



Designing a Fast-Paced KOTH Map

The Design and Theory of koth_frostbite

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Introduction

King of the Hill(KoTH) is a popular gamemode across first person shooters(FPS), where enemy teams fight to capture a central point. Its popularity is largely due to its simple rules and malleability, with several design and theming options, making it a popular choice for designers. However, KoTH maps are highly susceptible to steamrolling, where one team completely dominates the round, with very little chance for the losing team to fight back. This is a poor experience for all players. The winning team is bored by an easy victory, and the losing team is frustrated by an unwinnable battle.

KoTH has always been my favorite gamemode, especially in Team Fortress 2 (my favorite FPS). I've found that the best matches have been where the teams are as neck and neck as possible, where the lead is constantly changing and both teams have a chance to win. My goal is to create a map for TF2 that facilitates this dynamic.

Aims, Objectives, and Deliverables

Aims

- Create a KoTH map for TF2 that avoids steamrolls and encourages neck-neck scores
- Enhance the map with environmental storytelling
- Stay in line with TF2 conventions

Objectives

- The point should be easy to capture, but hard to defend, creating a constant back and forth between the two teams
- The overall size of the map should be kept small, to increase the likelihood of enemy players interacting
- Give every class a chance to shine

Deliverables

- Playable map that matches the quality of the official maps
- Polished level design that has been improved over several iterations and playtests
- Appropriate visuals for the maps setting
- Documentation of the levels design and development

Research

Anatomy of a KOTH Map

KoTH maps come in many different shapes and sizes, but there are certain conventions and elements that are common between them. Many maps follow the “Viaduct formula” (UEAKCrash, 2015)

- Spawn
 - Room where players respawn after death
 - Has multiple exits to avoid spawn camping



- Courtyard
 - Branches out into multiple lanes
 - Allows players multiple routes to the point



- Transition building
 - Breaks sightline
 - Prevents enemy team from firing into spawn
- Second Courtyard
 - Acts as a minor conflict area
 - Space for players to retreat to

- Transition building and route options
 - Breaks sightline
 - Branches off into multiple lanes
- Point
 - Main combat area
 - Goal of gamemode

This structure is mirrored for the enemy team, creating a balanced experience for both teams.

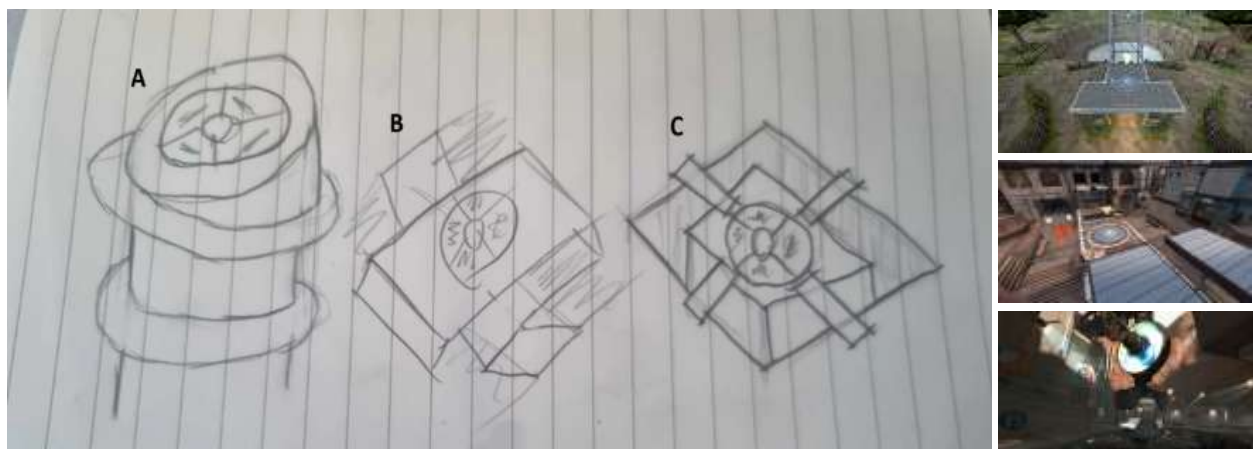
The “Viaduct formula” is a popular structure many KoTH maps follow, as it creates several distinct combat areas, while also focusing on the main point. It also allows designers to easily form different lanes of combat, allowing for different classes to all have a space where they’re at their most fun to play.

Production

Ideation and Planning

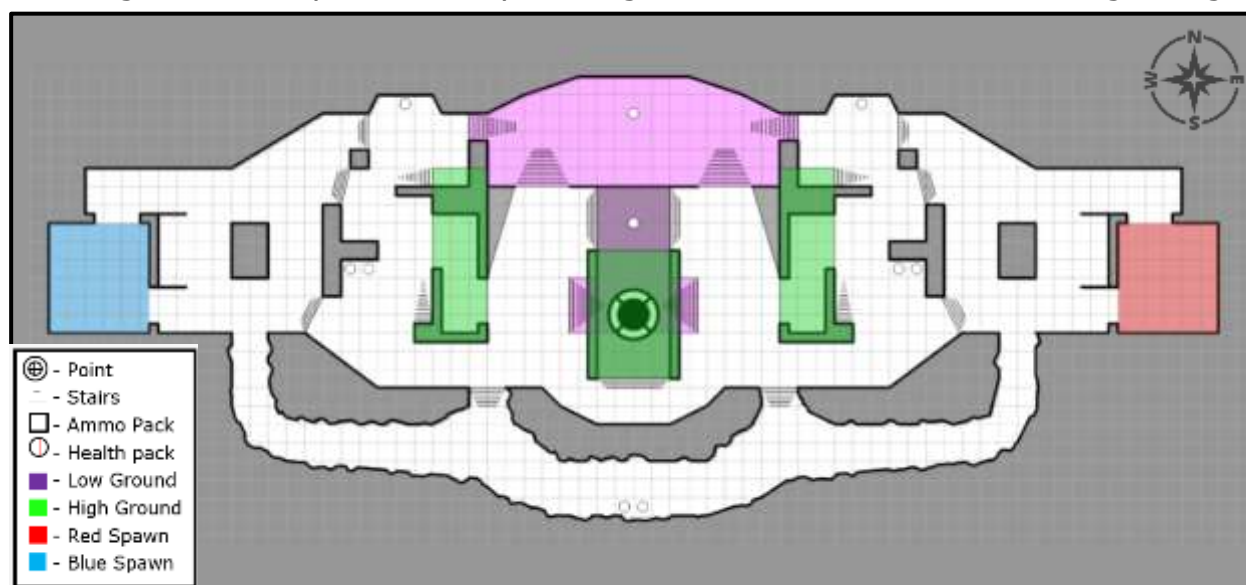
Since KOTH is based around a central point, that’s where development started. Three basic designs for the central point were sketched out and considered.

- Spiral – The point sits at the top of a pillar, with a ramp leading up and around it, similar to KoTH_brazil
- Underpass – A tunnel passes underneath the point, similar to KoTH_boardwalk
- Island – A pit surrounds the point with bridges leading to it, similar to KoTH_nucleus



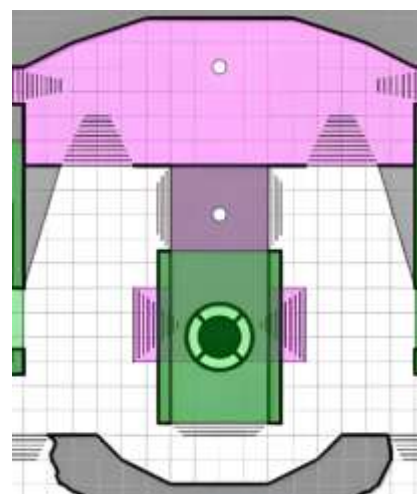
Feedback on designs A and C was largely negative, with many correspondents pointing out that being pushed off the point by knockback abilities (such as airblast and explosives) would get very annoying. While this is a manageable issue, option B was a highly common favorite anyway, so that was the design used moving forward.

Starting from the point and spreading outward led to the following design.



(1sq = 64hu)

The point is at the center, elevated off the ground with a path underneath, walled off on the EAST/WEST with a roof over the top, and a lowered area to the north, inspired by KoTH_lazarus. Having the point be protected forces players to engage directly, rather than firing from afar. The path under the point acts as a place for players to retreat, but the fact that it's available to both teams means that they'll likely run into another player and get killed if they go down there.

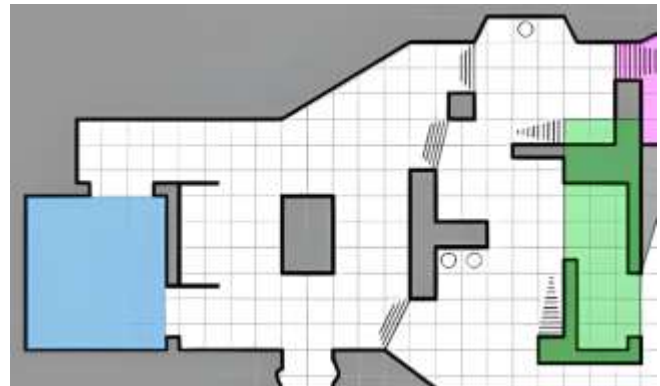


This forces fights to end faster, which should make the match feel more fast paced and encourage neck-neck scores.

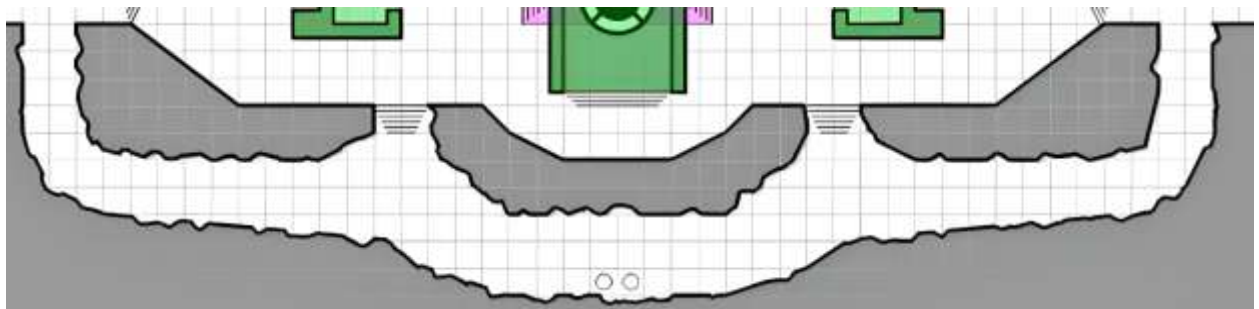
Two buildings flank the point on the left and right, with 2 floors allowing for sniper and sentry placement above, and cover below. Behind these buildings

is a small courtyard that houses a health and ammo pack, giving retreating players an advantage if the enemy team attempts to spawn camp.

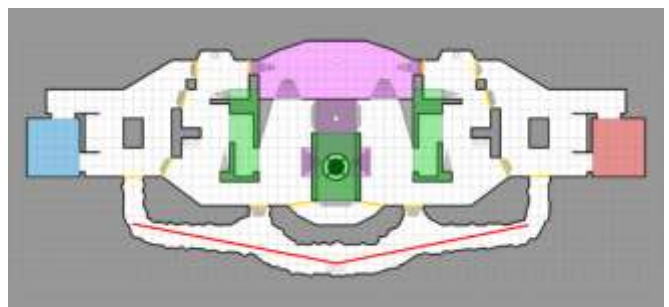
The spawn room has two exits, which gives players multiple options for leaving in the event of spawn camping. There's also another courtyard just outside of spawn with multiple routes towards the buildings. Pathways branch out as players leave spawn and converge on the point.



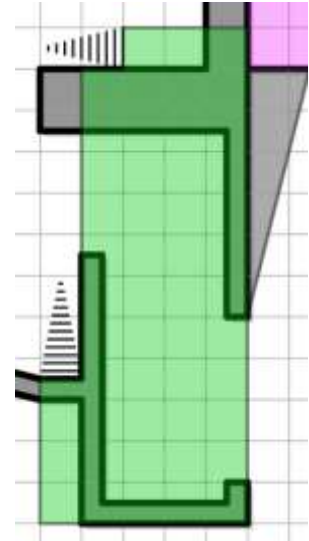
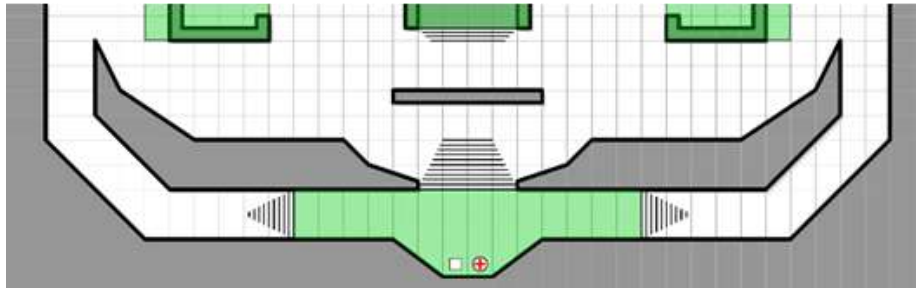
Finally, this flank route follows along the side of the map, allowing sneakier playstyles easy access to the point and behind enemy lines.



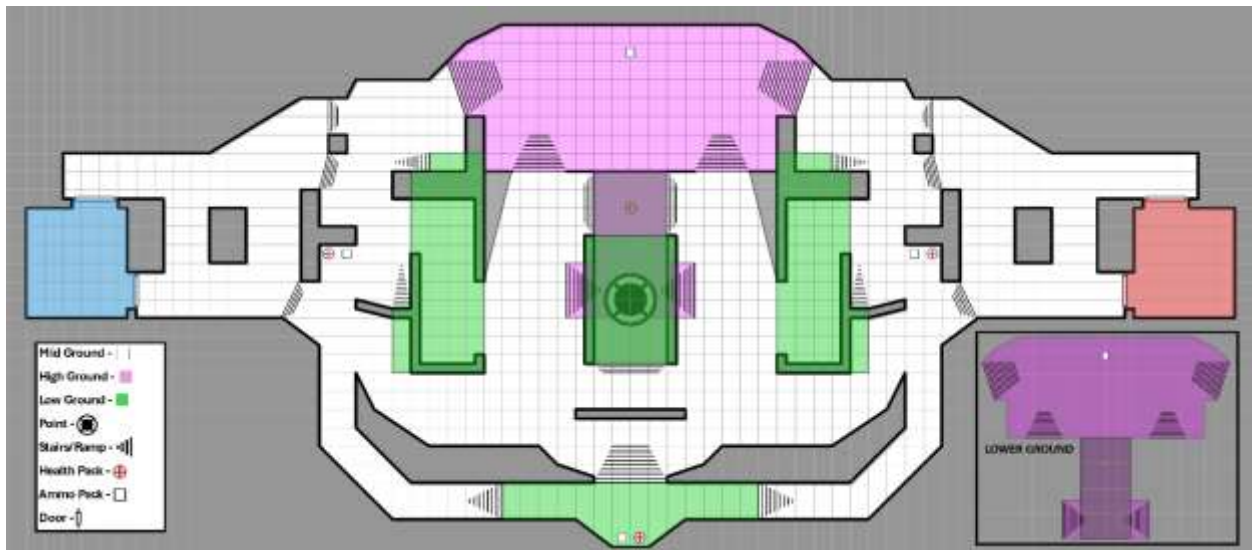
Feedback on this design was mostly positive, but there were still some things that needed improvement. The main complaint was the map had high density of choke points (marked in yellow), which would overly favor close range classes, and could lead to more stalemates. The flank route also contains a problematic sightline (marked in red), which players would be forced to confront with no cover.



To combat the abundance of choke points, several areas of the map were expanded, including the buildings and the exit to the flank route. The center of the flank was raised up to break the sightline, and the entrance was brought closer to the point to improve flow



After these improvements, this was the final version of the map diagram



(1sq = 64hu)

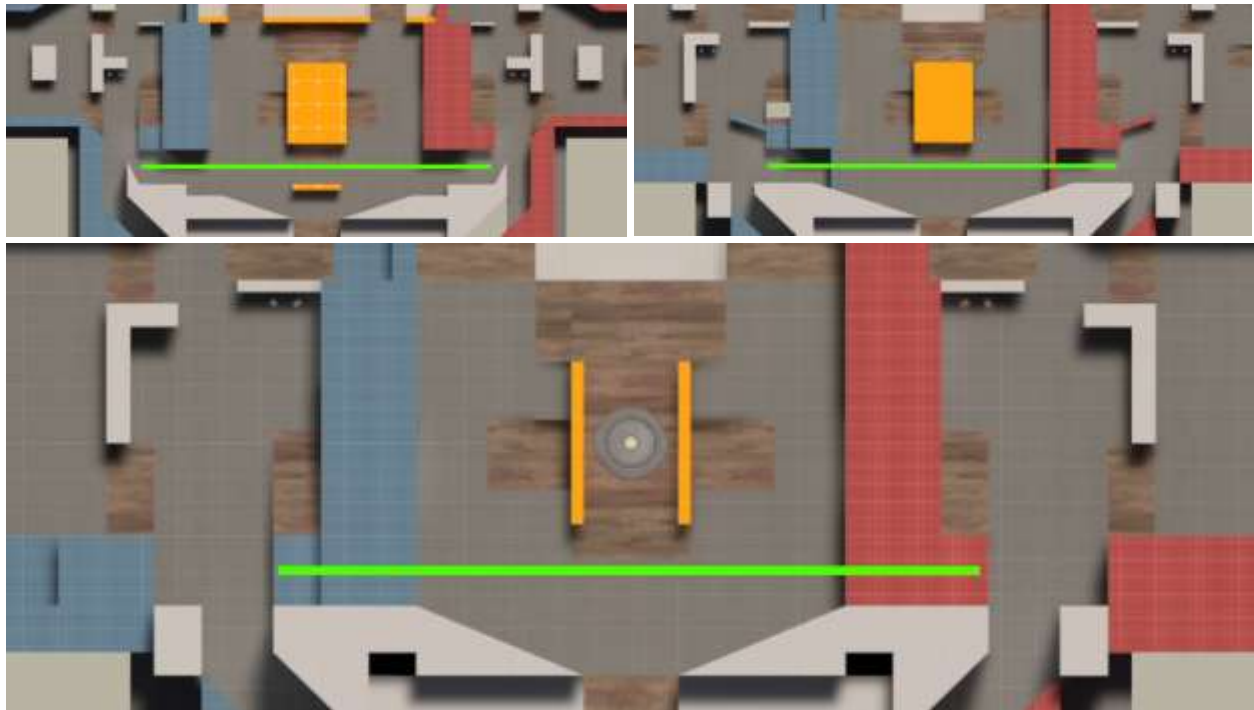
Midpoint

The initial blockout for the midpoint had a few subtle differences that came about when moving to a 3d space but overall was largely the same as the diagram.

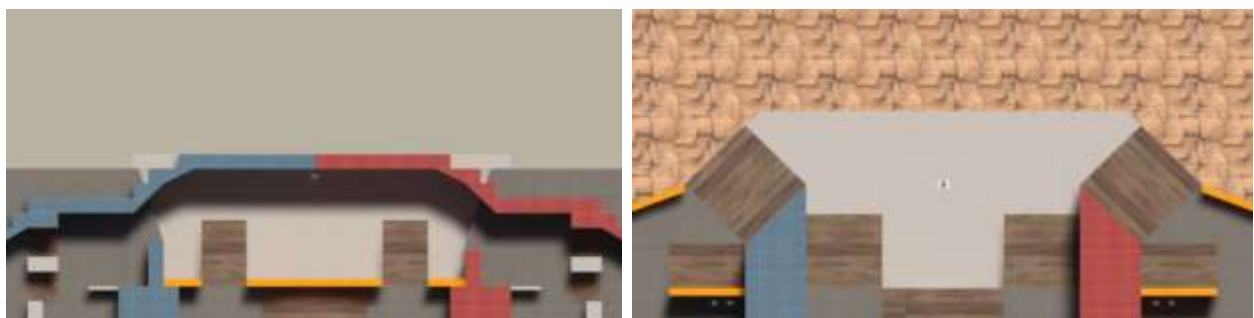
Playtesters responded well to the point structure, especially the path underneath, but there were still changes that had to be made. The first change was to these walls, with many players saying they restricted access to the point, making it much harder to capture. As this went against the goal of the map, they were removed in later versions, along with the roof over the point.



The buildings surrounding the point underwent very few changes, mainly to deal with a problematic sightline that went unnoticed during the initial planning, but quickly became apparent during playtesting. At first, doors were put in place that would open when approached by a player, but this ended up making the problem worse, as snipers were able to jump in and out of the door to sneak a few shots in before players could react. In the end, the buildings were extended to completely cut off the line, and other routes were added for retreating players.



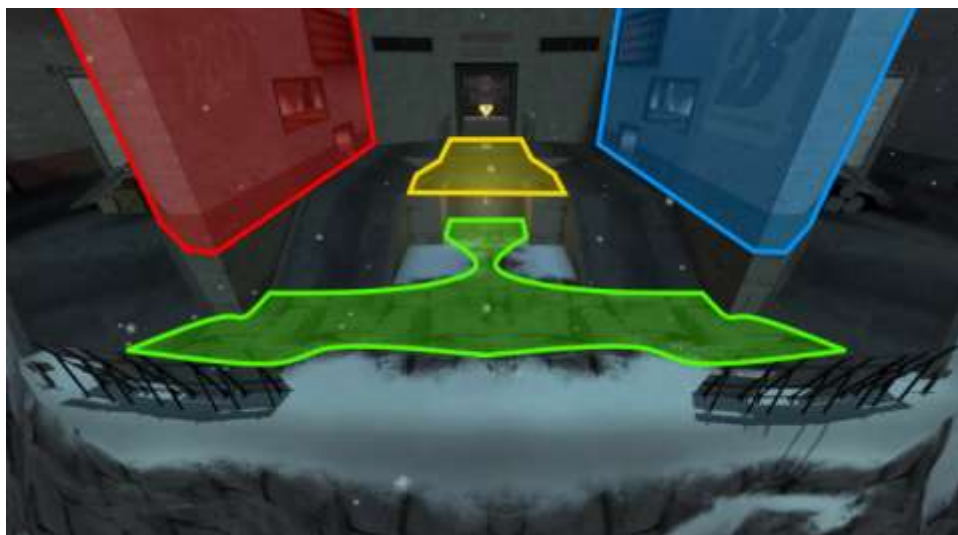
Undoubtedly the biggest change to the midpoint during production was changing the north wall into a sheer drop. This was done to make going for the health pack more risky, resulting in deadlier fights which fed into the map being more fast paced and avoiding stalemates. It also gave classes with knockback abilities (such as Pyro and Soldier) an alternative way to fight in the area, leading to more interesting combat encounters.



However, this risked players being pushed off as soon as they went around the corner of the buildings. Having to make a blind turn likely resulting in death would reduce the value of those routes, so these barriers (marked in green) were added to combat the issue.

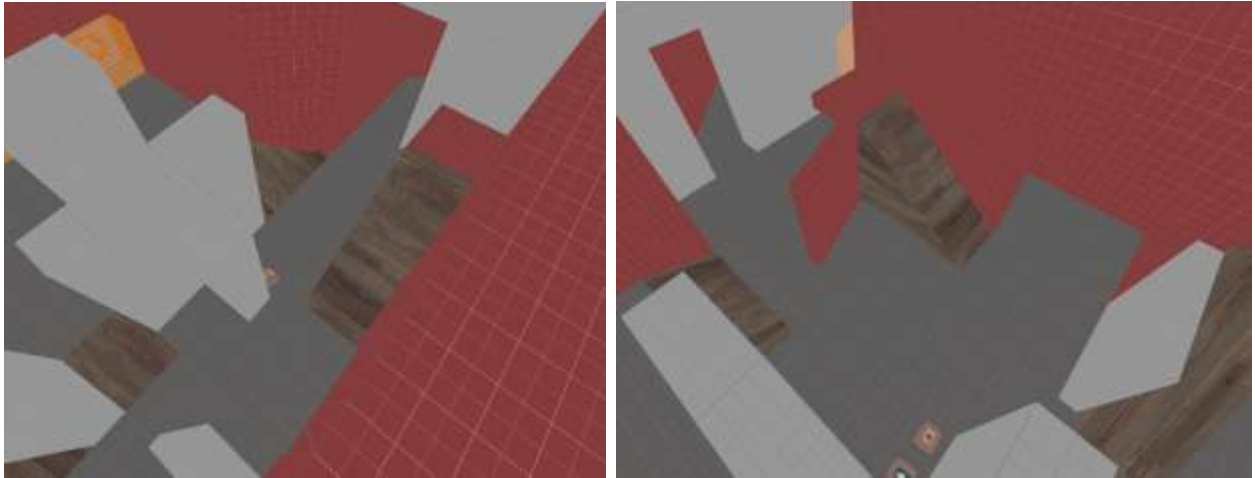


Since this is the central point, the affordance here is very important. The buildings are colour coded to their respective teams, allowing players to easily know where their enemies will be coming from, and where to retreat to if needed. The pathways where the snow has melted helps with immertino, as it implies someone else has already been here, while also guiding players to important entrances/exits. Finally, the point sits on a wooden platform, which helps it stand out.

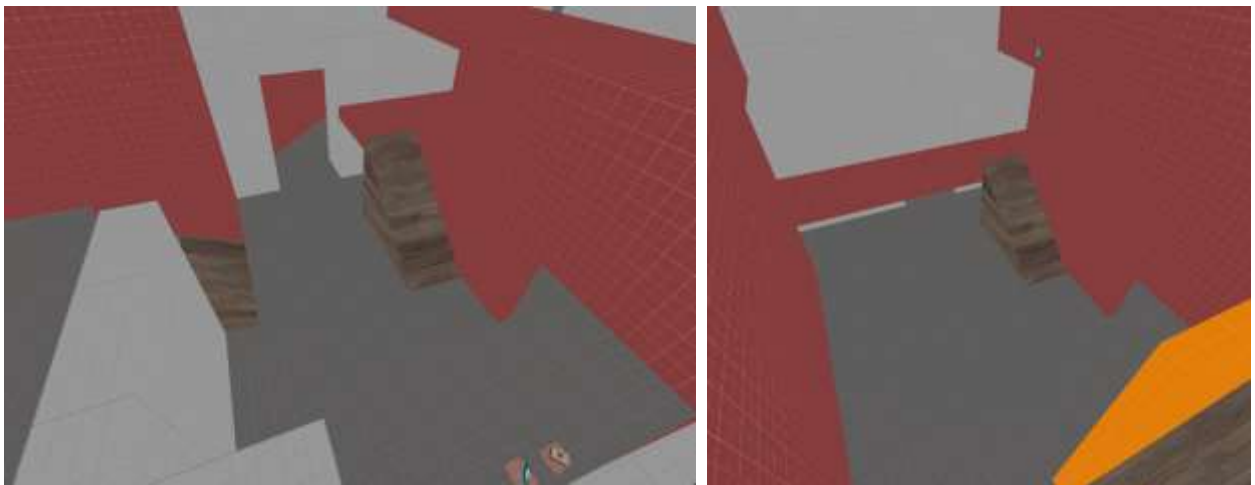


Courtyard

Getting the courtyard just right was very important during production, as it had to act as both an interesting combat space, and a place for players to retreat to. At first this area was far too small and very cramped, so it was expanded to give fights more room to breathe.



The stairs to the battlements were eventually connected to spawn to combat camping, which had the side effect of making the courtyard a far more interesting combat area, due to the change in elevation.

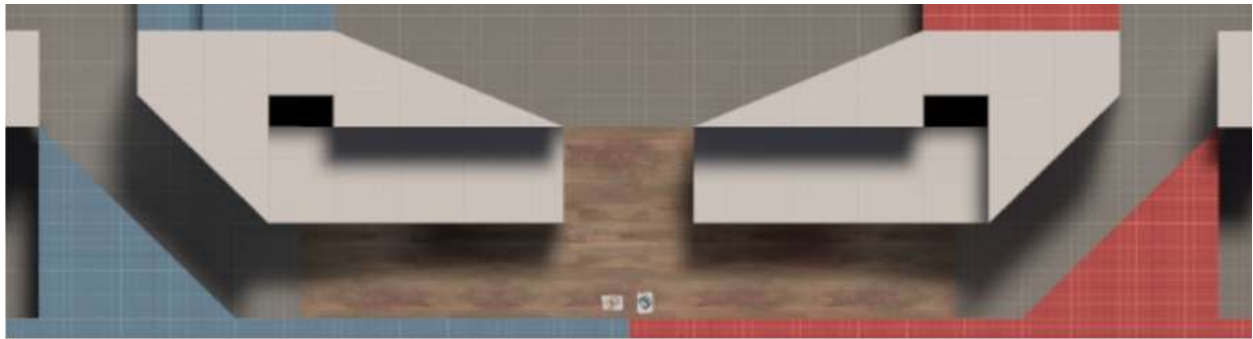


Expanding the courtyard had the side effect of exposing this unfortunate sightline, so a simple arrangement of crates were placed to break the line, which had the side effect of improving the visuals and making the area feel less empty.

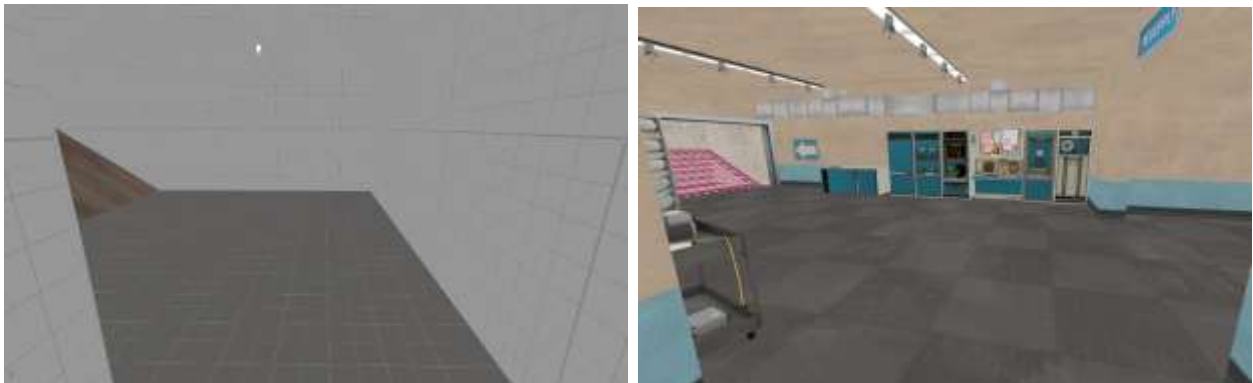


Flank

The flank was originally going to be a cave through a mountain, with an entrance on either end and a path to the point halfway through.



However a Spy player during playtesting pointed out that it's effectively impossible to get through without bumping into someone or getting caught. So, the hallways were expanded into full rooms, giving them plenty of space to move around and avoid detection.

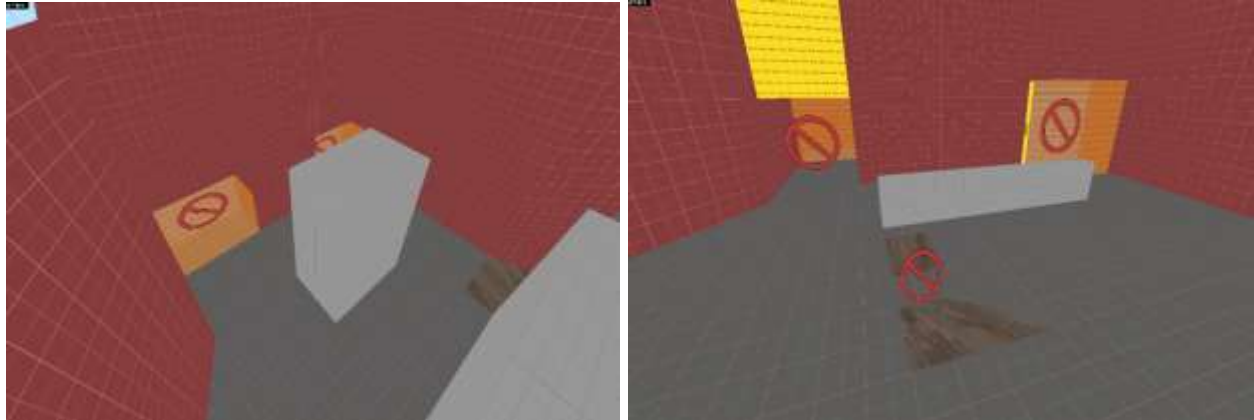


It was also noted that playtesters tended to avoid the flank unless they were playing a few specific classes. So, the health and ammo packs were moved from the courtyard to the flank rooms, which encouraged players to use that area more frequently.

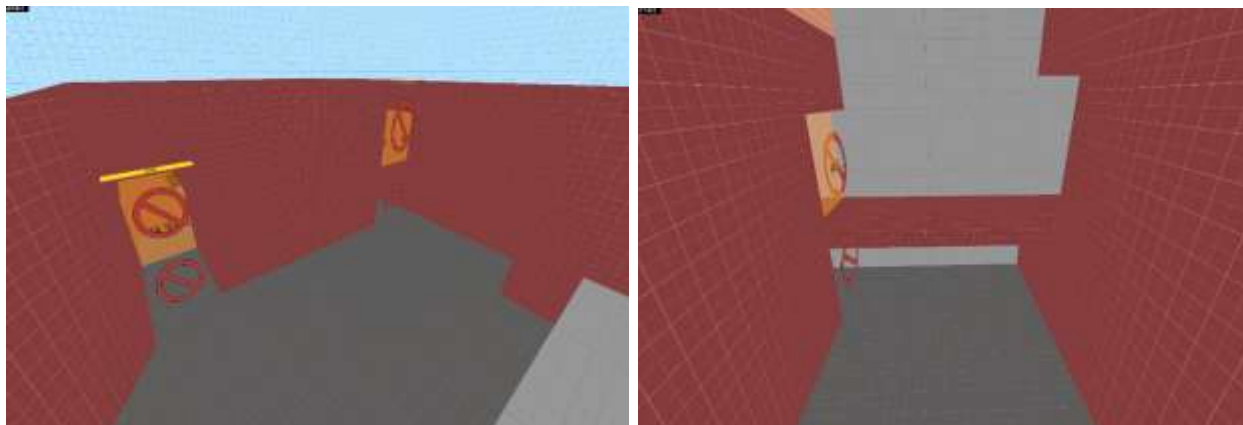


Spawn

Spawn has undoubtedly been changed the most out of every area in the map, undergoing several major changes during development.



The key to eventually fixing spawn was to add a third exit above the other two. This gave defending players a height advantage, and was eventually expanded to connect to the courtyard to allow players to easily access the battlements.



Here, the roof slopes towards the defending player base, creating a large flat wall towards the courtyard. This makes it encouraging to defending players, allowing them to rocket/sticky jump over and getting to mid faster. However, for attacking players, the use of shape theory goes against them, discouraging them from moving closer to spawn



Visual Design

The visual style and meshing is heavily inspired by Goldeneye for the N64 (GoldenEye 007, 1995), specifically the levels that take place in snowy mountain base. This artstyle would eventually inspire the name of the map, Frostbite.



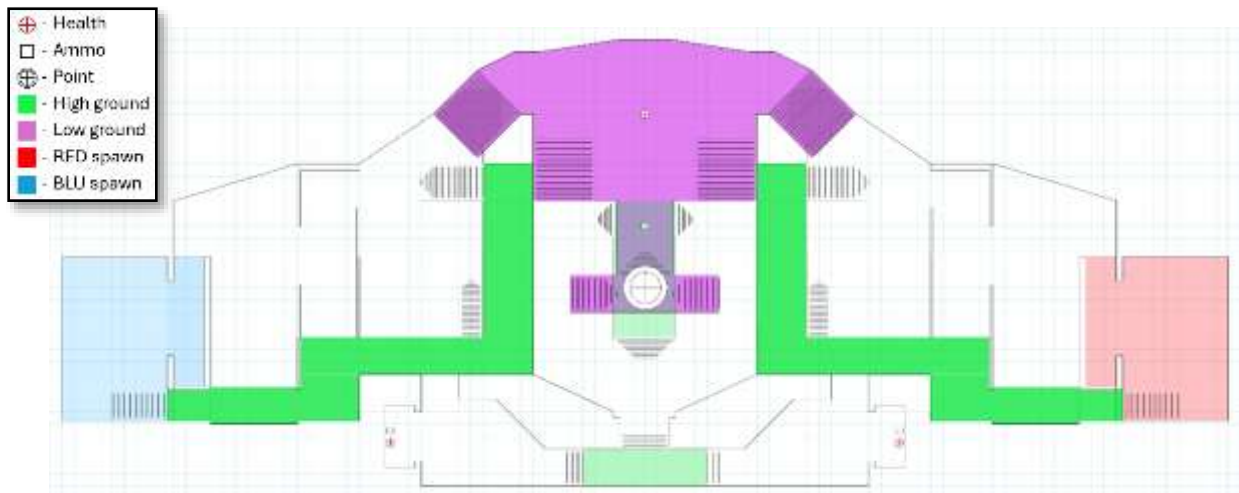
This style was not the intention from the beginning. The original plan was to take inspiration from classic TF2 maps like Dustbowl and 2Fort and set the

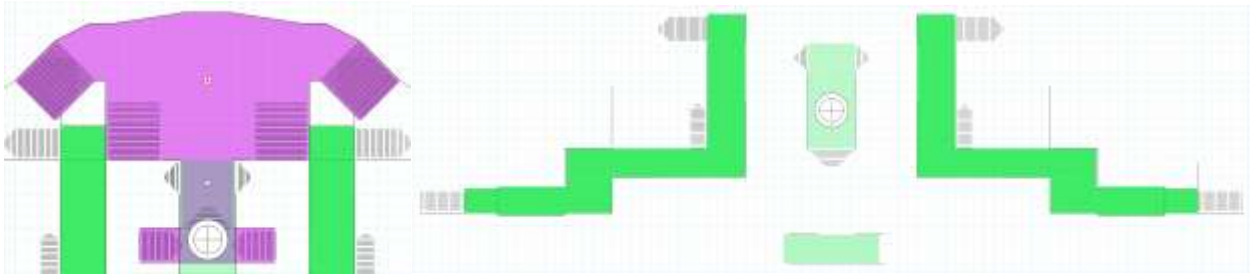
map in New Mexico. However, after changing the flank route from a hallway to a room, the idea shifted. The flank was intended to be a cave dug into a mountain, but when it shifted to being a room, it had to be decorated as such, and the maps visual design shifted to a more unique setting.



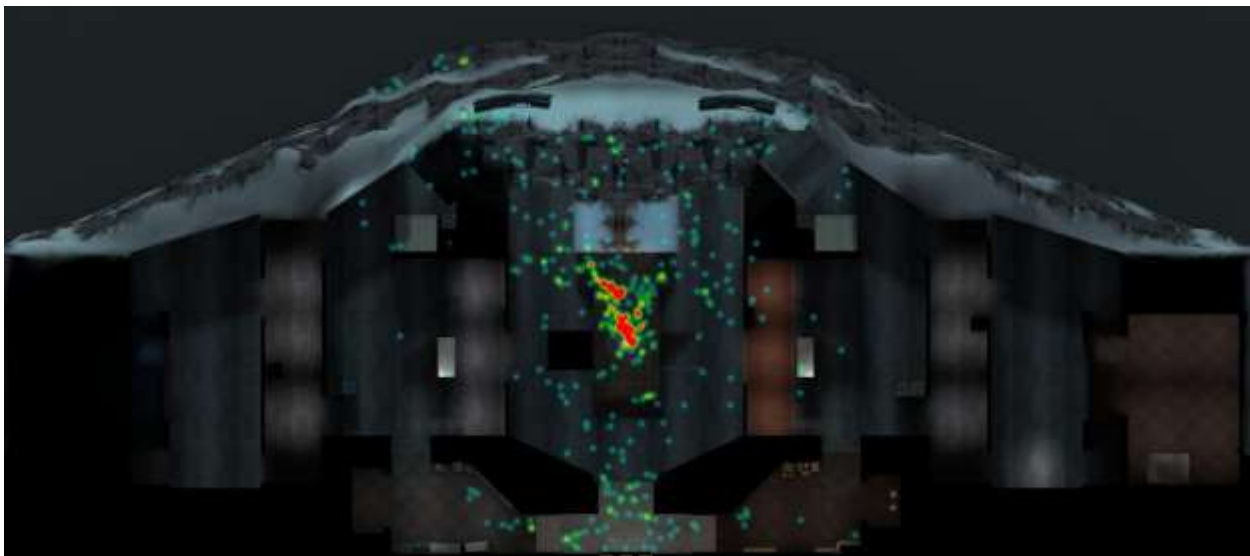
Evaluative Review

This final layout of Frostbite Very closely follows the Viaduct formula (UEAKCrash, 2015), with the Spawn-Courtyard-Transition-Courtyard-Transition-Point being very clear in the overhead view.





Below is a heatmap of where players died after the most recent playtest. Most deaths are concentrated around the point, implying that it is the most prominent area of conflict. This implies that the point is constantly being re-captured, keeping the scores neck and neck throughout the match. This is exactly in line with the stated goal of the map design. If one team was dominating holding the point for the entire game, deaths would be focused outside the point, as players struggle to get to it and take control.



Matches also tended to be very close at the end, and many playtesters agreed that this made the map more interesting to play, as the main point was easy to capture yet hard to defend. Many playtesters also complimented the visuals, enjoying the unique theme of the map.

However there are some areas where the map falls short. Due to the focus on encouraging neck-neck scores, Frostbite caters heavily to casual players. Competitive players tend to prefer maps with more balance between defending and attacking, as it requires more skill to play well. The map is also very narrow, being three times as long as it is wide, which is which can feel

limiting for the players. These are tough issues to fix, as they stem from key design choices made very early in development. In the future, it would be wise to keep these details in mind from the beginning of development.

Frostbite is available to play on the steam workshop.

<https://steamcommunity.com/sharedfiles/filedetails/?id=3590431169>

Overall, I'm exceptionally happy with how Frostbite came out. It's not perfect, but it addressed an issue I've with King of the Hill, and it gave me a chance to make something for one of my favourite games. The greatest compliment I received while working on it was when one of the playtesters asked if I could send them the link so they could play the map again. Not for testing, not for research, they just wanted to play the thing I made.

And I think that's pretty cool.

Gallery









Bibliography

GoldenEye 007. (1995). Rare.

Payne, C. (Director). (2023). *Emesis Blue* [Motion Picture].

Rogers, S. (2014). *Level UP!* Chichester: John Wiley and Sons Ltd.

UEAKCrash. (2015, April 26). *How to Make TF2 Maps*. Retrieved from Youtube:
https://www.youtube.com/playlist?list=PL2KT0JL74Qff_c1WbqNi4K5yAmpWAUQlq

Valve. (2005, June 29). *Team Fortress 2*. Retrieved from Valve Developer Community:
https://developer.valvesoftware.com/wiki/Team_Fortress_2_Design_Theory



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