Forging Halo

Level Design Concepts for Forgers

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Introduction

Forging For The Playlists

I have been forging steadily since the night Reach went on sale. I started as a novice and joined forging communities where forgers taught each other by giving feedback on each others' maps. But recently I began to realize there are communities of high end players that can explain why one map yields good Game Play while the next one fails miserably. The only source of this kind of information that I know of today can be found at Beyond Entertainment, and I highly recommend them to any aspiring forger.

I want to capture what I have learned about level design concepts in forging Halo, similar to my mini lessons on Forging Invasion. I am the first to tell you that I am still the student at this, and that my book is simply my account of what others have taught me thus far.

Why Halo?
It doesn't interest me that Far Cry 3 has a map editor that far exceeds Halo's Forge, matches that power with ease of use, and has a more powerful terrain rendering engine (you can see deep into the water), because Far Cry 3 suffers from the realism of present day weaponry in which you drop immediately when you are shot, yielding frustrating and boring multiplayer matches. At the end of the day I enjoy playing matches on halo.

Additionally, there existed an unparalleled community of forgers that literally exploded onto the scene with Reach. I began to enjoy forging simply from the increased flexibilities of Reach's forge tools, but I also developed fond memories of all the friends I made and the good times we had forging and playing customs together through out most of Reach. I can only hope the interest and the population returns with Halo 5.

About This Book
I have divided my lessons into three chapters. The first chapter, Geometry, will discuss the layout of the map's physical structures, the purposes of various concepts, and regularly return to the question, why?

The second chapter, Art, will discuss how a map is more than Geometry, just as Aesthetics is more than Art. Art, Architecture, and Theme will be discussed to help you get some ideas on how to bring your map alive and to simply add to the overall fun factor your map can offer.

The third chapter, Depth, will discuss how maps can add depth to the games that are played on them, and how the unsuspecting forger can inadvertently shallow the Game Play and make their map a tiring lap around the track if they are not careful.

Learning Is My Goal, The Playlist Is My Target
My emphasis is learning to forge, but with the caveat of forging maps to ascend to the playlists and work within that framework. My goal is to learn, using the playlist only as my target to that end. Each map I create needs to be better in novelty, art, inspiration, design, level concepts, game play, split screen performance, pathing, spawning – you get the picture – than the last one. And each map I design is specifically designed to work within the framework of the playlists. If I get my map into a playlist, then it only serves to confirm that I am achieving my goal of forging a map successfully for the playlists.

All of the lessons I present provide good healthy rules, but you need to understand that there are going to be exceptions to just about anything I say. By explaining why a rule is important to follow, you should be able to assess if the rule is necessary for your particular map; or if your map can break a rule without suffering the consequences.

Terms & Acronyms

This post will present terms and acronyms used through out the various articles on this book as a quick way to learn how they are used and what they mean in the context of this book.

Arena

The term Arena Style Shooter is used to describe Halo in general. The Arena is a small map that provides fast paced action that is designed to bring out skill. Each player spawns with the same weapons and the behavior of the map is highly predictable (weapon spawns, etc.). In essence, an Arena is where two men go in and the better man comes out.

Canvas

The term Canvas is used exclusively to refer to the publisher created forge space. This is in contrast to the term Map, which refers to the forged play area.

For example, Forge Island, Exile, Abandon, and Ravine are all Canvases. In their empty state, there are no forge objects on them. On the other hand, Simplex, Exile, Abandon, and Settler are all maps because they have forge pieces on them. Some of the Canvas names are also the names of maps that have been forged on them.

Through out this book, the word Canvas refers to the forge-able Canvas itself, where as the word map refers to a Canvas with forge pieces on it.

CQC

Close Quarters Combat

Egress Path

A Path that leads out of a Space.

Game Element

A Game Element is any single element or aspect of the Game Play. For example, a trick jump, scoping with the Sniper, camping your team's flag, spawn trap, map control, etc.

Geometry

An abstract term that refers to the collective surfaces of the map in the aggregate – both the terrain and forged structures together.

Ingress Path

A Path that leads into a Space.

Lobby

A small Space or Walkway leading to the main interior of a team base or major Space on the map. An anti-chamber of sorts. Can be used for staging, stealth approach, and general cover.

LOS

Line of Sight

Map

See Canvas.

Pace

The speed with which the Game Play proceeds, using the speed at which score is accumulated as the best metric to measure with.

Palette

The collection of forge objects associated with a Canvas. See Canvas.

Power Weapon

A Power Weapon is any weapon that you do not start with, that you pick up from the map (including ordnance drop). A DMR could be a Power Weapon if players don't start with it and the DMR is a limited commodity on the map.

Space

A Space is an area that is generally enclosed with external LOS found only through its entrances/exits. This generalization is used to help define the term, but there are always exceptions. A LOS may occur over a wall in limited and specific directions.

A Space can be a base, or any room or open area on a map by which the player in the Space only need concern himself with the entrances/exits. Walls are not necessary. For example, a space can have an open side that is exposed to the Canvas scenery, though this open side in no way exposes the Space to any LOS from the other playable areas on the map.

Staging Area

A staging area is any area that is used to prepare for a push.

Walkway

A Walkway serves to connect or provide a Path between Spaces, is generally singular height and width, and typically has only entrances at either end, but can have additional openings in the middle along the sides.

Chapter 1: Geometry

In this chapter we begin with a discussion of forging Geometry. As you would expect, the topics will center around the brick and mortar of your map – the structural layout, paths, elevations, and such. I hope to take the discussion deeper into the understanding of the why behind the design concepts, and to offer a more fully comprehensive discussion across this subject matter.

I intend to go beyond saying, Remember to have at least three ways into a base. Instead I want to discuss the psychology behind a players' response to the different ways you can forge a base and show you what you can expect if you have too few Paths leading into a base – and what you can expect if you have too many Paths leading into a base.

In this chapter I will also introduce you to some of the questions that you should be asking yourself along the way, and to maximize the overall fun factor and the value of simple Geometry that you forge into a map.

And this chapter will conclude with discussions on weapons, vehicles, anti-vehicular weapons, and heavy variants of big team battle maps.

Spaces, Walkways, and Paths

I will begin by defining the most basic elements of a map as the Space, the Walkway, and the Path. The Space is best thought of as a room or open area that has several ways leading into and out of it. A Walkway is well understood as the portion of a map that a player will traverse to move from one Space to another, is generally of singular width and height and has only two openings at either end, though a third or even fourth opening along the Walkway is possible. A Space can be a team's base, a room, a court yard, a hill top, a balcony ledge, etc.. For our purposes a Walkway can be a tunnel, a bridge, a

corridor, a simple doorway, or even a man cannon or teleport.

On the other hand, a Path is not a tangible construct of the Geometry, but rather the actual line or area of movement within a Space or a Walkway, and is defined or dictated by the Geometry.

Spaces

Spaces should have three or four ways in so that a team can push from multiple directions to surprise and flank camping defenders. If there are only two ways into a Space, then the offensive push becomes far too predictable – and typically boring. On the other hand, if you provide too many ways into a Space, the Space begins to feel indefensible which leads to deprived game play.

When I say that a base should have several ways in so that an offensive push can surprise and flank defenders, then you need to understand that I mean the ingress Paths to the base must not all lead to one side of the interior of the Space, lest there is no flanking possible. Instead a base becomes interesting if there are ingress Paths from opposing directions so that given adequate team work a push can come from both ends simultaneously. And a vertical drop down (for example) into a base also serves as an opportunity to flank as it allows entry into the base from an opposing end relative to other ingress Routes. A central entrance into the base tends to represent the unique means to reach the center of the Space more quickly and with less opposition, increasing the element of surprise.

Spaces should have three or four ways out so that a player can move safely about the Space knowing that if they have to retreat in a hurry, their retreat is not dictated solely by which entrance the enemy may choose to use. This point is particularly important if the Space is large enough that once a player has moved to the center of the Space they don't feel that their only choice is to move back the entire way they came in just to find cover.

An ingress Path into a Space may be one way – for example, dropping down through a ceiling, exiting a one way teleport, or flying in on a man cannon from another Space. Similarly, an egress

Path from a Space may be one way – for example, jumping off a balcony, entering a one way teleport, or jumping onto a man cannon for a quick escape. The number of ingress Paths and the number of egress Paths do not have to be the same, but they should both be roughly three or four each in most cases.

The Holdup Position

A Space with only one way in is a unique situation that has very limited purposes – typically for a holdup position where the defenders have an advantage of shooting anyone coming in the door with a single shot (e.g., shotgun, sword), but are at the disadvantage that they must never miss and they may find themselves against numerous enemies in one coordinated rush. This type of Space is frowned upon in general due entirely by its promotion of camping, but it has a significant following most notably in the Infection style playlists. Keep this in mind whenever you forge your map – that you do so for a specific segment of the population and you want it to play in a way that they enjoy playing the game.

A Holdup position could be a Dead End or it could have an additional egress Path leading out. Dead Ends are the types of Spaces (and Walkways) you will want to avoid unless you intend to create a trap. But even if it is intentional, you want to make it obvious to players before they turn into the Dead End. No one wants to run down a tunnel with a turn at the end only to find they were in a Dead End all along.

Paths And Their Approaches

Paths, whether through Spaces or across Walkways, that converge into a single Space should provide variation of approach styles to make the map more interesting for a wide range of players. Some players may enjoy Paths that have lots of LOS blockers and sharp corners and tend to promote CQC style game play. Others may enjoy taking the risky Path that requires a rush across a generally open area to surprise the defender camping in the Space. The various Paths should promote various styles of play.
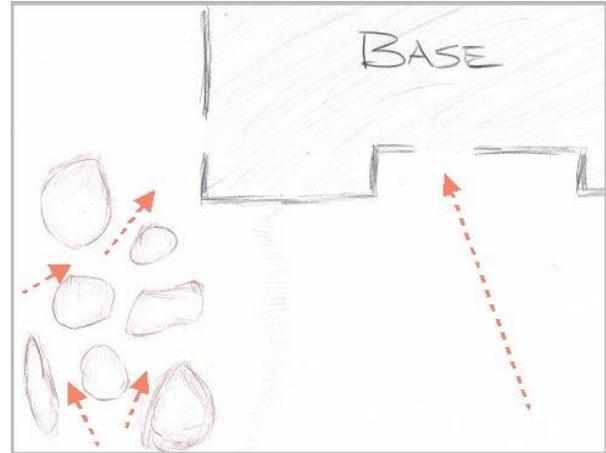
At the same time, each style of play that is promoted should not be implemented at the expense of others along any one Path; otherwise the most favorable Path would be overly used, unpredictability would be lost, and the Game Play becomes stale and boring.

For example, if a Path favors CQC but cannot really provide any other style of play, then some teams may avoid it entirely, which means their strategy becomes more predictable as they have less Paths to choose from, and defending a base becomes less challenging, stale, and boring after a while.

Retarding Movement

If a base has an objective in it (e.g., a team flag), then there are generally two scenarios that you will need to account for. Firstly, there exists a sizable segment of the population that simply enjoy camping the base as the defense squad of their team. They enjoy being the player that saves their team's honor and being a savvy defender that demonstrates unique problems for the flag thief to overcome. This in turn makes the game play very interesting for the flag thief who needs to figure a way to overcome a defender whose strategy, talents, or use of weapons and abilities are somewhat novel.

But it is the second scenario that I want to focus on more – the players who are never happy with camping and want to push their defense line out from their base, engage the enemy sooner and more frequently, and score more kills through out the game. It is these players that you need to focus on more, because having too many

Paths into their base can retard their movement out of their base.

It has been demonstrated that a very unintuitive behavior is adopted by players who want to push their defense line out of their base toward the middle of the map – that if their base is riddled with ingress Paths, that they tend to stay back to defend the objective out of fear that their base itself is indefensible. In other words, too many Paths into a base give the team a feeling that the base cannot be defended if they leave it. This can be an imaginary fear, but it can result in a real retarding of their movement, and that will lead to a feeling of boring game play for these types of players. Your map would in effect deprive them of the fun of pushing out from their base.

So you need to limit the ingress Paths into a team's base or any critical Space that a team would prefer to control or defend to a healthy and balanced number.

Cross Map Paths

A map requires several Paths from one end to another, and like before should promote varying approach styles to make the map interesting to a wide range of players. This is especially true when you have two team bases that you need to promote movement between. While the Paths may travel through several Spaces along the way, the idea here is that Pathing across a map should provide the same Game Elements of variation of approach to increase the map's overall fun factor, and be three or four unique Paths to eliminate predictability and depredation of game play.

When a map is designed for large parties and vehicular movement, then the Paths themselves are defined more by the vehicles than anything else. How you structure the edges of Walkways or Spaces that the Paths cross through for foot movement will determine what kinds of play styles players can engage in as they travel those Paths.

Likewise cross map Paths must not be too numerous, or a defending team will have trouble pushing out, not knowing which highway they need to have a guard posted at. This is the same situation as with a base, but widened across one half of the map.

Summary

Each Space should have three or four ingress Paths into it and three or four egress Paths out of it, and should be on opposing ends.

The Paths should promote varying styles of approach to increase the overall fun factor for a wide range of players.

The same principles of Paths into or out of a Space can be applied to cross map Paths.

Flanking

Flanking is the maneuver in which one team surrounds the other team on two or more sides, reducing escape options, and increasing the need to defend from multiple directions simultaneously. Being caught in the cross fire of a flanking maneuver seriously impacts a player's ability to defend themselves, and typically offers only the ability to push forward or drop back the way they came – neither of which are good choices.

While terrain and Geometry can play a role in promoting or enabling flanking, it can also play a role in reducing or eliminating flanking. For example, cliffs, walls, and other obstacles to both movement and cross fire can help one team eliminate possibilities of being flanked by anchoring their battle line to those obstacles. While this serves to reduce their exposure to attack from multiple directions, it also reduces their escape options.

If using terrain or Geometry to limit flanking options for a given Space, then you should consider adding features to increase other risks to balance its usefulness and playability. For example, Powerhouse has an open field bounded by walls and cliffs on three sides. The field is not typically used in games where a player can be threatened by cross map fire even though flanking is practically impossible to establish (the team in the field has only one direction to defend from). The openness of the field balances the benefits of no possibility of being flanked. However, in games where cross map fire is not possible, such as Living Dead, the risk drops away and what we see is that the Space is overly used and abused by the humans.

Flanking is something that you as a forger should include in any map, but keep in mind that the more players you have on a team the more interest there will be to perform flanking maneuvers. Flanking promotes team work, and as such increases in frequency and interest with increasing team size.

Basics of Flanking

Take the typical case of three major Paths across the map, from either team's perspective they will have the choice of Paths to the left, the center, and the right. Generally it is a good idea to allow the center to be flanked by the right or the left sides of the map or the other way around, but to limit cross map fire between the left and right Paths.

With a Path along the right edge of a map, some additional Paths between the right and center Paths allow a team to flank an offensive push that occurs in the center. The offensive team can have a variety of responses, such as clear out the edge Paths to make the central Path safe; rush the central Path and hope that they make it to the other end alive; bait the flankers and keep them busy while their teammates progress along the other side of the map; and so forth. These options are dependent upon the Geometry and terrain of your map, but typically do not diminish the importance or effectiveness of flanking to slow or repel an offensive push.

Paths Of Flanking

The Paths that connect major cross map Paths can be contiguous. Ragnarok and Abandon are two good examples where much of the edge routes can see the center from just about any point. The only thing blocking the LOS are the rocks and trees that form immediate cover, but they do not represent lengthy walls that break up the flanking Paths.

Other maps may have two parallel Paths with discrete connections between them. A good example of this is found in both the upper and lower levels of Adrift. The walls break up the opportunities to flank and can form corridors or tunnels with little ease of escapes.

Consider how much flanking you want your map to offer and why? The amount of cover between two Paths and the distance between openings will dictate how many points of movement allow for flanking.

Flank Spawning

What I call Flank Spawning is the act of spawning in such a way that you could immediately initiate flanking maneuvers. In most cases spawning along a flanking Path is not a concern. For most Game Types, if a player spawns along a flanking Path it is because that is the safest place to spawn on the map, presumably because it is the furthest location from any enemy. Assuming that is correct, spawning along the flanking Path doesn't offer an immediate flanking opportunity. Another way of saying this is that if a team is moving along the center Path (for example) then flank spawning should not occur due to their presence.

On the other hand, some Game Types, such as Halo Reach's Invasion, define discrete spawn areas that are influenced by the spawning player rather than the presence or absence of enemy players. Invasion's major Paths are so well defined that flank spawning would become a severe problem. Typically the invaders don't have – and should not be forced into – other Paths to avoid flank spawning, but the Paths they have available to them become essential Paths. Their objectives are defined in very large part by these essential Paths, which are designed specifically to guide the invaders using intuitive level design strategies. In cases where an offensive push requires an essential Path, flank spawning must be prevented. In the case of Invasion, the way to solve this problem is to simply spawn behind the objective rather than off to the side of the objective.

While new game types may be unforeseeable at the time I write this, the principle will remain the same.

Summary

Adjacent Paths should offer flanking with each other; cross map shooting should be minimized.

Typically flanking is contiguous with LOS blockers, but there can be cases where flanking Paths between Paths are limited, discrete, and far apart.

Flank spawning is okay if the Path that winds up being flanked is not an essential Path and the occurrence of the spawning is atypical.

Orientation

If a map looks nearly identical from each end, then a player could have trouble establishing their orientation to the map itself, their base, and where they had just been (where they died in a fire fight) upon spawning. The solution is to provide overwhelmingly obvious visual cues to help orient the player. I have seen numerous maps try various techniques, but the most successful have always been to provide a massive object or terrain that is so large that a player cannot miss it if they are looking in its general direction.

Enclosed Maps Are Difficult
I have seen maps that are fully enclosed that rely upon color coding the various sections of the map. This doesn't work well, because it takes a lot more processing on the part of the player to establish orientation. The colors of one end of the map may be the only thing they see and only when they are at that end of the map. They may have trouble identifying how the colors of that section relate to the other sections.

Publisher maps can rely upon techniques using skins, such as Adrift's door numbering system. Again, it becomes irrelevant if you do not know how the numbers are laid out in the first place.

Other examples include Citadel, Assembly, Zealot, and Haven.

The Weenie
Putting what I just shared into contrast, that regardless of where players may be on a map, if a central structure is towering high into the sky, they can use it as a known location on the map and learn their relative position from there. In level design lexicon, this structure is referred to as the weenie (no joke!).

Examples of publisher maps that leverage a weenie include Sandtrap, Last Resort, and Spire.

Massive Terrain Off The Side Of The Map
An even better approach is the use of terrain at one end of the map. Take for example The Cage on Forge World. It was literally attached to the side of a cliff, and the cliff itself was the source of orientation as it towered along one side of the map. It was in essence a weenie that was towering on one end of the map. This is one of the best examples of using terrain as a source of orientation, because The Cage was very open and the cliff was very massive in both vertical and horizontal directions.

If you were looking away you would know it because you couldn't see any of the cliff wall. If you saw any of the cliff wall in your view, you knew what direction you were looking in. The terrain on The Cage was essentially a weenie to an asymmetrical map attached to the side rather than being in the center of the map.

This concept of a weenie attached to the side of a symmetrical map has greater value, because unlike a weenie in the center of a symmetrical map, the distance from the weenie can be used to help orientate the player's location on the map as to which side of the map they're on. If the weenie were in the center of a fully symmetrical map, in the absence of any other unique aspects between the two sides, the player can only determine their distance to the center, but not which side of the map they are on.

Other examples of towering terrain being unique to one end of the map include Valhalla, Abandon (to a point), Solace, Avalanche, Construct, and Last Resort.

Spawning
I recommend against enclosed maps for the reason that they never seem to be as beautiful as those with at least some view of the Canvas. However, if your map is enclosed, the orientation of your spawn points need to be optimized for player orientation – they likely already suffer for a lack of weenie in the center of the map or massive terrain along one side, so you need to make up for it in some way.

If your map uses a weenie, then orient the spawn point so that the weenie is at least partially in the field of view. This should give

immediate orientation to the center of the map upon spawn.

If the terrain provides a massive wall along one side of the map, then the spawn point is free to orientate in nearly any direction, since the absence of the terrain wall in the spawn field of view can be just as orientating as its presence is.

Summary

Maps that rely on skins and colors for identifying where you are located are the most difficult to process orientation, because those markers are local to those sections of the maps.

Weenies provide immediate orientation to the center of the map, allowing other aspects of the map to fill in the orientation to the map itself – e.g., which side of the weenie the player is on.

Massive towering walls of terrain on one side of the map provide instant orientation in direction and distance from that end of the map.

Spawn points have different needs based upon the approach you choose for your map.

Segmentation

If you take a flat open Canvas without any obstacles and call it a map, you can essentially shoot anyone on the map – there isn't any cover. If you break the same Canvas up with large walls into many little Spaces, you can only shoot those in the same Space that you are in, while spending most of the game chasing each other from Space to Space in a boring hide and seek. The balance you need to find as a forger is in how much segmentation you should forge into your map to make it fun to play on by creating both meaningful and timely engagements.

Regulating The Frequency Of Engagements

When a map has just one large Space and no cover, the frequency of engagement is by definition continuous – without any LOS blocker between players, there is no reason to not shoot immediately and continuously. Then with the introduction of each LOS blocker, that frequency is slightly reduced, depending upon the required

time to pass around it. The more LOS blockers you add, the less frequent those engagements occur.

Now take this concept to an extreme, and simply build a wall down the center of the map. The wall breaks all LOS between the two halves, allowing a player to freely move about one side of the wall so long as the other player is on the other side of the wall. Since a player must now traverse the segment he is in to get to the other segment, the time between engagements is significantly increased.

This additional delay is an important aspect of level design for FPS games. It allows players to catch their breath, to recharge their shields, to reassess their strategy, and to take new courses of action that will lead to the next engagement that is more on their terms and more at a time of their choosing. This forms a cyclic experience of engagement-recharge, whose frequency when tuned makes the overall Game Play enjoyable rather than frustrating (too fast) or boring (too slow). And to tune this cyclic frequency, one needs to balance the number, size, and relative positions of the map's segmented Spaces.

Faster Than Sprint Movement

For maps designed for 8v8, vehicular movement is an important feature and can increase the frequency of engagement by making movement from one section to another much faster. Other means of moving faster than sprint speed include man cannons, grav lifts, and teleporters. (These will all be discussed in later lessons as they have important issues to consider beyond this topic. I raise them here only to note that there are means of traversing the map beyond foot and jetpack that are much faster and can impact the frequency of engagement.)

Other Applications

Spawn locations will always be a factor in your forging a map. Depending upon how the spawn engine for the given title functions, you may be able to leverage your map's segmentation to help create safe spawning.

For titles that favor spawning away from an opponent (e.g., Halo 4), this is particularly true, because spawn locations in a Space can be

typically positioned to be used when it is known that an opponent is not within the segment.

For titles that favor spawning away from death (e.g., Reach), this is not necessarily true. But keep in mind that you can still use segmentation to influence spawning to some degree.

Leveraging Elevation
Elevation is a key means of segmenting the play area, not just in the two dimensional plane but in creating multiple sections above and below each other, and at odd angles as well. Elevation should be a primary driver to segmenting your map. But the topic of elevation is vast enough to warrant a lesson of its own.

Summary
By erecting structures, you segment your map into distinct play areas that are typically isolated from each other.

As the forger, you tune the frequency of engagement by how many segments you have and how they are laid out relative to each other.

Depending upon the title's Spawn engine, you can leverage segmentation to ensure safe Spawning.

Elevation is a key level design concept that you should be using to segment your map.

Elevation

Elevation is a key concept in level design, and this no less true for Halo. Elevation can help make your map more interesting visually, interactively, and tactically.

Relieving Boredom
Forging Walkways and Spaces can only go so far. A flat map is going to suffer from boredom. Maps that contain variations in elevation through out are simply more interesting to look at and move about on.

Adding variations of elevation through out your map can give players more interesting perspectives of your map. Being able to stand on high ground and see over obstacles can offer a feeling of empowerment that players tend to

want and need. It helps them explore and learn your map in different ways other than just walking around.

Now compare that with a map that is predominantly flat. Can you see yourself having to run around the map to see all the parts of it because you cannot see over terrain or structures?

Being able to change your elevation can offer perspectives of your map that are simply more interesting.

Encouraging Movement
It isn't just how the map looks, but how players feel when they traverse the map. Moving up or down gentle ramps simply feels more interesting, and having some Paths move down under and hide below other Paths and Spaces can increase the curiosity of players to explore your map.

You probably would not be able to think of a map where players preferred to move exclusively about the ground level. This is because players just find ramps more interesting than flat ground and will choose a Path over a ramp more often than to remain on flat ground.

Terrain makes some of the best ramps, partly because they look more natural – more like they belong there. But they also offer subtle movements up and down that are more natural because the movements are not steady – terrain is never straight at any angle.

Consider the sand bar on Forge World. It gently slopes up in a natural curve to a flat surface. The slope is not a stead angle like a ramp block – not in any direction. And it is this natural, uneven, rough slope that a significant segment of the population would prefer to play on.

Enhancing Game Play
Adding variation of elevation through out your map also creates more interesting Game Play. In essence, adding a third dimension to the fire fight adds advantages to players who are above their adversaries. The player above can just step back to take cover while the player below is more exposed to fire from above than from the horizon. With the player above looking down, his oblique angle to the ground makes it possible to

easily aim explosive ordnance at the ground to take down his adversary, while the player below has no comparable target unless the player above is under a low hanging ceiling. And the player above can jump down to the player below while the player below generally doesn't have a corresponding movement up. (I would not consider jet packs comparable to jumping, because they are slow and leave you exposed.)

Clearly the player above has additional advantages while the player below loses some of what he already had. The general rule is that elevated positions offer additional protection, reduce effectiveness of cover below, make explosive ordnance easier to use, and offer more movement options to the player above.
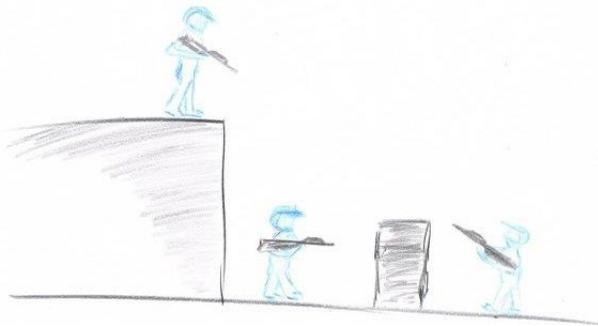
On the other hand you can wind up with a high position that is so exposed that holding it becomes a risk. While stepping back may shield a player from fire below, other means of cover may be necessary to cut off other sight lines.

Angled Walkways, or ramps, are useful to changing a players elevation in small ways that result in using the ramp itself as cover by backing down the ramp. For mid and long range fire fights, this is a powerful use of a ramp between two levels at different elevations, even if one is just a little lower than the other. This concept is perhaps one of the most basic in FPS, and you need to embrace it through out your map.

Angled Walkways that are open on one side can increase your map's skill gap by making strafing left and right also up and down. This makes strafing more challenging, increasing the skill gap on your map.

Wrap Around is a term for a Path that moves up and around on itself so that when you reach the other end of the Path you find yourself at the power position looking down at the start of the same Path. This type of feature can add interesting Game Play to many maps, as the struggle for the high ground begins with being exposed at the start of the Path itself, under fire by the one holding the power position above.

Orthogonal Paths – one Path crossing over the other – offer protection for the lower Path directly below the higher Path to the degree that the player above is unwilling to abandon his position of power. Orthogonal Paths tend to make maps interesting so long as there are not so many of them crossing each other that the map becomes a maze, creating confusion for even the more skilled. And allowing players to jump down from the high Path to the low Path simply gives players along the high Path more options.

Having a cascading series of elevated platforms allows you to limit the view of the ground position from the top position by hiding portions of the ground in the blind spot of the intermediate elevations. The player on the top elevation is then forced to abandon his position at the very top to that of the intermediate position if he is to get a better angle on his adversary below. Again, this incentive helps make your map more interesting, because it forces players to abandon one advantage for another.
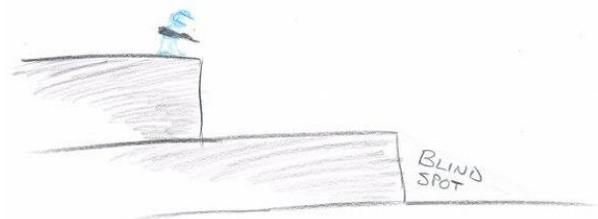
If an elevated platform stretches across your map with nearly unobstructed sight lines, then the platform should probably be segmented. Subtle changes to the platforms' elevation through the use of small ramps could help; or even a small pass through structure that breaks the sight lines.

Take that thought further, when two elevated platforms of equal height face each other, they can feel like the same platform with a hole in the middle. That is, it can feel like one large flat area. Others might recommend you place them at unequal heights to maintain some verticality in engagements, but I believe it depends on what you are trying to do with the opposing ledges. At least you are aware of the primary issue that opposing ledges presents.

Trick Jumps

Trick jumps are fun for some players who have skill and want to utilize their skill to create an advantage for themselves. But they should never be the primary means of getting anywhere on a map. They should only be short cuts that skill can leverage, increasing the skill gap of your map. Never make the principle Path require jumping; rather use ramps and staircases.

Trick jumps should be intuitive only as the short cut. It can be confusing to see the principle Path appear to go over a crate or some block that requires jumping. Someone may look at it and think, Is that the direction I should go? When all along it is just a short cut, but the principle Path is not obvious at all.

Summary

Forging elevation into your map makes your map more interesting to look at and interact with.

Elevation adds dynamics to Game Play by adding vertical elements to engagements.

Elevated positions generally offer players advantages, and tend to yield power positions on your map.

Elevation can add additional dimensions of Game Play to the players and offer more options of design to you the forger.

Ensure you do not create confusion through misuse of trick jumps as a means of creating Paths upwards to higher elevation.

Paths To Power

Elevation produces power positions on your map. The power position must not be so strong that a player cannot be dislodged from it – there should be several Paths to the power position, and each from a significantly different angle to permit flanking. So long as the players in the power position can be dislodged, camping in that position shouldn't be a significant problem. However, it would be better to give them incentives to abandon the power position.

One form of incentive is a Pickup. If the Pickup is at the power position, then the incentive shifts significantly to remaining at and controlling the power position. But if the Pickup is down below, then there is the incentive to abandon the high ground. However, if the Pickup does not pose a serious threat to the player holding the high ground, then he might remain and use the Pickup as bait.

Another motivation to jump down is the thrill of the kill – that is, not allowing an adversary to escape; while the motivations to remain above are either to maintain the safety that the position offers, or the unwillingness to endure the effort to return to the top again.

To offer incentives to abandon the power position, the map must offer Paths (generally beginning with jumping down to the lower level) that allow for a quick engagement while his adversary is still vulnerable. This implies that once engaged, the player below can quickly find cover from above, but that the cover serves as a trap and doesn't allow the player to go any further. The player above can then come down and finish off his adversary.

Not knowing if other enemies are nearby, the decision to jump down could be the wrong decision. This means that it would help your map to make it where he cannot determine on his own how close the other adversaries may be. This promotes team work by forcing the player above to rely upon team communication to make a more informed decision

Maintain Value

Power positions are valuable, so you don't want to make them cheap. A player must earn the position and must continue to earn it to keep it. If a player jumps down, then they had to have had a good reason – there was some incentive

drawing them down. It doesn't matter what that incentive was, it had to be more valuable than the high ground because he chose it over the high ground. So there needs to be a cost involved – a penalty to pay.

To make the return back to the top instant via a teleport or a grav lift, the player loses nothing but is merely inconvenienced that he had to jump down at all. But by making the trek back to the top somewhat cumbersome or time consuming you make him weigh his risks and penalties to return first.[1]

This is not to say that a grav lift or teleport cannot be used to move up to the high ground, but that it cannot be just a few steps from where the player jumps down. If using grav lifts or teleport to the high ground, make it time consuming to reach once down below.

On the one hand if you intentionally create a power position on your map, you want to make it effective over a significant portion of your map. You want it to provide sight lines to a substantial, if still a minority aggregate of your map. Since we are talking about forging for the playlists, it is unlikely that you want any one power position to be able to influence most of the map. Power positions that dominate most of the map are more descriptive of tournament style Arena maps than most of the playlist maps.

When I say you want it to be effective, I mean you want a player at the power position to influence movement at more than just a couple of locations here and there. You want the player to be able to impact overall Game Play by significantly retarding the movements of the other team.

Summary
Elevated positions typically are powerful and you generally want several opposing ingress Paths to it so that it cannot be too powerful where the player cannot be dislodged from it.

Offering incentives to come down from an elevated position can make a map more interesting, because the player holding the position can be torn in deciding what to do.

Don't make power positions cheap, but make a player work to return to the power position if they abandon it.

While a power position should never dominate the entire map, it should have a greater than average influence over the movement of adversaries.

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[1] Katastrophe @ Team Beyond Forum Discussion

Structure

When you forge a map, you are forging structures using blocks from the Canvas palette. But it is the Spaces, Walkways, and Paths that you are really forging. And the Structure of the Space, the Walkway, and the Path are more important than the structure of blocks that form them.

Room To Move
Spaces need to be roomy. They need to create Paths through them that are fun to traverse. They need to have cover to hide behind during fire fights, and that cover should be part of the structural surroundings.

Cover should be part of the structure itself – it should look like it belongs there, lest the structure feels incomplete. When you plan out the structure that you want to forge, you want to plan on how the structure itself will provide both the necessary cover and the necessary room to move about. You want a structure that will accommodate both the movement and cover that you want the Space to provide.

Spaces need plenty of room in all three dimensions, and these dimensions can change from one end of a Space to another. What is important is that you consider how these changes will impact movement and cover as one traverses the Space. If you try to squeeze the middle of a Space, it may provide cover well enough, but you could make it unwelcoming to pass through. If there are sharp corners within the Space, that should be okay, so long as a player is not forced to make the turn right at the

corner where a camping shotgun may be waiting.

Shallowing The Turns

It is important that when a player turns a corner that they can do so away from the corner, or that the turn itself is shallow so that the corner cannot conceal a camper. This is true for both Spaces and Walkways.

Unlike Spaces, however, Walkways should have a consistent width and height from one end to the other. This means that if the Walkway is narrow (e.g., say two Forge Units), then any turn in the Walkway should be shallowed to avoid campers around the corner. Making a 90 degree turn into two 45 degree turns or into three 30 degree turns is what I call shallowing a turn. Using curved walls is also a good way to shallow a turn.
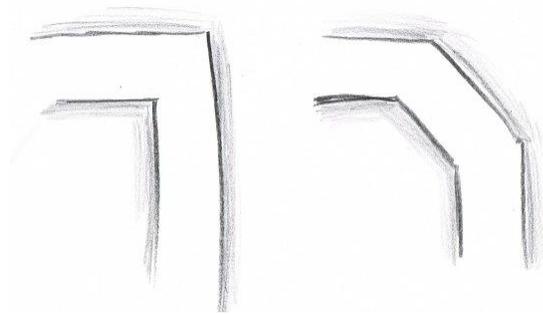
Shallow turns allow a player walking at full speed (perhaps even sprinting) to have time to react to campers around the corner due to the way that the camper emerges into the field of view of the player turning the corner. Unlike suddenly finding a camper at your feet at a 90 degree corner, the camper may be some distance away while they become exposed to the player making the turn.

Tight, narrow turns if at all should only be in places where heavy defense (e.g., flag room) is necessary for the purpose of giving an edge to the defenders – to make the last line of defense a bit more powerful. But anywhere else I think you want to consider either wide areas around the turn or shallowing the turn itself.

Dance Floors

A Dance Floor is any area that a player can jump and move about erratically to throw off the aim of their opponent. Every Space that you forge should have plenty of room to dance about in, and in all three dimensions. Any constructs within a Space that hinder dancing can lead to frustration during fire fights.

With Walkways, the width is some times limiting, making dancing more two dimensional – up/down and forward/backward. This is okay, and is sort of expected, but you don't want this limitation to be over a long length of Walkway. If all one could do is back out the way they came while dancing up and down and backward, the Walkway will feel like a trap, and discourage players from taking it.

The rule is to avoid low ceiling everywhere on your map. There may be a place for them on your map, but that alone would make your map the exception. Consider carefully if the frustration is a warranted risk you are willing to forge into your map.

Cover

Cover on a map should not just be for cover alone. In most cases it should be part of the structure itself. This is the most ideal, because it helps your map look more realistic and less cluttered at the same time.

But in some cases you will be in the open field and want to plant rocks or trees. Rocks, trees, and crates are good examples of Lazy Cover – cover that is thrown onto the map and doesn't really look like it was originally part of the design of the structure or even the original intent of the map. The difference is that in open fields, rocks can actually look like they belong there, that they were not an after thought. How you pull off rocks in an open field is more a matter of Art than Geometry, and we will talk about this later.

If you use rocks in an open field, and really any sort of cover not part of the structure itself, then you want to give the rocks additional purpose and utility. By making it possible for players to run up an incline edge of a rock, you offer them the ability to raise their elevation to see over other obstacles, while also giving them the ability to move back down the inclined edge of the rock for cover. The rock no longer provides just cover alone, but also advantageous sight lines. This is Multi-Purpose Cover. In other words, if you are going to add cover somewhere

that doesn't look like it is part of a structure, then at least make it useful in some other way so that it can also pass as cover.

Leaves on trees and bushes make great examples of Soft Cover – cover that is only able to shield you from your adversary's vision, but not their fire. The leaves on Boardwalk are the best examples of Soft Cover. They allow snipers to hide and wait for targets to appear in their sight lines while being very difficult to spot through the leaves. The colors of the leaves on Boardwalk were also a hue that gave neither red nor blue team an advantage. They are both equally blending and contrasting with red and blue. That is why those specific shades of hues are chosen by the publisher in the first place.

Summary

Structures need to provide room to move, engage, dance, take cover, and recover. Cover should be built into the structure itself – and the structure should look incomplete without it.

Walkways should be of consistent width and height. When narrow, corners in Walkways should be shallowed to avoid surprises from campers.

Avoid low ceilings.

Lazy cover should be avoided unless you can make it a necessary component of your map; and then it needs to provide other functions besides just cover.

Soft cover is for hiding behind though it doesn't actually protect.

Approaches

We talked about how the approaches to a teams' base need to provide variations in play style so that more players find the style of approach that they enjoy best and can also have the opportunities to try different styles against their adversaries. In this lesson I want to discuss making the approaches interesting through the bases' Geometry. That is, I want to discuss how a Lobby can help add to the map's overall fun for a wider group of players by providing more options to the players invading a base.

Lobby

A Lobby is the term I will use to refer to an anti-chamber, or small room or tunnel, that leads directly into the main Space. For the purpose of this discussion, we will look at base design, but the concepts are useful through out a map. Players can use a Lobby in several ways, such as a staging area, a stealth approach under cover, and a recovery area after a mad rush to the enemy base. The Lobby accomplishes each of these through the common feature in the Geometry that provides cover both from adversaries in the base and outside the base.

Staging Area

Remember we said that a base with opposing ingress Paths helps make it possible for a team to coordinate a push from opposing directions, in essences creating a flanking maneuver against anyone in the base? Well, having a Lobby along one of the ingress Paths helps to setup such a push. One or two of the players can move into the Lobby and wait for the rest of their team to setup their approach on the other side of the enemy base. They can essentially hide in the Lobby, so long as their adversaries guarding the base don't make regular rounds to check the various approaches.

The effectiveness of a Lobby being a staging area is in part due to its Geometry. If it's doorways do not allow being observed readily from either the exterior or the interior of the base, then it makes a great hiding room to wait in.

Take the upper tunnel to Longbows' base back against the mountains. Since most players remain down below, anyone in the upper tunnel is generally safe.

Take the lobby to Boneyard's ship in Invasion. Even if the Spartans knew the Elites were in there, often times they realized that it was safer to just stand back and wait for the Elites to emerge, rather than be taken down as they moved through the doorway (which had a very narrow, yet sharp corner). It was generally an effective staging area in many cases.

Take the lower tunnel into the bases on Standoff. Once far enough into the tunnel, you could not be seen; yet, you didn't have to emerge into the next room of the base. And

even if you did, it tended to act as a Lobby as well (so long as the guards didn't make their rounds down there).

Stealth Approach
So many times I have seen players approach in Stealth through a Lobby before springing into action when the base empties out (when his adversaries all go outside). The Lobby's Geometry offers cover from being seen, particularly after the Active Camo runs dry.

Once in the Lobby, the player can slowly sneak up to the base proper, such as the flag room, and wait for the room to become empty before making a run for the flag.

Recovery Area
Another use for Lobbies is the protection their Geometry offers when a player is making a mad rush for the base and is being shot at along the way. If he successfully reaches the Lobby, he can rest and recharge his shields while his adversaries are making their way to where he is at. The Lobby buys him time to recharge, while not directly moving into the base proper.

Summary
A Lobby can make a base more interesting by offering a place to stage for a coordinate push.

Lobbies can be fun for players that enjoy the stealth approach (to the enemy flag for example).

Lobbies can also double as protective areas to recover and recharge shields in before moving further into the base.

Symmetry

When discussing symmetrical maps, forgers think of maps where both halves are mirror images of each other. But symmetry is more than just the layout of a map. At the core of symmetry is the forger's ability to enforce the rules of the game. And I think it can help to see how symmetry is used in sports to better understand how and why it is used in level design.

Symmetry In Sports
Basketball is a fully symmetrical game. From the initial toss of the ball at the center of the court (the initial rush) to the conclusion of the game, each team is afforded exactly the same opportunities. The game is played on a fully symmetrical court. The reflective translation of the court's layout provides equal distance and equal effort to each team's hoop regardless of where you begin along the court's center plane. All of this creates pure symmetry in the Game Play itself to ensure unquestionable fairness through continuous equal opportunity to score, since both teams can score at any time.

Baseball is a fully asymmetrical game. Each team plays only one role (offense or defense) during a single Round, switching roles every Round. Two consecutive Rounds are called an Inning. The game is played on a dramatically asymmetrical field, where defense has free roam everywhere except the batters' box, and the offense has both exclusive access to the batters' box and shares only the Paths between the bases with the defense. In Baseball, there is never equal opportunity to score at any one moment in time, for only the offense can score. Rather, opportunity to score is balanced through the aggregation of any one pair of Rounds.

Football is a blend of symmetry. Asymmetrical properties of the game include a first and second half, essentially two Rounds. Each half starts with a kick off in which each team is the kicking team only once. The teams also change ends of the field to balance any benefits that the wind may offer. And each team plays a role of offense or defense, where the ball is owned by the offense. Symmetrical properties include the field layout, both teams can score on any play, and the asymmetric roles can change any number of times for any length of time.

Pool is the fourth example of a sport that I want to introduce, because it has a very interesting dynamic that is also found in a couple of Halo Game Types. Like Football, Pool is a blend of symmetry. One person plays at a time (one person is offense at a time and only he can score), and the changing of the roles (who can be the shooter) can change any number of times and at any time. But what makes Pool very different is that the player who is shooting

is winning, because until he misses and loses his turn, he is the only person who can score.

Symmetry In Halo

When we talk about symmetrical maps and asymmetrical maps, we are talking about how the Geometry, the Spawns, and the Weapons are laid out to establish either perfectly equal opportunities to yield an unquestionably fair game; or to establish the two ends of the map uniquely for the roles of offense and defense, regardless of how different the two ends compare with each other. In this respect, it is actually going to be easier to discuss asymmetry in Halo first, because there are just a few true asymmetrical Game Types that we need to cover.

One Flag, One Bomb, Territories, and Invasion are all examples of fully asymmetrical Game Types. Like Baseball, the goal is never to establish equality of play, but to promote unequal Game Play through team roles, while seeking fairness through the pairing of complimentary Rounds. For these Game Types, map symmetry is neither required nor desired; but rather dramatic asymmetrical Geometry supporting the role.

Static Spawning is required; yet the Spawn layout for each team is driven exclusively by the surrounding Geometry and not in any way by each other. Weapons can be placed in the middle of the map for an initial rush, but this is not necessary. Instead, each team has their own weapons and vehicles uniquely chosen to aid them in their roles.

For Invasion, the asymmetry goes a step further, and each team plays Invasion as a unique race depending upon their role on the given map; and the weapons and vehicles for each role match the race for that role.

Juggernaut and Living Dead are the most extreme of asymmetrical Game Types that I can think of in Halo. Not only does each team have unique roles, but the population of each team is different and dynamic. In each Game Type, players of one team can switch to the other, and the two teams are typically unbalanced.

It is these Game Types that I feel Pool makes the best analogy. So long as a player is a human

in a Living Dead (Flood) Game Type, he is winning. Why do I say that? Because he can rack up pretty much endless kills. Once he becomes a zombie (or the Flood in Halo 4), there are only so many points that he can accumulate.

The same is true with the Juggernaut. So long as a player is the Juggernaut, he can score.

For these Game Types, there are no symmetrical requirements for the map. Dynamic Spawning is best; and there are no initial rushes for power weapons, because the weapons used are restricted to each team's role.

All other Game Types are symmetrical, because they require both teams to continuously play the dual role of offense and defense, just like in Basketball. And it is this dual role that requires equal opportunities at all times in order to establish fairness of Game Play. But as with any rules, if you can make the Game Type play better in other ways, you should.

Slayer and all of its variants are symmetrical Game Types for the reasons given above. The key difference between the Slayer variants and other symmetrical Game Types is that Slayer has no objective.

CTF, Neutral Flag, Assault, Neutral Bomb, Ricochet, and Stock Pile are all examples of symmetrical Game Types for which the objective has a corresponding goal that is fixed to the bases; and with the exception of some Stock Pile implementations, their objectives never move across the map during Game Play.

KOTH, Odd Ball, Land Grab, Head Hunter, and Extraction are all examples of symmetrical Game Types for which the objective moves across the map during Game Play.

Categorizing the symmetrical Game Types like we did shows us patterns common between various Game Types. And those patterns have differing levels of needs for symmetry. What works for CTF will work just as well for Ricochet for all the same reasons, but not for KOTH or Slayer. So let's look at how to forge for these Game Types.

Symmetrical Maps

Symmetrical maps come in two flavors.

Reflective Translation is what we would call a mirror image, where a map is divided down the center and each half is a reflection of the other across the center plane. This is the more common form of symmetrical Geometry, but it carries the stigma of being too simple, too artificial, and too symmetrical to enjoy. Some maps, like Narrows, Haven, Construct, and Countdown, can pull off Reflective Translation so well that the symmetry seems natural and compelling. (I will talk more later about why they succeed so well.)

Yet, players love asymmetrical maps, because they look more natural – they are more interesting to play on. You can forge a symmetrical map and try to make it look asymmetrical by using different materials on each half. I saw one map where one base was forged out of rocks, while the other base was forged from blocks. They were Geometrically identical, but they looked very different. This approach also helps with orientation, because a player can identify which end of the map they are on by the materials surrounding them.

Another approach to hiding symmetry in a fully symmetrical map is to forge a Rotational Translation map. This is a map in which both halves of the map are identical to each other, but rotated 180 degrees around the center of the map. Asylum was the best example of this type of symmetry. Both teams saw exactly the same terrain before their bases – rocks on the right, and an open area on the left. Traversing either side of the map leads to different terrain as you cross the map's center plane.

Rotational Translation maps fall short in one way, however. While any point along the center plane is equal distance from each base, the differences in terrain prevent them from being equal effort from either base. If a Hill, a Territory, Odd Ball Spawn, or a Head Hunter goal is to be equal distance and equal effort to both teams' bases for a fully symmetrical experience, then they must be forged along the center plane of a Reflective Translation map.

Deciding The Map's Symmetry
At this point you understand the need for full symmetrical Game Play to establish fairness for symmetrical Game Types; and that forging the symmetrical Game Types that have moving objectives requires both equal distance and equal effort from each teams' bases. But is it truly practical to expect the majority of Game Types to be offered only on Reflective Translation maps? The argument would come down to how much fun is lost to the symmetry? And this in turn takes us to the Football analogy – can we forge a blend of symmetry to make these Game Types more interesting and fun to play?

Reflective Translation offers perfect balance and ultimate fairness, but nearly always at the price of boredom. Rotational Translation offers perfect balance and ultimate fairness so long as the Game Type doesn't require moving objectives across the center plane, and to some degree a touch of boredom (symmetry cannot be hidden completely). And asymmetrical maps offer the best opportunity to captivate the imagination of players, but offers the forger the greatest challenge to achieving near balance and fairness. If you choose to implement any symmetrical Game Type on an asymmetrical map, realize your number one driver is to create an environment so thrilling to play on with so little imbalance that what imbalance your map has is easily overlooked. So long as you achieve a great experience and you truly minimize imbalance, your map will be taken seriously.

Regardless of the map's symmetry or lack there of, there are important considerations to keep in mind.

Spawning
For those symmetrical Game Types that have base fixed objective goals, Static Spawning is required regardless of the symmetry of the map. This ensures that a team will always Spawn near their team's base and never at their enemy's base.

For all other symmetrical Game Types, Dynamic Spawning is usually preferred. In fact, I would argue that Dynamic Spawning is necessary for asymmetrical maps, because it helps balance access to key parts of the map. If there is a benefit to north end of the map, it wouldn't be fair to allow only the blue team to spawn at that end all the time. Dynamic spawning helps balance out the spawning across the map and all the opportunities that come with it.

Minimize Imbalance

If you choose an asymmetrical map, you will need to work extra hard to minimize imbalance through out the Game Play. This is where things can get tough. While testing you will not be able to prove you discovered every imbalance your map has to offer. You can only discover imbalance, but you can't know what it is you haven't discovered yet.

Regardless of the symmetry of the map, initial rush for Power Weapons should still be on your map, and they should all be at the very least equal distance and as much equal effort from initial Spawns as possible.

Moving Objectives

Let's step back and talk about the difficulties of forging the symmetrical Game Types whose objectives move across the map. We talked about how if you use a symmetrical map for the purpose of fairness, then it must be a Reflective Translation map, because Rotational Translation maps don't offer equal distance and equal effort together. But quite often even the perfect Reflective Translation map will make a Game Type like KOTH boring, because the Hills are always on the center plane of the map. So if you are like me you want to scratch the entire idea of attempting to forge a symmetrical map to forge these Game Types on. That leaves you with asymmetrical maps, or maps that are more interesting. This forces you to focus on making the map so interesting to play on that any imbalance that may be perceived is accepted as necessary to make the Game Type playable – to make it a lot of fun!

A far more interesting experience is an apparent random scatter of objectives across the map. For this reason you do not want Static Spawning, because you never want one team to have an advantage over a given Hill, Territory, or zone. Dynamic Spawning is best in these cases to allow players generally equal access to all parts of the map upon Spawn, and it also penalizes death by making the player spawn further from the action.

In these kinds of maps, you may also want to consider where you place the power weapons. If you place them away from the objectives, you tend to increase the opportunity for Spawning

players to acquire them. This can help prevent the game from turning lopsided.

Additionally, if a power weapon spawns at a distance from a Hill, then a spawning player may be torn between trying to take the Hill quickly or rushing the power weapon to help him take the Hill a little later. These kinds of difficult decisions can make your map more interesting to play on.

Summary

Symmetry is a key to enforcing the rules of a game and fairness of opportunities.

Making a Game Type enjoyable to where it becomes truly playable is just as important if not more so.

In each Game Type, there are Spawning rules and other formulas you need to follow to have your map taken seriously.

Traffic Patterns

Players moving around your map will create traffic over the Paths you intentionally or unintentionally forged. The Paths that they take represent choices that they make, either naturally or under coercion – either they wanted to take that Path, or they reluctantly took it feeling they had no choice. You want to offer choices that the average player would predominately wish to take to give the best possible experience. And you want those Paths to spread the traffic across your map somewhat evenly to reduce congestion at any one location on the map. Observing the traffic pattern – the aggregate analysis of these choices – can help you adjust your map to improve overall traffic flow.

Shortest Path

A player will naturally want to take the shortest Path from where they are at to where they want to be next. One of the things you as a forger should consider is what Path would a player see as the most natural Path to where they want to go? The best way to do this is literally stand at the start location, look toward the destination, and consider what the player sees from that perspective. What Paths look like they move toward the destination and what Paths look like

they move away from it? What they see will be the primary driver of their decision.

You don't want to make your map a maze. If a Path initially looks like it heads toward the destination, then it really should. It can become frustrating to enter a tunnel only to find out it was the long way. Paths that are intuitive tend to promote healthy traffic, or what some people call good flow in a map.

Then consider that they have learned the Paths on the map. Position yourself on the map at the start location again and determine how much if at all the decision of Paths to take would change based upon what they will learn to be the shortest Path to their destination? If their decision has changed a lot, then that is a clue that the Paths were not initially intuitive, or that there were too many surprises along the way.

This is perhaps the only real way to get a sense of what a player will do in forge. Test playing your map and then reviewing the film in theater is another way. Given this information, you can determine which Paths may need to be altered to shape the traffic you desire on your map, and to help reduce and even avoid congestion on your map.

Avoid Congestion

To some extent Spawning will help reduce congestion, so long as the title's Spawn engine is designed to spawn players away from the enemy. They will wind up spawning away from any location that the enemy is congregating at, which means that it will take time for them to return to the action; but sprint sort of defeats this feature.

The predominate problem with congestion is the feeling of having to endlessly defend yourself from the next guy that you need to fight off. Too many players in one place for any extended period of time starves players of the breather that they need between engagements.

On the other hand, when traffic is spread out evenly, one engagement at one end of the map won't be prolonged endlessly because the other players are else where. After the engagement, a breather can be taken to setup for the next engagement.

Methods Of Movement

Another aspect you need to look at is how players move about on your map and how that affects overall traffic patterns across your map. The slowest form of movement is walking; the fastest form of movement is the teleporter. All other forms of movement are somewhere in between. And since a player will want to get where they are going as fast as possible, the means of movement are important to consider, not just the Paths you forged on the map.

Vehicles can offer faster than sprint movement, but only if the vehicle is available. If a vehicle has been jacked, destroyed, or is in use by others on the team, then a player is left with walking (for example). You can regulate the amount of vehicular traffic (and thus the faster engagements they offer) by the number of vehicles you forge onto your map and their respawn times.

Man cannons offer fast movement. But it is recommended that this fast movement be balanced with the risks of exposure by allowing the player to fly high in the air in view of players across a good part of the map, or land in an opening with next to no cover. And never allow a man cannon or grav lift permit a player to bypass the efforts necessary of taking a power position, lest the power position becomes cheap. Having all of that in place, consider how the man cannon or grav lift may be used to get to a destination – how likely would someone want to risk using it and what are the alternatives? Are the alternatives true alternatives or coerced and undesirable alternatives?

Incentives

The map you forge should be playable on its own. It should not be forged for any power weapon. Instead the power weapon should support the map. I talk more about the power weapons and what to consider, but for now I just want to emphasize that any power weapon you place on your map should not be necessary, but should be complimentary and supportive by improving the Game Play. For example, and this is the point that I am making in this lesson, power weapons can be used to help players want to take certain Paths.

A Path to a power weapons will be a more natural decision on the part of the player who

really wants that weapon. You can use the power weapon as a way to give incentive to alter the traffic pattern in one area of the map. For example, you know that players will move along a specific Path, but would like some of that traffic to divert further toward the edge of the map. Placing a power weapon near the edge will yield that shift of traffic for you to some degree and only when the weapon is available.

Typically the initial rush for a power weapon such as rockets necessitates that the rockets are placed near the center of the map on an elevated platform. Not only do the two teams have to rush forward, but one of them must climb up and get the rockets while his team provides cover fire for him. Such planning can actually drive traffic more in desirable ways for the sake of the initial rush or other common Game Element that is fondly desired.

But it seems to me that the most important reason for using power weapons is to help shift traffic into conflict, to drive conflict, using the power weapon as bait for both teams. This implies that the location of the power weapon will be along a natural and desired Path, but in full view, exposed to both teams on each side. And that this exposure creates risk that in turn reduces congestion itself.

Deterrence
Open areas on the map – areas without cover – is a strong deterrence to choosing a Path. Such a Path, if necessary to get to the intended destination, becomes coerced and can create frustration for the player who doesn't want to take it but feels they have no choice. This is different than exposing a power weapon in the open. In the latter case, the power weapon can be used as bait – the player doesn't need to go after it, but can stay back and shoot at those that do.

My point is that there is a big difference between wanting to grab rockets and needing to go steal the enemy flag from their base. The former is not necessary to win the game, the latter is. Given the same open area for both, the latter will result in frustration.

I have heard so many players tell me on so many occasions how an area was way too open that they felt too vulnerable. But they had to cross the open field to be able to score. This is not what you want from your map.

Traffic Direction
In general you will be creating a map that either has base assigned goals or not. In either case, but more so for the latter, you want the direction of traffic to be flowing in generally a singular direction. That is, you don't want players to have to turn around 180 degrees. The exception is when they grab the flag, and that is about it.

I am not saying that your map should be a doughnut shaped map. I am saying don't create situations where players are having to turn around as a natural part of the Game Play. Turning around to retreat is normal. Turning around because one finds a Power Weapon at the end of a dead end tunnel is not.

Summary
You want to offer your players intuitive choices of Paths to take where all they might know is what they see in front of them.

Avoid Paths that are misleading or overly complicated to figure out.

Forge your map to reduce congestion, lest players wind up engaging their adversaries too often.

Use power weapons to influence traffic, especially to bait engagements.

The Correct Question

Once I was in a lobby and someone asked the question if a particular Path was inviting or not? That questions changed my perspective on forging at a fundamental level. It raised a paradigm shift in how I would evaluate maps from then on. No longer do I forge to a check list of things a map needs, but rather I forge toward a continuous experience of Game Play. This is why I find learning what makes good Game Play more important than what makes a good map. And a player's experience cannot be a result of check boxes, because the player's experience – good or bad – is both in degrees

and heavily influenced by their play styles, expectations, and preferences.

Is It Inviting?

When a player sees a Path that they want to take, unconsciously they ask themselves, How inviting is this Path? Various incentives and deterrents will drive their answer.

Open fields don't feel inviting due to the lack of cover and the threat of being fired upon. Yet, at the other extreme, cramped hallways won't feel inviting either, because they feel like a trap. And areas cluttered with cover won't feel inviting because they don't offer opportunities to move quickly and safely around each and every obstacle.

On the other hand, I think it is safe to say that even an open area can feel inviting on a dynamic level across time – that the answer to this question is not tied only to Geometry. For example, when the player knows his adversaries are tied up in a fire fight else where, an open area offers a quick dash in a straight line; yet that same open area can feel uninviting when a sniper is suspected. While the Geometry has not changed, the game dynamics have changed over time.

Making Paths inviting is key to forging traffic into the patterns you desire, as well as make the map fun to play on.

Is It Engaging?

Another question that is important to ask regarding a Paths is, Is it engaging? By this I mean when encounters occur on a Path, do they result in each side enjoying the engagement?

If one side has a distinct advantage then the other side would answer No. If either side (or both sides) feel too vulnerable then they will answer No. Do you see what this question is asking at a macro level?

Halo is a rare FPS that naturally offers lengthy and prolonged fire fights. At its core, Halo is fun because it has fire fights that one can engage in over a sustained period of time. Making play areas on your map that feel engaging is vital.

To be more specific, a player should look forward to engaging the enemy along a Path. The Path may be in a Space that allows a Arena style battle to take place where both sides fight for control until one side is the victor. Particularly in asymmetrical games where one team is offense and the other is defense – but also in symmetrical games where one player is taking the offense and the other is his team's defender – the Path should encourage the offensive push, create an enjoyable encounter for both sides, and allow the victor to capitalize by using the area to setup another push or defense.

To provide an engaging experience, the Path must include features like the Dance Floor, escape routes, cover, and so forth. I have seen a Space with only two Paths in and out that did this well. It was an essential Path on an Invasion map. It is rare to find a Space with only two egress Paths work so well, but I think the size (it wasn't too large, one could escape backward), and the partial cover in the middle helped a lot.

A major aspect of engagement is that both sides remain engaged until one is the victor. This means that they can find some cover pushing forward to a point so that they are not required to pull back and yield ground to their adversary just to recharge their shields. By being able to remain behind cover, there is some deterrence for their enemy to try to take the Path entirely – they need to protect themselves as well. While this depends upon the skill gap and disposition of each side, in general there is a lot of truth to this concept.

Do I Have Options?

Do you remember we talked about how Spaces should have several egress Paths? One of the questions players will ask themselves (unconsciously) as they enter a Space is, Do I feel I have options? The safety of the Space is driven only partly by how many Paths of escape exist. Other factors can include both cover and elevation (for climbing up on). And I am sure you can come up with more.

As you forge a Space, or even a Walkway, stand in the doorway and ask yourself what the player would see as they decide to enter the Space. Are they feeling limited on what they can do? Are they feeling there are not enough escape routes or the escape routes are too far away or too exposed?

Another context for this same question is when a player moves to cover during a fire fight and they ask themselves if they have options to move from there? This was a critical question for any Invasion map. In Invasion, the Paths were essential Paths and the invaders needed a way to get to an objective along one of the essential Paths. When they came off spawn, they had to immediately find cover. From there they had to have at least two solid options of movement to choose from. Both options needed to look inviting, and at least one would predominately be used if the other was heavily flanked by the defenders.

But the same question is a good question for you to use when you look at the Paths on your map. Consider if a player is moving along, encounters their adversary, and moves to the nearest cover. From there, look around and ask yourself, How many Paths from here are available and are they each inviting? Look at it from the ground perspective by standing behind the cover.

Other Questions
Now that you got an idea of how to ask the right questions that can drive players' decisions on where and how to move about your map, you may come up with some of your own. The point is that you want to ask questions that relate to the movement of players and the unfolding of the Game Play, rather than a focus on map features. You want to ask yourself questions that keep your focus on the perspective of the player's decisions to move and their decisions to engage.

Don't worry about whether you have cover within a Space. Ask yourself would the player entering the Space recognize the cover as something valuable that they would naturally gravitate to should they need it? Or is it useless due to the way you forged it?

Additionally, when you test play your map, don't ask for vague feedback. Don't ask, Any one got any feedback for me? Ask specific questions that help you get into their heads, to learn what motivated them to make movement decisions. Help them know what kind of feedback you find valuable.

Ask something like, Was the Path to Top Green inviting? You can learn specifically what needs to be addressed by the specific impressions that your map left in players.

Summary
Instead of forging to a check list of map features, forge to a dynamic and continuous player experience.

To do this, ask yourself the right questions in forge.

And ask these same questions in test lobbies to get very specific feedback and to show the other players what you are trying to determine through testing your map.

Foreshadowing

Foreshadowing is a Game Play experience in which a player sees something that suggests the presence of more play area on a map. The effectiveness of this experience eliminates surprise, heightens curiosity, and strengthens cohesion between the two portions of the map.

Invasion's Barriers
The best example of this is found in Invasion, where the map has two distinct play areas separated by a barrier. The players are instructed to take down the barriers to proceed further in the mission. They realize that taking down the barriers leads to what is beyond the barriers themselves. The barriers in essence foreshadow the rest of the map.

Additionally players can see bits and pieces of the other side of the barriers, just a little to confirm there is more – a lot more. The little specks of view reinforce the foreshadowing.

Generalizing
Take a map like Valhalla. The center hill blocks your view of the other side of it until you reach the top of it. While moving towards the hill you can't see what is on the other side, but you know there is another side because you can see how far away the cliff wall is from the hill. The hill and the cliff walls together foreshadow the other side of the hill as you approach it.

Now you may be thinking this doesn't really amount to much, but unconsciously it really does. Imagine you are moving toward the hill, and then when you get to the top and see over it you see a large obstruction, like a gorge, that prevents you from moving further. Would that feel natural? Or would it be a surprise? When you forge your map you want people to get a sense of what is beyond what they see and it needs to be reasonable, expected, never a surprise or a shock. The flow of your map's Geometry and Architecture needs to be consistent enough to make sense. One area of your map should naturally foreshadow the next.

Any ramp can help you suggest where it leads to by giving the player a little view into the Space at the other end of the ramp. If the ramp leads down into a basement of sorts, just seeing the floor immediately around the entrance of the Space is helpful, because they can already see what materials the flooring is made of, so they have some idea of what they will see once they get inside.

With each step around a round wall, the map slowly unfolds into view of the player. The round wall helps you to give the player the feeling there is more to see of your map if they just keep walking.

A single window breaking the enclosure can help players see just a little more of your map as they head down the Walkway, and can be used to help them see part of where they are heading before they get there.

The grav lifts on Gaurdian and those on Construct both foreshadow the other end of the lifts. The player who sees the lifts knows that there is more to the map and that the lifts will take him there. Lifts are bright to attract the attention of players, to draw them in.

Teleports are bright for the same reason. Clearly they imply there is more on the other end. But they give no clue what the other end may look like. They don't do much foreshadowing.

Summary
Techniques in foreshadowing can offer your players curiosity, and bring cohesion through out your map.

Each part of your map should give a sense of what is beyond it, and you should avoid surprises.

Seeing into a room can help give a sense of what the room looks like.

Seeing around a round wall can help show there is more to the map if one simply keeps moving forward around the wall.

Pace

The term Pace has been used by various people to mean different things. While it isn't a term I want to use in these lessons due to its ambiguity across the forging community, I feel I need to address a few interpretations at least once in this book. And because I have begun to use the term Engagement to refer to how often players engage with each other, I will use the term Pace to refer only to how quickly a team can score.

What Pace Means To Others
To some the term Pace can mean how often players interact with each other. As I said, I specifically use the term Engagement for this definition. How often players engage each other is a key to balancing the Game Play so that it doesn't become too hectic and frustration (too often), and it doesn't become too infrequent and boring (too seldom).

To others Pace can mean the movement of a player across a map. For example, sprint increases the speed of the player's movement. We will address this in more detail in a moment.

To others Pace can mean the player's intent to steadily fire his weapon so that loss of accuracy is minimized. For example, we are told to pace our DMR shots so that we don't fire into a larger bloom field.

But the definition of Pace that I want to use exclusively when talking about forging your map is how quickly the Game Play progresses. And the best metric of this is how fast a team scores.

Sprint Ability
Halo: Reach introduced Sprint as an ability through armor. Halo 4 made sprint a standard

ability for all players at all times. In retrospect, Halo 4 did it more correctly, because maps must be designed in their sheer size based upon the speed of players' movement, whether that is walking, sprinting, flying, driving, etc. It actually makes sense that a title will have sprint across the board or not have any sprint at all. You don't want to forge a map to compensate for sprint if sprint isn't part of the Game Type; nor do you want to forge a map without any consideration for sprint if the Game Type includes sprint.

Sprint serves only to traverse a large distance quickly. While sprinting, the players' abilities to aim, shoot, or throw grenades is on hold. While carrying the flag, the ricochet ball, or the oddball, a player's ability to sprint is disabled. Whether for Slayer or any objective carry Game Type, sprint does nothing to help score points faster.

So if sprint only helps you move across a large map faster, it stands to reason that there should be a reason for having a large map in the first place? With Halo 4, for example, the emphasis was to spawn as far from an adversary as possible. To maximize this Game Element, the map needs to be larger. To make it possible to traverse the map quickly to maintain a healthy Engagement cycle, sprint becomes necessary.

Safe Spawn –> Larger Map –> Sprint

To compensate for the need to sprint, disable engaging the enemy until traversing the map is accomplished.

Safe Spawn –> Larger Map –> Sprint –> No Engagement While Sprinting

So now that we see the relationships between these different Game Elements and the map that you want to forge, you should be able to see why sprint is incapable of increasing the Pace of your map. If anything, it lowers the Pace by making the distance that the flag must be carried longer than one should require; it delays the onset of Engagement slightly as a player moves out of sprint and begins to take aim; etc.

Vehicles

Vehicles can help increase encounters between players and it can also increase the movement of the flag across the map. But vehicles are not a sure solution to increasing your map's Pace. There are other things that can interfere with a flag's movement, for example. Once pinned down in an open field, the flag may sit there until reset to its flag stand.

But clearly a Mongoose or a Warthog can play a role in increasing the movement of a flag. And the Warthog can increase the fire power and speed with which that fire power is brought to bear upon the adversary. Each of these can positively impact your map's Pace. Just don't expect them to be the silver bullet. Their impact on Game Play is never in a vacuum.

How Much Pace Is Good?

It isn't really clear how much Pace is good or healthy for a map. It has also been suggested that a variety of maps with a variety of Pace is good for a playlist, to offer a variety of Pace to the players as they vote. Perhaps…

But I would look at the majority of the maps in the playlist you are forging for and ask yourself how much Pace do they exhibit, how do you feel about it, and how can you improve the overall experience (e.g., by increasing or decreasing the Pace on your map)?

Chaos

As a short side bar I want to add that chaotic Game Play is not always a bad thing. But you need to fit such an experience with the right Game Type and map.

I have found that games that are best when they play chaotically are multi-team Game Types with a singular objective, like Odd Ball or KOTH. In these kinds of Game Types, you have a teammate or two, but you have many more adversaries and they also have teammates that you must deal with simultaneously.

Your map doesn't need to be smaller to create the chaos – the variety of teams clashing together over a single objective will do that for you. In fact, a small map is likely to create chaos on just about any Game Type, including those that are best played in a more choreographed, strategic fashion.

This is not to say that a small map isn't good, but if the Game Play predominately devolves into chaos, it may be worth looking at how to stem the chaos across the board.

Summary

Pace is a description of how fast a game unfolds, using the speed at which score is accumulated as the best metric.

Sprint doesn't really increase a map's Pace.

When done in a thoughtful way, vehicles can improve a map's Pace.

Chaos is not a bad thing in and of itself, but I would consider chaotic Game Play acceptable only in singular objective Game Types played multi-team.

Less Is More

I will never forget how JoeSki was interviewed[1] after winning the Forgetacular contest in which he was asked if he had anything to share with other forgers, to which he said, Less Is More for video performance and because you shouldn't over forge just because you can. Chris Carney also used that quote when discussing[2] how he went about forging The Cage to point out that simple maps are easier for players to grasp. And when I submitted Hekau to the Ricochet Forge Contest, the one thought that was running through my mind all night long was, Less Really Is More.

I say this because one of the greatest achievements of Hekau was that it was the only map of the six finalists that suffered next to no frame drops in 2LP split screen mode. All the others had moderate to severe frame drops all the time and from most or all positions on those maps. But Hekau had only slight frame drops and only from the top of the spine looking down the center of the spine by both players.

To achieve this important performance edge over its competition, Hekau had a head start – the Canvas was the natural flooring for nearly every part of the map, where as the other five had floors made exclusively of blocks or mostly made of blocks. Impact's second rock's bowl

offered a natural gentle and somewhat uneven gradient of incline through out. As I shared in an earlier lesson, leveraging the terrain's gentle slopes is a powerful way to make your map more interesting and fun to play on. And it also helps in controlling video performance for split screen as well.

It was when I began to test 2LP and discovered significant frame drops that I began to literally rework the main wall and reduce the height of the central tower (the weenie). The wall was originally constructed out of 2×2 flats with large ramps on either side. These blocks merged together became problematic and had to be replaced some how with less blocks that looked just as good. I tried 2×2 talls with railings and it sort of looked good, but it was still too much. I tried 3×3 talls, which meant that each of the teams' bases had to move since the number of blocks, and thus their final angle off center, would be different. But in the end, that worked best for rendering performance and it gave 50% wider top. The only thing I lost in the process was the small edge that the black trim of the large ramps played in the original architecture. But I realized that the wider top of the wall gave it more of a Star Wars-esque feel and I never looked back. The frame rate was improved drastically by reducing the number of blocks through out.

This is an important lesson when forging for the playlists, because in general the publisher doesn't want to limit a customer's ability to play with their friends on their only xbox. If you are seriously targeting the playlist, then you seriously need to get video rendering performance under control.[3]

Going back to something I said at the start of this book, my goal is to learn and improve my skills as a forger, and I use the playlists as my target, the framework to forge my map for. And split screen is part of that framework. When I find that my map performs at 3fp in split screen mode, I scrap it and start over. People who are serious about forging for the playlist need to forge for split screen because split screen is part of the playlists.

Summary

Less Is More.

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[1] CE United Interview with JoeSki

[2] Chris Carney's Crash Course

[3] When Halo is offered on the XBox 1, the problem with video rendering may become a thing of the past.

Power Weapons

Power Weapons should compliment your map, never usurp your map. That is, they should add depth to your map by subtly, or possibly significantly, improving Game Play; not break your map by radically altering the Game Play. And the Power Weapons you choose to add should be based upon how you want to compliment the Game Play on your map.

Menotyou135 gave the best thesis on the role of Power Weapons I have read to date.[1] Here I include my perspective that follows his in a lot of ways.

Must Haves
Rockets – and Lasers on vehicular maps – offer stale mate breaking, dramatically imbalanced advantages as the fruits from near balanced battles to acquire them. The advantages these weapons offer players creates such strong incentives that they essentially compel movement on a map, even to the point of abandoning existing advantages. Additionally, Menotyou135 puts Power Ups into this category as well, though I don't know that I entirely agree with such an assessment.

So serious are the advantages that Rockets offer that any advantage held by a power position may readily be abandoned for those of the Rockets. After all, the threat that the Rockets pose to the power position is generally significant enough that one should feel they have little choice in the matter.

Skill Weapons
The Sniper is an example of a skill weapon. The advantages it provides – and the incentives it offers – are proportional to the player's skill. Unlike Rockets, Snipers do not force movement

in all cases, but should in those cases where skilled players want to upset the balance of the Game Play in their team's favor – and when the map provides significant opportunities in doing so.

Balance Shifters
Lesser Power Weapons, such as a Needler, don't threaten losing control of power positions, don't give game changing advantages to a team, and thus do not compel movement. But they can shift the balance of fire power, thus they encourage movement.

Niche Weapons
Niche Power Weapons, like the Shot Gun or Sword, give a player advantages only in special circumstances. Incentives to acquire these weapons are meaningful only when a player plans to force upon his adversaries into engagements for which these weapons have enormous advantage.

Application
The Rockets are a great example of a weapon that you want to forge onto your map as bait to draw the two teams into open conflict. The battle for Rockets will be near balanced, but the outcome will be to give the victor overwhelming advantage through very imbalanced fire power for the next engagement. This is an excellent weapon to use as bait, because both teams instinctively realize the stakes are high.

Snipers are an example of a weapon that you want to spawn somewhere that they are not very useful from, forcing the player to first move to where the Sniper spawns then to where they can best use the Sniper on the map. The Sniper in a sense may be one of the more camping style weapons, and rightly so (one of my pet peeves is that Halo Sniper is generally always played like SWAT and never like Sniper). This sort of spawn away from best use location strategy encourages movement on the map.

Typically you want one Sniper per team. Since Snipers are not advantageous to all skill levels like Rockets are, it doesn't make sense to put one Sniper in the center as bait for open conflict, because one team may never bite.

When it comes to Lesser Power Weapons, I tend not to focus on ways of making players decide if

they want the weapon or not. Rather, I tend to offer them as a way of offering additional fire power to a team so that they feel empowered more than anything else. In this respect I don't really make the player think much about it other than, Hey, I see a Needler as I walk down this Path, I guess I will pick it up.

Summary
Power Weapons can be categorized into roles and you should forge onto your map the role that best compliments the Game Play that your map promotes.

Some Power Weapons are good for baiting teams into open conflict, while others are not.

Some Power Weapons are able to shift the engagement and prove more powerful in only very specific engagements (e.g., Shot Gun or Sword in very CQC).

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[1] [Menotyou on The Meaning of Power Weapons](#)

Vehicles

If you forge a map for 4v4, you almost certainly don't need to include vehicles, though perhaps a ghost or mongoose might be fun. But as you increase the sizes of the teams, you will want vehicles and more powerful vehicles as well. You will need to consider the team size as well as the purpose for the vehicles, and if you are seriously forging for a playlist, follow the examples you find in the playlists, and take advice from those that have studied the performance of the vehicles.

Vehicular Power
When we talk about the power of a vehicle, we are talking about its aggregate power. This includes how much kill power it can produce and how much kill power is necessary to take it down. The more powerful the vehicle, the more counter measures the other team will require, or the Game Play can become severely unbalanced. For example, in Halo 4, I was advised not to include a Mantis unless the teams had at least six players. I looked and could not

find a map in a 5v5 playlist that had a Mantis. You need to consider that the size of a team is a degree of counter in and of itself, because they represent the number of players that can fire upon a vehicle.

Vehicular power can also be measured in part by the number of players necessary to operate the vehicle fully. Requiring more players is a negative for overall survivability and offensive capabilities, because you may not have a team mate immediately available to help you utilize a vehicle.

The Warthog is a good example. You cannot shoot and drive at the same time. You need a gunner to make the Warthog any kind of offensive weapon (the tiny segment of the Halo population that is into splatters is too small to factor in here). The scorpion is a good example of a one person offensive weapon system, but a second player adds significantly to its survivability.

Vehicular Purpose
The purpose of vehicles on your map is to provide teams with means to interact with each other in ways that are beyond the typical infantry weaponry, and thus increase the fun factor across a wider range of players. Typically you see more vehicles with more players, so that there are more ways of players to Engage each other, nothing more.

New strategies can be implemented with the introduction of vehicles. Larger maps for larger teams offer more room for vehicles to execute new strategies. And the type of vehicles you add determine how the Game Play will enhance.

For example, Scorpions and Wraith have their greatest success as defensive weapons as they help to control their team's side of the map. This isn't to say that one cannot push forward with a Scorpion to dominate the other team's side of the map. But the point is that these tanks are slow and more effective more often when kept back as defensive weapon systems.

The Gausshog, on the other hand, can deal an instant killer blow with a single shot on target like a Scorpion, except it doesn't produce the same wide spread damaging shock wave that the Scorpion's shell does. The Gausshog is far

more maneuverable than the Scorpion and can readily lend itself to flanking the enemy with deadly precision and excessive kill power. But like any Warthog, it can support flag capturing behind the enemy base, run circles around pockets or other slow vehicles like the Wraith or Scorpion, distract and duck behind cover, etc.

There is a vehicle for just about any kind of Game Play experience and balance for a map. As a forger, you need to decide why you want a vehicle, and then choose the vehicle that will provide you with the desired Game Play for your map, while not creating other issues. One of the concerns you need to address is how will people use the vehicles? As you intend them or in ways that they feel are more advantageous?

Keep in mind that you cannot just drop a vehicle onto a map to achieve the Game Play that vehicle offers most. The map must support the Game Play as well. The vehicle must support the map, not usurp the map. What I mean by this is the vehicle you place on the map should make the strategies and the Paths that your map has to offer work well or even better with the vehicle; the vehicle should not alter in significant ways how the map plays other than adding the variety of Game Play that the vehicle itself has to offer. Another way of looking at this is that the vehicles should flow with the Geometry, not break the intent of the Geometry.

Going Heavy
This last point is very important for heavy variants of large team maps. Adding a tank to a map may break the map or alter the Game Play significantly than the original version of the map that may have only light vehicles on it. Clearly the term heavy originally came from the fact that the heavy class of vehicles are added to a map. But you don't always need a heavy vehicle to make a heavy variant of a map. A more meaningful perspective of a heavy variant is simply more vehicular Engagements – there are simply more vehicle on vehicle encounters to be had and with a wider variety of fire power to choose from. [1]

Vehicles are about encouraging a wider range of Engagements between opponents. Going heavy is about encouraging more vehicular Engagements with a wider range of vehicles to choose from still.

Anti-Vehicular Weapons
The laser is a classic example of an anti-vehicular weapon that has no other real value. Yes, you can use it in shooting other players, but it isn't nearly as efficient as the sniper or DMR for taking down infantry. One can say it really works wonderfully against any vehicle, and that it is perhaps the best long range anti-vehicular weapon in Halo. The laser is a prime example of a weapon you do not want on your map unless you have a vehicle – in which case you do want it on your map.

But also consider, again, the sandbox performance data of all weapons. For Reach and Halo 4, the sniper is a good anti-vehicular weapon, and as such adds some additional dynamics when vehicles are added to the map. Unlike the laser, the sniper now has to ask himself if he wants to save his sniper rounds for a scorpion or banshee (or yes, even a Warthog), or does he want to share the love with his adversarial infantry? The point is that the sniper can add additional decision making burden upon a player's strategy, and this in turn can help make your map more interesting to play on.

Plasma grenades and plasma pistols are very powerful anti-vehicular weapons. In Halo 4, these were a love fest amongst many Big Team Battle players who would load up their personal load outs with both.

When planning to add vehicles, you need to consider the anti-vehicular weapons you want to deploy as counter measures. There are two groups of players you need to forge for – the vehicular lovers, and the infantry lovers. The balance is not always easy to find, but you need to forge your map for both groups if it is going to gain wide spread acceptance and appreciation.

Summary
Vehicles add more Game Play dynamics and are necessary for large teams, but you don't want too many vehicles – not everyone should be in a vehicle.

Widening the variety of vehicles with the correct choice of vehicles is more important than having a heavy class vehicle for the sake of having a heavy class vehicle.

The right vehicles should help the map work as it was originally intended, not alter it significantly.

Consider the various weapons that are anti-vehicular and what roles they can serve, and what decisions players will encounter as a result.

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[1] HWM Sarge – Heavy Enough?

Chapter 2: Art

There is a prevailing perspective amongst the forging community that Art is optional and must be sacrificed to achieve optimal game play. This perspective is based upon the limitations of the combinations of skins and Geometry within the Canvas' palette. If a block with the necessary Geometry has a conflicting skin (e.g., it breaks cohesion with surrounding skins), then Art is sacrificed while the necessary Geometry is accomplished. As a result, most maps lack Art and look like nothing more than a pile of blocks. This perspective runs contrary to those of us in the minority who view Art as essential to any map.

At the core of this debate is the question, What is a map? To say that a map is defined by Game Play alone is like saying Aesthetics is defined by Art alone, and I find that perspective extremely short sighted. A map is far deeper than Game Play, just as Aesthetics is far deeper than Art. In fact, I will go a step further and say, A map requires both Art and Game Play, or it isn't a map at all.

Instead of looking through the palette for pieces with the necessary Geometry while relegating skins as optional just to accomplish the Geometry of the map, look for pieces with both the necessary Geometry and the necessary skins. If the palette lacks the pieces you need, then recognize that the map is an impossibility and move on. I know that this raises the bar and you may feel you are disadvantaging yourself from the other forgers who couldn't care less about Art. But I wouldn't tell you to do something that I do not do myself.

I am sure that all of us want to make a great playing map that also looks outstanding. But what is important is the total quality of the map – at least that is important to me. So it becomes essential that we recognize and accept when a design becomes an impossibility and start over. Ultimately this discipline – or lack thereof – may indicate the forger's priorities.

Don't be so desperate to make a map with great Geometry that you forge nothing more than a pile of blocks. Rather, be desperate to discover what is possible in its fullness and bring those possibilities to fruition. Don't become so desperate to get a map into the playlists that you would sacrifice its Art. Be desperate to find playlist worthy maps that can be fully forged.

In this chapter I will show how Art, Architecture, and Theme can make your map more interesting and more fun to play on; and I hope to demonstrate the value of maintaining the discipline necessary to add each of these to your map. But my greatest hope is that you both see how important it is to have both Game Play and Art, strive to achieve both equally as much as you know to do, and develop the willingness to walk away from impossibilities in your quest to forge a wonderful map.

Aesthetics, Art & Architecture

A map yields much more than Game Play; it forms a comprehensive experience. This includes more than just the competitive experience, and yes more than just the visual experience. Good or bad, full or lacking, a map offers a full spectrum of experience across a player's senses and emotions. To discuss this topic in detail, we need to begin to understand three key terms – Aesthetics, Art, and Architecture.

Aesthetics

At its very core, the term Aesthetics means The study of beauty and the emotions. But forgers use the term Aesthetics in place of the word Art when discussing a map's beautiful Architecture or Artistic elements. Instead of saying, Your map has great Aesthetics, one should say, Your map is beautiful, or Your map is very artistic.

The emotions that a game can invoke include the emotions that the map invokes, or the emotions that the map supports (or fails to support). In this way the Aesthetics of a map are best understood as how the map contribute to the Aesthetics of the Game Play. In this context, it becomes a study of how the map contributes (or fails to contribute) to the emotions or the emotive context of the game itself.

A [Penny Arcade video made by Extra Credits](#) talks to The Aesthetics of Play, in which they study nine emotive elements that video games tap (usually only two or three in a single game) as the reason a player keeps coming back for more. They discuss how a game, through its collective experience from the Game Play, produces an aggregate of emotions that a player enjoys. In this sense it is a study of the emotions that Game Play produces in a person.

The nine include Sense Pleasure, Fantasy, Narrative, Challenge (not the same as difficulty), Fellowship (cooperative, teamwork), Competition (games allowing us to express dominance), Discovery, Expression, and Abnegation (unwinding, not having to engage our brains). Each is, the best that I can describe here, a discipline of emotion. Games provide players with usually two or three of these at a time. For example, Halo multiplayer isn't a game that provides discovery, because it is an Arena style shooter. But it does offer fellowship and competition.

Aesthetics can be driven through the quality of the visual components (the quality of the unifying and beauty of the Art forged into the map); but it also includes the emotions created by the sounds and music, the mechanics, the team play, the wonder of exploration, and so forth. Aesthetics is the collective emotions that a player feels when playing the game, and only some of what he feels is driven by what he sees. And by now you can see that forgers have extremely limited control over making great Aesthetics – most of Aesthetics are built into the game and cannot be altered.

The sound of Jeff Steitzer's voice can invoke desired emotions in the context of the Game Play. Imagine for a moment how you would feel during the game if you heard the voice of Bruce Willis, Tom Hanks, or Sylvester Stallone? Or of Nicole Kidman, or Demi Moore? Some of those voices may seem attractive, but in the context of the Game Play, they clash, they stand out, they don't feel like they belong. They create a flaw, a rip, in the painting that we view as the Artistic qualities of the Game Play.

Once you understand that Aesthetics encompasses every sense of the player, you then realize that Art and Architecture are tools of the forger to complete the Aesthetics on their maps. Those are pretty much the only elements of the whole realm of Aesthetics that are under a forger's control. (In this sense it might be considered proper to use the term Aesthetics in referring to how a forger employed Art in their map, but the term is too broad for me to consider using in this context myself.)

Art

Art is what most forgers mean when they use the term Aesthetics. They are talking about how beautiful a map looks. But when you think about it, you need to step back and look at why a map looks beautiful. Generally it is due to the Architecture presenting itself in a way that people see as unusually good, very pleasing to look at. This is where Art comes in. We can say that the Architecture employs wonderful Art.

At the same time it is important to point out that Art is perhaps the most subjective term one can use as a forger. Art is literally bound and gagged by the adage, Beauty is in the eye of the beholder. Others may not agree with your assessment of how beautiful your map actually appears.

Every forger has artistic talent in degrees – some far more than others. Art – or how to make beautiful maps – is so subjective, I don't know if anyone can teach you how to go about creating it. It is something that I feel a forger can only be inspired with.

In a nut shell, beauty makes your map more interesting. If the beauty is found through out the map, then your map is interesting through out. If your map is beautiful only in one corner, then it will be interesting only in that corner. When people play on a map that is beautiful through out, they find it interesting to play on, because of how the map makes them feel.

If you get nothing else out of this chapter on Art, get this point here. People enjoy playing on a beautiful map, because they enjoy how the map makes them feel when all they do is look at it. Can you see how important Art can be?

And while it is also worth noting that a beautiful map that plays good will usually win over a great playing map that looks like nothing more than a pile of blocks, don't think for a second

that a beautiful map that is boring to play on will be taken seriously.

All that aside, Art is expressed most often through the Architecture of structures.

Architecture

Architecture is what you think it is. It isn't a subjective term like Art, and it isn't a wide ranging conceptual term like Aesthetics. It literally is just how structures appear, the artwork carved into the structures, Walkways, etc.

The key thing that matters is unity – that the Architecture of every structure is the same or that they have the same common Architectural Theme that unifies them as one solid Architecture. Likewise, it is important that the Architecture produces or promotes cohesion with the Canvas the map is forged on. You would never create a barn yard map on Impact; and you shouldn't try to create a space station on Ravine.

Any interruption in an Architectural Theme can make the interruption stand out like trash on a pristine street corner. It almost always breaks cohesion with the rest of the map, making a distraction or even visual noise that consumes the brain processing power of a player who would prefer to concentrate on Game Play. Interruptions or even distinctively different Architectures make you look like you never really knew what it was you wanted to forge in the first place – or you never cared to begin with.

Architectural Theme carries with it more than the Architecture of the structures you forge. It also ties in the layout of the map, the Geometry that defines where the structures are related to each other, how much space exists between structures, how the Walkways connect the Spaces, etc. In some Game Types, like Invasion, it goes even further to include which Race is the defender, and does the structural Architecture present strong cohesion to the defenders' race? You would never expect to see the Elites defending a Spartan facility, yet you would expect to see Elites defending a Forerunner facility.

It is through a quality and unified Architecture that your map can express enormous Artistic qualities that can add tremendous value to your map.

Implementing Art

I can only share how I go about forging Art into my maps. I would never tell you what steps you should follow, because I believe everyone works a little differently.

I begin by playing around with blocks of various kinds, trying to achieve the right combination of skins to form some type of structural Architecture that I can spread through out the map.

Once I get the idea of what I want the Architecture to look like, I then go about creating the necessary Geometry for the map size and Game Play I want. I do this while implementing the Architectural Theme through out. It is during this phase I learn if I have enough blocks, what kinds of trade offs I must endure, and if the Architecture remains fully unified through out.

After this, I optimize the structures, looking for replacement blocks, or eliminate blocks, to maintain split screen performance. And while this may seem like a minor issue, it is critical in how the final Architecture will turn out.

Eventually I have a map that I try out and see if it plays well and is well received for a variety of reasons.

Summary

Aesthetics is far more than Art, and is the wrong word to use when discussing the quality of a map's Art or Architectural theme.

To achieve quality Art on your map, you need to have some artistic talent and you need to have an eye for what people will enjoy looking at.

To achieve unified Architecture through out your map, you simply need to be disciplined never to interrupt the Architectural theme.

It is my opinion that anyone can create any Geometry, but it is the Art behind the Architecture that is the real burden on the forger.

Immersion

Immersion is a word that describes how a player gets so caught up in the Game Play that they don't feel like they are playing a video game. It is like being in a dream state where they are not conscious of their surroundings, but rather find themselves part of the game itself – they are inside the Game Play. Breaking this immersion is like waking up from a dream, or at the very least realizing you are in a dream – that something is not right, not appropriate, not in the place it should be. As a forger, you want to create an environment in your map where the players don't feel like they are playing a video game, but are actually in the Game Play itself – and keep them there at all times.

Creating Immersion

There may be other ways to create an immersing environment in your map, but the best way I know of is through Theme. By forging a Theme into your map, you place the players somewhere. If they recognize the Theme, it becomes easier for them to feel like they are there. It helps them to see themselves where the Theme suggests.

It is important to create a Theme that is new, yet very concise and obvious. The first map I saw that fit this was Affinity[1], which presented a Forerunner Theme.
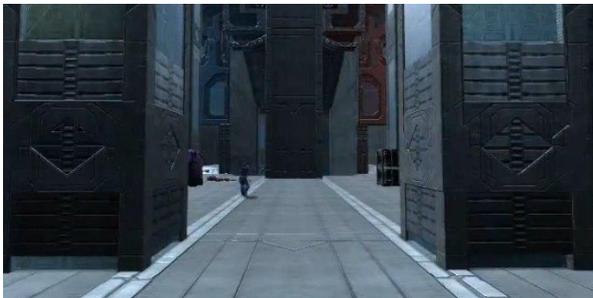
The reason Affinity was such a success in this respect is that the Architecture was unified through out and it leveraged the Forerunner Theme of the Canvas' palette. Playing the Theme of the Canvas' palette adds strength to your map's ability to immerse a player when it is working with you rather than against you.

Sustaining Immersion

Sometimes you need some extra scenery, like the barricades at the bottom of the central tower in Hekau, not to add cover, but to help the Theme come alive. The barricades at the bottom of the central tower make the central tower seem more realistic, because the way they are positioned in a circular pattern suggests that the ground level of the central tower has a purpose other than just being there for the sake of the map. The presence of the barricades suggest that the structure itself is used to protect whatever is in the center of the ground floor, and they do this by suggesting that they themselves are an inner wall of protection to that same end. The barricades can be used for cover, but their primary purpose is to deepen the immersion that a player experiences as they walk into the ground level of the central tower.

I also believe that leveraging the terrain helps a lot in creating a Theme for the purpose of immersing players. Given the textures on the blocks in any palette, the details of the Canvas really should be leveraged. If for no other reason, the terrain can help prevent repetitive, boring Architecture. On the other hand, the terrain becomes a part of your Architectural Theme – indeed, it becomes the foundation for your map's Theme.

Breaking Immersion

It is much easier to break immersion than to create it or sustain it. Breaking immersion simply requires a flaw such that players see, do, or in some way experience something that they shouldn't see, shouldn't be able to do, or should never experience. And there are too many ways to accomplish any of these.

From a visual perspective, anything that the player sees that looks out of place has the potential to pop the player out of immersion.

One of the more difficult things you as a forger will face is to create a unified Theme through out your map where everything seems to belong to the Theme. But there are other ways to create visual features that break immersion.

Visual noise can distract a player so much that they can no longer feel like they are in the Game Play, because they are trying to process the map features. When Halo 4 came out, the first thing I realized was that each forge Canvas' palette was full of noise. Needless to say, nearly every community map was visually noisy through out, and I dreaded playing on any of them just for that reason alone. I will talk more about visual noise in more detail later.

Structural detail can fail to line up, drawing the attention of a player to the fact that the blocks themselves are blocks.

Z-fighting can distract the player and remind him that the structure is made of forge blocks.

When the forging community began seriously forging for Reach's Invasion, one approach they adopted to improving video rendering performance was the gating of blocks. Literally blocks would disappear when they were no longer needed. Not only did it kill immersion, it was simply the wrong way to achieve good video rendering performance. The proper way is to reduce the block count. If the map cannot be forged due to the blocks that would have to be removed, then the map becomes an impossibility. Altering the map's Geometry is acceptable only when the Game Play lends to it – like when a wall is destroyed by a bomb exploding. Never gate blocks out of view.

And then there is the teleport. The teleport can be notorious for breaking immersion in a number of ways. You can instantly find yourself in a room that looks dramatically different than where you entered the teleport. You can sense a massive disorientation by utilizing the teleport. Where the teleport takes you can leave an unintuitive experience, like it really should have taken you somewhere else instead.

Teleports have a good purpose but you really need to utilize them judiciously and carefully. Teleports are an exercise in minimizing disorientation and as such require extra attention to how a player will perceive the overall experience. Pass through the teleport and stop on the receiver pad. Ask yourself What does the player see? Ask the correct questions.

The Symmetry Problem

The biggest problem with symmetrical maps is that by the very nature of their symmetry they look artificial. There are a few reflective translation maps that do symmetry proud and fully immerse the players into the Theme of the map despite their strict adherence to symmetrical design.

Take Narrows for example. Have you taken the time to look out across the gorge? You would see another bridge structure spanning the gorge just like the one you are standing on. The bridge is fully symmetrical, and it works very well as a symmetrical map, because bridges are symmetrical in real life. The bridge structure off in the distance was put into the Canvas to help immerse the players on the bridge that forms the map.

And it isn't enough to just create a bridge structure as a Narrows remake, for example. You need the full context of why the bridge is there. Forge in the gorge. Forge in another bridge structure way off in the distance if you have to. Take the time to build the Theme to give your map a context to immerse your players in.

Countdown, a rocket launch facility, has a fully reflective translation design using the center as a rocket exhaust well. The well gives the designer the opportunity to surround the well with rings of platforms in a fully symmetrical

Architecture. The facility looks extremely believable as a result.

Haven looks sort of like an alien religious order site, and the circular hallway around the perimeter makes it look alien and gives all the reason to expect the map to be symmetrical. The symmetry fits the Architecture very well.

Summary
Forging a unified Theme through out your map is a good foundation for creating an immersing environment. Leveraging the Theme of the Canvas' palette is also a good start.

Additional scenery can be useful to sustaining immersion as players move about your map.

Anything out of place can break immersion, leading the player to feel like they woke up from playing in the game to playing a video game.

Symmetry aids in immersing players when symmetry is expected within the Theme of the map.

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[1] Affinity, Halo: Reach, by Godly Perfection

Visual Noise

Visual noise is noise within the visual perspective of the player. In this lessons I hope to discuss the concept of visual noise so that you can readily identify it in your own maps. I hope to also discuss how it impacts the Game Play in negative ways.

What Is It?
Visual noise is noise that distracts from what is otherwise displayed on the screen. It is too much detail, too many colors mixed together, too much of too much in a small concentrated spot. And the worse case is when you use blocks whose skins are the source of the noise and are used everywhere. Then you have a map full of noise.

To better understand what visual noise is, we could ask how it is introduced into a map.

Visual noise is created by things like thin lines of extreme contrast to their background that serve no purpose – like graffiti on a wall. Only they are worse than graffiti because they are not graffiti. Contrasts in fine detail can yield visual noise unless the fine detail looks like it belongs there. In most of the Canvases of Halo 4, you see fine lines that move along in all directions and you won't be able to make them look like any of them are intended or were meant to be there.

In some cases it can be as simple as lines that are not at the same elevation, or at angles to each other, of different thicknesses, or different colors to each other. They don't create any kind of consistency, so they all clash against each other. Notice in the following picture that the line down the center walkway is off centered; the bands running horizontally on each side are different in both width, and in their heights off the floor; and that the vertical line running up the right wall serves no purpose other than to clash in pattern (it has no black lines in it) to the horizontal lines that it crosses. This is visual noise.

If you have lines running in both the x and y directions, and the block is placed where a Path may flow along the x axis, then the lines in the y direction are useless – they won't look like they belong there. The same is true when lines wrap around the center of blocks or around the edges of the blocks. In those cases, the lines draw your attention to the block rather than any Path that flows over the block.

On the other hand, if the line that runs along the edge of the block is very subtle, then the block takes on a feel of a tile. A tiled flooring is not bad. In this case, the lines actually look like they belong there, because the floor looks like a tiled floor. The subtle contrast is enough to give you the feel of a tiled floor without trying to compete for your attention.

It isn't just the lines on a block, but also lines through out the visual perspective. Take a ramp, for example. If a line on the floor runs up to it, but is off center to the bottom of the ramp, it looks like it shouldn't be there – it looks like it is noise.
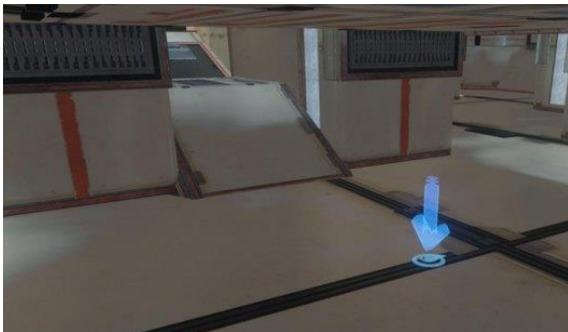
Take the example of a grill pattern at an entrance to a Space. If it isn't lined up properly, if it is off to the side, it looks like the forger just slapped the block there and never concerned themselves with what it looked like. The grill pattern against an otherwise solid surface looks like noise, because it doesn't look like it really belongs there.

Or take the various textures of the walls that are literally next to each other. If they all look different, if they all have different colors, patterns, and shapes, then they look like noise to each other, because they lack any cohesion.

There are blocks that use different colors, like the Halo 4 Ravine 4×4 corner. I have seen this used in a number of maps, and I have tried to use it myself. It is dog ugly, folks. Just avoid blocks that introduce the levels of ugliness and noise like this.

Less Is More
Remember the lesson on Less Is More? The same is true with visual aspects of your map. The best looking maps have always been those with the least detail exposed on the skins of the blocks, have employed the least number of blocks possible, and have leveraged the subtle variations of the surface textures of the terrain as the visual foundation for it overall appearance and beauty.


My number one goal in forging has become and remains to this day to utilize blocks with the most subtle changes in colors and the least geometric shapes on their skins (e.g., powder blue on white, rather than sharp black on white). I don't always achieve this goal at every turn, but it is a great start to suppress visual noise from which I can build upon.

Working With Noise
If there are lines through out the blocks, I try to line them up in a way that they actually look like they were intended there, rather than they were just the skin on the block. The best approach to using lines in the skins is to leverage them as lines on a street. When they are used to indicate predominate direction of traffic, they can actually look like they belong there.
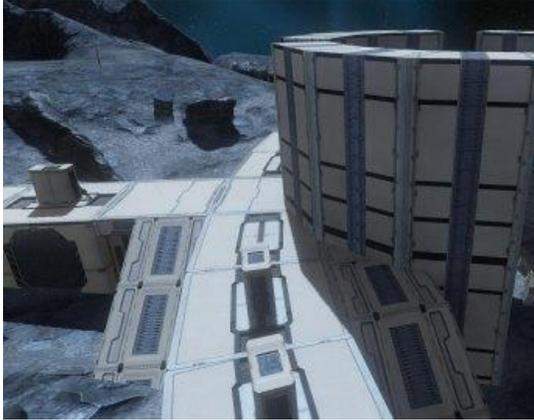
The central tower of Hekau is an example of where the numerous fine lines and powder blue bars were aligned with each other to make them look like the intended exterior paint job on the building itself. Maintaining the alignment in such a way that they look reasonable added to the beauty of the map. I didn't like the visual noise that the sides of the stunt ramp offered, but the stunt ramp provided decent Geometry and the skins on the top and bottom were extremely helpful in creating a subtle Architectural appearance.

In one of my Erosion maps, which I consider to have the most beautiful skins I have ever seen, I merged the 2x3s with 2x4s where their common skin imagery blended. This allowed me to create curved ramps as underpasses to other curved ramps, creating a crafted look rather than forged look.

Notice how I was able to use the direction of the lines, both the fat bars and thin lines, to show predominate direction of travel across the structure. I wasn't happy with some of the skins' patterns, but I was able to leverage them very effectively by forming a pattern as part of the Architecture itself.

Blindness

When Halo 4 came out, the blocks in the forge Canvases Ravine were horrendously noisy. The publisher responded to our complaining about visual noise (directly or indirectly, we really have no idea which) by giving us a detail blind palette in Forge Island. What do I mean by detail blind?

When you look at the skins of two blocks on Ravine, chances are you will see blushes of rust here and there. Take those two blocks and merge them together and you can see the corner of their merge by how the rust abruptly ends along the edge of the corner. Even if there was no rust, rather just a flat color, you could still easily see the corner edge of their intersection by how the colors of the two surfaces were slightly different. This in fact has always been the case even with every Canvas palettes on Reach.

But Halo 4's Forge Island introduced a new concept, Blindness, where the corner of the intersection of two blocks simply disappeared from view. It isn't clear why this happens. It could be a byproduct of the publishers' attempts to reduce visual noise. And it happens typically only in the shadows of interior spaces where the detail is lost to blending with shadow.

This blindness is more of a distraction than visual noise ever could be, and for a very similar reason – it requires the player to concentrate on what they are looking at to understand what they are looking at. It is a huge distraction to the player.

If the environment you are forging includes blindness of edges and details, you want to make sure that no where does the blindness manifest itself.

Striking Features

All of this discussion on visual noise should not be confused with striking features of Architecture. Bold, thick, solid patterns on a skin

repeated across a structure can be used to enhance a strong Architectural Theme. For example, the large black pattern repeated across the wall in Hekau doesn't stick out as noise, but as a bold Architectural feature.

Consider the next picture of the same Erosion map from above, in which the interior of the center structure leveraged the copper band at a singular height from the floor to give a solid Architecture. By maintaining a solid and consistent width through out the interior, the band becomes a striking Architectural feature rather than noise.

This is not the same as hopelessly aimless lines that go no where and thus have no real purpose other than the forger cannot get rid of them. And in many cases you don't want Architecture void of contrasting elements. You just want the contrasting elements to contribute to the Architecture and never be a distraction.

Summary
Visual noise is a distraction to players, most notably because it requires the player to concentrate on the noise and understand what it is he is looking at.

Visual noise breaks cohesion of the Architecture and breaks immersion across the board. In some cases you might be able to use it, but usually it is just noise.

Blindness is worse than visual noise, because instead of trying to understand what you are looking at, you are trying to see what it is that you are looking at.

As a forger, you should avoid both extremes, and don't be afraid to experiment with striking Architectural features.

Visual Cues

Visual cues are visual elements you place on your map that help players learn how to move about your map. You can also use visual cues to grab the attention of players to important features on your map. They can be used to warn players of hazards, such as boundaries of the play area. And visual cues can be used to manipulate a player's perception to see what you want them to see.

Navigational Aids
Some visual cues are used to help players understand how to navigate your map with less effort on their part. In level design practice, lights shining through a doorway help you see that there is a doorway down the hall even if you cannot see the doorway itself. The light also acts as a means to attract you to the doorway, a way to help you know where to go next. In Halo, lights tend to bleed through the walls, so instead of using lights, you might try using a change in the pattern of the flooring that alerts a player that there is a new Path opening to take.

This is very important for long Walkways where you can see the far end but not necessarily any side openings due to the Architectural features. If you have a repeating pattern of struts protruding from the structure along one side of the Walkway, and between two of them you have a doorway hidden behind the struts, you want to give the player standing at either end some indication of the door's presence so they can evaluate the risks and their options more correctly. You can do this by some visual cue in the flooring or above the doorway itself. The point is you don't want to hide the doorway in a

pattern, but instead draw attention to it through a subtle cue.

In level design practice, when you want a player to move along a Path in a field, you cut the Path out using sand, dirt, or pebbles. People will see the Path cut through the grass and naturally think that they need to follow the Path to get somewhere they should go to. Until Halo forge evolves into a full terrain editor, the lines and patters on the skins of the blocks are a good substitute. The lines or patterns on a block's surface can be aligned to the predominate Path that runs over that block, to aid the player in understanding that there is something in that direction, or that the intent is for them to move in that direction.

Beacons

You could use visual cues to point players to power weapons, or other valuable pick ups on your map. This is where light can be useful if used carefully. Light, such as the animated light of a receiver teleport, can be used to grab a player's attention and draw them to the power weapon. I used this technique in Reach, where the energy sword appeared to spawn out of the white flame from the floor. It gave a visual cue that would grab the player's attention, and gave the spawning of the sword a reasonable context (e.g., the sword didn't just spawn in thin air).

I have seen some other examples of how light is used to show case a weapon in a dark room.
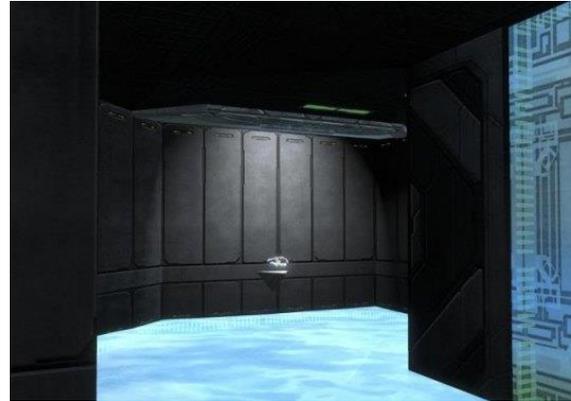
However, if you use a weapon spawning system (depends upon the title you are forging for), your weapon may have a way point indicator that simply draws the attention of the players for you. We will talk more in depth about the way point indicators for weapons later.

We can also see examples of how the Publisher uses light as visual cues in teleports, grav lifts, and man cannons. Each uses a bright light, and each adds to the attraction by animating their light. In the case of the grav lifts and man cannons, the animation of the light is also a visual cue as to the direction of travel. In the case of the teleport, the light at the sender node is quite different than at the receiver node to offer the visual cue that it can send. And the visual cue of the complete absence of light indicates an incomplete teleport channel configuration.

Map Boundaries

Safe Boundaries define where the play area exists on the map. Kill Boundaries define where off limit areas are at. But these boundaries are invisible to the players.

Quite often a map is bound by the walls and even a ceiling. In those cases, the walls and ceilings act as obvious boundaries to the map. But what if the map doesn't have a fully enclosed boundary? What if there are no walls or a few walls? How would the players know the boundaries of the play area?

This is where you want to use some sort of visual cue, a boundary marker, to suggest to the players that the marker is a boundary to the play area. There are two features that would clue the player that they are looking at a boundary marker, regardless what you use (you

could use a pole, a rock, a small block, etc., whatever looks good with your map's Architecture and Theme).

Firstly, the marker will look purposefully planted, yet not a real part of the playable area – it will look like a boundary marker. You should try to make the marker look as natural and reasonably expected on your map as you can. But there are simply cases where you will be signalling so strongly the edge of the map that it will have some effect on the player realizing they are on a map. This mini break in immersion can be mitigated by making the boundary look as natural to the surroundings as possible – like they really are in no way out of place at all.

Second, there is nothing beyond the markers. The biggest clue that they are looking at the marker is that the marker itself represents the outer most forged object on the map. A fence, a string of rocks, things that stretch and can rise no more than chest high can serve as a marker, because when they look over or around it, they see nothing else.

Additionally, you want to use the flavor of boundary that allows them to step past the marker and into an out of bounds warning zone. The other flavor is an instant death zone, but those are never to be used to indicate out of bounds. Their only purpose is to speed up the spawn cycle, and are properly used exclusively when a player falls so low below the map that they cannot return to it. Typically entering into one of these sudden death zones is accompanied with the caption or voice track, You fell to your death.

Consistency Is The Key
Visual cues are readily discerned from a distance so long as they remain consistent across your map. For example, visual cues indicating doorways should always be used in the same way. What appears as a visual cue for a doorway in one end of the map should not be used for any other purpose anywhere else.

Bending Perception
I wrote an article, [Forging An Illusion](#), in which I talk about how one needs to bend perception by exaggerating features so that players see what you want them to see, even though you really can't forge it correctly. Visual cues can be forged

that stand out and grab a player's attention to see in your forge work what you want them to see. This entire concept is heavily artistic and I really don't want to get into the subject here, other than to say that what you forge in the way of visual cues can help draw your players into a Theme more effectively.

Summary
Visual cues can help players learn to navigate your map faster, and the spawn locations of weapons.

They can also help identify the boundaries of your map.

You can even use visual cues to bend the players' perception into seeing Themes you want them to see that can help them immerse into your map.

Colors & Contrast

Colors and contrasts can be used to help your map look wonderful, or they could make your map look like trash. Both can also be used to draw the players' attention in the ways you want them to, as we discussed earlier. In this lesson I want to go into a little more depth of using colors and contrast on your maps, to improve the quality of Art, and to utilize them effectively for the players' benefits as well.

Contrast In Color
Colors of similar hues don't contrast with each other – they don't clash. But colors of opposite hues do. Take a purple weapon and sit it on a yellow table. It sticks out because the purple is at the opposite end of the color wheel from the yellow.

Now take that same purple weapon and place it on a blue or red table. It stands out far less. It blends in more. This is why the purple leaves on Boardwalk work so well as soft cover – both red and blue teams blend equally well behind the purple leaves, and both are just a little noticeable behind the purple leaves.

Understanding the color wheel can help you understand how to maximize or minimize contrast for various colors.

The Purpose Of Contrast
Contrast is used in level design to attract or grab a player's attention to something important. It can be used to draw a player's attention to a power weapon or some important pickup. It could also be used in a similar manner to draw a player's attention to an open doorway, as a visual cue to where they player should go next. The former is used through out level design, the latter is used for campaign mode rather than multiplayer mode.

Where there is contrast, there is attention grabbing. Where there is no contrast, there is a lack of attention grabbing. Those areas that lack contrast do not compete for the attention of the player. Therefore, most of the map should lack contrast. This is why visual noise in Architecture needs to be well controlled or it can wind up inadvertently competing for the attention of the player where it should not.

Contrast can occur either through variation of intensity or variation of color. For example, a black weapon on a white table is an example of contrast of intensity, and a purple weapon on a yellow table is an example of a contrast of color.

Managing Contrast
Since contrast should be avoided everywhere except where you want to draw the player's attention, you want to avoid contrast through out most of your map. However, this doesn't mean that the ceiling should be the same color and texture as the walls or the walls the same as the floor. This is exactly the problem with Halo 4's Forge Island Blindness that is created in the shadows when the ceiling, walls, and floor are all the same color.

You really want the surfaces to differentiate from each other so that when a player looks into a room they can immediately perceive the walls from the floor and the ceiling. But at the same time you don't want this contrast to be significant enough to be grabbing the player's attention. You want the differences to be subtle, such as the same hue of color, but a different shade or saturation; or just a slightly different hue.

A more natural approach is to use a flooring material that looks like flooring, a ceiling material that looks like ceiling, and wall material

that won't class with either. Of course, this is dependent upon the palette.

Once you establish the bulk of your map's contrast level, you then know how much to raise the contrast level to grab the player's attention. Hopefully the level through out most of your map is very low in contrast – you wouldn't need to go to extremes to grab a player's attention when you need to.

Summary
Colors can contrast as well as blend, you just need to decide what you want to achieve and with which colors.

Contrast can be from colors or from intensity.

Contrast is used to grab a player's attention.

You need to minimize the contrast levels through out your map so that they don't compete for the player's attention.

Ambiance

Ambiance refers to the overall environment that the map presents. This can include the time of day, weather, and other elements. It can also include the pristine qualities of the map's textures. Ambiance is for the most part decided for the forger based upon the Canvas they choose to forge on. But there are Special Effect objects that a forger can usually add that will significantly alter the Ambiance of the map. In this lesson I want to discuss how various qualities of Ambiance can impact the overall Aesthetics and in turn how it can impact a player's emotions.

Brightness
One predominant feature of all Reach maps were their bright Ambiance. They were all tuned to afternoon sunny skies. Halo 3 has a few dark maps, such as Sandbox, Guardian, Orbital, and Blackout; but otherwise were also predominantly sunny skies or bright interior Ambiance. It wasn't until Halo 4 that the majority of maps were dark, hazy, or in some way obscured. (ODST had mostly dark in the campaign, but we are focused here on multiplayer.)

Brightness is key to a player's speed of movement. Snipers is best played in massive open terrain or dark ambiance. (The Sniper playlists have always played like SWAT, never like a true sniper Game Type.) The darker the map the slower the player tends to move. This is basic psychology of FPS. I have always wondered why the publishers of Halo 4 turned the maps somewhat dark. They aren't dark enough to retard movement but they are dark enough to ruin the feel of energetic movement.

This is also why Active Camo is a key component to Halo. There are some players that love the slow,stealth Game Play you get in dark maps. Active Camo leverages Halo's sci-fi Theme to compensates for the bright Ambiance. In my opinion this compensation works best when it is a scarce resource on the map, implying Active Camo in loadouts is too much and clashes with the bright Ambiance.

Why does a limited resource of Active Camo not clash, but unlimited Active Camo does? Because a limited resource becomes a specialty; but unlimited brings into question if the Ambiance was properly chosen in the first place. In other words, it is okay to deviate from the map as a specialist. But it clashes with the map when the Game Play is heavily counter to the maps' original design. A specialist brings depth to the map and makes it interesting. Over use of Active Camo breaks the map and distracts from (or even shallows) what depth it could bring to the map.

Purpose

The purpose of Ambiance is to establish an atmosphere, an emotion within players, and to help immerse players into the Theme of your map. For this reason a special effect must support your map rather than usurp it. In other words, your map should provide pretty much the same Aesthetics (emotions and beauty) without the special effects; while the use of the special effect simply seals the deal and drives the Aesthetics home.

Special Effects

Canvas palettes typically include a selection of forge objects that when instantiated immediately apply their effect upon the video being rendered. Some darken the screen by applying a dark color, such as purple. While you

can approximate night sky with some of these effects, I haven't seen a true night sky effect that comes anywhere near the quality of natural dark we saw on Blackout.

However, if you need to make a black and white Ambiance (with natural greys through out) there is usually such an effect available. These work good for Living Dead maps (zombies or flood), because they help immerse players into a mindset of an old horror film. But for any other Game Type you want to leverage the natural Ambiance. Very rarely does any special effects work for any other Game Type.

Summary

Bright Ambiance sets an energetic feel of fast movement, while dark Ambiance promotes slow movement.

Active Camo compensates Halo's tendencies for bright Ambiance to allow for slow stealth movement one typically finds on dark maps.

Special effects allow you to manipulate the Ambiance, but its use should support the Theme of the map, never usurp the map.

Black and white special effects are sometimes used to promote the horror film Aesthetics of Living Dead maps; otherwise all other Game Types are best served promoting the natural Ambiance of the Canvas the map is forged on.

Cohesion

Like the topic of immersion, this topic on cohesion can be a bit abstract to talk about. Like Art, cohesion is subjective. But like Architecture, it can be straight forward to understand.

When I discuss cohesion, I usually refer to the cohesion of the Architectural Theme or the Architectural design, because that is where forgers tend to have the greatest difficulty in bringing forth strong cohesion. Either they have none, or their Architecture is missing it here or there and thus it simply breaks down.

There are a number of factors that can break cohesion of a map's Architecture. I will try to list

some of them here, but by no means are these the only ones.

Visual Noise

No map can sustain cohesion in any sense of the word if there is visual noise. Visual noise is where you look and see lot of colors, contrast, and patterns that don't create any kind of unity in Architecture. Halo 4's palettes are notorious for blocks' skins that contribute heavily to visual noise.

Consider the types of blocks that you use to build a single structure. Do they look like they go together? Do they look like they form a cohesive structural feature? This is the most difficult part right here, so let me say it again. Do the pieces that make a structure look like they work with each other? Or do they clash with each other, creating visual noise?

Clashing Architecture

Consider two structures that have distinct Architectures, yet they are sitting next to each other, or facing each other. If they look vastly different, they clash. Consider the types of blocks that they use in their construction. How would one structure made up of Brace Larges look compare to another sitting next to it made of 4×4 talls?

The following picture shows a collection of experimental Architecture that I was developing to see what I would be able to use effectively. Notice how they clash with each other due to their Geometries and skins.

Consider every publisher map you have ever played on. There are very few that have varying Architectural features through out the map (e.g., Powerhouse). Typically, the Architectural features are common everywhere you go. Consider the white walls and balconies of Boardwalk, the redwood flooring and walls through out Reflection, the grey steal structures through out Countdown, the grassy hills of Valhalla and the two silver grey forerunner structures at either end, the sand dunes and rock structures through out Sand Trap, the green quarts/metallic through out Guardian, the violet alien gentle curved structures through out Assembly and Zealot, the grey slate slanted walls through out Sword Base, the circular structures throughout Spire. Geometry helps maintain cohesion through out the map by bringing unity of Architecture.

Bringing Cohesion To Your Map

If one structure in your map is circular, make them all circular (Hekau). If one is elongated rectangular, make them all like that (Boardwalk, Sword Base, Reflection). If one is tall and narrow, try to make them all similar in ratio of height to width (Orbital, Narrows, Valhalla). If one is elevated off the ground, try to make them all elevated in the same way, but perhaps a little different elevation for each so that they are not on the same plane (Boneyard). If one is boxy, try to make everything about your map boxy (The Pit).

If your map has a weenie in the center, then try to make the rest of the map similar in elevation according to their distance from the weenie (Spire, Zealot). If your map is an asymmetrical map, consider a steady change in elevation from one end to the other (High Ground, Powerhouse, Zanzibar).

Try to make the doorways look the same through out. This makes the cohesion of the structures even stronger, because the doorways are a key element that players focus on, and they will see how the doors differ even the slightest. This doesn't mean that the doors have to be the same exact dimensions, but that they look like they were constructed with similar architecture with similar materials for trim, walls, etc.

Leverage the natural terrain and make the structures you forge on the terrain match the terrain in the context of the Theme you are trying to forge into your map. And when I say Theme, it can be abstract Art for all I care. It just needs to be clear what you are trying to do so that they player isn't scratching his head trying to figure out what you intended.

Keep It Simple

Like the phrase, Less Is More, just keep your Architecture simple. It does no good to make a complicated Architecture that is heavy in details. You should just make the basic structure look good, not complicated.

By keeping it simple through out, the simplicity of the Architecture will form a strong cohesion of visual Art that people can enjoy. And remember to keep it The same simple Architecture through out!

Don't use blocks with angles at one end and blocks with completely different angles in the middle. Since they can both appear in the same perspective of view by a player, they will more likely clash. If you want a specific Architectural structural concept repeated, make it the only one through out your map (Epitaph' walls, Reflection;s walls, Sword Base's walls, Sand Trap's temples, Countdown's central balconies, Boardwalk's walls).

Summary

Keep the structure's building materials simple and cohesive – do the blocks work with each other?

Keep the structures of the same Architecture – do they look like they were made out of the same factory?

Use the same approach for everything at the macro level – same design features, same materials and building blocks, same repeating patterns in structural features, etc.

When it comes to cohesion, the key is consistency through out every aspect and dimension of your map.

Theme

We talked about Art, Architecture, and Aesthetics and how they relate to each other. Along the way we mentioned Theme. I want to go into depth about Theme, demonstrate the value it can bring to your map, and some practical ways to forge a map with a strong Halo Theme to it.

Why Theme?

When a player looks at your map, what do they see?

Exactly…

Either your map will have a strong Theme, or your map will be nothing other than a pile of blocks.

As I mentioned earlier, I learned some techniques about how to bend perception by exaggerating features to help the player see what you want them to see, because you cannot forge what you want to forge correctly. My first map, Flight Deck, was my first attempt at this, and I thought an aircraft carrier was a great Theme to forge.

But Affinity[1] showed me how limited bending perception actually was, and how important it would be to leverage the Theme of the Canvas' palettes. I don't mean that bending perception was limited in the sense that you can only apply

those techniques so many ways. What I mean is that at the macro level, or at a rough draft sort of way, you cannot draw a player deep into the Theme when there are details on the skins of the blocks that don't support your Theme.
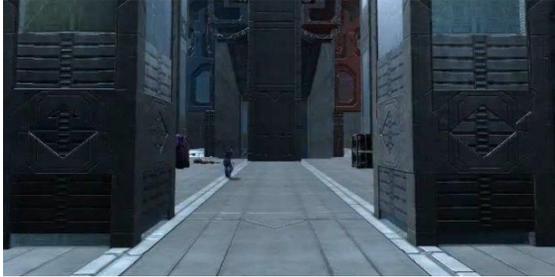
Looking at Affinity's tall columns with fine and accurate etchings across their pristine surfaces shouted forerunner. If you want to make a Halo map for the playlists, you can't do better than a forerunner Theme.

Leverage The Palette
Well, the truth is, you can't do better than the Theme of the Canvas' palettes. This is because the fine details of the skins add to your Theme – or take away from your Theme – in ways that nothing else will. The details, the etchings, the colors, the cohesion of these elements across the Palette, they all add to the total cohesion of your Theme, your Architecture, your Artistic works on your map in ways that tie everything together.

The fine etchings on the surface of the blocks will detail your map for you. But this implies that you need to do the heavy lifting of creating the bulk of the map's Theme in structural design – how the structures are laid out, the blue prints of the buildings, etc. You can only rely upon the skins of the blocks to bring the Architecture alive to the players by giving the surfaces of the structures the final touch to the Theme that you forged the structure only so long as the two Themes are one in the same.

So What Do You See?
Take a Forge World 1×4, merge it into the ground a little, put some small rocks in a ring around it, and what do you see?

Forerunner.

That is the Theme of your map, as simple as it may be. Do you see how you can Forge a

Theme without effort? Do you see how when you keep your map simple the Theme in the palette is leveraged more as the visual cues to the players what the map's Theme is suppose to be? Do you see how you make the skins carry your theme when you keep the structures simple?

This is yet another example of Less Is More. Don't be afraid of using too few blocks that your Theme will be missed. Be afraid of using too many blocks that your Theme will be hidden in the confusion and clutter. Don't be afraid of relying upon the skins of the blocks to carry your Theme. Be afraid of creating a Theme that contradicts that of the palette.

Summary
Maps without Themes are just piles of blocks.

Create maps with Themes based upon the Themes of the palette of the Canvas you are forging on. The palette's Theme can bring your map alive.

Don't over forge the Theme, but rather let the block skins present the Theme for you.

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[1] Affinity, Halo: Reach, by Godly Perfection

Chapter 3: Depth

We have already talked about how to make Geometry more interesting so that your map is more fun to play on, while casually mentioning that such forging can add depth to your map. I now want to focus on depth itself and particularly intentionally making your map more interesting to play on by offering choices through the features you forge onto your map.

If you make a simple map and play Slayer on it, you will get bored after a short while, because all you do is run around trying to kill your adversary. That sort of Game Play doesn't take a lot of thinking on anyone's part. You just run around until you find someone, aim, and shoot. That is a shallow map.

It is when you add features to your map that offer – or even force – players to make decisions that you are adding depth to your map. You are making the Game Play on your map go beyond the basics of focusing on the primary objective itself (killing for Slayer, the flag for CTF, etc). You are giving players more to think about, more choices to make, more strategies to employ, all of which are to achieve advantages so that they can win the match. Choices make your map interesting, which translates to fun.

In this chapter I want to discuss various ways you can forge depth into your map. I want to talk about using Power Weapons, vehicles, Geometry, and Spawn Layout. But keep in mind these are just a short list of samples. Ultimately the breadth of this topic is well beyond the scope of this book and well beyond my imagination. I only want to give enough breadth of ideas to get you started and to get you to see how limitless the possibilities can be.

Power Weapons

As I said before, Power Weapons should compliment the Geometry of your map, not usurp it. They should offer players decisions that help the map play better, not offer decisions that radically alter how the Game Play unfolds on the map. And they should form meta games – games within the game.

Secondary Objectives
A Must Have Power Weapon typically creates a secondary objective in any game, offering players decisions regarding the acquisition of the Power Weapon, thus forming the basis of a meta game. To better understand this, let's explore the importance of acquiring rockets to achieve a significant advantage over one's adversaries.

Rockets are so important that the knowledgeable players will learn the location and timing rules of the rockets' spawn and work to control that section of the map whenever the rockets are scheduled to spawn. This strategy of controlling rockets becomes another game within the main game. Attention on the main game is temporarily put off to the side while the rockets are being acquired.

While the primary objective of Slayer is killing, and the primary objective of CTF is capturing the flag, the secondary objective of the meta game introduced by the rockets is acquiring the rockets themselves. And while the primary objective adds score, the secondary objective adds advantages within the Game Play itself. So much do rockets add advantage that they can in some cases become necessary to winning the match itself.

The Advantage
Adding a Power Weapon could be used as incentive to draw a player from a power position. Should they abandon one advantage for another? Should they remain back and risk losing what advantage they have to the Power Weapon? Or even use the Power Weapon as bait to pick off adversaries trying to acquire them?

Forcing the player to make a decision enhances the Game Play, adding additional strategies that would not exist without the Power Weapon, all the while not altering the Game Play at any fundamental level. Forcing them to think beyond the most basic of instinct of aiming and shooting makes your map interesting.

Better Map Usage

Snipers are a good example of giving players a weapon that can best be used by specialized areas of the map – areas that are further from most fire fights and thus more out of range, but work well for the Sniper. These areas of the map may tend not to be used much during most of the Game Play, but can be very useful if one has a Sniper.

You can include one Sniper on each side of a map near each team's base where one can then move to an ideal sniper position that is also way out of position to be much help if the action goes to another area of the map. This kind of game breaking decision is exactly the kind of decision you want to temp your players with.

Stripping Depth Away

Consider the Halo 3 Rockets that spawns in the center of the map. A team will note when the rockets are picked up and used and begin to count to the next spawn. Before the next spawn they try to take control of the spawn area. The meta game is that of knowing where and when the rockets will spawn. All of these things a player is conscious of, because he can improve his Game Play by being aware of them.

Now consider the Halo 4 model of ordnance drop. The player cannot know where or when or even what weapon will spawn, because all of that was randomized. Having nothing to think about regarding the Power Weapons, he is left with only thinking about the primary objective. This elimination of decision making and the predictability necessary to form intelligent decisions makes the game shallow.

When confronted with this dilemma, some forgers simply chose not to forge ordnance drops onto their map, or at least not the random variety. The initial ordnance drop timer was fixed by the publisher and acted much the same way as the Halo 3 weapon spawn, except that it presented a way point indicator when a weapon became available (from spawn to acquisition).

Summary

Power Weapons are one way to offer players decisions by giving them secondary objectives to acquire, forming a game within the game.

Power Weapons should enhance the Game Play on your map, never alter the Game Play in a radical way.

Adding depth makes your map more interesting to play on and increases the life of enjoyment your map has to offer. Shallowing the map can reduce the Game Play to simply killing your adversaries, which will get old real fast.

Vehicles

We talked about how Power Weapons can be used to create depth in your map by leading or forcing players to make decisions unrelated to the Game Play and its primary objective. I want to now talk about how we can do the same with vehicles. We already discussed how vehicles can be used to offer players additional ways to travel and engage their adversaries. Let's look at the depth to your map that vehicles tend to offer.

Remember that depth is introduced when players are confronted with decisions to focus on objectives like Power Weapons instead of the primary objective of the game, and for the purpose of gaining advantages over their adversaries. Like Power Weapons, the more powerful the vehicle, the more important it becomes to winning the match.

Forging a Scorpion, a Wraith, or a Mantis can lead a player to make the decision should they jump in the vehicle and remain back, should they push forward, or should they not even bother with the vehicle at all? And if the vehicle is a very powerful weapon system with no real threat save the laser (as in Halo 3 Sand Trap or Valhalla), then the value of acquiring the vehicle becomes enormous (particularly the Scorpion). This last part in turn makes jacking the enemy Scorpion, Wraith, or Mantis all that much more valuable. From this value the meta game of jacking the enemy vehicle becomes a priority amongst a good segment of the population.

For me there was never any more satisfaction of jacking the enemy Banshee and successfully flying off with it on Valhala, the Scorpion on Valhala Heavy or Sand Trap Heavy, or the Gausshog or Banshee on Standoff Heavy. Those were the ultimate statement of dominance over

my enemy – that I could slip in behind their lines and take a very important commodity from under their noses and turn it on them. And honestly even if they stopped me cold in my tracks, there was still an enormous satisfaction of having denied them their prize. I valued the success of this meta game way more than whether we won the game itself, because of the personal challenge it presented to me to do the unusual, the unexpected, the ultimate in surprise. The depth that this type of meta game offered was enormous.

Summary

Vehicles can offer Meta for your map just as Power Weapons can.

If both teams have the same vehicles, then jacking the enemy's vehicles and denying them an equal advantage becomes a sport in and of itself.

The more powerful the vehicle, the more incentive there is to acquire the vehicle, or at least denying the enemy the same.

Map Control

By careful design of your Geometry, you can forge specific Meta Games into your map. You can also leverage your Geometry with careful design of your Spawn Layout to enable Spawn Influencing and Spawn Traps as additional Meta Games.

Manipulating Enemy Movement

The right Power Position overseeing adequate areas of the map allow a player in that position to influence how their adversaries will move about. They can do this by suppression fire where they do not want their adversaries to move through, forcing them to find alternate Paths. This can be used to a team's advantage, and can turn a Slayer game into a game of manipulating one's adversaries. The focus changes from Slaying to manipulating. The goal would be to utilize this advantage to achieve the primary objective (killing the adversary in Slayer). It could also be to lengthen the adversaries' Path to a KOTH Hill, for example.

The point is that Power Positions can be used in various ways, and can open up Meta Games that others discover later as they work to find advantages over their adversaries through many games over time. And while I talk about Geometry influencing movement, I am certain there are other Meta that Geometry can introduce that I am not even aware of. But this example should get you started in realizing how Geometry can create Meta even in potentially unsuspecting ways.

Baiting Power Positions

Now I want to take the idea a step further and discuss how one Power Position can be used to over look another Power Position, yet not be the Super Position.

Take a map in which there are three levels, level 1, the ground level; level 3, the high ground; and level 2, an intermediate level. Now create the Geometry necessary to allow level 2 to overlook level 1; and the Geometry to allow level 3 to overlook level 2; and finally the Geometry to prevent level 3 from having any sight lines on level 1. The result is level 3 influencing level 2, and level 2 influencing level 1.

Now put something important, say a Power Weapon, at the bottom of level 1. You now create the scenario where players on level 2 can use the Power Weapon as bait. But wait! Level 2 now is bait for level 3!

Do you see how this can increase the depth of your map? Do you see how players on either team can play levels 2 and 3 in a constantly dynamic changing strategy through out the match?

Influencing Spawns

Many of us have heard how in Halo 2 one could stand at very specific locations to help their team mates spawn in very advantageous locations on the map. The Spawn Engine for Halo 2 made this possible.

On the other hand, you can also influence the spawning of your adversary. For example, in Halo 4, in CTF games, one could stand in the enemy base and force the adversary to spawn far away from their base. The difficult part was sneaking into their base.

To understand how any of this happens, either someone must discover it in game, or someone must analyze the map's Spawn Layout in forge. In each case, manipulating spawns on a map, either your own teams' or those of your adversaries', become Meta Games in and of themselves. They are strategies, conscious decisions on the part of players, to pull them off for the purpose of achieving an advantage in Game Play.

Prosecuting Spawn Traps

Another favorite Meta Game that some maps lend to is setting up and prosecuting Spawn Traps, or even Spawn Kills in the open. In this sort of Meta Game, a team carefully shuts down their adversaries' spawn points so that they only have one place to spawn on the map. When they come out from the cover, they are exposed to fire from multiple angles.

This particular Meta Game may be considered too rough for most playlists, but it is something to consider. If you implement this in any way, make sure there is at least one way to break the trap.

Finally, Spawn Traps collapse in Reach, but heavily sustain themselves in Halo 4.[1] I mention this to point out you should learn how the Spawn Engine of the title you are forging for behaves to fully understand how to forge a Spawn Trap (or how to ensure one cannot occur).

Summary

Like Power Weapons and Vehicles, the Geometry and the Spawn Layout can also create Meta within your map.

Geometry can help create a Meta Game of manipulating movement to gain advantages, and can result in some interesting Game Play.

Geometry and Spawn Layout together can create a Meta Game of manipulating spawns for either team.

And you could, to the degree that the title you are forging for enables, add Spawn Traps as an additional Meta Game to your map.

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[1] Understanding Why Spawn Traps Exist

Leveraging Meta

We have talked about how to add depth to your map through Geometry, through Weapons, and through Vehicles. In each case we are adding meta games through these methods. But now I want to talk about leveraging the meta found in Halo itself. This can be meta that is common to all titles, or meta that is specific to a few titles only.

Halo Is Full Of Meta

I had always known that meta was short for meta game, and that meta game simply meant a game within the game. Everything I talked about thus far in this chapter on Depth can be summarized as adding meta to your map – adding a game within the game when the game is played on your map. But when I asked at Beyond Entertainment what they felt the term meta meant, I was surprised how abstract they took the term.[1]

Halo has meta in it. You simply leverage it in your map. Power Weapons – meta. Vehicles – meta. Jumping ability – meta (you can create trick jumps that make the game play differently, advantageously, etc.).

Not all meta is good for the game. Take sprint and jet pack for example.

Learning to leverage the meta that is there will help your map become more interesting. I want to take a look at just two. In the first case, dropping the flag, is title specific – Halo 4 lacked this meta. In the second case, jumping, all titles have this, though the height varies from title to title. But they can all result in trick jumps that players discover and utilize to their advantage.

Drop The Flag

If you can drop the flag, you can drop it through a window (throw it) where a teammate is waiting to take it. Isolation on Halo 3 was an example where you could throw the flag out the window of one base, take a short walk to the other side of the tunnel between the two bases, and throw it through the window of the other base to capture the flag. Isolation's design of having its front doors face away from each other while their back windows face toward each other leverages this particular meta in Halo 3.

Isolation's design makes throwing the flag through the window extremely advantageous, because it bypasses any setup that the defenders may be creating near their front door, and it cuts the trek, the time, and the effort to capture the flag substantially less.

Trick Jumps

There are many examples of trick jumps, or tac jumps (tactical jumps), found on any map. Some are intentionally forged into the map, but quite often many are found over time by adventurous players. You should intend to provide a few trick jumps to make your map interesting to play on. Some players just love trick jumps. But realize there are going to be some that you never saw until others demonstrate them.

Trick jumps are a product of jumping itself. Unlike most other FPS games, jumping in Halo yields a much higher than normal jump. Each title is different, so you need to experiment and see how hard each trick jump will be.

By adding trick jumps to your map, you increase the skill gap. But be sure you make jumps that are readily performed by seasoned players. Trick jumps should not be hit and miss – they shouldn't be border line in success when done right.

Summary

You can leverage game meta in your map to make your map more interesting.

Some meta is title specific and some is across all titles. So you want to get familiar with the title you are forging for and see how you can leverage its particular meta.

Leveraging meta should result in advantages, such as faster movement to a higher location, faster movement of the flag, etc.

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[1] Defining Meta @ Beyond Entertainment, a collection of feedback worth reading through

Dual Objectives In Invasion

Reach's Invasion was perhaps the best study on creating decisions for defenders while also giving the defenders no time to make them. The classic example is the dual territories scenario and how a defender must know which of the two Objectives he should defend. The decision that the defender is faced with is Should he abandon one Objective to save the other?

The two Objectives are forged close enough to each other that a defender can move from one to the other in time to interfere with an offensive push. However, they are far enough away that he cannot defend both at the same time.

A feature of the Game Type ensures that when an offensive push is repelled, the Objectives return to a minimum amount of time to capture – their Float Time – so that this decision remains credible. The purpose of the Float Time is to avoid the scenario where one Objective has just a couple seconds left, leaving the defenders with no choice but to remain and defend that Objective.

This Float Time determines how far the two Objectives can be forged from each other. If the Objectives are too far apart, then the decision to abandon one Objective to save the other is no longer a credible decision.

Not only does forging the two Objectives just within the Float Time apart from each other make the decision to abandon one Objective to save the other credible, it also offers the decision to defenders without any time to think through the consequences. It is this type of decision where there is no real time to think that makes Invasion interesting, where the invaders can trick the defenders into making a game breaking decision. It is this type of forging that adds a tremendous amount of depth to an Invasion map.

Invasion makes a great case study on forging depth into a map, though I doubt we will ever see a Game Type on the same level of complexity again. Nonetheless, I include it here to add to the breadth of this discussion.

Summary

Invasion is a Game Type that required specific features forged into your map that naturally provides quite a bit of depth.

The more intense types of decisions are those that are game breakers for which players have no time to think through the consequences.

Static Spawning

Now take everything I said about Spawning in the lesson on Symmetry and put them aside for a moment. I want to talk about depth that is added through Static Spawning. And then I want to talk about depth that is added through Dynamic Spawning. I want to bring both of these to your attention so that you are aware of both of them and so that you can decide for yourself what you wish to implement on your maps.

Rewarding Skilled Pushes

As I mentioned in the lesson on Symmetry, Static Spawning – teams spawning only on their side of the map – is only required for those Game Types that have objective goals tied to team bases. But there is a case for including it in most other Game Types.

Dynamic Spawning – teams spawning in the safest location anywhere on a map – provides for safer spawning above all else. The intention is to allow players to spawn as far from the enemy as possible. For example, if blue team overruns red team's base, then red team would spawn at blue team's base. This approach simply makes spawning safer.

But a side affect of Dynamic Spawning, especially for Slayer, is the counter intuitive rewarding of the team that is being overrun. Out skilled by the blue team (for example), the red team will be pushed back against their end of the map until suddenly they begin to spawn behind the blue team. The spawn engine suddenly begins to reward the red team with the ability to flank the blue team from behind. This reward is counter intuitive, as it rewards the less skilled team and penalizes the more skilled team for being aggressive.

The consequences are severe for the blue team. They can feel pressured not to overrun the red team's base – their movement becomes deprived. This is no small issue that you need to consider.

But there are those who feel that if the teams are so unbalanced that the red team would wind up spawning behind the blue team, then it would be better than having the blue team crush the red team. I would disagree with this, but it is open to opinion on how a Game Type should play out.

Dynamic Spawning

I used to think that Spawn Traps were bad, bad, bad. But I read a post somewhere in which someone advocated that Spawn Traps could create a healthy meta game in some cases. But what was really surprising was that he went on to say that Spawn Traps in a Dynamic Spawning experience was where real skill shined. (The discussion revolved around an Arena style map.)

I can imagine.

It would take real skill to Spawn Trap when a small change in your position can force a player to spawn behind you. Or in the case of Reach, just killing them on one end of the map causes them to spawn behind you on the other end.

The point of this is two fold. Firstly, Spawn Traps, when done correctly, can be considered a meta game – forging the ability to prosecute Spawn Traps under very carefully executed procedures is forging depth into your map. On the other hand, making it easy to prosecute a spawn trap is ridiculous.

Second, the skill gap is increased if you allow Dynamic Spawning on the map that allows for Spawn Traps from a single Power Position (for example) so that a team can drive the trap and then prosecute it through carefully played out strategies.

Summary

Static Spawning rewards skilled teams that push the other team back against their base. But this type of Game Play may be considered too brutal or unbalancing.

Dynamic Spawning rewards higher skilled players on some maps that allow them to drive

and then prosecute Spawn Traps all around them.

You should be aware of the depth each of these adds and decide if your map should include either to increase the fun and the skill gap on your map.