

Kadia Miller  
Arch 565 Journal

# Typical Work Flow

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Journal 01  
01.17.2025



Journal



Conceptual  
Physical  
Models for  
Iterations



Digital  
Modeling



Editing

# Form and Forces

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John Ochsendorf

Building a bridge - based in Peru  
Day 3 - the bridge is complete and  
resembles a basket

Tile Vaulting  
(Catalan vaults)

Catalan architecture

Gaudi

origins near Valencia, Spain

Fray Domingo de Petres

1" layer of tile thick - double  
curvature + amazing load capacity

Guastavino spiral stairs - tile stairs  
dome spanning 190 ft. - each day  
add rings and cantilever and held the  
worker's weight

this reminds me of Brunelleschi's  
duomo in Florence.

1961-65 Cuban Art School - long  
form vaults and domes + sagrada  
familia being built with this same  
technology

Colonia Guell Hanging Model, near  
Barcelona

Alex Jordan developed a program  
to bring gravity into the design  
environment - gravity free isn't real.

we have lots of analysis tools - not  
many design tools.

compressive forces in a spiral stair -  
thrust network analysis as a design  
tool.

constructability is part of the design  
process !!

# Initial Design

Journal 02  
01.23.2025

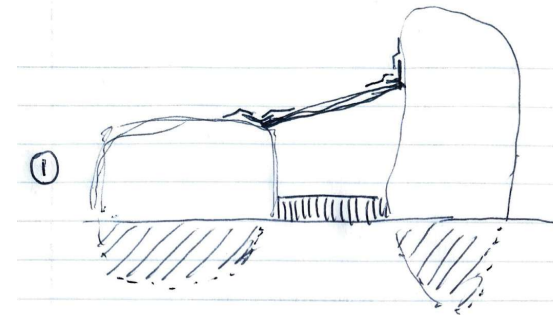
**Location of Project:** Rock field driving out to Natural Bridge Climbing Area.  
**Topology of Project:** Bouldering microhotel for chilling and winter use.



Inspiration



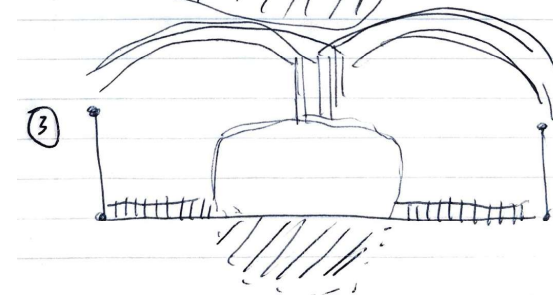
Actual Site from Google Maps



balancing in between  
2 rocks - old foam for  
the floor - some sort  
of flashing to keep the  
water out.



shell shape to cover  
the rock + climbing  
area.



use the rock as the  
structural element and  
form some parametric  
shape out.

# LiDAR Data

Journal 03  
02.07.2025

Tried really hard to get the LiDAR data from Montana Lidar Inventory but I couldn't get anything to download even though it is in green and says it has been completed.

## Lidar Acquisition Status

This map depicts completed, in-progress, and planned lidar acquisitions. "Completed" (green) means the lidar has been flown, processed, and delivered. "In-progress" (blue) means lidar is currently being collected or the data are being processed and going through quality control. "Planned" (yellow) means the area is expected to be collected in the near future (~1 year). If you are interested in an area adjacent to a planned collection, you should contact the organization listed about potentially partnering. There may be opportunities to work with the lidar vendor to expand the collection.

Click on a project area to view additional information, such as project name, collection dates, and a link to the project report.

[Download the lidar acquisition status map in PDF format.](#)

[Download the lidar inventory in GIS format \(geodatabase or shapefile\).](#)

Status map and GIS data updated June 2024.

### Completed Lidar Projects



### In-Progress (Processing) Lidar Projects



### Planned Lidar Projects

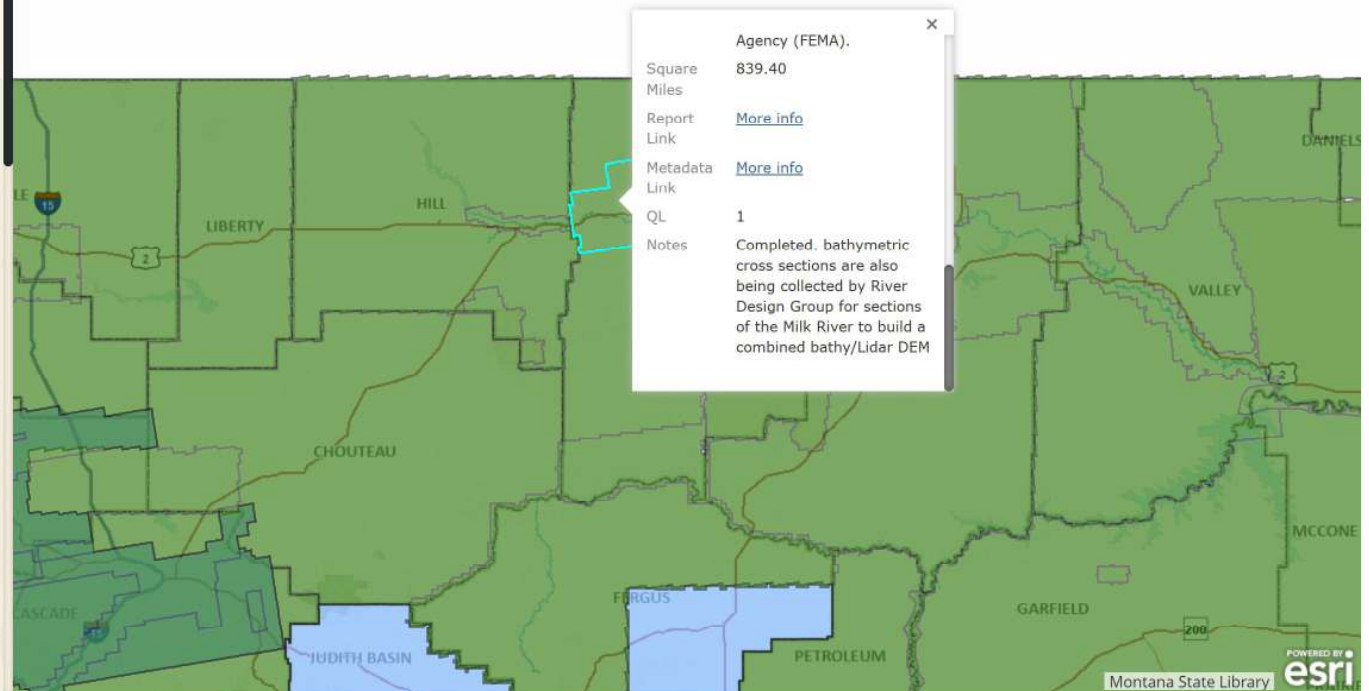


### MontanaBaseMap

Political Entities

CountyLines

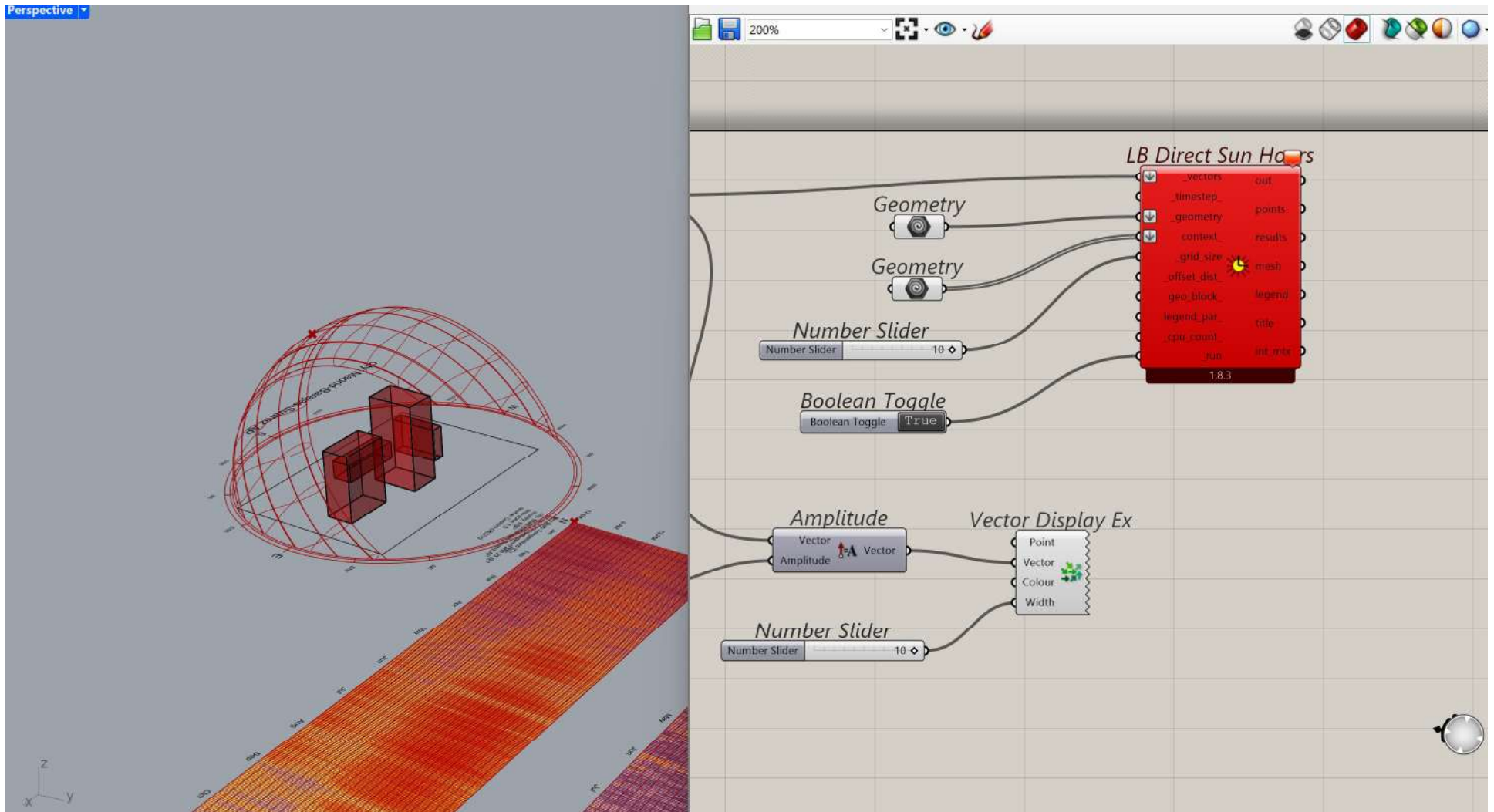
Counties



# Ladybug Plugin

Journal 05  
02.21.2025

This is definitely been my most favorite tool I've learned in the class so far. I analyzed all of the different tools on the "LB Import EPW" and was trying to do the sun path diagram when I ran into a problem saying "1. Solution exception:'PolylineCurve' object has no attribute 'ToBrep'"

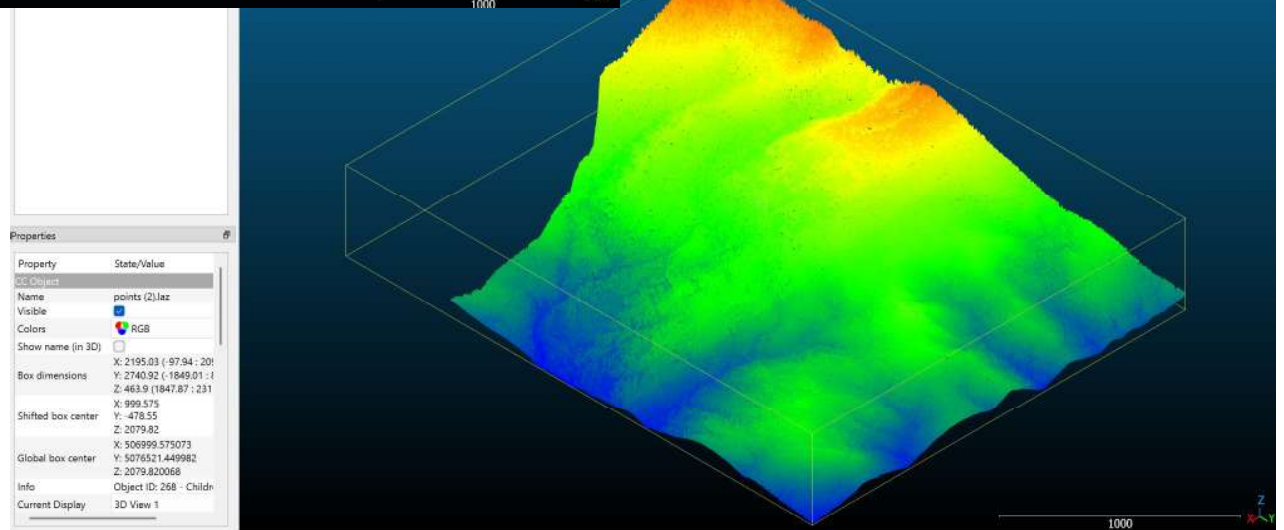
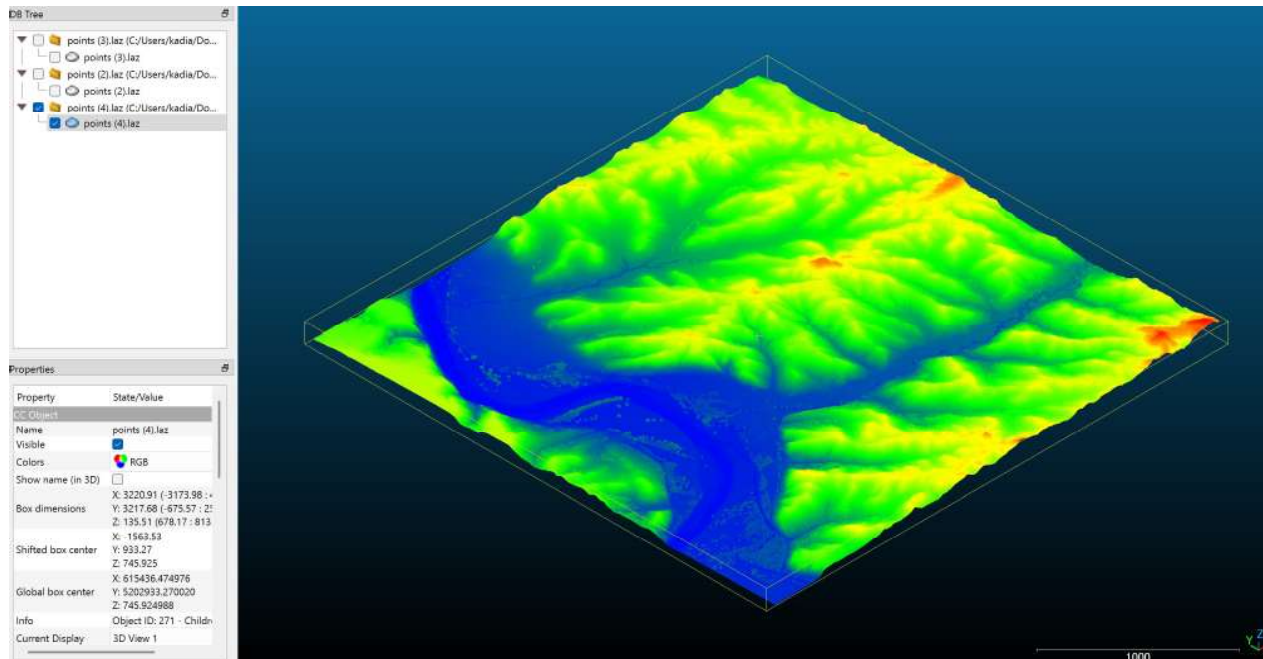




# Topography

Journal 05  
02.21.2025

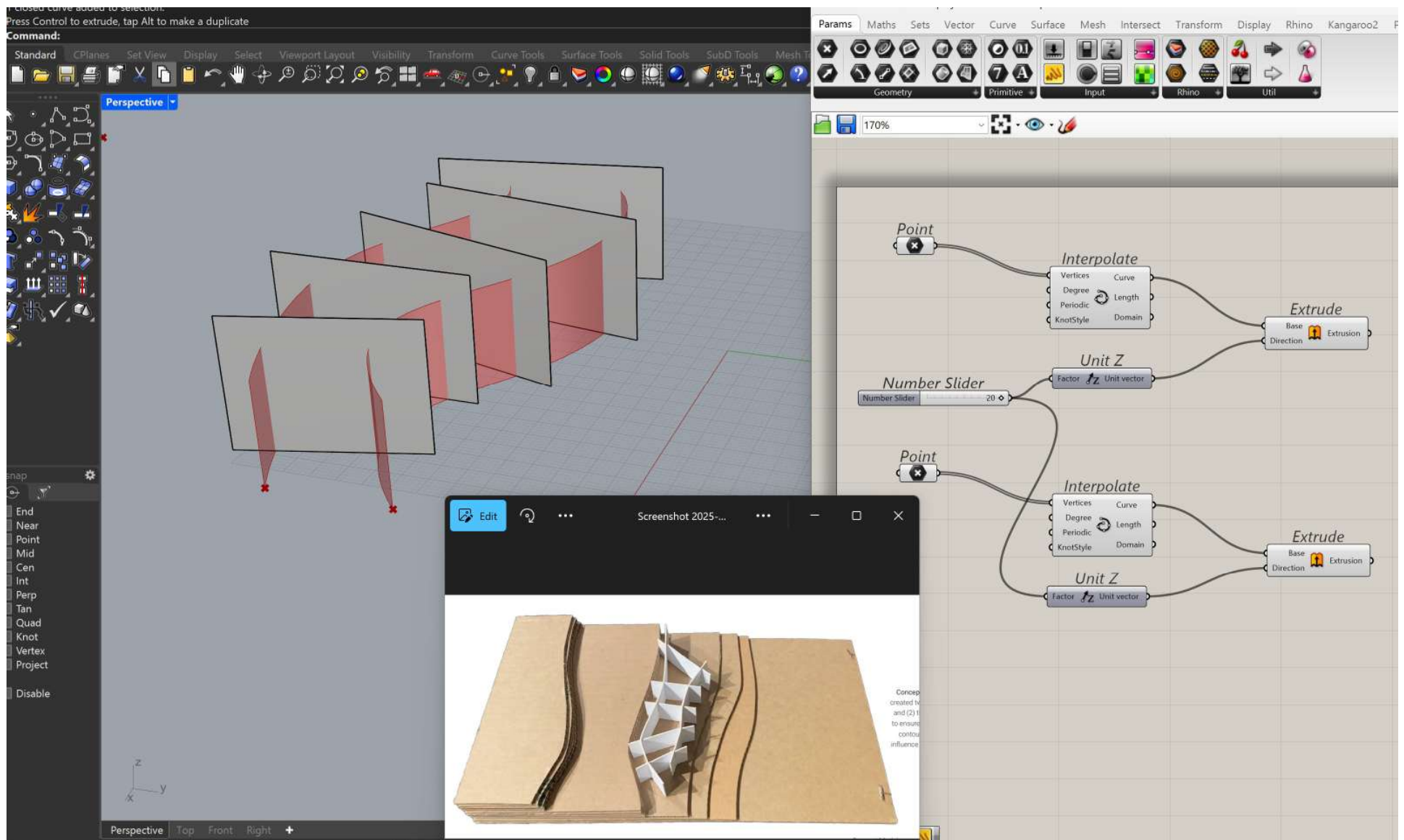
I got two different topography downloads into CloudCompare.



# Grasshopper Script 1

Journal 06  
03.01.2025

I recreate a physical model into a grasshopper script.

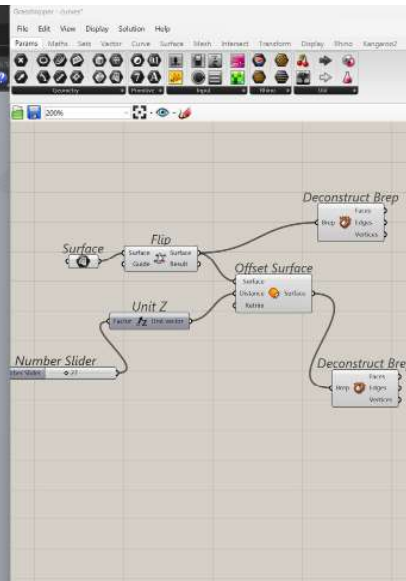
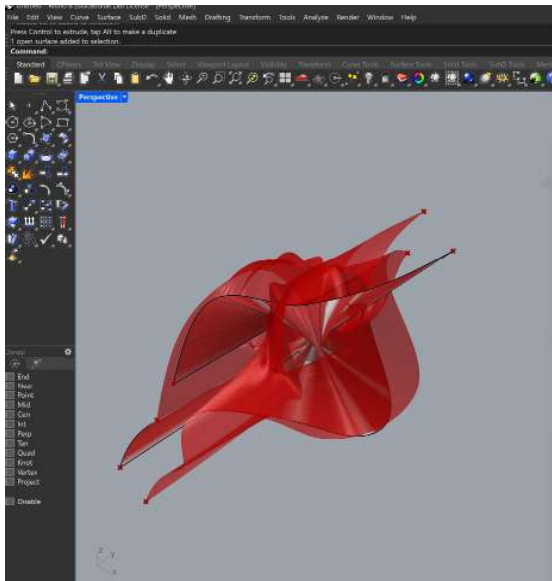




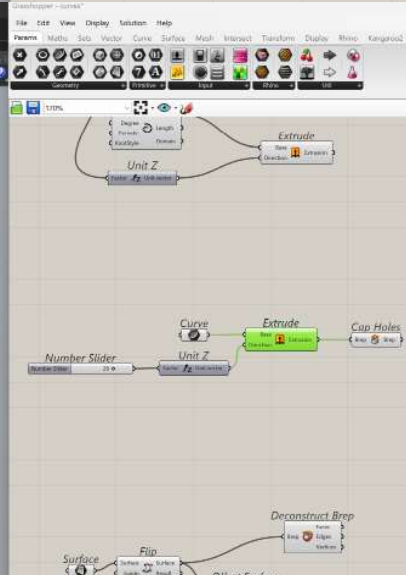
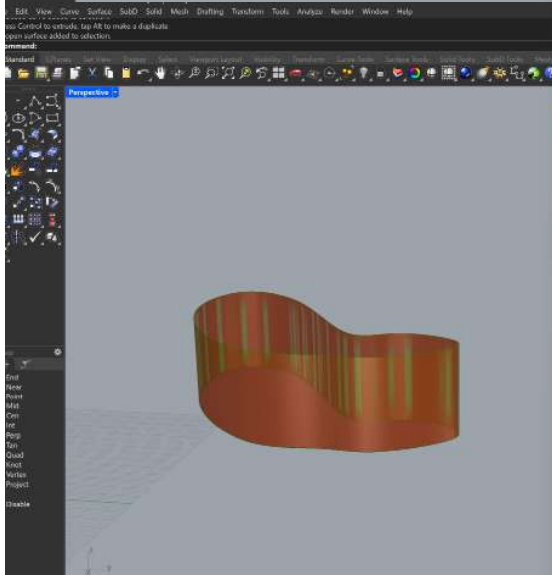
# Grasshopper Script 2

Journal 06  
03.01.2025

I watched a YouTube video to create this formation.



Lofted two curves and then offset the surfaces.

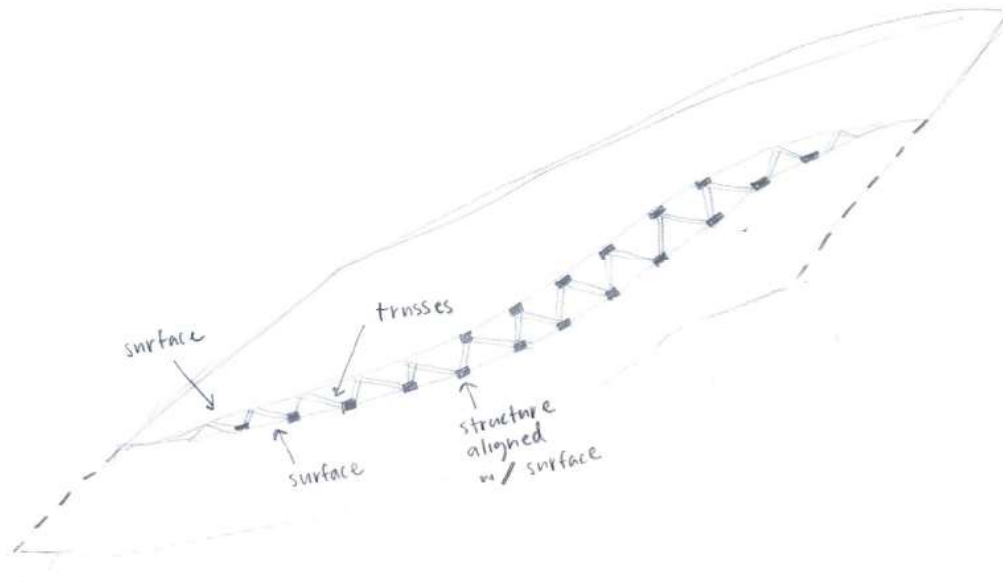


Created a curved shape and then extruded and capped.

# In-Depth Sketch& Inspo

Journal 07  
03.07.2025

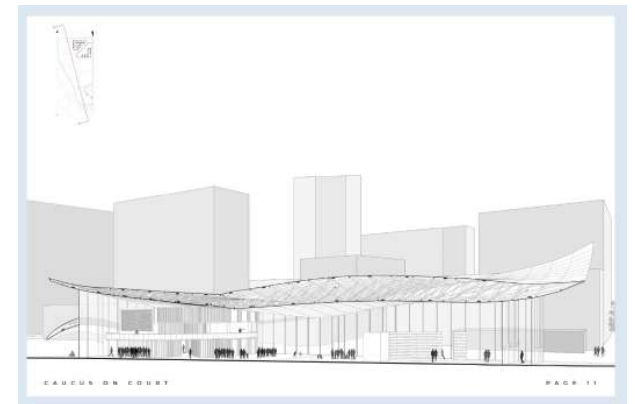
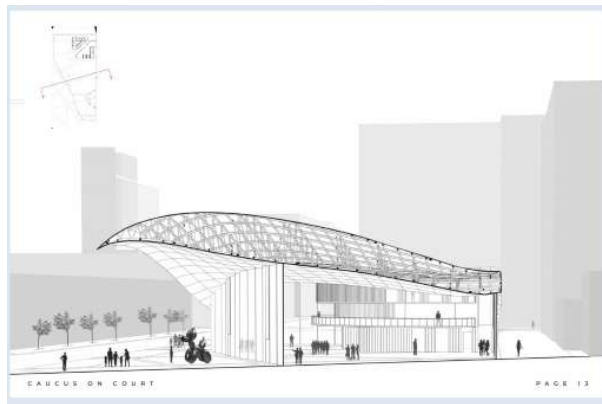
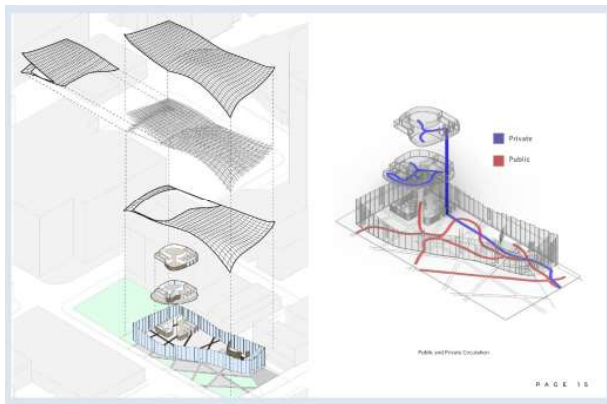
More in-depth sketch of structure for my climbing retreat micro-home. There will be 2 surfaces somehow connected and then small bendy beams that connect to these surfaces and then there will be trusses criss-crossing inside.



How would this realistically get built?

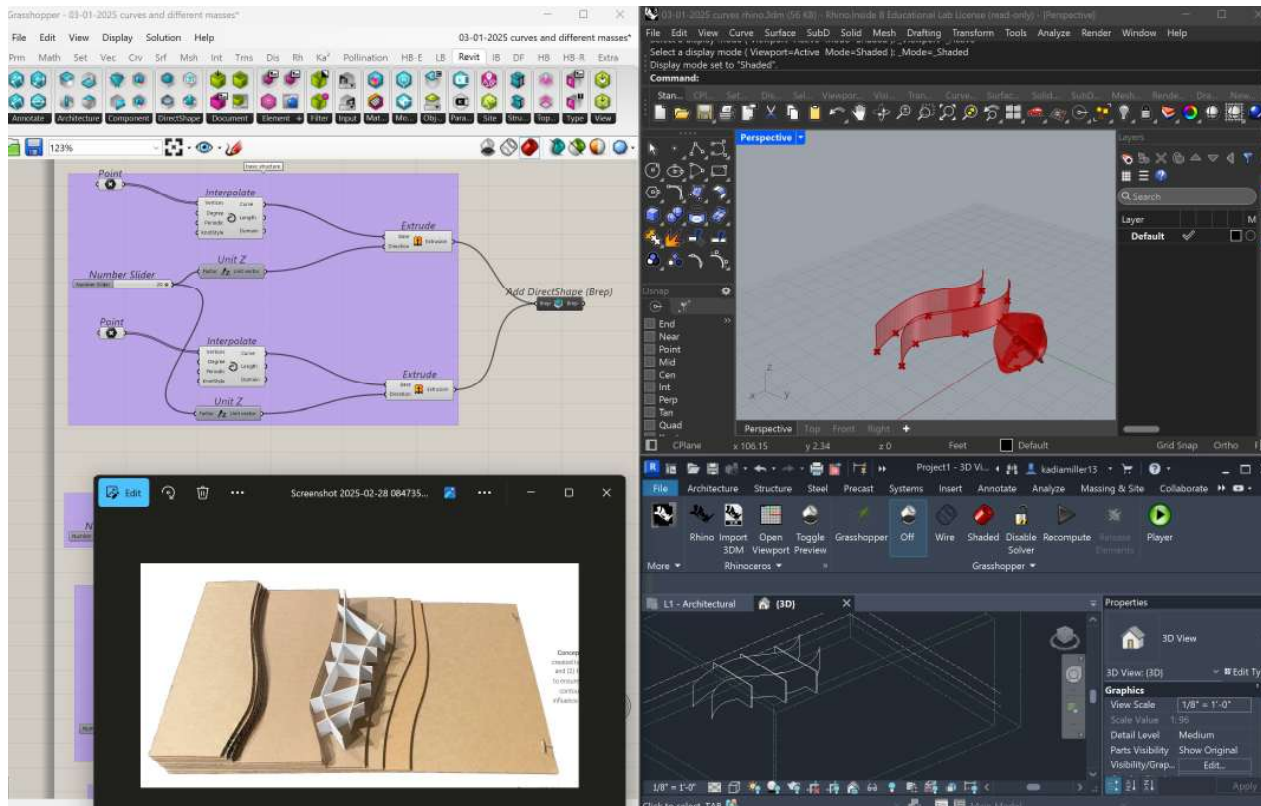
I think you would start with lining the beams up with the columns because that will transfer the weight down. The columns will all be set at different heights to create the curve shape. Then the "criss-cross" trusses will be welded (metal) or connected (wood) then there would be more beams for the top surface. Then a light-weight skin would be attached.

Eventually, it would be cool to create construction documents for something like this.



# Rhino Inside Iteration 1

Journal 07  
03.07.2025

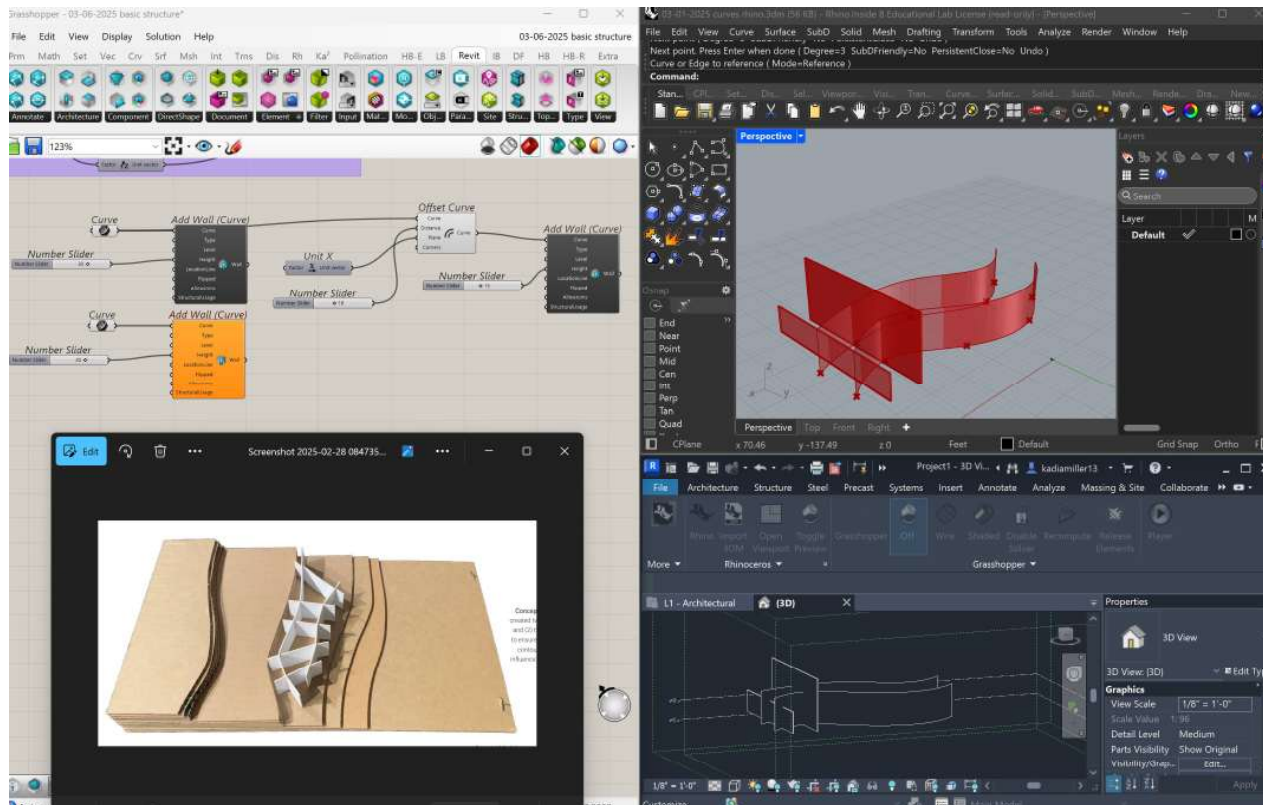


This is two surfaces connected by intersecting structures just like my sketch but just turned on it's side.

I started by extruding two curves and then added "directshape brep" to get the shape from grasshopper into revit.

# Rhino Inside Iteration 2

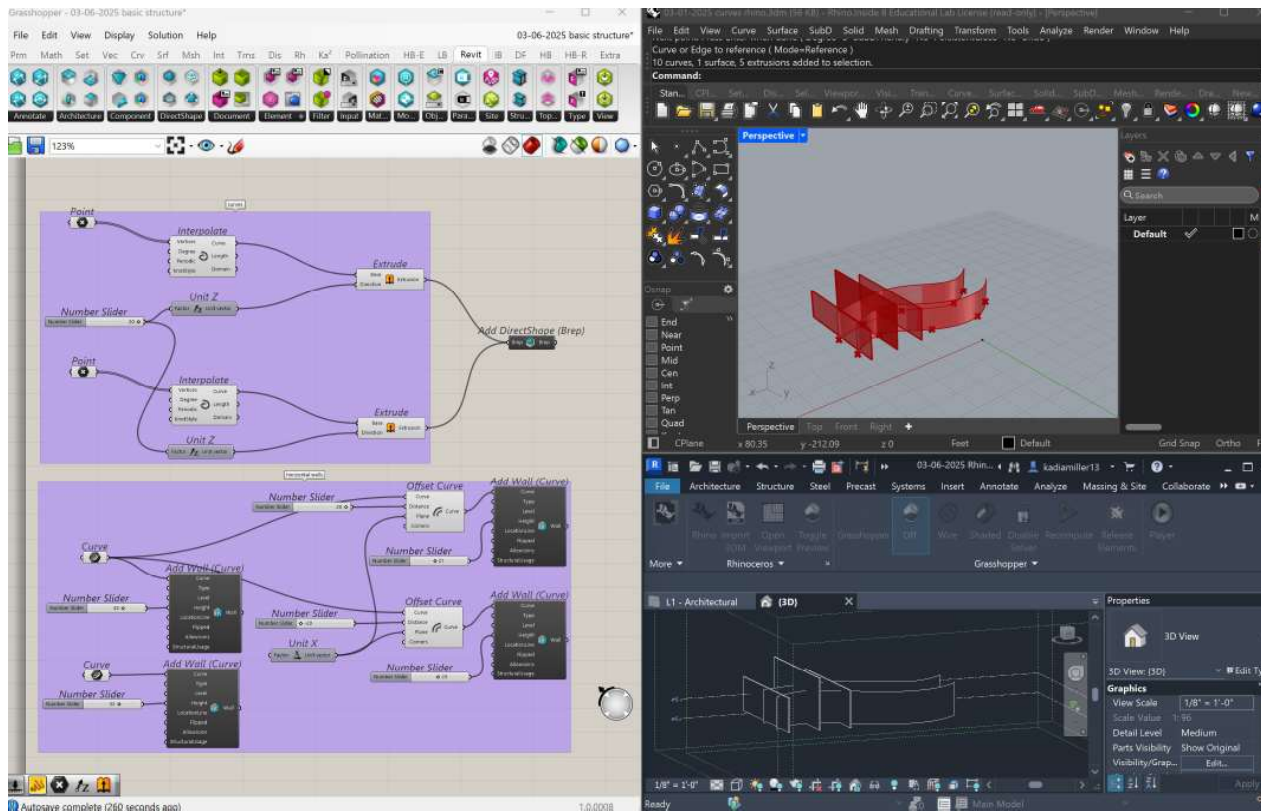
Journal 07  
03.07.2025



Next, to add the connections between the two curves I used “add wall (curve)” and then offset them so then I was able to control the offset distance and the height.

# Rhino Inside Iteration 3

Journal 07  
03.07.2025



The top set of code is the two outer curves and the bottom set of code is the walls.