



Tempus Schola : A Proposal for the New Jefferson-Houston School

Joshua A. W. McKenrick

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A Proposal for the New Jefferson-Houston School

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time school tree sunlight elementary

This work is dedicated to Alexa and Theodore, who have instilled in me the love and inspiration I had previously only dreamed about. Thank you for all you have done for me and for helping me to value every single second of time I have to share in this beautiful world.

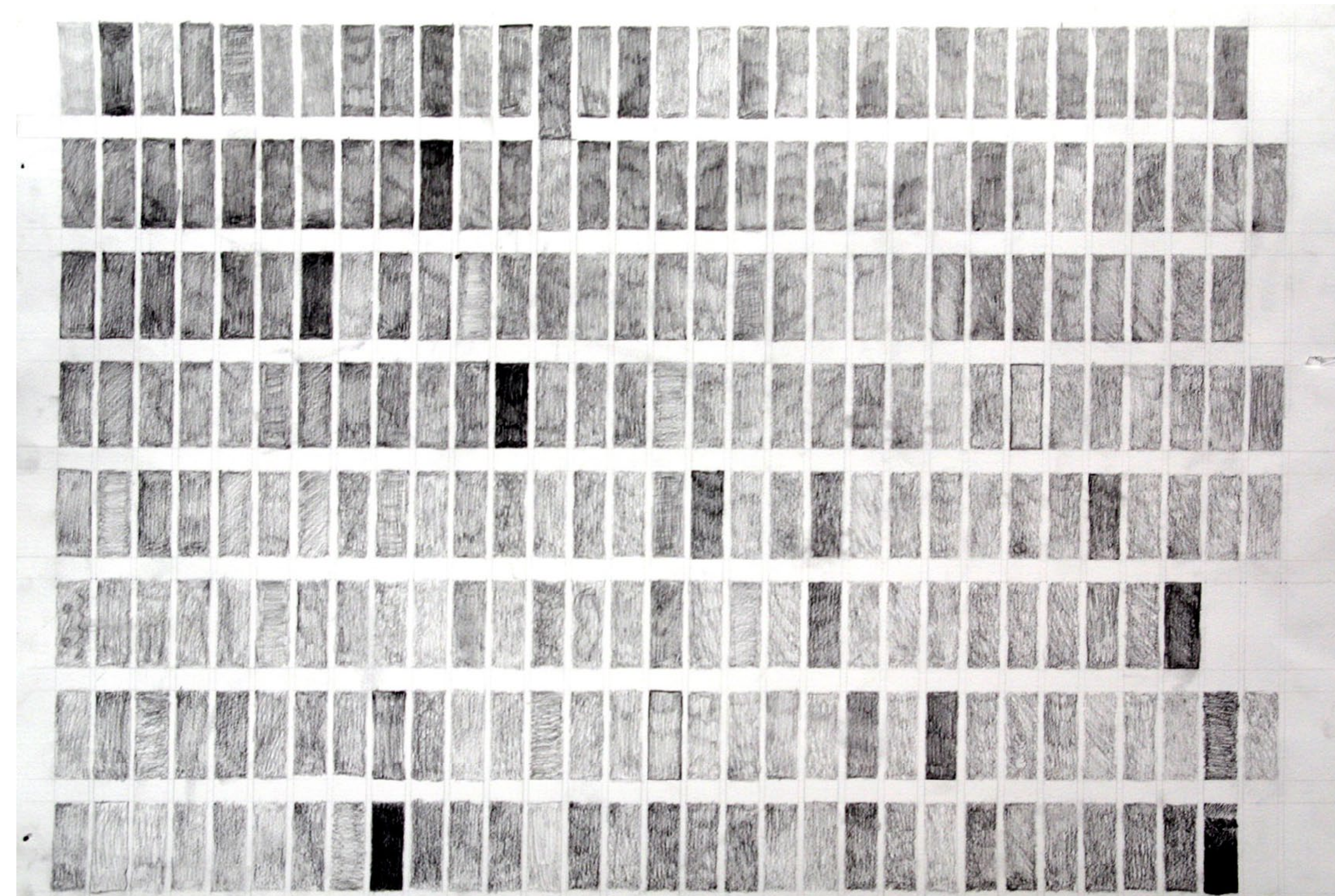
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ABSTRACT

Time is an ever-present entity that is an incredibly complex yet constant force in the life of each and every one of us. Since earliest history, humanity has attempted to recognize and use the evaluation of time to an advantage, eventually developing time into measurable commodity with determinable value. Beyond the obvious respect of time measurement, the larger concept of ‘time’ and its applications is of value to nearly every discipline. In the case of architecture, we have the ability to manipulate and use time to serve a purpose, whether that be creating a sundial to celebrate time passing or creating a black box to shield us from time’s presence. In most cases though, time is merely a variable to work with to achieve a higher goal.

This thesis looks to reverse this concept and use time and its varying manifestations as the main parameter to drive and develop architecture. In this case, the architecture will take the form of a school; a perfect example of a program in need of the recognition of time not only for its fluctuating yet ordered schedules and calendars, but also for the conservation and expedient use of this valuable commodity. Most importantly though, a school provides a significant opportunity to showcase the educational capability that results from the experience in, and the observance of, time itself. This thesis will produce a design for a Pre-K-through-8th grade school to be located on the site of the existing Jefferson-Houston School in Alexandria, VA.



“Whatever space and time mean, place and occasion mean more. For space in the image of man is place, and time in the image of man is occasion”
 -Aldo Van Eyck (1959)

“Old Time, that greatest and longest established spinner of all!...
 ...his factory is a secret place, his work is noiseless and his hands are mutes”
 -Charles Dickens, *Hard Times* Ch. 14

Opposite page (see also cover inset):
 My calendar of the thesis timeline with each rectangle representing a day of the thesis process. I rendered one box each day from September 1 to April 30, giving me a basis for my own recognition of time.

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Time as Orientation

In starting this thesis, I knew I wanted to work with time. Despite being in effect for literally all of history, it is a concept that remains in theoretical and scientific debate, yet remains a constant factor in the life of everyone on earth. What I wanted to define and design was a structure and program that could best utilize the exploration of what time is and all its relevant applications. After some searching and discussion, it came to me that a school, in this case an elementary school, would be the perfect opportunity to bring time to the forefront of architectural design.

As a student at the Washington-Alexandria Architectural Center in Alexandria, VA; just outside of the District of Columbia, there were plenty of opportunities to find a site that would fit my needs. It turned out that a school very near the Center was proposing a renovation to be done in time for the 2014 school year. The Jefferson-Houston School is located on 1501 Cameron Street in Alexandria, about 2 blocks from the King Street metro station. The school sits on 10 acres of land between Cameron Street, N West Street, and the Orange/Blue Metro Line. The school is sited within the grid of Alexandria which, at an angle of 9 degrees off the east-west axis, still provides the opportunity to fully utilize sun and shadow paths; an essential element for working with the parameter of time.

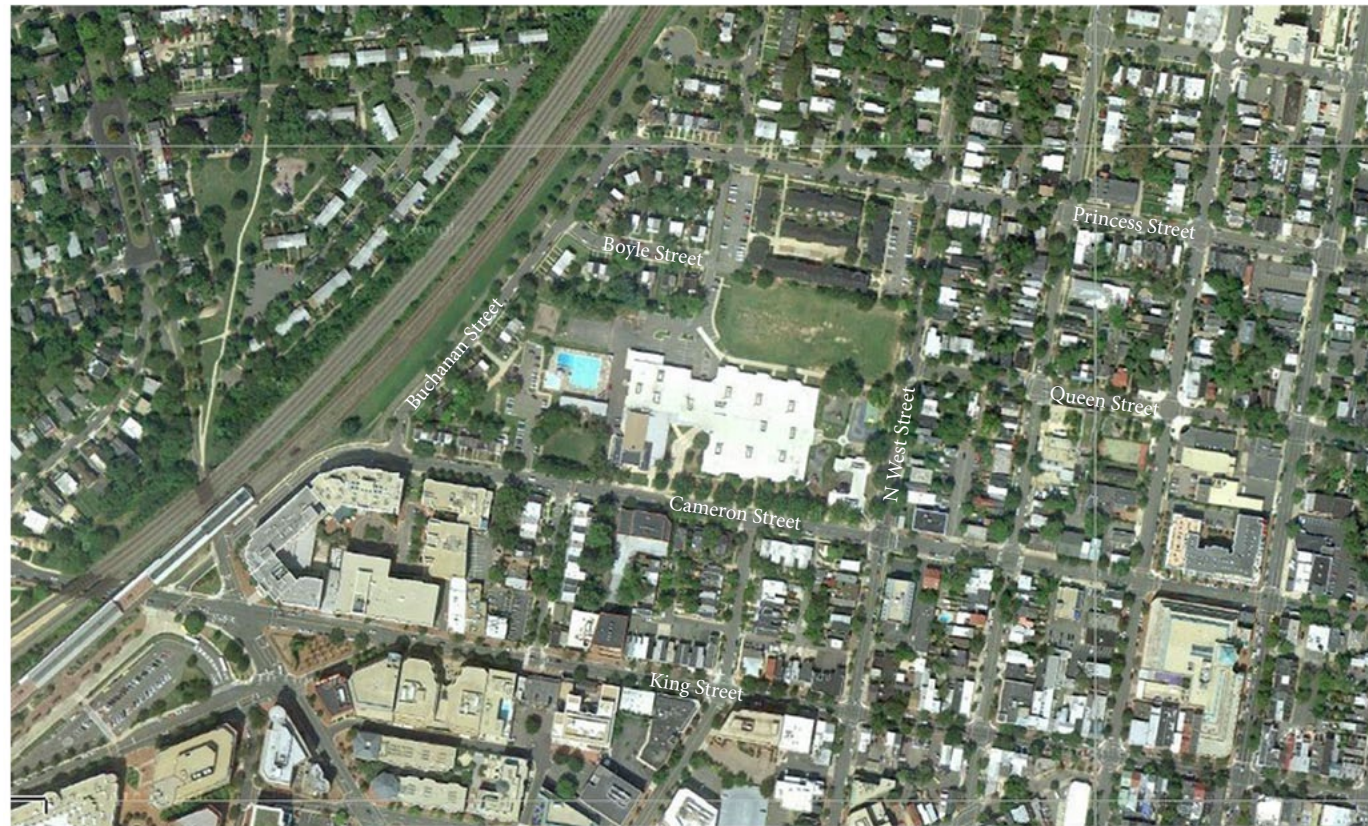


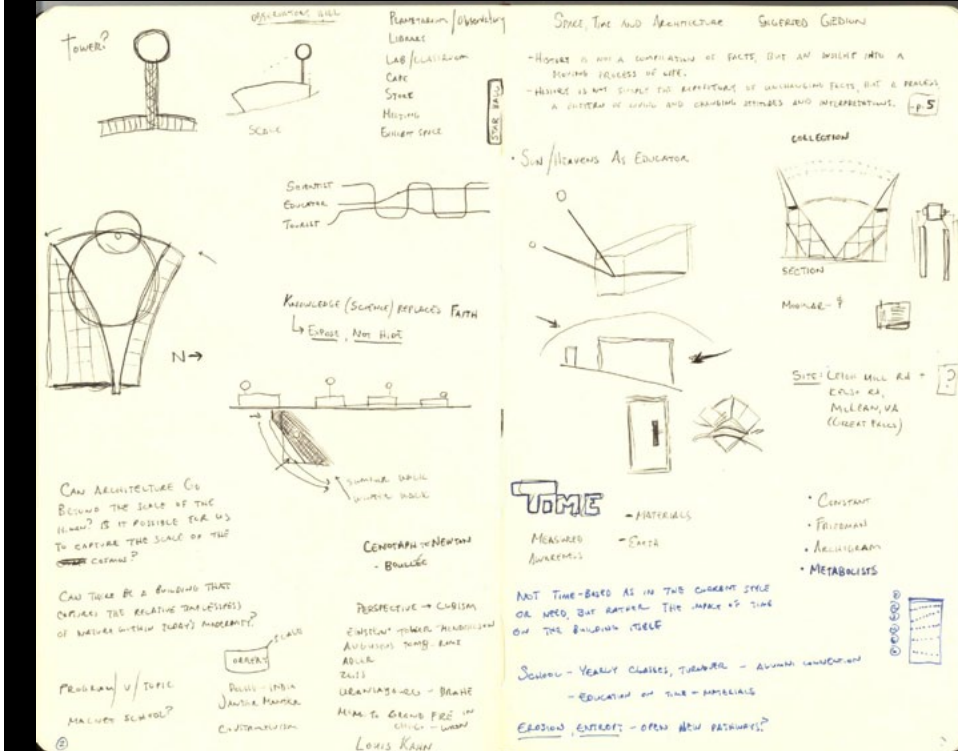
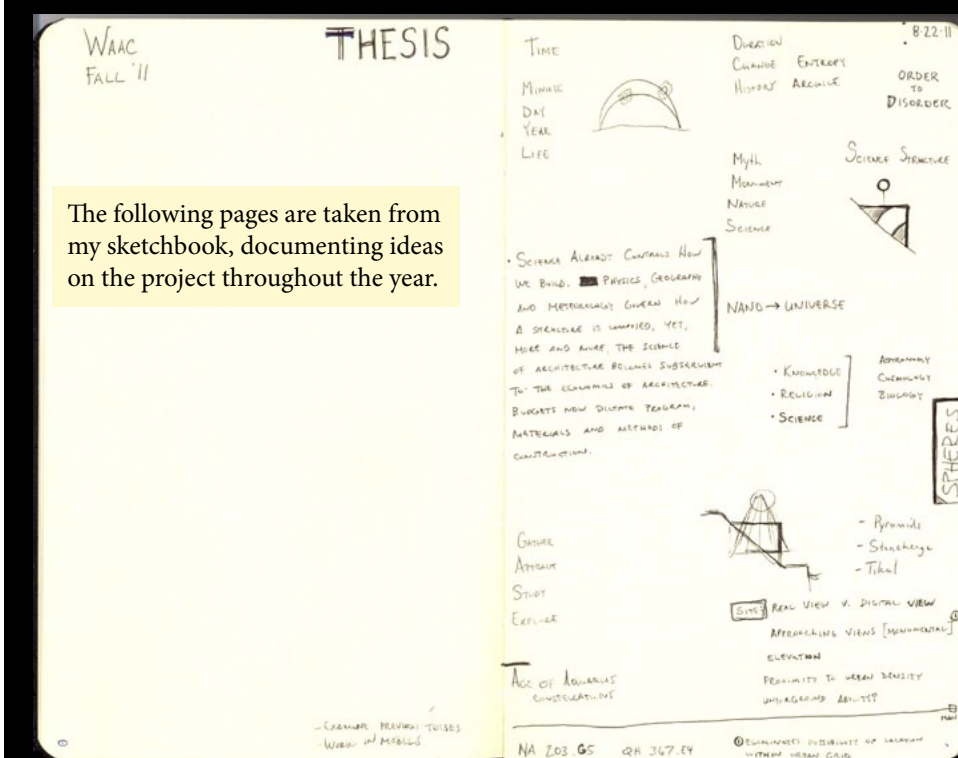
Image Courtesy Google Maps

The existing Jefferson-Houston School was constructed in the early 1960s as an open plan school, encompassing 83,000 square feet of learning space for grades K-5. The city of Alexandria schools is looking to demolish the old school and build a newer, energy-efficient building, able to service students from Preschool to the 8th grade. I used some of these goals in my own design, but from there on is where I parted ways from the proposal of the city. My designs would revolve around my concepts of time and space, not government budgets and schedules. The school is also currently connected to the Durant Recreational Center which is used by the community. Seeing this as an important space for the neighborhood, I wanted to keep the Rec Center accessible in its current location in my design work.



Image courtesy Alexandria City Public Schools

To start my design process, I looked at how the current school works given its location. The main street that runs by the school, Cameron Street, is a one-way street headed west toward the metro. Buchanan Street, the street that wraps around the school to the west is also one-way, headed north to Princess Street. In between Buchanan and Princess, there is a small road, Boyle Street, which provides access to the faculty parking lot. It is a well-controlled and defined access point, ideal for security purposes of a school. From this access point, there is a concrete drive that runs along the north side of the school that buses use for the morning drop offs and afternoon pickups. This drive exits onto N West Street, which does have two-way traffic and is better suited for route distribution. The circulation system set up for the school on the site seemed well fit and would be something I would keep as part of my designs moving forward.



In using time for orientation purposes, accessibility to sun paths would be a crucial part of my design. In terms of visibility and light distribution, the site is large and open on all sides, with no more than a 2 1/2 story structure across the street in any given direction. There is a large open field on the north side of the site that provides the potential for plenty of northern ambient light. Large oak trees line the streets and provide not only shading but a visual buffer between the street and the school. I felt that these trees were an important attribute of the site; and seeing how trees are excellent indicators of the passing seasons, utilizing trees in my design would become pivotal to its success.



One final site issue to note is the fact that there was another school that had previously occupied the site: the original Jefferson School of Alexandria, built in the early 1900s. It was located at the end of Queen St (one block up from Cameron St), as this location was close to the end of the city limits at the time. It was a simple rectangular building that remained part of the city until the current school was constructed. There is no current marker of its existence, only the greenspace of the playing field behind the school remains.

Diagrammatic site plan showing buildable space, existing Durant Center and Old Town Pool (left of red boundary) and existing tree locations along the streets



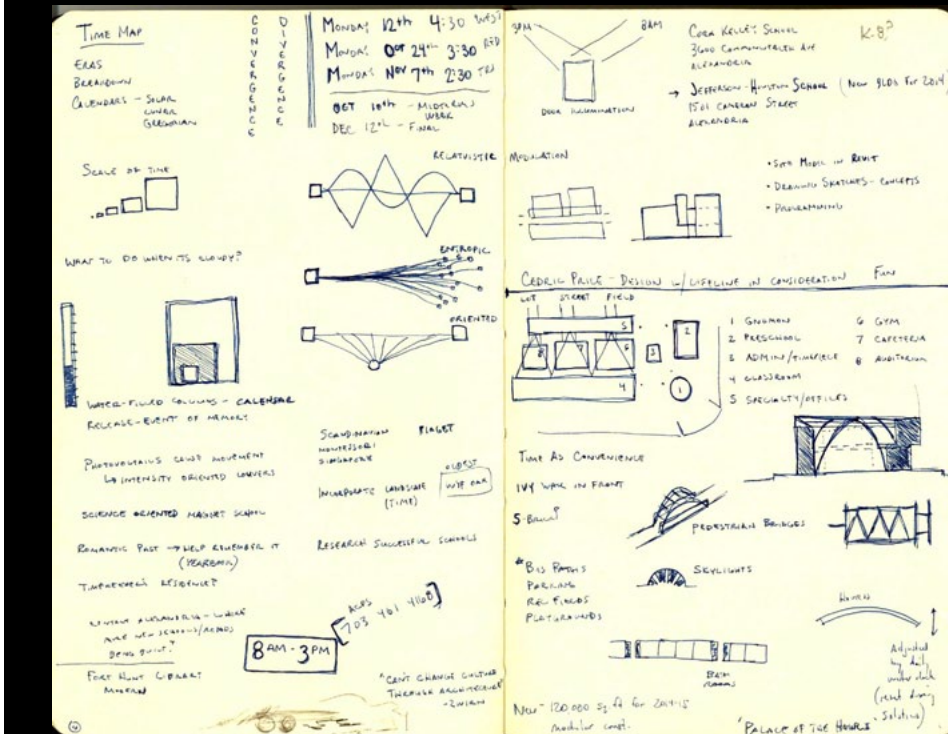
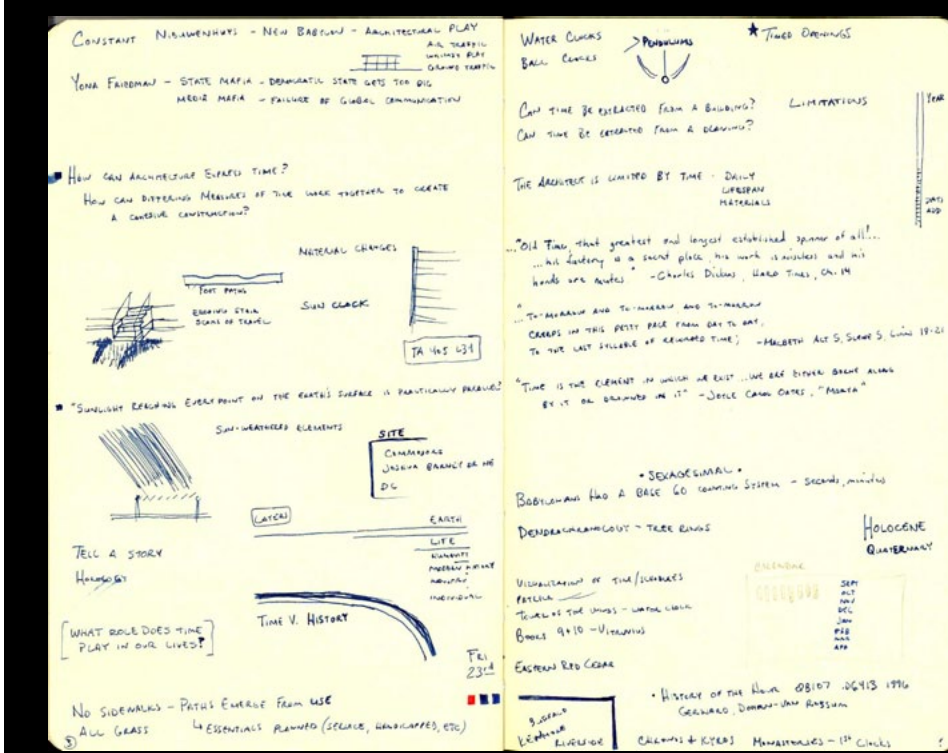
Looking North across Cameron Street and through tree canopy



Current Main Entry w/Durant Center on left



View looking Southwest across open field (previous Jefferson school site) (Washington Masonic temple in background)



Time as Sequence

In order to successfully design a school with time at the forefront, I needed to understand the daily, weekly, monthly and yearly schedules of, in this case, the Alexandria City school system. What is unique about a school's calendar is that much to the envy of every other employed person out there, the school only fully operates for 10 months out of a year. Since the students are not present during the summer, a given school year presents different intervals than that of a standard calendar year. The school year runs from late August to late June and is essentially broken into four quarters of 9-10 weeks each, or about 47 school days per quarter. There are plenty of holidays and workdays dispersed amongst these weeks to give the students and teachers plenty of breaks. For the Jefferson-Houston School, the day begins at 8 am and runs until 2:30 pm, with after school activities running through the afternoon.

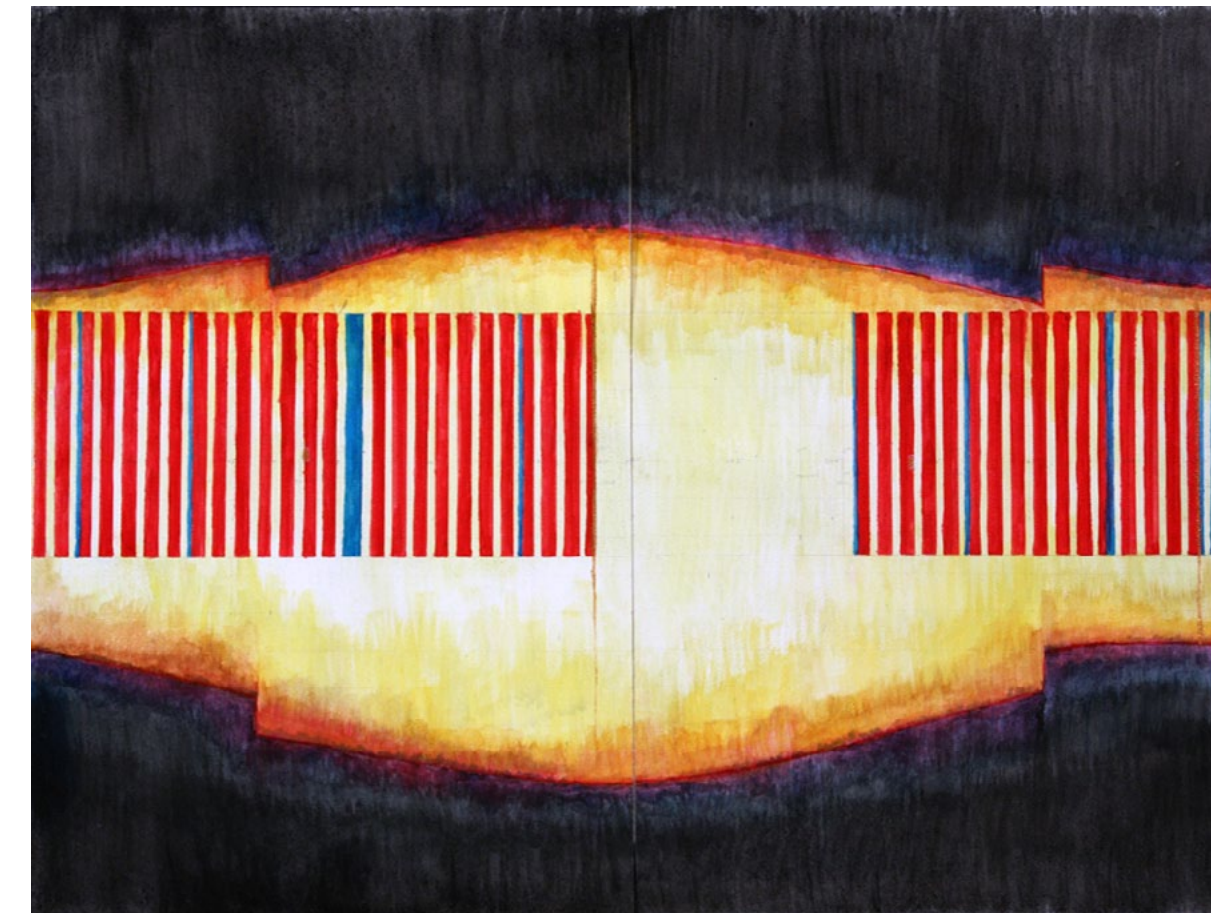
Taking these items into account, I still wanted to create a building that would function year round, but would especially shine during the time of prime occupancy listed above. In analyzing all these schedules, I decided to make a visual representation that best emphasized what I thought was important. Instead of breaking the school year down into months, I looked instead at the weeks of a school year. I browsed through the school calendars of previous years and no school year (from first student day of school until last student day of school) ran for more than 43 weeks. In the images to the right, the 5-day school weeks are represented by red bars with holiday time in blue. There are 43 bars (in this drawing modeled off the 2011-2012 school year) in total, against a background showing approximate daylight hours. The top and bottom of the drawing show midnight with the course of the day plotted evenly along the page. Sunrise and sunset are shown for the school's location, with the jog in the color indicating daylight savings time and its effect on the day.

I also decided to make the drawing adjustable, with the ability to show both the standard January-December sequence and the school year oriented July-June sequence. This gives the ability to better visualize the amount of time a student will be in the school over the course of a year.

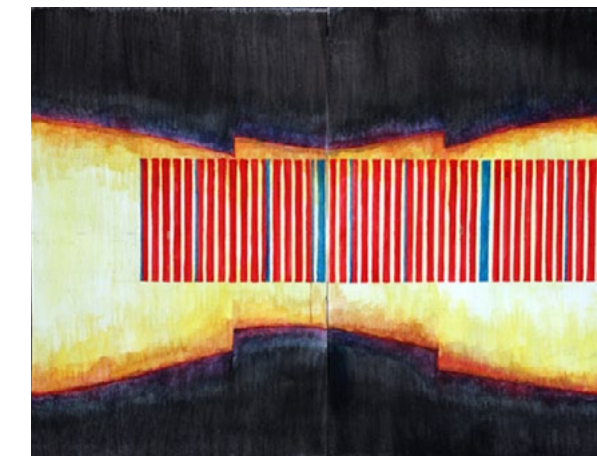
Since the drawing shows the duration of light over a given year, and since the sun and its path are the governing factors of that result, I thought it would also be important to show the special sunlight days of a given year; those being the two solstices and the two equinoxes. What is interesting is that the school year ends in June, very close and if not exactly on the date of the Summer Solstice. The Winter Solstice also falls near an important school year date, that being the final days before the much-anticipated Christmas break. The equinoxes are not quite as remarkable, falling in the middle of the first quarter for the fall equinox and then in the middle of the third quarter for the spring equinox.

This calendar structure served as a base parameter for the design of the school. With all the dates given, there are associated sun angles and daylight durations to work with. In order to make sure the building worked year, round, I need to design for the extremes (solstices) while also showing attention to the medians (equinoxes). A sun angle range between 27.8 degrees (Winter Solstice) and 74.6 degrees (Summer Solstice) was determined using the noon measurement as a barometer for working with light for this site. As shown by the drawings, the majority of the student school year occurs during the shorter days of the calendar year, thus requiring the design to be cognizant of the limits of daylight availability. By keeping the main elevation of the school south-facing, I would be able to get the most of amount of light for the longest amount of time.

As a secondary design element, since I was already incorporating sun angles into the design, I decided to base any angles used in the school on a 15 degree basis, being that 15 degrees is equivalent to one hour, on average (360 degree/24 hours = 15 degree/hours). Any type of rotation or angled walls will use this 15 degrees as a base parameter.



Time study in standard calendar sequence



Time study in school year sequence

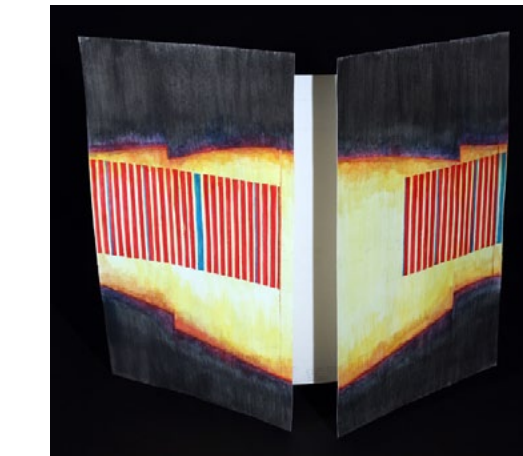
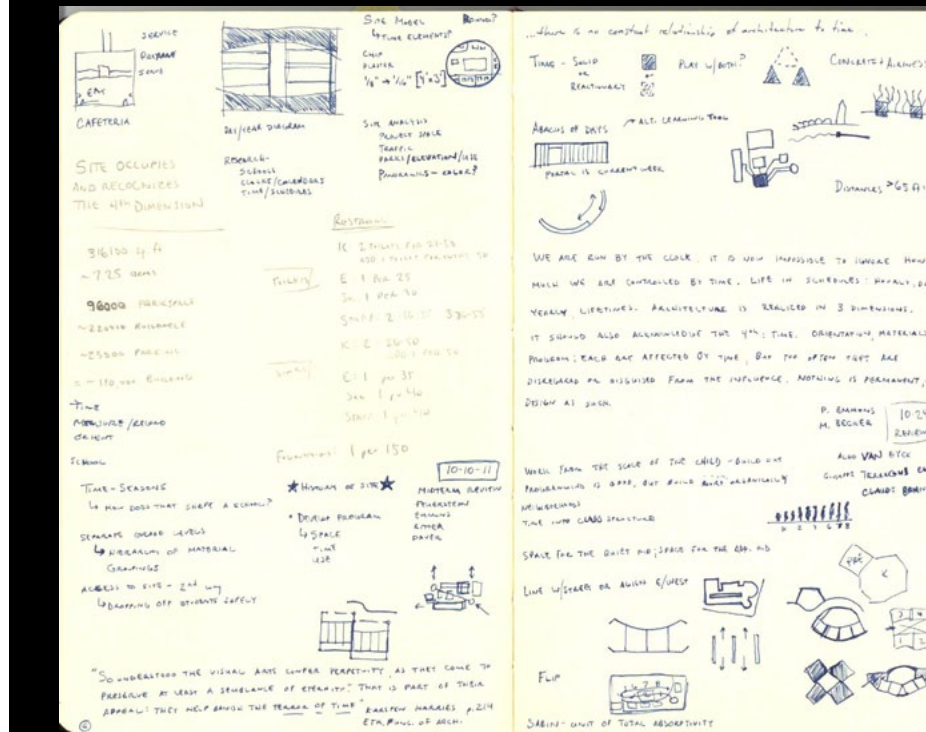
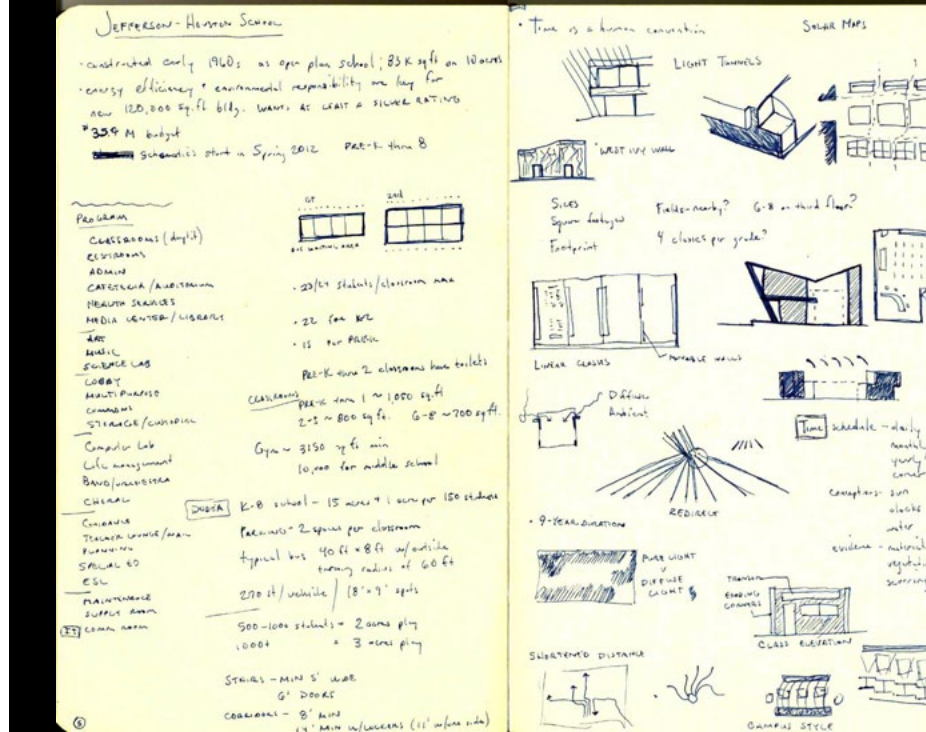


Image showing the adjustable ability



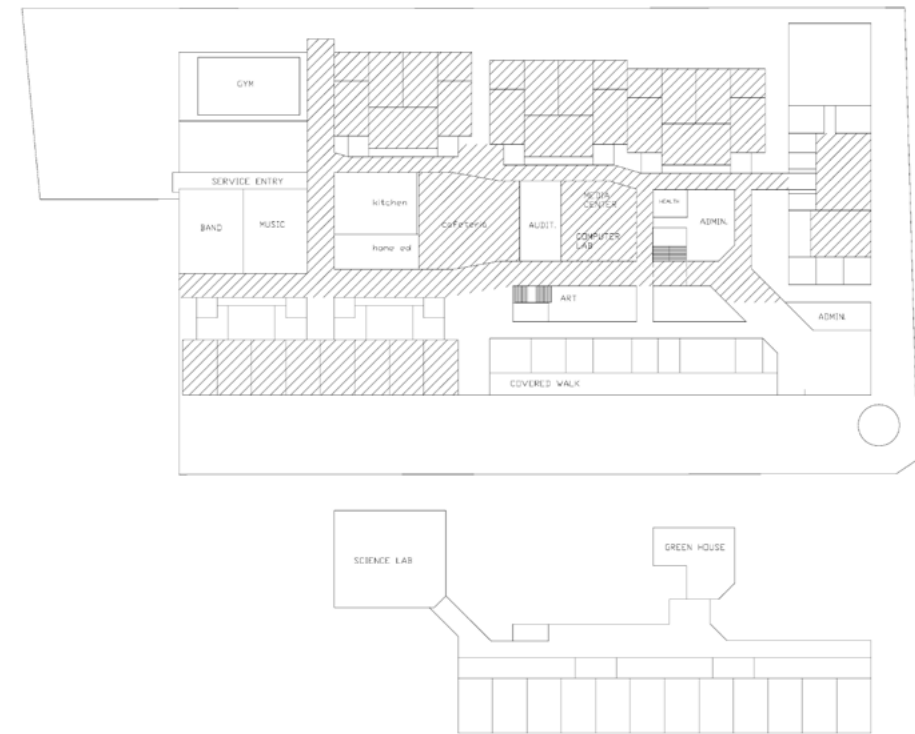
Time as Organization

When I started to look at programming the space for a new school, I wanted to make sure to give the proper amount of square footage for each area. The main resource I used for this determination was the Department of Defense Education Authority's Education Facilities Specifications for Elementary Schools. This literature gave outlines for appropriate sizes of rooms and classrooms for a given enrollment. I used this as another parameter in sizing and organizing the spaces of the school.

Once the general sizes of the spaces I needed was determined, I experimented with placement of the pieces into arrangements that would best serve the school and its daily routine. After a few iterations, I had developed an idea of the hierarchy and sequence that would best fit the movement of the students and faculty throughout the school on a typical day.



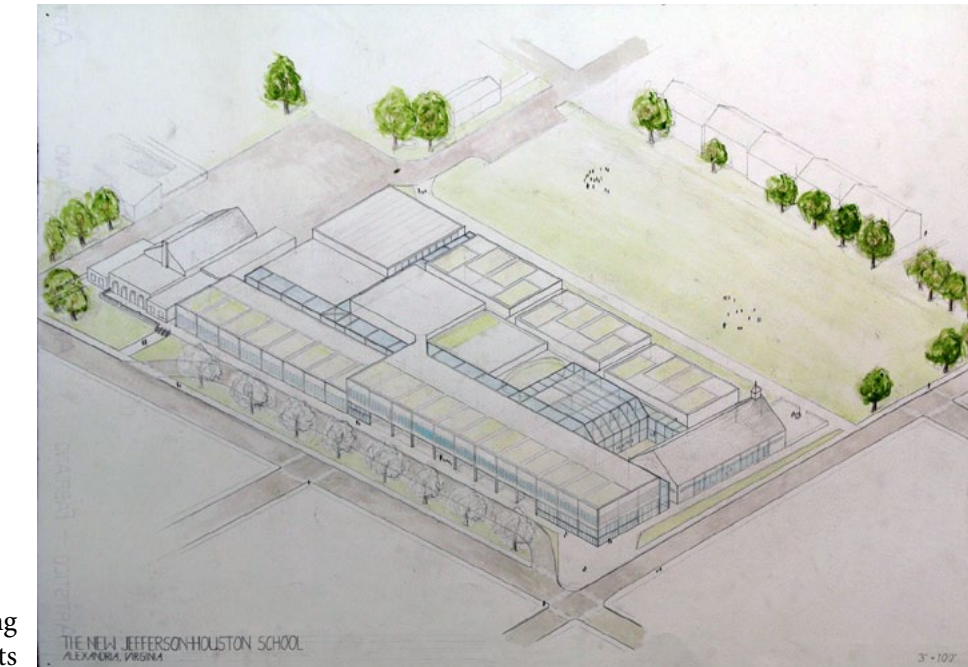
First attempt at space planning for the school. This had the grades along the perimeter, with all offices and specialty rooms near the center. This plan used controlled circulation throughout the building.



Second attempt at organizing the space, this time reworking the corners to better fit the program.

Program	sq ft	
Classrooms		
Pre	1300	1300
K	1300	2600
1	950	3800
2	950	3800
3	900	3600
4	900	3600
5	900	3600
6	900	3600
7	900	3600
8	900	3600
Restrooms		
Admin	Waiting	200
	P. Office	200
	AP Office	175
	Conf.	200
	Recept	300
	Extra	400
Cafeteria		2500
Kitchen		2450
Auditorium		1500
Media Center/Library		2000
Health Services		500
Gymnasium		6800
Lobby		
Commons		
Art		1200
Music		1250
Science Labs		1350
Computer Labs		1300
Life Management		1200
Band		1800
Choral		400
Guidance		500
Teacher Lounge		700
Work Room		400
Teacher Book Room		600
Office		150
Special Ed		1000
GT room		400
ESL		475
Storage/Supply		1200
Custodial		250
Maintenance		400
Comm Room		400
Recreation Fields		1 acre

Spreadsheet of spaces and corresponding square footages



Early axonometric showing massing and skylights



The next reworking rotated the 2nd and 3rd grades 15 and 30 degrees respectively. It also retooled the entry and main stair, as well as adding the new commons area and front curves (see following pages)



Early plan mockups exploring space

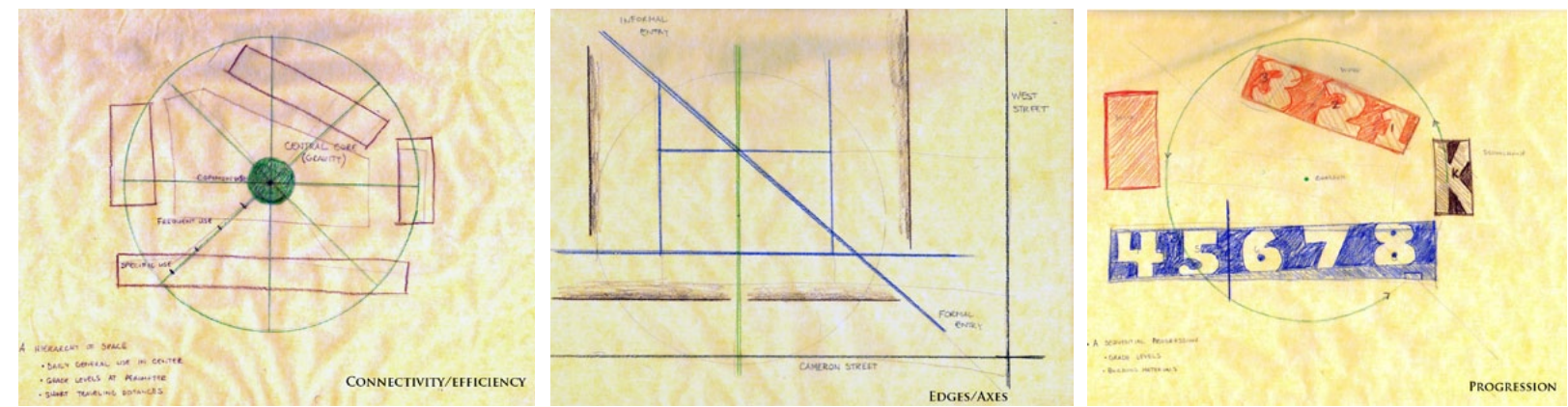
Massing studies looking at grade level and program placement. Elements from each of these were incorporated into the final layout



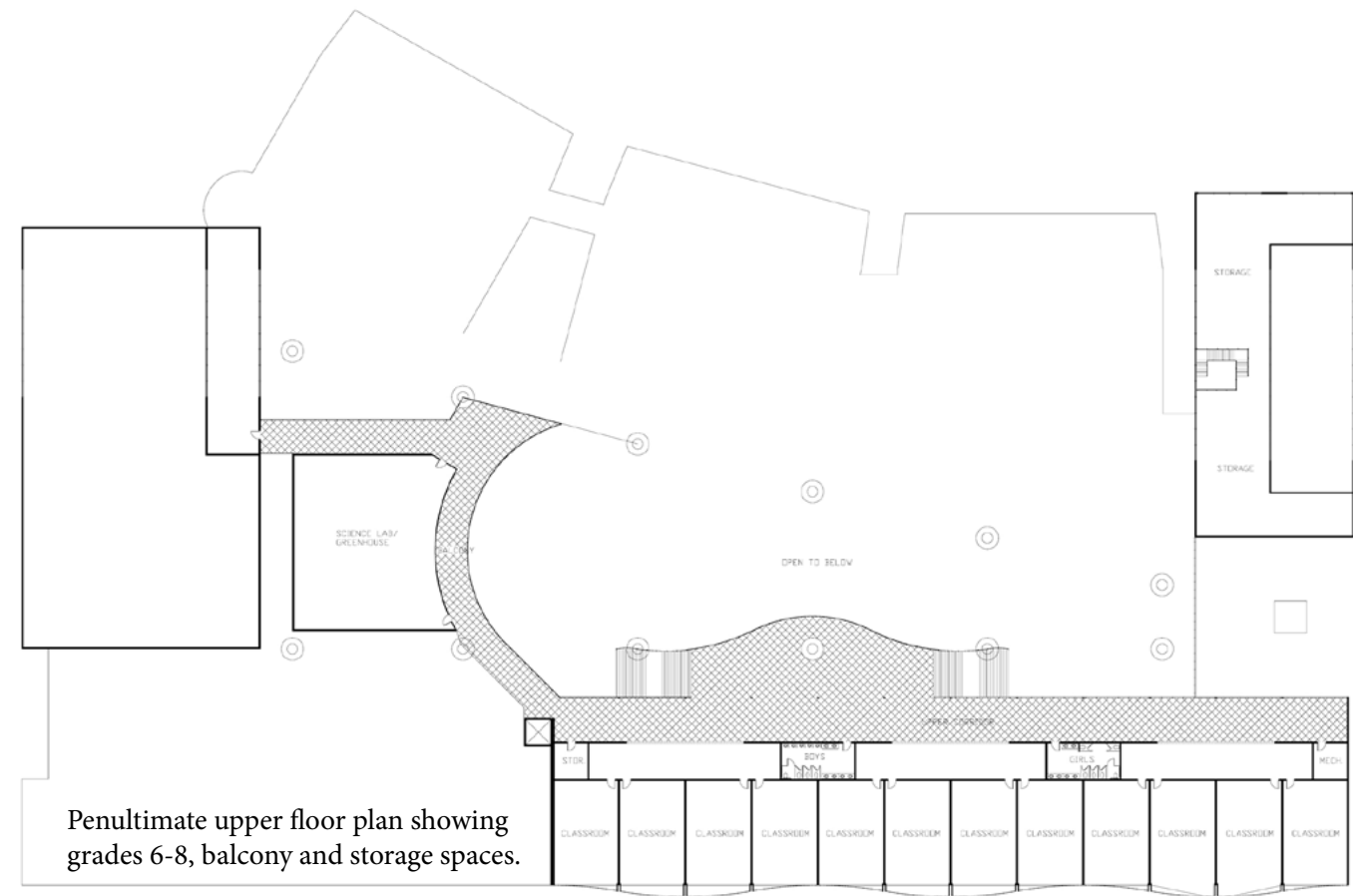
The playground to the left is situated (approximately) on the footprint of the original Jefferson School mentioned in the previous section. The playground itself is a simple walled-in space providing a barrier from the street and sidewalk and is directly accessible from the Pre-K/Kindergarten building.

This small courtyard to the left is directly accessible by the Pre-K/Kindergarten building, providing a controlled, completely visible play space for the smallest children. Its location adjacent to the administrative offices adds an added layer of security and peace of mind.

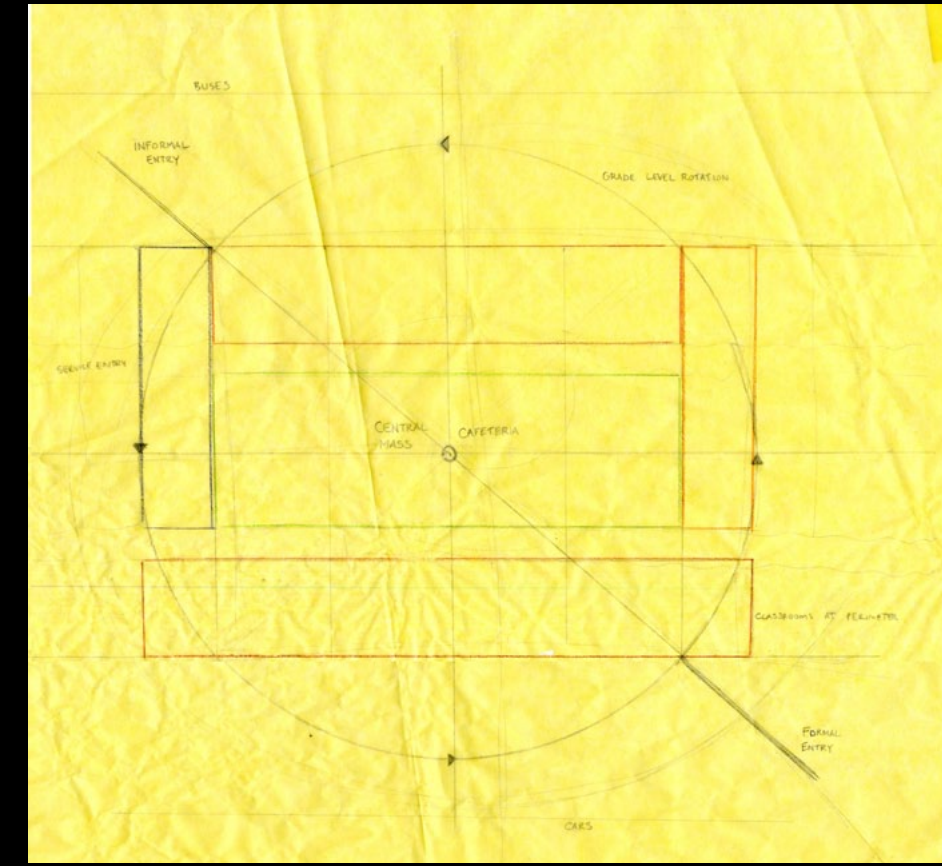
Penultimate Floor Plan showing lower grade levels, central open space, administration at entry and gym at rear.



The following diagrams highlight the concepts used for the organization and arrangement of the major pieces of the school.



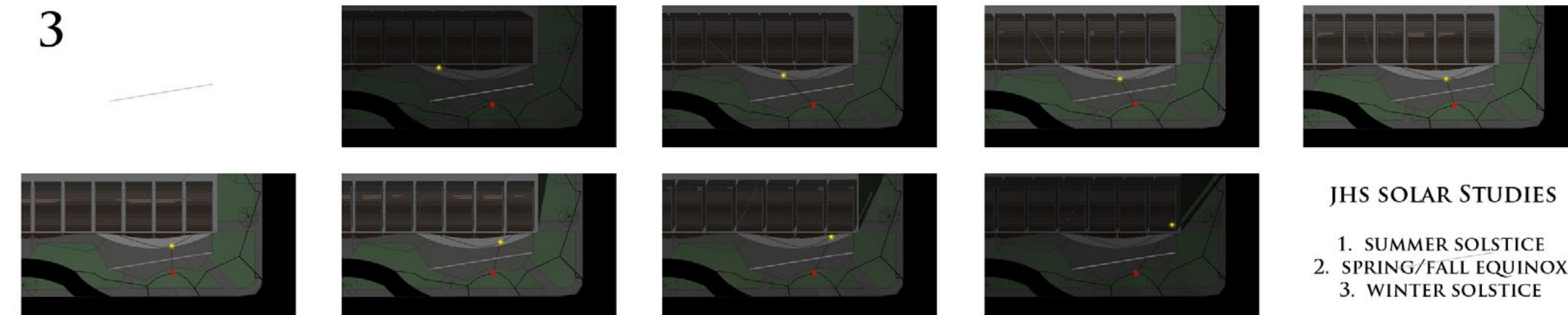
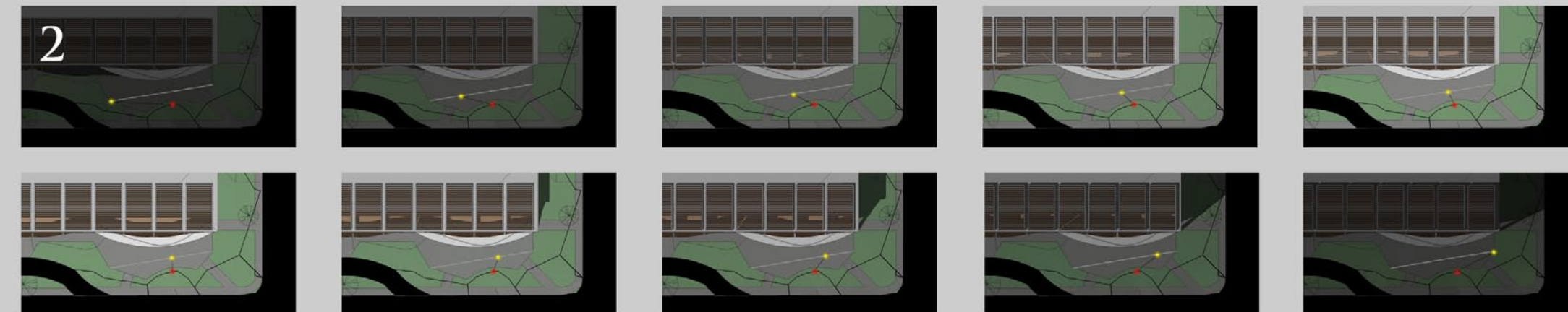
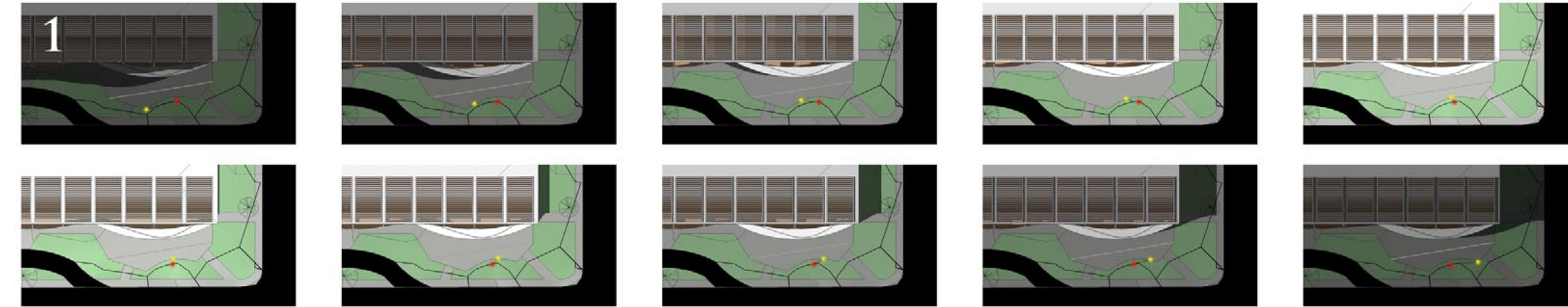
Penultimate upper floor plan showing grades 6-8, balcony and storage spaces.



An early concept diagram simplifying program and circulation into basic geometry.



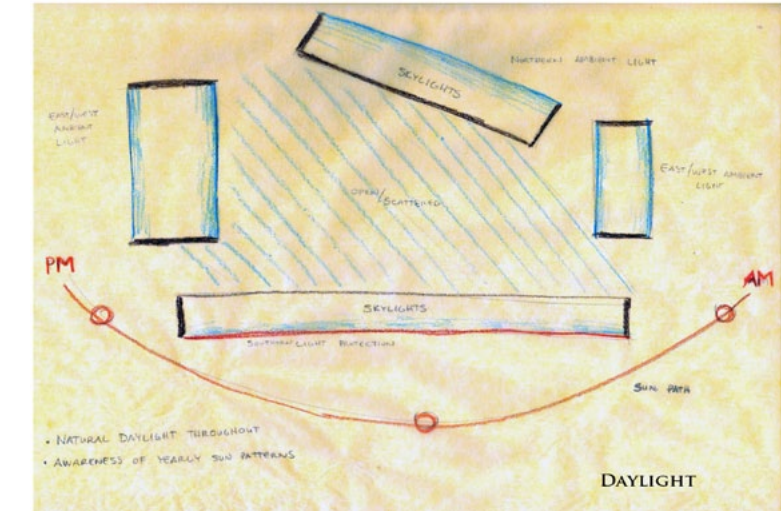
A diagram exhibiting average heights in inches of students from Pre-K (most left @37") to 8th grade (most right @63").



JHS SOLAR STUDIES
 1. SUMMER SOLSTICE
 2. SPRING/FALL EQUINOX
 3. WINTER SOLSTICE

As mentioned before, the path of the sun is an integral part of the school's design. I decided that the main entry of the school would exhibit this feature front and center. I started with a column 15 feet high. I then did solar studies on the four important dates (solstices and equinoxes), keeping track of the point of the end of the shadow from the column during school hours (8 am to 4pm). These points would then be connected to form curves (solstices) and a line (equinox) that would shape the entry. The summer solstice curve makes the south end of the entry courtyard. The winter solstice makes the curve of the curtain wall for the main entry. The equinox makes the line across the front courtyard that I used as the display of the school name. The gentle curves of the solstices would serve as a basis for other curves throughout the school, including the undulating facade of the southern facing classrooms, the main staircase and the roofs of the north facing classrooms.

To the left is the solar study I produced showing how the front entry was designed based on the shadow of the obelisk out front. The red dot is the shadow's origin point and the yellow dots are the end of the shadow for the given time. In the first two sections, the images show the shadows for every hour from 7:30 am to 4:30 pm. For the third iteration, the images run from 8:30 am to 3:30pm due to the shortened amount of daylight hours.



A daylighting diagram showing instances of glazing for the given sun path

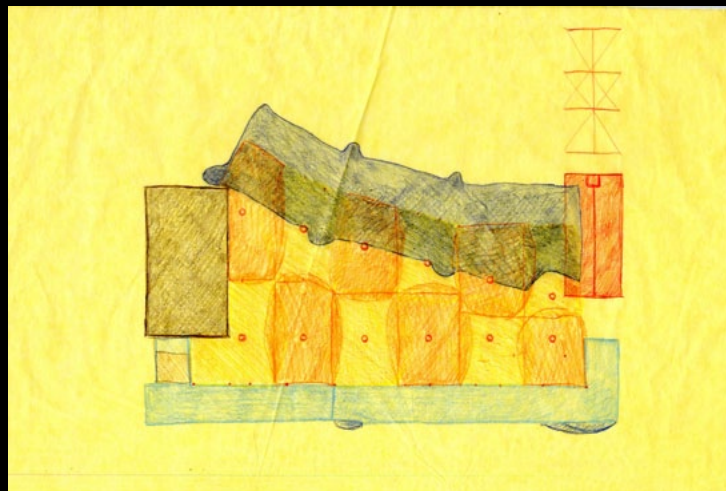


Example of South facing classroom curve



Example of north facing classroom roof curve

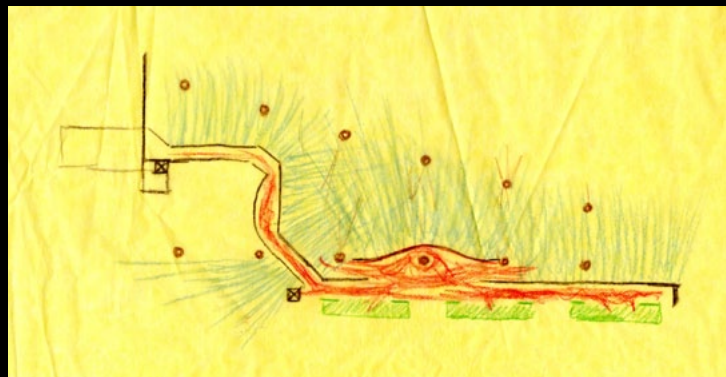
Roofing Diagram



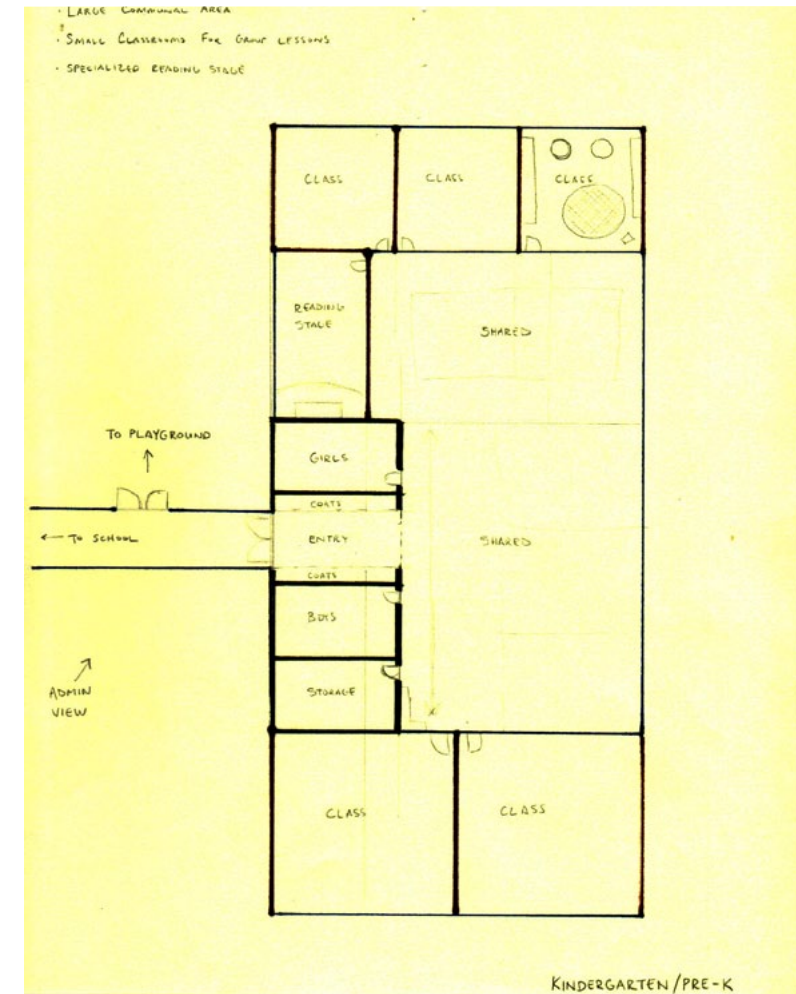
First Floor Circulation Diagram



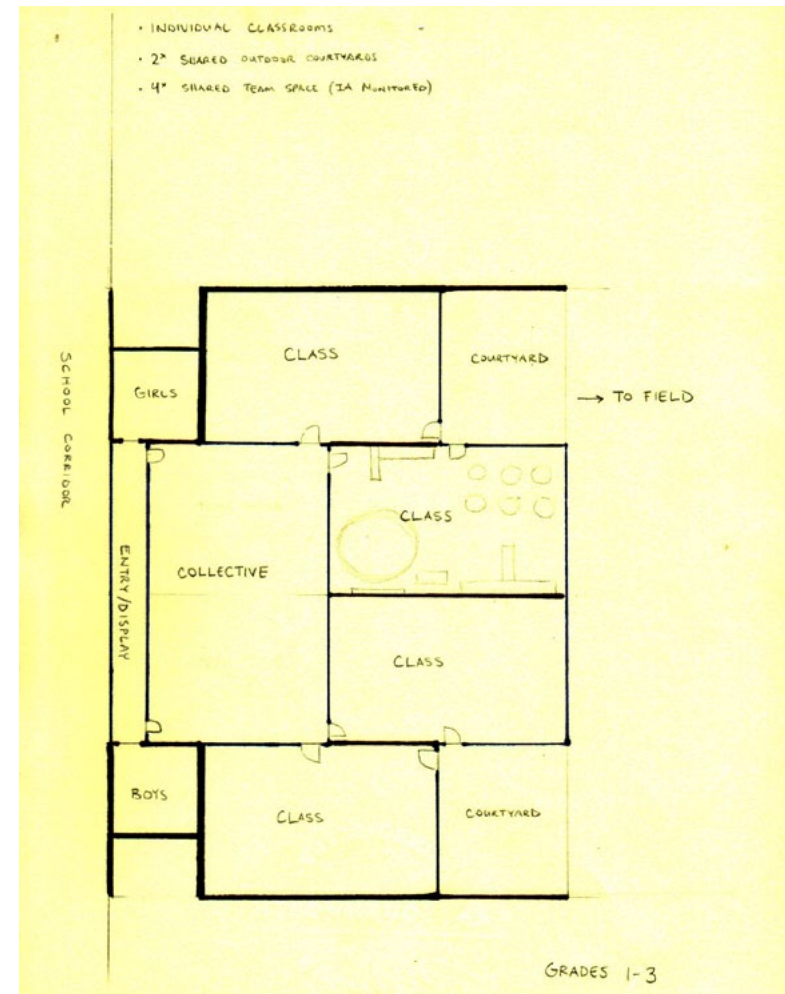
Second Floor Circulation Diagram



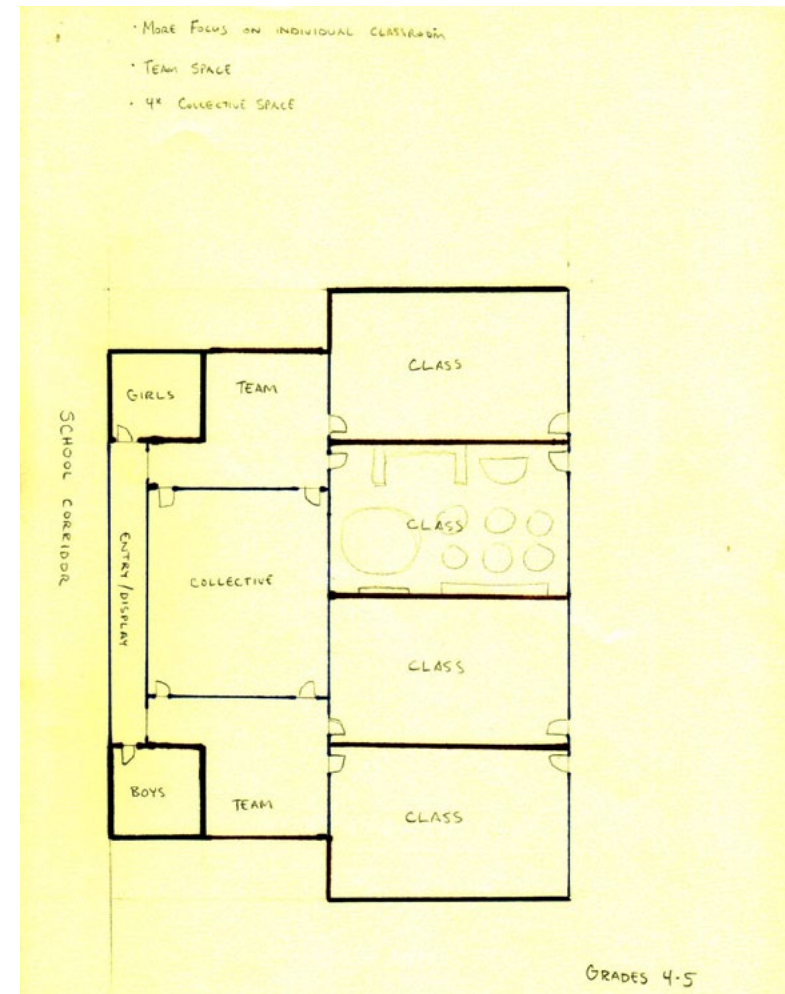
One of the more important aspects of the school design would be how the grade levels are arranged and scaled according to the students that use them. My research revealed the strengths and weaknesses of students according to their age group/grade level and indicated if they would benefit more from shared or individual learning spaces. I used the obvious point that younger students need to expel more energy, so I located the lower grades closer to the outdoor fields. Upper grades have more self-discipline and can benefit from a more ordered space. The images on these pages go through the separate ideas for the grade levels, grouping those that are most similar and would benefit from comparable layouts. There is a noticeable progression from level to level so as time passes, the students keep some familiarity with how rooms and spaces are laid out.



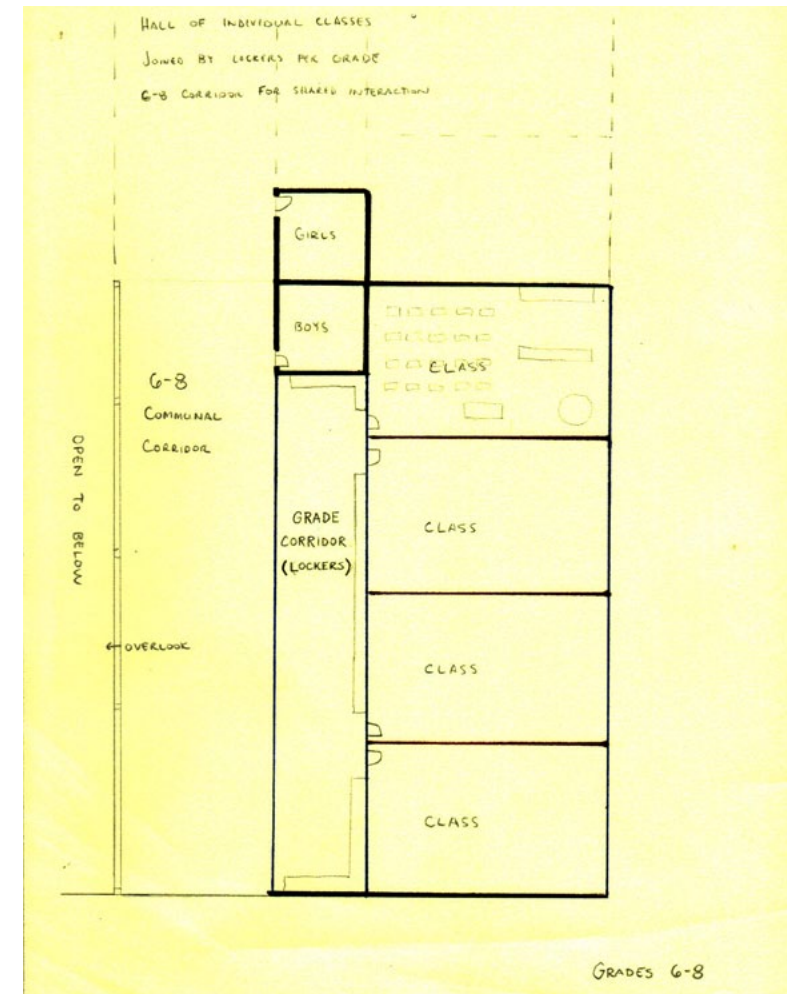
The Kindergarten/Pre-K space was to be in its own 'building', providing separation for the younger kids from the older ones. The main room is a large shared space, encouraging group work and play. Individual classrooms and a reading room line the perimeter, with the east wall open to light. Access to the fields are given as well.



The spaces for grades 1-3 keep a large group space as a focal point, then break into individual classrooms. Two classrooms share an outdoor covered courtyard that looks onto the fields on site. These grade levels would be north facing, allowing natural light to come in through curtain walls and brighten the rooms.

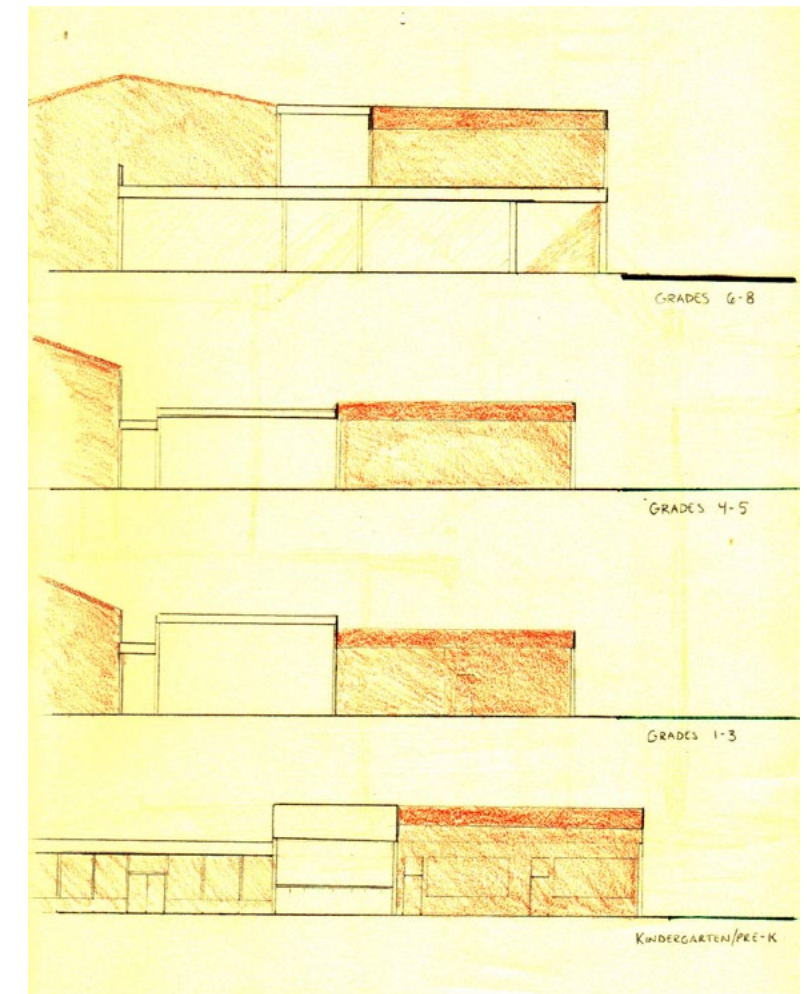


The spaces for grade 4-5 show the beginning of a stronger order, with a smaller group space. The 2-room shared space is moved inside, giving each classroom as similar view outside. Originally, for this and other grade levels, bathrooms were to be placed to service each grade, but this was changed to fit more realistically for the entire school.



Grades 6-8 are the most standard of spaces, with the group aspect of the levels occurring outside the give grade level in the second floor communal space. Outside the classrooms is a thin corridor for lockers and prep. Class windows face south and bring light all the way in through transoms on the opposite wall, illuminating the locker space as well.

Classroom Study Model



These quick sections show the placement of the grade levels, indicating height and orientation. Lower grades are all on the ground level, while grades 6-8 are located on the 2nd floor, providing some distinction according to the traditional elementary/middle school division. An elevator would be added to keep all spaces fully accessible.

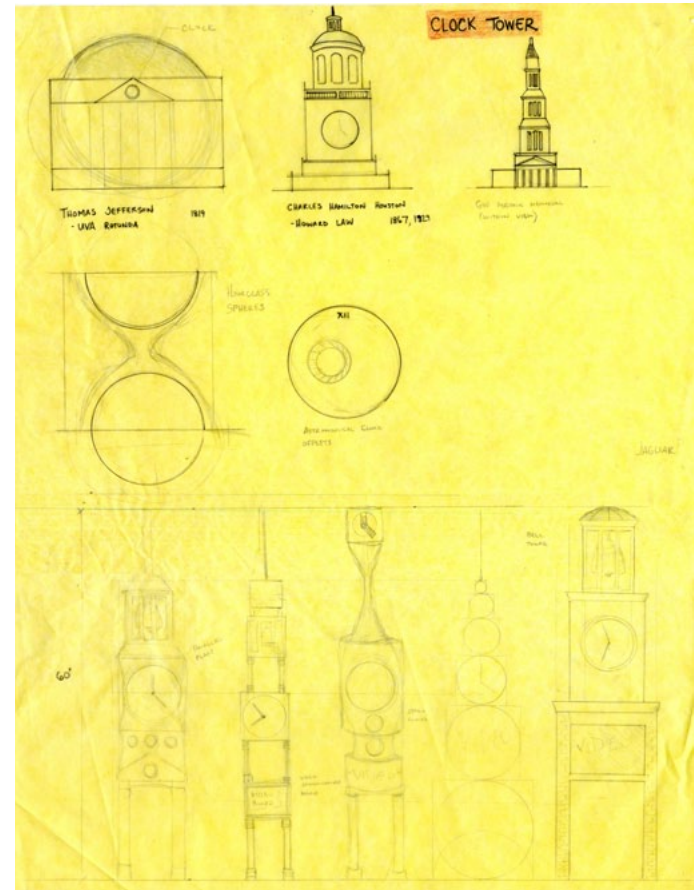
	Boys		Girls		Avg Traits
	HT	WT	HT	WT	
4	37	36	37	35	8 - outdoors, barefooted
5	40	42	40	40	9 - search for attention, need activity
6	42	46	41	44	1 - be fast, speed, swim, games, imitative
7	44	50	43	50	2 - classes, teacher, collective, un-creative
8	45	52	45	57	3 - questioning, talking, creative, playful
9	49	61	47	64	4 - fairness, imitative, creative, playful
10	51	70	51	74	5 - search for attention, need activity, creative, playful
11	52	77	52	79	6 - search for attention, need activity, creative, playful
12	58	85	60	95	7 - fairness, self-aware, animals
13	62	95	63	100	8 - critical of adults, solitary or friends

	Boys		Girls		Avg Traits
	HT	WT	HT	WT	
4	37	36	37	35	8 - outdoors, barefooted
5	40	42	40	40	9 - search for attention, need activity
6	42	46	41	44	1 - be fast, speed, swim, games, imitative
7	44	50	43	50	2 - classes, teacher, collective, un-creative
8	45	52	45	57	3 - questioning, talking, creative, playful
9	49	61	47	64	4 - fairness, imitative, creative, playful
10	51	70	51	74	5 - search for attention, need activity, creative, playful
11	52	77	52	79	6 - search for attention, need activity, creative, playful
12	58	85	60	95	7 - fairness, self-aware, animals
13	62	95	63	100	8 - critical of adults, solitary or friends

Time as Measurement

One of the most important design concepts for the school was to make the passing of a time a measurable and interactive quality expressed through the architecture. There are 3 main design ideas in the school which architecturally convey this passing of time throughout the school year.

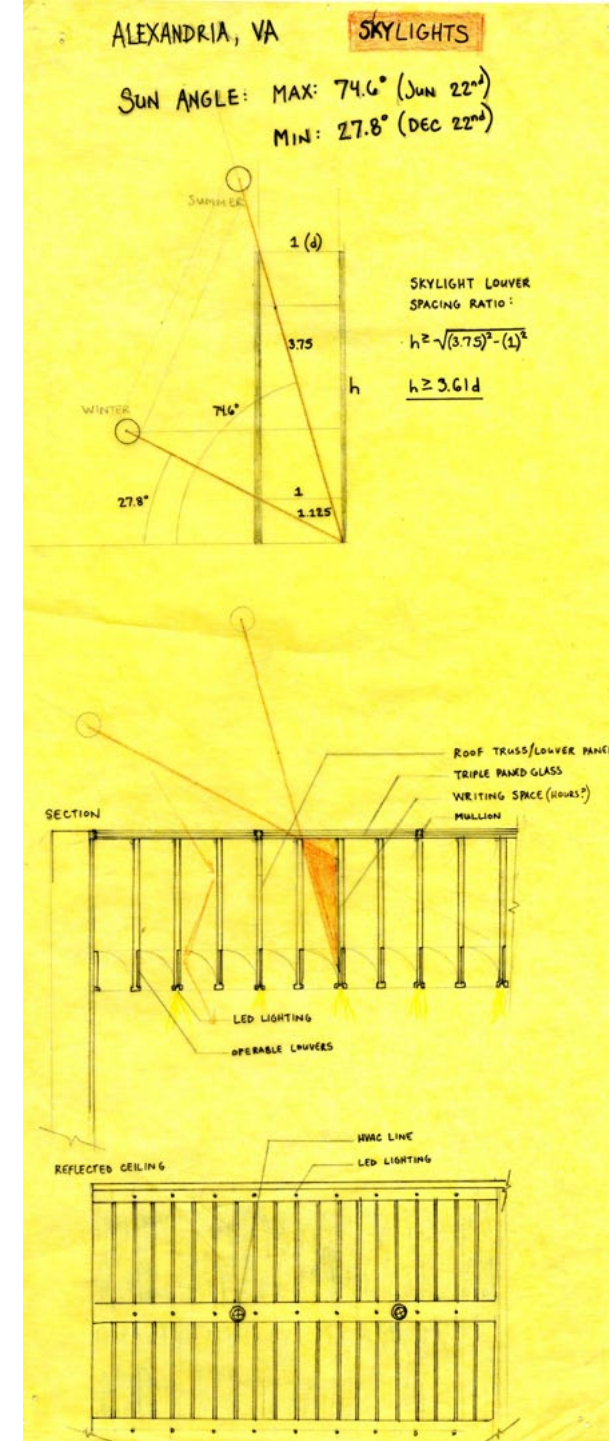
Ever since keeping time became important to the flow of society, public clock towers were built for everyone's benefit. The towers were focal points for the towns and villages and usually utilized loud bells to signal the important times of the day. For the school, I felt that a clock tower would be essential for identity purposes since I was dealing with time; but the tower would also present the opportunity to connect the school with the neighboring community. The tower is a simple cube on long columns (slightly tapered to be reminiscent of an hourglass), placed strategically on the site. The clock tower is visible from the intersection of Cameron and N West Streets; the main entry of the building, but more importantly, the tower is placed at the projected intersection of the axes of the trees (see the next section) of the interior atrium spaces. This location allows the majority of the interior space to have a clear view of the tower and the time.



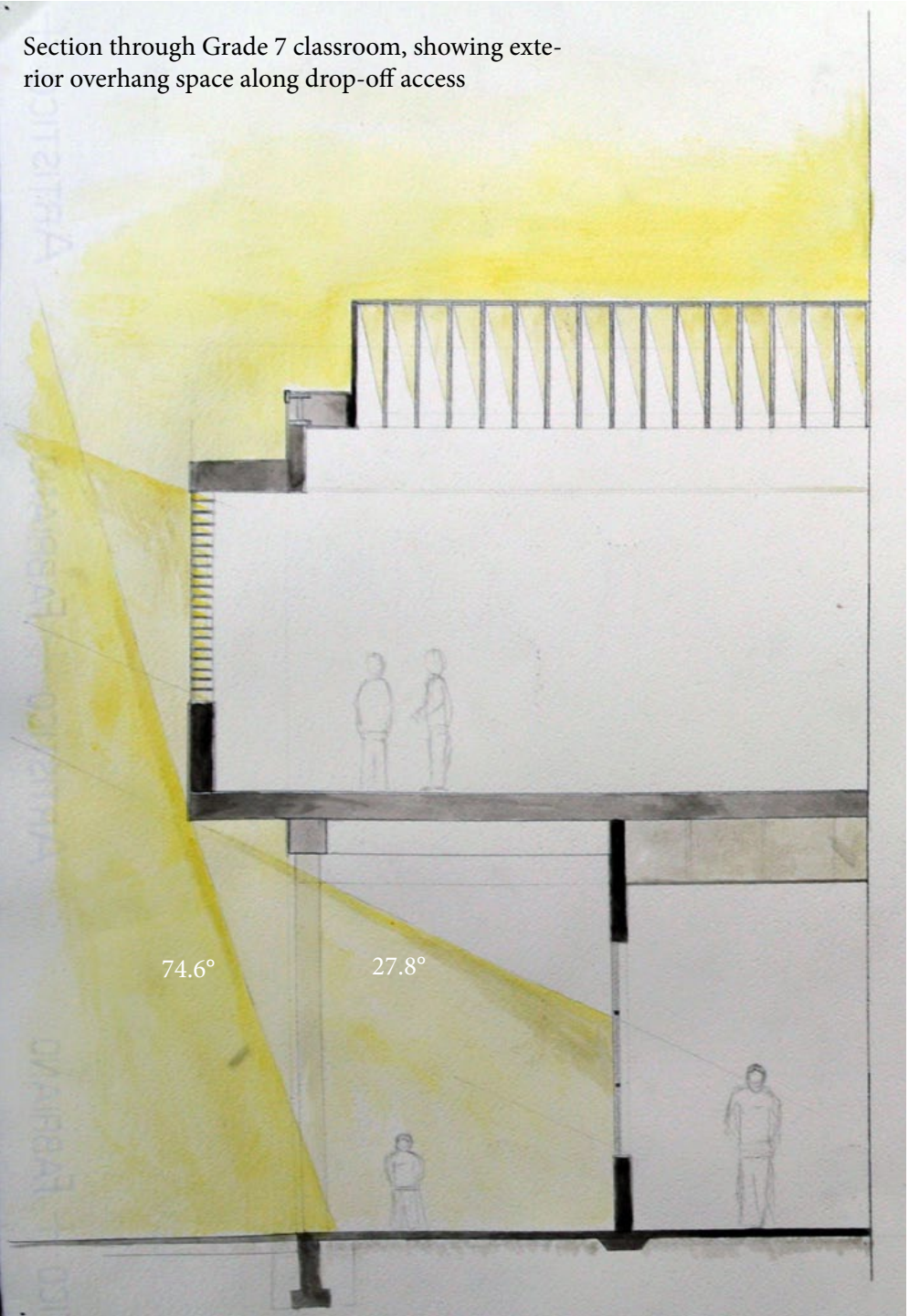
Clock Tower Ideas



Final Clock Tower Design



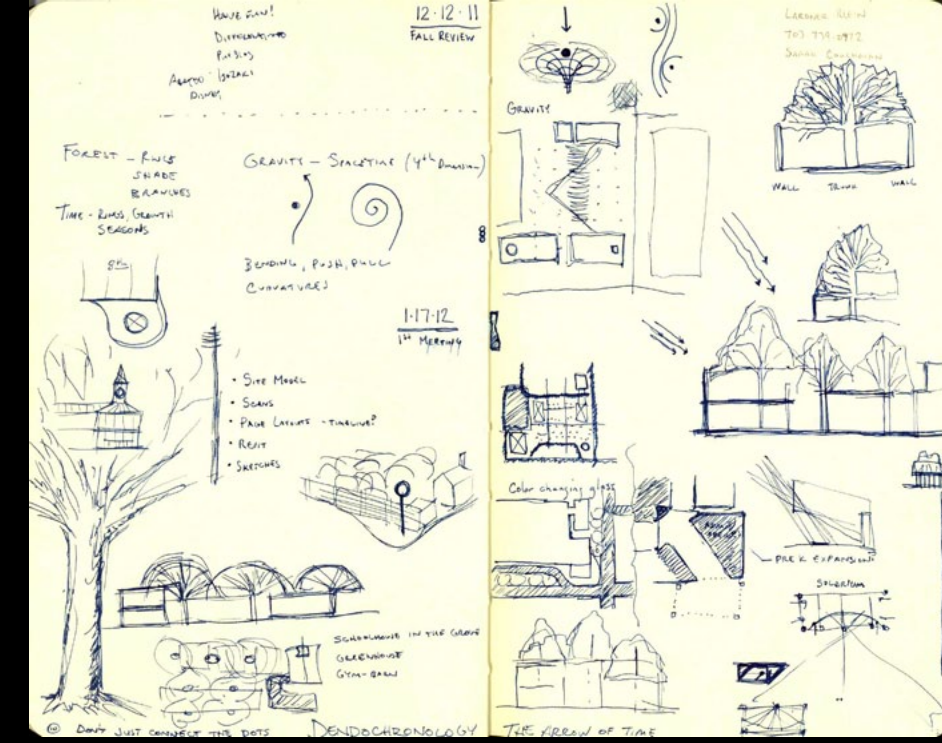
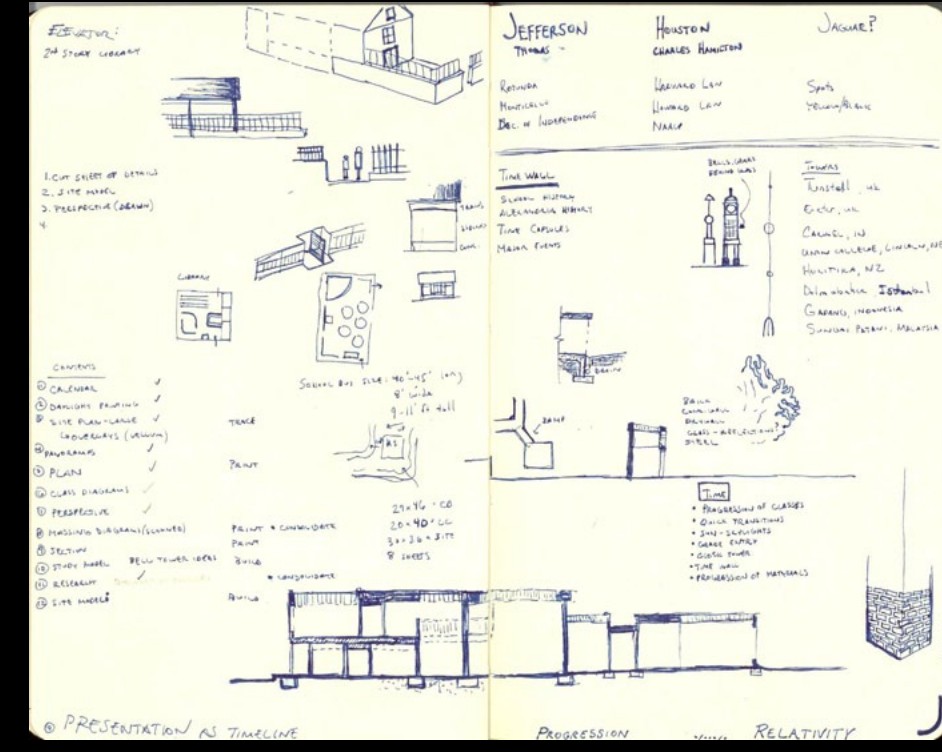
While determining the time from a clock is an easy direct approach suitable for students just learning to tell time, the upper grades are given the opportunity to use solar paths to determine the time of the day. The classrooms for grades 4-8 each have a system of skylights in them that not only bring plenty of natural light into the space, but also provide the ability to use the shadows of the skylights to determine an approximate time of day during the year. By accounting for the maximum (summer solstice) and minimum (winter solstice) sun angles for the site, I was able to create a ceiling louver system that would illuminate the rooms, but keep all direct sunlight from entering the space. The resulting line of the edge of the direct sunlight upon the vertical louvers could then be used to approximate the time of day by location and angle. Since the louvers would repeat over a classroom's depth, each louver could track a different time of the year.



Section through Grade 7 classroom, showing exterior overhang space along drop-off access

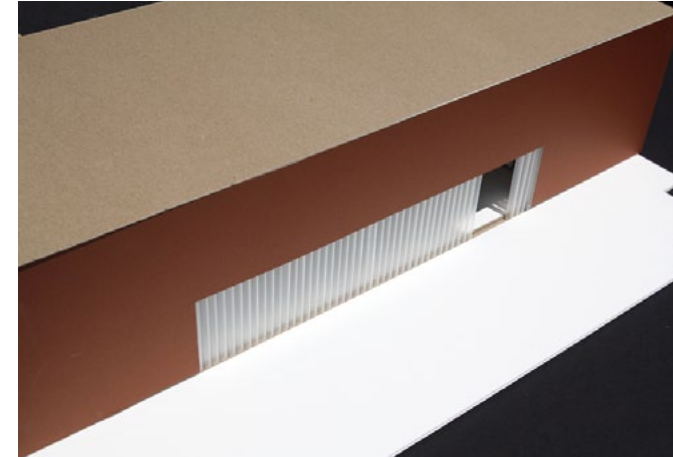
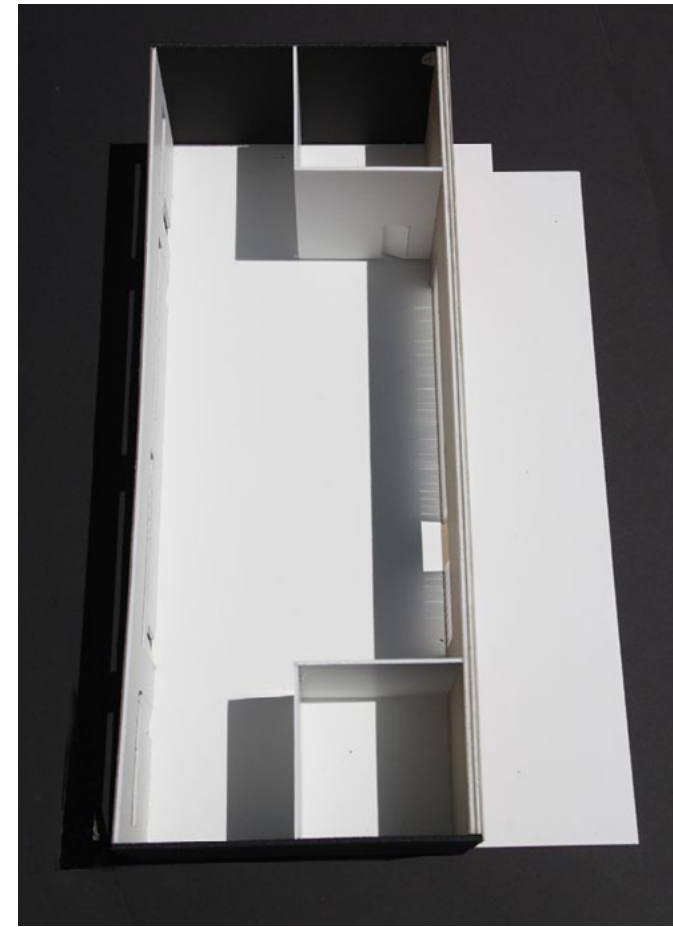
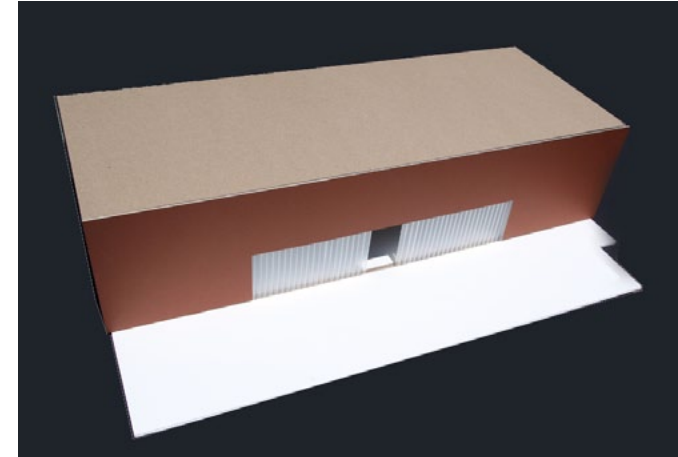
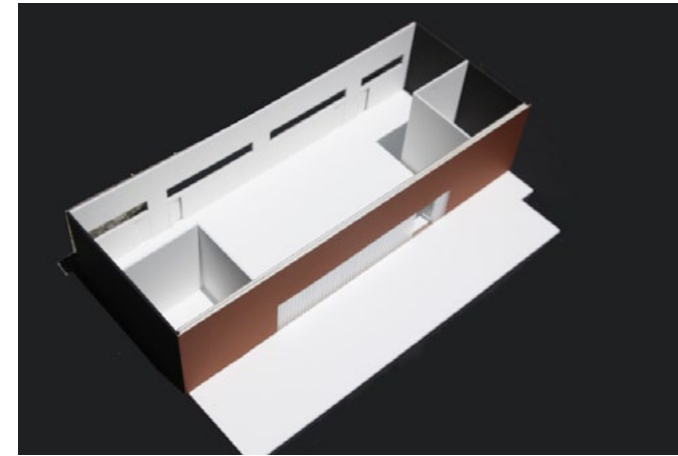
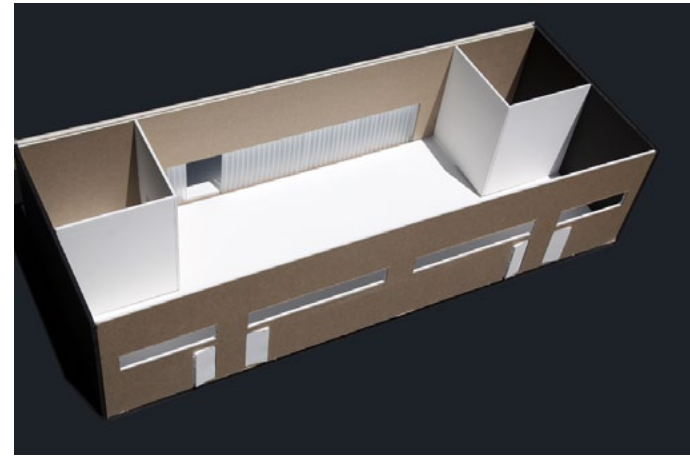


Clock Tower designs taken from Google Images

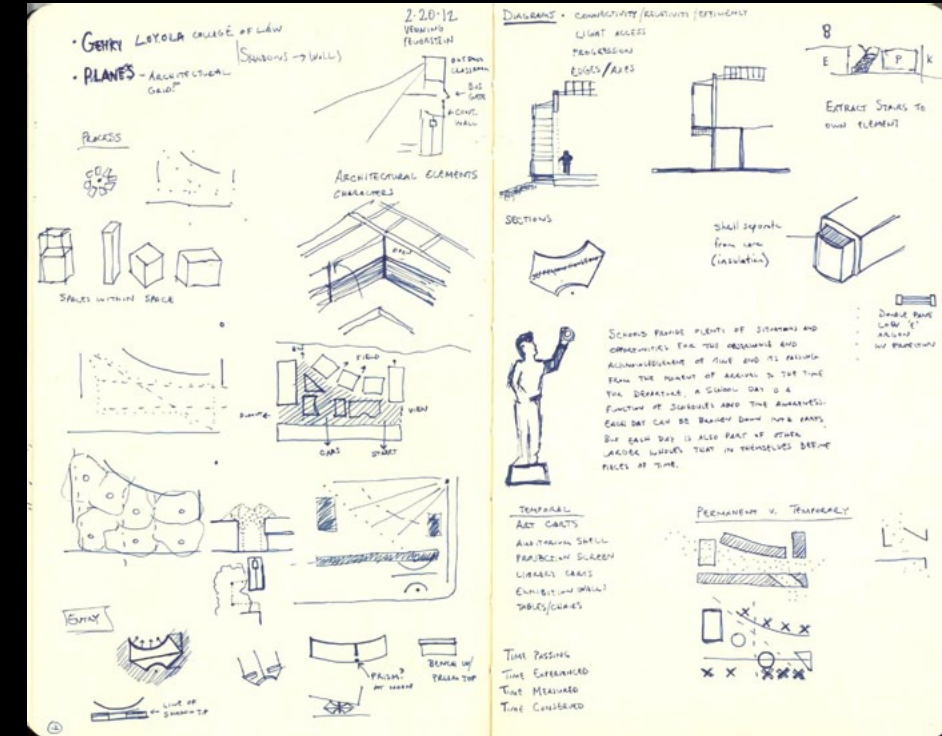
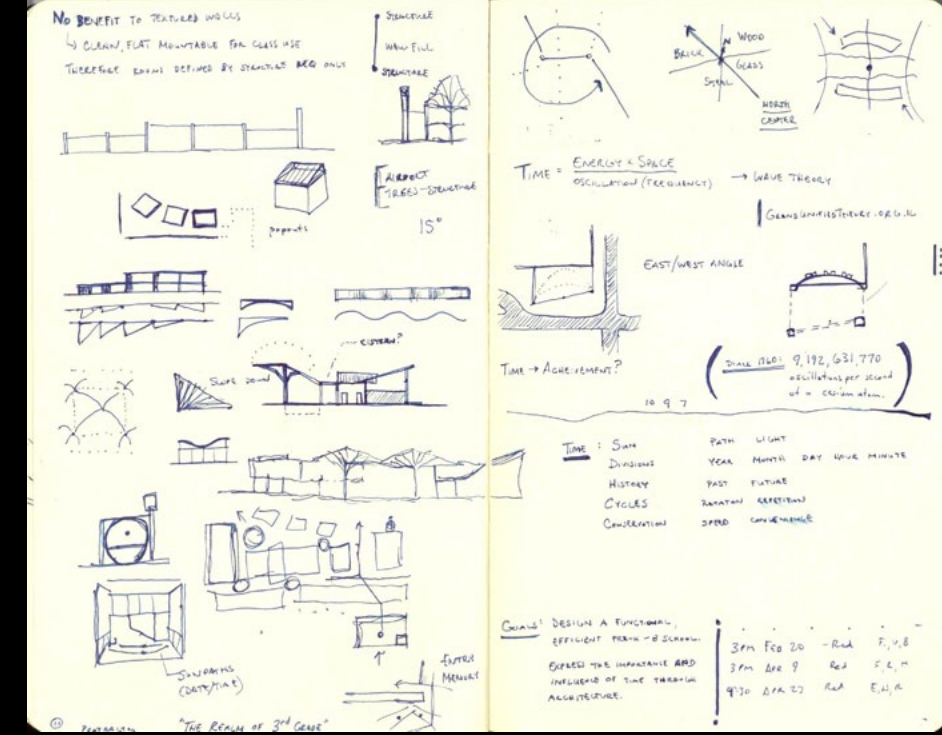
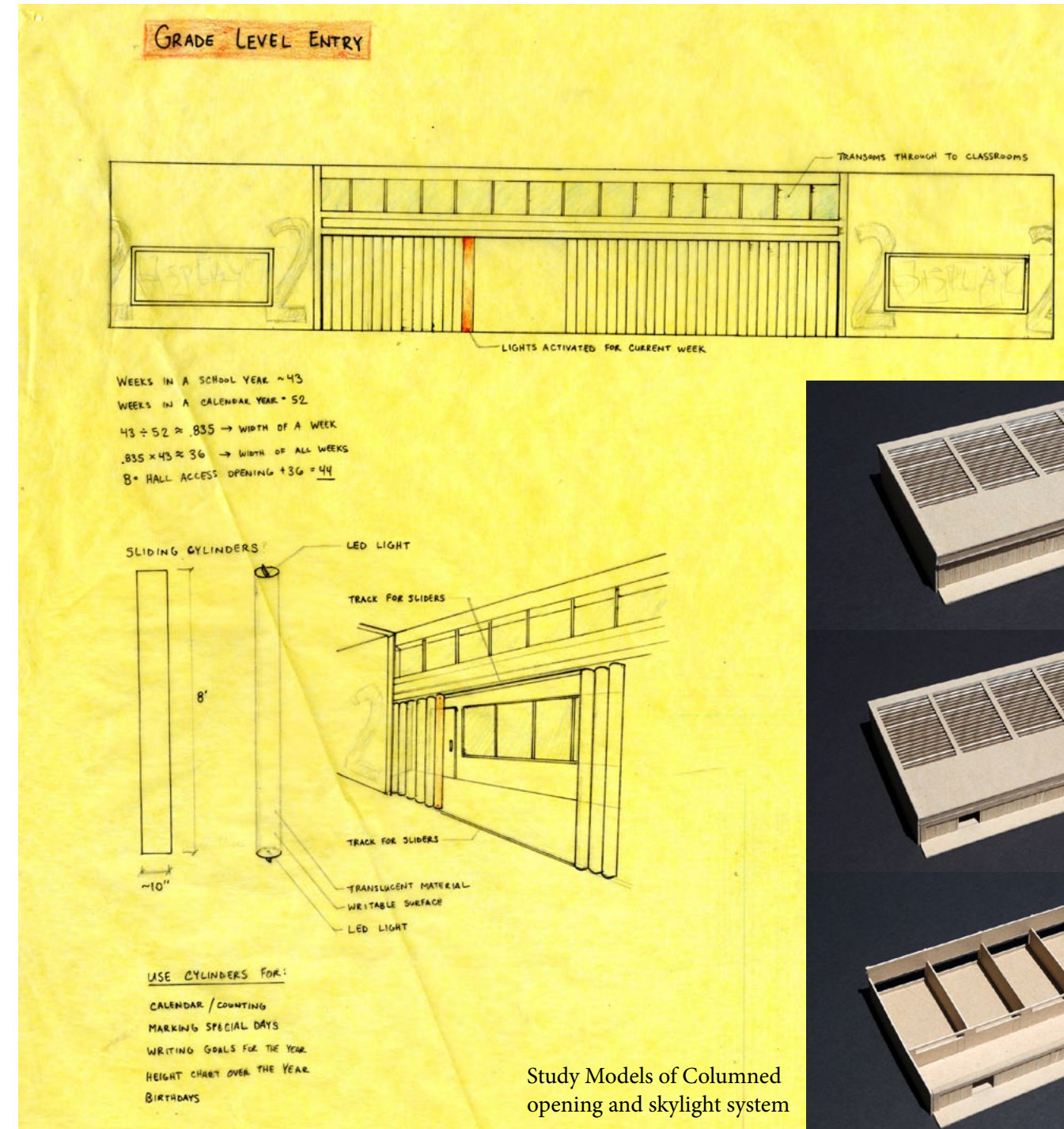


IDEAS

Finally, a distinguishing design element for the school stems from the weekly calendar drawing I completed during my research. As mentioned earlier, there are typically 43 weeks to a given school year. I took that number and designed an entry system to the grade levels that would signify the passing of those 43 weeks. Each grade level would have a long opening that would be filled with 43 translucent, slidable columns. At the beginning of the year, all of the columns would be to one side, leaving an 8' opening in the remaining space to access the classrooms. As each week passes, a column would be moved across the remaining opening to the other side. This would continue throughout the year so that by the end of the year, the access point to the classrooms is on the opposite side of the large opening. This dynamic entry would be a constant reminder to those in the school of the passing year. The column and its system could also be used as teaching tools or for grade-level calendars, with important dates or birthdays marked on the columns for the weeks they represent. Finally, for the current week, the translucent column would be lit from the inside, providing a better visual anchor for classroom access amongst the 43 columns.

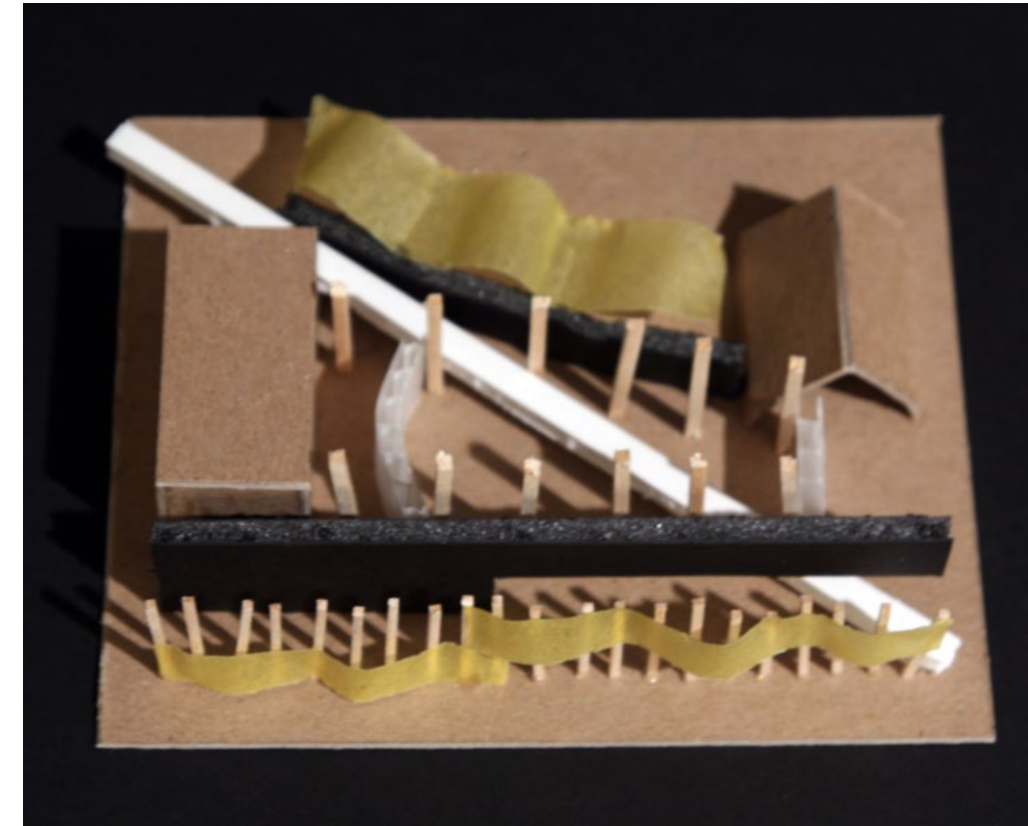


Larger scale study model photos showing classroom opening columns and weekly shifting



Time as Experience

With the classrooms and accompanying spaces measured and arranged, and the main features established, the next step was to go through the school and sharpen the overall experience once you enter the building. In the early floor plan designs, each room was a contained space with simple corridors providing access throughout. While this was certainly efficient, the design did not convey the feel and result of a building concerned with time. To remedy this, I took a step back and looked at which spaces needed to be in permanent places and while spaces had a more temporal quality that could afford to change and adapt to a given timeline.



This “spiritual” study model showed the main diagonal axis and its relation to the other pieces of the building. The curves are shown as well as black walls indicating a transition from one type of space (classroom) to another (open program).

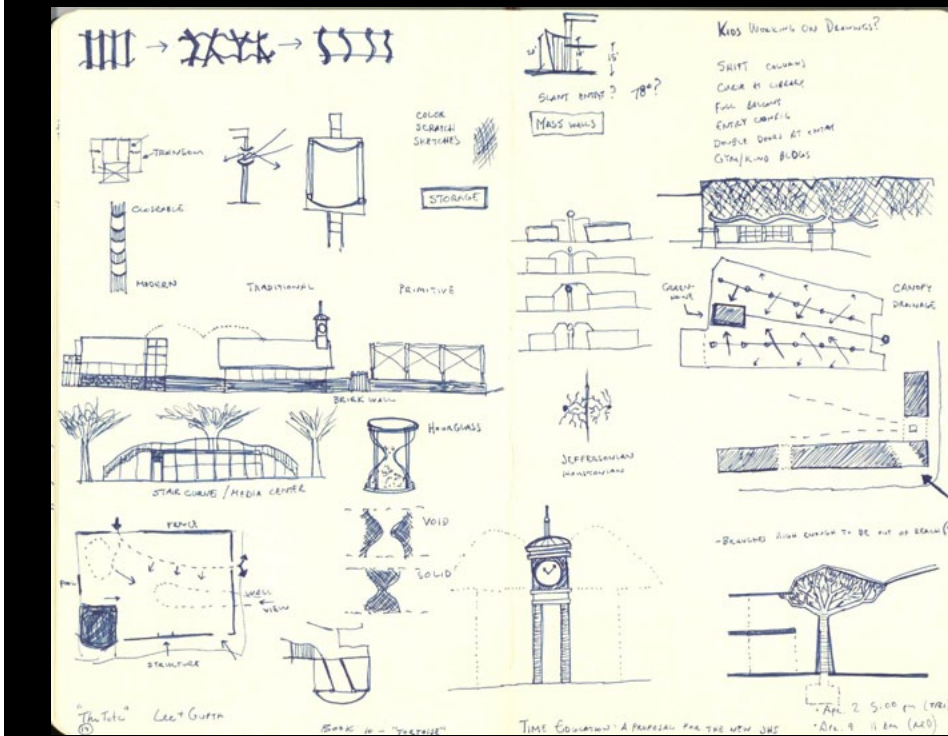
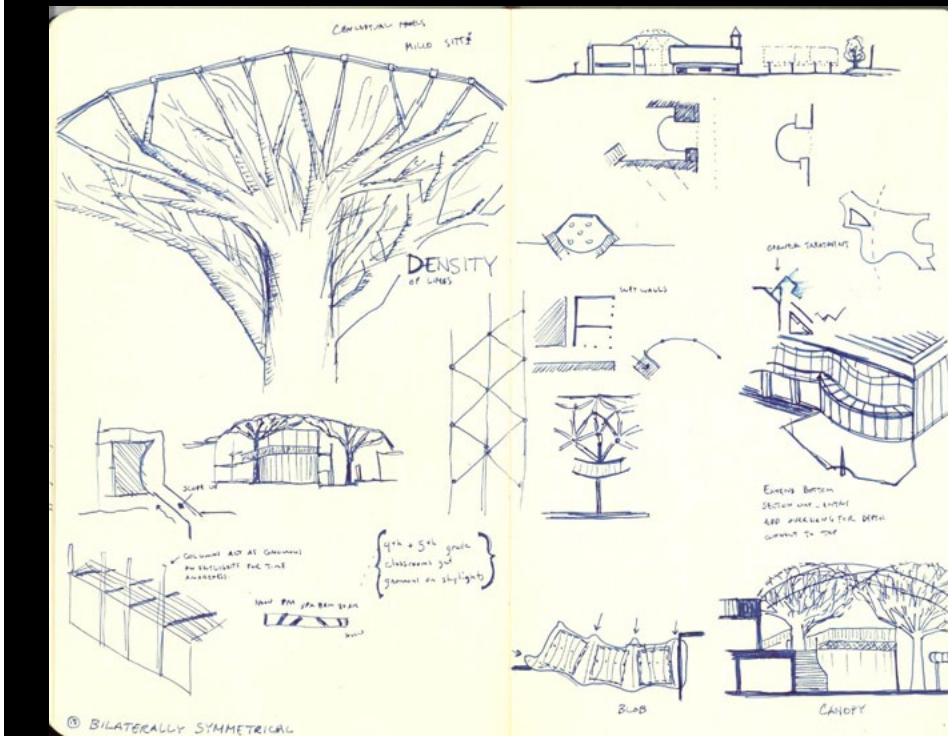
Early section through Cafeteria balcony showing the idea of a tree branch-like roof structure over top the main space. The open feeling and access to daylight are important concepts of the school design.



The grade level designs provided for enough adaptability within themselves with their shared spaces, but the grade levels would each need to be in permanent spots in the school. The offices and other spaces with heavy equipment (gym, kitchen, band room) would also need to be permanently situated. The remaining spaces, including most all of the circulation, could then be designed for an adaptive use. With the permanent places arranged along the perimeter of the school, the central space was then able to be opened up and become available to a variety of uses. In what I chose to call the “cafetorium gallery”, the central space of the school provides for circulation, cafeteria seating, auditorium seating, library reading space and an ever-changing art classroom. Each of these activities have a temporal quality to them that are not necessarily the same from day to day and would benefit from the flexibility of open space.

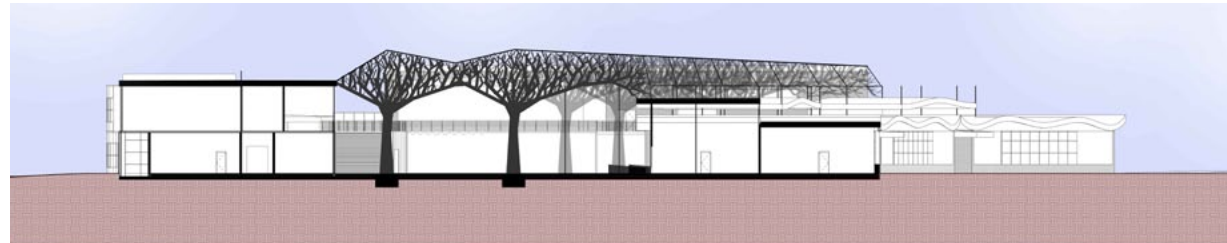


First floor plan showing the open central space and some of the intended uses

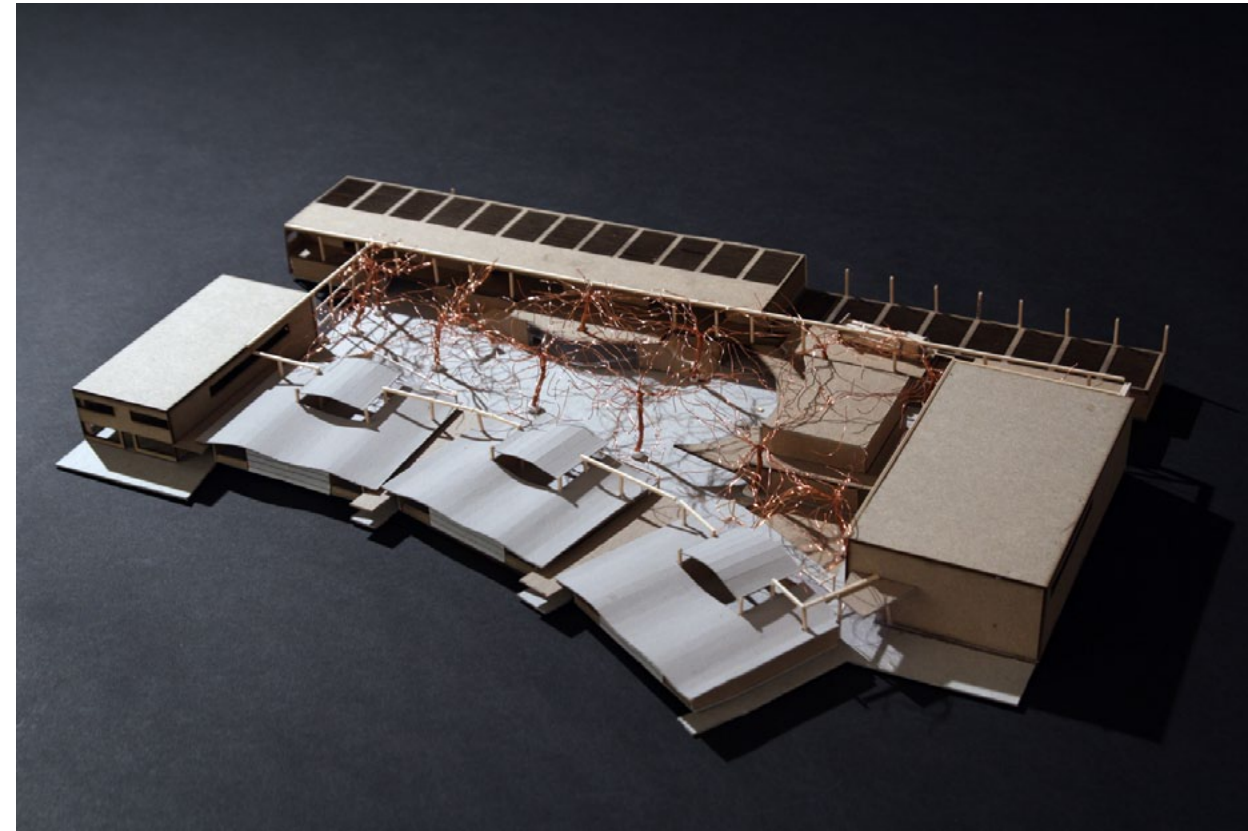


For the architecture of this important central space, I originally had the idea of replicating the beautiful oak trees that lined the streets of the school on the inside; transforming them into large structural pieces that would hold up the central roof (see images on this page). Realizing that this may be far too complicated for the effect desired, I decided to use actual trees on the interior, aligning them on the diagonal axis through the building (see previous page or final images). Special trees were also placed along the east-west axis on the stairways and one protruding up through the ceiling of the library. The roof of the central space would then be a large space frame supported by a separate grid of large steel and concrete columns. The space frame would use a 10' square cell module that is 5' deep.

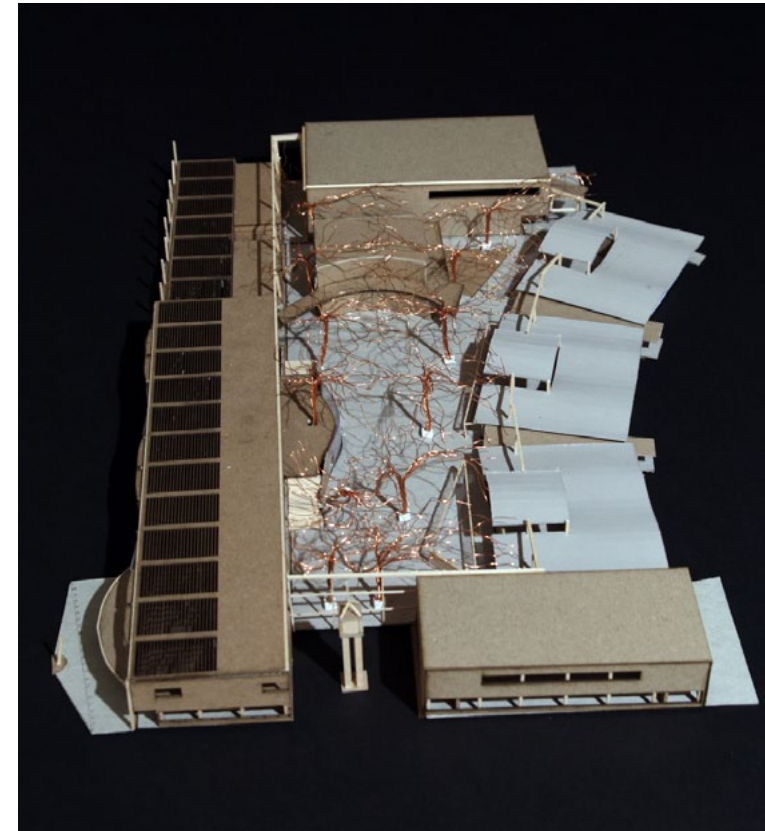
By changing to this design, it not only simplifies the roof and the structure of the space, but it brings in the temporal qualities of live trees into the dynamics of the school building. I specified Zelkovas for the interior space instead of the large oaks that line the streets for a few reasons. First, the size of the trees would need to fit underneath the 45' atrium ceiling, but still provide a canopy shape that was pleasant to sit under. Secondly, the Zelkova leaves change to beautiful colors in the fall, mostly golds and yellows; that would be a perfect reminder of time and the seasons passing. The Zelkovas can also be trained and pruned to work with the stairway design.



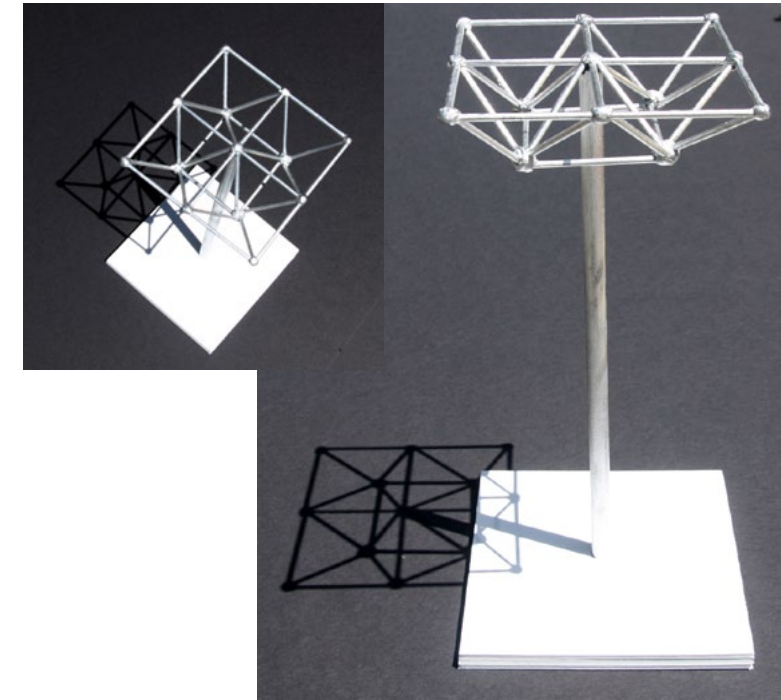
Section showing structural tree idea



South facing aerial view of study model



West facing aerial view of study model



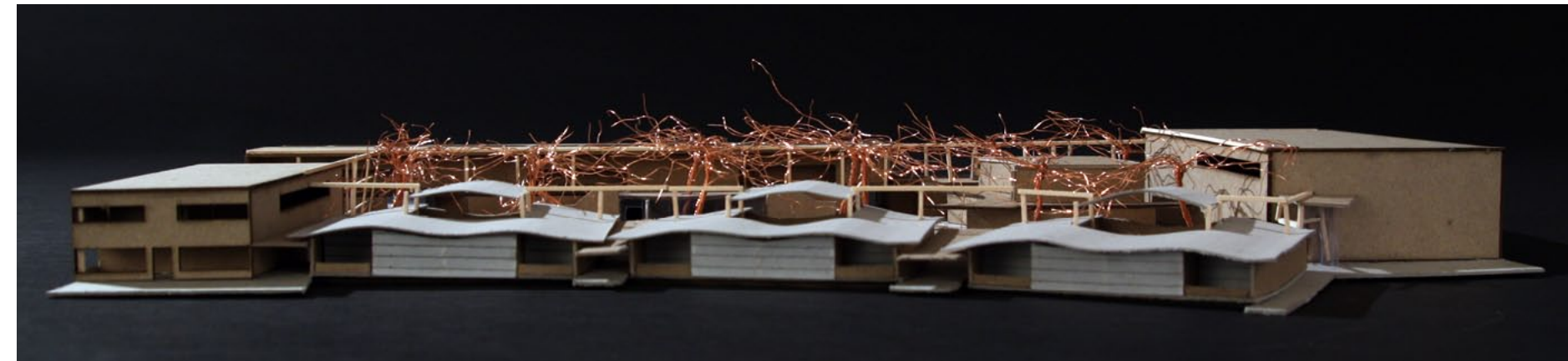
Study model of space frame design



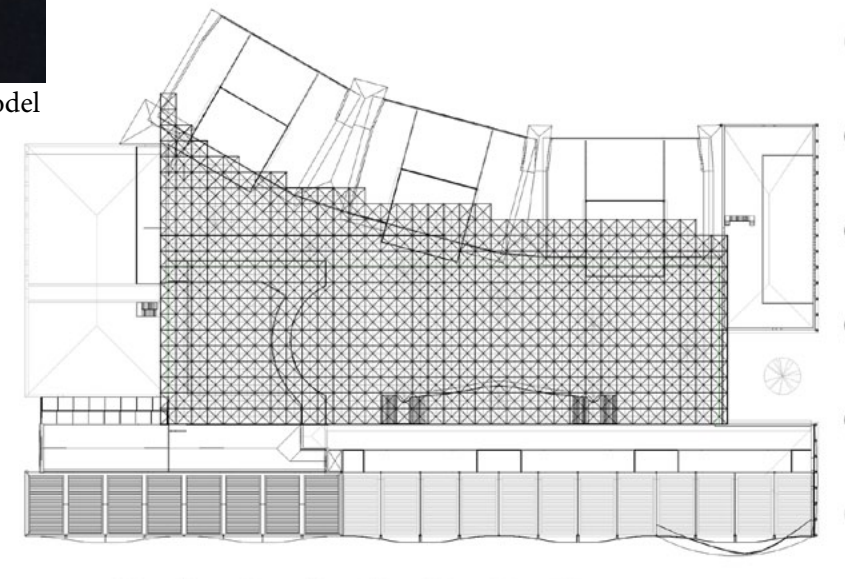
Zelkova tree (Zelkova Carpinifolia)



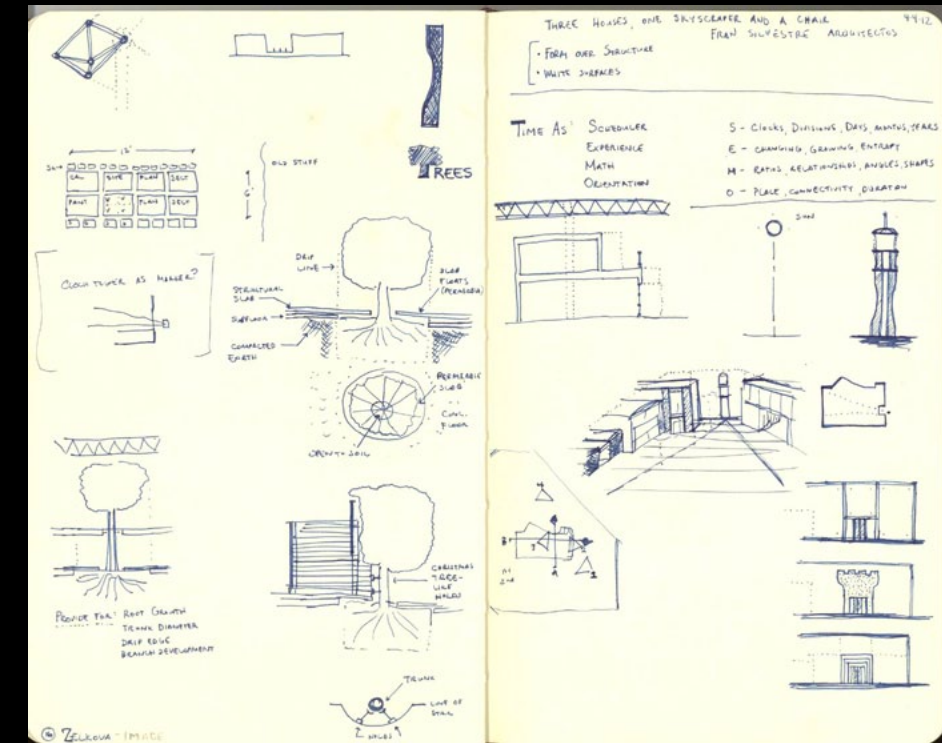
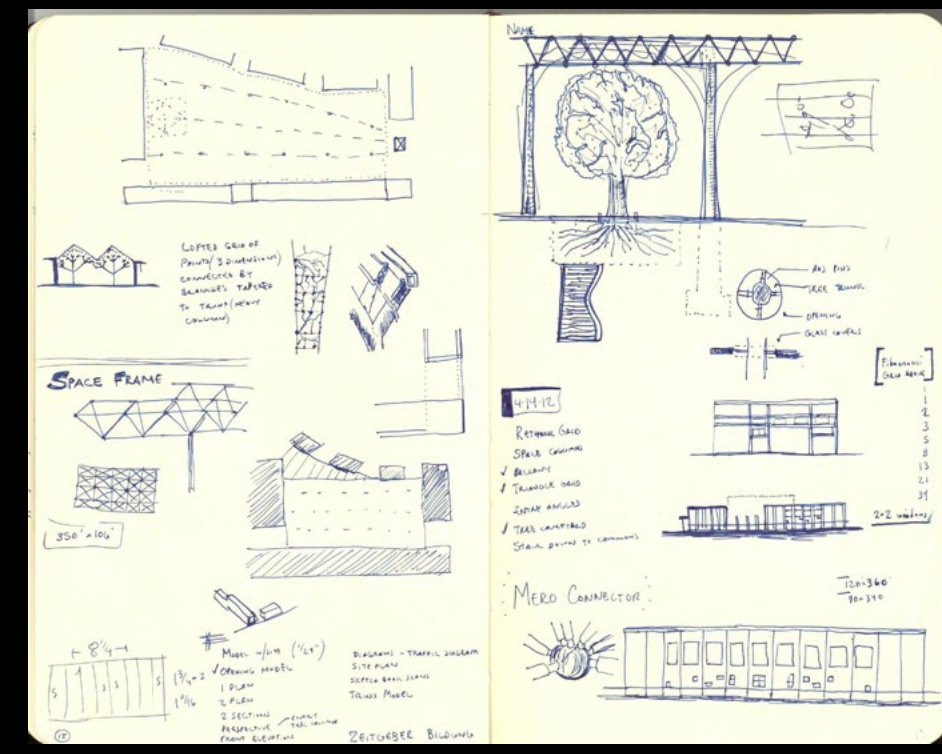
View showing tower placement at apex of tree axes



South facing view of study model



Final Atrium Grid Layout
The top edge is based on the Fibonacci sequence.



Time as Evidence

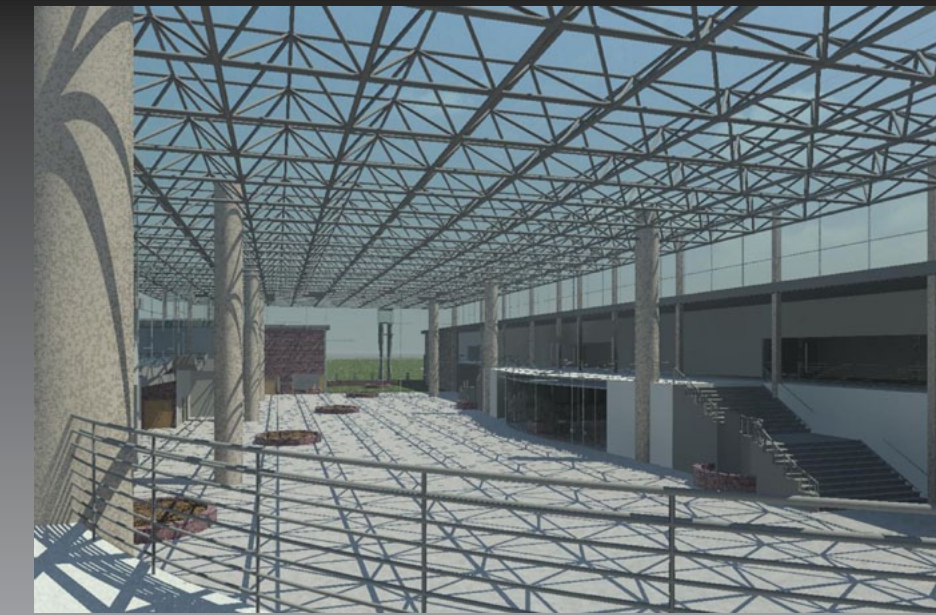
Though we think of time as being constantly in motion, there will be evidence left behind as to where the time has been. This evidence is a product of a particular period of time, whether that be a millisecond, a semester or a lifetime. The following images and notes are the evidence of the culmination of my design process for this thesis, aggregating the time spent over the past 8 months into pages that mark my place in this history.



Final Figure Ground Site Plan for the Jefferson-Houston School



Aerial view of final model



This is a preliminary interior rendering of the main cafeteria/auditorium/gallery space from the balcony above the kitchen looking east. The trees were removed to better show off the volume of the space and show the clock tower in the distance.



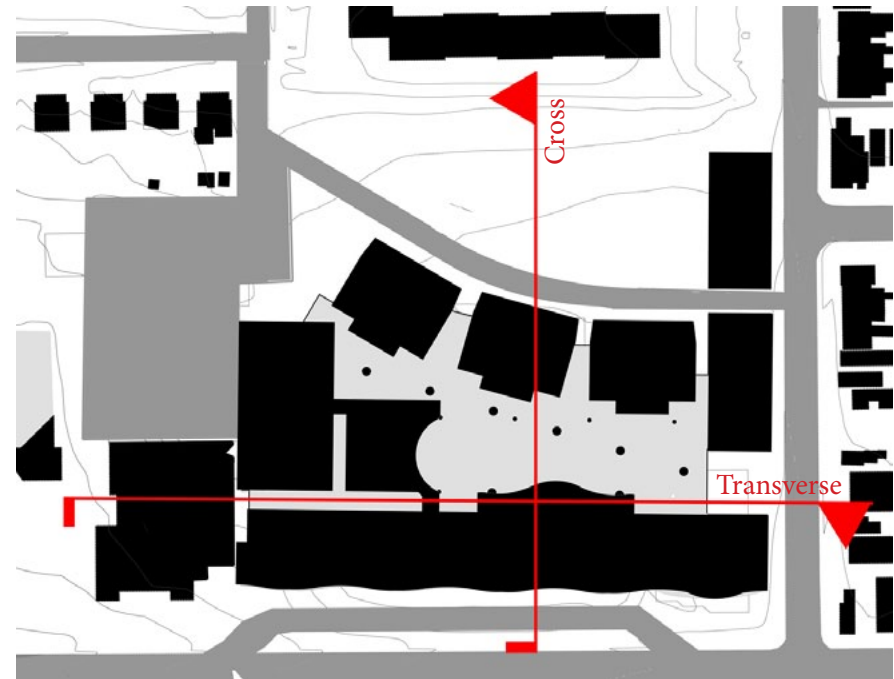
Final Floor Plan - Ground level



Final Floor Plan - Upper Level

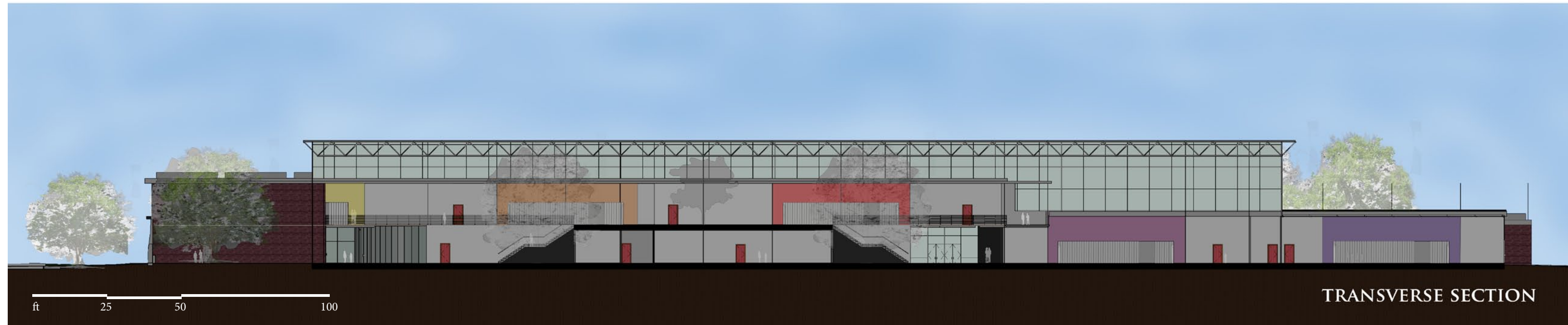


Cross Section showing upper grades, lower offices, main volume and 2nd grade pavilion.

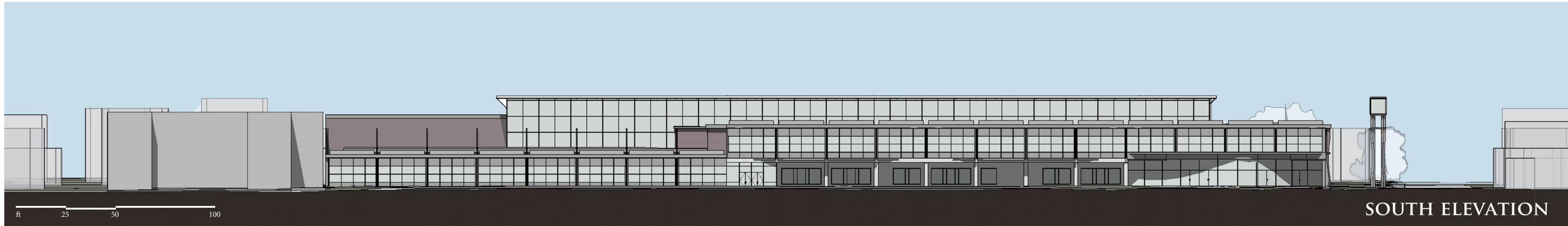


Section cut references

Long Section showing main stair, library, central entry and entrances for grades 4-8.



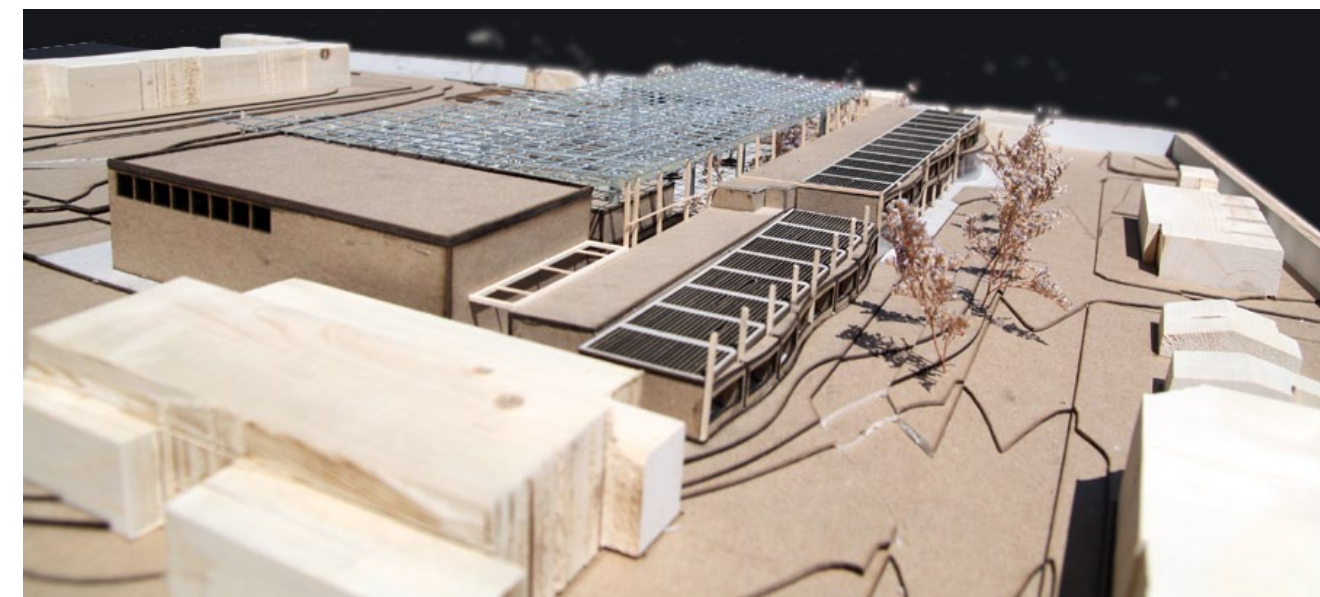
TRANSVERSE SECTION



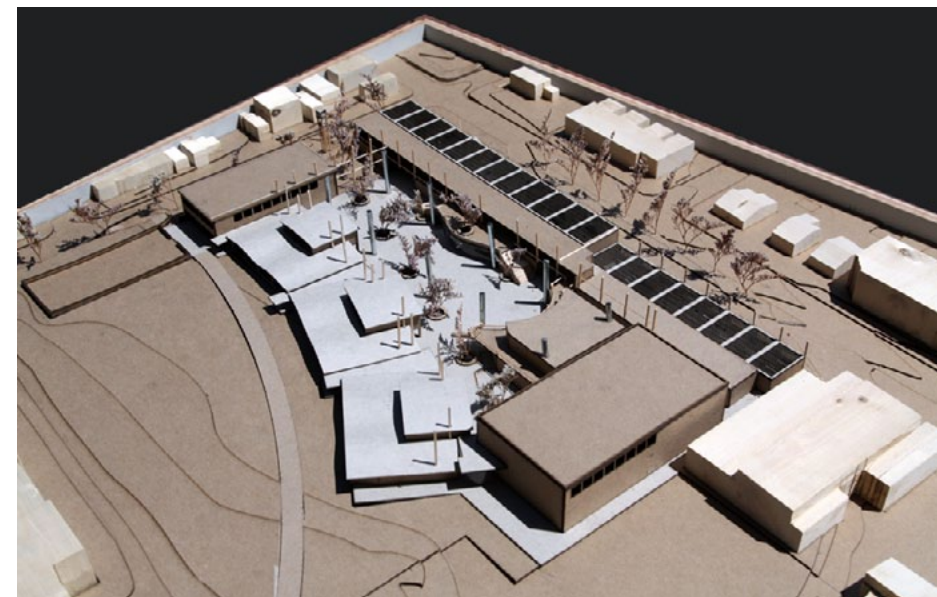
Final model -
overhead view
from south
w/atrium



Final model -
overhead view
from north
w/o atrium



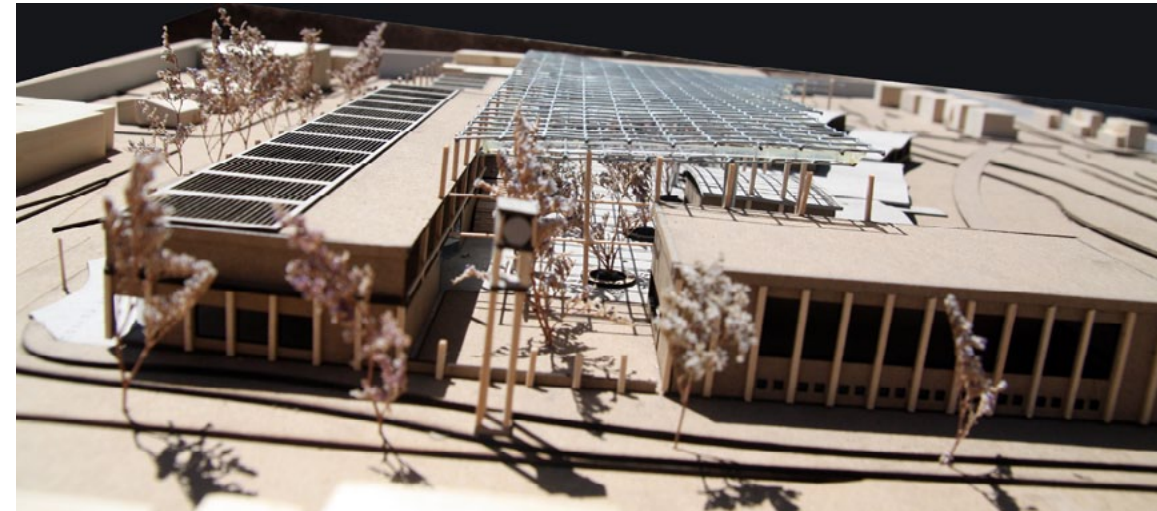
Final model - look-
ing northeast



Final model -
looking southeast
w/o atrium



Final model -
Main entry



Final model -
Center view w/
atrium

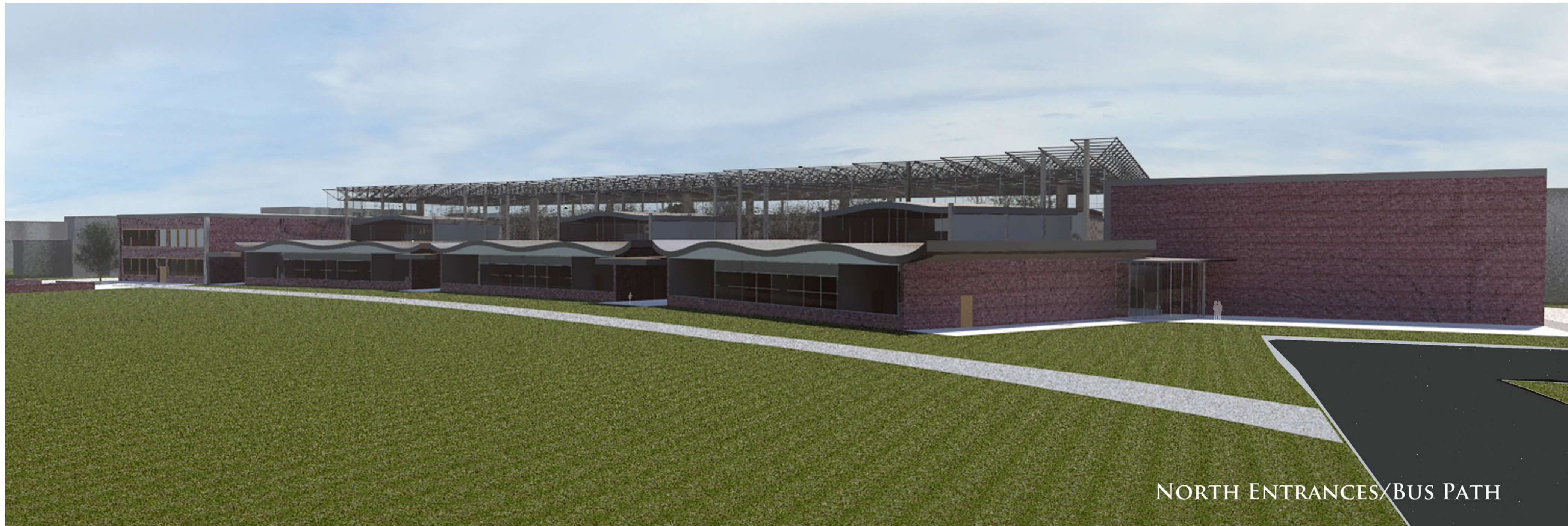


Final model -
southern central
entry

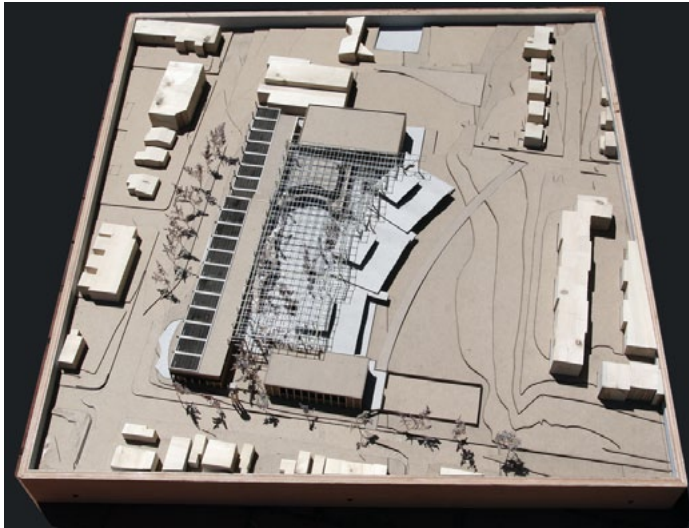


MAIN ENTRANCE

Final model - looking southeast w/o atrium



NORTH ENTRANCES/BUS PATH



Final model - overhead view w/atrium



Final model - 2nd/3rd grade pavilion detail



Final Model - Library Detail

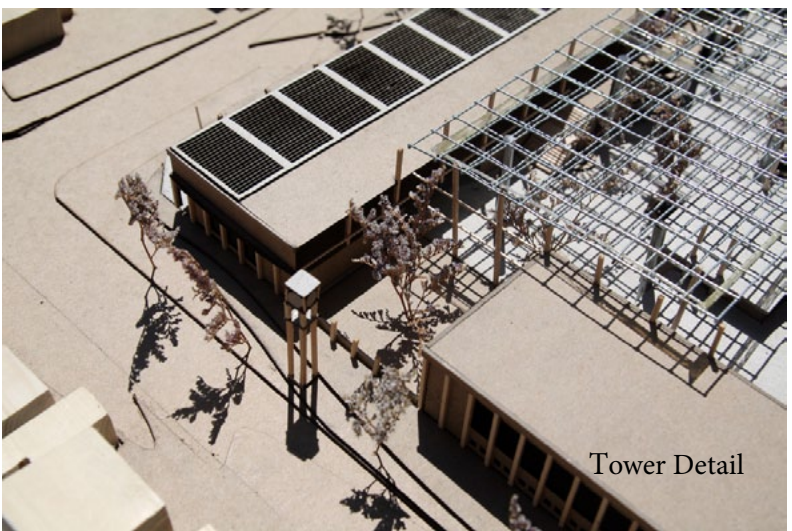
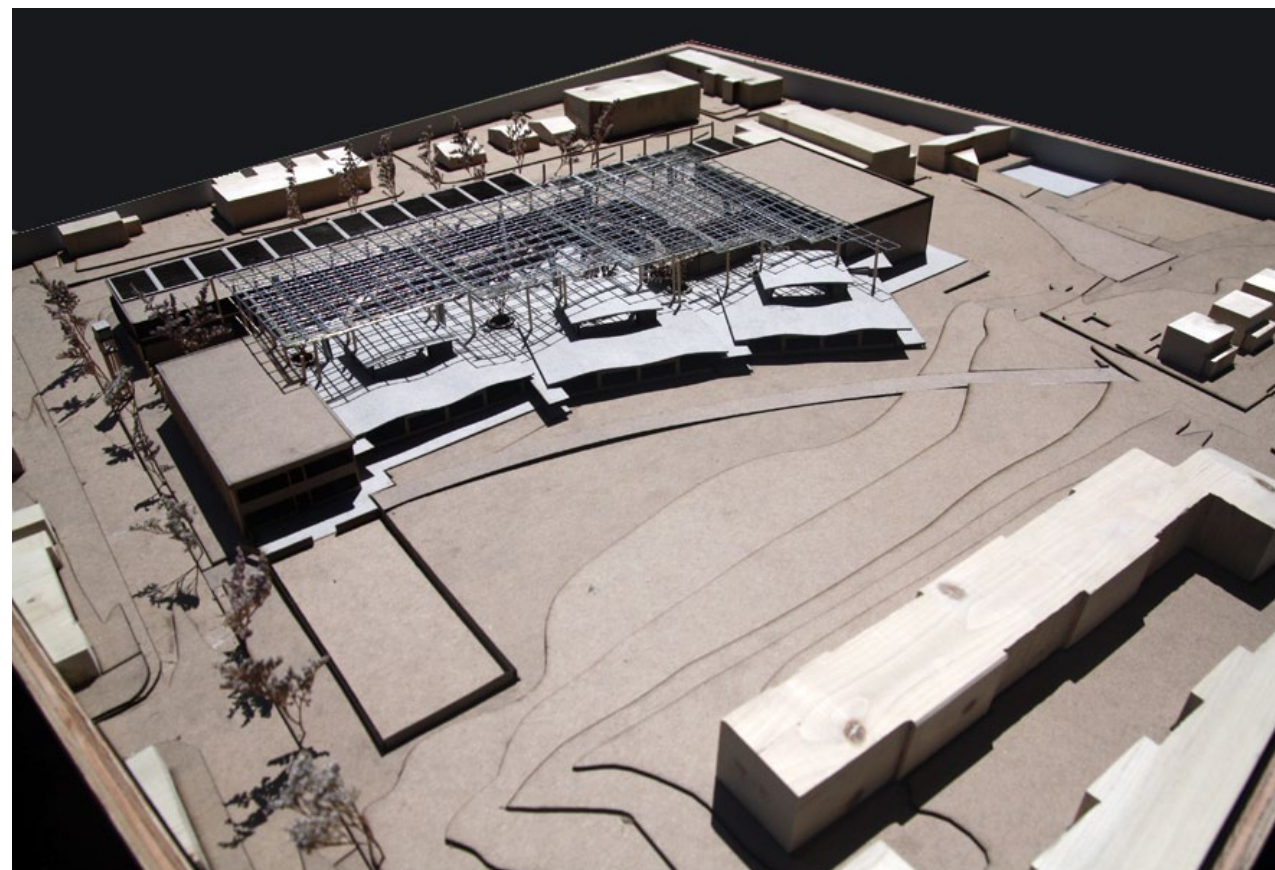


Commons Detail

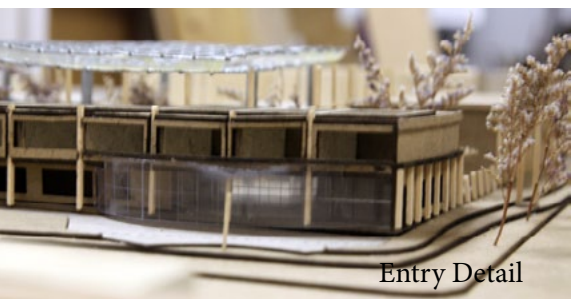
Final model - overhead view w/o atrium

Final model - looking south

Final Model - Central Space Detail



Tower Detail



Entry Detail

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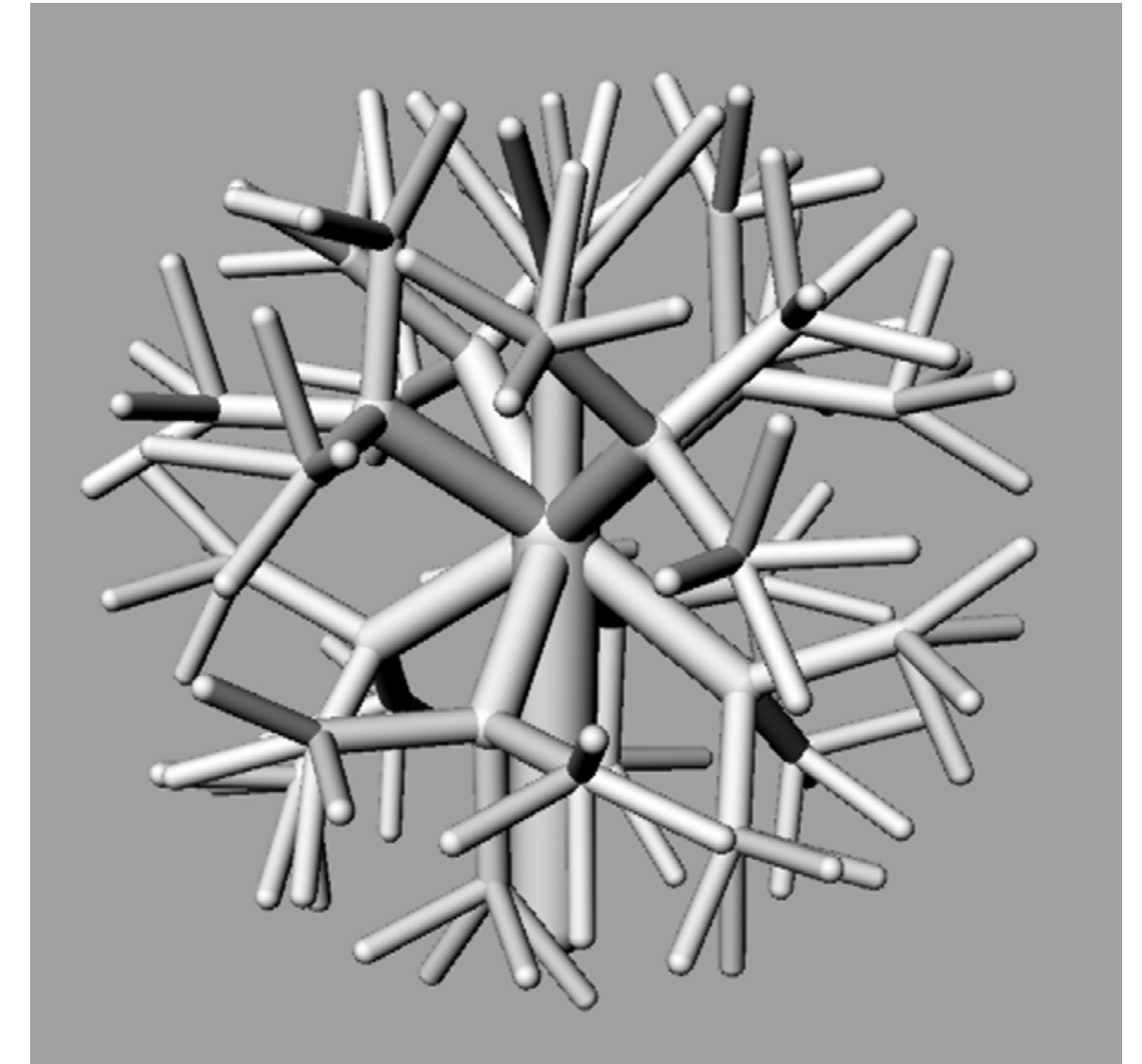
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Concept model for Structural Trees - created in Rhino/Grasshopper

Images Cited

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Page 1:

“Jefferson-Houston School.” Map. *Google Maps*. Google. 5 September 2011. Web. 5 September 2011.

Page 2:

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Page 21:

Stewart, Randy. “Zelkova+Carpinifolia3” 2010. Photograph. Washington DC. Zelkova. Randy Stewart Landscape, 27 Sept. 2010. Web. 16 Nov. 2011

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Most importantly, thank you for helping me create and share architecture.