Debriefing Document

UFCF7M-30-2 Game Level Design

William Whitehouse
19019239

Contents

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Statement of Authorship

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Playthrough Video Link

Video available on YouTube: https://youtu.be/0FC36vhzpQ0

Design Patterns Applied in the Level

Guiding Light

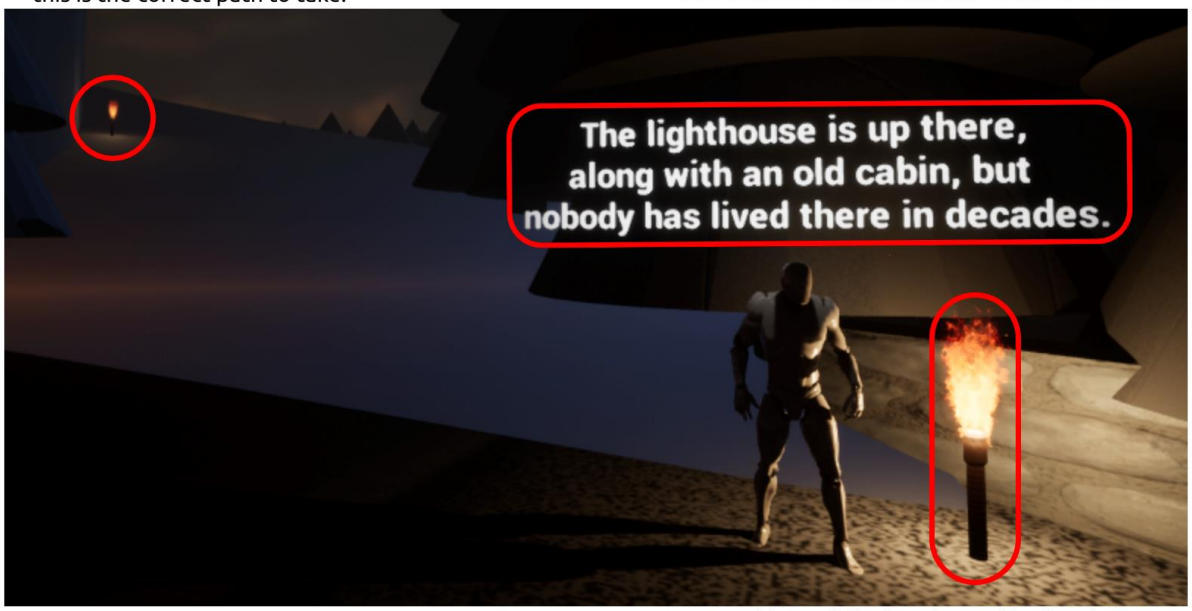
What is this pattern?

This pattern is when light (e.g. lamps, torches, glowing objects) guide the player to a location, objective or item.

Application in the level?

A torch can be seen up the spiral in the distance, this is a guiding light and indicates to the player that this is the correct path to take.

The text is illuminated with a Rect Light Component. This lights up the text and makes it easier to read in the dark environment and to indicate to the player that it there is something important to read.



This torch is placed to guide the player up the spiral, as well as light up a villager. This villager contains a hint to the player about the location of the lighthouse and cabin.

Figure 1 – Guiding Light Pattern Application

Was it effective?

This implementation was effective, without the torches the level would be too dark to see where to go. Players would not explore certain areas if it didn't include torches as they are hidden behind buildings. This pattern was especially effective on the final objective (run to your boat) under the time constraint as the fog's density increases making it difficult to see anything in front of you.

Landmark

What is this pattern?

This pattern is a large object in a scene that acts as a visual “point” to the player, it can represent an important area, a goal, or objective. Landmarks are a design pattern that is used in other patterns, such as the Spiral pattern.

Application in the level?

The lighthouse is an application of landmark. It is a large object that represents the centre/ highest point of the map.

The lighthouse also demonstrates guiding light, the lighthouse light spins round during game play and can be seen across the island. This light guides the player to this landmark.

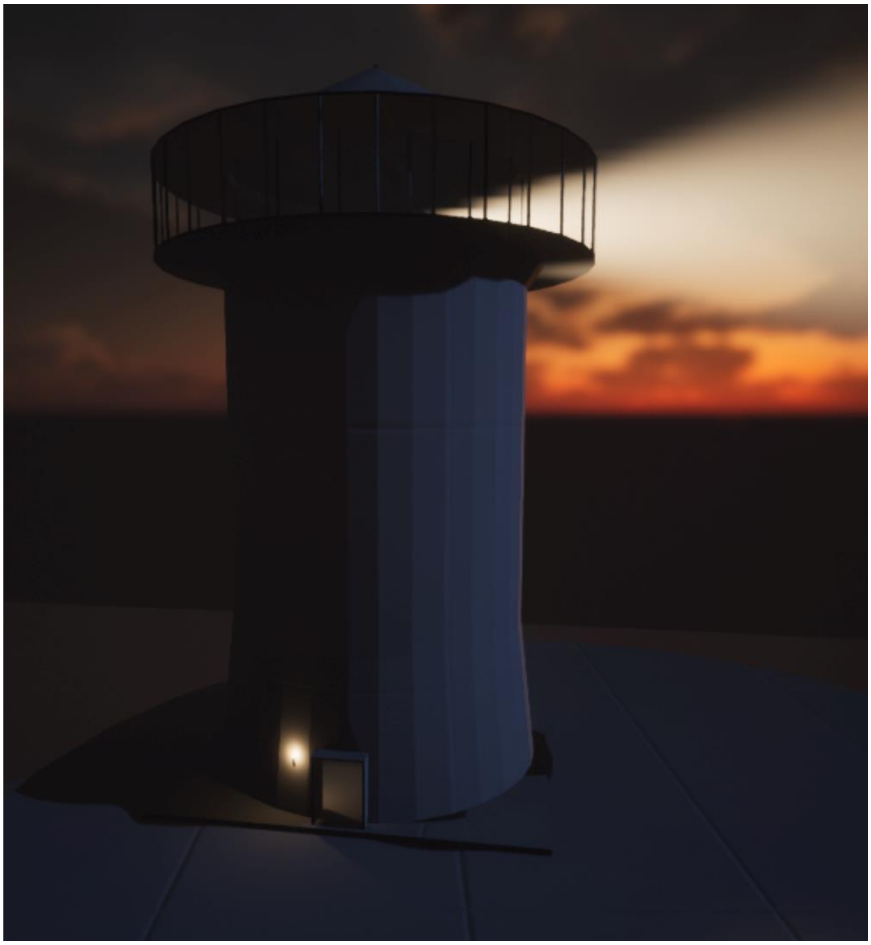


Figure 2 – Landmark pattern application

Was it effective?

The lighthouse landmark pattern is moderately effective as it is a large object designed to act as a centre point but at far edges of the island it is not visible, and neither is the light. Also, the fact the lighthouse is on top of a high platform (Spiral) it is even harder to see.

Spiral

What is this pattern?

This pattern consists of a large piece of land or a mountain with a spiral ramp leading from the bottom to the top. It is designed to allow the player to easily get to a high area and for a landmark in the level as it is very high.

Application in the level?

The spiral is the largest object on the map, making it a landmark. From anywhere on the island the player can see the spiral.

The spiral also is the location for the cave system. The exit of the cave system is at the back of the spiral.

The spiral ramp goes all the way round the central cylinder. There is a platforming challenge to allow the player to reach the top of the spiral quicker.

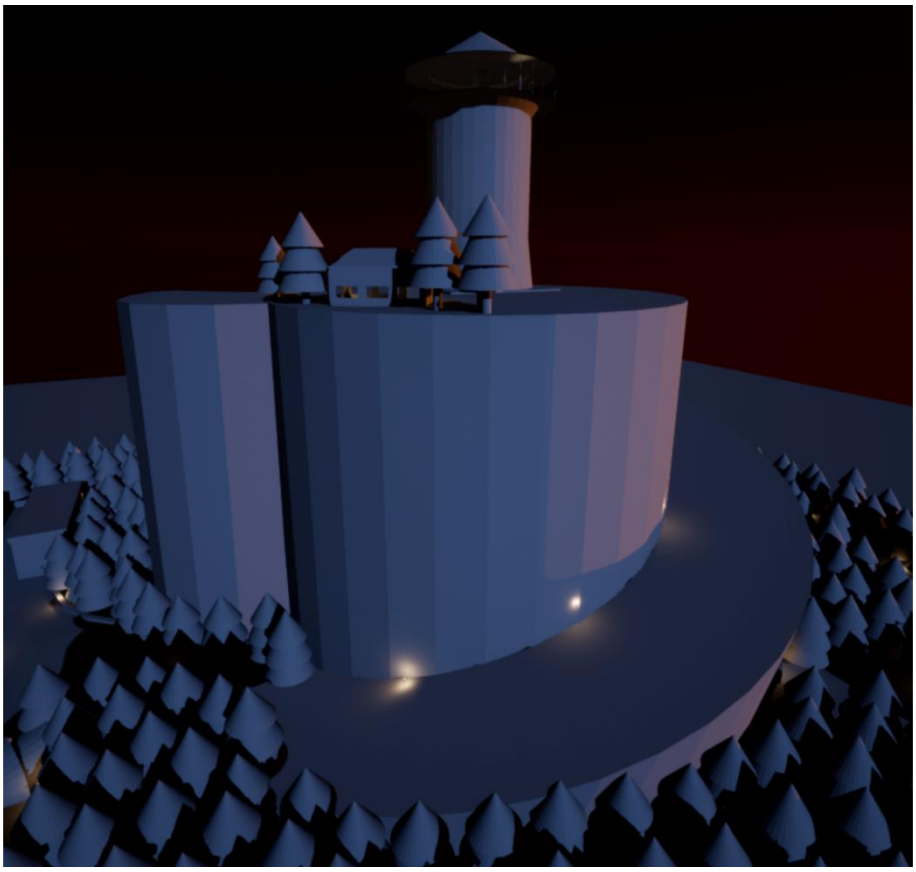


Figure 3 – Spiral Pattern Application

Was it effective?

The spiral was effective, it served both as a landmark and centre point for the map. The spiral was also effective for including all the caves.

The only issue with this implementation is the aesthetics, the spiral doesn't look very natural and doesn't blend in with its surroundings. It's also very large and there are no other height differences or elevations throughout the map, the only elevation is the spiral.

Alternate Path

What is this pattern?

This pattern contains multiple paths the player can take to end at the same location, this can include physical paths/areas but also includes different methods of completing an objective or puzzle.

Application in the level?

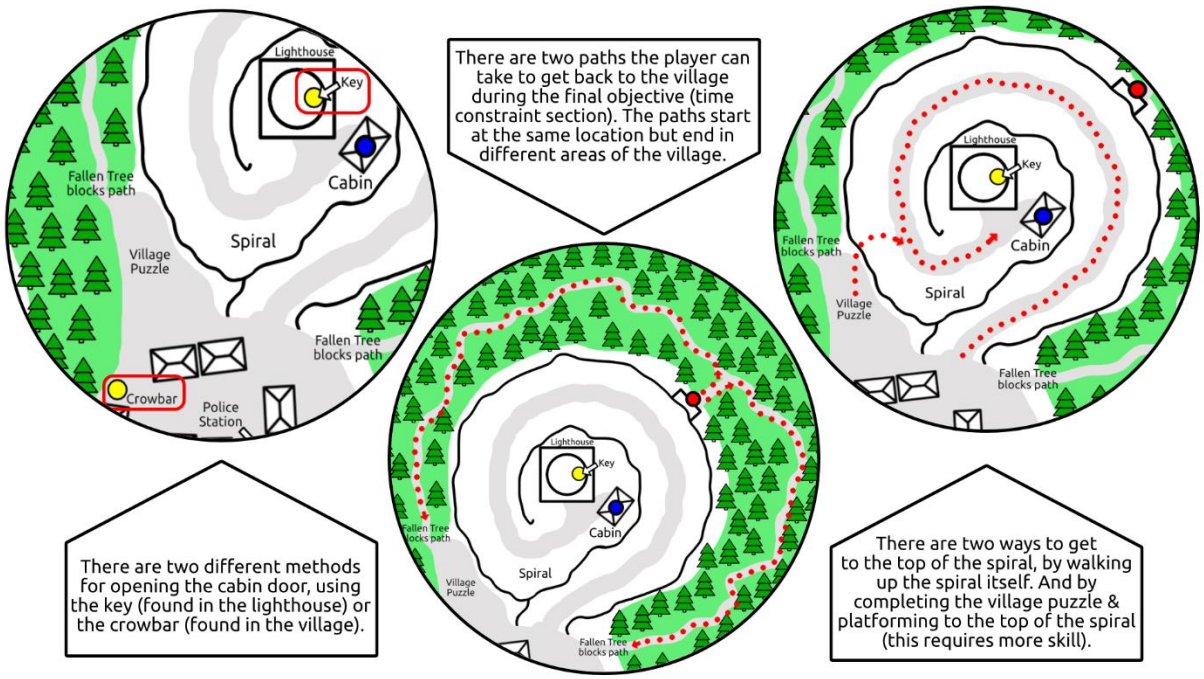


Figure 4 – Alternate Path Application

Was it effective?

The alternate path pattern was very effective, it made the level more interesting and less linear. It also gave the player a choice, and the level could support many playthroughs each with their method.

To improve the methods for opening the cabin door, more methods could be added to add more alternate paths. For example, the player could pick up a rock and smash a window get inside.

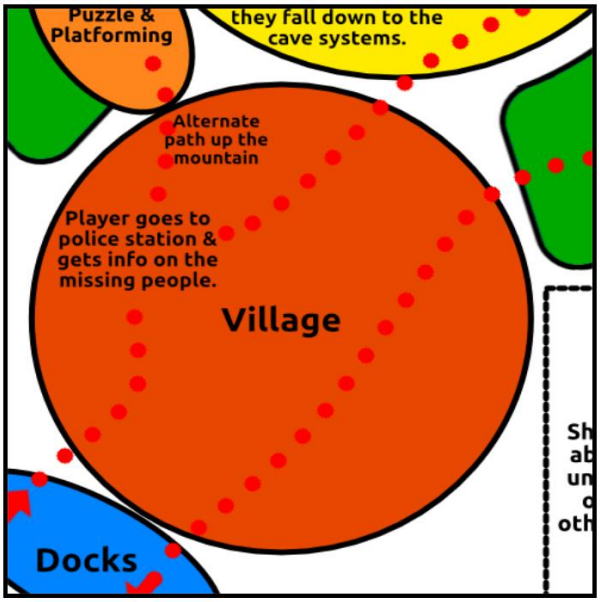
Backtrack

What is this pattern?

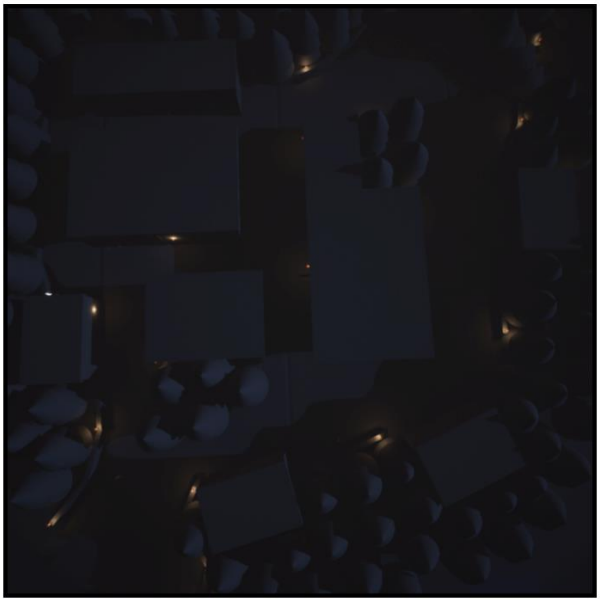
This pattern is whenever the player returns or plays backwards an area of a level, for example, using a path to get into a village and then using the same one to exit or to escape a cave or dungeon.

This also applies to areas in the level, for example, the player could find a puzzle which has the answer to something that was in a previous area of the level. This would force the player to revisit those areas and explore and traverse them backwards.

Application in the level?



The player backtracks on the village area, the first time they go through this area is when starting the level, they have time to explore and interact with the villagers and go to the cabin. They return to the village when running to their boat on a time constraint.



The backtracking is over an area in this case rather than a specific path.

Figure 5 – Backtracking Pattern Application

Was it effective?

The backtracking was effective, it allowed the player to revisit a big area of the map with different lighting and with new abilities unlocked.

Issues

Unreal Crash - Lose Cinematic

Where is the issue?

The entire game and Unreal Editor (If not playing in a build) will crash when playing the lose cinematic. This only occurs when losing the game, the player could win the level and the winning end cinematic will play normally and the game will quit. This is what makes this crash strange and very difficult to debug.

What is the issue & What action has been taken to fix the issue?

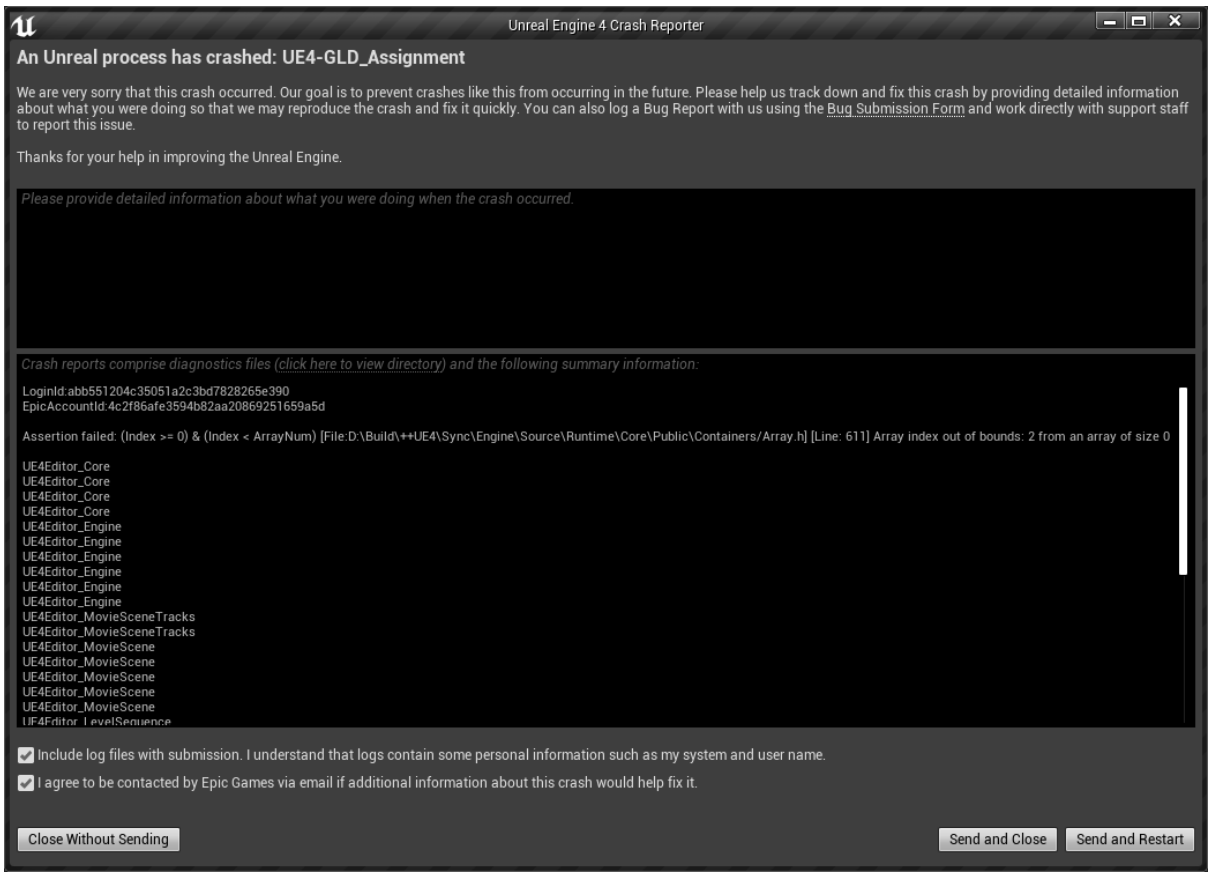


Figure 6 – Unreal Crash Reporter

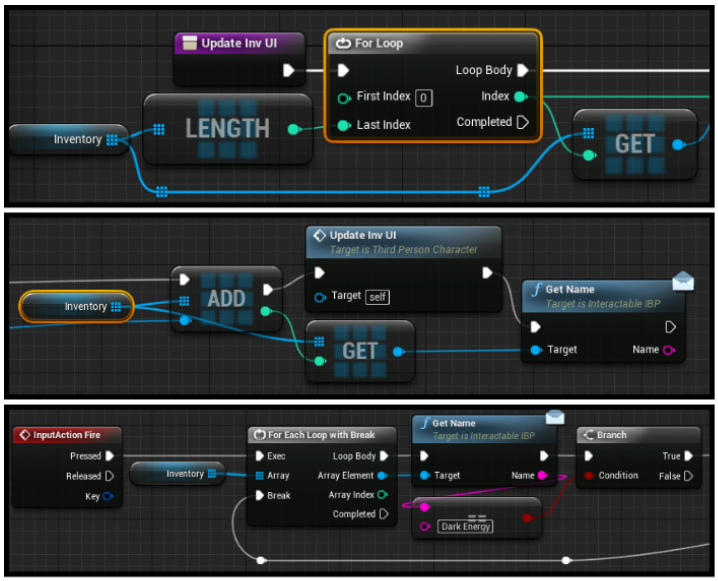
The Unreal crash reporter (Figure 6) shows us that the crash is caused by an array being accessed out of bounds. Unfortunately, this is all the information that the crash reporter shows us, going into the crash logs it shows us what array was accessed out of bounds.

```
LogScript: Warning: Script Msg: Attempted to access index 1 from array
'Inventory' of length 1 in '/Game/CharacterController/Blueprints/
ThirdPersonCharacter.ThirdPersonCharacter_C'!
```

Figure 7 – Unreal Crash Log

After viewing the log (Figure 7) it shows us that the array `Inventory` is being accessed at index 1 when its length is 1. This should be an easy issue to fix but looking at the blueprint the `Inventory` array is in it shows us that accessing the array like this should not be possible, and it doesn't get accessed during the final cinematic – where the crash occurs. Figure 8 shows every instance the

`Inventory` array is accessed or used in the blueprint, and next to it is text explaining how this instance cannot cause a crash.



This cannot cause a crash, its a for loop, and we are getting the index from within the loop. This should not be causing the crash.

This should not cause the crash, we are adding an object to the Inventory Array and then getting it back using the index given to us by the add node. This should not cause the crash.

This is a for each loop, it should be impossible to access an array out of bounds using this. This should not cause the crash.

All of these uses occur the entire game without causing any crashes. But once the end lose cinematic plays, the Inventory array becomes an issue that crashes the entire game.

Figure 8 – All instances of the Inventory Array being used and how it doesn't cause the crash

Can this issue be fixed?

I don't know a fix for this issue and don't believe it's something I can attempt with very little time remaining until the level hand in deadline.

Niagara Particles – Don't Appear in Final Build

What & Where is the issue?

This issue only affects builds of the level, the Niagara particle systems don't appear, they still cast shadows and are a part of the level, they just don't render.

The Niagara particle systems include:

- Dark Energy
- Player's Projectile
- Monster
- Low Fog
- Portal

What action has been taken to fix the issue?

I have conducted research online about this issue and cannot find a solution, it is most likely a bug in this version of Unreal and the Niagara particle system and is fixed in a more up-to-date version.

Can this issue be fixed?

No, this issue cannot be fixed in this version of Unreal, but possibly can be fixed by updating which version of Unreal is being used.

External Assets Used

This is a table of all the external assets used in the level. To be clear: no logic related assets, e.g. blueprints, materials, particle effects, any asset that was "complete", etc. were used in the level. Except for the Character Controller as this asset was part of the Unreal template the level uses; however, the Character Controller's blueprints, and logic have been heavily changed (changes & additions).

Asset	Type	Name & Link	Author
Lightning 01	Sound FX	Thunder 06	WW Audio
Lightning 02	Sound FX	Thunder with rain rolling crisply and slowly in the distance	Airborne Sound
Lightning 03	Sound FX	Thunder with rain bursting and grumble in the distance	Airborne Sound
Lightning 04	Sound FX	Slow lightning with background torrential rain	Airborne Sound
Lightning 05	Sound FX	Thunder with rain rolling and crackling hesitantly in the distance	Airborne Sound
Rain 01	Sound FX	Rain - medium swell - some drops on metal - Neumann RSM 191	Pole Position Production
RocksCollapsing	Sound FX	Huge stone trap door - releasing rocks and falling-1	Olivier Girardot
StoneDoorOpening	Sound FX	Door - stone 4	Soundmorph
Portal_Sound_01	Sound FX	Sci-Fi Warp Sound 1	Stormwave Audio
Alien_Screech	Sound FX	Alien screeches sci fi horror Nightingale Music Productions	Nightingale Voice Box
Character Controller	Blueprints Meshes Animations Textures Materials	Unreal Third Person Template	Epic Games
Blender Meshes *File: Content\Meshes\ BlenderMeshes*	Meshes	Custom "Programmer Art" meshes designed for this level	William Whitehouse
Fire_PS	Texture	Unreal Example Assets: M_Fire_SubUV, M_Radial_Gradient, M_Smoke_Sub_UV	Epic Games
Rain_basecolor	Texture	Rain Drops on Screen Effect - (UE4 Tutorial) – Youtube Video	UnrealCG
Cloud_M	Texture	Unreal Example Assets: T_SmokeSubUV8x8	Epic Games
Key_M	Texture	Unreal Example Assets: T_Metal_Gold_D, T_Metal_Gold_N	Epic Games
Paper_M	Texture	Unreal Example Assets: PaperDiffuse, PaperNormal	Epic Games

StoneBrick_M	Texture	Unreal Example Assets: T_Brick_Clay_Old_D, T_Brick_Clay_Old_N	Epic Games
StrawRoof_M	Texture	Unreal Example Assets: CASC_Cross, T_Water_N, water_n	Epic Games
MonsterFX_M	Texture	Unreal Example Assets: T_Metal_Gold_D, T_Metal_Gold_N	Epic Games
Water_M	Texture	Unreal Example Assets: T_Water_M, T_Water_N, water_n	Epic Games
WoodenDoor_M	Parent Material	Unreal Example Assets: M_Wood_Floor_Walnut_Worn	Epic Games
Starter Content	Content	Unreal Example Starter Content	Epic Games
Crouch Animations	Animation	Animation Starter Pack	Epic Games
Death_2	Animation	Animation Starter Pack	Epic Games
Pushing Animation	Animation	How to Push an Object with Animations | Movable Objects - Unreal Engine 4 Tutorial – YouTube Video	Matt Aspland
Meshes *Folder: Content\Meshes\ Meshes*	Meshes	Unreal Example Starter Content	Epic Games