

Assignment 1: Parametric Sketching

Object 1: Birdhouse

Reflection

Purpose:

The intent of this design is very straightforward, a birdhouse attached to a telephone pole. However, I believe that this can explore the detail of the possibilities of another parametric system. This system creates invitation to an otherwise uninvitational space, and is the begining of a branch to a parametric system. The initial idea

Time Shifts

The initial idea of this branch was to examine the shape of the object and its major parts. As we dive into larger time, we start to see more detail about the object, and explore what exactly we see. We start to see more 3 dimensional aspects along with more detail about the object, exploring its shape and how it is put together.

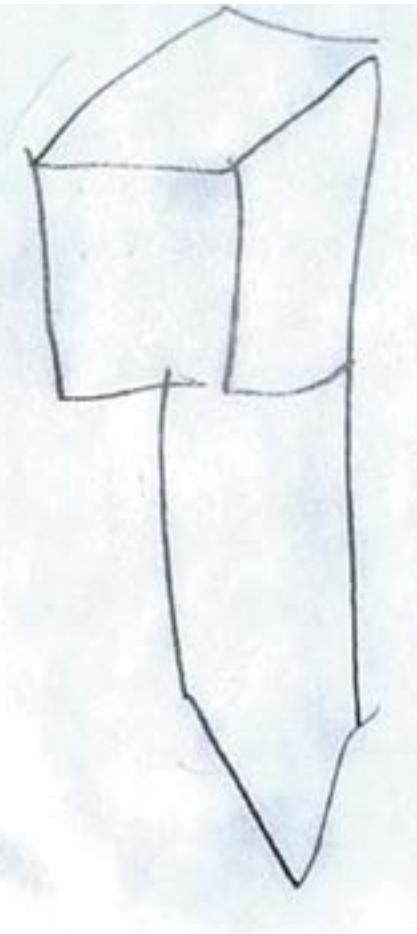
Parametric Thinking

The different stages of time explore shape, 3D, and detail and purpose. These aspects can become pertinent to exploring branches of a parametric design, I.E a small part of a design and its function and purpose.



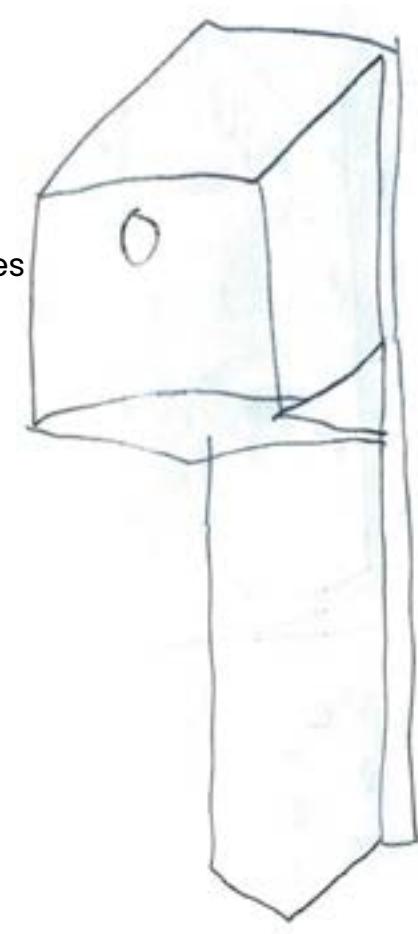
5 Second Sketch

Initial Impression of the object



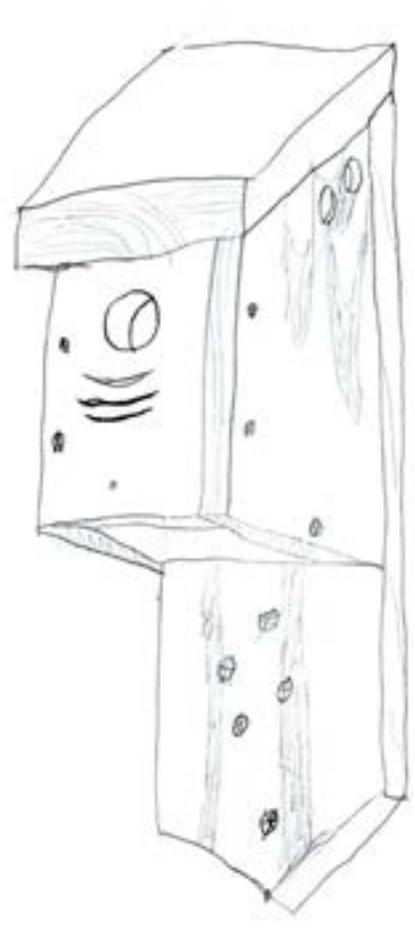
1 Minute Sketch

A rapid sketch of the object to asses the properties of the object



10 Minute Sketch

A explorative interpretation of the object, including the features of what makes up up the detail.



Object 2: Construction Crate

Reflection

Purpose:

The intent of this design slightly more complex than the last, due to the fact that that it contains more objects within the framework. I wanted to explore a system with many different aspects and how those aspects create a parametric design.

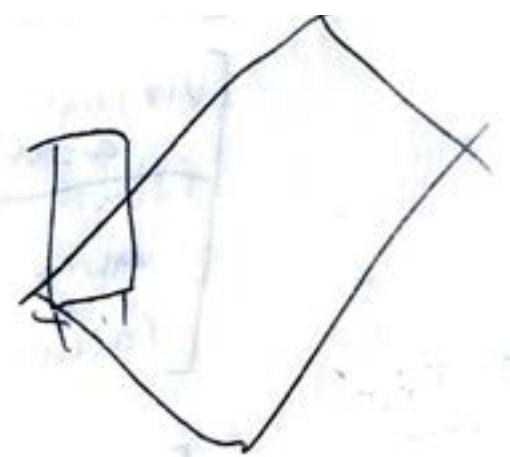


Time Shifts

The initial ideas were to include the most physical objects to understand how the plastic correlated to all of those objects. The initial impressions were the bricks and the crate, but then I evaluated how the plastic morphed in relation to those objects.

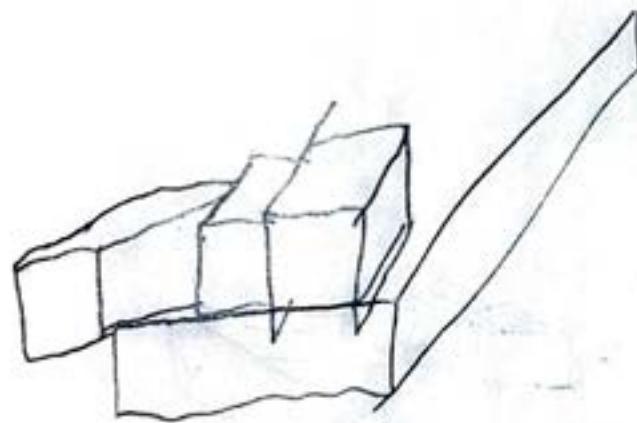
5 Second Sketch

Initial Impression of the object



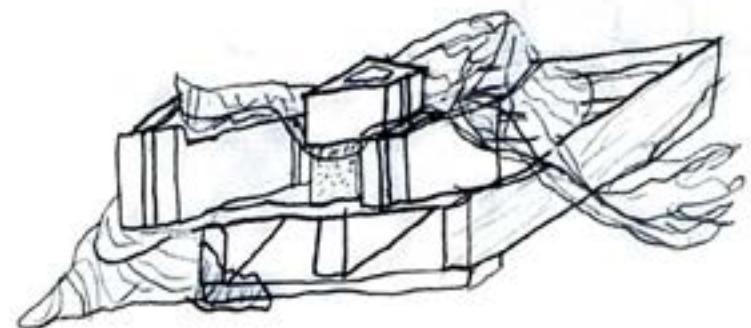
1 Minute Sketch

A rapid sketch of the object to assess the properties of the object



10 Minute Sketch

A explorative interpretation of the object, including the features of what makes up up the detail.



Parametric Thinking

This system is based on different objects coming together to create a unique parametric design. The objects are random and not organized, and yet creates a sense of uniformity with the plastic tarp and covering.

Object 3: Tree Group

Reflection

Purpose:

The intent of this sketch was to analyze a complete tree system that seemed to be random, yet a complete form. This idea was to explore a system that had combined the ideas of Objects 1 and 2, and created a parametric system that had its own branches and details

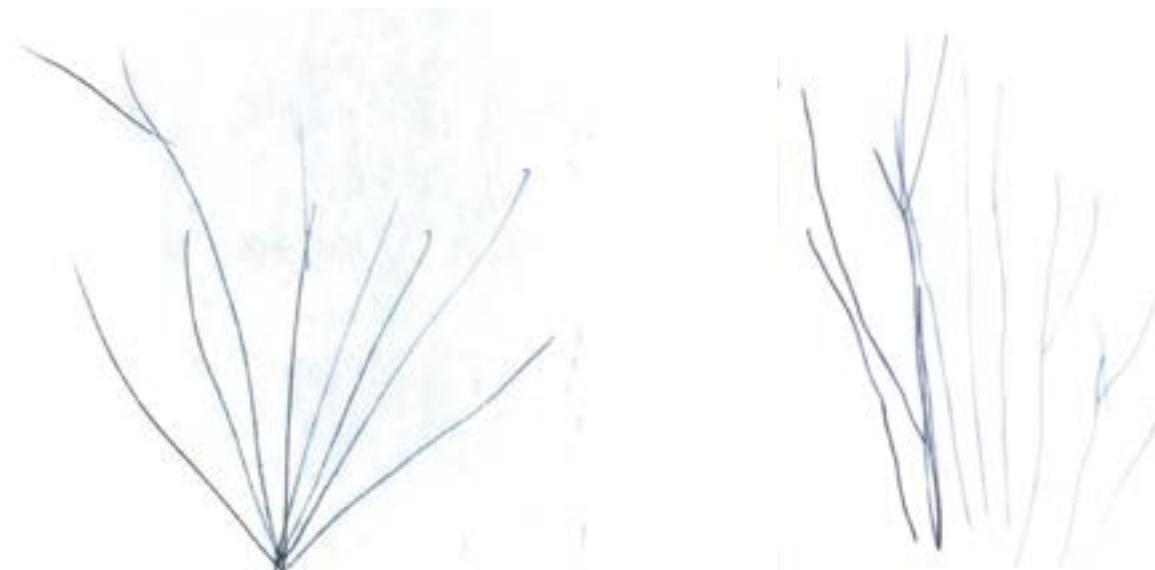


Time Shifts

The initial interpretation was to explore the many types of systems that all seemed to integrate together. I eventually got to more detail about the branches of the system and then gave them form after drawing interpretation.

5 Second Sketch

Initial Impression of the object



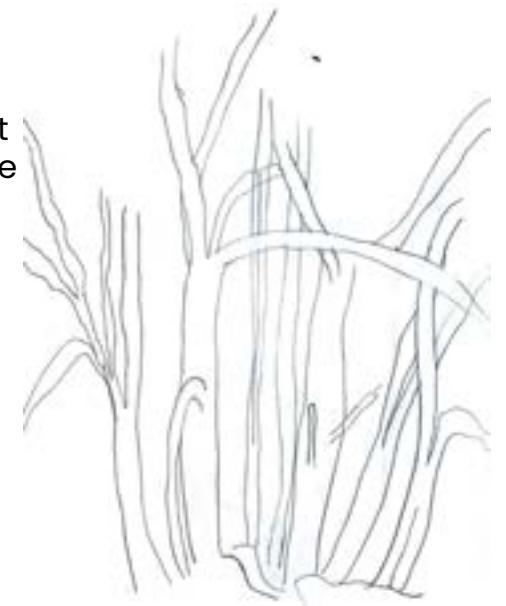
1 Minute Sketch

A rapid sketch of the object to assess the properties of the object



10 Minute Sketch

A explorative interpretation of the object, including the features of what makes up up the detail.

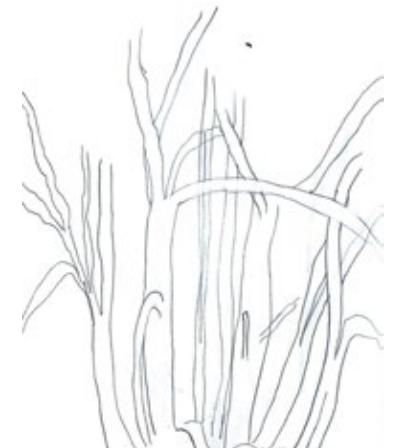
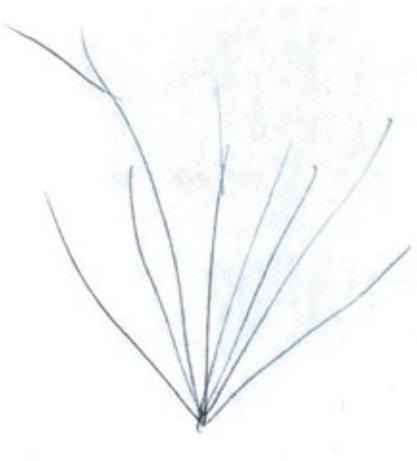
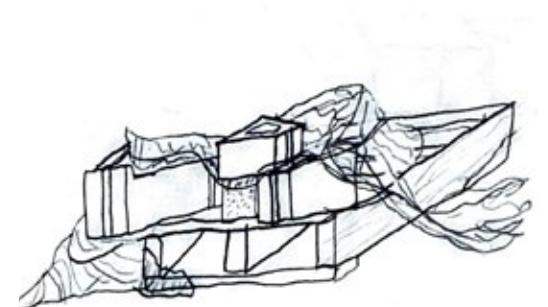
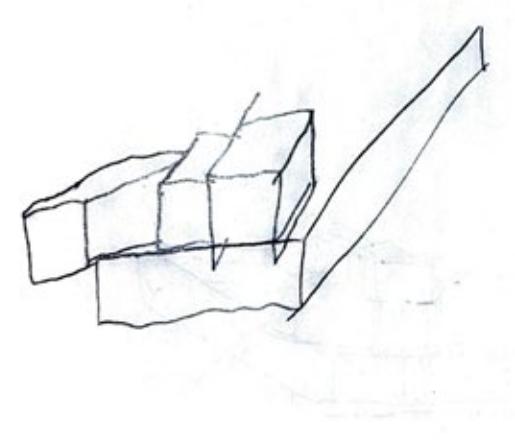
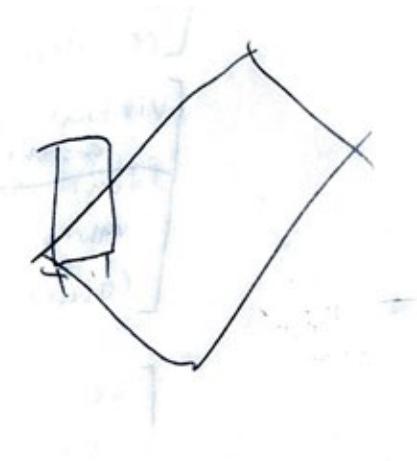
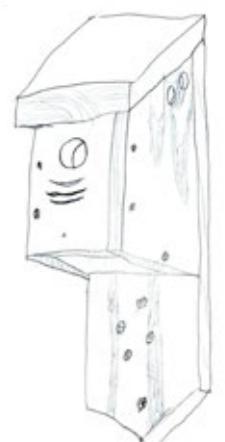
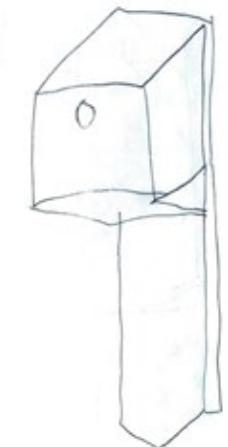
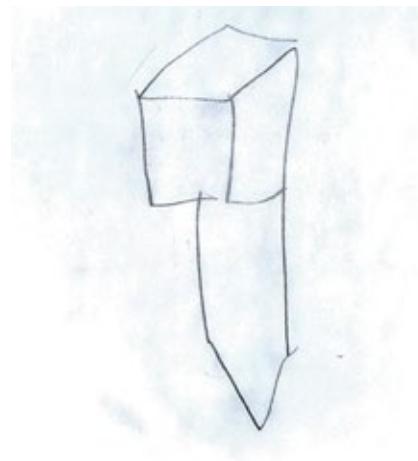


Parametric Thinking

This system explores the complete idea of an almost random geometry set, but a developed design that integrates all types of random variability. Ultimately the goal of this was to see the end goal of the parametric design.

Assignment 1: Reflection

After this assignment was completed, ultimately I wish that I had done more parametric and abstract objects found in nature. I started to get into it with the root system an the abstract ways that it grows out. Perhaps I could expand my reach farther into nature. Traditionally I look into repetitive patterns and do not look into non-repetitive patterns. For the future I want to look into weird patterns beyond my interests and how those can translate into ideas in term of design



Assignment 2: Linking Software

Parametric Modeling: Perforated Metal Panel

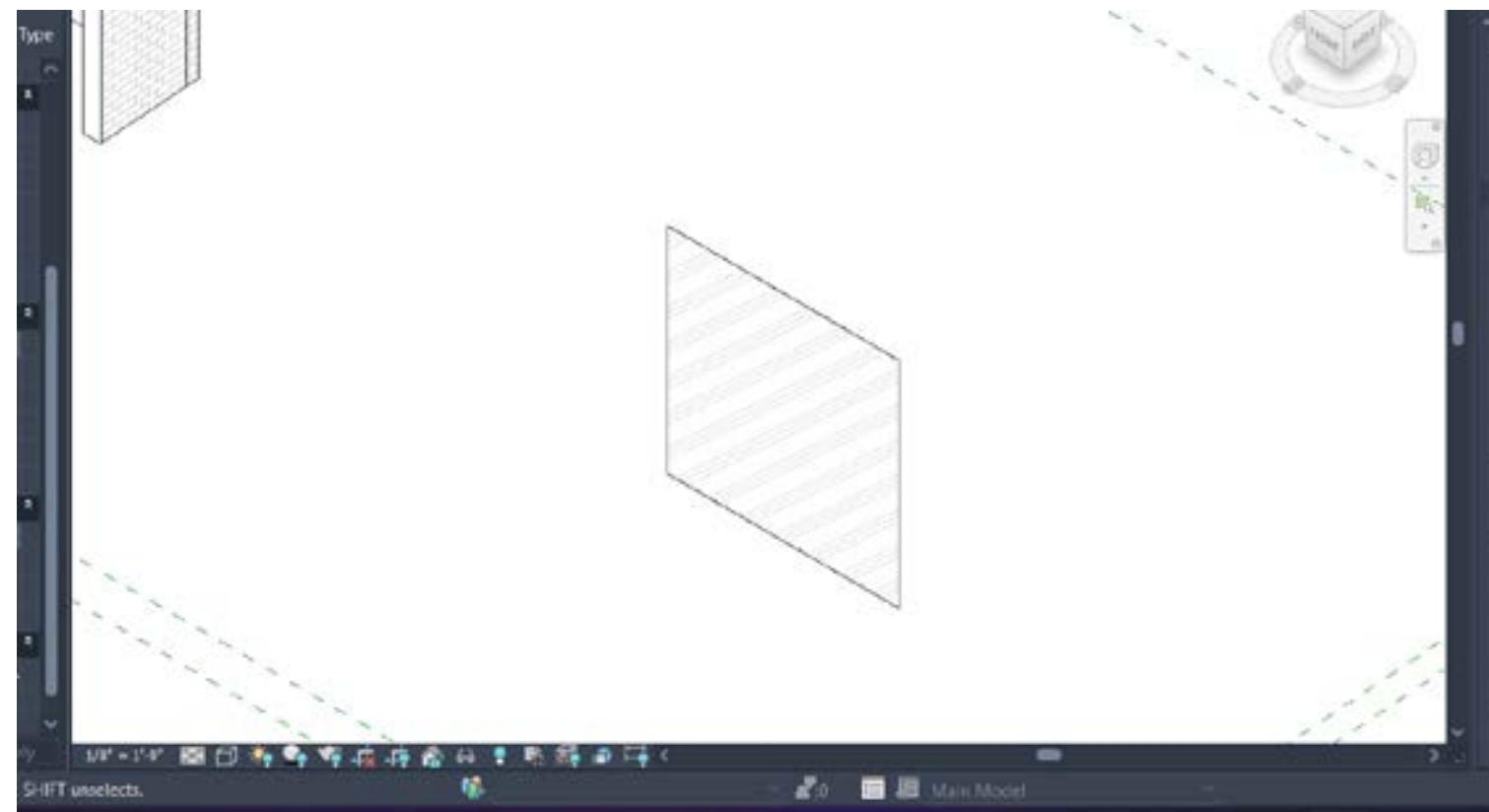
Thinking Process

Idea

Create a wall in revit that can create a perforated surface that will show up without having to see it in a realistic view or a rendering software. The idea is to be able to show the walls in elevation/ section.

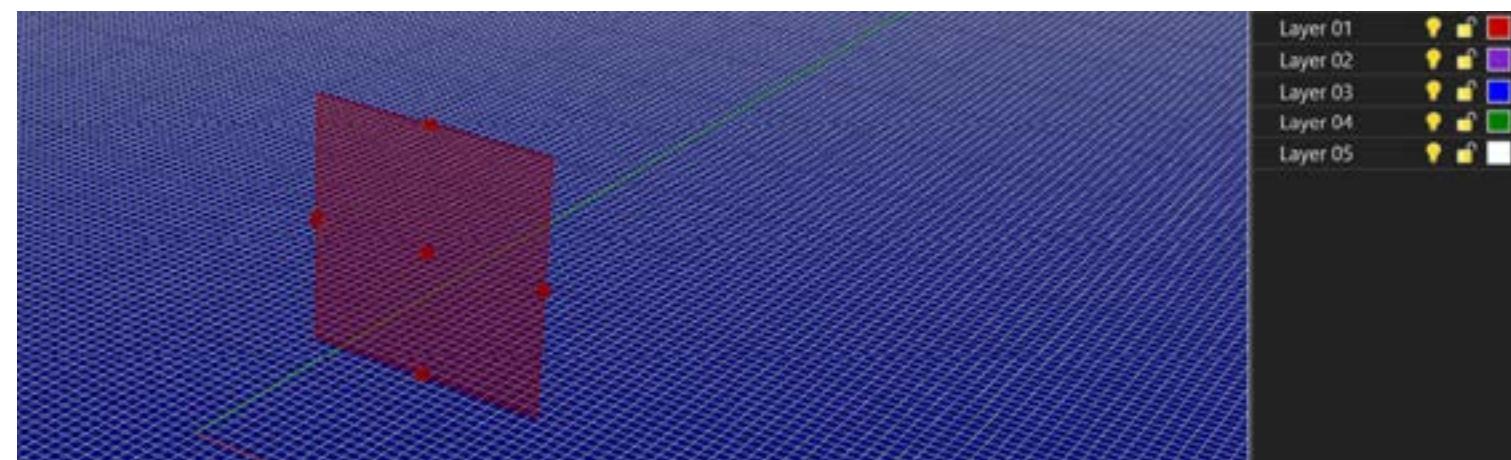
Thought process

For the walls to appear the way I wanted them to. I had to work backwards and realize that I needed the wall profile to show all the holes that I was interested in seeing. I would take an existing wall profile that I want the boundary of the wall to look like. Then I would divide that surface to create the holes. Then add a shape to those holes to cut out of the wall.



Part 1:

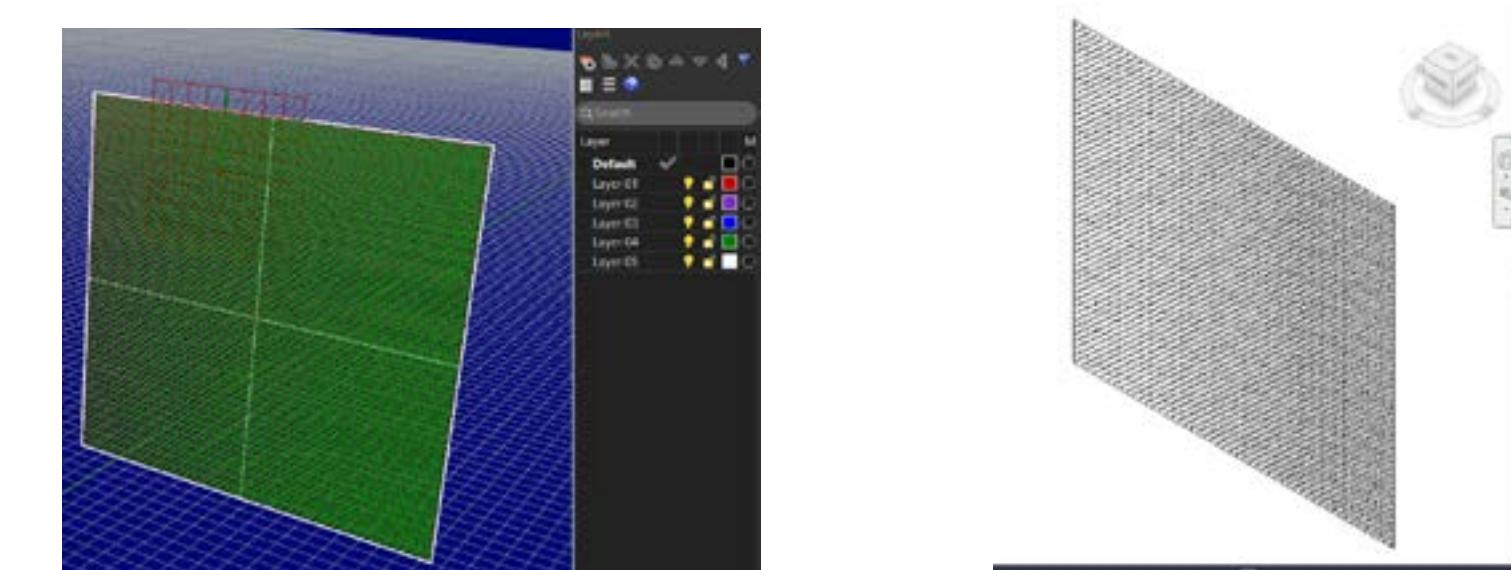
- Step 1: Create wall in revit
- Step 2: Shape profile to what you want wall to look like
- Step 3: Open Rhino Inside Revit then Grasshopper
- Step 4: Apply wall as geographical element in script to attain profile
- Step 5: Bake profile surface



Part 2:

- Step 1: Divide wall with points
- Step 2: Remove outside points (nothing will be cut through them)
- Step 3: Add text (if desired) and separate points inside of curve from outside
- Step 4: Orange gradient and reshape cutouts

Step 5: Bake profile surface

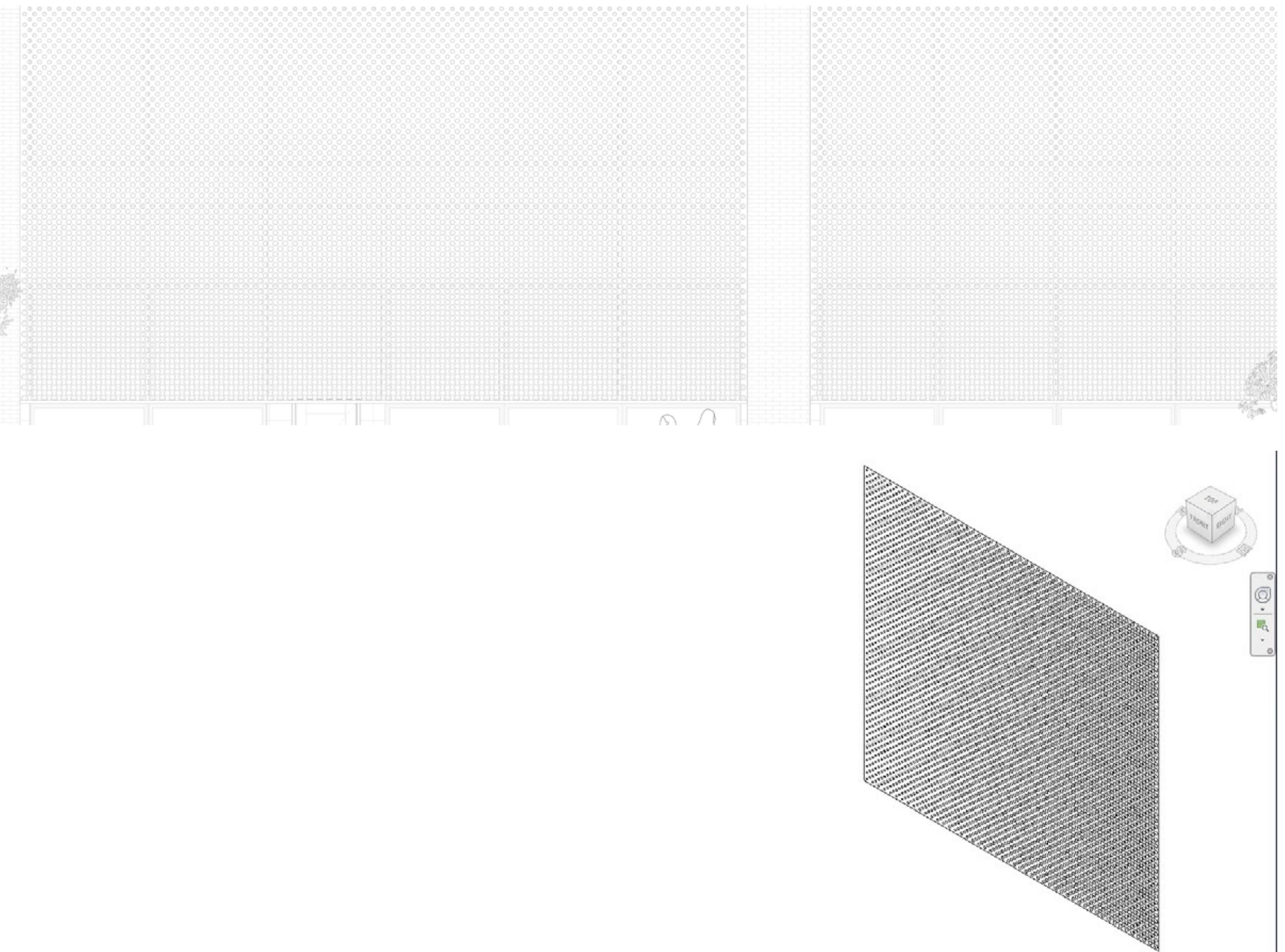


Part 3:

- Step 1: Use surface pattern as profile for wall
- Step 2: apply wall type to wall pattern.
- Step 3: Bake as revit wall

Assignment 2: Reflection

It was my goal for this project to create something that was helpful to the development of my project. I thought that it would be cool to have a grasshopper script that could cut out holes out of a revit wall for me without having to do it myself. Ultimately I think that the idea of the parametric design was not as abstract as it could have been. I do wish that I had an idea that lead to something different and more unique. That being said, I do quite like the perforated panel that I created, as it was not just cutouts on a plane but rather a varied size of polygons on a plane with a possible condition to create a design.



Assignment 3: Digital Model

Parametric Modeling: Perforated Metal Panel

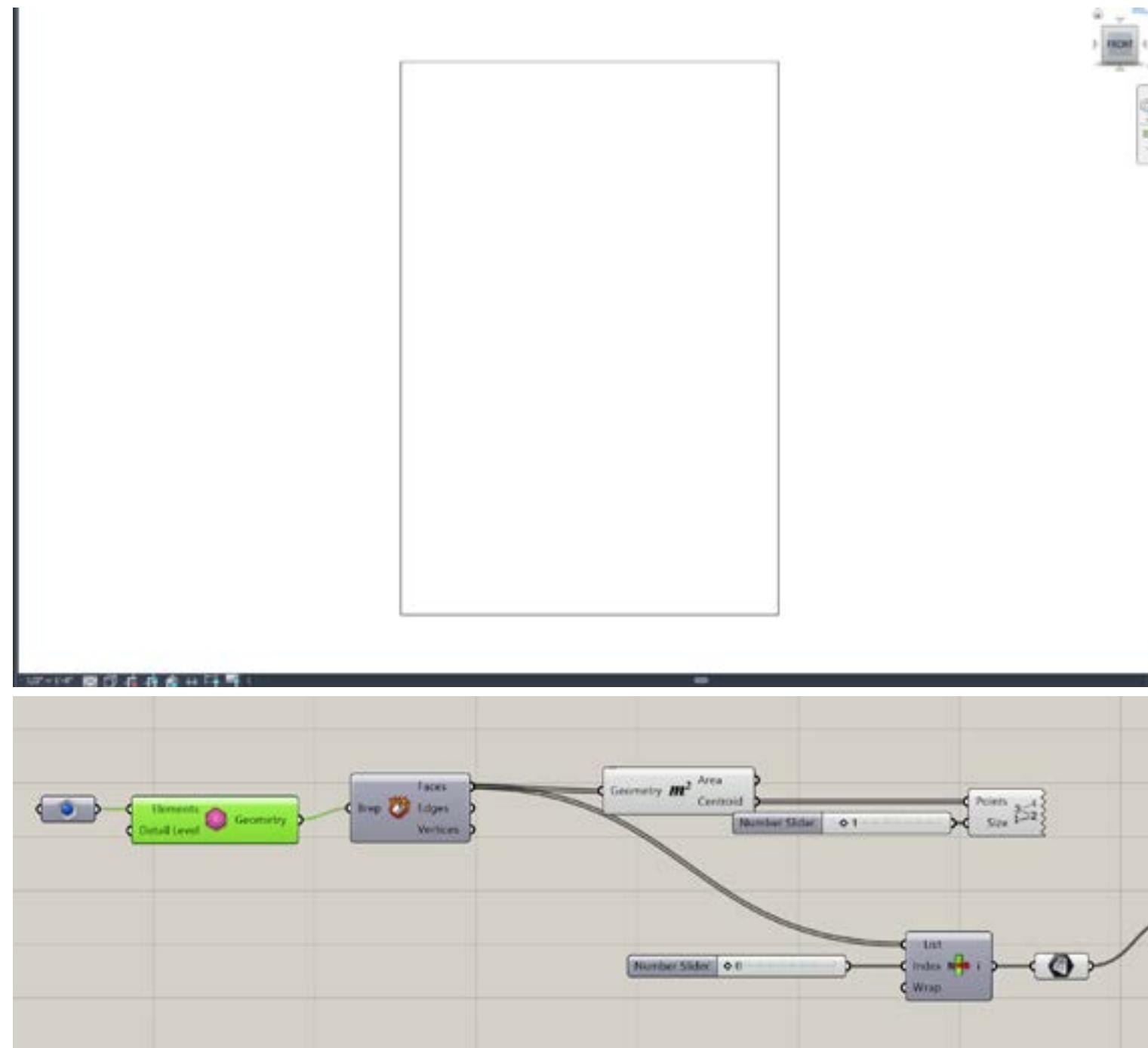
Thinking Process

Idea

Create an element in revit that can become a perforated surface that will be able to be see through without using revit material properties.

Thought process

For the walls to appear the way I wanted them to. I had to work backwards and realize that I needed the wall profile to show all the holes that I was interested in seeing. I would take an existing wall profile that I want the boundary of the wall to look like. Then I would divide that surface to create the holes. Then add a shape to those holes to cut out of the wall.



Part 1:

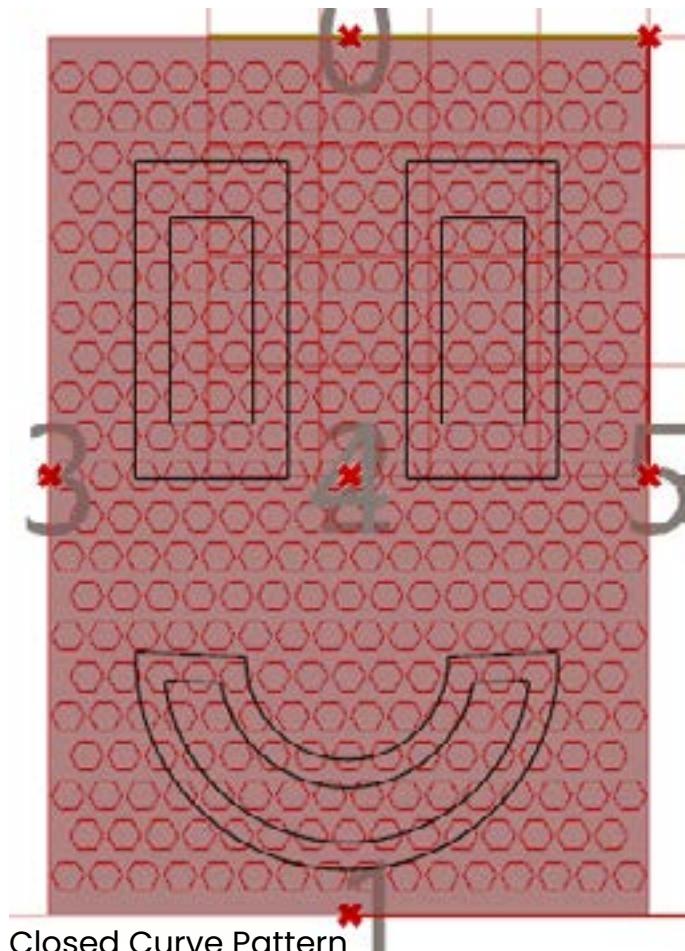
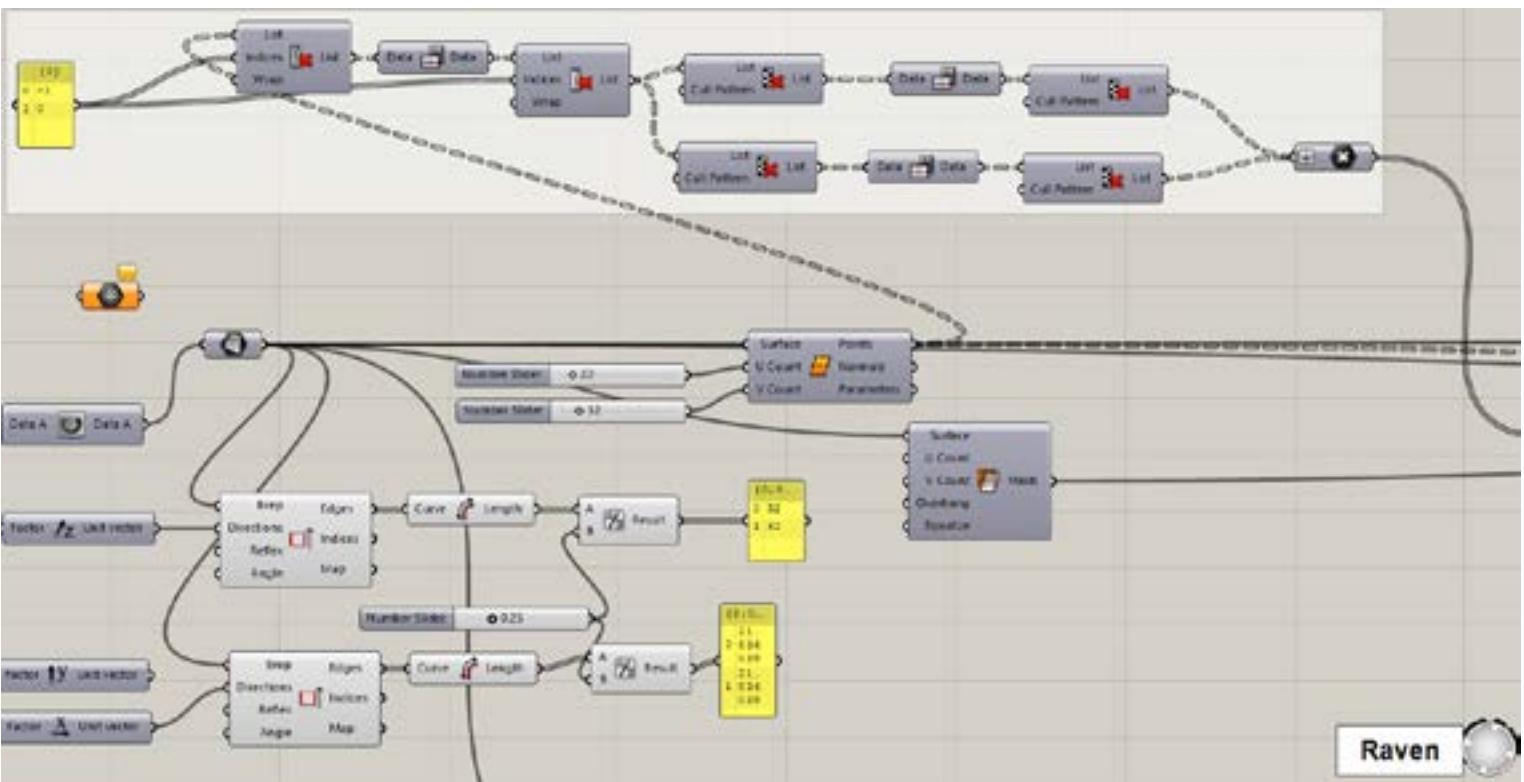
Create planar graphical element in Revit that you want to perforate. Using either a wall or a roof for element creation

Part 2:

The grasshopper script is meant to take the element gathered and separate the faces to isolate the face of the wall which acts as the profile surface as the wall.

Part 3:

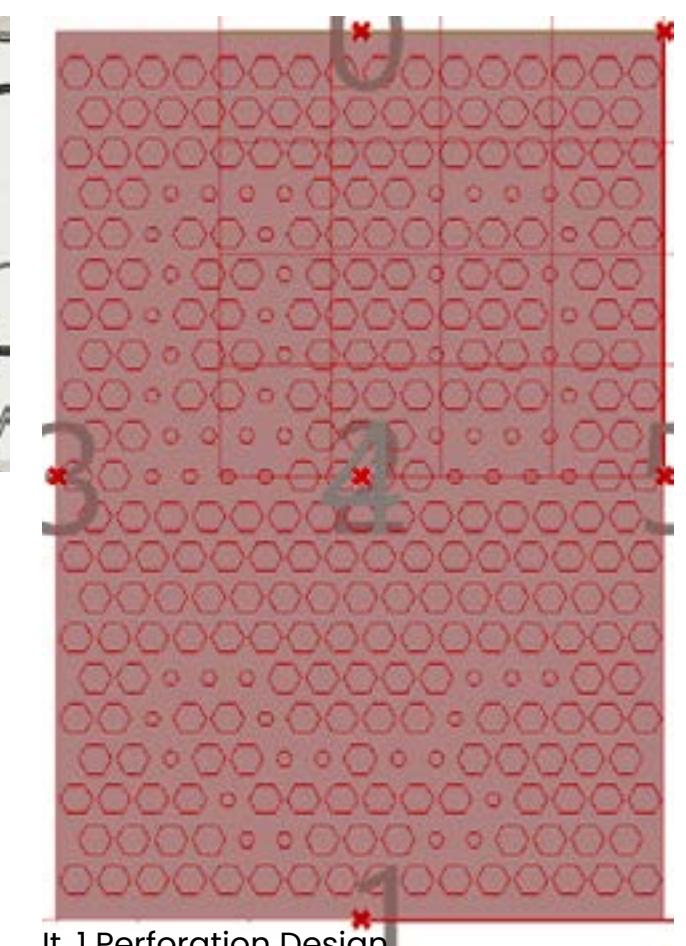
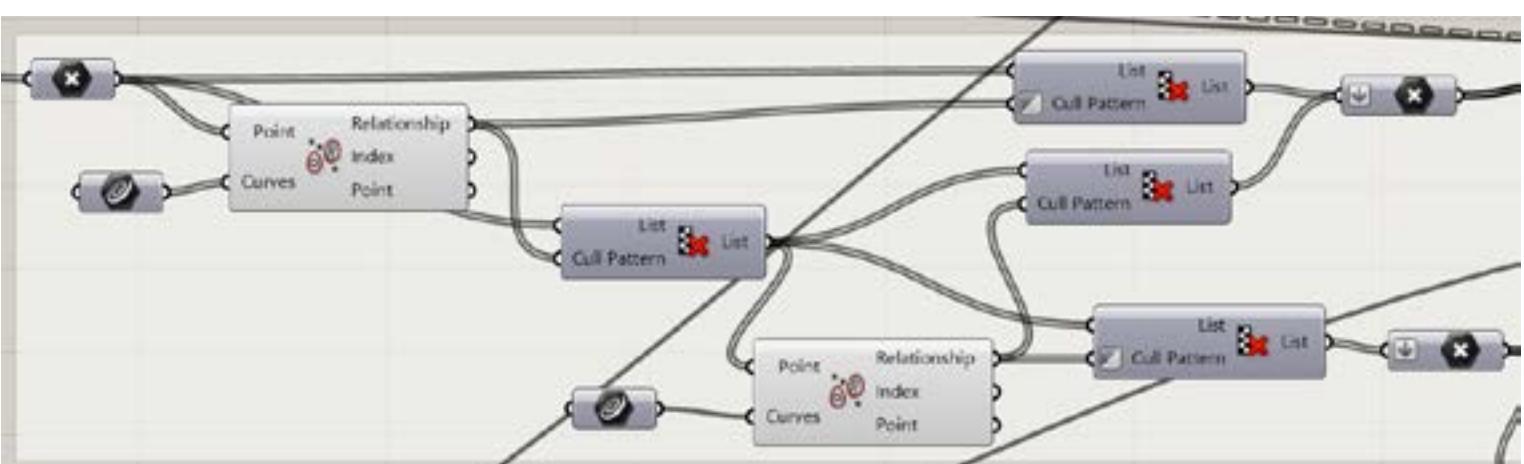
After acquiring the surface, it is broken down to gather distances of the perimeter, which can then be used to determine the amount of holes in the perforation. The group offsets the holes to make it a nonlinear grid.



Closed Curve Pattern

Part 4:

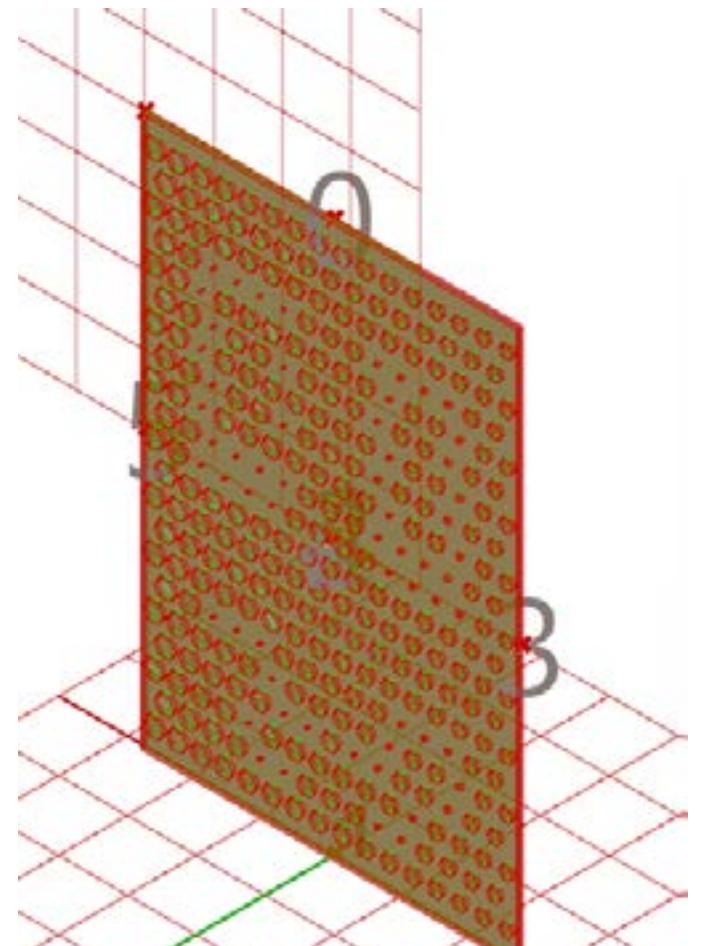
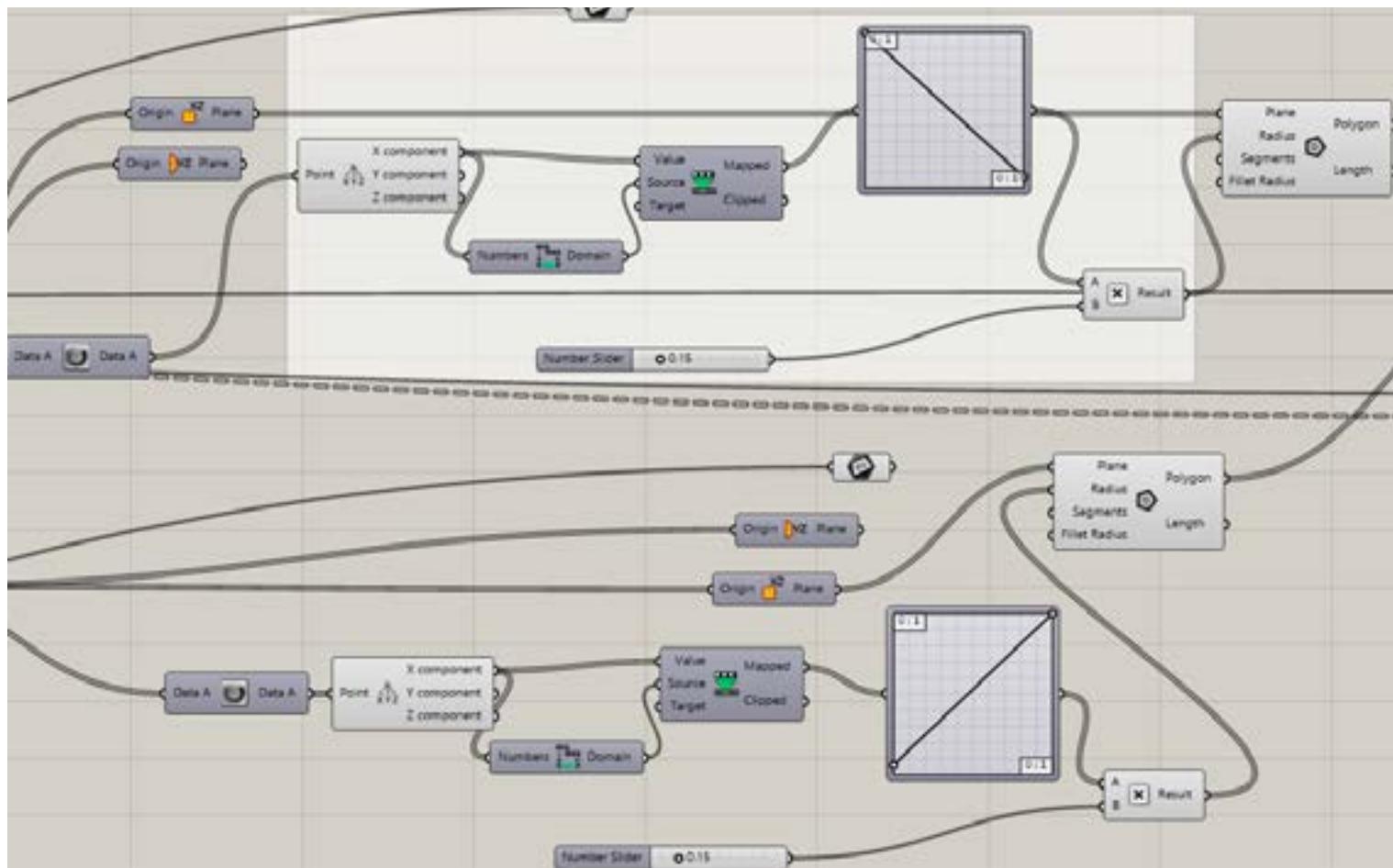
Add either text or a closed curve design that can be used as a pattern within the perforation



It. 1 Perforation Design

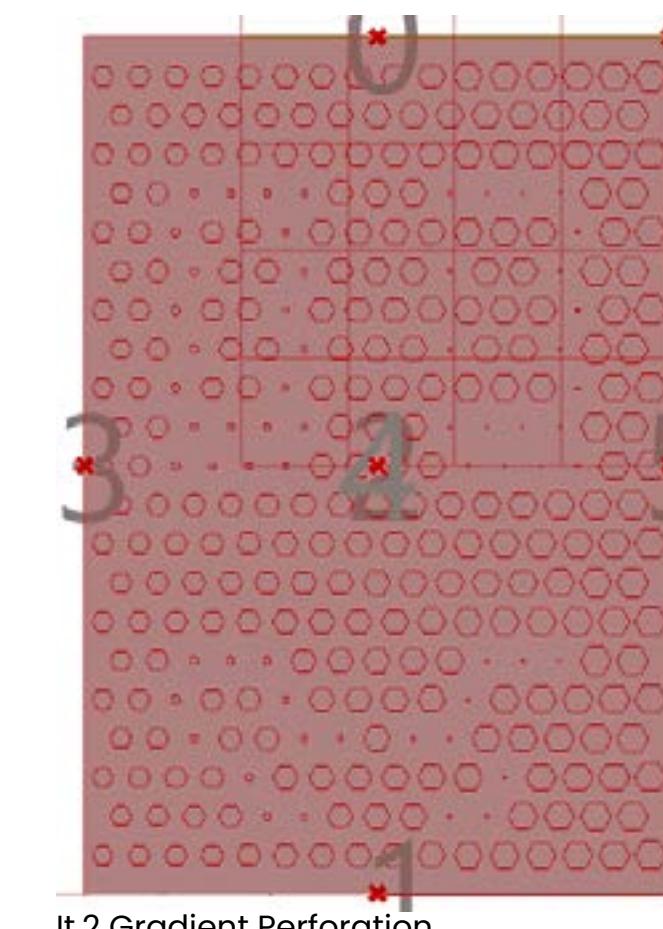
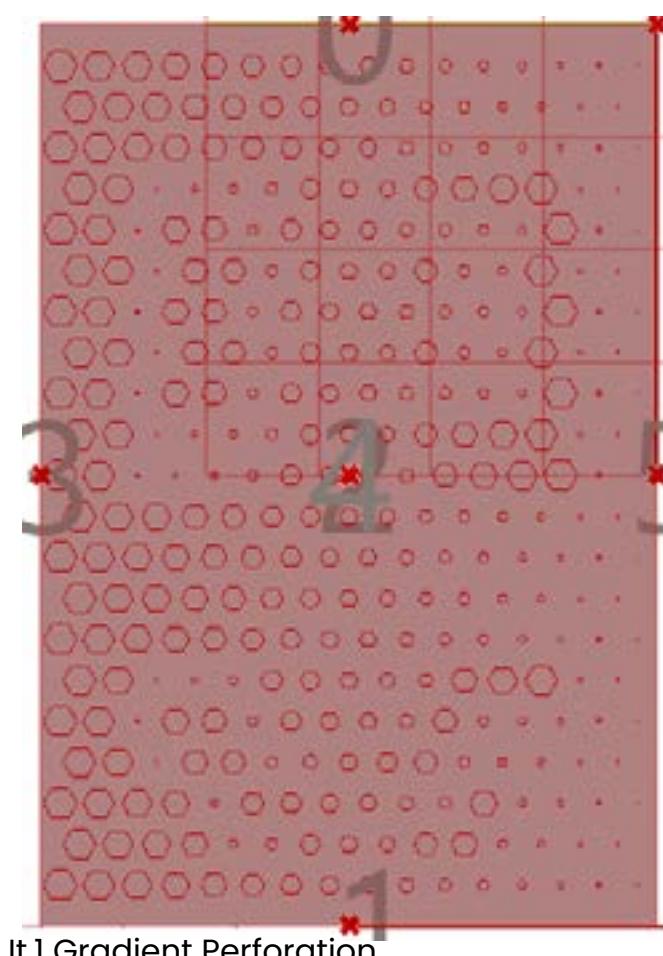
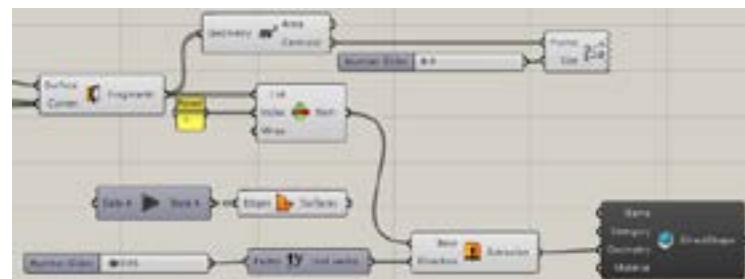
Part 5:

Once the Curve pattern has been separated, there is an option to apply a gradient perforation to the material, not only to the main detail, but the perforation within the design.



Part 6:

Acquire the initial surface and curves created from the perforation, and develop it into one surface. Extrude the surface to the depth of the wall/geometry. Then bake into revit

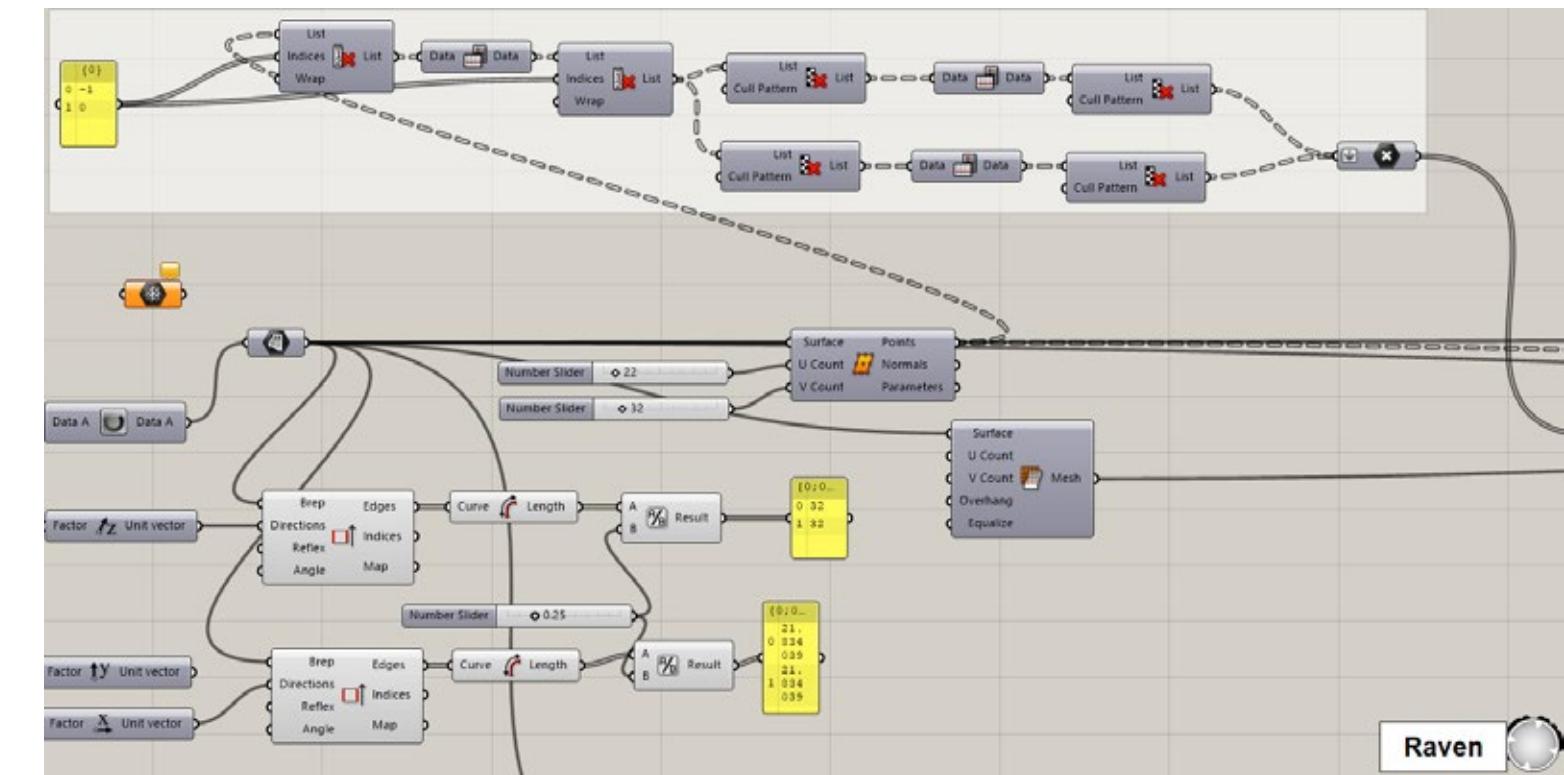
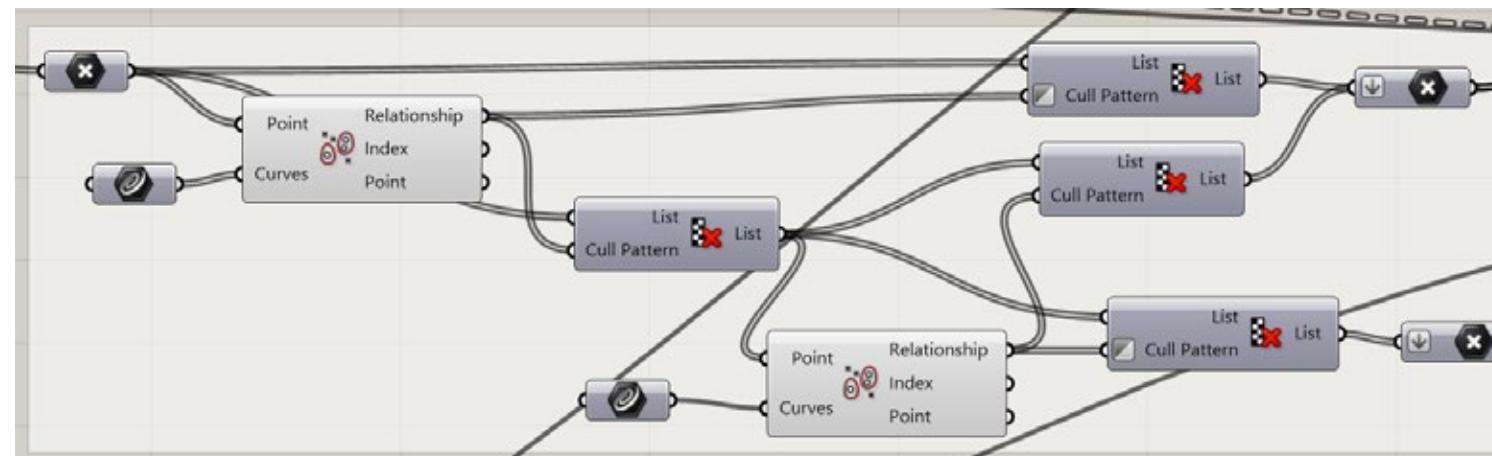
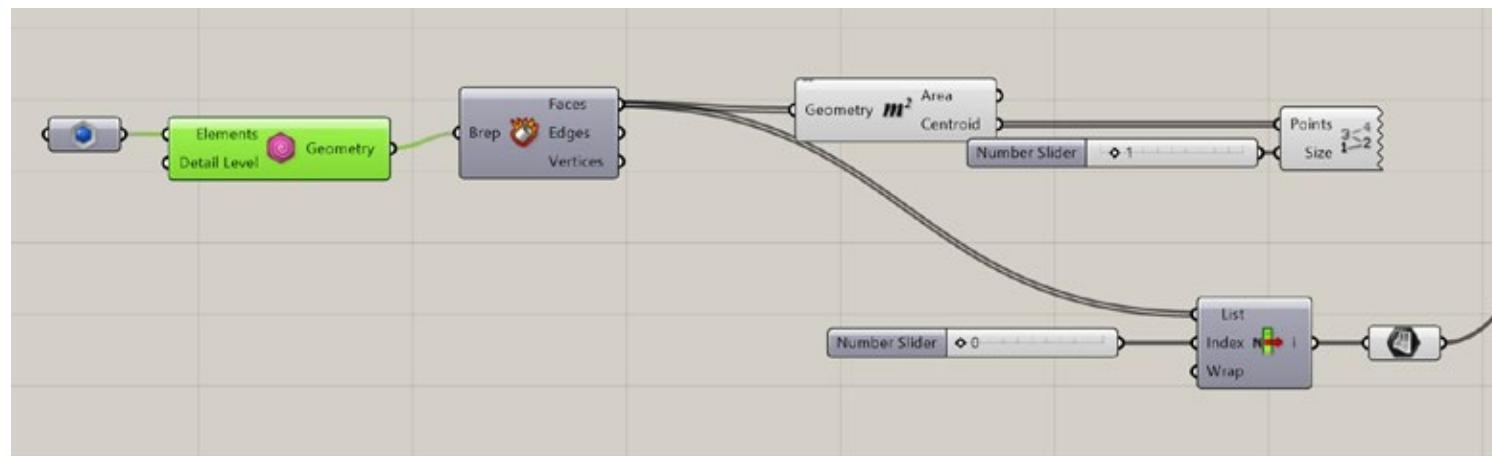


Reflection

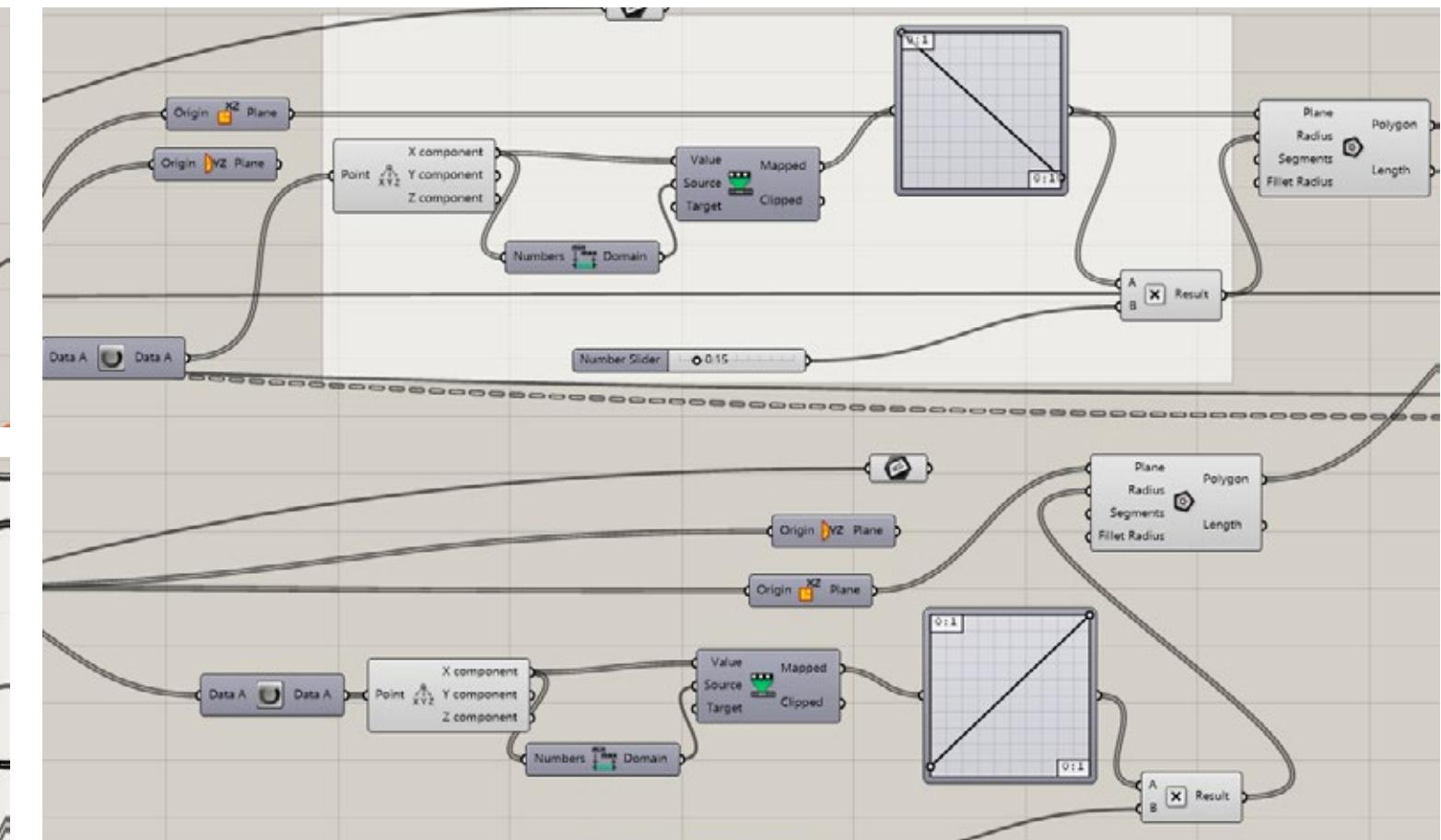
This perforated panel has informed me of what can be done with parametric design. Through this process, I could see what can be done with one line, and perhaps in the future I can expand. Possibly changing the shapes of the holes, or introducing an image to the detail for a more detailed piece of art.

Assignment 3: Reflection

I liked this project for its complexity in creating this perforated surface. Whilst it was not necessarily a great parametric design, I'd think that it allowed for some unique interpretations and unique extrapolation. I do hope that I can use this script in the future in architectural practice. Re-immersing myself into grasshopper has felt like a re-exploration of a tool that can do complex tasks simply. Ultimately in the future I would like to do abstract systems using grasshopper to enhance my design capabilities



Raven



Assignment 4: Rendering





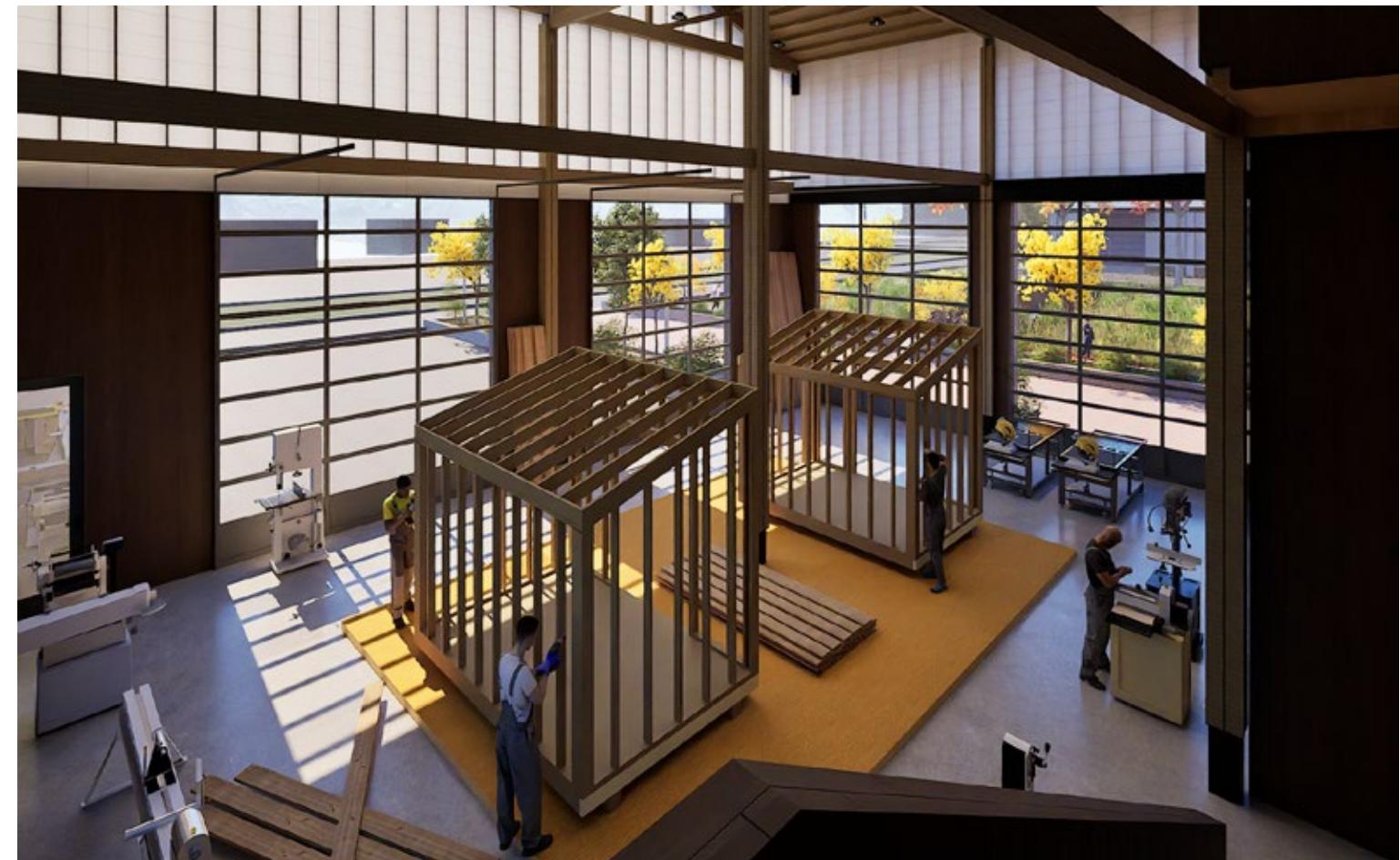


Assignment 4: Reflection

I found that using Twinmotion was a fun tool that has better implications than some other softwares that I have used for rendering. Ultimately I would like to figure out how to include clouds in the future within path tracer., I also want to include few minor additives, such as background information, and more detailed assets. Perhaps exploring rendering in Unreal Engine.



ARCH 565: Advanced Computer Systems



Resource Collection

Revit Help

Revit best practices - Bim After Dark / The Revit Kid - <https://www.bimafterdark.com/>

Revit best practices - Bim Pure - <https://www.bimpure.com/>

Addins / programming - Archi Lab - <https://archi-lab.net/>

Addins / programming - The Building Coder - <https://thebuildingcoder.typepad.com/>

3D modeling - HermanMiller - <https://www.hermanmiller.com/resources/3d-models-and-planning-tools/product-models/pc-side-chairs/>

Tutorials - <https://www.youtube.com/@balkanarchitect>

Grasshopper

Hydrashare - Pollination/Grasshopper Script - <https://hydrashare.github.io/hydra/index.html>

Parametric House - Grasshopper parametric design - <https://parametrichouse.com/>

McNeel Forum - <https://discourse.mcneel.com/c/grasshopper/2>

The Man Himself - David Rutten - <https://ieatbugsforbreakfast.wordpress.com/>

Kangaroo - Daniel Piker - <https://spacesymmetrystructure.wordpress.com/>

Parametric Design Tutorial - https://www.youtube.com/@Arch_ly

Architectural Visualization

CG Architect - <https://www.cgarchitect.com/>

Playtime - <https://www.play-time.es>

mir - <https://www.mir.no/work>

Judi Wang - <https://jeudi.wang>

KVAN1 - <https://kvant1.no>

Brick Visual - <https://brickvisual.com/#homestart>

FAB- Material Library - Epic Games Launcher>Fab library

Helpful Videos

Importance of Font - Helvetica - <https://spacesymmetrystructure.wordpress.com/>

Importance of Font! - Papyrus - <https://www.youtube.com/watch?v=jVhIJNJopOQ>

Keep design simple, elegant and timeless - Vignelli - <https://www.youtube.com/watch?v=N4Dz28mgHpo>

Be Curious! - Paper and stick - <https://www.youtube.com/watch?v=UXENKmAUL0E>

Across the pond - <https://www.youtube.com/watch?v=QWzN8BfAVfc>

Inspiration - <https://vimeo.com/7809605>

Youtube Channels

Architech Network - <https://www.youtube.com/@architech.network>

Design Cool Things - Gediminas Kirdeikis - <https://www.youtube.com/@DesignGoBrr>

Unreal Engine - William Faucher - <https://www.youtube.com/@WilliamFaucher>

Twinmotion - JohnCreation38 - <https://www.youtube.com/@johncreation38>

Rhino Help

Plugins- Rhino Add-ins - <https://www.food4rhino.com/en/app/elefront>