

From Waste to Walls **Redefining Value: An exploration into reusing waste as materials.**

Ambitions & Priorities

- The use of predominantly discarded materials for the walls of the space that demonstrate the potential and value within the items we throw away.
- A space that communicates the larger issue of waste pollution to the masses without empty stats.
- Interactive and responsive lighting that allows visitors to engage with the space and experience the materials through touch.
- A design that was led entirely by the versatility of the materials.

The environmental issue of waste pollution is at the heart of this exploration. By exploring qualities of different discarded materials, this project tackles the urgent environmental concern of waste pollution and explores how waste can be transformed into new resources. As designers, this not only poses as a challenge, but as an opportunity to contribute positively to the industry and the environment by reusing discarded materials.

The drive behind this research came from the ever-increasing concern for the climate crisis, and how waste is contributing to the heating of the planet. Through different processes, this research has revealed the possibilities that innovation lends to us as designers, by experimenting with different discarded materials, such as plastic, food, textiles and cardboard. Following the principles of Ellen MacArthur's Circular Economy Theory, I have been exploring innovative ways to transform these discarded items into something valuable. This research has involved hands-on experimentation with materials, such as melting and pressing plastics, creating tiles from food waste, and repurposing textile waste into sheet materials. These new

materials challenge conventional waste lifecycles and highlight the ease of reducing waste in landfills. The aim for this research was to force reflection and encourage people to reconsider the value of the products they are discarding due to the many qualities they possess. The design outcome for these experiments exists as an exhibition in the Tate Modern in London - dedicated to showcasing these materials, and the process behind making them, using responsive lights that visitors can interact with. Materials are displayed on large screens, encouraging visitors to touch and engage with the materials in a tactile manner. Using tracking technology, the lights behind the screens will follow the users around the space, highlighting how we, as individuals, are equally responsible for the waste pollution crisis. This design shows just one example of the many possible ways of utilising these materials. Highlighting how commonly discarded materials can be transformed means users will question their own level of consumption, and more importantly, be prompted to consider their impact on the environment, and the role they play in the larger issue of waste pollution.

Step 1



Step 2



Step 3



Step 4



Step 5



Step 6



Material Making Process

I experimented with various discarded products using a number of different processes to repurpose them into new materials. The exhibition space showcases a plastic sheet material made from discarded packaging and milk bottles which was made by melting small pieces in an oven, and pressing into a sheet.

Step 1 Sourcing Materials – I collected plastic milk bottles from cafes and restaurants local to Norwich. I started with 12 but these made multiple samples.

Step 2 Shredding – On an industrial scale, this stage would be made quicker by using a shredder, however for my experiments, I used a knife and cut the plastic into small pieces.

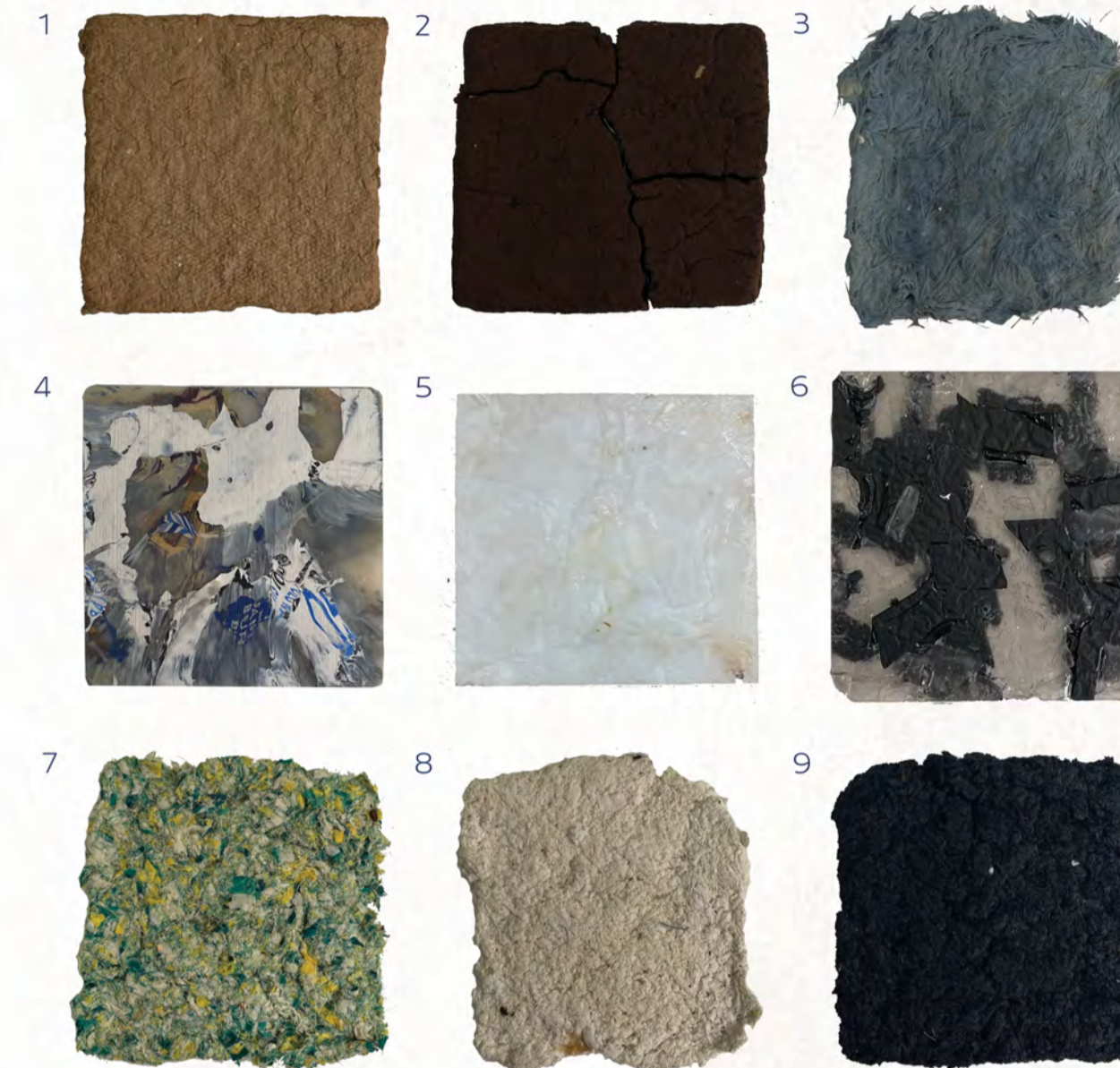
Step 3 Layering – Because the plastic shrinks so much when heated, it was important to layer the plastic pieces until I got a thickness I was happy with.

Step 4 Melting – I used a fan circulated oven to heat the plastic in an oven tray lined with parchment. After allowing each layer to melt for about 5 minutes, I added another on top.

Step 5 Pressing – To get the plastic to a consistent thickness, I used a manual press and a wooden mould and left it there to cool flat.

Step 6 Cutting & putting to use – I was making sample tiles, so I cut my sheet into 2 10x10cm squares, however there are endless ways this sheet material can be used.

Materials Exploration



- 1. Cardboard
- 2. Coffee Grounds
- 3. Thread
- 4. Milk Bottles & Plastic Packaging
- 5. Milk Bottles
- 6. High Impact Polystyrene (HIPS)
- 7. Satin
- 8. Cotton
- 9. Polyester

Lighting Exploration

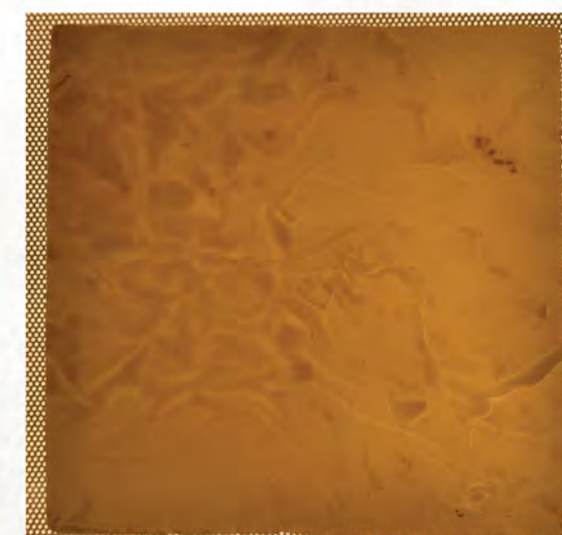
Because the design for the space was material led, it was important to test how the different materials responded to light. I wanted to use lighting behind the materials, so experimented to see how each material let the light through it to determine which one would be better suited to my idea. The milk bottles and the plastic packaging allowed the light through the best, so I used a combination of these to make the walls in the exhibition space from. I used a warm light to resemble the colours that would be used in the space.



Cardboard



High Impact Polystyrene



Milk Bottles

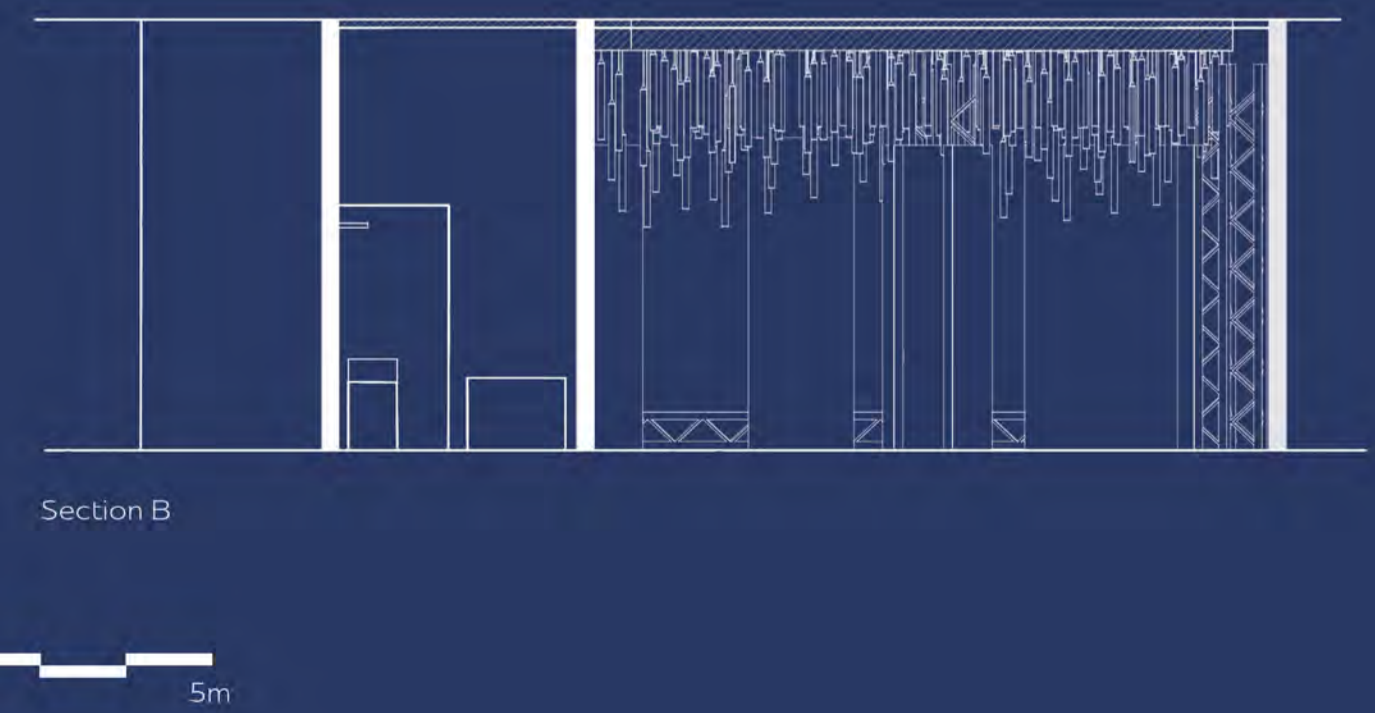
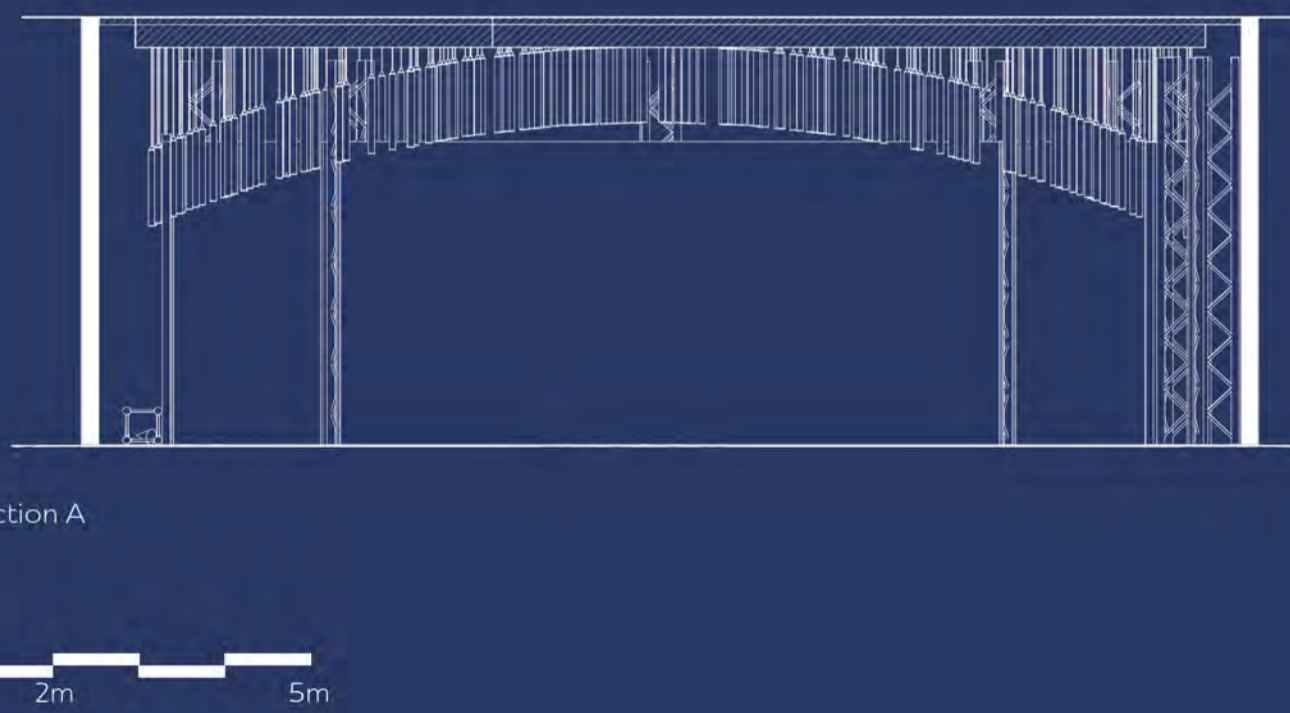
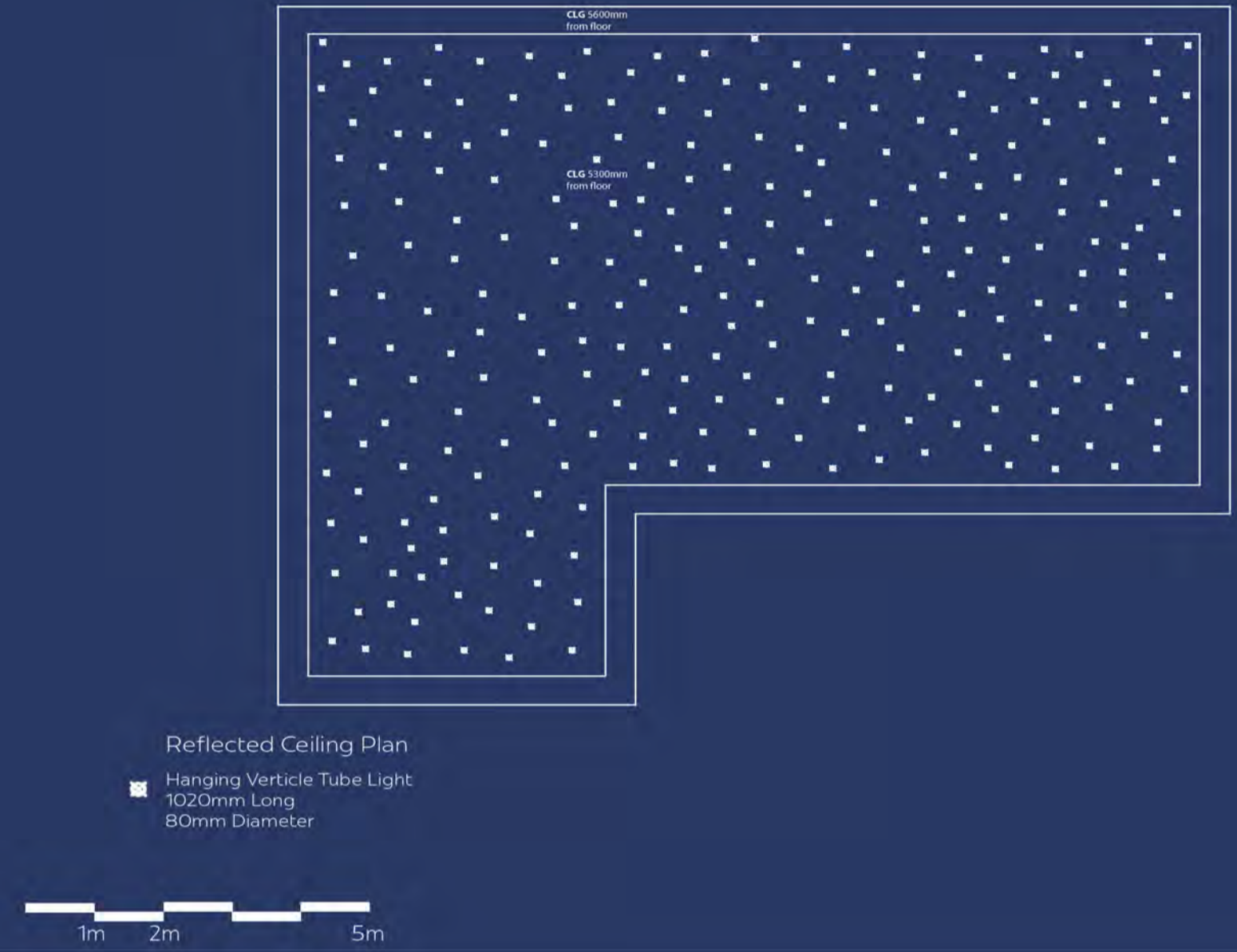
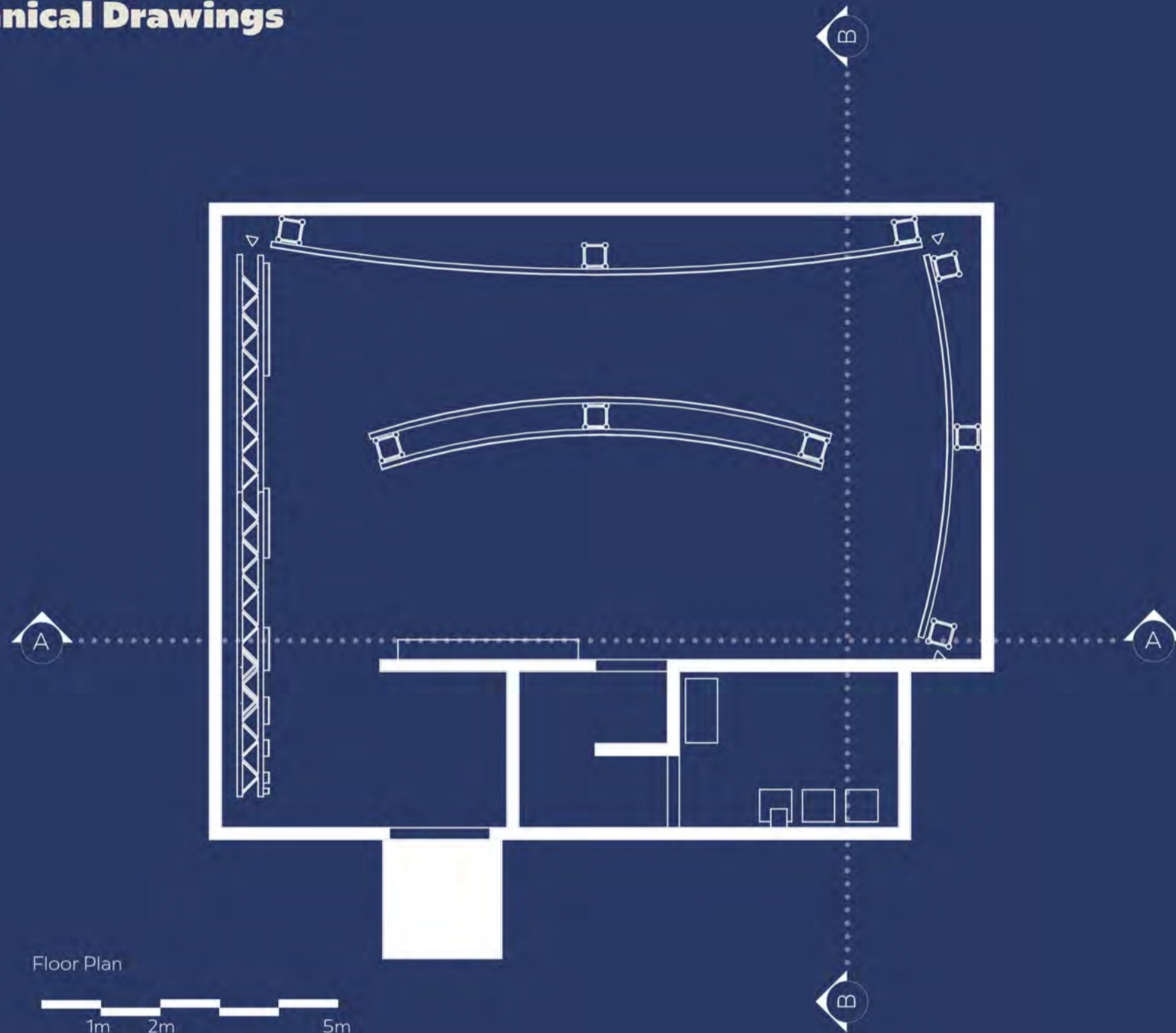


Milk Bottles & Plastic Packaging



Cardboard & Plastic

Technical Drawings



Overhead Lighting

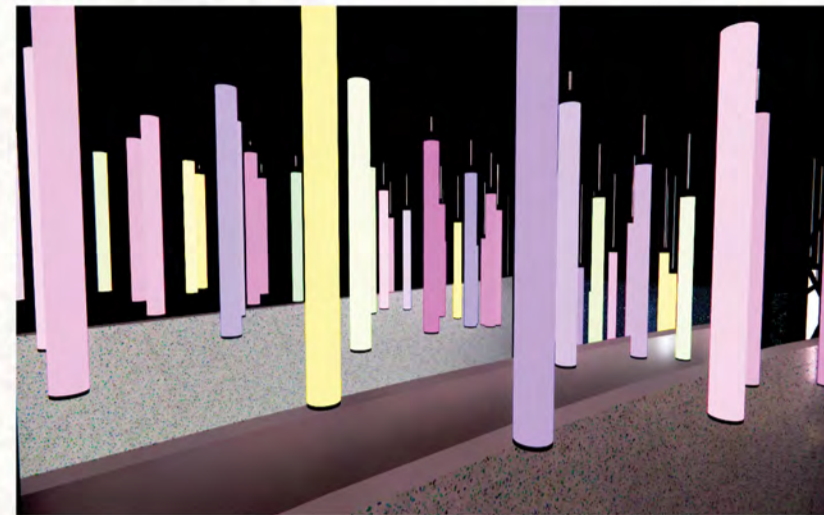


Hanging Verticle Tube Light
1020mm Long
80mm Diameter

Lights are suspended along a curved ceiling path, peaking at the center to reflect the curvature of the walls.

Lighting

Vertical tube lights hang overhead in the large expanse of ceiling space and use sensor technology to light up when someone is below. To prevent drawing attention from the material walls, the space is dark, aside from the colourful glow given off by these tubes.



Fibonacci Wall

The walls leading to the exit, while working the same as the other walls, are arranged in a decreasing order to match their decreasing width, inline with the Fibonacci sequence. This is to help guide visitors around the space.



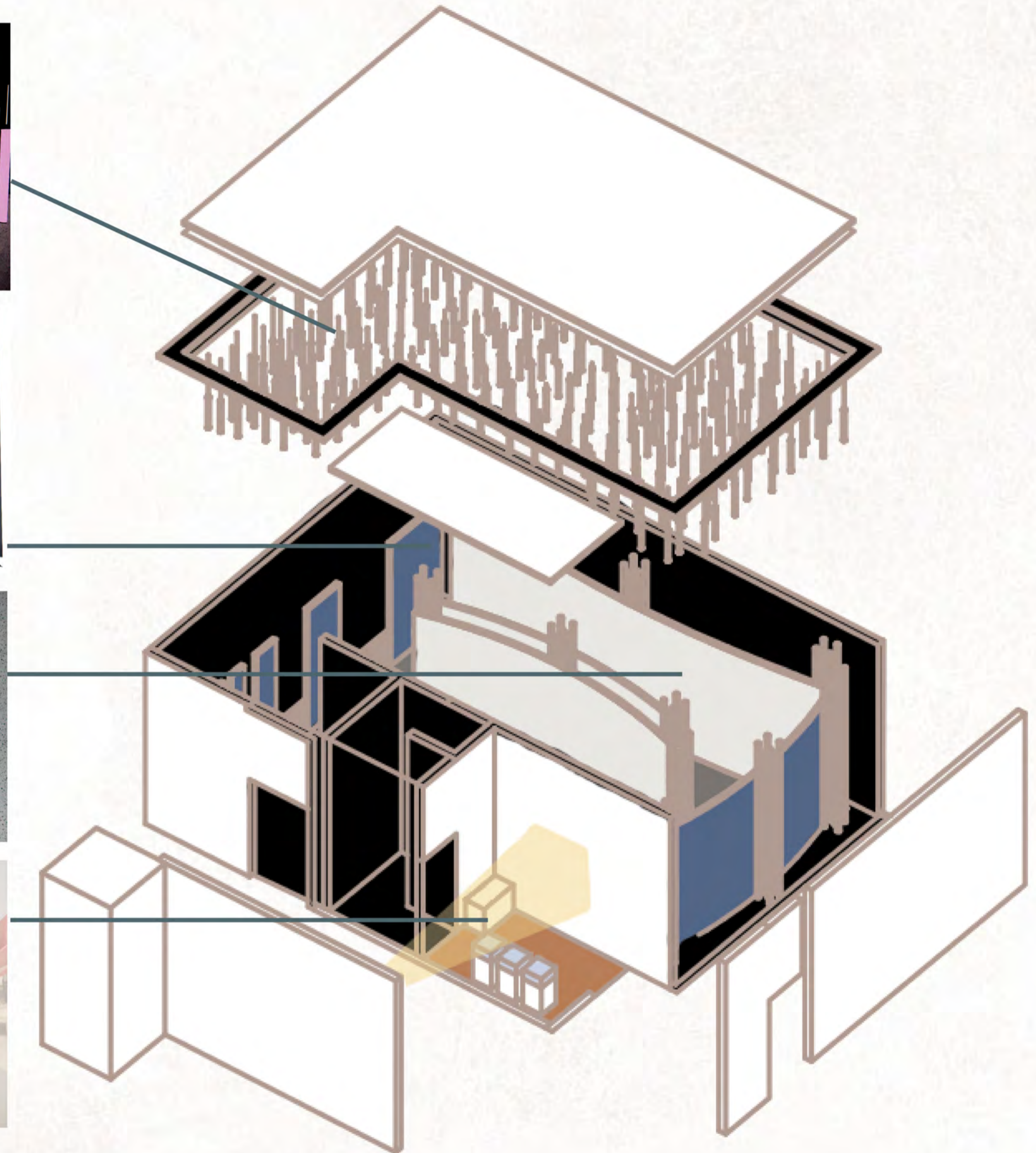
Room 2

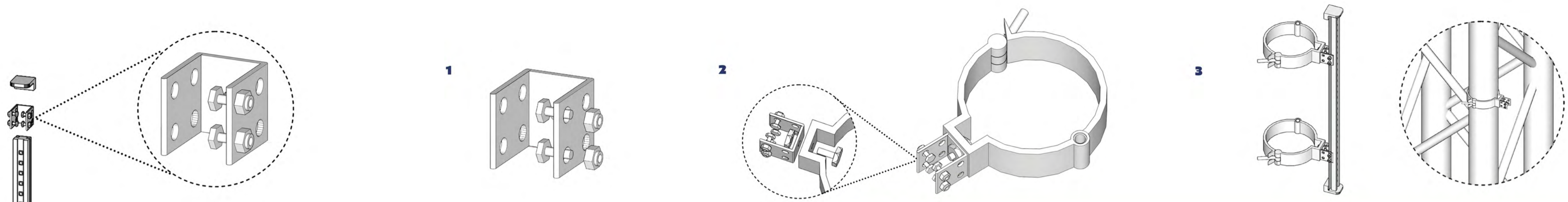
The exhibition space is an area for visitors to interact with the materials through responsive lighting fitted behind the sheet materials. Using tracking technology the walls light up when prompted by someone touching the sheets, encouraging people to be tactile with the materials.



Room 1

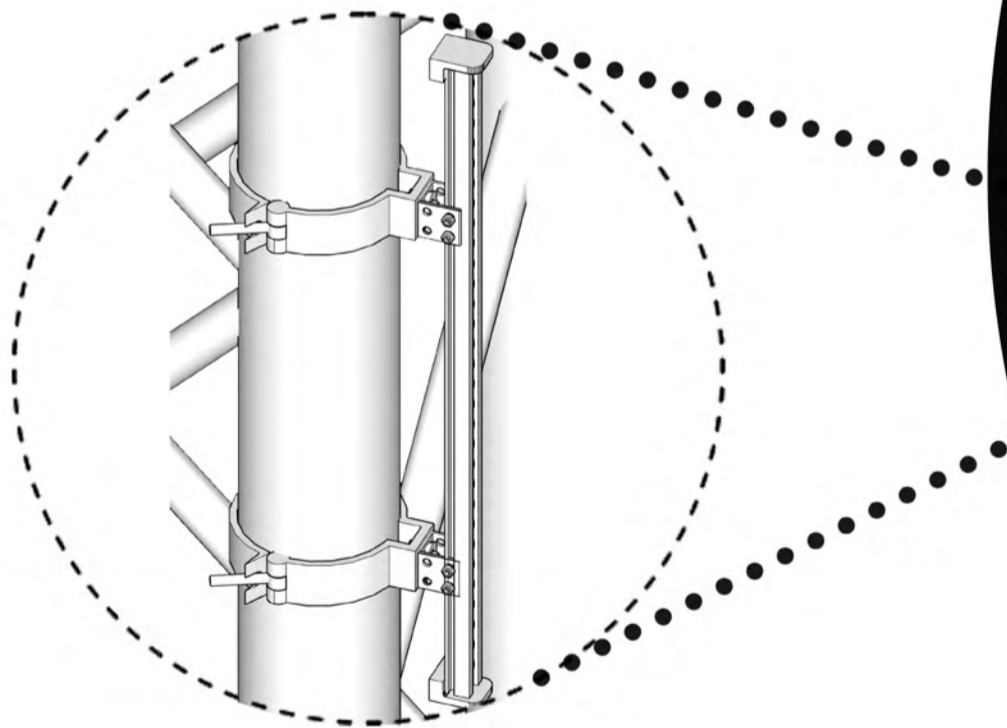
A space that introduces visitors to the concept of the work and educates them on and demonstrates the processes used to create these materials. A video showing this process is projected on the wall, with material samples showcased on plinths that were made using these processes.





Construction

- 1** Small nuts and bolts are threaded through the bracket
- 2** The bracket attaches to the clamp with another bolt.
- 3** The light can be threaded onto the bracket, and clamped onto the truss.



Attaching the lights

Because the brackets hold the lights together as one unit, the lighting can be attached to the truss at either end of the wall. The plastic sheets are clamped on top of the light wall.

