

Overwatch: Environment Texture maps

RGB

R

G

B

Diffuse/
Albedo



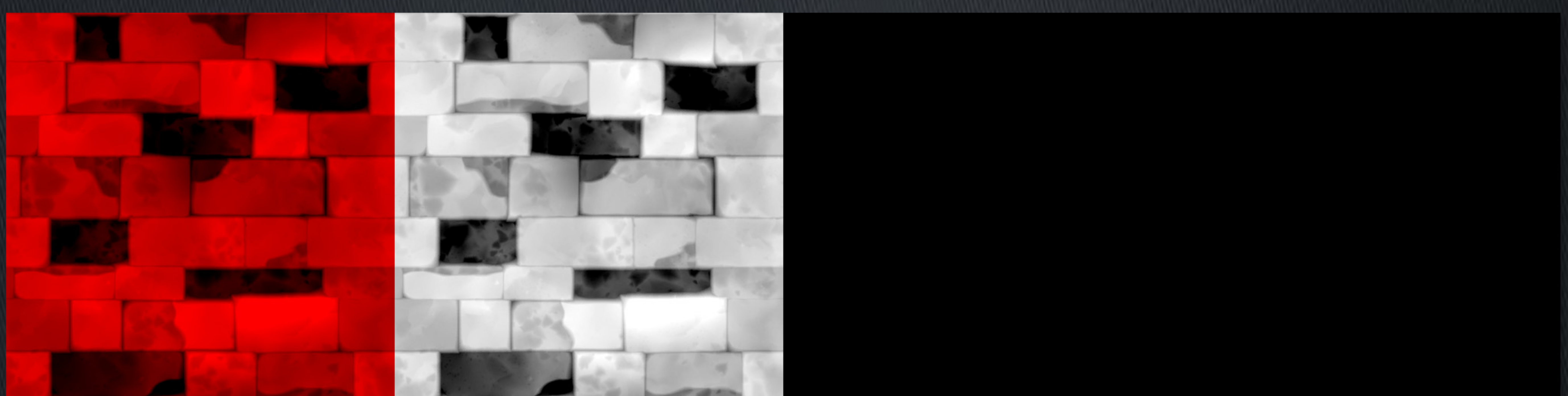
1024x1024

Normal



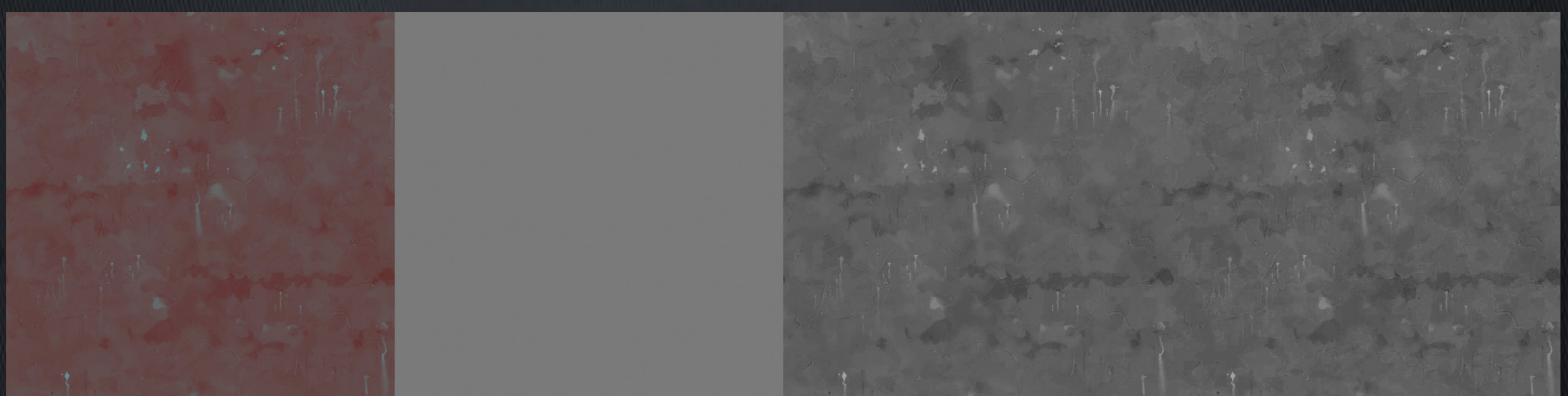
512x512

Height?



512x512

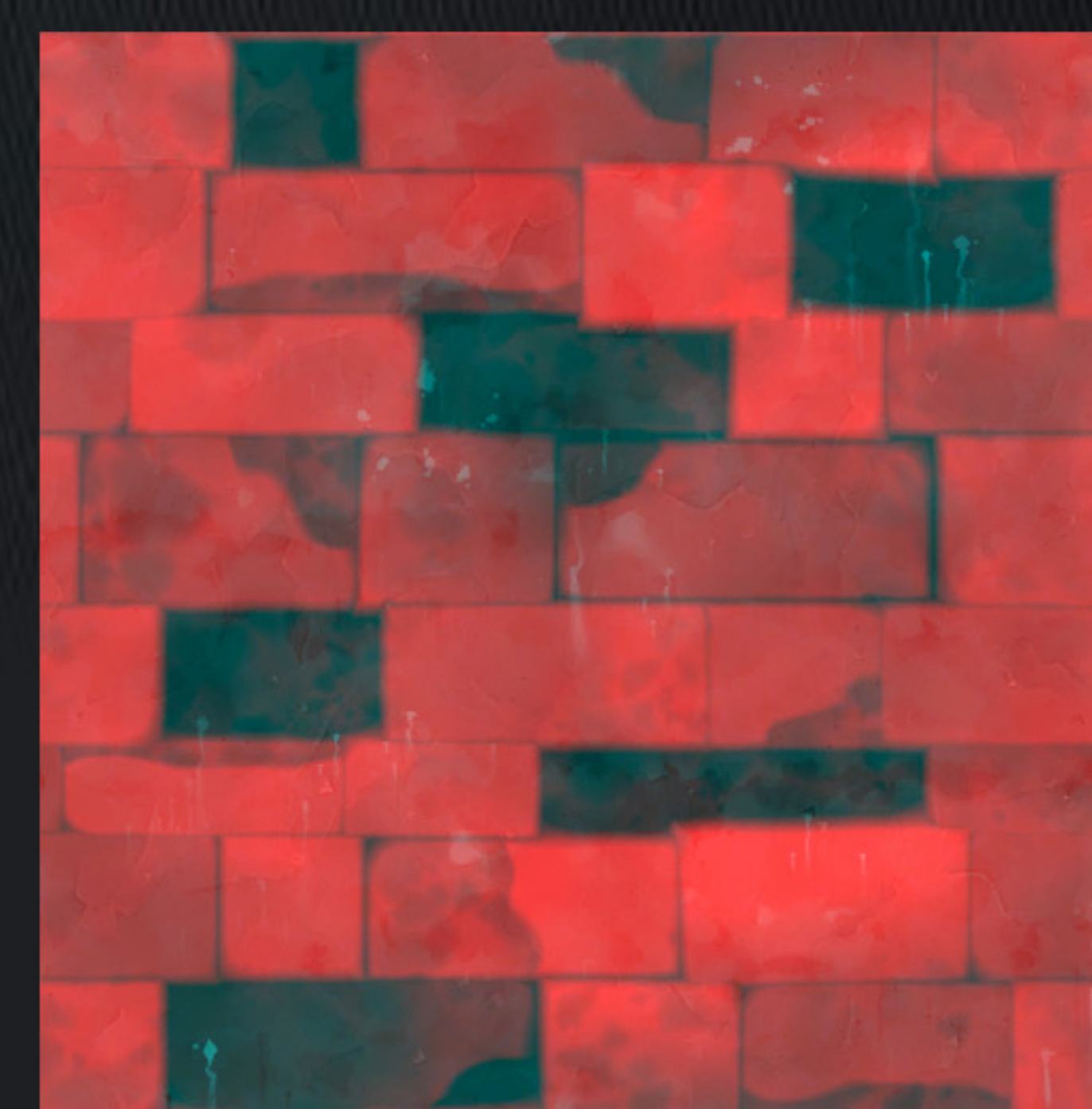
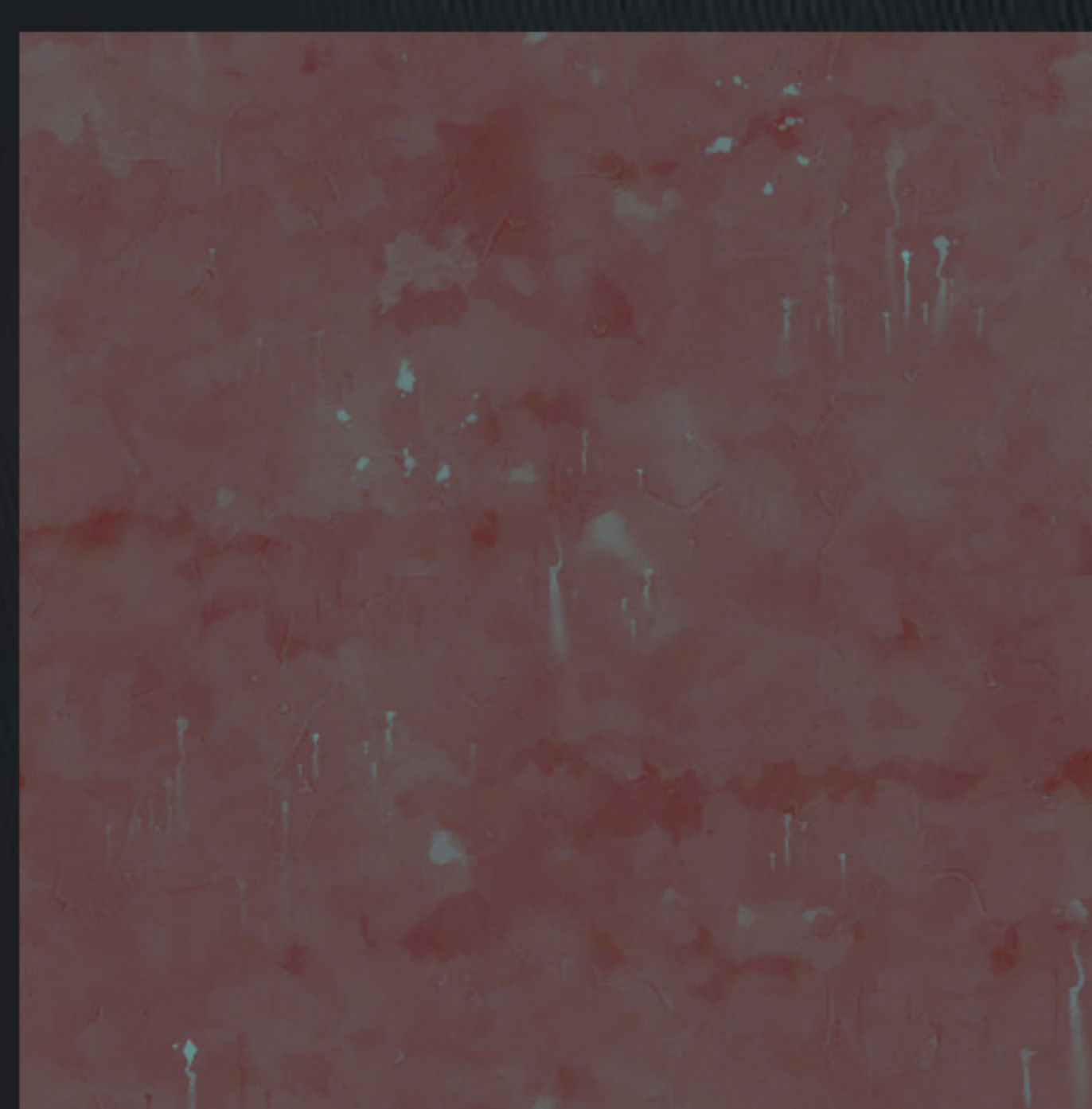
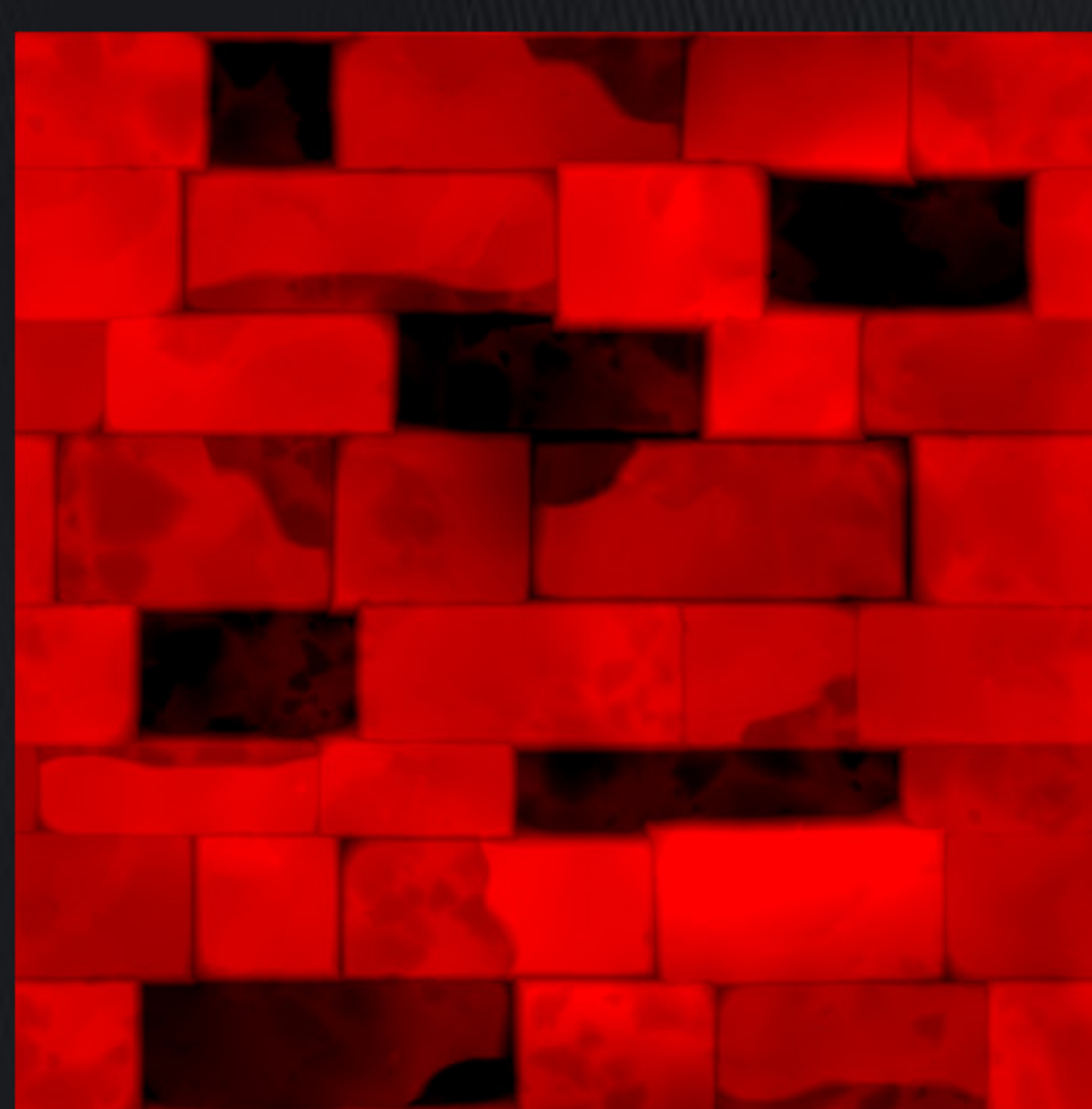
Spec?
Metalness?



512x512



The normal map seemed to have no blue channel.
This indicates that they are using a compression method such as “BC5”
to reconstruct the blue channel.
This is both more performant, and results in less artifacting.



As what I suspect is a height map only used the red channel and the specular didn’t, I assume these actually combine into one texture map and are split in engine for performance.

Notes:

I presume the height map is not used for parralax occlusion mapping, but rather is used for blending textures together, allowing sand and grit to gather in the cracks and low points.

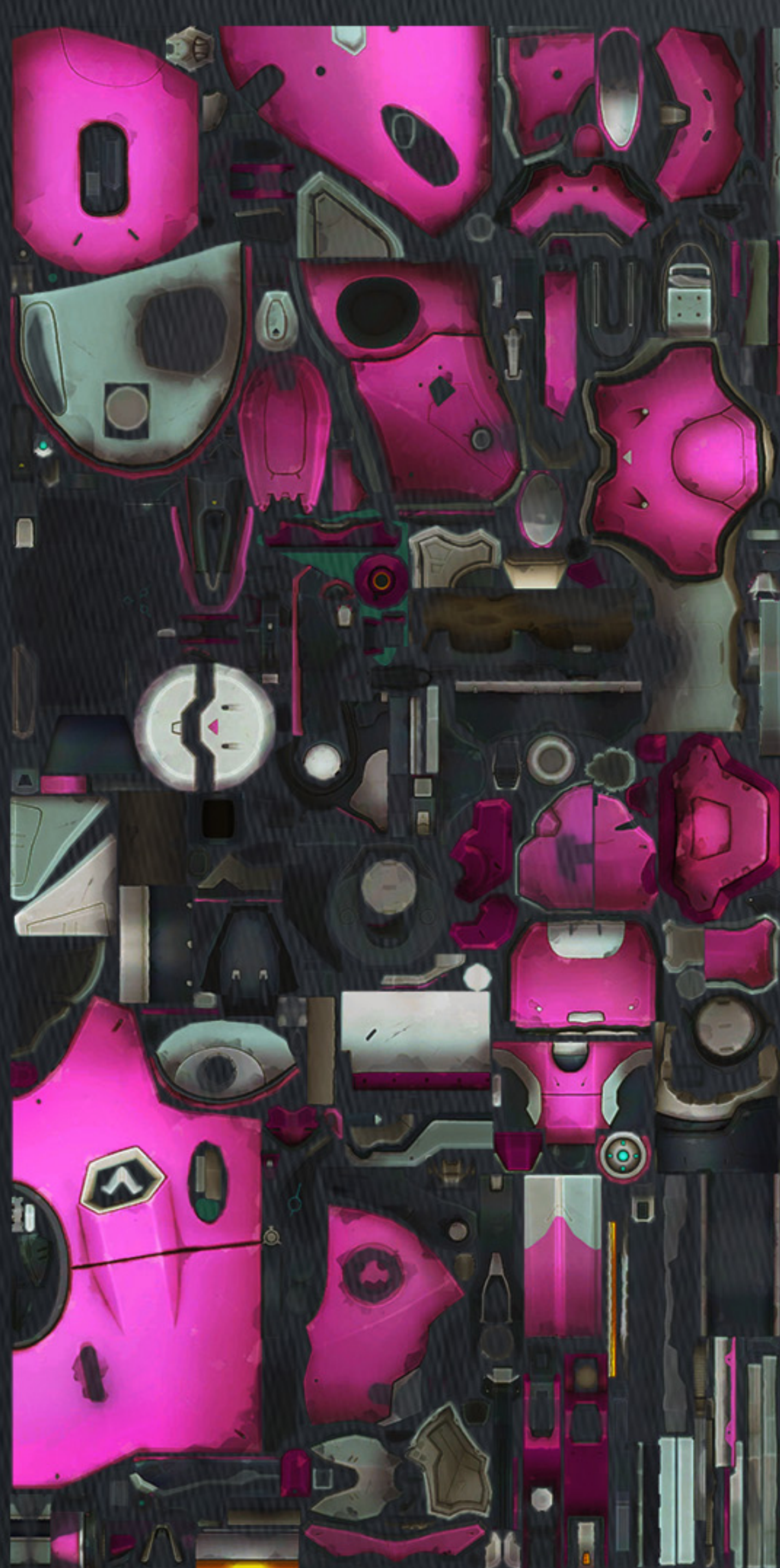
I have observed a lot of scratches and grunge in the specular in game.
This works great to help break up repitition.

It would appear standard Overwatch materials use three textures, Diffuse, Normal and Height/Spec.

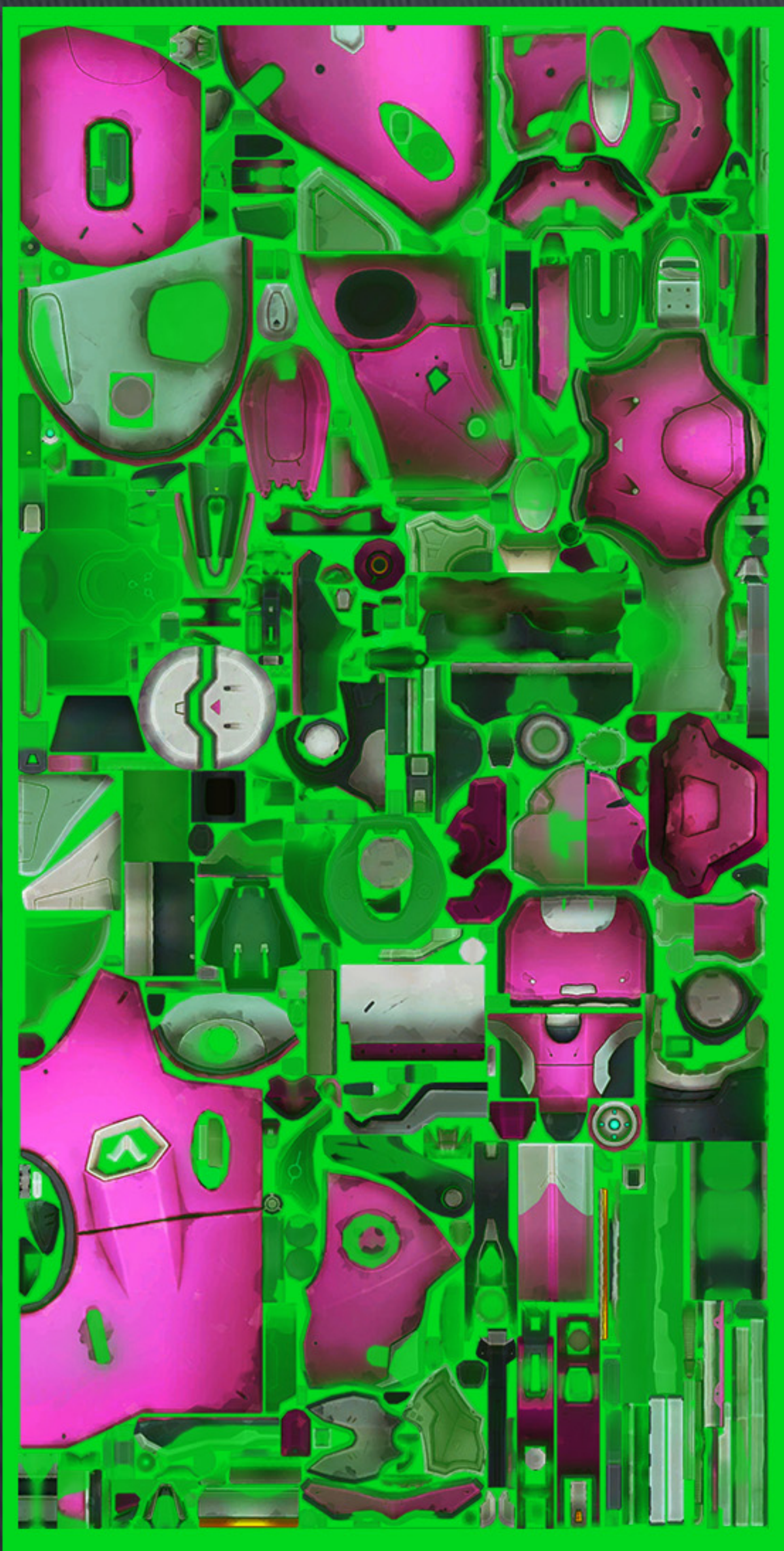
I imagine they are using a PBR model, so the Spec may not make sense.

Overwatch Character Breakdown

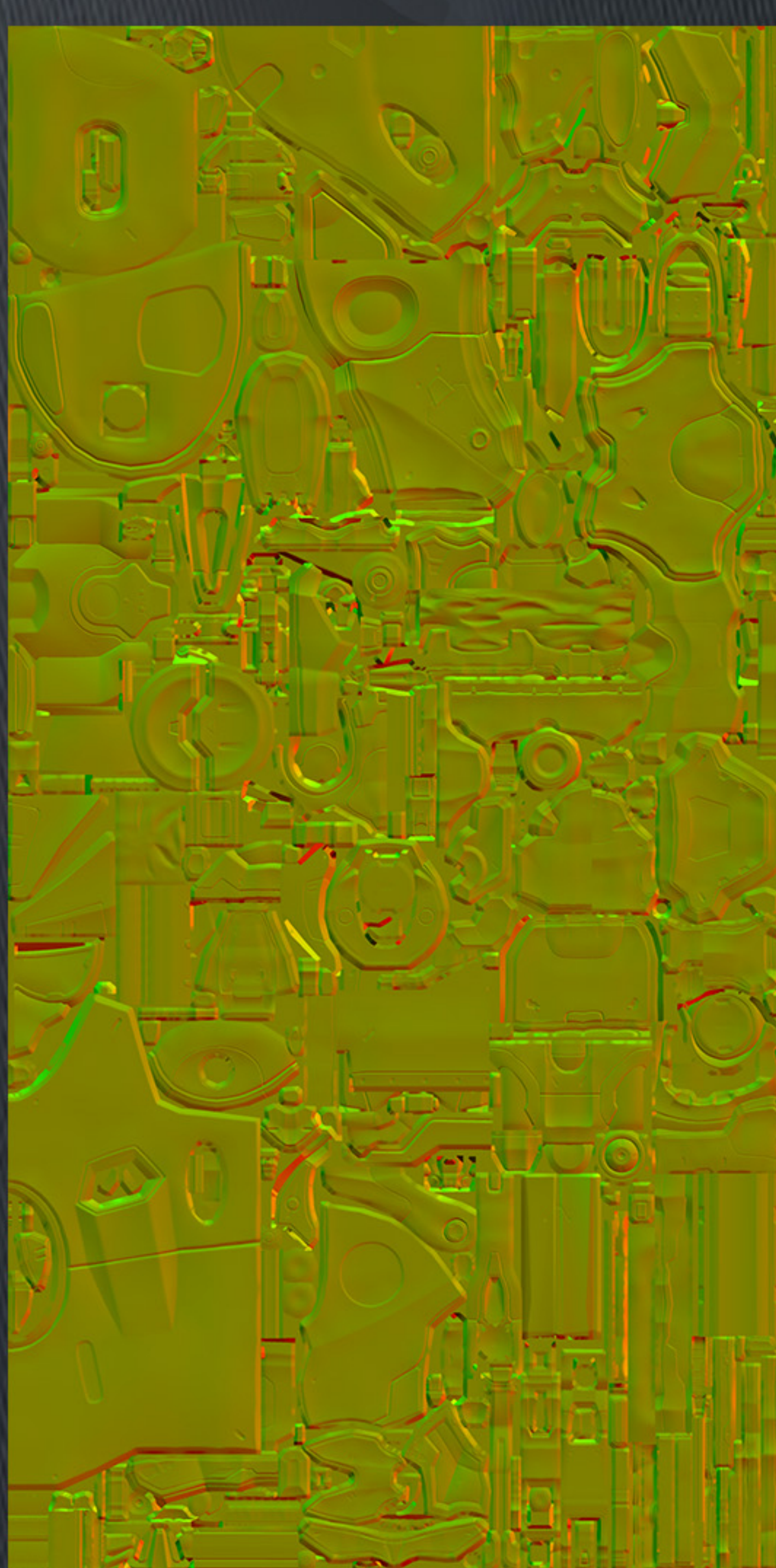
D.VA Mech textures



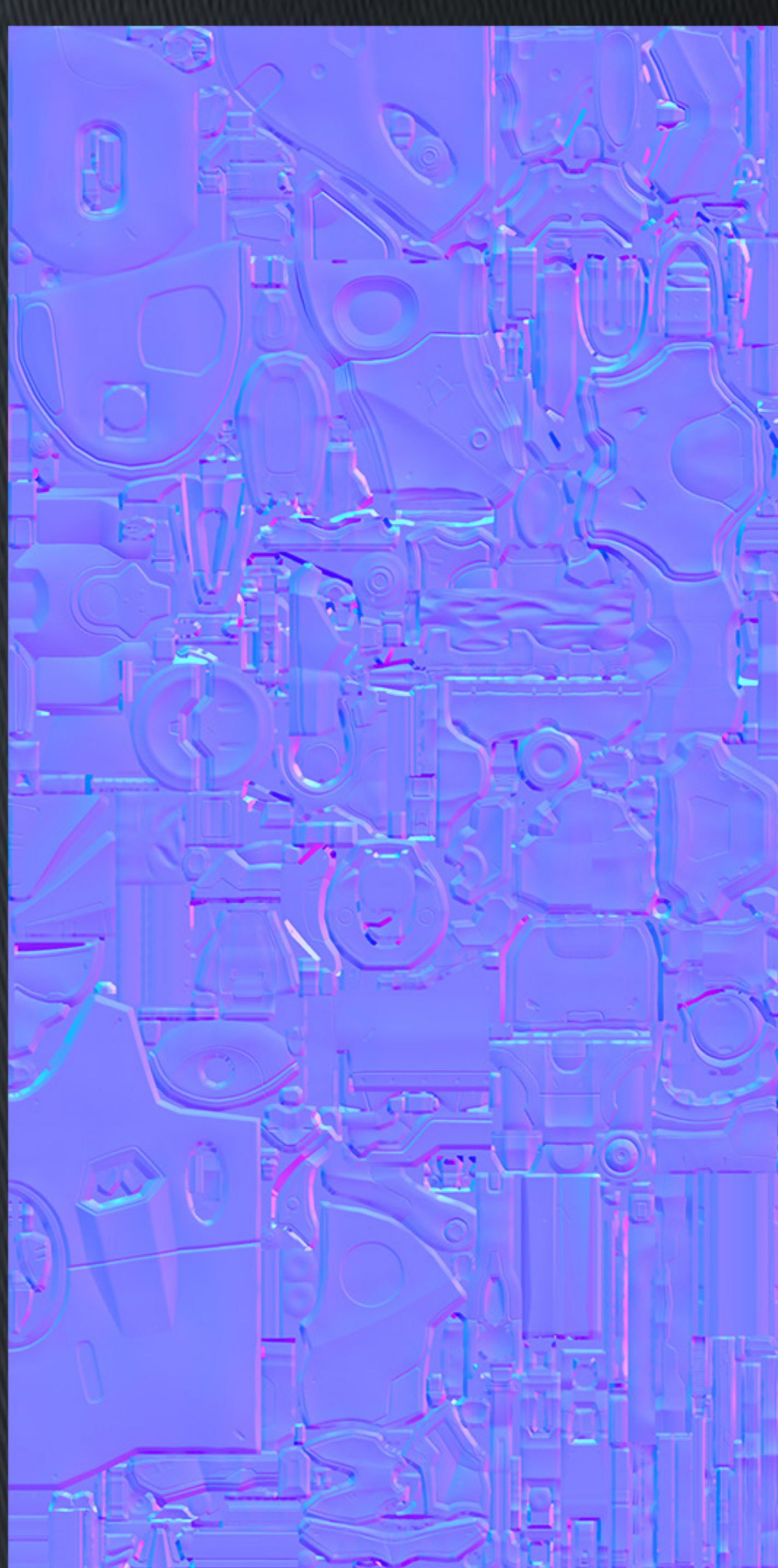
Diffuse
All maps are
1024x2048



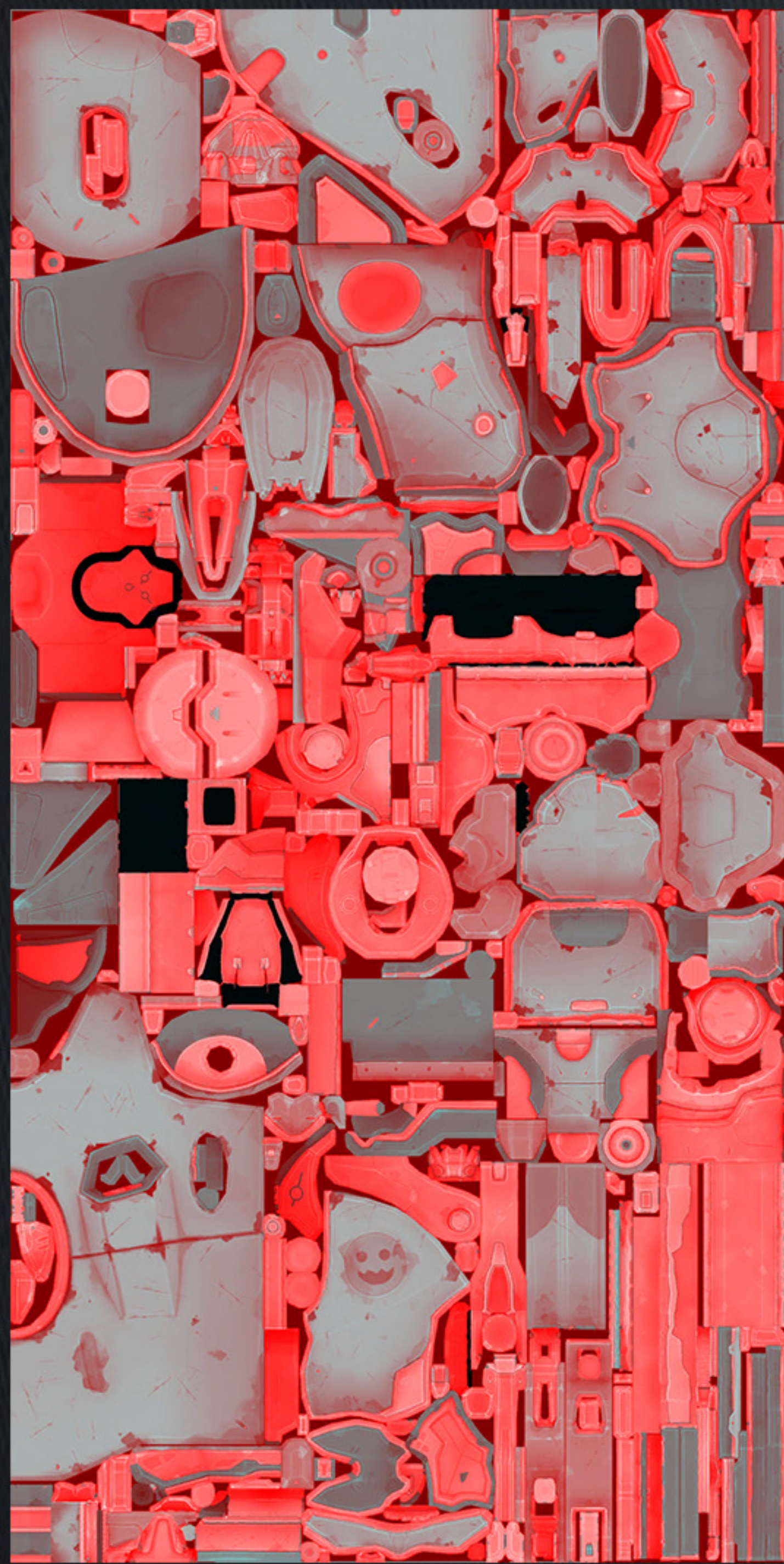
Diffuse has
transparency.
For glass?



Normal Map
Like other examples, has no blue channel
unless we add it in.

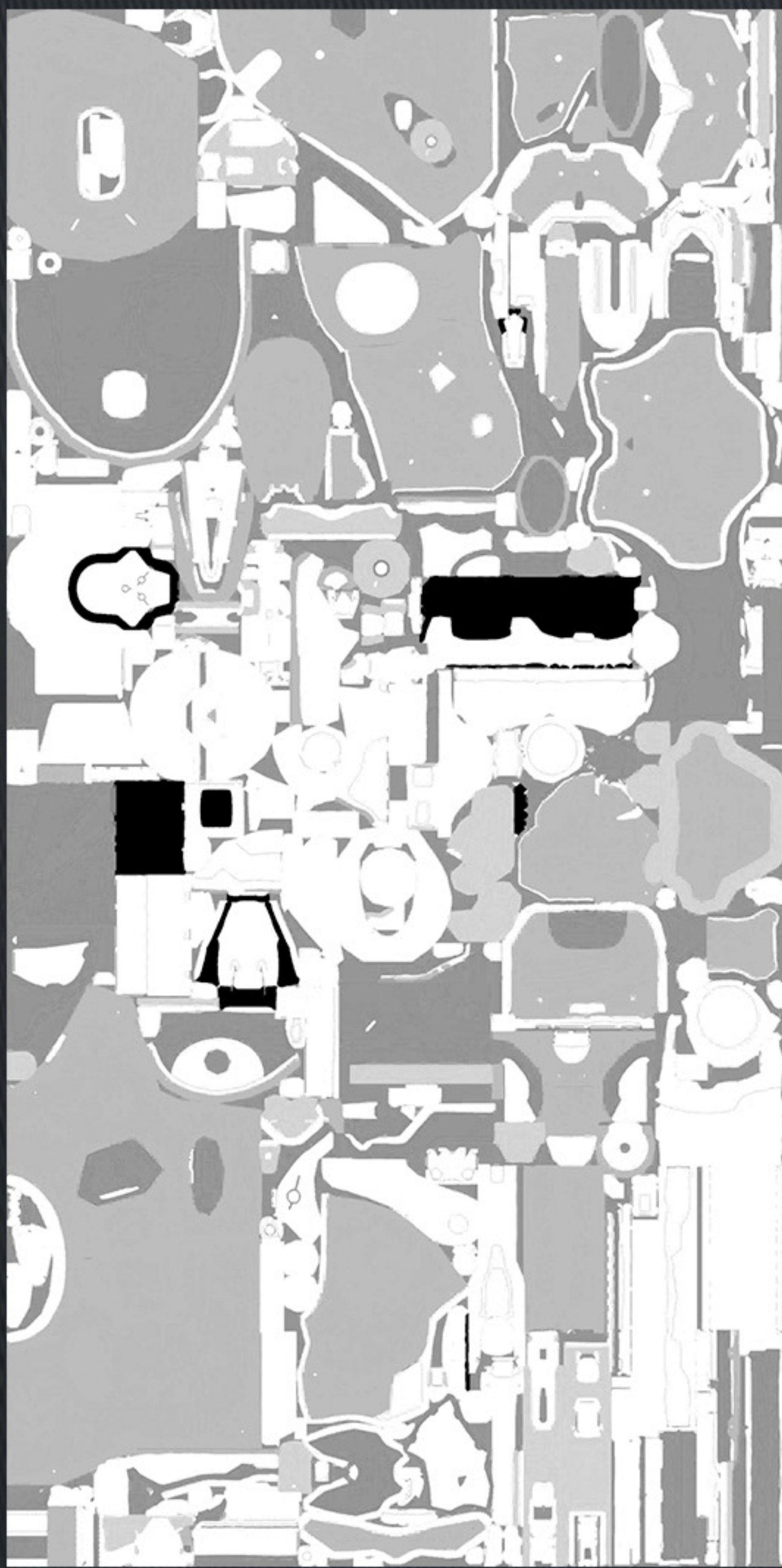


RGB



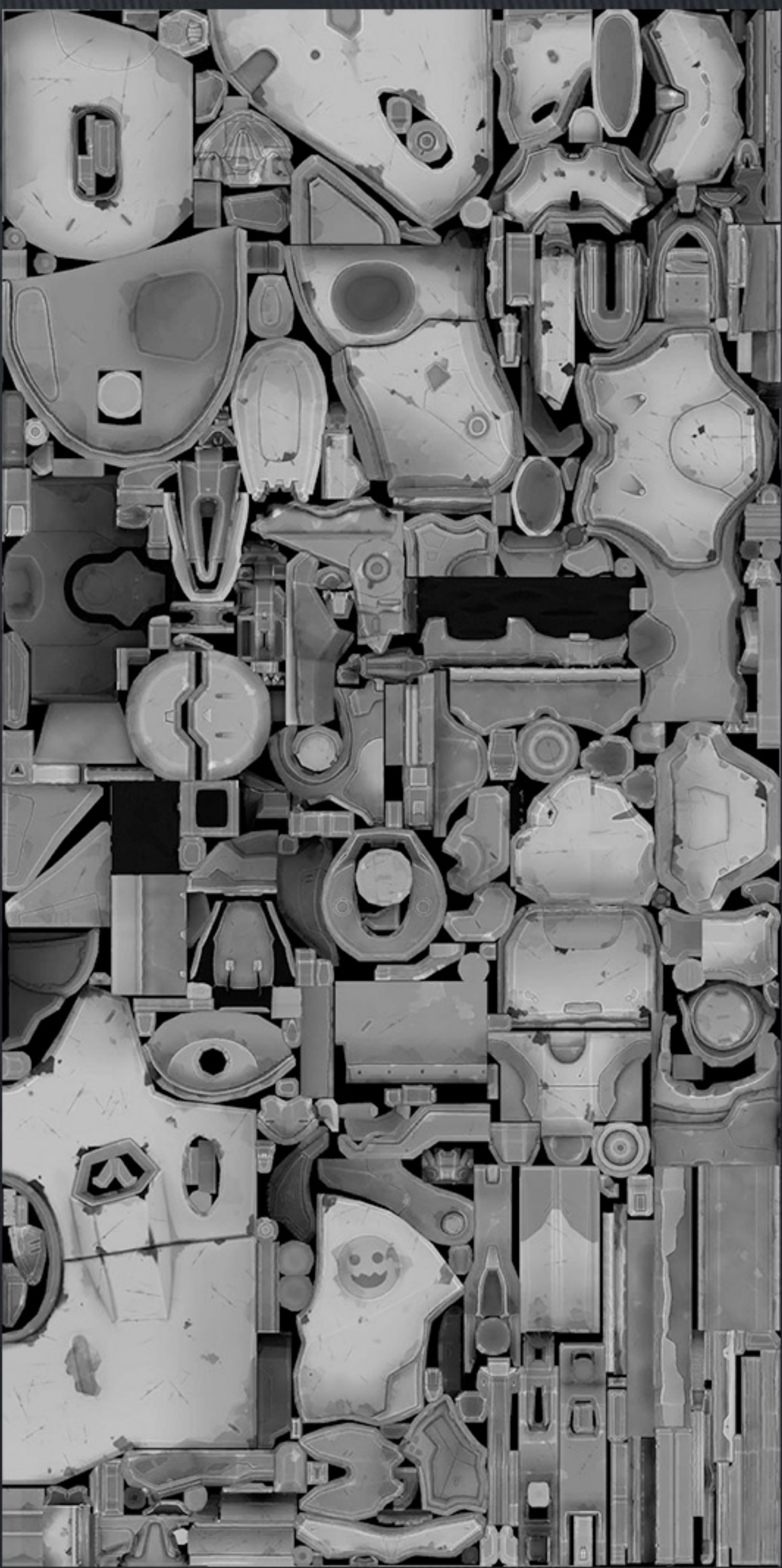
Tertiary Map

R



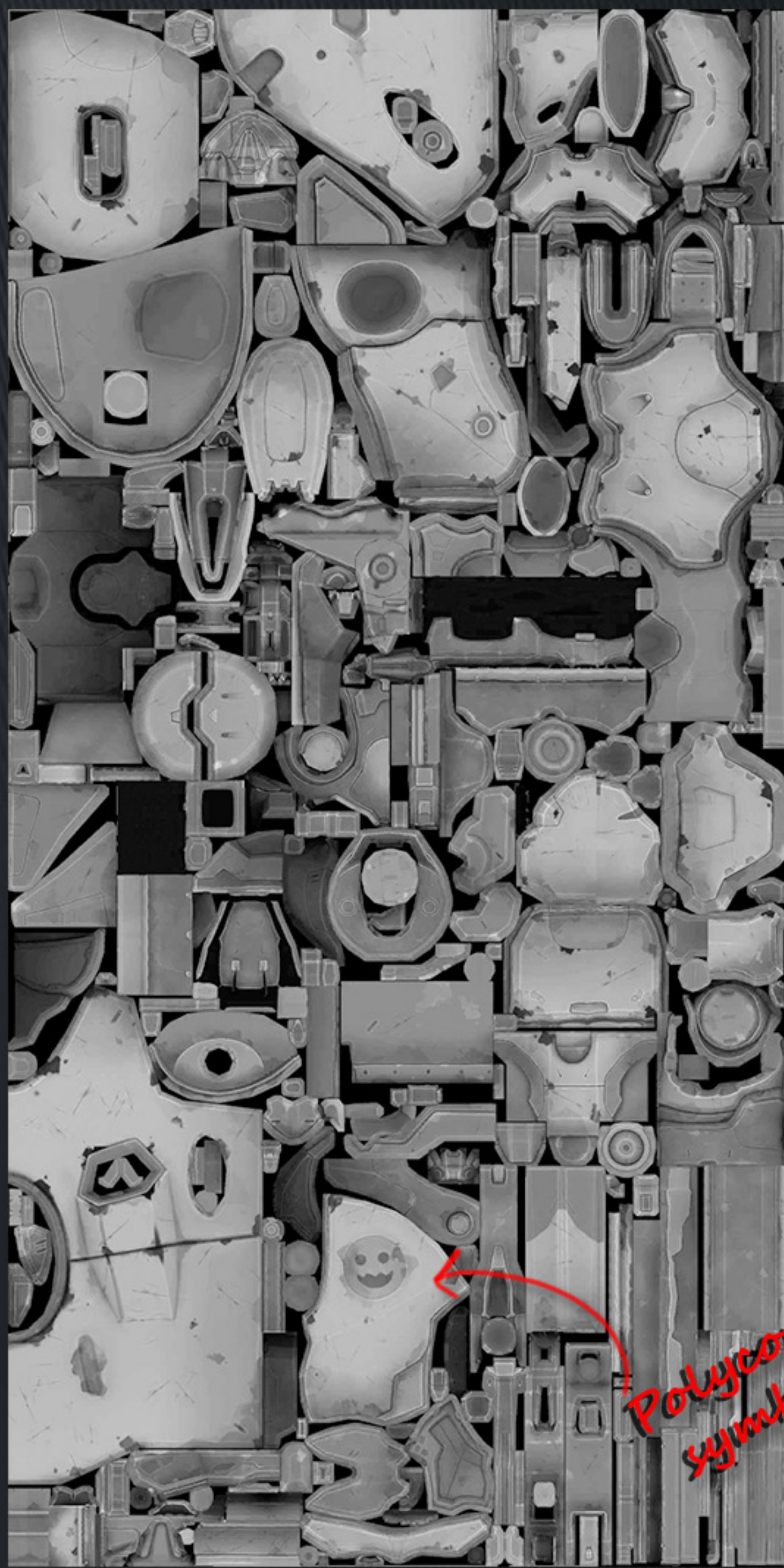
Metalness?

G



These appear the same,
They may have subtle differences.
If they are like the environment assets, these
would be specular or detail maps

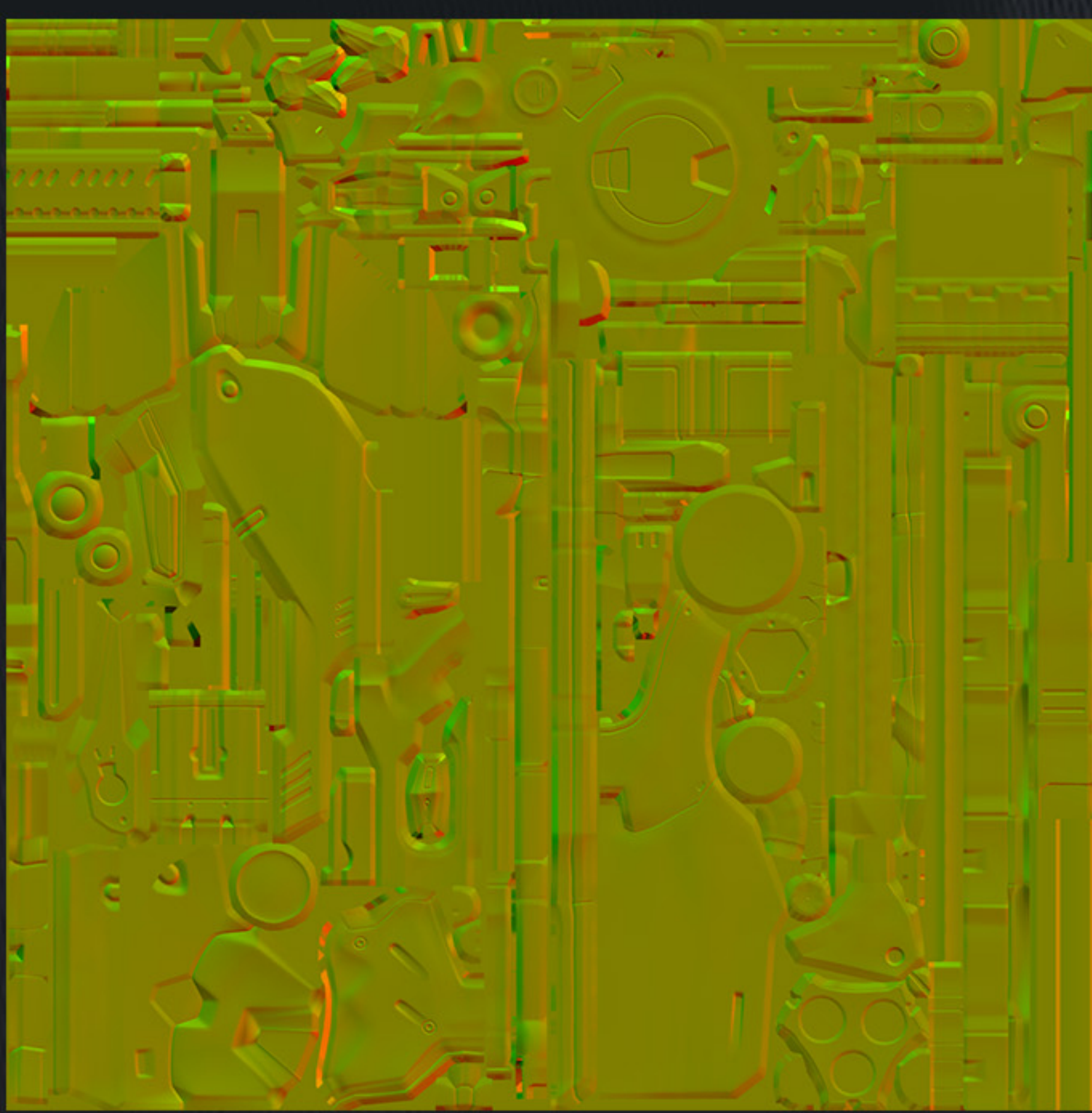
B



Mecha Weapons



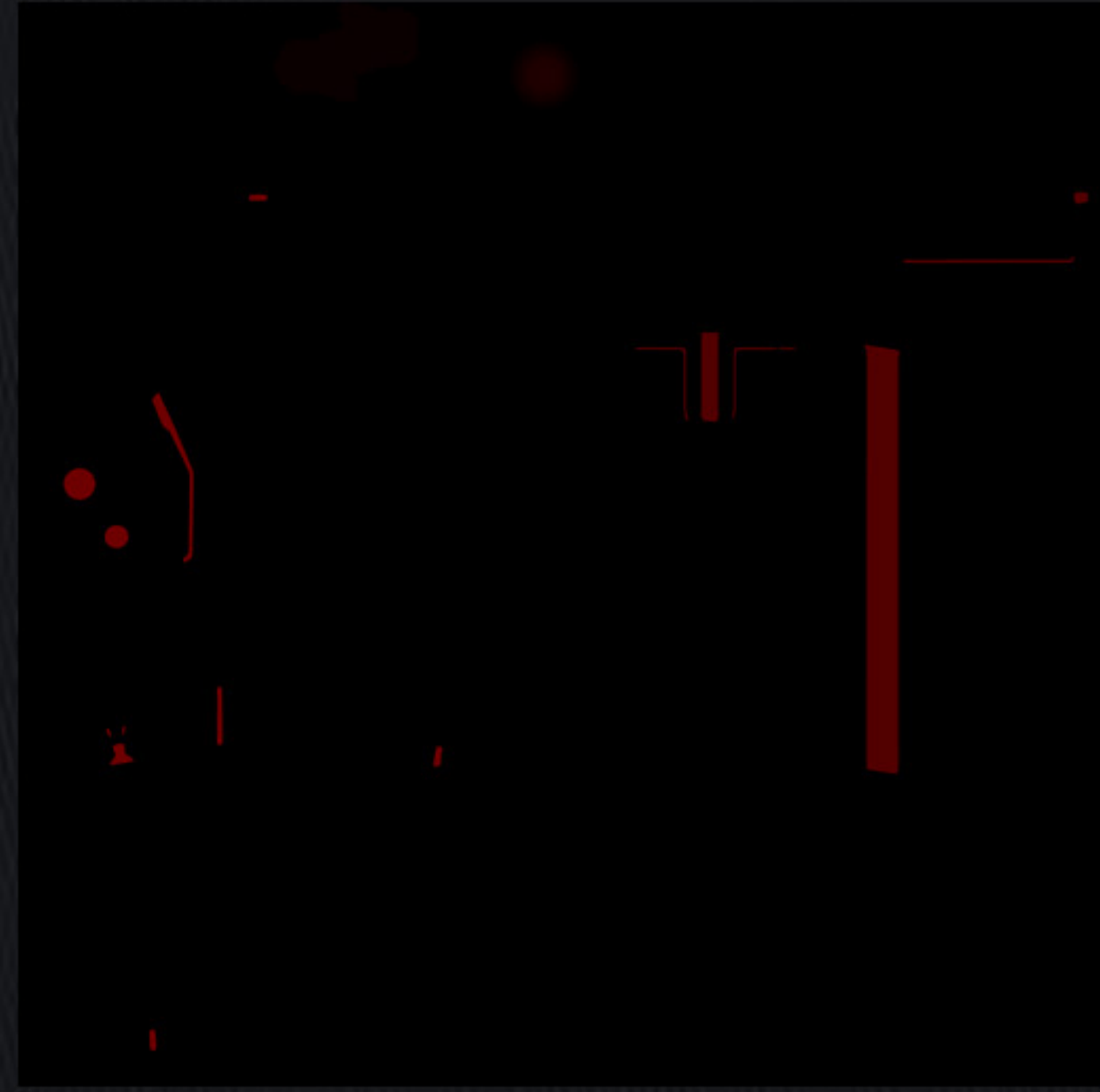
2048x2048



1024x1024



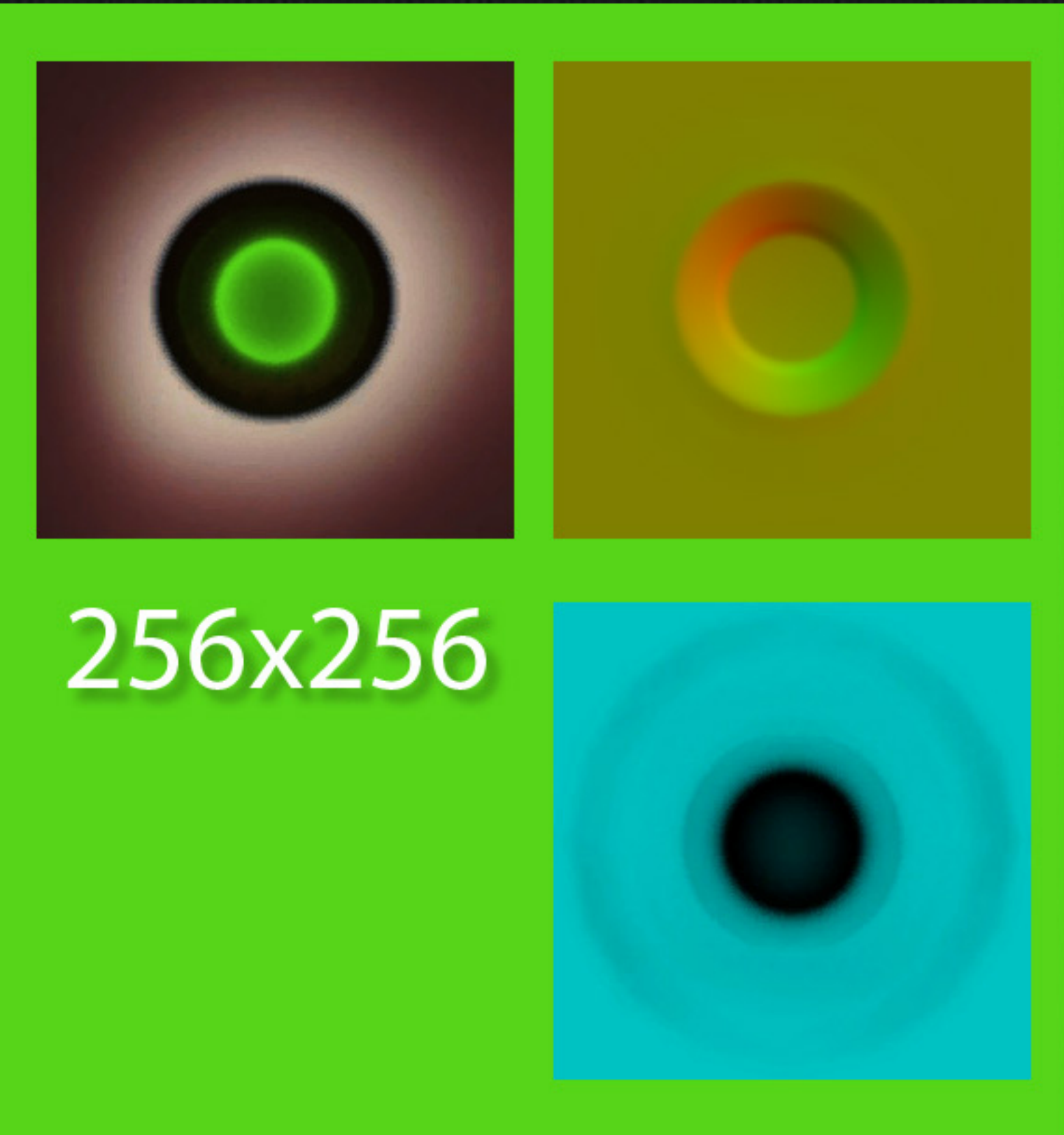
1024x1024



Emissive
512x512

Just like above, these three texture maps are present.
A new map is introduced, utilizing only the red
channel.

This grey map lines up with all the green parts on the
diffuse so it seems to be an emissive map, handling
where the parts of the gun are glowing.



256x256

There is also this texture.
The diffuse appears to have a hole inside it.

It may be used in the boosters that the mech has, or
perhaps the character's eye.

Overwatch Character Breakdown

D.VA Hana Song

Part: 1



Hana “D.VA” Song



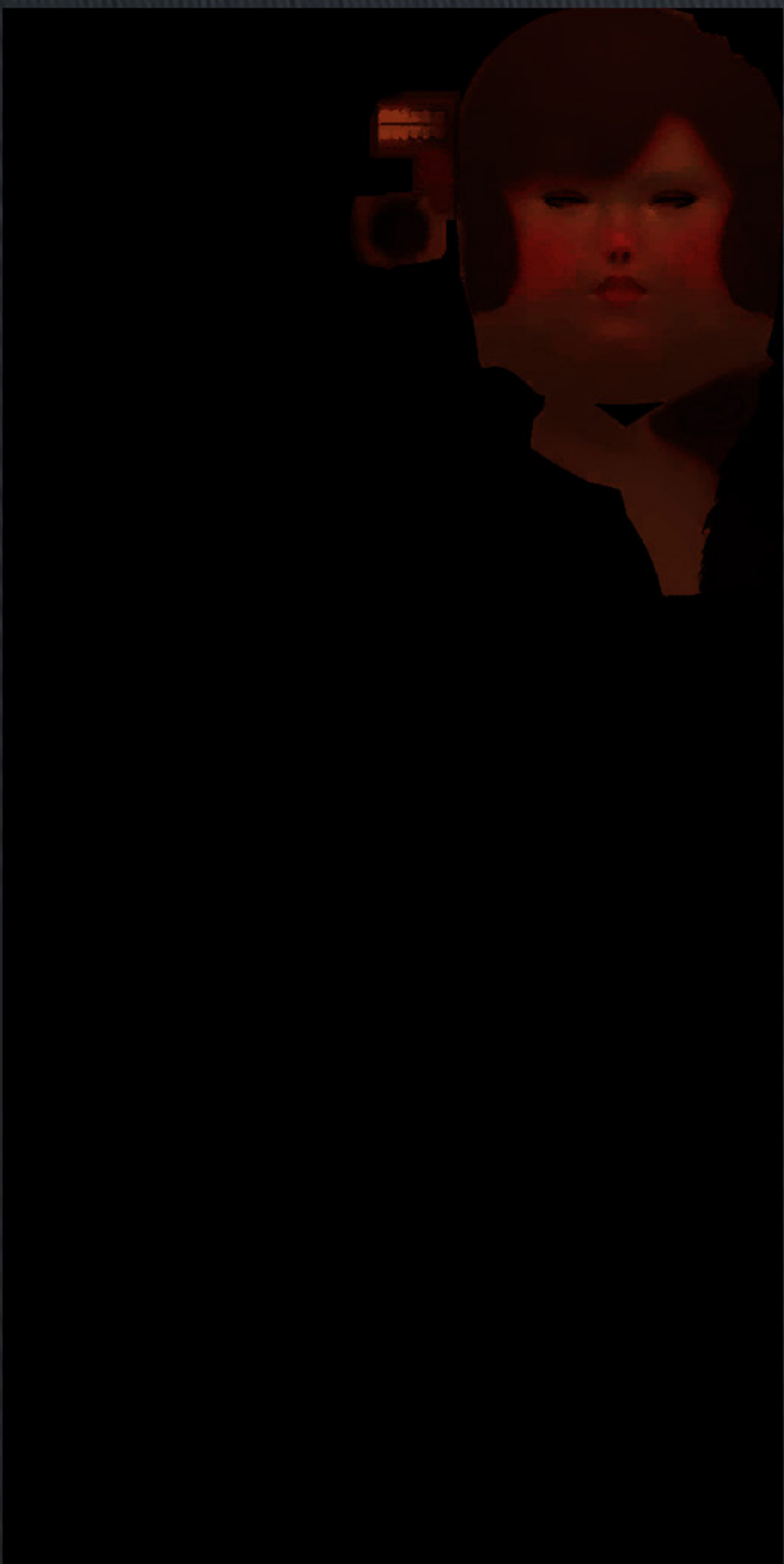
1024x2048
Green added so transparency can be seen



1024x2048
Normal map, missing blue channel



1024x2048
Metalness (R) + Roughness?



512x1024
Subsurface Scattering Map?
Only applied to organic parts



512x1024
Mask, only filled red channel.
Only applied to body suit?

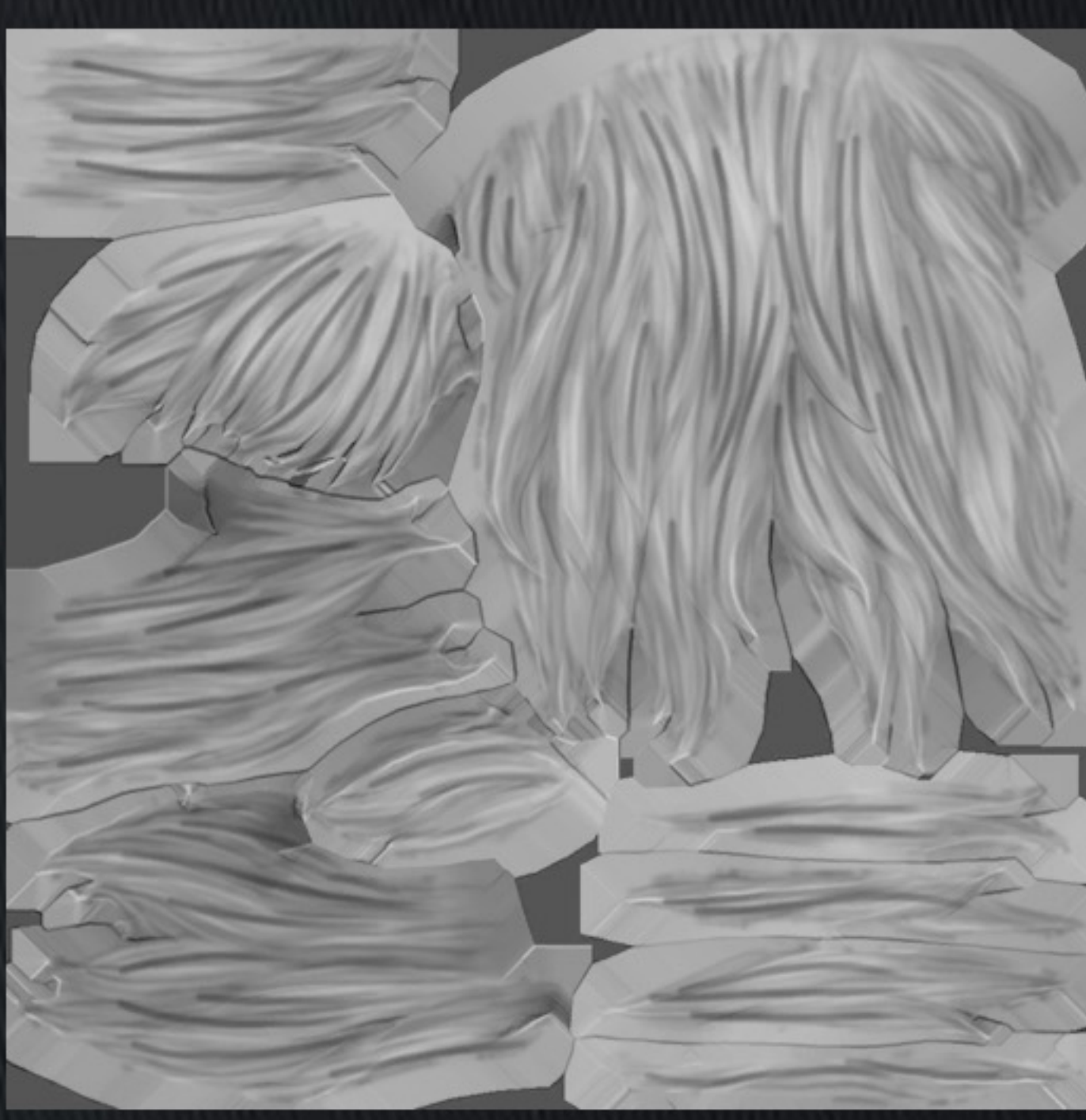
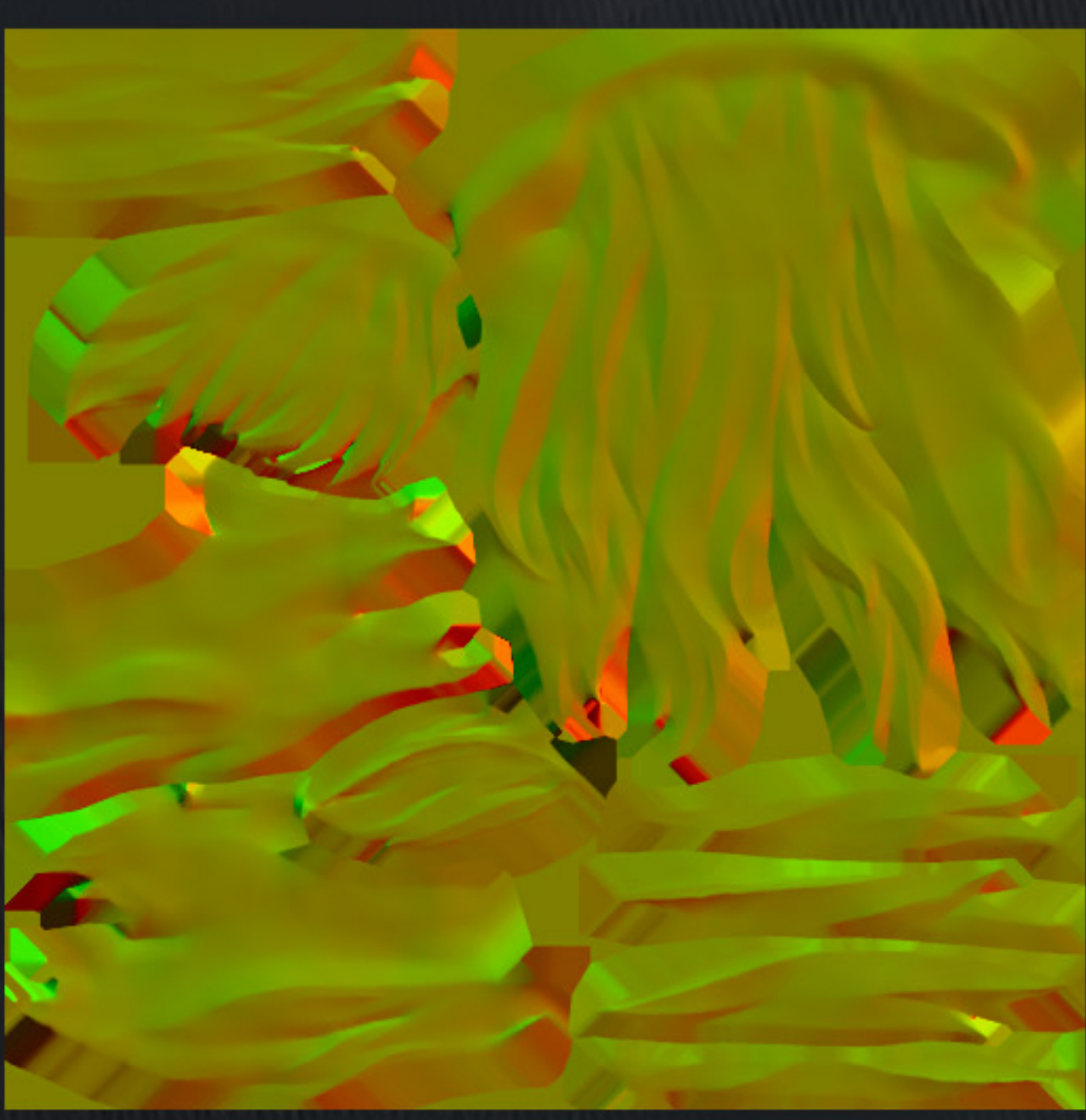


256x512
Appears to be an emissive map.

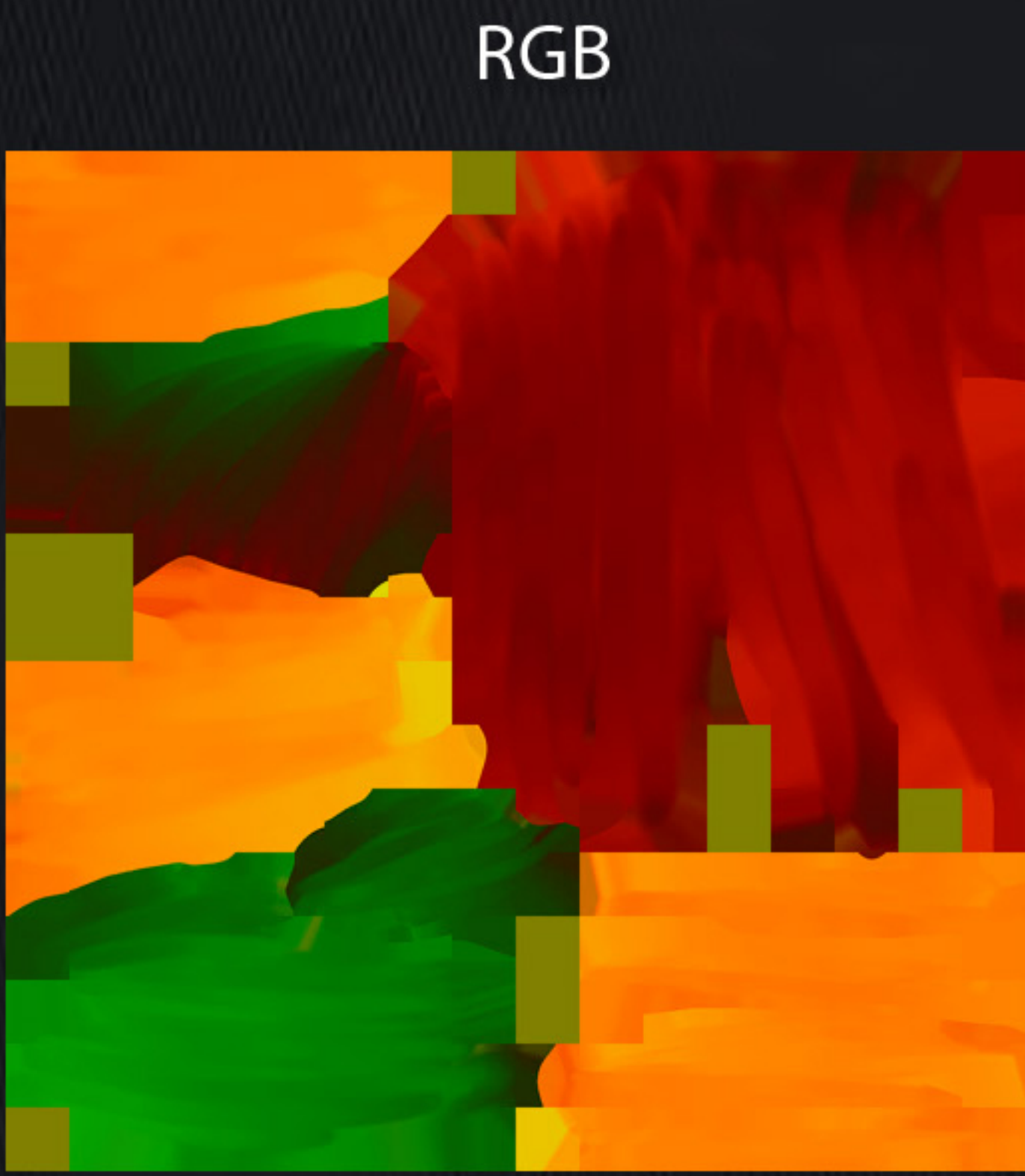
Hair



All hair textures were 512x512
Green added to show transparency



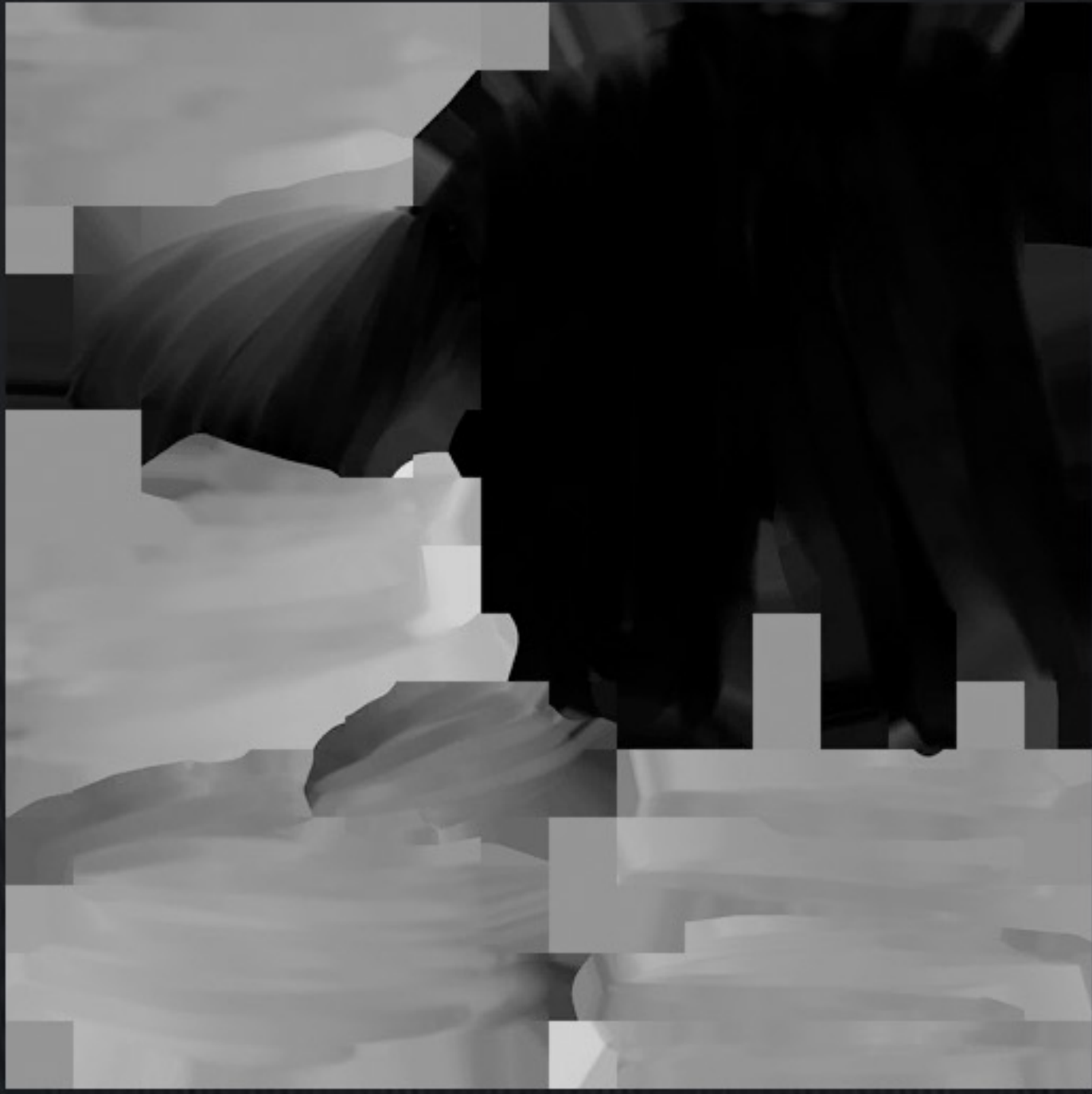
Two textures, again only in the red channel.
Appear to be AO or height information.
Unlikely to be metalness as hair is not metal :P



RGB

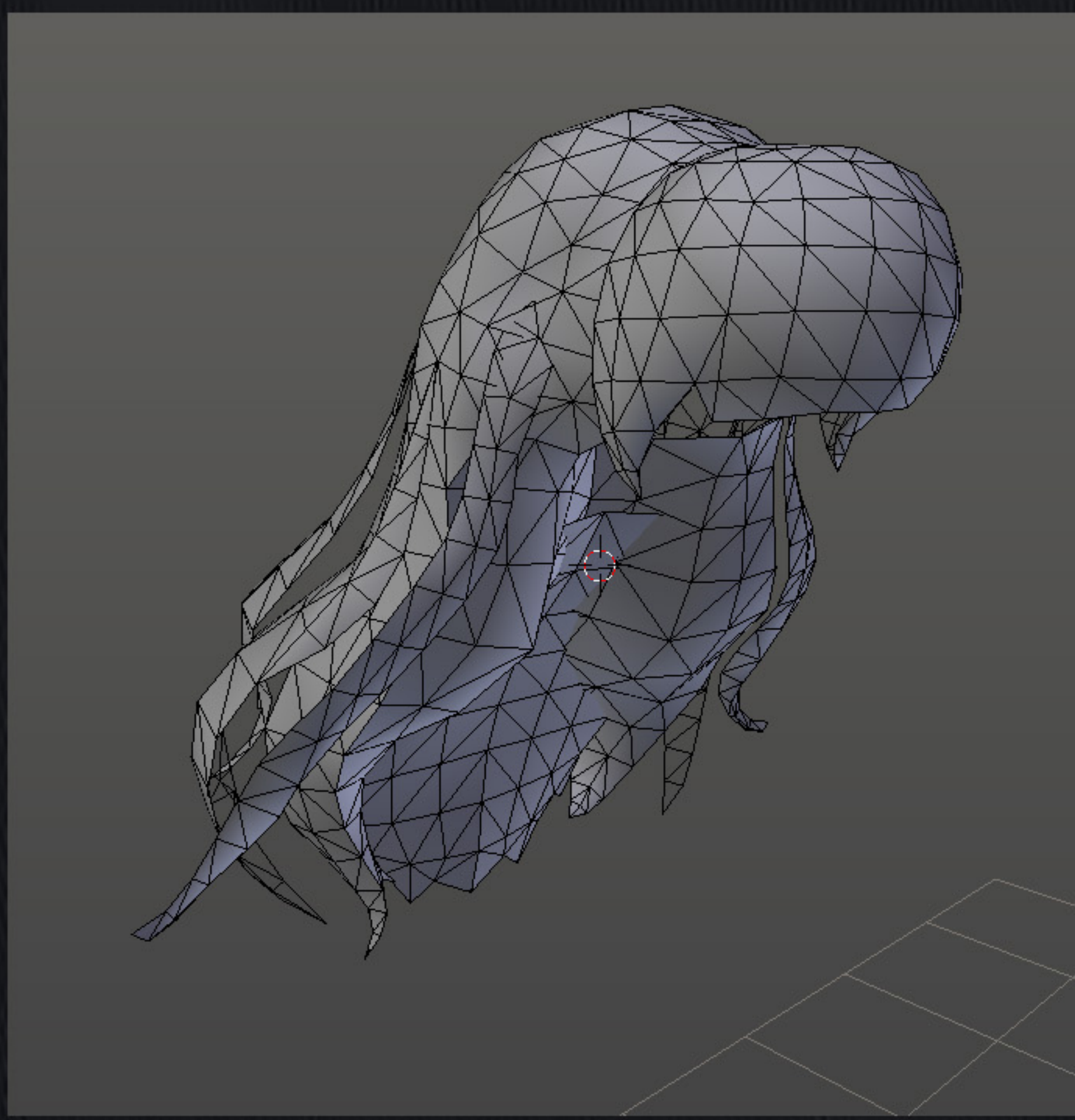


R

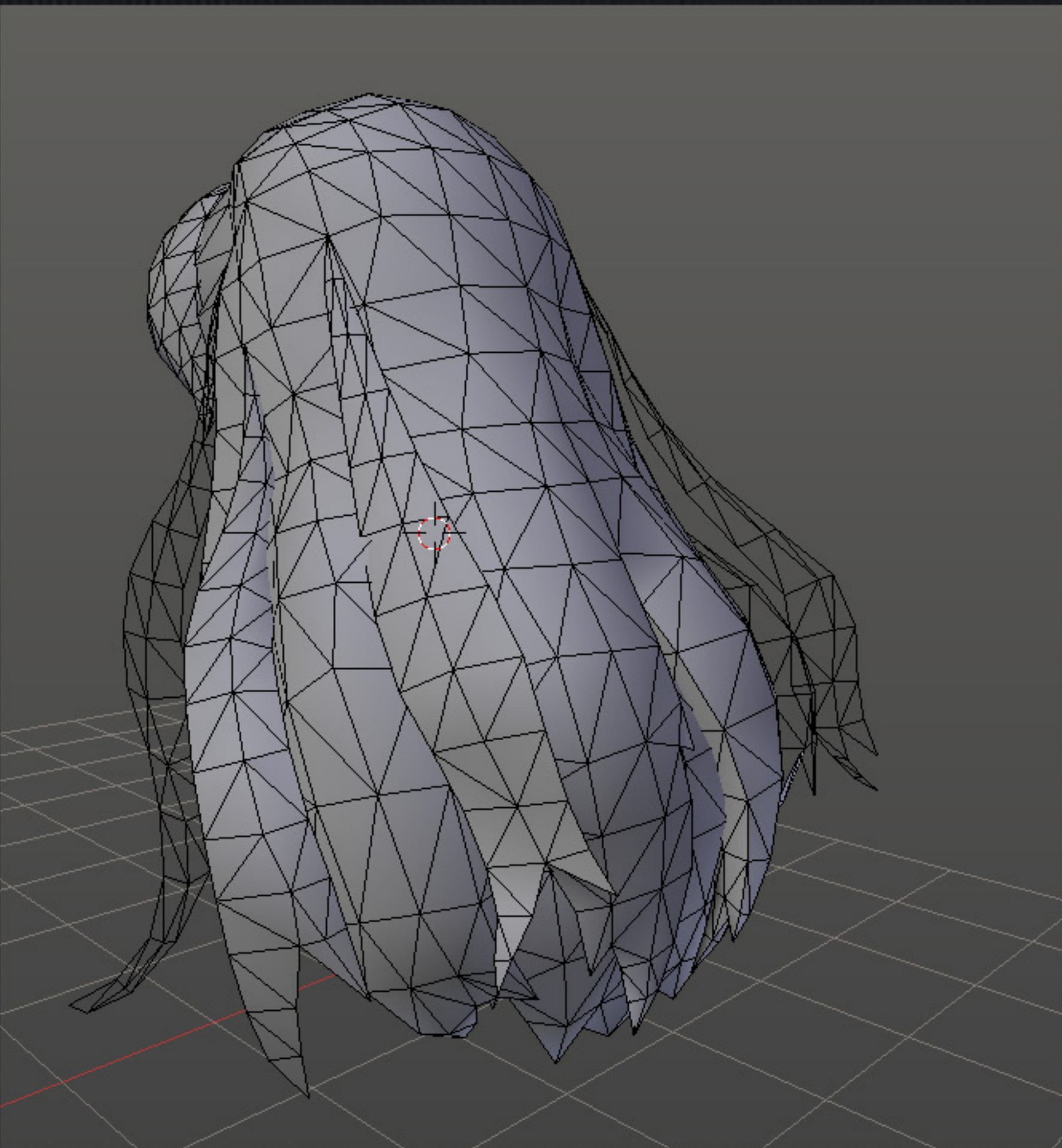


G

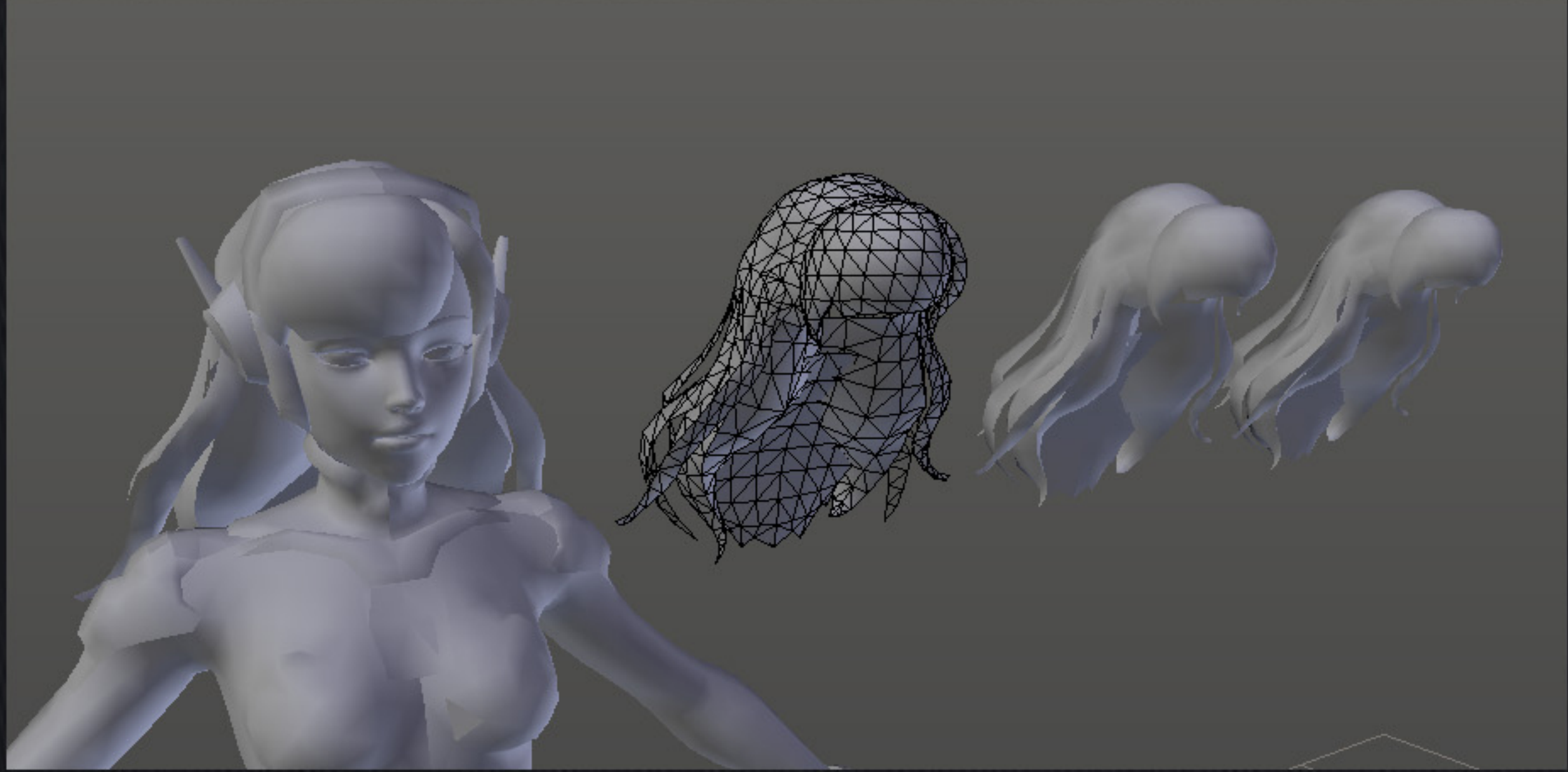
The good folks over at Polycount explained that this texture is a “Comb” map, or “Anisotropic direction” map. These textures control the anisotropic shine of the hair, causing it to light much more naturally.



Front



Back



The hair mesh perfectly caps her head. There is no head mesh under the hair. The ripped mesh had FOUR lots of seemingly identical hair. This extra mesh may be used to help give the appearance of depth? Or garbage from the ripping process.

Of note is how ribbon like the hair is.

Overwatch Character Breakdown

D.VA Hana Song textures

Part: 2

512x512 Decals

The second texture appears to be the Alpha mask, but is covered in scratches so may instead be a specular mask.



The decals are applied all over both the human and the mech.

The black background is normally transparent. Of interest, these are lain atop the mesh of the objects, not part of the original mesh at all.



They could remove them, or change them very easily without needing to adjust the main textures.

Poly budgets

A compiled list of the tri counts of each hero in Overwatch

Character	Body Tri count	Weapon Tri C	Extras Tri count	Total Tri Count	Extra notes
Bastion	25,580	11,592	2,810 (Bird)	39,982	Body count does not include weapons
DVA	21,903 (Mech)	14,154	19,580 (Hana)	56,029	Mech count does not include weapons. In play Mech and Hana seem to be rendered at the same time
Genji	29,969	9,364	308 (Head cloth)	39,333	Head cloth is dynamic, double sided mesh
Hanzo	35,807	No weapon :(	2,050 (Fancy Arrow)	37,857	His bow was missing in the model rip :(
Junkrat	31,842	Missing	3,570 (Wheel)	35,412	Weapon missing
Lucio	30,355	Missing	1776 (Hair)	30,355	Weapon missing
McCree	37,222	12,118	80 (Cigar)	49,340	
Mei	45,228	Missing	2,310 (Robot)	47,538	Weapon missing
Mercy	30,736	12,079	224 (Glowy Wings)	43,039	Not the frame around the wings
Pharah	37,438	Missing		37,438	Weapon missing
Reaper	23,122	15,022		38,144	
Reinhardt	26,704	15,483		42,371	No projected shield, probably pretty low poly though
Roadhog	25,522	Missing		25,522	Weapon missing
Soldier76	20,898	10,708		31,606	
Symmetra	32,146	Missing		32,146	Weapon and turrets missing.
Torbjorn	35,908	6,804	2,360 (Facial hair)	42,712	No Rivit gun, no Turret
Tracer	35,006	Missing	2,404 (Hair)	35,006	Weapon missing
Widowmaker	33,498	14,194	2,209(Hair)	47,692	
Winston	25,919	Missing			Weapon missing
Zarya	36,662	16,951	1,907(Hair)	53,613	
Zenyatta	Missing	Missing	Missing	Missing	Zenyatta was unreadable
Average	31,556	12,588		40,270	

Note: These are rough, they were collected through ripped models hence some pieces are missing.

Likewise, some characters had strange doubles ups (D.VA had four sets of identical hair)

These should only be used as a rough guide.

Overwatch Environment Breakdown

Here we can see that Blizzard clearly blend between textures. Likely making use of the height maps of before.

By blending with the height data, the shader blends in more sand at lower depths, causing the cracks and crevices as well as some bricks to fill with sand before the higher points.

Most implementations of this use either vertex colours or a splat map to handle where and how intense the transition occurs.



Note:
The textures are washed out a bit due to the ripping process.



Almost all edges have this highlight and generally large bevels.

This both helps make objects appear softer and rounder, and gives it that blizzard style that is so iconic.

This also fakes rim lighting on EVERYTHING, which helps make lighting appear more dramatic and comic book-y

These choices help push and maintain their artistic style.



This LOOKS like it's beveled, but it's all in the texture.

They can pull this off with clever placement of their highlights, and larger objects tend to have more actual bevels.

The side of the bridge here does have insets though.



Two seperate textures. You can observe the razor thin line indicating the seam.

Difference being the yellow stripe or not. Beyond that they are identical textures?

Overwatch Environment Breakdown

Corners

Here we see some very clever unwrapping.

The texture looks great by itself, but Blizzard took it one step further by modelling a few bricks into the corners of the level wall.



Then with some careful unwrapping, they treat it like a normal flat surface.

Breaking up the corners, this prevents the level feeling too much like a series of boxes.



Blizzard appear to loathe 90 degree corners.

They almost always put some kind of frame or trim upon the corners.

These could be door frames, or modeled directly into the walls mesh.



Often using chunky static meshes that sit on corners to cap them off.

This has the added benefit of making texture tiling less obvious.

This method can also be used on convex corners.



Of course, there are always exceptions.

But even on these corners, they dress them with assets either at their base, or along the top.



Alternatively they use a subtle bevel on the corners to break up the stiff artificial 3D feel of 90 degree corners.



Overwatch Environment Breakdown

Rocks



As with other Overwatch textures, the rocks here have their edges highlighted with wide bevels, this aids in making them appear softer.



Rock clusters work well to hide mesh intersections.
Masking them with textured crevices.

Rock clusters are also more poly efficient as they waste less mesh hidden inside other rocks.

Rocks are modeled in two forms.
Individual, singular rocks.
And grouped clustered rocks.



Combination of 3D rocks, and the same rocks baked into a texture.

This serves to make sections appear much rockier than they are.



Identical, but different scale

Rocks can be scaled large or small
Built into prefabbed bundles and placed around the world to help ground the scene or be individually placed.



Corners often capped with a 3D asset.
This covers seams and helps make the world pop.

Stones use same colours and design as stones inside the wall texture.



Observe the combination of seams + baked in crevices.

Rocks in a level always follow a similar design scheme, to show different parts of the world.



Overwatch Environment Breakdown

Seams and intersections

Intersecting mesh is surprisingly abundant in Overwatch.

Blizzard likely observed that most players don't notice and don't care.



Clipping geometry that simply sits inside other meshes is generally really common.

It is only noticable to people who go looking for it.



Sometimes they muck up their UVs

This is pretty common and you'll likely find instances like this in all games.



The point here, is to not worry so much about your seams and intersections.

Overwatch looks fantastic and players don't see these things.



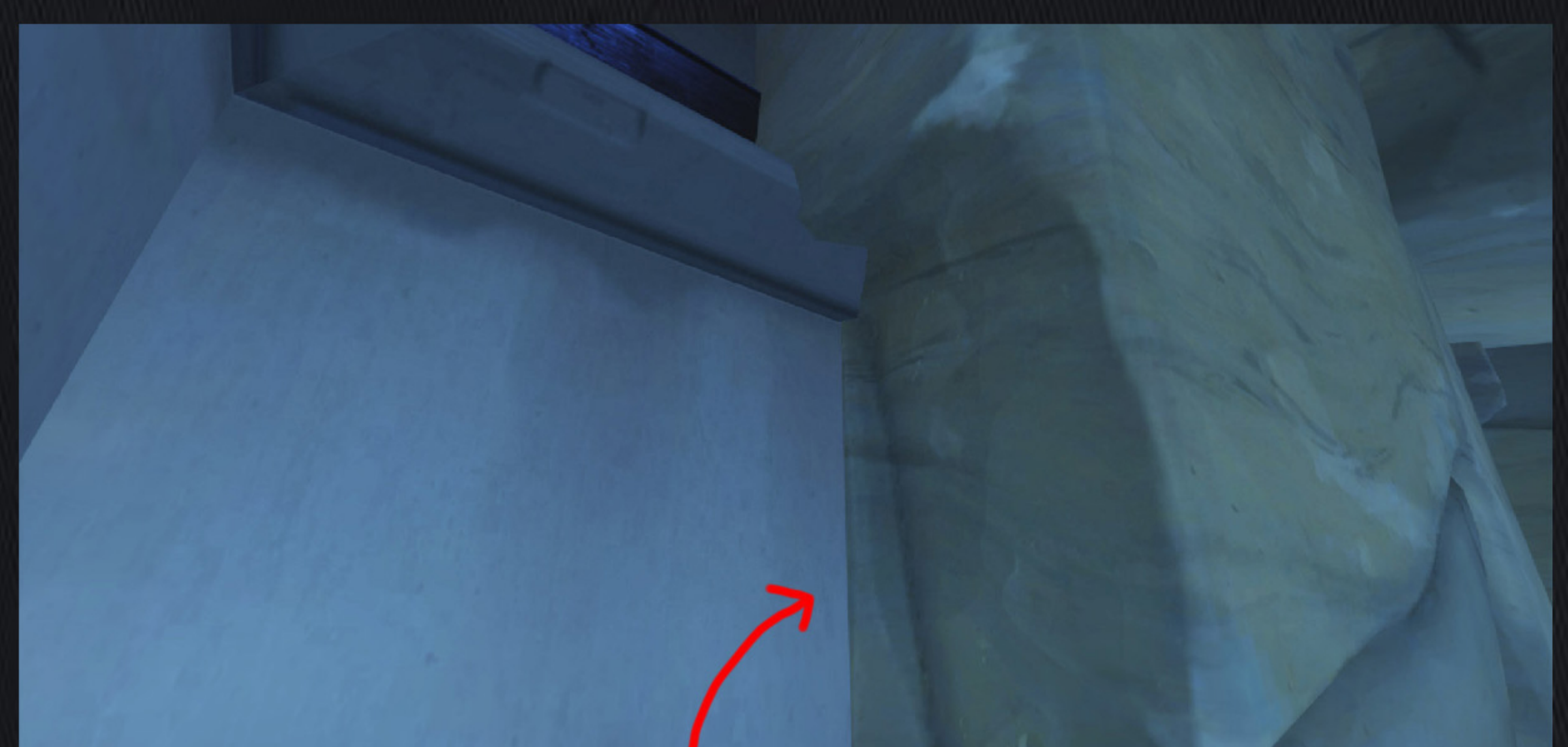
Faster Dev time is more important than perfect seams and UVs.



By embracing that you will have intersections, you can do fun things like this computer lab built in a cave.



The intersections are hidden around the curve of the rock, only by coming quite close do they appear.



Overwatch Environment Breakdown

Reflections and Shine

All materials seem to include a specular or reflectivity map.

These maps make little detail pop.



Tiling textures become much less repetitive by using the subtle specular map, picking up unique details as the light runs along it.



Windows and puddles make use of relatively simple and blurry cubemaps to add depth.

This method works great to break up repetition of identical assets or tiling textures.



They appear to simply mask out the section of the texture that will read the cubemap.

Of interest, they atlas many windows together, likely for performance.



Look closely, you will see tiny speckles of light in the sand.

This tiny touch makes all the sand appear much more real and tangible.



Through a rough and bumpy specular, the sandy and worn metals of a desert appear.

Contrast this to other environments where the metals are much smoother.



Overwatch VFX Breakdown

Hit flashes

The muzzle flashes appear for only a brief moment.

Yet they are stylized akin to a comic book.



The flashes appear to be emitted on quads or perhaps a premade spikey mesh.

Likely they are randomly rotated or scaled slightly every time they are spawned.



The VFX for hitting a wall is very similar to the muzzle flashes.
Sticking to the comic book style, exaggerated and crisp.



The hit flashes are spawned a little smaller, scaling up through their lifetime and fading out.



Explosions are made up of multiple pieces.

From particle VFX to unique mesh assets animating.



Explosions often use a series of sprites (Perhaps a fancy shader)

The effect really helps push the comic drawn style Overwatch loves.



Here is a quick series of frames showing Junkrats Wheel exploding.

- We can see it is composed of:
- 1) A particle glow initially.
 - 2) An expanding ring.
 - 3) Particle streaks shooting out.
 - 4) A sprite animation of explosive puffs.

