The University at Buffalo's School of Architecture and Planning

interSIGHT V14.11

UB AP iS

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interSIGHT

is an annual publication that highlights the work of students at the School of Architecture and Planning at the University at Buffalo. The intent of this journal is to record current design preoccupations and scholarship. This issue reveals courses and work completed throughout 2010. Intersight V14.11 seeks to provide meaningful insights into design, ideas and the life of the School at Buffalo.

buffaloBooks

Cover image by A. Levin

Additional copies and back issues are available at the above address or by visiting the Intersight website: www.ap.buffalo.edu/intersight

buffaloBooks

is a series of publications that focuses on ideas and design. Published by the School of Architecture and Planning at the University at Buffalo, The State University of New York, the series explores these ideas through the documentation of significant lectures, events and work; contributes to the speculative investigation of design in architecture and planning; and makes this information accessible for students and those with an interest in architecture, planning and the construction of the physical environment.

www.ap.buffalo.edu/books

Intersight V14.11 is dedicated to

Professor Brian Carter
Dean, School of Architecture and Planning (January 2003 - December 2010)

and to

Professor Mehrdad Hadighi
Chair, Department of Architecture (January 2005 - December 2010)

Intersight is an annual publication embodying a portion of the discourse on design undertaken by the University at Buffalo's School of Architecture and Planning. The content is framed through a synthesis of student work and distinguished professionals affiliated with the university through their involvement in fellowships, chairs, and lecture series. The publication seeks to represent the current trends of academia portrayed through the pedagogy of the university in the year of 2010.

Intersight is made possible through the Fred Wallace Brunkow Fellowship. It is with great gratitude that I thank Kathryn Brunkow Sample and Steven B. Sample for this endowment and to the State University of New York and Cannon Design for their continuous generosity.

This publication is made possible through the coordination of many individuals. A great deal of gratitude is in order to former Dean Brian Carter for his unparalleled dedication to the publication and the promotion of student work. To the faculty members and student body who have contributed your work, I thank you for your dedication to the production process. To Barbara Carlson, William McDonnell, and Cheryl O'Donnell, your administrative and managerial contributions are what truly make the publication possible, and I thank you for your coordination and insight.

Many thanks are in order for those who have visited the university through lecture series and various visiting faculty positions. I would also like to acknowledge our distinguished faculty members who have so diligently promoted the continuous growth within our education. Without your dedication and mentorship, we would be lost.

Special thanks to the faculty advisory board and student editorial board for their invaluable assistance in guiding the production of the publication.

-Daniel Barry
Fred Wallace Brunkow Fellow, 2010-2011

Foreword

Intersight is the School of Architecture and Planning's journal which documents work developed throughout the previous academic year. This work places our school in the context of the larger university, our city and region. The work captures the educational process by which faculty and students research, design, plan and fabricate projects to address living creatively and responsibly on an increasingly fragile planet. The work explores the relationships between our disciplines of Architecture and Planning and related fields, but also seeks to forecast and experiment to inform and address the challenges and opportunities facing the communities we serve and the environment.

Robert Shibley, FAIA, AICP
Dean, School of Architecture and Planning

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The Bachelor of Science in Architecture (BS. Arch.) is a pre-professional baccalaureate degree. Students in their freshmen year develop skills in drawing, modeling and full scale prototyping. Their sophomore year introduces them to historical precedence and building typology and how these can be a basis for architectural design. In their junior year they study the integration of building systems and how that influences the architecture's program and responsiveness to environmental factors. In their final year as seniors they are tasked with developing a multi-housing scheme from concept to construction details. The BS. Arch. is designed to instill concepts and skills and complete all prerequisites for entry into a two-year accredited professional master of architecture (M. Arch.) degree program.

Traveling can enhance architecture students' awareness of the world and bring them closer to understanding global diversity and appreciating what is universal and unique to a culture.

The School of Architecture and Planning offers exchange programs, study abroad programs, and global summer studios each year at international locations. Exchange programs and summer study abroad programs are offered on a regular basis. Global studios are offered each summer at differing locations from year to year in order to provide the most diverse studio opportunities for students.

In 2010, the School of Architecture and Planning offered summer studios in Barcelona, Tokyo, Costa Rica, and London. Annual opportunities to spend a semester abroad are made available in locations such as Denmark, Belgium, and Germany.

The Bachelor of Arts in environmental design provides students with the skills to understand, analyze, and solve problems associated with urban development and the design of sustainable environments. Environmental design applies knowledge of social science and design to plan and develop community environments that affect, and are affected by, human behavior. While concerned about humanity's use, misuse, and abuse of the natural environment, environmental design is also concerned with the planned environment which humans build - the "artificial" or designed physical environment - and its ability to meet community needs.

The Master of Urban Planning (M.U.P.) program at the University at Buffalo intends to prepare students to become versatile and ethical professionals capable of excellence in meeting the challenges set out above. We provide such capabilities through instruction in theories and methods of planning, planning practicums, and exposure to specialized fields within urban planning, including urban design; community development; international and economic development; environmental planning; and, geographic information systems. We are committed to growing excellence in conveying such capabilities, doing so in ways that engage students in issues of diversity, and extending our teaching to students of diverse backgrounds. Along with the dual M.Arch./M.U.P. with the Department of Architecture, the Department of Urban and Regional Planning inaugurated a J.D./M.U.P. Program in conjunction with the Law School during academic 2006-2007.

The 3.5 year track offers students with a bachelor's degree in a field other than architecture an opportunity to obtain a Master in Architecture. The initial four semesters of a core studio sequence introduce students to the values, issues, and methods of architectural design. Projects address technical, social, environmental, and aesthetic problems related to decision making in design. Upon completion, students are presented with the opportunity to study through a Graduate Research Group of their choice. The non-sequenced, upper-level studios develop positions and skills as they relate to design process, synthesis, and evaluation. Each advanced studio is organized around the study of a specific building environment and/or design issue.

UNDERGRADUATE ARCHITECTURE

STUDY ABROAD

URBAN AND REGIONAL PLANNING

3.5 YEAR - M ARCH

THE LIVING WALL

GRIFFIS SCULPTURE PARK

One hundred first year architecture students designed and fabricated 14 full-scale structures that they occupied for a period of 24 hours. Together these structures form a 100 foot long wall that was subsequently opened to the public. This experience of designing, building and then inhabiting has enabled the students to better understand the consequences of their decisions and to explore the successes and shortcomings of their designs. Each unit was designed to accommodate a simple program; a minimum of three sleeping areas, enough space to walk around and stand upright, and an entry condition.

The Living Wall as an educational project was an exploration into lightweight wood-frame construction, modularity, prefabrication and minimal / temporary living conditions. The finished Wall has acted as a social sponge as it invites visitors to explore every facet of its dense layering of inhabitable spaces which aggregate to suggest a slice of urban fabric in a sparsely populated context.

As the projects developed and students recognized that they would be installed outside for a period of at least six months, critical issues of shelter, drainage and securing to a firm foundation began to force the students and their designs to respond to real life issues that architects struggle with on a daily basis. Professional engineers from the area volunteered their time to help structure the projects and ensure they would remain safe for the duration of installation. Individual units were designed with neighboring structures in mind, allowing the design teams to consider ways in which the shared boundary or parti-wall condition could enhance the structural, spatial and social aspects of the Wall as a linear community of micro-dwellings.
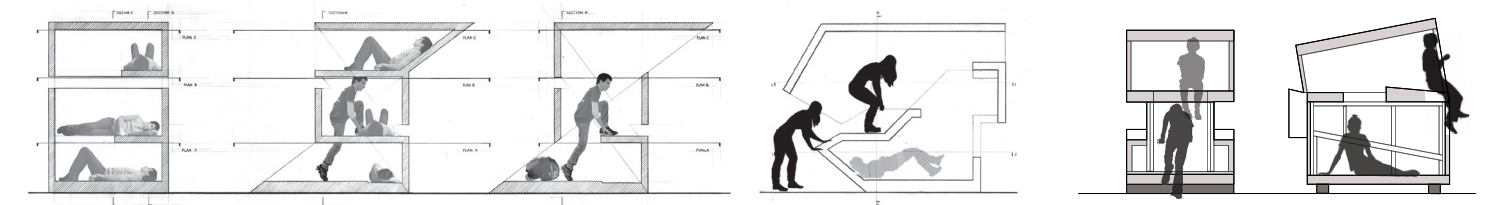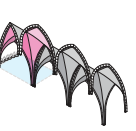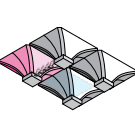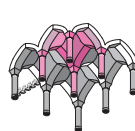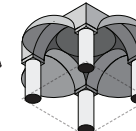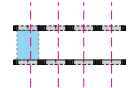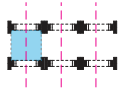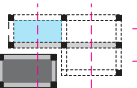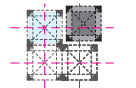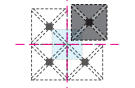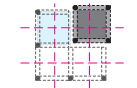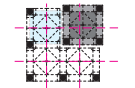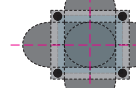
Occupancy Sections

MODULAR MOSQUE

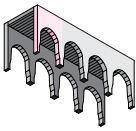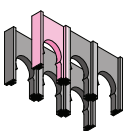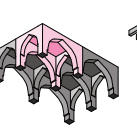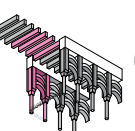|										
MODULE										
DESCRIPTION	MONOLITHIC ARCH SYSTEM CREATES A SPACE WHEN THE MODULE IS JOINED TOGETHER IN A PARALLEL CONFIGURATION.	HORSESHOE ARCH SYSTEM CREATES A SPACE WHEN THE MODULE IS JOINED TOGETHER IN A PARALLEL CONFIGURATION.	POINTED ARCH SYSTEM CREATES A SPACE WHEN THE MODULE IS JOINED TOGETHER IN A PARALLEL CONFIGURATION.	COLONNADE SYSTEM CREATES A SPACE WHEN THE MODULE IS JOINED TOGETHER IN A PARALLEL CONFIGURATION.	GROIN VAULT SYSTEM THE UNIT BY ITSELF CREATES A SPACE FOR ANY PROGRAM THAT THE MOSQUE CAN PROVIDE	DEEP VAULT SYSTEM THE MODULE NEEDS TO BE USED IN CONJUNCTION WITH THREE OTHER UNITS TO CREATE THE SPACE INTENDED FOR PRAYER	DOME VAULT HYPOSTYLE SYSTEM THE MODULE NEEDS TO BE USED IN CONJUNCTION WITH THREE OTHER UNITS TO CREATE THE SPACE INTENDED FOR PRAYER	GROIN VAULT HYPOSTYLE SYSTEM THE MODULE NEEDS TO BE USED IN CONJUNCTION WITH THREE OTHER UNITS TO CREATE THE SPACE INTENDED FOR PRAYER	DOME VAULT HYPOSTYLE SYSTEM THE MODULE NEEDS TO BE USED IN CONJUNCTION WITH THREE OTHER UNITS TO CREATE THE SPACE INTENDED FOR PRAYER
PLAN										
DIRECTION TO MECCA	UNIDIRECTIONAL	UNIDIRECTIONAL	UNIDIRECTIONAL	UNIDIRECTIONAL	NON-DIRECTIONAL	NON-DIRECTIONAL	NON-DIRECTIONAL	NON-DIRECTIONAL	NON-DIRECTIONAL
PROGRAMS MOST COMMON PROGRAMMATIC PURPOSES	ENTRANCE PRAYER HALL	ENTRANCE PRAYER HALL MIHRAB	PRAYER HALL	PRAYER HALL MIHRAB	PRAYER HALL	PRAYER HALL	PRAYER HALL	PRAYER HALL	PRAYER HALL MIHRAB

Parametrically Defined Components

Oriented toward Mecca, the mosque is an ever-growing organism that represents unity in prayer. Modularity is of great importance in mosque design. A mosque that is built based on modules allows for expansion when necessary while at the same time always appearing to be a completed structure. Replicable units are used to reinforce the building's orientation. This is particularly evident in the structure of the hypostyle hall as it follows a grid-like pattern defined through parametric constraints. Growth is determined by the needs of the community and may be in response to population increase, need for schools, public services, or the housing of pilgrims.

Programmatic Growth Diagram
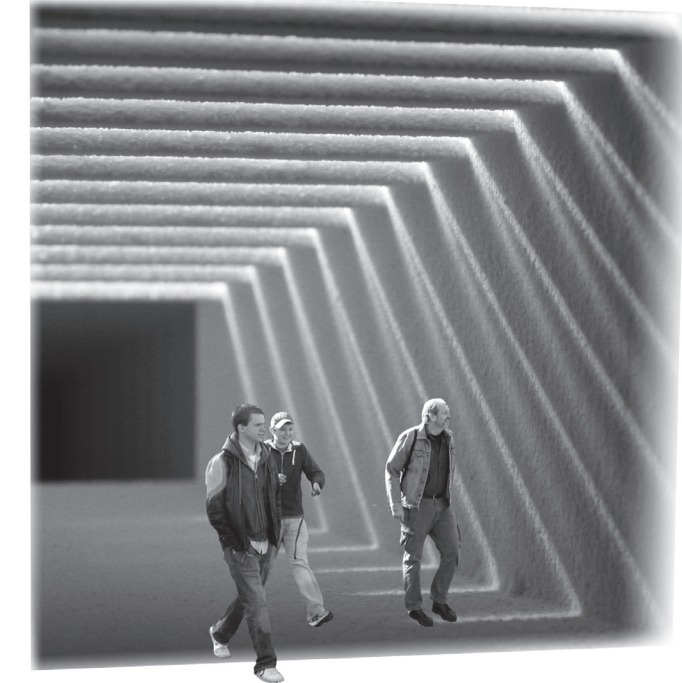
Programmatic Section
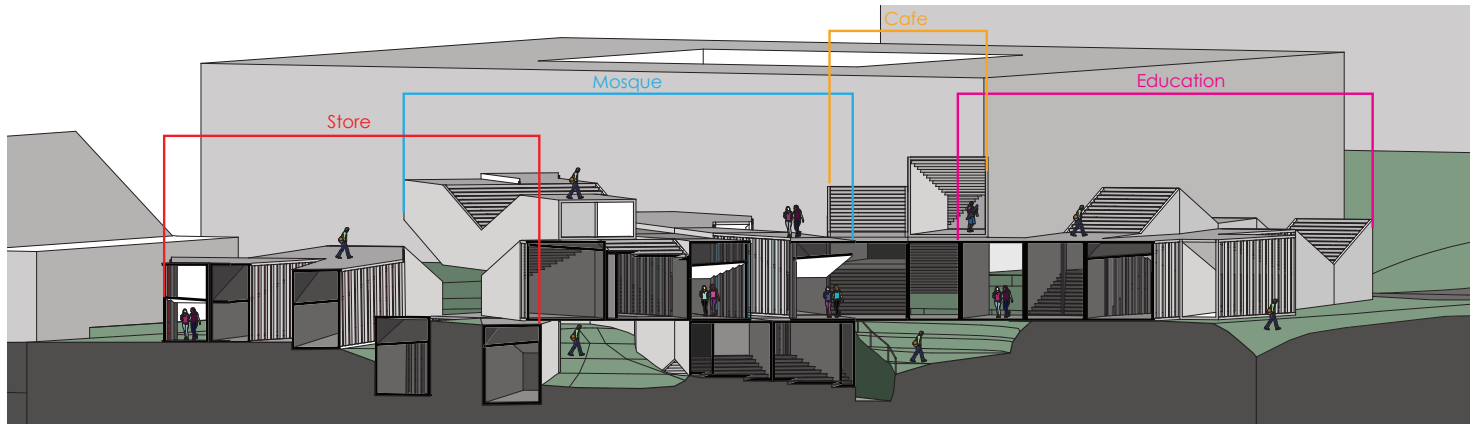
PERFORMATIVE FLOCKING

Beginning with the study of flocking birds, this project is based on interconnected systems whose performance could adjust with changing environmental conditions. Formal relationships established within the building are the culmination of environmental, structural, and spatial relationships working in unison to create a performative space. The primary study of the project was natural lighting, utilizing a field of electrochromic panels that rotate and change opacities dynamically based on real-time data.
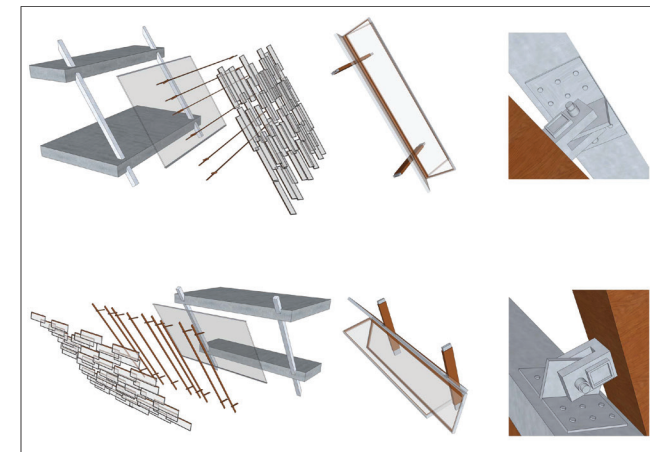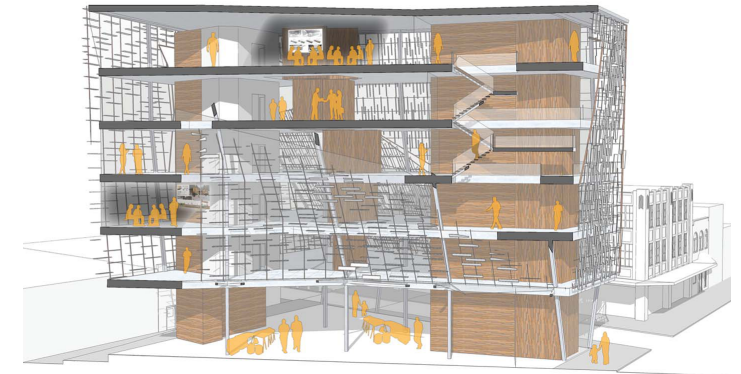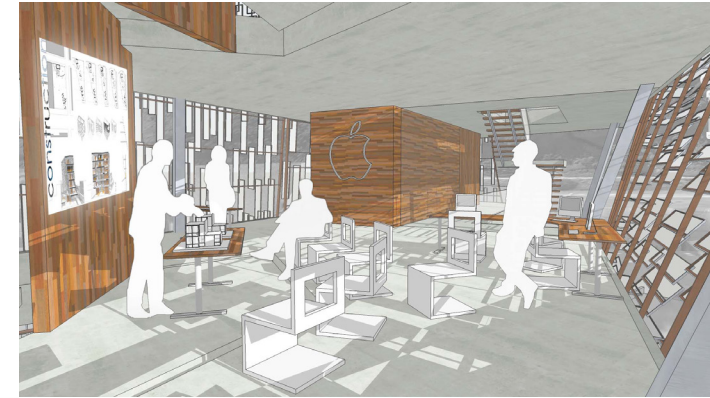
Construction Details
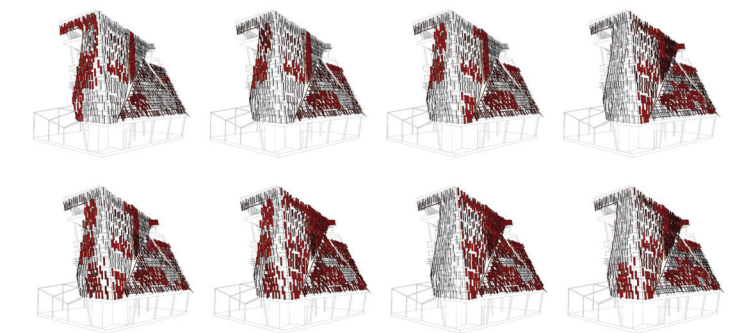
Panel 'Flocking' Patterns

The building at its foundation is a simple form, connected by an undulating field of panels. The creation of such a field transforms the building's façade from a simple barrier into an undulating skin. The ability for the façade to change creates a direct relationship with the occupant. Consequentially a relationship between the building and the surrounding urban context is formed. This relationship, comprised of the densities of people and the density of panels, allows for a visual connection between the function of a space and the viewer. Extending beyond the realm of simple visual permutation, the panels directly influence the environmental performance of the building, giving rise to a multitude of potential interior conditions.

Natural Lighting and Ventilation Diagram

FOLDING SPACE

Aerial Site Map

30'   30'
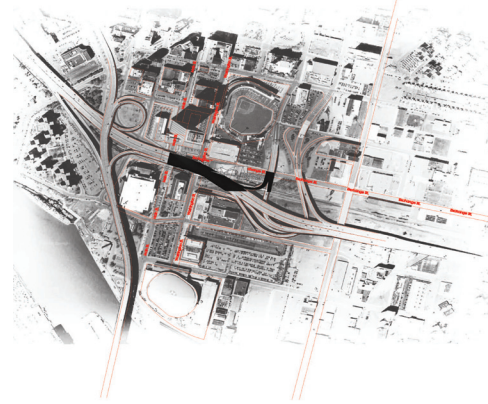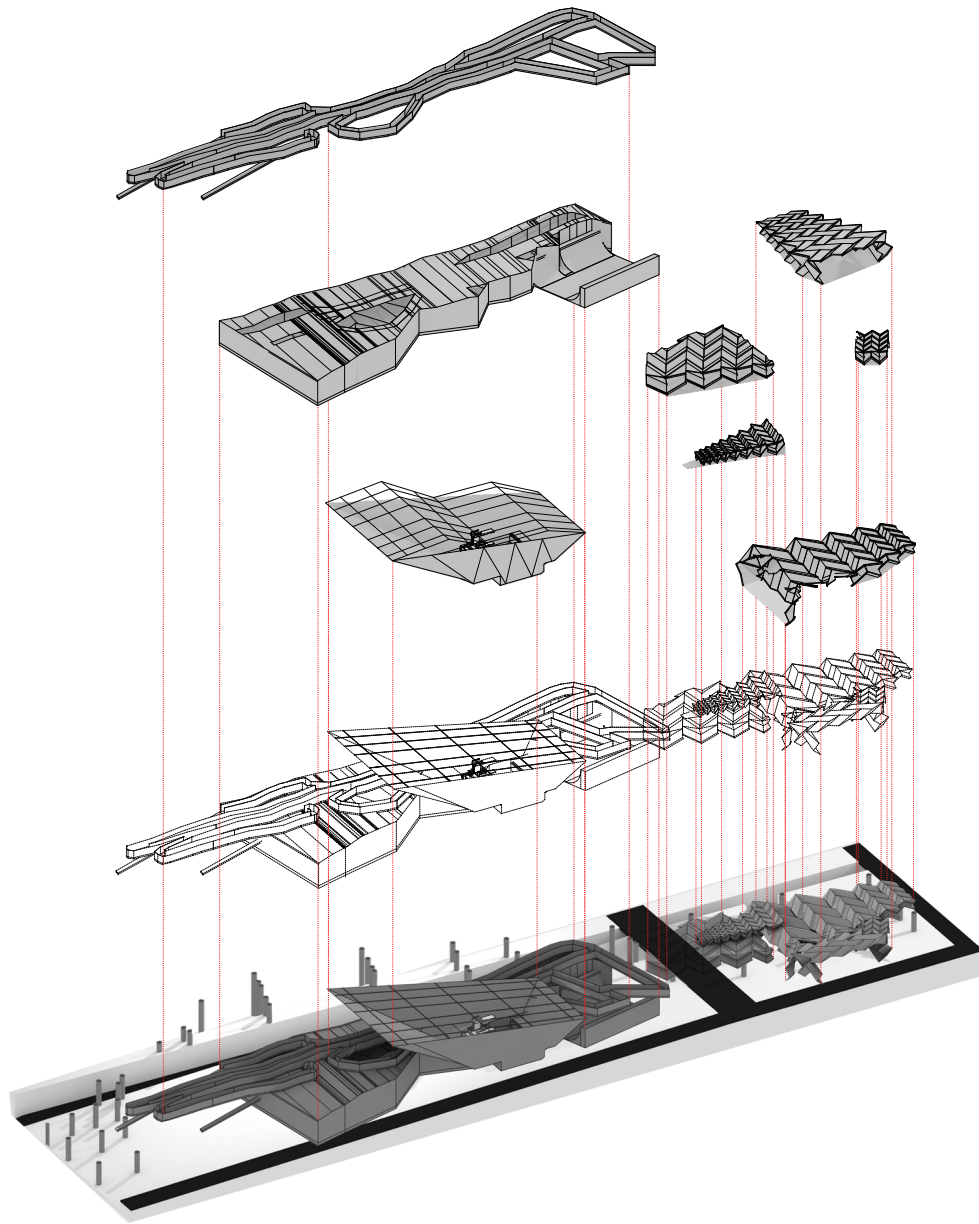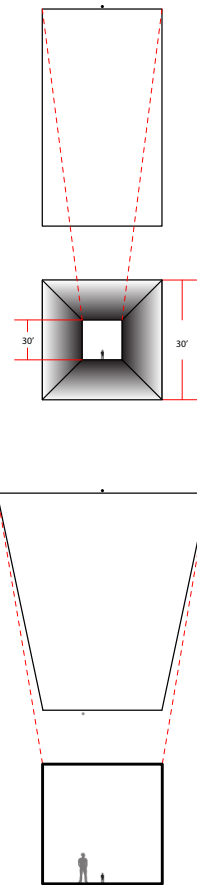
Generated Perspective Through Voids

The human eye perceives the world in perspective. Using this perspectival experience to delete space, this project begins with the mapping of downtown Buffalo based on three points taken from under the highways. The results are tapering spaces that could be studied to determine what space can be temporarily erased. From this study a transportation hub was generated integrating the concept of deleting depth with various levels of activity. Programs chosen to be included on the site include a BMX bike park, a cross-country ski trail and a high dive arena, each with a different speed and direction of movement to their space. Folded concrete was used as the structural system and influences types of landscape, ground plane, and glazing systems used.
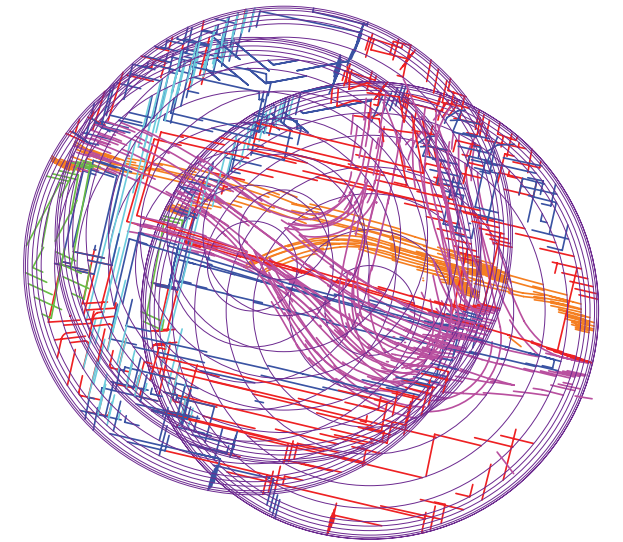
Perspective Mappings

USELESS
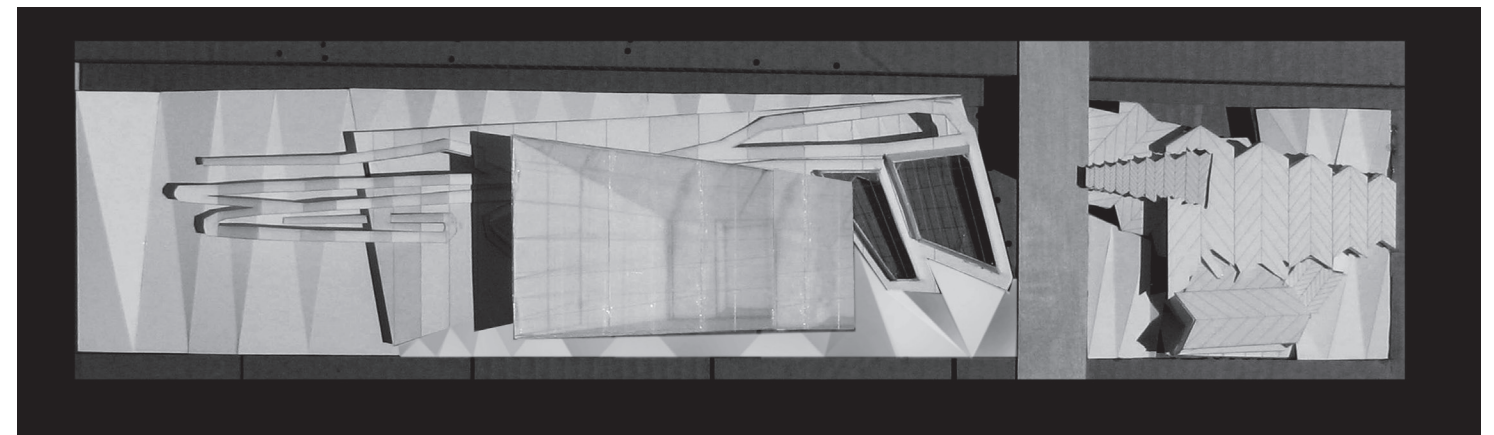
Huberman argues that an artist can use information in different ways in order to pique the viewer's interest. This information may be dispersed, private, not enough or too much. While Huberman discusses this idea of "too much" in relation to art and information, it can also be applied to urban design.

Buffalo is a city built that was built on "too much." In the late 1800's and early 1900's, Buffalo was a growing city defined by industry. As the city prospered city planners began to prepare to accommodate this expansion and allotted space for new buildings. Construction of large and overly elaborate buildings continued as the city boomed. Buffalo was building "too much" in order to accommodate for future needs.

With the opening of the Erie Canal and the collapse of heavy industry, Buffalo population began to decline and a portion of the city became useless. Excess on the urban scale creates spaces where use is less clear. Although these spaces may not be altogether useless they create such conditions that allow for adaptations to their use. Buffalo is clearly maintaining this idea of "too much" within a city context, but it has not seized the opportunity provided by "too much" and pushed forward. A city of "too much" allows for potential when considering uselessness. The following are examples of this phenomenon.
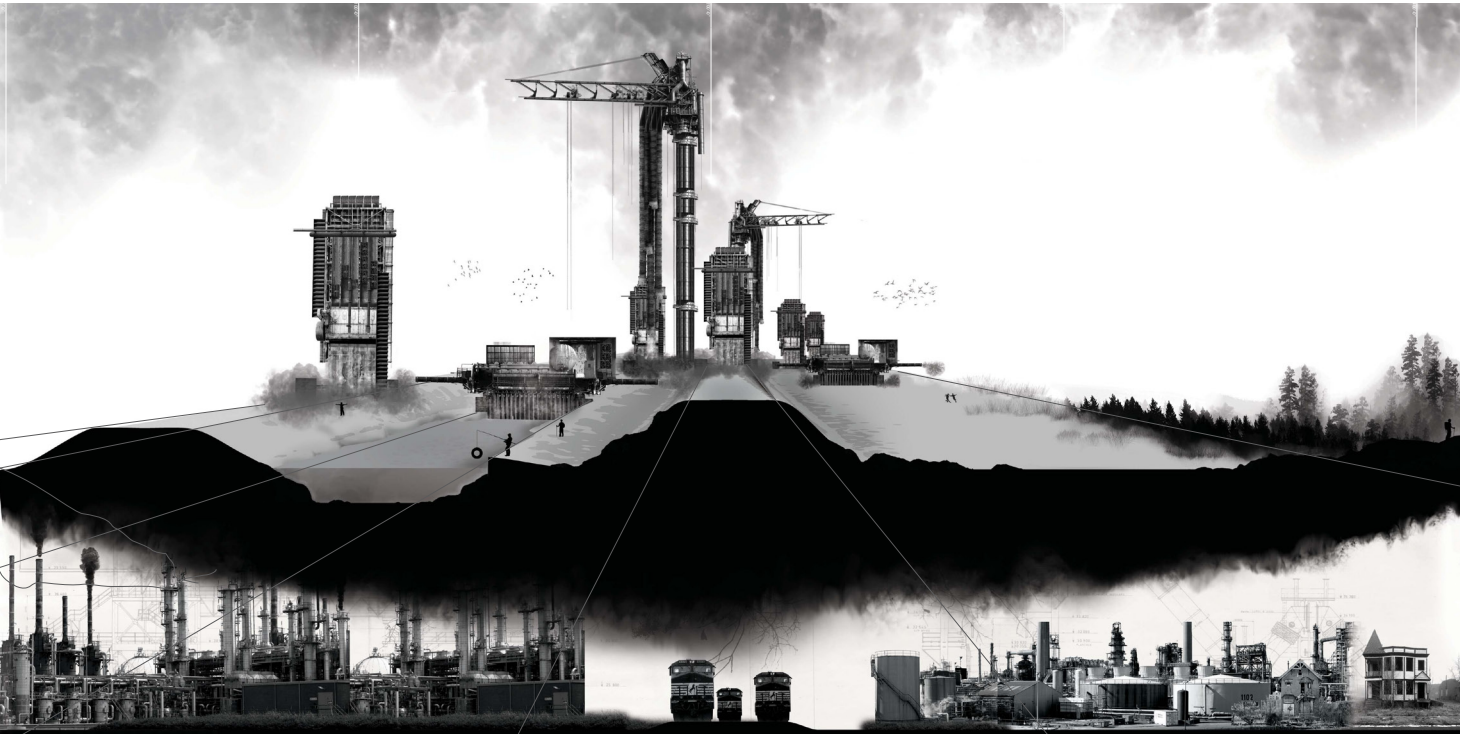
Buffalo Central Terminal was built with a very specific architectural organization and for a particular use. It was built on a grand scale to accommodate 200 trains per day. But with the switch from trains to other forms of travel, the anticipated volume of trains was never realized. Quickly the Central Terminal became useless. City Hall was built for the expansion of government operations as they related to the growth of Buffalo. When this growth did not occur as expected the size of City Hall became "too much."

During this time of industrialization, the parks played a vital role in alleviating the density of the city. Olmstead designed the parks as unprogrammed areas of land used to escape from the highly industrialized city. Each of these parks was specifically designed for their site and conditions. The parks were built for the city as it existed at the time, for a city of half a million and growing and like the rest of the city they were built to be too much so that at some point they would be "enough." But with Buffalo no longer about industry, the "too much" that was once a good thing for the parks, never reached its full potential. While the excessiveness of the parks in Buffalo is not immediately apparent, the parks were built with a growing population in mind. According to the Urban Land Institute, every 1000 people within a city require 2.8 acres of park. This means that according ULI standards, Buffalo currently has an excess of 514 acres. Excess space becomes antagonistic to program and induces new readings of space.

The project focuses on the potentials afforded by excess. The Winchester House uses a smaller scale environment to demonstrate how too much leads to the playing out of a multitude of conditions, encouraging the redundancy of program to achieve a set of ever changing programmatic conditions. Similarly the proposed park does the same thing at the landscape level. It enacts a particular set of functional roles that are continuously played out to reject stasis:

a] to create uselessness through excessive construction and deconstruction;
b] the potential temporal use of such excessive instances;
c] the realization of a beginning and ending function; and
d] the adaptation to change and the realization of new use.

Outward Constructor

Buffalo City Plan

Upward Constructor

The use, the rate of activity, the area of activity, and the different types of functions within the park are formed as a response to the activities of three mechanical objects that work within the urban context of Buffalo:
a] Outward Constructor
b] Upward Constructor
c] Destructor

Illustrated here, these three mechanisms work within specific limits. They are designed to be in conflict with one another and to enable the intersection of boundaries.

Destructor
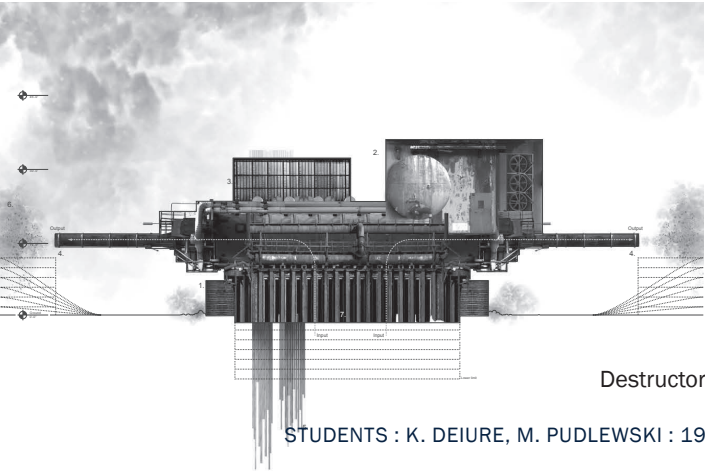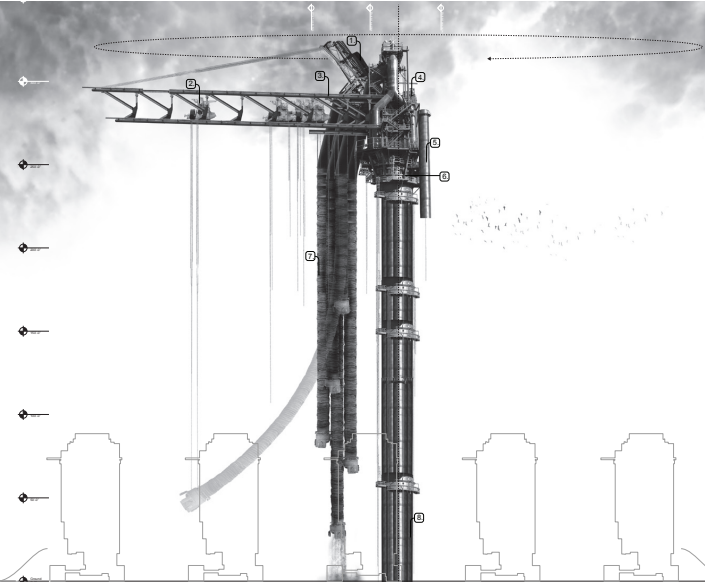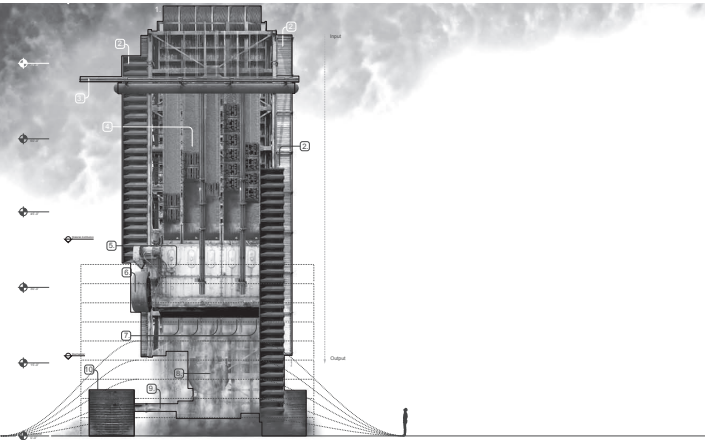
18TH STREET PARK

The 18th Street Park & Totem Fence Project is an effort to bring the families and residents of Buffalo's West Side together to make a permanent piece of art reflecting their diversity, energy, and the promise of the area. The Park is located on the corner of 18th and Rhode Island Streets, adjacent to the Urban Roots Community Garden Center, a new cooperatively-owned business. The Park is envisioned as a unity project, directly connecting the neighborhood and the Garden Center, but also connecting UB with the community, and unifying the block with a sustainable landscaping program. The project began in 2006 when Cynnie Gaasch and Harvey Garrett of the West Side Community Collaborative (WSCC) / Greening Collaborative asked the Small Built Works Program to consider re-designing the badly neglected pocket Park. At that time, over 55% of the Park was hardscaped in concrete and the street furniture (benches, barbeque pit) had literally rotted away. It had long been a hang-out space for teenagers and drug dealers. Over the years, neighbors banded together to clean up the Park, remove broken-down components, and provide basic maintenance. The current project developed as a substantial public-private partnership with many contributing community entities including Making Fishers of Men & Women Youth Group, Five Points Bakery, Pilgrim St. Luke's, West Side Empowered Blocks, Peace of the City, Urban Roots Community Garden Center, the 18th Street Come-N-Unity Block Club, as well as Councilman Bonifacio & Councilman Rivera's offices, and the Mayor's Office of Citizen Services.

Small Built Works students facilitated a multi-year visioning and design process and identified the following design goals: 1) make the Park green and sustainable; 2) make places for numerous small groups to gather; 3) make the design express the diversity of the neighborhood; 4) make the installed components as durable as possible and the plantings as 'maintenance free' as possible; and, 5) build a permeable barrier (wall or fence) between the Park and Garden Center. In addition to the overall design, UB students were specifically asked to provide an appropriate setting for 6.5"x 6.5" terra cotta tiles, hand made by local children and residents in the studio of artisan Nancy Gabriel. Three design criteria were established for the fence: a) provide good security for the Garden Center; but also, b) that it be as visually transparent as possible; and, c) provide an appropriate substrate for the hand made tiles. The new fence replaces an existing stockade/chain link fence that was falling over and regularly getting tagged.

The primary design concept is a linear east-west 'scrape' of concrete planks, alternating with 5-inch gaps. This strategy produced a Fence that is very hard to climb, but has a visual transparency of 35% open area. Perceptually, the Fence creates a full-scale flicker film for passers-by. Literally, two center-pivot gates (that are totems themselves) allow the whole block to be thrown-open, permitting free east-west movement between the two green environments.
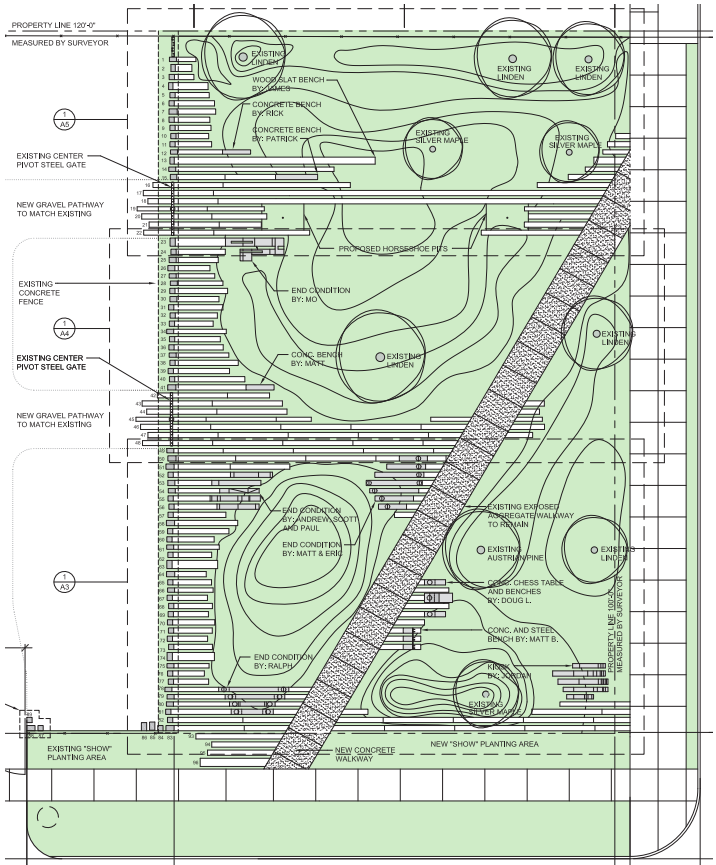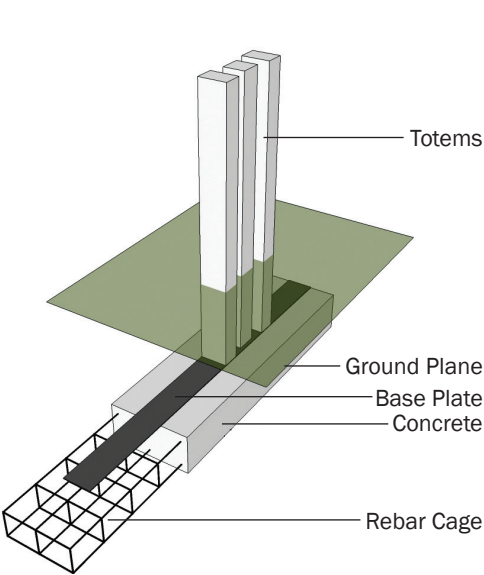
An important concept of the Totem Fence & Park was that there actually is no 'barrier' between the Park and Garden Center because the fence is literally part of the design of the Park. The linear, site-cast paving planks emanate directly from the Totems. The percentage of concrete flatwork has been reduced to 15%, all of it permeable so that no rainwater run-off from the site will reach the City's combination sewers. Working with Dave Majewski, the landscaping calls for all native plantings that will not need watering or maintenance after the first couple years. The design also includes organically composted soil and edible berry bushes.

18th Street Park Master Site Plan

Each plank in the fence was considered a singular piece of art, a 'Totem', and just as the neighborhood children were given a finite amount of clay to form into a tile, UB students were given finite quantities of concrete and steel to fashion. Each Totem incorporated a limited palette of materials: a) exposed aggregate concrete in three plan configurations ranging in height from 6.5-foot to 8-foot tall; b) one or more hand made tiles; and, c) a piece of plate steel 3/8 inch thick by 1-foot by 4-foot. Twelve reusable 10-foot plate-steel forms, and 85 rebar cages for inside the totems, were fabricated in the UB Shop and used to pre-cast 85 half-ton Totems at Great Lakes Concrete. The choice of exposed aggregate purposefully allowed the Totems to be further fashioned in the field; for example, if one of the pieces was chipped, the imperfection could be hammered out. The hand-hammered surfaces turned out to be even more plastic than the formed areas. This is also a maintenance strategy in the event of future tagging or other vandalism. The permanence of the construction signals that this neighborhood is substantial, and will enjoy a long-lasting piece of collaboratively-produced public art.

AARHUS

SEMESTER ABROAD : ARKITEKTSKOLEN AARHUS, DENMARK
STUDENT : A. PERKINS

Deployment Diagram

Trailer Plan + Elevation

The trailer is structured through the use of a welded steel frame and clad with 0.5 mm aluminium sheet. The size of the trailer was highly considered in the design, both for its properties pertaining to weight and portability. While a fabric vessel was considered for its light weight construction, security constraints suggested a more rigid, durable structure. When collapsed, the trailer stands at 1.2 meters long while the rear hatch unfolds to form a sleeping bay measuring 2 meters in length.

It was my birthday. I had landed in Copenhagen, Denmark, my feet hitting foreign soil for the first time. I made it, separated by thousands of miles from everyone I knew, being independent and loving it – that is, until I went to buy my train ticket to Aarhus. Where and when my wallet had gone missing is unknown, but it left me penniless, alone, and in the wrong city. Through the help of several generous and sympathetic strangers, all of whom struggled to understand my mangled pronunciation of "Aarhus," I was able to make it to the apartment that had been arranged for me.

As strange as it might sound, I wouldn't have had it any other way. I had gone to Denmark to not only to learn as a designer, but as an individual. The experiences I had endured have made me more resilient, resourceful, and more ambitious than ever before. Through my studies abroad, I now have close friends from all around the world and have worked internationally through internships attained while abroad.

While my opportunity to travel was provided through an academic venture, I certainly could not overlook the possibilities to explore new cultural experiences. Given four weeks to pursue an independently designed project, I capitalized on the opportunity through an expedition to Scandinavia. Embracing the prevalent cycling culture of Denmark, I proposed to design, build, and deploy a portable shelter which could be taken in tow throughout my journey. Upon constructing the shelter, I set out on a two week expedition across the countryside, immersing myself within the landscape. As I roamed the Danish countryside, I could not help to think that despite all the hardships I endured I genuinely had the best six months of my life.

-Andrew Perkins

24 : ARKITEKTSKOLEN AARHUS, DENMARK

STUDENT : A. PERKINS : 25

BARCELONA

-J. Ma

The Barcelona Program offers an immersive academic experience which is comprised of one design studio and two elective seminars. Students live in Barcelona, become residents rather than tourists, and use the city as laboratory and classroom. Students are housed in rented apartments in the Gothic Quarter, and thus can set up their own household for living and work. Studio projects, seminar topics, and assignments directly relate to the city, its distinctly Catalan culture, its way of doing architecture, and the messages that its physical environment speak.

This studio examines Barcelona in its depth and height, focusing on the concept of section as embodied by such elements as the roofscape of the city with its many distinct fabrics, the dense medieval quarter with its rumpled cornice line, the vast Cerda-grid expansion with its unyielding regularity, and now, the "posts" popping through the city's mat in groups or alone; there is also the Roman City of Barcino lying some five meters underground. The seminar courses focus upon learning from the "un-designed" and upon recording and representing the perceptual and phenomenal aspects of this complex urban environment.
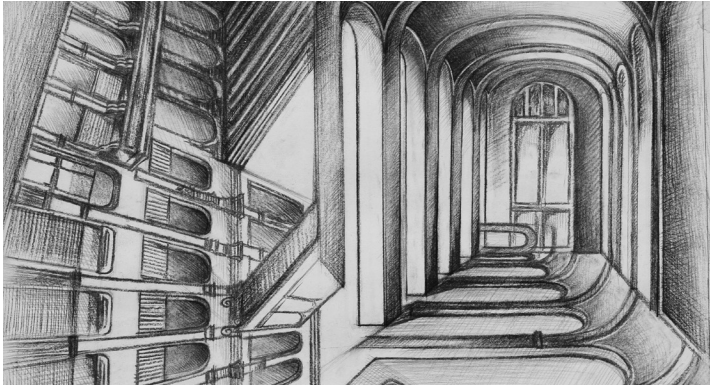
-N. Marple

-L. Schmitz

-B. Wu

-M. Bohan

TOKYO

-A. Costanzo
Micro-Dwelling for an Introverted Writer
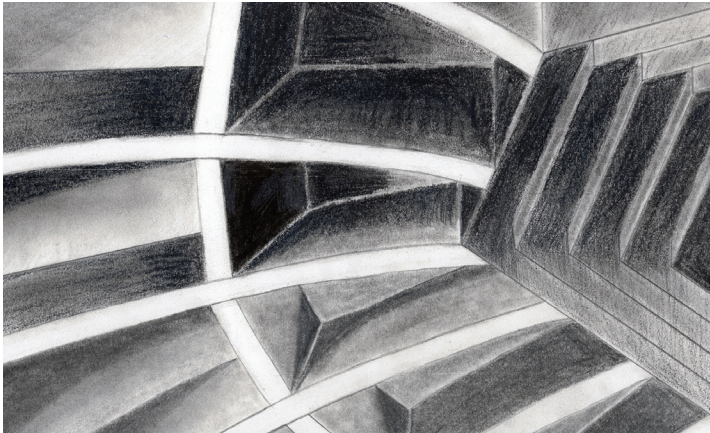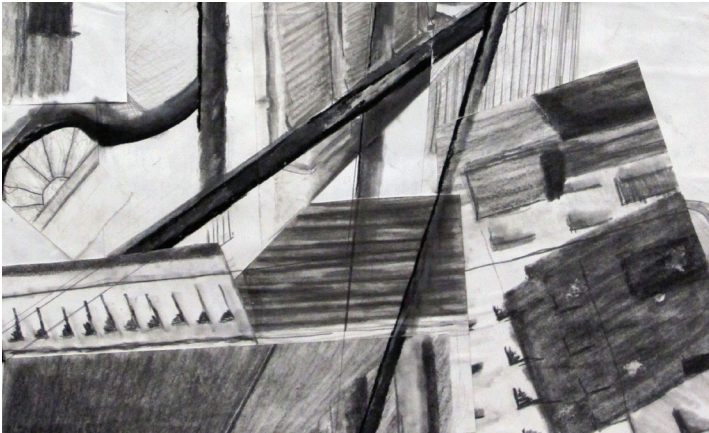
"In Tokyo there is no language of urban form or binding by geometry. Events (and non-events) occur with such randomness and frequency that patterns and hierarchies cease to be discernable. Order is not visual, although it is present as a complex code programmed by the media and tradition. Objects and buildings float in the 'field' - lifeboats and pleasure yachts, sinking, drifting, always at peril in the urban storm."

-Peter Wilson, Western Objects, Eastern Fields

Bernard Rudofsky's book *Architecture Without Architects* catalogs a series of examples of how various fluctuations in nature have created unique formal and spatial compositions. While these 'fluxes' were in particular those born of the elements and of the earth, we can apply Rudofsky's notion of natural organization to the modern fluxes of the city. Due to the combination of extreme density and a cultural preference for the single family house, Tokyo has a rich body of structures built on awkward, compact sites with multiple, often conflicting programs. The majority of these buildings are essentially architectural coincidences rather than forming a part of the "designed" city. The goal of the studio and seminar is to explore the latent design potential inherent in such entities. Studio projects are short in nature (6 projects in 9 weeks) and are inspired by a multitude of sites around Tokyo, with an emphasis on resolving difficult spatial and programmatic challenges in a complex and dynamic urban environment.

Students are arranged in small groups, living within apartments dispersed throughout the city. Class time is predominately held in-situ, with an emphasis on exploration and cultural exposure. The program features a week of travel on Shinkansen (high speed rail), allowing students to visit some the of country's most significant historic architectural sites. Destinations include Ise, Nara, Kyoto, Osaka, Hiroshima, Fukuoka, and Kanazawa.
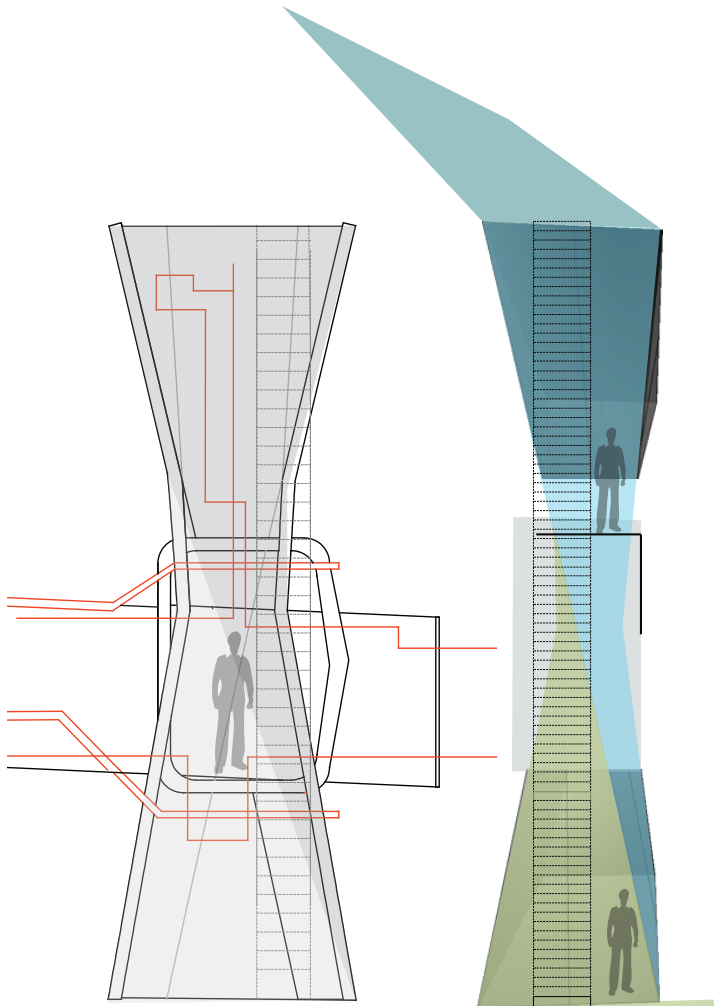
-E. Saleh
Micro-Dwelling for an Introverted Writer
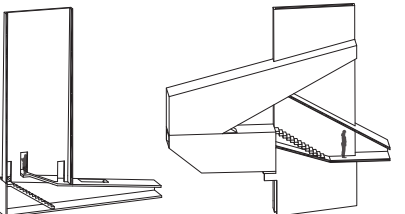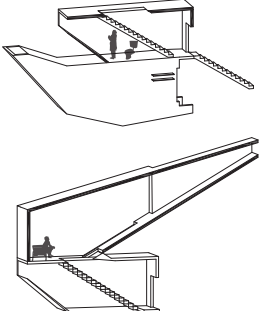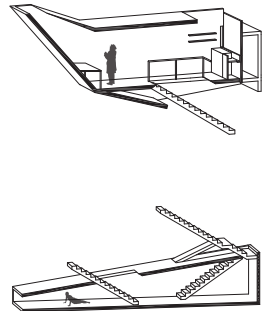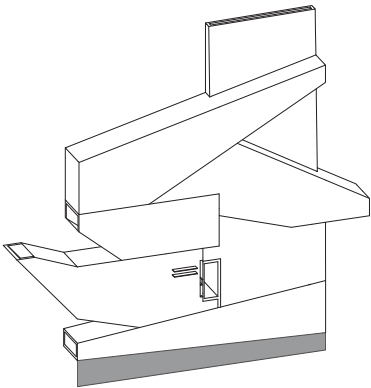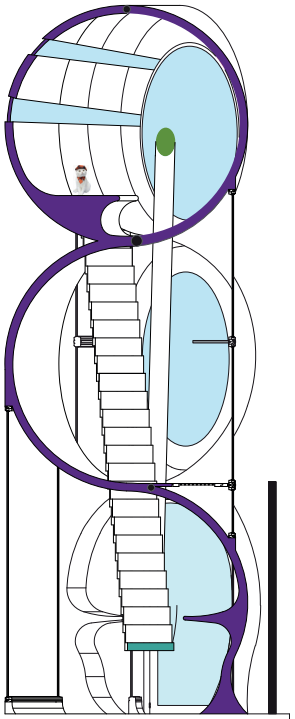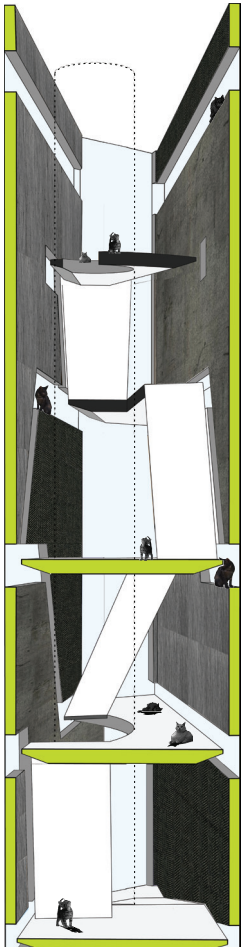
-M. Waters   -M. Gregory   -J. Tingue   -J. Lanctot
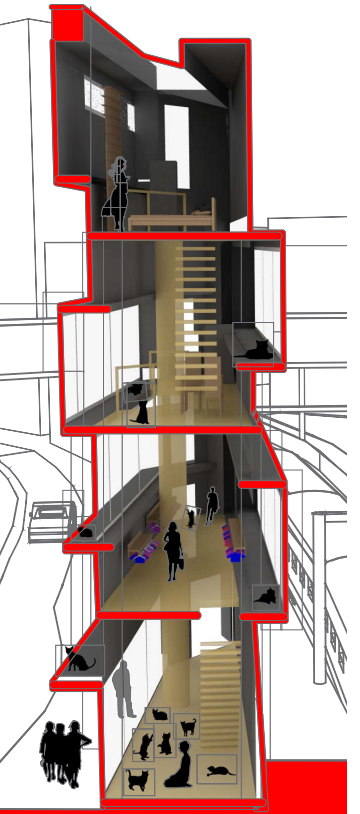
Studio and Retail Space for a Designer and Her Nine Cats

COSTA RICA

Sustainable Futures is an interdisciplinary program in architecture, landscape architecture and planning involving five university partners and the Monteverde Institute. The ten week course offers students the opportunity to live and work in a rural, but rapidly developing region on the Pacific slope in Costa Rica. This is a "service learning" engagement where studio work is focused on projects identified by the community that are concerned with creating futures that are ecologically and socially just.

Site Plan

EDUCATION

ENTERTAINMENT

PERFORMING/FINE ARTS

HEALTH

COMMUNITY INVOLVEMENT

RECREATION

FROM THE PAST TO THE PRESENT
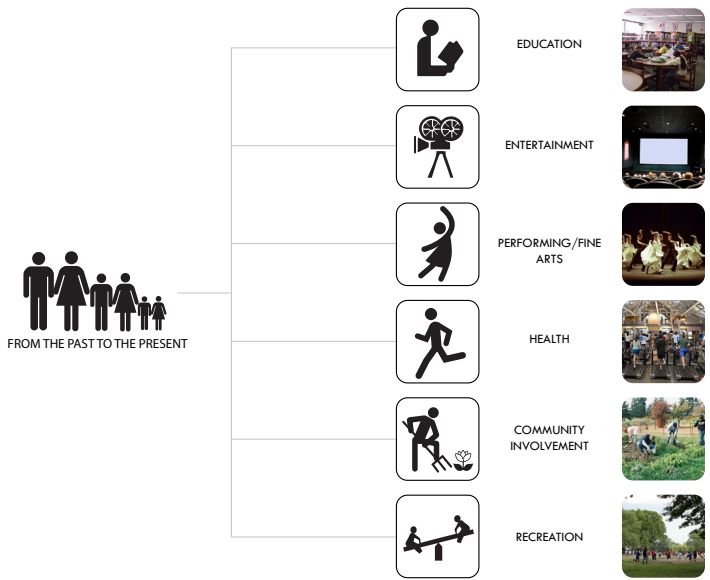
Programmatic Diagram
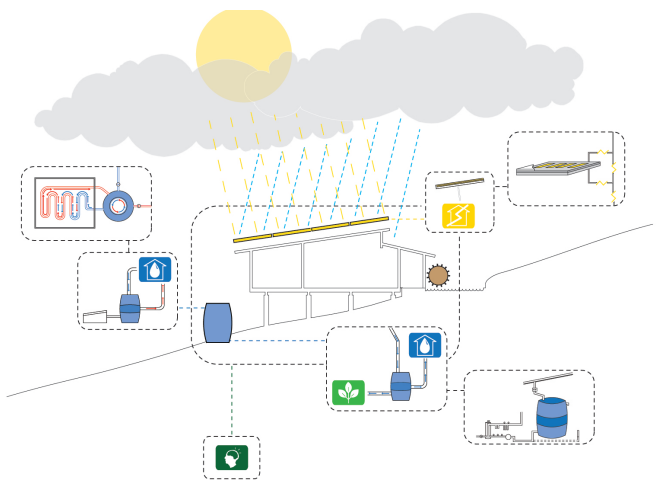
Active Systems

Teachers' Housing Long Section

EVAPOTRANSPIRATION

PRECIPITATION

INFILTRATION

EVAPORATION

Undisturbed Cycle

Educational Sundial

SOLAR SHADING

EVAPORATIVE COOLING
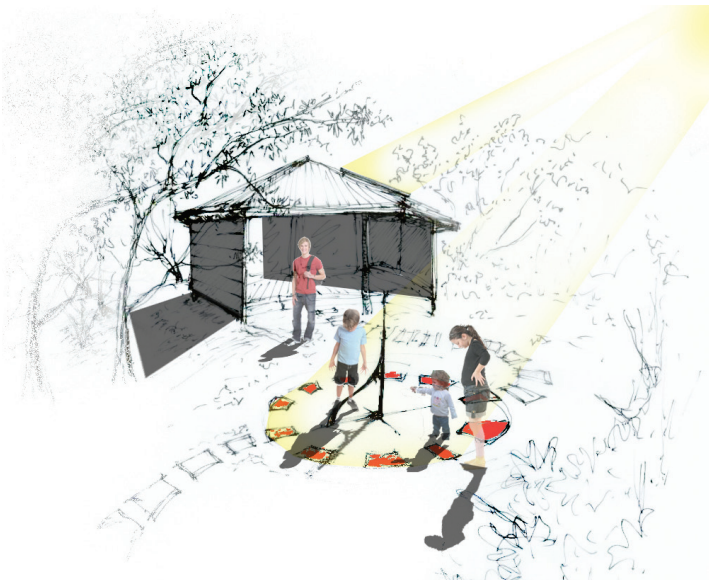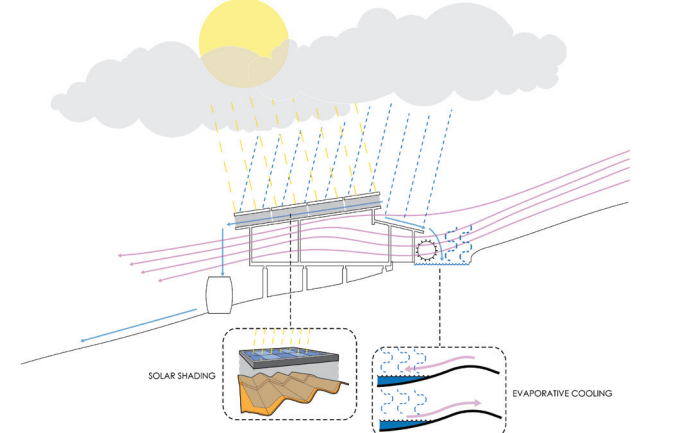
Passive Systems

Teachers' Housing Short Section

LONDON

This program compared urban sustainability planning and policy in Europe and the United States. M.U.P. and M. Arch. students spent ten days in London, exploring various pressures that London faces – including population growth, immigration, built environment, transport, air quality – and investigating how planners and government officials are coping with them.   The course included lectures, tours and site visits to Arup, Transport for London, University College London's Centre for Advanced Spatial Analysis, Terry Farrell and Partners, London's City Hall and Mayor's Office and London Underground. In addition a trip was conducted to Letchworth Garden City.

To appeal to the wide range of interests among MUP students, participants designed and conducted an independent research project focusing on a thematic area of their choosing, including sustainable communities, sustainable business, sustainable development, sustainable lifestyles, smart growth, green design and green buildings, non-motorized transportation, renewable energy, water supply and water resource management, pollution and toxics, agriculture and food, and education and environment.   These topics were then used to conduct a comparative analysis of urban sustainability planning practices between two organizations, one in the US and one in the UK.

Adaptive Reuse as a Tool for Urban Regeneration

The intention of this work is to compare the similarities and differences between urban regeneration tactics that are used as tools of environmental and social sustainability in the United Kingdom and in the United States. Urban regeneration has been a greater priority in the United Kingdom than in the US because of density in and around Central London. In the UK regeneration projects are part of regular practice whereas in the US regeneration projects as take on a case-by-case basis. The regeneration projects that do exist in the United States are those that have been driven by necessity in cities such as New York but more frequently regions turn their back on the inner city and choose to continue developing outward.

Islington on the Green Intersection of Essex and Upper Islington Boroughs London, England

The UK site that was studied is located in the Borough of Islington. Recently completed, Islington on the Green is a residential building that reused a 19th century façade that faces onto an historic park. This project addresses the need for residential properties in the borough.

Islington Green is a small park located at the convergence of Upper Street and Essex Road. (see Appendix for map) This park is all that remains of a larger public expanse of land that was not occupied by manors and other private holdings in the 17th century. Now Islington Green serves as an entrance from the Angel tube station into the town of Islington. In 2007 the park was rehabilitated to make it a more pedestrian and bike friendly place. New city wayfinding was installed and the street named Islington Green was partially blocked to traffic to create more of a piazza. During a personal visit of this site, the roadway now containing tables and chairs was heavily used and this appeared to have all age groups represented. There were several small groups of people having coffee together, while others were reading by themselves on park benches. There were a few small children there with their parents, while other foot traffic going through the site was of a variety of types of people visiting the local shops. This project lacks a social sustainability and disengages itself from the surrounding community.

Genesee Gateway Genesee Street between Oak and Ellicott Buffalo, New York, USA

The site studied in the United States is located in the Ellicott District of downtown Buffalo. This is one of the larger examples of renovations in the city as it is a whole city block of vacant buildings. These buildings were constructed between the 1860's to the 1890's to replace some earlier existing buildings. Since that time the economy in Buffalo has experienced radical change and because of this the buildings have been abandoned. Many Buffalo buildings have been abandoned for decades.

In reusing the buildings, the architect has also made an effort to replicate mansard roofs and facades where applicable and the buildings contain as much of the original brick as possible. New construction, such as a set of stairs in the rear of the building, as well as access from one building to another in the rear is quite evident. Unlike Islington, the new buildings that were created at Gateway were designed to imitate existing structures. Opportunity to introduce new design to the block as with the midblock building was ignored and instead designers chose to include a building that is trying to be both a new and a period building at the same time. Certain modern aspects are brought out quite well, but also are quite separated from the historic structure.

Simple planning in the Borough of Islington was a driving force behind Islington Green. The importance of saving historic structures and at the same time providing more housing is clearly defined as a priority. Is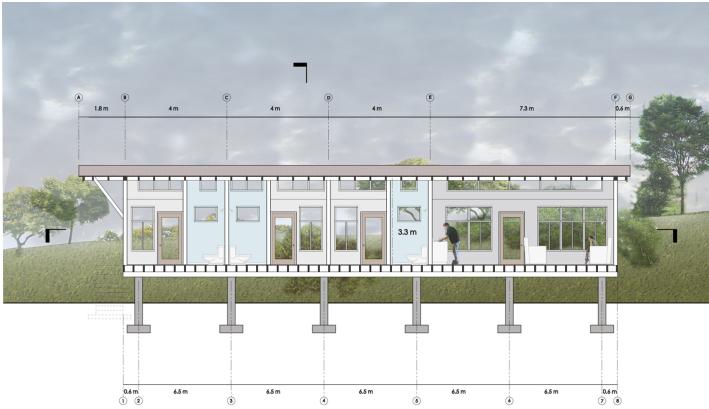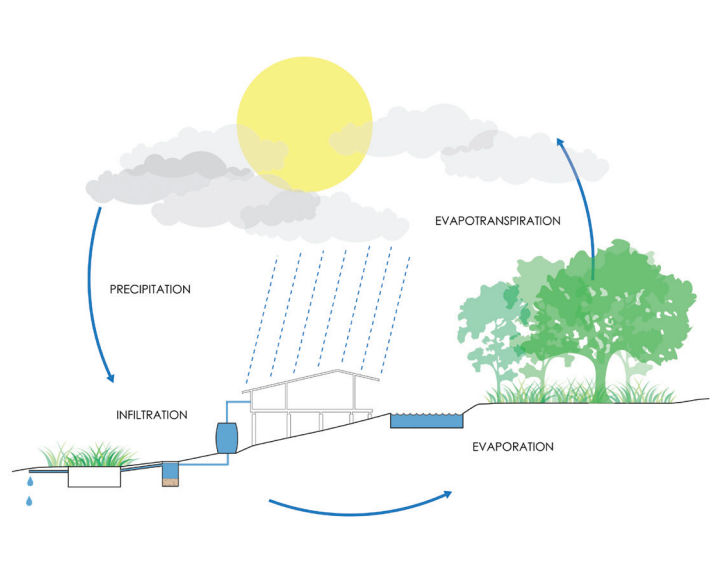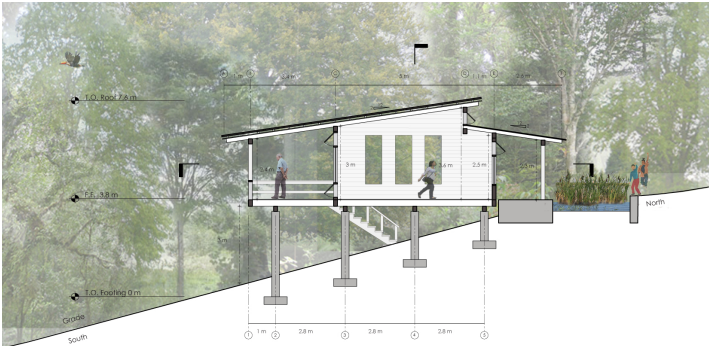lington's plans match the goals of the overarching London Plan and plans for the UK. In contrast, the US city of Buffalo, NY currently has retroactive planning with no specific plans for its abundance of vacant buildings.

The research engaged in for this project seeks to offer ideas for city planners that encourage design decisions made based on sustainable principles. By using the Borough of Islington as a best practice example, Buffalo can incorporate these ideas into its current attempts to rewrite its zoning code and other plans in the future. Both Islington and Buffalo have had a rise and fall in their economies and now Islington has recognized that they need to move on in a different direction. Buffalo and Western New York need to dramatically change their opinions about urban sprawl not only from an environmental sustainability perspective but from a socially sustainable perspective as well.

-C. Creenan

OBSERVING THE SHRINKING CITY

PD566/ ARC566 : URBAN DESIGN II : E. VANZ
STUDENTS : B. HADLEY, K. MASTALINSKI,
M. MOCH, D. NEAD

arrested decline:
Buffalo, NY | USA

BROADWAY FILLMORE

pre 1950:

Early Neighborhood Growth:
Polish-Catholic Community

Economic Growth and Peak:
Heavy Industry and Manufacturing

Loss of employment had the most significant impact on the neighborhood.

1950 - 60's

Demographics:

32,590 persons
27,527 persons/sq.mi.
92.4% white

Employment:
  55.8% heavy industry

Housing:
>5% vacancy

source: US Census Bureau, 1950 census

1970 - 80's

Demographics:

16,509 persons
11,931 persons/sq.mi.
68.6% white
30.2% black
1.2% other

Employment:
  34% heavy industry
  15% unemployed

Housing:
15% vacancy

source: US Census Bureau, 1980 census

1990 - present

Demographics:

10,631 persons
7,683 persons/sq.mi.
22.8% white
71% black
2.1% asian
3.9% other

Employment:
  14% heavy industry
  20% unemployed

Housing:
27% vacancy

source: US Census Bureau, 2000 census

1925

1950

1980

2010

"Is our American obsession with growth so pervasive that a community would rather fail at being large than succeed at being small?"
-D. Kildee

A recently popular topic of discussion in urban and regional planning discourse is that of shrinking cities. A handful of such cities are experiencing rapid population decline (take for example cities such as Detroit, Cleveland, or Buffalo, which exist in what is commonly referred to as the 'rust belt,' where the original motivating force of industry has evacuated). Abundant presence of swaths of inexpensive land around these cities, coupled with the convention of the automobile, has led to extensive sprawl, where as metropolitan areas shrink as suburbs expand, things spread out, and the subsequent low density threatens economic and social vitality. Shrinking is imminent and action must be taken or these cities will continue to shrivel and eventually starve themselves into extinction.

People need to acknowledge and adopt the perspective that there exist many opportunities in shrinking cities. For instance, shrinking cities offer existing infrastructure; streets and utilities such as sewer, gas, electric, and water save on the cost of development. Over time, with proper incentives and investment, shrinking cities could reconfigure the distribution of their populations. Any infrastructure deemed antiquated could be overhauled or redeveloped in order to better suit the needs of modern times. Land uses can be re-evaluated more flexibly. But the existing population must be encouraged to consolidate itself within a fairly short time frame if the city is to shrink in such a way that will serve to re-establish its former social and economic vitality. Smart urban designers will make choices that capitalize upon existing assets and the heritage of these cities.

A good city is generous in providing a sense of place. A sense of place may be tied to a physical environment and may include heritage, memory, and tradition. Historic structures provide a physical linkage between people and their environments. A sense of place is psychologically constructed through a passive awareness of one's perspective within the evolution of the city. Consequently, it is also important to allow room for new types of built forms and structures to reflect changing societal trends, thereby maintaining a dynamic sense of place throughout the lifespan of a city.

The shrinking city must take advantage of its ability to manipulate the built environment in order to provide a sense of place. A deliberate rationale should be established in order to determine where preservation, demolition, infill or open space creation is suitable. Sites suitable for preservation, re-use, and infill are tangible assets in the strategy of place making. Furthermore, negative space created through demolition and open space designation may also engender a sense of distinct place and community. However, this works best when there is a coordinated scheme for open space creation.

Just as a good city will have large central parks and pocket parks in order to serve the public realm, it is possible for the shrinking city to encourage unique and diverse communities within the city by connective neighborhoods through welcoming park systems and greenbelts. Locations that are appropriate for park linkages may have an attached value for open space use. A coherent method must be used in order to determine what is worth saving, what will consolidate municipal services and what is most appropriate for demolition.

Cities must provide an opportunity to obtain success through education and employment. Along with providing opportunities to enhance knowledge, cities need to provide ample opportunities to obtain financial wealth by providing a competitive job market. As market demands fluctuate over time an intelligent city will be able to adapt to serve the needs of its population and continue to prosper. Instead of depending on one major field of employment, such as industry, a diverse job market will allow cities to transcend fluctuations in job demand. Good cities need to be hubs of constant activity to serve the needs of residents, while attracting and impressing visitors. An ideal city should never sleep. As centers of business and entertainment, there should be a variety of activities and events in close proximity to each other at different times of the day. In order to create an environment of constant activity and interaction, an eclectic collection of restaurants, bars, boutiques, and shops should be intermixed with residences, schools and offices.

In order for the city to function as a hub, it must be accessible through a variety of means. A multi-modal transportation network would effectively allow residents and visitors to access places of employment and entertainment safely and efficiently. A walkable city that is serviced by public transportation reduces the need for personal automobile traffic while providing convenient options to access destinations outside of a comfortable walking distance. As modes of transportation have historically allowed the boundaries of cities to expand, a shrinking city is able to utilize the established infrastructure to connect residents to their destinations.

Diversity is often touted as a characteristic of a good city. Famed urban activist Jane Jacobs said, "Diversity is the key to a successful city." Most American cities, however, have used mechanisms such as zoning, transit, education, and service distribution in such a way that has inadvertently limited diversity. Under these conditions cities have formed separate homogenous neighborhoods void of diverse interaction. Shrinking cities have the opportunity, by working to break these divisions, to become great cities. By seeking diversity through a variety of designs, mixture of uses, and multiple social groupings, shrinking cities can create a dynamic community that can serve all of its residents.

In order for their successful survival, the citizens of declining cities must accept the phenomenon of the shrinking city as inevitable; they must embrace opportunities offered by the shrinking city. Acceptance is the first step to planning for consolidation; it is the first step toward

community centers
places of worship
## greenspace / parks
shops
public transportation

the ultimate realization of a sustainable city, planned to balance the waxing and waning of its population as it strives for equilibrium.

Today, a huge percentage of the buildings that once stood in the Broadway Fillmore neighborhood have been knocked down, replaced by nothing but empty grass covered lots. Over 40 percent of those structures that remain standing are vacant and have been marked for demolition. Faced with a complex set of challenges, we asked ourselves the question: what do we do in a neighborhood that has seen such deterioration?

In a neighborhood characterized by a population that has a history of economic disadvantage, walkability and affordable public transit are essential. Bus routes and ample sidewalks exist along major arterials. There are over 16 bus stops along Broadway within a ½ mile stretch. Places of worship are multitudinous. Saint Stanislaus and Corpus Christi are among the most prominent structures, with steeples reaching for heaven far above adjacent buildings. Ranging from Catholic and Baptist churches to Ethiopian and Islamic mosques, these anchors mirror the cultural diversity of the neighborhood. Commercial activity in the neighborhood has declined from a gushing river to a mere trickle. Businesses and shops, though sparse, are located strategically along the Fillmore and Broadway corridors, which experience the highest levels of traffic in the neighborhood. The Broadway Market is an important remnant of the Polish heritage of the region and a critical anchor of the neighborhood. During the Easter holiday, the market sees huge crowds. Although there are several fruit stands, delis, bakeries and a save-a-lot located within the Broadway Market, sources of healthy and affordable food are somewhat scarce throughout the rest of the neighborhood. There are a number of buildings along Broadway and Fillmore that are currently empty but could be marketed as prime candidates for rehabilitation to become inhabited by new businesses. The Eckhard Building on the northwest corner at the intersection of Broadway and Fillmore is being advertised for the same purpose. Public facilities include the Adam Mickiewicz Library on Fillmore Avenue, the Polish Community Center on Paderewski Drive, and the Matt Urban Life Center on Broadway Avenue. Saint Stanislaus School is also located along Fillmore Avenue. Central Terminal is located at the southeast corner of the neighborhood. Construction of the Terminal was completed on June 22nd 1929. The facility experienced its highest volume of traffic during WWII and declined steadily thereafter until its abandonment in October 28, 1979.
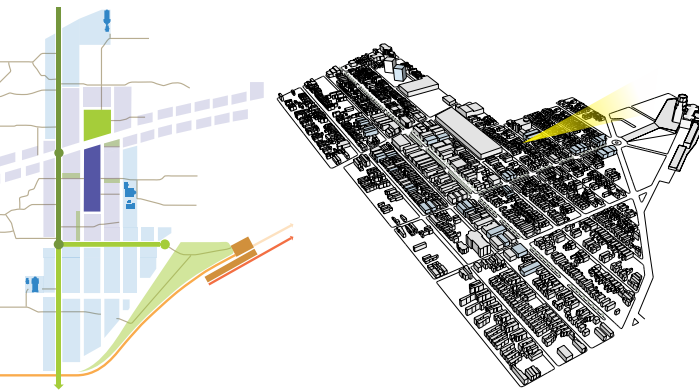
Existing Regional Infrastructure

Immediate Interventions: 1-5 Years
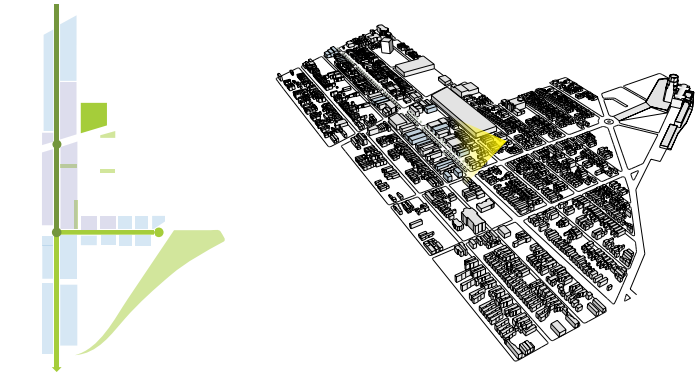
Intermediary Measures: 3-10 Years
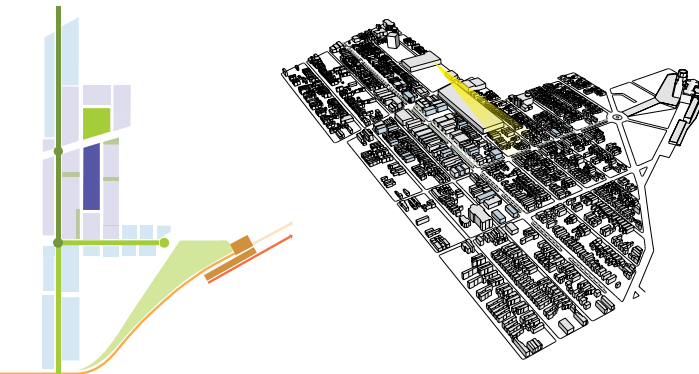
Long Term Goals: 5-20 Years

Broadway Business District:
Formulate a partnership among local businesses, launch a marketing campaign to attract customers from outside the neighborhood inventory and advertise available vacant commercial and industrial buildings that can be reused by new businesses

Preservation and Adaptive Reuse:
Identify places of historical significance and secure them by way of local and national landmark recognition, and by reincorporating their use in contemporary functions.

Transportation and Connectivity:
Redevelopment of railroad property within the Broadway Fillmore neighborhood is considered a priority of the comprehensive plan of the city of Buffalo.
+ Reopen Central Terminal and investigate existing track for reuse.
+ Introduce a light rail linkages with downtown Buffalo at Main Street (linkage to metro), and Cheektowaga (serves town and Galleria Mall).
+ Potential future tie-in to high-speed rail connection with other major cities such as Toronto, NYC, and Chicago.

Parks and Gardens:
Create a green parkway system within the neighborhood by reconfiguring Fillmore avenue. The parkway shall connect MLK Park to William Street, the Central Terminal, and eventually, the Buffalo River. Provisions shall include better lighting, maintenance of existing pocket parks and creation of new ones in contiguous empty parcels.

Policies of Housing and Vacant Land:
Promote home-ownership and owner occupancy, and invest in improvements to housing stock: acquire and rehabilitate abandoned homes, build new homes on empty lots, reduce multi-unit properties from 3 to 1, encourage affordable housing for seniors and people with special needs. In keeping with Buffalo's 5-in-5 plan (5000 homes demolished in 5 years), preference is that homes slated for demolition shall be located in areas of highest current use around anchor points such as the Broadway market, Corpus Christi, Saint Stan's, and Central Terminal.
Increase regulations to ensure responsible and sustainable owner investments, and advocate public-private partnerships to aid owners with improvement related expenses.
+ Develop tax incentives and low-interest loans to nurture homeowners and businesses
+ Encourage homesteading and foreclosure and auction sales:
+ Waive assumption of responsibility by new owners for preexisting tax debts and other such penalties accrued by former owners to promote future tax revenue
+ Encourage utilities providers to consider waivers or reductions of assumption of responsibility for outstanding debts or offer to promote increased future business.

URBAN INTERSECTION

PD 562 : TRANSPORTATION, LAND USE, AND URBAN FORM : D. HESS
STUDENTS : D. KRUSE, R. MFIZI

Transportation and the urban form are interconnected. The Industrial Revolution led to sweeping changes in how people move across the land and where they live. As transportation systems have evolved, the streetscape has become a place of multiple worlds interacting with each other all at once.

The streetscape assessment of Main St. and Winspear Ave. was a look into the multi-modal aspects of transportation. Features examined were bikes, cars, and buses. The ultimate goal was to determine both the current conditions of the area and improvements that can be made to create a "complete street." Photographic analysis was performed to get an understanding of current conditions and to assess potential conflicts that arise from the different travel modes. From this analysis it was determined that: the width of the street without access to a pedestrian island or raised crosswalks would lead to pedestrian disconnect with the intersection; the lack of a bicycle lane can prove to be difficult for some to navigate their way along the sidewalk, and although a bus line travels through the intersection there is no bus stop shelter to provide comfort for travelers. Shops, restaurants, and a gas station provide the major economic base of the area.

Based on our analysis, this intersection has a clear hierarchical structure for transportation. Passenger vehicles dominated, with bus user next and pedestrian and bike travel the least popular. Based on the physical analysis, improvements and additions were proposed to better serve all modes of transportation.

Using a complete streets model, a major shift in thinking would be needed to alter the look of the study area. First, the number of traffic lanes, the turn lane and parking spots along the sidewalk would all need to be reduced. Reducing the number of lanes from two travel lanes to one in each direction with a center turn lane at the intersection would allow additional amenities to be included. Specifically the introduction of a bicycle lane in each direction would allow cyclists to be protected and given their own right of way. At the intersection, curb bulb-outs would help reduce the speed of cars at critical crossing junctions for pedestrians. Pedestrians would be given more room to wait for the crossing signal, as well as a shorter distance from one curb to another. Raised crosswalks would encourage slower traffic and help pedestrians feel as though they are a part of the street environment. The introduction of more street trees and ground vegetation along both sides of the road would make the environment feel more natural and act as a green infrastructure technique to help reduce storm water runoff. Additionally, the construction of covered bus stops would better serve the existing users and might encourage new riders. Finally, it was proposed that introducing fee based parking would provide necessary funds for the neighborhood to maintain and revitalize sidewalks and building facades.

38 : PD 562 : TRANSPORTATION, LAND USE, AND URBAN FORM : D. HESS

STUDENTS : D. KRUSE, R. MFIZI

THE FRUIT BELT NEIGHBORHOOD

PD 581 : PRESERVATION PLANNING AND
LIVABLE URBAN NEIGBORHOODS : K. TRAYNOR

The Fruit Belt neighborhood has undergone many transitions within the past decade that have left the area in a weakened state. Many of its residents have lost hope. The sense of community is still alive but is diminished. It needs to rebuild itself in order to face the increased threats of demolition planned by the city to accommodate future development. Although major demolition has already occurred, the area continues to grow as reflected by the new infill housing built for residents.

New development is crucial for this area to thrive once again, but it must follow a strict set of design guidelines. These guidelines will help preserve many of the historical elements of the buildings and the area. Community involvement is crucial in order for the Fruit Belt neighborhood to become New York State's first conservation district.

Conservation districts are both similar and different from local historic districts; both focus on preserving a community's physical characteristics while conservation districts focus primarily on preserving the community character rather than the historic fabric. The emphasis in a conservation district is to protect the neighborhood's character and the associated elements of structures, such as the scale, mass, set back, lot coverage and height allowances of buildings. Tailoring zoning and design guidelines to respond to specific needs in the neighborhood will ensure that these needs are met.

What can YOU do to help? Community involvement and participation are important to guarantee the success of this project. Attend local meetings and voice your opinions and ideas.

Graduate Urban Planning students focused on developing infill design guidelines that will transform the Fruit Belt neighborhood into a thriving community. Future infill development in the Fruit Belt neighborhood should be sensible to prevent further fragmentation within the neighborhood and emphasize the essential elements that make the neighborhood unique. Students focused on re-building the forgotten sense of community through the incorporation of our design guidelines for future infill development. The hope was to re-create the historic character lost through decades of demolition, increased vacancies, and inconsistent modern infill. Special elements that should be included in the Conservation District for the Fruit Belt:

1. Conserve and protect the natural beauty of the neighborhood such as green spaces, trees, sidewalks and houses with significant architectural elements;

2. Foster and guide new infill development that is compatible with the existing plan site, landscape and architecture of the neighborhood; and

3. Reduce unnecessary demolition and promote rehabilitation of existing structures and turning them into new uses.

The Fruit Belt neighborhood was founded in 1839 and named after the orchards and vegetable gardens planted by German immigrants. As the neighborhood grew, the orchards planted by the residents helped determine the layout of the preset street patterns. The street names, named after the German immigrants themselves, provide evidence of the early development of the neighborhood. When the German's moved out new groups moved in and the Fruit Belt has since become an historical African-American neighborhood.

The decline of the neighborhood is marked by large numbers of vacant lots and demolished structures. Modern infill developments been inserted without regard to the overall neighborhood. Designation as a conservation district is a very useful tool to help guide neighborhood revitalization while preserving the neighborhood's essential elements. While many of the original unique physical elements and features have been lost, preserving the culture, heritage, and character of the neighborhood is very important in creating a sense of place.

Essential to preserving the existing character of the neighborhood is the maintenance of existing details on the front façades of those houses that meet the requirements for the National Register for Historic Places. The overlay drawing of the house shown illustrates the rehabilitation of a beautiful house versus demolition or neglect. The existing front facade of this particular house includes windows, porch, overhang eaves and post.

PD 581 : PRESERVATION PLANNING AND LIVABLE URBAN NEIGBORHOODS : K. TRAYNOR

CLASS OF PD 581 : FALL 2010 : 39

RE-PAVING PARADISE

PD 450 : ENVIRONMENTAL DESIGN WORKSHOP III : J. WHITE
STUDENTS : A. HICKEY, R. KUCINSKI, B. LYTLE, M. ORTIZ, M. PARK, N. VERANO

This studio explored how automobiles and parking influence building location, shape, form, and size. The studio also investigated parking constraints and their influence on quality of life and the economy. It asked: How do we bring benefits of urban living to suburban or rural areas? Is it possible to give small towns and suburbs an urban center? Throughout the semester, students studied the Boulevard Consumer Square shopping plaza in depth. They identified problems with walkability, parking, zoning, and other important issues. They identified solutions to those problems and they developed plaza design guidelines based on those solutions. Collectively, the class developed an extensive knowledge on different strategies for creating a vibrant mixed-use urban center. Students applied the knowledge gained from these studies to design a new "suburban center" that more realistically and efficiently accounts for the automobile, makes the plaza more environmentally responsible, and introduces urban patterns of development to improve quality of life, health, and the economy.
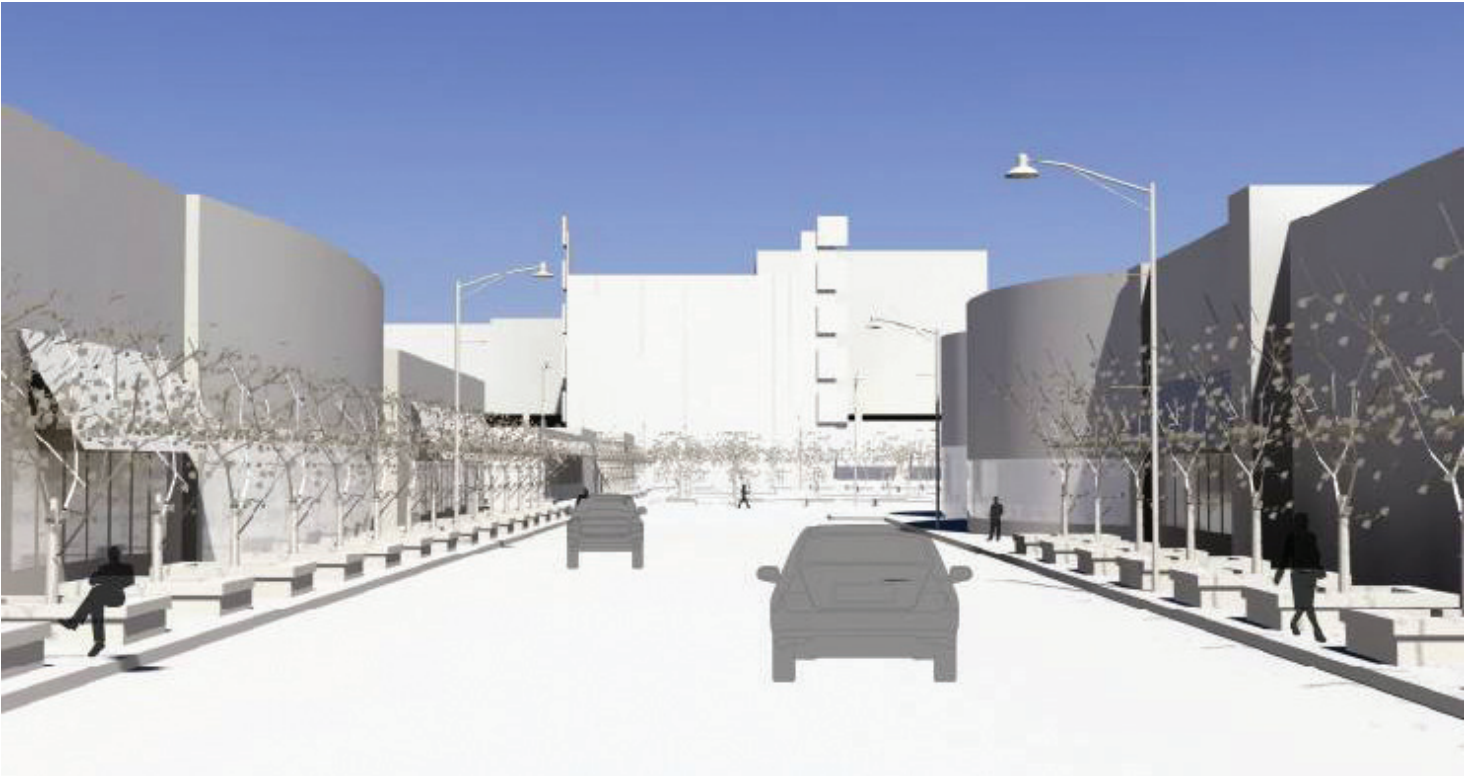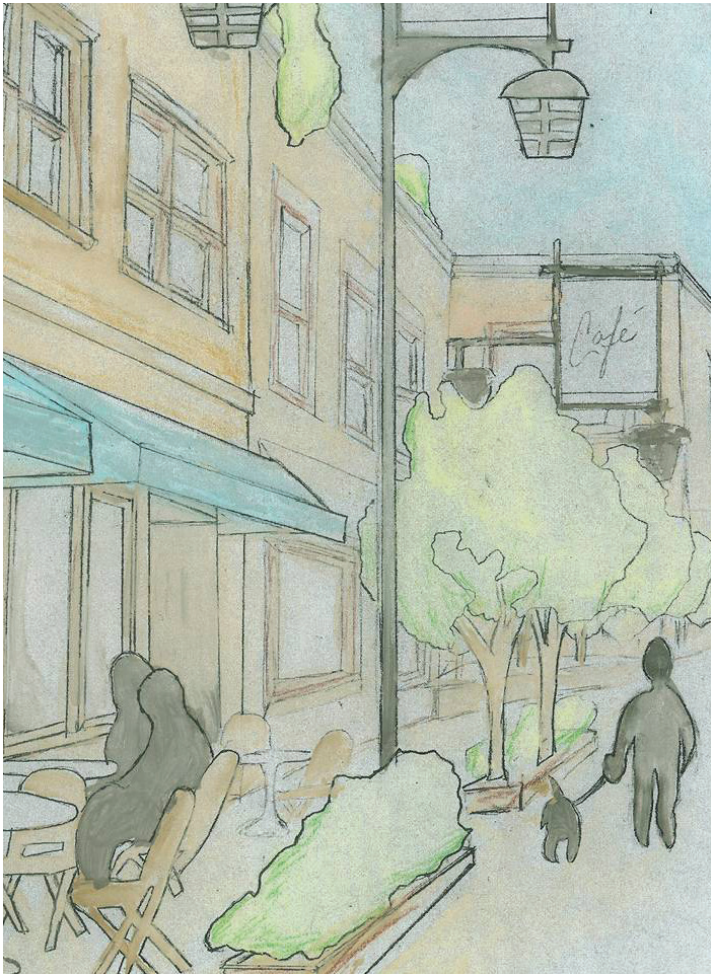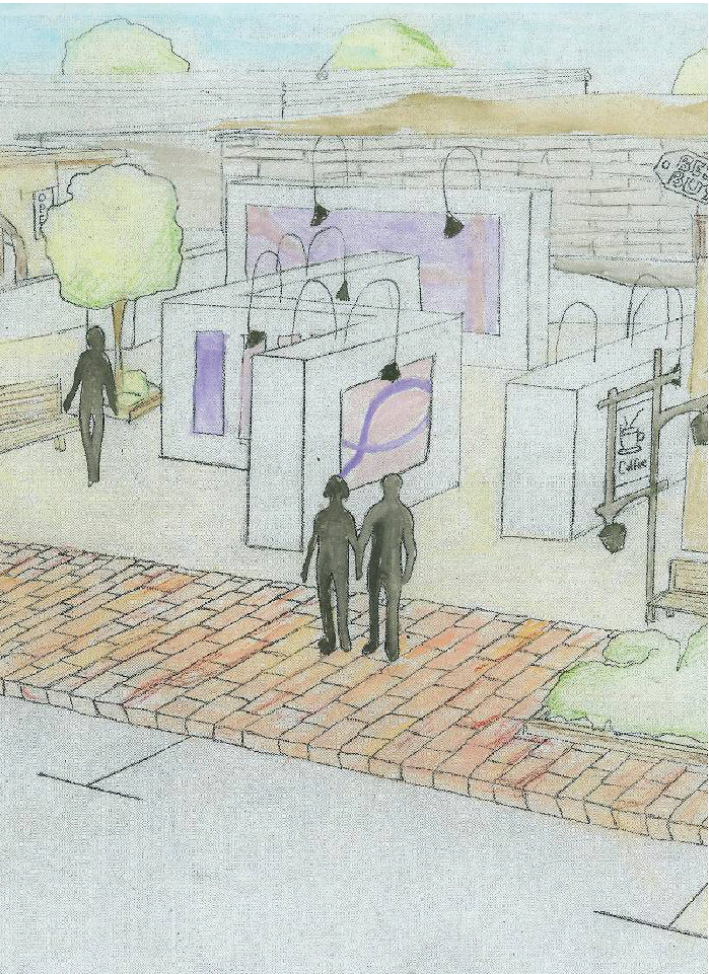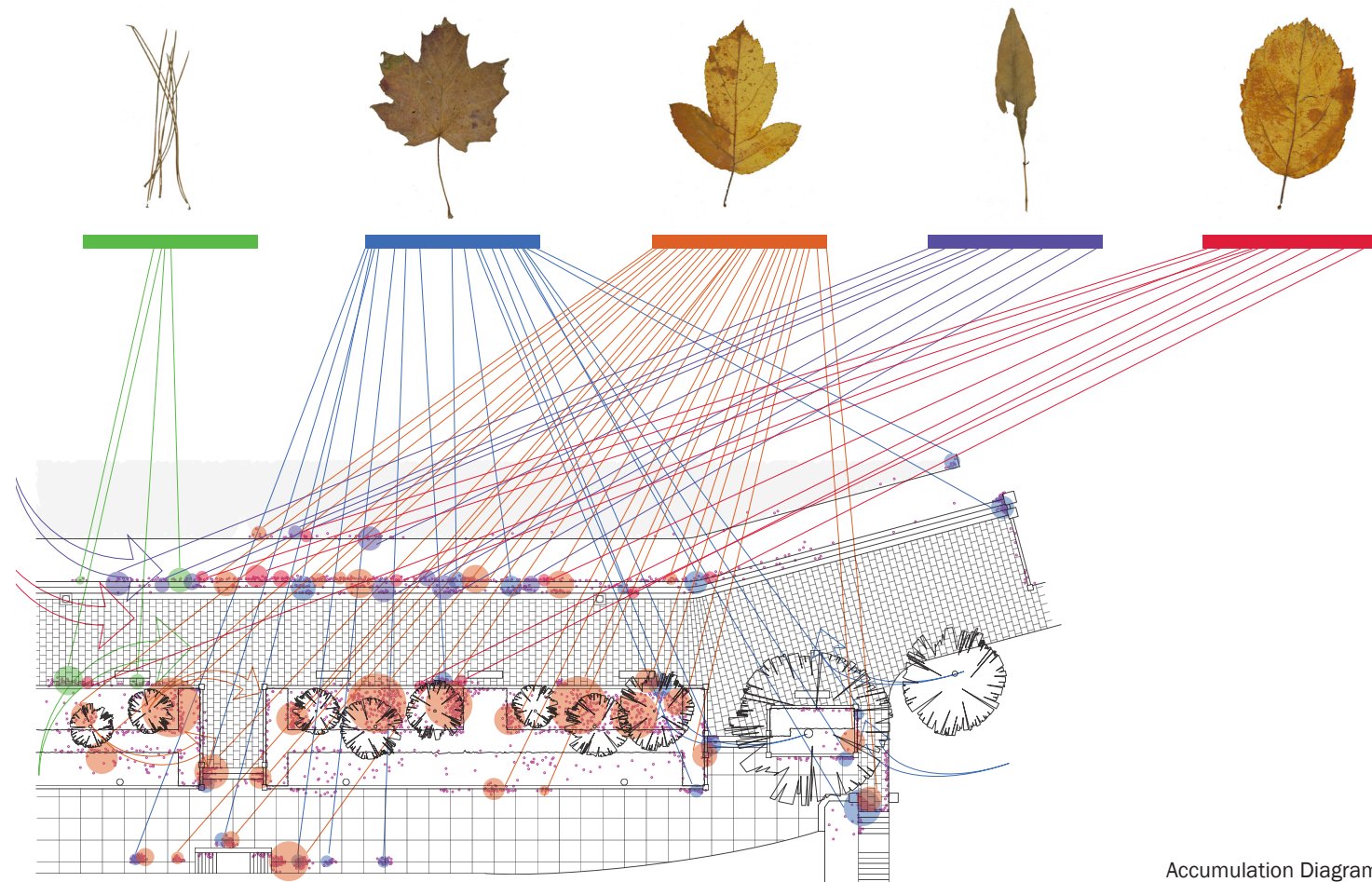
ACCUMULATION

During the fall season, transitioning between different surfaces usually goes overlooked by the user of the space. Leaves of the surrounding foliage, which usually consist of different sizes, covers the adjoining edge of these spaces. The pavilion creates a new edge, which collects the leaves and presents them to the user along multiple walking paths. These walking paths are at the ground level and elevated above the ground plane in order to make the edges more apparent to the user. The new experience not only be intensifies the elevated pathway, but also the glass panels that entrap the leaves at different angles to then create another viewing experience.
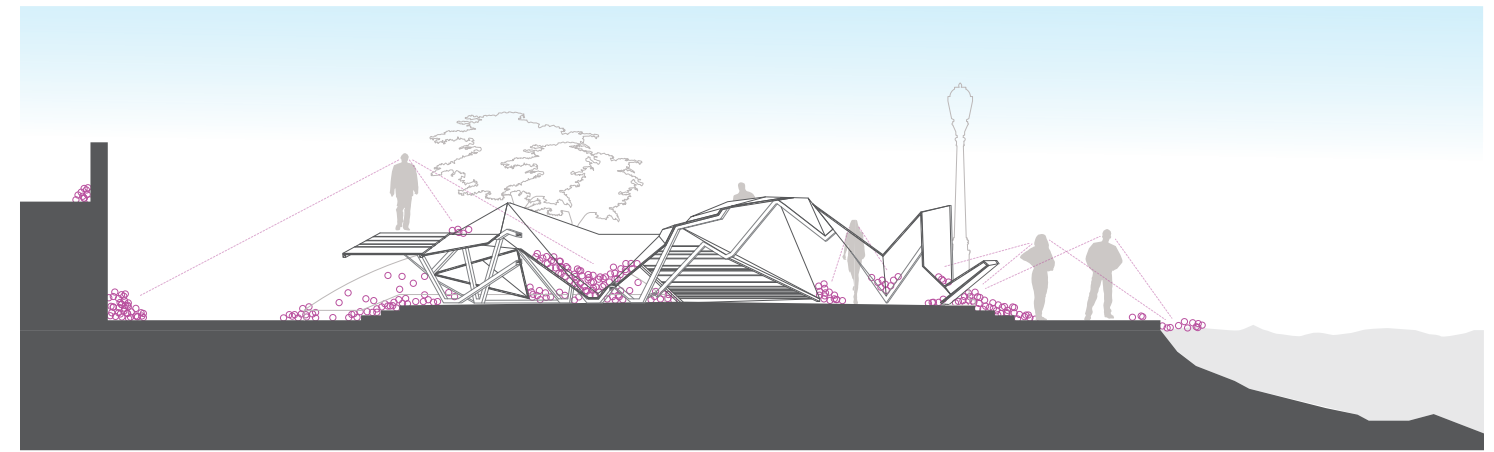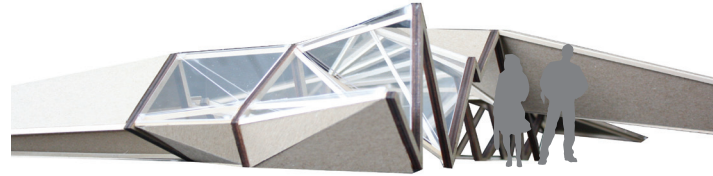
Site Section

Accumulation Diagram
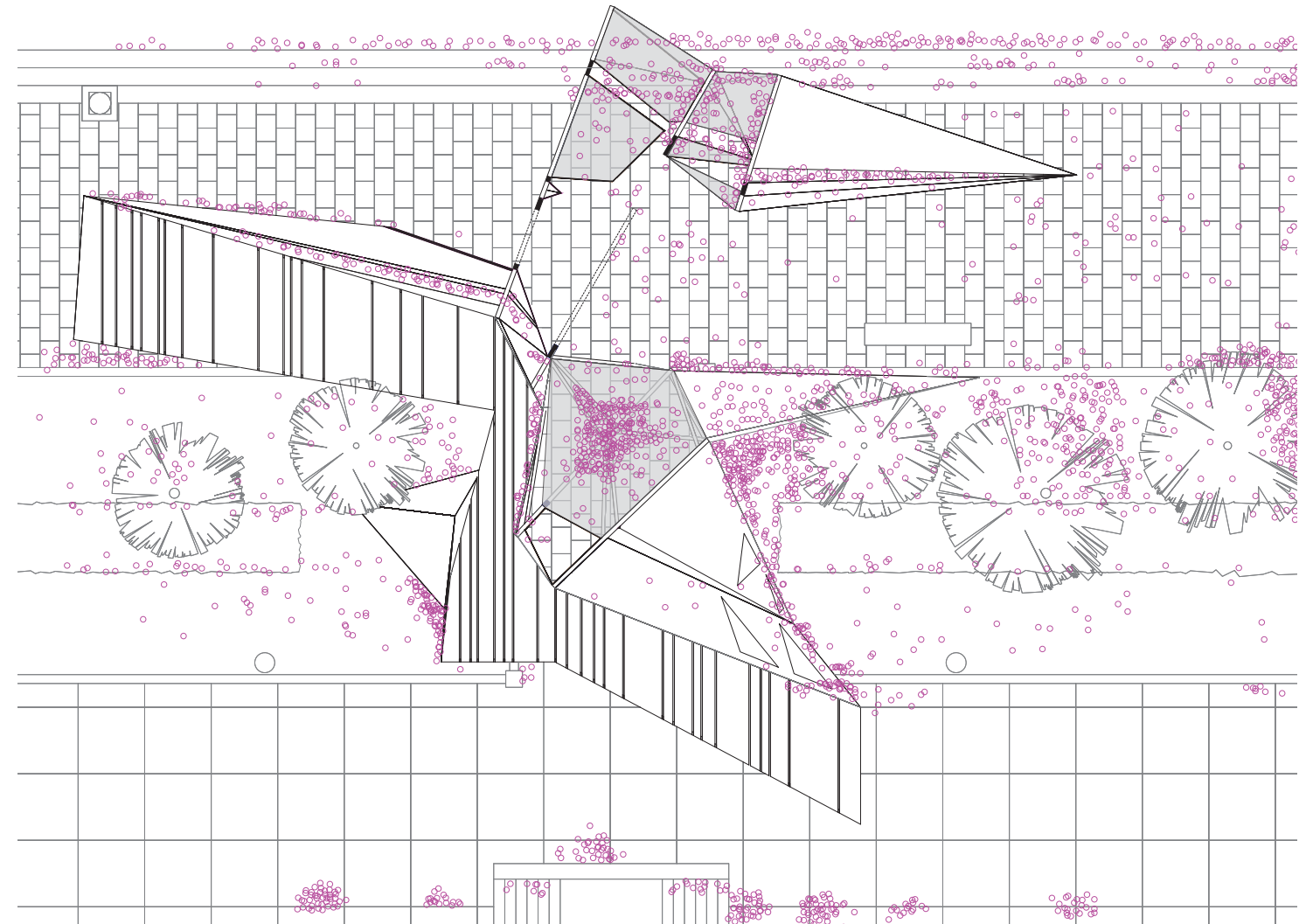
Site Plan

AQUARIUM

The intersection of Main Street and Buffalo Harbor offers strong dynamics that became important factors in the development of the design. Multiple modes of transportation including Interstate 190, Route 55, the Metro, the Amtrak Railway, cycling paths, the river walk, and the waterways' ship routes all contribute to the dynamic forces guiding the project.

The topography of the site as well as the path of the canal are reconstructed to generate the aquarium and to create a new type of urban public space for different activities. The circulation in and around the aquarium is arranged in multiple layers using ramps and stairs that reflect the dynamic transportation paths around the site. The salt water tank and the IMAX are located on the northern edge of the site and are raised to a height that mediate the height of nearby downtown structures and the lower grounds of the waterfront, gently lowering the contour of the city. The raised saltwater tank effectively advertises the presence of the aquarium, since it is easily seen from the raised highways, and from the city. In addition it is seen from every level of the outdoor public grounds. The gradual rise of the landscape from the harbor approaching the higher urban fabric provides views of the tank as one moves up from the lower outdoor public spaces on the reconstructed landscape. While inside, the visitors standing below the tank, experience a fragile threshold between the saltwater and fresh water of the canal.
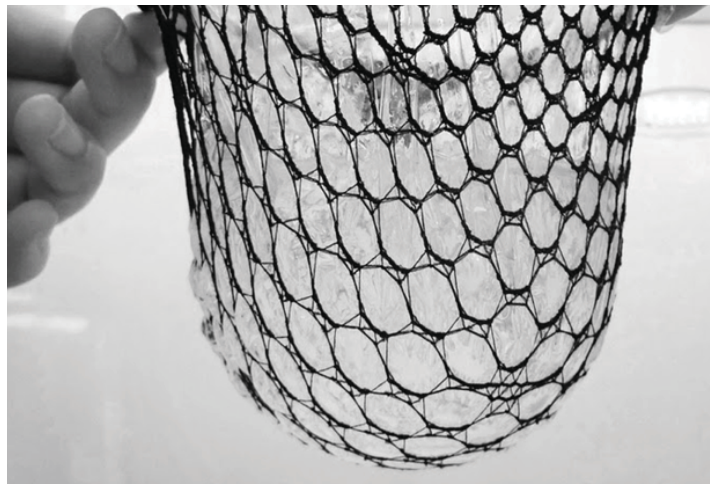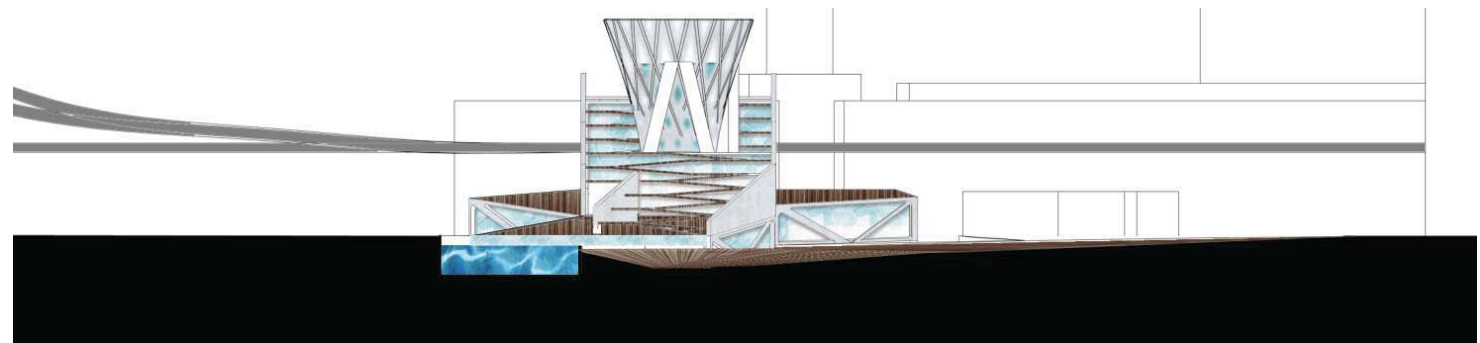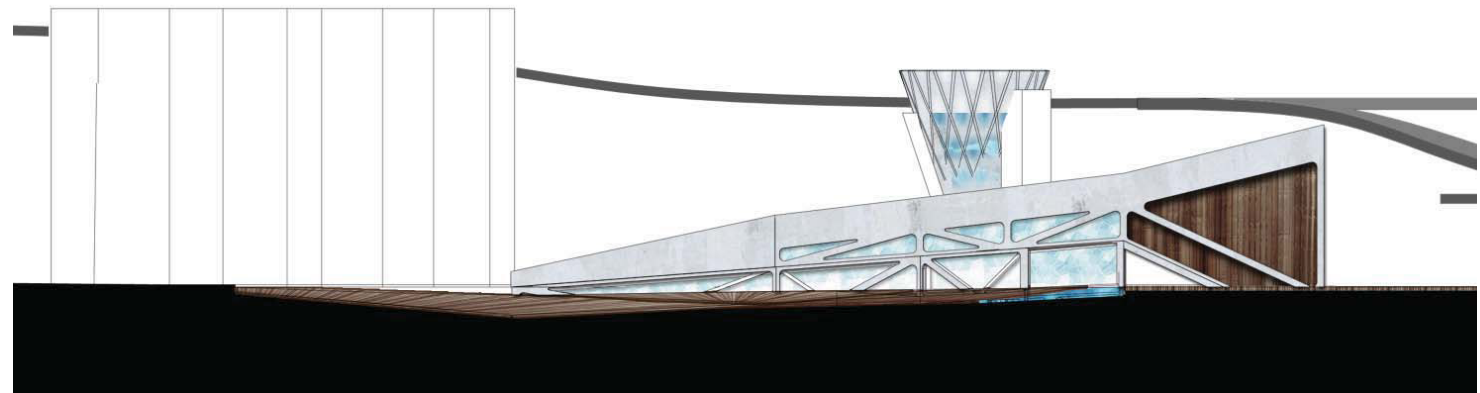

Tensile Water Tank
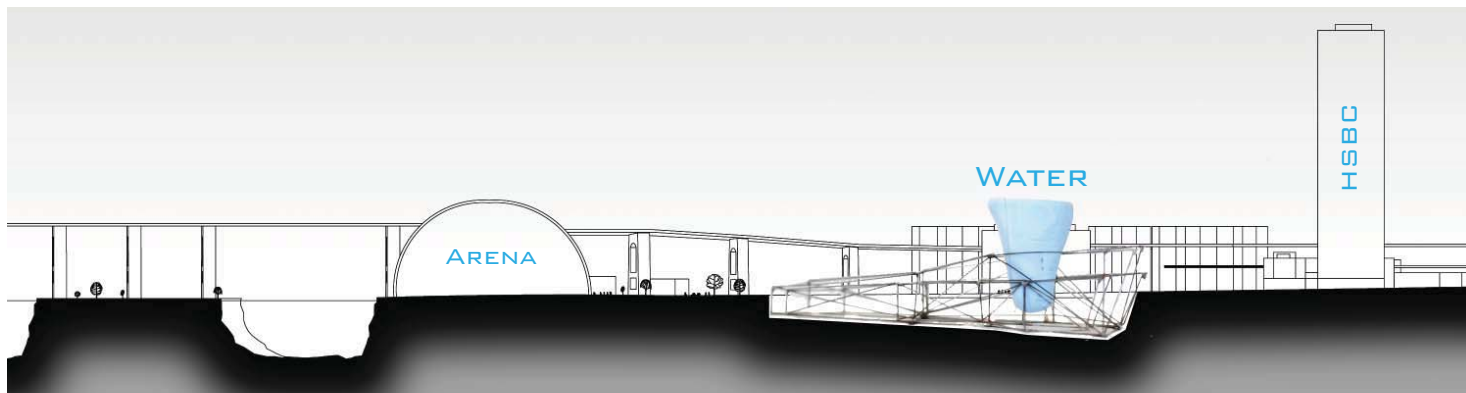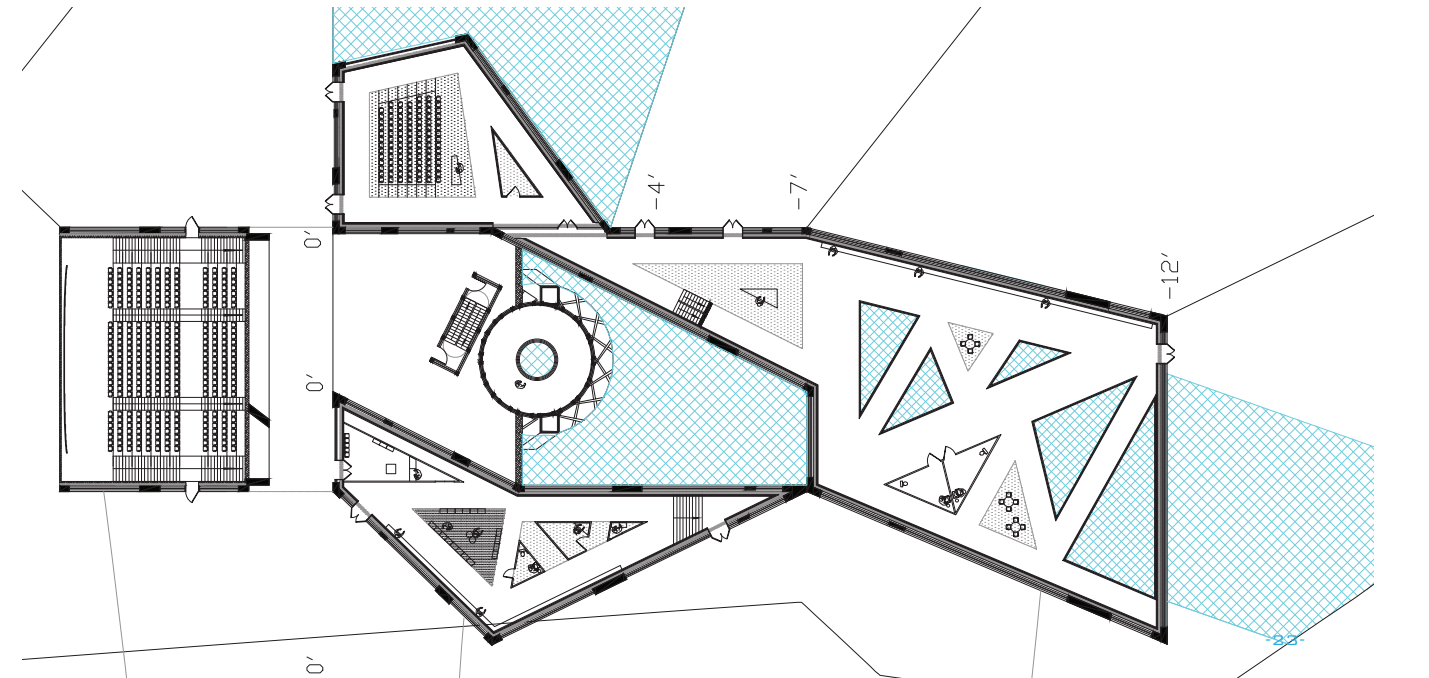
Ground Floor Plan

South West Elevation

Site Section

South East Elevation

ARTIST COMMUNITY

It has been argued that the cities which will thrive in the coming century are those that can attract and retain the creative classes – digeratti, architects, designers, performers, musicians, film makers, painters, sculptors and visual artists of all types – who contribute to our cultural well-being. Inspired by this argument, the focus of this studio is the design of an artists' community in Buffalo, an institution for the creative class that seeks a balance between work and life, and between the individual, the collective and the public. This institution is to be a community of artists from around the world. They are supported by a non-profit organization that provides living quarters and workspace free of charge for periods ranging from one month to a year. This community will also interact with the local population through public spaces incorporated into the scheme. This new institution is proposed to augment the vibrant arts community of Buffalo and to complement recent cultural initiatives supporting urban revitalization. The site is located mid-block on the east side of Elmwood Avenue between Auburn and Cleveland. It is currently occupied by a retail store and grade parking, but is to be treated as vacant.
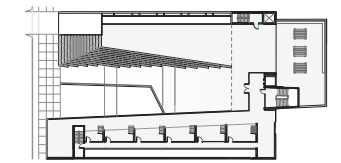
THE COLLECTIVE
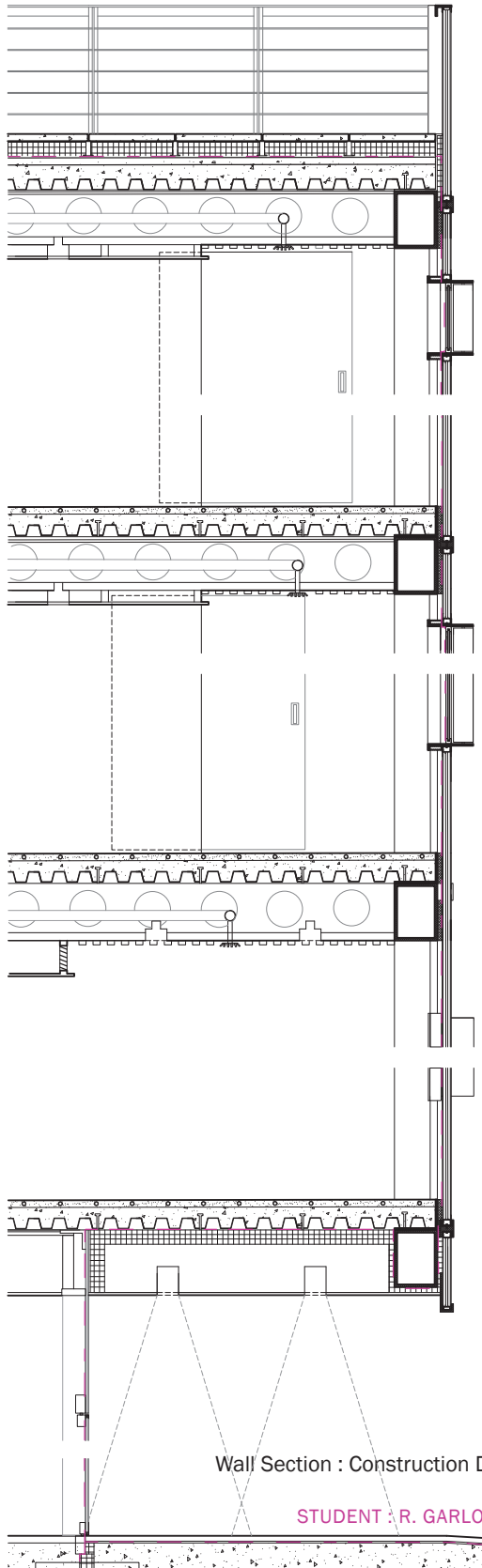
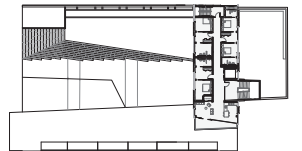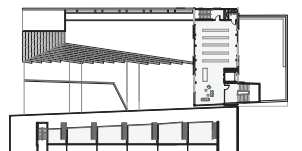Wall Section : Construction Details
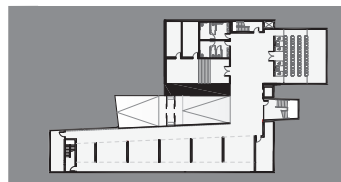
Plan : Below Grade
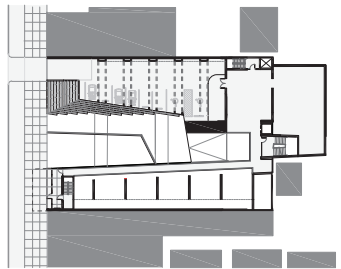
Ground Floor Plan
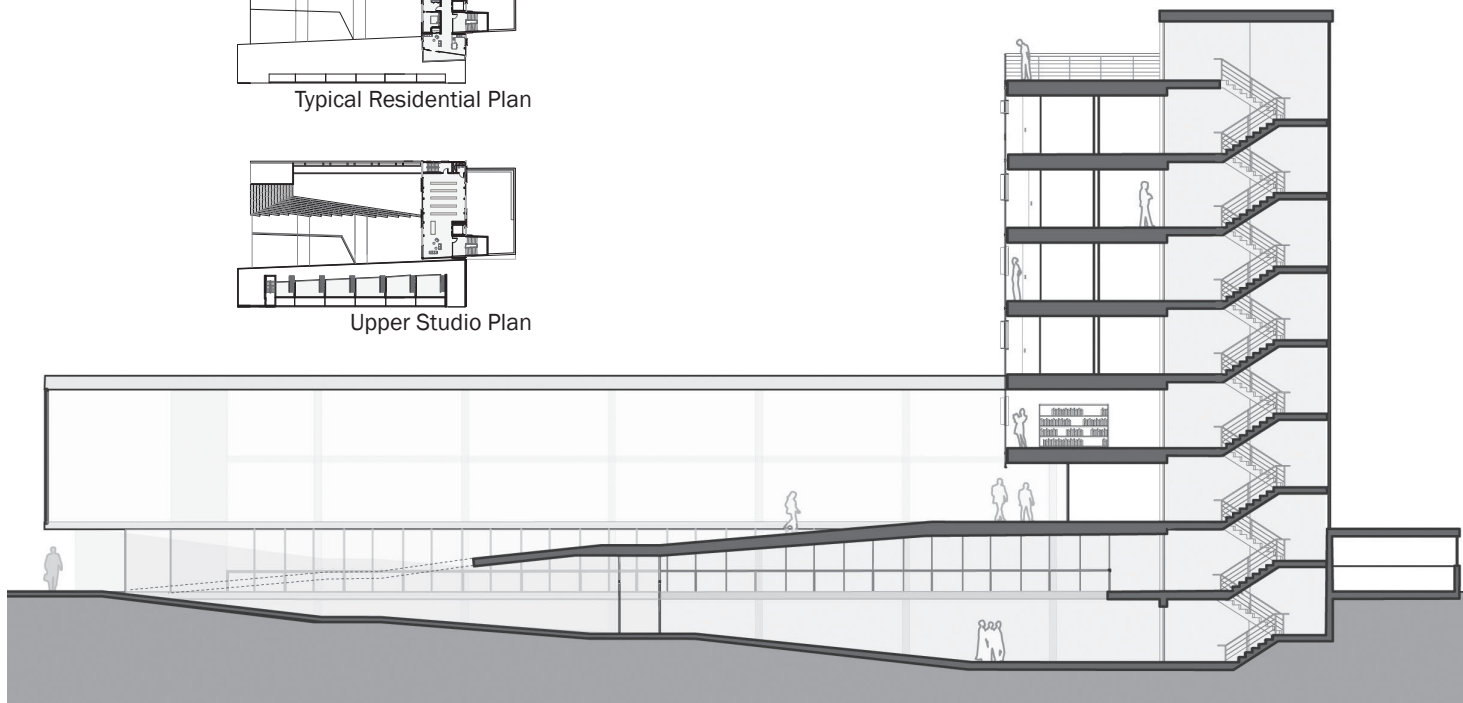

Upper Floor Plan
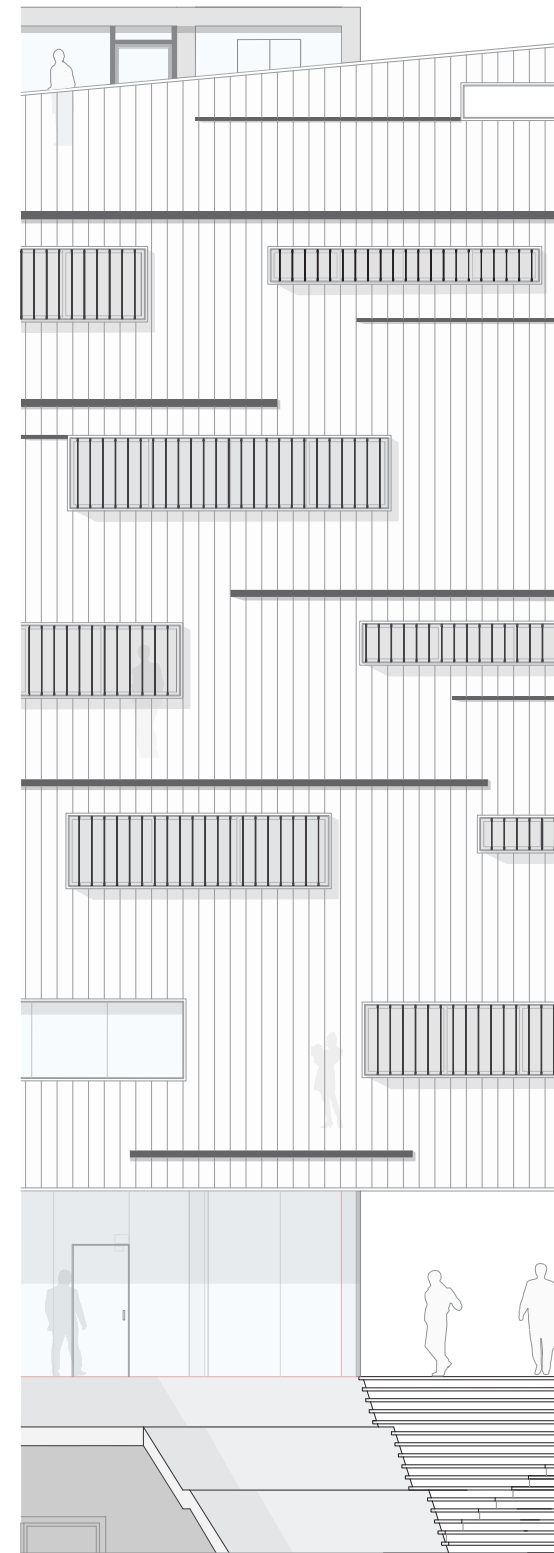

Typical Residential Plan

Upper Studio Plan

Because of the transient nature of the artists' relatively brief residency, the foundation of this project must draw from the already strong sense of community found in Elmwood Village; a bustling and eclectic strip of boutiques, restaurants, bars, cafés and art galleries with a vibrant street life. The project must address the streetscape in a way that welcomes the public, not through an opening in a façade, but into a new urban space, an extension of the streetscape respectful of the surrounding context. Not only the art but also the artists become installations. To encourage an intellectual exchange that is of benefit to both the artists and the public, integration must occur in what truly becomes a shared urban space, both balancing and blurring the boundaries between what belongs to the artists and the private institution and what belongs to the city and its populace.

This scheme explores the distinction between stereotomic and tectonic construction, or what Kenneth Frampton describes as the gravitation of mass toward the earth, and the affinity of the frame with the immateriality of the sky. Public spaces are organized within and upon a constructed "ground," while private living spaces hover above. These two realms are connected by a void, that is excavated into the ground to first pull the public from Elmwood into the building, then to rise up as vertical circulation that is extruded from the rear face of the residential building.

Residence + Gallery Section

The individual façades of the private artist residences hovering above the project combine to create a communal facade based on the grid of the Vierendeel truss. Each is designed to mask the individuality of the units. Starting with a plane of channel glass, privacy ratings are assigned to the three sections of each individual unit (bedroom, bathroom, and entrance/minimal "living.") These privacy ratings also influence the size and placement of the windows. The linear windows intentionally cross between units, blurring individual boundaries while ensuring an operable window on each end of each unit to encourage through ventilation. The horizontal steel strips and window frames are the only thermal breaks in the channel glass, and function as its support system.

Facade Detail Elevation
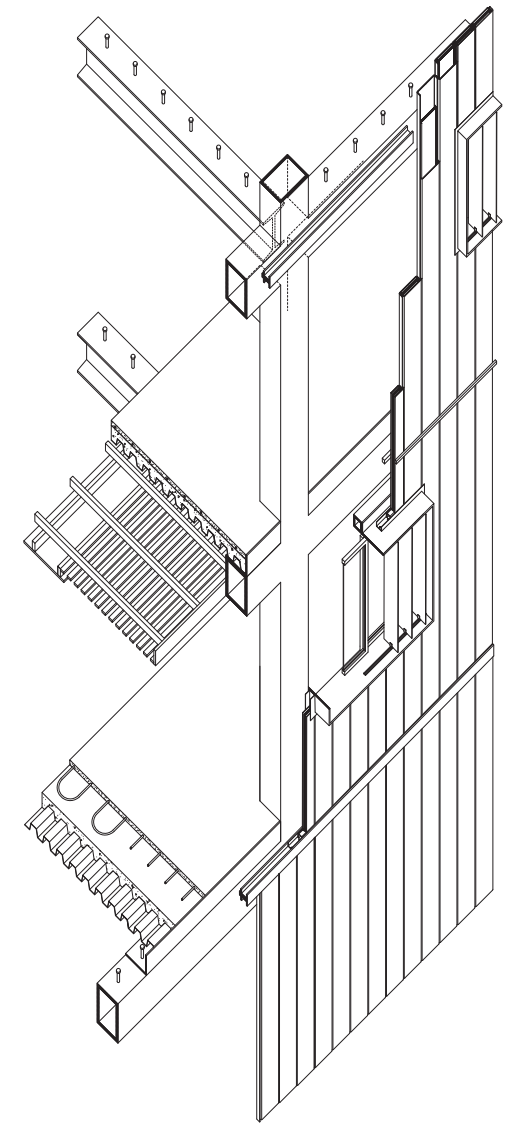
Facade Construction Specifications

The history of the city of Buffalo and the Niagara Region is indelibly tied to the history of material innovation. Buffalo has been at the forefront of material, architectural and technical explorations during the past century. These range from infrastructural experiments in moving goods and people by inventing a method of flow through the Erie Canal to conveyance systems and sea legs; and from slip-forming for the construction of concrete silos to Sullivan's innovative steel frame construction and terra cotta cladding for the Guaranty Building, which contributed to the development of the high-rise building and the curtain wall.

MATERIAL CULTURE projects forward from this history and explores ways in which the culture of materials shapes our environments and contributes to our constructive sensibilities. Our research scrutinizes the transformation from idea to artifact. We seek to advance the process of design through full-scale fabrication, assembly and installation; critical exploration of design and production; and study of the potential of materials. In these investigations, the conceptual premises of architecture are consistently tested through making.

Architecture, along with its allied professions of urban design, landscape architecture, and planning, must be in the forefront of creative thinking about the post-industrial era. Because we make and unmake the world daily through building, we are responsible for a large percentage of resource extraction, depletion, energy use, carbon emissions, waste, and transportation costs. It is projected that buildings consume as much as 60% of the world's energy divided between our industrial production and buildings for other uses.

The SUSTAINABLE URBAN AND NATURAL ENVIRONMENTS Graduate Research Group offers an intense exploration of the role that our discipline plays in the making of the next world. This focus requires collaborative association with allied professions and disciplines, reinforced by our close relationship with the Department of Urban and Regional Planning, and through existing Joint Degree Programs. Using seminars, studios, research, design/build and study abroad, faculty and students endeavor to understand the opportunities and responsibilities of creating a more sustainable, healthy, vibrant and resilient world.

INCLUSIVE DESIGN is design for all. A global movement that seeks to improve the usability of environments, products, and systems for the widest range of people, it is based on the principles of social justice. Inclusive Design is one of the most important design movements of this era because its emphasis is on empowering the average citizen.

The curriculum includes a sequence of required courses supplemented by electives and workshops that provide both a theoretical and working knowledge of Inclusive Design. Along with a core curriculum, students work with faculty mentors to develop individualized programs of study that reflect their specific interests.

The faculty members in this Graduate Group are associated with the Center for Inclusive Design and Environmental Access (IDEA Center – www.ap.buffalo.edu/idea). The faculty and the IDEA Center have international reputations as leaders in this field, and they provide unparalleled resources to students to help them make the world a better place for all.

The SITUATED TECHNOLOGIES Graduate Research Group focuses on the design of artifacts, spaces and media that are responsive to their context. We are interested in the possibilities offered by computational technologies for exploring new forms of social interaction with and within the built environment. Our focus areas include learning environments, design environments, responsive architecture and pervasive media. Computational technology provides both a means and a medium for this research: an operative paradigm for articulating relations between people, information, and the material fabric of everyday life.
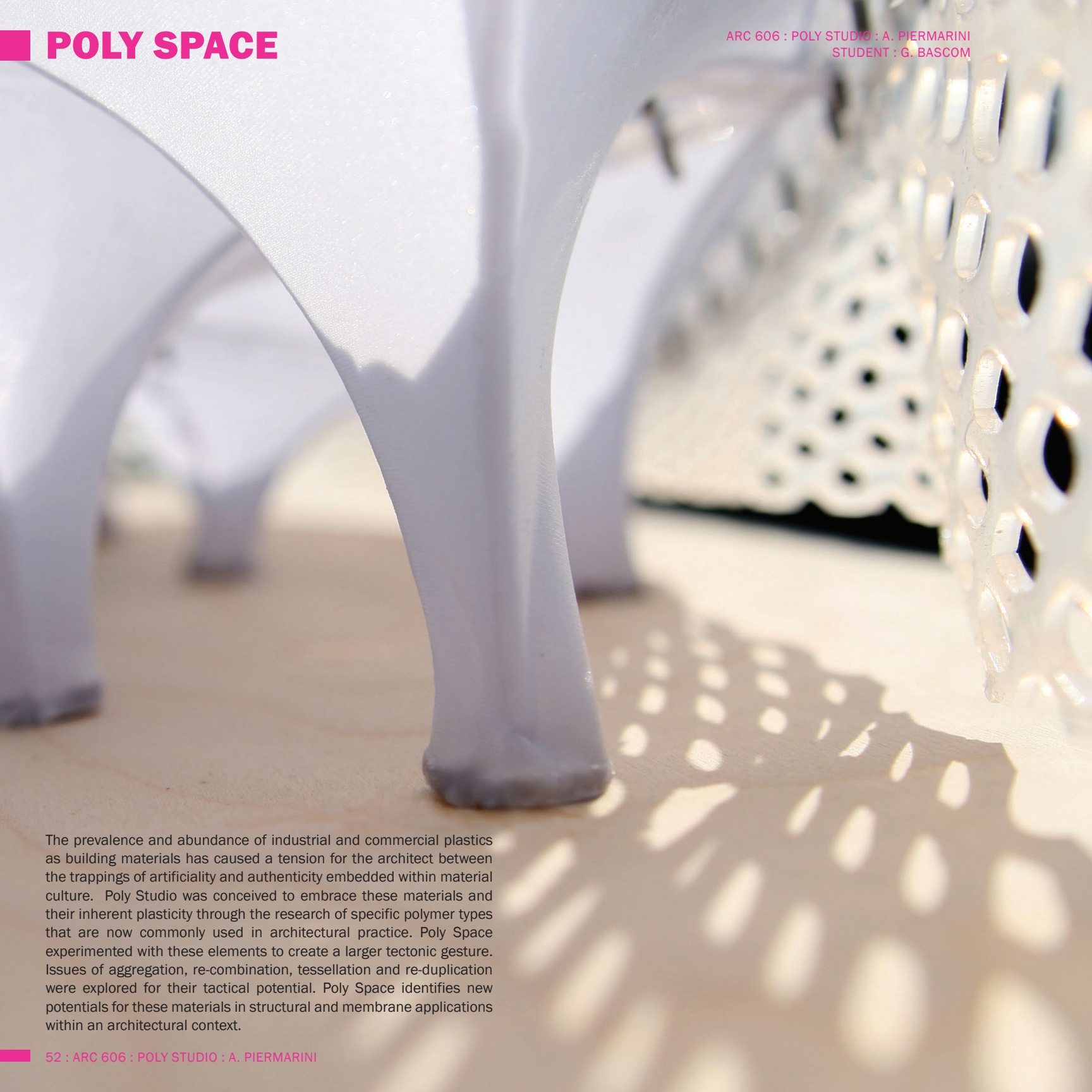
The faculty associated with the research group are also members of the Center for Architecture and Situated Technologies. The Center conducts sponsored research in Learning Environments, Responsive Architecture and Pervasive Media.
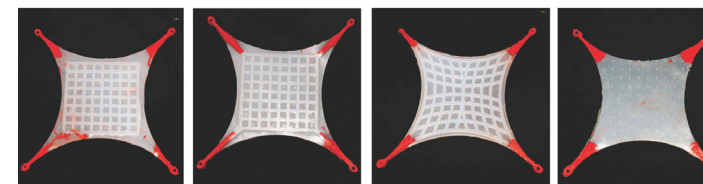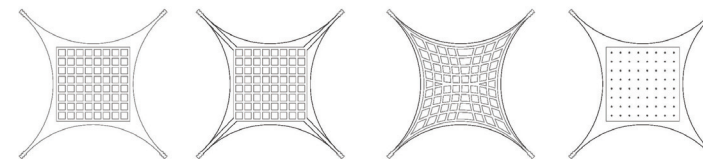
MATERIAL CULTURE

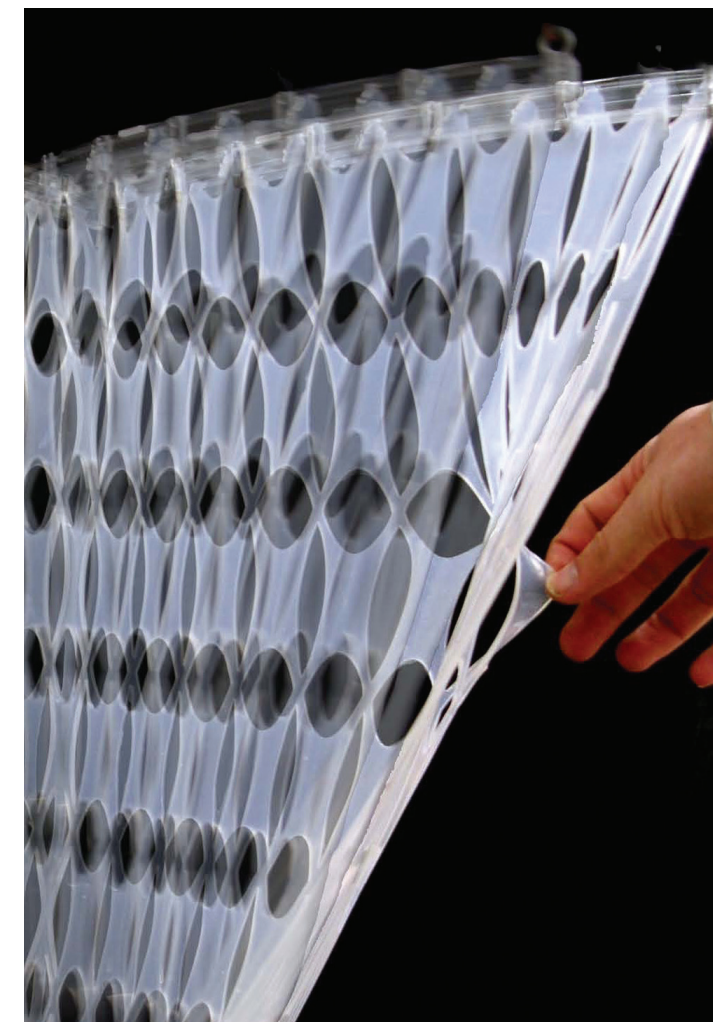# SUSTAINABLE URBAN AND NATURAL ENVIRONMENTS
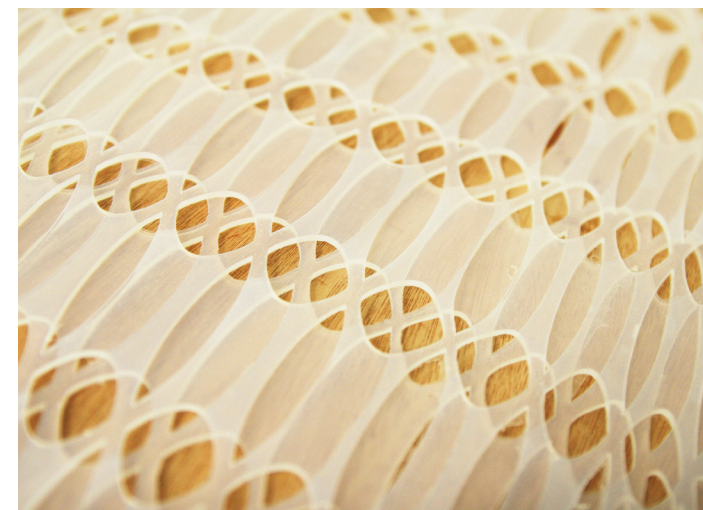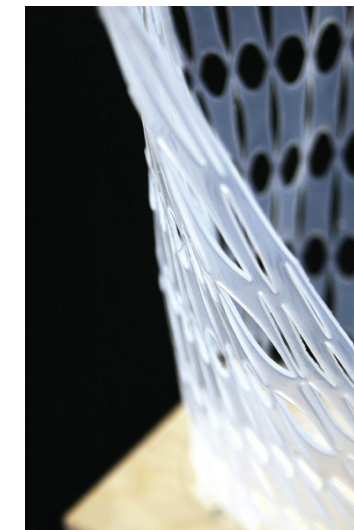
INCLUSIVE DESIGN

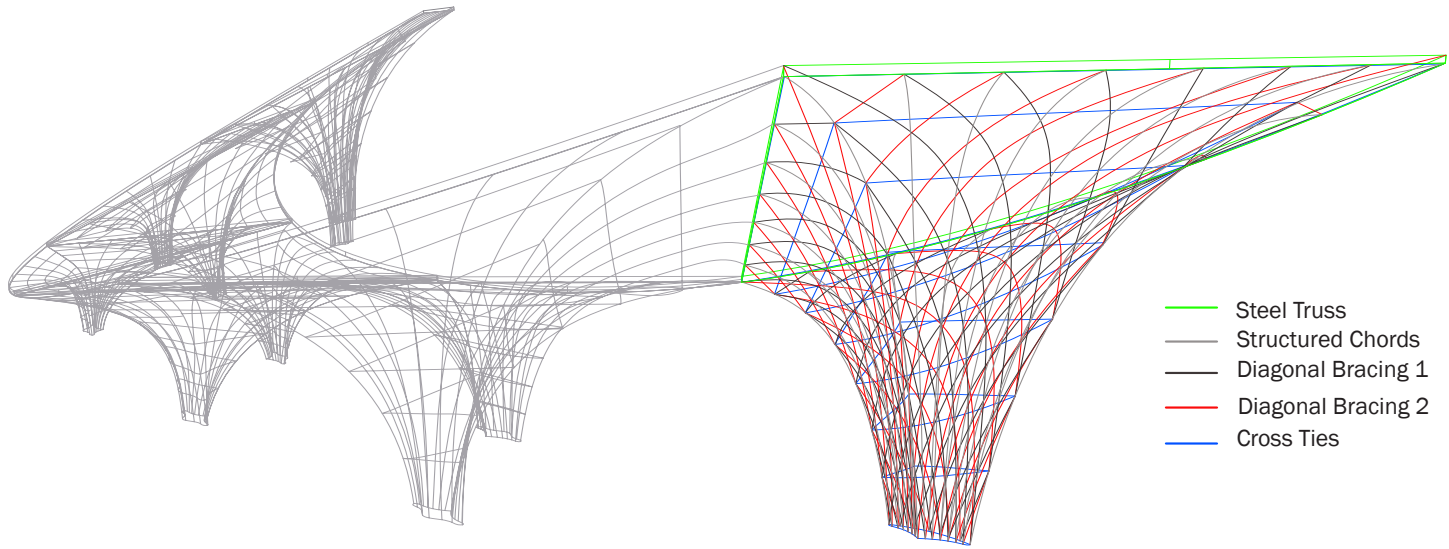# SITUATED TECHNOLOGIES

POLY SPACE

Panel Component Studies

The prevalence and abundance of industrial and commercial plastics as building materials has caused a tension for the architect between the trappings of artificiality and authenticity embedded within material culture. Poly Studio was conceived to embrace these materials and their inherent plasticity through the research of specific polymer types that are now commonly used in architectural practice. Poly Space experimented with these elements to create a larger tectonic gesture. Issues of aggregation, re-combination, tessellation and re-duplication were explored for their tactical potential. Poly Space identifies new potentials for these materials in structural and membrane applications within an architectural context.

Steel Truss
Structured Chords
Diagonal Bracing 1
Diagonal Bracing 2
Cross Ties

Steel Reinforcement Diagram

Poly Space is an industrial recycling center and museum located within one of the many brown field sites in Boston, MA. This project explores the relationship between prefabrication and custom fabrication in the design of a large span building. The design engages the inherent complex interrelationships between the program, social space, material performance, structure, and enclosure challenging assumed hierarchies. In Boston, the recent Big Dig project has produced many residual spaces, tangled between rail yards, on/off ramps, businesses and residential districts. The site we considered is located with such conditions of entanglement and required a robust architectural proposal that would engage with its surrounding. The proposed design is a gestural response to its immediate environment. The building uses the multi-lane highway to enhance the design by considering the vantage point of the motorist.
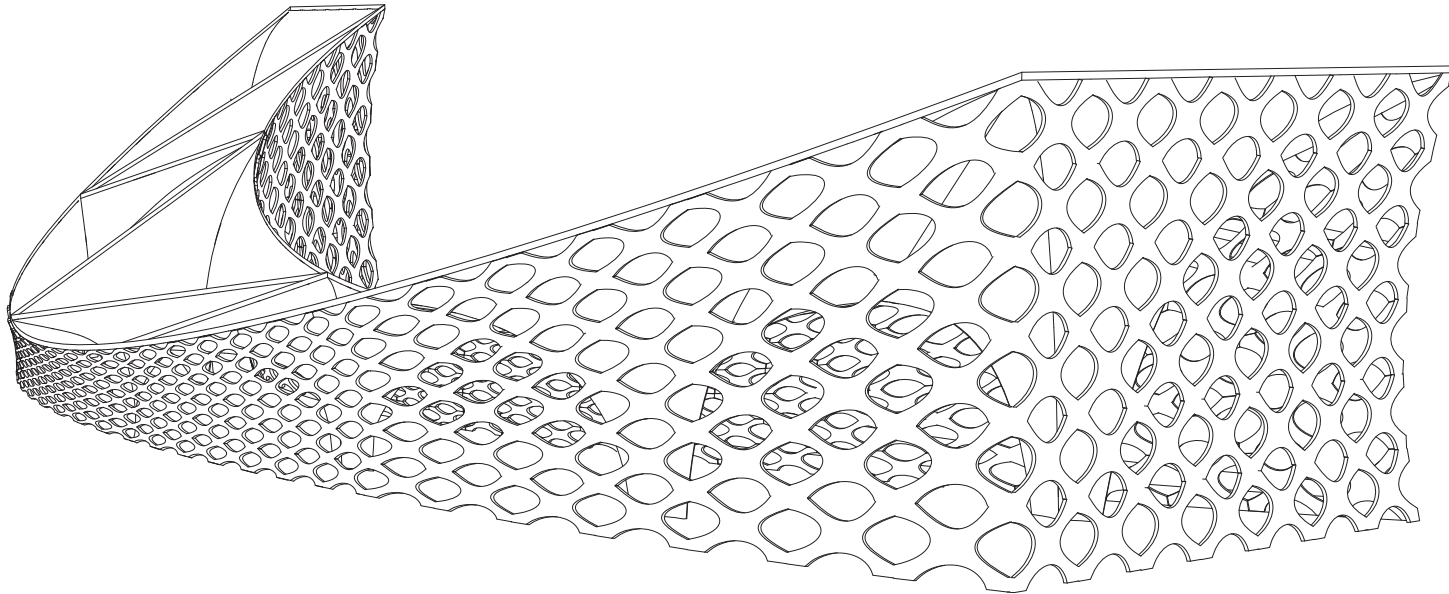

Perspective
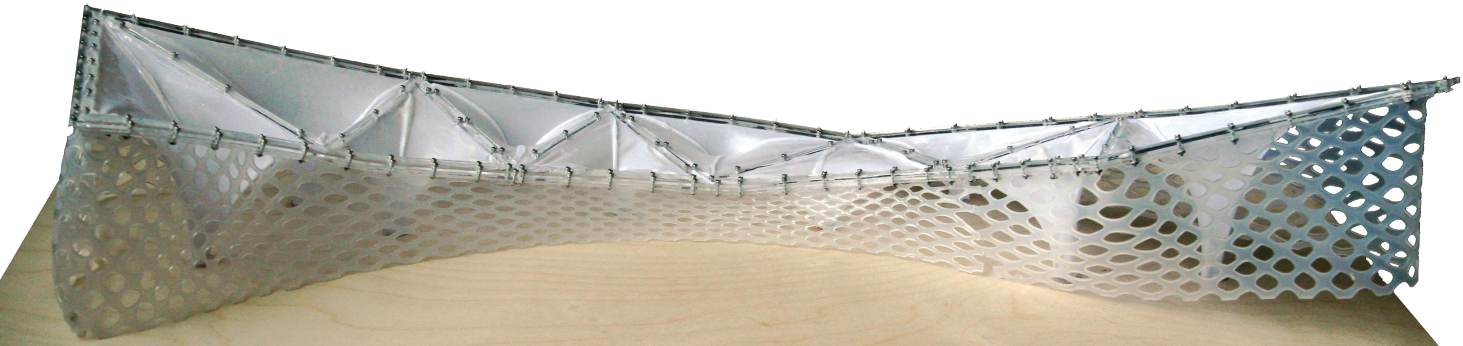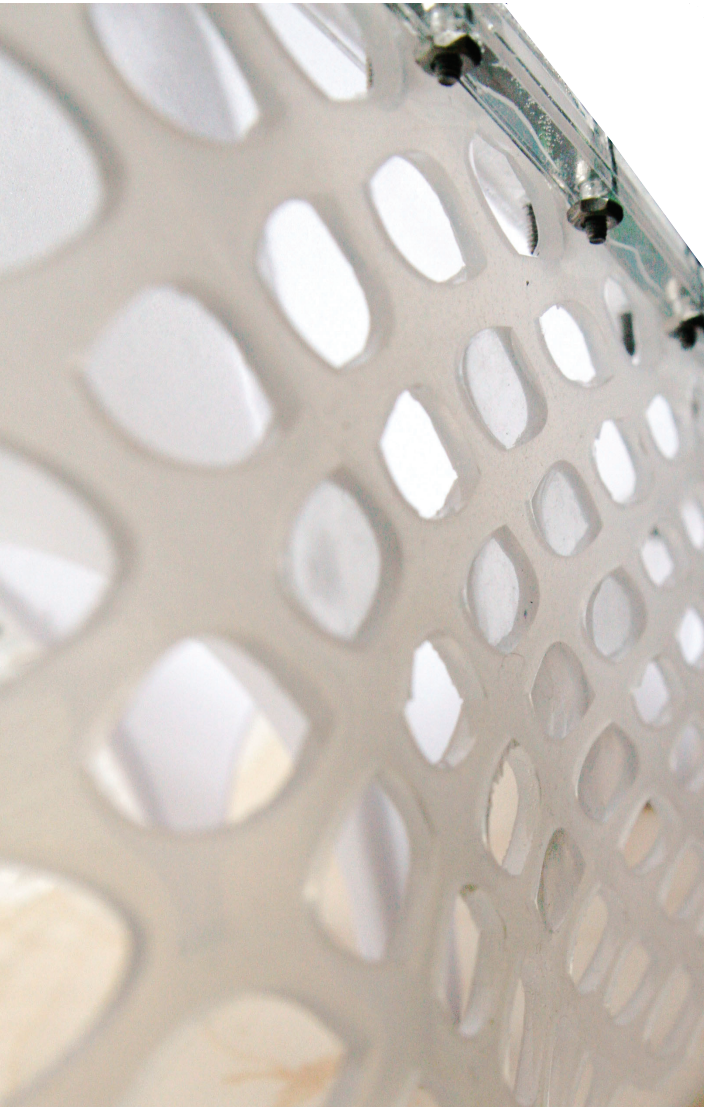
ROOF

Forming a relationship between architecture and people, this roof design presents a liberation of space through a non-uniform floor plane. A multi-level space is created through the use of a singular modulated roof structure. The material of the building defines a highly specific space through the roof form while avoiding obstruction to program and circulation by eliminating physical thresholds.

The primary building material is resin fiberglass, chosen for both its rigidity and translucency. Reinforced with steel, it has the potential to carry the load of the building. The mediation of thickness modifies the transparency of surfaces, allowing for control of light and privacy.
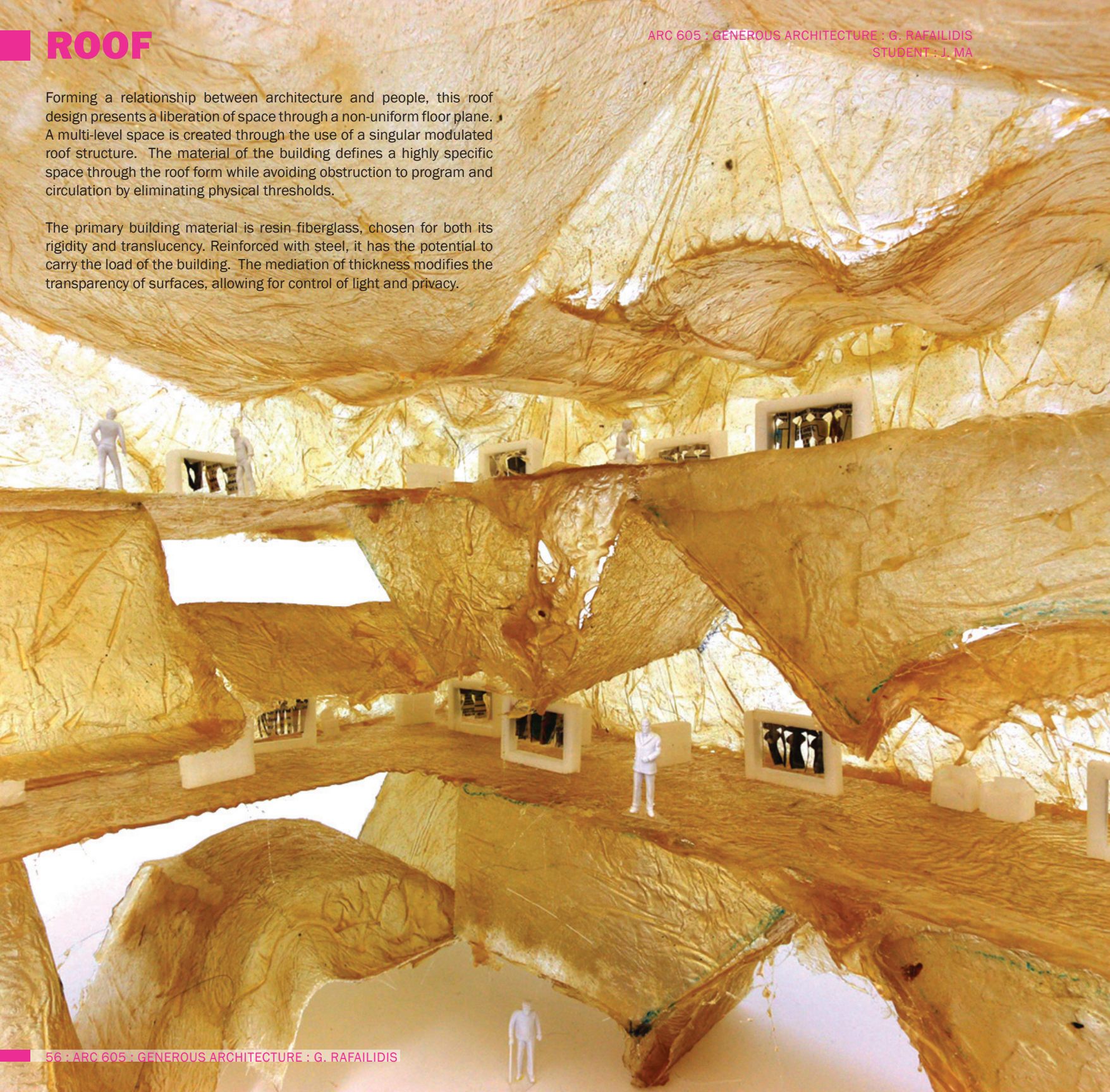

Roof Stacking Studies

The composition of the roof landscape is derived from existing buildings in Buffalo. Initial stacking attempts were made in order to construct bigger agglomerations of spaces and to achieve a vertical density. The vertical stackin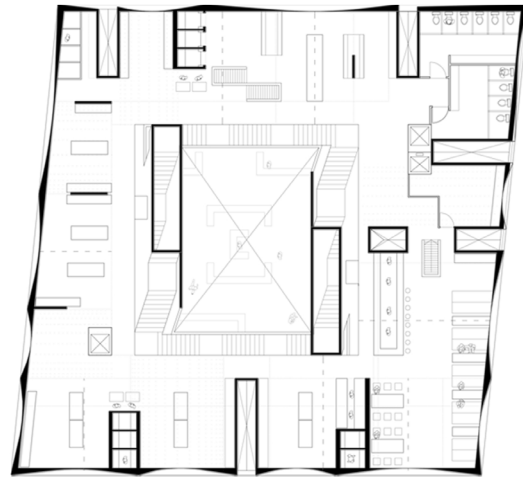g of floor plates creates mediation through adjacencies. On alternating floors, the form of the floor plate varies from flat surfaces to pitched landscapes, in turn creating alternating relationships between the form of the floor versus the form of the roof.
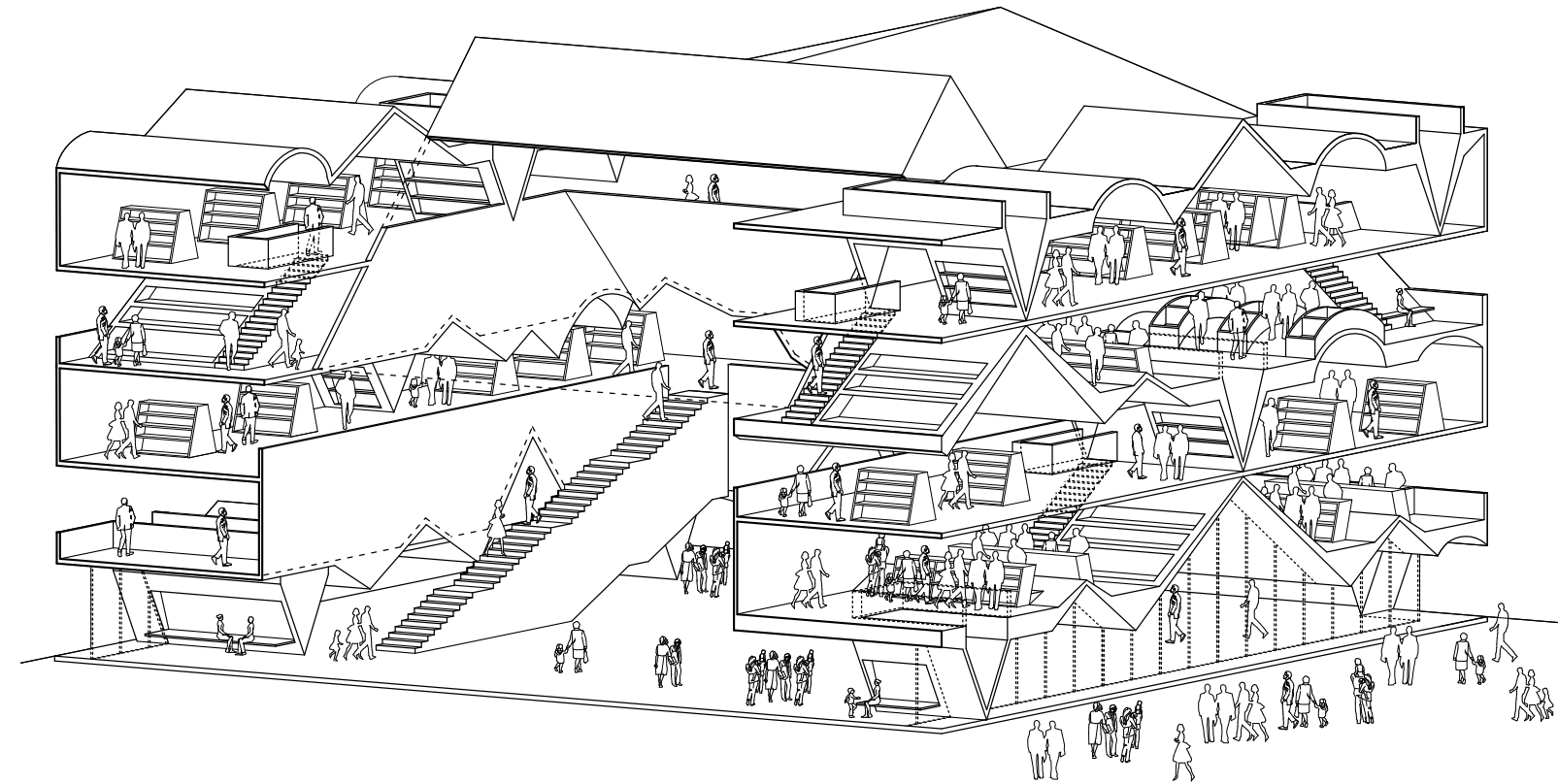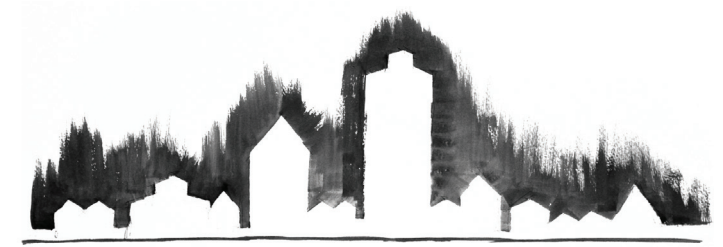

Axonometric Occupancy Section
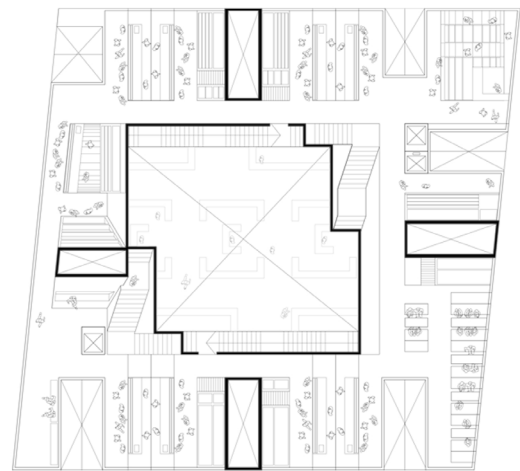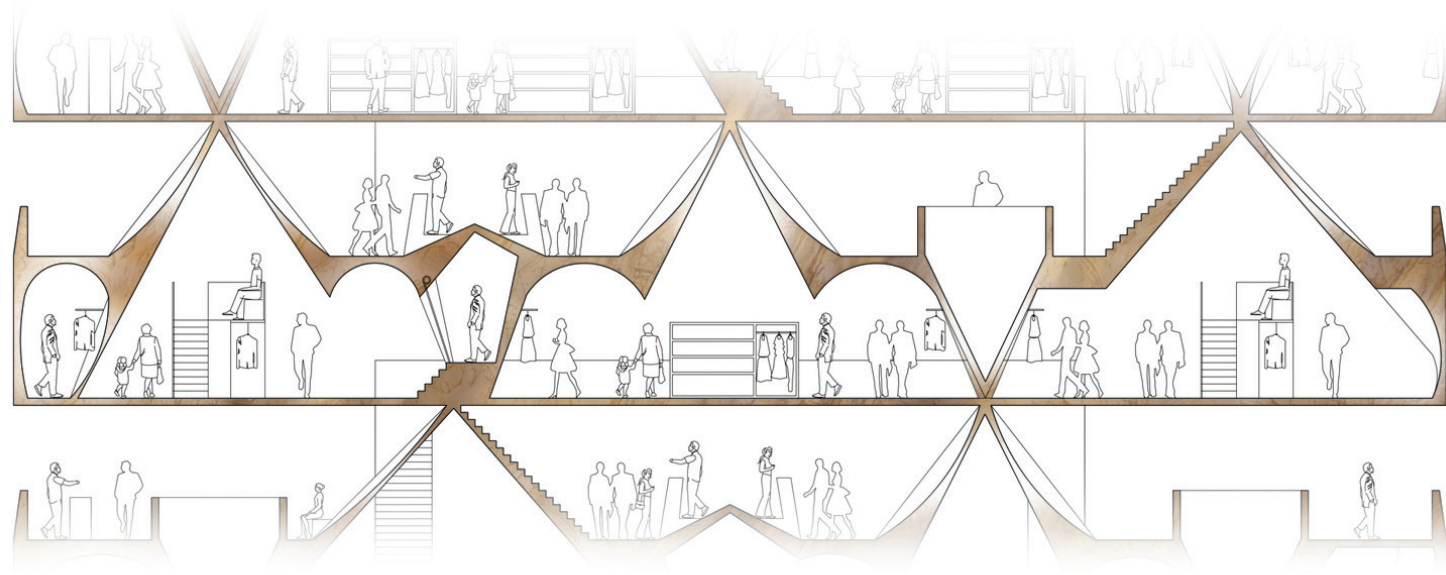
Exterior Local Market Plan

Interior Shopping Mall Plan

Conceptual Diagram

Occupancy + Material Section

The building functions as a department store with a local market nestled into the exterior pockets of the modulated roof. The programs of the local market and the department store complement one another. The local market creates an anchor for the department store within the community while the department store draws more people to the site because it is a destination. The department store is housed inside the modulated roof.
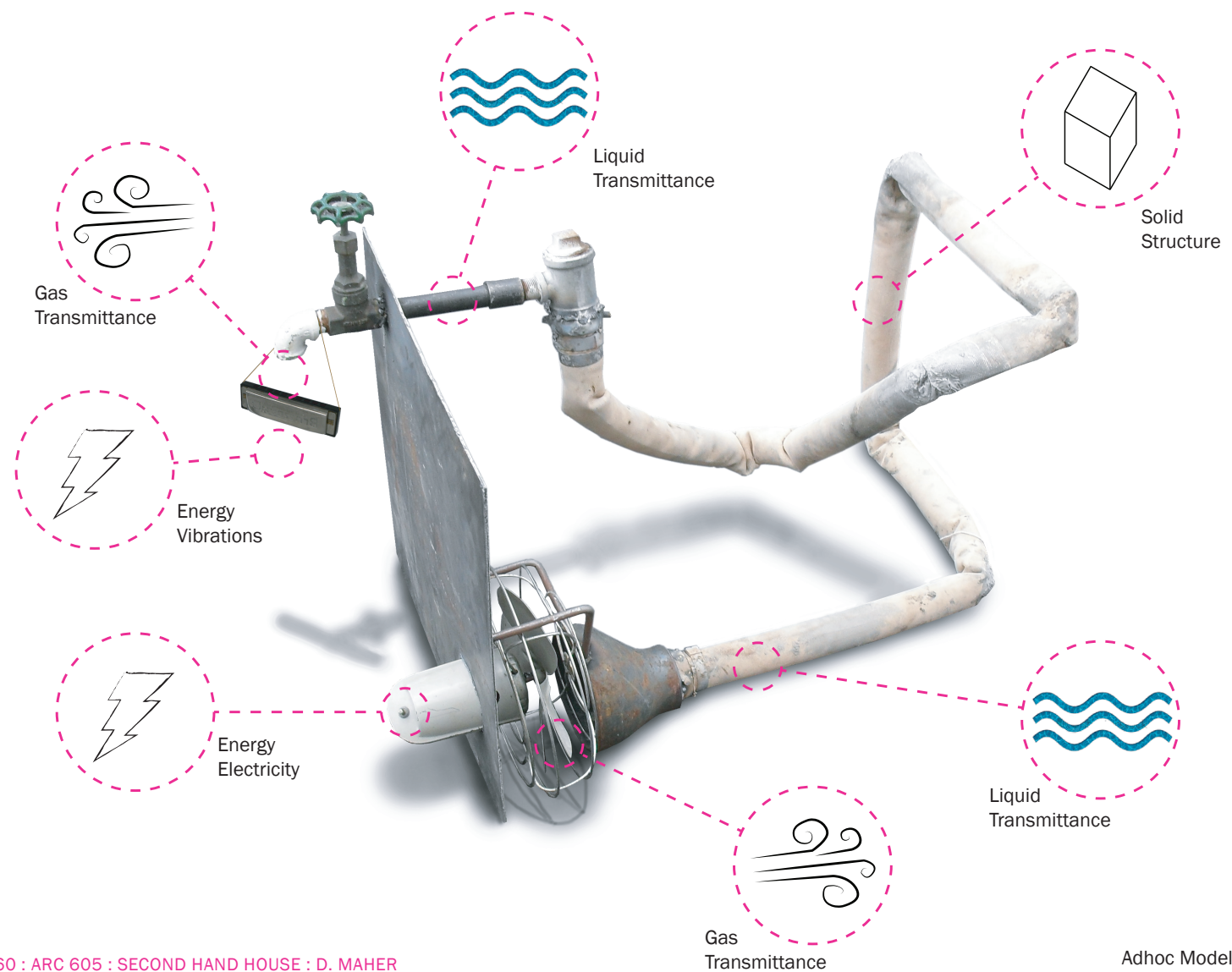

Programmatic Diagram

DOMESTIC ALCHEMY

Adhocism is interpreted as re-contextualization of different objects to achieve a purpose. The juxtaposition of familiar objects mediates these ends through their associative properties - that is, those inherent qualities that society has assigned particular entities such as the sound, feel, and operation of a fan. This process does not create something necessarily foreign, but maintains characteristics of the components while overlapping elements create moments of transformation and ambiguity. The artifact created is a play on its components' own contradictory associations and movements; the fan is associated with air; the hose, water; the concrete, solid; the pipe fittings, back to water; and finally the harmonica, back to air - all implying constant oscillation between the various states of being.

Operating using these methods in another found object - an abandoned house in Buffalo, NY - an analysis of already displaced components in the house began. Detaching objects from preconceptions of use, material, and gravity, the architecture suggests new states of being. The door resting out of place on the floor begins to call into question the conventional threshold and suggests a new movement and orientation of space. In order to engage domestic scale and context, we begin to focus experiments on objects that are commonplace within the household. A series of object-driven collages explores repetition of components, manipulations of scale, and skewed/hybridized ideas of utility.

Gas Transmittance

Liquid Transmittance

Solid Structure

Energy Vibrations

Energy Electricity

Liquid Transmittance

Gas Transmittance

Adhoc Model

Displacement Collage

A catalog of existing thresholds in the house was created as a way to locate opportunities to carry out our threshold strategies in the house at 99 Chenango St. This catalog provided a method to graphically analyze the locations of threshold and their correspondence with the different programs of the house. As a result, an understanding of the traditional patterns of usage in the house in relation to thresholds aided in engaging new relationships and new usages.

The "Ad-Hoc Model" became the ground for experimentation and relationship building between various new and existing thresholds of the house. The goal was to define a new space through thresholds defined by found objects. The model demanded both a new functionality as a domestic situation and an integration of environmental servicing in the house with the structures of threshold. The spatial and environmental thresholds usually concealed within the house are exposed in the spine. This interstitial space became the ultimate threshold, providing access to the house and exchanging air, water, and space between parts. It penetrates the volume of the house, integrating and assimilating familiar materials and assemblies with its own misinterpreted logics and performative necessities. The shell of the house remains, for the most part, unaltered - while the void expresses itself as a collage of disparate parts.
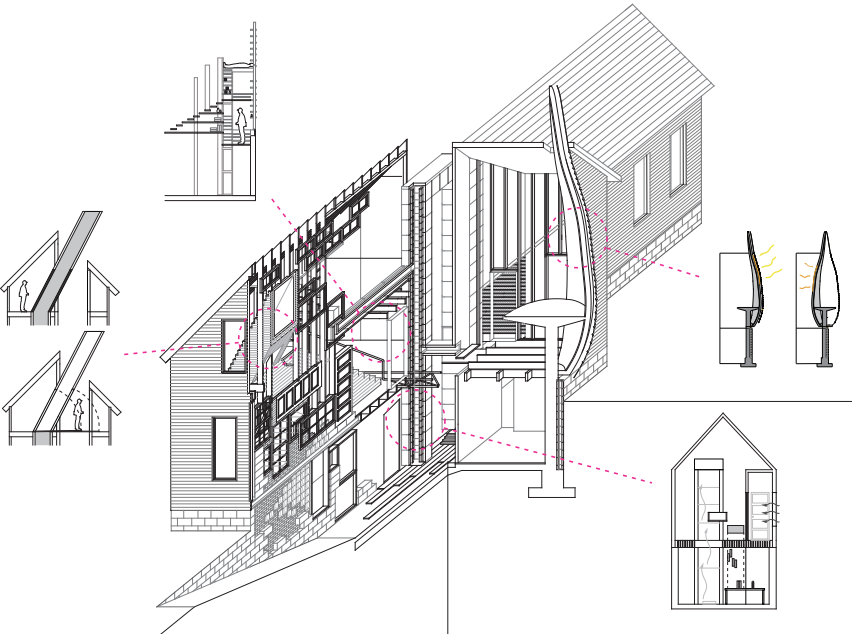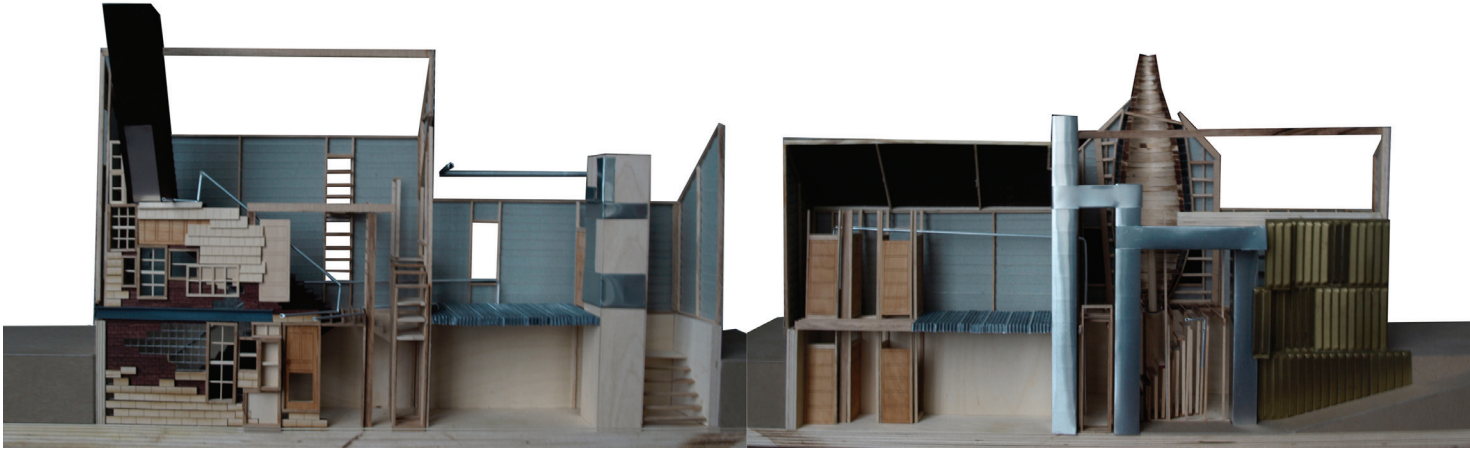

Exploded Axonometric Threshold Diagram
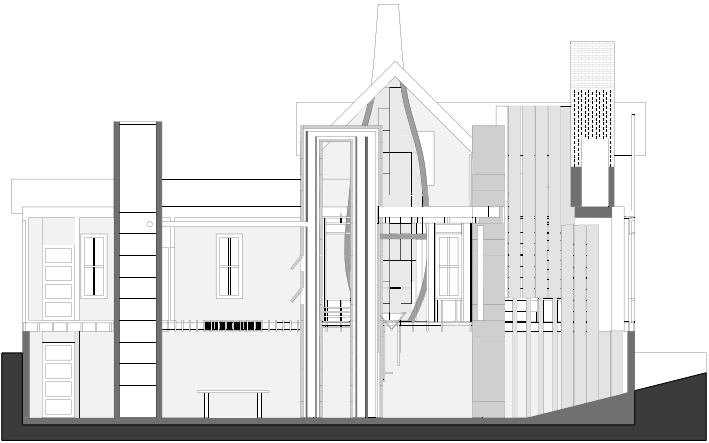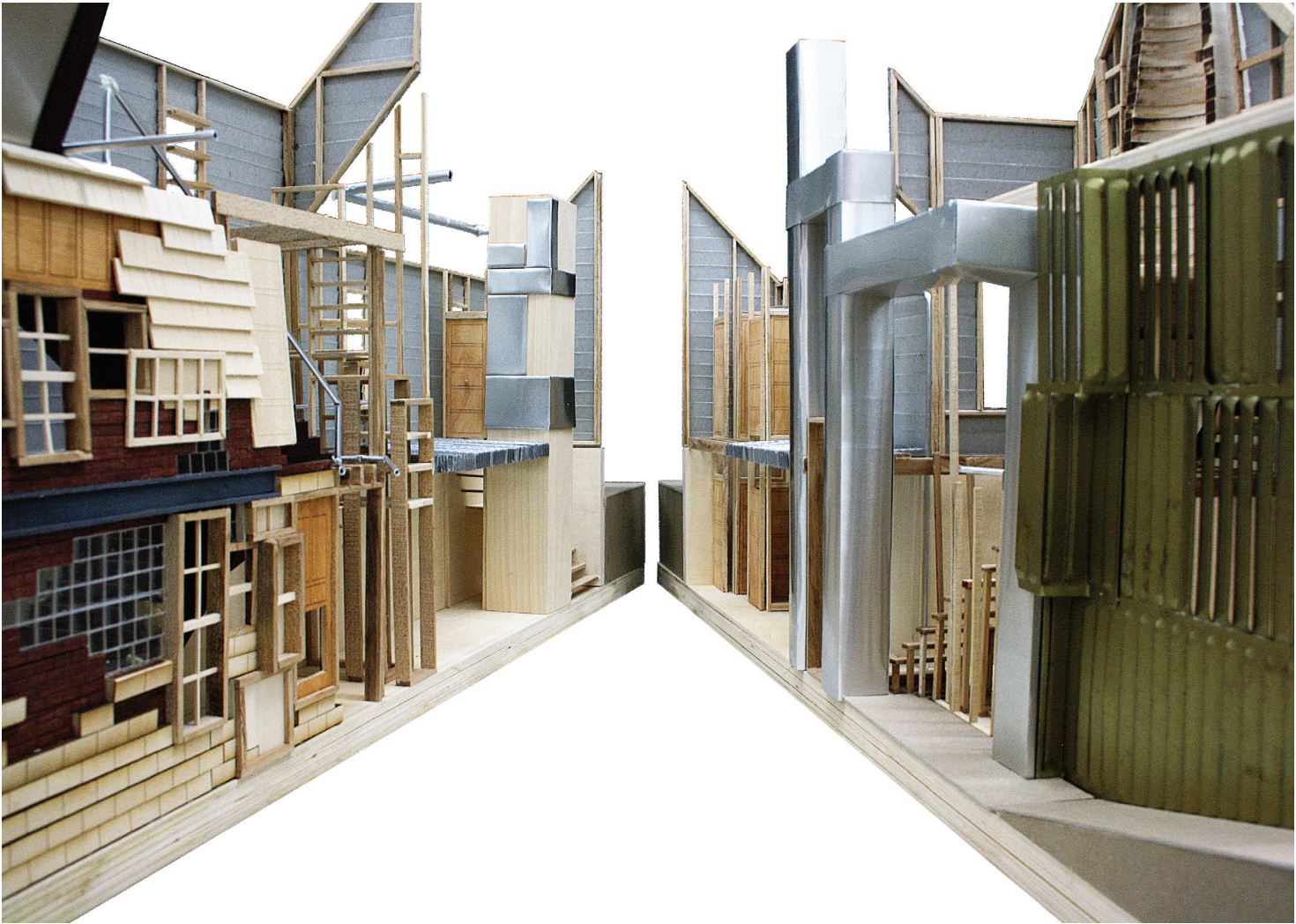
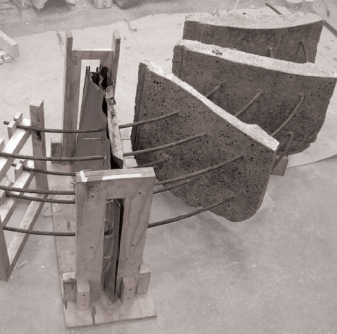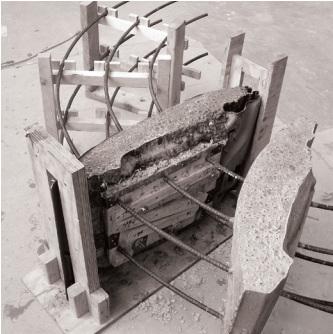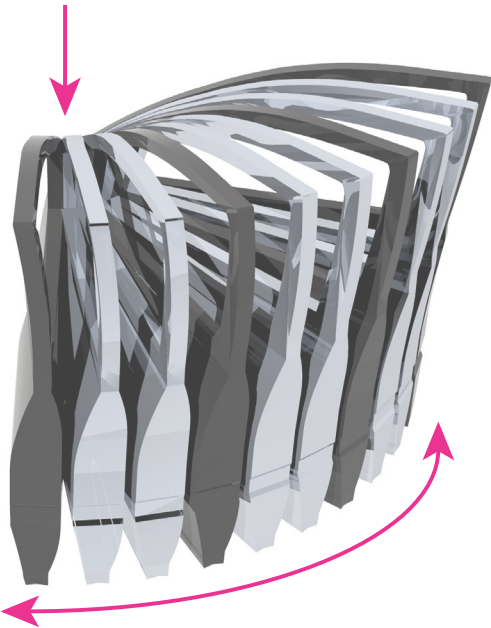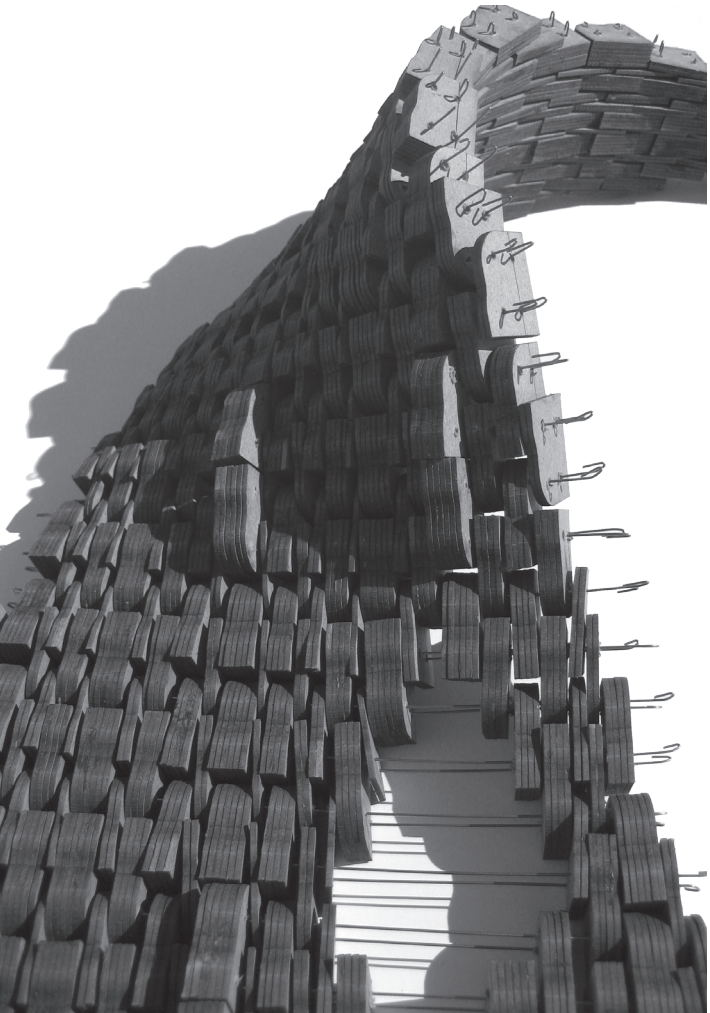Displaced Objects + Void Section
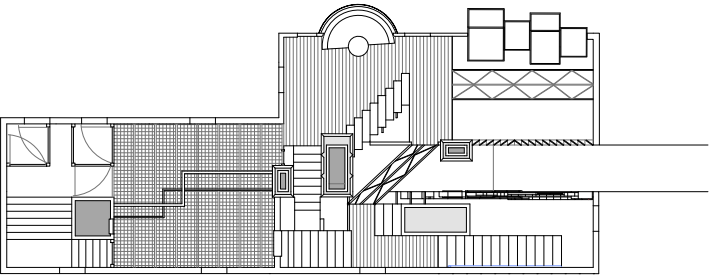
Ground Floor Plan

HINGE

A found object, a car door, is the precedent for Hinge. The door is analyzed from its point of rotation, path of rotation, as well as both its internal and external construction. For instance the exterior of the door is aesthetically appealing with its thin, finished metallic cover, while the interior of the door is an undulating landscape of structural reinforcement.   From this a comparable analysis was made of conventional stone aggregate used in concrete. Replacing the crushed stone with crushed glass, the exterior of the concrete is finished and polished, leaving an exposed glass aggregate. Through a series of tests, each containing various quantities and qualities of glass and stone aggregate, different finishes are exposed giving the cast structural integrity while maintaining aesthetic appeal.
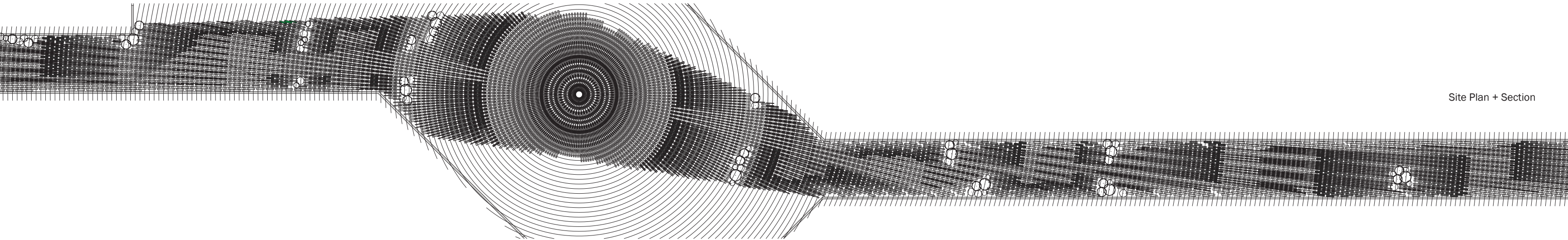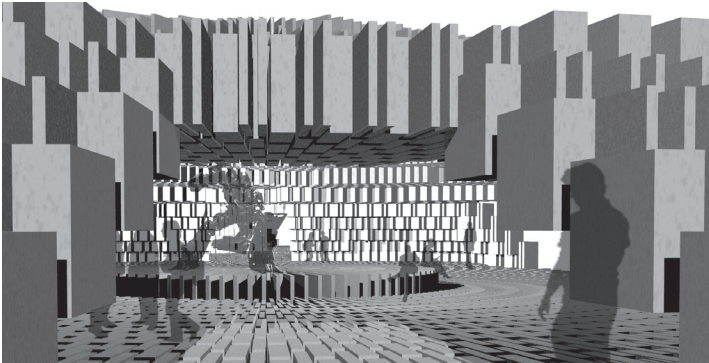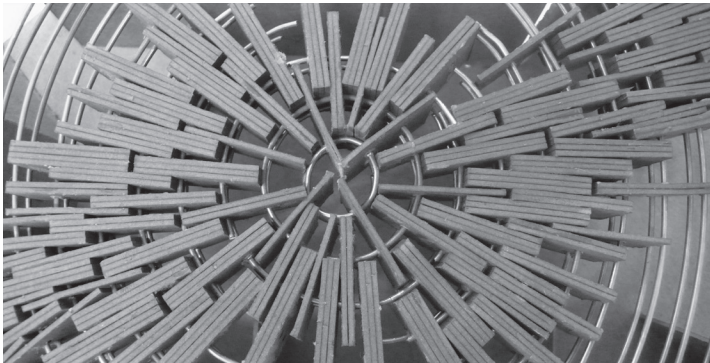
The surface has the ability to flex, creating opportunities for space to be created. The hinged surface morphs to create various inhabitable spaces and surfaces from which to orient programmatic function. The surfaces act as mediators between interior and exterior realms and at the same time provide a new landscape within the environment. Along the surface, benches, viewing areas, points of recreation, and secondary programs such as galleries and amenities are provided.

Four Stage 'Hinge' Cast
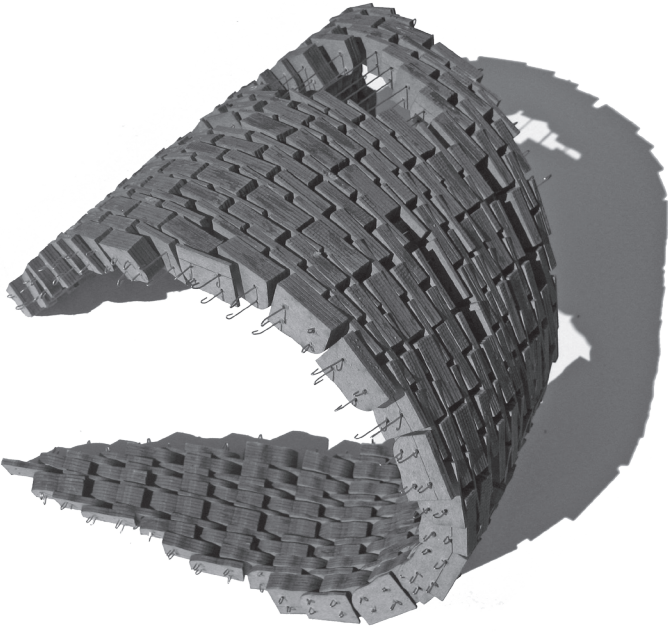
Glass Aggregate

Four different sizes of glass aggregate are used in the concrete in order to work with the thrust-stress levels of an arch. As the size of the concrete forms increase, so do their inherent stress-strain levels. The polished glass surface is exposed to the inhabitant, differentiating and filtering light as it passes through the surface. The surface itself links its existing surroundings within the community. A pedestrian walkway and public amenities are provided to encourage interaction with the surface and to utilize the facilities.
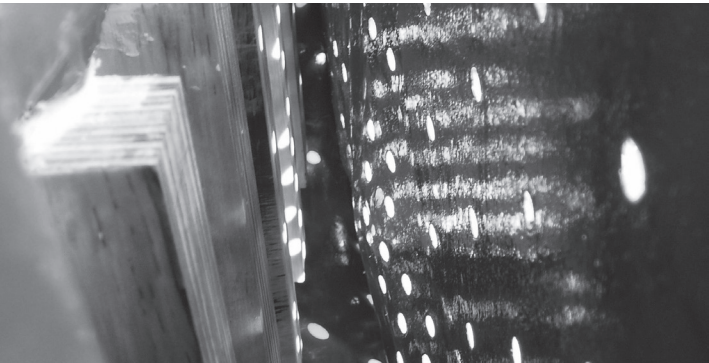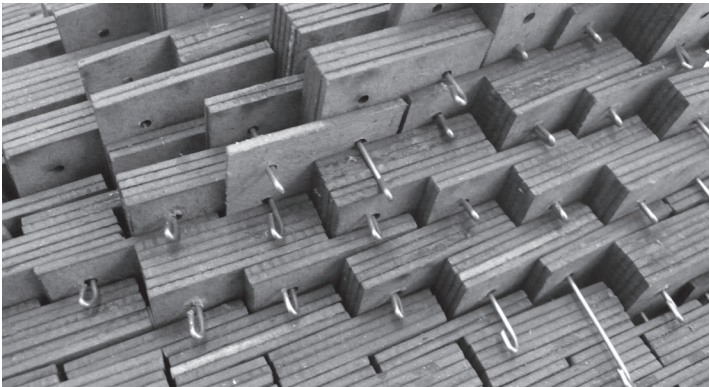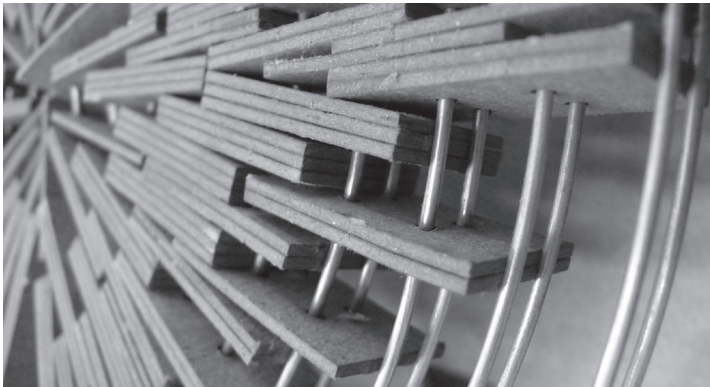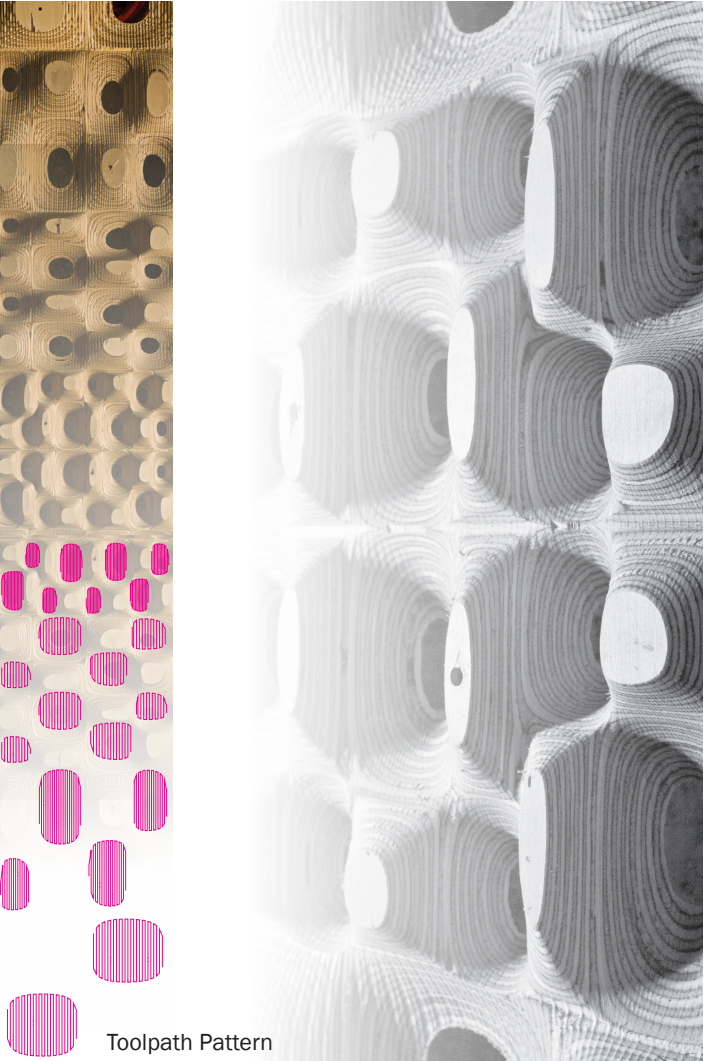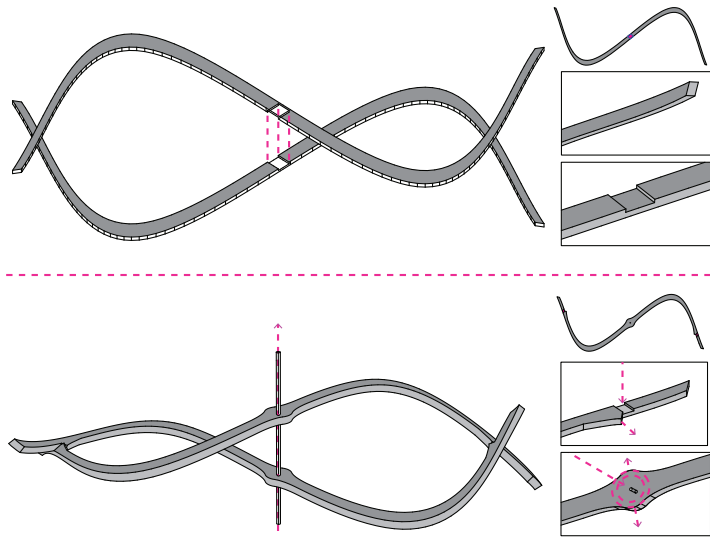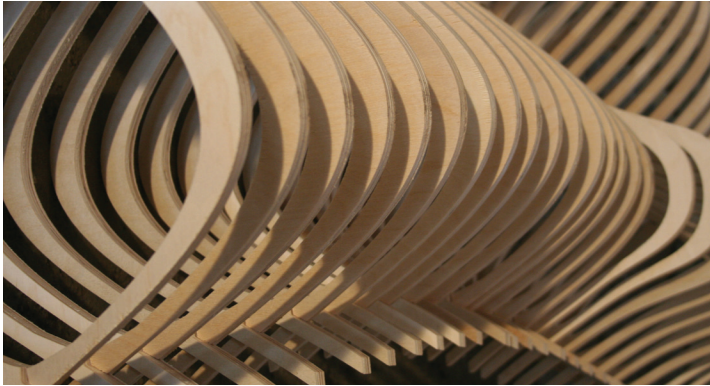

Site Plan + Section

COMPUTING (N) CONSTRUCTION

ARC 492/596 : CNC : N. CORNMAN, C. ROMANO
STUDENTS : J. BRENNAN, A. FEIT, W. GEORGI,
J. PIWOWARSKI, M. SAMA, R. STORA, S. ZISSIS
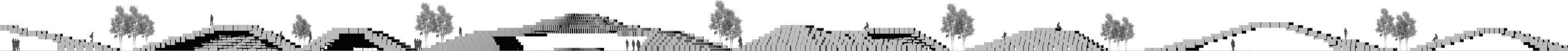
This course provides ongoing analysis and experimentation with the new(er) 3D digital fabrication technologies that have become more accessible to the architect. This is a phenomenon in constant evolution that has lead to radical changes in design and production processes. CNC digital fabrication machines offer new opportunities for design professionals in the 21st century and are ushering in a more flexible project methodology capable of adapting to meet different and changing needs. These advanced fabrication tools call into question the future of the traditional model/linear approach to architectural design. The impact of this new technological paradigm is being felt in every phase of the production process, from conceptualization to materialization, from distribution to consumption. Moreover, it suggests a possible paradigm shift in the making of the world around us.

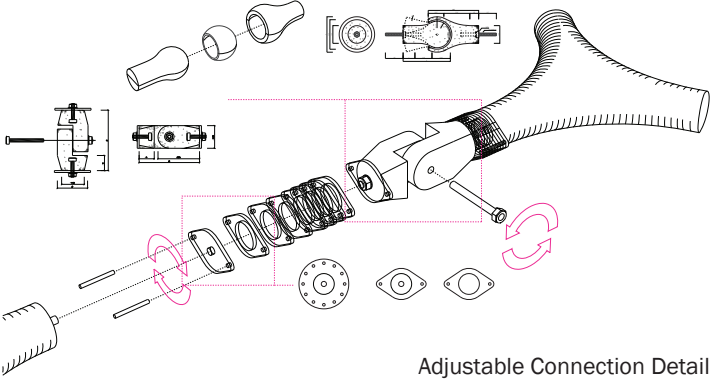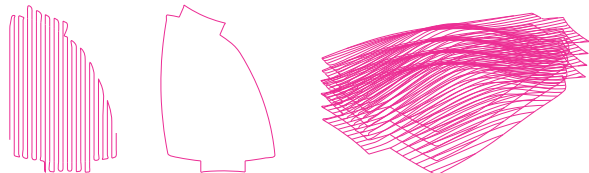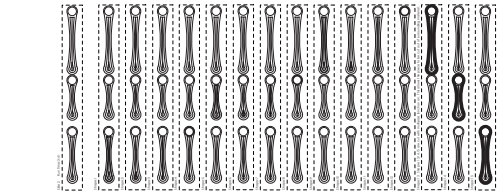Toolpath Pattern

Interlocking Connection Detail

Adjustable Connection Detail

Surface + Component Details

68 :ARC 492/596 : CNC : N. CORNMAN, C. ROMANO

STUDENTS : J. BRENNAN, A. FEIT, W. GEORGI, J. PIWOWARSKI, M. SAMA, R. STORA, S. ZISSIS : 69

TRASH TRANSFORMER

The Trash Transformer is designed to educate children on the causes and consequences of waste production by promoting responsible waste reduction and material conservation. This mobile education unit is constructed from re-used materials to promote the need for reduced reliance on the Earth's natural resources. The unit will travel to various schools as a mobile classroom and is targeted at students between grades 4-8. The transformer will be located in a public space to create awareness of the project. One component of the unit will be transported to an open space of the school and remain there after the primary unit has left the site. This piece remains as an iconic reminder of the program, encouraging participants to continue in the preservation of the environment. The goal of this design is to spark a genuine self-driven interest in the students of this material and to avoid the resistance to learning that simple mandatory interactions frequently produce. The unit itself is transformable and offers interactive technologies and a variety of physical spaces. Demonstrating that materials can be reused and recycled in an attractive, modern manner within the spaces will support the concepts being taught. The unit's design facilitates a waste-reduction program, but is flexible enough to respond to curricular variation.
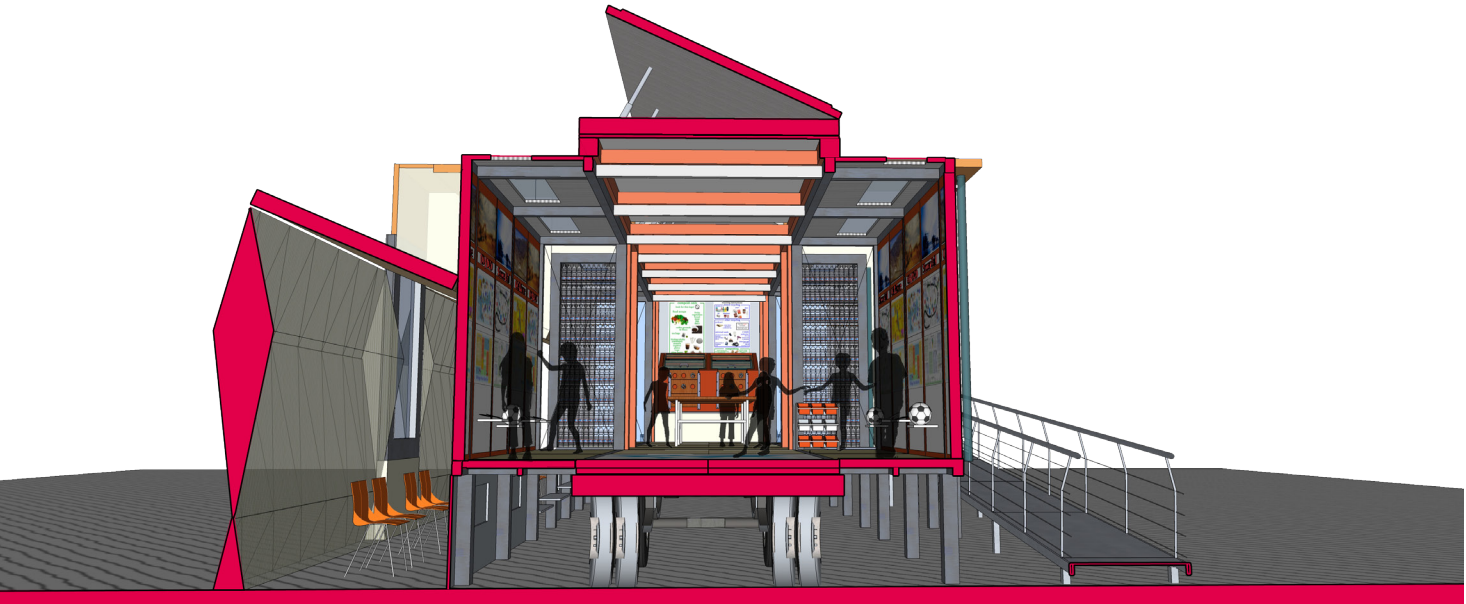
Deployed Trailer Section
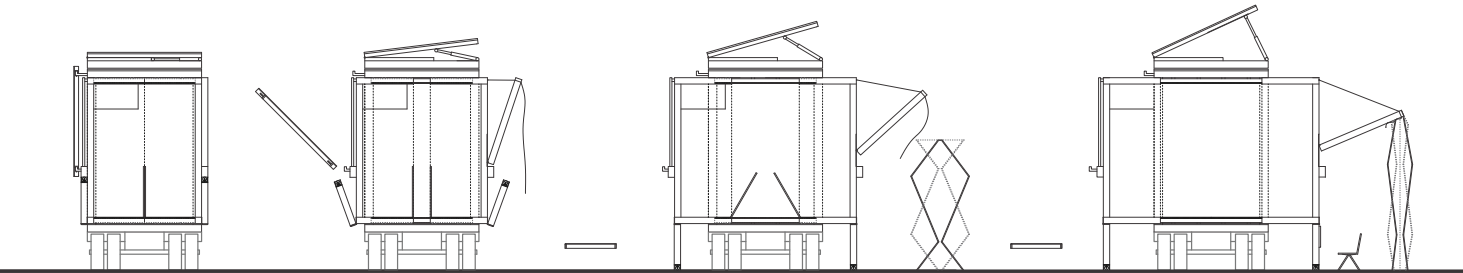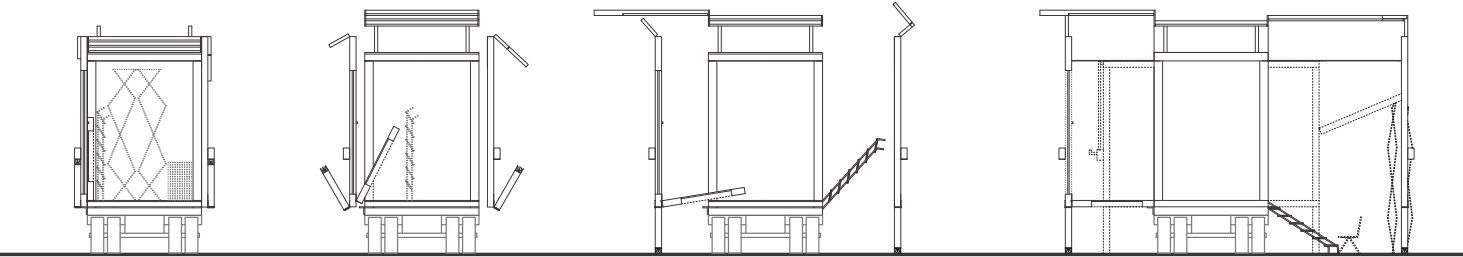
On Site Deployment Process
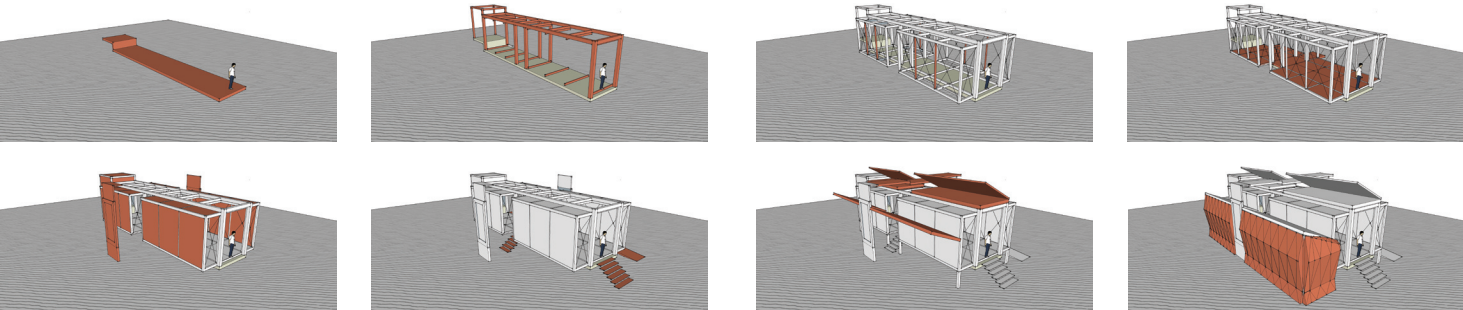
Construction Process
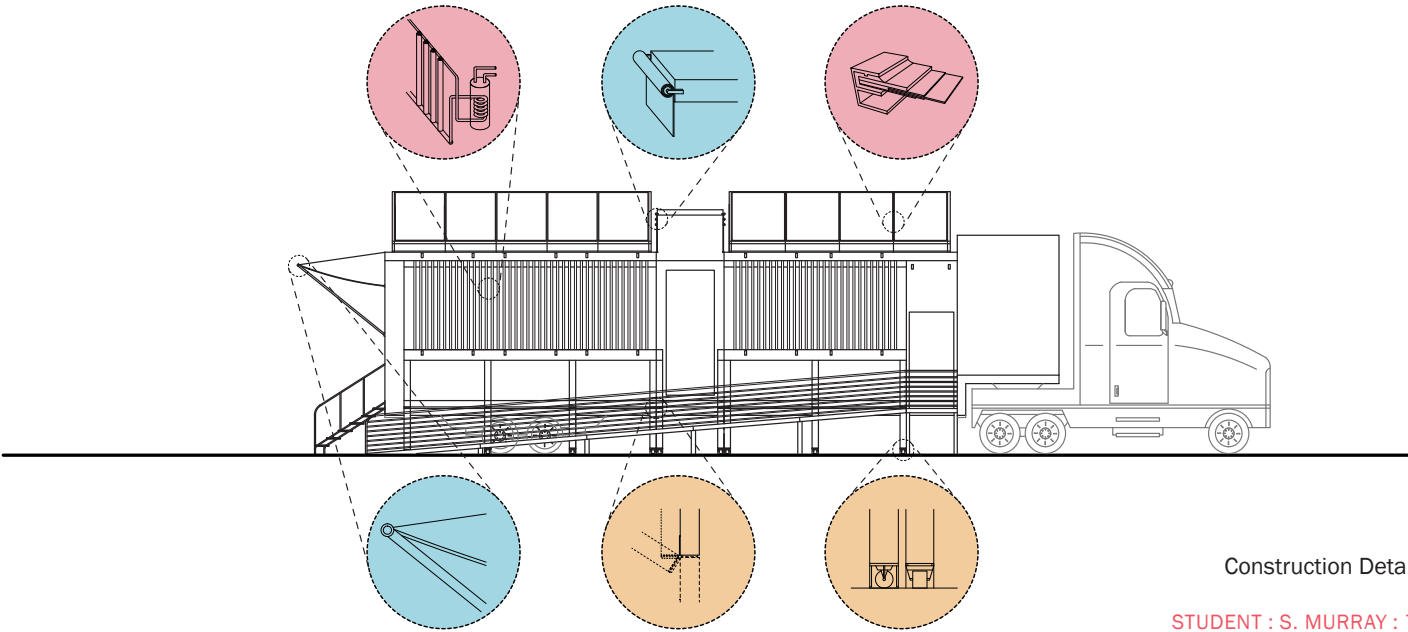
Construction Details

TOTEMIC FIELDS

Unmaking is the great unsaid of architecture. It is the shadow of our fixation on our generative shaping and reshaping of the world. With every act of construction, something will be unmade. This activity is seldom recognized as a part of the making, although without the unmaking, nothing could ever change.

Totemic Fields is a temporal and permanent intervention that uses indexical markers to narrate the tale of a community both lost to environmental mismanagement and revitalized through re-purposing. The Love Canal analysis and intervention provided an opportunity to explore the sensitive paradigm of death and rebirth. Totemic Fields narrates the story of the tragedy at Love Canal in an effort to ensure greater awareness to our consumption and disposal.
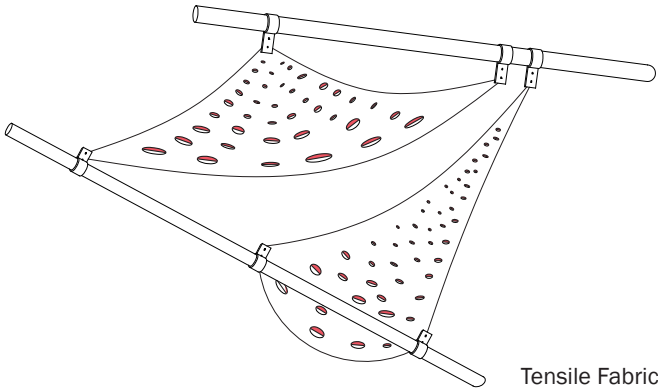
Tensile Fabric
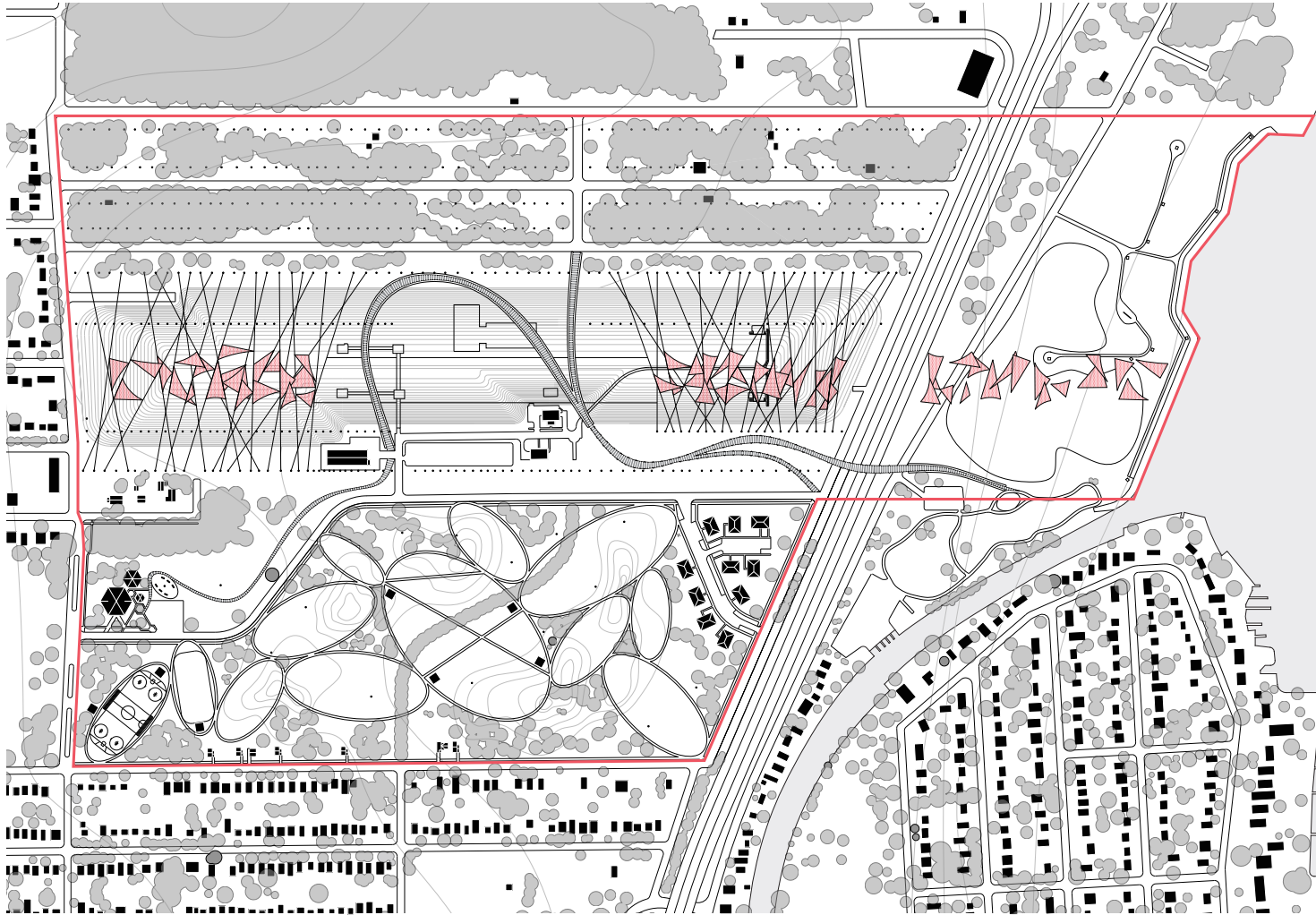
Site Plan
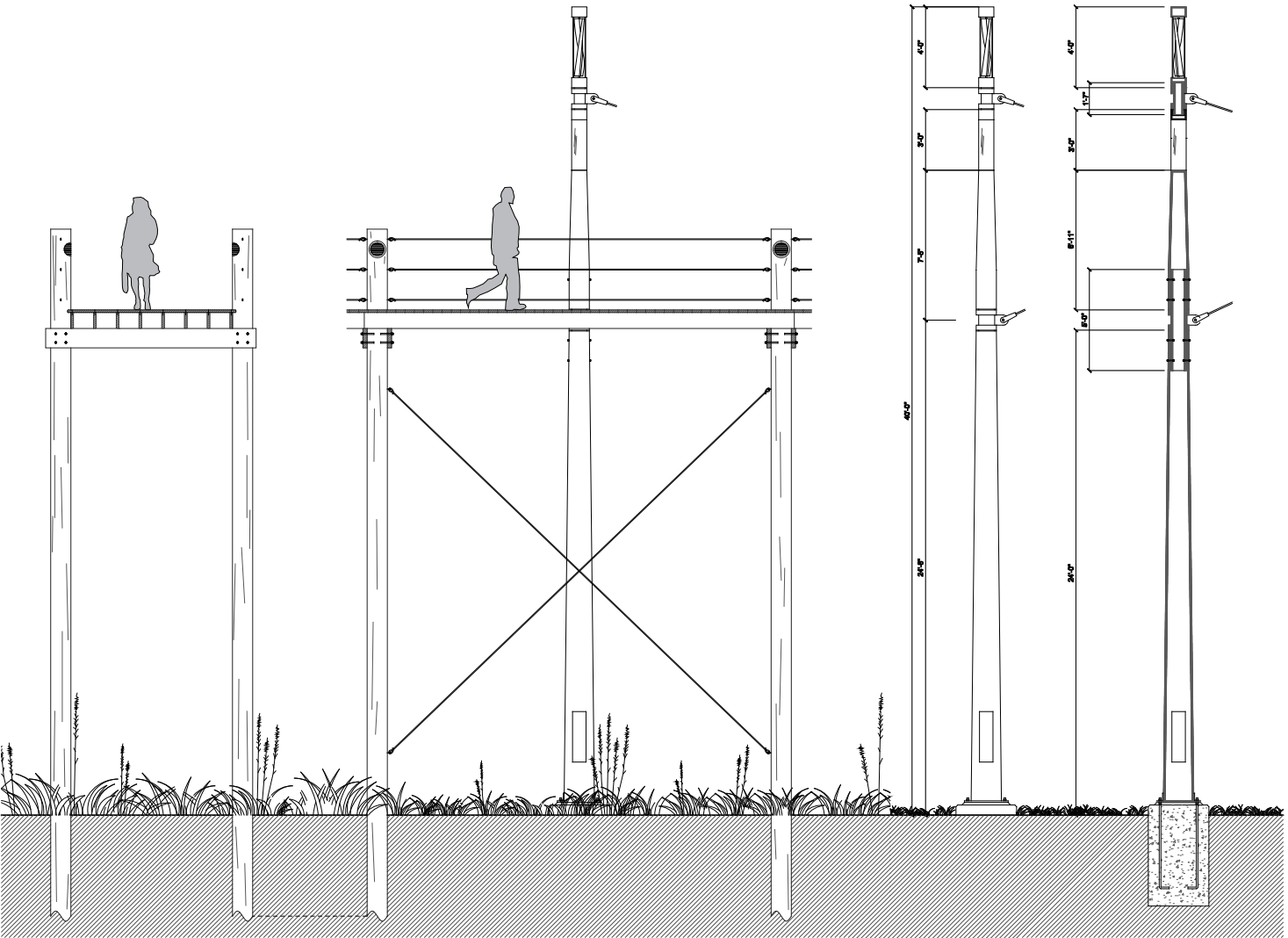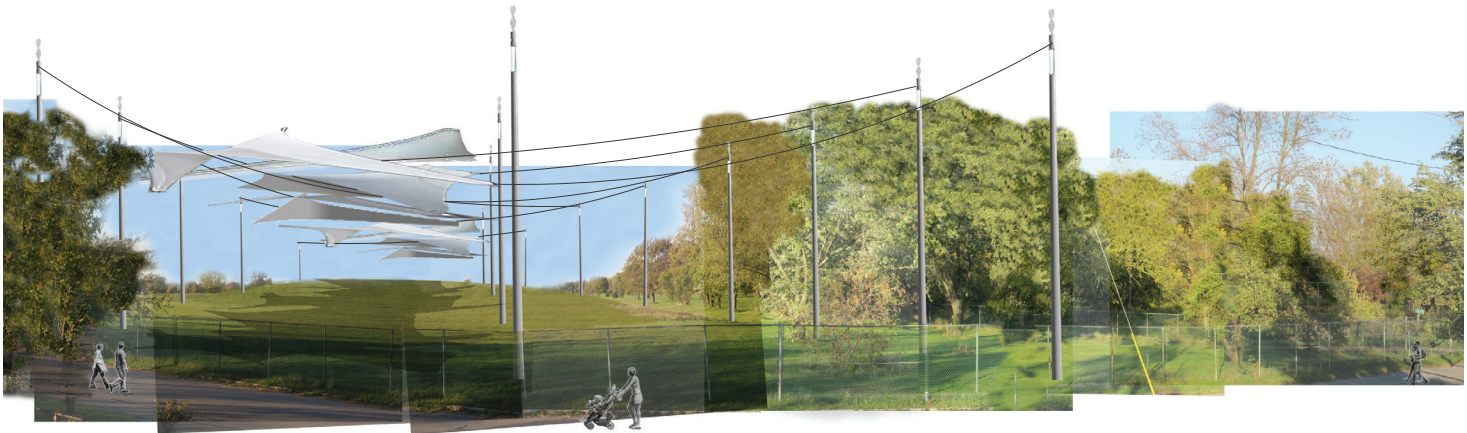
Elevated Boardwalk

THE PIERS

The building incorporates constructed wetlands, a living machine, greenhouse, and Combined Heat and Energy Generator into the design to be both functional and didactic. A large green-house space was incorporated into the design of the atrium along with a series of four story long span brick archways. The enclosed space allows for exhibits, entertainment, gatherings, education, and relaxation at all times of the year, consuming minimal energy aside from solar gain and the thermal mass capabilities of brick and water. The re-grading of the topography filters water through a series of wetlands and pond areas before it is released back into the harbor.

Brick as a building material was of primary importance in the realization of the structural systems, filtering methods, site development, and energy use strategies of the buildings. The use of Phase Change Materials within individual bricks can improve the already strong thermal properties of the brick resulting in as much as a 7 times increase in thermal lag time of that of normal brick. The stored energy from the sun in specific direct gain passive areas can moderate the interior temperature for significantly longer. Finally, brick pave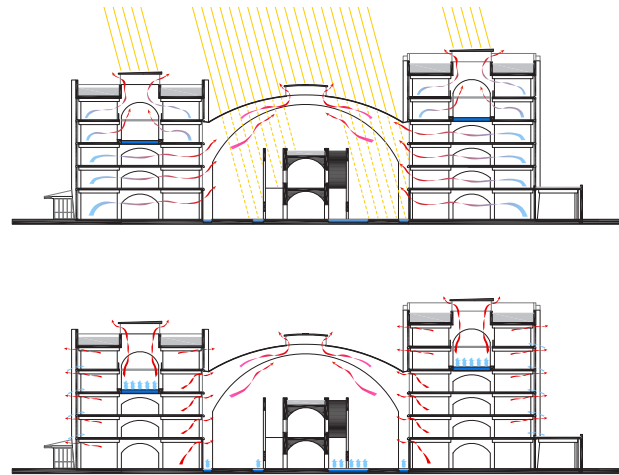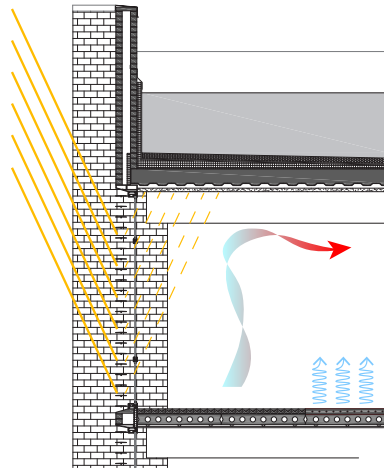rs and paths structure the organization of the site and allow for filtering of water from the parking and pathways, limiting on-site contamination.

This design studio was a part of the 2nd annual Brickstainable Design Competition. The goals of the competition are "to stimulate the local and international design community by challenging them with a competition seeking ideas, concepts and assemblies which hold the greatest potential for shifting paradigms for the masonry industry as they relate to energy efficiency and environmental regenerative building design; thus, bringing broad awareness to the intrinsic sustainable properties of the oldest manufactured building material: brick... and to raise the bar for sustainable design in all areas of the built environment."
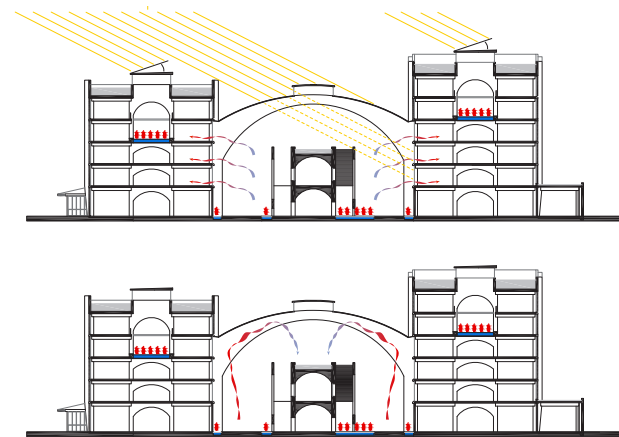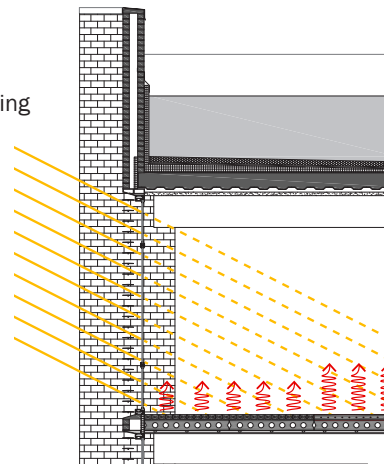
Summer Conditions

Passive Cooling : Ventilation
Active Cooling : Radiant Floor
Cooling, Operable Louvers

Winter Conditions

Passive Heat : Direct Solar Gain
Active Heat : Radiant Floor Heating

THE ECO MACHINE

Through ambient research in a larger context, a specific site with adjacencies to high pollution buildings was selected as an ideal location to support an Algae farm. By focusing on the site's climatic qualities, form and fenestration patterns were developed in order to significantly reduce energy loads for the supporting research spaces. Embedded within the program is a fully integrated research center, generating bio-fuel through algae production.

In 2010, The Eco Machine won the American Institute of Architects New York State (AIANYS) Student Award. The project was also awarded first place in the 2010 Pella/ WESTNY Design Competition in recognition of the "significant design work that demonstrates the potential for its use of fenestration in interesting and innovative ways to capture more than light, air and view."
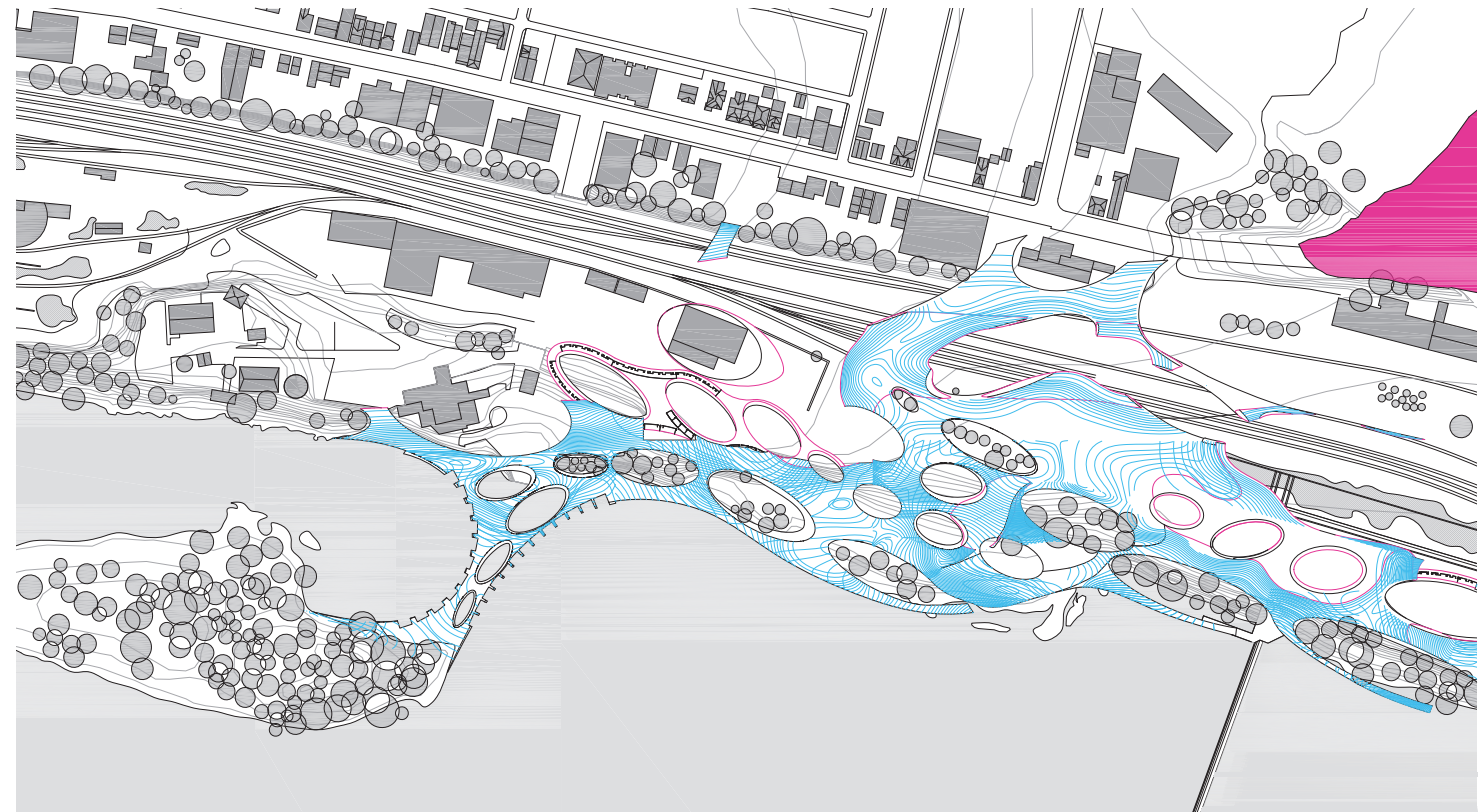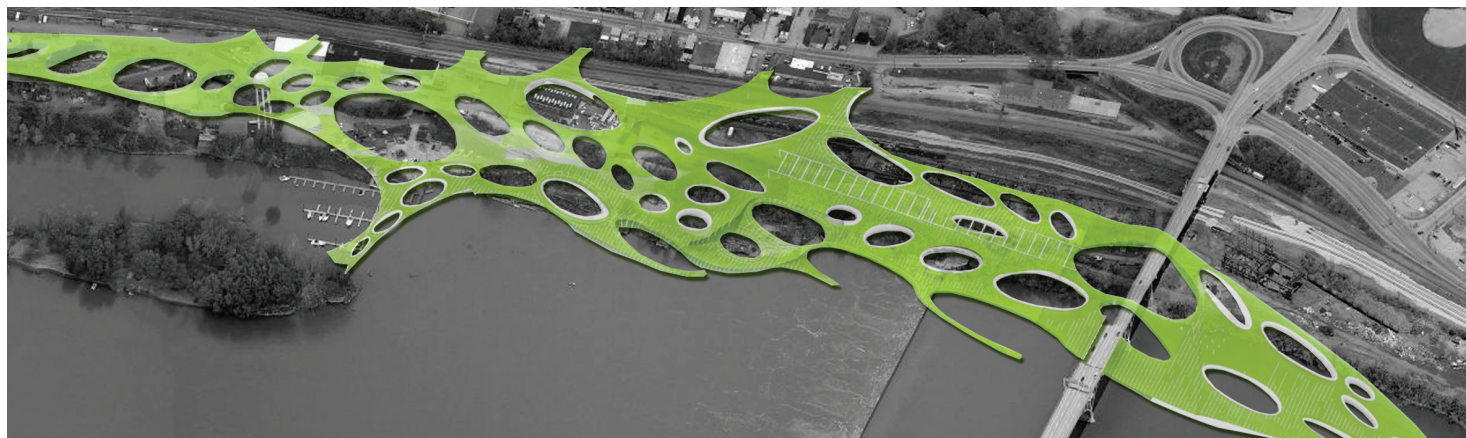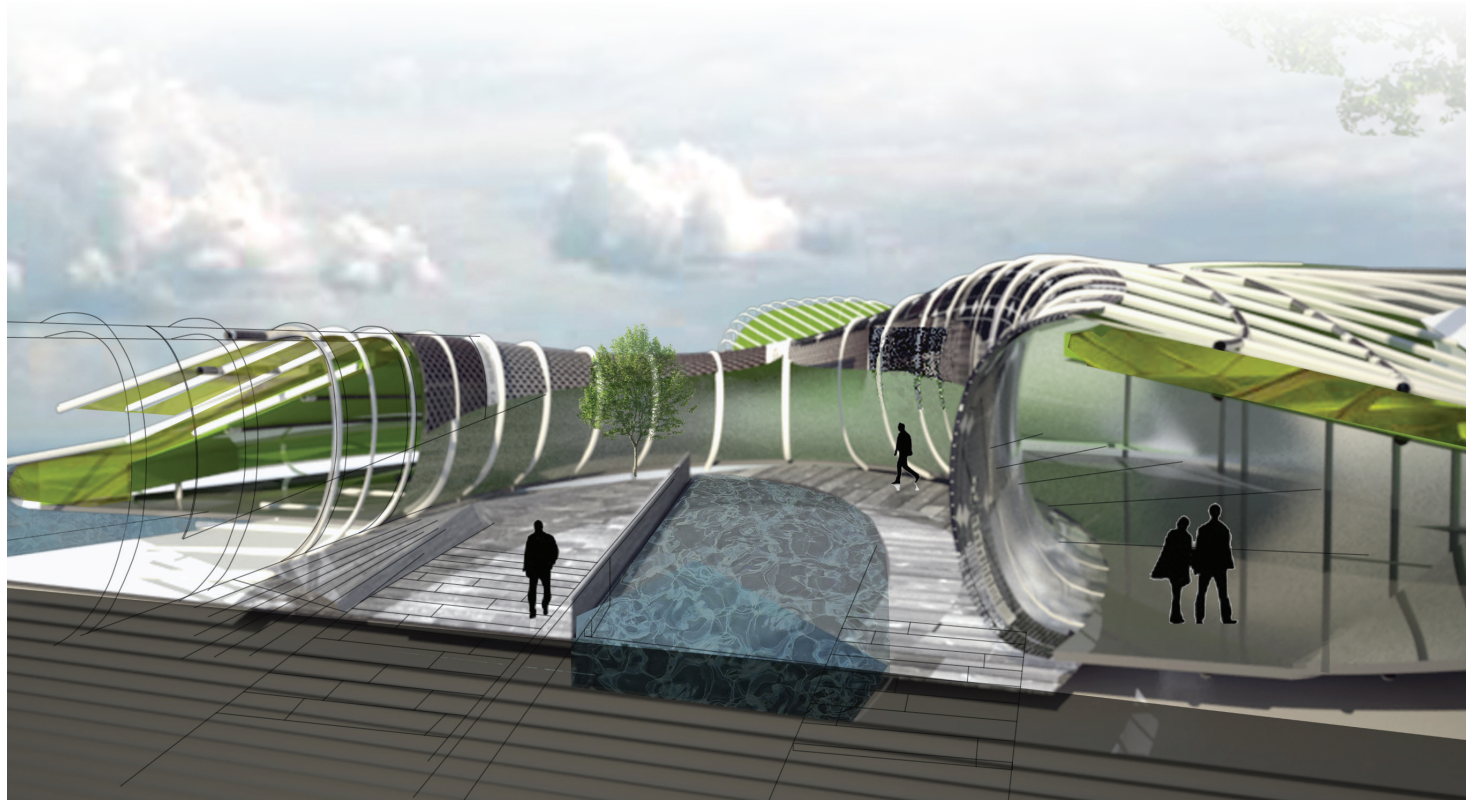
Site Plan

Section A

Section B

SUMMER_75d

WINTER_75d

Laboratory Interface

photovoltaic
modules

fixed
glazing

perforated
panels

Uncoiled Surface

Neoprene Gasket
Mullion

5" DIA. Roller
Section Hinge at Jamb

Perforated Aluminum Panel

10" DIA. Steel Tube

Glazing

2"x2 1/2" Embedded Steel Track

Meet Rail Joint
Photovoltaic Module

Section Hinge at Jamb

Mullion Cap
Glass Clip
Machine Screw
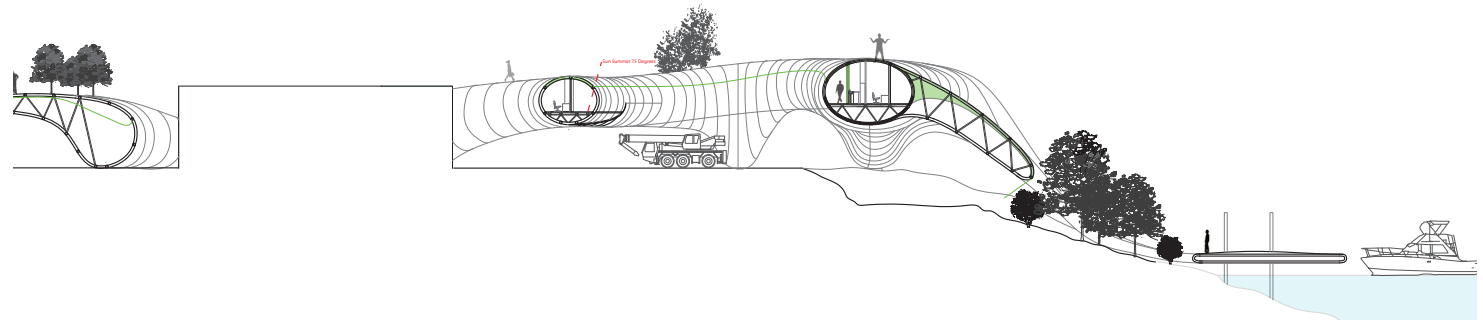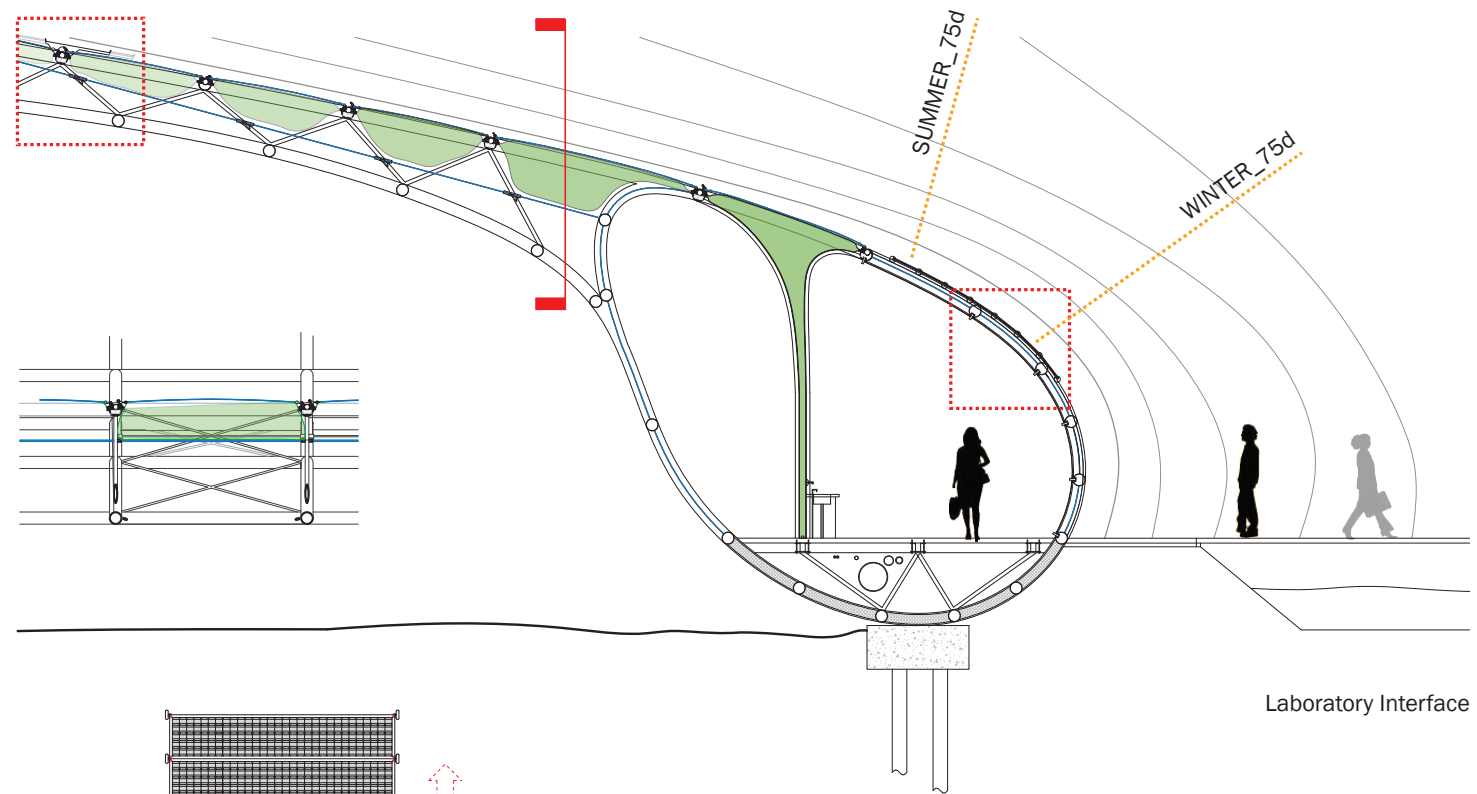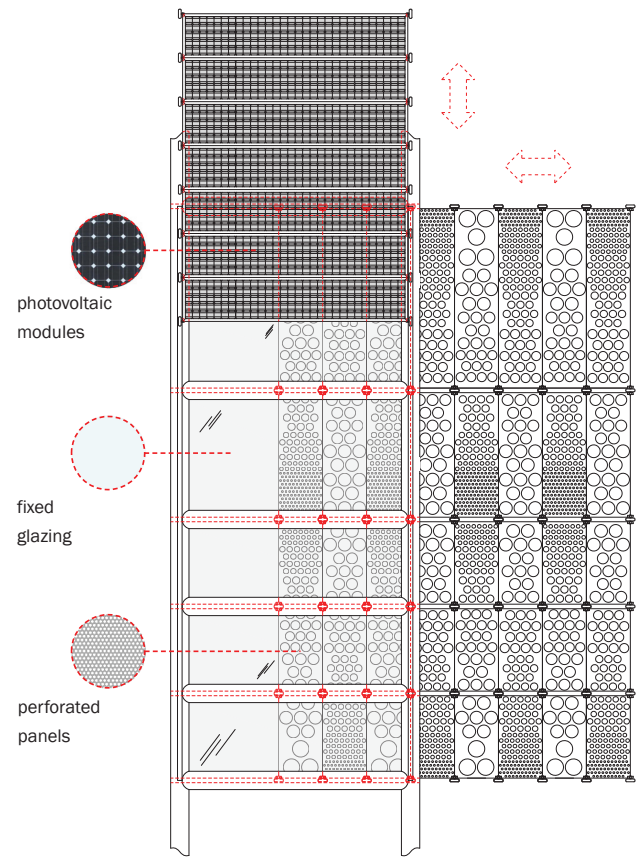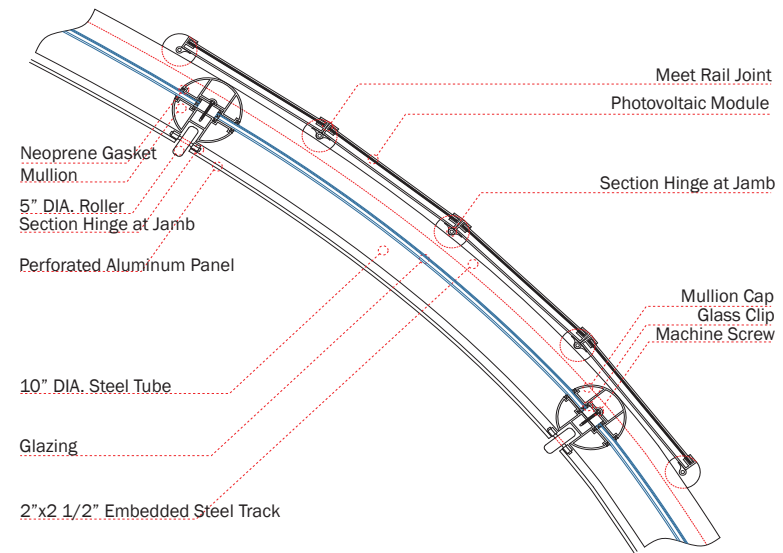
Tracking Detail

Each support space utilizes a layered facade system to supplement its own energy use in relation to program function. Laboratory areas are calibrated in form to meet peak energy loads over the course of the calendar year. A multi-directional independent tracking system orchestrates the Eco Machine's fenestration in such a way as to crea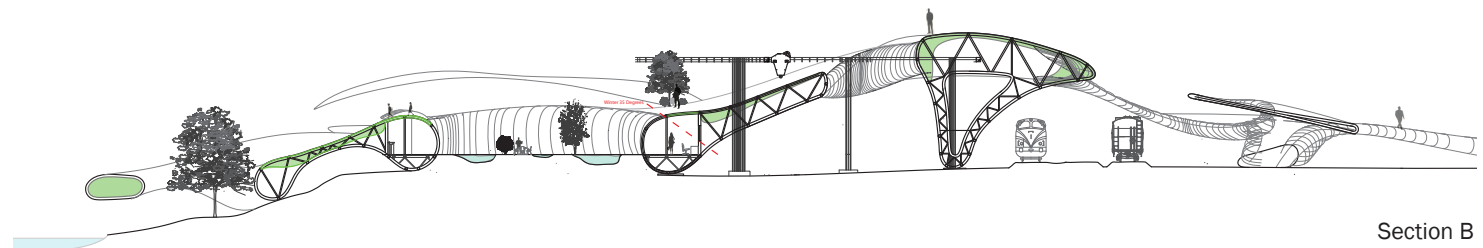te a uniform composition of practical working stations and algae production spaces. Located on the interior of the research floor are a series of perforated aluminum panels that can be adjusted from left to right to meet the demand of the building's occupants. Fixed glazing runs between the support trusses to provide an additional thermal barrier. Lastly, mounted to the exterior of the steel trusses are a series of photovoltaic modules that track the sun's movement throughout the year. While the perforated interior system relies on a human interface, the solar surface automatically adjusts to the sun's predominant angles of 75 degrees in the summer and 35 degrees in the winter in southern exposure. This system provides an offset to the high-energy usage from each of the laboratories, thus harvesting the grown algae from the remaining surface area to be used for outsourcing of variously graded bio-diesel products.
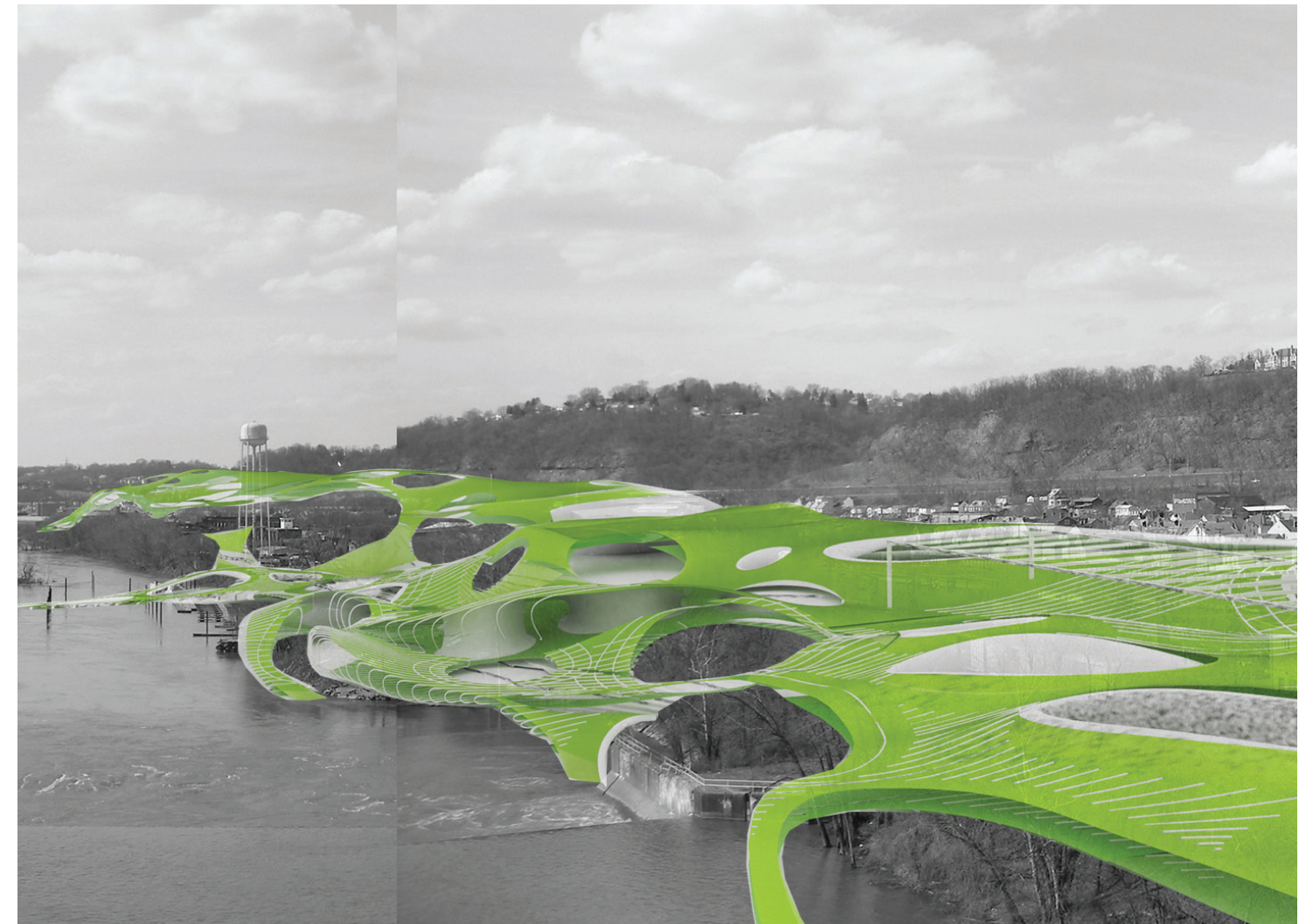
NEXUS

A "nexus" is a connection. A bus stop is a nexus in space and time. It connects physical routes of transit and pedestrian travel; it is a place where personal times coexist and are structured to fit a civic structure; it is a place where the personal meets the social and where different social worlds collide; it is a place where the real world connects to the virtual world of information and signs. Thus, as architecture, the bus shelter is a compressed and highly charged space that belies its very humble and modest appearance. It poses interesting challenges that shed light on the nature of contemporary culture and the place of architecture within it.

A healthy public transportation system is critical to the development of a sustainable university campus. The UB 2020 Master Plan seeks to reduce reliance on private automobiles for transportation to the campuses, between campuses and within each campus. Bus shelter design is a critical factor in promoting the use of public transportation. The prototypes developed within the studio investigate the design of shelters and terminals while exploring the significance of such a construction in contemporary life and architecture. The results of the studio will be used to inform the prototypes developed for the UB 2020 Master Plan and construction in the coming years.

Frameshift Shelter

The Frameshift Shelter is designed to service intercampus transit users. By providing real-time arrival information, the shelter will service short waiting periods along a shuttle bus circuit that links with the greater UB transit system. The shifting of a frame within a frame is conceptually intended to define the view and approach from several vantage points. In an adaptable configuration, the shelter may respond to different sites and demands for proper protection from the elements. Other inclusive features of the shelter include an interactive digital panel with audio and visual information, infrared tube-heated seating and leaning posts, and a centrally located directional wayfinding column to designate the boarding area.
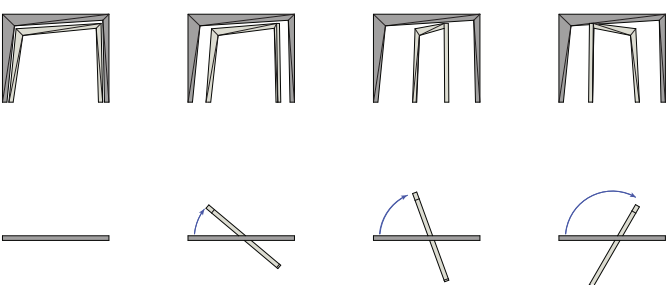
Conceptual Diagram
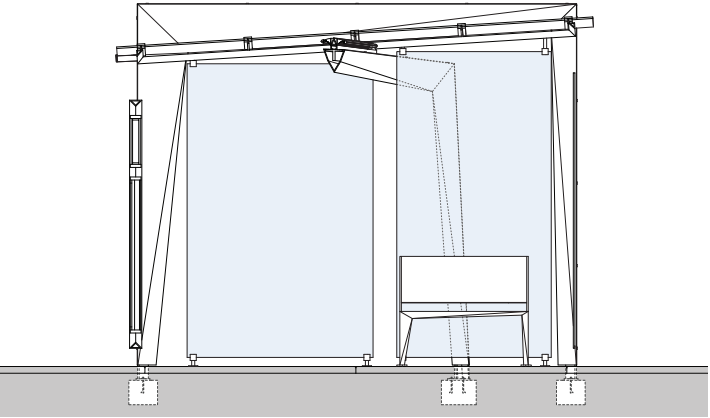
Front Elevation
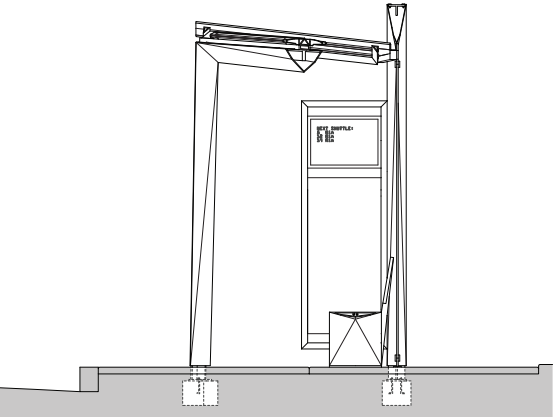
Side Elevation

Accessibility Section
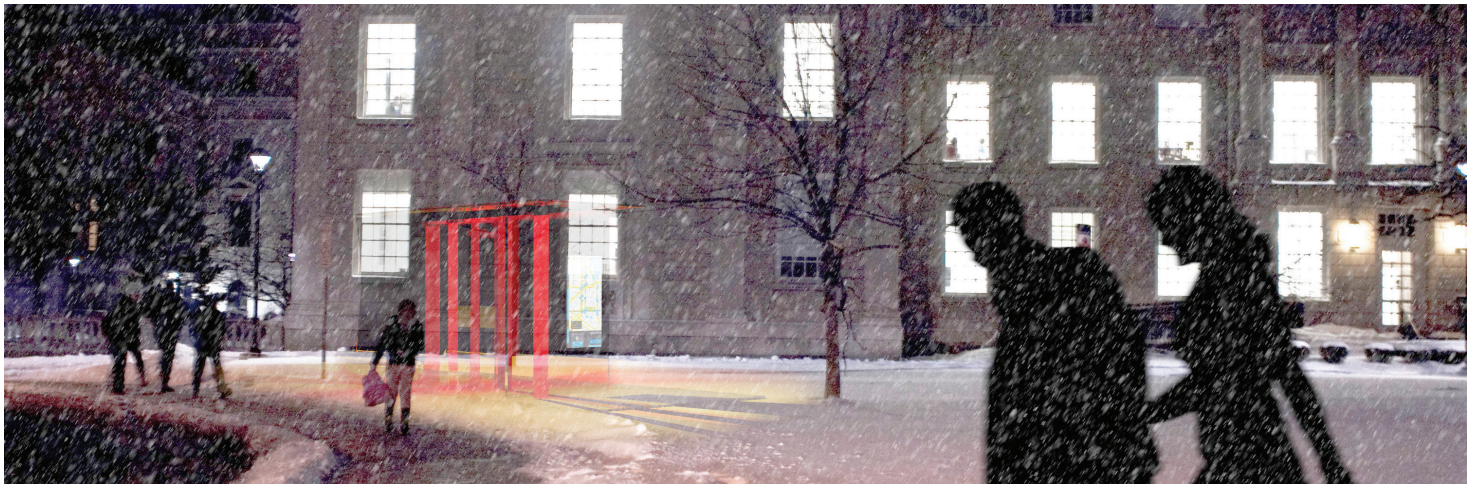
Deformed Grid

The deformed grid of this bus shelter is constructed of 3Form, a polycarbonate plastic. The material is used as an iconic landmark for the transportation structure and is illuminated through the use of embedded LED lights to signal the arrival of buses. The skin of the shelter is heat formed to create shelter and bench seating. Real-time transit information is provided on touch screens within the shelter. A geothermal heating system extends the functionality of the structure for the four-season campus. Powered by rooftop photovoltaic cells, the amenities provided by the shelter include an information panel, intercom, lighting, radiant heating, and Wi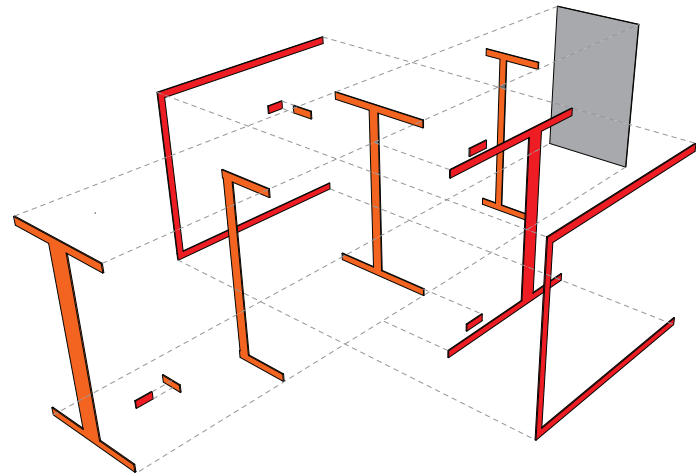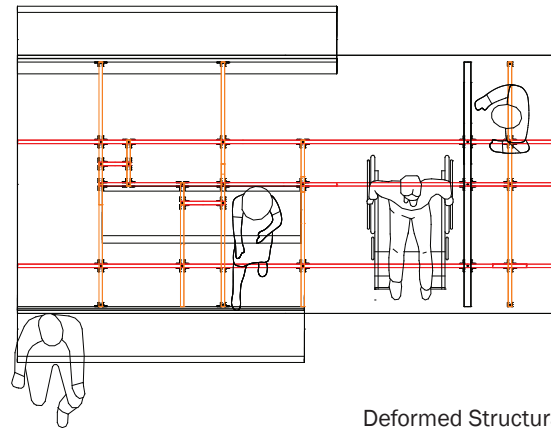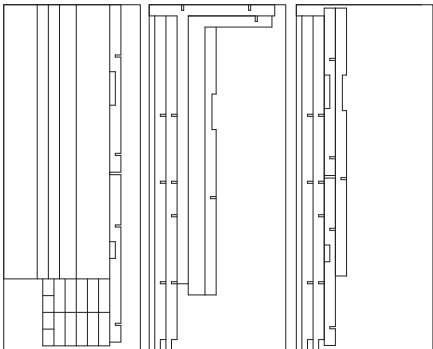-Fi base stations. Extending the process of student integration, the design is formulated to capitalize on the School of Architecture and Planning's CNC router. The materials used within the structure will be designed, cut, and assembled by the student body as a public amenity.

Minimalist Structure

The minimalist structure is a result of intensive research surrounding public transportation on a university campus. Climate, safety, economy, and usability are all factors that drive the final design. The intention of the minimalist approach in the shelter design was to enhance the aesthetics of any campus. The structure is a 'kit of parts' consisting of steel angles, flanges, and structural glass. It is easily constructed and provides maximum visibility while providing shelter from the elements. The interior rain wall provides roof drainage as well as a vertical surface that acts as a projection screen. The digital display includes bus arrival and departure information, an audible and visual signaling system, and electronic advertisements.

Deformed Structural Grid Exploded Axonometric

Deformed Structural Grid Plan

CNC Cut Patterns
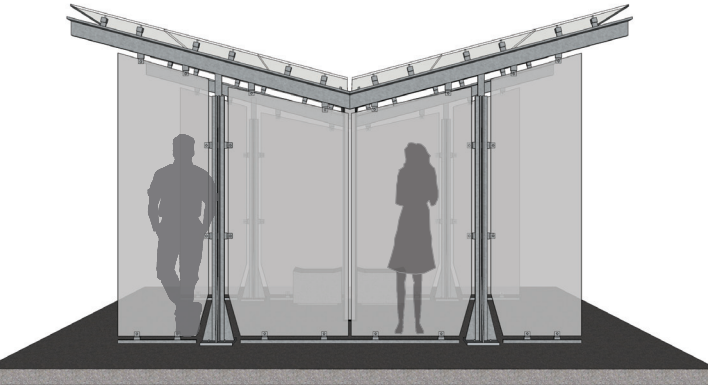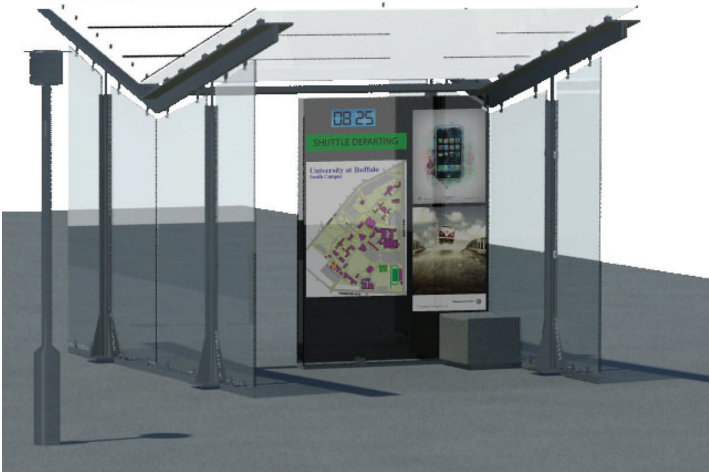
Front Elevation
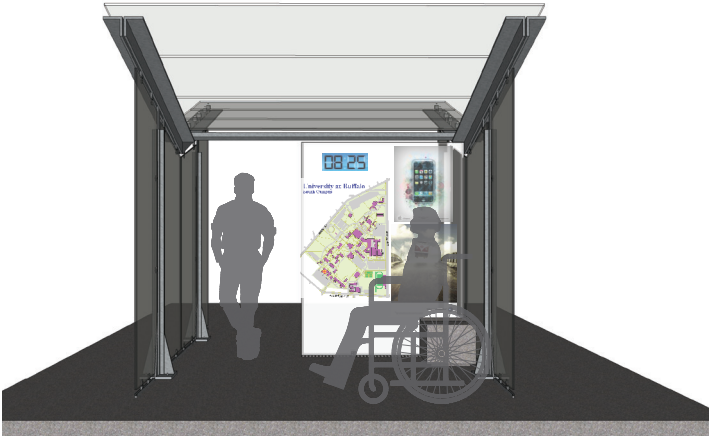
Side Elevation

DYNAMIC PERMEABILITY

ARC 606 : RE-INVENTING THE OLD : K. MACKAY
STUDENT : J. REINHARD

Dynamic Permeability addresses two significant issues that exist in the Buffalo-Niagara region: proper care of the rapidly expanding aging population and the disconnected nature of regional tourist destinations. Both the elderly care industry and the tourism industry may reap the benefits of a singular building type that unites information and acts as a hub for each specific population. Initial design concepts are generated through an exploration of architectural forms that empower one building user over the other. The design process focuses on using the initial visual system concepts of direction and hierarchy to balance the interaction between the two programs in a way that is not merely comfortable, but beneficial to both user populations.
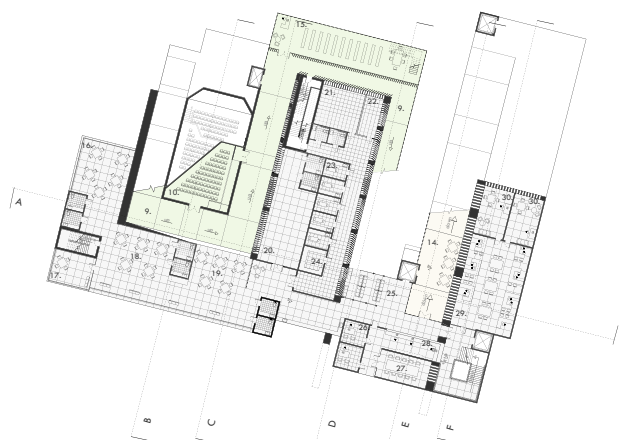
Upper Floor Plan
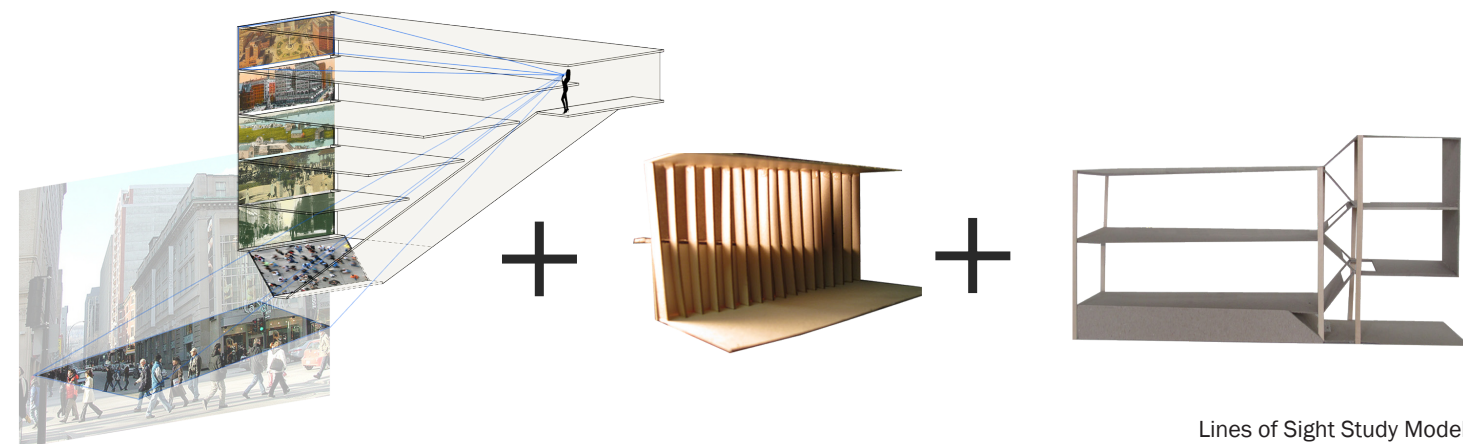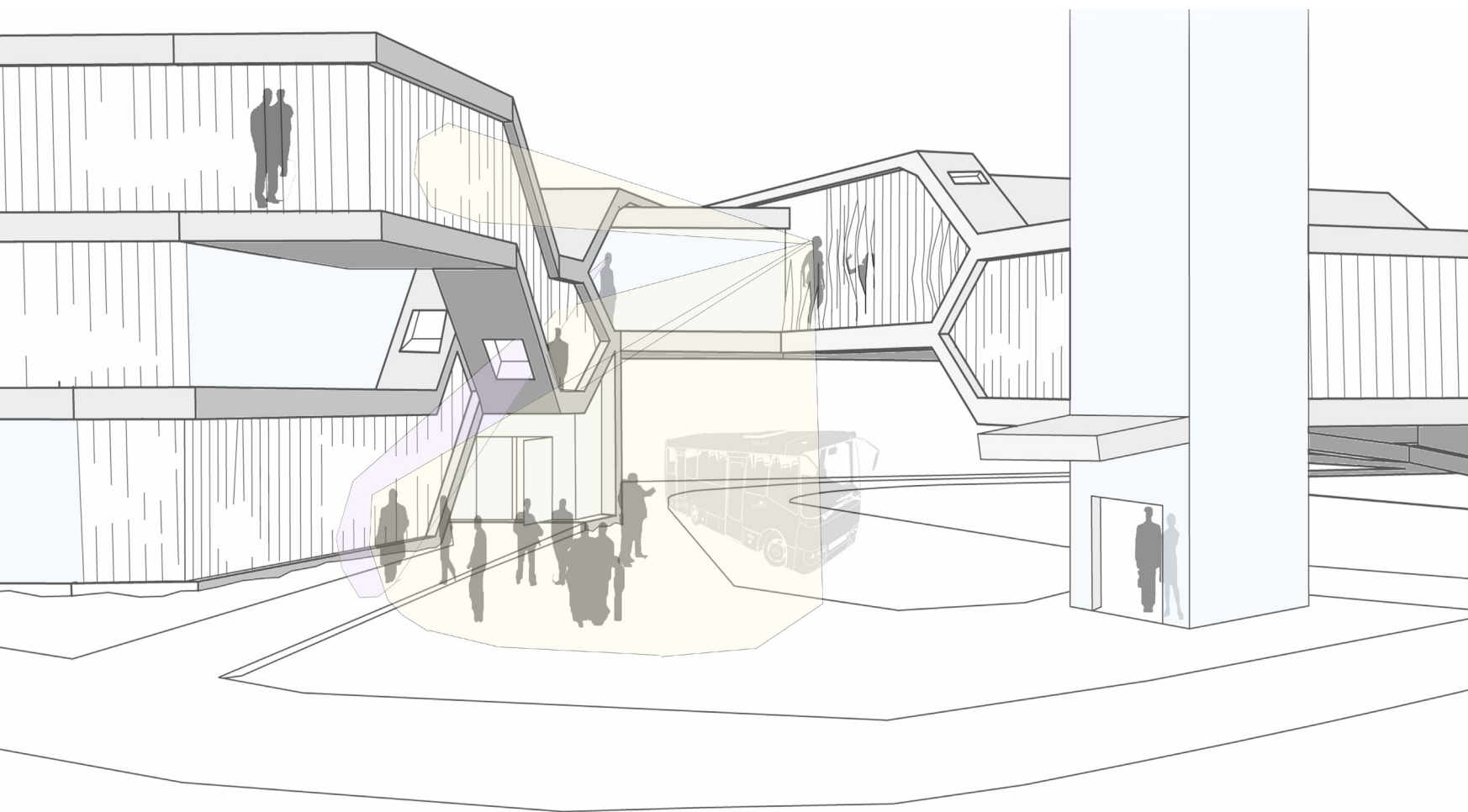
Lines of Sight Study Model
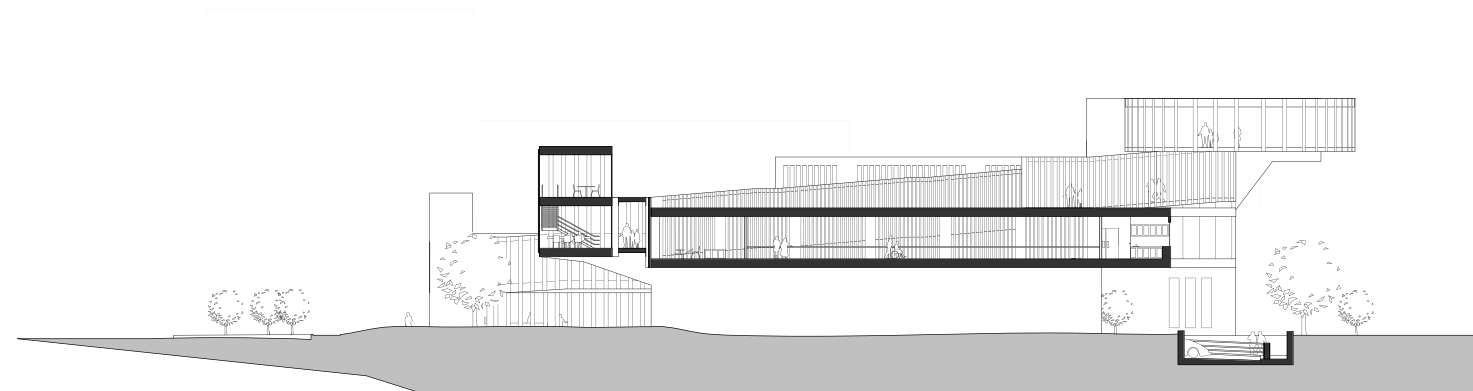
Longitudinal Section
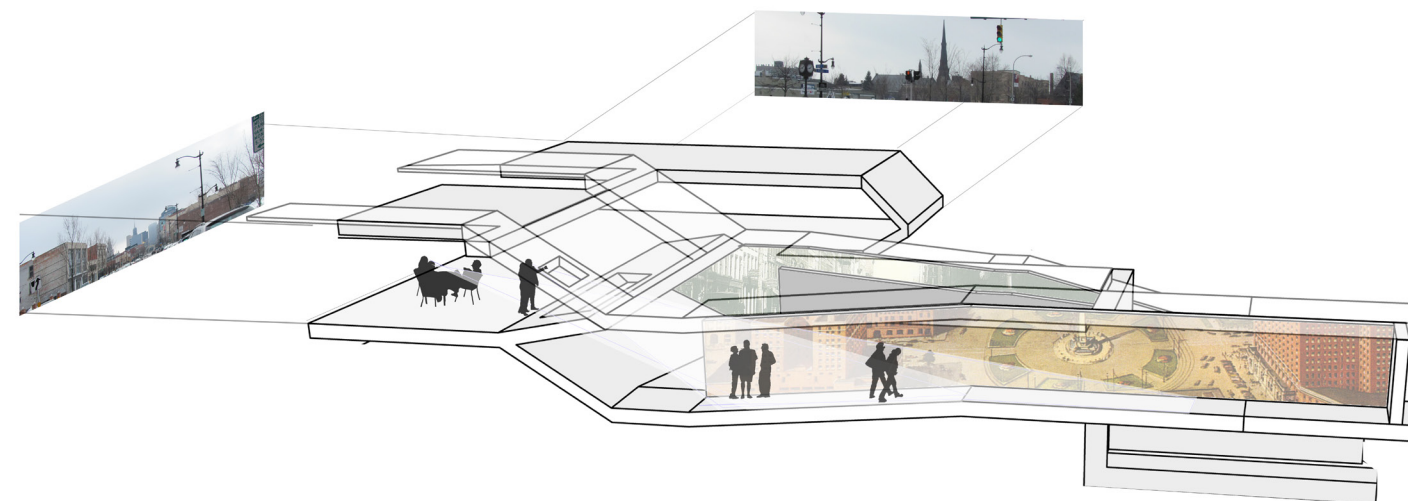
Building Section + Sight Lines

84 : ARC 606 : RE-INVENTING THE OLD : K. MACKAY
STUDENT : J. REINHARD : 85

DETERMINED INTERACTION

The Town Square for Aging project proposes a new approach to design that integrates the aging population into a community. The idea expands on senior centers and nursing homes by creating space that includes recreational activities, utilities, and medical offices. By combining these facilities with other community services into one location embedded in the urban area, older adults and their families can perform daily routines in a space that is sensitive to their needs.

In this instance, the Town Square for Aging is coupled with a visitor's center for tourism in Buffalo. The city has many historic and cultural landmarks and yet a small tourism market. With the Town Square for Aging acting as a tourist hub, visitors will share some of the same space as the elderly users who best understand this history. The Town Square for Aging utilizes a system of louvers on the interior and exterior of the building to control the levels of visual connection and day lighting throughout the building. This system is responsive to the programmatic needs and systems needs of the building. It blocks sunlight that creates excessive heat load on the building and controls direct sunlight, such as in the Dementia Daycare Center where indirect day lighting is preferable. The louvers are also operable in the auditorium and other locations where daylight is often not necessary. The louvers on the exterior walls will control views into the building by pedestrians on the street. Some interior walls are composed of the louver system. Carrying the language of the partial wall through the building, the louver walls allow elderly users to choose the level of interaction that they wish to have with the tourists. Negotiating lines of sight, the system allows for glimpses of interaction and potentials for visual permeability and connectedness between multiple spaces.
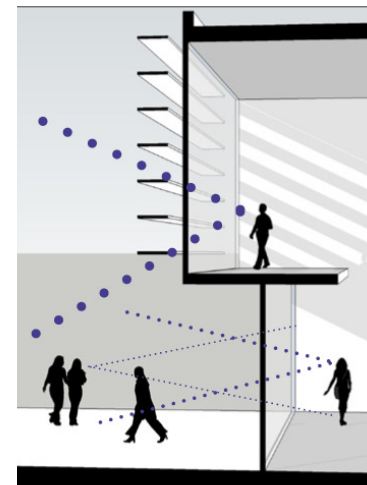
Privacy Generated by Louvres
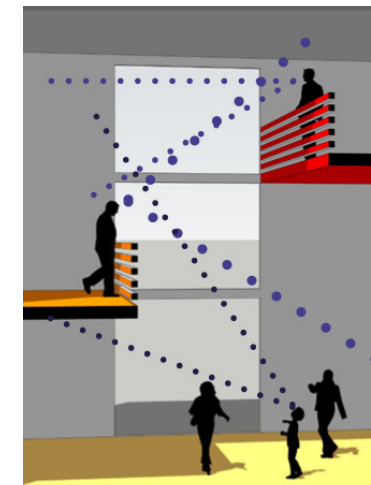
Interior Lines of Sight
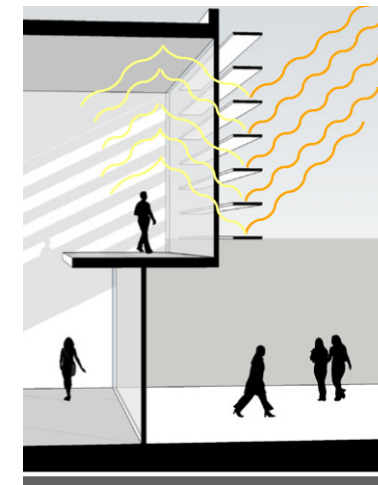
Indirect Light Provided by Louvres
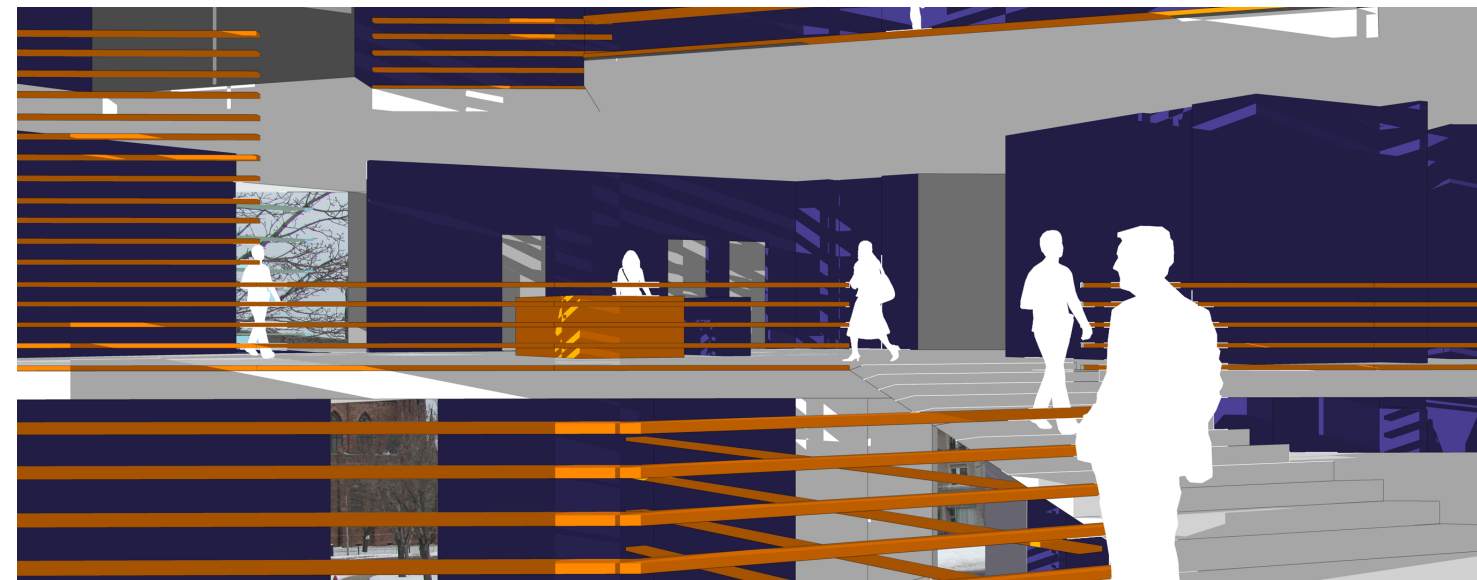
The following proposal was developed out of earlier analytical studies and attempts to address specific issues of image collection and dissemination, as well as the systems of aggregation and observation that result. It poses the question of what happens when the existential world is reduced, or flattened, to an imagistic one, by critiquing the current culture of image production, as well as the society of control that results. Thus, while it was proposed as a sincere answer to specific needs on behalf of both the MTA in New York City and MTV, it is, ultimately, a dystopian vision of a world reduced to spectacle, broadcast as entertainment and monitored by agencies of authority that extend far beyond official institutions and include every participant in the spectacle itself.

The proposal consists of four interrelated strategies, two of which are focused on creating theatrical conditions of spectacle through manipulating sight lines and focusing views towards a series of what are essentially stage-sets and display windows. These strategies are generally either photographic or cinematographic, and rely on a number of framing devices that carefully construct the visitors' experience of the subway. The second two proposals translate the resulting spectacle into a digital format and disseminate it to a global information network, where the original images are monitored by both local and federal authorities, and an expectant audience. The result is what is called, within the framework of the proposal, surveil-a-tainment; the watched become the watchers in a system of social regulation

that approximates Foucault's description of disciplinary societies. As in Foucault's panoptic vision, power has been entirely internalized, and feeds off of systems of display that pervade contemporary online media; YouTube's motto, "Broadcast Yourself," becomes a forum for public confession in a pervasive form of entertainment where the lines between theatre and life have become utterly blurred, and where social regulation functions through systems of inclusion and exclusion based on nebulous notions of "acceptable" behavioral standards - a vision, perhaps, much more terrifying than the obvious Orwellian references that the project might conjure.

This proposal seeks to mitigate the challenges facing both the MTA and MTV by creating synergistic relationships between the two, designed to both increase revenues and ensure the safety of NYC's substantial commuter population. It's a system affectionately referred to as "surveil-a-tainment," and it consists of launching a series of highly targeted products throughout Manhattan's mass-transit infrastructure.

These unobtrusive interventions use the existing infrastructure of the subway in order to tap into the vast potentials of online media, which will result in increased security and revenues, the consequence of which will be reduced fares and service extensions. While the front-end distribution of images follows an entertainment model, the back-end provides 24-7 surveillance for local and federal law enforcement agencies.


the world is watching

M.V.U_ Mobile Viewing Unit:

The first part of this proposal is the Mobile Viewing Unit, or M.V.U. for short. This involves the rollout of modified subway cars, in which window space has been maximized, providing extensive views both into and out of the car. In addition to this, the traditional seating arrangement of the car has been inverted, focusing the attention of passengers to the periphery - to the interior of adjacent trains, the platform and the tunnel. The car thus becomes both a stage on which commuters become the main players, and a gallery from which commuters observe their surroundings.

In addition to these minor modifications, each train will be equipped with video projectors, located 19' on center along the exterior of the both the top and the bottom of the train. The apparatus will project real-time images of street views above the train, both promoting the areas beneath which the car is passing, while giving the commuter the sensation of being displaced to the street level. These projectors can also be used to display vital information about service changes, maintenance or emergency information. Projection screens consist of simple mounting units and 112 sandblasted plexiglass with relatively good clarity.

The projectors are controlled by a series of proximity sensors that alert them of the approach of oncoming trains and platforms. At the approach of either, the projectors turn off, while the clarity of the plexi-glass provides commuters views into the lighted interior of adjacent trains, or onto adjacent platforms.
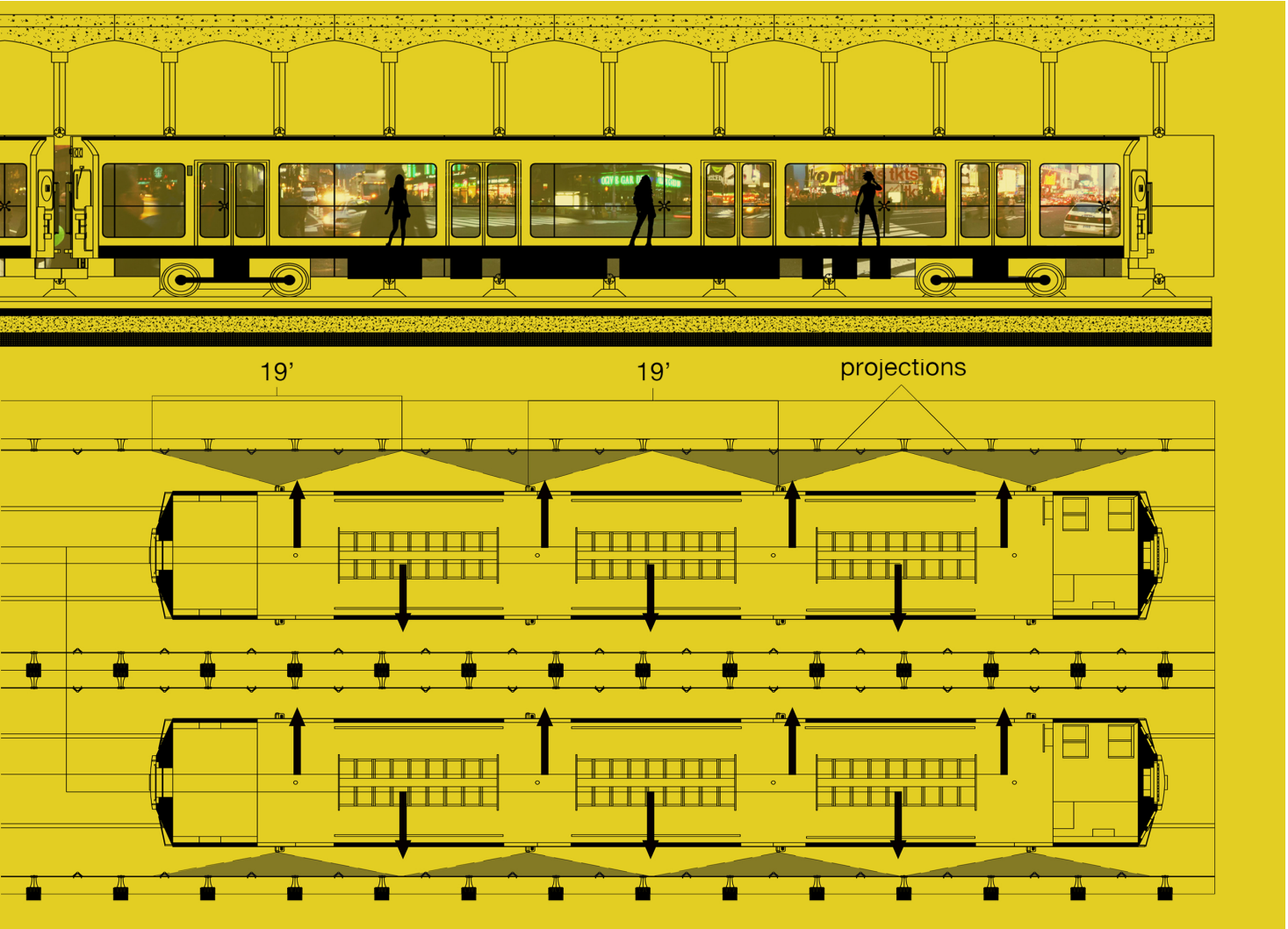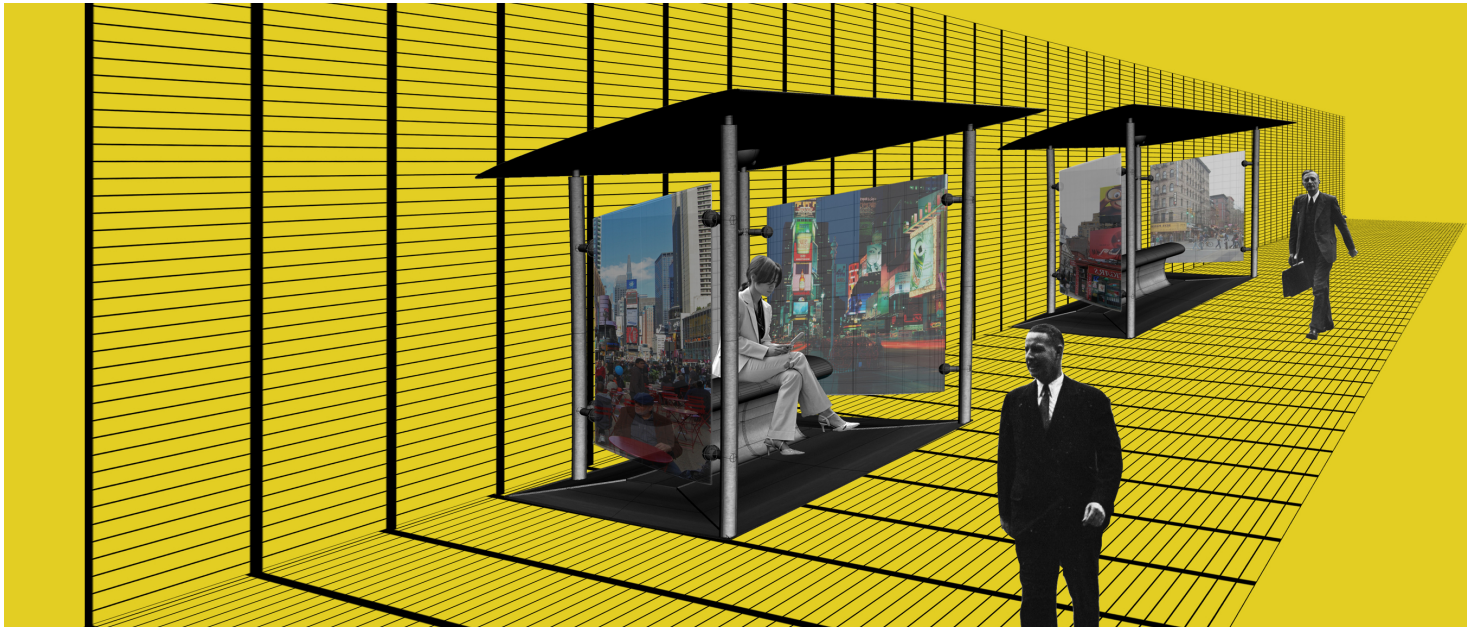
V.B._ Viewing Booth:

At the platform, commuters are greeted by rows of View Booths, or V.B.s for short. These are small, media-rich environments, designed with a 10' maximum length to complement the standard platform length of between 160' - 180'. These units are easy to assemble and are relatively noninvasive. They consist of a roof-mounted projection system and a second projector behind the back panel. Like the train projectors, these cast views of street level scenery or vital information pertaining to subway service.

The roof and wall panels are inclined slightly towards the occupant, and curved , making occupants the center of focus. This creates a second stage condition, in which awaiting passengers become both audience

and actors in the unfolding drama of the subway. When a train arrives, the regularity of the booths creates a cinematographic condition, in which people on the train see a series of isolated scenes conditioned by a regular filmic flicker. This experienced is mirrored, as the regular distribution of train windows provides a similar experience for booth occupants.

Both of these strategies complement the current MTA policy of "If you see something, say something," while at the same time creating a venue for spectacle and image creation that is complemented by the next set of strategies that transform this phenomenal experience into a digital one.

E.O.U_ Entertainment and Observation Units:

The first of these is the E.O.U. or Entertainment, Observation Unit. The E.O.U. is a modification of traditional surveillance cameras. It is a cybernetic unit that follows commuters as they enter the subway, recording and displaying real-time images of them on the screen, to the MTVA website and to local and federal law enforcement agencies. It plays off of current web trends of self-promotion and self-publication, as seen in sites like YouTube, MySpace and Facebook.
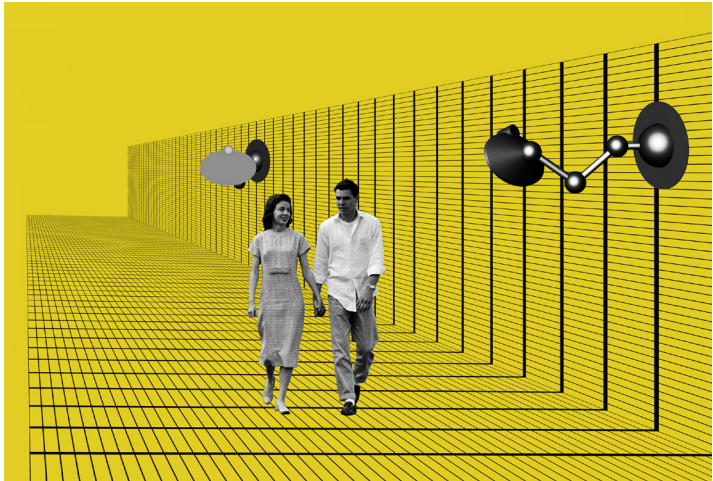
M.E.I.O.U_ Mobile Entertainment, Information, and Observation Units:

The second digital strategy is the M.E.I.O.U., or Mobile Entertainment, Information and Observation Unit. These are playful, platform-bound units designed to respond to and interact with subway passengers. Like their wall-bound cousins, these units are cybernetic in nature, however, their interface is much more user-friendly.

A camera and motion and proximity sensors are mounted above a large touch-screen interface. The image of the user is projected on the interface, to the MTVA website and to local and federal law-enforcement, however, the user has much more control of their image. The M.E.I.O.U. asks commuters if they would like to "play" while alternately providing them with a number of service options.

In the examples that follow, Marilyn has accepted the M.E.I.O.U.'s invitation to play, and has been given the option of tagging photos and video of herself, viewing the most popular MTVA images, interacting, viewing live feeds or voting on MTVA images. In the first example, she has chosen, "Vote!" and is reviewing the "Hottest" category. She can scroll through a number of photos, vote or comment, change her category or go home to visit other interactive displays.
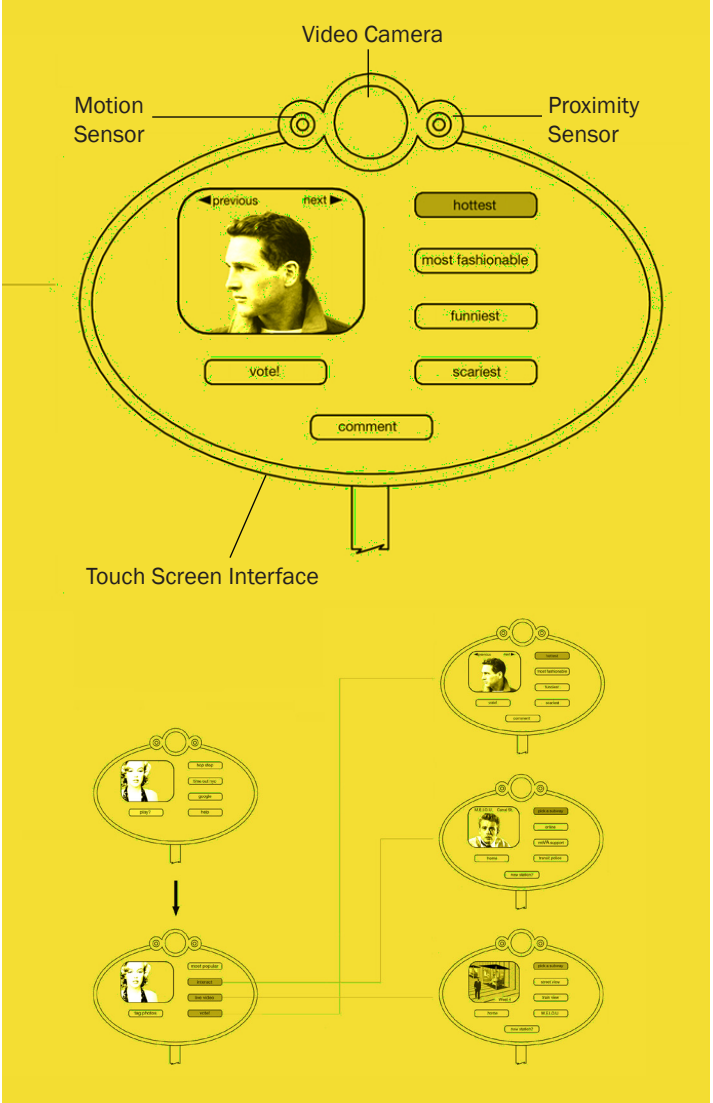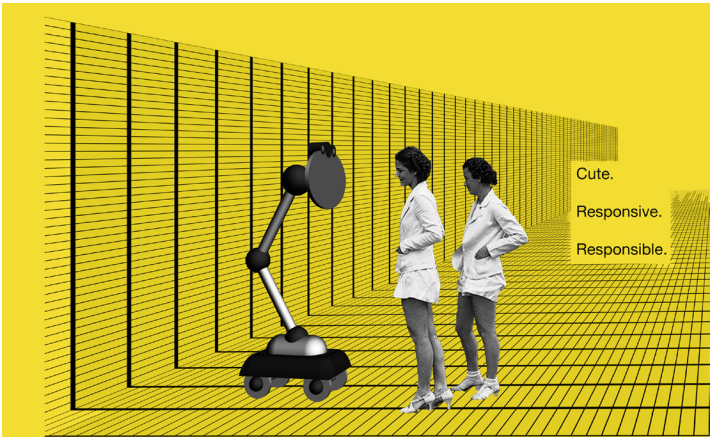
In the second scenario, Marilyn has chosen "Interact." She is talking with James Dean, who has chosen a similar option on a M.E.I.O.U located at Canal Street. She has the option of continuing her conversation with James, talking with somebody logged into the MTVA website, talking to MTVA support, or making a call to local and federal law enforcement. She can also choose a new station.
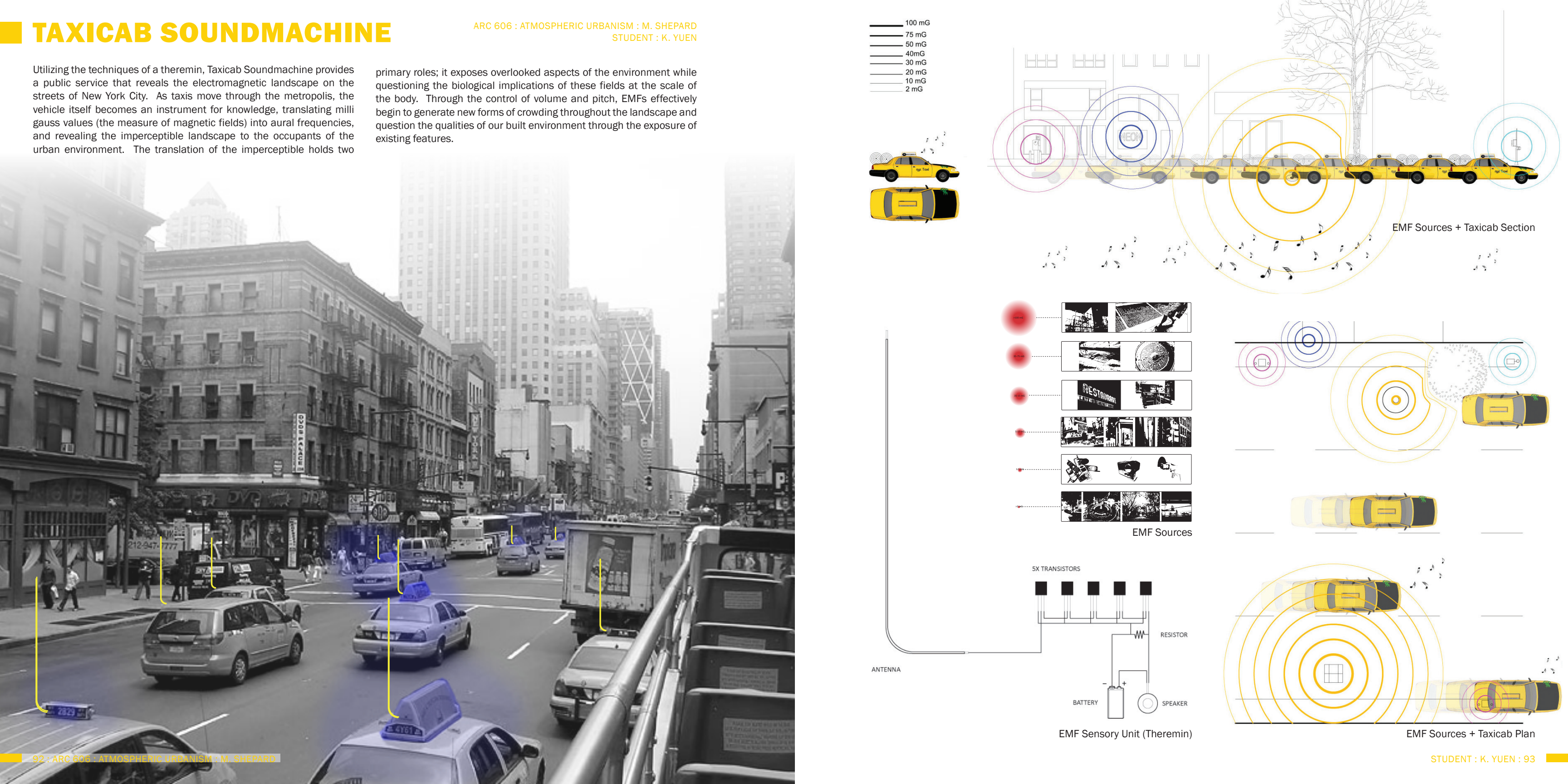
In the final scenario, Marilyn has chosen to view live video feeds. She's watching a feed of the West 4th station, but she can choose street views, train views or views from other M.E.I.O.U.s.

Conclusion:

All of this results in a highly integrated system of image production, collection and dissemination. M.V.U.s and V.B.s create conditions of spectacle that enhance the performative potential of the subway as a unique venue. This creates the context for image production, while also re-enforcing the current MTA policy of "If you see something, say something." The images produced through the phenomenal reconfiguration of the subway are then collected, categorized and distributed digitally through the E.O.U.s and the M.E.I.O.U.s, following the YouTube motto, "Broadcast Yourself."

Dissemination occurs through these units to other stations, local and federal law enforcement and to the world via MTV's 24-hour cable network and the web. Once online, the images are replicated and re-circulated by consumers of digital media - providing increased revenues through viral marketing, online advertising and increased corporate sponsorship. The result of this is increased tourism and subway visitation, which causes price deflation and service extensions, which also extend the MTVA network, all of which feeds back into the phenomenal strategies already outlined.

Cute.
Responsive.
Responsible.

Video Camera
Motion Sensor
Proximity Sensor

previous   next
hottest
most fashionable
funniest
vote!
scariest
comment

Touch Screen Interface

TAXICAB SOUNDMACHINE

ARC 606 : ATMOSPHERIC URBANISM : M. SHEPARD
STUDENT : K. YUEN

Utilizing the techniques of a theremin, Taxicab Soundmachine provides a public service that reveals the electromagnetic landscape on the streets of New York City. As taxis move through the metropolis, the vehicle itself becomes an instrument for knowledge, translating milli gauss values (the measure of magnetic fields) into aural frequencies, and revealing the imperceptible landscape to the occupants of the urban environment. The translation of the imperceptible holds two primary roles; it exposes overlooked aspects of the environment while questioning the biological implications of these fields at the scale of the body. Through the control of volume and pitch, EMFs effectively begin to generate new forms of crowding throughout the landscape and question the qualities of our built environment through the exposure of existing features.
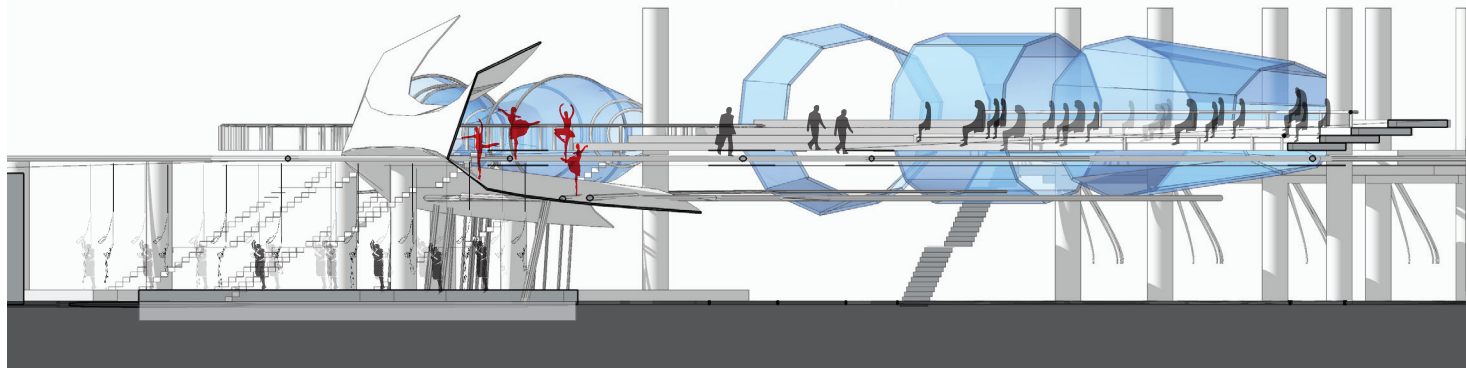

100 mG
75 mG
50 mG
40mG
30 mG
20 mG
10 mG
2 mG

EMF Sources + Taxicab Section

EMF Sources

5X TRANSISTORS

RESISTOR

ANTENNA

BATTERY   SPEAKER

EMF Sensory Unit (Theremin)
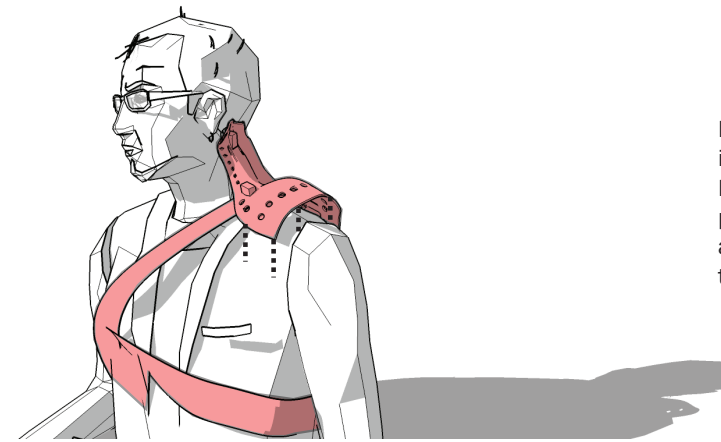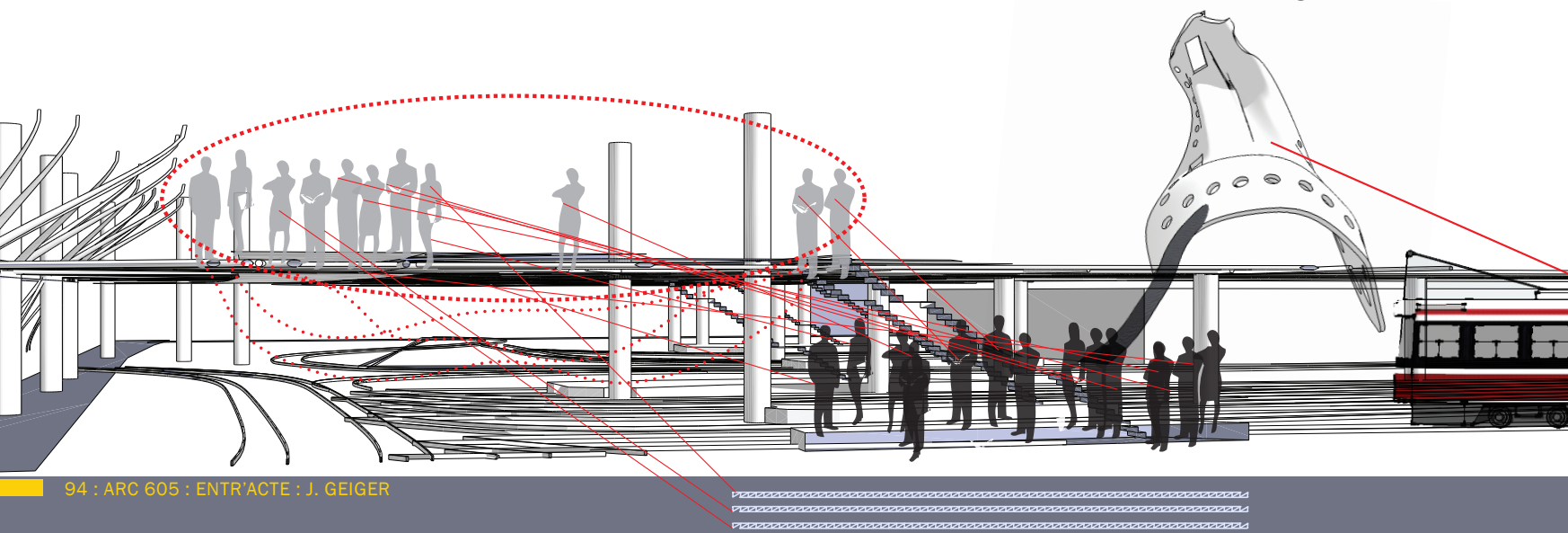
EMF Sources + Taxicab Plan

HAPTIC STATION

Developed as a performance space, Haptic Station attenuates the commuting public to their city's transportation infrastructure by harnessing the latent movements of crowds. Unique sensory stimuli that relate to the behavior of the site are embedded within the infrastructure to construct a regenerative feedback loop. Through the utilization of wearable devices, fluctuations within the crowd may be networked to form new sensations of excitement, anticipation, and connectedness. The site's behaviors manifest themselves as a mix of playful, insightful, and purposeful interactions.

A streetcar garage and turnaround act as the site for a civic performance between the inhabitants of the city and its infrastructure. A complex grid supporting this network floats in the sky and lays in the ground in the form of electric cables and steel rails strung throughout the city, yet these massive grids become invisible to the public. By attaching themselves to the grid, the audience can directly observe or interact with the cyclical behavior of the streetcar. The electric grid acts as interface. Above ground programmatic spaces for exhibition, performance, and public gardens collect bioinformatic data (heart rate, perspiration level, 'fidgeting,') analyze it, and rebroadcast it to the crowd. Below the grid, commuters equally engage in the sharing of bioinformatic data. By plugging into the grid, the crowd may begin not only to influence the shifts within the crowd, but also within the streetcars along Queen Street. Here, the bioinformatic data is utilized to inform the crowd not only of the crowd's status but also of the status of the train. As the crowd gathers and awaits the next train, information regarding its speed and proximity are conveyed through wearable devices. Through cross referencing the bioinformatic data with the scheduling of trains, the system creates a feedback loop through which the status of the crowd influences the departure and arrival of trains while the scheduling of trains is in direct relation to the levels of anticipation within the crowd.

Haptic Prosthetic : Networked Feeling

Individual behaviors are monitored and projected through the devices in order to create a communal identity through haptic response. Embedded motors induce sensation by applying vibration to pressure points. Additionally, heart rate monitors are located on the device itself as well as throughout the infrastructure through their incorporation of the vehicle's straphangers to monitor the crowd's responses.


Strap Hangers

Pressure Point : Neck

Pressure Point : Shoulder

Controls Interface

Heart Rate Monitor

Programmatic Section

Prosthetic Networking Section
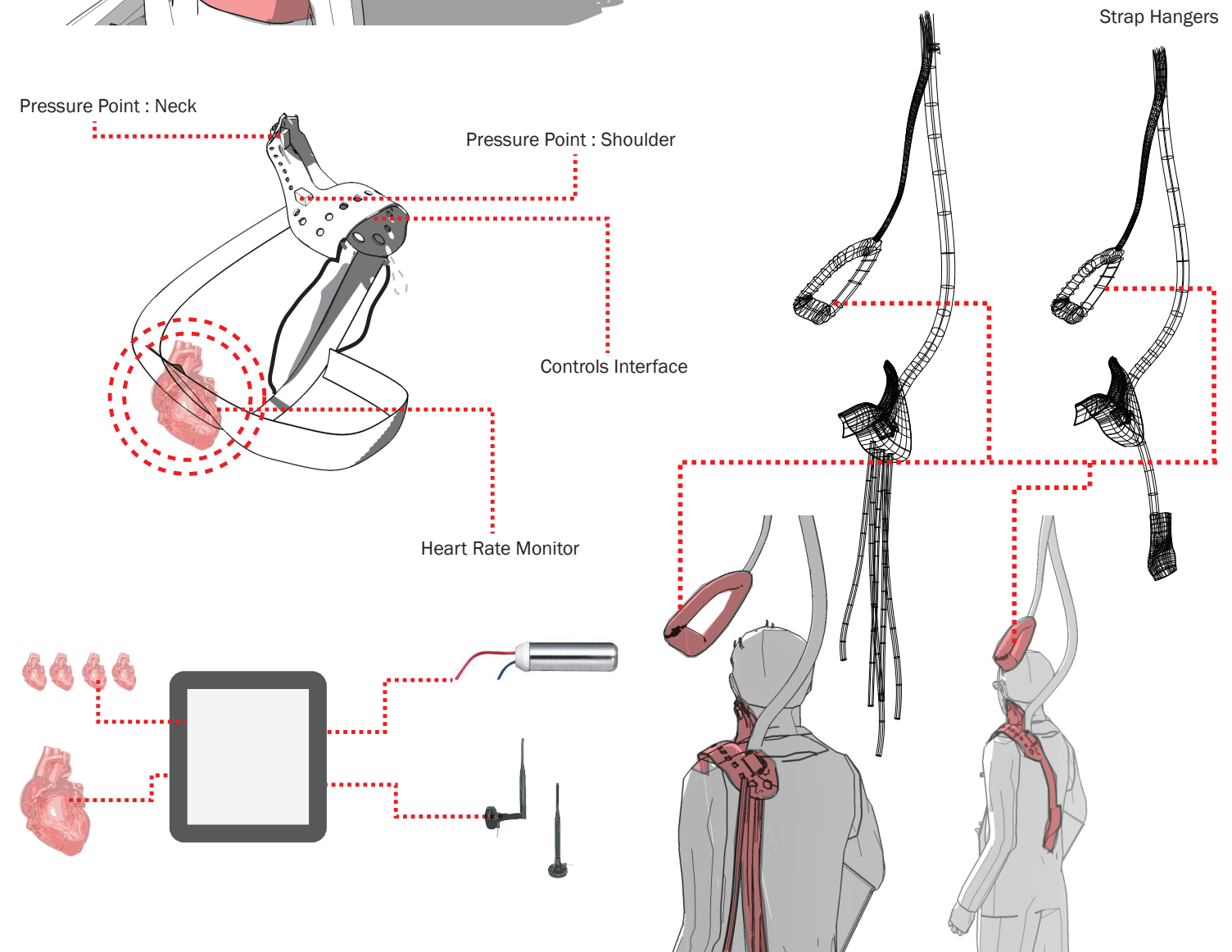
SOCIAL CYCLING

Through a series of architectural interventions, Social Cycling develops an integrated social network among Toronto's cycling enthusiasts. Whether daily commuters, competitive cyclists, or recreational riders, multiple scales of intervention generate a collective community of cyclists who share and benefit from one another's experiences.
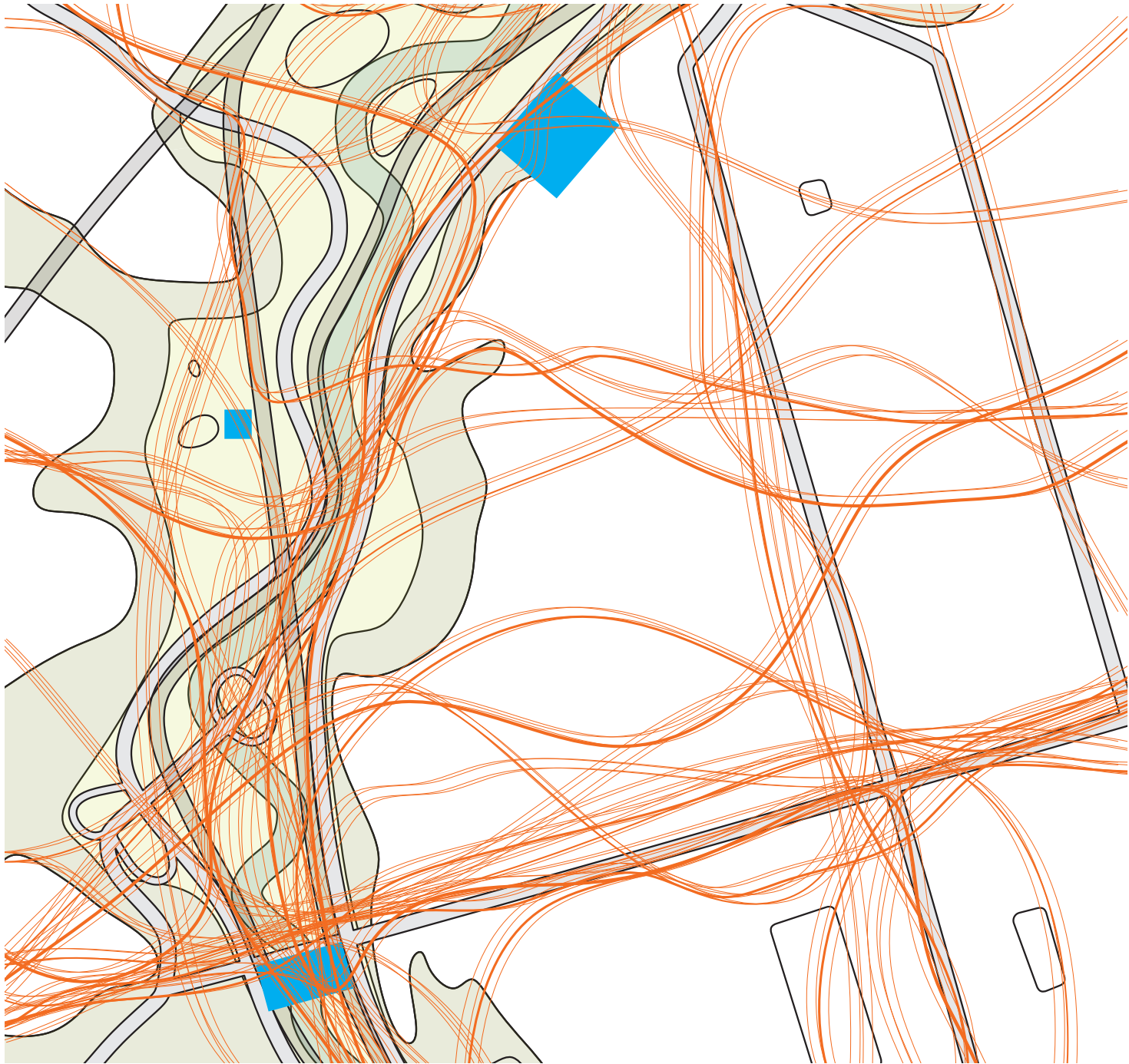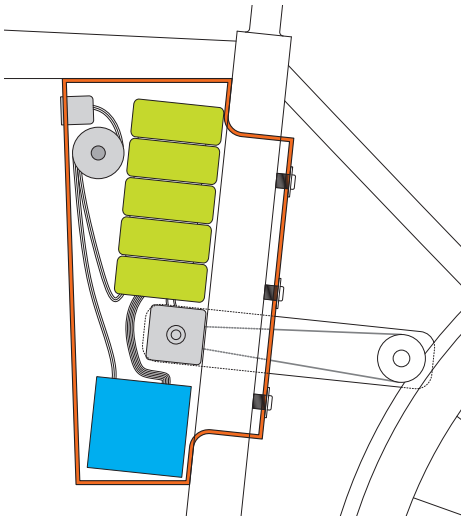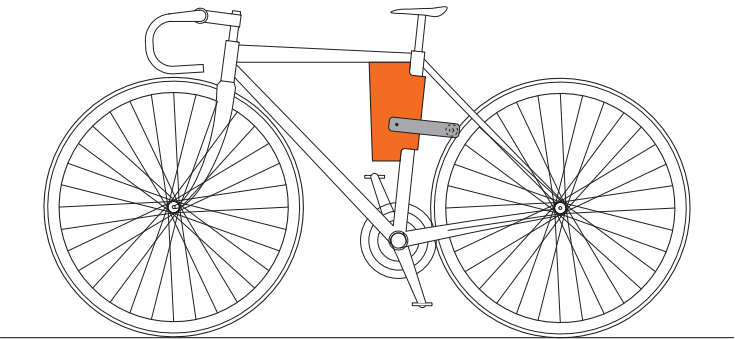

Powered Route Mapping

MICRO: Mapping Power

By combining on-board computing with variable resistance, cyclists can simulate, track, and alter their ride. Route mapping tracks the characteristics of each rider's path for the duration of the wearable's lifetime.
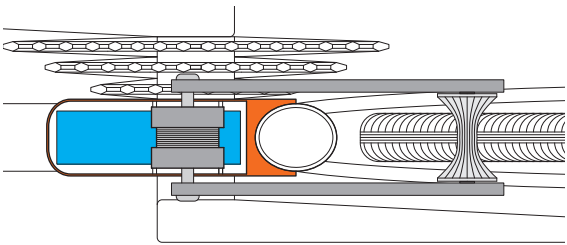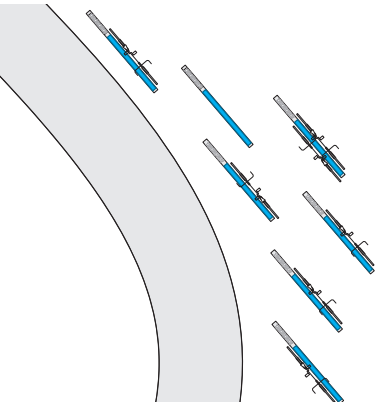

Power Generation

On Board Computing and Power System

On Board Computing Diagram
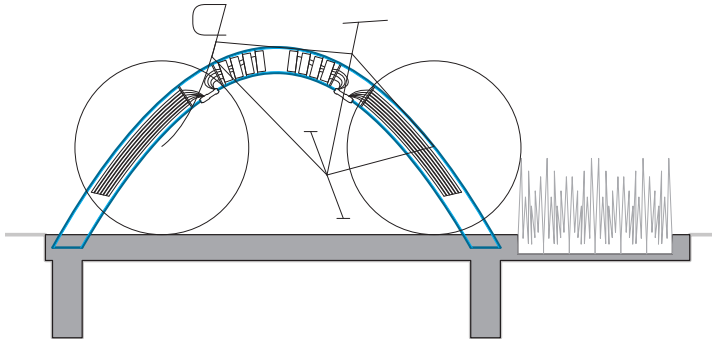
SMALL: Local Storage

Local storage points will be placed along regularly used cycling routes. Securing a bicycle will become more than a physical connection, but an informatic one as well. Cyclists' data and energy will be networked through the wireless connections established with these units.
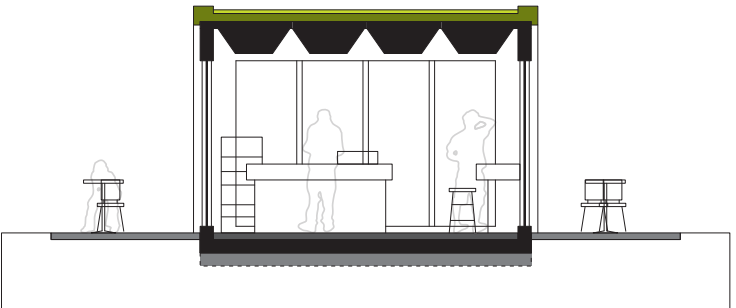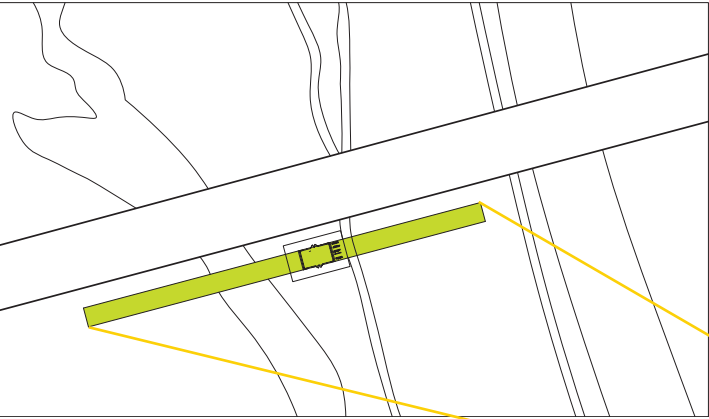

Bike Rack Plan
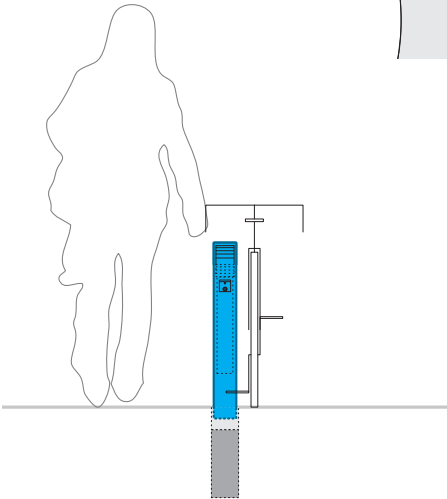
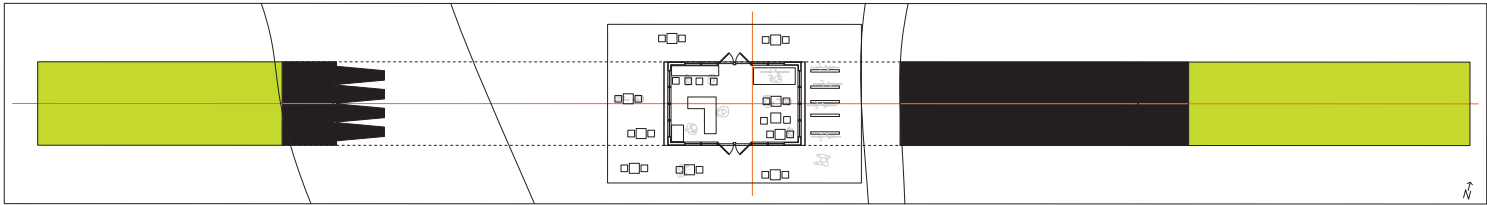Bike Rack Section

Bike Rack Elevation
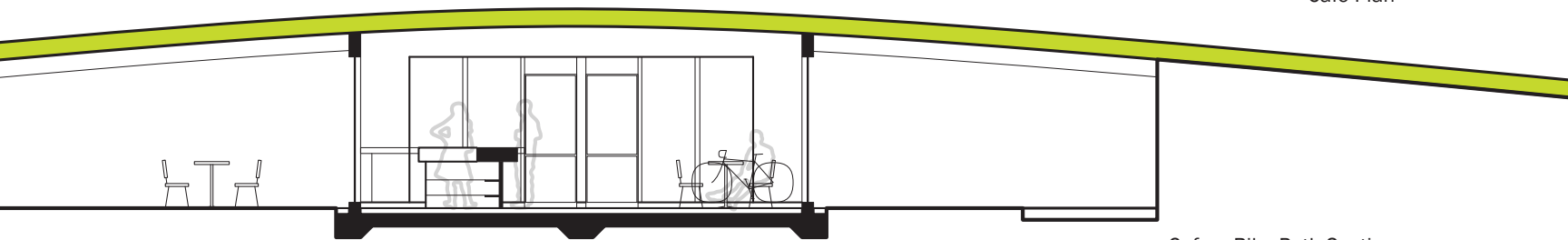
MEDIUM: Cyclist Cafe

Each cafe is located at the crossroads of user generated cycling paths in order to provide shelter, food, social space, and basic bike maintenance facilities. Socialization of the otherwise disparate crowd of cyclists occurs here.

Master Site Plan

Cafe + Bike Path Cross Section

Cafe Plan


Cafe + Bike Path Section

LARGE: Velodrome

The veoldrome is a gathering space for the traditional crowd. In addition to an Olympic standard racetrack loop, the velodrome will host other large gatherings throughout the year. The velodrome is built into the side of the existing ravine. By occupying this transitional space, the velodrome connects residential areas with the ravine. Through incorporating the powered bicycle mount during races, crowd participation is mapped and sent to provide more resistance or added power to each racer.
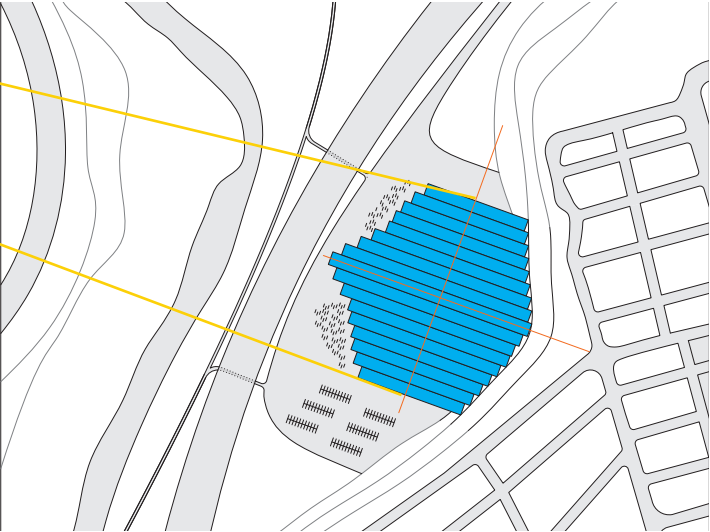
Velodrome Section
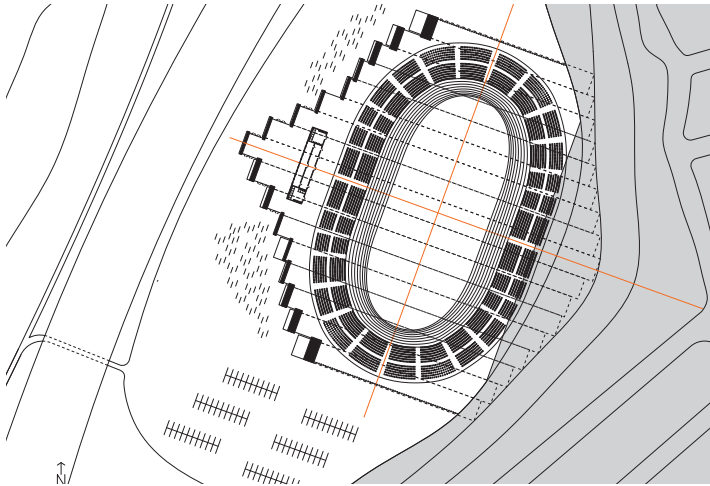
Velodrome Plan

MACRO: Networking

The data collected by individual cyclists will be shared through an online information-sharing network. Maps reveal the emerging densities of cyclists' movements throughout the landscape to form a three dimensional digital topography. Riders may share experiences, analyze power generation, monitor and compare aerobic health factors, and collectively identify themselves within the community of cyclists. The data collected acts as an extension of the existing services that record time, location, heart rate, and power generated by the cyclist. Elevation, road conditions, accelerants, and the presence of other riders may also be layered into the shared experience of the ride.
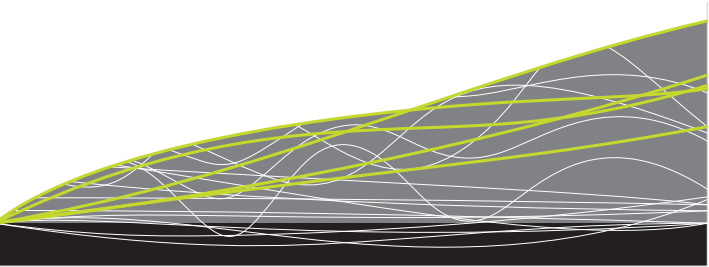
Power Generation
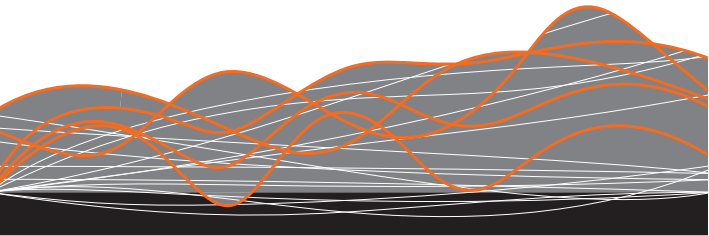
Aerobic Exercise
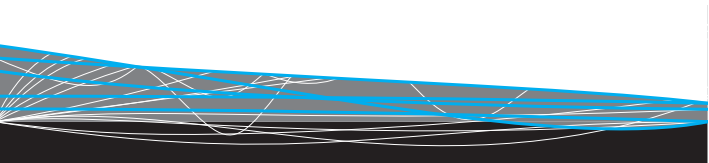
Powered Commuters

Baseline Topography

Knowledge becomes tangible through the construction of the interface. The mediation generated by such interfaces directly influences the perception of the objects that they seek to represent through the formal reconstruction of represented elements. Here, interfacing is seen as a point of intervention for both the represented medium as well as by the ways in which their quantifiable elements become represented.

The lighting levels of a space are documented through the use of photocells and an Arduino. Once quantified, these values are interfaced with Processing as a part of a two-fold process. The data feed generated here is parsed and transcribed into a text file. This development of the text file is a method of interface through which multiple computer programs may converse with one another in order to generate dynamic forms. Utilized by Processing, the information is read and reinterpreted as a responsive audio output. The data collected through an analysis of the lighting directly manipulates the output sound of the system. Additionally, the data is then transferred to Grasshopper as a means of visually formalizing the generated sound waves. Through synthesizing the formal qualities of a sine wave, three-dimensional forms are generated and understood as through visual graphic.
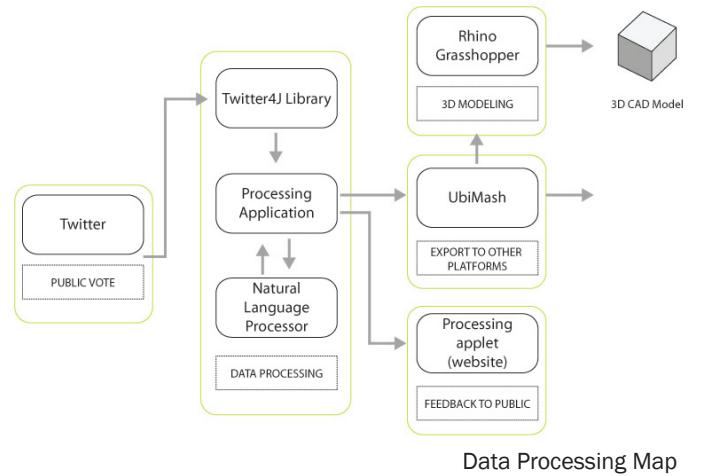
In October 2010, From Light : Form Sound was exhibited in the ACADIA annual design conference in New York City.

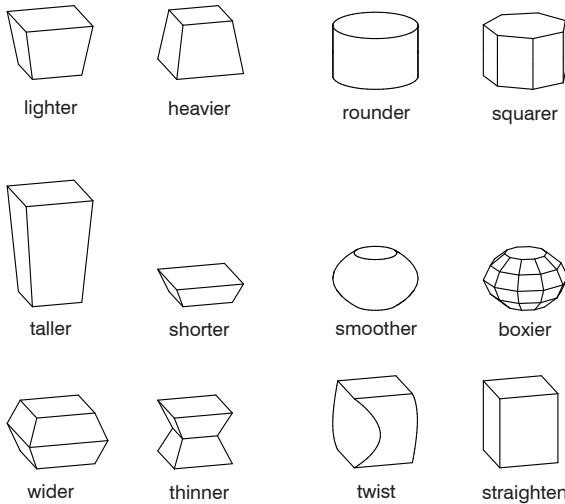| 650 | 875 | 704 | 984 |

Translated Wave Forms
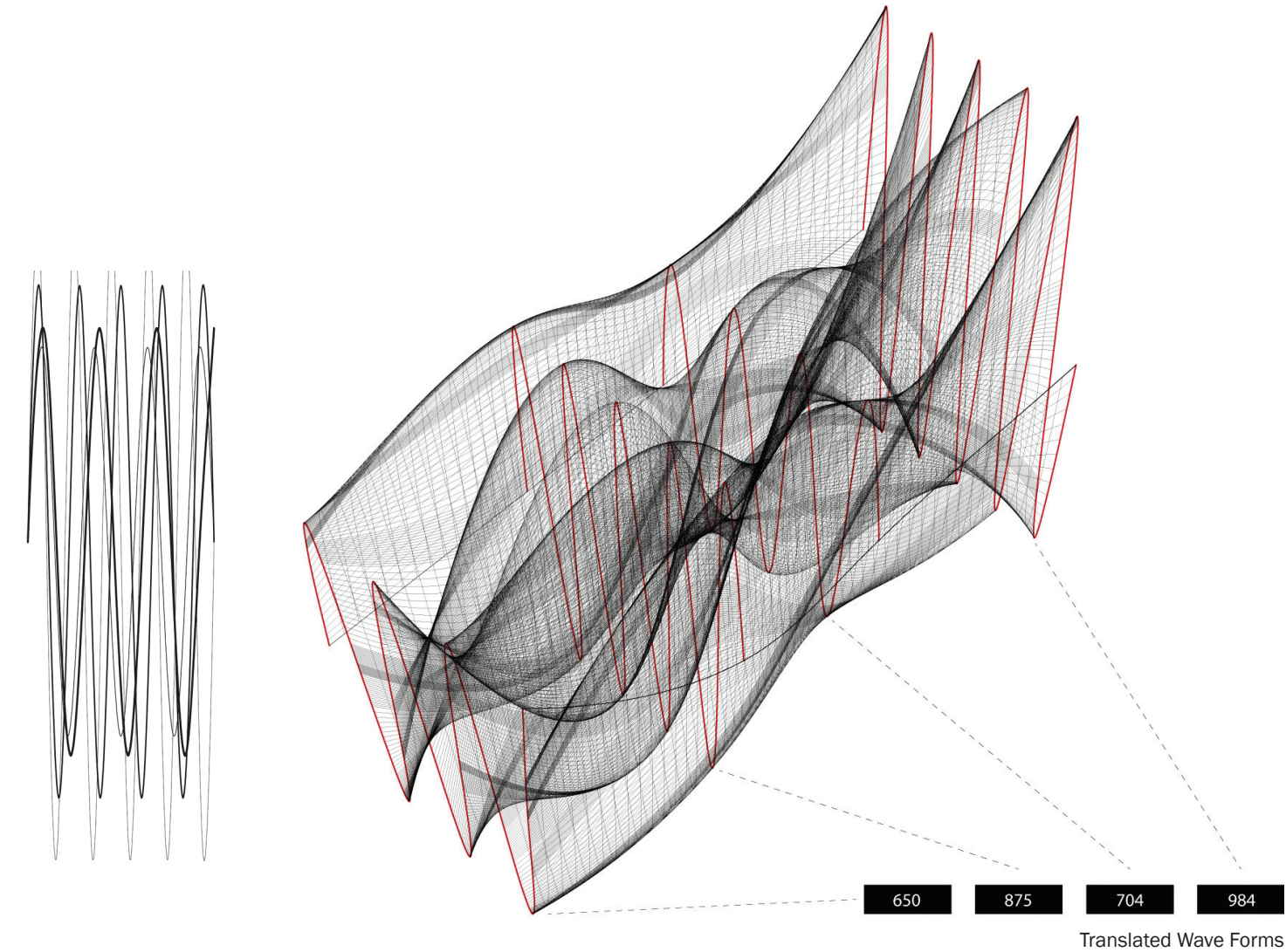
TweetForm utilizes the power of Twitter as a social networking platform to inform a parametric model in Rhino. This enables crowd sourcing for collaborative form finding. Form finding activity is no longer restricted to individuals; instead, a much larger community can access the form, suggest modifications online, and preview the variations to the form as suggested. To participate the crowd must have access to a Twitter account, and post keywords to a specific hashtag associated to a particular Twitter account.

TweetForm advances traditional parametric design by expanding the range of parameters traditionally considered within architectural parametric design methods. Specifically, it attempts to draw linguistic parallels to conditional organizations, opening a wide range of new communications for collaborative design. This is achieved by integrating a natural language processor. The keywords, which are associated to particular geometrical variations in the model include: lighter, heavier, taller, shorter, wider, thinner, rounder, squarer, smoother, boxier, twist, and straighten. The processing 3D application reads the Twitter stream and scans for the keywords. If keywords are found, data is sent via UDP directly to Grasshopper. Since the Rhino model is associated with the Grasshopper definition of generative behaviors as described by the keywords, the model gets updated accordingly whenever a keyword is received in the buffer. The 3D model was streamed online during the system testing, and was projected in one of the public spaces in the workshop venue in order to display the live updates from the Twitter stream.
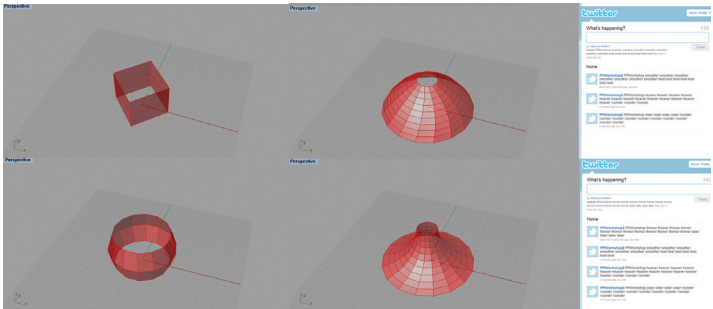
In addition to opening new access for ubiquitous and mobile devices to engage in crowd-sourcing parametric design, Tweetform posits an open call to the crowd to collaborate in the design of buildings and cities. Is there a possibility for good designs to emerge? If there were an open platform for crowd-designing the city, how would we manage such a large-scale participatory design?

lighter	heavier	rounder	squarer
taller	shorter	smoother	boxier
wider	thinner	twist	straighten

Keywords

Twitter Feeds + Digital Model
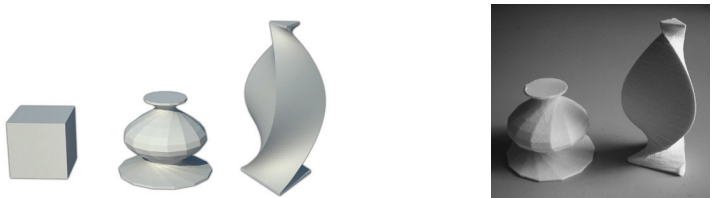
Digital Models + 3D Prints

Data Processing Map

This project was developed as a part of the SmartGeometry workshops held in Barcelona (19th-22th March 2010). The project was developed with the guidance of workshop tutors: Hugo Mulder (ARUP), Przemek Jaworski (FOSTER+PARTNERS), and Flora Dilys Salim (SIAL). Continued development was made at the University at Buffalo before being exhibited at the 2010 ACADIA annual design confrence in New York City.

The School of Architecture and Planning at the University at Buffalo offers numerous additional opportunities to promote education and practice beyond the classroom. Annual endowments and the support of patrons make it possible to bring distinguished professionals, researchers and thinkers to participate in the life of the School of Architecture and Planning as visiting chairs, fellows, distinguished critics, and guest speakers.

The annual lecture series provides students with valuable insights into the fields of architecture and planning. Distinguished architects and planners are appointed annually through the Clarkson Chair program while the annual McHale and Banham Fellowships bring outstanding and emerging designers to work in the studios, present ideas and host events with students during their tenure at the university.

A thesis is a yearlong project that involves one semester devoted to a directed research (pre-thesis) to produce a thesis proposal, followed by a semester devoted to completing the proposed project. Students can work on their thesis within a single Graduate Research Group or use advisors from across multiple groups. A thesis is not mandatory to the Mater of Architecture degree, but provides motivated students an opportunity to develop with faculty advice independent research and creative work.

CHAIRS, FELLOWSHIPS, AND LECTURE SERIES

THESIS

FALL TWO THOUSAND TEN
LECTURES

AIAS Lecture . Peter   September 15
BOHLIN

Vito   October 5
ACCONCI

October 6
ANMAHIAN WINTON

BIRDAIR LECTURE   October 13
PUGH + SCARPA

Martin   October 14
SMITH

Richard   October 20
KROEKER

ALPHA RHO CHI LECTURE   October 27
INNOVATIVE PRACTICE

Lance   November 2
HOSEY

Greg   November 10
MORTENSON

John Patkau/Raymond Ryan/Lynda Waggoner   November 19
FALLINGWATER

Laurie   TBA
HAWKINSON

BETHUNE LECTURE . Jeanne Gang   December 1
STUDIO GANG

EXHIBITIONS
HAYES LOBBY GALLERY

PELLA DESIGN AWARDS
August 30 - September 24

AFFINITY OF FORM
Kaveeshwar Gallery, UB Capen Hall   September 1 - October 2

INTERSIGHT
September 27 - October 29

GLOBAL STUDIOS
COSTA RICA . JAPAN . SPAIN . UK   November 1 - 19

UB SOLAR
November 22 - December 17

SPRING TWO THOUSAND ELEVEN
LECTURES

Eduardo Cadaval   February 8
CADAVAL & SOLA-MORALES

GSA LECTURE . Florian Idenburg   February 16
SO-IL

SYDNEY GROSS LECTURE   February 23
WEISS / MANFREDI

CLARKSON CHAIR IN PLANNING . Philip   March 23
BERKE

AIAS LECTURE . Sinus Lynge   March 25
EFFEKT

JAMMAL LECTURE . Christine / Harry   March 30
BAE / RICHARDSON

CLARKSON CHAIR IN ARCHITECTURE . Teddy   April 6
CRUZ

BANHAM SYMPOSIUM . Jeremy   April 7
TILL

BANHAM LECTURE . Kenny   April 13
CUPERS

ALPHA RHO CHI LECTURE . James   April 15
JOHNSON

GPSA LECTURE . Ian   April 28
BENISTON

EXHIBITIONS
HAYES LOBBY GALLERY

"AMERICAN CHARTRES": BUFFALO ELEVATORS
Anderson Gallery   January 22 - March 6

buffaloBOOKS
January 24 - February 21

CNC: COMPUTING (N) CONSTRUCTION
February 21- March 14

MATERIAL MATTERS
March 14 - April 1

THE HAYES RENEWAL
March 14 - April 1

UB DESIGN ARCHIVE
Kaveeshwar Gallery, UB Capen Hall   April 1 - May 15

BANHAM FELLOW
April 4 - April 22

NEXUS
April 25 - May 16

CONTINUING EDUCATION

LECTURE SERIES

"I argue that there are three principles governing the just city which are: equity, democracy, and diversity; and that if you frame urban policies around those three principles... Every project you embark upon, those three principles should be a metric that should always be applied. We have environmental impact statements, why don't we have justice impact statements."

-Fainstein

"I asked Martell, why do you invest back into the university after your graduation? He responded that 'Although I do not now practice architecture, I regard my architectural education from the University at Buffalo as having prepared me for action within another field.' His response reminds me as an educator of one of the purposes of project-based studio designs. It is not to show solutions to problems which may be taught, but developing ways of thinking which have not yet been presented. When we approach an unforeseen challenge, we may draw on something which allows us to respond. It is in this essence to which I am inspired by the insightful conversation we had. Hearing him talk about his divergence from architecture and how he maintains the approach of the architect, I found it interesting what we teach in addition to architecture while we teach about architecture."

-Tuomey

"As architects, we tend to look at things as an outsider. We view them as objects and rarely place ourselves inside. I try to teach students to engage themselves in the work. What begins as a grand scheme may be reduced to a modest structure while maintaining a rich essence. Rather than trying to look beyond something, it should be seen for what it is."

-Scarpa

"What I am discovering is that there is a fine line between the peculiar and the beautiful, between art and popular culture. I'm interested in the moment at which the two commingle. I am interested in becoming the teacher and the student, exploring the extraordinary within the ordinary."

-Scarpa

"Projects are evaluated certainly by economic development departments but also by city planning departments in terms of their contribution to economic competitiveness, and maybe to sustainability. But are they evaluated in their contribution to justice? Not usually... That's what it should be focused on."

-Fainstein

"A sustainable building is not a concept of architecture; it is a question of ethics. I do not see what we do as anything special, but just the right thing to do. Questions of efficacy have been raised regarding some of the decisions we have made. To this respect, I would argue that we make buildings for people, not simply machines to look at. If we must sacrifice some efficiency, so be it. I would argue that a building which is an energy hog that everyone loves is more sustainable than a zero-energy building that nobody likes."

-Scarpa

"The life of an architect is a public life. It is a negotiated life, a life of collaboration. It is not the life of a retreat. But to keep your head clear, you sometimes want to withdraw from that and think about what it is that is motivating you from the inside."
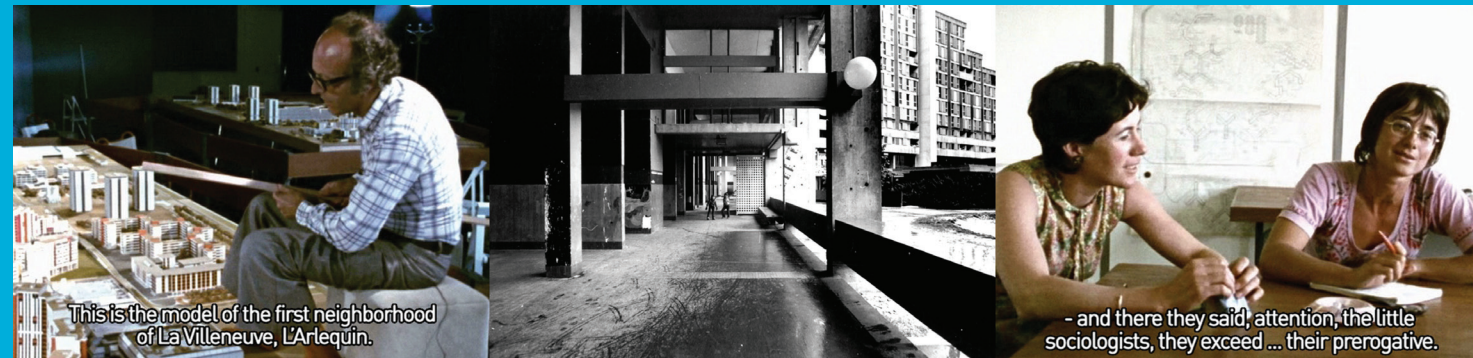
-Tuomey

"I think we're at a really interesting time in the relationship between our ability as architects to automate processes and then what happens when its delivered out to a particular building culture."

-Reiser + Umemoto

CONFERENCE
BEFORE AND BEYOND: ARCHITECTURE AND THE USER

"Before and Beyond" is a two-day international symposium exploring the question of how architecture and urban design deal with matters of use. Rapid urbanization and the development of mass culture over the past century have only exacerbated the fascination with architecture's "dark side:" the unknowable universe of its consumption and everyday use. If there is one figure that has functioned as the principal way of addressing both what informs and succeeds the controllable process of architectural production, it is that of the user. This innocuous category has been crucial to a number of emerging paradigms, from participatory planning and post-occupancy studies to populism, programming, and interaction design. Despite its centrality, it remains unclear how exactly the notion of the user has shaped the stakes of architecture across the modern and the postmodern.

With contemporary concerns of sustainability in a growing urban world, user-centered design delivers new promises for architecture's social agency, from urban interventions in the favelas of Caracas to the renovation of public housing in the suburbs of Paris. Against the prevailing idea that such agendas threaten to usurp the discipline's formal potentials, this symposium asks instead how the user has been a critical source of invention over the past century, prompting us to reconfigure the processes and premises of design.

Before and Beyond: Architecture and the User
UB School of Architecture and Planning   April 6—7, 2011

This is the model of the first neighborhood of La Villeneuve, L'Arlequin.

– and there they said: attention, the little sociologists, they exceed ... their prerogative.

EXHIBITION
IN SEARCH OF THE USER

France was radically transformed in the postwar decades. Economic growth, rapid urbanization, and strong government intervention led to the proliferation of mass housing projects and new towns across the country. Architects initially designed for a new social category known only through social statistics: that of an anonymous, standardized user. Vehicles for the large-scale modernization of everyday life, these new modern environments were met not only with celebration but increasingly with contestation. Breaking away from the suburban monotony they had caused soon became a political goal. Following the popular slogan born after the protests of May 1968, a younger generation of architects, urban planners, social scientists, and other experts mobilized to "change the city in order to change life." Their experimentation was focused on the same figure of concern - the user - which was now reinvented as an active and diverse participant rather than passive and uniform beneficiary.

The installation explores this search for the user at the intersection of architecture and social science. It recounts the construction in the early 1970s of Villeneuve, a new neighborhood on the outskirts of the provincial city of Grenoble that was a hallmark of French attempts to create an alternative kind of urban life. Reinterpreting an array of archival sources and original documentary footage, the installation traces three different but interrelated perspectives in the making of Villeneuve: that of architects, inhabitants, and social scientists. Each of these perspectives is projected onto a single panel of the extraverted triptych, unraveling the user as a multiple yet productive construct. Inhabitants learned to think themselves as users with certain rights and obligations. Social scientists made of them objects of expert knowledge and intervention. And architects thought about them as recipients of what they designed. Together nevertheless, their interaction amounts to an in situ form of experimentation in which positions are negotiable and the search is without end.

BIRDAIR LECTURE:

Graduating from MIT as an aeronautical engineer, Walter Bird worked with the Curtiss-Wright Corporation in WWII to develop the P-40 fighter plane, and went on to found Birdair in 1956. While situated in Buffalo, Birdair worked to advance the development of air-supported structures and tensioned membranes. Birdair has since developed fabric roofs for an array of large scale venues as well as a portable pneumatic pavilion for the United States Atomic Energy Commission following a collaboration with Victor Lundy. Additionally, Bird taught at the School of Architecture and Planning at SUNY Buffalo. This annual lecture series is made possible through the generous donations made by Birdair Inc.

PUGH + SCARPA
'10_ Diebedo Francis Kere
'09_Walker @ Hadid
'08_Diller Scofidio + Renfro
'07_Peter Eisenman

MARTELL DISTINGUISHED VISITING CRITIC:
Sheila O'Donnell and John Tuomey

Chris Martell received his M.Arch in 2001 from the University at Buffalo. After working locally with Kideney Architects and Cannon Design, Martell went on to Frost Lighting in New York City before starting Key Lighting and Visual LLC, the most technically advanced lighting and production company on the east coast. Through the generous donations provided by Chris and Sally Martell, the Martell Distinguished Visiting Critic Program makes it possible to bring architects of international significance to the School of Architecture and Planning at the University at Buffalo. These critics actively engage with graduate design studios in addition to providing a school-wide public lecture during their period of attendance.

'09_MOS
'08_Thom Mayne
'07_Tod Williams and Billie Tsien
'06_Brigitte Shim
'05_Steven Holl

CLARKSON CHAIR : ARCHITECTURE
Yve Alain Bois

The Clarkson Visiting Chair is an endowed visiting position awarded semiannually to a distinguished scholar or professional in the disciplines of architecture, planning, and design. This award is in recognition of excellence in the pursuit of scholarship and professional application within these disciplines and is made possible by the generous support of Will and Nan Clarkson. The Clarkson Chair was established in 1990 by Will and Nan Clarkson in order to provide the school with a senior visiting professional to spend a week in residence, be available to students and faculty, give a public lecture, and present seminars in their specific area of expertise.

'09_Michele Addington
'08_Kenneth Frampton
'07_Joan Ockman
'06_Anthony Vidler
'05_Glenn Murutt
'04_Peter Zumthor
'04_Michael Kwartler
'03_Lars Lerup
'03_Gerrit-Jan Knaap
'01_Alan Artibise
'00_Mark Wigley
'00_Michael Storper

'99_K. Michael Hayes
'98_Robert Yaro
'96_Sanford Kwinter
'95_Patsy Healey
'94_Daniel Hoffman
'93_M. Christine Boyer
'92_Alberto Perez-Gomez
'91_John Forester
'90_Marco Frascari

JAMMAL LECTURE:

The Jammal Lecture at the University at Buffalo is an annual event that brings eminent scholars in the field of international planning to campus to deliver a public lecture to students, faculty and the community. The lecture is named in honor of Ibrahim Jammal, who with his wife, Viviane, established the endowed lecture. Dr. Jammal founded the University at Buffalo Department of Planning and served on its faculty for more than 30 years. Dr. Jammal is widely regarded as a major force behind the study of globalization within the field of planning, and the School of Architecture and Planning celebrates this legacy each spring with a Jammal Lecture in Planning.

Susan Fainstein
'09_ Faranak Miraftab
'08_ Tridib Banerjee
'07_ Saskia Sassen

BETHUNE LECTURE:

As an annually supported lecture series, the Bethune Lectures are held in honor of Louise Bethune. As a Buffalo native, Bethune graduated from Buffalo High School in 1874 and began to practice architecture in 1876 working as a draftsman for Richard A. Waite. In 1881, she opened her own office in Buffalo, leading to her distinction and notoriety as the first professional female architect in the nation. In 1889, she was named a Fellow of the American Institute of Architects, one of the highest honors bestowed by the AIA. In her honor, the Bethune Lecture is annually held by the University at Buffalo's Departments of Architecture and Planning in celebration of the gender barriers overcome by women such as Louise Bethune.

Jeanne Gang
'09_MaryAnne Thompson
'09_ Shelley McNamara and Yvonne Farrell
'08_Benedetta Tagliabue

BANHAM FELLOWSHIP:

Peter Reyner Banham (SUNY-Buffalo, 1976-80) spent his time in Buffalo engaged in a scholarly project on the imaginary of American industrial architecture at work in early modernism that took the form of historical research, hands-on engagement and seminar instruction that resulted in his landmark work, *A Concrete Atlantis*. In celebration of experimental criticism, the Banham Fellowship in Architecture is intended to support design work that situates architecture within the general field of sociocultural and material critique.

Kenny Cupers
'09-'10_Brian Tabolt
'08-'09_Michael Kubo
'07-'08_Eva Franch-Gilabert
'06-'07_Sergio Lopez-Pineiro
'05-'06_Jonathan Solomon
'04-'05_Hilary Sample
'03-'04_Grace Ong
'02-'03_Donald Kunze
'01-'02_Tsz Yan Ng
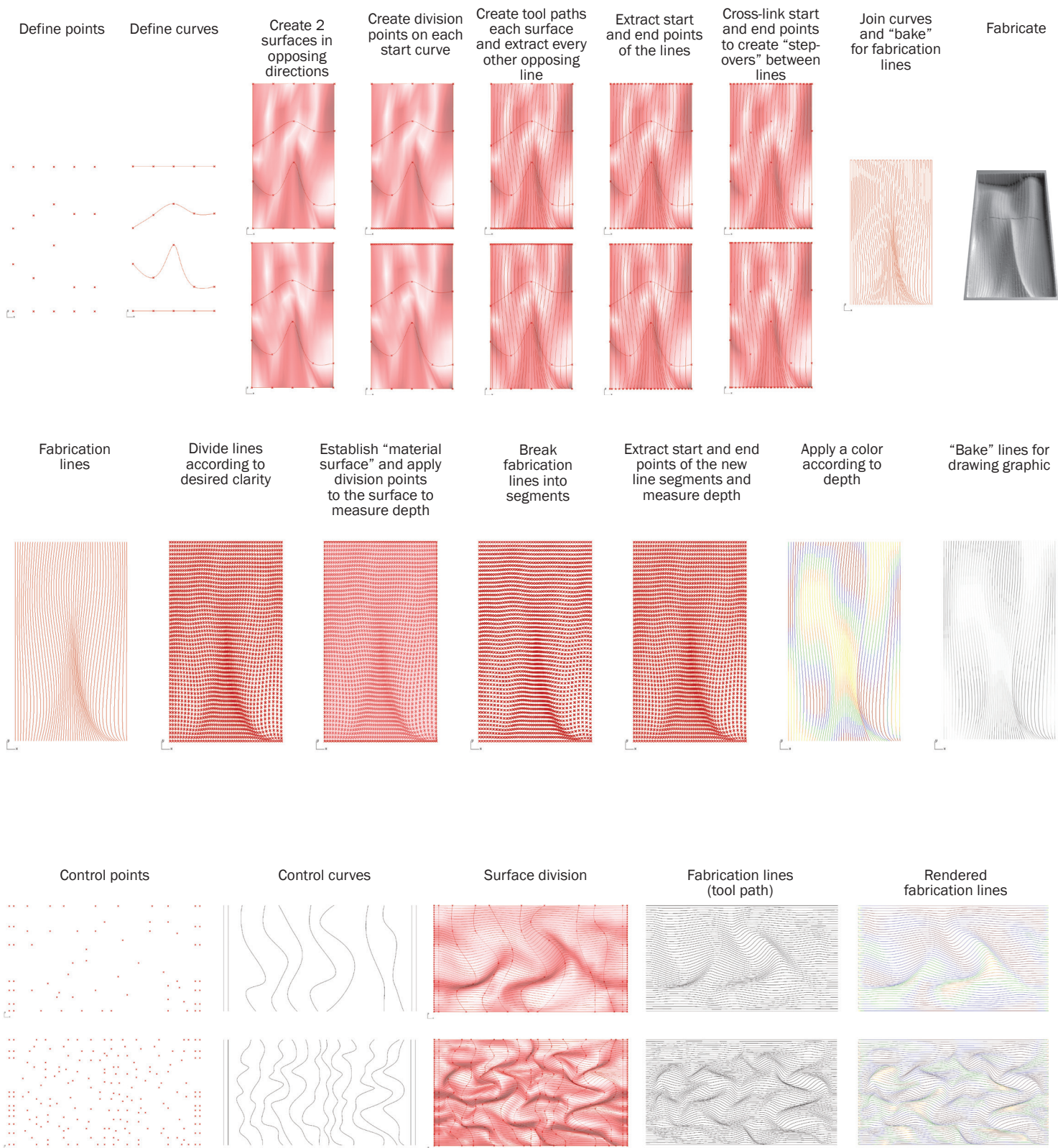'00-'01_Hugo Dworzak

LINES OF FABRICATION

THESIS : O. KHAN, A. LECUYER, M. SHEPARD
STUDENT : N. CORNMAN

Lines of Fabrication explores the way that CNC technology can change the approach to drawing in the field of architecture. Typically, drawings serve as graphic representations of a design. A fabricator who may subjectively revise and alter them in order to produce the intended result then interprets these representations. By using this method of fabrication, the architect surrenders a certain level of control of the project because of the way information is translated through representational language.

CNC technology enables the architect to advance beyond this method through the development of new languages and processes of fabrication. With the ability to process information, CNC machines return the control to the architect throughout the process of fabrication. Data and information can be directly transmitted from design drawings to fabrication through the actual lines of the drawing itself. By understanding the language of the CNC machine and the drawing software, it becomes possible to produce drawings in a specific way that directly inform the fabricator of what is to be fabricated and how it is to be fabricated.

Through the use of the Grasshopper plug-in for Rhinoceros, this project examines the information that can be contained within a drawing ranging from simple XYZ coordinates to the way that points, lines, and planes are interrelated within the drawing. It also explores how a CNC router can read the data from the lines of a drawing and ultimately how the lines can be drawn in specific ways to contain information that will control how the machine will fabricate a proposed design.

Lines of Fabrication was exhibited at the Center for Architecture Annual Architecture Schools Exhihibition in September of 2010 before being presented and exhibited as a part of the INPUT_OUTPUT Symposium at the Tyler School of Art at Temple University. In October 2010, Lines of Fabrication was exhibited in the ACADIA annual design conference in New York City.

| Define points | Define curves | Create 2 surfaces in opposing directions | Create division points on each start curve | Create tool paths each surface and extract every other opposing line | Extract start and end points of the lines | Cross-link start and end points to create "step-overs" between lines | Join curves and "bake" for fabrication lines | Fabricate |

| Fabrication lines | Divide lines according to desired clarity | Establish "material surface" and apply division points to the surface to measure depth | Break fabrication lines into segments | Extract start and end points of the new line segments and measure depth | Apply a color according to depth | "Bake" lines for drawing graphic |

| Control points | Control curves | Surface division | Fabrication lines (tool path) | Rendered fabrication lines |

Embedding Fabrication Data:

1. XYZ reference points
2. Connect XYZ to create control curves
3. Create surfaces to establish start and end points
4. Set tooling bit radius
5. Apply bit radius division points to surface
6. Remove duplicate points
7. Create tool paths on the surface from each division point
8. Establish data list
9. Extract / cross- link points of tool path for step-over lines
10. Control data list
11. Connect line segments to produce continuous line
12. Estimate time and cost of fabrication
13. Establish the actual material surface
14. Divide fabrication line with division points
15. Apply division points to actual material surface
16. Segment the fabrication line
17. Measure cut depth between the material and fabrication line
18. Render fabrication line to convey design intent
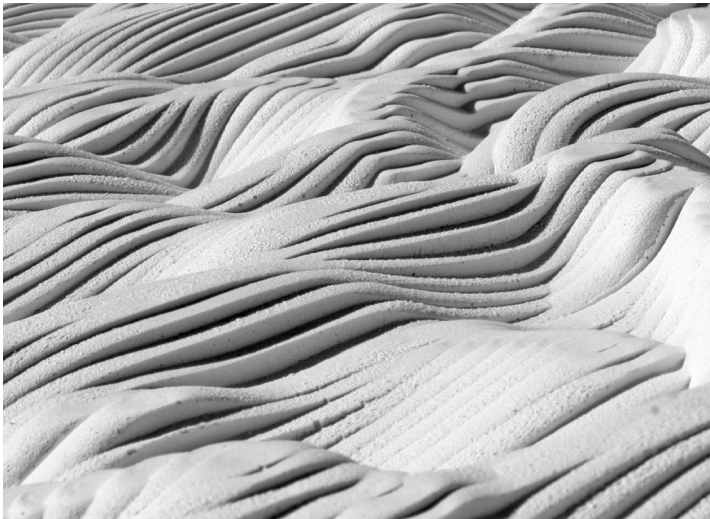
Final Cast Detail
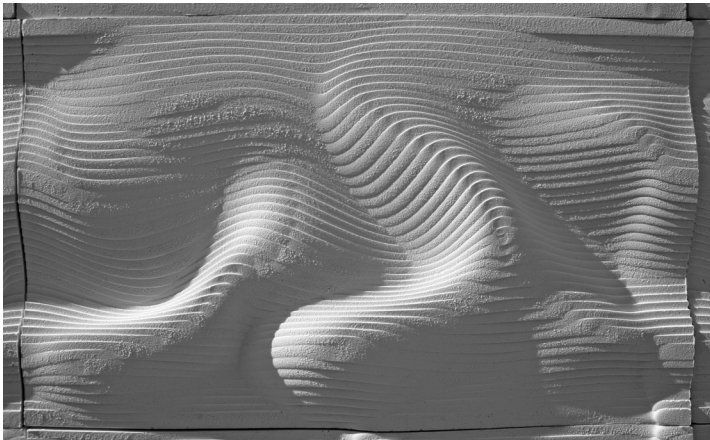
Toolpath 1 Axonometric Diagram + Produced Cast
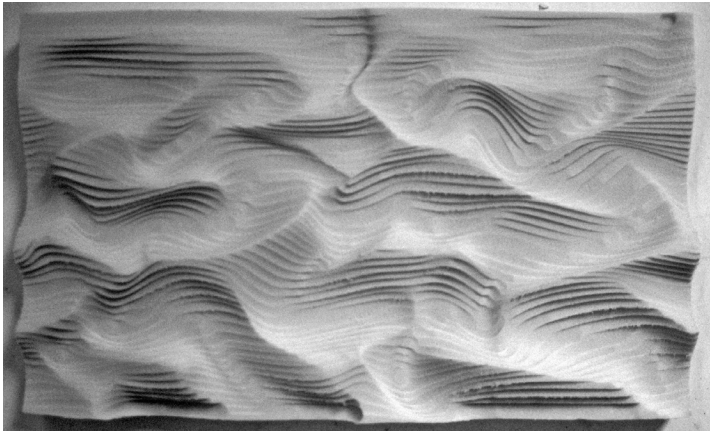
Toolpath 2 Axonometric Diagram + Produced Cast

Casting Process:

1. Transmit drawing to CNC
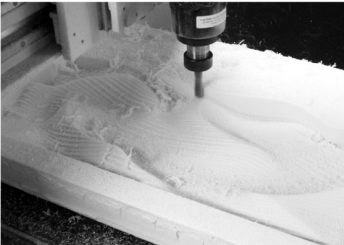
2. CNC mill rigid foam board
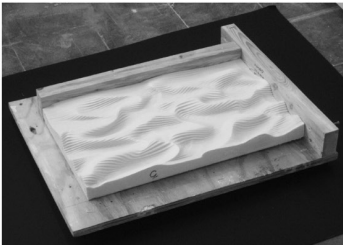
3. Fit negative into formwork
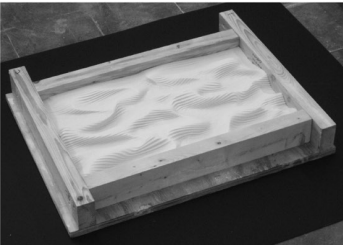
4. Enclose the mold
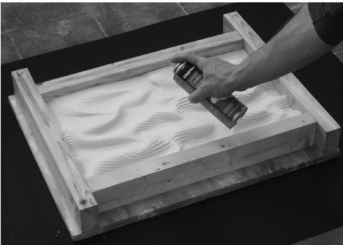
5. Spray lubricant
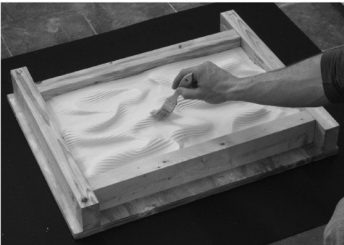
6. Evenly distribute w/ brush
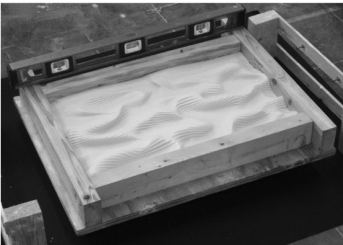
7. Level formwork
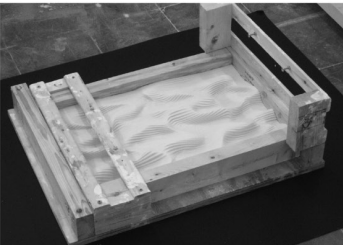
8. Dry fit fastener jigs

9. Pour hydrocal

10. Vibrate to reduce air pockets

11. Screed top for level surface
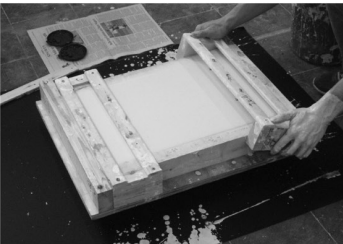
12. Place fastener jigs
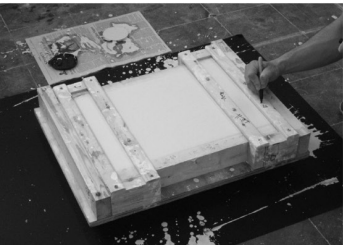
13. Timestamp and cure
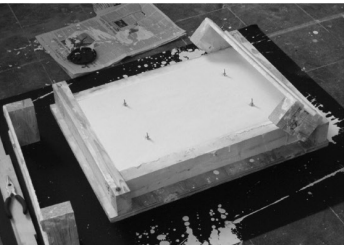
14. Remove fastener jigs
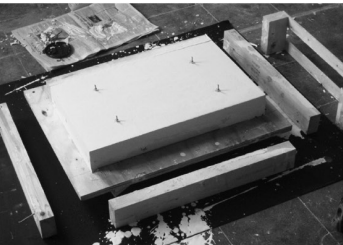
15. Remove formwork

16. Finished panel

Through this method of drawing and fabricating, the lines of the drawing become much more significant. They represent much more than just a design. Lines become tool paths through a process of defining relationships between the various types of information they contain. The lines in the drawing no longer simply define the edge of a piece of material but also define how a piece of material will be fabricated. This significantly changes the way an architect approaches and produces a drawing. As the role of drawings changes, lines take on a different importance within the interrelated web of information that will be transmitted throughout the fabrication process. The line is used to draw and represent, to define and transmit information, to control fabrication and to directly realize a design.

iM HEADPHONES

iM Headphones

Sonar Sensor Beam Width
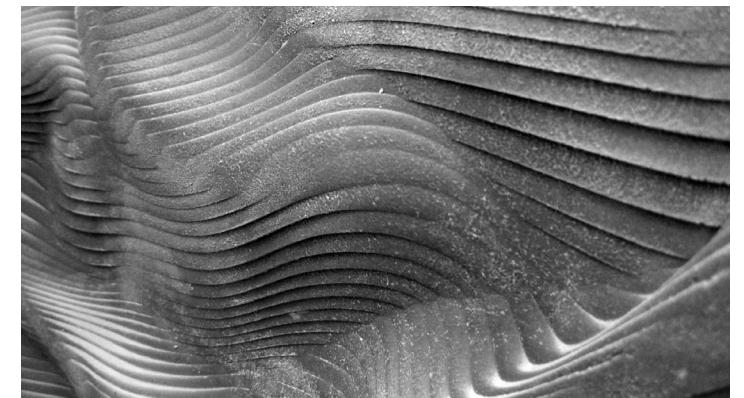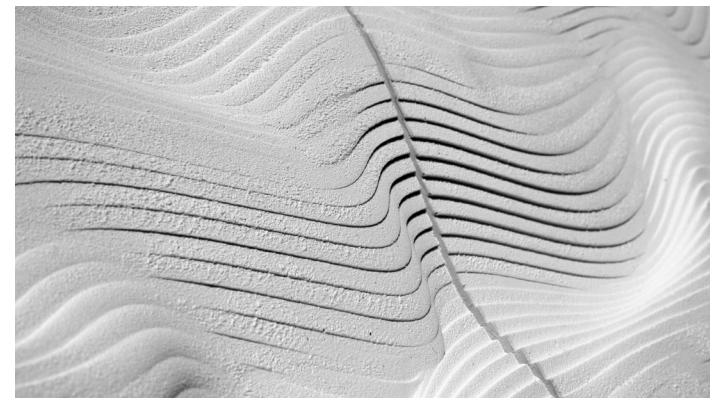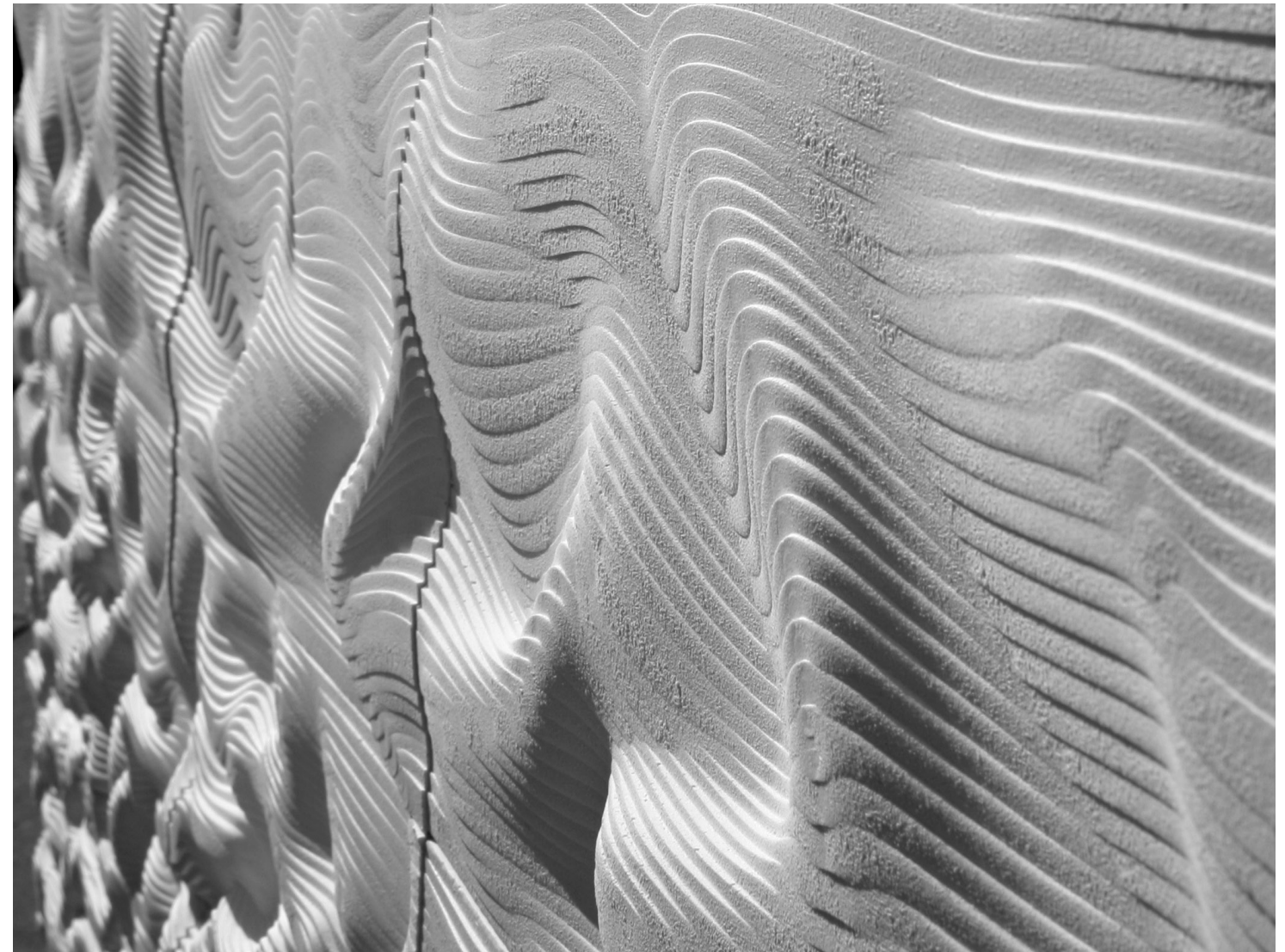
iMeasure (iM) Headphones: Readdressing the Personal Stereo is a set of sonar-enhanced headphones that "play" particular sounds in relation to spatial readings. This thesis is rooted in Michel de Certeau's notion of walking as a spatialized practice in *The Practice of Everyday Life*. This thesis proposes new forms of walking that are mediated through ubiquitous devices. The research aim of iM Headphones is 3-fold:

1. To re-envision ubiquitous listening devices like the Sony Walkman or the iPod. Instead of personal sound tracks, the aural experience is driven by user movement within space.

2. To design and compose particular "compositions" in relation to specific locations and spatial conditions. For example, one composition creates particular phasing effects of tones when indoors.

3. To design a map in which the user can re-visit after the performance. As opposed to a photograph or a video of the interaction, I created an animation and drawing using distance readings, compass headings, and GPS location.
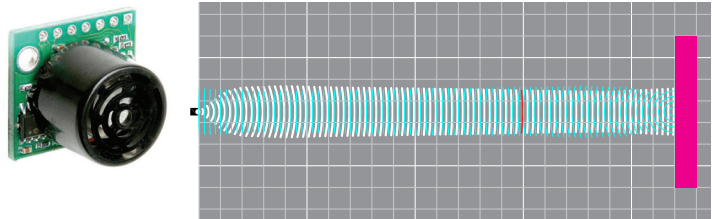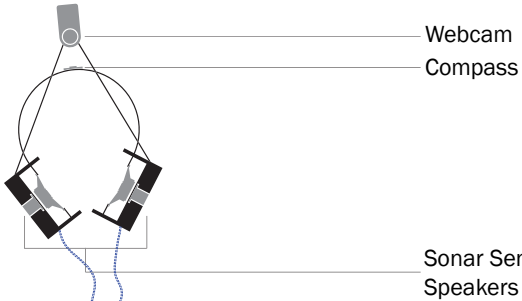
Webcam
Compass

Sonar Sensors/
Speakers
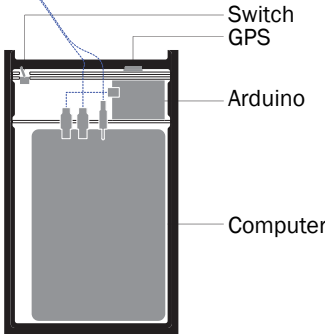
Switch
GPS

Arduino

Computer

mapping
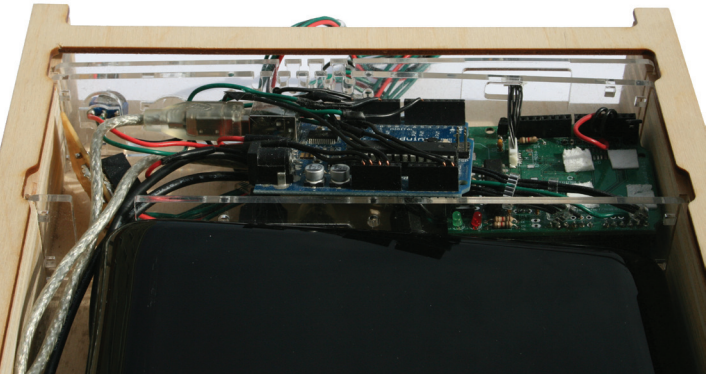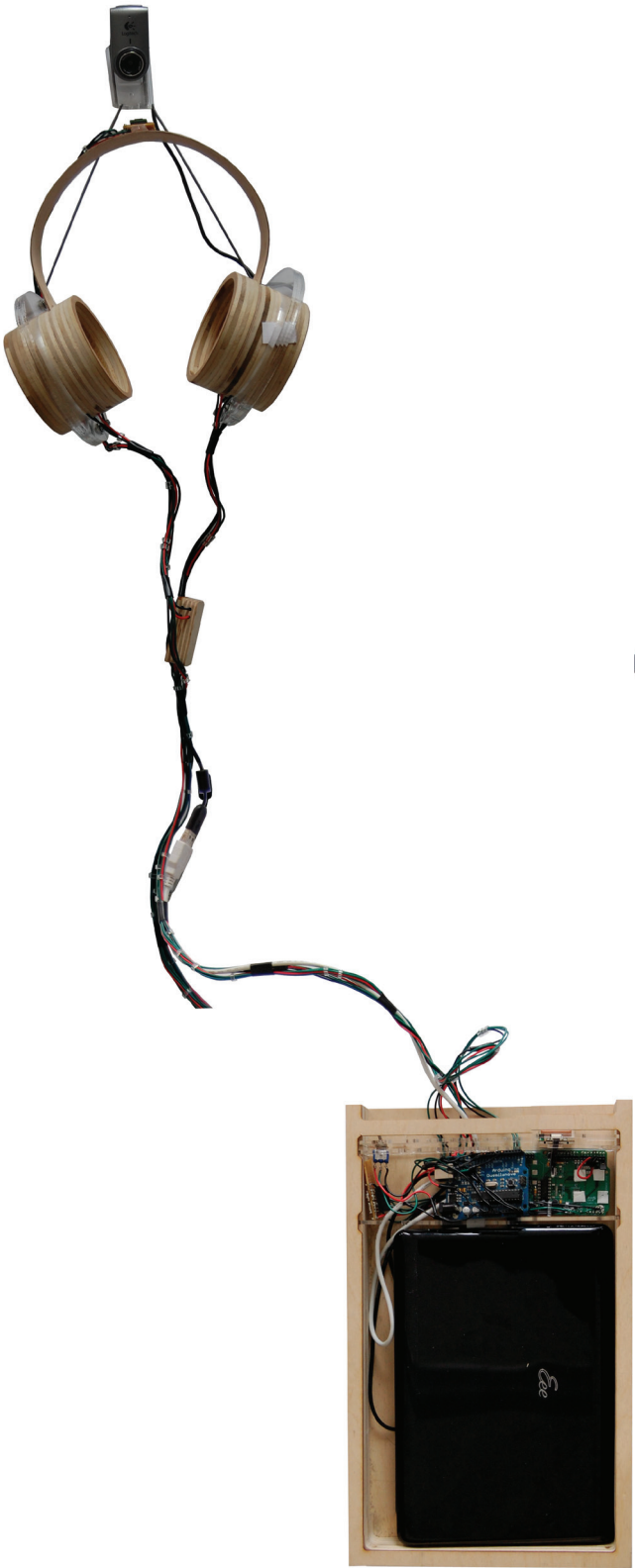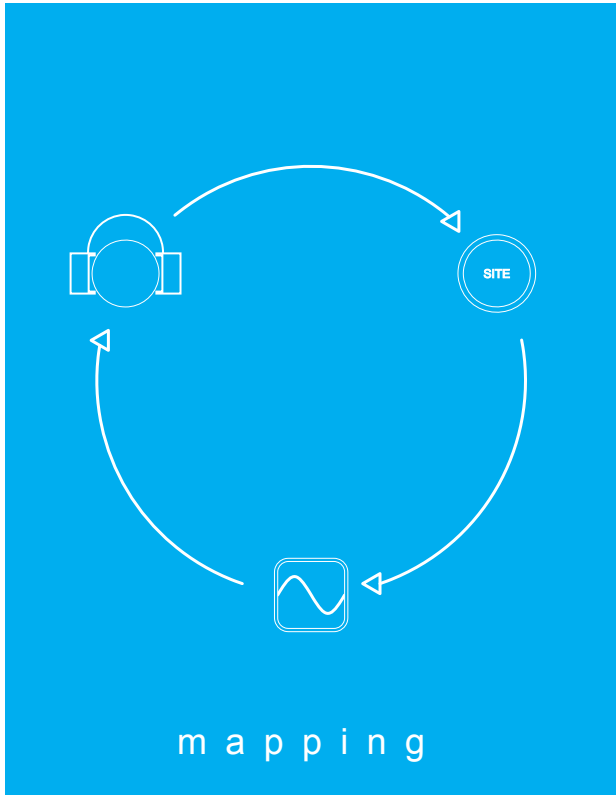
Four specific walking paths were designed and documented:
A Walk Around the Obelisk
A Walk Across the Bridge
A Look Out the Observation Tower
A Walk Along the Waterfront

COMPASS

GPS

m   a   p

Compass Direction

GPS Location

Start Point

Distance Measurements

Conceptual Diagram

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