

# Nalu

An Educational, Public Furniture Installation

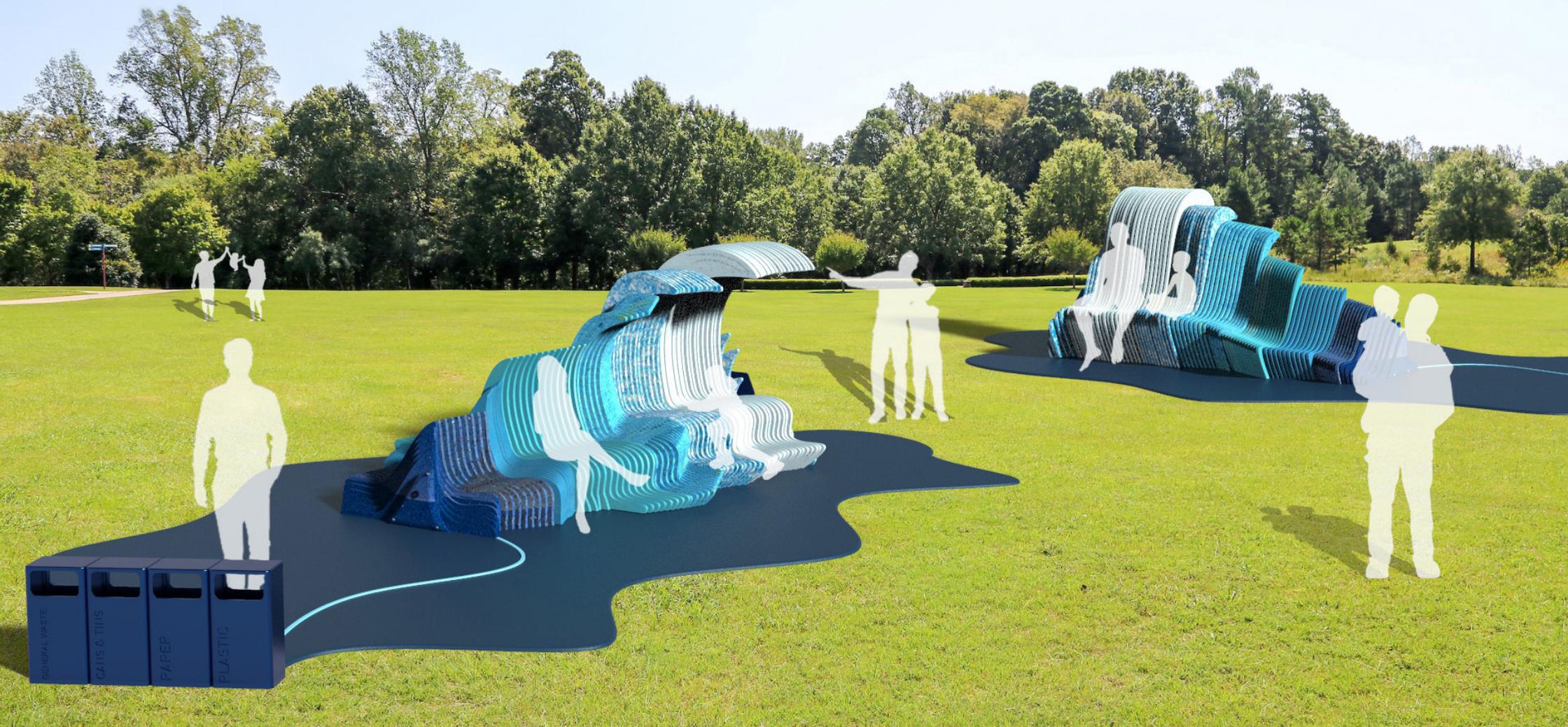
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**BIRMINGHAM CITY**  
University

## Concept Overview

Nalu is an outdoor furniture installation which aims to encourage social interaction, whilst educating the public about the ever-growing issue of ocean plastic pollution. This installation is manufactured from 100% recycled ocean plastics and incorporates recycling bins for public use.



# Public Spaces

Public Spaces are vital for human interaction, but not everyone in society is treated equally in public spaces, whether that be young people discouraged from congregating in public, or homeless people who are actively prevented from resting in public spaces due to intentionally anti-social designs.

Although design cannot solve all of society's problems, design can generate solutions which help to create more inclusive spaces. Interaction and inclusion in public spaces, combined with a major emphasis on sustainability is essential to producing successful, long-lasting public spaces.



# Sustainability

During the research process, it was noted that there is a significant lack of sustainability within public furniture installations. This is an opportunity to raise awareness and encourage sustainable behaviour.

100% recycled ocean plastic sheet was chosen as the primary material, due to its sustainable credentials and its bold aesthetic to engage users.

The ocean plastic pollution situation is undoubtedly one of the world's biggest environmental threats. With 1 in 3 fish being caught for human consumption containing plastic and millions of animals dying from plastic pollution each year, it is imperative that the public is better educated and aware of this issue.

The plastic pollution situation needs to be a talking point in every home and something that is approachable for children and easy for them to understand.



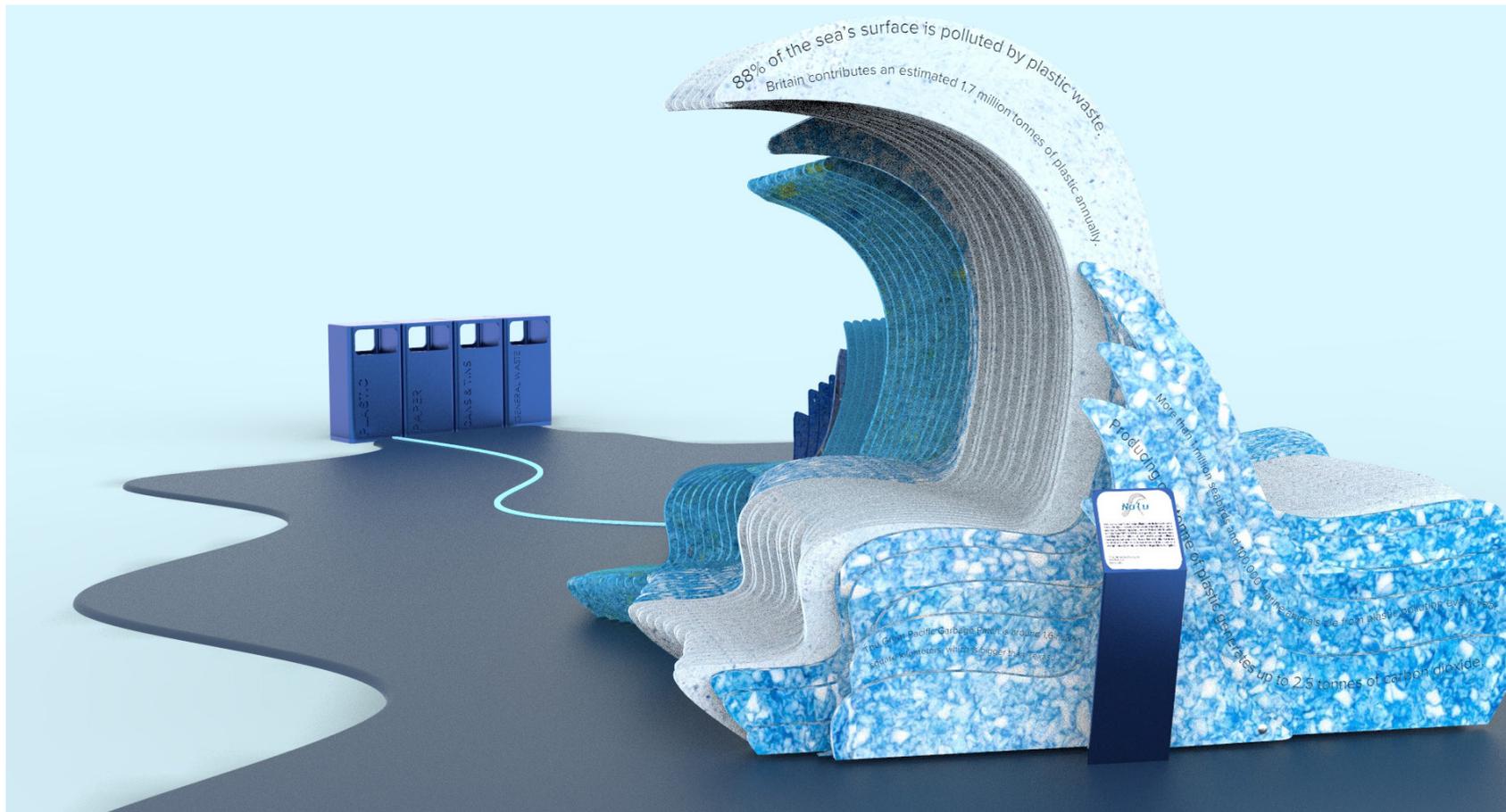
# Education

The installation was designed to help educate those who use the public space. Facts about the environmental impact of plastic pollution were etched onto different surfaces of Nalu, encouraging users to discover, read and discuss the information. Users were also encouraged to consider their own actions with a visual connection made from the installation to the recycling bins to encourage recycling and the responsible disposal of rubbish.

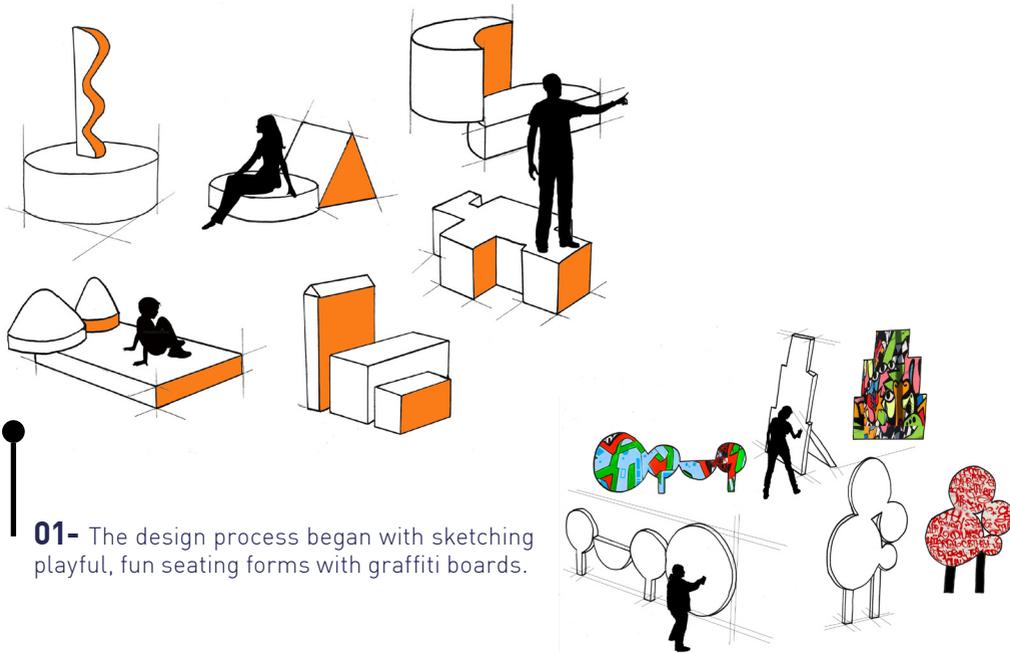


# Recycling

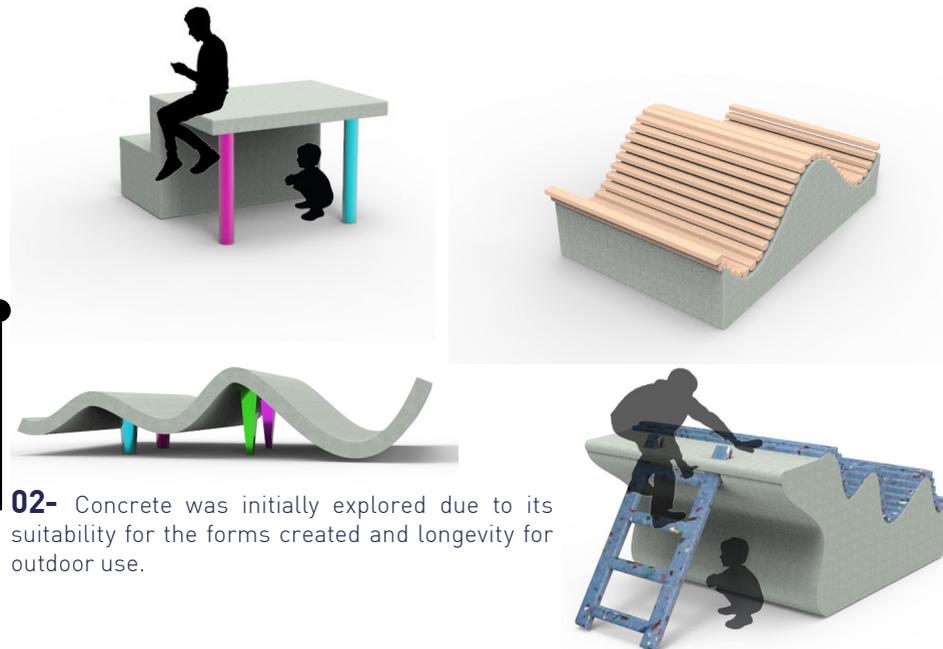
Nalu incorporates recycling bins into the installation. After the user has read about the plastic pollution facts and has seen the vast amounts of recycled plastic material, the aim is to encourage them to recycle any rubbish they have. Public Spaces are now more important than ever as a result of the pandemic. A recent survey by Keep Britain Tidy shows that more than half of the country's parks have had to pull in extra resources to deal with litter issues since lockdown was eased. Therefore, recycling our rubbish and keeping public spaces tidy is imperative.



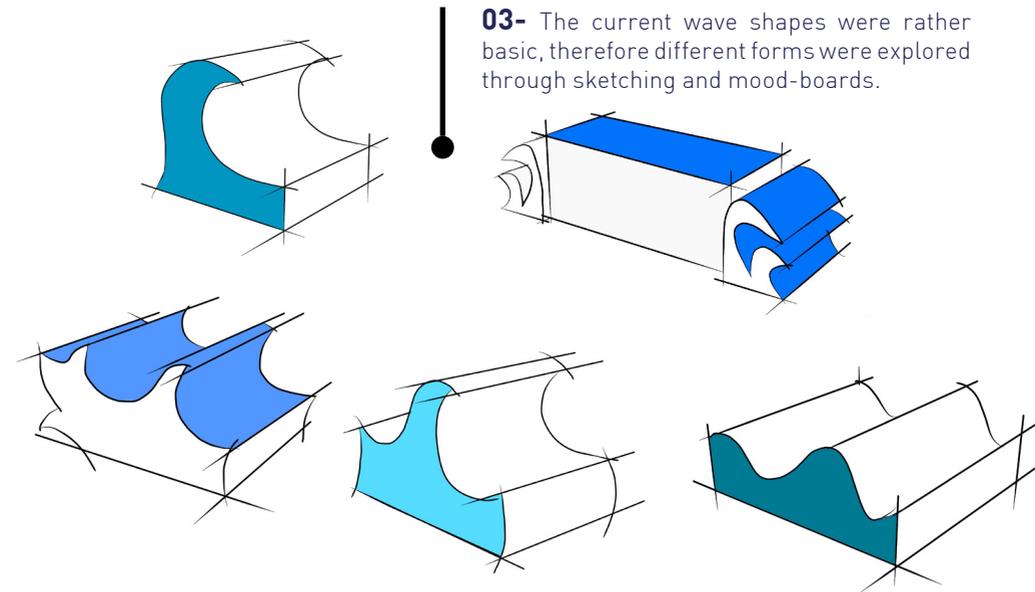
# Design Development



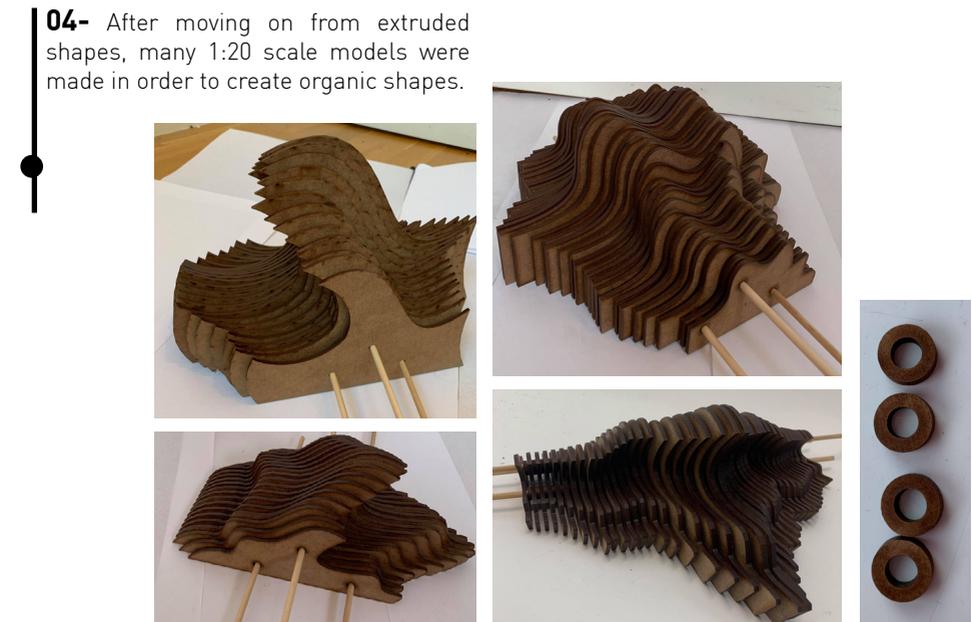
**01-** The design process began with sketching playful, fun seating forms with graffiti boards.



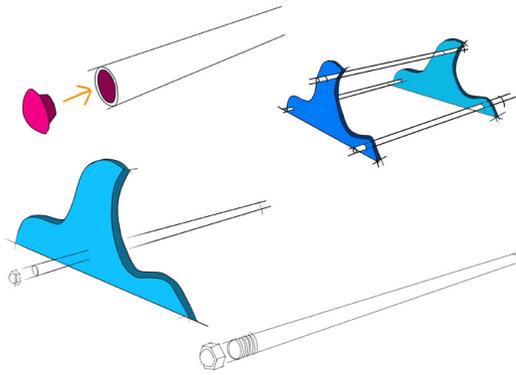
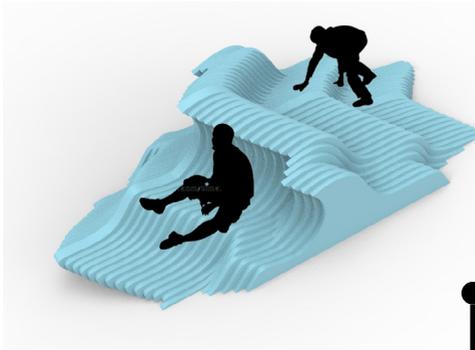
**02-** Concrete was initially explored due to its suitability for the forms created and longevity for outdoor use.



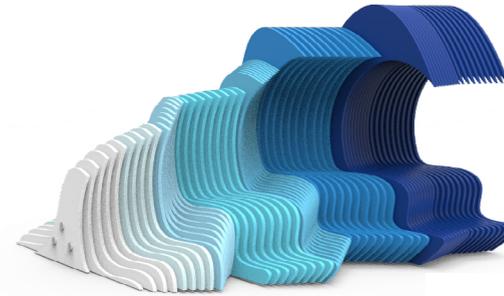
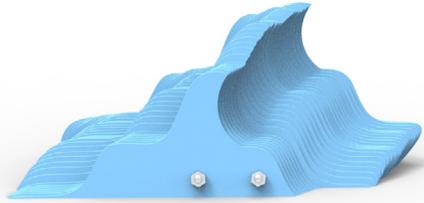
**03-** The current wave shapes were rather basic, therefore different forms were explored through sketching and mood-boards.



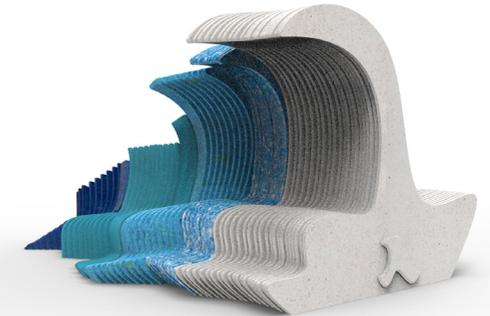
**04-** After moving on from extruded shapes, many 1:20 scale models were made in order to create organic shapes.



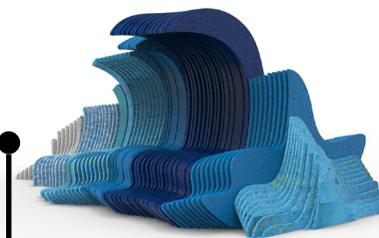
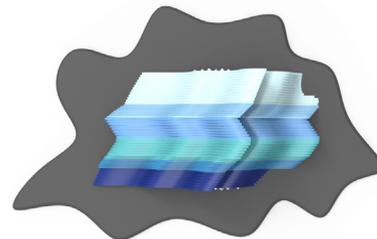
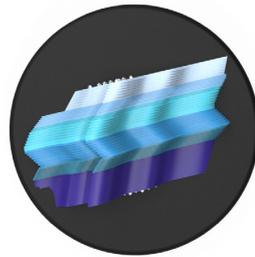
**05-** After creating scale models, fluid Solidworks models were produced. Additionally thoughts were made about the structure.



**07-** The forms of the previous models were more sculptural than practical, and the overall form was still unresolved. This form very much still represents the ocean theme, whilst also providing numerous comfortable places to sit.



**06-** The layered form kept being developed. Additionally it was decided that Wet Pour rubber flooring would be used for the base.



**08-** To transform the project from a bench into an educational installation, the ocean plastic facts were added to the design. Initially the facts were going to be cut into the surface of the large flat back piece. However, it was decided that the facts could be located around the design on the flat pieces.





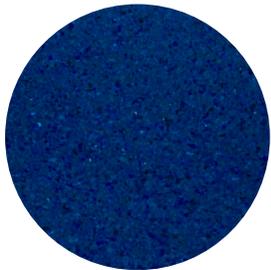
## Material choice

Nalu needed to have a major focus on sustainability through its material choices. Additionally, colour use and bold aesthetics were a significant requirement for the project. Therefore, the use of recycled plastic material, which is sustainable and colourful was an interesting area to explore.

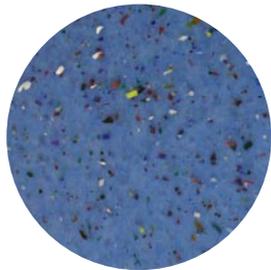
## Smile Plastics

Smile Plastics produce environmentally friendly recycled plastic sheets. They are high quality and have the lowest ecological footprint possible. Each panel is made from a single type of plastic so it can be easily recycled, extending its use indefinitely. This company was selected over other options, as they produce custom orders, therefore they would be able to manufacture sheets using 100% ocean plastics and to the required size. Smile Plastics are based in the UK, this therefore reduces the environmental impacts from transport.

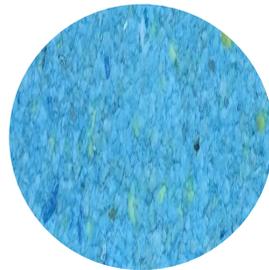
Sapphire



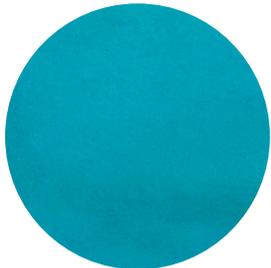
Ocean



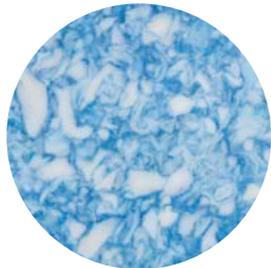
Turq



Maldives



Blue Dapple



Alba



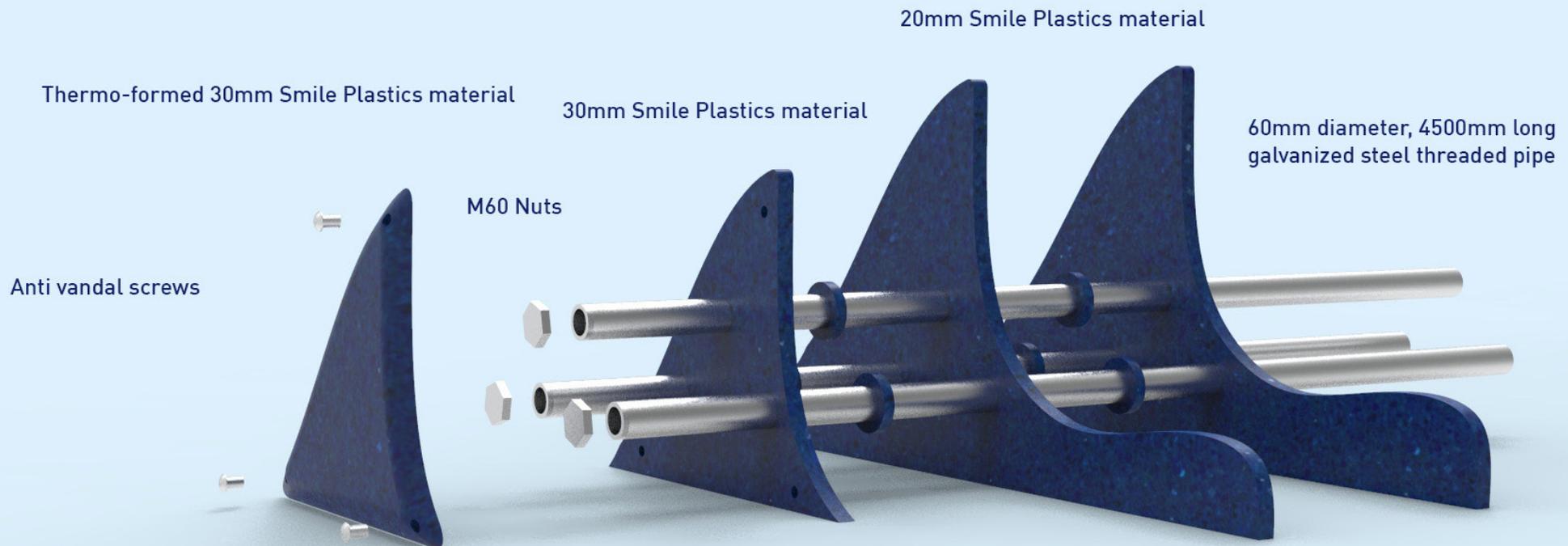
# Manufacture

To manufacture Nalu, all the plastic components (the main pieces and spacers) are drawn using CAD and are then CNC cut. After polishing, the pieces are threaded onto 3 60mm diameter hollow steel poles (the length of these poles is dependent on the size of the bench). 3 of the cylindrical pieces are attached to the steel poles in between each layer of the 'wave' pieces.

The pieces are secured with nuts which are attached to the ends of each pole, which all have threaded ends. The fixings are covered up with thermo-formed pieces of the recycled plastic material. The end pieces are then fastened to the structure using anti-vandal screws.

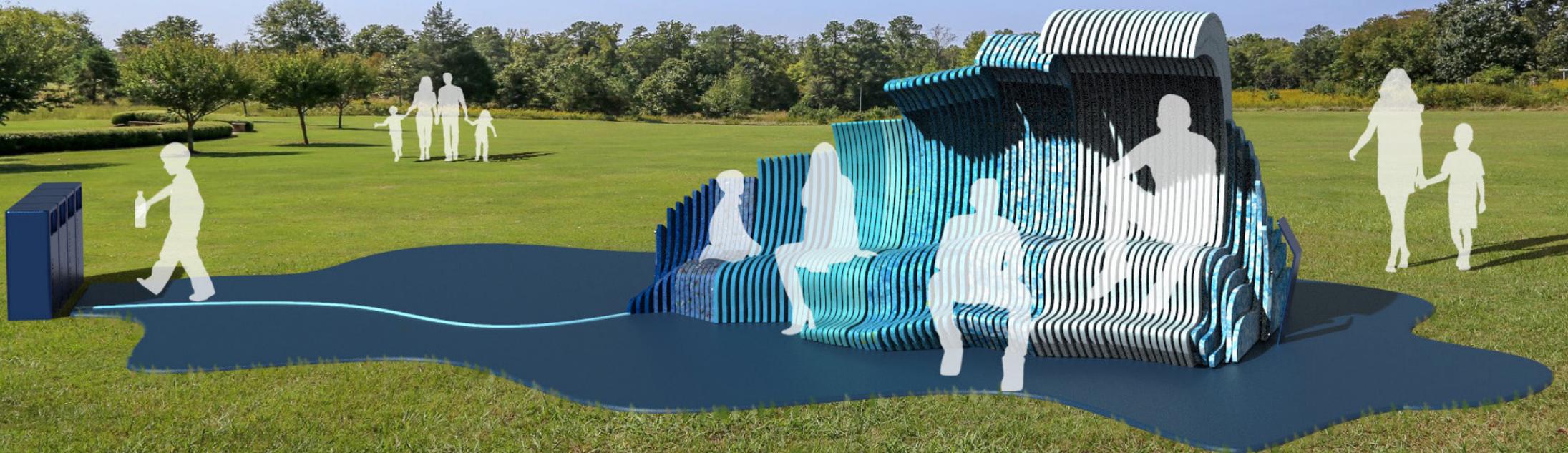
# Maintenance

If any of the plastic pieces get damaged, due to the way the product is assembled, the individual component can easily be removed from the steel pipe and can be replaced.



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