

Taxiway Building Blocks

By PeriapsisPrograde

29 July 2013

Version 1.0

Contents

<u>Introduction</u>	2
<u>Straight pieces</u>	3
<u>Turning pieces</u>	4
<u>Intersection pieces</u>	5
<u>Tarmac pieces</u>	6
<u>Apron pieces</u>	7
<u>Useful notes for devs</u>	8

Introduction

First, let me say thanks for downloading Taxiway Building Blocks! (TBB)

This addon, or really just a pack of meshes, was mainly inspired by my own frustrations while working on ~~surface-base~~ surface base addons. While buildings and runways are relatively easy to add to bases, taxiways are not. To get a really good-looking taxiway, you need to create a separate mesh for it, like the one at the Habana base. If you can't make meshes, there are a couple alternatives. You can either draw it on surface tiles or use "runways" with the taxiway texture, but neither of those look as good as a dedicated mesh.

This addon contains pieces, or "building blocks," which can be combined to make basic taxiways. This allows base developers to use these pieces to create mesh-quality taxiways even if they lack the ability to make a mesh.

I hope these parts prove useful to you!

Straight Pieces

Straight pieces are the backbone of your taxiway system. They are the primary paths from one place to another.

They come in 4 types: TBB1, TBB2, TBB5, and TBB10. The number after “TBB” refers to its ratio of length to width. For example, if you have a taxiway 100 m wide and 500 m long, you would use TBB5.

It is important to use the right ratios, even if it forces you to use multiple pieces (i.e. for a taxiway 3 times longer than it is wide, using TBB2 and then TBB1). This keeps the texture's pixels square. If you make its **SCALE** not to match its ratio, the pixels will appear stretched.

With no rotation, a straight taxiway will be oriented north/south.

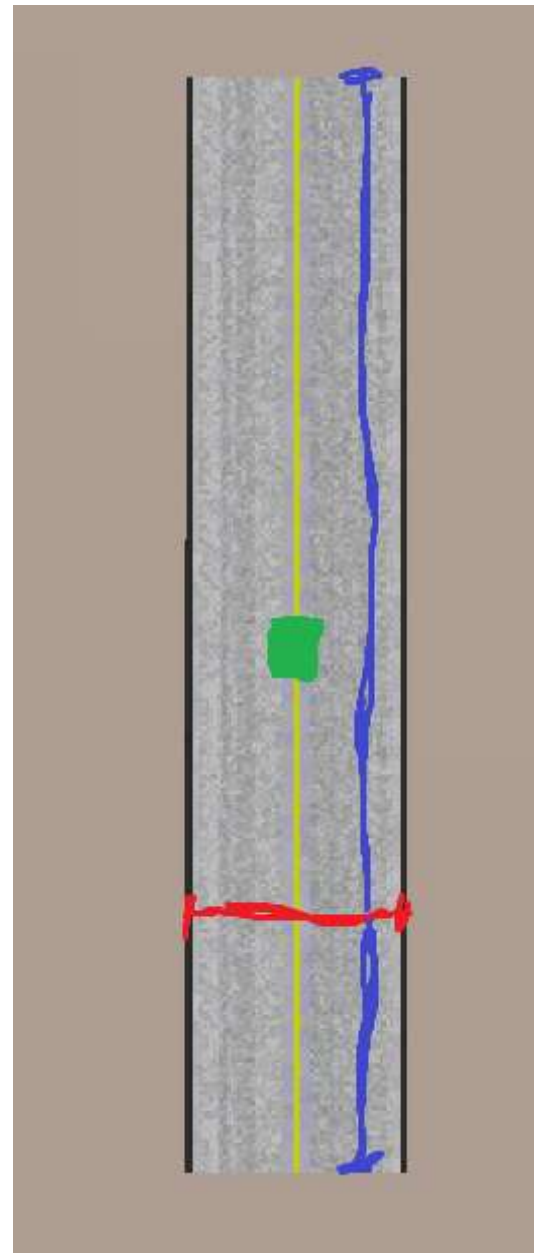
GREEN POINT: POS is located at the center of the piece.

RED LENGTH: This is the width of the taxiway. It is defined by the first part of the **SCALE** parameter.

BLUE LENGTH: This is the length of the taxiway. It is defined by the last part of the **SCALE** parameter. It should be x-times longer than the width according to the TBB number you use.

Format

```
MESH
  FILE TBB<number>
  POS <x> <y> <z>
  ROT <angle>
  SCALE <width> 1 <length>
  OWN MATERIAL
  PRELOAD
END
```



Turning Pieces

Unless you are extraordinarily lucky, your taxiways will need to turn at some point. Taxiway Building Blocks has included turning pieces to help with that.

Turning pieces come at four different angles: 30, 45, 60, and 90 degrees.

The `<width>` parameter should be the same for both the x and z values. It should be equal to the width of the main taxiway pieces.

The POS location is on the inside corner of the turn.

With no rotation, a turning piece will be to the southwest of its POS. One edge will be aimed straight south; the other will be at an angle southwest.

GREEN POINT: Where POS goes.

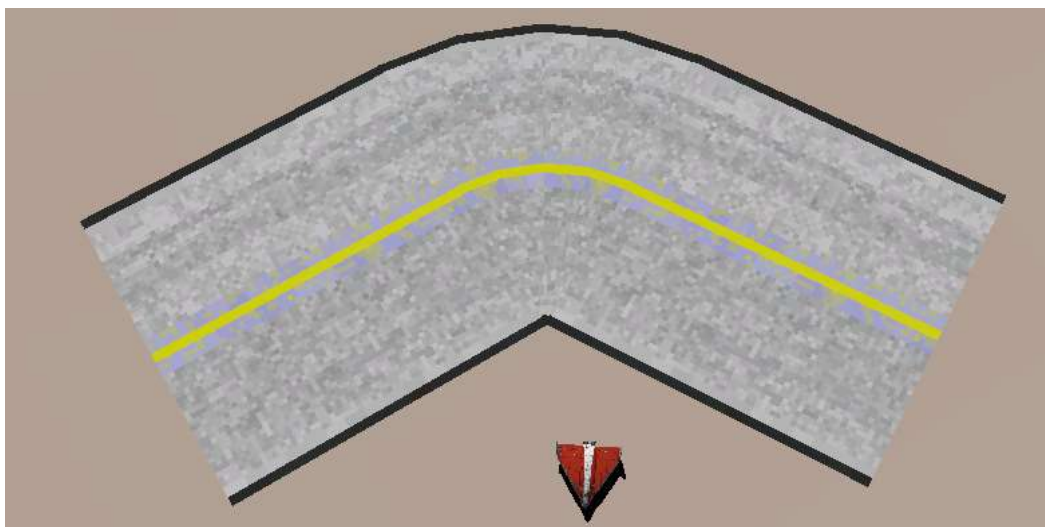
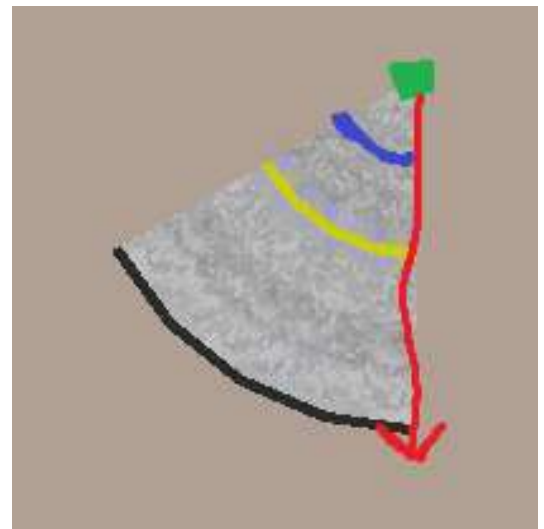
RED DIRECTION: One side will be aligned with south if you use no ROT parameter.

BLUE ARC: Equal to the angle of the turn.

Format

```
MESH
FILE TBBTURN<number>
POS <x> <y> <z>
ROT <angle>
SCALE <width> 1 <width>
OWNMATERIAL
PRELOAD
END
```

Example of TBBTURN60



Intersection Pieces

Format

If you have a complicated enough system, you will need to intersect taxiways.

If you have a 3 or 4 way intersection, you can use intersection pieces to get the correct texture.

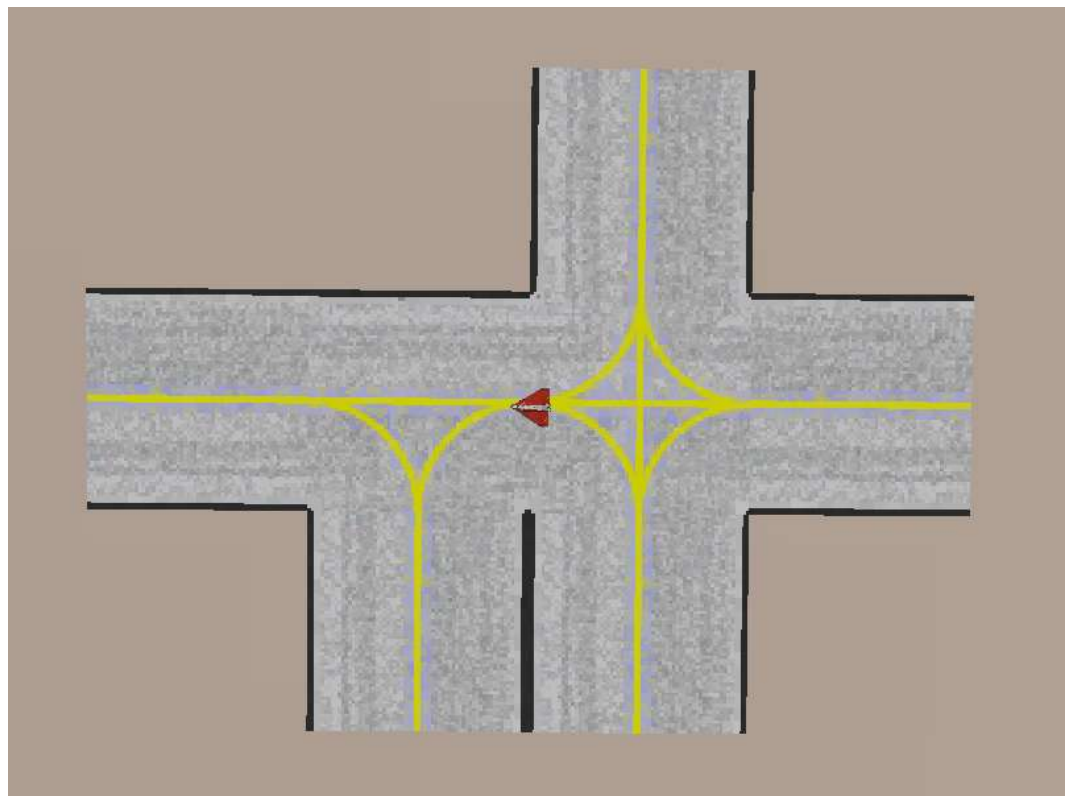
If it is only a 2 way intersection, just make the taxiways turn together.

With no rotation, a 3 way intersection will connect west, south, and east.

As with straight pieces, the POS point is located in the center of the piece.

<width> again should be the same for both x and z, and be equal to the width of the taxiway.

```
MESH
  FILE TBBINTERSECT<number>
  POS <x> <y> <z>
  ROT <angle>
  SCALE <width> 1 <width>
  OWNMATERIAL
  PRELOAD
END
```



Tarmac Pieces

You may want to add large, blank areas of tarmac. Taxiway Building Blocks has parts for that.

Tarmac pieces use the “Concrete” texture, not “Taxiway1.”

It comes in scales of 1, 2, 5, and 10; that is the **<number>** parameter.

The **<number>** chosen should be the ratio of the size of the tarmac to the width of the other taxiways. Also, **<size>** should be the same for both **x** and **z**. This will keep the pixels from appearing stretched and the same size as pixels on other parts.

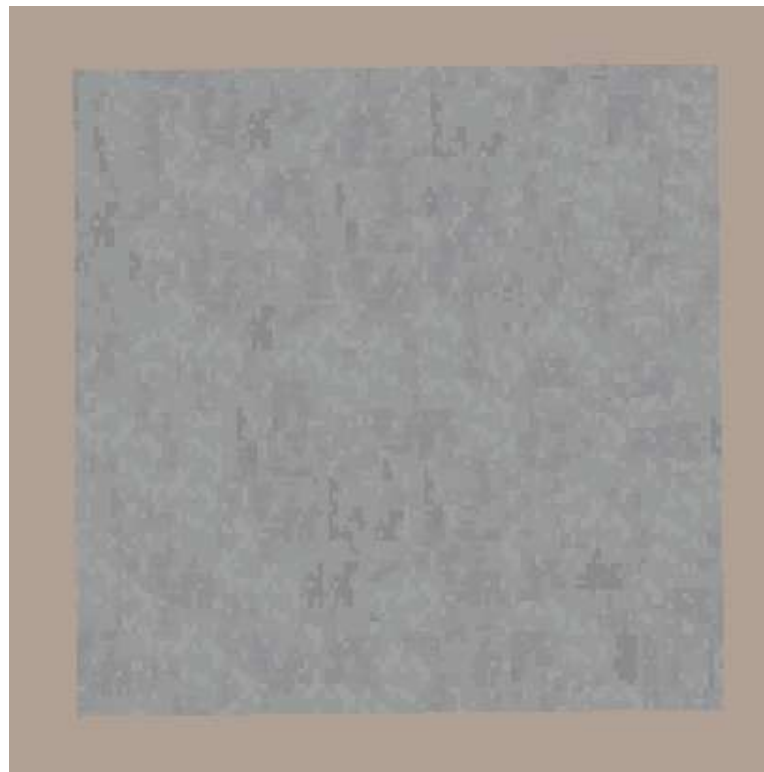
Like straight and intersection parts, **POS** is located in the center of the piece.

Tarmac pieces have no yellow lines or any other markings on them.

They can be useful as parking areas, or to simulate broken, damaged, or closed pavement.

Format

```
MESH
  FILE TBBTARMAC<number>
  POS <x> <y> <z>
  ROT <angle>
  SCALE <size> 1 <size>
  OWNMATERIAL
  PRELOAD
END
```



Apron Pieces

If your base will allow large or long vehicles, you should consider adding aprons around your turns. This will make turning easier for clumsy craft.

Apron pieces are similar to turning pieces. Their **POS** is in the same place, and they also start with one edge aligned south and face southwest.

To accommodate both small and tight turns, aprons come in many sizes: 30, 45, 60, 90, 120, 135, and 150 degrees.

The **<size>** parameter should be the same for both **x** and **z**, as well as the same as the width of the taxiway.

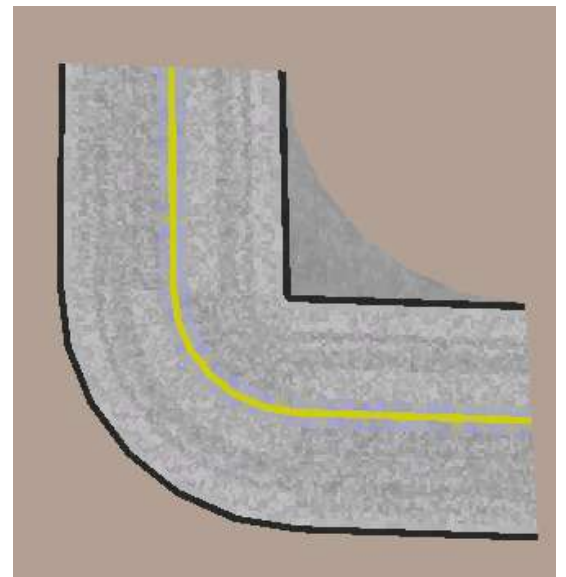
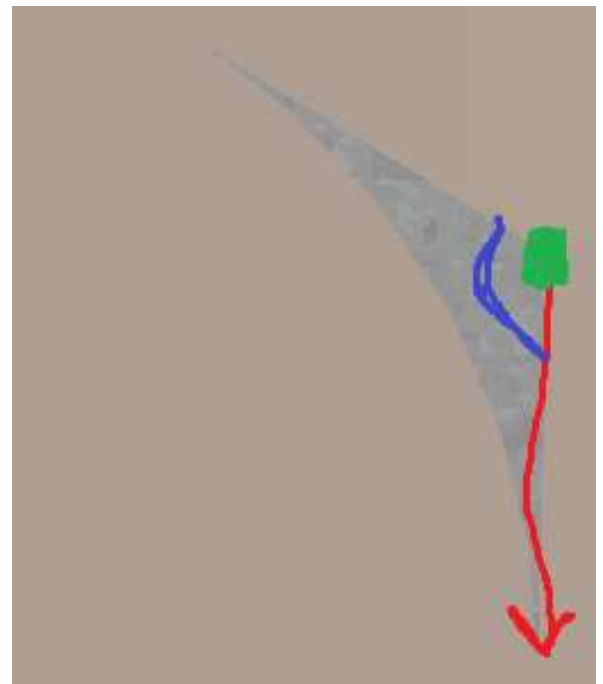
GREEN POINT: This is where **POS** goes.

RED ARROW: With no rotation, one side will be aligned with straight south.

BLUE ARC: Equal to $180 - \text{the degrees of the turn}$. This is the **<number>** used.

Format

```
MESH
  FILE TBBAPRON<number>
  POS <x> <y> <z>
  ROT <angle>
  SCALE <size> 1 <size>
  OWNMATERIAL
  PRELOAD
END
```



Useful Notes for Devs

Orbiter uses a left-handed coordinate system. POS vectors are in the form (west, altitude, south). Negative numbers should be used for east and north locations.

ROT values are measured in degrees counterclockwise.

Taxiway Building Blocks uses only default Orbiter textures.

The POS of a turning piece will be the same as the POS of an apron for it.

Taxiway Building Blocks is released in the public domain as much as it is possible to do so for an Orbiter addon. Feel free to use these parts in your own addons, but DO NOT include them in the download package. Place “Requires ‘Taxiway Building Blocks’ by PeriapsisPrograde” in the addon description, as well as giving proper credit in the readme.

This may be useful for some of the math involved in placing the pieces.

Angle	Sine	Cosine	Tangent
0°	0	1	0
30°	0.5	0.86603	0.57735
45°	0.70711	0.70711	1
60°	0.86603	0.5	1.73205
90°	1	0	undefined
120°	0.86603	-0.5	-1.73205
135°	0.70711	-0.70711	-1
150°	0.5	-0.86603	-0.57735
180°	0	-1	0
210°	-0.5	-0.86603	0.57735
225°	-0.70711	-0.70711	1
240°	-0.86603	-0.5	1.73205
270°	-1	0	undefined
300°	-0.86603	0.5	-1.73205
315°	-0.70711	0.70711	-1
330°	-0.5	0.86603	-0.57735