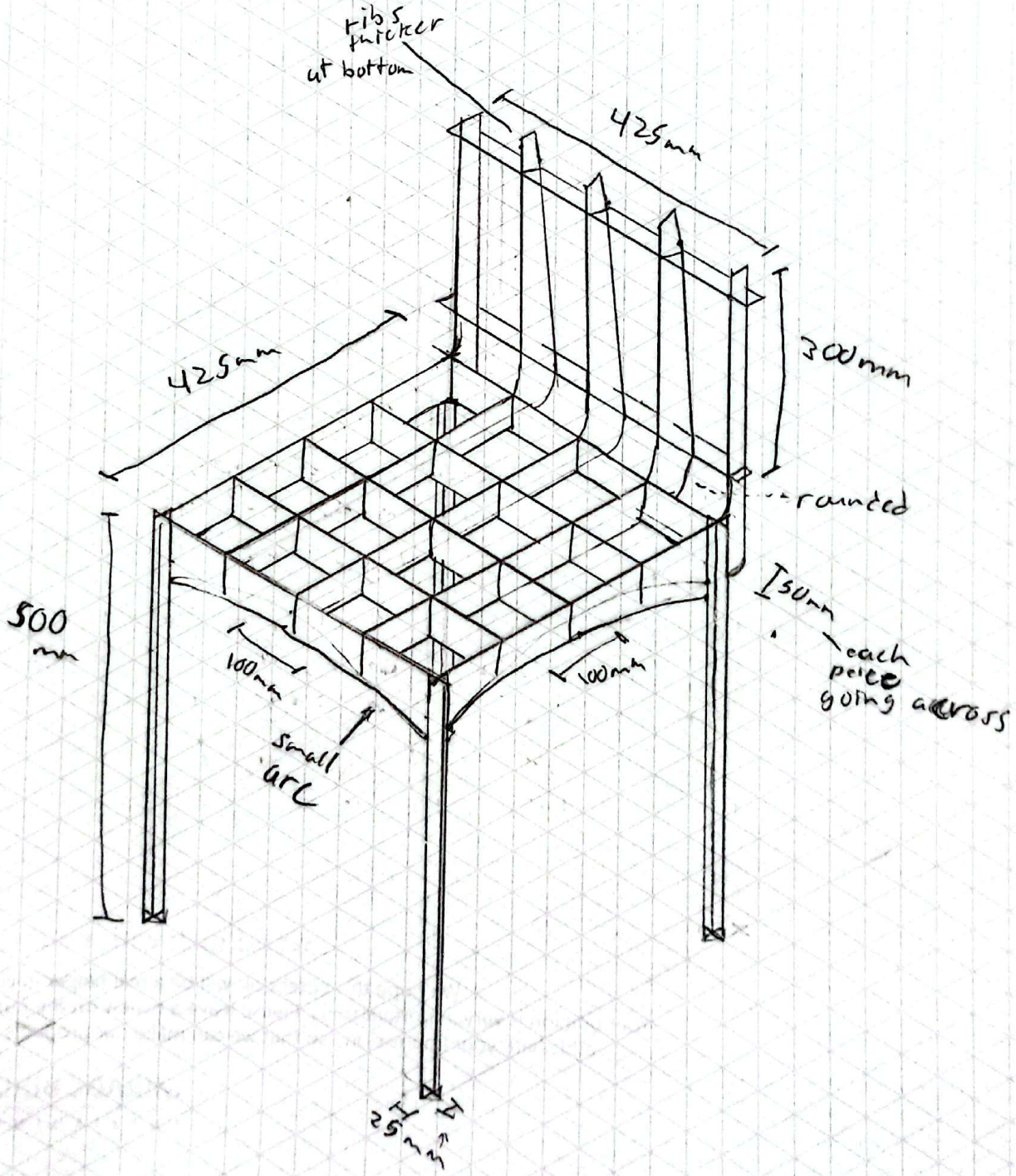
Chair 1 approx 300g

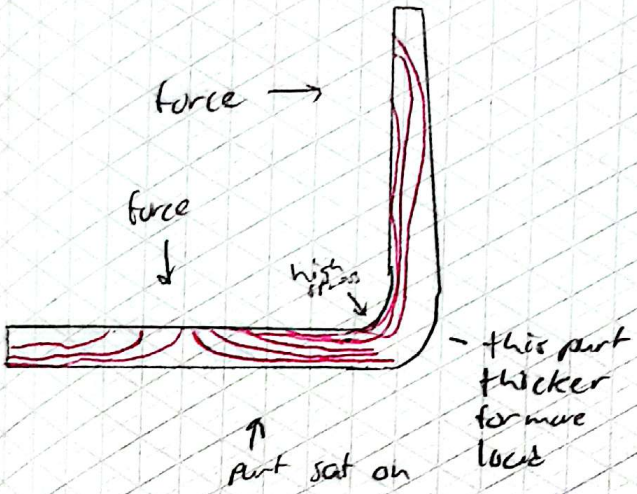
/ ← distance = 50mm

This is a lightweight design. I left room to add more material where more strength is needed. Potential areas include legs, center of seat, fillets. If needed, I can add more going across and more leg thickness. This design has uniform features in many spots. Everything interlocks. Ex ⊓ and ⊓ so together

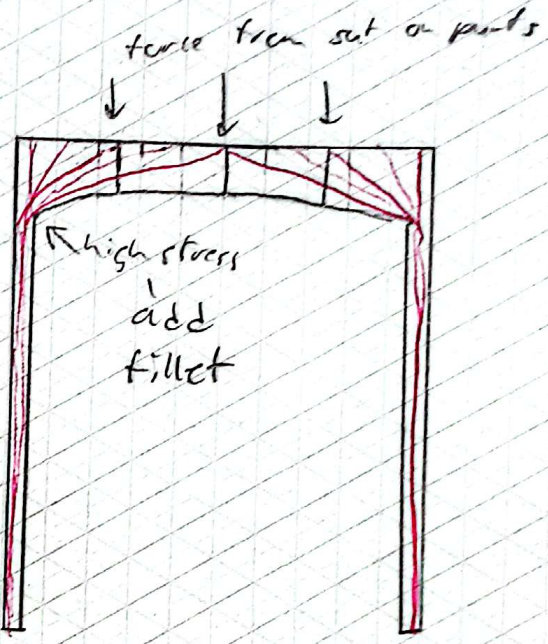


Chair 1 Analysis
(with each unique part)
(red like is stress lines)

Chair Rib/Support



Chair legs

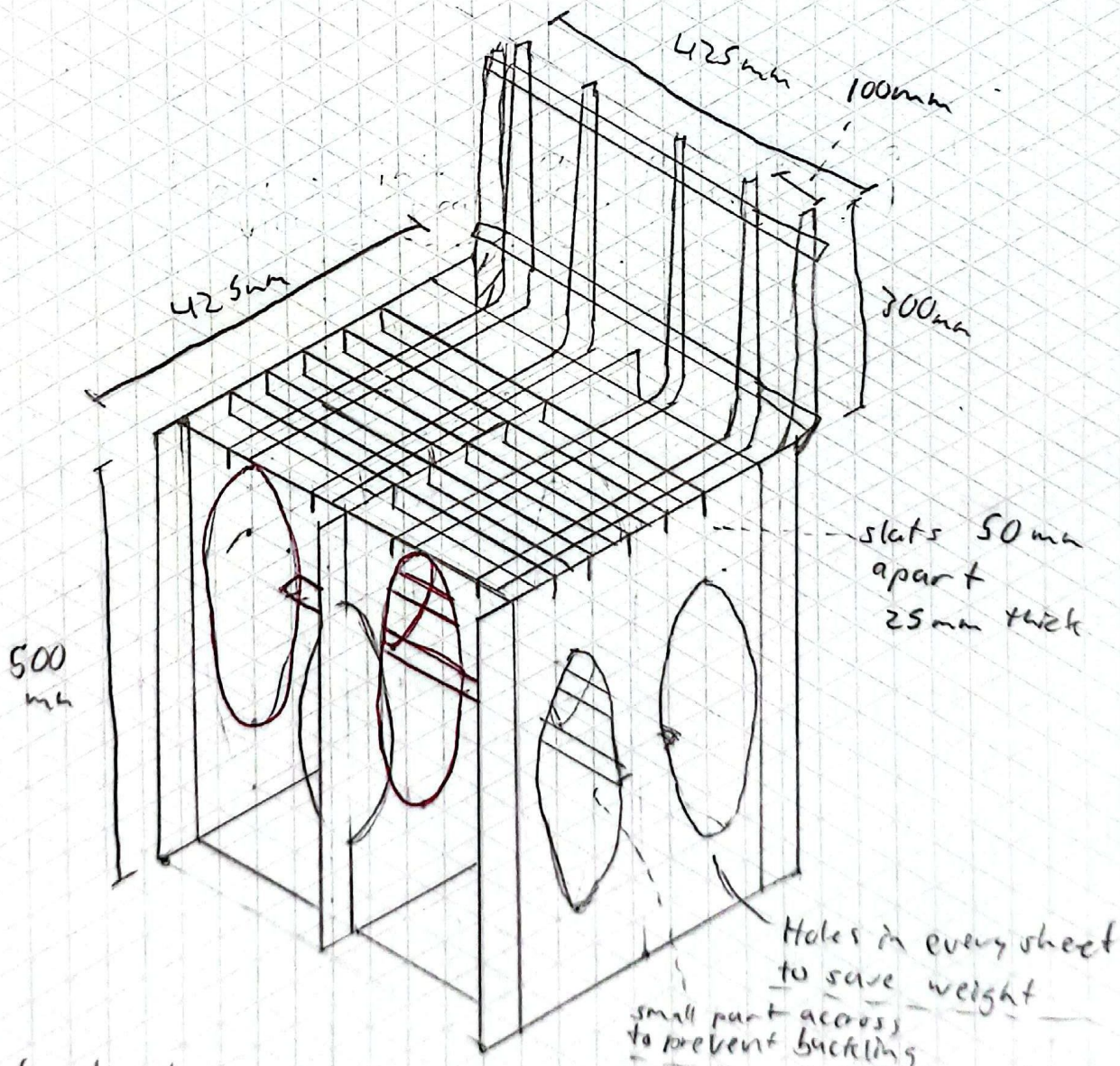


Based on the stress lines and analysis, for the ribs/support there is not much to reduce, but there will be high stress on the ends because that is where it connects to the legs. For the legs, there is concentration at the end of the arc, so a fillet can be added, also, most of the stress will be focused in the areas where it will attach to the part sat on, so to spread it out, we can add more parts sat on.

Chair 2 approx 780g

/ → 1 line = 50 mm

This design is much heavier, but more likely to support high loads as the "legs" are much wider, distributing load more. There are also more slats that can be sat on to further increase distribution of load. Because I am not sure how rigid the material is, I have decided to once again not have a plain sheet to sit on as it may bend easy. Once again, everything is interlocking.



Red is internal and cannot be seen from this view in Real life. (Hidden)

Chair 2 Analysis

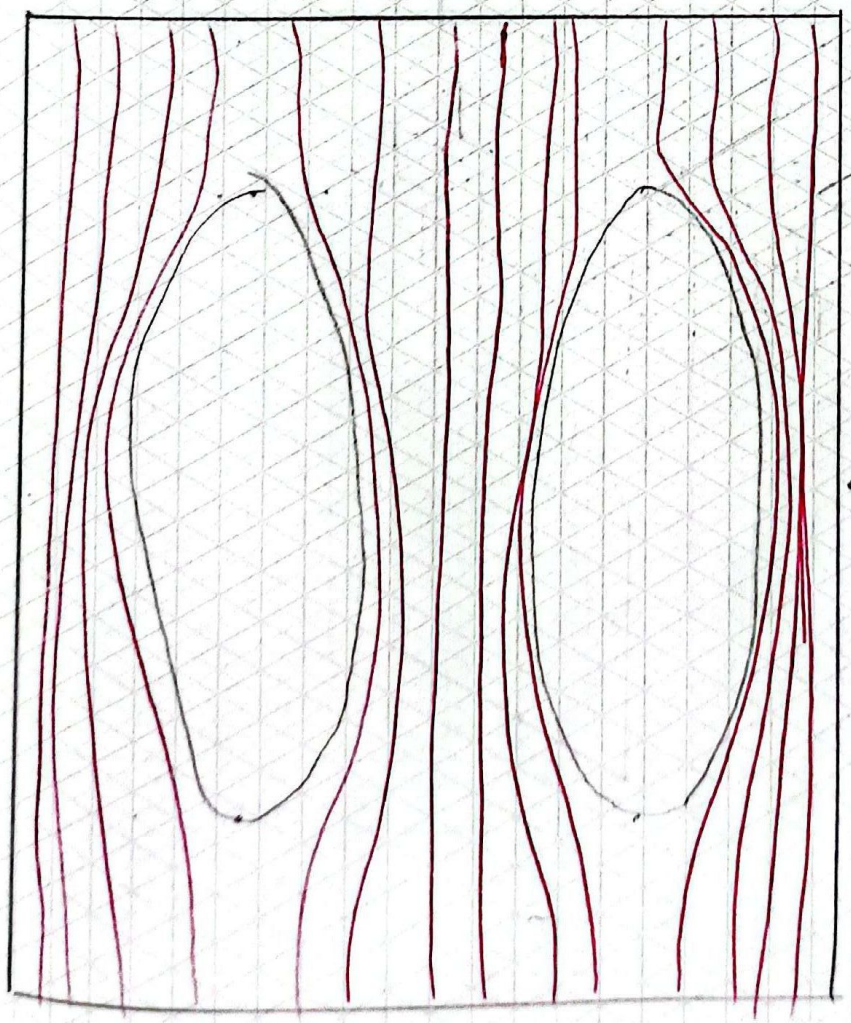
Red line is stress lines

For the vertical ribs, it is the same as chair 2.

This helps ribs to stop bending, and can support load.
Not much to do here

stabalizers for ribs, also seats that are sat on
can add more ribs to distribute more → in design

"legs" – higher stress concentration near center of ovals but is okay



Chair 3

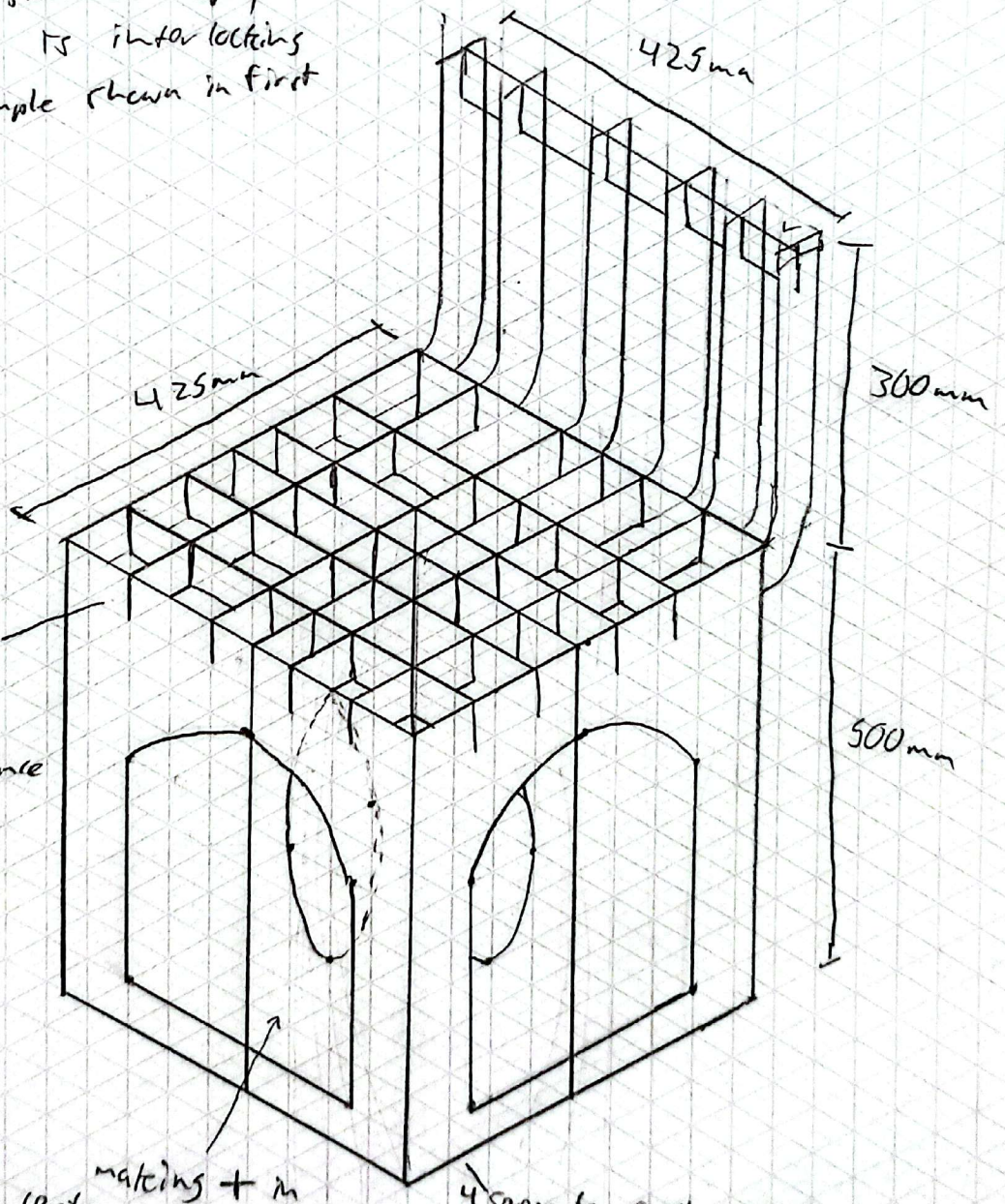
← 1 line/distance = 50 mm

Every drawing is to scale. Approximatly 550 g. with this weight, lot of room to add more support, or can possibly remove unneeded things to get under 400g. This design should be stable for the legs and should not crush or buckel (may see some tension). This design, with some tweaks seems worthwhile. Furthermore, there are many thick slats, further distributing weight.

(can add sheet on top)

Everything is interlocking

(small example shown in first drawing)



Chair 3 analysis
Red lines is stress lines

Many parts are the same as earlier. I will do new ones.
Inner "legs", slats, and ribs, are all the same or very similar as other previous parts.

Outer "legs"