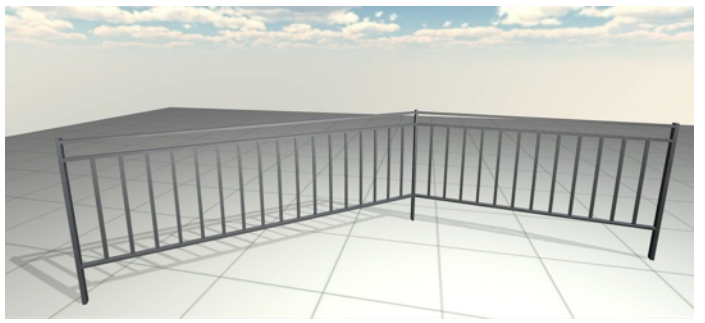
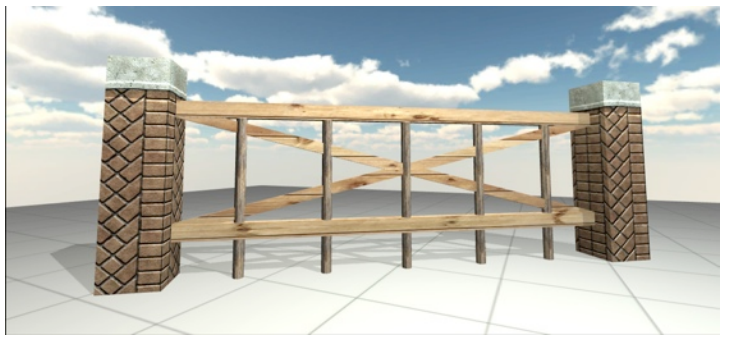
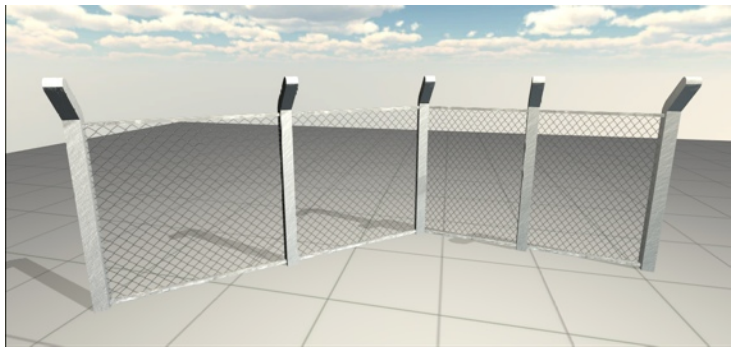
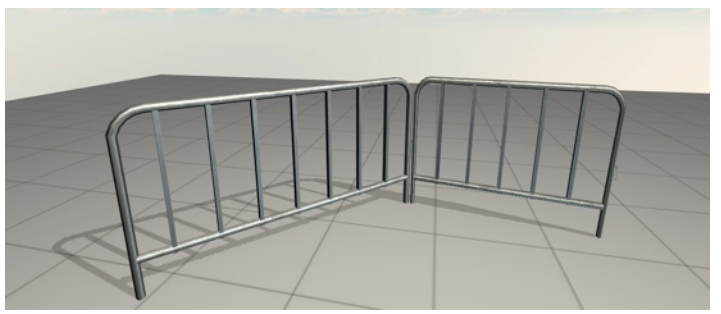
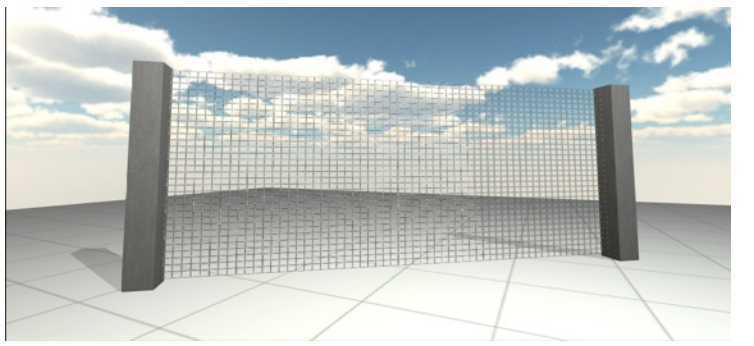
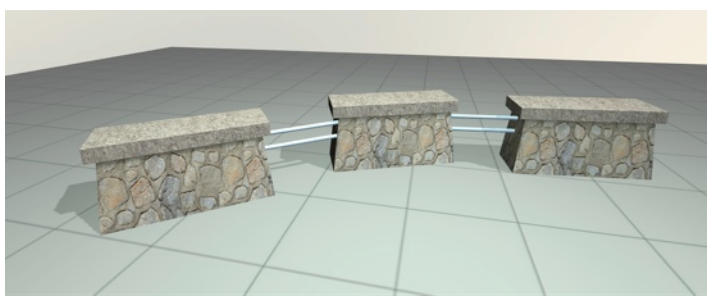
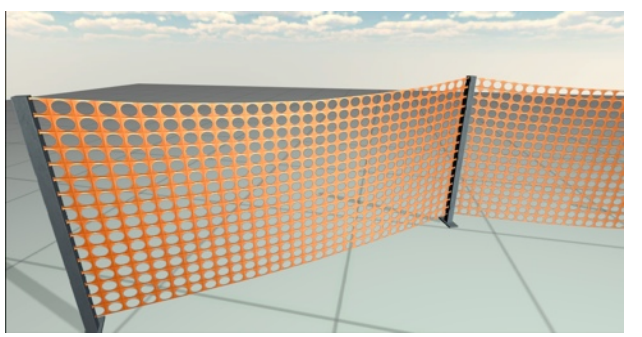
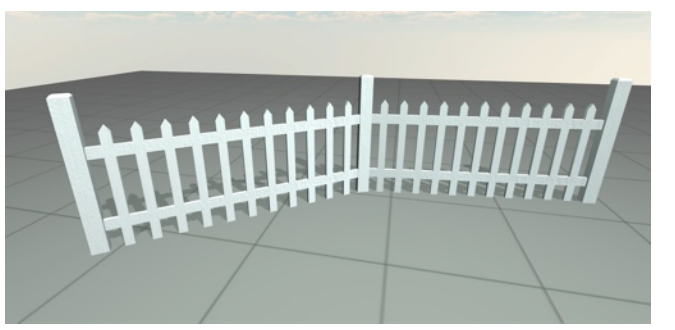
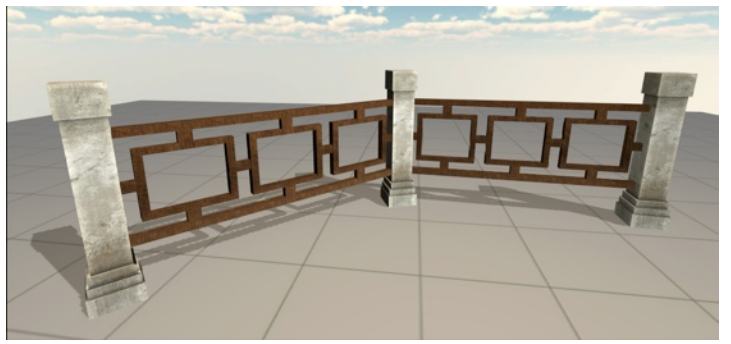
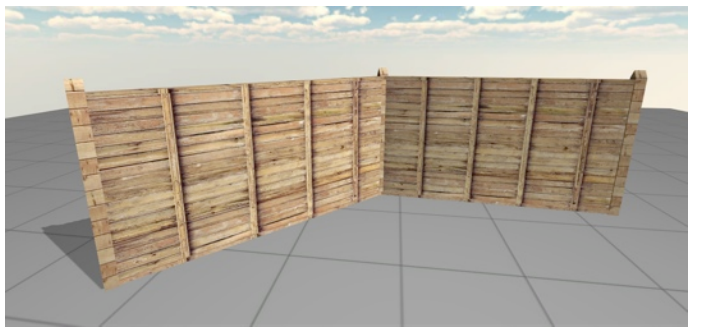
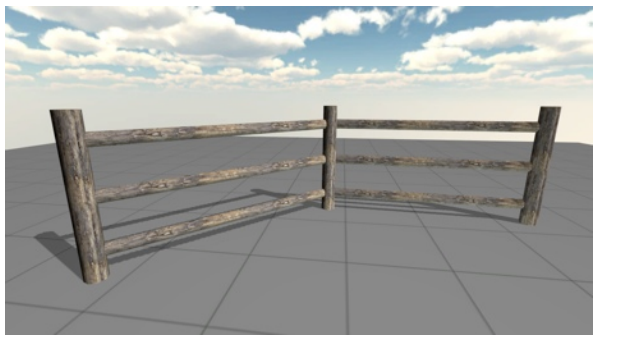
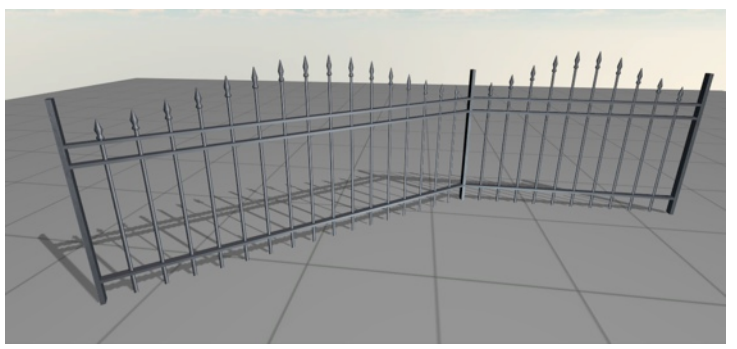
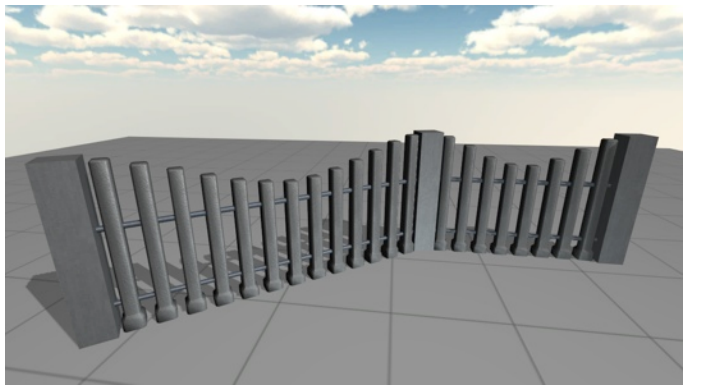
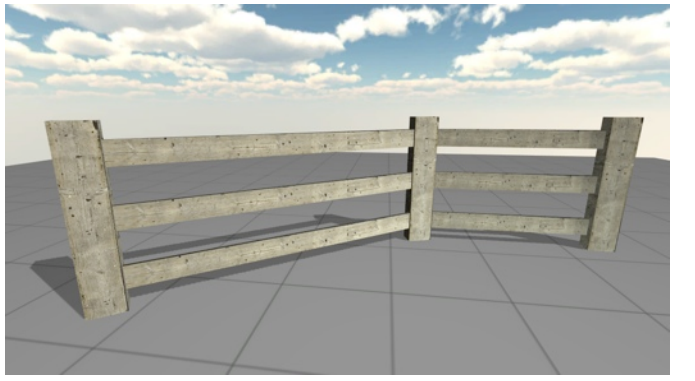





**... and hundreds more.**

# Auto Fence Builder

## Getting Started

The goal when creating Auto Fence Builder was to allow the creation of many styles of fences,  and build large networks of them with just a couple of clicks in the scene. No setup required... Just Click & Go!

To launch Auto Fence, select 'AutoFence Builder' from the Window menu or press Shift-Alt-F.

The new Auto Fence Builder will be added and selected in the hierarchy, along with a default preset.  In order to interact with Auto Fence Builder, it must be selected in the hierarchy.

### Creating The Fence

You can now start shift-clicking on either terrain or geometry objects to immediately build a new fence. (Auto Fence will build upon any terrain or Game Object/ that has a collider.)

Each time you click, the fence will continue to the new click-point by placing a  new fence post and extending the rails from the previous post. The fence will automatically follow the contours of your terrain or geometry.

To insert a new post between existing ones, shift-control-click near the midpoint.

To move or delete any post, switch on the 'Move & Delete Controls' in the inspector; You can now reposition a post with the movement handles, or delete a post by control-clicking on the sphere above the post.

If you have large gaps between the posts, you can switch on 'Interpolate'  which will place extra fence sections between you key points, determined by the 'Distance' slider. You can also smooth any corners by selecting the 'Smooth' tickbox in the inspector.

### Changing The Style of Fence

To choose a different style for the fence, select 'Choose Preset' menu within the Auto Fence inspector. This will change all the component parts. If you wish to change just one element, for instance, the style of the posts, you can choose from many varieties in the 'Choose Post Type' menu.

### Editing The Size, Shape & Complexity

The inspector contains all the controls for fine-tuning the design of the fence (See Editing Auto Fence on page 2-4). Here you can, for example, control the overall height of the fence, add multiple rails, or resize/move individual parts.

### Managing Your Fences

Auto Fence creates a folder in your hierarchy called 'Current Fences Folder' where all the parts of your current fence are stored. When you are happy with the design and layout of your fence you can press  the 'Finish & Start New' button at the top of the inspector. This will put all the components in to a 'Finished Auto Fence' folder, where they can no longer be edited by Auto Fence. You can of course edit/delete/move them using the normal Unity controls.

## Editing Auto Fence

### Component Parts

A fence consists of three main components:

**Posts** These are the main posts created wherever you shift-click in your scene, and in-between posts if you have 'Interpolate' or 'Smooth' selected. (You can choose to have non-visible posts by selecting '_No Post' in the 'Choose Post Type' menu.)

**Rails** Rails stretch between each post to create a fully joined fence. These can be either simple types such as planks or cylinders, or 'Panel' types such as boards, or wire sections. Select 'Choose Rail Type'

**SubPosts** These are 'filler' posts, typically smaller, that allow you to create multiple vertical posts between each main post. This allows for the creation of complex looking fences, but still achieved with a few simple clicks in the scene. Select 'Choose Sub Type'


### Post Options

**Fence Height** Controls the overall height of the fence - changing this will also scale the rails and subposts accordingly.

**PostHeight Offset** Allows the vertical position of just the posts to be changed, This can be useful if you want to sink them in to the ground a little for example.

**Post Size** Scales the size of the post, x: width, y: height, z :depth.

**Post Rotation** Allows the rotating of the main posts on 3 axes.

**Post Mat** Select a custom material for the post.

## Rail Options

**Num Rails** You can stack up to 12 rails vertically.

**Rail Gaps** When using multiple rails, this controls the vertical distance between each one.

**RailPosition - Offset** Allows the rails to be moved independently of the posts, sideways , up/down, and backwards/forwards.

**Rail Size** Scales the size of the rail, x: width, y: height, z :depth.

**Rail Rotation** Allows the rotating of all rails on 3 axes.

**Central Y** This will help place the rails centrally on the vertical axis, relative to the main posts.

**AutoHideBuried** Rails are removed if they would pass through the ground or other colliders.

## SubPost Options

**Show Subs** Subposts can be switched on/off.

**SubPost - Spacing Mode** **Fixed**: This allows you to have a fixed identical number of subposts between each main post, regardless of the distance of that section.

**Depends On Post Distance**: This will keep the visual space between subposts the same by adapting the number of subposts in each section.

**Sub Spacing** Controls the gap between each subpost, and therefore the number of subposts.

**Rail Size** Scales the size of the rail, x: width, y: height, z :depth.

**Rail Rotation** Allows the rotating of all rails on 3 axes.

**Central Y** This will help place the rails centrally on the vertical axis, relative to the main posts.

**Sub Position - Offset** Allows the subs to be moved independently, sideways , up/down, and backwards/forwards.

**Sub Size** Scales the size of the sub, x: width, y: height, z :depth.

**Sub Rotation** Allows the rotating of all subs on 3 axes.

**Force Subs to Ground Contour** Often you will use subposts to bridge between rails, requiring them to be offset from the ground to match the rails.

Alternatively, **Force Subs To Ground Contour** will give you the option to set the subposts at ground level and to follow any unevenness of the ground's contour.

**Use Wave** Using the built-in sine-wave generator, it is possible to create some classic ornate fence designs. (Show subs must be enabled)

**Frequency** determines the number of wave patterns

Frequency = 1

Frequency = 3

**Amplitude** determines the height of the wave pattern:

Amplitude = 1

Amplitude = 4

**Wave Position** offsets the sideways positioning (phase) of the pattern:

WavePosition = 1.57

Wave Position = -1.57

## Global Options

**Interpolate** Auto Fence initially creates main posts at the points you click in the scene. If these points are far apart, the span of each section would be too large and look unrealistic.

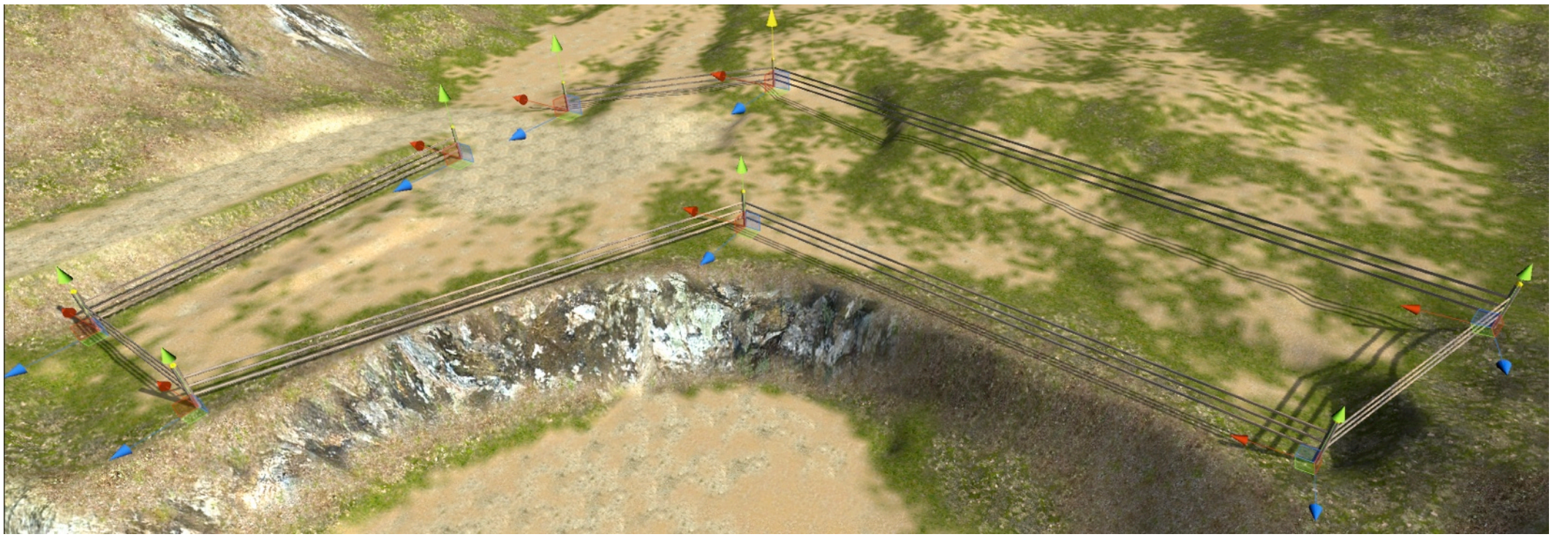
By enabling Interpolate, Auto Fence will automatically place posts between your click-points, at regular intervals. This makes it possible to create long complex runs of fencing in just a couple of clicks: Auto Fence will fill in all the details and correctly adapt to the shape of the ground it builds upon. Distance controls the spacing of the interpolated posts.

Long fence created with 3 clicks:

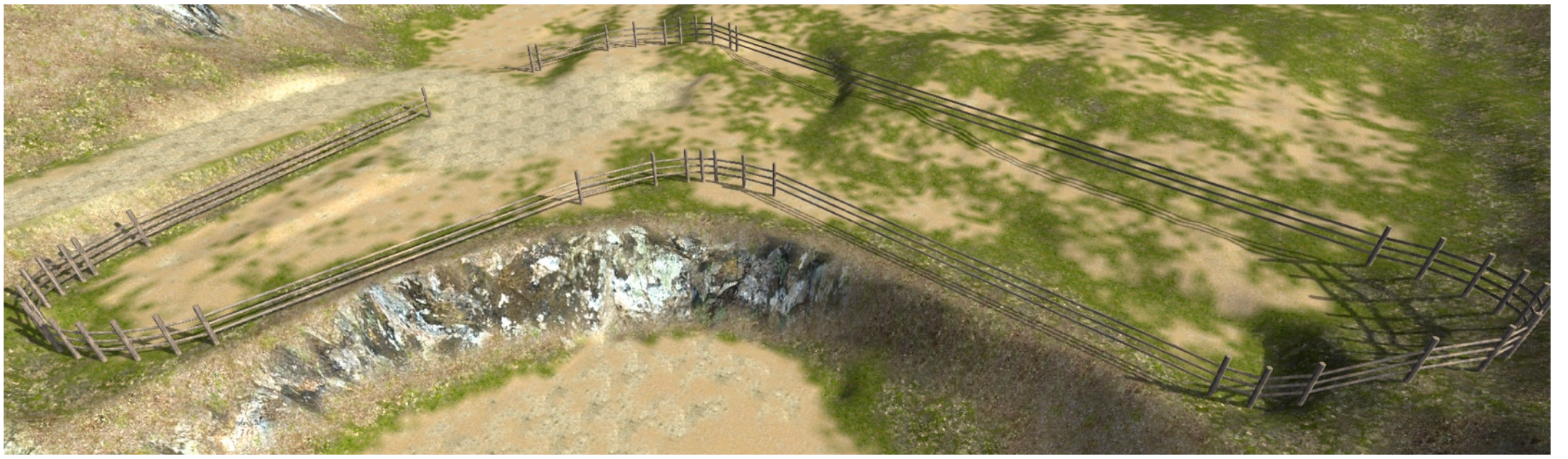
The same with **Interpolate** enabled, Distance = 3:

**Smooth** If you create a fence with a few simple clicks and have sharp angles at corners, you can round-off the shape of the fence using the Smooth control.

Simple fence created from 8 clicks:



With Smooth enabled:



(... Smooth continued)

**Rounding Distance**

For the sake of performance you may wish to control the density of the smoothing posts to have as few as possible. By specifying an average distance between smoothing posts, you can have more or less posts created.

** As all of the following settings are concerned with optimizing the number of posts, you should disable Interpolate temporarily, as it is difficult to see the effect of the optimising controls if all sections are being interpolated as well. **

Rounding = 1:

Rounding = 9:

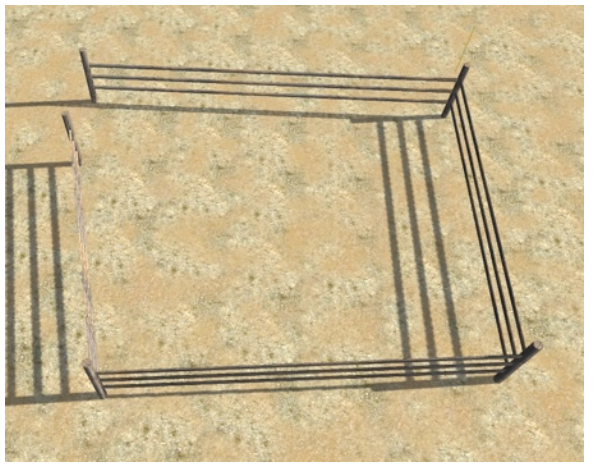
**Remove From Straight Sections**

Again for the sake of performance, you may wish to remove posts on straighter sections that do not contribute to the smoothing. This controls allows you to remove posts where the angles between sections are minimal.

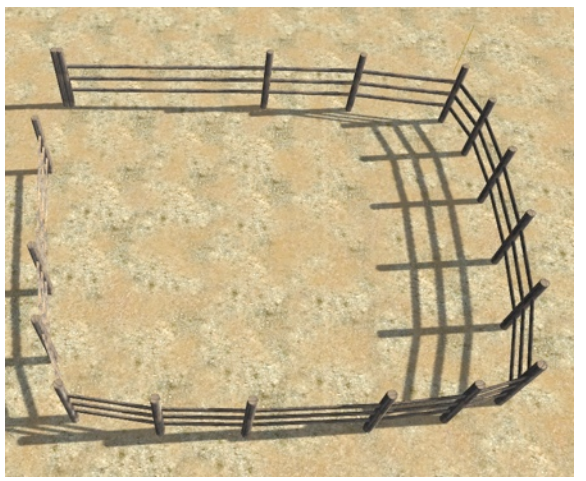
Remove From Straight Sections = 12, notice the long straight sections with no posts:

Remove From Straight Sections = 2, notice how the smoothing posts extend further from the corners in to the straighter sections

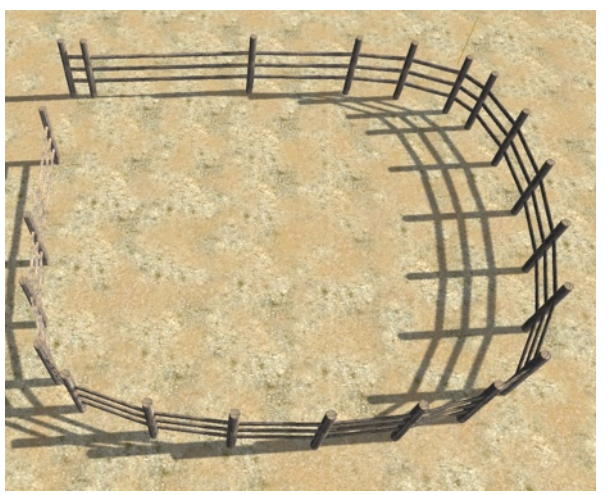
**Corner Tightness** This slider lets you choose the amount of smoothing, from tight angle to full rounding:



Corner Tightness = 1.0:



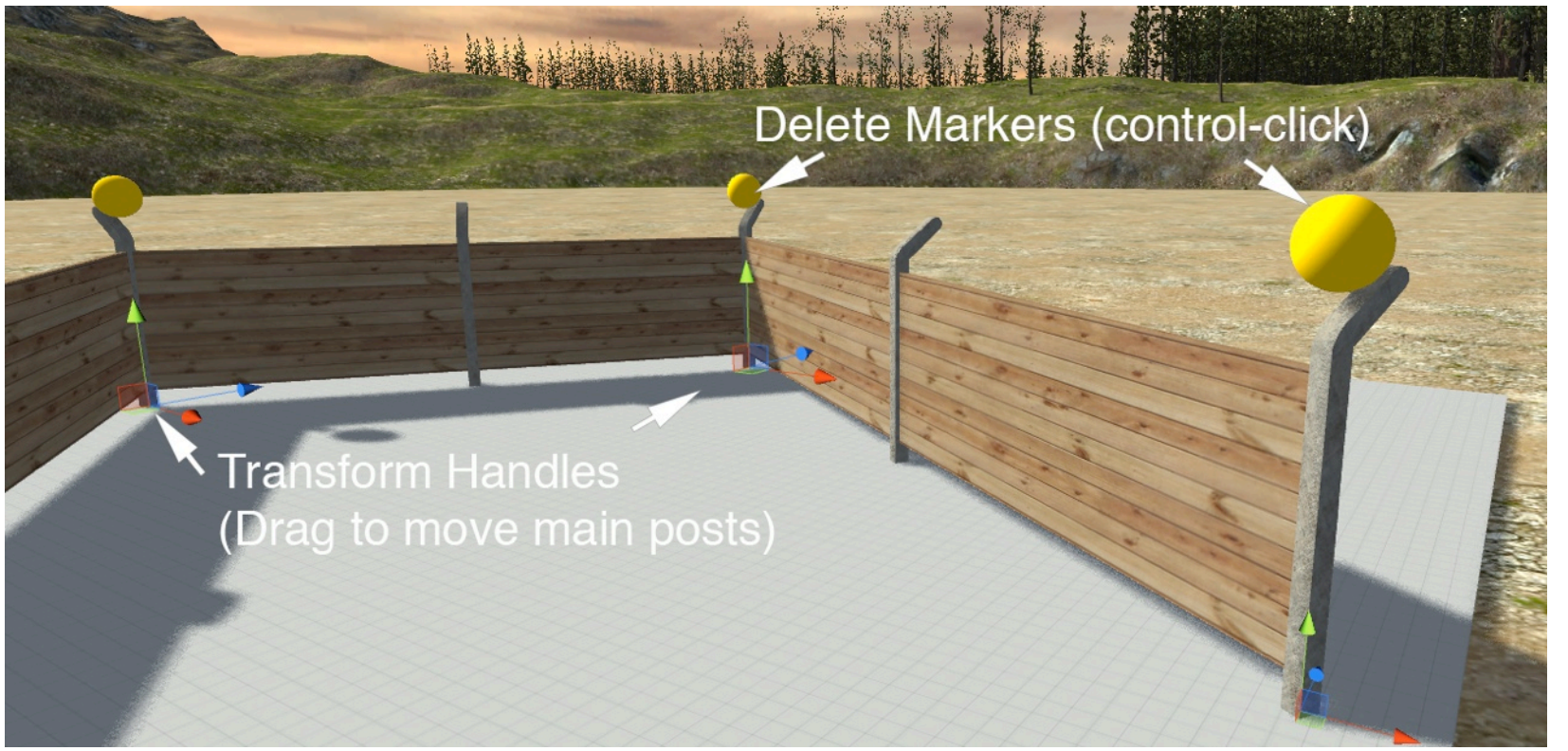
Corner Tightness = 0.5:



Corner Tightness = 0.0:

**Close Loop** This will create a final post at the position of the first post to create a closed loop. 'Close Loop' can be switched off again to restore the original positions.

**Show Handle Controls** Enabling this will show the transform handles and the delete markers.




**Move Posts**

You can reposition the main posts by dragging the transform handles to a new position

The posts will remain grounded and change their elevation as you drag. Because of this, when dragging across very steep slopes, you may find it easier to drag the red/blue handles or planes individually as the height is locked to the ground. Note, the green height transform pointer is not moveable individually as this would try to lift the post off the ground.

One of the handles on the first post is for Auto Fence itself, this can be moved out of the way anywhere if not required.

**Delete Post**

Control-click on a yellow Delete Marker to delete that post. The fence will simply re-join the neighboring posts.

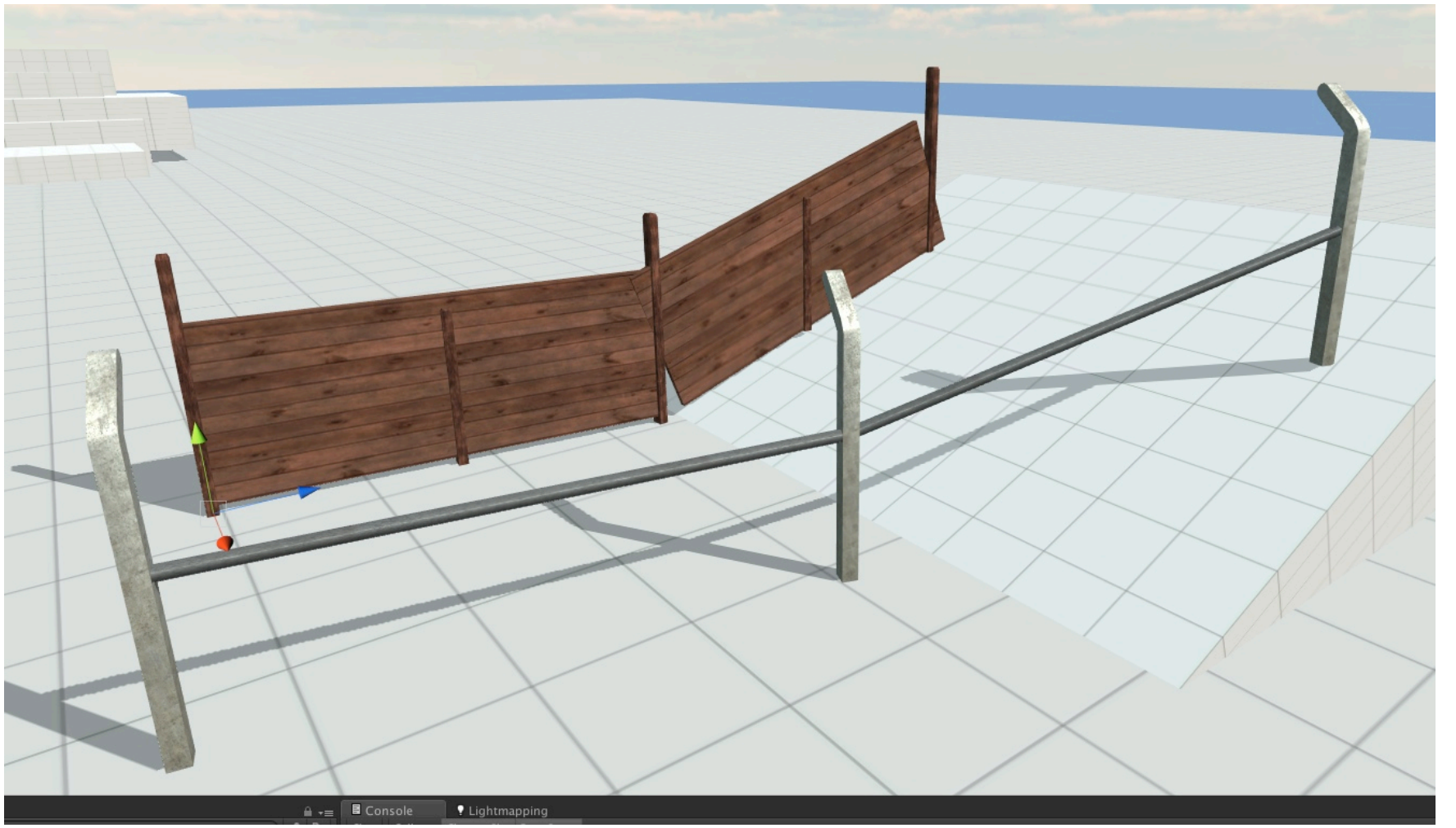
**Insert Post**

To insert a post, shift-control-click approximately midway between two other posts.

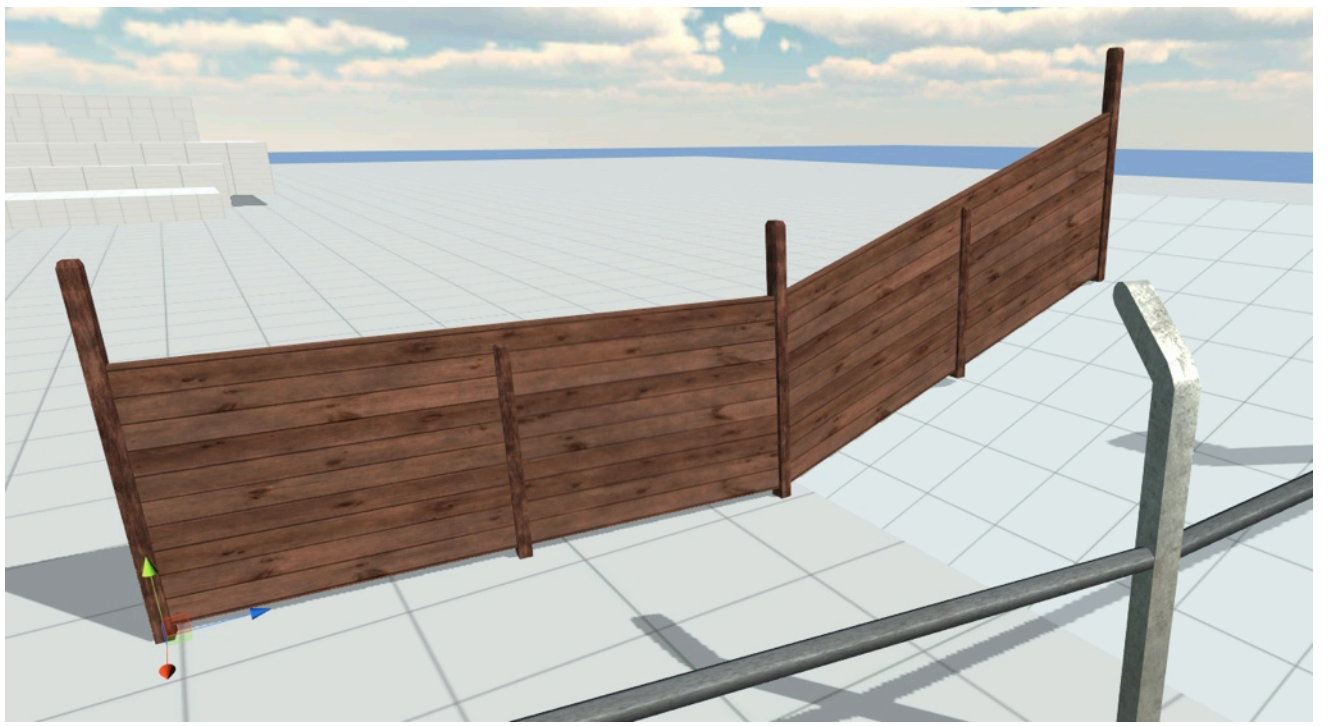
**Slope Mode**

This determines how the rails will function when on a sudden change of slope or elevation. It really only affects 'Panel' type rails, i.e. tall sections that fill a vertical span, as these look different when tilted. Normal rails, such as a thin cylinder don't look any different and Slope Mode is disabled when using these.

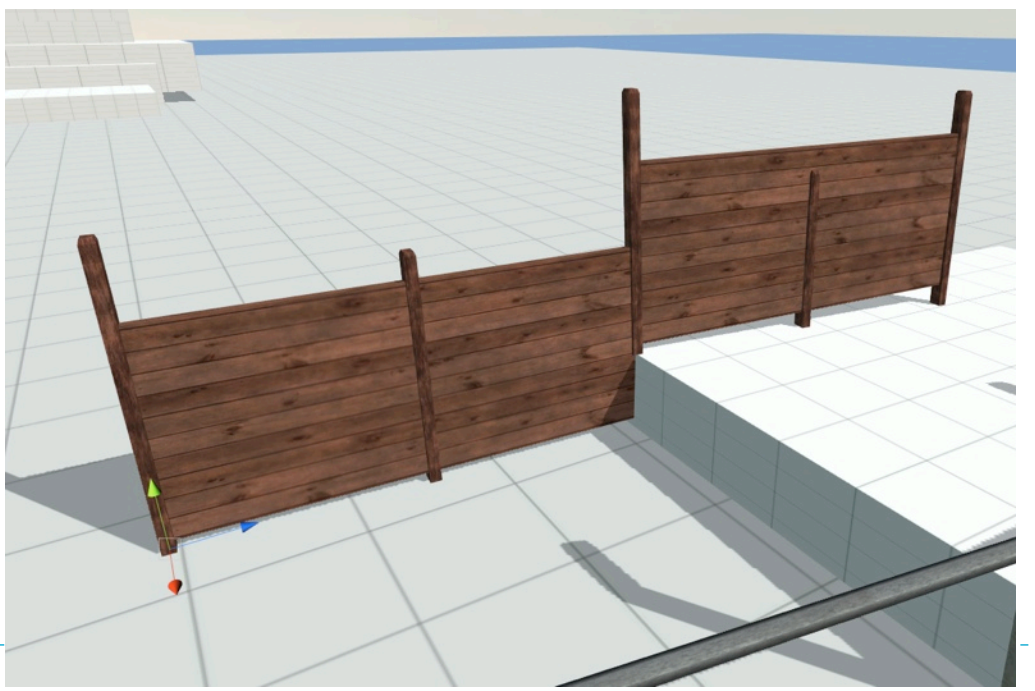
In '**Normal Slope**' mode, you can see that the wooden panel looks wrong when it is tilted to the angle of the slop, but that the black rail looks fine.



In '**Sheared**' mode, you can see that the wooden panel looks much better with its mesh deformed to keep the upright sections vertical. The down-side to this is that a new mesh must be created for every Panel-style rail, and this could have performance and memory implications on large scale fences with many rails.



In '**Stepped**' mode, the next Panel is raised to the next post-height. This requires manual placement of any posts that align with the intersection of the next step.



**Add Colliders** Adds a Box Collider built upon one rail between each pair of main posts. (not subposts). If you finish the fence and have long straight sections, it can be more efficient to remove the colliders from those rails, and make one large one on a new Game Object.

## Presets

Presets can be selected from the drop-down menu.

To save a preset from your current settings, first give it a name in the text box to the left, then click 'Save Preset'.

Presets are saved to individual files in Assets/Auto Fence Builder/Editor/Auto Fence Presets. They can easily be transferred to a new project, by copying to the same directory in the destination project. Auto Fence will see them next time it is instantiated.

## Adding More Fences

**Finish & Start New** You shouldn't add more than one instance of Auto Fence to the scene, instead use Finish & Start New. This will place your current fence in to a folder named 'Finished AutoFence'. You can now continue clicking which will start a completely new fence. Once a fence is 'Finished' it is no longer editable by Auto Fence. However, if you later wanted to change it, you can select the same fence preset, then using the old one as a guide, just shift-click along its length a few times until you have created an editable duplicate.

**Clear All** This will clear all the fence you're currently working on. You could, alternatively, control-click on all of the delete markers to remove the fence.

## Performance

Auto Fence Builder's primary purpose is to allow for the design of any style of fence, and to easily build large stretches of fence over uneven ground. Individual fence components have been designed to use as few polygons and materials as possible. Materials use specular and normal maps where they contribute noticeably, and simple diffuse shaders have been used where they look good on their own. You have the option to change shaders depending on your needs.

On a typical use, say a perimeter fence around a house, the entire fence can use as few as one to three drawcalls, and one drawcall is possible if all components use the same material. In terms of batching performance, it's generally preferable to use a few medium-size fences than a couple of massive ones. On the other hand, with very complex designs with many rails and subposts, lights and shadows, then drawcalls can be higher.

Depending on the scene's needs and your target platform, it's necessary to make the same choices you would if you were modeling the fences in the traditional way. i.e. designing a fence with multiple component parts and detailed parts (e.g. the Victoriana preset), is going to use many more polygons than a simple design such as DarkPanels2.

The meshes are combined when you have finished your fence and press 'Finish & Start New", but you have the option to disable the combine script attached to 'Finished AutoFence' if you want to. The meshes are also temporarily combined when you enter Play mode to preview the current fence you are working on.

## Creating Your Own Prefabs

The simplest way is to duplicate a preset in the 'FencePrefabs' folder and assign a new material. The finished prefab name must end with _Post or _Rail.

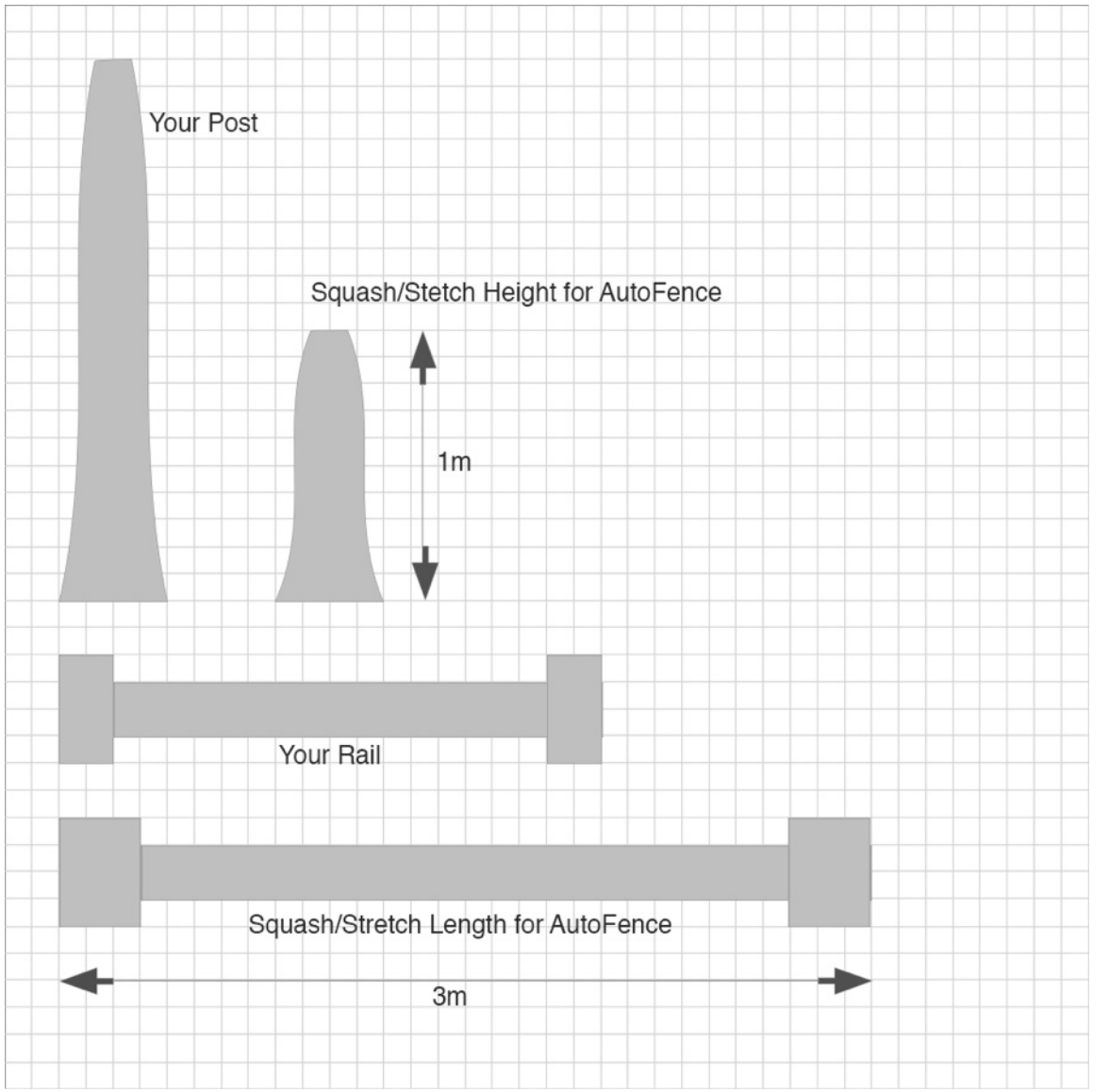
However, if you want to add a custom mesh:

Posts should be exported as .fbx at 1m high and whatever width/depth suits your design. Bear in mind, the height can be scaled within Auto Fence, so it is is best to initially build your post of any dimension that looks good, and then finally scale the height down to 1m; even if it looks squashed/stretched it will look correct when restored in in Auto Fence. This ensures that all designs can be scaled consistently. The pivot should be set to the center of the base. If they are intended only as subposts, you can use any height.

Rails should be 3m long. This is important so that they link correctly to the posts. You can design any size rail you want, but squash/stretch just the length to 3m before bringing in to AutoFence. AutoFence will then rebuild it to the correct looking length. The pivot should be set in the centre of the left end of the rail.

Due to there being different interpretations of +X/-X or +Z/-Z in different modeling software, you might find that you need to rotate Rail models 90 degrees to lie in the right direction. However, if this isn't possible, you can set the rotation for the rail within AutoFence.

If this proves tricky, you can import one of Auto Fence's .fbx models in to your own software to use as a template, following whatever orientation seems to apply in any particular program.



After importing your .fbx in to Unity, simply create a prefab from it by dropping it in to a scene, and then dragging it from the hierarchy in to the 'Auto Fence Prefabs' folder within Auto Fence Builder.

Posts must be named ending with '_Post' (e.g. 'RustyIron2_Post' ) in order for Auto Fence to recognize it as a valid post.

Rails must be named ending with '_Rail'. Panel-style rails should be named ending with '_Panel_Rail' so that Auto Fence knows to treat them a little differently.

## Troubleshooting

| | |
|---|---|
| **Shift-clicking doesn't add posts** | Make sure Auto Fence Builder is selected in the Hierarchy |
| **I can't select anything in the scene** | Click somewhere off Auto Fence Builder in the Hierarchy. Remember to re-select Auto Fence Builder to be able to shift click new posts in the scene view. |
| **Some rails have disappeared** | Disable AutoHide Buried. |
| **There is an extra transform handle** | This is just the transform handle of AutoFence, it can be ignore or moved. |

After importing Auto Fence Builder it should remain in the top level of your Assets folder with its contents unmoved. If any of its resources are accidentally deleted, 'Finish' the fence by pressing 'Finish & Start New', and reimport the Auto Fence Builder package.

We understand it can be frustrating to buy an asset and find a problem, so it's been tested exhaustively on a variety of setups, but being the first release 1.0 we maybe fudged-up somewhere in a remote dusty corner that someone will eventually explore with a particular setup!

So... any issues, bugs, missing features etc.... *please* contact us at twoclicktools@ gmail.com before leaving a review and we'll get straight back to you.

We'd love to hear your feature requests, ideas for new component parts etc., and see any great fence designs you come up with.