

Level Design

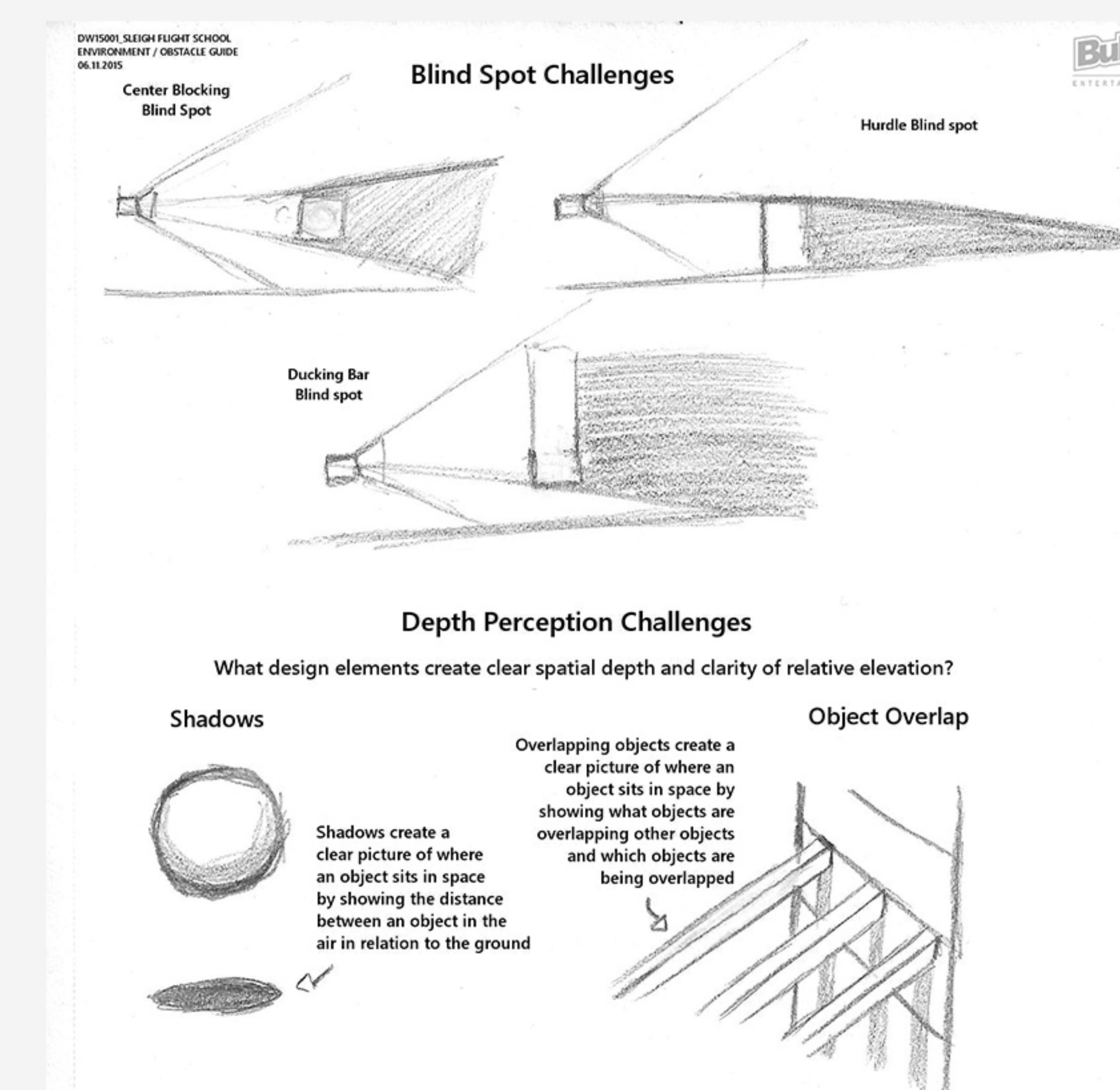
| Obstacle Design / Obstacle Placement |

- I had been given a game design from DreamWorks, so I had to figure out how to make our level design work with it. It was simple enough, a basic 3-lane infinite runner style of game, but the fact we would have players going over and under things while not being restricted to a floor created some new problems I had to solve.

- If players were going to be flying through the air, they would need a point of reference for depth, otherwise they would have trouble reading obstacles ahead of them and accurately deciding to jump or dive under them.

- Elements like the 'Starfield' were critical in providing a consistent point of reference for players trying to read the track ahead of them.

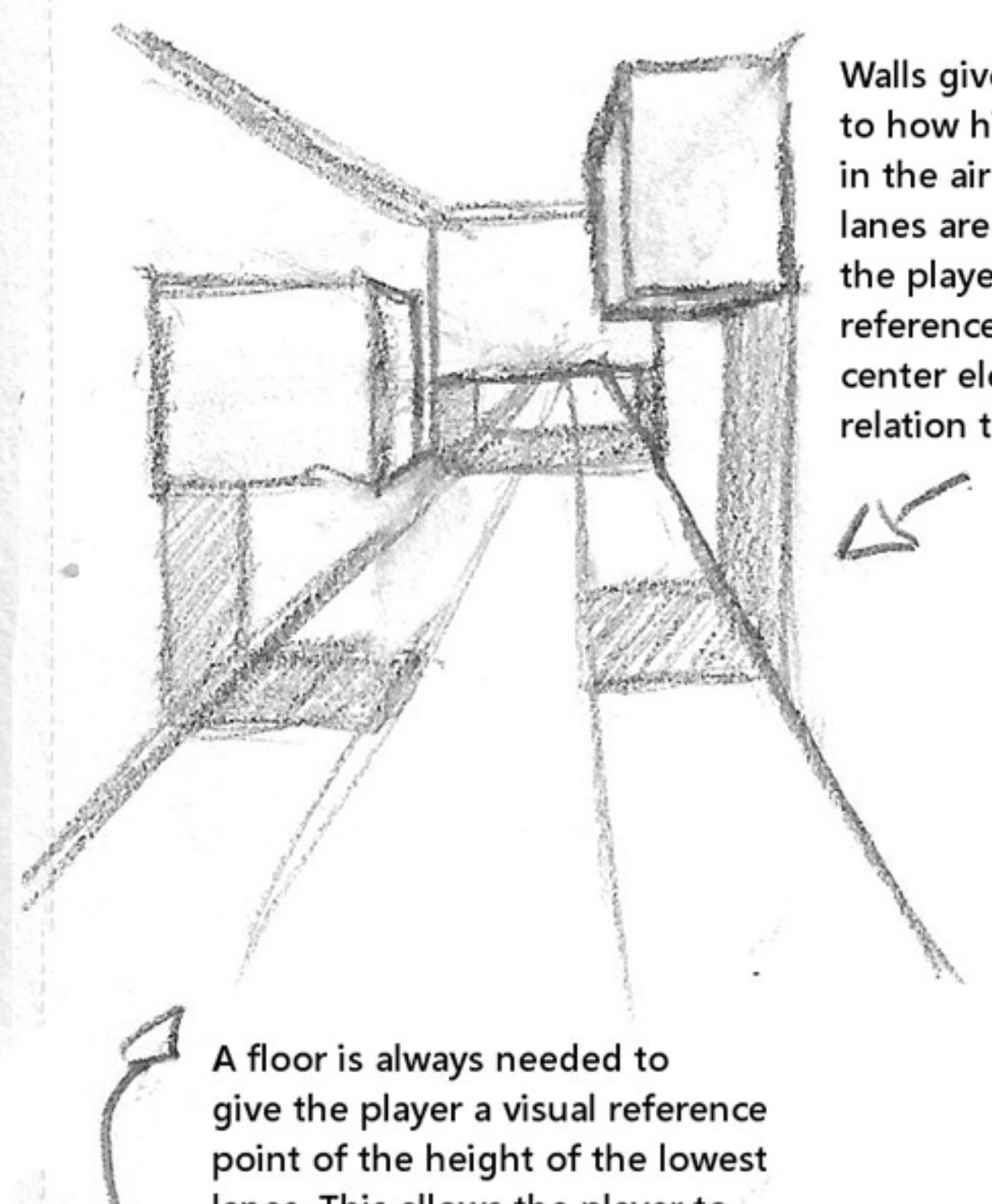
- I put together this guide for the team to use when thinking about how to construct spaces. This became invaluable during development since it allowed artists to think like level designers and required little intervention from me later on to get placement of objects right.



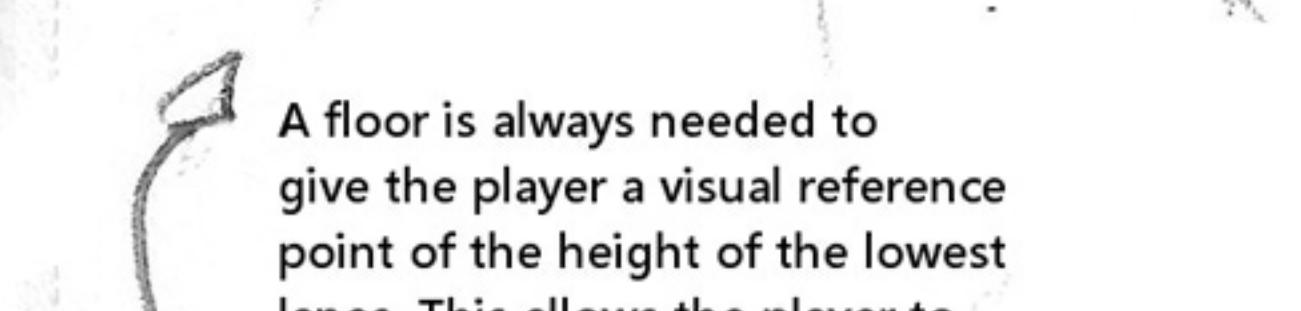
How do we use these two elements to create clear depth perception and ease of determining relative position in space in relation to elevation?

2 options

Canyon Environment



Walls give a visual reference to how high an obstacle sits in the air and which elevation lanes are clear. They also give the player a visual point of reference for where the center elevation lanes are in relation to the environment.

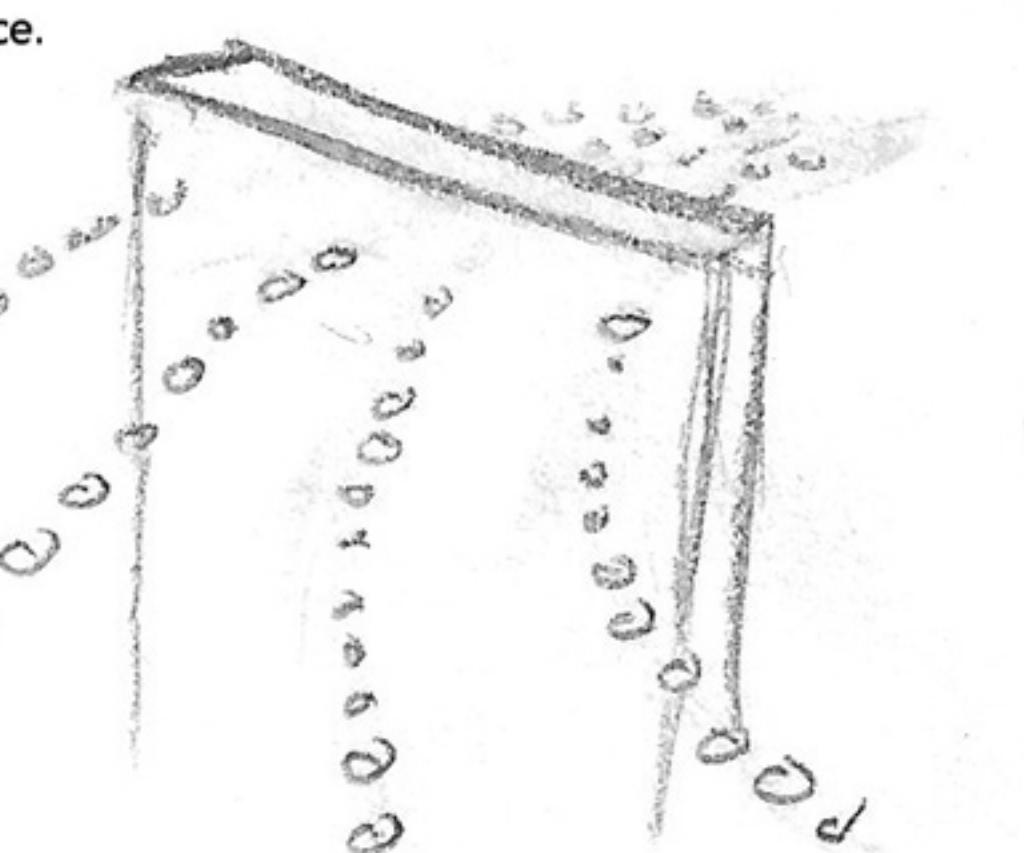


A floor is always needed to give the player a visual reference point of the height of the lowest lanes. This allows the player to accurately gauge the elevations of obstacles by comparing the distance between where the object sits in space and where its shadow sits on the ground

By being able to visually measure the distance between an object and the floor (The gap the object creates) the player is able to instantly know whether they need to jump or duck. The existence of this gap is only made possible by the presence of a surface for shadows to fall onto.

This environment allows every obstacle's position in space to be interpreted clearly and accurately, but restricts what can be done with the environment as a solid floor must be present at all times. This kind of environment will require us to rethink how our environments are structured which means further time conceiving.

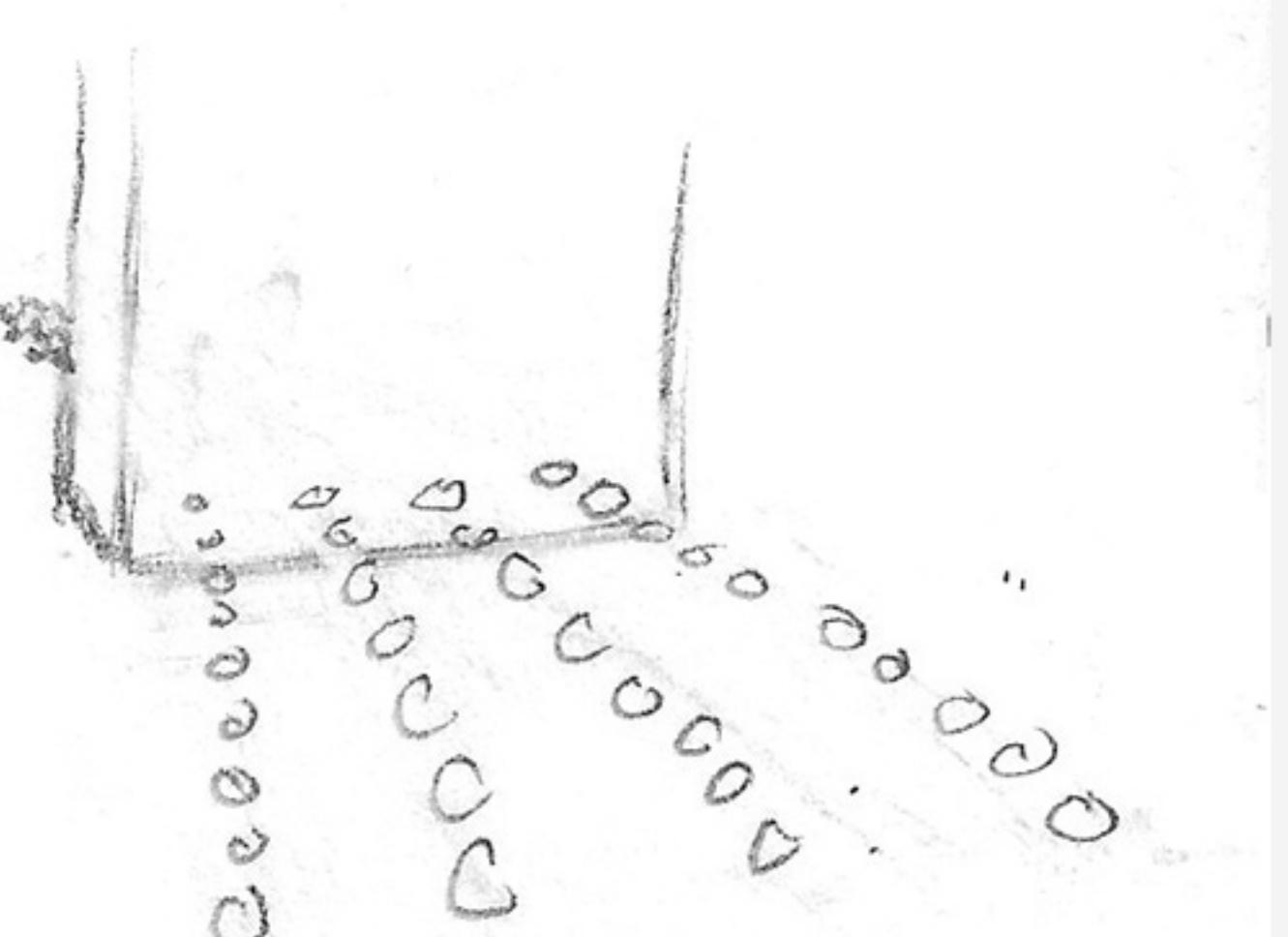
Starfield Highway Environment



These dots or "stars" are visible to the player and cover the entire highway into the distance. They represent the center elevation lane and will be the player's reference point for determining the height of obstacles. This becomes our "floor".

Because the starfield overlaps this obstacle and the object doesn't block the view ahead, the only visible path is to jump

The player determines if they need to jump or duck by observing if an obstacle overlaps the starfield or is being overlapped by it.



Ducking bars don't work as well as hurdles do, as there is still no perceivable gap which makes it more difficult to see which path is open. The fact that they give the player such a huge blind spot gives it the appearance of a wall and the lack of a surface for a shadow to fall on means the player can't get a visual measurement of how much space is under the obstacle.

However, the fact that the obstacle overlaps the starfield and not the other way around indicates that the top and central lanes are blocked meaning that the player must duck.

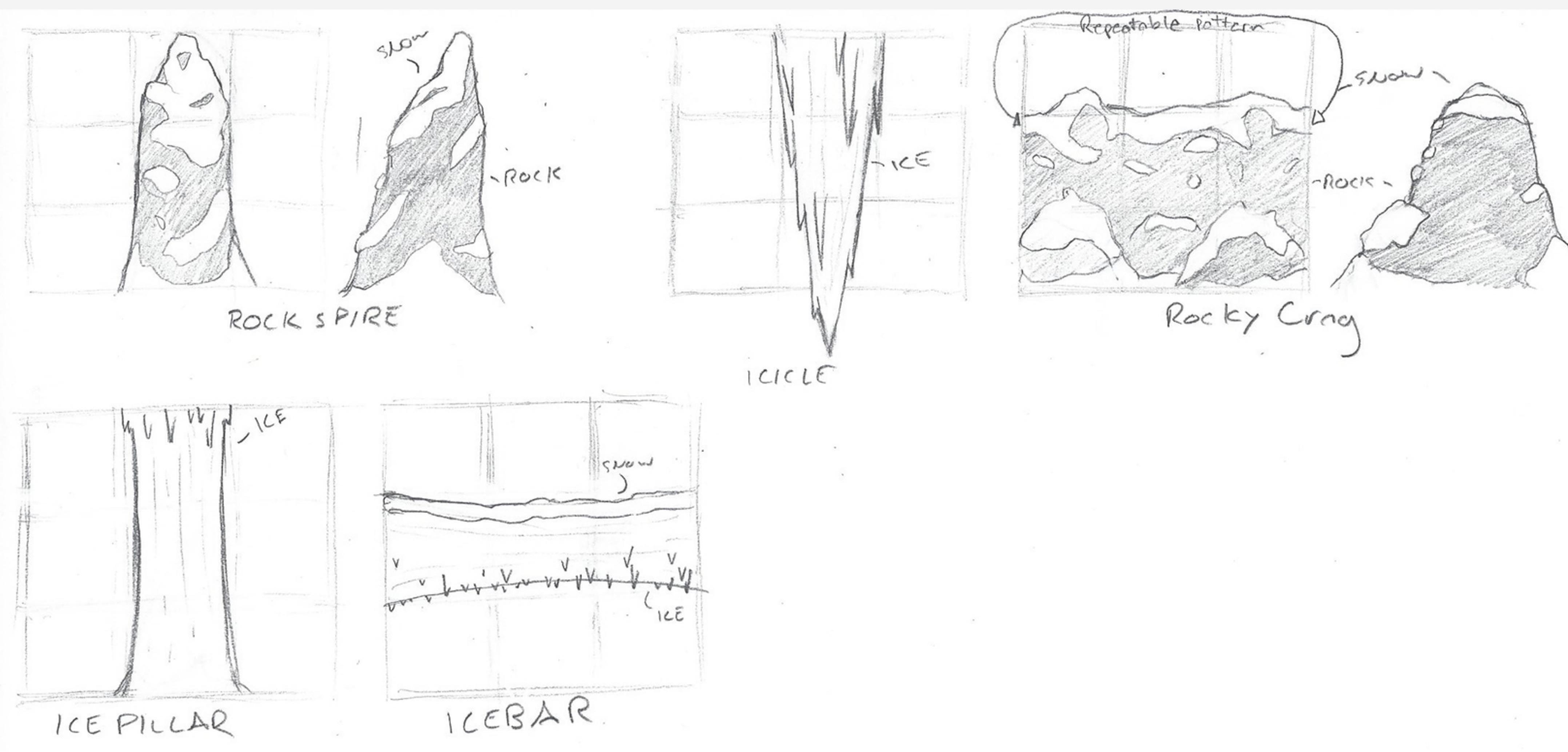
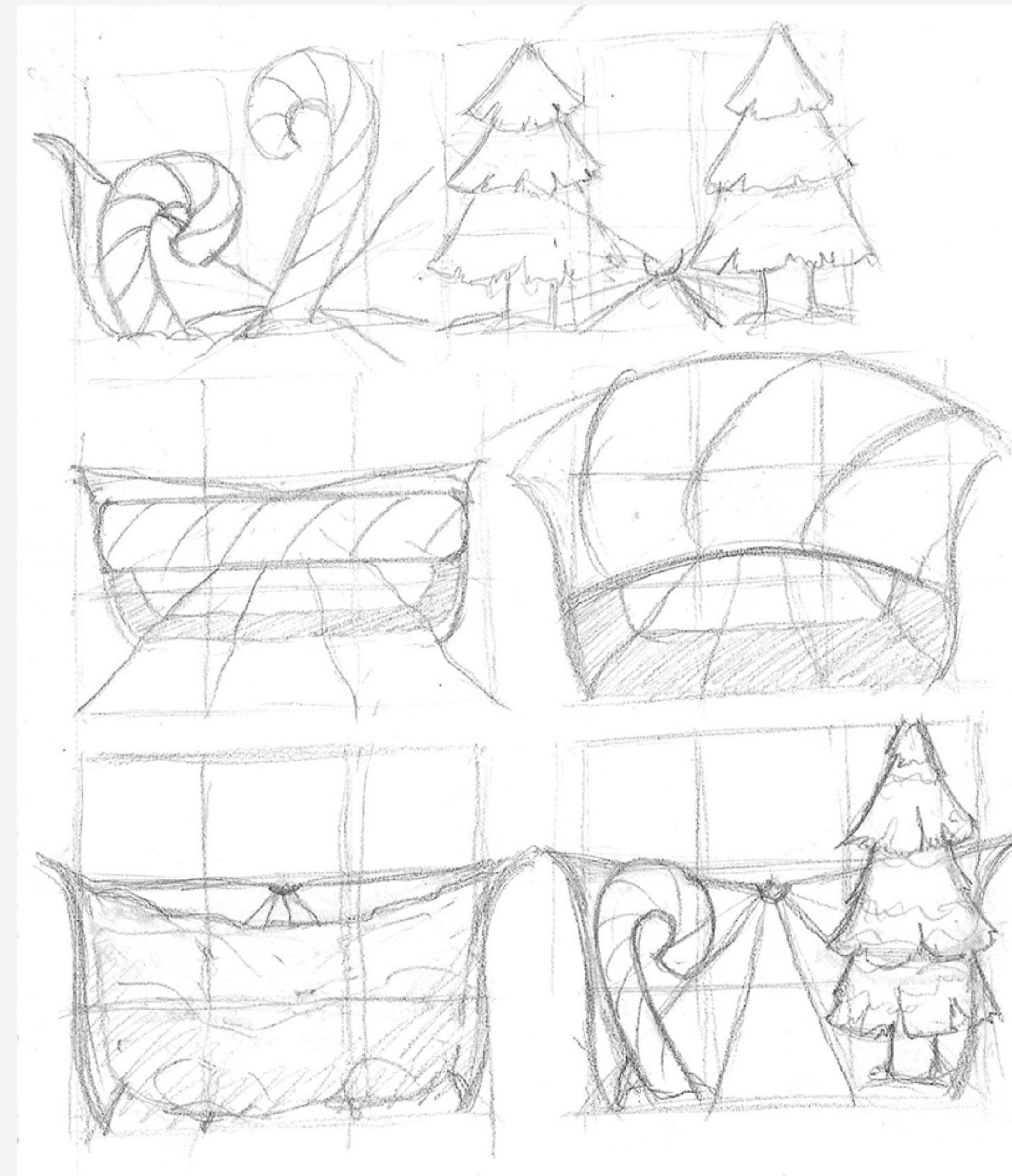
This environment works well when in the air, however, ducking bars are less clear so they probably shouldn't be used in the air. The hurdles work very well in this environment however as they don't require a secondary element of depth (shadows) to clear up which paths are open for the player to traverse to. In terms of environment design this is the most flexible and doesn't require a significant amount of rethinking and reconcepting.

In Conclusion

A combined use of both methods may be most beneficial with a majority of time spent in the level taking place in a Starfield environment, however this may vary from level to level (Candy Cane Lane will be far more Canyon environment than Chimney Dodge for example). The reasons for this are that Starfield environments will be cheaper and require less time to conceptualize and create assets for in comparison to Canyon environments. Canyon environments have yet to be conceptualized and will need special assets created to make them work. A combination of both environments allows us to use both of their strengths while controlling and minimizing their individual drawbacks.

KEY POINTS

- The rules for the visual design of each obstacle is determined by which environment it will sit in.
- A visible gap created by a measurable distance between two objects by a shadow is a clear indicator of an open path for the player.
- Walls give a point of ref for the elevation lanes of obstacles and the player.
- If the object touches the floor or pushes up out from the floor but does not extend to the top of the canyon walls, the player must jump over it.
- A gap between the floor and object means the player can duck under it.
- The absence of negative space between the floor and the object also communicates that the only viable open lanes are of higher elevation.
- Floors and Starfields give a reference point for players to gauge which elevation lanes are open and blocked.
- An object being overlapped by the Starfield that doesn't block the player's view of the horizon line means the only open lanes are the top lanes (Jumping).
- An object that blocks the view of the horizon line and of the Starfield but isn't overlapped by the Starfield means the only open lanes are the lower lanes (ducking).



- I designed most of the obstacles in the game. The trick here was to come up with objects that had a very clear hitbox and visually stood out from their surroundings.
- Players have a propensity to jump over objects rather than diving when given the choice, so for objects the player needed to duck under I made sure that the player's view of the road ahead was obstructed by the object as much as possible, eliminating all doubt that they couldn't go over it.
- Players wouldn't realize they had to jump over an object unless the Starfield intersected with it and they could clearly see over the object. For these obstacles I made sure that there would be high contrast between it and the Starfield in every situation. These objects would also be placed so that the interruption of the Starfield was highly visible, but the object still looked jumpable.

	A	B	C	D	E	F	G	H	I	J
99	23				0.3705647097	T				
100	0.3772964226				0.3738393226	C				
101	0.3805710355	T	T	T	0.3771139355	B				
102					0.3803885484		L	M	R	
103	24				0.3836631613	T				
104					0.3869377742	C				
105					0.3902123871	B				
106	0.3969441				0.393487		L	M	R	
107	25				0.3967616129	T				
108					0.4000362258	C				
109	0.4067679387	T	T	T	0.4033108387	B				
110					0.4065854516		L	M	R	
111	26				0.4098600645	T				
112	0.4165917774				0.4131346774	C				
113					0.4164092903	B				
114					0.4196839032		L	M	R	
115	27				0.4229585161	T				
116					0.426233129	C				
117		o	o	o	0.4295077419	B				
118	B BEGIN				0.4327823548		L	M	R	
119	28				0.4360569677	T				
120					0.4393315806	C				
121					0.4426061936	B				
122					0.4458808065		L	M	R	
123	29				0.4491554194	T				
124					0.4524300323	C				
125					0.4557046452	B				
126					0.4589792581		L	M	R	
127	30				0.462253871	T				
128					0.4655284839	C				
129					0.4688030968	B				

	A	B	C	D	E	F	G	H	I	J
137					0.495		B			
138					0.4982746129		L	M	R	
139	33				0.5015492258		T			
140					0.5048238387		C			
141					0.5080984516		B			
142					0.5113730645		L	M	R	
143	34				0.5146476774		T			
144					0.5179222903		C			
145					0.5211969032		B			
146				"	0.5244715161		L	M	R	
147	35			"	0.527746129		T			
148				T	0.5310207419		C			
149				T	0.5342953548		B			
150					0.5375699677		L	M	R	
151	36			T	0.5408445806		T			
152		"	"		0.5441191935		C			
153	C END	"	"	T	0.5473938064		B			
154	D BEGIN				0.5506684194		L	M	R	
155	37	"	"	T	0.5539430323		T			
156		"	"	O	0.5572176452		C			
157					0.5604922581		B			
158					0.563766871		L	M	R	
159	38	C			0.5670414839		T			
160					0.5703160968		C			
161		C			0.5735907097		B			
162	E BEGIN				0.5768653226		L	M	R	
163	39	C			0.5801399355		T			
164					0.5834145484		C			
165		C			0.5866891613		B			
166					0.5899637742		L	M	R	
167	40				0.5932383871		T			

	A	B	C	D	E	F	G	H	I	J
169					0.5997876129		B			
170			"	"	0.6030622258		L	M	R	
171	41		"	"	0.6063368387	T				
172		C		"	0.6096114516	C				
173			T		0.6128860645	B				
174		C	I	"	0.6161606774		L	M	R	
175	42		I	"	0.6194352903	T				
176		C	I	"	0.6227099032	C				
177			I	"	0.6259845161	B				
178		C	I	"	0.629259129		L	M	R	
179	43		I	"	0.6325337419	T				
180			I	D	0.6358083548	C				
181			O	"	0.6390829677	B				
182				"	0.6423575806		L	M	R	
183	44			"	0.6456321935	T				
184				D	0.6489068064	C				
185				"	0.6521814193	B				
186		D		D	0.6554560322		L	M	R	
187	45	C		C	0.6587306452	T				
188				"	0.6620052581	C				
189		C		"	0.665279871	B				
190				"	0.6685544839		L	M	R	
191	46	C		"	0.6718290968	T				
192				"	0.6751037097	C				
193		C		"	0.6783783226	B				
194				"	0.6816529355		L	M	R	
195	47	D	D	D	0.6849275484	T				
196				D	0.6882021613	C				
197				D	0.6914767742	B				
198				"	0.6947513871		L	M	R	
199	48			"	0.698026	T				

A	B	C	D	E	F	G	H	I	J
203	F BEGIN	T		0.7111244516		T			
204	49	I	"	0.7143990645		C			
205		T	C	"	0.7176736774	B			
206		I			0.7209482903		L	M	R
207	50	T	C		0.7242229032	T			
208		I			0.7274975161	C			
209		T	C		0.730772129	B			
210		I			0.7340467419		L	M	R
211	51	T	C	B	0.7373213548	T			
212		I		I	0.7405959677	C			
213		T	"	B	0.7438705806	B			
214		I	"	I	0.7471451935		L	M	R
215	G BEGIN	T		B	0.7504198064	T			
216		I	"	I	0.7536944193	C			
217		T	"	B	0.7569690322	B			
218		I		I	0.7602436451		L	M	R
219	53	o		o	0.763518258	T			
220					0.7667928709	C			
221					0.7700674839	B			
222					0.7733420968		L	M	R
223	54				0.7766167097	T			
224					0.7798913226	C			
225		C	"		0.7831659355	B			
226			"		0.7864405484		L	M	R
227	H BEGIN	C			0.7897151613	T			
228			T		0.7929897742	C			
229		C	I		0.7962643871	B			
230			I		0.799539		L	M	R
231	56	C	T		0.8028136129	T			
232			I		0.8060882258	C			