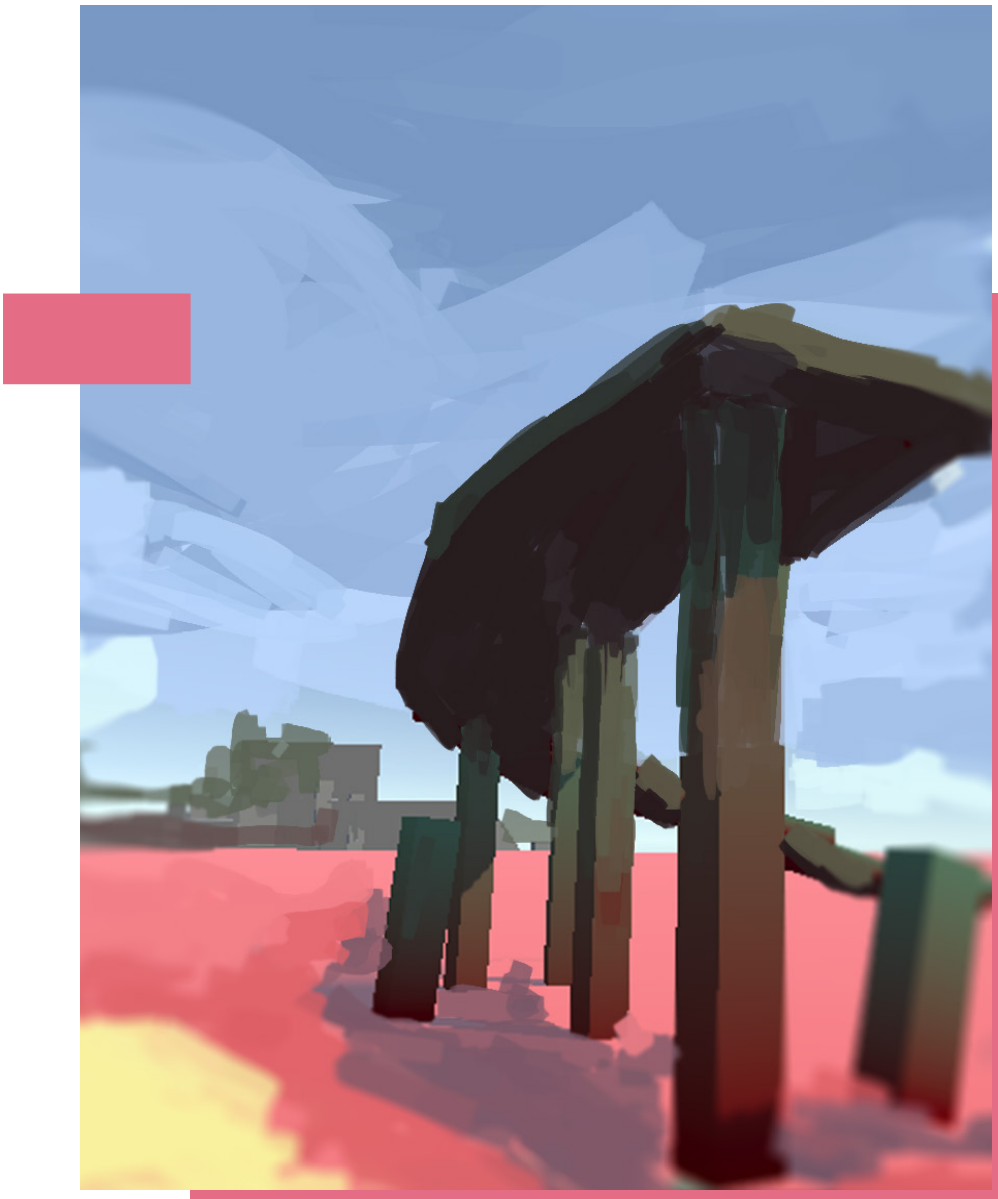
WORLD BUILDING

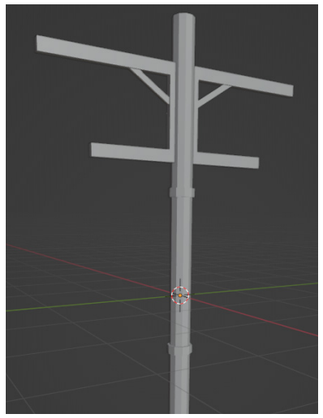
PRE-PRODUCTION STAGE



BILL ZHUOYUAN FANG

2023





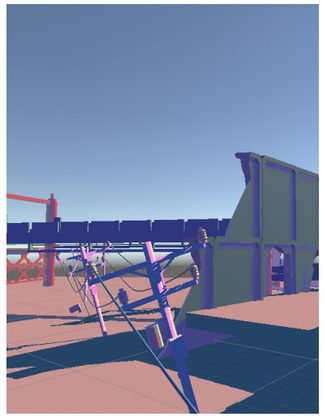




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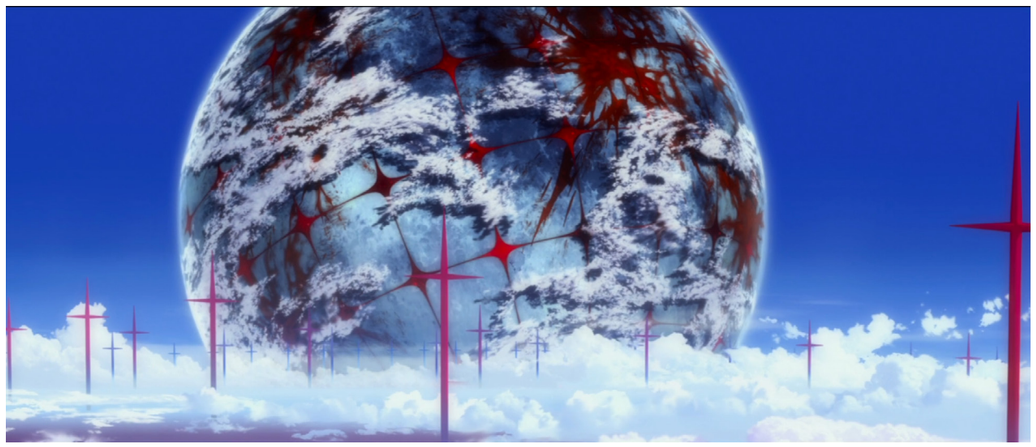
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PERSONAL VISION

I've always painted bright and happy scenes full of life and vibrant colours, I wanted step out of my comfort and create a world inspired by one of my favourite anime: Neon Genesis Evangelion. My world takes place after a post apocalyptic world where humanity used to exist. Man has perished, for some number of years, what is left is the traces that a civilisation once existed. Divine Retribution is what caused their downfall, but as to who that deity is, I have not yet decided, however I am leaning towards either the Christian god or a god that is represented through the sun/moon. The ideal scene I envisioned consists of the iconic red sea and reference to the celestial bodies of the earth, moon and/or sun. My creative license and efforts would go towards making the dated objects that hint at the lore of the world. Obvious ideas that come to mind are abandoned or fallen buildings, cars or other vehicles, roads and collapse bridges. Another concept to consider is absence/presence of plants, which would suggest the future of the planet, and a massive shift in overall colour/visual aesthetic, the mood will shift from being depressing and gloomy to peaceful and hopeful. Clouds, rain, stars and other climate related factors, along with the time of day would heavily determine the atmosphere and impressions of what took place on these lands. I am currently leaning towards a moonlit scene void of life and vegetation, but is something I'm willing to explore and experiment. Ruined religious architecture add even more connection to the lore, churches, temples, shrines imply the existence of religion and maybe even multiple religion, which can be also viewed historical monuments, providing an indication as to what country and place once stood, which is also affected by the general style of architecture.

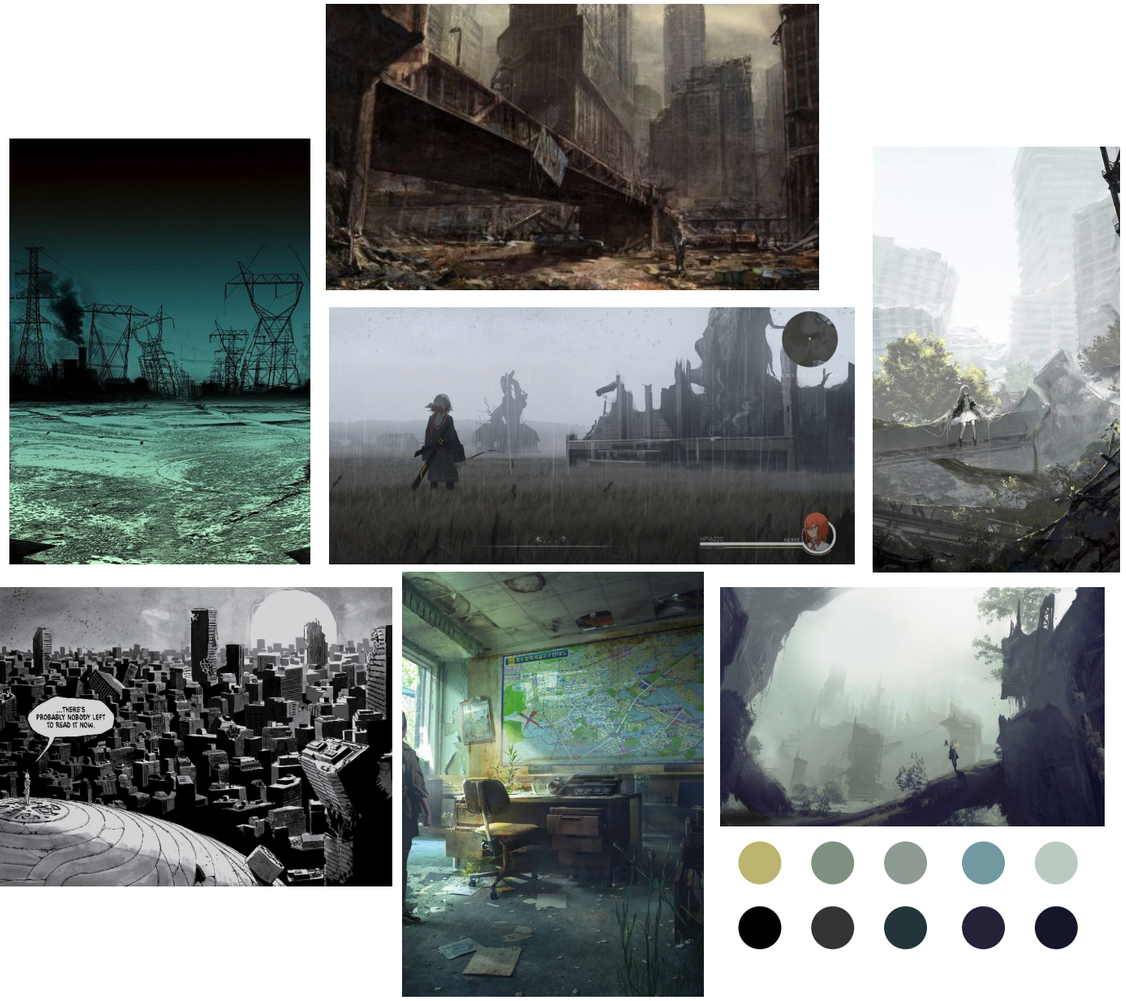




EXPECTATIONS & LIMITATIONS

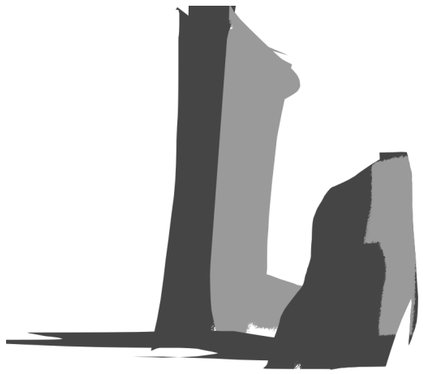
In the next 12 weeks, I would expect myself to far surpass the 70 hour total worth of work expected to produce, as I feel like I work slower while thinking more than average, a habit I am trying to change. I have also decided to move from Maya to Blender, so learning a new software will probably put me behind schedule in terms of 3d modeling, at least for the first few weeks. Although I have very little knowledge of shaders, taking technical art as my games specialisation, I expect to focus a large portion of my time on the visual aesthetics of the environment. The biggest boon I plan to acquire from this class and assignment, would be to raise my not so confident 3d modeling and engine skills to a level where it can be used to assist my 2d illustrations. I definitely do expect a fair share of struggles, especially 3d engine related, but I do expect myself to overcome them with time and help. I have high expectations for myself, and my project so it should be no surprise that I will be pushing myself to the limits and make this piece of work sit proudly in my developing portfolio. Finally, I find it quite difficult to express originality especially in the earlier stages of development, where my idea isn't fully set, but I'm sure that my pride as a designer will push me into territories I am unfamiliar with, so I can truly call this world I created my own.

CONCEPT MOODBOARD



The apocalyptic and post apocalyptic worlds are no new concepts carried out in similar settings. Aged and broken down buildings, roads, rails, or other concrete or metallic objects of different scale scatter the scenes. The density of these objects give an idea of what the place was like before the tragedy, larger buildings and more cars indicate a larger city, with the absence of these showing a more rural area. How objects are broken also hint at what sort of disaster happened. What binds these elements together is the ambient atmosphere paired with a muted colour palette, further emphasising the absence of life.

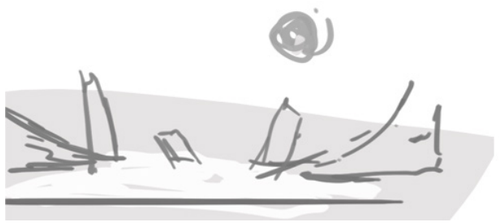




Quickly carving out some shapes that resemble simple buildings that are damaged and almost collapsed, while also playing with the shapes in a graphic way to illustrate some form of light and shadow. Textured edges and jagged horizontal cuts into the building add a nice sense of contrast to the strong vertical shapes.



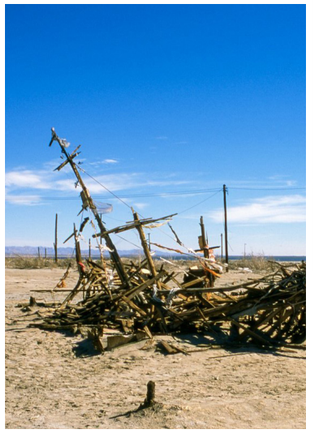




A quick doodle of a beach?
Not quite sure if it is a beach or just flooded buildings.
Buildings still standing in water makes more sense of a flood.
The idea of the sun/moon lighting on the water surface could look rather tranquil.

BEACH COMPOSITION MOODBOARD

Looking at these ruined and desolate beaches and flooded buildings, the combination of water + land + sky + man-made structure feels quite plentiful to make a visually interesting scene. There are a lot of ways to compositionally use positive shapes of the buildings and land, as well as the negative shape of the water and sky. Clouds and fog can help illustrate a sense of an atmospheric perspective, which can also be designed to emphasise the mood. These elements are all rather large compositionally, setting the structure for the scene, along with lighting, should build a solid foundation to a visually interesting environment that captures my idea.



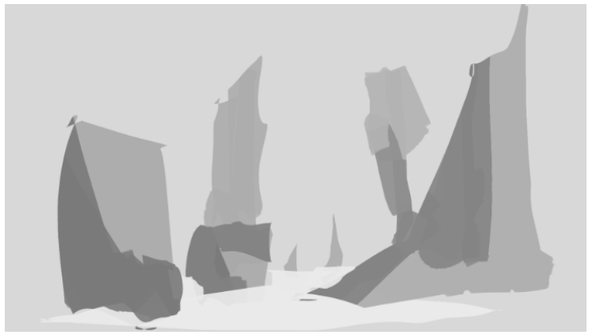












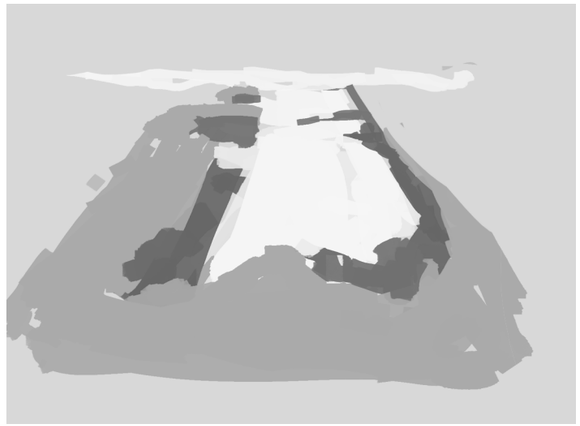
Experimenting more with blocking out the big shapes of the scene, without thinking of details. I'm starting to get some interesting compositions. I'm imagining the sketch on the right to be some kind of reservoir formed by a flood on a hilly landscape, now with buildings sticking out.





Another flood concept with a sign signaling what the area used to be called, could play with the wear and tear of the sign. The sign appears next to a road along with the rest of the flooded buildings/objects.

This is supposed to be some kind of broken up highway road with cracks and water pushing in. The perspective is quite extreme here, unable to show much of the sky and surroundings, but could be the start of the scene, with the camera pointed down, and slowing moving up to reveal the rest.



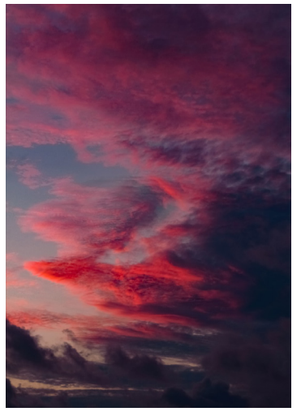
SYMBOLISM MOODBOARD





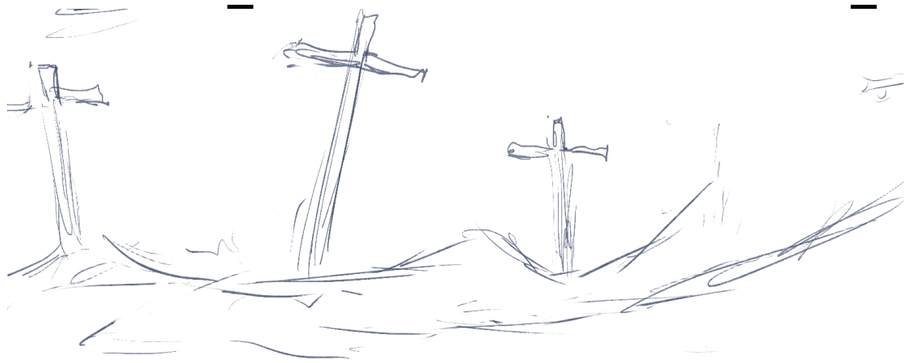






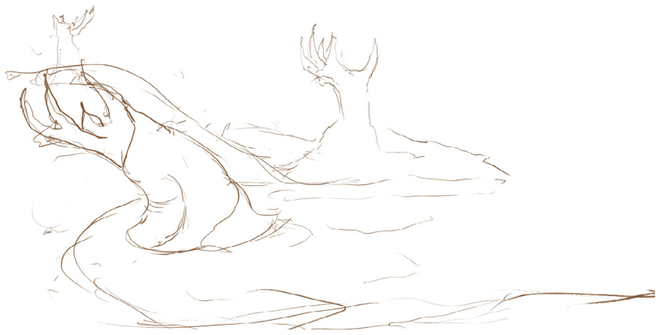


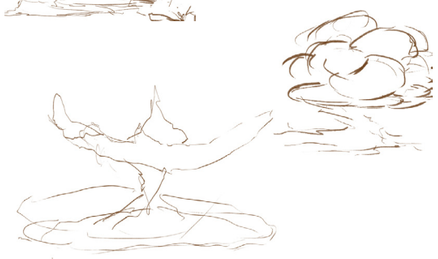
These are just a collection of images that feature something that tells a deeper story, in other words, I'm looking at what they represent rather than what is actually there. Full moons are scary, maybe it's to do with theories leading to natural disasters, maybe it looks like a huge eye is watching you, I'm not really sure there is just an ominous feeling about them. Moody skies overcast the land and sea with shadow, absorbing all the light. Churches and christian iconography is something I wanted to explore and research specifically, as I feel like a broken church/cathedral would be fitting of a ruined world.

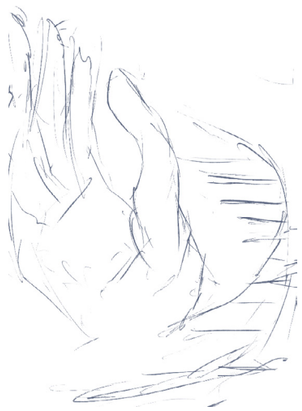


Trying to imagine what a tried up beach, which just ends up looking like deserted hills of sand, so pretty much a desert. These vertical structures were supposed to be telephone lines of some sort, but ended up more like crucifixion crosses, which is interesting in its own biblical/religious ways. Telephone lines kind of have a similar cross shape anyways, which makes indirect references and could be composed in a similar way of Jesus' crucifixion which would make a less explicit lore related element.

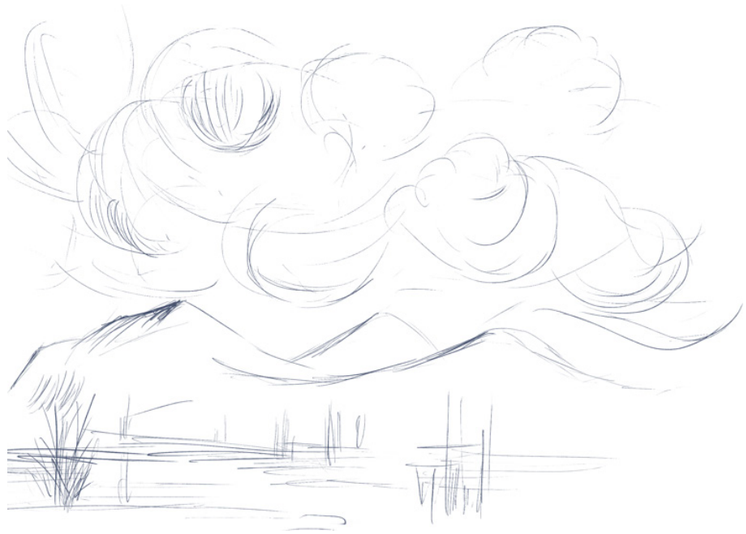








Other religious imagery that came to mind was the tree from the garden of Eden, maybe shriveled and withered away or got corrupted. And god's hand, but instead of reaching down from heaven as a symbol of giving grace, it's cracked and buried into the earth/floating in the sea, maybe a way to say 'god is dead.'



A small composition of a full scene where I tried to play with the juxtaposition of a peaceful scenery overshadowed by an ominous sky. The scribbles of harsh winds/clouds weren't really effective here but and so is the lack of wind blowing on the water/plants. The idea is still interesting, though it may be too poetic/abstract to be understood directly. This would fit as a nice prequel scene to an apocalyptic world if I were to implement some sort of cutscene player.

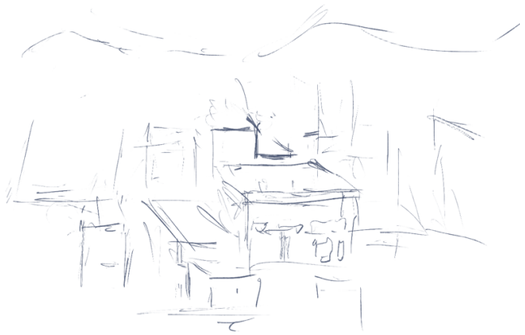
Stained church glass shattered, probably should find better shape reference.

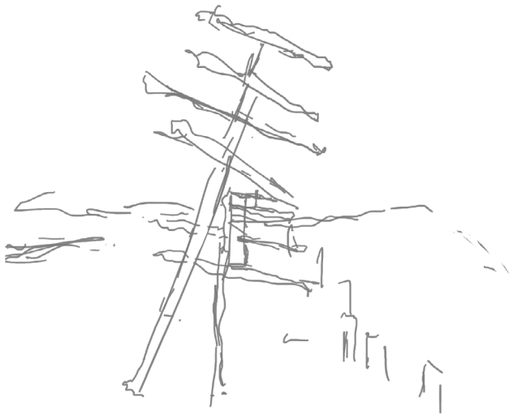


Broken down church wall.



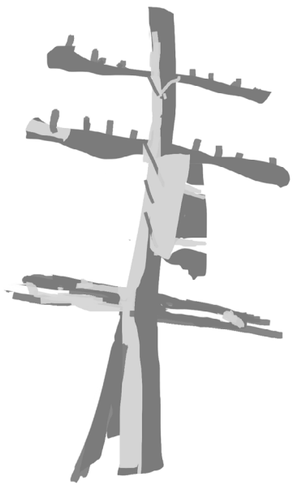
some scribbles of a cluster of buildings.

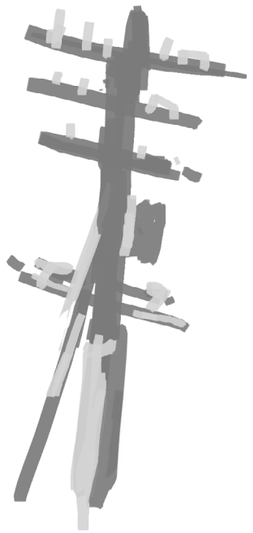






Here are some actual bent down telephone poles, after looking at a couple references. The structure can actually get a bit more complex than I initially realised, but for the sake of clarity and my lack of 3d modeling proficiency, I'll probably keep this prop low on priority as it will probably be in the distance anyways.





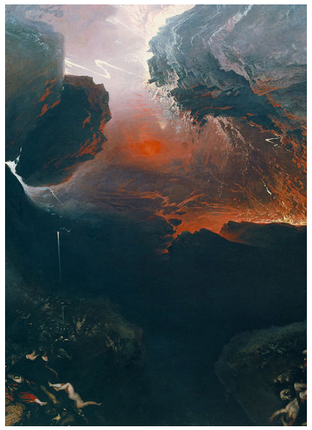
On second thought, I really like industrial, but not too technologically advanced feel of these poles, and I might include them closer to the foreground area in the scenes. I think a row of these along the beach/ sunken in water could provide an interesting breakup to linear perspective of a beach I'm imagining.

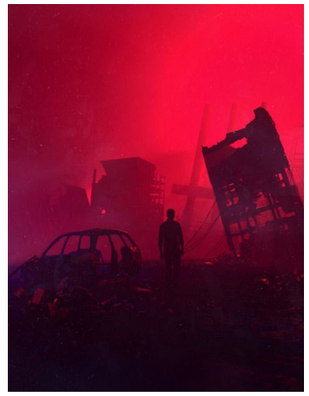












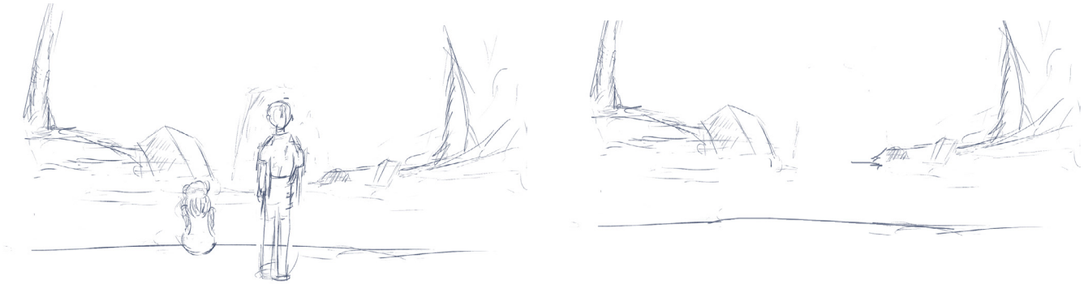
AESTHETICS MOODBOARD

Red as a colour just screams disaster and danger, and will definitely be used for at least one of the key elements. Red sky, red clouds, red sea, red land, red buildings, when something's not suppose to be red and is, really makes it discomforting to look at. The mood just becomes so ominous and off putting and I feel like it fits really well with the thematic of an apocalypse, raising questions like: 'why is the sky red? Is there a sun really close by radiating heat?' Or 'why is the sea red? Did something die in it or contaminated the water?' Maybe we associate red with blood and flesh, which is why we may find it so unnerving to look at, especially when it's everywhere in the scene, leaving no space for eyes to rest. It is already decided that red will be used, so what I'll really be experimenting with is how much red there is, where it is and why it's there.

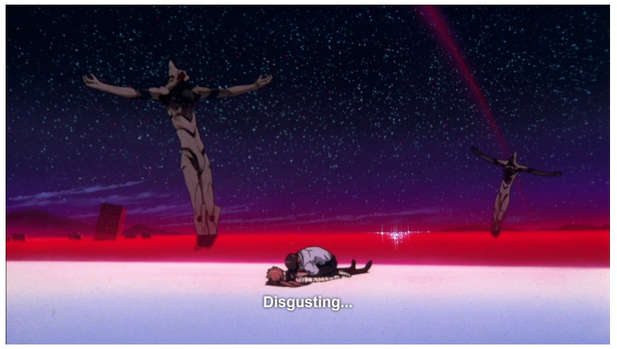


This is one of the most iconic scenes in the Evangelion franchise, and gave me the primary inspiration for this project. The composition of this scene, is as perfect as it is in the cinematic context of the story. However, the whole scene feels rather ‘small’ to me. The buildings don’t seem that far back, and lack a sense of scale. The perspective is also quite boring, but then again it is just a 2d illustration.

Divided by the sea of buildings and debris in the middle. I find the compositional of these objects quite beautiful when put together, despite the juxtaposition of these individual elements resembling a chaotic and desolate world,



After trying to sketch the scene out from memory, while making it less abstract by removing the floating head in the back. The composition feels really bold, almost graphic, simple but striking. I added some spikes/sharper objects on the side breaking the rather smooth and horizontally flowing aspects of the foreground and water. These sharp points of interest trap the eyes back into the scene, emphasising the emptiness in the skies. More foreground elements can help create an even more confined feel. After removing the characters from the scene as just a quick experiment, I found the scale of the scene immediately improved, I don’t plan on making characters for the world anyways as it would contradict my idea.

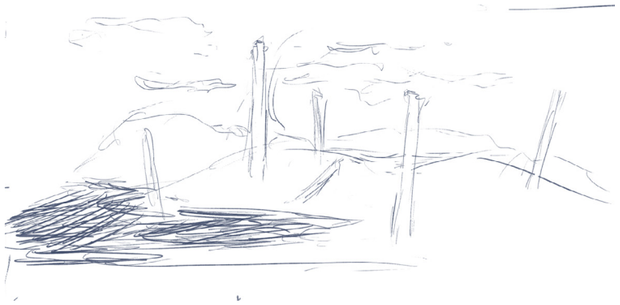




Some more reference from The End of Evangelion movie, having a quick look, and re-drawing it from memory helps me visualise what is the most important parts of the setting and simplifying it. Here, the humanoid figures known as evas are standing in a disturbingly celebratory position with their arms out, which I think raises many questions as to what happened here. This got me to thinking some sort of alien creature could have caused mankind’s fall, in my own world leaving something like a giant carcass somewhere in the scene could be really cool.

Not really sure when this scene took place in the movie as i don’t remember, but either way, I found this sort of barren landscape along with these metal poles as well as the overall colour palette being super dark, but also saturated creates a significant amount of discomfort. With the water on the side of these hills, makes the place feel more like a wasteland as the water feels like it doesn’t belong there. This is the direction to go if I want my world to be completely doomed, punished by some kind of evil god.

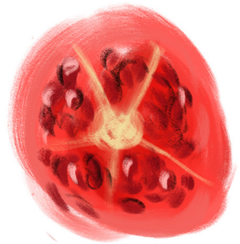


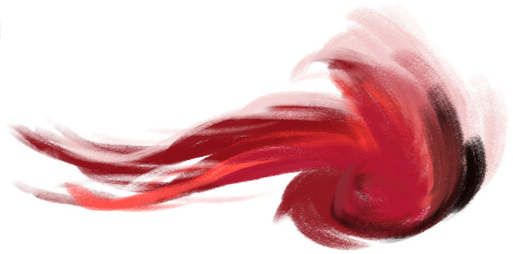




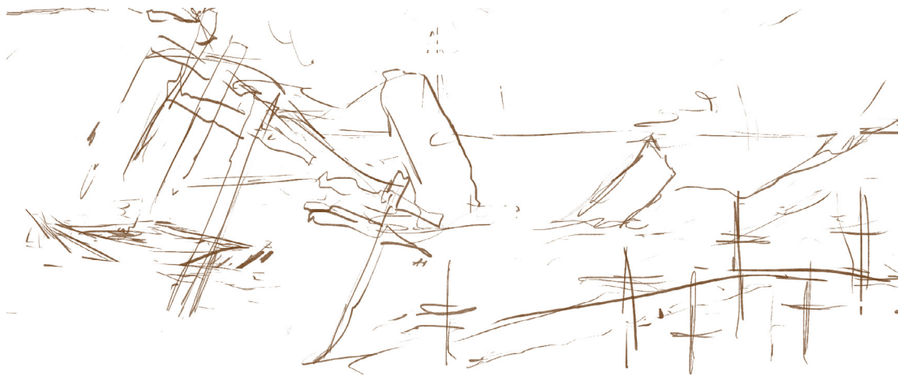
This was the result of some abstract experimentation sketches, where I didn't really pay much thinking as to what I was drawing, I just kept the brush moving and played with the colours and shapes. It ended up as some kind of alien infested plant habitat or something I'm not really sure, but it did help me grasp how attention demanding the colour red is, and it shouldn't be too overused unless that's the desired effect, which in my case, it certainly could work. I'm still trying to be reserved when using red however, as I do want some colour variety to create interest, but more importantly still make objects that should be recognisable, recognisable.



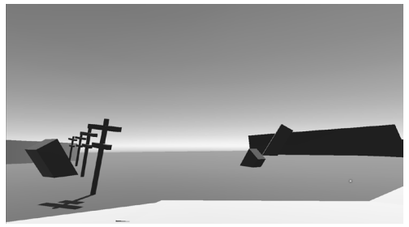




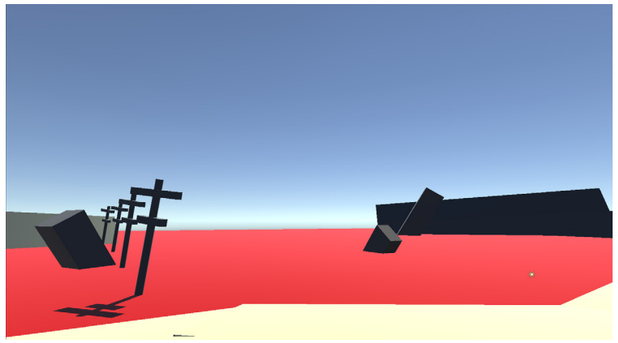
Did a few other abstract sketches focusing on colour harmony.

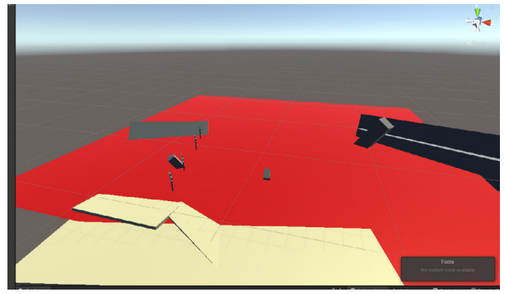


After procrastinating for a while, I finally decided to draw up a composition sketch using some of the previously researched and referenced objects. Definitely still kept the memorable scenes from Evangelion in mind, but working on changing the position and shape of the sand as well as the composition of the buildings to see what could be improved.

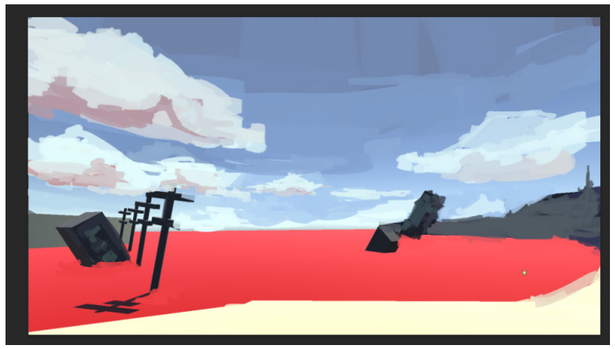


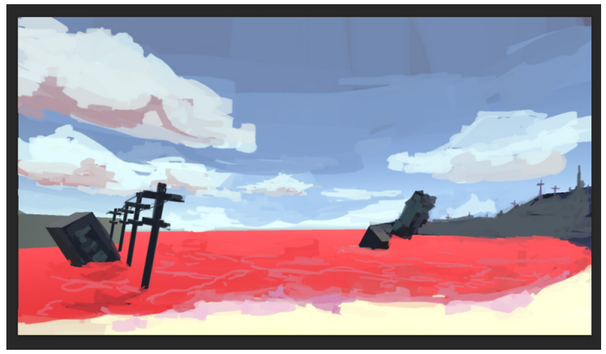
Finally got around blocking out the scene in unity, and really only using simple primitives such as cubes/planes to map out where things need to be.





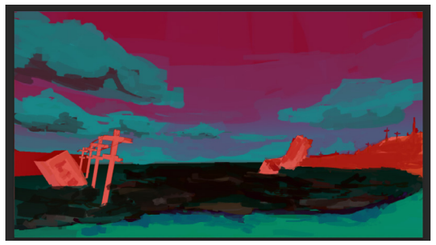
It surprised me how much space the scene actually took as the camera renders way further than I originally anticipated. I feel like after flooding the scene with objects I might get a but lost, still, a rather small price to pay to get the scale right. The first things I will probably play with in the production phase is creating a simple water shader with some level of depth and reflection, and a post processing global volume to add some dynamic lights/atmosphere.

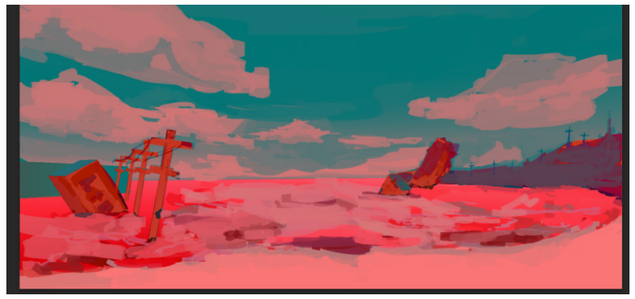




Painting over a prepared 3d concept was simpler than I had guessed, I will probably add it to my regular environmental workflow, as it provided a strong foundation to9 start. The perspectives and big shapes are already laid out so all I need to do is add some texture and volume variety, broke up the sky gradient into blockier shapes and it looks much nicer, good enough for a concept piece anyways.





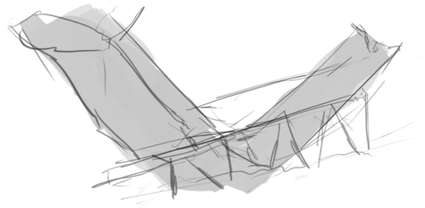


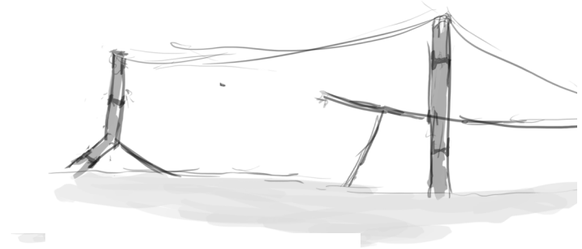


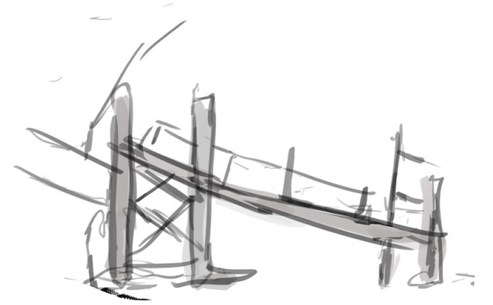
Playing around the colour variations and changing the mood by placing a flat colour and switching the layer mode until something interesting happened. The last one here definitely stood out the most, as the green sky although the shapes I painted are gone, feel so enclosed and hellish, without just simply cranking the contrast to the maximum.



After looking around at some more ruined infrastructure, I found this image of a broken bridge to be interesting. It breaks up the streamline of the water kind of like a dam, but water still passes through. Also hadn't thought about textures at this point, but objects that are sunken in water will probably be eroded in some ways such as rust. There is also quite a lot of room to play with the bridge's structure as to where it is broken, I think it would pair nicely with telephone poles.



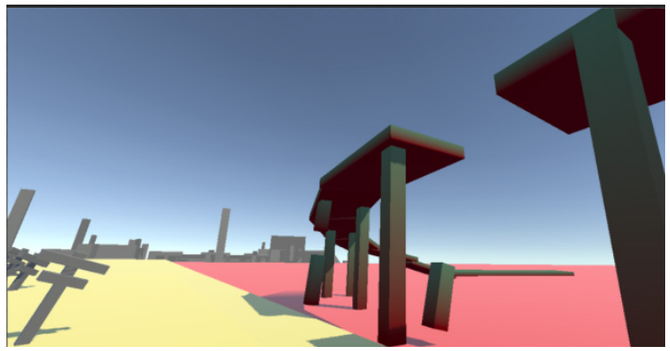


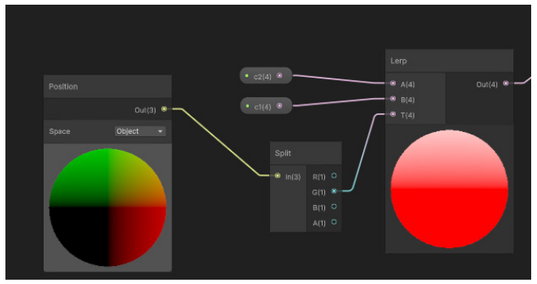


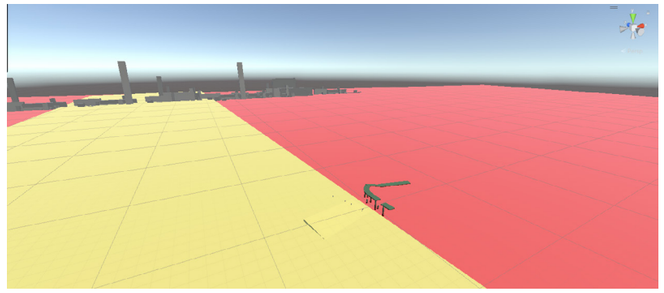
Without too much effort, i drew up another small composition sketch ready to be greyboxed and painted over, playing with the curvature and perspective of the bridge here.

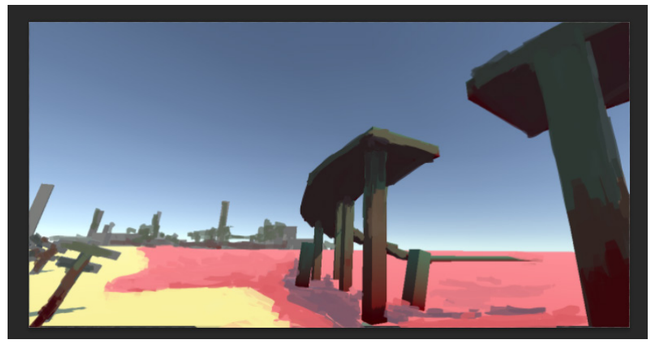


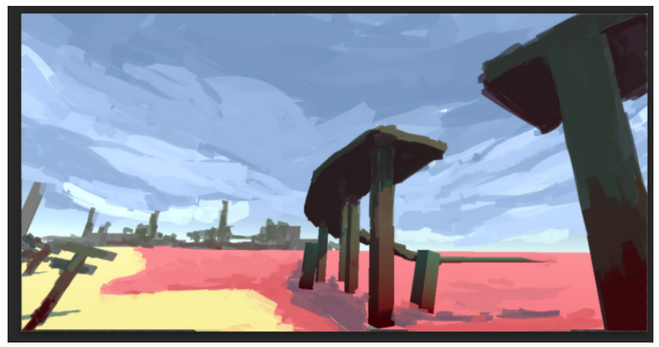
Pretty much the same as before, simple primitives, probably had like 80 cubes in the background buildings which I'll just make into a couple once I model them. A gradient based on y position was attempted here, but each bridge leg was treated as a separate object, not exactly the effect I wanted, but should work better when I model the bridge as a single object.







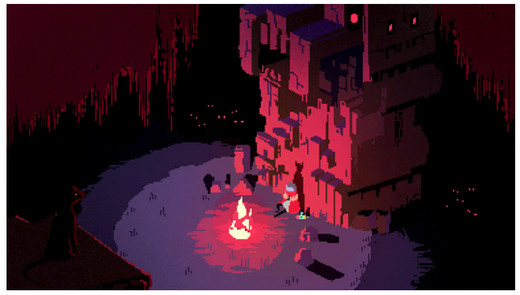




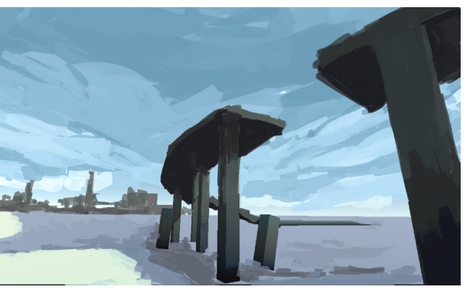
Again , quick paint over with some hue variation and added fixed the rust gradient on the bridge, looks much cleaner. Divided up the boring sky gradual sky, adding more camera perspective of looking up at the sky. There some space on the right where the bridge sinks into water, might add another land connection or something, feels a bit off sinking into the abyss like that.



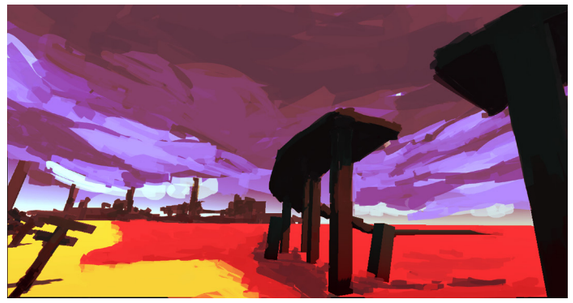




Tried the same technique from before, except changing the setting and mood to a night view. Didn't work that well as most of the lighter shapes just dissipated. The muted monochromatic colour thematic does look interesting, reminds me of something from hyperlight drifter, which is another world set in a post apocalyptic environment.



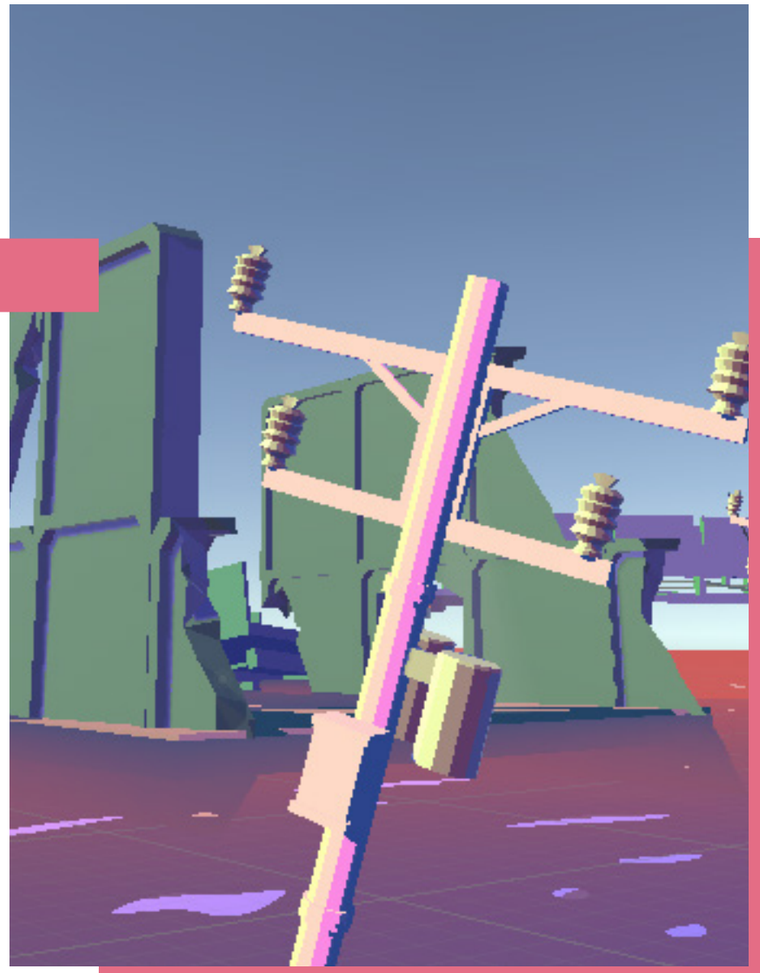
Shifted the hue to a soft blue, making the whole scene rather grey as everything is the same as the sky hue. This didn't look that great in the red hue surprisingly, as it felt too soft and pastel like. I originally thought the scene needed red, but this experiment opened that limitation.



Upped the saturation, and made the mood much more intense, not it feels like some sort of radiation had taken place and the red sea is the evidence. This got me thinking about what style I am going to render and texture the objects. I will probably going with a stylised but not low-poly approach, which I think is certain the most difficult, but most rewarding.

WORLD BUILDING

PRODUCTION STAGE



BILL ZHUOYUAN FANG

2023

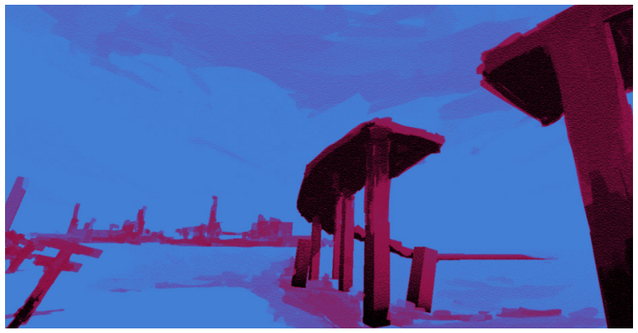


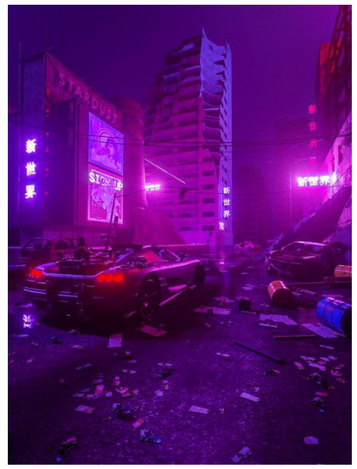
COLOR

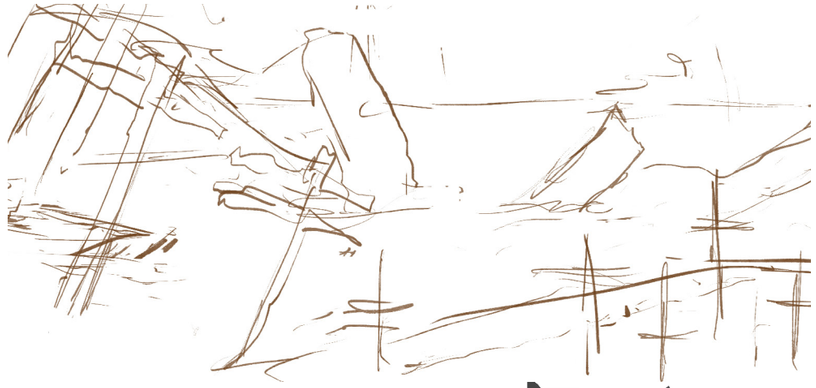
Vibrancy is celebrated, however still used with caution to resemble an apocalypse. Neon Apocalyptic, but not cyberpunk.

STYLE GUIDE

Something of the middleground in realism. A bit of grit and texture with ambiance added to cell shading.

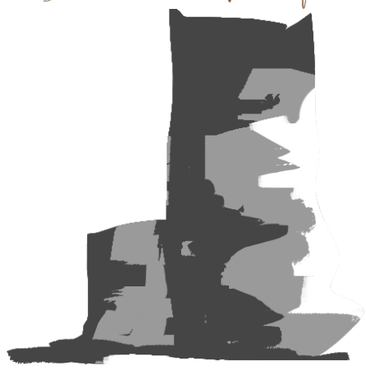






LANDMARKS

Roads, bridges buildings all of what is expected of a city-view. Manmade, but broken and aged.



TIME

Semi futuristic, but not fully dystopian. Religion is core, so historical buildings are welcome





MOOD

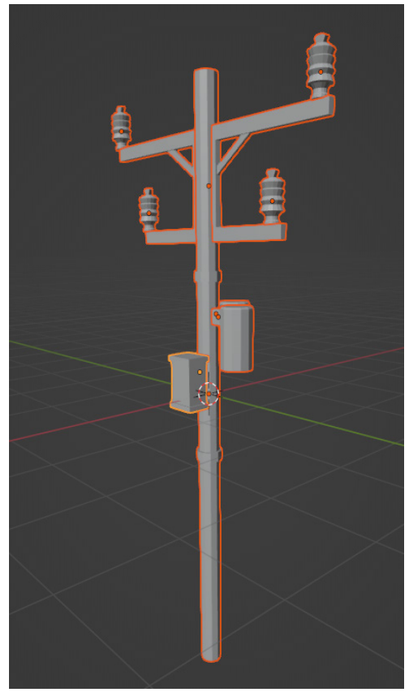
Emptiness is the keyword. The scene is still full of objects, but the viewer should feel that it is empty.











MESH

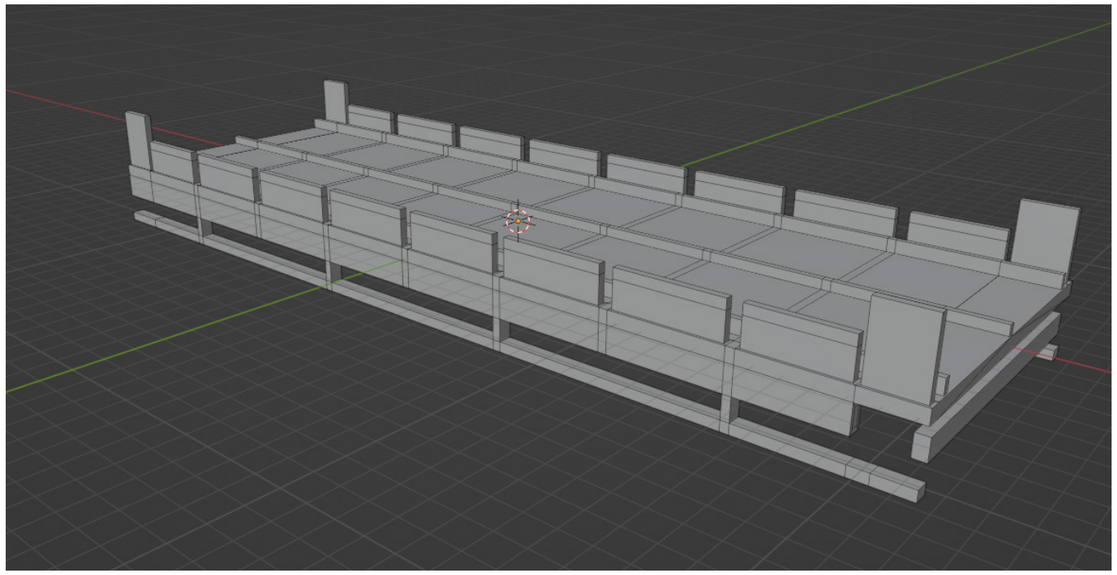
Keep the edges mostly hard, the sharper angles make it easier to style, only use soft surfaces when needed.

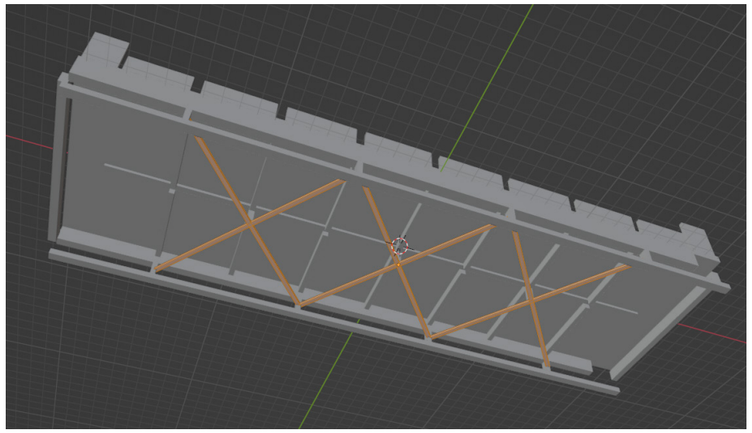
Textured	3d Models	Asset list
✓	✓	Objects
☐	☐	broken bridge
☐	☐	broken walls (5 min)
☐	☐	broken buildings (need 3 min)
☐	☐	church glass
☐	☐	church interior
☐	☐	church walls
☐	☐	telephone pole
☐	☐	water
☐	☐	clouds
☐	☐	

A small but progressing asset list, this will probably be much more relevant in the post production stage where I will be texturing assets that need to be textured, and iterating them in the scene itself.

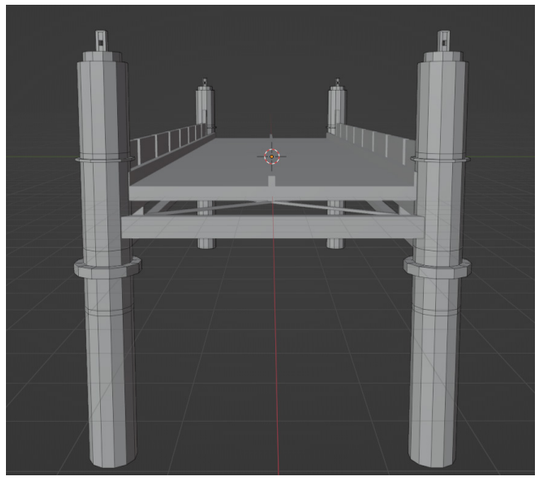
Completed	Started	Tasks
✓	✓	Project related tasks
☐	☑	greyboxing layout
☐	☑	water shader
☐	☐	reflective glass shader
☐	☐	ambient lighting
☐	☐	particles?
☐	☐	moving objects
☐	☐	post processing effects
☐	☐	skybox

This was more of a list of stuff that potentially could be in the final product. I'll probably be updating both of these weekly with new things I might try to make and ones already finished.
A hierarchy of importance isn't really necessary for me, as I feel like I would build the project from most important to least from start to finish anyways.

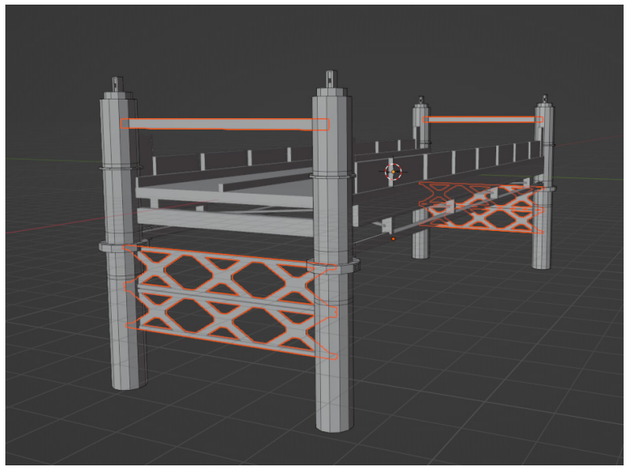




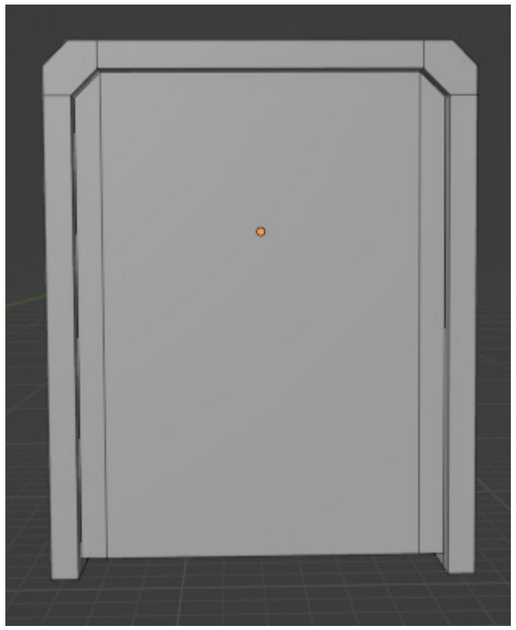
The first piece of architecture I made with blender was the bridge. Separation between the road part and the pillars was important as I'm planning to use this asset multiple times.



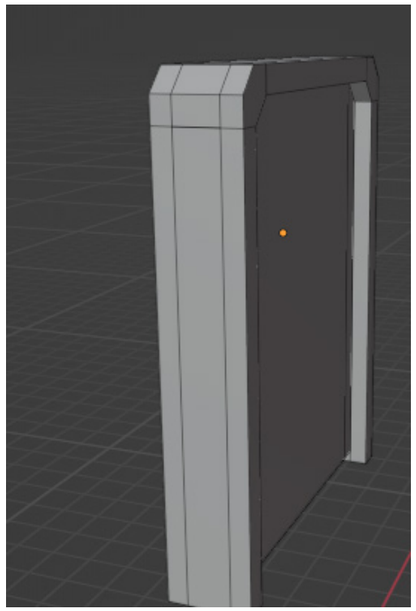
This bridge was supposed to be quite, similar sizes to highways maybe. Starting with probably my biggest asset was not the best idea, as I didn't really know how to scale of the object so it doesn't look totally out of place. In hindsight, starting with assets that are closer in size proximity would have solved this problem.



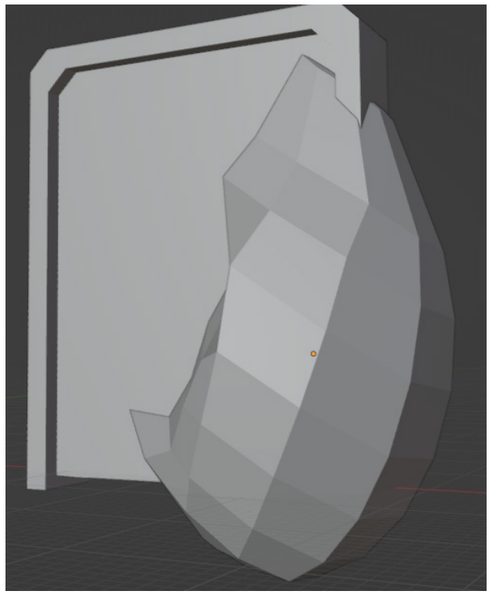
At this stage, I wasn't really sure how to 'break' the bridge apart. References I looked at all seemed to have modeled it with breaking it apart in mind. Going back, loop cutting and deleting everything seemed really inefficient, so I decided to just finish it as it is and maybe make a new one later.

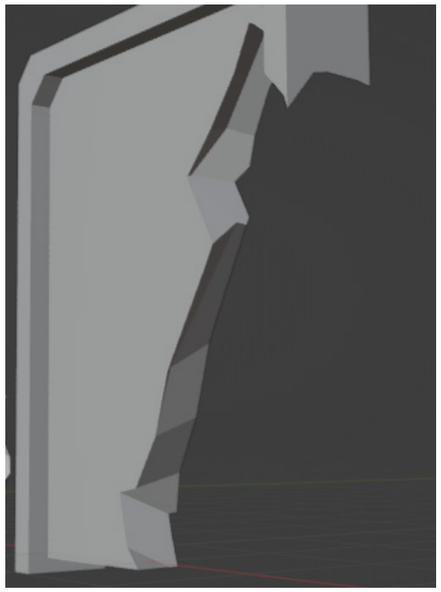


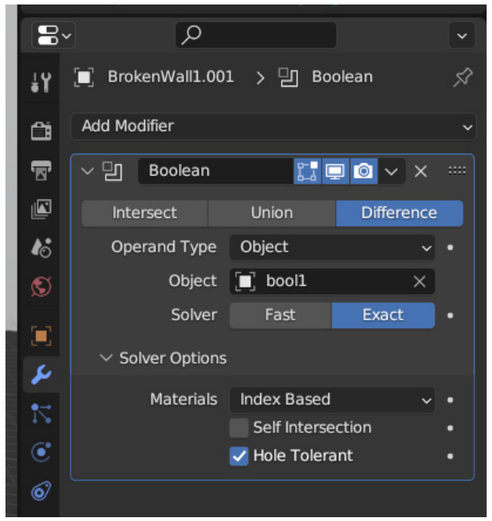
These were some simple walls with slightly rounded corners, I plan to place them on a platform, that resembles the supports of a large building.



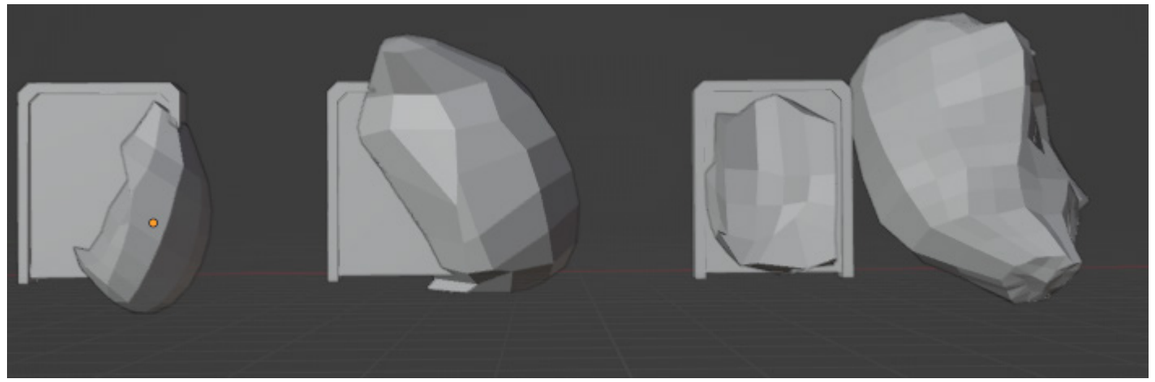
This will probably be one of the assets that gets some texture due to its flatter surface, since it's meant to be metallic, some gritty rust might look nice.

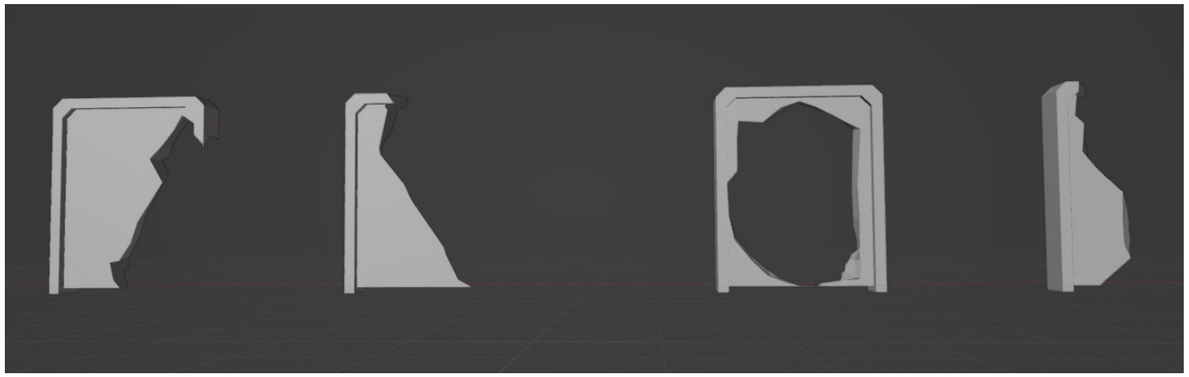






Here was probably the biggest breakthrough for my 7ish week journey in blender. I figured out (sort of) how to use the boolean modifier, which I've never used while I was using Maya before. Or what ever the equivalent is. Basically minus an object from another object, easily creates these ruptured surfaces through the sides of the walls.



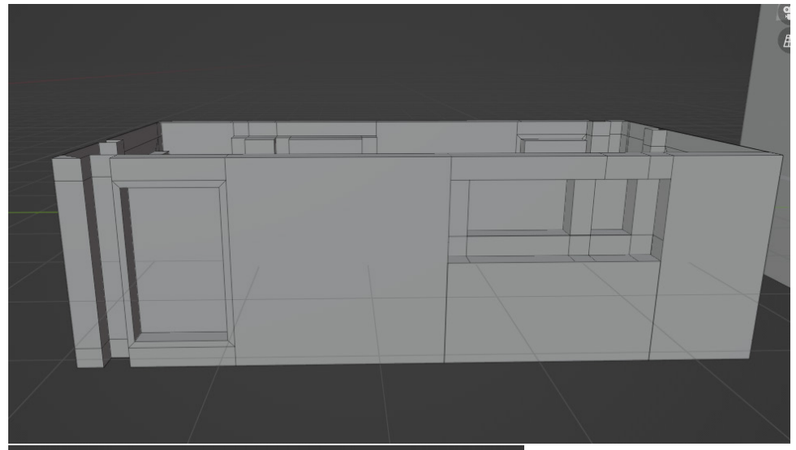


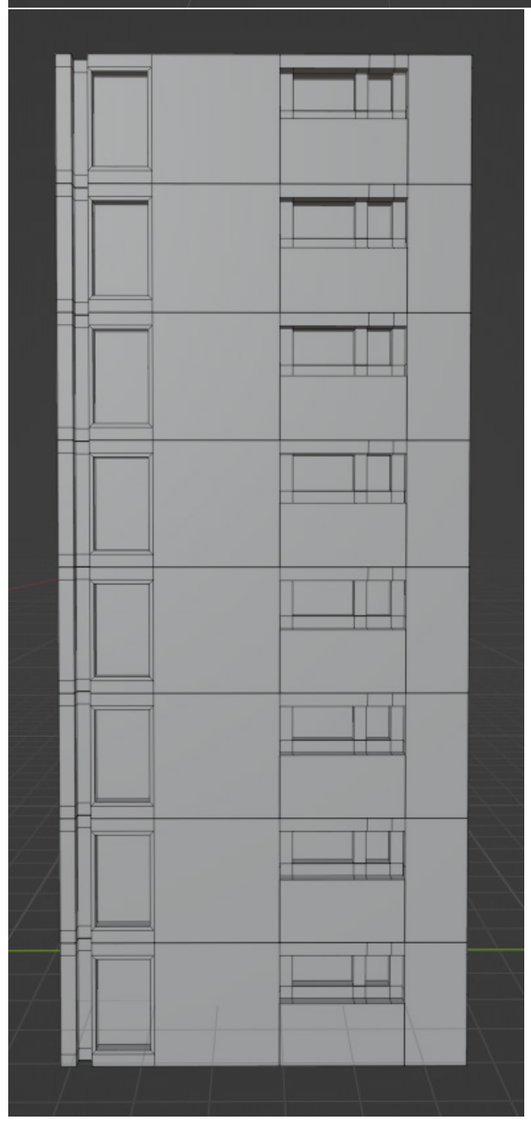
Repeated the same boolean modifier effect on a couple more walls and now we have some building blocks to play with.





For reference, these were the buildings walls I based the models on, I quite like how they resemble some factory or some kind of open spaced larger scaled building,

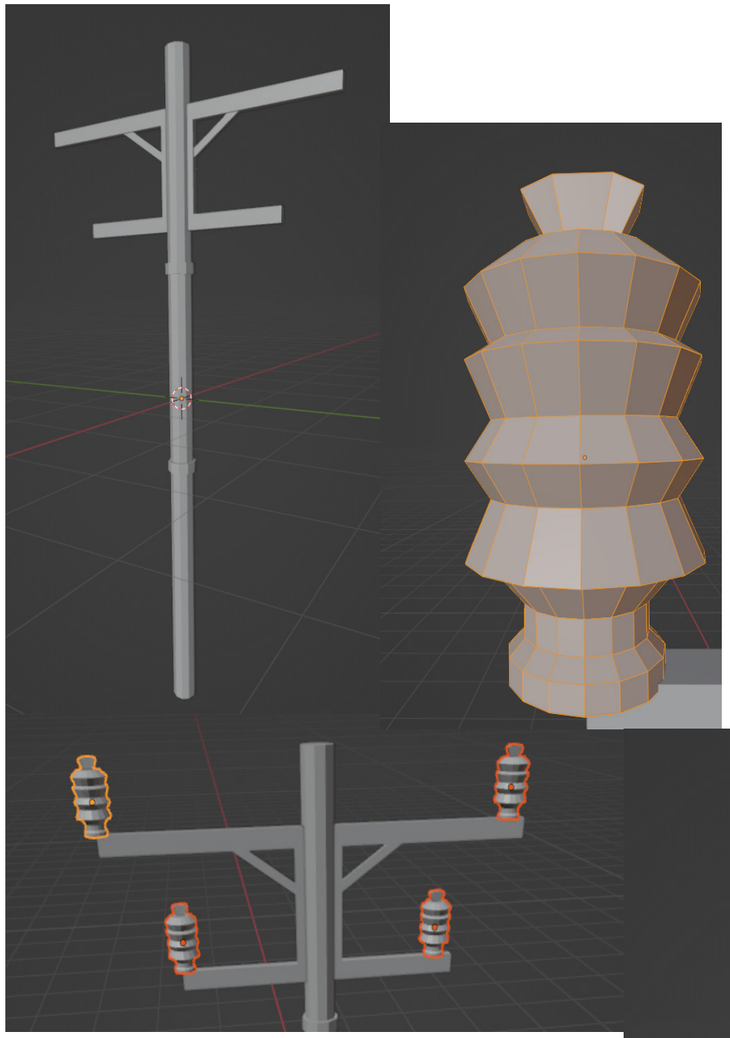


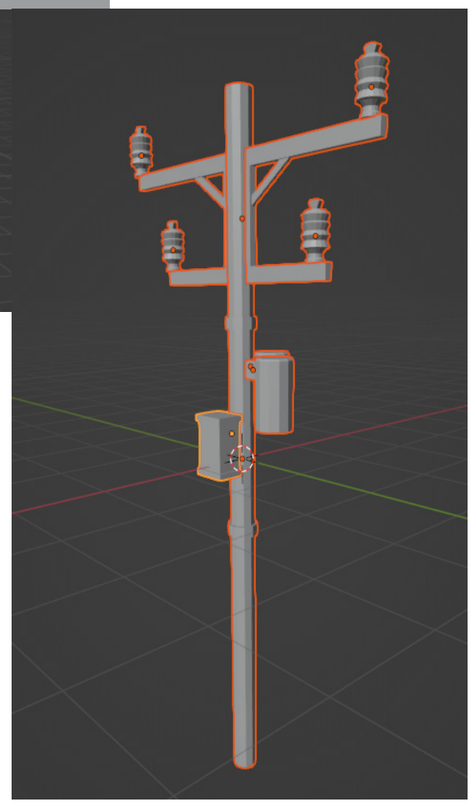


This was mostly an experiment to see how to layer buildings. I initially tried to extrude each floor up, but found it very difficult to maintain the crevasses of the windows and doors.

Simply modeling a single floor and copying it up was much simpler, while also making it easier to unwrap if I were to texture it.

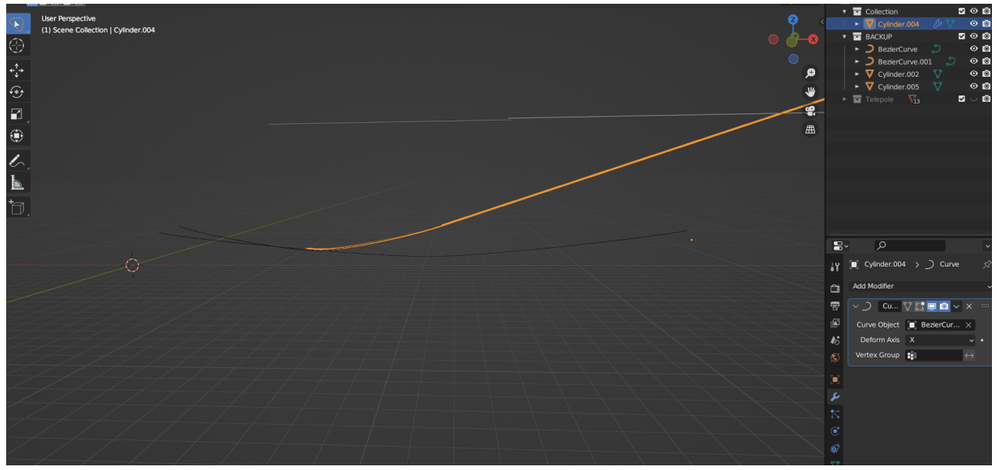
Still, I probably won't be using this model since there are some unfixable gaps and other topology errors, using a boolean modifier just exposes the errors. Maybe this could be a smaller building in the distance, but it would be much better to start from scratch for a better result

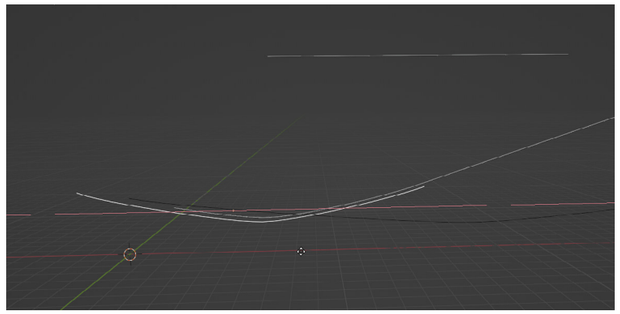




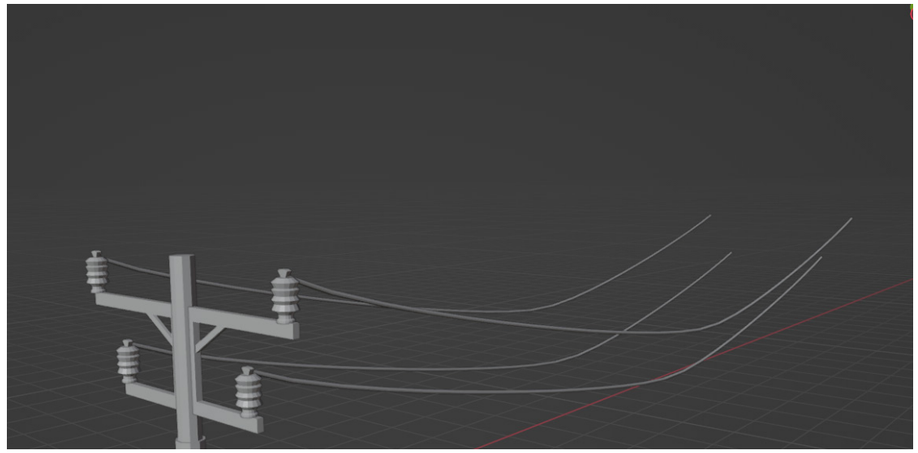
I didn't really want to repeat the boolean mod on all my assets, so for the telephone pole, I decided to model each part separately so each part can be removed if needed once placed in the game engine.

After pulling around the edges, the shapes started to emerge, the extra cylindrical power banks on the sides really sells that this is/was a function electric pole.

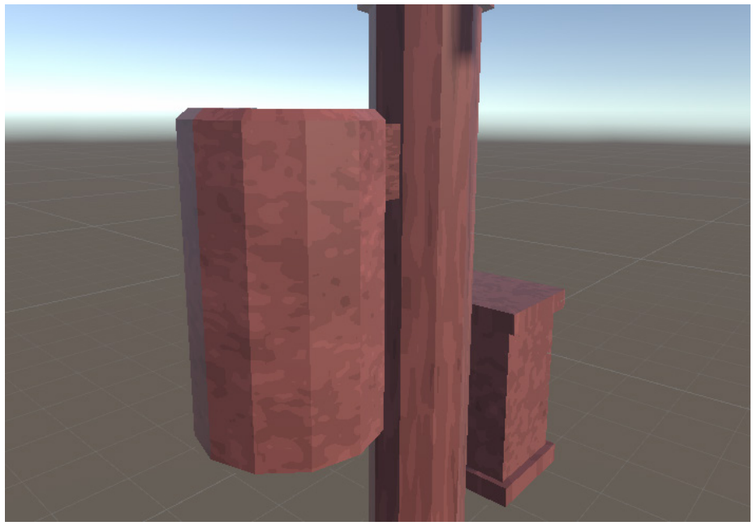




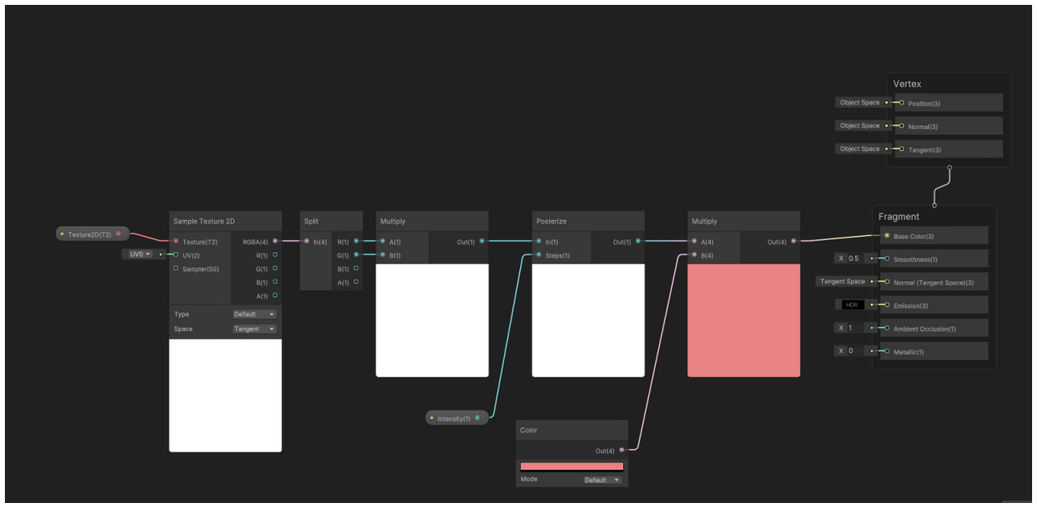
I was struggling here with iterations on the wires themselves. I felt that it was absolutely needed to make this telephone pole stand out and recognizable. Getting a natural curvature was really hard, especially if I wanted to keep the poly count to a reasonable amount.

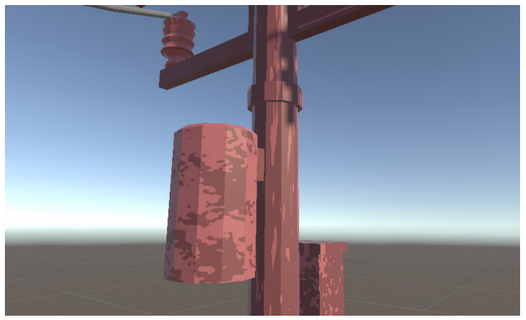


Was pretty close to giving up here and use a 2d simple plane and draw over it, until I searched around and found a guide on how to use bezier curves to shape the curvature. However, changing both the curve and the mesh itself was rather difficult after adding the modifier, so I had to remake the mesh a couple times to get the length right.

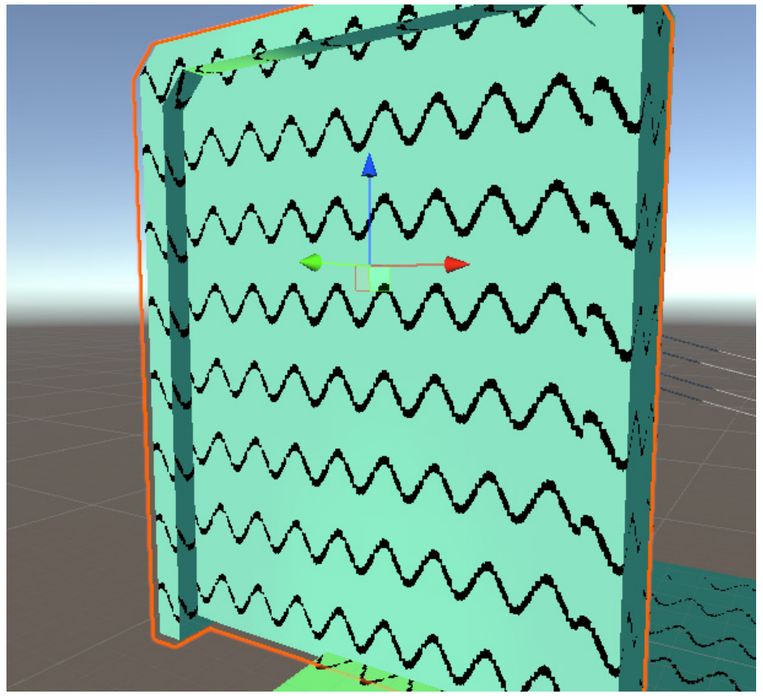


I felt that I had enough models to make a small scene in unity now, also wanted to switch things up a little. I also wanted some of the results I can get without texturing in a proper software, as I have more experience with shaders now.



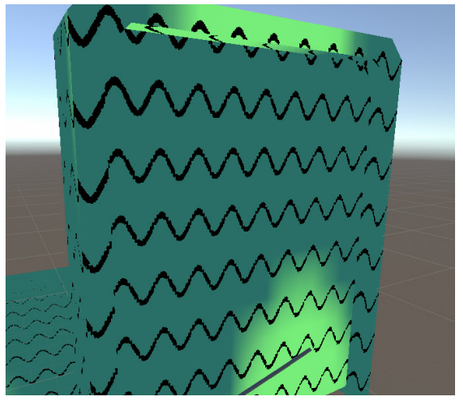


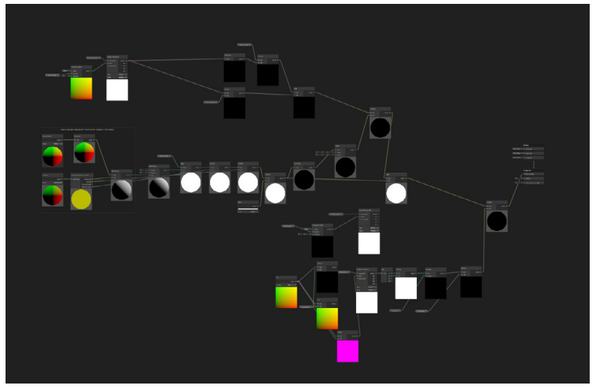
The goal here was some kind of muddy or rusted, scratched surface and it turned out okay, but the models would have to be properly unwrapped to get a nicer look. The alternative is to apply different materials with varying intensities on each part, as I had modeled them separately anyways.

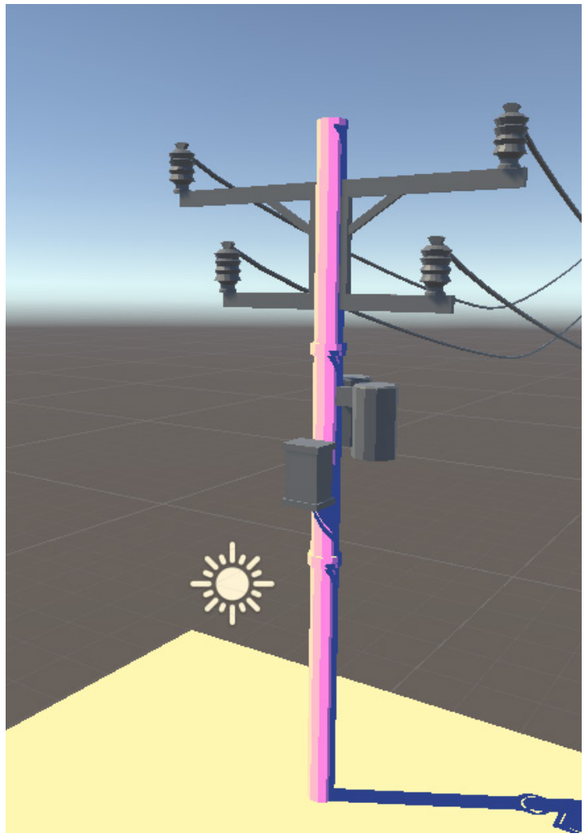


This was some experiment with coloring in the shadow areas with a pattern. It doesn't really work as shown here as I couldn't figure out how to make the texture only appear in the shadow areas.

But moving forward, this probably isn't the style I'm looking for, with patterns and drawn lines on flat colours, I'll probably work towards more rendered, gradiating look.

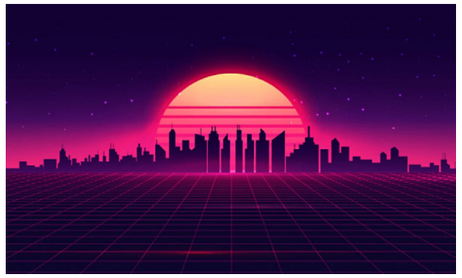


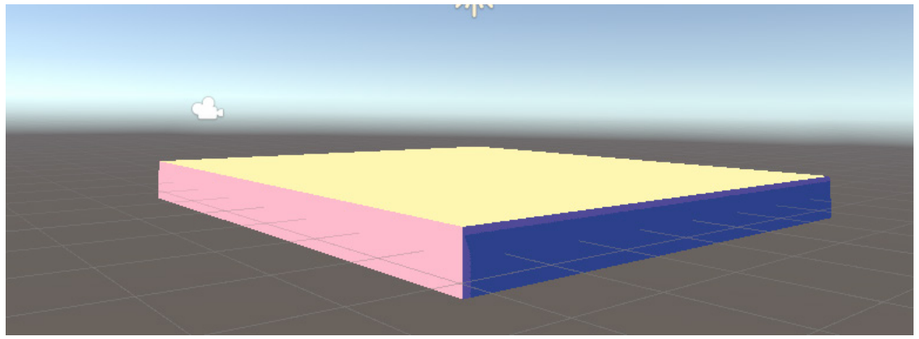




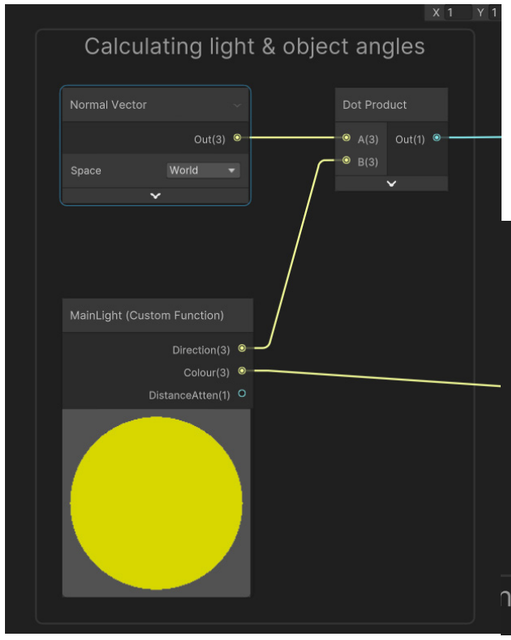
About another week or so of focusing on shader stuff, I landed on some pretty nice looking effects. It was an unlit shader with a sort of baked shadow color, but it would still react to a change in the light source.

The main color thematic/goal was inspired the neon-apocalyptic style as well as synthwave aesthetics from the mid 2000s.

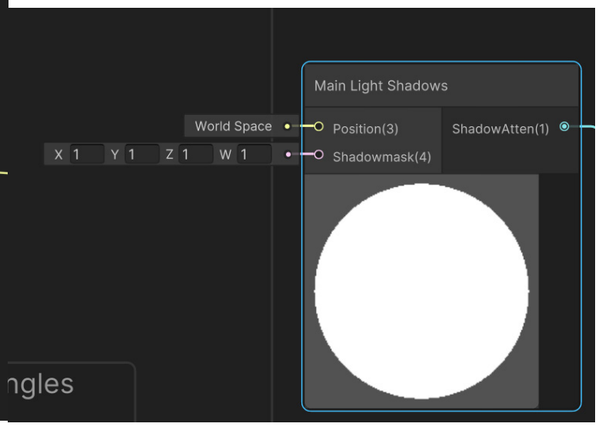


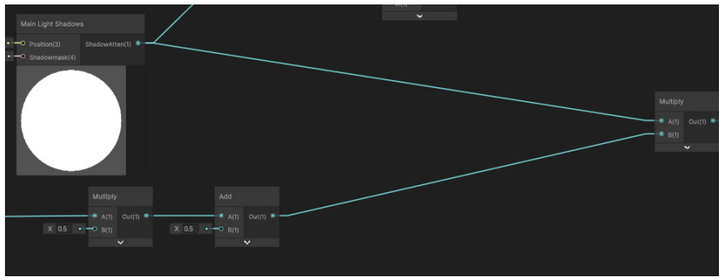


What really gave this shader its definitive look and why I decided to not just use a simple lit material, is that the shadow color isn't just a grey flat shape. The effect I'm trying to create here is a faking a secondary light source that is adding a degree of vibrancy to the shadows.



What allowed this effect were these 2 custom nodes that grab the attenuation of the main light source and shadows in the scene, allowing other nodes to directly modify them.

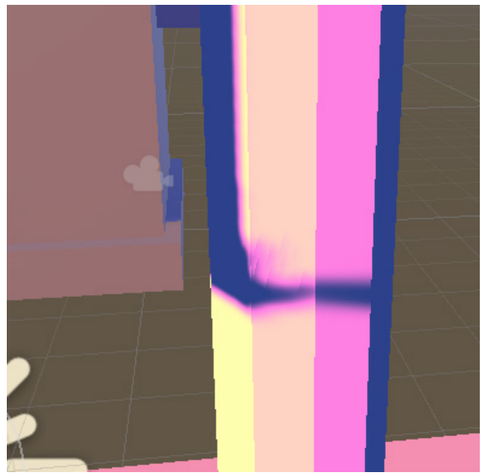


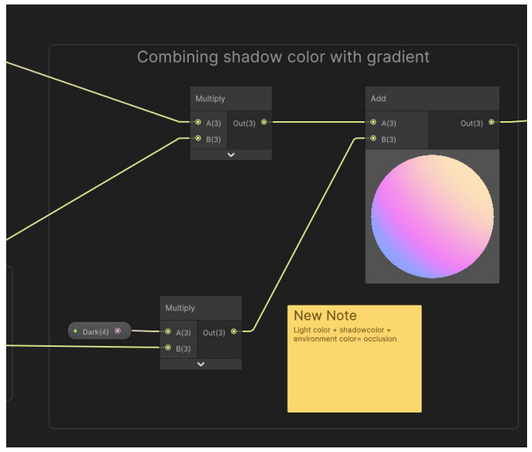


With this calculation, I mapped out gradients at intervals 15%, 50% and 100% to be the shadow, midtone and light respectively, adding a color variable to each point.

To make sure it remains a 'fixed' gradient, meaning it wont transition smoothly without a normal change. This allows the geometry of the object to be fully shown with all the angles, which I can manipulate in blender by selecting smooth or flat shading.

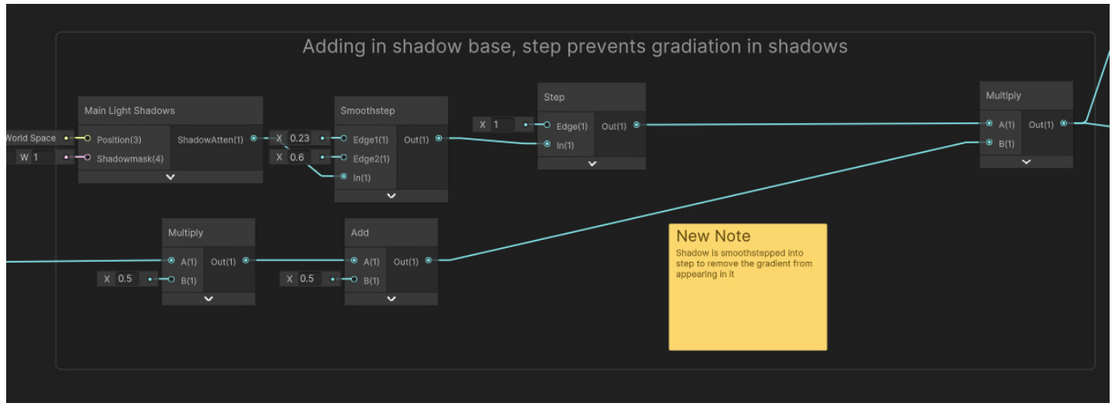
There was one problem that bothered me a bit, the shadows had this weird bleeding effect, which would be okay if it remained consistent. But it didn't as it reacted differently on what is causing the shadow.

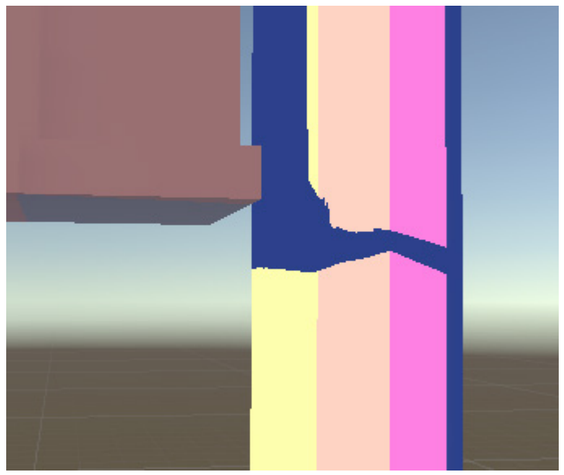




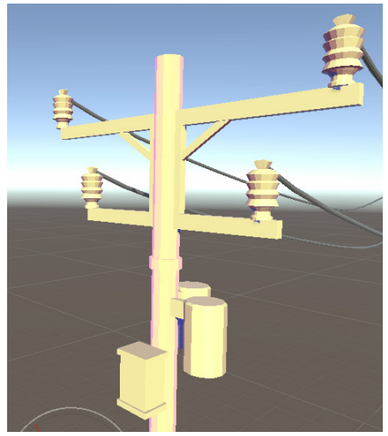
This issue took a while to fix as trying to step the shadow messed with the lighting calculations, which caused the light to appear in midtones and midtones in shadows.

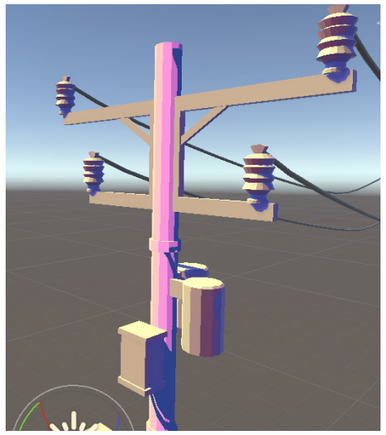
Later I figured out it was a problem with the gradient node and figured it was better to remake gradient by using 2 different lerps and 3 color properties.

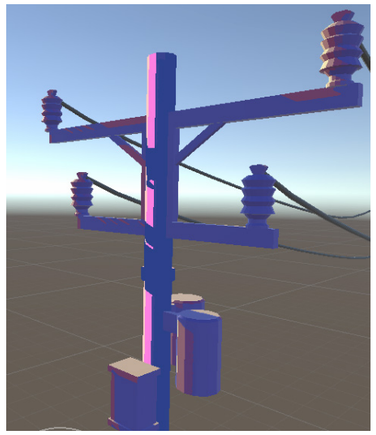


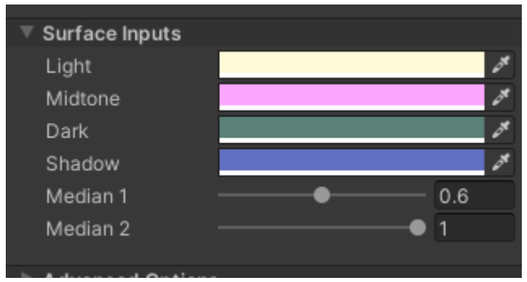


The issue was solved and the flat shadows looked much crispier in my opinion. The gradient was now also accessible inside the inspector, which wasn't possible before, as unity currently doesn't not allow access to sample gradient without specific coding.





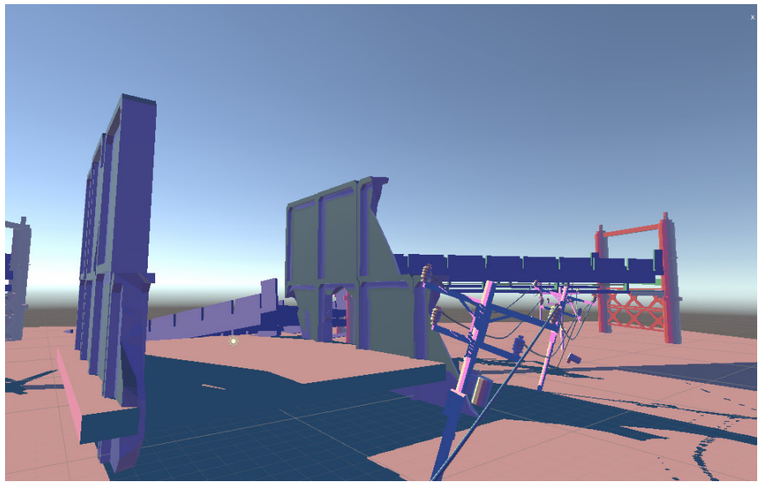


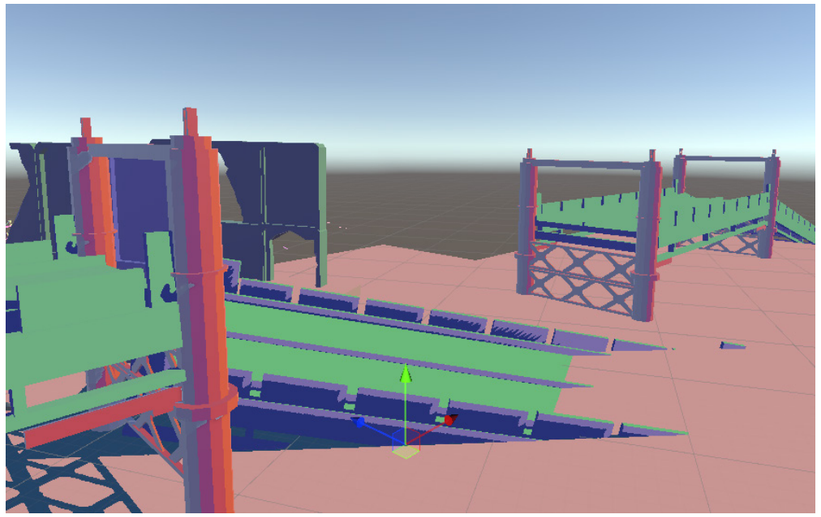


And that's how the shader is created, here seeing it fully functioning with real time lights.

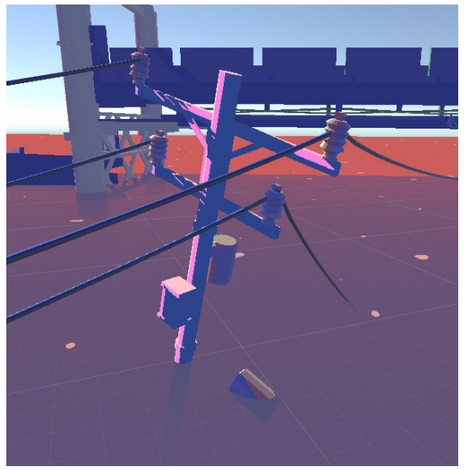
I later duplicated the shader and made a metallic version with a bit of specular for the wiring and metallic parts of the scene.

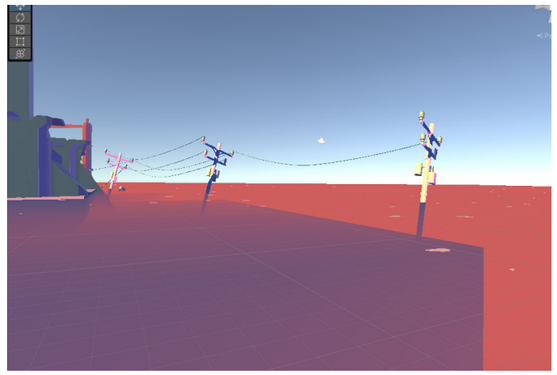
Laying down some of the assets I made earlier, I made a small scene diorama along with using basic unity primitives. Created a bunch of materials using the same shaders, and messed around until a nice color harmony was achieved.



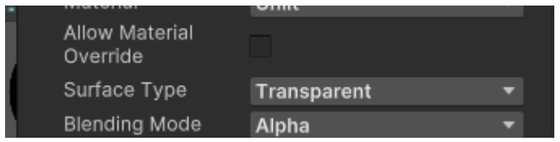


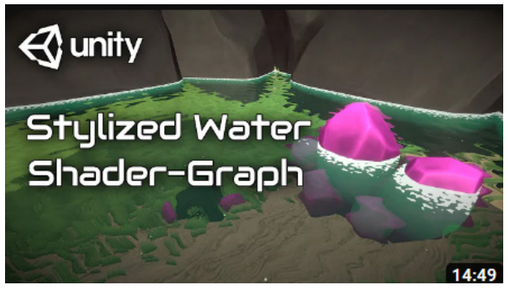
The bride will probably be the first remodel I will have to do as it simply looks too out of scale. Theres just not enough details making it look more like a toy bridge, this is a scaled down version of what I anticipated already.



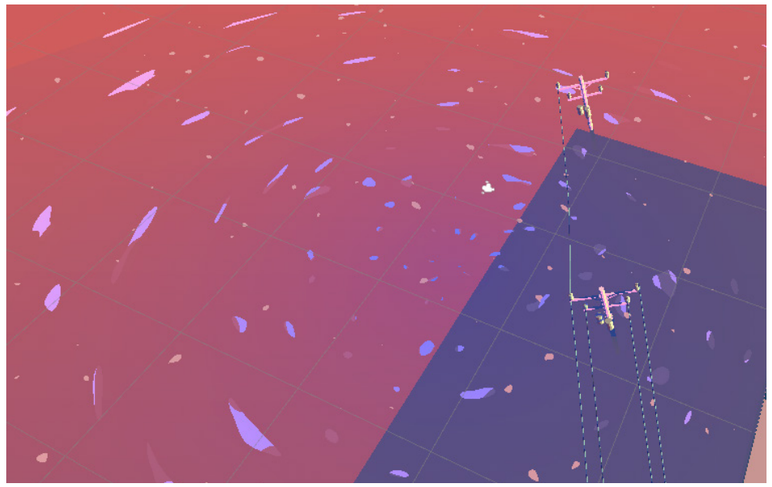


Making the water shader was a bit mind boggling as i had a pretty different result as to what the video had shown. I later figured out the water refraction wasn't really working with the camera.

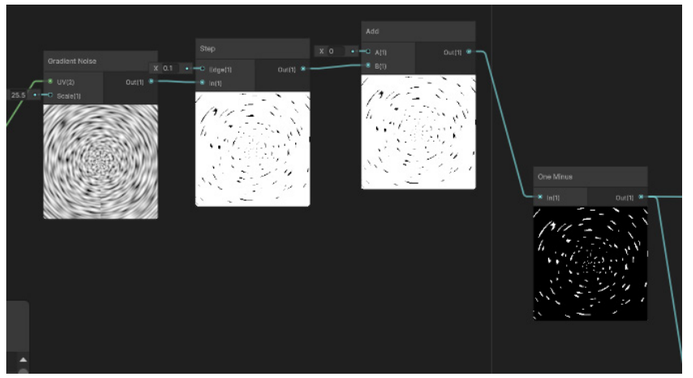




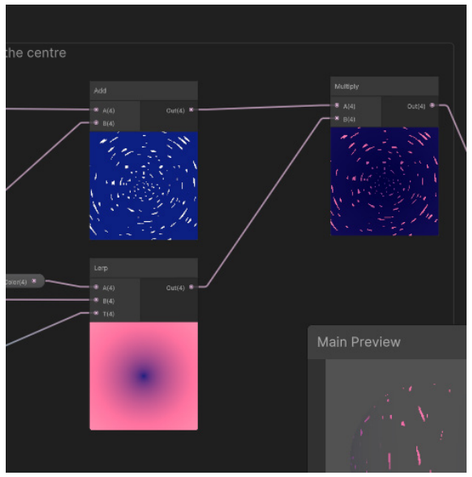
This was how it was done in the video.



I didn't find a solution in the end and just went with what I had, a simple transparent cube that gets darker as it got deeper.

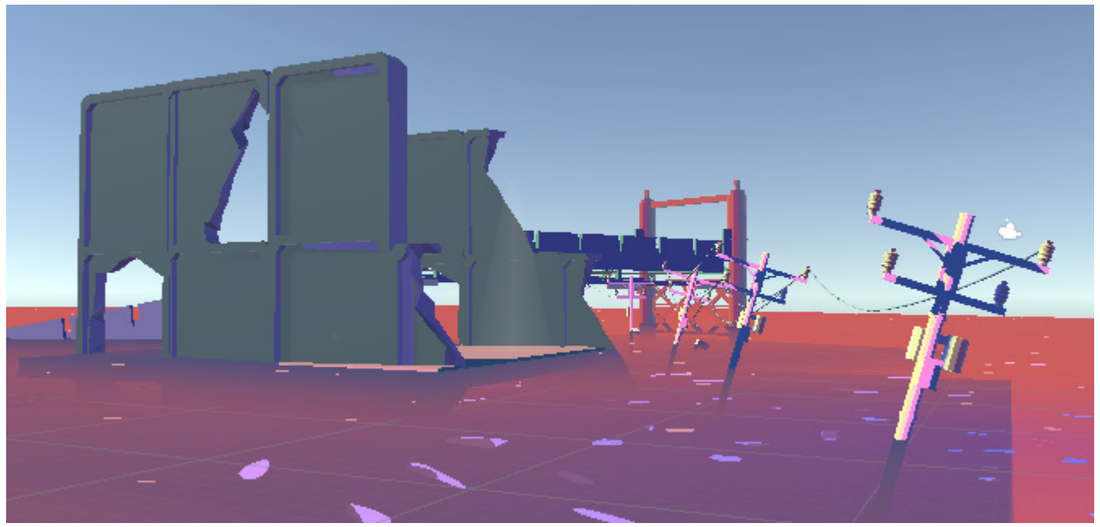


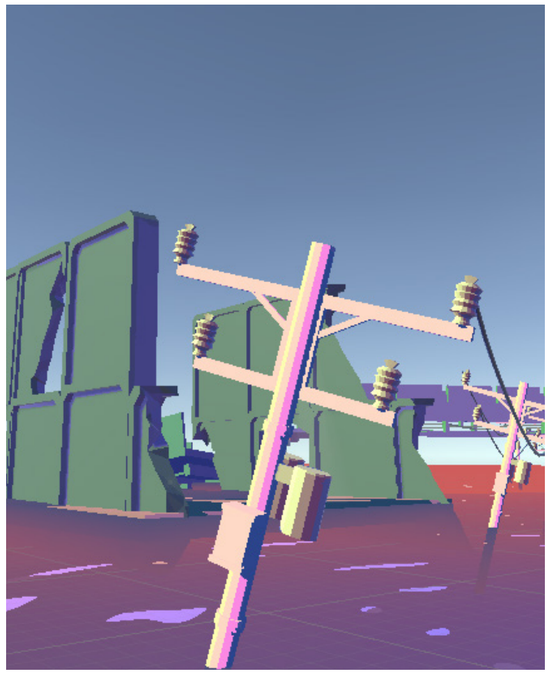
After learning to use the polar coordinates node from tech art class, I decided to make a whirlpool on a plane that sits slightly below the water. The foam of the water itself was simply just moving towards one direction, with the whirl effect, theres a bit a variety.



The technical side was rather simple as I simply made 2 different circular patterns with noise then had one spinning in one direction, and the other as a mask alternating the alpha channel of where the original would show up.
The coloring was just a circular gradient going outwards

I felt pretty good about how it's heading so far, although I probably had spent a bit too much time making everything look as perfect as it can, instead of making more/better models. I definitely had enough time to remodel the bridge, but i chose to simply leave it in the background instead, hiding the less appealing parts of the scene.



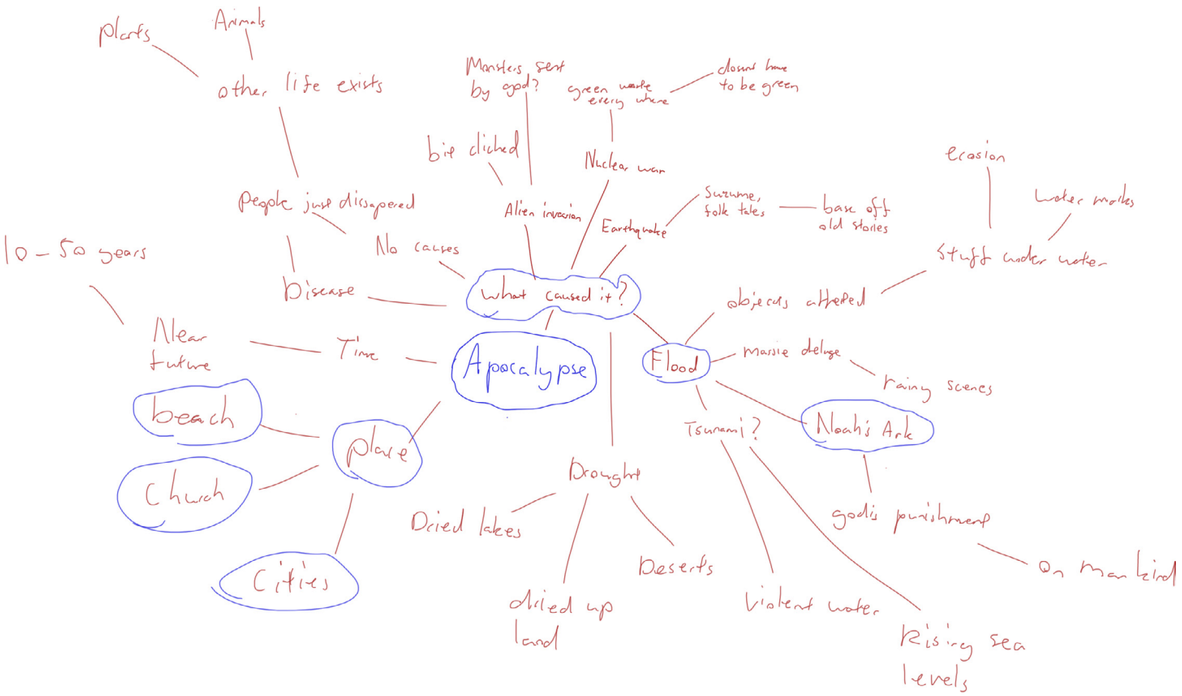


Still, I feel quite impressed with myself at solving a bunch of these issues to create this nice looking scene. I just fear that from now on, not all my creative decisions will be beneficial as it's at a point where I'm fidgeting with smaller details, but I do feel like this could be pushed much further, like a properly rendered sky maybe hand drawn or going back to fix the water refraction.

TECHNICAL OUTLINE

Looking back, I feel much more confident in both my 3d modeling skills and shader skills compared before I started this project, both of which are areas I struggled with last year in GDS2 so I am quite happy with my progress so far. I still have a couple assets missing such as the church and all its related assets, which I might make a separate scene. Moving forward, I still have one area I haven't really touched yet and that is properly texturing my meshes, which I will hopefully get to in the coming weeks. I'm not really looking forwards to it since I know it will probably stress me out, but I also know I eventually have to get to learning the process some time. Aesthetically, I feel like the project is already at a good spot, without too much needed, just a couple remodels. But also at the same time, I feel like I haven't done enough, when I started the project, I envisioned the world to be more grand and full of assets, from the most recent experiment with the diorama proved that a scene doesn't need to be super complex. So I am left at this weird mindset where I want to spend more time and effort into this project, but unsure where.





I thought about my world a bit more, and realised it was missing a clearcut story of how the world was destroyed. I really should have made this at the start of the production stage or even better, before in the pre-production stage. This would have helped tremendously with making the style guide and asset creation overall. Better late than never, this still helps give me a list of possibilities. After watching Suzume, a film that explored earthquakes and tsuna-mis and connected them with supernatural folktales, I am currently learning towards a flooded world with a story around Noah's Ark, well that's the only flood story I know of. I think I will look at more mythologies about floods to give this world the backbone it needs.

WORLD BUILDING

REFINEMENT STAGE



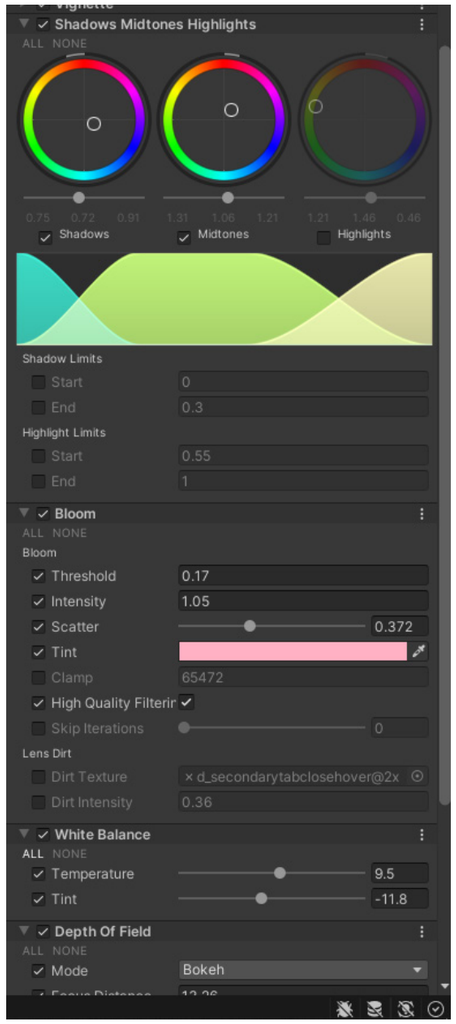
BILL ZHUOYUAN FANG

2023

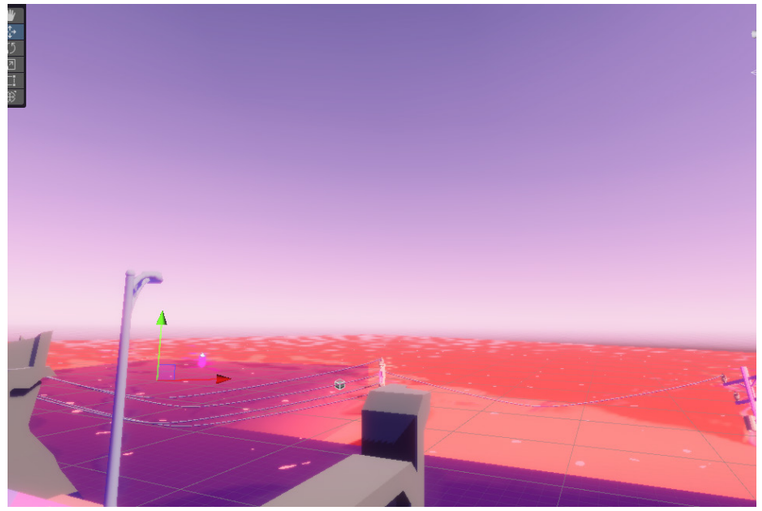
After reading the feedback from assignment and other peers I showed the progress to, I've decided that I probably should spend a bit more time planning rather than just making. I've updated my asset list to be more detailed, and having a priority for an easier direction to follow. I don't really view each object as a separate deadline, but rather the whole thing is due when it's due. I do agree that a massive priority needs to be placed on some of the key effects I've neglected up until now, such as post processing and skyboxes. The color palette is something I'm quite proud of and probably won't make many more adjustments as it took a lot of experimenting to get here.

☐	☐	1	clouds	hand painted prob
☐	☑	3	pylons	extra tele poles
☐	☐	9	skybox	
☐	☐	5	debris	
☐	☐	2	water reflections	
☐	☐	8	moving wires	wind direction incorp
☐	☐	10	post process	wait until end to fine tune
☐	☐	5	particles	

I don't really feel like I need a paint-over as I haven't achieved all the desired effects I wanted from the originals yet, but I've worked in different directions leading up to where I am, which is much better.

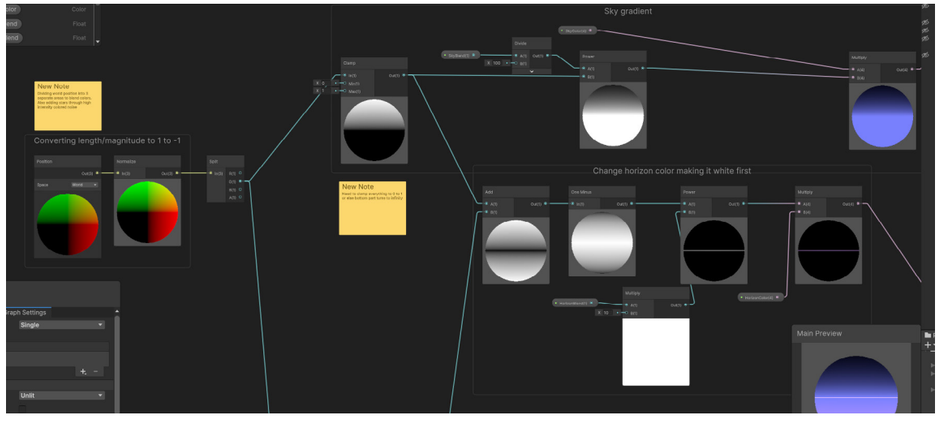


I was already quite accustomed to using the global volume in unity, but I hadn't used many parts of it especially in conjunction with shaders and particles. Since I don't have everything ready yet I just ended up not spending too much time on,, and just add some color adjustments

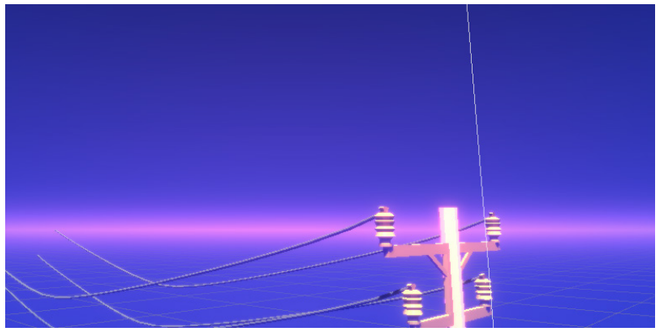


I also experimented with some procedurally generated skybox clouds, but they didn't look so great as the quality of the noise just felt too poor to be used in a stylised scene

After looking around skybox shader tutorials, I found a procedural star filled sky shader done with noise.



The sky shader itself was quite simple, basically lerping a color on top of a hemisphere for the sky, and flip it upside down for the ground, with a horizon in the centre. I didn't really have to even listen in to the video to understand what was happening, which me a little bit proud of my progress over the past few months.

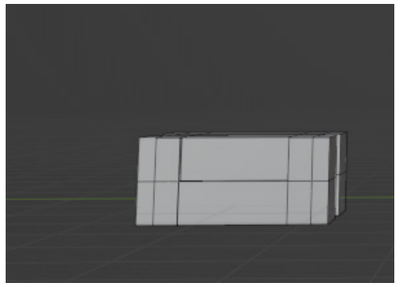


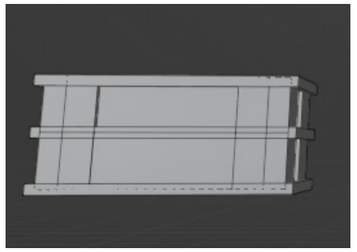


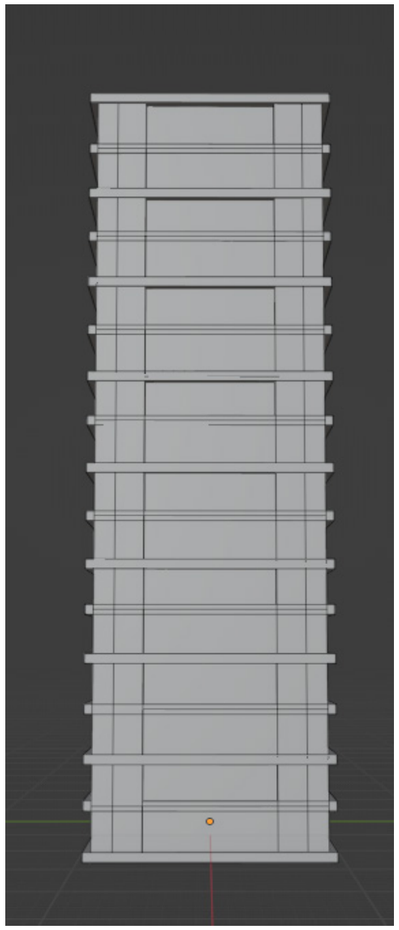
The stars were a bit more complex, despite being fewer nodes, but still nothing to spend hours thinking over. A noise is placed very far away on the y axis, with the a random range of colors, a lot of the noise is then blurred out and added onto the sky hemisphere. The colors from the random range have to be really intense and also requires post processing bloom to get the desired effect of a shining star.



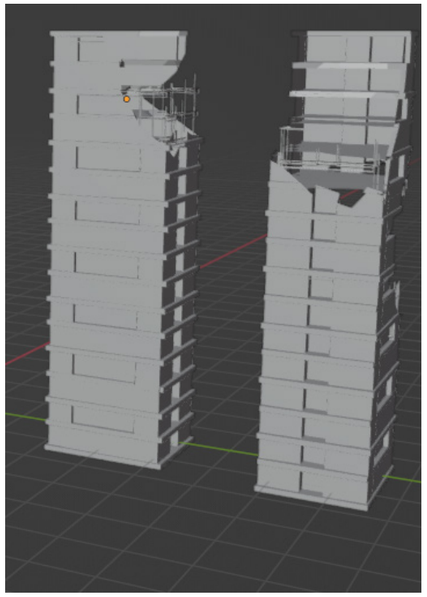
After tinkering around with the intensity and distance parameters, I feel like this is good enough for now. I originally planned the sky to be moving along with the lightsource, to determine weather it's day or night. But after a bit of consideration, keeping the scene at night time just feels right for the aesthetic I am hoping for.

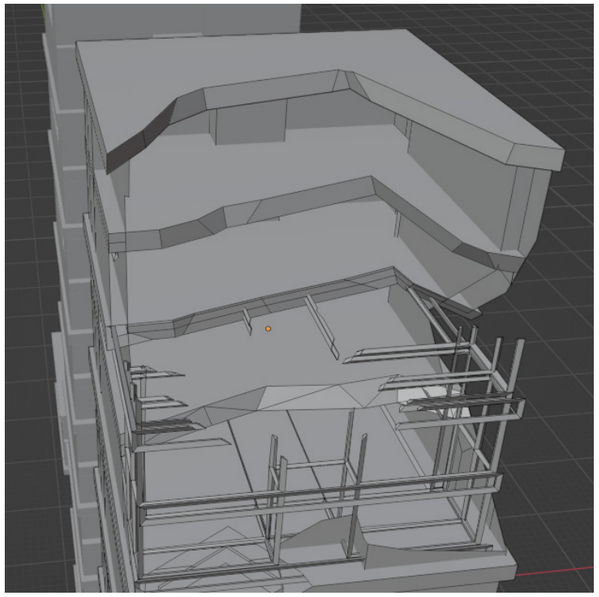


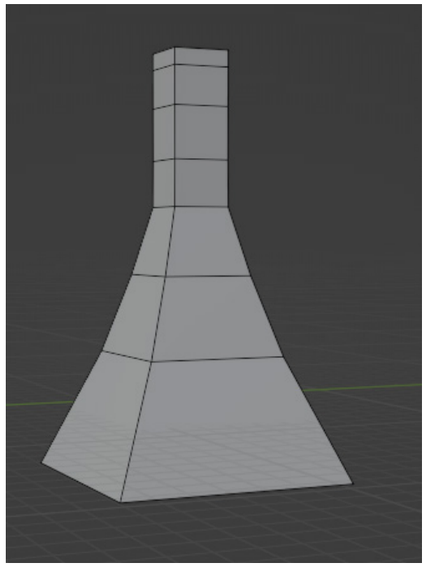


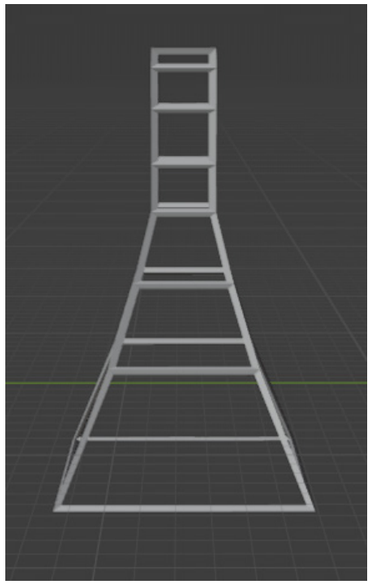


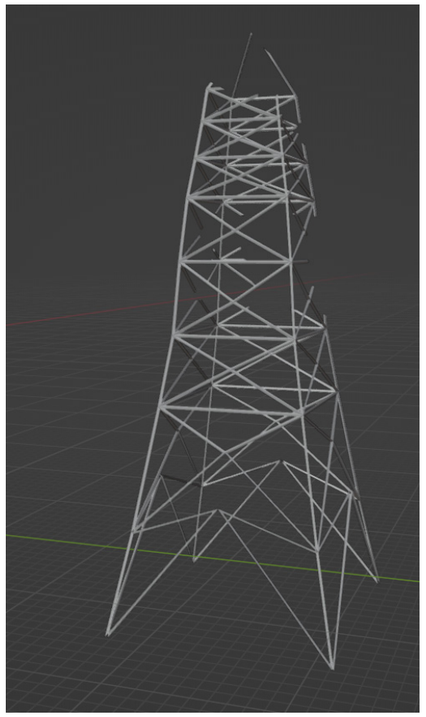
Back to a bit of modeling, as I've decided at this point, I won't going too deep into unwrapping and texturing and focusing on the style I'm aiming for, rather than a natural progression workflow. This actually opened up a bit of creative freedom as I didn't really have to worry too much about keeping a super clean topology. Here I also experimented with a wireframe modifier with a duplicated mesh on top, to create these sharper and thinner building walls. I hadn't planned to use wireframes before I started modeling, so some parts of the wireframes didn't turn out great, as they were super messy. I only kept a bit of it after running them both through separate boolean modifiers.

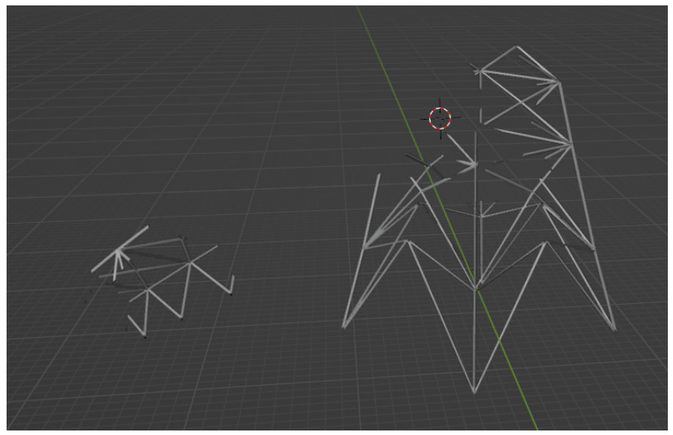






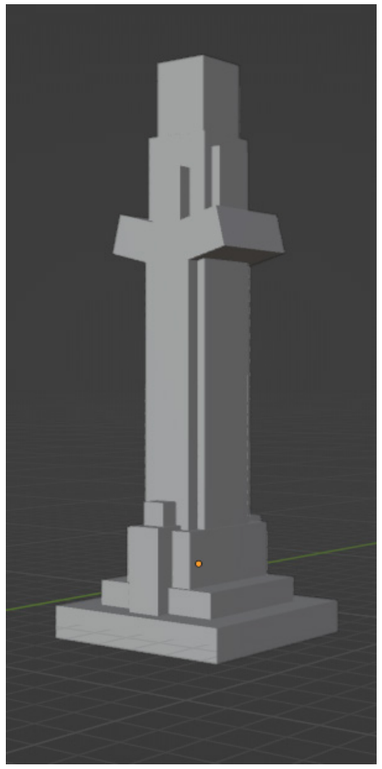


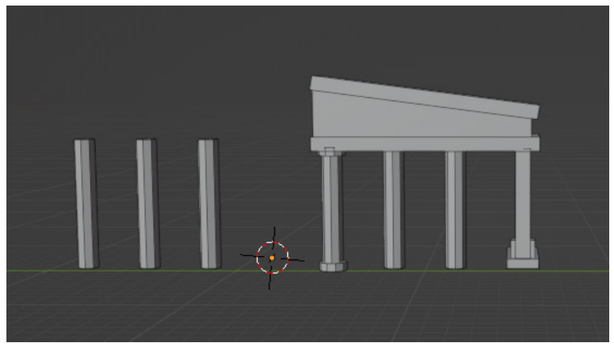




After figuring out the wireframe modifier, I decided to make a pylon to fit in theme with my telephone poles from before, which I think would be a great addition. These were quite simple as the wireframe simply expanded the edges and I could keep switching the modifier on and off to see the before and after, which made the modeling super simple. Running another boolean mod, again turned out pretty great,

Completed	3d Models	Priority	Asset list	Descriptions
✓	✓	1-10 High	Objects to make	Progression states
☐	☑	5	broken bridge	need to re model
☑	☑	~~8~~	~~broken walls (5 min)~~	~~fin~~
☑	☑	~~8~~	~~broken buildings (need 3 min)~~	~~need to resize~~
☐	☐	8	church glass	transprarent
☐	☐	1	church interior	
☐	☐	9	church walls	Hero object
☑	☐	~~10~~	~~telephone pole~~	
☑	☑	~~9~~	~~water~~	
☐	☐	1	clouds	hand painted prob
☐	☑	3	pylons	extra tele poles
☑	☑	~~9~~	~~skybox~~	





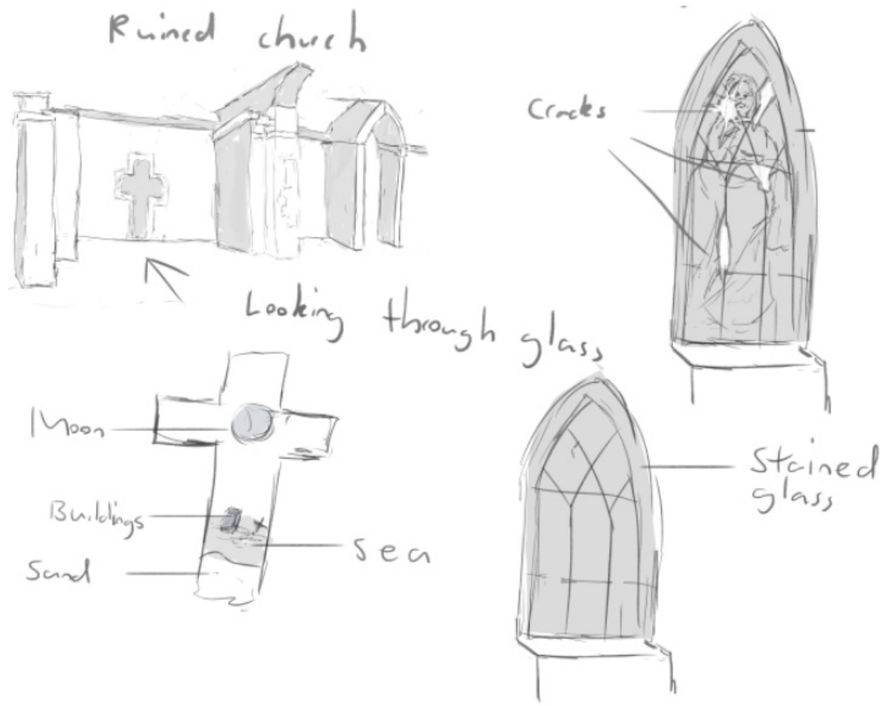
At this point I still had a good amount of time remaining, so I decided to spend extra effort to make the church look nice. From the beginning, I was struggling as I lacked a clear concept, I liked the idea of Roman churches and gothic cathedrals, so I was trying to mash them together.

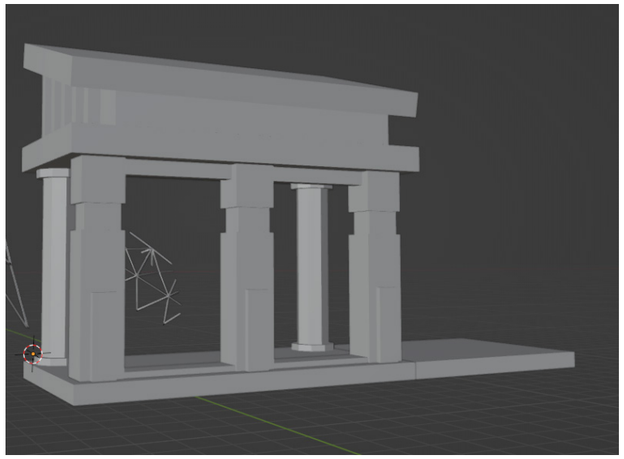




After a bit of trial and effort, I decided it was best to go back to concepting for a bit to fully understand what I wanted, but more so to flesh the idea out. At this stage, I really think a stained glass with reflections and refractions would look wonders, as the project is filled with light related elements already, so it would elevate it even further.



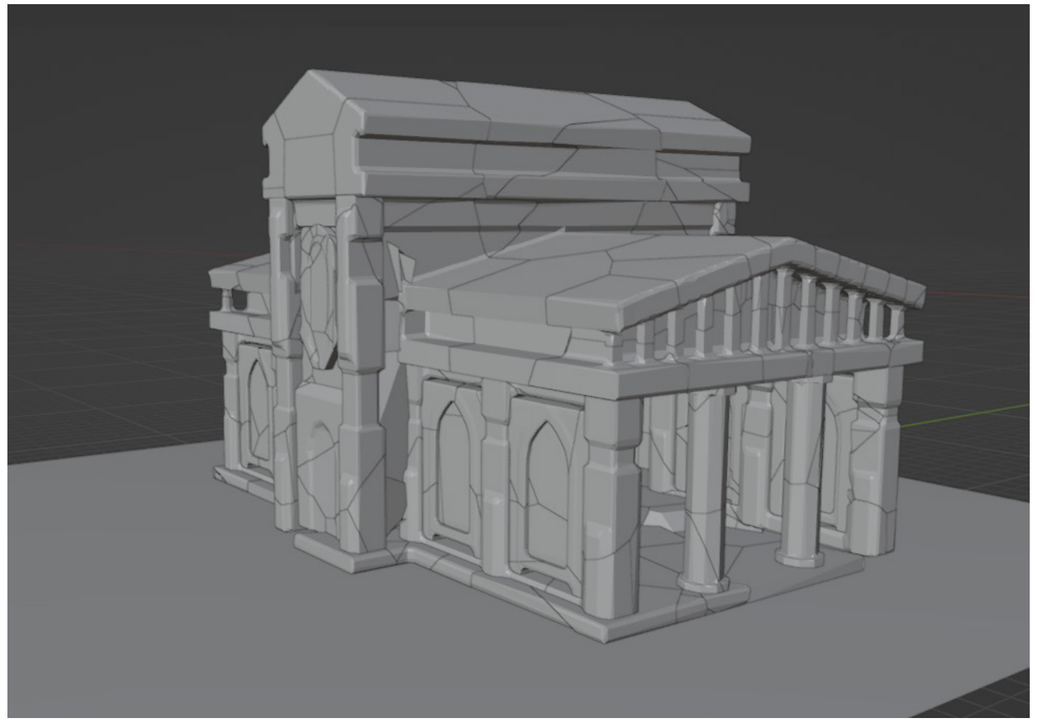


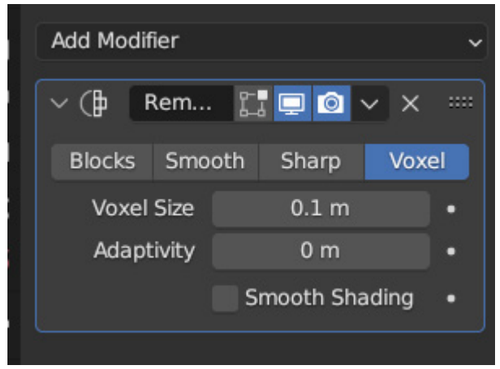


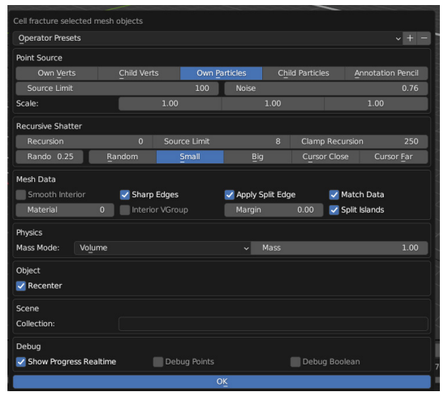




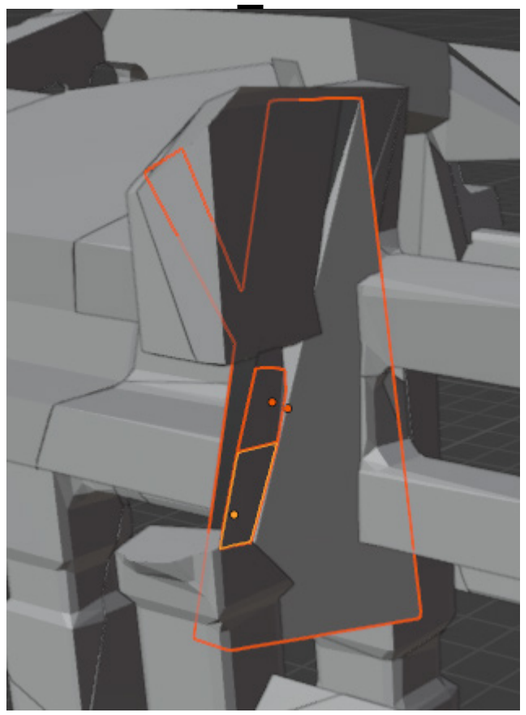
This did end up taking a massive a amount of time, almost a full week in fact. But I am happy with the results here as I felt I did a great job at bringing the concept to life. The tricky part was the mesh had too many sections to use booleans to cut away, as I still wanted each segment to individual, especially the glass.





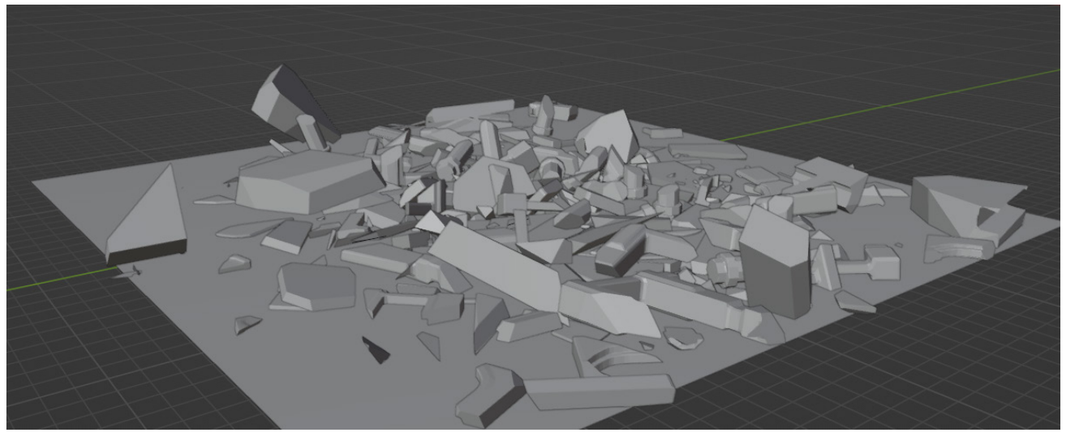


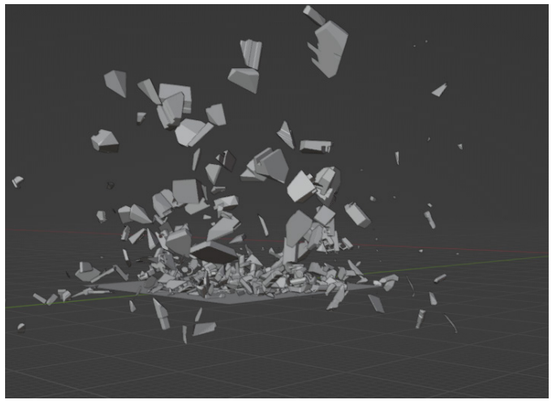
Looking around for an alternative to booleans, I found the cell fracture tool to be quite popular for this type of effect. Using a remesh modifier, crashed my project a couple times as the tri-count went to the millions. The cell fracture tool also used a ridiculous amount of cpu for the fracturing action, which made it difficult to make adjustments.



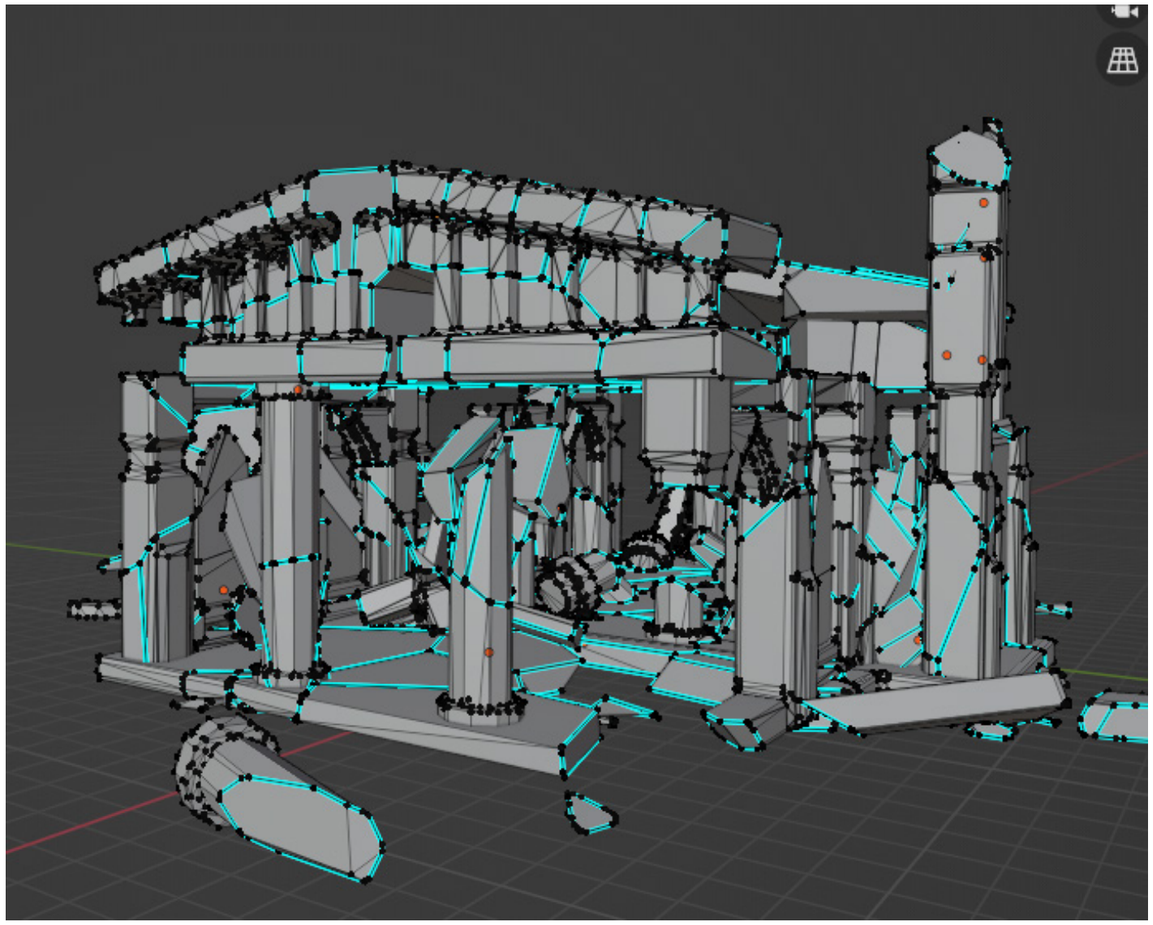
Other than taking a long time to make changes, my meshes were split into random chunks of 180 or so separate objects which ruined the point of using this for me as the boolean would have done the same. I ended up fracturing each of my meshes one by one anyways.

Afterwards, adding a rigibody to the fractured cells allows them to free fall as if there were gravity. This is nice as I don't have to lay them out by hand inside the engine.



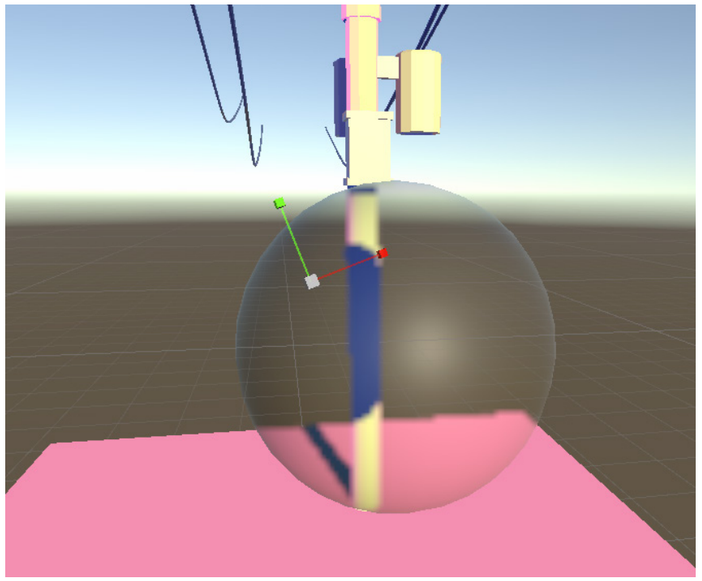


This whole process was quite taxing on the cpu, I would probably go with a different method, or simply go for a more blocky style in the future.

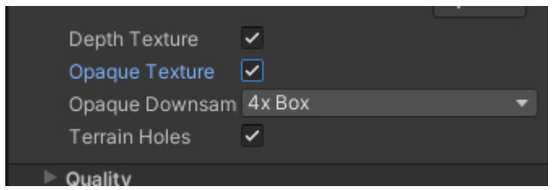


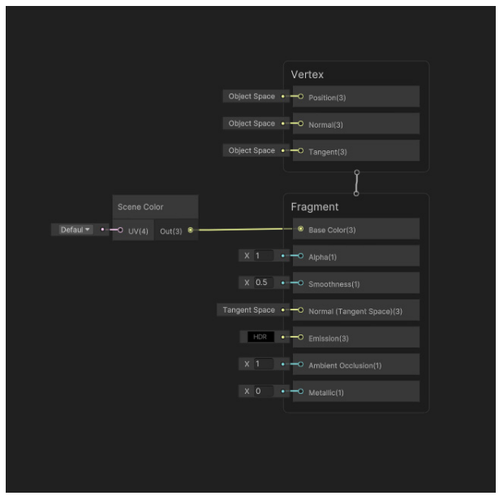
Using passive and active rigibodies, I amble to replicate physics on an engine level inside the modeling software, quite impressive. After decimating the object a few times, and deleting about 70% of the debris I ended up with this. It looks pretty good, but the topology is still absolutely horrendous, making any sort of change to the geometry is near impossible. Half the faces are also rendered as back faces, which wouldn't be industry viable, but for my shader, I can just turn on render both faces and it should work just fine.

At this point I wanted to take a break from blender for a bit and go back to some shader work or work on the other lighting effects.



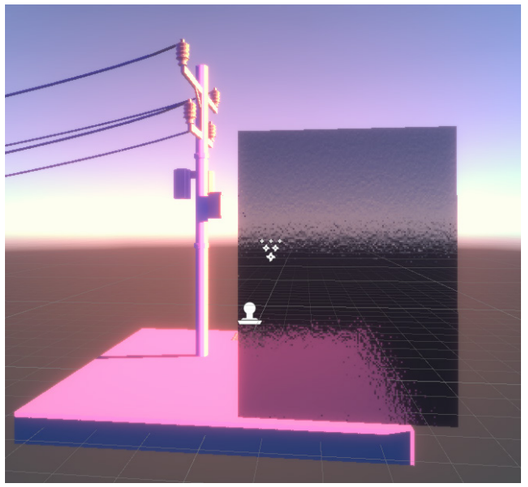
Playing with the scene color node, as I planned to make some glass shader on the cathedral later, I managed to fix one of the biggest hurdles I couldn't get over from before. The opaque texture option in the URP asset allows shaders to access opaque textures inside to be viewed through transparency in the scene.



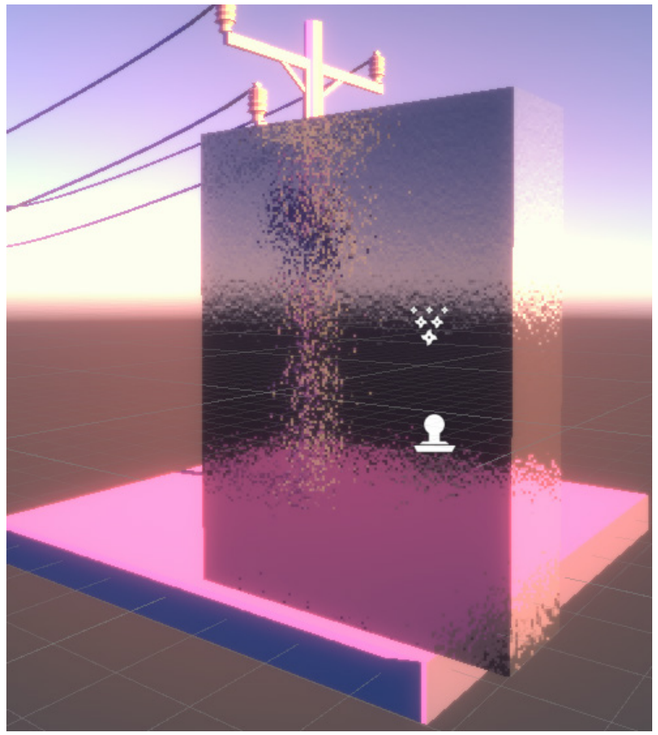


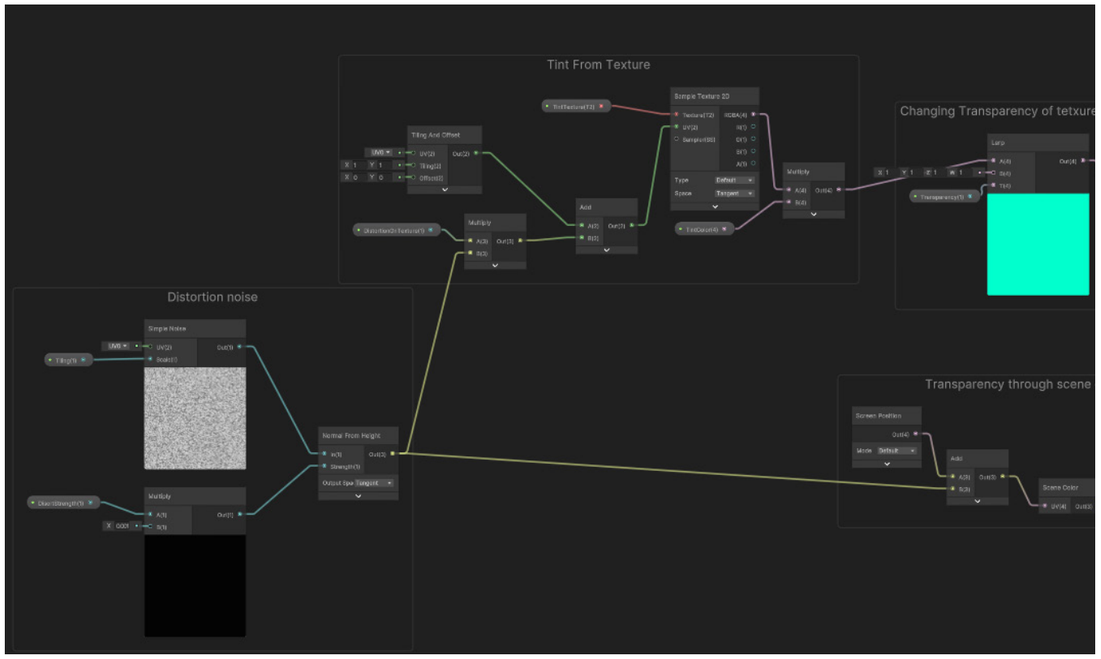
This was the reason why my water shader from before didn't function as intended, as the refraction of light through the water simply didn't show. Immediately, I went back to my main scene and played around with it looks so much better as it's no longer just a gradient box.

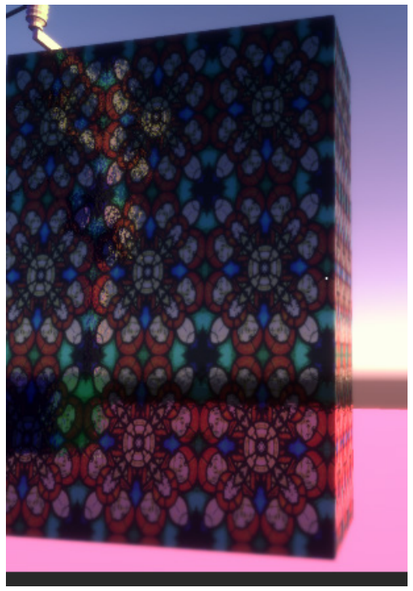


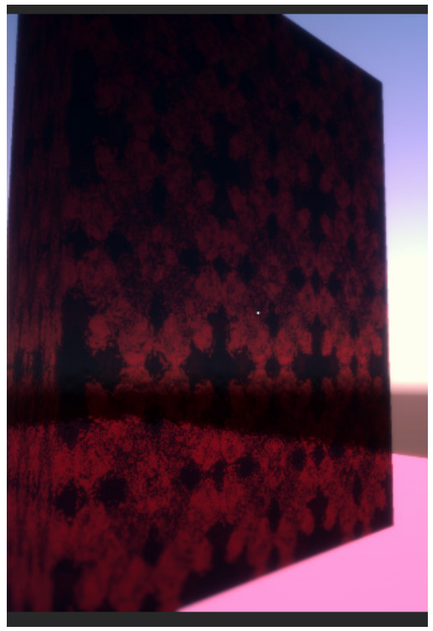


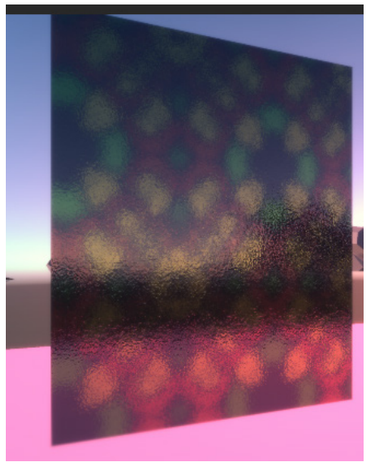
The blurring texture on the glass looks neat when viewing objects that are behind the glass, but gets a bit off-putting when placed behind objects. It looks like particles are being emitted from the object in front, which is not really an effect I wanted.





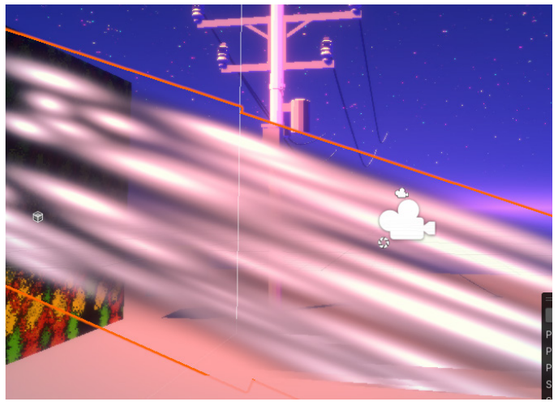






Quite happy with the results here as there is a good amount of variety that is achievable with this simple graph. I took a simple temporary texture from the internet, I plan to make my own texture at the end of the process. The shader is missing a refraction which is a small detail when there is a coloured texture, but would look much better when it's simply transparent. If I end up using multiple different types of glass, I'll try and add refraction in, for now I'm planning on moving onto the next area which is the lightray effect.

The godray effects were very simple to as I hadn't even watched a tutorial on the effect and I already have something to work with. By simply turning the max particle size to 0 and turning on particle trails, I already have this fake light ray moving in a single direction.

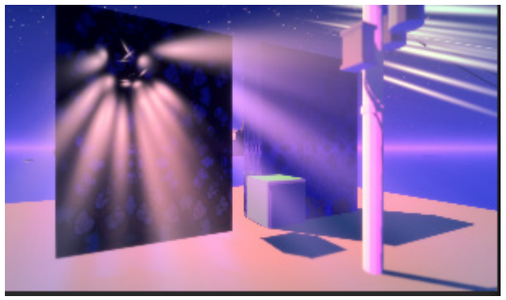




I turned the ends of the particle trails to be transparent, which creates a more gentle fade out towards either ends of the trail. I also switched the material around to another default soft round brush particle in png format as the jpg lacked transparency towards the outer rims. I did find the particle trail to be more taxing on the cpu, as I noticed in the stat menu especially after placing multiple of these down.

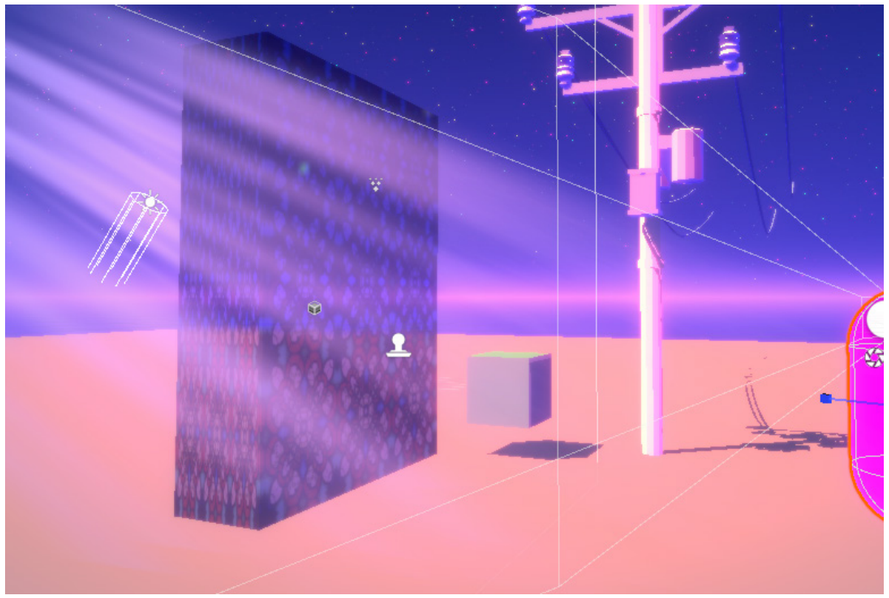


There was also a major problem, I couldn't change the size of the trails, because I had to turn the particle size to 0. Changing the width here resulted in these smaller lights which look okay from the side but not so great from the front. The only other way would be to stretch the texture itself.

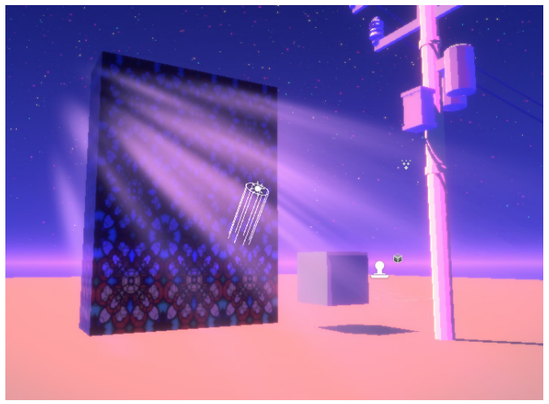






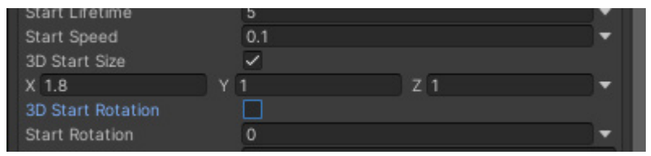


I ended up using the particles themselves instead, and stretched the y axis by a lot, in length under renderer, and scale the x axis in the particle itself. Separately scaling the particle was more appealing to me, as directly scaling the y also changed the scale transparent areas.



After messing around with the position and trying out other settings such as lights and rotations, I ended up with a pretty convincing godray effect, which means it's time to move onto the ground projection itself. I wasn't quite sure how to proceed this part as I planned to use a custom light node to grab the shadow atten from WorlSpacedLightPos, but the glass object is transparent, so there was no shadow.

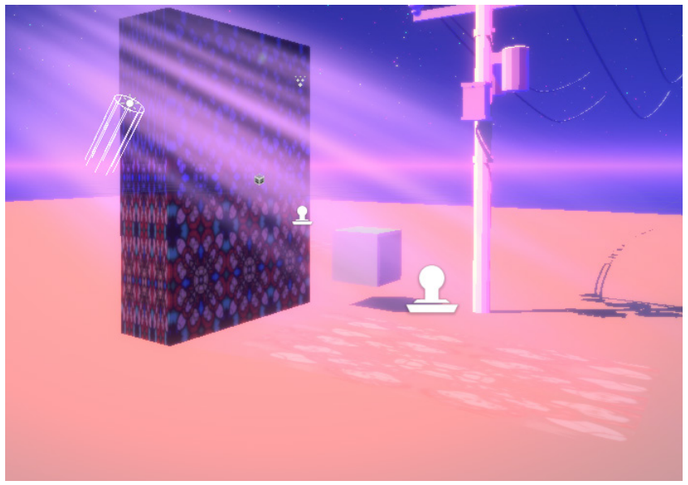


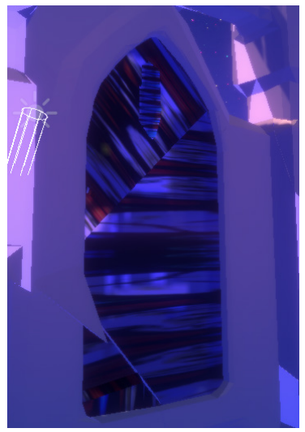


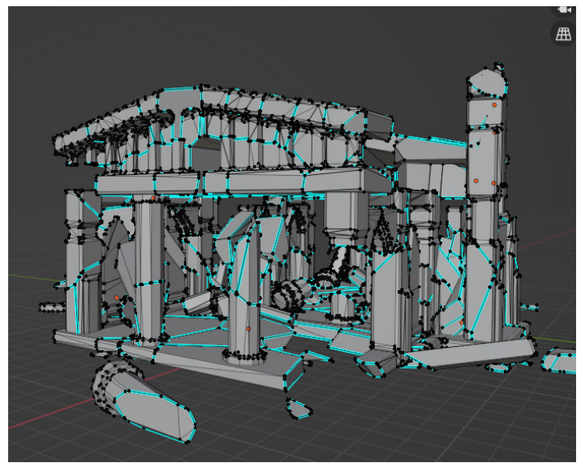


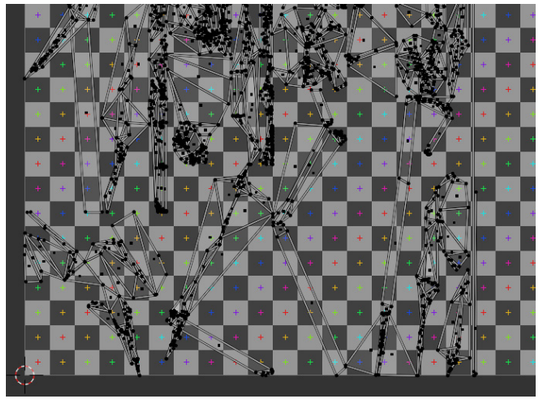
I ended up just using a simple stretched decal with a bit of transparency. Quickly, I ran into another problem after applying it to the glass on the mesh, the glass texture was messed up as it wasn't unwrapped.

There weren't many tutorials for the decal effect I was looking for, which was just some transparency on the edges. This however isn't really that big of a problem as I have come up with a solution. When I go paint the texture in photoshop, I can just change the shape there, I would probably need to make 3 or 4 of these but it was still probably faster than trying to make an exact shape I want from shadergraph nodes, and lerp the object over.

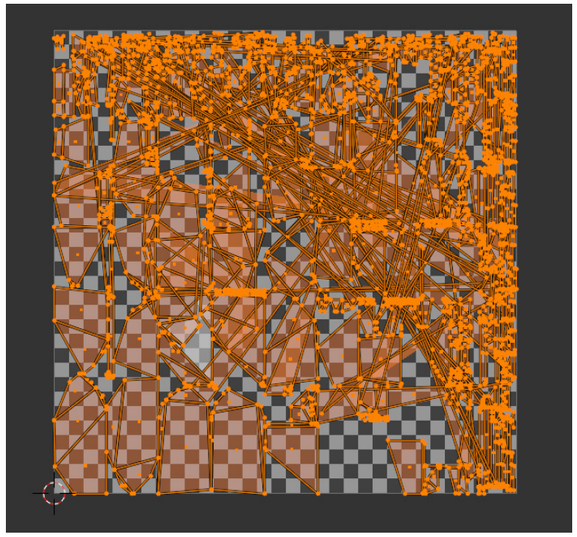




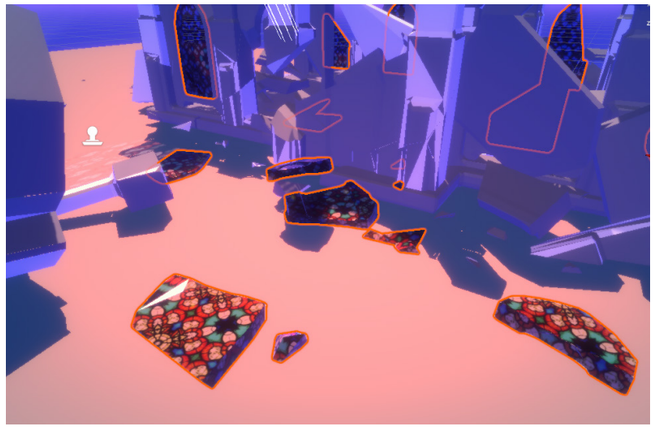


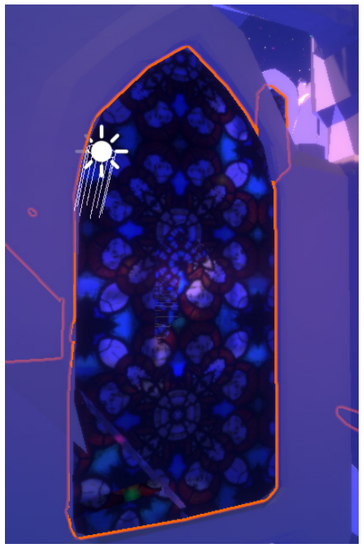


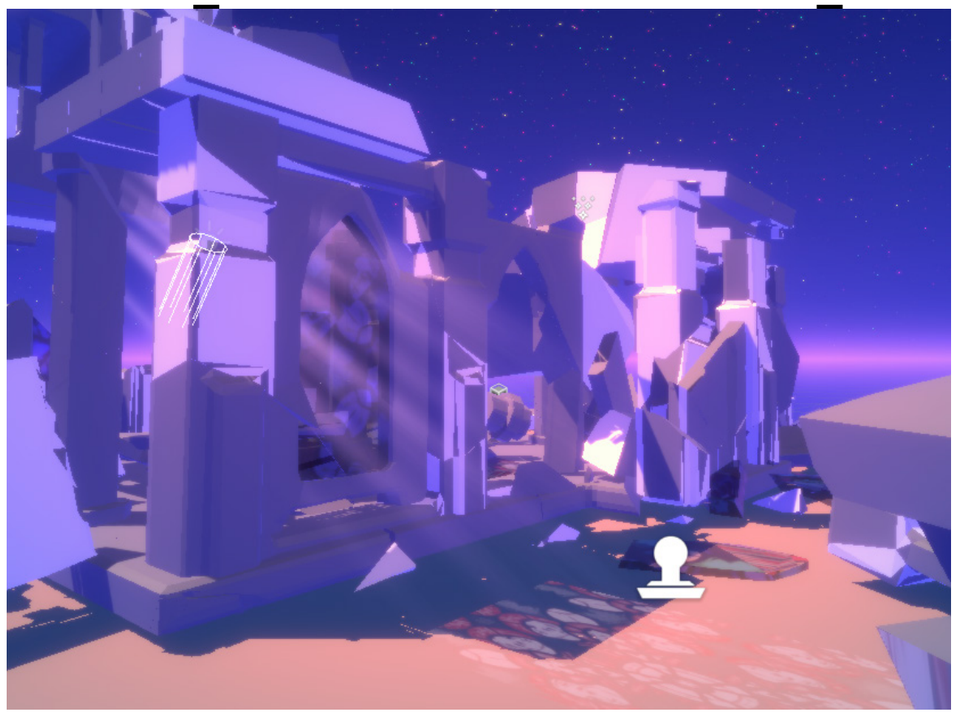
I was still pretty new to blender so I previously unwrapped the glass in maya before fracturing the object. Unwrapping with this topology would be a nightmare and not possible within my timescope, I also didn't have time to remake the model, so I was tempted to give up on textures at this point.



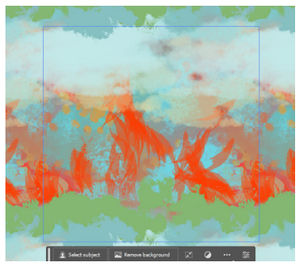
But after playing around a bit with the smart UV projection tool, I ended up with a pretty messy chunk of faces, but unexpectedly worked quite well. The textures are a bit spread out but it didn't really matter in the end as I can simply change the tiling. Even the smaller bits of shattered glass on the ground look spot on.



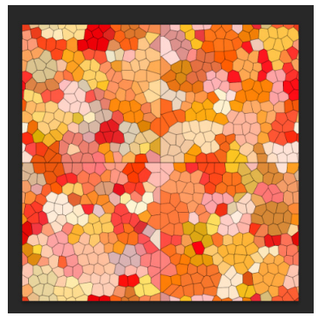




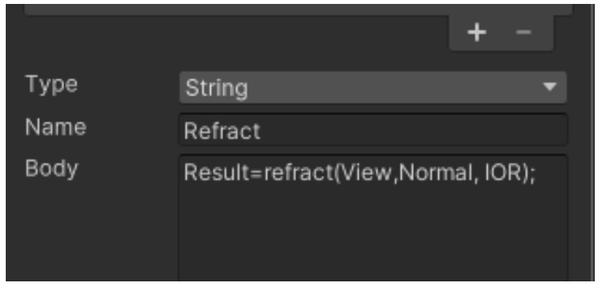
At this point I was pretty satisfied with how things look, so I went and started painting the textures for the glass. I played around with a couple abstract brushes I had in my library and used photoshop's stained glass filter gallery to make the image into a mosaic. I originally thought this wouldn't look great in engine as there already is a distortion from the shader, so they would overlap, but it turned out fine. I was a bit annoyed that the texture couldn't be seamless as the glass filter didn't work with the pattern preview mode, and content aware fill felt really awful as it would mess up the individual cells of the glass.



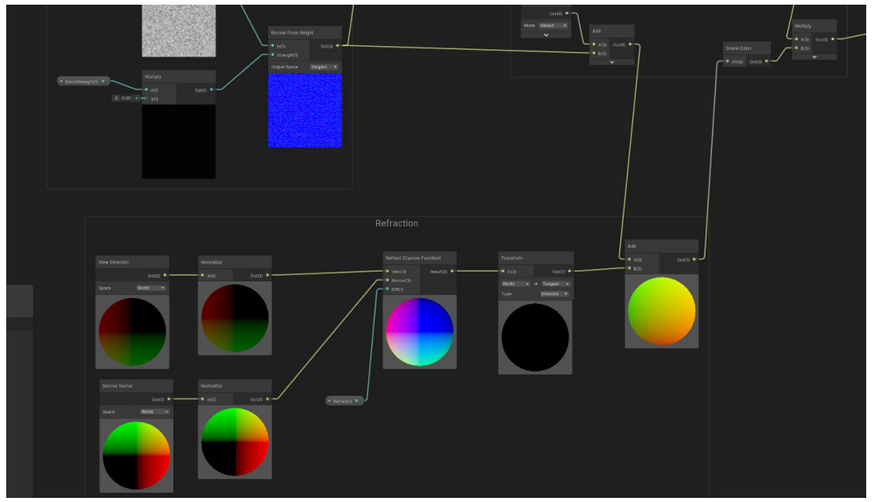


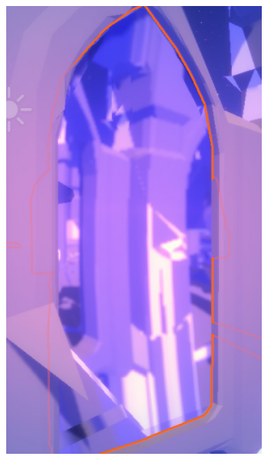


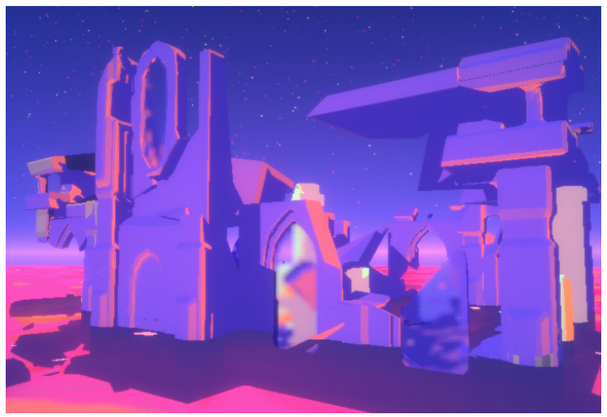
I went back and had a look at some guides on how to make refractions work. This one I found explained the concept quite well except for the math formula. What is normally seen from the camera is returned in a different angle based on an index, then the value converted from world space to tangent space to be displayed on a face.



This had a nice effect when the glass is more transparent, as it was clear what was being refracted, but ultimately not what I was looking for. The glass looks too smooth and blurry from afar with or without any distortion.



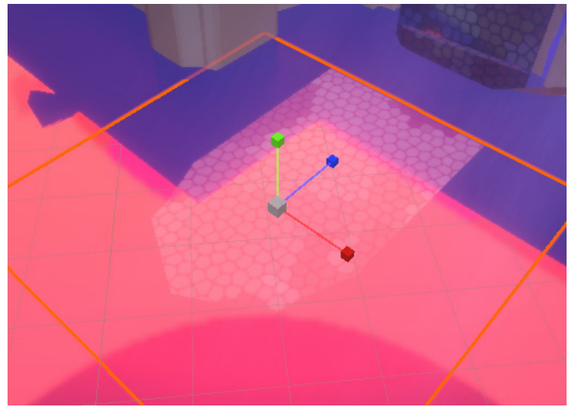




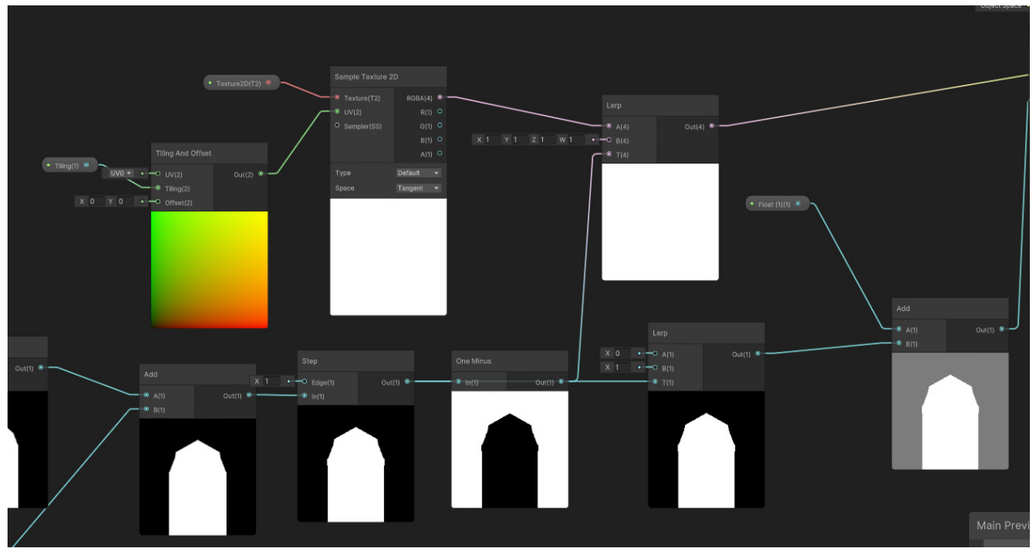


After adding textures in, the refraction wasn't so clear which was what I wanted, the lighter tint that moves along with the camera gave the object a bit more realism. I also played around with the IQR index value and found the negatives have nicer effect for glass, and positive for water.

After setting out the scene a bit more, I decided church will be placed on top of a water object that floods the bottom parts. This meant that the decal projector wasn't needed as I no longer had to project the reflection onto an angular plane such as a rock or another wall.



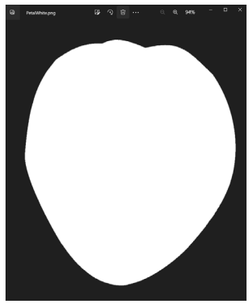
This meant that I could just use a plane instead, which I believe would be cheaper on performance. For the shape, I decided to try and make the mask to lerp on with polygon nodes and it didn't turn out so bad. Using the one-minus for the alpha value, I was able to get a transparent plane with only the reflection.

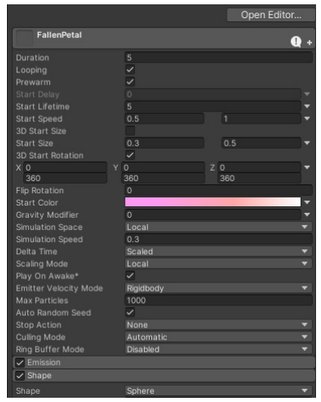


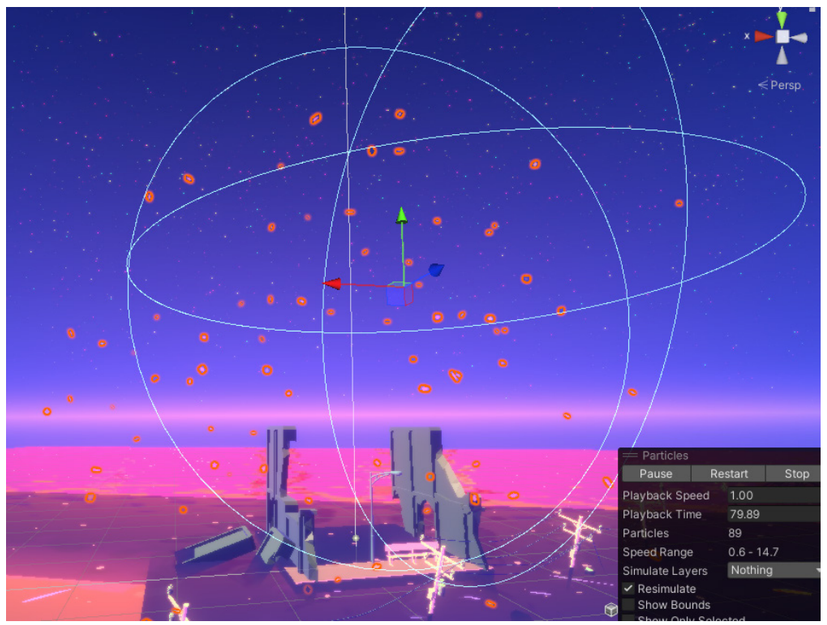




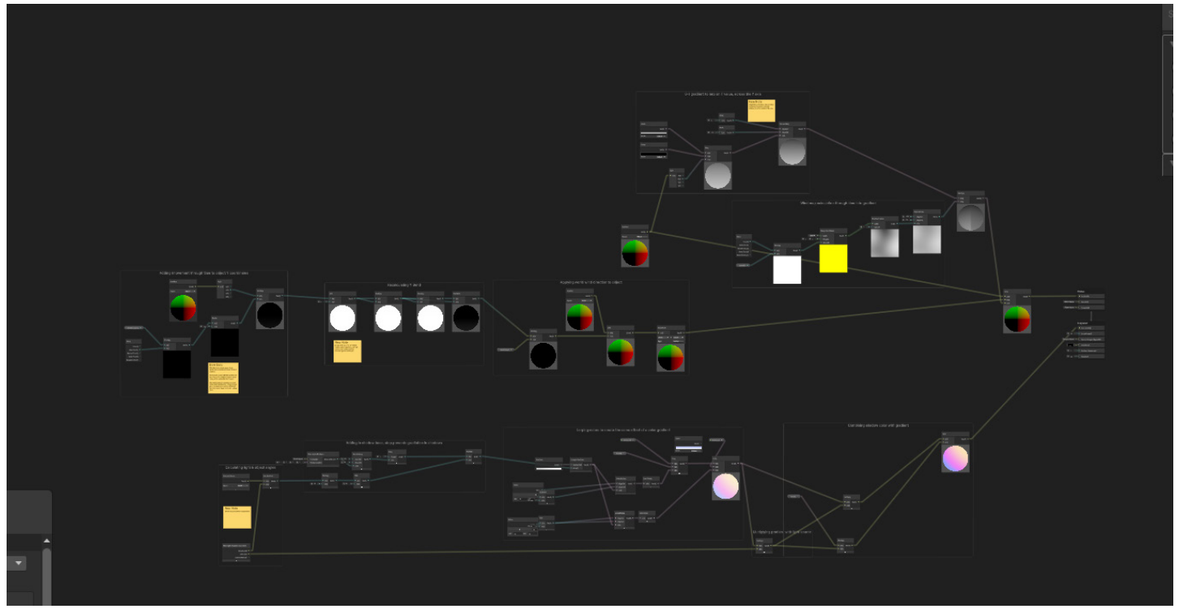
Finished a couple more meshes and did some scale and positional adjustments to the old ones. The bridge feels much more like a bridge when it's elongated like this.



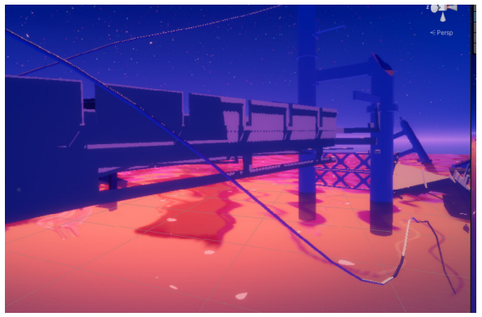


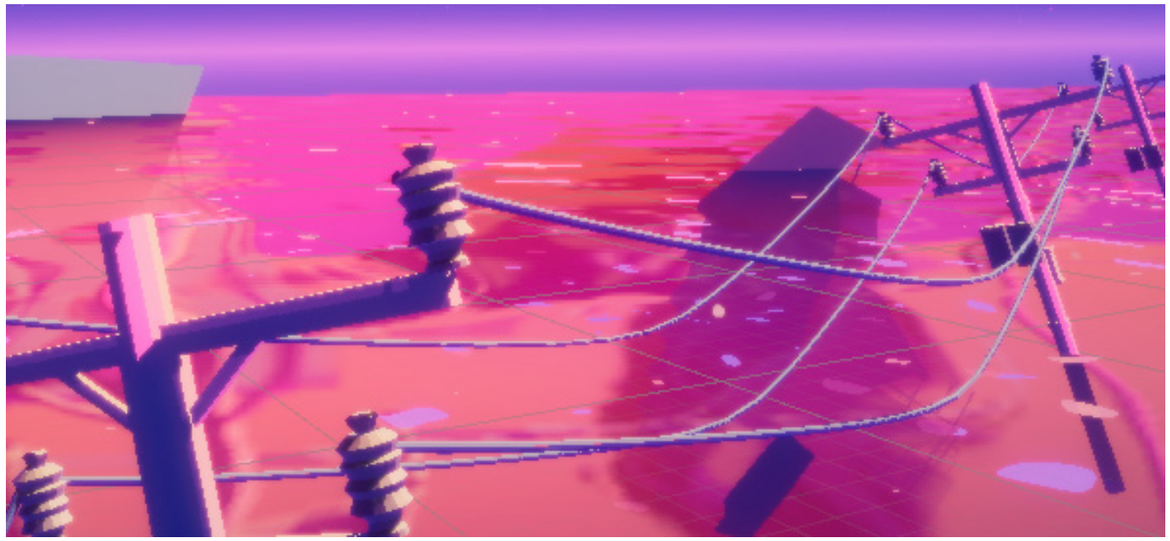


Used the particle system here to generate a falling petal effect. I just drew up an organic looking circle and coloured it in particle shader.

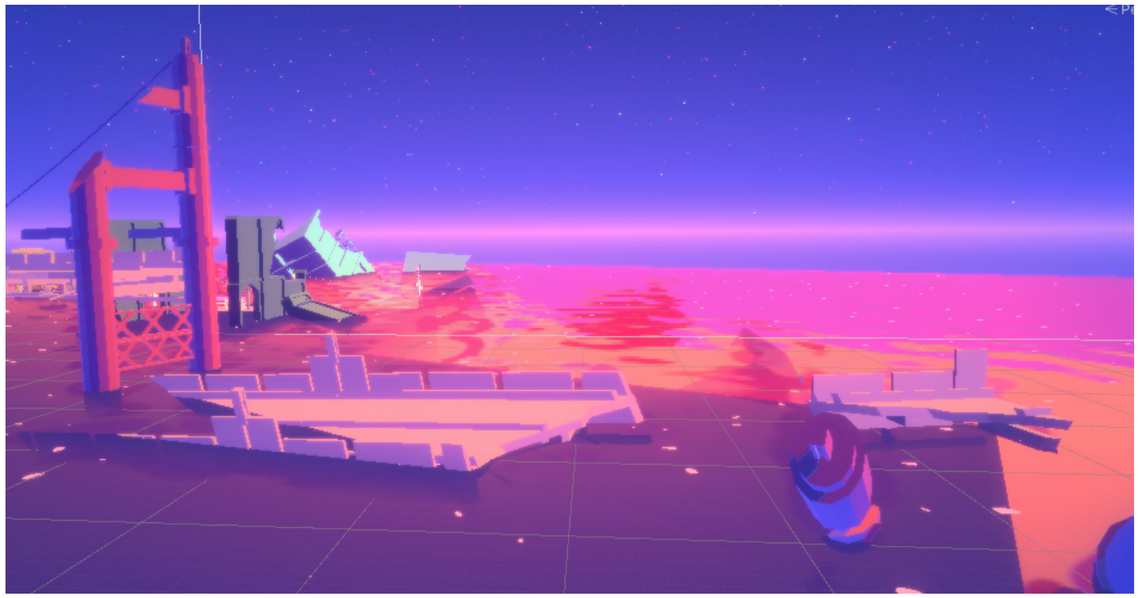


The wire shader required a good amount of effort and research, it was probably the final step of this project on my checklist. The vertex displacement was lerped onto the centre areas of the wire, as the ends shouldn't move as much. Faking wind through noise and world position, as well as also using the graphic color shader from before.

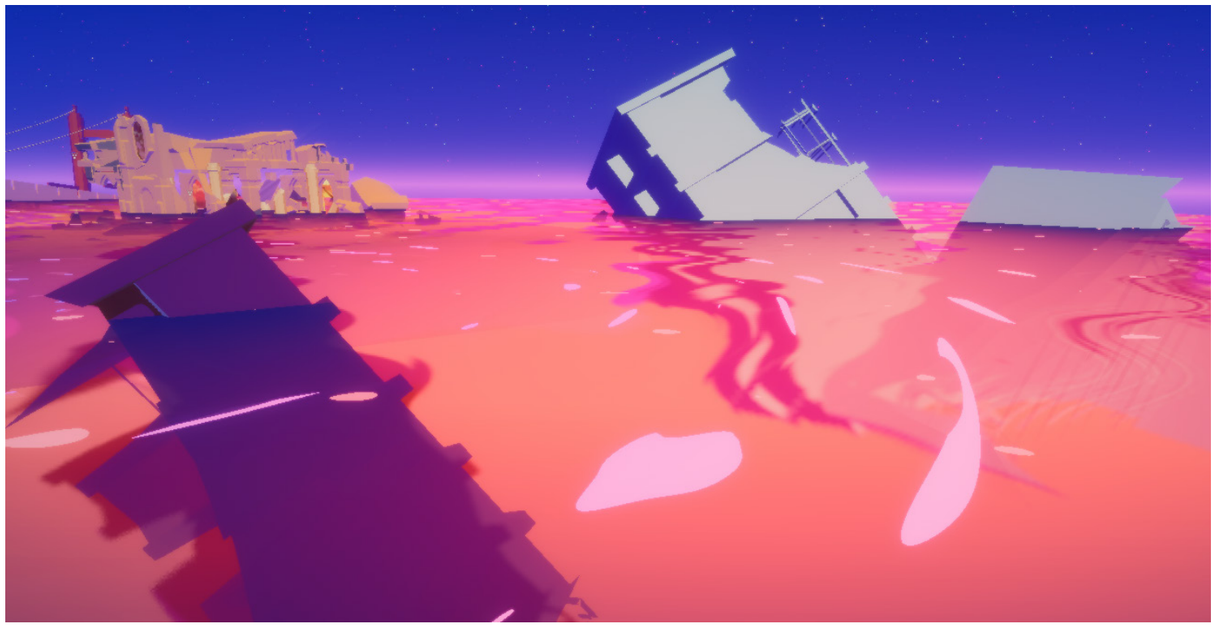


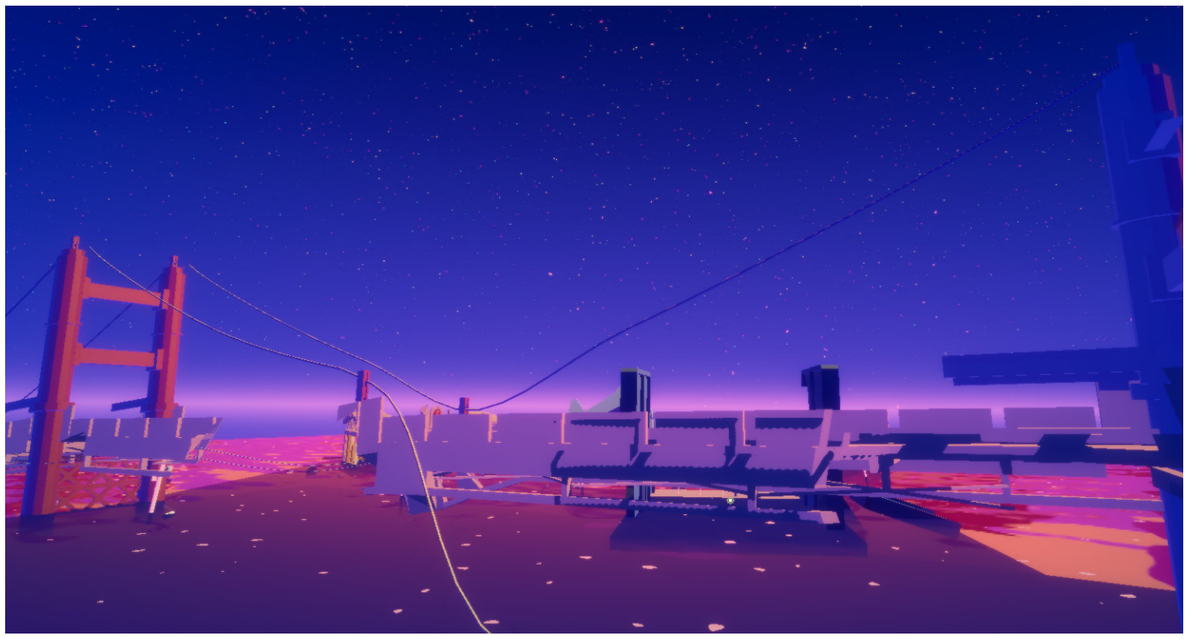


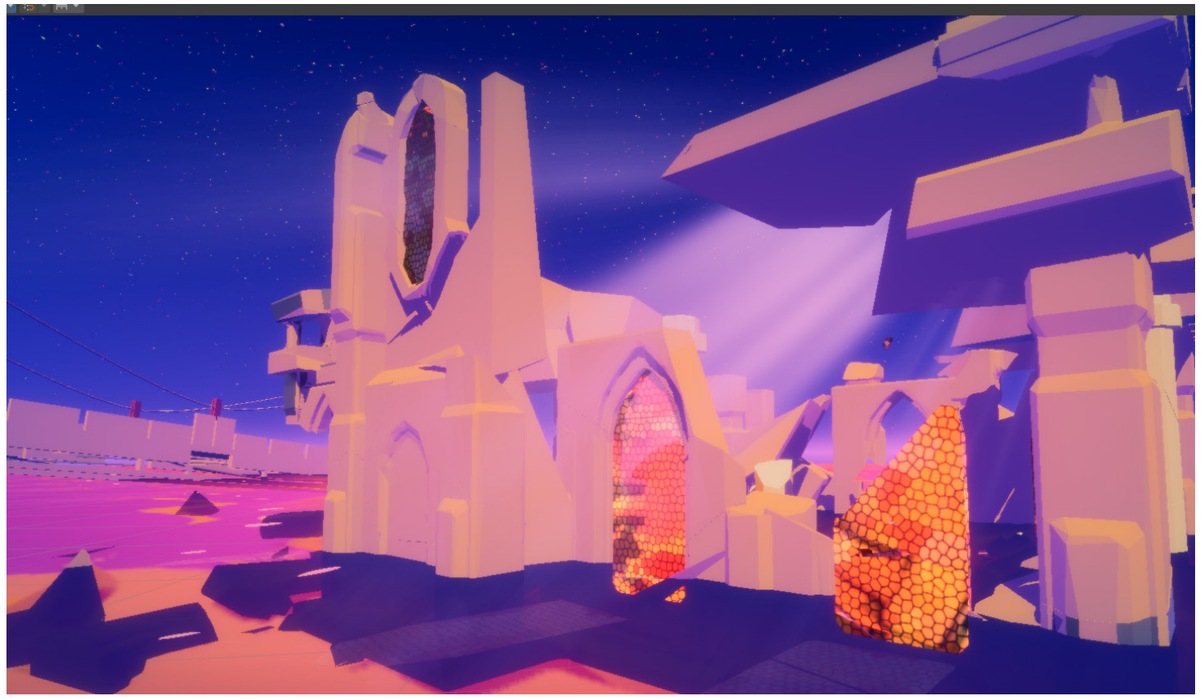






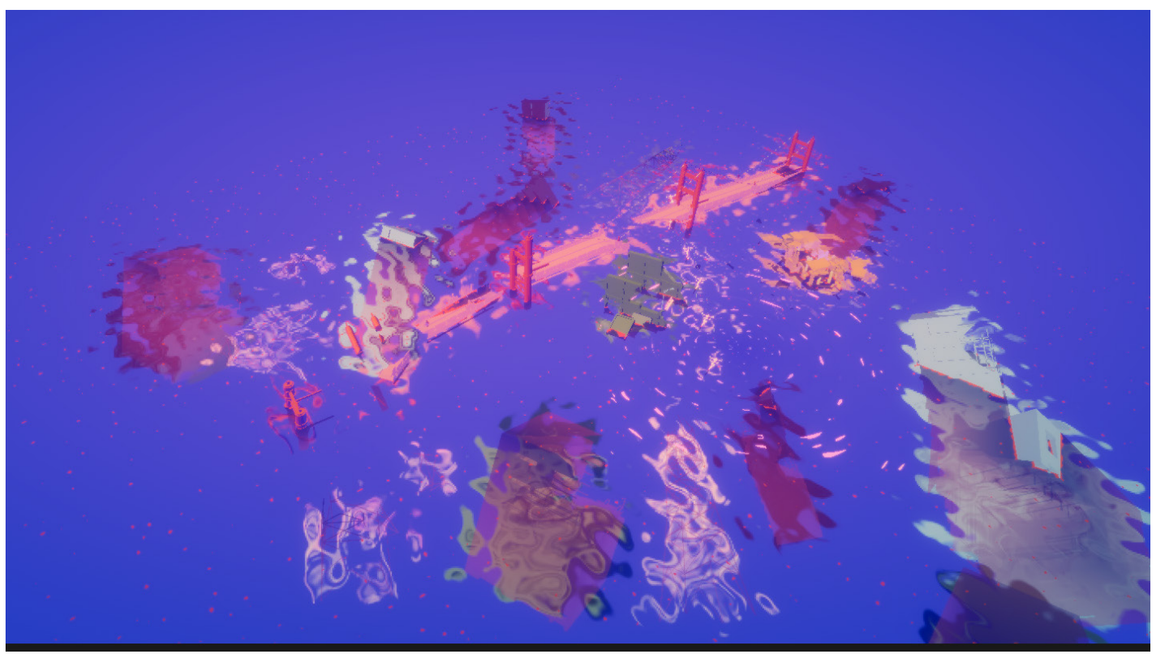






Transparent waters





THE FLOOD

In the shadow of a world undone,
An apocalyptic flood, the wrath begun,
The world is in waters red and dark,
As stars weep silently, leaving their mark.

Despair, like a tempest, rages and howls,
Angst echoes through lands with mournful growls,
Humanity's sins, a weight hard to bear,
Brought forth the deluge, a judgment too fair.

Mankind's creations, now mere relics,
Beneath the waves, their memory convicts.
As the tides swallowed their humble abode,
They face the truth as life erodes.



TECHNICAL REVIEW

Starting off with moodboard and thumbnail sketches both processes I was quite familiar with, I would probably do mind maps before them in the future as I think it gives a clearer straighter path to settle on. Transferring the idea to 3d was always difficult, as now I have to think about the structure of each individual object, asking myself, "is the object balanced?," "is this shape too repetitive?," "how will light effect this?" and so on. The process of breaking objects down was certainly the highlight of the process. Using a cutter object the chunk away the built mesh, or cell fracturing it followed by setting rigibodies to simulate physics. I made the main stylised unlit shader with lighting and all before most of the models, and did the post processing after, which made it quite easy, to style the models.
The degree of realism wasn't too consistent with the models, with the different levels of detail, but the shader did well at mushing everything together so it all fits.

REFLECTIONS

After reading my personal vision and expectations from the start again, I feel like I did a good job on this project, even for my own selfishly high standards. I fully explored everything I set out to explore and more, incorporating so much I would have thought to be "too difficult" before the project. Taking technical art this semester was probably the best decision I made since joining the game design course, as I feel like it's the first subject that not only felt challenging, but also super rewarding. I doubt my 2d art skills improved by much this semester as I didn't do too much concepting and painter overs, but my 3d skills have evolved much higher and beyond my expectations, and I can confidently call myself a 3d artist now. I did find this course to be a bit too relaxing, but I took it upon myself with many ambitious moves such as switching to blender at the start of the course, as well as making the broken church as detailed as it is. The only thing I regret not having more time spent on, would be changing the ground floor, as I only realised it's effect after turning the water fully transparent