



Portfolio

Christopher Thomas MacDonnell

Master of Architecture

School of Architecture — University of Virginia

Certificate of Historic Preservation

School of Architecture — University of Virginia

Bachelor of Science in Architecture

Pre-Professional Program

School of Architecture — University of Virginia

Historic Preservation Intern

University of Virginia Library

3-D Cultural Heritage Informatics

Press Photographer

Cavalier Daily — Student Newspaper

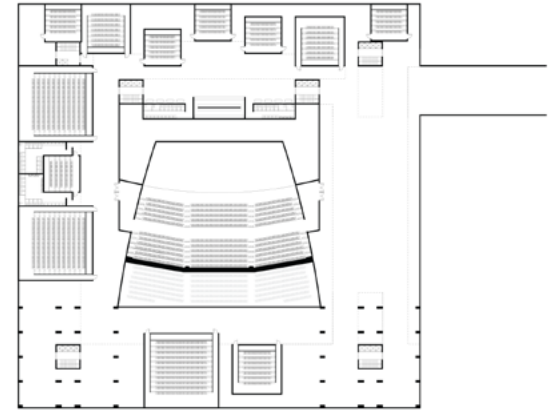
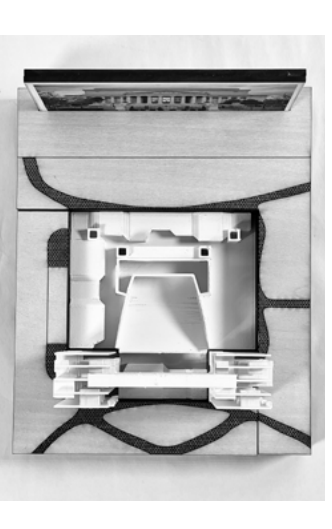
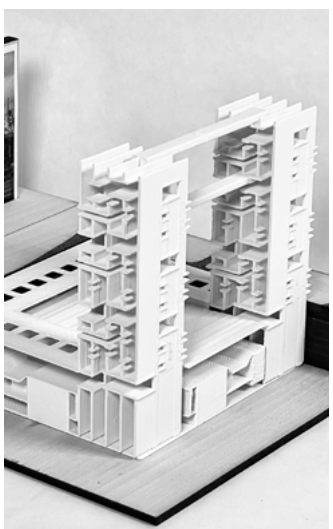
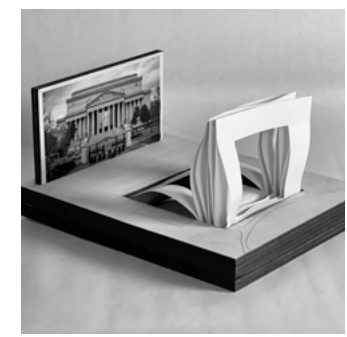
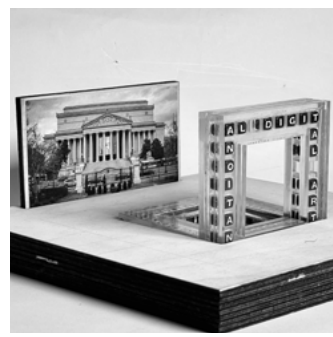
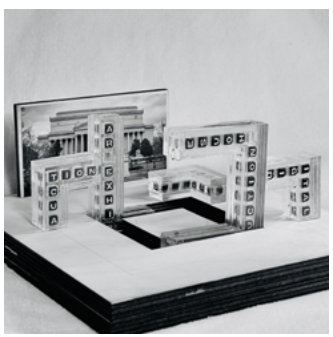
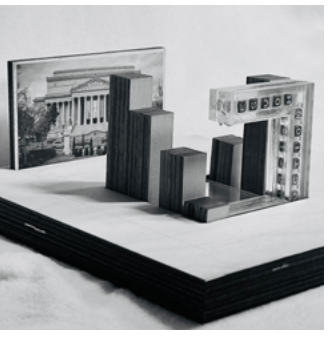
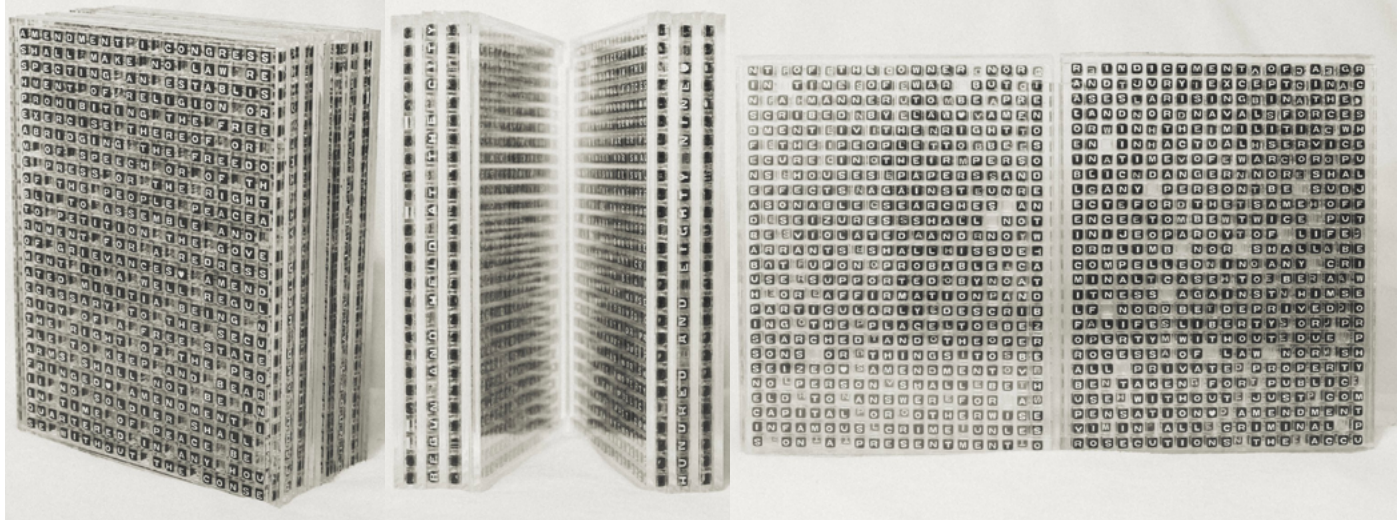
University of Virginia

Designer

Chris Mac Studio LLC

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National Gallery of Digital Art
 Sculpture Garden, National Gallery of Art
 National Mall — Washington D.C.
 ARCH 8020: Professor Shiqiao Li

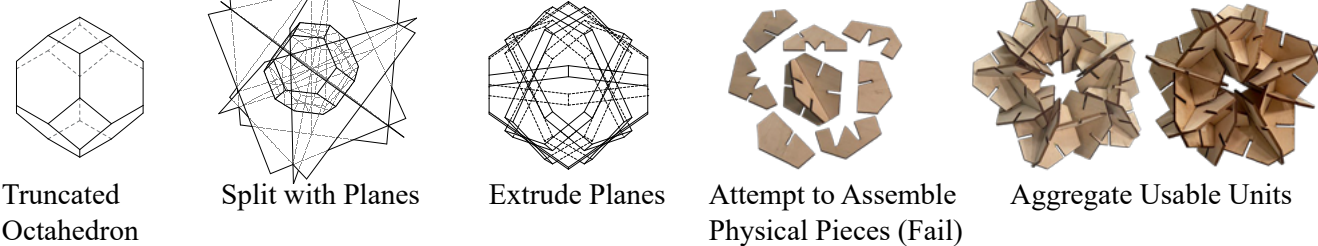
Process
 Create a prosthesis. Students each tasked with researching computation technology and digital art to develop a prosthetic device. Result: “Book of Rights” - The text of the first 10 amendments to the US Constitution, broken into base alphabetical units. Preserved in acrylic for the future AI Government. Layered upon the text of the Declaration of Independence, readable only through the gaps. Text as generative design. When viewed straight on the layers compound into unreadable noise.

Next: This device was broken into units. The units were iterated into different arrangements, each of which framed the National Archives. Rather than conform to DC’s neoclassical style, or reject it by designing purely more modernly, this project sought to bring both eras into focus together. To display how both art and our rights rely upon one another.

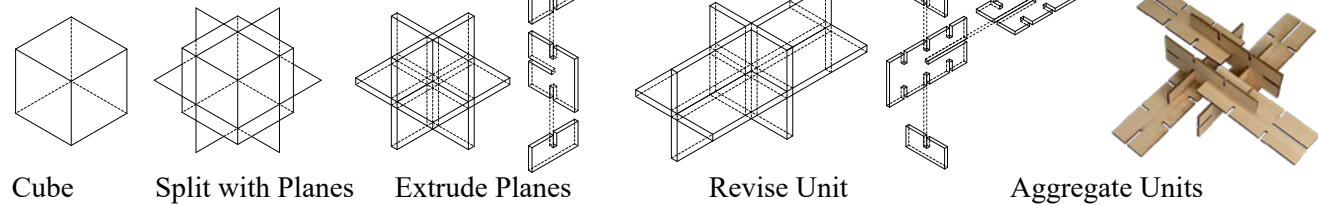
The result is a gallery and theater for digital art in the form of a triumphal arch on the National Mall.

Geometry Studies

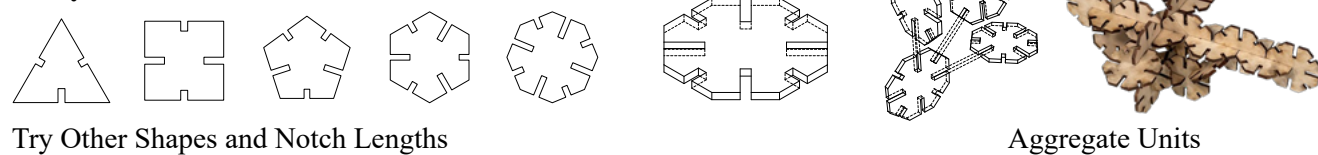
Study I



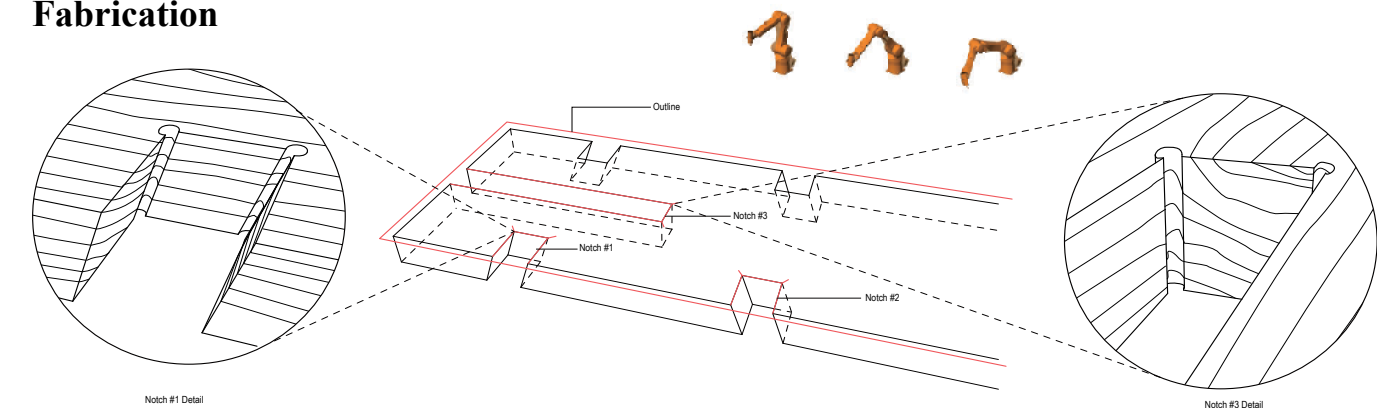
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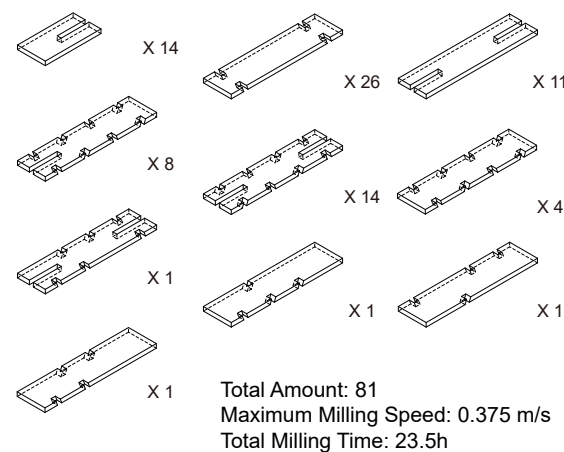
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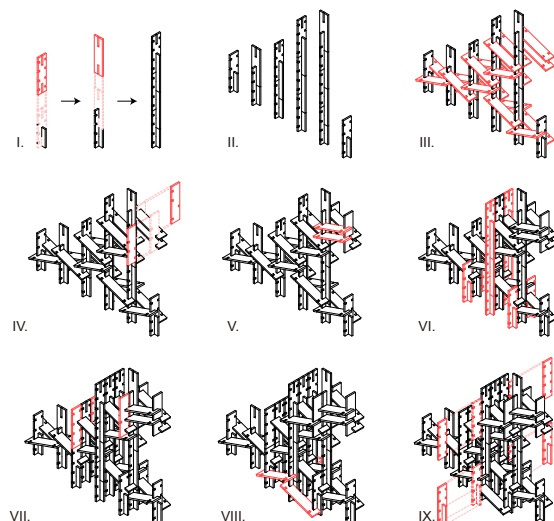
Fabrication



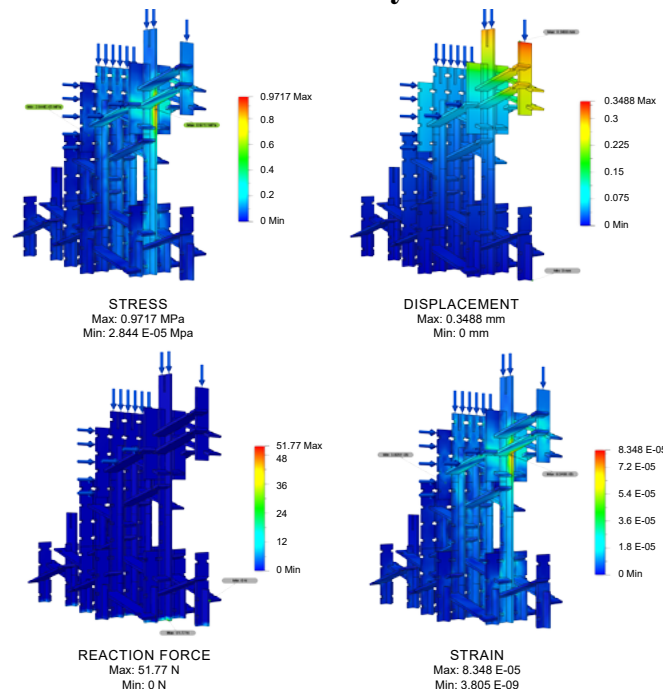
Units



Installation Plan



Virtual Structural Analysis



Material Properties

Type: Southern Yellow Pine
Mechanical:
 Young's modulus: 12,066 GPa
 Poisson's Ratio: 0.37
 Shear Modulus: 663,656 MPa
 Density: 0.570 g/cm³
 Damping Coefficient: 0.00
Basic Thermal:
 Thermal Conductivity: 1.490E-01 W/(m·K)
 Specific Heat: 1,600 J/(g·°C)
 Thermal Expansion Coefficient: 38,000 μm/(m·°C)
Strength:
 Yield strength: 41,400 MPa
 Tensile strength: 78,000 MPa

Generative Crossed Timber System

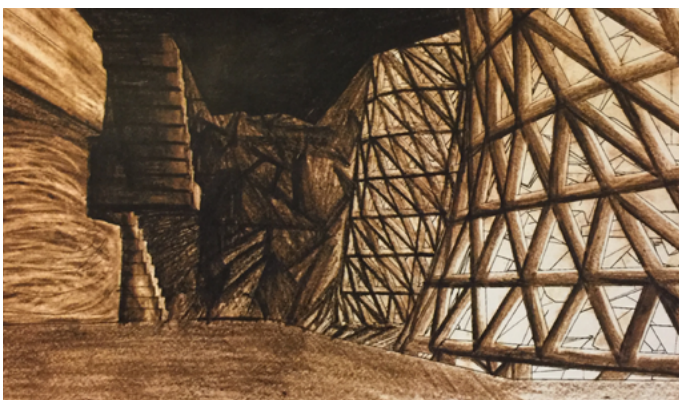
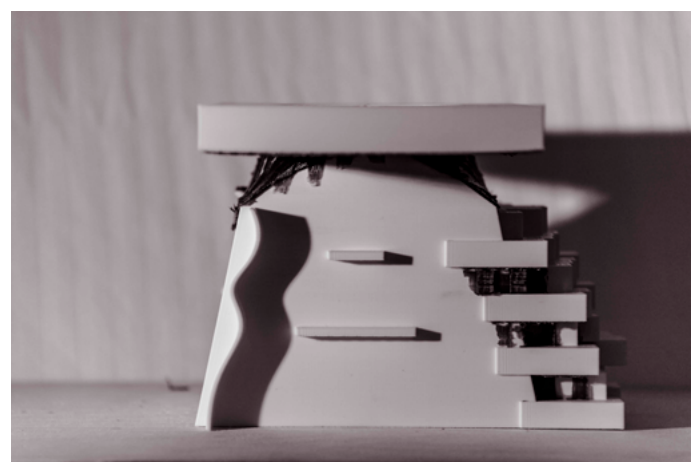
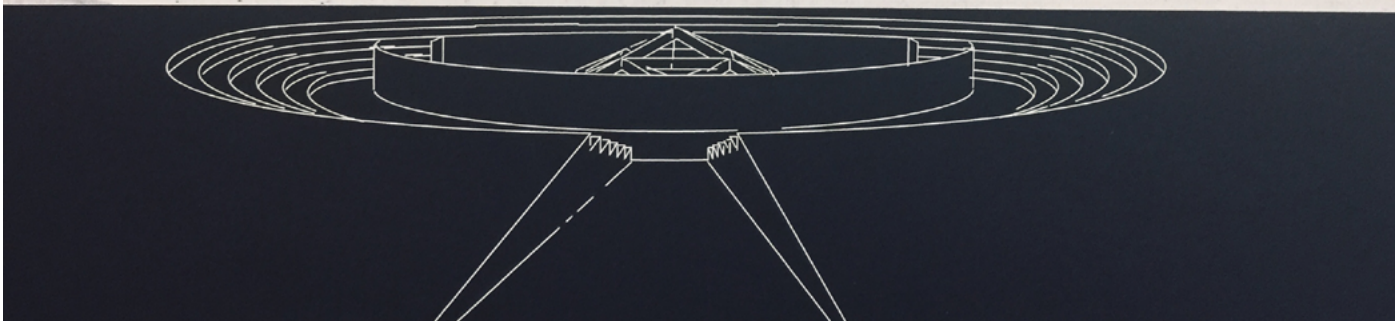
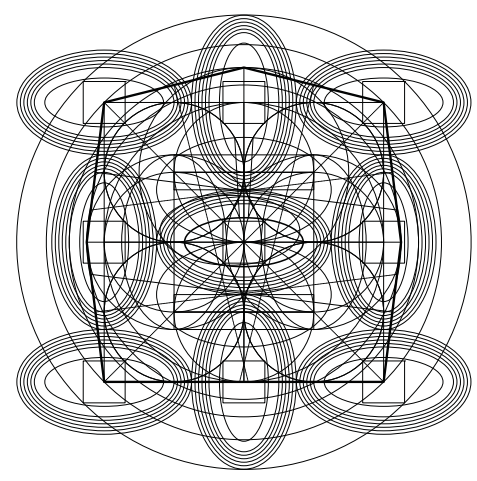
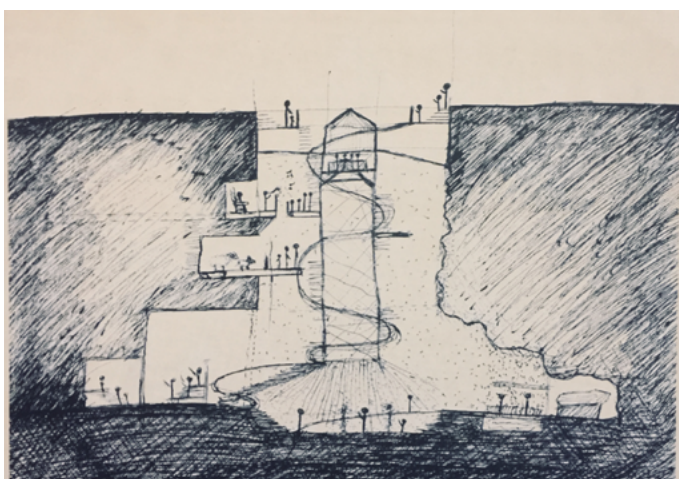
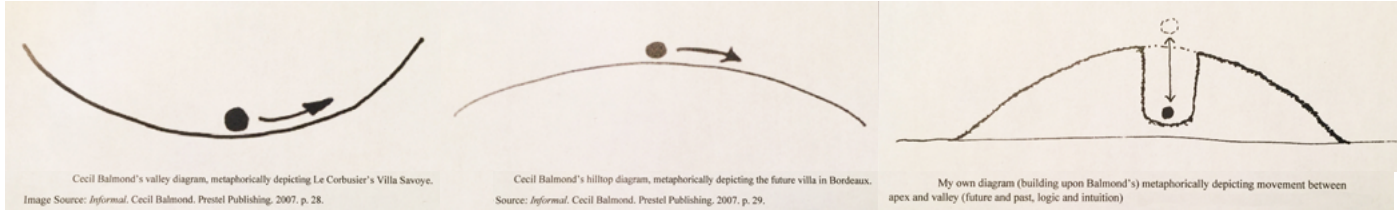
Campbell Hall — University of Virginia
 ARCH 8010: Professor Ehsan Baharlou
 Studio Team: Christopher MacDonnell (MArch),
 Yuwen Zhou (MLA), and Ziwei Shen (MLA)

Honorable Mention: FAST COMPANY Innovation by Design Awards 2022

Process

This studio was a design and build semester exploring mass timber. Teams were tasked with learning about timber strength and how it can gain strength through manipulation. Our group focused on using one material only, and thus notching emerged as an effective strategy. We looked to Kengo Kuma and others as precedents.

We also looked into the space filling geometry of Archimedean solids. We broke down a truncated octahedron into flat planes and reassembled the pieces into higher levels of organization. Our original goal was to create a single unit that could aggregate endlessly. We realized that we needed a unit with various parameters which could be turned on and off, to introduce a control factor over how the system aggregated, and allow us to strengthen the design to the desired shape and cantilever.

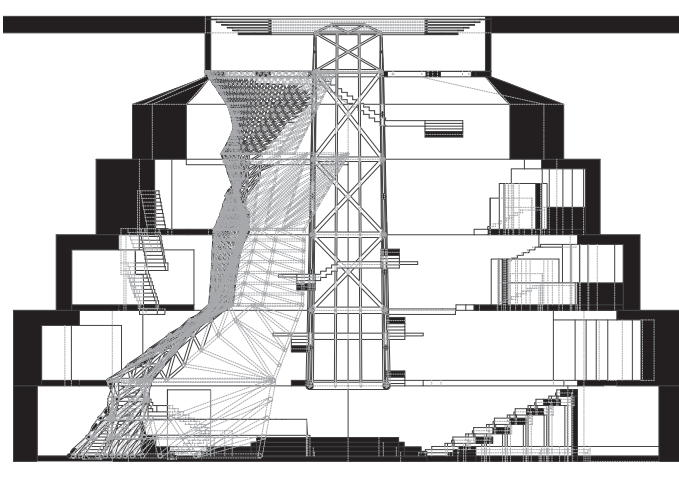
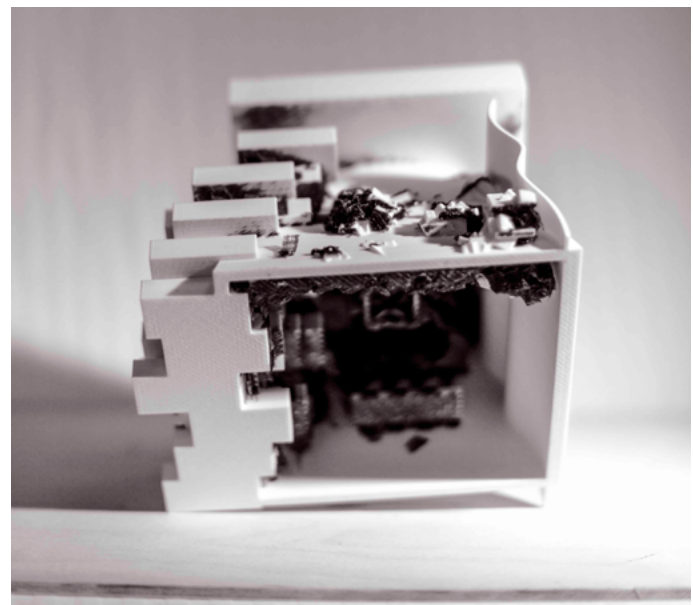


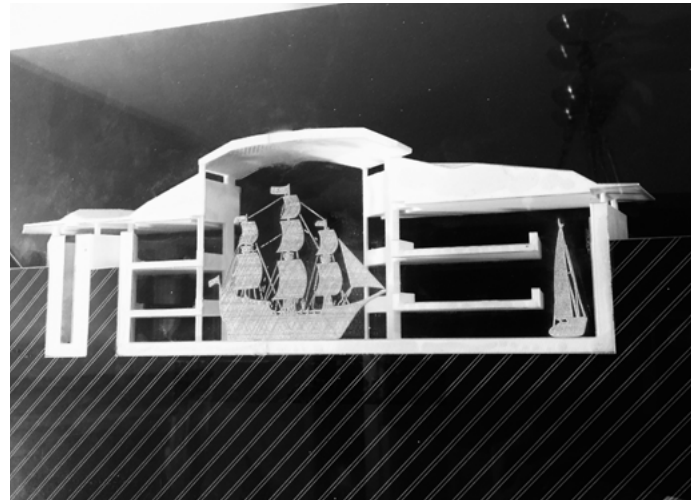
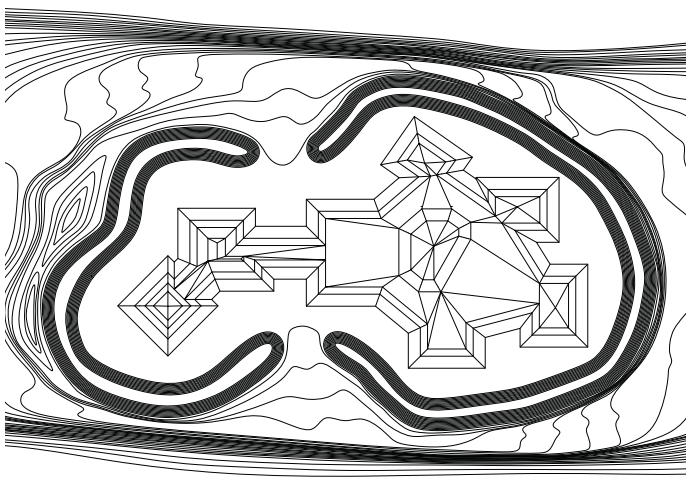
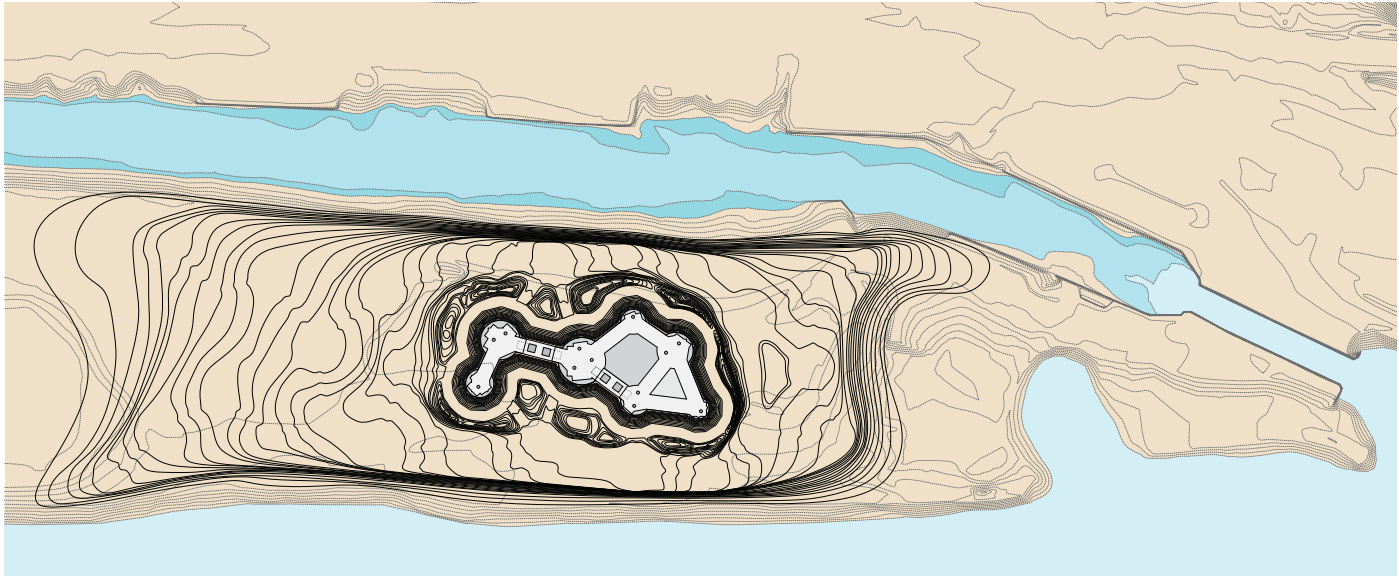
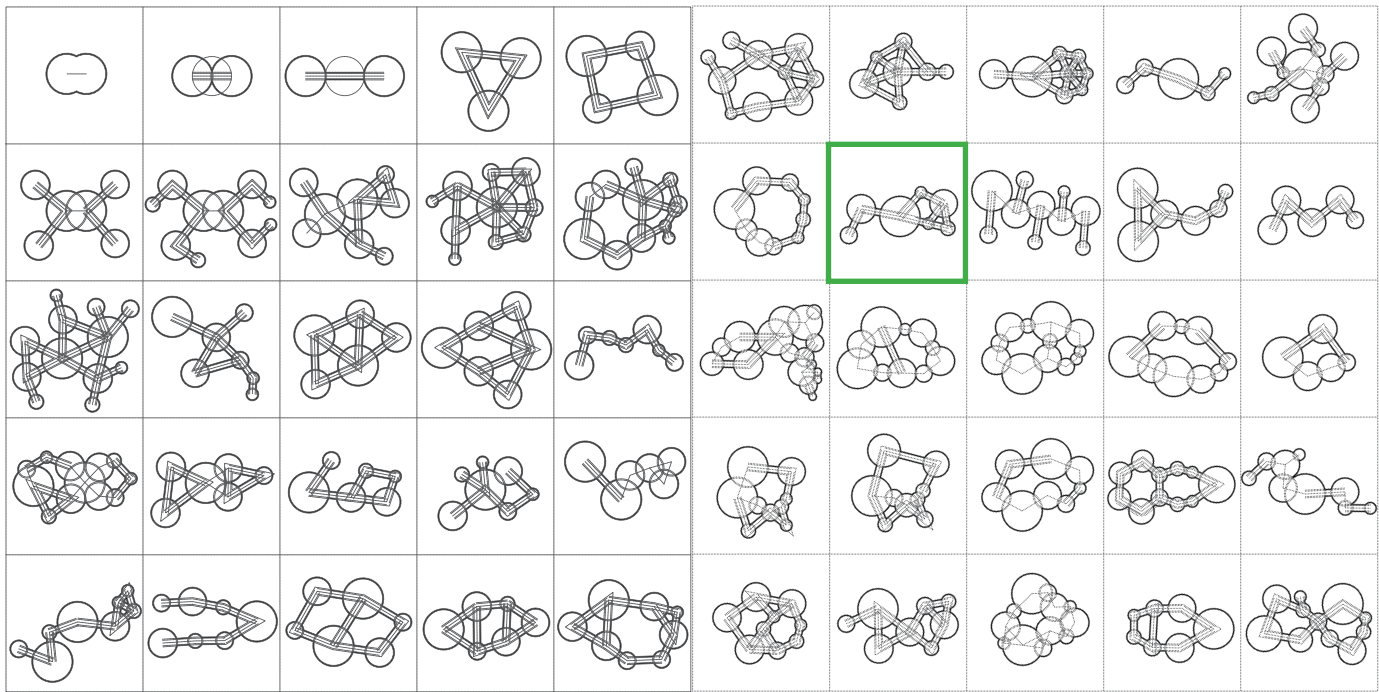
Hidden Histories Museum
 Colonial Williamsburg — Williamsburg, Virginia
 ARCH 4020 Thesis: Professor Peter Waldman

Process
 Cecil Balmond's valley and hilltop diagrams inspired my own diagram of movement between apex and valley, as a metaphor for movement between present and past.

The history depicted at Colonial Williamsburg is only one slice in time. There are many stories left untold, and even covered up. Cultures lost to colonization and an entire geologic record have no place in today's Colonial Williamsburg. This project seeks to uncover those narratives while keeping them encapsulated, below the earth.

This project was an incredible exercise in the exploration of architecture theory, narratives, and place-making. The result is a space where materiality and styles clash, and concepts of man, intuition, reason, logic, nature, past and future converge.





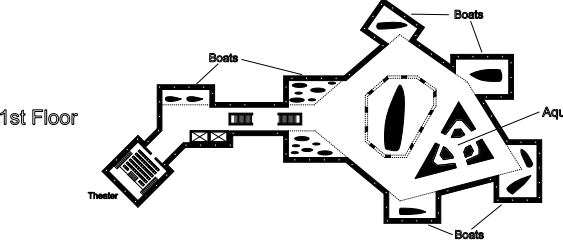
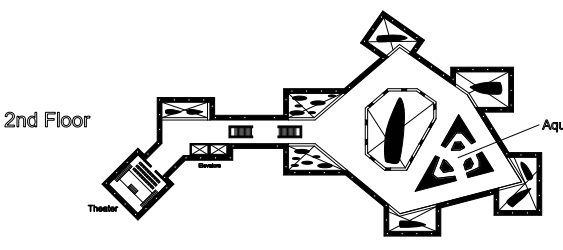
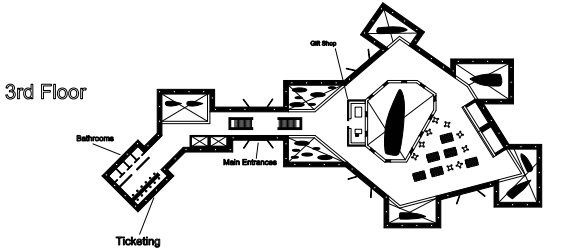
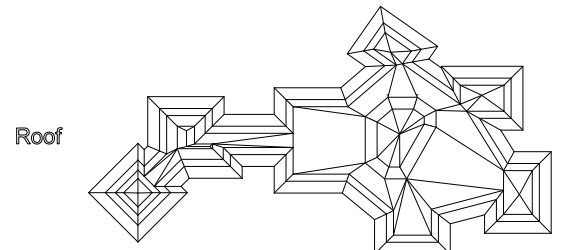
James River History Museum
 Great Shiplock Park — Richmond, Virginia
 ARCH 8020: Professor WG Clark

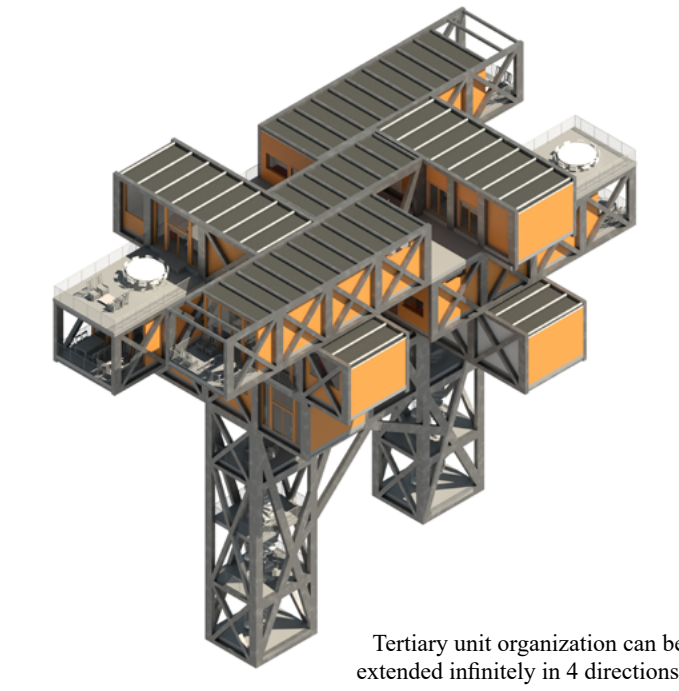
Process

The program was open ended and we needed to justify our selection. Given the historic significance of the James River and its relationships to both the colonies and the native communities, I suggested a museum to the history of the James and all its people. Given the site is located at a historic shiplock, used for raising ships past a dam, I determined that ship building and history made sense for the program as well.

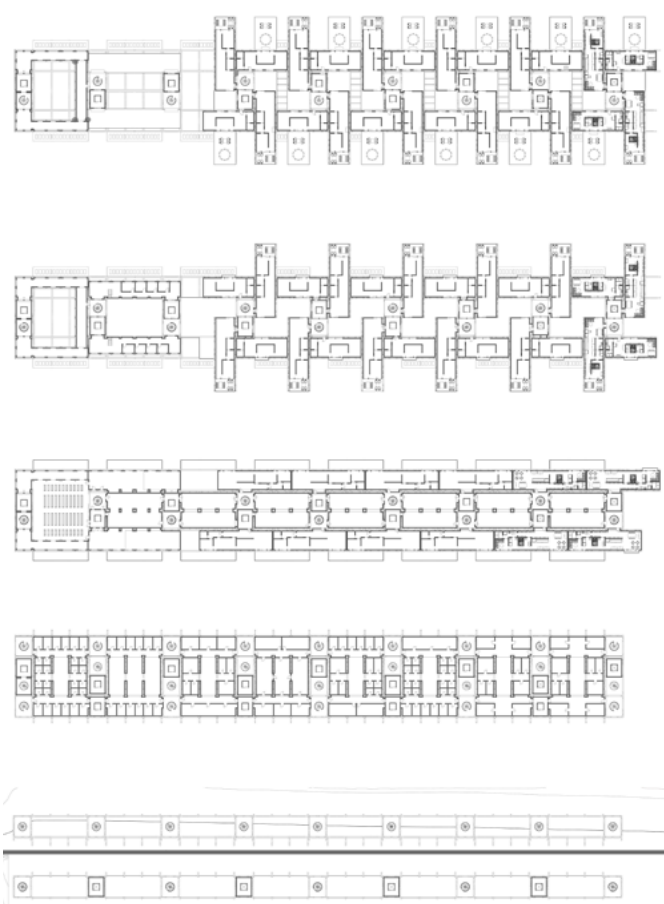
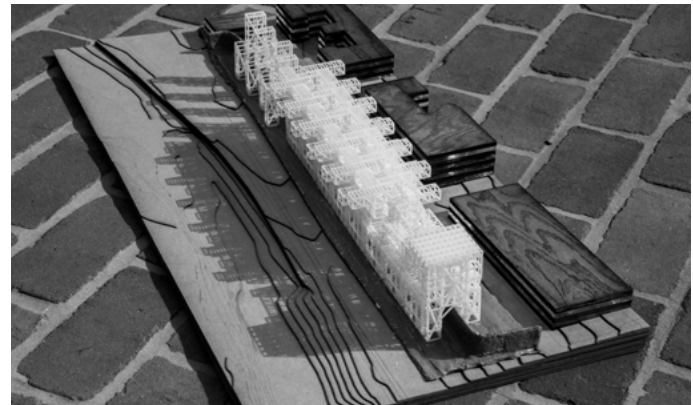
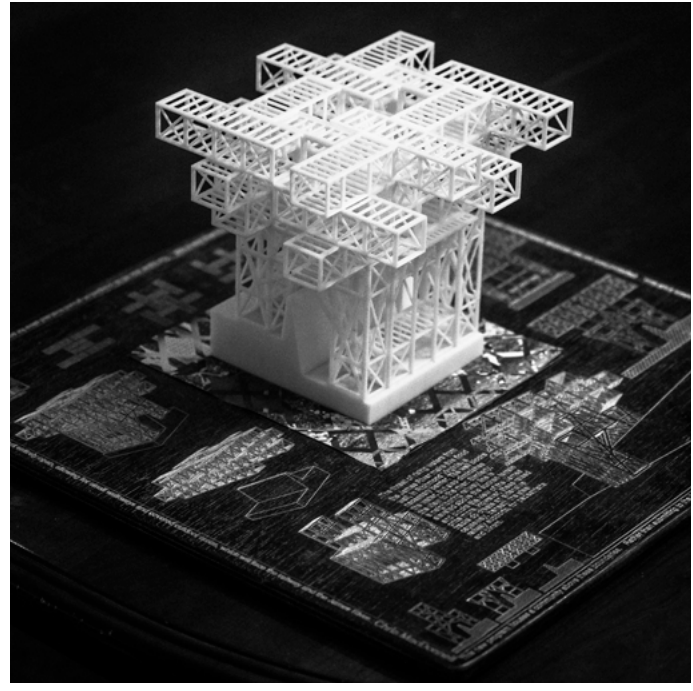
The design process began with inspiration of Native American mound building. Iterations of mounds and connections between them were performed and analyzed. This mound was transposed onto the site and its network was extended into the landscape, reforming the topography with a series of paths and plateaus.

The landscape takes visitors through a series of ADA accessible inclines, arriving at the top floor. After entering the museum visitors descend into the mound network, where historic ships of all sizes, both native and colonial, are displayed, together with an aquarium of local species and a theatre space.





Tertiary unit organization can be extended infinitely in 4 directions.



Prefabricated Flood Wall Monastery

Flood Wall — Richmond, Virginia
ARCH 3020: Professor Ed Ford

Process
“The Parts Studio” — Given Program: Monastery. This studio was my introduction to unit based design. I learned how units can be aggregated to form secondary and tertiary arrangements, resulting in a branching network. Our studio was tasked with re-purposing shipping containers and/or designing within size parameters of units capable of being pre-fabricated and shipped to the site. We were also given the option of designing a built-on-site structural system which units could slot into, like wine bottles into a rack.

Through wood block iterations I realized units could be arranged in a perimeter to create larger spaces. I also realized units could be turned upright for vertical circulation, and to scale the flood wall. Rather than design on one side of the wall this Monastery straddles it, and provides a view of the river above the raised railroad.



Selection of Photographs for Cavalier Daily; including Secretary of State John Kerry's first Foreign Policy Address (UVA Old Cabell Hall) and Tina Fey's inaugural Speaker for the Arts Address (UVA Amphitheatre).

