Import your own rails into LOTUS

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The rails you use in LOTUS consist of several parts. You don't have to worry about the gauge, if you want to create your own railtracks, you simply follow the next few steps.

1 3D models

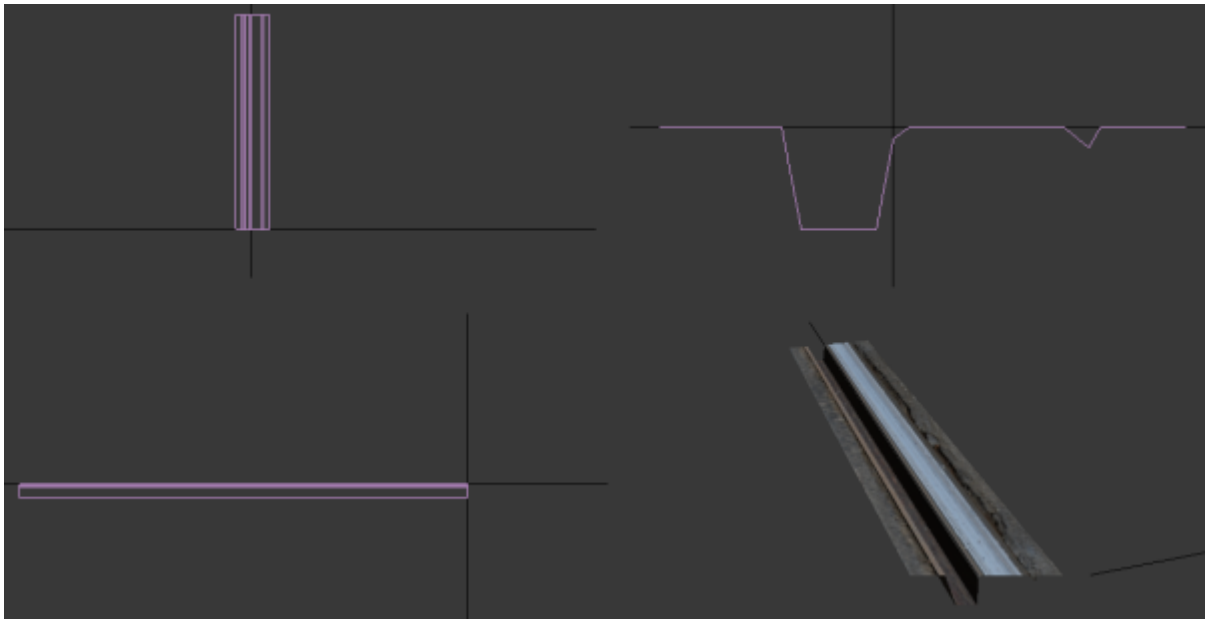
1.1 Must have

You have to create some 3D models of the railtrack to use all functions of LOTUS for railtracks.

1.1.1 Railtrack spline

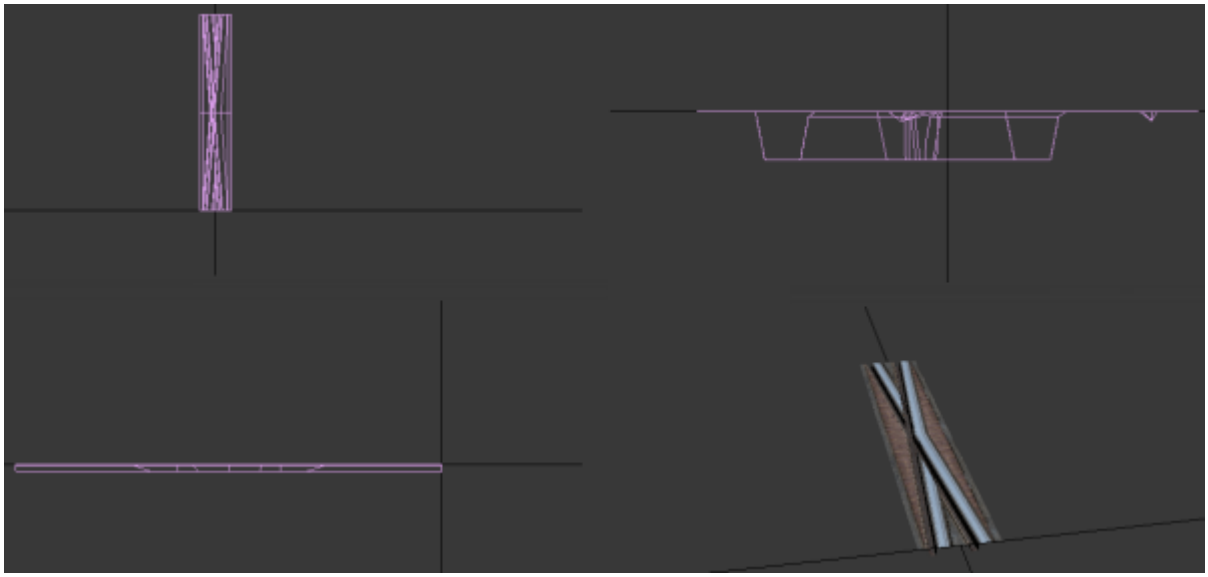
This spline is the base of the railtrack. Therefore you have to keep an eye on some rules:

- The 3D model is based on the right track of the rail without any other components, which we describe later on.
- The top edge of the rail has the height of 0.
- The spline starts at y = 0 and has the length of 1 meter in the positive y dimension.
- The y axis itself is located at the axis the wheel is driving on.



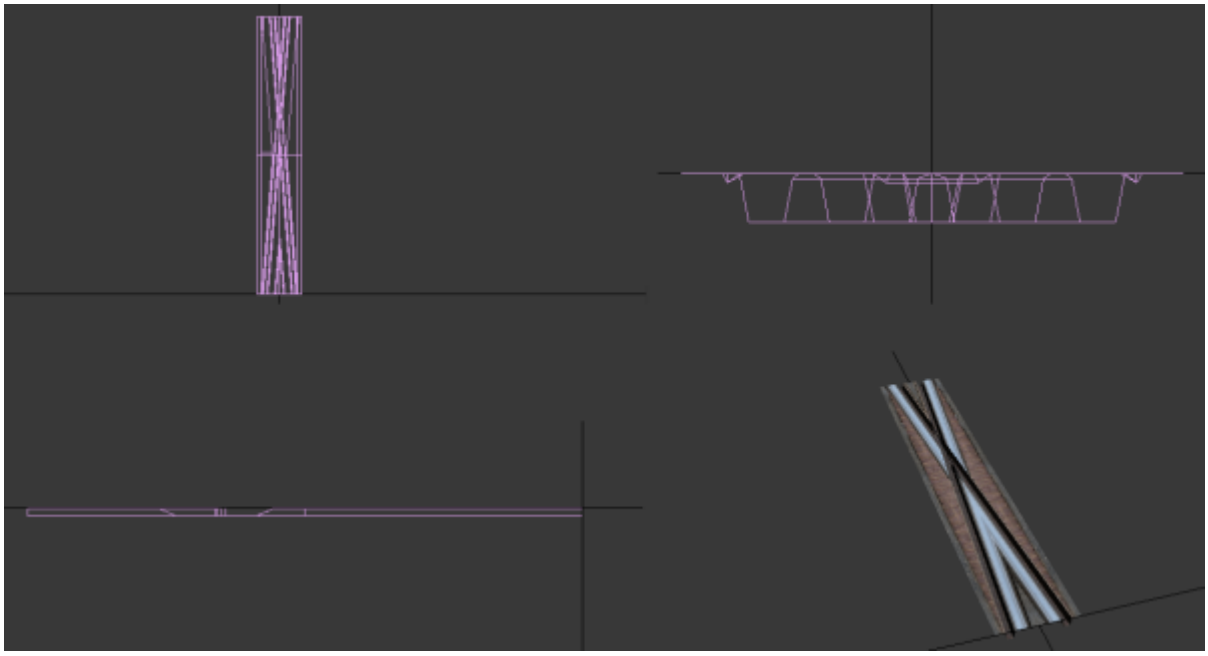
1.1.2 Parallel Crossing

There are two types of point frogs, the first is named "parallel". You create this point frog out of two parallel railtracks. The mesh has to be united, because the point frog will be deformed by LOTUS. A good length for this croosing is two meters, because the deformation can have high values, so we use the average length of this crossing as a reference. Before creating the 3D model keep in mind, that you don't want to look under the crossing.



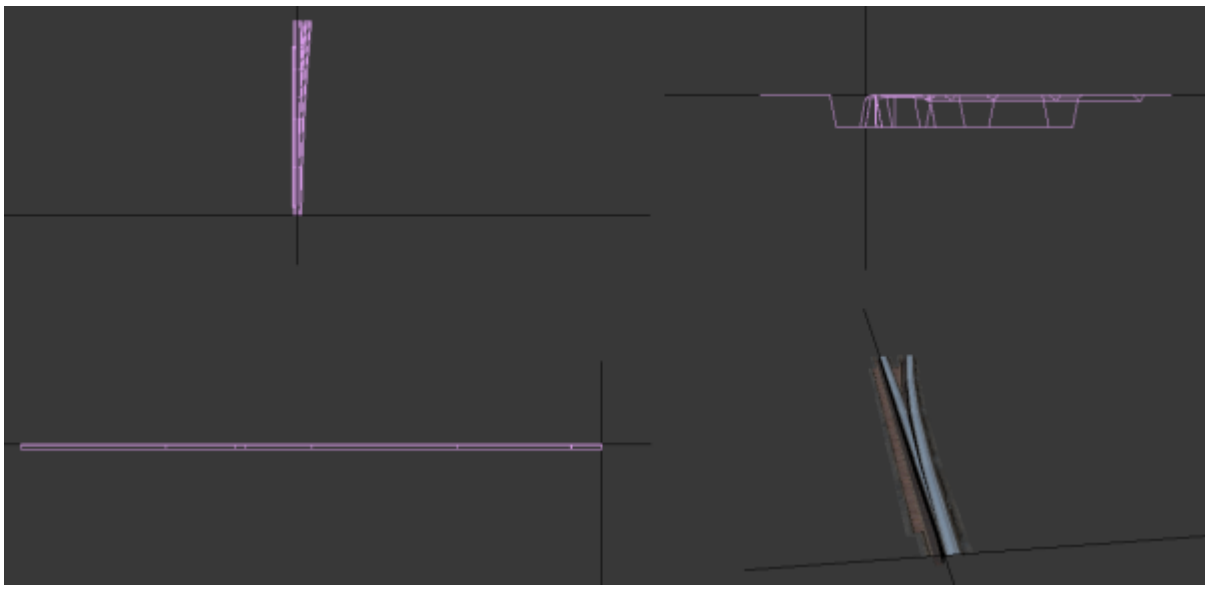
1.1.3 Antiparallel Crossing

The second type of point frogs is named "antiparallel", so you use one mirrored railtracks. When creating such a crossing you have to put two railtracks parallel to eachother and then you have to mirror the right railtrack. All rules we set for the parallel crossing can be applied here too.



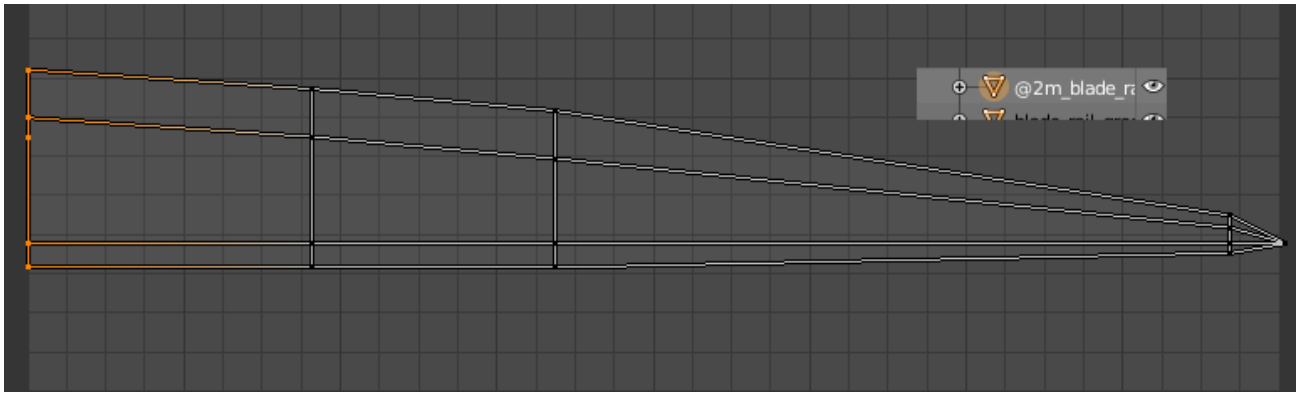
1.1.4 Switches and Switchblade

The switch itself contains the switch without the blade. Regarding the different radius of the curves a length of four meters is the way to go. As usual only the right railtrack will be created in our 3d program. The other railtrack gets created by LOTUS. Its good to create the switch blade within the file of the switch, but you have to export both parts seperately.



The switch blades needs a meshanimation to get the visual effect as needed. You have to do the following steps:

- Copy the 3D object of the switchblade
- Change the name of the copy to "@2m_<name of original object>"
- Change the uv-mapping of the copy as it looks like in the picture below



1.2 Optional

When creating railtypes with the whole superstructure you may need some more 3d models.

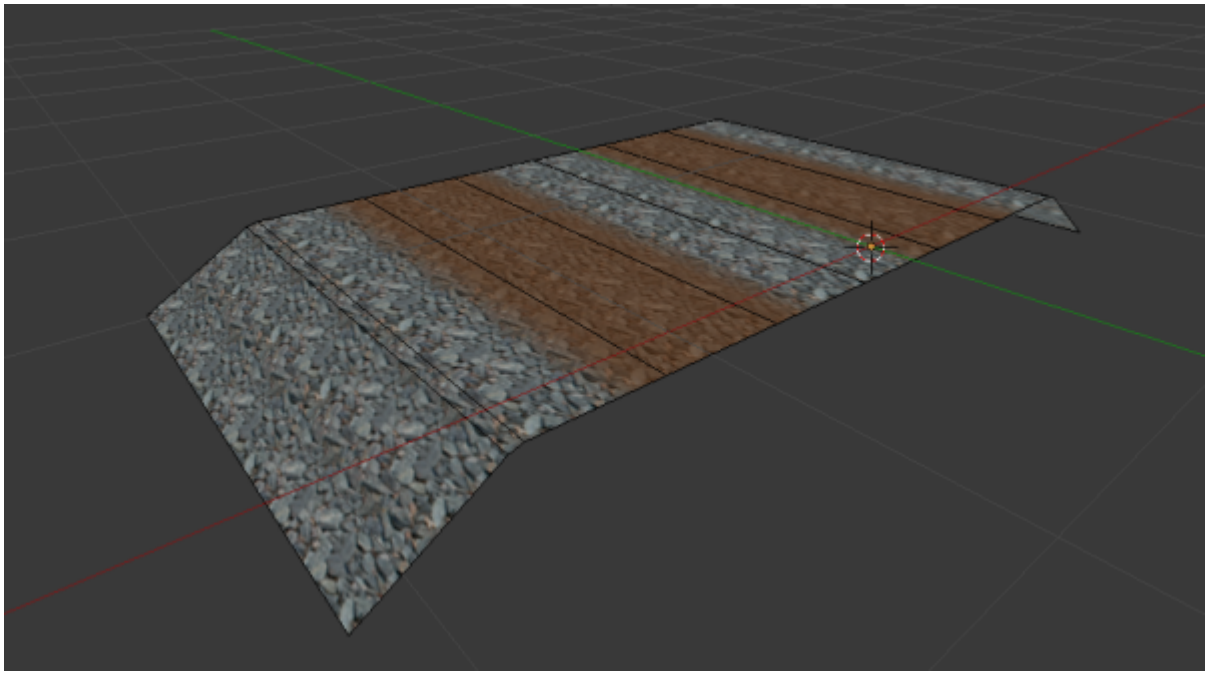
1.2.1 Ties

Before creating a new 3d model of a tie you have to be clear, if the tie should either have a third dimension or only uses two dimensions. If the superstructure consists of ballast a third dimension probably won't have a visual effect. The monolithic ballastless ties obviously need a third dimension. Also the 3d model of the tie contains the rail attachments which makes the tie related to the gauge. When creating the rail attachments keep an eye on the polygon count.

The usual length between two ties depends on the load per axle and is about 60 cm to 70 cm, tram tracks may have 80 cm.

1.2.2 Ballast

The ballast is the lowest but visible mesh of the superstructure. The ballast usually is no simple plane, you need to build a more komplex mesh. The image below shows a textur with the normal abrasion after some years of usage. So in fact you place the kind of abrasion onto the texture. This process keeps the ballast related to the gauge. Also the vertical position of the ballast is below the height of the railtrack.



1.3 Flexible Ties

The flexible ties are consist of several parts, which are stored in one blender file. The parts are listed below:

- sliding block right (y = 1)
- additional part (y = 0)
- additional attachment (y = -1)
- left part and middle part (y = -2)
- right part (y = -3)
- sliding block left (y = -4)

The parts are placed on the y axis. The value on the y axis are written next to the element in our listing. The y axis is also the axis, where the wheel is located. Therefore the parts aren't placed in their middle.

The sliding blocks consist of the sliding block and their attachment to the tie. In case you are unsure what the dimension of a sliding block looks like, here is an example (W x H x D): 28 cm x 2 cm x 8 cm. 2,5 cm out of the 28 cm are either left or right of the y axis depending on the sliding block.

The additional attachment is located mostly left to y axis depending on the location of the wheel.

The left part including the middle part is an approximately 10 meter width tie containing the left rail attachment. The rail attachment is on the same axis as the additional attachment.

The tie of the right part begins at the value x = 0, the rail attachment therefore is "floating" a little bit left to the y axis.

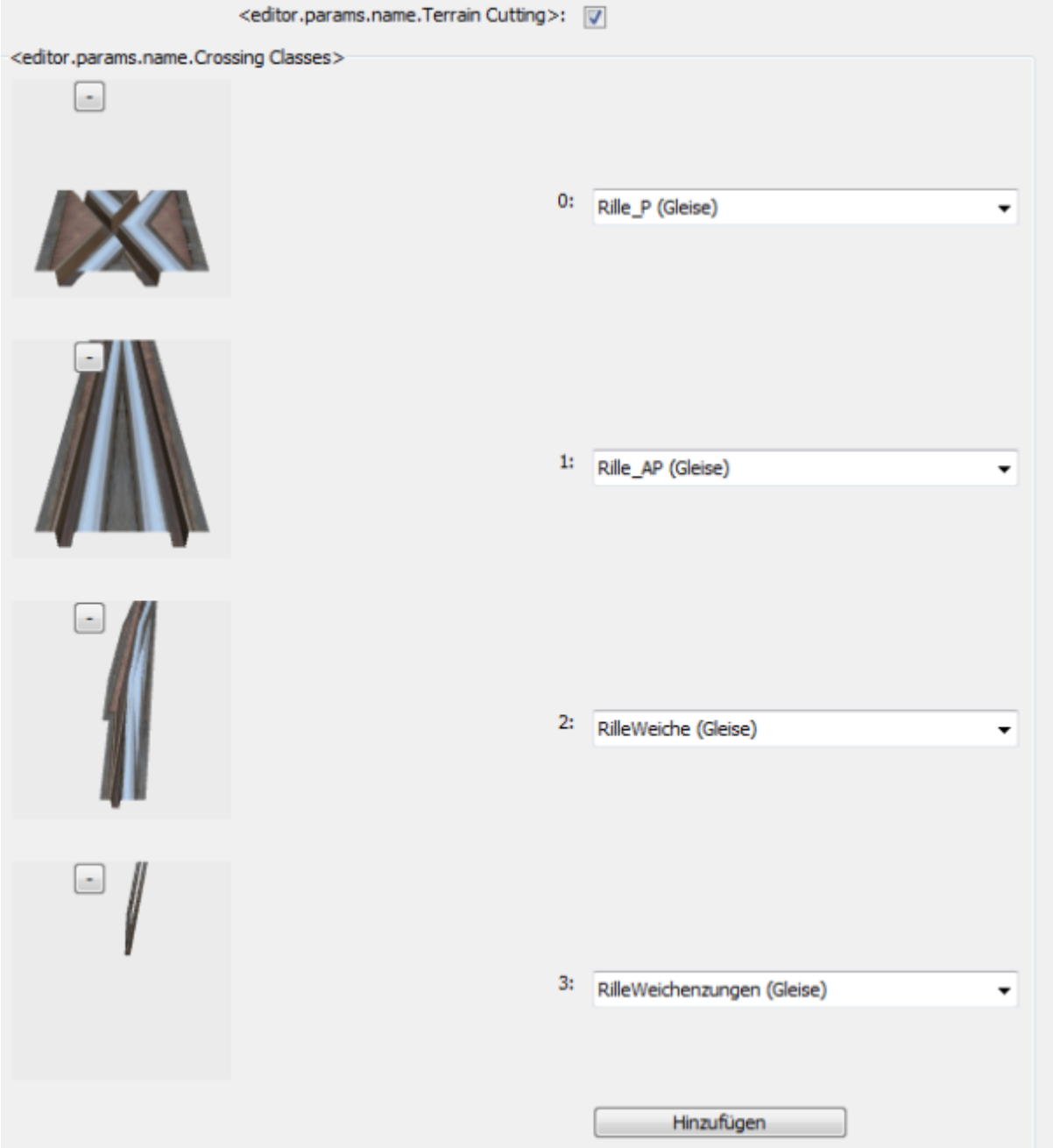
2 Import

You import the meshes with the Content Tool, but have a closer look at the material settings or general settings of the objects.

2.1 Railtrack

The railtrack spline has the category "Rails" within the Content Tool. Within the General Settings for our railtrack spline you have to setup the following:

You set the attribute "Terrain Cutting" only when the upper side of the rail is on the same level as the surrounded terrain. When having a ballast underneath the railtrack you won't set this.



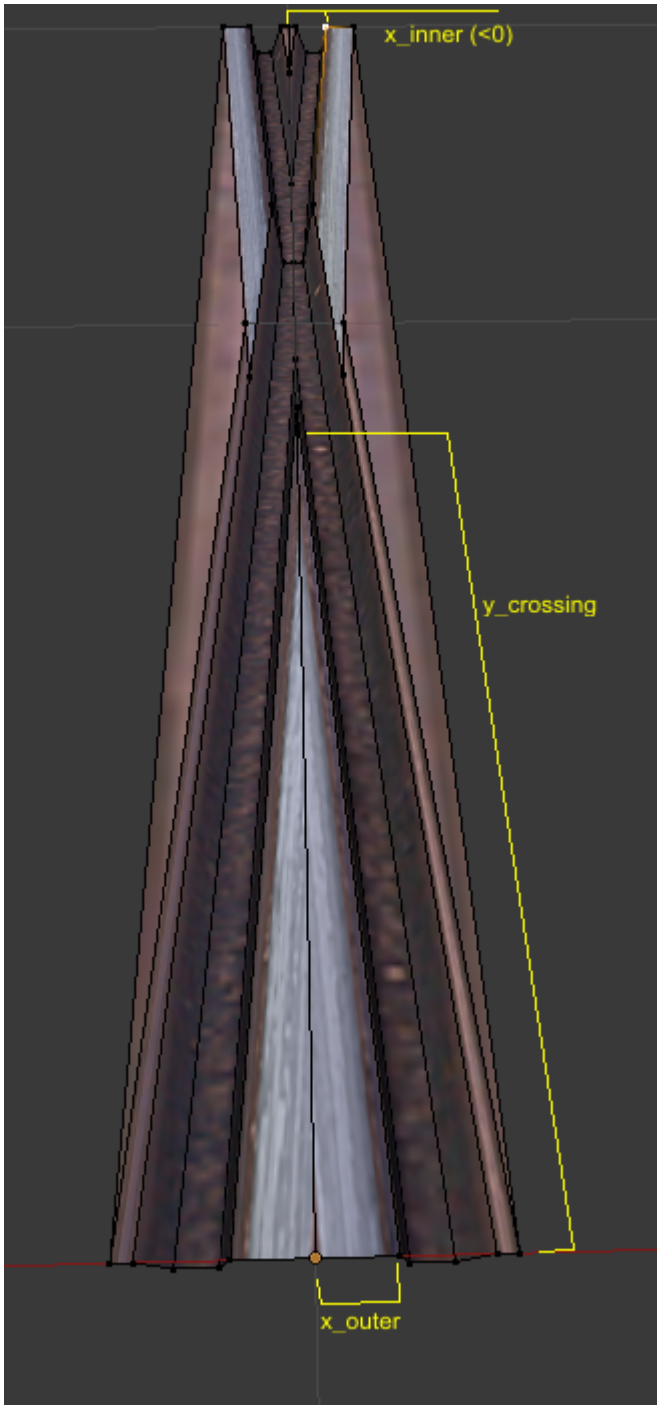
Every point frog and switch has to be added within the "Crossing Classes". You can use for different splines the same switches and so on. Obviously you should import the crossings before setting up the crossing classes.

2.2 Crossings

The following crossing types are imported as "Crossing/Switches". Set up the general settings as the following:

The "XingType" is the first setting, in the first place it's "Antiparallel". When importing point frogs you need the values for "XInner", "XOuter" and "YCrossing" relevant. You get them out of your 3d modelling program.

The setting "Terrain Cutting" has the same value as the railtrack spline. The value at "Step count" is "-1".



Keep in mind: The value of "XInner" is always below 0.

2.3 Switches

The process to import switches and switch blades is nearly the same as the process to import crossings. Within the general settings there are the attributes regarding the switch in our focus:

In the picture the settings "XOuter" and "XInner" are marked. The setting "YCrossing" is in this case three meters. This value is realted to other factors so you may change this value afterwards.

Watch out for the attributes "Length of one unit" (in our example "4") and the "step count" at "-1".

2.4 Switch blade

The switch blade has mostly the same settings as the switch itself. Obviously the XingType is "SwitchBladeBlade". To set up the mesh animation of the blade you choose withi the material settings the material type "Complex+Normal+Simple Meshanim" after yo set up the tangent info for the mesh. You'll then see three blades within the viewport of the Content Tool, but you'll see only one mesh listed on the right side of the Content Tool.

2.5 Ties

A tie is imported as a sceneryobject as category "Rails" to be able to select it in the Map Editor.

2.6 Ballast

The ballast is a standard spline also within the category "Rails". In a very rare case, the ballast also can be imported as a surface spline.