

# 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 beginning 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.

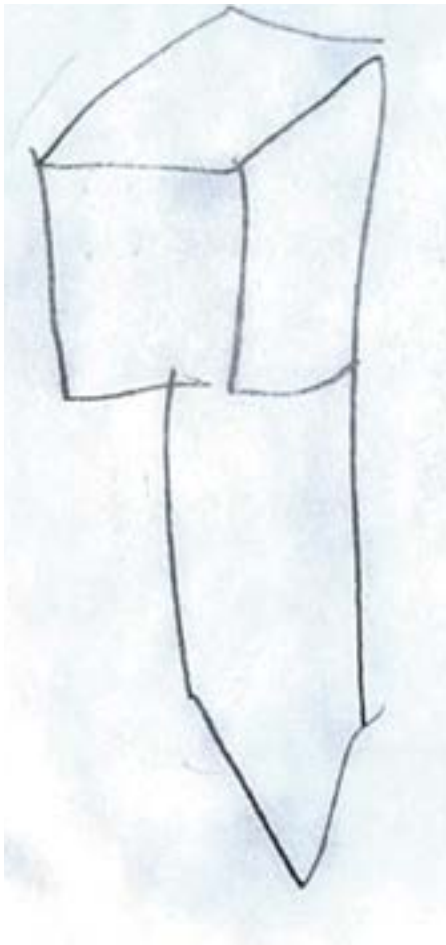
### Parametric Thinking

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.



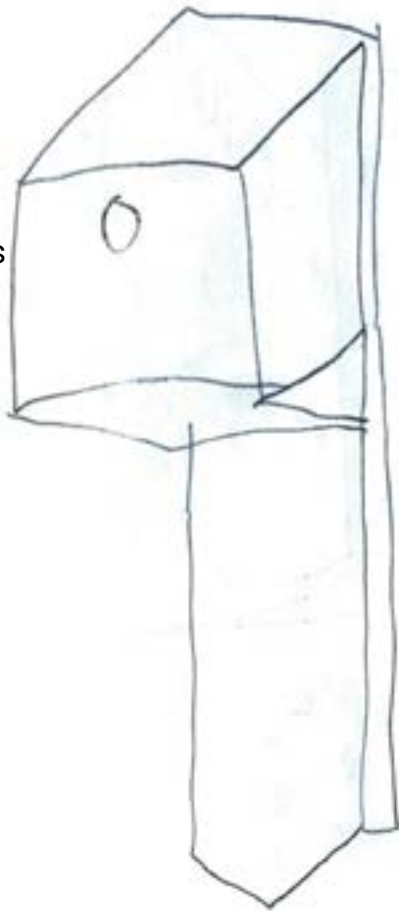
### 5 Second Sketch

Initial Impression of the object



### 1 Minute Sketch

A rapid sketch of the object to 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.





# 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.

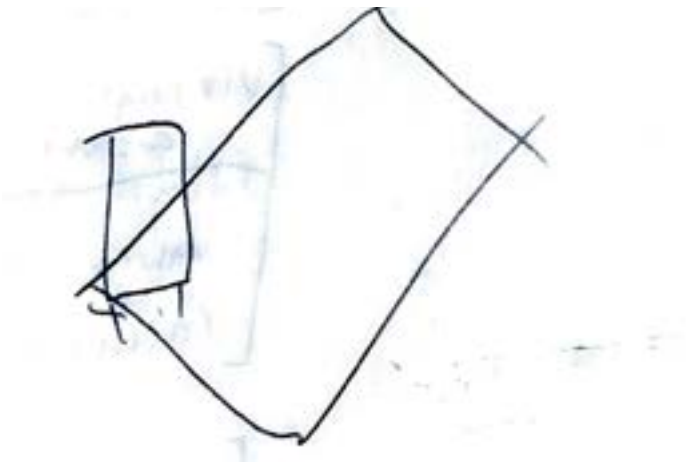
### Parametric Thinking

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.



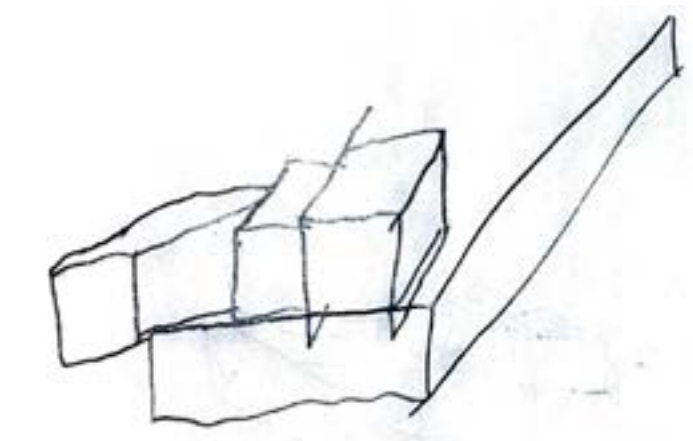
### 5 Second Sketch

Initial Impression of the object



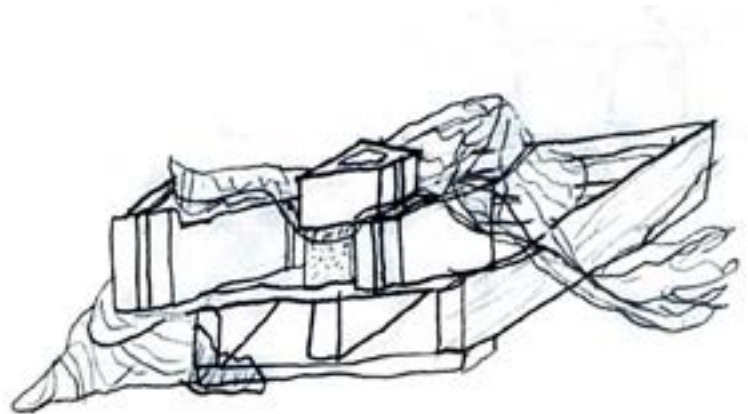
### 1 Minute Sketch

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 the detail.





# Object 3: Tree Group

## Reflection

### Purpose:

The intent of this sketch was to anylize 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 it's own branches and details

### Time Shifts

The initial interpretation was to explore the many types of sytems that all semed to integrate together. I eventualy got to more detail about the branches of the sytem and then gave them form after drawing interpretation.

### Parametric Thinking

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



## 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.



## Assignment 2: Linking Software



# Parametric Modeling: Perforated Metal Panel

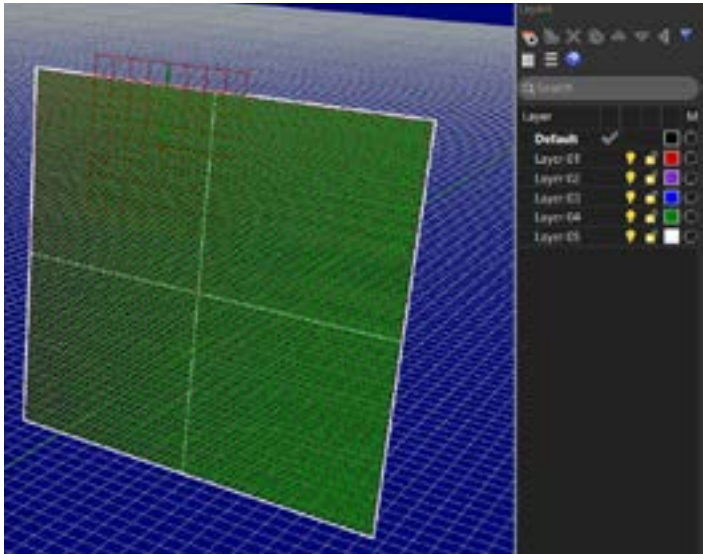
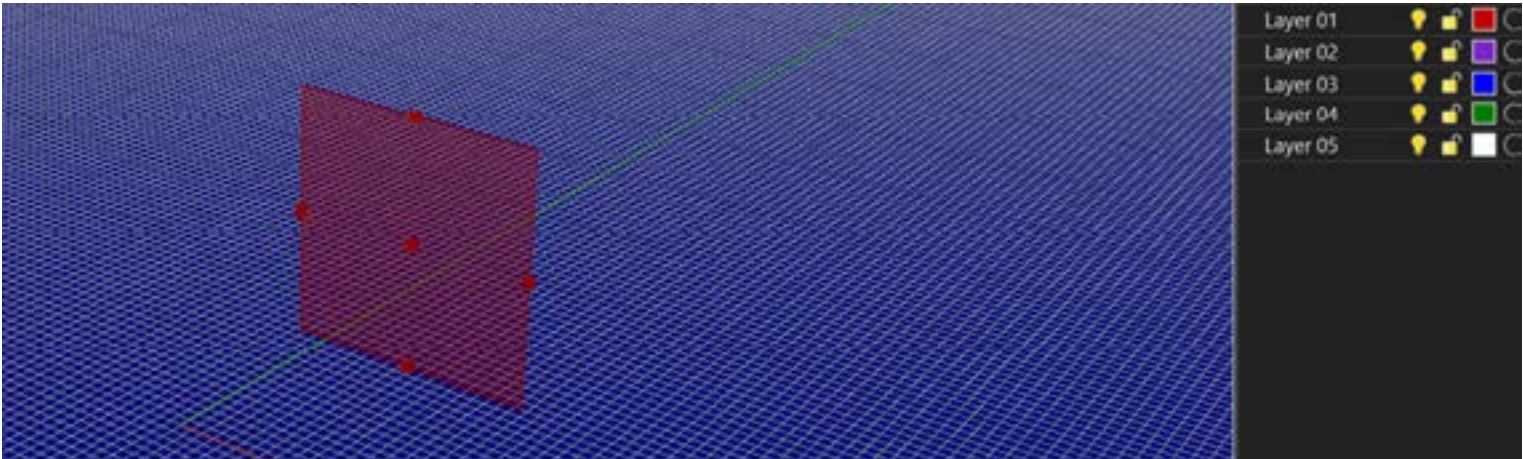
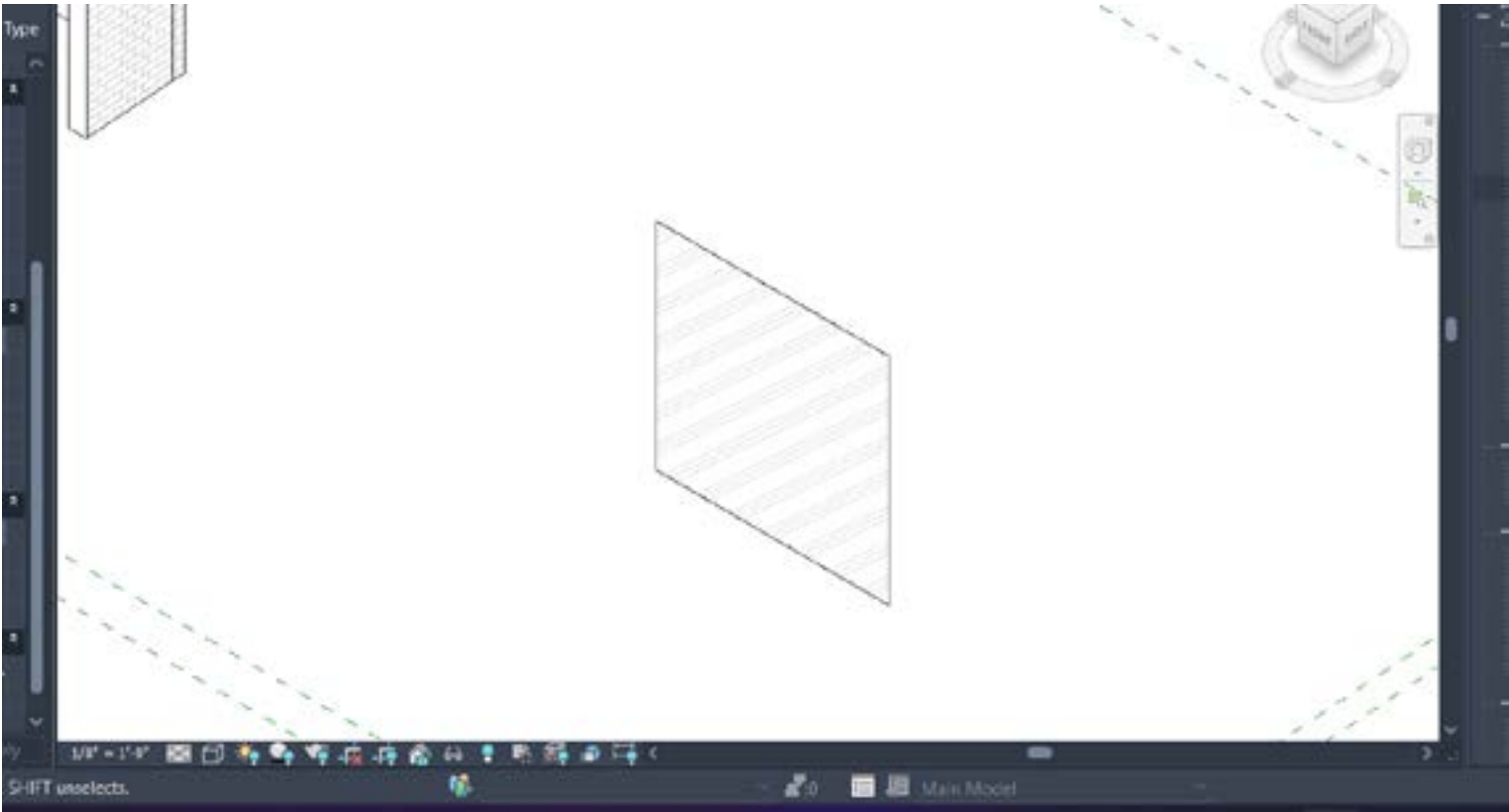
## Thinking Process

### 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: Arrange 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 3: Digital Model

# Parametric Modeling: Perforated Metal Panel

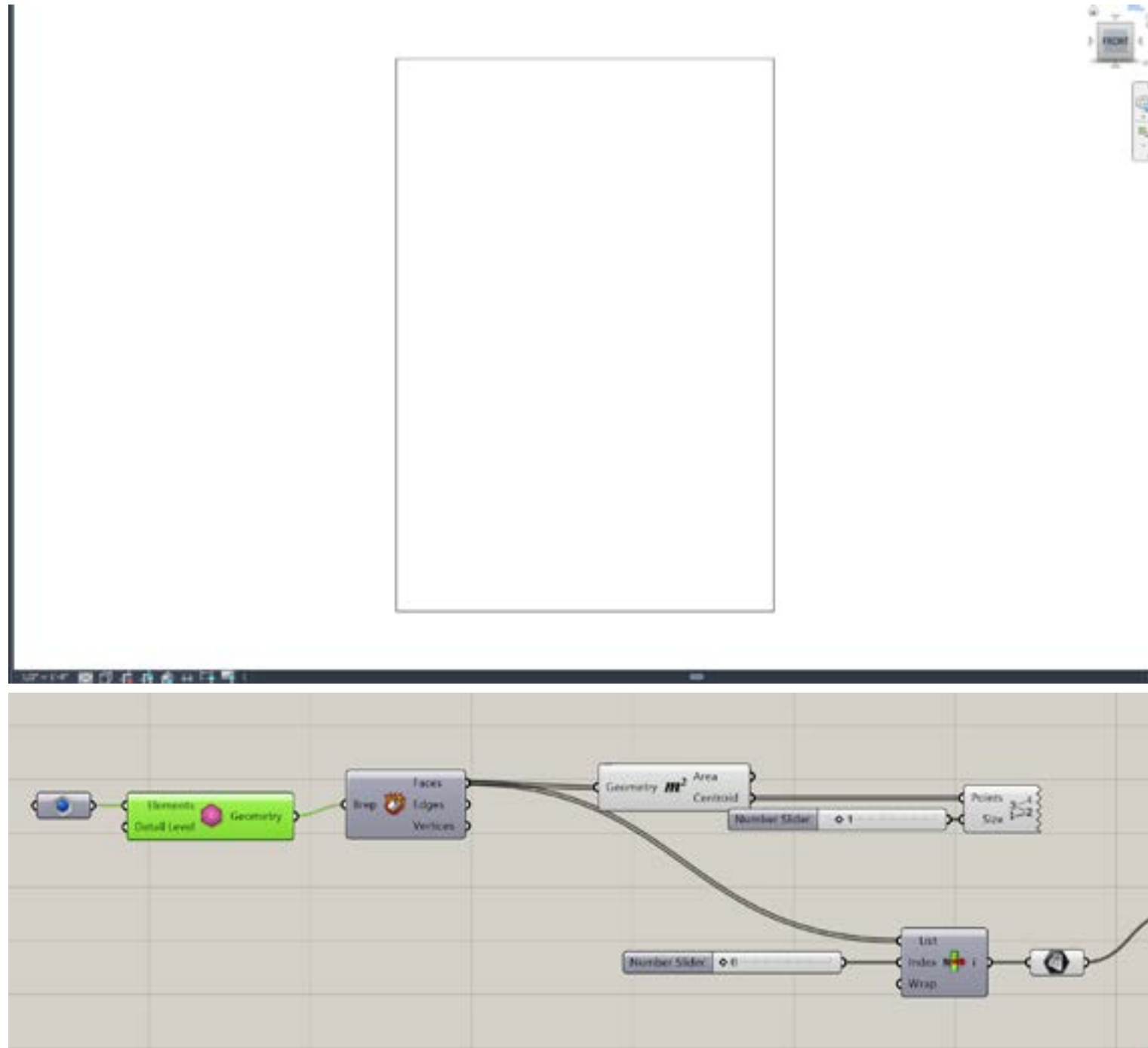
## Thinking Process

## 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:

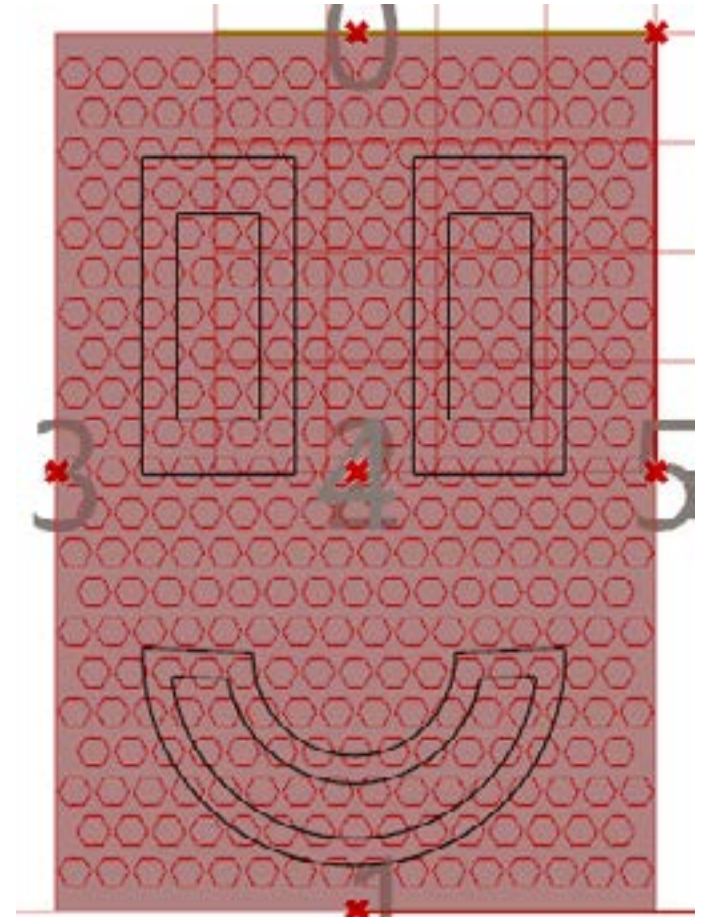
## Create planar graphical element in Revit that you want to perforate. Using either a wall or a roof for element creation

## Part 2:

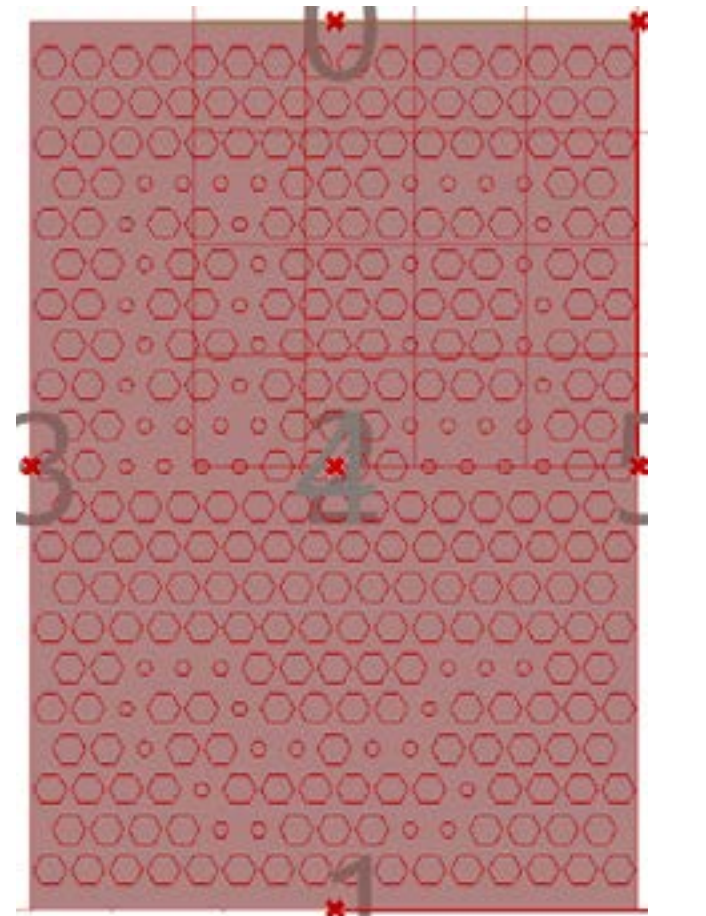
**The grasshopper script is meant to take the element gathered and separate the faces to isolate the face of the wall which acts as the profile surface as the wall.**



**After acquiring the surfaec, 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.**



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



Bruce Strider Michelson

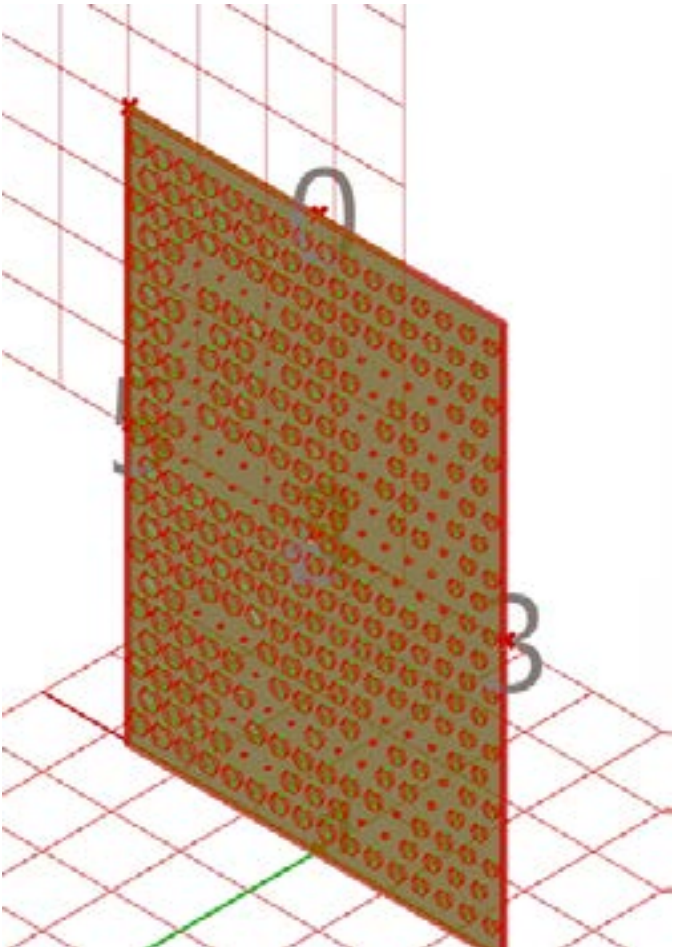
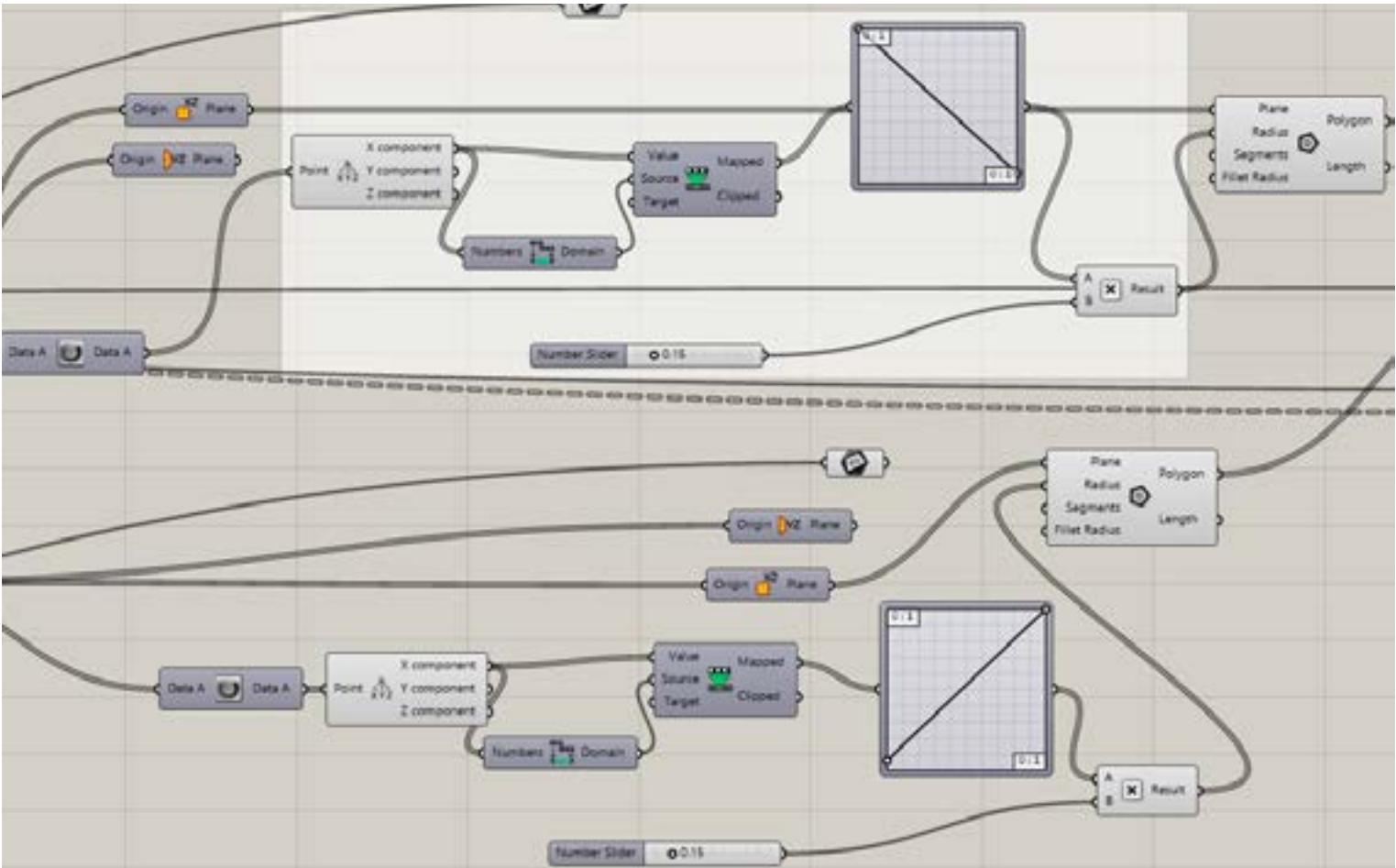


Part 5:

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.

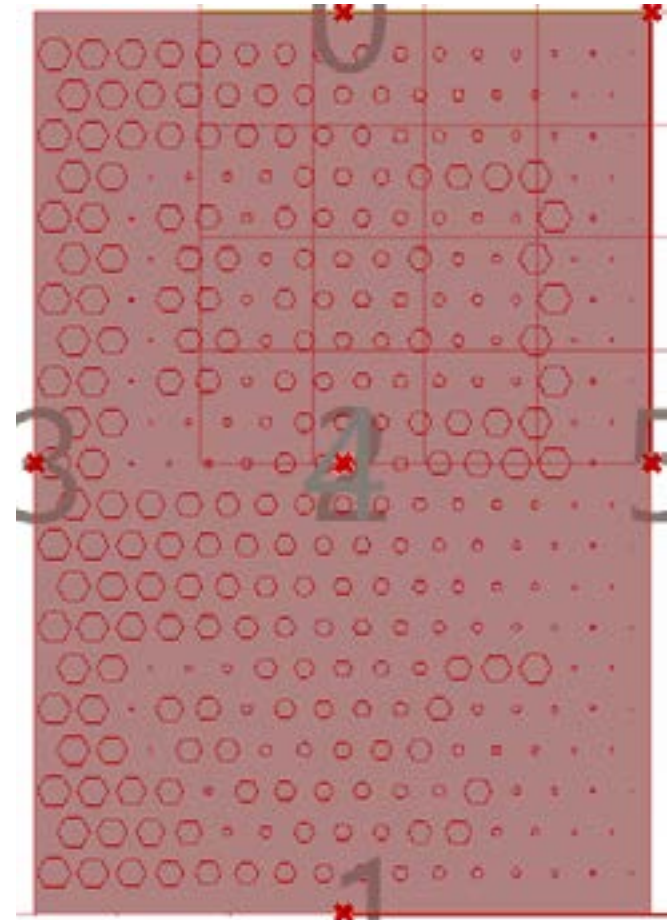
Part 6:

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

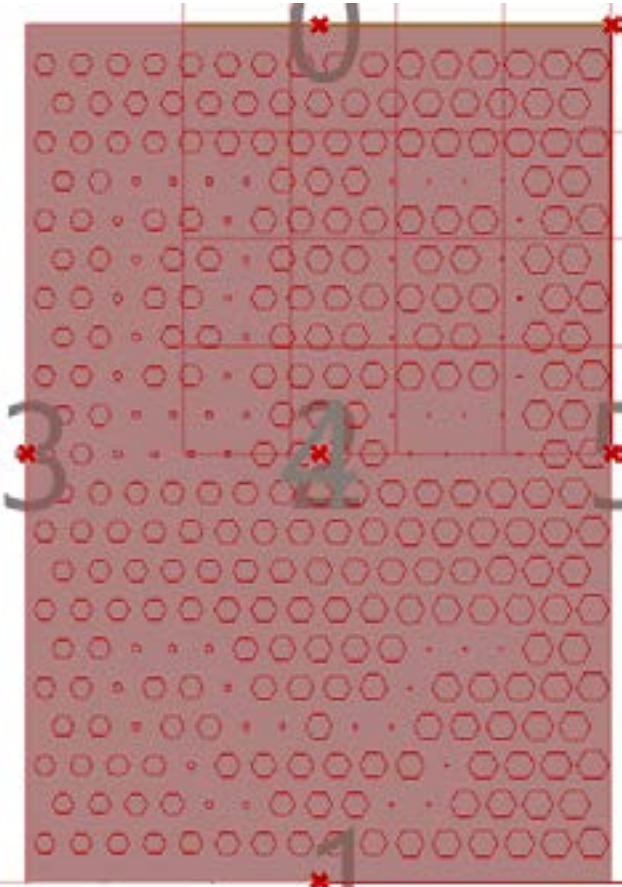


Reflection

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.



It.1 Gradient Perforation



It.2 Gradient Perforation

