

Record of Production

Modeling

Designing the chair was a very long process and many attempts were made before the faceted pod chair was created. The chair was initially curved but it was very hard to extract the dimensioned faces, and I modeled it with flat faces to find the dimensions before liking this esthetic better. As the chair construction, still wasn't quite right we attempted to solve this geometric issue with Trigonometry which resulted in the dimensions to be formed for Prototype 1 which was effective in determining what the key issues were. From here the conclusion was made that it would be beneficial to remodel the design again and with 8 segments forming the band instead of 7 which was successful. The modeling of the chair legs was easy in comparison and just required a lot of re-modeling to achieve the shape I desired.

The mistakes that were made was originally using 7 segments instead of 8 and not originally modeling my project in 2D as it would have allowed me to find the exact dimensions of the project a lot faster. In saying this, I was still able to find my dimensions in the end so this was a very valuable process.

Level of difficulty: 5

Template making

My CAD design aided this process as a perfect drawing was created on the software. I printed the drawings on a full exact 1:1 Scale. The segments were then cut out with scissors leaving a gap of 10 mm or more. We then used spray on adhesive to bind the paper to pine plywood which was then roughly cut with the band saw. I used the disc sander to neaten up the edges and ensure they are smooth and no longer warped. This allows for the segments to be roughly cut before having the angled cuts made by using the Jigs, ultimately making the process quicker and reduces the amounts of passes taken through the table router.

Originally Templates were made without using the full-scale prints from CAD, which was problematic as it did not give the exact angles that was required to form the Pod chair shape, this issue was solves and another template was created in its place.

Level of difficulty: 1

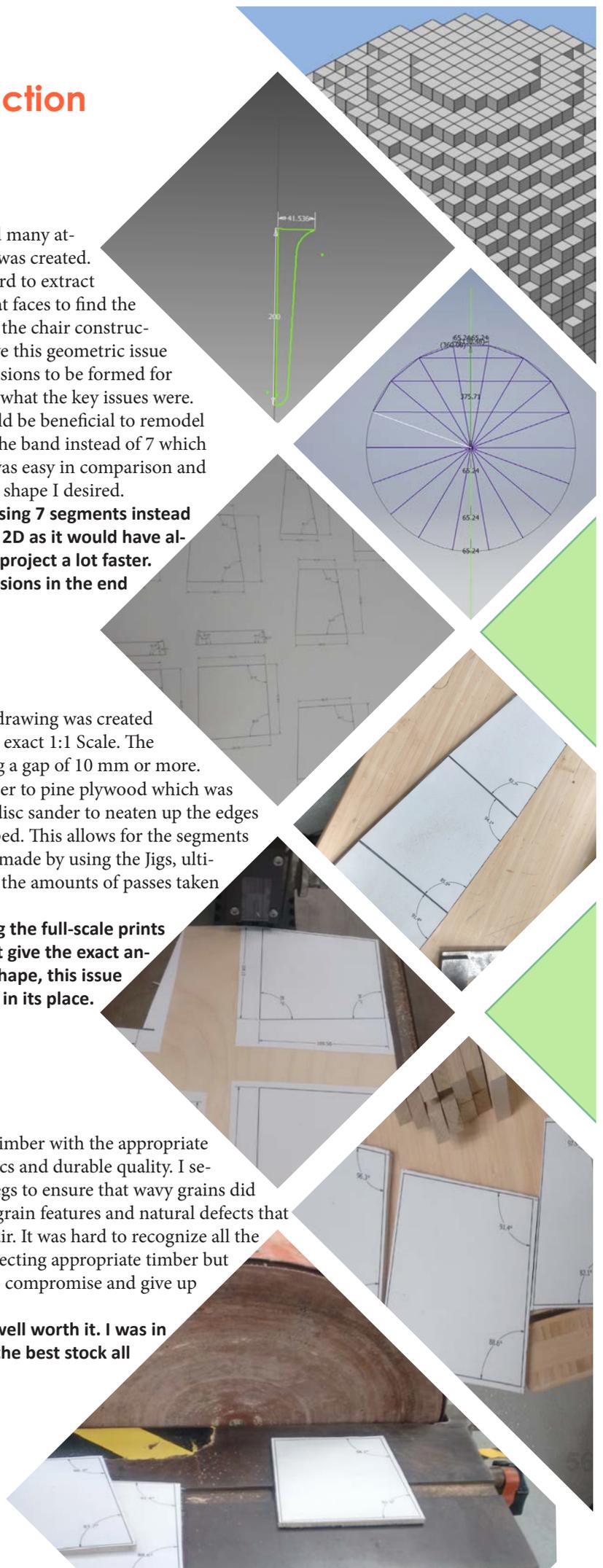
Selection of Timber

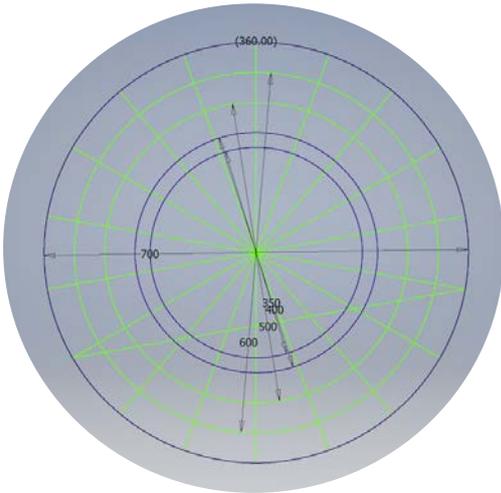
This is an important process to select the right timber with the appropriate grain features to ensure the best possible esthetics and durable quality. I selected quarter sawn timber stock for my chair legs to ensure that wavy grains did not hinder leg strength and kept an eye out for grain features and natural defects that would compliment the natural nature of my chair. It was hard to recognize all the elements that needed to be considered when selecting appropriate timber but all the stock was so nice that it was fairly easy to compromise and give up pieces that didn't compliment my chair.

This took a lot longer than expected but was well worth it. I was in the pile early so I managed to select some of the best stock all of which suited my Job.

Level of difficulty: 1

Hours taken: 2





Problem

Solution

inability to model CAD in 3D

Model chair in 2D instead to find angles and go from there



Lack of timber to perform batching

A finer band saw blade was used and the rough face of the timber was not thickened after the cut to decrease the amount of timber wastage



Instability of chair

Remodel 3D printed prototype on Adobe Inventor Professional to ensure that there is stability, this will be achieved through adding a fourth leg and widening their stance

Prototype 1

This was what I thought was to be my final design before I determined that there were flaws in my design. The segments each had the same angled cuts which left huge unfilled gaps if it was created in a round and if joined together it created an odd shape which was unplanned. This initial model was made from cardboard, each segment was cut out with a Stanley knife and ruler, after being marked precisely using a template that was created after the initial prototyping. These pieces were then taped together to make a life-sized model which also enabled us to see that the initial design was also too small. This led to the remodeling of my POD Chair and led to a better result as there were no longer any flaws in the design.

The biggest issue with this prototype was that it did not form a sphere shape, but this was good in highlighting that alterations in design needed to be made. This led to a much better design and allowed for the segments dimensions to be determined.

Level of difficulty: 1

3D Printing Segments

3D printed will be utilised to produce segments for Jig making process to ensure accuracy and precision. These pieces were all individually modeled and then printed which allows for a jig to be made off each piece.

The 3D printer was a very useful piece of technology to incorporate as the segments were modeled exactly as shown in the plans.

Level of difficulty: 3

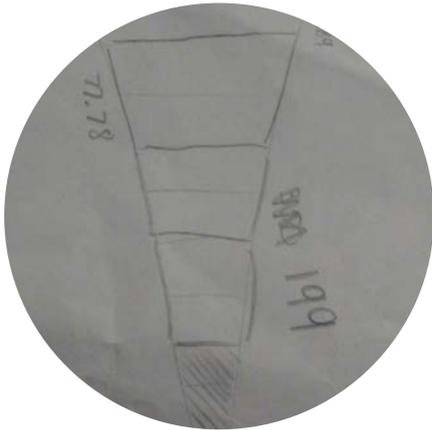
Jig Planning

The decision to make Jigs heavily relied on my ability to produce 64 segments perfectly, there was no other solution as using a table saw would be too hazardous and either way some form of jig would need to be made to secure the pieces to ensure they are accurately cut. The 3D printed pieces were utilized in the designing and production of the jigs to base angled cuts off and to test whether the jig held the pieces at ninety degrees and so forth. A prototype Jig was made to determine the importance of Jig functions and to ensure that there was enough space for clamping and cutting, this also highlighted the marginal room for error as a fraction of a degree could throw out the whole POD chair.

This was a tedious process due to the fact that as soon as there were many issues that needed to be overcome which led me to the redesign of the Jig multiple times. Two issues that proved to be problematic were finding a solution for clamping and working out how to cut exact angles.

Level of difficulty: 5





Problem

Design of three dimensional Pod Chair, with angled cuts

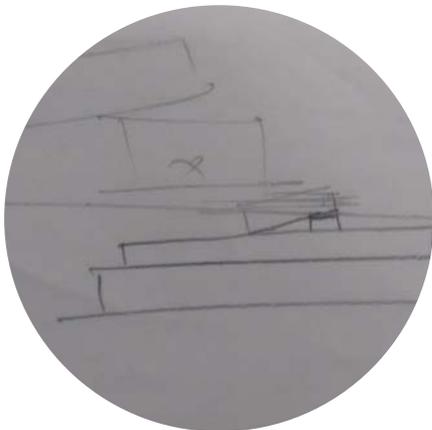
Solution

Make a three model to test two dimensional dimensions



Incorrect dimensions of prototype 1

Remodel on Adobe Inventor Professional to ensure dimensions and angled cuts function and work effectively.



inability to design first Jig

used teacher to find sources and other furniture designers that also use jigs to gain a better understanding of functions that can be performed by a Jig.

