DAGD 300 Final

Project Document

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Table of Contents

Milestone 1: Concepting and Greyboxing

Story

The year is 3022. You awaken from your containment chamber weak and shaking. It feels like ages since the ACA Corp conducted their last experiments on you. How long have you been asleep in stasis? You disconnect the patches that were used to monitor your vitals. The air is hazy, and the lab is empty. The facility appears to be on lockdown. You then realize the impossible. You reach out your hand and discover you have the power of telekinesis. With this new-found power, you attempt to escape the clutches of confinement. But as you explore the facility, you realize you are not alone...

Environment Setting

Orion 77 is a containment station conducting research on gathered anomalies from across the planet. This facility was owned and operated by the ACA Corporation prior to its fallout. Now the facility is abandoned.. but why?

The level that we are building takes place in the research facility level of Orion 77. The player will progress through a sci-fi environment and discover new abilities that will aid in their escape.

Gameplay Phases

Phase 1:

- Awakening from containment.
- Tutorial for basic controls
- Introduction to first ability (Telekinesis)
- Application of first ability

Phase 2:

- Exploration
- Discovery of 2 new abilities (Blink & Light Orb)
- Puzzles

Phase 3:

- Escape Sequence (Player runs from threat)
- Obstacle course with ability application
- Completion of level

Gameplay Mechanics

Core Controls

- Move (WASD keys format)
- Jump (Space Bar)
- Use/Pickup (E Key)
- Ability Wheel (Tab)

Abilities

- Object Displacement "Telekinesis"
- Blink/Teleport
- Light/Power Orb

Asset List

Environment and Architecture

- Crates (Storage and Power)
- Elevator Lift
- Staircase
- Wall Panels
- Ceiling Panels
- Floor Panels (Modular)
- Tunnel Panels (Modular)
- Grids
- Vents
- Doors
- Stairs
- Steps

Props
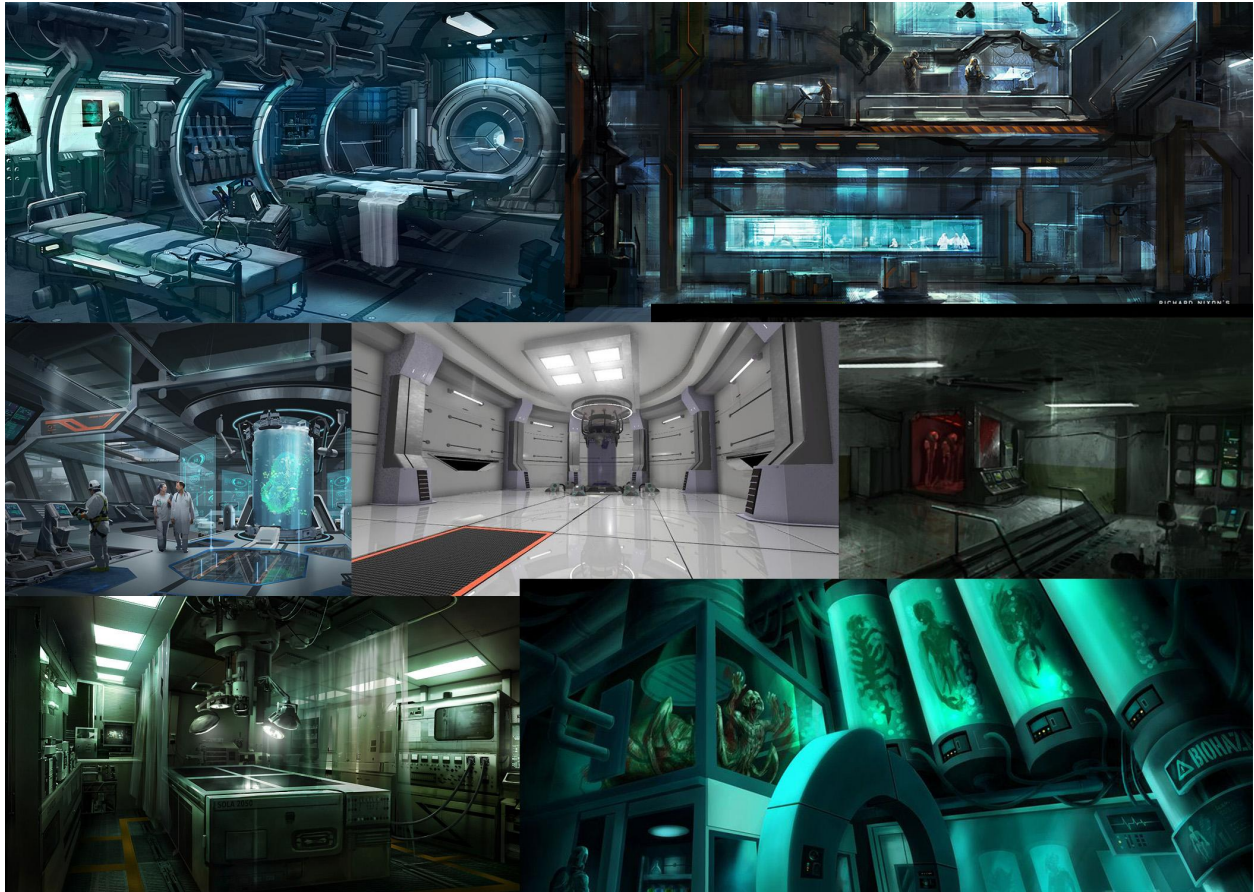
- Lab Desk
- Lab Paperwork
- Lab Containment Capsules
- Light Housing
- Fans
- Terminals
- Computers
- Monitors
- Containment suits

Decals

- Rust
- Grunge
- Chemicals
- Scratches

Concept Sketches and Moodboards

Environment

SPACE

Alien

Containment Pod

Scanner
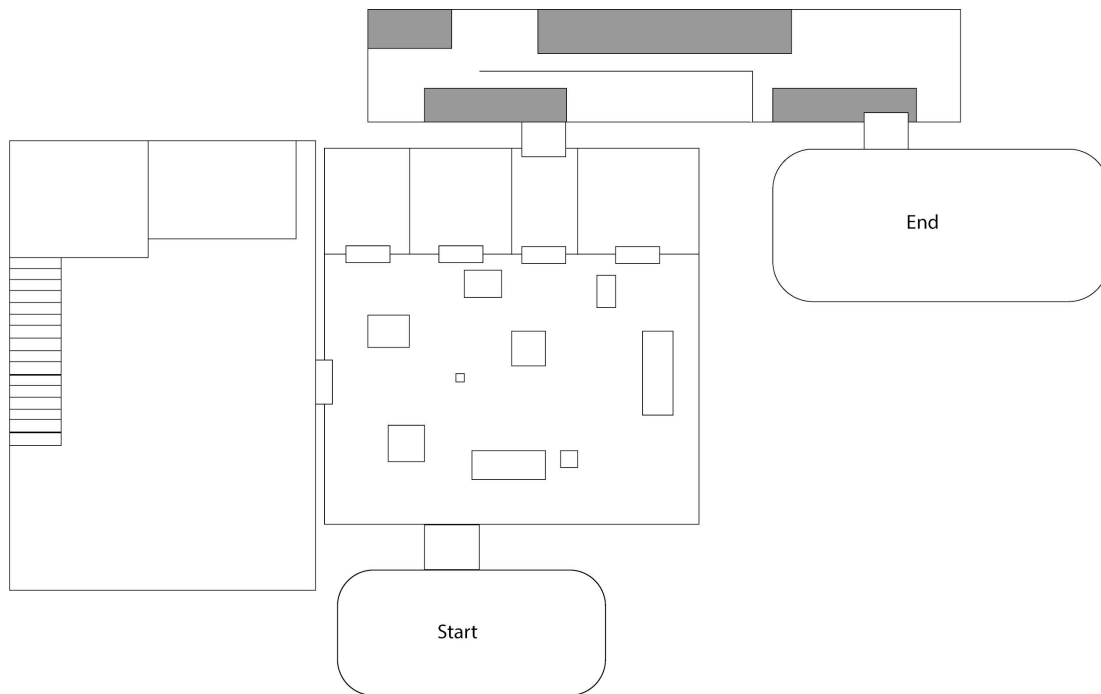
Radiation Chamber

Beds

Hall
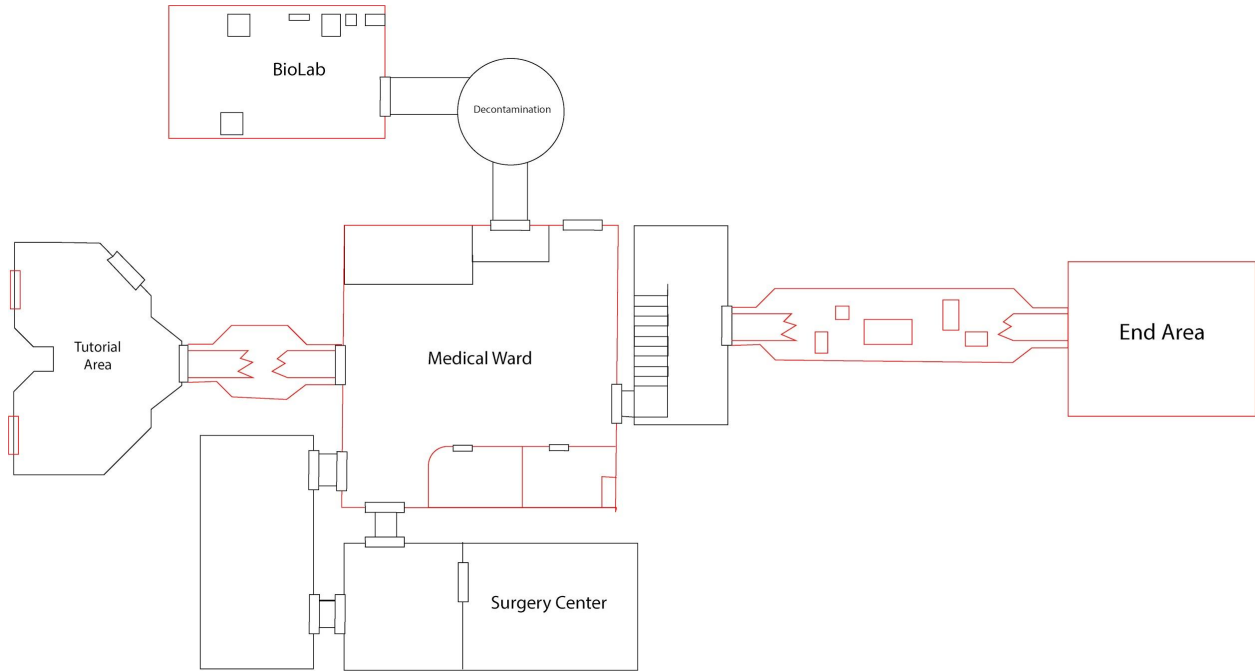
Beds

Storage

Admin

?

Props

User Interface (Ability Wheel)

Level Layout Concepts and Wireframes

Early Concepts

BioLab

Decontamination

Tutorial Area

Medical Ward

End Area

Surgery Center

End

Start

3DS Max / Final Wireframe

Containment Lab

Decontamination

Archives

Facility Plaza
(Main Area)

Broken Tunnel 1

Reception Area/
Spawn/ Tutorial

Stairwell

Escape Sequence

Broken Tunnel 2

End

Elevator

Start
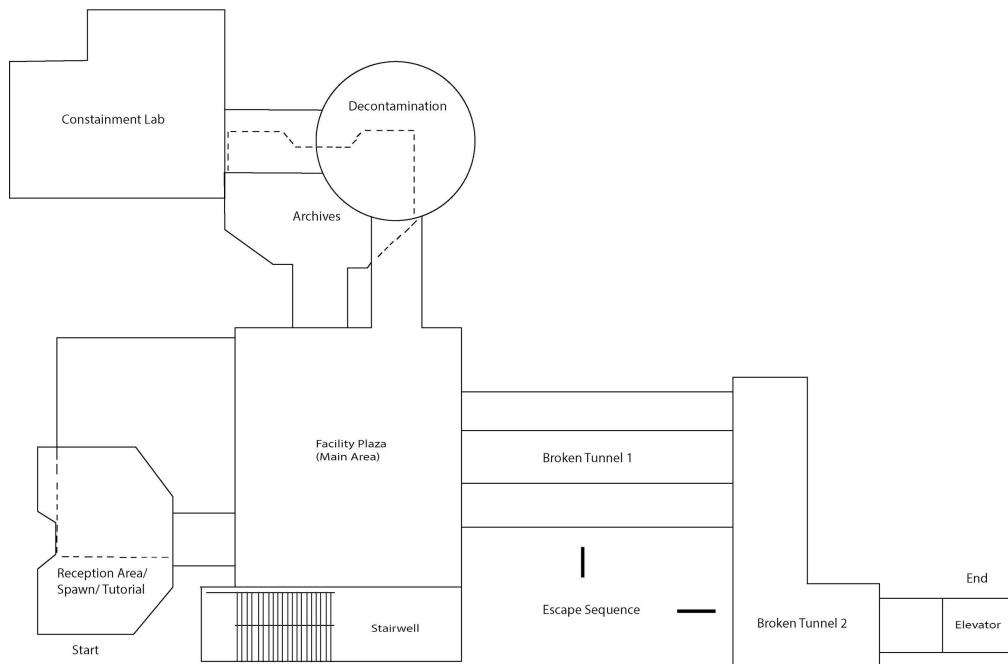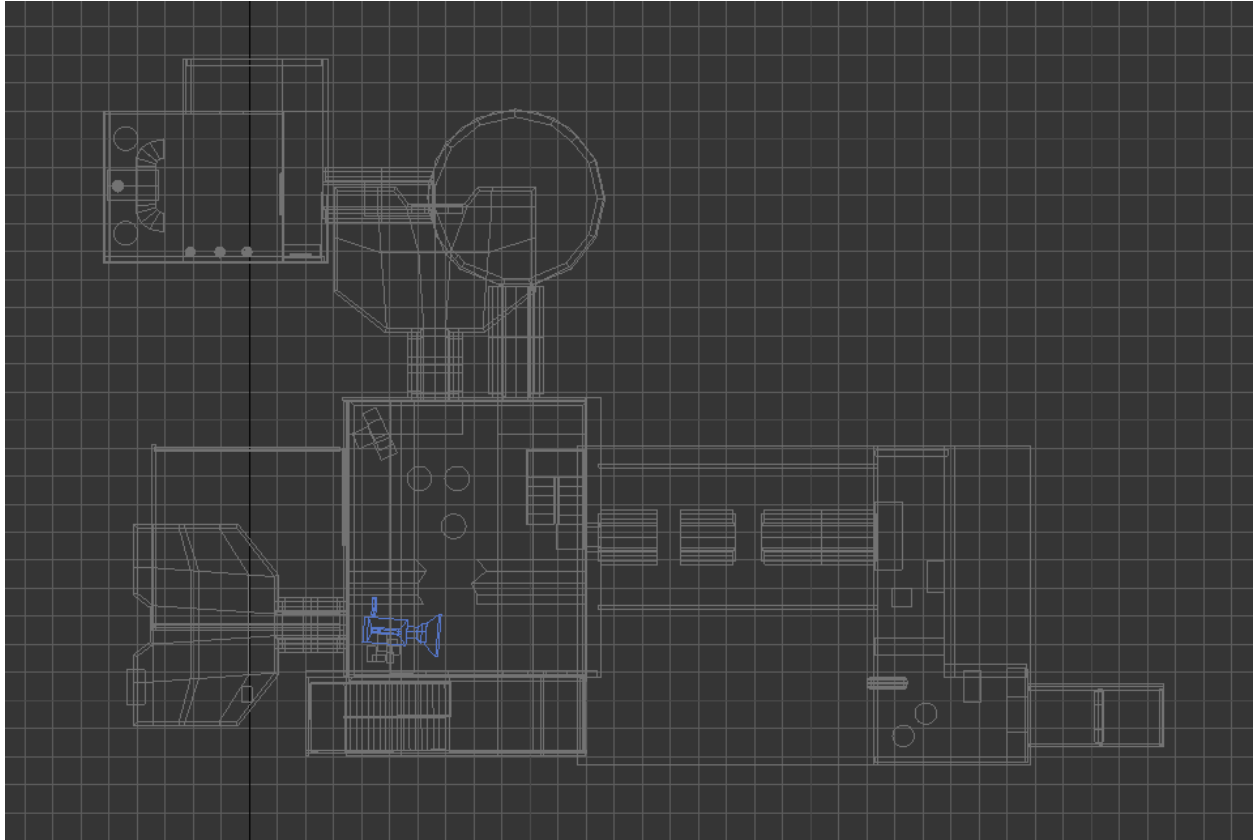
Greyboxing

Whole Level
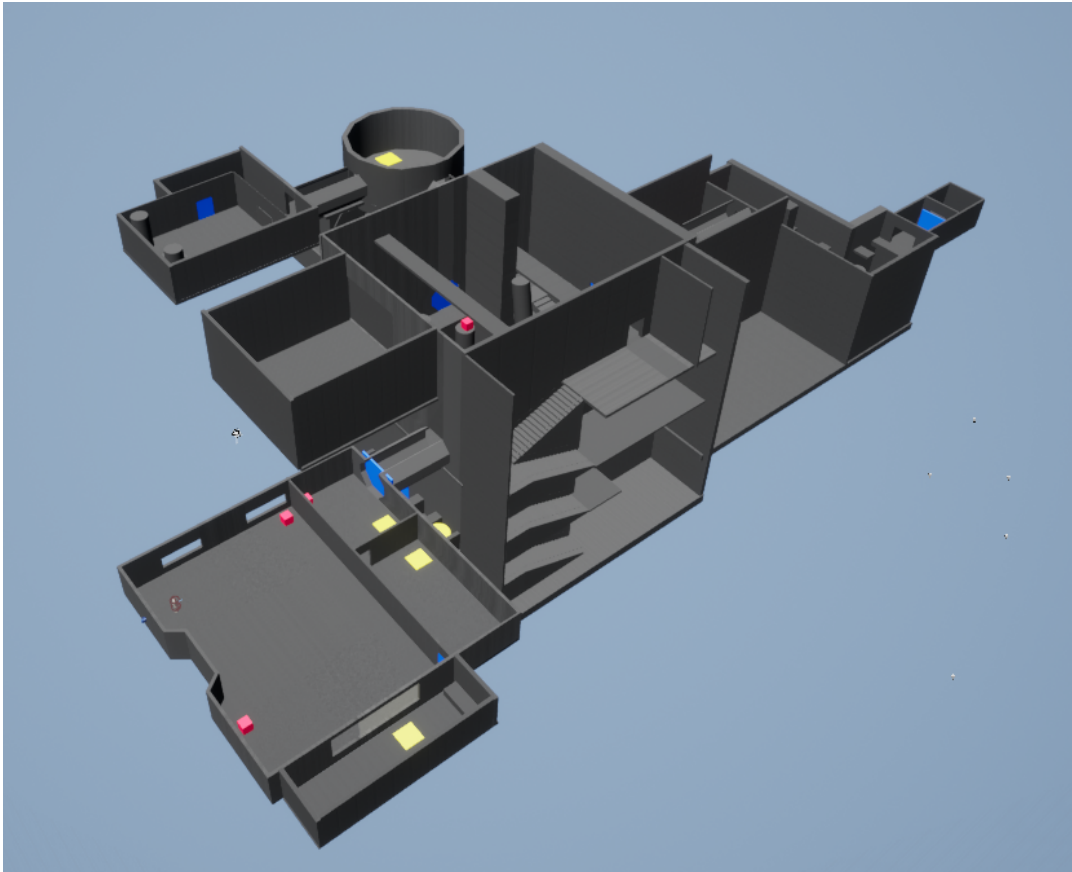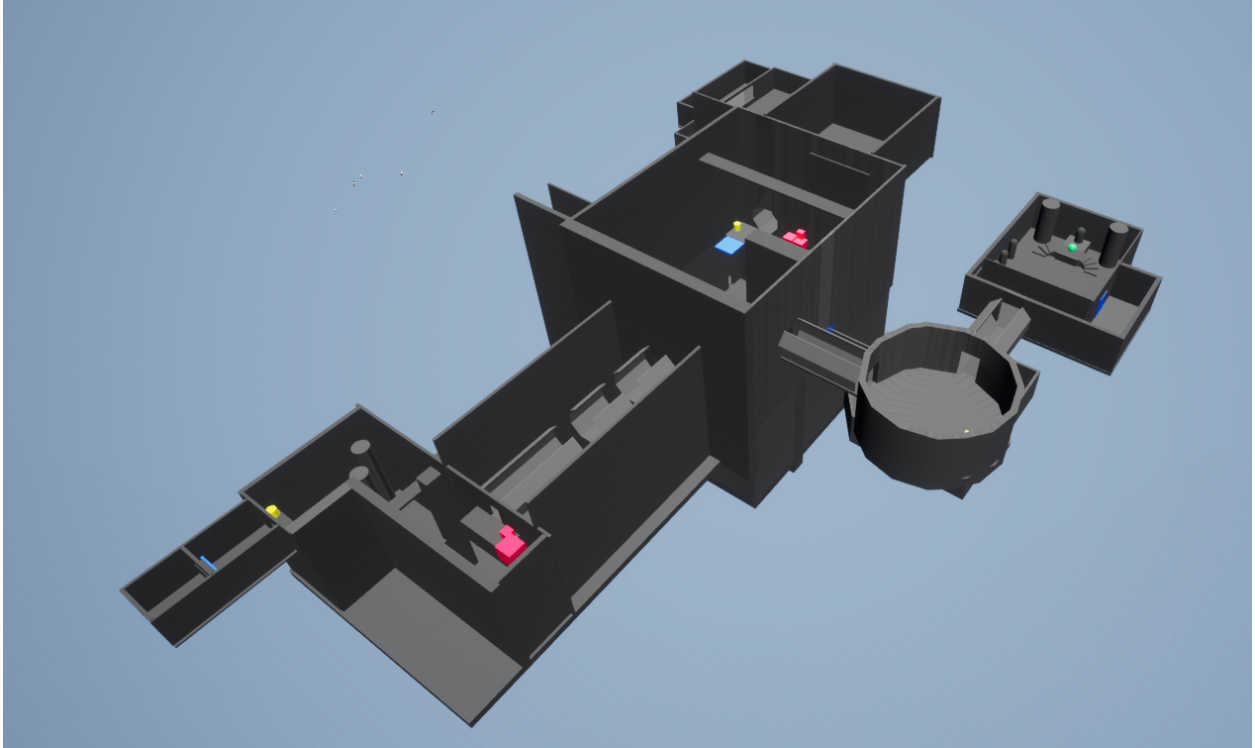
Tutorial Area
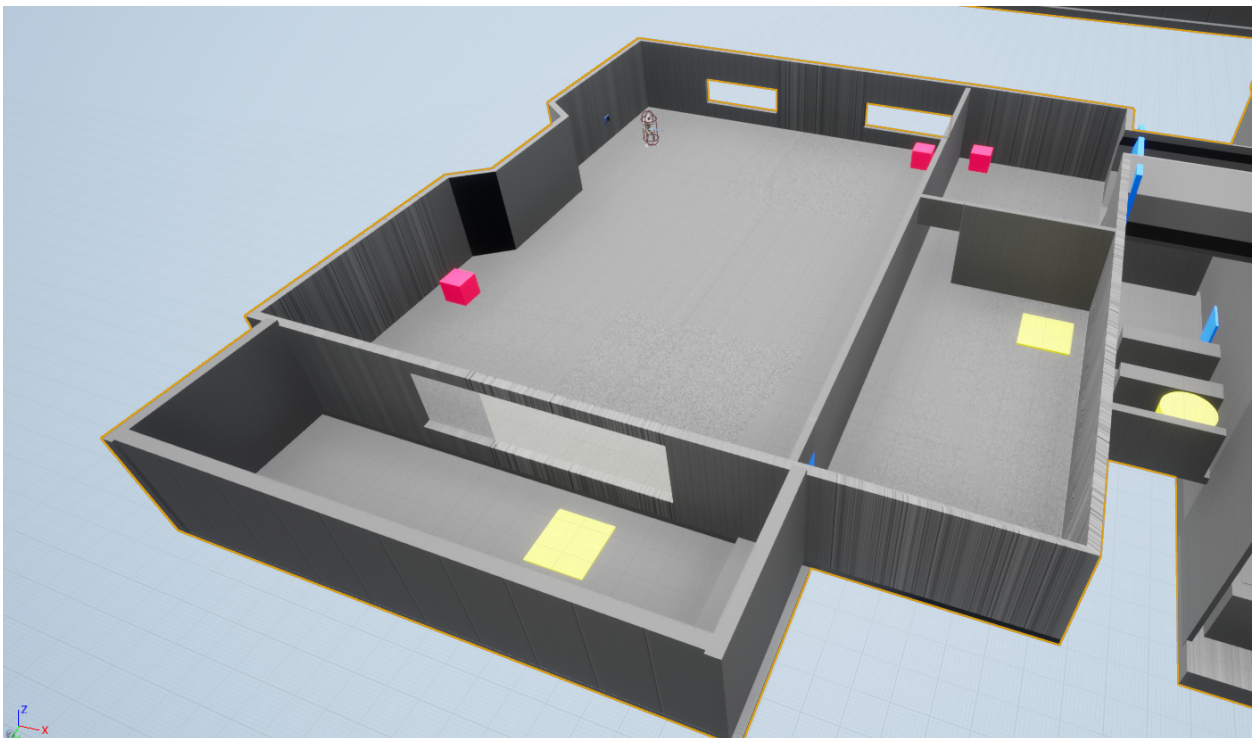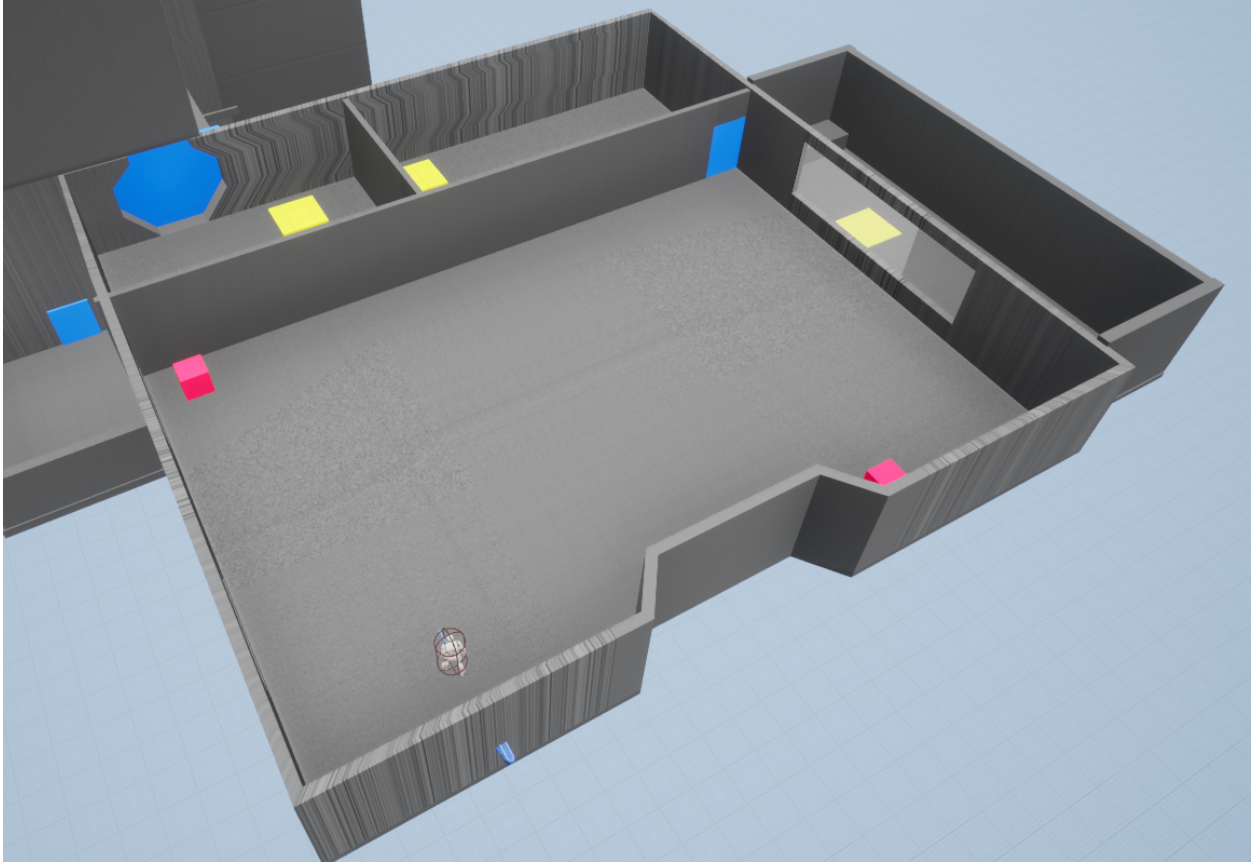
First Floor
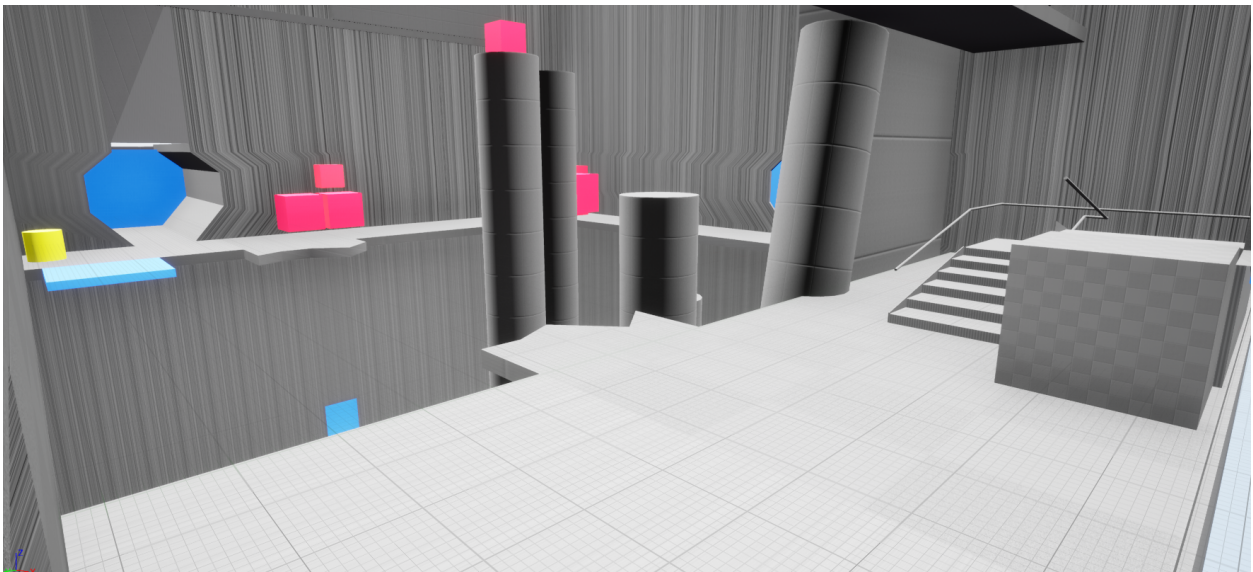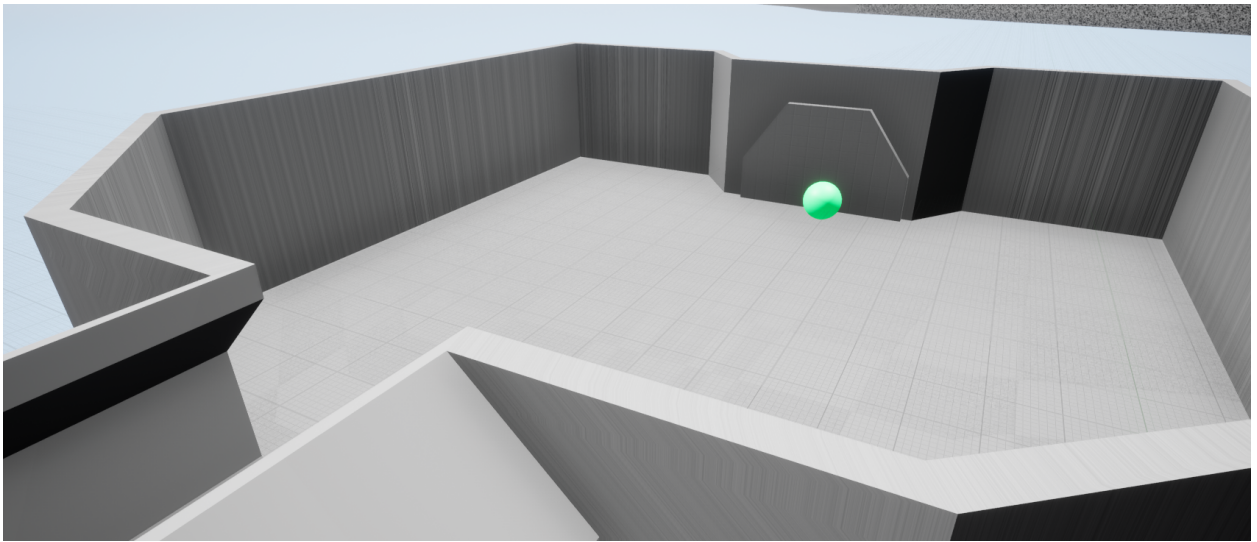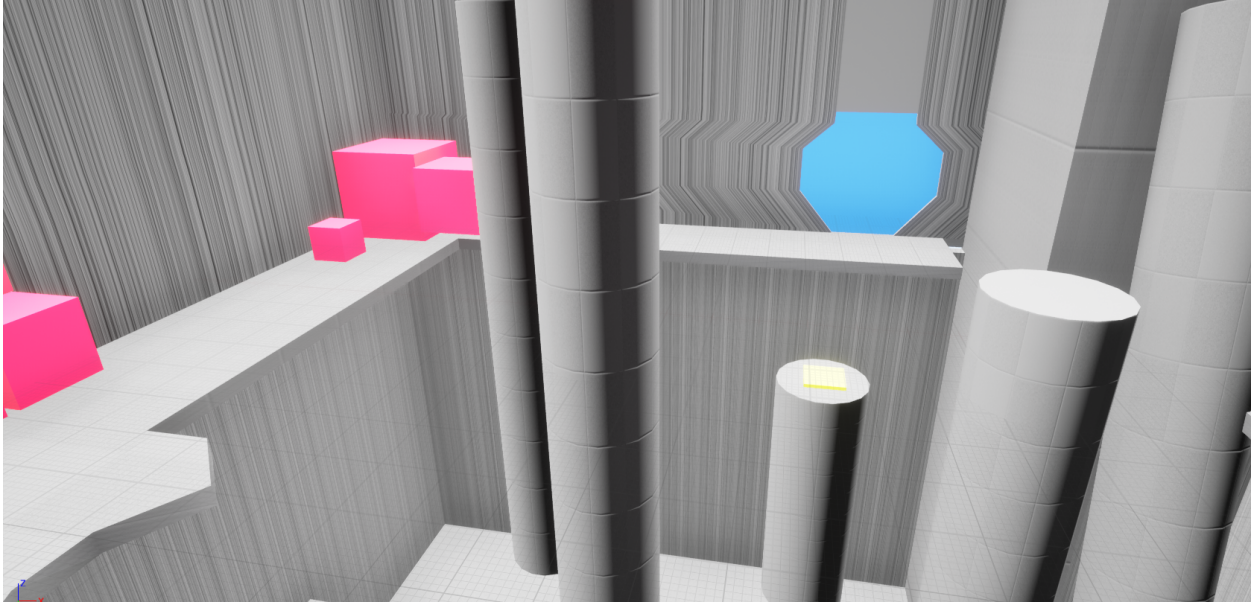
Second Floor
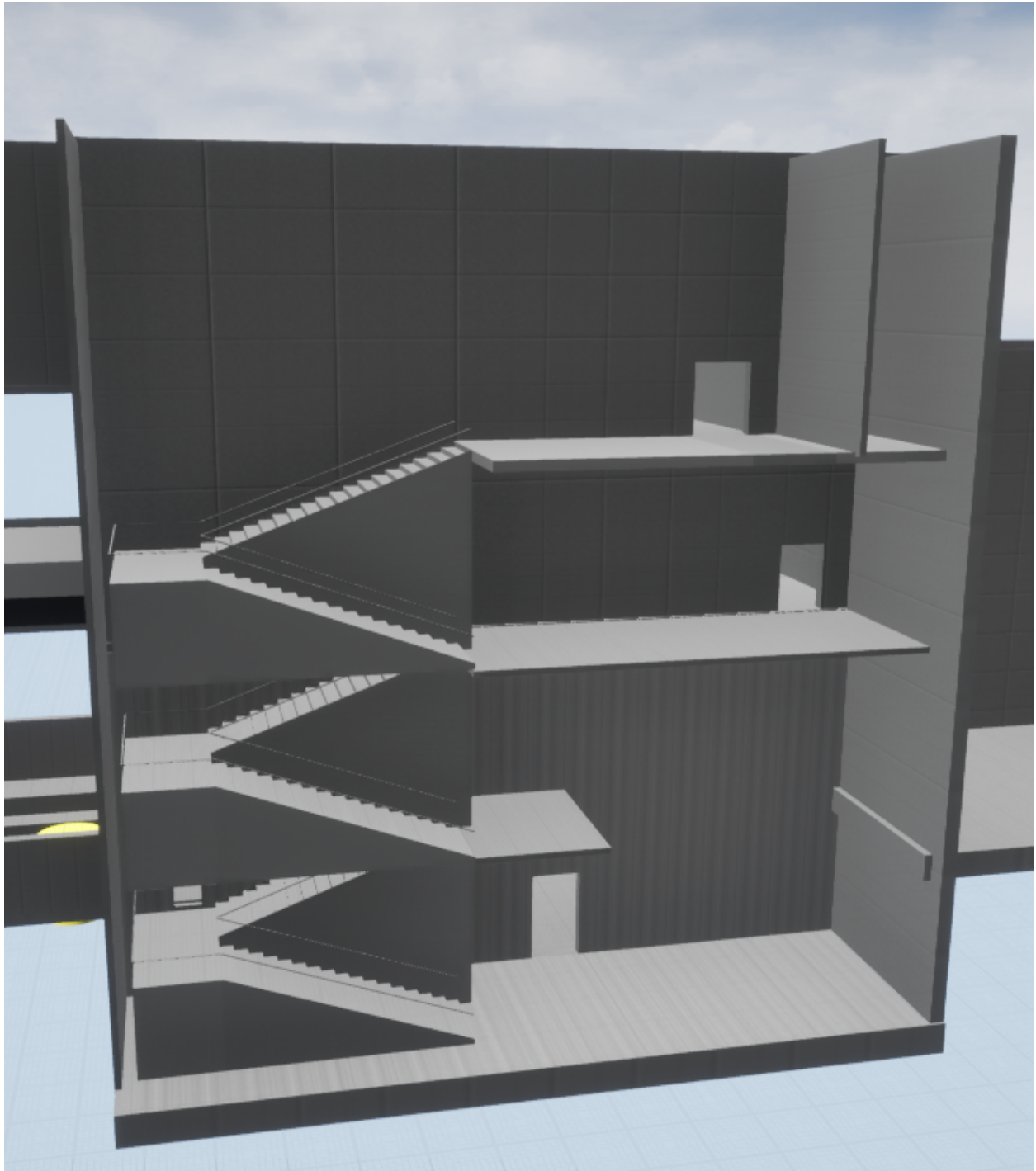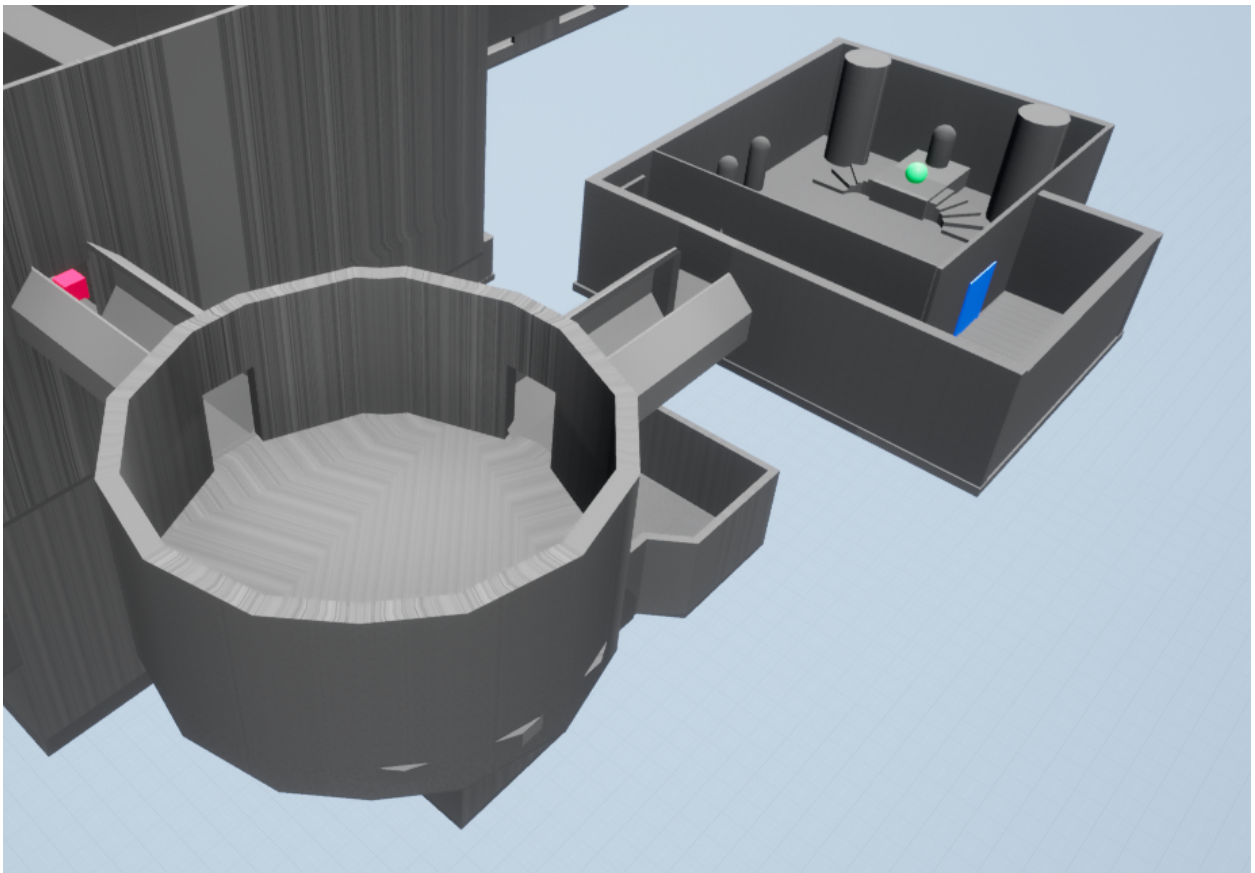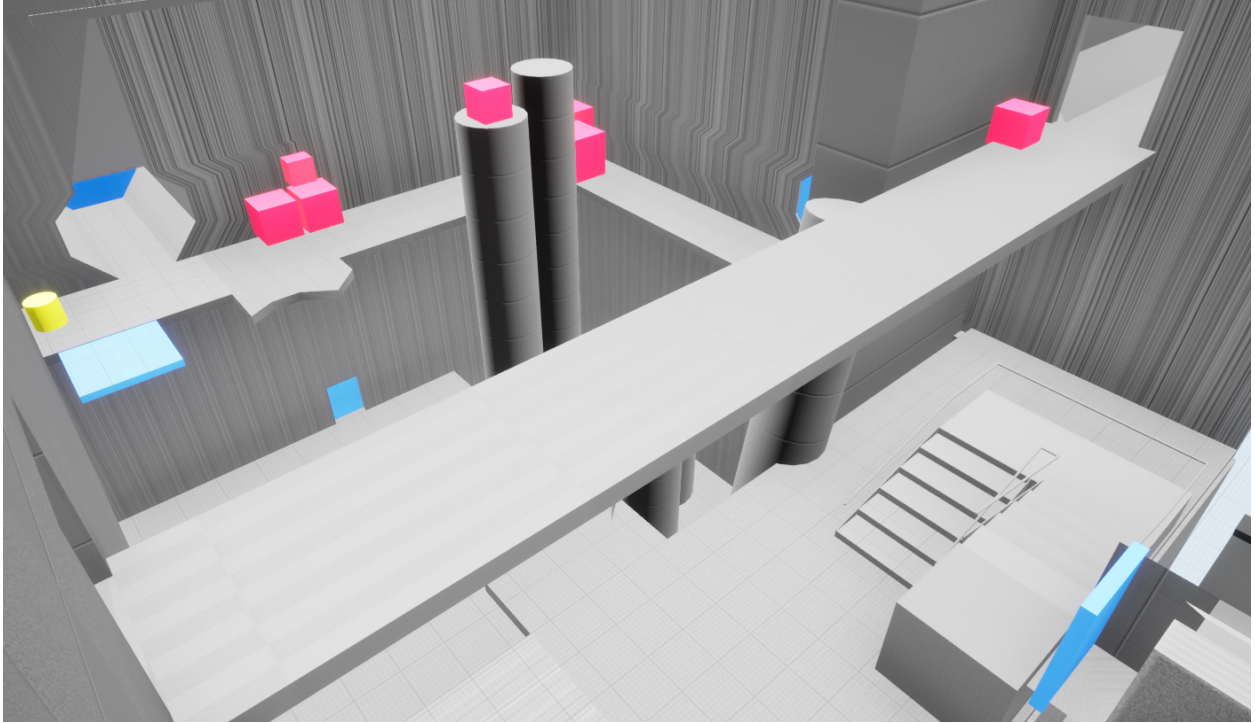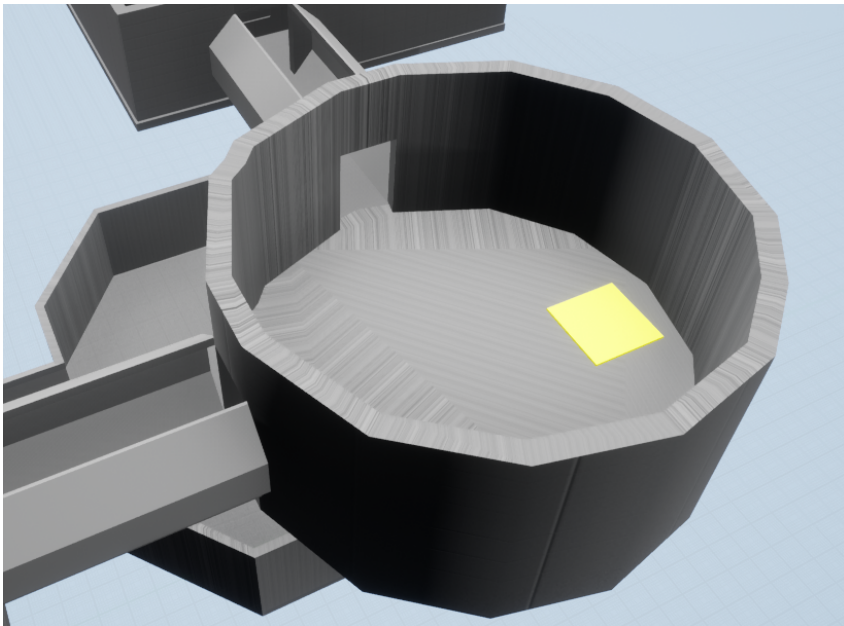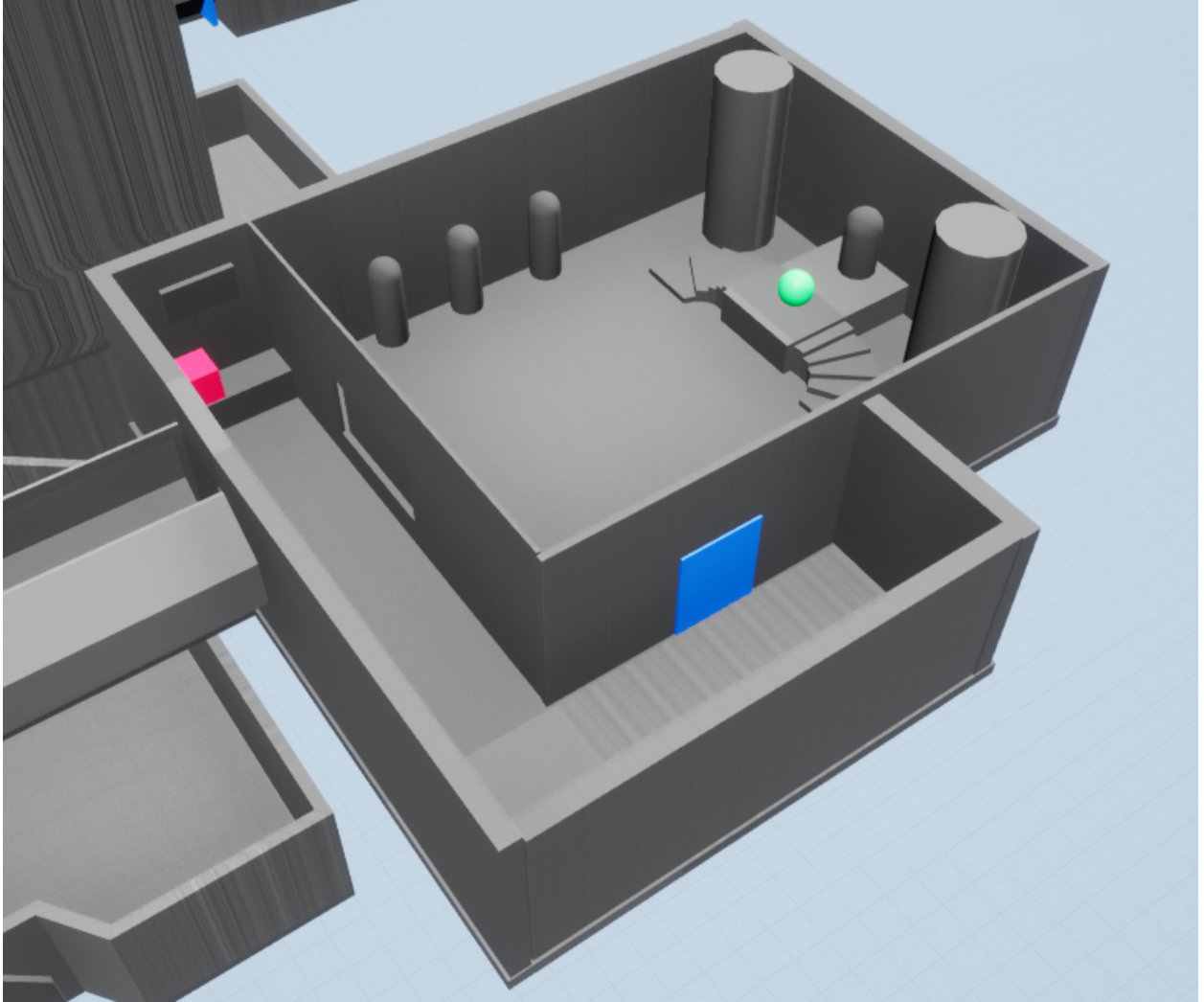
Engineering Room
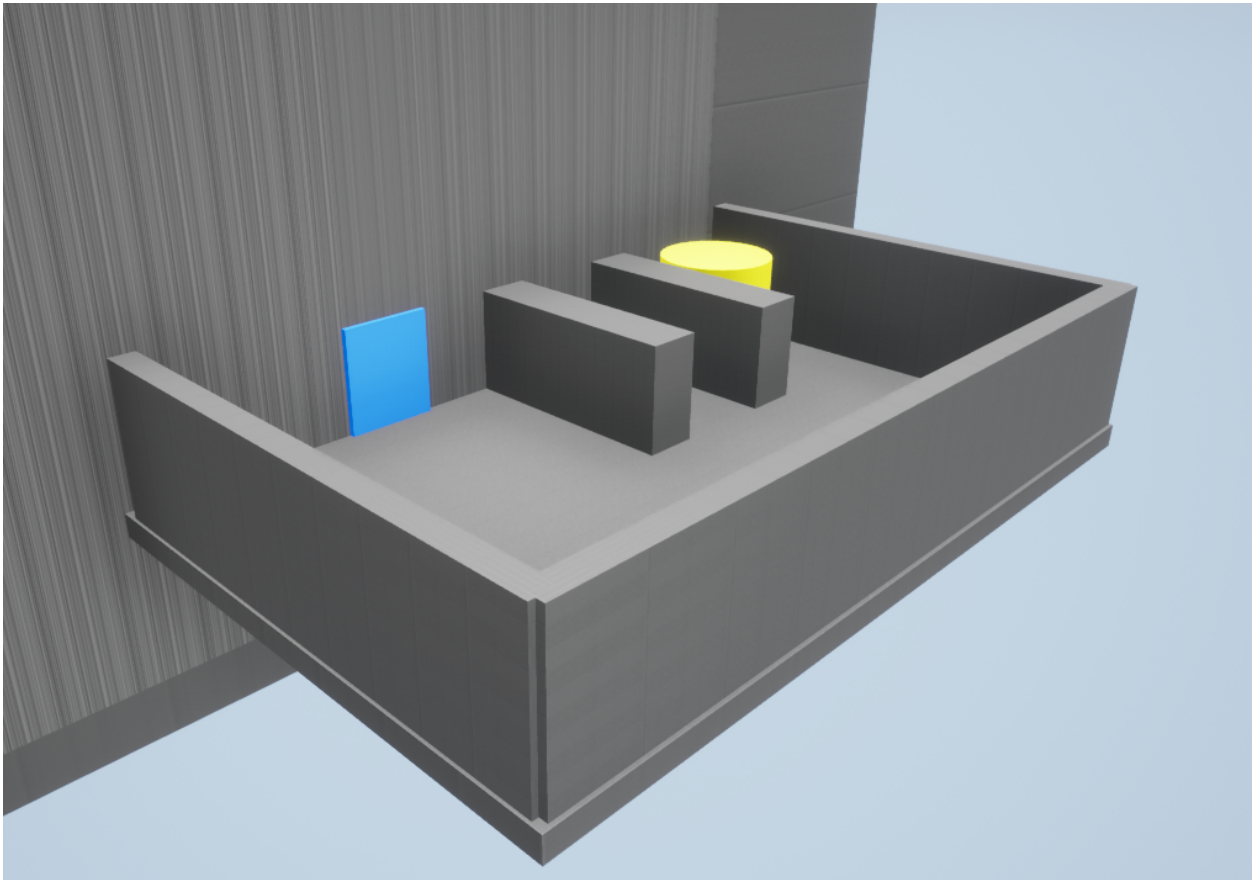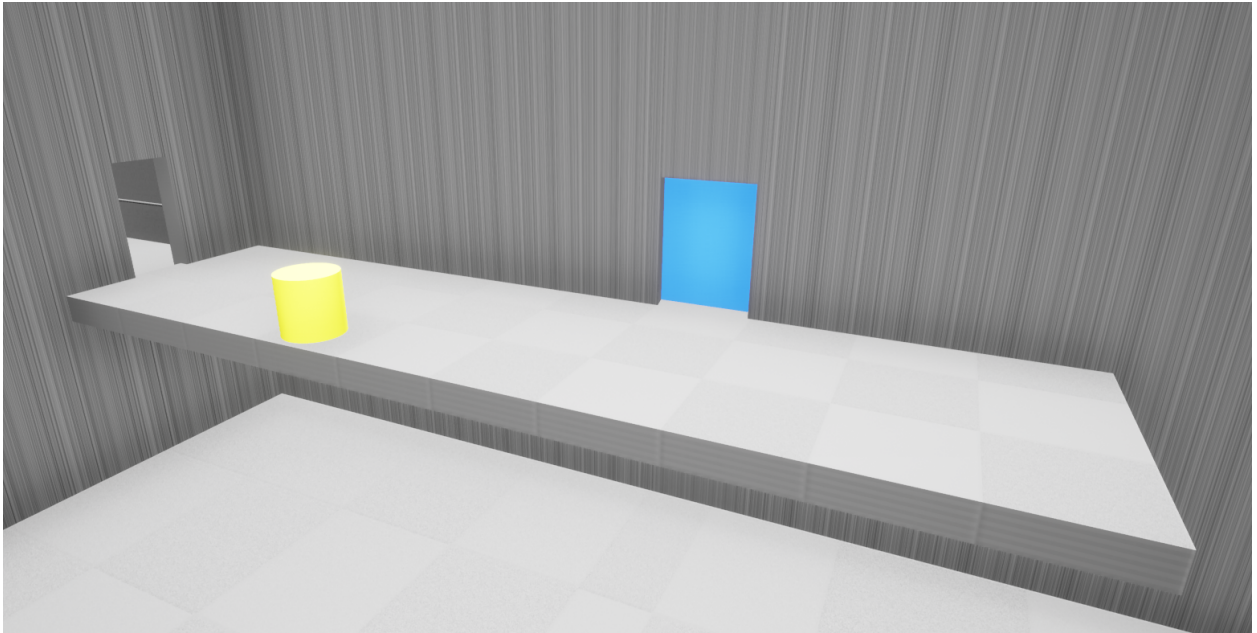
Escape Sequence
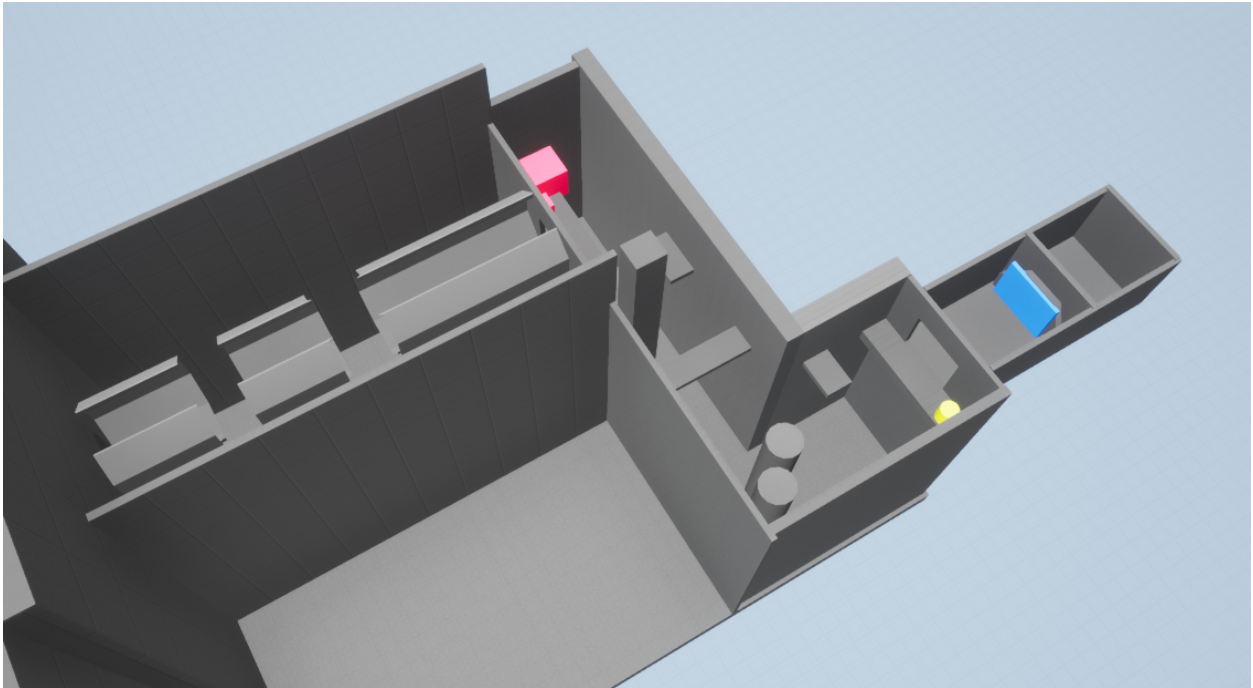
Early Asset Creation

Power Crate

Wall Panels
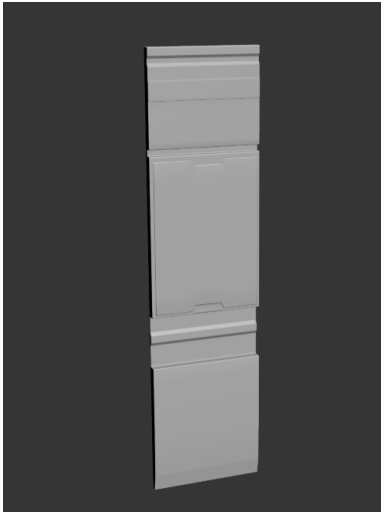
Door
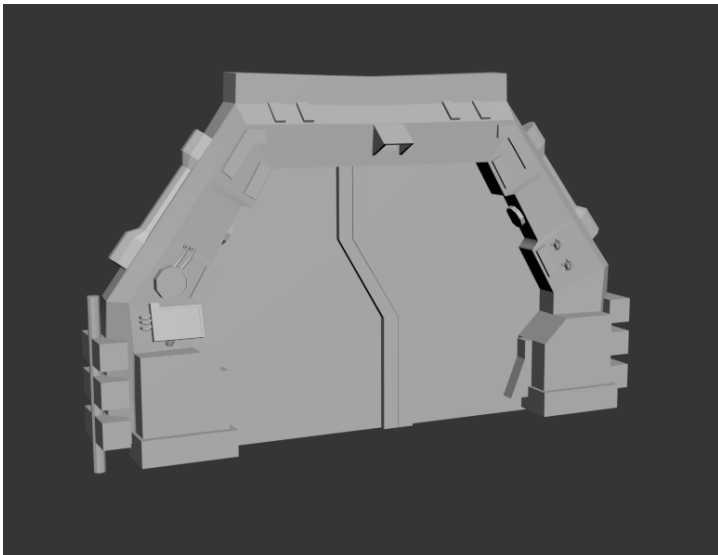
Steps
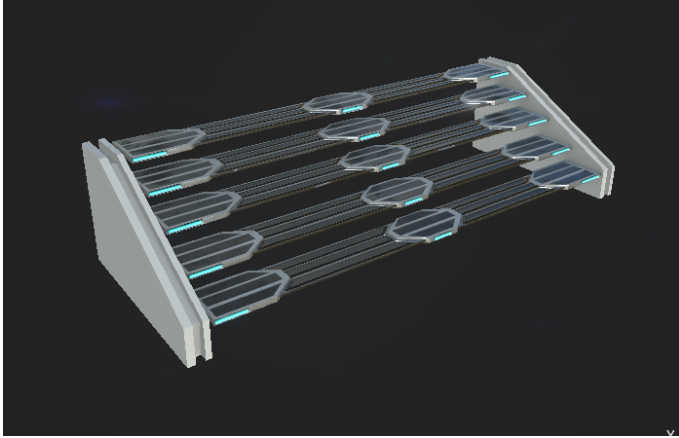
Future Greybox Changes

- Prevent player progression into second half of map until they get a blink- maybe have the bridge to light powerup require blinking to get across
- Adjust escape sequence area to last longer/have more to do

Milestone 2: Behavior and Interaction

Gameplay Interactions

Static Mesh Interactions

- Opening Doors (2 types)
- Power Lift Interface (Light Orb Interaction)
- Cube telekinesis with player
- Cube interaction with Power Receptor
- Light Orb Interaction with Moving Pillars

Puzzles

- Tutorial Puzzle teaching Telekinesis
- 2nd Puzzle involving Telekinesis
- 3rd Puzzle teaching Blink
- 4th Puzzle involving Blink and Telekinesis
- 5th Puzzle teaching Power Orb
- 6th Puzzle involving Blink and Power Orb
- 7th Puzzle involving Blink, Power Orb, and Telekinesis

Encounter Cycle (Step-by-Step)

Intro Sequence showing
(could show a full wide shot of the facility if we can dress it up well, establishing shot).
Camera zooms down to the player, showing off the room.
Then pans/moves over to the glass to show it has cracks/ to place emphasis that it is interactable.
Player Start
    Text saying: "Use WASD to move around the facility"
    As the player moves around, another text appears.
    "You have the power of Telekinesis. Use it to escape."

First Puzzle: Power Cores
The player will see that within the vicinity, there are power cores scattered about the containment area. These power cores have 2 states ("Active" and "Inactive") and will be displayed with emissive light to indicate their respective state. These power cores are able to be placed inside their respective slots on a power receptor. The player will see a current power receptor with an inactive core. This will give the player the hint that these Power Cores belong in these receptors. The player will then use the telekinesis ability to grab and place the active power cores in the empty slots beyond the broken glass found at the side of the containment room. After the player fills the first power receptor, feedback will be given in the form of sound/particles/partial power restoration and a door to the next area will be opened.

The player then makes their way into the Main Area.

Main Area - Accessing the Teleportation Lab
Sequence introducing Main Area- when the player walks through the hallway leading to the main area, a cutscene sequence will play, showing off the area along with the door the player will have to power to get through. A pulsing cord will come down from under the door, indicating where the player might have to go to power the door. It will then show a close up of the next power core, with enough detail around to help recognize where it is without being too obvious

The player will encounter a broken bridge in front of his view, too far away to jump over. When the player follows the path to the left. He will encounter a locked door. The player will know it is locked by the red light indicated above it. The player might notice there is a power cord attached to the door that connects elsewhere. This hints to where the power source for the door is located. The player will eventually find his way to the lower level of this area where he will find the power receptor connecting to the door from before. This receptor is requiring a cylindrical power core. There is a staircase that can bring the player back to the level above. In the stairwell is located a device that is powered by a cylindrical power core. The player may use his telekinesis to bring this core to the door's power receptor. The player will then enter a research lab that contains the "Blink" Ability.

Teleportation Research Room
The player will see something glowing at the far end of the room. The only way the player can make it down is dropping from the 3 platforms below. Once the player is at the lower level, they will find the "Blink Ability." This ability allows the player to teleport across a certain distance. There will be an indicator giving the player feedback on the approximate position they can blink to. The player will see that they cannot make it up the same way they made it down. The player will be required to use their newly-found Blink ability to teleport themselves up the platforms to get to the exit. The player will then come back to the main area from before.

Main Area - Crossing the gaps to get to power orb (With Blink)
With the new blink ability, the player will be able to reach areas that they couldn't before. The player will also discover that the telekinesis can be used in tandem with the blink ability to reach even further places. They can go back to the stairwell where they will use the blink ability to jump over a gap between two platforms leading into a different area. The player will enter a decontamination area, and the door will lock behind them. The next room that the player will reach is the "Energy Research Lab"

Energy Research Lab
In this room, the player will find the Power Orb ability. This ability can be used to power certain objects within the environment for multiple purposes. The player will be able to use the power orb to unlock the door that locked near the decontamination room from earlier. The player will then go back to the Main Area.

Main Area - Puzzle unlocking the Electrical Room
(can also have all lights go out/dim to force the player to use the power orb to light the area)

Upon exiting the previous area the player will be shown a quick cutscene showing the pillar puzzle and the lift.

Power orbs can be used on the pillars to allow them to go up and down, causing the player to have to traverse across them to eventually reach a power orb receptacle that powers the lift.

Players then have to go back to the tutorial room and re-light an 'unpowered' cube, which they can then put into one of the untaken receptors in that room to open the

door to the Electrical Room. Now the player has access to the Electrical Room. This room can be found when using the power lift to go to one of the lower levels.

Electrical Room - Restoring the Electricity

When the player enters this room for the first time, the lights are off and it is pitch black. The player may use the Power Orb to traverse the room to find anything useful that would help the player. Behind the electrical machinery in the room, there is a Generator that is currently turned off. The player may use the Power Orb to turn the power back on. Not only does restoring the power turn the lights back on, but it also opens up a door in the Main area.

Main Area - Exiting the Electrical Room

Once the player has restored the power to the environment and re-enters the Main Area, he can make his way to a newly unlocked door. However, once the player opens this door, a sequence will take place where a dark creature breaks out from the upper level. As the creature moves towards you, intense music begins to play, triggering the escape phase of the level.

Escape Phase

During this time the player is attempting to flee from an unknown threat. In order to escape they will have to leave through the newly opened door and navigate through puzzles involving implementation of prior mechanics, including:

- Dash across gaps/up to platforms
- Use light orb to raise/lower pillars or move objects
- Telekinesis objects to create platforms
- Light the way

The player enters a shaft where they see platforms above them that they can reach with their blink ability. However, the next platform is too far out of reach. There is a light receptor above the player that can be activated using the light orb. Once activated, the platform begins to rise. The player must find a way to activate the receptor while being able to blink to the platform very fast. Around the next corridor, the player will encounter a large area with nowhere to blink a broken bridge. The

player will notice that there are objects at either side of the area. The player will need to use telekinesis to place these objects in mid-air to create a bridge to get across to the next platform. In the final area, the player will need to use both the Light Orb and Blink ability to traverse across the platforms to the end platform. Once the player exits this area, they encounter the elevator, which helps them escape the incoming threat. As the elevator activates, the screen fades to black, as the first level Orion 77 has now finished.

Milestone 3: Polish

Meshes & Materials

3D Modular Kit

When deciding our environment and assets, we decided to build a modular kit, which would allow us to re-use assets to fill our extensive level and guarantee detail in every corner. Due to time constraints, loss of a team member, and art style inconsistencies, we did not include every asset we made in the final iteration of the level.
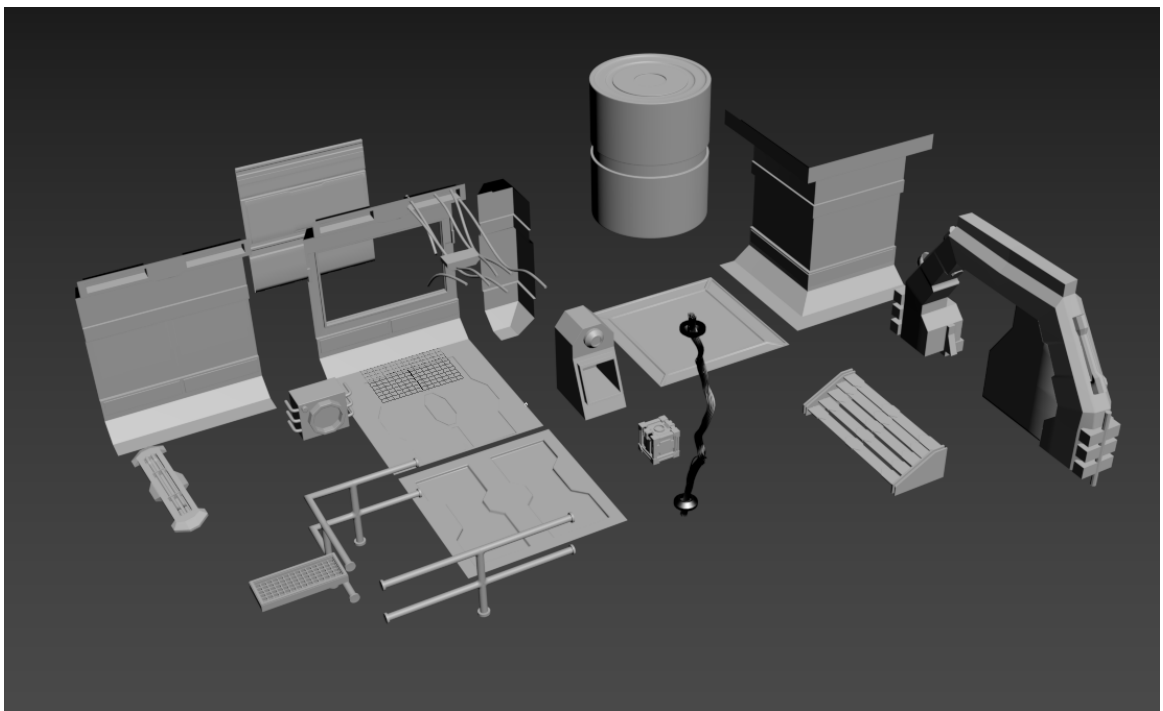
Here is a list of 3D Assets that made it into the final level.

- Ceiling_Tile_A
- Ceiling_Tile_B
- Corner_Transition_A
- Corner_Transition_Inverted
- Door
- Wire_Tangle
- Wire_Cluster
- Light_Orb_Receptor
- Crate
- Crate_Receptor
- Pillar_A
- Pillar_B (able to catch light orb)
- Fan_A
- Floor_Tile_A
- Floor_Tile_B
- Light_Small
- Light_Large
- Railing_Corner
- Railing_Straight
- Wall_A
- Wall_Window
- Vent_Grid

Texturing

We used Substance Painter to create materials for most static meshes. Because we only had a team of two, this seemed like the fastest route to create game-ready textures for our meshes. To name a few, we utilized tools such as emissive maps, ambient occlusion, alpha masking, procedural wear/scratches, and high-poly mesh bakes.
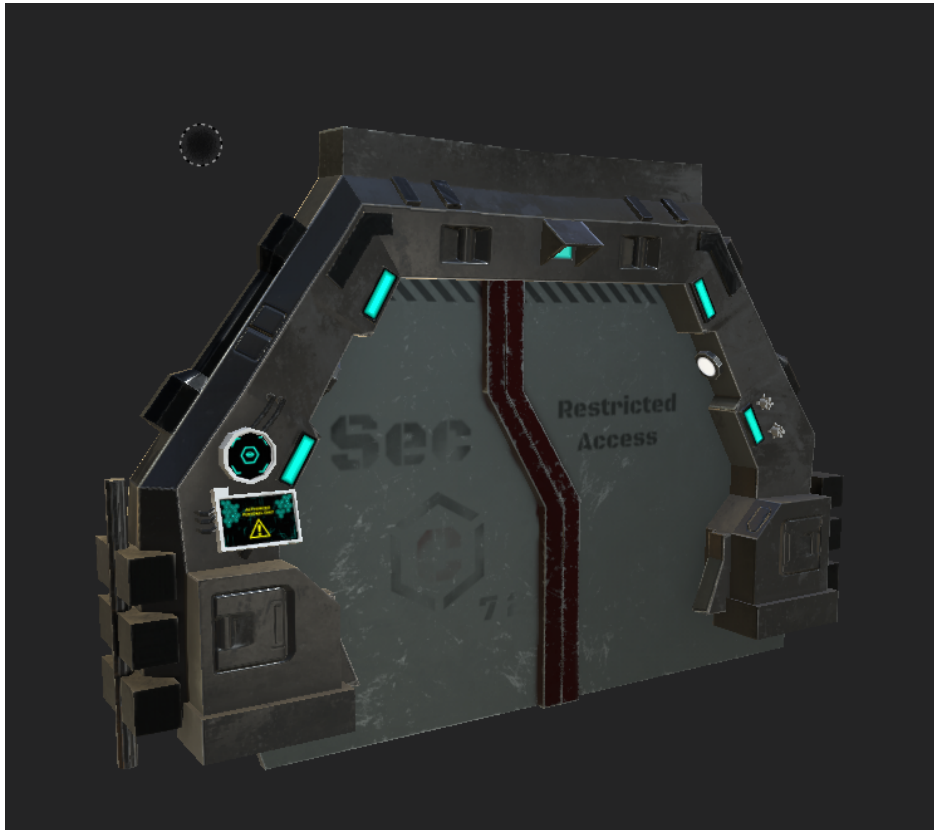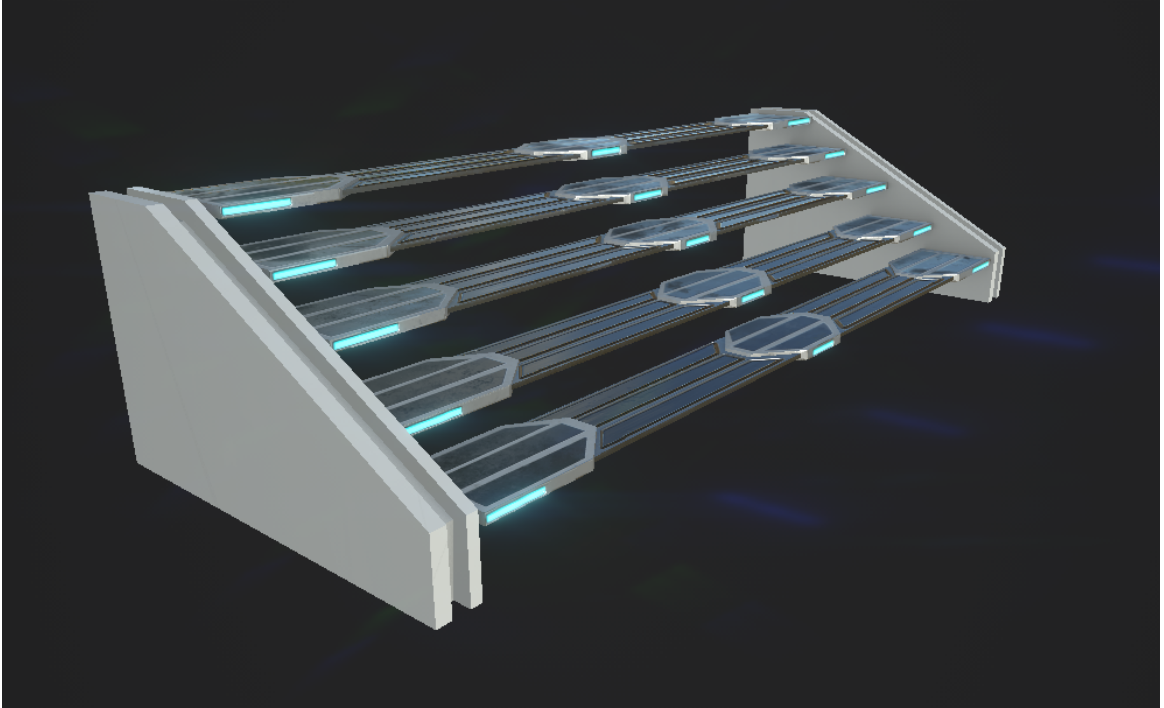
Atmosphere

Lighting

      When lighting our scene, we used a variety of lights to compliment the direction of our game level. For basic rooms and hallways, we used Unreal Engine's Area Lights, as well as the emissive maps of our light textures to illuminate the surroundings. We used Unreal's Spotlights to illuminate much larger areas of the level, like the Main Area. We also placed reflection captures throughout the scene to simulate reflections for our texture maps and lightmass density,
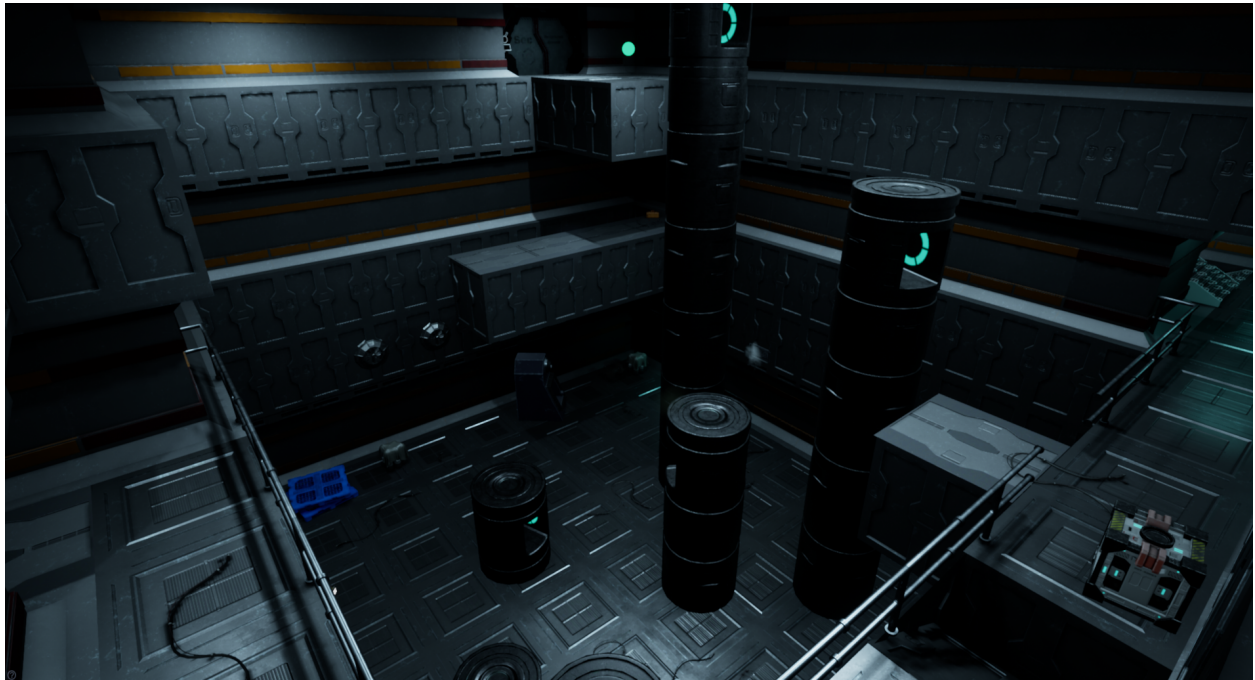
Lightmap Density

      We ensured that the direct/indirect lighting in the scene would be appropriate when it interacted with the objects in our scene. In order to do this, we had to change the lightmap density of every static mesh, so that light would lay across the mesh appropriately.
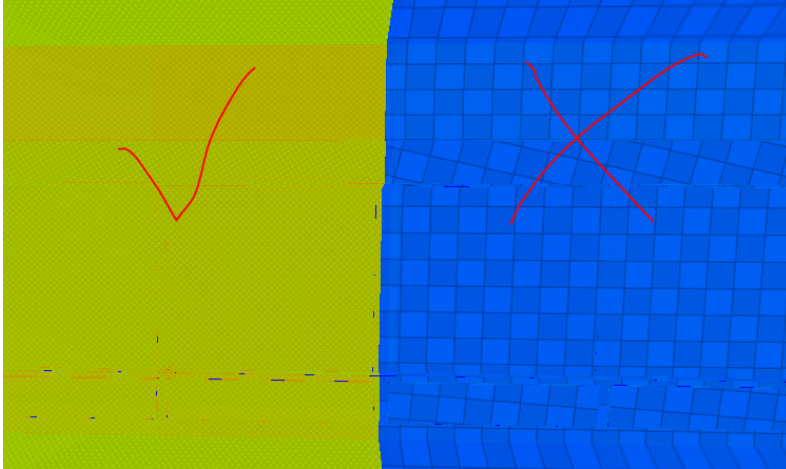
Ex.) Lightmass density on our wall static meshes

Post Effects (Post-Process Volume)

- Bloom/Glare
- Exposure Compensation
- Lens Flares
- Film Effects (Slope, Toe, Shoulder, White Clip, Black Clip)
- Depth of Field
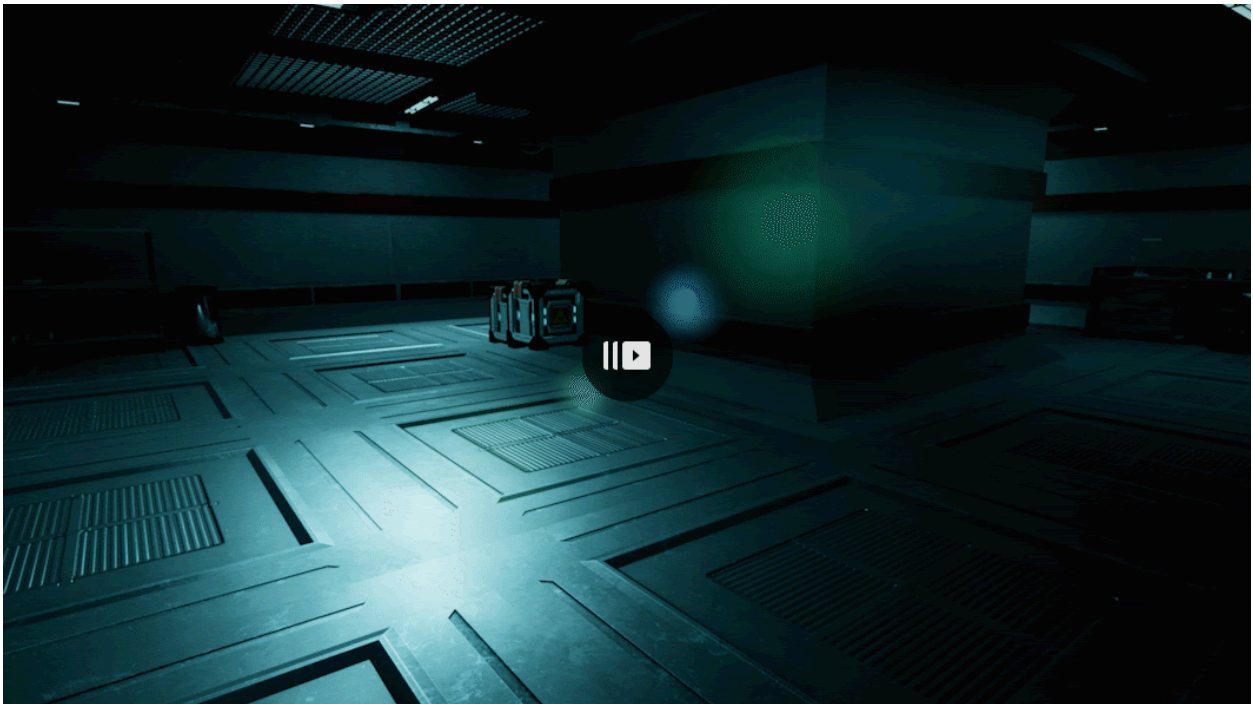
Particle FX

Dash

In order to provide feedback to the player regarding the dash mechanic, we wanted to create a particle system that clearly shows where the player will teleport to, and if they can teleport to that location.

We achieved this by using a two-part system. The first part was the location telegraph, which we made using a pulsing material on a plane, which we then swapped the color of when the player could teleport.

The second part of this system is the actual particle system. We created two systems that spawn different colored particles, similar to the pulsating material.

The implementation of this system was rather simple. The player had a plane attached to them with the pulsating material on it, along with both particle systems. By default, the particle systems and plane are disabled. When the player tries to activate the dash ability, the particle system and pulsing plane are moved to the potential dash location and are enabled. If the player dashes, then the colors of the effect are swapped.
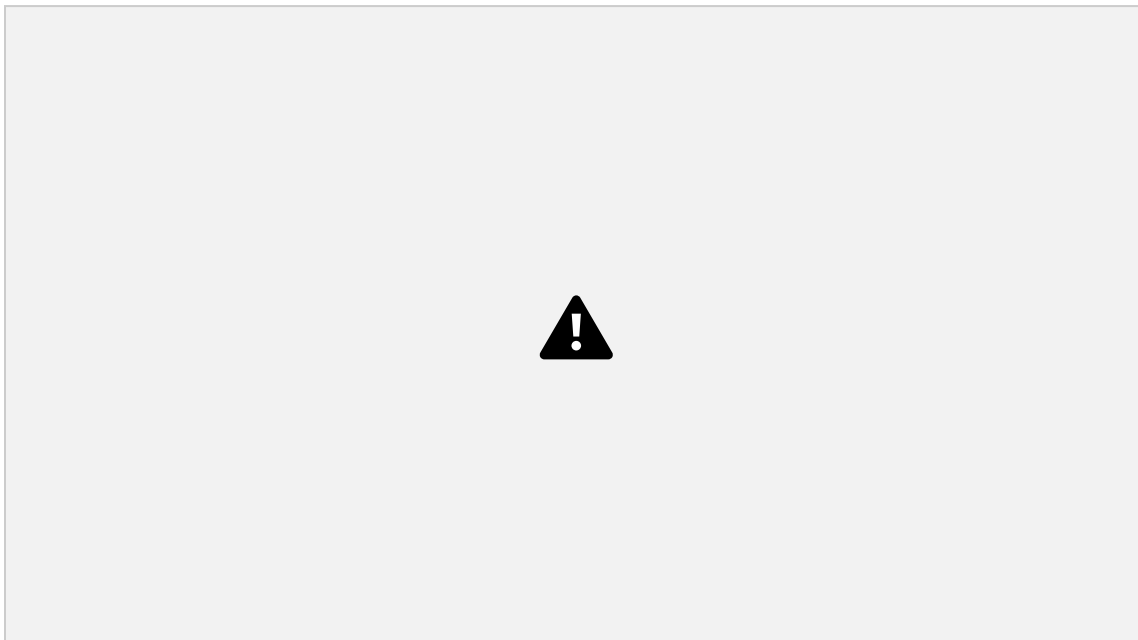
Light Orb

The light orb has a very simple particle system attached to it. It consists of small light balls that float off in a random direction, for a random amount of time.

Steam

The steam particle system is included in the starter content of Unreal. We used it in our level to add additional life to our scene by putting it by vents to make it seem like they are running.

Props & Set-Dressing

Our Props

We modeled, unwrapped, and textured props that would compliment the surrounding throughout our level. We chose to make sci-fi assets like, power-crates, blast-doors, power-receptors and so forth. These assets would not only fit in our level, but blend with the environment and player interactions to create an atmospheric experience for the player.

Additional Propping

The remainder of the props we used were obtained from two packs on the Epic Marketplace: **Modular Scifi Season 1 Starter Bundle** & **Modular Scifi Season 2 Starter Bundle.** These packs included a large number of Scifi office and industrial props, including desks, shelves, laptops, barrels, gas tanks, and pallets. These props were used for decoration.

Set-Dressing

We used both the props we created ourselves, in addition to the props from the Marketplace packs, to set-dress our environment. We placed desks, shelves, stools, and office supplies in some of the science rooms, and in the engineering / maintenance areas we placed pallets, barrels, gas tanks, strewn about wires, industrial lights, toolboxes, and other small props around the area to make it feel lived in and real.

Animations & Living Environment

Prop Anims

One of the things that helps our environment feel alive are the animating props that are placed into our level. We have a few props / meshes that animate inside our scene. These include wall fans, doors & door consoles, vents, and pillars. Each of these move in a unique way, and give different material / movement feedback to the player.

The fans placed around the level rotate inside their housing, making it seem like the scene is ventilated.

The vents are animated because of the steam particle, which was talked about earlier. In combination with the fans, it really sells that the scene has proper, working ventilation.
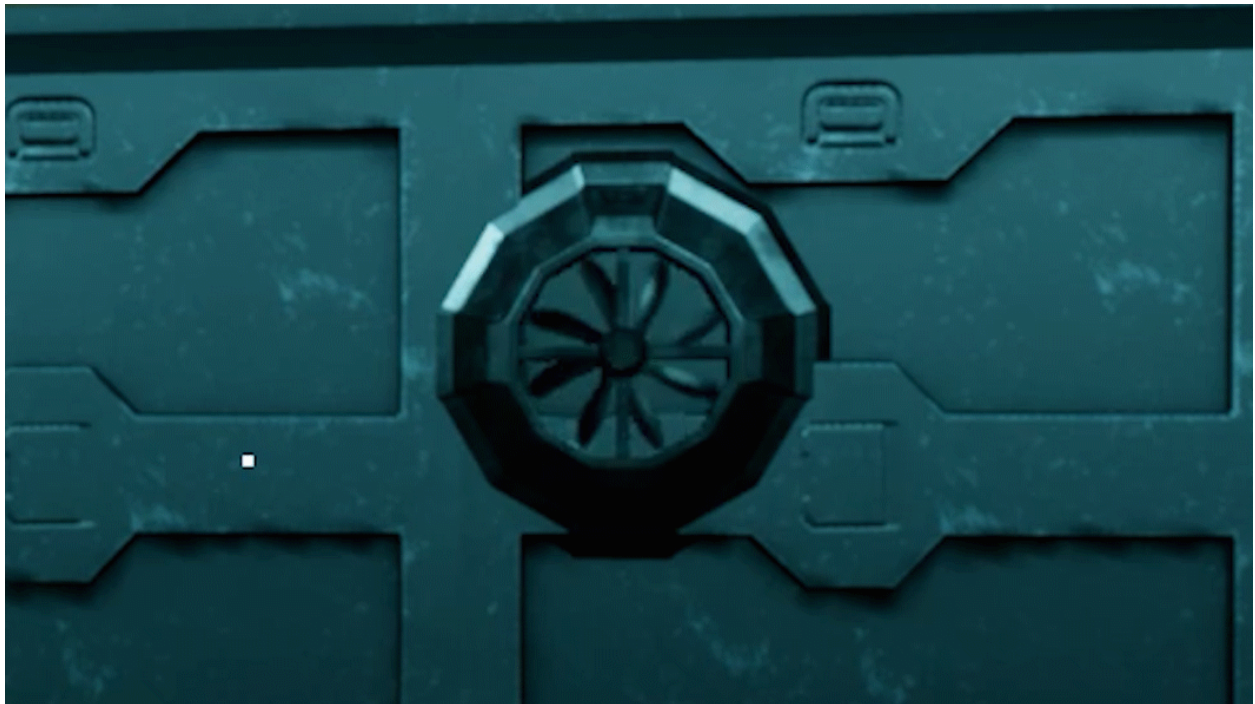
When activated, the doors do a simple opening sequence. First, the lights on the door turn on via a simple material change. Next, the console next to the door turns on, also due to a material change. Lastly, the two pieces of the door slide away into the wall.

The pillars have simple animations. When they are powered, the lights on top of the pillar turn on, and the pillar then moves up or down. Once the power runs out, the pillar lights will switch off and the pillar will return to its original position.

Camera Anims

Throughout the level, there are several camera sequences that help show the player where to go. In total, we have six sequences.

1. **Opening Sequence-** This is the sequence that is played when the game is first opened. It showcases the starting location, and gives a subtle hint at the first puzzle.
2. **Main Area (First Time)-** This sequence is shown once the player moves through the first door into the main area. The camera establishes the room that the player is in, and guides them towards the next puzzle.
3. **Door Open (Dash Room)-** This sequence is shown once the player solves the previous puzzle. The camera is focused on the door, and watches as it opens. The purpose of this sequence is to show the player what effect the puzzle had on the environment, and to show them where to go next.
4. **Exiting the Dash Room-** Once the player collects the dash ability, a sequence plays showing the player how to get out of the room using their new ability.
5. **Light Orb Puzzle-** Once the player collects the light orb ability, a cutscene showing the basis for the next puzzle, and the main flow throughout the puzzle, is played. At the end, the goal is clearly shown in order to give the player a goal and idea of how to solve the puzzle.
6. **Door Open (Final Room)-** When the player completes the last puzzle, a cutscene showing the final door opening is played. Similar to the first door sequence, this shows the player what effect their actions had on the environment and where to go next.

How it all comes together

Everything mentioned here brings the scene to life in many ways, while also allowing for cues that the player can follow. The lighting, particles, animations, and level of detail in the props and scene create a stunning, living environment.

Below are more beauty shots of our environment
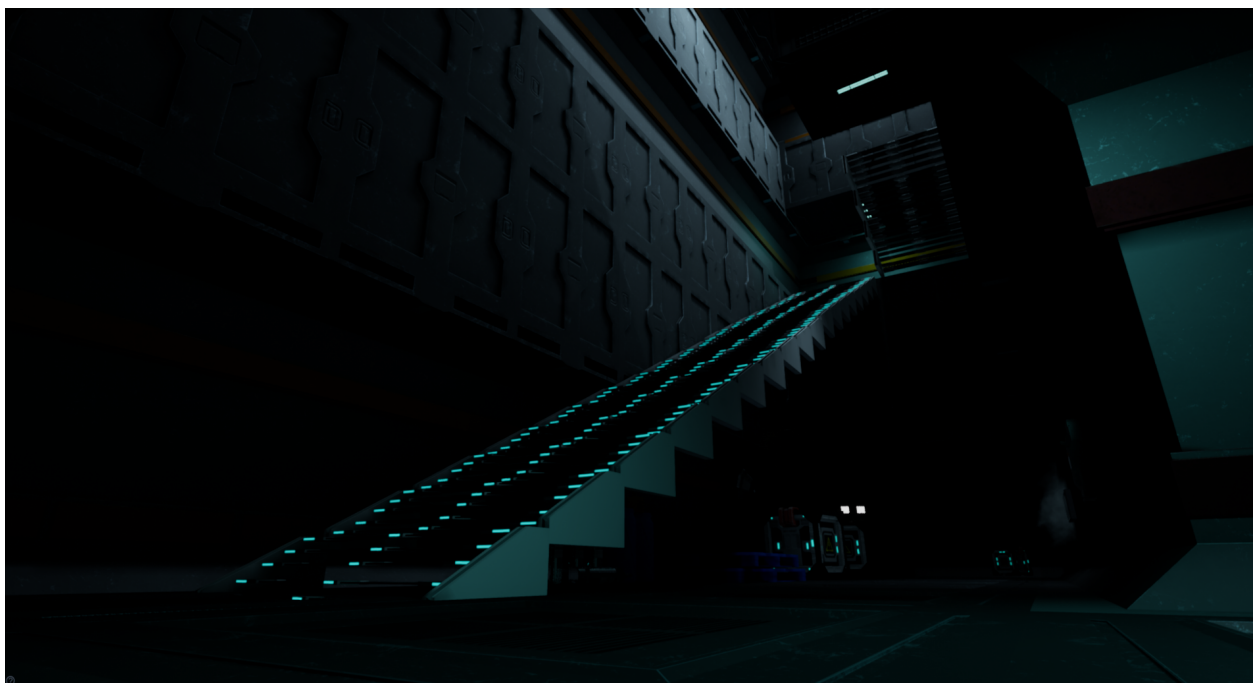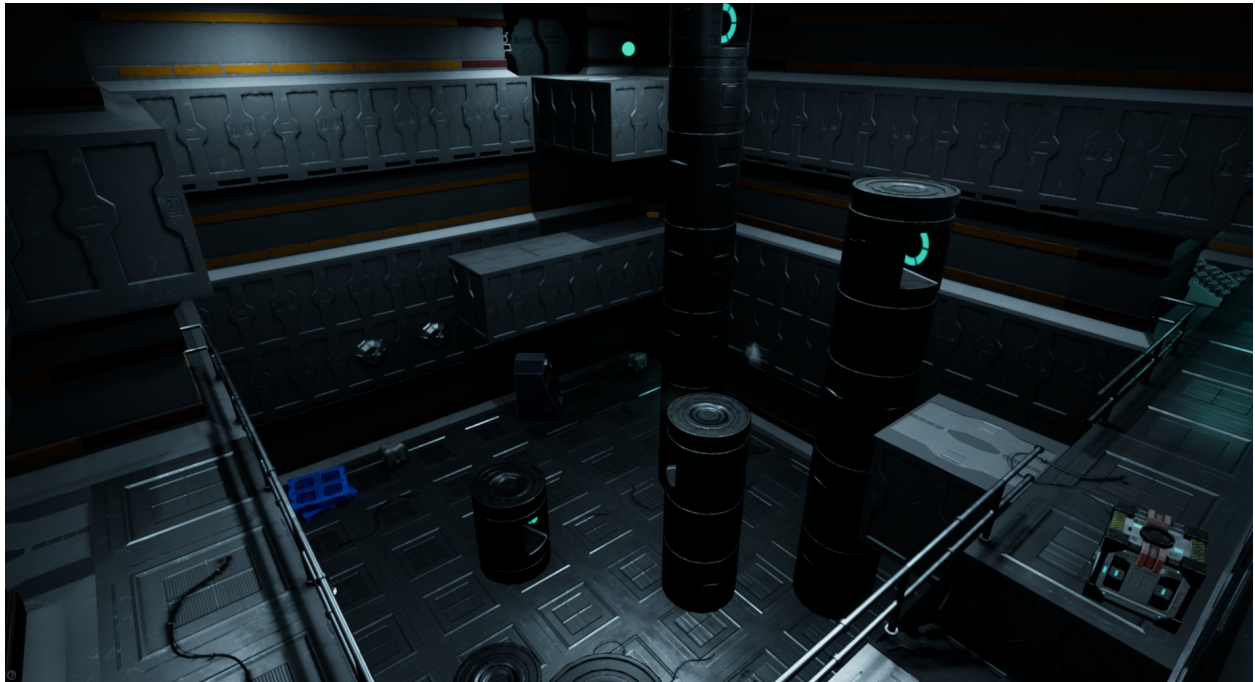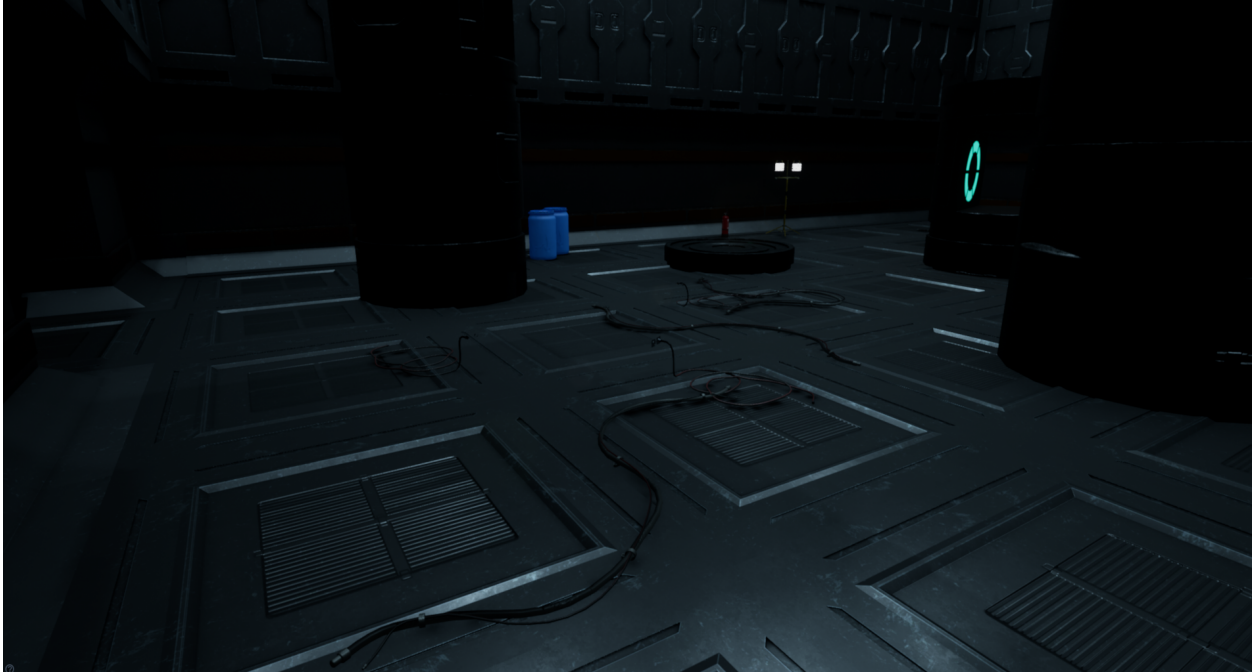
Changes to the Original Plan

Over the course of this project, we made a few changes to our project based on a few factors.

First, we cut down the length of our level by removing the light orb room and the escape sequence section. This decision was made when we lost a teammate in the middle of the semester. This allowed us to finish up the project with limited assets and materials.

Second, we had to use prop assets obtained for free from the marketplace. This was also due to the loss of our teammate. Overall this worked out well for us as we got a lot of quality props to place around our scene.

Third, we had to change the layout of our level so it would work well with our modular kit. The main areas we changed were the starting room, staircase, and walkway to the light orb area.