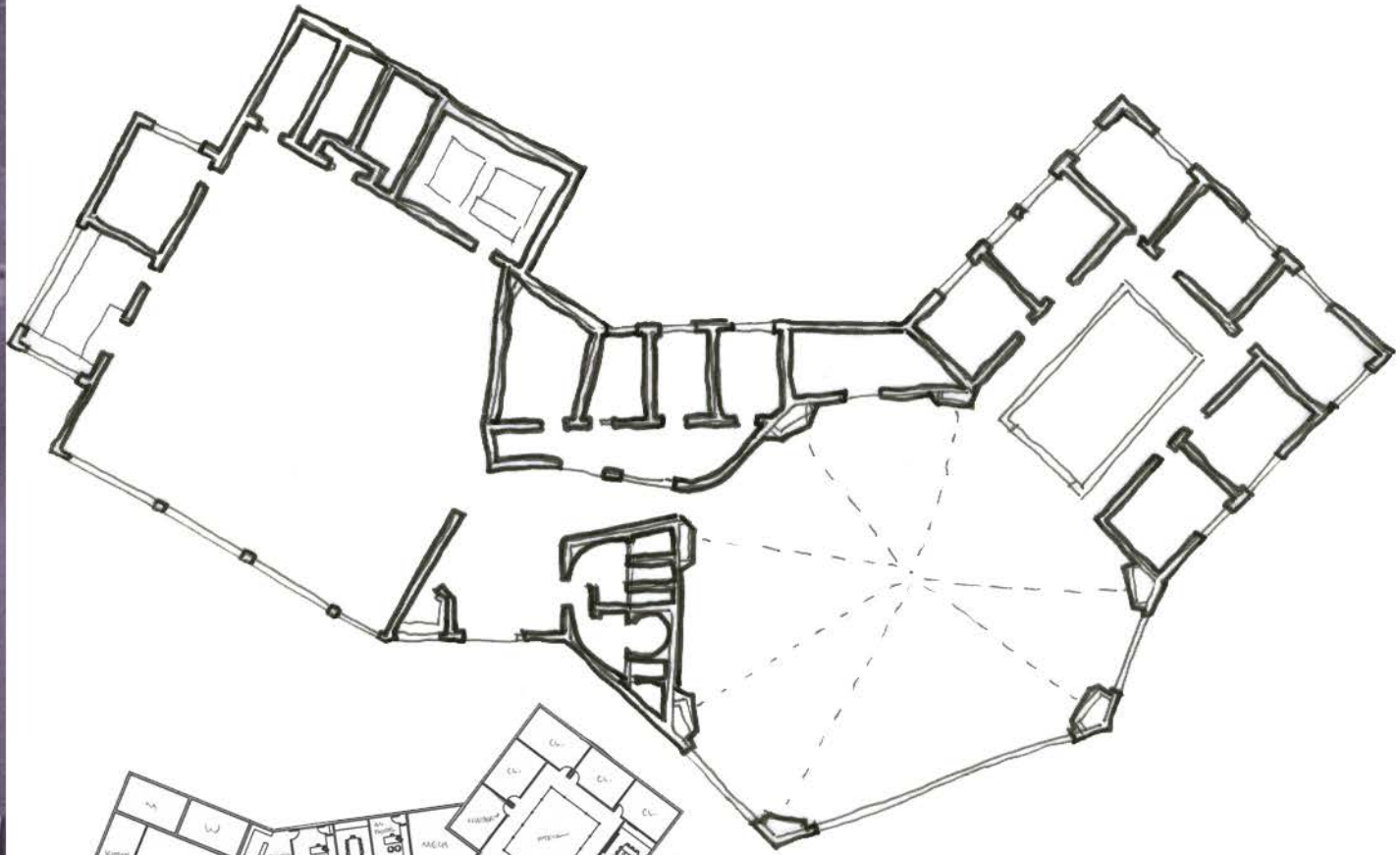
AZIMUTH STUDY

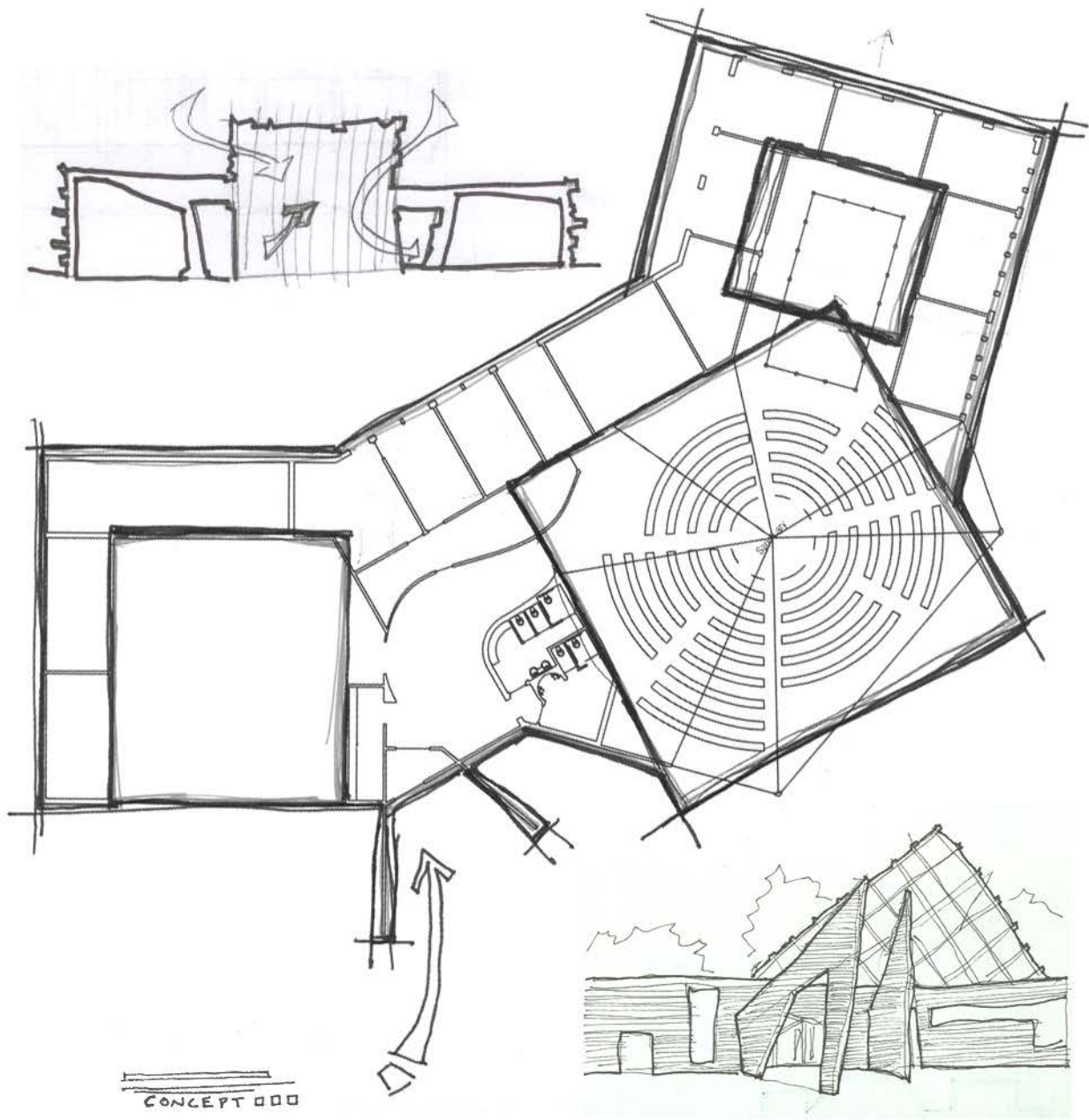




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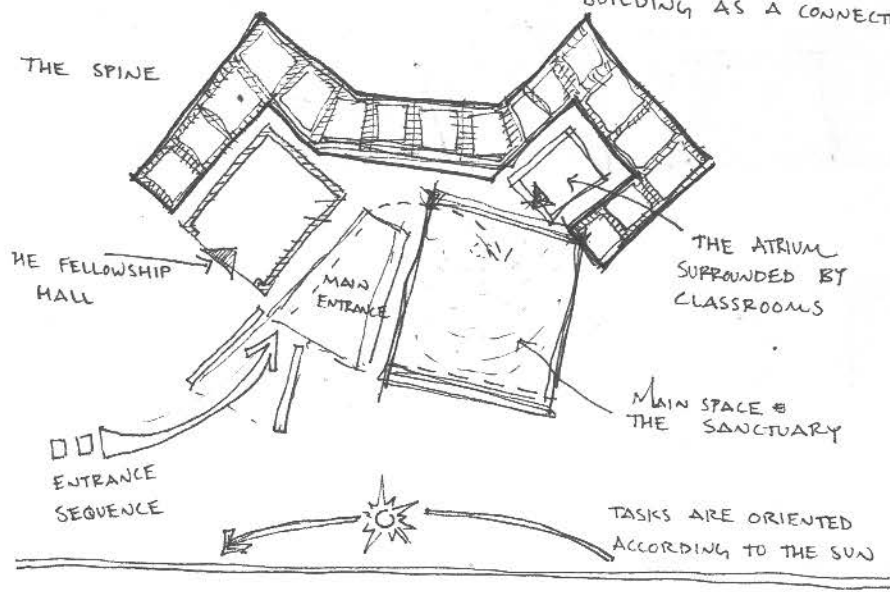


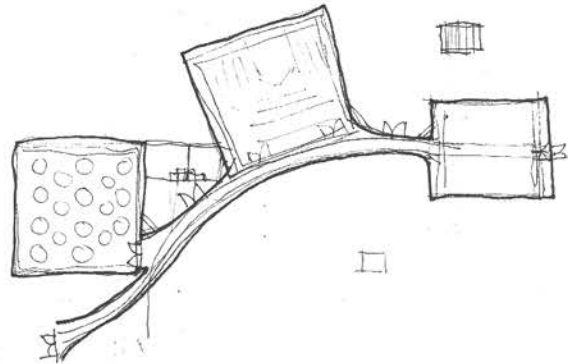
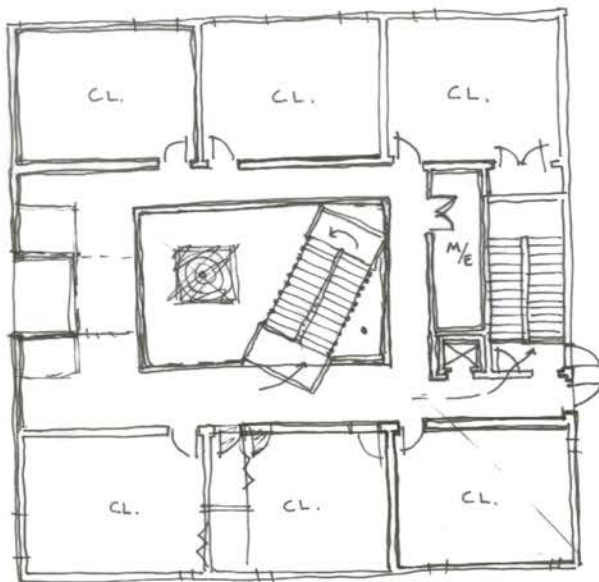
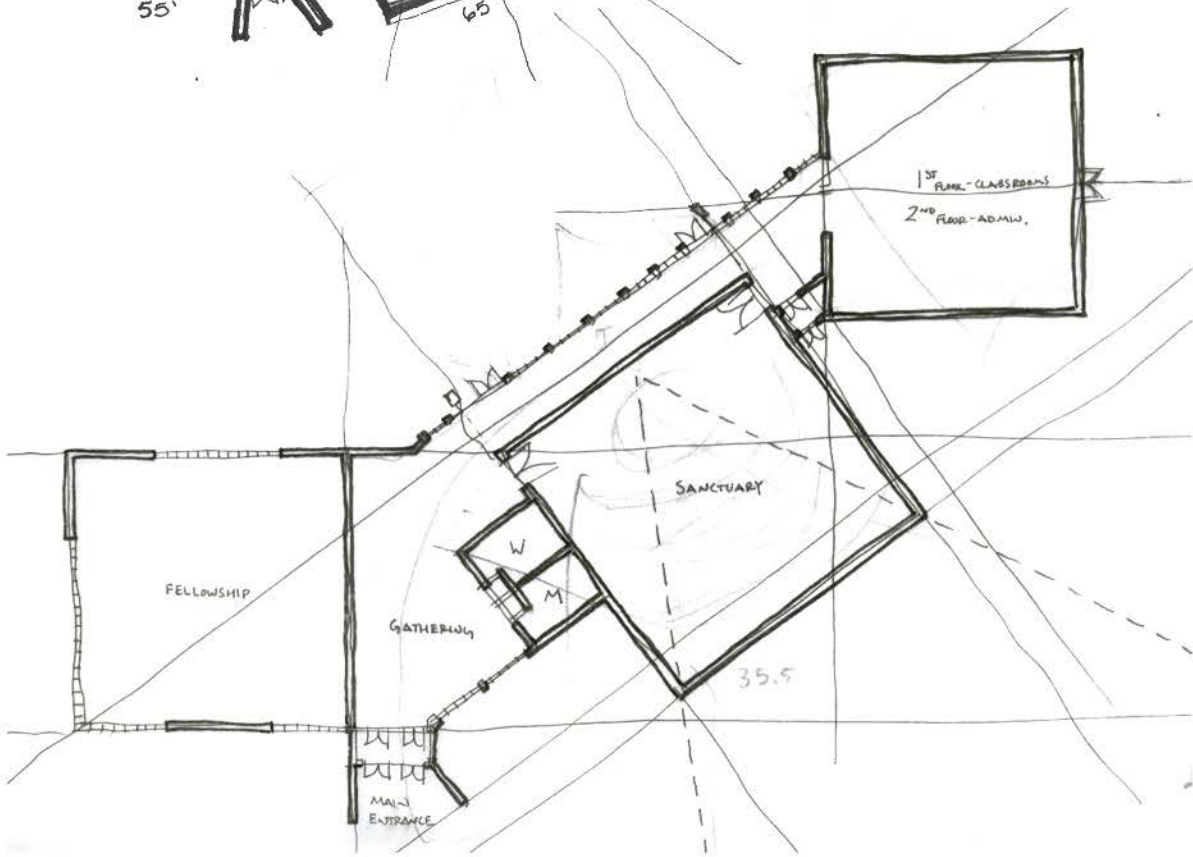
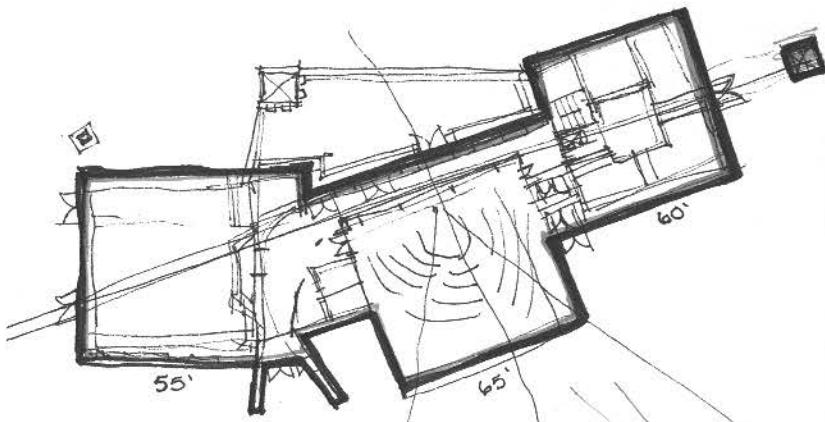


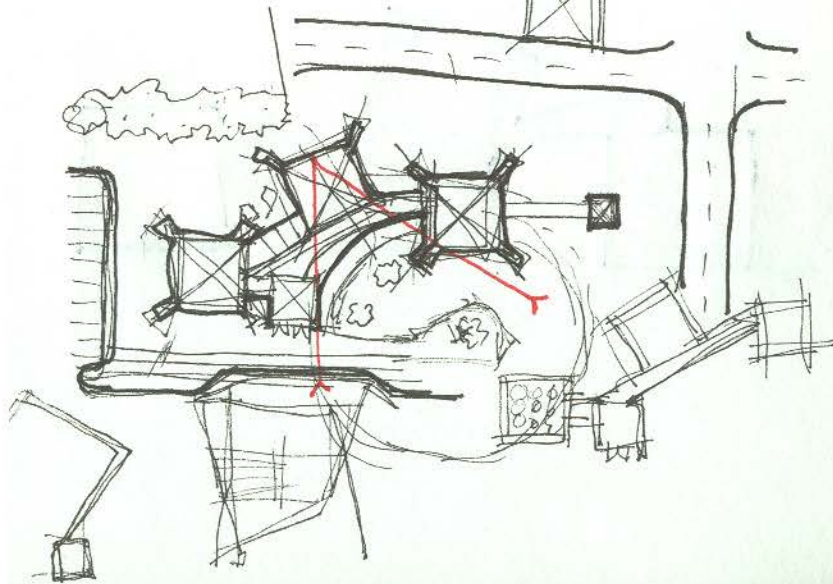
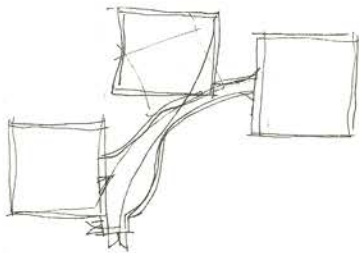
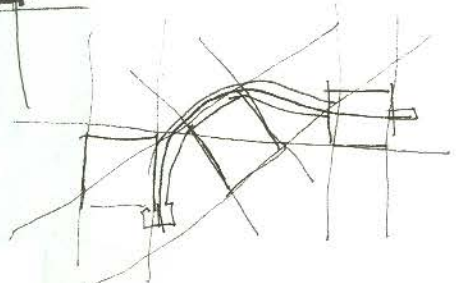
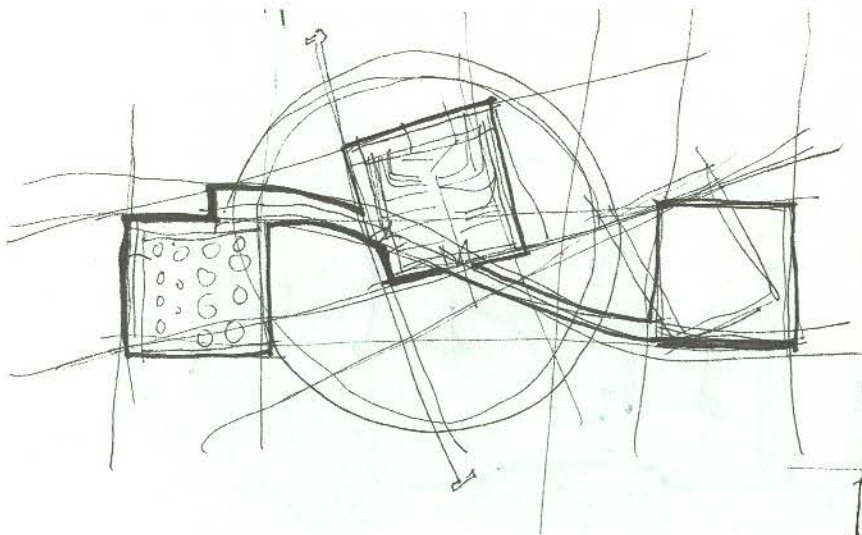
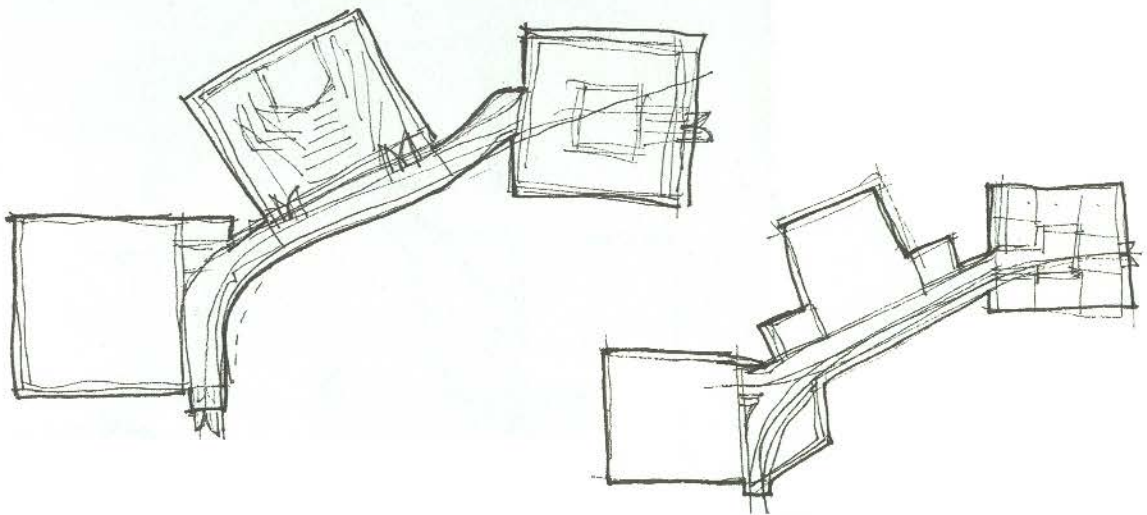


CONCEPT 000

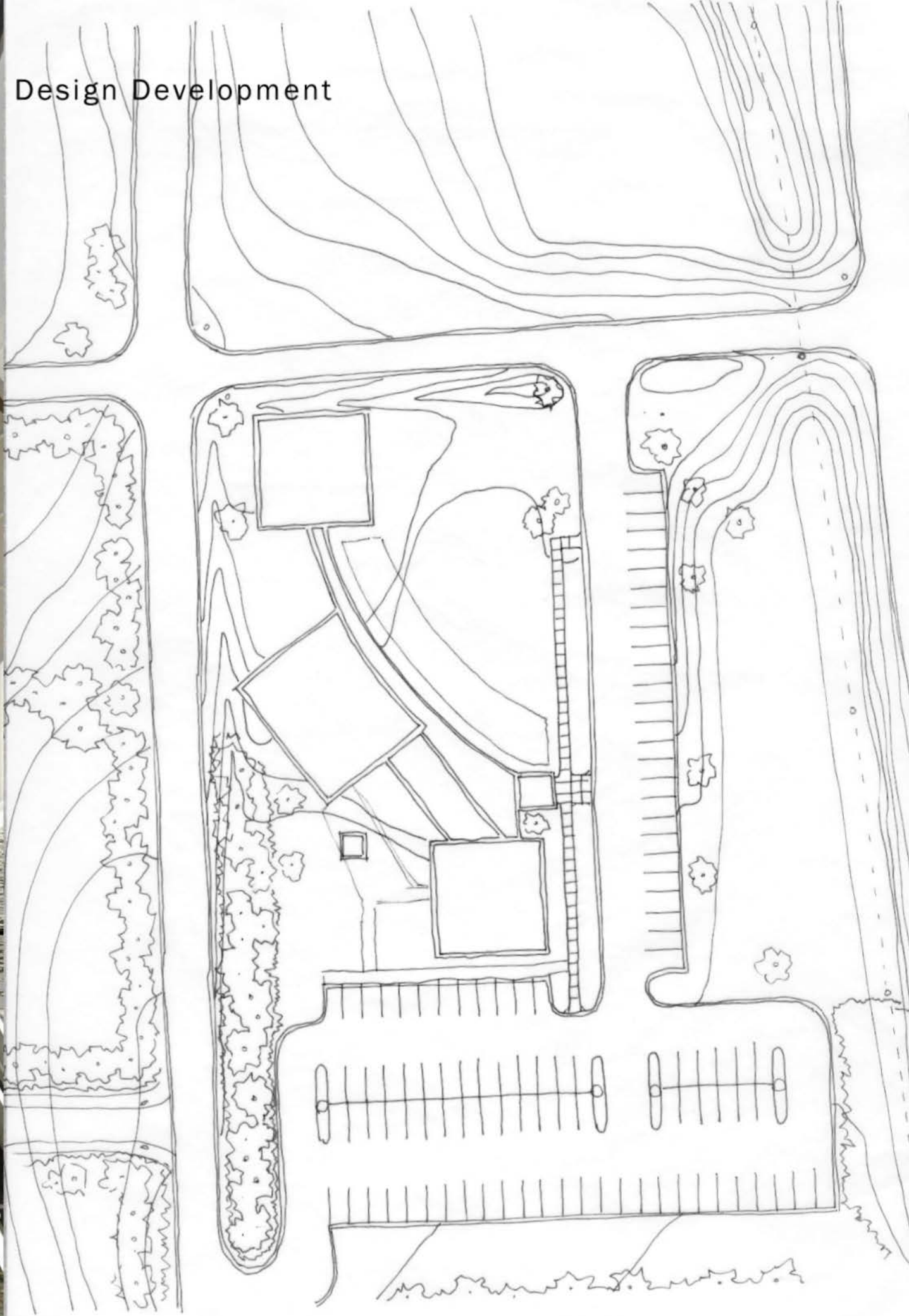
THE SPINE OF THE BUILDING = ALL FUNCTIONAL ROOMS
 CONTINUES THROUGHOUT THE ENTIRE BUILDING AS A CONNECTION

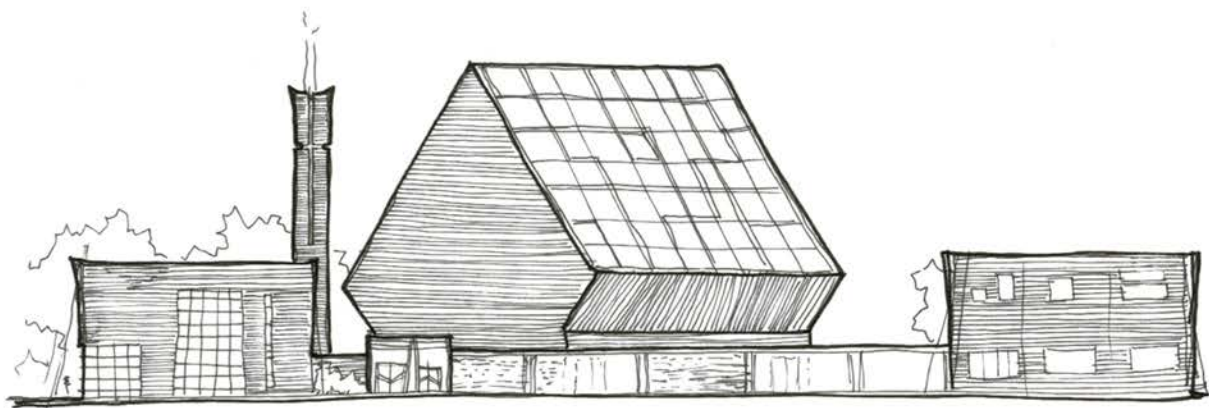
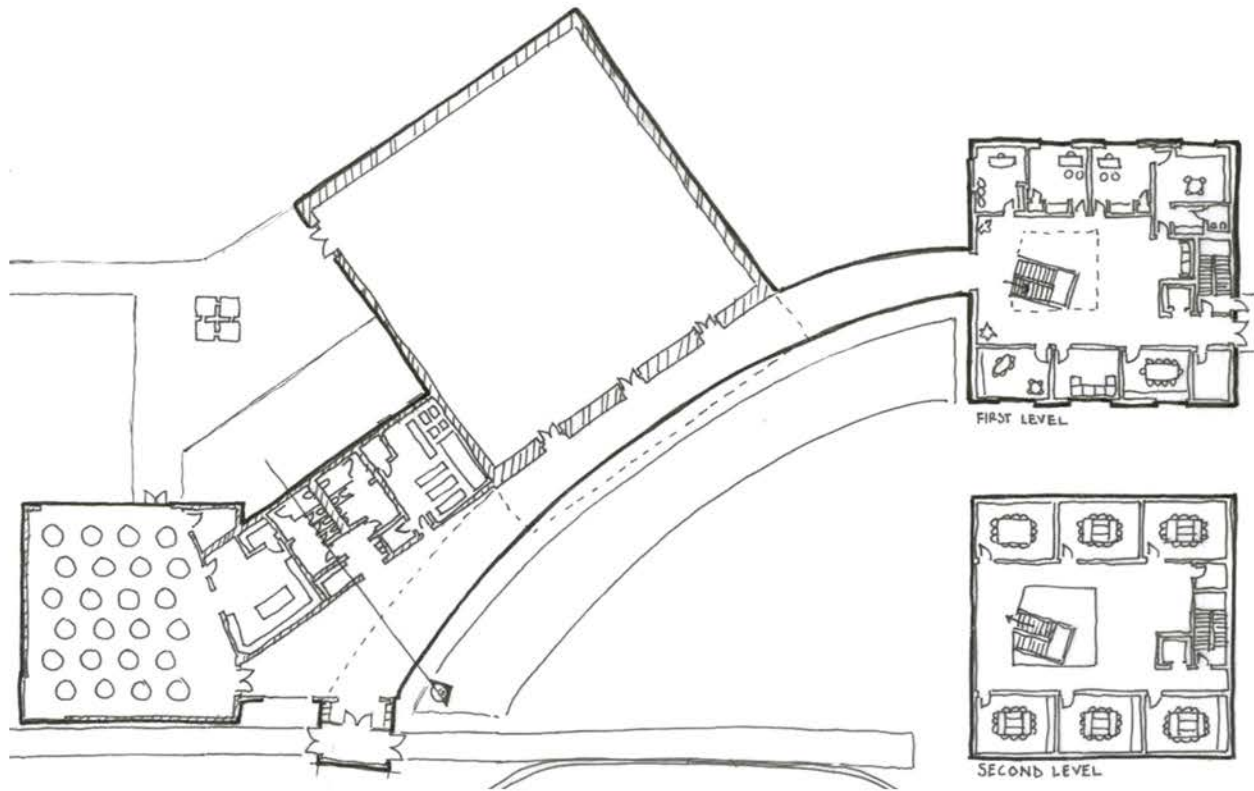


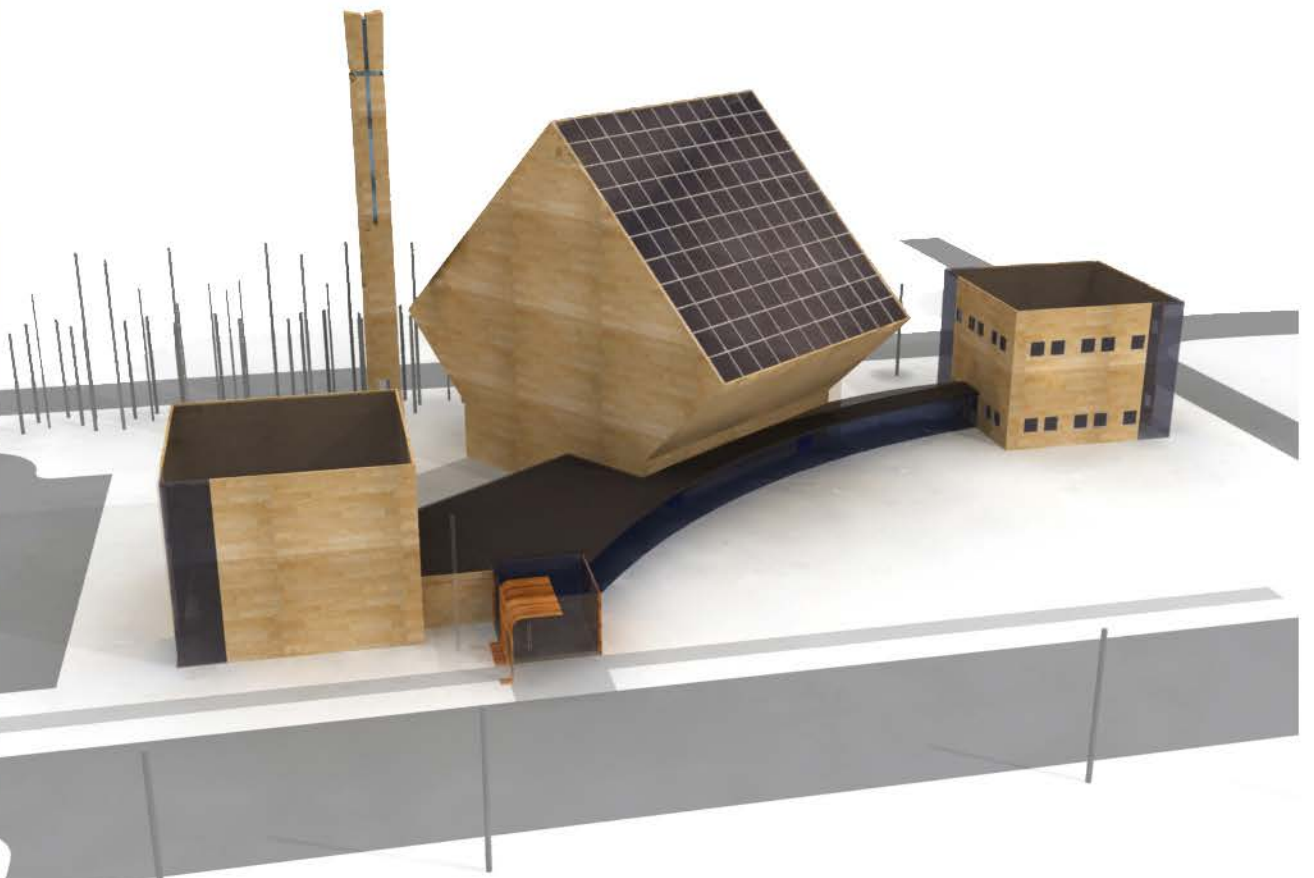
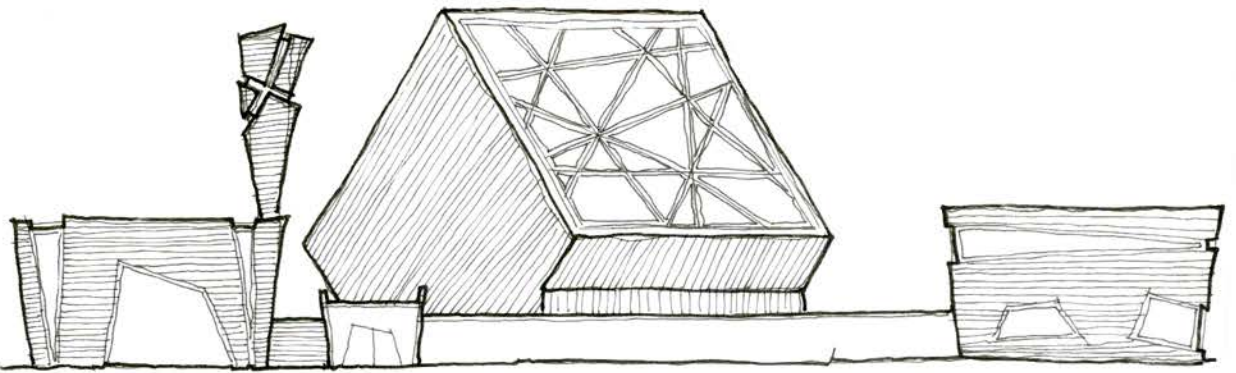
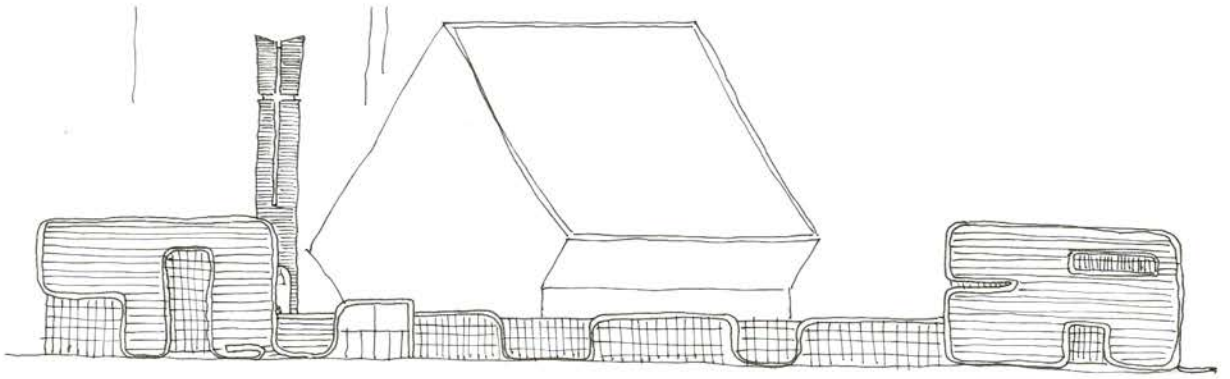


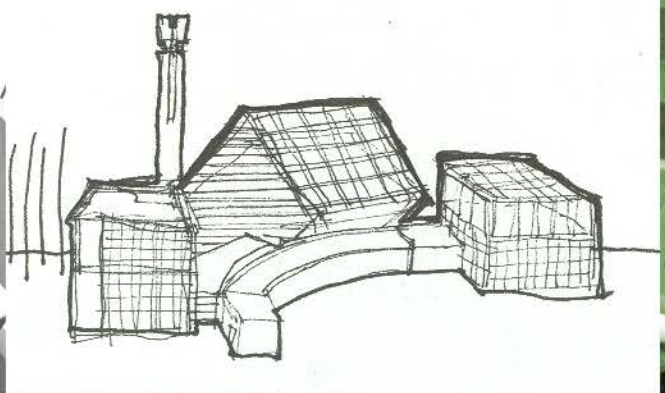
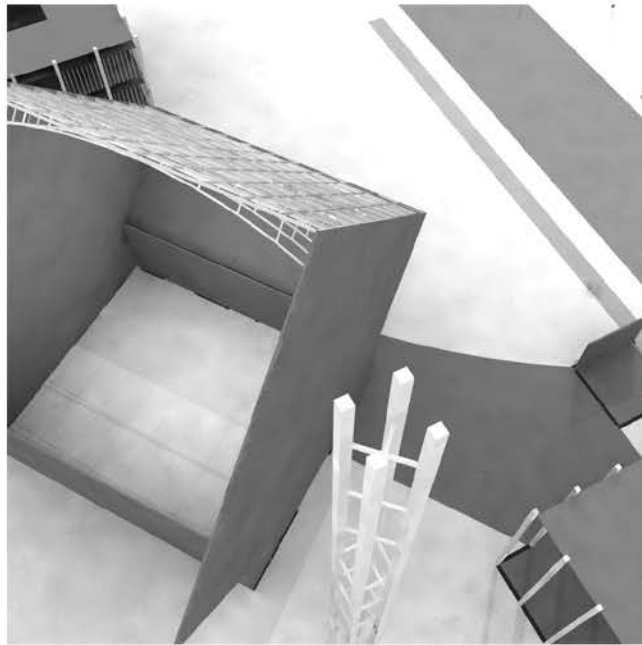
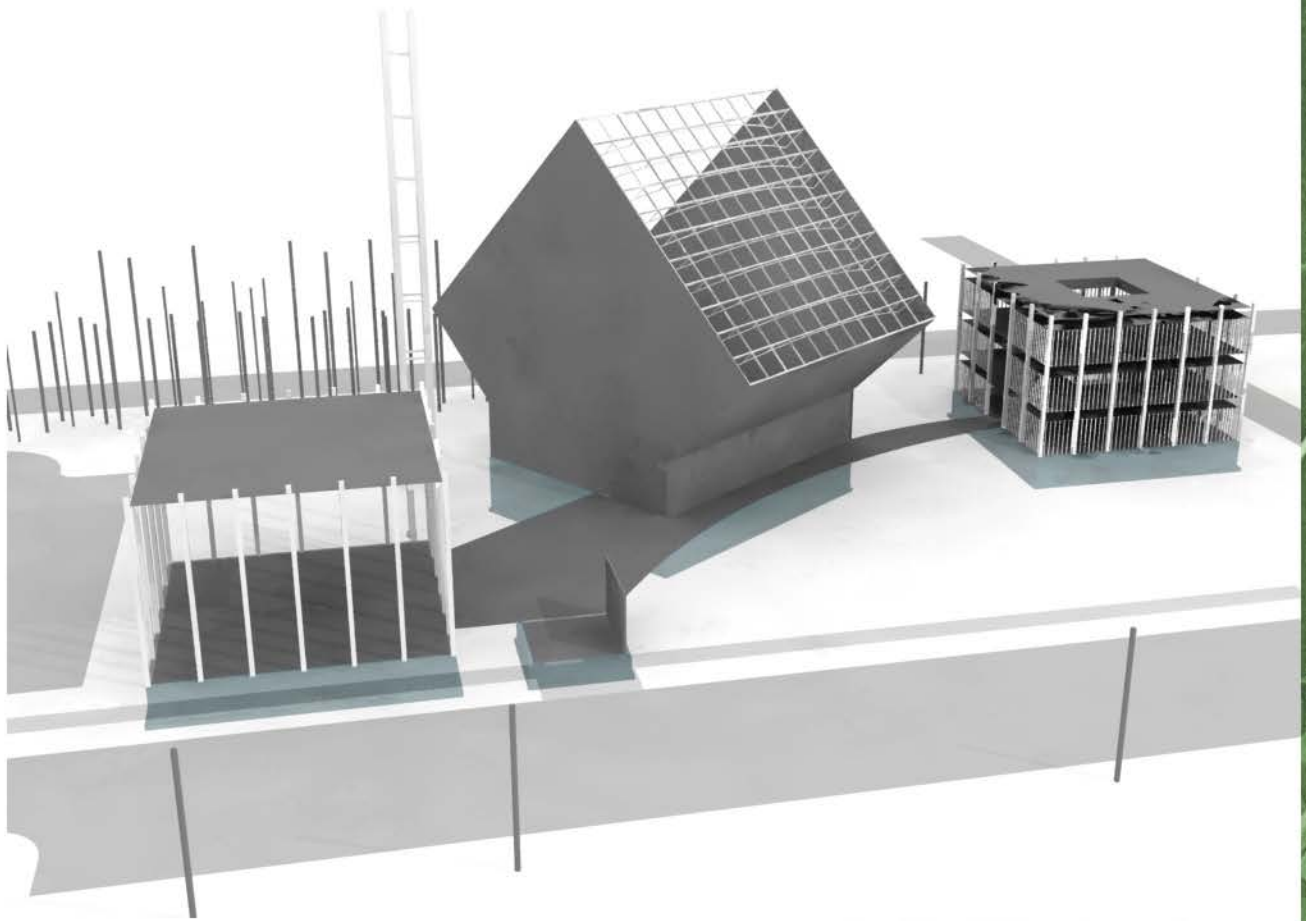


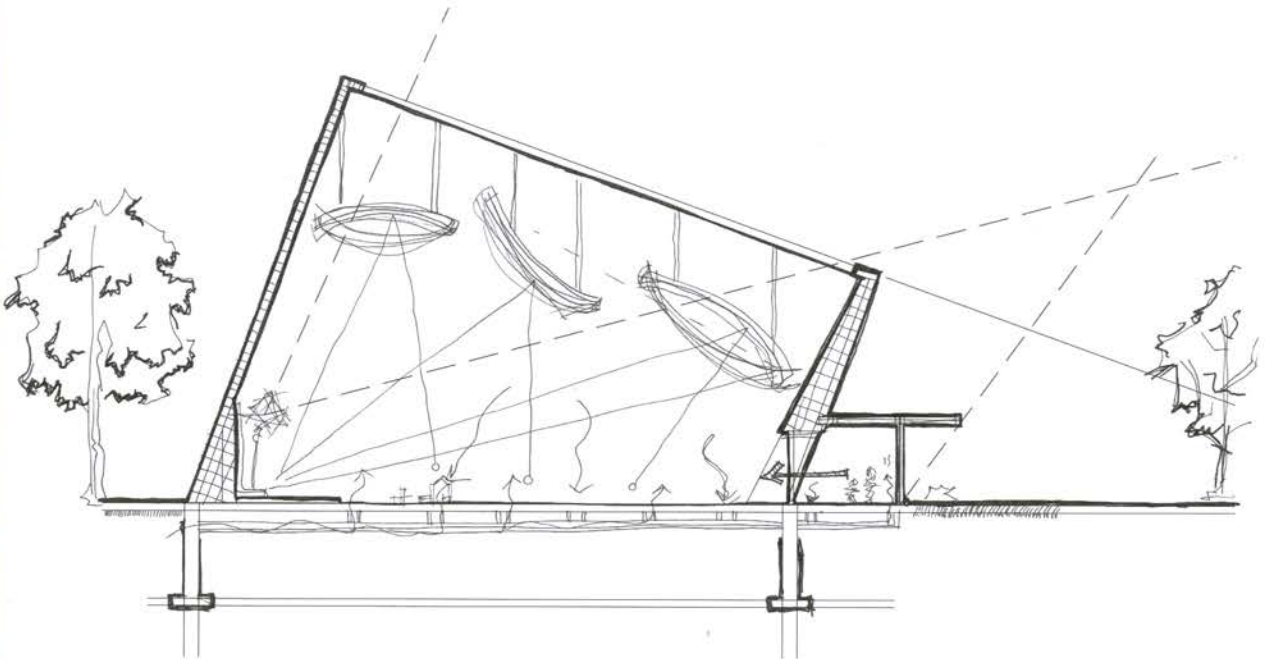
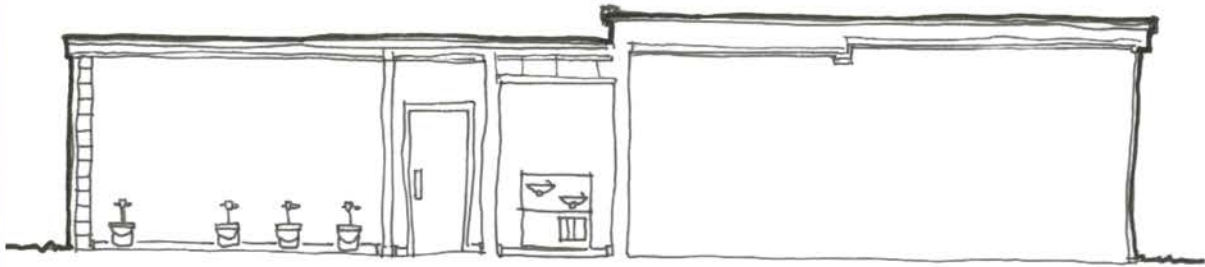
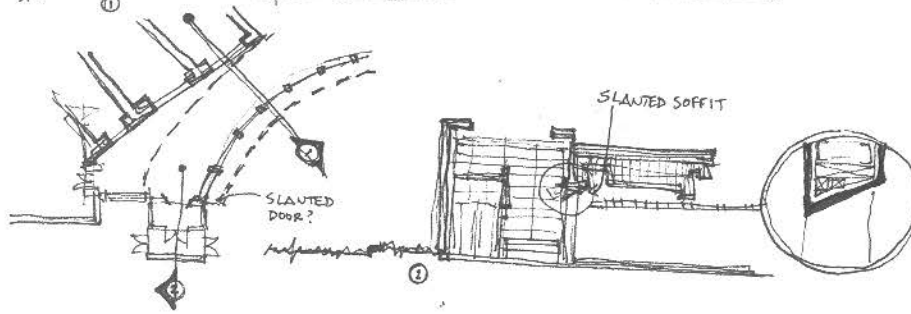
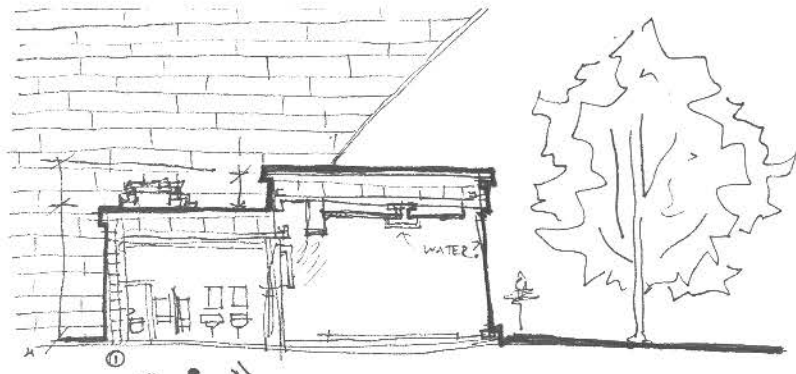
Design Development

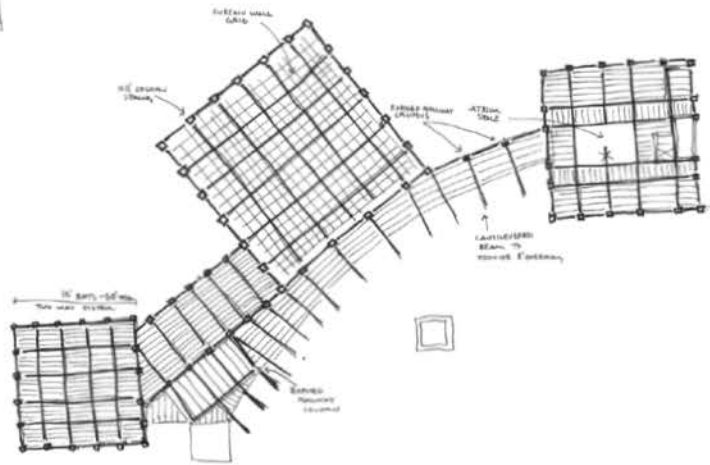
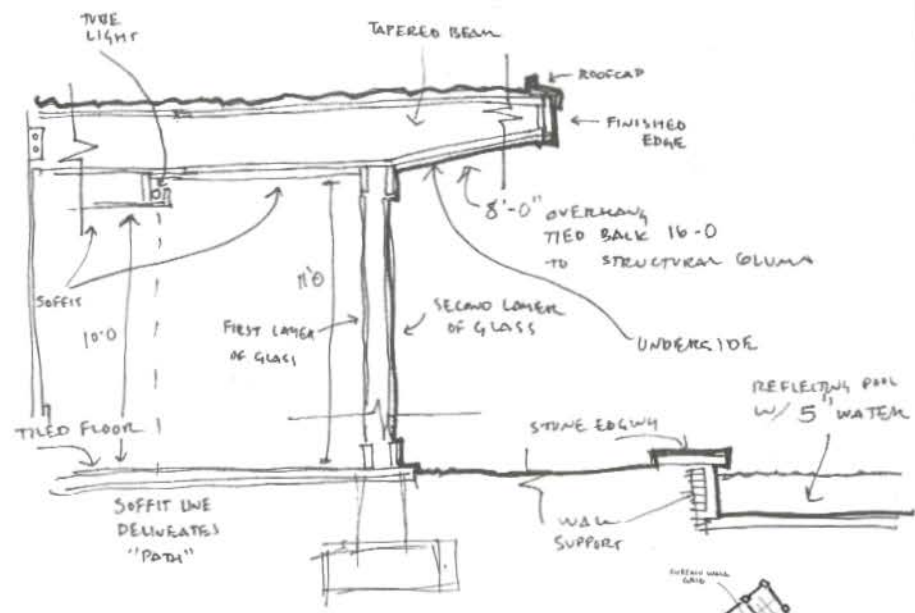
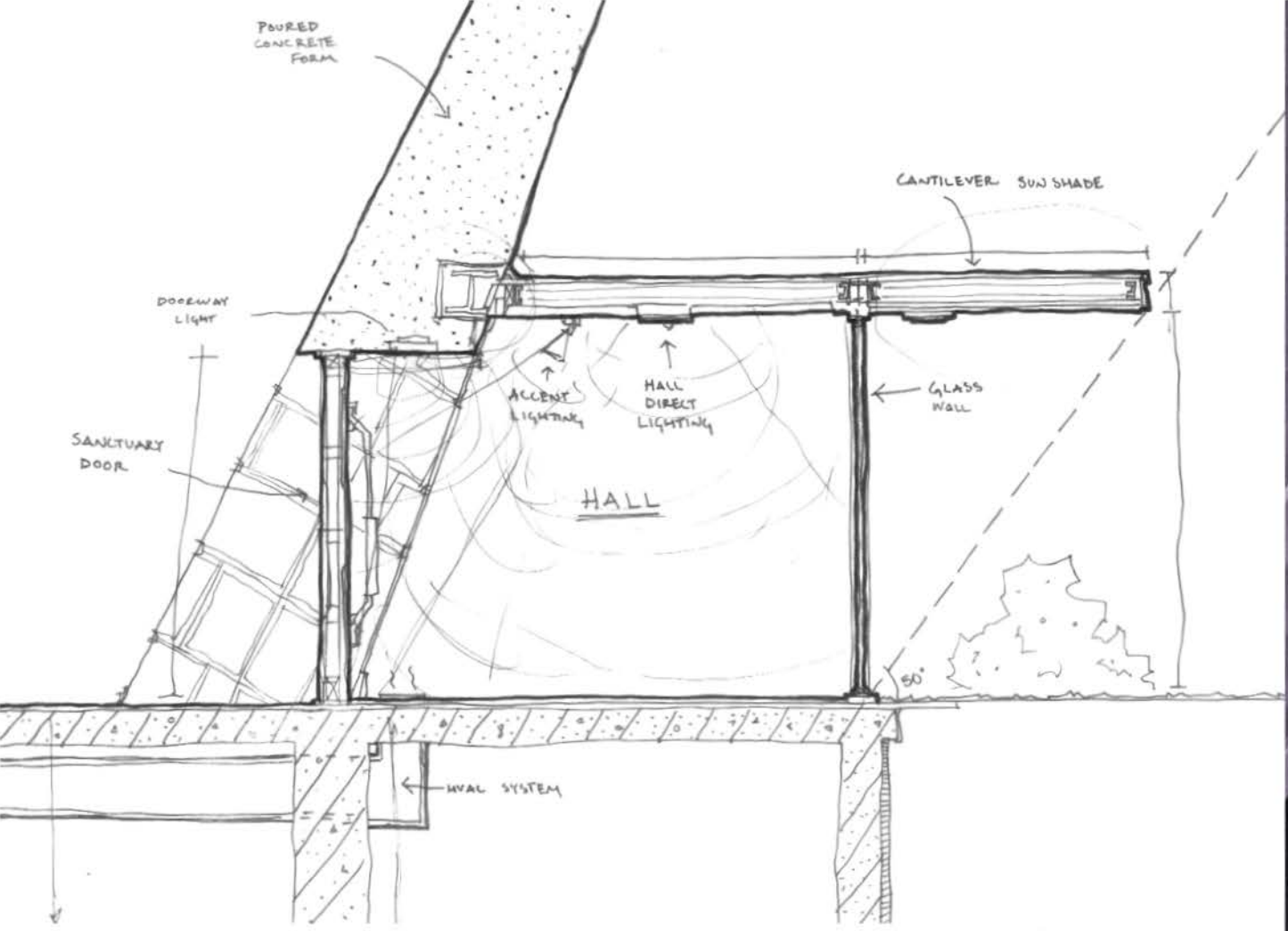


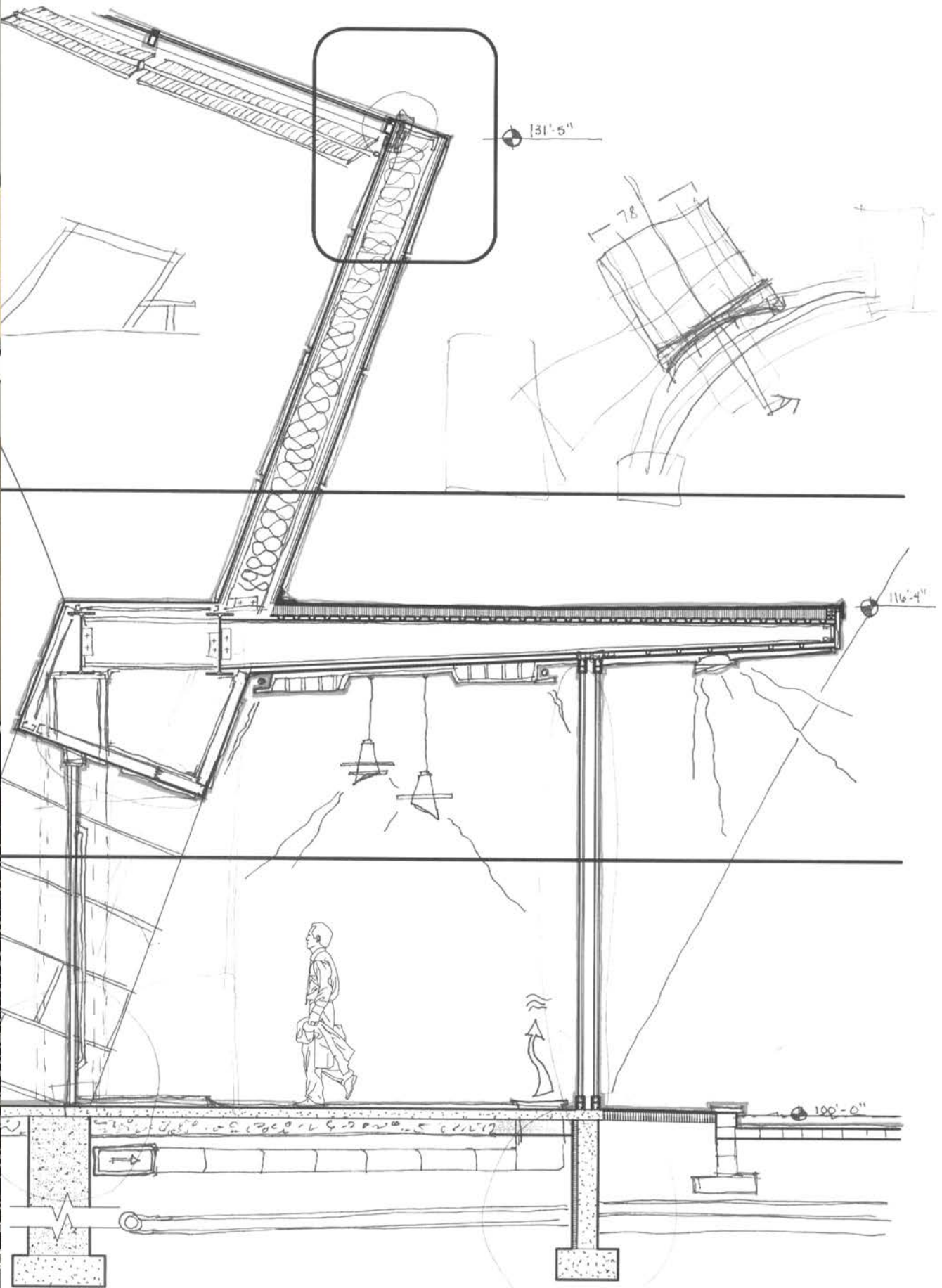


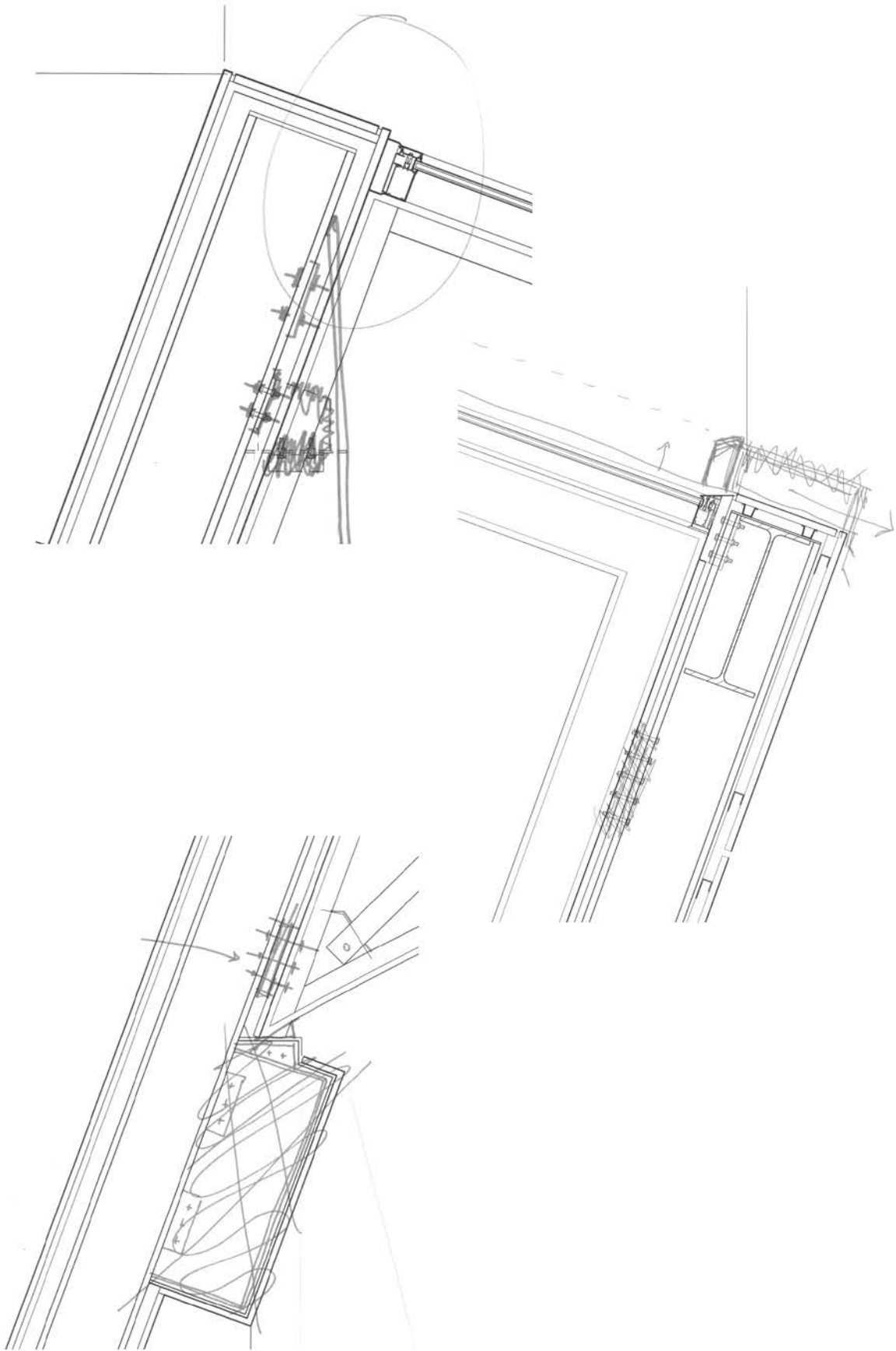


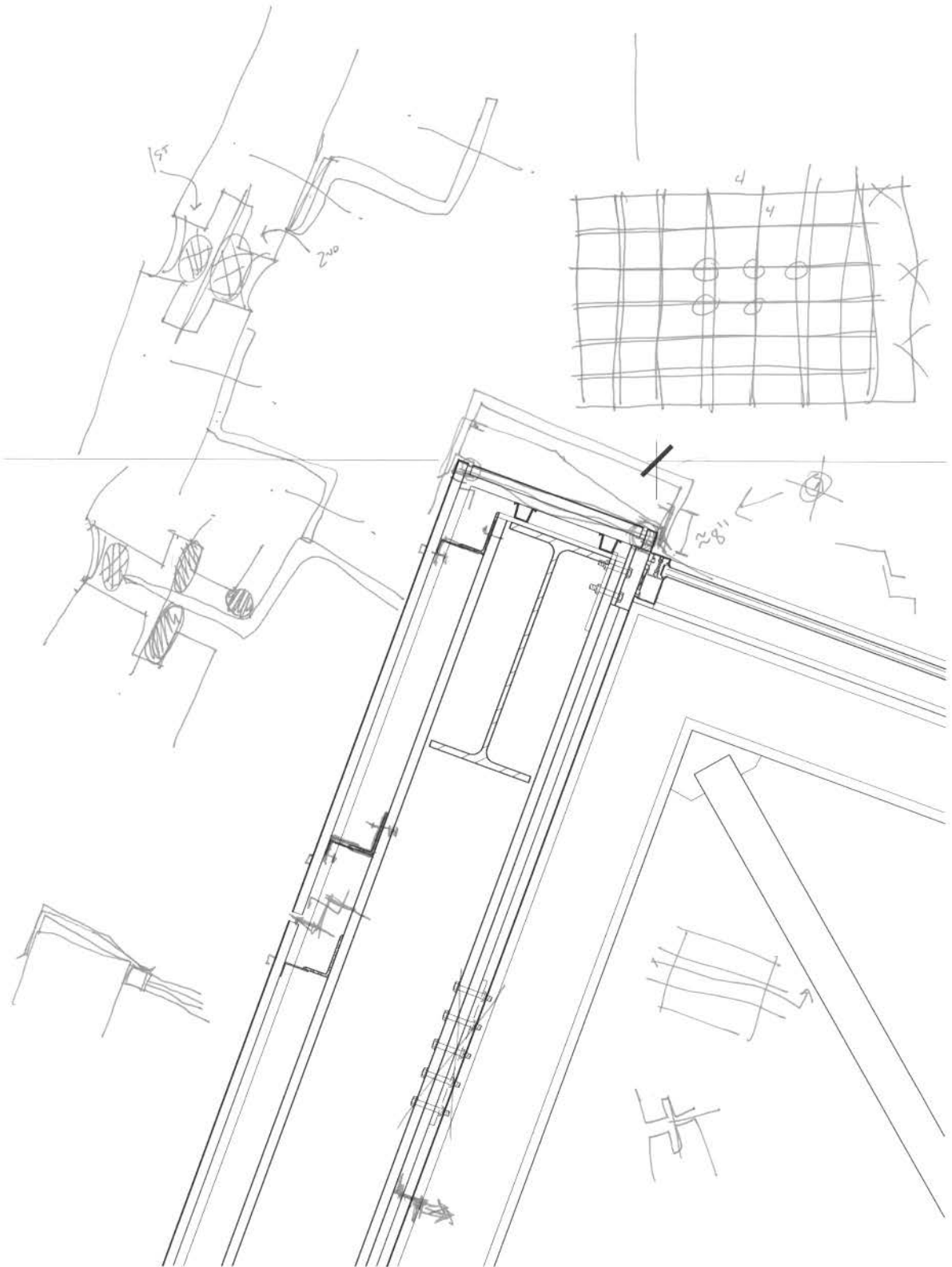


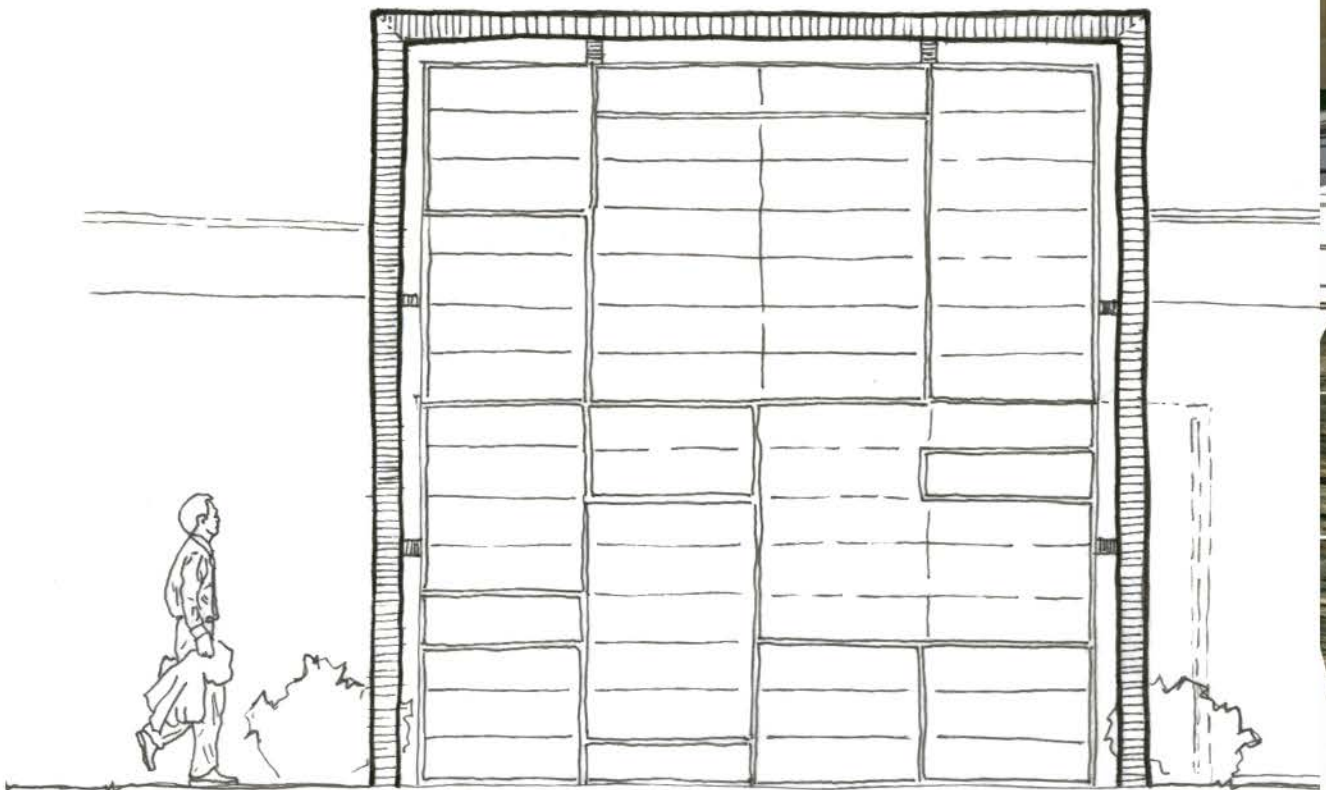
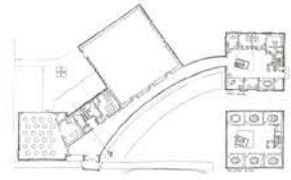
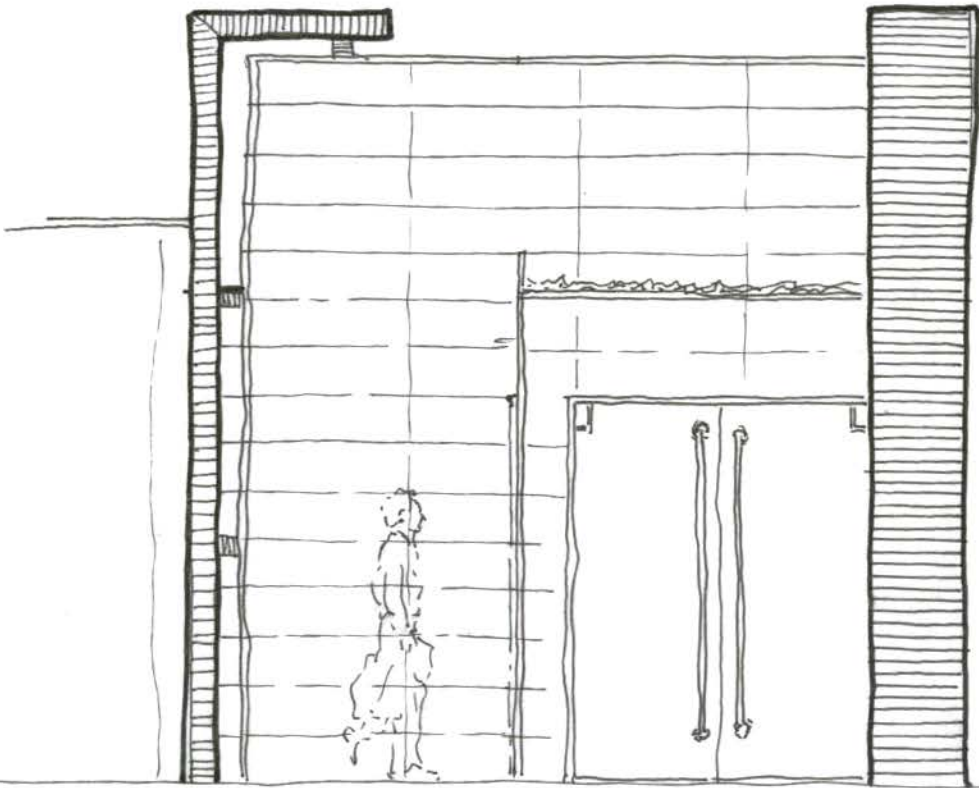


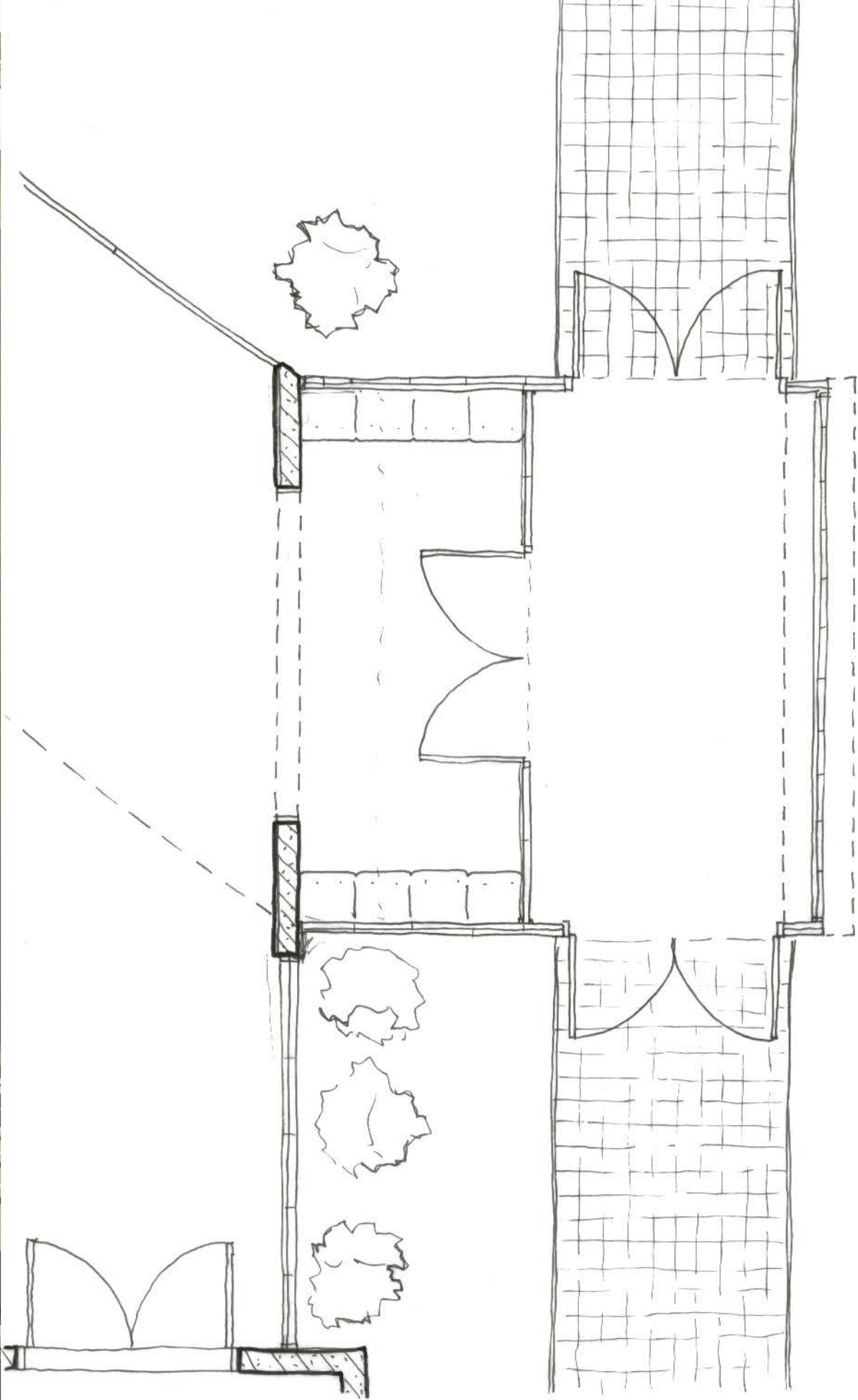


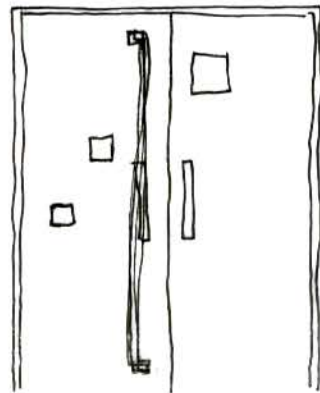
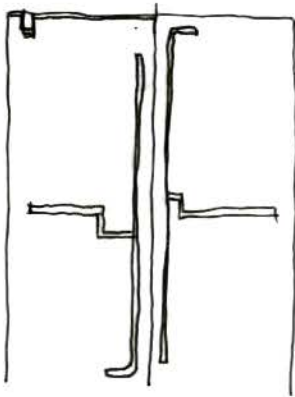
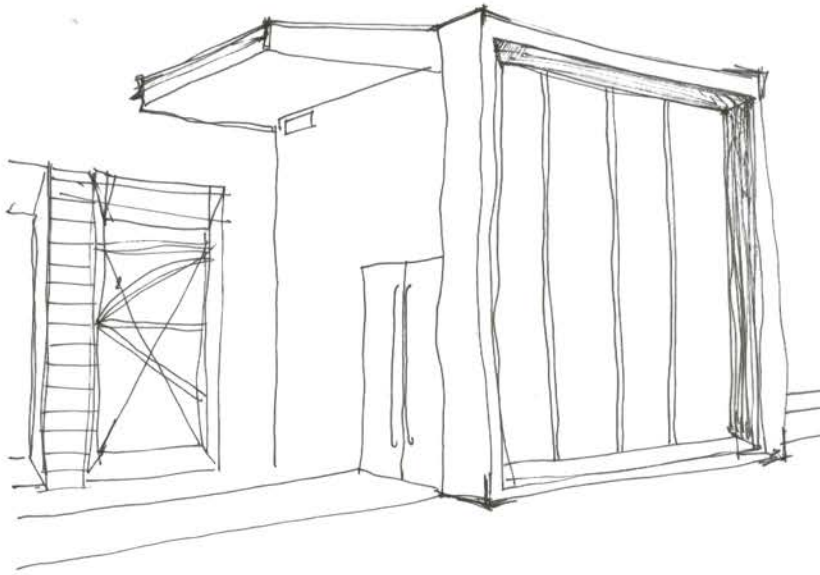
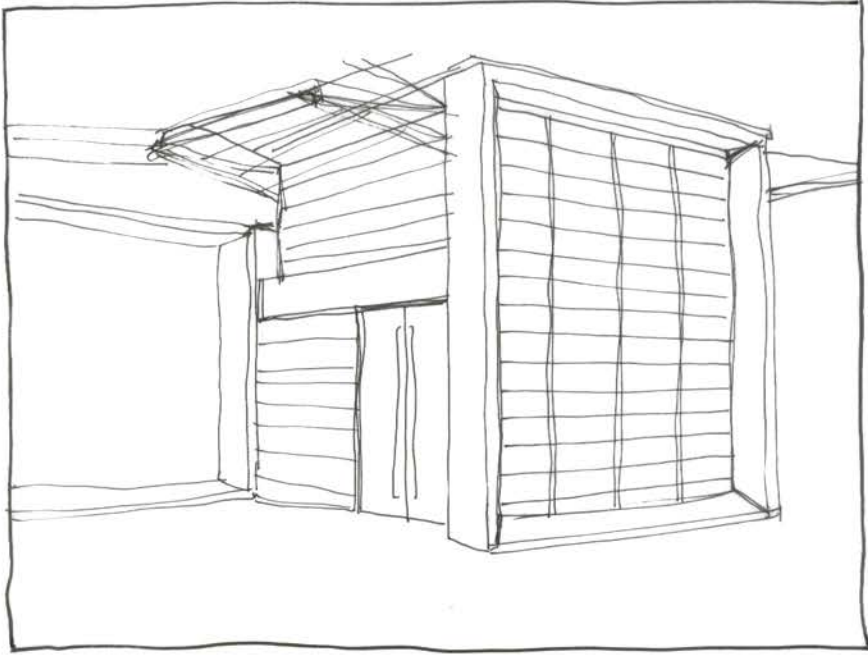


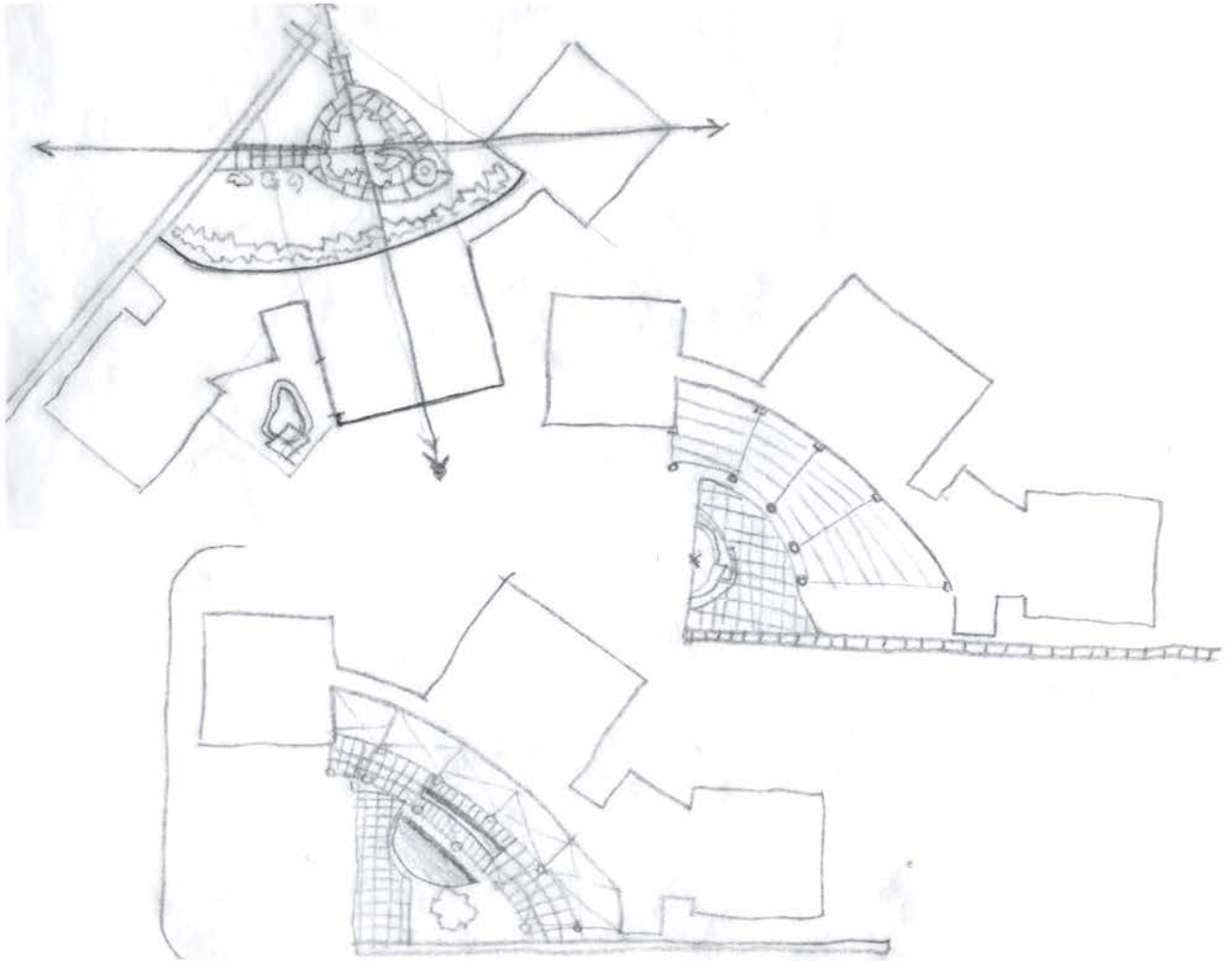
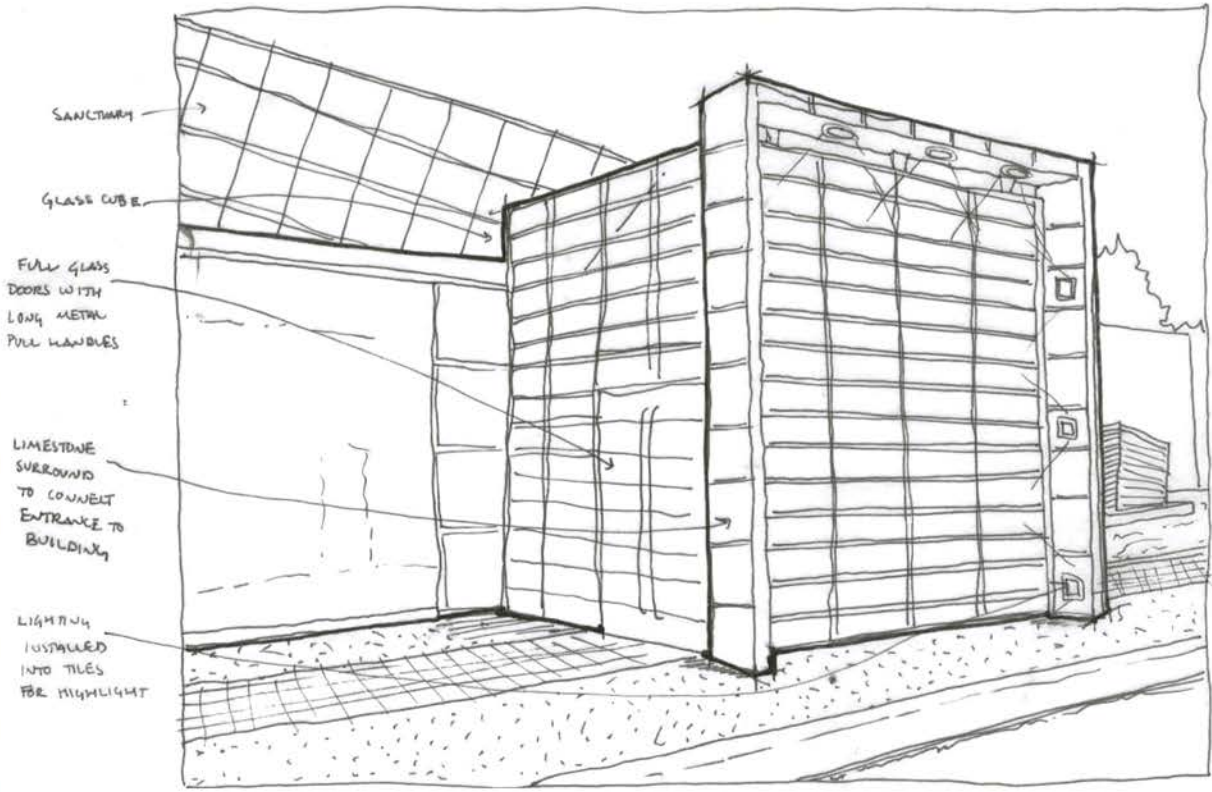


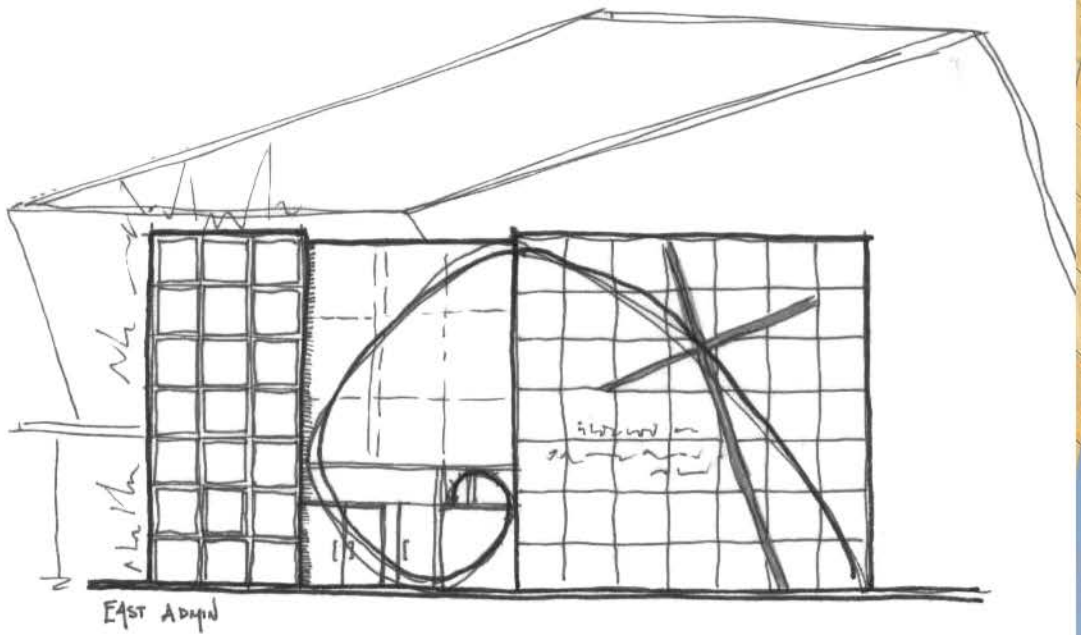
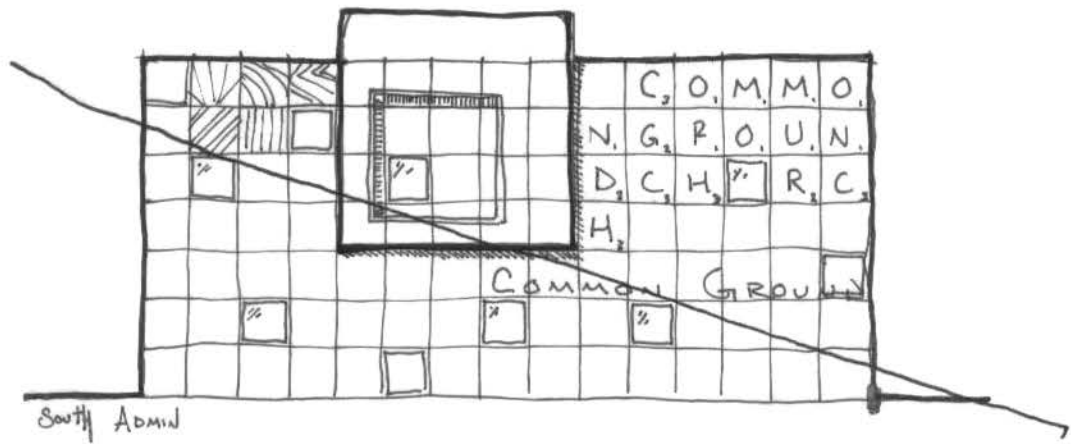
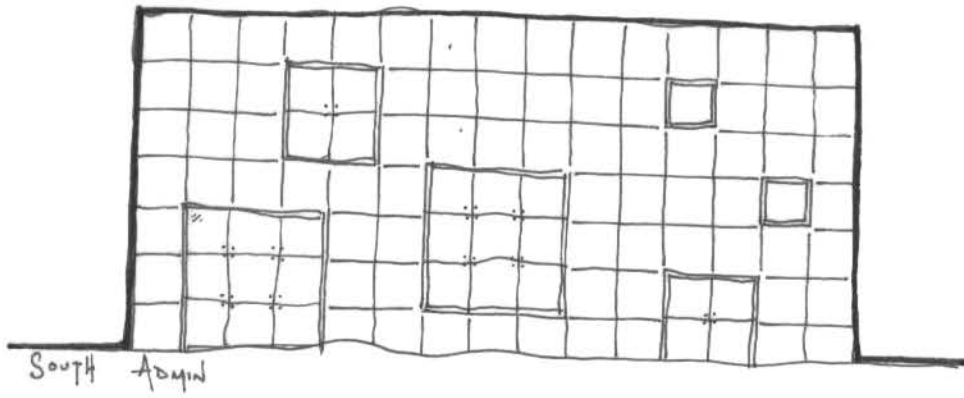


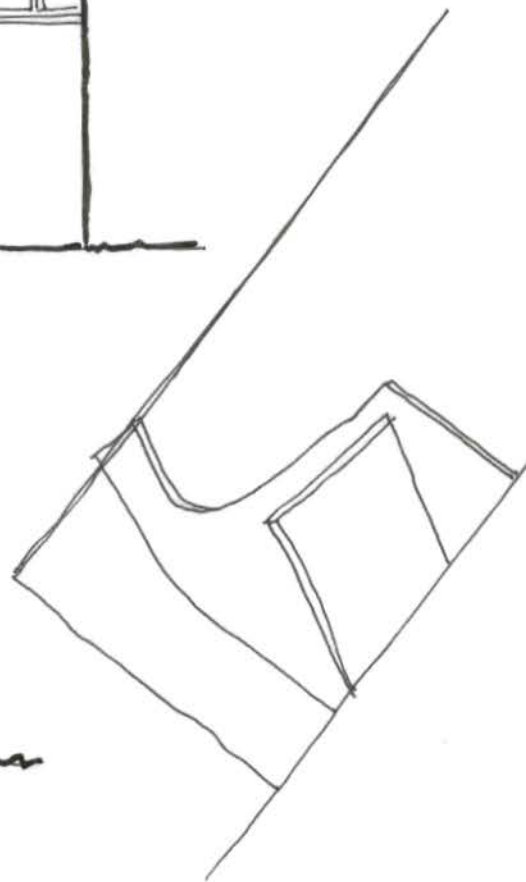
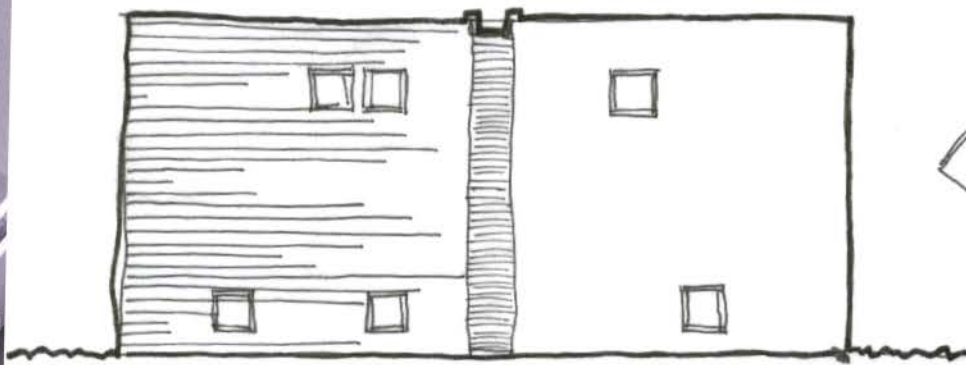
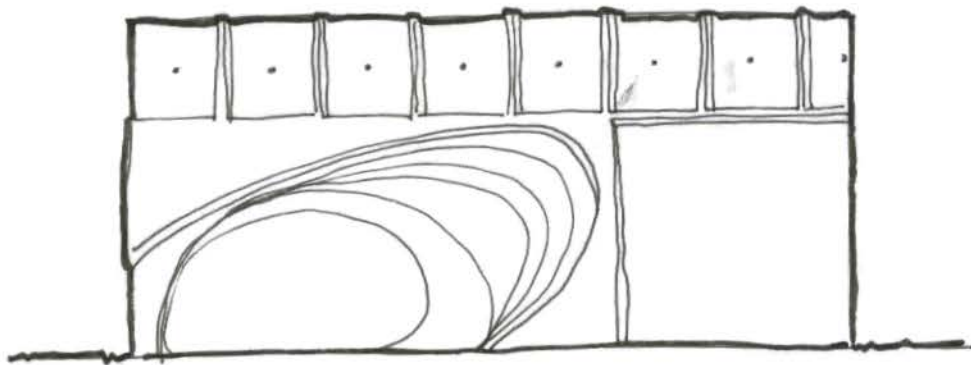
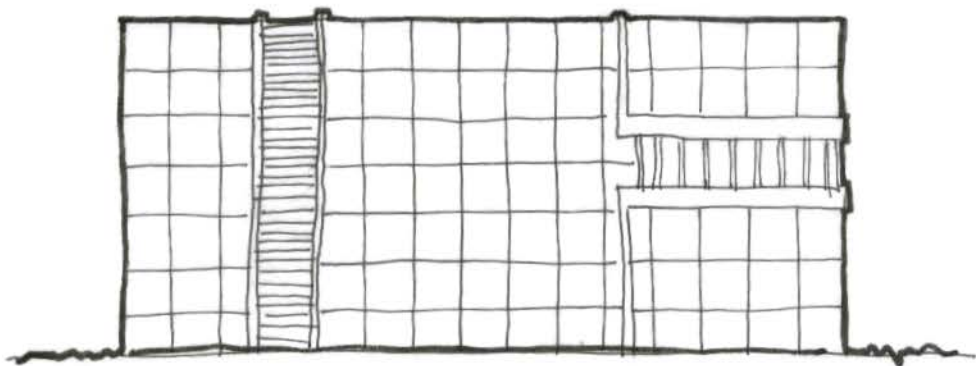
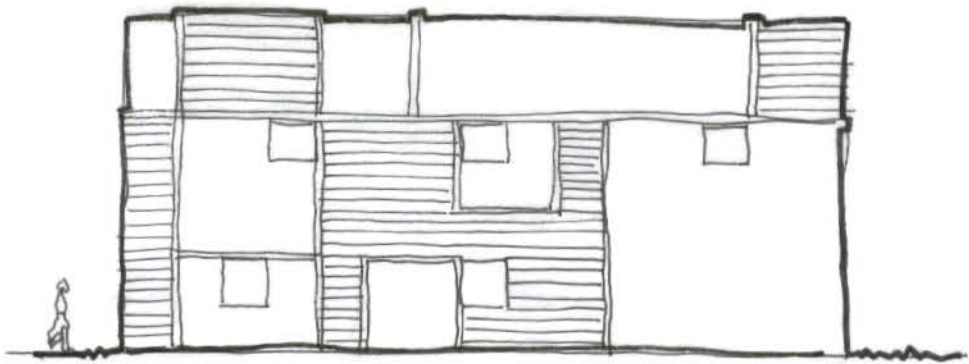


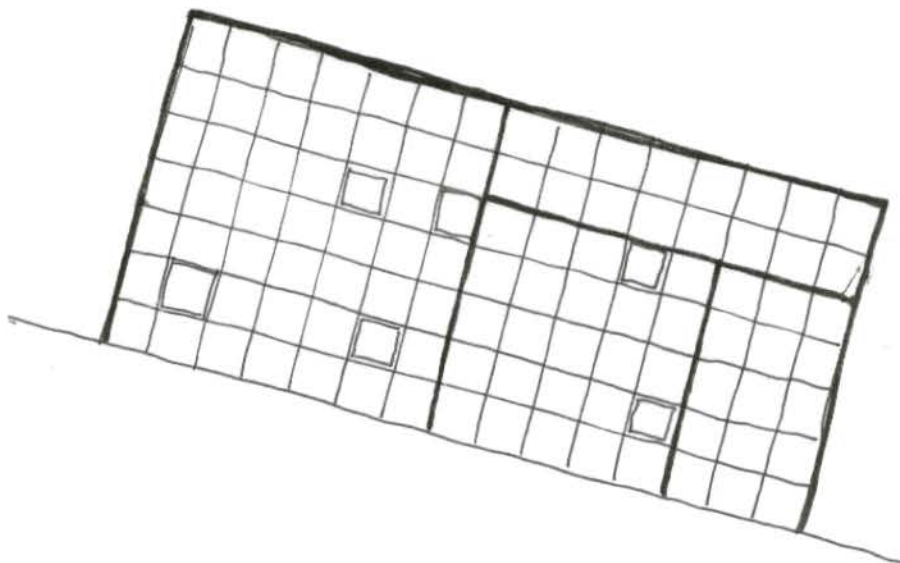
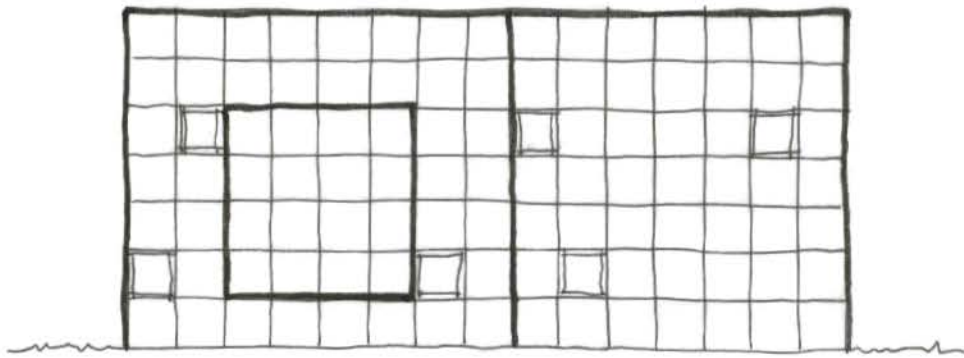
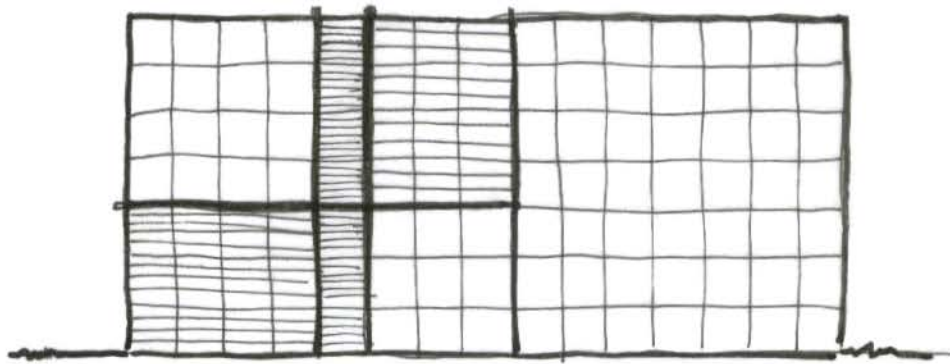
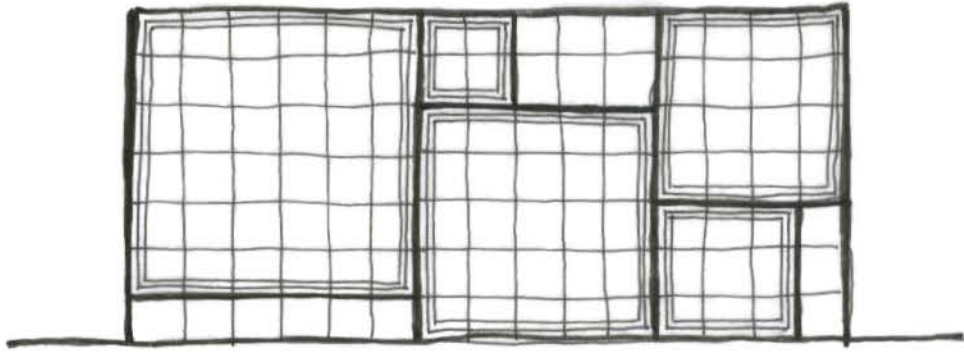


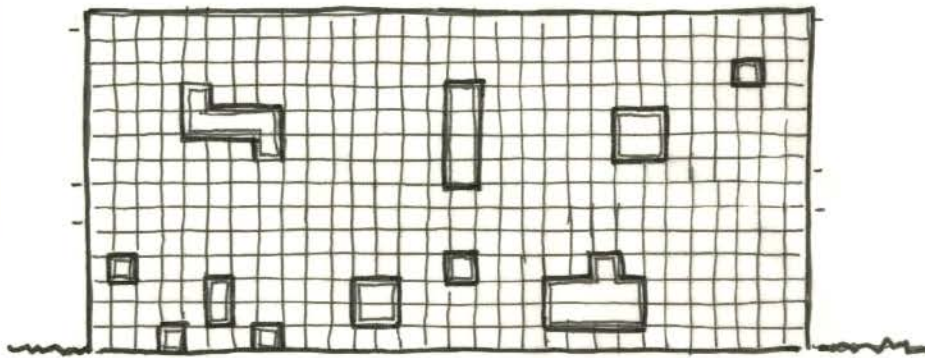




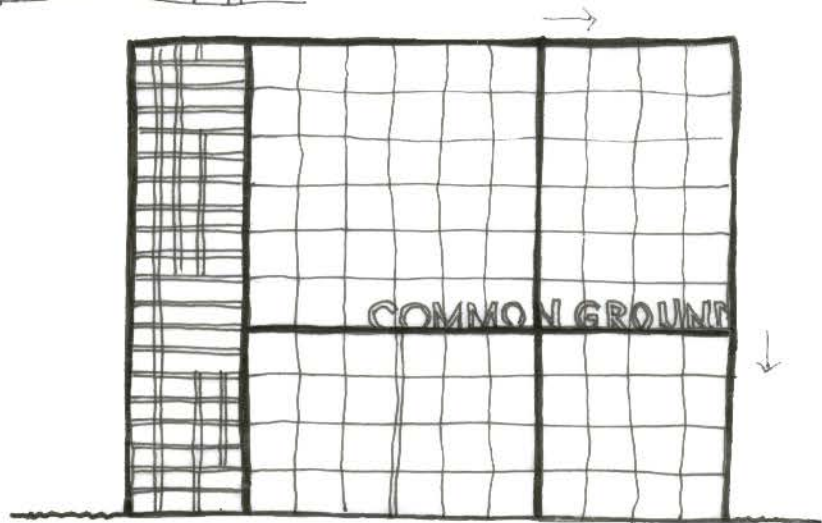
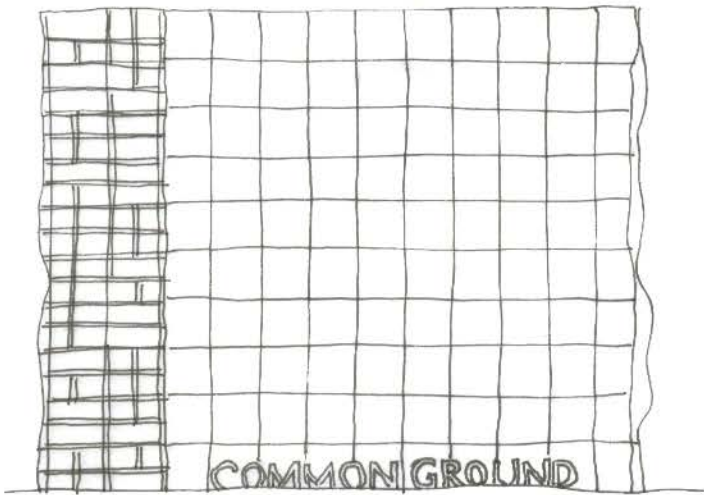
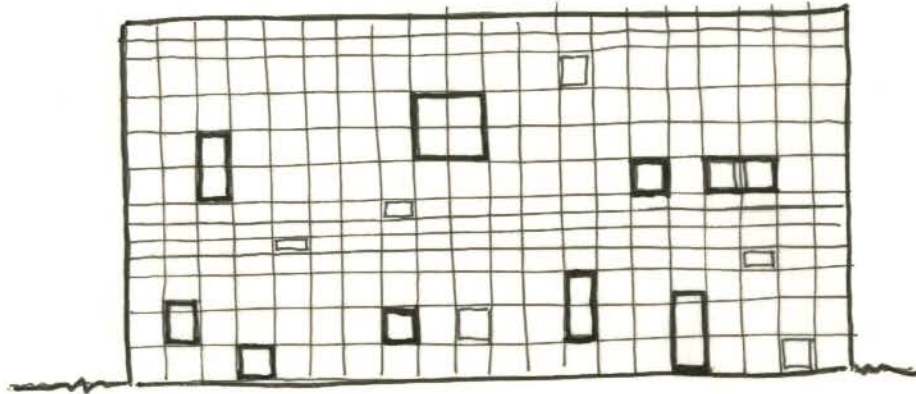


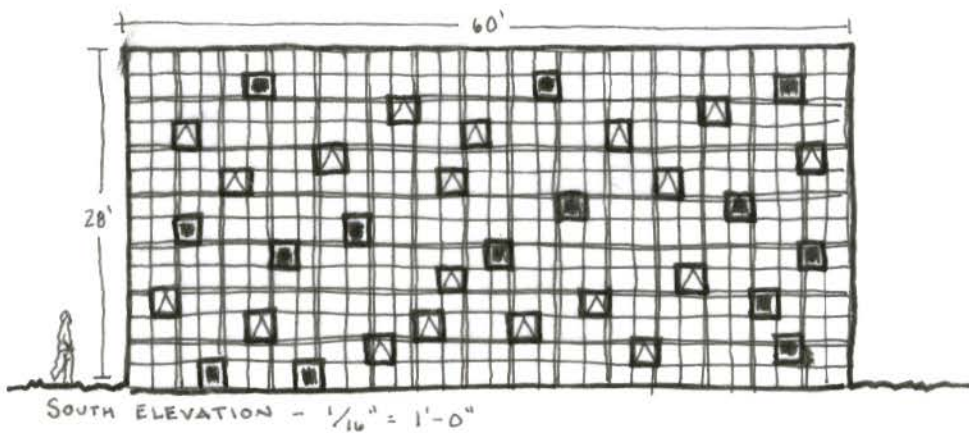
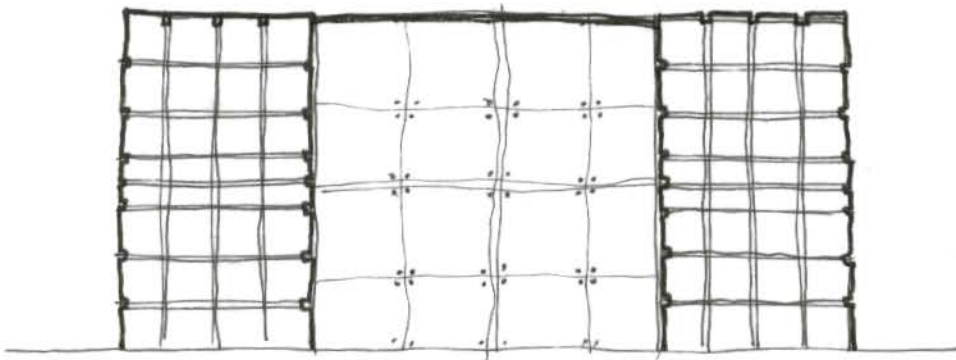
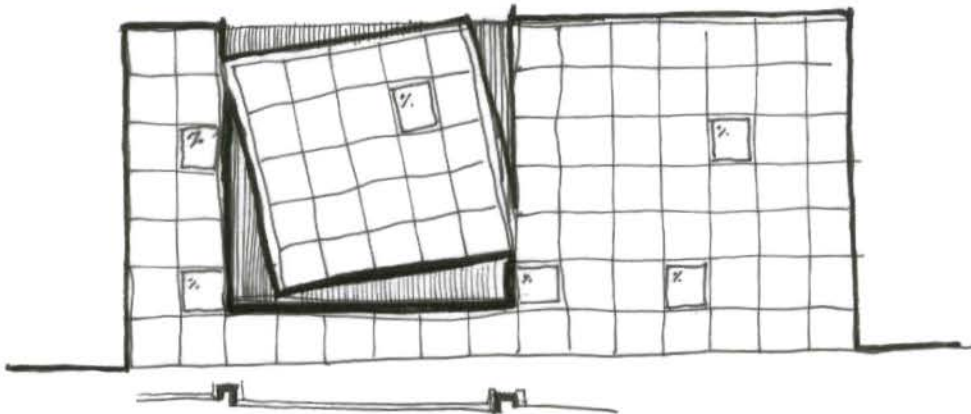
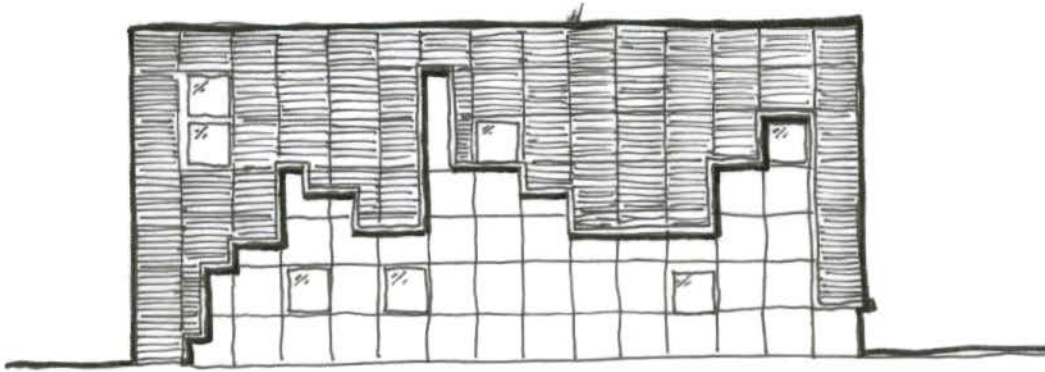


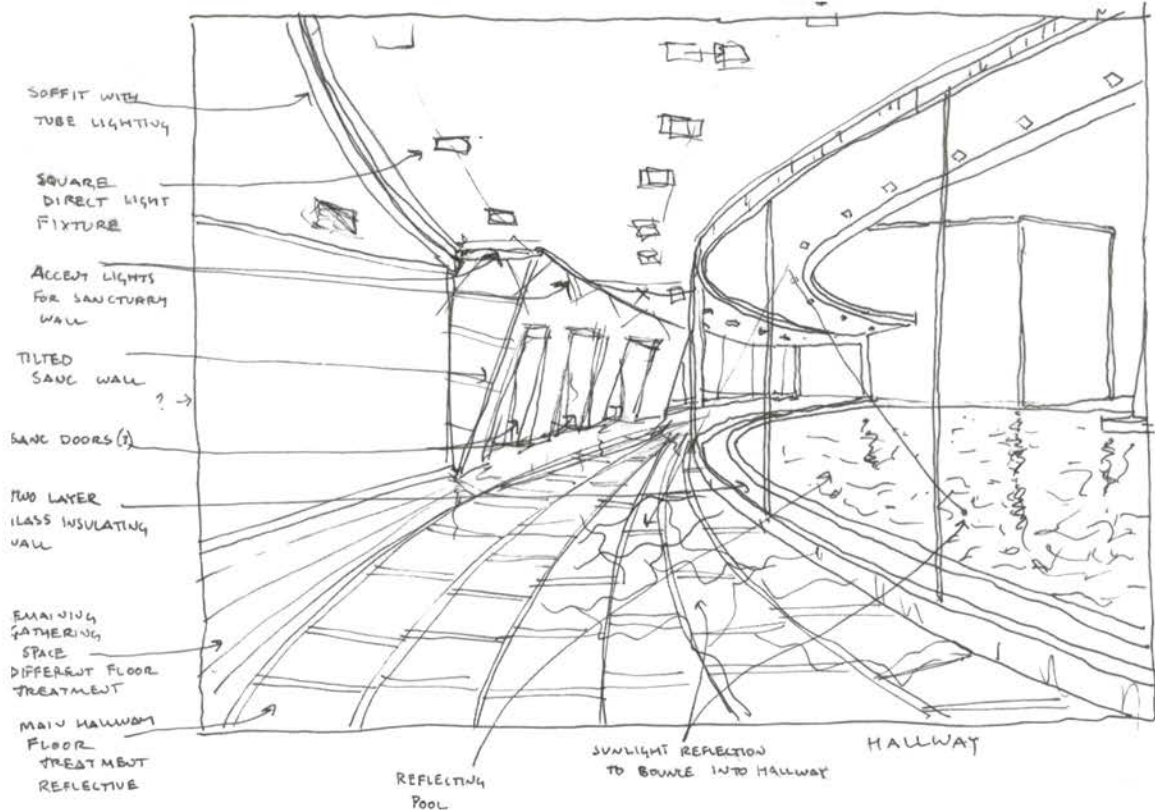
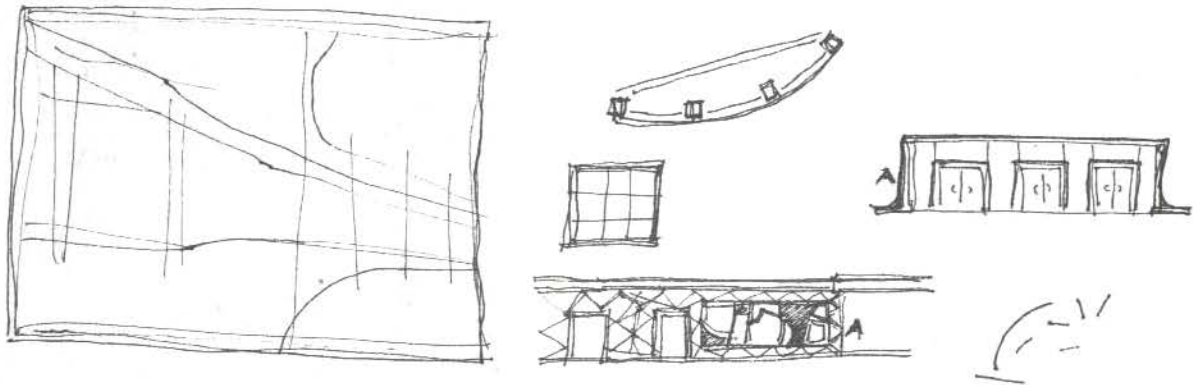
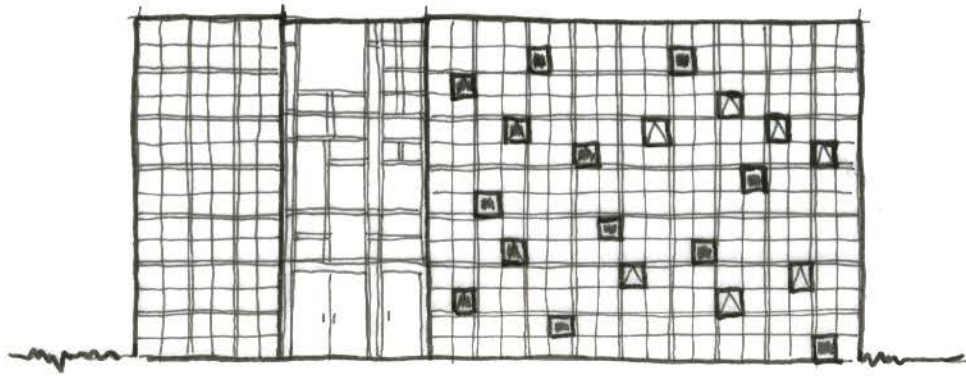


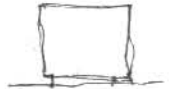
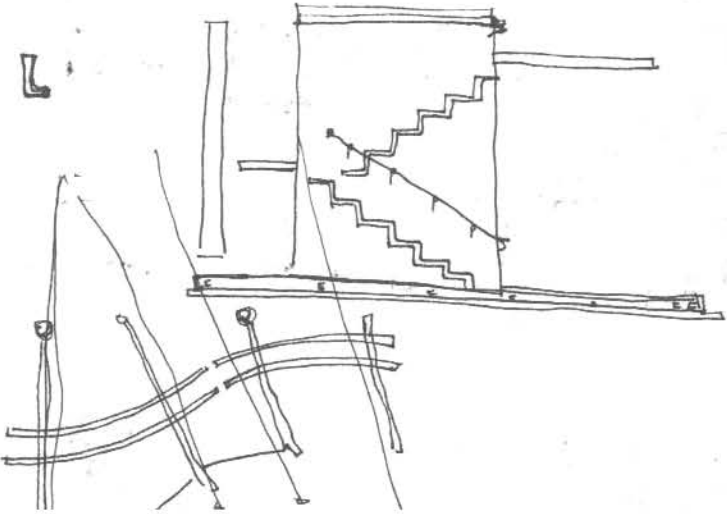
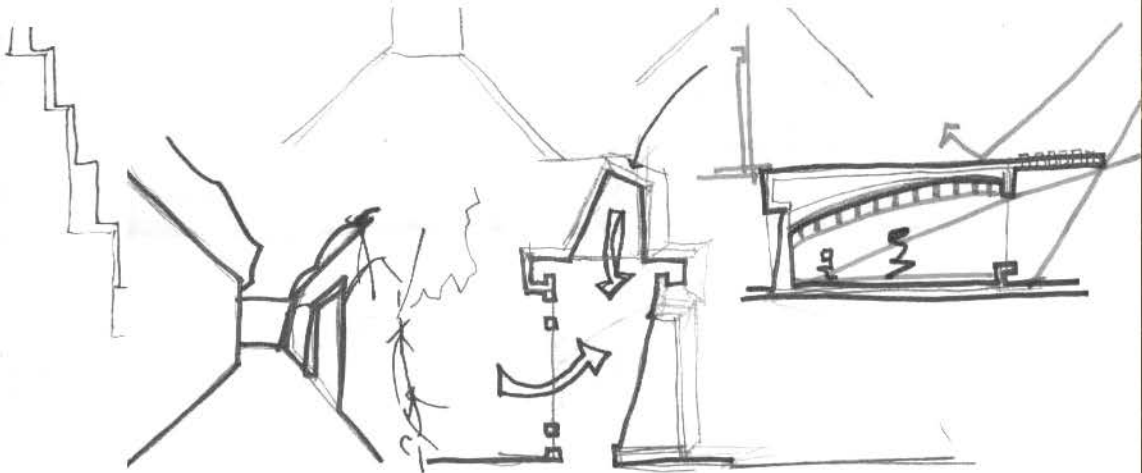
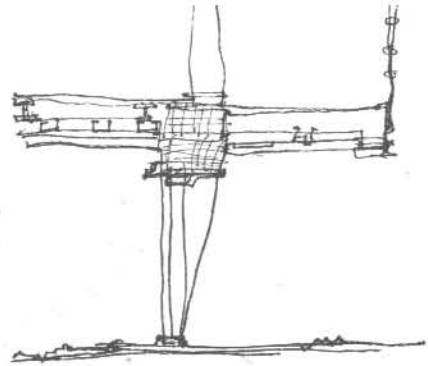
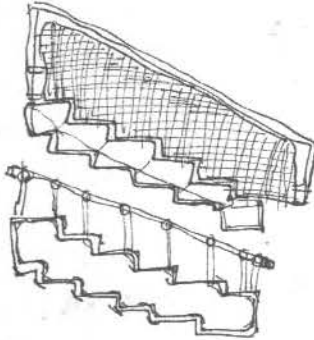
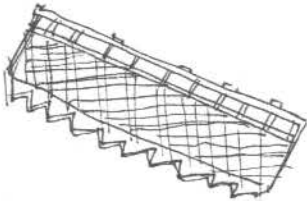
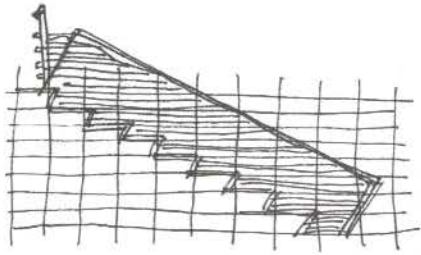


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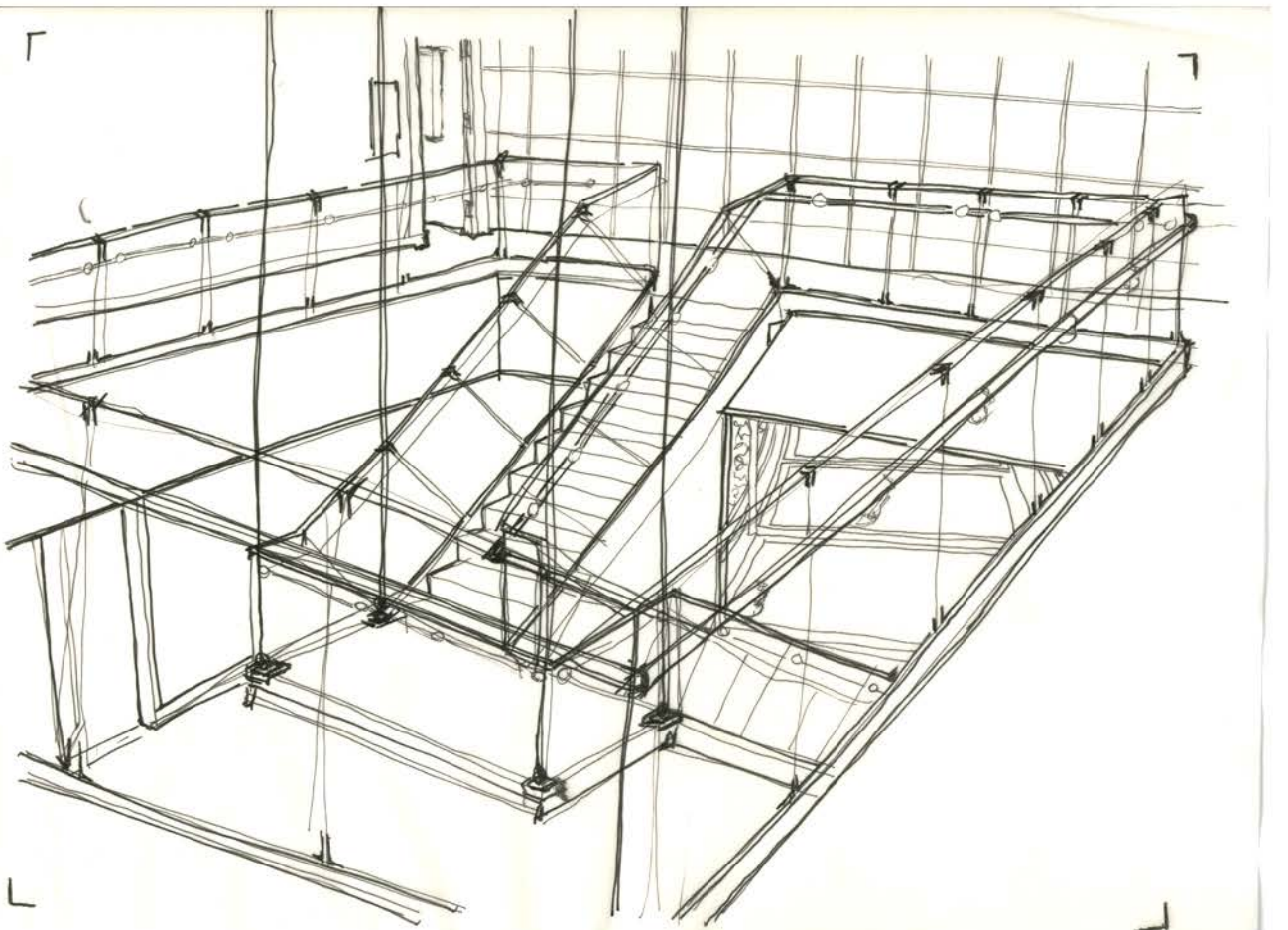


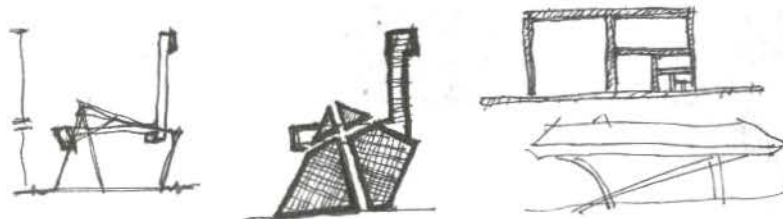
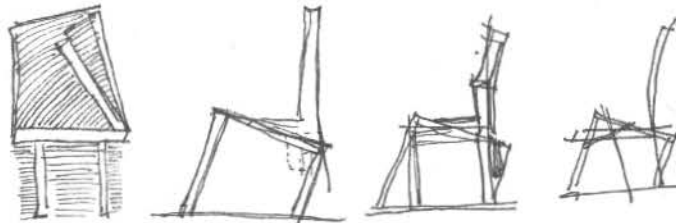
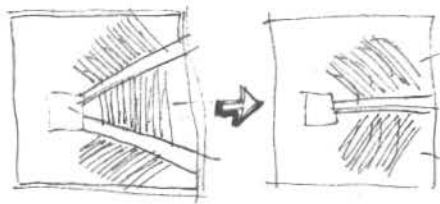
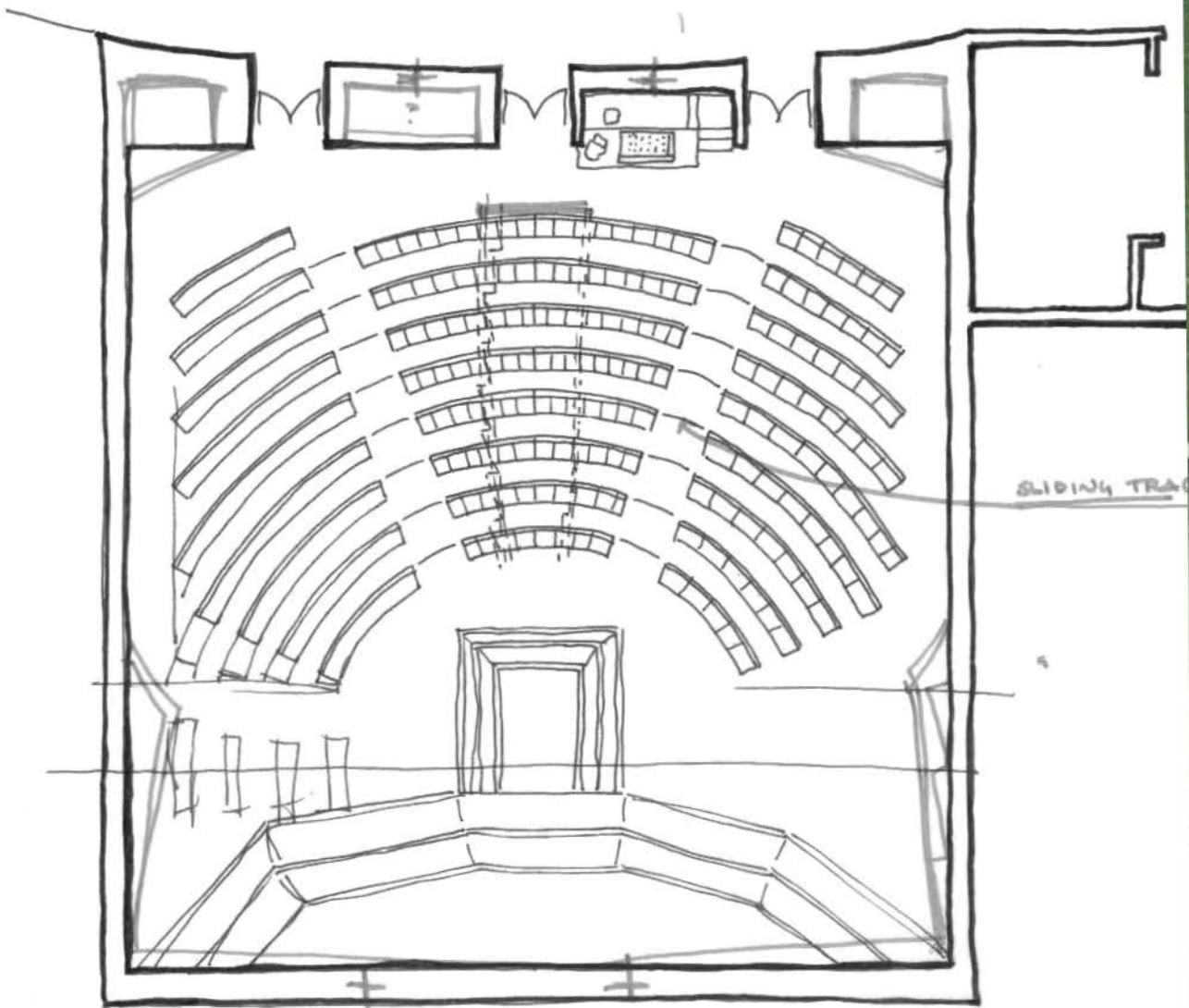


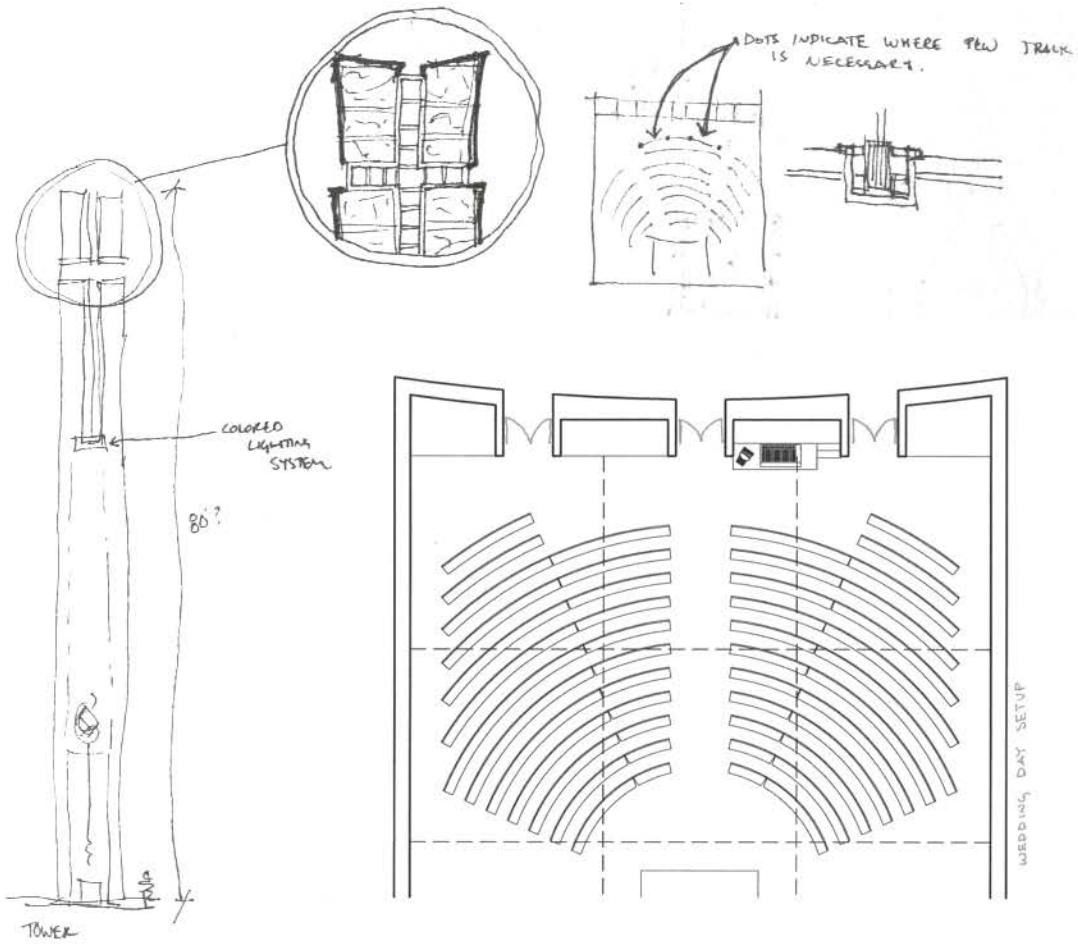
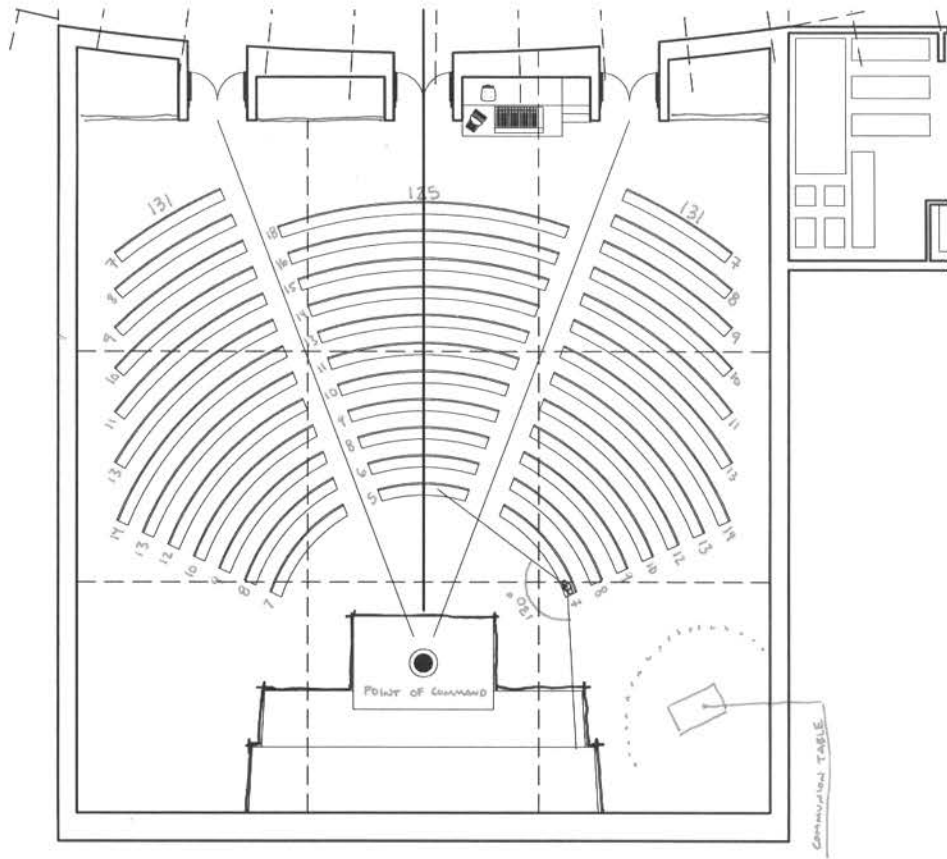


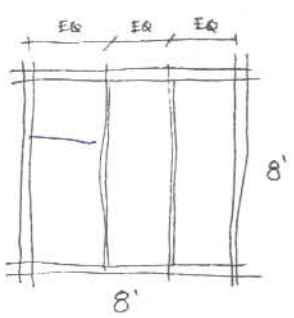
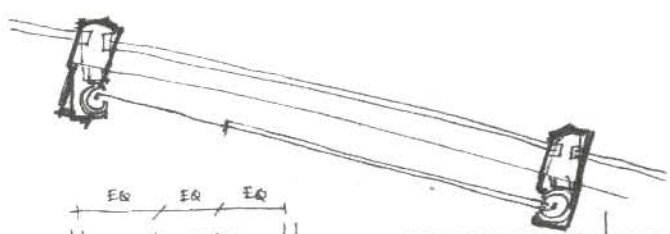


STAIRCASE

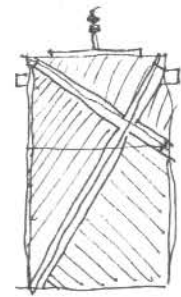
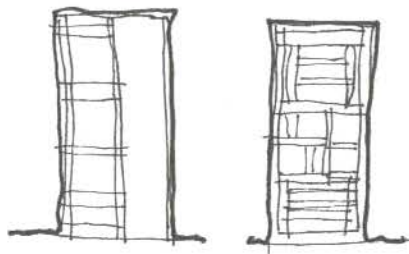
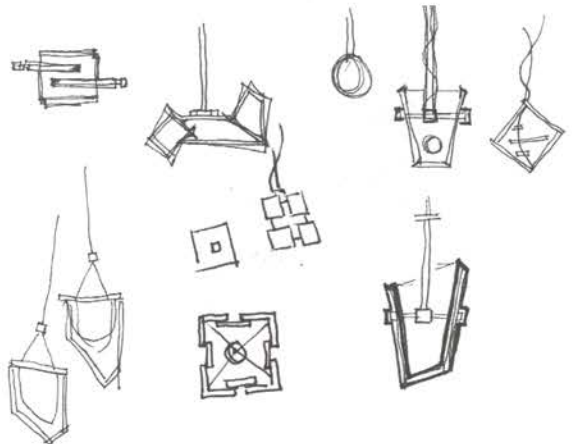
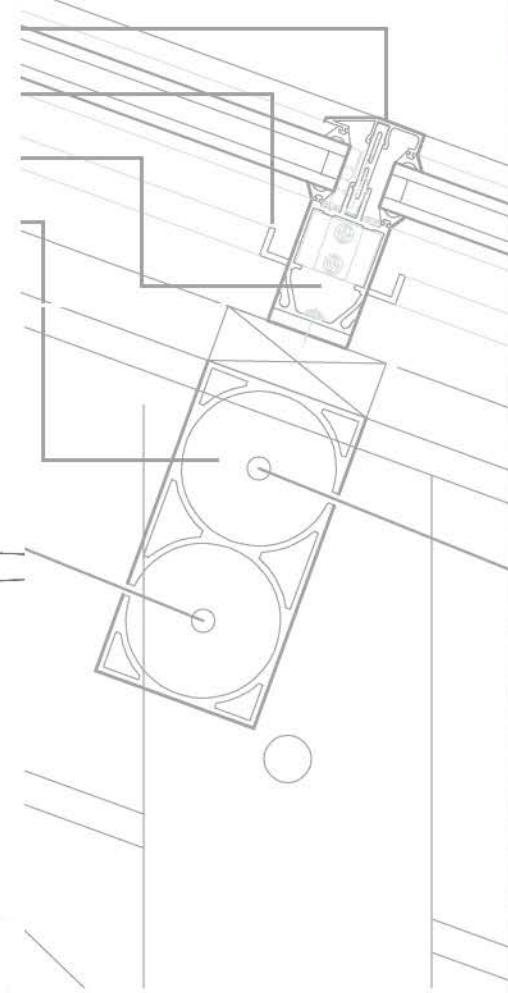
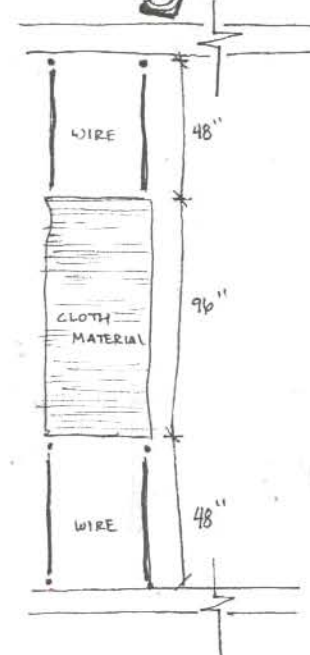




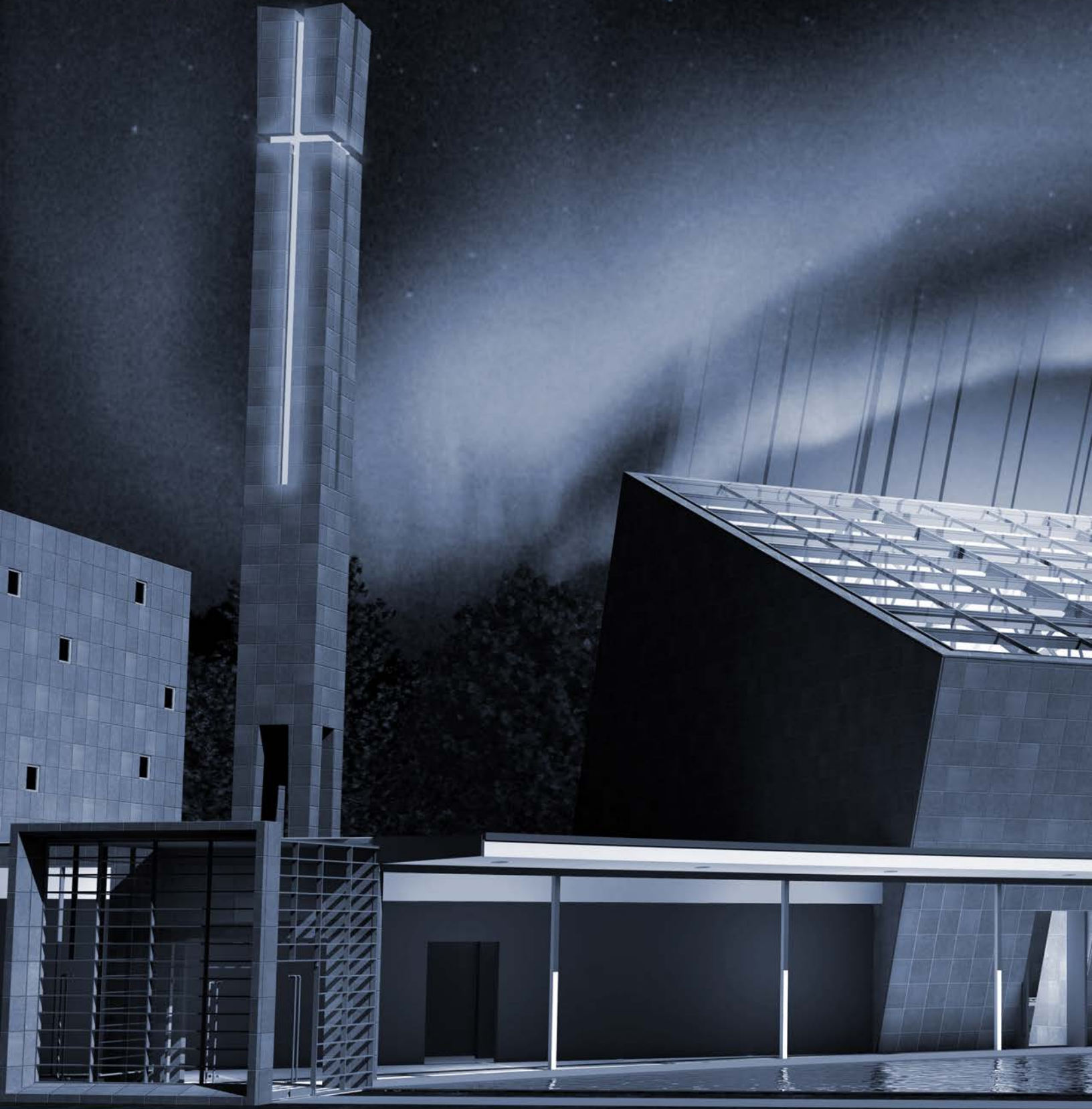


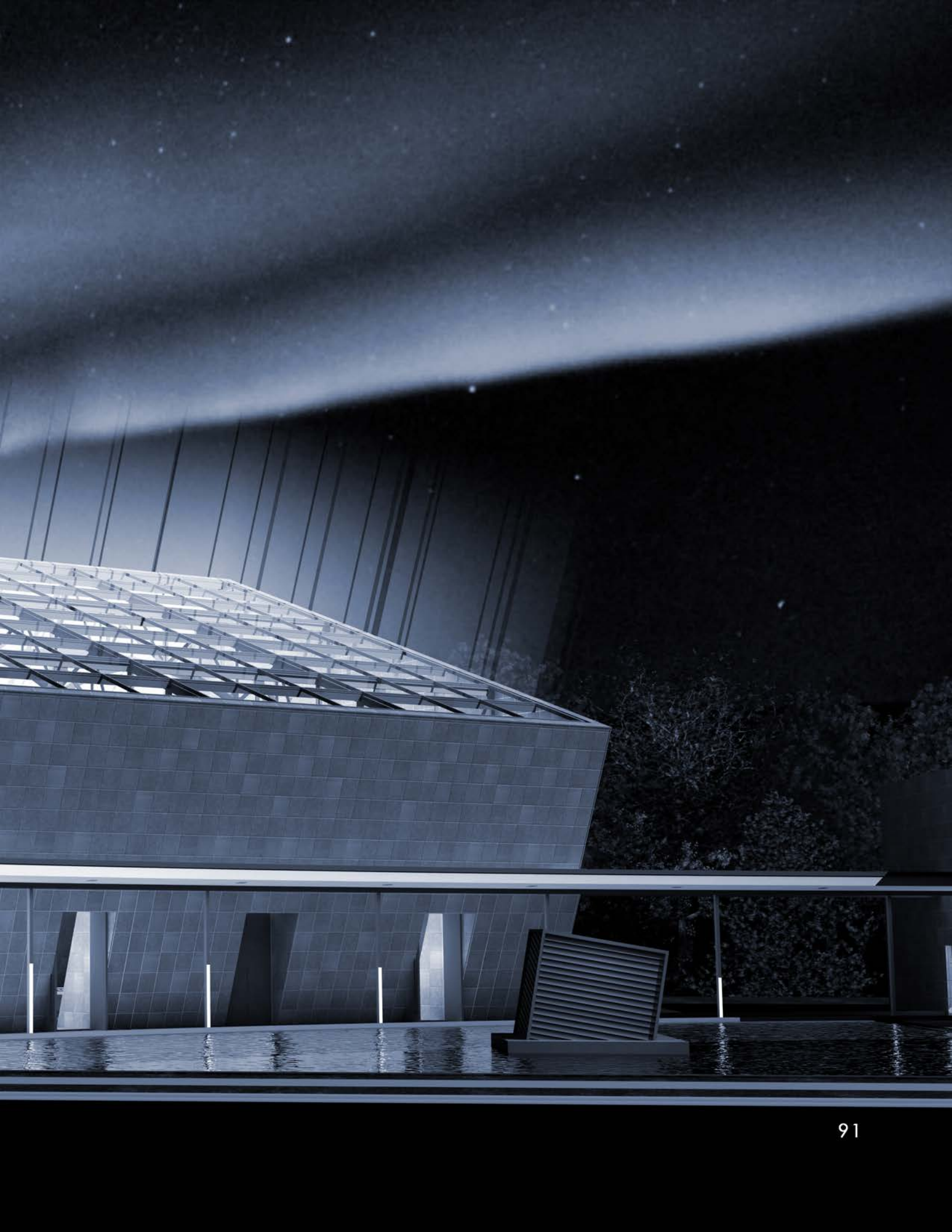


pg 444 - GRAPHIC STANDARDS



Project Solution







Color Light Form & Sound A New Religious Building for Common Ground Church

Commonly, the word church is most often associated with the Christian faith where the word 'church' is defined as both the building for worship and as the congregation. The building is a space used to worship and build a relationship with God. Architectural design does not have the ability to create that relationship with God; however, a well-designed religious building can contribute to the congregation's experience during worship.

The new religious building portrays the vibrant faith and worship of the Christian Missionary Alliance congregation that makes up the church of Common Ground. It serves as a place of worship, celebration, and education. It also creates adequate space for the current parishioners, while allowing future expansion of the church community.

The conceptual basis of color, form, light and sound is driven by our perceptions. As we move, the appearance of the world changes; our minds are interpreting and sorting what our senses take in, filtering only the crucial information to our direct attention. We constantly assess our surroundings for basic biological needs, and are consciously and subconsciously affected by the environment due to our natural expectations and developed experiences. Color, form, light and sound have the ability to alter our moods, emotions, and physical health. Sites, buildings, and rooms can be designed to display the most optimal setting through careful programming, planning, and attention to principles and proven scientific knowledge. Spaces are not only defined by the furnishings or equipment used within them; hues can accent specific emotions, lighting can focus attention, forms can facilitate function, and sound can create ambience. These four factors are essential to the health, safety, and welfare of each individual.

Project Emphasis and Goals

The main project emphasis of the new religious building is the four perceptual foci – color, form, sound and light. These individual perceptions carry different associative, symbolic, emotional, and physiological cues, both conscious and unconscious. Using the best combinations of the four, Common Ground Church is designed based upon the understanding of how the human psyche perceives each focus. Along with these four principles in every step of the design, three other major points for the project were taken into consideration.

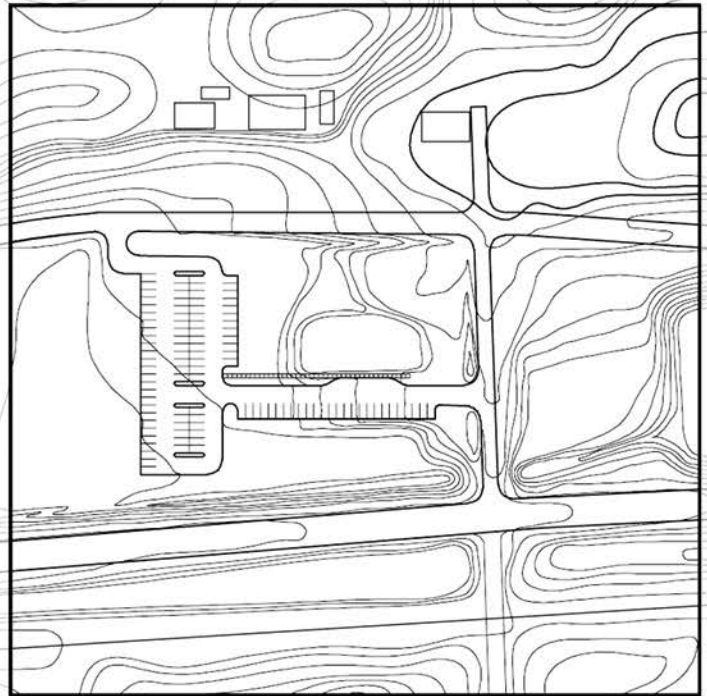
1 | The design provides a religious building that upholds the mission statement of Common Ground Church and the Christian Missionary Alliance denomination. The beliefs and values of the congregation were used in defining the space that houses this congregation.

2 | The design will create an identity for Common Ground church that will not only stir the emotions of the current congregation, but also develop interest for those who are not yet a part of the church. A dynamic form that expresses a religious structure as an aid for a fulfilling worship experience and conveys a strong community at the heart accomplishes this.

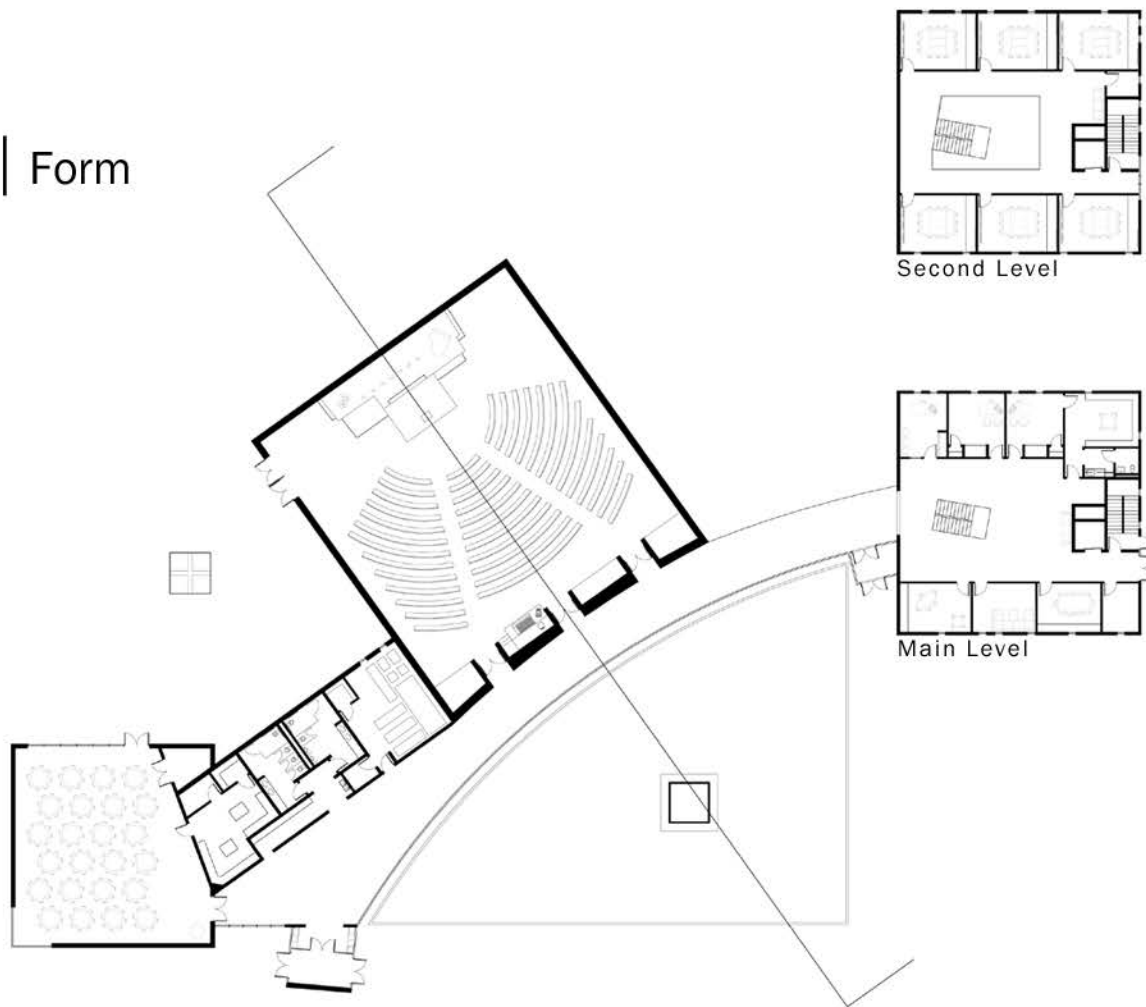
3 | All issues of the project considered sustainable design. Creating an efficient and effective environment for a religious building included renewable resources for energy, earth-friendly materials, natural lighting considerations, and passive heating and cooling systems.

The Site

Common Ground Church began in 1999 when Sunday worship was held in the living room of the pastor's home. In January of 2000, Common Ground purchased a 13-acre plot of land in Lake Elmo where a small church existed. Now, five years later, the congregation that was once only 15 members is 250 and growing. The existing building no longer has the proper accommodations necessary for it's expanding community. The new Common Ground Church is built on the location of the original building, taking advantage of the existing parking lot and entrances onto the site.



Form

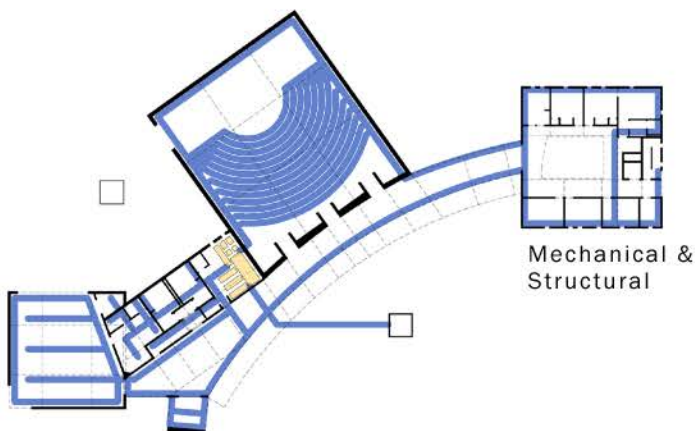


The basis of the design is derived from the shape of a cube. The church is broken into three distinct sections – the education and administration building, the fellowship hall, and the sanctuary. The three shapes echo the concept of a triune God – Father, Son, and Holy Spirit. The forms thrust out of the ground, growing in height. The largest cube, the sanctuary, tilts dynamically forward at a twenty-degree angle, bringing the focus directly upon it.

Mechanical

The mechanical system is a central all-air system that is used through flooring vents. This allows for conditioned air to be supplied only at the inhabited zones within the sanctuary, education atrium, and fellowship hall. Under floor air displacement systems reduce cooling loads by 25% of a typical overhead VAV system.

The cooling tower is located at the center of the reflecting pond. Wrapped in a louvered tilted cube, the monument optimizes the use of the summer winds to cool the water that travels through it. The chilled water is then piped back into the mechanical room. This removes the necessity of having a unit on the roof, while reducing unwanted noise and vibration inside of the building.



Main Entrance

The main entrance of the building is a clear glass cube that opens to the south parking lot. The limestone detailing visually connects the southern side of the cube to the rest of the building. The entrance is rotated at a five-degree angle toward the sanctuary in order to give the structure a subtle burst of energy, serving as the starting point of the journey to the sanctuary.



■ ■ | Color

We perceive sunlight as white light. However, when the visible white light is passed through a prism, it is broken down into individual wavelengths that produce six different colors – violet, blue, green, yellow, orange, and red. The experience of color depends on the intensity of light, the way it is reflected from a surface, and the color of surrounding objects.

Common Ground Church uses a simple palette of colors and materials in order to set the tone accordingly. The entire outer shell of Common Ground church is clad in Dolomitic Limestone, which is quarried in the same region of the United States as the church. It is a 100% recyclable material that requires only natural cleaners for maintenance. The hues of the limestone are known to represent future, hope and wisdom. The classrooms have their own individual shades, optimizing learning habits according to color psychological data. The younger aged classrooms

are painted warm yellow and peach, while the older classrooms are pale blues and greens, in order to promote learning. The nursery contains bright colors on the floors and walls for the infants and toddlers. Warm reds, oranges, and greens inspire the celebrations that take place inside the fellowship hall.

Floating Staircase

At the end of the hallway is the entrance to the education and administration building. A steel formed suspended staircase hangs at the entrance of the building, sending children upstairs to the six classrooms that surround the breakout space and atrium. With glass sheets used to wrap the railings, the staircase appears to float in the middle of the two-story space.



The Pathway

Surrounded by straight lines and forms, the hall is an extension of the main entrance to Common Ground. Acknowledging the basis of a natural path, the hall follows an elegant curve around the large reflecting pool outside. This leads to the sanctuary, the heart of the church. An almost seamless sheet of double-layered glass wraps the south wall of the hallway, bringing the natural environment inside. The hall has high ceilings that create a sense of awe in the members as they move toward the twelve-foot doors of the sanctuary. The ceiling is finished white to allow the caustic effects from the reflecting pool to display patterns onto the ceiling, creating movement and extending the use of water throughout the building. Water is used in the Christian faith as a metaphor for Jesus Christ, who is the source of life for Christians.



The most unique attribute that sound has over the other senses is that we are always at the center of our perceptual experience. Meaning, although our visual experience is always in front of us, our audible experience can happen from any direction around us. The sanctuary was designed to optimize the experience of the congregation. Sunday's service combines contemporary music and teachings of the Word of God through prayer and biblical messages. The clear polycarbonate acoustic clouds reflect the sound of the worship team and pastor out into the congregation.

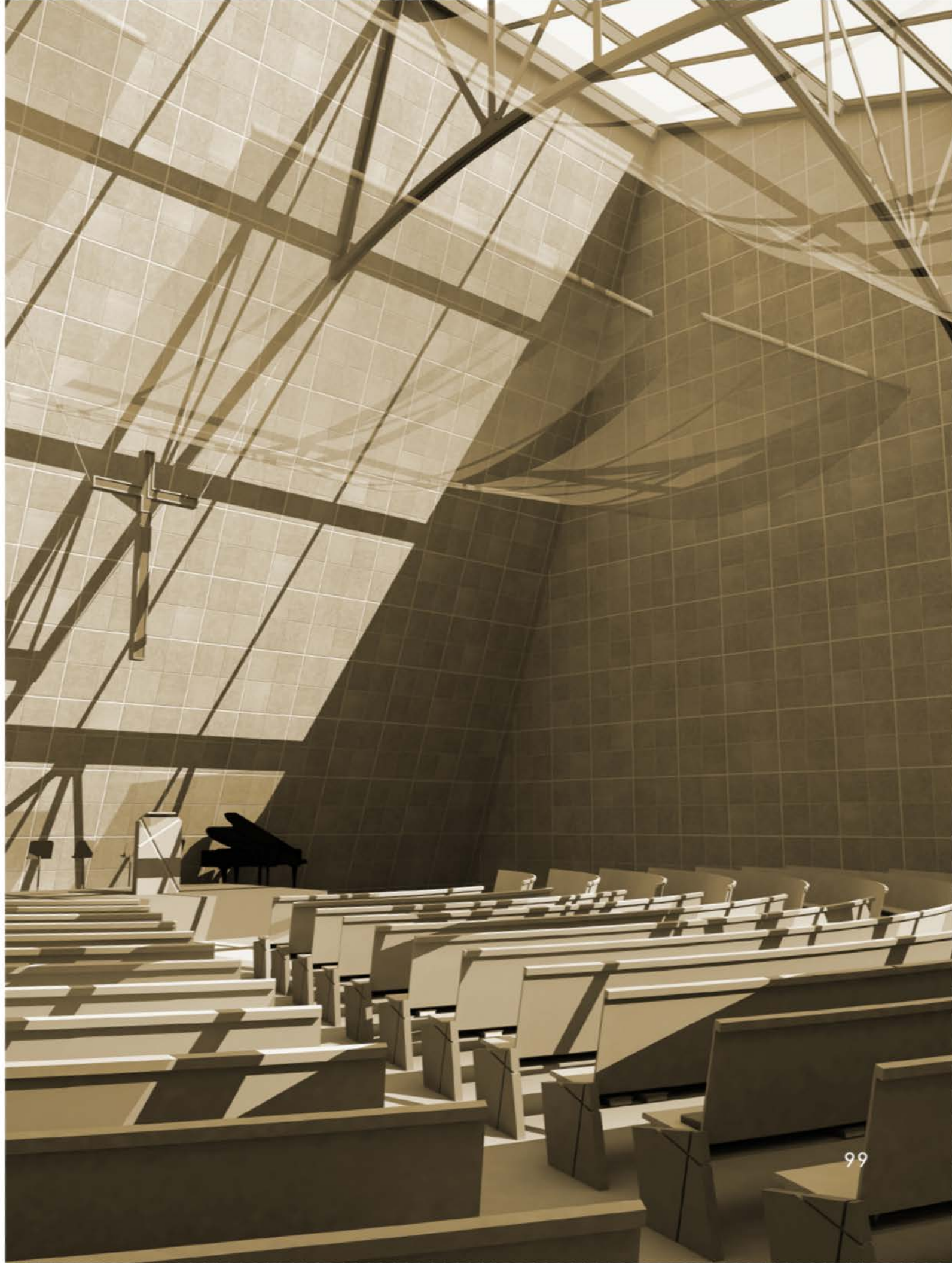
The seating was designed according to the performance space design criteria. Rows are spaced 36 inches apart in a radius-curved formation. Curved pews were designed for the sanctuary seating in order to maximize the seating capacity within the worship space. The shape of the seated area places maximum number of seats within the directional limits of the sound of the unaided voice, beneficial for speech performance.

The angle of vision and the angle of encounter are 130 degrees, which will allow the congregation to maintain eye contact with the pastor at all times, and keep them from experiencing natural sound communication deterioration.

Sliding Pews

The optimal seating arrangement for Sunday service has two aisles splitting the sanctuary into three separate sections. A specialized track system underneath the center section of pews allows them to slide freely in two positions. When a center aisle is required for a wedding or other special event, the sanctuary can be transformed to accommodate that particular situation.





■■■■ | Light

An integral piece in this design is the use of light in each room. The majority of design decisions were based upon the use of natural light. Rather than using detailed surfaces or artwork to decorate the interior of the building, light is used to accent walls and floors in the building.

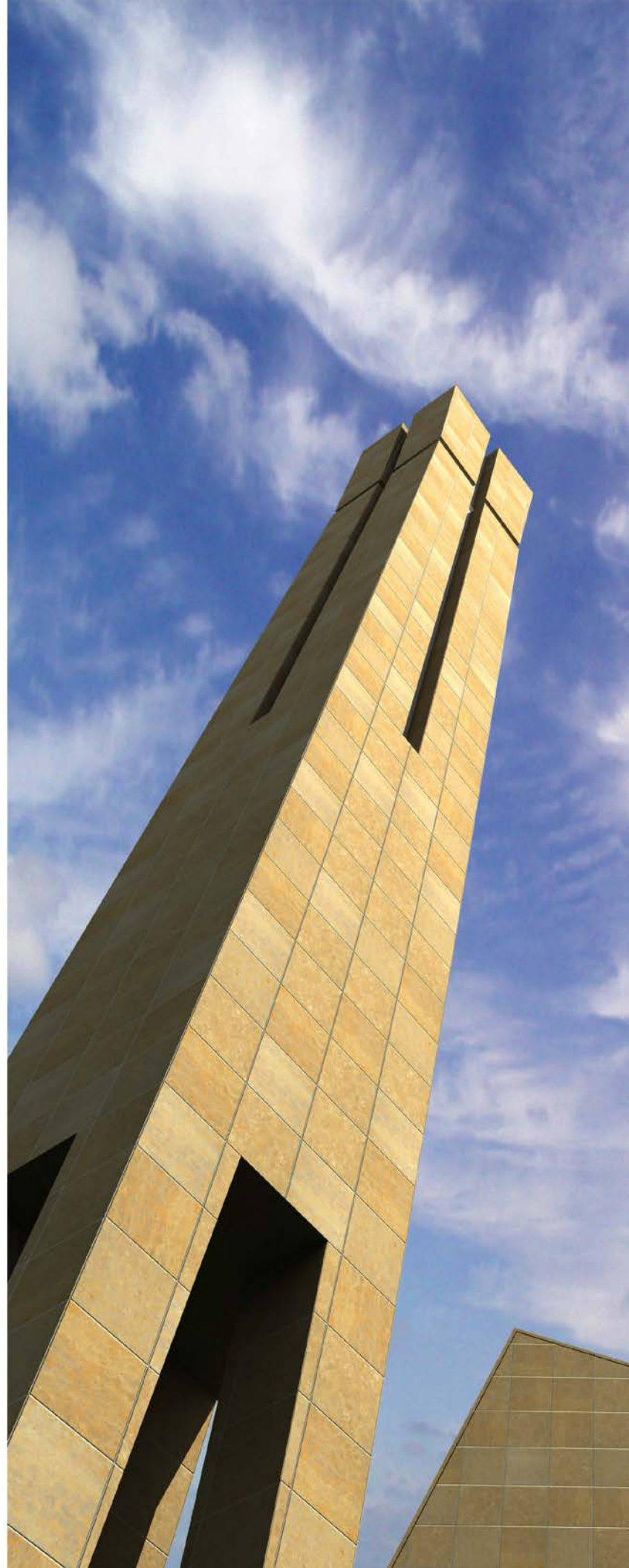
The hall was designed to take full advantage of the winter sun, using the awning to protect the space from receiving direct sunlight from May to August. The floor has lights that wash up the limestone walls of the sanctuary, and the ceiling has concealed lights that also highlight the top portion of the wall.

The education and administration wing optimizes the daylight through the use of a skylight in the central atrium, and two-foot square windows around the perimeter that flow within the grid of the exterior walls. The heights of the windows vary from room to room, allowing for various views for the students and children in the classrooms. The offices all take advantage of the north wall, allowing only daylight to fill the rooms in order to not disrupt their workstations.

The top portion of the sanctuary is comprised of skylight windows, streaming in the sunlight for the congregation. Because the pews face north, direct sunlight is not an issue. The limestone-clad walls produce intricate patterns of light as the sunlight filters through the glazing system and the trusses that soar overhead. The orientation of the building was designed according to the angles and azimuth of the sun from 10:00 to 11:30am on Sunday throughout the year, in order to optimize the light that penetrates into the building.

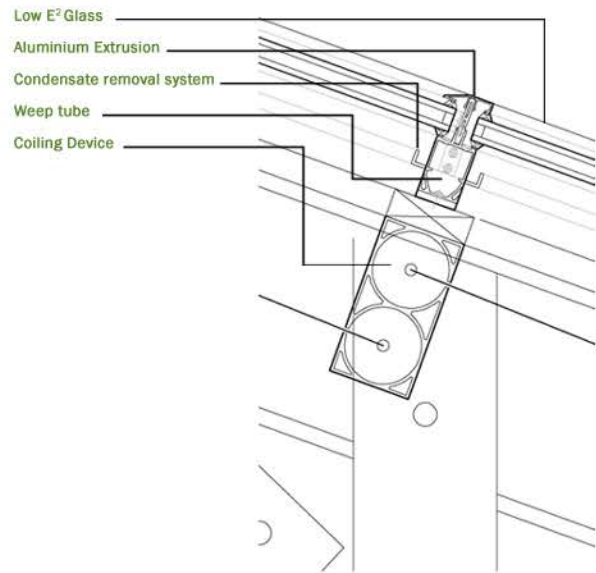
Glow From Above

The campanile serves as both a bell tower and a light tower for Common Ground Church. The structure extends past the trees of the surrounding site, serving as a beacon that can be recognized from a distance. At night, the tower emits a celestial glow over the church.

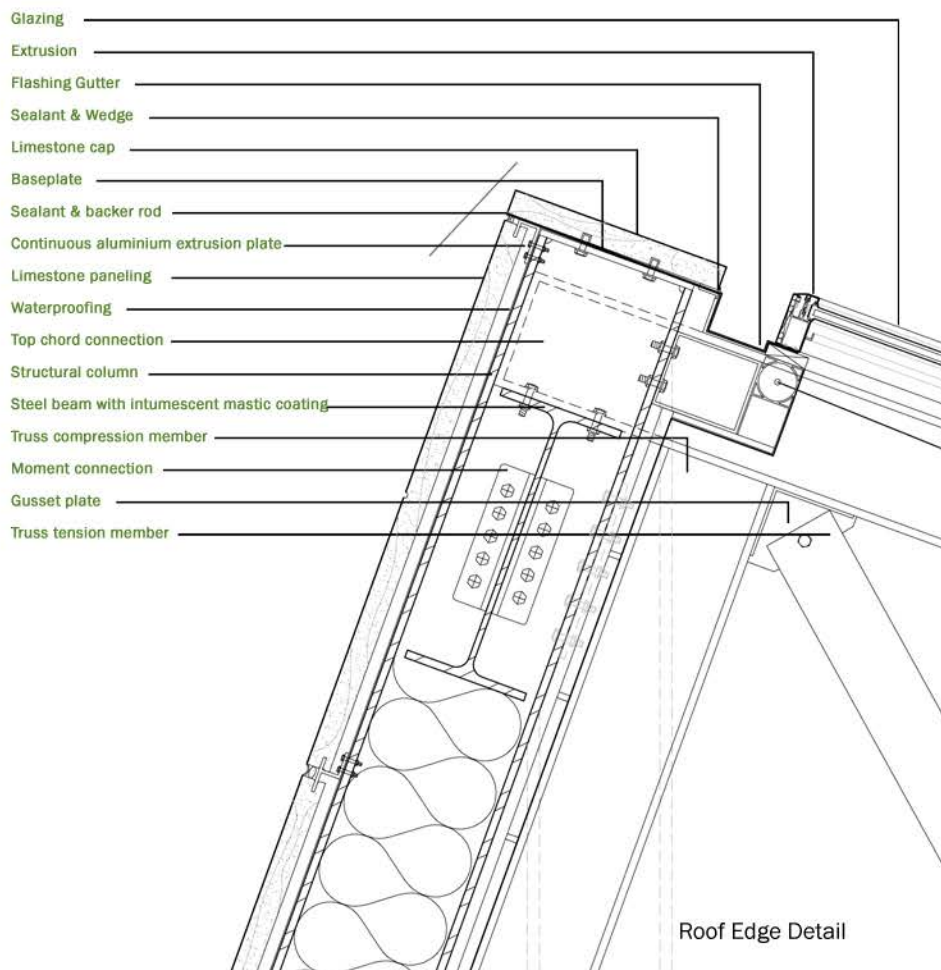


Sun Shade

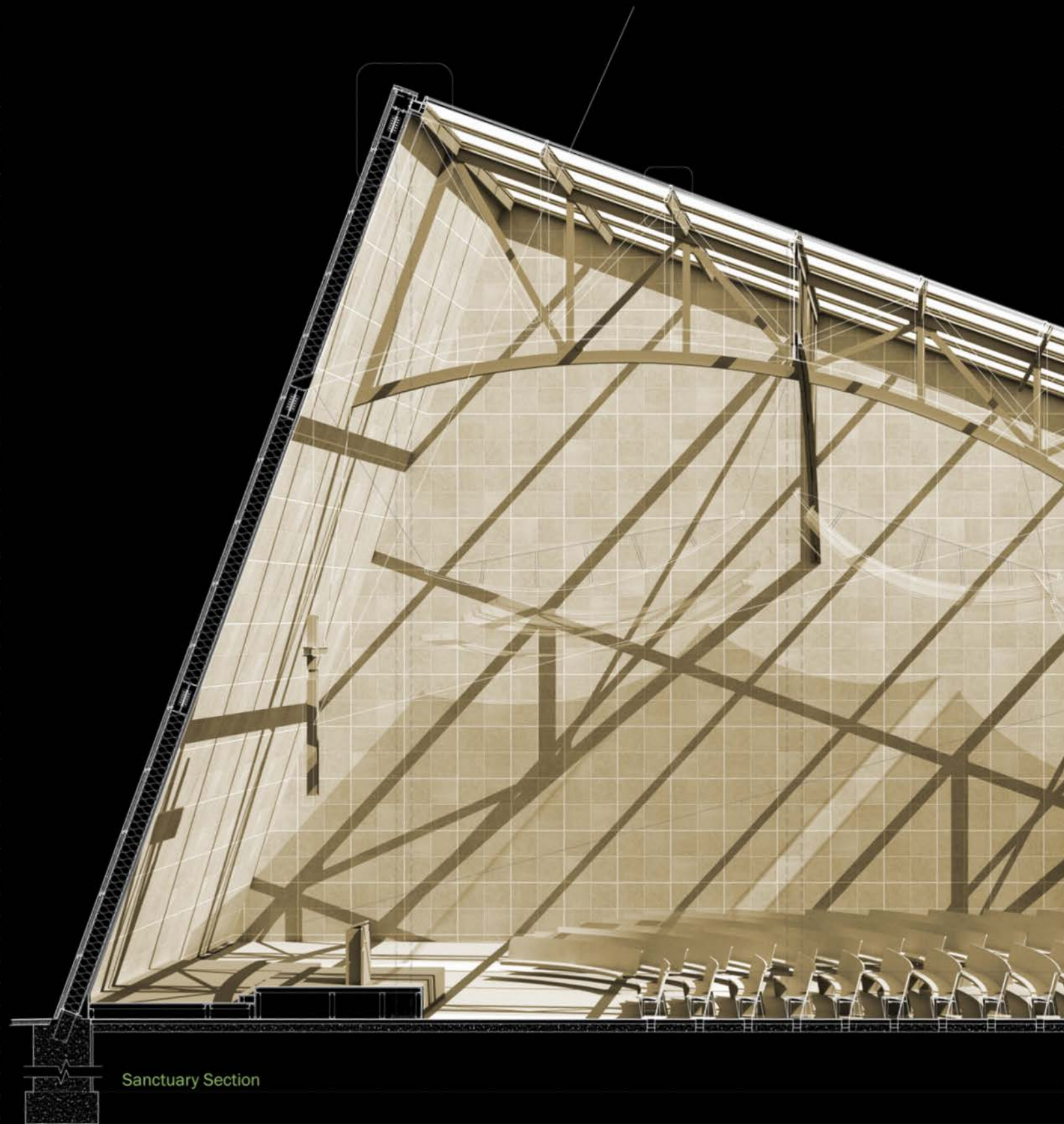
Using the sun tables and charts, the worship space is oriented to have a focal point on the cross resting above the altar. A rolling sun shading device is positioned beneath each mullion of the skylight structure of the sanctuary. Inside each piece is an eight-foot translucent film that is attached by wire on each side. Using a computer program with the pre-determined sun angle calculations, the sunshades can be controlled to only let in a single beam of light that is focused upon the cross for the duration of the service. The translucent film will still illuminate the sanctuary sufficiently, while the focused beam of sunlight will magnify the presence of God in the church.



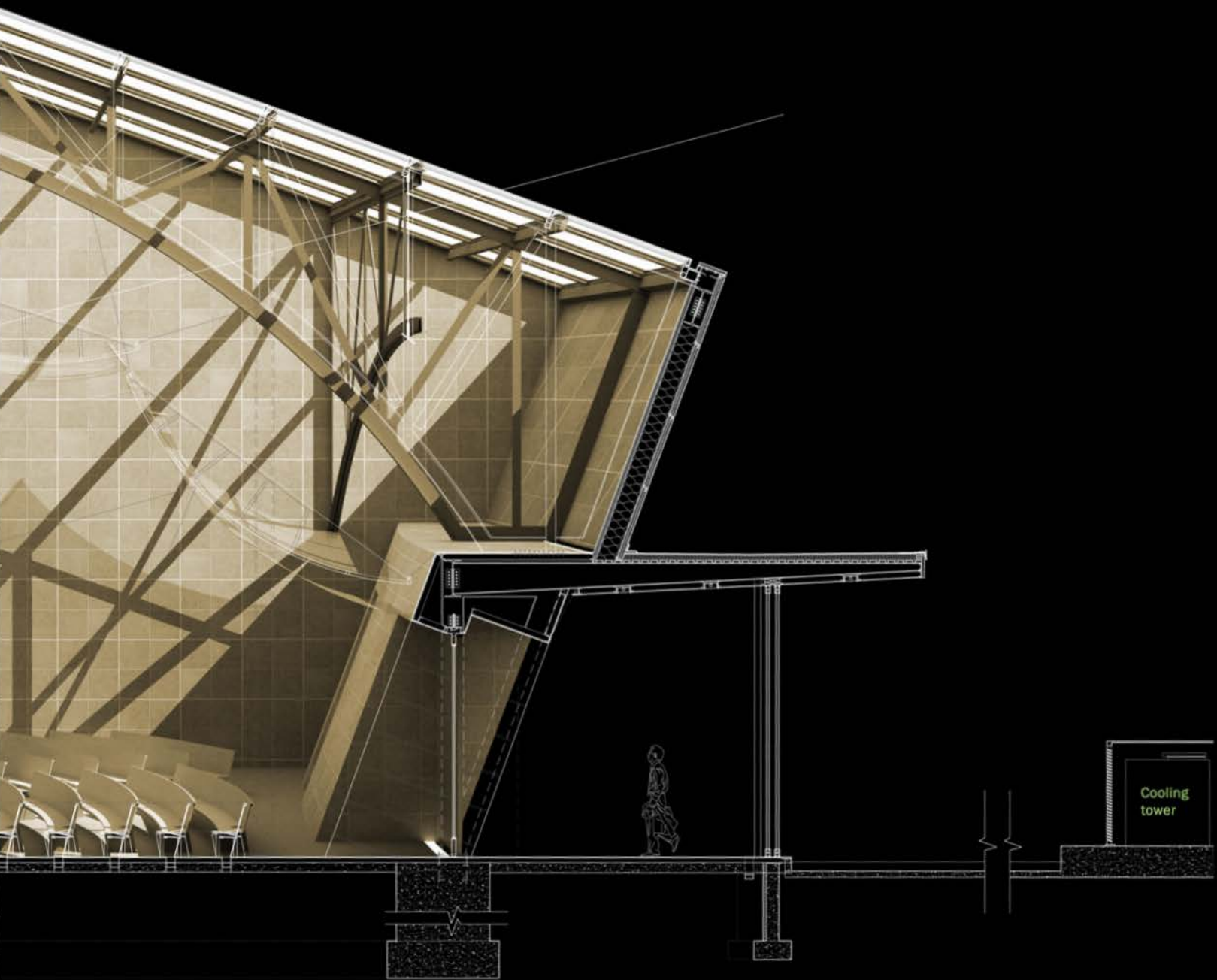
Sun Shading Detail



Roof Edge Detail



Sanctuary Section



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Appendix A:

The C&MA Doctrinal Statement

1. There is one God,(1) who is infinitely perfect,(2) existing eternally in three persons: Father, Son, and Holy Spirit.(3)

([1] Deuteronomy 6:4, [2] Matthew 5:48, [3] Matthew 28:19)

2. Jesus Christ is the true God and the true man.(4) He was conceived by the Holy Spirit and born of the virgin Mary.(5) He died upon the cross, the Just for the unjust,(6) as a substitutionary sacrifice,(7) and all who believe in Him are justified on the ground of His shed blood.(8) He arose from the dead according to the Scriptures.(9) He is now at the right hand of Majesty on high as our great High Priest.(10) He will come again to establish His kingdom, righteousness and peace.(11)

([4] Philippians 2:6-11, [5] Luke 1:34-38, [6] I Peter 3:18, [7] Hebrews 2:9, [8] Romans 5:9, [9] Acts 2:23-24, [10] Hebrews 8:1, [11] Matthew 26:64)

3. The Holy Spirit is a divine person,(12) sent to dwell, guide, teach, empower the believer,(13) and convince the world of sin, of righteousness, and of judgment.(14)

([12] John 14:15-18, [13] John 16:13, Acts 1:8, [14] John 16:7-11)

4. The Old and New Testaments, inerrant as originally given, were verbally inspired by God and are a complete revelation of His will for the salvation of men. They constitute the divine and only rule of Christian faith and practice.(15)

([15] 2 Peter 1:20-21, 2 Timothy 3:15-16)

5. Man was originally created in the image and likeness of God;(16) he fell through disobedience, incurring thereby both physical and spiritual death. All men are born with a sinful nature,(17) are separated from the life of God, and can be saved only through the atoning work of the Lord Jesus Christ.(18) The portion of the unrepentant and unbelieving is existence forever in conscious torment;(19) and that of the believer, in everlasting joy and bliss.(20)

([16] Genesis 1:27, [17] Romans 3:23, [18] 1 Corinthians 15:20-23, [19] Revelation 21:8, [20] Revelation 21:1-4)

6. Salvation has been provided through Jesus Christ for all men; and those who repent and believe in Him are born again of the Holy Spirit, receive the gift of eternal life, and become the children of God.(21)

([21] Titus 3:4-7)

7. It is the will of God that each believer should be filled with the Holy Spirit and be sanctified wholly,(22) being separated from sin and the world and fully dedicated to the will of God, thereby receiving power for holy living and effective service.(23) This is both a crisis and a progressive experience wrought in the life of the believer subsequent to conversion.(24)

([22] 1 Thessalonians 5:23, [23] Acts 1:8, [24] Romans 6:1-14)

8. Provision is made in the redemptive work of the Lord Jesus Christ for the healing of the mortal body.(25) Prayer for the sick and anointing with oil are taught in the Scriptures and are privileges for the Church in this present age.(26)
([25] Matthew 8:16-17, [26] James 5:13-16)

9. The Church consists of all those who believe on the Lord Jesus Christ, are redeemed through His blood, and are born again of the Holy Spirit. Christ is the Head of the Body, the Church, (27) which has been commissioned by Him to go into all the world as a witness, preaching the gospel to all nations.(28) The local church is a body of believers in Christ who are joined together for the worship of God, for edification through the Word of God, for prayer, fellowship, the proclamation of the gospel, and observance of the ordinances of Baptism and the Lord's Supper.(29)
([27] Ephesians 1:22-23, [28] Matthew 28:19-20, [29] Acts 2:41-47)

10. There shall be a bodily resurrection of the just and of the unjust; for the former, a resurrection unto life;(30) for the latter, a resurrection unto judgment.(31)
([30] 1 Corinthians 15:20-23, [31] John 5:28-29)

11. The second coming of the Lord Jesus Christ is imminent(32) and will be personal, visible, and premillennial.(33) This is the believer's blessed hope and is a vital truth which is an incentive to holy living and faithful service.(34)
([32] Hebrews 10:37, [33] Luke 21:27, [34] Titus 2:11-14)

<http://www.cmalliance.org/whoweare/doctrine.jsp>

Appendix B

Statement of Intent

Color, Form, Sound, & Light

A New Religious Building for Common Ground Church in Lake Elmo, Minnesota

Lake Elmo, Minnesota is where I grew up. Despite the constant commercial growth surrounding this city, it has maintained a warm rural feel. However, over the past ten years, the development that has occurred has not improved the aesthetic quality within Lake Elmo. Leaving Lake Elmo on a main highway toward St. Paul, you pass a one-story masonry building surrounded by fields and gardens with little character and even less definition. This is Common Ground Church. This non-descript building does not portray the vibrant faith and worship of the Christian Missionary Alliance congregation that makes up the church of Common Ground.

My thesis proposal is to design a new building for Common Ground Church. Pastor Gary Johnson is my client. The new building will create ample space for the current congregation, also allowing future growth for their church community. I propose a sanctuary space, a lobby used for gathering and entering the building, classrooms, church offices, a large kitchen, and a fellowship hall. The theoretical premise of the project is that form, color, sound, and light can inspire human emotions toward a higher level of worship. I want the building's design to evoke full congregational participation during worship, as well as provide excitement and encouragement to each member. The scale of this project gives me opportunity to develop fully the interior design, including thorough lighting and acoustical analysis. Furthermore, it will allow me take a step toward beautifying Lake Elmo.

Proposal

Color, Form, Sound, & Light

A New Religious Building for Common Ground Church in Lake Elmo, Minnesota

Conceptual Basis or Unifying Idea

Commonly, the word church is most often associated with Christians, and the word 'church' is both defined as the building for worship, as well as the congregation. The building is a space used to worship and build a relationship with God. Architectural design does not have the ability to create that

relationship with God. However, a well-designed religious building can contribute to the experience that the congregation has during worship.

The conceptual basis is that color, form, sound, and light can stir human emotions toward a higher level of worship. Our perceptual response to these factors in our surrounding built environment can influence our psychological and physiological well-being. I plan to use these four factors as the design tool for the new religious building.

Project Justification

Common Ground Church is currently a small masonry building surrounded by trees, prairie land, and a busy highway. It is most often confused for a small office building, because it is nothing more than a single story block with punched-in windows and a clerestory. The building not only fails to represent a church, or what we perceive to be a church, but it also fails to meet the needs of the congregation and pastoral staff. The new religious building will portray the vibrant faith and worship of the Christian Missionary Alliance congregation that makes up the church of Common Ground. It will serve as a place of worship, celebration, and education. It will also create adequate space for the current parishioners, and allow for future growth for this church community.

I. User / Client Description

- Pastor Gary Johnson
 - Main client
 - Founder of the church
 - Runs all major operations of the building
- Assistant Pastor
- Secretary
- Worship Team
 - Ten members of the congregation that lead worship music during the service
 - Require adequate performance space for a variety of musical instruments
- Congregation
 - Two hundred people
 - Attends service on Sunday
 - Regularly cleans and maintains the building during the week
 - Uses building for
 - Worship
 - Bible study
 - Celebrations
 - Social events
- During summer, service generally peaks at 150 people Sunday morning.
- The rest of the year has about 180 people Sunday morning.
- Parking requirements include 125 parking spots, which would include congregation members and visiting spaces

II. Major Project Elements

The three major functions of the church will be worship, celebration, and education.

The spaces will include:

- Main Entrance
- Sanctuary
- Church Offices
- Pastoral Study
- Library
- Classrooms
- Fellowship Hall
- Kitchen
- Restrooms

- Mechanical / Electrical
- Storage
- Parking

III. Site Information

- **Economic Base** - Lake Elmo is an upper middle class town east of the Twin Cities metro area. The area is comprised mainly of residential development and open rural land. All surrounding suburbs provide the essential commercial needs for the city, allowing it to maintain the small town character.
- **Demographics** - Lake Elmo has a population of 7,507, a median age of 34.4, and an average family size of 2.88 people. Almost three out of four homes are married households with a median income of \$78,000. Forty percent of the city has a college or higher education, and Ninety-five percent of the city is Caucasian.
- **History** - Lake Elmo originated as a resort stop for the wealthy individuals of St. Paul. It started out as Bass Lake Village, a small village on a stagecoach trail between Stillwater and St. Paul in the late 1800's. In 1900, it began developing stores and offices, and it became incorporated in 1925 as a substantial shipping point and dairy village. In 1969, Lake Elmo officially became a city when it split from an existing township with Oakdale. The site was farmland until 1978, and then purchased as a three-parcel lot. Construction began on the Lake Elmo Baptist Church in 1979, and Common Ground Church purchased the land and existing building in 2000.
- **Environmental Issues** - The macroclimate of Lake Elmo is cool, with mild summers and cold winters. Summer temperatures range from 60.3 and 83.1 degrees, and winters ranging from 3.6 and 23.9 degrees, on average. It has an average of 32.6 inches of rain a year.
- **Site Area** - The three parcels total 13 acres divided by a small street.
- **Specific Location** - The site is 5.3 miles east of 694. Three streets surround the site - Hwy 5 to the south, Kelvin Ave in the middle, and Stillwater Lane to the north and east.
- **Major Landmarks** - The Imation Headquarters is west of the site on Highway 5, downtown Lake Elmo is one half mile east, and Sunfish Park & Lake are directly north of the site. The most notable landmark of the city is Lake Elmo, directly south of the site.
- **Site Topography** - The two parcels of land west of Kelvin Ave are relatively flat, with minor drainage contours forming the only elevation changes of the site. The single parcel to the east of Kelvin Ave is a retention pond.
- **Vegetation** - The sites has an abundance of trees, with younger trees serving as parking shade devices to the south, and mature trees forming walls to the north and west of the site. Gardeners maintain a large vegetable garden to the west of the existing parking lot.
- **Transportation Links** - The main transportation is highway 5, which serves as one of the two main highways between Stillwater and the St. Paul Suburbs. Traffic remains constant the entire day, heading east & west.
- **Views** - Besides the highway, nature surrounds the site. Sunfish Lake is to the Northeast of the Site, and to the South are rolling valleys of trees and wild grass.
- **Solar Orientation** - The site maintains major south exposure to the sun year round, with few trees serving as the only shading devices.
- **Winds** - The wind comes from the northwest during the winter months, and the southeast during the summertime.
- **Existing Structures** - The existing church is a compact building of 6800 square feet. The parking lot currently holds space for 104 automobiles.
- **Acoustic Environment** - Automobiles on Highway 5 serve as noise pollution to the site.

IV. Project Emphasis

The main project emphasis of the new religious building is the four perceptual foci – color, form, sound and light. These individual perceptions carry different associative, symbolic, emotional, and physiological cues, both conscious and unconscious. Utilizing the best combinations of the four, Common Ground Church will develop based upon my understanding of how the human psyche perceives each focus. Along with those four principles in every step of the design, three other major points of the project are important for a successful solution.

First, I intend on providing a religious building that upholds the mission statement of Common Ground Church and the Christian Missionary Alliance denomination. This involves studying the doctrine of the denomination, and understanding the individual mission statement for the church. The beliefs and values of a church is what define the congregation, so it should also help define the space that houses the congregation.

Second, I will create an identity for Common Ground church that will not only stir the emotions of the current congregation, but also develop interest for those who are not a part of the church. A dynamic form that expresses a religious structure as an aid for a fulfilling worship experience and conveys a strong community at the heart will accomplish this.

Finally, all issues of the project will consider sustainable design. Creating an efficient and effective environment for a religious building includes renewable resources for energy, earth-friendly materials, natural lighting considerations, and passive heating and cooling systems.

V. Plan for Proceeding

Definition of Research Direction

In order to move forward, I must immerse myself with the individual subjects of perception. Studying various research documents on human response to each factor is the primary step. Basic design principles for lighting and sound from an architectural standpoint are also important. Case studies for churches will help establish what has been designed for this particular typology.

Describe Design Methodology

Reviewing case studies varying from theater design to modern churches will discover overall successes and failures in one or more of the perceptual subjects. Books, journals and internet sites on the psychological study of color perception, lighting effects, and acoustics will further my knowledge on how to design the new church. Trying to find case studies that have a similar conceptual basis will benefit the most in the development of my design solution.

Documentation of the Design Process

The majority of the design process entails a sketchbook and computer generated models. Sketching will record every consideration made, and the free flowing nature of sketching will not limit the imagination of the design process. Further along in the project, computer generated models will explore spatial relationships and evaluate issues such as the human scale of the project. Recording all valuable information will allow me to reference all knowledge gained in the research and design process of the project.

Schedule of Work

T	October 5	Thesis faculty preference slips available
R	October 7	Thesis Proposal Due
F	October 8	Research for Program – Perception
M	October 11	Research for Program – Perception
R	October 14	Faculty preference slips due
M	October 18	Research for Program – Case Studies
R	October 21	Primary and Secondary Critics announced
M	October 25	Research for Program – Case Studies & Site Information
R	October 28	Last day in Arch 561
M	November 1	Research for Program – Site Information
M	November 8	Organize Research
R	November 11	Veterans’ Day Holiday

M	November 15	571 U.S. Supreme Court Building Due
W	November 17	Collaborate Research
F	November 19	Last day in Arch 571
M	November 22	Collaborate Research
W	November 24	Draft Thesis Program due to Primary
F	November 26	Thanksgiving Holiday
M	November 29	Refine Program
M	December 6	Refine Program
Th	December 9	Final Thesis Program due to Primary
F	December 10	Last day of classes
M	December 13	Research
W	December 15	Finals week
M	December 20	Research
F	December 24	Christmas Eve Holiday
M	December 27	Research
M	January 3	Research
T	January 11	Classes Begin
W	January 12	Conceptual & Schematic Design
F	January 14	Begin Weekly Reviews w/ primary & secondary
M	January 17	Martin Luther King, Jr. Holiday
W	January 19	Conceptual & Schematic Design
M	January 24	Weekly Review primary
W	January 26	Conceptual & Schematic Design
M	January 31	Weekly Review primary & secondary
W	February 2	Conceptual & Schematic Design
M	February 7	Weekly Review primary
W	February 9	Finish Conceptual & Schematic Design
F	February 11	Design Development
M	February 14	Weekly Review primary & secondary
W	February 16	Design Development
M	February 21	President's Day Holiday
W	February 23	Weekly Review primary
F	February 25	Design Development
M	February 28	Weekly Review primary & secondary
W	March 2	Design Development
M	March 7	Weekly Review primary
W	March 9	Mid Semester Thesis Reviews
F	March 11	Presentation Drawings & Model
M	March 14	Spring Break

M	March 21	Weekly Review primary & secondary
W	March 23	Presentation Drawings & Model
F	March 25	Easter Holiday
M	March 28	Easter Holiday
W	March 30	Weekly Review primary
F	April 1	Presentation Drawings & Model
M	April 4	Weekly Review primary & secondary
W	April 6	Presentation Drawings & Model
M	April 11	Weekly Review primary
W	April 13	Begin Final Presentation Material
M	April 18	Weekly Review primary & secondary
W	April 20	Finish Presentation Boards
F	April 22	Begin Final Display
M	April 25	Thesis Projects due at 4:30pm - Memorial Union Ballroom
R	April 28	Final Thesis Reviews
F	April 29	Draft of Final Thesis Document Due to Primary Critic
M	May 2	Revise Final Thesis Document
F	May 6	Last Day of Classes
R	May 12	Final Thesis Document due at 4:30 in the department office
F	May 13	Commencements at 4:00pm in Fargodome

Experience

2nd Year Fall 2001

Vince Hatlen

Spatial Form Studies	N/A
Nativity Elementary School	Fargo, ND

2nd Year Spring 2002

Milt Yergens

Lofty Intentions Design Studio and Lofts	Fargo, ND
ADA Salem Lutheran Church Remodel	Hiterdahl, MN
New Hiterdahl Church	Hiterdahl, MN
Lachine Canal Footbridge Charette	Montreal, Canada

3rd Year Fall 2002

Carol Prafcke

Ronald McDonald House	Fargo, ND
John Deere Implement Dealership	Fargo, ND

3rd Year Spring 2003

Steve Martens

Fluid Motion Wellness Center	Fargo, ND
NDSU Student Memorial Union	Fargo, ND

4th Year Fall 2003

Cindy Urness, Mark Barnhouse, and Brian Dougan

Master Planning of Downtown Fargo	Fargo, ND
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4th Year Spring 2004

Don Faulkners

Marvin Windows Competition
Excelsior Building – Skyscraper
Kite Design

Fargo, ND
San Francisco, CA
N/A

5th Year Fall 2004

Jay Waronker

Olympic Charette
U.S. Supreme Court Building

Athens, Greece
Washington, D.C.

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Figure Captions

Figure 1.1 – Stair Perspective for Common Ground Church. Cain, J. D. (2005).

Figure 1.2 – Campanile for Common Ground Church. Cain, J. D. (2005).

Figure 2.1 – Aerial map of Lake Elmo, Minnesota. Terraserver. Retrieved November 21, 2004 from the World Wide Web: <http://www.terraserver.microsoft.com>. Color mapping by Cain, J. D. (2004).

Figure 2.2 – Night Exterior of Common Ground Church. Cain, J. D. (2005).

Figure 2.3 – Christian Missionary & Alliance Logo. Christian Missionary & Alliance Logo. Retrieved December 1, 2004 from the World Wide Web: <http://www.cmalliance.org/whoweare/newlogo.jsp>

Figure 2.4 – Exterior Photograph of First Baptist Church. First Baptist Church. (1979). Process: Architecture, No. 11, 33.

Figure 2.5 – Vineyard and Loium Visitor Center. Loium Visitor Center Web Site. Retrieved November 21, 2004 from the World Wide Web: http://www.loium.at/navigation/powerslave.id.22.nodeid.22_language.de.html

Figure 2.6 – Visible Light / Color Diagram. Yahoo Image Search. Retrieved November 28, 2004 from

the World Wide Web: http://www-class.unl.edu/chem/HTML/lecture_syllabus/lecture_16_summary/light_electromagnetic.htm

Figure 2.7 – Entrance Perspective of Common Ground Church. Cain, J. D. (2005).

Figure 2.8 – Hall Perspective of Common Ground Church. Cain, J. D. (2005).

Figure 2.9 – Color Wheel. Cain, J. D. (2004).

Figure 2.10 – Campanile for Common Ground Church. Cain, J. D. (2005).

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Figure 3.3 – Night Perspective of Common Ground Church. Cain, J. D. (2005).

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Figure 4.1.2 – First Floor Plan of First Baptist Church. First Baptist Church. (1979). Process: Architecture, No. 11, 33.

Figure 4.1.3 – Second Floor Plan of First Baptist Church. First Baptist Church. (1979). Process: Architecture, No. 11, 33.

Figure 4.1.4 - Interior Photograph of First Baptist Church. Lam, W. M. C. (1977). Perception and Lighting as Formgivers for Architecture. New York: McGraw-Hill, 111.

Figure 4.1.5 – Courtyard Photograph of First Baptist Church. First Baptist Church. (1979). Process: Architecture, No. 11, 35.

Figure 4.1.6 – Sanctuary Photograph of First Baptist Church. First Baptist Church. (1979). Process: Architecture, No. 11, 34.

Figure 4.1.7 – Exterior Photograph of First Baptist Church. Korab, B. (1989). Columbus Indiana. South Bend: Mossber & Company, Inc.

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Figure 4.2.2 – Interior Photo of St. Mary's Catholic Church. DJC Architects, Ltd. Retrieved December 2, 2004 from the World Wide Web: <http://www.djcarchitect.com/Page1.html>

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- Figure 4.3.4 – First Floor Plan of Galvin Family Chapel. Crosbie, M. J. (1999). Architecture for the Gods. Australia: The Images Publishing Group, 57.
- Figure 4.3.5 – Interior Photo of Galvin Family Chapel. Crosbie, M. J. (1999). Architecture for the Gods. Australia: The Images Publishing Group, 60.
- Figure 4.3.6 – Exterior Photo of Galvin Family Chapel. Crosbie, M. J. (1999). Architecture for the Gods. Australia: The Images Publishing Group, 57.
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- Figure 4.5.3 – Exterior Photo of First Unitarian Church. Bryan Mawer Photography. Retrieved December 1, 2004 from the World Wide Web: <http://www.brynmawr.edu/Acads/Cities/imgb/imgb3/212b.jpg>
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- Figure 4.7.2 – Exterior Photo of Hartford Seminary. Meier, R. (1984). Richard Meier, Architect. New York: Rizzoli, 249.
- Figure 4.7.3 – Ground Level Plan of Hartford Seminary. Meier, R. (1984). Richard Meier, Architect.

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Figure 4.7.4 – Interior Photo of Hartford Seminary. Meier, R. (1984). Richard Meier, Architect. New York: Rizzoli, 258.

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Figure 4.11.3 – Section of Loium Visitor Center. Lefaivre, L. (2004, July). Loium Visitors' Center. Architectural Record, Vol. 192, No. 7, 117.

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Figure 4.12.5 – Lobby Level Plan of Walt Disney Concert Hall. Russel, J.S. (2003, November).
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Figure 4.12.6 – Concert Hall Photo at Walt Disney Concert Hall. Russel, J.S. (2003, November).
Walt Disney Concert Hall. Architectural Record, Vol. 191 No. 11, 144.

Figure 4.12.7 – Interior Lounge of Walt Disney Concert Hall. Russel, J.S. (2003, November).
Walt Disney Concert Hall. Architectural Record, Vol. 191 No. 11, 151.



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