Adiel Alexis Benitez
Massachusetts Institute of Technology
Master of Architecture Candidate
<table>
<thead>
<tr>
<th>CONTENTS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ACADEMIC</strong></td>
<td></td>
</tr>
<tr>
<td>01. A Troglodytic Winery</td>
<td>6</td>
</tr>
<tr>
<td>02. Bathhouse at the Baltinache Salt Lagoon</td>
<td>14</td>
</tr>
<tr>
<td>03. Studying the Morgan Library Addition</td>
<td>20</td>
</tr>
<tr>
<td>04. Charleston Jazz School</td>
<td>24</td>
</tr>
<tr>
<td>05. New York YMCA</td>
<td>30</td>
</tr>
<tr>
<td>06. Long Span Canopy</td>
<td>38</td>
</tr>
<tr>
<td>07. Asymmetrically Balanced Object</td>
<td>42</td>
</tr>
<tr>
<td>08. Essex Crossing NYC</td>
<td>44</td>
</tr>
<tr>
<td><strong>PROFESSIONAL</strong></td>
<td></td>
</tr>
<tr>
<td>09. Vanserg Hall Renovation, Kennedy and Violich</td>
<td>56</td>
</tr>
<tr>
<td>10. Skylight, DS+R</td>
<td>60</td>
</tr>
<tr>
<td>11. TransTectonics at Art OMI</td>
<td>64</td>
</tr>
</tbody>
</table>
A Troglodytic Winery
Valle De Guadalupe, Baja California Mexico

Water scarcity, logistical limitations, and a need to more efficiently manage resources all work to complicate the production of wine in the Mexico’s Valle de Guadalupe. This project serves as a response to the regional and global infrastructures of the Valle, investigating the potentials for hyper-local construction strategies to facilitating the housing of wine production. The project explores techniques and methods of excavation and retention of earth to create an architectural language that is from and of the site. Many existing wineries in the Valle de Guadalupe use passive design strategies to make their wineries comfortable and efficient. One of these strategies involves embedding winery spaces that are more thermally controlled into the landscape. In this project excavation is leveraged to facilitate thermally protected spaces critical for wine production, while also allowing for the excavated earth to be re-used as an earth form work. The main structure for the winery is a large earth concrete cast canopy, site cast on two large mounds which are formed from the earth excavated from the existing terrain. The resulting structure will resonate with the rugged character of the existing site.

Concept Section Diagrams

Model 1:200. Winery in context, CNC Milled canopy+site.
The various project components are designed to engage with the existing Baja landscape. Both interior and exterior spaces, including a residential component, all leverage excavation and embedded relationships to contain occupiable spaces. The parts are also oriented to maximize views out into the landscape. These relationships are reinforced in the materialization of walls and other containing surfaces. This creation of rugged, earthen, and in situ spaces was studied in both model and plan as a way of tying together material articulation and siting strategies.

There are only three thermally conditioned spaces, the barrel aging room, the residential cabins, and a cooled grape storage room. The heating of the spaces during the colder months is handled by a zoned, radiant flooring system, allowing for heating to occur only in spaces when they are being occupied. This allows the winery to manage its active systems efficiently. Perforations in the roof allow for light to pattern the spaces of the winery, hinting at occupiable zones, and working in tandem with the organization of the existing heated floor system.
The earth cast roof worked to create spaces that are rugged and troglodytic in nature, while also acting as a large shading device to allow for open air production. The wine production is open to the views of the Valle, while operating in a space that is inherently of the site, and in tune with the landscape. Additionally, the Baja climates allow for many of the thermal comfort concerns to be dealt with passively. The canopy acts as a shading device, enough during the hotter months.
The winery is envisioned as an extension of the existing rugged landscape, offering a constructed ground that acts as a canopy for the winery program, exploring contemporary potentials for earth construction processes.

Oculus: The canopy operates as a constructed ground that extends the existing terrain. An opening in the roof allows for visitors and workers to circulate down into the winery, spiraling down to the barrel aging level. The main vertical connector, the ramp offers both a water collection and circulation strategy. The open air void allows water to fall freely and collect in a reservoir beneath the ramp. The water is then recycled for use in wine production.
The indigenous communities of the Atacama have developed an intimate relationship with the desert landscape. Their occupation of the landscape is rooted in the belief that it is sacred, giving meaning to the various cosmological and geological characteristics of the desert. In the present day, mining in the region has strained an already limited supply of natural resources. Lithium mining in particular, has rapidly grown within recent years, powering the global tech industry. Mining a ton of lithium requires roughly 500,000 gallons of water. Lithium mines are consuming about 2 million gallons of water per day. (Water used to extract and concentrate brine, which typically contains only traces of lithium.) The scaring of the landscape through mining and extraction, at its current scale, is perceived by many of the indigenous community as both dangerous and harmful. The project exists as a restraining architectural device, taking on the form of a bathhouse. It responds critically to the massive consumption of water as a result of present day lithium mining, appropriating an existing tourist destination, the Baltinache lagoon.

The project takes advantage of the exiting landscape, appropriating the abundant supply of rock salt and using it as a building material. The use of this unique and local building material allows the project to be as non-invasive as possible, while also allowing for variety in the spatial and tectonic articulation of the project.
The project arrives as a series of bearing walls, that are built up of salt, and are extending from the terrain that slopes down into the lagoon. These salt walls blend into the terrain, which consists primarily of salt, and salt composites. They extend into the water, allowing for a small area of the lagoon to be capped, and delineate a restrained area for swimming and bathing.
The project leverages the material qualities of rock salt to manipulate the play between light and shadow. This play of light through solid and void also allow for apertures of light to double as frames that selectively distill the view of the landscape.

The use of this unique and local building material allows the project to be as non-invasive as possible, while also allowing for variety in the spatial and tectonic articulation of the project.
Studying The Morgan
Analyzing Renzo Piano’s Modern Addition

The Morgan Library and Museum began as the private library of financier Pierpont Morgan of J.P. Morgan & Co. It houses a collection of illuminated, literary, and historical manuscripts, early printed books, old master drawings, prints, etc. The building complex is composed of three historical buildings and the addition designed by Renzo Piano Building Workshop (2006). The expansion in 2006 added more than fifty percent of exhibition space and various amenities including a performance hall, an entrance on Madison Avenue, a cafe, a restaurant, a shop, a reading room, and collections storage. The new design integrates the three historical buildings with three intimately scaled pavilions to create an accessible and inviting setting. In studying the Morgan library addition, project was focused on understanding the systemic tectonic logics, culminating in a 1:10 scale model of a façade fragment. The project looked in detail at the structure and façade assemblies, studying how the material assembly informed programmatic organizations and spatial qualities. (Completed in collaboration with Sarah Wagner, Hyerin Lee, Taeseop Shin, Stephan Hernandez, and Stella Zhang)
Reading room detail
Youth Jazz Institute
Charleston, SC

The city of Charleston has a rich history and culture. The people and culture have shaped the urban fabric and created a place marked by memory and traces. The role of institutional spaces is particularly important in Charleston because of its former role as major slave port during the slave trade era. Contrary to its segregated and divided past, the present day Charleston seeks to create inclusive dynamic spaces that engage the public. The descendants of the slave trade brought with them their own rich culture that ultimately birthed modern jazz and jazz culture. The proposal, a Jazz institute for the youth of Charleston, serves to promote progressive shifts within the city. It looks back, in order to move forward. The site sits facing Marion Square, the new urban center of the city, and is in relation to the many other institutional and public buildings. The site offers both a prominent urban face on the corner of Calhoun and Meeting streets, as well as a more intimate in-filled face within a Charleston alley.

Study Model
The program called for spaces to gather, opportunistic spaces that children could explore. The courtyard serves as that space for opportunity. It can serve as a practice space for the students, or as a more intimate performance space. Additionally, while the relationship to Marion Square is a primary component within the building hierarchy, the private institutional entrance within the Charleston alley played a large role. In Charleston, alleys are important interstitial spaces, occupied as public space, rather than forgotten space. This part of the site allowed for the consideration of a more private entry, as well as speculation on infill as a design strategy.

Longitudinal Section

1. Institution Lobby
2. Auditorium/Lecture Hall
3. Offices
4. Practice Spaces
5. Outdoor Practice Space
6. Outdoor Courtyard
7. Connective Threshold
8. Library
9. Study Rooms
10. Outdoor Reading Space
Material studies were used to explore the layering of space, as well as the layering of material edges. This exercise allowed for speculation on establishing edge conditions which would later inform relationships between interior and exterior spaces within the urban context. These ideas would be further developed into considerations for facade materialization.

The axonometric served as an exercise for thinking through drawing. Connections were worked between the differing types of program. Interstitial space between floors were needed to establish these vertical relationships. By intervening vertically in the section, creating these opportunistic moments free of specific program, new types of interaction could occur. By working in axon it was possible to push ideas from section into three dimensions and speculate on how these interstitial spaces could work themselves into the project.
A proposal for a Bronx Branch of the NY YMCA brought into question the history of the Y within the context of its contemporary practice. The historical Y, a traditionally introverted, reformist institution, can be seen as an urban citadel. In the present moment, the YMCA has opened itself as a community resource, an institution motivated by the people that make up the communities it is trying to serve. The Edenwald site in the Bronx, presented an opportunity to consider the Y’s desire for community engagement and rethink the main programmatic elements as a catalyst for both architectural intervention and public interaction. The key program was tested through a doubling that serves to propagate user activity throughout the site. Programmatic doubles are resolved as a series of figured Boolean operations, acting as spatial voids within a bar building typology. The tectonics of each “double” were figured as a means of creating distinct programmatic zones that engaged both interior and exterior use. Material types are rendered to facilitate the particularities of each given use. The resultant sequence of spaces was then able to allow programs such as basketball courts, and swimming pools to exist as an extension of a public plaza, offering a flexibility in use, and an ennobling of the existing site to be enjoyed by the Edenwald community.

Diagrammatic tests of potential programmatic doubles.
Planometric figures were deployed to organize the doubled program within the site. The Boolean action on the bar typology allowed the doubling of program to act as a point of difference, while allowing for the edges between inside and outside to be deteriorated. Each pair allowed for an interaction with a public plaza, allowing for a basketball court to have the potential to become a ground for public gathering, a market and so on. The pool is no longer limited to a purely fitness oriented use, but can extend into the landscape, and offer a different use. A kids pool area in the summer, or an ice skating surface in the winter.
The doubles were conceptualized as generative for new types of use. The volumetric translation of a planometric figure, led to a single programmatic pair to have sectional variations, facilitating public occupation, and visual connections, in addition to the pragmatic requirements of each program. Two types of basketball courts can become one large shared space, and a pool can change its use throughout the seasons.
A porosity between programmatic pairs was articulated in the materialization of their respective volumes. The boundary between inside and out was rendered either transparent or operable to allow for two spaces to be used as one. Sectional play was key to allowing for these interrelationships to exist, while also taking advantage of the site and surrounding context. The façade assembly continues this desire to create a dialogue between inside and out, acting as a translucent edge. The material continuity of the façade is disrupted by the material changes in areas where key program is doubled.
The design of a long span canopy was driven by an interest in using the bending moment to shape the profile and cross section of the main structural members. A ceiling surface was then derived from the geometries of the load carrying members. In this way the moment analysis was the genesis for the structural form, and the spatial experience. An analysis of various loading conditions allowed us to adjust the cross section at various key moments. The resultant profile was able to accommodate both uniform and asymmetrical loading conditions. Calculations were completed by considering glu-laminated timber beams as an appropriate material that would allow for both the shaping of the profile, as well as a balance between material strength and member size.
Study model

LONG SPAN CANOPY
Asymmetrically Balanced Object

PARTNERS  |  KEVIN MARBLESTONE+ERIN WONG

The design intent was to parametrically compute and fabricate an object that can be balanced on one finger. There was the added intent to create an object that balances in a way that is opposite of what is initially expected. Thus the design focuses on an asymmetric geometry where the larger side is actually leaning upwards. This is achieved by removing material from the interior of the geometry. The amount of material removed was computed in Grasshopper in order to drive the center of mass of the global geometry to a target axis, when one would place their finger and then balance the object.

The final geometry takes advantage of a hollow pocket to behave opposite of what its apparent global geometry suggests. The slight crank, allows for a small dimple to take shape, and imply a location for the users finger.
The lower east side is culturally diverse and rich. The Corners of Essex street and Delancy serve as the meeting point for this community. The current neighborhood suffers from a fragmented fabric, and amidst rapid development in the area, needs an anchor to meet and support the needs of the community. The community is in need of public space, specifically a space for congregation that can work to tie the neighborhood together. An existing master plan, proposed by Shop architects, has begun to introduce a retail and developer driven redevelopment plan. We propose a critique of the existing master plan. We want to critique not only the urbanistic approach to the development, also the arrangement of programs and their hierarchy.

Essex Crossing NYC
PARTNER | PATRICK WEBER

Perspective: Broome street

Concept Section Diagrams
ACADEMIC GROUND PLAN

1. Museum Lobby
2. Market
3. Market Line
4. Retail
5. Office
6. Retail/Office Lobby
7. Library Lobby
8. Residential Tower Lobby
9. Flexible Public Space
10. POPS
11. Outdoor Seating
12. Library
We propose a large flexible public space that can work to the benefit of the community, and its needs over time. We want to connect to existing community programs, and begin to blur the line between public space and retail and commercial programs. We want to strengthen and integrate the existing public zones with our own, working towards a porous and accessible ground floor, which would facilitate additional public spaces as you move vertically. A major component of the existing master plan is the market line; a subterranean longitudinal connection that spans sites two, three and four. We want to consider the market line as another opportunity to integrate public space rather than simply facilitating a retail focus.

Community Hub: The space was conceptualized as a large multipurpose, public space. This added program would allow for a community accessible space to organize the commercial and business programs that were a large component of the masterplan.
HOUSING STRATEGY: We worked through various housing strategies, both in model and drawing. We wanted the relationship between the housing and public zones to be thought of as another opportunity to integrate public space. This was another opportunity to reflect the texture of the neighborhood. We include private outdoor spaces, and utilize the skin as a means by which to layer privacy. The thin tower typology is also oriented to maximize day lighting.
In addition to a porous ground level, we integrated public spaces vertically. These culminated in a rooftop park that floats above the main public space. The park offers views back into the neighborhood, as well as views back into the block. The residential towers also have private outdoor spaces that overlook the rooftop park.
The renovation of the Vanserg hall language center on Harvard’s Campus included the addition of a central meeting space. This space was framed by a series of custom patterned acoustic panels that wrap existing columns within the space. The primary focus of my efforts on the project was the design development of the panel patterning, followed by working towards the fabrication and on site delivery of each panel. The patterns are derived from a figural representation of speech or speech bursts. We were limited to four possible perforation sizes, and needed to parametrically generate patterns that could satisfy this and other fabrication limitations.


Pattern Variations

A

B1

B2

B3

Completed common space
The panels are sited in dialogue with skylights which were added as a part of the renovation. They frame a common space between newly renovated classrooms and lecture spaces. All panels were CNC routed and finished on site at Kennedy and Violich Architecture. Fabric material was cut and installed in house.
Working on a project in the design development phase, I helped to further the design of a skylight feature that was situated at the heart of a large scale renovation project. The skylight, a composition of conical glass reinforced gypsum (gfrg) components, needed to accommodate both existing structure, and an existing rooftop terrace with two different finished datums. The geometry, a morph between a regular rectangular module, and circular skylight lens, would need to accommodate the preexisting conditions, while also allowing for formal variety that could allow for light to enter at multiple times of day. The resulting composition, both accommodated the existing conditions, and allowed for a family of four distinct conical geometries to be arranged within the skylight grid, requiring only four different molds.

3D printing was used to test both individual modules as well as composition of distinct geometric groupings.
The final design would require only four distinct molds to accommodate the existing structural and contextual conditions, while allowing for variety in the composition of the skylight modules.
TransTectonics
Exploring Material “Mis-use”

A set of four provocations that challenge conventional processes of material assemblies pushing towards innovation in design research. The prototypes PlyGlass, Ghost of Stone, Rock in Full Metal Jacket, and Wooden Bubble behave as tools for experimentation through intentional mismatches, calculated discrepancies and improbable pairings of materials and tectonics.

At MIT, Cristina conducts the research TransTectonics, exploring non-conventional assemblies of materials through small prototypes, which are later translated to larger scales and contexts becoming architectural installations that activate public spaces.

Photos copyright © Sarah Wagner

Project collaborators: Adiel Benitez, Christopher Dewart, Michael Tarkanian, Miles Discroll and Michael Scheiner. Cristina Parreño was provided support by CAMIT, North American Sculpture Center, Precision Stone Inc., Epica International Roboticom and Biesseamerica for this project, now on view at Art Omi.