



JJEDDA

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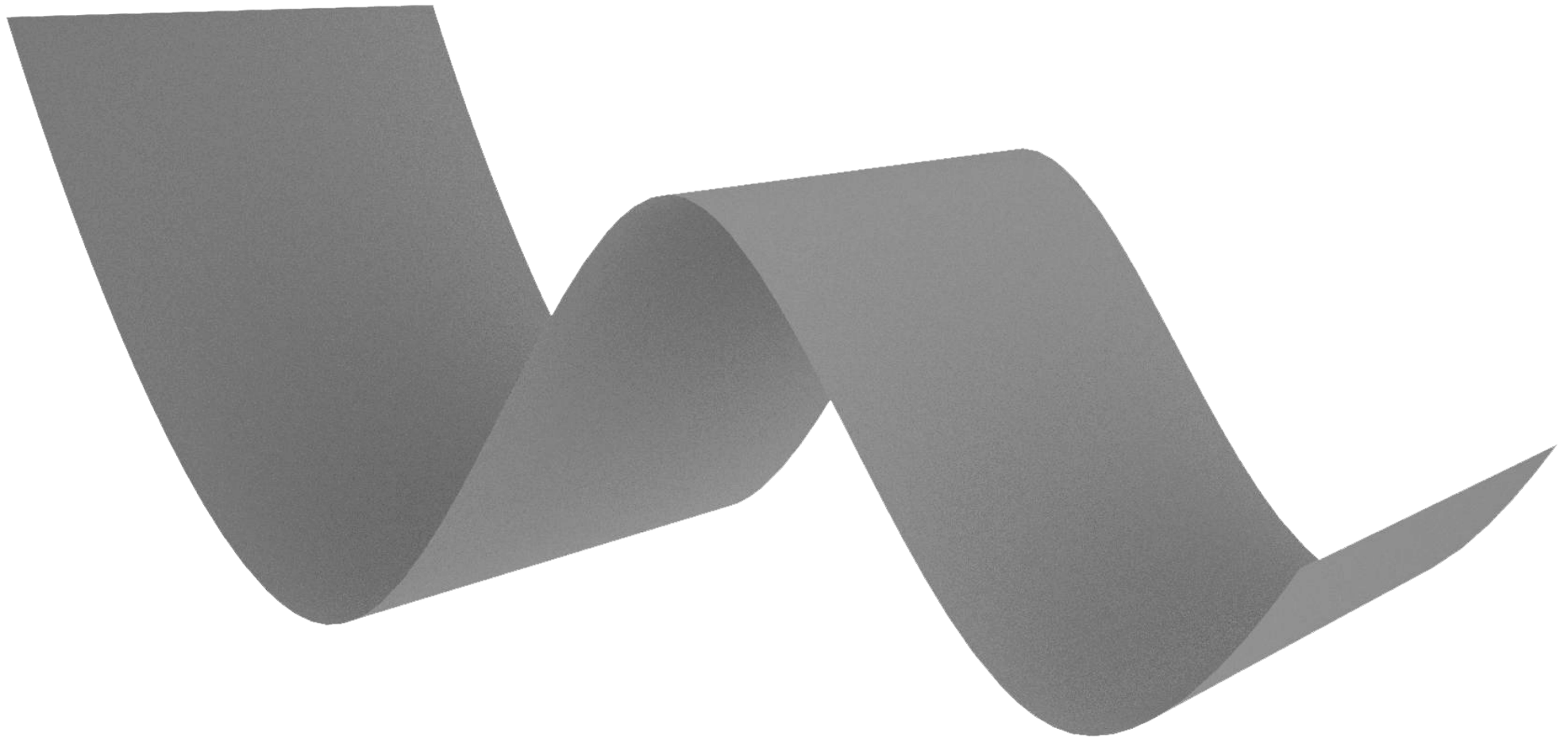
PREMISE

Throughout the semester, we noticed the evergrowing mess on people's desks - mostly composed out of magazines, books and rolls of paper. With this project, we saw an opportunity to design an object which could help to organize some of this reading material, or at least contain it.



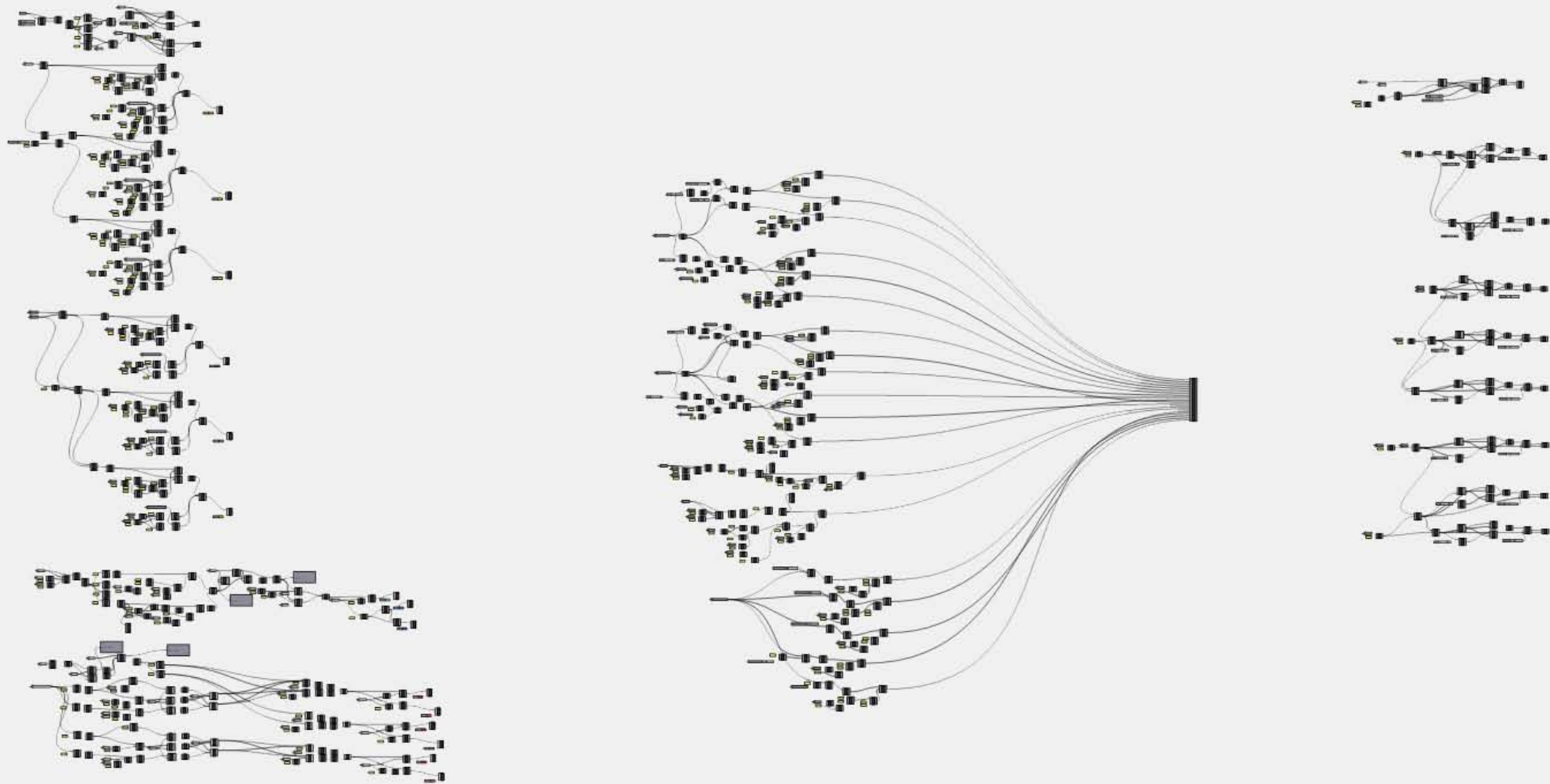
IDEA

The main idea was to develop a surface, which through its modulation, could contain magazines and newspapers. The object would be functional, while its geometry simple and not intrusive.



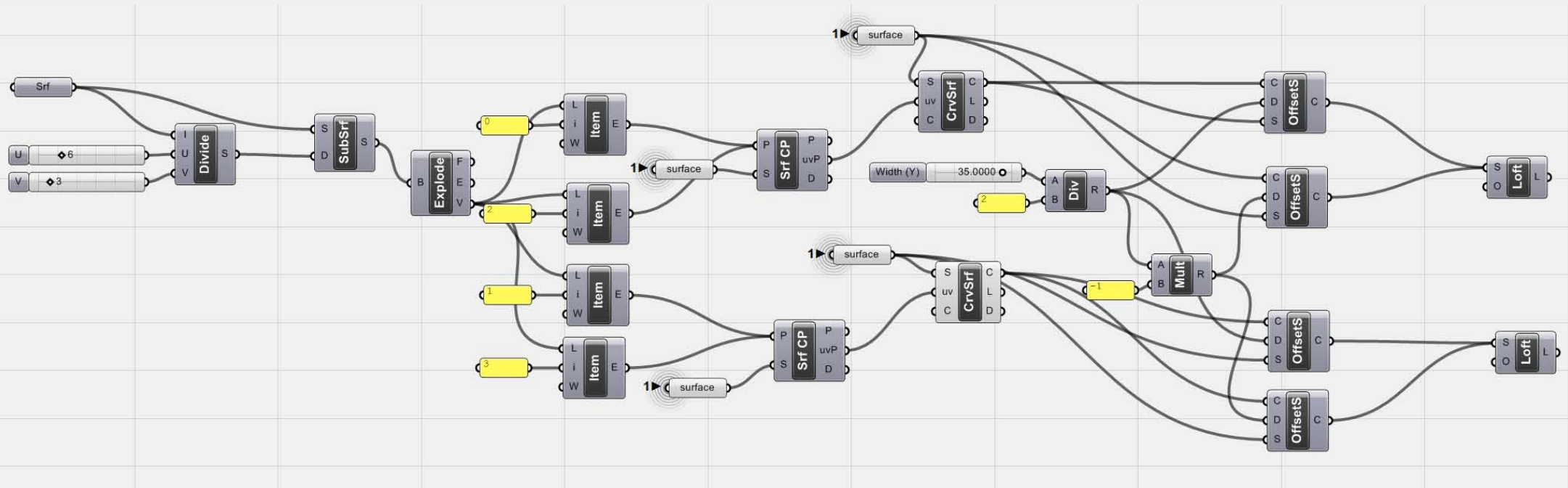
PROCESS > DIGITAL MODEL > SURFACE

The undulating surface was derived by compressing a planar surface sideways, rising and lowering parts of the plane in a sinusoidal fashion. The resulting wave had two dips to accommodate the placement of reading material, while the adjacent walls acted as lateral supports for the books and magazines. In terms of dimensions, the surface was entirely based on the proportions of a typical magazine, or a A4 sheet. However, the dimensions were determined to accommodate larger magazines - giving the wave a lateral depth of 30 cm and a height of 20 cm from table level to the apex.



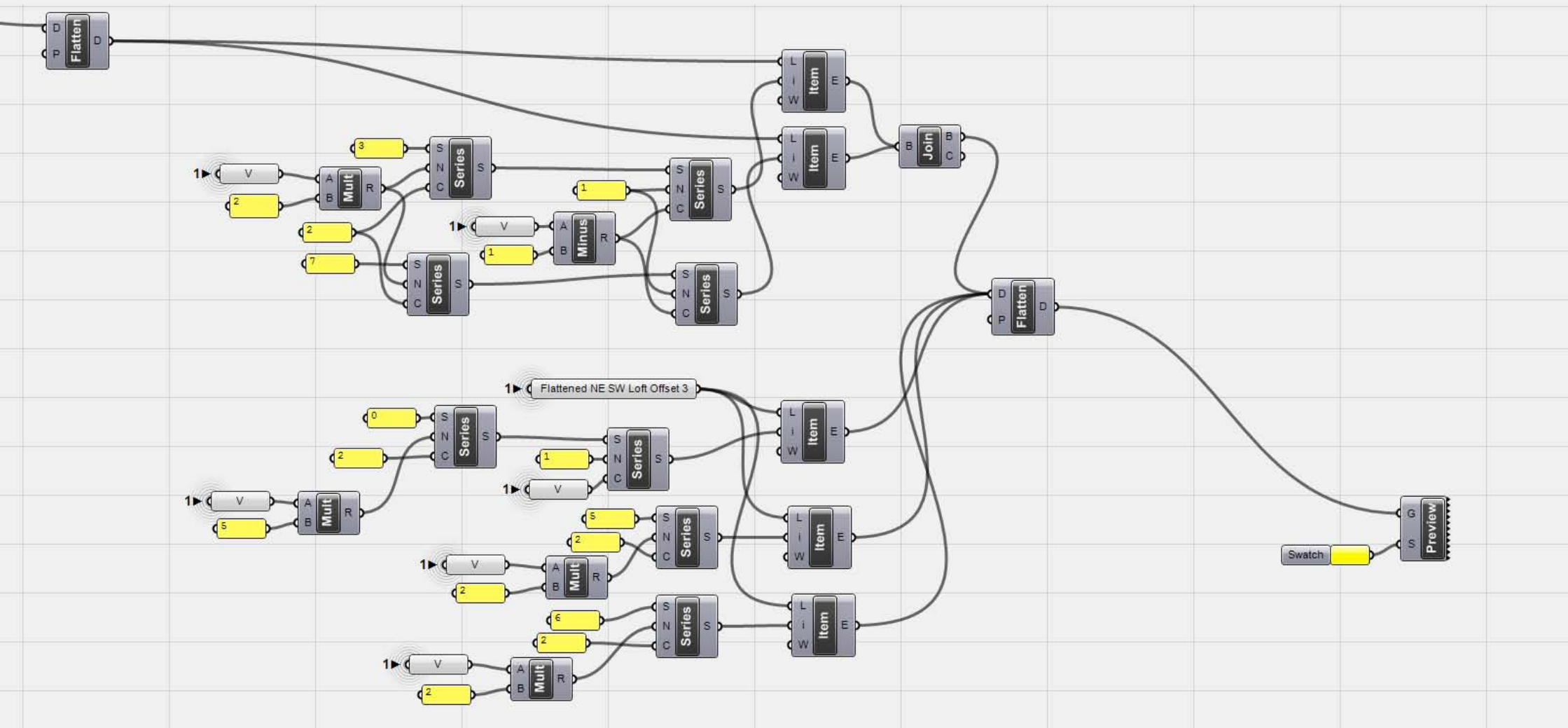
PROCESS > DIGITAL MODEL > SCRIPT

The script was developed in Grasshopper and consisted in four main parts.



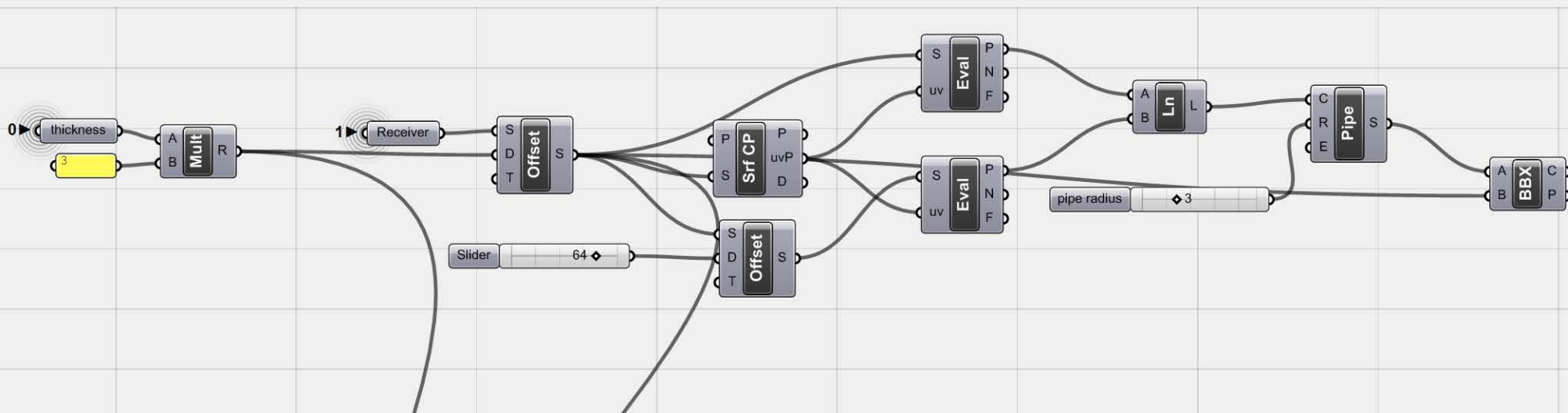
PROCESS > DIGITAL MODEL > SCRIPT > DEFINING THE SURFACE

The first step was to define the variables in the script and set-up the parameters that could be changed, such as the width of the strips.



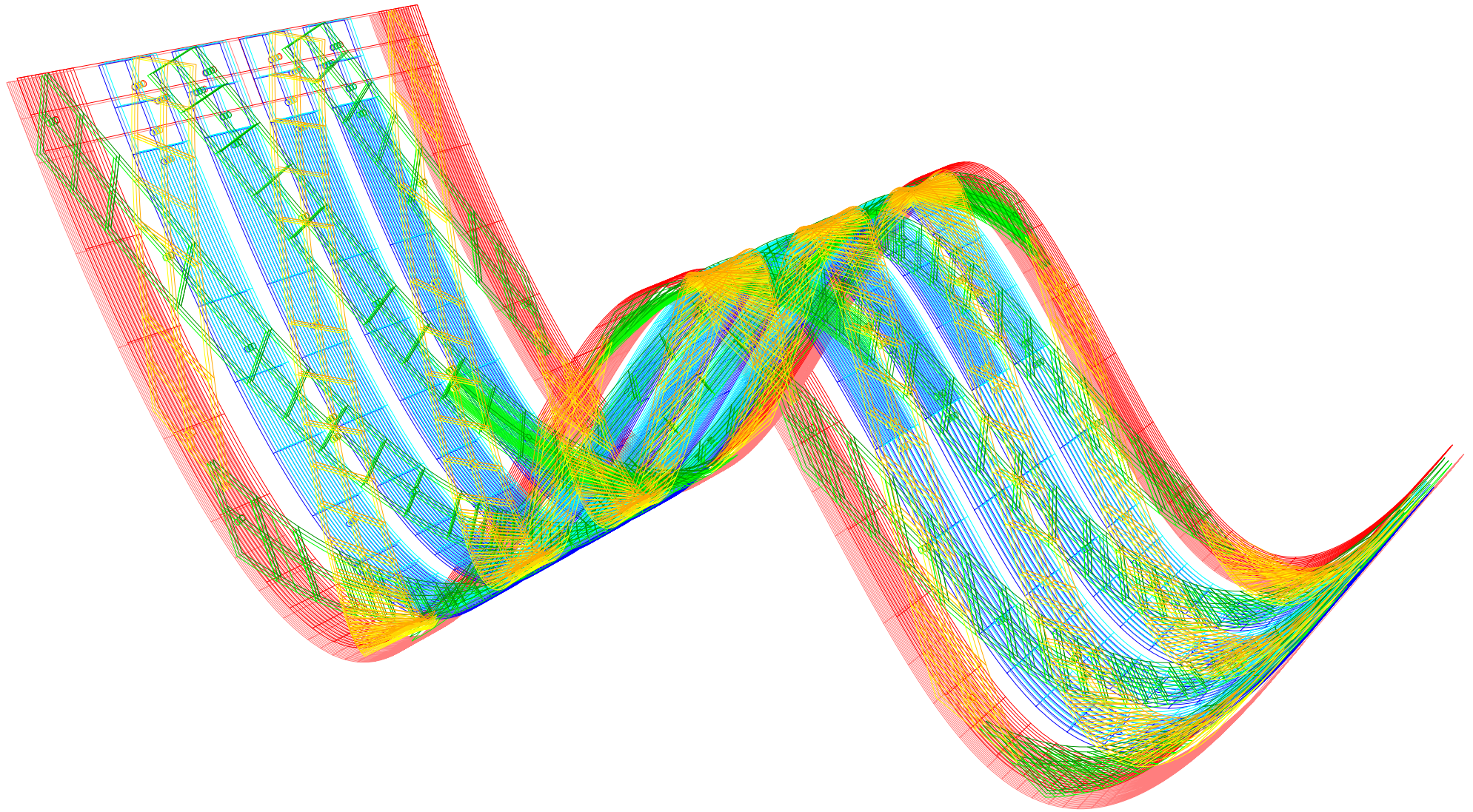
PROCESS > DIGITAL MODEL > SCRIPT > STRIPS

Each set of strips was then defined in the script.



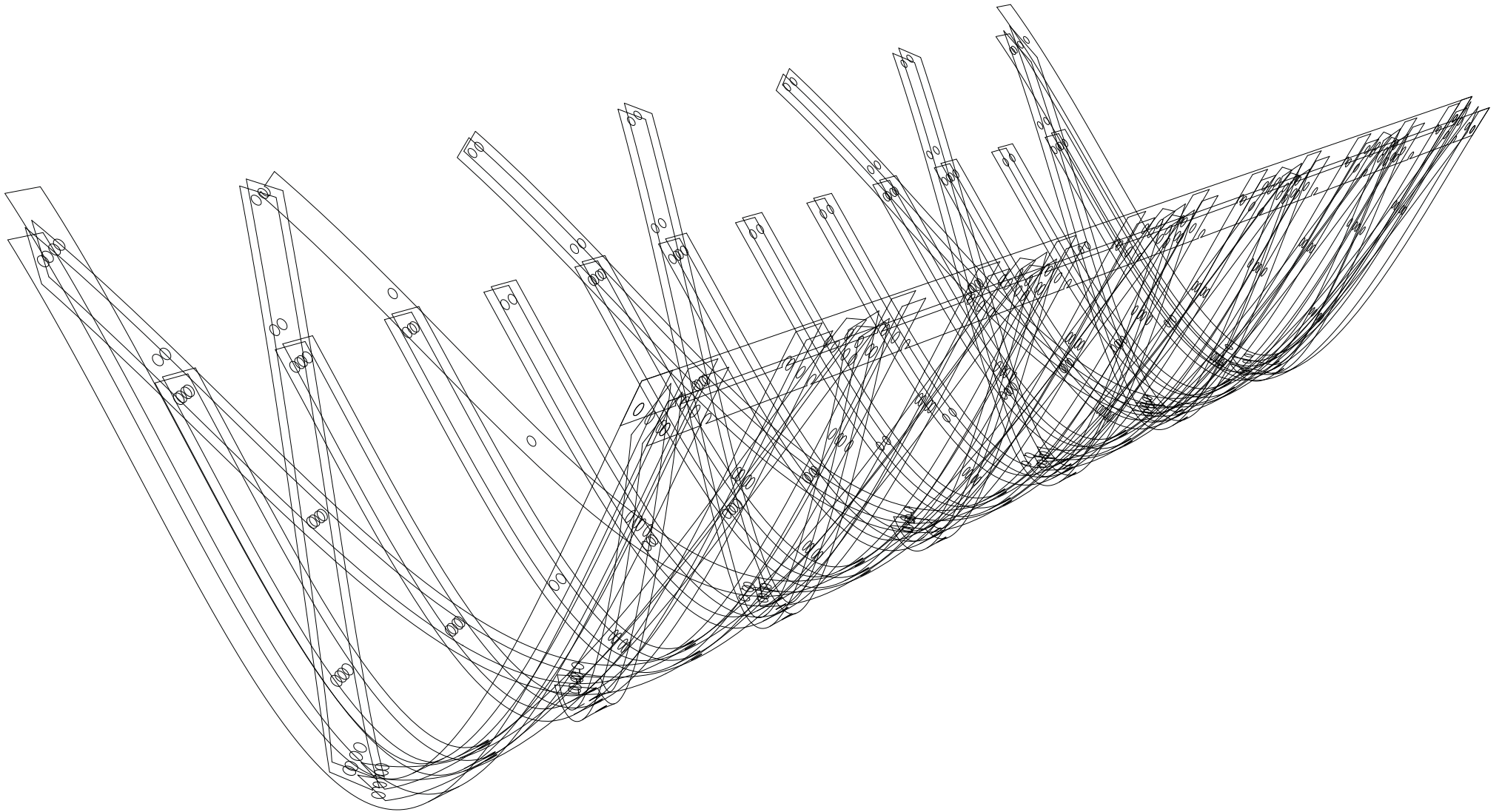
PROCESS > DIGITAL MODEL > SCRIPT > CYLINDERS

Finally, the cylinders used to trim the holes were scripted.



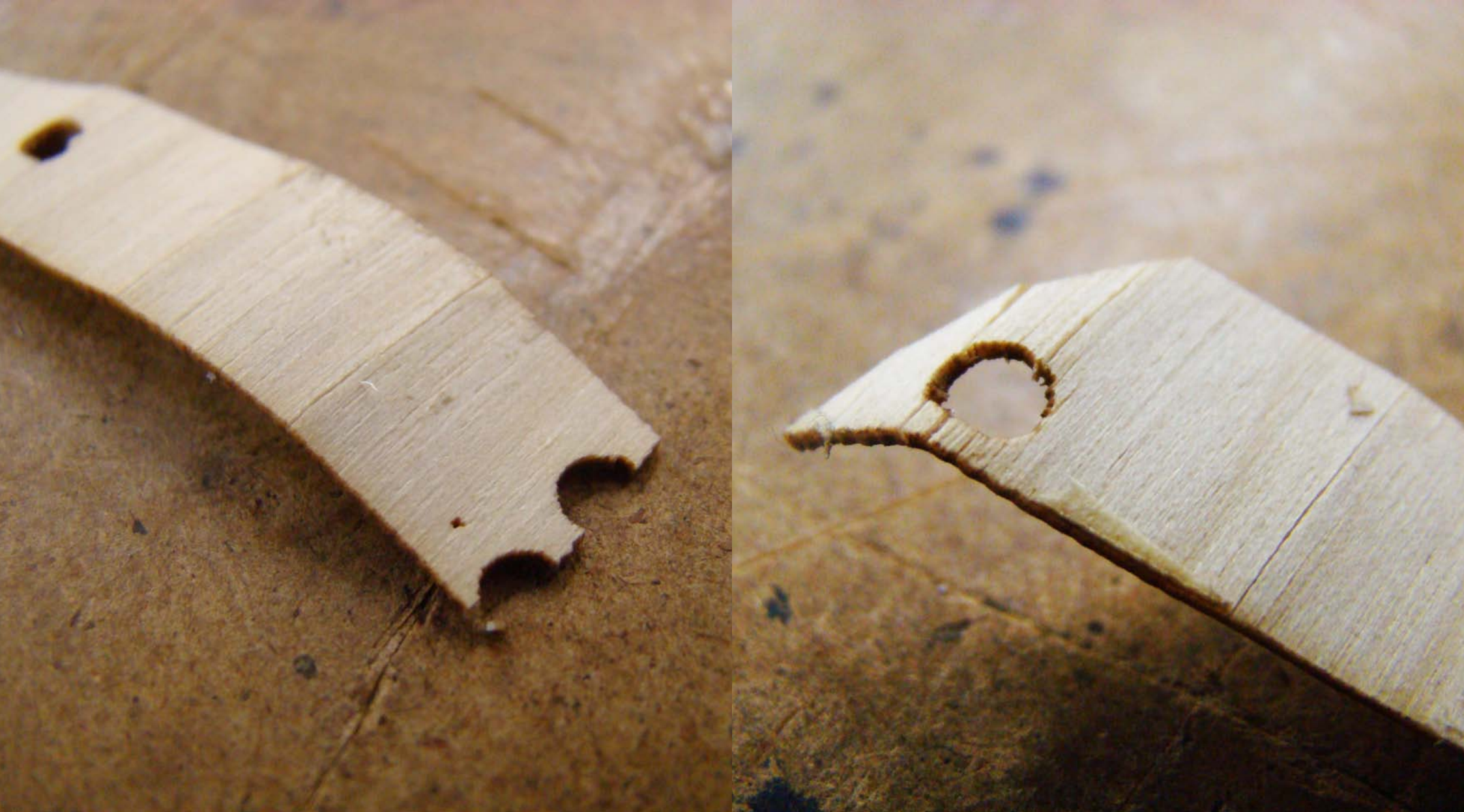
PROCESS > DIGITAL MODEL > SCRIPT > PARAMETRIC MODEL

When the script was run over the surface, strips were modulated along the surface. We ensured that there would be alternating splices on the different layers to help with model's rigidity. We also placed connections at every intersection point to further ensure the model's rigidity.



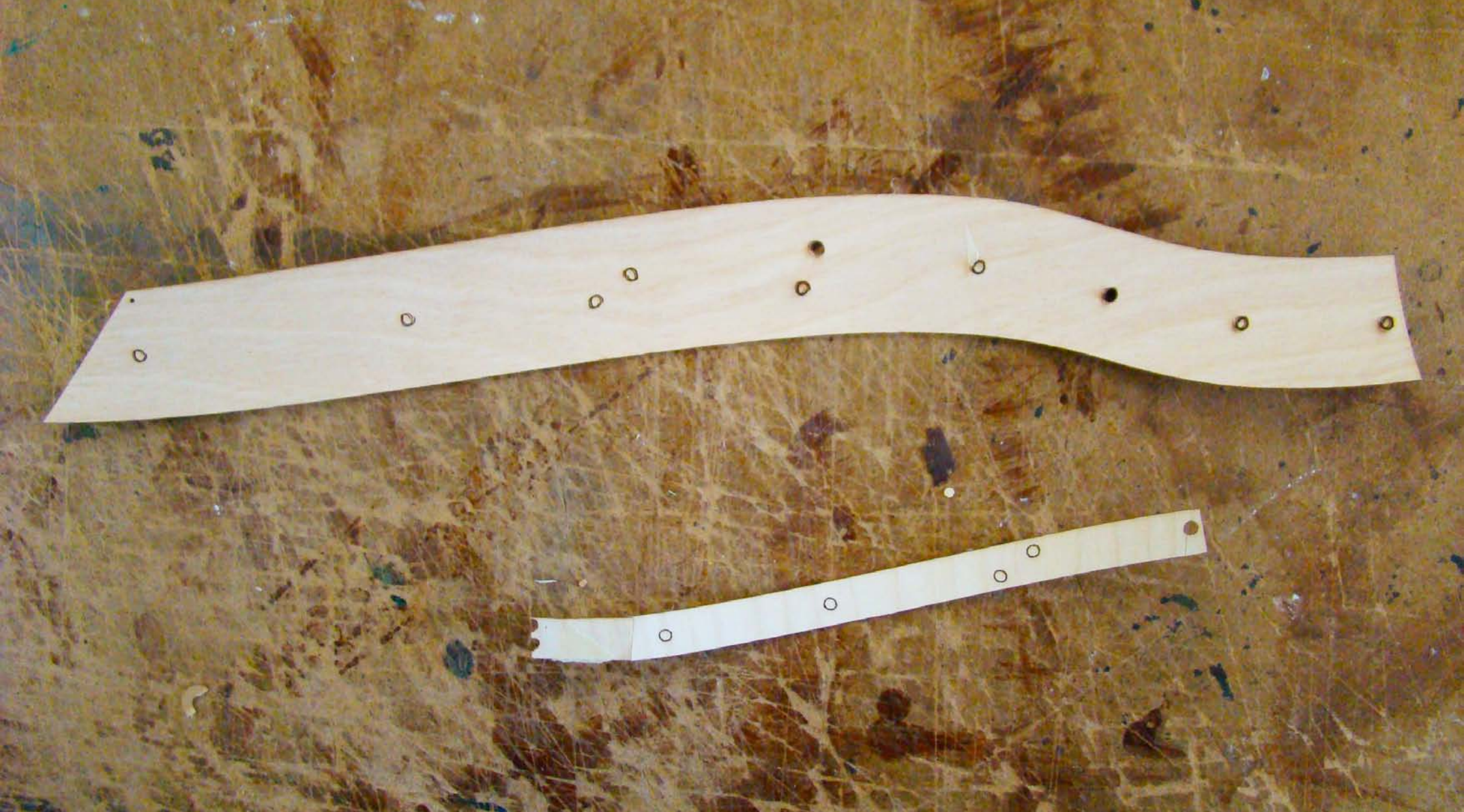
PROCESS > DIGITAL MODEL > MOCK-UP

For the first mock-up, we chose to construct the bottom edge of the structure, since it contained all the factors which we believed might cause a problem later on. These factors consisted in the edges and the location of the holes falling on them, the size of the screws vs. their proximity, and the rigidity of the material and structure at one of the inflection points. Moreover, we made the strips skinnier in an attempt to see if we could reduce the width of the strips.



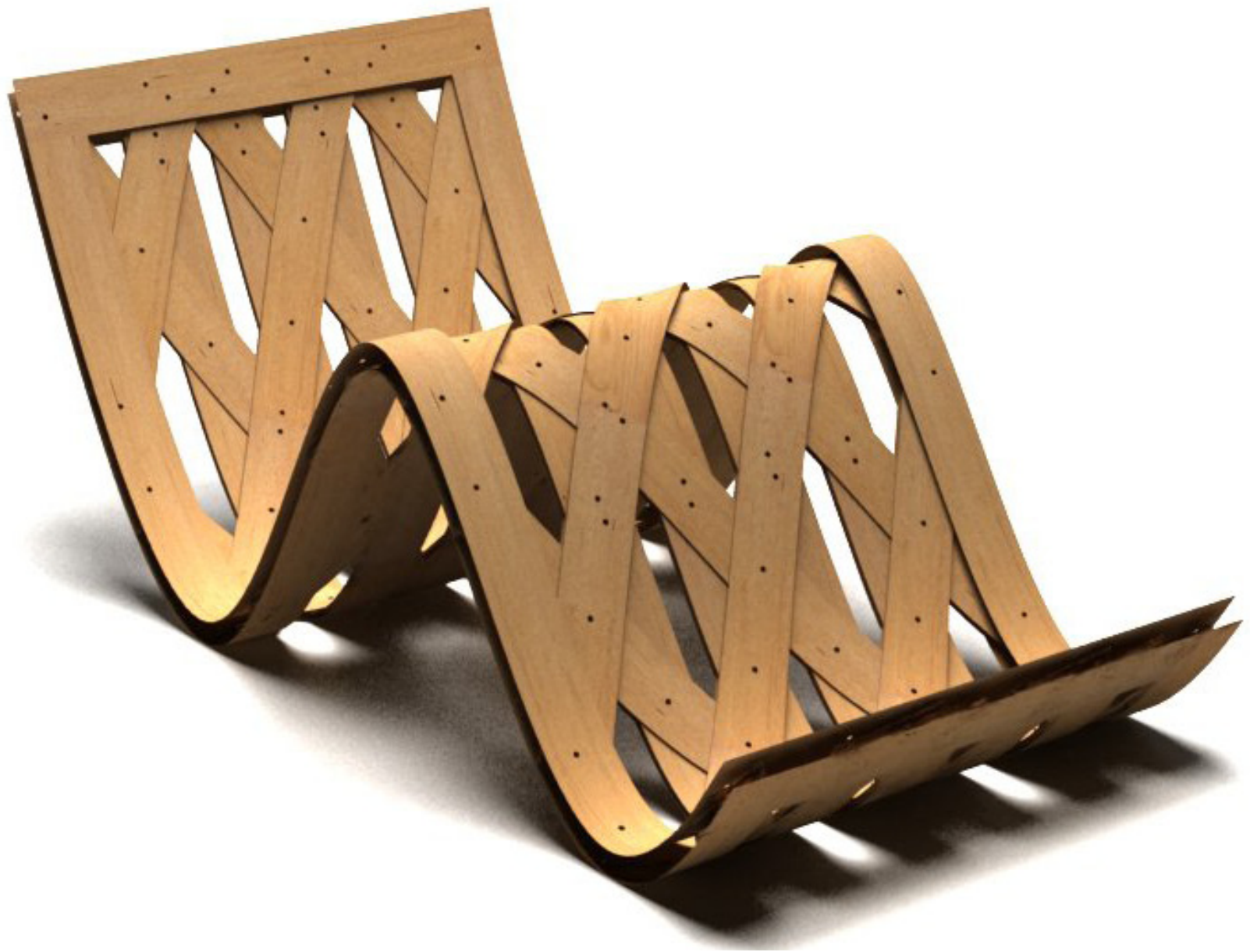
PROCESS > DIGITAL MODEL > MOCK-UP > PROBLEMS

After the construction of the mock-up, many problems became apparent. First, the strips were too narrow, allowing for very little rigidity within the built piece. Furthermore, the holes were falling off the edge on some strips. In other cases, the holes were too close to each other. Therefore the screws would touch and sometimes overlap. Finally, we accidentally did not cut along the grain of the material, which led there to be no tension in the members themselves.



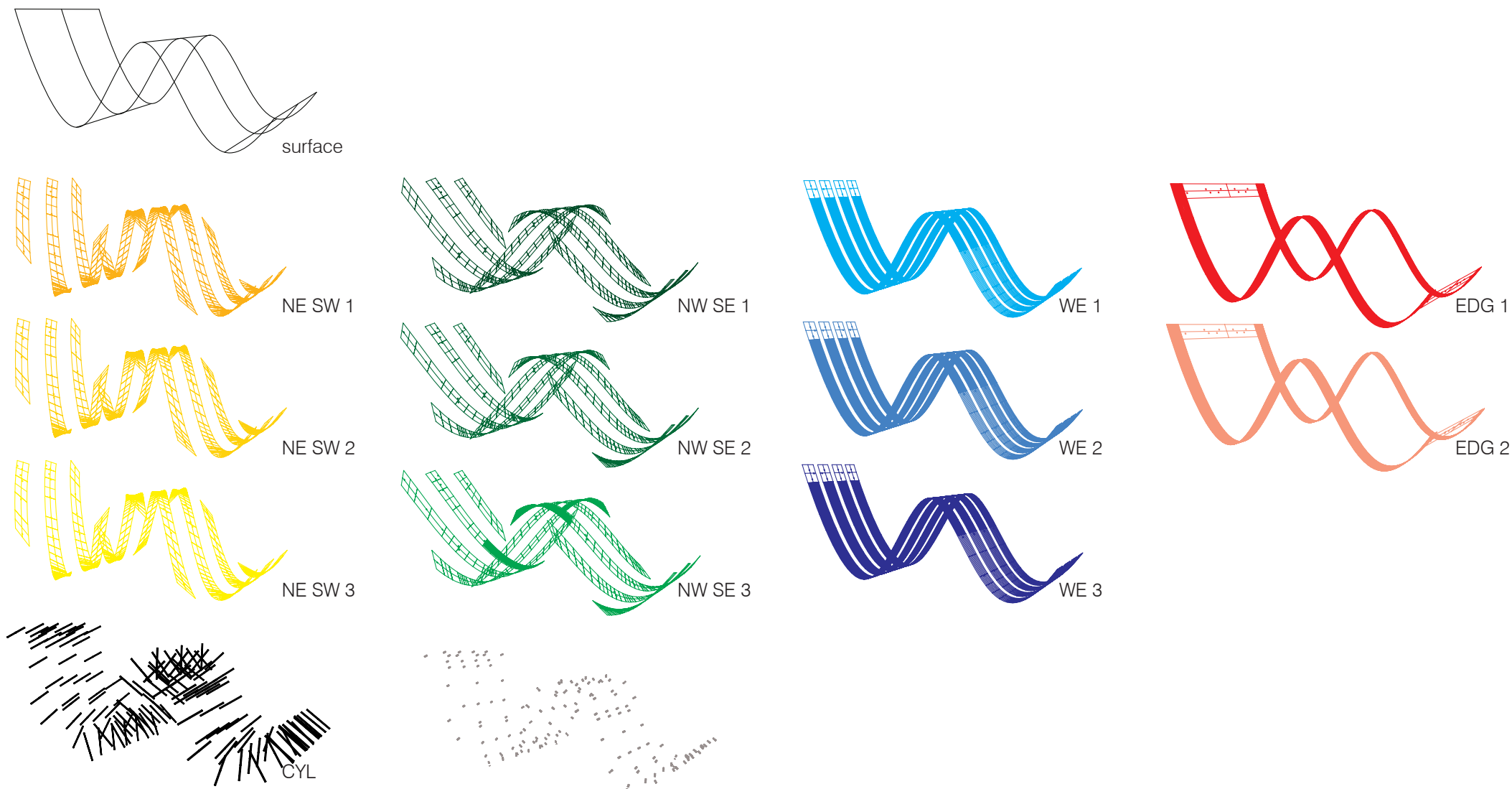
PROCESS > DIGITAL MODEL > IMPROVEMENTS

The problems of the mock-up requestioned the script and modifications were made to solve the issues we had experienced. We reduced the number of U and Vs to 6 and 3, as opposed to the previous 6 and 6, to be able to increase the width of the strips. The latter could thus be tripled in size. The size of the model was also reduced to increase the structure's rigidity and customize it for its intended use - the width of an average magazine was used for the measurements. Also, by reducing the size of the model we managed to reduce the quantity of veneer to be used.



PROCESS > DIGITAL MODEL > 3D STUDY

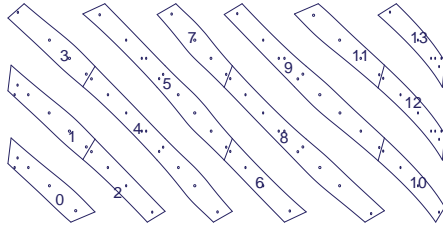
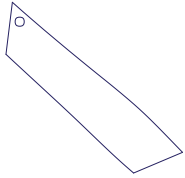
The 3D model was tested and rendered to provide a better idea of what the final physical model would resemble. We were pleased and almost stopped here.



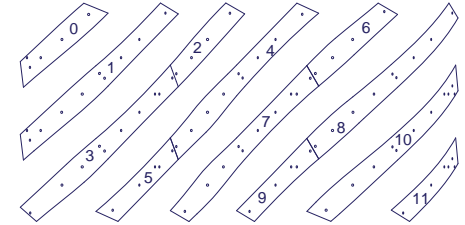
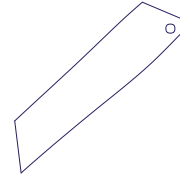
PROCESS > DIGITAL MODEL > BAKING

Once the script was corrected, we ran it again on the surface and the various layers were baked accordingly. The cylinders (bottom left) needed to trim the holes (bottom right) were also baked.

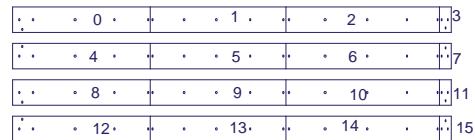
NESW



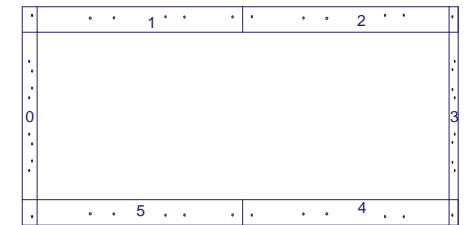
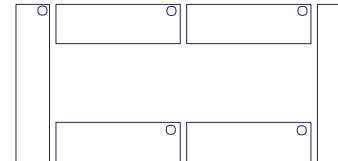
NWSE



WE

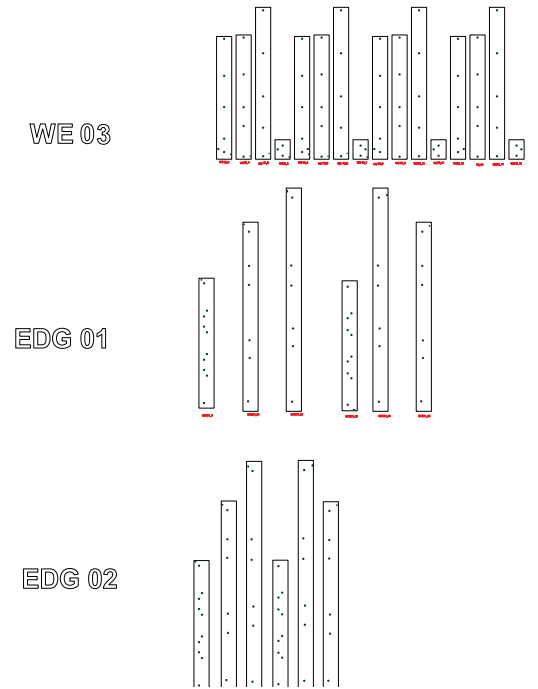
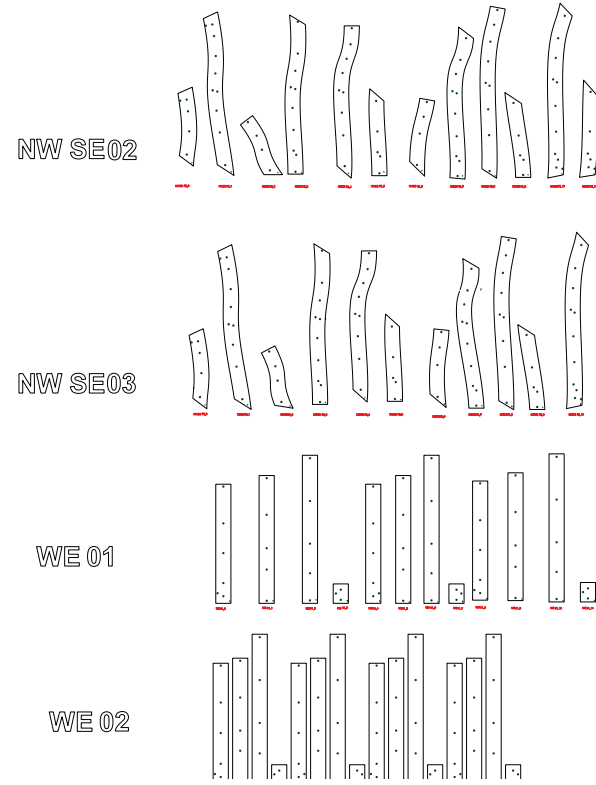
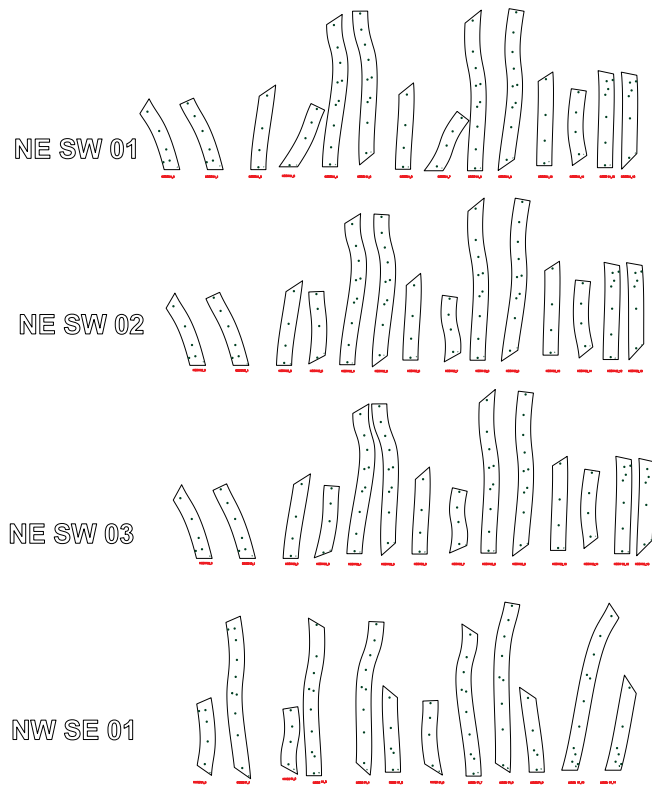


EDGE



PROCESS > UNROLL > TYPES

The baked strips were unrolled and formed the 4 categories.



PROCESS > UNROLL > LASER CUTTER SHEETS

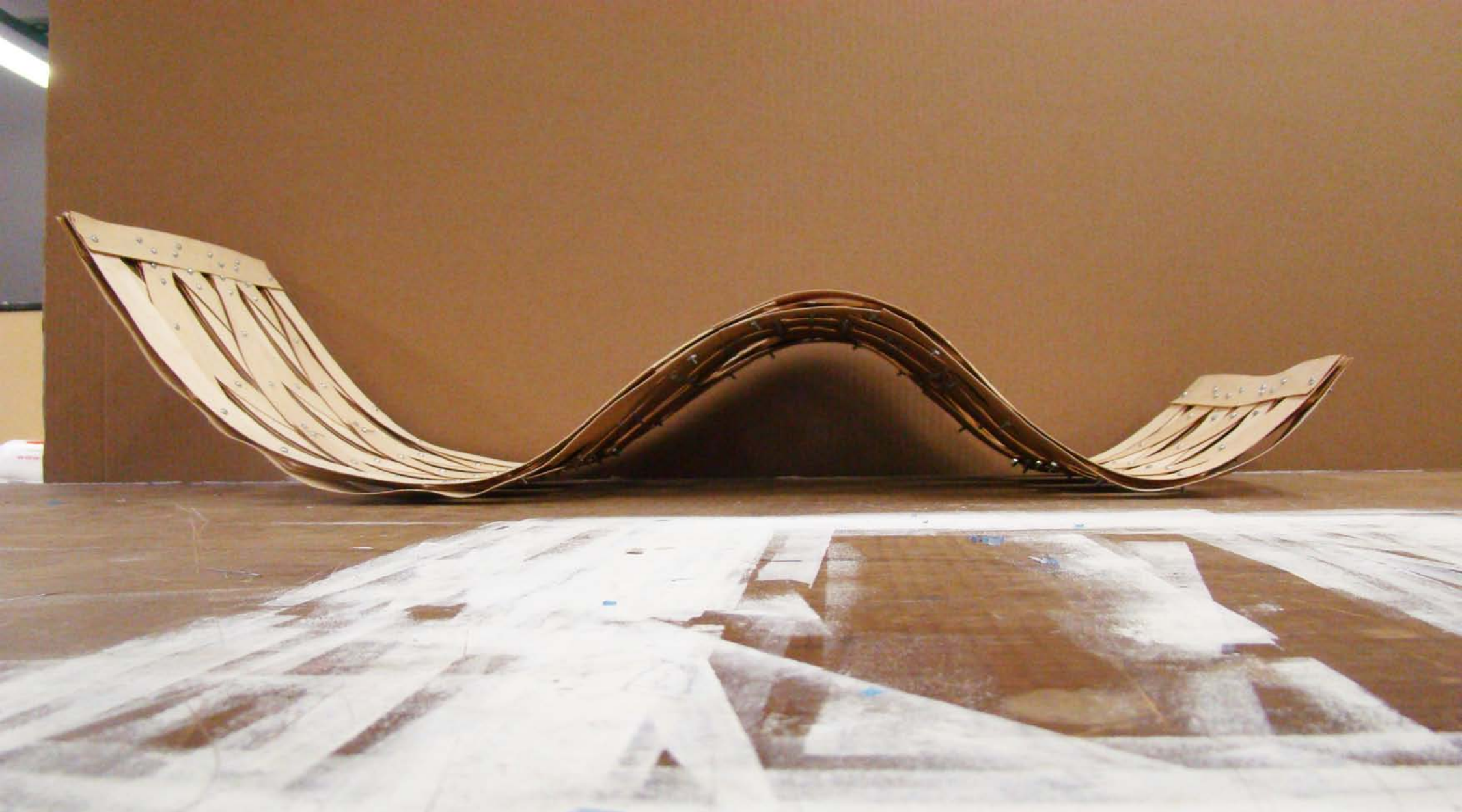
The unrolled strips were placed on sheets and laser cut.



Battle of Gibraltar, Cornelis Claesz. van Wieringen (1607)

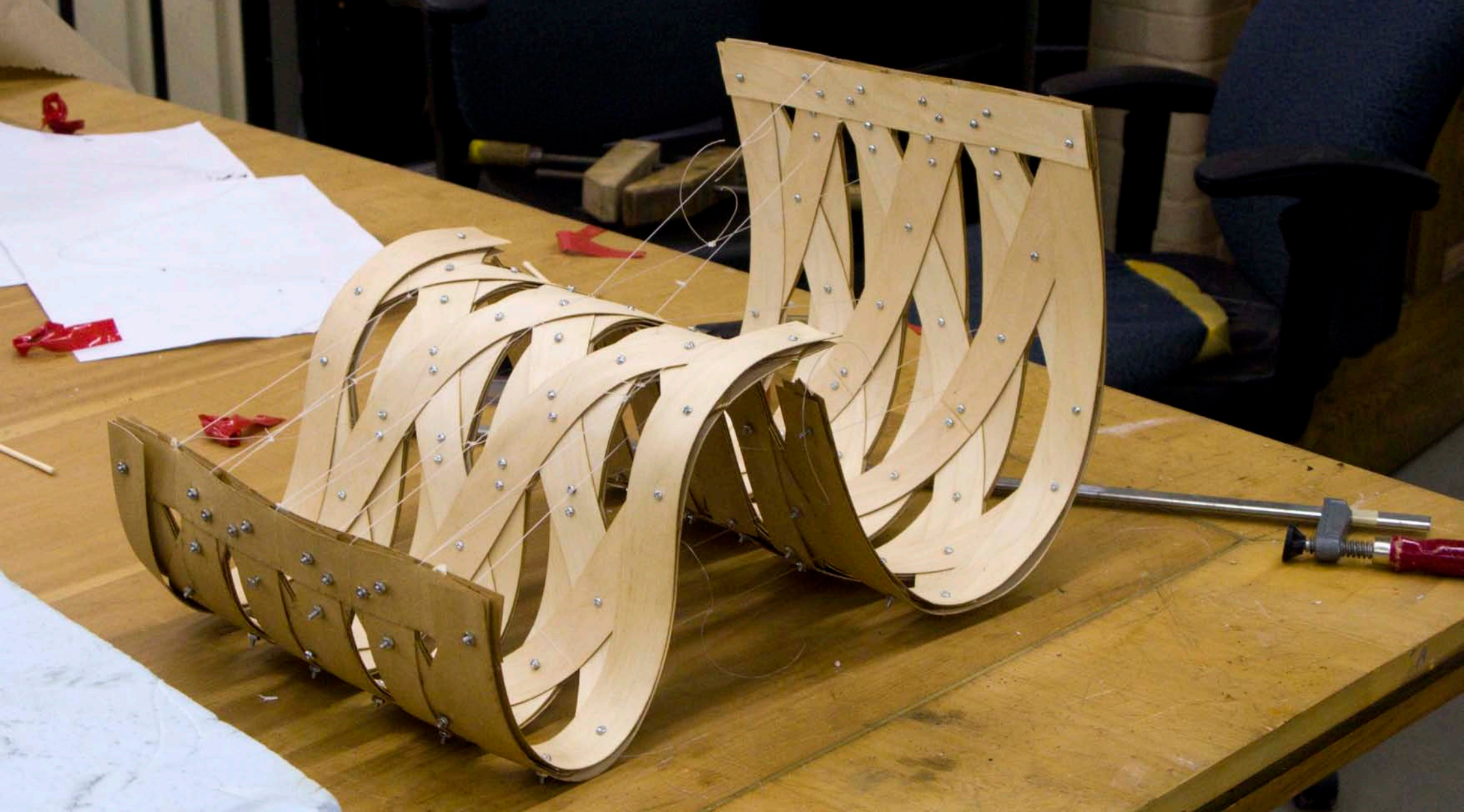
PROCESS > ASSEMBLY

The assembly process was a war-zone. Jeanne and Emily exchanged vengeful glances throughout the day. Ali and David remained calm on the surface, but were anxious nonetheless. Junia acted in rage - especially when she discovered the camera had not documented the construction process as planned. Don was banned from the assembly until nightfall.



PROCESS > ASSEMBLY > PROBLEMS

To our great dismay, the structure was not holding up as well as we had expected it to. Since the surface was not double-curved, the tension was not enough to achieve the required rigidity. The edges should not have been spliced, and yet it was necessary, as the laser cutter could not cut the entire length of the strips.



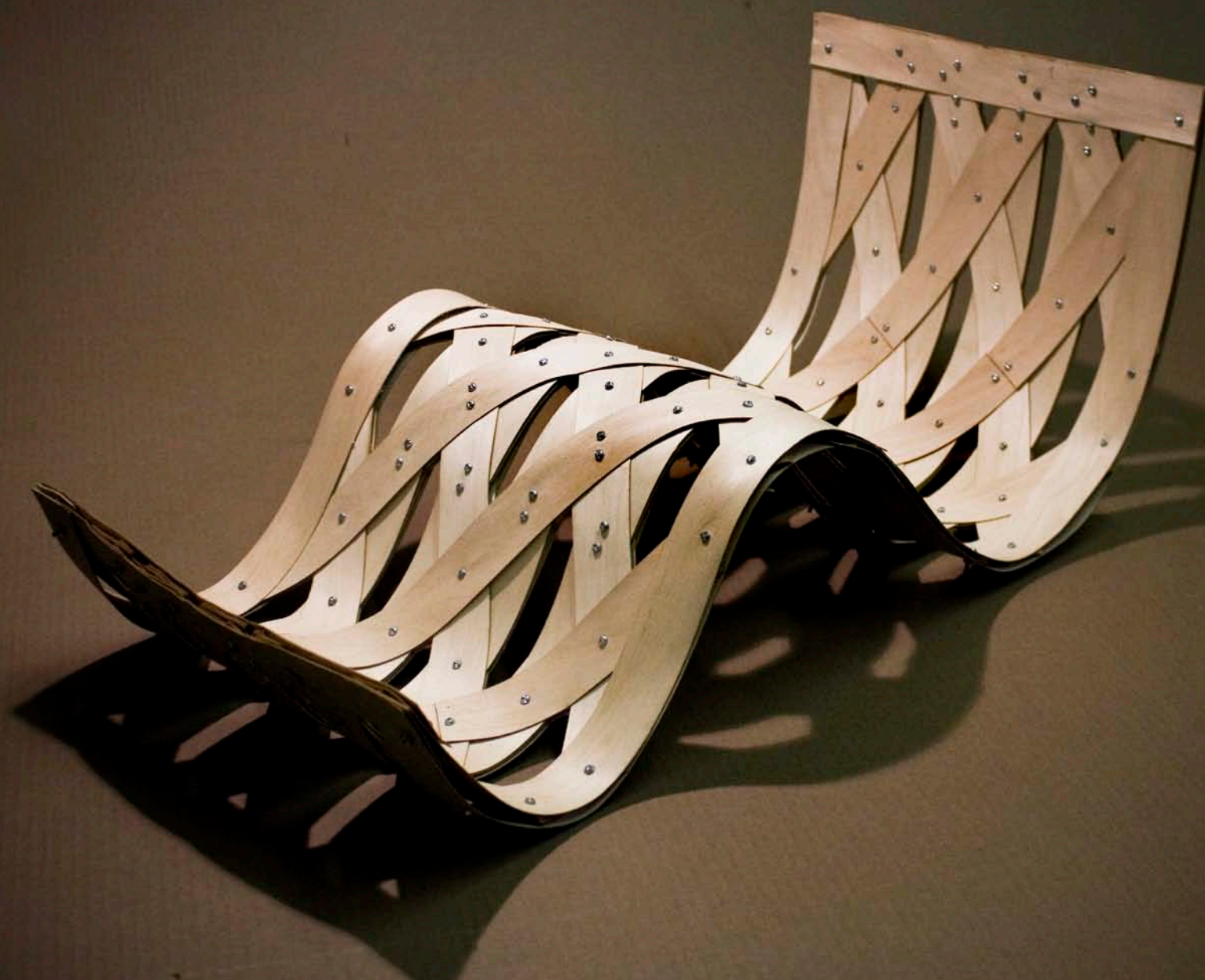
PROCESS > ASSEMBLY > SOLUTION

The solution to the model's inability to hold its desired shape was to steam the entire structure. Fishing wire was used to compress the edges together as well as several key nodes within the structure. We also added small pieces of veneer to the spliced edges to ensure the geometry of the edges was correct.



PROCESS > ASSEMBLY > STEAMING

The model, supported by a metal rod, was then placed in a plastic container filled with 2 L of boiling water. A plastic bag was put over it to keep the steam within the container. This steaming process was performed twice to reach the final form.



FINAL MODEL > FORM

The final product was successful, but came in slightly over budget at \$110.



FINAL MODEL > MAGAZINES AND NEWSPAPERS

It worked well with both magazines and newspapers.



FINAL MODEL > PROFILE

The profile of the model matched the initial design proposal.