

Julie Solomon

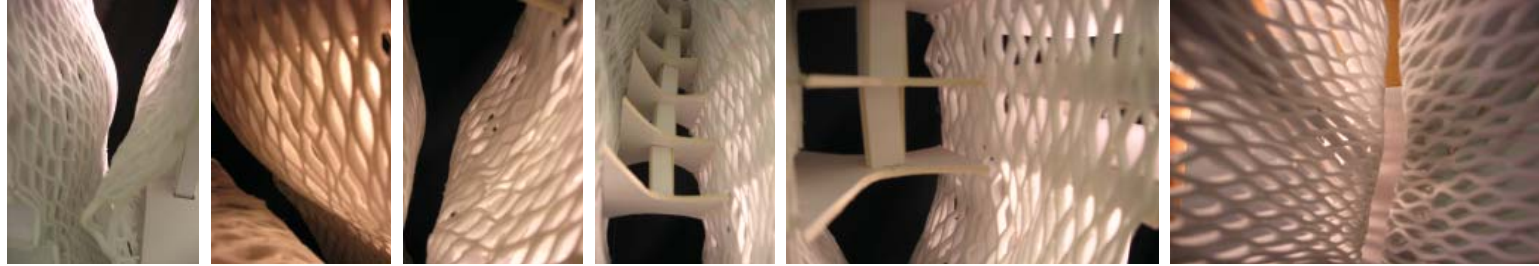
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Organic Movement and the Grid ::
A Boutique Hotel for Chinatown Manhattan

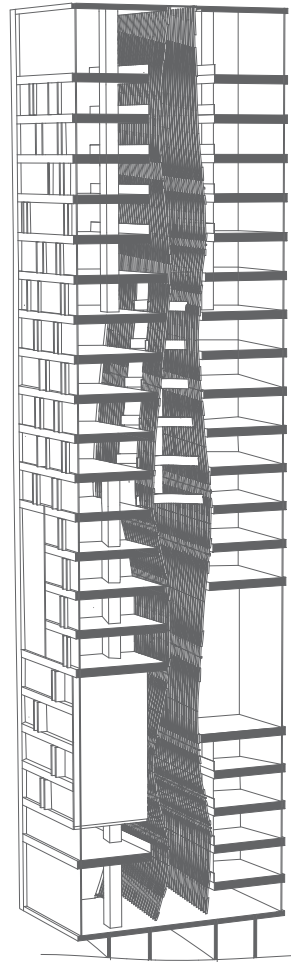
Fall 2008



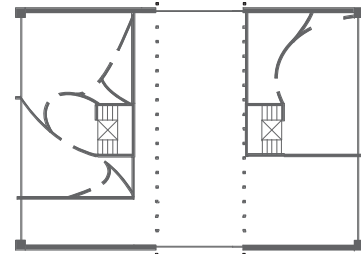
Manhattan is a grid system and within this grid system there is an organic flow of circulation. The constraints created by this imposed grid allow for organic movement by creating boundaries that control and restrain possible circulation paths. By using a grid organization system, based on the ideologies of the Manhattan grid, in the design of a boutique hotel, organic inter-grid circulation can be applied to both sectional movement and plan organization.



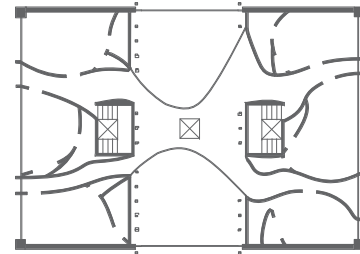
Circulation diagrams of the Chinatown site.



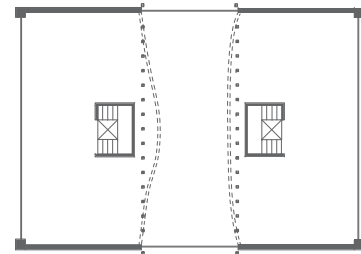
Sectional perspective.



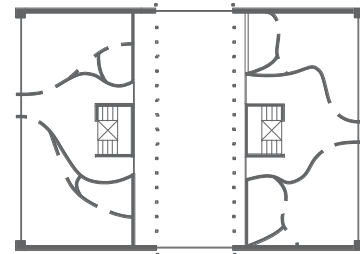
Level 2



Level 18



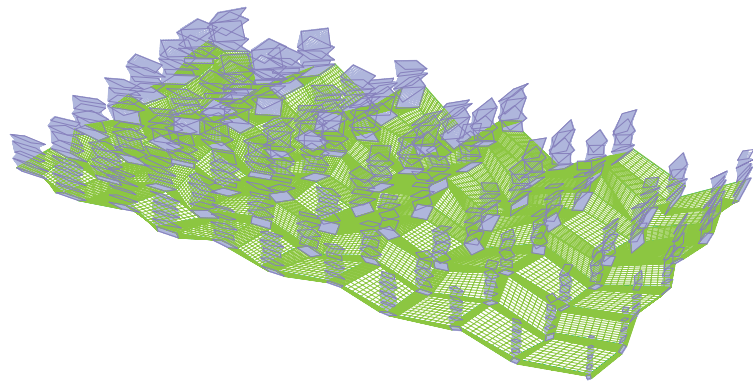
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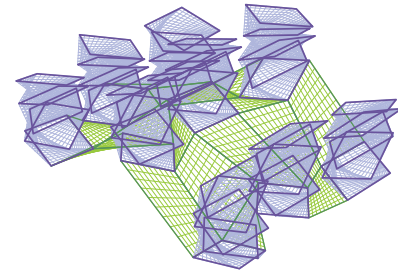
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Geometry, Pattern, and Performance ::
Islamic Extension to the Metropolitan Museum of Art

Fall 2009



Axonometric view.



Axonometric detail.

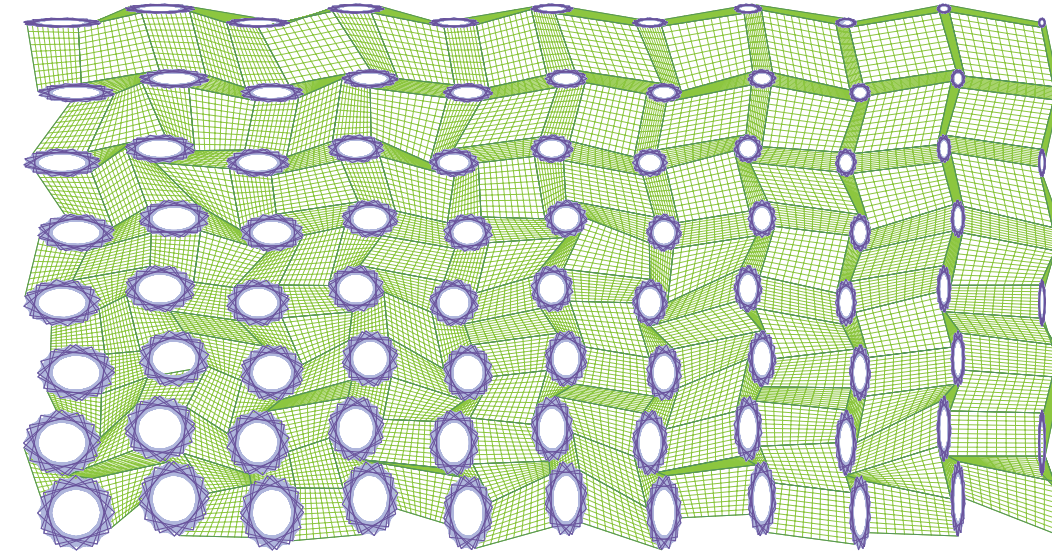
Islamic Pavilion Exercise

Drawing inspiration from the mosaic pattern, the use of rotating squares acts as the primary design tool for both pavilion and landscape. This geometry is then employed in a field of differing variables in order to create infinite growth possibility. The forms generated by this design method create the overall field. Without each component present, the computation loses focus and discipline.

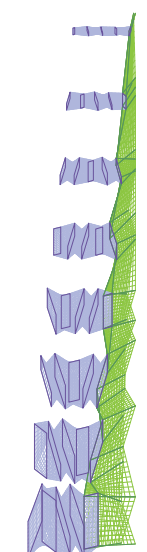
The script used in the design of this pavilion utilizes rotating squares around a central axis in order to generate three dimensional forms. By rotating a simple square based on divisions of Pi in the X/Y-plane, an Arabesque pattern is formed,

creating the illusion of a star shape. When these rotating squares are pulled apart in the Z-plane, they create tube like structures. Lofting these squares based on the rotation of the square allows for complex forms to be generated.

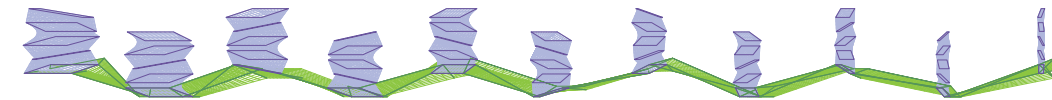
These forms are then generated multiple times in an X/Y-plane grid to create the field. When variables inside the sinusoidal function are altered, deviations in the field of forms appear. By combining deviations in 3 directions, the field is able to morph. As the forms deviate from the set grid, so does the landscape.



Plan.



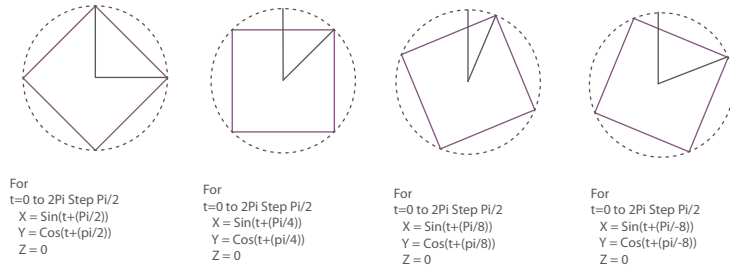
Latitudinal section.



Longitudinal section.



View through the museum.

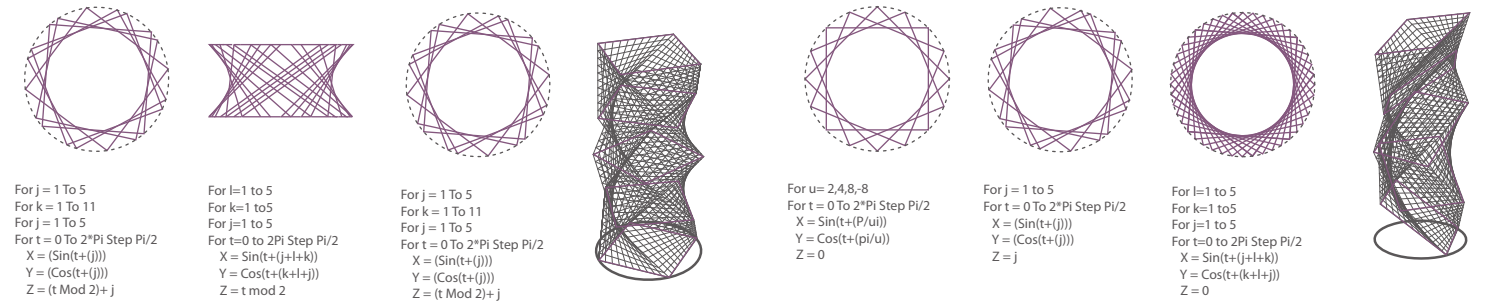


Islamic Extension for the MET

The Masjid-Jami located in Isfahan, Iran, embodies a large number of Islamic characteristics. The artifact encompasses the use of mosaic geometry and color to create a visual pattern. Through a series of rotating shapes employed at different scales, a strict pattern and geometry is formed. According to The Mediation of Ornament, mosaic forms are the first type of Islamic geometry. "Geometry appears, thus, as a frequent category to classify, describe, and comprehend the visual experience of many objects or monuments of architecture... It is also part of the process of creating things." [135] These patterns were applied throughout Islamic art. According to Grabar, "In all these works the visible unit of design - vegetal,

geometric, or other - has been constricted into a vehicle for the expression of something else than itself...each object or wall is totally covered; no part is left without ornament...the ornament can best be defined as a relationship between forms rather than as a sum of forms." [198]

The design for the extension to the Metropolitan Museum of Art acts in a similar fashion. Drawing inspiration from the mosaic pattern, the use of rotating squares acts as the primary design tool for both pavilion and landscape. This geometry is applied in a way that creates both form and circulatory patterns. Originally, this geometry was used in a field of differing variables in order

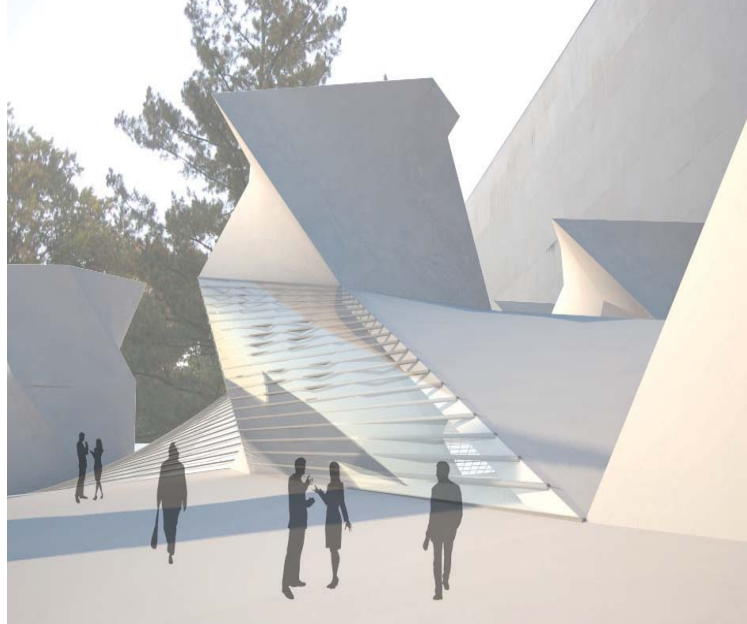


to create infinite growth possibility. According to Stan Allen, "a field condition could be any formal or spatial matrix capable of unifying diverse elements while respecting the identity of each." It all cumulates in "composition by parts." The forms generated by this design method create the overall field. Without each component present, the computation loses focus and discipline.

The MET extension design grows on this field condition. By employing the same geometry in similar discipline, space is created on the underside of the landscape. The landscape and museum merge into one another. The rotating squares act as

both storage, core, and light wells in the project. The turbulent space created by the connection of the rotating squares acts as gallery space. Each space is therefore unique within itself, but parametrically related. The entire design is composed of hyperbolic, four rail surfaces. Every connection and inflection point of the design can be simplified down to a straight line. The field moves from dense to scattered as the site morphs from Fifth Avenue into Central Park.

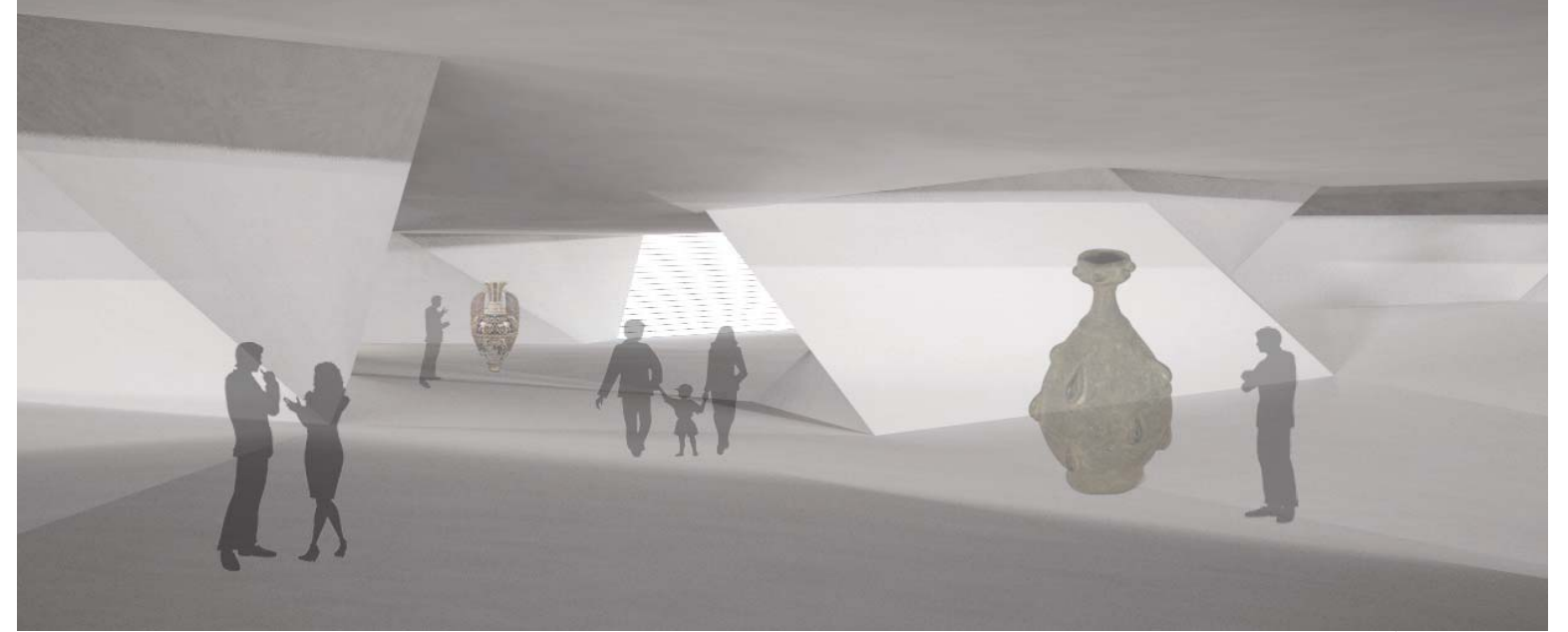
Allen, Stan. Field Conditions. Points + Lines. 1985
 Grabar, Oleg. The Intermediary of Geometry. The Mediation of Ornament, Princeton University Press, 1989.
 Grabar, Oleg. Islamic Attitudes toward the Arts. The Formation of Islamic Art. Yale University Press, 1973.



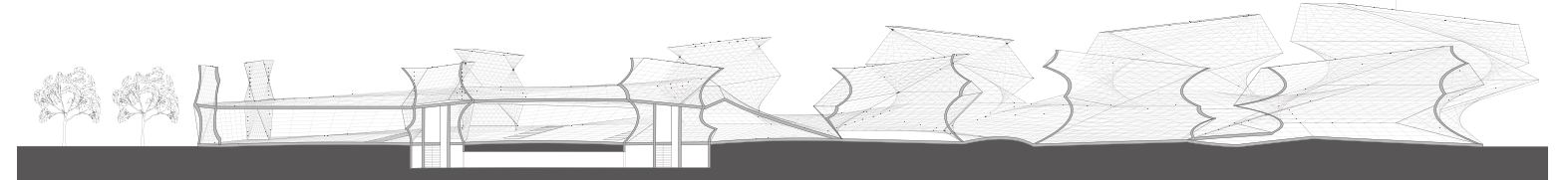
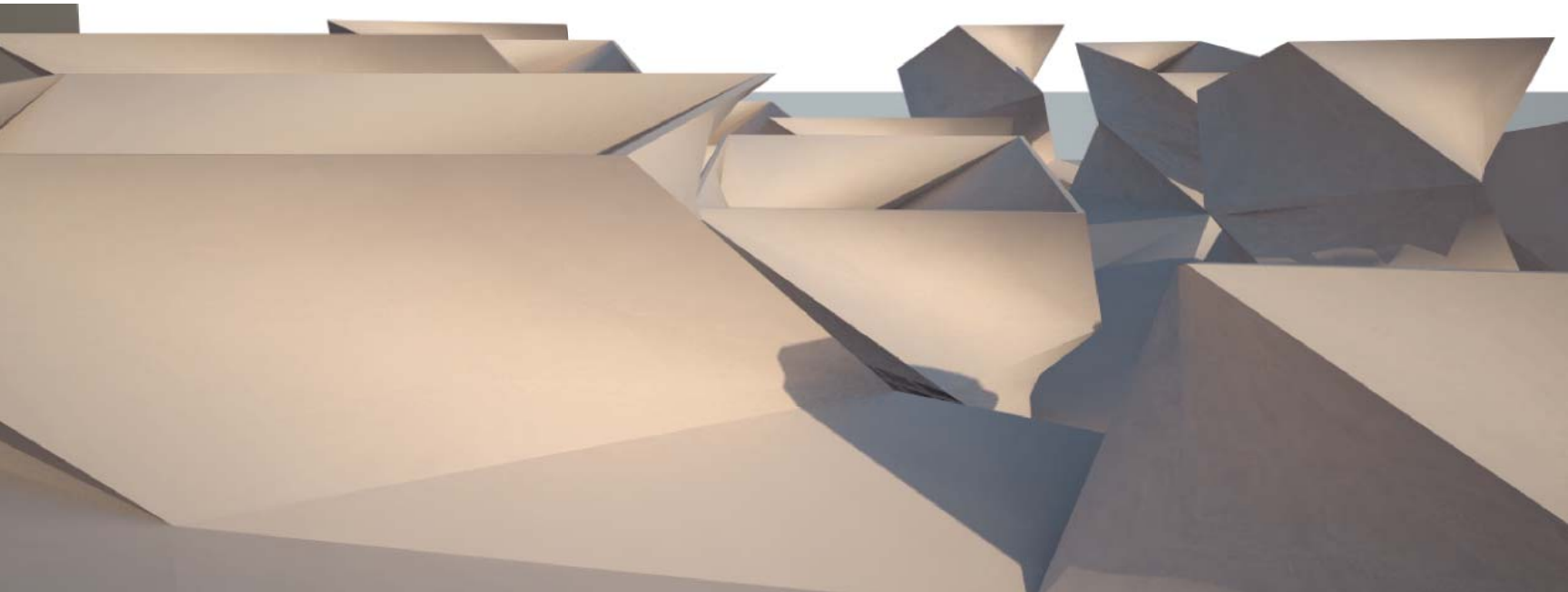
Rooftop landscape.



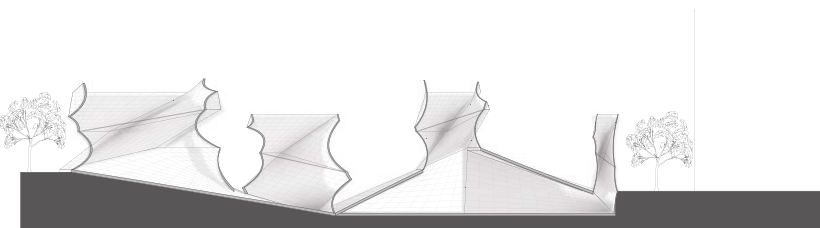
Entrance.



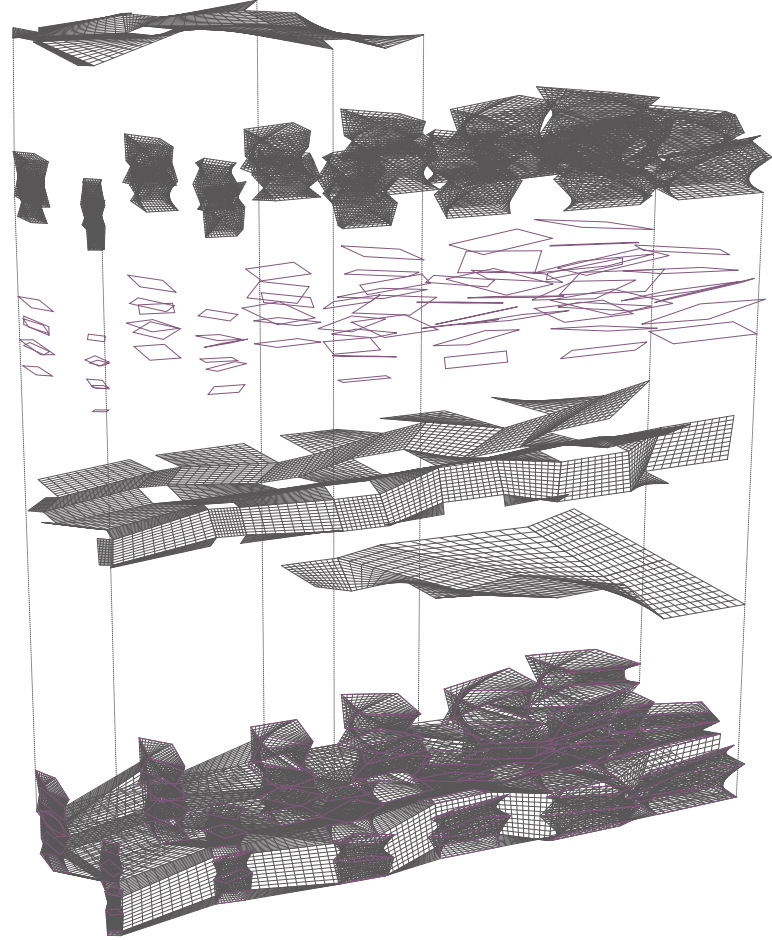
Latitudinal section.



Longitudinal section.

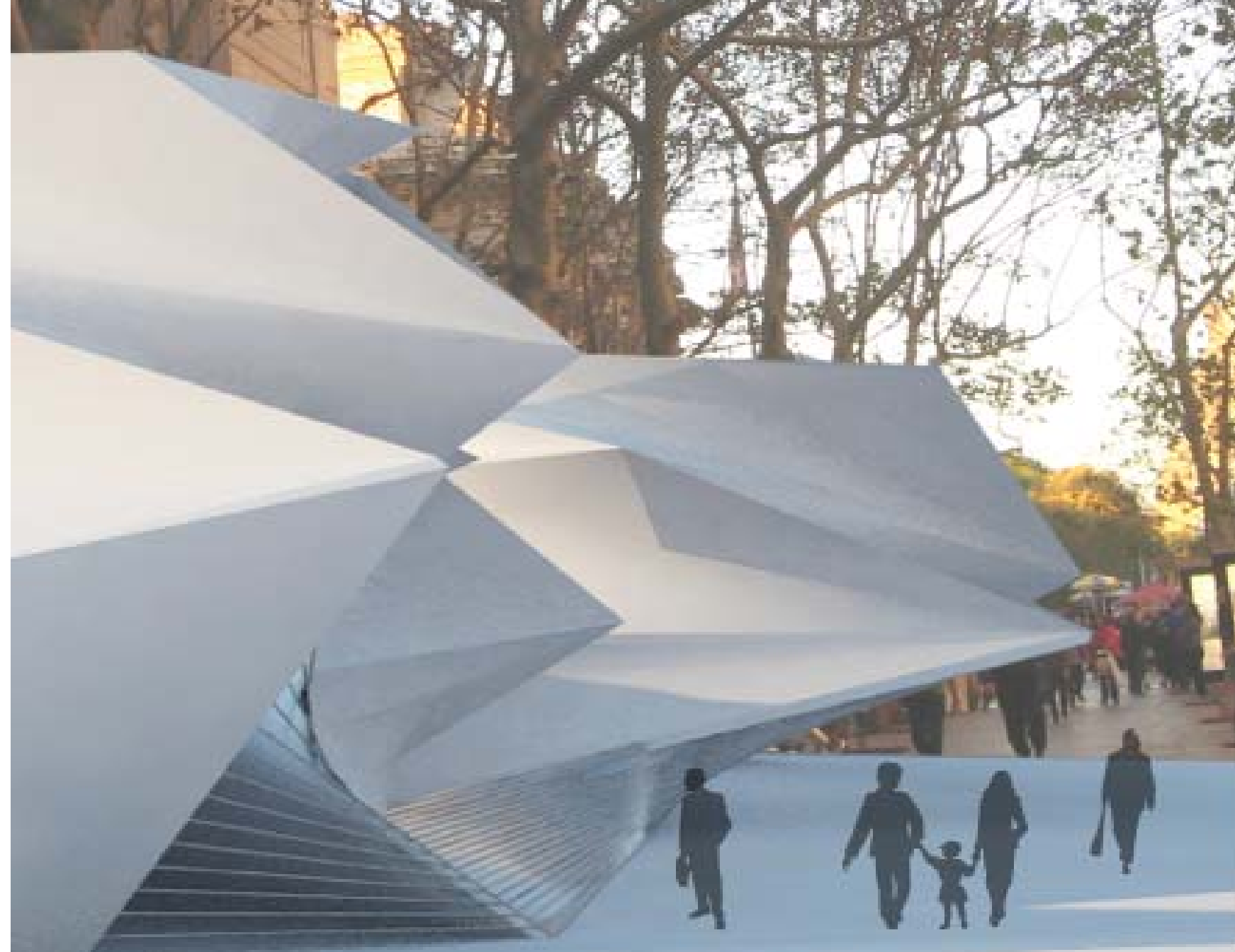


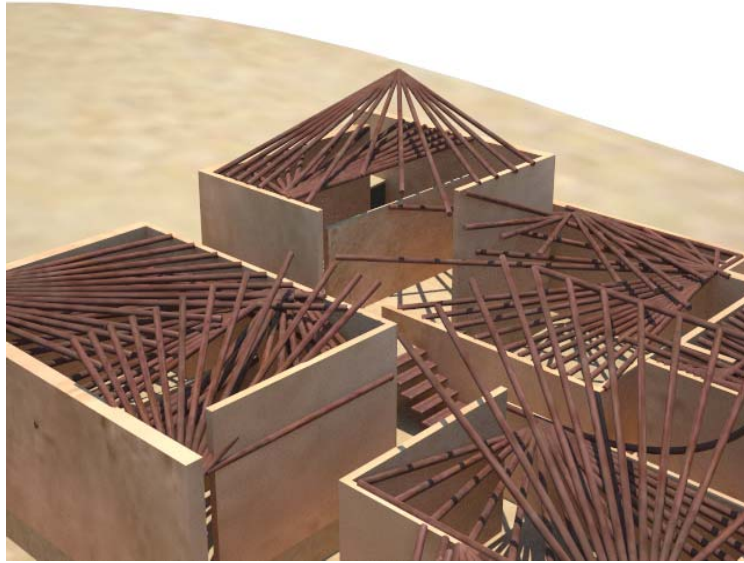
Latitudinal section.



Exploded axonometric.

Opposite: View of Fifth Avenue.





Aerial view.

A Center for Women's Health Partner: Tiffany Pryce

The greatest focus of architectural design should be on the affects of the design on the people who will occupy the building. The relationship between architecture and the human body is both physical and psychological, with both imposing on each other resulting in a building with unique architectural expression while working practically for those who inhabit it.

Buildings that incorporate natural lighting, ventilation and clean water improve the quality of life of the people within it. We seek new methods to incorporate light and air flow into spaces that retain privacy while maintaining an open feel that contributes to a positive mental state.



View from inside the clinic.

Through the use of materials, passive solar strategies and cross ventilation pattern, we want to open up buildings that are known to be very secluded and fragmented such as hospitals, clinics, schools and offices. Our aim is to create a prototype clinic that can be implemented by the UN in countries that lack many of the resources they desperately need.

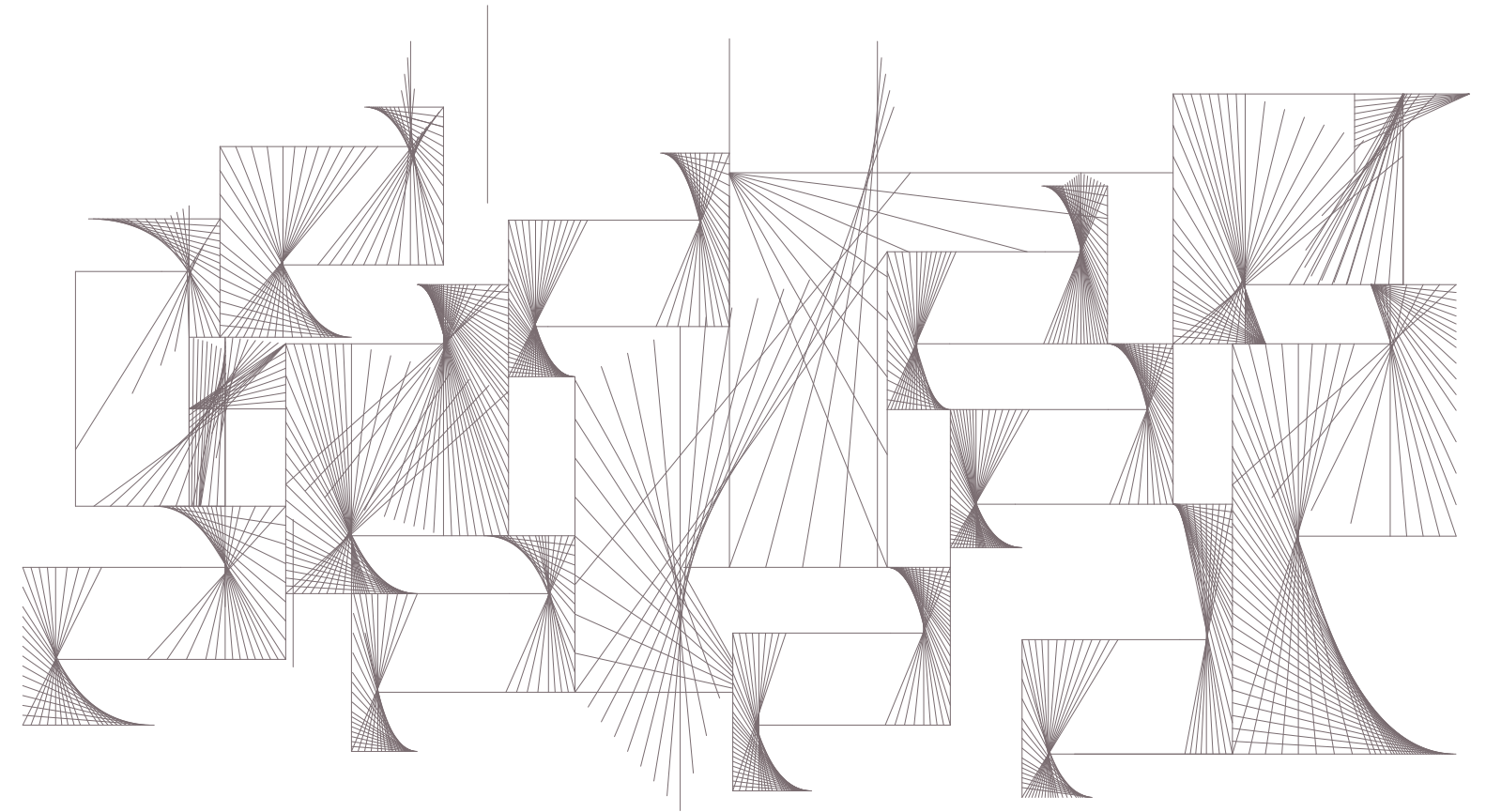
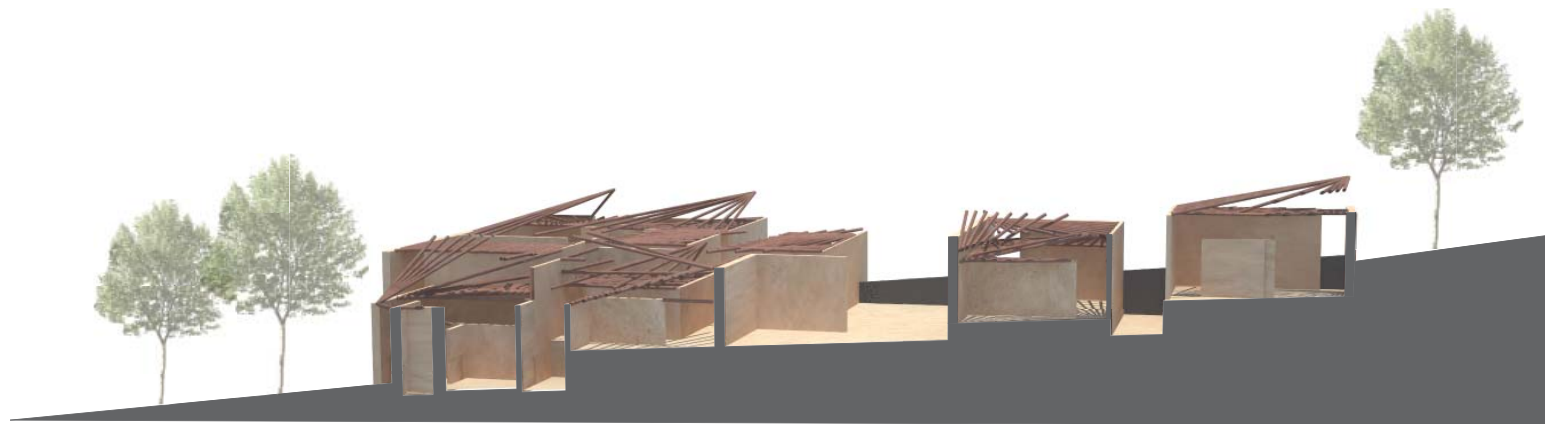


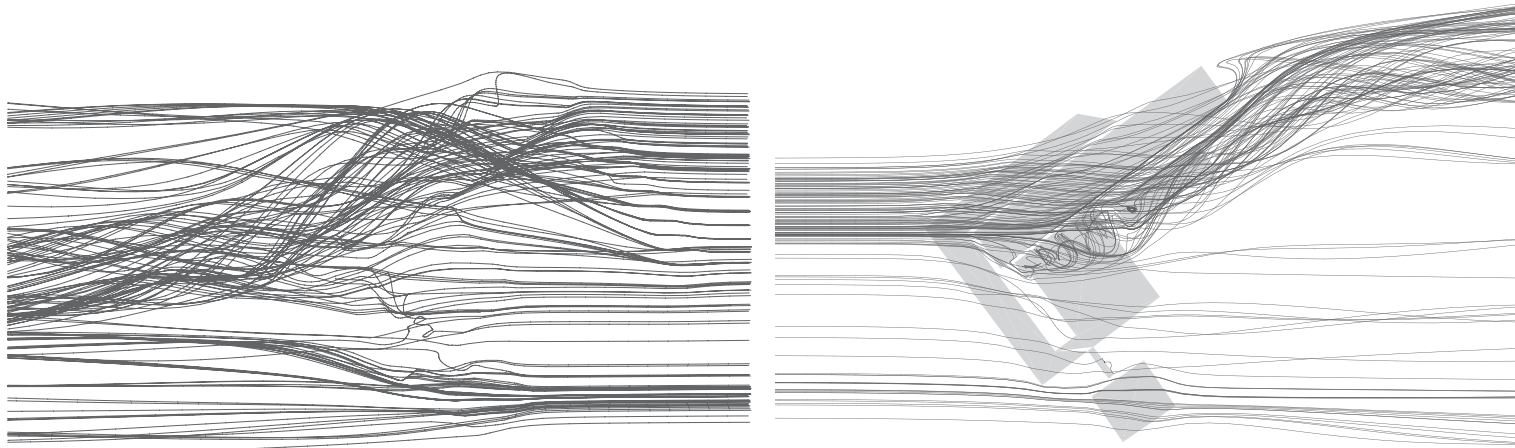
Diagram of site lines throughout the structure.



Sectional perspective.



Opposite: Entrance to the clinic.



Wind diagram through site.

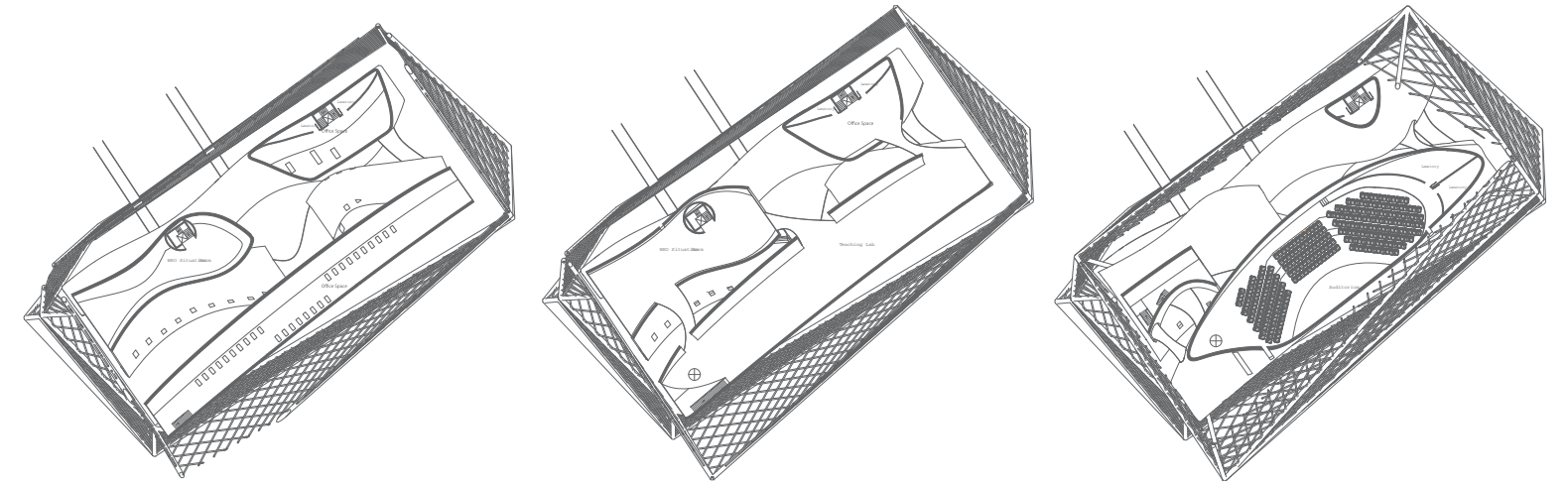
Wind diagram through building structure.

An Extension to the World Health Organization

Ventilation equals healthy architecture, however, not all ventilation is healthy. Through the examination of both natural and mechanical ventilation systems, it can be seen that natural ventilation pulled from outdoor air is unquestionably cleaner than standard mechanical systems. Sick Building Syndrome (SBS) along with other health and environmental problems can be avoided through the implication of a natural ventilation system.

The wind flow and climate of Geneva, Switzerland allows for this type of system to be utilized with ease. Through the design of optimized wind cavities, aided by experimentation in

SolidWorks, a design is reached that allows for maximized air flow. The addition of a double skin ventilated façade system increases the effectiveness of this design. With the conjunctive use of both the wind cavity design and ventilated façade, this addition to the WHO campus should theoretically require no mechanical ventilation systems, therefore making it healthy architecture.



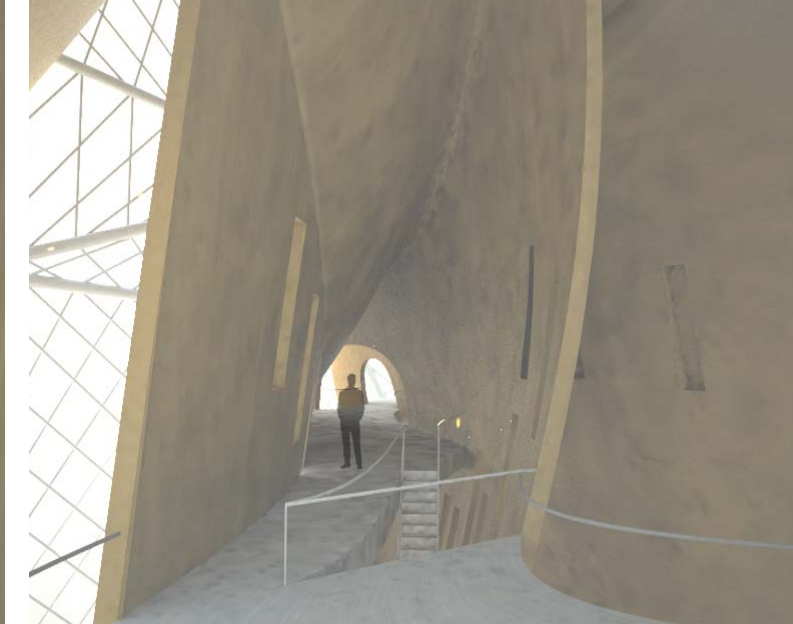
Level 1

Level 2

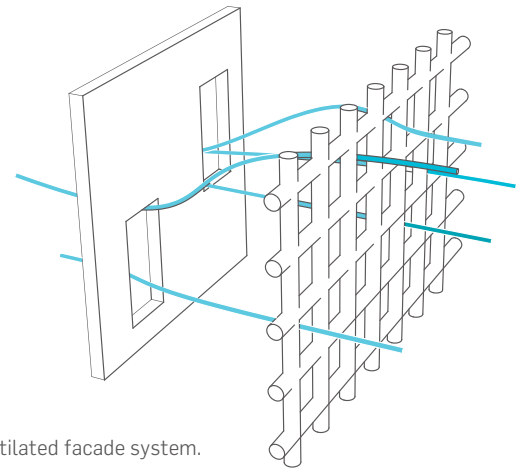
Level 3



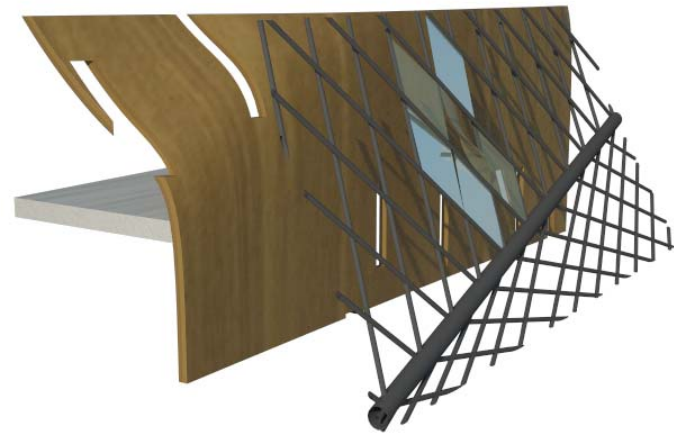
Main corridor.



Circulation space.

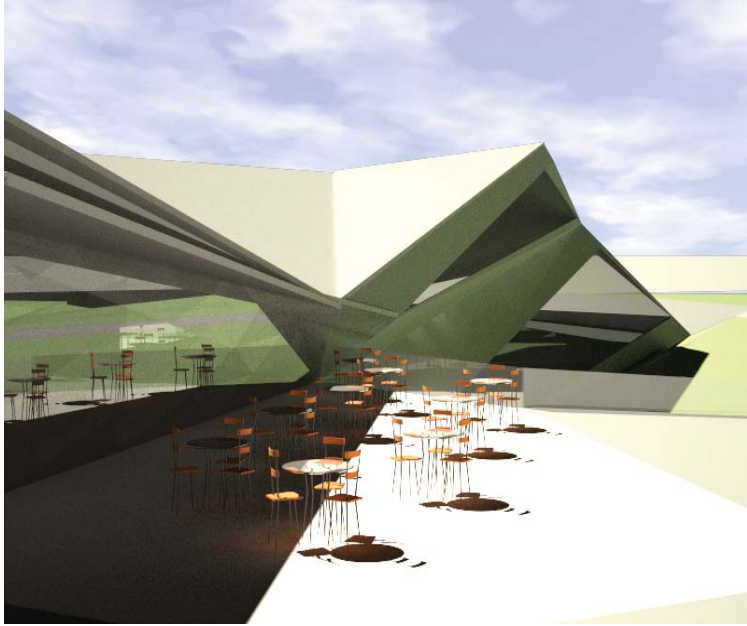


Ventilated facade system.



Folded Form and Function ::
A Multi-Music Center for UPENN
Spring 2008

Partner: Rachel Medina



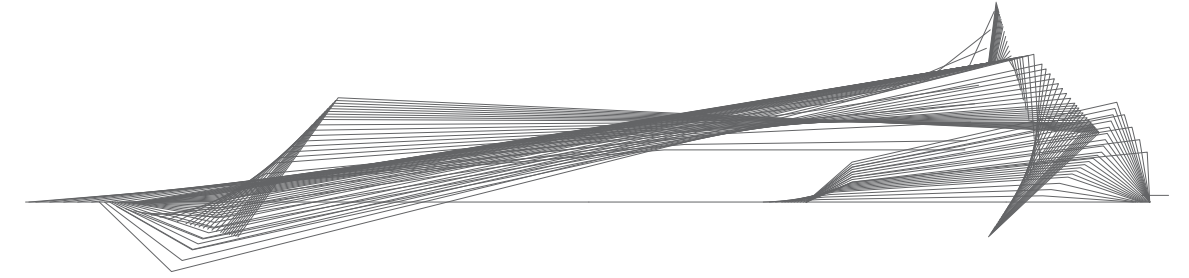
Exterior courtyard.



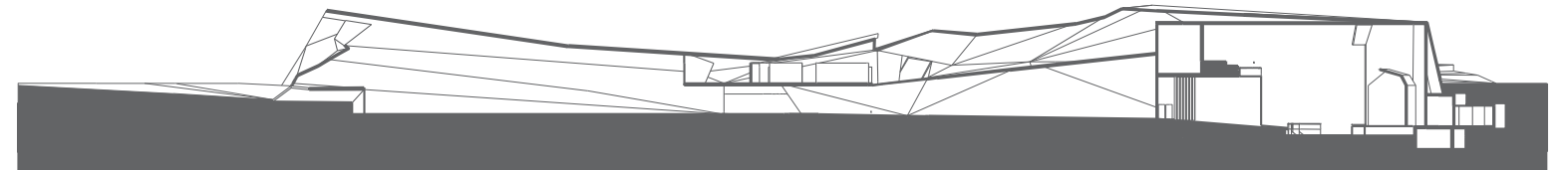
The design of a multi-use music venue was the focus of this project located on the University of Pennsylvania campus in Philadelphia, PA. The venue includes a large indoor auditorium, recording studios, rehearsal space, practice rooms, a cafe, and an outdoor stage with lawn seating. The facility is to be used by both UPenn students as well as the residents of Philadelphia. The design focuses on the southern axis of the adjacent stadium, accessible both from the street and the walkway of arches running parallel to the stadium. An inner atrium space is surrounded by a ramping system used for circulation throughout the design.



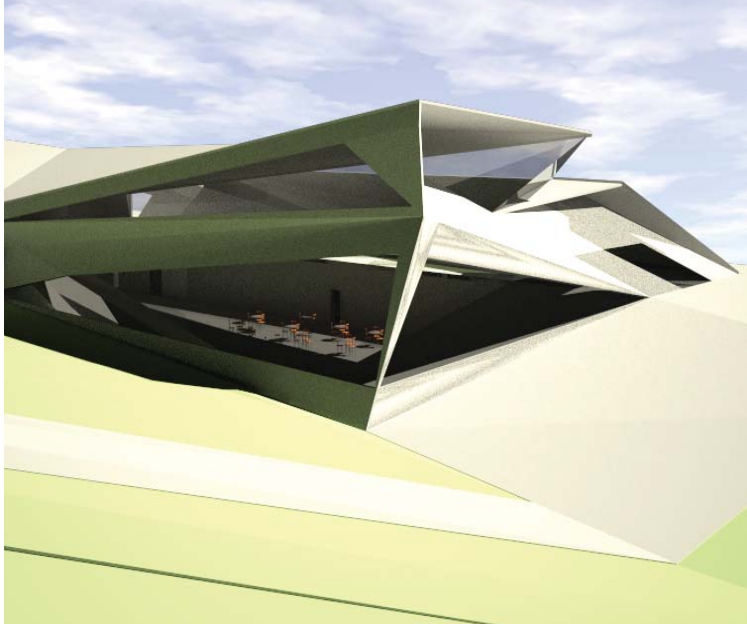
Recording studio.



Diagrammatic section based on sunlight patterns on site.



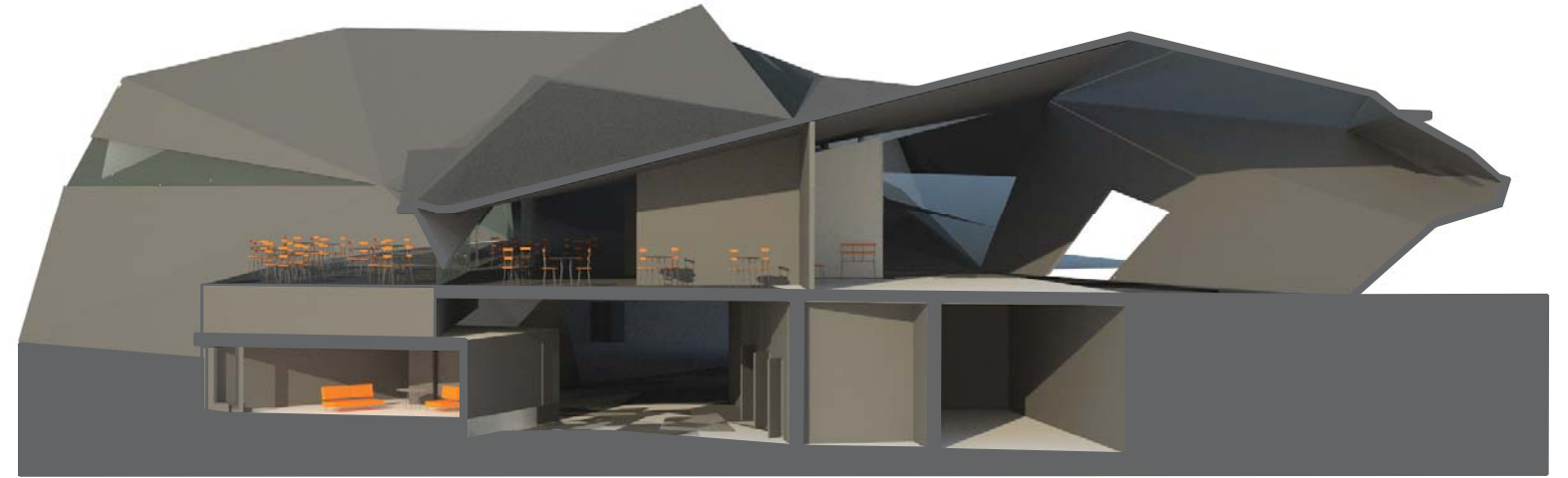
Longitudinal section.



Exterior entrance.



Performance space.



Sectional perspective.

Extrinsic Growth ::
Czech National Library
Spring 2010

Partner: Christine Lois
Schematic Design: Future Systems



View from the "eye" looking out on Prague.

The proposal for The New National Library of the Czech Republic encompasses not only the need for bridging the gap between the Baroque architecture of the surrounding city of Prague and the contemporary concept for what a library should be, but to create a form and function that is both alien and continuous with the context.

The contemporary notion of a library represents a space where intimate and social functions transcend one another in a cohesive interaction that allocates for both spectra of program to intermingle without disruption. These conditions should coexist without harm or compromise to the other. The seemingly extrinsic outer skin that engulfs the interior of the building is conceived by examining the site and introducing



Balcony view.

a form which is physically growing from both the ground and urban fabric as well as up above the existing local skyline. The form is maintained mathematically by expressing and understanding catenary shapes and their relation to compression and tension. The catenary structure is determined by a compromise between structural stability and the interstitial space it creates.

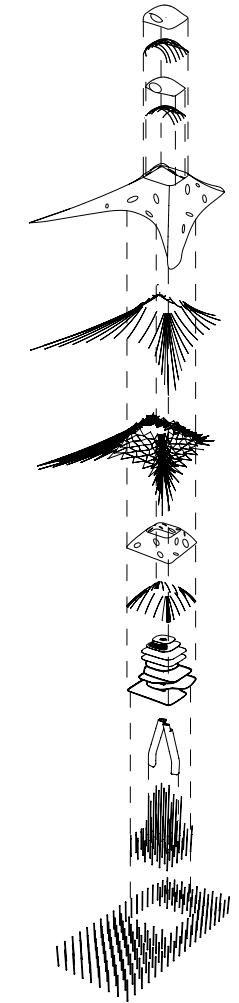
Voids penetrate the skin in order to create balconies which provide extended views into the surrounding cityscape. Staggered floor plates break up otherwise large spaces. Open atria explode into the "eye" and allow for visual association without mandating social interaction; intimate space must form through social function. The most interactive connection



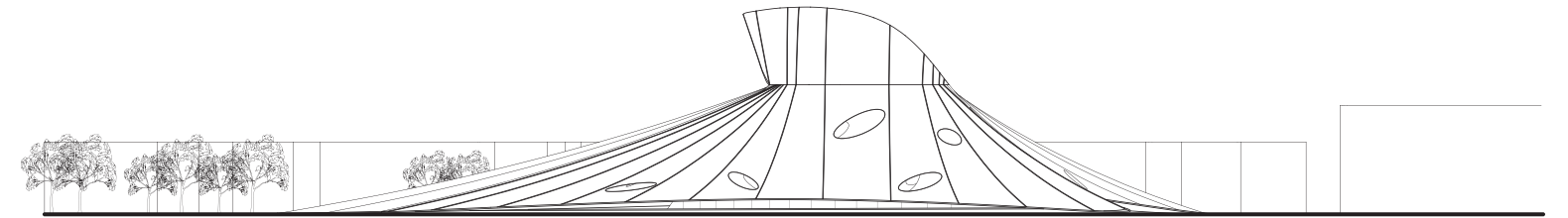
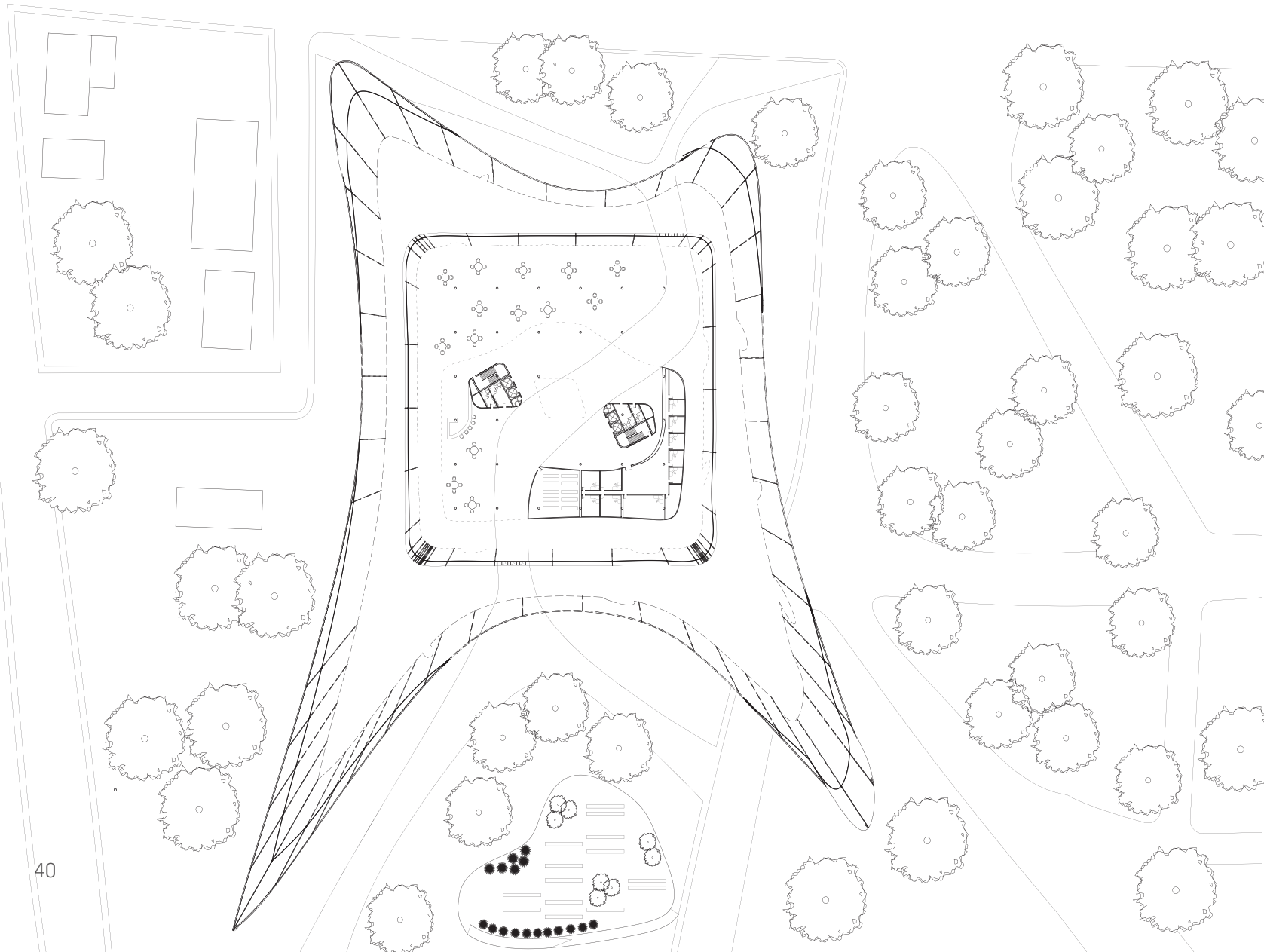
Open top level.

between the building and the site is the attempt to make the pedestrian access of the site contiguous throughout the building. This manifests itself in a tentacle-like structure that grows out of the form and into the streets of the city.

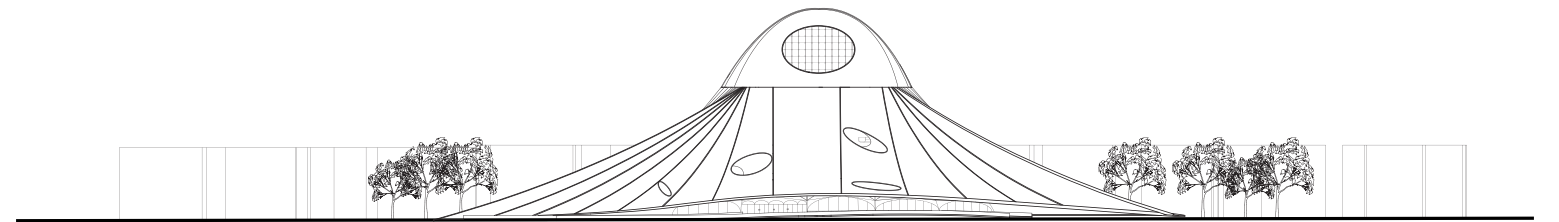
Within the context in which it exists, the library must possess a clear function. It should not take away from the fabric in which it is woven, but still distinguish itself as the public space that it is defined as.



Exploded axonometric.

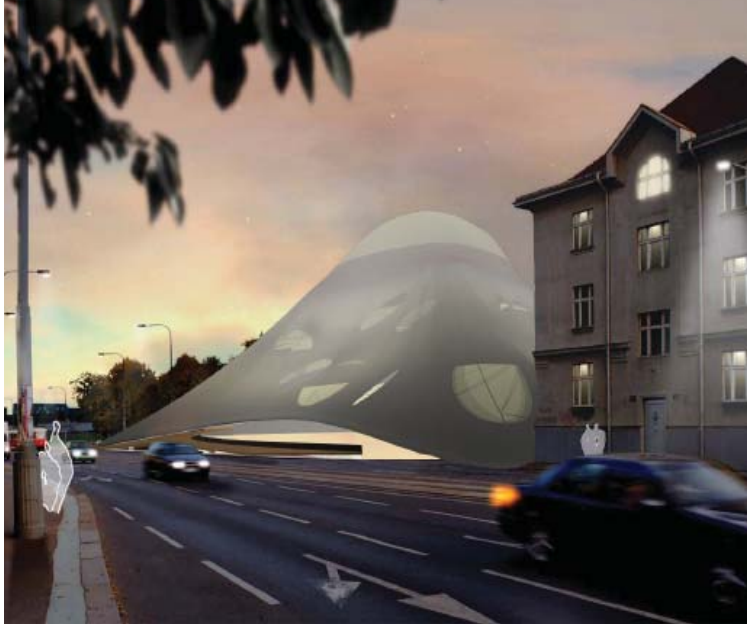


East elevation.



South elevation.

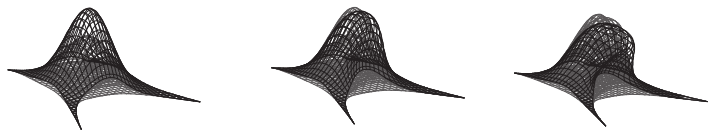
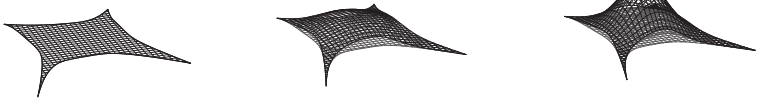
Opposite: Level 1



Night view from street.

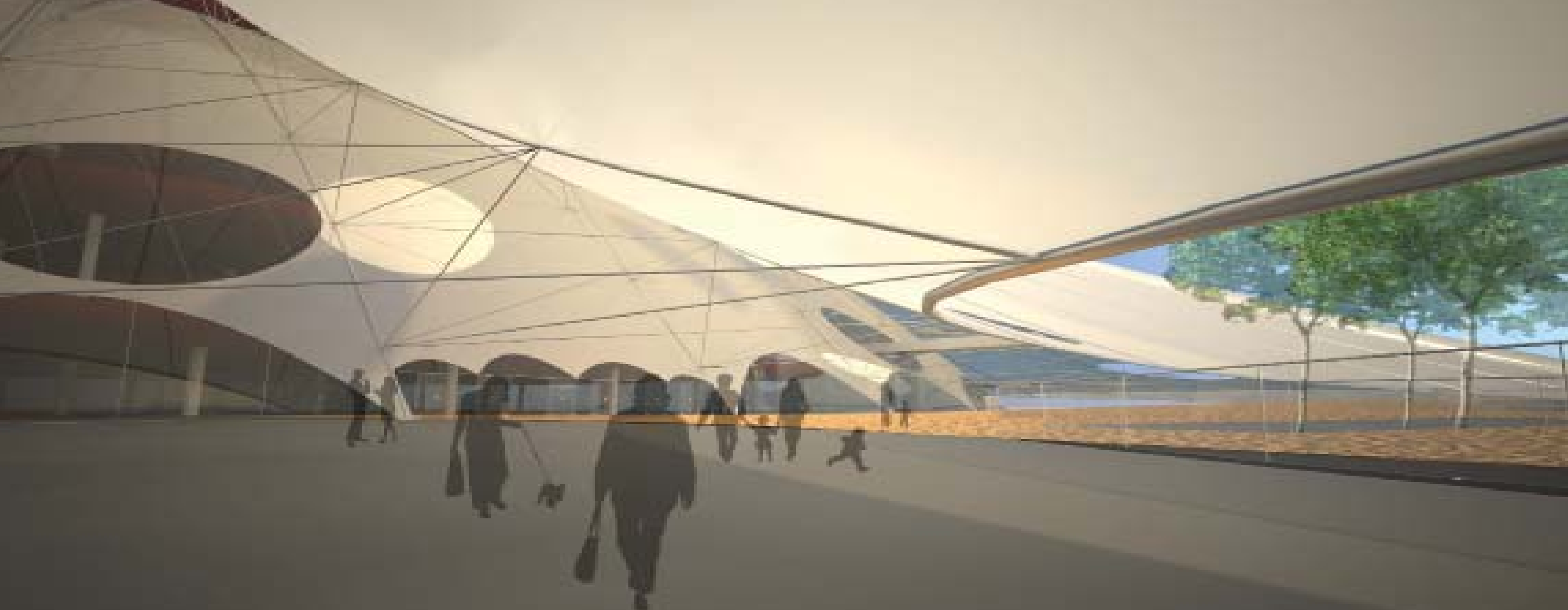


View in library courtyard.



Opposite: Looking up through the inner atrium.





Integrated Lifestyle Housing ::
Communal Housing for Allston, MA
Fall 2007

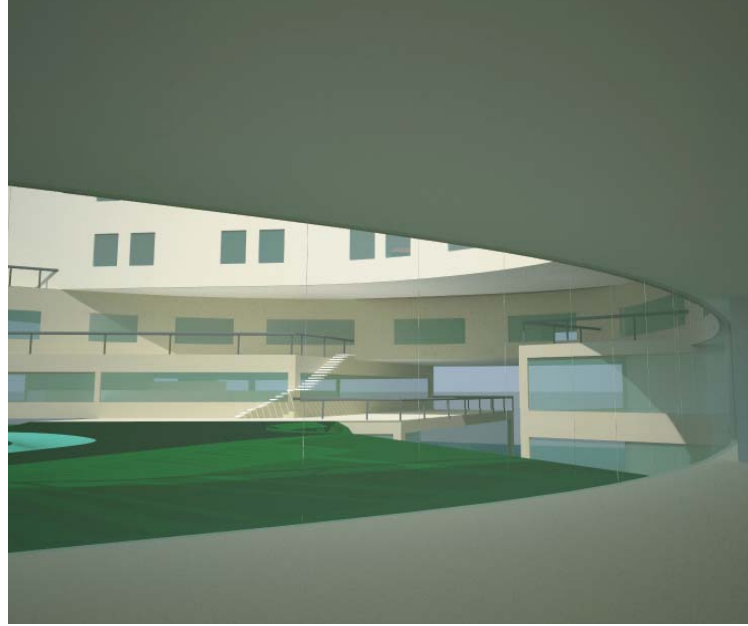
Partners: Christina Candella, Kristin Diotte, William Su



Inner "street".

People possess varying desires to interact with each other. The design of integrated housing challenges this notion through the immersion of different lifestyle choices into one housing complex. Creating an environment that replicates urban lifestyle allows for inhabitants to interact freely and at their own accord.

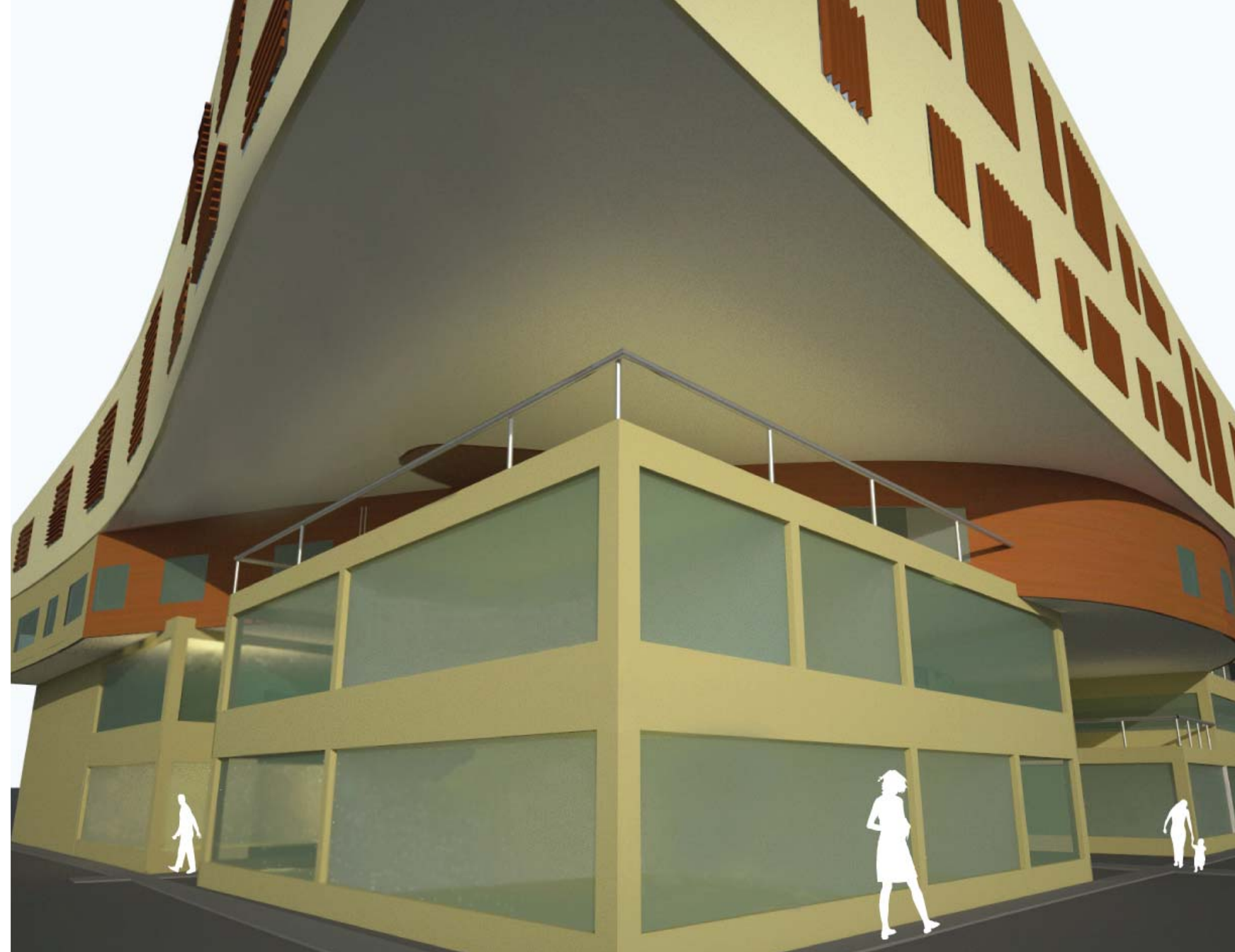
The design of this community housing project takes the idea of an urban fabric and recreates the feeling of a city street internal to the design. Inhabitants can maintain the urban experience while relaxing at their leisure.



Inner courtyard.



Longitudinal section.

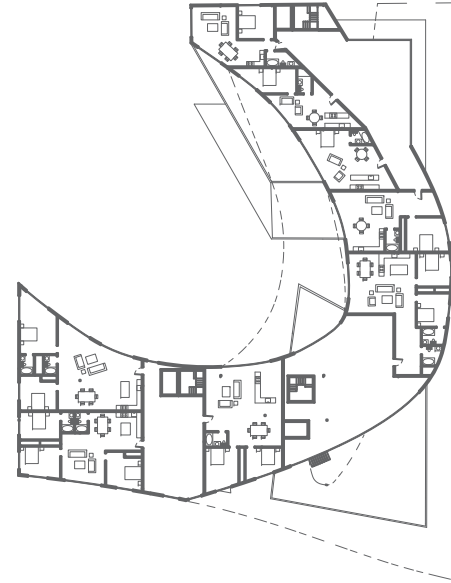




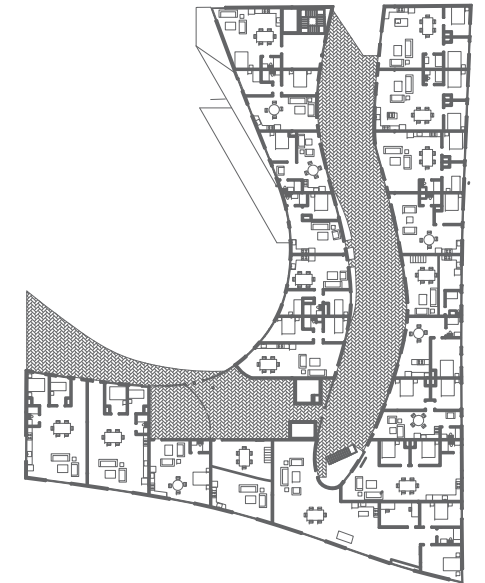
South elevation.



East elevation.



Level 3



Level 4



Series of gelatin studies.

Within the discourse of architecture there have been few attempts to expand past the confinement of earth's continental land mass and into other environments. While historically there exists proposals spanning from the marine cities of modernity to the underwater biospheres of present, designers have yet to plunge into the most challenging environment of all, liquid. One of the most notable materials to exist in liquid is the cell membrane, a substance that is inherently biological.

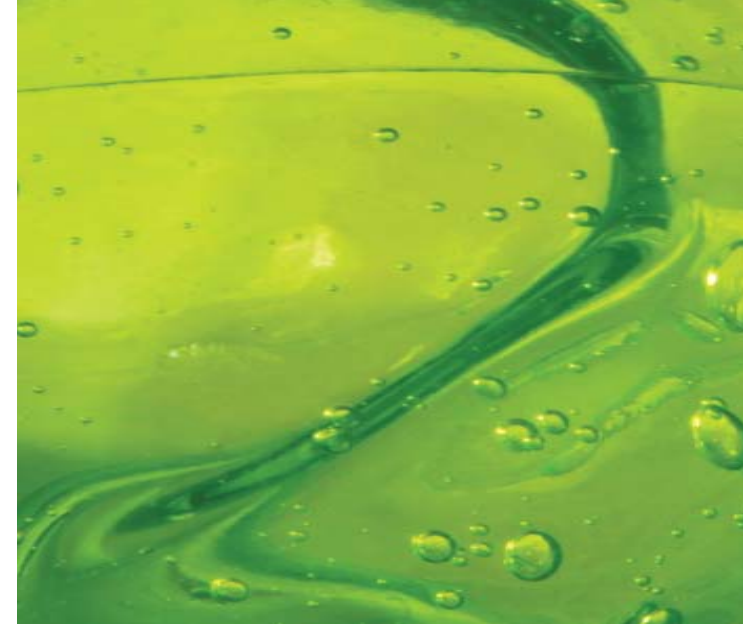
In order to create a liquid architecture, biological processes must be utilized. The ability for a biological process to develop in three dimensions only becomes possible with a weightless environment; liquid possesses the unique ability to simulate weightlessness on earth, facilitating a weightless architecture.



In this case, liquid becomes a crucial factor in both the form and functionality of the system.

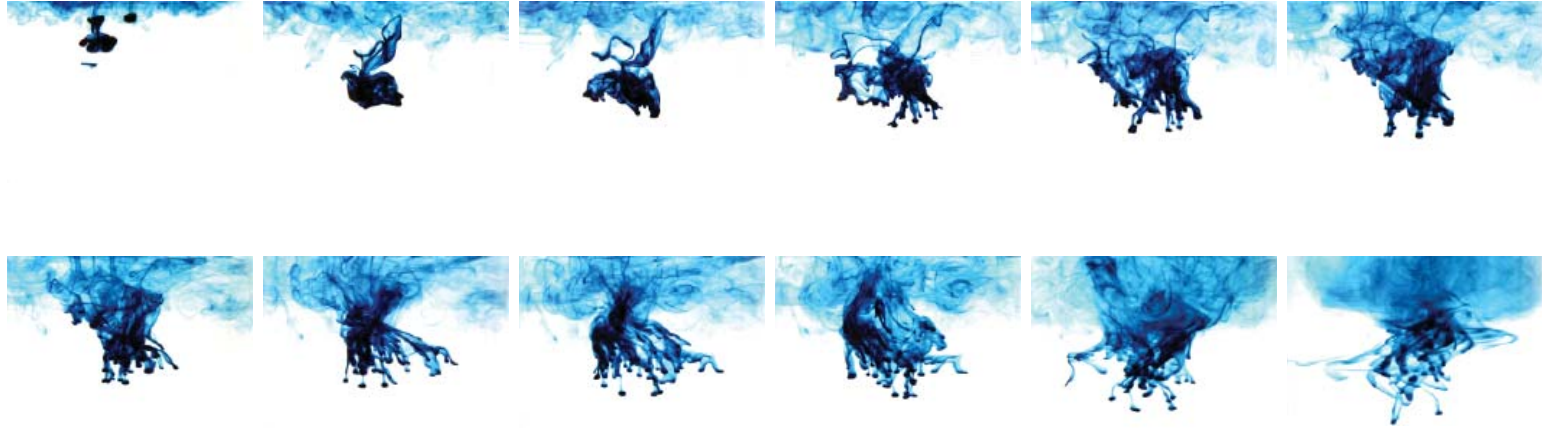
From humans' time in the womb, liquid aided buoyancy has allowed for the embryo to grow and self-structure in all dimensions. A return to this system enables an entirely new way of building; site becomes liquid, material becomes membrane, and humans breathe fluid as opposed to air. Through the use of these systems, an inhabitable liquid membrane structure is feasible.

This thesis will examine the consequences and design possibilities that are propagated by the use of a liquid environment. The use of biological membrane processes in

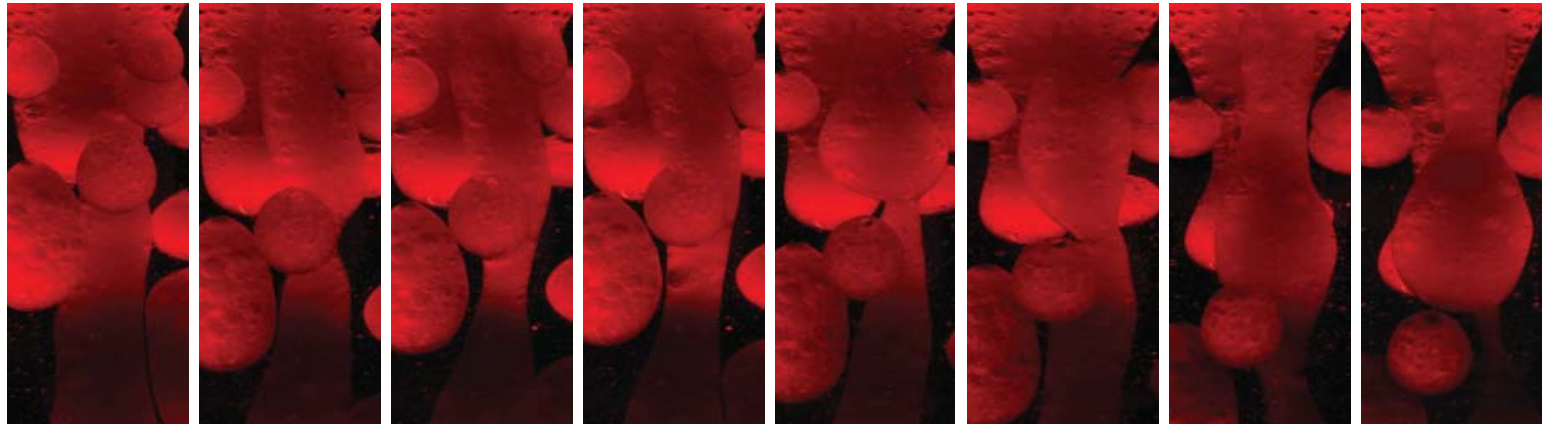


conjunction with an underwater site allow for an architecture distinguishable from traditional land design. With gravity and the consequences it brings absent from the environment, form takes on the potential of a new method of design.

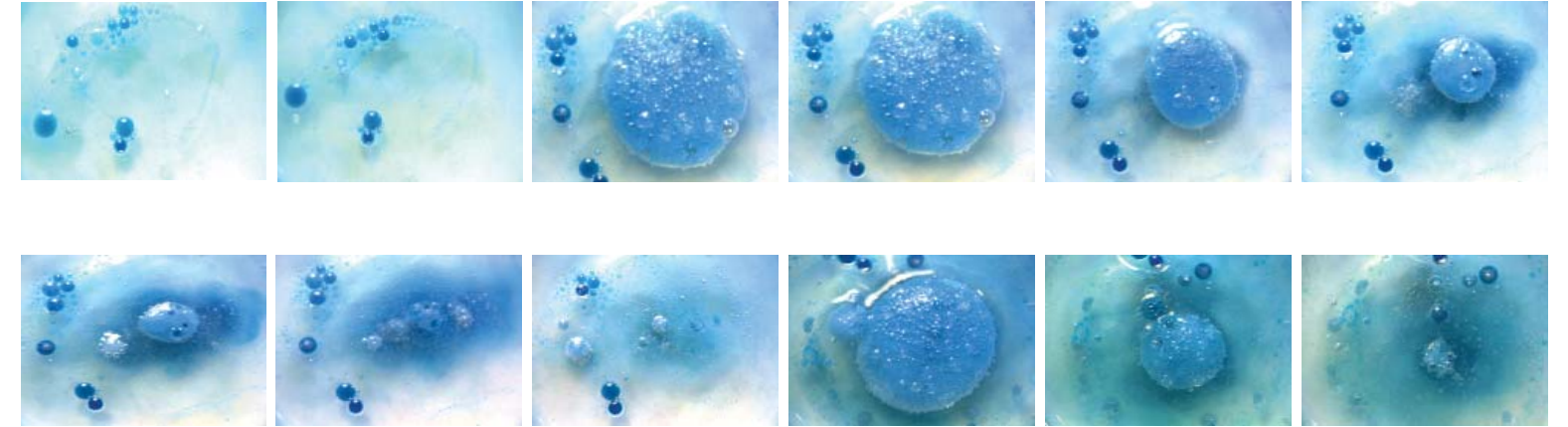




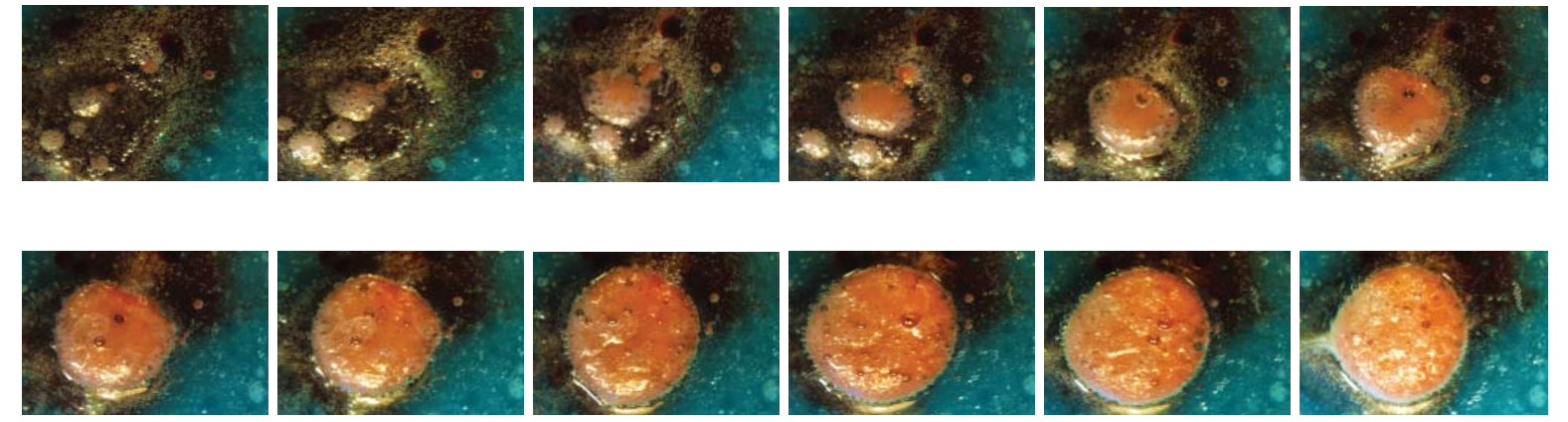
Study_1: Dye dropped into water.



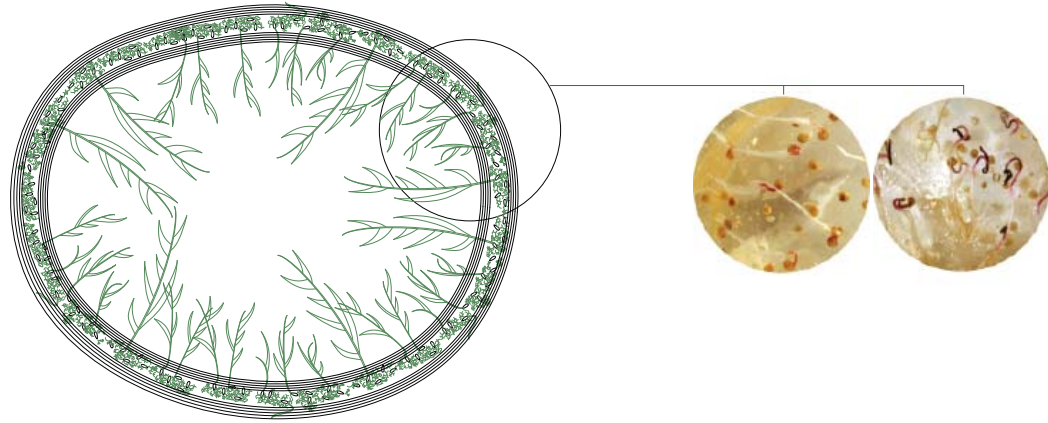
Study_2: Lava lamp motion.



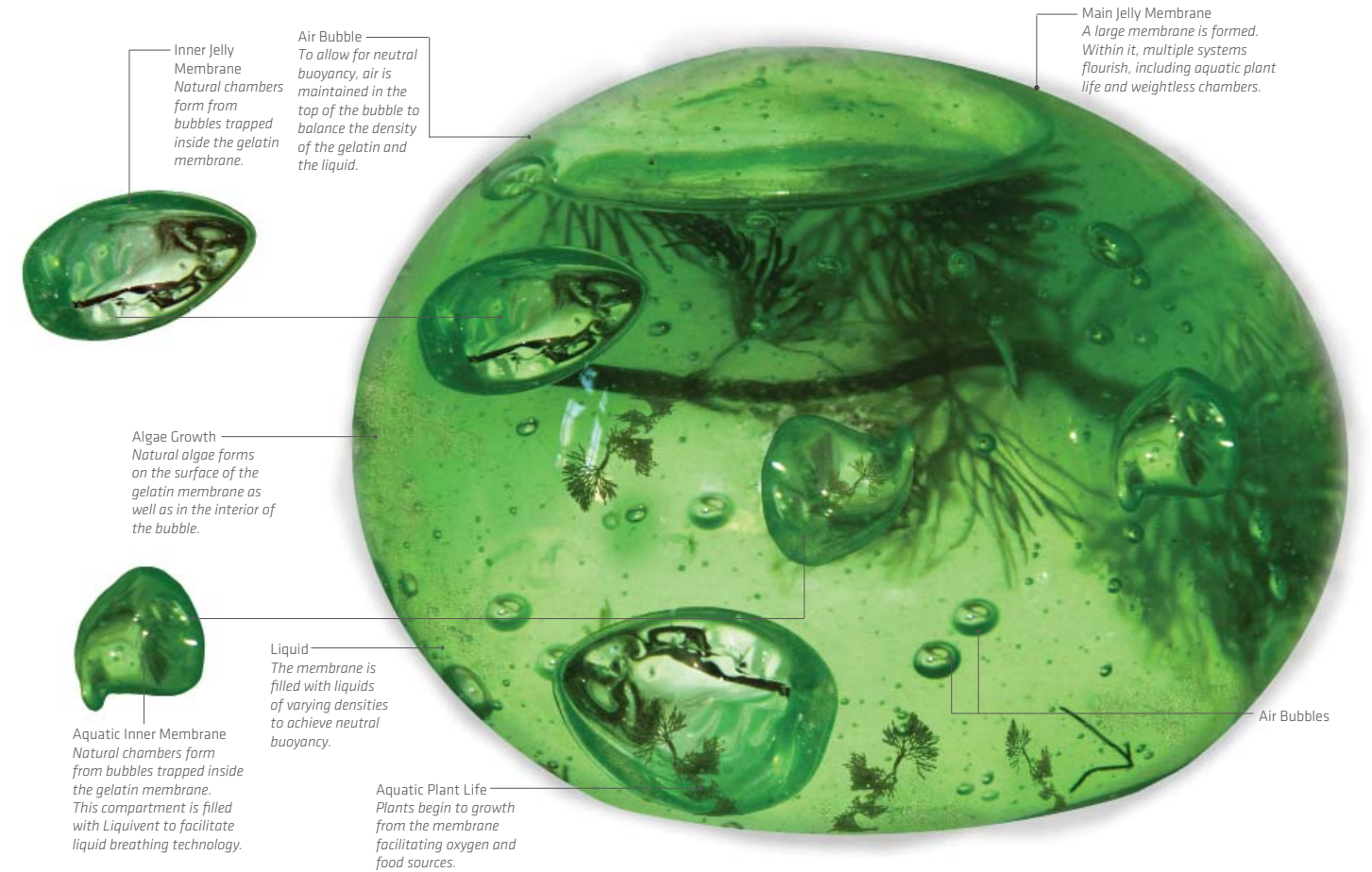
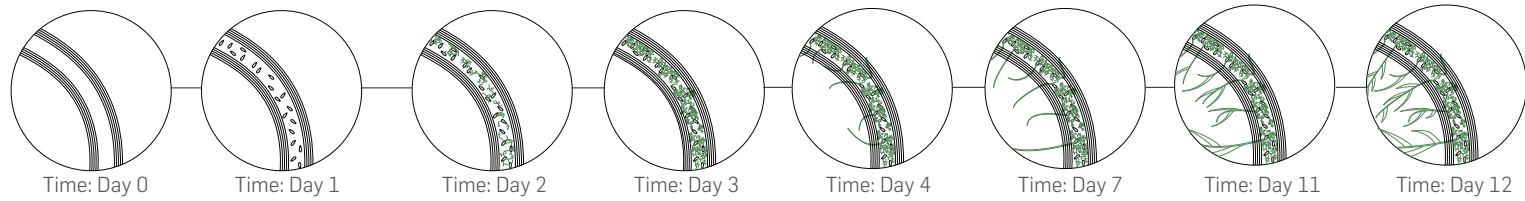
Study_3: Gelatin, vinegar, liquid interaction.



Study_3.1: Study_3 with dye added.



Plant growth in a gelatin membrane.



Inner Jelly Membrane
Natural chambers form from bubbles trapped inside the gelatin membrane.

Air Bubble
To allow for neutral buoyancy, air is maintained in the top of the bubble to balance the density of the gelatin and the liquid.

Main Jelly Membrane
A large membrane is formed. Within it, multiple systems flourish, including aquatic plant life and weightless chambers.

Algae Growth
Natural algae forms on the surface of the gelatin membrane as well as in the interior of the bubble.



Aquatic Inner Membrane
Natural chambers form from bubbles trapped inside the gelatin membrane. This compartment is filled with Liquidvent to facilitate liquid breathing technology.

Liquid
The membrane is filled with liquids of varying densities to achieve neutral buoyancy.

Aquatic Plant Life
Plants begin to grow from the membrane facilitating oxygen and food sources.

Air Bubbles





Stage_01

Liquid Membrane
A fluid filled membrane exists in liquid beneath the surface. Membrane is in a jelly state and has achieved neutral buoyancy.

Stage_02

Semi-Liquid Membrane
Liquid exists membrane and membrane exists its state of neutral buoyancy. Due to the decreased volume of liquid inside the membrane, the membrane begins to rise to the surface as gravity takes effect.

Stage_03

Semi-Dried Membrane
Membrane floats on the surface, completely empty of any fluids inside. As it rests on the surface of the liquid, the membrane begins to slowly dry.

Stage_04

Dried Membrane
Membrane is harvested from the liquid and now rests on land. It fully dries and begins to distort as the last of the fluid leaves its gelatin membrane.

