Developer documentation/manual

Software functionalities (Major functions)

Generating Virtual Spaces via Spline Component

Splines are often used to create assets that are placed along a line such as walls, fences, electric poles and roads. Until the release of Unreal Engine 5, it was difficult to fill a closed spline loop with a mesh and create roof or a floor. This is now possible with UE5 mesh generation tools.

Attaching interactable objects on the walls

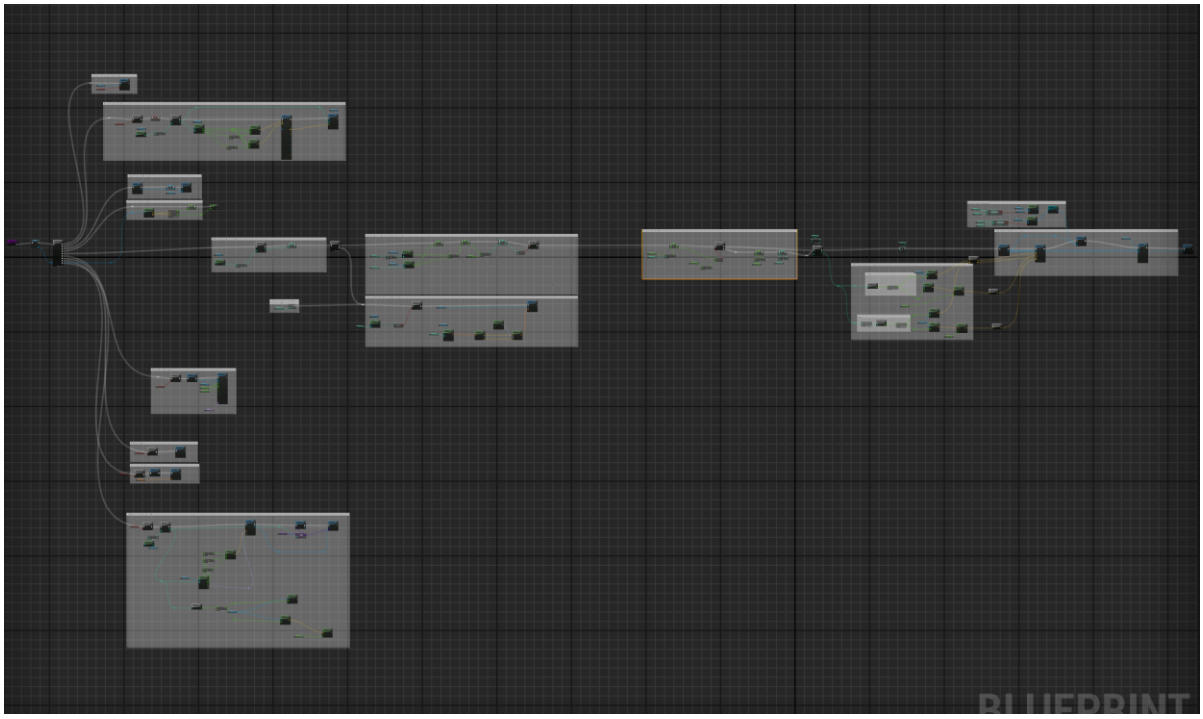
Even an art gallery with empty walls might still be considered artistic and abstract, people usually expect to see artworks on the walls. MetaVision offers creators to place Interactable objects on the spline generated walls that can be inspected or interacted by the virtual visitor.

Mesh Generation and manipulation

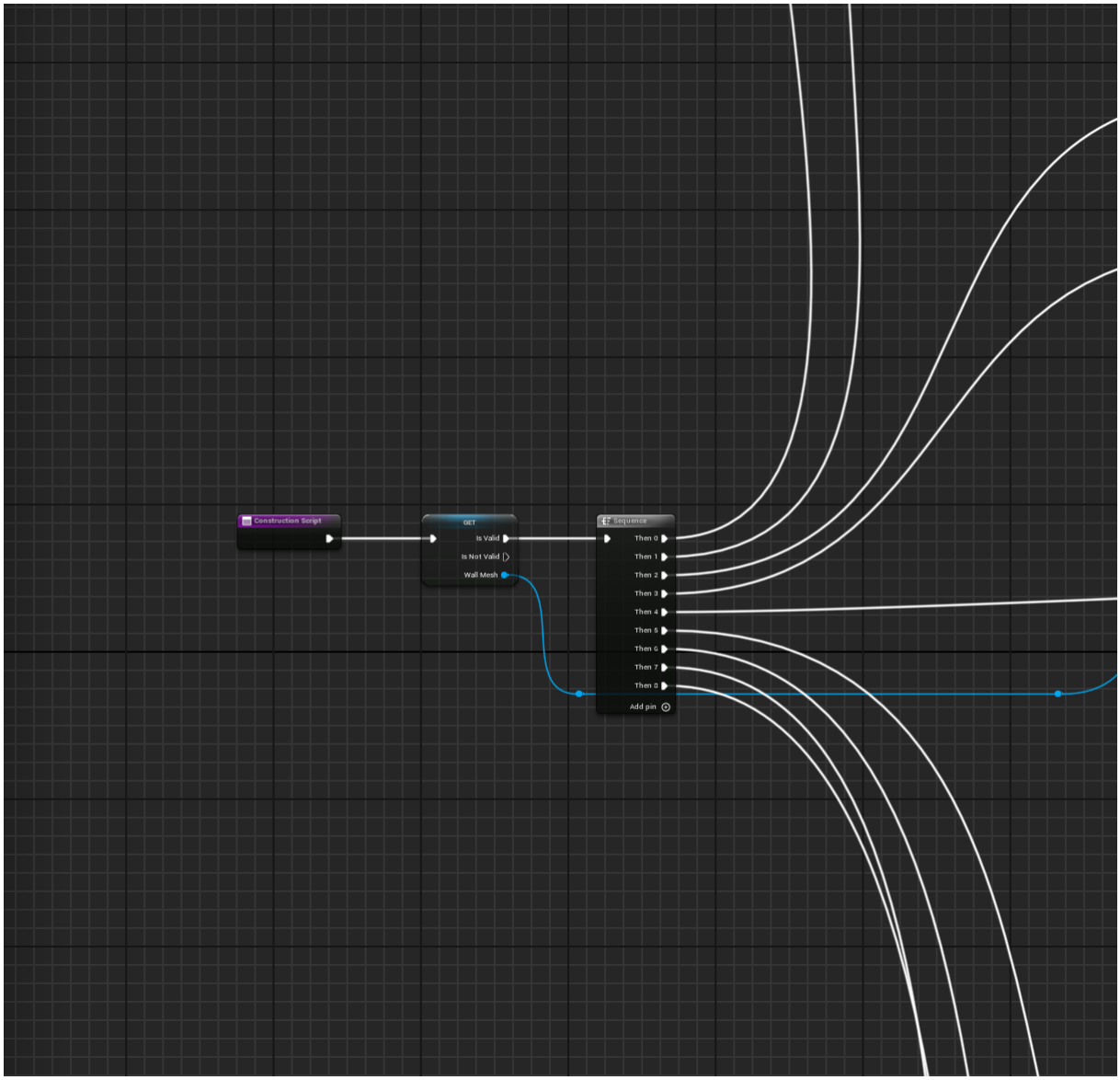
The impact of the procedural generation relies heavily on the amount and the compatibility of 3D assets used in its algorithm. Normally these models are created in a different modelling software and exported to a game engine UE5 released with a modelling tool that users can natively create and manipulate basic geometries. It has been showcased with LYRA simple game starter kit, where the environment assets are created completely inside engine. They created sample objects to promote the capabilities of script based modelling. MetaVision uses its mesh generation based on this feature, and allows the creation of more geometric objects and manipulations. These can be combined with the '*spline wall generation tool'* as walls or as separate architecture elements such as pillars, domes, archways, or even allow the user to create their own art installations inside the game engine.

Sample code snippets

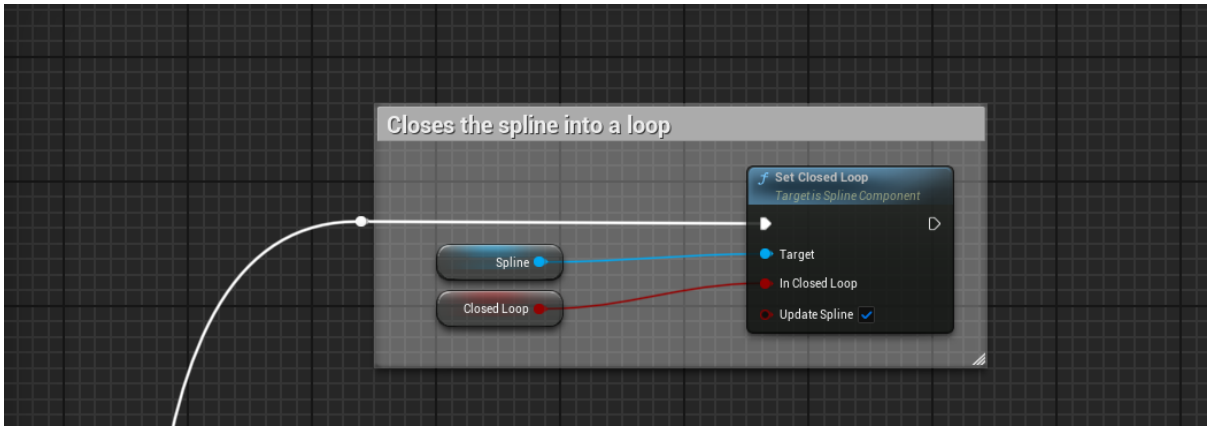
BP_Spline Wall



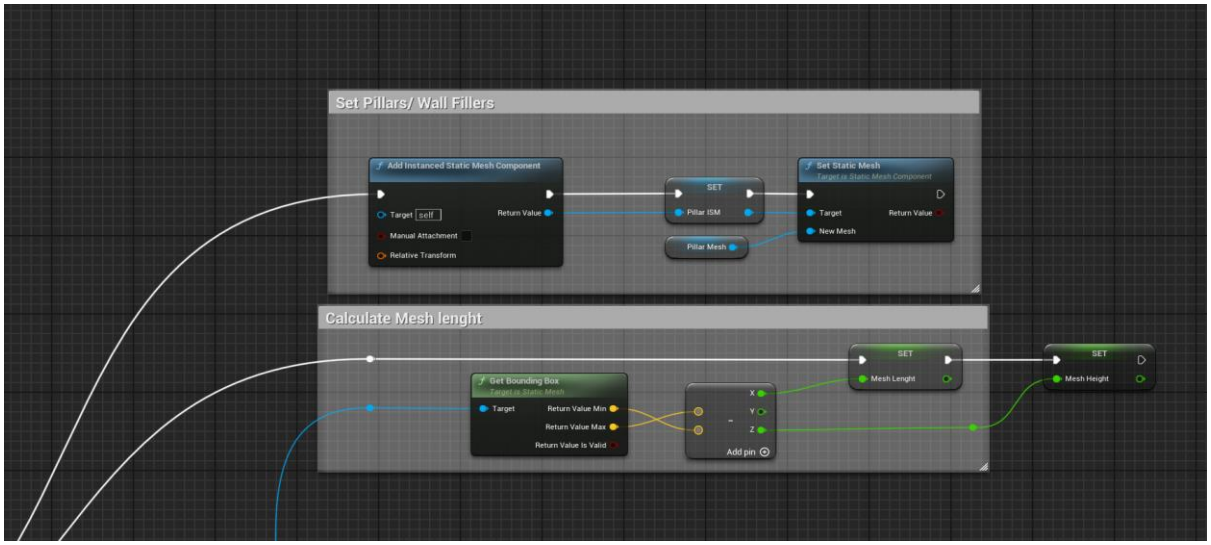
Wall generation



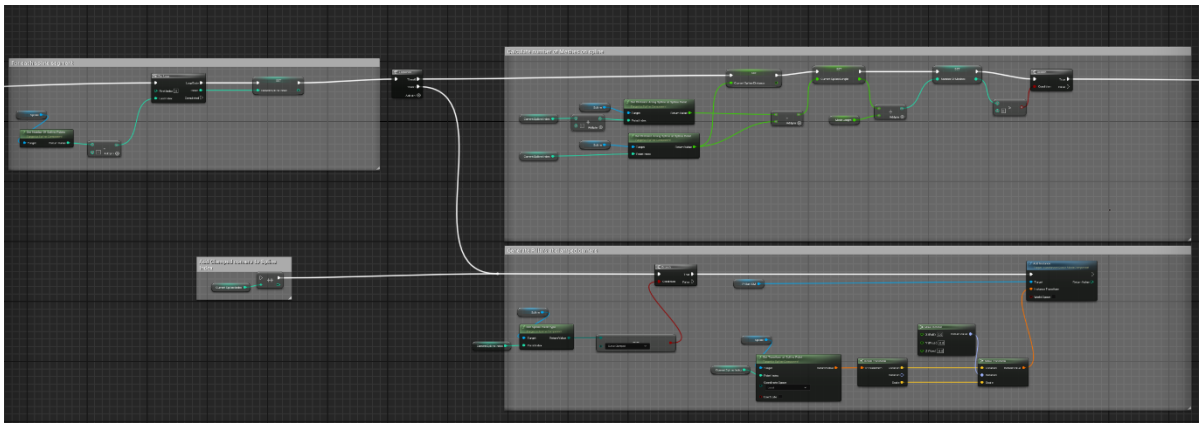
Checks if there is a valid mesh.



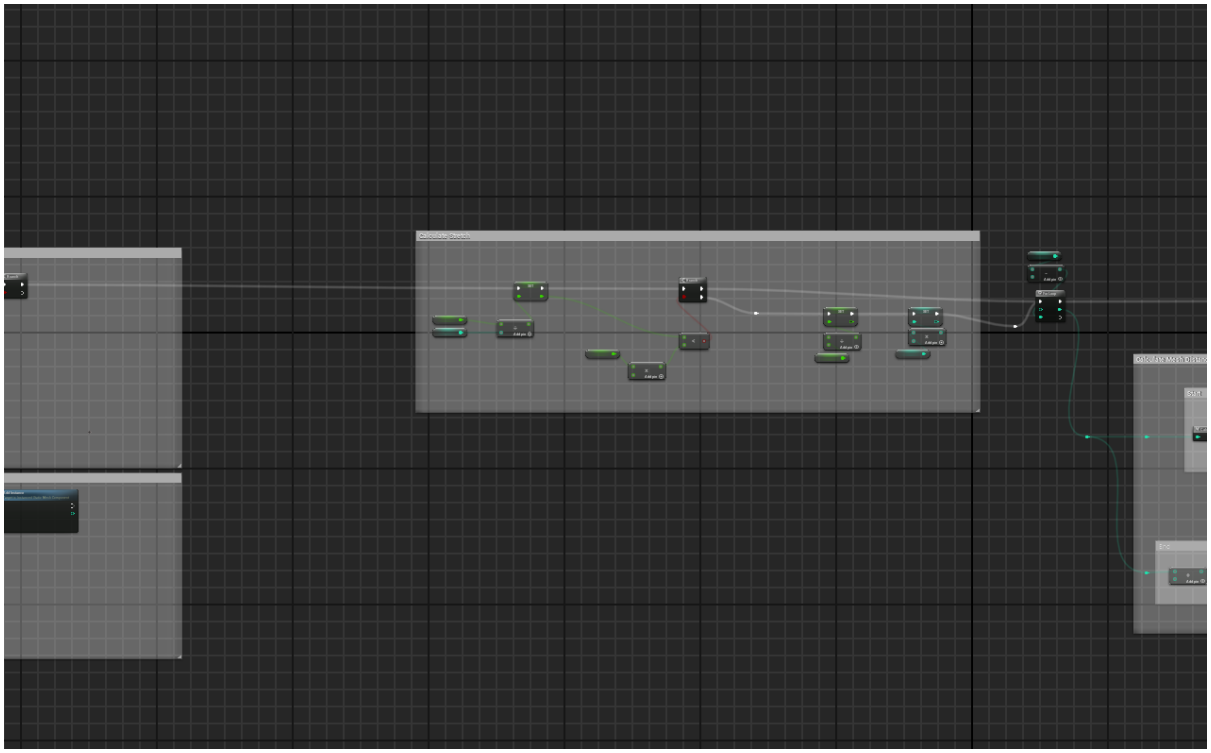
Checks if it is a closed loop or an open wall



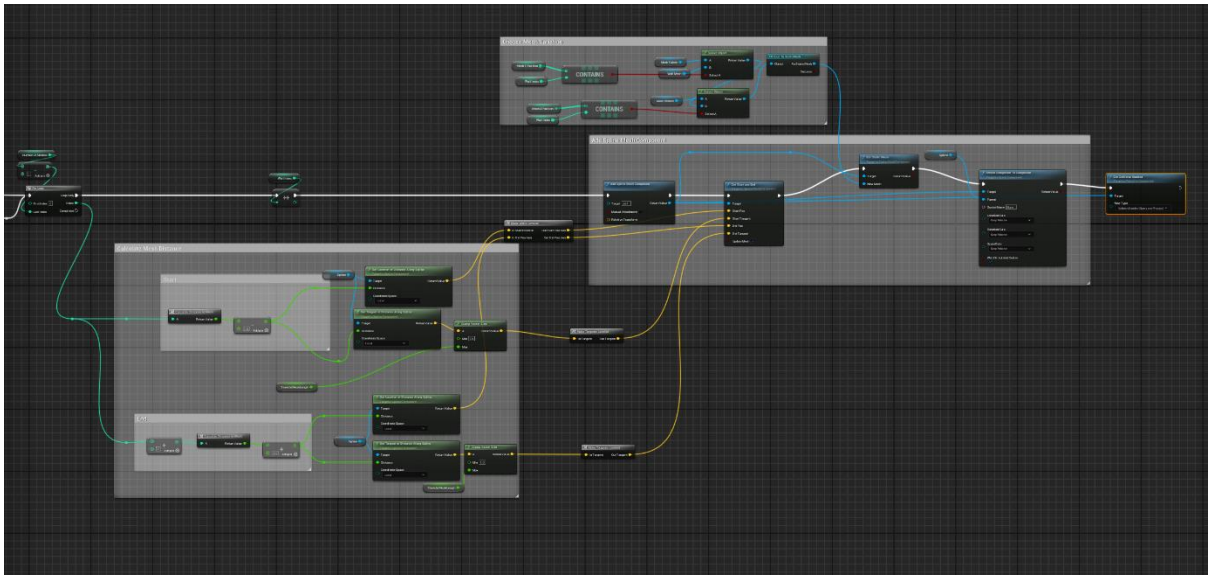
Set pillars or wall fillers for sharp edges when a spline point is marked as clamped (keyboard 'T' to clamp & shift + T to unclamp it.)



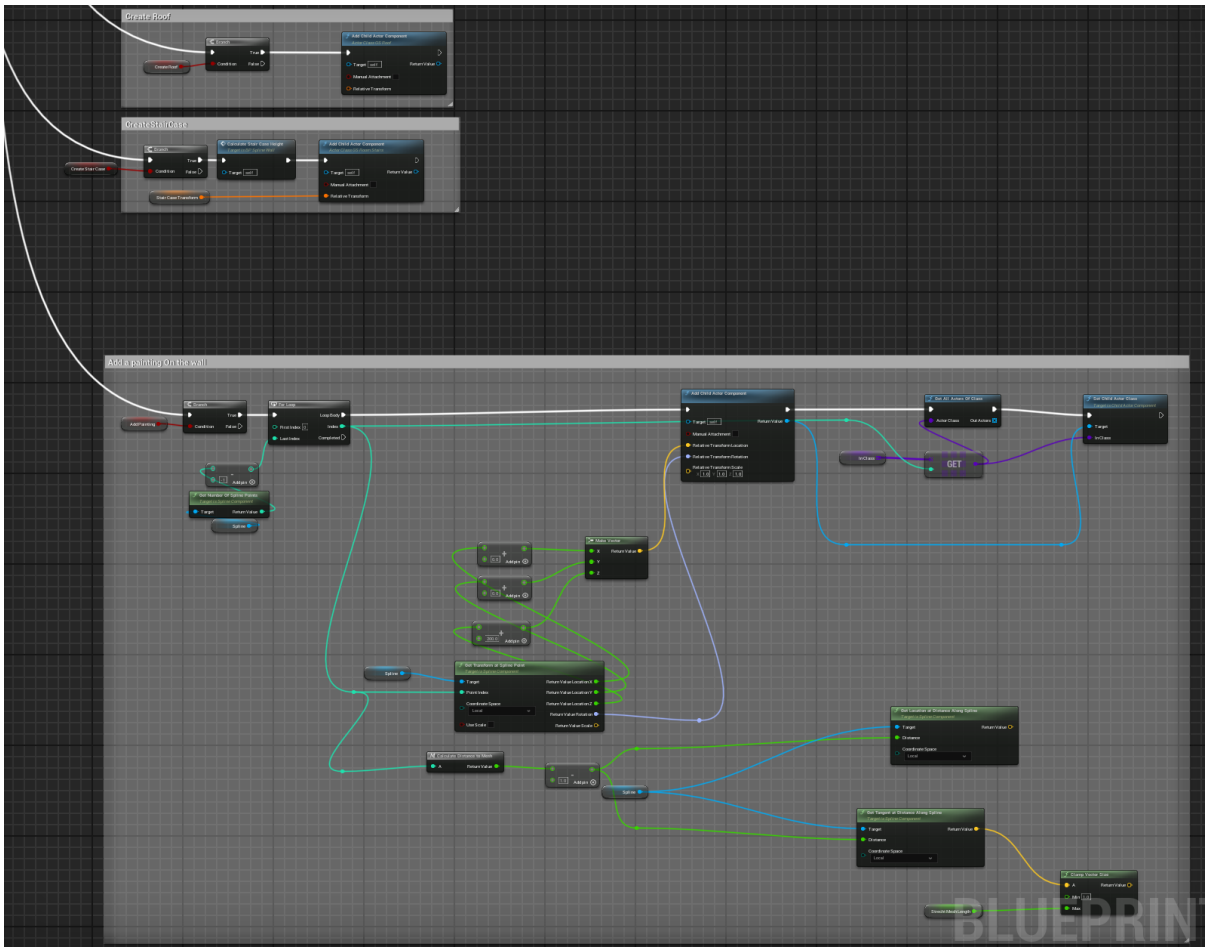
Wall creation part 1: For each segment, it calculates the number of meshes along the spline and generate pillars on clamped corners.



Wall Creation part 2: Calculates the bending limits for wall meshes. (If you use UE5 generator for the wall meshes, make sure to add at least 16 segments in the wall generation tool)

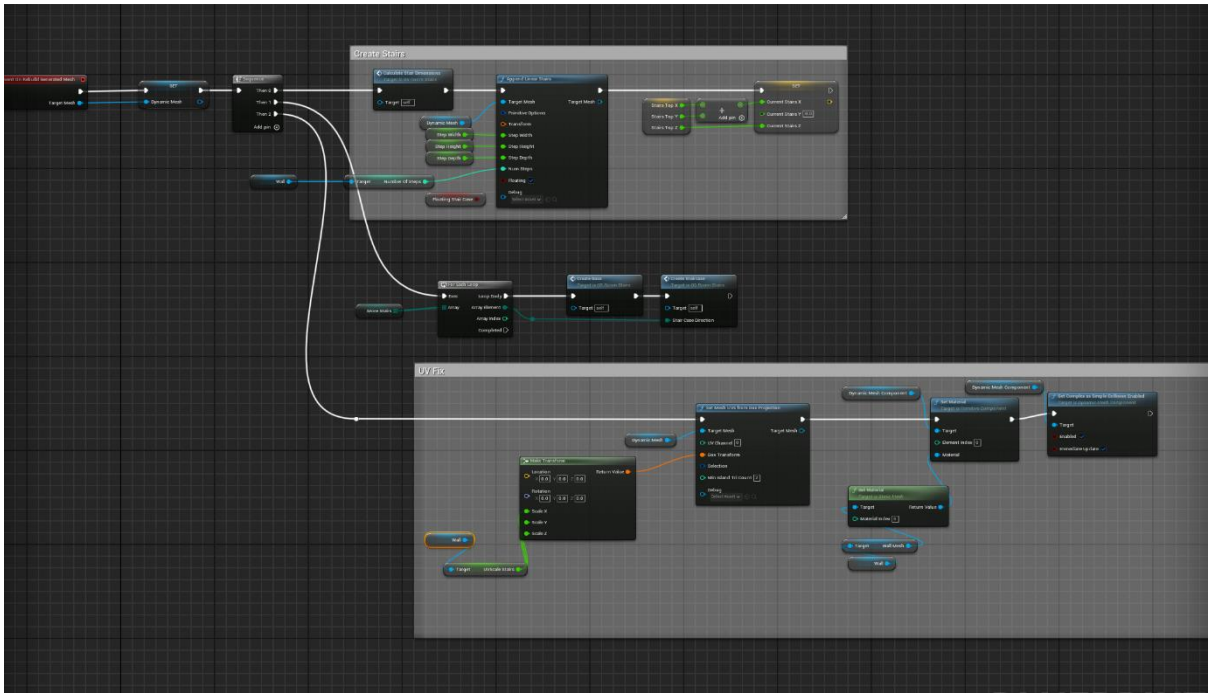


Wall creation part 3: Calculates mesh distances to fit them to the spline points, selection of mesh variation, assigning meshes to spline and an option to add collision to the wall.



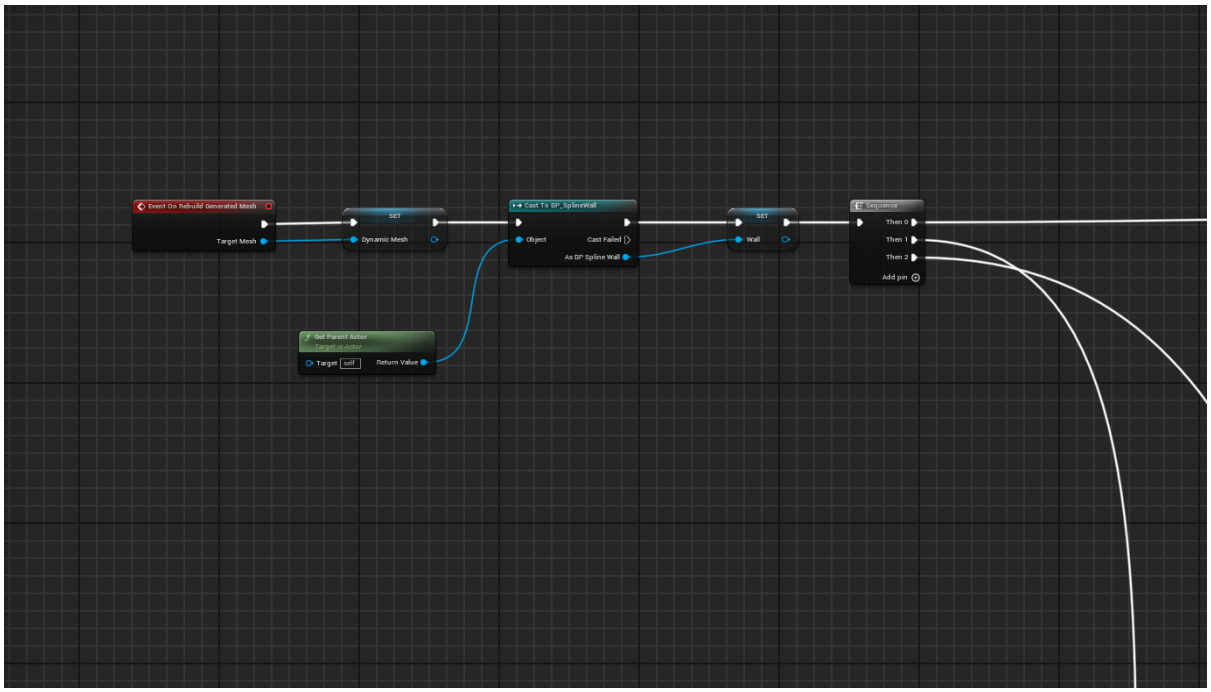
Extras: Roof, staircase and paintings on the walls. Roof and Staircase creation has their own Blueprints.

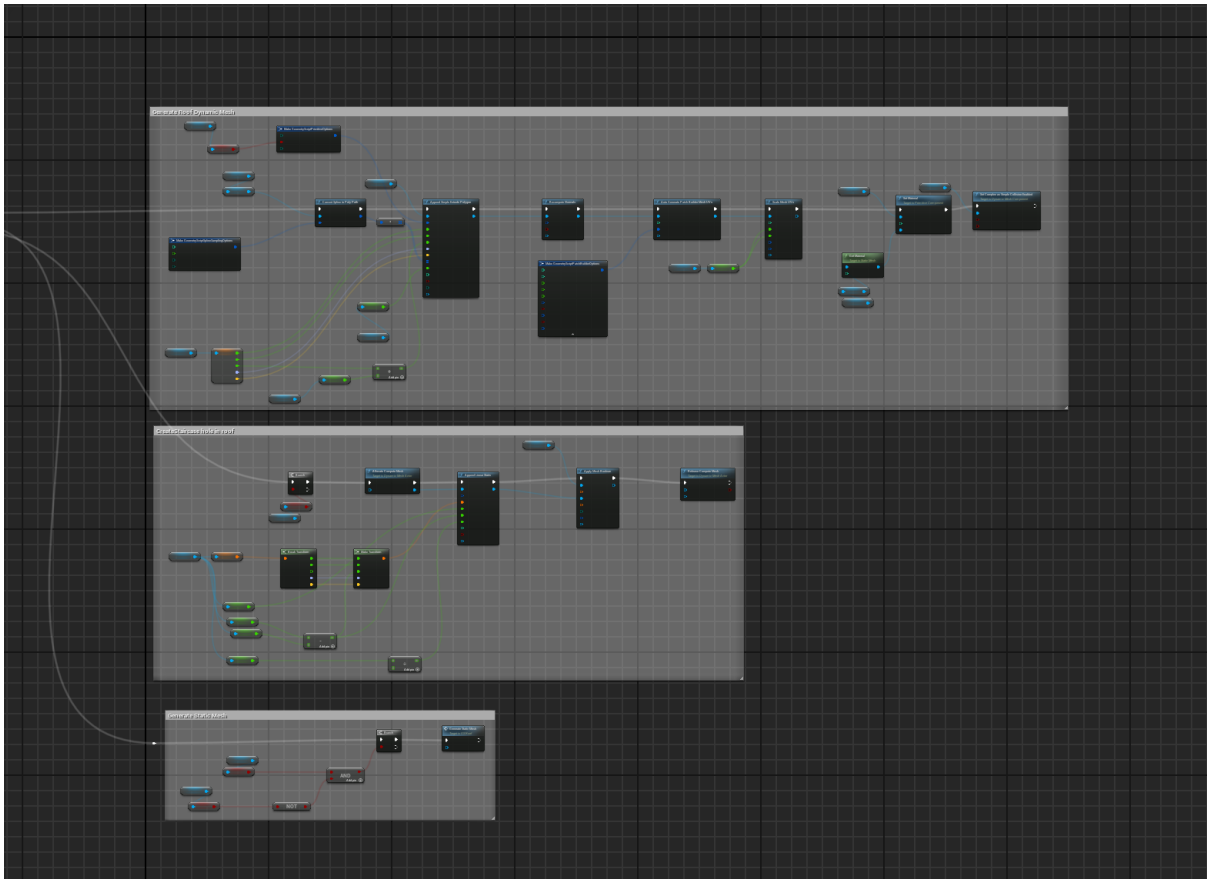
BP_RoomStairs



This blueprint creates a staircase for the BP_SplineWall blueprint and adjusts its textures and UV's with the walls.

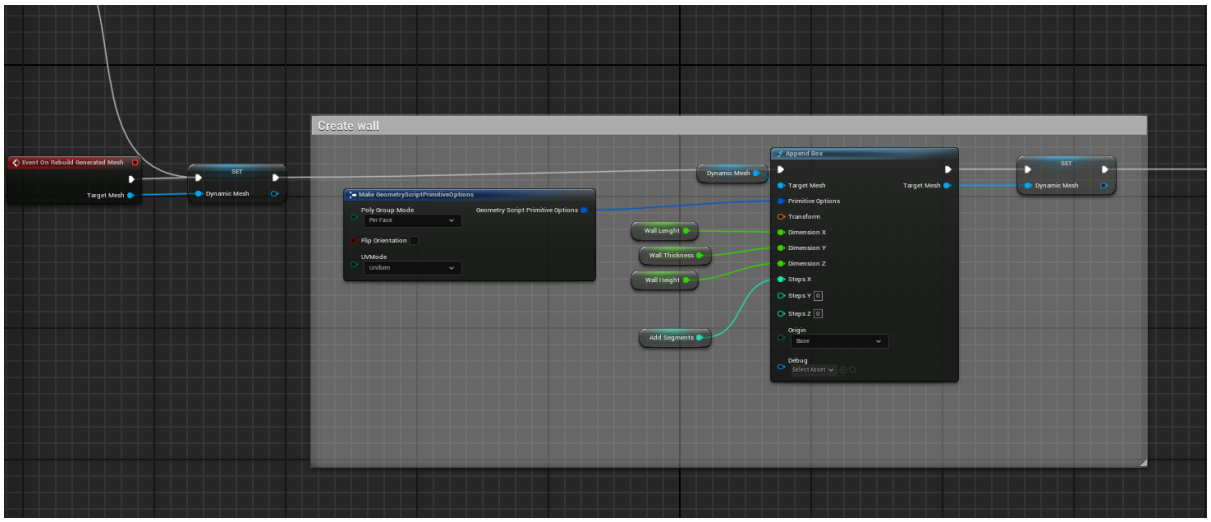
BP_Roof





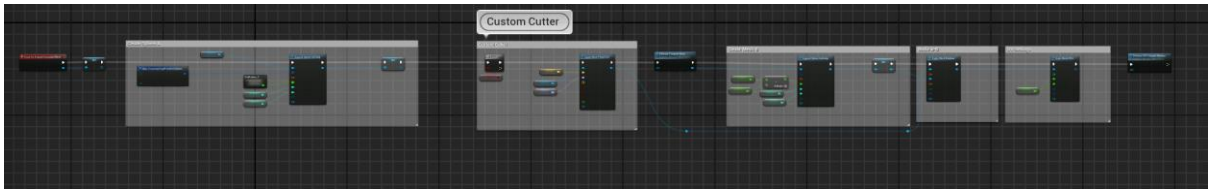
Generates a dynamic roof mesh inside the closed spline walls, checks if a staircase assigned to it, and creates a static mesh to replace the dynamic roof mesh. Dynamic meshes will not appear in game time, thus they need to be converted to static meshes.

BP_BasicWall



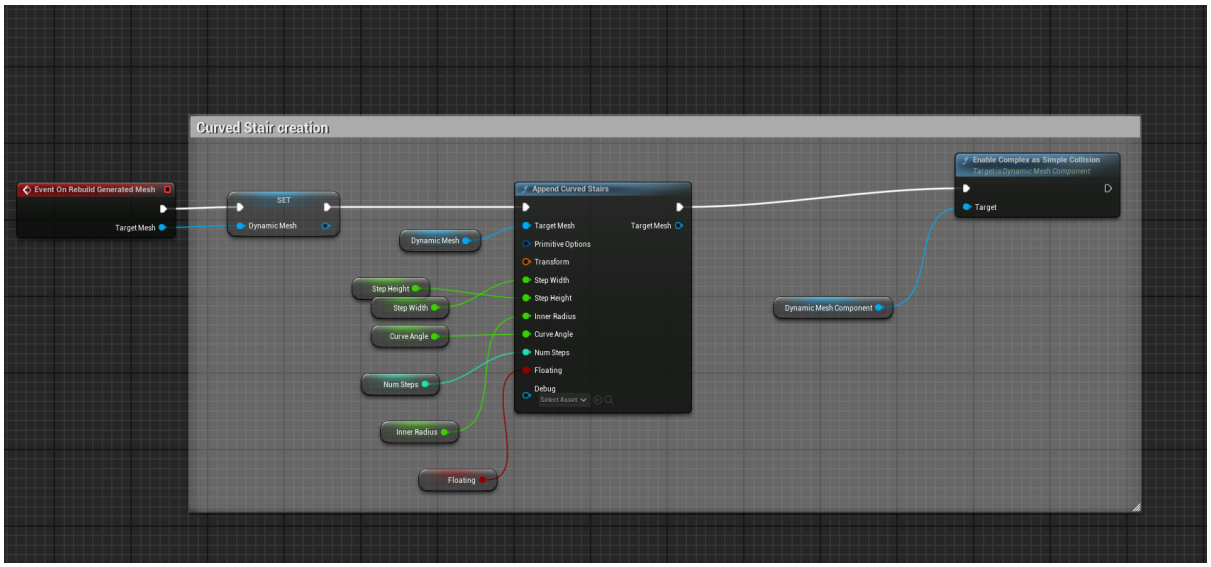
Generates a basic wall for the spline generation. It is the simplified version of LYRA tool, this version allows users to add segments and change UV scale.

BP_Sphere



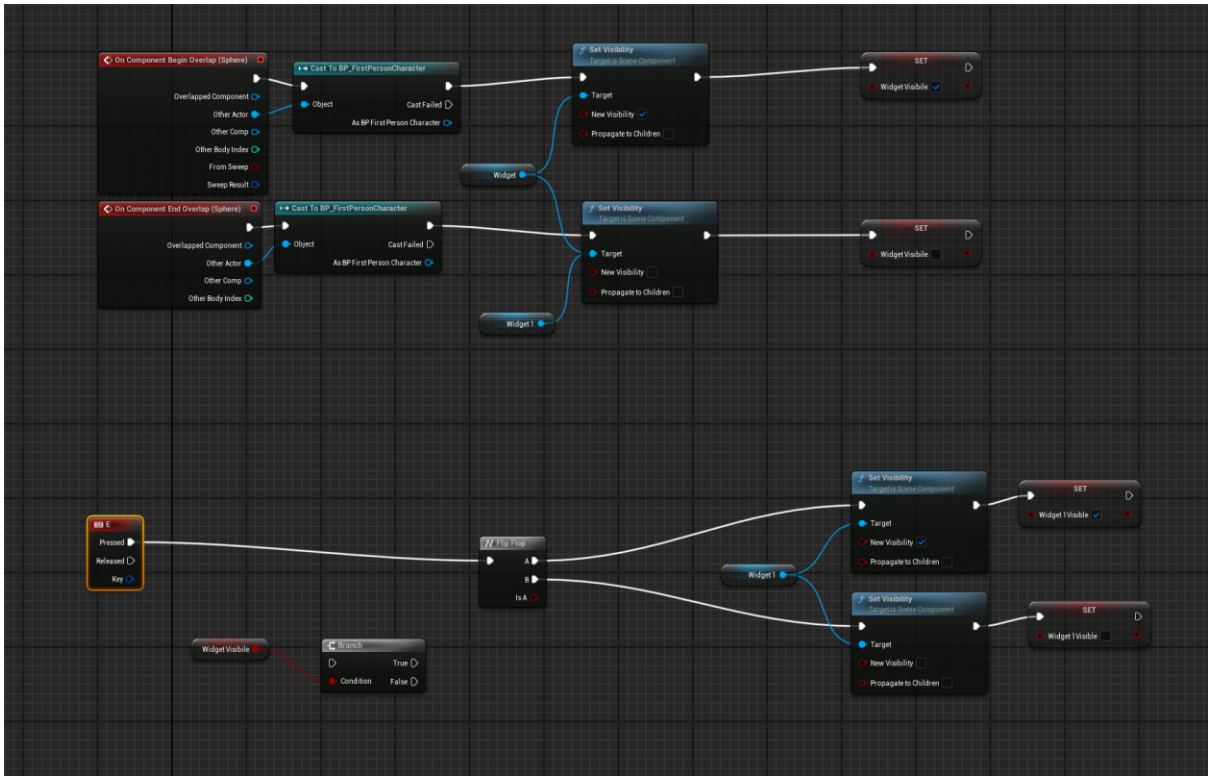
This tool allows users to create spheres and domes.

BP_Curved Stairs



Allows users to create staircases.

BP_Interactable



This actor blueprint allows users to create interactable objects such as paintings and lights to be mounted on the walls.