FIT 3169 - A1 presentation: Industrial 3D scene

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Contents

First of all, this unit is quite interesting for me. I am an exchange student, and in my school I only do programming, so this was the first time I used 3D modelling or texturing software. I took this unit because I really wanted to be able to design my own environment for the game I program. I took a lot of time to understand and master Maya and Substance Painter but at the end I am really proud of my assignment, I learned a lot.

Research and conceptual development

When we saw the different genres in class, I was immediately attracted to the steampunk style. I play video games and I think the games I play are close to this fantasy style so I was naturally drawn to it.

So to start I conducted research into the steampunk genre and its defining characteristics. This involved analyzing various steampunk images, movie or video games, to understand the key elements of the genre. I also took a lot of inspiration from Zaun, a fictional city in the world of Arcane, which features an industrial aesthetic and incorporates elements of magic and science.

The main element of my scene is a radioactive fluid, so I tried to incorporate several key steampunk elements, such as gears, pipes, and valves that could work around this fluid. The fluid is inspired a lot from a purple fluid you can see in Arcane.

Research and conceptual development
Steampunk Inspiration

Steampunk furnace made by **davzeppelin** in blender

- Lot of pipes
- Everything is rounded
- Glass that let you see the inside of the machine
- Valves

Research and conceptual development
Steampunk Inspiration

Steampunk city by Kadaj on Steam Artwork

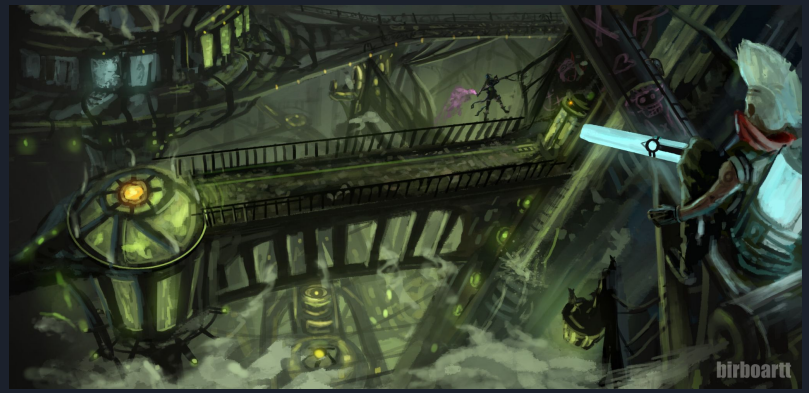
- Capsule shaped building
- Long bridge for the transport
- Smoke
- Iron
- Brown/dark colors

Research and conceptual development
Steampunk Inspiration

Bioshock video game

- Metallic materials
- No sun, lack of light only emissive light
- Glass

Research and conceptual development
Zaun Inspiration



Netflix serie Arcane

- Different height
- Lot of fog, smoke
- Green emissive color

- Fluid
- Emissive
- Dangerous
- radioactive

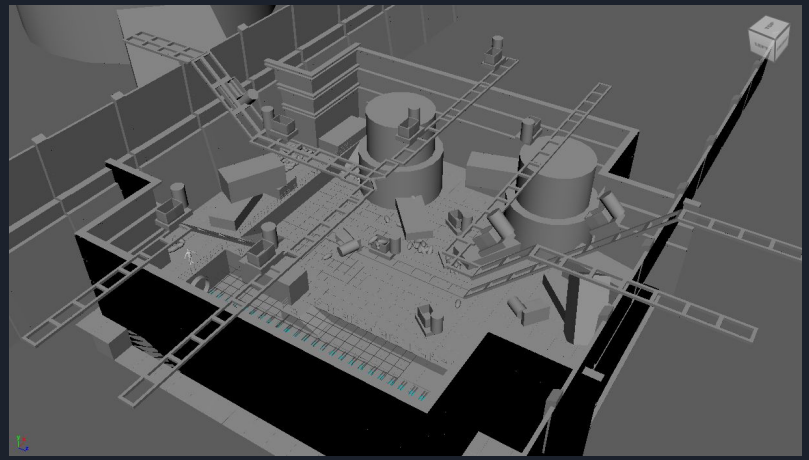
Netflix serie Arcane

Research and conceptual development
Zaun Inspiration

Netflix serie Arcane

- Abandoned buildings
- Neon light
- Patchwork

Production Process - Greyboxing

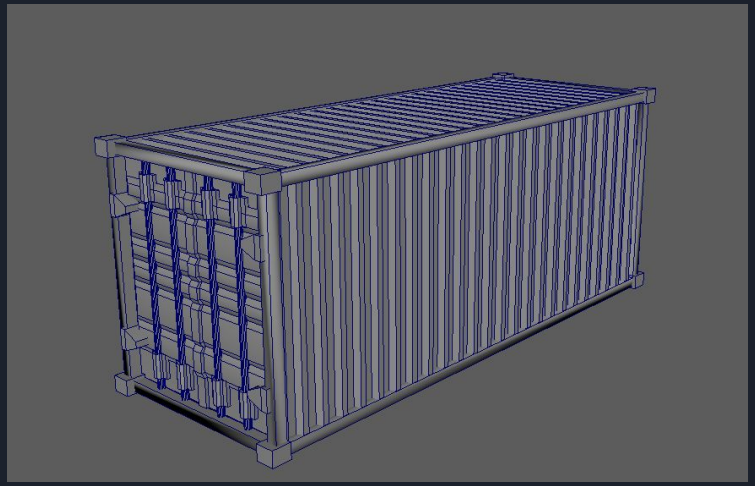


I really wanted two big machine producing something with a conveyor belt, they both look toward the same spot so the worker can grab the materials produced.

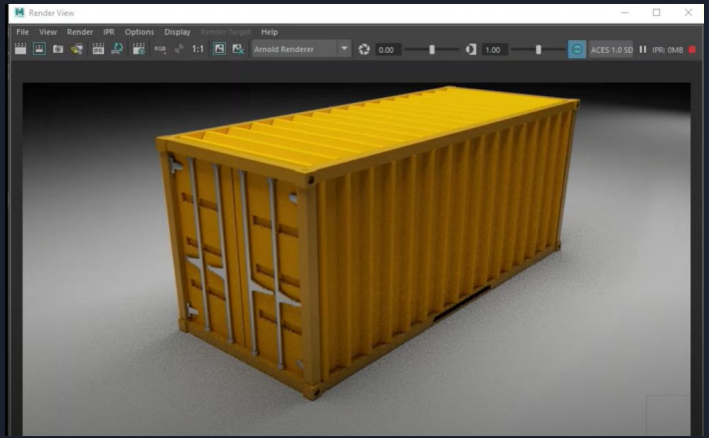
I wanted something messy, with thing not symmetrical at all and a lot of stuff on the ground. You can see a lot of capsule on the ground.

The last feeling a wanted to work on is the height difference. When you look from the top or from the inside, it’s like a spider web with pipe, rail, bridge going everywhere. I didn’t put the pipe during the greyboxing so I was expecting something even more like a spider web when you look from top or bottom.

Production Process - Modelling

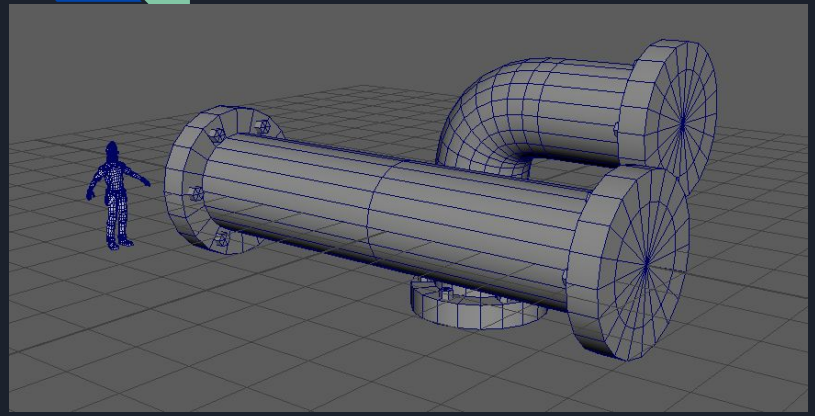


Like I said at the beginning I never used Maya or Blender before so I started with some easy props that are pretty generic to any genre. So I could learn the software and be productive for the assignment. For the first models I used guide on youtube.



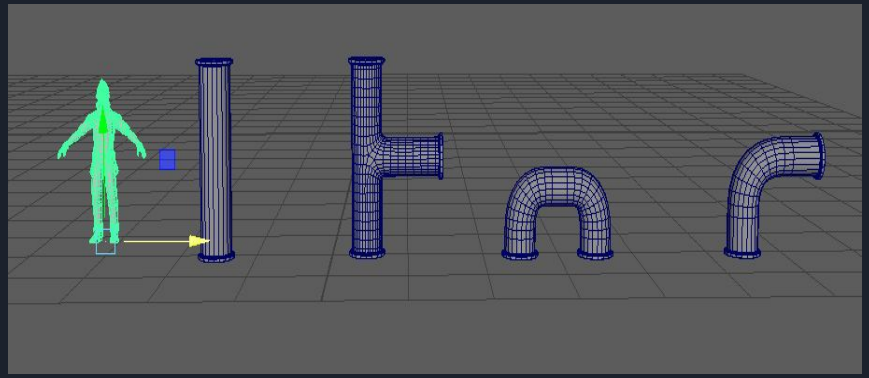
https://www.youtube.com/watch?v=vHdnTwX-E-4&ab_channel=fillx3DModeling

Production Process - Modelling

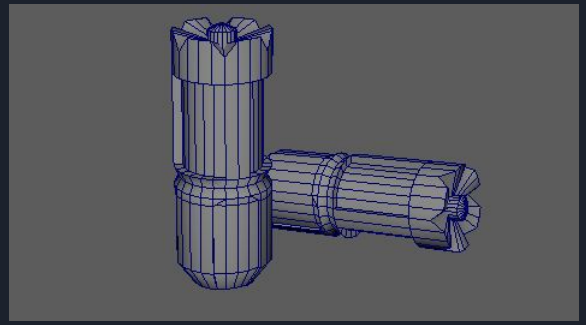


You can see the problem of these pipes, they are way to big and they didn't use a scale of 1 so couldn't stick them together

After learning the basics of Maya and the week 1 activity I was able to create my own little model using image and internet. So I started creating the little props I would need for my scene that are not too difficult to create (pipes, capsule).
I spended a lot of time on the pipes because it was my first model I was doing without tutorial and restarted a lot of time. I finally used the one we did during class.



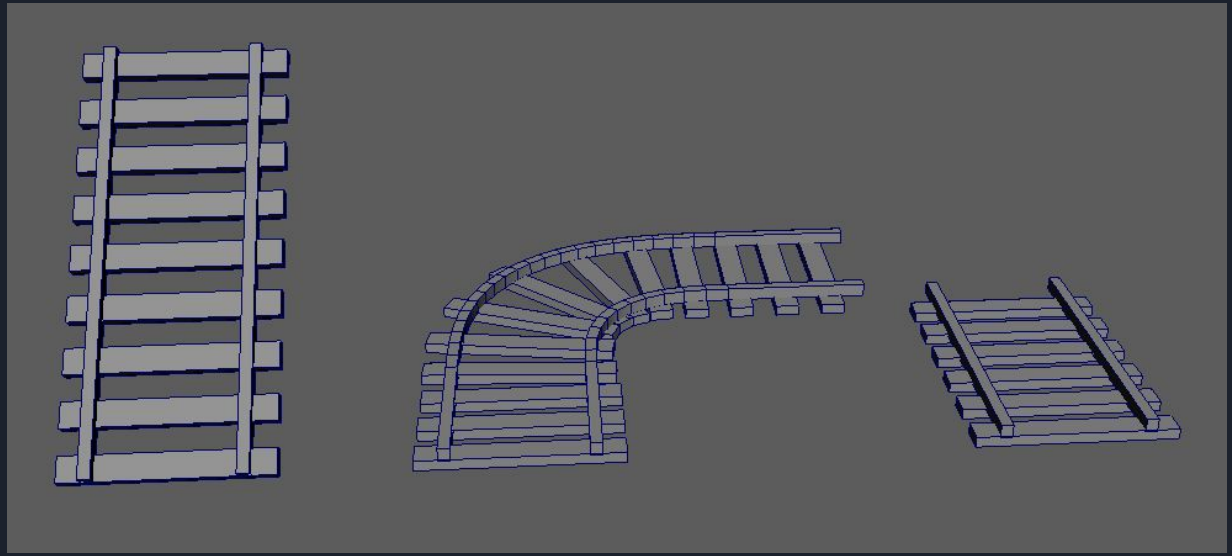
Production Process - Modelling



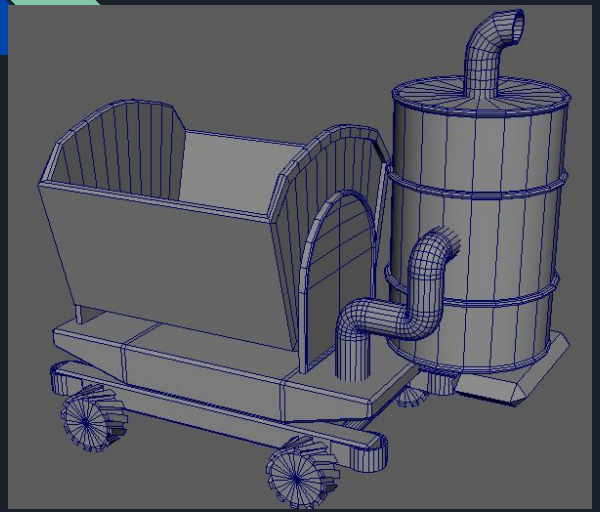
For the capsule I mainly took inspiration from image on google. (looking for capsule sci-fi with liquid)

Production Process - Modelling

Same for the rail, really basic I tried to reproduce what we did for the pipes to have modulable rail.



Production Process - Modelling



After I did all these little props that can populate the place I needed more advance and bigger model, first I wanted a cart that could fit on the rail to get the capsule from the big machine that I will do later.
After using maya for some weeks I started the know some technique and was able to do more advanced model.
This model is where I realized that DALL·E 2 (an AI that can generate image) could be extremely useful if I don't find the reference I want exactly on google.

Main reference for the body from google image

Image from DALL·E 2, mainly used for the barrel

Production Process - Modelling

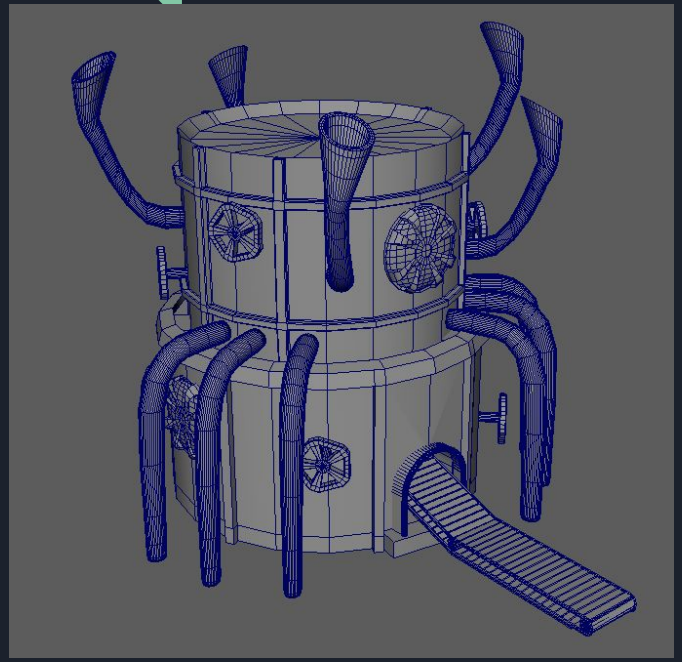
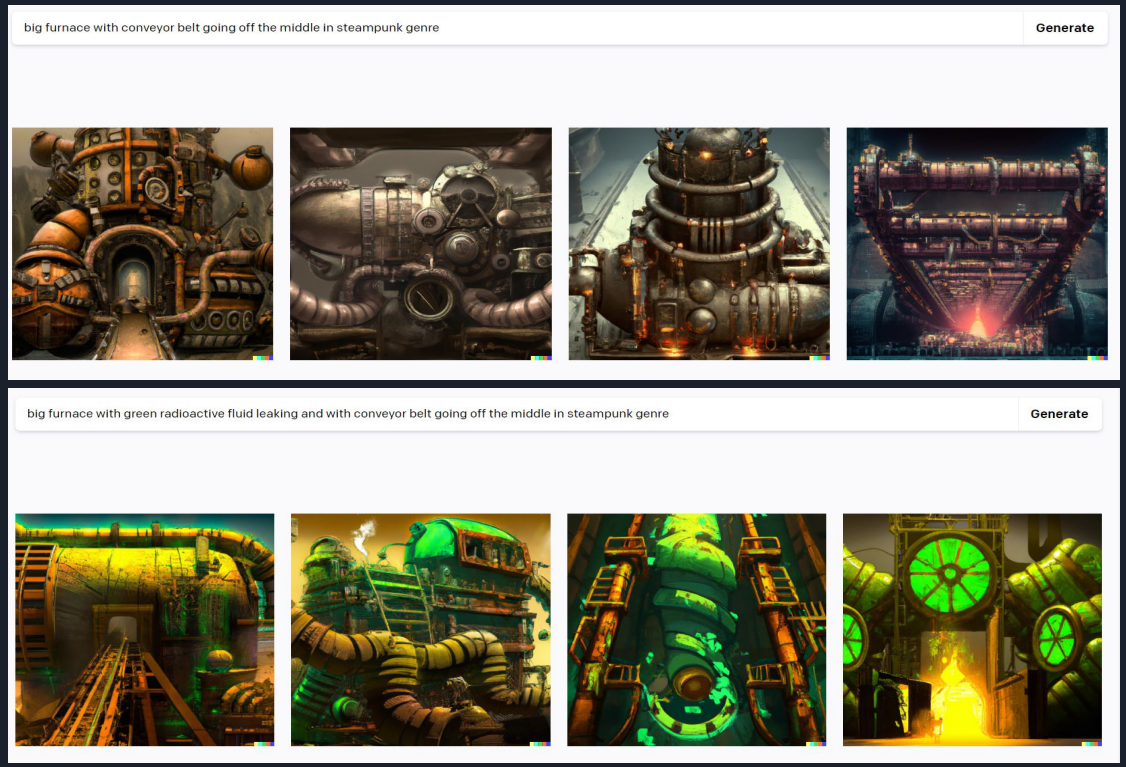
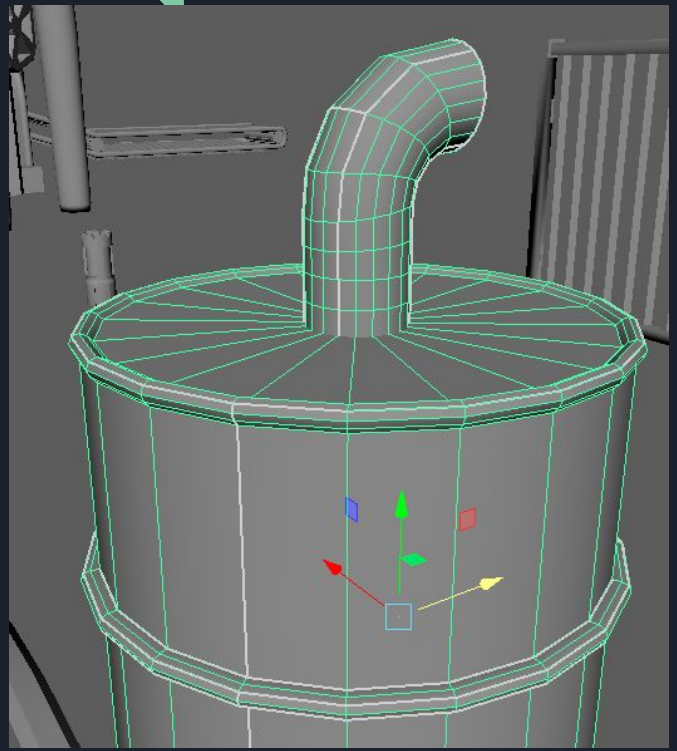


Image from DALL·E 2

All I was missing now was a big machine to link all this together.
I only used DALL·E 2 for the reference of this model.



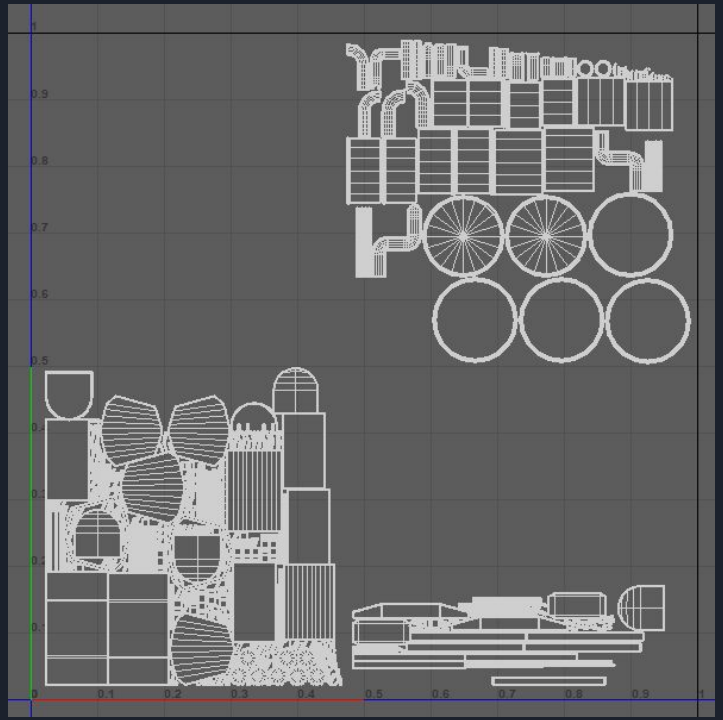
Production Process - UV unwrapping



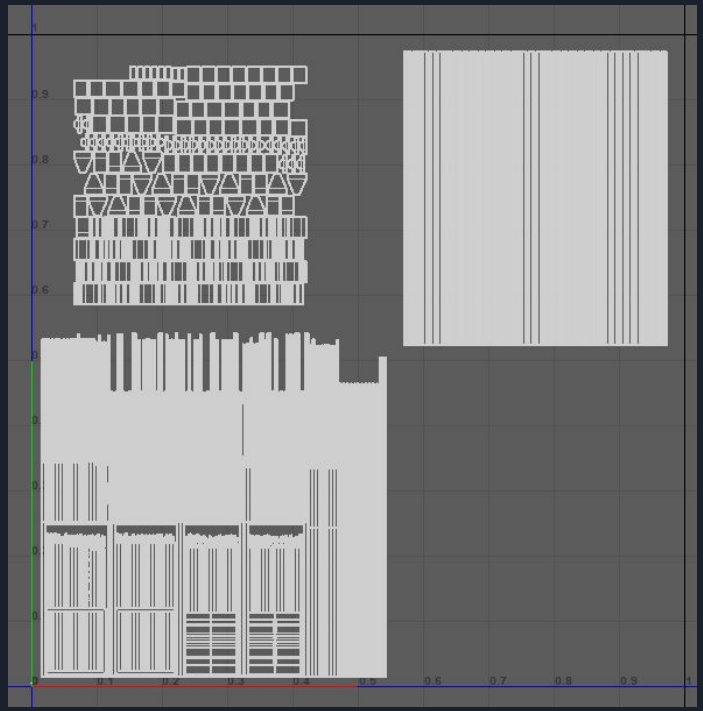
For all my UV I did the same process every time. For every sub-model I create an automatic mapping. Most of the time I keep the same amount of cut the automatic did, but I move them into corners or side that we don't usually see. Like inside the cart or behind the barrel of the cart. After I did this I layout every submodel and scale every UV so they can all fit into 0-1 values.
Then I spread all the submodel that I want with a different texturing a little bit so I can easily create mask on Substance Painter with them by just selecting the UV shells.

Here we can see well the cut that are on the corner or behind the barrel.

Production Process - UV unwrapping

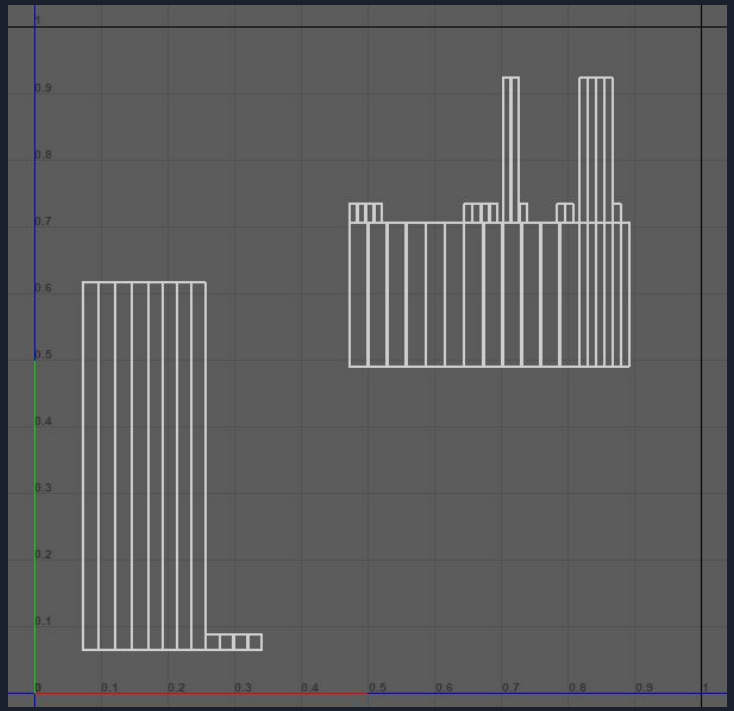


Cart UV mapping

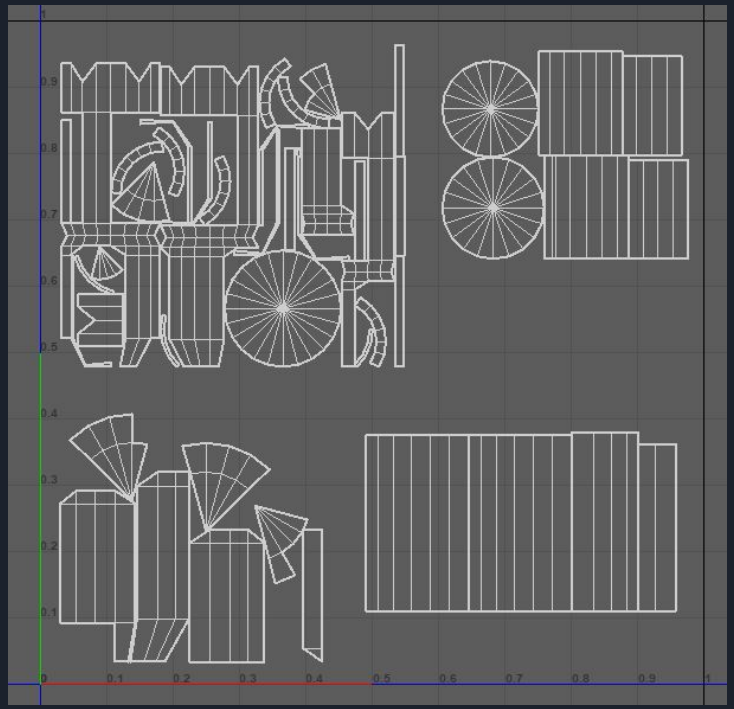


Container UV mapping

Production Process - UV unwrapping

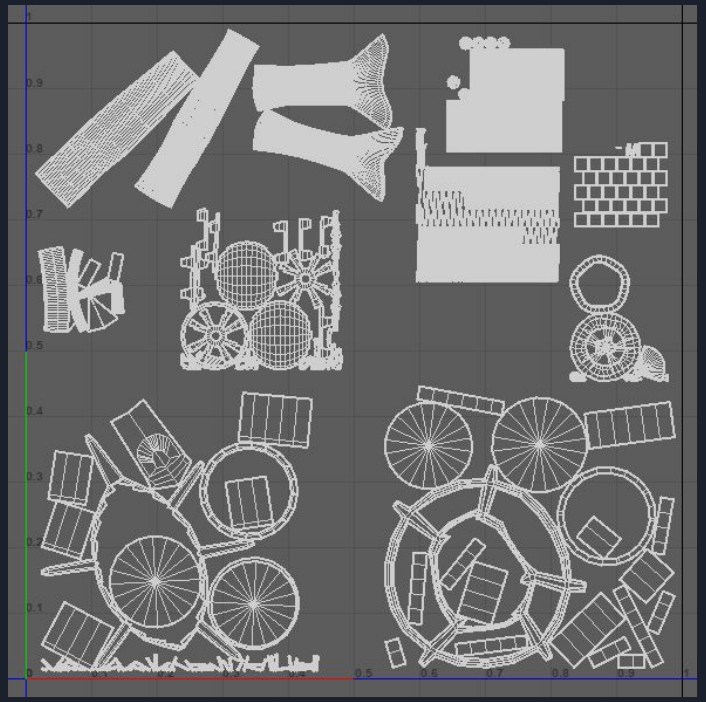


Rail UV mapping (with the plank and metal part spread)

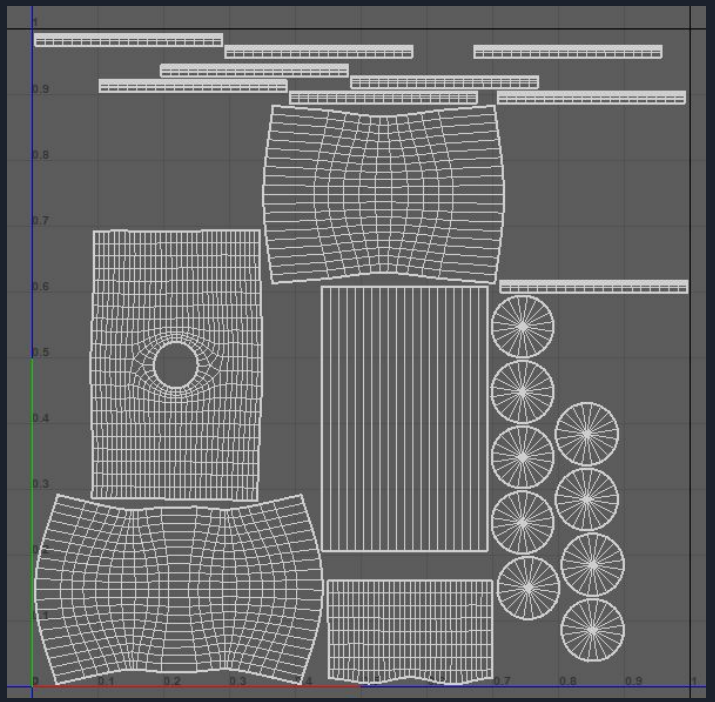


Capsule UV mapping

Production Process - UV unwrapping

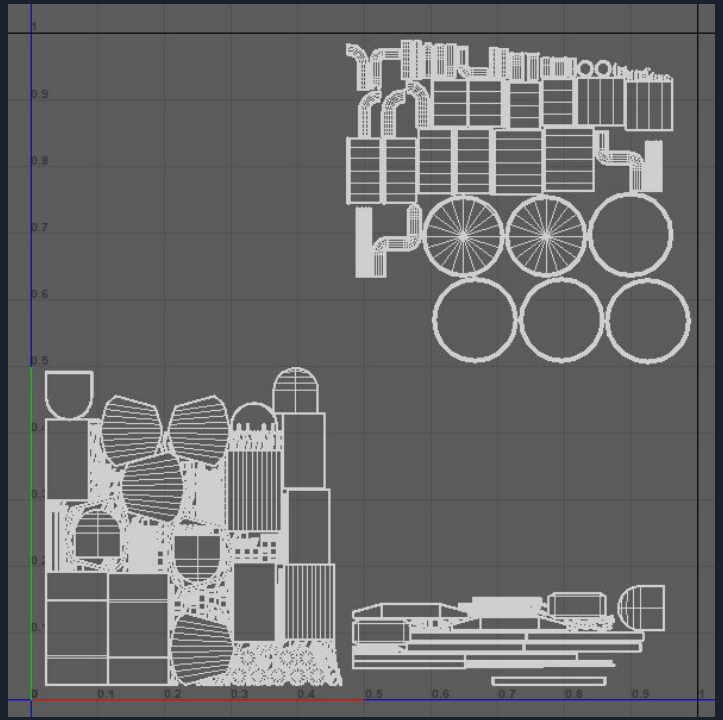


Furnace UV mapping

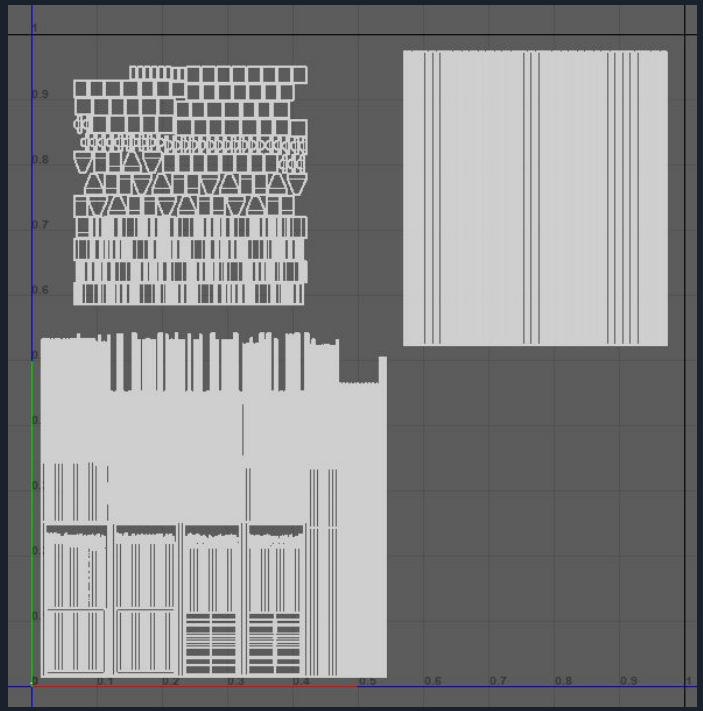


Pipes UV mapping

Production Process - UV unwrapping



Cart UV mapping



Container UV mapping

Production Process - Texturing

For the texturing part there I focused on 2 main things. First I would have a abandoned scene, something dirty/rusty. So all my texture has to be pretty dark with rust on it.

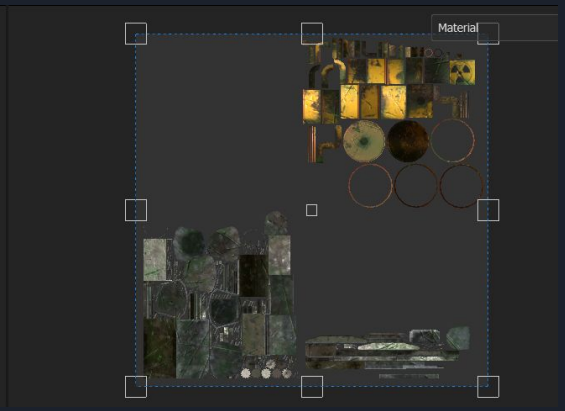
The second thing I wanted to work on is this radioactive fluid. By 2 way, I wanted to have some emissive texture that would represent the fluid, may be leaking or seeing it through glass. And second I wanted all my model to be a little greenish like if the liquid was evaporating and was affecting everything around.

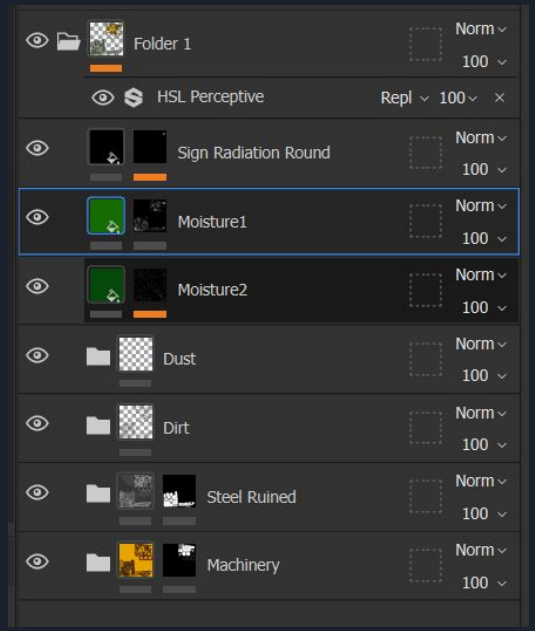
The container reflects this principle well, with a dark material and then adding some rust and the greenish element at the end like if it was moisture.

Production Process - Texturing

For all my models I used pretty much the same process. After baking the mesh map, I first use mask to separate all the different part of my model that would have different texture. Then I add one of the default smart material that come with Substance Painter.

After that I can add the details, like the rust/dust/dirt, add some scratch, add this greenish part to link all the model with the same concept.





Production Process - Texturing

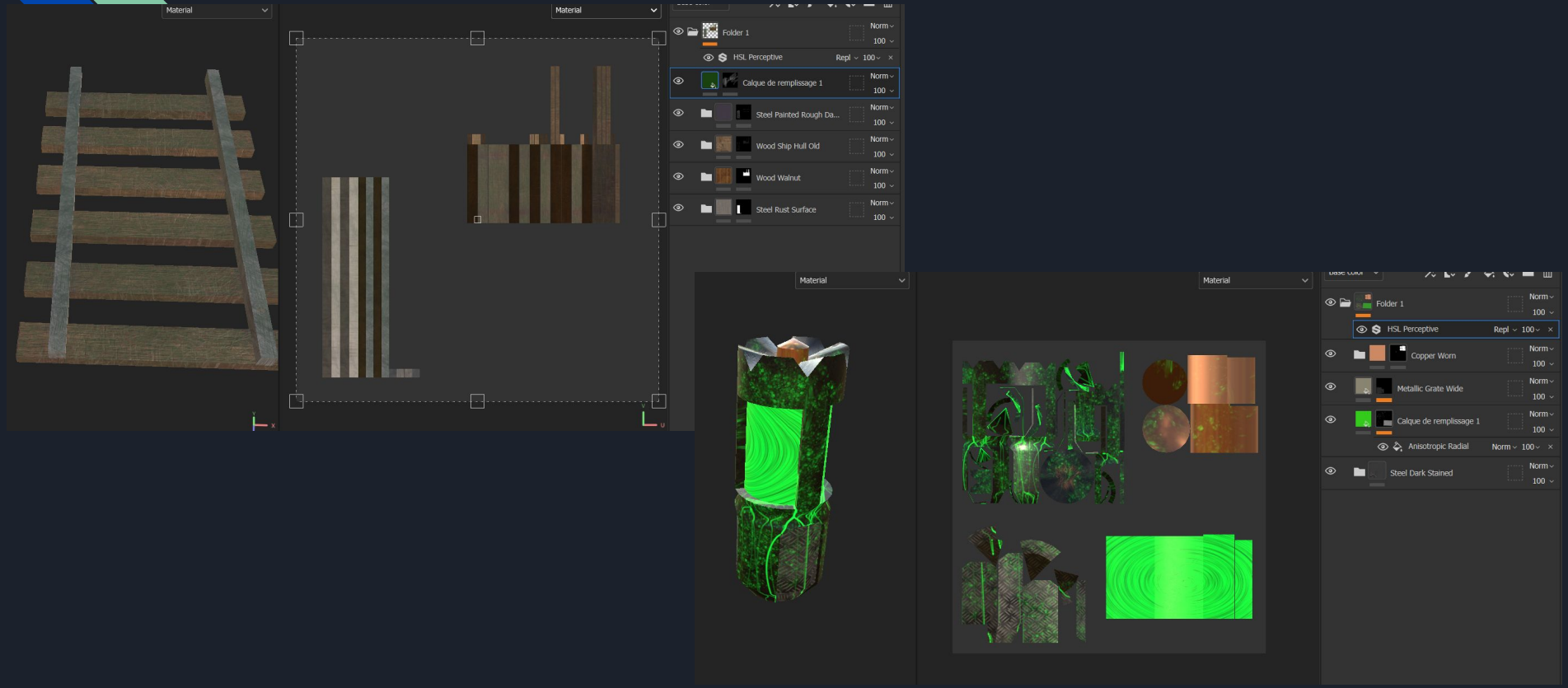
Something I used a lot, too to make the fluid more realistic when making it leak from my object, is some physics simulated brushes. All the leaking are done using this, so it simulate how real fluid would leak on the surface. Every time I was working on the fluid part I had to be careful the add the emissive layer so it render really well in unity.

Production Process - Texturing

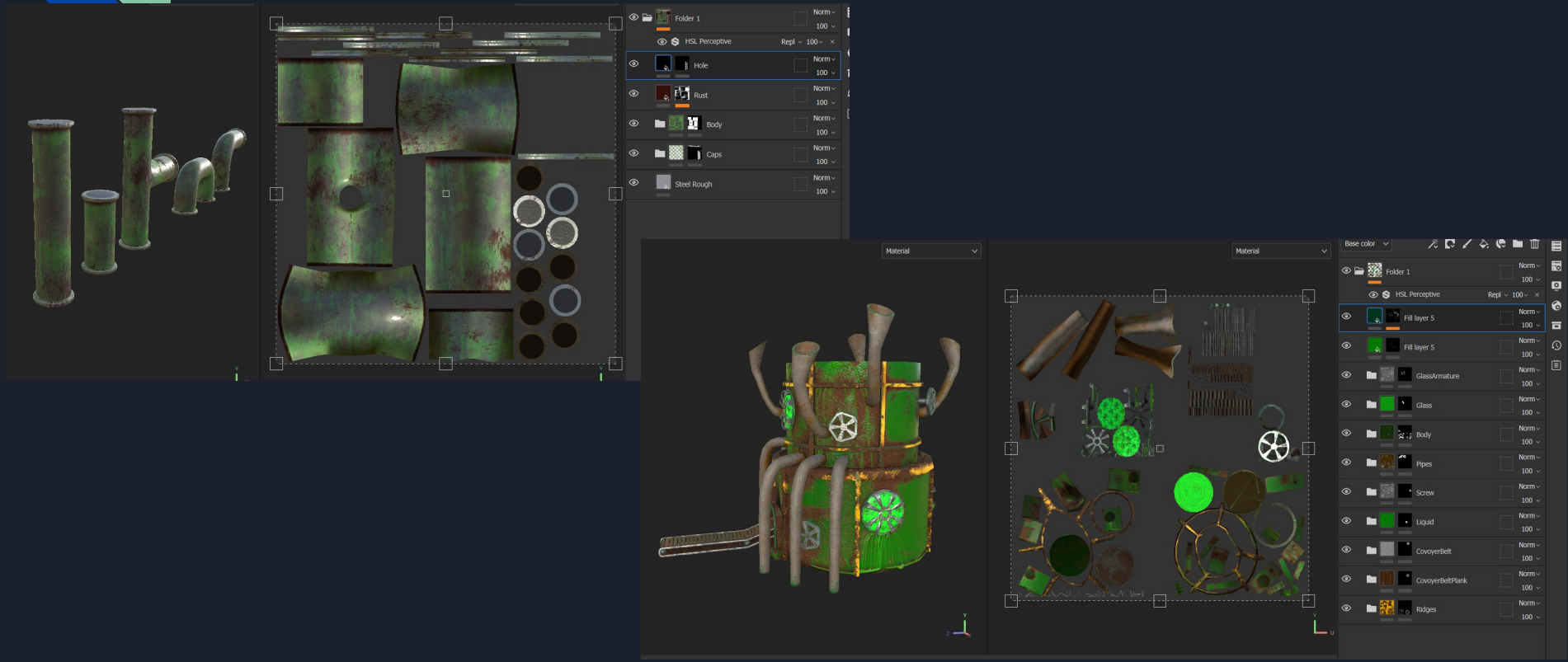
One last thing I did is adding a HSL filter on the whole texture. After importing on unity, I could barely see the difference of color on my object, they looked way darker on Unity than Substance Painter. The HSL filter set to 0.6 enlight the object and it looks way better in Unity.

Comparison with HSL and without HSL in unity.
My scene will be during the night so without HSL the model was nearly completely black.

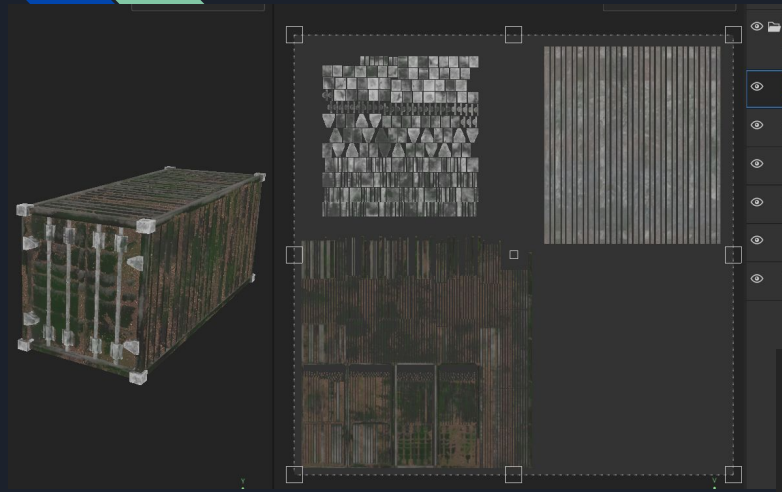
Production Process - Texturing

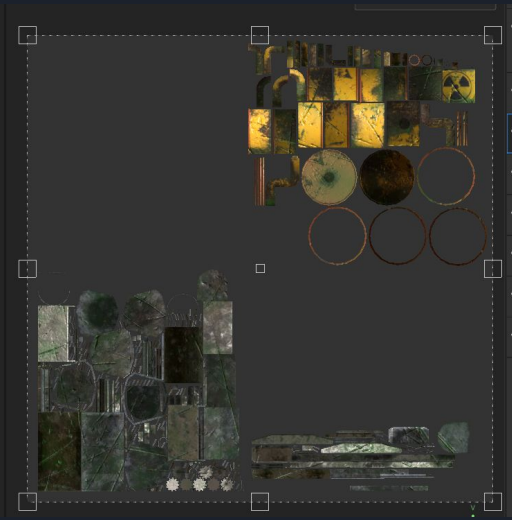


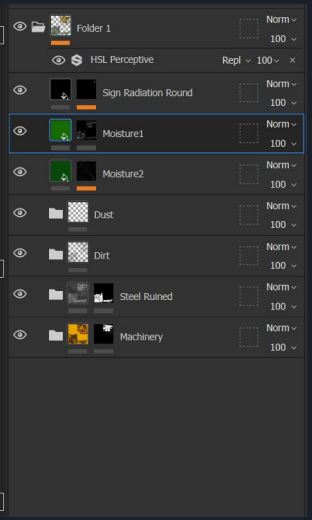
Production Process - Texturing



Production Process - Texturing



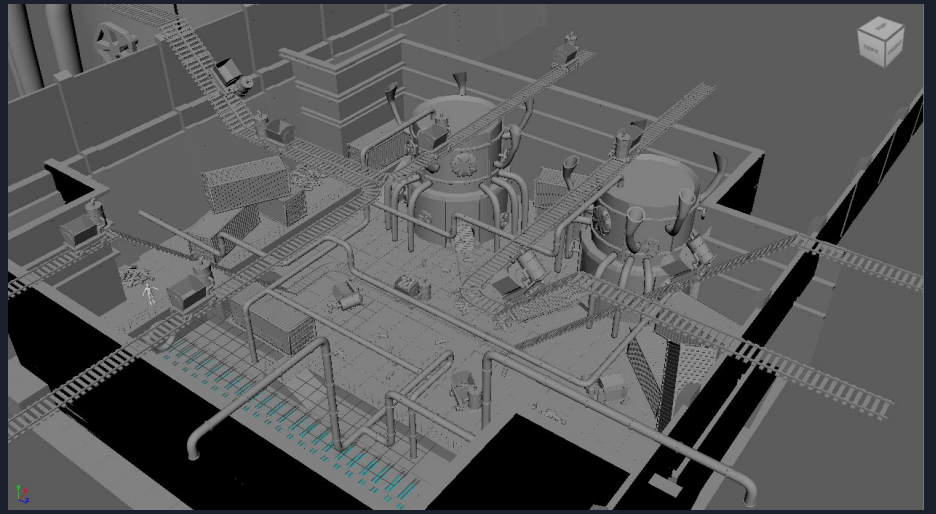




Production Process - Scene arrangement

To finalize the scene, I did all the positioning of the models on Maya. I only used Unity to connect the model with their texture, the lighting and the post processing.
I didn't really had a lot to change from my greyboxing, at least for the big part.
I used the replace tool from Maya to replace my greybox model with the new models, I just had to be careful that they had pretty much the same size and the same pivot position.

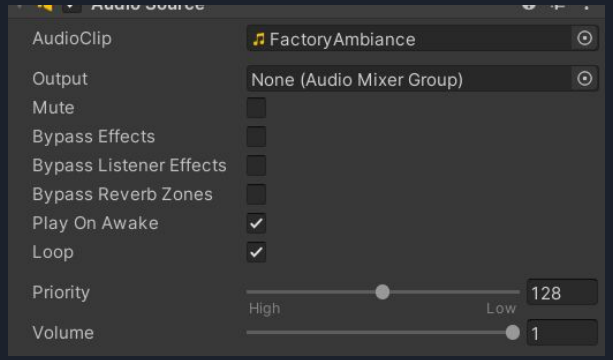
One big thing I did is too add all the pipes and way more capsule on the ground because when playing on Unity the ground was too clean, not messy enough.



You can see that compared to my greyboxing it look a lot similar, just more capsules and moving a bit things around after playing on Unityso they feel better.

Production Process - Ambient sound

There is 2 main point I wanted to focus with the ambient sound. First we are in a abandoned scene and it's really dark/foggy so I wanted a sound that could make you feel a bit anxious.



Main ambient sound with factory machine sounds. Volume of 1 because it's the main one.

Machine Steampunk Factory made by szegvari on freesound.org

Production Process - Ambient sound

Then I wanted the player to feel that even if it's abandoned he is not alone, behind the whole there is still people. Maybe the industry is still working behind or just people are using the abandoned space.

Abadoned Nuclear Factory.wav made by szegvari on freesound.org

Factory Atmosphere (Extended) made by RICHERlandTV on freesound.org

Mysterious and anxious music. Volume of 0.4 so it doesn't overtake the main one.

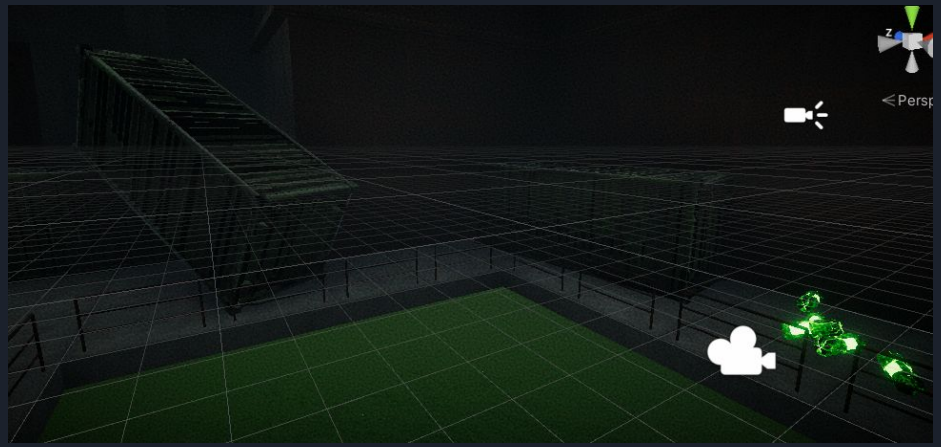
Sound of metal and tools that knock against each other. Volume of 0.1 so you can hear it from far away like if there were people around you behind the walls

Production Process - Lighting

My scene takes place at night. Only the moon will light the scene, it helps to reinforce this feeling of fear/anxiety in an abandoned place.

My second type of lighting is the emissive light from the fluid. It allow me to easily focus the view of the player on certain point. For example at the main part of my scene where the big furnace connect I added a lot of capsule on the ground for this effect.

Important point, a lot of capsule and emissive color from the fluid



Behind the player, not important, less capsule you can barely see

Production Process - Lighting

To focus on the industrial part of the scene I added a lot of fog and these dark cloud. Could be the smoke or the pollution of the machines that made the vision of the player blurry.

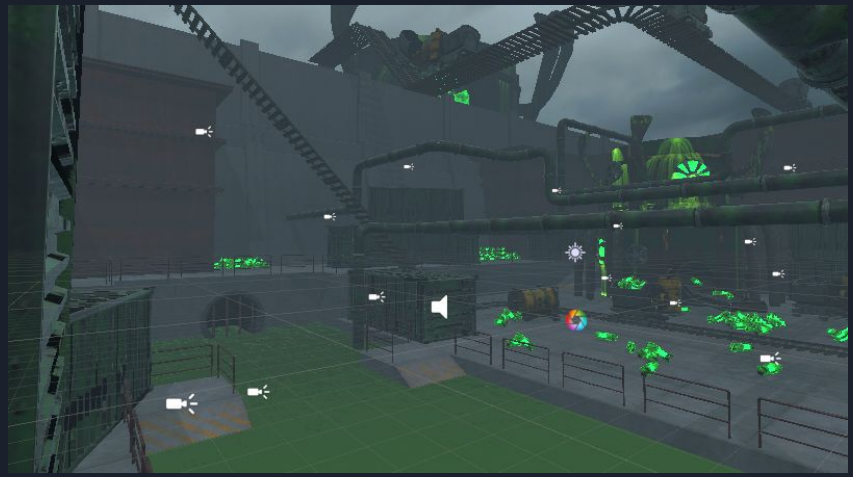
With Fog (density = 0.06)

Without fog

Production Process - Post process

Again I really wanted this mysterious, a bit like horror scene feeling. This is what I focus on the post process effects.
First I tweaked some values of the color grading so it look nicer (increase the temperature, lowered the post-exposure, desaturated a bit ...).

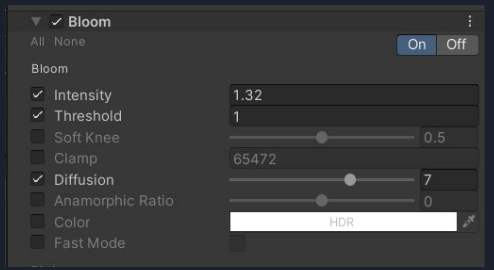
With color grading



Without color grading

Production Process - Post process

Then I added 4 other post process effects.
A bloom effect so the emissive color looks better

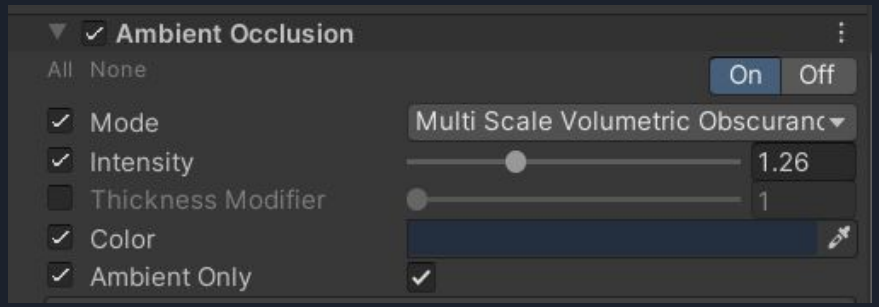


With bloom

Without bloom

Production Process - Post process

Some ambient occlusion.

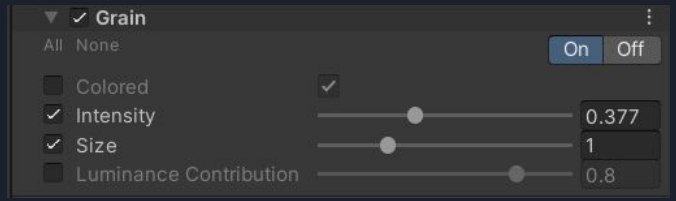


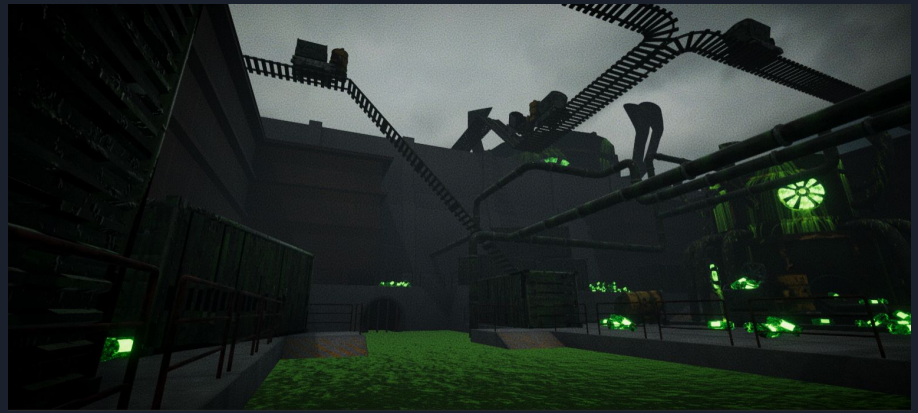
With ambient occlusion

Without ambient occlusion

Production Process - Post process

A vignette effect and some grain, like if you were holding a camera a bit like in a horror movie.





With vignette and grain

Without vignette and grain

Reflections

- Obviously I learned a lot about Maya and Substance Painter, I already had a lot of knowledge about 3D but never modeled or textured before.

- I think I didn’t managed my time well. I did too much at the beginning, spending a lot of time on things that we were gonna learn during class. I tried to UV unwrap or doing modulable pipes before the class and lost a lot of time on this. Plus I had a lot of workload during week 3-4 so couldn’t work as much as I wanted on the project. I would have like to add 1 or 2 more model to polish the assignment a bit more.

- Overall I am still really happy of the result because It’s my first time I create an environment and the result could be used for future gaming project . Which is the main reason I took this unit, is to learn how to design scene that I can use in game programmation.

- At the beginning I didn't think I would be able to do this, I even thought of changing this unit but finally I am really proud of my work. Looking forward for assignment 2.