

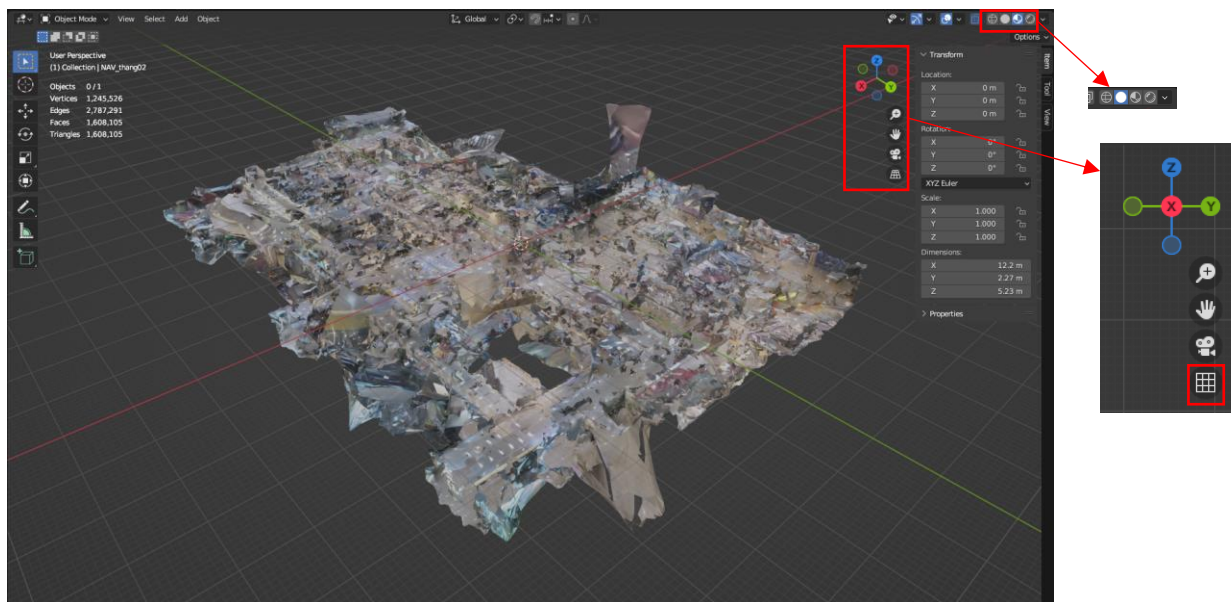
NavMesh Creation Guide for Navigation Content

1. Introduction

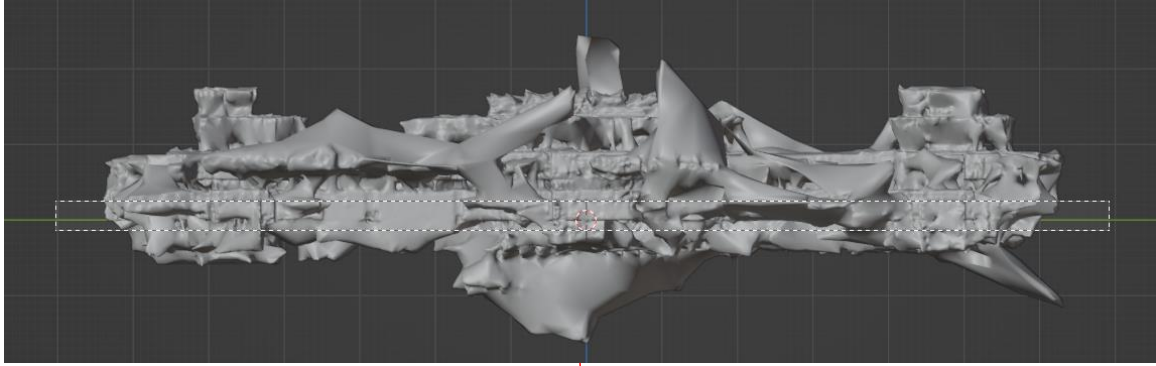
This document will guide you through the steps of creating and adding NavMesh for navigation content after you have a Mesh of the 3D area generated based on the video. Content created on Blender and Unity Editor software.

2. Mesh Drawing

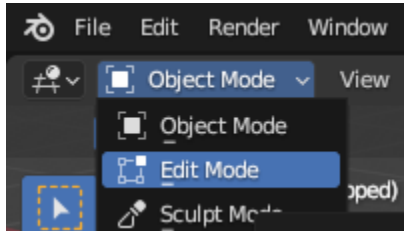
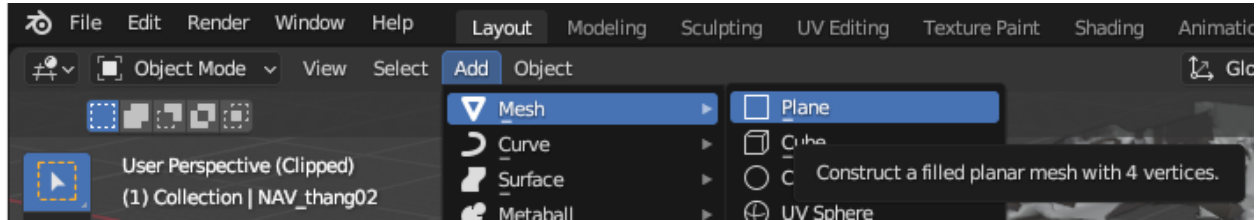
Once you have the **environment mesh**, open the 3D Blender graphics application and import the mesh file and open the Solid view, horizontal view:



View the 3D section of each floor to draw by pressing **Alt+B** and drag and drop the mouse according to the cutting area:

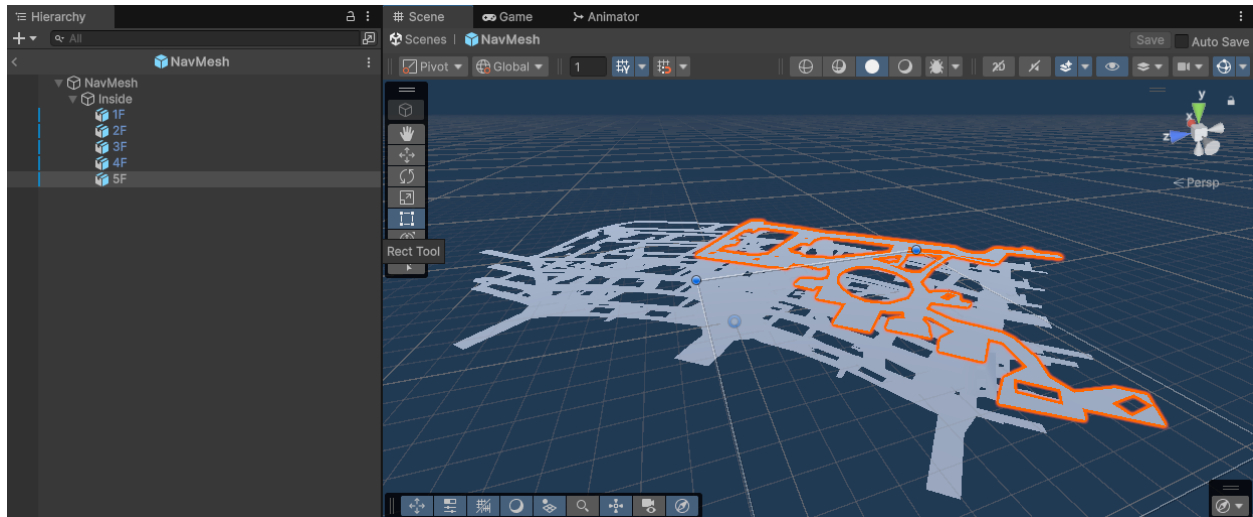


Make a new mesh and draw according to the traversable areas:



2.1. Each area can be drawn into a separate mesh separate from each other

Each layer can be drawn into a separate mesh separate from each other. This help when there are multiple travers area (eg: stair, normal ground, hall for children only,...) In the mesh of each layer, different components can also be divided into different meshes with area names. This helps the navigation system to display the name of the area when the user navigates. If you don't need to display the area, draw the navmesh as one mesh is fine.



2.2. Constantly switching back and forth between solid view and material preview

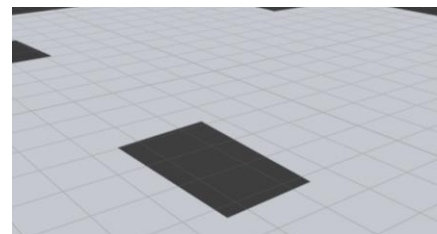
The 3D mesh layer may be distorted in the record process. Compare the nav mesh you're drawing and the 3D mesh with photos texture to determine exactly if you're drawing correctly



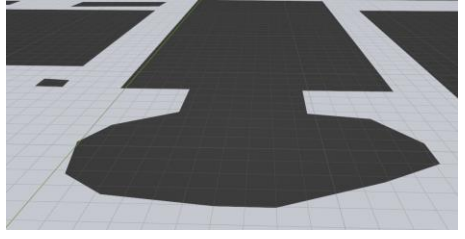
2.3. Do not draw nav mesh in areas that cannot be traver on

Some examples:

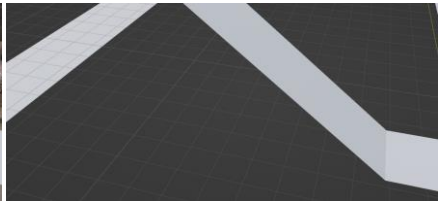
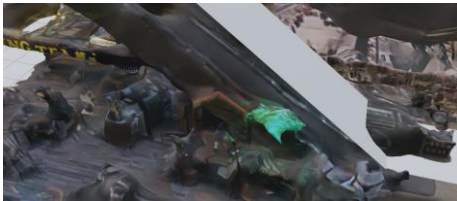
- Wall, Pole, Structure Suport Frame:



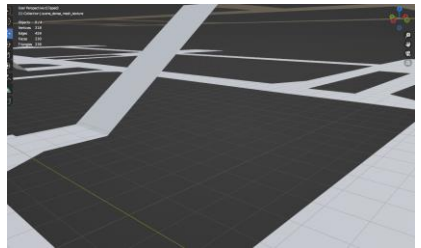
- Vender, stadium:



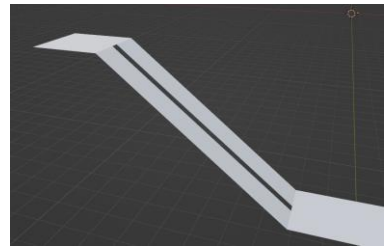
- Under the stair or escalator:



- Skylight/floor opening:

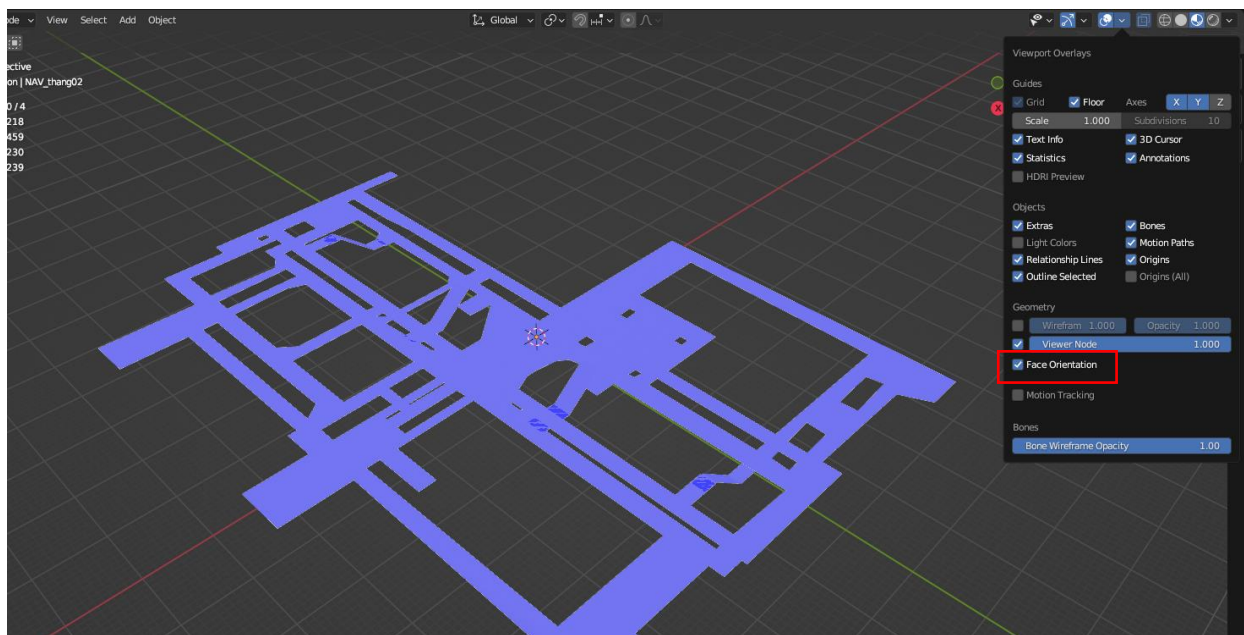


- Space between 1 way escalators:



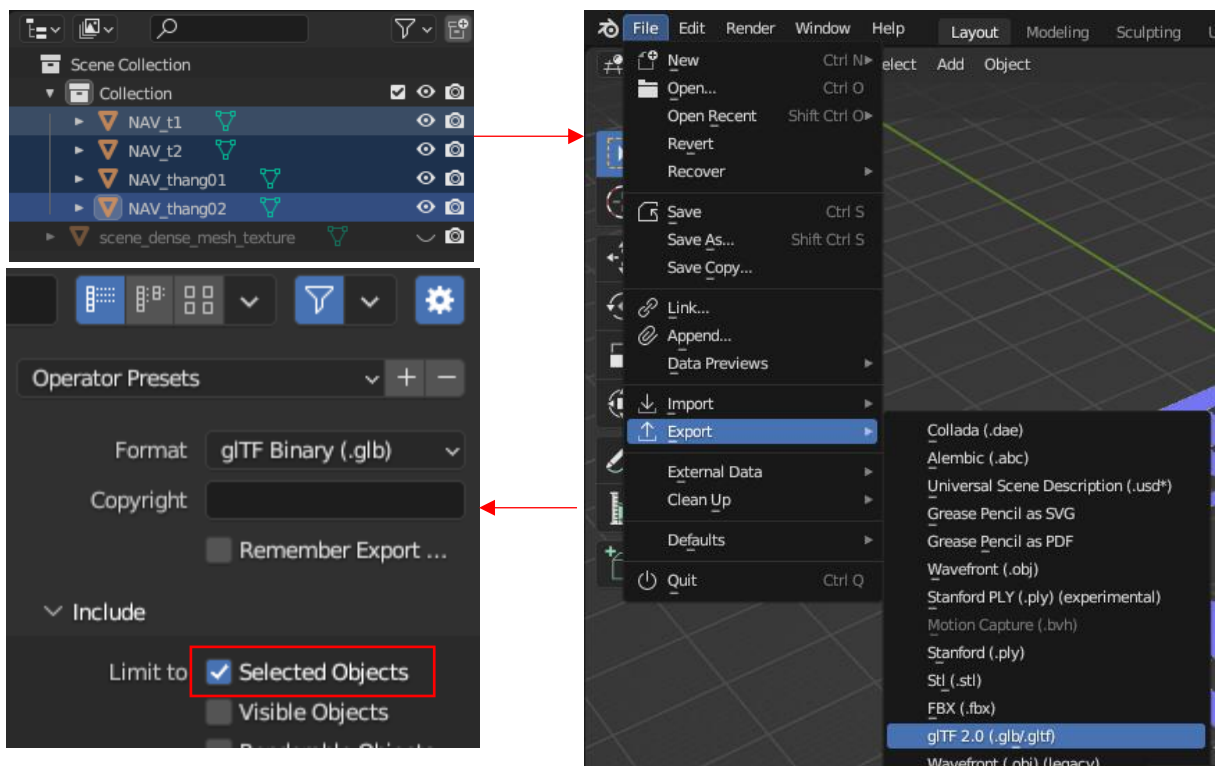
2.4. Ensure the NavMesh's orientation

After drawing the NavMesh, ensure that all drawn faces are pointing upwards (blue is up, red is down):



2.5. Export drawn mesh

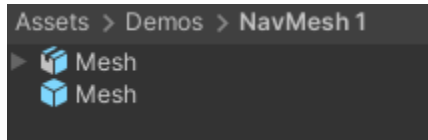
After drawing, we export the mesh as .glb file:



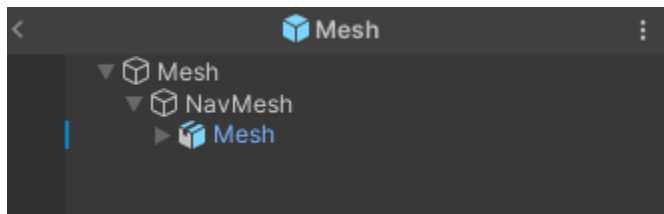
3. Create AssetBundle for NavMesh

3.1. Prepare bundle

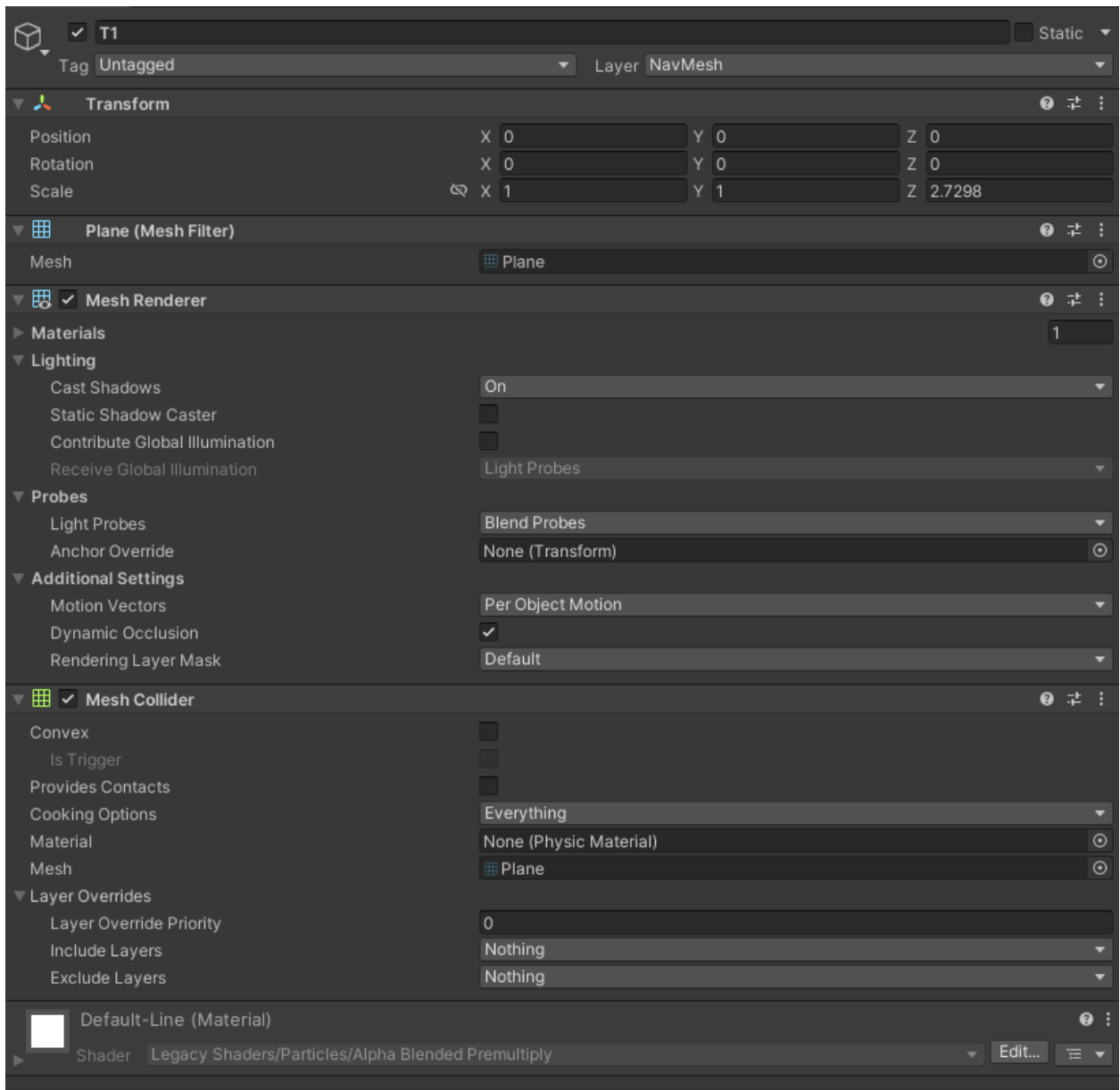
Create a new prefab next to the Mesh file that was created in the **Unity Xense Editor / Unity Xense AssetBundle Builder** application.



Open the **Prefab** and add a child GameObject named **“NavMesh”**, then add the created **Mesh** as a child GameObject of **NavMesh**.



Change the name of the child mesh to **empty** or to the **area name**; this helps display the user’s position when performing navigation.



Make the following changes to NavMesh:

- Change the layer to layer 6: “**NavMesh**”, and apply it to all child objects at the same time.
- Add the **NavMeshSurface** component.
- Select **Use Geometry** → **Render Meshes**.
- Select **Object Collection** → **Collect Objects** → **Current Object Hierarchy**.

Inspector Lighting Project Settings Build Settings Package Manager

NavMesh Static

Tag Untagged Layer NavMesh

Transform

Position	X	0	Y	0	Z	0
Rotation	X	0	Y	0	Z	0
Scale	X	1	Y	1	Z	1

NavMesh Surface

Agent Type: Humanoid

Default Area: Walkable

Generate Links:

Use Geometry:

Object Collection

- Collect Objects:
- Include Layers: NavMesh, NavMeshWarpPlane

Advanced

Override Voxel Size: Voxel Size: 0.05666667 (3.00 voxels per agent radius)

Override Tile Size: Tile Size: 256 (14.51 world units)

Minimum Region Area: 2

Build Height Mesh:

NavMesh Data: NavMesh-NavMesh

Clear Bake

3.2. Select the Area Type for the Mesh.

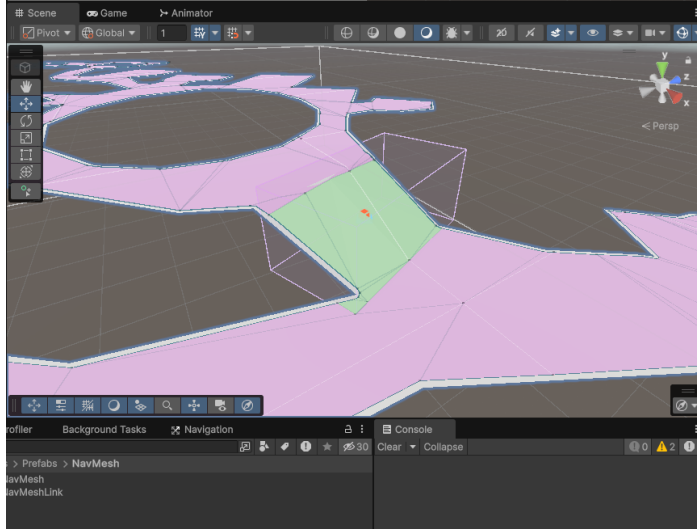
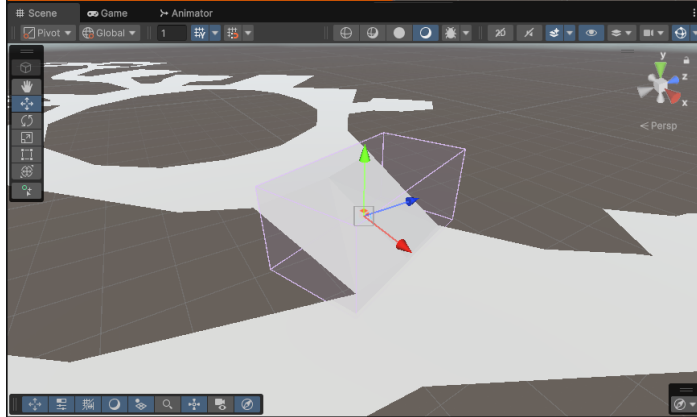
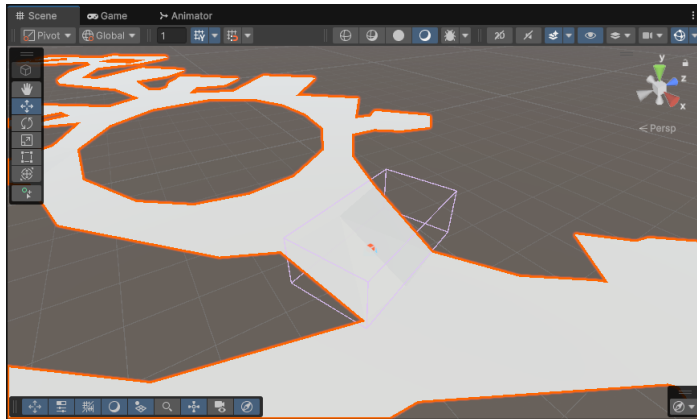
On a floor/mesh, there can be different types of areas such as slopes, stairs, one-way gates, etc. To mark these areas, do the following:

- Add a GameObject with the **NavMesh Modifier Volume** component with the correct **Layer**.
- Move the new object to the desired area and set the bounds to cover the area that needs to be changed.
- Select the corresponding **Area Type**.

In case you want to modify an entire **mesh** or specific areas on a mesh that have been separated into different meshes, add a **NavMesh Modifier** to the mesh object, select **Override Area**, and choose the corresponding **Area Type**.

In this example, the 5th floor area is considered a slope (in reality, the 5th floor mesh has the Area Type: Walkable with some small areas marked as Slope). You can handle this in one of the following ways:

- Separate the 5th floor mesh into areas such as walkable paths, slopes, stairs, etc., then add a **NavMesh Modifier** to each sub-mesh.
- Keep the 5th floor as a single mesh, and add multiple **GameObjects** with **NavMesh Modifier Volume** to modify specific parts of the mesh.

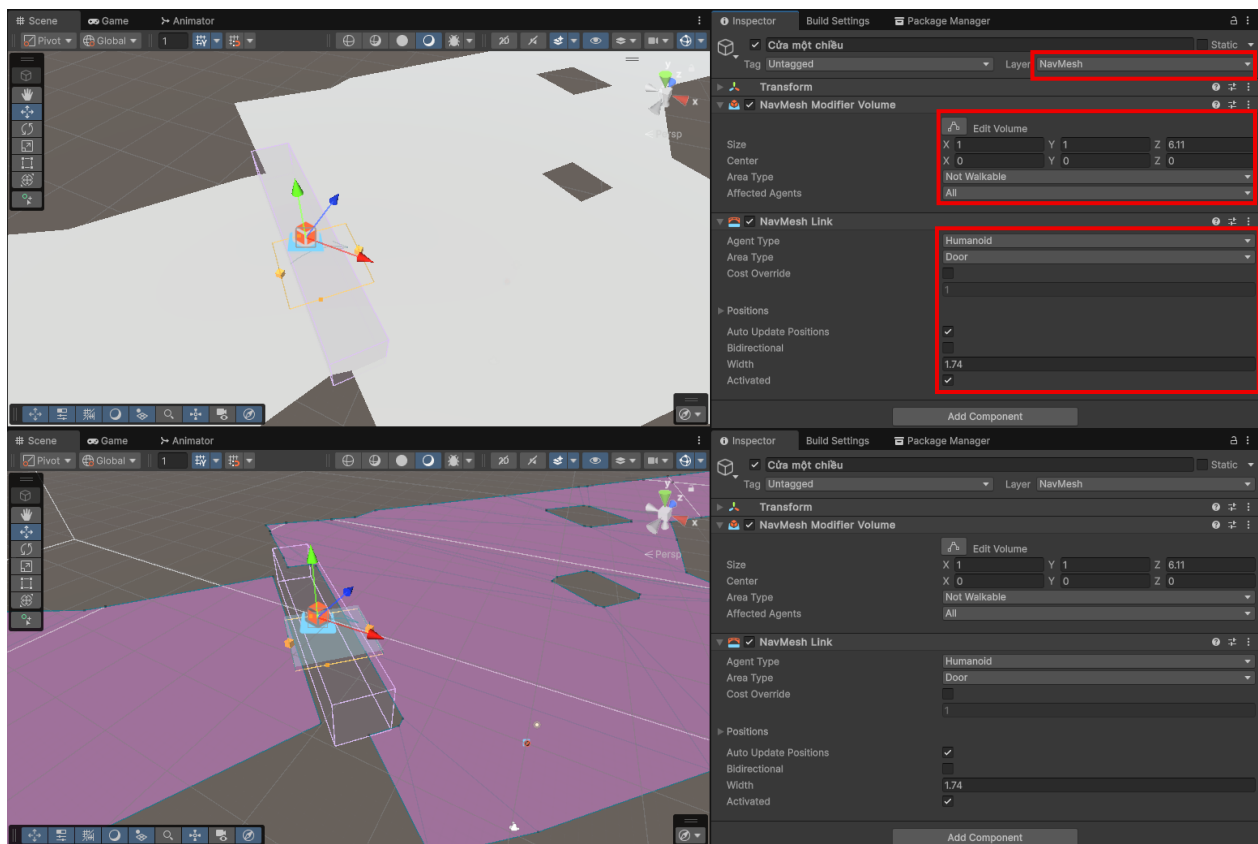


3.3. Set one-way movement areas

In the navigation space, there may be special areas that only allow movement in one direction, such as separate entrance and exit gates or escalators. To enable accurate navigation through these areas, do the following:

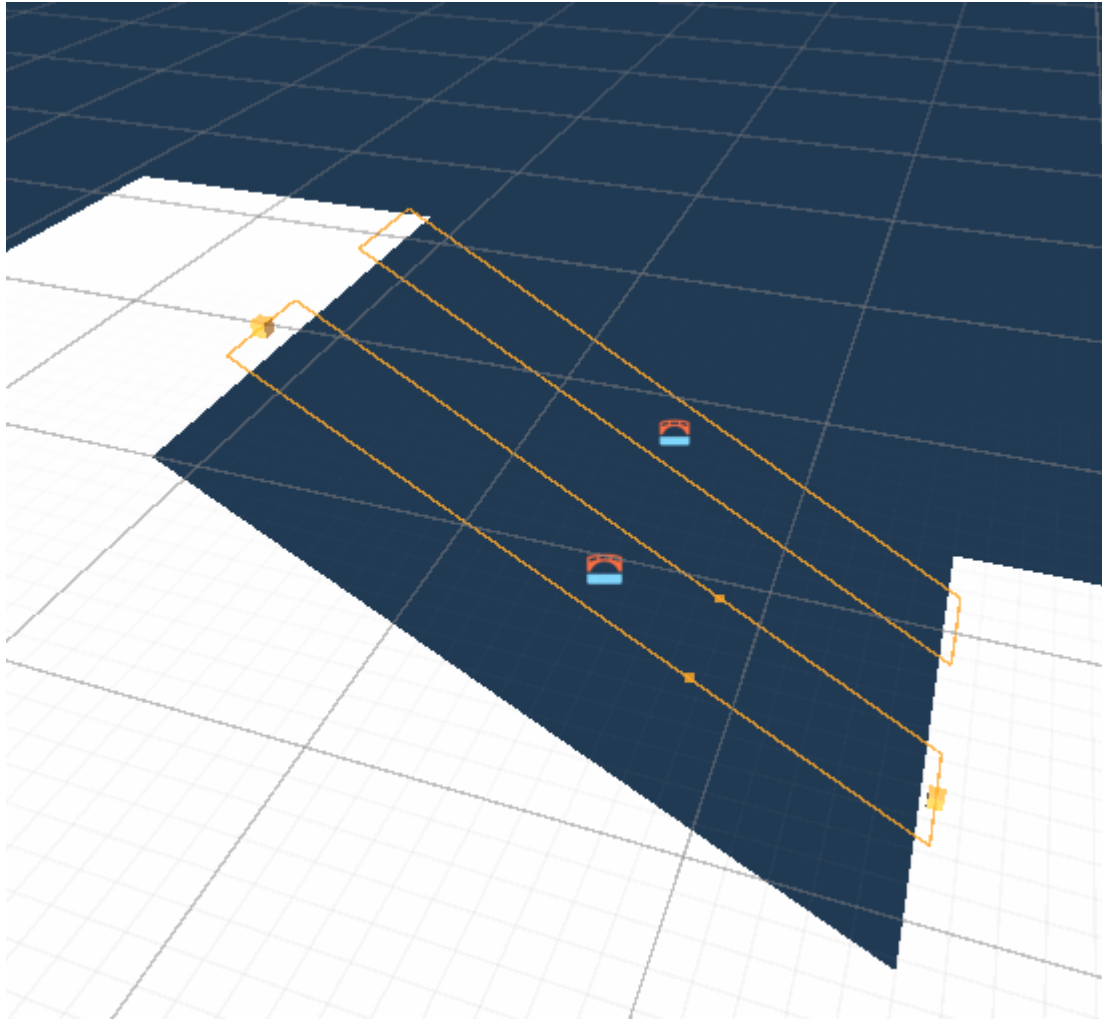
- Add a **GameObject** with the **NavMesh Modifier Volume** component on the correct **Layer**.
- Move the object to the correct position and set its **Area Type** to **Not Walkable**.
- Add the **NavMesh Link** component and move the two link endpoints to the corresponding sides of the area.
- Move the **Start Point** to the entrance position.
- Move the **End Point** to the exit position.
- Change the **Width** value to match the actual width of the area.
- Select **Auto Update Position**.
- Choose the corresponding **Area Type**.

Note: **NavMesh Link** also supports **bidirectional movement** if **Bidirectional** is selected.



In cases where there is **no mesh at the location**, it may not be necessary to add the **NavMesh Modifier Volume** component. Similarly, for **one-way escalator areas**, for example in the image below, if the person who created the mesh did not draw a mesh for the stairs, you can still add a **NavMesh Link**.

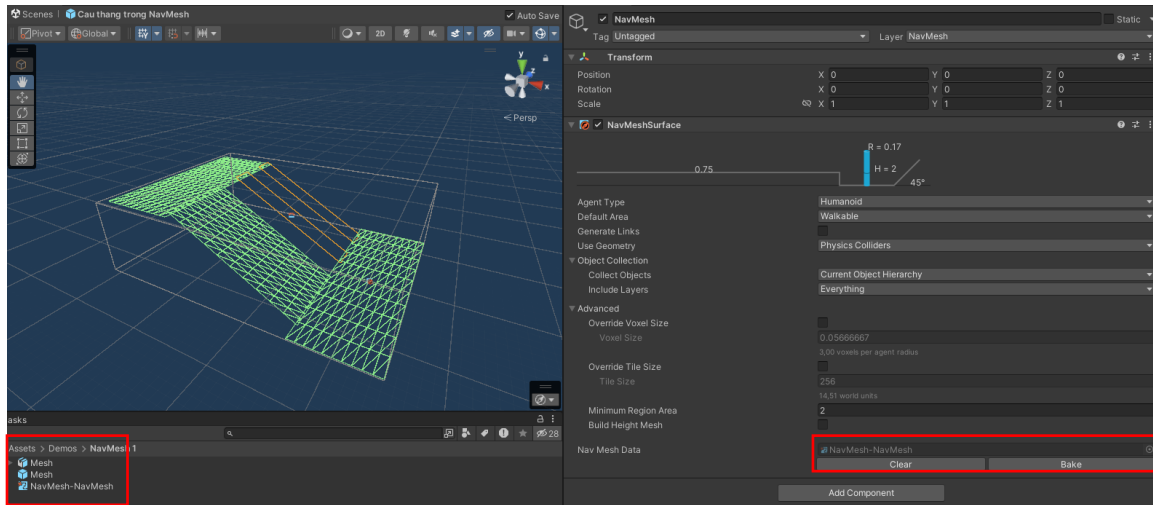
However, the author recommends **drawing the stair mesh** and adding a **NavMesh Modifier Volume**, similar to the example used for **one-way areas**.



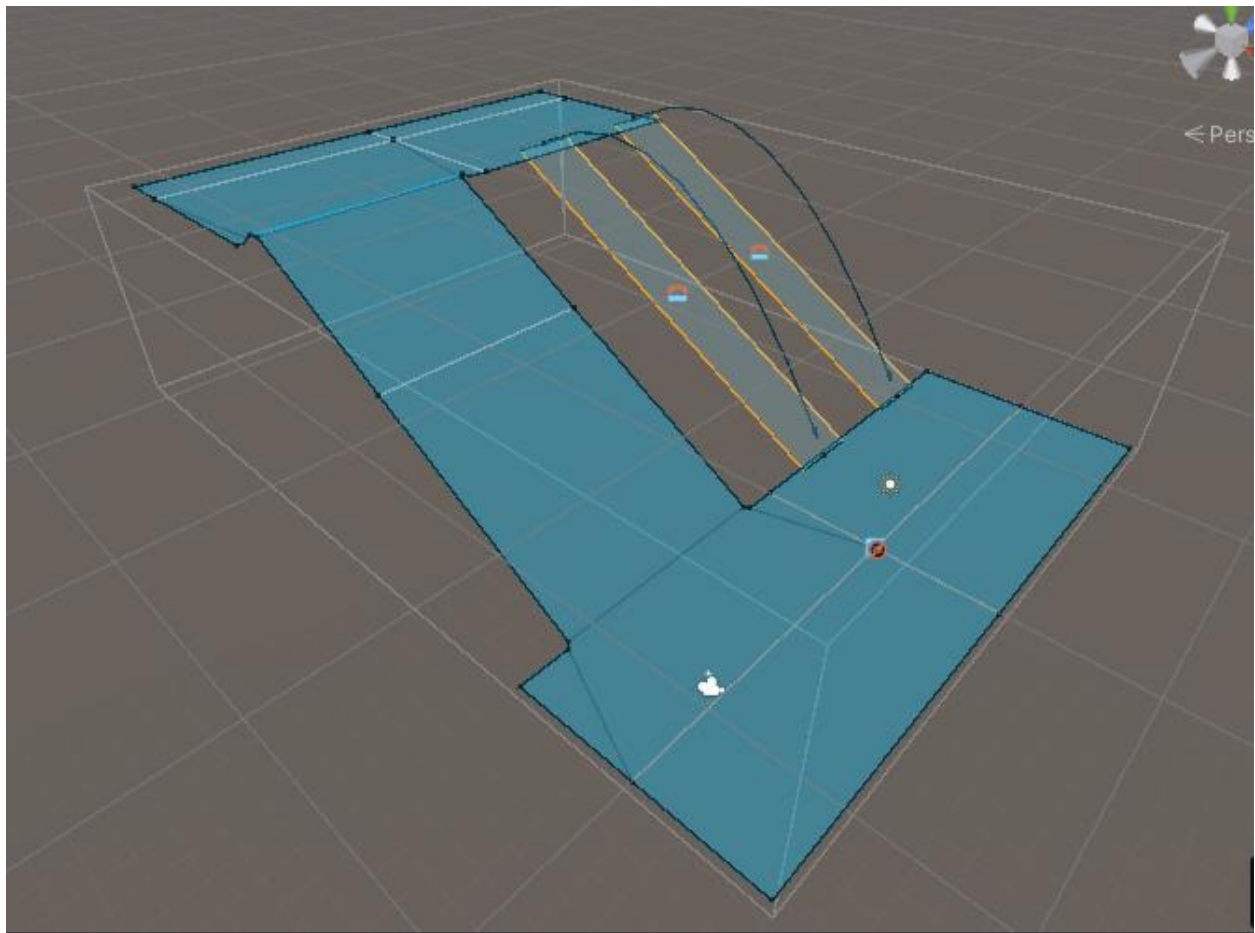
3.4. Build NavMesh

Disable the Mesh Renderer component on the child meshes.

In “NavMesh”, click the Build button. After building, a white bounding box will appear surrounding the entire Mesh area



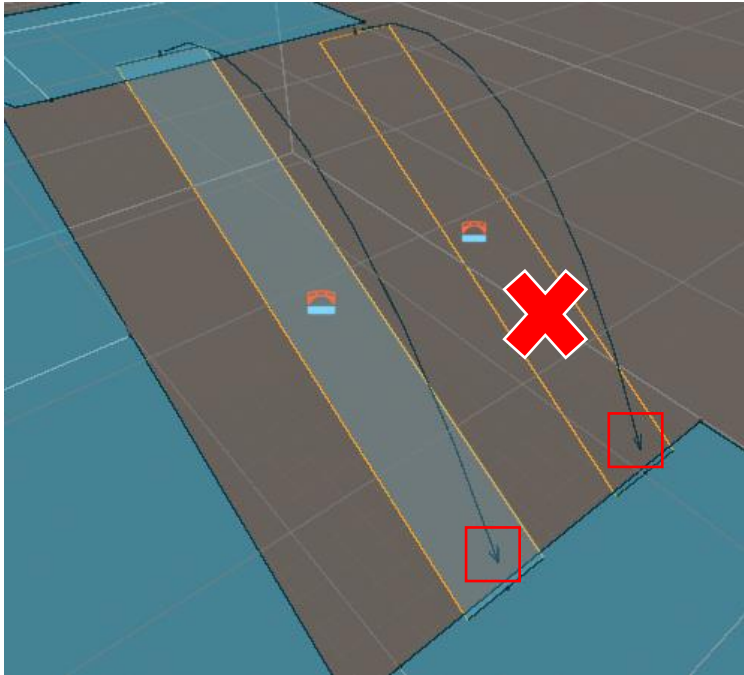
Perform a final check by dragging the prefab into any scene, then click the button to display the NavMesh:



At this point, you should see:

- **Walkable areas** displayed as a light blue mesh (the default color for the Walkable Area Type), surrounded by a white box-shaped frame. Other Area Types will appear in different colors.

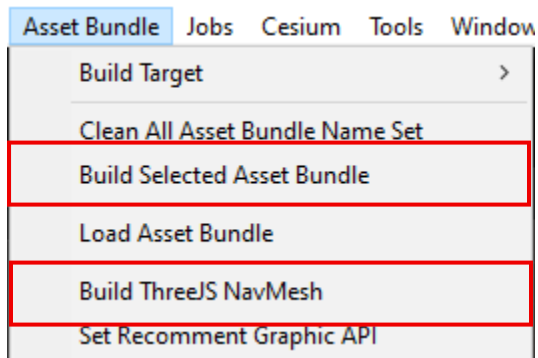
- **NavMeshLinks** with arrowheads (located at the end of the curved line) indicating the correct movement direction. The body of the link is light blue. If Bidirectional is selected, arrows will appear at both ends of the curved line.



3.5. Build AssetBundle

Build the AssetBundle as usual:

- Select the created Prefab.
- Assign a bundle name to the prefab.
- Choose Asset Bundle → Build Selected Asset Bundle.



4. Add NavMesh on CMS

In the content section, locate the 3D space where the NavMesh has been created and add the bundle file path to the Nav Mesh URL field (remove the post-fix).

For example, if your download file paths are:

- File android:
https://MyDomain.com/file/my_nav_mesh_android
- File ios:
https://MyDomain.com/file/my_nav_mesh_ios
- File web:
https://MyDomain.com/file/my_nav_mesh.TJSNM

Then you should enter:

- https://MyDomain.com/file/my_nav_mesh

into the Nav Mesh URL field on the CMS.

Some server services and cloud storage platforms such as Google Drive do not allow creating direct download links with the file name at the end for security reasons.

Please note that the Xense application requires a NavMesh download URL that includes the file name at the end, as shown in the example above.

The screenshot shows a CMS editor interface for a page titled "Edit 3D Space". The interface includes a title field, a body editor with a rich text toolbar, and several form fields. The "nav mesh url" field is highlighted with a red box and contains the URL "https://s3.educationx.vn/ar-world/NavigationMesh/aeonib_nav_v2". Other fields include "SessionID", "is production block" (with radio buttons for N/A, false, and true), and "block url". At the bottom, there are "Save", "Preview", and "Delete" buttons.