

Documentation OSB3D

How to add template blocks, building types, cars, and materials to the Unity project.

1. Assets for Road Generation

1.1 Adding Street Items

Add prefab to Resources > Prefabs > StreetItems

By default, the Street items are set with a minimum spacing of 3f, if larger items are used more spacing might be needed to avoid overlaps. Then change the variable itemSpacing in the RoadGenerator, set in Setup(). The script can be found in Scripts > CityGeneration.

1.2 Adding Cars, 3D models

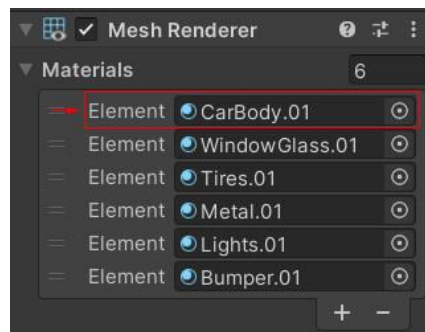
Add prefab to Resources > Prefabs > Cars

By default, the Street items are set with a minimum spacing of 7.5f, if larger cars are used more spacing might be needed. Then change the variable carSpacing in the RoadGenerator script, set in Setup(). The car will get randomly assigned material, for more information on material selection in section 1.3.

1.3 Adding Cars, body material

Add prefab to the folder Resources > Materials> Cars

In the mesh model, the car body needs to be the first material in a list of materials. Additional materials will not be assigned, then the original material of the model will be used. It is therefore recommended to have additional materials such as materials for tires and window glass after the assigned materials.



1.4 Adding Street Trees

Add prefab to Resources > Prefabs > StreetTrees

2. Assets for Block Generation

2.1 Included Building Types

The building prefabs are divided into folders by their building type. By default, the types included are BCC30, BCC40, BCS30, BCS40, BD20, BD30, BP05, BP10, BP15, BP20, BR20, BR30, BR40, BRV20. For information on how to add additional building types, see section 2.2.

The first letters in the code denote the building's position in the block and the following numbers are the buildings width. By default, the buildings are 25 units deep, except for the building types BD, BP and BRV which can have any depth. One unit in Unity is by default one meter.

BCL = Corner building left

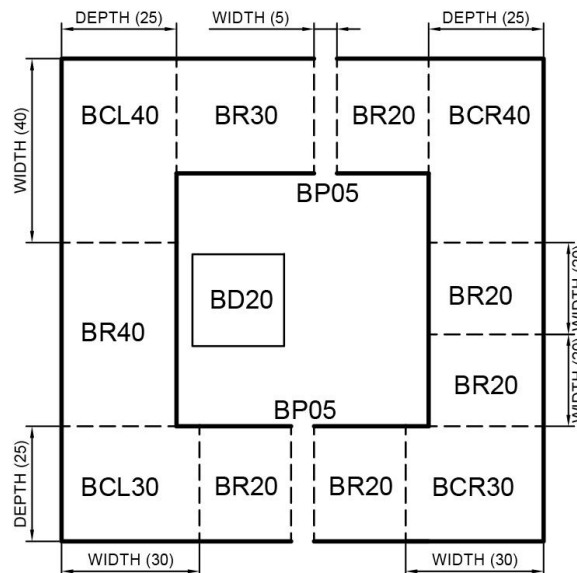
BCR = Corner building right

BD = Detached building, for example the buildings inside the courtyard

BP = Passage, a part of the block where a door and an elevator can be placed

BR = Row building in the block

BRV = Row building variant, has another depth than the standard row building



Example block for demonstration of building types (not implemented)

2.2 Adding Buildings, 3D-models

Add prefab to the folders for corresponding building type in Resources > Prefabs > Buildings

Either buildings can be added to the existing building types or new building types can be created. To create a new building type, create a new folder in Resources > Prefabs > Buildings, named with your new building type code, and place the prefab in the folder. Then add the new building type code in the List<string> buildingCodes in the BlockGenerator-script, it is set in Setup(). The script can be found in Scripts > CityGeneration. To get correct assignment of Materials, see section 2.2.2. The x-direction of the building is considered as the width, the y-direction the height and the z-direction the depth when placing the building. For correct scaling of the elevator and for placement in terrain, the size in each direction of the building mesh itself is used.

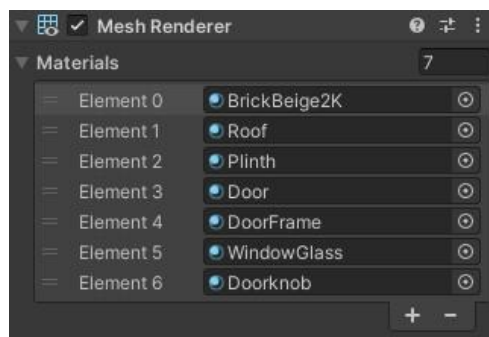
2.3 Adding Buildings, materials

Can be added to Resources > Materials > Buildings to the appropriate folder.

For correct material assignment, the material order in the mesh renderer of a building needs to be:

1. Façade
2. Plinth
3. Door
4. Window frames
5. Roof

Any additional material, such as material for window glass, doorknob, or stair, should come after, then the original material of the 3D-model will be used. By default, the door and window frame are set to the same material. This is controlled in the SetBuildingMaterials() method in the BlockGenerator class. This does not apply to passage-prefabs (BP05, BP10, BP15, BP20). For those, the only material assigned is the façade material and they are handled by the DoorPlacement class.



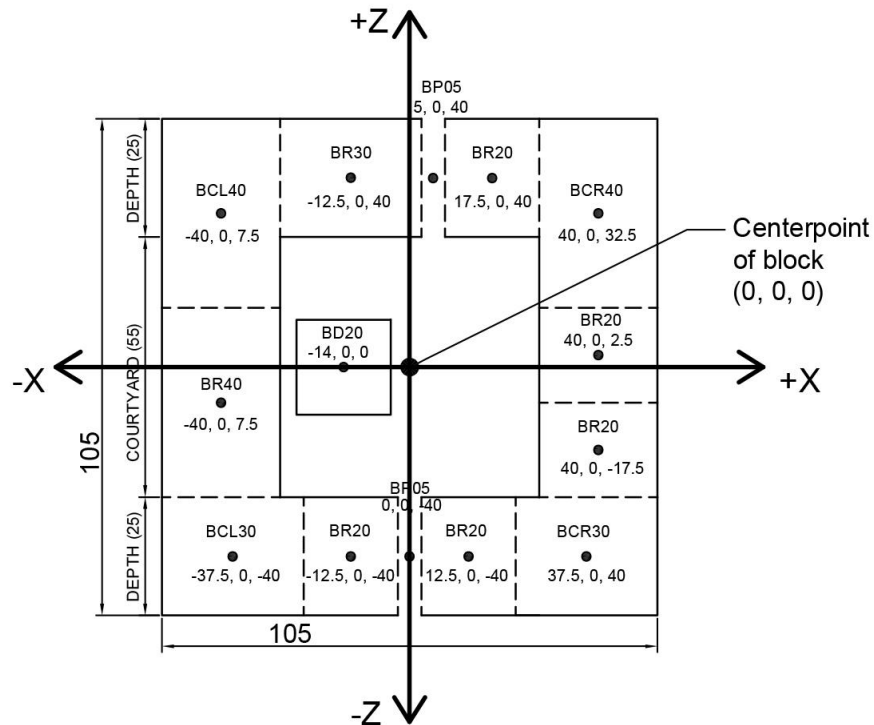
2.4 Block Template files

Can be added to Resources > BlockTemplates

Needs to be a .txt-file with comma separated values. The first row in the file is assumed to be a header and will be ignored. Subsequent rows entail information on the buildings in the block, with a row for each building or passage in the block. Each row should include the following information in the following order, without spacings;

buildingCode,positionX,positionY,positionZ,rotationY

The first value, buildingCode, is which type of building should be placed. Read more about building types in section 2.1 and 2.2. The following values are that buildings position and rotation in the block, when the center of the block is at (0, 0, 0). The position is at the building's origin point, for the included buildings this is at the center of the building in the x/z direction and the bottom of the building in the y-direction. All blocks are assumed to have a size of 105 *105 units. In the figure on the next page, building positions in an example template is demonstrated.



2.5 Template block with generated terrain

For blocks with generated terrain, all buildings should have the positionY value denoted as t. The terrain variables can be set in the Unity Editor on the “Block Terrain”-script. The variables are:

Resolution of the terrain. Lowest is preferred to avoid performance issues.

Scale of the Perlin noise used to generate the terrain.

Min Height of the terrain, by default set to 0.

Max Height of the terrain, by default the lowest value is 0.5. This can be changed in the script.

Edge Distance for the gradient used to blend the edges of the terrain.

Material to use for the terrain.

2.6 Placement of Elevators and Doors

Building types with the prefix BP are slots to place doors and elevators. Elevators are then placed next to the building before in the Block Template. No elevators or doors are placed in terrain blocks and doors are not placed towards unconnected edges. By default, elevators are assumed to be placed next to a building in the building's x-direction, i.e., along the width of the building. The building types starting with BCL are excepted from this rule, so the elevator is placed in the z-direction, i.e. along the depth of the building. New building types that also should be excepted from this rule needs to be added to the “exceptedBuildingTypes”-list in the PlaceElevator-script.