



Revit Pure Live #024 – Mastering Revit Materials

Enscape | Revit Pure Live

AGENDA

- What is Physically Based Rendering
- What are the different materials that make up a PBR material
- How to create and use these different material maps to help us achieve a better rendering
- Enscape Material Library and Material Editor
- Questions



What is Physically Based Rendering (PBR)?

Physically Based Rendering is a way of creating materials that will accurately respond to light just as if they were in the real world. It is a theory based on measured surface values.



What are the benefits?

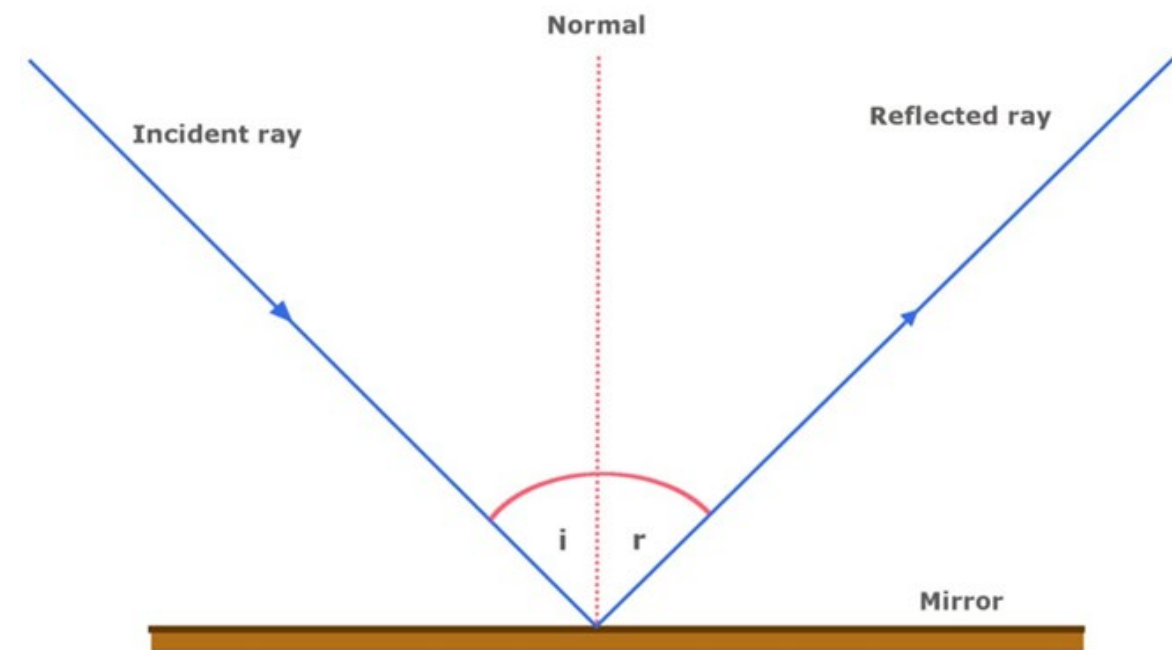
- Physically Based rendering removes the guess work of wondering what my materials are going to look like in a certain lighting condition.
- It requires fewer textures to make a PBR material and thus saving on computing memory.
- It will help develop a texturing standard for your company knowing every material that is created will have all the texture maps that make up a PBR Material.

Physics behind PBR

How does light work?

When a light wave encounters an object, it is either transmitted, reflected, absorbed, refracted, polarized, diffracted, or scattered depending on the composition of the object and the wavelength of the light.

<https://www.scienceabc.com/pure-sciences/what-is-the-law-of-reflection-definition-and-a-simple-explanation.html>

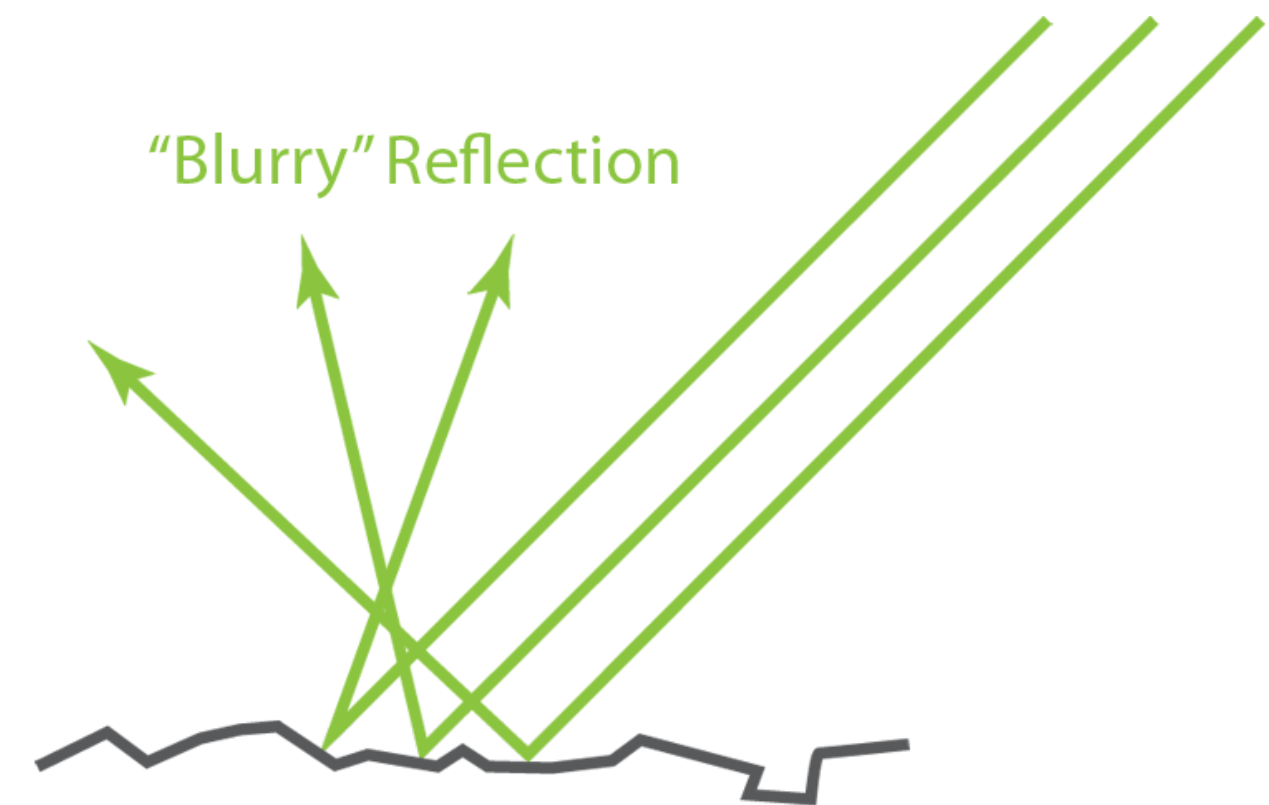


Physics behind PBR Continued

How do reflections work?

Reflection is when incident light (*incoming light*) hits an object and bounces off. Very smooth surfaces such as mirrors reflect almost all incident light. Mostly every material around us has some form of surface roughness that will be reflected.

<https://medium.com/@grahamte/physically-based-rendering-simplified-d01ec18667d1>

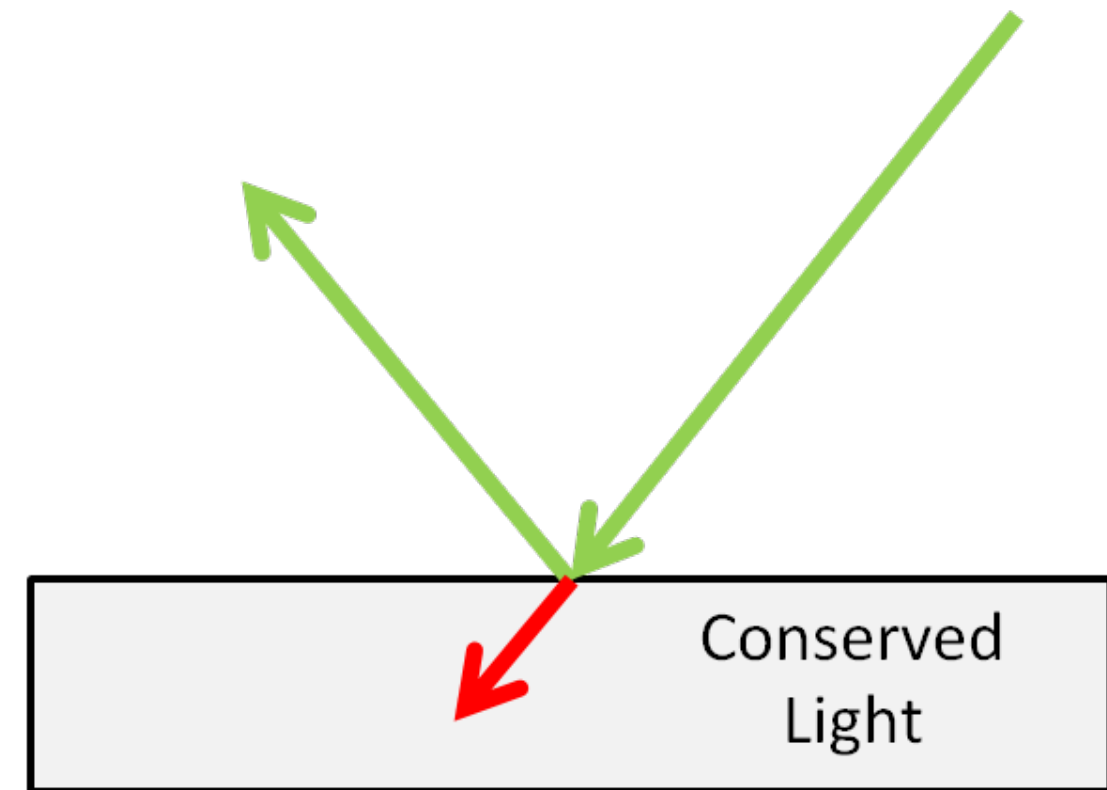


Physics behind PBR Continued

What is Energy Conservation?

When the light ray meets the surface, some of the light ray is absorbed by the object, the light intensity will decrease as it changes into another form of energy, usually heat. And the rest of the light ray being reflected off the object.

<https://marmoset.co/posts/basic-theory-of-physically-based-rendering/>

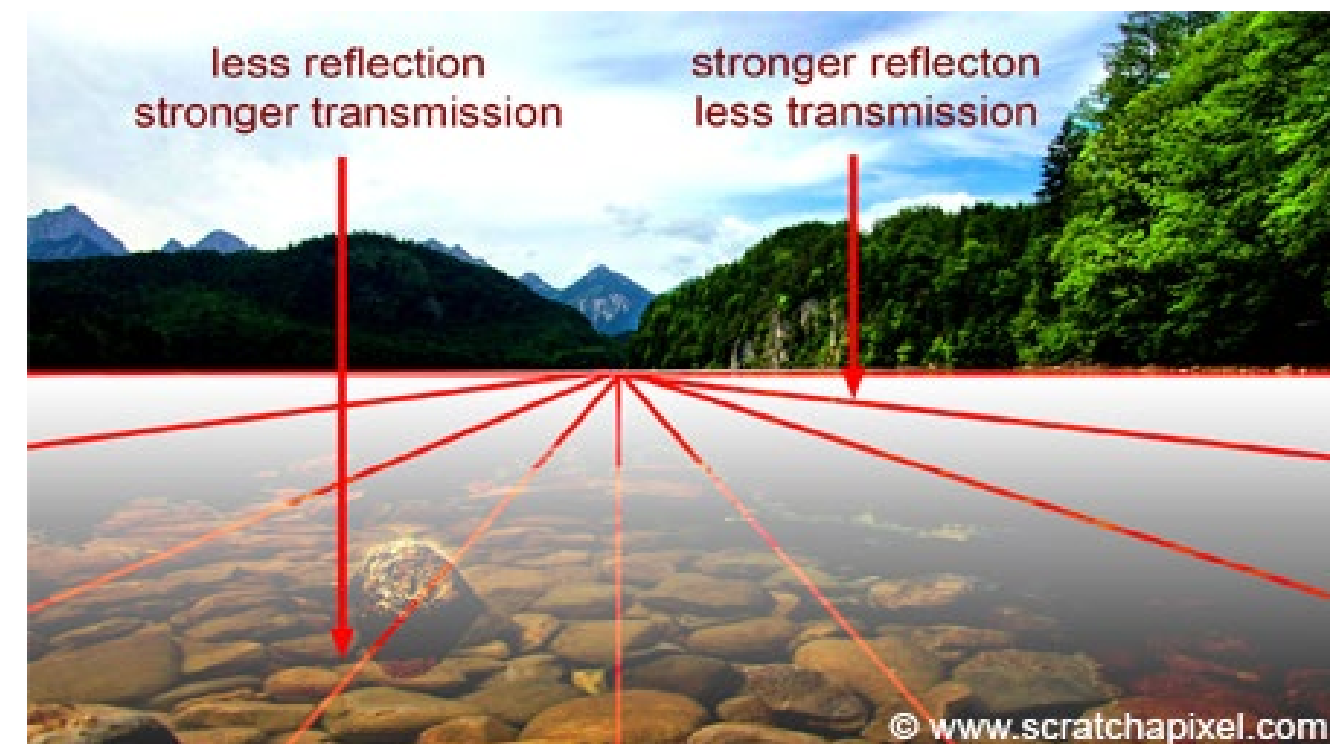


Physics behind PBR Continued

Fresnel?

Fresnel is everywhere! The most common place we see it is when looking at water. When we look straight down, we can see to the bottom, but when we look at an angle, we cannot see to the bottom anymore.

<https://www.scratchapixel.com/lessons/3d-basic-rendering/introduction-to-shading/reflection-refraction-fresnel?fbclid=IwAR3AzXPmdK2txPEzAkOJHAqGVKXhHFucG3317B6EKPt4TjgRAtpJvLCXVy4>



Common Material Types for PBR

Albedo/Diffuse

This Albedo map is the base color of the material. The big difference between the Albedo map and the traditional Diffuse map is the Albedo map has the shadows removed from the texture. This is so our materials will look more natural in every lighting condition.



Roughness

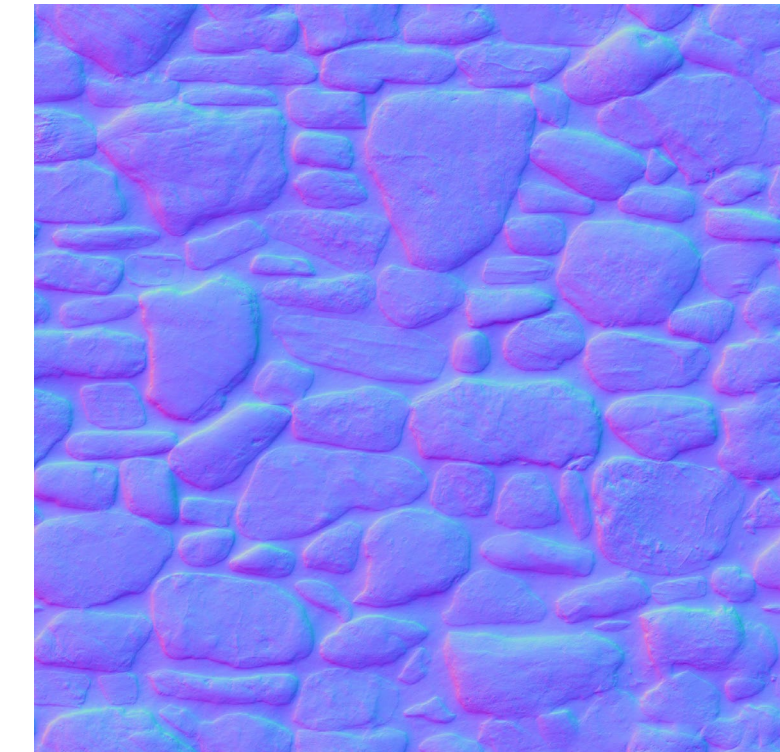
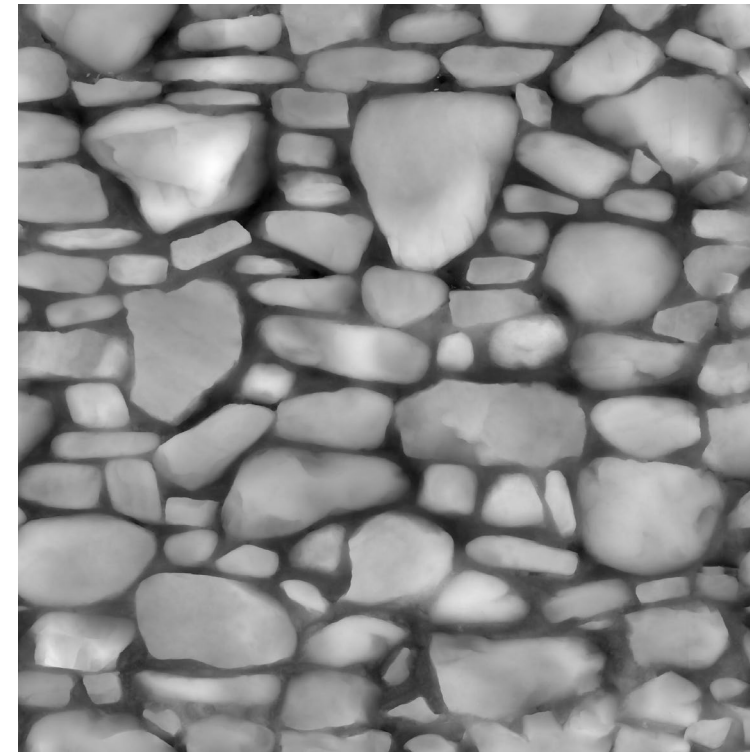
Controls how the surface imperfections are being displayed. This is an inverted **Gloss Map**. Rough Materials scatter reflected light in more directions than smooth Materials, which controls how blurry or sharp a reflection is.



Common Material Types for PBR

Bump/Normal/Displacement







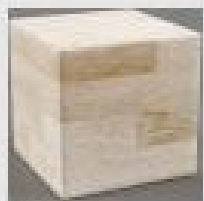



A Normal Map decides about dents and bumps on the object and is like the regular bump map but much more advanced. It will display a more 3d look due to the fact it has information about bumps and dents in the XYZ axes. A Displacement Map is a more advanced version of a Bump Map and will give the appearance of a 3d affect





Revit Materials

2019 Physically Accurate
Materials

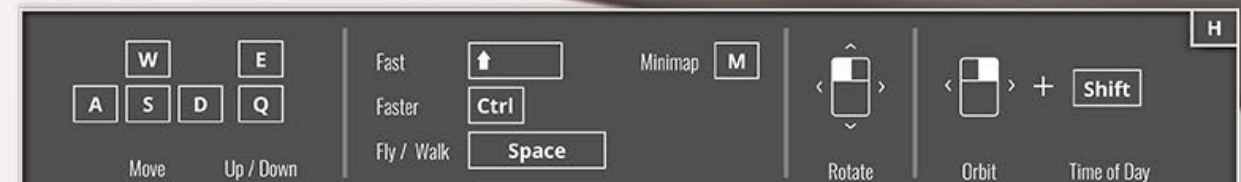
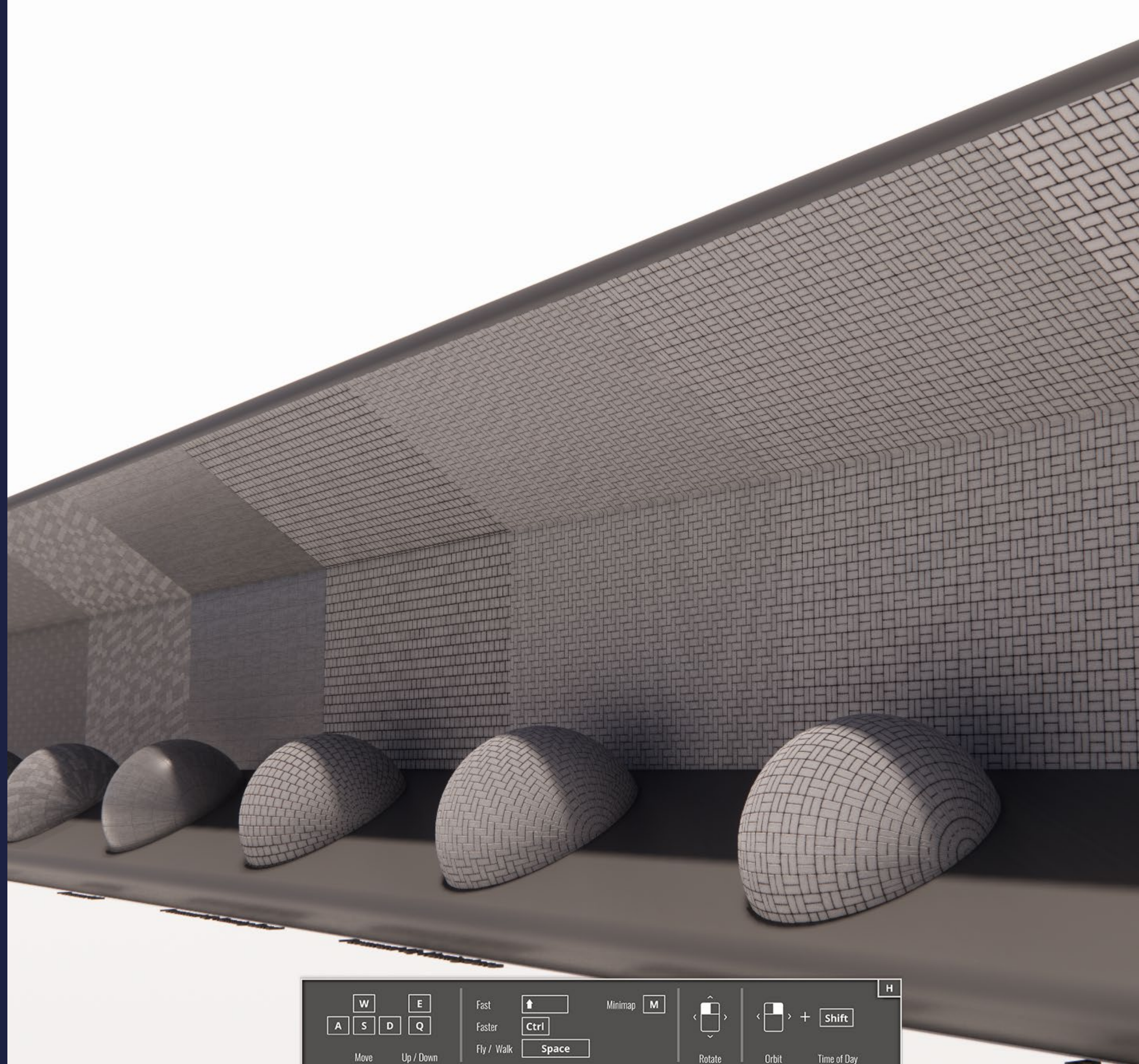
	Flooring - Maple	Appearance	Opaq...	Flooring: Wood
	Flooring - Maple Hand Scraped	Appearance	Opaq...	Flooring: Wood
	Flooring - Oak - Espresso	Appearance	Opaq...	Flooring: Wood
	Flooring - Oak ...laimed - Rustic	Appearance	Opaq...	Flooring: Wood
	Flooring - Oak Distressed	Appearance	Opaq...	Flooring: Wood
	Flooring - Pine	Appearance	Opaq...	Flooring: Wood
	Flooring - Red Oak	Appearance	Opaq...	Flooring: Wood
	Flooring - Red Oak - Oiled	Appearance	Opaq...	Flooring: Wood
	Flooring - Red... Stained Brown	Appearance	Opaq...	Flooring: Wood
	Flooring - Walnut	Appearance	Opaq...	Flooring: Wood



Enscape Materials

244 Pre made PBR

Materials



Great resources for textures

Adobe Substance 3D Assets

<https://substance3d.adobe.com/assets/allassets?free=true>

 TEXTUREHAVEN

<https://polyhaven.com/>

 SketchUp
TEXTURES

<https://www.sketchuptextureclub.com/textures>

 POLIIGON

<https://texturehaven.com/>

 ambientCG

<https://ambientcg.com/>



<https://3dtextures.me/>

ANY QUESTIONS?

