

Auto Fence Builder

Getting Started

Thanks for buying Auto Fence Builder, its aim is 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.

To launch Auto Fence, select ‘Auto Fence Builder’ from the GameObject 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 your 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 & Finishing 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 into 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. See **Finishing** at the end of this manual for more information.

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.
- Main Post SizeBoost** Scales the size of Main Posts (where the user clicked), but not interpolated posts
- Post Rotation** Allows the rotating of the main posts on 3 axes.

Rail Options

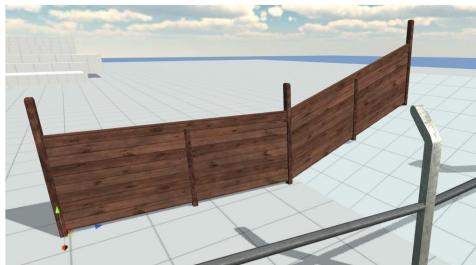
- Central Y** This will help place the rails centrally on the vertical axis, relative to the main posts.
- Num Rails** You can stack up to 12 rails vertically.
- Rail Gaps** When using multiple rails, this controls the vertical distance between each one.
- RailPosition Offset** Allows the rails to be 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.
Overlap at Corners	Extends the length of rails to close any gaps at the joint.
AutoHideBuried	Rails are removed if they would pass through the ground or other colliders.
Slope Mode	Determines how the mesh is modified when over a slope or height change. Set 'sheared' when needing panels to smoothly join, over a slope.

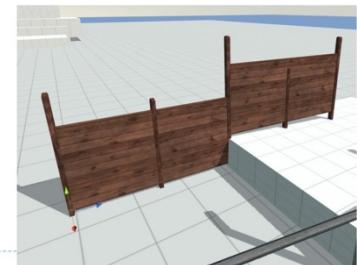
Normal



Sheared



Stepped



Add Secondary Rails Adds an independent second rail part that can have its own design settings.

SubPost Options

Show Subs	Subs can be switched on & off
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.
Sub Position Offset	Allows 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, as in this image

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.

Frequency = 1



Amplitude = 1

Frequency = 3



Amplitude = 3



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. **Interpolate** disabled:



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



Keep Interpolated Posts Grounded

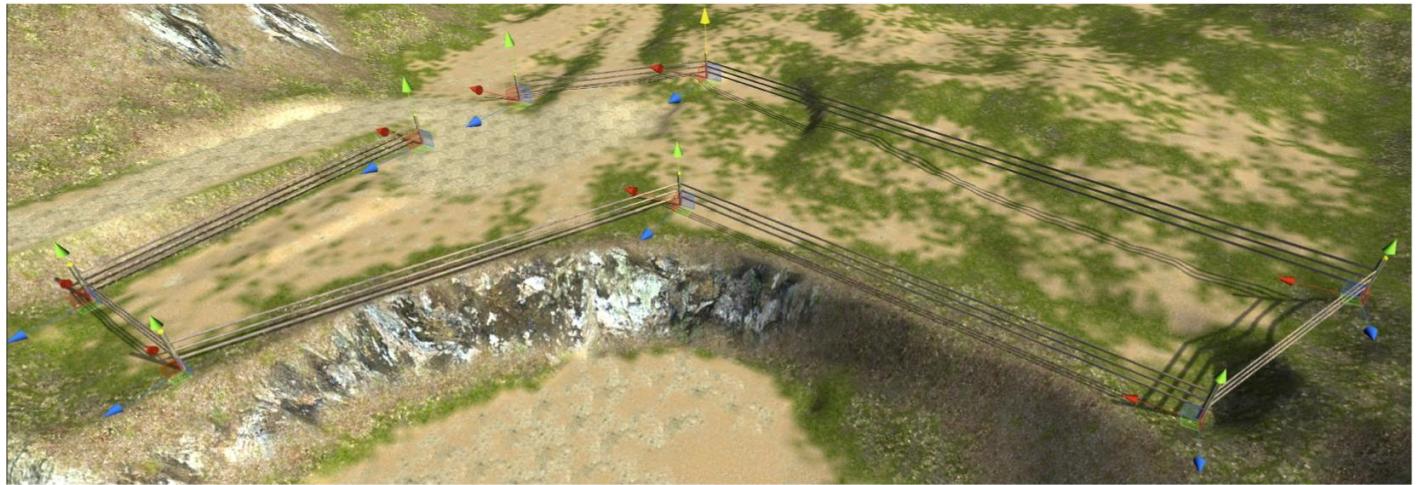
AFB automatically keeps all interpolated posts on the ground.

If you prefer them to be linearly arranged as in the image below, then disable this.



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. **Smooth** disabled:

With **Smooth** enabled:



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:

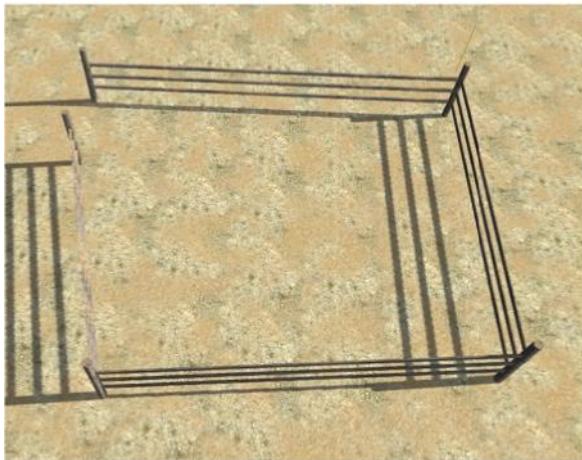


Remove From Straight Sections = 2, notice how the smoothing posts extend further from the corners in to the straighter sections

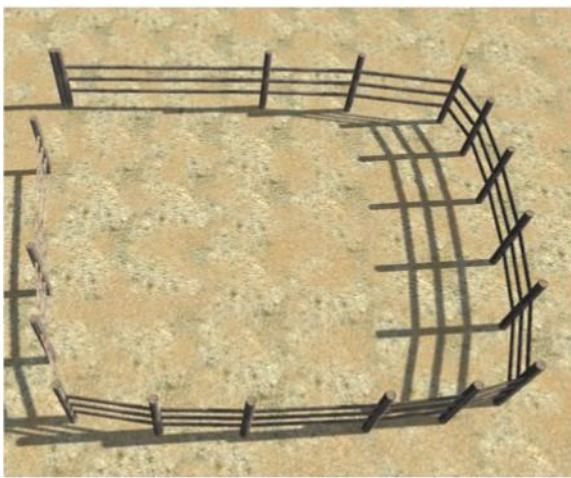


Corner Tightness This slider lets you choose the amount of smoothing, from tight angle to full rounding:

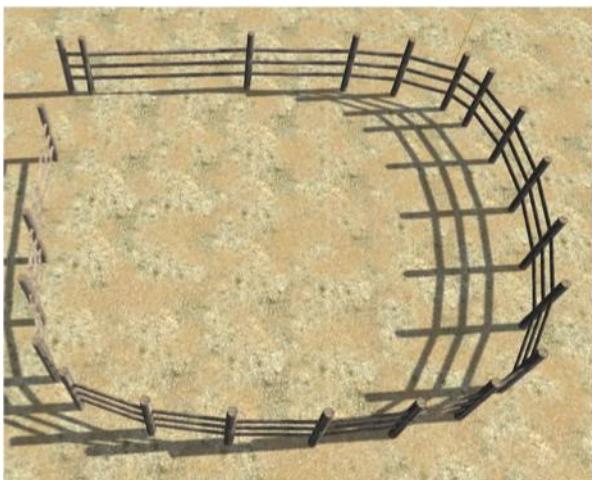
Corner Tightness = 1.0



Corner Tightness = 0.5



Corner Tightness = 0.0

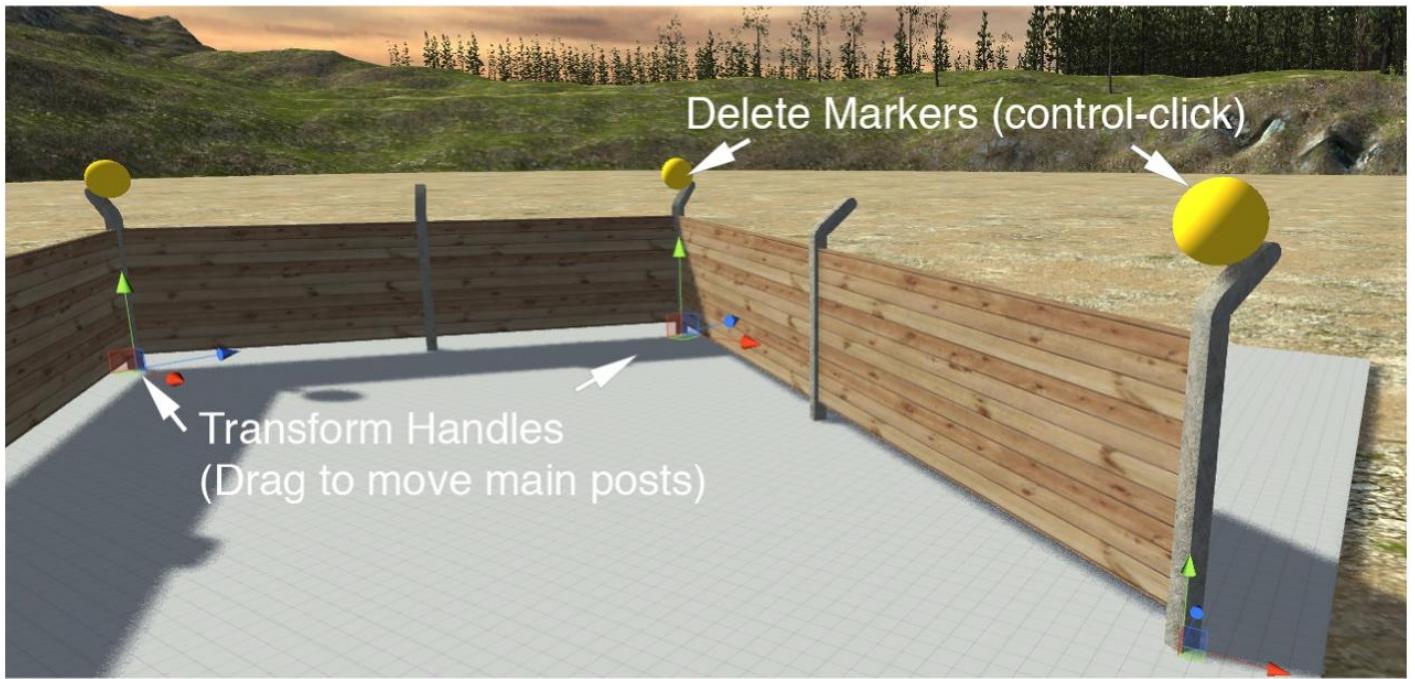


Close Loop

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 Move, Insert & Delete 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.

Add Gap

To create a gap, Control-Right-Click. This will create a space from the previous post, then regular shift-clicking will continue the fence after the gap. Note: '**Allow Gaps**' must be enabled in the **Global Options** section.

Edit Gaps after fence was created: enable 'Show Move/Delete Controls' (at the top of the Inspector), then control-RIGHT-clicking on the yellow markers will toggle them to gap/closed. (Be careful not to control-LEFT-click, as this deletes posts -- though they can of course be re-inserted)

Three blue lines will be drawn in the editor to show these gaps. These can be disabled with 'Show Debug Gap Line', though it's recommended to keep it on, as without it it's difficult to see if you're looking at lots of separate smaller fences, or a single continuous one with gaps.

(Gaps Continued...)

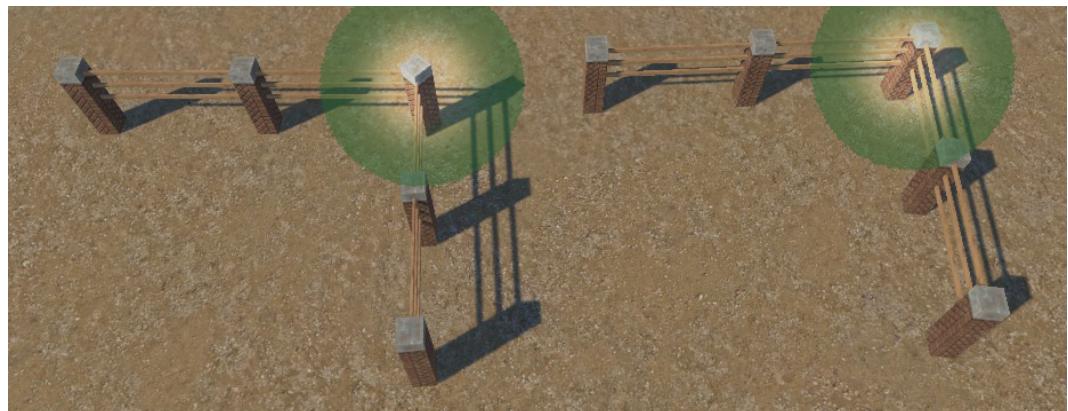
Note: Trying to create two consecutive gaps will merge them in to one larger gap as it doesn't make sense for AFB to store multiple lots of nothing.

As ever, if mistakes are made while experimenting with gaps, posts can be easily re-instated by control-shift-clicking with the left mouse button in the usual way.

Global Scale	Enables all parameters of a fence to be scaled globally. If 'Scale Interpolation Also' is selected, the interpolate distance, will modify the number of in-between posts, and keep the width/height ratio the same to preserve the rail shape. Leave this unchecked if you don't want the number of posts to be affected.
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.

Advanced Options

Random Post Height	Adds random variation to the height of the Posts and Subposts
Random Roll	Adds random rotation to all Posts, Subposts & Rails around the x axis
Random Yaw	Adds random rotation to all Posts, Subposts & Rails around the y axis
Random Pitch	Adds random rotation to all Posts, Subposts & Rails around the z axis
Snap Main Posts	This will snap all Main Posts (the user's click points) to the Unity World Grid Note: This is not intended to work on interpolated Posts or Subposts, as these Need to be set to neat in-between positions by AFB.
Snap Size	The quantization size of the snapping. Default = 1
Lerp Post Rotation	By default, the Main Posts are rotated at corners to interpolate the angle between the fence either side. If you want to keep them rotated to match the incoming rail angle, then disable this.



Rotate Alternate Repeats	When you have multiple straight wall-type panels together, it can be easy to see the repeated texture from one panel to the next. This option will rotate every 2 nd panel-rail on the y-axis to disguise this repetition. Note: This will not happen on slopes, as the symmetry would be broken. Also, if your chosen rail design is not symmetrical, this will give strange results. You will need to consider if it helps on a case-by-case basis.
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Cloning Options

Copy Layout

Drag a ‘Finished’ Fence in to the empty Game Object box, and press Copy Layout. This will copy the layout (all post positions) to the current fence. i.e. you will now have 2 fences in identical positions.
By doing this, you can for instance, create a stacked fence (use ‘Global Lift’) Or simply use the current fence to add new post and rail design details to an existing finished fence. This is deceptively powerful and effectively means you can create fences and walls with any amount of unique independent parts.

Batching & Combining: Performance Options

These options are designed to optimize performance by combining lots of the small parts in several combined meshes. This can drastically improve frame rates in Unity.

It’s advisable to check which mode is giving optimal performance on a project or scene-by-scene basis, as there are lots of factors that can affect which will give the most benefit.

Batching Mode

Add Combine Scripts

This option keeps the fence parts separate in the Hierarchy, but at runtime will be combined into joined meshes. This offers good performance, and allows you to keep the parts separate if you wish to later edit a finished fence while in the editor. (e.g. delete or move certain sections)

However, because they are joined (by an attached script) at runtime, you can not dynamically modify the parts during runtime.

Static Batching

If you have enabled Unity’s ‘Static Batching’ [Edit->ProjectSettings->Player]

Then you can choose this option. Instead of attaching scripts to perform the combining, Unity will automatically batch them at runtime. With this option enabled, AFB needs to mark all the parts as ‘Static’.

This mode also retains editability in the Editor, but loses editability at runtime.

None

This has no performance benefits from either combining or batching. It should only be used if you intend to modify the fence parts in any way at runtime.

Adding More Fences

Finishing

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 clear the old fence and 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 clone it in to a new fence using the Copy Layout controls.

Finish & Duplicate

This is the same as Finish & Start new, while also keeping the current fence instead of clearing it. This is another way of cloning a fence.

Clear All

This will clear all the fence you're currently working on. This enables you to start on a new fence if you do not wish to keep or 'Finish' the current one. You could alternatively, control-click on all of the delete markers to remove the fence parts.

Creating a Copy of the Fence with permanently merged meshes, and creating independent Prefabs.

After performing either a 'Finish & Start New' or 'Finish & Duplicate', the resulting folders will have a Button script attached called "Create Merged-Mesh Copy". This will make a completely independent object from AFB, comprising of just a few pre-combined meshes.

You could, for instance, create a prefab from this folder, the export it as a .unitypackage. If you then imported this package in to a new empty project, the entire merged fence with materials and meshes would be present. i.e. no need to have Auto Fence Builder in the project.

These merged meshes can also be easier to work with when setting up custom lightmaps.

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.

Creating Your Own Prefabs

See 'Using Custom Objects.pdf' You can now drag&drop custom objects, or use the old method below.

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 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.

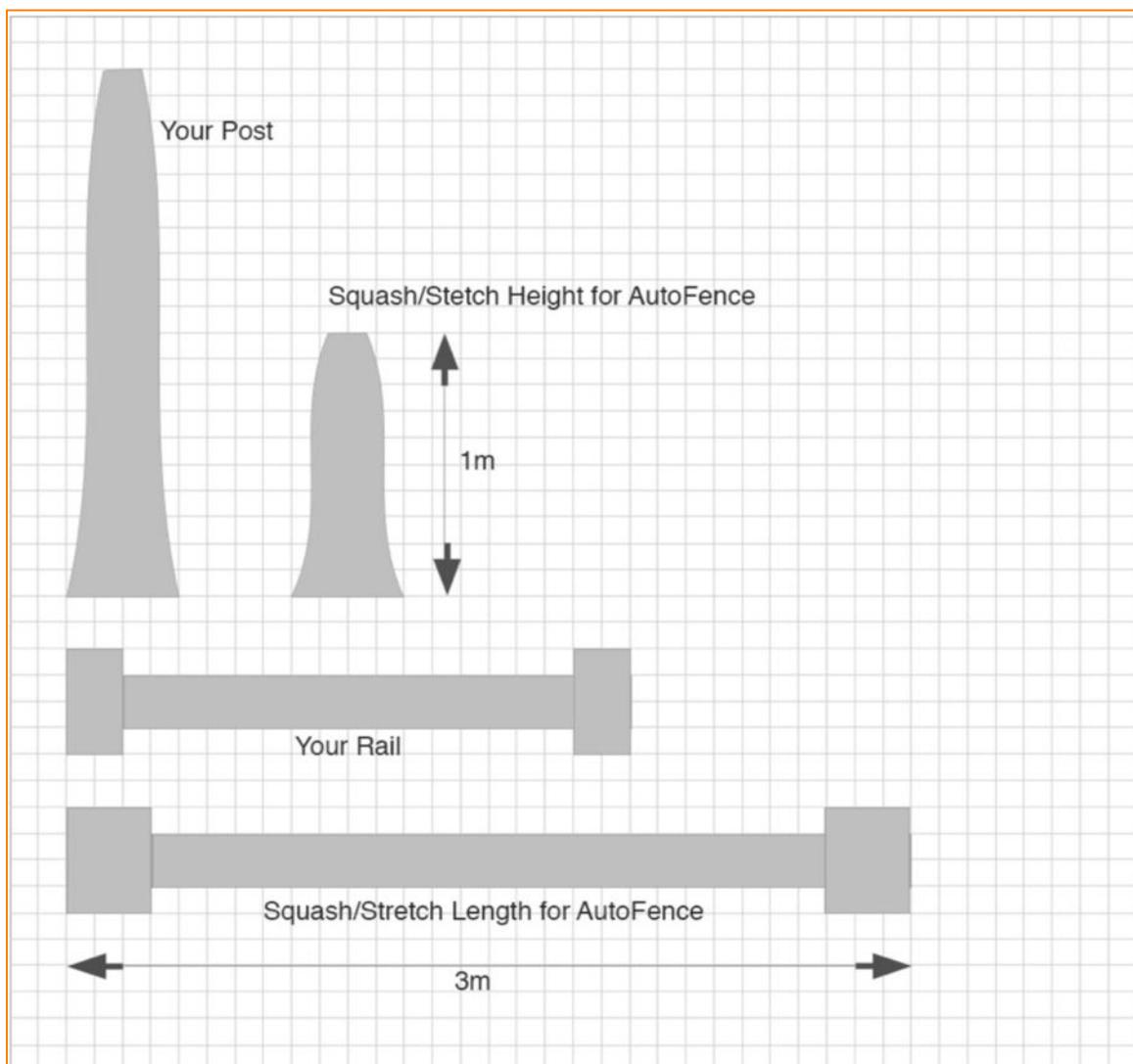
Rails should be 3m long. This is important so that they link correctly to the posts. You can design any size rail you want, but squash/stretch just the length to 3m before bringing in to AutoFence. AutoFence will then rebuild it to the correct looking length. The pivot should be set in the centre of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

Add a material to your mesh and convert to a prefab by dragging from the Hierarchy to Resources/FencePrefabs.

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.

Note: Meshes & Prefabs must be *single*, top-level objects – no groups/folders.



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 Rails.
There is an extra transform handle	This is just the transform handle of AutoFence, it can be ignore or moved.

Textures

Most of the textures are saved in compressed .png format for space-saving. If you want to edit the textures that have an alpha channel in Photoshop, you will need something like the free SuperPNG plug-in, otherwise you may see the alpha channel incorrectly interpreted as transparency.

Most of the textures are 2048x2048 and were imported with a high 'Max Size' and 'Aniso' level for quality. You can lower these settings to target low-end platforms and mobile if necessary.

And finally...

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.

