

# Water Damage Level Design Document

A custom level in Halo Infinite

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## Contents

Document Summary .....	4
Initial Planning .....	5
Goal .....	5
Narrative Story .....	5
Layout Planning.....	5
Sky Layer 2 .....	5
Sky Layer 1 .....	5
Ground Layer.....	6
(B1) Basement 1 Layer .....	6
(B2) Basement 2 Layer .....	6
Map Requirements .....	6
Halo Waypoint Requirements.....	6
Gameplay Requirements .....	6
First Layout Design.....	8
General Shape Diagram(s) .....	8
Side view Diagrams .....	13
In Engine Greyboxing .....	15
Metric Greybox (In-Engine).....	15
Overview .....	15
Red Base.....	17
Exterior Catwalk.....	21
Central Control Building.....	22
Large Prop Planning .....	27
Gameplay Planning .....	28
Spawning.....	28
Weapon, Equipment & Vehicle Placements .....	29
Base Exterior .....	29
Base Interior.....	30
Outer Edge Placements.....	31
Neutral Area Placements .....	32
Small Passage .....	34

Control Building Interior .....	36
Vehicle Ramp .....	37
Initial Prop Placement.....	38
Lighting.....	39
Art Pass & Updated Level Design.....	42
Red & Blue Differences .....	42
Team Base Exterior .....	43
Team Base Interior.....	49
Wasp Tunnel .....	51
Central Building Exterior .....	52
Central Building Interior.....	55
Lower Vehicle Ramp .....	58
Out of Bounds Environment .....	59
Playtesting.....	62
Initial Playtest & Changes .....	62
Approach for fixes .....	62
Map Changes.....	64
Second Playtest.....	93
Fixes .....	93
Environment Art Pass.....	97
Lighting Update.....	97
Outer Environment .....	98
Playable Area Changes.....	100
Final Map .....	104
Final Thoughts.....	104
Misc.....	105
Thumbnails.....	105

## Document Summary

This document is used to track my progress for the level as well as my design process. The sections have been written alongside my progress, which is why some areas may not be present in the final level, as some changes have been made at every step.



## Initial Planning

### Goal

My goal for this level is to create a 12v12 BTB map that has a nice balance between vehicle gameplay and on-foot gameplay.

### Narrative Story

After the discovery of the forerunner artifact on Reach, researchers began their hunt for artifacts on human colonies. One discovery was made on Algolis, in the northern hemisphere. Covenant mining operations resulted in the melting of several arctic landmasses, partially revealing the forerunner artifact. After being reclaimed by humanity, a massive dam was built in the newly created oceans to help maintain the flow of water, while also acting as a launch pad for expeditions into the sea.

### Layout Planning

The main draw of the level is the tall center building, which is one of the control rooms for the dam. Its height adds verticality in gameplay, and its shape allows the player to orient themselves quite easily, and determine where they need to go. The overall layout of the map is symmetrical. There are two different sides to the map, the 'water' side (containing all the water the dam is holding), and the 'open air' side.

There are 5 layers of this map.

1. Sky layer 2
2. Sky layer 1
3. Ground layer
4. Basement 1
5. Basement 2

### Sky Layer 2

Sky layer 2 is the top-most layer. This level is mainly used for Wasp aerial combat. The control building's height goes beyond this layer, through an invisible barrier, so the roof of the building cannot be accessed.

However, in the center of the control building in Sky Layer 2, there is a large opening that wasps can fly through, and wraiths can shoot through. Additionally, this contains a catwalk that players can climb up to by traversing the inside of the control building. Here, players have a chance at fighting the wasps, or using this point as a vantage point.

### Sky Layer 1

This layer is again mainly used by the wasps for aerial combat. There isn't too much on the exterior of this layer.

The interior (inside the control building) contains a the control room of the dam. Players can access this by climbing the interior of the central building. This room cannot be used as a sniper point, but windows allow the players to see the exterior.

## Ground Layer

The ground layer is the top of the damn, and is where most of the combat takes place. In the center of this layer are the entrances to the control building, and also access points to lower levels. Team bases are on opposite ends of the map, and do not have direct sight lines to each other.

The open air side of the ground layer contains a large passage through the control building, allowing for heavy foot traffic & engagement. Additionally smaller vehicles (mongoose, ghost, warthog) can traverse through this opening.

The water holding side of the base is mostly solid wall. However, players can quickly descend to the B1 layer by jumping off the ledge leading to the heavy vehicle ramp / passage.

## (B1) Basement 1 Layer

This layer's neutral engagement zone is primarily the heavy vehicle ramp.

The core of this layer is at the team's bases. Each team base has access to the B1 layer through stairs in their base, which connect to the team's main room. This room, on B1, is where the flag return is. This room also features another set of stairs leading further down into the B2 layer.

## (B2) Basement 2 Layer

The access to this layer is through the team's bases. After descending the stairs from their base's main room, they are able to access a catwalk that is suspended on the open air side of the map. The catwalk traverses to the opposite side of the map, climbing the outside of the control building.

## Map Requirements

### Halo Waypoint Requirements

<https://support.halowaypoint.com/hc/en-us/articles/14796740242708-Community-Forge-Map-Requirements>

### Gameplay Requirements

#### General Map Requirements

- BTB map
- Vehicle gameplay & mobility
- Foot-soldier paths & cover
- CTF set up
- Kill Volume on bottom of map
- Proper Nav Mesh Setup
- Out of Bounds volumes
  
- 3 Map Intro Cameras
- Winning Team Outro setup
- Team intro setups

#### Team Bases

- 8 Initial Spawns
- 8-12 spawn points
- 1 Spawn Volume

- 1 Weighted spawn volume
- 3 flag spawn locations
- 1 Flag delivery plate
- Bot Nav Markers (hide)
- (KOTH) – 5 hill markers

#### Vehicles

- 1 Wasp
- 1 Warthog
- 1 Razorback
- 2 Mongoose
- 1 Ghost
- 1 Wraith

#### Weapons

- 1 Commando (WR)
- 1 BR (WR)
- 1 Hydra (WR)
- 1 Bulldog (WR)
- 1 Disrupter (WR)
- 1 Stalker Rifle (WR)
- 1 Heatwave (WR)

#### Equipment

- 1 Repulsor (ED)
- 1 Grapple (ED)
- 1 Threat Sensor (ED)
- 1 Shroud Screen (ED)
- 

#### Neutral Zone

##### Gameplay

- 8 spawn points

##### Weapons

- 2 Shock Rifle (WR)
- 2 Sniper (W. Pad)
- 1 Rocket Launcher (W. Pad)
- 2 Cindershot (W. Pad)
- 1 Energy Sword (W. Pad)

##### Equipment

- 1 Active Camo (E. Pad)

## First Layout Design

### General Shape Diagram(s)

I started with a general shape diagram, plotting out an approximate design of the level. I went with a top-down view, and worked my way through the layers. This helped me plan out how each area would link up with each other.

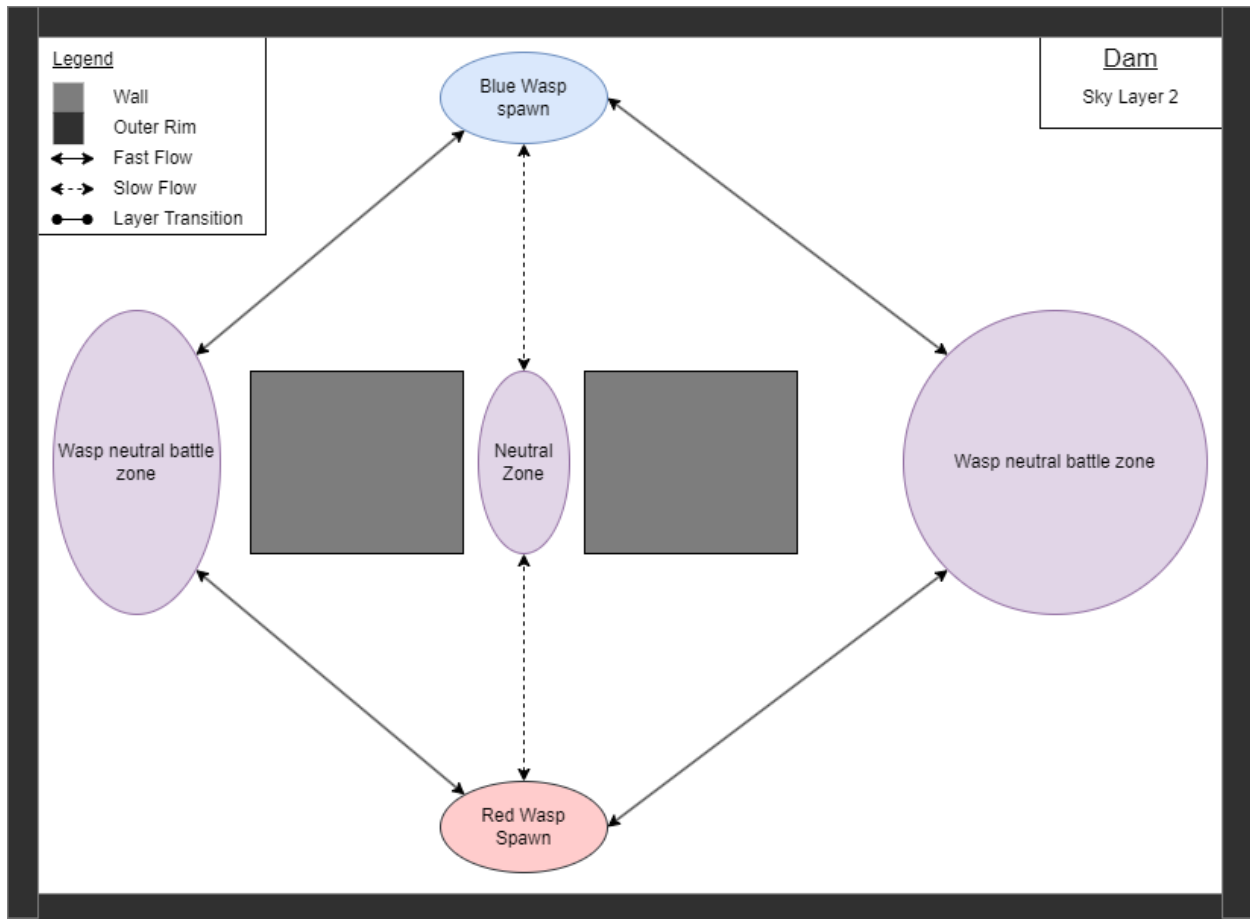


Figure 1 - Top down view diagram of Sky Layer 2 & it's game flow

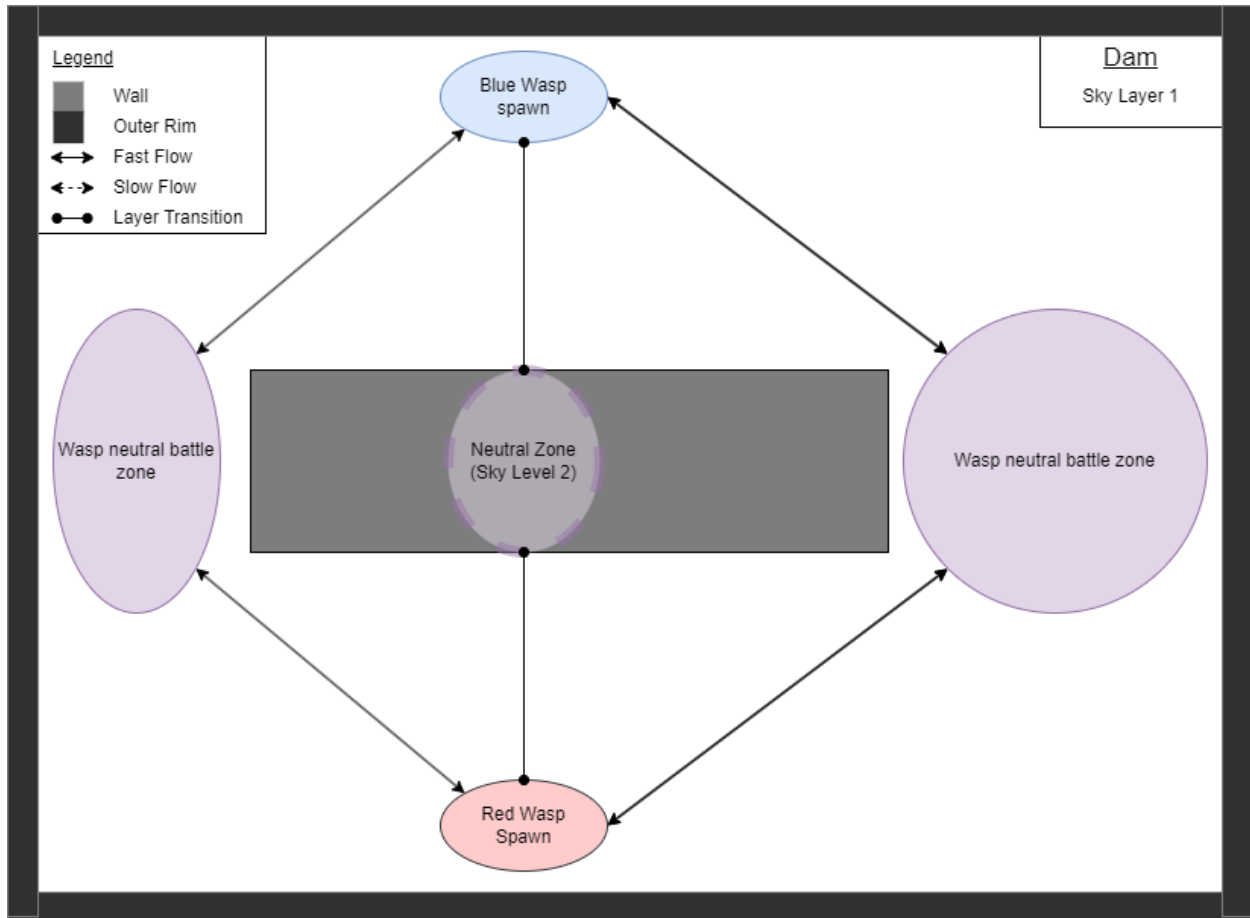


Figure 2 - Top down view diagram of Sky Layer 1 & its game flow

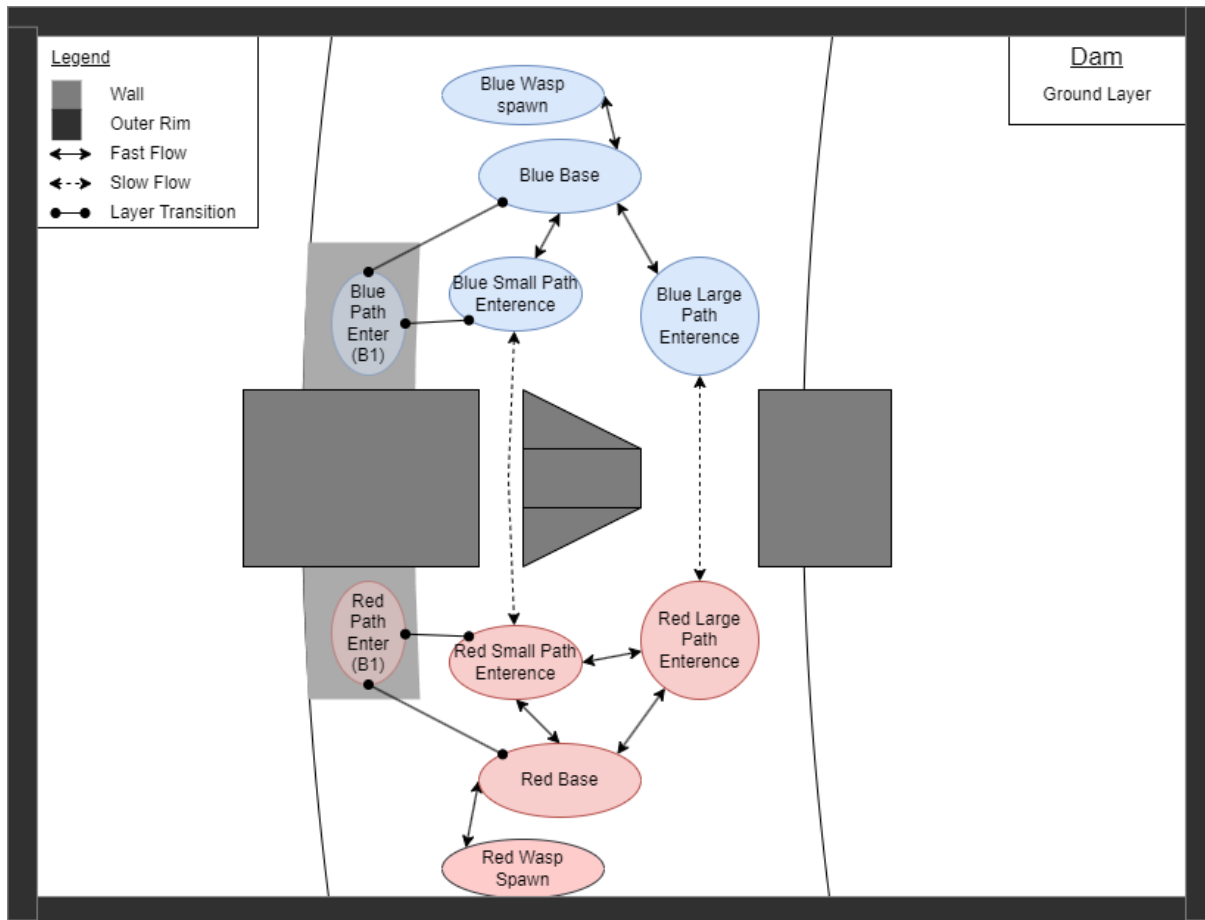


Figure 3 - Top down view diagram of Ground Layer & it's game flow

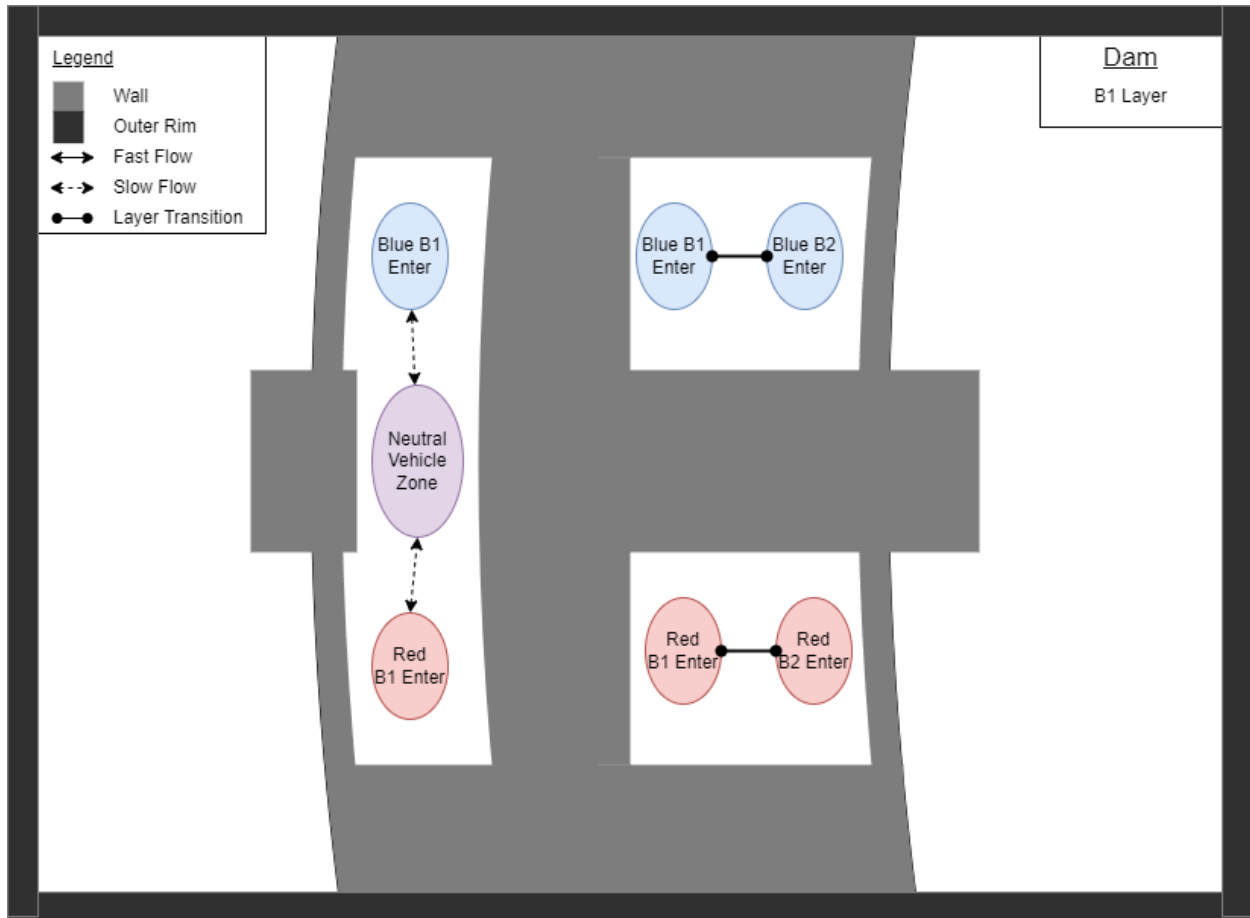


Figure 4 - Top down view diagram of B1 Layer & it's game flow

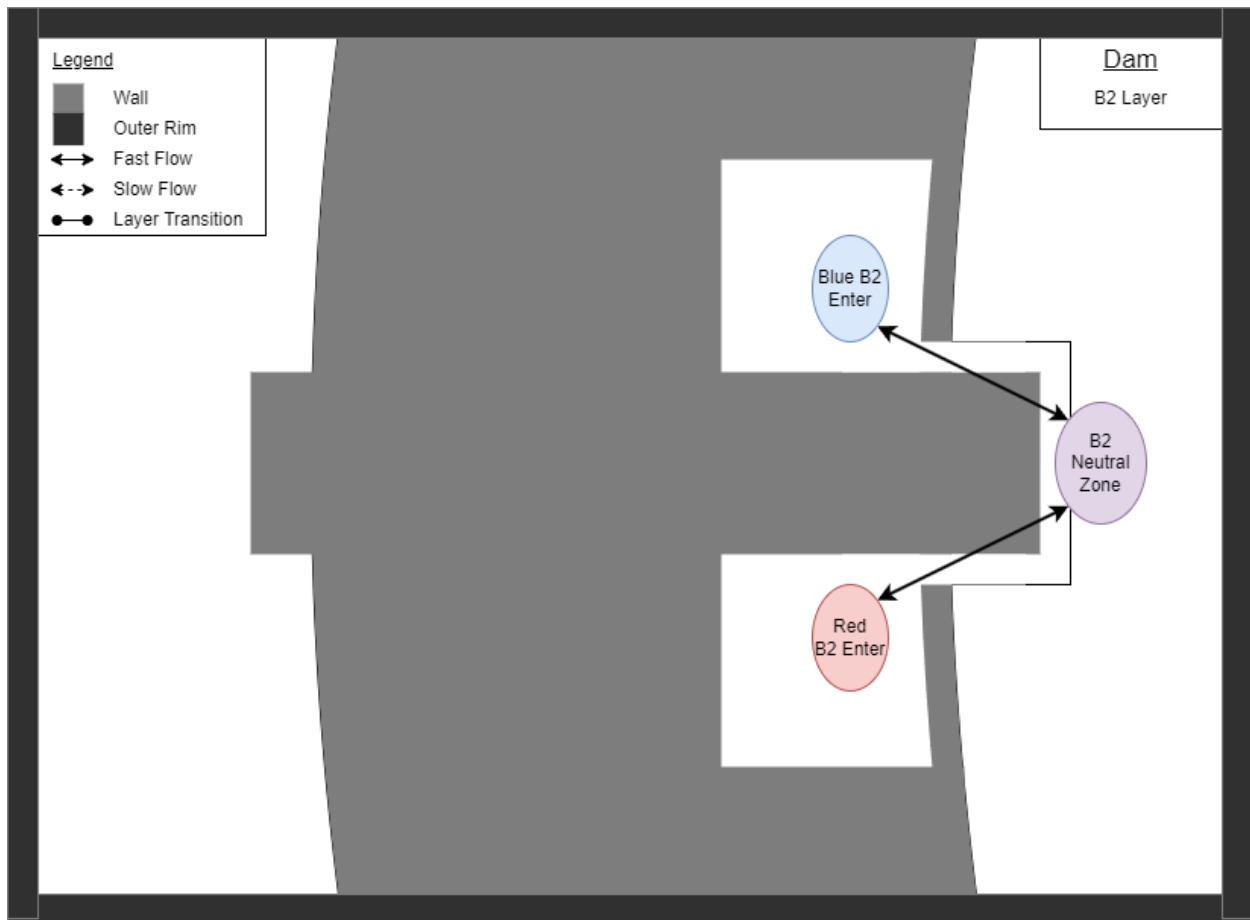


Figure 5 - Top down view diagram of B2 Layer & it's game flow



## Side view Diagrams

With the design from the general shape diagrams, I created side view diagrams of the team base, and the center building. This helped me further plan out the access points to each layer, with a better idea of where the layer traversal would take place.

In this step, I was able to further plan out the rough geometry of the level design.

I created two diagrams, the red base, and the center building. The red and blue team bases are the same, and are inverted designs of each other, so I did not need to make a blue base design for this step.

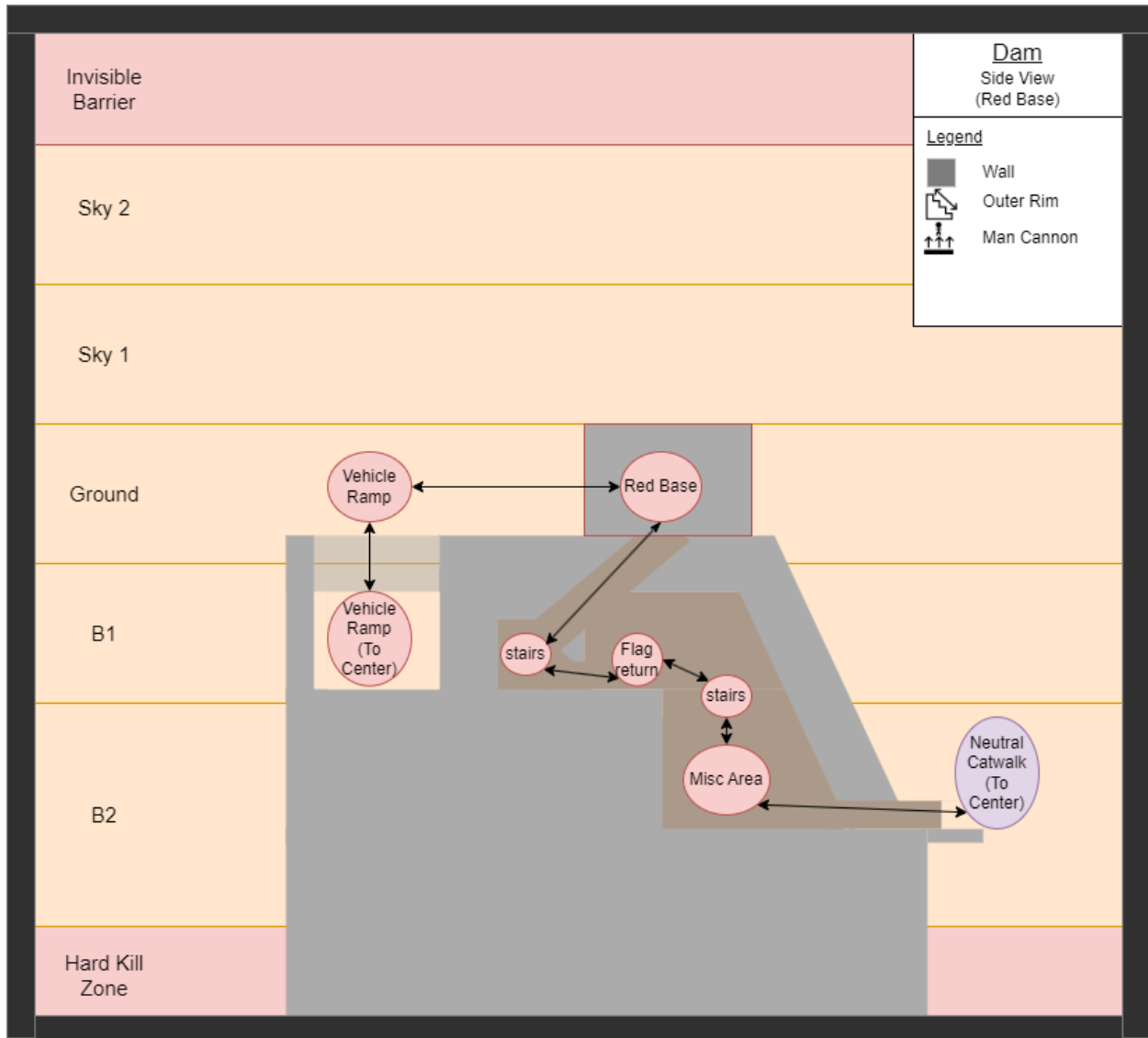


Figure 6 - A side view of the red team's base & it's layered design

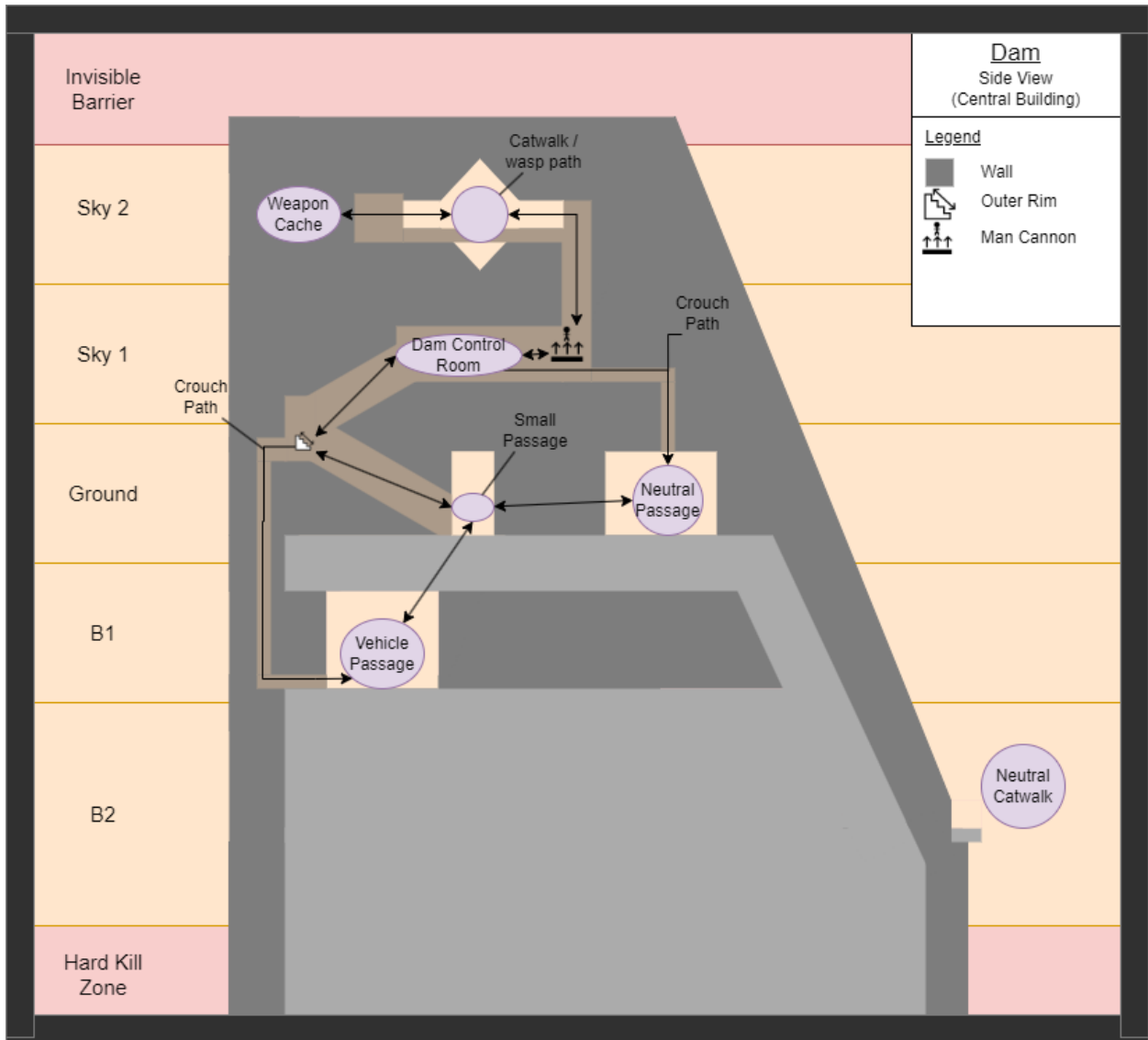


Figure 7 - A side view of the central building & it's layered design

## In Engine Greyboxing

After creating a general layout, I moved to in engine forge. I wanted to get an idea of the player's metrics, while also sculpting a rough idea of how large the level should be, before moving ahead with obstacle, weapon, and vehicle placements.

This step also gave me a better idea of what geometry, props, and tools were available in Halo Infinite's Forge. One big concern I had was whether there was a water object or tool available in forge, because I wouldn't be able to capture the environment of a dam without water. While there wasn't a waterfall or river asset, a water plane existed, so I continued ahead with the dam.

## Metric Greybox (In-Engine)

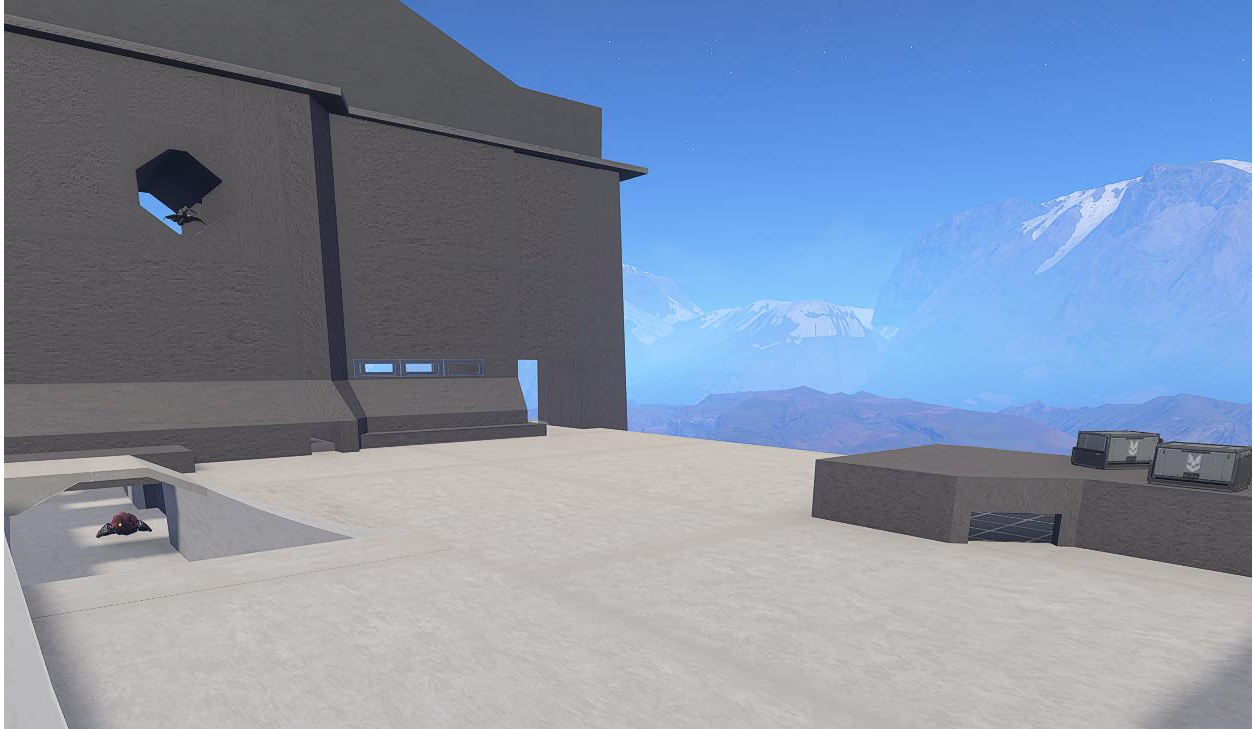
I created a rough greybox of the map in-engine (Forge), using the diagram layouts I had designed. This helps me plan out roughly how large the map should be while getting an idea of the in-game space and size of the map. This also helps me plan out additional geometry & props that can be placed inside the level.

During this stage, I also designed the interior of the team bases.

## Overview



*Figure 8 - An overview of the red team's base & their side of the control building (the central building)*



*Figure 9 - A view from the left side of red team's base & their side of the control building. On the left hand side, there is a ramp down to the lower level*

## Red Base

*The base is mirrored for blue team.*

The idea for the base was to create a simple building interior, with a basement that leads to the outer catwalk level. Similar to maps like blood gulch and Valhalla, I wanted the base to have a very simple design, as most gameplay would occur outside the bases, through vehicle and on-foot gameplay.



*Figure 10 - Outside view of Red Base, a warthog and wasp were placed to test some additional metrics*



Figure 11 - The other side of red base. There is a larger entrance into the base.



Figure 12 - Inside view of red base. View from small entrance looking towards large entrance





Figure 13 - Red Base Interior. View from small entrance wall, looking towards window wall

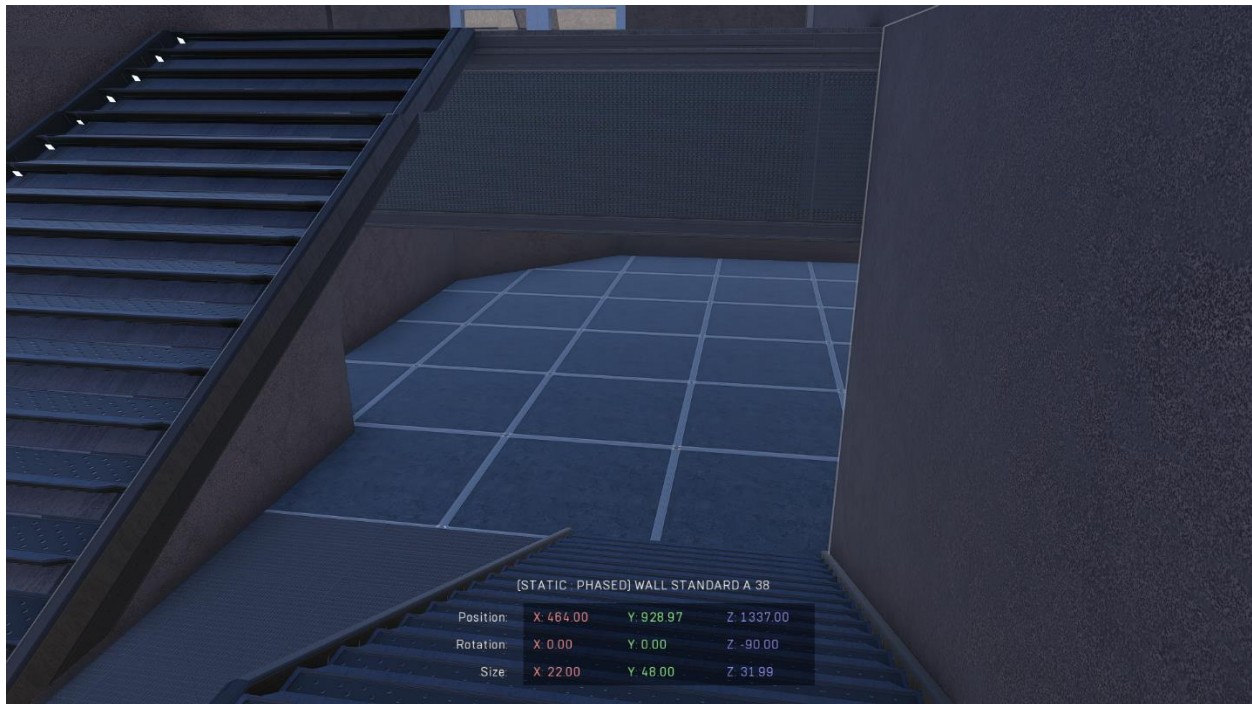


Figure 14 - Stair wall opposite of window wall. Looking into the basement

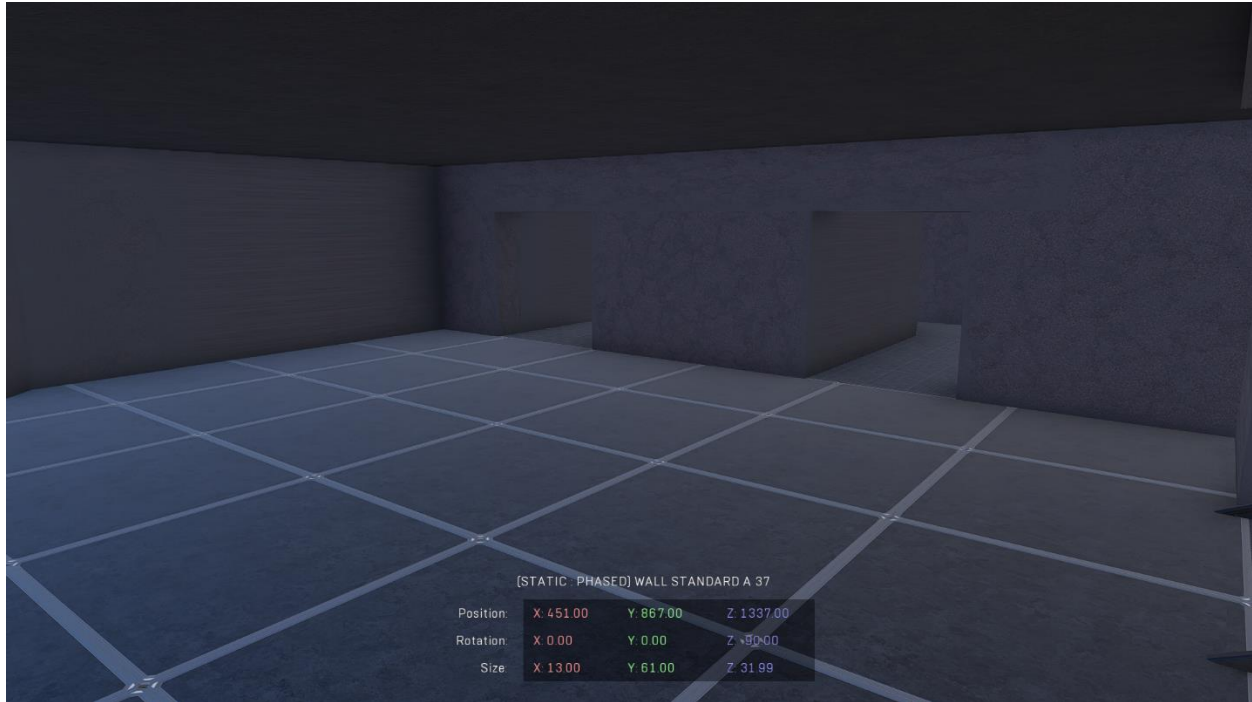


Figure 15 - View of basement, on stair side wall. Looking towards the dam wall entrance.



Figure 16 - Red base basement. Looking towards dam wall entrance & door



## Exterior Catwalk

Both bases have an exit that lead to the exterior catwalk, which hangs on the edge of the dam. This path is meant to be a more *secret* passage that players would be able to take in order to sneak to the other base. To balance it, it is open, and narrow, leading to possible falls into a killzone.

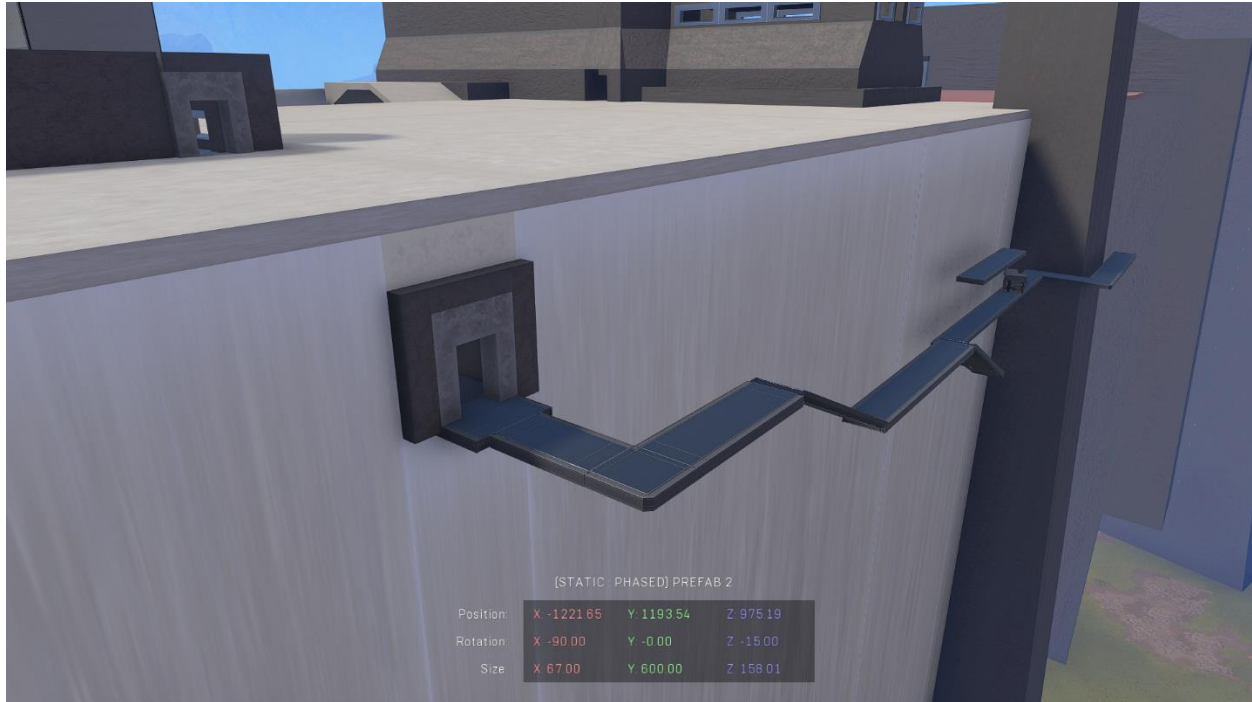


Figure 17 - Red base dam wall. Basement entrance located on side of dam wall, leading out to catwalk.

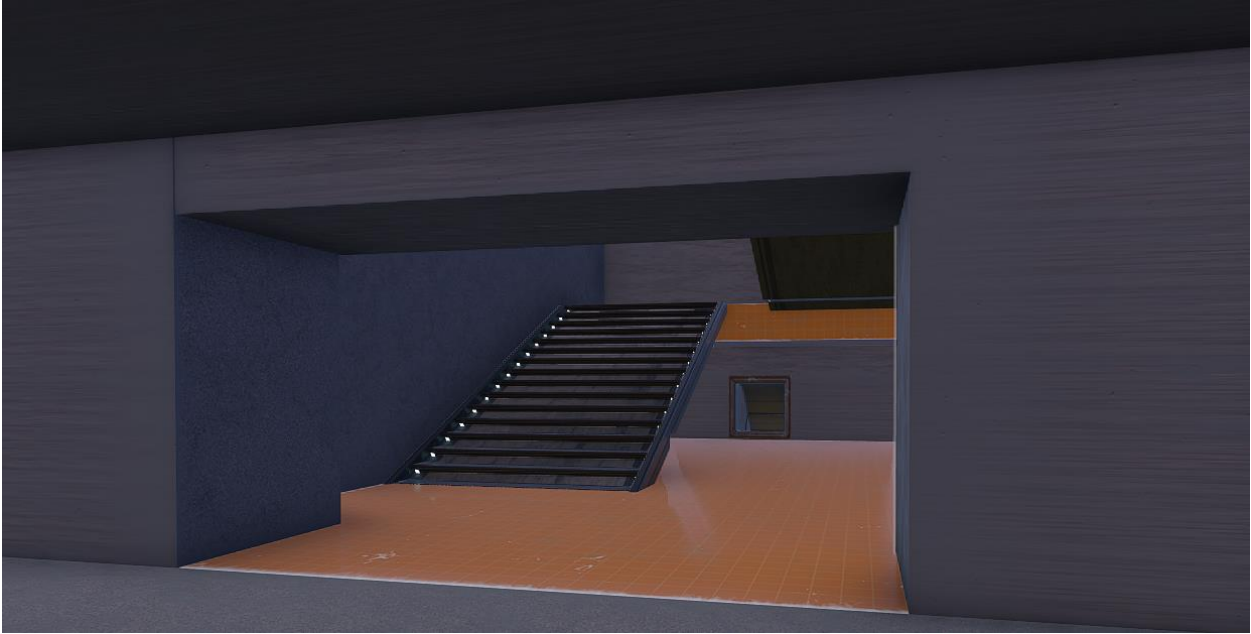
### Central Control Building

The control building has two entrances. One is through the small passage (featured in the image below) and another entrance in the large passage on the opposite wall.

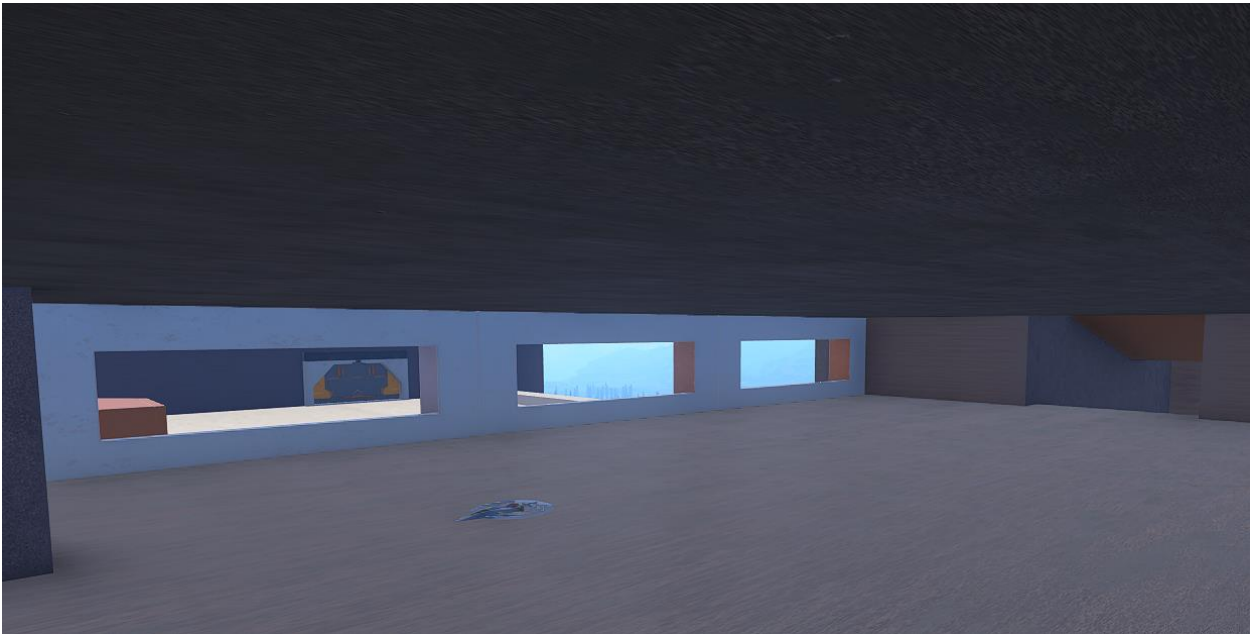
The small passage opens into a stairwell, and a vent. The stairs lead up into the control room, while the vent leads into the lower vehicle ramp under the control building.



*Figure 18 - Entrance into control building. Looking inward, there is an entrance to the stair well on the left wall.*



*Figure 19 - The interior stairwell room, leading up to the second floor. There is a vent at the back of the stairwell, which leads into the lower vehicle ramp, acting as a 'secret' passage.*



*Figure 20 - The control room, looking towards the stair well entrance. There are windows on both sides for players to shoot out of.*

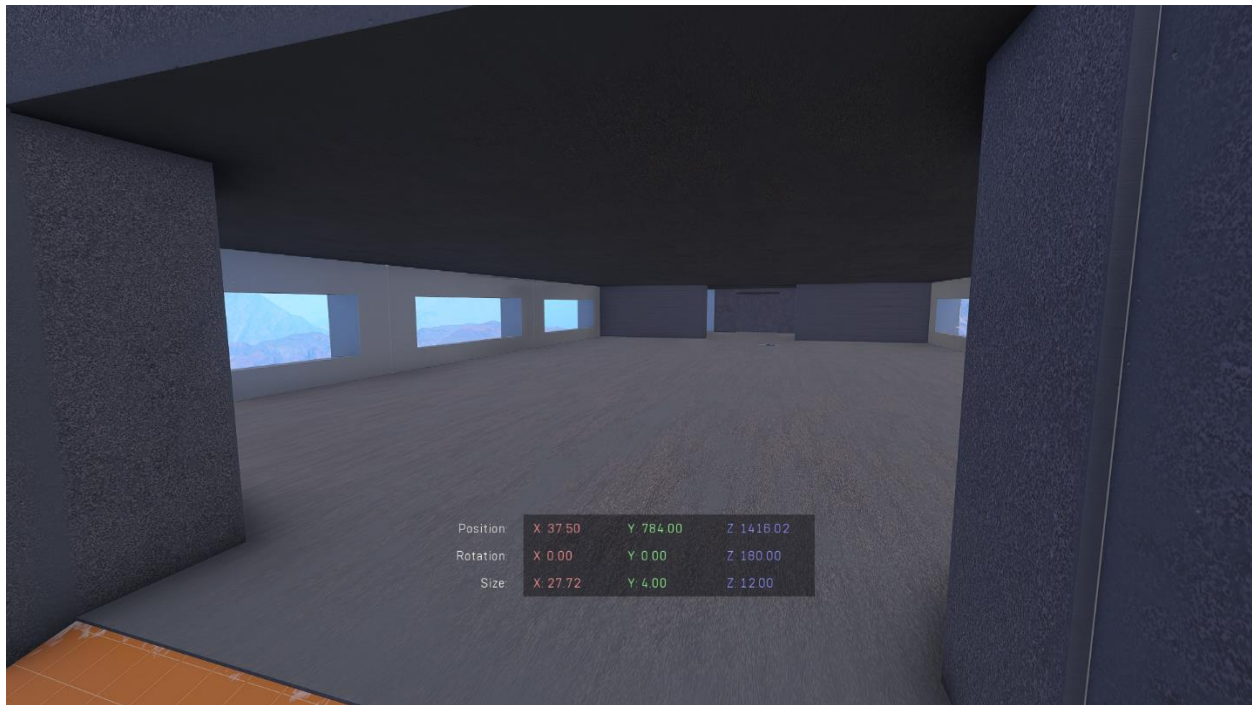


Figure 21 - Another perspective in the control room, from the entrance. There is a doorway into the grav lift room at the end.

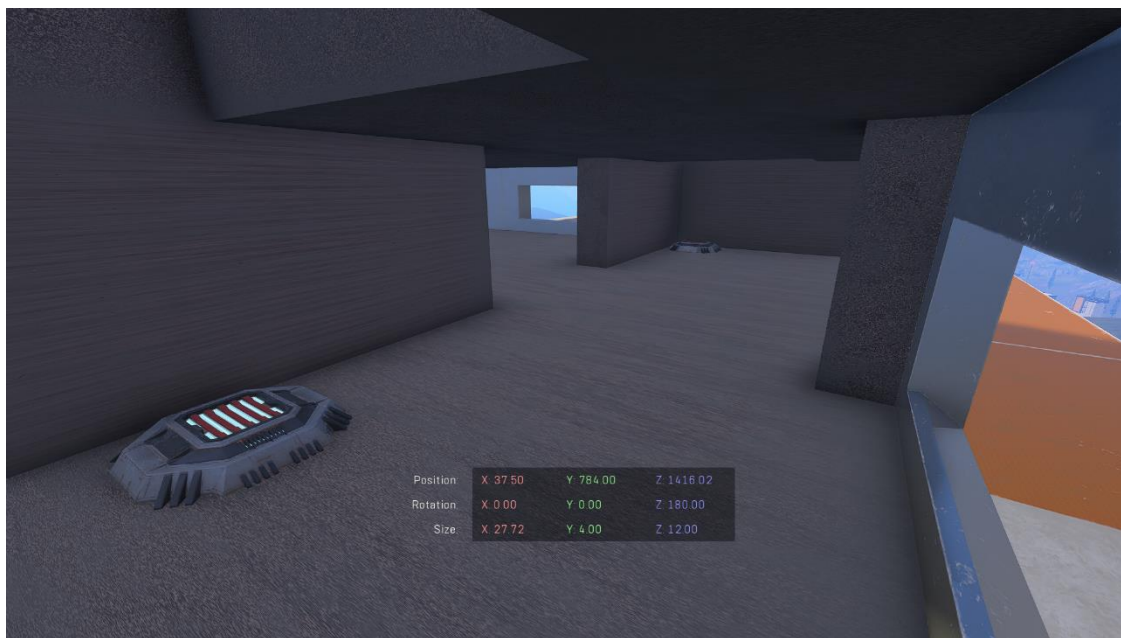
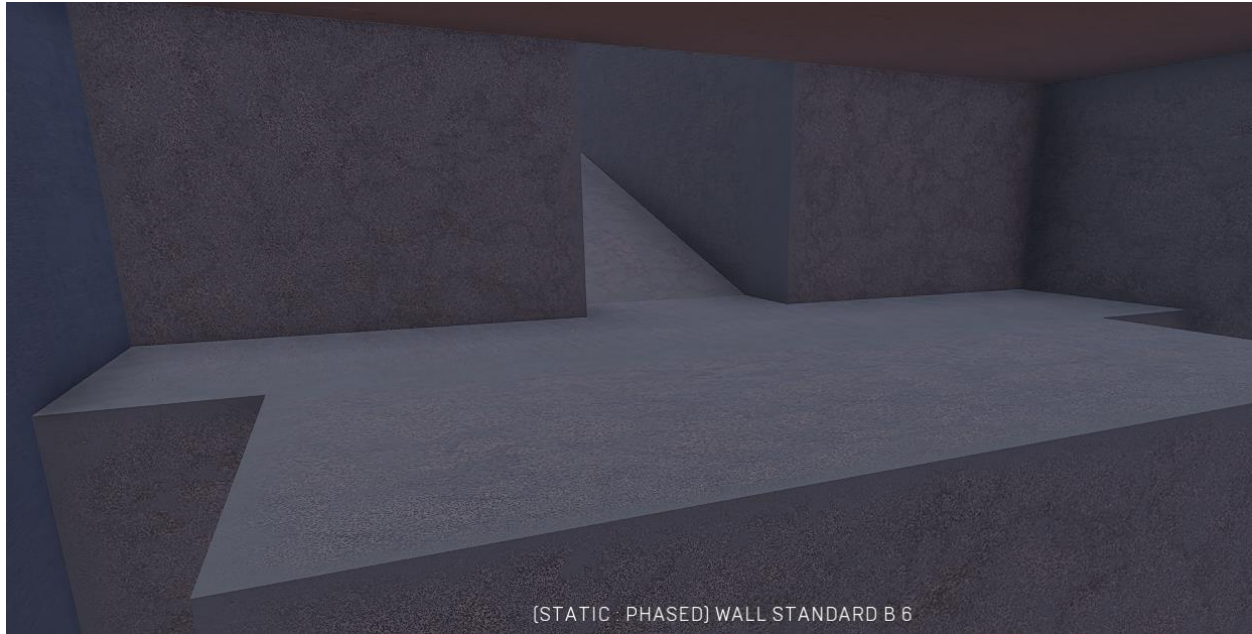
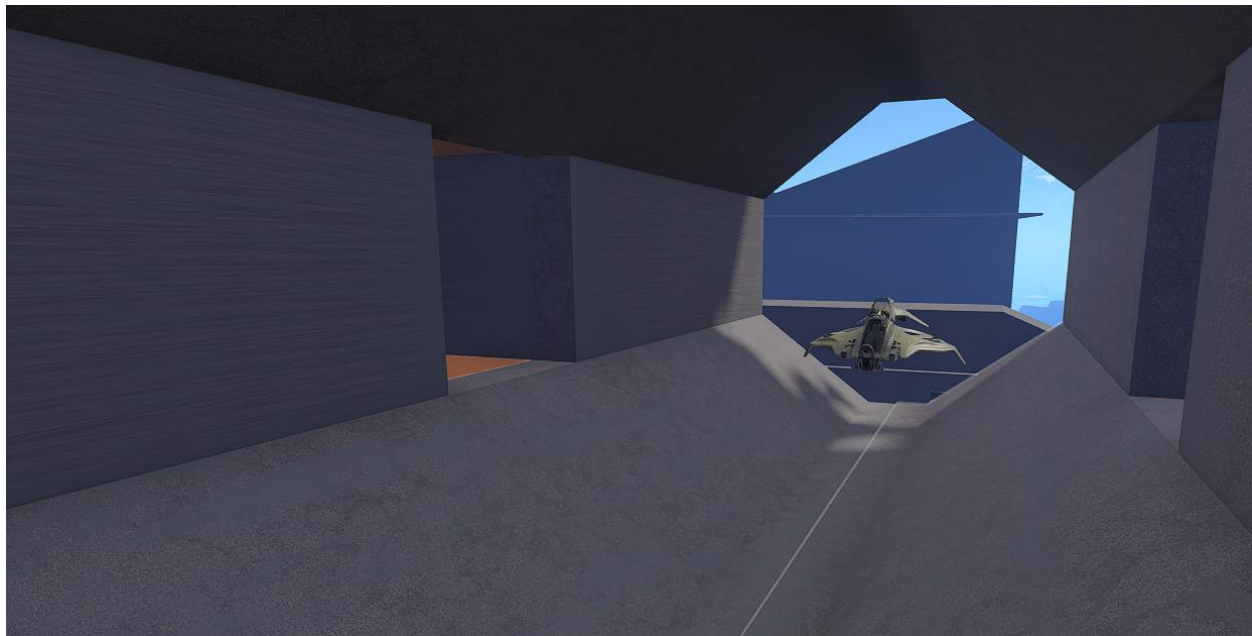


Figure 22 - One of the gravity lifts the player uses to reach the room in sky level 1. There is another gravity lift on the opposite side of the room





*Figure 23 - The gravity lift landing room. There are holes on opposite sides for the player to enter from the gravity lifts. There is a ramp leading to the Wasp tunnel.*



*Figure 24 - The wasp tunnel in Sky Level 2. The left side is the exit from the gravity lift room. The right side of the diagram is the tunnel control room, containing a power equipment.*

### Stairwell vent passage

There is a passage in the stairwell through an air duct system. This passage leads to the B1 layer, at the large vehicle passage under the control building.



Figure 25 - The stair well room, with a focus on the duct entrance under the stairwell.



Figure 26 - The vehicle passage where the air ducts connect. There are T connectors where the player can exit, to board or attack vehicles or players.

## Large Prop Planning

After forging the map layout, and adjusting sizes & placements, I started on placing some placeholder block-outs for large props in the red courtyard. I used large generic blocks for this step, as they were easy to move around, and duplicate making the process faster.

I also added an additional building outside of the base. This building is enterable, and the interior can be used to shoot into the large passage. Additionally, a mancannon has been added to red base, and the cannon launches the player onto the top of the new building, allowing for another landing for players to shoot from.

While designing, I tried to imagine where the players should have sightlines from different areas of the base. The areas closer to the base were left more open, while the further areas were given some more cover from the props.

I also kept in mind the vehicle gameplay while placing the blocks. I tried to make the vehicle paths intuitive, while also giving them some freedom should they want to steer of the path a bit.

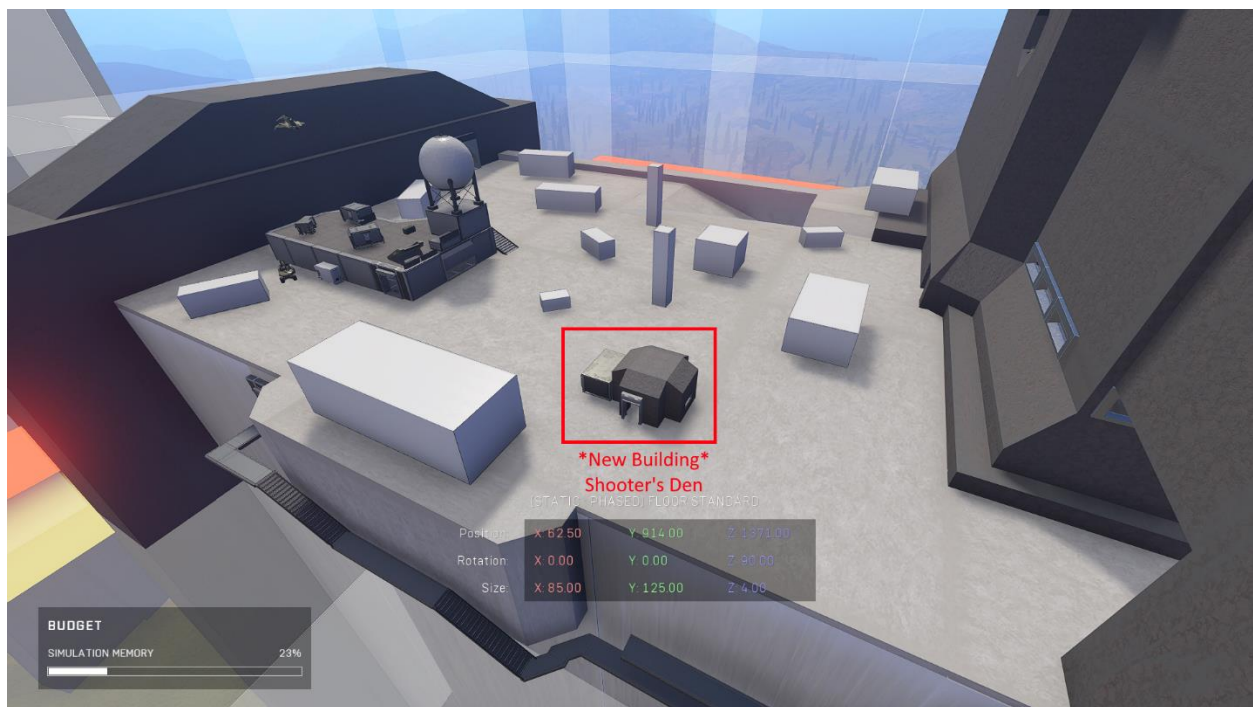


Figure 27 - An overview of the large prop placement. A new building has been placed, by the large passage at the bottom of the diagram, and is an enterable shooter's den.



## Gameplay Planning

After placing the large blocking props, I began to plan the gameplay elements for the map. I also did some more prop / geometry adjustments / additions in this step. I found that having the gameplay elements available really helped with organizing sightlines, cover, and extra geometry.

## Spawning

After setting up the initial spawns using the intro cinematic setup, I added 48 respawn points at each base, with 6 additional neutral zones in the control building.

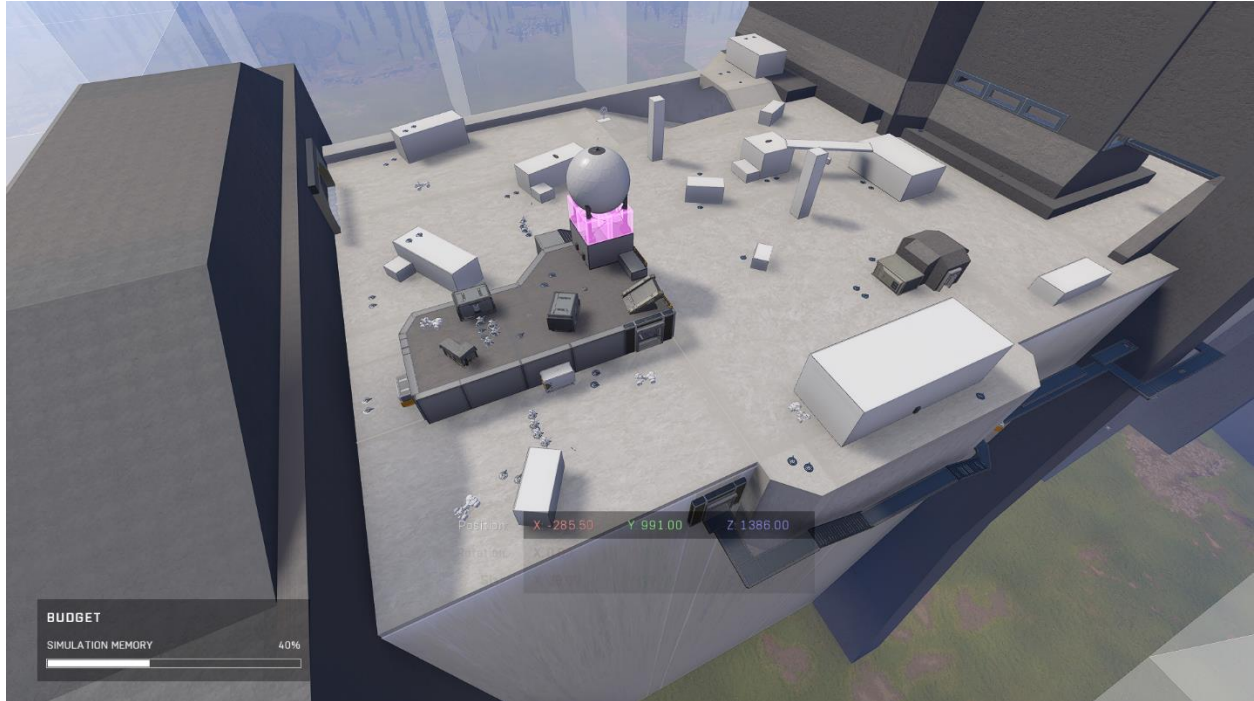


Figure 28 - An overview of the spawn points at red base

My process for the spawn points was to add them in, in areas that were well covered. I wanted the players to be able to quickly identify where they were immediately after they spawned, and have an idea of where they should be headed.



## Weapon, Equipment & Vehicle Placements

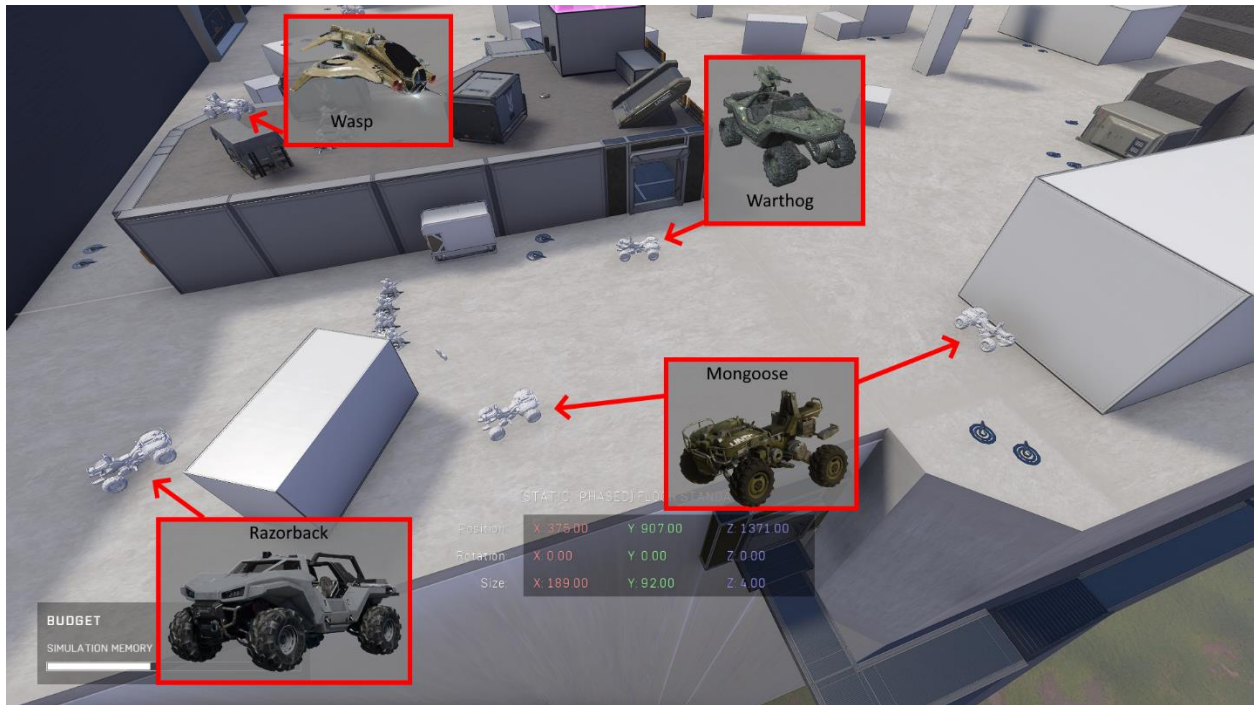
**Weapons, vehicles, and equipment** were placed in areas that I felt they would naturally be used in. I also used the existing *Fragmentation* map & *Highpower* map placements as a reference for where weapons should be placed in order to be intuitive.

### Base Exterior

- **BR** and **Stalker** rifle are located on the roof of the bases, to allow for medium ranged defenses
- The **hydra** is located right outside the left doorway at the bases, to allow for a better defended area from an enemy wasp
- The **sniper rifle** is located a little further out from the base, on a weapon pad, in an open area, to reduce the possibility of camping for its respawn
- For vehicles, I kept the different factions together on opposite sides. The banished vehicles on the left side of the base, and the UNSC vehicles are on the right side.

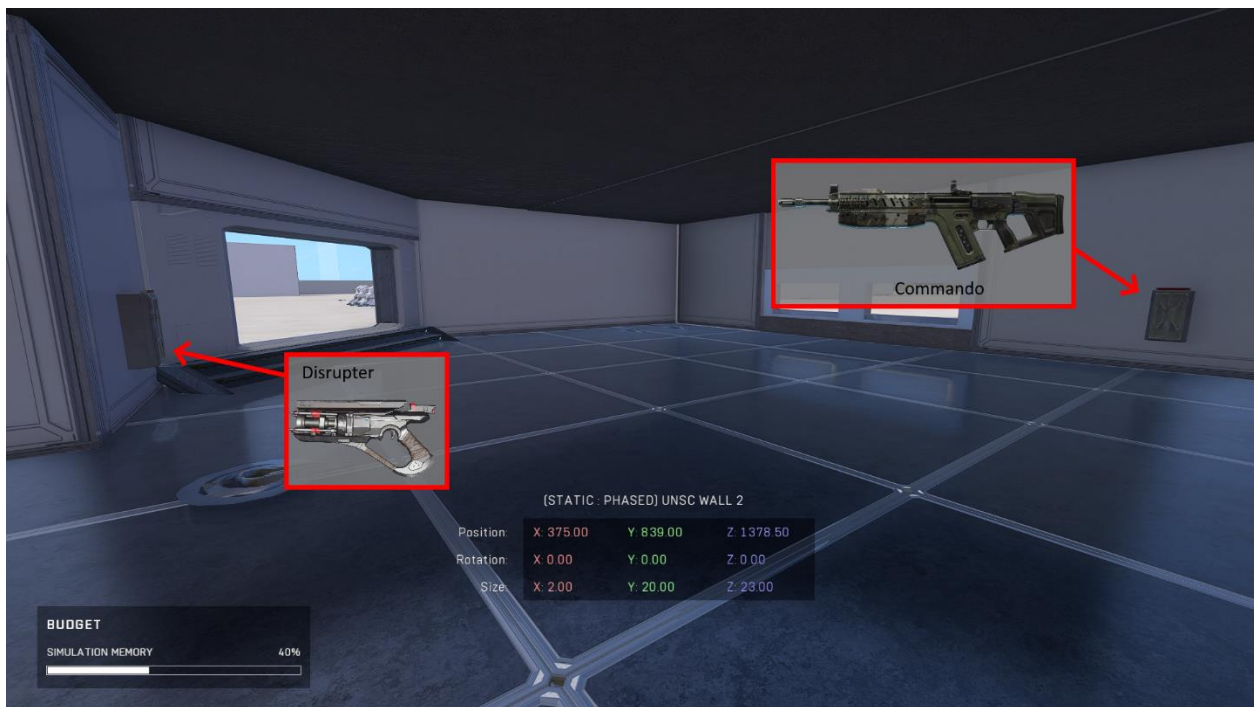


Figure 29 - Placements on the left side of the base



### Base Interior

For the interior, I placed mainly close ranged / automatic weapons. The idea being that defenders would be using these weapons in CTF.



## Outer Edge Placements

- The shock rifle was placed on the edge of the dam. As the wasp would likely be flying on this side of the map, it allows for a counter, to EMP the wasp and drop it into the kill zone
- An energy sword is placed in the center of the catwalk, as it works well in this narrow path, but isn't too overpowered as there is little cover.





### Neutral Area Placements

In addition to placements, I added a ramp and bridge to the large passage, to allow for another entryway into the center control room.

- In the center of the large passage, a rocket launcher was placed at
- Inside the small building, a heatwave was placed for population control in the large passage

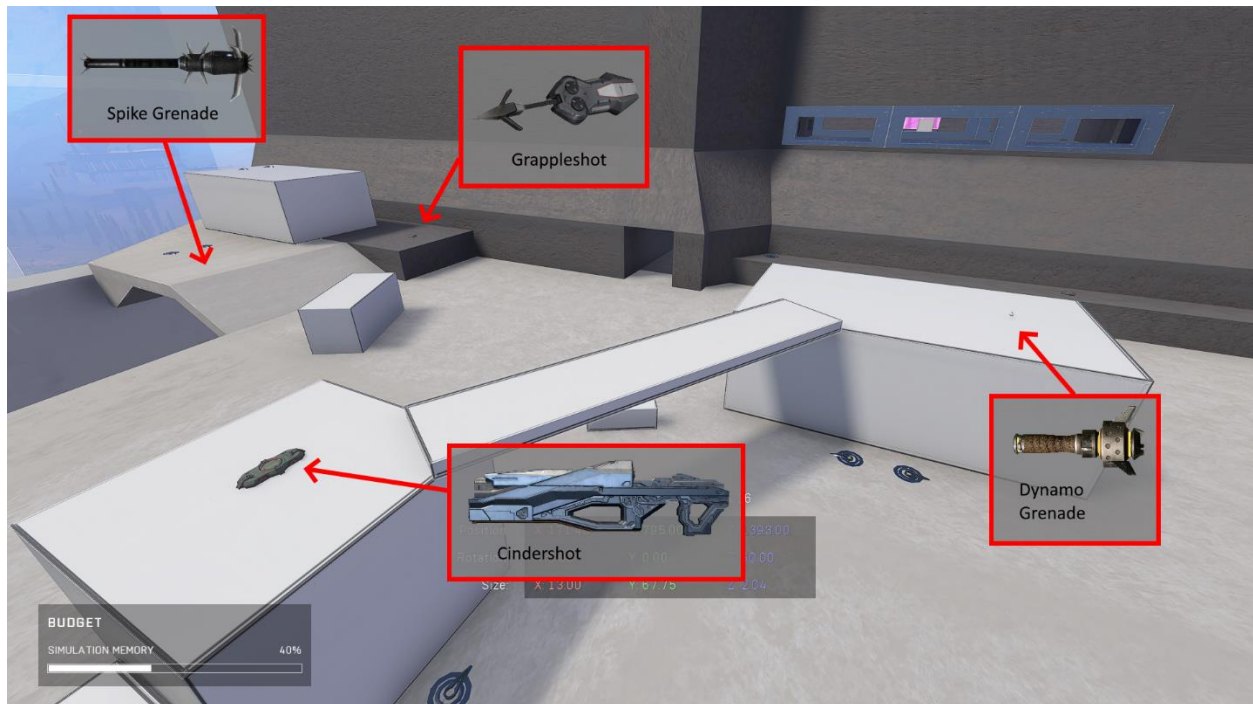


Figure 30 - In the large passage, a ramp has been added, leading up to a rocket launcher spawn. Additionally, a bridge was added here to connect into the control room



## Small Passage

- A cindershot weapon pad has been added. This area has a great view into the small passage, allowing the player to bounce the shots into the passage.
- For a similar reason, a spike grenade was added here, to allow for the spikes to bounce around chaotically inside the small passage.
- A dynamo grenade was added on a large prop as well, but this prop is closer to the large passage, allowing the pickup to be quickly used on passing vehicles.
- Inside the small passage, I placed an active camo equipment pad, to draw players into the center of the passage.

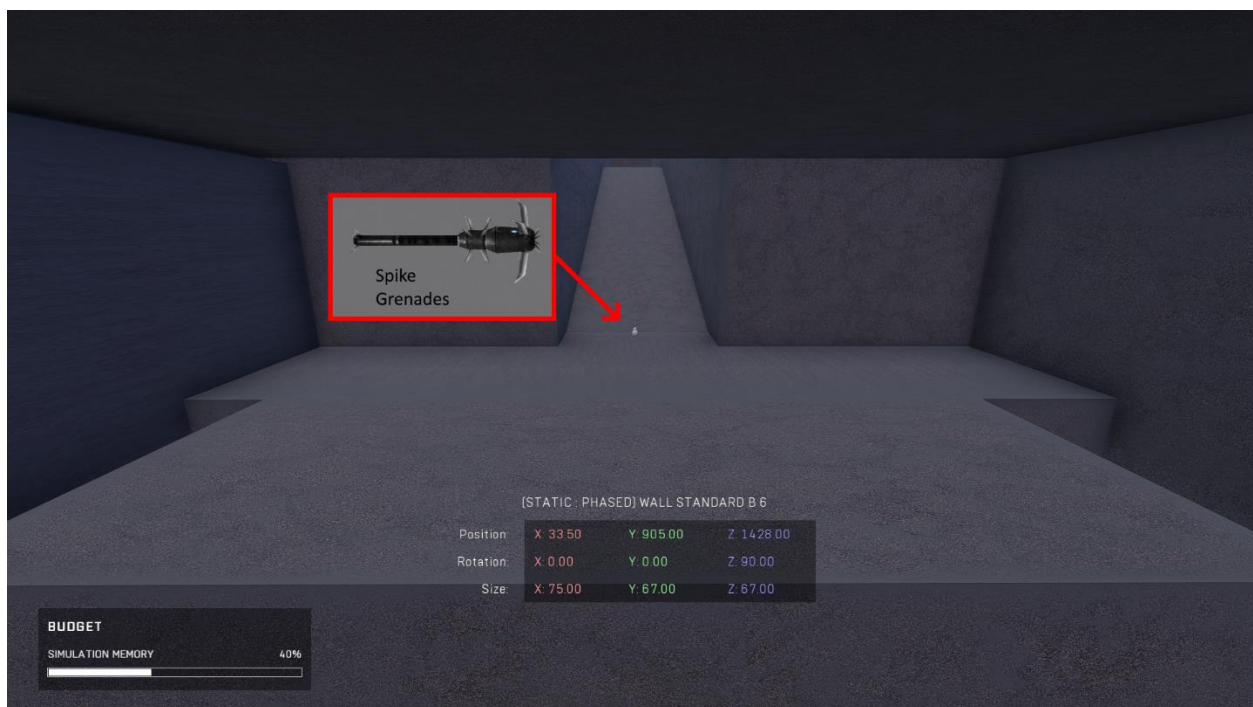






## Control Building Interior

- I added two weapon racks inside the control room, containing a sentinel beam and a pulse rifle. I wasn't too sure on what weapons to add in here to keep the room balanced, and this will likely change through playtesting
- At the top of the gravity lift room, I added a spike grenade spawn. Again, this area is close quarters, and leads into the wasp tunnel, which is a perfect area to bounce spikes around





## Vehicle Ramp

- I added a plasma grenade spawn here, to directly combat any passing vehicles below
- I also added a disruptor rack here for similar reasons



## Initial Prop Placement

I started to place some props around red base. Since blue base is mirrored, many of the props are the same across the bases. While I used many of Forge's accent pieces to help with the props, I had some difficulty placing props for large blocks. In many of these instances, I looked to the forge community, and used some of their uploaded prefabs.

Some of the prefabs I used included

- Premade military trucks
- Oil Tanks
- Shipping Containers

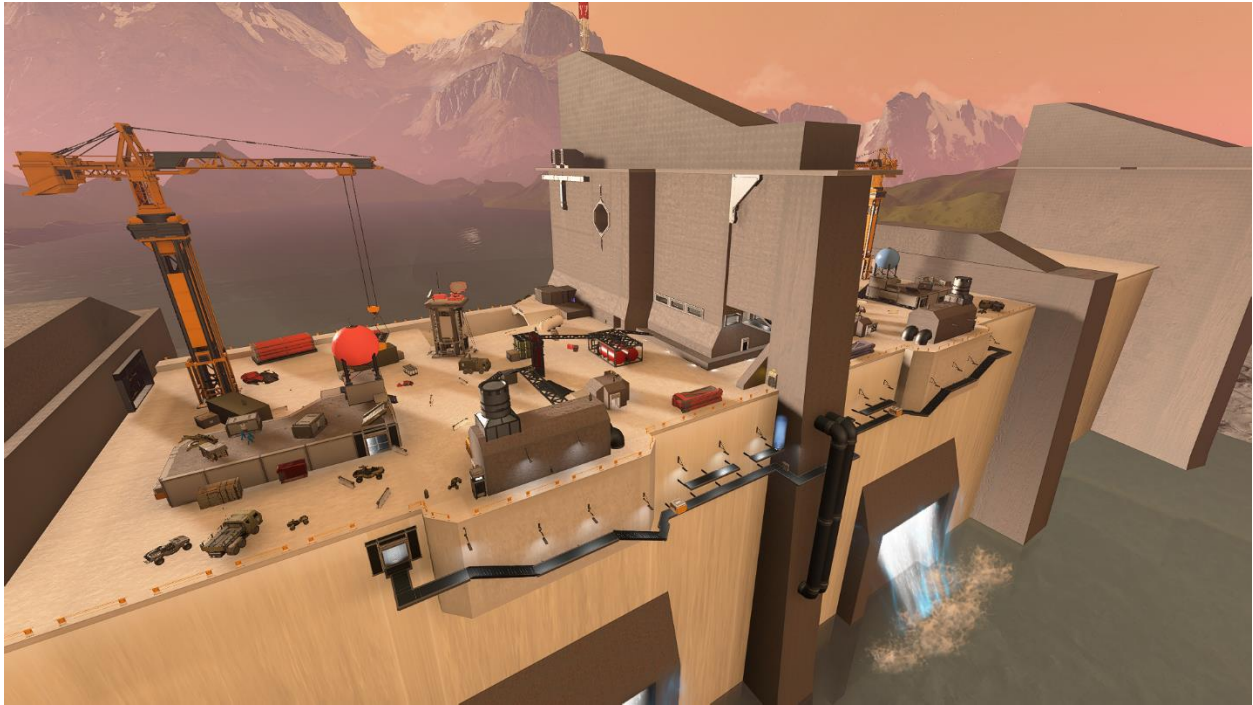


Figure 31 - An overview of red base after the initial prop placement

## Lighting

I began to place lighting across the map in places that I felt were too dark. I also adjusted the skylight to match an environment that I wanted.

For the environmental lighting, I decided for an evening sunset. This was tricky, since lowering the sun might present some issues when aiming, as it might be too bright. I plan to playtest this and might change it if it becomes an issue.

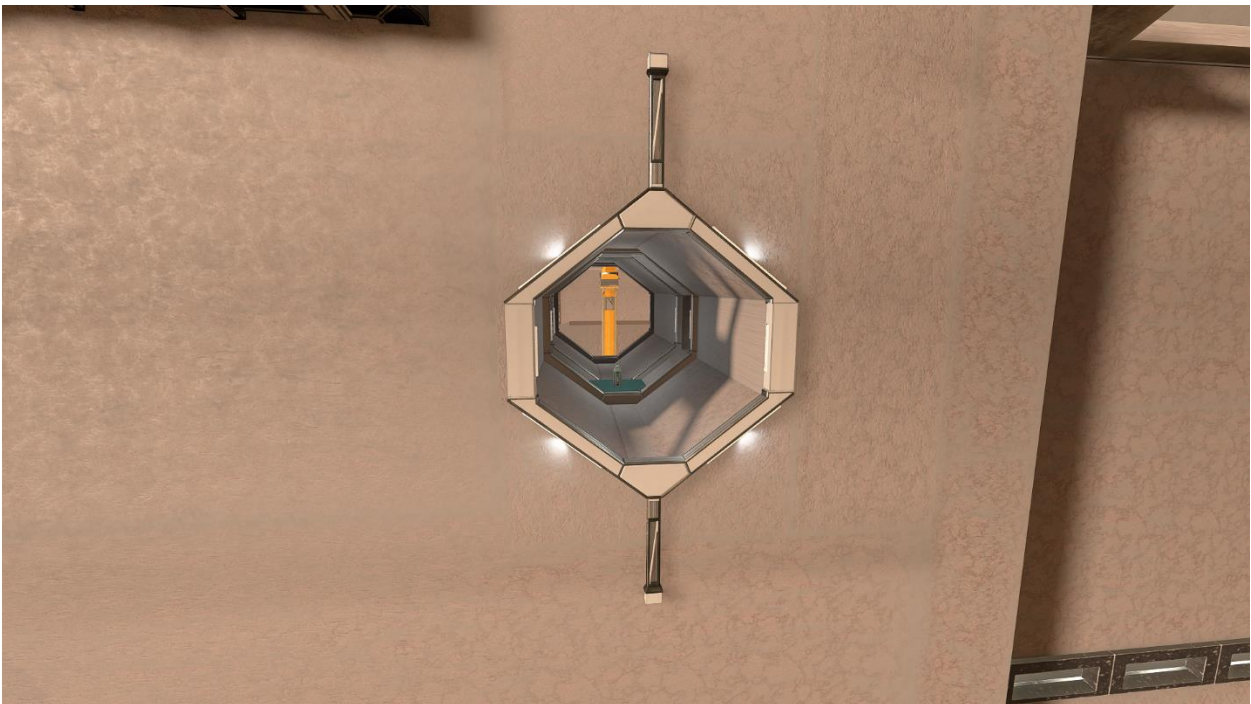


For the central building, I added many long tube lights along the edges where the building intersects with the ground. I felt this really added some character to the building, and better highlighted the huge structure.





In the sky level wasp tunnel, I added some accent braces in the prop placement. I added some more long tube lights on these braces, and it resulted in a great looking tunnel.



Along the catwalk / scaffolding path, I added wall lamps. Their industrial design & their spot light helped make the scaffolding feel more open and dangerous.



## Art Pass & Updated Level Design

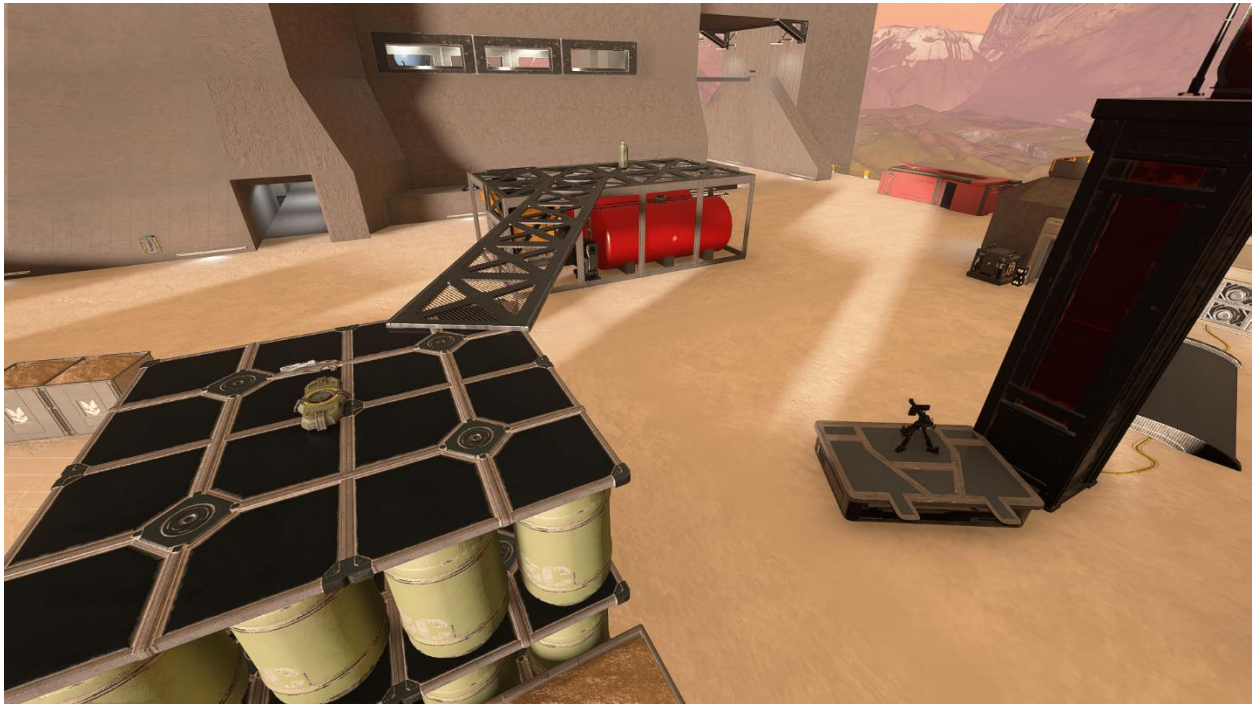
After placing the lighting props, I continued on the addition and adjustments of props, both large and small, as well as general level dressing.

The geometry for both red and blue base are identical, however some of their props / decorations are different.

### Red & Blue Differences

The main difference is the gated area of both bases. Red base features a pallet of metal canisters, and inside their gated room there are large oil drums. Blue base features large data towers, and inside their gated room there is a workstation plugged into some forerunner props.

The other changes are relative small changes, and are primarily color changes.



*Figure 32 - Red base features a gated room filled with some large red oil tanks. There is also a large pallet of UNSC barrels that can be climbed on.*





Figure 33 - Blue base features a large cluster of data towers, and their gated room has a workstation researching some forerunner artifacts

### Team Base Exterior



Figure 34 - The vehicle spawns at red base. There are some concrete barriers, and a military truck prop used for cover

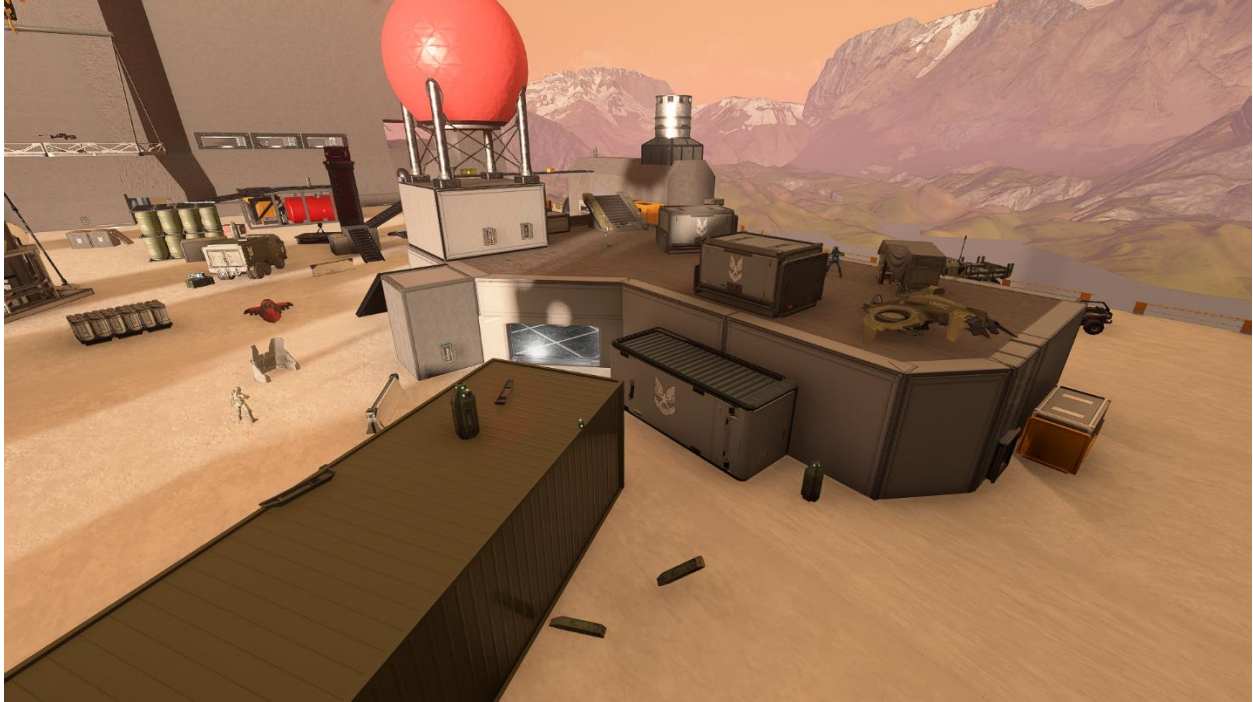


Figure 35 - The 'construction' area of the base. There are 2 shipping containers that the player can use to reach the top of the base.



Figure 36 - At the high tide part of the dam at the base, there is a pallet of large metal piping. There is also a large crane which holds the platform that the sniper spawns on.



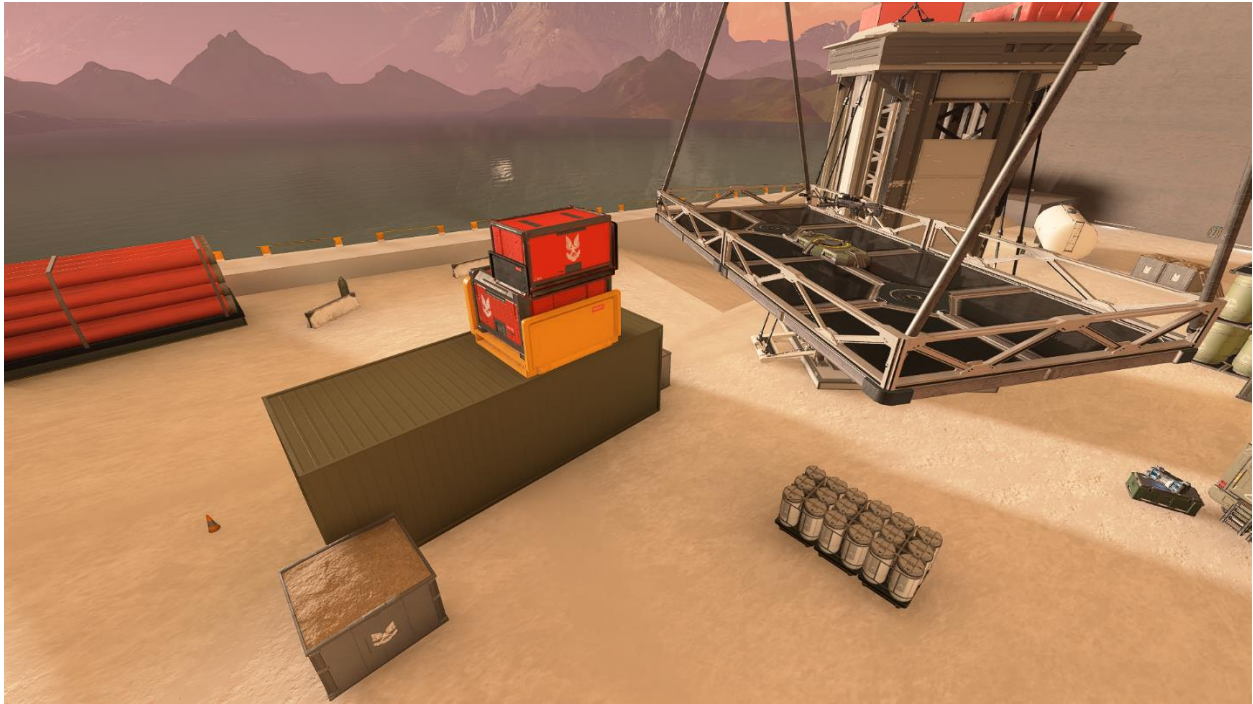


Figure 37 - The platform that the sniper spawns on can be reached by climbing some crates



Figure 38 - The front of the base features some cover for foot soldiers, but is also somewhat open so vehicles can traverse through



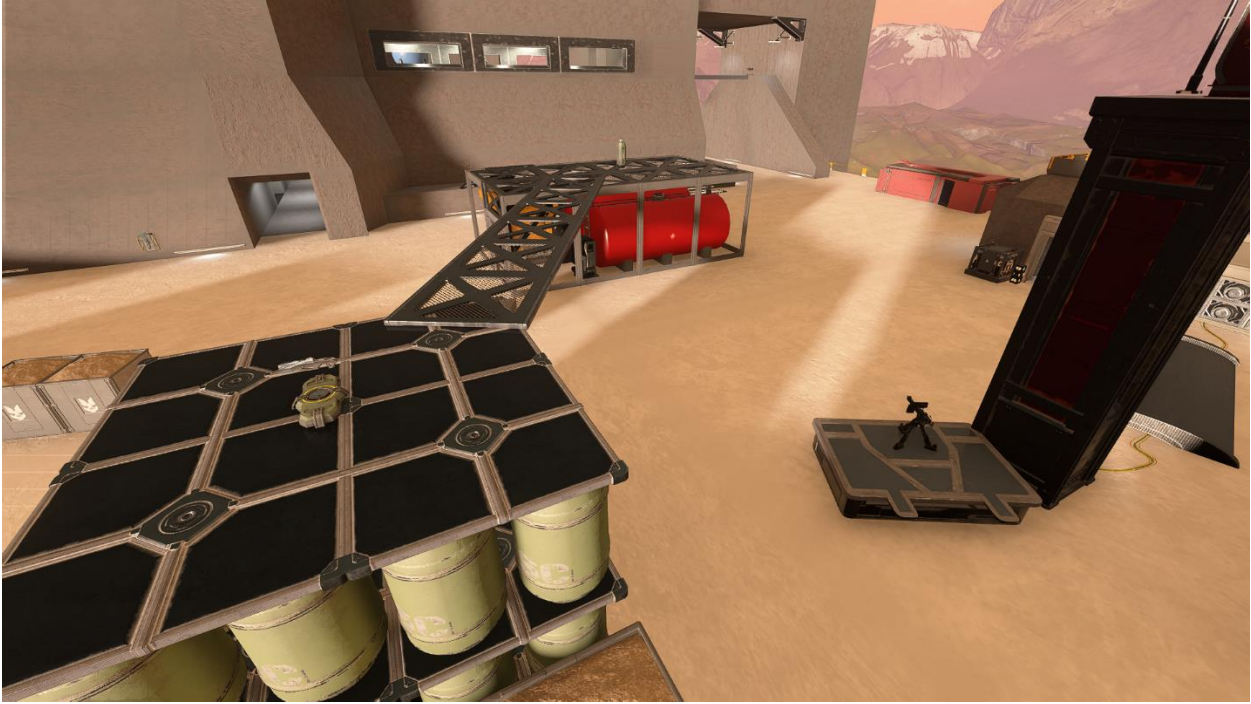


Figure 39 - The large pallet of metal containers and the gated bridge leading to the large oil tanks. The cindershot spawns on top of the metal containers.

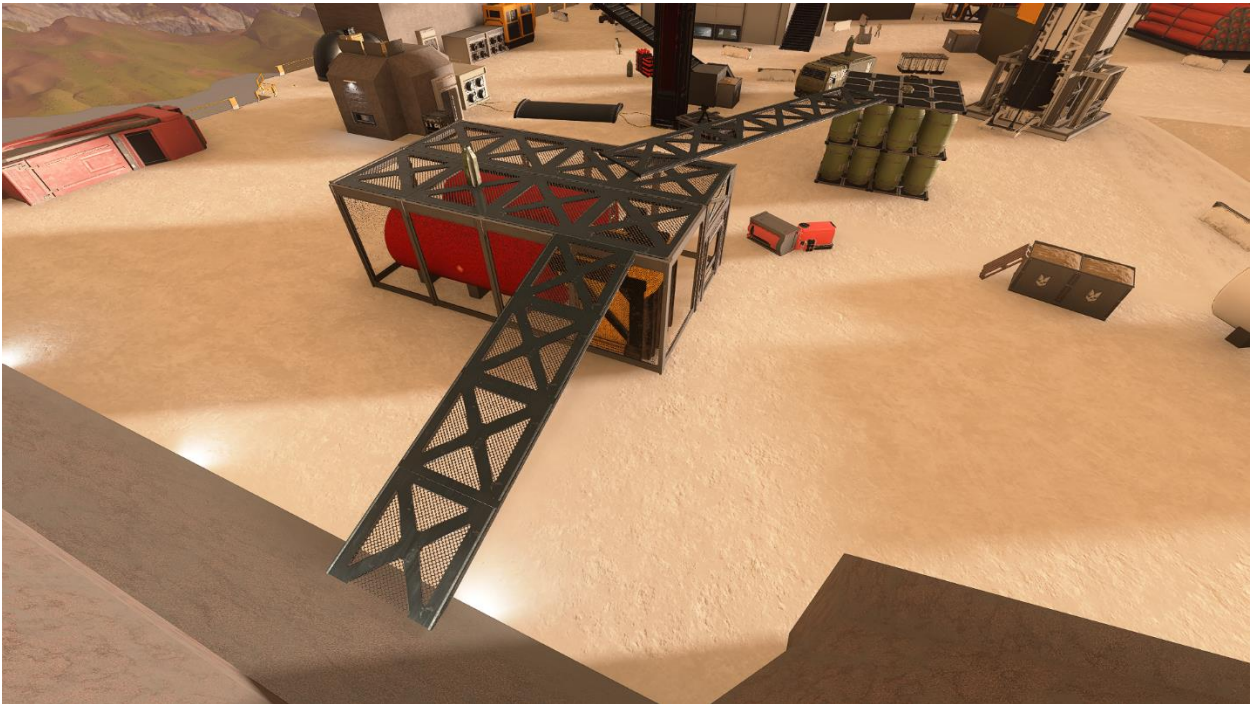


Figure 40 - The gated room has a gated ramp leading to the trim of the control building.

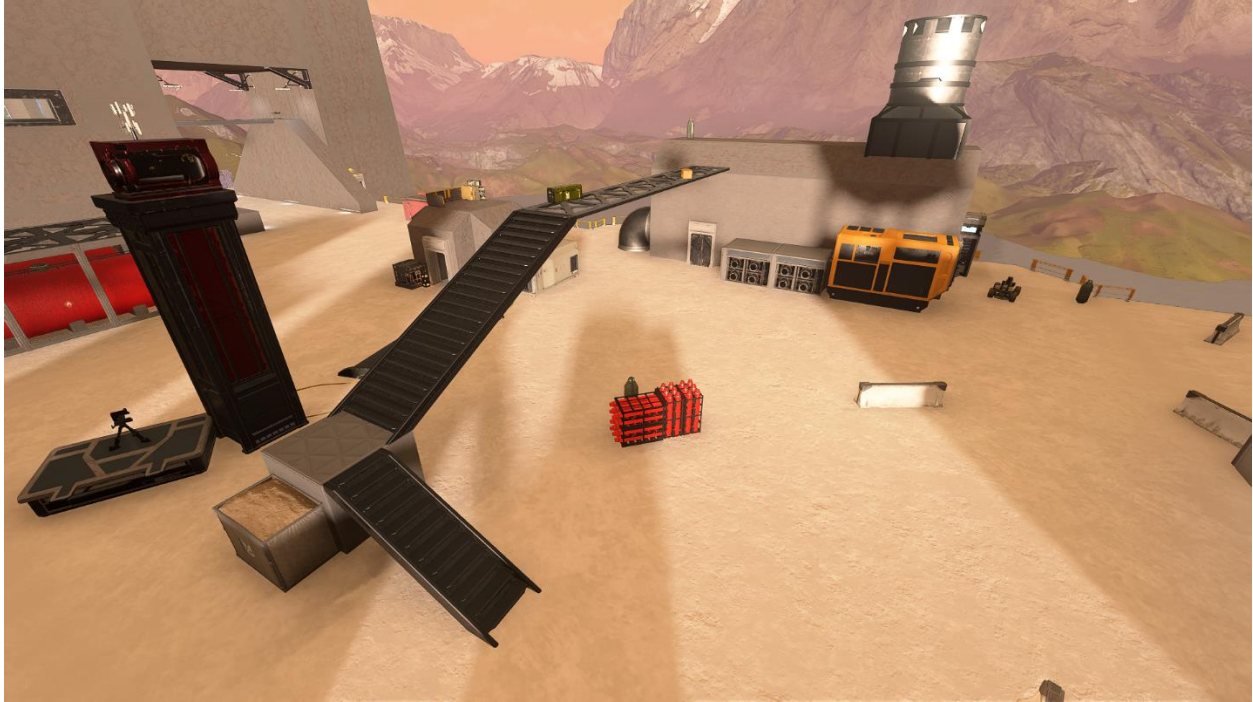


Figure 41 - In the base's courtyard, there is a set of stairs that leads to the top of a 'water testing' building. A weapon pod spawns there. This bridge also adds some elevation to the gameplay



Figure 42 - Aside from the bridge, there are also generators that the player can jump on to clamber to the roof of the testing building.





*Figure 43 - Close to the large passage under the central control building, there is a small building that can be used as cover. There is also a small bump in one of the paths, to slow down speeding vehicles.*



*Figure 44 - Inside the small building, the heatwave spawns, and there is a small window that can be shot out of*



## Team Base Interior



Figure 45 - Inside red base on the ground level. There are some props that can be used as cover, and also some weapon racks that hold base weapons.

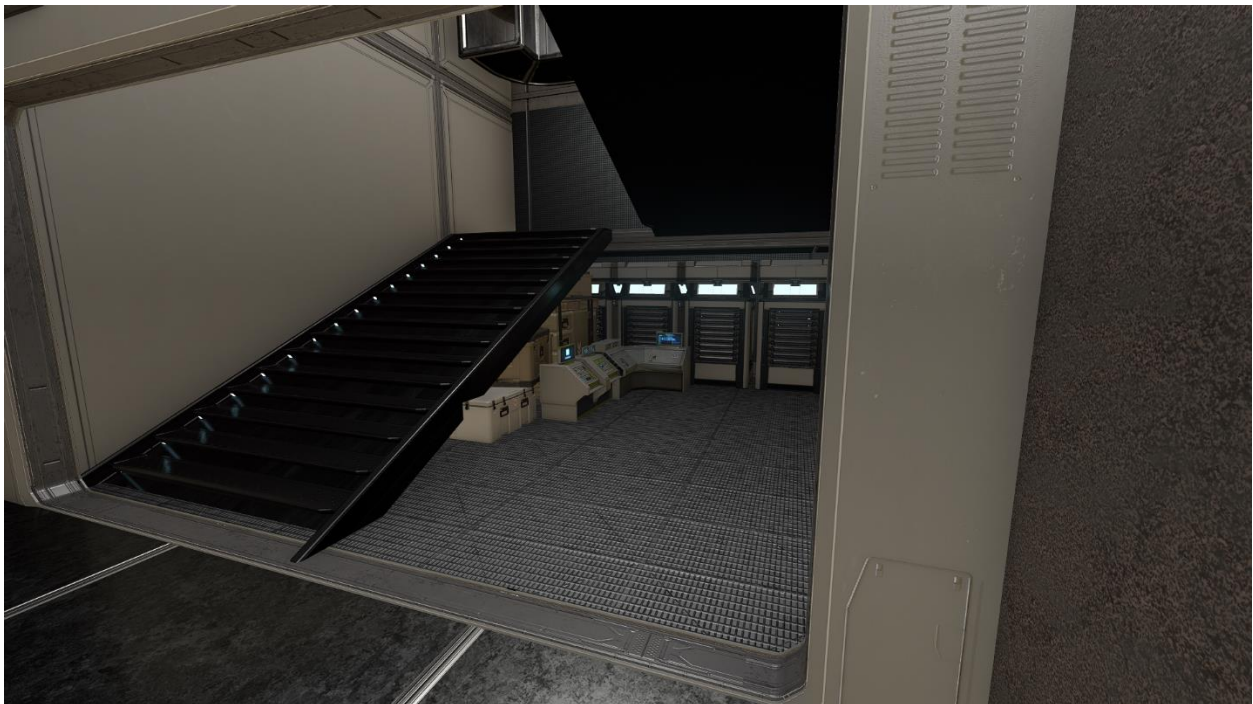


Figure 46 - The stairs from the base's ground level to the basement. Under the staircase, there is a workstation that is used to block and area.



Figure 47 - The basement of red base. More props to be used as cover, as well as a bulldog weapon rack.

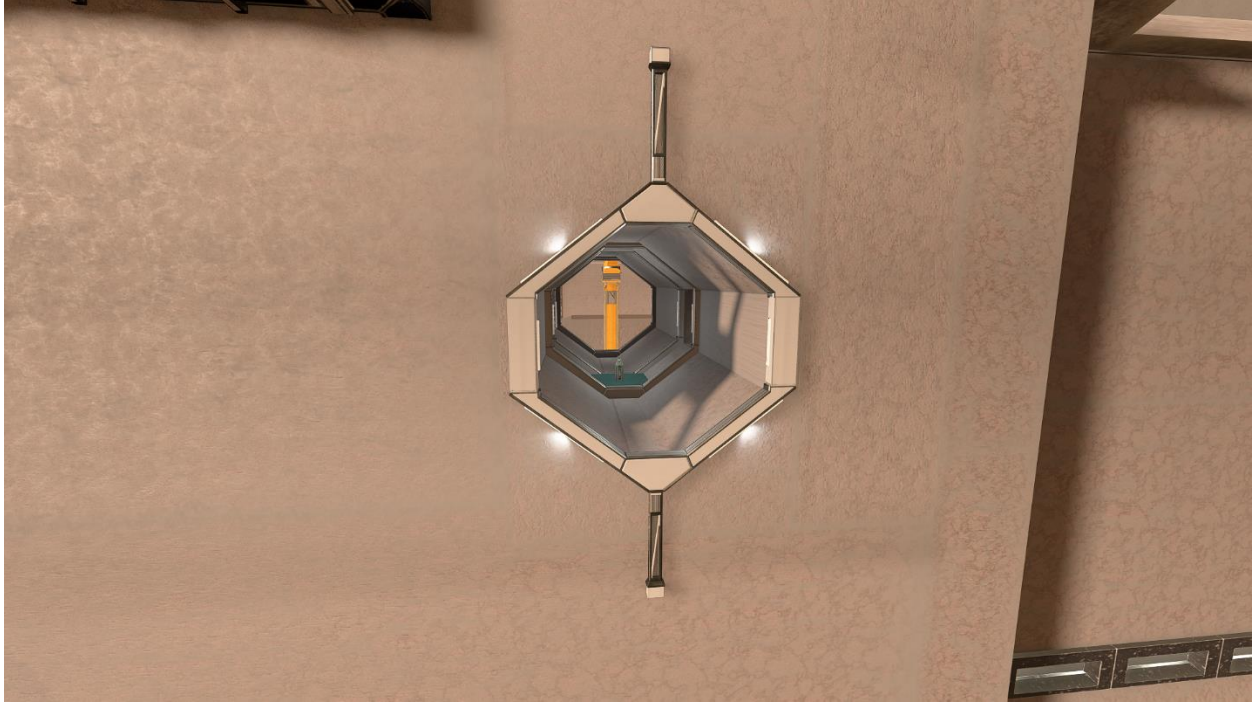


Figure 48 - The base's basement leads out to the catwalk



## Wasp Tunnel

Before decorating the wasp tunnel, I decided to remove the tunnel control room. I felt that an additional room on the level was unnecessary. I then decorated the tunnel using some braces and support beams, and really liked the look of it, with the lighting.



*Figure 49 - The sky level tunnel entrance. Players can pass through using wasps. Additionally, players can climb up through the interior, or use a grapple shot to reach this tunnel. There is a power weapon drop pod in the center.*

## Central Building Exterior



*Figure 50 - The large passage way under the control building. This passage is large enough for multiple vehicles and players to pass through. There is a ramp & bridge that lead to the interior of the control room.*

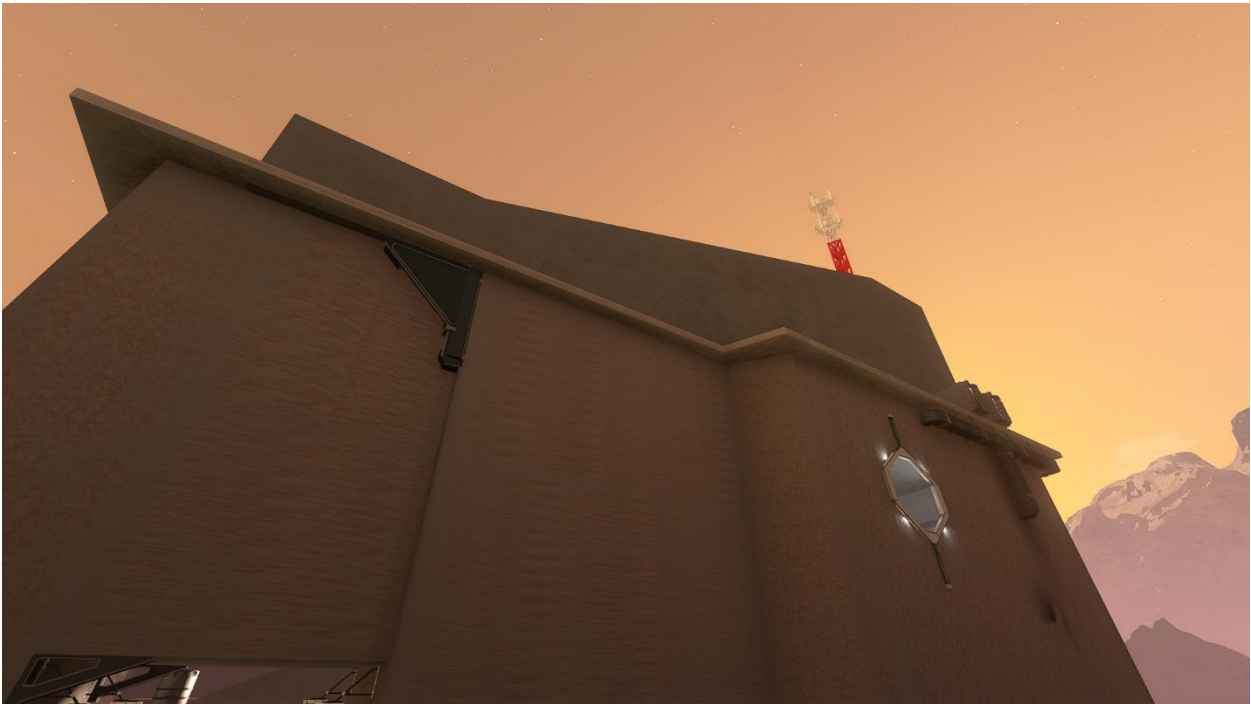


*Figure 51 - On the ramp to the control room, there is a rocket launcher weapon pad*





*Figure 52 - Hanging off the edge, there is a catwalk leading to either base's basement. A sword weapon pad is located under the large pipes in the center. There are also grav lifts that lead back to the ground layer.*



*Figure 53 - The top of the control building. There is a tunnel at the top-most layer, and the player cannot go higher than that.*



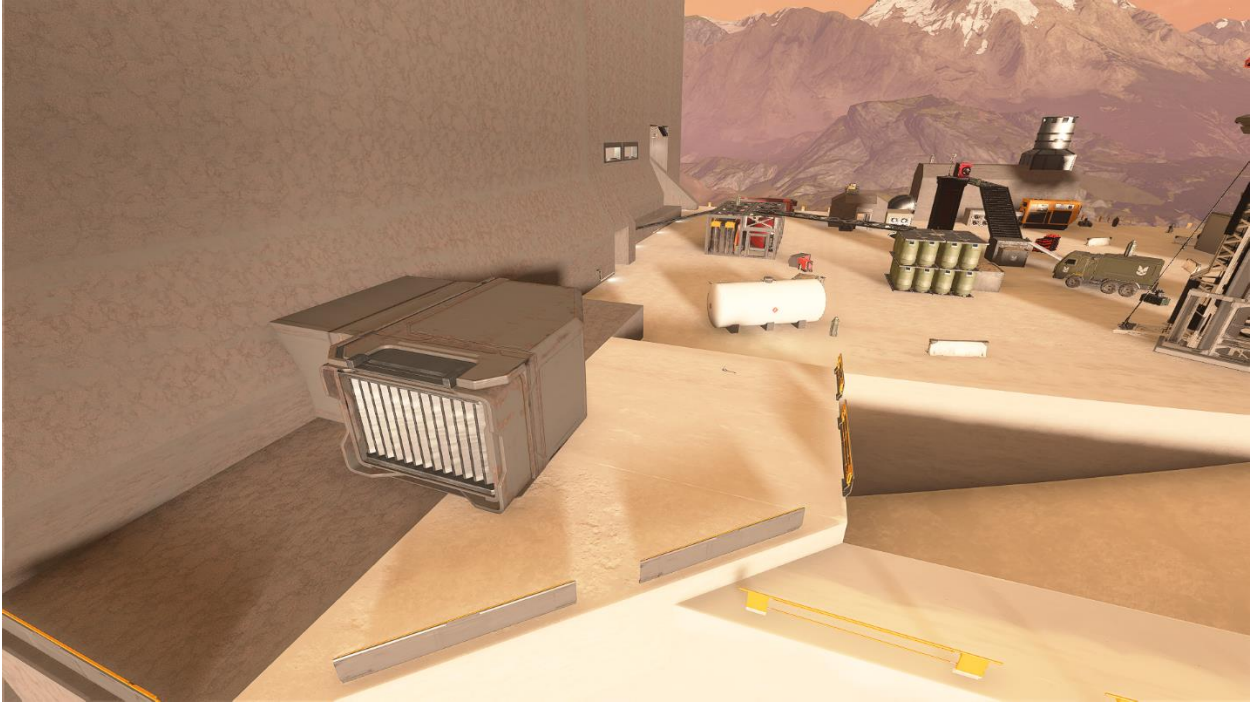


Figure 54 - Under the sky tunnel is a large platform where players can spawn. There are spike grenades and a grapple shot located here.



Figure 55 - On the back most of the control room, there are some large pipes, and air ducts.

## Central Building Interior



*Figure 56 - In the small passage, there is an active camo pickup, and also some cable towers used as cover. The entrance to the control room stairwell is here.*



*Figure 57 - The control room stairwell. Under the stair well, there is a vent that can be used to reach the lower vehicle ramp under the control building.*





*Figure 58 - The main control room. There are windows that overlook both bases, as well as some weapon racks in this room. Additionally, a base weapon drop pod spawns in here. On the other side of the room, there is the grav lift room.*



*Figure 59 - The grav lift room, leading up to the wasp tunnel entrance.*





Lower Vehicle Ramp



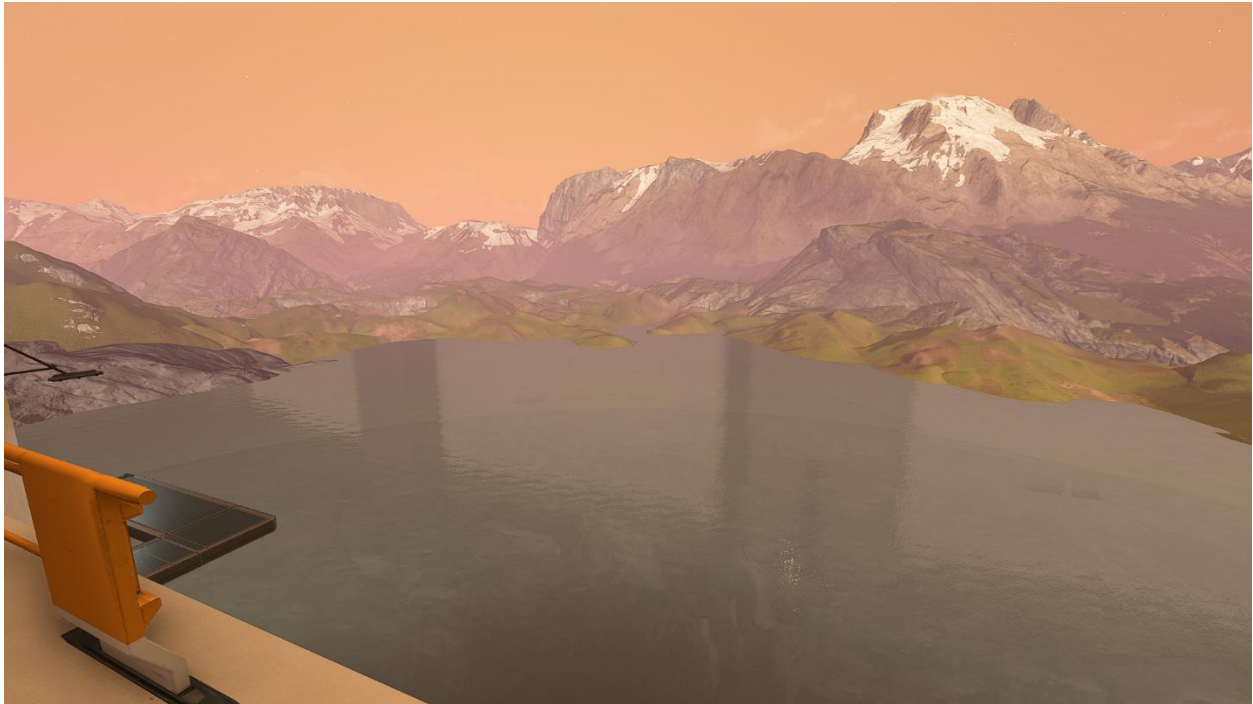


### Out of Bounds Environment

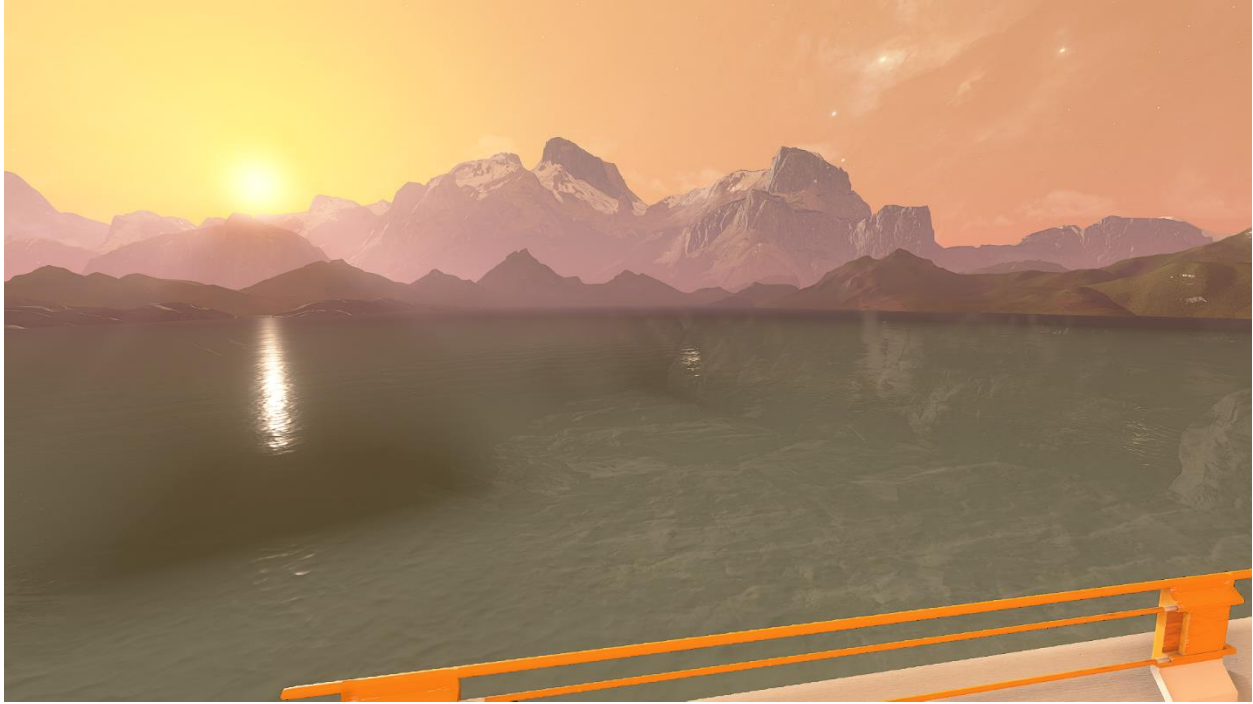
The area outside of the playable space is centered in a large, mountainous area, with a large body of water flowing through the dam. I used multiple large water planes to achieve the water effect, and also used multiple large terrain pieces to create the mountainous area.

Originally, I was going to just stick with the institute canvas' environment, but I didn't like the placement of the several facilities in the outer rims, and decided to hide those with geometry, since I really liked the skybox and mountainous areas outside the map.

To hide all of the map geometry under the water, I used multiple scaled up rock objects

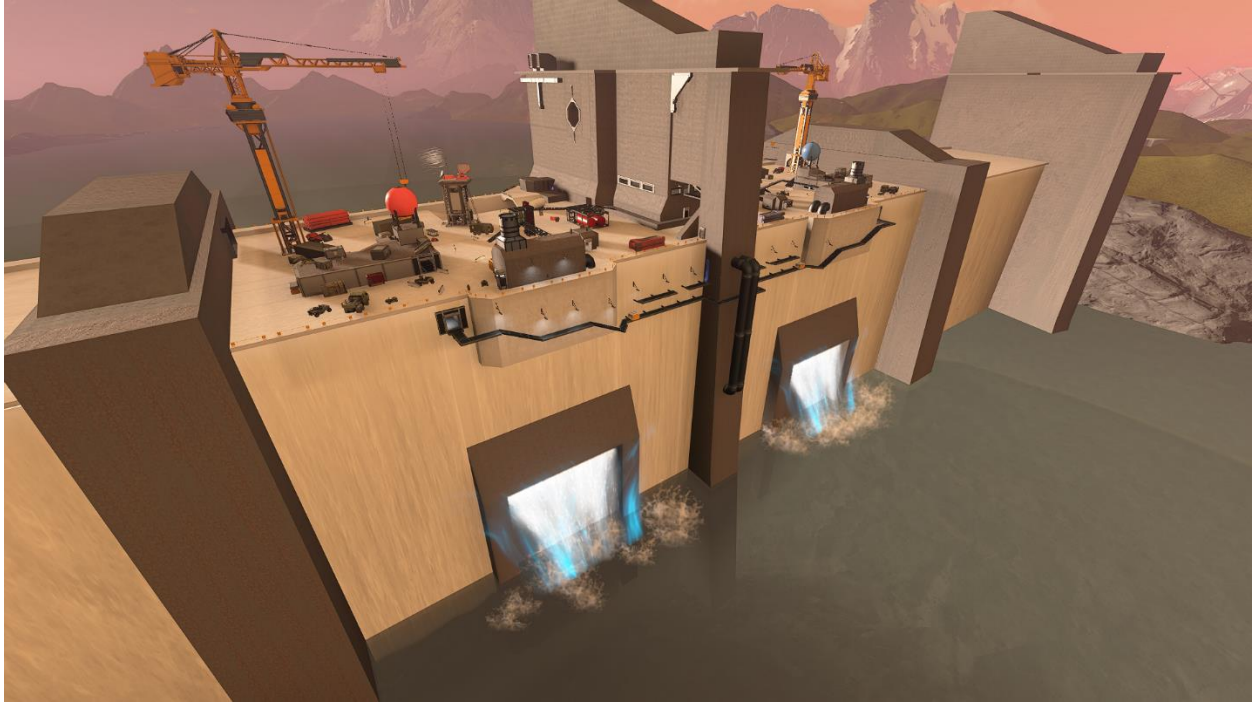


*Figure 60 - The exterior of the map features a large body of water, as well as many mountains*



*Figure 61 - The setting sun is angled right above the edge of the mountain, creating a warm sunset effect, and reflection off of the water.*

While browsing the Halo Forge subreddit community, I stumbled upon a technique someone used to simulate running water. They used some forerunner FX pieces and altered their colors. I played around with similar objects and colors, and was able to create an effect that somewhat simulated a waterfall. I added the water smoke particle to this object to further solidify that it is flowing water, and added them to the bottom of the dam, as well as some hiding geometry.



*Figure 62 - A flowing water FX created at the edge of the dam*

## Playtesting

### Initial Playtest & Changes

I performed a small playtest with a few testers, to test the general flow of the level. While I had tested with the bots while forging, testing with actual players really helped finding flaws in the level.

Overall, testers liked the idea of the map, most weapon placements / balance, and vehicle placements, but did not enjoy the current vehicle paths, restrictiveness of the current design, and the lack of cover in many areas. Players really enjoyed the wasp tunnel, but felt that it was too underused in its current iteration, and would've liked more walkable paths to it.

The main pain points were

- Obstacle & prop placements that were used to deter vehicles from entering certain areas
- The current layout was too restrictive in movement, and many rooms lacked circulation
- weren't clear enough, and it looked like vehicles were able to traverse those areas
- A lack of consistency in slope metrics & window metrics made it hard to determine if the ramps were climbable and if the windows were enterable
- Some areas lacked cover & purpose for foot traffic

### Approach for fixes

#### Vehicle Navigation

For the vehicle navigation, the issue was that some areas were very difficult to navigate through while driving. While this was originally by design, to slow down vehicles in the areas where foot traffic would be high, it was the 'wrong' type of difficult, as players were constantly flipping their vehicles.

My approach to fixing this was to clearly convey areas that vehicles shouldn't be able to enter. This involved adding many props in open areas, which not only helped vehicles navigate better, but also acted as foot traffic cover for the open areas. In order to do this, I had to better plan out where I wanted vehicles to actually go, and what their pathing should be like.

The wraith was especially difficult to create paths for. Because of its large size, most of the areas it should be able to traverse need to be somewhat open. But, the caveat for this is that any foot traffic in those areas would be in the open.

I started on the vehicle navigation starting with the wraith, because it was the largest on the map. After that, I continued pathing for the smaller vehicles, since they were able to branch off the same paths as the wraith.

The wasp paths stayed the same for the most part.

#### Current Design Lacks Circulation

This was a more involved change, as it would need changes in much of the already existing geometry. But, it was necessary, as the circulation & gameplay flow was very restrictive, and felt bad.

To fix this, I planned additional paths & openings by viewing it from a player's perspective. I would enter player mode, and start in spot A, and then try to get to spot B as fast as possible, while bots were shooting at me. This really helped me find the pain points of the designs in areas.

### **Better Metrics**

This was an easier fix. I revisited the pain areas for slopes, and adjusted their slopes so that it was easier to identify that you were able to climb them. Additionally, I added some visual affordance, by adding some grates onto the slopes where players were having a tough time.

### **Lack of Cover**

Another easy fix here. I simply went to the more open areas, and added some props to use as cover here.

My main concern was adding too much cover, so I had to balance between cover and open areas. Luckily, the changes for the vehicle pathing & layout circulation fixes were able to help me add spots for cover, while also looking more organic.



## Map Changes

### Team Bases

#### Interior

Not much changed with the interior, but a note was made by a tester that a whole enemy squad would be able to hide in the vent entrance into the base. Additionally, the vent took a long time to get through in this fast paced game.

I adjusted how long the vent path was to address these issues.

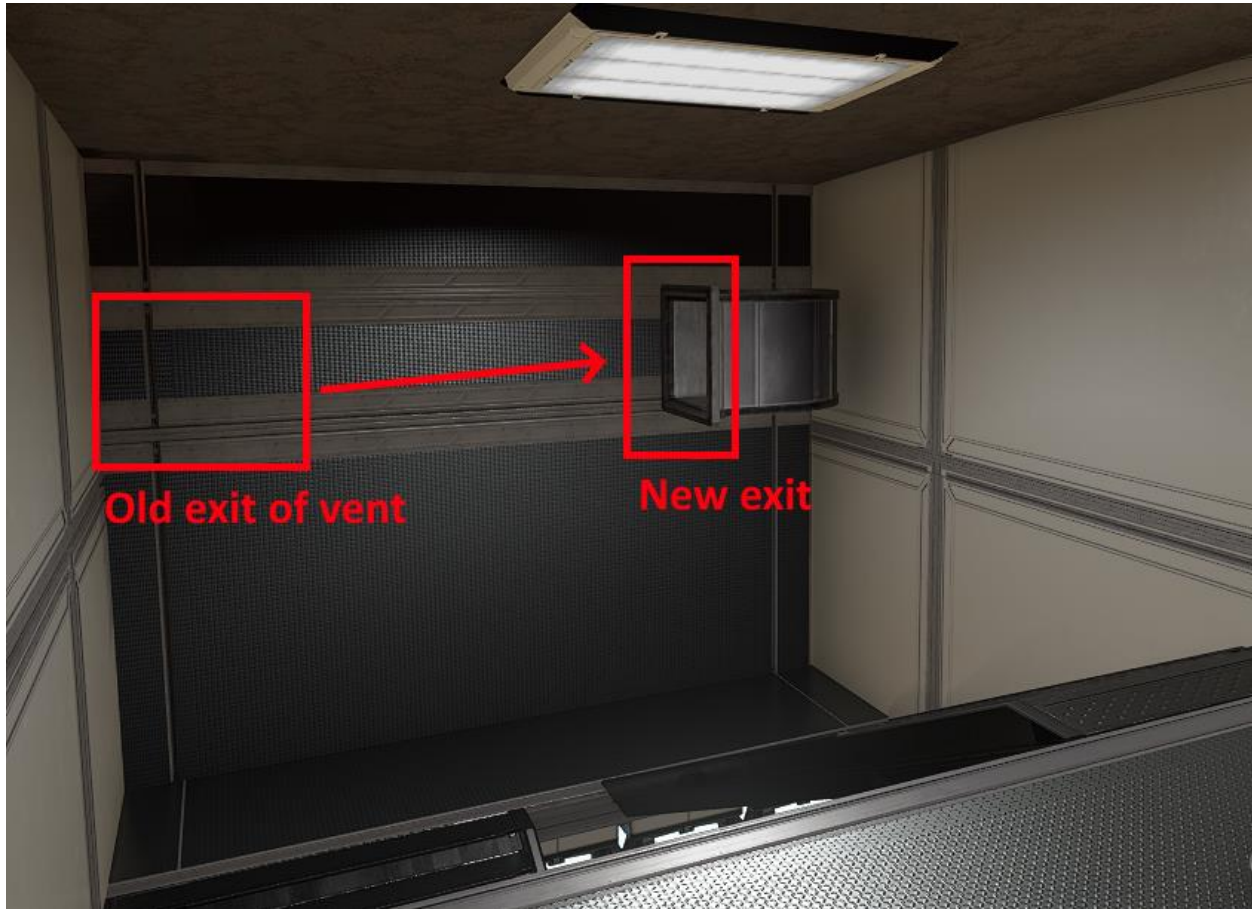


Figure 63 - The new vent passage is now much shorter

### Warthog Spawn Area

The warthog spawn area didn't have many changes. I removed the barrier that was behind the Warthog, and also moved the warthog over towards the base, so it didn't block the path as much.



## Behind the Team Base

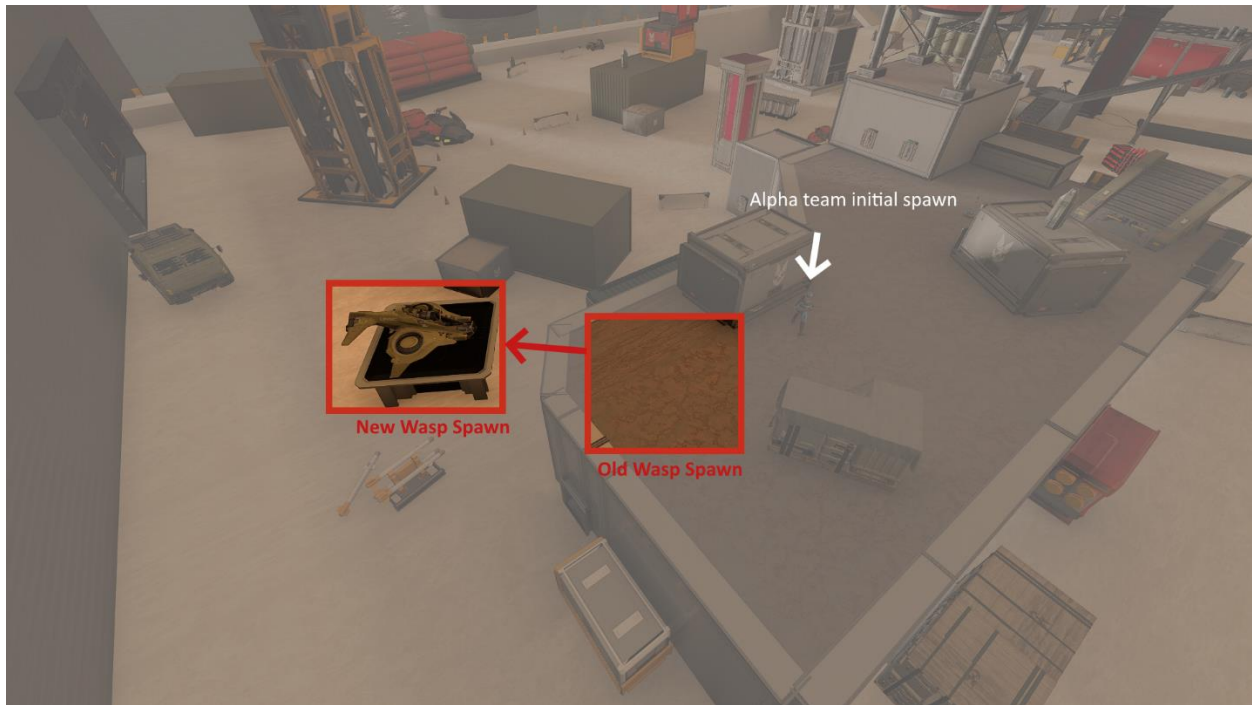
The area behind the base was empty, and lacked purpose or obstacles. I added some large and small props here. The idea was to make a warthog run possible, but have some small dynamic props that might trip up the driver if they aren't careful.



## Wasp Spawn Location

The wasp's spawn location has been moved to behind the team's base on a platform. During playtesting, players felt the original wasp spawn location was too unfair in favour of the Alpha squad of that team, as the wasp spawned really close to their initial spawn.





### Crane Area

The crane area of the bases was originally very difficult to navigate through with a vehicle, as there weren't clear areas of where vehicles should and shouldn't go. I addressed this by adding some barriers and having some clearly defined driving paths.



Figure 64 - The old crane area. The space is very open, and it's hard to tell that the wraith will have difficulty driving here.





Figure 65 - The old wraith spawn area. Aside from going behind the wraith, there isn't much room to circle around the back side of the base, as it is very closed off, except for the area beside the wraith, which requires the player to do a u-turn, possibly flipping.

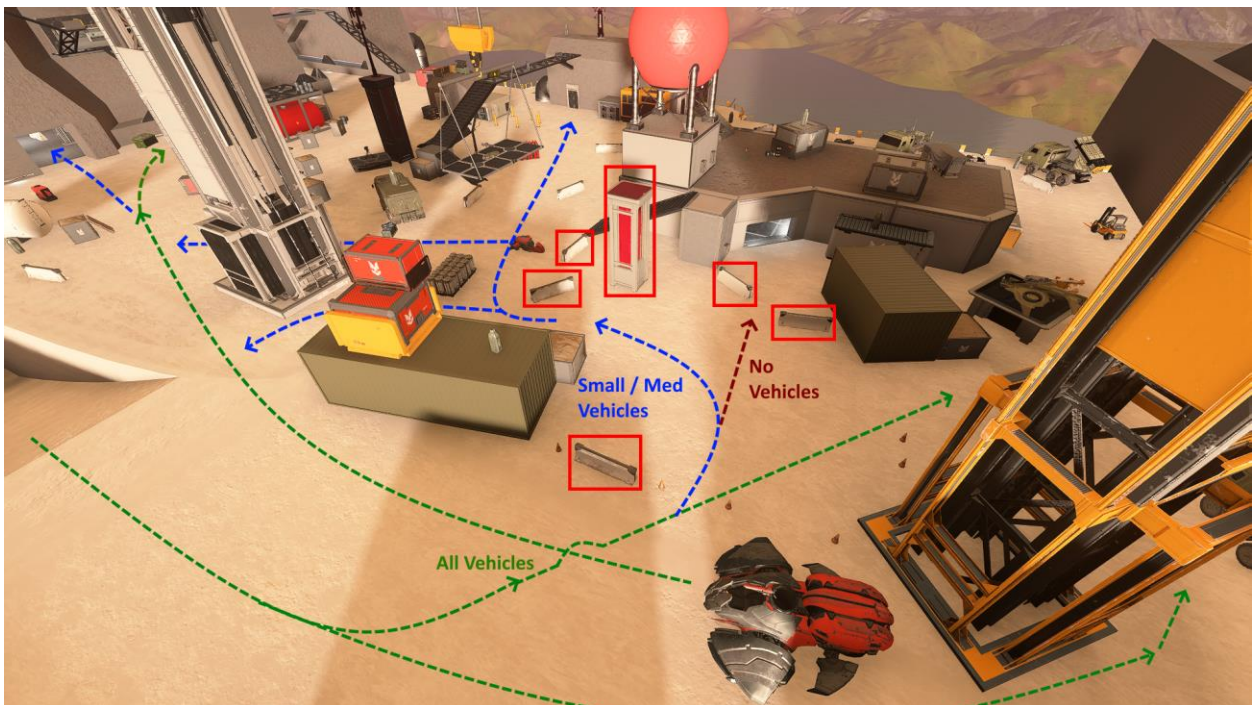


Figure 66 - The updated crane area. I added multiple props to deter vehicles from taking certain paths. In the diagram, I drew the ideal paths for each vehicle type.

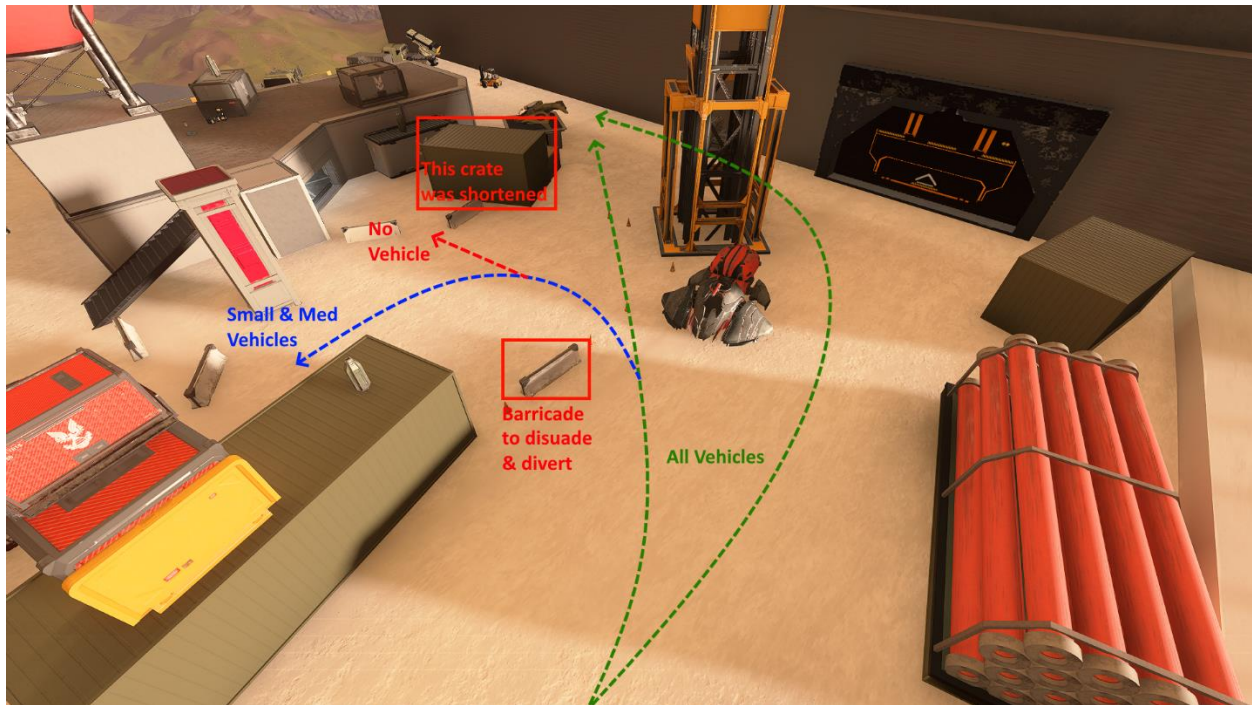


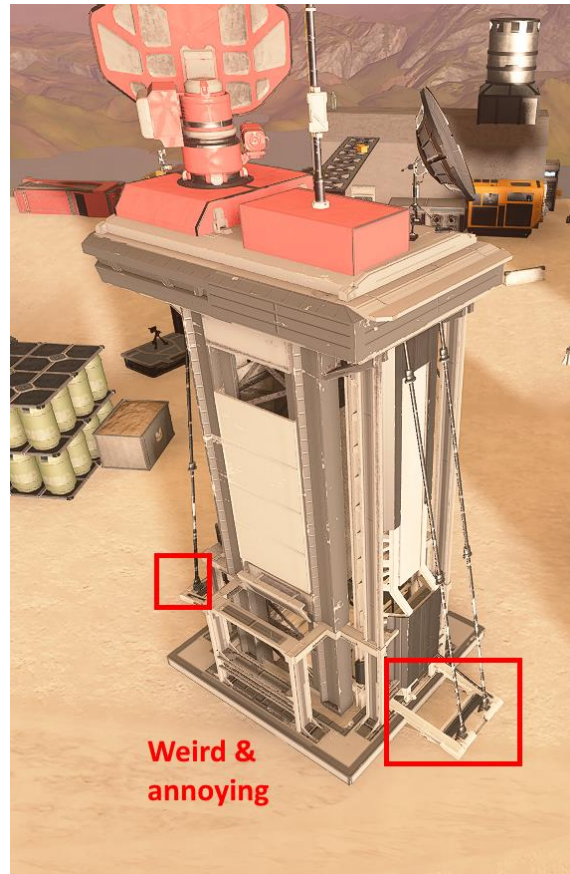
Figure 67 - Updated wraith / behind base vehicle paths. The shipping container prop was shortened, and a vehicle path was opened up in that area. A barricade was added at the turn, to try to divert players into the new drive path, but players are able to u-turn around it if they want to.

### Radio Tower Prop

The radio tower prop was cumbersome to navigate around, and players would avoid that area. This was mainly due to the bottom of the tower having weird geometry sticking out, but there was also no reason to go near the tower. A tester noted that they felt like something should have been there, since it felt like a 'hero piece', and they were disappointed when nothing was there.

I adjusted the prop, so that the weird geo at the base was no longer present, and I also added a needler weapon rack to the base, to give the tower a purpose other than just cover. Lastly, I rotated the tower, so that the vehicle path beside it was clearer.

I also noted, while forging, that when viewing the tower from the sniper spawn, it felt like I should have been able to climb to the top of the tower. To fix this, I made the tower higher to remove that confusion, but it is still climbable with a grapple shot.



*Figure 68 - The original tower had crane pieces merged into the base, to act as 'cables' connected to the tower. The geometry of this made walking around it a hassle, and annoying*



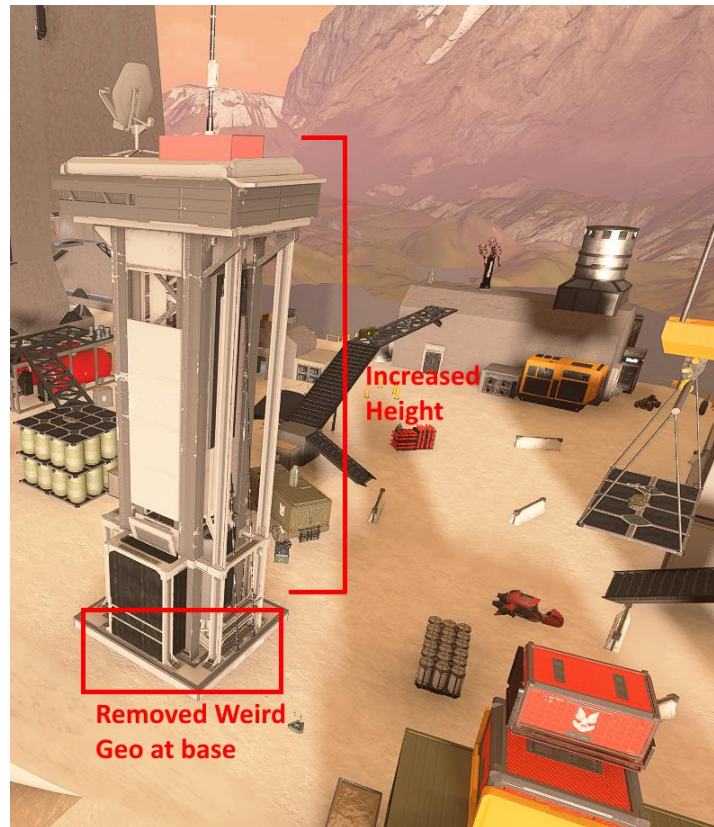


Figure 69 - I shrunk and pushed in the crane pieces at the base, cleaning up the geometry. I also made the tower much taller.

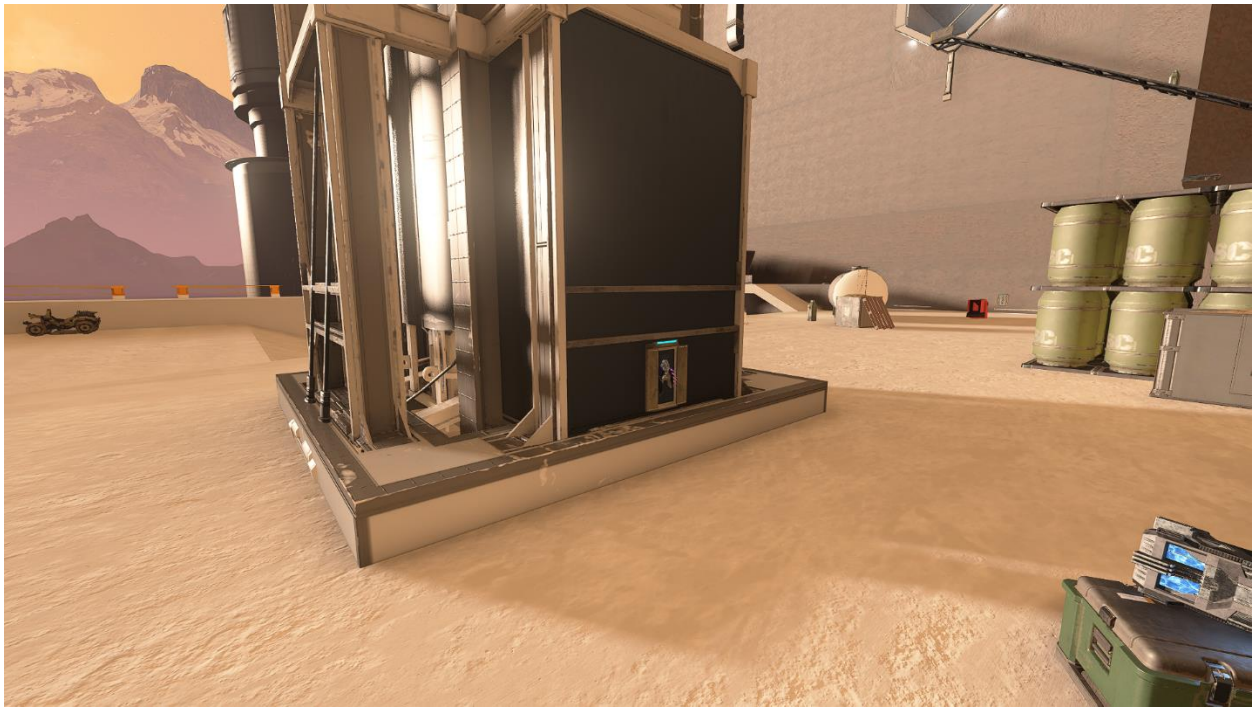


Figure 70 - I added a needler to the base of the tower so it has some purpose



### Sniper Spawn Platform

The sniper spawn at each base was quite difficult to get to. I had the players jumping on some closely stacked crates that were on the ramp side of the map. This was to make it difficult for any enemy players that might have travelled through the ramp, to steal a team's sniper rifle. While this worked, it also made it difficult for the owning team to get their sniper rifle. One tester also noted that they felt they should have been able to jump to the platform from the team base.

I added a tall pillar beside the base's exterior stairs. I also removed the railings on the sniper platform, as they were cumbersome.



Figure 71 - The old path to the sniper rifle. The player has to make several jumps just to get to the platform.





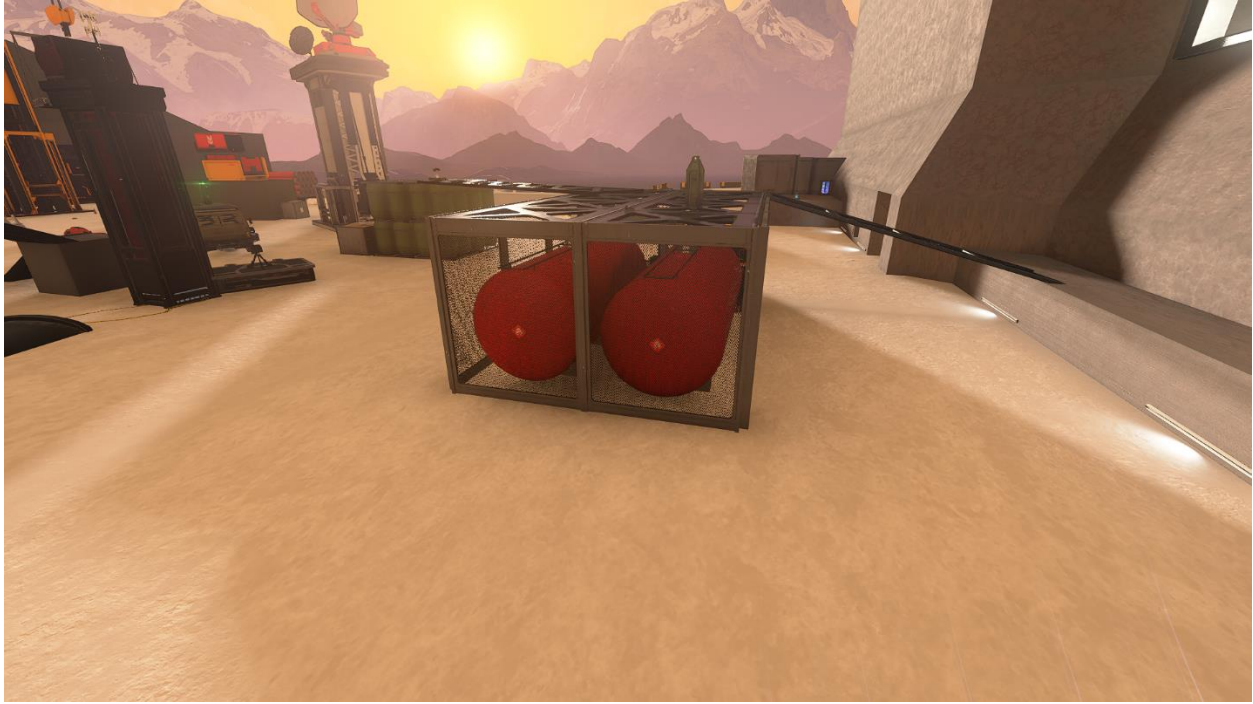


Figure 73 - The old gated room. No cover at all, and the ramp leads down to the edge of the control building, which also has no cover or purpose.



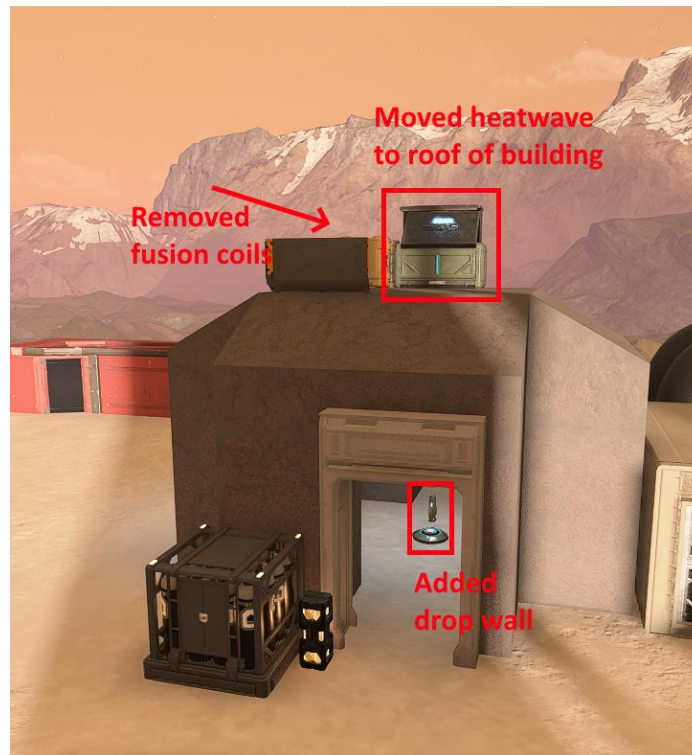
Figure 74 - There are now multiple props around and on the room, allowing for more paths to get to the roof. The ramp has also changed to lead to the center control room (now with the rocket launcher).

### Small Building (man canon exit)

The small building saw little use in the playtest. While testers did use the man canon to land on the building, there was little gameplay around the actual building.

I didn't change much in terms of geometry or prop placement. I believe that with the updated vehicle paths, this building will be more used, and will revisit this during the second playtest.

For what did change, I moved the heatwave to the top, to give more purpose to the roof, while also adding a drop wall to the interior. I also removed the fusion coils from the roof, and moved them to the water testing building's bridge, as I found players would avoid using the man canon because of the danger of the fusion coils.



*Figure 75 - A side view of the small building outside of the red base. The heatwave has been moved to the roof, and a drop wall equipment pad has been added into the interior. Also, the fusion coils are removed*

Additionally, some traffic stoppers have been added behind the structure. This guides the vehicles along one of the two paths, while also providing a 'splatter free' zone for foot traffic.



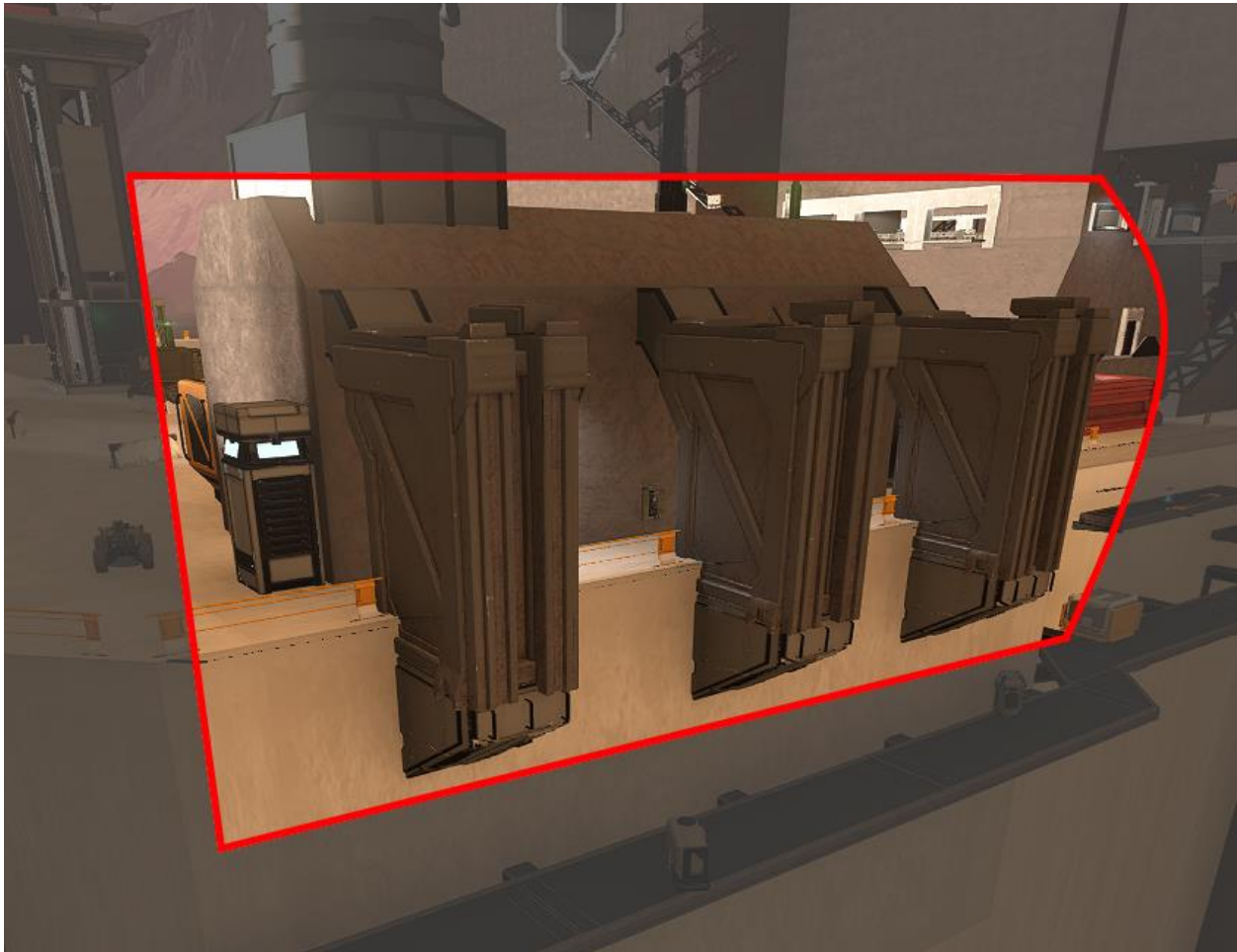


*Figure 76 - Traffic stoppers have been added behind the small building, creating a splatter free zone for foot traffic.*

### Water testing building

The point of pain for the water testing building was that the outside edge had no cover from the wasp. While the shock rifle was located there, it was difficult to reach, because the player would be in the open while trying to reach it.

For this, I added some pillars to the building, which allow for some cover. That said, the area is still not completely safe, as the wasp has explosives that can be used to blow the player out of the cover.



*Figure 77 - Pillars have been added to the outside edge of the water testing building, allowing for some cover from flying vehicles.*

### *Hanging Catwalk*

The catwalk on the side of the dam has been changed quite a bit. During the playtest, players avoided using this area quite a bit. Those that did use it found themselves falling off the map quite a bit because it was so small, and narrow.

The first change is the height that the catwalk is at. Originally, the catwalk had two stair cases, dropping down two levels. While this diverted attention from the catwalk, because it was hard to see, it also made it easy to forget about the catwalk altogether, and make it a very boring space.



*Figure 78 - The original catwalk dropped two levels, creating quite the distance between ground level & the catwalk*



*Figure 79 - The drop was so far, that a gravity lift was needed to return to ground level*



I removed the two staircases, and moved the catwalk up. Doing this also removed the need for the gravity lift in the center, as players could now clamber up to the ground level, using a second platform. To remind ground level players about the catwalk, I also added gated flooring at the edge of the dam, to draw some attention to the lower levels, while also preventing some accidental falls.

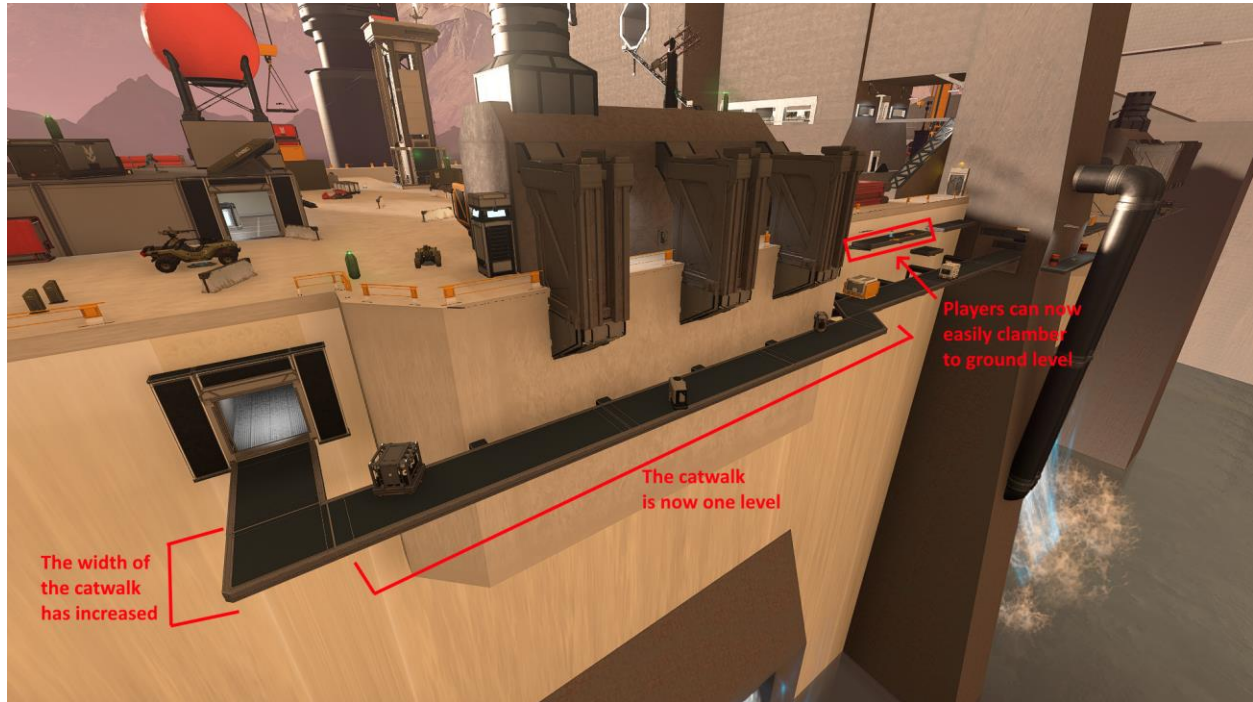


Figure 80 - The new catwalk is now larger in width, reducing falls. It is also now one layer, allowing the player to clamber to ground level through the use of a raised platform

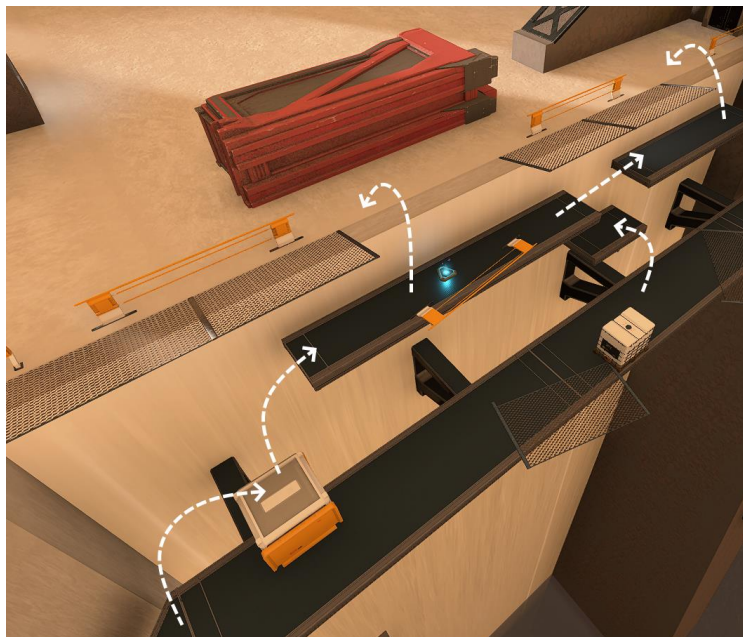
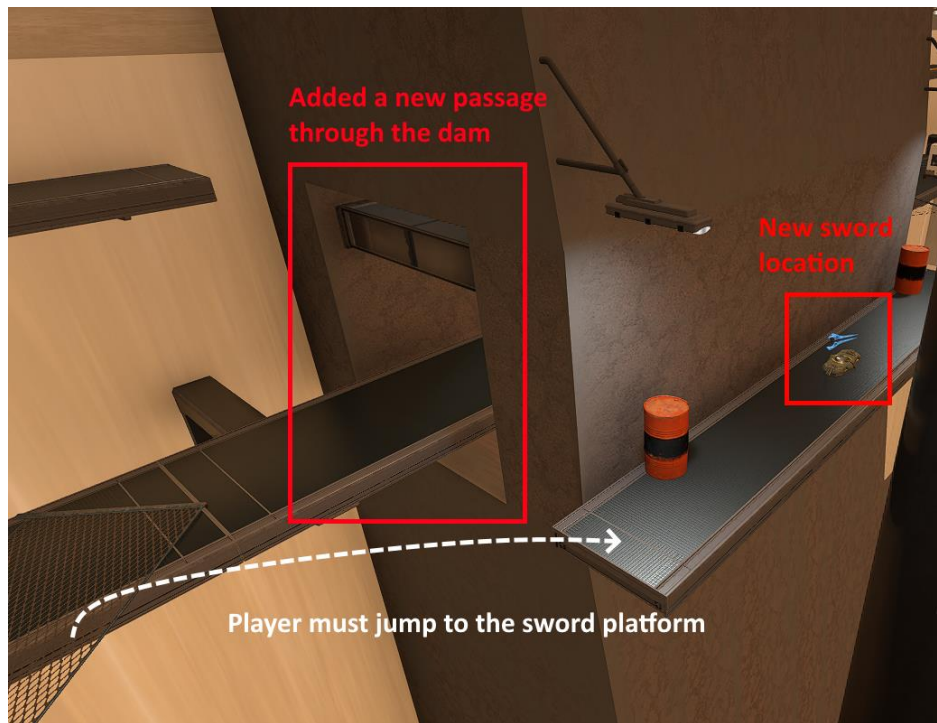


Figure 81 - The new catwalk allows for easier clambering



Lastly, the sword weapon pad remains on this level at the same position, but the path to get to it has been altered. The catwalk now passes through the dam in a newly created passage. The platform of the sword is no longer directly connected to the main catwalk, and the player must risk a jump to get to it.



*Figure 82 - To get to the sword, the player must risk a jump*

### *Control Building (Center Structure)*

Many changes have taken place in the control building, though its structure stays relatively the same.

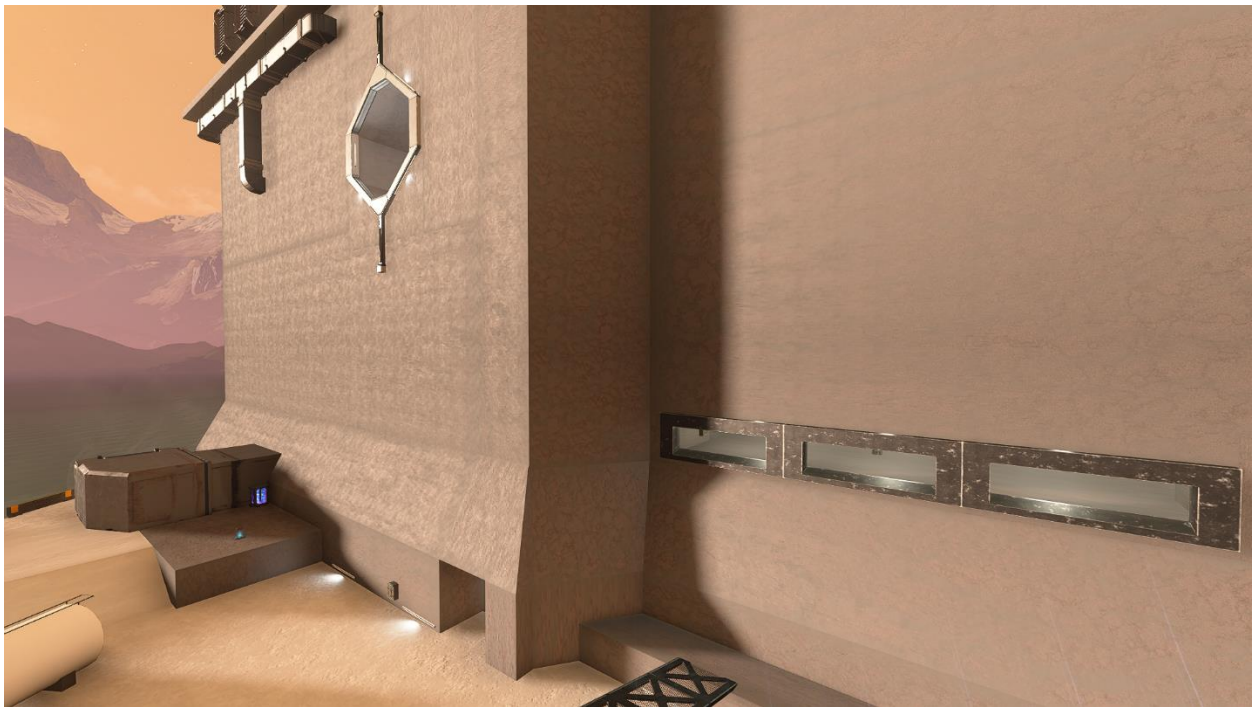
#### **Exterior Walkway**

A new walkway has been added on the outside of the building. This walkway leads from the control room to the wasp tunnel. The control room's windows have been grown so that players can pass through them as doorways now.

This change added two additional ways to get to the power weapon in the wasp tunnel, as there was originally only 1 way through foot, which was a very long path. It also allows for more vertical gameplay, as players can aim from the walkway to the ground level areas, and vice-versa.

Additionally, as the walkway leads from the gated room on both team's bases, it's much easier to reach the control room now, making that area more of a hotspot.

One extra bonus is that it breaks the blandness of the exterior wall with the walkway's props.



*Figure 83 - The old exterior had no pathway. There was only one way to the wasp tunnel through the interior, and there was very little gameplay in the narrow path which made it boring*

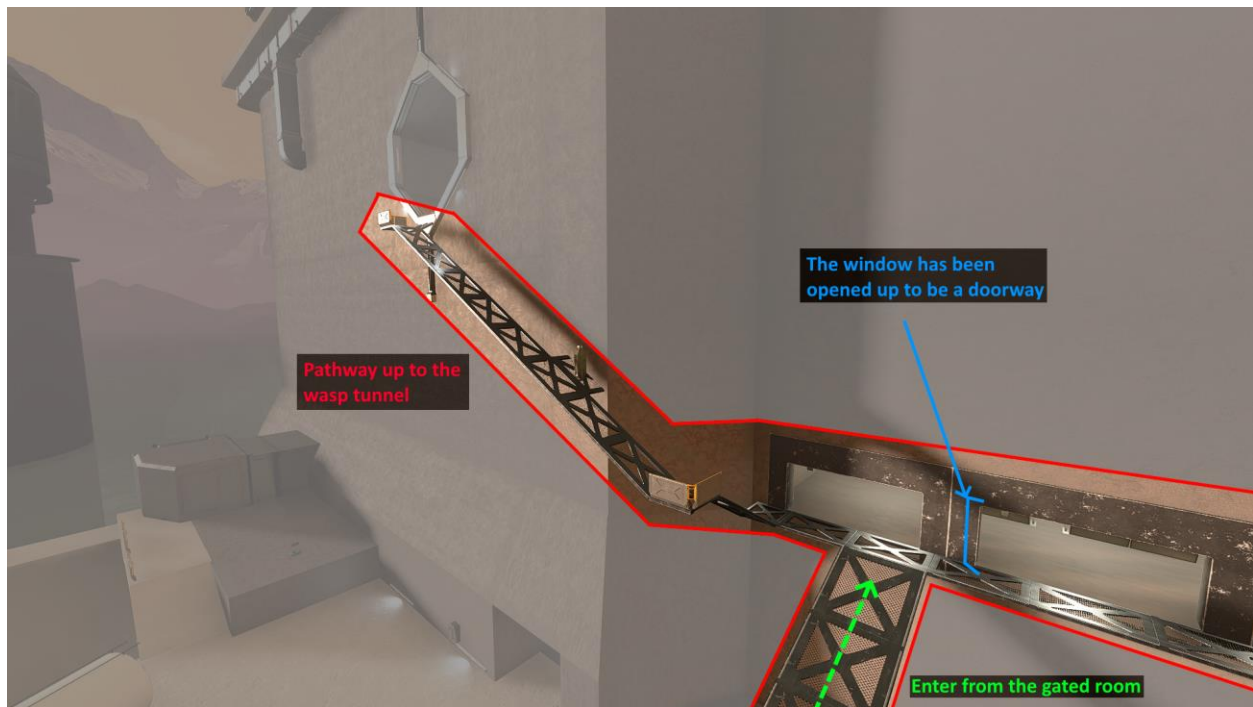


Figure 84 - The new exterior features a pathway to the wasp tunnel, coming from the control room.



## Wasp Tunnel

The altitude of the wasp tunnel has been decreased quite a bit. This was to allow for a climbable walkway up to the wasp tunnel. Additionally, the walkway inside the tunnel has been replaced with a grate walkway, to better tie in with the exterior walkway. It also looks nicer.



Figure 85 - The wasp tunnel's interior walkway has been changed to be grates, instead of a plain block

## Control Room Interior

I added some cover & props into the control room. Originally, the room was completely open, leaving the players completely open to fire. I also moved the rocket launcher into this room, after opening up the windows, as this was a better 'center' to the map than the large passage was (where it was originally placed).

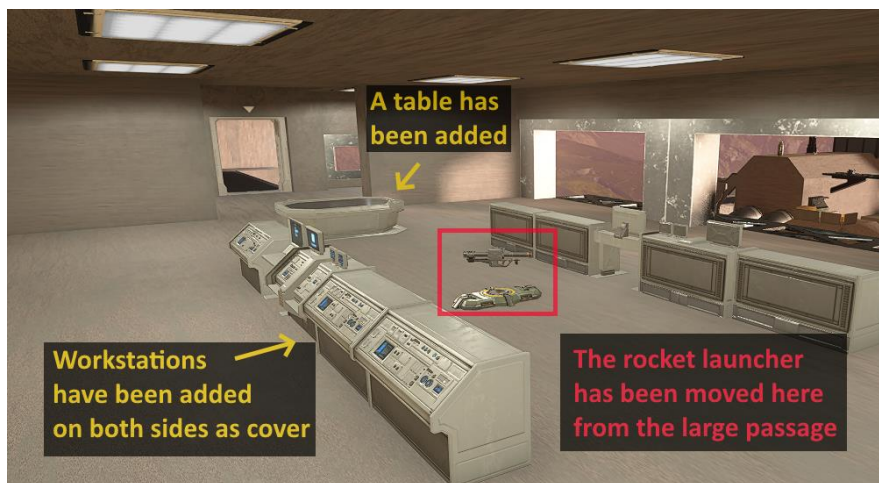


Figure 86 - The interior of the control room now features some props used as cover. The rocket launcher has also been moved to be in this room.

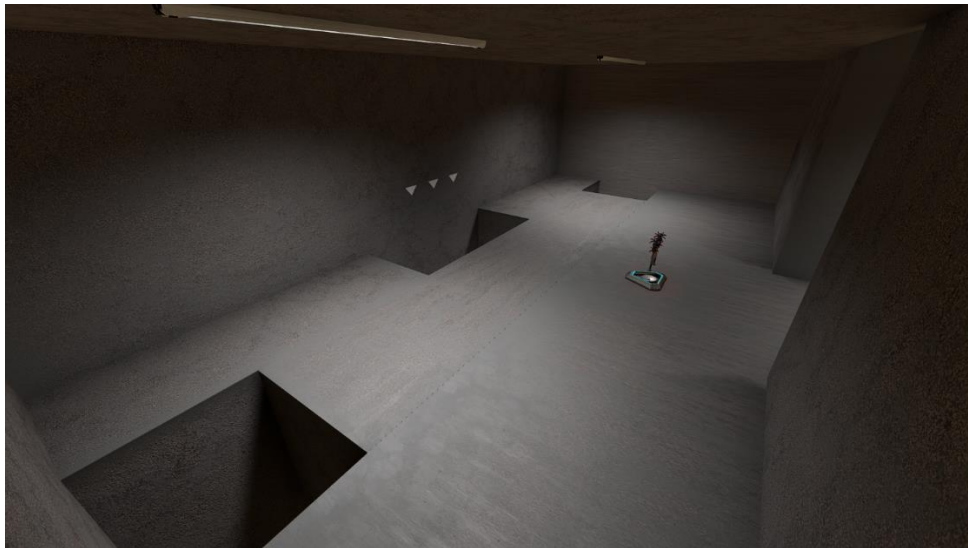
### Gravity Lift Room

The gravity lift landing room was also an area that I discovered was cumbersome to navigate. I had originally only two holes in the floor, and both had the gravity lift leading up into them. While the holes were large enough to get down from the top level, players would often land in the gravity lift, sending them right back up.

To address this, I simply added a third hole in the room, away from the gravity lifts, while also adding some decals to the wall to show it went down.



*Figure 87 - The original room only had two holes to travel up and down through*



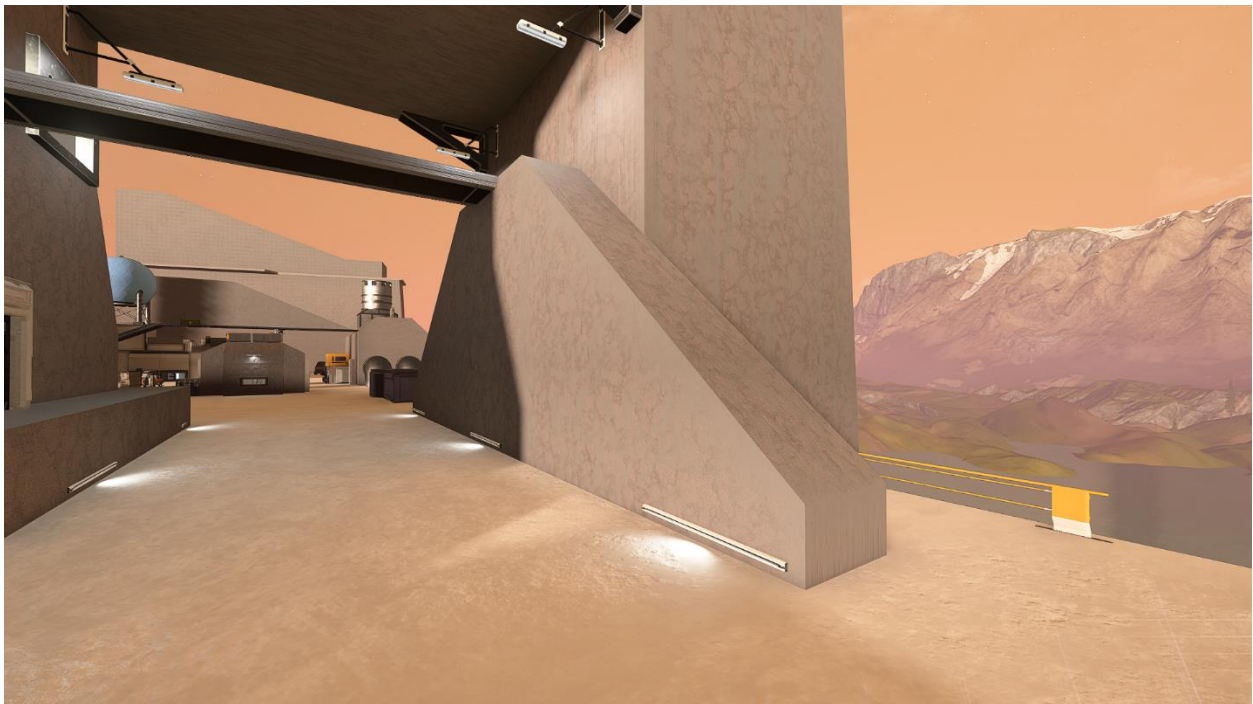
*Figure 88 - I added a third hole, dedicated to going down*

## Large Passage

The large passage was very open, with very little cover for foot traffic. Additionally, the ramp on the outside wall had a weird slope, and it was hard to determine whether the player could climb it.



*Figure 89 - The original large passage has no cover, and was a no man's land for foot traffic.*



*Figure 90 - The slope here was quite sharp, and players didnt know if they could climb it*

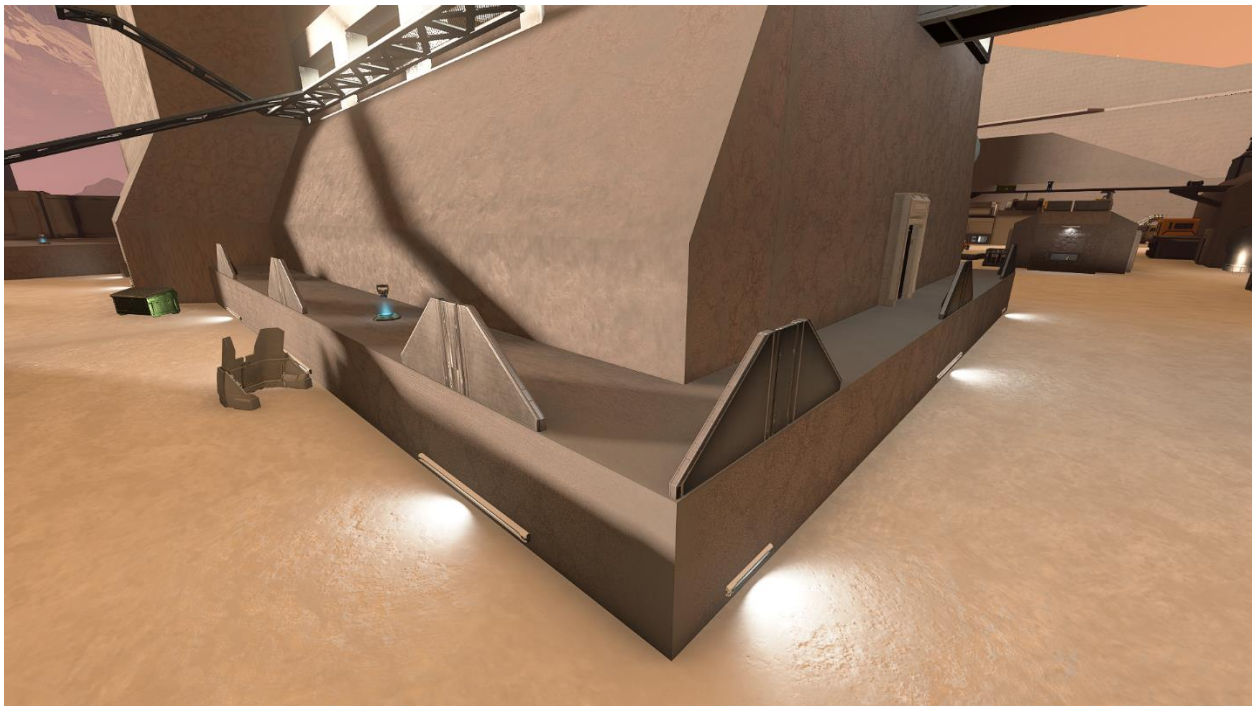


To address these changes, I added some cover to the ledges of the passage. I also adjusted the slope of the rocket launcher ramp to be less sharp. One suggestion I had from a tester was to use more affordances with traversable terrain, so I added some gates to the surface of the slope, which also added to the artistic appeal of the area.

After these changes, I still felt that the area was too unsafe for foot traffic, and ended up creating an opening underneath the ramp area, which had more cover for foot traffic.

As mentioned, I moved the rocket launcher to the control room, but still wanted a weapon here, and ended up placing an arcane sentinel beam. I have yet to test the map with the new weapon, so it might change in future iterations.

Lastly, to add some appeal to the newly created opening, I placed an overshield equipment pad there.



*Figure 91 - The newly added cover on the edge of the building. It is scaled to hide standing Spartans from possible vehicle gunfire*



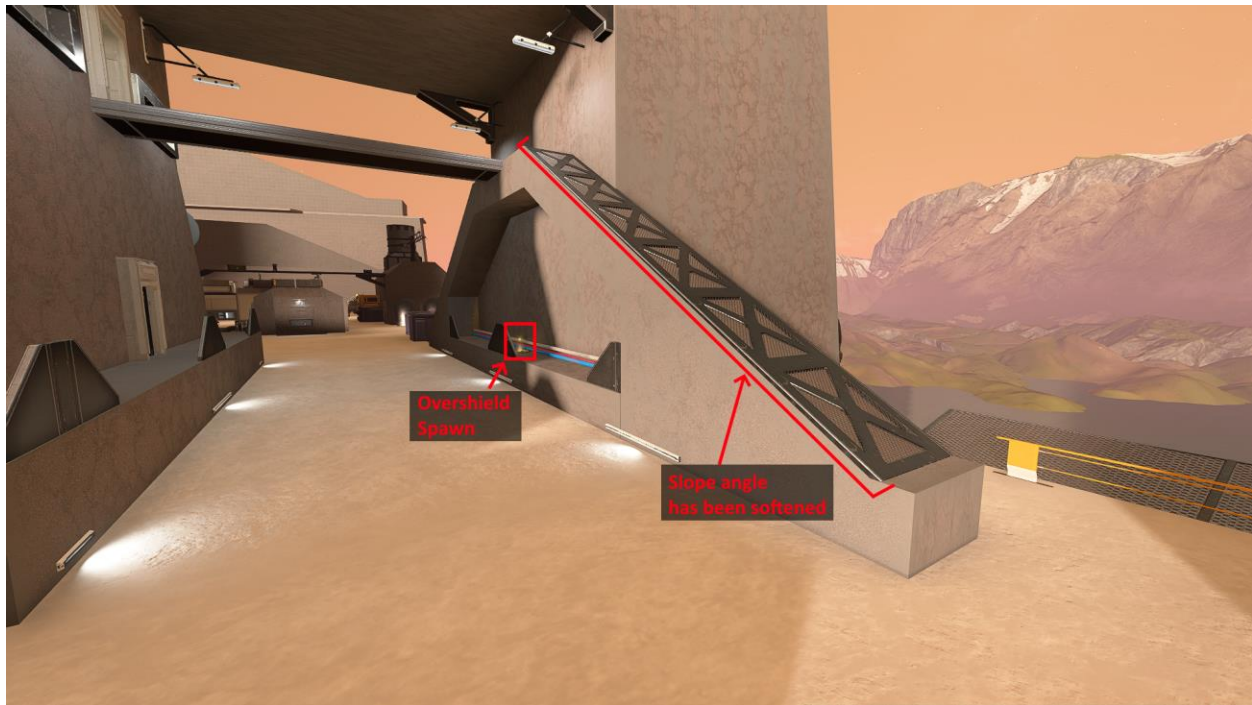


Figure 92 - The ramp's angle has been adjusted to be softer, and grates have been added on the surface as well. Additionally, an opening has been created under the slope, and an overshield pickup is in there

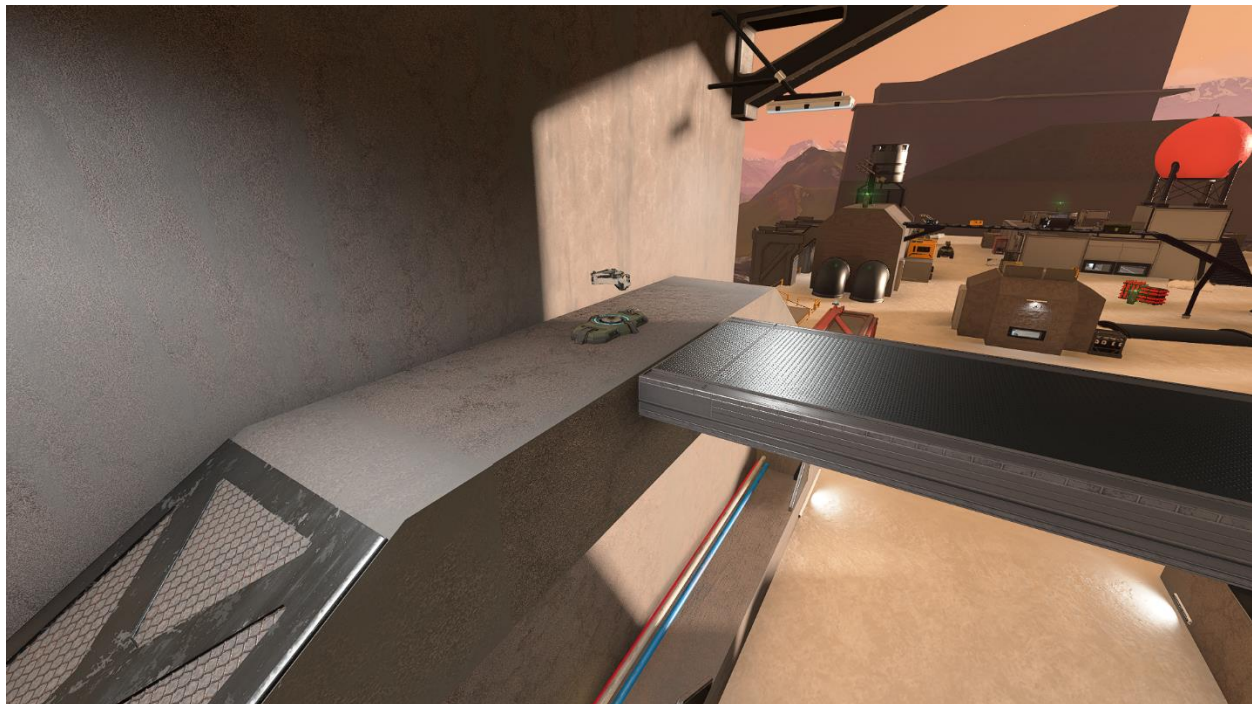


Figure 93 - The rocket launcher has been moved, and an arcane sentinel beam has been placed on the ramp now

### Small Passage

The original design of the small passage was to be used as most a foot traffic passage, while allowing for a mongoose to drive through. However, after getting feedback on the vehicle paths, I decided to open up the pathway for medium sized vehicles as well.

The overall design hasn't changed, but some cover and vehicle stoppers have been placed in the room. Additionally, some large electric fusion coils have been placed in the room, to allow for anti-vehicle gameplay.



*Figure 94 - The original room was very open, with only a few points of cover. The doorway was weirdly sized so it was unknown whether a warthog or ghost could enter.*



*Figure 95 - The new design features a little more cover, with some large electric fusion coils on the side. Some traffic stoppers have been added to the staircase room, to stop vehicles from entering*

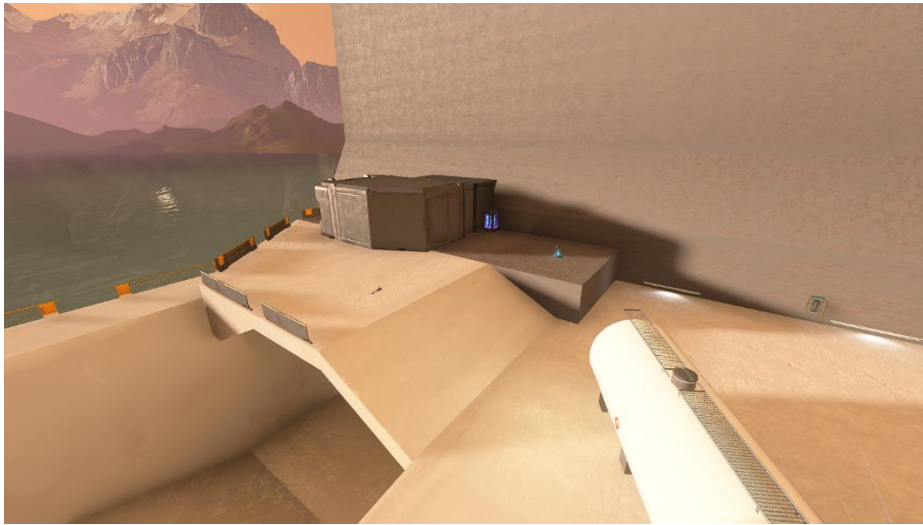


### Large Vehicle Ramp & Passage

This passage was another area that received quite a bit of feedback. Players felt that it was pointless to enter the area on foot, as the area was very open, and it took a long time to traverse on foot, even after entering through the central vent. Even though there was a skewer there, it wasn't worth the risk.

To address this, I added some stair cases in the passage, to allow for a faster way to reach ground level on foot. This required that I reduce the size of some of the ramp's entrance's roof geometry a bit, but I discovered that this area wasn't used during gameplay at all, and it would be okay.

I also added some more props & cover in the passage for foot traffic.



*Figure 96 - The old ramp roof was long, and pointless, as no gameplay or fire fights occurred here.*



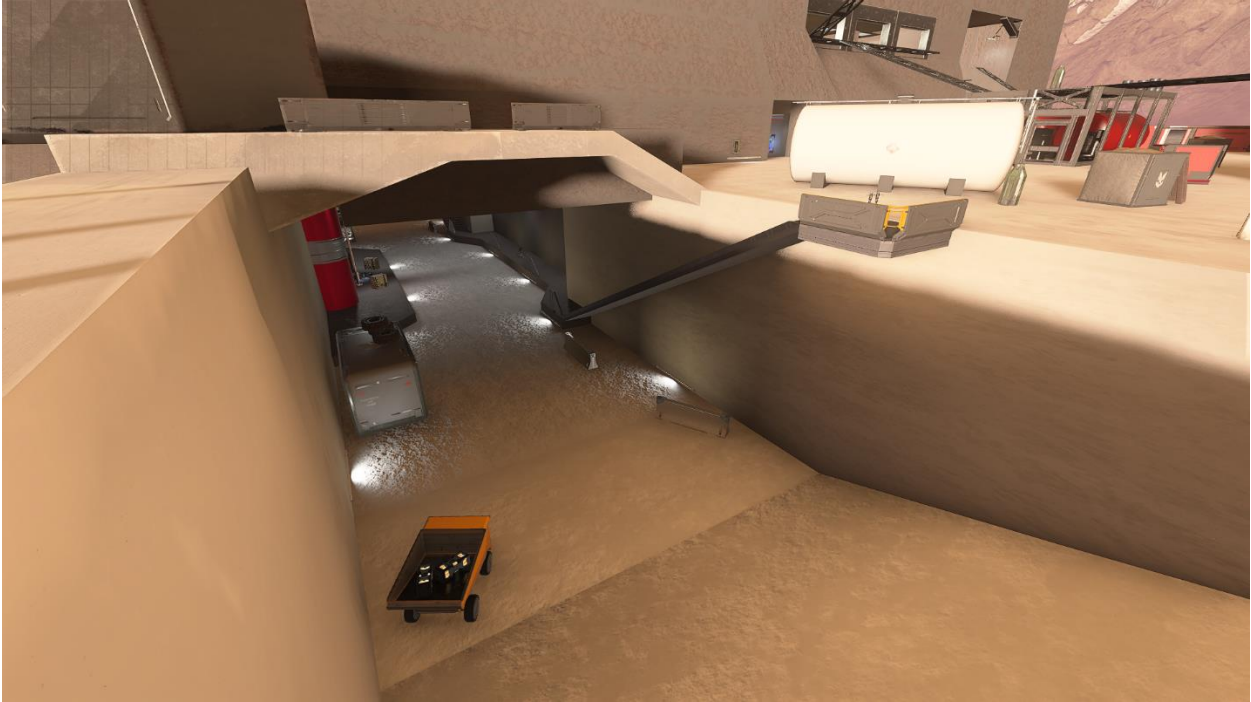
*Figure 97 - The roof was shortened, and a stair case was added, leading down to / up from the passage for foot traffic*



*Figure 98 - The passage was originally very open, with no cover for foot traffic, making the area very dangerous*

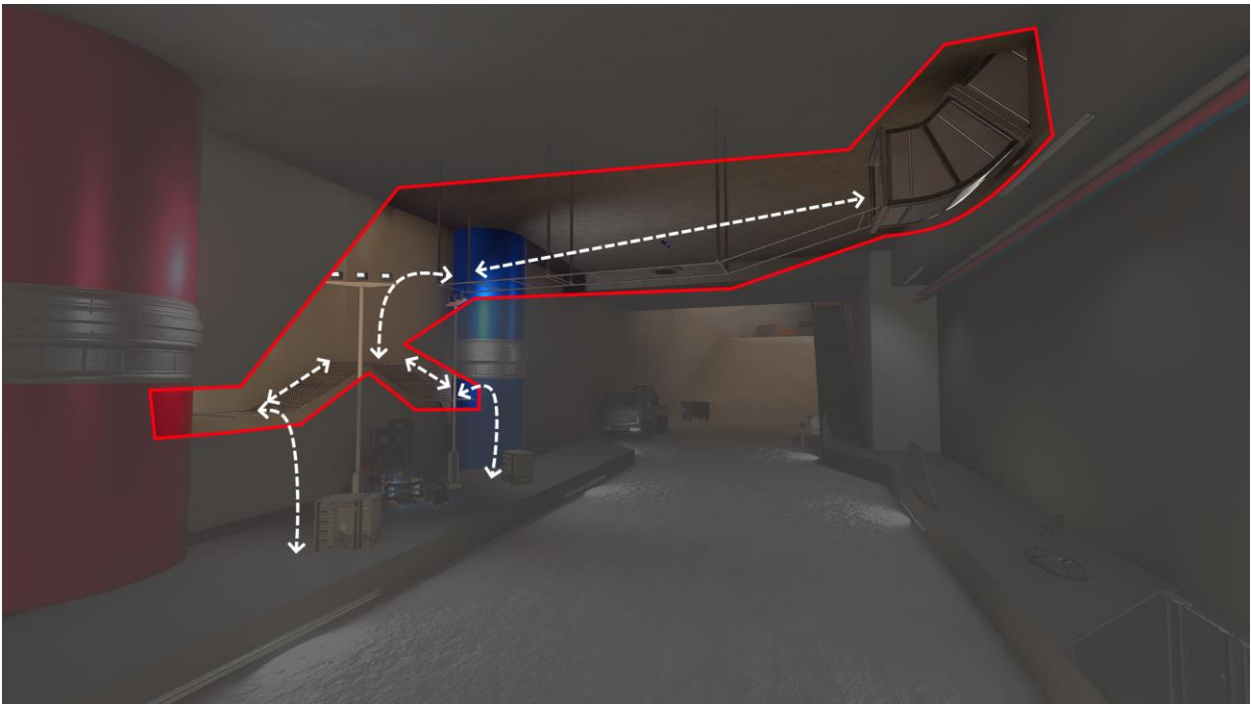


*Figure 99 - I added some cover, and large props to try to create more safe areas for foot traffic.*



*Figure 100 - More prop placement on the ramp section of the passage*

Similar to the vent feedback for the bases, players felt the vent section was too long, and restrictive in gameplay in this area. So, I reduced the vent section, and added some hanging platforms. This also allowed me to a platforming opportunity for the player to go back up the vent, and enter the small passage.



*Figure 101 - Players can use the scaffolding to travel back to the small passage on the ground level, and vice-versa*



## Second Playtest

The second playtest's goal was to see how the updated level layout and prop placements were used in the level. From the test, I learned:

- The overall flow of the map was much nicer, as players were able to traverse the map much easier.
- After opening up multiple paths to some areas, they were used much more, especially the edges of the map
- The map felt too small for the amount of vehicles I put in the map
- Some areas still felt a little empty
- Some equipment / weapon placements needed to be updated

## Fixes

### *Vehicle Fixes*

I started by adjusting the vehicle placements, as there were too many vehicles (16) on the map.

I removed 1 mongoose, 1 gungoose, and 1 wasp from each base, then adjusted each team's vehicle placement to fill out the area.

The ghost I moved to where the gungoose were spawned, and the wraith I moved into a garage at the back of the base. By moving the wraith to the back, I also addressed the issue of there being no use for the area behind the base.

While I removed the wasp from each base, I still wanted the wasp in this map. Since the wasp is quite a difficult vehicle to defeat, I decided to place a wasp at the center of the map, spawning on a platform outside of the wasp tunnel. This gave more use to the tunnel, acting as an entrance to the landing platform, while also making the wasp a vehicle that players had to fight over.



Figure 102 - Updated vehicle spawns, 1 mongoose has been removed. The wraith is behind the base in a garage



Figure 103 – (blue base) The razor back has been moved to the back of the base, near the edge of the level at each base

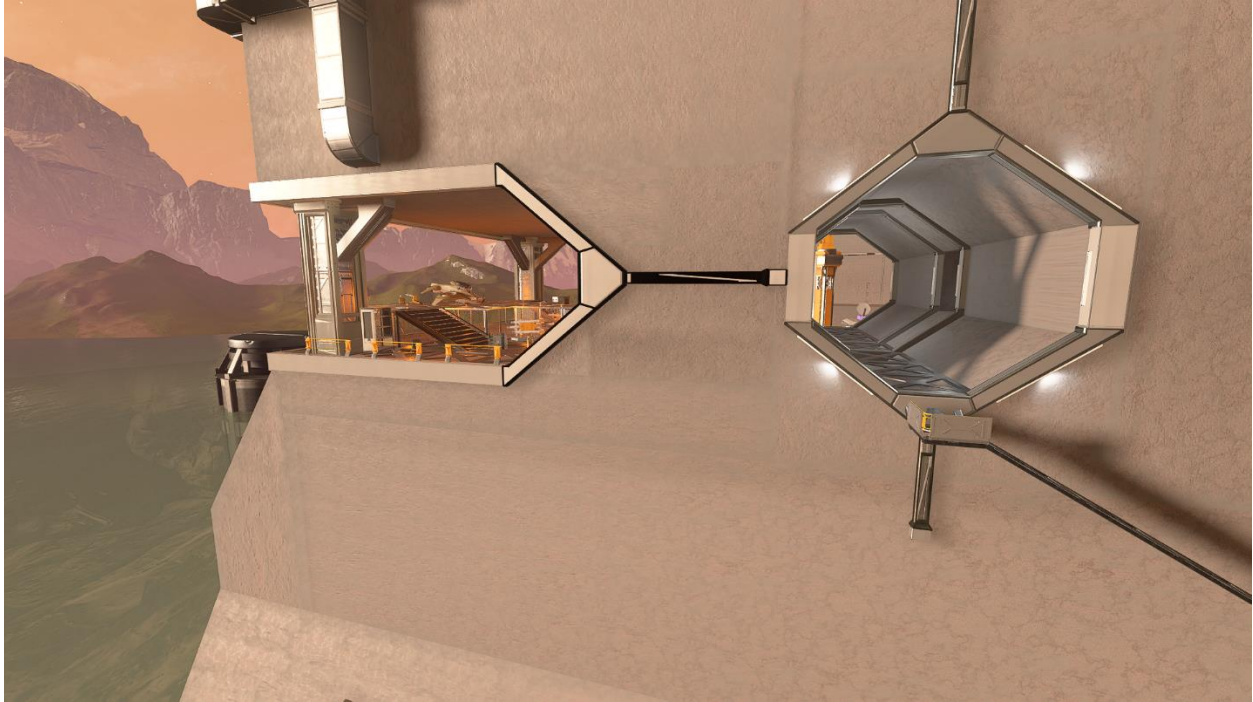


*Figure 104 - The ghost has been moved to where the gungoose spawned, while the gungoose has been removed*

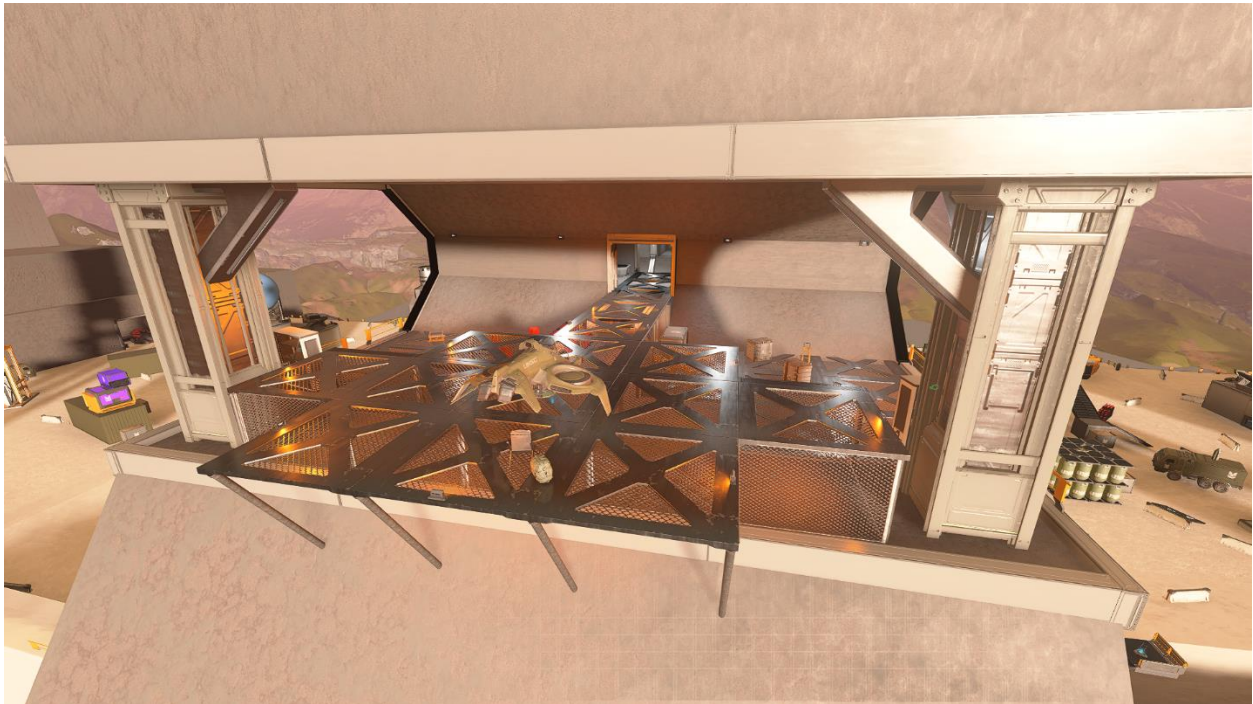


*Figure 105 - The wraith garage behind the base. The wasp, and its platform has been removed.*





*Figure 106 - A new room / platform has been created, connected through the wasp tunnel.*



*Figure 107 - The new platform is where the wasp is spawned, and only one is on the map*

#### *Additional Fixes*

I changed some weapons that were spawned in the control room. Before, there were two weapon racks in the control room that spawned a pulse rifle, and bandit rifle. I found that these weapons weren't really used in my playtests, and decided to replace them with a striker sidekick and a commando rifle.



*Figure 108 - A striker side kick, and commando rifle have been placed in weapon racks in the control room.*

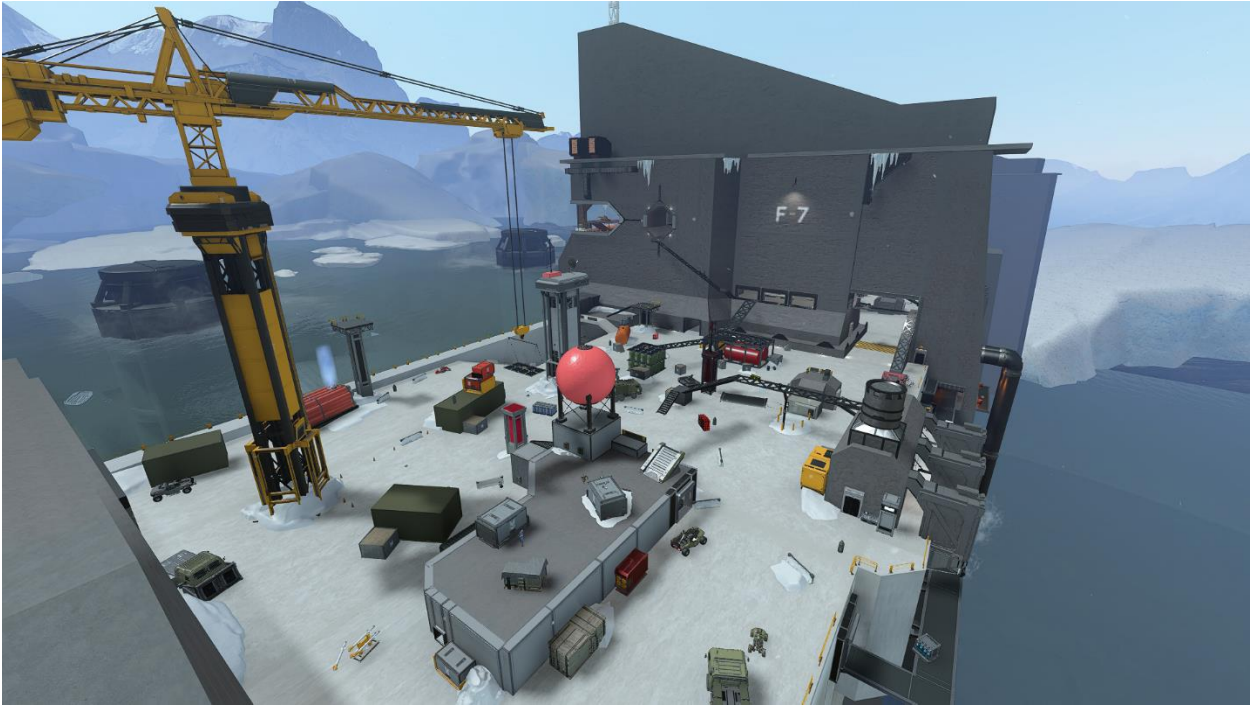
There were additional minor changes on the map, such as fixing geometry and moving some props around.

## Environment Art Pass

Originally, the environment of the level was 'a water dam undergoing maintenance during the sunset'. After the second playtest, I wanted to try to get the level into the official community playlist, and discovered that [seasonal themed maps were being looked at to feature](#). While my map was technically set in summer, it was hard to convey a summer theme through a water dam, with construction work. Thus, I decided to change the season to be winter.

## Lighting Update

The first change I made was adjusting the lighting of the level. To invoke a winter-like feeling, I changed the time to be roughly around noon, and adjusted the colors to be more cold colors rather than the warm colors I had with the sunset lighting. I also added the 'Snow Fall Light' screen effect that has snow particles fall around the player's camera.



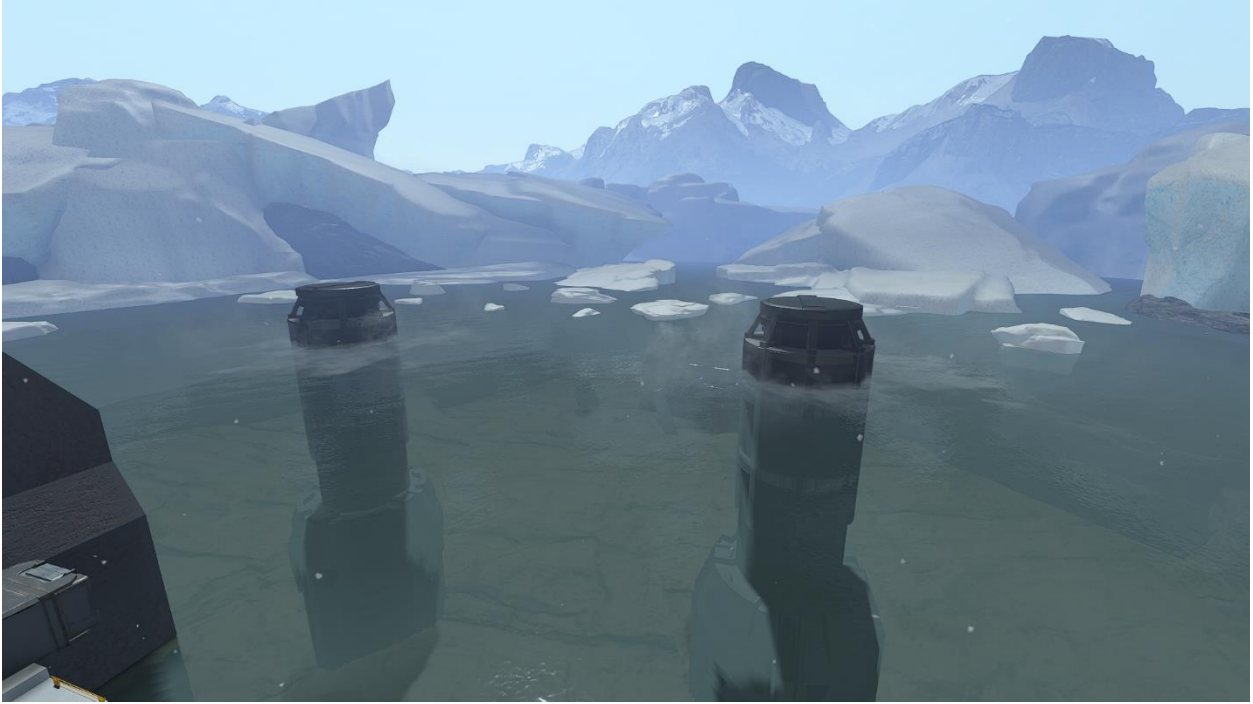
*Figure 109 - The updated lighting is much more cold.*

### Outer Environment

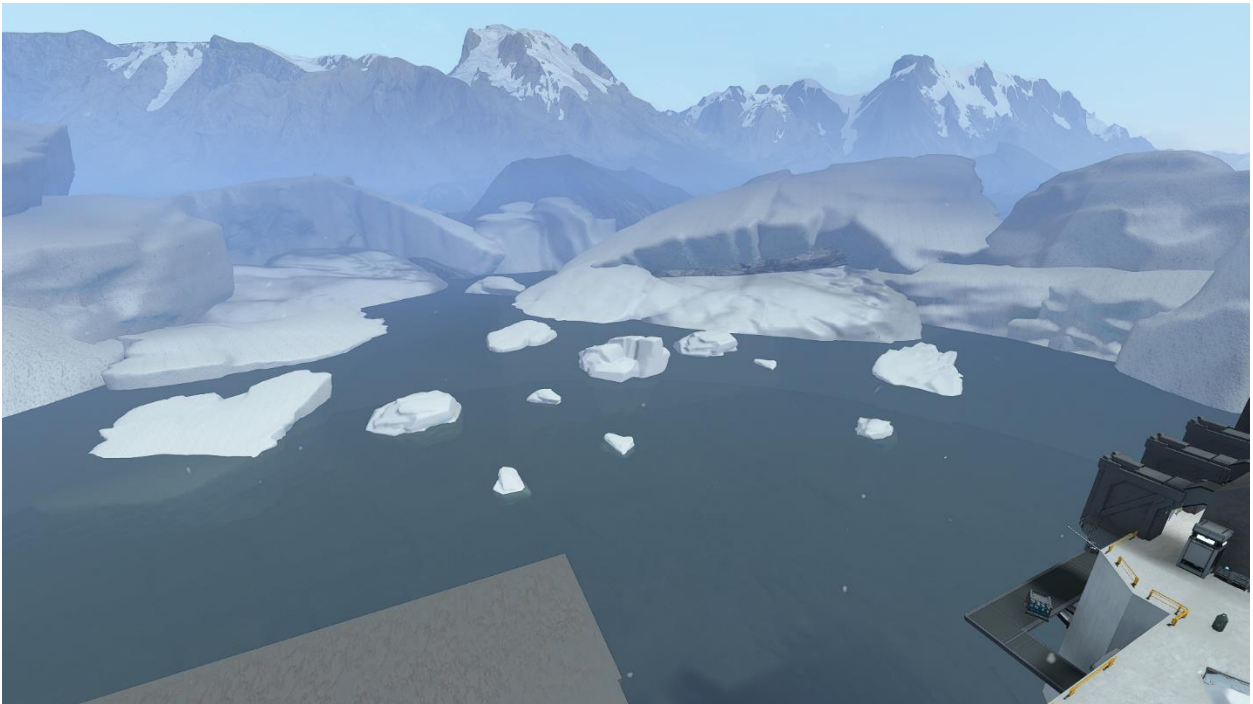
Most of the geometry of the level stayed the same, while a majority of the outer environment pieces changed. On both sides of the dam, I changed the mountainous terrain to be large glacier pieces, with some broken glacier pieces melting in the water.

On the high level water side of the dam, I originally had large cylindrical machines there, but they had no purpose before. I have since added some steam particles to them, and narratively changed them into large heaters, to melt any incoming glaciers or ice pieces from damaging the dam.





*Figure 110 - The high-level water side of the dam. Large glaciers have been added, with some melted glacier parts in the water. The large machine pieces have been narratively changed to large heaters to melt the incoming ice.*



### Playable Area Changes

Most of the playable area's geometry has stayed the same, with glacier rocks added, and scaled down, to represent fallen & shovelled snow around the map. I had to ensure that the paths I had already created weren't being changed by the snow I added.

While playtesting, there were still some areas that I felt were still a little awkward to navigate around, so I used some of the snow to fix this by either adding some climbable geometry for additional paths, or using the snow as an affordance to better steer the player around some obstacles.



*Figure 111 - Red base, piles of snow have been placed around the base, while also taking care not to obstruct the paths I had already created*

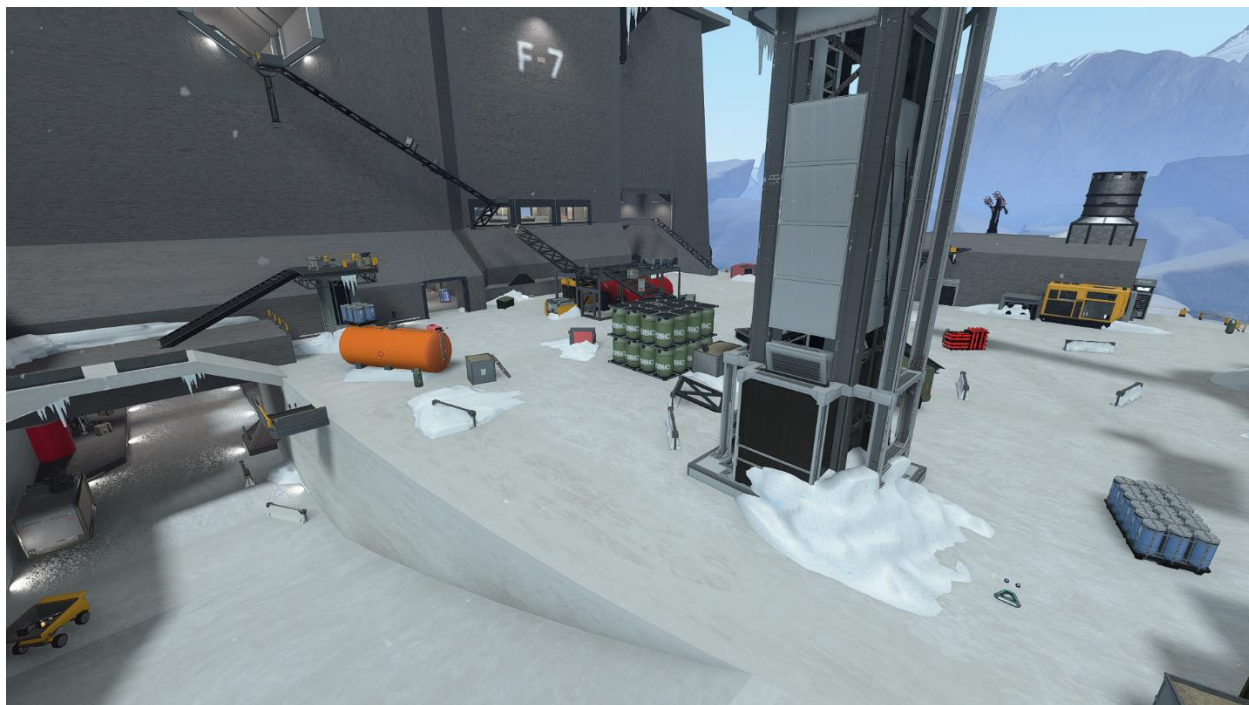


Figure 112 - Red base courtyard. Snow was used to try to steer the player better when driving vehicles.



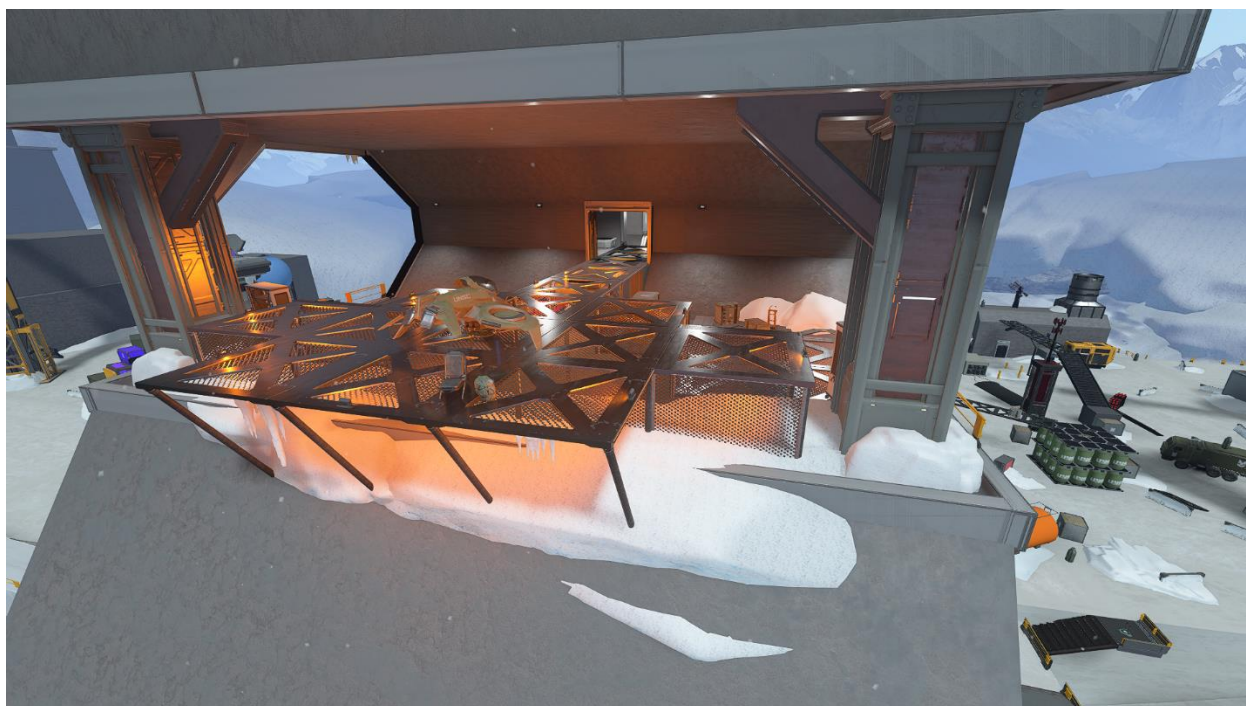
Figure 113 - Snow was also used to create additional traversal opportunities. The crate is now climbable on this side, when it previous was not possible.





*Figure 114 - The truck at the back of the bases has been altered to be a snowplough*

Outside of some geometry changes, most of the winter changes were simple aesthetic pieces, and shouldn't affect the gameplay too much. These changes included things like icicles hanging down from objects, and snow drifts present in inaccessible areas.



*Figure 115 - The new wasp den. Snow is hanging off the side of the wall, as this is the area that was hit the hardest by the snow*

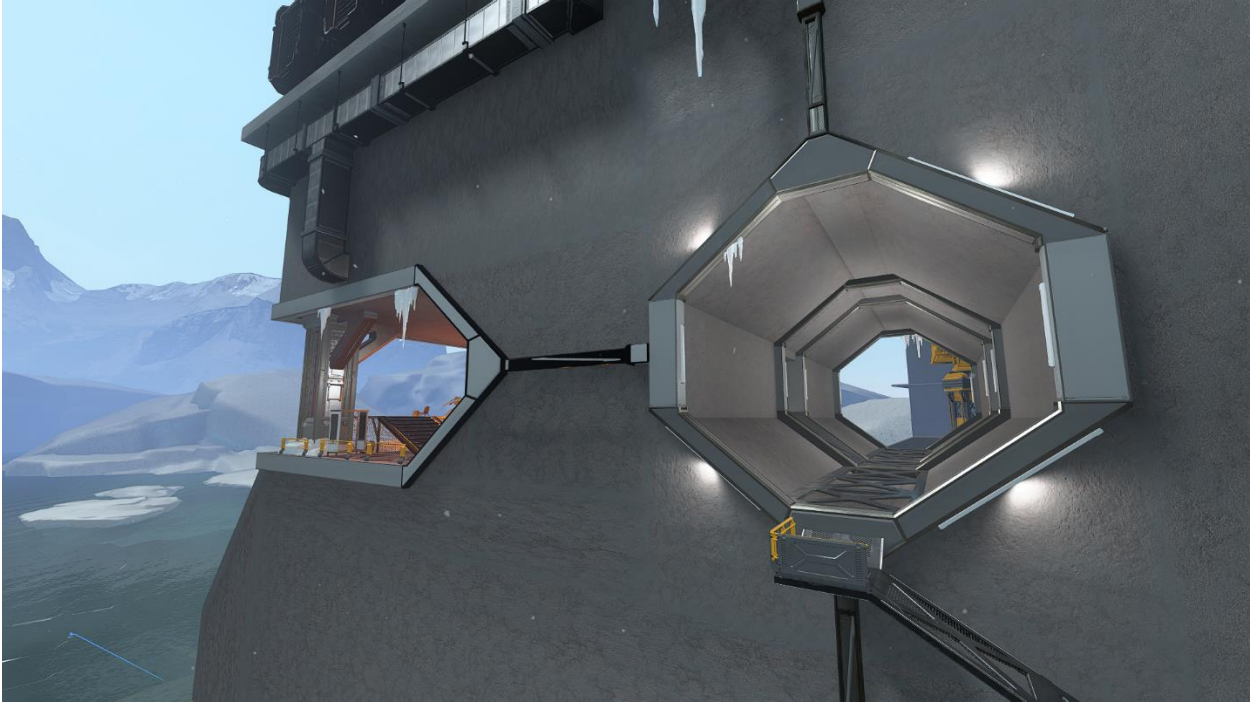


Figure 116 - The wasp tunnel now has some icicles hanging on the side of it.



Figure 117 - Large icicles are hanging off the roof of the control building

## Final Map

After being content with the process of the map, I published the map to the content browser under the name “Water Damage”.

It can be found here: [Halo Waypoint](#)

Video Walkthrough: [Youtube](#)

## Final Thoughts

Overall, I really enjoyed making this map, and I believe I was successful in achieving my goal of creating a moderate-large sized map, with balanced soldier, vehicle, and air vehicle gameplay.

I learned a lot about map flow, and affordances while playtesting and iterating on the map, and I feel that my level design experience has improved.

While I am happy about the final design, I feel that the map could have been larger, in terms of its width. The width feels like a decent size for foot-soldier gameplay, but when players start to drive around, it feels a little small on the width. This could have been found out if I play tested some more during the grey boxing stage, and played with the vehicles a bit more, and I feel the design could've been better if I did so. But overall, the design matches what I wanted out of my map, and I am satisfied with the results for now.



Misc.

Thumbnails

Initial Playtest Thumbnail



Second Playtest Thumbnail



Final Map thumbnail

