A Catalyst for Gradual Change

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ABSTRACT

A Catalyst for Gradual Change

A Catalyst for Gradual Change

This thesis seeks to explore the way in which an area, or neighborhood, which suffered from a loss of its inhabitants can again become a viable and vital area within a city. Lack of density, lack of activity, and abandonment in an urban area is often detrimental to further progress.

Re-inhabitation of an area that has suffered from a loss of its inhabitants must begin in the place where the former population fled to. In order to reinvigorate a desolated area, that area must be infused with a population. While this population may not be permanent initially, it must pass through the area with increasing frequency and strength. An increase in this transient population must occur in order to eventually break the cycle of abandonment and neglect. Once the population is of a more permanent nature it can begin to provide the depressed area with the resources it needs to once again be vibrant and productive as an independent community with its own unique identity. This newly considerate population will begin to affect the area and mold it to their needs and desires and by doing so will give life back to that place.

An area situated within the context of a larger urban condition should have purpose and identity unique among the context of a greater urban area. The structures within that area play an integral role in the identity of that place. This identity is formed based on both the formal and programmatic characteristics of the place. Formally, the materiality, architectural language, technology, and sustainable practice are all to be considered when a new building is to be inserted into and already complex urban context.

THESIS

A Catalyst for Gradual Change

A Catalyst for Gradual Change

Throughout the United States many of the urban areas which were once central to American life have fallen into a state of decay. This urban decay has occurred largely as a result of the trend to flee the city which began to take hold after the Second World War. The desire for more personal space became a driving force for people choosing a place to call home and while the majority of business and industry maintained an urban locale, the city's people, its very lifeblood, began to reside at increasing distances from the urban center. The volume of this migration was such that the traditionally rural condition was violated as well and, with this intrusion of the masses the suburban condition was born. What had once been the black and white of urban and rural began to give way to the grey called suburban.

To say that no great American city has survived and that everywhere the fabric that once composed the urban condition has been torn is an exaggeration and falsification. The decay that has become a plague to many an urban condition has not ravaged every one and the effects of the phenomenon are varied. In many instances, however, the suburban trend has left the city a place which is punctuated by periods of mass population followed by mass desertion. This also holds true, in reverse, for the suburban condition; when the city is populated the suburb is not. This cycle occurs day in and day out as thousands commute from home to work and back again. This scenario proves one thing unequivocally: the population that is living in this way is not using its space or resources, including time, efficiently. This is not to say that every space can be, or ought to be used all day everyday, that is an impossibility. A population should, however, use space, on the urban scale, more effectively and more efficiently than is possible

with what has become the normal and accepted urban-suburban condition.

The successful rebirth of the American city is vital not only to survival of the urban condition but, ultimately to the success and viability of society as a whole. Concern for the quality of life is growing. The consequences of choices and ideas conceived by past generations are beginning to take their toll in a recognizable way. Recent attention in particular has been devoted to the environmental impact that is a result of irresponsible and reckless use of resources. The measures that various parties have begun to enact are indeed a starting point but, in no way, will they be sufficient to counteract the damage that has already been done. In fact, there are many who would claim that the impact of the damage that has been done has not been seen to its fullest extent, nor will it be for years to come. There are also those who argue that regardless of what measures are taken now the damage that has been done can never be rectified. If this is meant to suggest that no attempt be made at repair the response is simple: why not try?

The current urban condition that characterizes Detroit is among the best examples of the devastation that can occur when flee to suburbia and abroad occurs. Once among America's finest, most progressive, and most populous cities Detroit is now widely considered a failure.

> Detroit was fat in 1955—the Census Bureau estimated that 2 million people crowded the nearly 140 square miles. But the decline already had begun. The most severe decline in population occurred between 1955 and 1960 when the number dropped by nearly 25 percent. From 1960 to 1980 the drop was about 25 percent. And from 1955 to 2000, the drop has been about 50 percent (Gavrilovich 294)

The list of events which have contributed to the decline of Detroit is long and complex. Some of these events have had catastrophic effects on both the people who live in the city and the place itself. An attempt to fix all the ills that plague the city simultaneously would surely result in yet another of these events and thus perpetuate the cycle that Detroit has become so familiar with. The beginning of a solution will manifest itself on the scale of a neighborhood.

The glory years experienced by Detroit and its people occurred largely due to the overwhelming success of the automotive industry. The decades of prosperity this one major industry provided were enough to keep the introduction of any other solid industries into Detroit. This lack of diversification eventually caught up with the city and ultimately resulted in the beginning and perpetuation of the end to the prosperity. The Motor City continues to cling to its name and remains largely reliant on the automotive industry for success, which, in its current form is failing. With the Decline of the automotive industry Detroit has lost its sense of purpose and its identity as a city not only in the United States but internationally. The Big Three have failed to keep pace with their competition and thus failed to keep the city out of ruin. If it is to become a viable, vibrant city once again while continuing to cling to the automotive industry, the industry itself must shift into a position that once again sets it apart from the foreign competition.

To lay blame squarely on the shoulders of the auto industry alone is surely unfair and inaccurate. Flee to the suburbs, racial tension and other economic forces have indeed played a significant role in the devolution of Detroit. With the development of the highway system many Detroiters began to leave the city for the promise of more spacious surroundings.

> First the Lodge, then the Ford, Chrysler, Fisher, and Jefferies acted like pneumatic tubes hurtling workers from central city venues to

myriad suburbs. Once commuting from downtown became a snap more people moved to greener space beyond Detroit.

This choice has had far reaching consequences for the city which has lost so much of its populous to the outlying areas. With this move away from the city, the areas which were once filled to capacity suddenly were lifeless. Racial tension in the city has been an issue from its infancy with several major riots resulting at the height of frustrations. Other economic factors including recession, foreign labor, and emerging markets have compounded economic troubles for Detroit as well.

Detroit's path away from decay and abandonment lies in its ability to innovate. The new thought must be applied not only to what type of business is inserted into the existing urban fabric but too, where precisely that business is introduced. Innovation is something that, historically, has been especially strong in the city particularly as it relates to the automotive industry. The automotive industry, although failing as it exists today, has the potential to once again become the lifeblood of the city. However, a change in the type of work being carried out in the city must occur. This change has been begun in the new technology area in Downtown Detroit. The next step for the automotive industry and many others as well, is to follow the movement of sustainability. Sustainability is rapidly coming into the public eye and response to it can help ensure a positive result. The growth that crops up from this next step should occur on a small scale in strategic pockets throughout the city; to attempt a city wide renovation from the start is to begin in failure. Where the growth does begin that growth should be steady, sustainable, and strive to include members of the community from the area immediately surrounding the site.

Inside the healthy community is a heterogeneous one. There

> is a mix of diverse people and places, and that mix has some optimum proportions, a “balance.” The parts are in constant inter change with each other participating mutually in the total function of the community. (Lynch 91)

With these factors taken into account it is possible to set in motion a plan to reinvigorate Detroit one pocket at a time.

Before establishing exactly what will be placed in a given area to spur that area’s re-population, it must be established where that area is. Without proper placement the new endeavor will inevitably fail. In order to bring life back to a neighborhood that area must again be infused with a population. That population may not, at first, be of a permanent nature but with increased traffic will come a care for that place and some concern for its character and appearance. The site must be on the edge of an established and successful area of the city with easy access to the suburban condition. This placement will allow an influx of population from both the successful surroundings as well as the suburbs. Currently a plan for mass transit in Detroit that will utilize the radial thoroughfares of Michigan, Woodward, and Gratiot is being discussed. Each radial will run a line from the center of the city to the perimeter with stops at cross streets considered to be particularly important to the city. Placement along a corridor like this would allow a further increase in traffic and a sort of forced interaction between the passengers and the neighborhoods that the stops are situated in. One of these crossroads would be an ideal location for the establishment of a new pocket. Because of the depopulated nature of Detroit the connection to outlying areas is crucial.

With the previous conditions satisfied it is appropriate to discuss the nature of the proposed development. The shift in the type of work that will be done at a

new automotive facility is one that moves away from a direct manufacturing role. Americans, having a higher standard of living, cannot compete with the foreign labor that has taken over many manufacturing jobs. It is also true that until the volume of manufacturing that needs to be accomplished reaches the same levels that were once achieved, emphasis must be placed in another area. In the interest of furthering the role of Detroit in the new, cleaner-running, "greener", automobile the proposal for a facility for the research and development of sustainable fuels and technologies is relevant, promising, and practical. A facility such as this will help move the American auto to the next step and once again secure its place on the cutting edge.

Detroit is an ideal locale for this next step for two reasons. First the history and knowledge of the automobile already present here rivals anywhere else in the world. Secondly with this change in focus a new work force must be gathered. This new work force can begin to provide the population necessary to bring life back to the city. Detroit is uniquely placed within close proximity of several of the county's leading educational institutions. These institutions can provide a workforce for all of the disciplines needed to carry out the research and development of new automotive technology including, biologists, chemists, engineers, and physicists.

With the establishment of a new facility in an existing neighborhood there will naturally be a tension between the new and existing. However, if a city is thought of as an organism, then that organism must evolve and evolution is not a phenomenon that occurs trivially, but rather out of necessity.

> If a city is an organism, then is has some characteristic features that distinguish living creatures from machines. It does not change its size by simple extension or swelling of limitless adding of parts,

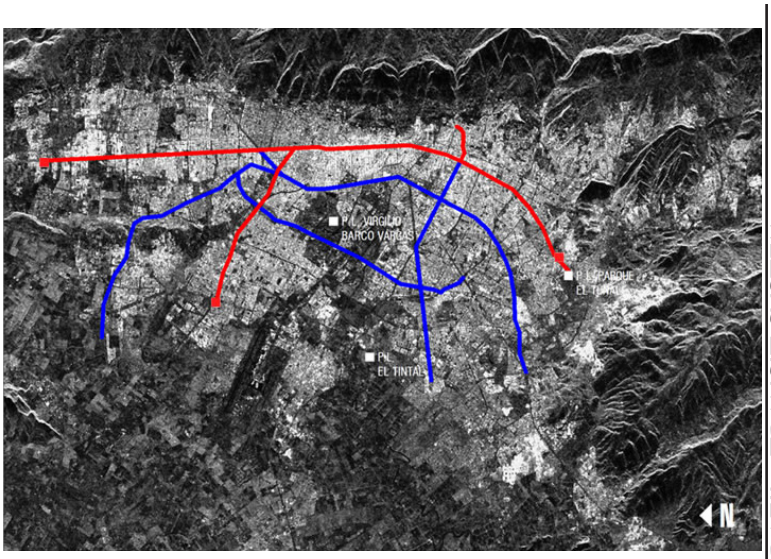
> but recognizes its form as it changes size, and reaches limits, or thresholds, where the change in form is a radical one. (Lynch 89).

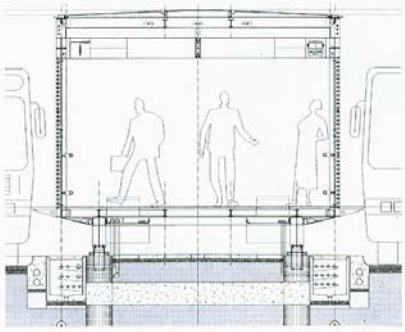
Detroit is in desperate need of such an evolution and it is because of this that, in spite of the tension that will initially exist, that select pockets of Detroit can again be reborn and begin to repopulate the city. This tension will occur at the personal level as well as in the built environment. Much of this tension will be due to the fear associated with change and thus may begin to be combated via inclusion of the old into the new. As the new population becomes more familiar and comfortable with the surrounding area it will begin to immerse itself into the culture of the existing and indeed the opposite will be true as well. It will be in this spirit of learning and cooperation that a successful re-growth will occur and thrive. Regular interaction between the existing and the new will be a prerequisite of success.

The barrier that exists between urban and suburban is one that must be broken down and redefined if a more effective and complete usage of the urban fabric is to occur. The invisible border that exists between the two must become flexible allowing the two conditions to interact more effectively. With continued concern for issues relating to urbanism and the betterment of society through the built environment a new emphasis on environmentally sustainable practice has come to the forefront. These issues will need to be considered and responded to effectively if we are to ensure continuation of a recognizable lifestyle for future generations.

PRECEDENT

A Catalyst for Gradual Change





Curitiba, Brazil is an inland city of approximately 1,789,000 people. The master plan of the city is composed of a central business district at the center from which a series of radial streets push into the outer reaches of the city. These radials support the high speed transit lines that serve the municipality. The radials are supported by a series of secondary streets laid across the landscape in a grid. This grid carries "inner-district" busses that move the population to areas between the radials. To travel between the grid, within neighborhoods, feeder busses are used.

The Transit system in Curitiba has proven extremely effective. Traffic conditions around the city are favorable despite having the third largest number of vehicles per capita in Brazil. The system has been mimicked in cities throughout Brazil as well as in Germany and Los Angles. Particularly interesting is the way areas surrounding the transit stations have developed. The stops along the radials have been placed in order to connect major cultural sites/attractions and businesses. These areas have experienced an increase in density, activity, and overall growth with respect to the rest of the city. This phenomenon occurs at stops on the neighborhood scale as well.

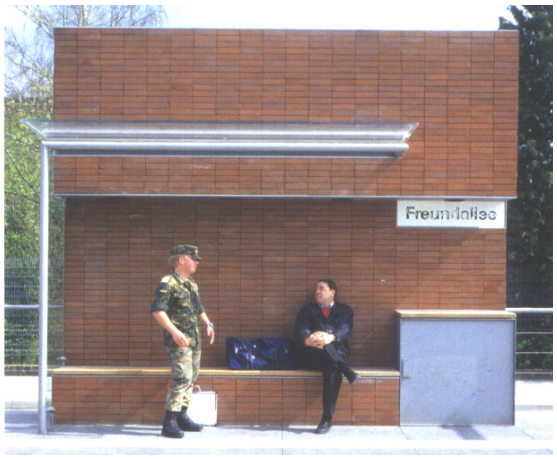
The examination of Curitiba has revealed several points of interest for this thesis project. The primary idea to take from Curitiba is the pattern of development around the various stops, this will become important in locating the site. This notion of growth from a central point outward will also aid in the programmatic aspects of the thesis in that this central program becomes an important and identifiable node within a greater urban context.

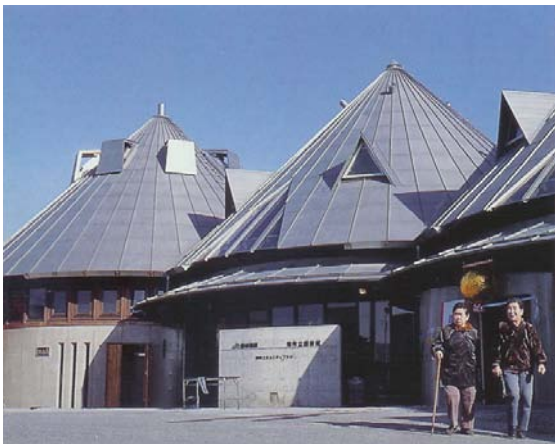
HANOVER LIGHT RAIL STATIONS

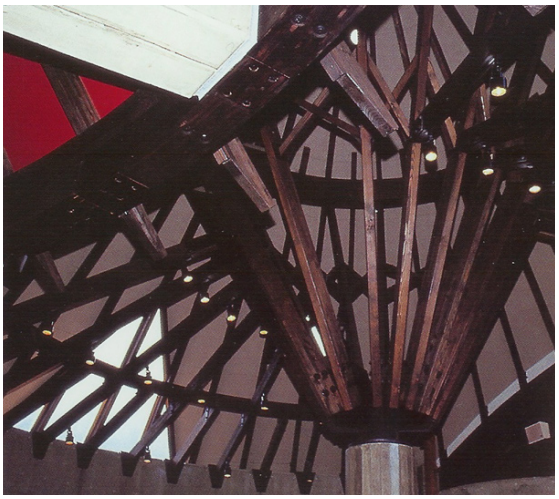
In 2000 Hanover, Germany hosted World Expo 2000. With a population of about 1/2 million people the city already had a light rail transit system in place. In order to accommodate the anticipated surge in population, city officials opted for a system expansion. A local design firm, Despang Architekten, was commissioned to create thirteen new stations. Each station was composed of several modular pavilions clad in materials thought to be representative of the neighborhood in which the station was situated.

The architect emphasized the importance of the materiality in the project noting that by creating each stop from a different material it contributed to the sense of place. They called their use of materials "urban punctuation". The idea behind this "punctuation" was that rather than relying entirely on traditional signage it would be possible to use the pavilions themselves as a way finding device.

Creating a sense of place is essential to this thesis investigation. The rail stations contribute to the place through their use of materiality. The materials, having been carefully selected, reflect the surrounding area.







Hanawa, Japan is located near Tokyo with a local population of about 12,000. Throughout the '90s the town suffered from urban decay due to the population's flee to the suburbs. The town center was described as deserted and business in the area was suffering.

Town authorities commissioned Kuniaki Ito to redevelop Hanawa's train station. In order to spur the growth it was decided to include auxiliary functions under the same roof as the train station. Residents of Hanawa worked to determine the programs most suited to the area. Within the Civic Center function of the station a gallery, tea room, and a library. In addition to using the program of the building to relate it to the neighborhood the building is tied to traditional Japanese culture and the natural environment formally.

After the station was built it began to see an increase in traffic and people passing through got off to explore the station. Eventually the traffic from the station began to bleed out into the downtown area. Lately the center of Hanawa has experienced growth and increased traffic. Once again a population has come to inhabit the downtown and businesses are again flourishing.

The station incorporates several ideas central to the development of this thesis. Where the precedents in Curitiba and Hanover have shown the success of two distinct concepts, economic/population growth and connection to place respectively. The station and civic center at Hanawa illustrates the successful merger of these ideas. Hanawa station relates to the natural environment surrounding the town through its form. Beyond form there exists a link from the station to its users on a cultural level. An exposed structure within the terminal references the Japanese umbrella, which in the culture is an important symbol. Additionally the rectilinear masses are based on the module of a tatami mat which is the conventional flooring and modular system in traditional Japanese construction.

SITE

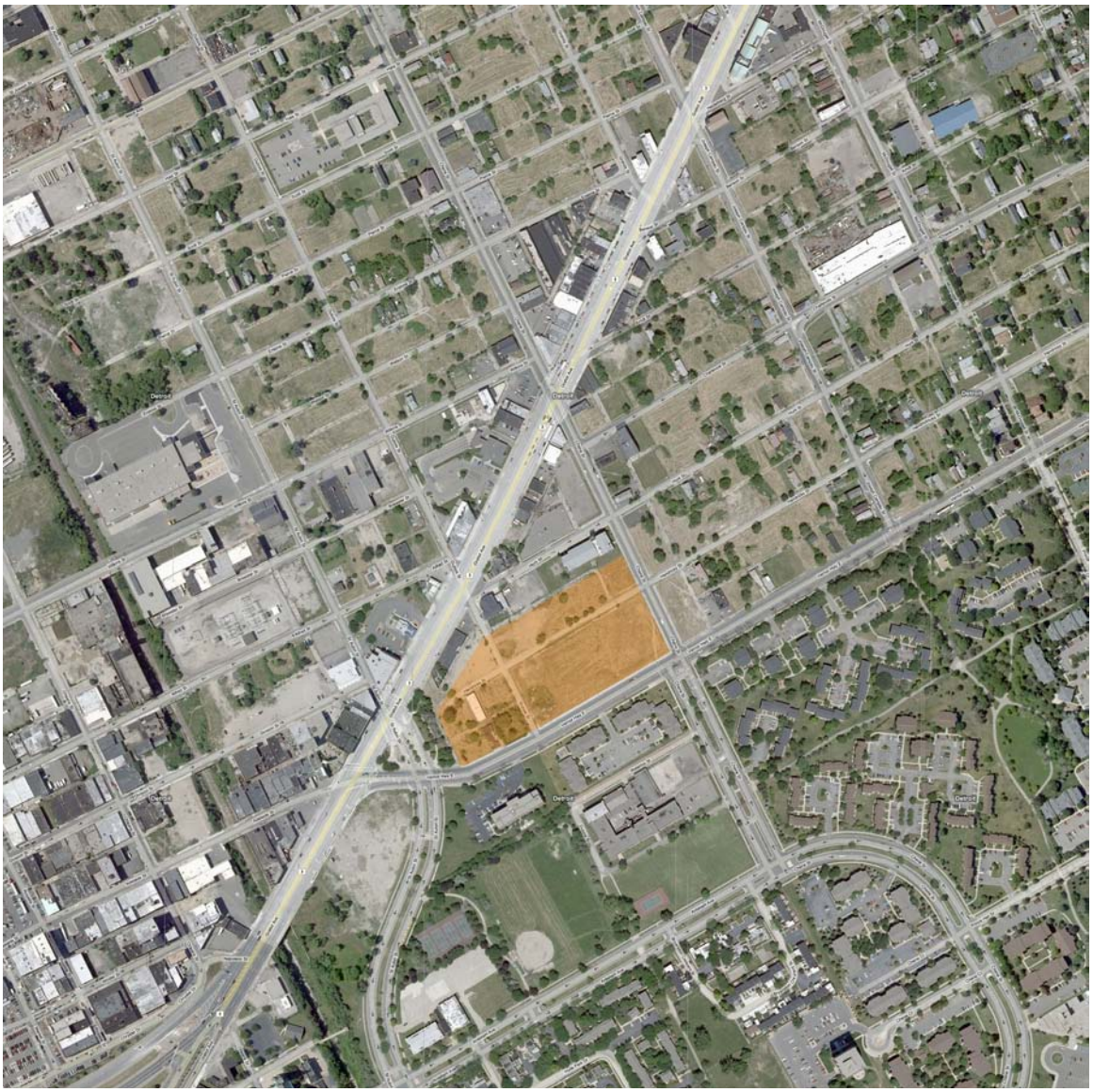
A Catalyst for Gradual Change

SITE CRITERIA

+Urban
- ~Population/inhabitants
- ~Pre-existing infrastructure

+Major Intersection
- ~At a node
- ~Access to/Integrated with a mass transit path

+On the edge
- ~Area conducive to growth
- ~Lacking optimal density
- ~Room for expansion (horizontal and/or vertical)
- ~Vacant land/structures available



PROGRAMING

A Catalyst for Gradual Change

PROGRAM STATEMENT

This thesis will run the course of its investigation by developing a research and development facility for the discovery/implementation of sustainable energy sources/methods as they relate to local interests.

Michigan possesses an immense number of highly educated technical talent that, due to recent economic situations, is available to be redirected toward up and coming areas of research and development.

This program has the potential to refocus the nearby population into an urban hub which can influence the greater urban context and be affected by it as well.

This program promotes growth within the greater Detroit area. This proposed facility, being unique in many ways can serve as an identifier for surrounding neighborhood.

What will take place at this facility?

Research: Learn, Discover, Investigate, Study, Explore, Examine, Inquire.

Develop: Make, Implement, Advance, Mature, Improve, Grow, Expand.

What will the program include?

Spaces for: Learning, Gathering, Collaborating, Dining, Sharing. Inspiring, Educating.

QUANTITATIVE PROGRAM SUMMARY

RESEARCH AND DEVELOPMENT CENTER FOR SUSTAINABLE AUTOMOTIVE FUELS

Gross Square Footage

Space	Square Feet
Laboratory Bar	582,622 sf
Auxiliary Bar	130,375 sf
Total	**712,997 gsf**

Laboratory Bar

Atrium

Space	NSF Per Space	# of Spaces	Net Square Feet
Reception	1,000 sf	1 (Lvl 1)	1,000 sf
Sm. Conference	200 sf	24 (4 per Lvl)	4,800 sf
Lounge	7,002 sf	6 (1 per Lvl)	42,012 sf
Toilet	414 sf	6 (1 per Lvl)	2,484 sf
Receiving	2,300 sf	1 (Lvl 1)	2,300 sf
Storage	243 sf	6 (1 per Lvl)	1,458 sf
Cold Storage	150 sf	6 (1 per Lvl)	900 sf
Total			**54, 054 nsf**

Laboratory

Space	NSF Per Space	# of Spaces	Net Square Feet
Bio-Chem Lab	3,339 sf	70 (10-16 per Lvl)	233,800 sf
Office (Bio-Chem)	93 sf	280 (4 per Lab)	26,040 sf
Prototype Lab	30,180 sf	1 (Lvl 1)	30,180 sf
Office (Prototype)	93 sf	42 (Lvl 1 & 2)	3,906 sf
Greenhouse	70,020 sf	1 (Lvl 4, 5, & 6)	70,020 sf
Office (Gh)	200 sf	1 (Lvl 4)	200 sf
Storage (Gh)	200 sf	3 (1 per Gh Lvl)	600 sf
Mechanical	1,404	70 (10-16 per Lvl)	98,280 sf
Total			**463,026 nsf**

Outdoor

Space	NSF Per Space	# of Spaces	Net Square Feet
Patio	647 sf	3 (Lvl 2, 4, & 6)	1,941 sf
Roof Garden	13,194 sf	1 (Lvl 3)	13,194 sf
Total			**15,135 nsf**

Circulation, Structure, and Partitions

Space	Square Feet
Gross Square Feet	582,622 sf
Net Square Feet	532,215 sf
Total	**50,407 sf**

Auxiliary Bar

Outreach

Space	NSF Per Space	# of Spaces	Net Square Feet
Exhibition			
Gallery	12,401 sf	1 (Lvl 1)	12,401 sf
Lobby	5,000 sf	1(Lvl 1 & 2)	5,000 sf
Storage/Receiving	2,734 sf	1(Lvl 1)	2,734 sf
Library			
Lobby/Circulation	2,085 sf	1 (Lvl 1)	2,085 sf
Reading Room	4,302 sf	1 (Lvl 2)	4,302 sf
Stacks	1,864 sf	1 (Lvl 1)	1,864 sf
Cafeteria			
Dining Room	7,117 sf	1 (Lvl 2)	7,117 sf
Dining Patio	2,208 sf	1 (Lvl 2)	2,208 sf
Kitchen	2,000 sf	1 (Lvl 2)	2,000 sf
Classroom	880 sf	5 (Lvl 2)	4,400 sf
Retail			
Showroom	1,044 sf	5 (Lvl 2)	5,220 sf
Storage/Break	298 sf	5 (Lvl 2)	1,490 sf
Toilet	464 sf	2 (Lvl 1 & 2)	928 sf
Mechanical	862 sf	2 (Lvl 1 & 2)	1,724 sf
Total			**53, 473 nsf**

Office

Space	NSF Per Space	# of Spaces	Net Square Feet
Support Staff	7,426 sf	1 (Lvl 3)	7,426 sf
Reception	995 sf	1 (Lvl 3)	995 sf
Lounge	1,160 sf	1 (Lvl 3)	1,160 sf
Administrative Staff	4,891 sf	1 (Lvl 4)	4,891 sf
Reception	995 sf	1 (Lvl 4)	995 sf
Lounge	1,160 sf	1 (Lvl 4)	1,160 sf
Lg. Conference	1850 sf	2 (Lvl 3 & 4)	3,700 sf
Storage	200 sf	2 (Lvl 3 & 4)	400 sf
Toilet	464 sf	2 (Lvl 3 & 4)	928 sf
Mechanical	862 sf	2 (Lvl 3 & 4)	1,724 sf
Total			**23,379 nsf**

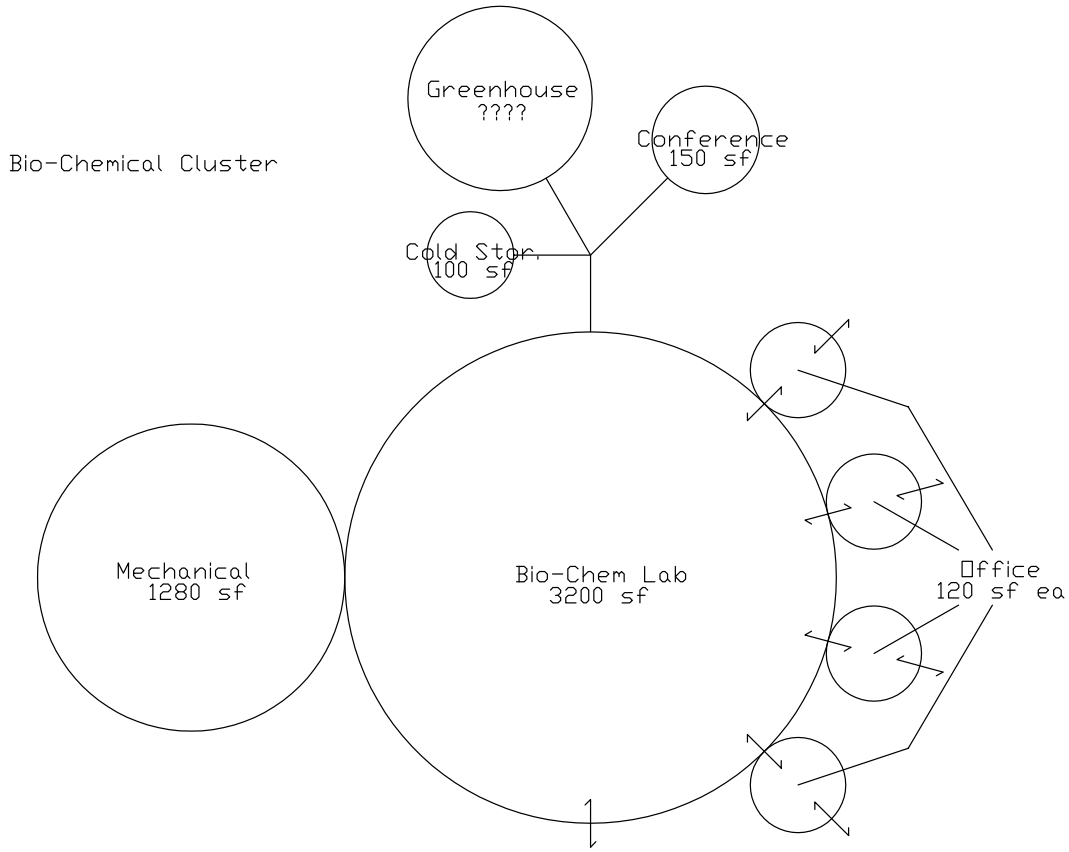
Outdoor

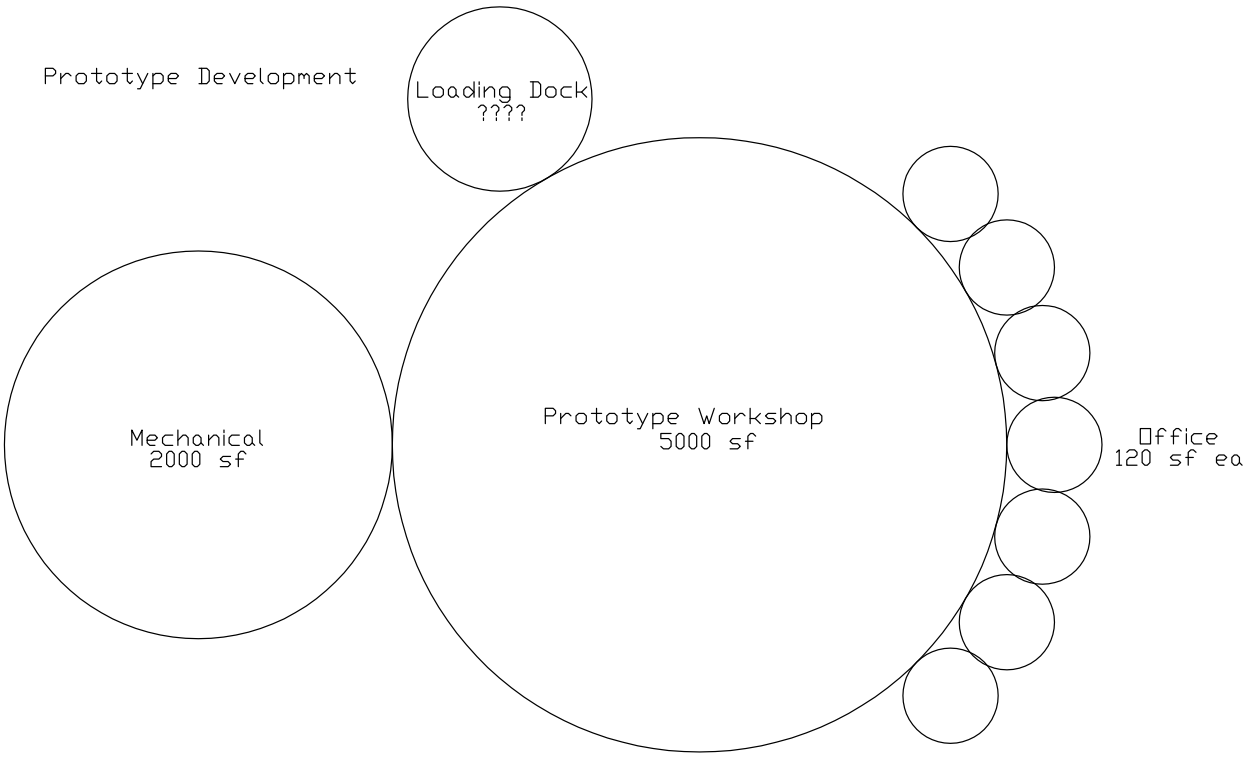
Space	NSF Per Space	# of Spaces	Net Square Feet
Patio	4,563 sf	2 (Lvl 3 & 4)	9,126 sf
Roof Garden	25,000 sf	1 (Lvl 3)	25,000 sf
Total			**34,126 nsf**

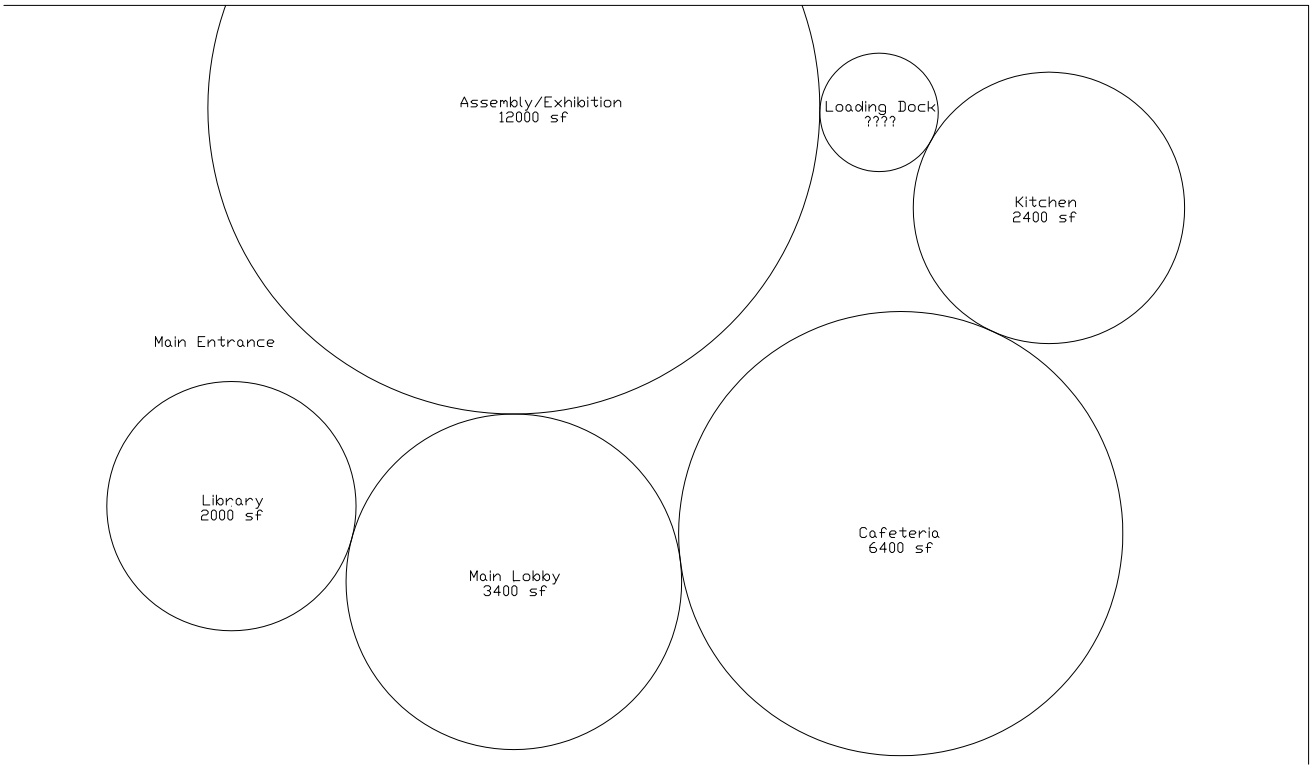
Circulation, Structure, and Partitions

Space	Square Feet
Gross Square Feet	130,375 sf
Net Square Feet	110,978 sf
Total	**19,397 sf**

SPACIAL RELATIONSHIP DIAGRAMS






Assembly/Exhibition
12000 sf
Loading Dock
????
Kitchen
2400 sf
Main Entrance
Library
2000 sf
Main Lobby
3400 sf
Cafeteria
6400 sf

QUALITATIVE PROGRAM SUMMARY

Laboratory Bar

Atrium

Purpose:
This space is the primary entrance to the Laboratory Bar. This is a central point on all floors. The greatest activity and traffic flow will occur here
Activities:
Receive guests and employees daily. The upper floors will serve as lounge space and create an atmosphere that encourages informal collaboration throughout the area via forced interaction and chance encounters.
Sub-areas:
Kitchenette, bathrooms, lounge seating, conference areas, shipping & receiving, cold storage, reception
Considerations:
Abundant light, comfortable atmosphere that draws occupants to the space

Biochemical Laboratory

Purpose:
This space will provide the main area for researching new, more sustainable, fuel sources. Research here may also include the improvement of existing fuel sources.
Activities:
Research
Sub-areas:
Offices, mechanical rooms
Considerations:
Productivity, safety, energy, ever-changing technology, heat gain, photosensitivity, adaptability/flexibility, 10'-12' modularity

Prototype Engineering Laboratory

Purpose:
This space will provide the main area for researching gains in the efficiency of engines and fuel sources. This area may be a proving ground and development area for fuels discovered in the Biochemical Laboratories
Activities:
Research
Sub-areas:
Offices, mechanical rooms
Considerations:
Productivity, safety, energy, ever-changing technology, heat gain, adaptability/flexibility

Greenhouse

Purpose:
This space will provide plant matter for use in research of new fuels
Activities:
Growing plant materials, informal gathering
Sub-areas:
Offices, equipment storage
Considerations:
Light, adaptability/flexibility, heat gain,

Roof Garden/Patios

Purpose:
This space will give occupants an additional area in which they can relax and gather. Again, the intention is for chance interactions to lead to collaboration in an informal setting.
Activities:
Gathering, collaboration, relaxation
Considerations:
Plant materials, light, pathways

Auxiliary Bar

Exhibition Space

Purpose:
This space will serve as a display area for work that is ongoing in the Laboratory Bar as well as hosting lectures on topics pertinent to the activities of the facility.
Activities:
Display/exhibition, lecturing
Sub-areas:
Lobby, toilets, receiving, storage
Considerations:
Controlled light, comfortable atmosphere that draws occupants to the space, acoustics, seating, exhibit design

Library

Purpose:
This space will provide the occupants of the Laboratory Bar and select members of the public with access to topic-specific technical volumes and periodicals.
Activities:
Research, information gathering, collaboration, relaxation
Sub-areas:
Circulation desk, stacks, reading areas, toilets
Considerations:
Acoustics, views, lighting, comfortable atmosphere that draws occupants to the space

Classrooms

Purpose:
These spaces will provide a connection between the occupants of the Laboratory Bar and the surrounding community and a means of educating the public about the facility, the work done there and its importance locally and globally.
Activities:
Lecturing, controlled experimentation, collaboration, education
Sub-areas:
Storage, toilets
Considerations:
Light, acoustics, seating

Retail

Purpose:
These spaces will provide a connection between the occupants of the Laboratory Bar and the surrounding community and a means of additional revenue.
Activities:
Retail sales
Sub-areas:
Storage, toilets
Considerations:
Display

Cafeteria

Purpose:
This Space will provide a connection between the occupants of the Laboratory Bar and the surrounding community.
Activities:
Dining, chance interactions, collaboration
Sub-areas:
Kitchen, storage, toilets
Considerations:
Acoustics, seating

Cafeteria

Purpose:
This Space will provide a connection between the occupants of the Laboratory Bar and the surrounding community.
Activities:
Dining, chance interactions, collaboration
Sub-areas:
Kitchen, storage, toilets
Considerations:
Acoustics, seating

Administrative & Support Offices

Purpose:

These spaces provide the necessary space for the administrative and support staff of the Laboratory Bar and Outreach areas.

Activities:

Administrative and support duties Chance interactions, collaboration

Sub-areas:

Large conference areas, lounge areas, storage, toilets

Considerations:

Acoustics, light, privacy, workstation configuration, seating

Roof Garden/Patios

Purpose:

This space will give occupants an additional area in which they can relax and gather. Again, the intention is for chance interactions to lead to collaboration in an informal setting.

Activities:

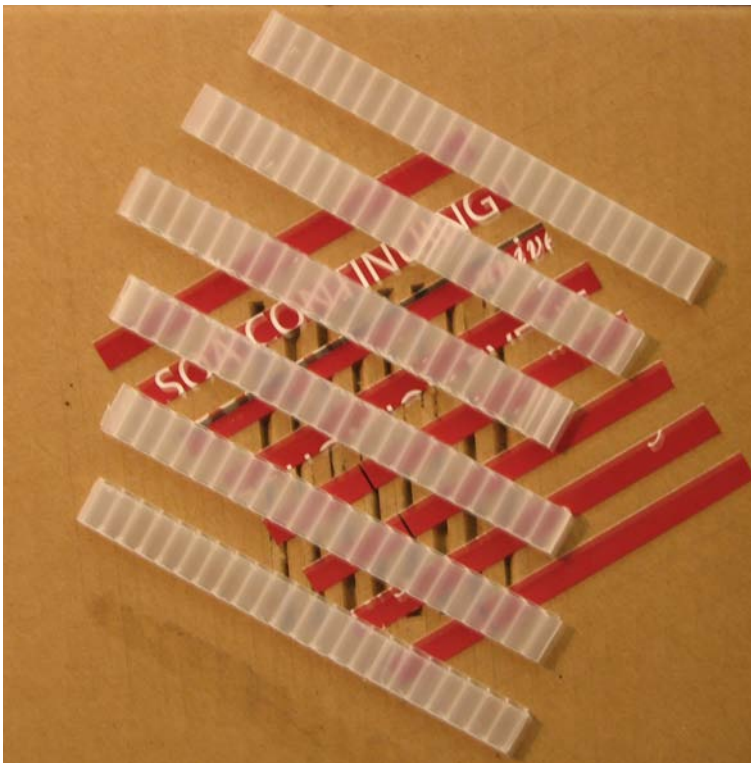
Gathering, collaboration, relaxation

Considerations:

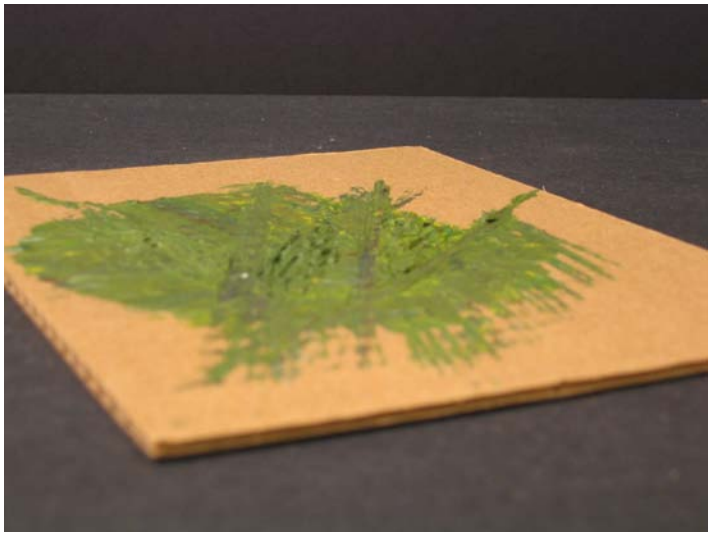
Plant materials, light, pathways

SCHEMATIC DESIGN

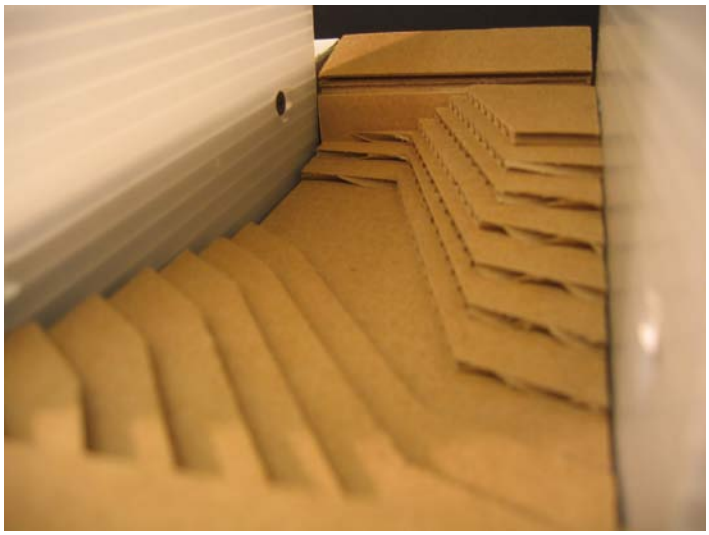
A Catalyst for Gradual Change

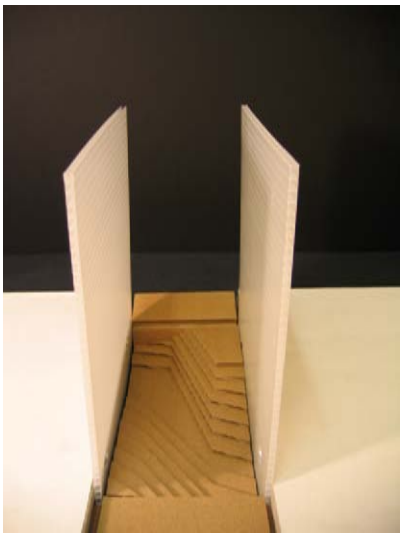


Path & Connection Study. Studies beginning exploration into how a major path, connection or trough fare might affect the site and the Architecture on it. Angles and orientations based upon the three main roads surrounding the site.

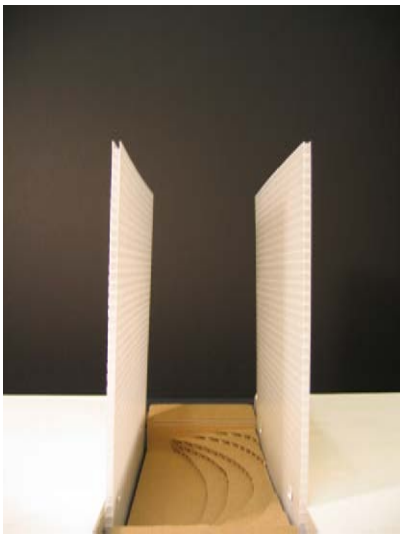


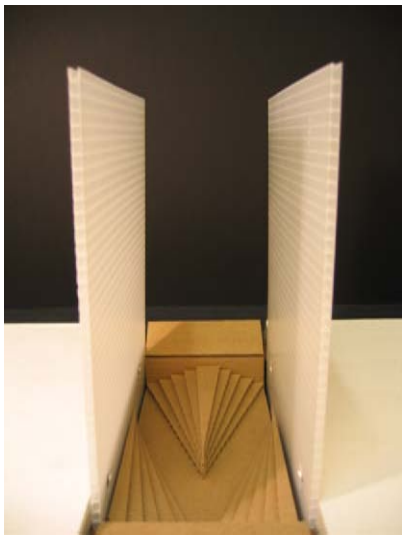
Trampled Path Study. The tendency of a person to walk diagonally from one corner of an area to the other corner is examined. the site has potential for major activity to occur at opposite corners. The path taken by passers by may become key to the inclusion of the community into the project.

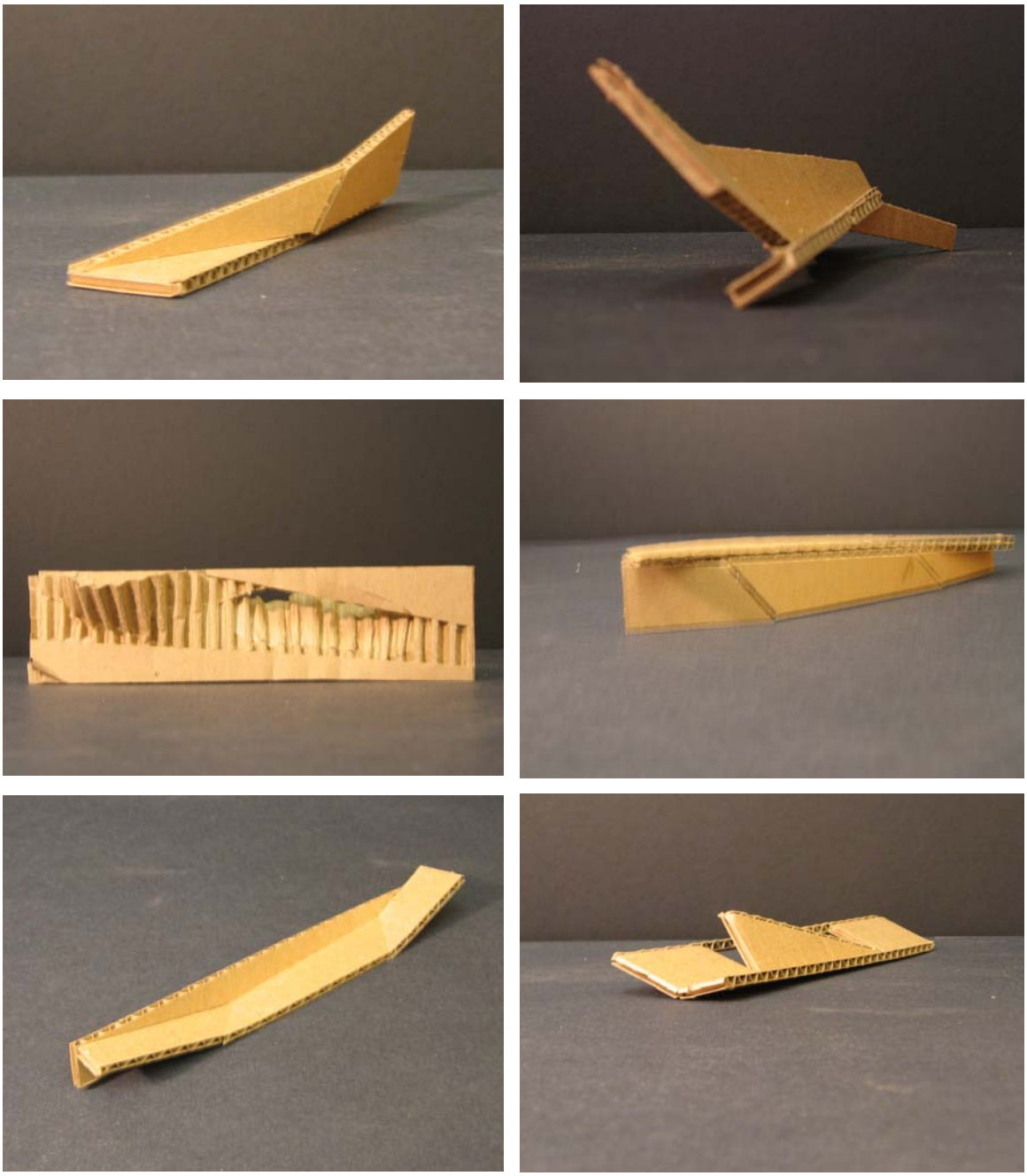




Tower Landscape Study. The void between two tall masses is explored. The potential for interesting and inspirational moments to occurs exists as well as a potential gathering area for workers and community persons to mingle



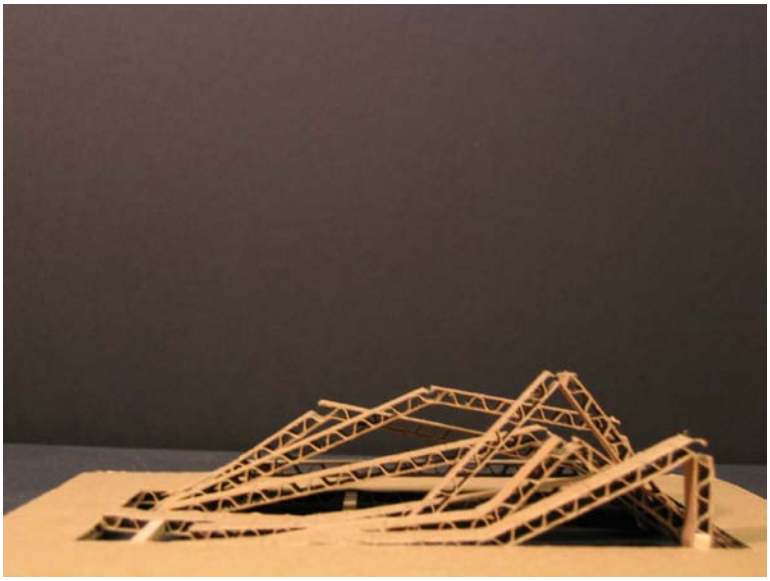


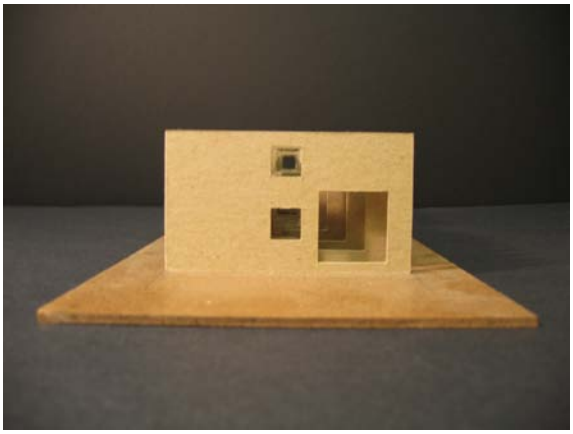


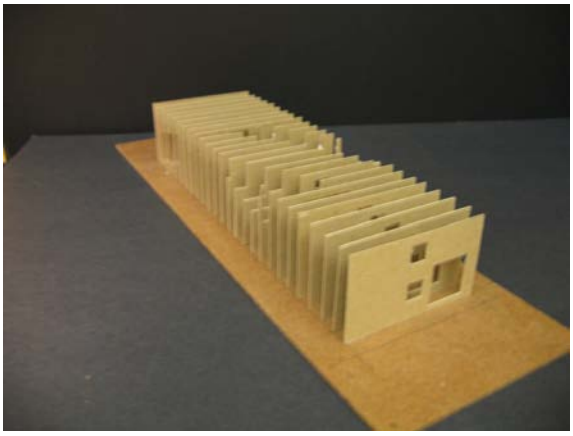
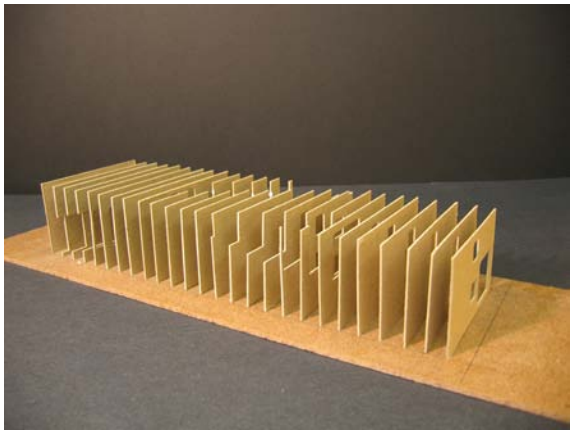
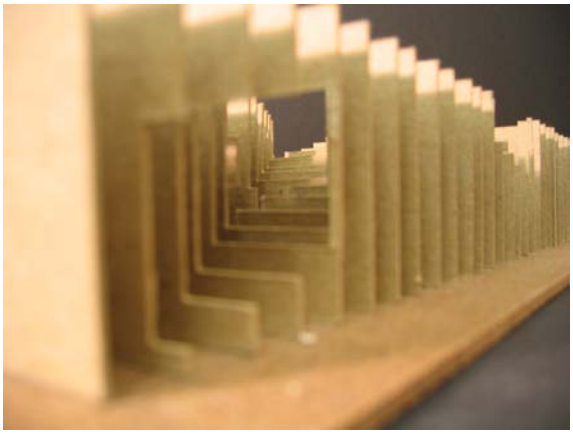
Folded Cardboard Planes. Experimentation in transforming a regularized & modular plane and into a 3-dimentional figure without cutting so as to create multiple planes. Blurs line between vertical and horizontal and may provide methodology for creating special moments in space.

The Dissolving Edge. Model shows progression of a modular plank rotated from 90 degrees to 0 degrees in increments of 3 degrees. Creates the sense of a progression. Construction lines form undulating curve.

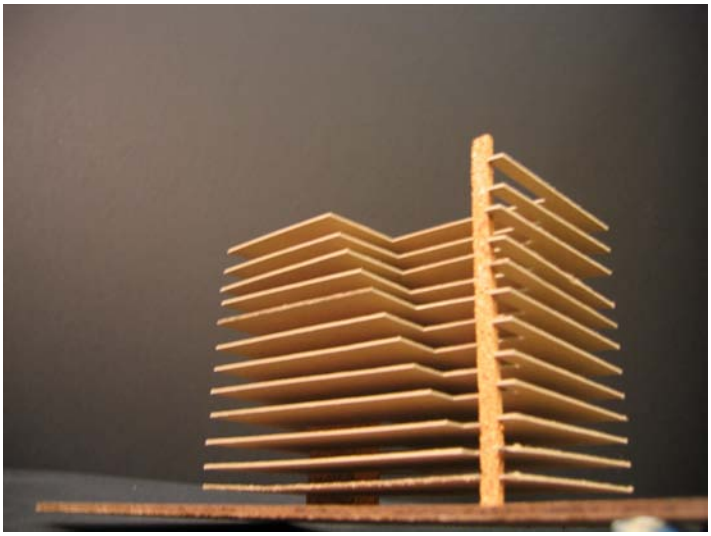
Shifting Edge. Exploration into a method of reducing the visual shock of a single plane through simple cuts and folds.



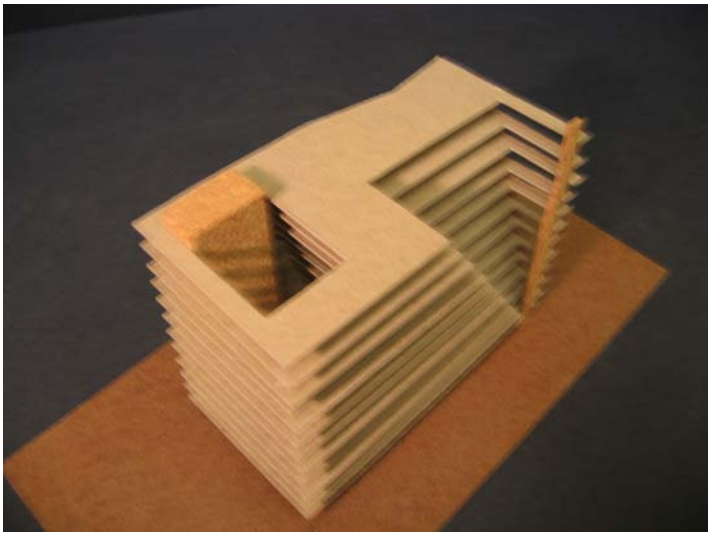


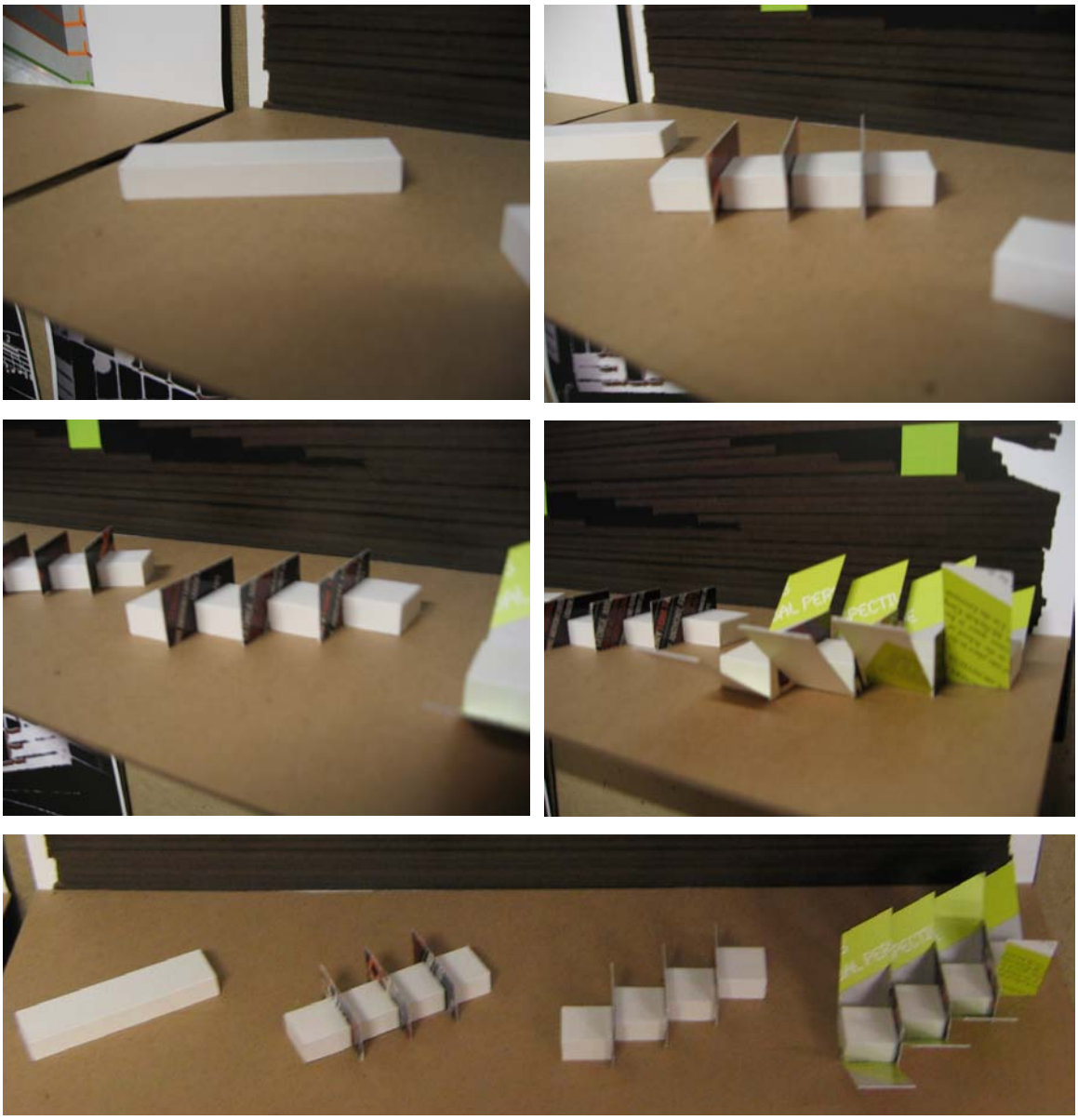




Shifting Module #1. Each planar module has the same three shapes removed. As the series continues the largest square shifts slightly from one end to the other. The resulting form retains many of the modular characteristics and gains a degree of dynamism.

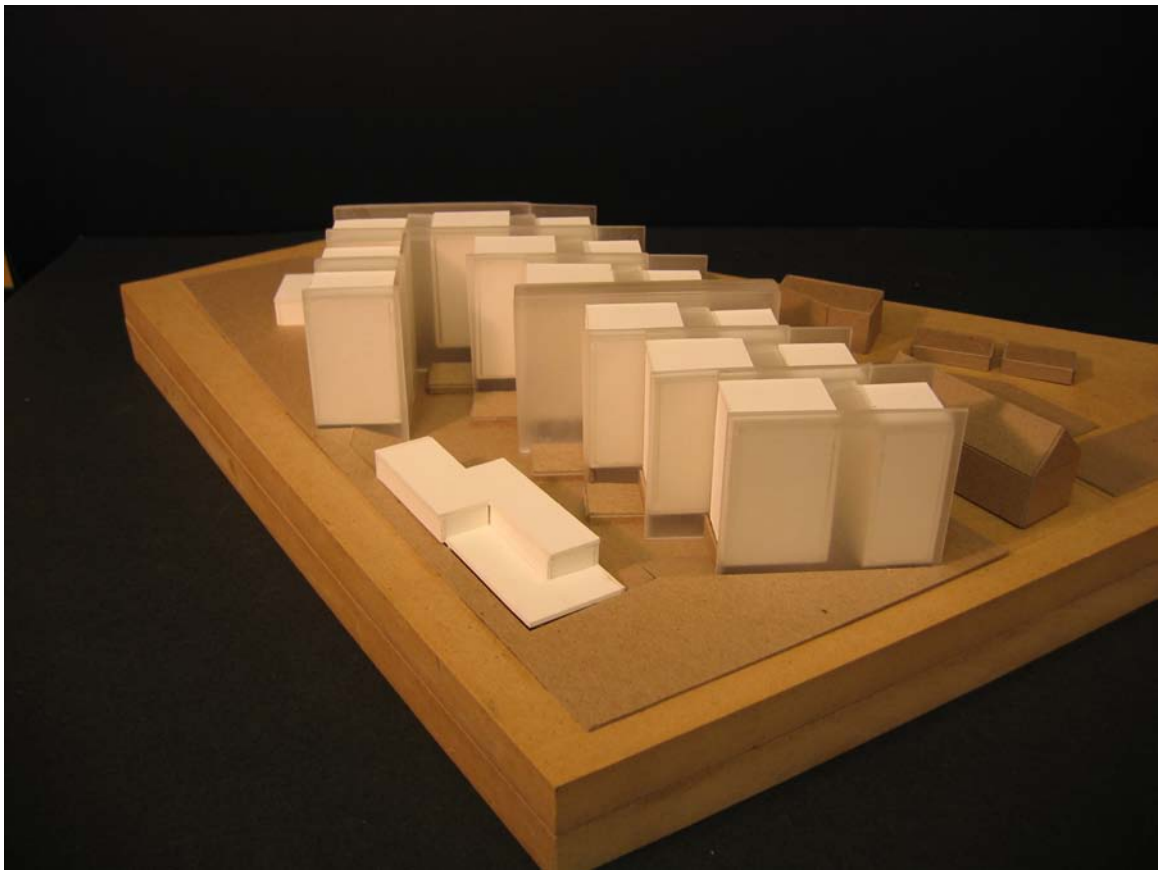


Shifting Module #2. The same idea as SM #4 is present here but, rather than shift the voids they are made progressively larger toward the top of the composition.

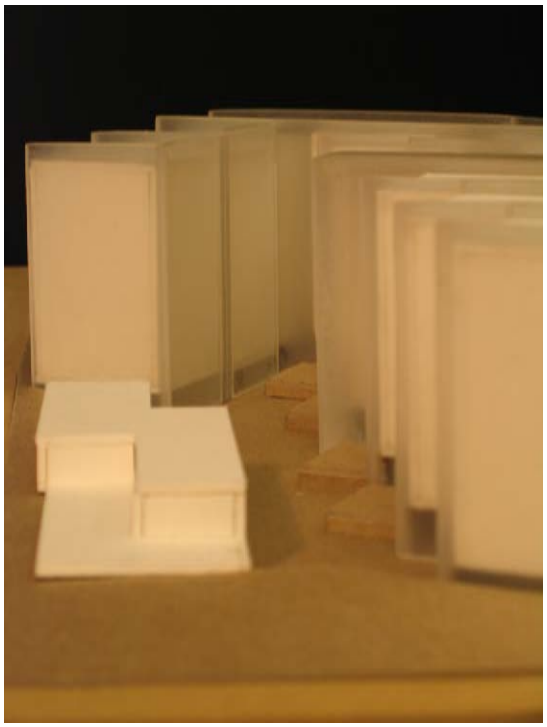


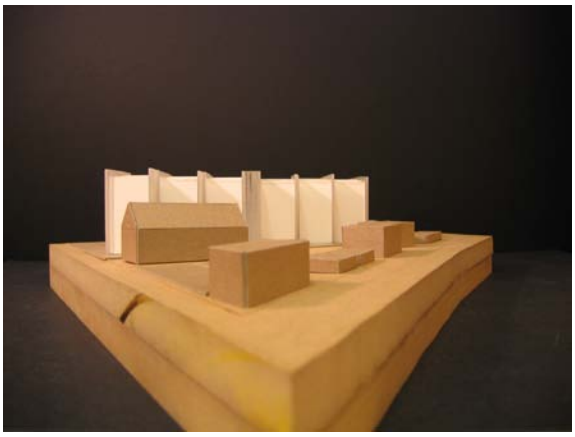


Stepped Shifting Module. Block exists. Block is Sliced. Blocks are shifted along slice place. New space emerges in the void created by the shift.

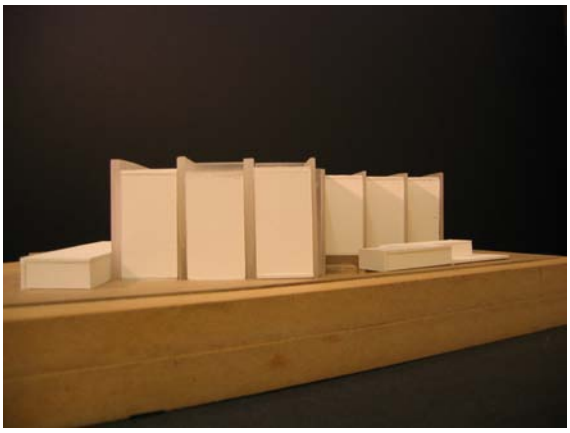


Axon From East

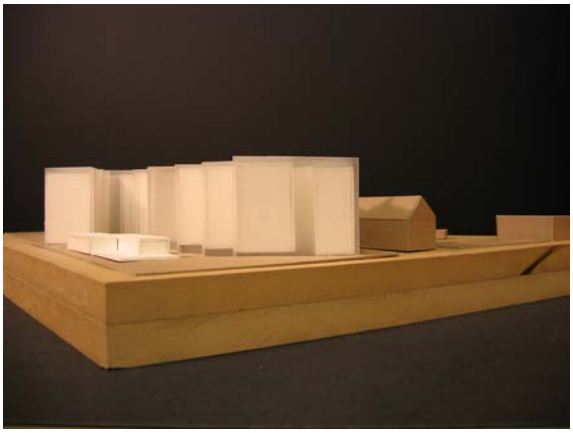




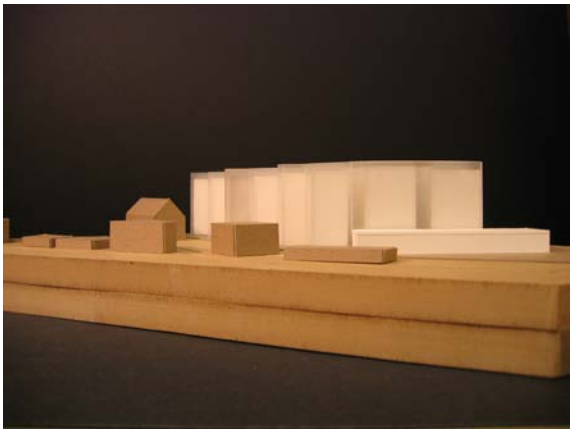
North Elevation



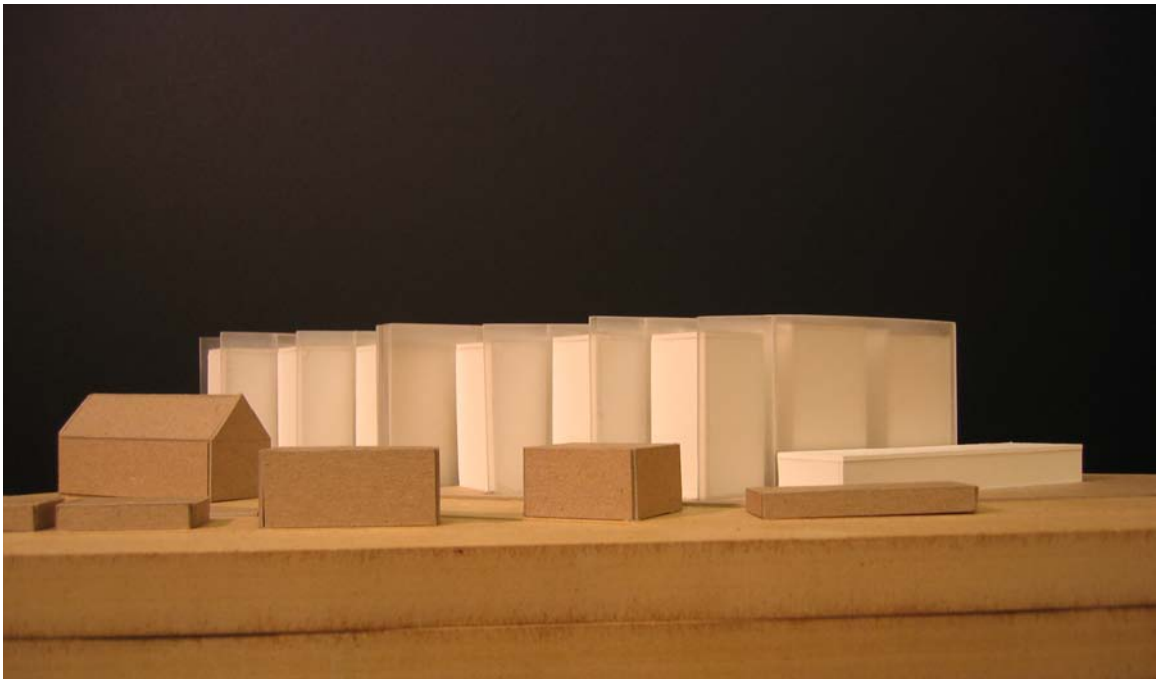
South Elevation

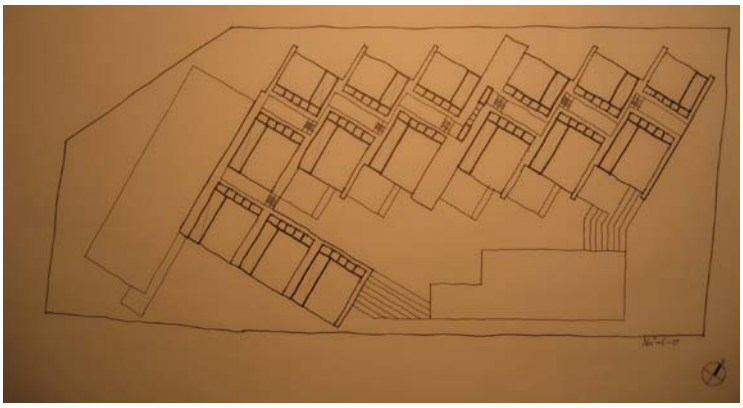


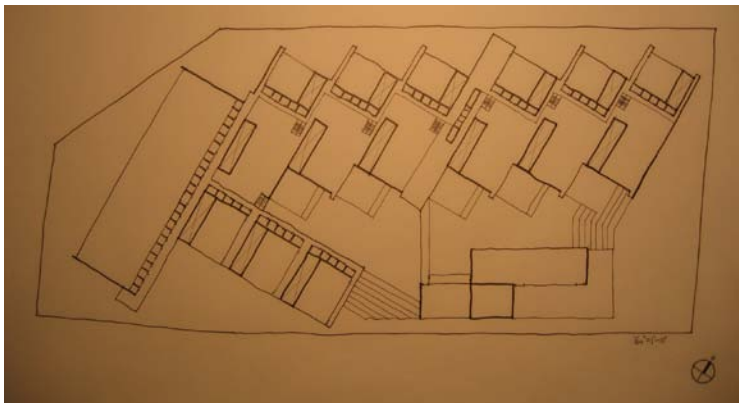
East Elevation

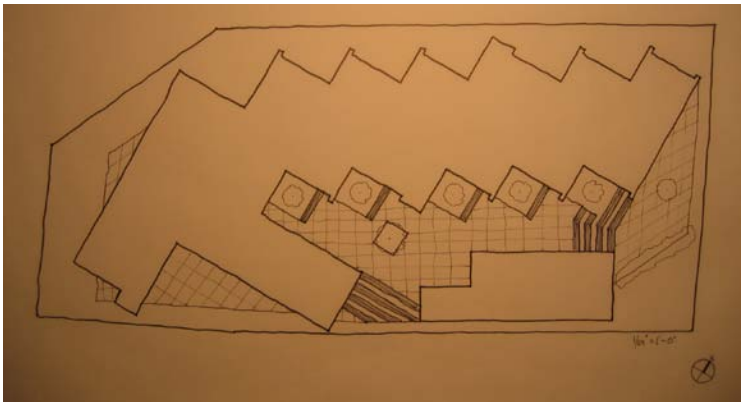


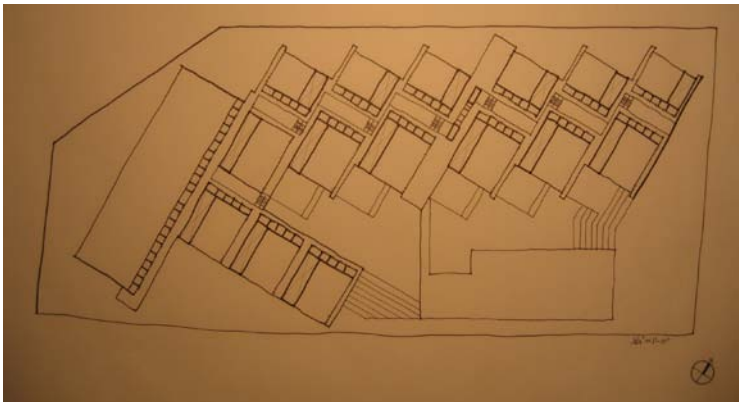
West Elevation

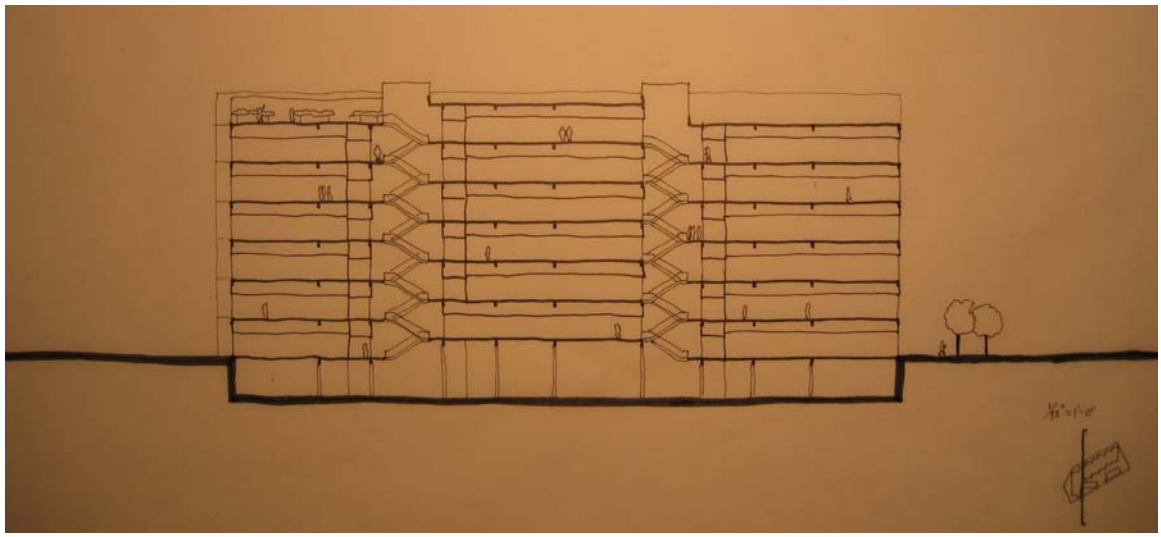


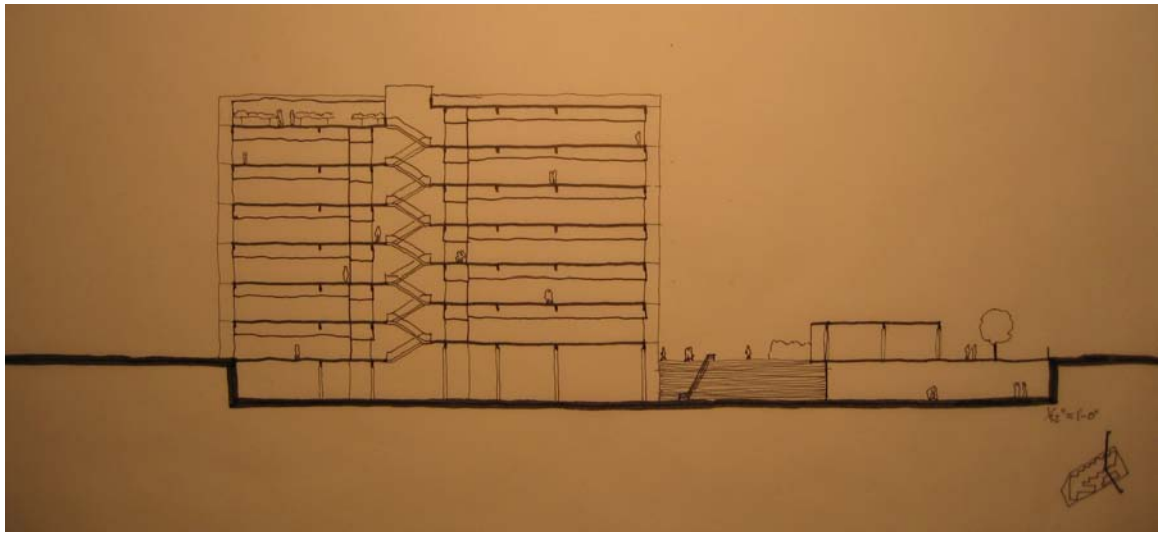


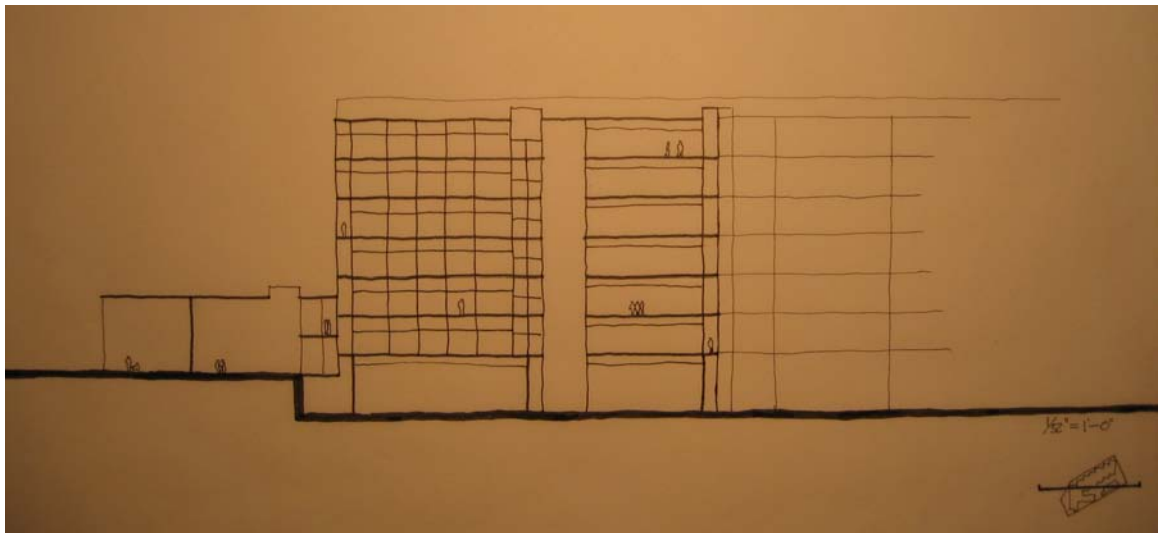












DESIGN DEVELOPMENT

A Catalyst for Gradual Change

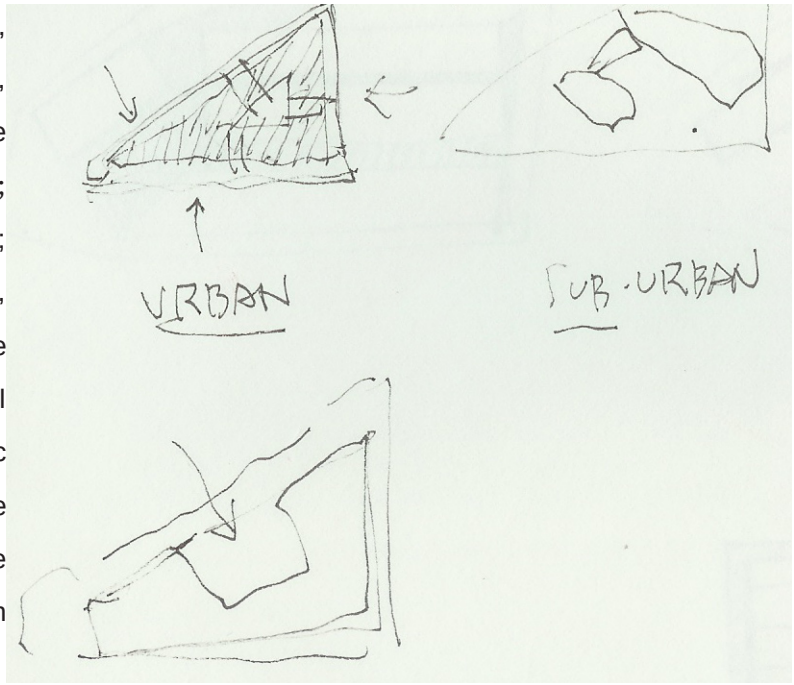
Design Development

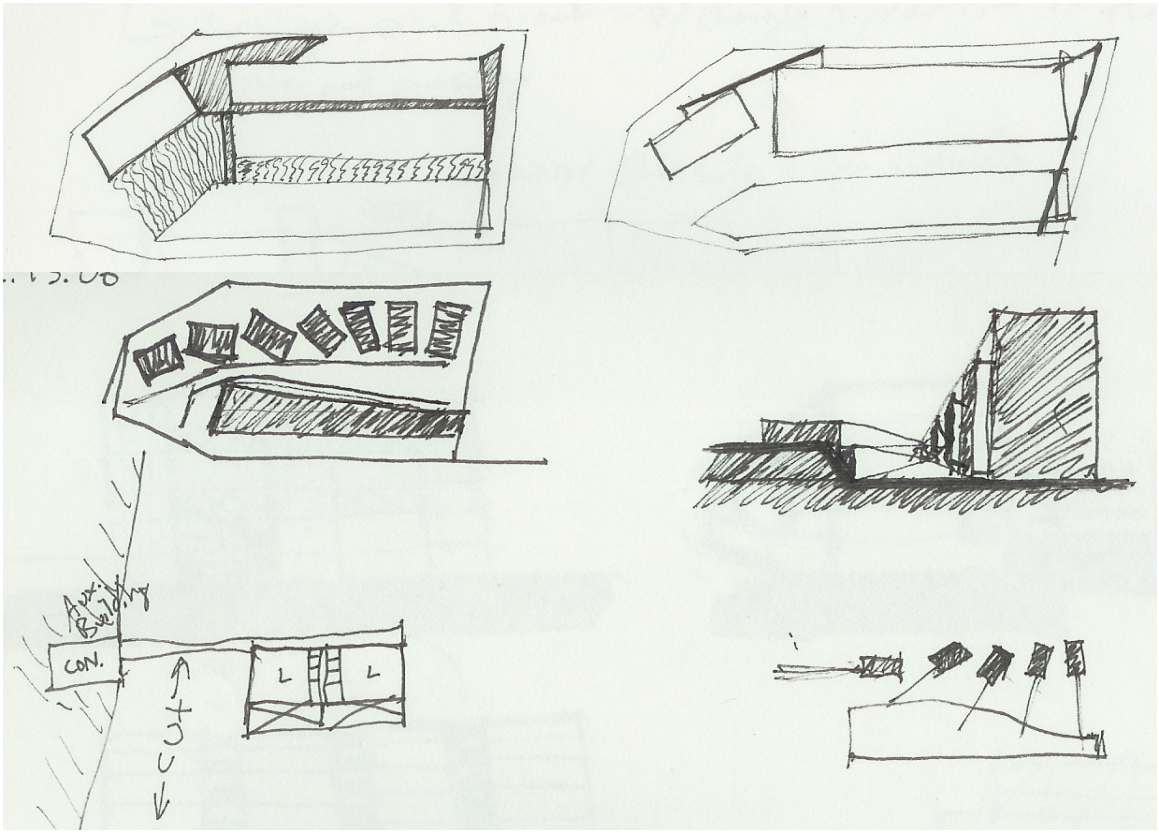
At the conclusion of the schematic design phase it was pointed out that the direction of the form being created had adopted a decidedly sub-urban language. The design showed little regard/response to the existing, albeit decaying, surrounding urban condition. The feel of the scheme was beginning to take the shape of the sub-urban "style" of the apartment complexes along the southern edge of the site across Vernor Highway.

During the site analysis phase these complexes were seen as an asset to the site. This view, however, was not taken because of the architecture, but rather with in response and acknowledgement to the activity on the site and the potential for the adjacent area's population to bleed into and through the new architecture, giving it life.

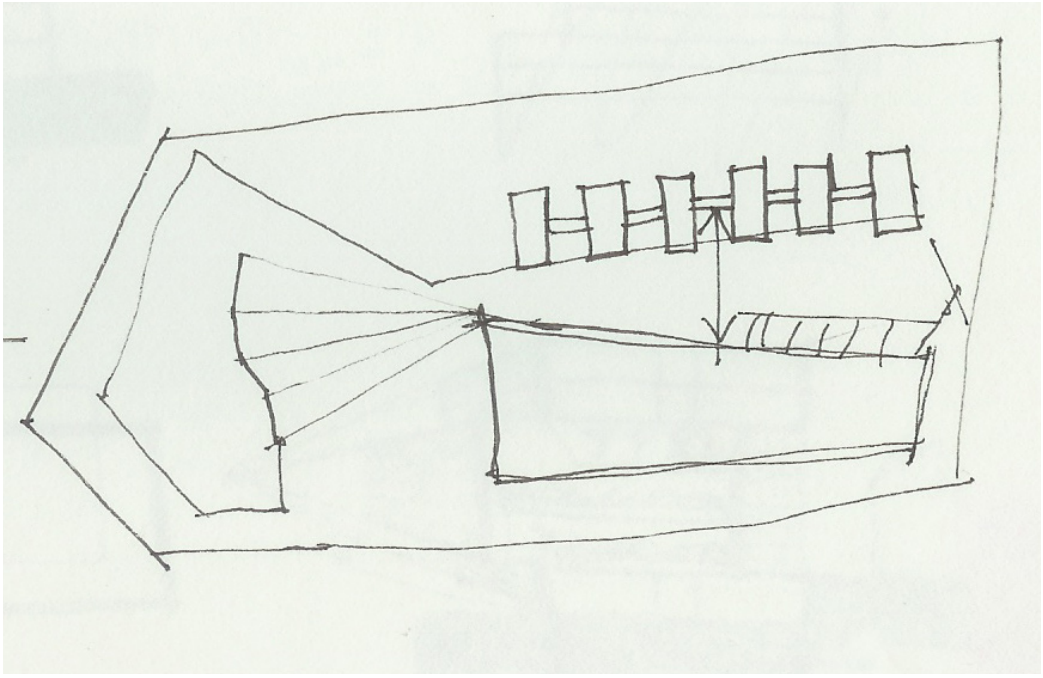
In response to this observation a new approach to the building's Architectural language was adopted. Rather than ignoring the unique shape of the site, that shape was embraced and used as a driving force for the form of the building. Additionally the Architecture immediately surrounding the site, including the apartment complexes, was used to provide a framework to break up and provide variation to the facades. Stylistic cues from the industrial context of the city were brought to the site as a way of indicating that this new facility was a continuation, rather than a departure, to Detroit's industrial heritage.

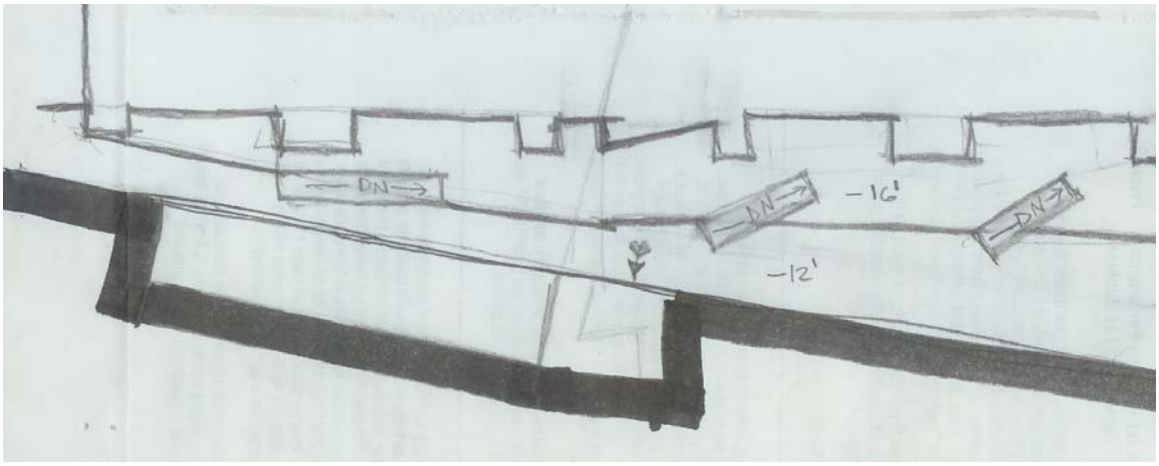
Design Development was also the first time that three major designed elements were recognized/identified, acknowledged, embraced, and melded together. The first being the Laboratory Bar; the second, the Auxiliary Bar; and the third element which, ultimately turned out to be the vital connection between all of the pieces, was the public space that ran between the buildings and provided a large gathering space at the Western end of the site.

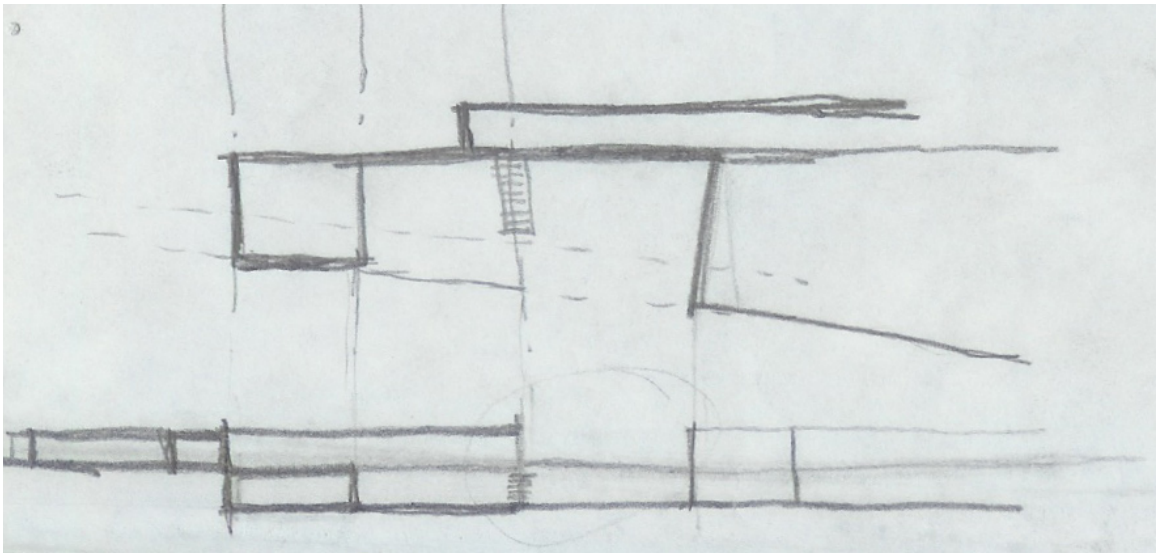


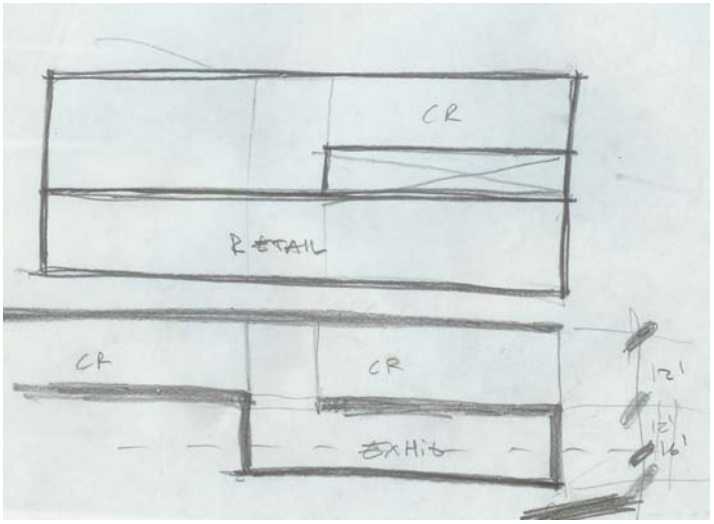


Early sketches looking at how the site might be used to its full potential and respond to its surroundings more responsibly.

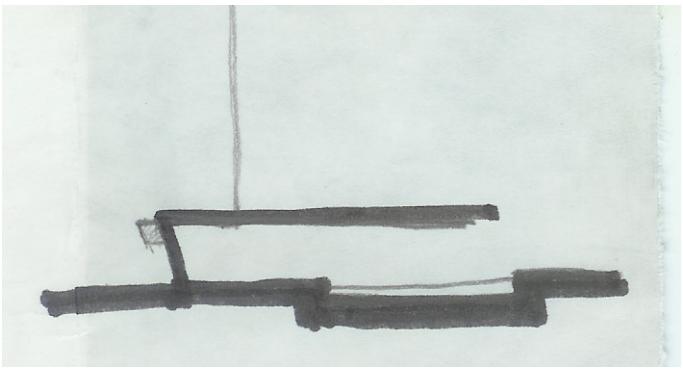


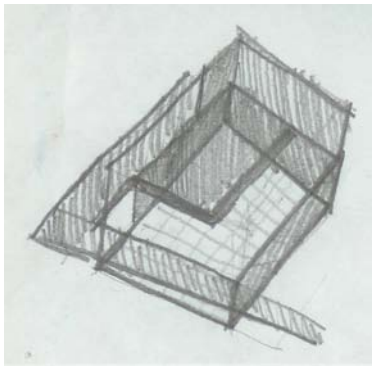




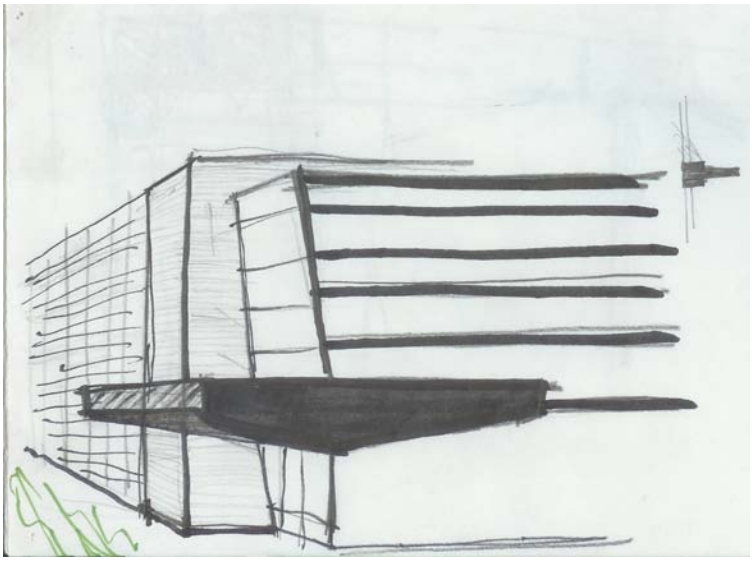


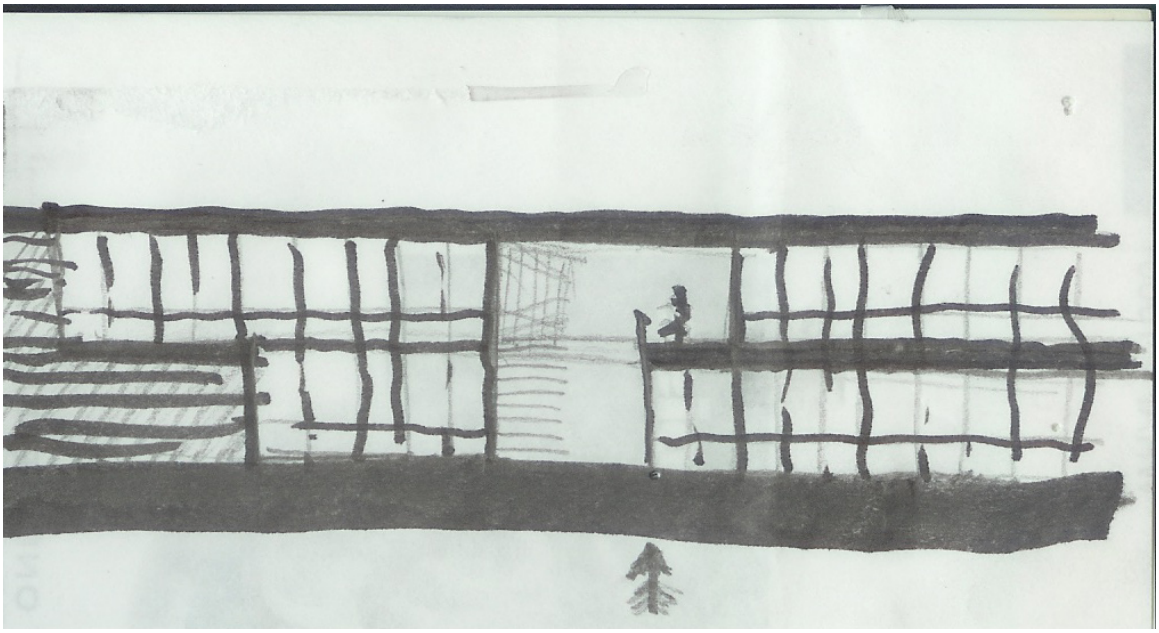
Plan-section relationship diagrams. The beginnings of the Auxiliary Bar and Cut articulation

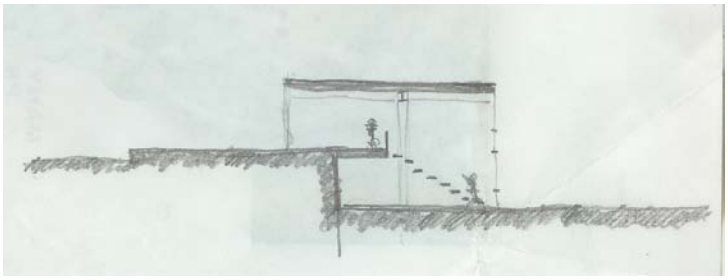


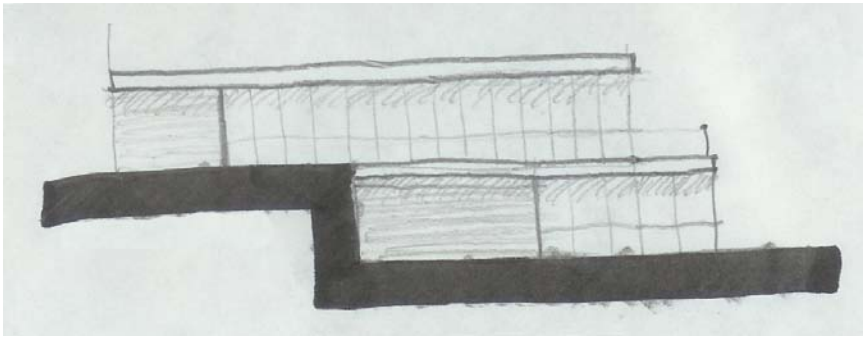


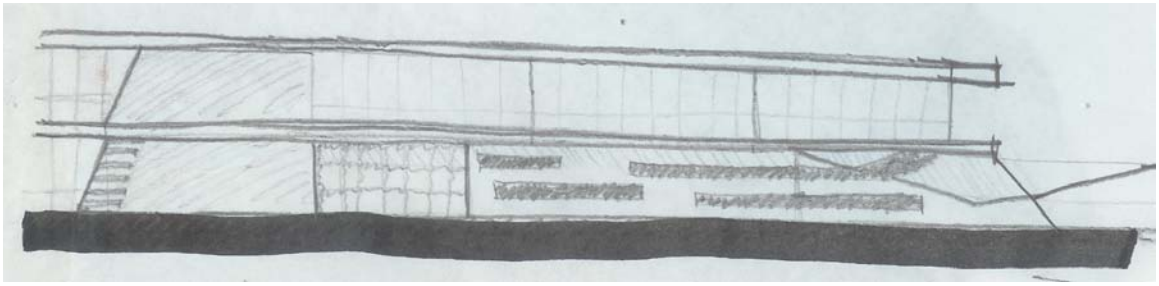
Sectional relationships and the desire for a dynamic space begin to emerge. Further development is realized on the Auxiliary Bar.

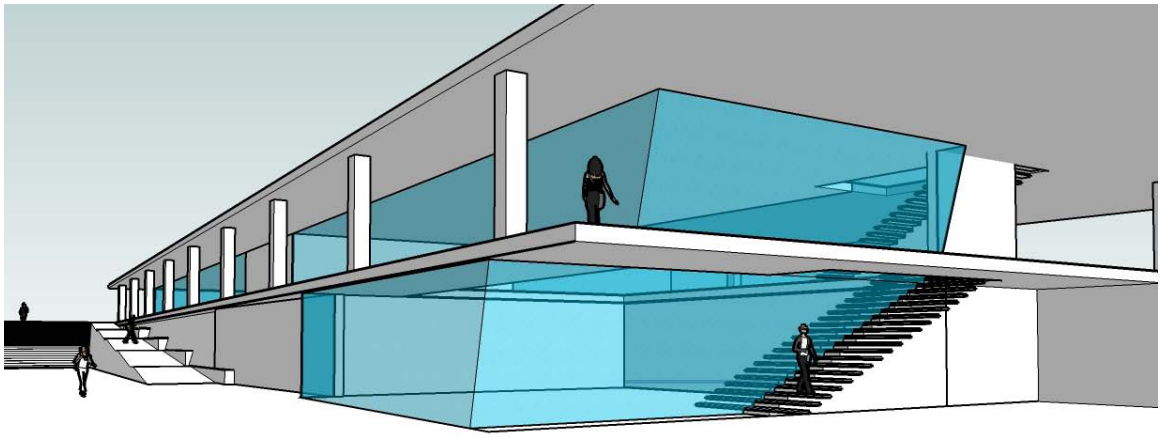


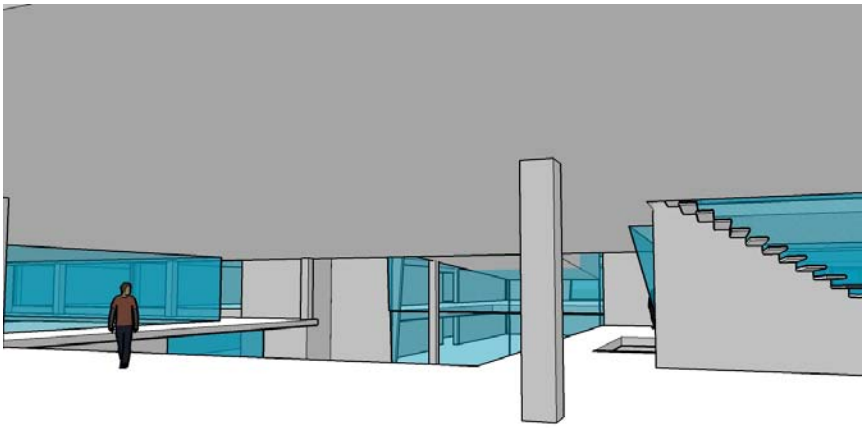




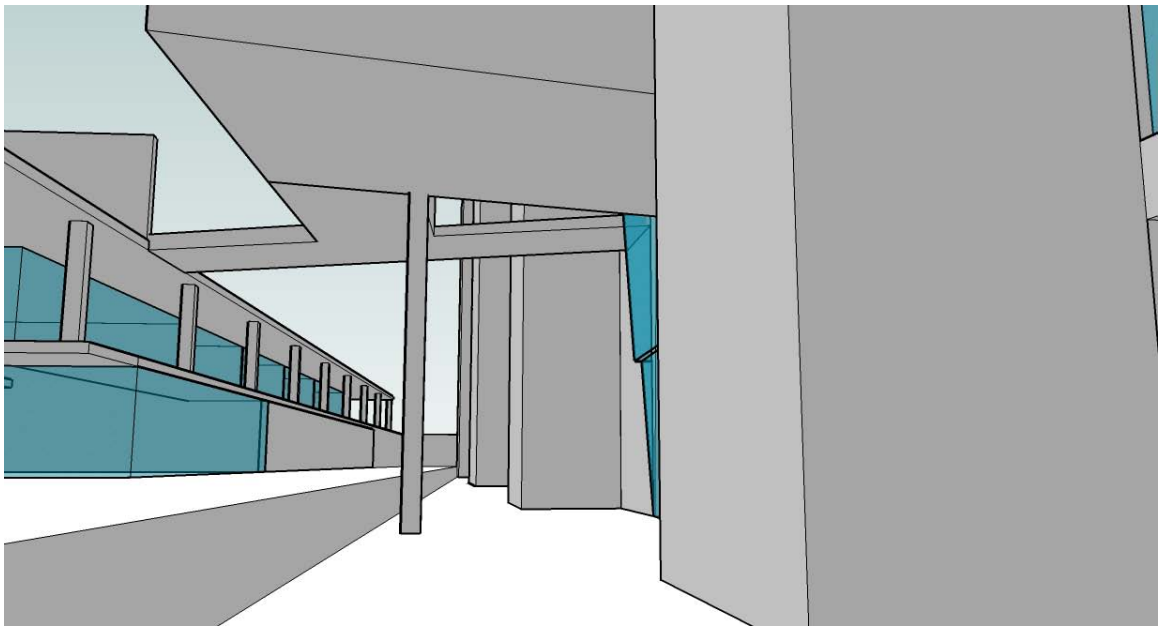




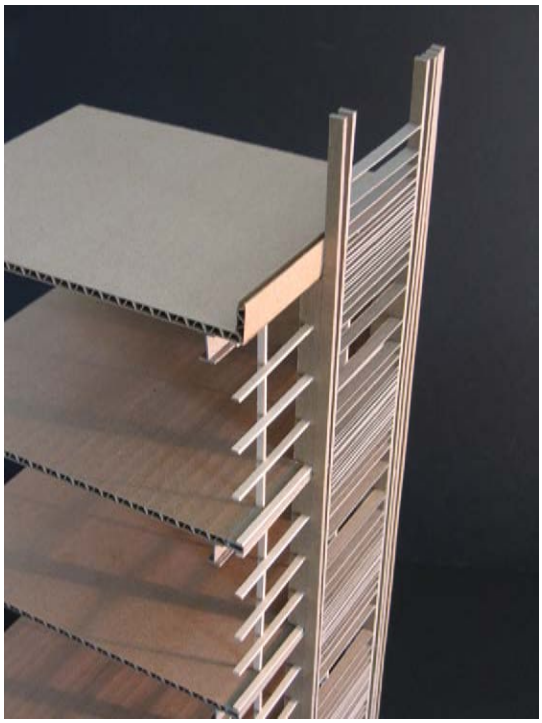


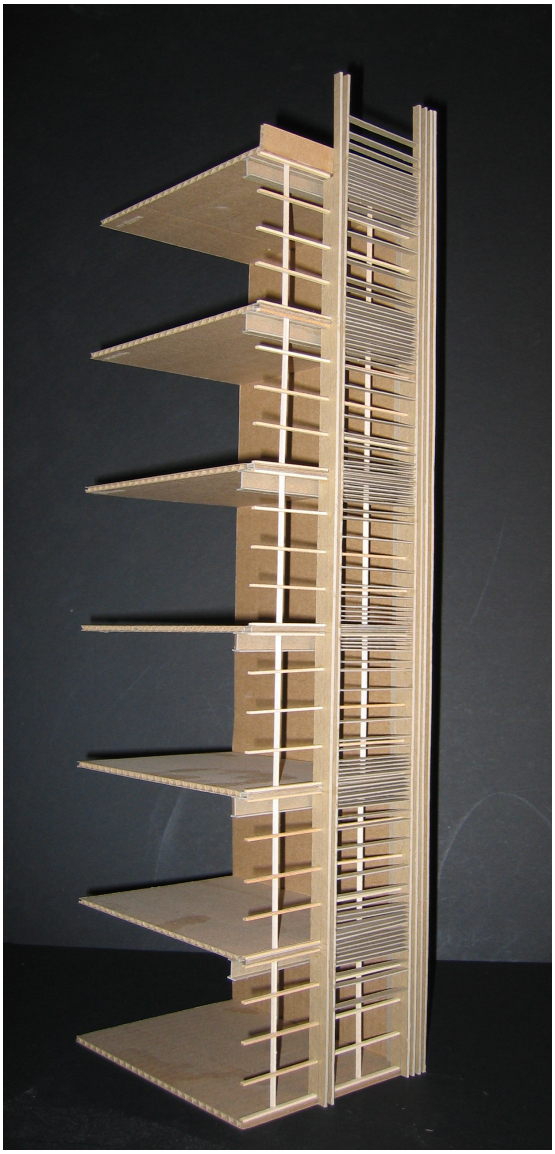


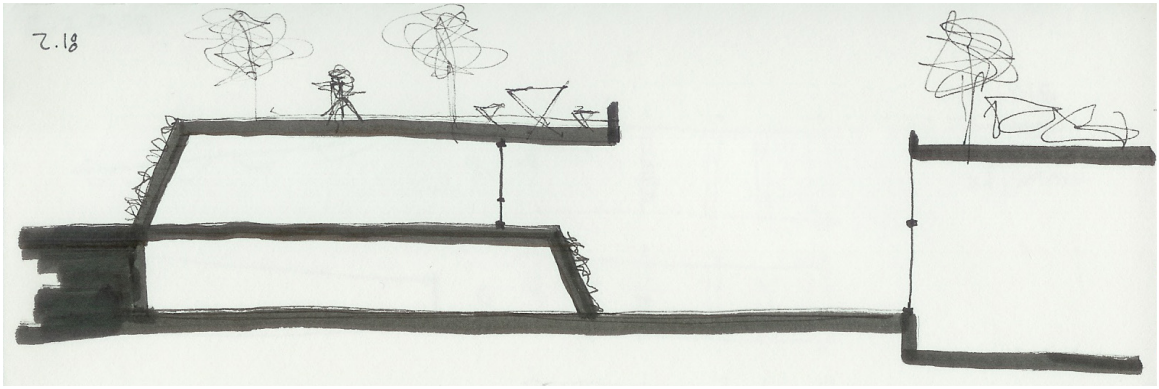
From top to bottom: Digital model of showing views North from Vernor, to the East in the cut and to the West in the cut at the main entrance.



Laboratory bar curtain wall and shading development. The curtain wall glass is set back from the shading louvers which run both vertically and horizontally in order to counteract solar heat gain from the maximum number of solar positions.



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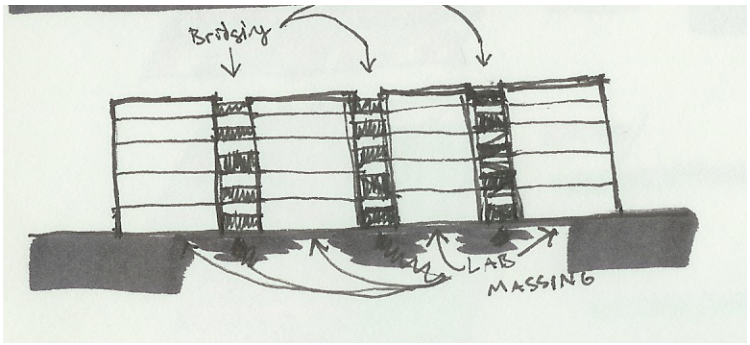
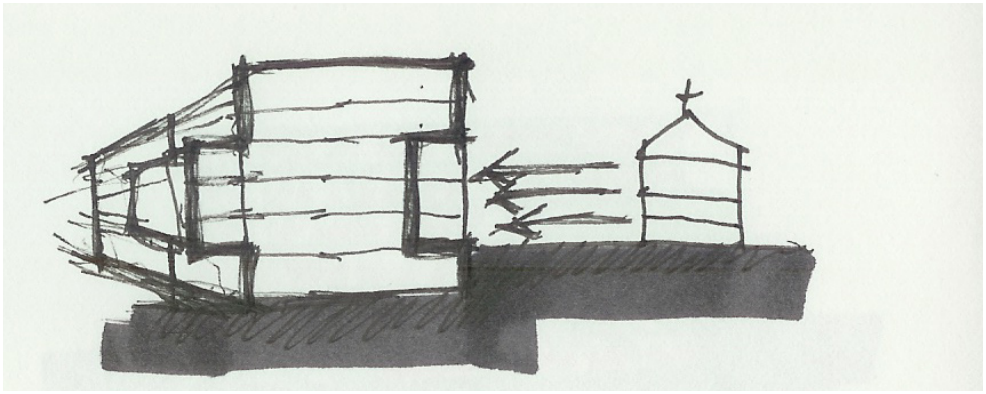
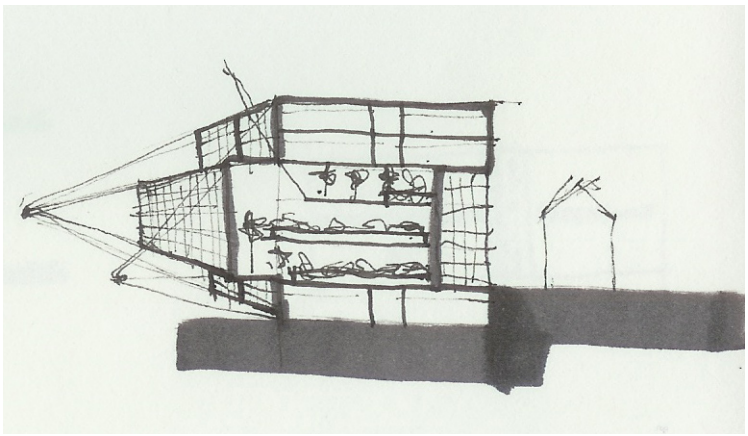
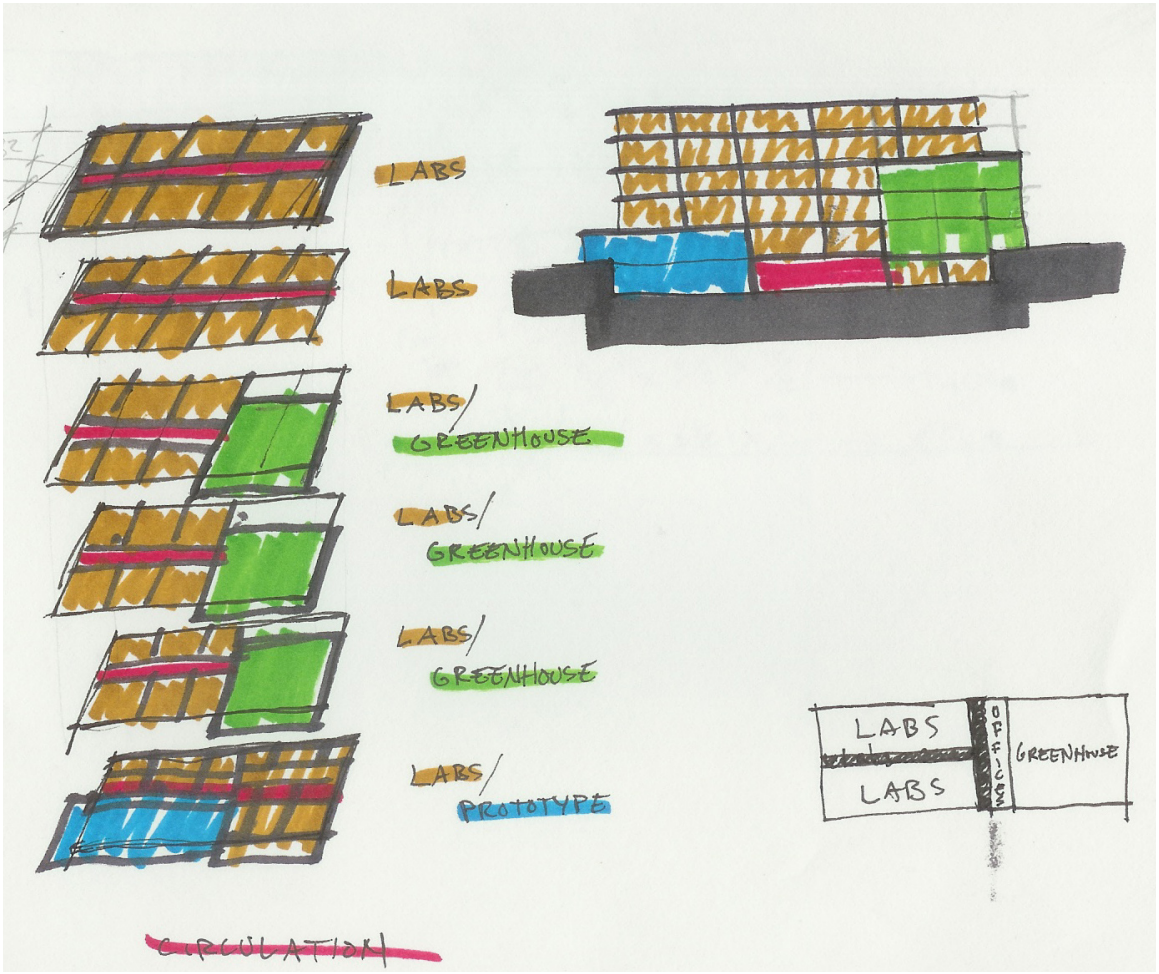

Bridging
LAB
MASSING







New planning diagram

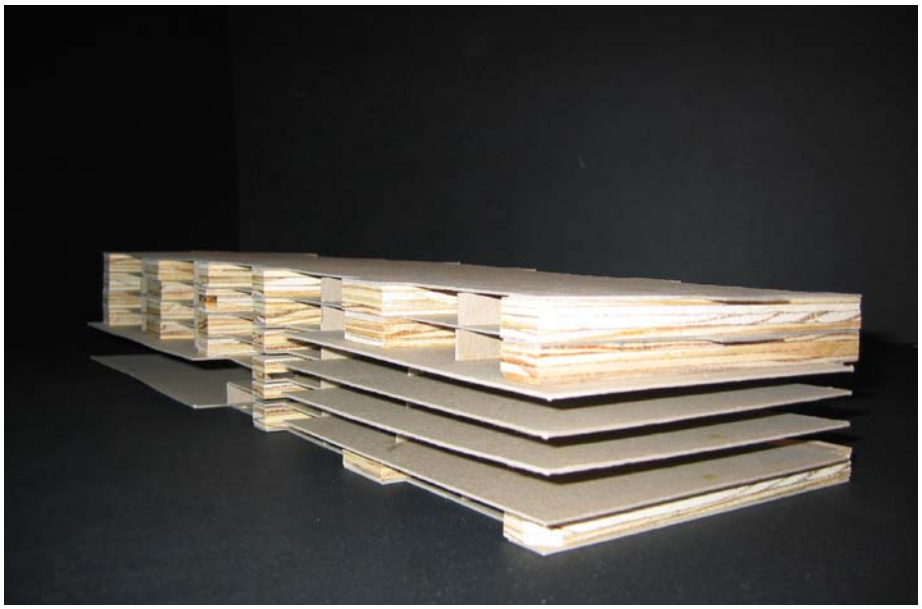
Previous Page:

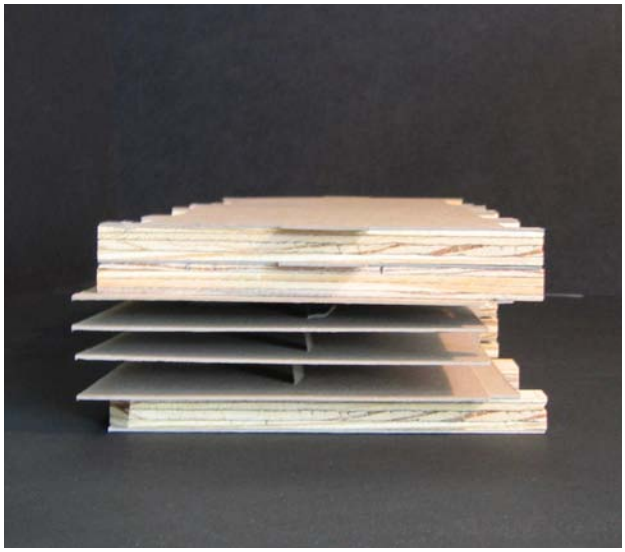
Refinement of Auxiliary Bar/Laboratory Bar relationship.

Mass and void of Laboratory Bar.

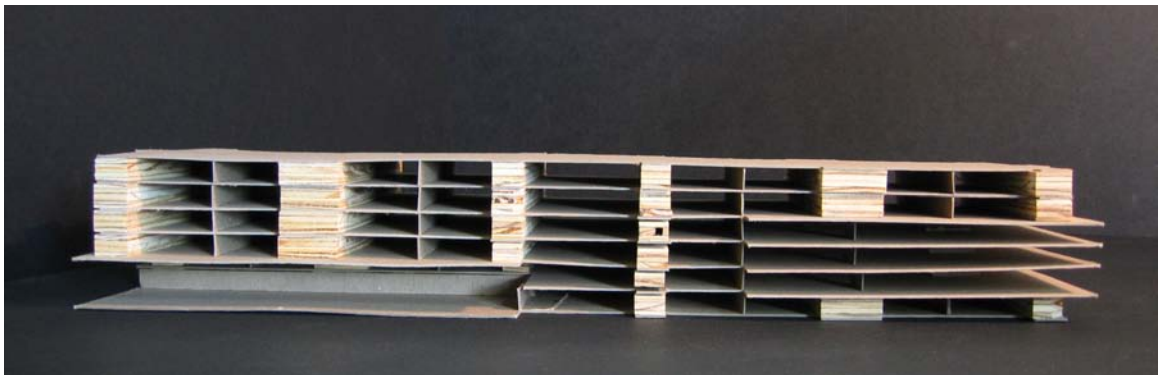
Progress toward more contextual response.

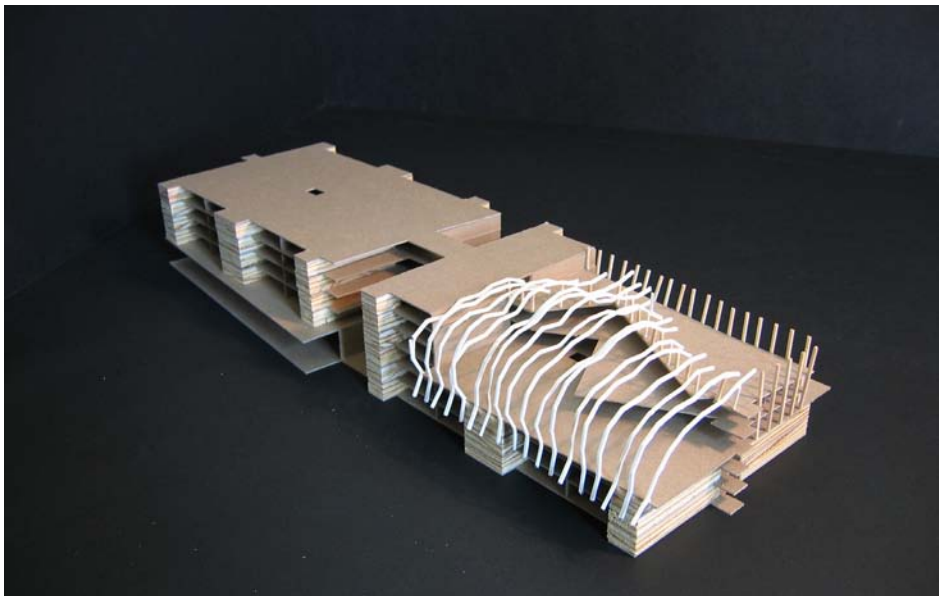
Refinement of contextual impact and beginnings of Greenhouse articulation



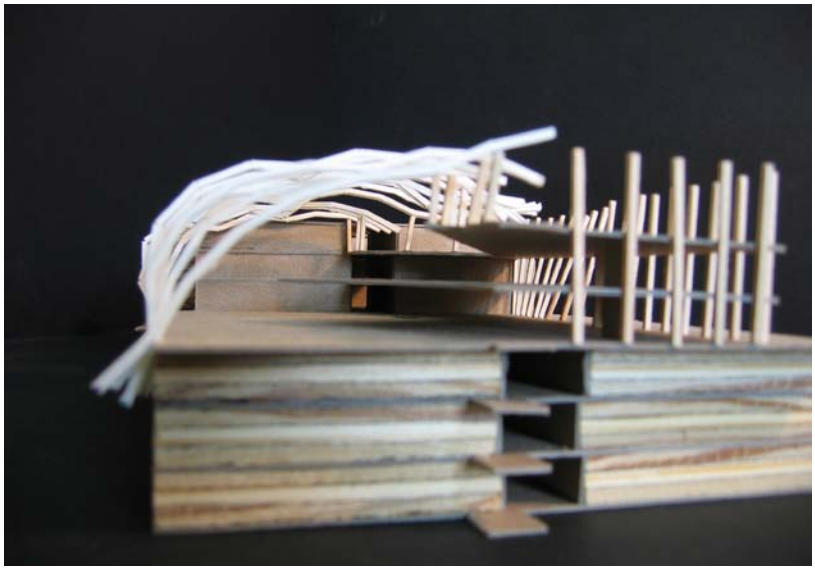


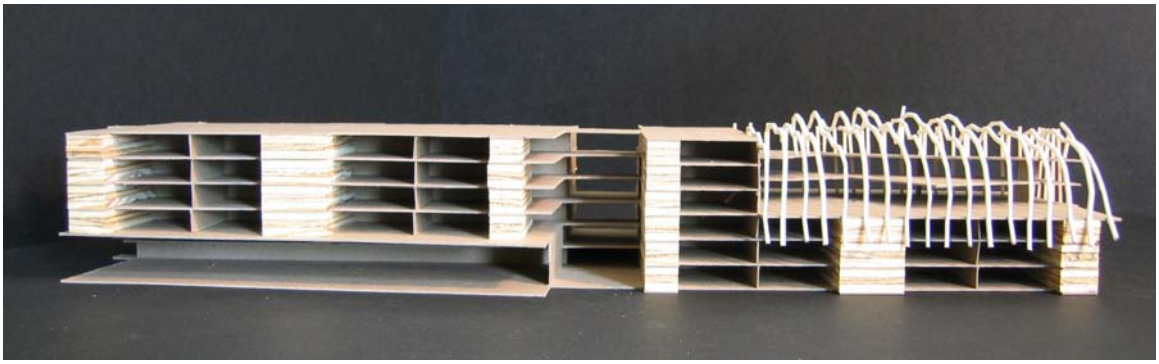
Further development of the Laboratory Bar. Emphasis on the voids/disruptions caused by the Greenhouse and Prototype Lab.





Greenhouse expressed as a shifting module. Ultimately the decision was made that this language shown here was to far a departure from the rest of the building. The final design shows larger fins, more directly related to the initial sketch model, carry the this idea through to the end.





FINAL DESIGN

A Catalyst for Gradual Change

Final Design

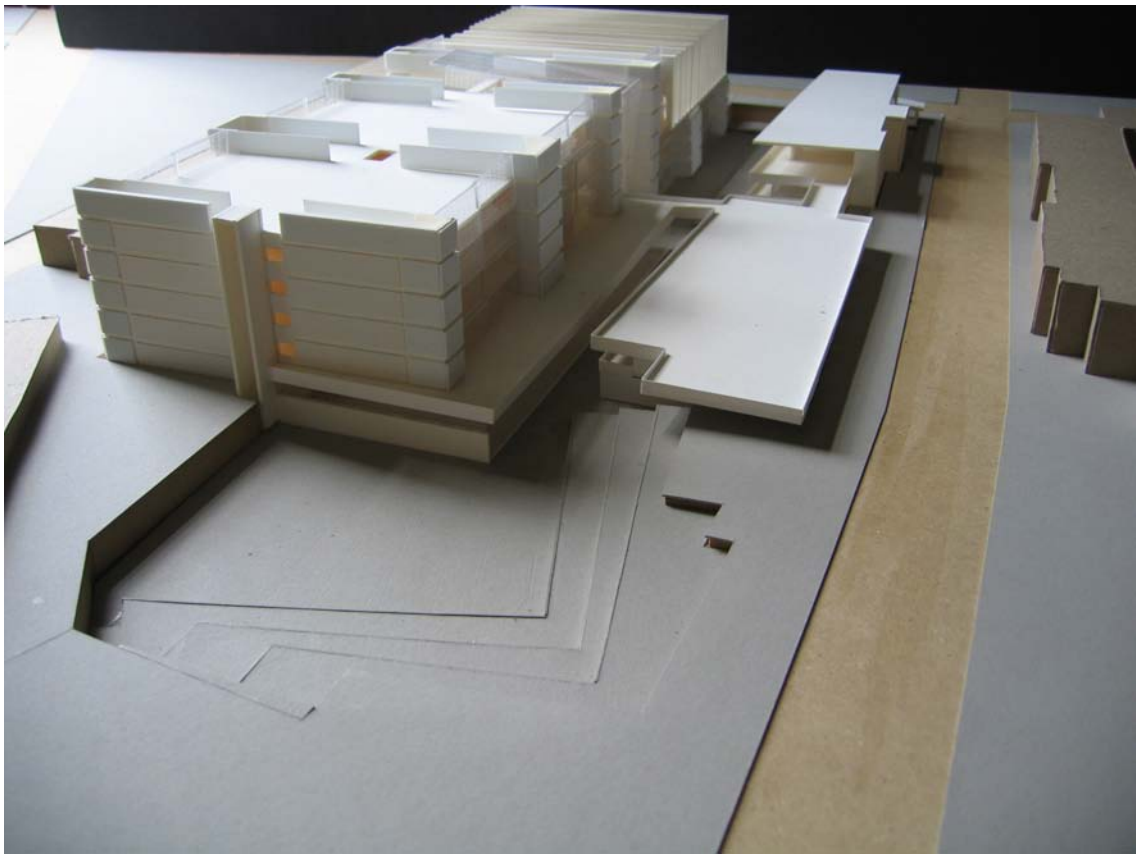
Having refined the Architectural language and programing of the proposal considerably throughout the design development phase, there remained three areas that still required some refinement. The primary concern was the breaking up of the Laboratory Bar's facade. Secondarily the scale change between the Laboratory Bar and the Auxiliary Bar. Finally resolution of the gathering space that served to terminate The Cut was a concern.

In spite of the tremendous effort that had been put toward the break-up of the Laboratory Bar's facade, it was still read as massive and monolithic. The rhythm of the laboratory space (void) and the mechanical rooms (mass) coupled with the curtain wall system that lent a significant variation to the building horizontally, served to provide a base from which an even more successful solution could be reached quickly. To further the facade variation it was determined that each laboratory space would be pushed or pulled horizontally along the North-South axis. These pushes and pulls were as random as possible to allow for maximum variation while still allowing the interior components to function unimpeded. The Greenhouse was articulated as a series of shifting modular planes which gave the space differentiation from the rest of the Laboratory Bar as well as provided a point of visual interest.

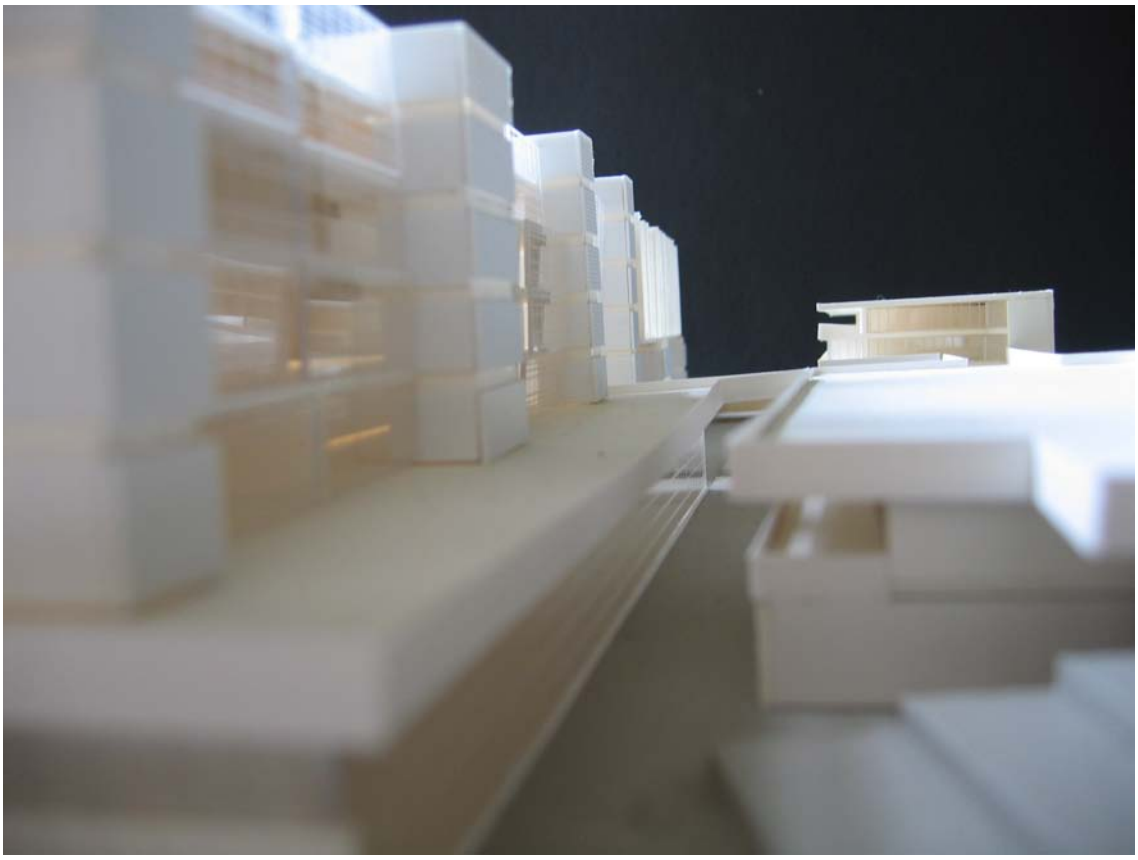
To address the scale discrepancy between the Auxiliary and Laboratory Bars the decision was made to shift a significant part of the building over and up. The shift was made on the third level and involved moving the administrative offices, that had previously been next to the support office, to a position above the support offices thus gaining an additional story in the Auxiliary Bar. The area that was initially covered by the administrative offices was turned into a large roof garden that allowed for additional green space on the site as well as another area for impromptu meetings and collaboration. This decision served to provide sufficient balance to the composition of masses as well as bringing the key outreach areas down to a more human scale directly adjacent to the gathering space.

The articulation of the Gathering space was a decision made with the shifting module as a basis. The series of horizontal planes rotate over each other to form a series of terraces that transition from the Cut back to the street level.

Overall site from the NW corner

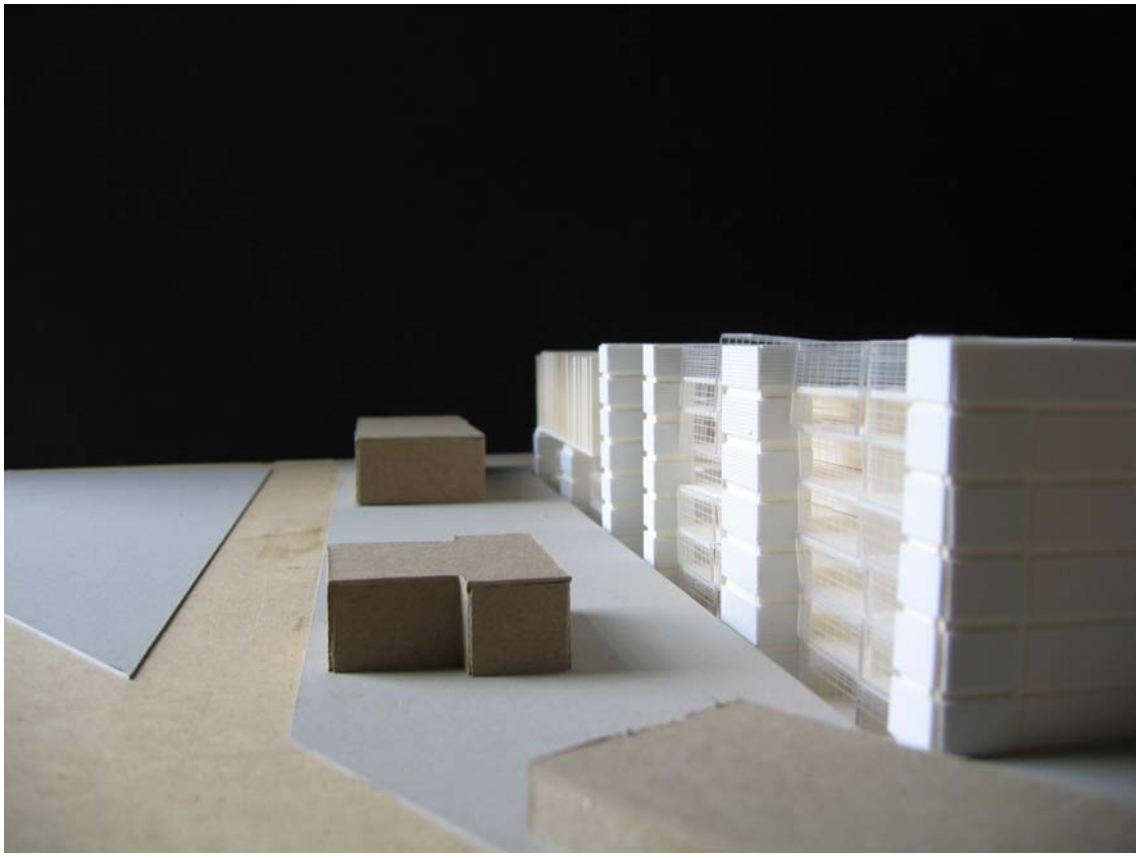


Overall site from the SW corner

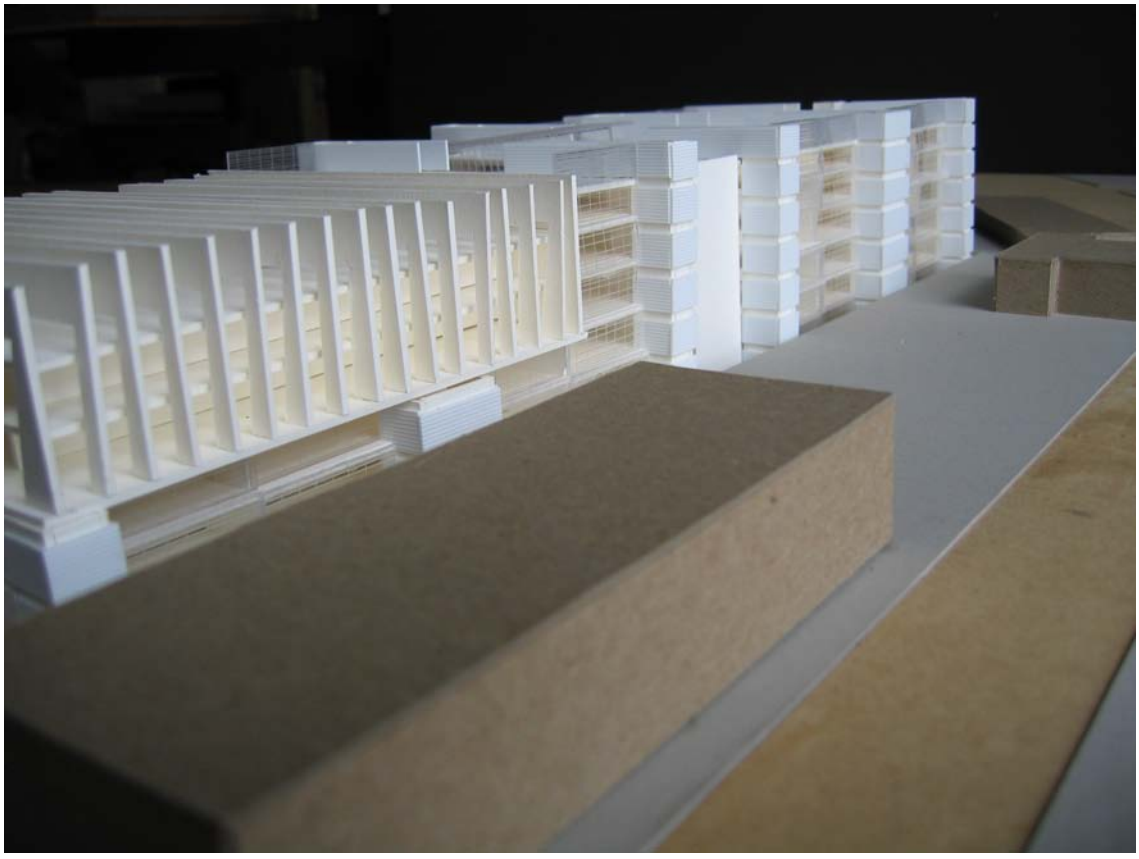


View from the park East through the cut

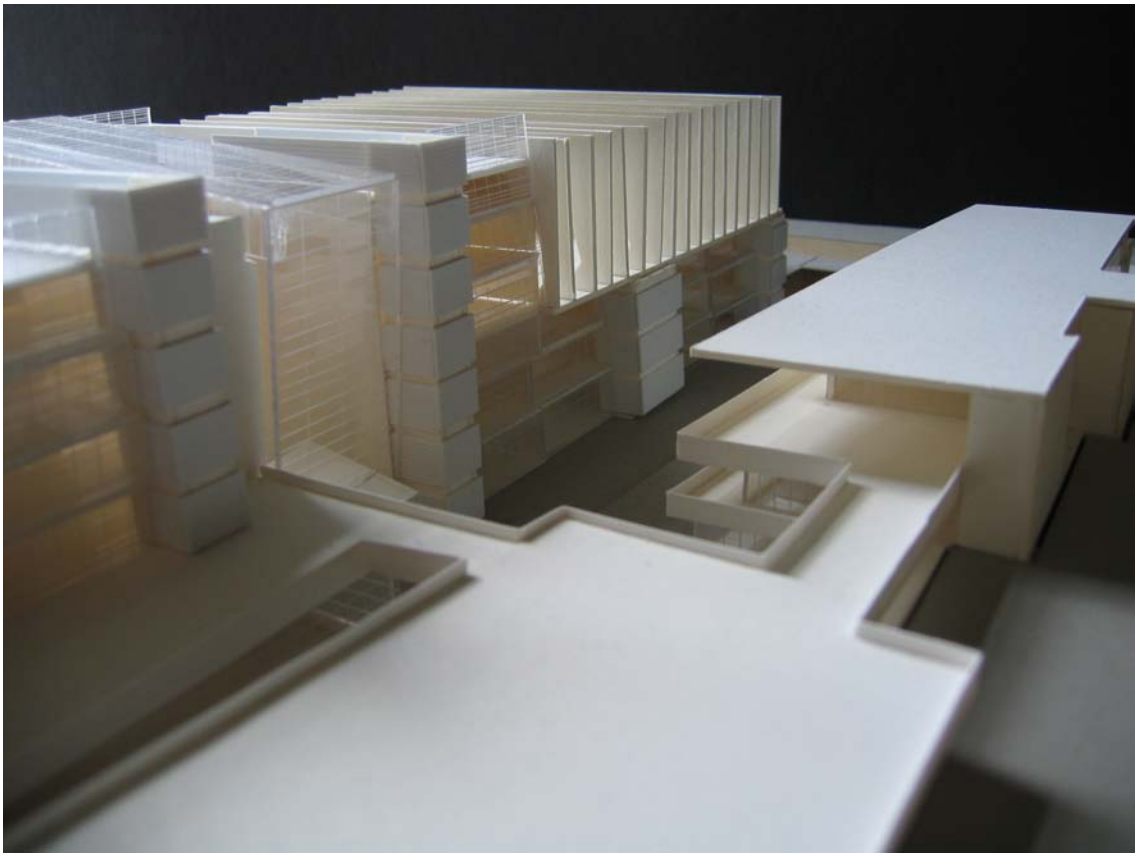
View to the East along Vernor



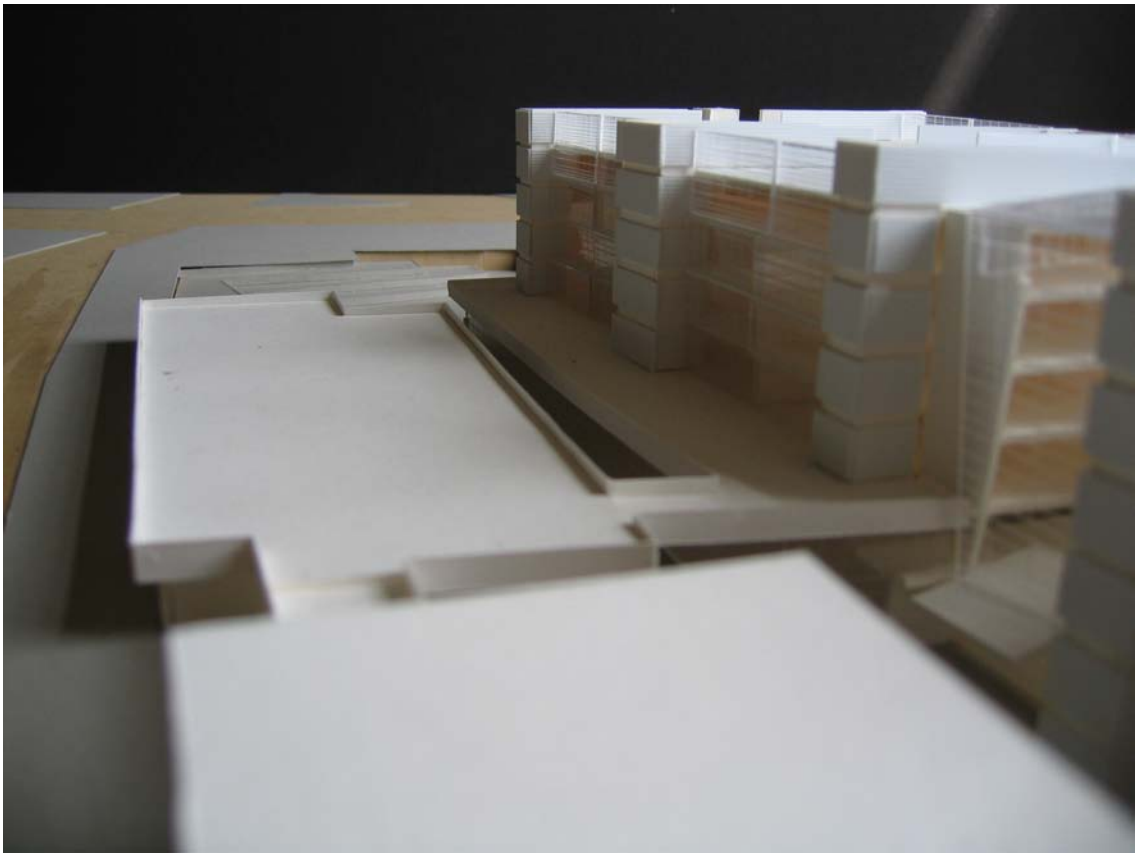
View to the East along Hendricks



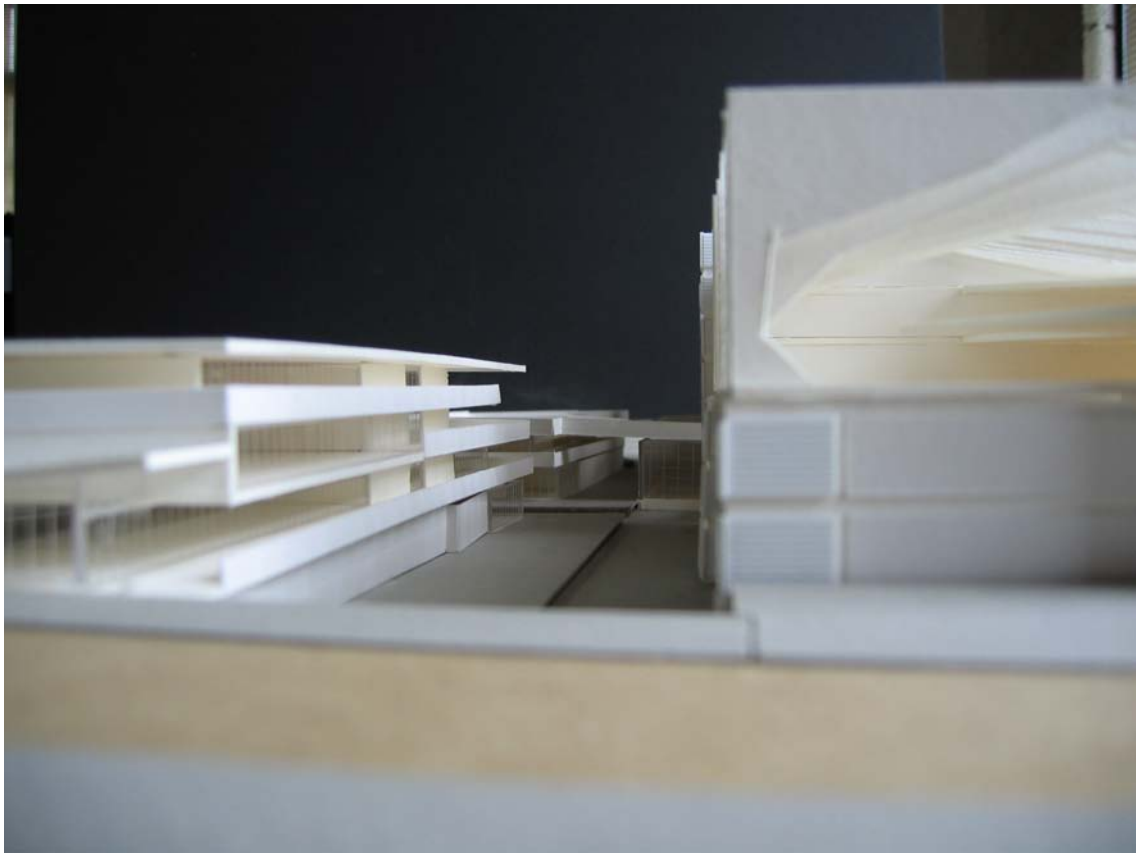
View of North Laboratory facade from the NE



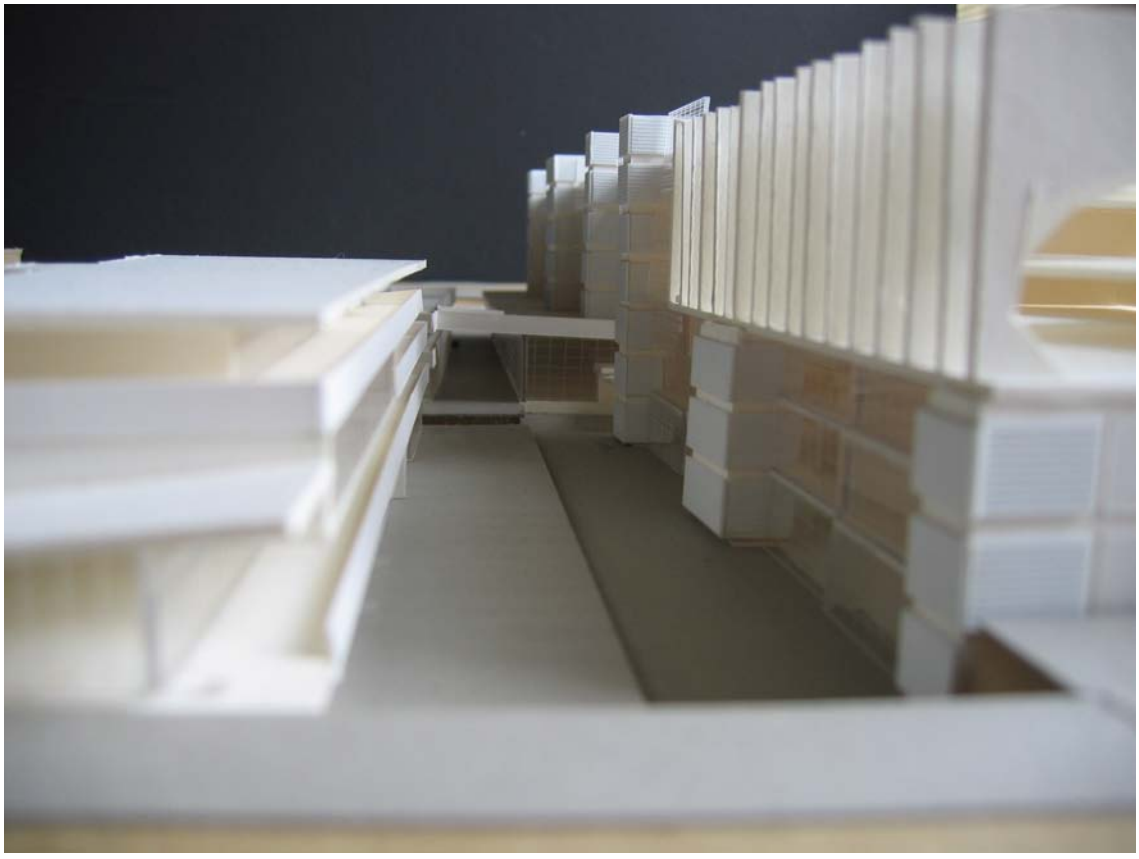
View from the SW of Laboratory bar from the roof garden



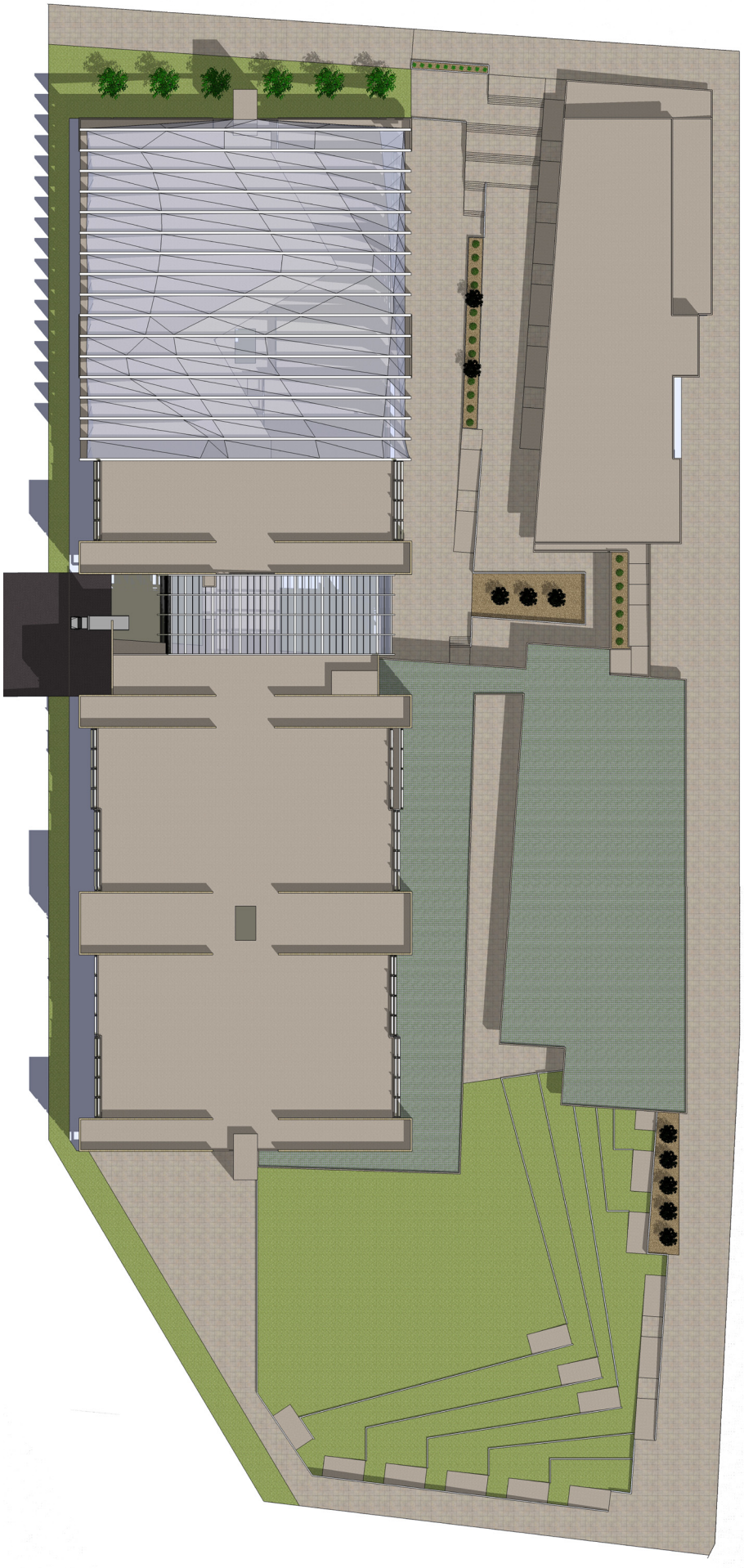
View from the SE of the roof garden and Laboratory bar



View to the West of the Auxiliary bar from across Chene



View to the West through the cut



Site Plan: NTS

Level 1 Plan: NTS

Biochemical Laboratory
Prototype Engineering
Greenhouse
Exhibition/Classroom/Retail
Library
Cafeteria
Office/Conference
Mechanical
Support
Green Roof

N

Level 2 Plan: NTS

Level 3 Plan: NTS

Biochemical Laboratory
Prototype Engineering
Greenhouse
Exhibition/Classroom/Retail
Library
Cafeteria
Office/Conference
Mechanical
Support
Green Roof

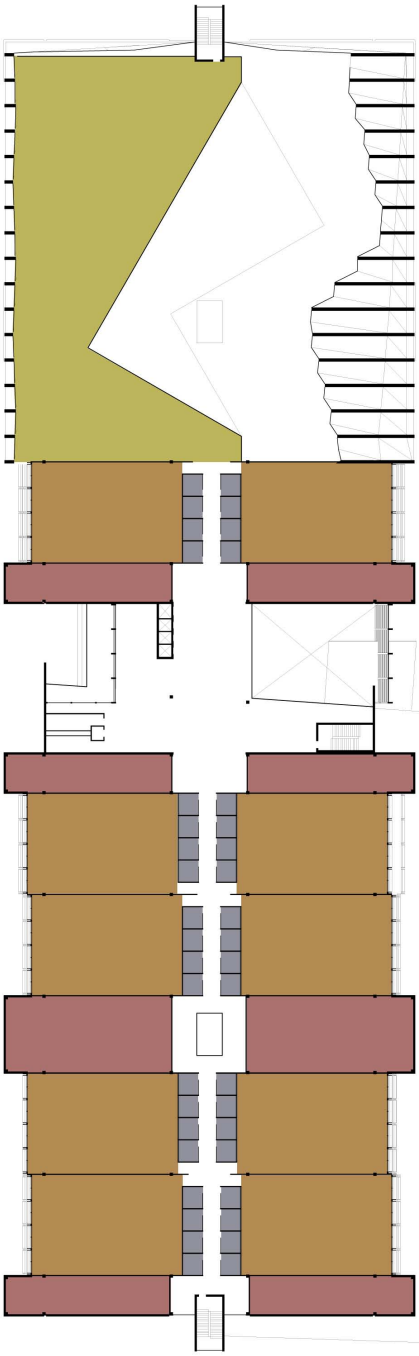
N

Level 4 Plan: NTS

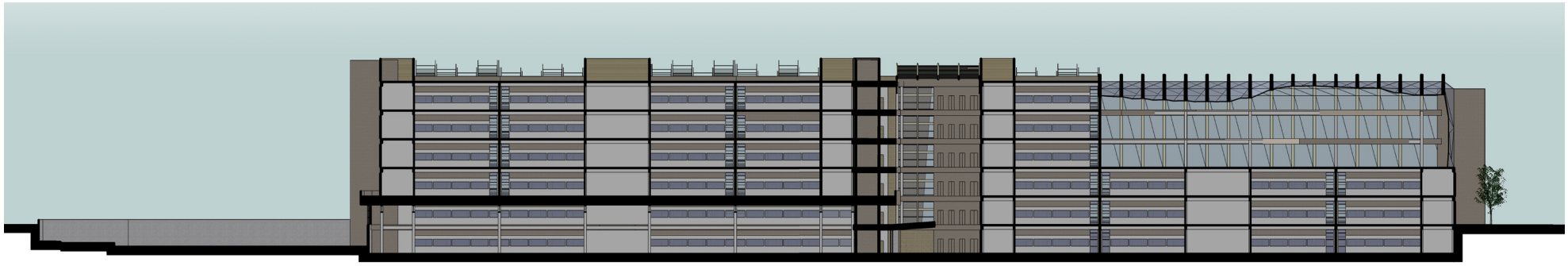
Level 5 Plan: NTS

Biochemical Laboratory
Prototype Engineering
Greenhouse
Exhibition/Classroom/Retail
Library
Cafeteria
Office/Conference
Mechanical
Support
Green Roof

N

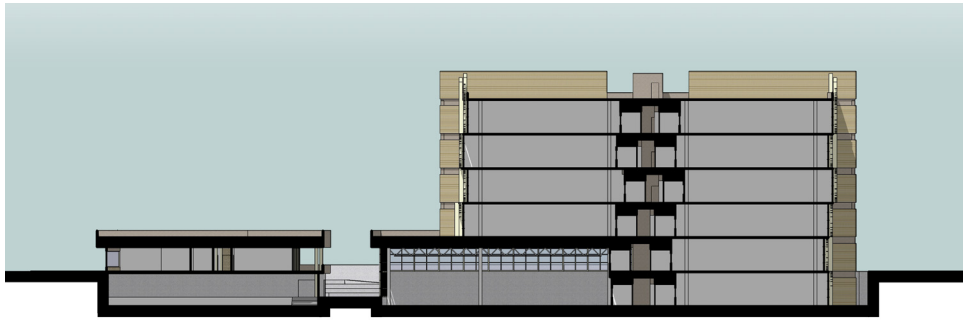


Level 6 Plan: NTS

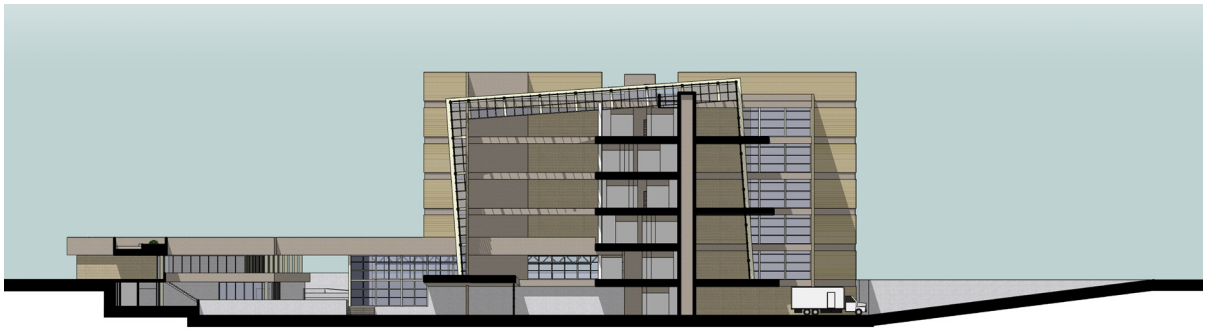


Longitudinal Section Through the Laboratory Bar to the North: NTS

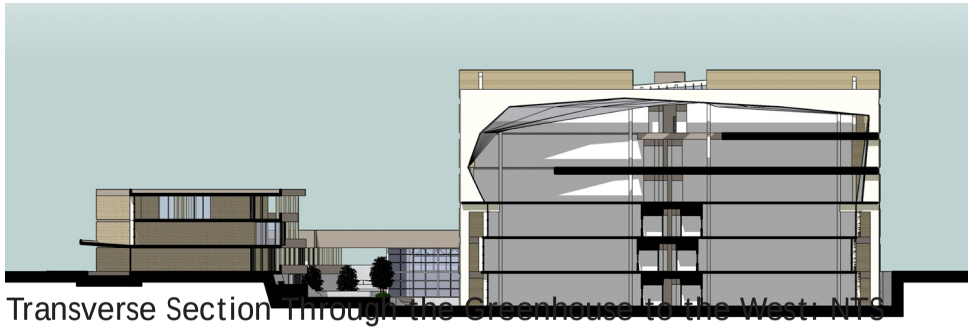
Longitudinal Section Through the Auxiliary Bar to the South: NTS



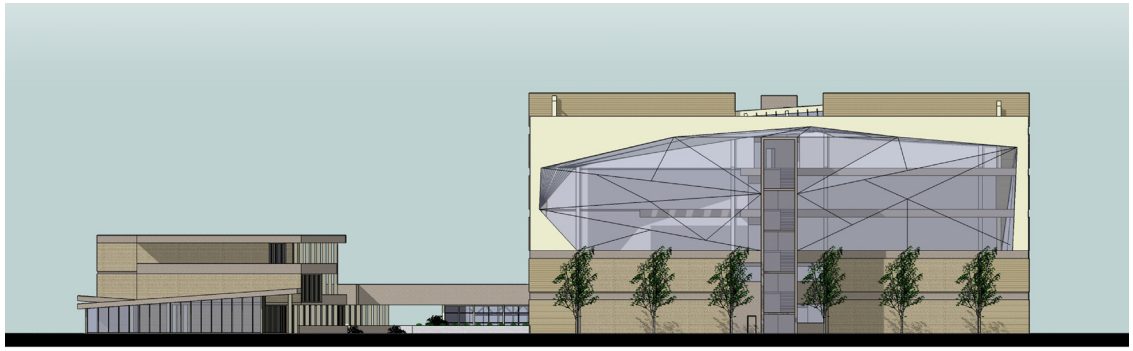
Transverse Section Through the Prototype Laboratory to the West: NTS



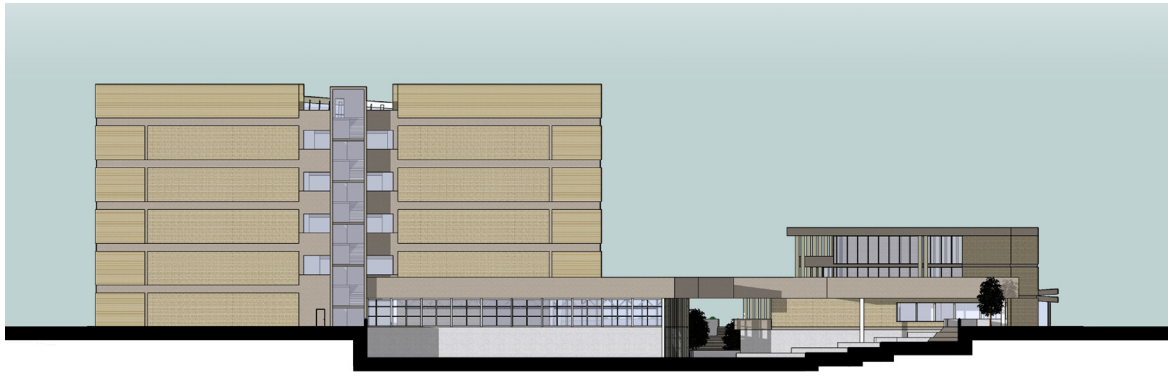
Transverse Section Through the Atrium to the West: NTS



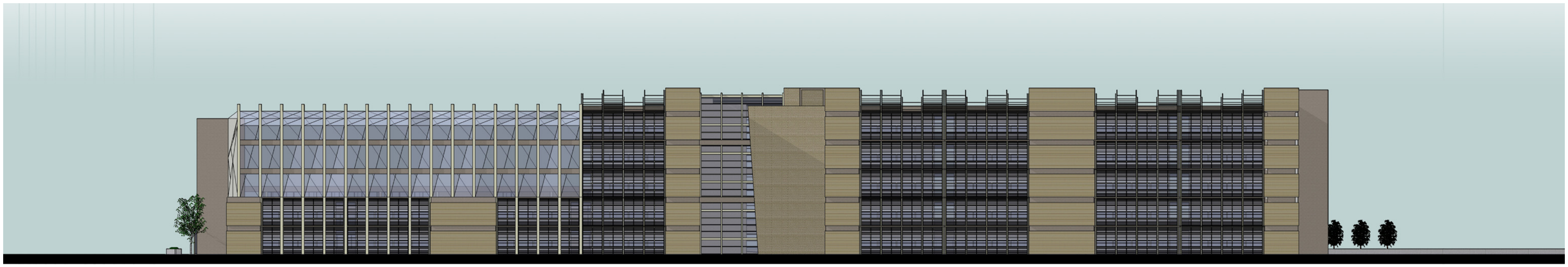
Transverse Section Through the Greenhouse to the West: NTS



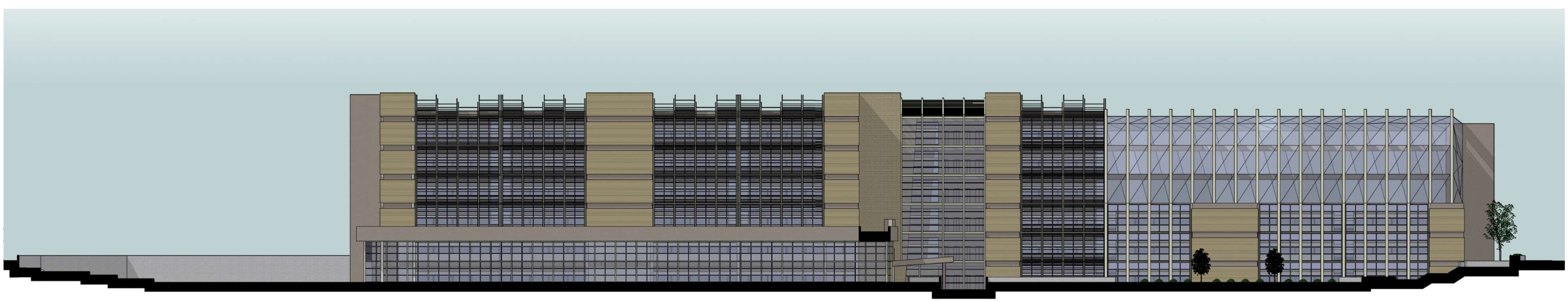
Overall East Elevation: NTS



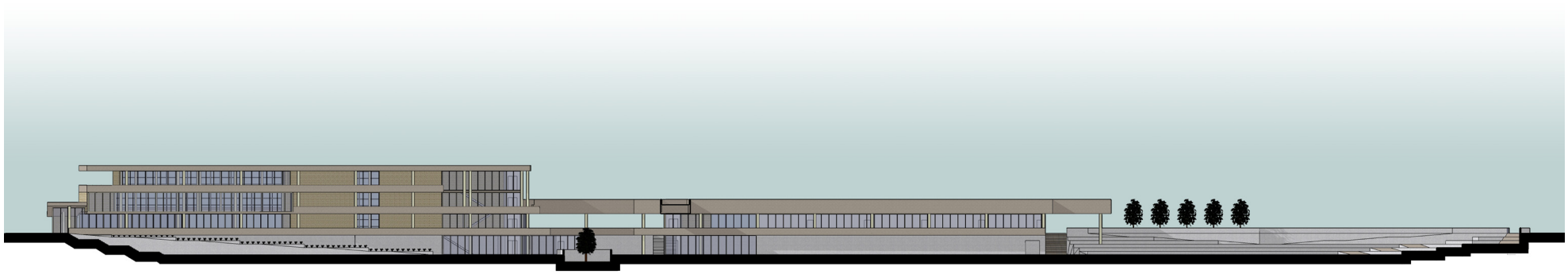
Overall West Elevation: NTS



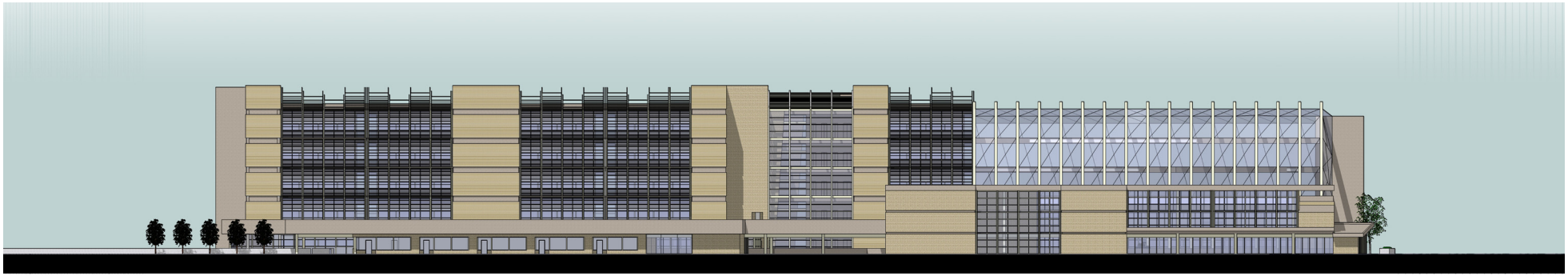
Overall North Elevation: NTS



Laboratory Bar South Elevation: NTS



Auxiliary Bar North Elevation: NTS



Overall South Elevation: NTS

View from the SE corner of Vernor and Chene

View from NE through cut

View from the East through cut

View of bridge from roof garden to offices

View to the East along Vernor

CONCLUSION

A Catalyst for Gradual Change

CONCLUSION

In closing this thesis strives to investigate the possibilities of urban renewal through the vehicle of a facility for the research and development of sustainable automotive fuels and technology. In order to achieve renewal on the local scale the facility has incorporated additional programmatic features to involve the surrounding community in the rebirth of the area.

Great emphasis was placed on the use of the shifting module and in using that module to create space in which collaboration could occur. In this collaboration there were two types focused on. the first was intentional and forced and the second was that of accidental encounters.

The design strove to integrate the new building into the surrounding and existing context not only through programmatic gestures but also through the architectural language of the place. Design cues were taken from the factories of old and modified as much as was necessary to accomplish the new goal. Additionally the boundaries of the site and what lay beyond played a vital role in determining the form of the building.

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