

Timothy C. Owen

**Screen**

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

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Two primary ideas drove the design of this church, sited at a Christian camping and retreat center in southwest Pennsylvania. The control of light entering the building is realized through a double layer of screens which form the exterior walls of the building and the walls of the sanctuary inside. These screens are the result of rigorous experimentation to maximize daylight and reduce glare in the space. The second main idea centers around the treatment of the overhead plane. Unified as a screen, curvilinear sheets of fabric are lit by openings in the roof to create sinuous bands of light that define the overhead plane and draw the eye upward. The primary design of these curves continue to define smaller elements in the church.

As a secondary concern, the site links the church to the camp proper. A curving approach dips into the earth to obscure views of the church just until the visitor approaches the final court that leads to the building entrance. It is only when the person enters the sanctuary do they realize how the exterior and interior screens control the sunlight to illuminate a worship space that is flexible enough to both meet the needs of the camp and allow for future evolution of the liturgy.



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“We would worship with difficulty without buildings;  
often we worship with difficulty *because* of them.”

- Edwin Heathcote



## Introduction

The control of light, the materiality of the interior, the treatment of the entrance, the proportions of the space - all of these things can influence the worship experience in a church. This thesis is about the control of light, the treatment of the overhead plane, and the site of the church, but it is also a reflection on how we worship.

All that happens in worship depends on God, but it occurs through the instruments of human speech and the human body (White, 2000). The fundamentals of the Christian liturgy, the passing of the sacraments by hand and the passing of God's word through speech and music, remain much the same as they were when the church was founded, but the manner in which those functions are carried out has changed.

This church is, in part, a reaction to the need for flexibility in accommodating this new approach to the liturgy, and its design is a conscious reflection of the primary need of a church to provide the setting and shelter needed by a community of believers to carry out their worship of God.

## Screen Research

While controlling light is necessary in buildings, how that light is controlled takes many forms. This building controls light through two screens in series, exterior and interior. An attempt was made to qualitatively and quantitatively test several screen designs in order to find the combination that would allow daylighting to effectively light the space while reducing the glare from the exterior.

After reading several studies on glare reduction and daylighting, it was hypothesized that a double screen system could produce the desired condition. While a single screen can reduce glare by diffusing the light entering the space, any view of the zenith of the sky where the luminance is the highest will still cause occupant discomfort.

The second screen mitigates these effects by adding another diffusing surface after the light rays enter the space through the primary screen. While the external hallway would be bright, the sanctuary space would have the best lighting condition possible; maximum daylight penetration with minimal glare because the view of the exterior wall is obscured. While it should be noted that reducing sky glare by the use of vertical fins is not a new solution (Hopkinson, 1972), the use of a secondary screen has few precedents. It was the aim of this study to discern whether this system was viable for daylighting.





## Methodology

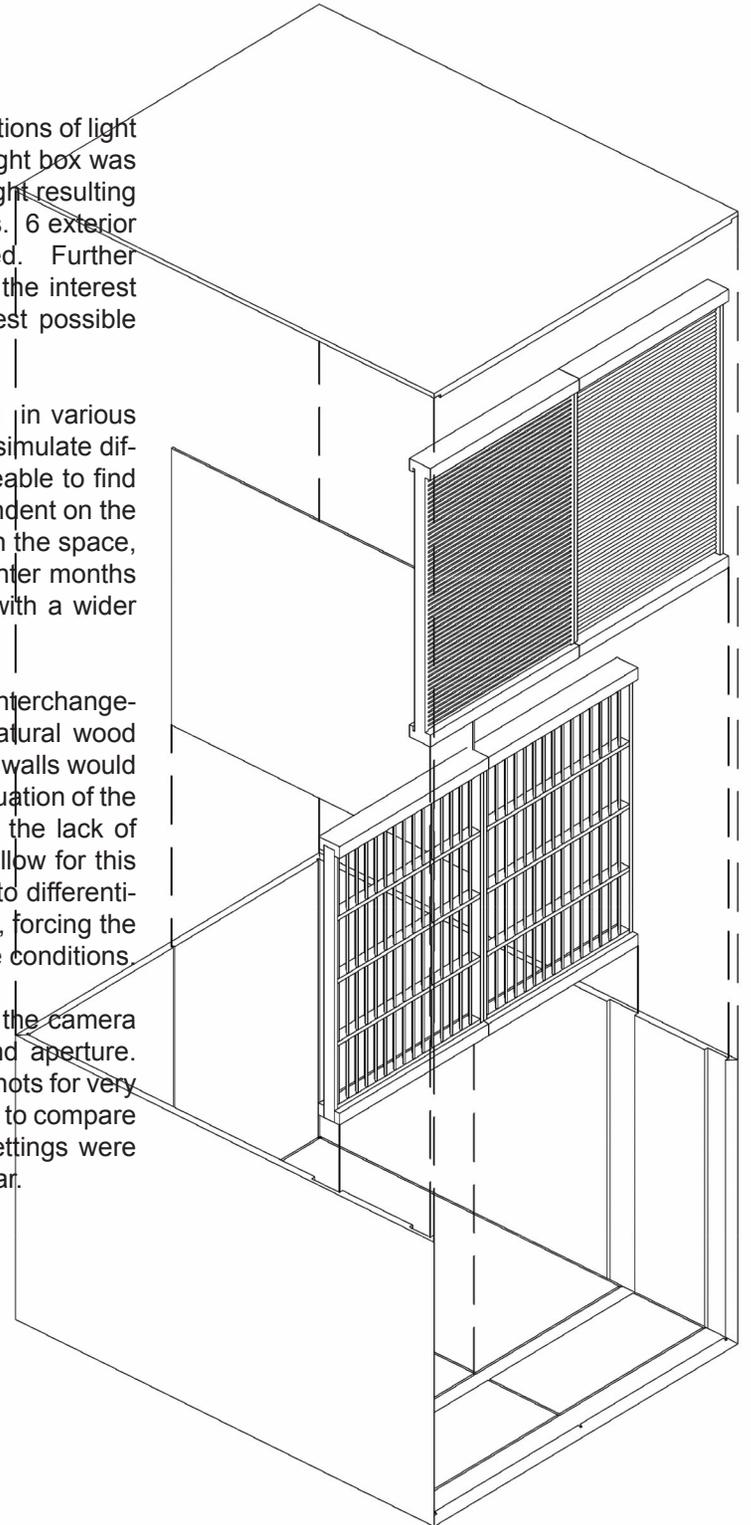
In order to accurately predict the conditions of light passing through the screens, a light-tight box was designed in order to photograph the light resulting from different combinations of screens. 6 exterior and 2 interior screens were designed. Further combinations were thought of, but in the interest of time, eight were chosen as the best possible solutions.

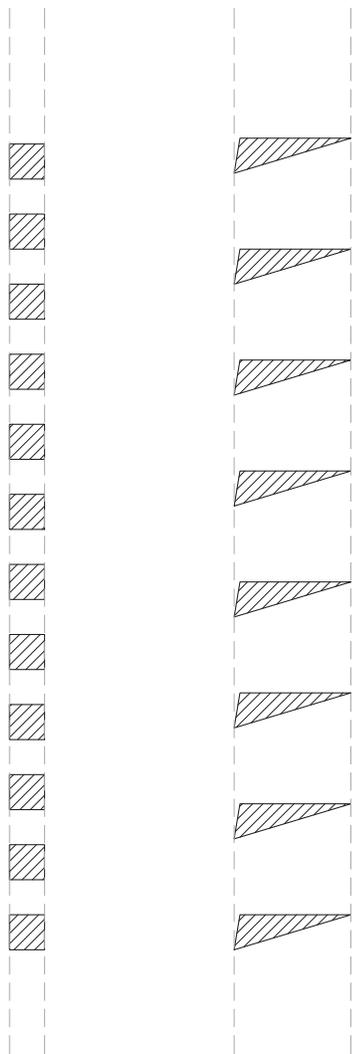
The screens were then photographed in various combinations, using a tiltable table to simulate different times of the year. It was desirable to find out how the different sun angles dependent on the seasons affected the amount of light in the space, i.e. would the low sun angle of the winter months create excessive glare in the space with a wider spaced exterior screen?



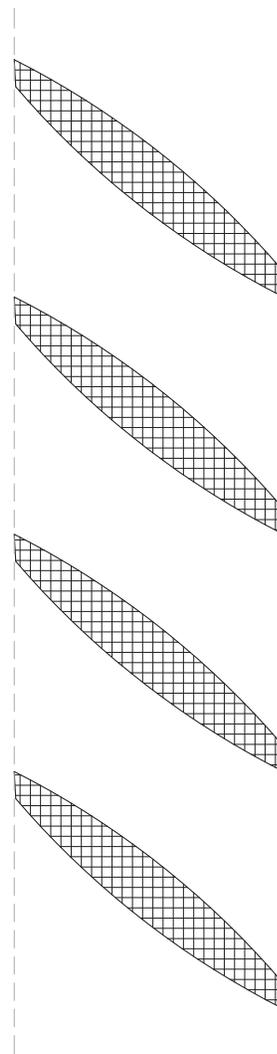
It was originally planned to have an interchangeable interior wall system with both natural wood walls and white walls. While the white walls would have allowed for a more objective evaluation of the light conditions inside the box due to the lack of wood grain, time constraints did not allow for this modification. As a result, it was hard to differentiate between similar lighting conditions, forcing the evaluation to be based on the extreme conditions.

To ensure a non-altered level of light, the camera was set at a single shutter speed and aperture. However, this proved detrimental, as shots for very low light levels were almost impossible to compare to others, so two separate camera settings were used based on the time of day and year.





Exterior Screen - Vertical Section



Sanctuary Screen - Horizontal Section



Methodology continued...

The screens were constructed at a 1 inch = 1 foot scale. All of the screens were constructed out of wood and cardboard. 3 in. square and circular cross-sections made two screens and a 3 in. x 10 in. right triangle cross-section made the last. Two screens of each were made, at 3 in. and 6.5 in. scale spacing. The interior screens were constructed with rows of horizontal or vertical slats rotated at a 38 deg. angle.

All of the exterior slats were treated with 2 coats of polyurethane to give them a higher degree of reflectivity, which would assist in bouncing light into the space. In addition, the triangular cross-section slats were painted white on the top surface to further enhance the light diffuses into the space. The interior screens were painted white on all faces. By decreasing the contrast between the screens and the sky condition, further glare reduction would result (Hopkinson, 1972).



March 21, 8am

Exterior: Square, 6 in.  
Interior: Horizontal



March 21, 12pm



March 21, 3pm



March 21, 5pm



March 21, 8am

Exterior: Square, 6 in.  
Interior: Vertical



March 21, 12pm



March 21, 5pm



October 22, 12pm

Exterior: Triangular, 3in.  
Interior: Vertical



March 21, 8am

Exterior: Square, 3 in.  
Interior: Vertical



March 21, 12pm



March 21, 5pm



October 22, 12pm

Exterior: Triangular, 6.5in.  
Interior: Vertical



December 21, 12pm

Exterior: Triangular, 6.5in.  
Interior: Vertical



December 21, 12pm

Exterior: Triangular, 3in.  
Interior: Vertical



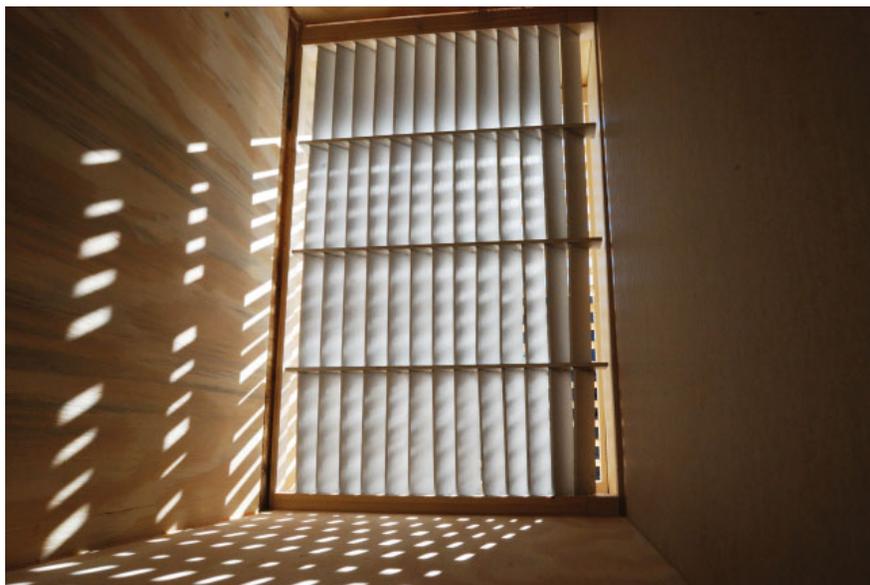
March 21, 8am

Exterior: Triangular, 6.5in.  
Interior: Vertical



March 21, 8am

Exterior: Triangular, 3in.  
Interior: Vertical



Triangular Cross Section, 6.5in spacing, Vertical Interior  
January 21, noon



Triangular Cross Section, 3in spacing, Vertical Interior  
January 21, noon

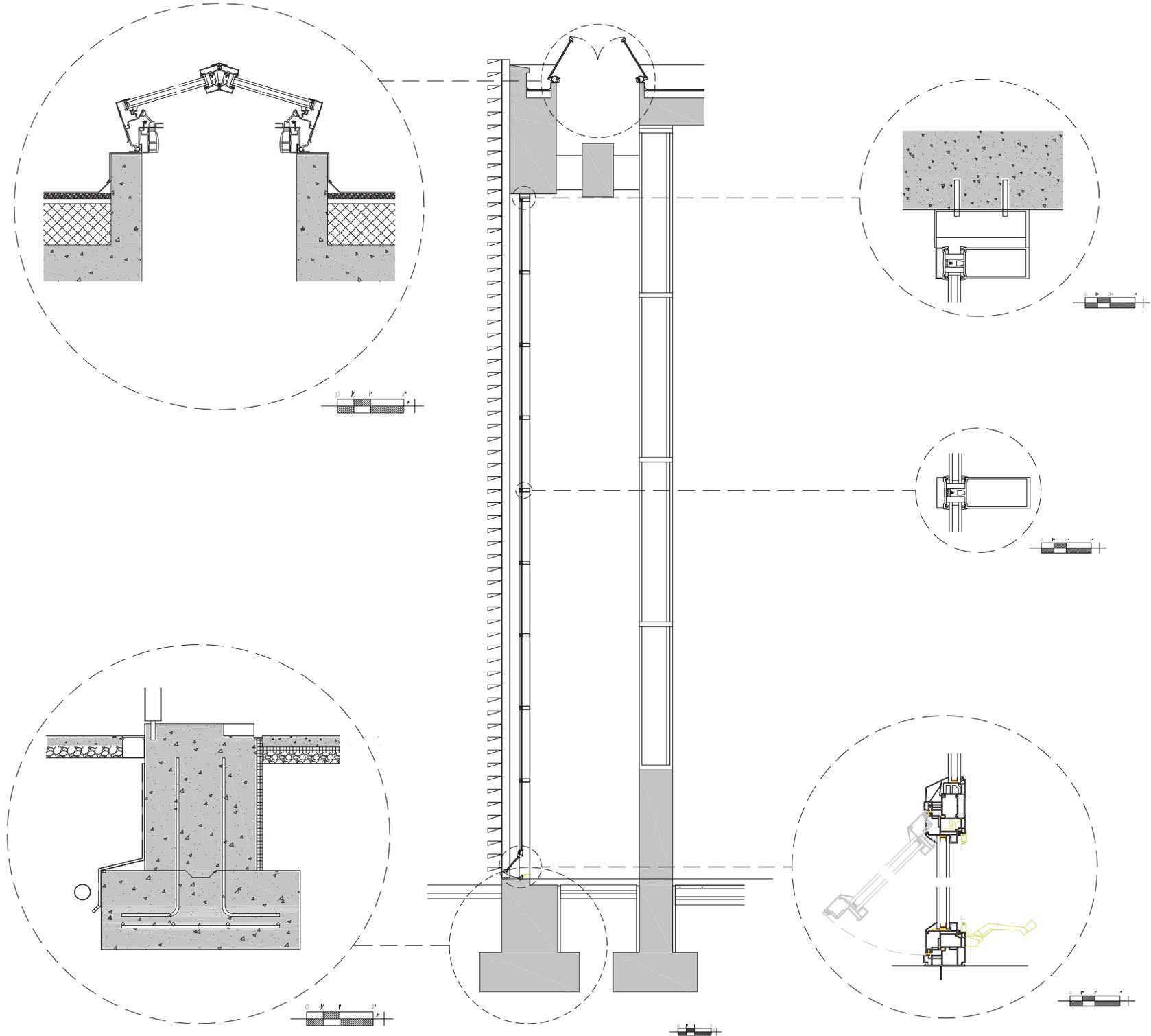
## Results and Conclusions

As was suspected at the beginning of the experiment, the use of a double layer of screens mediated the effects of harsh glare in the space by obscuring the view of the outside window. The triangular cross-section at 6.5" spacing backed by a vertical screen proved to be the best combination.

While an effort was made to take pictures on sunny days, it was noted that the 3 inch spacing screens were far too dark at certain times of the year. This problem would be exacerbated on cloudy days, making the interior very dark indeed and requiring additional artificial lighting, which would defeat the purpose of the screen system.

Because glare is largely a contrast effect, brightening the interior through material selection can help reduce glare. This was realized in the final design by specifying light colored woods such as birch and maple, and using concrete tinted with titanium white pigment.

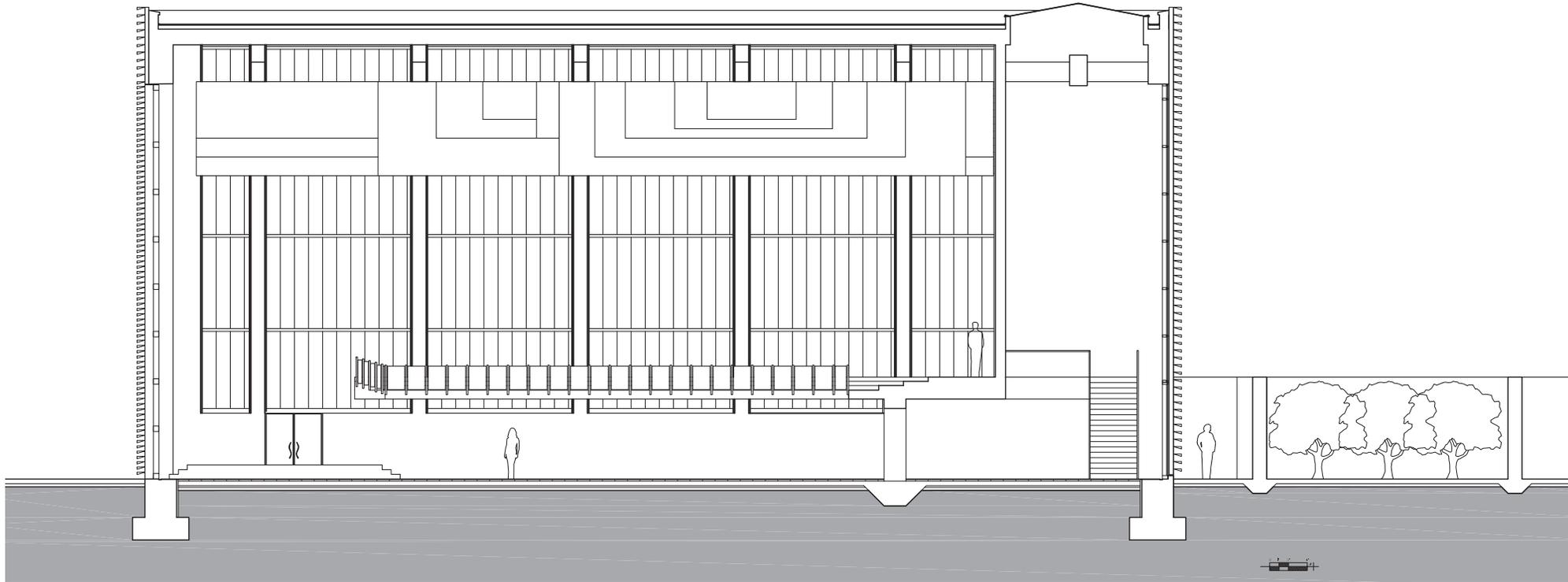
Further ways to reduce glare include painting the top of the exterior louvres white in order to bounce more light into the space, thus increasing the ratio of interior daylight to exterior skylight. Additionally, tinted glass could be specified for the upper portions of the curtain wall which would reduce the luminance from the brightest part of the sky.



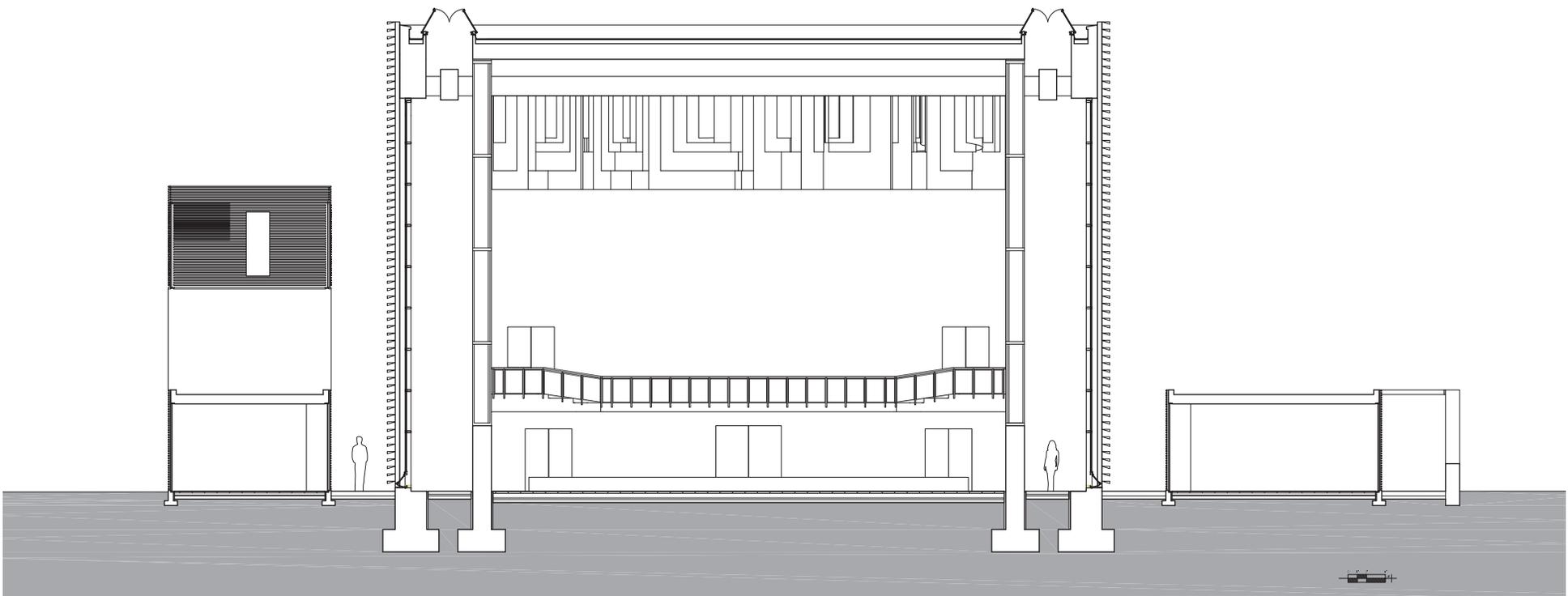


Facing page: Typical wall section, with details

Section | Longitudinal



Section | Transverse



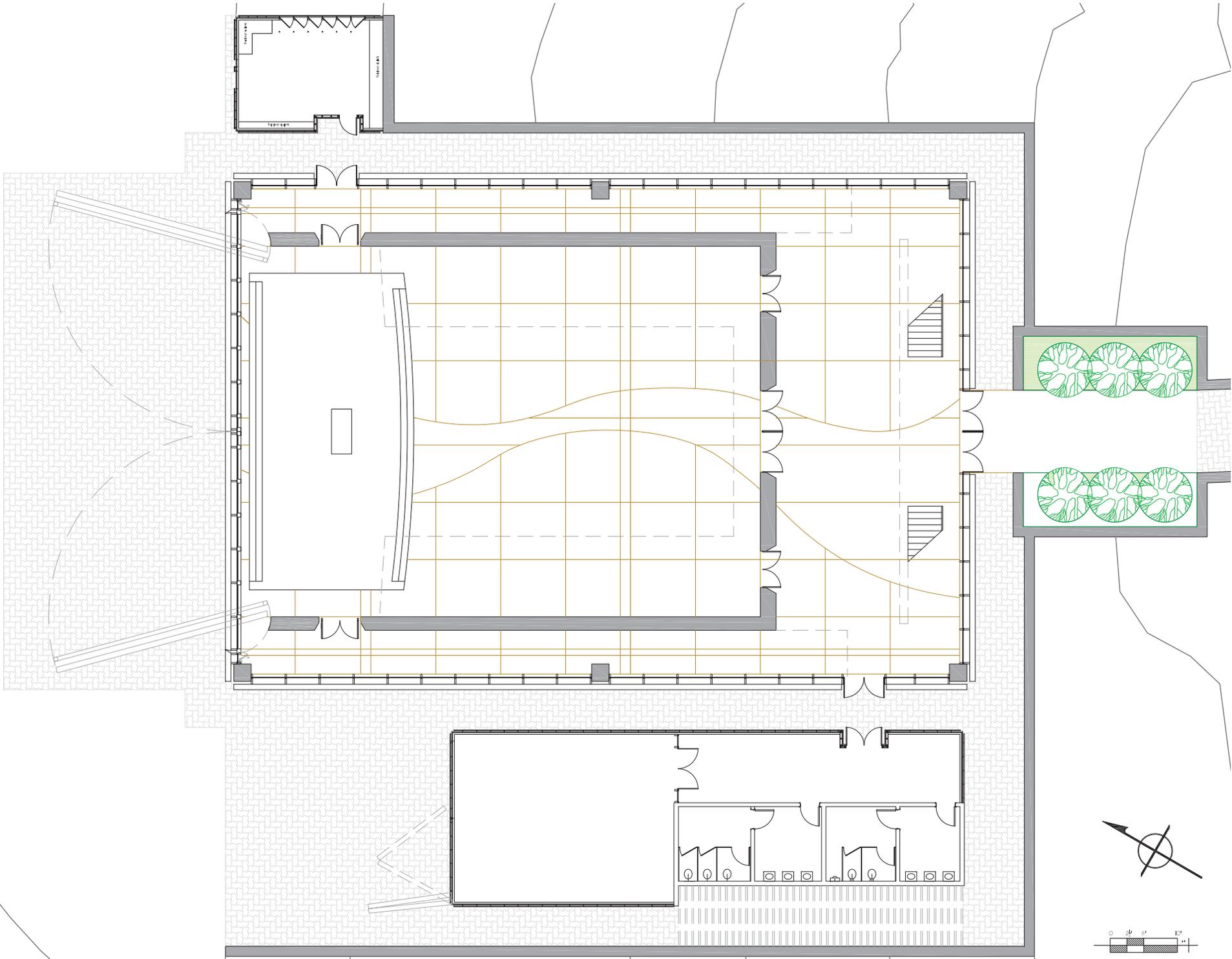


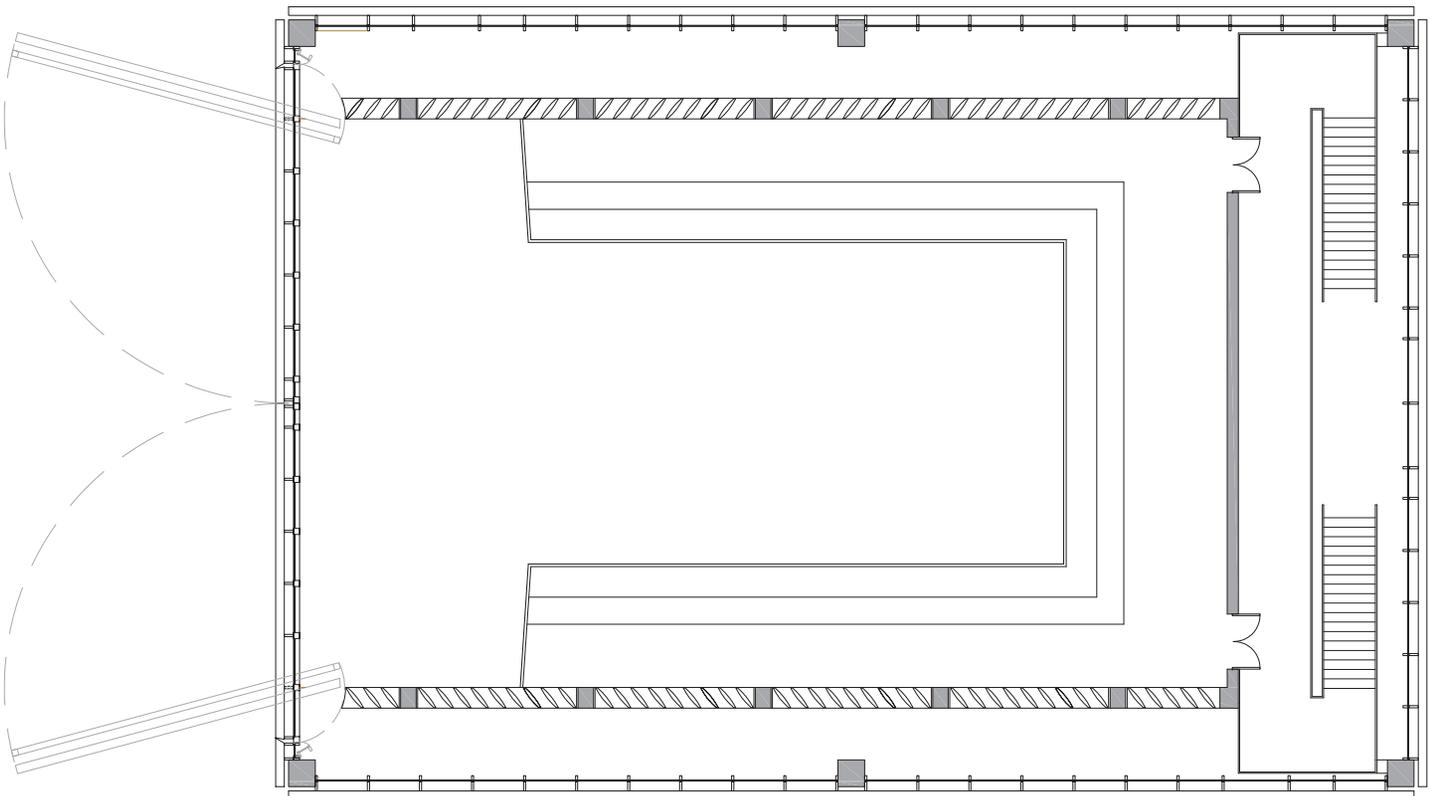
## Planning the Church

The plan of the church is simple in nature. As the camp already has offices and auxiliary buildings, the church was designed around the bare necessities of the liturgy. The primary consideration was the sanctuary and the altar-table space, followed by the sacristy and an accompanying building with restrooms and a multi-purpose space.

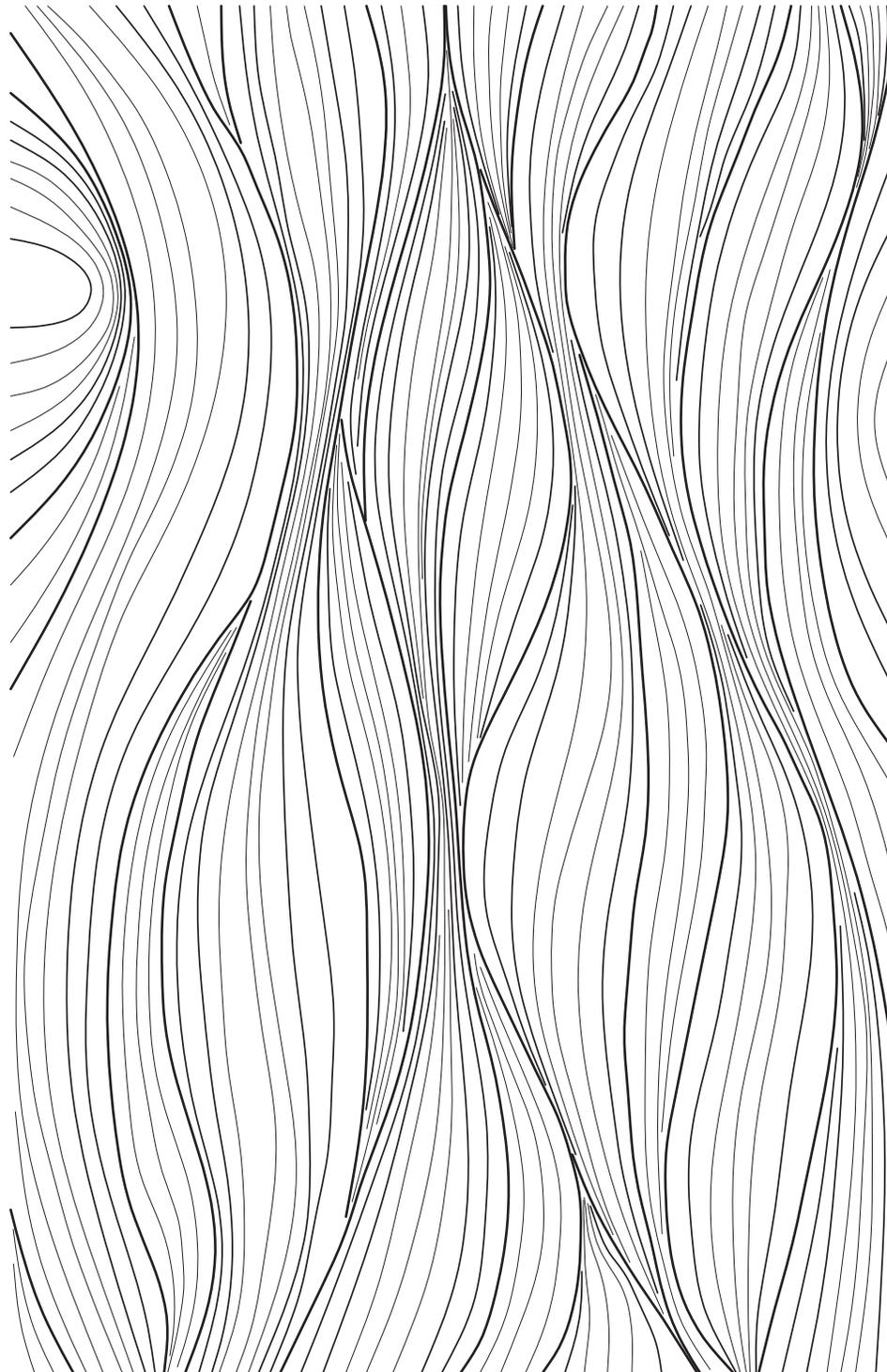
Reflecting the desire to allow for changes in the liturgy and provide maximum flexibility for the means of the worship, the plan is rectangular in form, its orientation dictated by the view out from the mountain side and the direction of the sun. Tall side passages surrounding the sanctuary allow people to move unobtrusively during the service.

The balcony wraps around the sides and back of the sanctuary, giving those sitting there a greater feeling of intimacy with the service. Dual staircases lead to the balcony from the double-height narthex, which is lit both from the screened walls and the roof skylights.







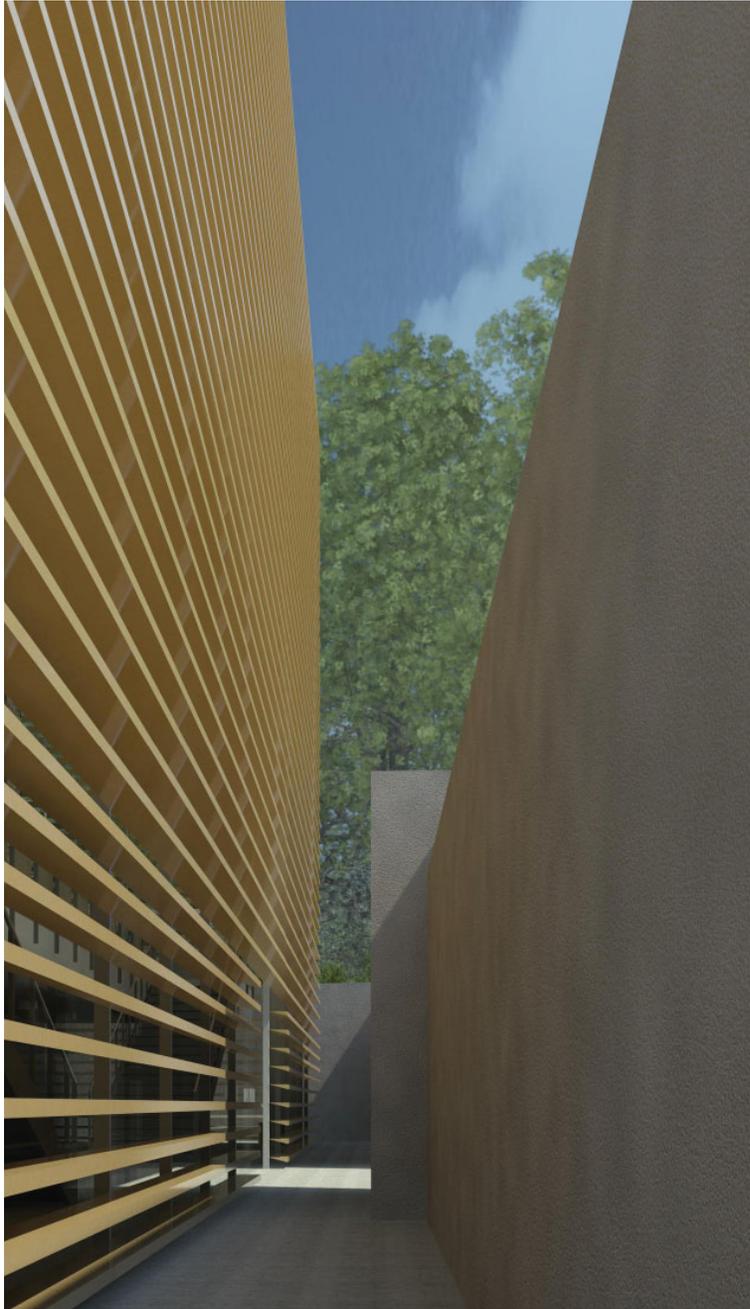


One of the definitive ideas of the thesis was the treatment of the overhead plane. Early in the thesis, the overhead plane consisted of a series of nested shells, designed to control sound and to indirectly bounce skylight into the church. This idea was abandoned and a new idea was formed from the vision of curving bands of light that would form the ceiling of the church.

The form of the ceiling is not a structural construct. It is functional ornament that screens and filters the light entering through the curving skylights. At night, bands of light follow certain curves in the pattern, creating rivers of light along the ceiling. The ornament is made of partially translucent fabric, which adds a dynamic element to the ceiling as air movement in the space causes it to ripple and undulate.

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Facing page: Nighttime sanctuary rendering showing ceiling ornament



## Site Selection

Jumonville, Pennsylvania

Jumonville Camping and Retreat Center is nestled in the Laurel Highlands area of the Allegheny mountains. The camp is very large and serves a large number of people through the whole year. Jumonville has had a large impact on my life and the impact it has on the lives of the young people who come there is also tremendous.

The part of the camp where the church is sited is commonly referred to as “The Edge of the World,” because of the expansive view and perceived drop-off of the grade. Many people feel closest to God in a natural setting, and this helped drive the siting of the church.

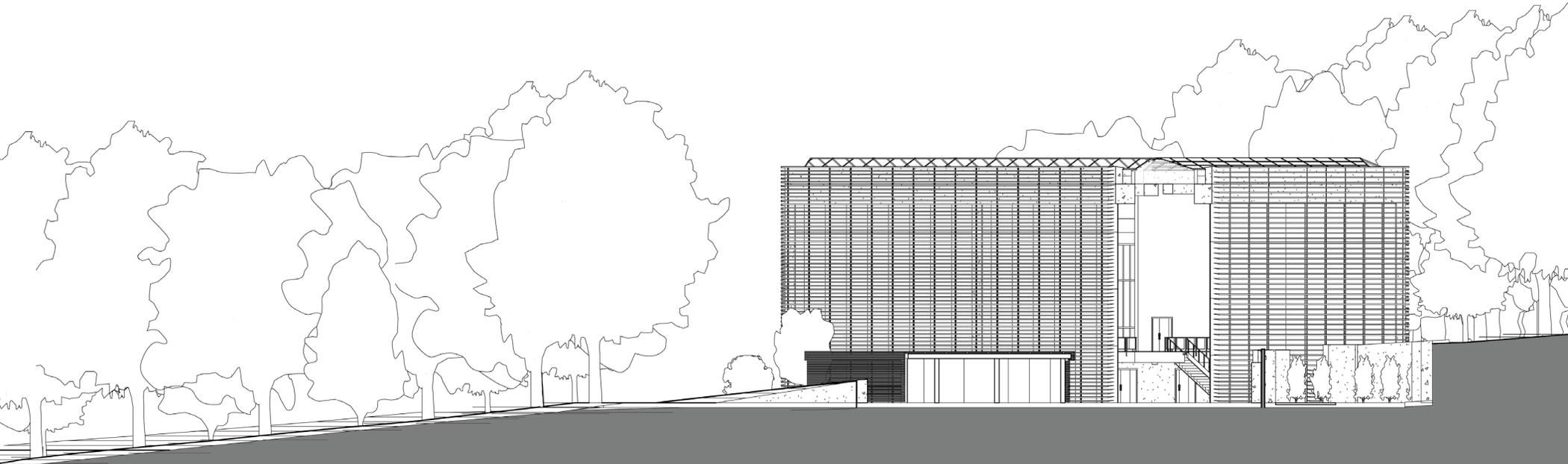
Because of its location, the church can take advantage of the expansive views out the front of the church, as well as serve the needs of the camp programmatically.

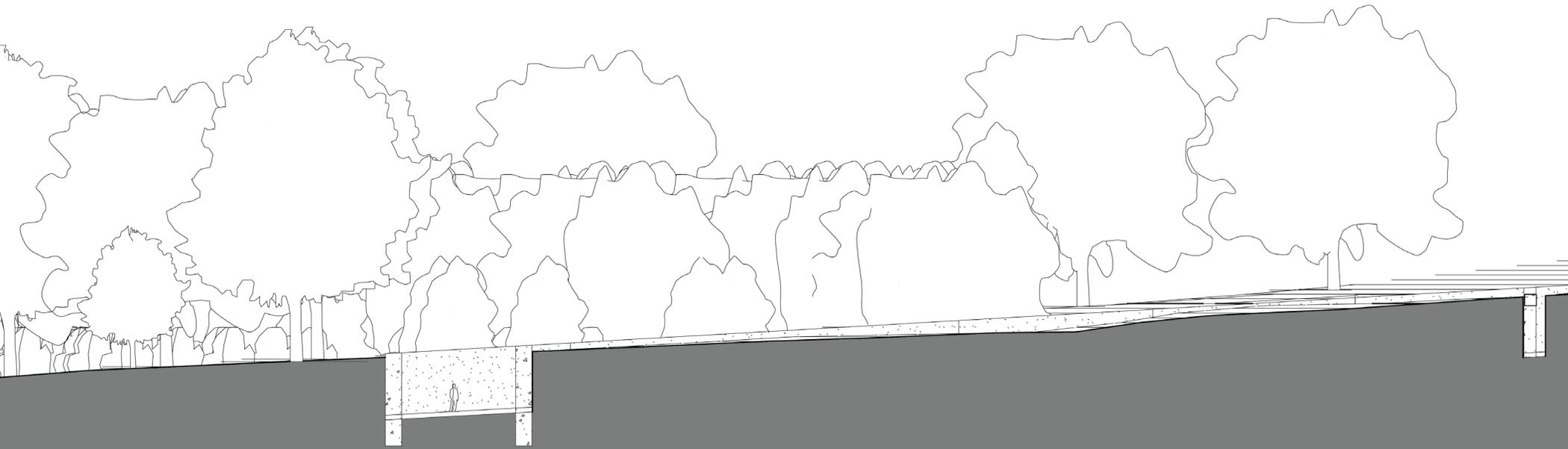


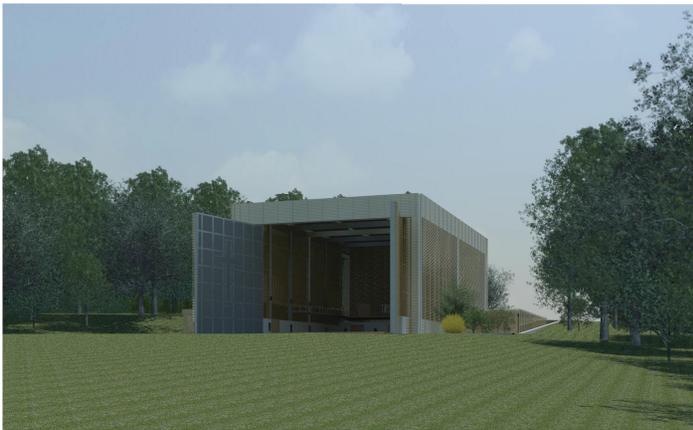
Facing page: Main entrance rendering

## The Importance of Slope

Much of the walkway and the backside of the church are nested in the steep topography of the mountain. Much as the biblical Tabernacle was separated into two exterior courts and a high holy place, the person arriving at the church must pass through the garden space at the end of the path and then the narthex space before entering the sanctuary. The descent into the trench from the parking area or from the path leading up from the camp proper can be a journey in itself. As one passes from a vantage point where the top of the church can be seen to the deep confining space of the trench where the view is completely obscured, anticipation is built for what comes at the end of the path. When the person passes into the sanctuary, the full extent of the view becomes apparent.







## Connection to Nature

A church with a spectacular view can greatly enhance a worship experience, especially if the congregation enjoys nature. The doors that make up the entire front of the church can open fully, connecting the congregation to nature. In the context of the camping environment, this design element allows the congregation the full experience of the view while still providing a setting for worship. Furthermore, this allows for larger gatherings or just the possibility to worship in the outdoors with the church functioning only as a support space. Weddings are performed frequently at the camp and the patio spaces in the front of the church can also be used for these and other outdoor events that might be held at the camp.







## For My Colleagues,

I would like to reflect, for a brief moment, on the lessons learned while I have worked on this thesis. The thesis is not just about the building you get out of it, but the idea that leads that building to its final iteration. Now, you will have heard this from your professors already, and I'm sure you will hear it many times, as I did. However, what I hope to impart is not a lesson about the thesis itself, but how you get to the end of the thesis; the means and process by which you complete your work.

I am writing about a hard lesson. It took me many stops and many starts to finish my thesis, to even get to a place where I began to have but an inkling I had a thesis at all. It is a curious truth about architecture, one that must be learned, not one that is found in any pedagogy: we design best when we get our ideas out of our heads. Now, to an architect this may seem a slightly absurd statement. Of course, you might say, you have to draw and model in order to make your idea known, this is what architecture is all about. But what is also true, what I discovered at some cost and with much help, is that you cannot hope to make a thesis out of what is inside of your head.

Now let me explain what I mean by that, because that statement is, at best, a little obtuse and seemingly contrary to what I said immediately before it. I am a planner. I always like to know what's going on, I like my calendar to be marked full of what I have to do for a month or more in advance. I often treat my projects in the same way. I try to think about every little detail, to work two steps ahead, to anticipate the larger changes that one design decision will make on the project as a whole. This is not a bad thing, but architects must often think in multiple dimensions and consider multiple angles in order to envision the project as a whole. But concerning the thesis, this is not enough.

The problem lies in the fact that the thesis is not a building. The thesis, as an idea or an exploration can define a building, or a building can be used to demonstrate the thinking behind the idea, but the thesis is not a building. I only say this because I was only able to develop my thesis, to discern the larger whole of the idea that I was shaping, after I separated it from the program of my building. I was letting the drawings of the building in front of me dictate the direction of my thesis as a whole. Instead, I found that as I explored the idea not the building, and as I developed and understood my thesis as a separate entity, only then was I able to design the building as a physical response to the thesis.

In short, get your ideas out there. You will sketch, research, and build, but keep in mind that the development of the thesis is both of the mind and the body. The mind and the body, the thesis and the building are not disparate elements. They may be different in nature, but in the end they work in conjunction towards the unification of the whole. Do not be afraid. Do not try to plan everything out in advance. This will strangle your ideas - allow the thesis to breathe a little. Then take a deep breath and allow it to grow into a project that you will be proud of. Like I was, you might be surprised at what you can accomplish.



## Concluding Thoughts

My committee stressed quite a bit that my thesis is not the end of my journey; this is not my life's work. While I have dedicated a year of my time and energy to this project, I have much more to look forward to, more to see, and much more to design.

The thesis year has been tremendously formative for me, and the lessons I have learned I will take with me into the profession, not the least of which is follow your instincts. I had to restart many times before I realized that my first idea was not the one I should have been pursuing and switched to the church. It was only after this that I was able to bring my full creative and intellectual potential into play. Now, it's onward and upward.

To my advisor, Michael Ermann, for his advice and wise counsel, who lit a fire underneath me and drove me to succeed when I was not sure I could.

To the rest of my committee, Hans Rott and Bill Galloway, whose advice was also invaluable. I suspect that only in the future will I realize how much so.

To my parents, for their unconditional love and un-failing support. It is because of them that I was able to make it this far.

To my camp bosses, Ree Enlow and Larry Beatty, without whom I would not have the tremendous experience and inspiration of Jumonville in my life.

To Matt Tolbert, Burchard Metal Shop Technician, for his assistance with the baptismal font.

To Joe Newman and the southwest Pennsylvania GIS Community for their help on sitework.

To Jason Forsyth, Jacob Couch and the team at the Virginia Tech ECE Department Configurable Computing Lab for the use of their network and hardware for rendering purposes.

To my many friends and colleagues who have supported me every step of the way - even when you gave me a hard time for spending too much time in studio, thank you.

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## Introduction

Appendix A shows the design and production of a scale model of the church baptismal font. The font would be seated in a wall niche and would be part of a yet to be designed water feature that could be an integral part of the worship.

The model was milled from solid aluminum in the Burchard metal shop. The bottom surface was lathe polished, while the top was polished partly by lathe and then finished by hand. The actual font would most likely be a solid wood that would match the wood of the church interior or perhaps copper.

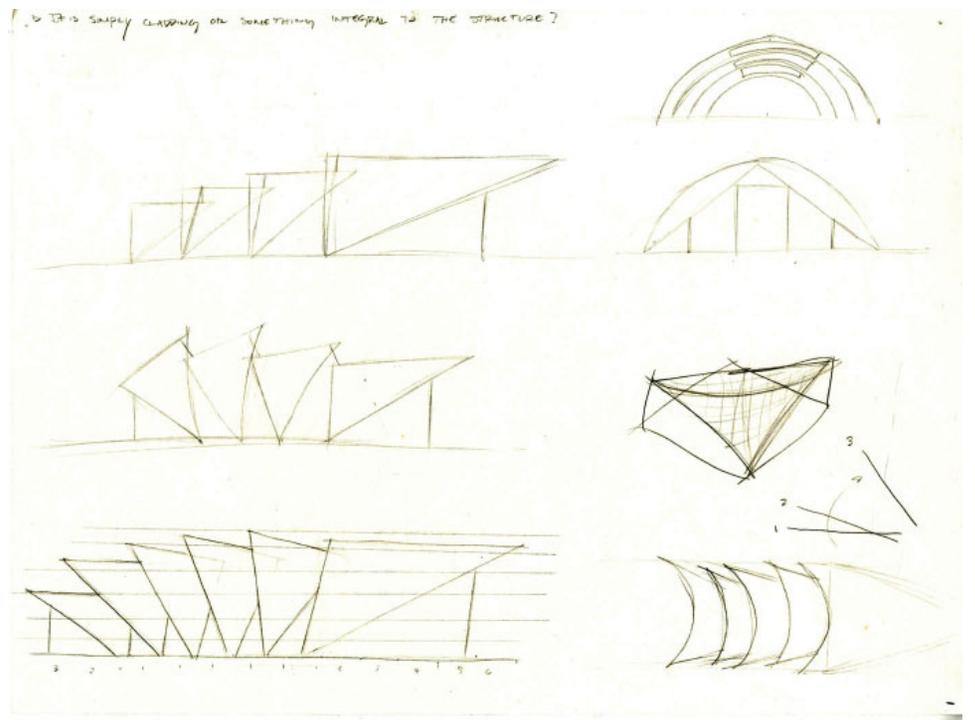
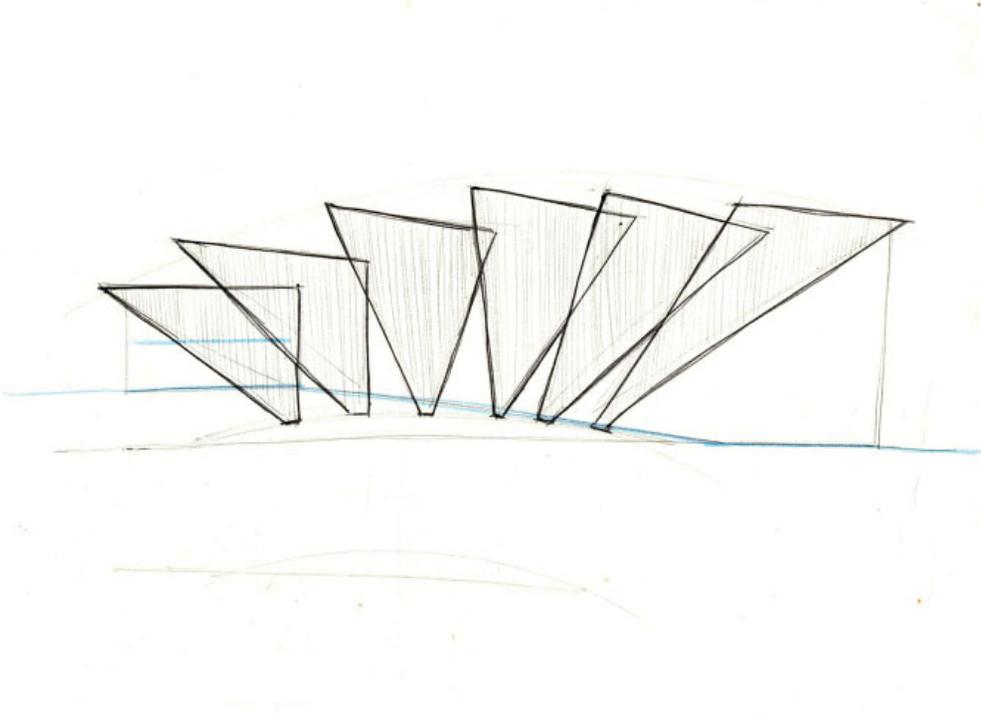
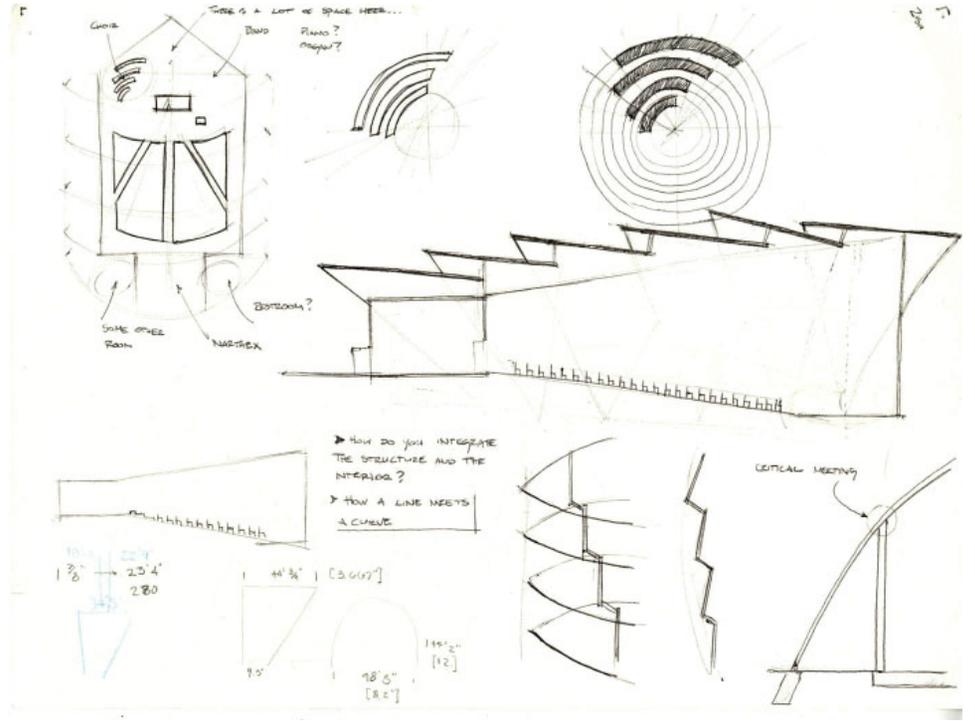
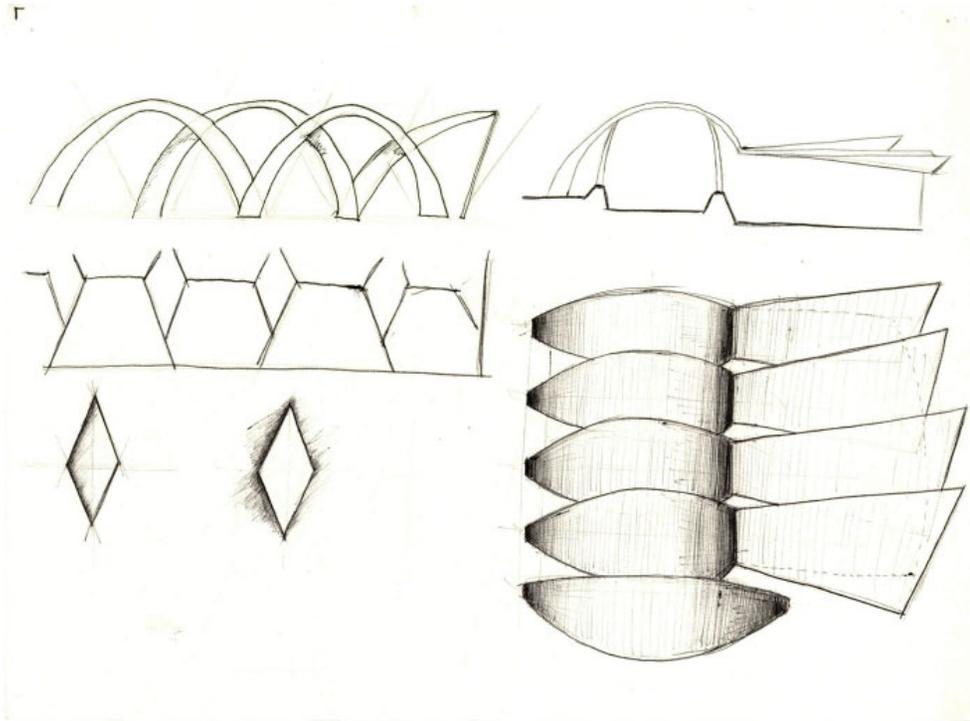




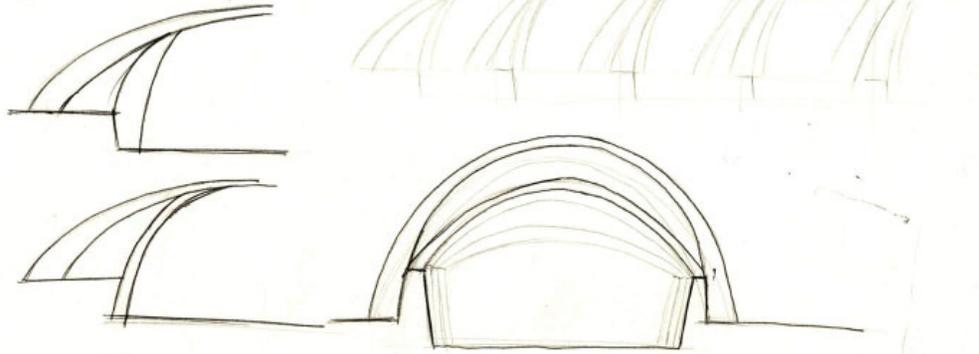


## Introduction

Appendix B is the cumulative record of my design process. These sketches are not necessarily in chronological order, but rather follow the progression of thoughts as the thesis was developed.



150.00 - BOTH INSIDE AND OUTSIDE  
 52.24 CURVES MUST BE GOOD  
 10.24 - ELLIPSE, NOT CIRCLE?  
 14.54  
 30.00  
 247.66

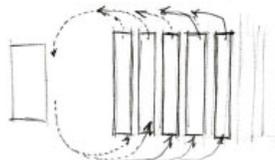
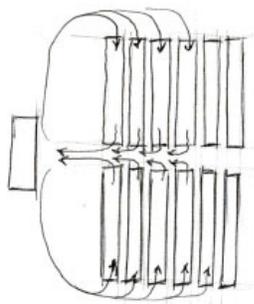
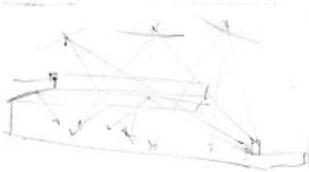
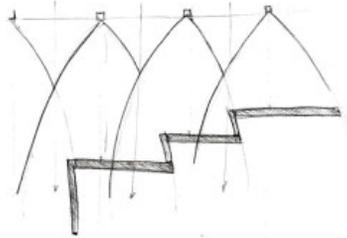
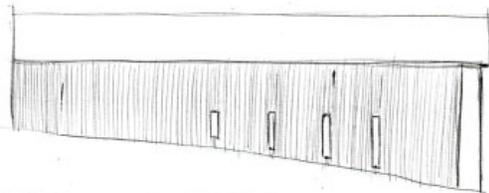


30.05 late

IDEAS → BUILDING → BUILDING  
 IDEA

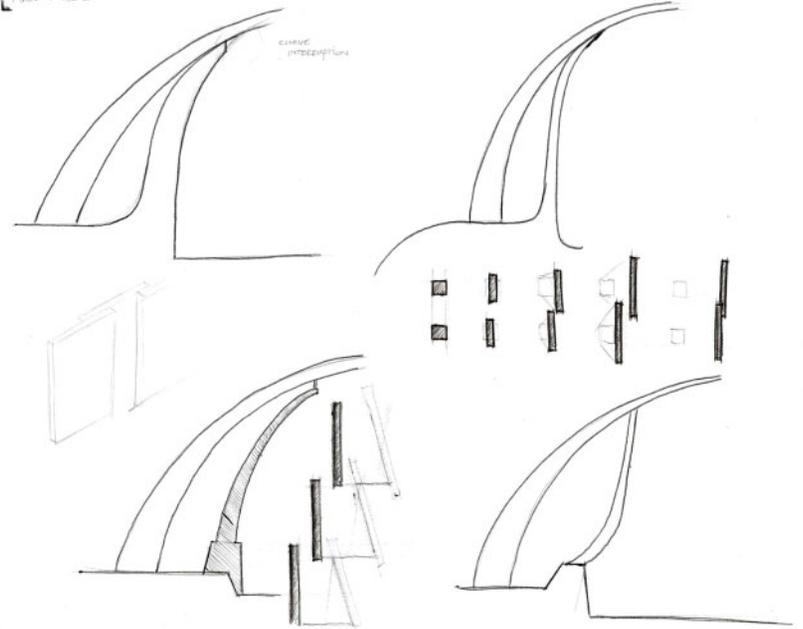
It is okay to MAINTAIN A PRACTICAL SIDE TO MY THESIS. BY MAINTAINING A OUTSIDE STRUCTURE THAT IS NOT SUPER COMPLEX, I WILL BE ABLE TO EXPLORE MORE.

More Zentao • It is only between the reality of things and the imagination that the spark of the work of art is kindled.



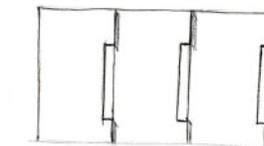
Always add in  
 and cut to  
 circulation  
 corridors

Also casual effect



Zentao

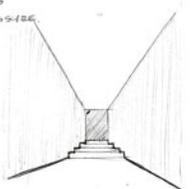
Must see work of architecture from 5 points:  
 Historically, aesthetically, functionally, personally, professionally  
 - Talk about the rational, but always the undercurrent of ~~emotions~~

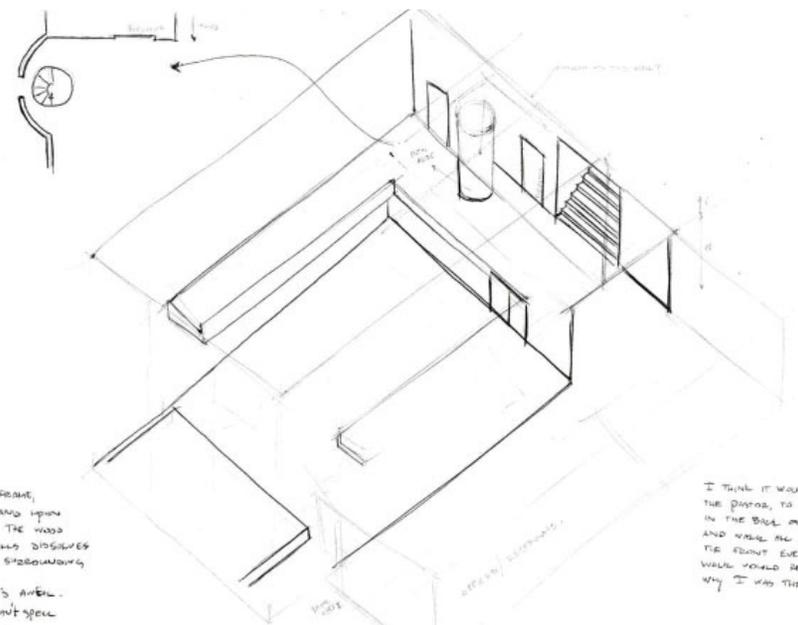
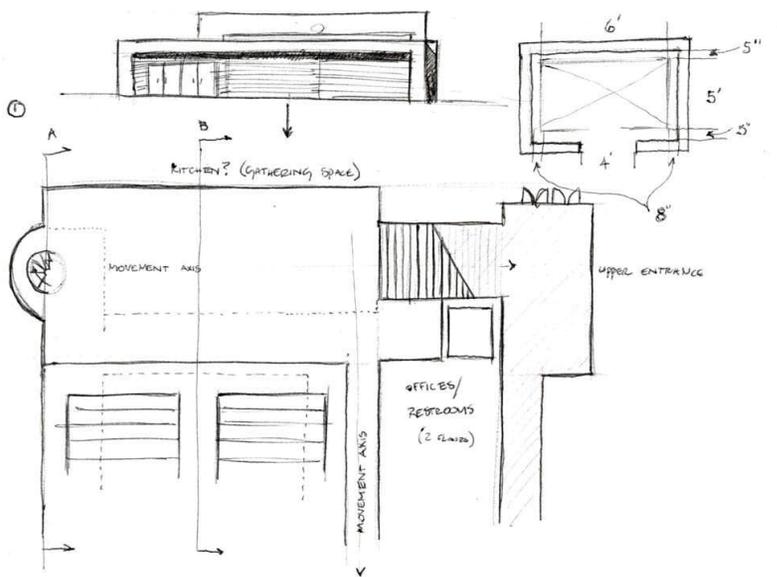
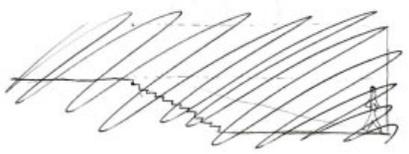
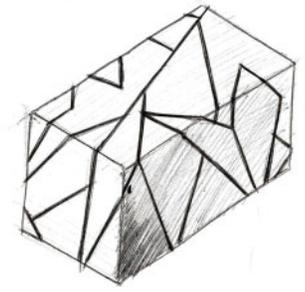
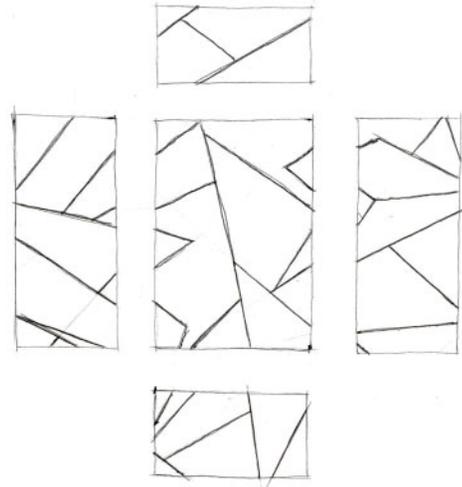
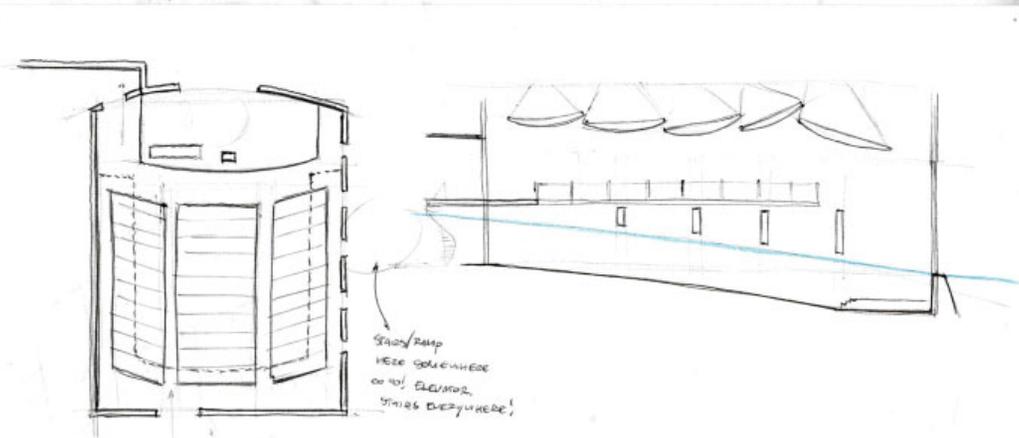


I had before embraced the idea of my building based on the strength of the spiral. Now I find myself facing the proposition of redesigning the exterior without those, and I feel completely lost.

The arch doesn't really do anything for me.  
 - LEAVES A LOT OF QUESTIONS ABOUT STRUCTURE AND ENCLASURE.  
 - PURELY FORMATIVE?

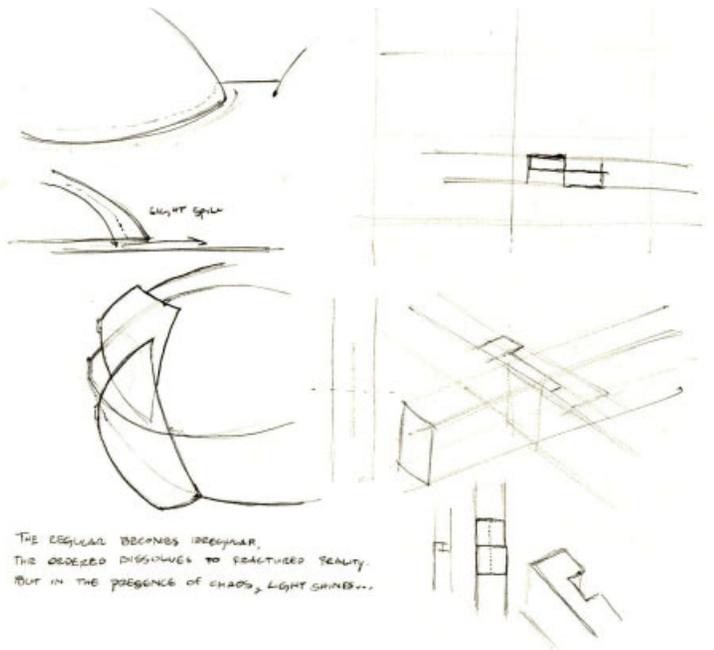
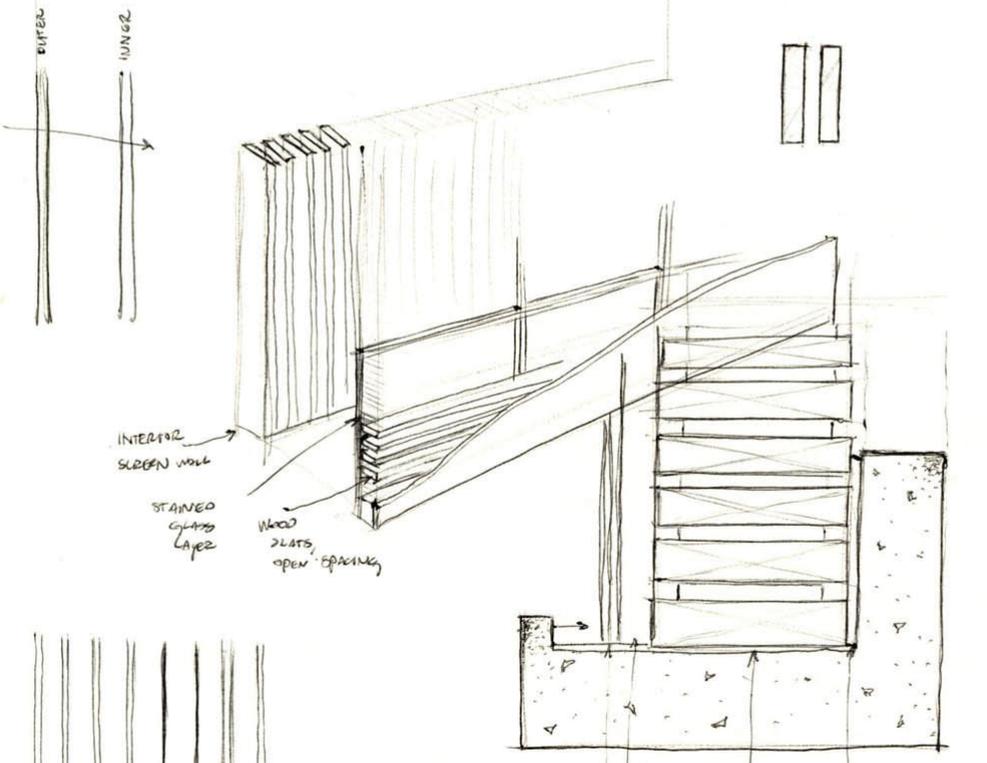
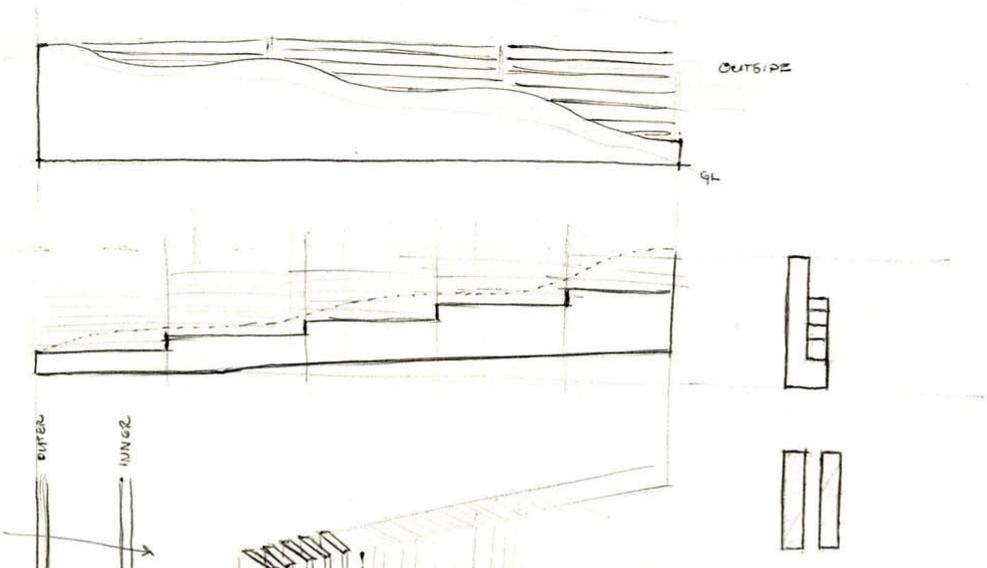
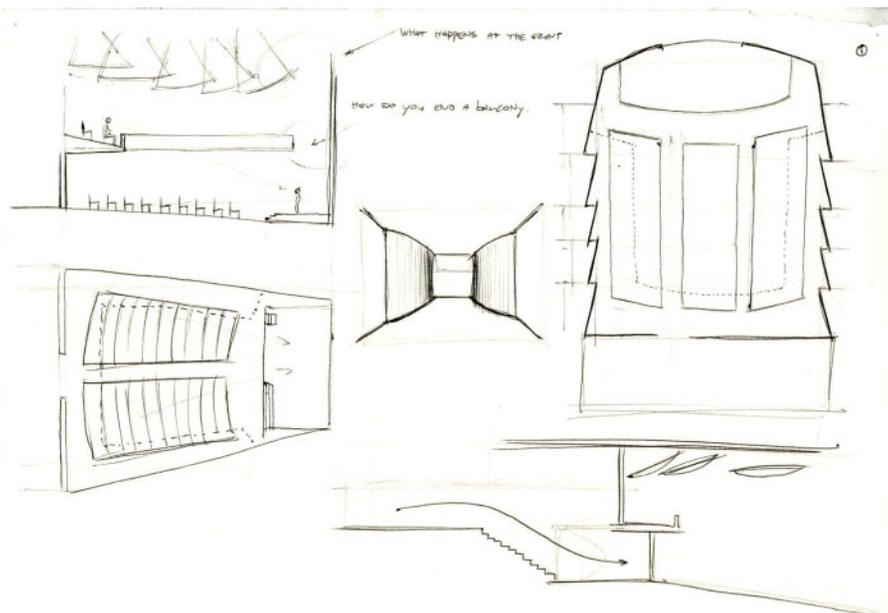
[EXPLORE MORE]



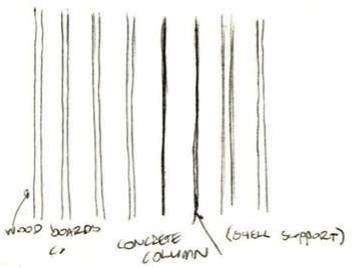


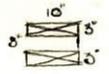
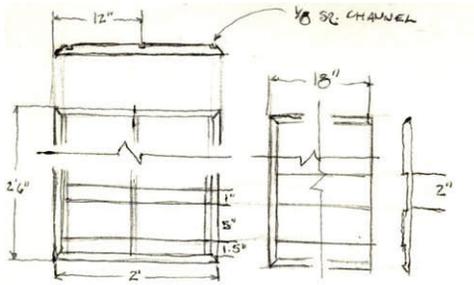
A STAGE FRONT, SET INTO AND UPON THE WALL, THE WALL AS HIS WALLS DISGUISES INTO THE STAGELIGHTING FOOTBOY. JOO THAT'S AWELL. AND I CAN'T SPELL NORTH GRAP.

I THINK IT WOULD BE NICE, AS THE PASTOR, TO HAVE TO COME IN THE BACK OF THE CHURCH AND WALK ALL THE WAY TO THE FRONT EVERY SUNDAY. THE WALL WOULD REMIND ME OF WHY I WAS THERE.



THE REGULAR BECOMES IRREGULAR.  
THE ORDERED DISSOLVES TO FRACTURED REALITY.  
BUT IN THE PRESENCE OF CHAOS, LIGHT SHINES...

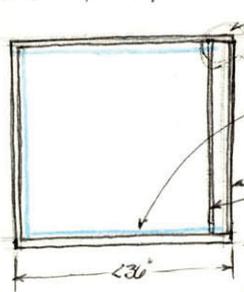




JUMONVILLE  
 LAT: 39.885  
 LONG: -79.648  
 ELEV: 2185 ft, 2400+ to DUPAR'S  
 KNOB

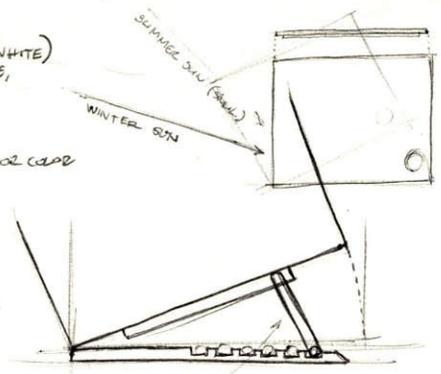
1/21/2011

DAYLIGHTING STUDY BOX DESIGN



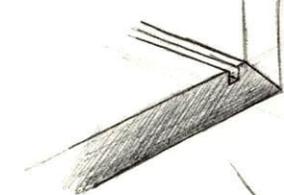
INTERIOR BOX (WHITE)  
 - STAND, MOVABLE,  
 ADJUSTABLE  
 - BEADABLE  
 INTERIOR PANELS  
 - CHANGE INTERIOR COLOR  
 SCREENS

ELEVATE OFF  
 GROUND TO  
 HELP W/ PICTURE  
 TAKING.

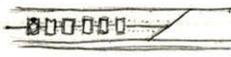


TWO PIECE?

NEED DIMENSIONS...

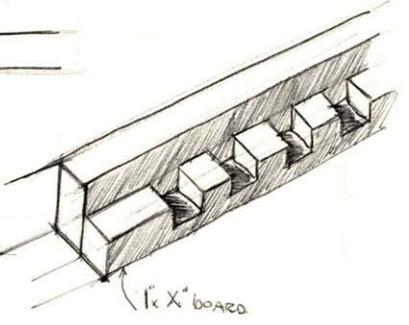
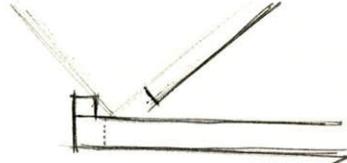


CORNER  
 DETAIL



INTERIOR  
 MATERIAL  
 SHAPE  
 SPACING

44 IN TO CAMERA HOLE



SIDE PANELS  
 WHITE x 3  
 PLAIN BOX

▷ MAKE A HYPOTHESIS AND  
 GO WITH IT BASED ON  
 WHAT YOU KNOW TO LIMIT  
 THE NUMBER OF SCREENS

- SHAPE CIRCULAR ○  
 SPACING SQUARE □  
 MATERIAL BOARDS ▭  
 TRIANGLE ▽

TAKE TUBES TO  
 2"

SCREENS  
 FRONT SECONDARY

$$3' \frac{13}{16}'' \times \frac{6' 11''}{83} = 1822.875'' \quad 3056.4375$$

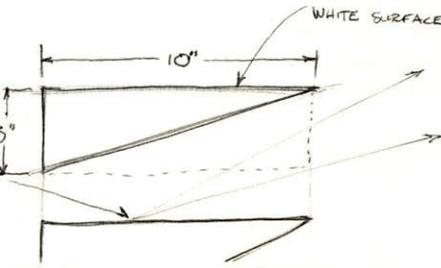
$$17 \text{ tubes} \times 3'' \times 3' \frac{13}{16}'' = 1877.4375$$

CIRCULAR TUBES  
 MAKE UP 61.40% OF AREA.  
 = 38.50% OPENING

2188 sq. in

$$11 \text{ planks} \times 3'' \times 3' = 1188'' \quad \text{MAKE UP } 39.75\% \text{ OF AREA}$$

(5" spacing) = 60% OPENING



$$\% \text{ OPEN} = 1 - \frac{((t \times L \times M) / A_t)}{A_t} = 1 - \frac{A_m}{A_t}$$

$A_t$  = AREA TOTAL  
 $A_m$  = AREA MEMBERS  
 $t$  = THICKNESS  
 $S$  = SPACING  
 $M$  = # MEMBERS =  $\lceil (h / (t + s)) \rceil$   
 $L$  = LENGTH  
 $h$  = HEIGHT

$$\% \text{ OPEN} = 1 - \frac{((t \times L \times (h / (t + s))) / A_t)}{A_t} = 1 - \% \text{ OPEN}$$

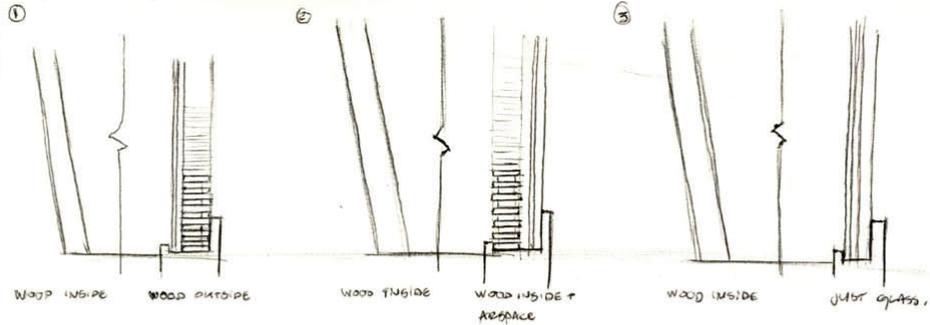
$$t \times L \times (h / (t + s)) = (1 - \% \text{ OPEN}) A_t$$

$$h / (t + s) = \frac{(1 - \% \text{ OPEN}) A_t}{t \times L}$$

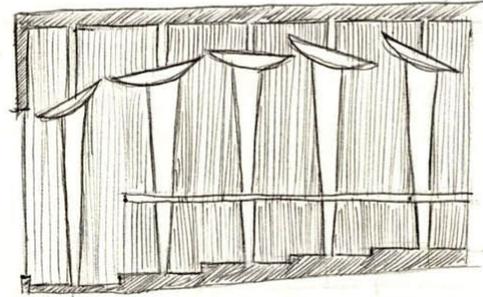
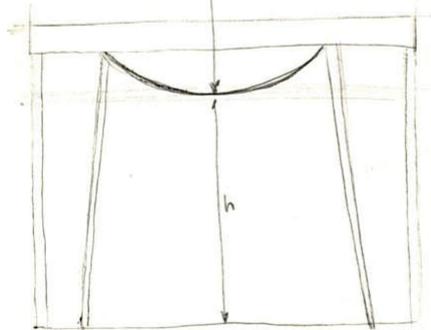
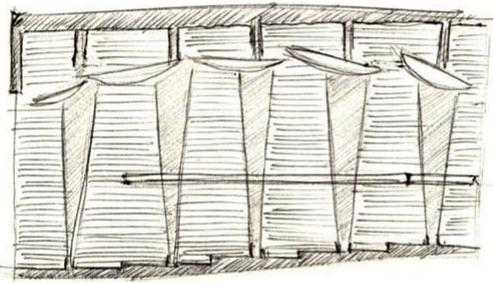
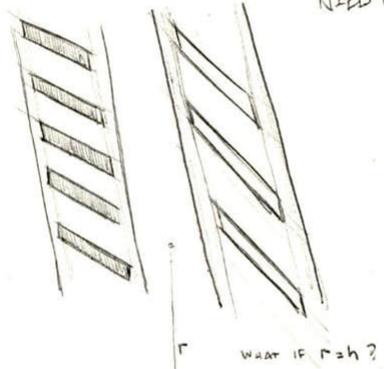
$$h = \frac{(1 - \% \text{ OPEN}) A_t}{t \times L} (t + s)$$

$$S = \frac{t \times L}{(1 - \% \text{ OPEN}) A_t} - t$$

1/9/2011



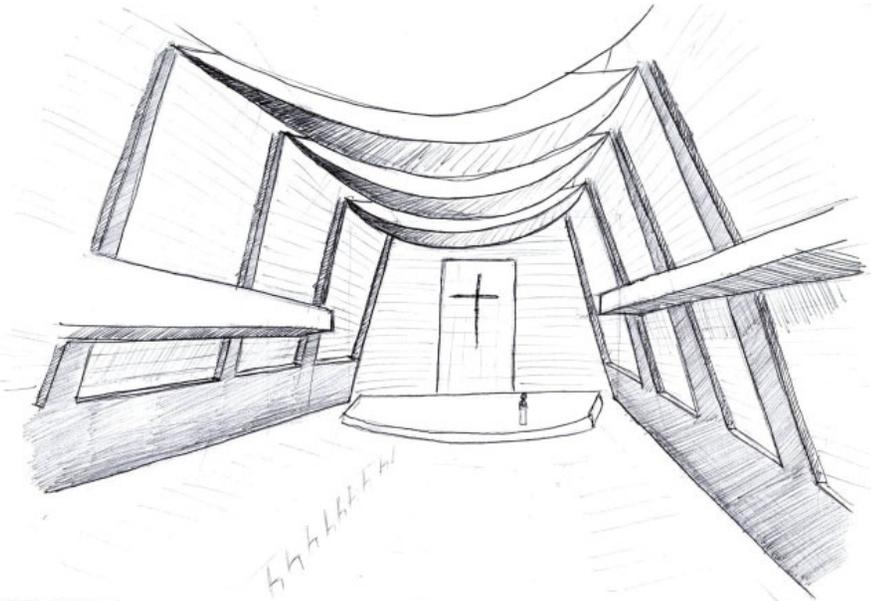
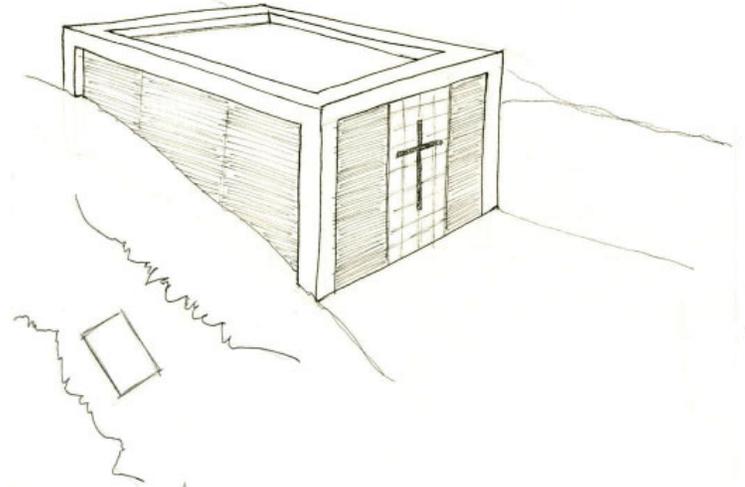
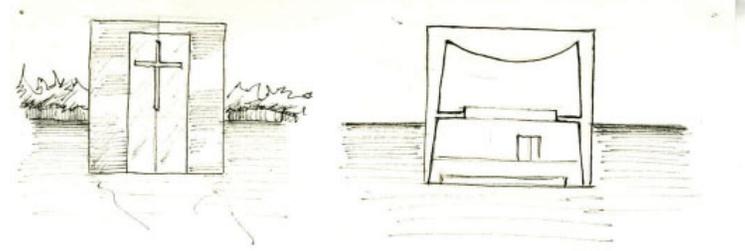
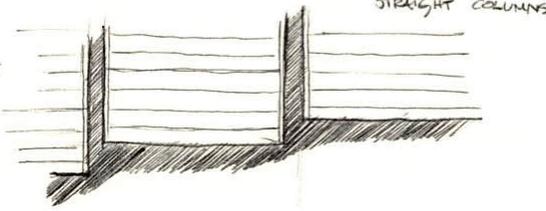
NEED MORE STAIRS!



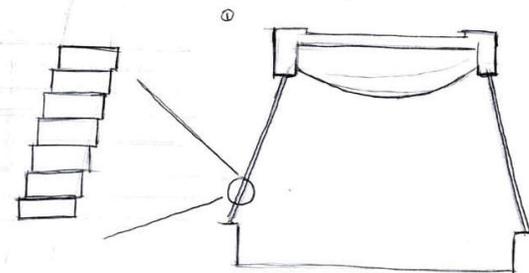
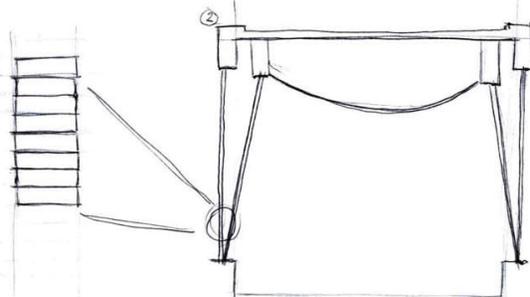
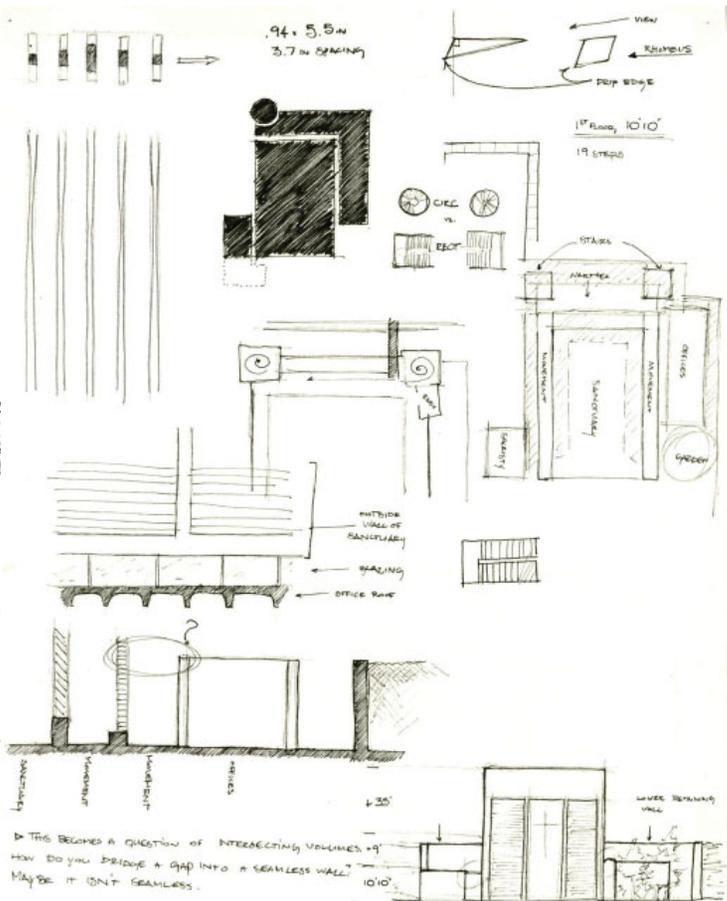
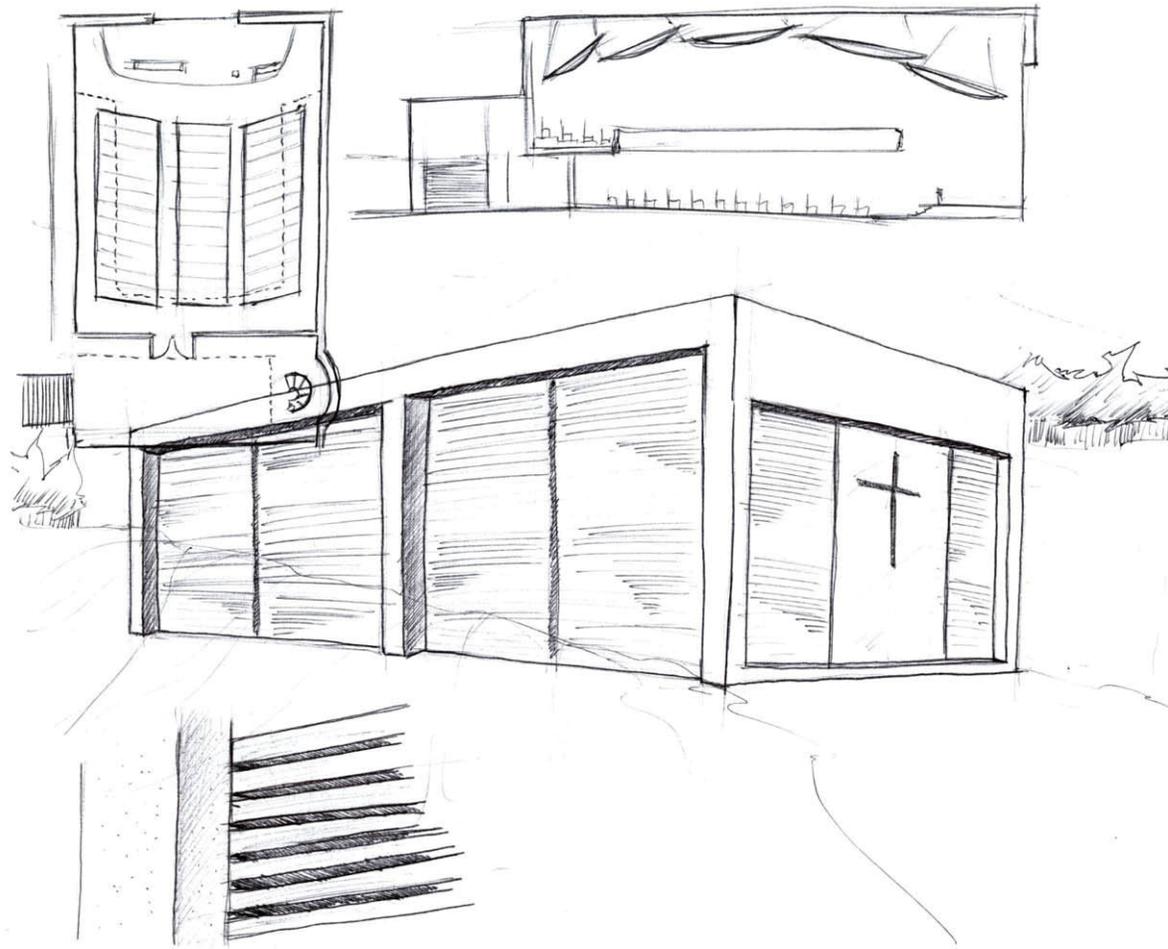
IF I'M WORRIED ABOUT INTERRUPTIONS IN THE HALLWAYS, WHY NOT BRING A CONCRETE OR GROSS WALL UP TO HEAD HEIGHT TO REFLECT THE SOUND?

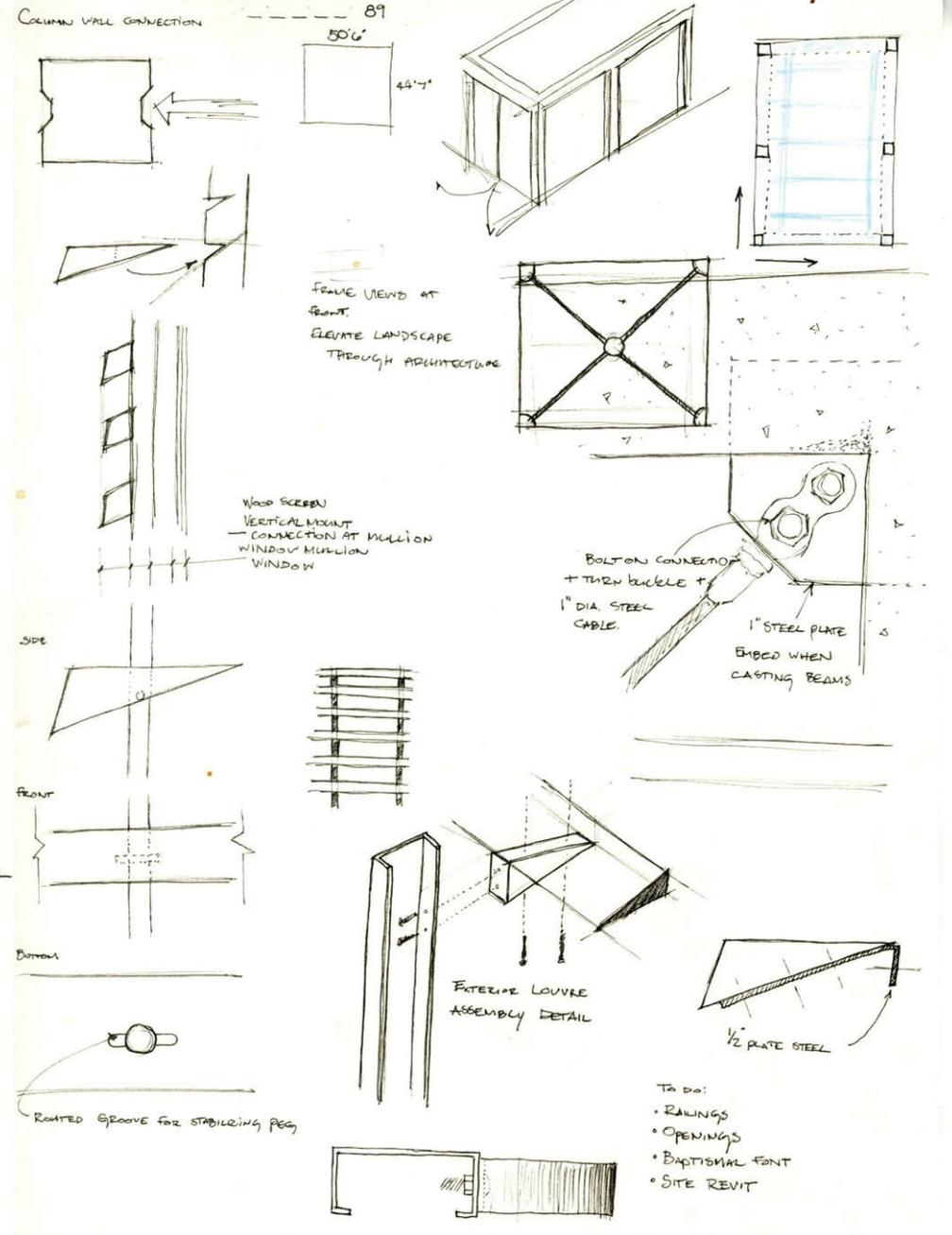
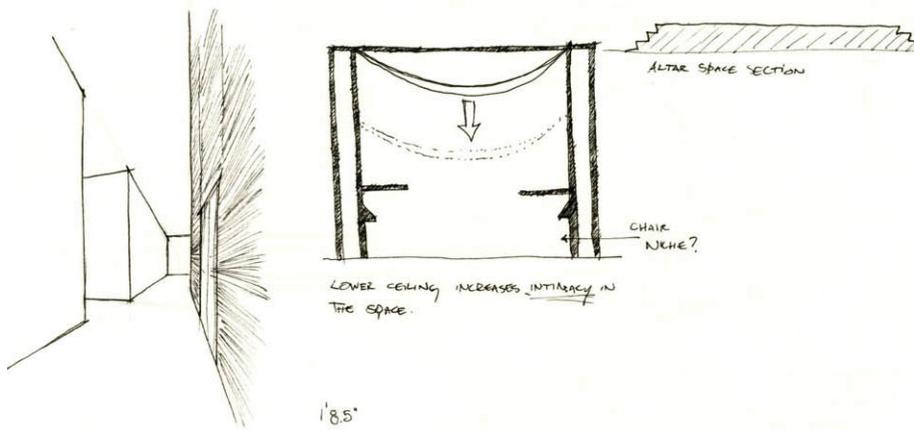
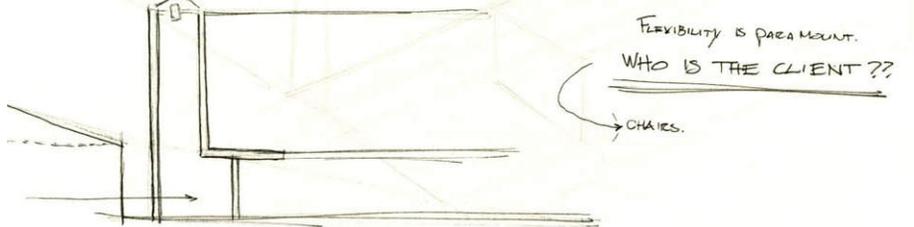
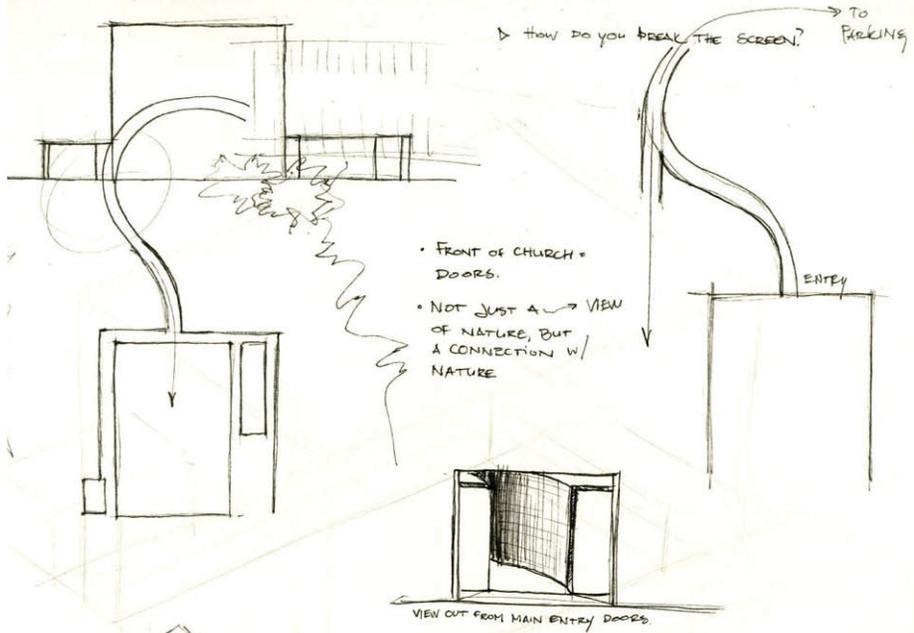
HEIGHT/WIDTH RATIO MUST BE

$\frac{height}{width} \geq 0.6$



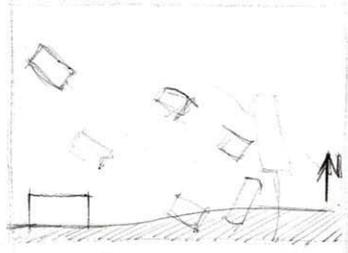
EMPHASIZE VERTICALITY ON INTERIOR?



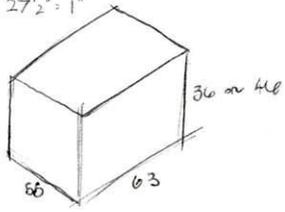


3/17/2011

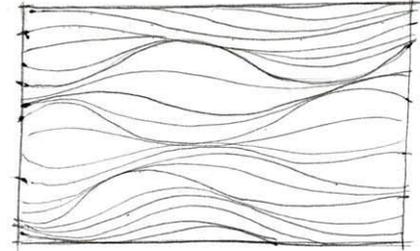
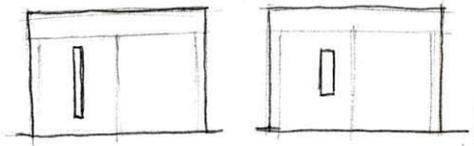
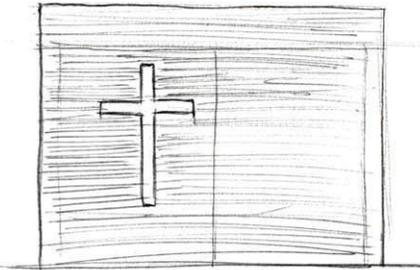
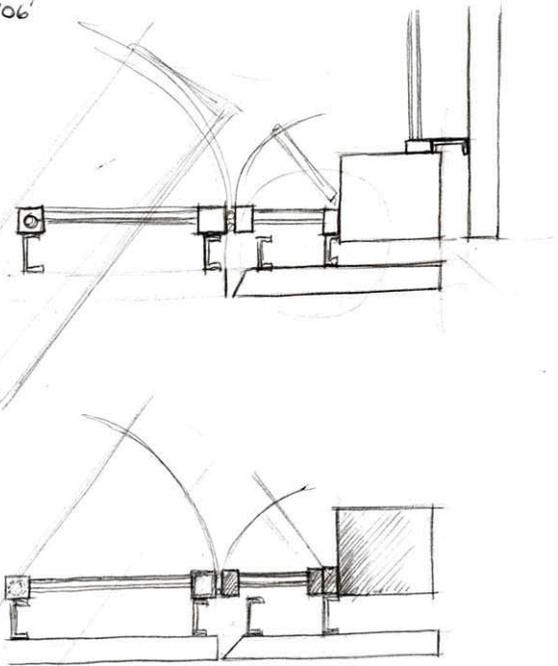
706'



66' 2" = 2 3/16"  
 325.74' = 1"  
 27' 2" = 1"



54' 11 7/8"  
 76' 11 1/8"

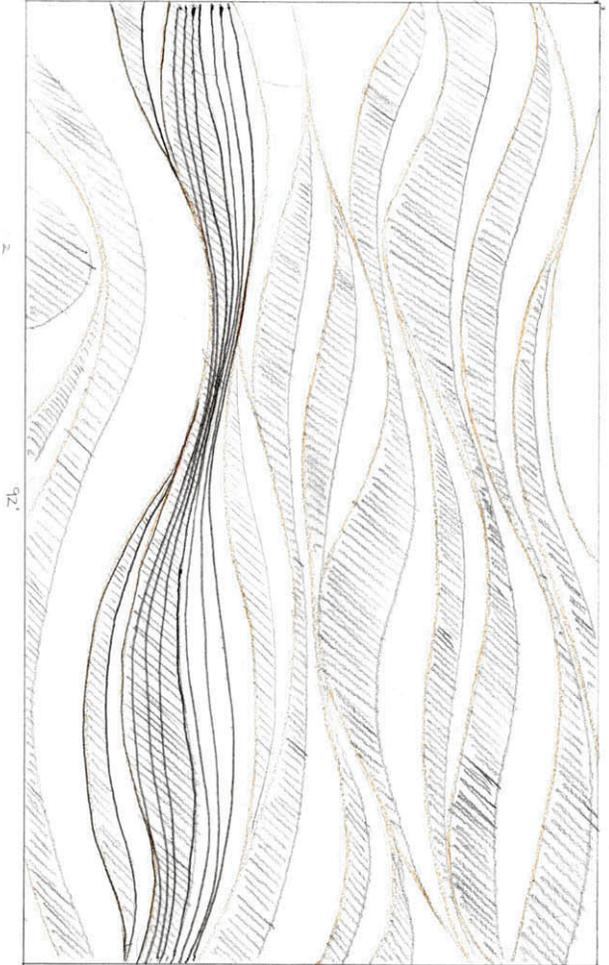


SYMBOLIC TRANSFORMATION /  
 ABSTRACTION



SHRINK W/ ONE WAVE, SHIRT 1/3 PHASE TOWARDS BACK

DEEP FRONT TO BACK



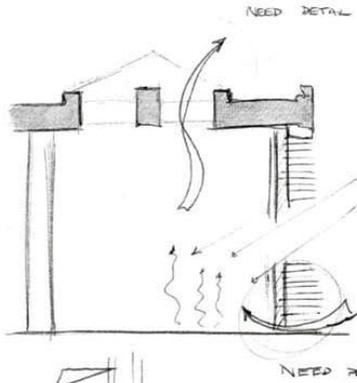
SPICES  
 SET SPICES @  
 LEVEL, 10ft  
 MINIMUM HEIGHT  
 5ft

LOWER IN SIDES, HIGHER IN MIDDLE

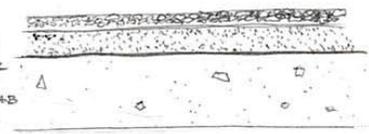


3/25/2011

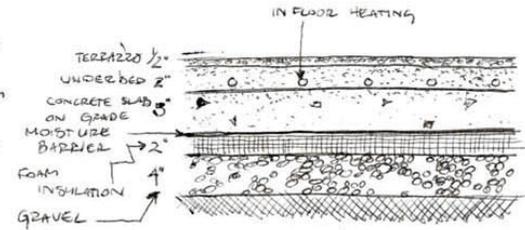
VENTING DETAILS



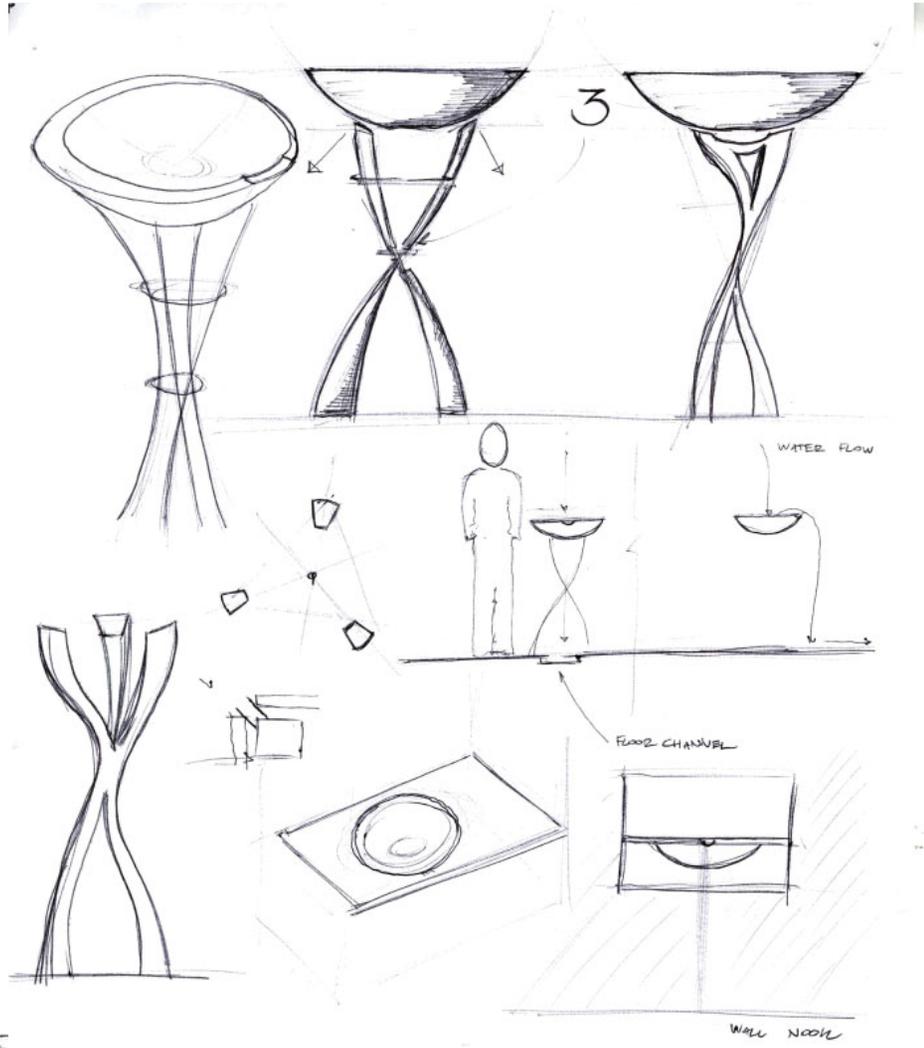
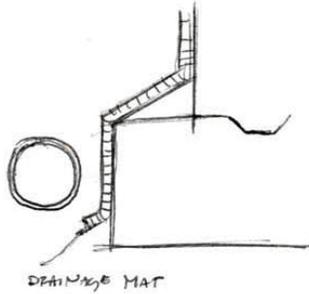
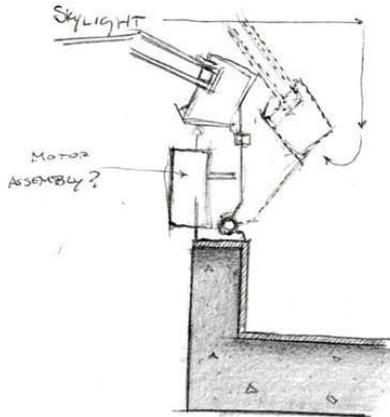
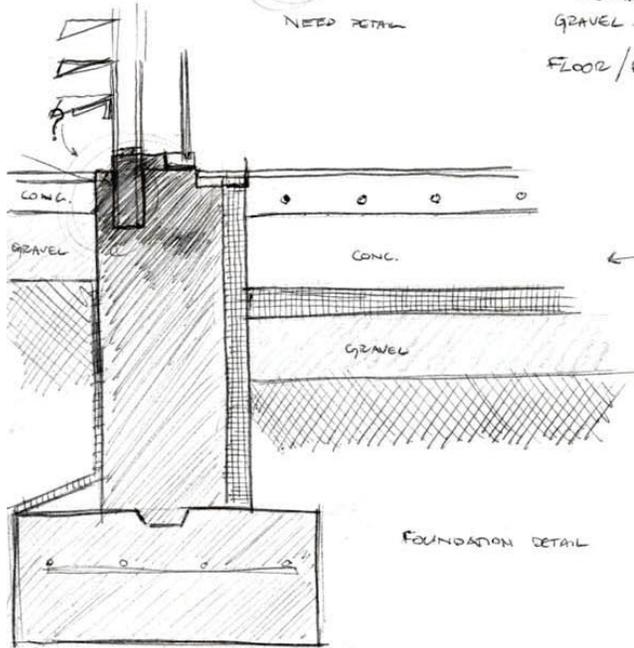
1/2" TERRAZZO  
 3/4" UNBERBED  
 BUILDING PAPER  
 CONCRETE SLAB  
 ON GRADE



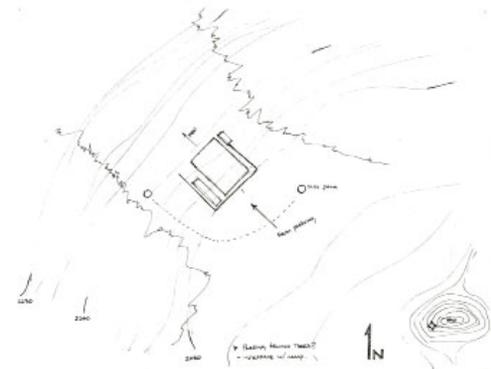
FLOOR DETAIL

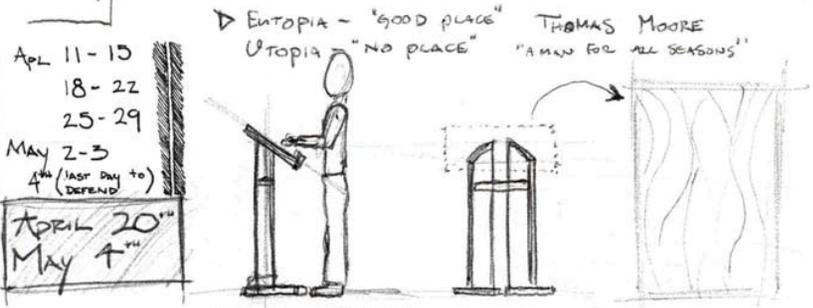
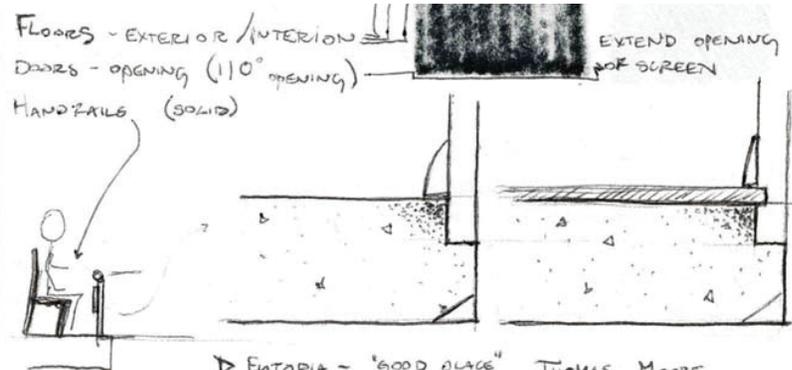


FLOOR/FOUNDATION



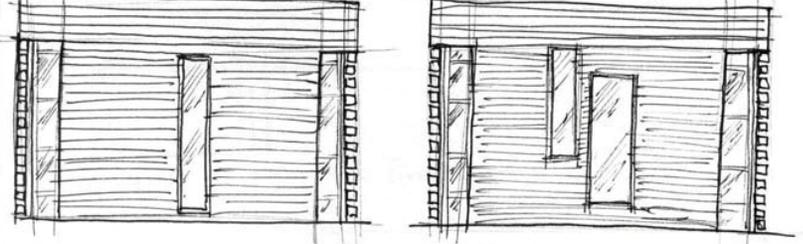
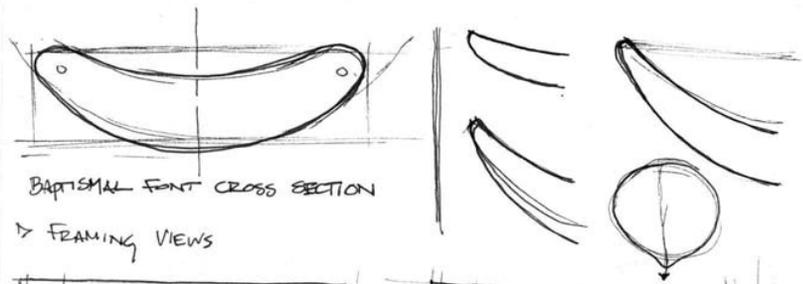
BAPTISMAL FONT



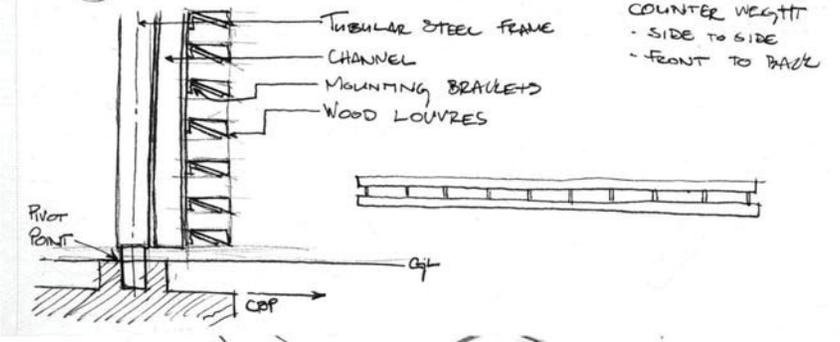
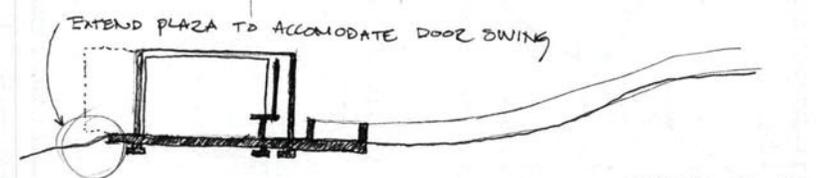
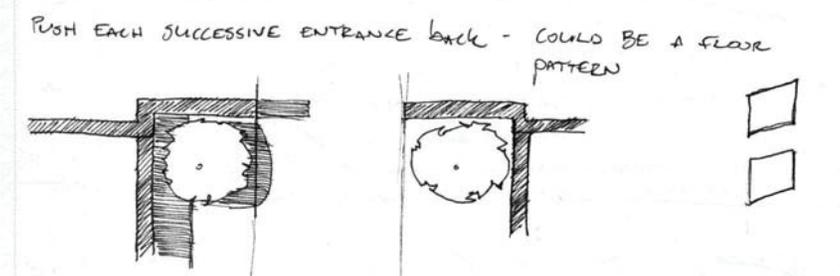
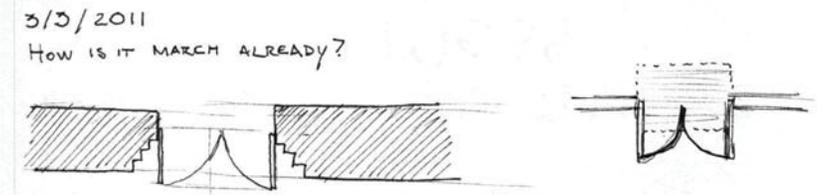


LECTERN DESIGN  
EVERYTHING REFERENCES THE OVERHEAD PLANE.  
LECTERN, DOOR HANDLES, SCANCES.

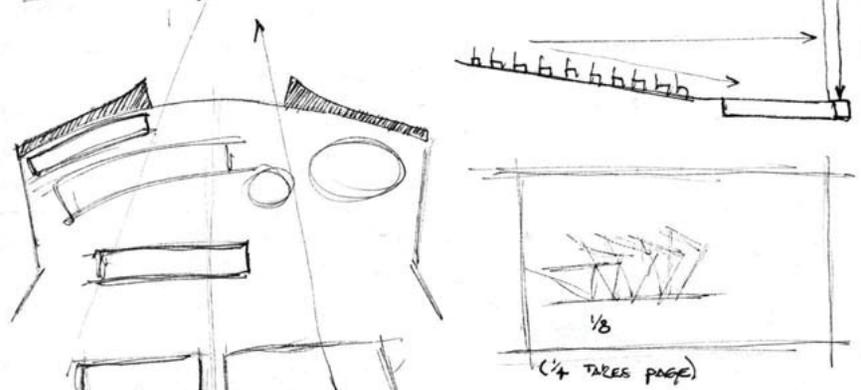
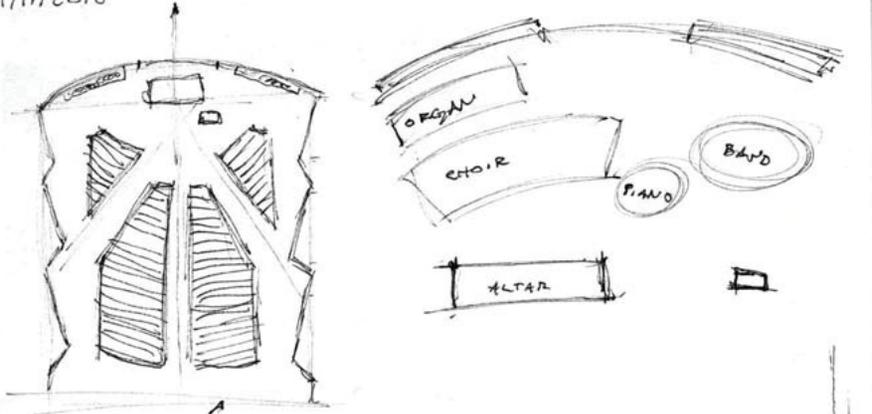
|        |         |         |        |
|--------|---------|---------|--------|
| 13.194 | 1'11"   | 1:8     | 9      |
| 9.389  | 1'13/8" | 0.58152 | 14.234 |



▷ CENTRAL PLACE THEORY

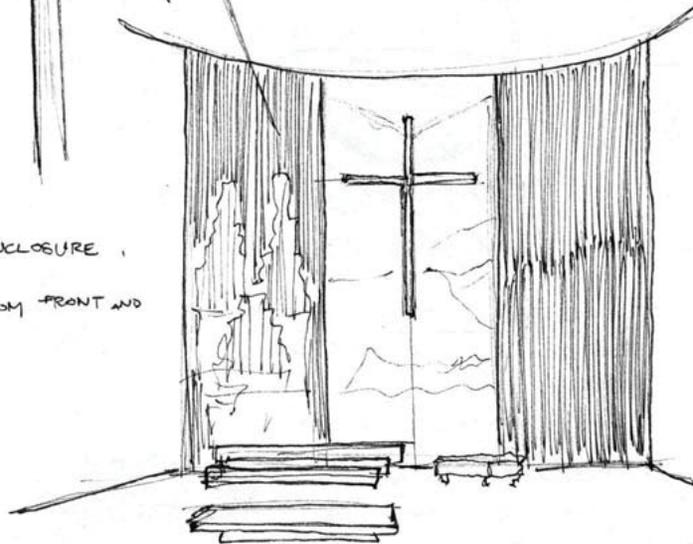


11/11/2010



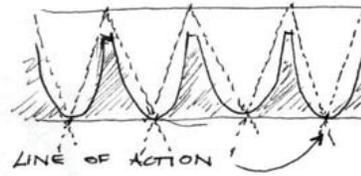
▷ SPATIAL ENCLOSURE

PERSPECTIVES FROM FRONT AND REAR



2/3/2011

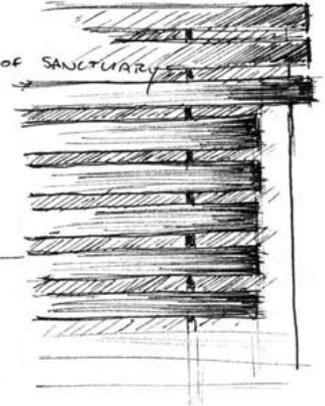
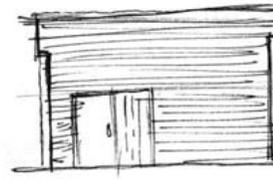
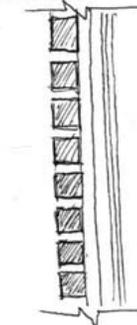
▷ BEST THESE PRESENTATION IS ONE THAT IS JUST A SLIVER OF TIME IN THE DESIGN.  
- LET OTHERS GET IN YOUR HEAD.



2/10/2011

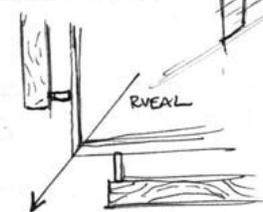
SACRISTY / OFFICE ATTACHMENT - MIRROR WOOD OF SANCTUARY

WALL SECTION

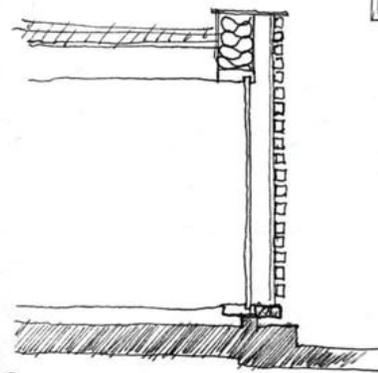
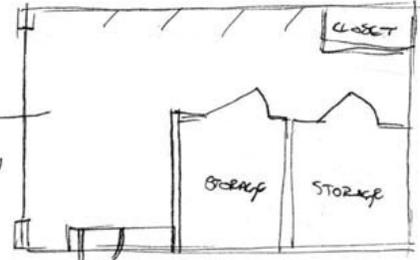


FRONT SCREEN DETAIL

CORNER DETAIL



Big WINDOW



SECTION THROUGH FACADE

1 1/2, 3  
1 1/2



## Introduction

Appendix C is the data and calculations that accompanied the design and implementation of my screen photography box. These include data on solar angles and times of year for which I took photos, sun path chart of the site, screen percent opening, and acoustical calculations for the interior of the sanctuary.

Table 1: Solar data for Jumonville, PA

| Month, Day | Time | Altitude angle | Azimuth angle<br>(deg from S) | declination |
|------------|------|----------------|-------------------------------|-------------|
| 20-Jan     | 900  | 12.66          | -49.68                        | -20.12      |
|            | 1200 | 29.63          | -8.00                         | -20.09      |
|            | 1700 | 3.16           | 60.43                         | -20.04      |
| 20-Mar     | 900  | 28.40          | -63.13                        | 0.24        |
|            | 1200 | 49.57          | -10.10                        | -0.11       |
|            | 1700 | 16.33          | 75.80                         | -0.02       |
| 21-May     | 900  | 44.09          | -79.43                        | 20.19       |
|            | 1200 | 70.06          | -10.49                        | 20.21       |
|            | 1700 | 27.00          | 94.62                         | 20.25       |
| 22-Jul     | 900  | 42.39          | -81.61                        | 20.46       |
|            | 1200 | 69.83          | -17.22                        | 20.44       |
|            | 1700 | 28.96          | 93.25                         | 20.40       |
| 22-Sep     | 900  | 31.23          | -60.11                        | 0.31        |
|            | 1200 | 50.29          | -4.44                         | 0.26        |
|            | 1700 | 13.70          | 78.49                         | 0.18        |
| 20-Nov     | 900  | 16.38          | -44.92                        | -19.91      |
|            | 1200 | 30.17          | -1.20                         | -19.94      |
|            | 1700 | -1.09          | 64.55                         | -19.99      |

| Jumonville, PA, Dunbar's Knob |              |
|-------------------------------|--------------|
| <b>Latitude</b>               | 39.885 North |
| <b>Longitude</b>              | 79.648 West  |
| <b>Elevation</b>              | 2300 feet    |

Table 2: Screen Percent Opening and Cross-Sections

| Shape              | Spacing (in) | # of Members | % opening (calculated) | To Build | Height | Length | Test Area (in <sup>2</sup> ) |
|--------------------|--------------|--------------|------------------------|----------|--------|--------|------------------------------|
| <b>Circular</b>    |              | 42           | 0%                     |          | 84     | 48     | 4032                         |
|                    | 2.5          | 18           | 57% y                  |          |        |        |                              |
|                    | 3            | 16           | 62%                    |          |        |        |                              |
|                    | 4            | 14           | 67% y                  |          |        |        |                              |
| <b>Square</b>      | 2            | 21           | 50% y                  |          |        |        |                              |
|                    | 3            | 16           | 62%                    |          |        |        |                              |
|                    | 6            | 10           | 76% y                  |          |        |        |                              |
| <b>Rectangular</b> | 2            | 21           | 50%                    |          |        |        |                              |
|                    | 3            | 16           | 62%                    |          |        |        |                              |
|                    | 5            | 12           | 71%                    |          |        |        |                              |
| <b>Triangle</b>    | 1            | 28           | 33%                    |          |        |        |                              |
|                    | 1.5          | 24           | 43%                    |          |        |        |                              |
|                    | 3            | 16           | 62% y                  |          |        |        |                              |
|                    | 6.5          | 9            | 79% y                  |          |        |        |                              |

2" Width on all members

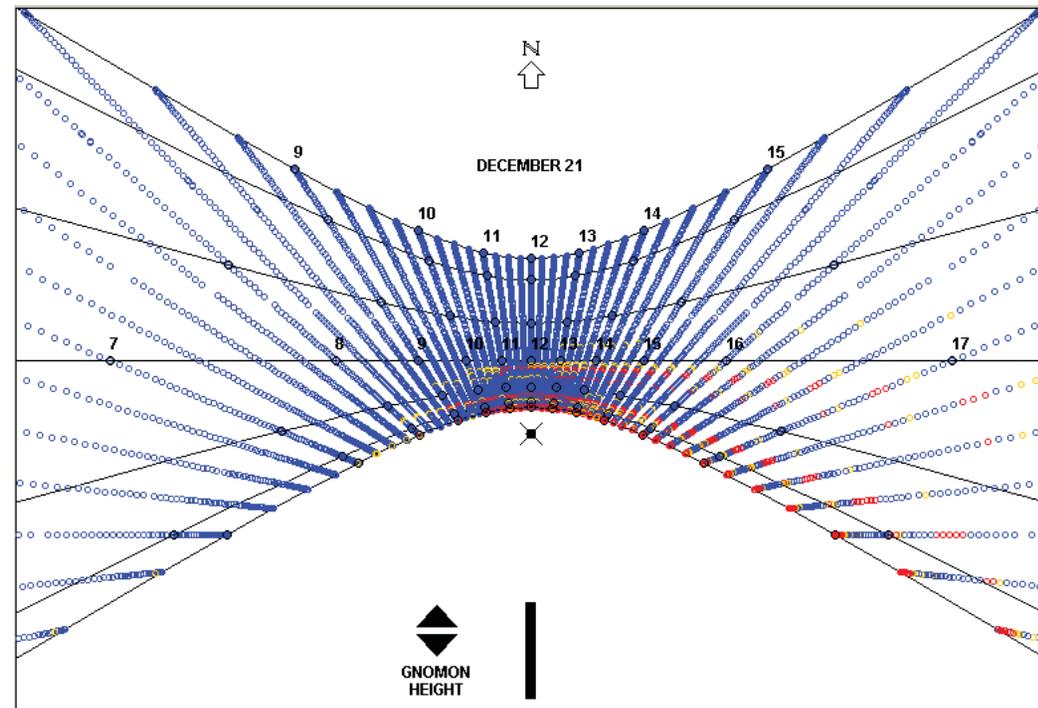


Figure 1: Sun Path Chart

Table 3: Acoustical Calculations for Reverberation Time

|                        |   | 125     | 250     | 500     | 1000    | 2000    | 4000    | area (S) (ft <sup>2</sup> ) | Volume   |
|------------------------|---|---------|---------|---------|---------|---------|---------|-----------------------------|----------|
| <b>Walls</b>           | concrete rough  | 0.10    | 0.02    | 0.04    | 0.06    | 0.08    | 0.10    | 1540                        | 224922.5 |
|                        | wood paneling   | 0.42    | 0.21    | 0.10    | 0.08    | 0.06    | 0.06    | 6624                        |          |
|                        | brick   | 0.02    | 0.02    | 0.03    | 0.04    | 0.05    | 0.07    | 2007.5                      |          |
|                        | glass, heavy  | 0.18    | 0.06    | 0.04    | 0.03    | 0.02    | 0.02    | 2530                        |          |
| <b>Ceiling</b>         | concrete  | 0.10    | 0.02    | 0.04    | 0.06    | 0.08    | 0.10    | 5060                        | 5060     |
|                        | glass-fiber roof fabric<br>(37 1/2 oz/yd <sup>2</sup> (partial reflectivity)) | 0.38    | 0.23    | 0.17    | 0.15    | 0.09    | 0.06    | 5060                        |          |
| <b>Floor</b>           | Wood parquet on concrete  | 0.04    | 0.04    | 0.07    | 0.06    | 0.07    | 0.07    | 5060                        |          |
| <b>Total a</b>         |   | 4140.03 | 1917.39 | 1442.03 | 1385.72 | 1430.62 | 1602.77 |                             |          |
| <b>Reverb Time (T)</b> |   | 2.72    | 5.87    | 7.80    | 8.12    | 7.86    | 7.02    |                             |          |

|                        |   | 125     | 250     | 500     | 1000    | 2000    | 4000    | area (S) (ft <sup>2</sup> ) | Volume      |
|------------------------|---|---------|---------|---------|---------|---------|---------|-----------------------------|-------------|
| <b>Walls</b>           | concrete rough  | 0.10    | 0.02    | 0.04    | 0.06    | 0.08    | 0.10    | 770                         | 174322.5    |
|                        | wood fiberboard   | 0.15    | 0.26    | 0.62    | 0.94    | 0.64    | 0.92    | 770                         |             |
|                        | wood paneling   | 0.42    | 0.21    | 0.10    | 0.08    | 0.06    | 0.06    | 4784                        |             |
|                        | thick fibrous behind open facing<br>glass, heavy                              | 0.60    | 0.75    | 0.82    | 0.80    | 0.60    | 0.32    | 1457.5                      |             |
| <b>Ceiling</b>         | concrete  | 0.10    | 0.02    | 0.04    | 0.06    | 0.08    | 0.10    | 5060                        | 5060        |
|                        | glass-fiber roof fabric<br>(37 1/2 oz/yd <sup>2</sup> (partial reflectivity)) | 0.38    | 0.23    | 0.17    | 0.15    | 0.09    | 0.06    | 5060                        |             |
| <b>Floor</b>           | Wood parquet on concrete  | 0.04    | 0.04    | 0.07    | 0.06    | 0.07    | 0.07    | 5060                        |             |
| <b>Total a</b>         |   | 5557.88 | 3798.37 | 3475.35 | 3440.72 | 2565.14 | 2236.24 |                             |             |
| <b>Reverb Time (T)</b> |   | 1.57    | 2.29    | 2.51    | 2.53    | 3.40    | 3.90    | <b>Average T</b>            | <b>2.70</b> |

|                        |   | 125     | 250     | 500     | 1000    | 2000    | 4000    | area (S) (ft <sup>2</sup> ) | Volume   |
|------------------------|---|---------|---------|---------|---------|---------|---------|-----------------------------|----------|
| <b>Walls</b>           | concrete rough  | 0.10    | 0.02    | 0.04    | 0.06    | 0.08    | 0.10    | 1540                        | 224922.5 |
|                        | wood paneling   | 0.42    | 0.21    | 0.10    | 0.08    | 0.06    | 0.06    | 6624                        |          |
|                        | brick   | 0.02    | 0.02    | 0.03    | 0.04    | 0.05    | 0.07    | 2007.5                      |          |
|                        | glass, heavy  | 0.18    | 0.06    | 0.04    | 0.03    | 0.02    | 0.02    | 2530                        |          |
| <b>Ceiling</b>         | concrete  | 0.10    | 0.02    | 0.04    | 0.06    | 0.08    | 0.10    | 5060                        | 5060     |
|                        | glass-fiber roof fabric<br>(37 1/2 oz/yd <sup>2</sup> (partial reflectivity)) | 0.38    | 0.23    | 0.17    | 0.15    | 0.09    | 0.06    | 5060                        |          |
| <b>Floor</b>           | Wood parquet on concrete  | 0.04    | 0.04    | 0.07    | 0.06    | 0.07    | 0.07    | 5060                        |          |
| <b>Total a</b>         |   | 5556.83 | 2979.99 | 2099.83 | 1841.12 | 1481.22 | 1400.37 |                             |          |
| <b>Reverb Time (T)</b> |   | 2.02    | 3.77    | 5.36    | 6.11    | 7.59    | 8.03    |                             |          |

|                        |   | 125     | 250     | 500     | 1000    | 2000    | 4000    | area (S) (ft <sup>2</sup> ) | Volume      |
|------------------------|---|---------|---------|---------|---------|---------|---------|-----------------------------|-------------|
| <b>Walls</b>           | concrete rough  | 0.10    | 0.02    | 0.04    | 0.06    | 0.08    | 0.10    | 1540                        | 174322.5    |
|                        | wood fiberboard   | 0.15    | 0.26    | 0.62    | 0.94    | 0.64    | 0.92    | 0                           |             |
|                        | wood paneling (peforated, etc.)   | 0.40    | 0.90    | 0.80    | 0.50    | 0.40    | 0.30    | 4784                        |             |
|                        | thick fibrous behind open facing<br>glass, heavy                              | 0.60    | 0.75    | 0.82    | 0.80    | 0.60    | 0.32    | 1457.5                      |             |
| <b>Ceiling</b>         | concrete  | 0.10    | 0.02    | 0.04    | 0.06    | 0.08    | 0.10    | 5060                        | 5060        |
|                        | glass-fiber roof fabric<br>(37 1/2 oz/yd <sup>2</sup> (partial reflectivity)) | 0.38    | 0.23    | 0.17    | 0.15    | 0.09    | 0.06    | 5060                        |             |
| <b>Floor</b>           | Wood parquet on concrete  | 0.04    | 0.04    | 0.07    | 0.06    | 0.07    | 0.07    | 5060                        |             |
| <b>Total a</b>         |   | 5423.70 | 6914.53 | 6377.55 | 4772.40 | 3760.50 | 2753.00 |                             |             |
| <b>Reverb Time (T)</b> |   | 1.61    | 1.26    | 1.37    | 1.83    | 2.32    | 3.17    | <b>Average T</b>            | <b>1.72</b> |

|                        |   | 125     | 250     | 500     | 1000    | 2000    | 4000    | area (S) (ft <sup>2</sup> ) | Volume   |
|------------------------|---|---------|---------|---------|---------|---------|---------|-----------------------------|----------|
| <b>Walls</b>           | concrete rough  | 0.10    | 0.02    | 0.04    | 0.06    | 0.08    | 0.10    | 1540                        | 224922.5 |
|                        | wood paneling   | 0.42    | 0.21    | 0.10    | 0.08    | 0.06    | 0.06    | 6624                        |          |
|                        | thick fibrous behind open facing  | 0.60    | 0.75    | 0.82    | 0.80    | 0.60    | 0.32    | 2007.5                      |          |
|                        | glass, heavy  | 0.18    | 0.06    | 0.04    | 0.03    | 0.02    | 0.02    | 2530                        |          |
| <b>Ceiling</b>         | concrete  | 0.10    | 0.02    | 0.04    | 0.06    | 0.08    | 0.10    | 5060                        | 5060     |
|                        | glass-fiber roof fabric<br>(37 1/2 oz/yd <sup>2</sup> (partial reflectivity)) | 0.38    | 0.23    | 0.17    | 0.15    | 0.09    | 0.06    | 5060                        |          |
| <b>Floor</b>           | Wood parquet on concrete  | 0.04    | 0.04    | 0.07    | 0.06    | 0.07    | 0.07    | 5060                        |          |
| <b>Total a</b>         |   | 6721.18 | 4445.47 | 3685.75 | 3366.82 | 2585.34 | 1902.24 |                             |          |
| <b>Reverb Time (T)</b> |   | 1.67    | 2.53    | 3.05    | 3.34    | 4.35    | 5.91    |                             |          |

|                        |   | 125     | 250     | 500     | 1000    | 2000    | 4000    | area (S) (ft <sup>2</sup> ) | Volume      |
|------------------------|---|---------|---------|---------|---------|---------|---------|-----------------------------|-------------|
| <b>Walls</b>           | concrete rough  | 0.10    | 0.02    | 0.04    | 0.06    | 0.08    | 0.10    | 1540                        | 224922.5    |
|                        | wood fiberboard   | 0.15    | 0.26    | 0.62    | 0.94    | 0.64    | 0.92    | 0                           |             |
|                        | wood paneling (peforated, etc.)   | 0.40    | 0.90    | 0.80    | 0.50    | 0.40    | 0.30    | 6624                        |             |
|                        | thick fibrous behind open facing<br>glass, heavy                              | 0.60    | 0.75    | 0.82    | 0.80    | 0.60    | 0.32    | 2007.5                      |             |
| <b>Ceiling</b>         | concrete  | 0.10    | 0.02    | 0.04    | 0.06    | 0.08    | 0.10    | 5060                        | 5060        |
|                        | glass-fiber roof fabric<br>(37 1/2 oz/yd <sup>2</sup> (partial reflectivity)) | 0.38    | 0.23    | 0.17    | 0.15    | 0.09    | 0.06    | 0                           |             |
| <b>Floor</b>           | Wood parquet on concrete  | 0.04    | 0.04    | 0.07    | 0.06    | 0.07    | 0.07    | 5060                        |             |
| <b>Total a</b>         |   | 5171.90 | 7953.43 | 7664.75 | 5693.50 | 4786.90 | 3694.40 |                             |             |
| <b>Reverb Time (T)</b> |   | 2.17    | 1.41    | 1.47    | 1.98    | 2.35    | 3.04    | <b>Average T</b>            | <b>2.07</b> |

## Introduction

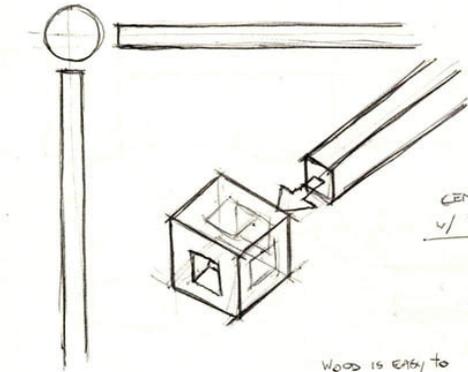
Appendix D is the cumulative record of a completely different design process. As has been mentioned previously, when I began the thesis, I was exploring a tutoring center centered around modular construction and design. It was only because of the wisdom of my committee that I was able to change tack completely and begin work on my church. However, the amount of work on the tutoring center was not insignificant, and represented a large amount of research and theoretical design. It is this process and collection of sketches that I include here.

▷ TO CONSTRAIN YOURSELF TO THIS SYSTEM OF BUILDING INHERENTLY ELIMINATES SOME CONDITIONS YOU MAY WANT TO CREATE BECAUSE YOU CAN'T DO SOME THINGS WITHOUT CHANGING THE FUNDAMENTAL NATURE OF THE MODULE. IF YOU HAVE TO CHANGE THE MODULE THAT MUCH YOU MIGHT AS WELL DO AWAY WITH IT AND BUILD A REGULAR BUILDING...

▷ "DISTINCTIONS OF PHYSICAL MEANS OF MODULARITY"  
- STEVE SAID THIS.

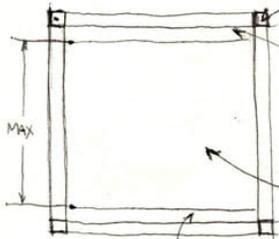
▷ DEVELOPING A MODULAR SYSTEM IS FINE AS LONG AS YOU DON'T HOLD PRECONCEIVED NOTIONS ABOUT WHAT THE BUILDING WILL BE. THAT, THE MODULE IS THE GENERATOR OF THE BUILDING, NOT THE OTHER WAY AROUND.

▷ NODAL FRAMEWORK



CENTRAL HALL  
V/ BRANCHES

START W/ UTILITIES.

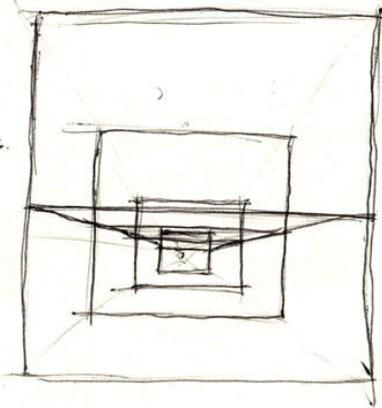


THIN FLOOR (HEATED SLAB, THIN THICKNESS)

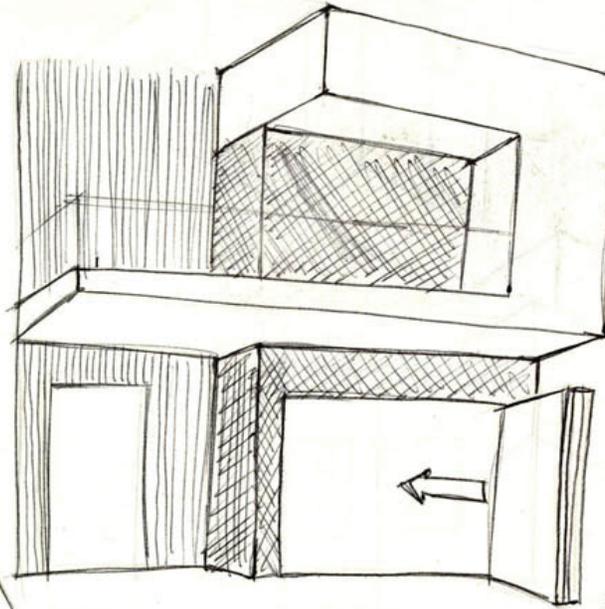
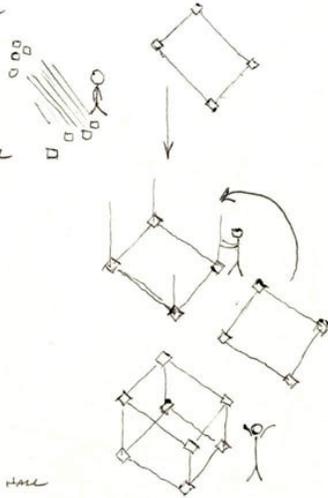
WOOD IS EASY TO MANUFACTURE, BUT STEEL WILL ALLOW FOR THROUGH + CABLES.

DUCTS HERE

NEED TO MAXIMIZE THIS HEIGHT

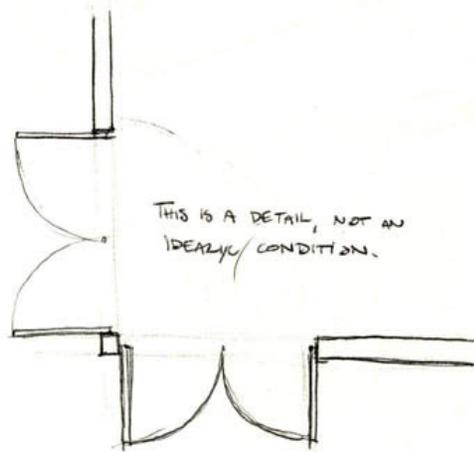


9/2/2010



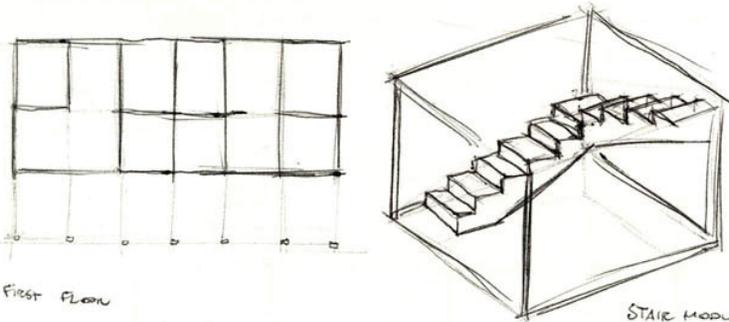
▷ USE CONDITIONS (BASIS OF THESE) TO FORM SPACES. THESE SPACES MAY NOT HAVE A SPECIFIC FUNCTION AT THIS TIME, AS THE USE OF THE BUILDING WILL MOST LIKELY CHANGE OVER TIME.

LOUVERS.



THIS IS A DETAIL, NOT AN IDEALIC/CONDITION.

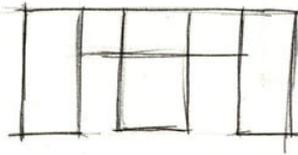
▷ HOW DO YOU STOP SOME THING?  
WHAT IF THE STAIR TOWER IS THE ANCHOR, AND THE REST OF THE BUILDING FLIES OFF OF THAT LIKE AN IMPOSSIBLE CANTILEVER...



FIRST FLOOR

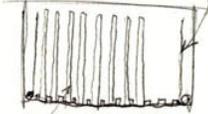
STAIR MODULE

- ▷ 102 IN WIDE (8.5 FT.)
- 13.5 FT HIGH
- UP TO 52 FT LONG
- ▷ SHIPPING CONTAINER: 8' x 8' x [20']

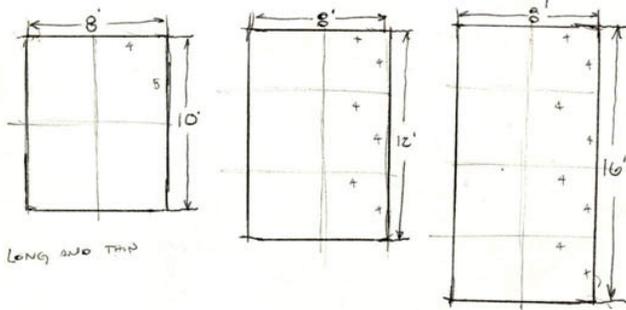


ROOM AS CONTAINER

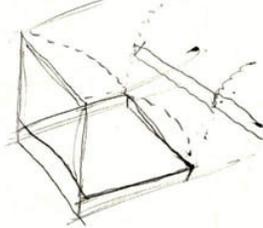
FOLLOWING FLOOR



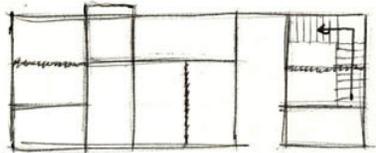
PANELS FOR OTHER AREAS



LONG AND THIN

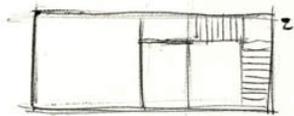


TRANSFORMATION

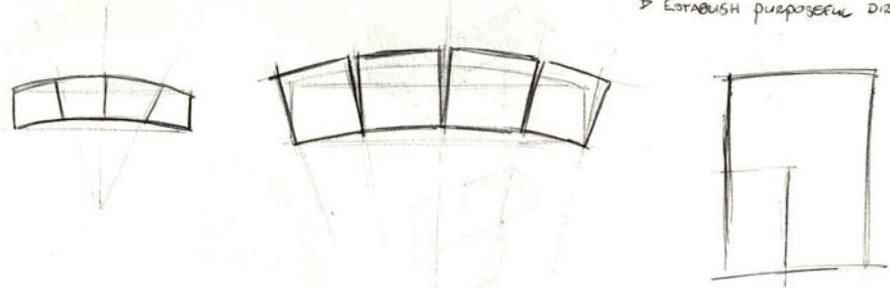
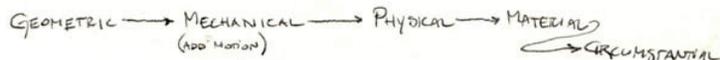


THIS SCHEME WHEREBY  
 ENDS ITSELF TO A  
 8 x 8 GRID. TO  
 SPREAD AWAY FROM THIS,  
 THE BUILDING MUST BE  
 ALTERED OR A SECOND  
 GRID MUST BE USED.

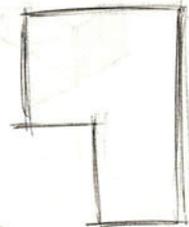
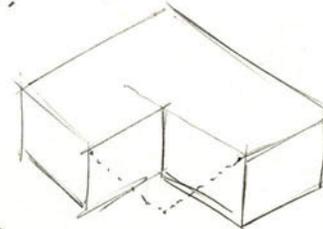
MEETING SPACES @ 4 MODS  
 SMALL CLAYS @ 2 MOD



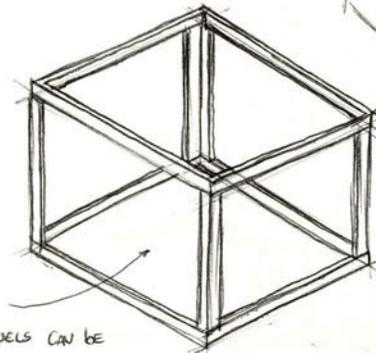
PHYSICAL BEFORE MATERIAL



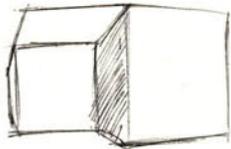
▷ SHOULD I START WITH A  
 MODULAR UNIT AND BUILD  
 OFF OF THAT? OR START  
 WITH THE BUILDING AND  
 ADAPT THE UNIT TO FIT  
 THAT?



SHOULD I START W/ A  
 THEORY?



DAMMIT



PANELS CAN BE ANYTHING

STARTING POINTS: KEYWORDS

- WOOD
- DOUBLE HEIGHT SPACE (VENTILATION)
- MODULAR PREFABRICATED
- DAYLIGHTING
- FRAME
- ~~CONSTRUCTION~~

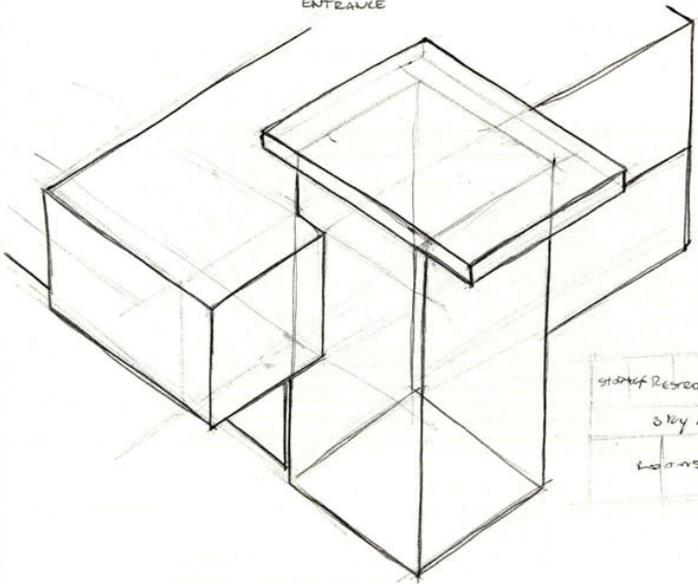
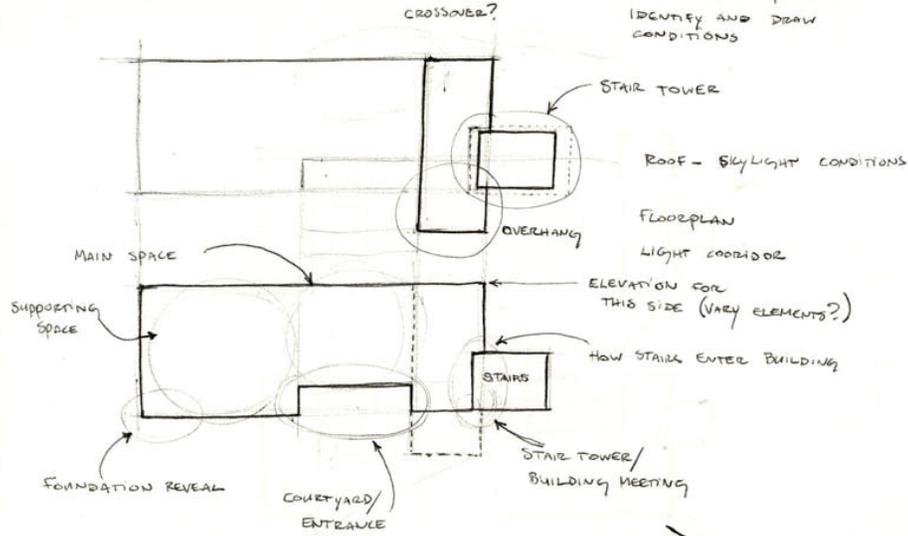


REVISED KEYWORDS:  
 DAYLIGHT  
 VENTILATION  
 NATURAL CONVECTION  
 BUILDING TO GROUND  
 DOUBLE HEIGHT SPACE  
 COMPRESSION/RELEASE



YOU ARE ON AN AIRPLANE. THE GUY NEXT TO YOU SAYS...

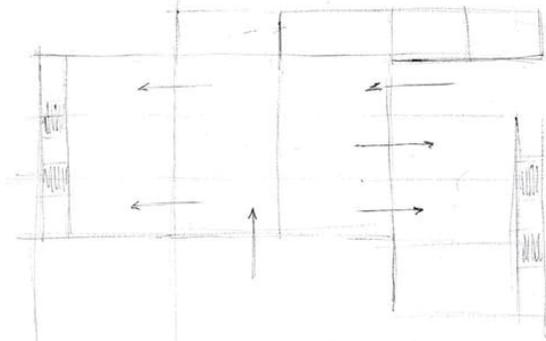
▷ BASIC FLOOR PLAN - IDENTIFY AND DRAW CONDITIONS



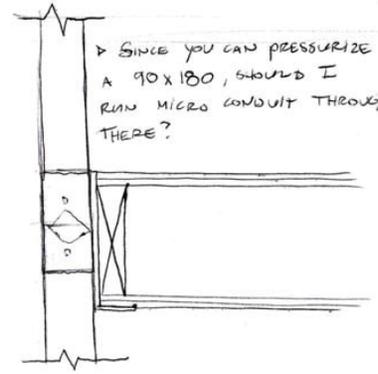
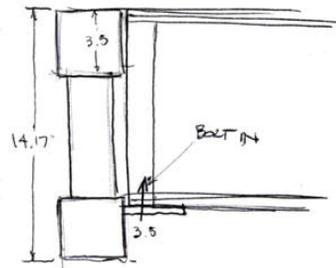
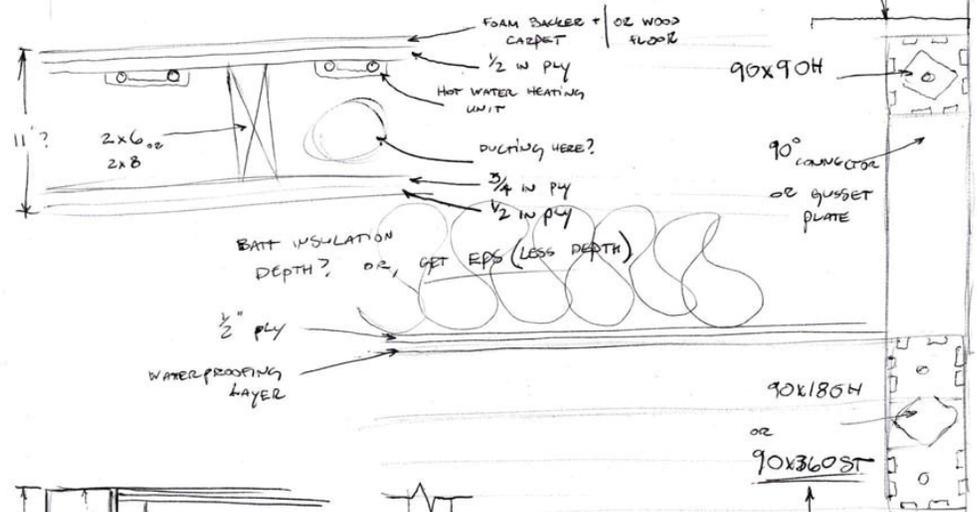
9/23/2010

9' 3/4"   
 1' 3/4"

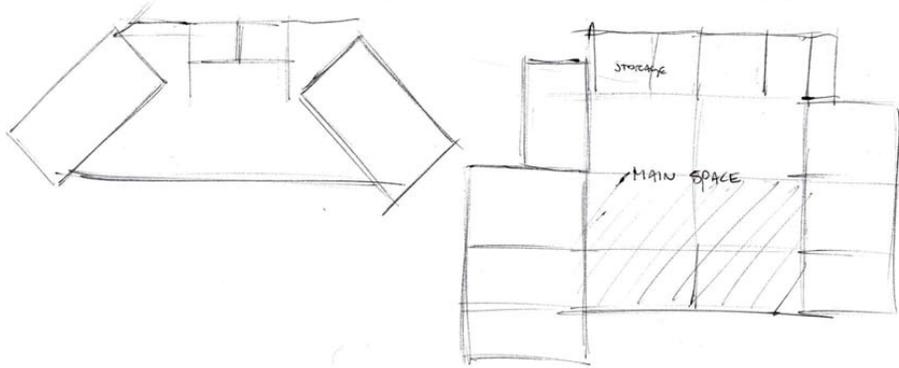
0.3937 (MM TO IN)



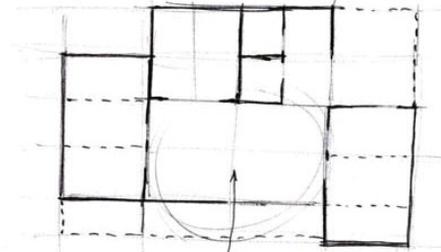
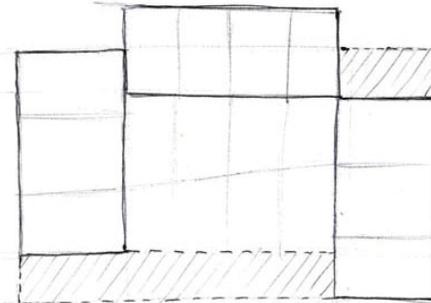
SOMEWHERE OVER HERE THERE NEEDS TO BE A FRAME CONNECTION AND INSULATION.



9/23/2010

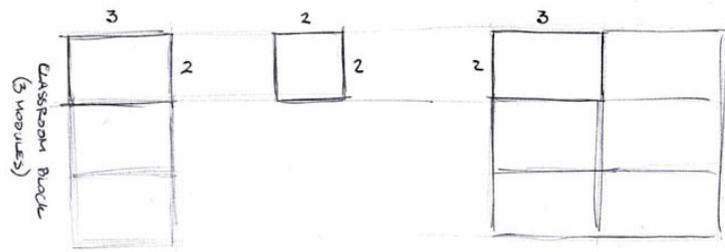


9/23/2010

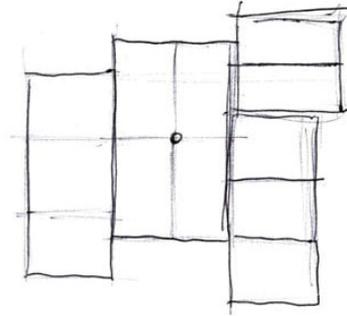
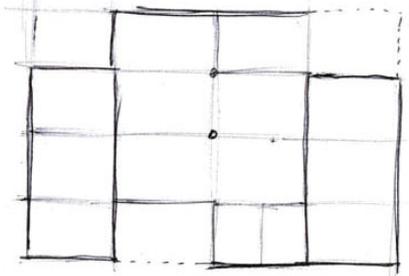
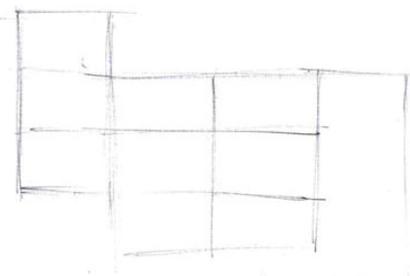
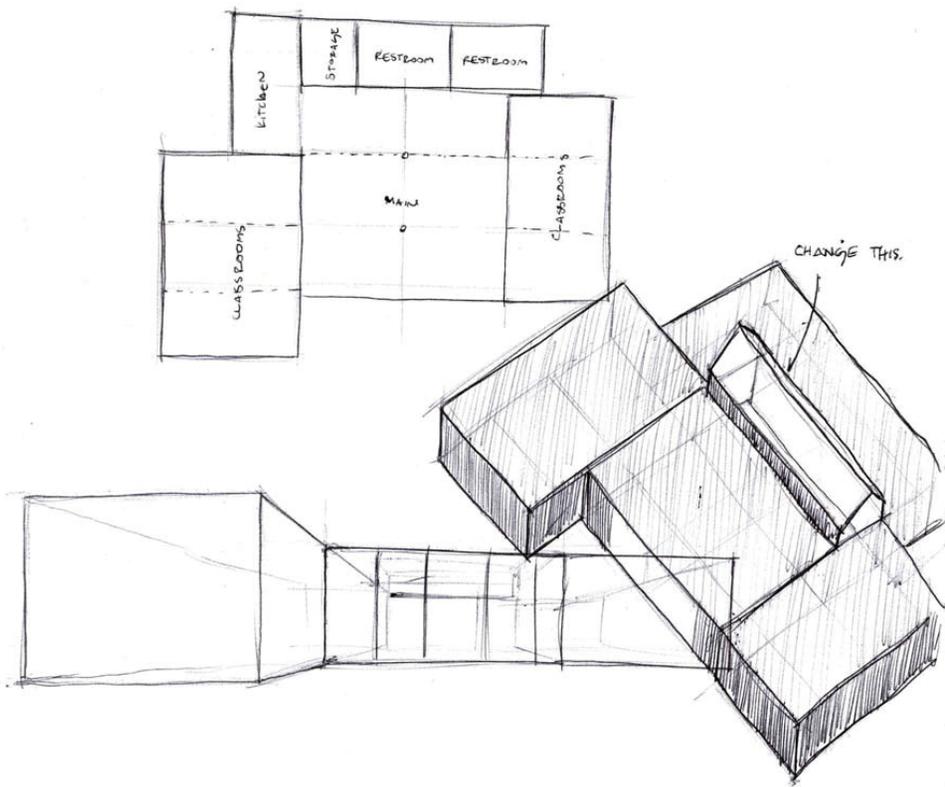


TOO SMALL OPEN ACCESS TO OUTDOORS TO CREATE LARGER SPACE

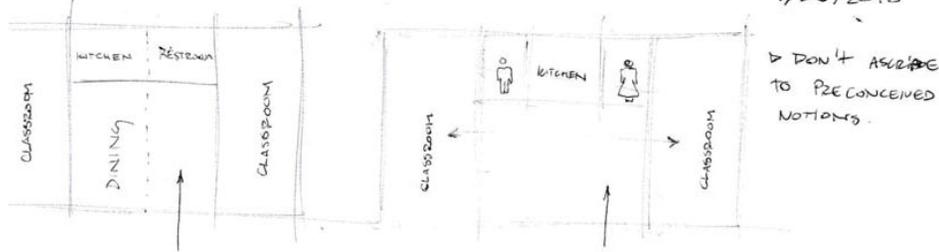
RESTROOM



CHANGE THIS.

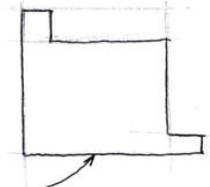


9/22/2010



▷ DON'T ASSUME TO PRECONCEIVED NOTIONS.

▷ MAINTAIN PUBLIC VS- PRIVATE



HOW MUCH HEAT TRANSFER AM I GOING TO GET THROUGH THE STEEL?

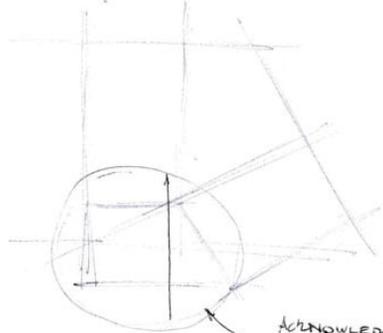
RESTART... LET'S CHANGE THE BEAT...

9/22/2010

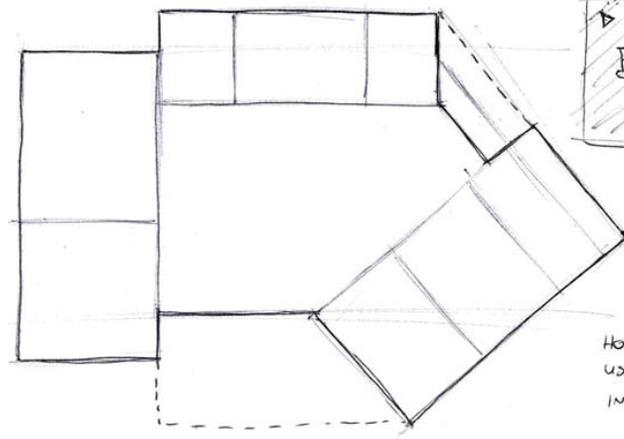
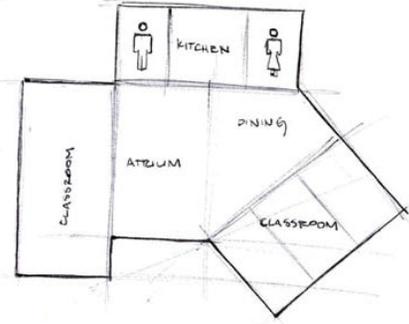
▷ I'VE BEEN THROWING AROUND THE TERM MODULAR, BUT PERHAPS WHAT I REALLY WANT IS PREFAB.

▷ ZALPH RAPSON - CASE STUDY HOUSE #4

PRIVATE SPACES CONNECTED BY CENTRAL PUBLIC ATRIUM SPACE



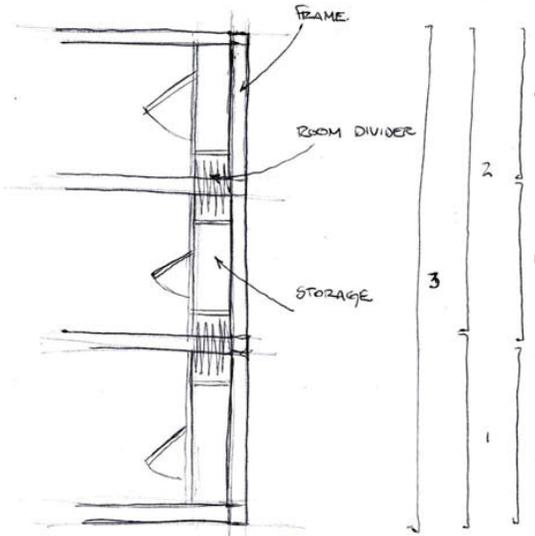
ACKNOWLEDGE ENTRY CONDITION



▷ USE BOSCH REXROTH CORP. ALUMINUM FRAMING SYSTEM

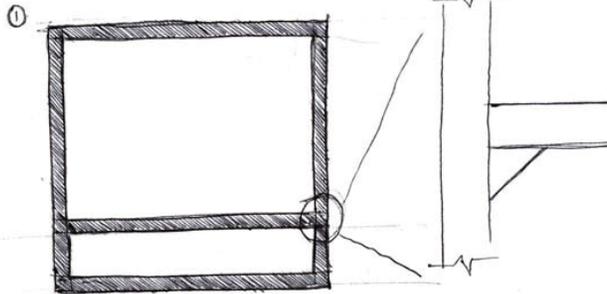
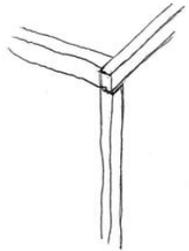
90-SERIES PROFILES. 90x90H 90x180H

SIMILAR TO THE LOBLOLLY HOUSE, DEVELOP CONNECTORS TO USE [MAINTAIN STRUCTURAL INTEGRITY]



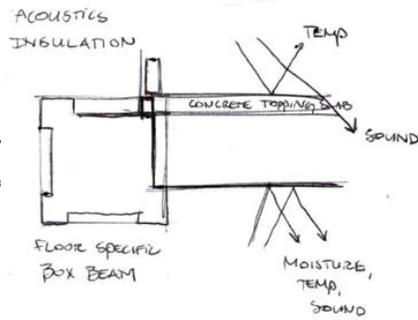
DIVISION BREAKDOWN

▷ ASSUMING A CONNECTOR CAN BE FOUND...

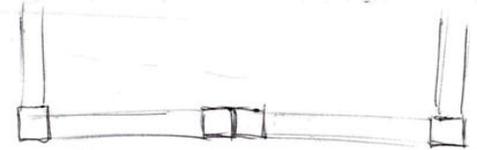


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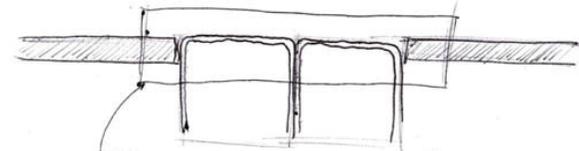
FLOOR/CEILING



9/11/2010

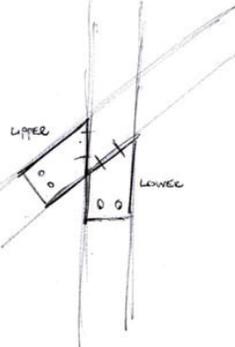
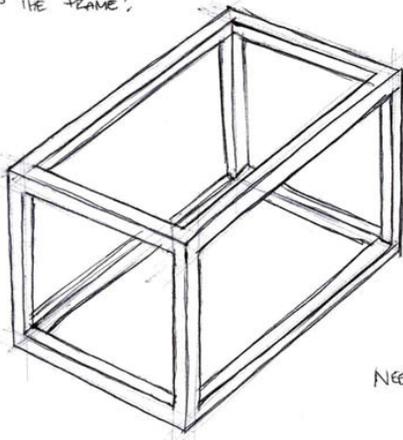


WHAT'S WITH CONCRETE TOPPING SLABS?

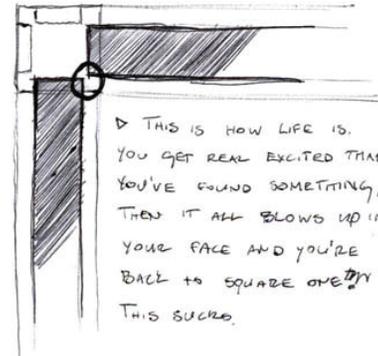


WHAT TO DO AT A JUNCTURE?

▷ WHY DO I KEEP COMING BACK TO THE FRAME?

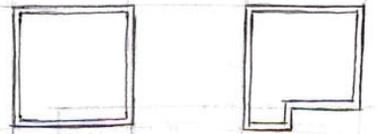


NEED MODULE ARRANGEMENT

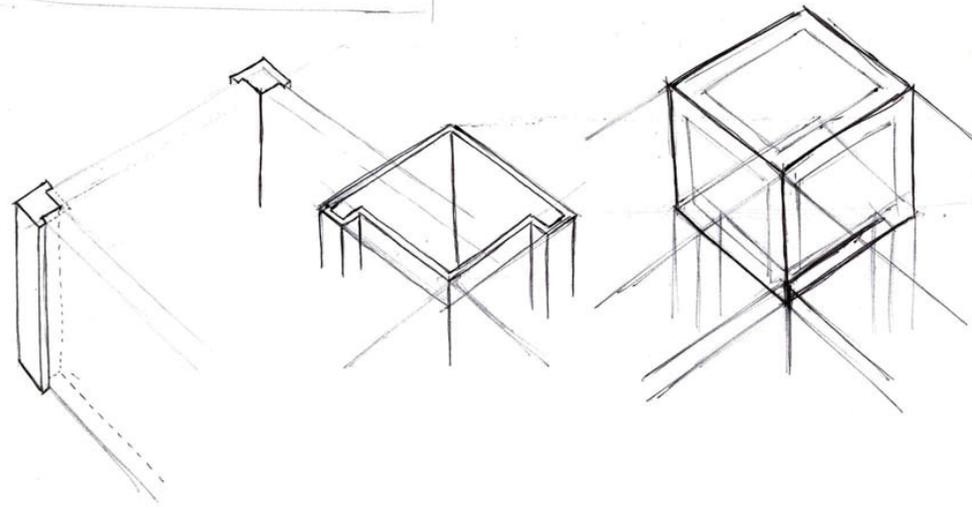
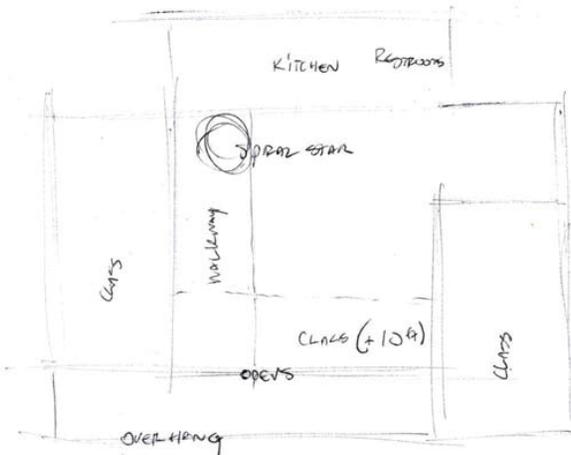


▷ THIS IS HOW LIFE IS. YOU GET REAL EXCITED THAT YOU'VE FOUND SOMETHING, THEN IT ALL BLOWS UP IN YOUR FACE AND YOU'RE BACK TO SQUARE ONE. THIS SUCKS.

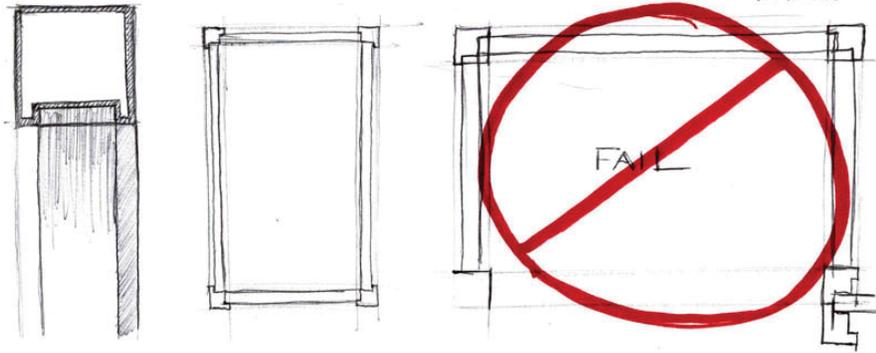
9/14/2010



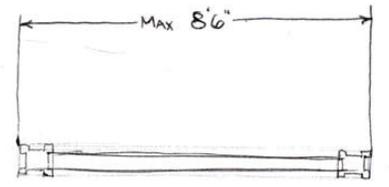
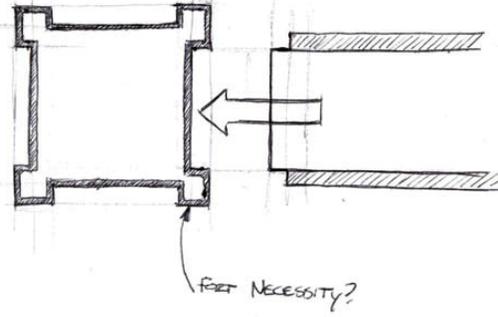
WORK FROM CORNER



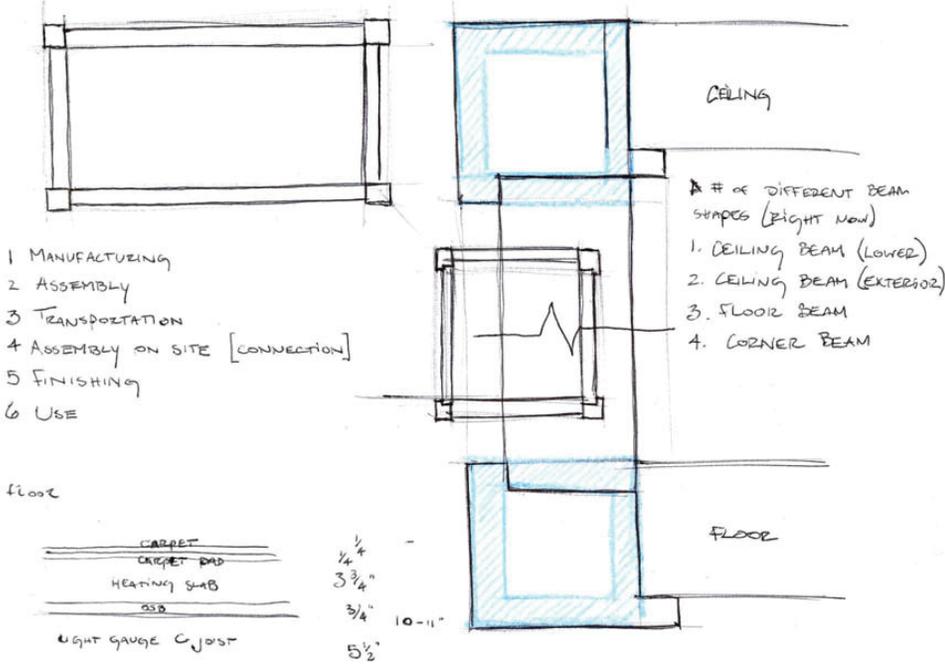
9/14/2010



9/14/2010

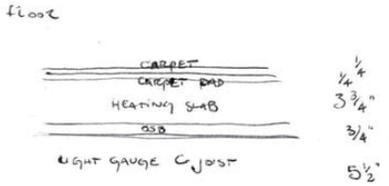


IF IT IS CONCEIVABLE THAT AN END NODE OR BOX BEAM CAN BE LESS THAN 11' OR 12' IN ORDER TO ACCOMMODATE THE PLUMBING CHASE AND INSULATION.



- 1 MANUFACTURING
- 2 ASSEMBLY
- 3 TRANSPORTATION
- 4 ASSEMBLY ON SITE [CONNECTION]
- 5 FINISHING
- 6 USE

- # of DIFFERENT BEAM SHAPES (RIGHT NOW)
1. CEILING BEAM (LOWER)
  2. CEILING BEAM (EXTERIOR)
  3. FLOOR BEAM
  4. CORNER BEAM

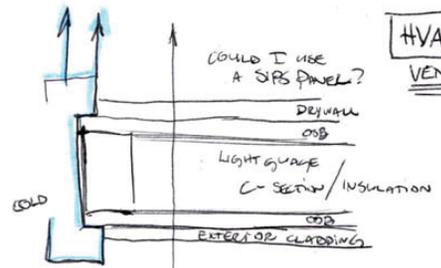


WHAT CAN WEATHER PROOF DOWN HERE?

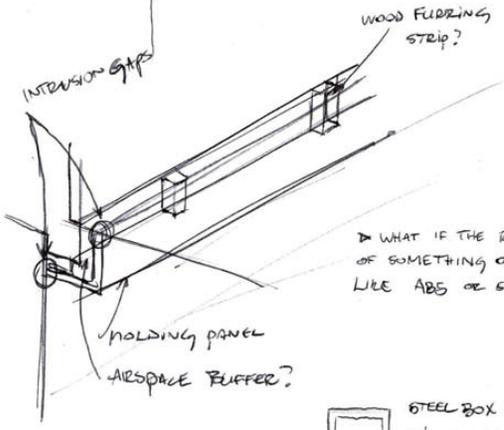
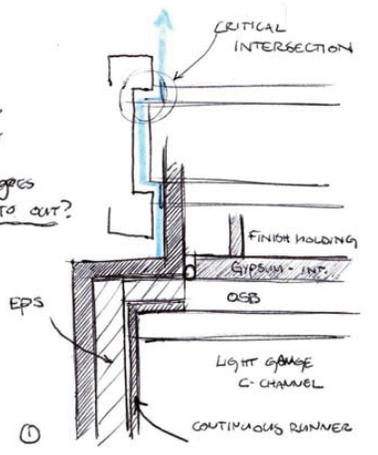
INCREASE TOTAL HEIGHT TO 10'?

DWELL HOUSE PROS COME TO ENVIRONMENT WHAT DOES THIS MEAN TO THE SYSTEM

**HVAC VENTILATION**



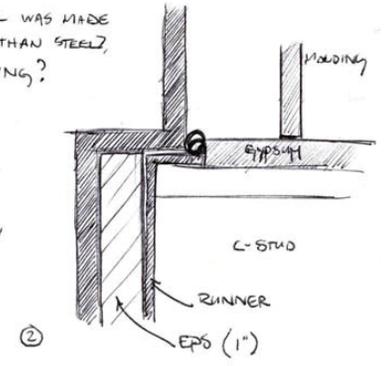
HOW DO YOU INSULATE A PIECE OF STEEL THAT GOES FROM INSIDE TO OUT?



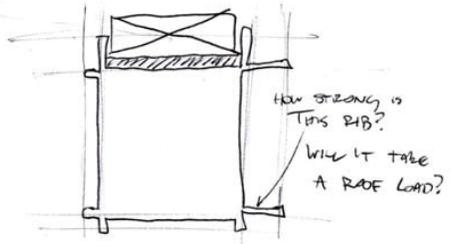
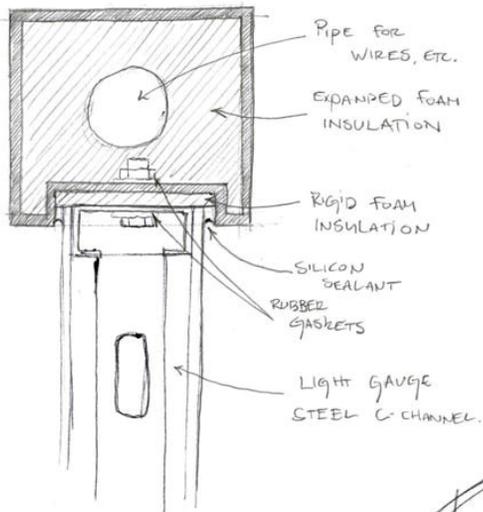
WHAT IF THE RUNNER WAS MADE OF SOMETHING OTHER THAN STEEL, LIKE ABS OR SOMETHING?

- STEEL BOX BEAM  
5 1/2, 6, 7, 8, 9, 10, 12, 14, 16

ASSUME C-STD - 3 3/8, 4, 5 1/2, 6  
GYPSUM - 5/8  
OSB - 1/2 - 3/4

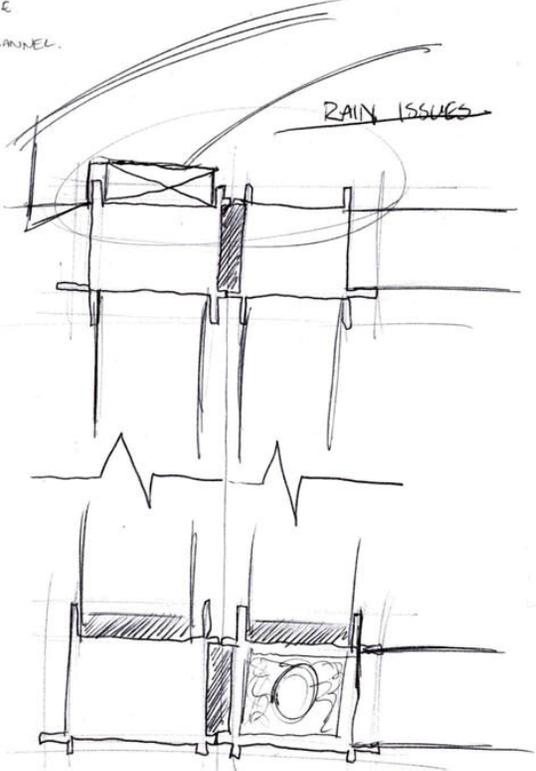


9/8/2010



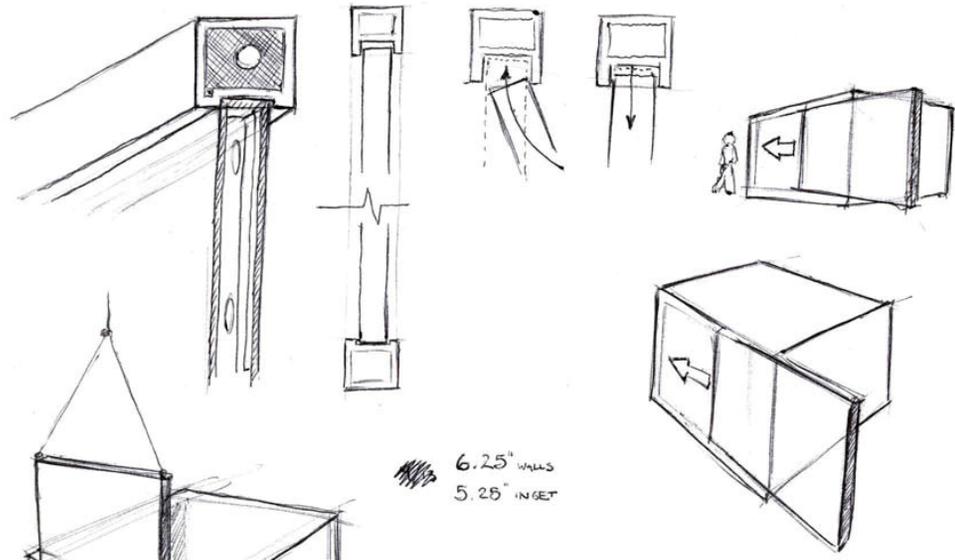
NEED EXTERIOR VIEWS W/ UPDATED PIPS CONNECTIONS

RAIN ISSUES

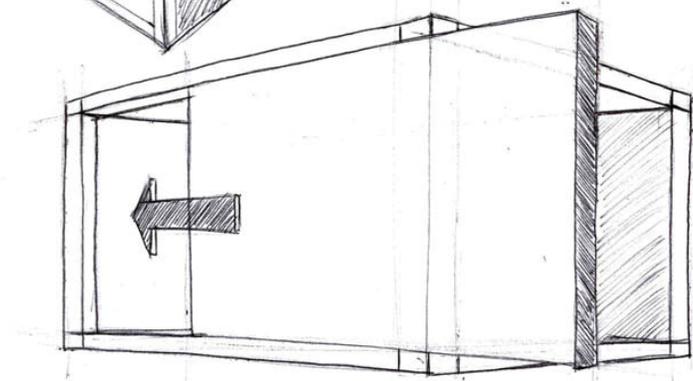


THIS ALL SEEMS TOO COMPLEX

9/8/2010



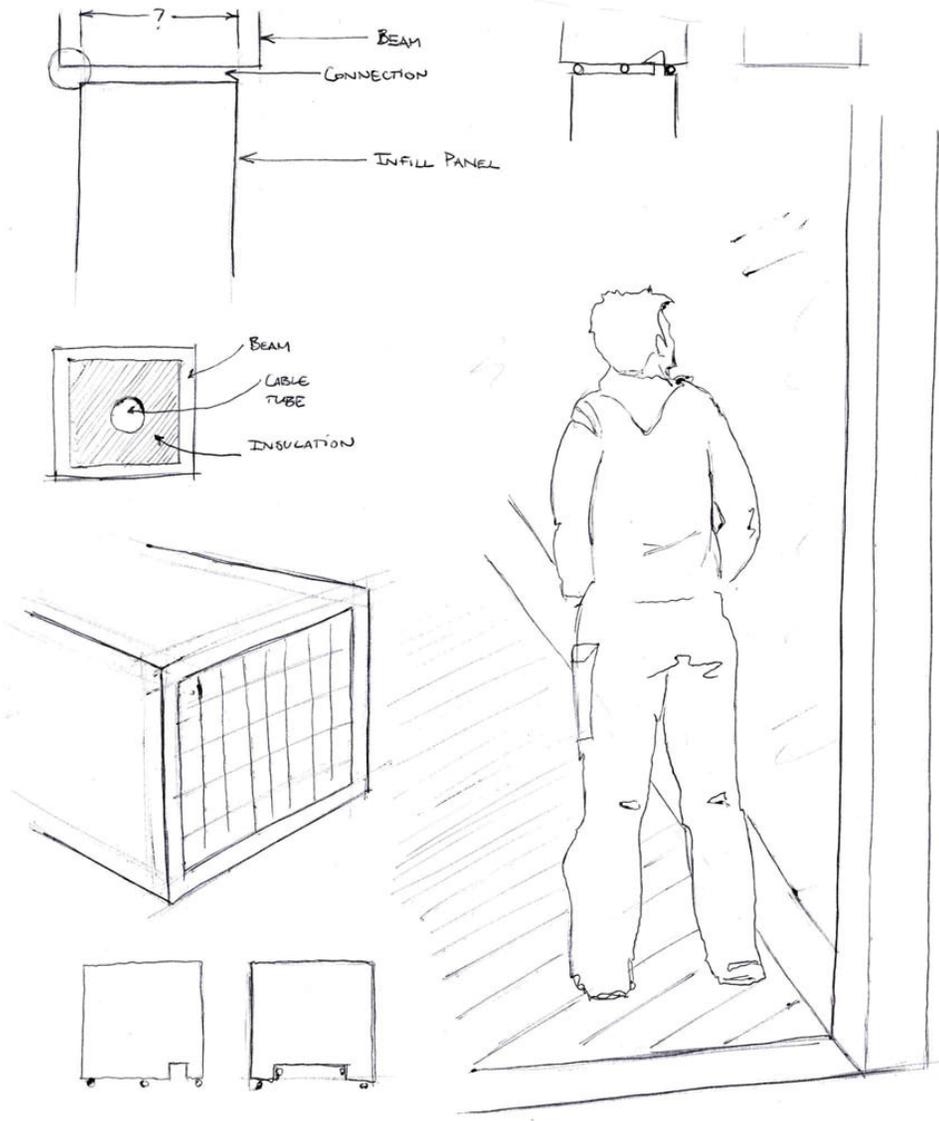
6.25" WALLS  
5.25" INSET



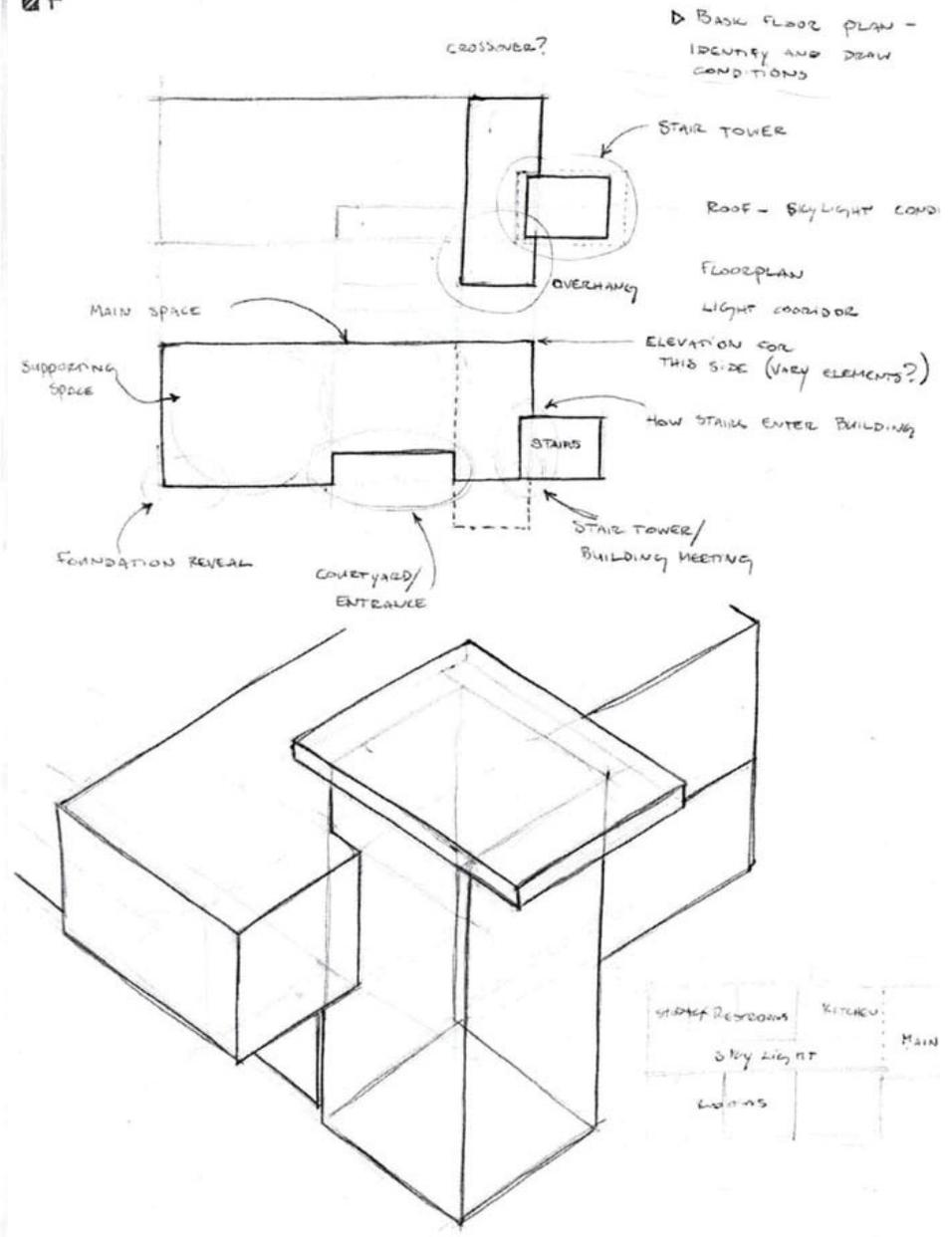
LOWER INTO POSITION  
DON'T SLIDE.

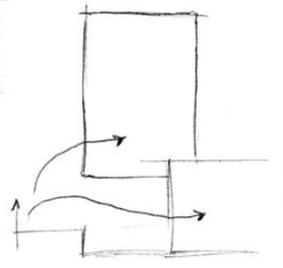
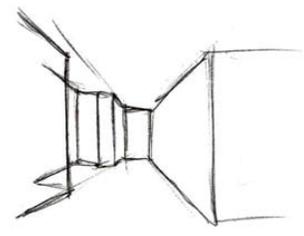
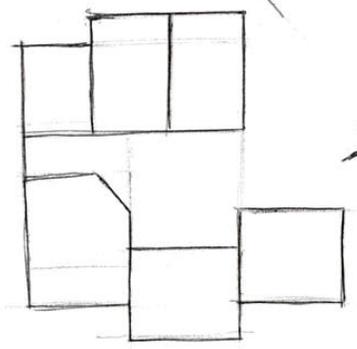
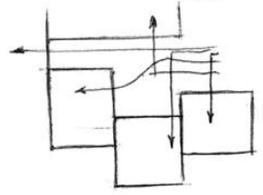
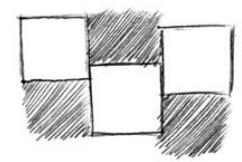
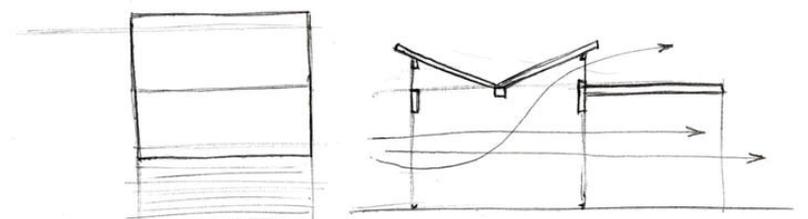
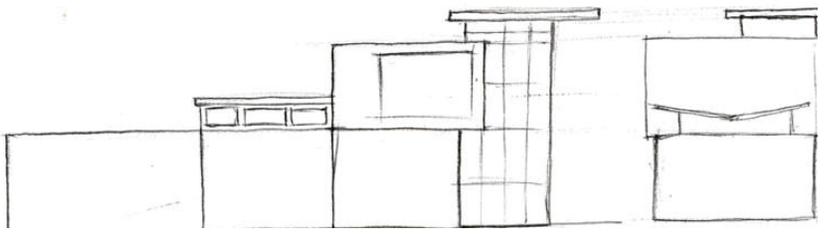
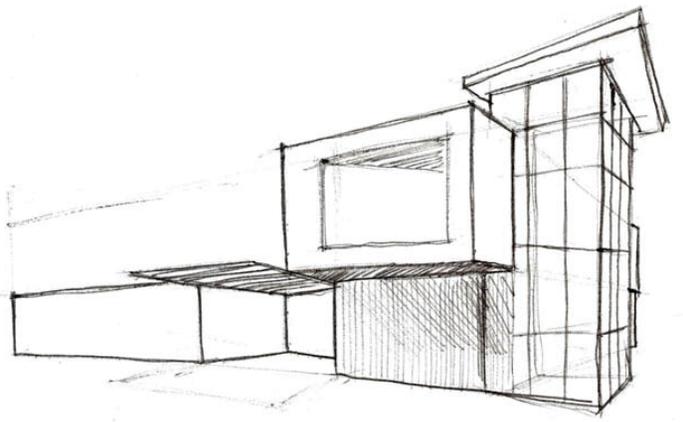
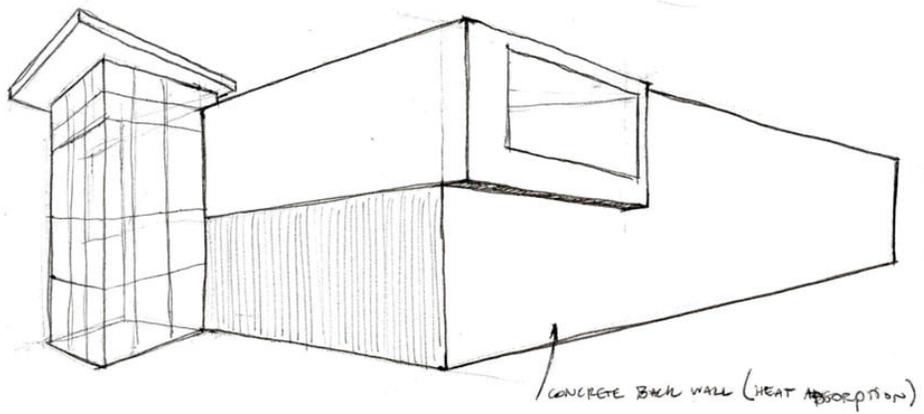
1. THE MODULE MUST COME FIRST.
2. I WILL NOT TRY TO MAKE A PERFECT SYSTEM.

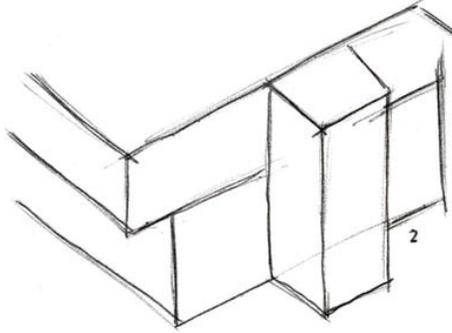
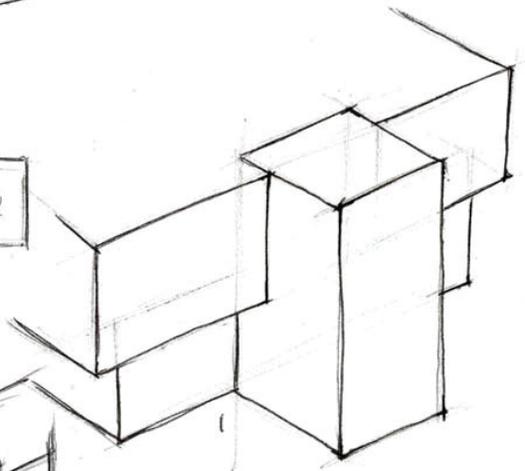
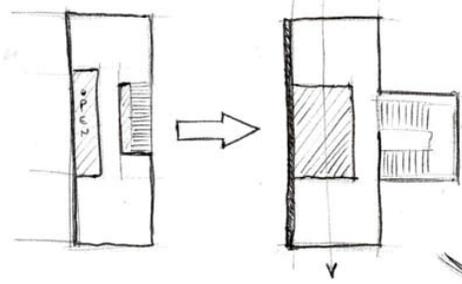
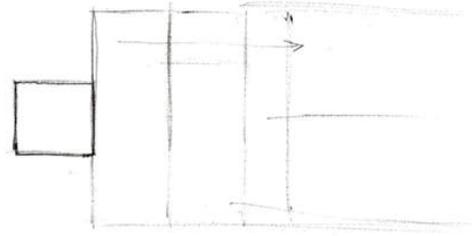
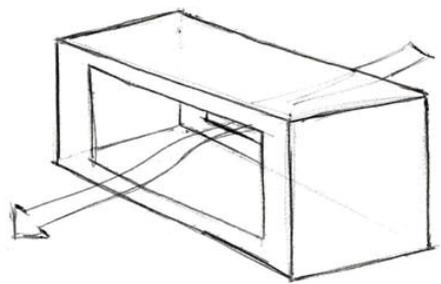
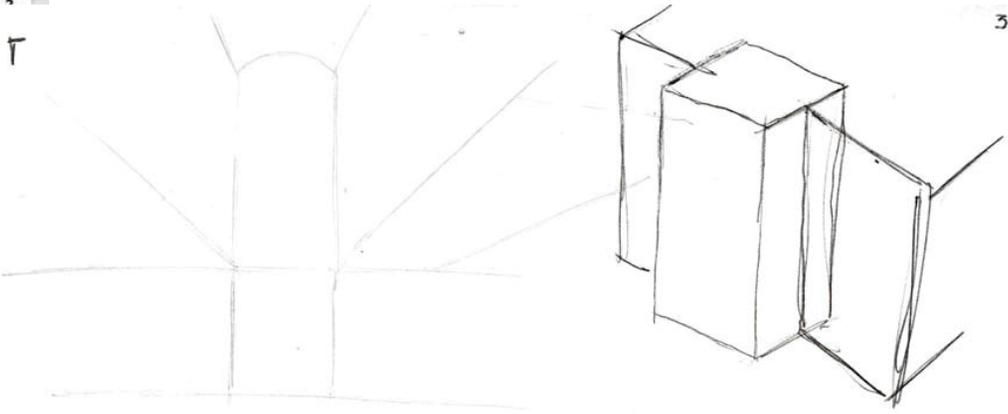
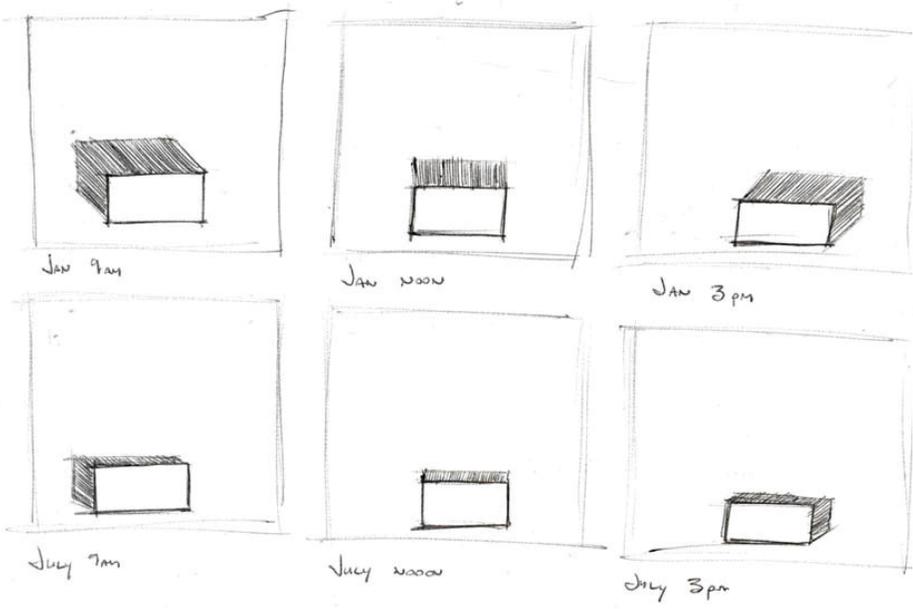
9/8/2010



RT







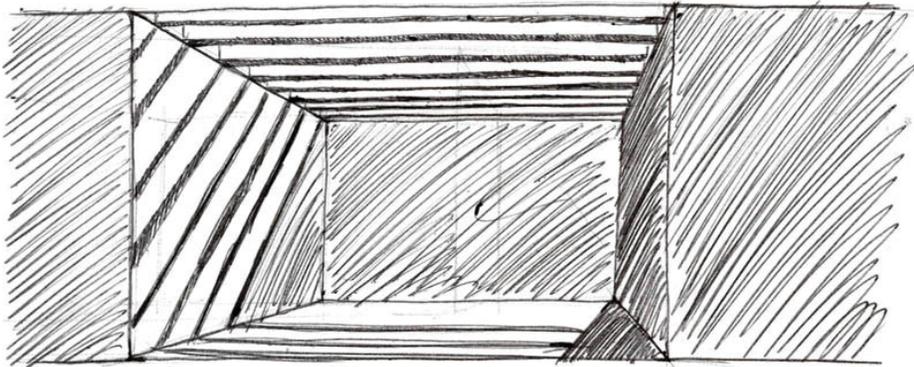
THIS IS A SMALL BUILDING.  
 THIS SHOULD NOT BE TOO HARD.  
 E.G. I SHOULD NOT BE HAVING THIS HARD  
 A TIME WITH THIS

- ▷ Ways to get light into a building -
1. WINDOWS - MUST BE TEMPERED IN
  2. DOORS - SOME WAY TO BLOCK
  3. SKYLIGHTS - DIRECT SUNLIGHT INTO INTERIOR

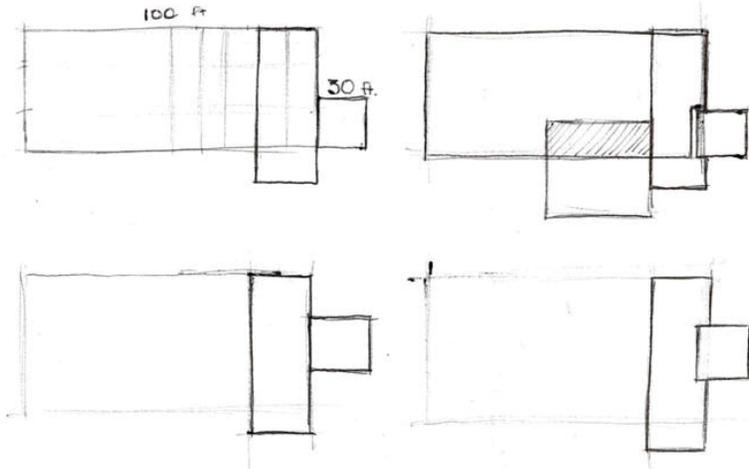
▷ THE SITE IS VERY THIN. THIS DICTATES A LOT.

LIGHT CORRIDOR

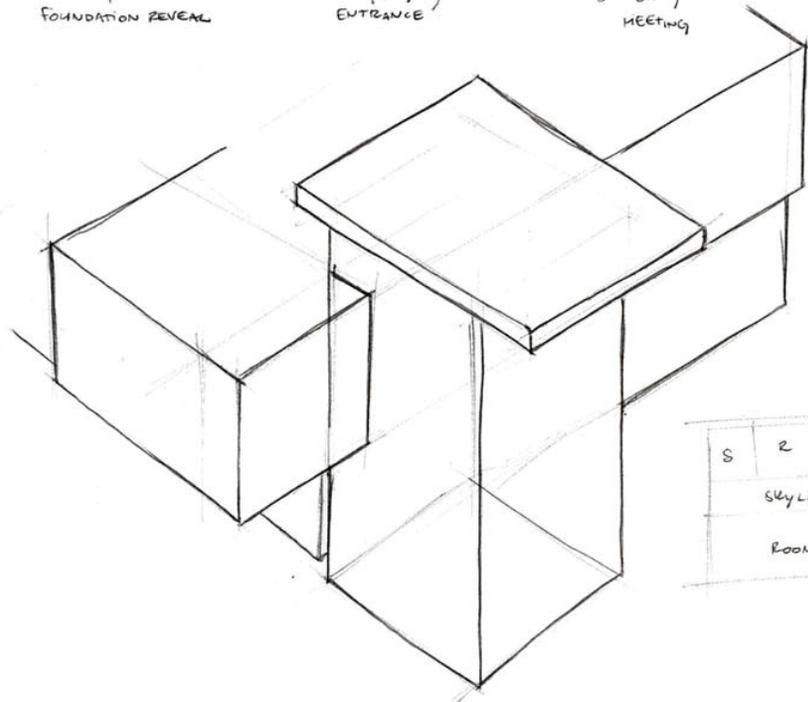
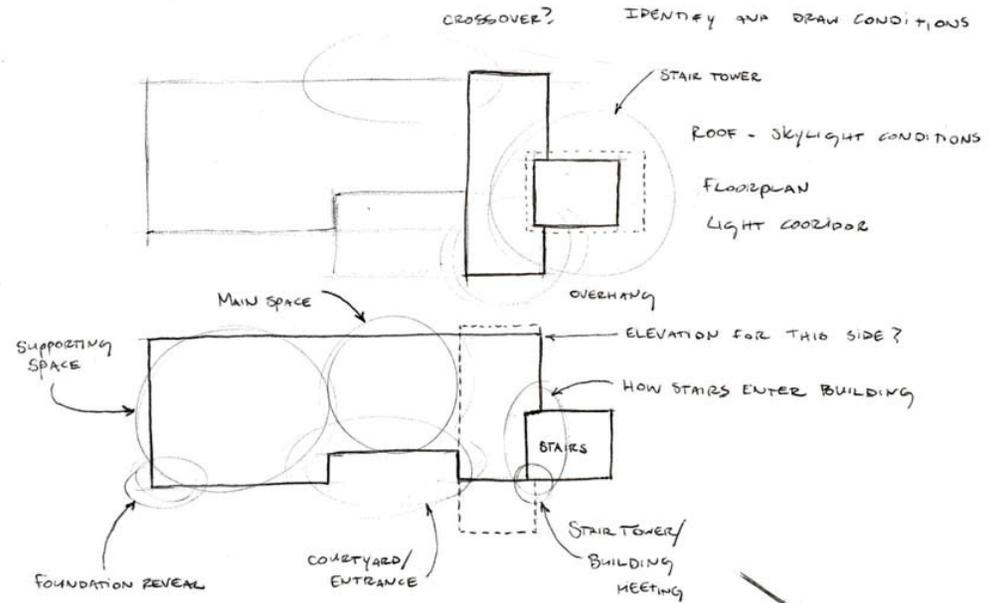
HOW DOES THIS CONDITION WORK WITH THE REST OF THE BUILDING?



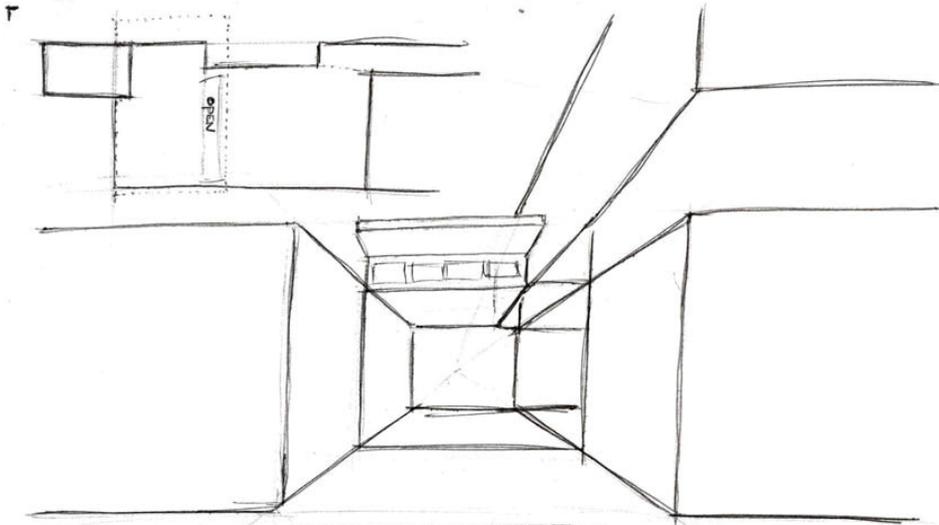
▷ SPACES DICTATED BY CONDITIONS. FORMED FROM SPACES GENERATED AROUND CONDITIONS



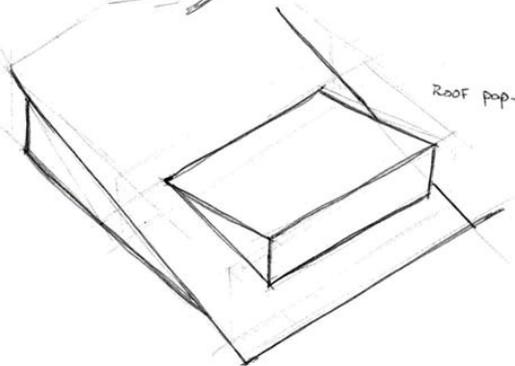
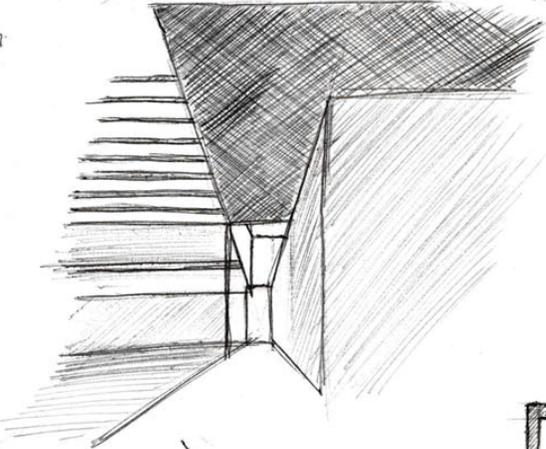
▷ BASIC FLOOR PLAN - IDENTIFY AND DRAW CONDITIONS



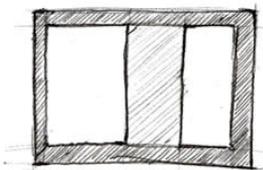
|          |   |   |      |
|----------|---|---|------|
| S        | R | K | MAIN |
| SKYLIGHT |   |   |      |
| ROOMS    |   |   |      |



Apply shading.

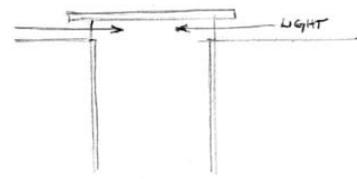


Roof pop-up.



OUTSIDE REFLECTS INSIDE...

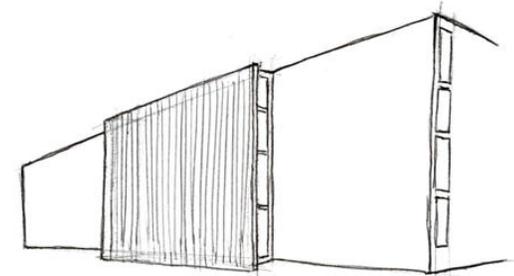
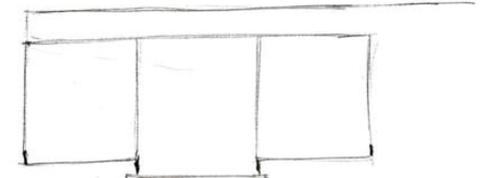
10



▷ USE OF MATERIALS TO DELINEATE SPACES OR TRANSITIONS.

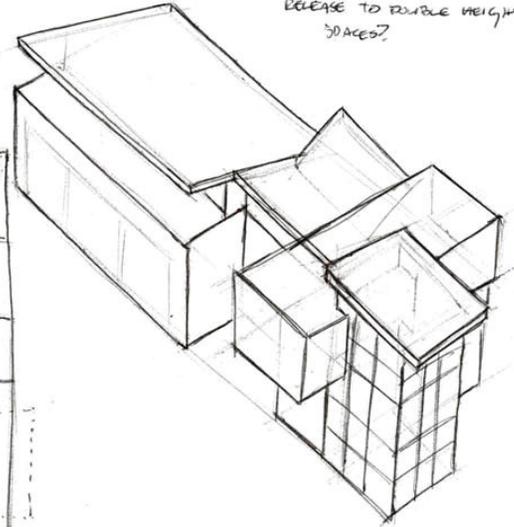
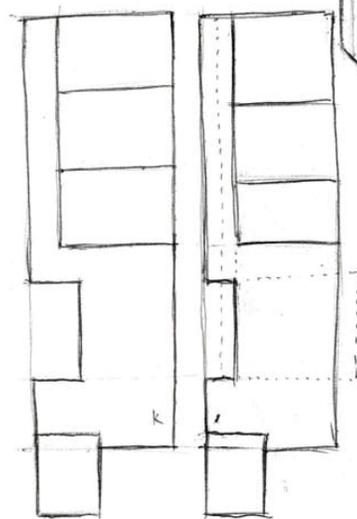


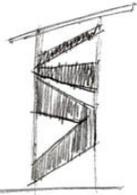
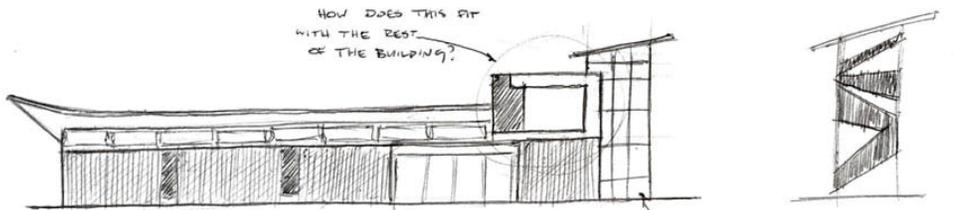
SWITCH - CREDESTORY WINDOWS TO FACE NORTH.



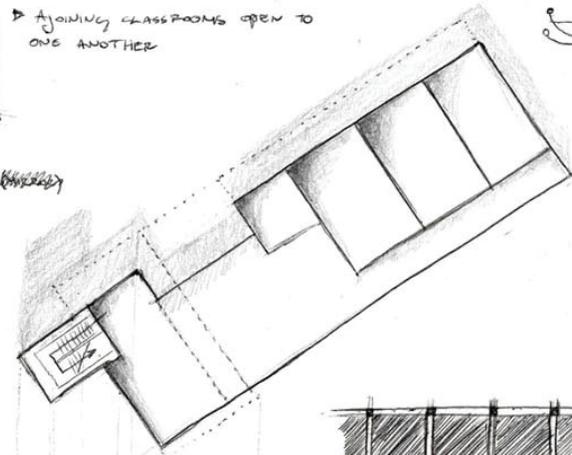
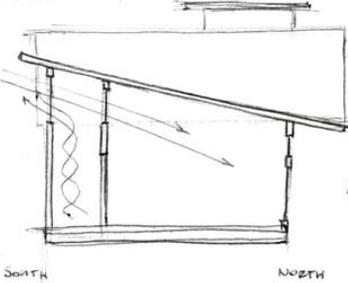
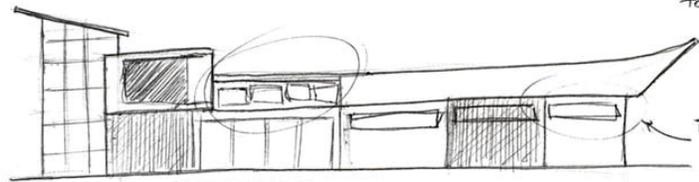
▷ THEY HAVE ANALYZED THE PART, AND MISSED THE WHOLE AND THEIR BLINDNESS IS BEAUTIFUL...

▷ WHAT HAPPENED TO ANCHORING, WHAT HAPPENED TO COMPRESS AND RELEASE TO DOUBLE HEIGHT SPACES?

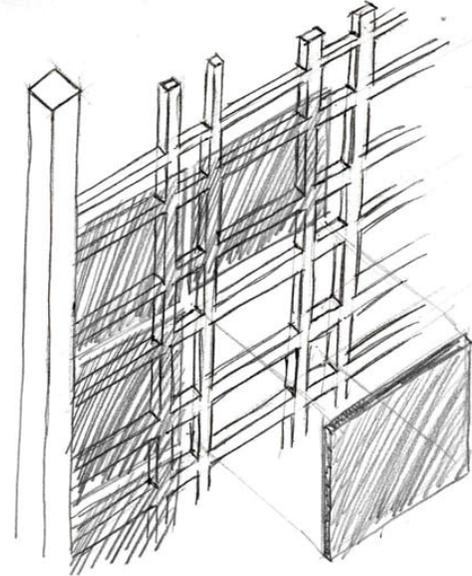
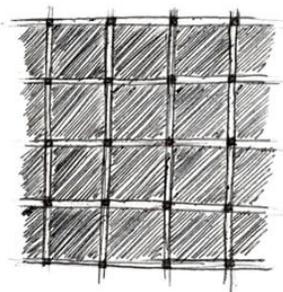
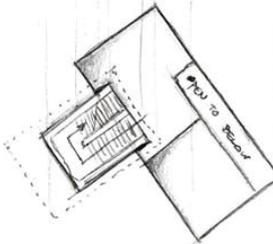
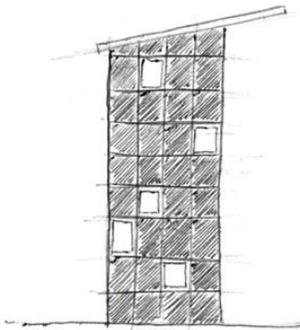




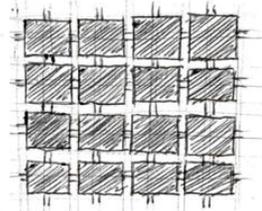
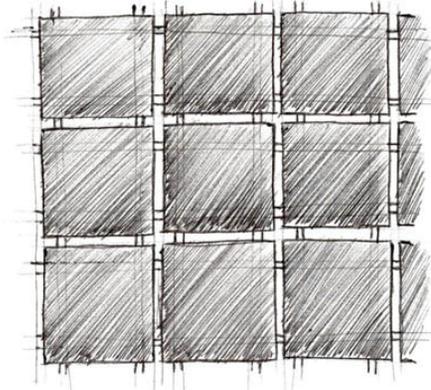
AM I HAPPY WITH A BASIC GLAZED BOX FOR MY STAIR TOWER? IF NOT, THE DESIGN MUST WORK WITH THE WHOLE.



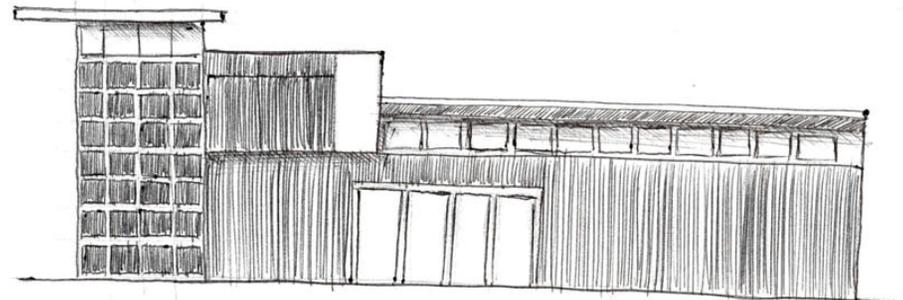
▷ DOES A ROOF DIPPING DOWN DE-EMPHASIZE A MAIN ENTRANCE, EVEN IF THE ONLY ROAD TO THE BUILDING IS ON THAT SIDE?

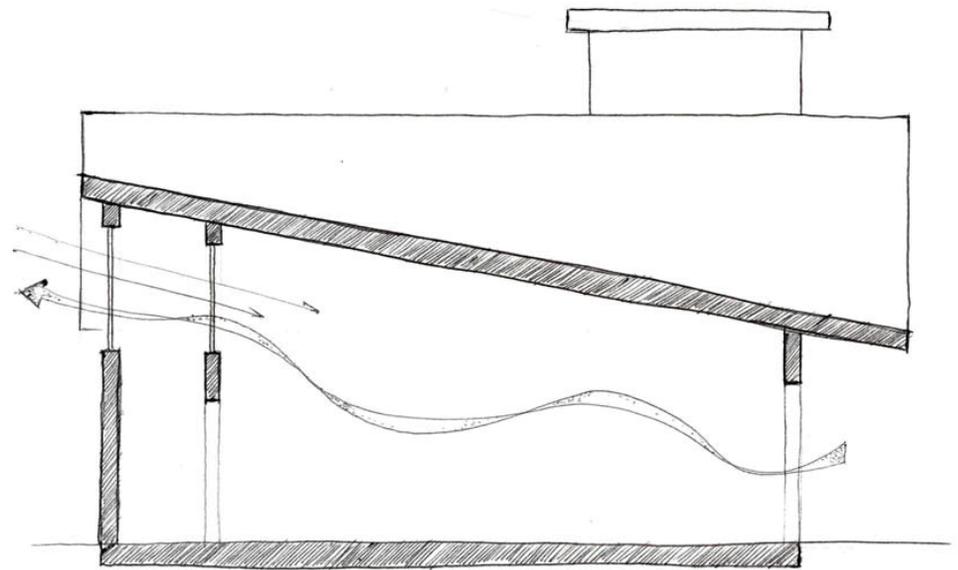
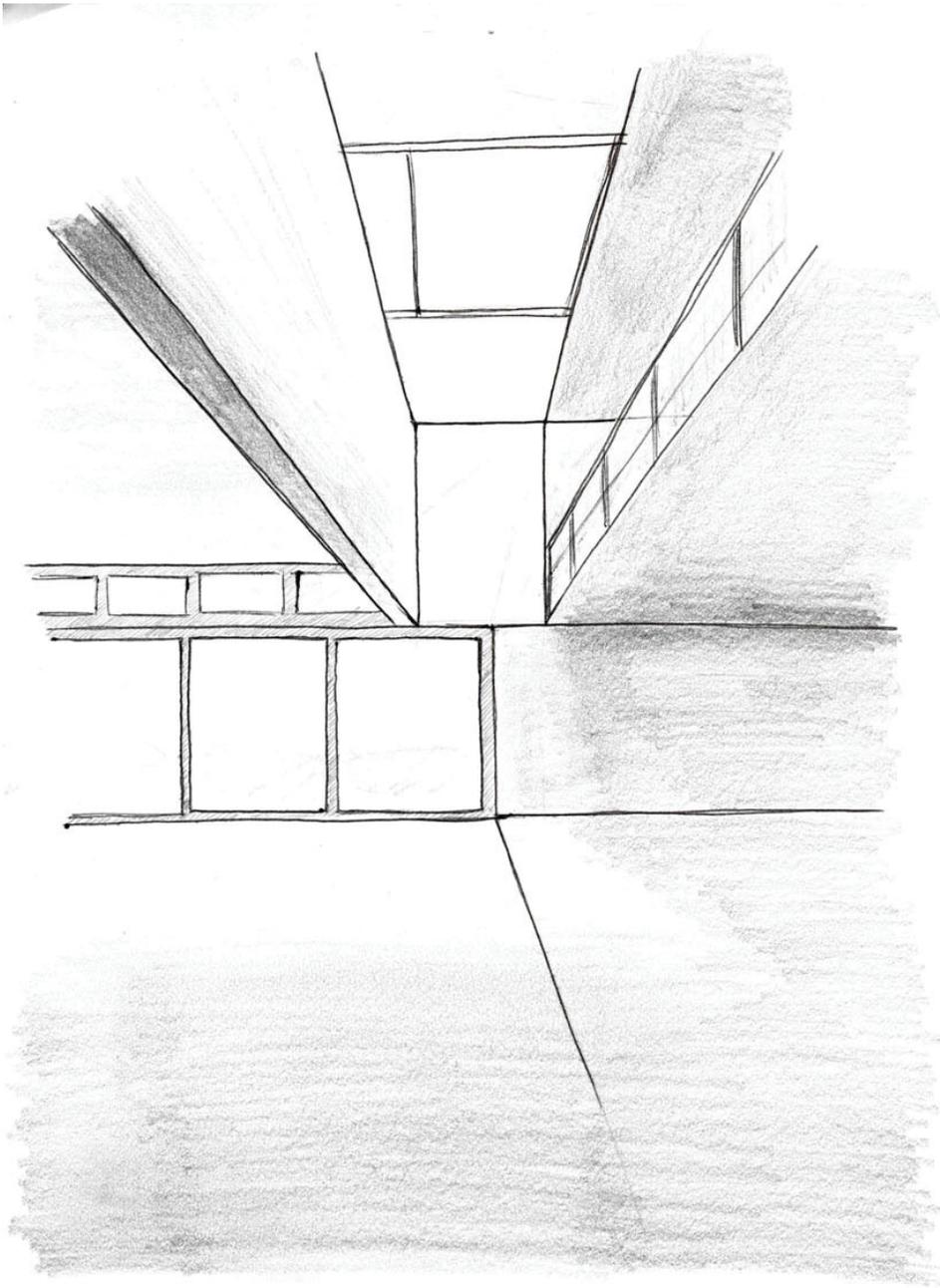


▷ CLADDING SYSTEM (BASIC) FOR STAIR TOWER (V.1)  
WOOD PANEL ON ALUMINUM FRAMING



- ▷ SÖRGÅRD SCHOOL, SKILLINGARVD, SWEDEN  
GROUP ARCHITECTS AB; ERIK STÅHL (HEAD ARCH.)
- ▷ KINDERGARTEN NUSSACKERWEG, LUDWIGSBURG, GERMANY  
BERND ZIMMERMAN
- ▷ POSTFOSSIL NURSERY, HANOVER, GERMANY  
DESPANG ARCHITECTEN
- ▷ WILDALPEN MOUNTAIN CAMPUS, WILDALPEN, AUSTRIA  
HOLZBOX
- ▷ STORE MOSSE VISITOR CENTRE, GNOSjö, SWEDEN  
WHARE ARCHITECTS AB





▷ SECTION THROUGH CLASSROOM/HALL

▷ WILL SMALL ALTERATIONS OF THE CURRENT FLOORPLAN BRING BACK A MODULE THAT CAN BE REPLICATED TO MAKE A WHOLE?

MODULE "A SEPARABLE COMPONENT, FREQUENTLY ONE THAT IS INTERCHANGEABLE WITH OTHERS, FOR ASSEMBLY INTO UNITS OF DIFFERING SIZE, COMPLEXITY OR FUNCTION."

THE QUESTION BECOMES:

IS IT NECESSARY THAT AN ARCHITECTURAL MODULE IS SEEN?

