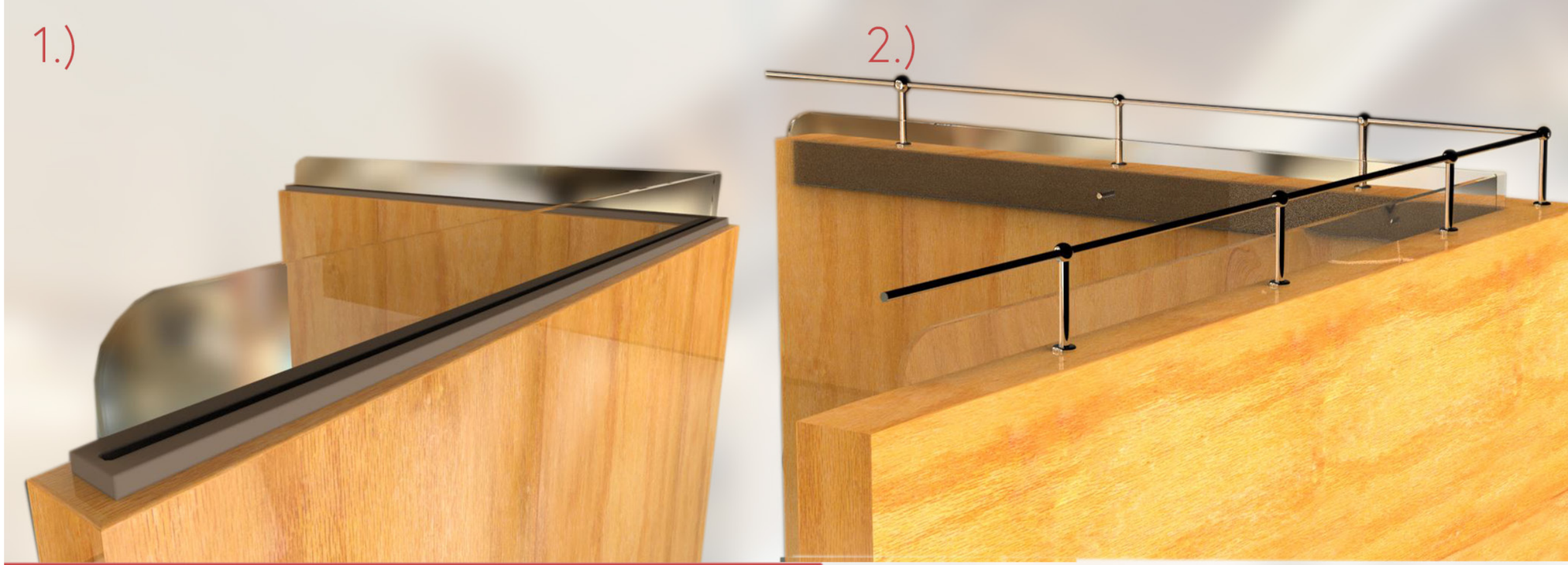
First Steps

Of the four aesthetics first proposed, #3 was chose for its low-profile and hidden (from the outside) fixtures.

Unfortunately, these suggestions and election were made before I realized that this choice would have major implications on two factors that I was not aware of as I made these mock-ups sight-unseen:

a.) The contour of the wood perimeter was curved into a custom, unique shape. Matching a curve exactly is very difficult when thermoforming plastic, and much more so when dealing with the large pieces this project seemed to require.

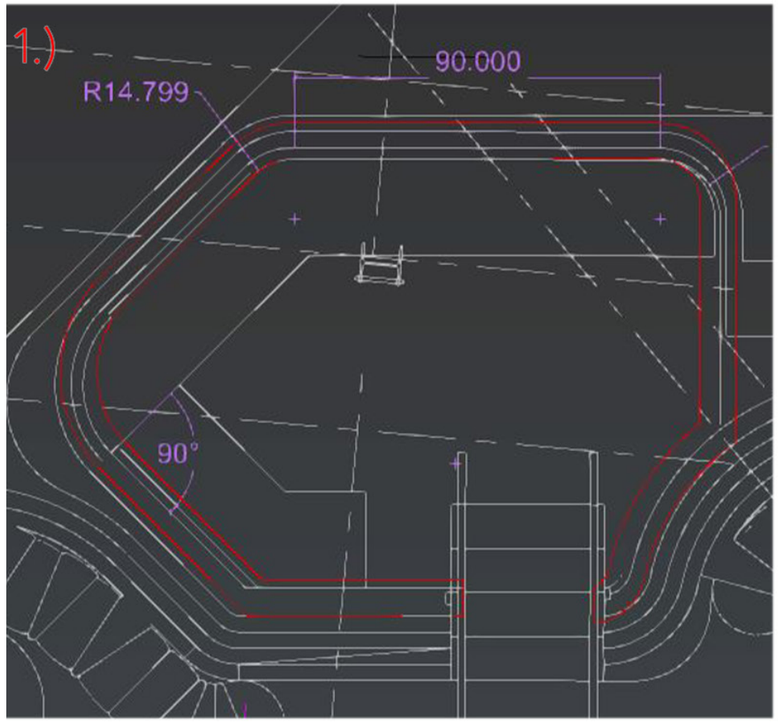
b.)The over-hang seen in the following pages presents a further set of unique constraints resulting in further customized solutions in order to mount and stabilize the large pieces of Acrylic.

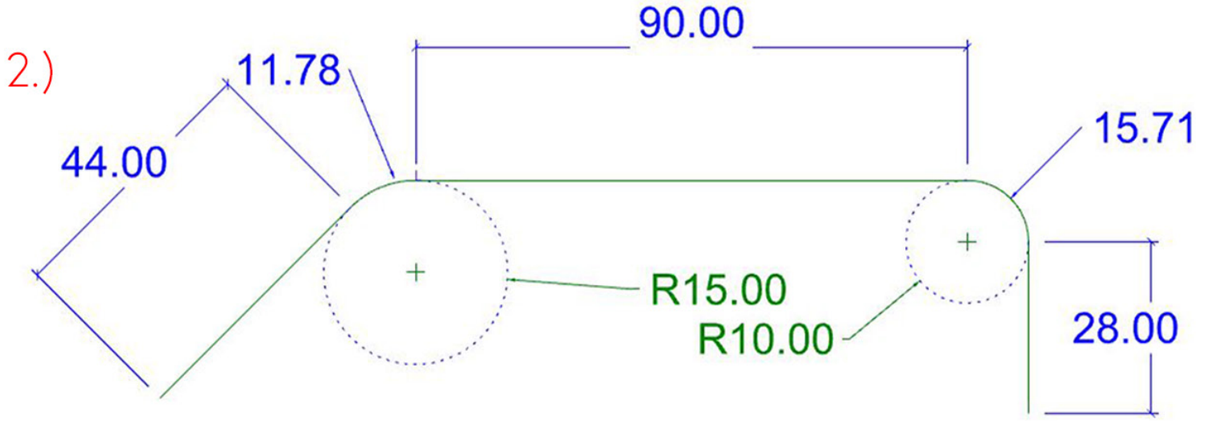


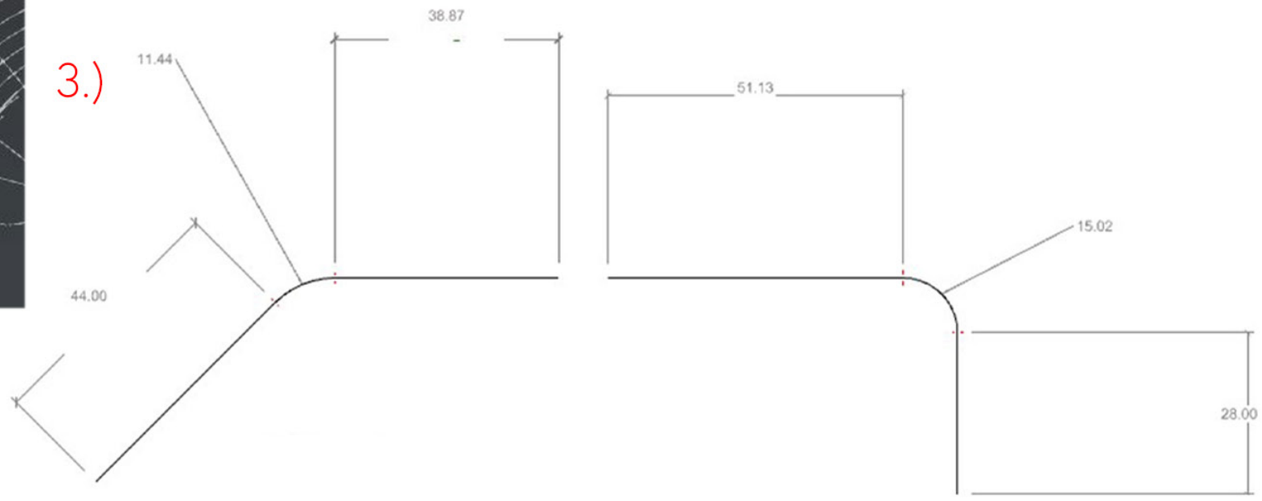
Extracting Accurate Dimensions

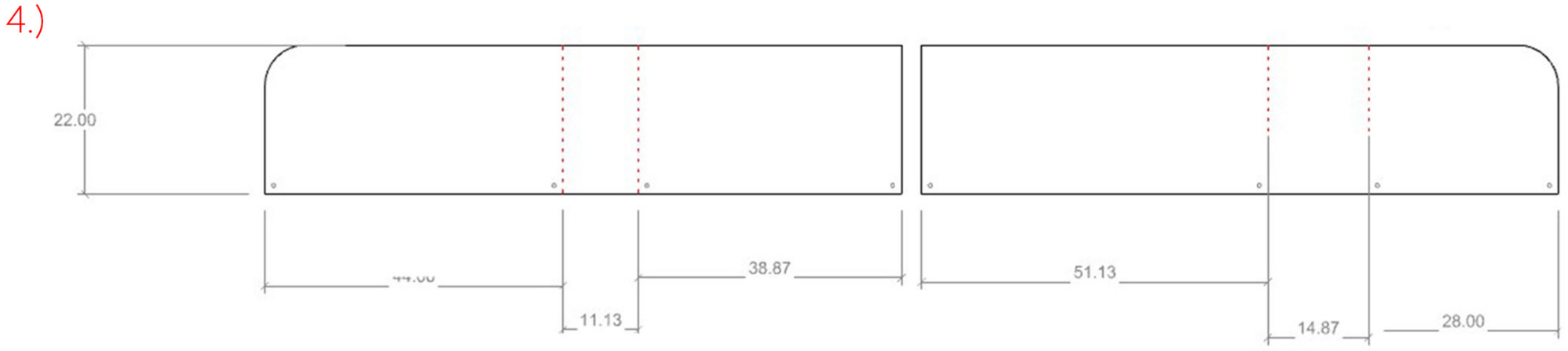
I used what plans I could find as well taking measurements from the site. Measuring curve radius can be difficult, and it took several trial and error test pieces to determine the correct dimensions at which the acrylic needed to be bent.

With a requested height of 20” by Steve James or the “elbow on the wood” test, I then determined the most economic layout and size for the panel to fit on one standard 48”x96” sheet of Acrylic.







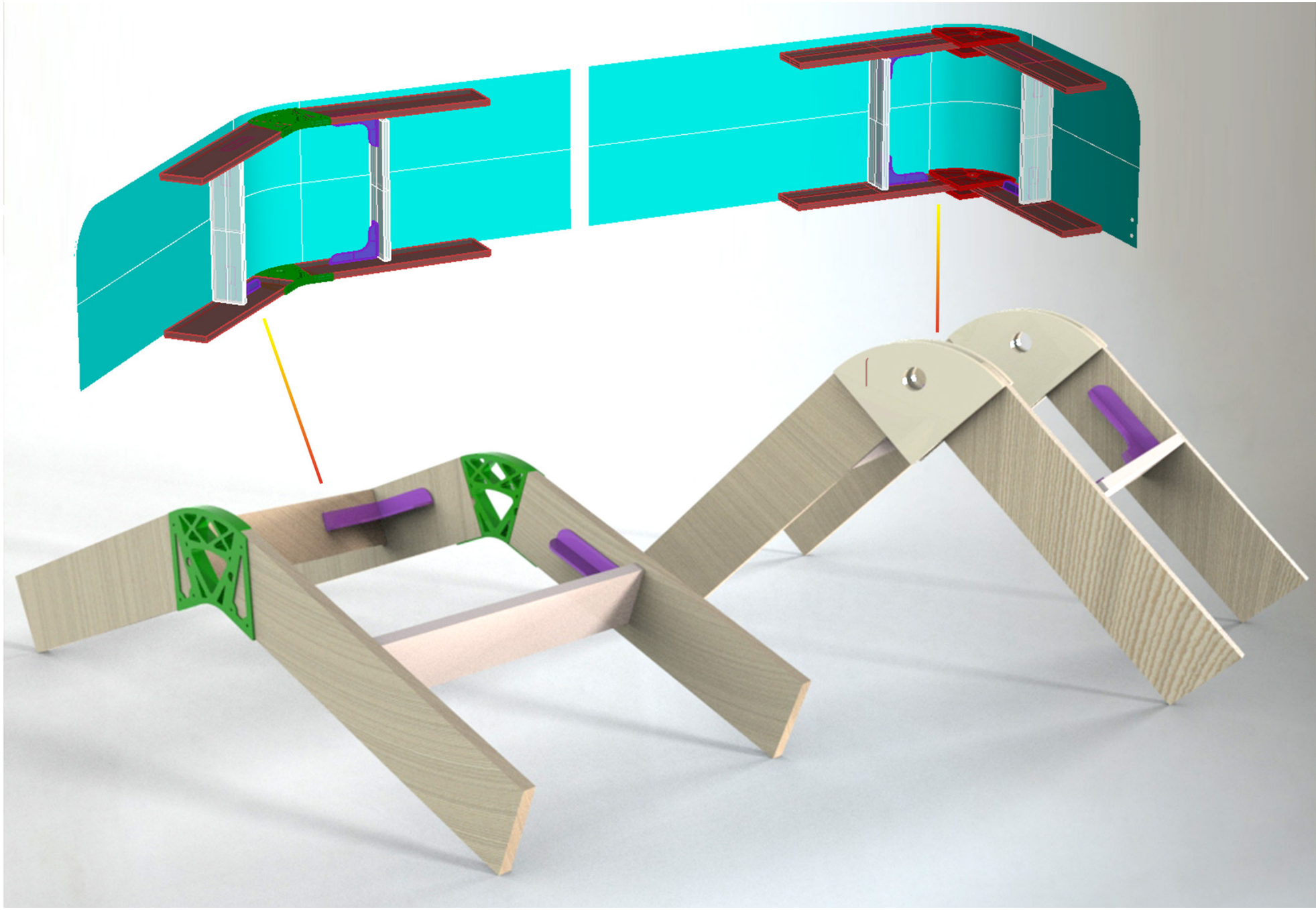


Theorizing and engineering the molds.

I used the dimensions directly from my CAD drawing to make a 3-dimensional mold to accurately match the require curve at which the acrylic needed to be thermo-formed.

The first would require a piece designed and 3-D printed and hold together two for longer planks for wood held together by large 90 degree steel brackets to ensure rigidity and accuracy.

The second would require 4 CNC cut pieces of ply wood to form the more tedious 90 degree bend.



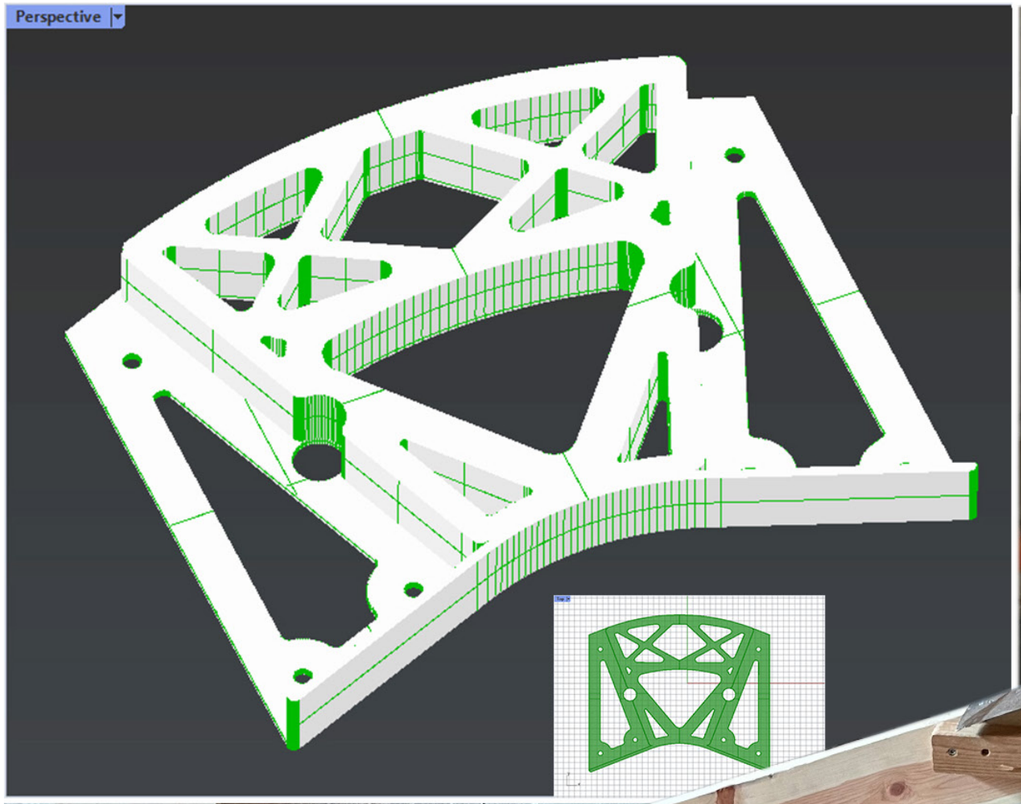
Creating the Molds

Shown:

-3D CAD model i designed to match the curve perfectly. I engineered the pieces to sustain the heavy clamping forces required to bend the acrylic the desired shale.

- 3D printed piece made from PETG

- Full assembled mold complete with steel pieces to conduct head outward to the edges of the acrylic pane to avoid warping or cracking.



The Right Bend in the Plexiglass

Using a combination of CNC'ed wood to form the curve of the plexiglass for molding and the same series of clamps.

A series of mirrored holes were added to the mold in order to give equal and opposite points of contact for the clamps to apply pressure during the slow bending process.

Sheet steel was added to this mold to help conduct the heat from two propane-powered heaters as well the continuous use of a propane-powered heating torch.

The Acrylic would have the tendency to spring back while warm , but as it heated and cooled, tit retained the mold's shape after removal.

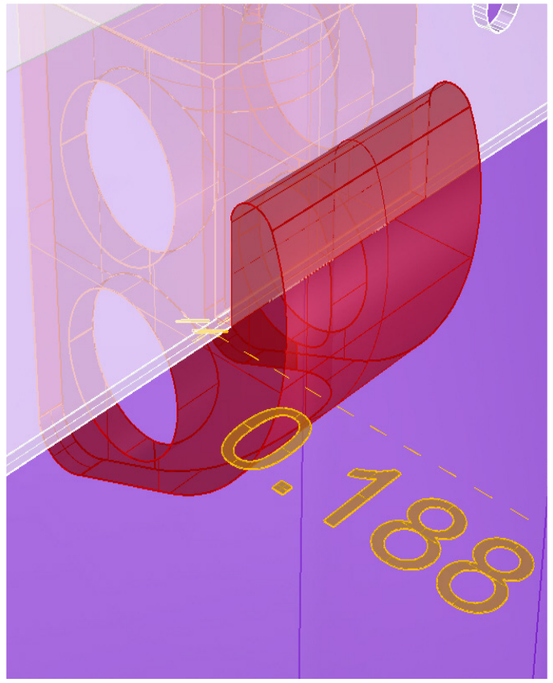
Preliminary Mounting

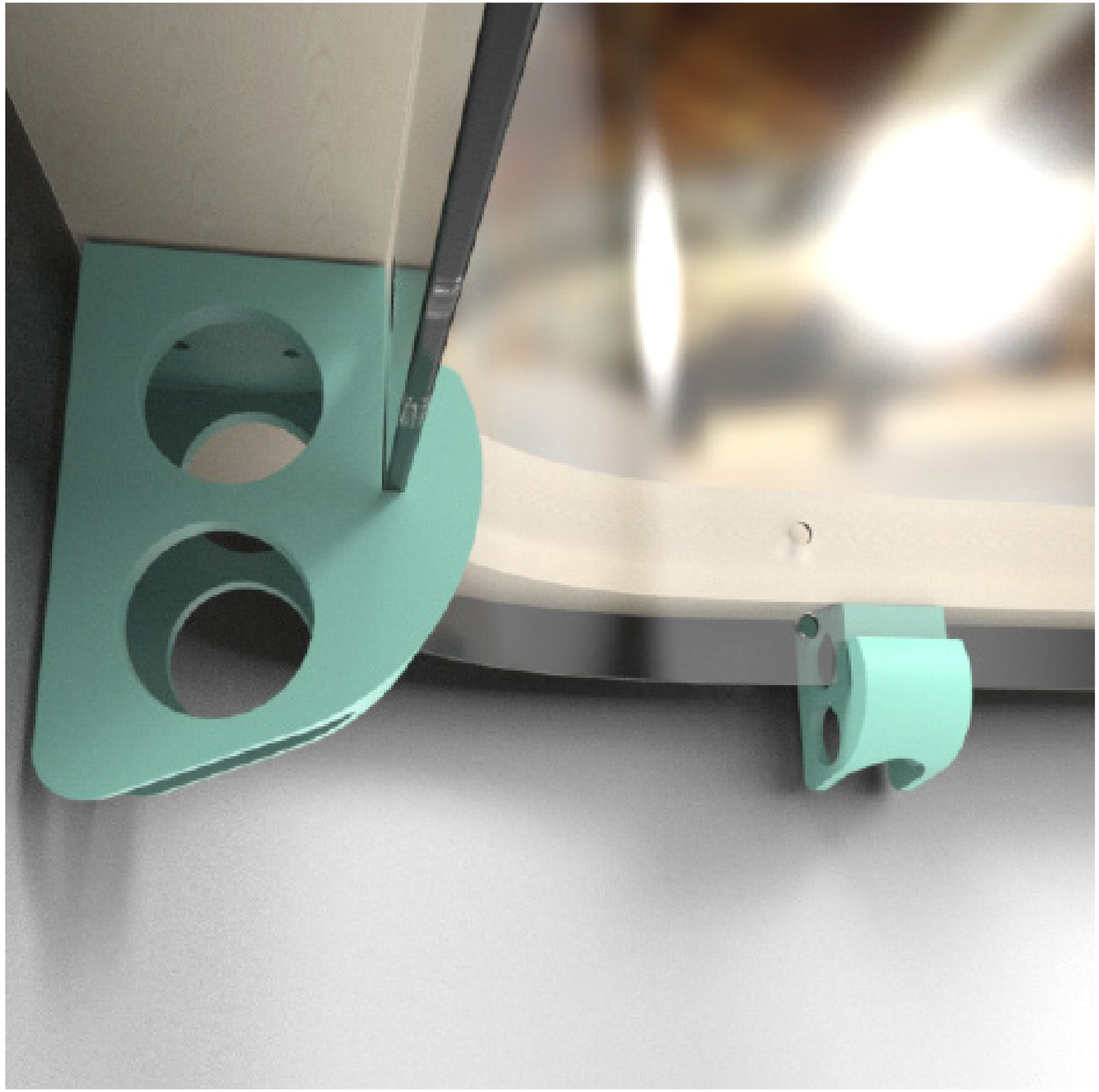
The large plexiglass pieces needed to be held in place while measurements were taken, holes were drilled.

For this purpose I had to painstakingly design brackets that would hold the plexiglass at the exact appropriate height and depth from the overhang of the wood.

These were temporarily attached by two screws to underside of the wood protrusion.

Though developing these pieces was time consuming, the job of mounting the acrylic would have been impossible in their absence.



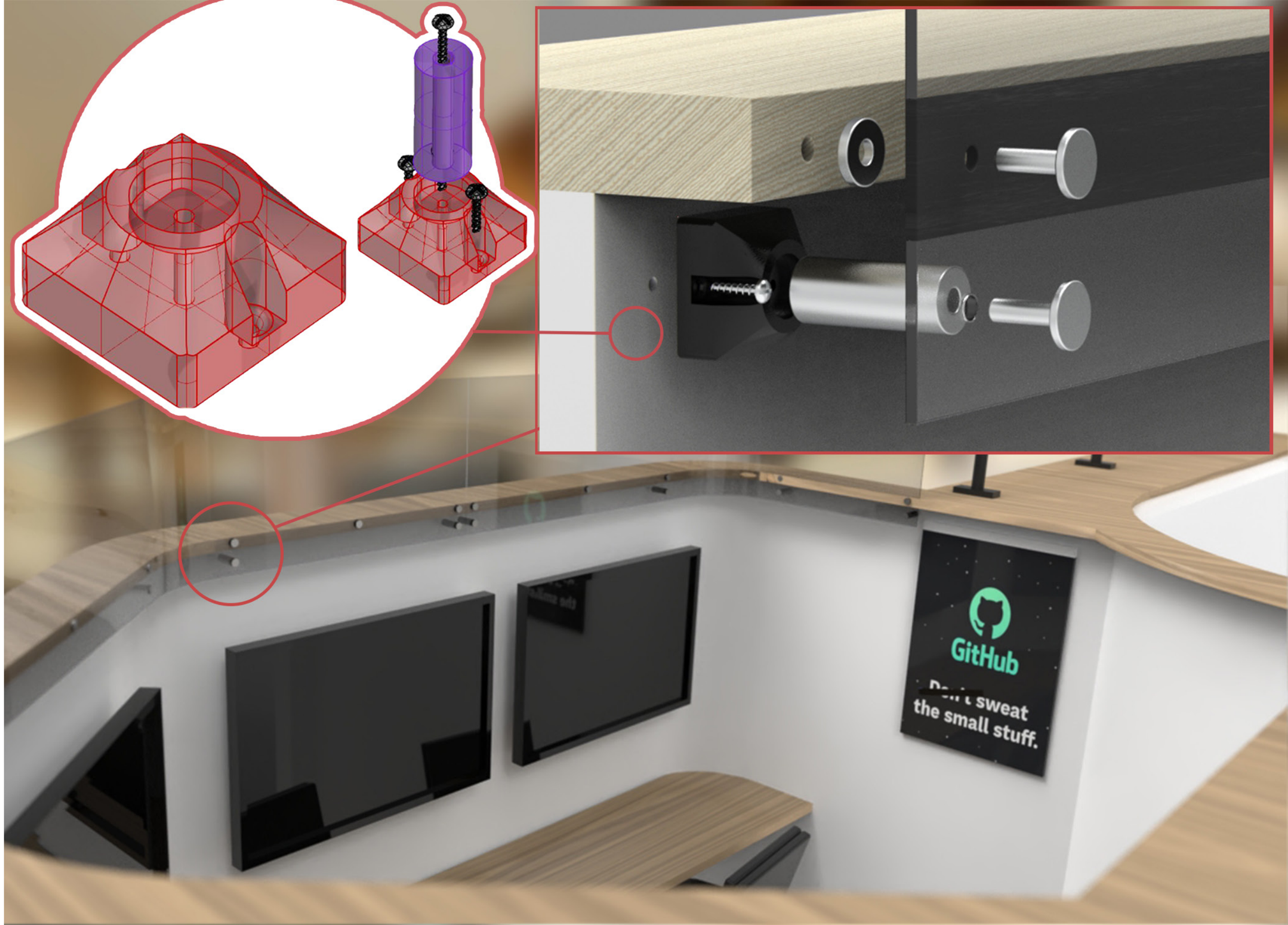


Final Mounting

Due to the top piece of wood's varying overhang lengths/depths, I had to design mounting couplings to screw into the wall surface at three separate points per stand-off support. The multiple points of contact compensated for shallowness of the fasteners (due the steel reinforcement behind the drywall being impractical to drill into).

After measuring each point where it would be mounted, I 3D-printed each coupling and fastened to the wall.

I used steel and soft plastic washers to create a gentle buffer between steel and the area of acrylic where pressure was being applied.




Camera 3
Camera 4
MacMini 1B
MacMini 2A
Preview
Program Out
PRV
CAM 1
CAM 2
PGM
CAM 3