

DM-Kiroh

Level Design Documentation



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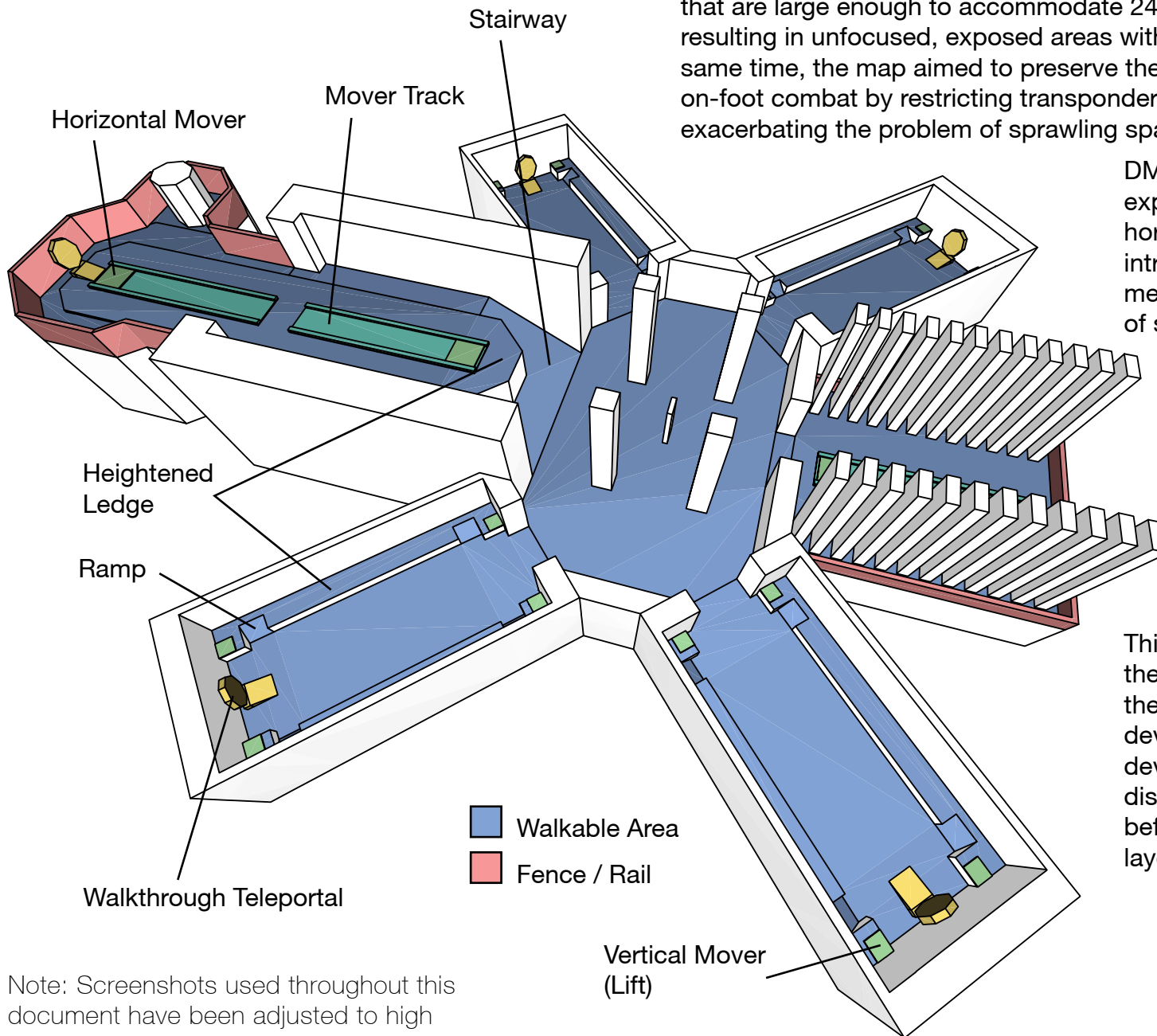
Out amidst the dark ocean waters sits an unknown island citadel; its cold, monolithic barren walls mute now as to their original design. The facility's self-sustaining wave generators continue to operate unmanned, guarding the secrets of a fortress prison whose inmates are encapsulated in solid rock, frozen and forgotten for all time. Wholly apathetic to the structure's history, its current thrill seeking inhabitants have appropriated the grounds for their own murderous amusements, setting up a sprawling network of airlifts, teleporters, movers and scaffolds of towering verticality to better facilitate the bloody massacres relished down below.

DM-Kiroh

12 to 24 Player Deathmatch Map
Unreal Tournament 3

DM-Kiroh is an atypical UT3 map in that it is designed for up to 24 players --double the usual maximum number supported. As such, the game space must necessarily be quite expansive. The goal, then, was to create spaces that are large enough to accommodate 24 players comfortably, without resulting in unfocused, exposed areas with lengthy downtimes. At the same time, the map aimed to preserve the intensely personal feel of on-foot combat by restricting transponders and vehicles, potentially exacerbating the problem of sprawling spaces.

DM-Kiroh solves these problems by expanding vertically (instead of horizontally) on the one hand, and introducing built in transportation mechanics and an extensive system of scaffolds on the other.



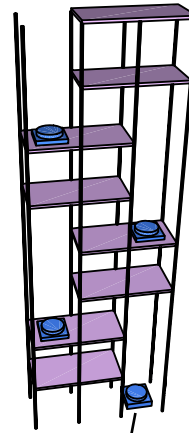
This diagram is a cutaway view of the ground level layout. Some of the aforementioned transport devices can be seen here; these devices and their operation will be discussed in the following pages before delving into the structural layout of the map.

Note: Screenshots used throughout this document have been adjusted to high contrast for ease of viewing

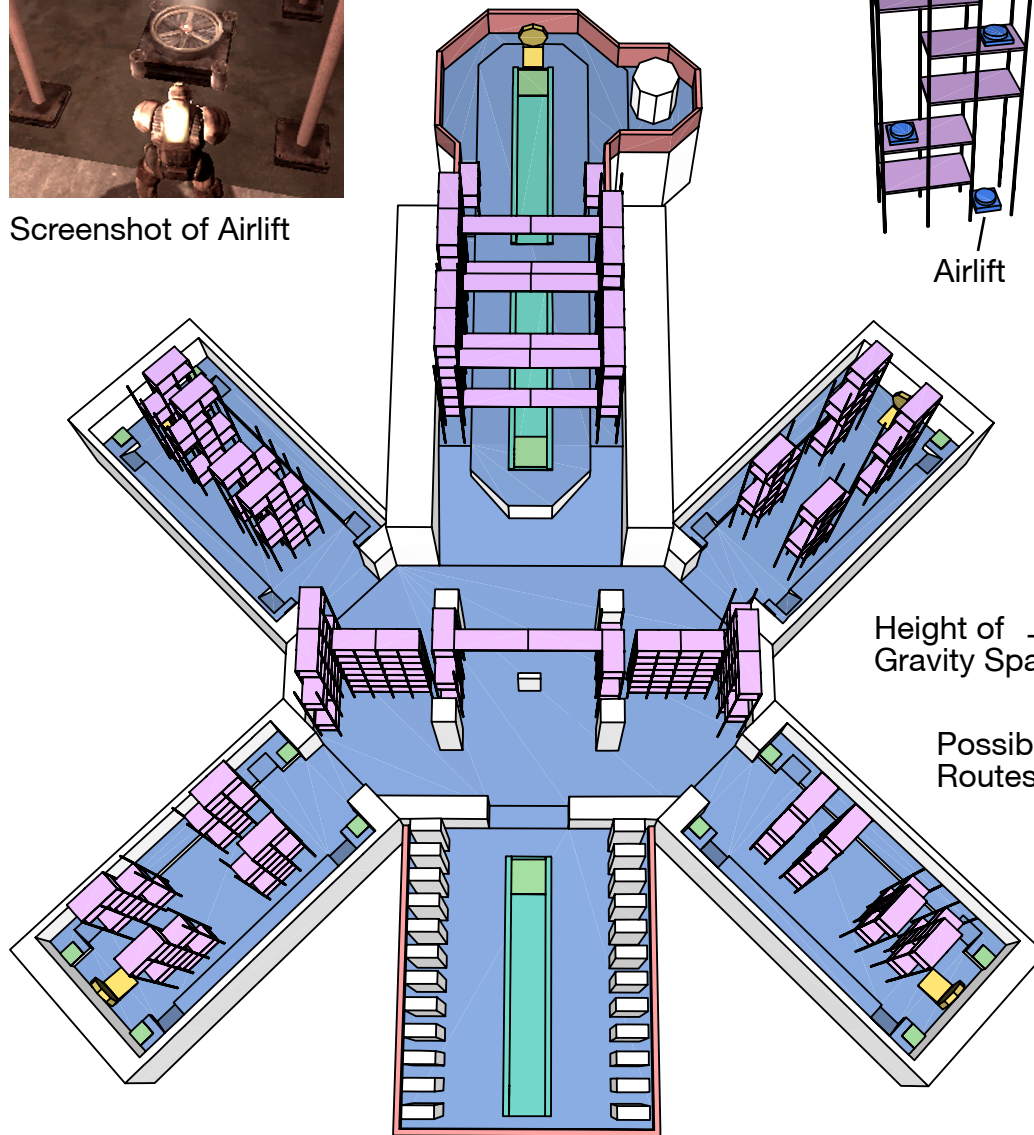
Scaffolds and Airlifts



Screenshot of Airlift



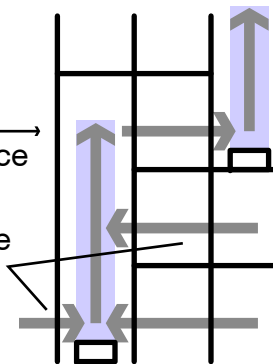
Airlift



Ground Level Layout with Scaffolds

A large part of the success of Kiroh's verticality results from the extensive use of scaffold-like structures which act as something of a skeletal backbone to otherwise widely exposed spaces. Unfortunately, UT3 does not have a built in mechanism that is particularly useful for traversing vertical spaces quickly, fluidly, and flexibly. Jump pads are inflexible in that they require the player to face specific directions, as well as landing points towards which the player must hurtle, and movers are not fluid in that they force the player to wait until the mover platform is physically available. As such, the nearest mechanic of use is space volumes, which the player can easily enter and exit at any point along the length of the space.

DM-Kiroh, then, utilizes space volumes coupled with multi-tiered platforms (the scaffolds) to allow players to quickly travel up and down the height of the map. These scaffolds share a typical configuration, illustrated above and to the left.

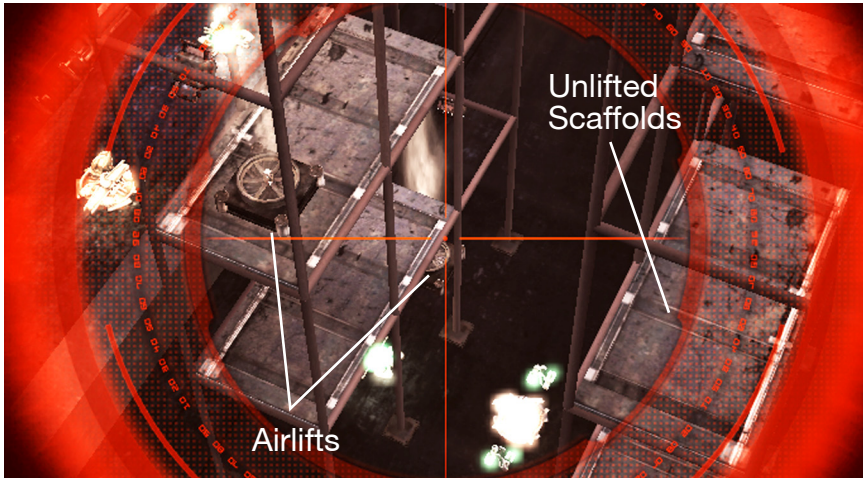


Each scaffold set contains four space volumes with a forced upwards velocity that instantly pushes the player up to the next tier level and keeps them floating at the top of the space.

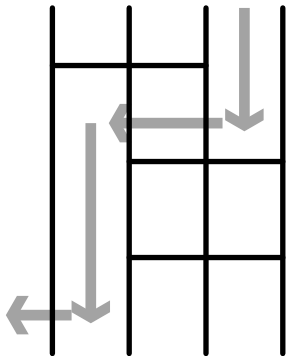
Industrial vents resembling jump pads (upper left screenshot) visually indicate to the player the location and the purpose of the space volumes. An added bonus is that UT3 by default employs a swimming animation for player models inside space volumes, completing the illusion of an "airlift".

Scaffolds and Airlifts (Continued)

Besides contributing to vertical game space, the platforms also provide ample cover against sniper-fire from the upper reaches of the level--a necessity since such expansive spaces by default give snipers an edge in gameplay.



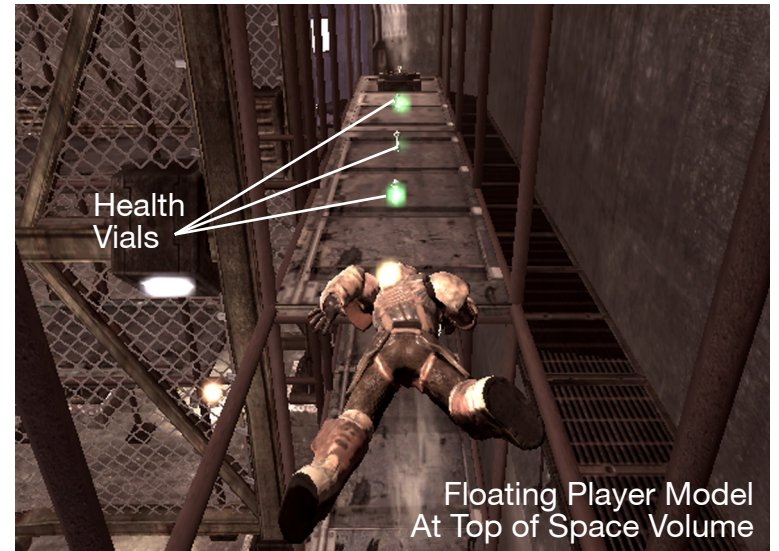
Sniping from Above



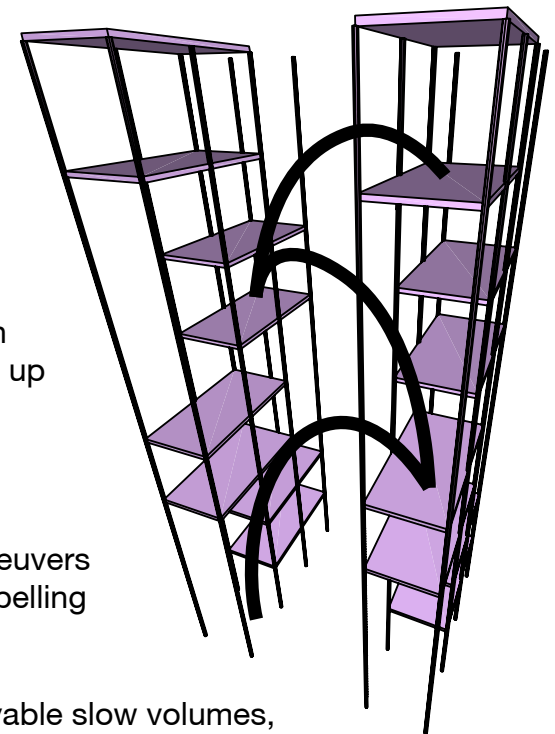
The scaffolds are arranged in pairs; each set with airlifts is located within jumping distance of another set without airlifts. The player can use the latter sets to jump down in reverse of the path used to travel up (see left) to reach the floor.

Players can also travel back down by jumping between platforms. These maneuvers decrease the length of falls, allowing the player to control his descent in a rappelling sort of fashion (see right).

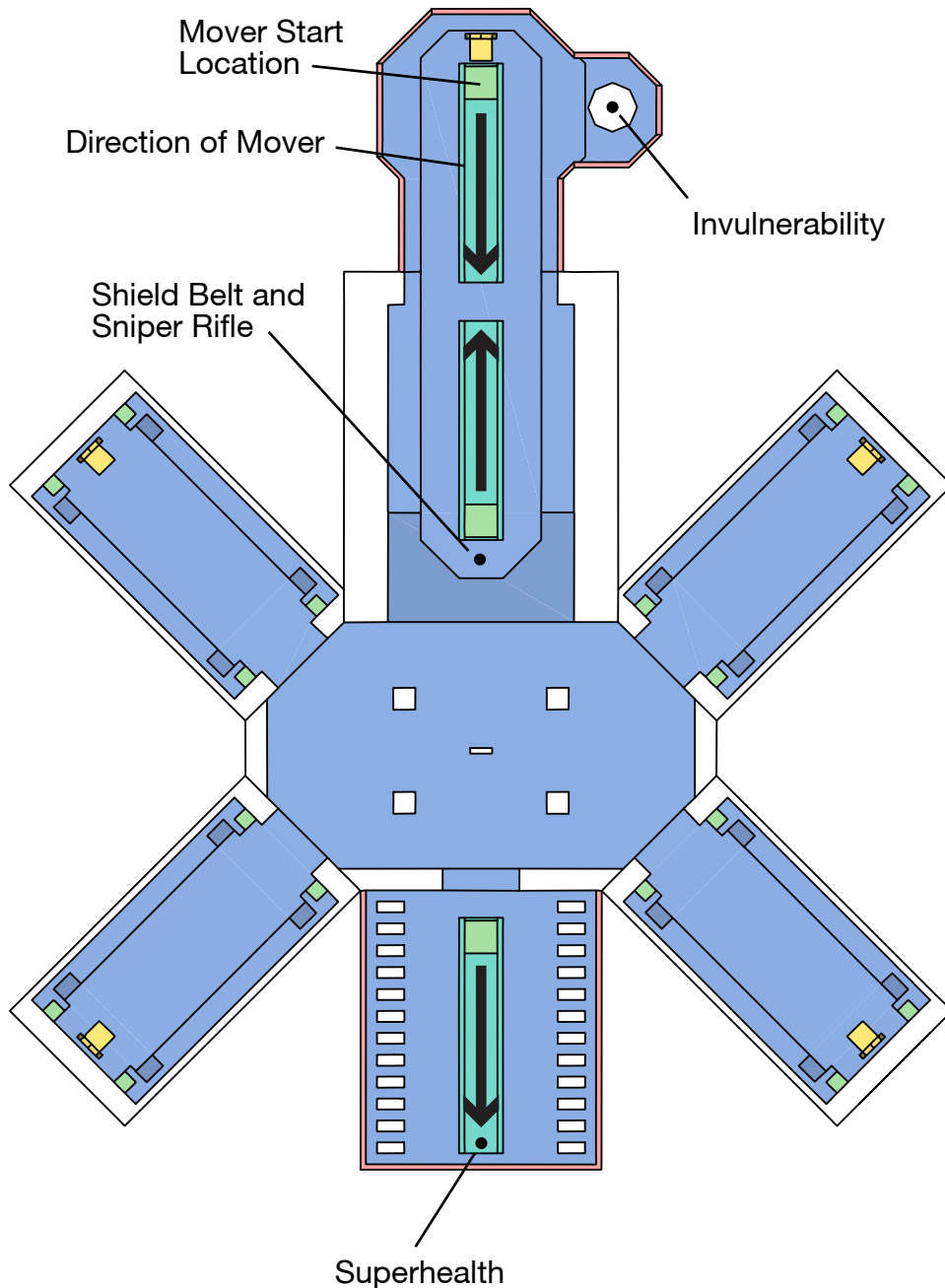
One final note of importance: the velocity on the space volumes are overridden by deployable slow volumes, meaning the airlifts will cease to function if enclosed within a slow volume space.



Health Vials Help Guide Bots Through Scaffolds



Horizontal Movers



As mentioned previously, DM-Kiroh does not support transponders or vehicles. This makes traveling down long corridors a time consuming and (in such a sniper riddled map) perilous task. The horizontal movers, then, serve two purposes (and the joining of these two functions is a recurring theme throughout the map...).

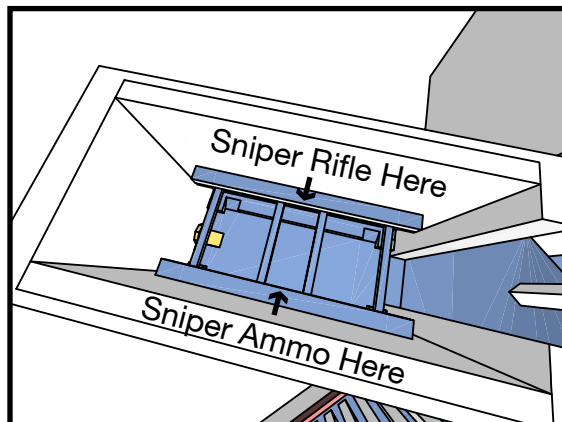
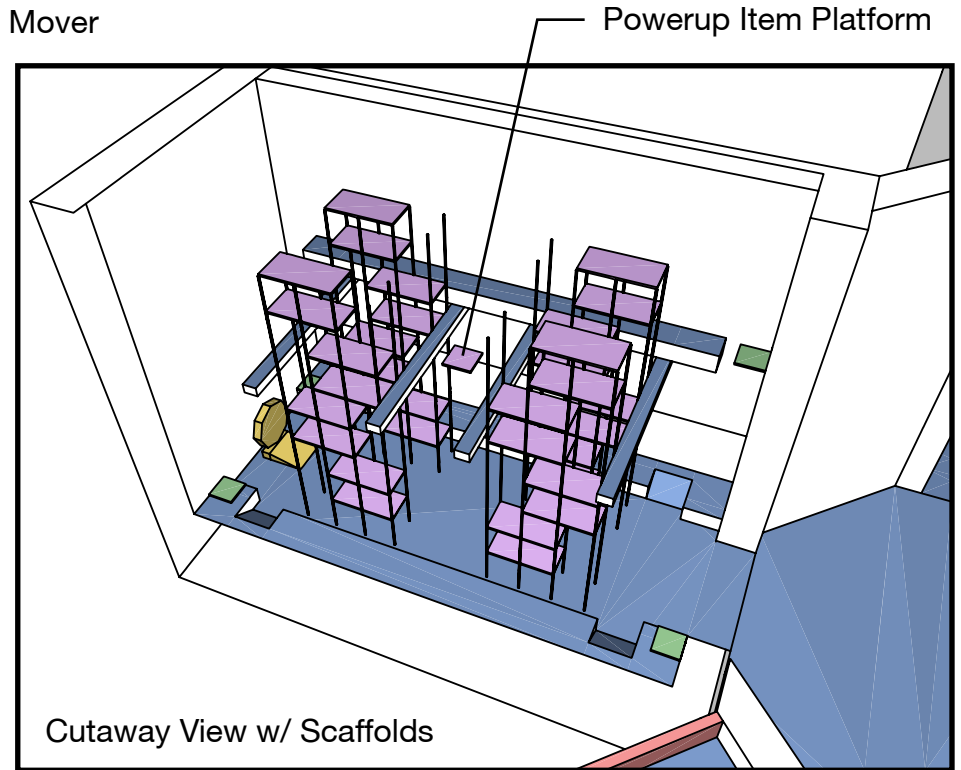
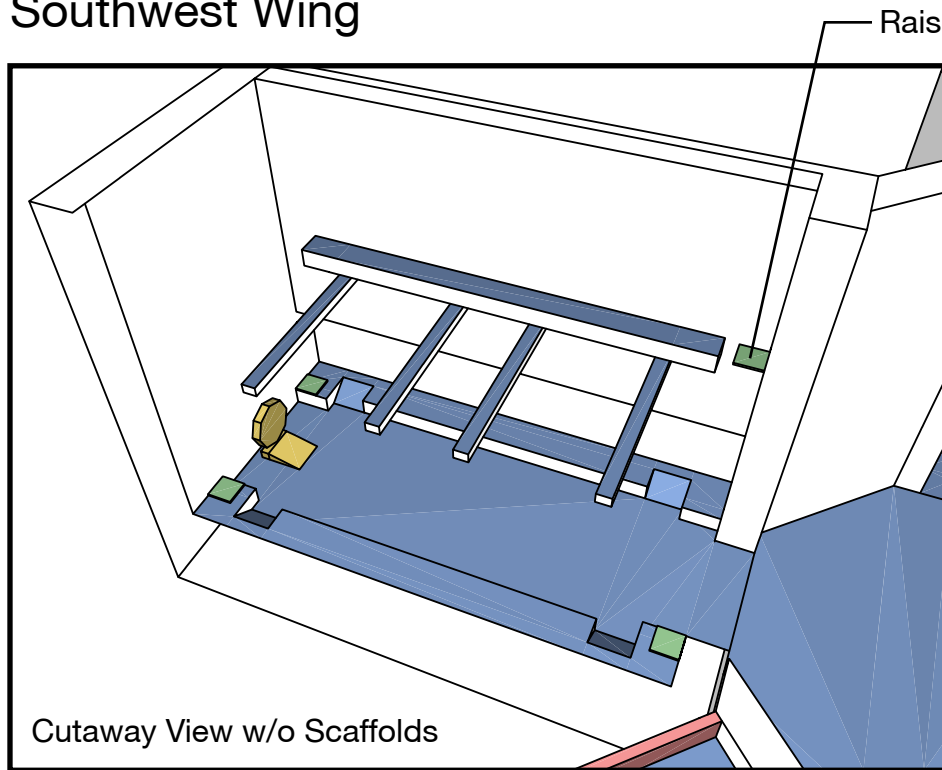
Firstly, they can quickly propel players towards important powerup items such as the invulnerability and superhealth, located at the rear and front of the map, respectively. These reaches of the map also make good positions to snipe from, so the movers additionally help players close the gap to snipers attacking from those positions. Secondly, they allow the player to quickly leave danger zones or zones of inactivity.

The horizontal movers, however, are like any other movers in that they have a set position from which they start and to which they return--they are, obviously, of little use to players at the opposite end of the track from the mover.



Moving Towards the Superhealth

Southwest Wing



While these diagrams illustrate the southwest wing of the map, the layouts for each of the four wings of DM-Kiroh are essentially the same: a floor lined with raised ledges on either side, and 2 pairs of scaffolds situated in the middle, leading to the upper area.

Above, two shelves run along the length of the wing, with a sniper rifle on one shelf and sniper ammo on the other. These shelves are connected with narrow beams stretching across the wing. Besides with the scaffolds, the shelves can also be reached with the four vertical movers, but these movers have timed delays of 1.5 seconds, indicated to the player with an animated collapsing piston (see next page for image).

In the middle of the upper space, hanging from cables, is a small platform with a powerup item (see next page for image). The item is different for each wing: berserk, udamage, deployable slow volume, and invisible.

Finally, a walkthrough teleportal, randomly linked to one of the 5 other portals in the level, gives the player a hasty exit from the wing, if needed.

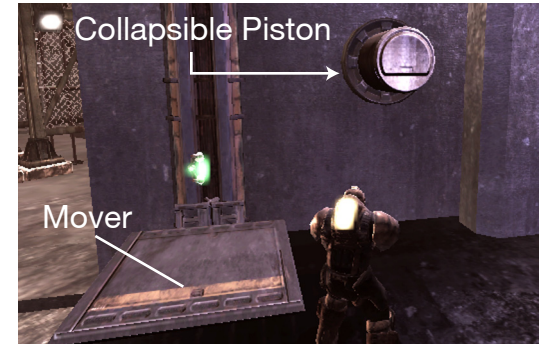
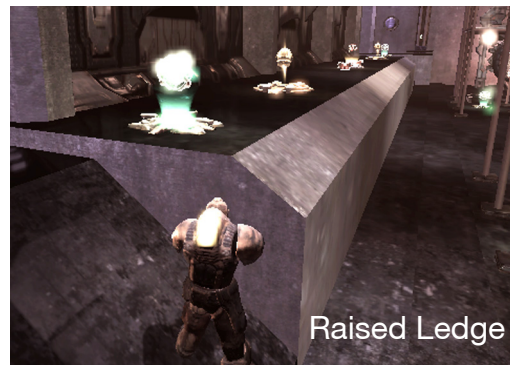
Southwest Wing (Continued)

This arrangement generates several dynamics. At the floor level, the legs of the scaffolds create narrowing and focusing--if porous--structures which the player must navigate through and shoot between, making the space prone to the dangers of splash damage. But the scaffolds also allow players to quickly escape up and out of the line of sight of floor level players by using the airlifts.

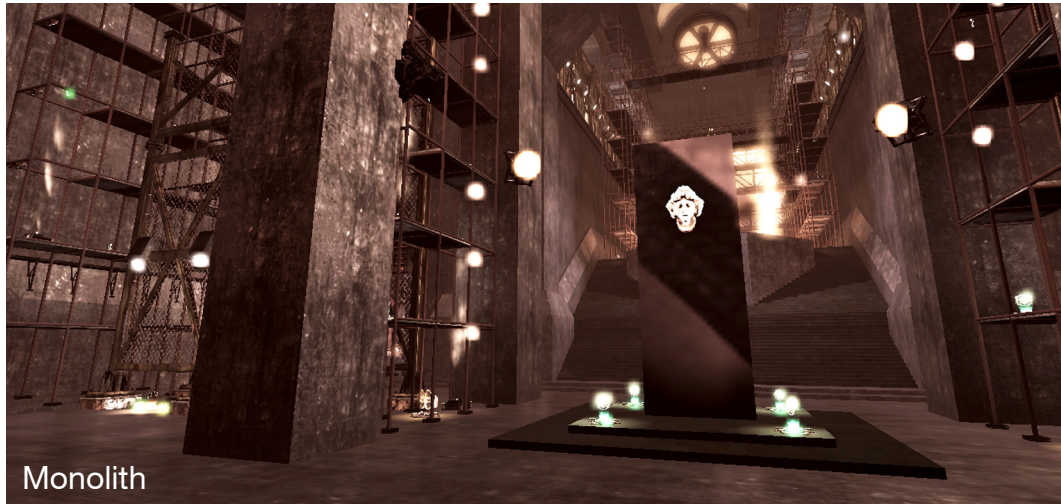
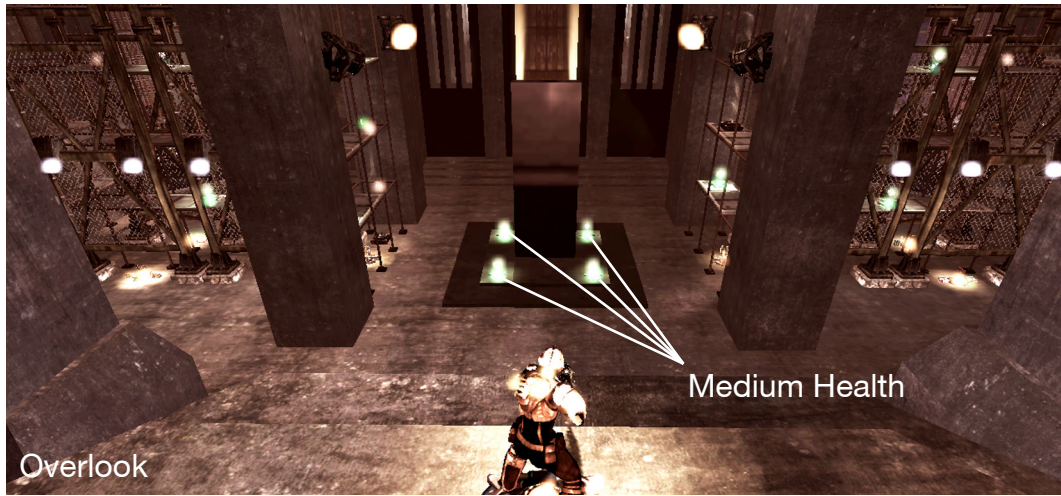
The raised ledges along the sides are too high for the player to jump on to from the floor, so the player must access them via one of the four ramps located towards the bow and stern of the wing to reach the items located on them--again, channeling the gameplay into concentrated areas.

The height of the upper shelves gives snipers an advantage in that it takes the weapons provided below (rocket, minigun, link, flak) more time to reach the sniper than a sniper bullet can reach lower level players. But this advantage is mitigated by the shortage of clear line of sight vantage points and the fact that lower level players can reach the top of the level in five seconds or less. Balanced against this upwards capacity are several built in protections for the sniper. The layout of the airlifts are staggered enough that snipers from above will have a significant chance to halt a player making progress upwards via the scaffolds. Players can reach the top more directly with the movers, but the timed delay once again provides snipers with a window of opportunity.

Lastly, as an emergency exit, players can use the teleports to escape from floor level firefights or sniper fire, or to quickly (and randomly) shuffle through areas to move closer to the action in another part of the map.

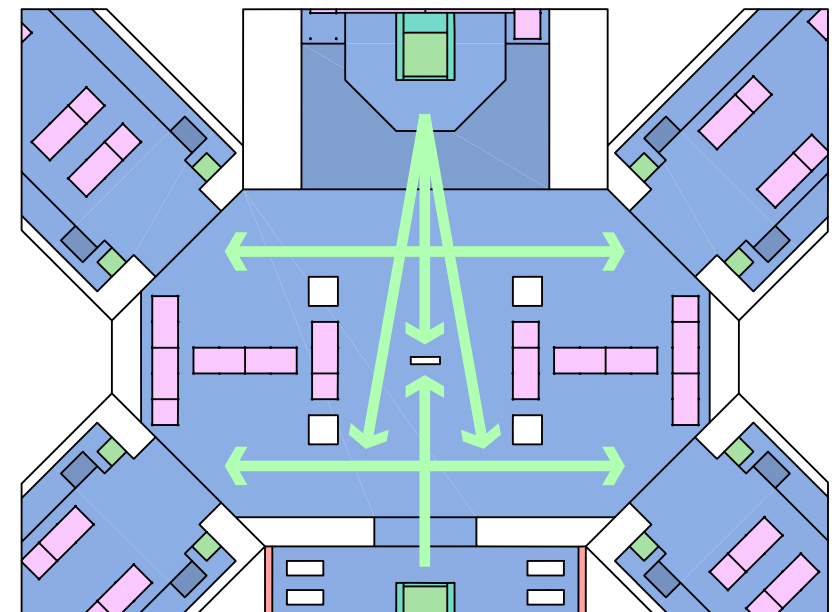


Central Chamber



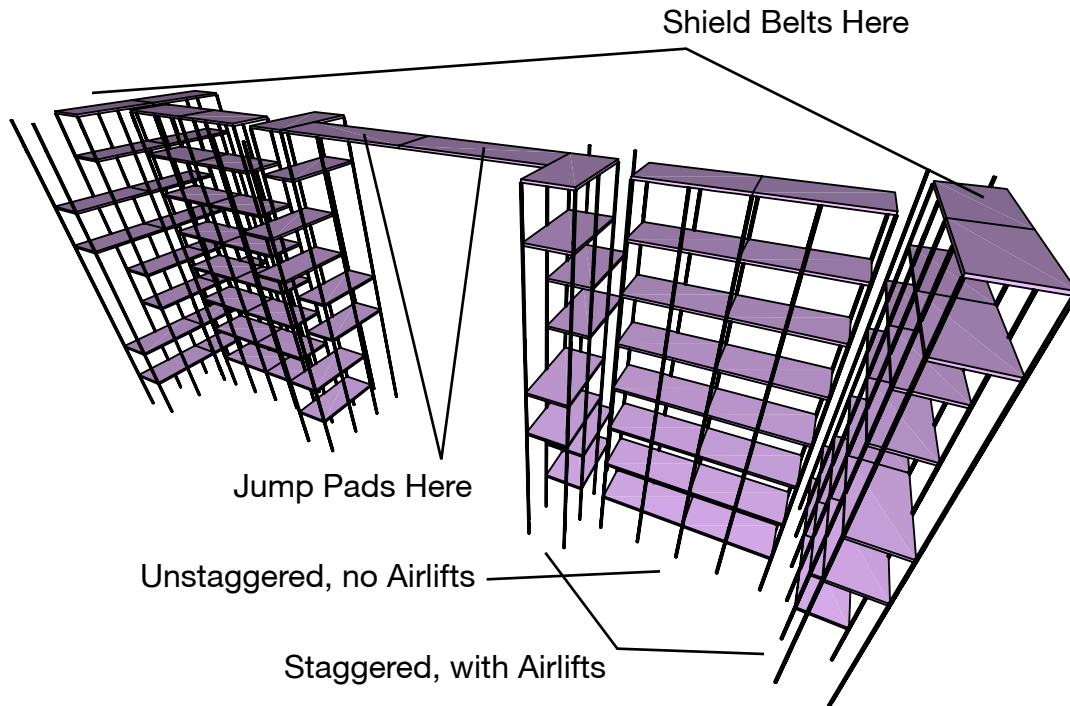
The four wings of the map are connected to a central chamber--a large, open space with four massive pillars in the middle of the floor, arranged around a Monolith-type statue. The chamber is essentially divided into a fore and aft arrangement by a series of scaffolds that stretch from either side to the central pillars. This division is easily crossed by going under and between the scaffold legs, but shooting through them is a more difficult (though entirely possible) matter.

The Monolith at the center occupies the space between the front entrance and the stairway leading to the rear hall. An overlook rises out of the stairway, looking over the central area. The overlook is raised enough to block line of sight against players below, and holds a sniper rifle and shield belt, making it an effective sniping position. The Monolith, pillars, and scaffolds then work to break up lines of sight, giving players some coverage while passing through the central chamber.



Clear Lines of Sight

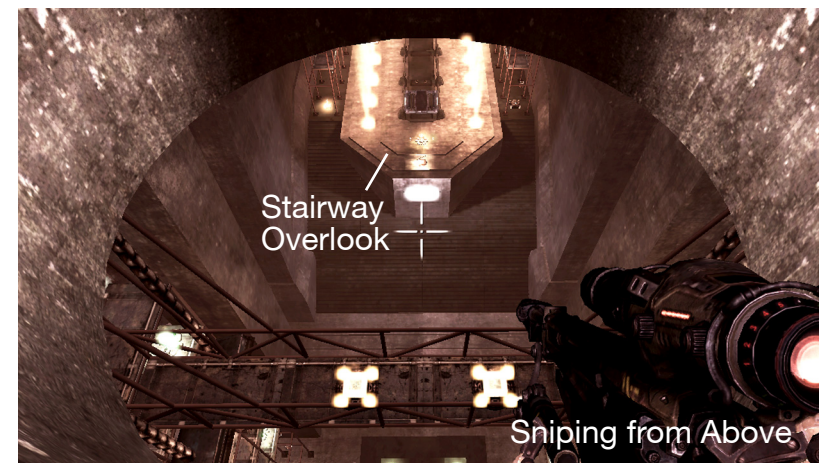
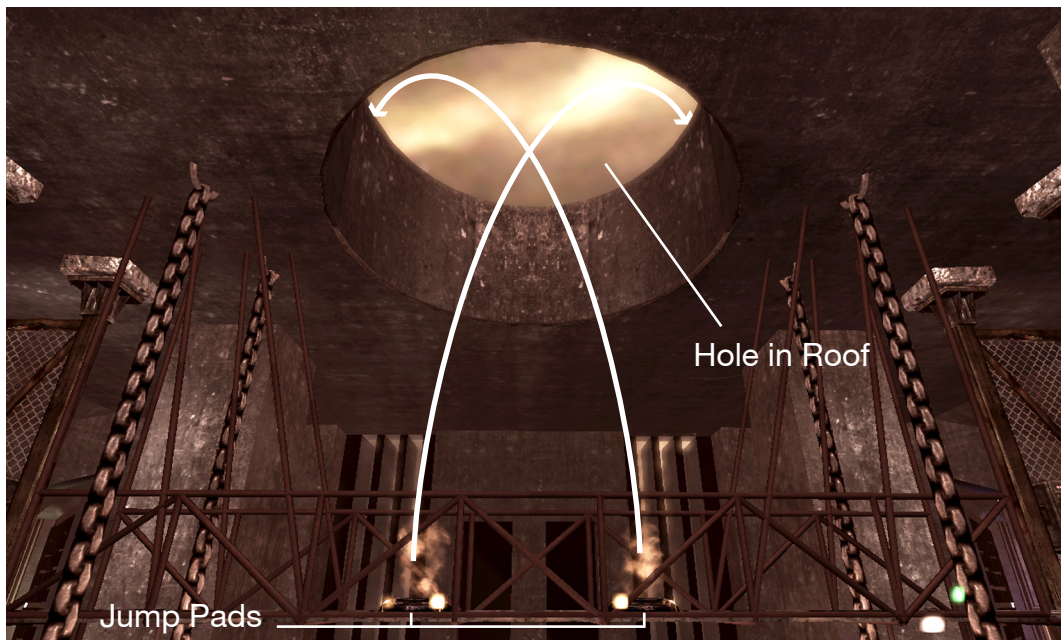
Central Chamber (Continued)



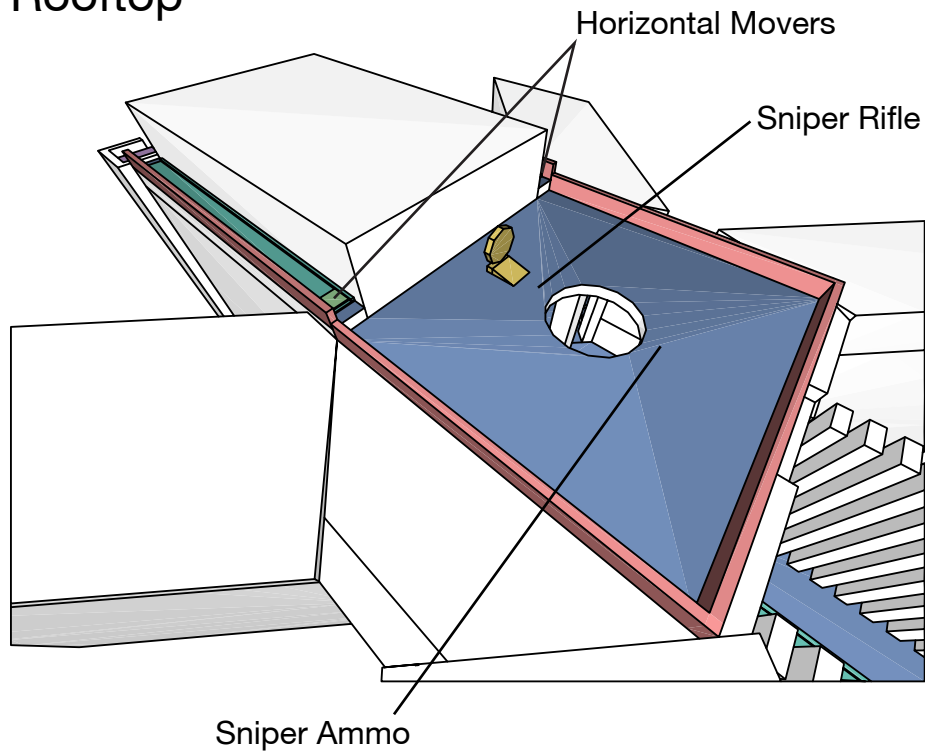
The scaffolds in the central chamber are arranged rather differently from the ones in the wings. One set of double long scaffolds lines both port and starboard walls, met perpendicularly with unstaggered, unlifted scaffolds on the side facing the center. A gap between the staggered and unstaggered scaffolds allows the player to jump down between them. These scaffolds meet perpendicularly again at the other side with another set of regular scaffolds laid out between two of the pillars. At the top of the scaffolds on either side is a shield belt.

The two formations of scaffolds are connected at the top by a plank stretching across the center, above the Monolith. This plank has two jump pads (pointing in opposite directions) with which the player can jump through a hole in the center of the roof.

The scaffolds work to counter the overlook position at the top of the stairway. Players can safely climb up the scaffolds out of line of sight from snipers on the overlook and reach the shield belts. Once at the top, players can attempt to directly counter the sniper by jumping to the roof and grabbing the sniper rifle there.



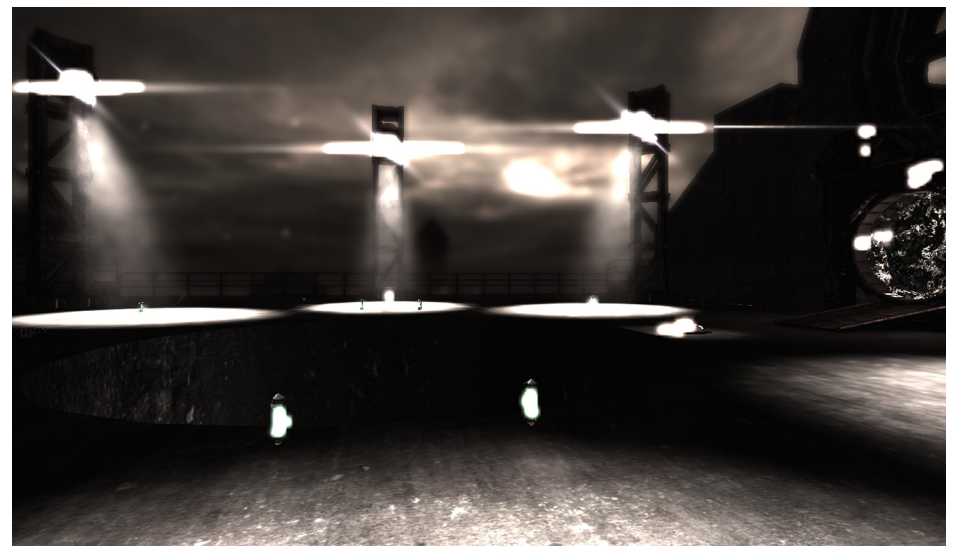
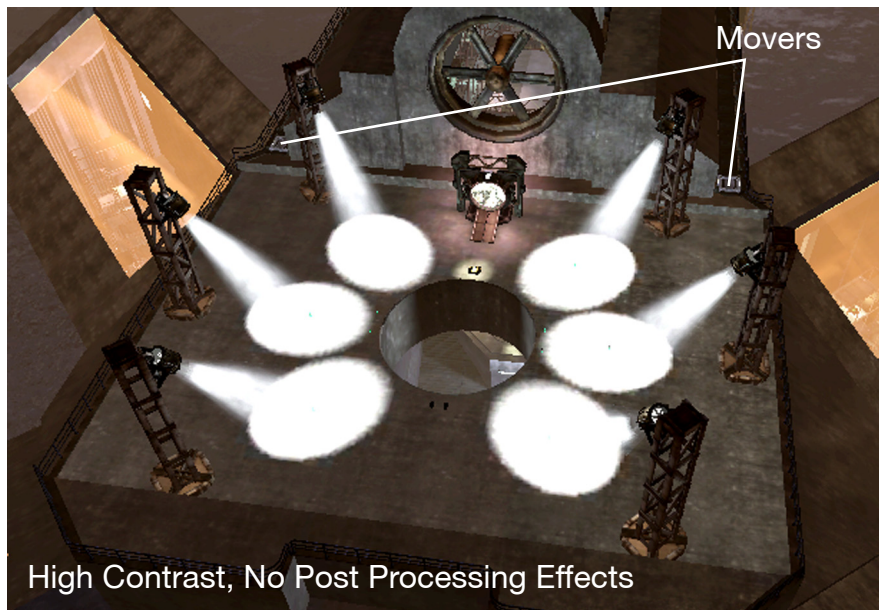
Rooftop



The roof can be accessed via two ways: the teleportal and the hole in the center (these access points allow players to easily catch a negligent sniper already on the roof unawares). The teleportal has been placed close enough to the hole that a careless walkthrough from another portal can lead to the player walking off the roof through the hole (this is to help prevent teleportal abuse).

The sniper rifle is situation directly in front of the teleportal, above the stairway overlook below. This means a player attempting to snipe the overlook will have to grab the rifle and then travel around the hole to the other side (where the ammo is located) in order to face the ledge.

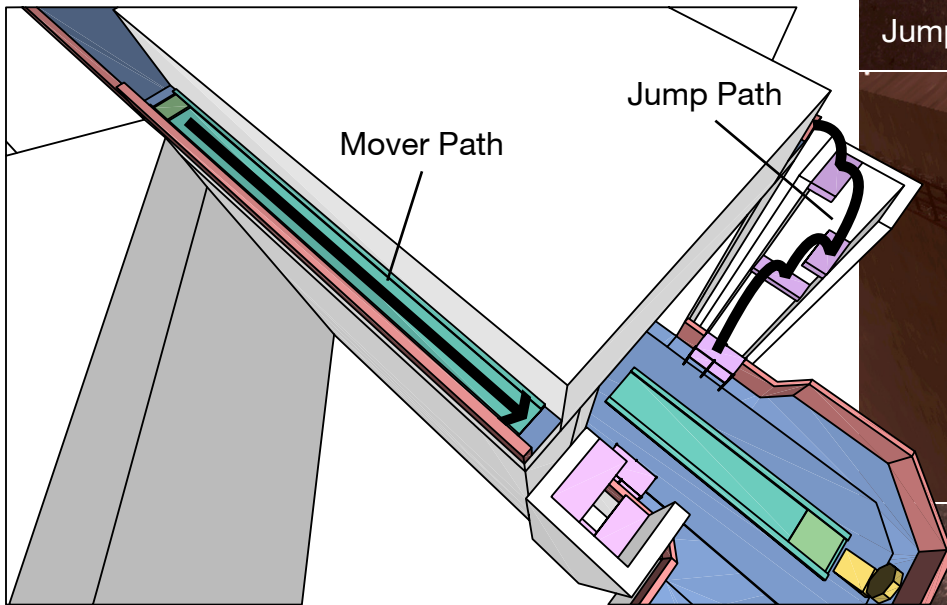
But located closely around the hole are 6 post process volumes with 2 second recovery delays (the time it takes to revert back to regular colorization). These volumes, which overlap the locations where the spotlights fall on the roof, decolorize the screen (see below) to simulate blinding from the spotlights, severely limiting visibility. The hole is narrow enough that the player must travel around the hole to have line of sight to different parts of the central chamber. Thus to avoid blinding, the player must skirt the narrow area between the hole and the spotlights. The access points and spotlights together help balance out an otherwise overpowered vantage point.



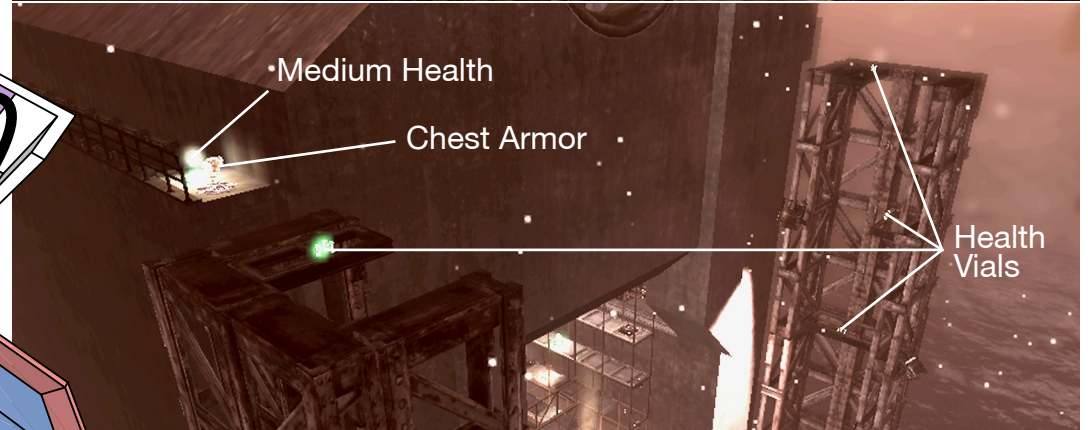
In-Game Screenshot Inside Post Process Volume (No Adjustments)

Rooftop (Continued)

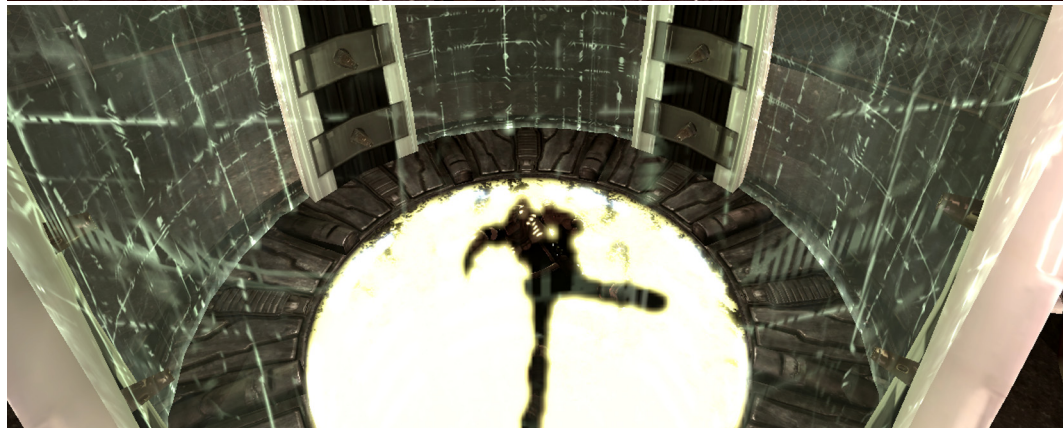
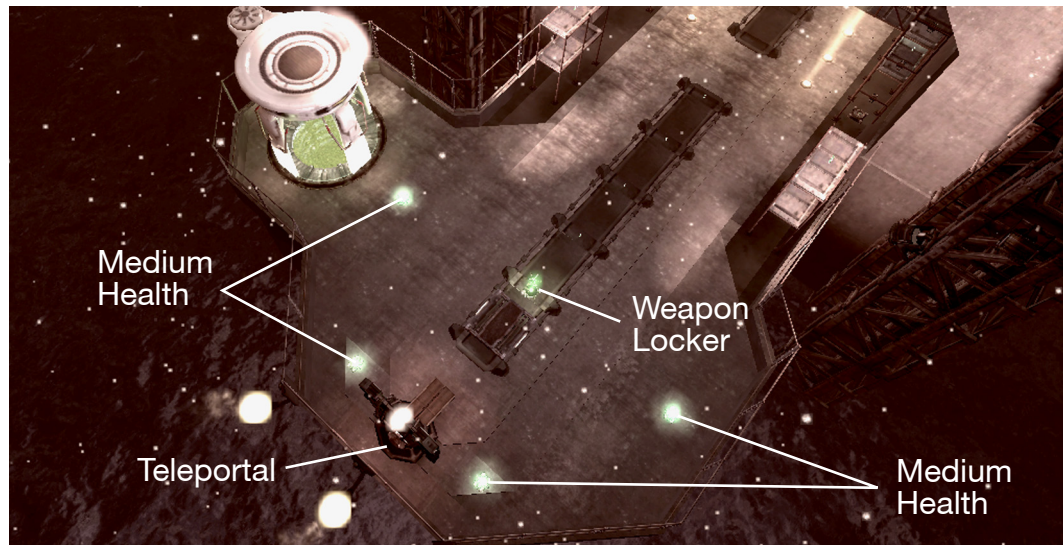
The two methods of reaching the roof from below have already been mentioned. However, as the diagram on the previous page displayed, there are also horizontal movers leading away from the rooftop to the rear end of the map. These movers travel the entire length of the rear hallway, towards a pair of platform rigs with staggered tiers. These tiers are positioned so that the player can safely jump down between them in succession to the floor level below (a one way trip).



This arrangement is designed to allow the player to safely bypass the long hallway below, and instead approach from above and behind. The platform rigs themselves also make excellent sniping positions. Finally, the movers cover a significant length of space, permitting players to quickly reach the important invulnerability item located at the far rear of the map.



Rear and Invulnerability Chamber

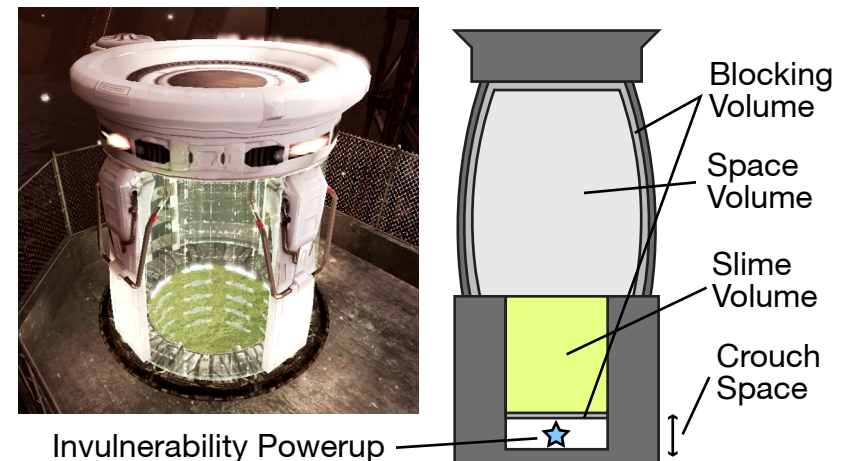


The primary importance of the rear end of the map is the invulnerability chamber. Located at the bottom of the chamber is the invulnerability item, but to reach it the player must first swim through a slime volume while taking 20 damage per second.

Players enter the chamber by jumping through a permeable "force field". Inside the chamber, above the slime pit, is a regular space volume, allowing the player to control his descent into the pit. A blocking volume overlapping the static mesh used for the "force field" is set to block all weapons, to help prevent camping inside the chamber for the powerup spawn.

The slime pit bottoms out onto another force field (again, a weapon blocking volume to preclude abusive camping), below which is a clear space just tall enough to allow the player to crouch safely. In the middle of this space is the invulnerability item. Once grabbed, players can leave the chamber again by jumping up into the slime volume and swimming out.

Since the invulnerability item spawn can be heard throughout the level, the placement of the movers, teleports, and airlifts culminates to allow players from most any part of the map to quickly reach the chamber.



Rear Hallway

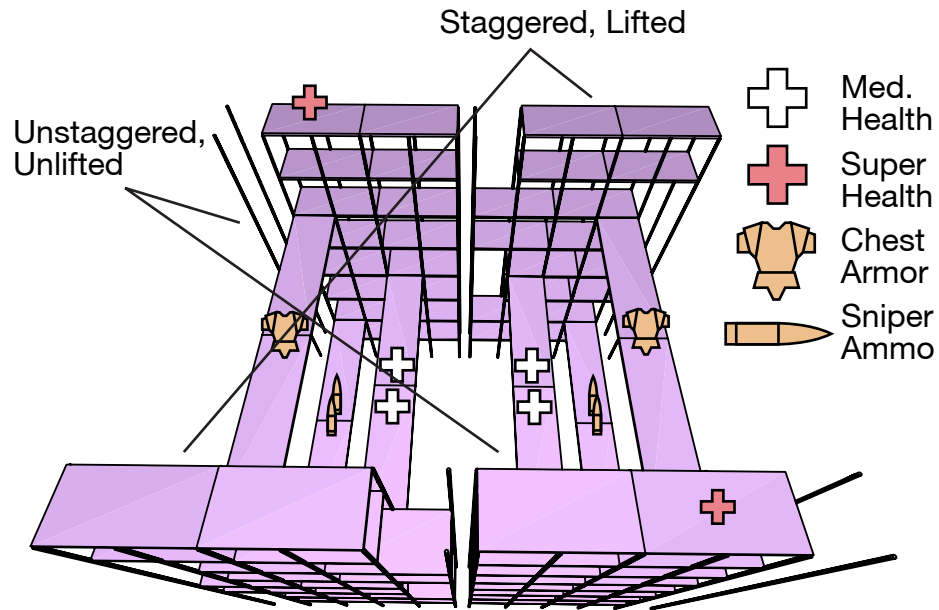
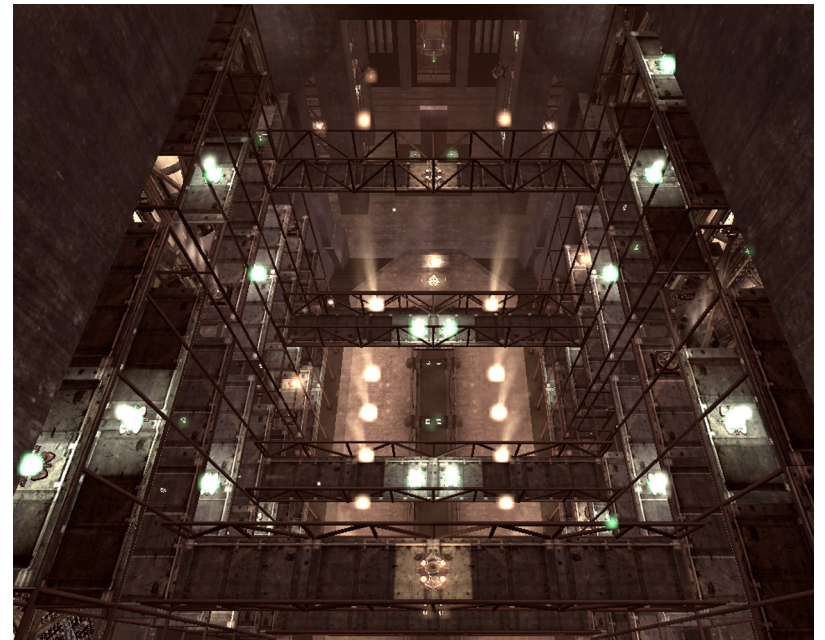
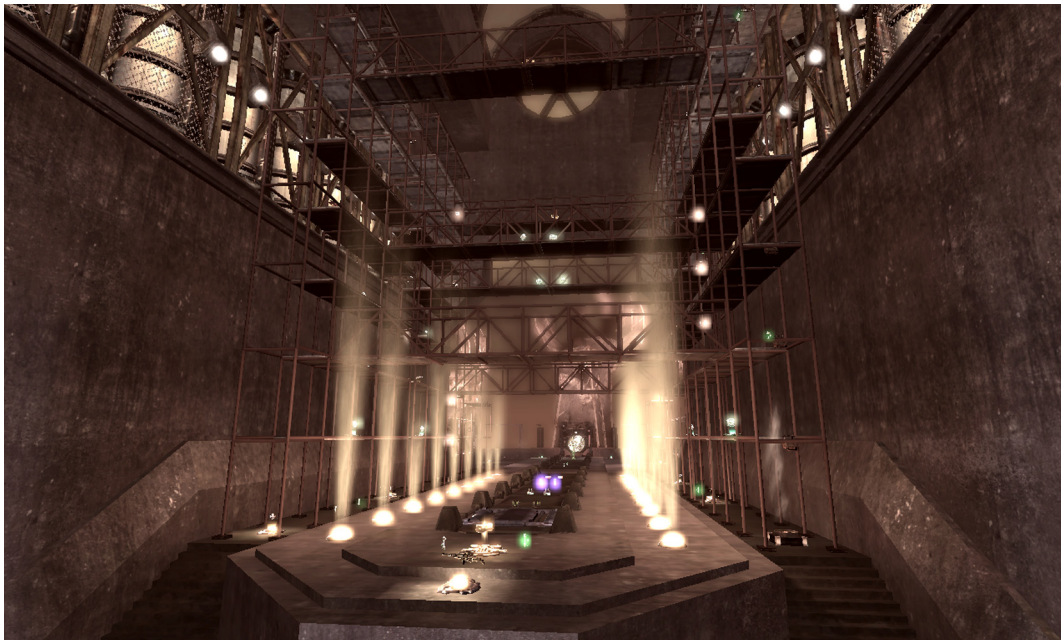


Diagram Does Not Display All Items Present

The entire rear hallway, despite being something of a sniper's nest, actually contains only one sniper rifle--the one located on the stairway overlook at the front of the hallway. This helps limit the number of snipers likely to occupy the area at any given time. In addition, the sniper shells are distributed at less than convenient locations.

But the two superhealths at the top of the scaffolds and the shield belt located on the stairway overlook make this region a truly effective sniper camp to players who want to take advantage of the set up. This arrangement also helps mitigate the impact of the invulnerability powerup at the rear end nearby.

Because of the long fields of vision which stretch both ways to the front and rear of the level, a skilled sniper can easily dominate a large portion of the map from this position--hence, the horizontal movers below as well as above (stretched over the whole length of the hallway roof), not to mention the invulnerability item and the teleportal next to it.

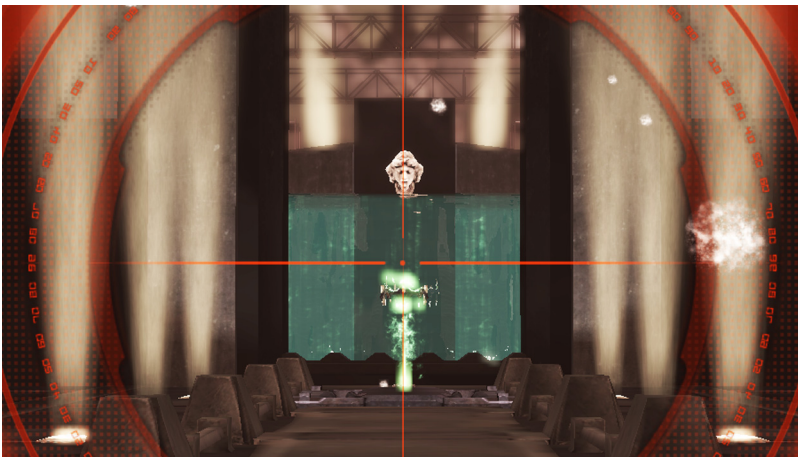


Front Entrance



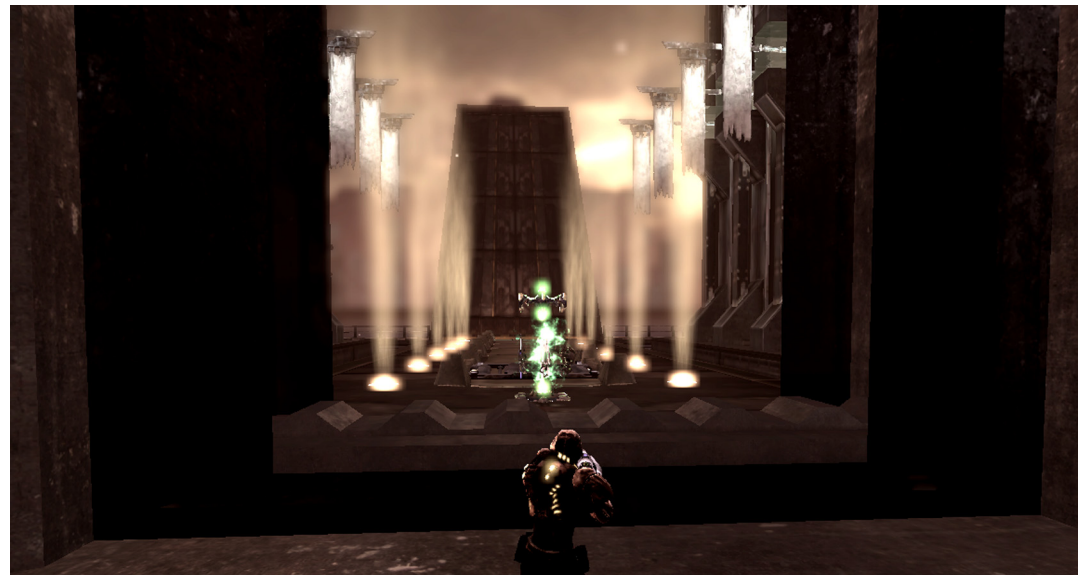
The front entrance is mostly of interest for the superhealth located at the end of the mover track. The mover allows players to retrieve the superhealth and return to the central chamber in a matter of seconds. Additionally, players spawning towards the middle of the central chamber can quickly equip themselves by grabbing the weapon locker (Link Gun, Biorifle, Shock Gun) at the start of the mover track.

Because the only method of reaching the superhealth is through the doorway chokepoint (unless the player makes a dangerous jump from the roof down), this location also makes a useful sniping spot, as the walls of the doorway protect snipers by narrowing exposure.



Sniping from the Superhealth:

This has been made even more effective with the placement of a slow volume over the medium health items in the middle of the central chamber



Design Notes

While the large, expansive spaces and multitude of sniper positions may seem to favor sniper play, in practice the map readily accommodates the entire range of play styles. Indeed, because of the ease of traveling long distances via the transport devices, and the close spaces provided by the scaffolds, the floors of the wings, and the narrowness of ledges, it is easily possible, for example, to dominate the charts with a biorifle or even an impact hammer.

Unfortunately, the game engine's handling of space volumes leaves something to be desired. While the vast majority of play will encounter no problems with the spaces, on rare occasions the game will glitch and cause players to propel downwards instead of upwards, killing the player instantly. This difficulty, however, was deemed to be less problematic than the other possible mechanisms for transportation (i.e., movers, jump pads), especially in light of the quality of flow achieved through the use of the volumes, and the rarity of their glitching.

Finally, bots do not interact particularly intelligently with the horizontal movers. This is masked to a degree by the fact that the movers have been placed along important bot path nodes, but the bots will at times jump or walk off the movers before reaching their presumable destinations. Bot interaction with the airlifts, however, is markedly more successful (it is not uncommon, for instance, to see a bot travel up the length of the central scaffolds and onto the jump pads to take out a sniper on the roof) due to extensive bot pathing and the careful placement of items to lure bots along, but again, players will infrequently witness seemingly erratic behavior of bots simply floating at the top of the space instead of moving on.

As a closing note, the Redeemer was purposefully left out of implementation, but may add another interesting layer to the map. One possible location for placement would be at the front entrance, replacing the superhealth there, but significant additions would need to be made (like the invulnerability chamber) to balance the weapon out.