SCANS FACTORY

CONSTRUCTION SITE PLAYABLE VEHICLE

DOCUMENTATION

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[SCANS] Construction Site: Loader pack features a fully functioning loader with its environment.

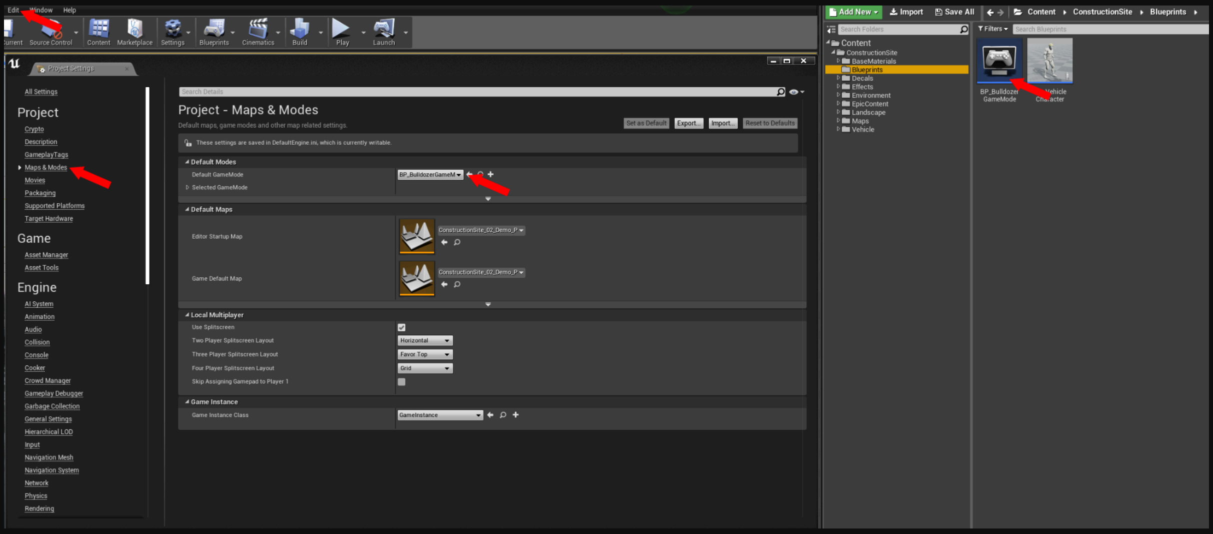
Unreal Engine 4
The Loader is based on an Unreal Engine Vehicle System with added physics of an arm and bucket. It interacts with the environment - it deforms the landscape, reacts to water and mud (wheels get dirty), has an extensive system of particles, and more - check video.

Unreal Engine 5
The Loader is based on Unreal Engine Chaos Vehicles. All functionalities have been adapted to the new version.

Unreal Engine 4

First Steps

The pack is based on a modified **Third Person template**, after adding it to your project you need to change **Default GameMode** in **Project Settings** to our **BP_BulldozerGameMode**.



Project - Maps & Modes
Default maps, game modes and other map related settings.

These settings are saved in DefaultEngine.ini, which is currently writable.

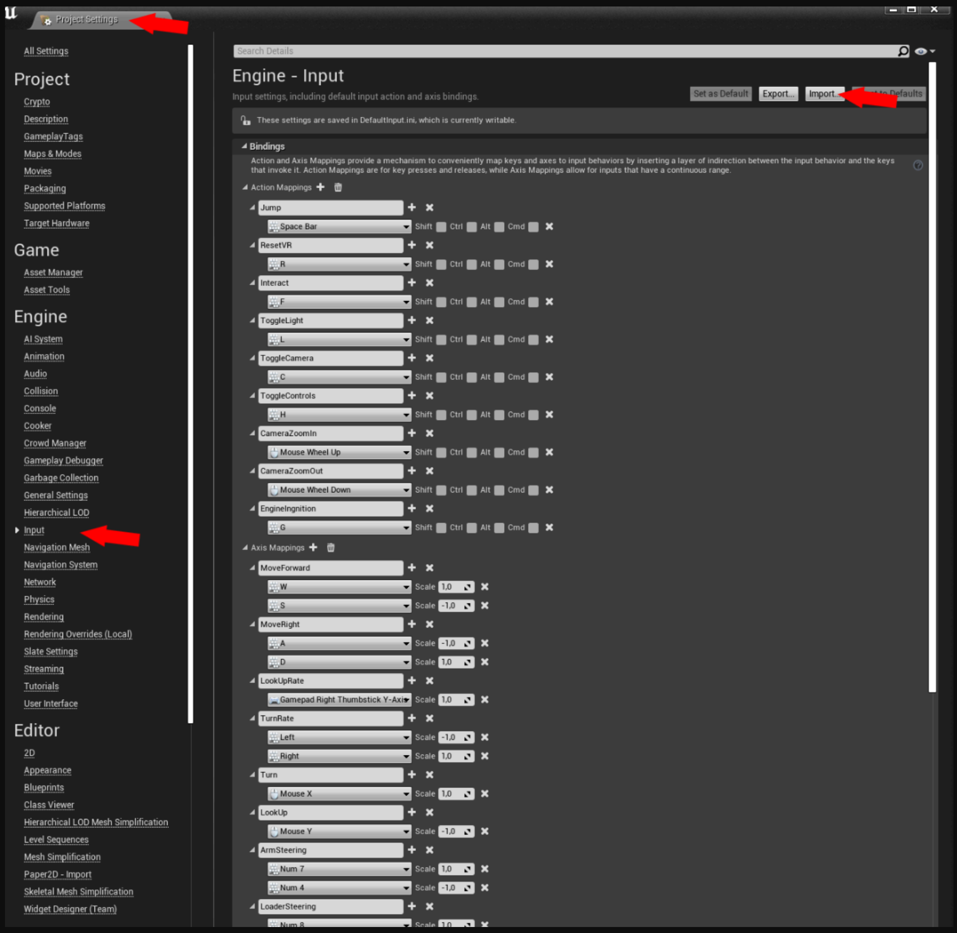
Default Modes
Default GameMode: BP_BulldozerGameM
Selected GameMode

Default Maps
Editor Startup Map: ConstructionSite_02_Demo_P
Game Default Map: ConstructionSite_02_Demo_P

Local Multiplayer
Use Splitscreen: ☑
Two Player Splitscreen Layout: Horizontal
Three Player Splitscreen Layout: Favor Top
Four Player Splitscreen Layout: Grid
Skip Assigning Gamepad to Player 1: □

Game Instance
Game Instance Class: GameInstance

If you add a pack to the Blank project you should definite Engine input or import it, simply download it from our drive - Loader input



Engine - Input

Input settings, including default input action and axis bindings.

These settings are saved in DefaultInput.ini, which is currently writable.

Bindings

Action and Axis Mappings provide a mechanism to conveniently map keys and axes to input behaviors by inserting a layer of indirection between the input behavior and the keys that invoke it. Action Mappings are for key presses and releases, while Axis Mappings allow for inputs that have a continuous range.

```
Action Mappings
  Jump
    Space Bar            Shift □ Ctrl □ Alt □ Cmd □
  ResetVR
    R                    Shift □ Ctrl □ Alt □ Cmd □
  Interact
    F                    Shift □ Ctrl □ Alt □ Cmd □
  ToggleLight
    L                    Shift □ Ctrl □ Alt □ Cmd □
  ToggleCamera
    C                    Shift □ Ctrl □ Alt □ Cmd □
  ToggleControls
    H                    Shift □ Ctrl □ Alt □ Cmd □
  CameraZoomIn
    Mouse Wheel Up       Shift □ Ctrl □ Alt □ Cmd □
  CameraZoomOut
    Mouse Wheel Down     Shift □ Ctrl □ Alt □ Cmd □
  EngineIngnition
    G                    Shift □ Ctrl □ Alt □ Cmd □
Axis Mappings
  MoveForward
    W                               Scale 1,0
    S                               Scale -1,0
  MoveRight
    A                               Scale -1,0
    D                               Scale 1,0
  LookUpRate
    Gamepad Right Thumbstick Y-Axis Scale 1,0
  TurnRate
    Left                            Scale -1,0
    Right                           Scale 1,0
  Turn
    Mouse X                         Scale 1,0
  LookUp
    Mouse Y                         Scale -1,0
  ArmSteering
    Num 7                           Scale 1,0
    Num 4                           Scale -1,0
  LoaderSteering
    Num 8                           Scale 1,0
```

The name of the demo scene is **ConstructionSite_02_Demo_P.**

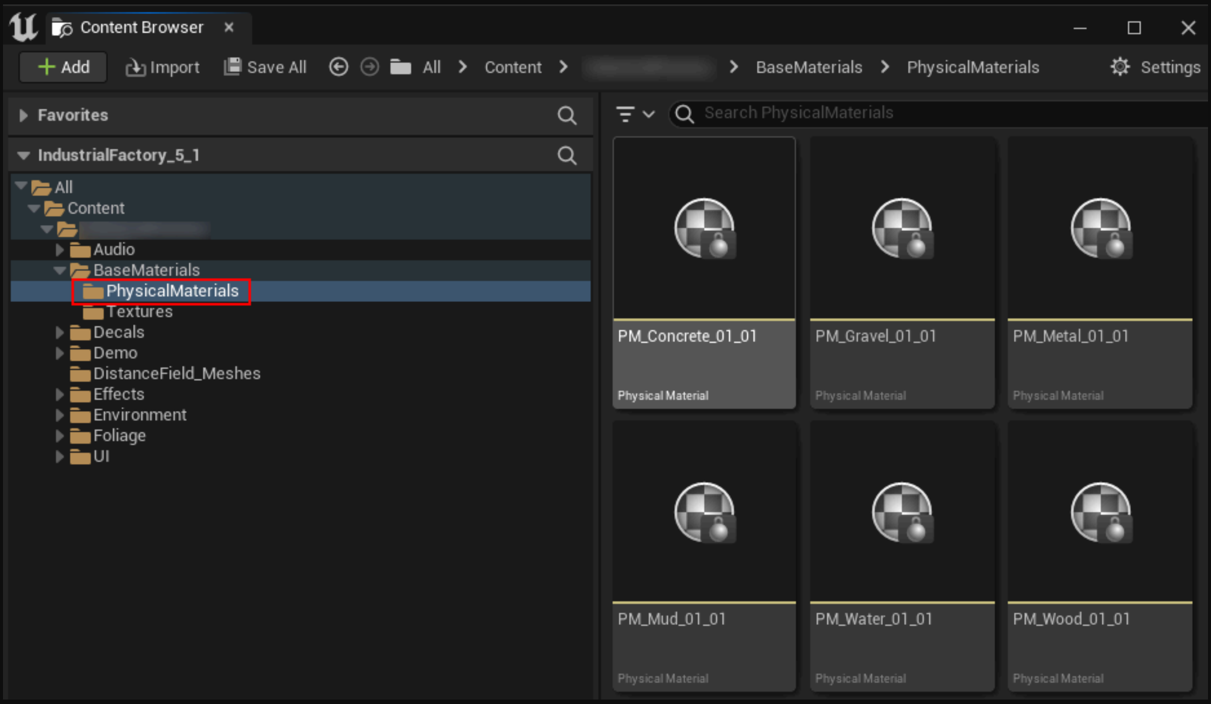
Pawn

We add to the standard Third Person template pawn some extra functions:

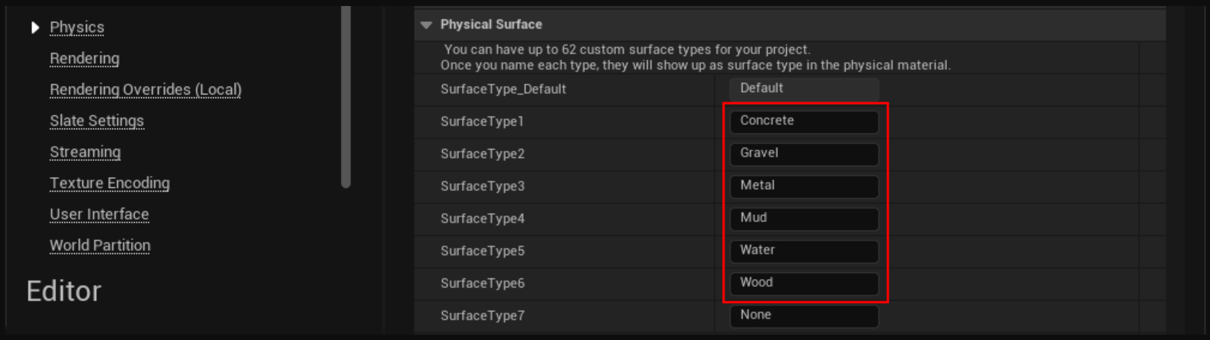
- switch the camera from **Third Person** to **First Person** by pressing **C** on the keyboard
- change the camera to **Top Third Person** by pressing **T** on the keyboard
- pawn flashlight by pressing **L** on the keyboard
- functions for pawn footprints

Footsteps warning

We defined four **Physical Surfaces**: Concrete, Gravel, Metal, Mud, Water and Wood.



Our pawn has footstep sounds implemented for these surfaces. For proper operation and compilation, it must be defined in Project Settings > Engine > Physics > Physical Surface:

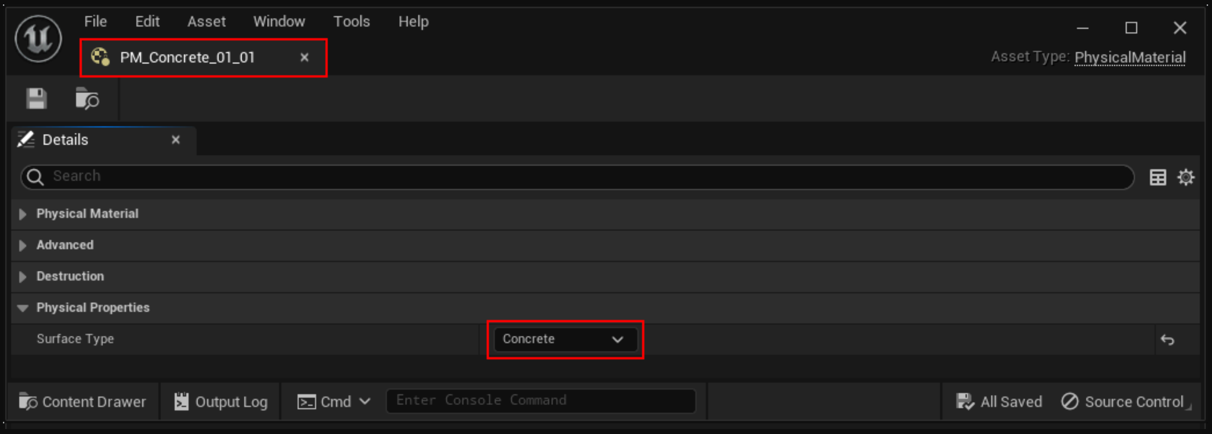


Physical Surface

You can have up to 62 custom surface types for your project.
Once you name each type, they will show up as surface type in the physical material.

SurfaceType_Default	Default
SurfaceType1	Concrete
SurfaceType2	Gravel
SurfaceType3	Metal
SurfaceType4	Mud
SurfaceType5	Water
SurfaceType6	Wood
SurfaceType7	None

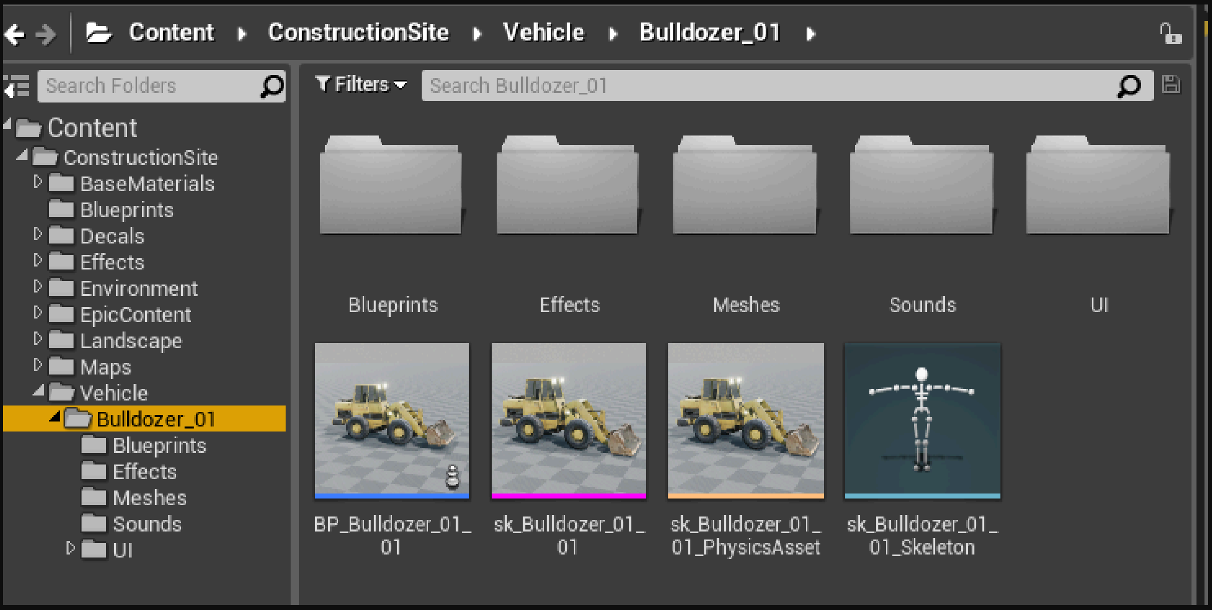
Most likely, in your project, you will need to assign the correct surface in the physical material properties. Just Double-click on each material and choose the correct value from the list:

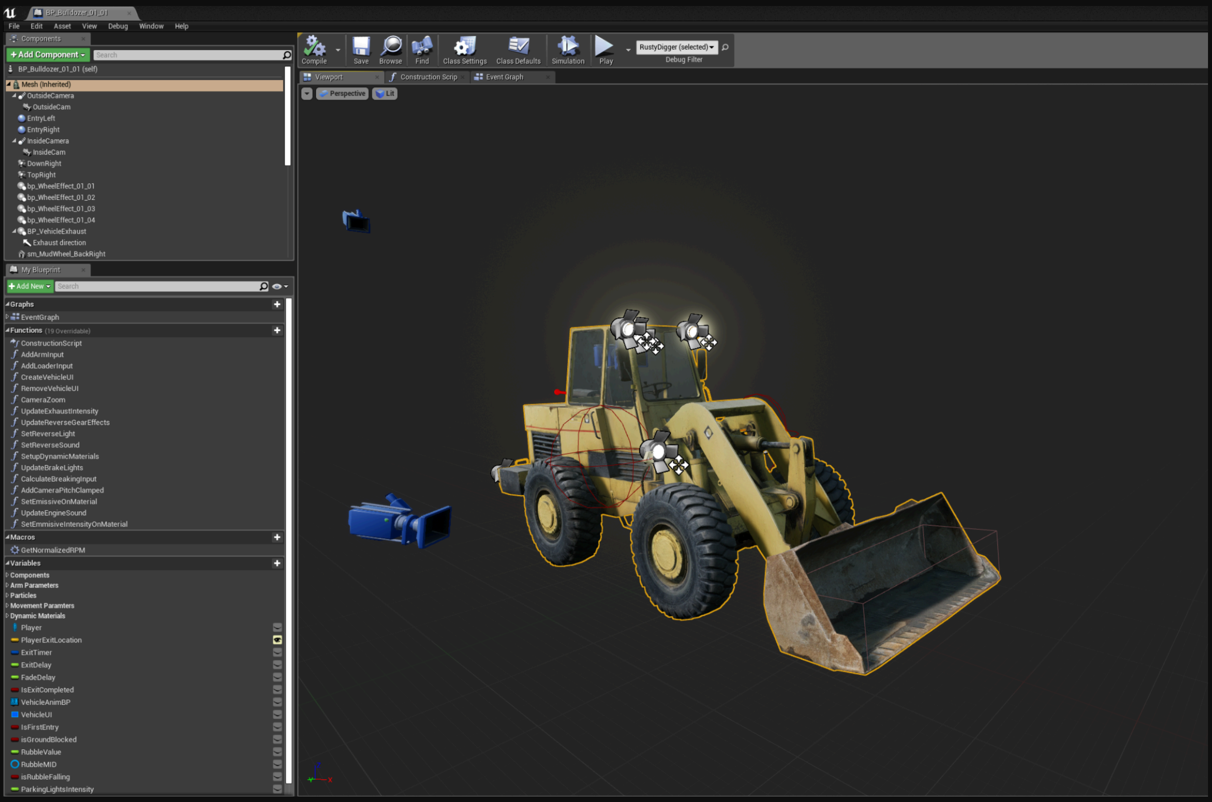


Surface Type: Concrete

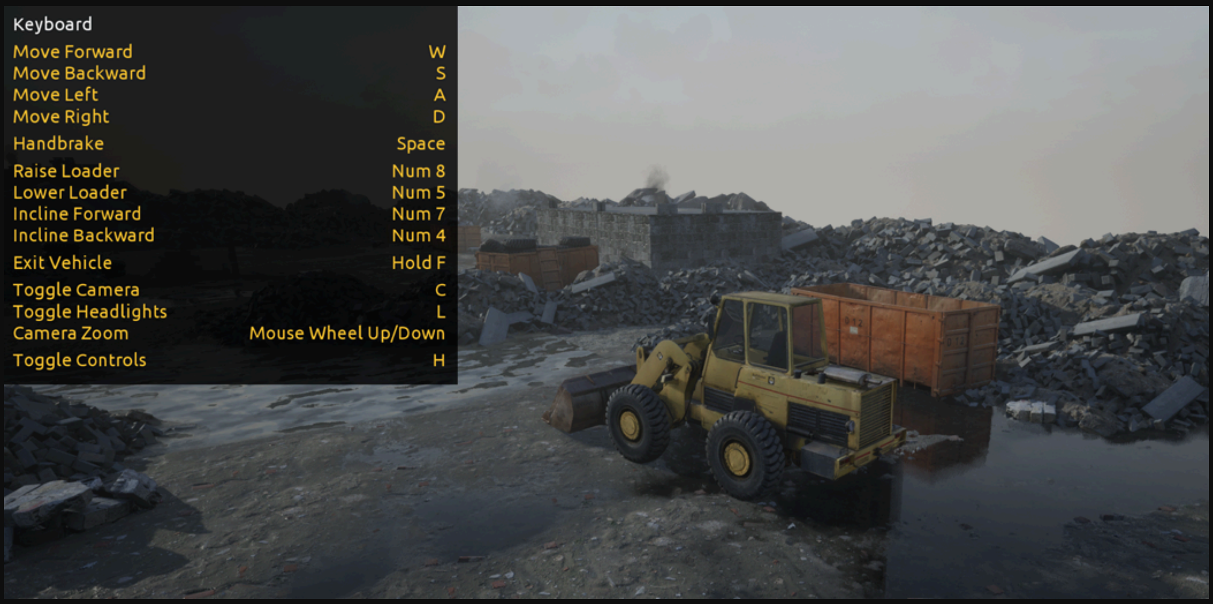
Bulldozer

Bulldozer BluePrint's name is **BP_Bulldozer_01_01**



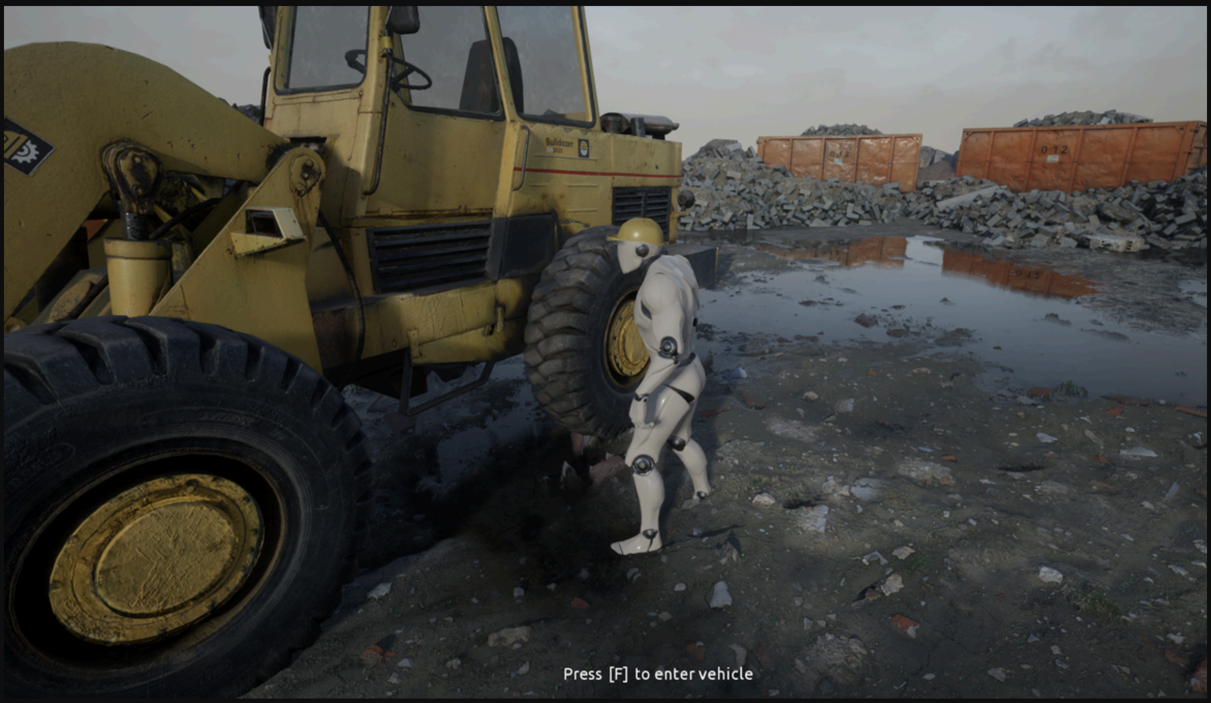


Bulldozer keyology



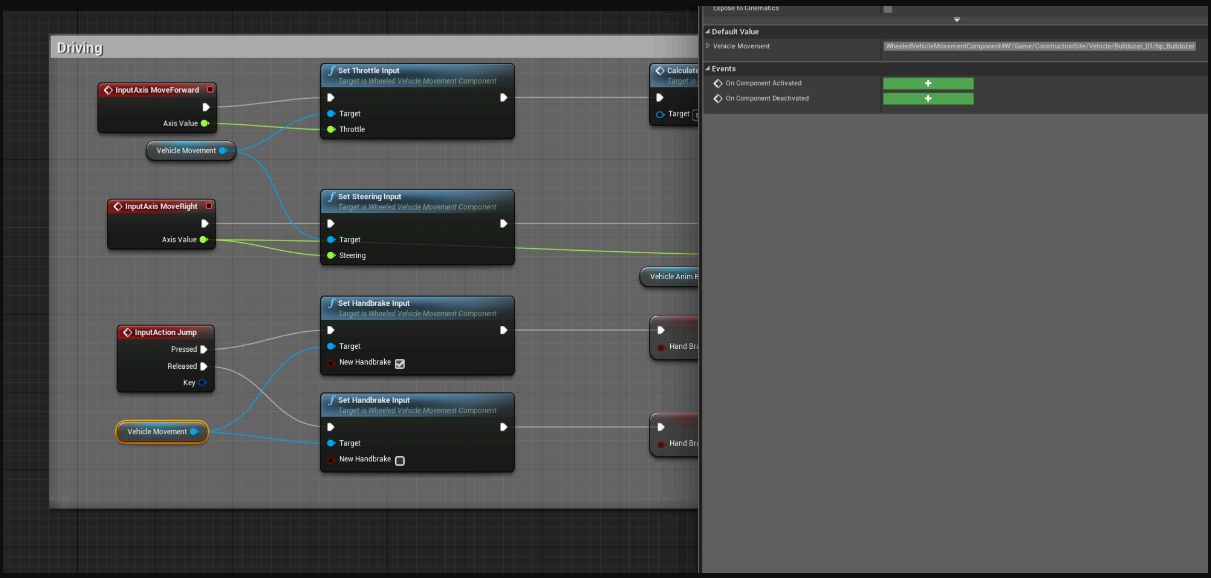
Keyboard	
Move Forward	W
Move Backward	S
Move Left	A
Move Right	D
Handbrake	Space
Raise Loader	Num 8
Lower Loader	Num 5
Incline Forward	Num 7
Incline Backward	Num 4
Exit Vehicle	Hold F
Toggle Camera	C
Toggle Headlights	L
Camera Zoom	Mouse Wheel Up/Down
Toggle Controls	H

To get pawn into the bulldozer press **F** on the keyboard near the trigger area.



Press [F] to enter vehicle

You can easily edit the driving characteristics of the bulldozer because it is based on the **Unreal Engine Vehicle System**.



Expose to Cinematics □

Default Value

Vehicle Movement: WheeledVehicleMovementComponent4W'/Game/ConstructionSite/Vehicle/Bulldozer_01/bp_Bulldozer

Events

On Component Activated +

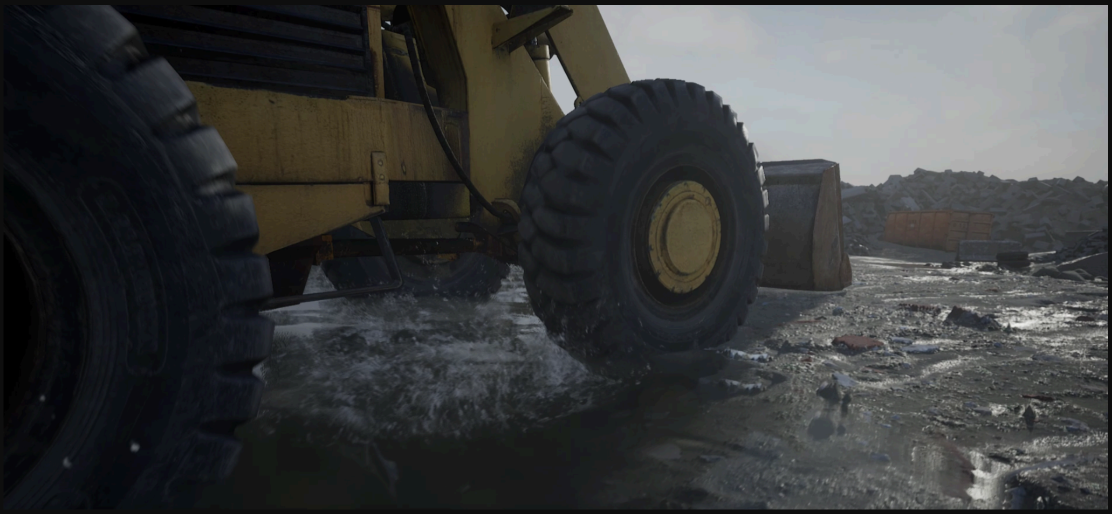
On Component Deactivated +

Animation of arm and bucket are based on **Animation BluePrint**.

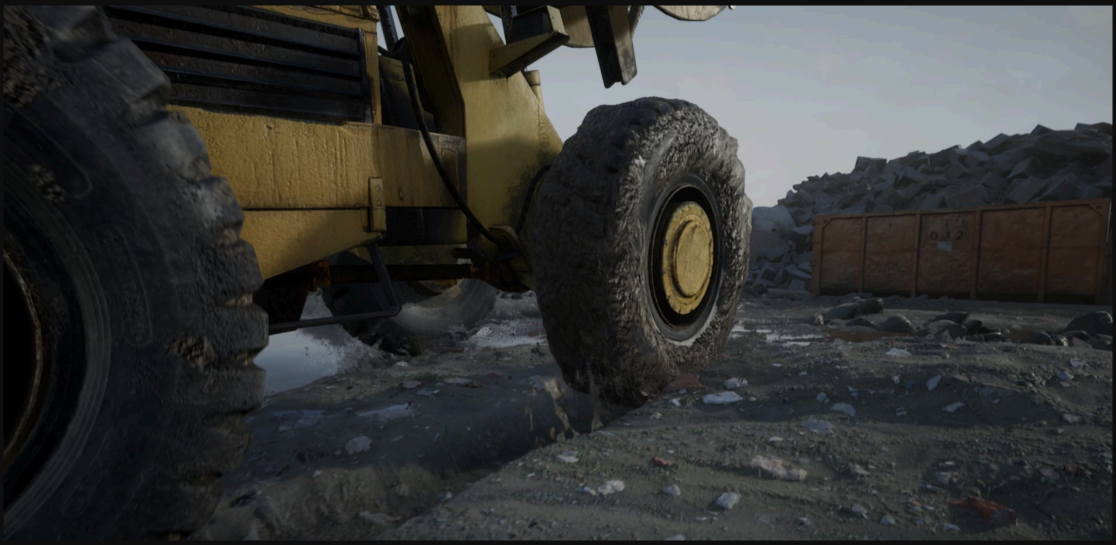
Bulldozer features

- deforms the landscape

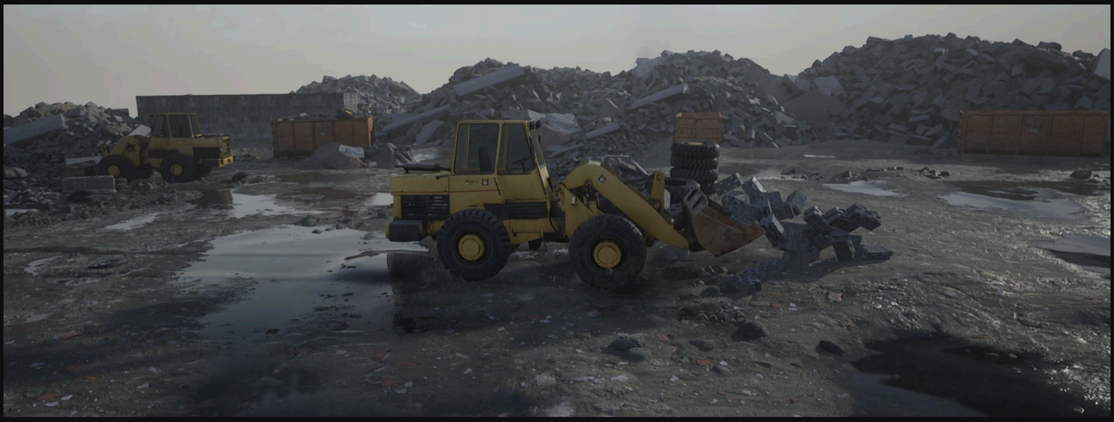
- reacts to water and mud



- wheels become dirty after defrosting landscape and clean after contact with water-based on layers system



- the bucket has interaction with objects possessing physics



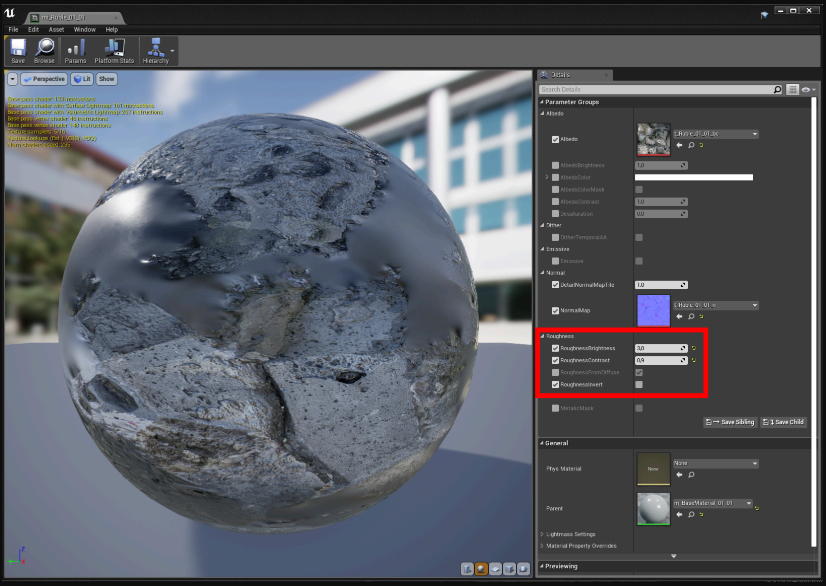
- In contact with the landscape, it flattens the area (heightmap) and the fake ground appears in the bucket, after being lifted it spills out the load - based on particles.

- and more like 3 definite cameras, lights, steering wheel, and lever animation.

Materials

Two main materials are **m_BaseMaterial_01_01** and **m_BaseMaterial_02_01_Masks**.

m_BaseMaterial_01_01 is special optimal material for models based on photogrammetry scans with many textures. We decide for optimization reasons, to resign from additional texture and generate roughness texture from base color. You can easily control a roughness by two parameters and easy invert it by switch:



```
Base pass shader: 133 instructions
Base pass shader with Surface Lightmap: 161 instructions
Base pass shader with Volumetric Lightmap: 207 instructions
Base pass vertex shader: 46 instructions
Base pass vertex shader: 148 instructions
Texture samplers: 5/16
Texture Lookups (Est.): VS(0), PS(2)
Num shaders added: 235
```

Parameter Groups

Albedo

- ☑ Albedo: t_Ruble_01_01_bc
- □ AlbedoBrightness: 1,0
- □ AlbedoColor
- □ AlbedoColorMask: □
- □ AlbedoContrast: 1,0
- □ Desaturation: 0,0

Dither

- □ DitherTemporalAA: □

Emissive

- □ Emissive: □

Normal

- ☑ DetailNormalMapTile: 1,0
- ☑ NormalMap: t_Ruble_01_01_n

Roughness

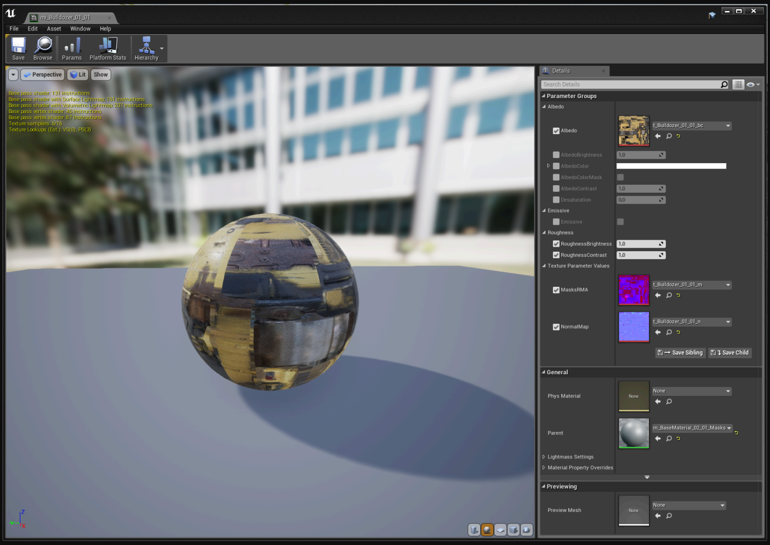
- ☑ RoughnessBrightness: 3,0
- ☑ RoughnessContrast: 0,9
- □ RoughnessFromDiffuse: ☑
- ☑ RoughnessInvert: □
- □ MetalicMask: □

General

- Phys Material: None
- Parent: m_BaseMaterial_01_01
- Lightmass Settings
- Material Property Overrides

Previewing

m_BaseMaterial_02_01_Masks is based on PBR standard and use RMA mask (roughness, metalnes, ambient occlusion):



```
Base pass shader: 131 instructions
Base pass shader with Surface Lightmap: 161 instructions
Base pass shader with Volumetric Lightmap: 207 instructions
Base pass vertex shader: 45 instructions
Base pass vertex shader: 87 instructions
Texture samplers: 6/16
Texture Lookups (Est.): VS(0), PS(3)
```

Parameter Groups

Albedo

- ☑ Albedo: t_Bulldozer_01_01_bc
- □ AlbedoBrightness: 1,0
- □ AlbedoColor
- □ AlbedoColorMask: □
- □ AlbedoContrast: 1,0
- □ Desaturation: 0,0

Emissive

- □ Emissive: □

Roughness

- ☑ RoughnessBrightness: 1,0
- ☑ RoughnessContrast: 1,0

Texture Parameter Values

- ☑ MasksRMA: t_Bulldozer_01_01_m
- ☑ NormalMap: t_Bulldozer_01_01_n

General

- Phys Material: None
- Parent: m_BaseMaterial_02_01_Masks
- Lightmass Settings
- Material Property Overrides

Previewing

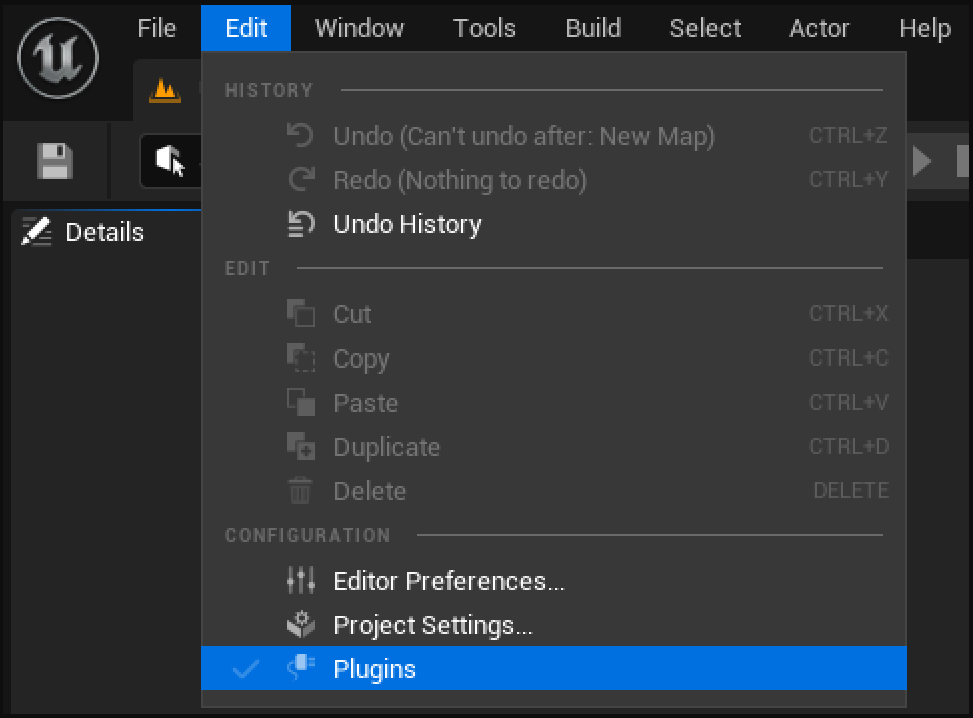
- Preview Mesh: None

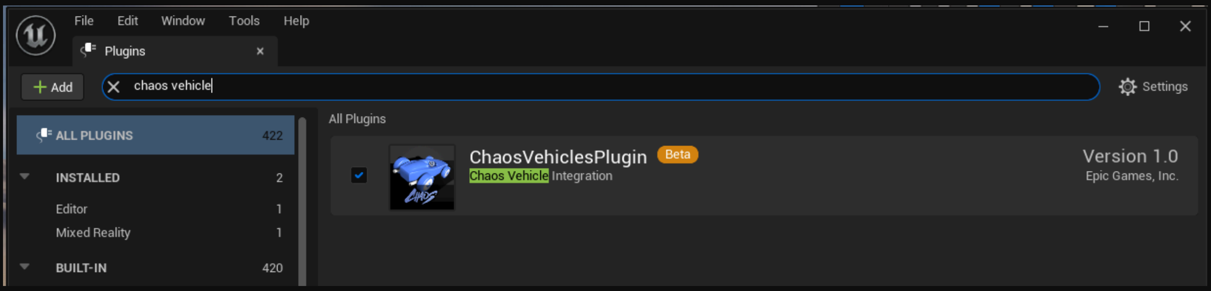
Unreal Engine 5.0 Update

The bulldozer is based on an Unreal Engine Chaos Vehicles. It interacts with the environment - it deforms the landscape, reacts to water and mud (wheels get dirty), has an extensive system of particles, and more - check video.

First Steps

You need to turn **ON** a **Chaos Vehicle Physics Plugin before importing this content**. Chaos Physics is set by default in Unreal Engine 5, but you still need to turn **ON** Chaos Vehicle Physics plugin.





chaos vehicle

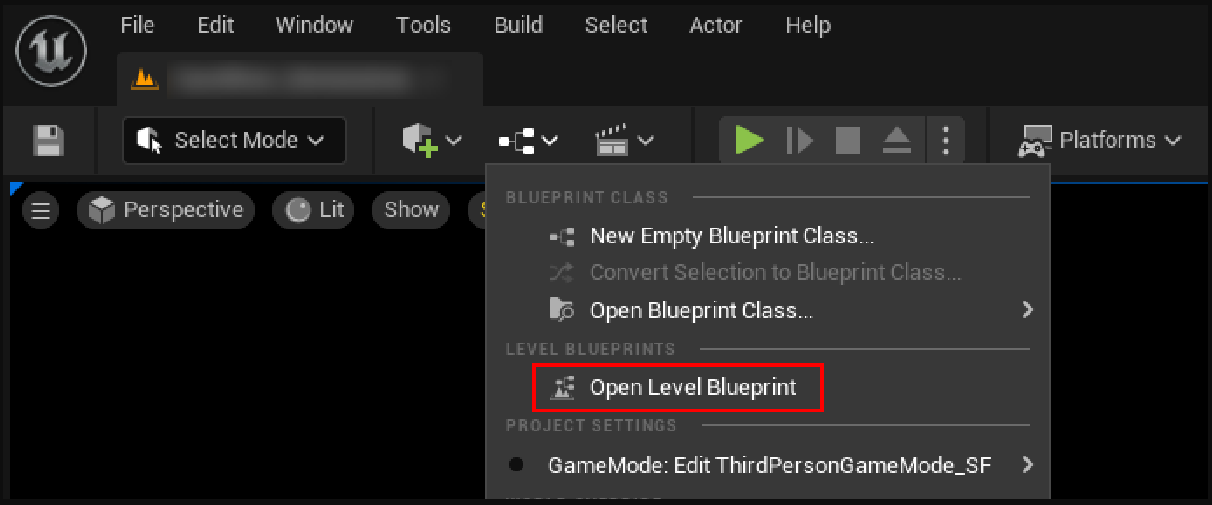
☑ ChaosVehiclesPlugin Beta
Chaos Vehicle Integration
Version 1.0
Epic Games, Inc.

Disable HUD Menu (startup fade & rendering problems)

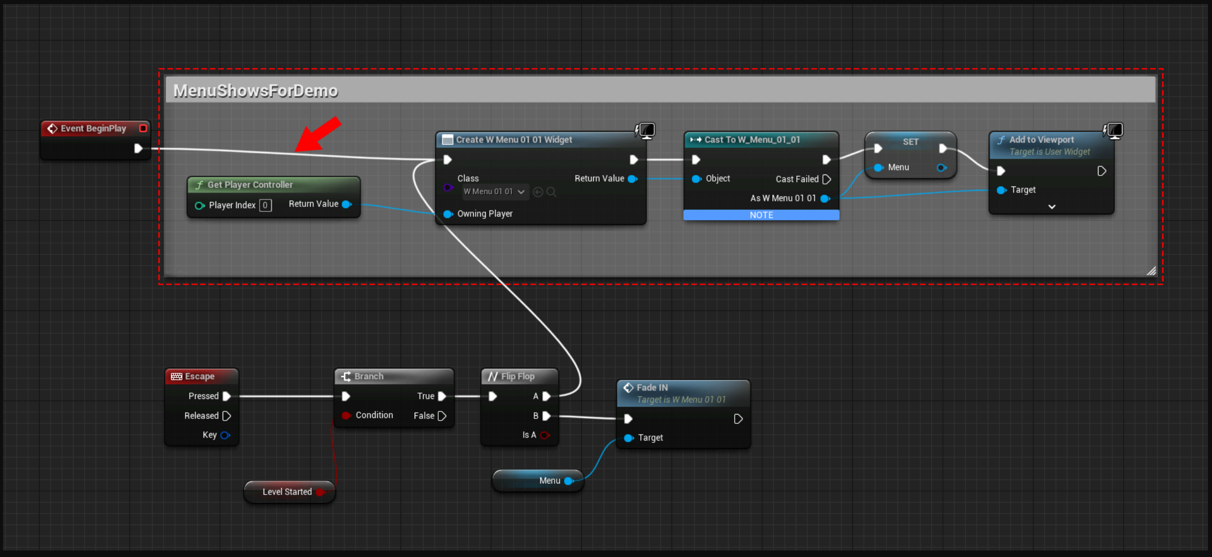
We have included a user interface menu & fade board when GameMode is launched. All files related to the menu are located in this directory:

\Content\ProjectName\Demo\Maps\Menu\

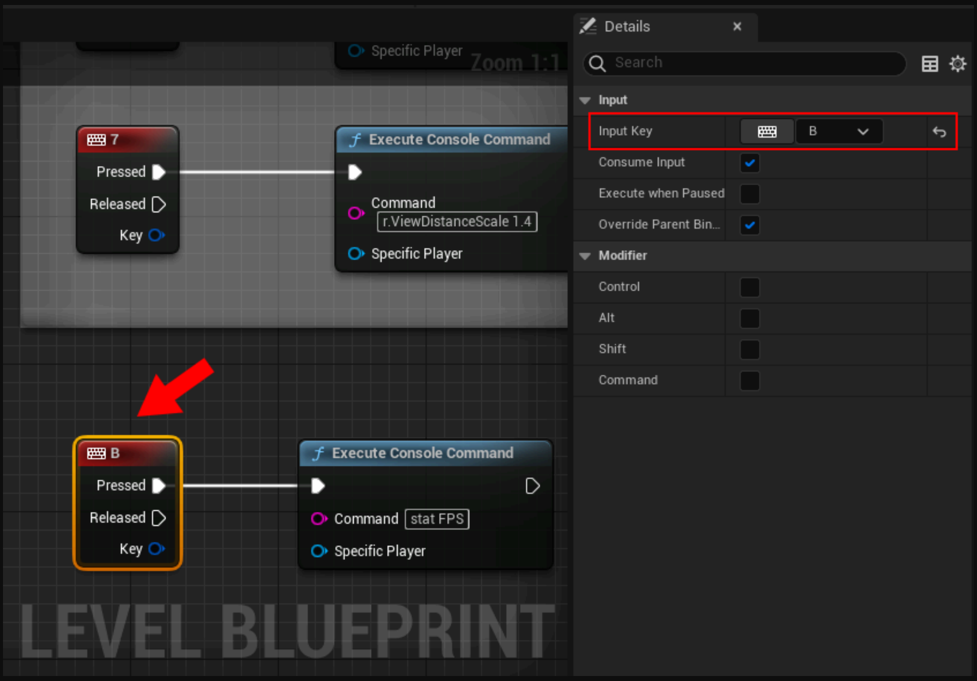
If you want to disable default menu, go to Level Blueprint settings:



The displayed menu is controlled by a selected graph. You can edit it or simply disconnect the indicated node:



However, if you'd like to customize user menu, you can edit the keys assigned to individual functions:



Command r.ViewDistanceScale 1.4

Command stat FPS

Input Key B

☑ Consume Input

□ Execute when Paused

☑ Override Parent Bin...

□ Control

□ Alt

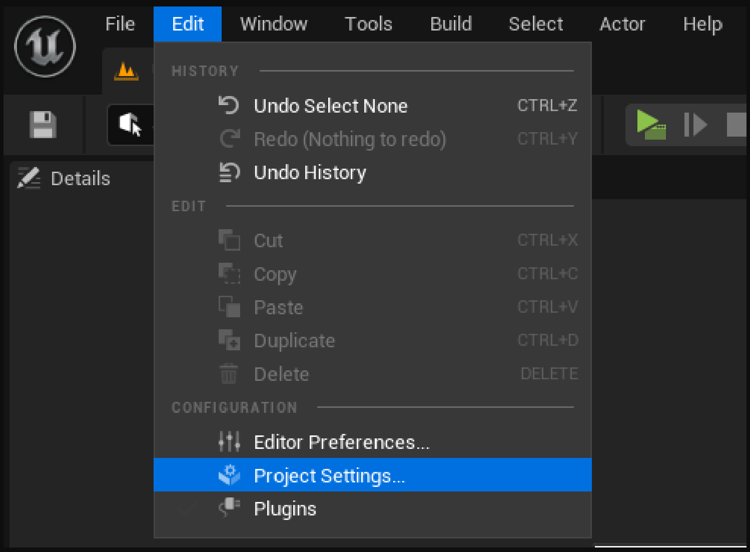
□ Shift

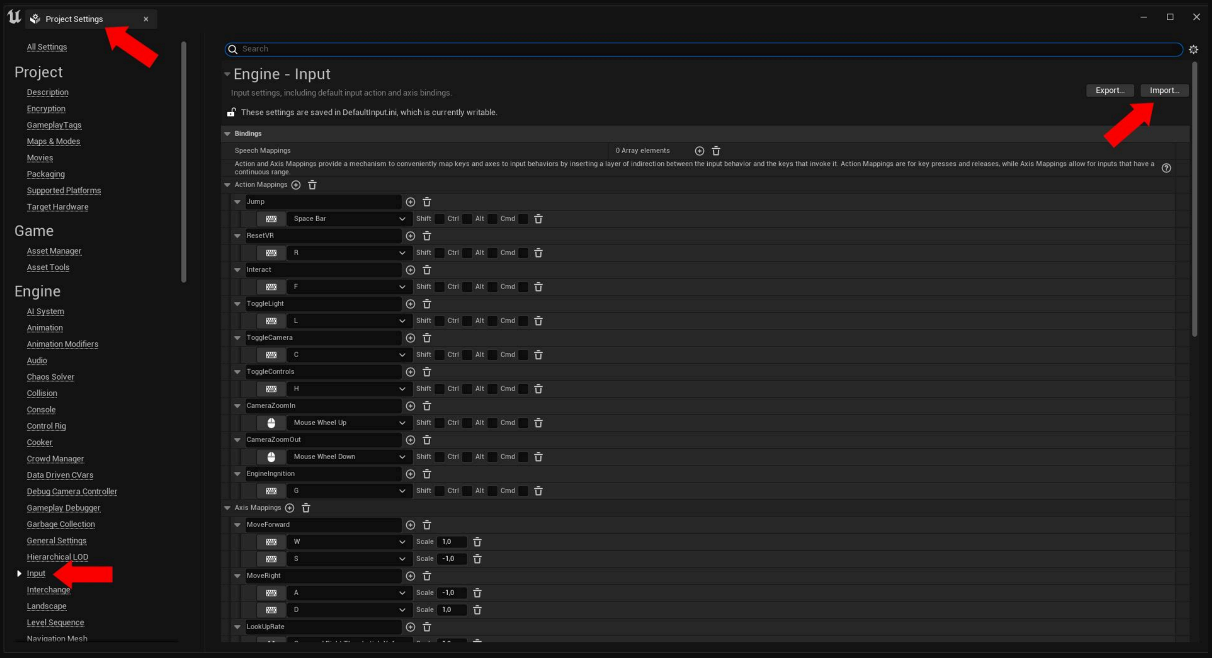
□ Command

Main parts

Inputs

If you add a pack to the Blank project you should definite Engine input or import it, simply download it from our drive - Loader input





Engine - Input

Input settings, including default input action and axis bindings.

These settings are saved in DefaultInput.ini, which is currently writable.

Bindings

Speech Mappings — 0 Array elements

Action and Axis Mappings provide a mechanism to conveniently map keys and axes to input behaviors by inserting a layer of indirection between the input behavior and the keys that invoke it. Action Mappings are for key presses and releases, while Axis Mappings allow for inputs that have a continuous range.

Action Mappings

Action	Key	Shift	Ctrl	Alt	Cmd
Jump	Space Bar	□	□	□	□
ResetVR	R	□	□	□	□
Interact	F	□	□	□	□
ToggleLight	L	□	□	□	□
ToggleCamera	C	□	□	□	□
ToggleControls	H	□	□	□	□
CameraZoomIn	Mouse Wheel Up	□	□	□	□
CameraZoomOut	Mouse Wheel Down	□	□	□	□
EngineIngnition	G	□	□	□	□

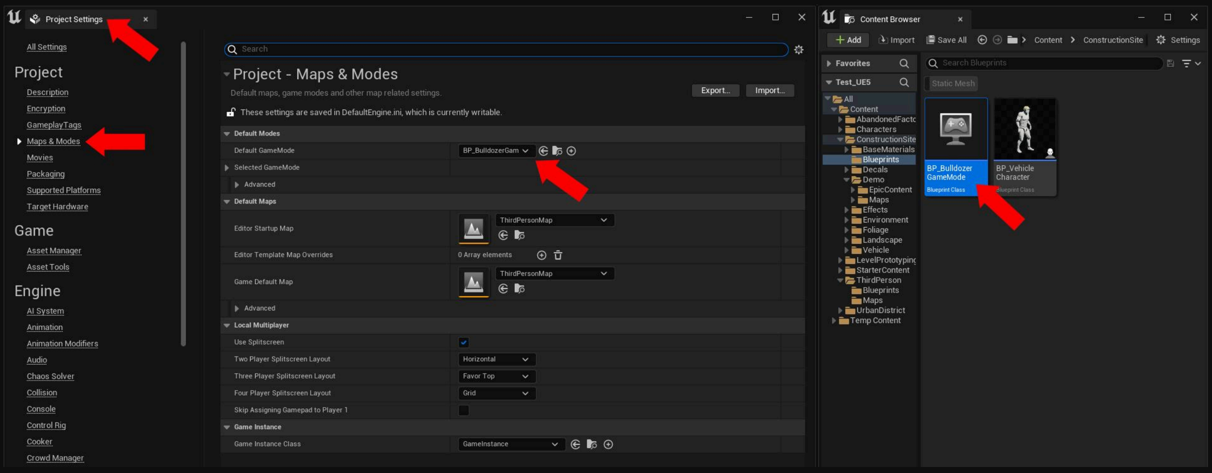
Axis Mappings

Axis	Key	Scale
MoveForward	W	1,0
	S	-1,0
MoveRight	A	-1,0
	D	1,0
LookUpRate		

[Link to Import Input file](#).

GameMode

The pack is based on a modified **Third Person template**, after adding it to your project you need to change **Default GameMode** in **Project Settings** to our **BP_BulldozerGameMode**.



Project - Maps & Modes

Default maps, game modes and other map related settings.

These settings are saved in DefaultEngine.ini, which is currently writable.

Default Modes
- Default GameMode: BP_BulldozerGam
- Selected GameMode
- Advanced

Default Maps
- Editor Startup Map: ThirdPersonMap
- Editor Template Map Overrides: 0 Array elements
- Game Default Map: ThirdPersonMap
- Advanced

Local Multiplayer
- Use Splitscreen: ☑
- Two Player Splitscreen Layout: Horizontal
- Three Player Splitscreen Layout: Favor Top
- Four Player Splitscreen Layout: Grid
- Skip Assigning Gamepad to Player 1: □

Game Instance
- Game Instance Class: GameInstance

.../ConstructionSite/Blueprints/**BP_BulldozerGameMode**

DefaultPawnClass is set to BP_VehicleCharacter

Character

.../ConstructionSite/Blueprints/**BP_VehicleCharacter**

This is the default character that is used with Bulldozer vehicle. Mainly it handles:

- *entering vehicle,*
- *possesing/unpossesing player (with fade),*

and additionally it implements functionalities such as:

- *player flashlight,*
- *player camera change TPP/FPP,*
- *movement input,*
- *toggling HUD (help display).*

Bulldozer Blueprint

.../ConstructionSite/Blueprints/Vehicle/Bulldozer_01/**BP_Bulldozer_01_01**
This is the main vehicle that player can drive around.
*This blueprint derives from **WheeledVehiclePawn** which is a base class for vehicles in Chaos physics engine.Bulldozer driving behavior is done just by tweaking values in the **VehicleMovementComponent**, e.g. in the **MechanicalSetup** or **VehicleSetup** sections (in Details panel).*

*Player inputs are handled in the **Event Graph**:*

- *steering,*
- *accelerating,*
- *breaking,*
- *reversing,*
- *handbrake,*
- *manipulating loader arm,*
- *manipulating loader bucket.*

Additional vehicle functionalities:

- *toggle lights,*
- *wheel FX (mud),*
- *loader bucket debris (rubble) FX,*
- *handle fade on player enter/exit,*
- *and other minor FX effects.*

*In a Bulldozer blueprint there is also a **CameraSwitcher** component. It handles vehicle camera changes. On **BeginPlay** three cameras are set and when the player presses the **ToggleCamera** input button, the camera is changed.*
*Camera rotation and zoom is handled in **Camera rotation** and **Camera zoom in/out** sections in blueprint Event Graph. **Wheel Camera** is static that is why it is not present in these sections.*

Wheels

.../ConstructionSite/Blueprints/Vehicle/Bulldozer_01/Blueprints/**BP_BulldozerFrontWheel_01_01**
.../ConstructionSite/Blueprints/Vehicle/Bulldozer_01/Blueprints/**BP_BulldozerRearWheel_01_01**

Basic wheel setup for the vehicle. Most important values:

- *wheel radius/width,*
- *brake torque/hand brake torque*

Animation Blueprint

.../ConstructionSite/Blueprints/Vehicle/Bulldozer_01/Blueprints/**AB_Bulldozer_01_01**
Base animation blueprint for bulldozer vehicle. Additionally to wheel setup this blueprint handles animations:

- *hydraulics setup for loader arm and bucket,*

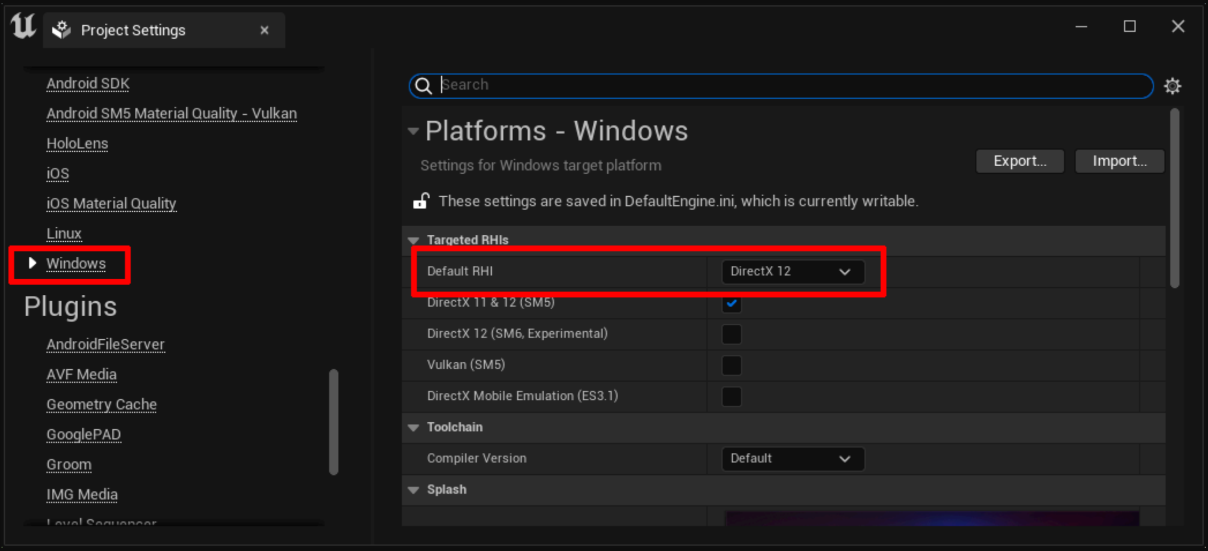
- *secondary animations:*
    - *steering wheel,*
    - *speed/RPM gauges,*
    - *loader manipulation levers.*

Landscape Tessellation with Virtual Heightfield Mesh

Unreal Engine 5 has no tessellation option. To use landscape with height map detail, Virtual Heightfield Mesh should be used.

Follow these steps for **each** Landscape actor at level:

1. Make sure you have **DirectX 12 set as default RHI** in your project settings (Windows tab). New projects created in Unreal Engine 5 use DirectX 12 by default.



Project Settings

Android SDK
Android SM5 Material Quality - Vulkan
HoloLens
iOS
iOS Material Quality
Linux
Windows

Plugins

AndroidFileServer
AVF Media
Geometry Cache
GooglePAD
Groom
IMG Media

Platforms - Windows

Settings for Windows target platform

Export... Import...

These settings are saved in DefaultEngine.ini, which is currently writable.

Targeted RHIs

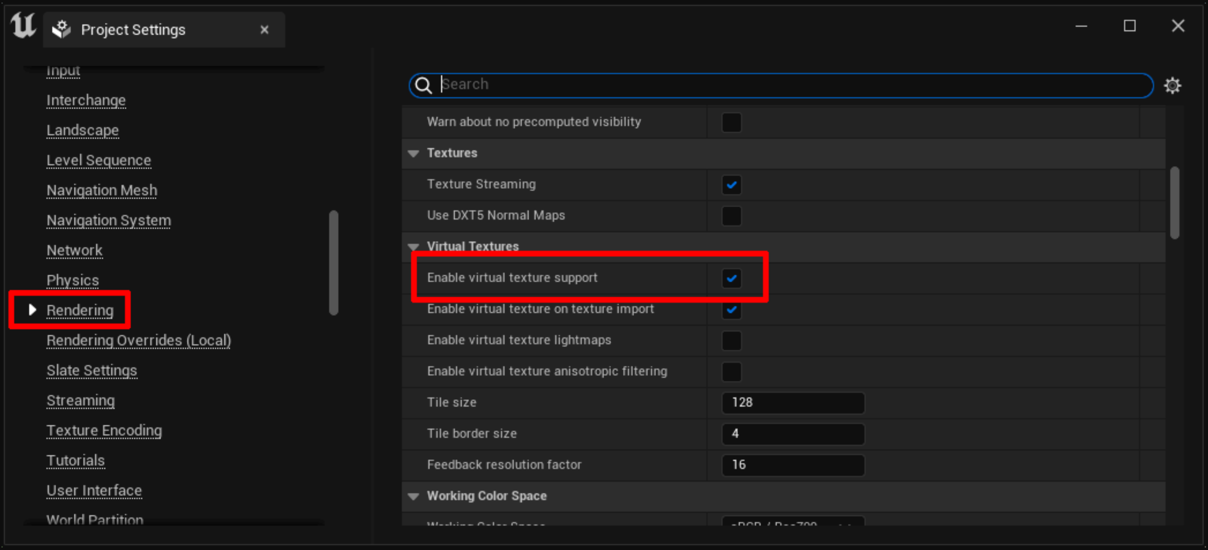
Default RHI	DirectX 12
DirectX 11 & 12 (SM5)	☑
DirectX 12 (SM6, Experimental)	□
Vulkan (SM5)	□
DirectX Mobile Emulation (ES3.1)	□

Toolchain

Compiler Version	Default

Splash

2. **Enable Virtual Texture support** in the Rendering tab in your project settings.



Project Settings

Input
Interchange
Landscape
Level Sequence
Navigation Mesh
Navigation System
Network
Physics
Rendering
Rendering Overrides (Local)
Slate Settings
Streaming
Texture Encoding
Tutorials
User Interface
World Partition

Warn about no precomputed visibility	□

Textures

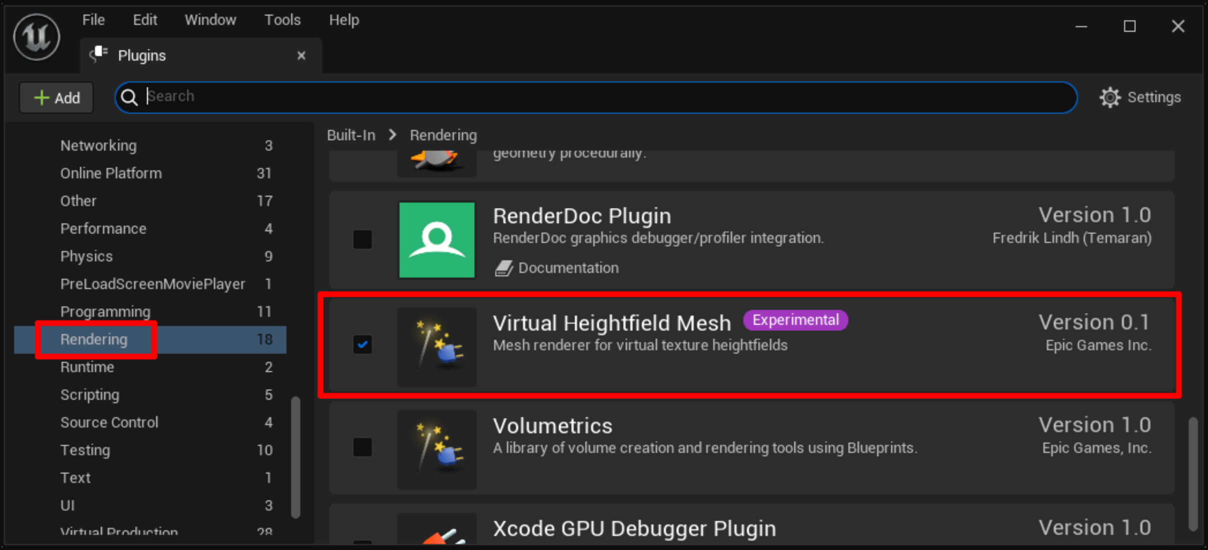
Texture Streaming	☑
Use DXT5 Normal Maps	□

Virtual Textures

Enable virtual texture support	☑
Enable virtual texture on texture import	☑
Enable virtual texture lightmaps	□
Enable virtual texture anisotropic filtering	□
Tile size	128
Tile border size	4
Feedback resolution factor	16

Working Color Space

3. Enable the **Virtual Heightfield Mesh plugin**.



Networking	3
Online Platform	31
Other	17
Performance	4
Physics	9
PreLoadScreenMoviePlayer	1
Programming	11
Rendering	18
Runtime	2
Scripting	5
Source Control	4
Testing	10
Text	1
UI	3
Virtual Production	28

geometry procedurally.

□ RenderDoc Plugin — RenderDoc graphics debugger/profiler integration. Documentation — Version 1.0 — Fredrik Lindh (Temaran)

☑ Virtual Heightfield Mesh Experimental — Mesh renderer for virtual texture heightfields — Version 0.1 — Epic Games Inc.

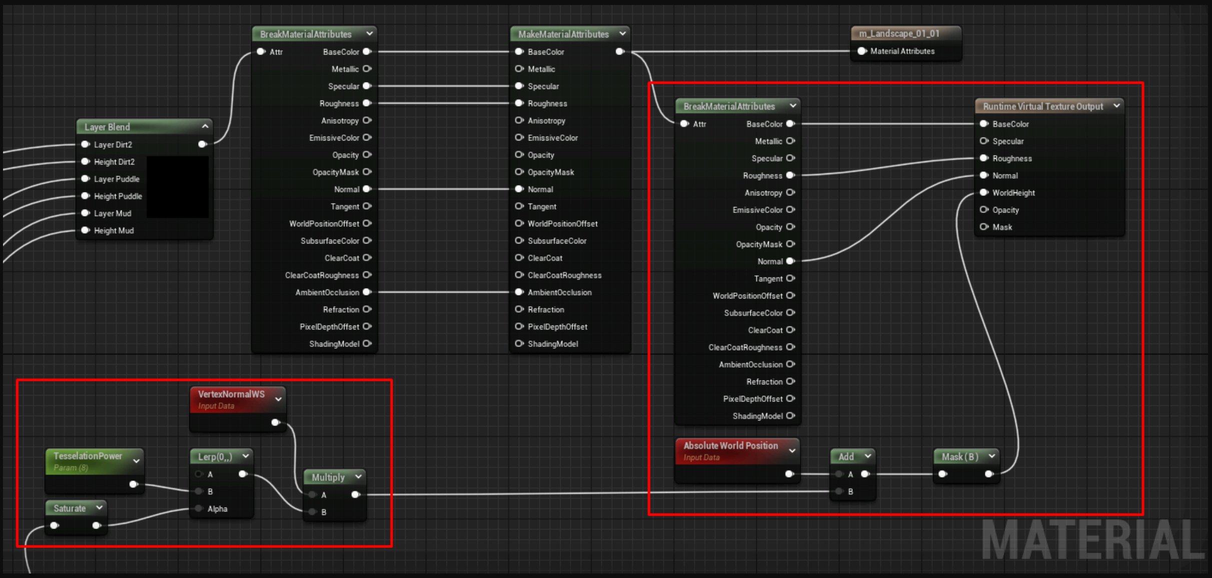
□ Volumetrics — A library of volume creation and rendering tools using Blueprints. — Version 1.0 — Epic Games, Inc.

Xcode GPU Debugger Plugin — Version 1.0

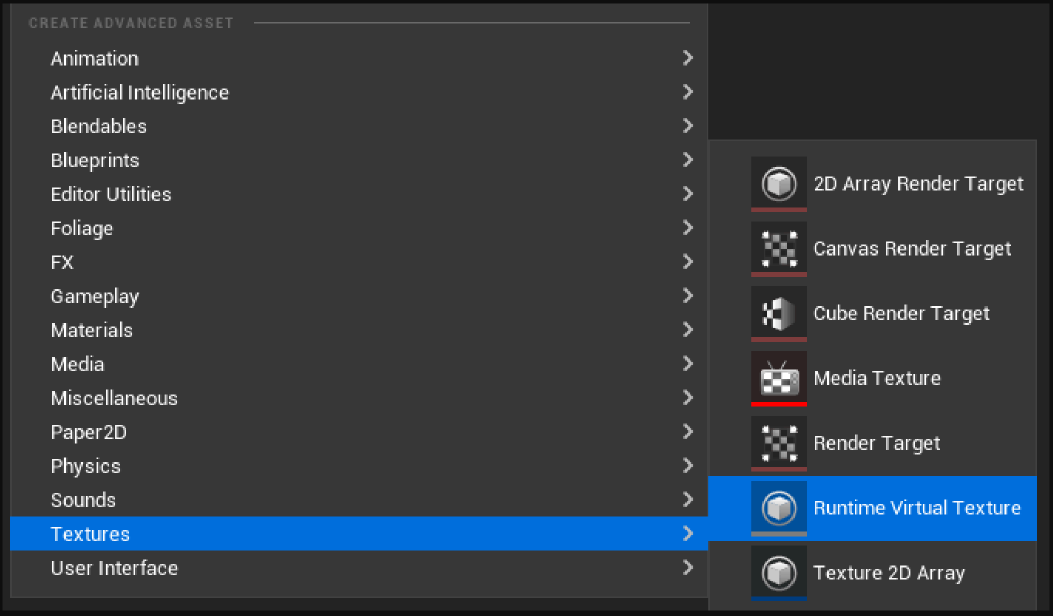
4. Restart editor.

After that demo map **ConstructionSite_02_Demo_P** will be run properly. If you want this functionality on your own map follow next steps:

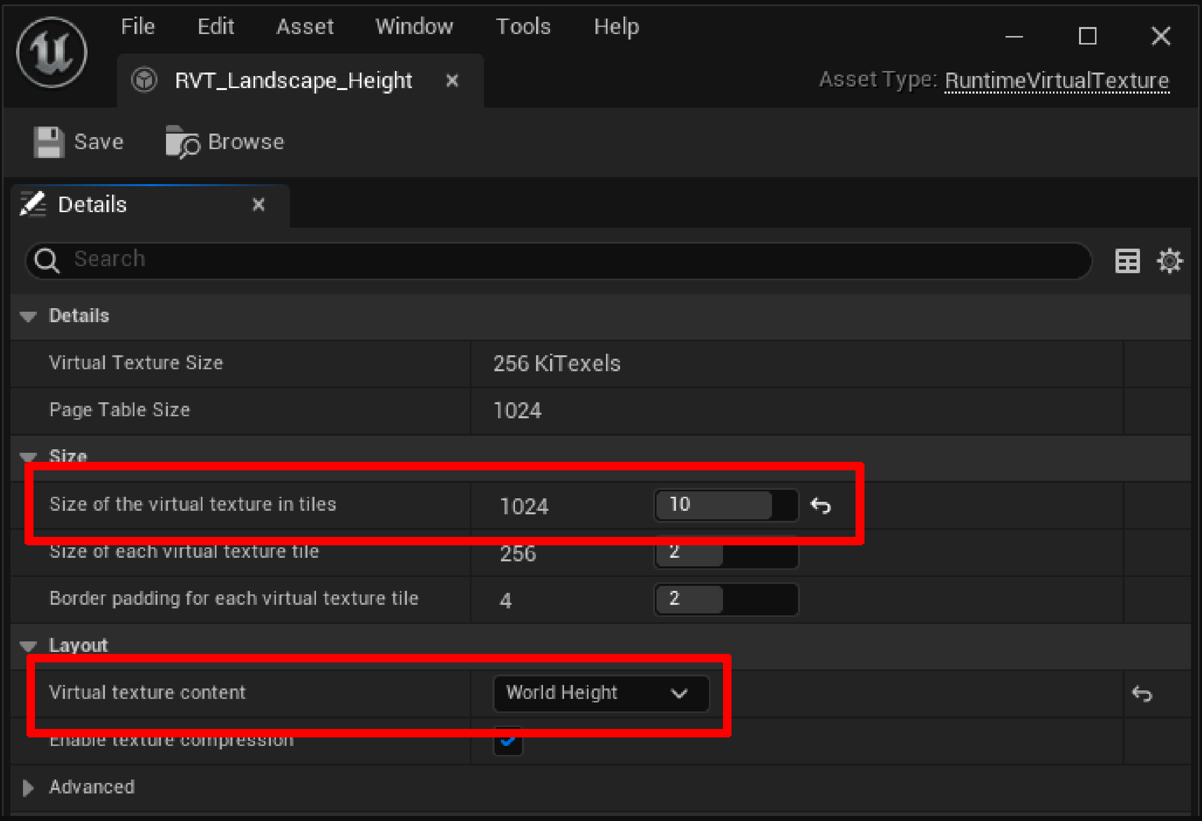
5. Open landscape material **m_Landscape_01_01**, add **Runtime Virtual Texture Output node,** and setup material like in the picture.



6. In Content Browser create two **Runtime Virtual Texture**. Name the first texture **RVT_Landscape_Height** and name the second **RVT_Landscape_Color**.



7. Open **RVT_Landscape_Height/RVT_Landscape_Color** and set them as shown in the pictures.



RVT_Landscape_Height

Asset Type: RuntimeVirtualTexture

Details

Virtual Texture Size: 256 KiTexels

Page Table Size: 1024

Size

Size of the virtual texture in tiles: 1024, 10

Size of each virtual texture tile: 256, 2

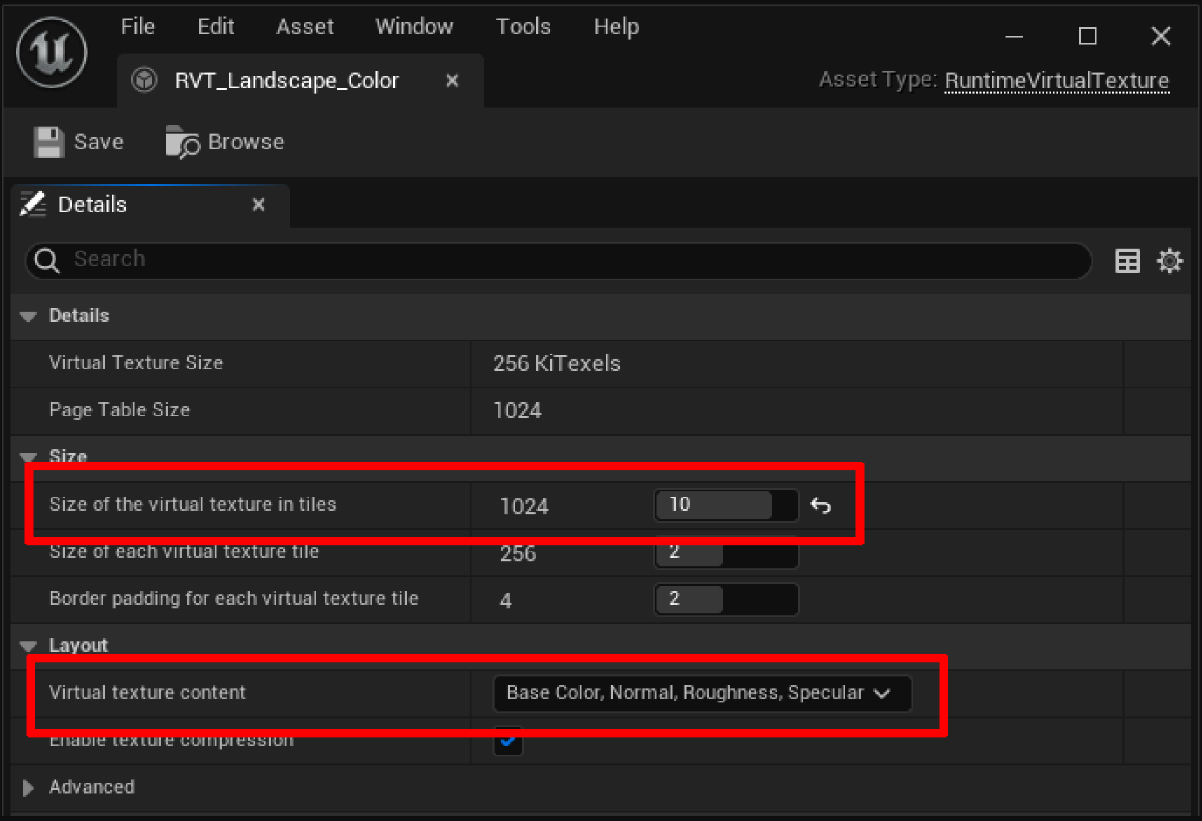
Border padding for each virtual texture tile: 4, 2

Layout

Virtual texture content: World Height

Enable texture compression: ✓

Advanced



RVT_Landscape_Color

Asset Type: RuntimeVirtualTexture

Details

Virtual Texture Size: 256 KiTexels

Page Table Size: 1024

Size

Size of the virtual texture in tiles: 1024, 10

Size of each virtual texture tile: 256, 2

Border padding for each virtual texture tile: 4, 2

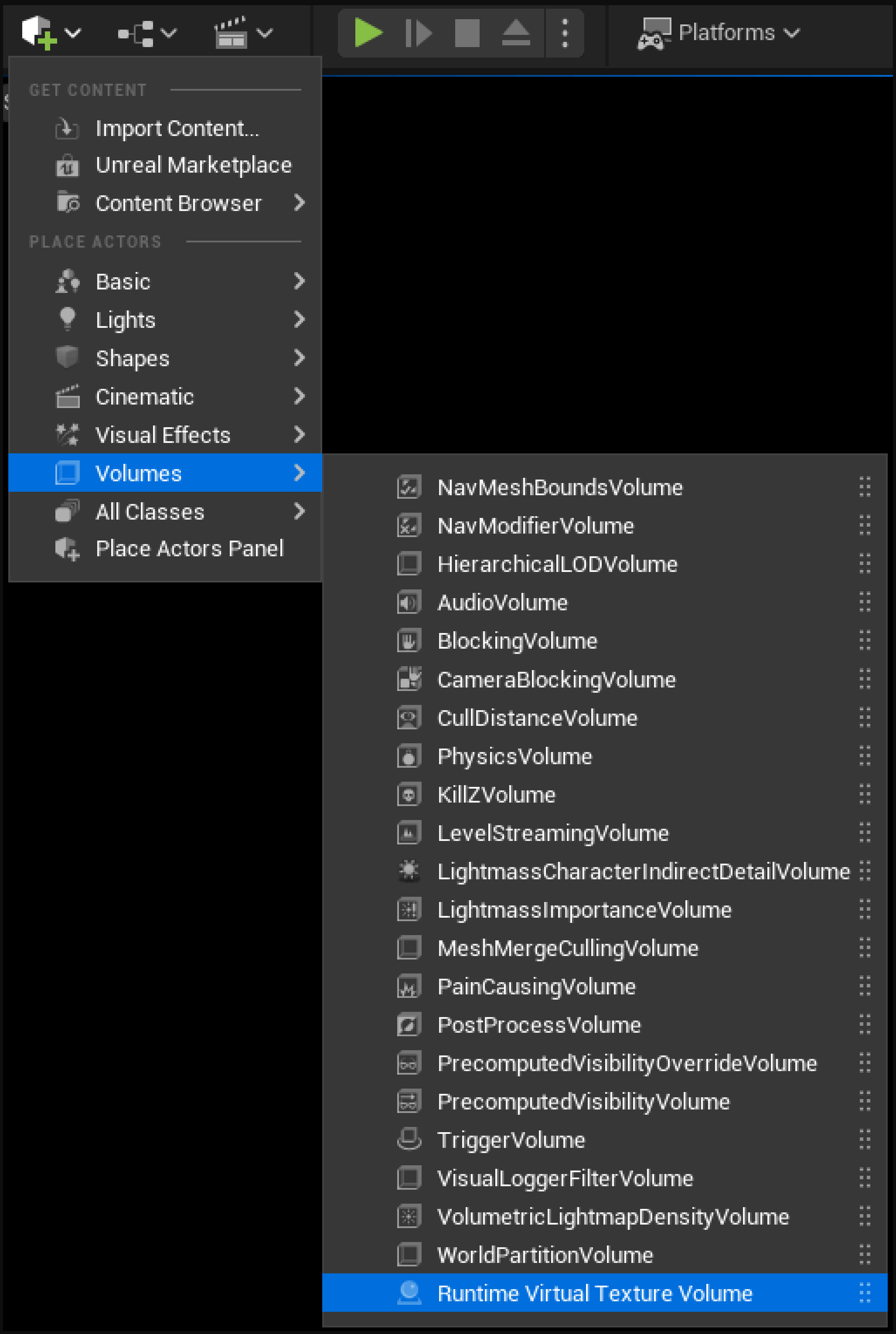
Layout

Virtual texture content: Base Color, Normal, Roughness, Specular

Enable texture compression: ✓

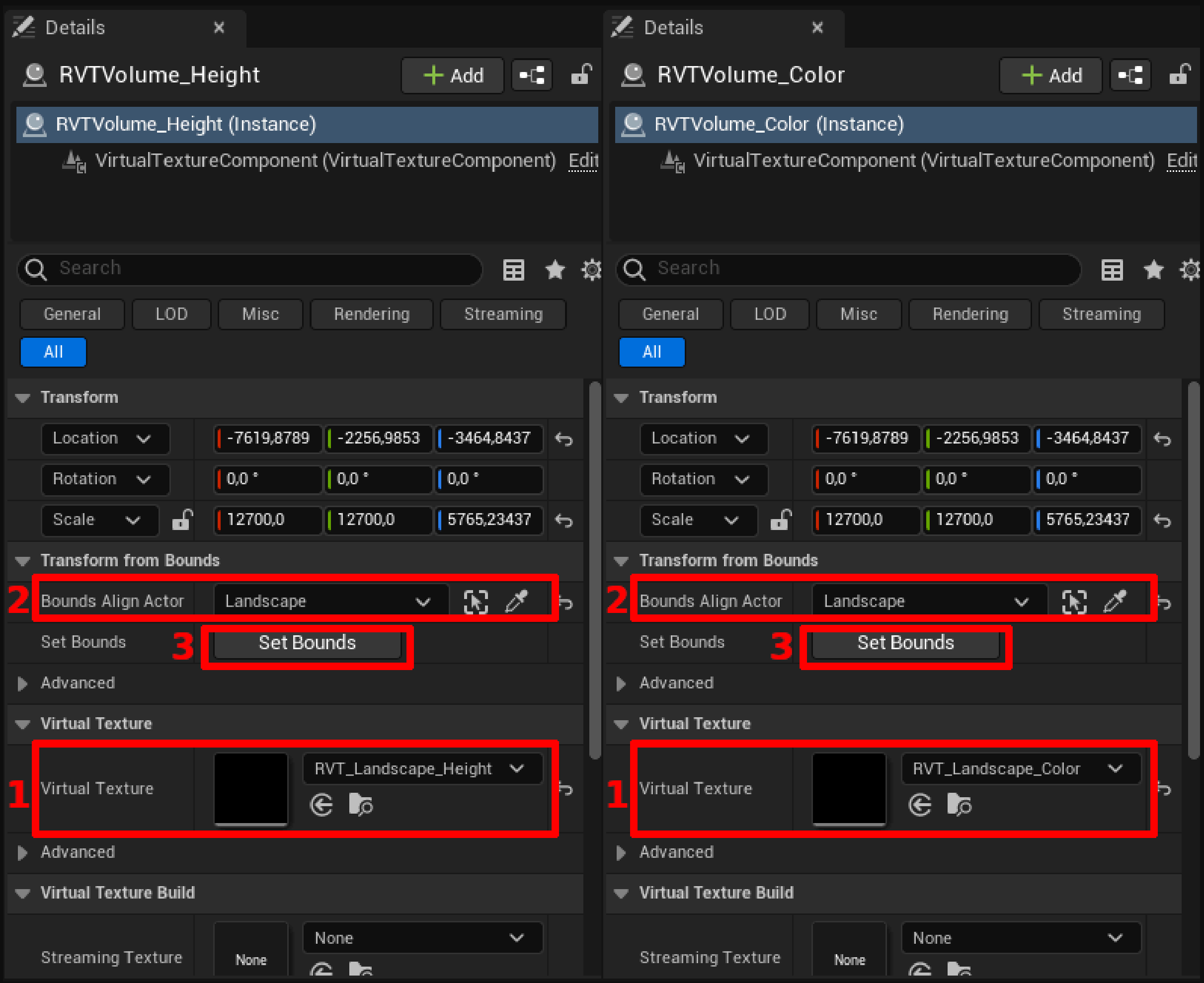
Advanced

8. Add to level two **Runtime Virtual Texture Volume** from Volumes menu. Name the first volume **RVTVolume_Height** and name the second **RVTVolume_Color**.



9. Select the **RVTVolume_Height**, assign the **RVT_Landscape_Height** texture to **Virtual Texture** property (1), assign the landscape actor from level to **Bounds Align Actor** (2) and click **Set Bounds** button (3).

   Then select the **RVTVolume_Color**, assign the **RVT_Landscape_Color** texture to **Virtual Texture** property (1), assign the landscape actor from level to **Bounds Align Actor** (2) and click the **Set Bounds** button (3).



Details — RVTVolume_Height

RVTVolume_Height (Instance)

VirtualTextureComponent (VirtualTextureComponent) Edit

Transform
Location -7619,8789 -2256,9853 -3464,8437
Rotation 0,0 ° 0,0 ° 0,0 °
Scale 12700,0 12700,0 5765,23437

Transform from Bounds
Bounds Align Actor: Landscape
Set Bounds

Virtual Texture
Virtual Texture: RVT_Landscape_Height

Virtual Texture Build
Streaming Texture: None

Details — RVTVolume_Color

RVTVolume_Color (Instance)

VirtualTextureComponent (VirtualTextureComponent) Edit

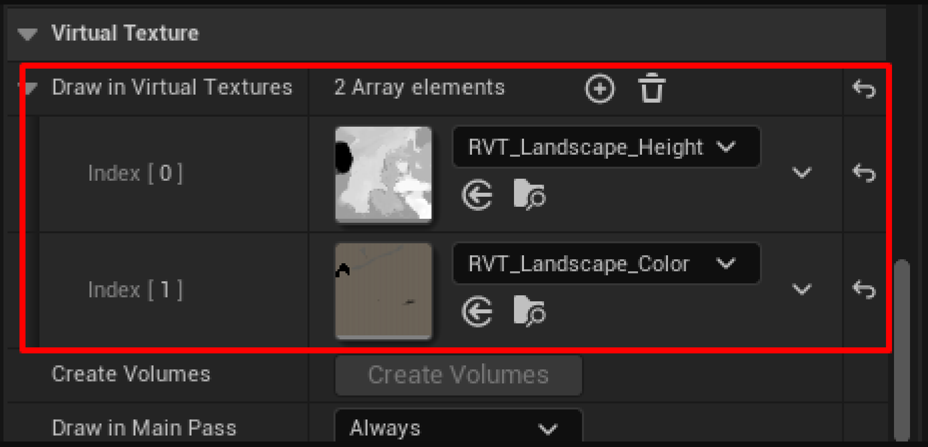
Transform
Location -7619,8789 -2256,9853 -3464,8437
Rotation 0,0 ° 0,0 ° 0,0 °
Scale 12700,0 12700,0 5765,23437

Transform from Bounds
Bounds Align Actor: Landscape
Set Bounds

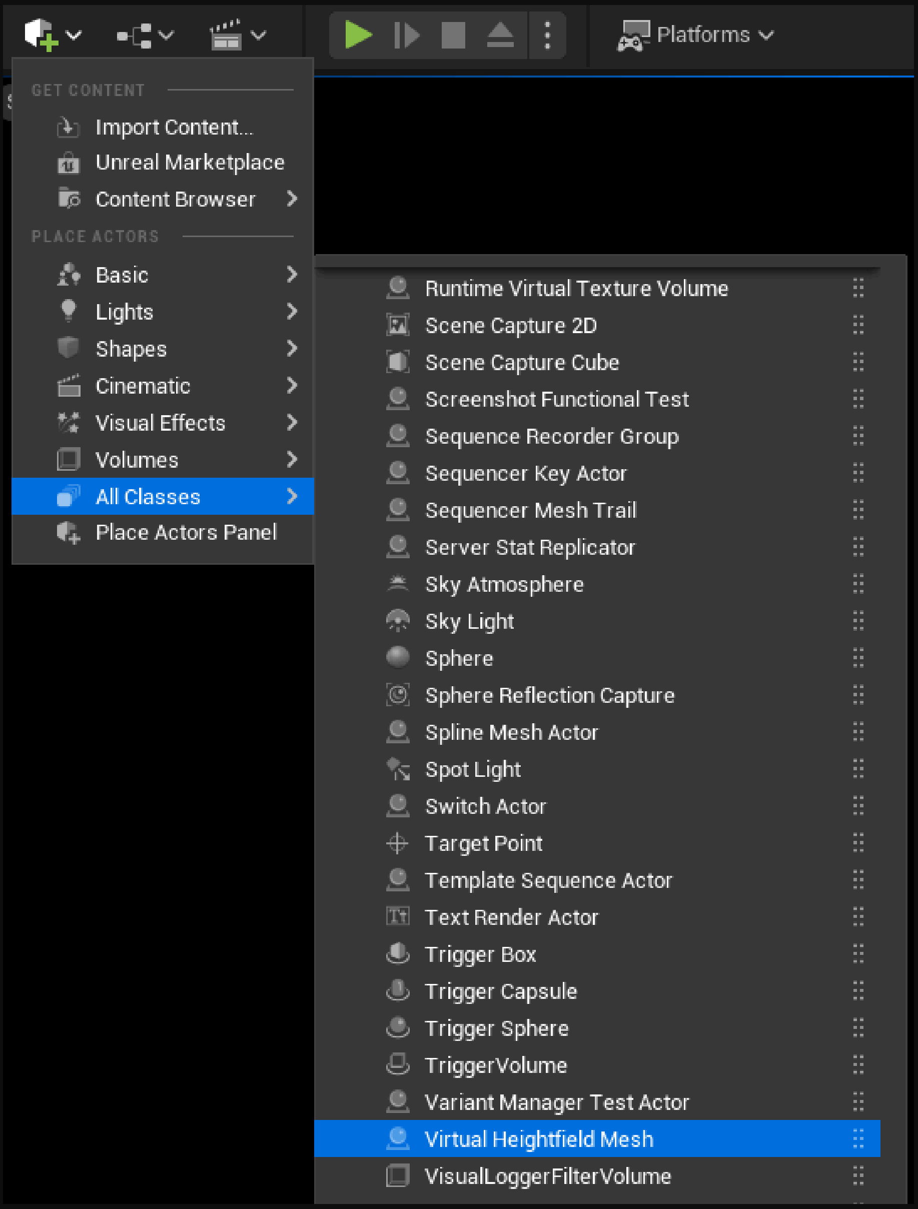
Virtual Texture
Virtual Texture: RVT_Landscape_Color

Virtual Texture Build
Streaming Texture: None

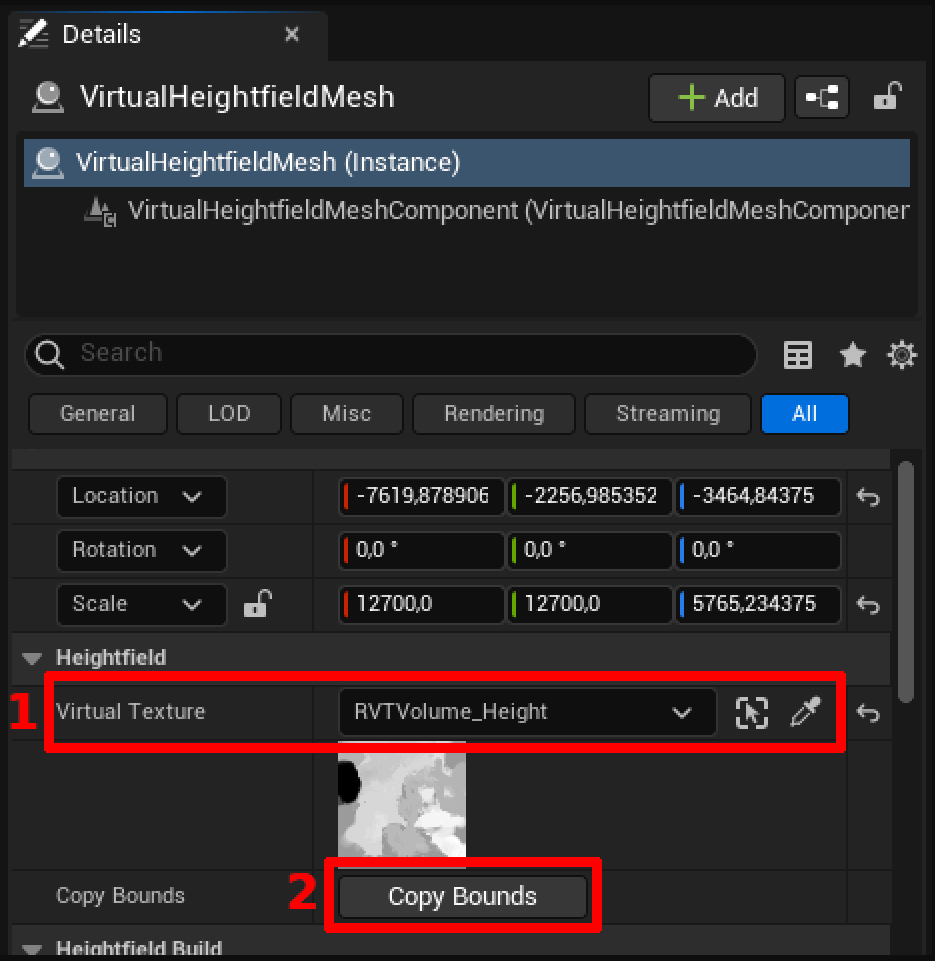
10. Select the landscape actor at level and assign **VT_Landscape_Height** and **RVT_Landscape_Color** textures to **Draw in Virtual Textures** under the Virtual Texture tab like in the picture.



11. Add to level the **Virtual Heightfield Mesh** from All Classes.



12. Select the **Virtual Heightfield Mesh**, assign **RVTVolume_Height** volume to **Virtual Texture** (1) and click the **Copy Bounds** button (2).



Location -7619,878906 -2256,985352 -3464,84375

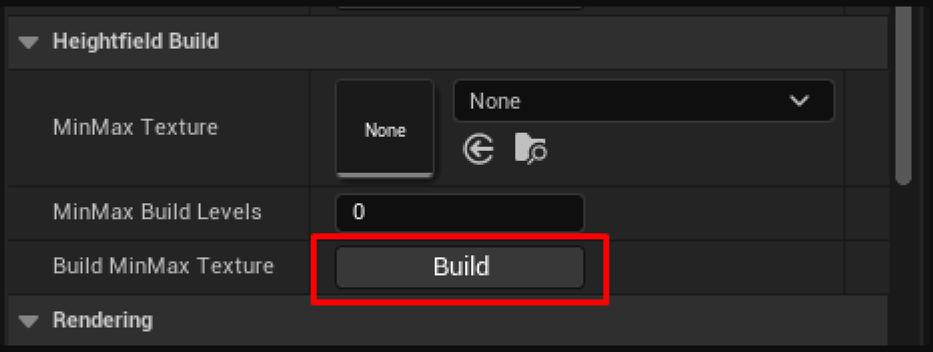
Rotation 0,0 ° 0,0 ° 0,0 °

Scale 12700,0 12700,0 5765,234375

Virtual Texture RVTVolume_Height

Copy Bounds

13. Build MinMax Texture by clicking the **Build** button under Heightfield Build. Name and save this texture in the project. This may take some time up to 30 minutes. When the build is over, don't forget to save the texture.

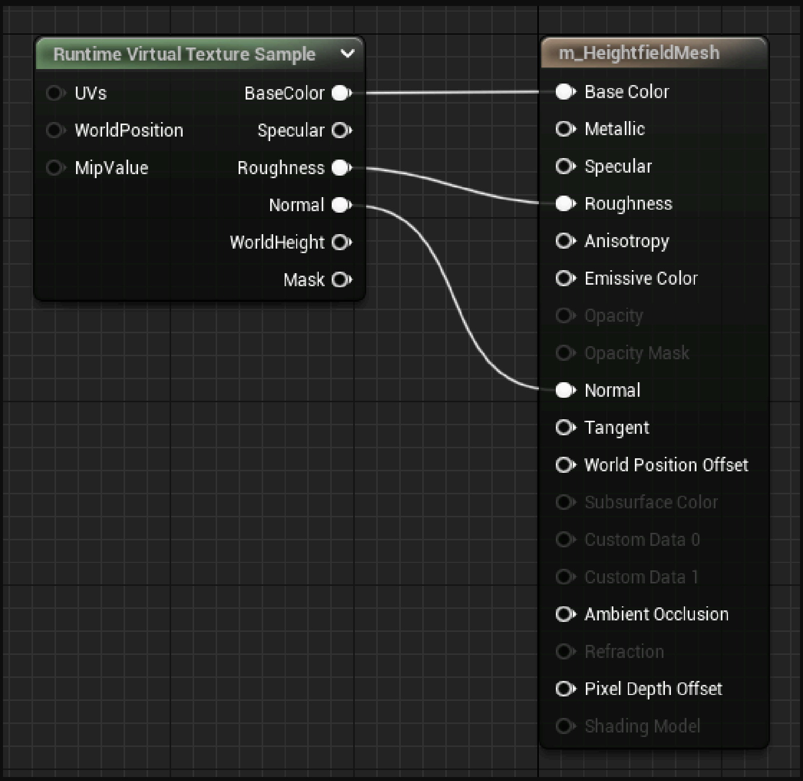


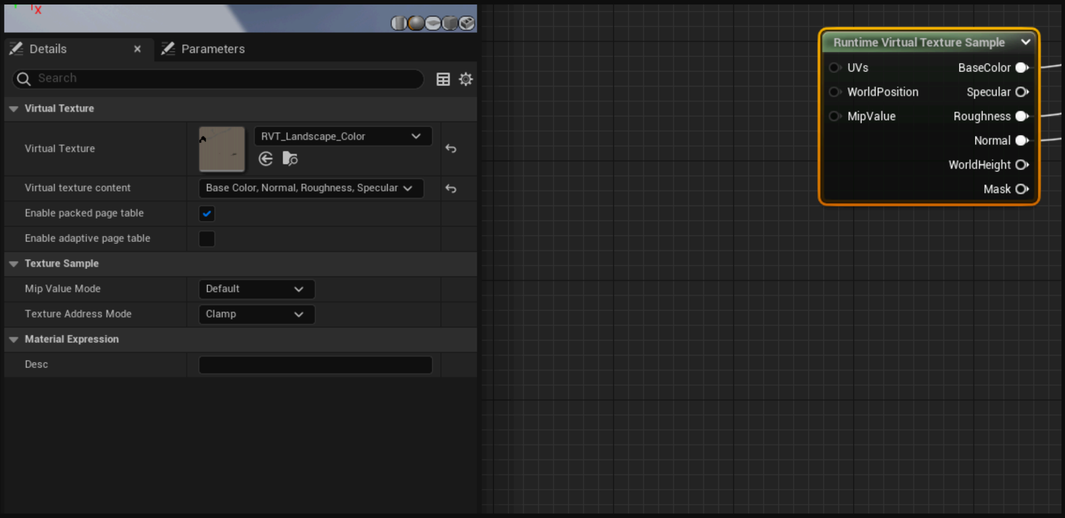
MinMax Texture None None

MinMax Build Levels 0

Build MinMax Texture

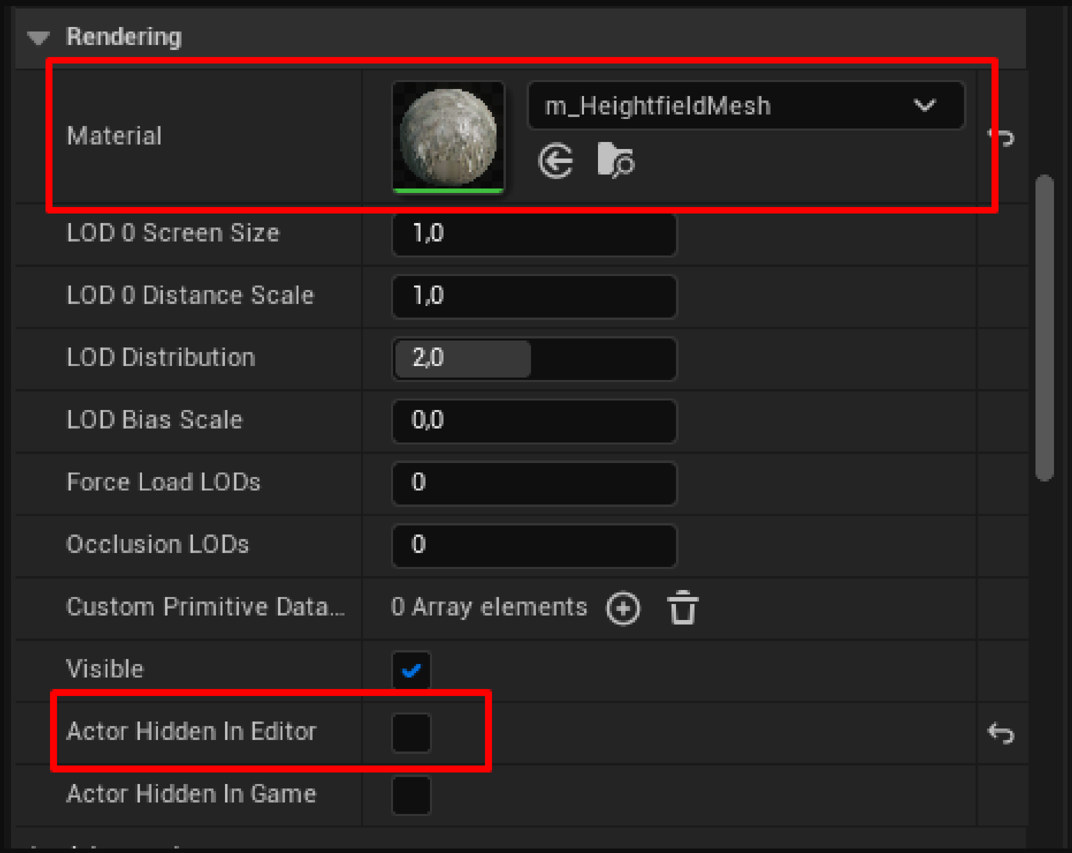
14. Create a new material for the **Virtual Heightfield Mesh** and setup like in the picture. In the **Runtime Virtual Texture Sample** node assign the **RVT_Landscape_Color** texture from the content.





Virtual Texture	
Virtual Texture	RVT_Landscape_Color
Virtual texture content	Base Color, Normal, Roughness, Specular
Enable packed page table	☑
Enable adaptive page table	□
Texture Sample	
Mip Value Mode	Default
Texture Address Mode	Clamp
Material Expression	
Desc	

15. Select again the **Virtual Heightfield Mesh** and assign created new material. Then disabled **Actor Hidden in Editor**. And hide original landscape.



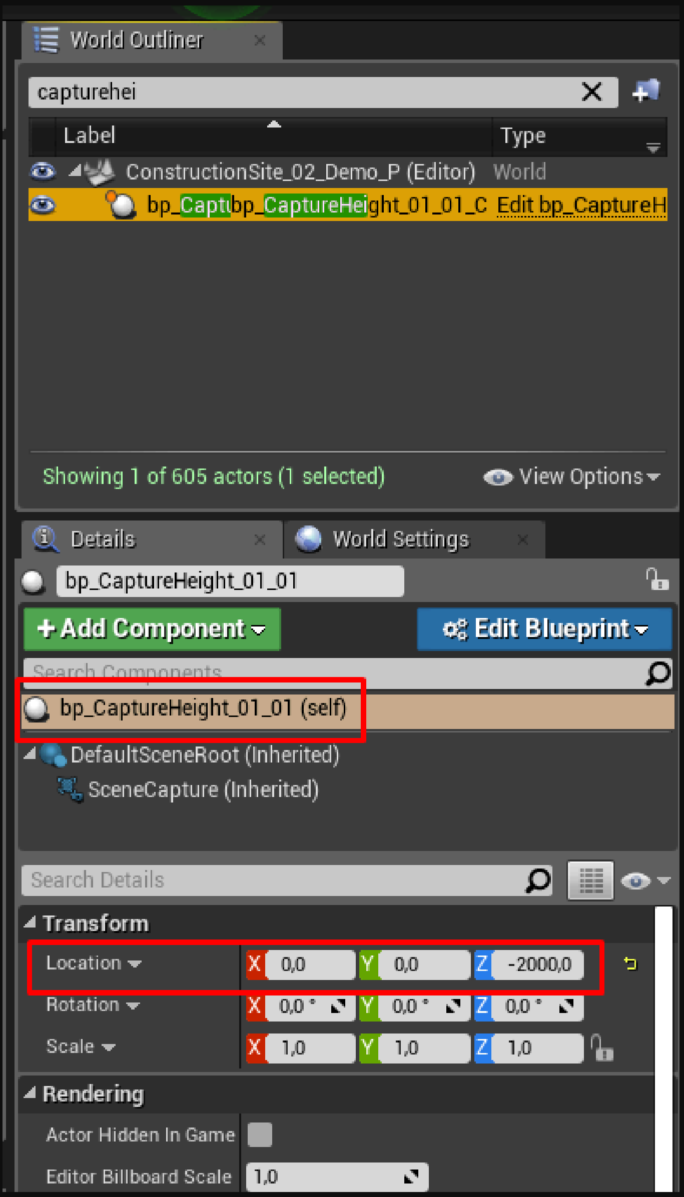
Rendering

Material	m_HeightfieldMesh
LOD 0 Screen Size	1,0
LOD 0 Distance Scale	1,0
LOD Distribution	2,0
LOD Bias Scale	0,0
Force Load LODs	0
Occlusion LODs	0
Custom Primitive Data...	0 Array elements
Visible	☑
Actor Hidden In Editor	□
Actor Hidden In Game	□

16. Now you have a high detail landscape in the Unreal Engine 5. Repeat these steps for each landscape actor on the level.

Landscape Deformation with Virtual Heightfield Mesh

1. Landscape needs to use Virtual Heighfield Mesh
2. Put on level actor bp_CaptureHeigh_01_01 (under the landscape for example -2000 Z (like in the Demo scene)

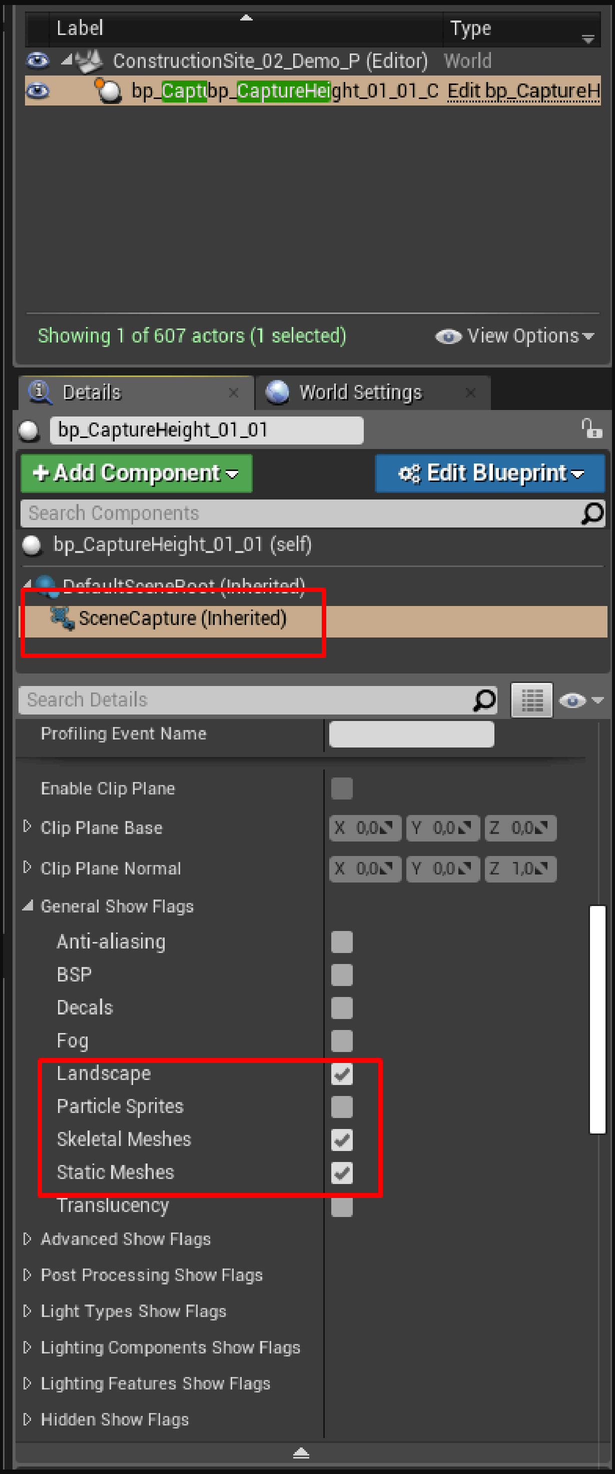


	X	Y	Z
Location	0,0	0,0	-2000,0
Rotation	0,0 °	0,0 °	0,0 °
Scale	1,0	1,0	1,0

Actor Hidden In Game □

Editor Billboard Scale 1,0

3. Be sure Scene Capture component in this blueprint have proper flag turn on (Lanscape, Skeletal Meshes and/or static meshes



Label	Type
ConstructionSite_02_Demo_P (Editor)	World
bp_Captibp_CaptureHeight_01_01_C	Edit bp_CaptureH

Showing 1 of 607 actors (1 selected)

Details | World Settings

bp_CaptureHeight_01_01

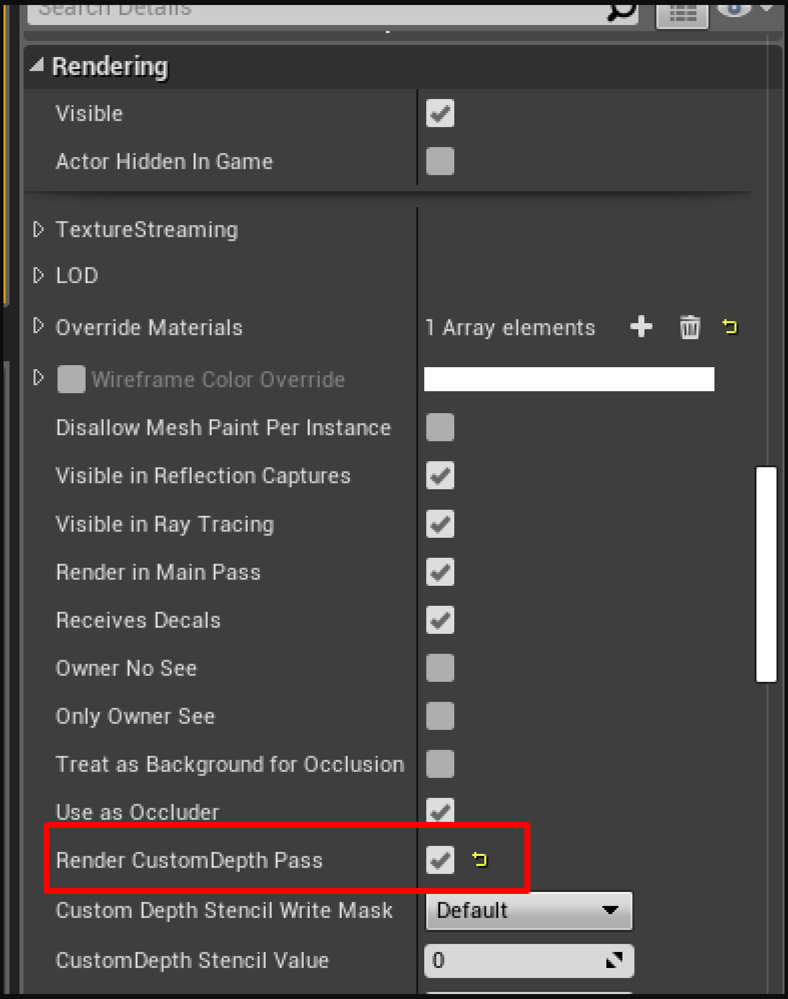
bp_CaptureHeight_01_01 (self)

DefaultSceneRoot (Inherited)

SceneCapture (Inherited)

Profiling Event Name	
Enable Clip Plane	□
Clip Plane Base	X 0,0 Y 0,0 Z 0,0
Clip Plane Normal	X 0,0 Y 0,0 Z 1,0
General Show Flags	
Anti-aliasing	□
BSP	□
Decals	□
Fog	□
Landscape	☑
Particle Sprites	□
Skeletal Meshes	☑
Static Meshes	☑
Translucency	□

4. On every mesh which you want it react with landscape you should turn on CustomDepth Pass(rendering section).



Search Details

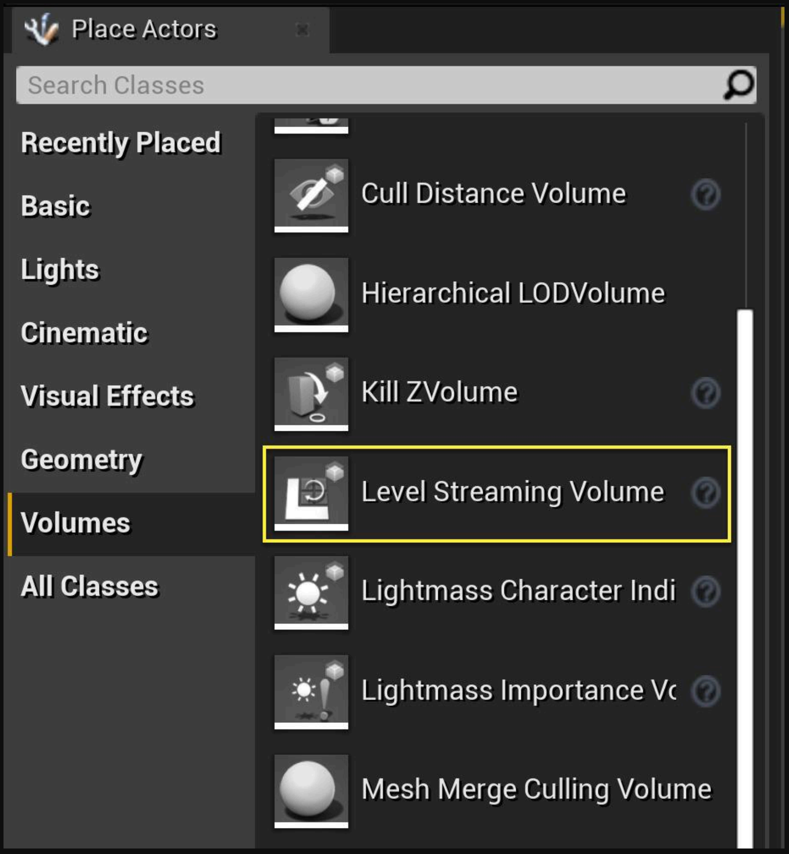
Rendering

Visible	☑
Actor Hidden In Game	☐
TextureStreaming	
LOD	
Override Materials	1 Array elements
Wireframe Color Override	
Disallow Mesh Paint Per Instance	☐
Visible in Reflection Captures	☑
Visible in Ray Tracing	☑
Render in Main Pass	☑
Receives Decals	☑
Owner No See	☐
Only Owner See	☐
Treat as Background for Occlusion	☐
Use as Occluder	☑
Render CustomDepth Pass	☑
Custom Depth Stencil Write Mask	Default
CustomDepth Stencil Value	0

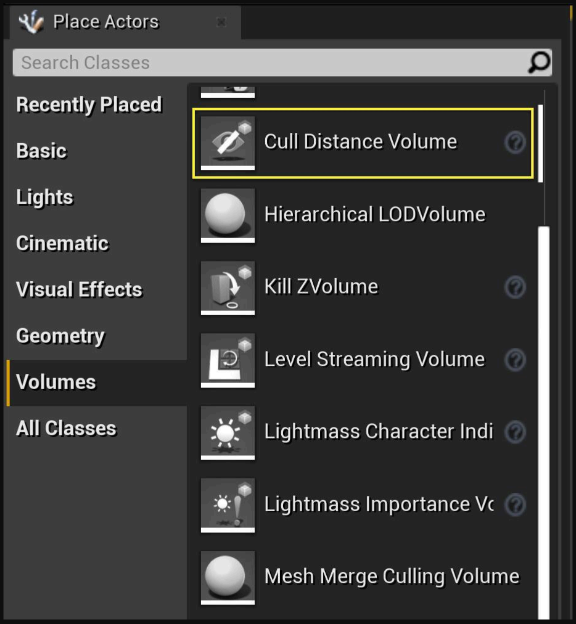
Optimization

We optimize our scenes to achieve the best performance and experiences. We use Level Streaming Volumes and Cull Distance Volumes for this purpose.

Level Streaming Volumes
are a feature in Unreal Engine that allow for the dynamic loading and unloading of map data during gameplay. This solution is especially useful for large environments where the entire map cannot be loaded into memory at once. By dividing the map into smaller areas, known as streaming volumes, only the portions of the map that are currently visible to the player are loaded into memory. This can greatly reduce system resource usage and improve performance by reducing the amount of data that needs to be processed at any given time.



Cull Distance Volumes
are a useful optimization tool that defines what distance to draw (or make visible) any Actor within the volume. These volumes store any number of size and distance combinations called Cull Distance Pairs. These are mapped to the bounds of an Actor (along its longest dimension) and then assigned to that Actor instance in the level.



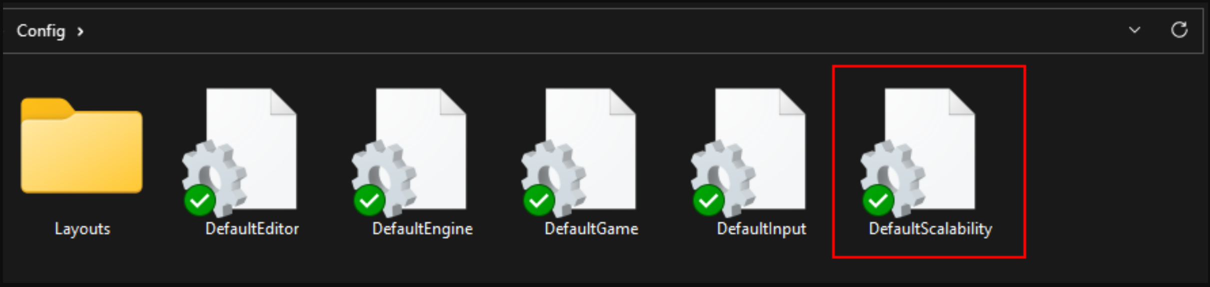
Check how to properly use these solutions in the official UE documentation:

Level Streaming Volumes
Cull Distance Volumes

Scalability Settings

The Scalability settings allow you to adjust the quality of various features, especially the visual appearance in order to maintain the best performance. We place our custom settings and modifications in the DefaultScalability.ini file.

If you want to make your own changes, go to: ProjectName > Config > DefaultScalability.ini



You can read more about the Scalability Settings in the official Unreal Engine Documentation

Performance

SPECIFICATION UE ver. 5.1	**QUALITY SETTINGS**		
	LOW	**HIGH**	**ULTRA**
RTX 3060 FULL HD AMD Ryzen 7 5700X 8-Core 32 GB RAM SSD STORAGE	150 FPS	140 FPS	110 FPS

Thanks!

Again if you will have any problems, let us know! :)
Scans Factory Team