Neil O’Donoghue

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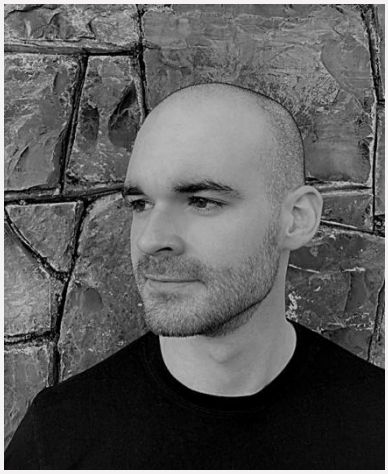
Designer Statement



From a young age Neil has been fascinated by space and the role design plays in how we experience it. His work reflects his desire to create instinctive and innovative design. As an artist and a craftsman he prides himself on the quality and attention to detail of his work.

Inspired by an ironic contrast of the quirkiness of Ettore Sottsass' work and the discipline of Dieter Rams' principles, Neils design ethos is to create functional, simple and at times fun furniture.

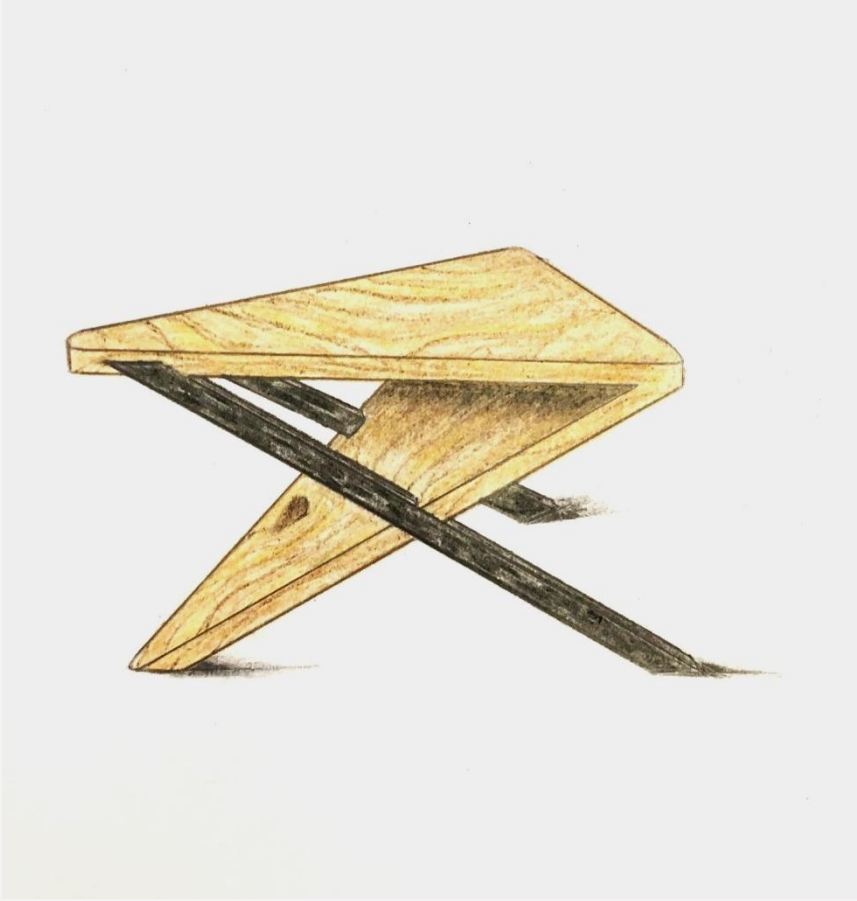
Neil O'Donoghue was born in 1995 in County Galway on the west coast of Ireland. In his formative years, Neil displayed and sold his artwork in markets across Galway, where he gained the invaluable experience of being immersed in the environment of fellow craftsmen and entrepreneurs. Neil spent 2 years studying Architectural Design prior to making the transition in 2019 to Furniture Design and Manufacture at ATU Connemara where he studied for 4 years and left with a first class honours degree. He is currently studying a Masters degree in Design Innovation at Maynooth University.

His design approach reflects his exploratory attitude towards materials and enjoys the challenge of questioning preconceptions one may have with a given material. Three words are at the foundation of his work: Transparency, circularity and renewability.

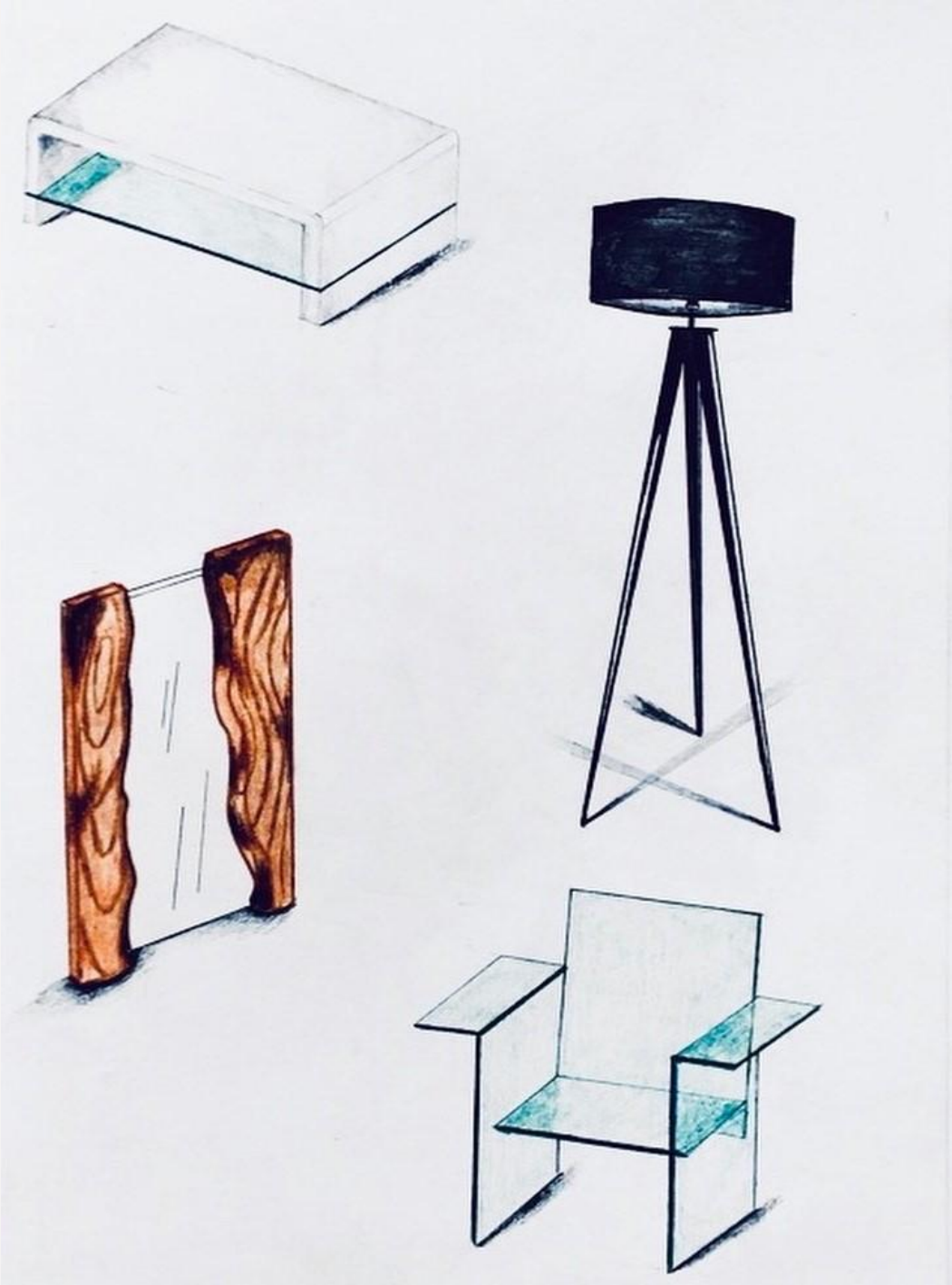
Commencing the Design Process

Rendered Sketches

I decided to look at timeless classics from the past for inspiration. I did this through the medium of rendered sketches. Using colouring pencils I have chosen some 20th century designs and some concepts of my own to express the differing properties of a given material, such as glass, wood, steel, etc. This in return makes me think of how significant material choice is in these early stages of a design process.



Rendered Sketches



Rendered Sketches

Rendered Sketches

Rendered Sketches

Primary Research

Circular Economy
The Ellen MacArthur Foundation

The aim of a circular economy is to conserve natural resources by designing things to be used again and again before the materials are recovered. The model of a circular economy offers an alternative solution to the linear system of accelerating waste production.

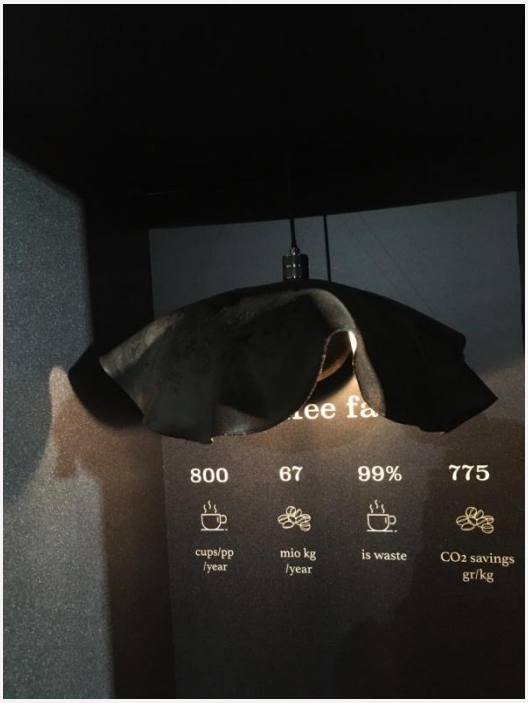
- The Ellen MacArthur Foundation was established in 2010 with the aim of accelerating the transition to the circular economy.
- According to the Ellen MacArthur Foundation, a circular economy is dependent on three key principles driven by design; elimination of waste and pollution, circulating products and materials at their highest value, and the regeneration of nature.
- The first principle requires a major shift in the design of products away from the take-make-waste linear economy, to a way of allowing the products to re-enter the process in a circular way. Much of this waste ends up in landfill or incinerators.
- The second principle aims to keep materials in use, either as a product or, when that can no longer be used, as components or raw materials. This way, nothing becomes waste and the intrinsic value of products and materials are retained. An example of this is biodegradable materials.
- The third principle aims to support natural processes and leave more room for nature to thrive. A circular approach moves away from the extraction of materials and focuses on regeneration to rebuild soil and increase biodiversity.

Dutch Design Week 2022

I attended Dutch Design Week in October of 2022. Dutch Design Week is the largest annual design event in Northern Europe. It presents work and concepts from more than 2,600 designers to more than 355,000 visitors from home and abroad. Hosted in Eindhoven, Netherlands, the event includes innovative projects, installations and exhibitions. I had the chance to see what is happening in the world of design right now and what is being done to tackle climate and environmental challenges.

Dutch Design Week 2022

The Kaffa Collection is a good example of the shift towards eco-conscious products. The Kaffa Collection is the result of research in organic waste streams to turn into biodesign. By using coffee grounds bio-composite in the design, The Kaffa Collection spreads awareness about the possibilities that lie in front of us with waste streams. The new created material remains biodegradable. I had a conversation with the designer of Kaffa and she told me it took 83 cups of coffee to make the hanging lampshade in the image below. Each lamp shade is unique due the drying process which shapes the lamp.

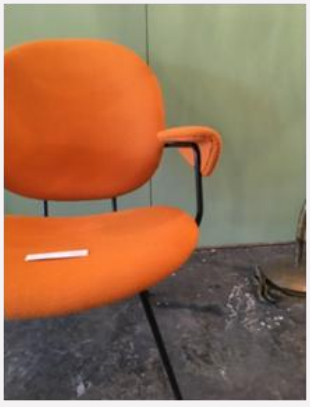


Dutch Design Week 2022

This product explores alternative, natural binders like magnesium and potato starch, combined with hemp fibres. Through exploration with locally sourced biobased sustainable materials a lampshade was made by mixing potato starch hemp and a magnesium like concrete.
Designed and made by Dutch designer Sebastiaan Baar.

Dutch Design Week 2022

- A contemporary chair design, which pushes the boundaries of traditional crafts. While reflecting the old function and traditional aesthetics of quilts and pillows, it defines a more contemporary version – a wrap-up garment for a 3 dimensional object. I enjoyed the quirkiness and playfulness of this design.



- A contemporary orange fabric chair design. The armrest is an interesting detail that caught my eye.

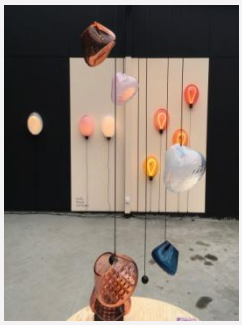
- Tubular coloured chairs exhibited in the Louis Van Peek Exhibition.

Dutch Design Week 2022








What's Happening Right Now
EU Legislation in progress

On the 30 March 2022, the European Commission put forward a proposal establishing a general framework for setting ecodesign requirements for sustainable products. The aim of this regulation would require products to use fewer harmful substances and to use more recycled content, with an aim of making products less harmful to the environment. This regulation would introduce new rules applicable to all products on the internal market, one of which being the furniture industry. This new proposal will enforce the European furniture industry to revaluate current practises and come up with solutions to tackle climate and environmental-related challenges. One of the pressing challenges to overcome will be the move away from fossil based materials and promoting the push for renewable materials.

In June 2022 The European Furniture Industries Confederation (EFIC) published a report of their position on the Europeans Commissions new proposal. They welcome the proposal and believe "furniture is well suited for a circular economy, a transition that is seen as an opportunity" . In the report the EFIC expanded on 21 recommendations and concerns the European furniture industry needs to consider in order to accommodate the incoming Ecodesign for Sustainable Products Regulation, such as;

- no. 7 – Innovation should be promoted (new eco-friendly materials to be used in furniture industry)
- no. 8 consider the whole lifecycle of a product
- no.12 moving away from fossil-based materials

What are Companies Doing

Some companies have already begun making changes to address the climate and environmental challenges we face.

Benchmark, a furniture company located in England, are implementing life-cycle assessment analysis in their work. Life cycle assessment or LCA is a methodology for assessing environmental impacts associated with all the stages of the life cycle of a commercial product, process, or service. Benchmark believe in responsible manufacturing and carefully consider their products and how they make them. For this reason, Benchmark chose to invest in LCA of their core product collections to enable them to provide independently verified analysis to demonstrate the low environmental impact of the furniture they produce.

Another example of this is Sebastian Cox, who runs a furniture design studio and workshop in London. Sebastian Cox implements measures in his workshop to track the carbon footprint of their furniture.

Chairs made by Benchmark

Choosing an Eco-friendly material

When deciding which eco-friendly material I would use, I reflected on the products and experimentation with new 'green' materials I saw during Dutch Design Week.

I conducted some research into other eco-friendly materials such as sheep's wool, plant-based polyurethane rigid foam, felt, cardboard, organic linen, seagrass, cork and various species of seaweed found on the Irish coast. After researching cork further, I looked to see what else cork is used in. This is when I came across the flooring material linoleum.

Linoleum or 'lino' is as a robust floor covering popular throughout most of the 20th century. In 1855, Frederic Walton began to experiment with raw linseed oil. Within a few years he created linoleum, the origin of all resilient flooring.

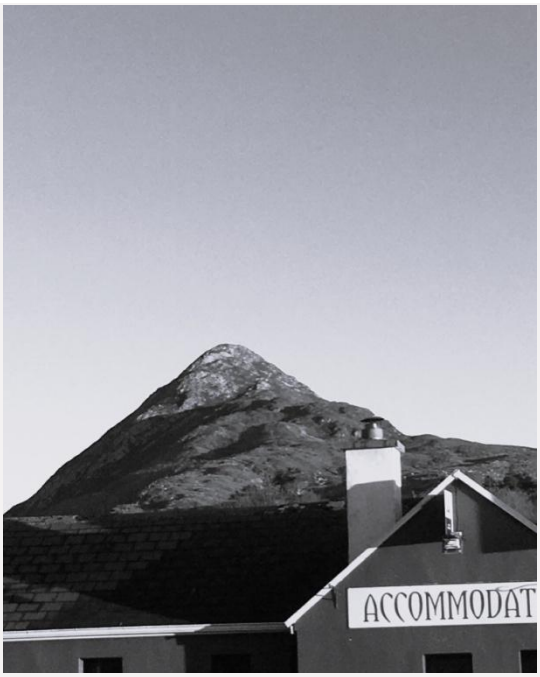
Since linoleum was first invented, the ingredients have essentially remained the same. Linoleum is created with six main ingredients: linseed oil, pine rosin, wood flour, cork dust, calcium carbonate, and natural pigments.

Linoleums Properties

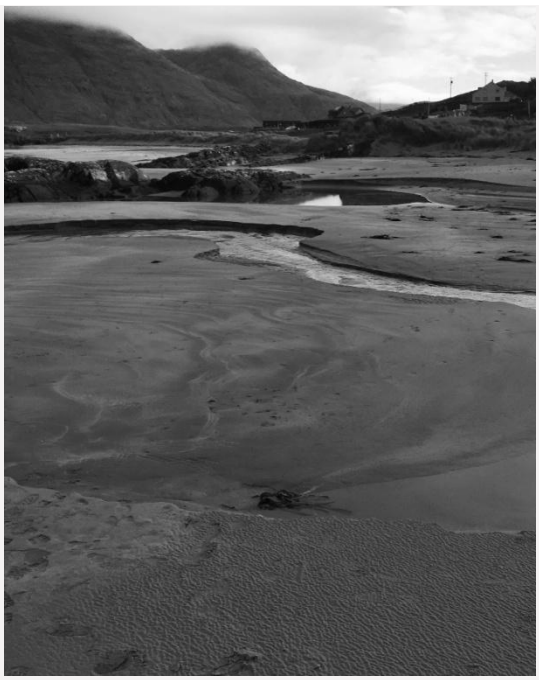
- Biodegradable
- Carbon neutral
- Robust
- Antistatic
- Available in a variety of colours
- Resistant to water, grease and oils

Inspiration

Irish Landscape



Irish Landscape



Fiberglass Chairs - Inspiration for Linoleum

Charles & Ray Eames – DAR, 1950

Arne Jacobsen – Swan, 1958

Marc Newson – Felt, 1993

Nipa Doshi & Jonathon Levien – Almora, 2014

Sheet Metal Chairs - Inspiration for Linoleum

George Nelson - Coconut, 1955

Jasper Morrison – Thinking Man’s Chair

Maarten Van Seeren – LC95A, 1996

Agenore Fabbri – Nastro di Gala, 1991

Bent Plywood Chairs - Inspiration for Linoleum

Browdie Neill – Cowrie, 2013

Grete Jalk – Lounge Chair, 1963

Pierre Paulin Chairs

Pierre Paullin – The groovy chair, 1973

Pierre Paulin – Oyster Lounge, 1964

Pierre Paulin – Butterfly Chair

Pierre Paulin – Tulip Midi, 1963

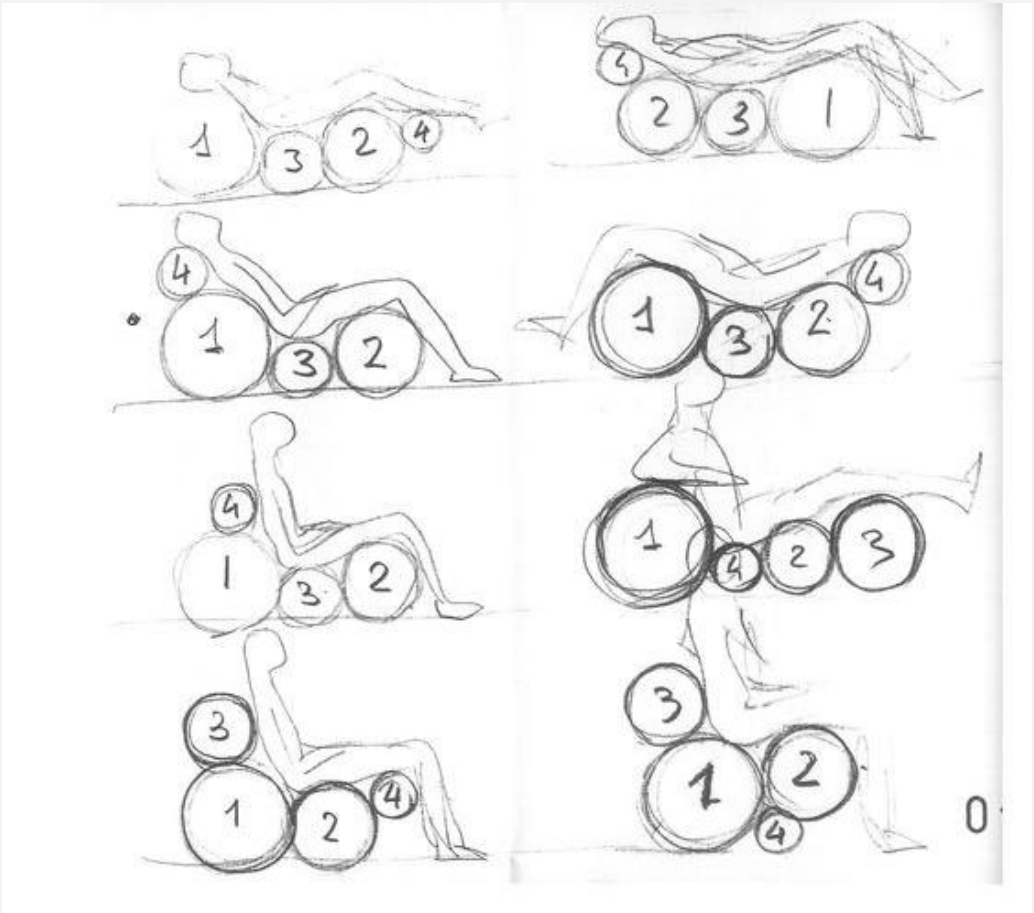
Joe Colombo

Tube Chair

1969

Materials

- Polypropylene
- Polyurethane foam
- Metal hooks



Sling Chairs with Dimensions

Kamp & Volf – Serengeti Chair

720mm (H) x 730mm(W) x 850mm(D)

Seat - 326mm(H) x 540mm(D)

Sling Chairs with Dimensions

Brazilian Leather Sling Chair

750mm(H) x 735mm(W) x 584mm(D)

Seat – 355mm(H) x 444mm(W)

Under Chair Clearance – 310mm

Sling Chairs with Dimensions

CH766 Alejandro - Sling Chair

775mm(H) x 780mm(W) x 760mm(D)

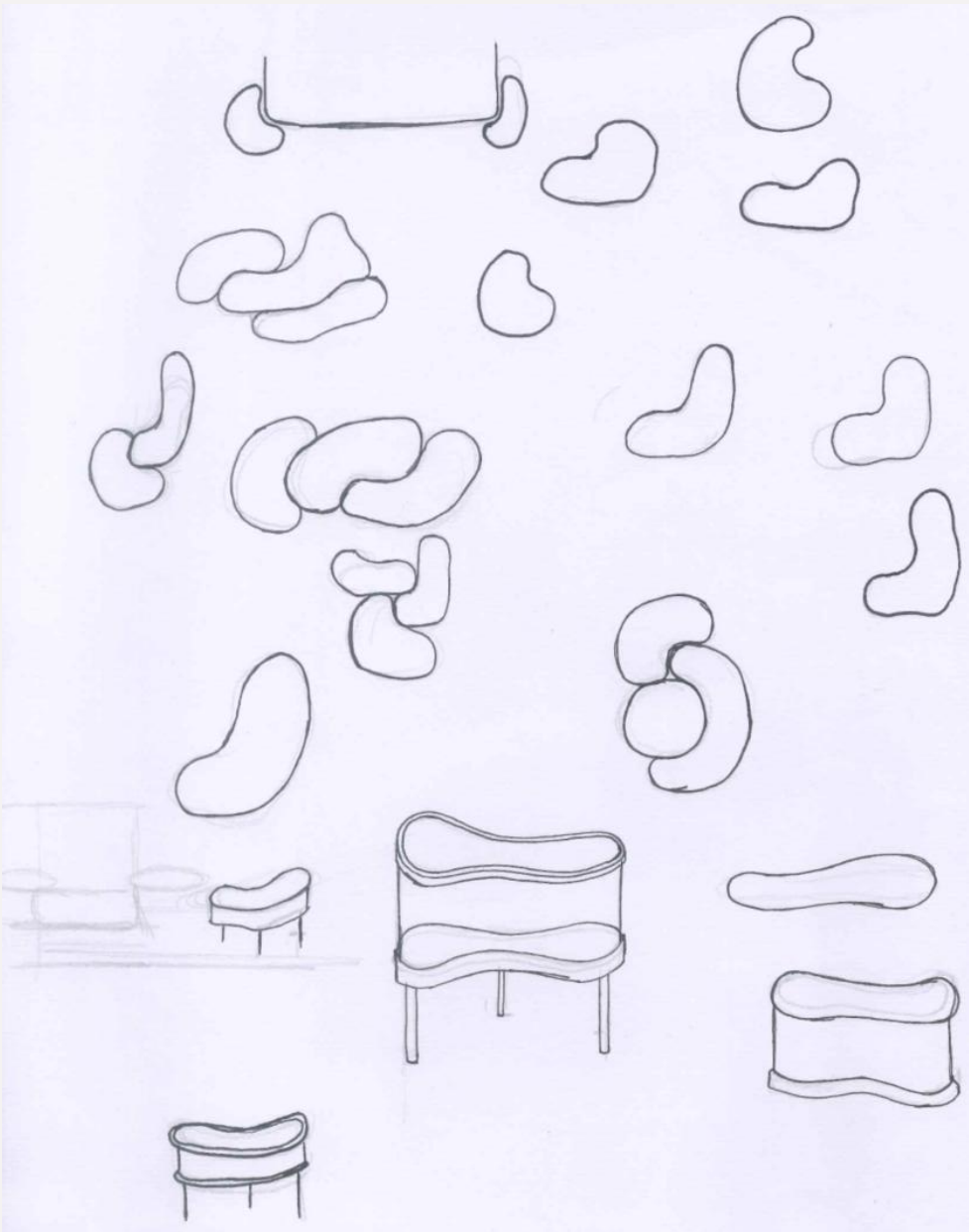
Utilising Colour & Cylindrical Forms

Footprints, Dolmens & more Irish Landscape

Moodboard

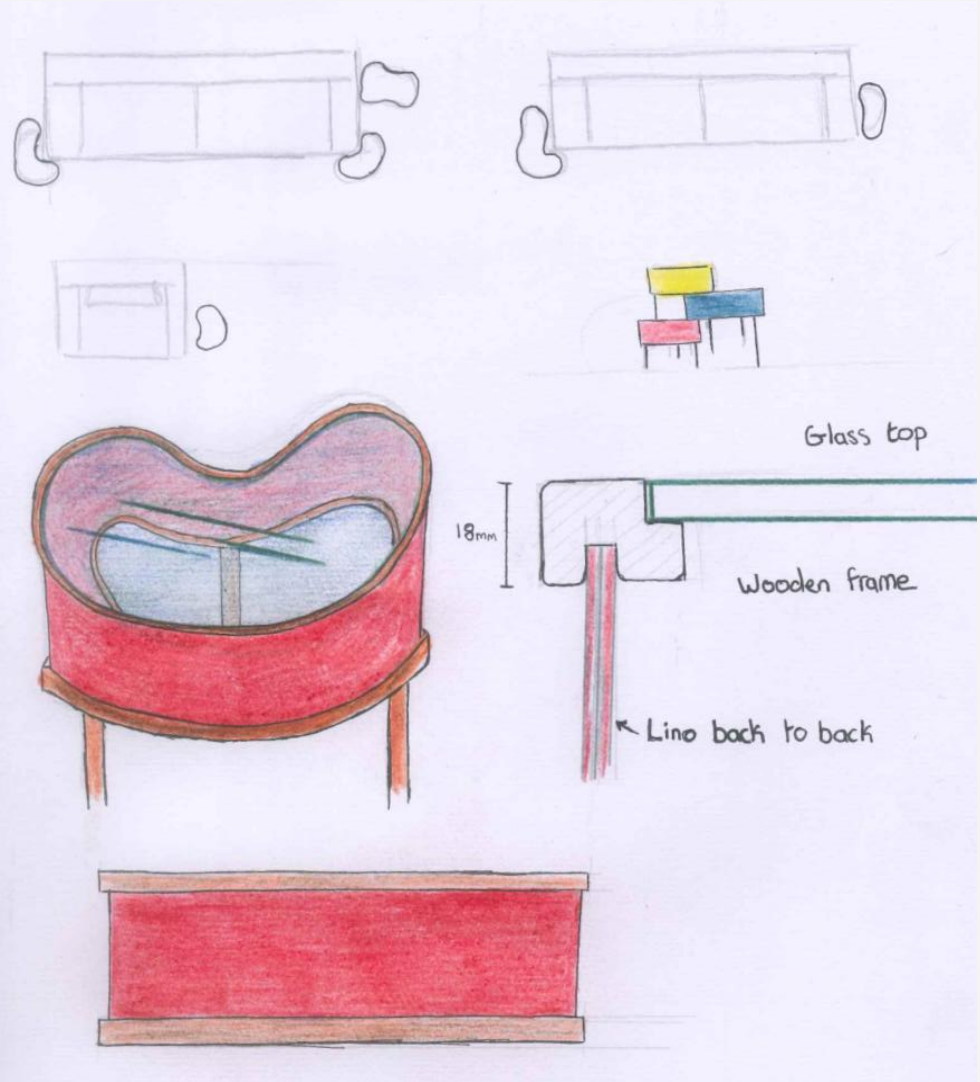
Sketches, Idea Generation & Prototyping

Idea Generation



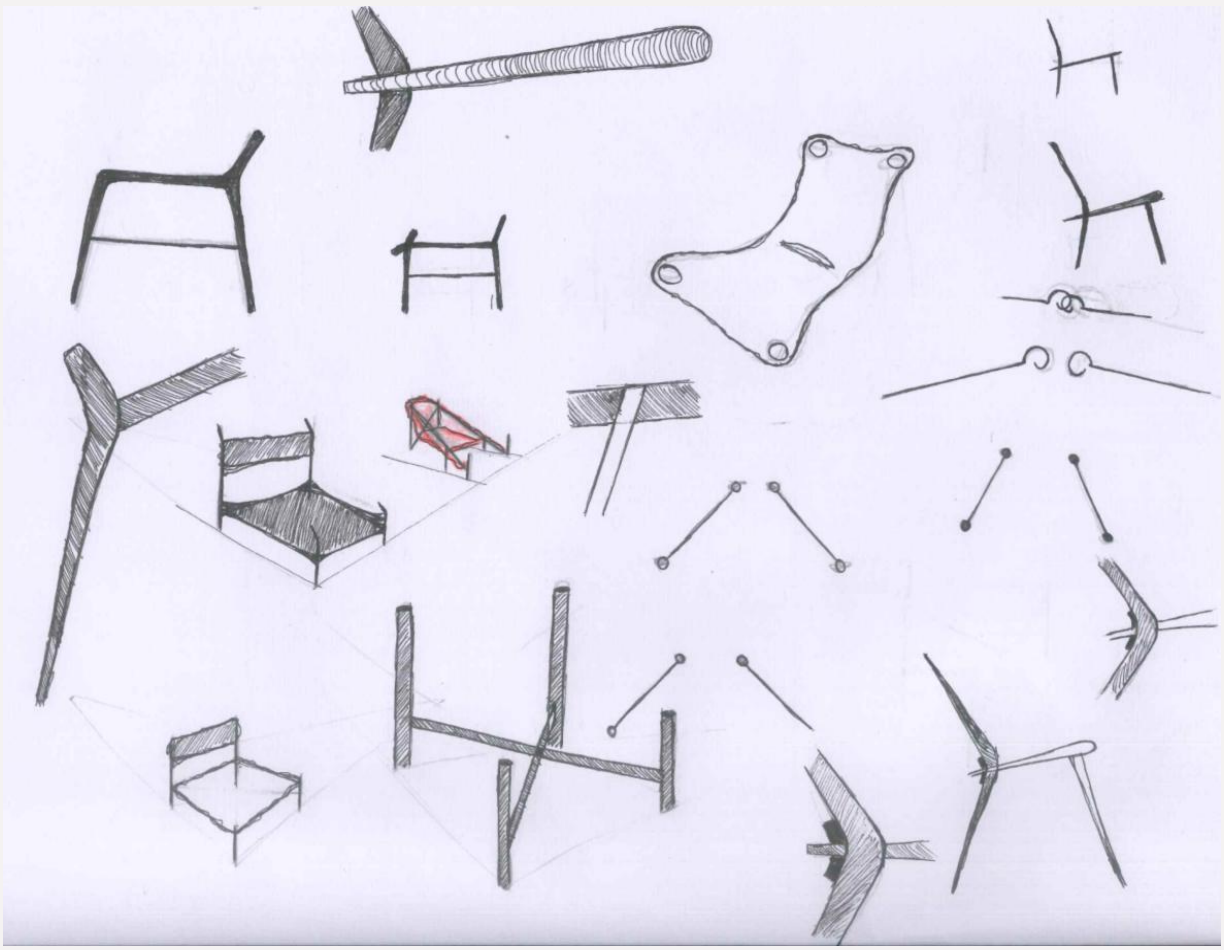
Initial sketches looking at organic forms that nest into one another.

Idea Generation – The 'Puddle' Side Table



A set of 3 side tables at different heights made from lino, glass and oak. With a simplistic approach these small side tables are inspired by the organic shape of a puddle. I see them in use around the corners of a couch. A functional and colourful concept.

Idea Generation

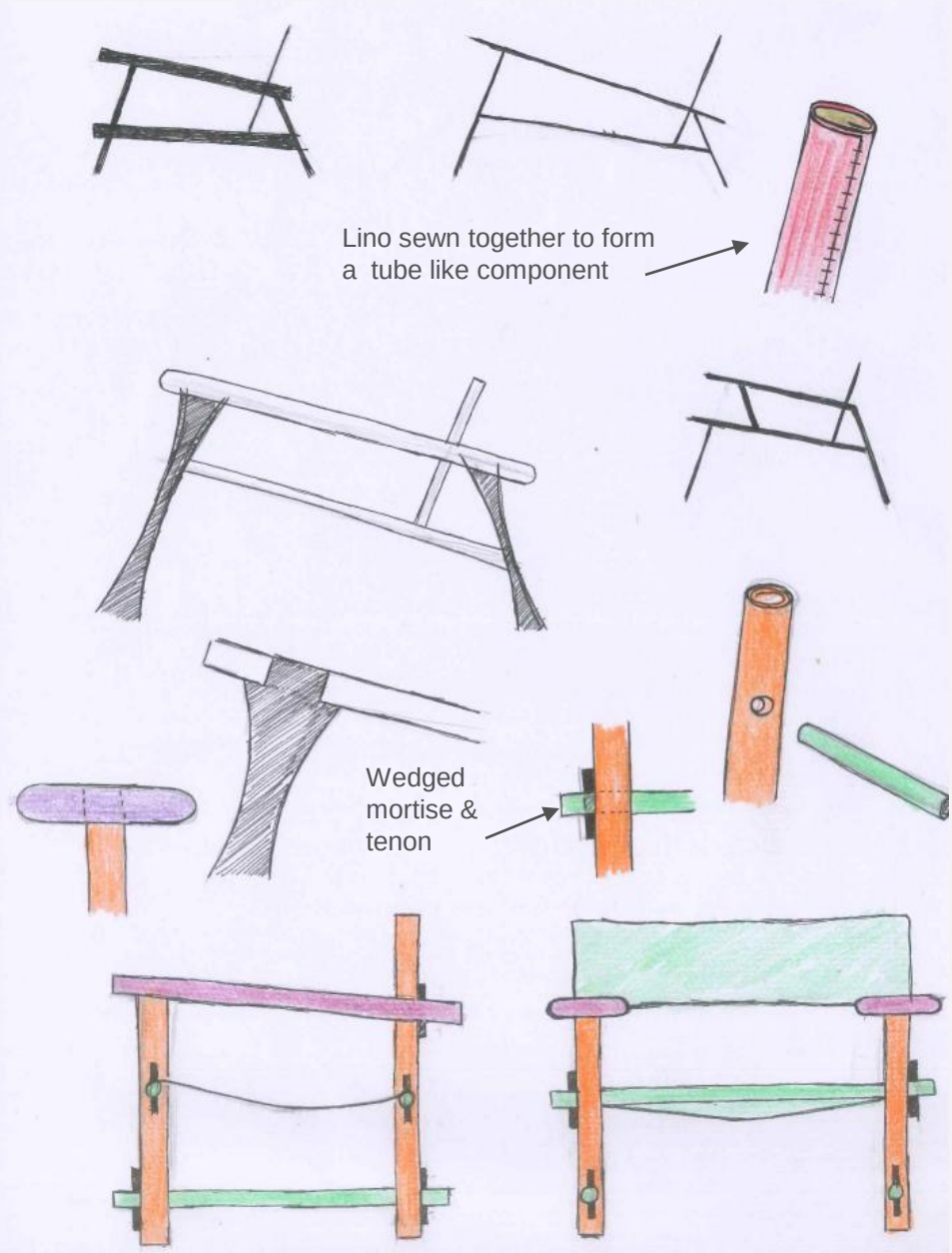


Sketches exploring various jointing methods and mechanisms involved in the construction of a chair.

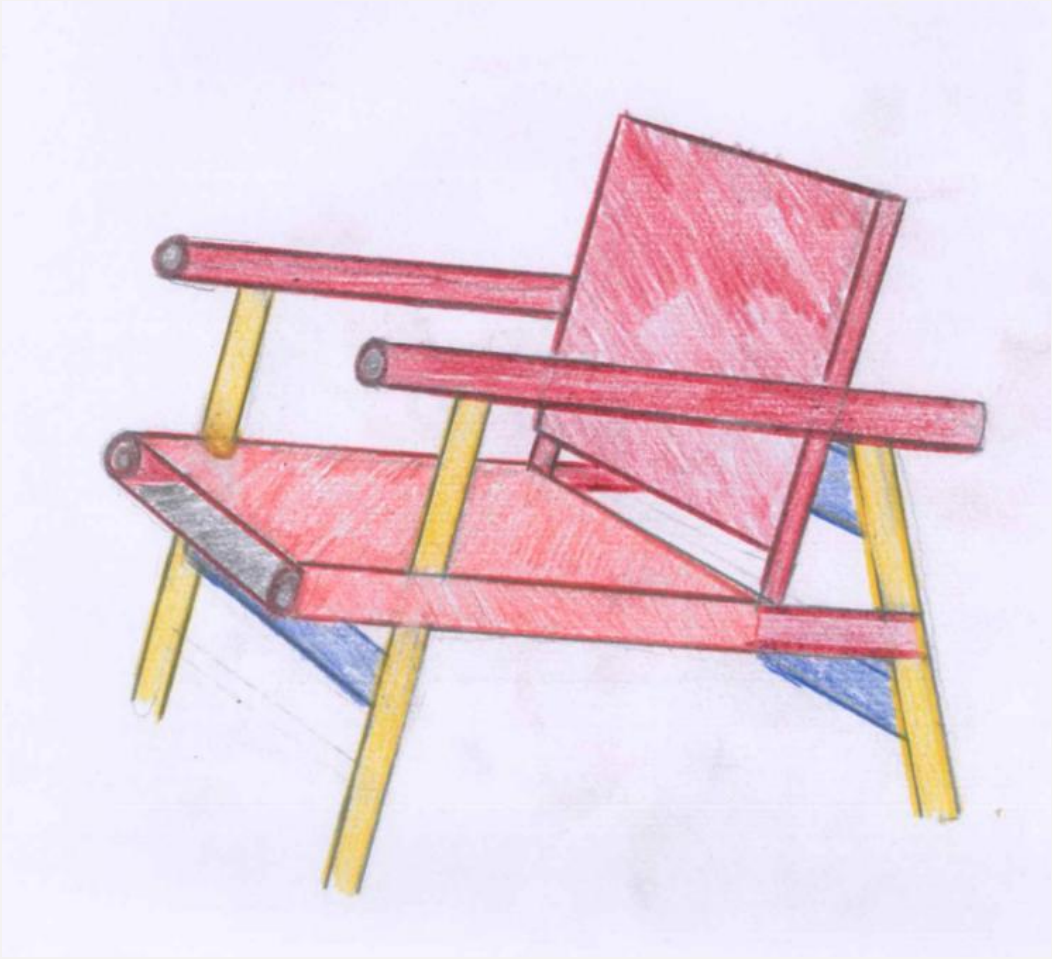
Idea Generation

Sketches exploring side profiles of chairs, considering scale and size of a product, as well as thought for where one component meets another.

Idea Generation



100% Lino Chair



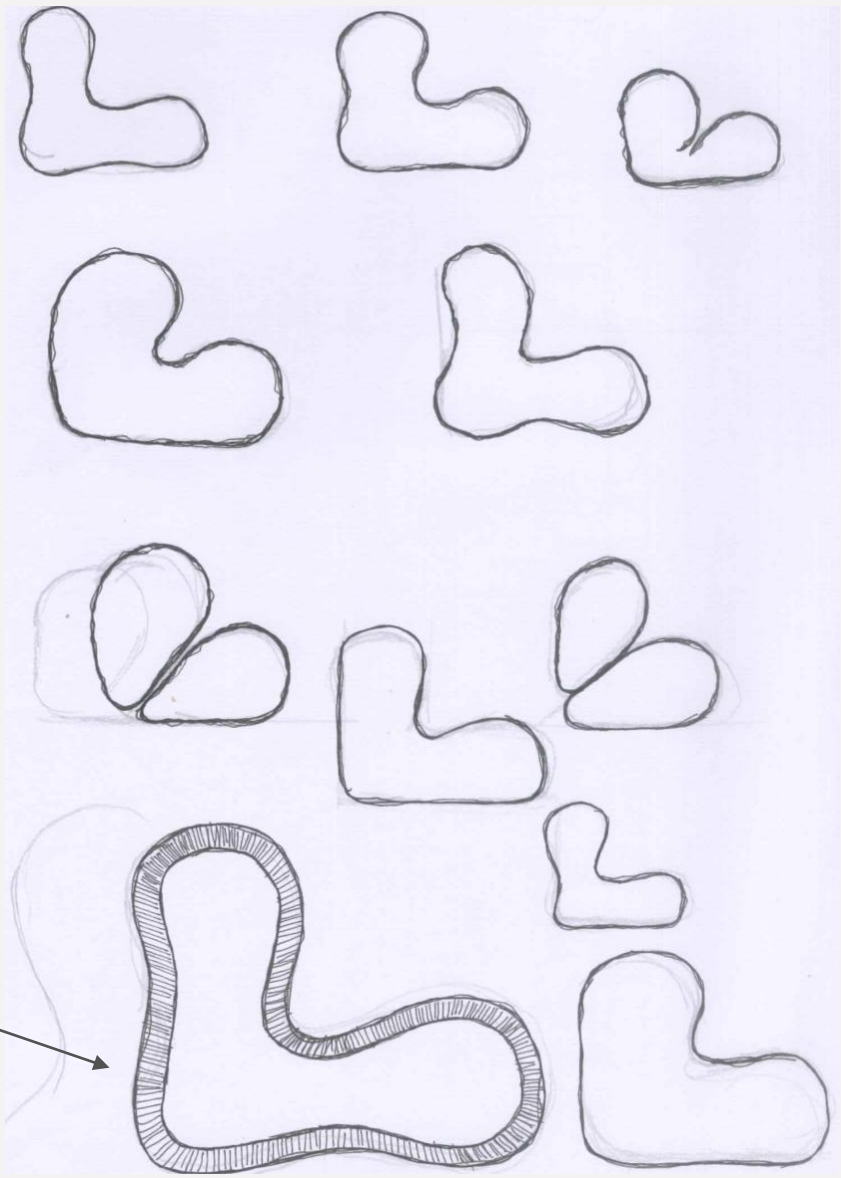
Exploring the concept of a product made solely out of lino. Lino would be sewn together to form tube like components, incorporating the primary colours. These components would be constructed together using wedged mortise & tenons. The back and seat of the chair would resemble the comfort of a sling chair.

Sketch Model

1:5 Sketch Model made from soft wood and card.

- A fully biodegradable product
- No glue used
- Just one material – 100% lino
- Inspired by the 2nd principle of the circular economy

Idea Generation



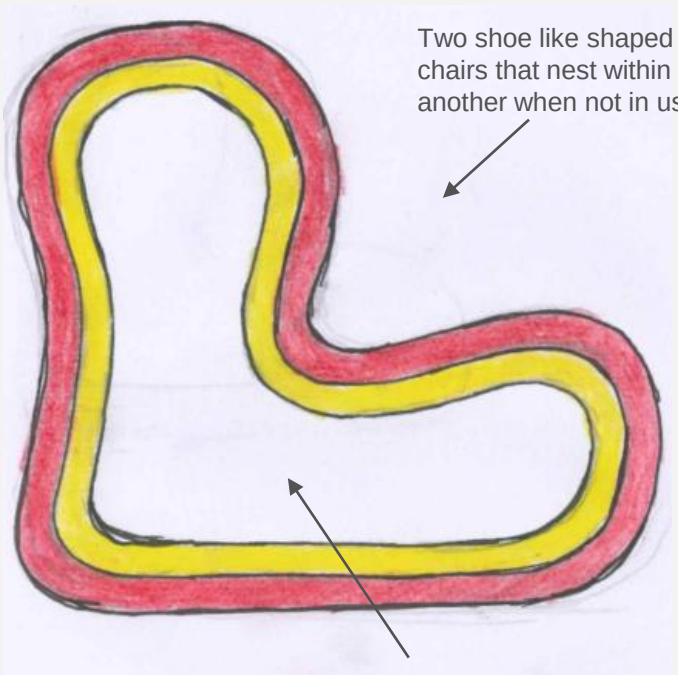
Corrugated cardboard to give the chair structural integrity

Sketches exploring side profiles of chairs with a focus on soft curves and contouring lines

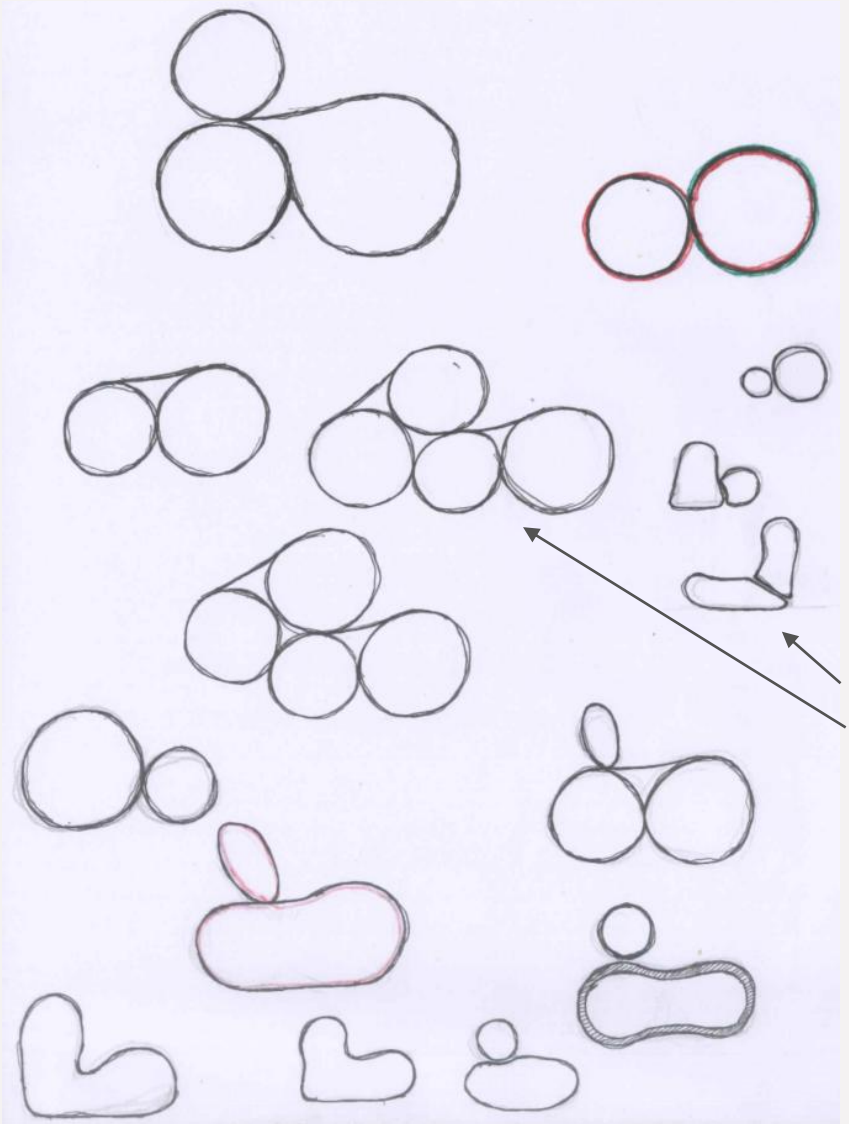
Idea Generation

Thumbnail sketches

Side profile of a concept made from layers of corrugated cardboard on top of one another to form a 600mm wide seat, achieving the structure of the chair. They would then be covered in lino, concealing all cardboard, as well as bringing colour to the product

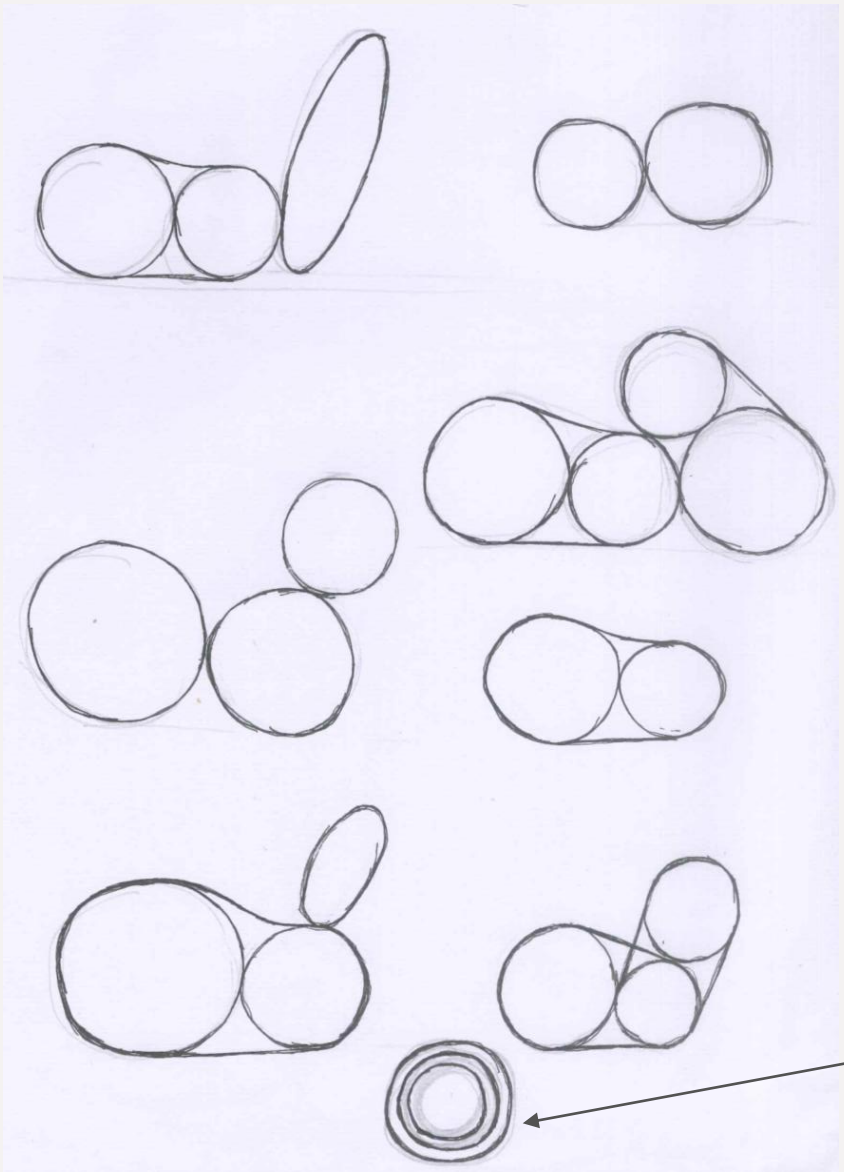


Idea Generation



Sketches exploring side profiles of chairs with a focus on circles and organic shapes inspired by the Letterfrack landscape

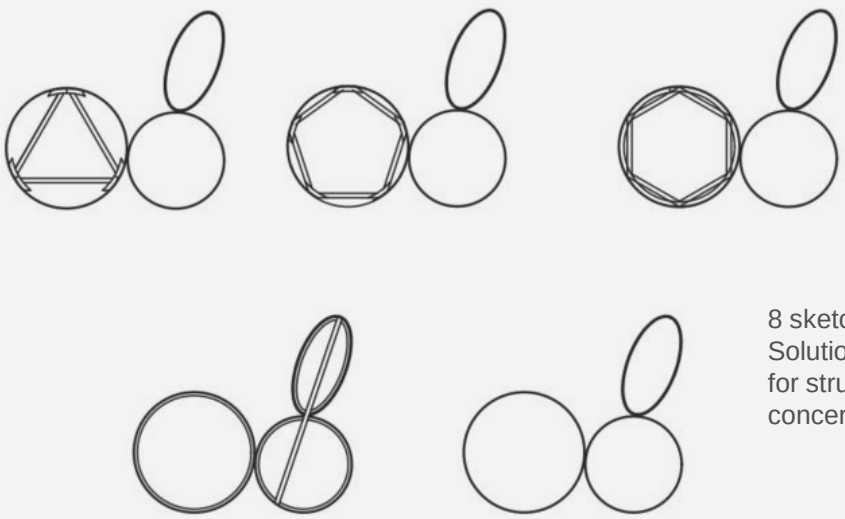
Design Development



Components nest within one another, for ease of distribution

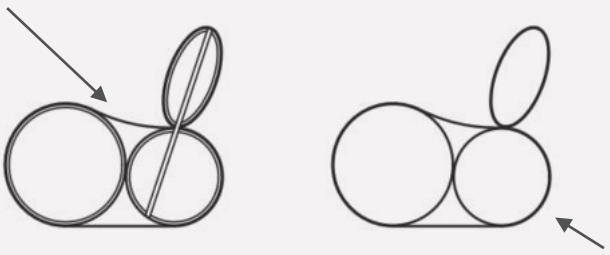
Further sketches exploring side profiles of chairs with an emphasis on circles. A circle is the strongest structural shape. The reason being is that stress is distributed equally along the arc instead of concentrating at any one point.

Design Development



8 sketches providing Solutions
for structural integrity concerns

Lino stretching over the two circles will result in a hammock like effect in the centre, providing a comfortable seat

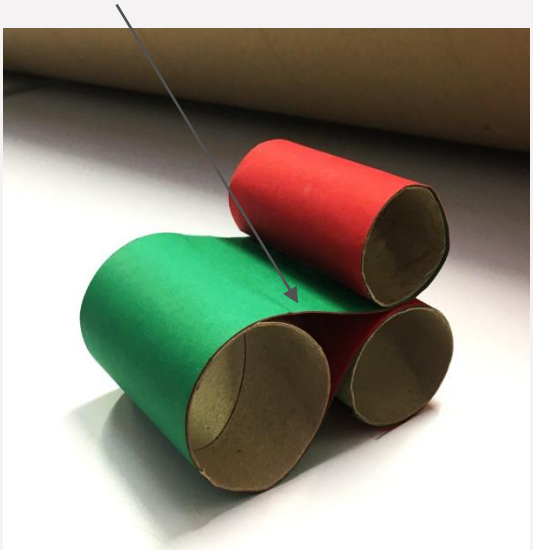


A layer of lino sweeping along the whole chair, providing colour, a resilient covering & a surface that is resilient to water, greases and oils

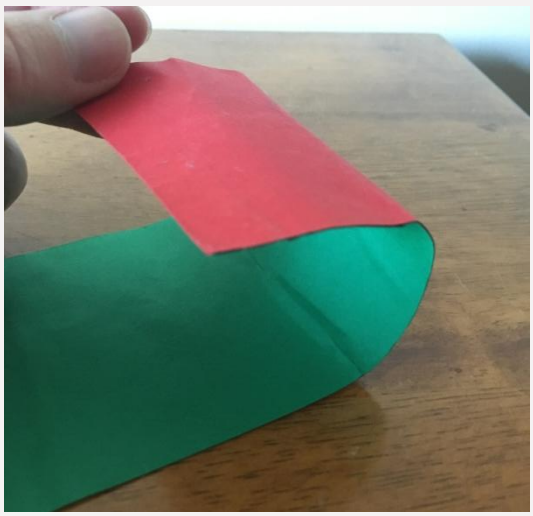
Various sketches of a side profile of a chair with additional information

Sketch Model

Red & Green card stuck together, sweeping over all three tubes. A hammock like effect is created, providing additional comfort



3 cardboard tubes each one smaller than the next so they can be nested into one another

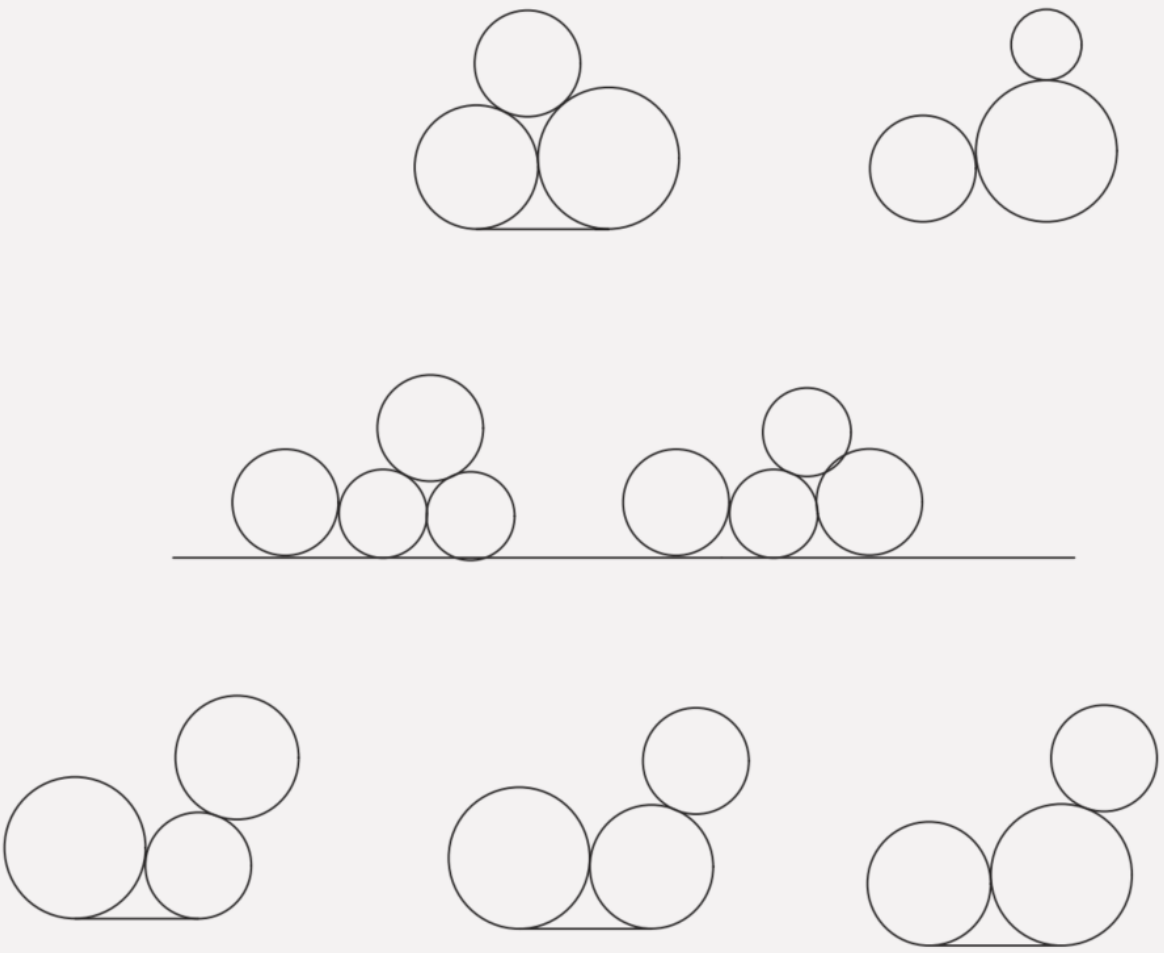


Sewing 2 layers of lino back to back, as opposed to covering each tube individually, would bring down the amount of lino used by 40% – saving cost. By using 2 different colours back to back, it also emphases the sweep of each curve in the colour change

1:5 Sketch Model made from toilet rolls and card.

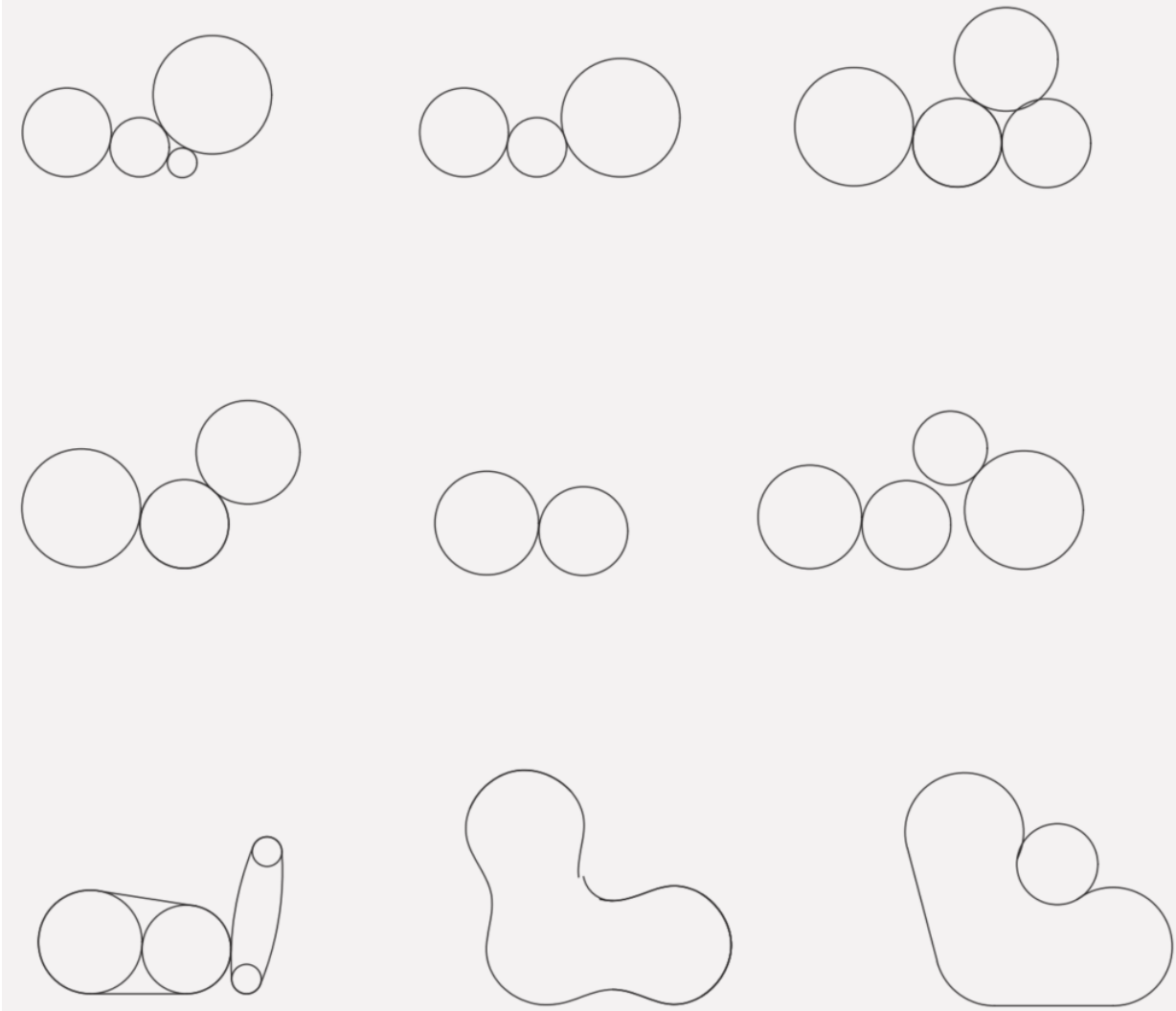
- A fully biodegradable product
- It would be made from lino and cardboard tubes
- Inspired by the EU legislation in progress 'Ecodesign for Sustainable Products Regulation'

Design Development



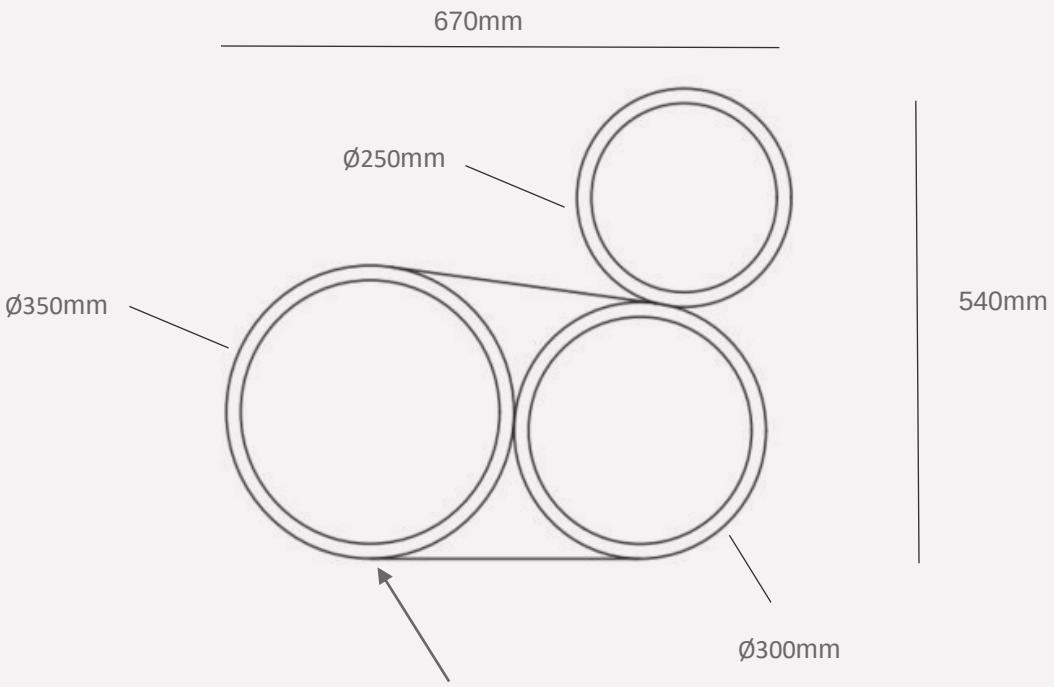
Side profiles of chair concepts exploring the idea of just using circles with each circle smaller than the next for nesting purposes.

Design Development



Further side profiles of chair concepts exploring the idea of circles and organic forms.

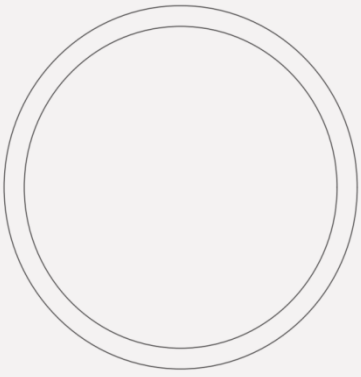
Concept with Dimensions



Backrest Angle or 'Rake' = 107°

Seat Angle or 'Tilt' = 7°

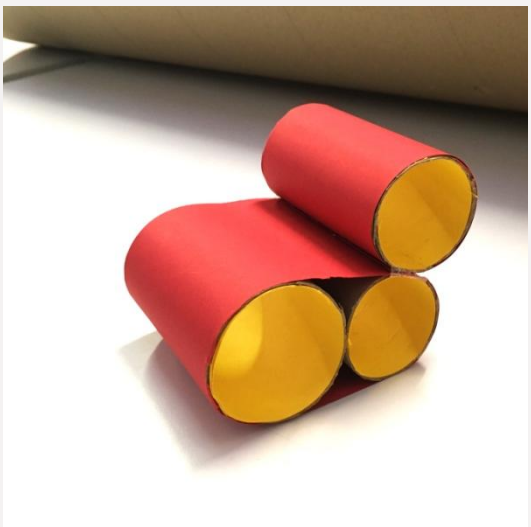
Rings made from wood to support cardboard tube



20mm thick rings

The 3 tubes with rings fit inside one another

Sketch Model



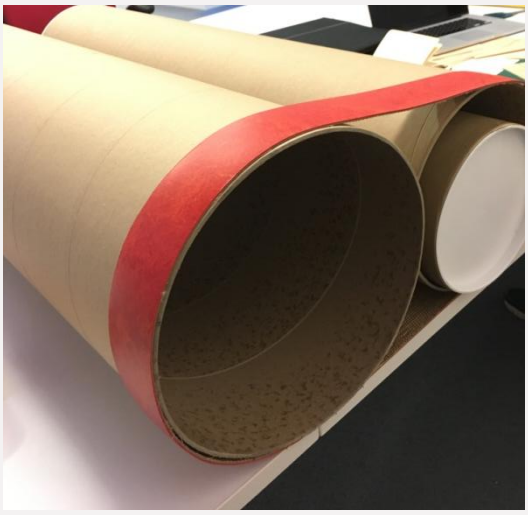
1:5 Sketch Model made from toilet rolls and card.

- A fully biodegradable product
- It would be made from lino and cardboard tubes
- Inspired by the EU legislation in progress 'Ecodesign for Sustainable Products Regulation'

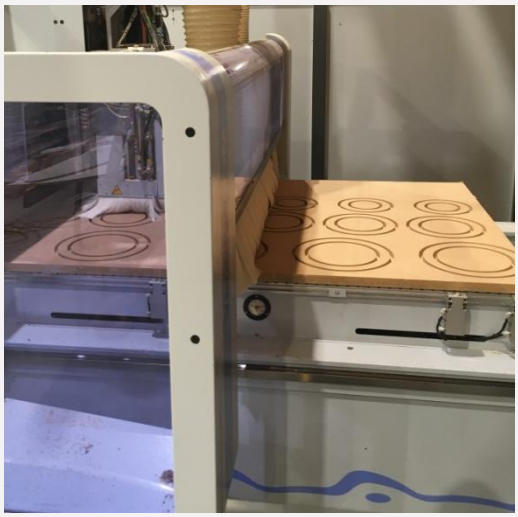
Prototyping

Cardboard tubes with diameters of 350mm, 300mm & 250mm. The largest readily available standard sizes

A photo of the light shining through the hollow part of the tube

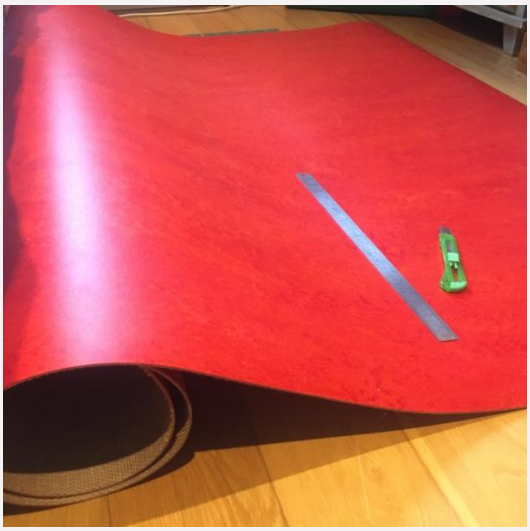


A strap of lino over the cardboard tubes



Wooden rings been cut out on the CNC

Prototyping



Cutting a roll of lino

The cardboard tubes covered in lino

Three wooden rings inside the cardboard tube for structural support. Experimenting with a white detail around the edge

Prototype 1 – A chair made from 3 tubes that fit within one another

Prototyping

Prototype 1

Prototype 2

I found that the backrest of prototype 1 was too small when in a sitting position. I decided to make every tube 50mm bigger so the point of contact between the tube acting as a backrest meets your back at a higher point.

I also tested flexiply instead of carboard as the surrounding of the tube for prototype 2. It was just as secure as the cardboard.

In prototype 1 the wooden rings were 20mm thick. For prototype 2 I decided to make the wooden rings 15mm thick to see if it would comprise the integrity of the structure or not. 15mm was strong enough.

Photos of prototype 2

Wave Table Concept

Cardboard represents wood

2 components of wood would hold the linoleum in its form

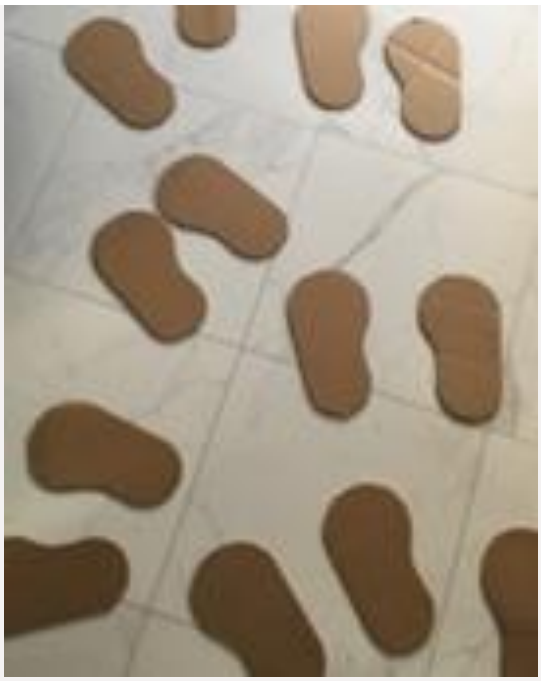
Pros

- Utilising the structural properties of linoleum
- Fully biodegradable product
- No glue used

Cons

- More of a coffee table than an end table

A Set of Footprint Shaped Tables Concept



Dolmen Shaped End Table Concept

Cardboard
represents wood

Pro's

- A fully biodegradable product
- Utilising the structural properties of linoleum
- No glue used
- Functional

Cons

- Structural concerns

Other Iterations

Cardboard
represents wood

Shelf for books

2 shelves

Divider for
additional support

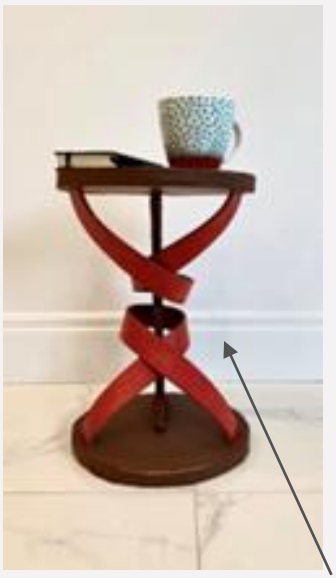
Summary

I like the simplicity of the concept & that it would be sold as a set of 3. Concerns regarding its structural properties.

Ribbon Table, Inspired by the Vines Surrounding a Tree

Sliding dovetail joint

Locking mechanism as opposed to glue to connect the linoleum to wood



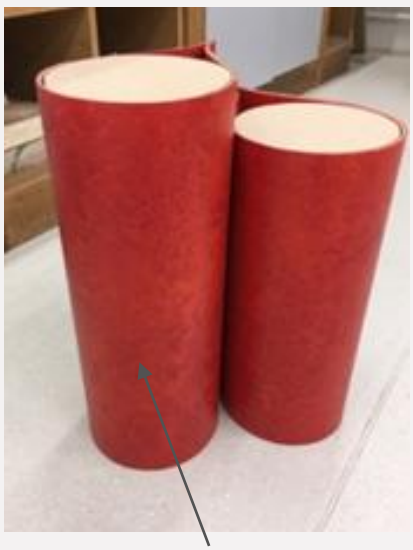
The table is a mirror image of itself

Summary

The locking mechanism joining the linoleum to the wood keeps the sliding dovetail intact. It does not utilise the structural properties of linoleum.

Podium End Tables Concept

Linoleum fixed into position at the back



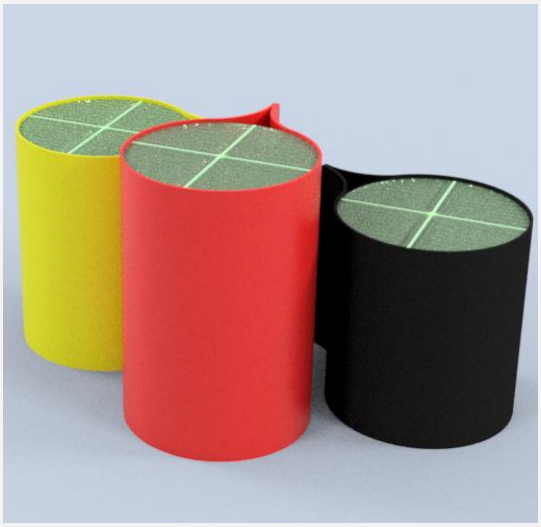
Linoleum placed back to back forming one enclosed loop

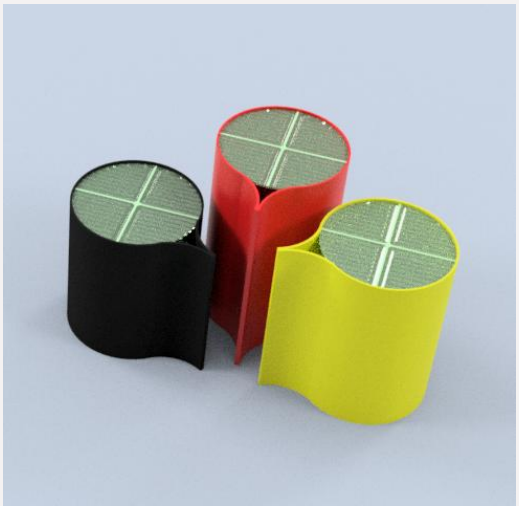
Iterations of concept, showcasing the variations and colours possible

Summary

The shape is achieved from utilising the flexibility and structural properties inherent in linoleum combined with the tension created from fixing the material together against two pieces of wood.

3D Modelling Renders of Podium Concept

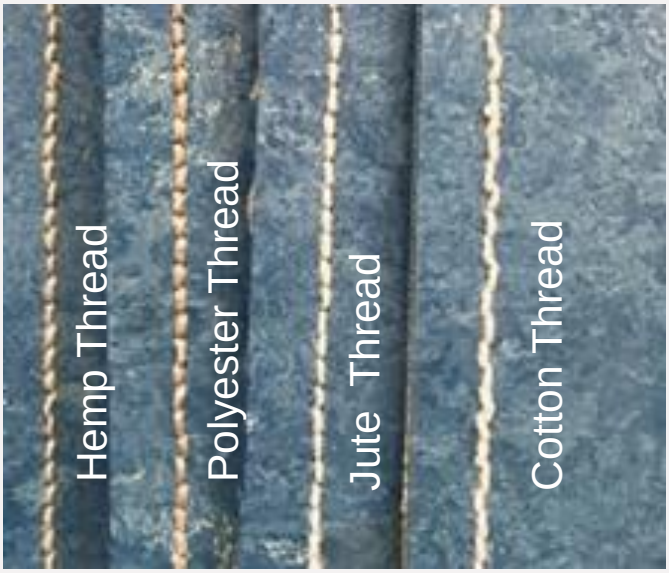




Design Development i

Cable Ties → Sewing

- (Left) 6mm stitch length with cotton thread
- (Right) 12mm stitch length with hemp thread



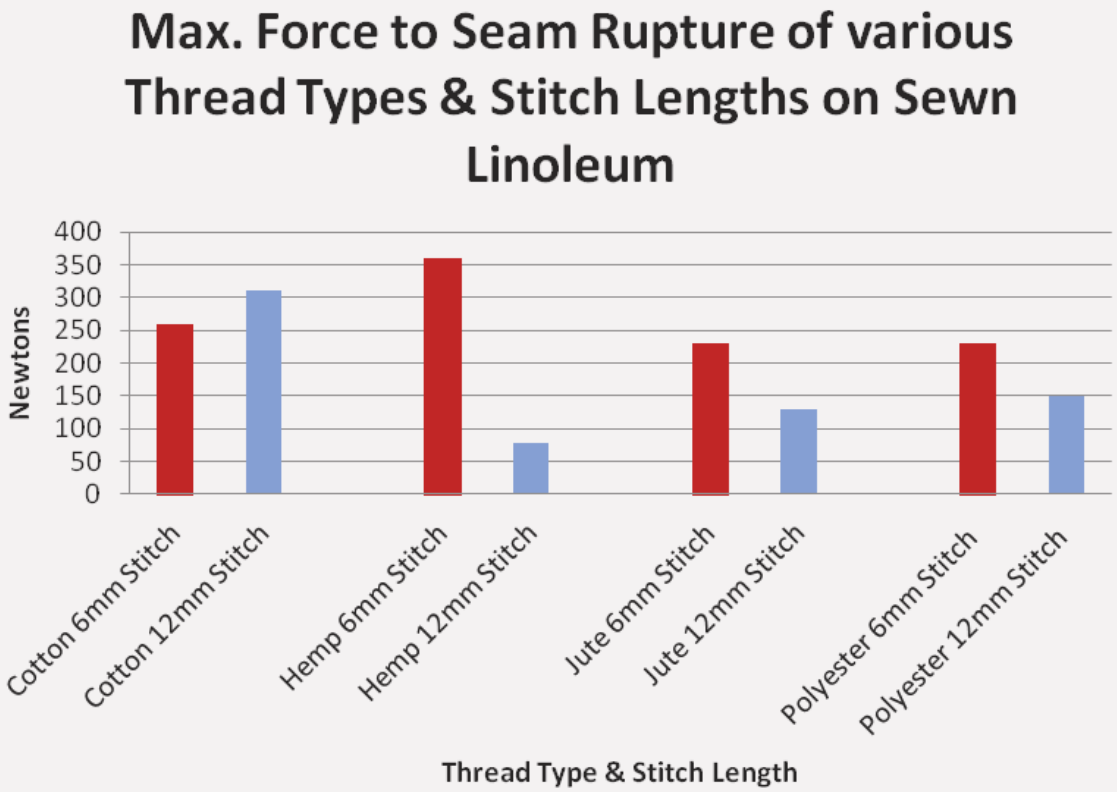
It was decided to test the maximum force to seam rupture using the strip method of two stitch lengths (6mm & 12mm) and 4 threads (cotton, jute, hemp, polyester) on linoleum to establish the strongest combination.

Conditions of Sewing Tested

Sample	Material	Thread	Stitch Type	Stitch Length	Needle Type	Seam Allowance
A	Linoleum	Cotton	Saddle	6mm	80/12	15mm
B	Linoleum	Hemp	Saddle	6mm	80/12	15mm
C	Linoleum	Jute	Saddle	6mm	80/12	15mm
D	Linoleum	Polyester	Saddle	6mm	80/12	15mm
E	Faux Leather	Polyester	Saddle	6mm	80/12	15mm
F	Linoleum	Cotton	Saddle	12mm	80/12	15mm
G	Linoleum	Hemp	Saddle	12mm	80/12	15mm
H	Linoleum	Jute	Saddle	12mm	80/12	15mm
I	Linoleum	Polyester	Saddle	12mm	80/12	15mm

- The Materials & the Conditions of Sewing that were Tested.
- QR code to video recording of a test specimen.

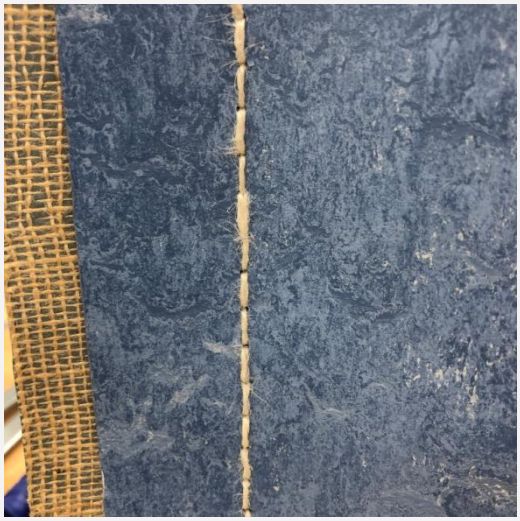
Results of Sewing Test



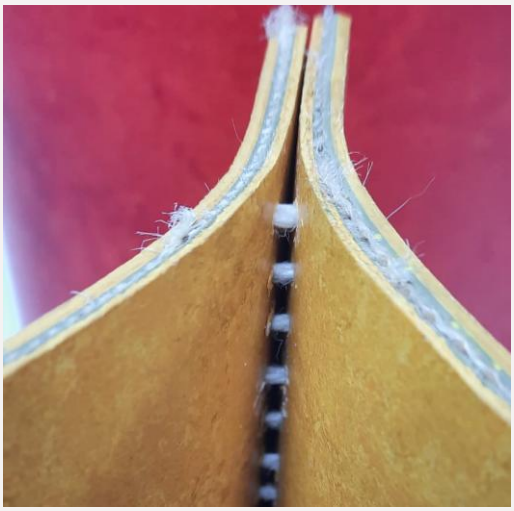
- Hemp thread with a 6mm stitch length required the most force to seam rupture (360N). This is a force equivalent to 36.7 kilograms.
- Cotton thread with a 12mm stitch length required the most force to seam rupture (310N). This is a force equivalent to 31.6 kilograms.

Sewing

The two strongest threads from testing



Cotton thread with a 12mm stitch length. The thread began to fray quite easily



When sewing linoleum, the surface layer began to crack from the force applied to get the needle through

Prototype 1

Each *Podium* consists of two layers of linoleum placed back-to-back, forming one enclosed loop. The shape is achieved from utilising the flexibility and structural properties inherent in linoleum combined with the tension created from sewing the material together against two pieces of wood. The wooden table top surface rests on a seam. A saddle stitch was used which comprised of a 12mm stitch length. Cotton thread was picked ahead of hemp for aesthetic purposes.

How to house the glass?

The table top surface rests on a seam.

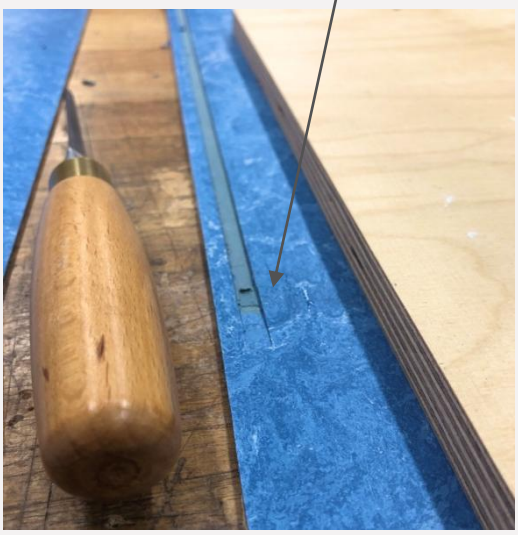
A cut is made through the internal layer of linoleum for the table top surface to sit on.

Another variation of a cut made in the internal layer of linoleum.

Cutting a 1.5mm rebate into the linoleum for the table top to sit in.

Experimenting with Rebates

Experimenting with three rebates. Accidentally cut the rebates too deep.



Cutting the rebates with a 3mm chisel. This took a lot of concentration to get right. Also I created a 'ramp' at the end of the rebate for the table top surface.

Cutting the rebate with a 6mm chisel.

Cutting the rebate with a router.

Make A Difference
Prototype 2

In prototype 2 I experimented with how best to cut the rebates. Using a hand router gave me the best results. A 'ramp' effect at either end of the rebates was benefitial too. Further exploration was done in sewing the material for prototype 2. I'm not quite happy yet with the quality of seam. Again a 12mm stitch length was used with cotton thread. I will use glass as opposed to wood in the product. The glass allows the user to see inside the end table and the internal seam. In addition, I experimented with different heights and proportions. Prototype 2 is 400mm high.

Acquiring Information

Contacting a Leatherworker

I reached out an Irish leatherworker based in Kildare. I had a 15-minute phone call with a well-known Irish designer who primarily works with leather. The following is the information gathered from that phone call;

- The thickness of materials they typically work with range from 2mm-5mm.
- A Pearson No.6 sewing machine, or a Singer 45 sewing machine would be compatible with linoleum.
- They recommended threads from the UK based business ‘Coles Sewing Centre’.
- In addition to sewing, they suggested testing the use of Chicago screws to fasten linoleum together.
- Having an ever so slight groove in the linoleum for the seam to sit in.

Sourcing Linoleum

As part of the primary research conducted for this project, local suppliers in the Galway City region were contacted to source linoleum. The material was available in over seven stores in the Galway City area alone. From conversations with local flooring suppliers, it became evident that there is an abundance of linoleum off cuts in the flooring industry. This is because flooring installers must always source more of the material than required for a given job. These off cuts typically end up in landfill. The image above shows some of the linoleum off cuts I received free of charge from a local supplier in the Galway City region.

Design Development ii

Sewing Progression 1

Using waxed thread to lower the chances of fraying.

Experimenting with pre drilling holes to prevent cracking the surface layer of linoleum when sewing.

Experimenting with different needle sizes.

Experimenting with different drill bit sizes to accommodate the thread.

Sewing Progression 2

Marking out where to pre drill the holes.

Utilising a jig to hold the two layers of linoleum in place when sewing them together.

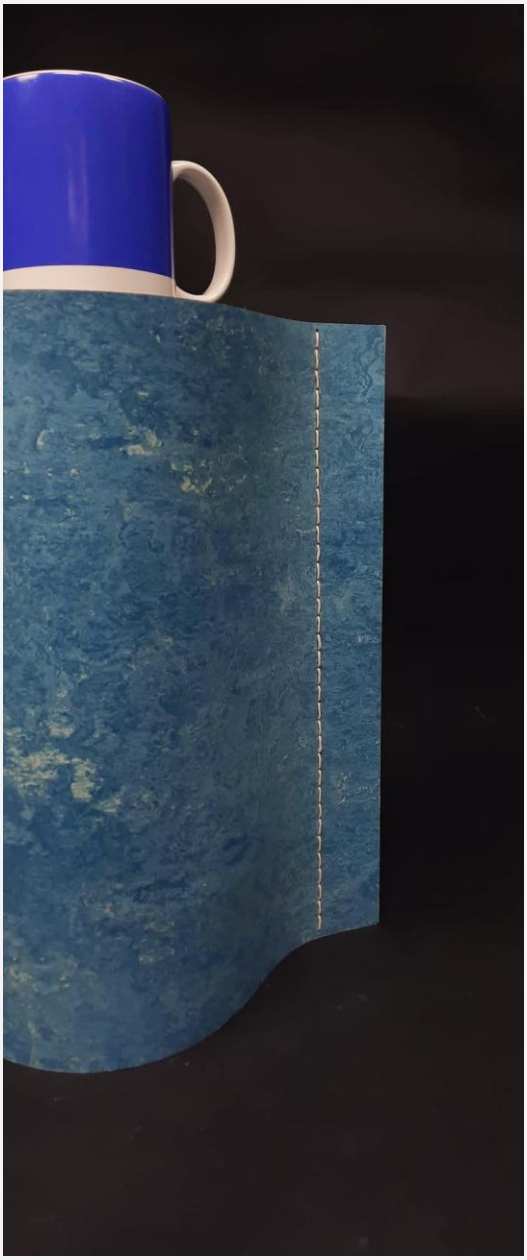
Further development of a jig to better hold the glass in place when sewing the layers of linoleum together.

Sewing the two layers of linoleum in the jig.

Sewing Before & After

Before

I'm pleased with my progression of quality of seam. Utilising a jig to hold the product in place was very benefitial. In addition, pre drilling holes and waxing the thread resulted in a better outcome.



After

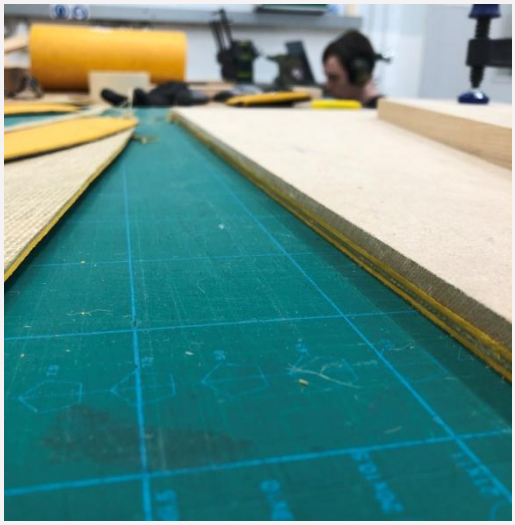
Prototype 3

In prototype 3 I experimented with how best to improve the quality of seam. Overall I'm happy with my progression of quality of seam. Prototype 3 consists of two *'Podiums',* 350mm in height. For my finished piece I will have a set of three *'Podiums',* One 400mm in height, with the other two 350mm in height. I'm happy with the diameter of the table top surface, as end tables are not designed for clutter. I want them to be small and adaptable for the ever changing demands of modern day living. I envision the higher *'Podium'* for a cup, with the other two for a plant or books.

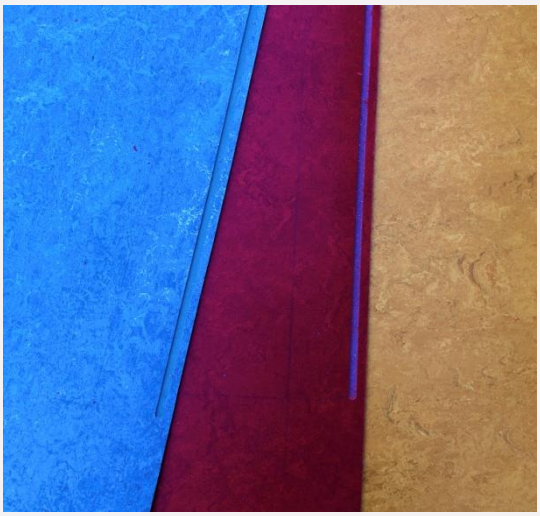
Manufacturing Concept for Feedback

Step 1 - Cut Linoleum & Rebate

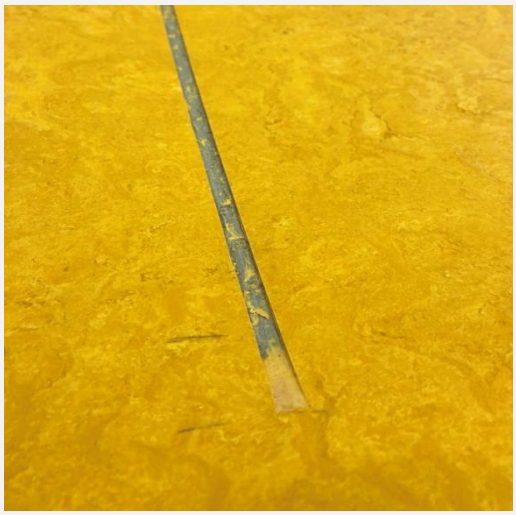
Cutting the linoleum to size with a stanley knife.



Resulting clean edge of linoleum after cutting it to size.



Cutting rebates with a router.



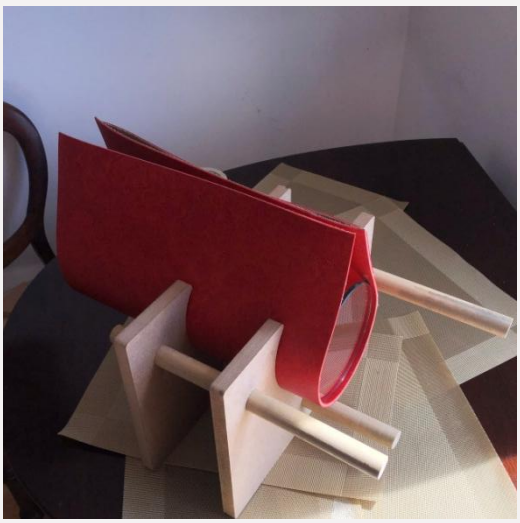
Cutting 'ramps' on either end of all rebates.

Step 2 - Drill Holes & Fit Glass

Mark out where to drill holes and proceed to drill holes.

Put the two layers of linoleum in jig and line the holes up.

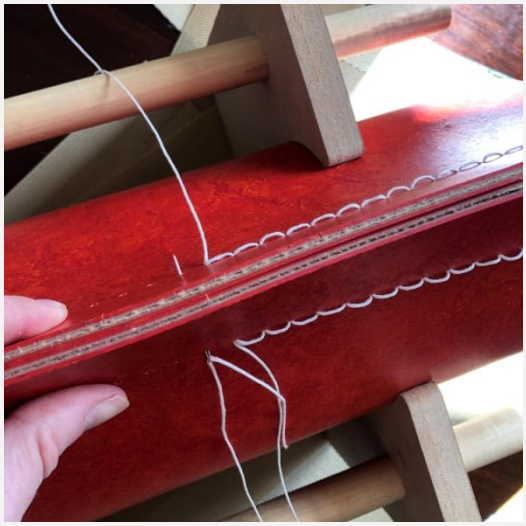
Fit the glass into the rebates.



Now the piece is ready to be sewn togethor.

Step 3 - Stitch & Sand

Begin sewing the linoleum together using a saddle stitch.

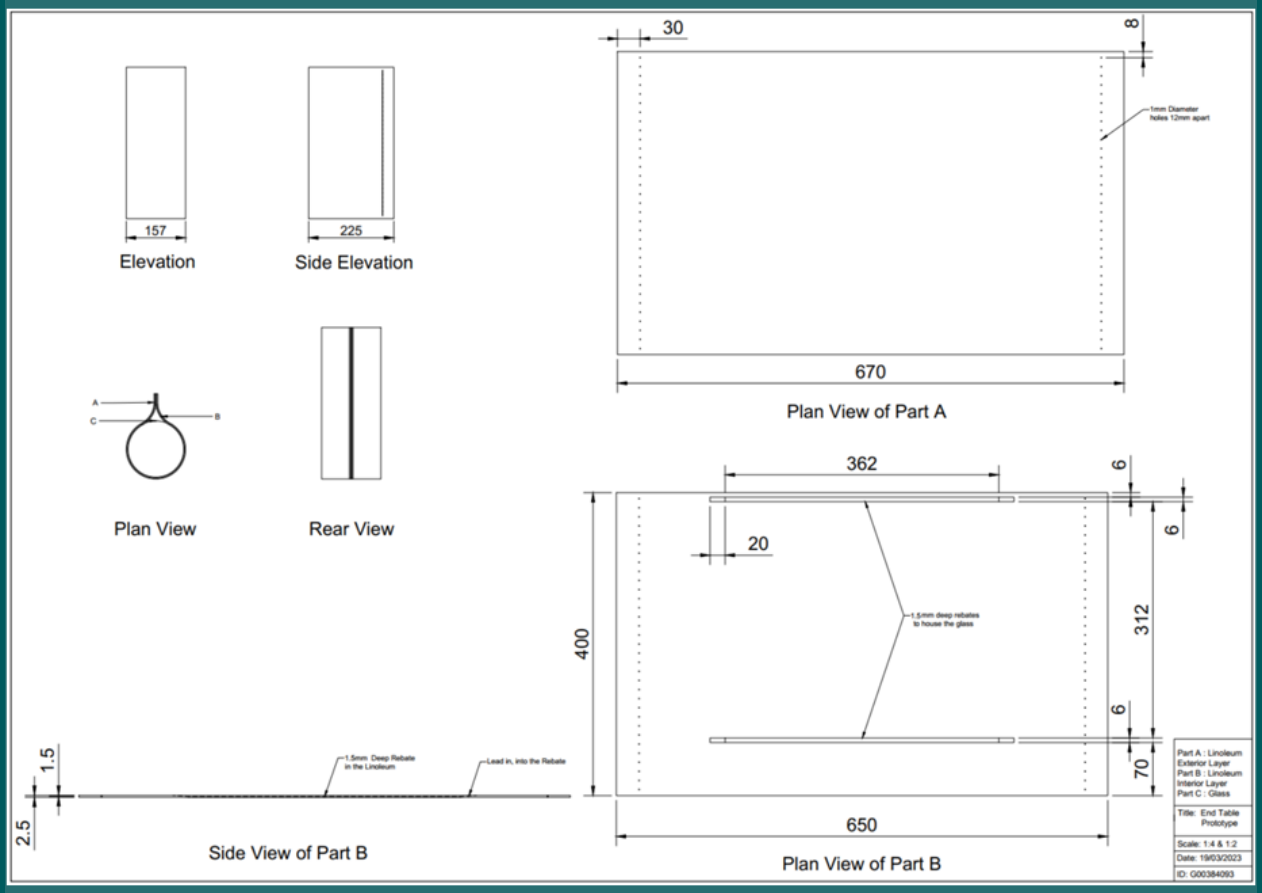


Ensure that you are going into the correct hole. Once finished, tighten each stitch.

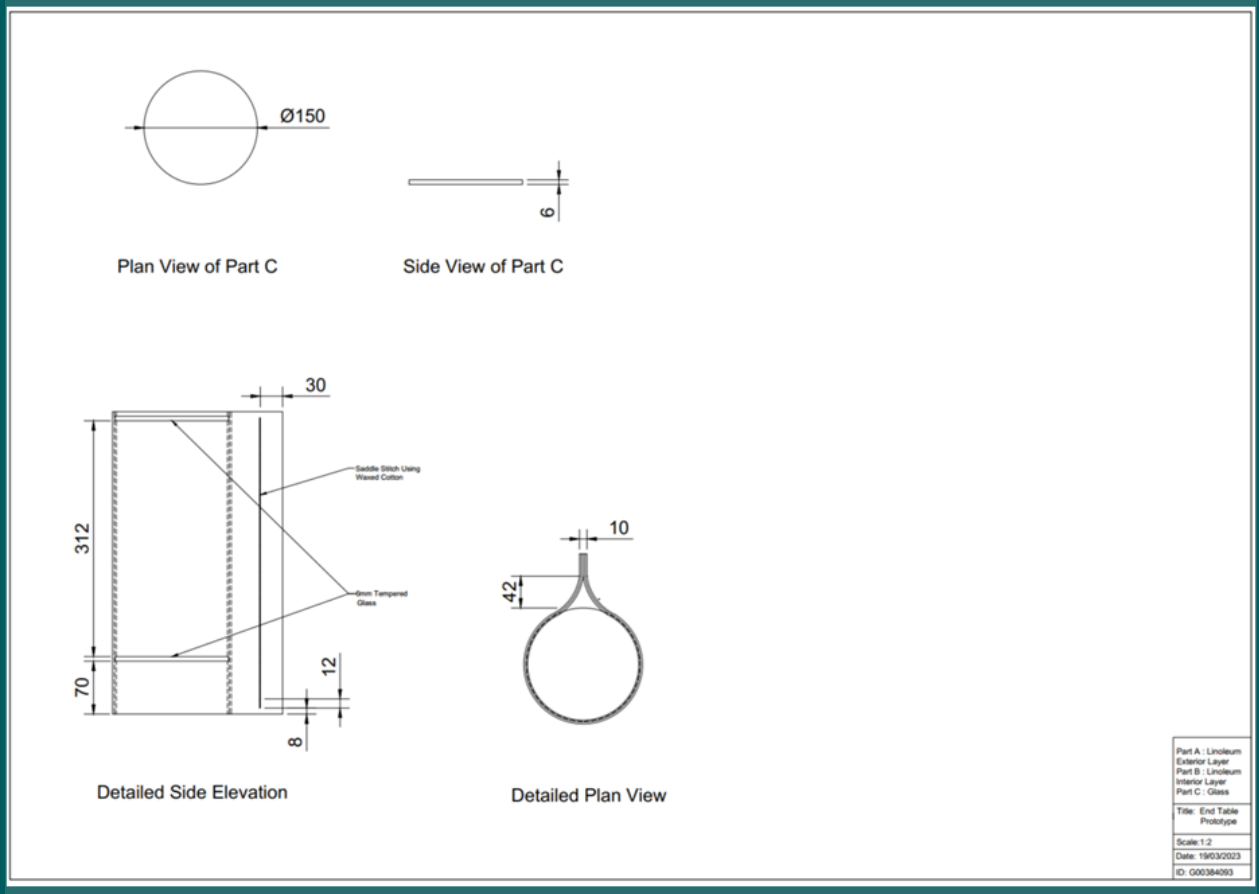
Sand both the top and bottom surface along with the 'tail'.

Continuation of sanding & removing any excess dust with a brush.

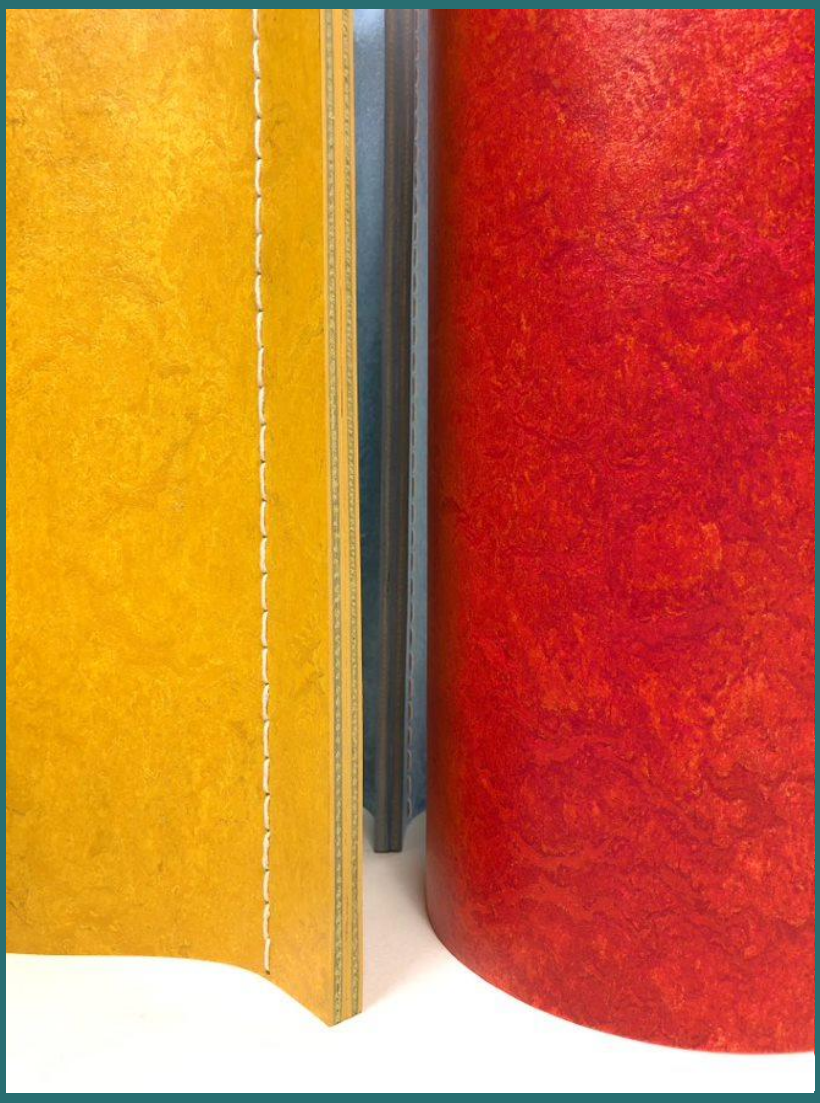
Working Drawings



Working Drawings



Concept of End Tables Brought to People for Feedback



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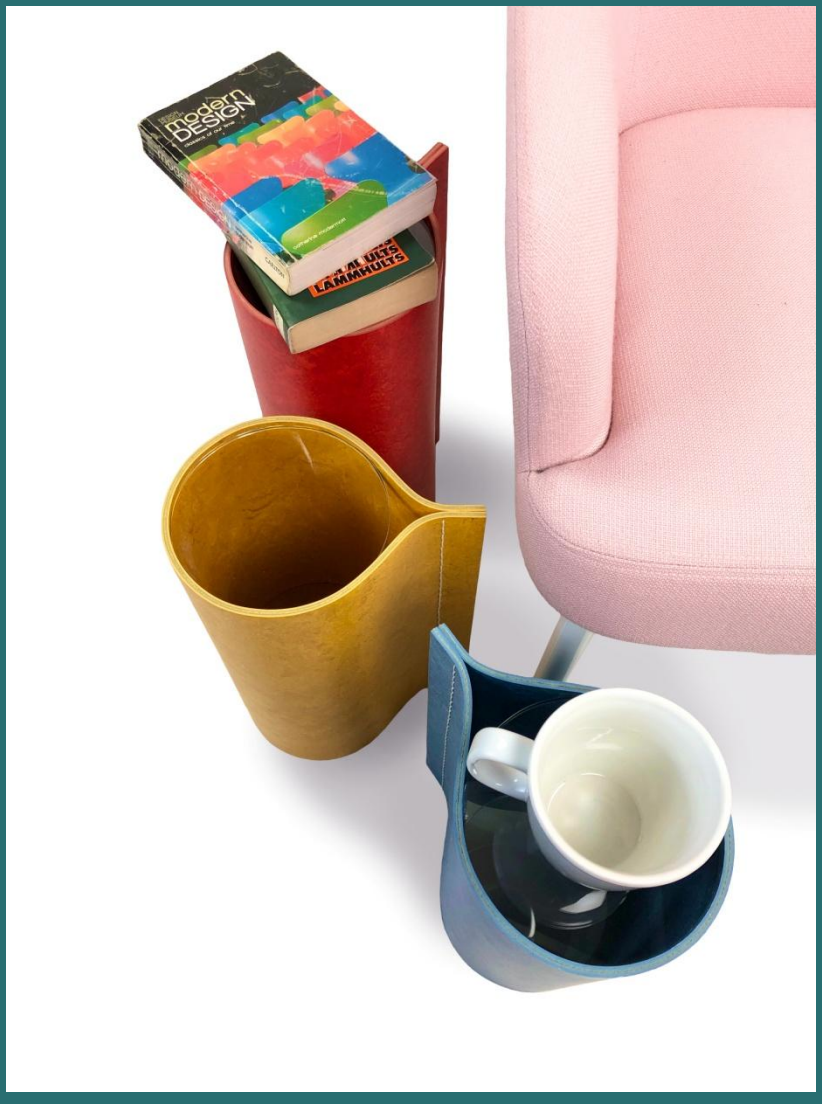

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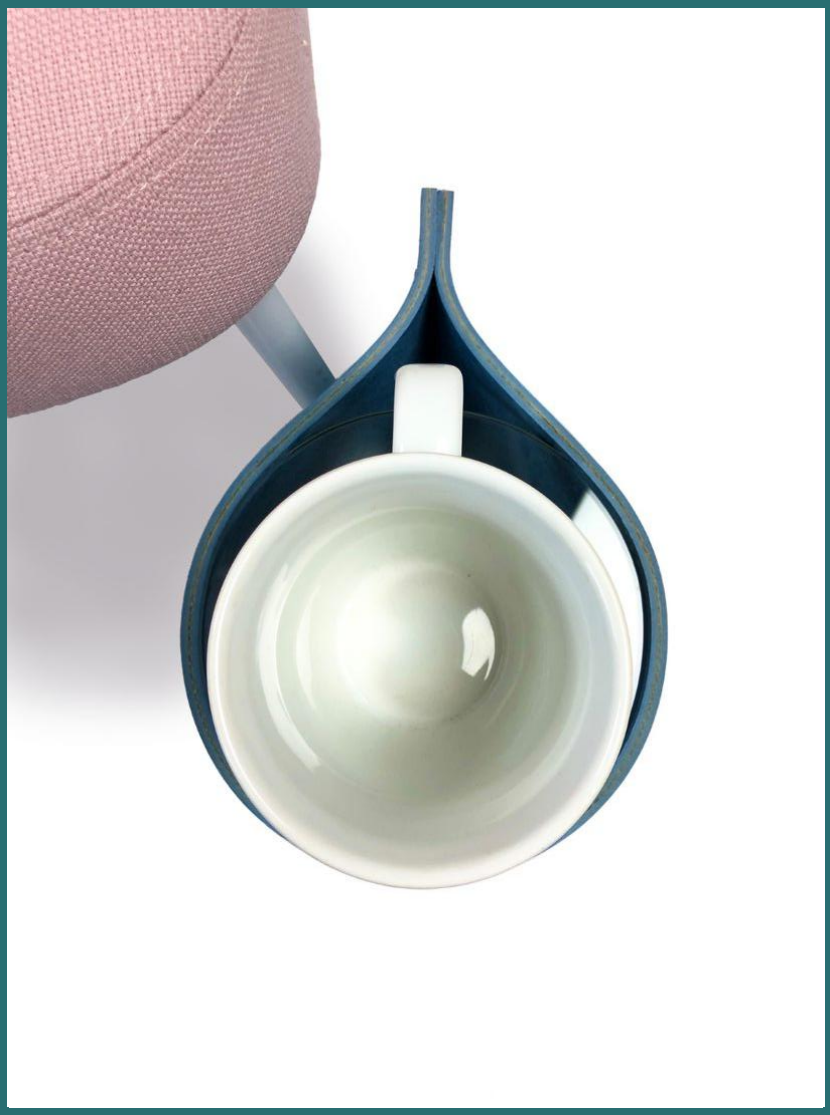

Concept of End Tables Brought to People for Feedback

Feedback & Further Experimenting

Feedback & Ethnographic Research

The Podium End table concept was brought to over 30 renters residing in small living spaces in urban areas of Dublin over a 3 month period were people kept them for a few days in their home at a time. Additionally I conducted in-depth interviews with people to better understand their needs and desires. The following are the key takeaways:

• The form and aesthetic of the design was well received

• Colour is good, but use more vibrant colours

• The curved aspect of the concept was found to be soothing

• They need to be more functional – serve more than one purpose

• They can afford to be bigger

• Incorporate varying sizes and heights

Experimenting with Bigger Diameters, Colours & Creating a ‘Slot’ Shelf

Cutting green linoleum.

Experimenting with the size of a cutting out a slot.

Cutting a curved slot into both layers of linoleum.

Comparing the old concept with the new concept.

Experimenting with Different Heights & Varying sized Slots

Experimenting with warmer colours & heights.

Experimenting with different sized slots.

I was very pleased with how my experimenting went after gathering the feedback. The cut slots into the linoleum did not affect the integrity of the structure. Now that I knew this, I decided I would make a collection of four products based on the feedback I gathered:

• An end table for reading, (150mm diameter & 350mm high)

• A side table with greater storage (400mm diameter & 350mm high)

• A shelving unit/ Drinks cabinet (300mm diameter & 550mm high)

• A taller shelving unit (300mm diameter & 1050mm high)

Each product will be manufactured using the same process as the Podium end tables.

Final Concept – The Groove Collection

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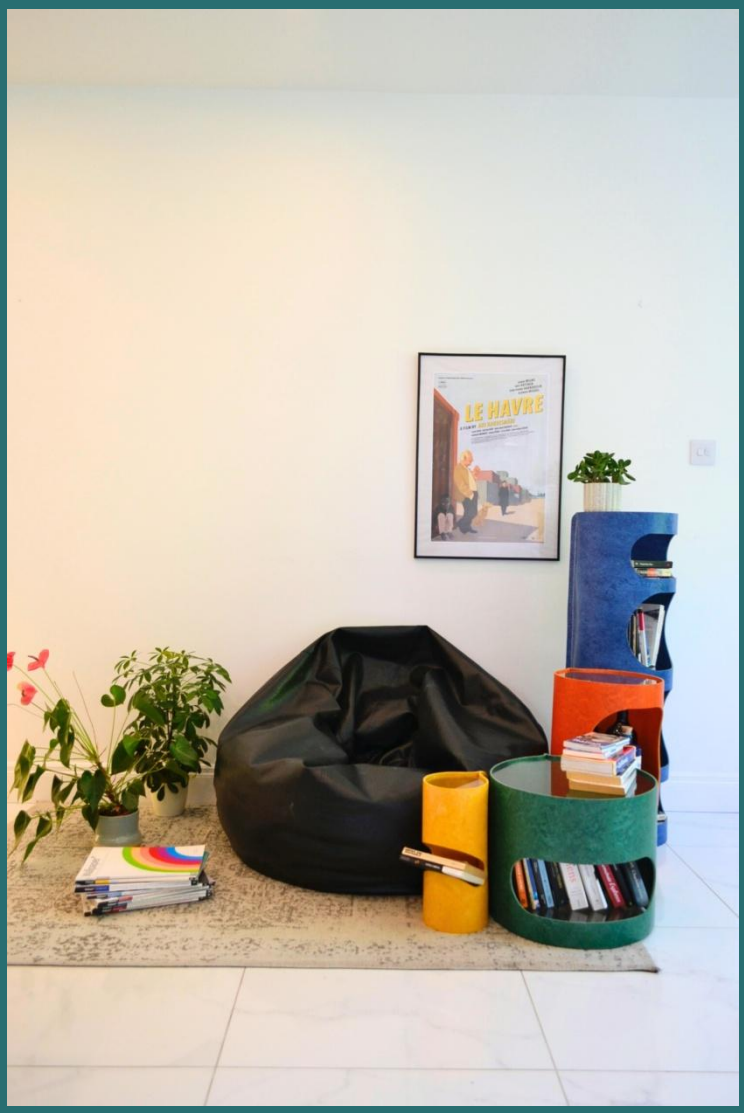

Final Concept – The Groove Collection