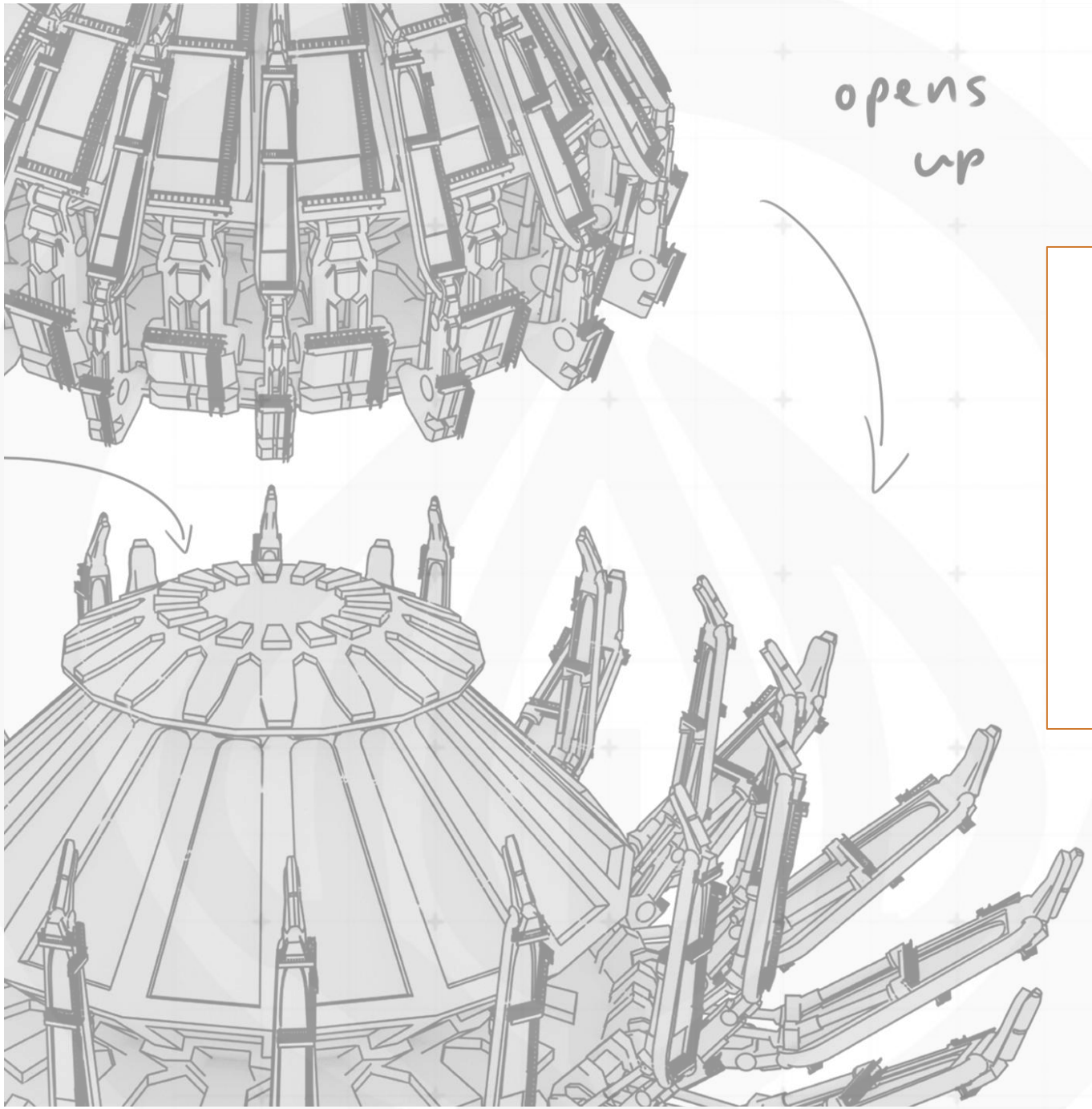

THE ART OF
THE TERRASPHERE
Isabelle Gosling



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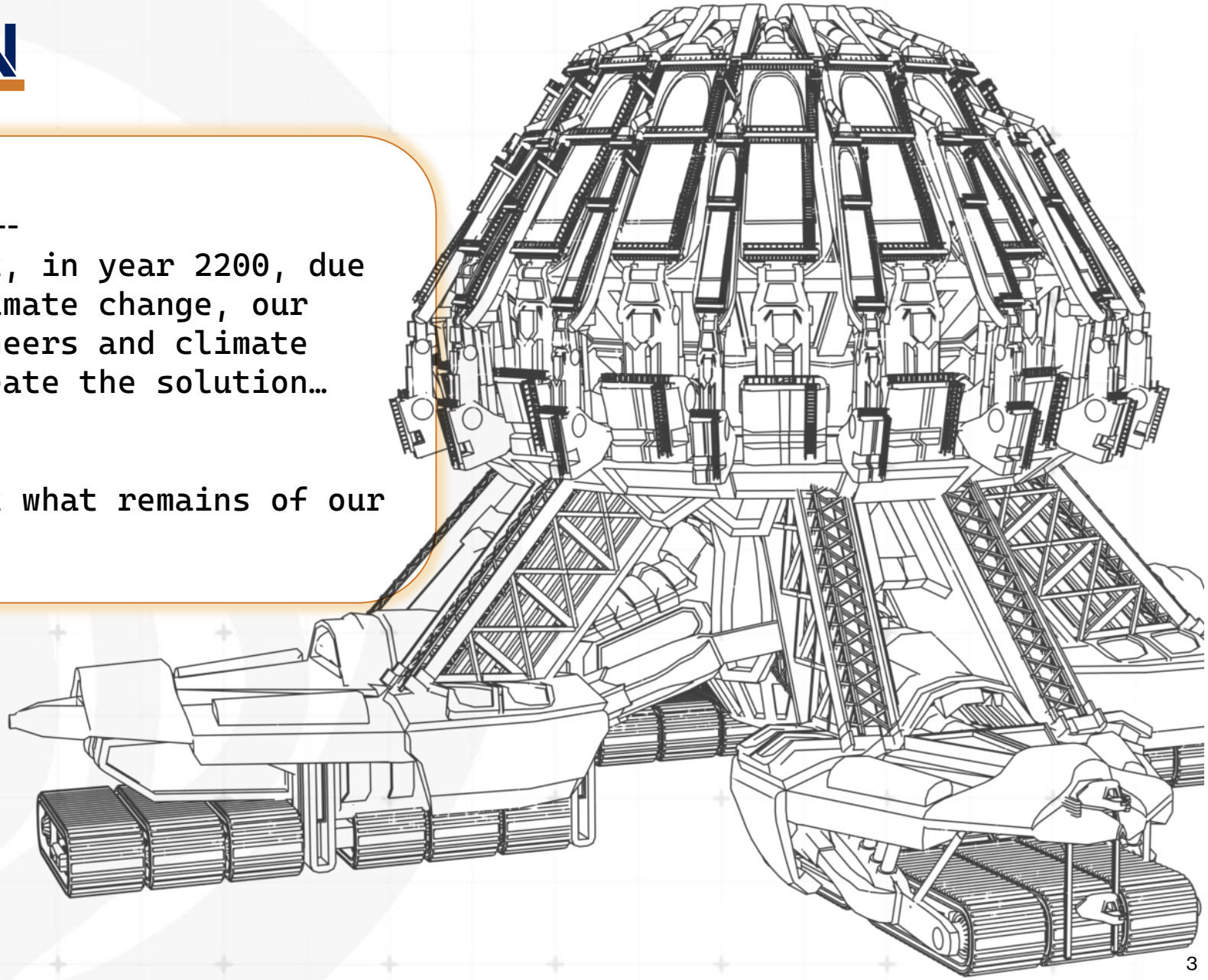
INTRODUCTION

WELCOME TO THE TERRASPHERE!

After the world finally dried out, in year 2200, due to the devastating effects of climate change, our worlds remaining botanists, engineers and climate scientists banded together to create the solution… The Terrasphere.

Their mission was simple. Protect what remains of our plant life on earth.



The Terrasphere is a sci-fi vehicle designed for an adventure and survival game about collecting and protecting plant life in a post-apocalyptic world. The purpose of the vehicle is to travel across the earth and store any organisms the player has collected in its botanical self-regulated environment.

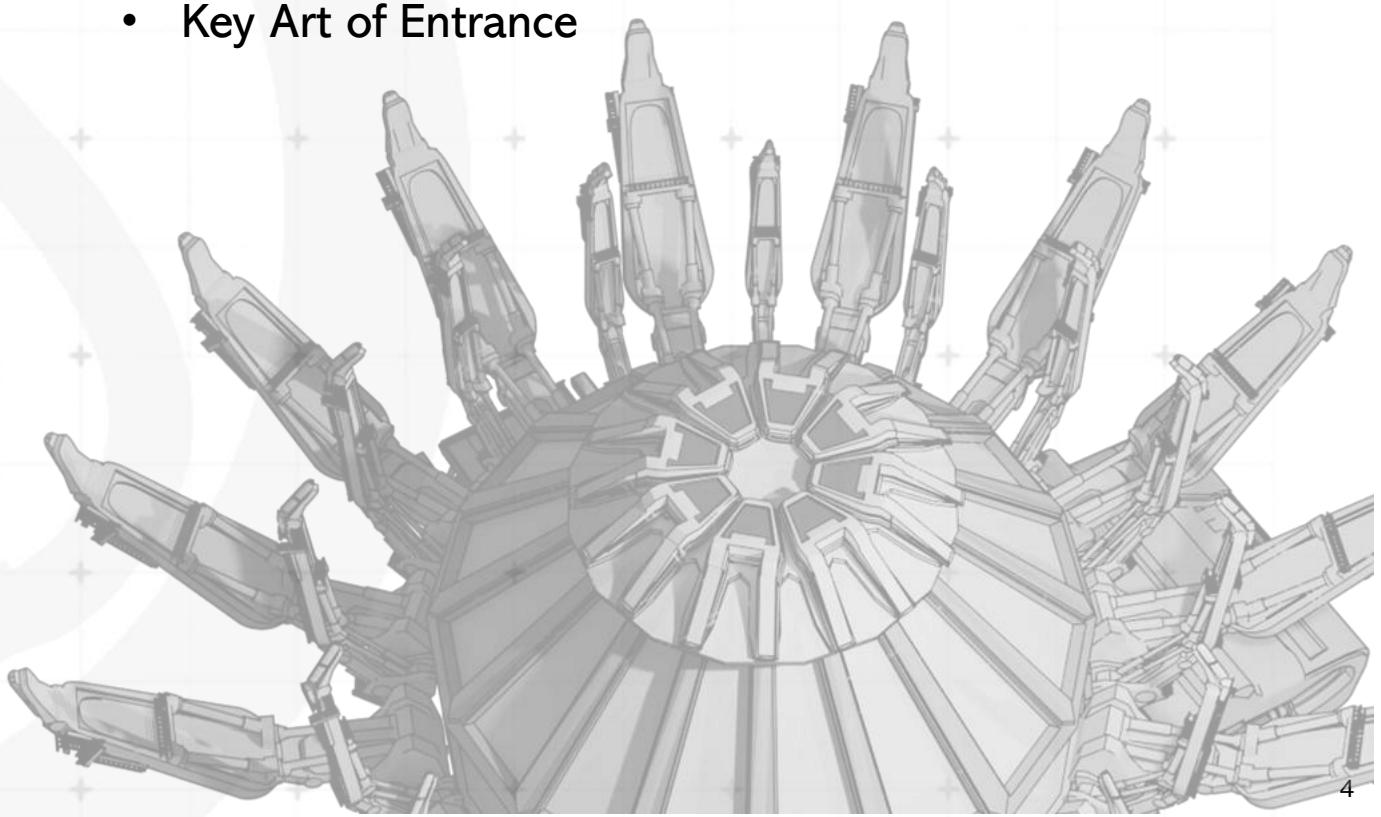
DELIVERABLES

Research
- Botanical research
- Climate Change Research
- Mood boards

Ideation
- Initial Sketches
- Thumbnails of full design
- Thumbnails of Smaller Functions
- Colour Iterations

3D
- Chosen design built in 3D
- Small functions blocked out in 3D
- Textured Model

Final Design
- Callouts of smaller functions
- Rendered Image of Main design
- Orthographic
- Key Art of Entrance



RESEARCH AND INSPIRATION

INSPIRATION

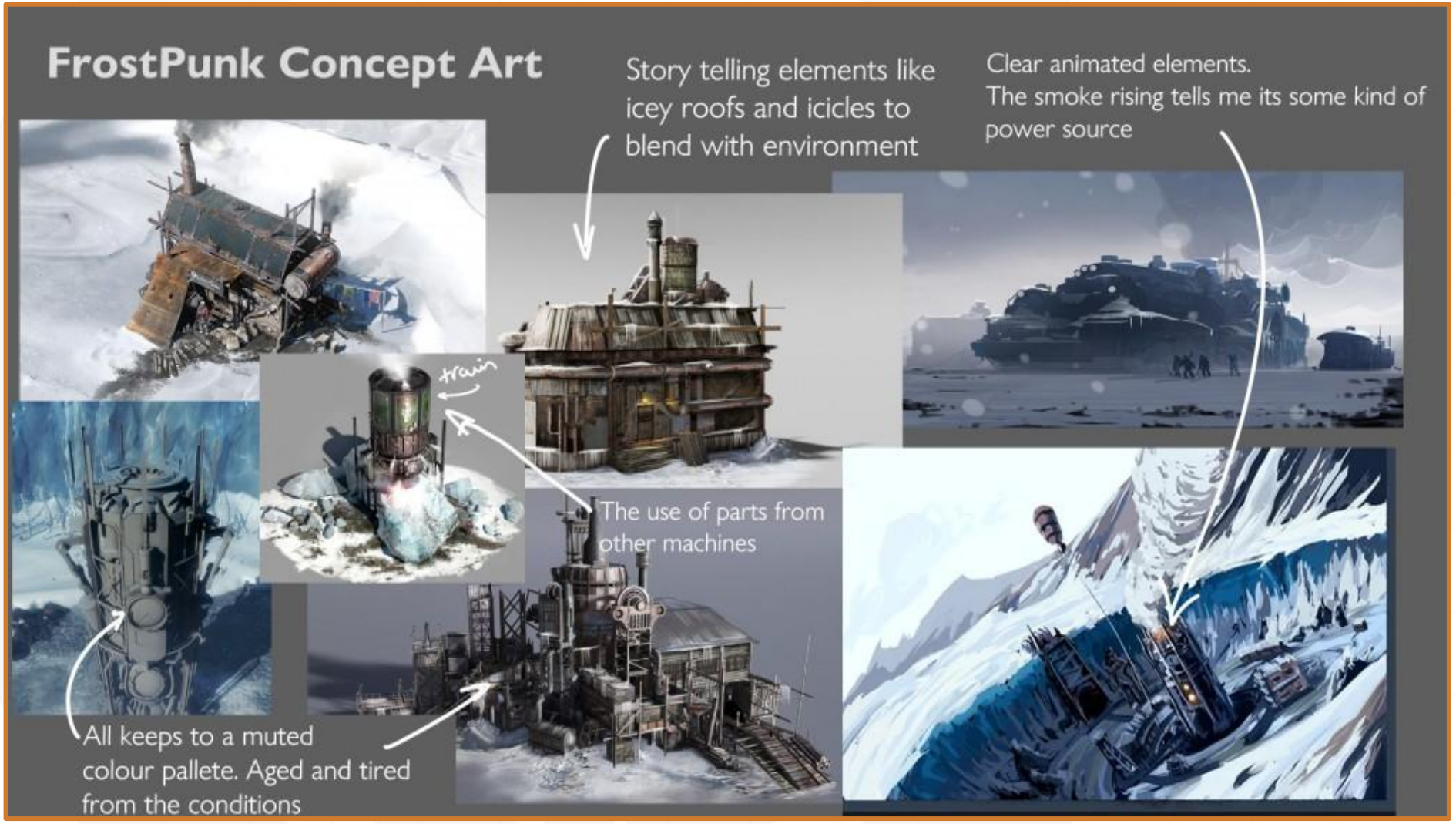
DUNE

(George Hulls designs)

For this project, George Hulls designs in Dune were a big inspiration. Since the setting for these vehicles were like that of my own, I referenced his work to see how he achieved scale and believability.

The main focus for me this project was the spice harvester, with its multiple tracks and small ridged details.

INSPIRATION



FROSTPUNK
(2018)

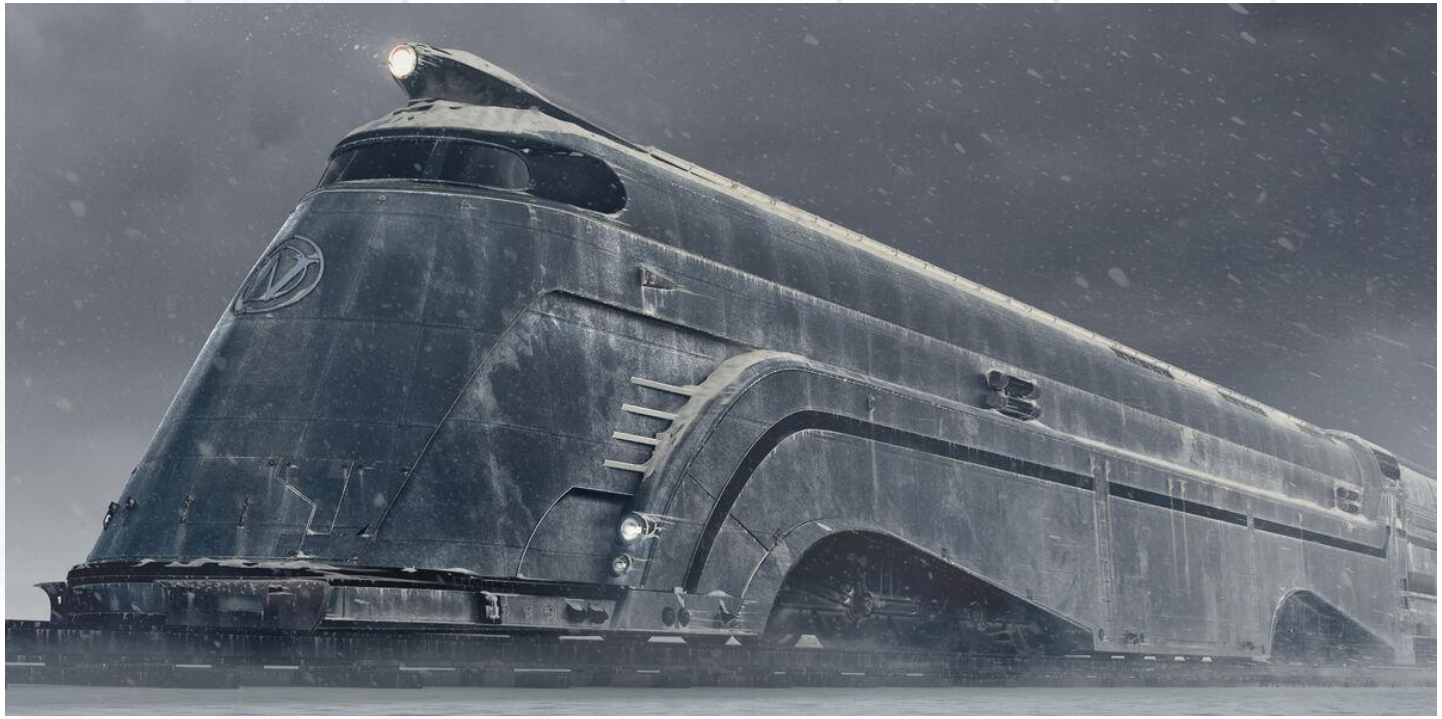
I then thought I would move the focus to a video game example. As recommended by my supervisor, FrostPunk was an example of a frozen post-apocalyptic environment. This game would help me consider examples for a game industry setting. A sense of scale is also evident here as the game looks at the world from a top-down view, so it was interesting to see what details are evident from such a perspective.

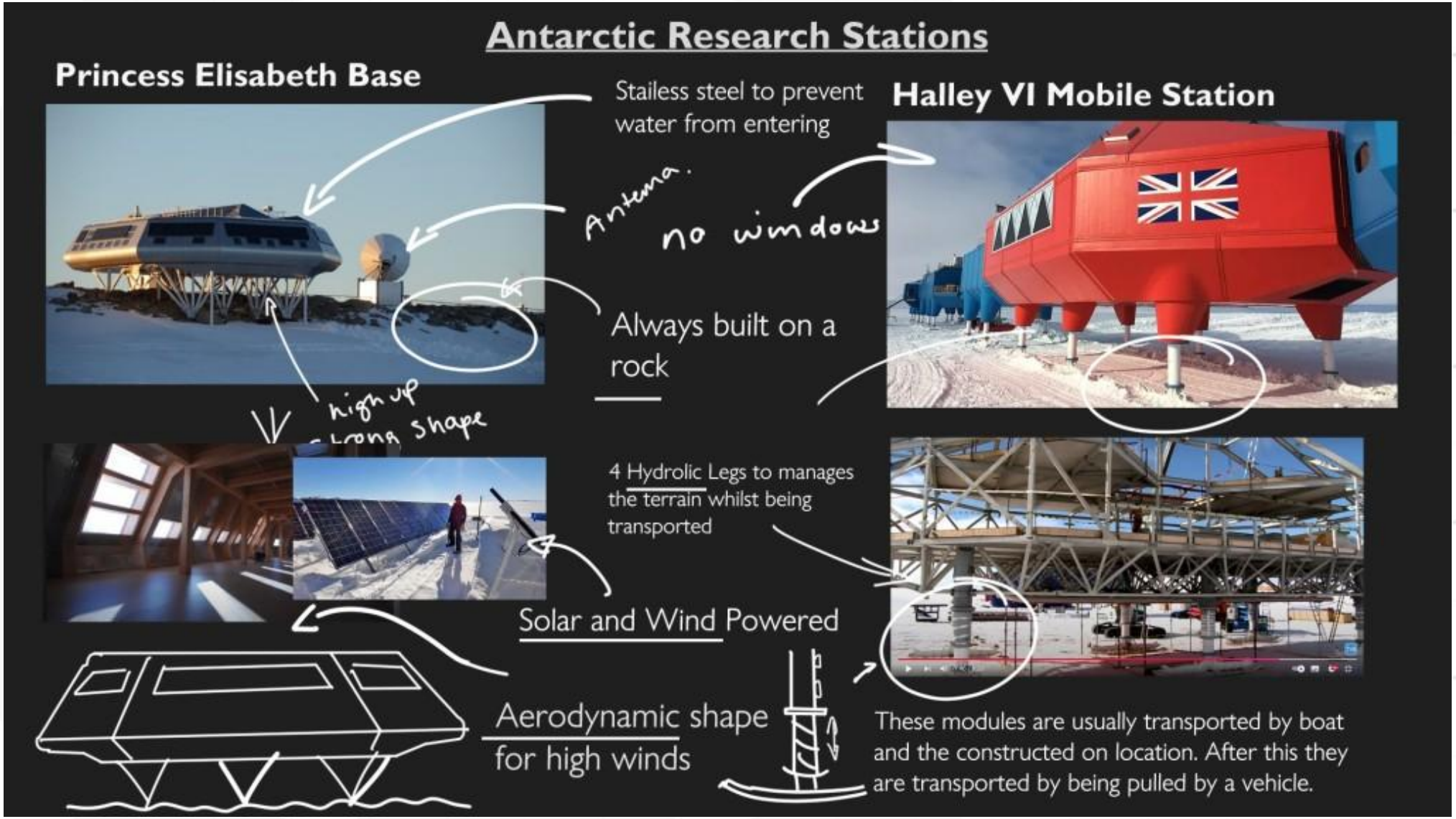
SNOWPIERCER
(2020)

INSPIRATION

I then found another film industry example that inspired me, the trains from Snow Piercer. The flowing edges that nicely connect all the elements of the train together was something I wanted to keep in mind for my design.

As well as this, the trains scale and gritty textures perfectly represented what I wanted to portray.





I then decided to research into Antarctic bases.

Having the Antarctic be a harsh desert environment. I decided to research into what makes them so resistant to extreme weather conditions.

- Stainless steel
- Solar and Wind Powered
- Aerodynamic shapes for high winds

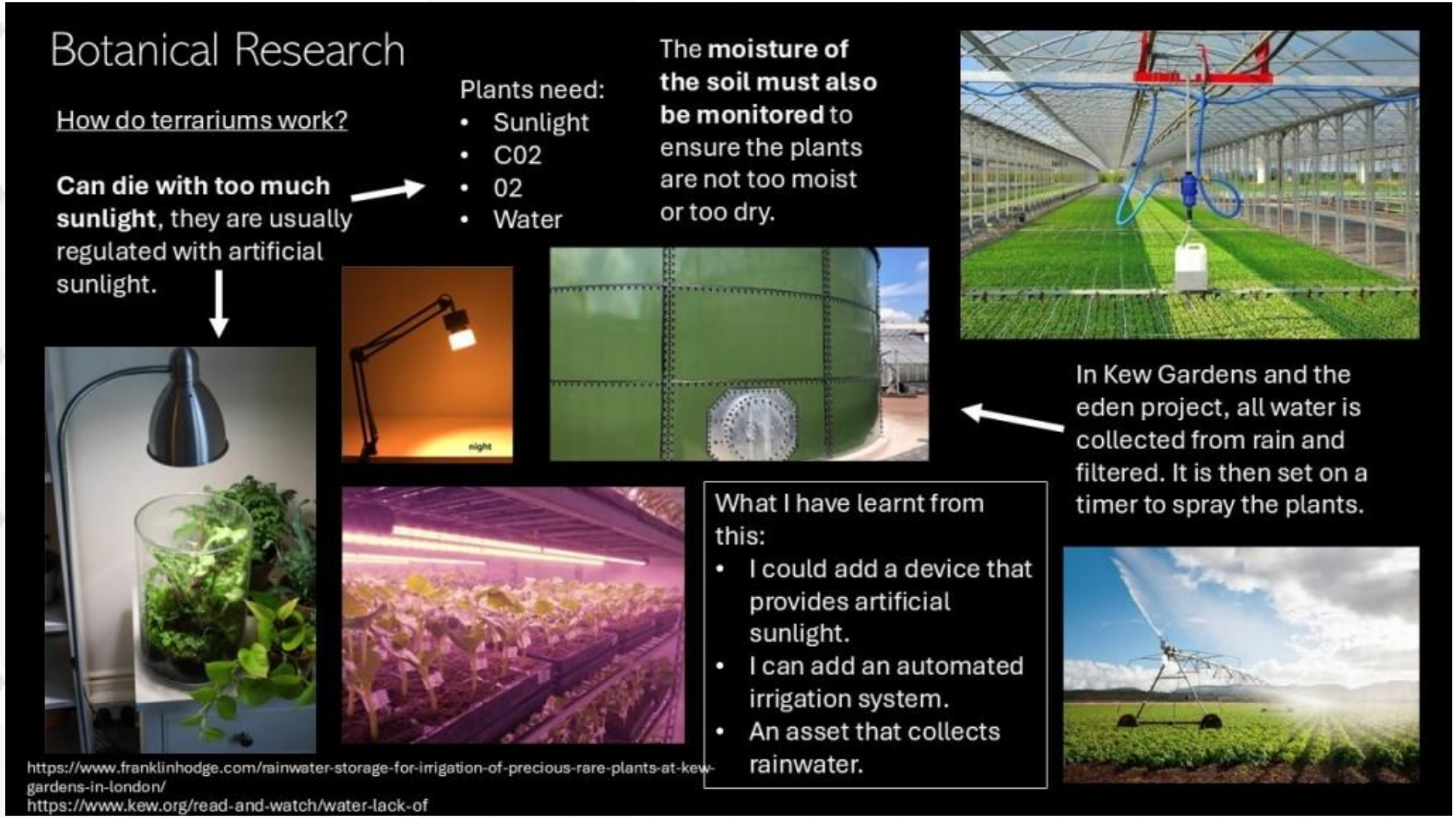
BOTANIC RESEARCH

In order to understand what I will need to show externally on the Terrasphere, I also wanted to understand what would be included on the inside.

Therefore, I researched the fundamentals of farming and botany.

- Sunlight
- C02 + 02
- Water

I also researched some methods of how some of these sources are regulated, like through irrigation and artificial sunlight.

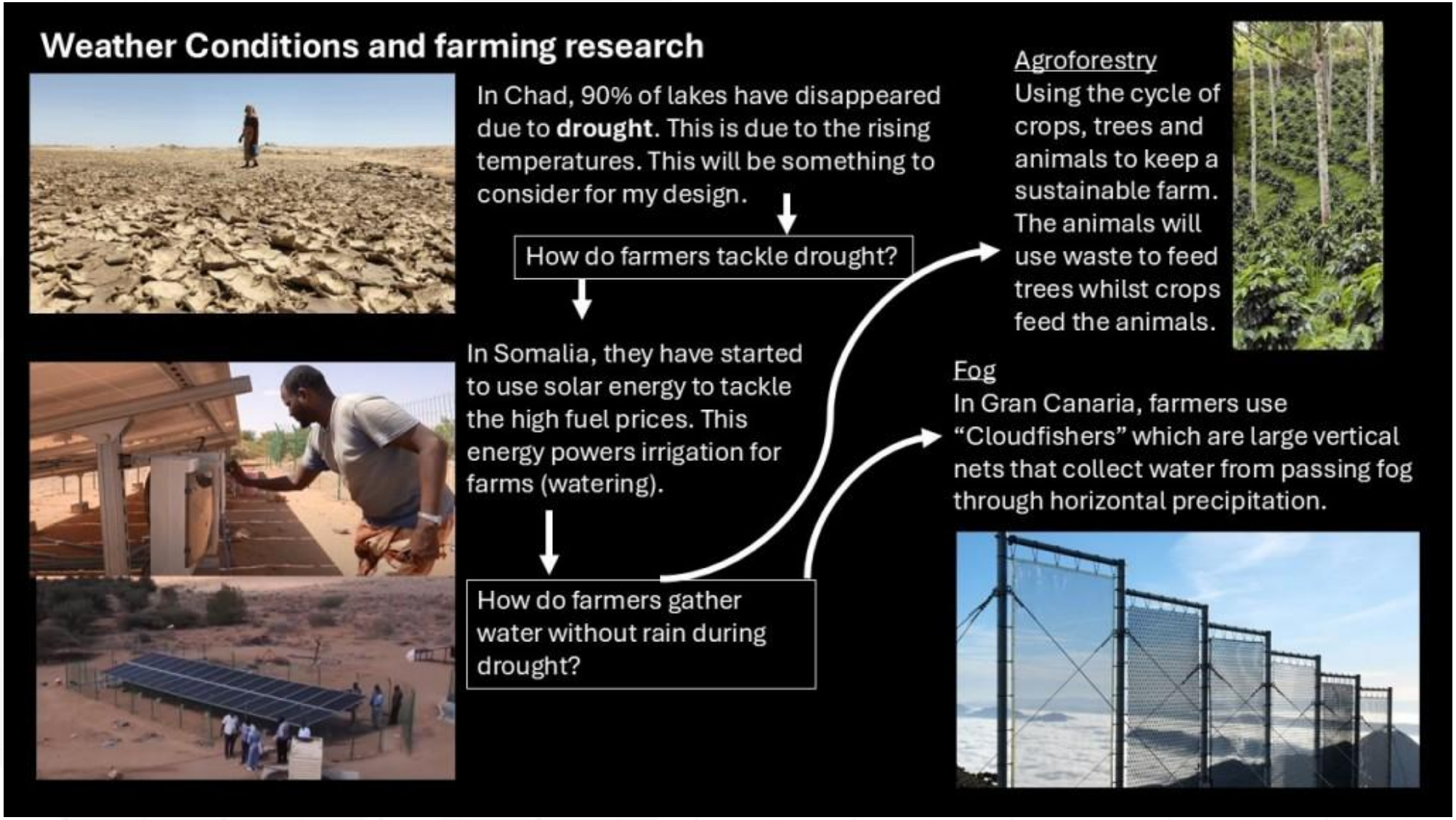


WEATHER AND FARMING RESEARCH

Following this, I then researched more into how climate change and drought has affected farmers so far.

This included ways of collecting energy for farming as well as finding a source for water.

Here I discovered that Gran Canarian Framers **use nets to collect the vapour for fog**. I thought this may be an interesting visual for my design.



WEATHER AND FARMING RESEARCH

I discovered some ways that farmers in hot climates protect their plant life too.

This included methods such as shade, mulch to trap moisture and automated irrigation.

Weather Conditions and farming research

Shade
Farmers use shade tunnels which are made from UV polyethylene which allows ventilation and water permeability.

Could add a shading system?

Mulch
This is a protective layer of composted material that is placed on top of soil.

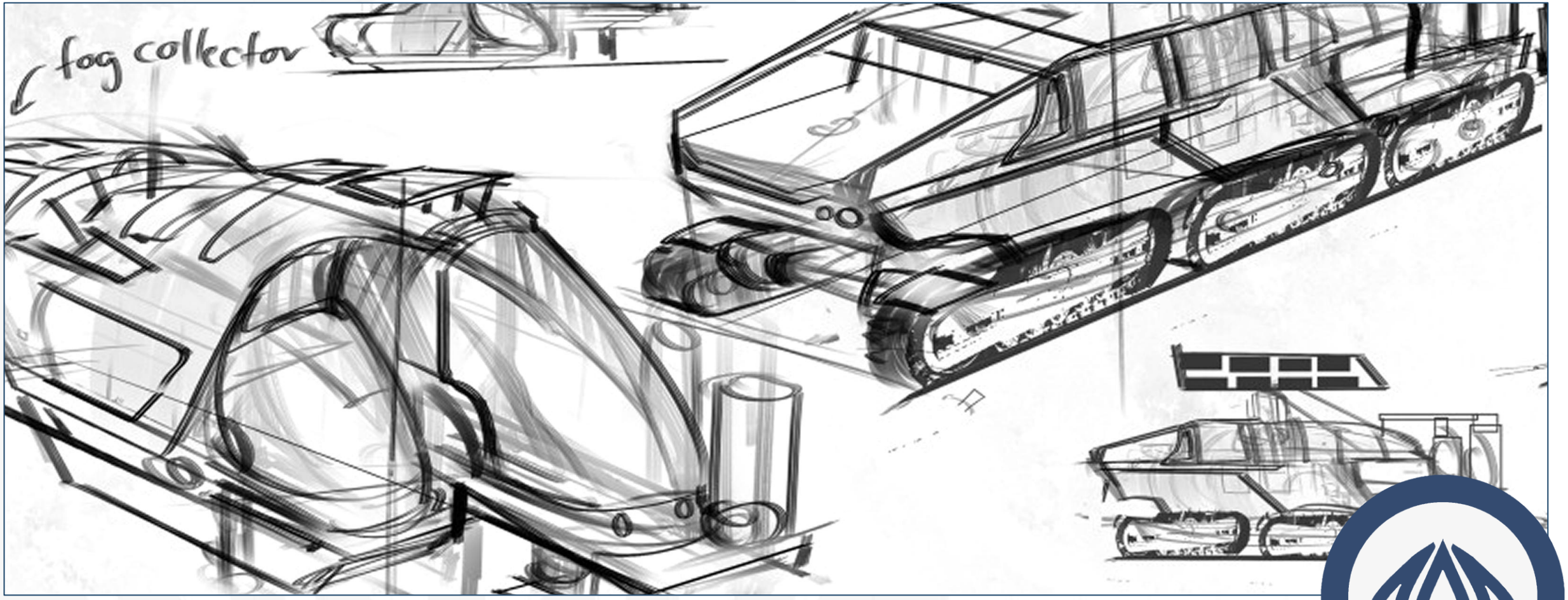
- Retains moisture
- Moderates soil temperature

Source:
https://www.bbg.org/article/summer_gardening_advice_column

How do farmers deal with heat?

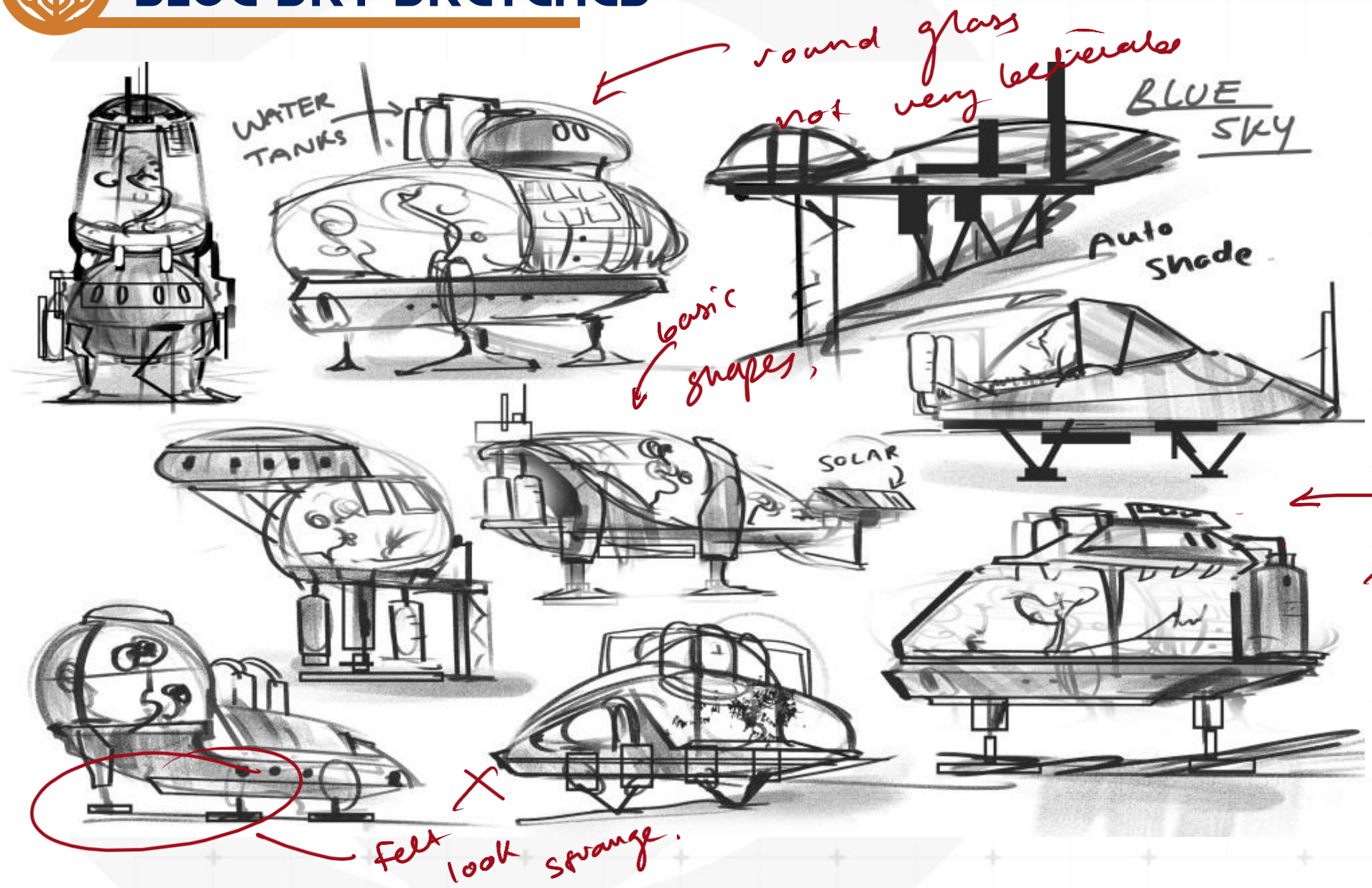
Thermal Buffering through trees
This is another part of agroforestry where the trees will provide shade for the plants below.

Drip Irrigation
Water that is provided directly to the root of the crops, eliminating waste of water. Provides water at a consistent rate.



IDEATION

BLUE SKY SKETCHES



Here are some initial sketches I did after my research.

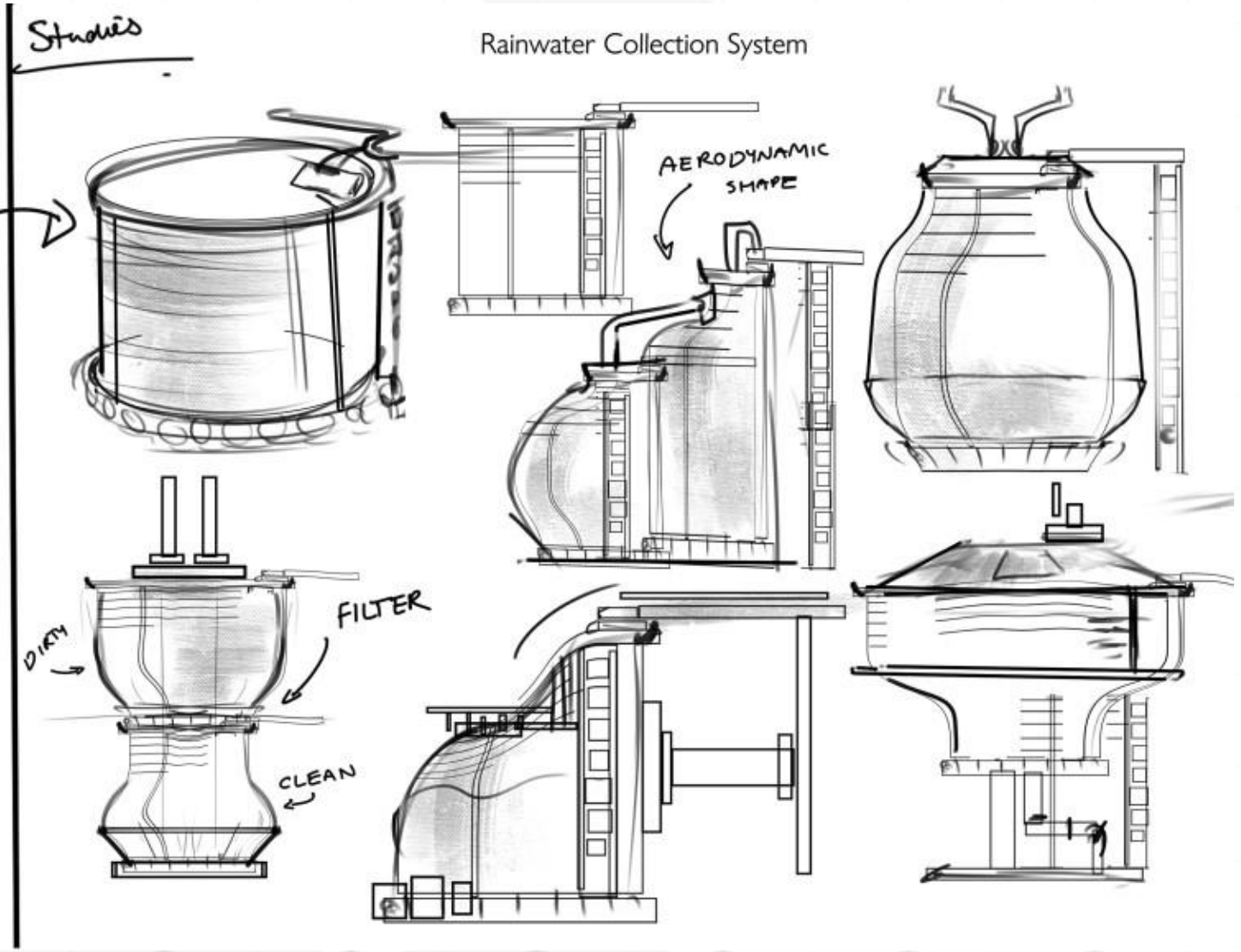
There were a few issues with the look and style of theses sketches, as advised by my supervisor, that I let go of early on in the project.

EARLY MOODBOARD

After my preliminary research and blue-sky feedback, I quickly put together some images to help me to start thumbnailing.

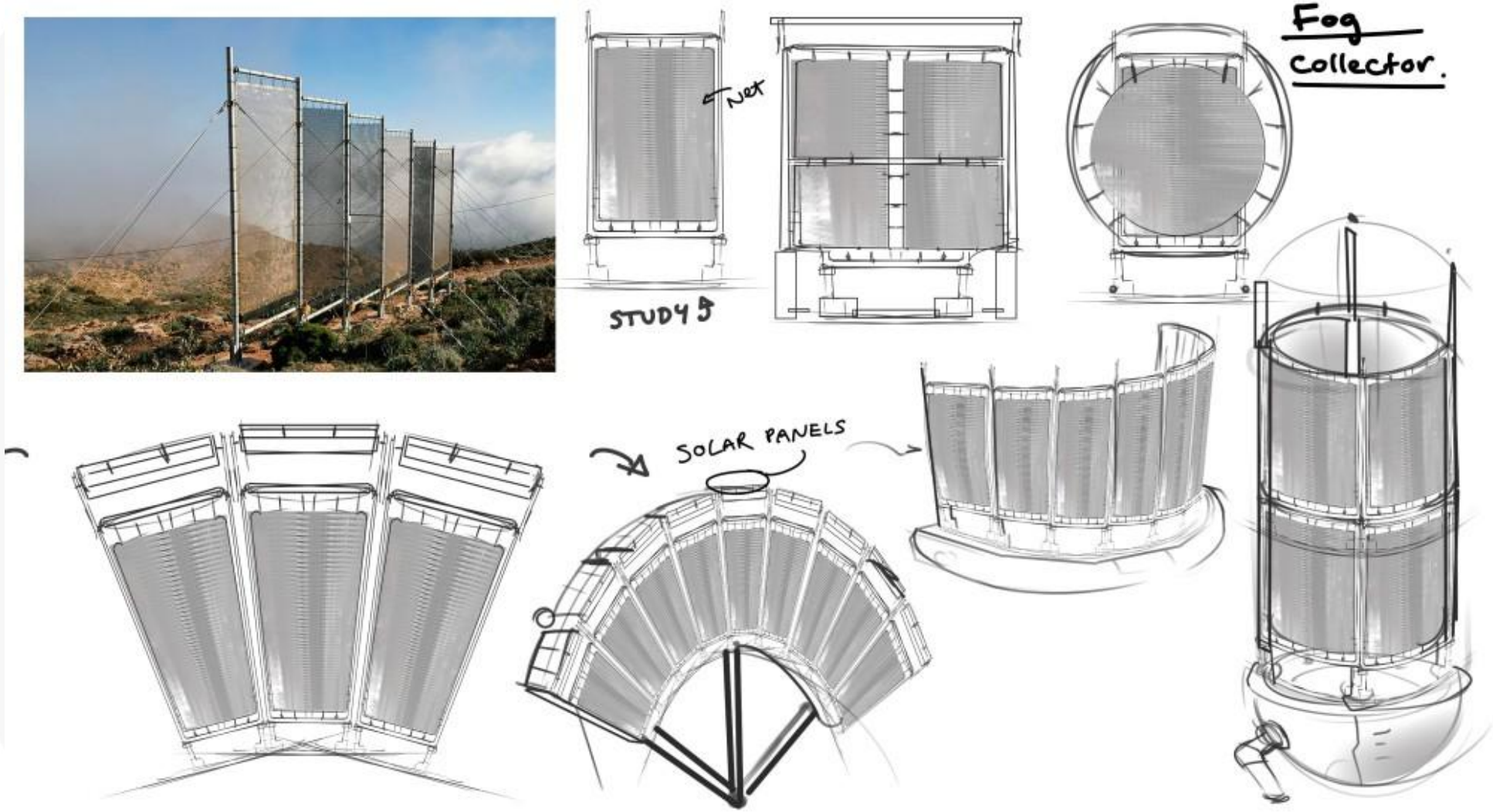
This included some images I found during my research phase and then some extra images of vehicles to refer to.

THUMBNAILS



I wanted to focus on some smaller functions of my final design; therefore, I studied and sketched some different water tanks that could be applied to my design later.

FOG COLLECTOR THUMBNAILS

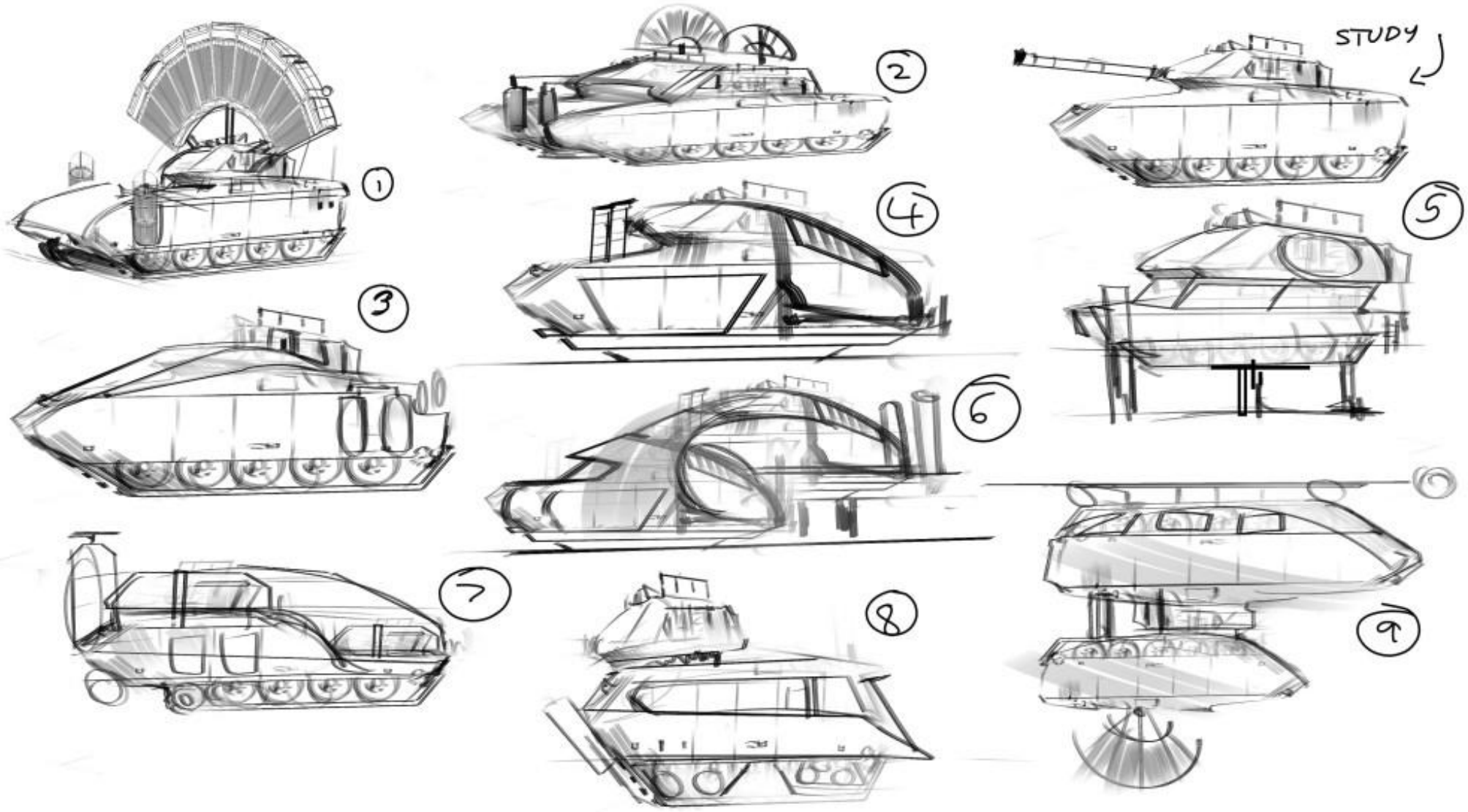


Next, I wanted to explore different ways I could use the fog collector nets that I discovered in my research phase.

I tried some differing ways of shaping them after sketching a study, I discovered I quite enjoyed the idea of them curving around the structure placed next to one another.

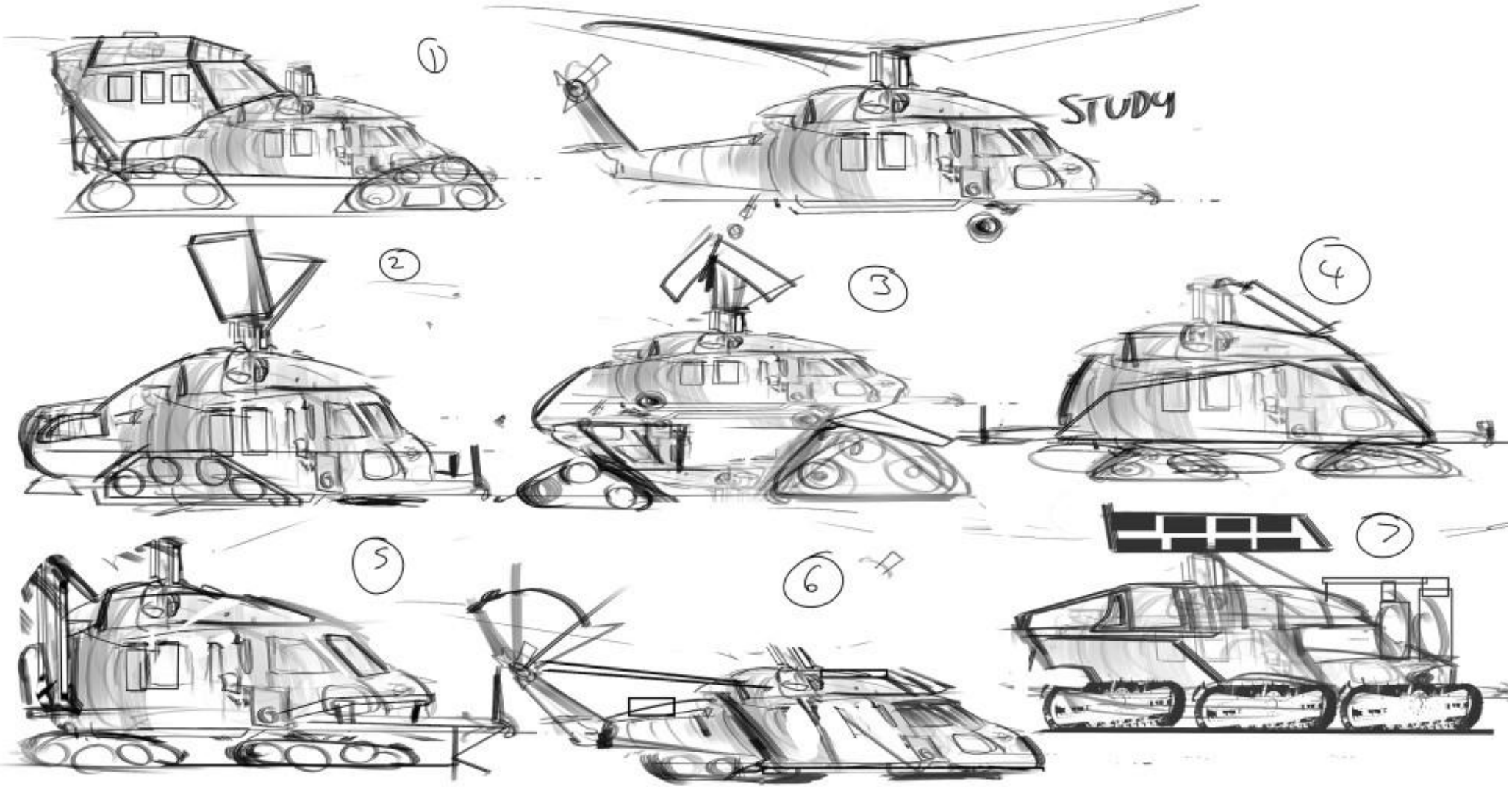
THUMBNAILS

Keeping the same method of sketching a study and rearranging different elements of it, I sketched a tank and then played around with the shape and placement of it.

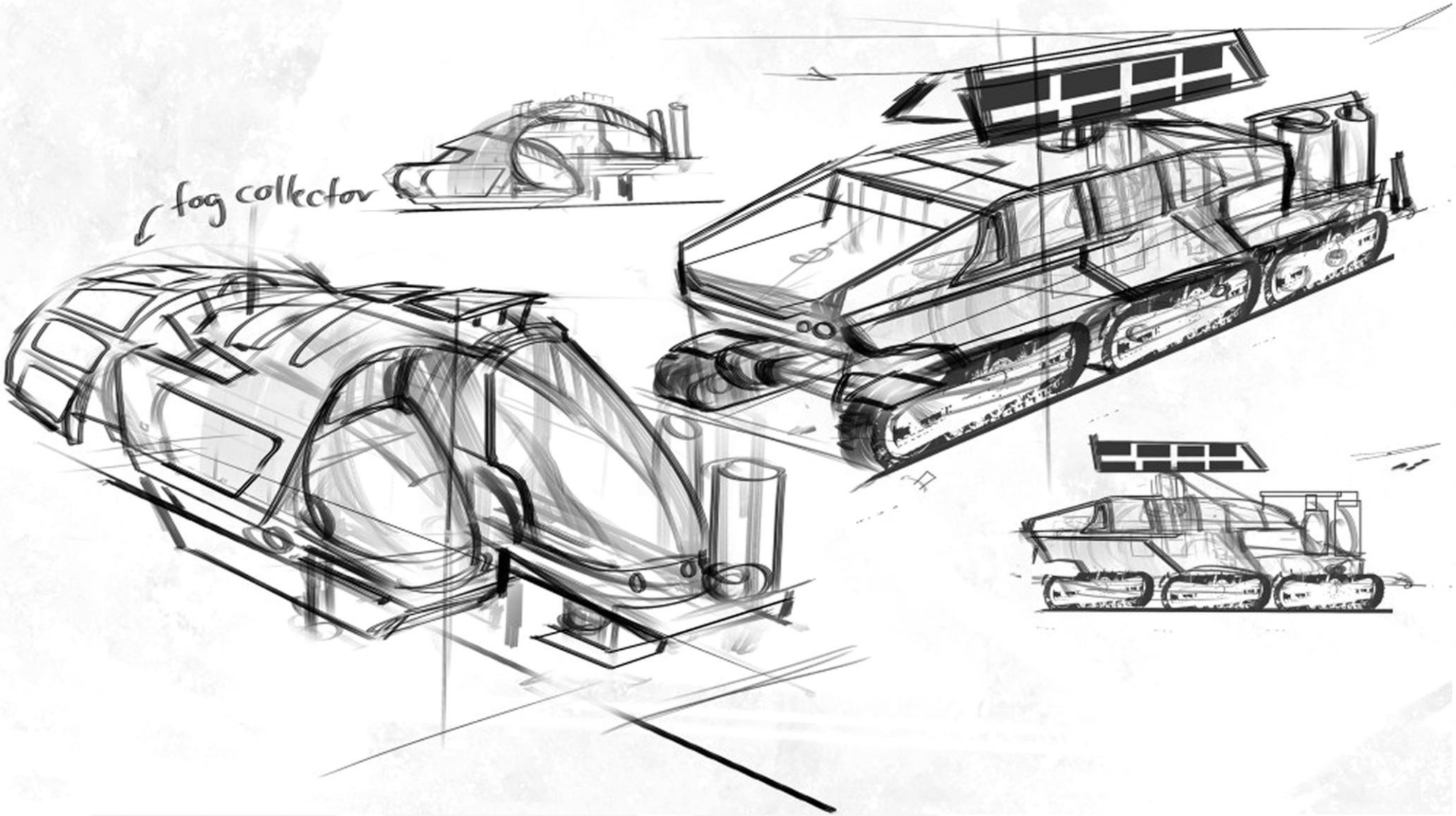


THUMBNAILS

After this I used the same method again but with a different vehicle, a desert helicopter

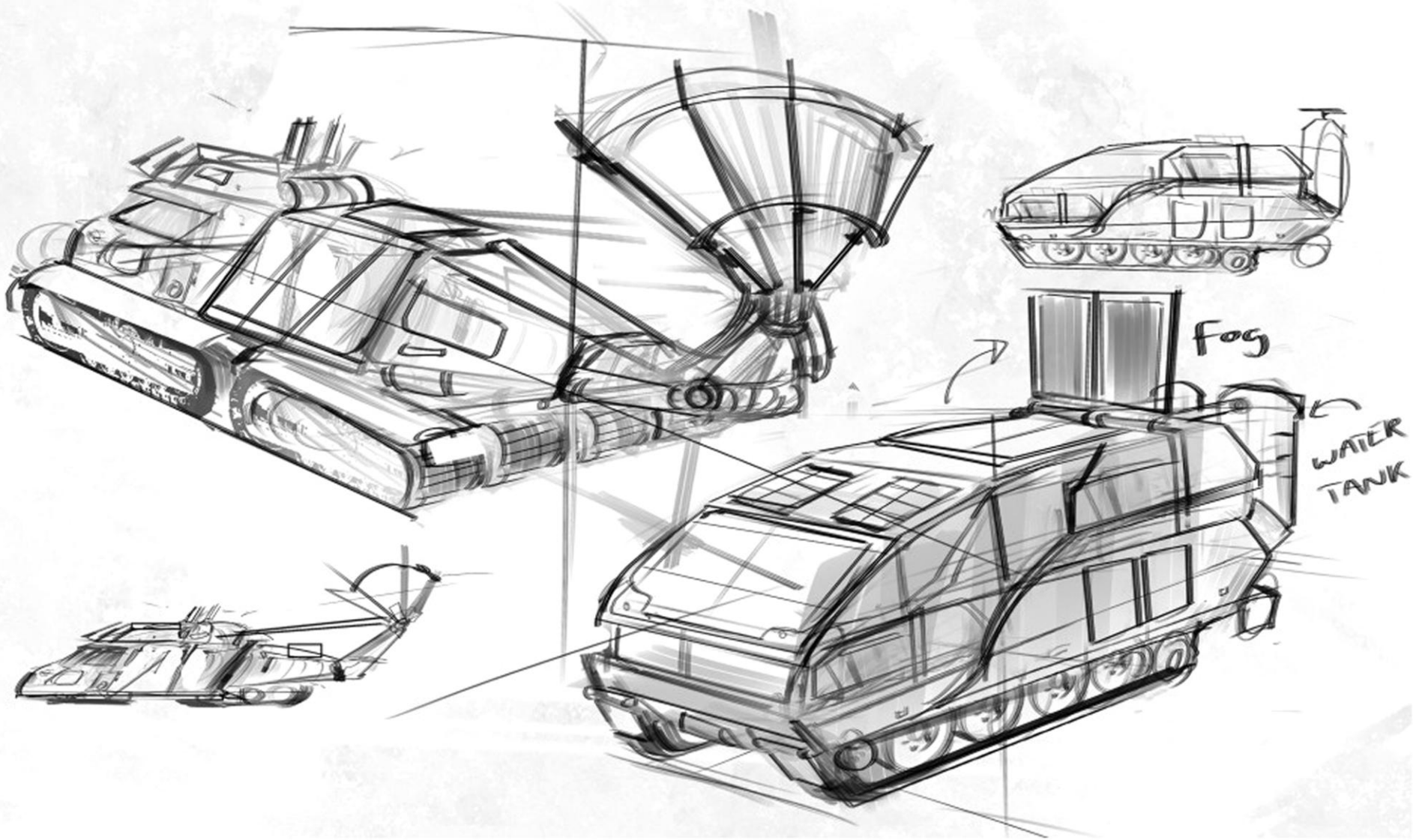


PERSPECTIVE THUMBNAILS



After quickly sketching the thumbnails, I then picked my favourite designs and sketched them out in perspective to add more clarity that the side profiles couldn't provide.

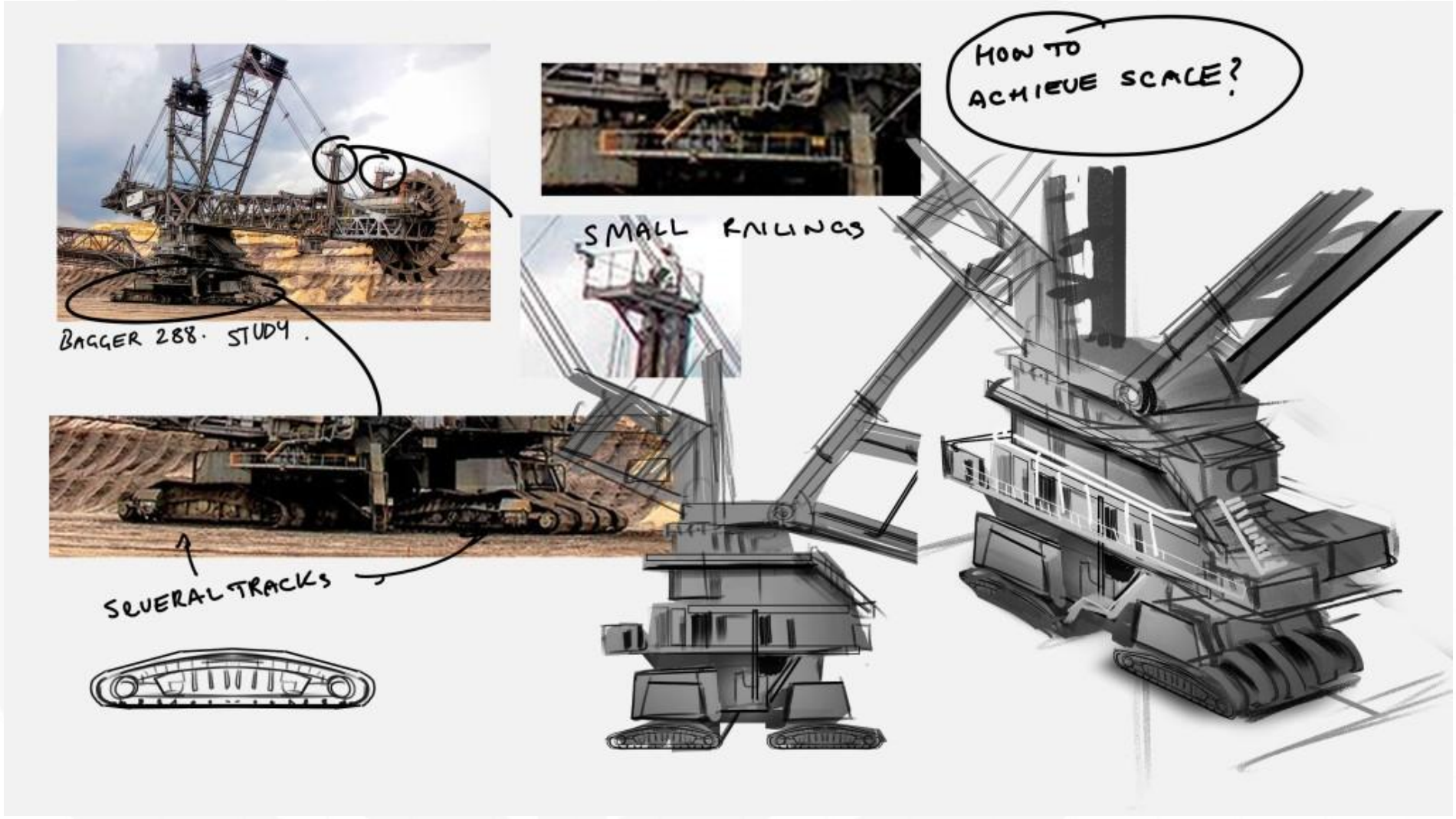
PERSPECTIVE THUMBNAILS



I continued this with two more designs.

Though I did enjoy the sketches, my supervisor quite rightly advised that I wasn't capturing the sense of scale I needed for such a grand structure I was setting myself.

EXPLORING SCALE



After my feedback, I set myself a small goal to explore what gives something a sense of scale.

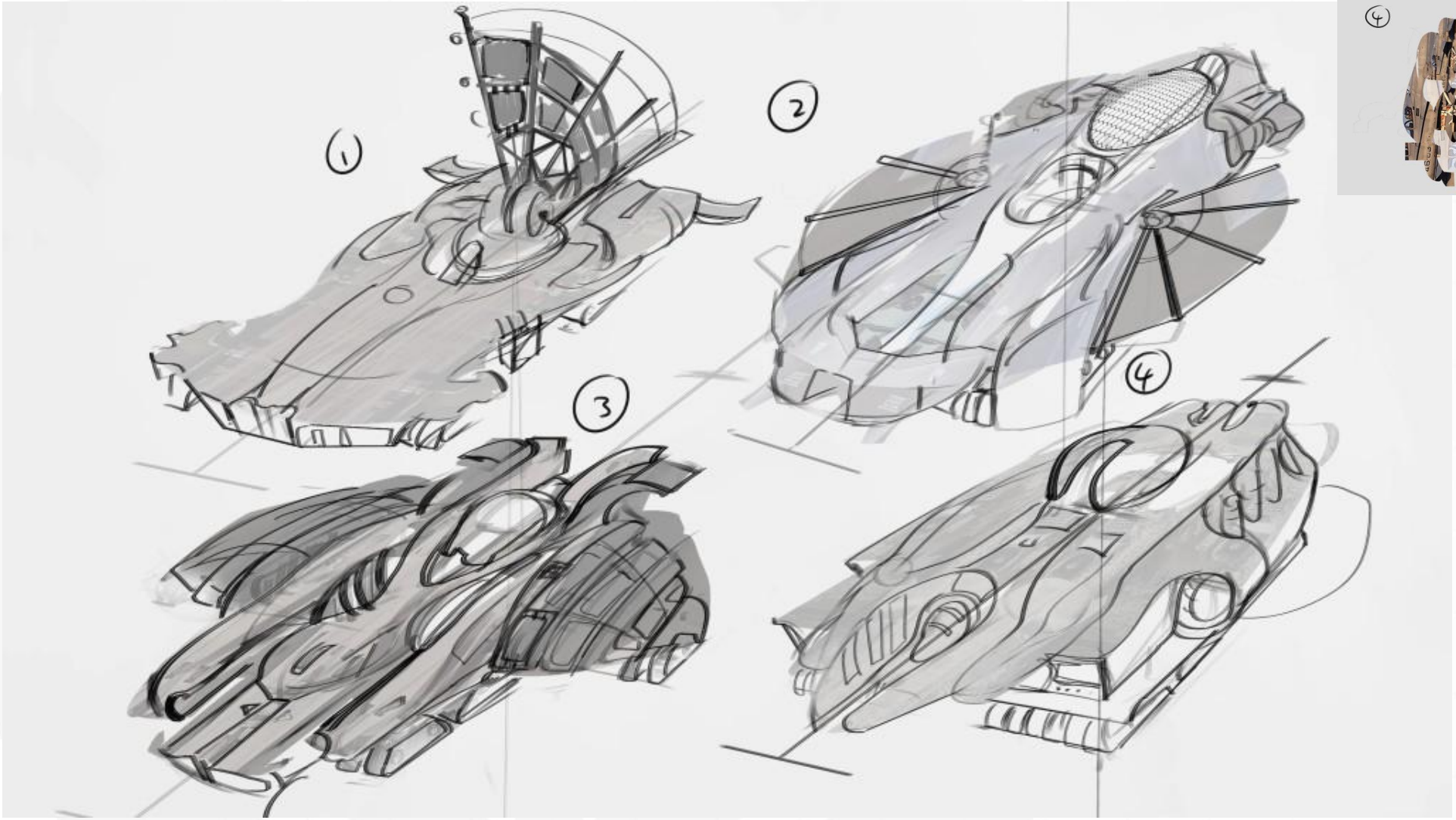
For this, I focused on the German mining vehicle “Bagger 288” which is the largest vehicle in the world.

What I discovered gave a sense of scale was:

- Multiple caterpillar tracks
- Small railings and barriers
- Small windows and layers to the vehicle.

THUMBNAILS

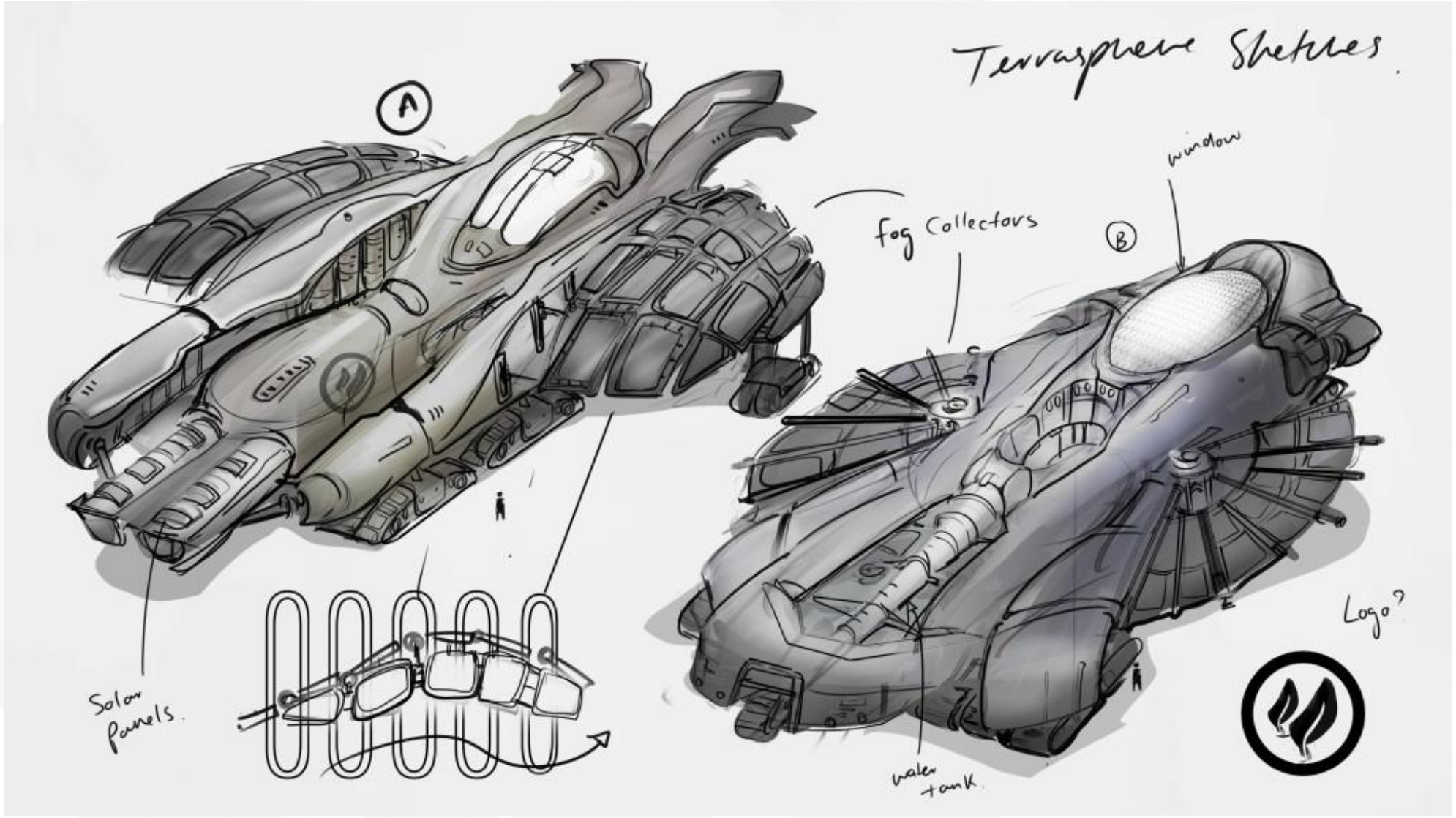
Lassoed cutouts of vehicles, with applied symmetry.



Having struggled slightly with producing shapes for my design. I thought I would try a new method for thumbnailing.

I used a Feng Zhu method for vehicle design where you lasso a shape from an image of a vehicle and then mirror it to make a unique shape. After that, you transform that shape into perspective and sketch over the top to add clarity.

THUMBNAILS

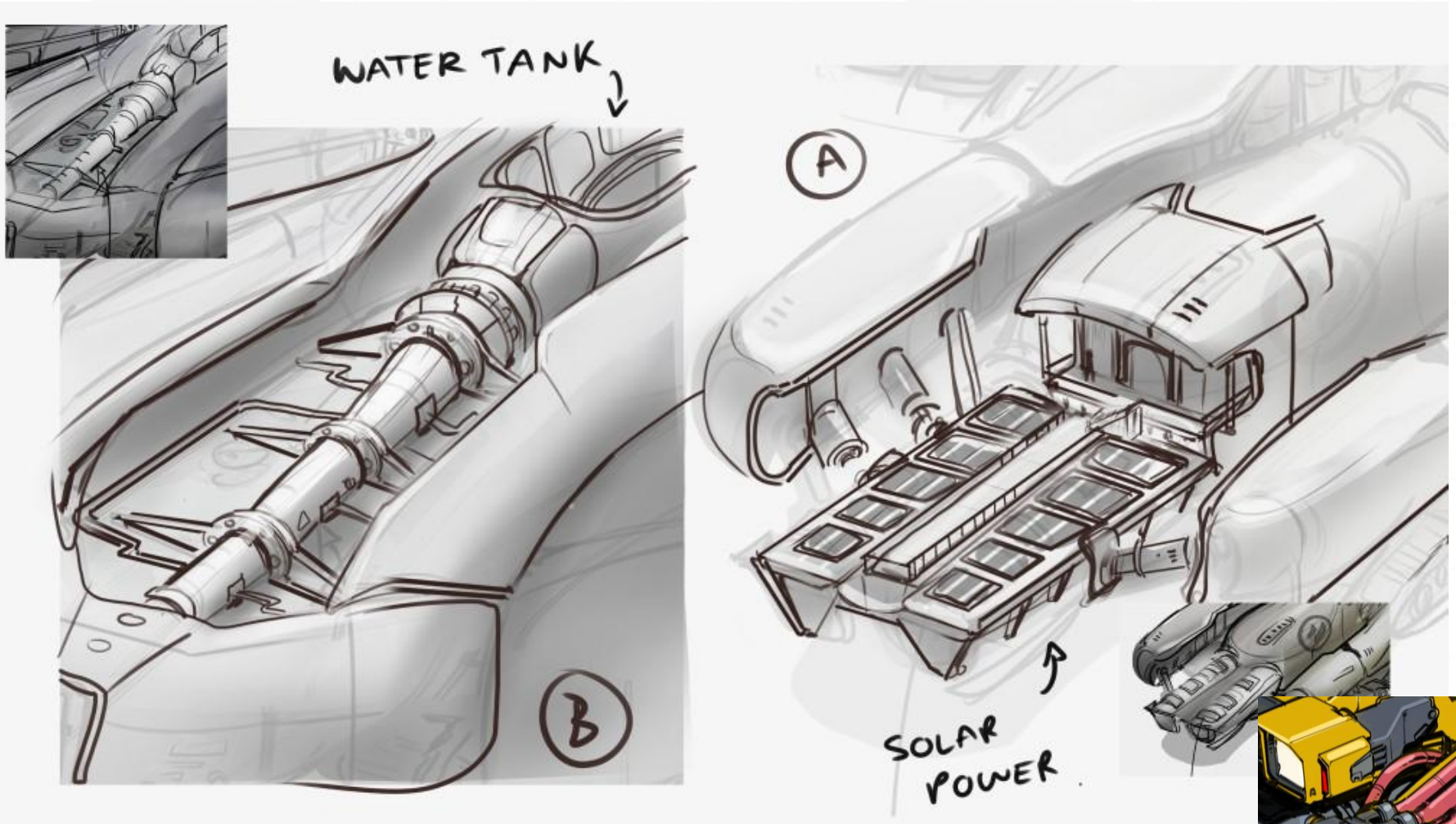


After using this method, I sketched over the ones I liked the most and added some extra value and detail as Feng Zhu demonstrated.

I made sure to include the fog collectors as a large part of the design.

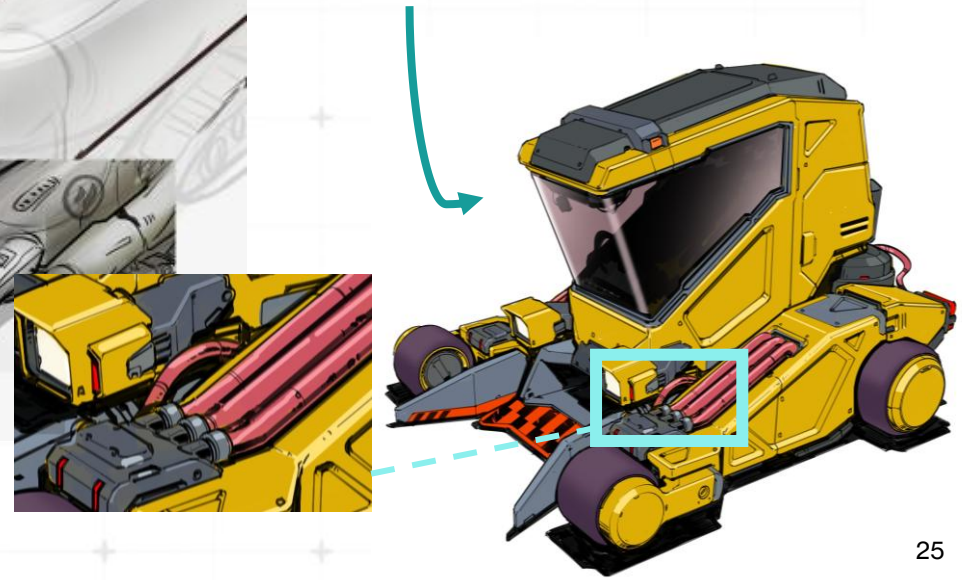
This exercise did teach me an interesting way to produce designs, but even so, I felt like these designs were still lacking in a sense of direction.

CLOSE UP SKETCHES



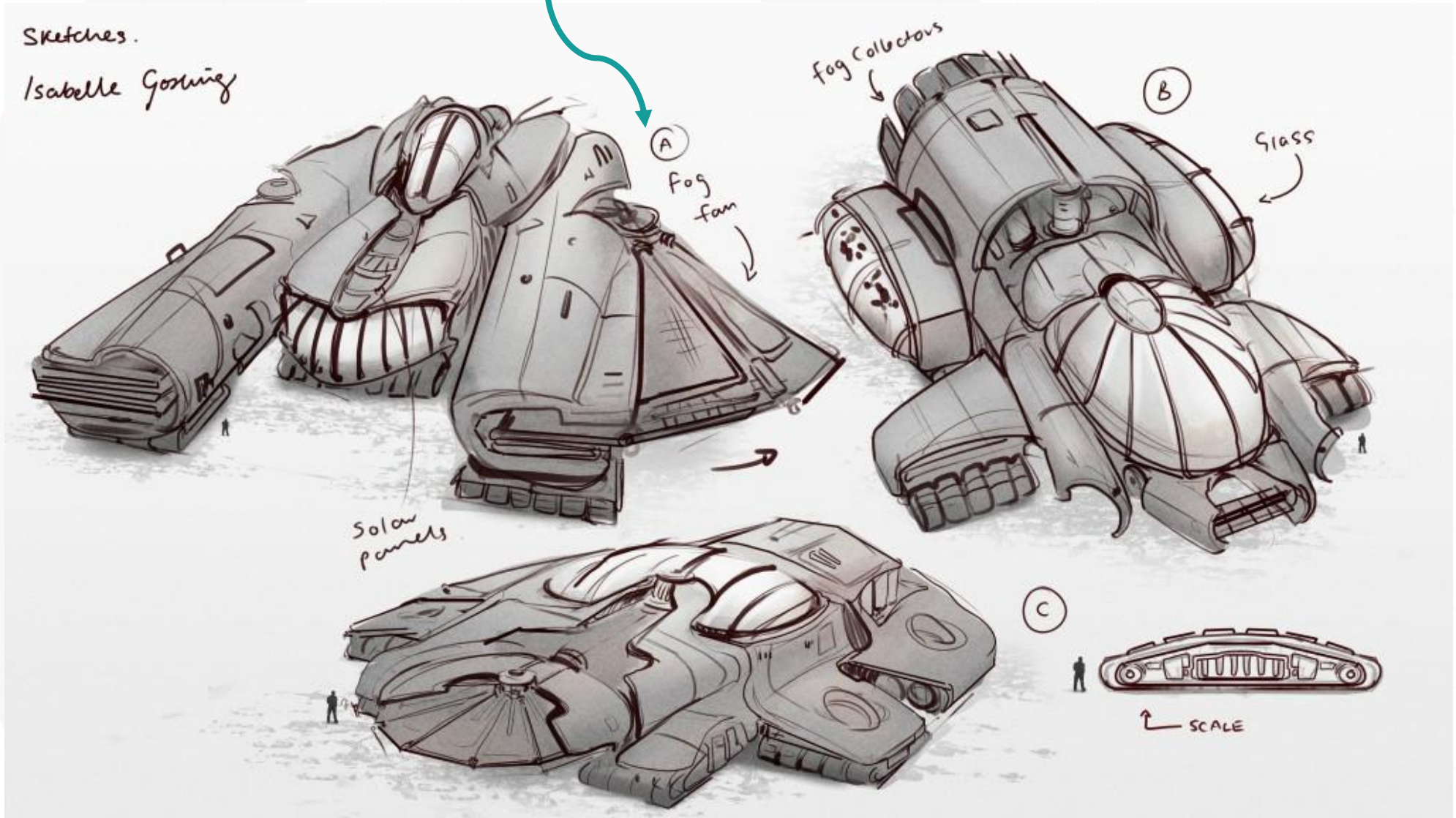
With the parts of the sketches, I was unhappy with, I decided to zoom in and add some linework to areas like the water tank and a solar farm on the front of the vehicles.

This was inspired by Shaun Mooney's clear and intentional linework.



THUMBNAILS

Function where a wing-like fog collector extends



I continued this thumbnailing method to produce some more thumbnails, learning from my previous ones.

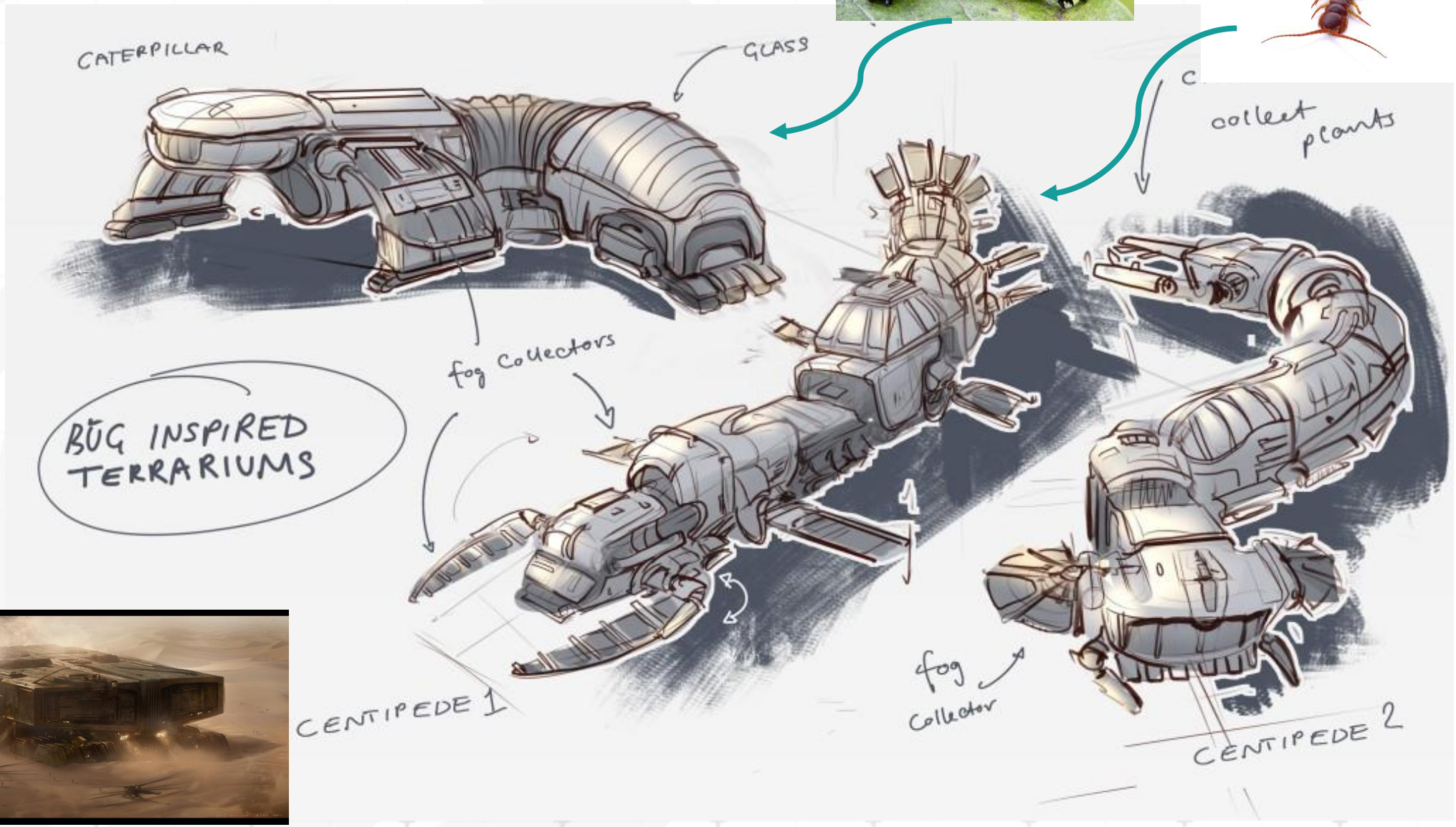
My supervisor enjoyed thumbnail C the most as it better emphasised a sense of scale.

For thumbnail A however, it benefited from a moving function, in this sense, a fog fan that moves outward.

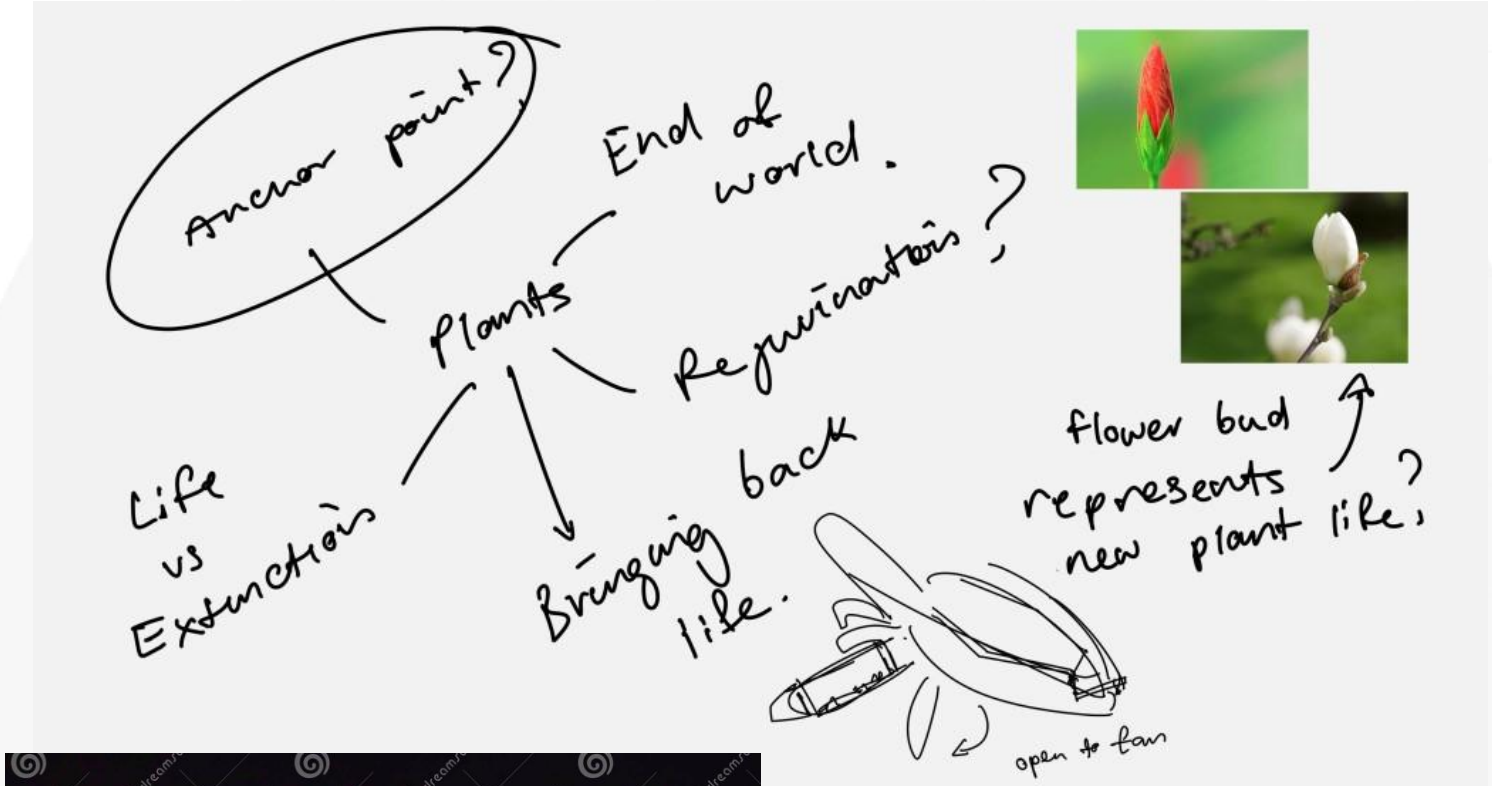
BUG INSPIRED THUMBNAILS

Since my vehicle is a large greenhouse, I thought basing some designs from common insects that help the environment might work nicely.

This was inspired by how George hull was said to base the spice harvester off of a tick, to represent its parasitic nature to the planets.



FINDING AN ANCHOR POINT

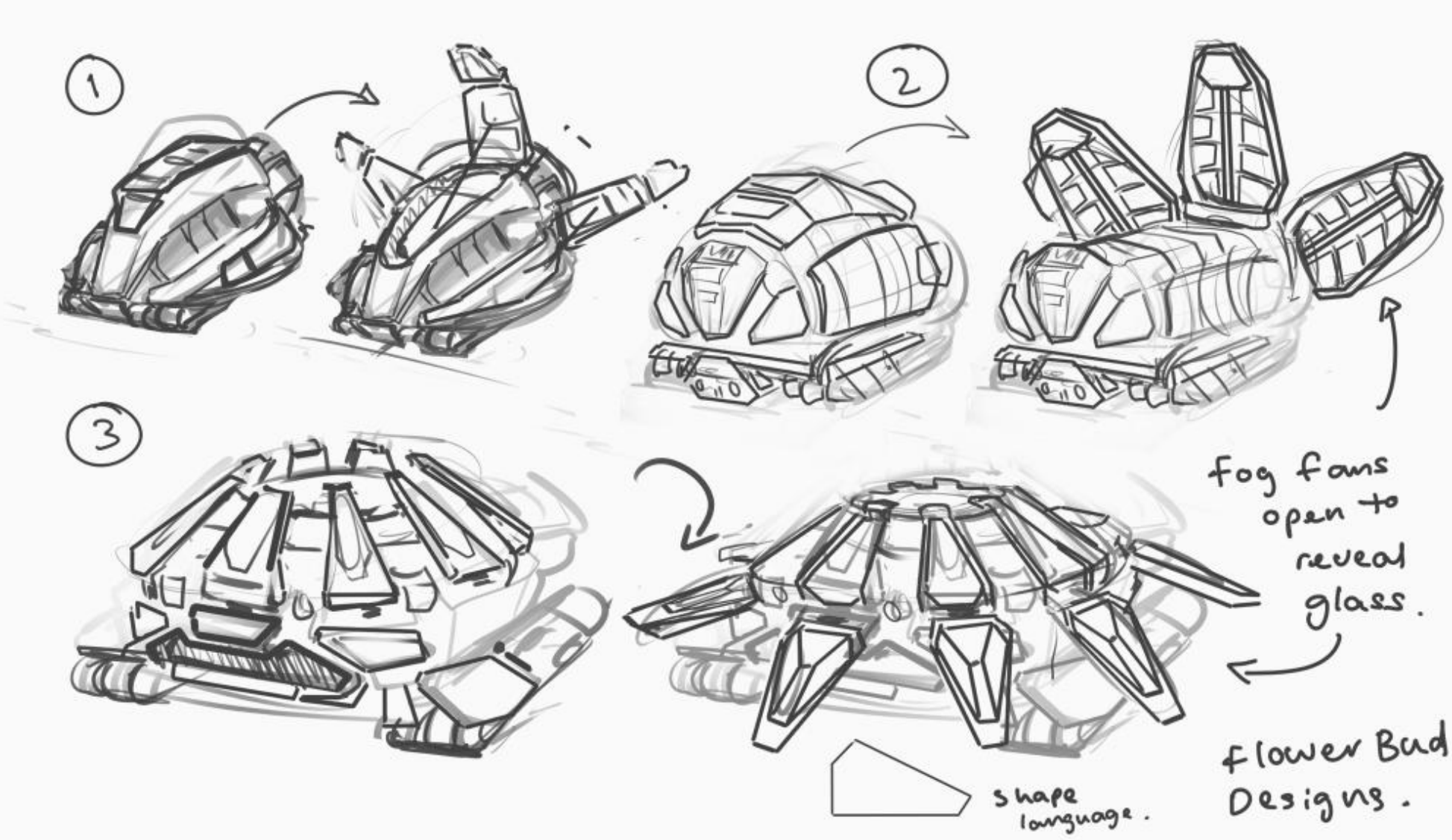


At this point in the project, I felt like my design still lacked a sense of direction and meaning. I then came across another Feng Zhu talk, this time about Science Fiction design. Here he spoke about finding an “Anchor Point” for his designs.

Taking this advice, I made a mind map that explored how my design was about the rebirth and growth of plant life. From this, I found that a flower bud would better represent this. As well is this, I could place the fog collectors where the petals would usually be. This gave me a new sense of direction for my project to follow.

Feng Zhu talk, where he based his space station design off a blood cell.

FLOWER BUD SKETCHES

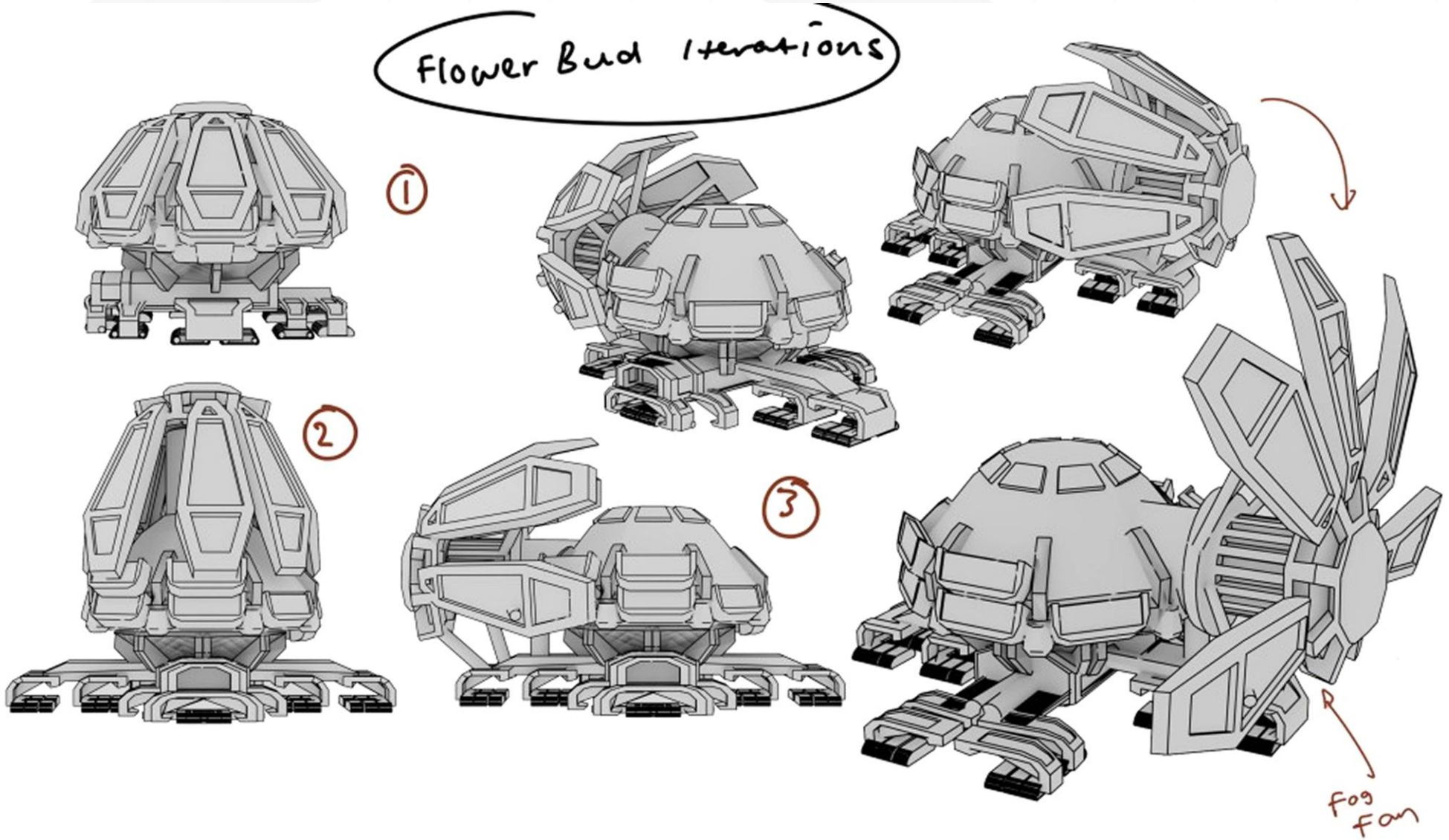


After finding an anchor point, I sketched some different ways that I could apply the shape of a flower bud to my design.

I started by experimenting with how the fog collectors could open up and represent a blooming flower in the process of collecting water.

This could potentially emanate a pleasing visual.

FLOWER BUD 3D SKETCHES

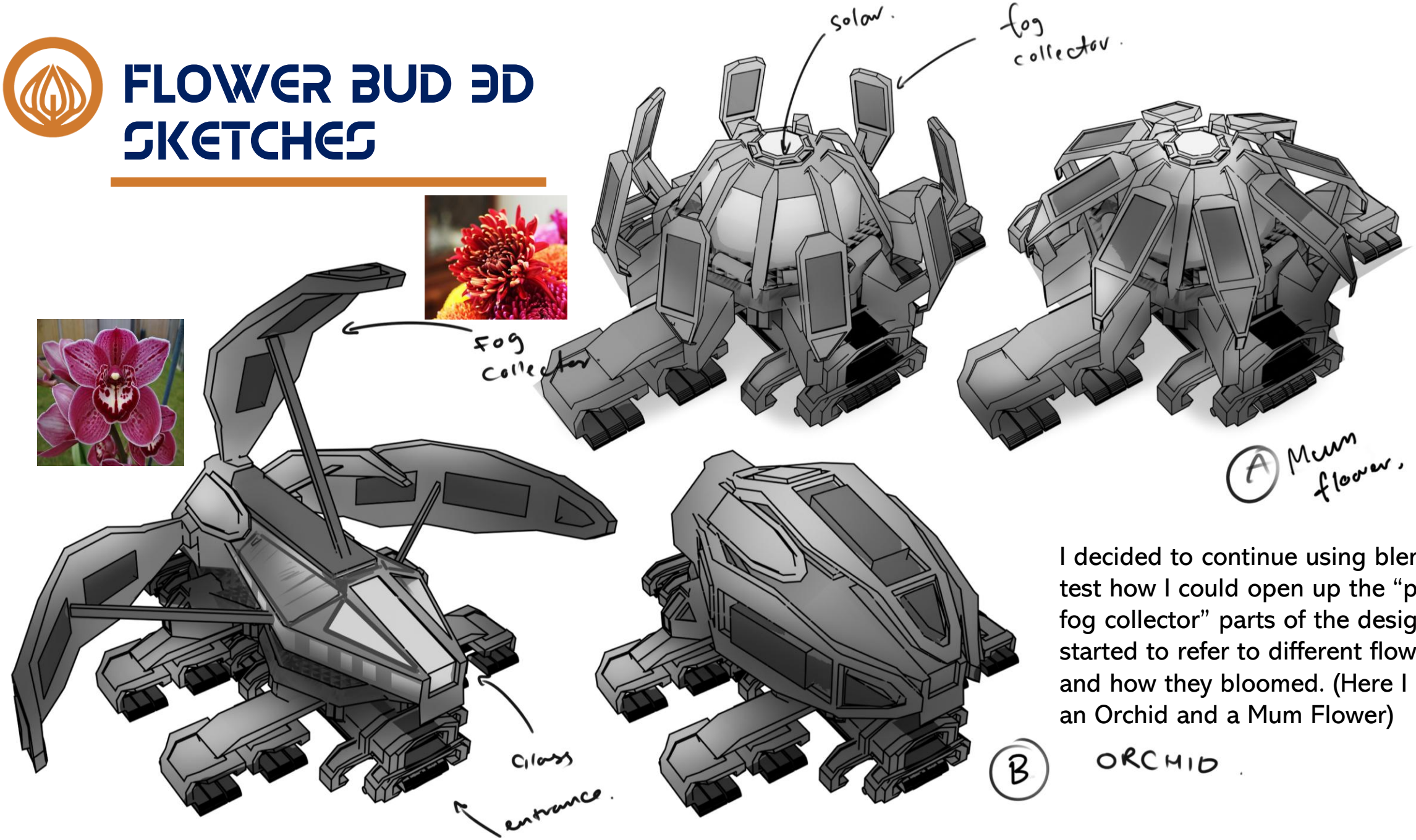


I continued to do some iterations of the flower bud shape, this time using 3D (Blender).

This made thumbnailing more efficient in the sense of being able to easily move different elements around.

blender

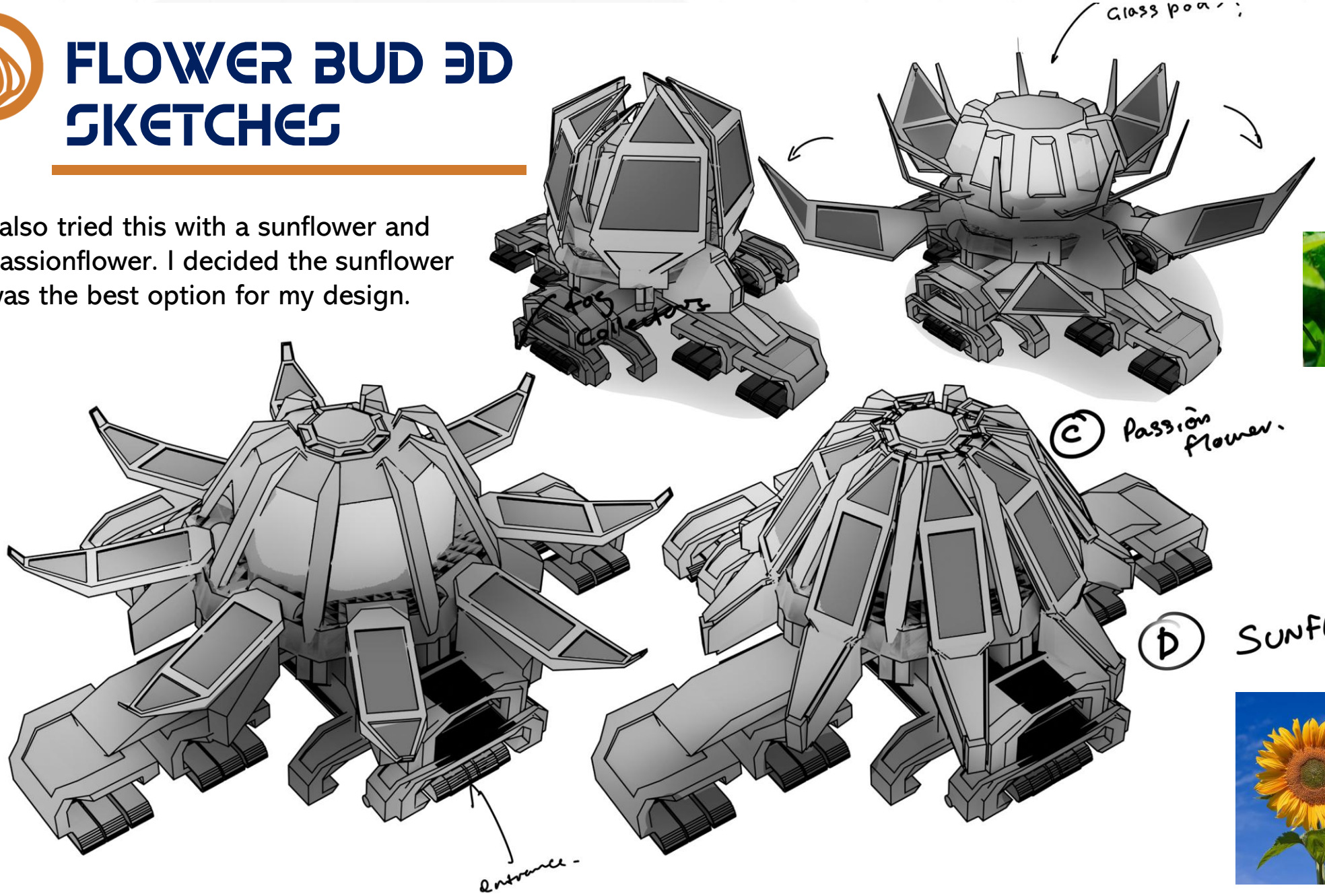
FLOWER BUD 3D SKETCHES



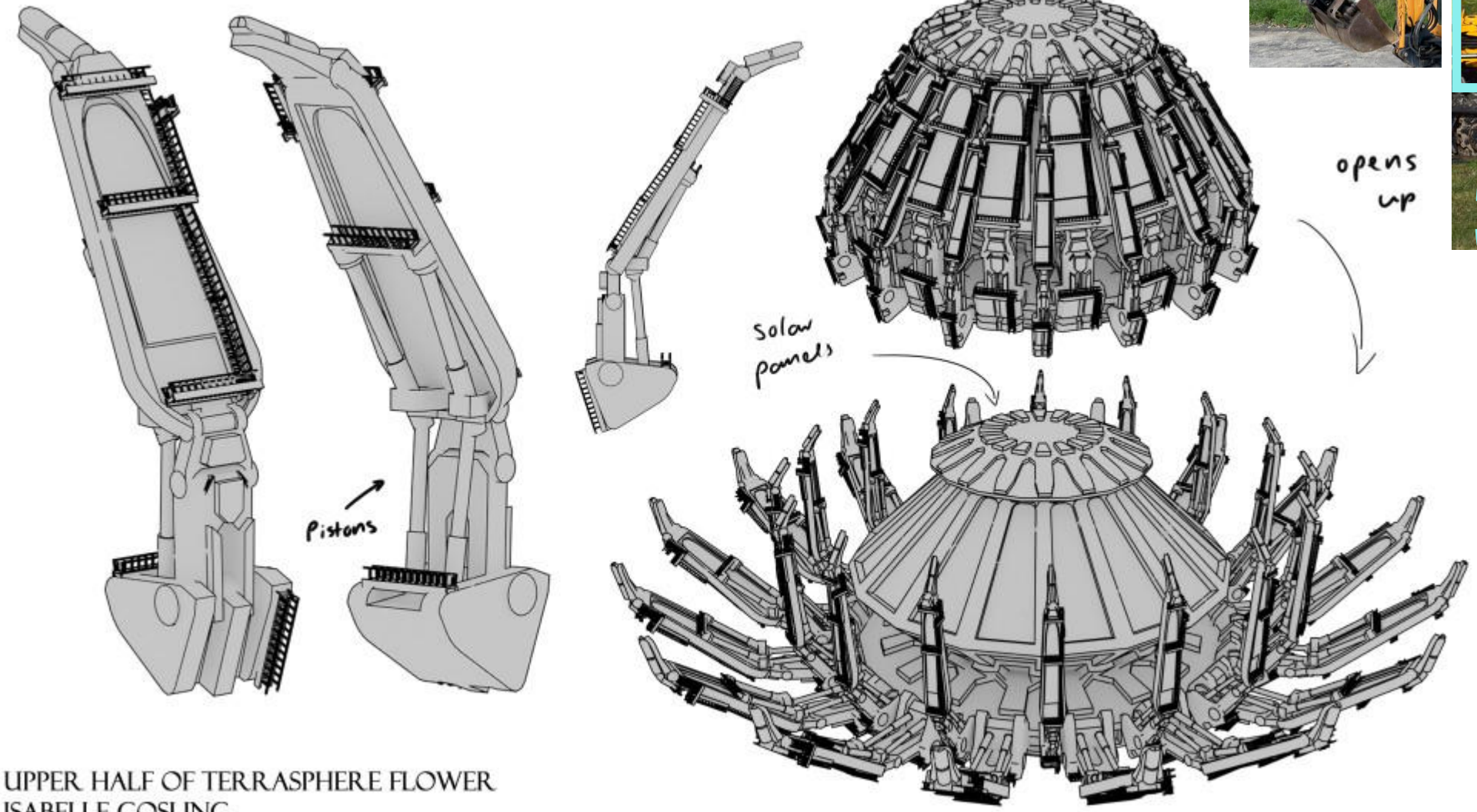
I decided to continue using blender to test how I could open up the “petal fog collector” parts of the design. I started to refer to different flowers and how they bloomed. (Here I used an Orchid and a Mum Flower)

FLOWER BUD 3D SKETCHES

I also tried this with a sunflower and passionflower. I decided the sunflower was the best option for my design.



FOG COLLECTOR PETALS



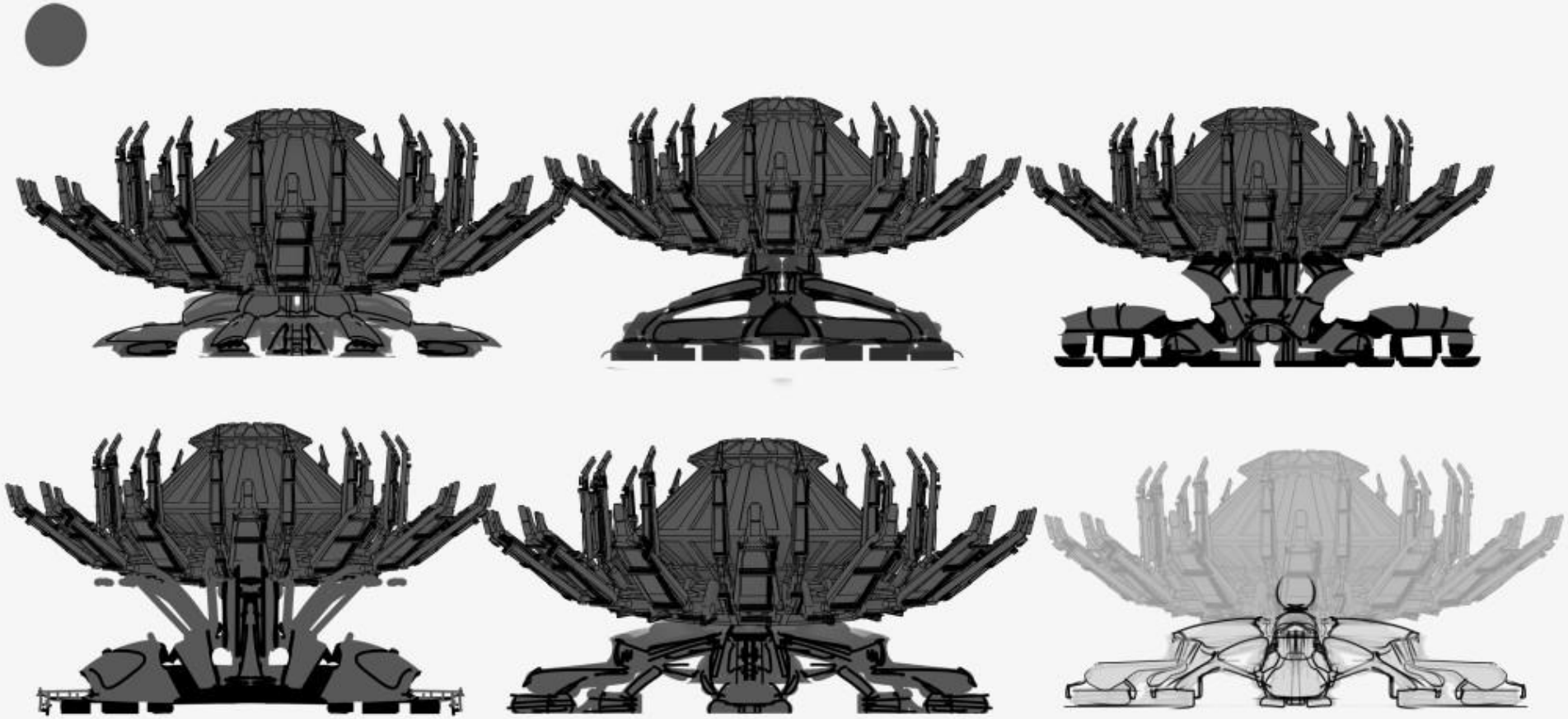
UPPER HALF OF TERRASPHERE FLOWER
ISABELLE GOSLING

After reviewing my 3D iterations, I was advised by my supervisor that adding large mechanical hinges to the design would add a sense of complexity and scale to it. To do this, I referred to the hinges of diggers and their hydraulics.

BLOCKING OUT IN 3D

Now with my main flower shape. I partnered the bottom half from my previous 3D iterations with the top half. It became evident to me that I needed to now iterate and explore the bottom half of my design so that it harmonises well with the top.

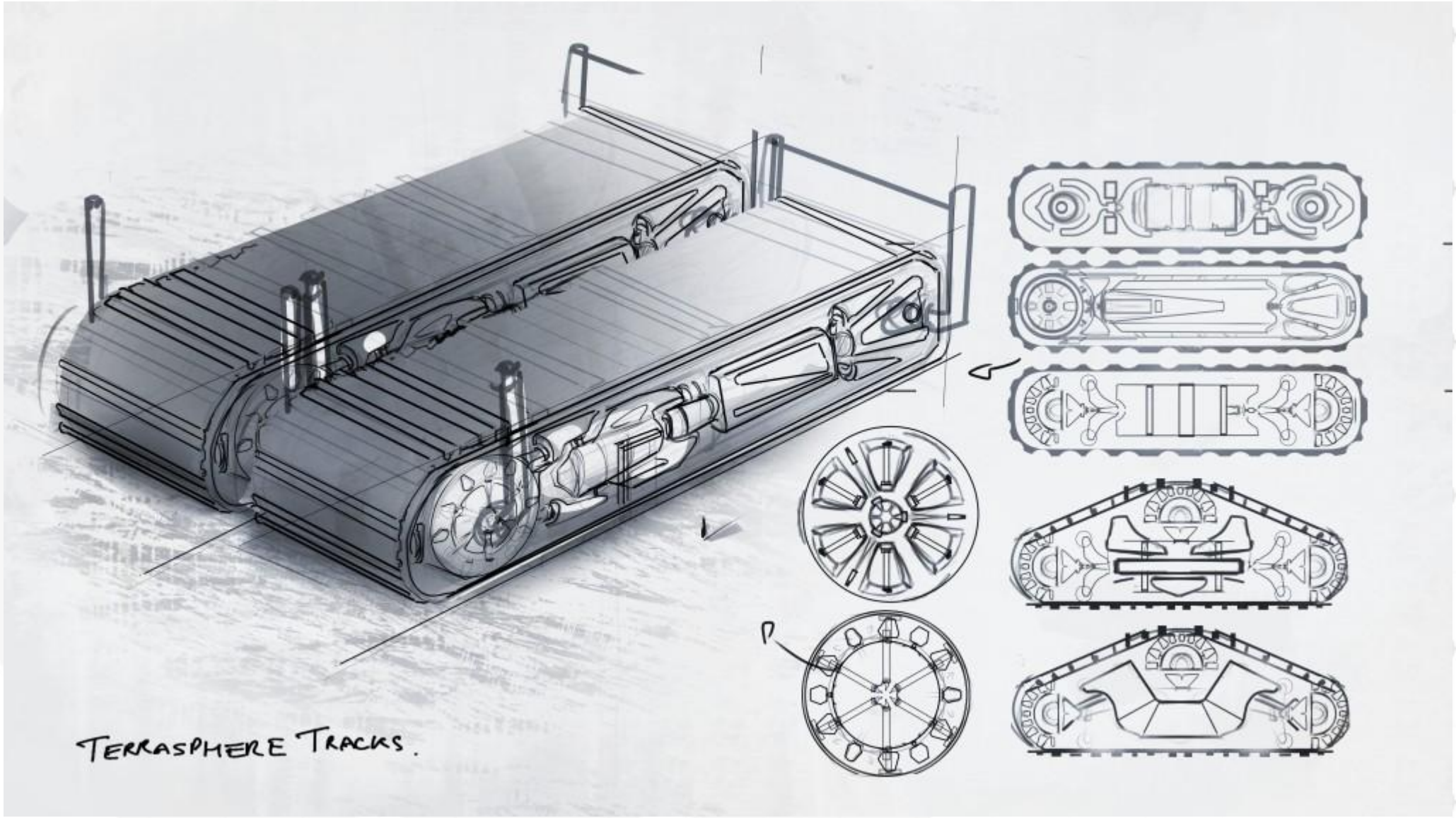
LOWER HALF ITERATIONS



I then wanted to explore through iterations how the bottom half would look with the fog collector and the main greenhouse area.

With these sketches I tried to keep that organic appearance and shape language without having it compete with the upper half.

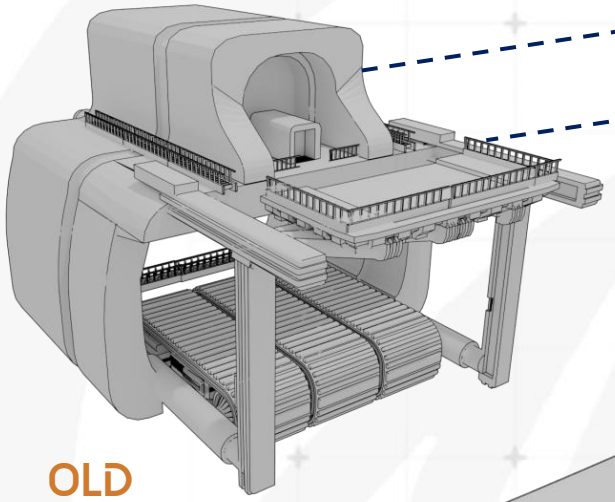
CATERPILLAR TRACKS



As well as the whole lower half design, I knew I was going to have caterpillar tracks in my design.

Therefore, I had a play with the details of the idlers, referring to glowers and plants for this process too.

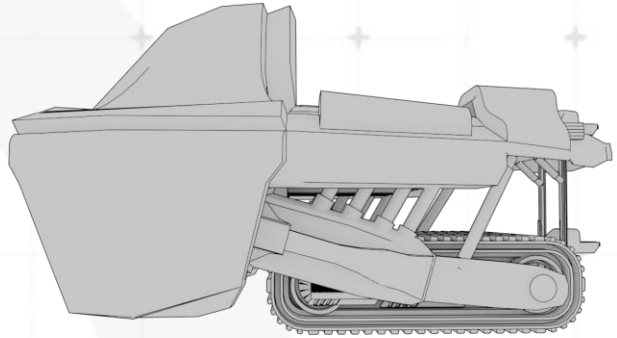
ENTRANCE EXPLORATION

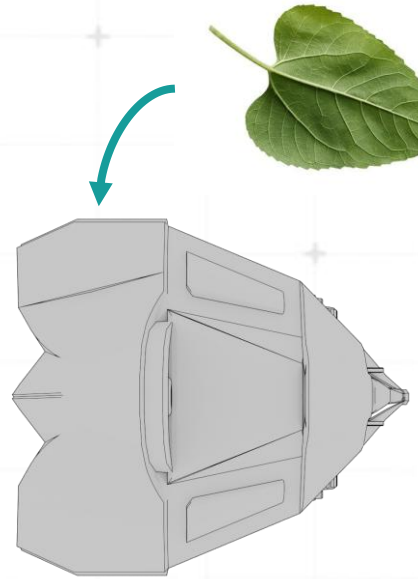


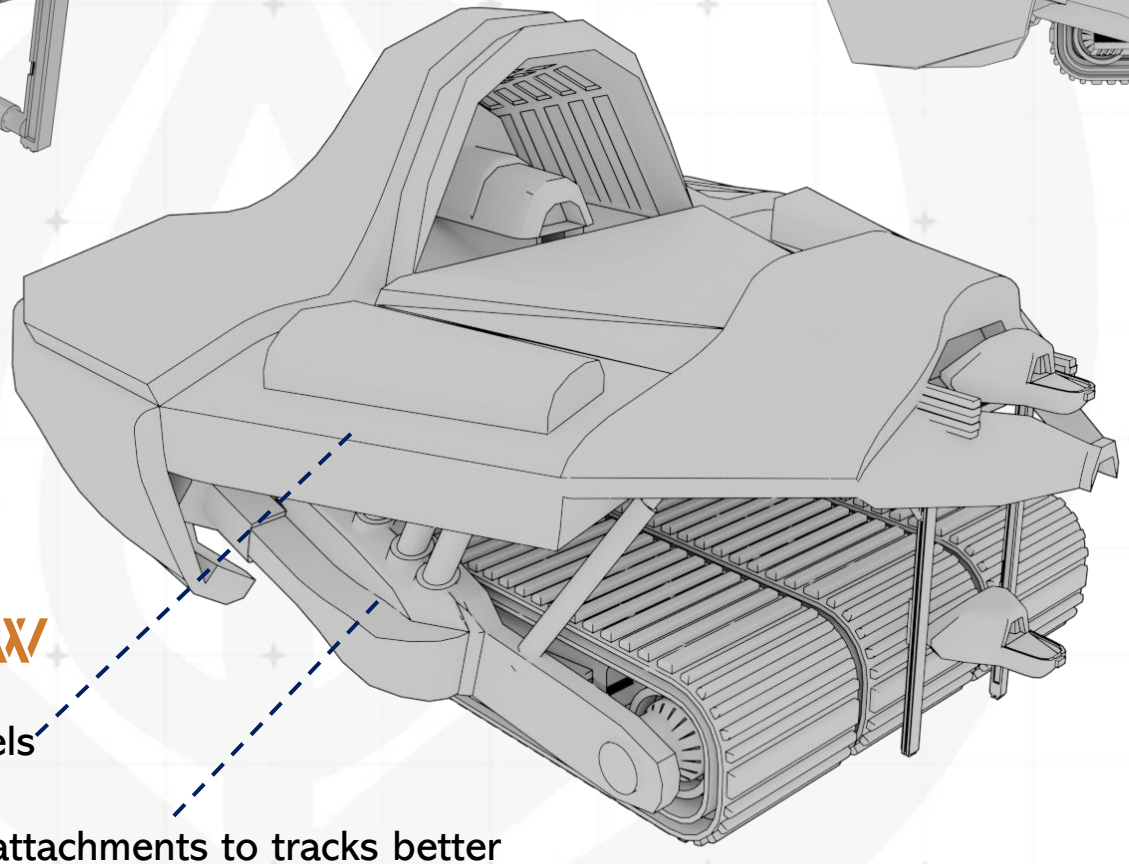
Too boxy

Not cohesive with design Language.

OLD







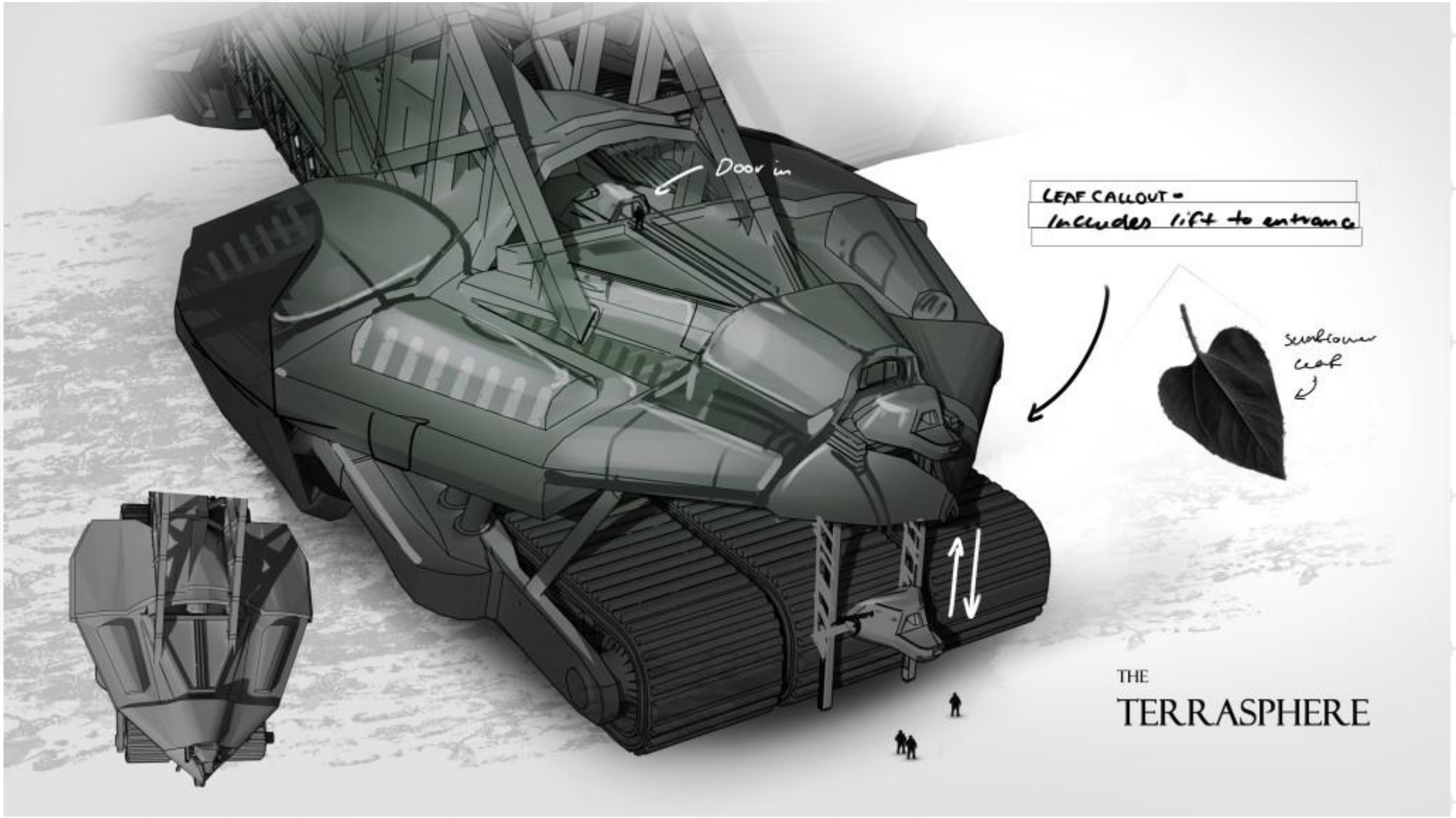
NEW

Curves and bevels

Shows off attachments to tracks better

I then took my original entrance from the 3D block out and decided to change it to better suit the vehicle. Since my main design is based of the shape of a sunflower, I used the shape of a sunflower leaf to build a new entrance. This was a lot more interesting visually and my supervisor much preferred it to the right-angles on the original.

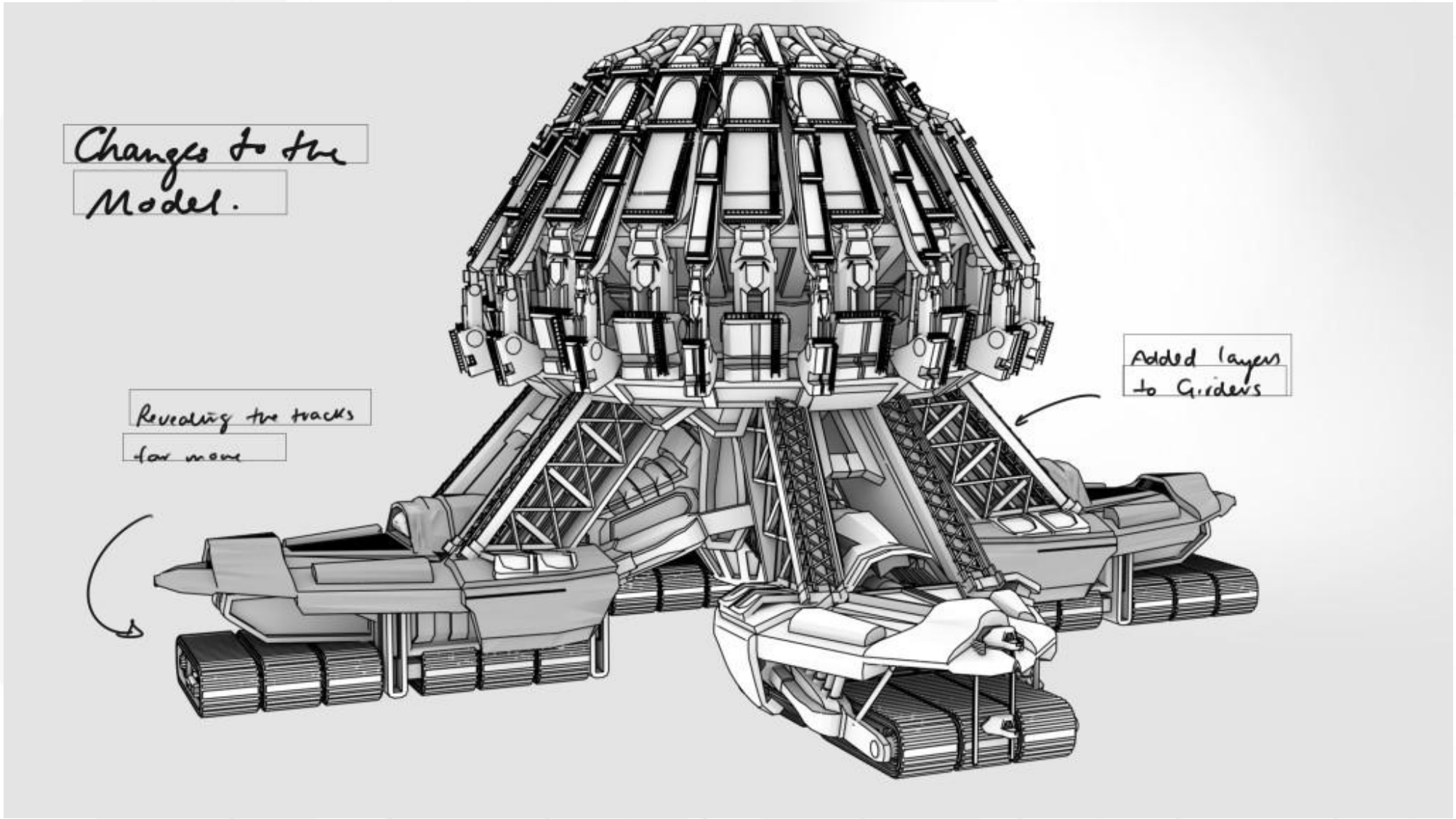
EARLY ENTRANCE EXPLORATION



I moved on to a rough sketch over of my 3D model, planning ahead what I needed to add to my design as well as how I was going to lay this out onto a design sheet.

It became clear that using a dark green colour, didn't enhance the design and almost made it appear muddy. This encouraged me to move onto colour iterations.

BLOCKING OUT IN 3D



After this. I pared the entrance with the upper greenhouse and fog collectors once again. This time attaching them with thick girders to add a sense of believability to being able to withhold the weight of the structure.

The leaf shaped entrances next to the flower bud I believe complimented one another quite well and overall gave off the organic look I was trying to achieve with this new anchor point.

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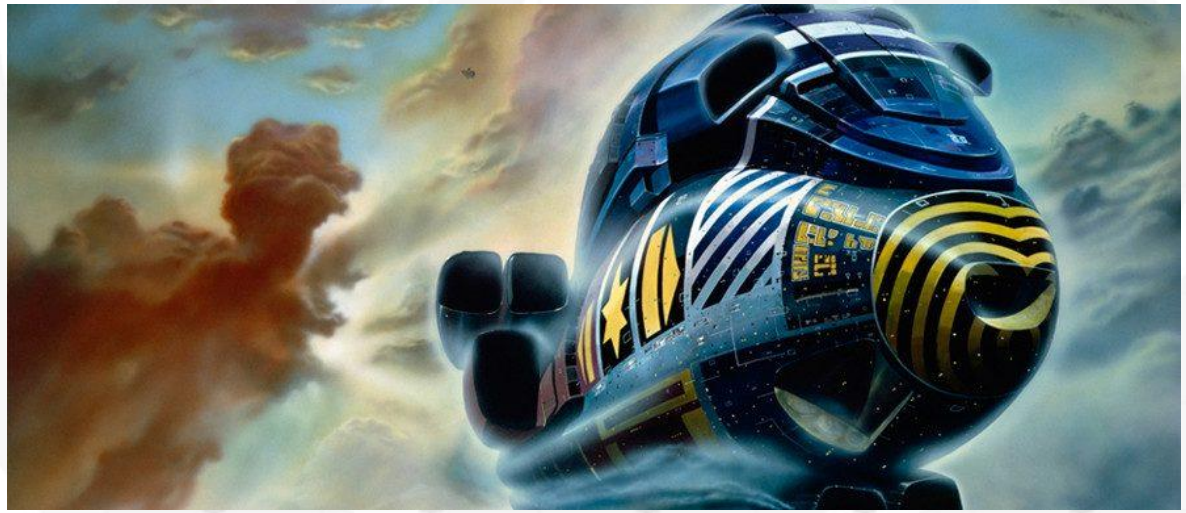
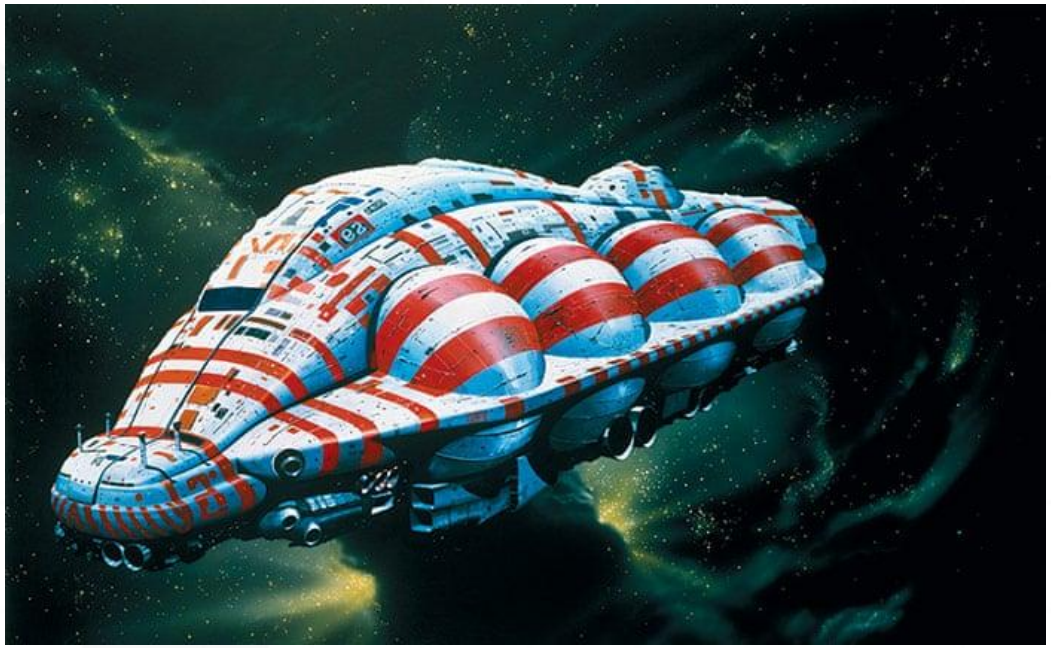
COLOUR INSPIRATION

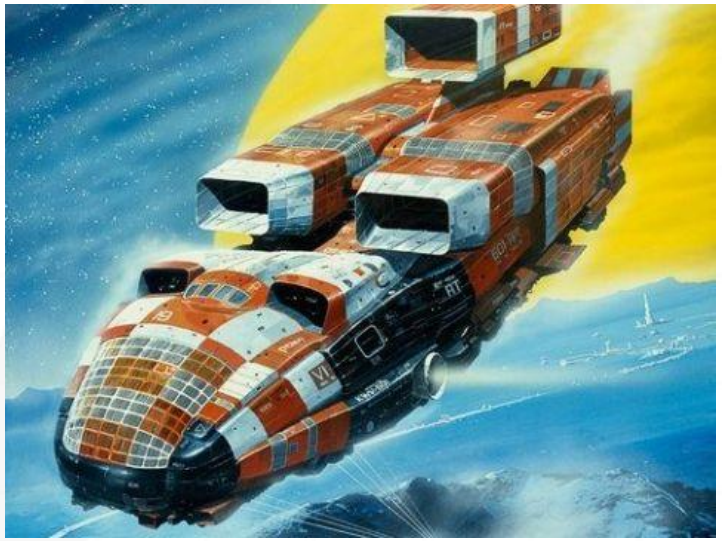
CHRIS FOSS

Chris Foss is a British artist from Guernsey, who is well known for creating colourful illustrations of spaceships using airbrushes on paper.

The bright markings on his spaceships inspired me to use a similar palette of vivid colours. I believed this would help my vehicle better contrast its desolate and desaturated environment, as well as would echo the positive purpose its trying to portray.



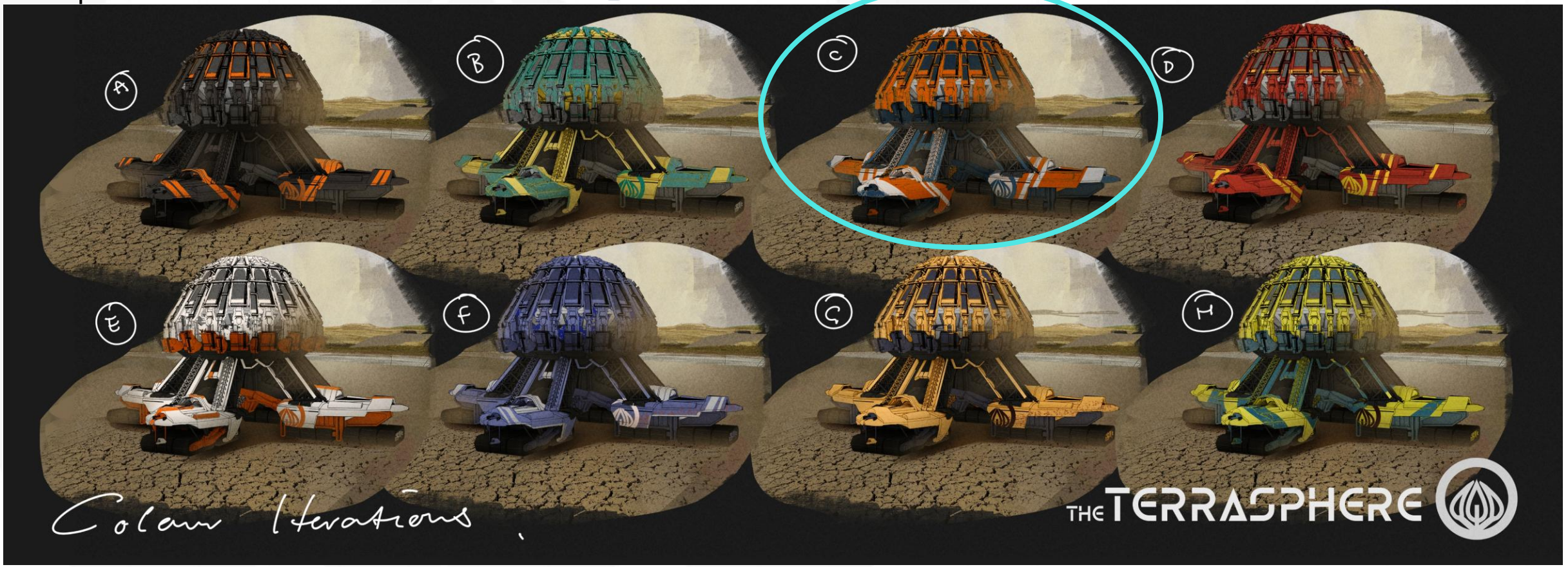




COLOUR ITERATIONS

I also put together a logo for the Terrasphere whilst I was iterating which nicely echoes the flower bud shape.

Here are my colour iterations for my design, I wanted to explore pairing two vivid colours like Chriss Foss would as well as sparingly use one vivid colour with a completely desaturated one (Thumbnails E&A). After this I decided on thumbnail C, I think it the orange nicely contrasts the environment as well as looks like it belongs to a company.



ENTRANCE EXPLORATION

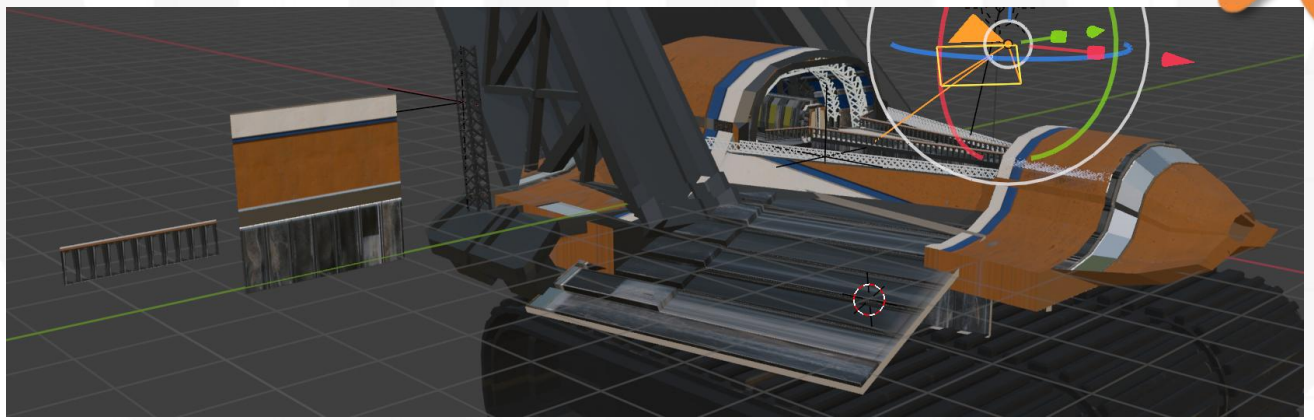
With my new colour palette. I then applied it to my smaller “leaves” of the design after rendering it more.

I used some kit bashing techniques from free photo packs to add details to the design in places that wouldn't be too easily visible.

This definitely began to bring together the design a lot more.

BLOCKING OUT WALKWAY IN 3D

Rough Render for key art



I was advised to add more clarity to the entrance of my design. I thought I could do this through a piece of key art.

I began by building a texture in **Quixel Mixer** with all the materials that I would need for my design. I then used this material to separately create smaller assets in **blender** like a door, barriers and the walkway. I then arranged these assets into the scene and rendered it to make a base image.

Texture made in Quixel Mixer

ENTRANCE KEY ART

After finishing the render for my entrance way. I then brought it into photoshop to paint over and photo bashed any parts that needed changing or were too obviously 3D. I also made a significant difference to the background and lighting to make it appear bleaker.

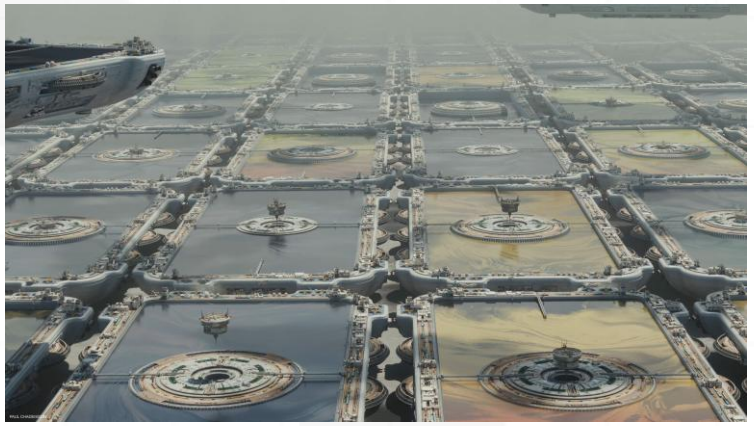
ARTIST INSPIRATIONS

PAUL CHADEISSON

Chadeisson is a freelance concept artist who has worked on both AAA and blockbuster films. His work always manages to achieve a magnificent sense of scale.

He usually does this through the use of 3D modelling, kit bashing and displacement maps to emphasise miniscule details.

This is an artist I discovered before texturing my model and his work encouraged me to use similar techniques on my own work such as adding small barriers, bevels and indents.

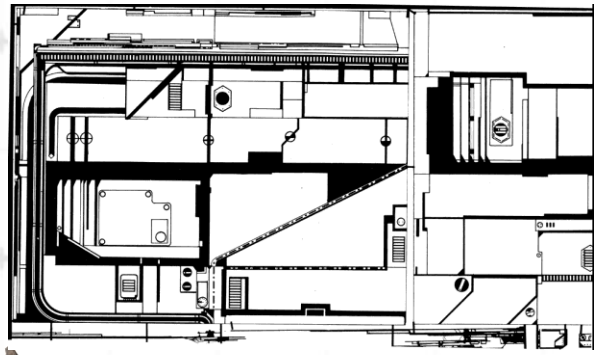


Small Textures and Details

Simplistic shapes

TEXTURING THE MODEL

Blade Runner Displacements



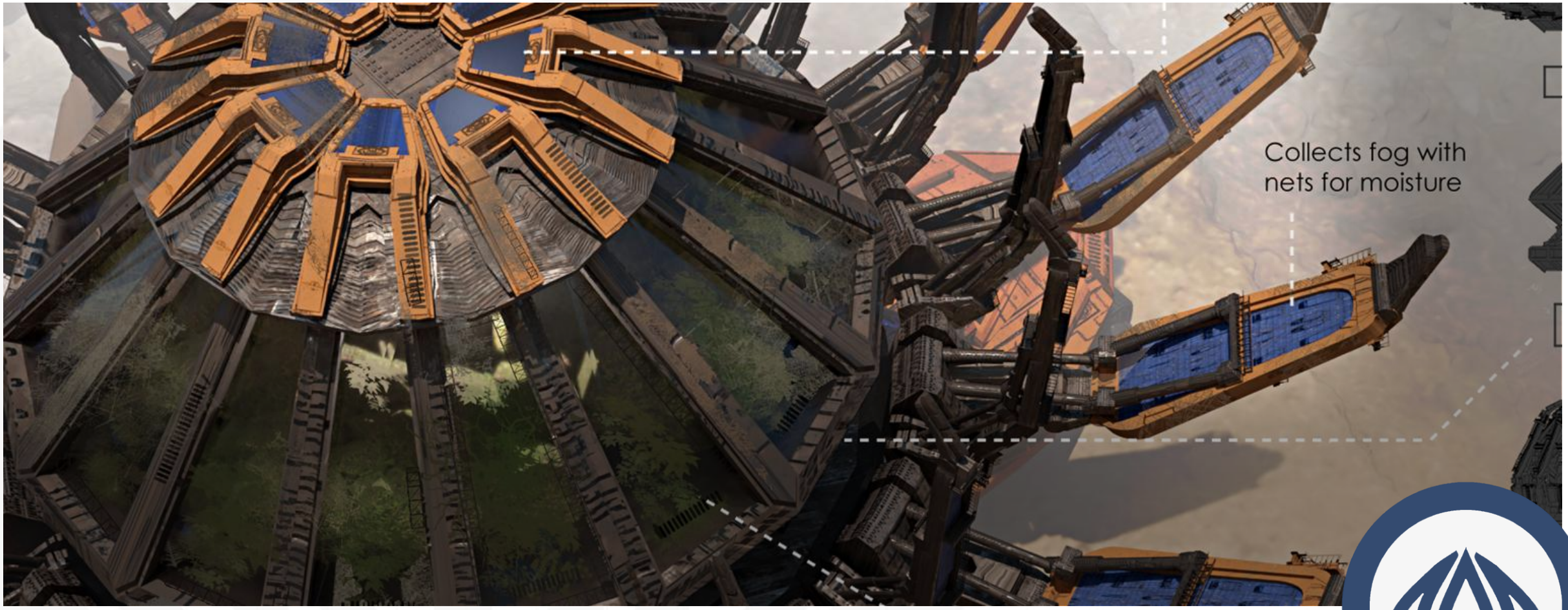
After everything, I went on to texture my full design. I used 4 materials that I made in Quixel Mixer and found on PolyHaven:

- Orange Metal
- Blue Metal
- Metal Plates
- Rubber for the tracks

As well as this, I used the free displacement maps released from the original Bladerunner films. This added a sense of intricacy following Chadeissons style.

Metal Plate Texture

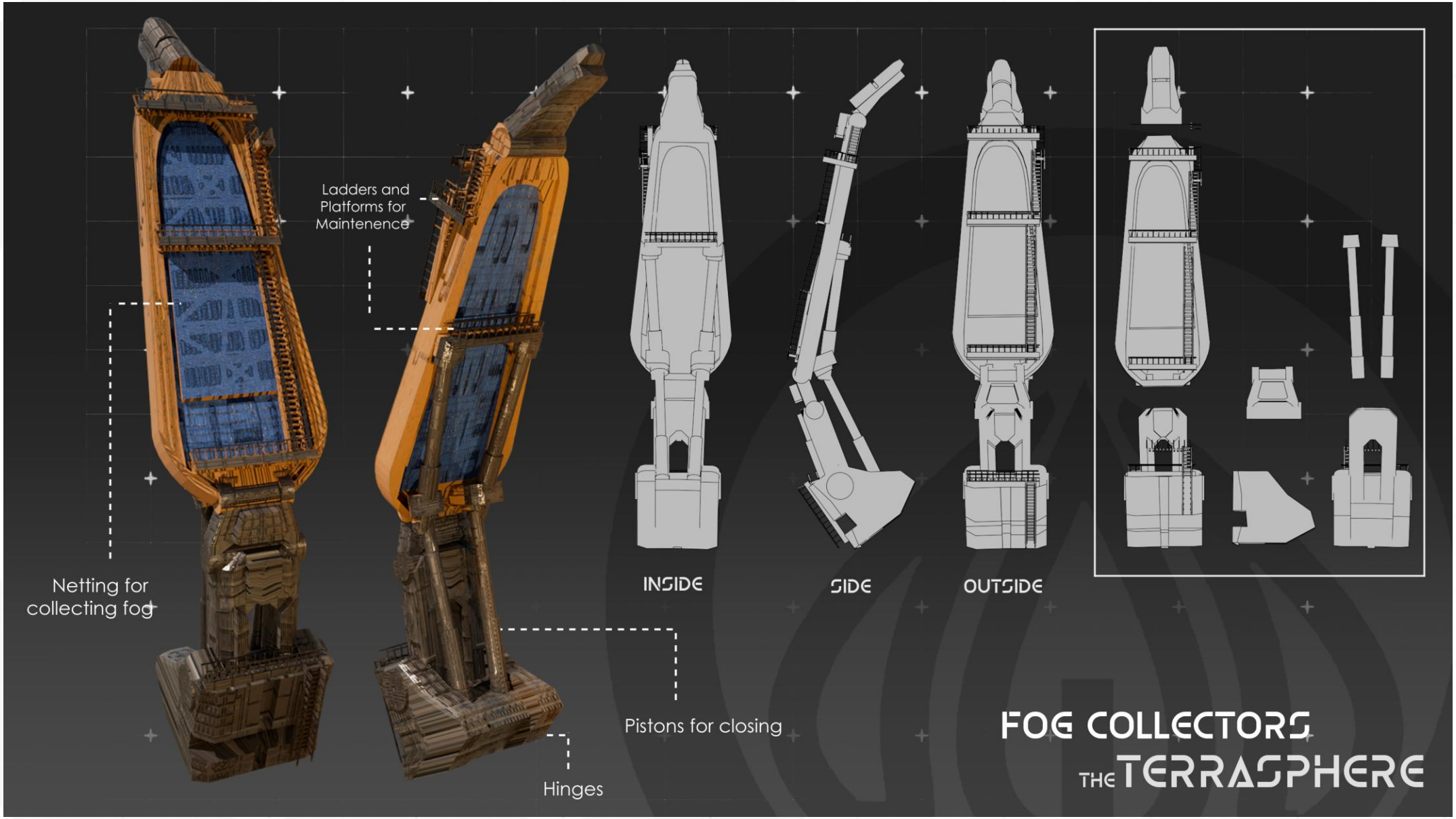
Ground from PolyHaven



FINAL DESIGNS

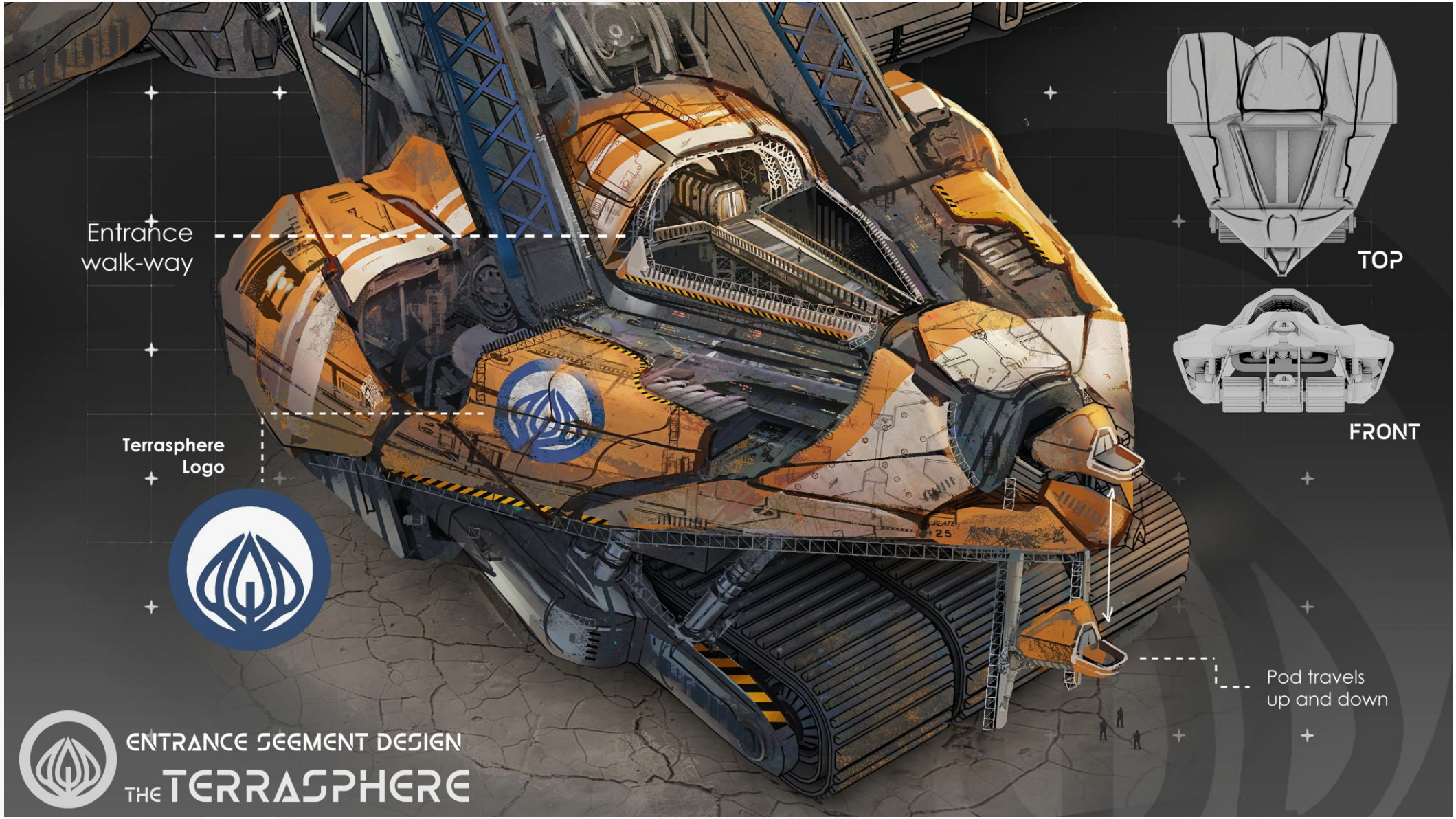
PETAL CALLOUT

After texturing. I take the “petals” and render them separately in order to break down their design better. This is my final design sheet for the Fog Collectors.



ENTRANCE CALLOUT

Final Design sheet for Entrance.

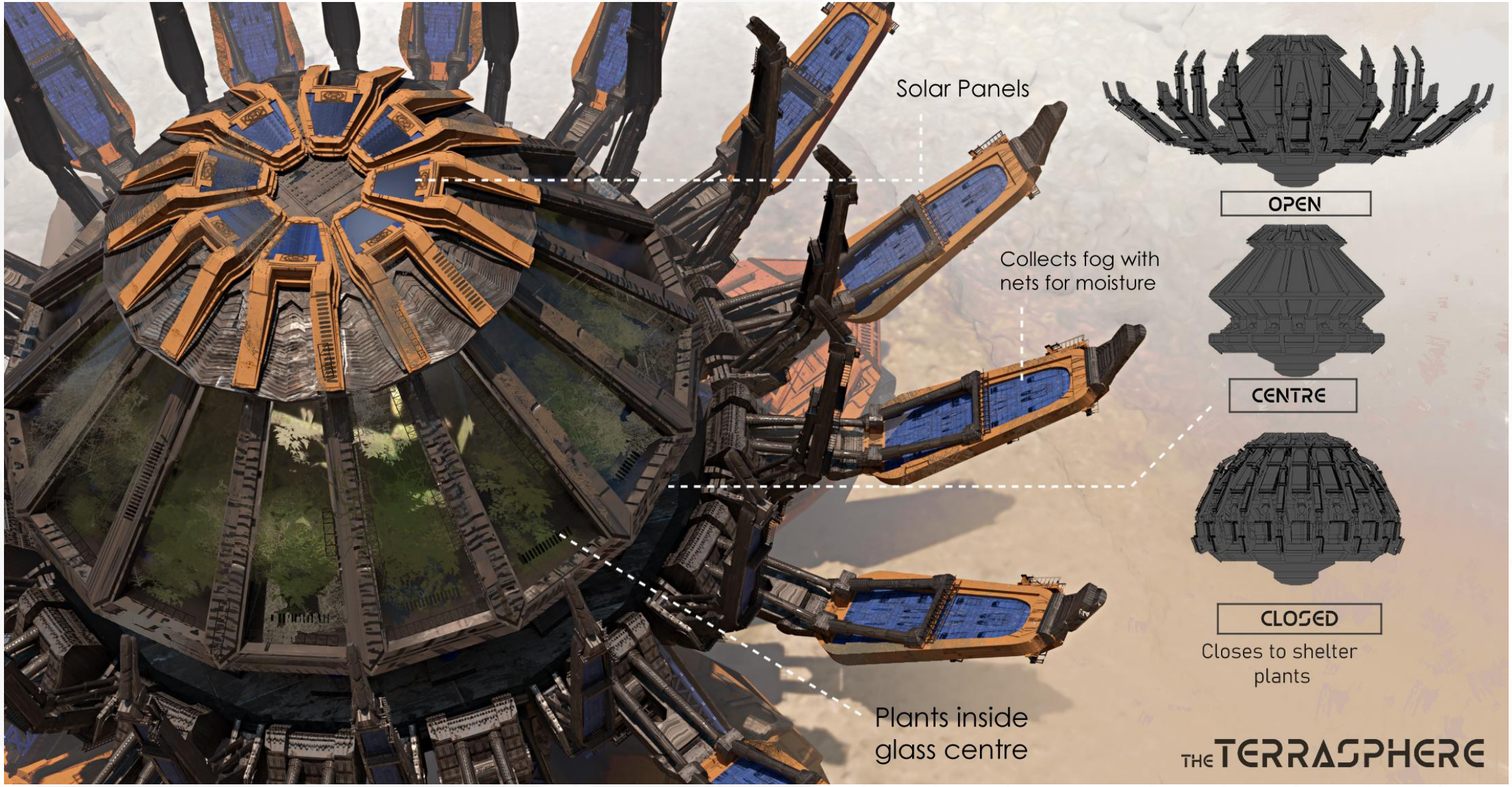


ENTRANCE WALKWAY FINAL KEY ART

Final polished piece of key Art.

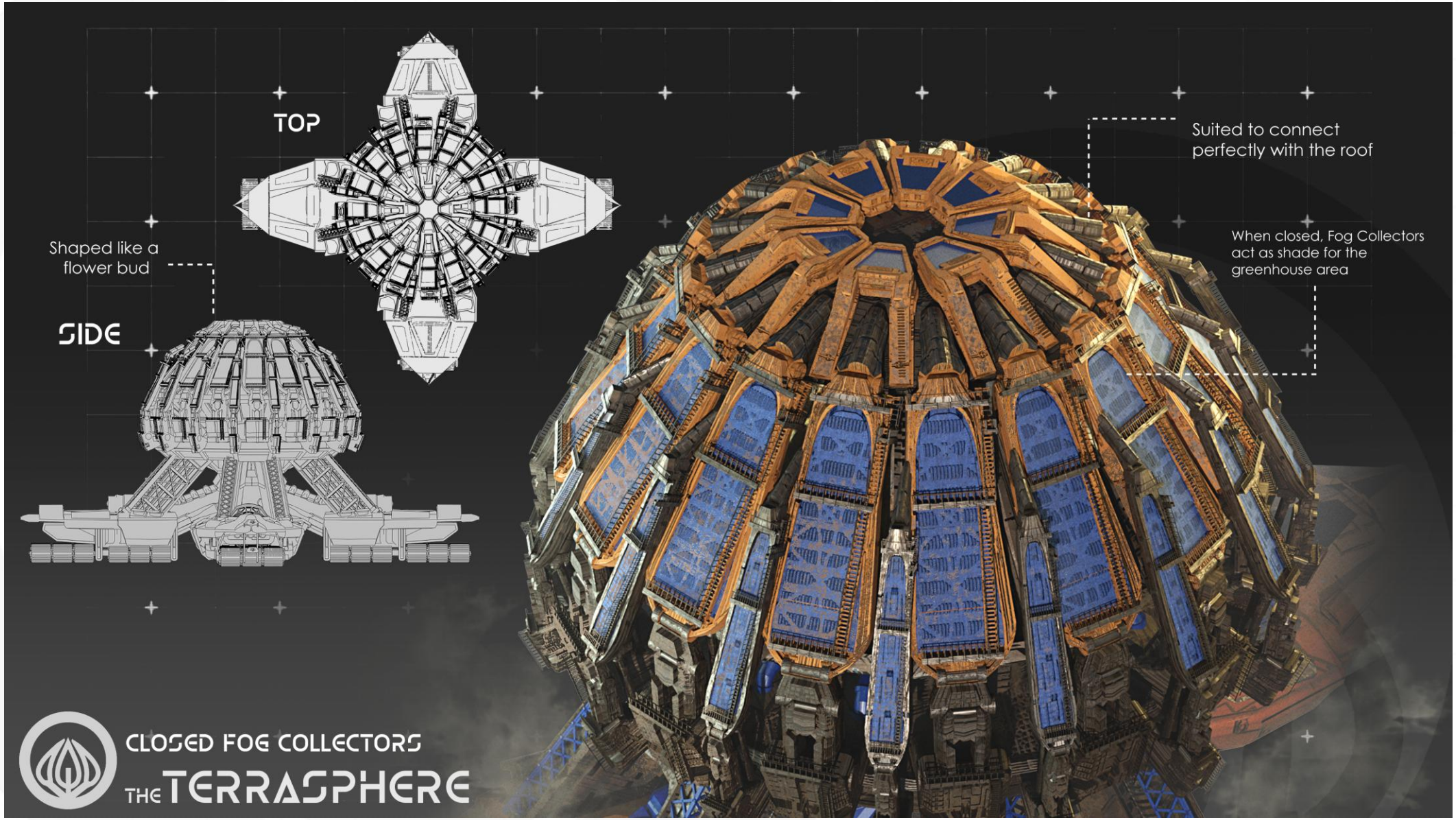
GREENHOUSE CALLOUT

Final paint over of the greenhouse area and top half functions.



CLOSED FOG COLLECTOR CALLOUT

Final paint over of the greenhouse area and top half functions.



FINAL DESIGN SHEET

Final Full Terrasphere Design Sheet..

CONCLUSION

INDUSTRY COMPARISONS

WHAT WENT WELL?

When comparing my final piece to that of work in the industry, I think my Fog Collectors in the design definitely managed to achieve a sense of scale and detail that can be compared with Chadeissons work. I was encouraged to use displacement maps and this enhanced the design more.

Also, comparing the colour to that of Foss's work, I believe my design achieved a vibrant colour palette that nicely contrasts the dull post-apocalyptic environment.

Work by Paul Chadeisson

Work by Chris Foss

My Final Piece

INDUSTRY COMPARISONS

WHAT COULD BE IMPROVED?

Reflecting on areas for improvement, I notice a slight inconsistency in the finer details of my design. When you zoom into Chadeisson's work, you'll find small windows, barriers, and mechanisms that continue to reveal themselves until you can zoom in no more. If I had further applied this, I believe I would have achieved a greater sense of scale in my work.
Additionally, when I revisit George Hull's spice harvester, I see that although I increased the number of caterpillar tracks over time, pushing the quantity even further could have helped me reach a scale comparable to his..

Work by George Hull for Dune

Work by Paul Chadeisson

My Final Piece

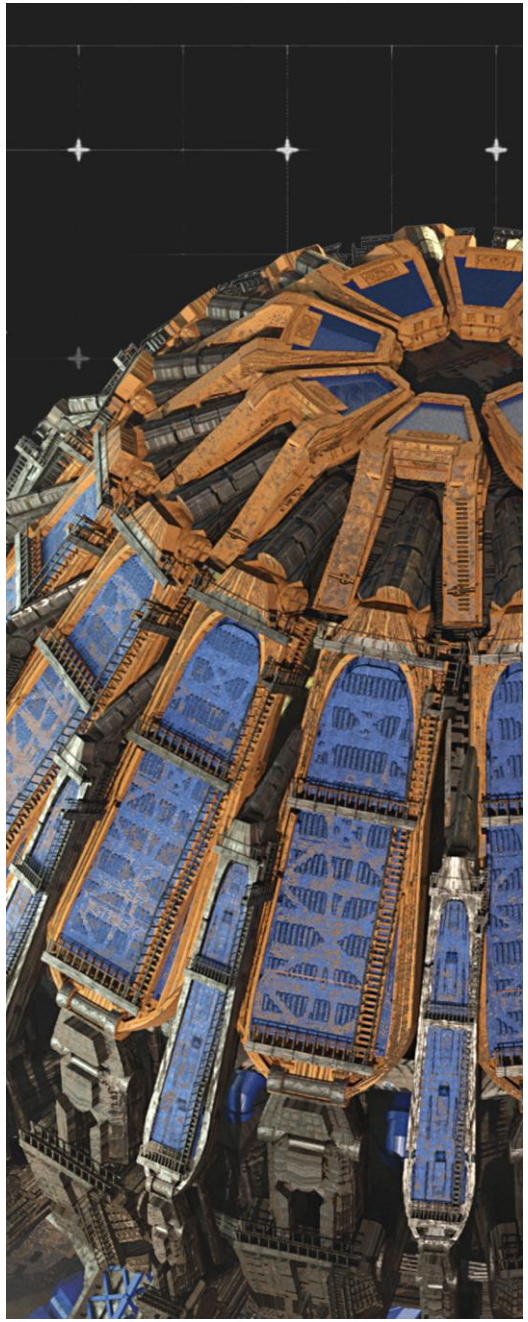
EVALUATION

I am pleased with the outcome of my final design. I believe I have created a realistic vehicle design that can be replicated in a game industry setting. I provided a clear demonstration of the functions of my design, showcasing various angles and perspectives.

I was able to apply researched elements to my work, such as Fog Collector nets from Gran Canarian farming, solar panels used in countries already affected by climate change, and the use of controlled sunlight (with the fog collectors acting as shade for the greenhouse area). These considerations of real-life botanic techniques, I believe, add a sense of authenticity to the design.

As well as this I think the gritty realist style also helped enhance this sense of believability. Using inspiration from films like Dune and its Spice Harvester design as well as realistic post-apocalyptic video games like FrostPunk helped me compare my work to that of professional concept artists and taught me how to better achieve a sense of scale in my design. As well as this, finding an anchor point based on Feng Zhu's science fiction methods gave my design a sense of direction, by referencing nature to echo meaning.

Returning to the subject of scale, I feel I have made significant progress in achieving and understanding this concept. However, I believe there is still room for improvement. When comparing my work to that of Hulls and Chadeisson, I notice that small details sometimes detract from the sense of scale that these professionals can achieve. For instance, the size of the caterpillar tracks and the varying amounts of detail on different parts of the design affect the overall sense of scale I was aiming for. This is an area I will continue to develop long after this project concludes, but I am proud of the improvements I have made so far.



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https://www.youtube.com/watch?v=HguuyyqcEt0&t=60s
Fog Collector Research:
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