



**M. Arch Portfolio**

NCSU 2021

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# Thank You,

*I just want to take this time to say  
Thank You for giving me a chance to apply  
and for giving me this opportunity to  
showcase my hard work.*

*To see more information about myself  
or to view previous portfolios from  
years past, please visit*

**MackCarter.com**

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**G-2 is a mixed-use high-rise building, that anchors the new Alameda Financial District. This new transport hub between Oakland and San Francisco helps bring business to the city of Alameda as well as relive the growing cities of San Francisco and Oakland.**

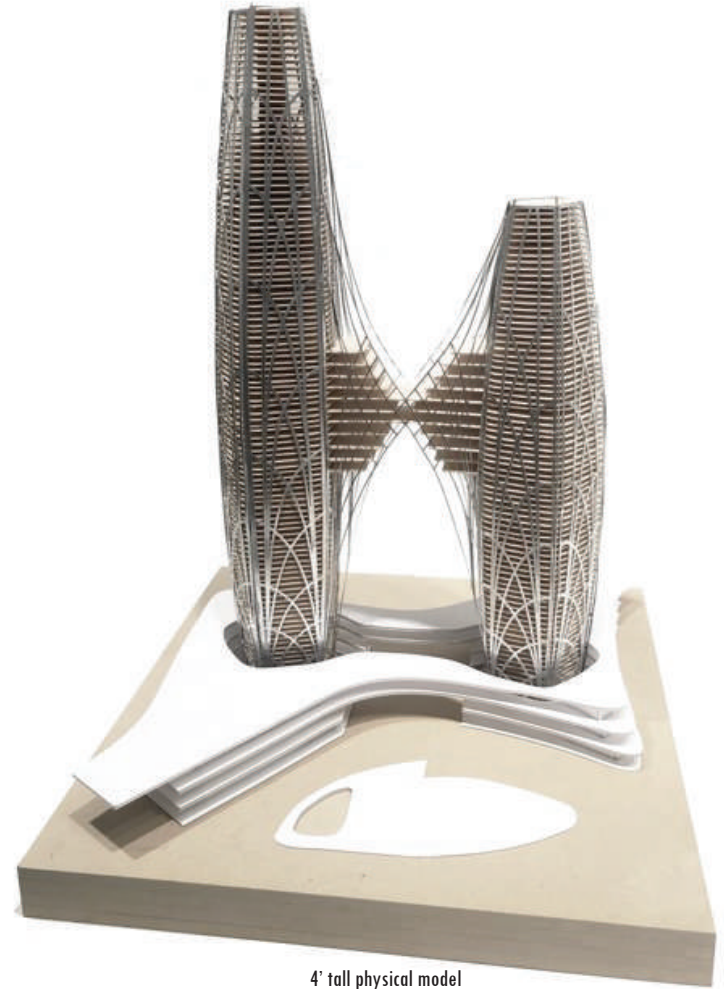
**The design is a response to the demand for social and business activities as well as offers an affordable lifestyle comparable to the big cities. By having direct access below the building to the subway system allows safe and quick transportation in Alameda and beyond.**

**G-2's form draws its inspiration from Alameda's multicultural diverse identity, symbolizing the unity and reflecting the integration of nature's fabric and urban texture. The beauty of the bay area is manifest in its connection to nature, connection between its residents and the means that make them possible. G-2 is a symbolism of the connection and connectors of the bay area. It is the gateway to a new connection between the major surrounding cities and Alameda.**

# **G-2**

**Highrise studio**

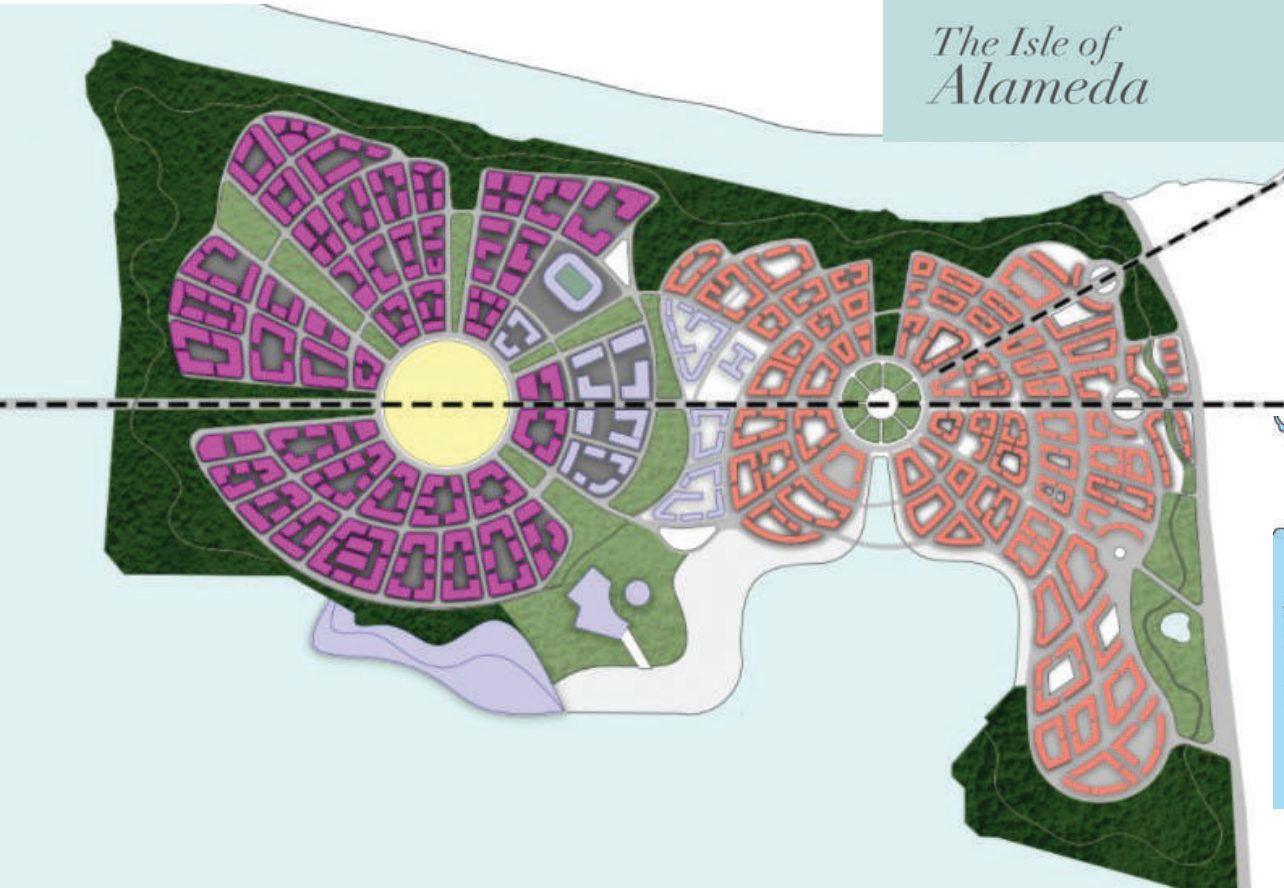
RABIA RANA  
MACK CARTER  
OLUWAROTIMI OSIBERU



4' tall physical model

## G-2

The existing site required a complete overhaul and afforded the opportunity to develop an entirely new city, built around the new high rise structure.



The site is the island of Alameda located between San Francisco and Oakland CA.

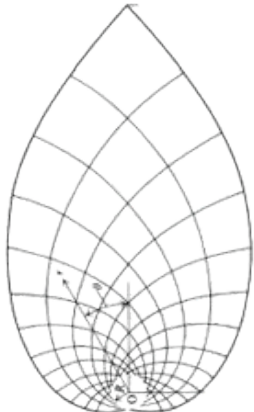
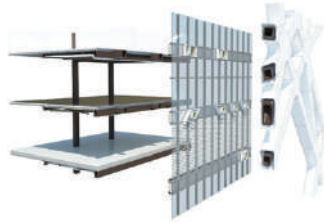


G-2

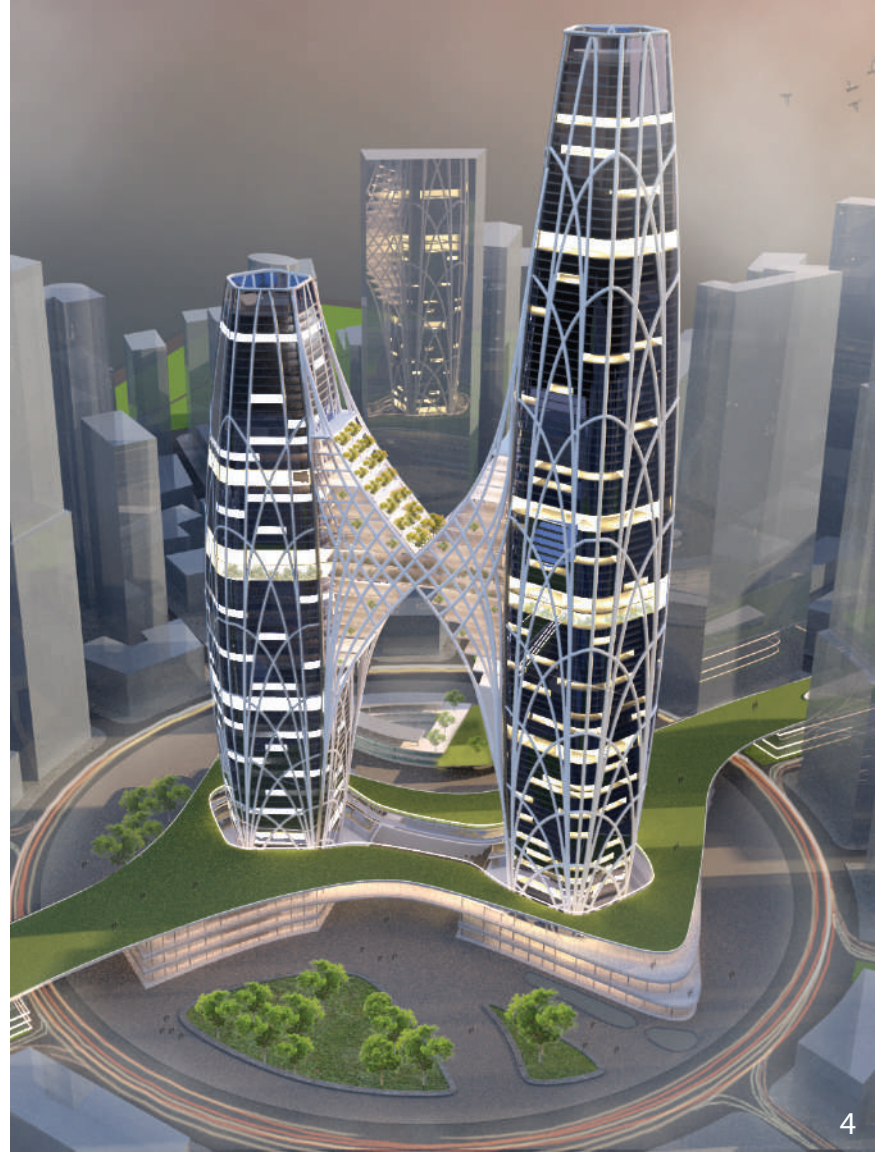
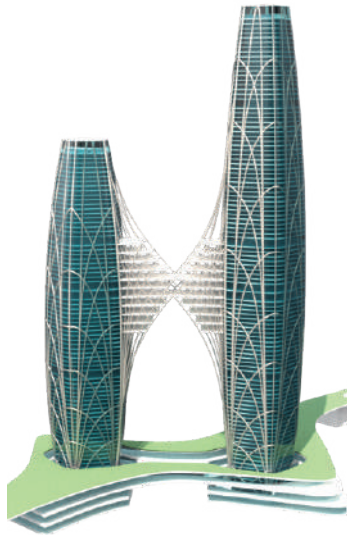


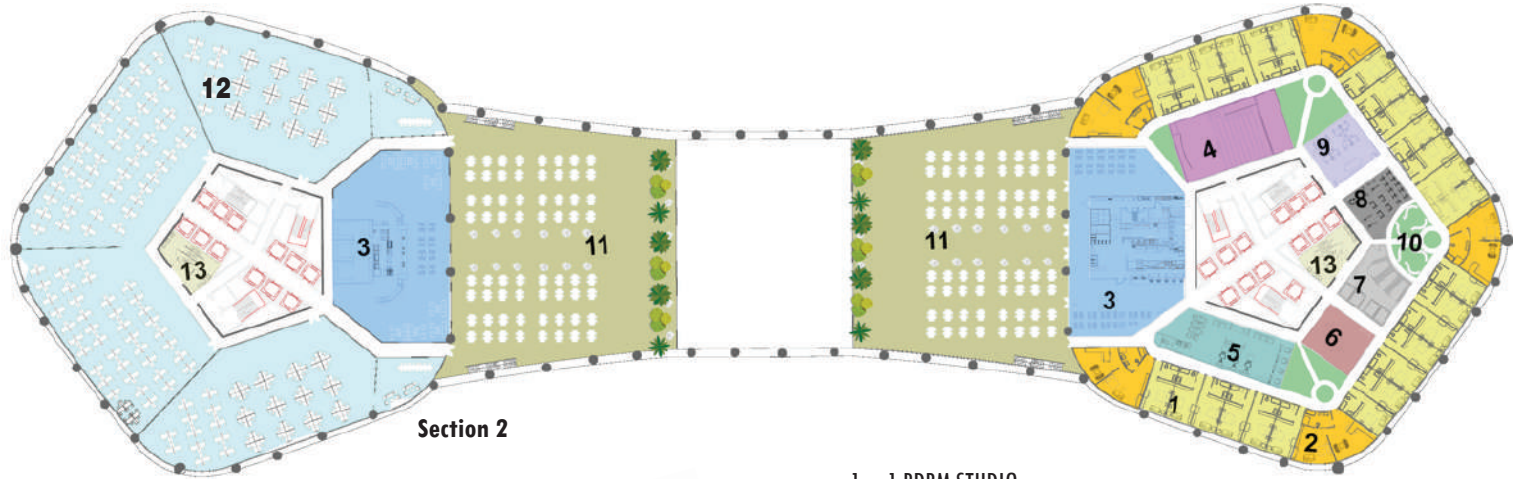
## G-2

The structure is primarily located on the outside with a glass envelope between the exostructure and the floor plates. The inspiration for the exterior truss structure is based on a concept that was invented and patented by SOM called the Mitchell Curve. The stiffness and flexibility in the design makes for an ideal system to handle extreme winds and seismic loads.



Mitchell Curve

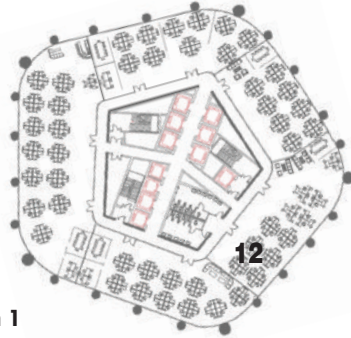




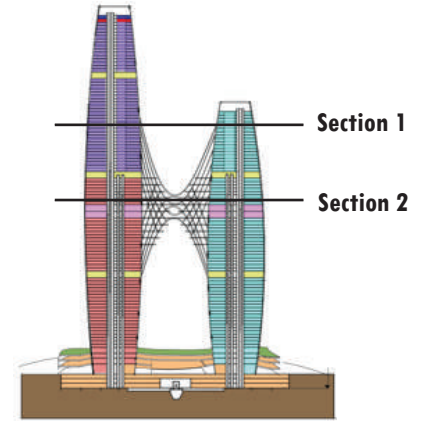
Section 2



Section 1



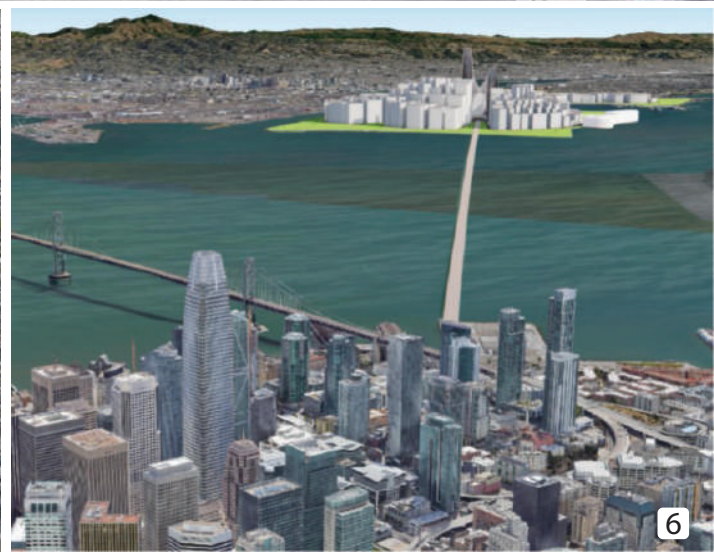
1. 1 BDRM STUDIO
2. 2 BDRM STUDIO
3. RESTAURANT/BAR
4. MINI VIP CINEMA
5. BEAUTY SALON
6. SQUASH
7. HOT TUB+SAUNA
8. FITNESS
9. BUSINESS CENTER
10. GREEN ZONE
11. TERRACE
12. OFFICE SPACE
13. BATHROOM



Section 1

Section 2

## G-2 Renders





**G-2**

**Early Sketches  
and First Model**



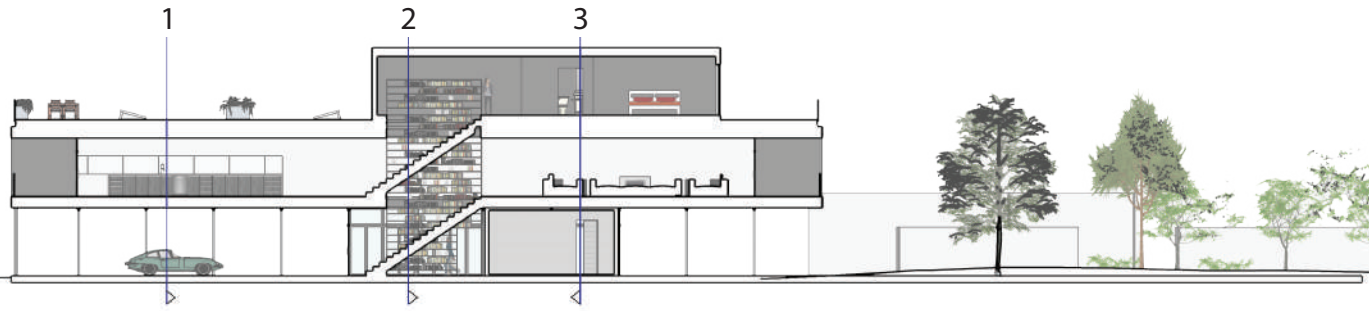
**Built on a long thin site in downtown Raleigh this book lovers home was designed to have easy access to a large quantity of books, grand views of downtown Raleigh, and shield the occupants from the fast pace of the Raleigh nightlife. The site also offers the homeowner to have access to onsite parking considering parking in downtown is limited.**

**Signet translates to Bookmark; this is a fitting description to the site considering the long slender profile of the location at the corner of West Davie Street and Commerce Place.**

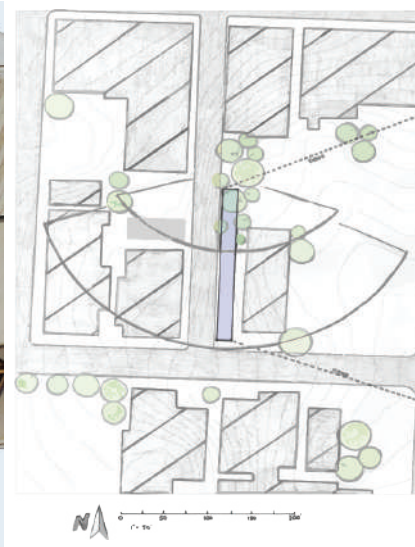
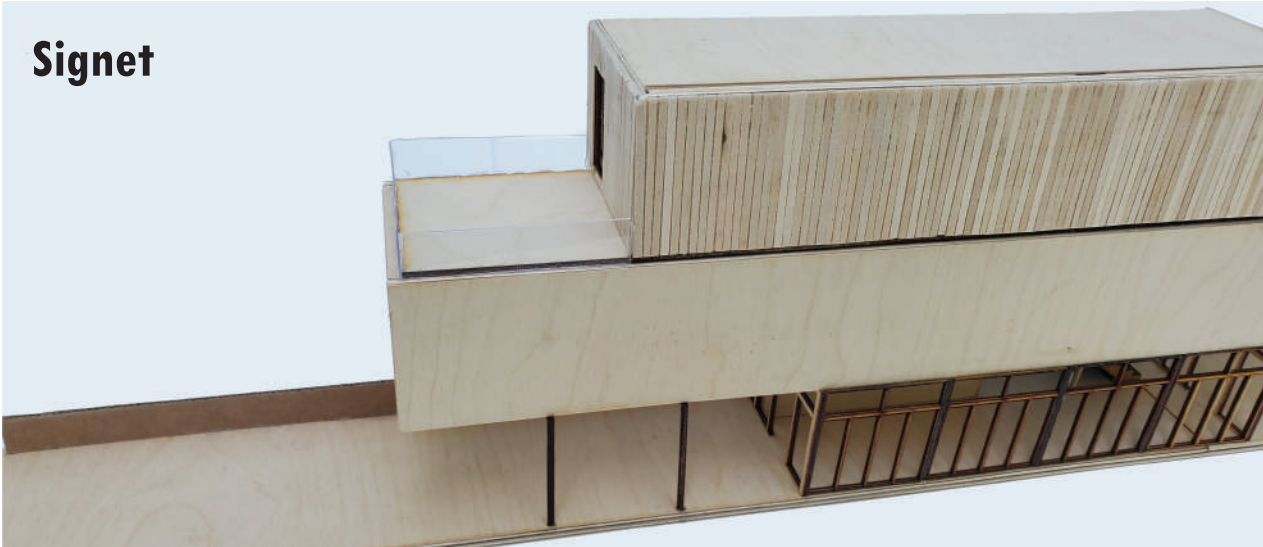
**Signet** Technology Studio



# Signet

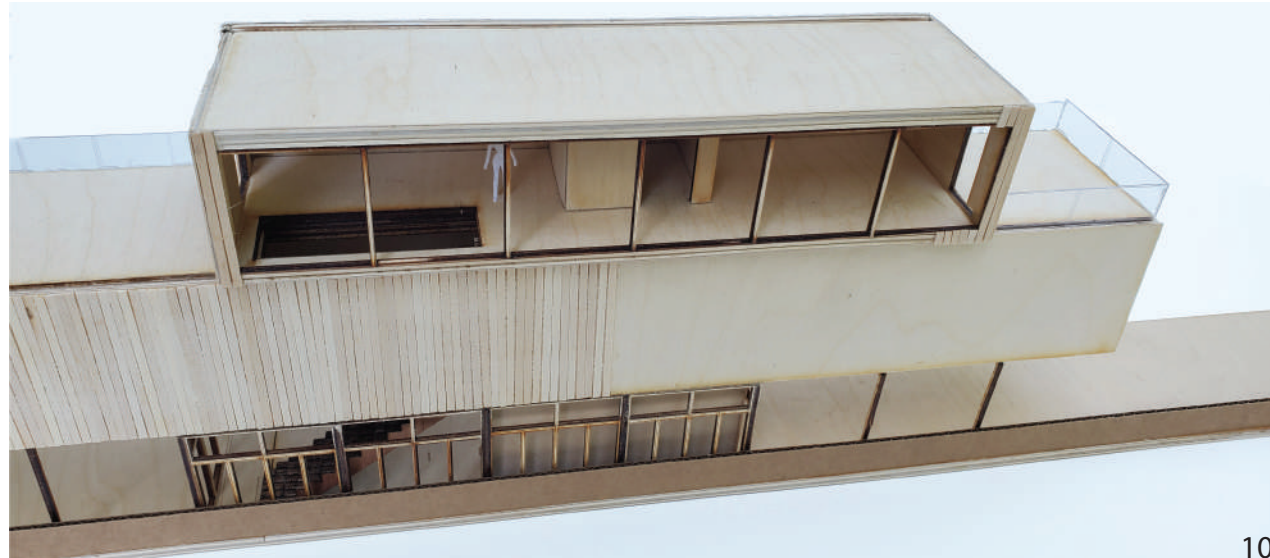


# Signet



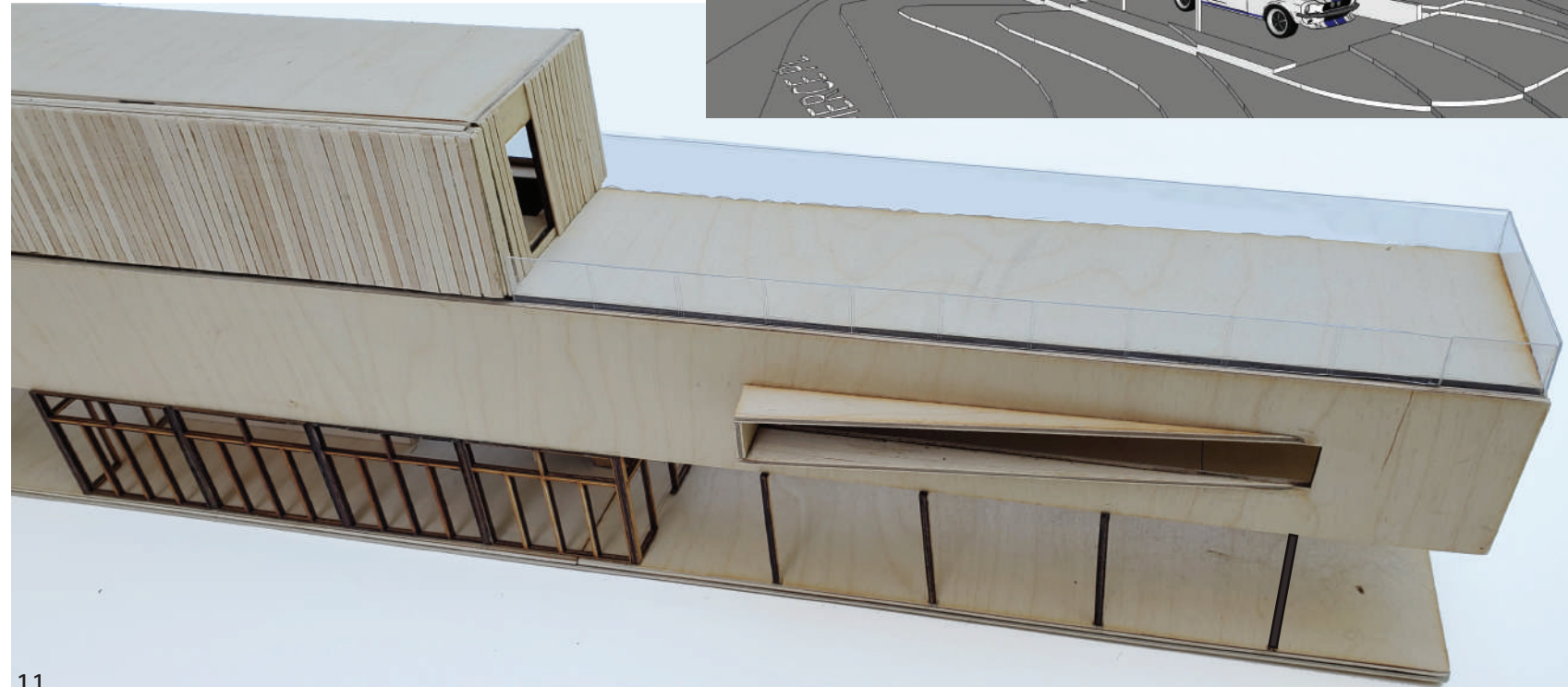
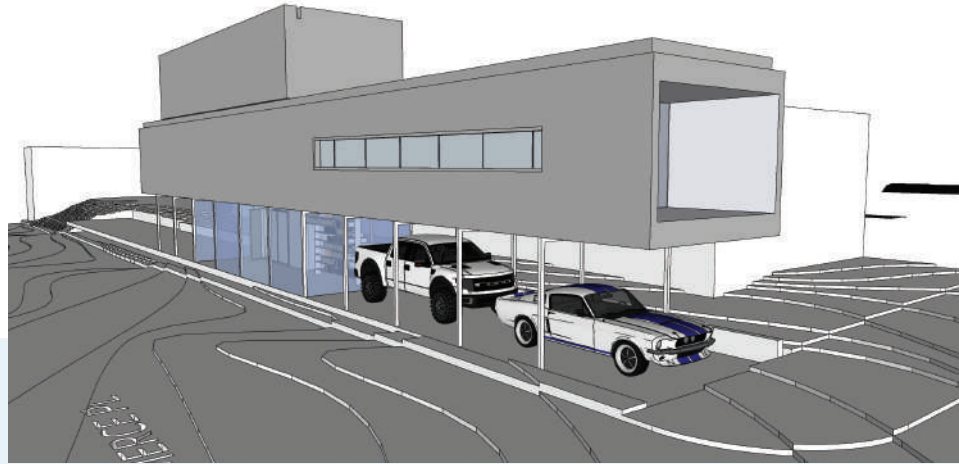
The finished model was made mostly out of wood to understand how to use a single type of material in one model effectively.

The site is tightly packed so in order to achieve the best views the master suite was pushed to the top floor along with the roof top garden.

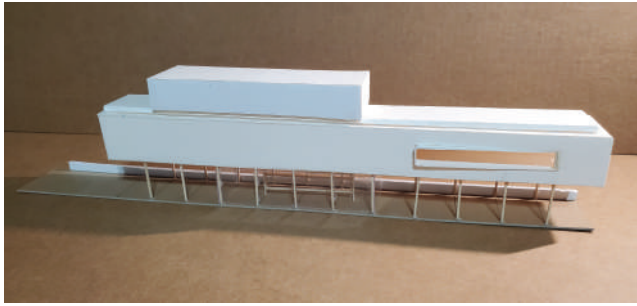
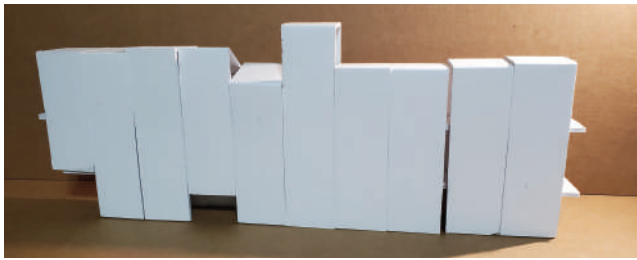
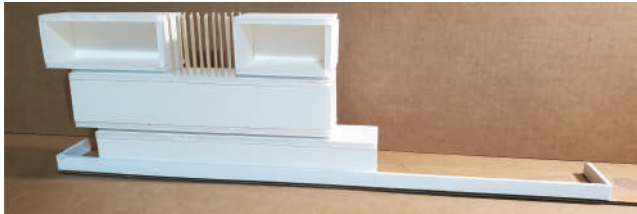
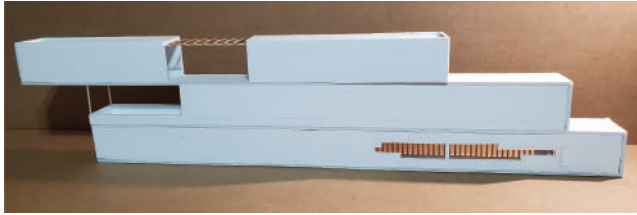
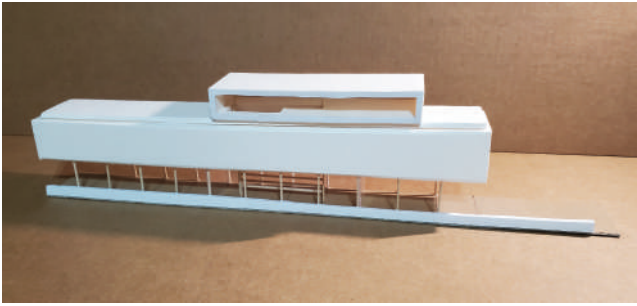
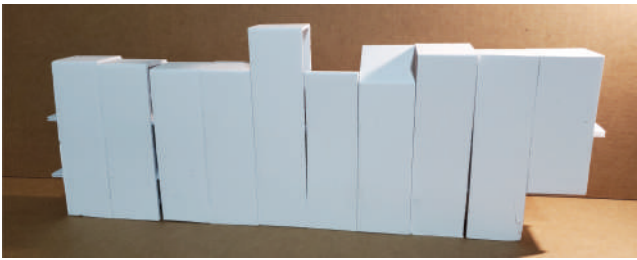
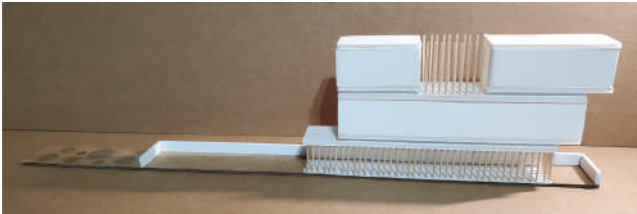
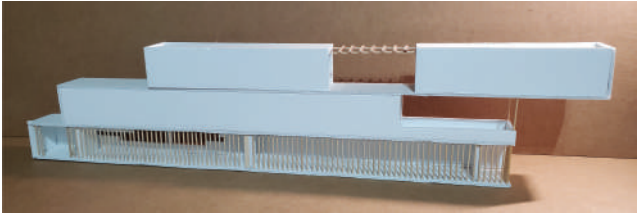


# Signet

The long tight constraints of the site forces the programming to become carefully calculated to utilize the most space. Considering the site is only 30 feet wide and allows for no overhang from the footprint, space can only be found by going up.



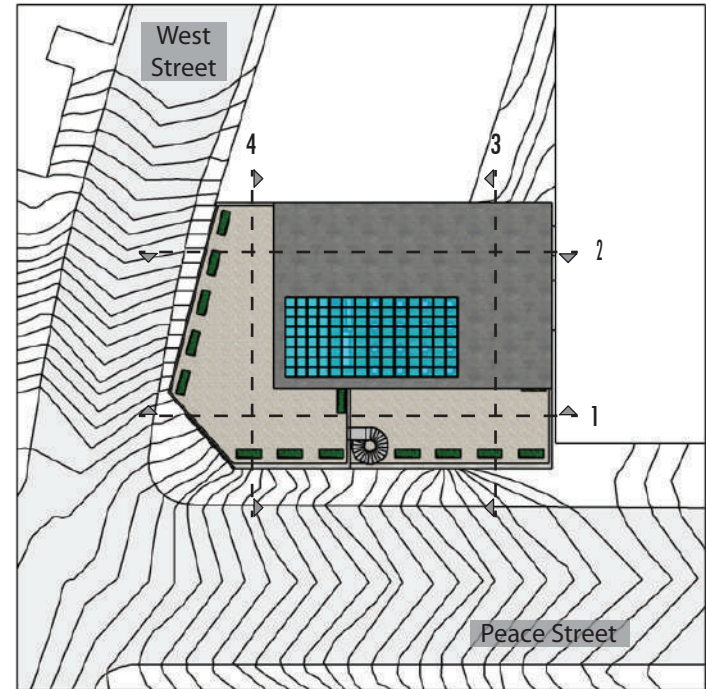
# Signet Prosses models



Bearing is a small library focusing on Raleigh's history and maps near downtown Raleigh. The library will house a collection of rare books and documents related to the history of the city and immediate region, feature a map and drawing collection, and serve as a hub for searching other local libraries and resources related to the history of Raleigh.

Located on the busy intersection of Peace Street and West Street, the library serves as an escape from its surrounding fast-paced urban life. The library houses a noncirculating collection of rare books, documents, maps and drawings relating to the history of the city.

The form aims to engage the busy intersection and attract visitors by showcasing a central open-air curvilinear atrium in an otherwise extremely boxy form. A series of staggering floor plates and walls hold the original boundaries of the site and are gradually sucked into the center of the building. A topography change of 14 feet allowed for the library to have two entrances: one on the first floor facing Peace Street and one on the back of the site on the second floor facing West Street.



# Bearing Library and Museum

Technology studio

# Bearing



Section 1

Section 2

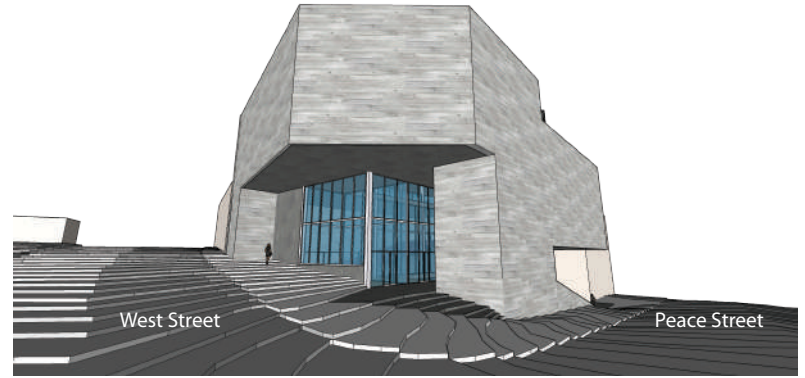


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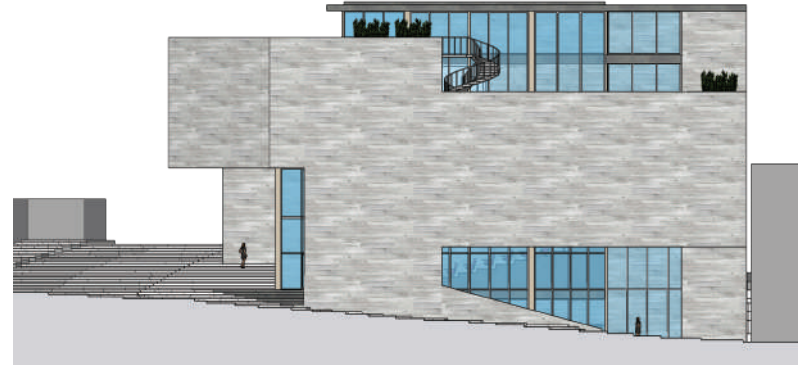
Section 4



# Bearing

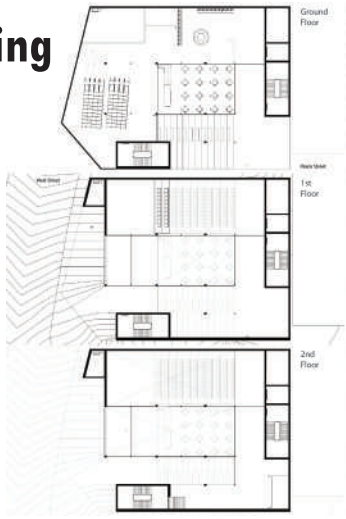


West Elevation

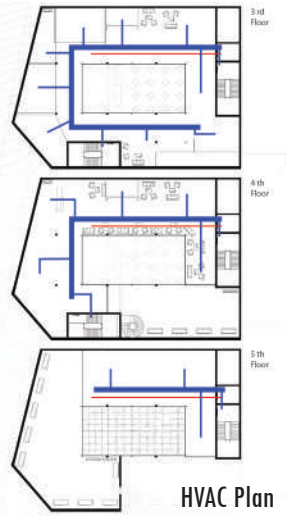
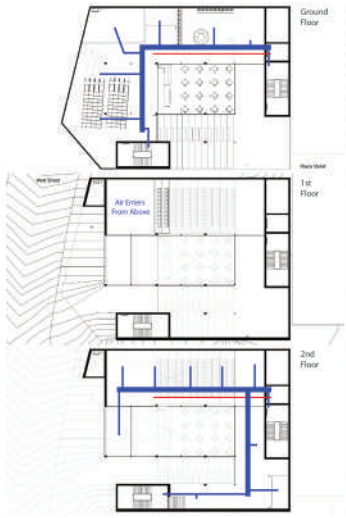
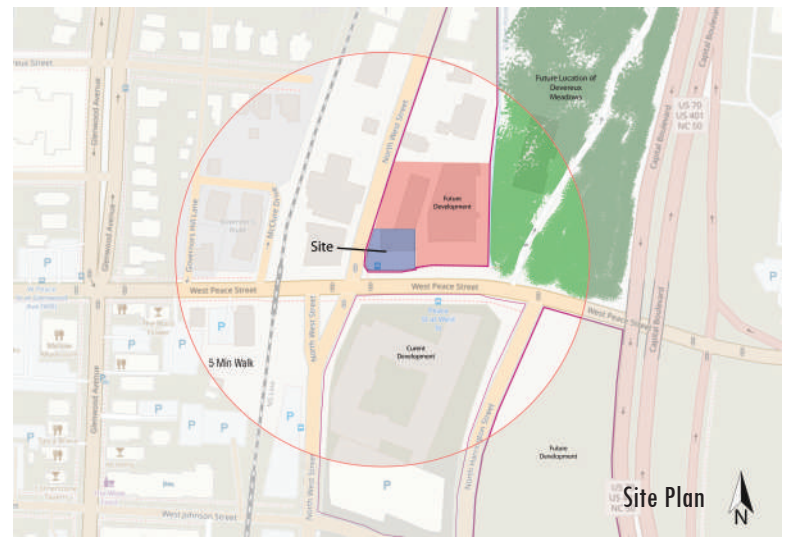


South Elevation

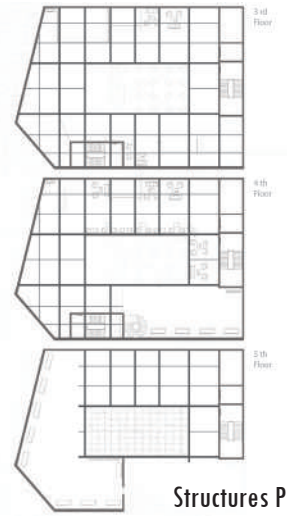
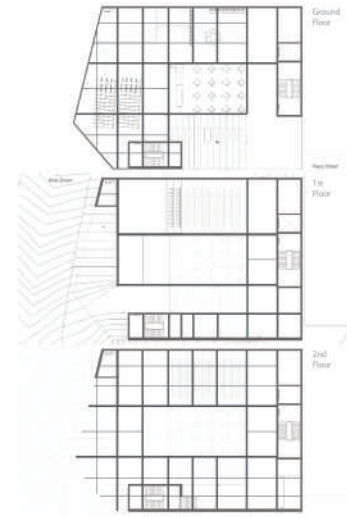
# Bearing



Floor Plan



HVAC Plan



Structures Plan

**Daylighting reduces the need for electric lighting by introducing daylight into a building. Effective daylighting is achieved through the strategic placement of skylights and windows, as well as lighting controls that monitor available daylight and respond as needed to decrease or increase electric lighting.**

**The daylight research test facility helps create any unique daylight simulations from any part of the world for almost any time of day in one facility. The old DRF was deteriorated and falling apart, so once it was determined that it was unfit to be used again, professor Place took the opportunity to build a larger and better facility as soon as possible.**



NCSU Collage of Design

# Daylight Research Facility

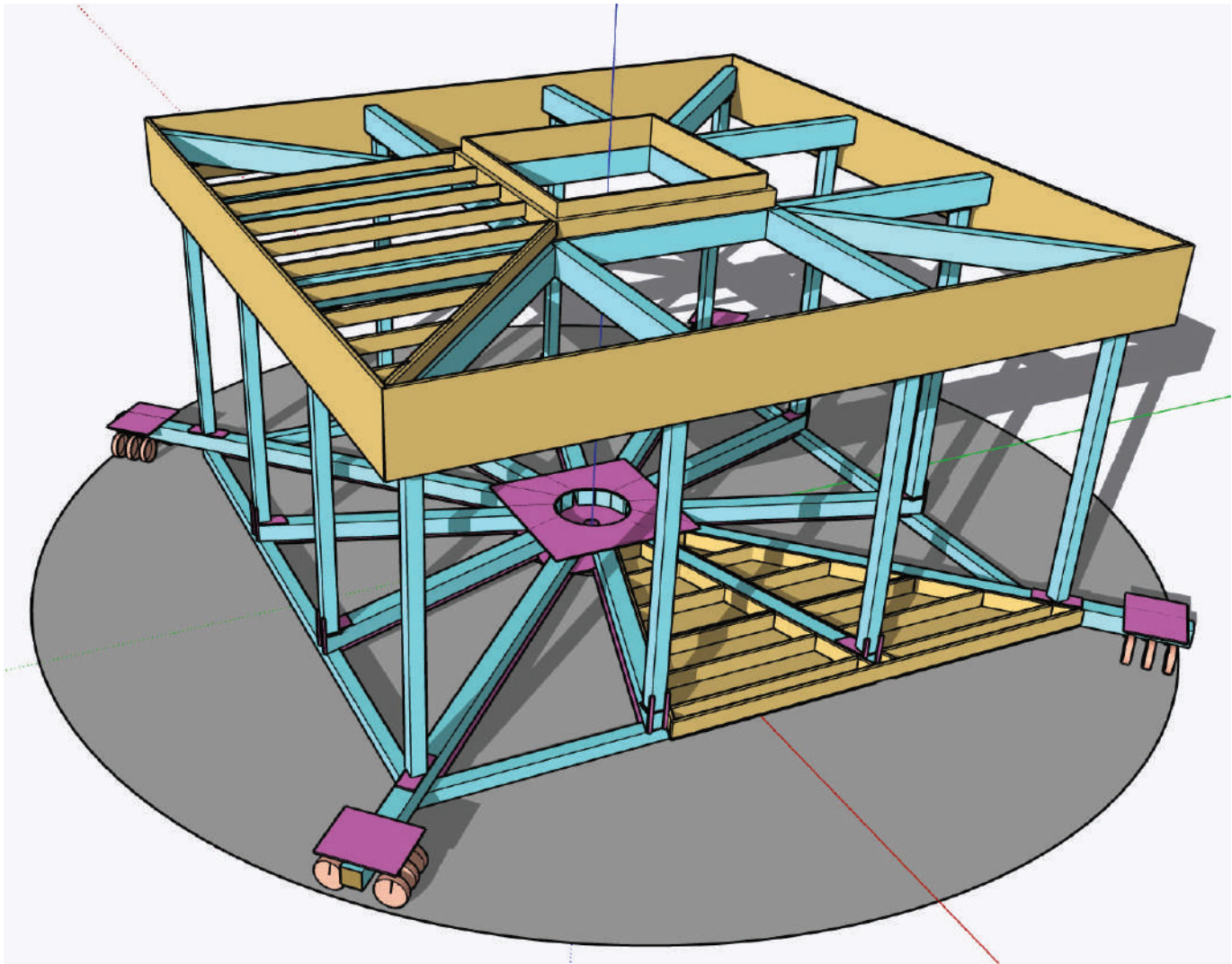
## NCSU D.R.F.

Professor Wayne Place and Professor Jianxin Hu has taken on the responsibility or renovating the DRF. The old facility was a simple modular hut that was made of cheap wood and foam that sat on the interior brown concrete pad. To prepare for the new facility Professor Place and Professor Jianxin had a new concrete pad poured around the existing one and made sure that it was precisely level with the interior circle. Once completed the new DRF will be nearly twice the size of the original.



## NCSU D.R.F.

Once the new concrete pad was finished the new Daylight Research Facility was designed by professor Place in Sketch up and AutoCAD. This is a rendering from Sketch up.



## NCSU D.R.F.

The columns were welded first because of the ease of access to the materials and to make room for the floor beams to be picked up with out materials in the way. The center hub was installed next in self levelling mortar to ensure a perfectly flat surface for the entire building to rest on.



# NCSU D.R.F.



## NCSU D.R.F.

After letting the bottom of the center hub cure for an entire weekend we then installed bottom floor plate that also includes the top of the central hub. Between the two hubs are two large three foot wide Teflon disk that should allow the entire facility to rotate fairly easily.

The use of NCSU Facilities' military telescoping forklift and two 3,000 pound magnets were the only way to safely install both the lower and upper center hubs.





## NCSU D.R.F.



The 8" x 8" floor beams were placed to take the maximum load in each beam from the outside towards the center hub. The four corner beams extend out from the structure to hold wheels that can assist in turning the structure. Every place that a beam touches the center hub or the outer frame must be welded completely to ensure maximum strength during loads and movement of the test lab.



**NCSU D.R.F.**



**My work in the military as a Structural Civil Engineer for the US Air Force has been a huge benefit in many ways from allowing me to see the world, meet new people, and learn new experiences as I traveled. The biggest influence has been the invaluable knowledge that I have gained in working as a Civil Engineer.**

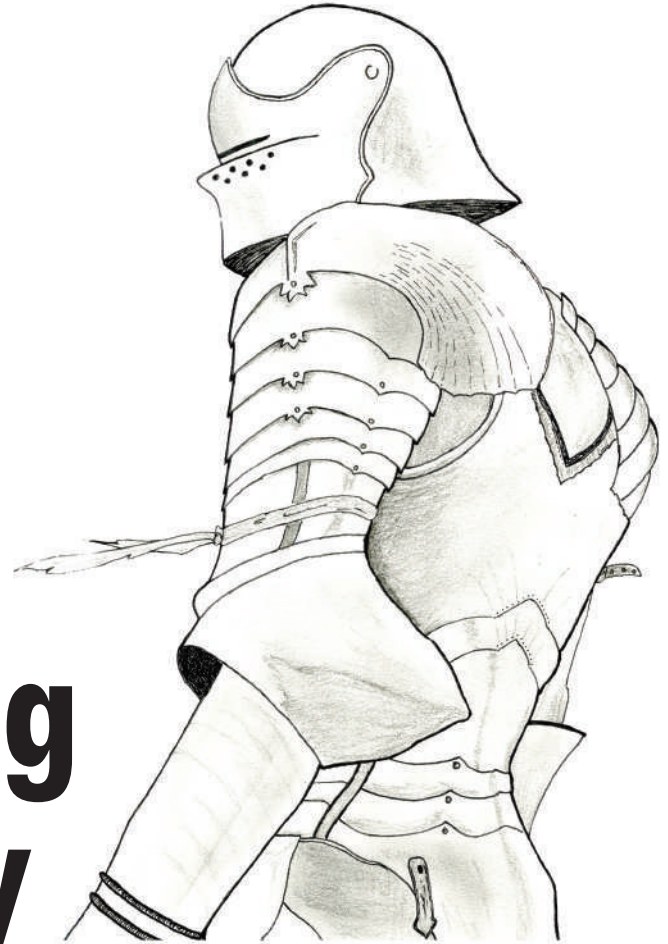


**Military** Experience

# Military



**A good architect should be well rounded in drafting, drawing, model making, photography, and digital design. Photography and hand drawing helps us capture the environment around us. This a small section of my freehand drawings and photography.**



# Hand Drawing and Photography

Experance

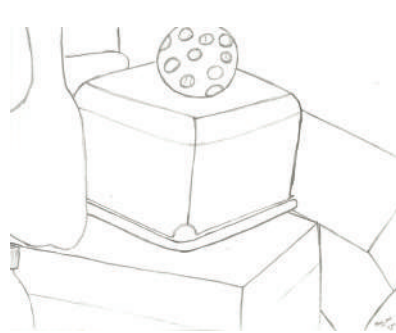
# Hand Drawings Photography



© Mack Carter II



© Mack Carter II



Drawings are from random  
objects placed in front of  
myself and drawn to scale.



© Mack Carter II