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# Stair Builder 12



## Introduction

Stair Builder is a collection of software tools that will help you design and model stairs in ArchiCAD. It provides **better control** while being **less complex** than other solutions. It is designed for people who find it awkward to design stairs within a settings dialog or wizard, and who prefer to design within the context of the virtual building.

Some benefits of Stair Builder include:

- **Design in Context.** Each flight, landing and balustrade is a separate element that can be stretched and re-shaped graphically. As a result you can directly reference other building elements (walls, slabs, etc.) as you design the stair.
- **No Calculations** As flights and landings are added to the stair, the riser height of all flights is automatically re-calculated. If you stretch a flight, extra treads are added, linked flights and handrails will adjust to accommodate the change, and the riser height for the whole stair will be updated. The base elevation of each flight is also automatically calculated. You can adjust the total rise at any time.
- **Intuitive Design** Designing a stair with the new Stair Builder is similar to drawing walls in ArchiCAD. Click to place, rotate and stretch each flight or landing into place. If the reference edge aligns with that of an existing stair, the new flight will automatically link to the stair. To place a railing along the edge of a stair, choose the *Railing* tool and click on the stair edge.
- **Powerful Graphic Editing** Each flight and railing can be individually selected in the floor plan and edited graphically. Flights may be straight or curved, and each side of the flight can be straight, tapered or curved. If you edit a flight to which a railing is attached, the railing will automatically adjust to match the new shape of the flight.
- **Optimized 3D Model** Stairs typically include many components – newels, handrails, treads and balusters. Each of these may be modelled using hundreds or thousands of polygons. Stair Builder optimizes the polygon count to provide clear curve definition with relatively few polygons.
- **2D Representation** The 2D representation of the stair includes riser numbering, break lines, nosing lines and walking line. Above/below the break lines, you can choose how the remainder of the stair should be represented. The correct break line is automatically displayed in the home story and on stories above. A label is provided to display key information about the stair tool.
- **Extensible System** The Stair Builder tool is an extensible system. Over time, more balustrade and flight types will be added. Each is a separate object, with its own special parametric options, so the tool itself will remain easy to use. If you have access to a GDL developer, you can create your own custom newels and balusters

Stair Builder uses two element types to model stairs – **Stair Components** and **Railings**.

- **Stair Components** are accessed from the Stair Tool in the ArchiCAD toolbar. Each stair component models a single flight or landing. Link any number of Stair Components together to form a complete stair.
- The **Railing** tool is a new tool in the ArchiCAD toolbar. It allows you to model balustrades and handrails, and either place them independently like regular ArchiCAD objects, or snap them onto stair and slab edges.

Stair Builder does **not** provide tools for modelling ramps or escalators.

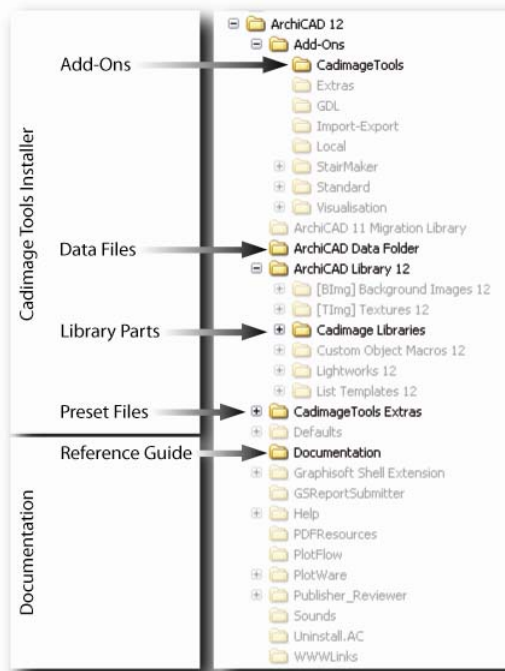
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## Setup

Before you can use the new Stair Builder tool, you must install the tool and update your ArchiCAD **Work Environment**.

## Installation

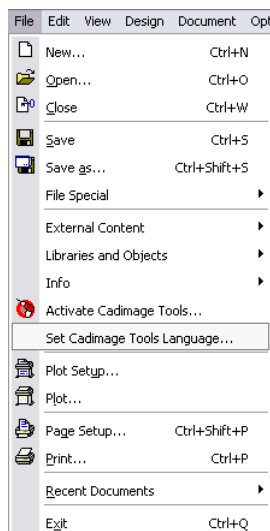
Follow the instructions on the [Cadimage Tools web site](#) to download and run the installer.



The installer will insert add-ons, data files, libraries and preset files into your ArchiCAD 12 folder.

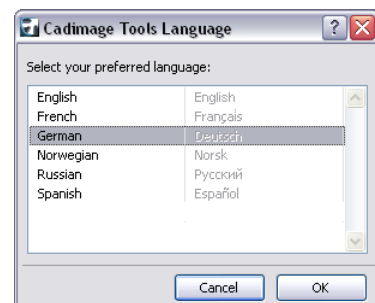
You can download and install documentation separately. This will be added to the Documentation folder, and can be accessed from the ArchiCAD **Help** menu.

## Language



Start ArchiCAD, and select the most appropriate language from the **File > Set Cadimage Tools Language** menu. This language will apply to all Cadimage Tools you have installed. You will have to re-start ArchiCAD for the language to come into effect.

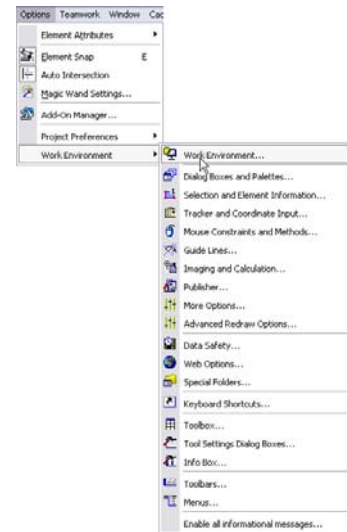
Note that a particular tool may not have a translation for the selected language, in which case the tool will display in English.



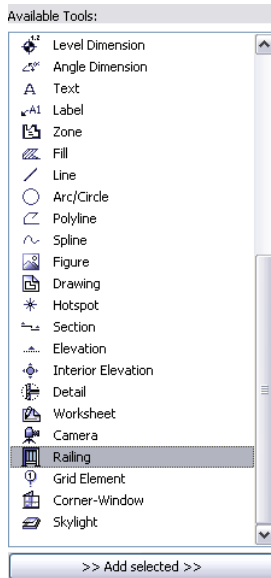
## Work Environment

Start ArchiCAD and choose **Options > Work Environment** to bring up the **Work Environment** dialog.

Use this dialog as described below to set preferences that will help you use Stair Builder effectively.



### Add the Handrail Tool to the ArchiCAD Toolbox

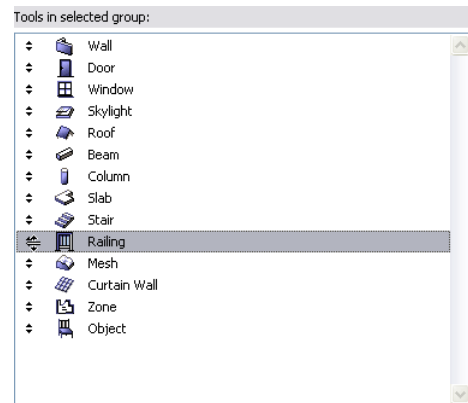


In the **Options > Work Environment > Toolbox** dialog, choose **Railing** from the **Available Tools**.



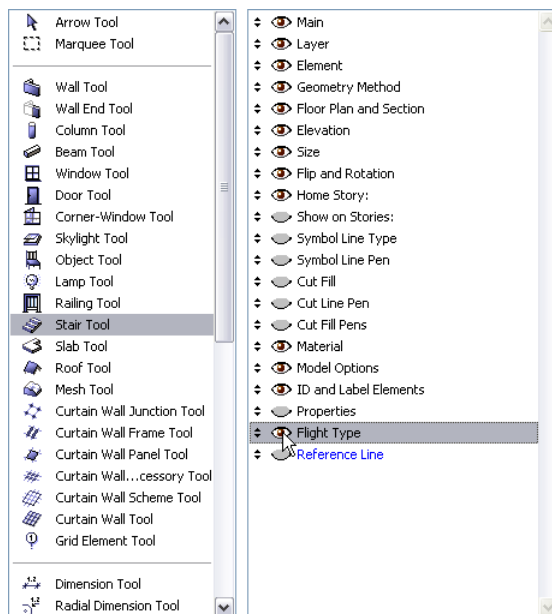
In the **Toolbox Groups** list, choose **Design**.

Click the **>> Add Selected >>** button to add the **Railing** tool to the **Design** group in the toolbox.



Click on the arrow icons to pull the **Railing** tool to a position directly below the **Stair** tool.

### Customize the Info Box

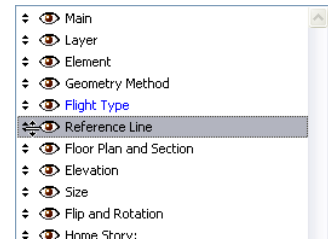


In the **Options > Work Environment > Info Box** dialog, select the **Stair Tool** from the first list, then click to activate the new **Flight Type** and **Reference Line** items.



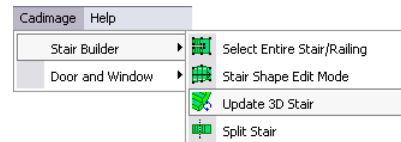
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Drag these items to a position near the start of the **Info Box** list.



### Keyboard Shortcuts

When you installed Stair Builder, items were added to the **Cadimage** menu. These menu items provide handy editing options. You will use these menu items frequently when designing stairs, so it makes sense to assign keyboard shortcuts.



Use the work environment to assign shortcut keys to the menu items. For example, you may want to use the shortcut key combination **Alt-M** to change the stair shape edit mode. This allows you to quickly change between shape editing and reference line editing.

### Default Settings

In your ArchiCAD templates, set the default style for the stair component and railing. Whenever you open a new project, the default style will be re-set for these tools.



## Design a Stair

This section outlines various techniques you will use when designing stairs.

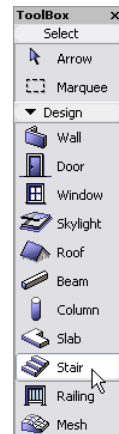
The basic approach to designing a stair is to place, link and edit stair components. Other than selecting the *CT Stair Component* library part, everything described in this section can be done without opening the stair settings dialog. All the settings you need can be made via the Info Box or graphically using dynamic hotspots.

## Place & Link Stair Components

### Prepare to Place a Stair Component

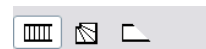
Double-Click on the Stair tool in the ArchiCAD toolbox, and select the *CT Stair Component* from the Stair Builder library.

Before placing the stair, check that the following settings are correct. If you forget one or other of the settings, don't worry. You can change the reference line, component type and stair width after placing the stair component. If you forget to choose the rotated diagonal geometry method or the correct edit mode, you can later stretch the flight or landing to size.



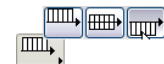
### Component Type

In the **Info Box**, choose to place a *flight*, *winders* or *landing*.



### Reference Line

Choose a *reference line* position from the **Info Box**. This mimics the reference line of the wall tool. When you place a stair, you will indicate the path of its reference line. The stair is placed centrally or to one side of the reference line.



### Stair Width

In the **Info Box**, set the stair width. You can also set an offset from the reference line.



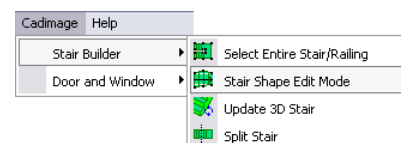
### Rotated Diagonal Geometry Method

Choose the **Rotated Diagonal** geometry method from the **Info Box**. Note that you cannot stretch radial winders as you place them.



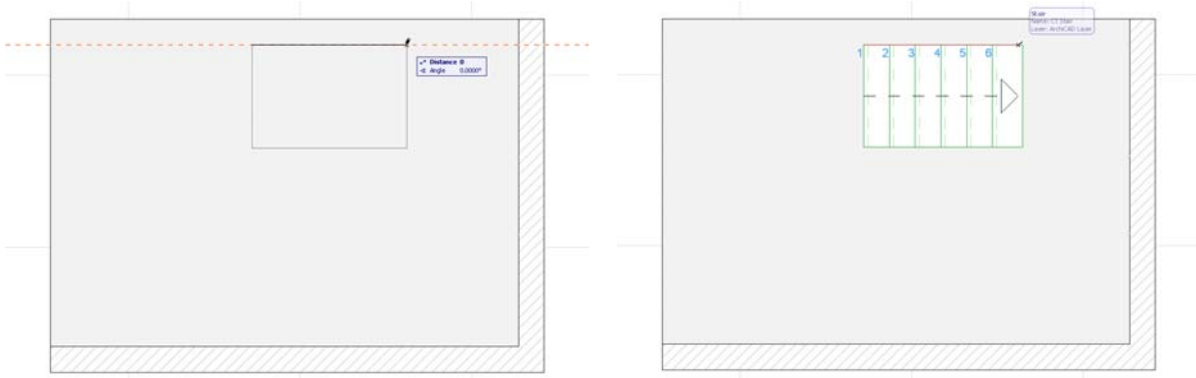
### Edit Mode

Set the **Stair Shape Edit Mode** to **Off**. If you accidentally leave the edit mode on, you won't be able to use the rotated diagonal geometry method. This is no problem, as you can still resize [the stair component](#) once it is placed.



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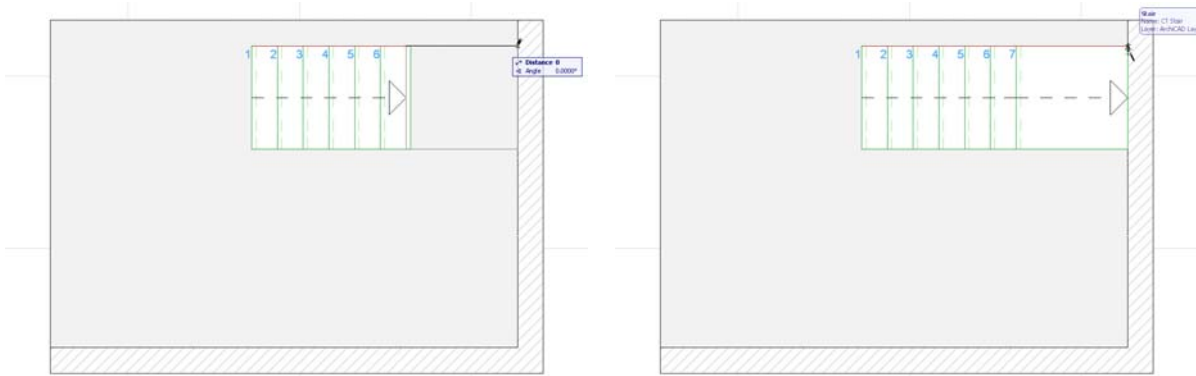
### Place a Stair Component



Click to indicate a start point for the flight or landing, move the mouse cursor to indicate a direction, and finally click to indicate the end point. A flight or landing will appear, depending on the **Info Box** settings.

At this point, the component will be linear, but now that it is in position you can change it to a curved flight, winders or landing.

### Link Stair Components

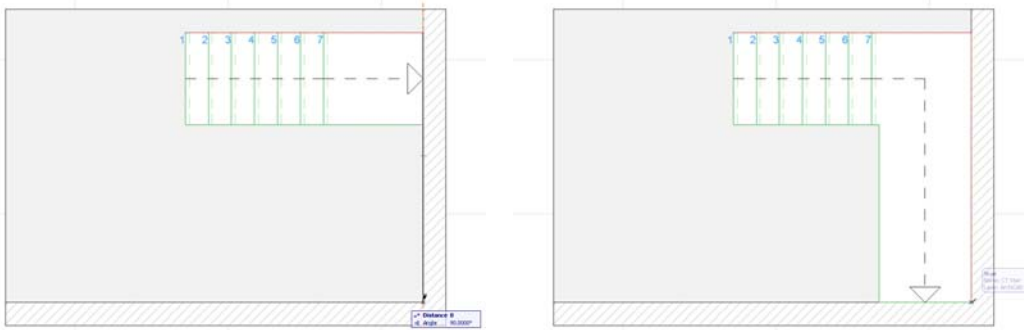


Add extra flights and landings to the stair by placing stair components. Any new stair component that is placed at the end of the stair will be automatically linked into the stair structure. Use the **Info Box** settings to choose flights, landings and winders before you place them.

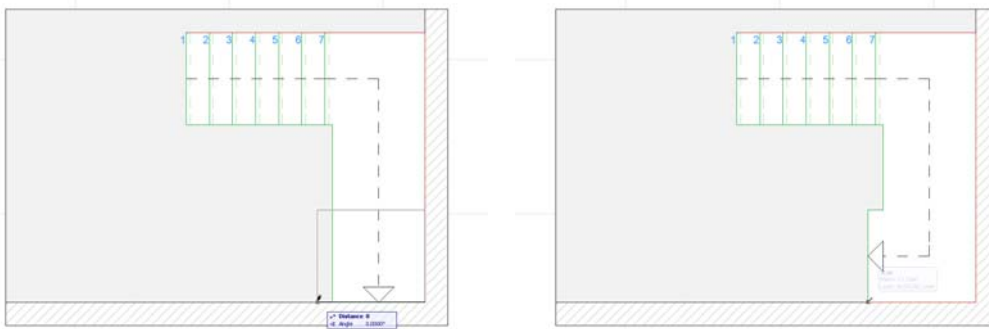
You can link the start of a new flight to the end of an existing stair. You can also link the end of a new stair to the start of an existing stair. A list of [special conditions for linking components](#) is provided later in this document.



**L-Shaped and U-Shaped Landings**

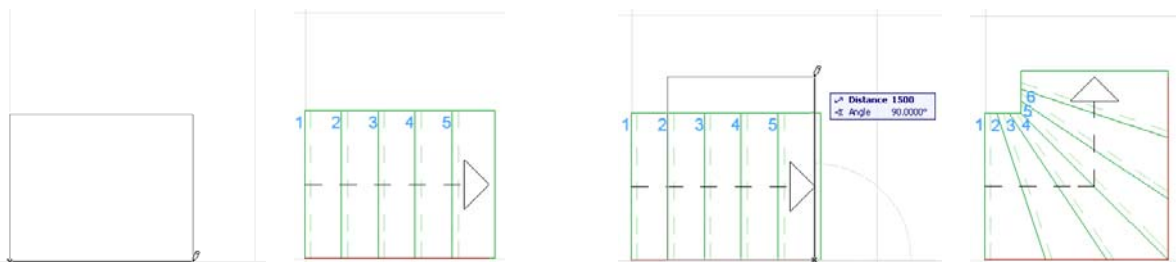


To form an L-shaped landing, first place a straight landing then add a second straight landing at an angle to the first.

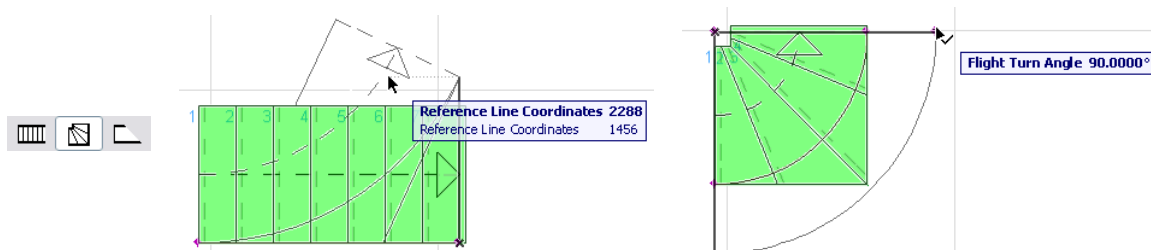


Add a third straight landing to create a U-shaped landing.

**Winders**



Link two flights at right angles to form a set of non-radial winders.



To create radial winders, choose the [Radial Winders](#) type from the info box, [bend the stair component](#) and set the [angle](#) and [radius](#). You can also set the [minimum number of edges](#) on each side of the winders.



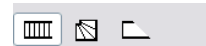
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## Edit Stair Components

Once a stair component has been placed into the project, you can adjust its settings at any time. Select the components you want to change, and adjust the settings as described below. All of the adjustments described in this section can be carried out within the context of the project – you do not need to open the stair settings dialog.

### Change the Component Type

Use the **Info Box** to change the **Component Type** to Flight, Winders or Landing.



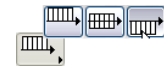
### Adjust the Width

Adjust the **Stair Width** in the **Info Box**.

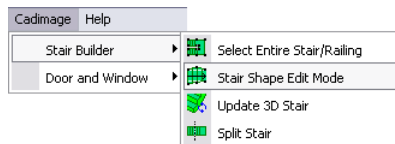


### Change the Reference Line

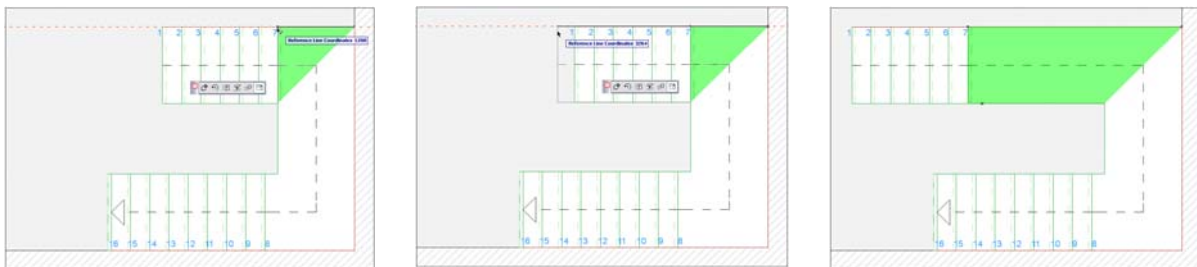
Choose a new [Reference Line position](#) in the **Info Box**.



### Adjust the Length

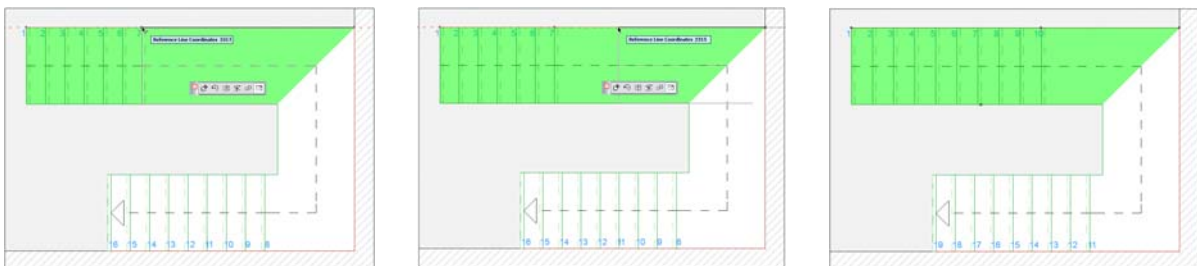


Set the **Stair Shape Edit Mode** to Off.



Select the stair component and stretch the hotspot at either end of the [Reference Line](#) to adjust its length. Any linked components will remain intact.

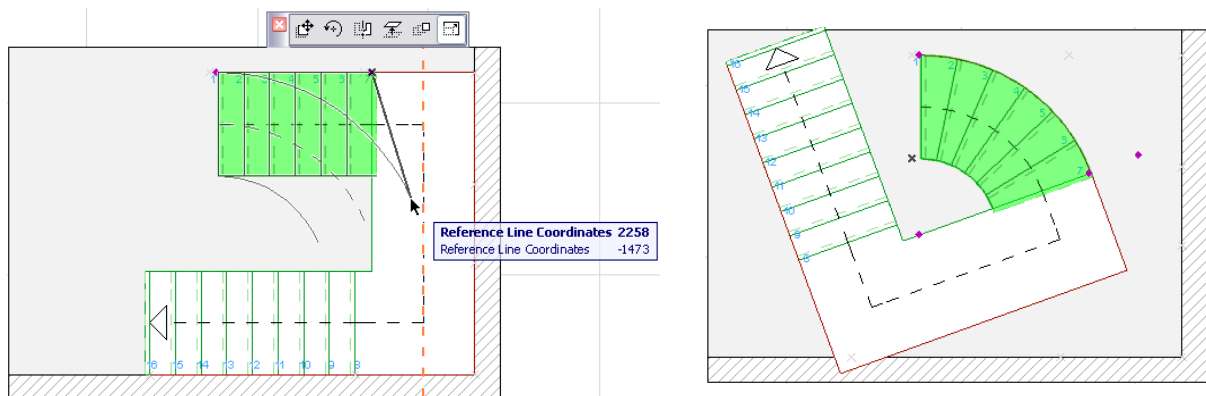
If you adjust the length of a flight, the number of treads will be re-calculated.



To change the position of the transition point between two linked, parallel stair components, select both components and adjust the dynamic hotspot at the intersection of the reference lines.



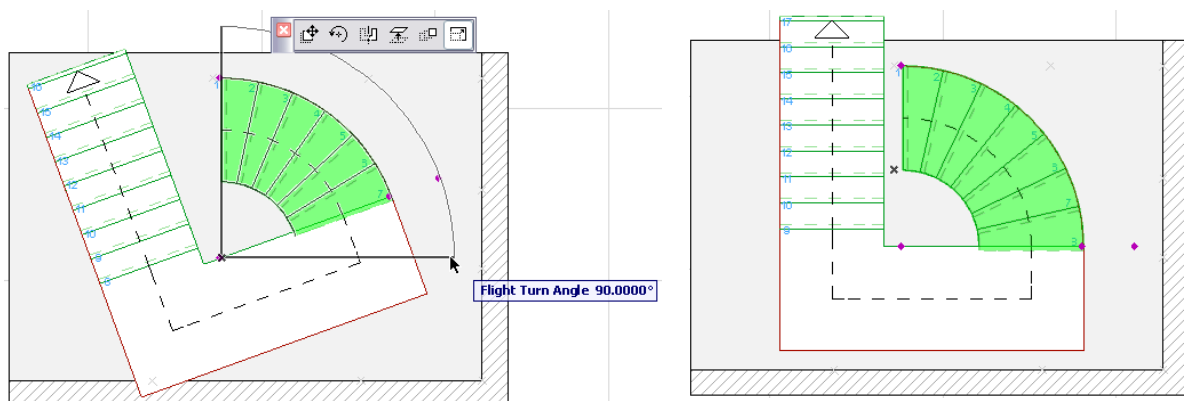
## Create a Curved Stair Component



When a stair component is first placed, it runs along a straight line. To make the component run along an arc, set the **Stair Shape Edit Mode** to **Off** and stretch the hotspot at the top end of the Reference Line to bend the stair. When you first bend the stair you can reference to a point in the project but you cannot directly control the angle and radius. You can adjust the radius and turn angle directly once the stair component has been curved.

Another way to curve a stair is to open its **Settings Dialog** and set the [angle and radius](#). This approach can be useful if you know the numeric values of the radius and angle. However you may find it quicker to adjust the values graphically, as this does not require opening the settings dialog.

## Set the Curve Angle



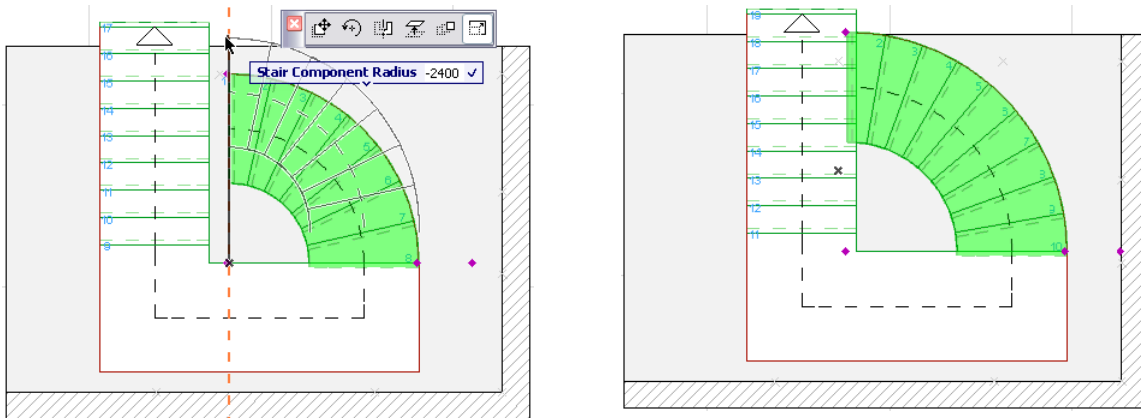
You can change the angle through which a curved stair component turns. Set the **Stair Shape Edit Mode** to **Off**, then adjust the angle by moving the angle hotspot. Type in an exact value, or snap to a guideline or to a point in the project.

You can also adjust the turn angle via the [stair settings dialog](#).



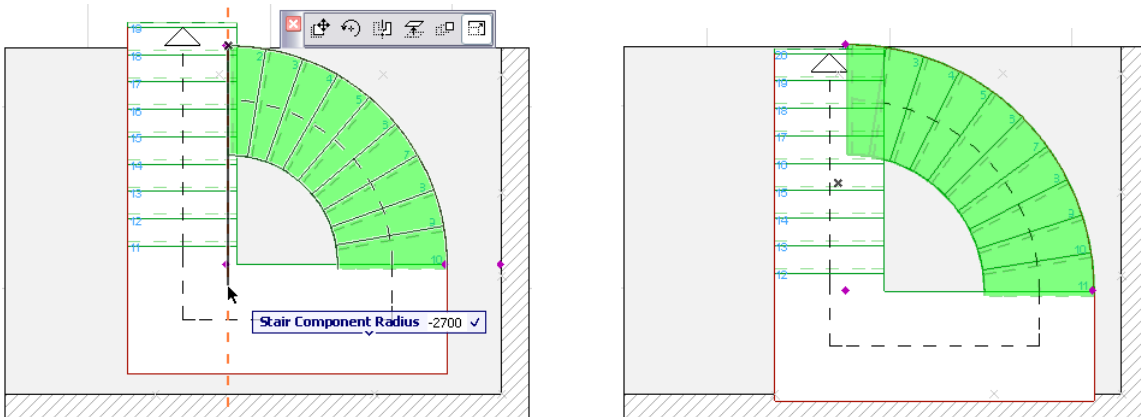
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### Set the Curve Radius



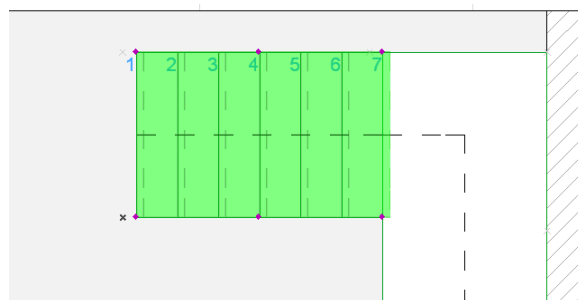
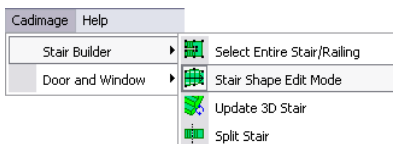
You can change the radius through of a curved stair component. Set the **Stair Shape Edit Mode** to **Off** and adjust the radius by moving either the centre hotspot or the radius hotspot. The radius hotspot can be found at the start of the stair component's reference line.

Type in an exact value, or snap to a reference line or to a point in the project. A negative value for the radius will make the stair curve in a clockwise direction. A positive value will make the stair curve in a counter-clockwise direction.



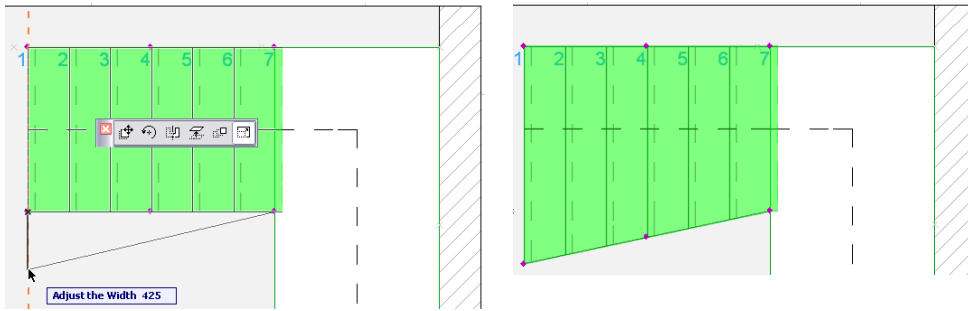
You can move either the center or the radius hotspot. If you want the start point of the stair component to remain stationary, adjust the center hotspot. If you want the center point to remain stationary, adjust the radius hotspot.

### Change the Shape

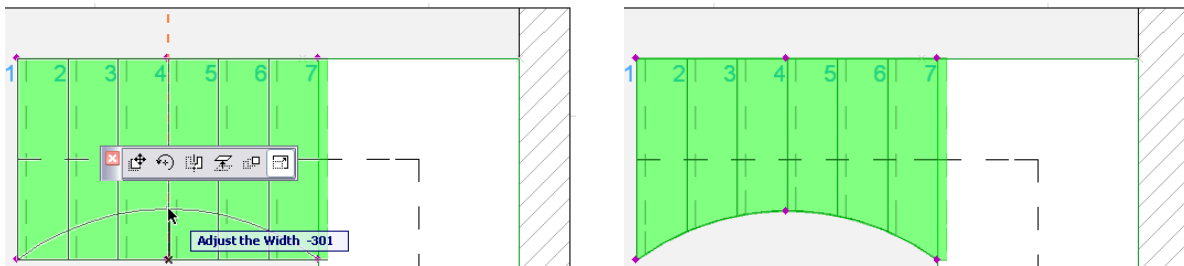


Set the **Stair Shape Edit Mode** to **On** and select a stair component. A bunch of new hotspots will appear. Use these hotspots to adjust the shape of the stair component.



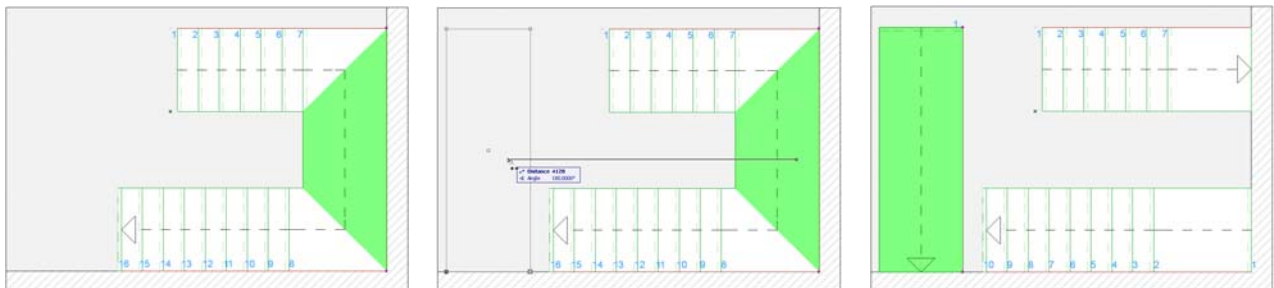


A hotspot at each corner can be used to adjust the distance of that corner point from the walking line.



A hotspot at the midpoint of each edge can be used to adjust the distance of that edge midpoint from the walking line, forming a curved or straight edge.

### Unlink Components



If you rotate or drag a stair component so that its reference line no longer forms a continuous path with the other components in the stair, it will become unlinked. If you accidentally unlink a component, don't worry – just undo the change you made to re-link the components.

Any editing done using dynamic hotspots or the info box settings will automatically maintain the links between stair components.

### Change the Riser Height and Tread Depth

You cannot adjust the preferred tread depth or riser height graphically. You must use the [stair settings dialog](#) to do this.

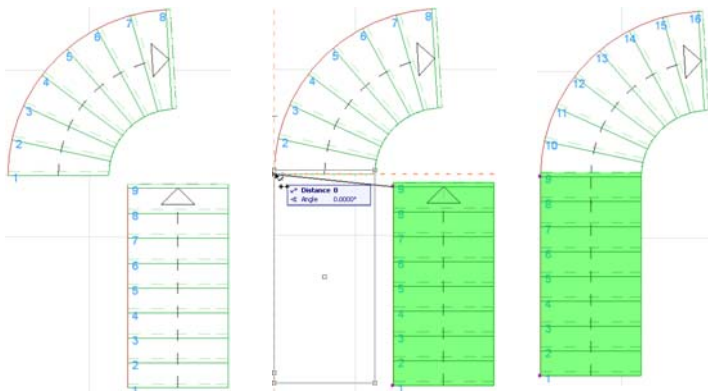
### Delete a Component

If you want to remove a component from the stair, select that component and delete it. This may cause the stair to break into two linked sets of components. If this happens, simply [drag one of the sets to re-link it](#).



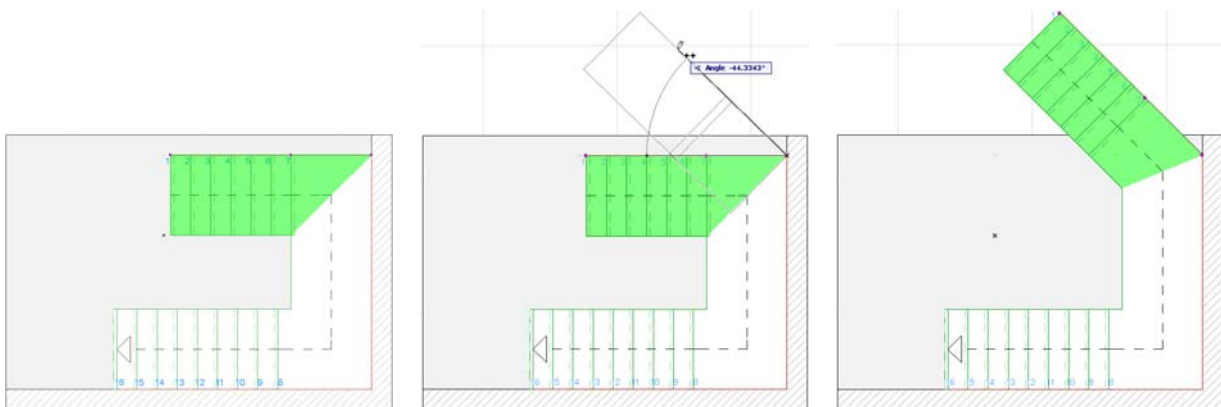
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### Link Components



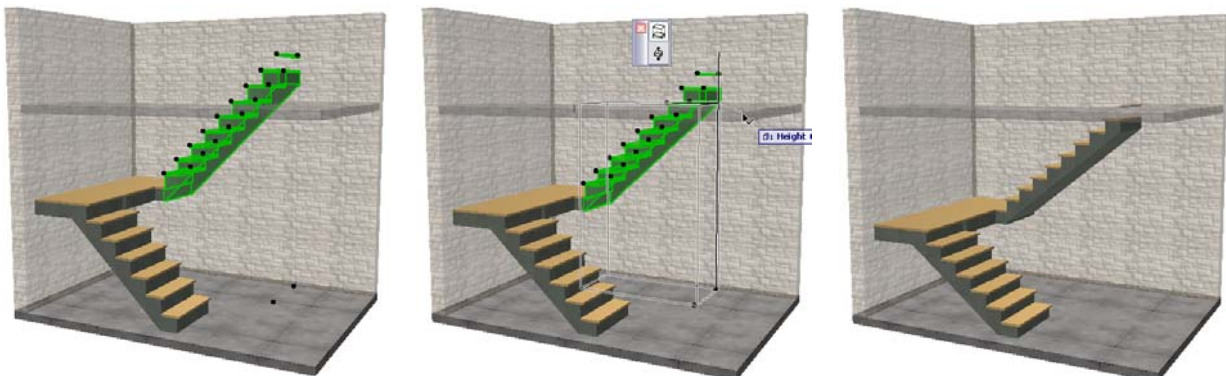
You can link components that are already placed in the project. Just drag the component so that the reference lines meet and it will automatically link.

### Rotate Multiple Components



When you rotate a stair component, you usually want to maintain the links of all the components of the stair. To do this, select all of the components that will be moved by the rotation and rotate them about the stationary end point.

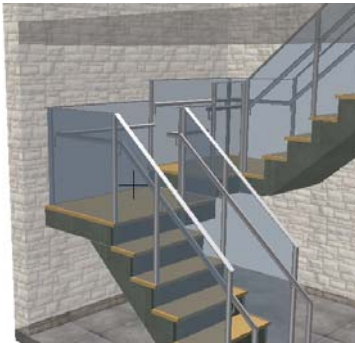
### Adjust the Total Rise



In the 3D window, stretch the top hotspots of the last flight up or down to set the total rise of the whole stair.



## Create a Stepped Landing



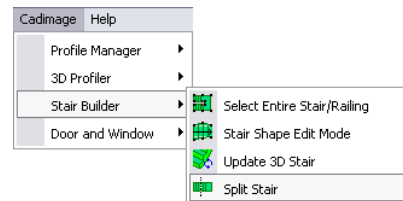
To create a step part way along a landing, split the landing at that point then set the **Stepped Landing** checkbox to **On** in the [Stair Settings dialog](#). This cannot be done graphically.

## Split a Flight or Landing

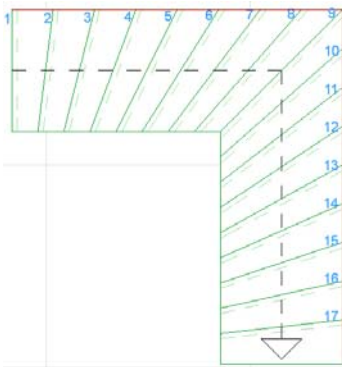
To add a flight in the middle of an existing stair, you can unlink flights, add the new flight, and re-link them. Alternatively you can use the **Cadimage > Stair Builder > Split Stair** tool to split selected flights. This tool splits a given stair component at a point along its reference line.

To indicate the split point, you stretch a line across the stair. The point where this line intersects the reference line is the split point.

To illustrate how the **Split Stair** tool works, consider the following example.

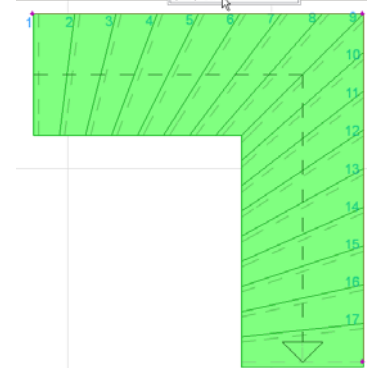


### Example

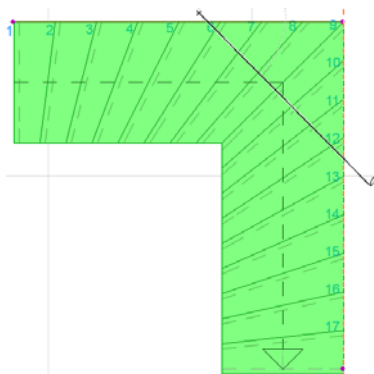


We will create a stair consisting of a flight rising up to a corner landing, followed by a flight leading off the landing.

First draw two flights, ignoring the landings. Because they meet at an angle, the treads form non-radial winders.



Now select the two flights, and select the **Split Stair** tool from the **Cadimage > Stair Builder** menu. You can save time here if you have this tool set up on a [keyboard shortcut](#).

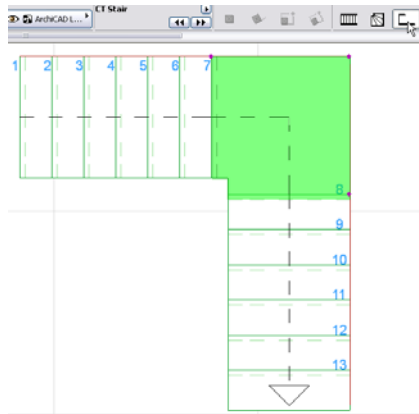
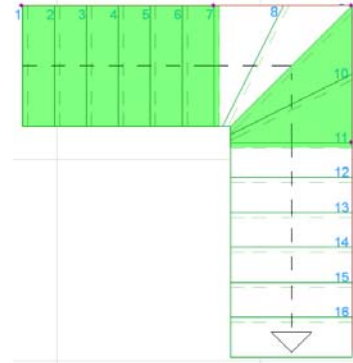


Click on either side of the [reference lines](#) of the stairs to indicate the two split points.



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The stair is now split into four components, including two straight flights and two half-winders. The line we drew was diagonal, but this simply indicated a split point on the two reference lines. When the components split, they always meet at right angles to the walking line.



Finally, select the winders and use the **Info Box** to change them into [landings](#).

### Some Notes on Linking Stair Components

- Two stair components will link together provided that their reference lines join. The reference lines must form a continuous path.
- Straight flights and landings may meet at an angle to form corner landing or non-radial winders.
- Curved flights and radial winders cannot have mitred ends. To link them to a stair, you must ensure the reference lines meet tangentially.
- A stair component can not link to another component in a different storey. (Railings *can* link across stories however.)

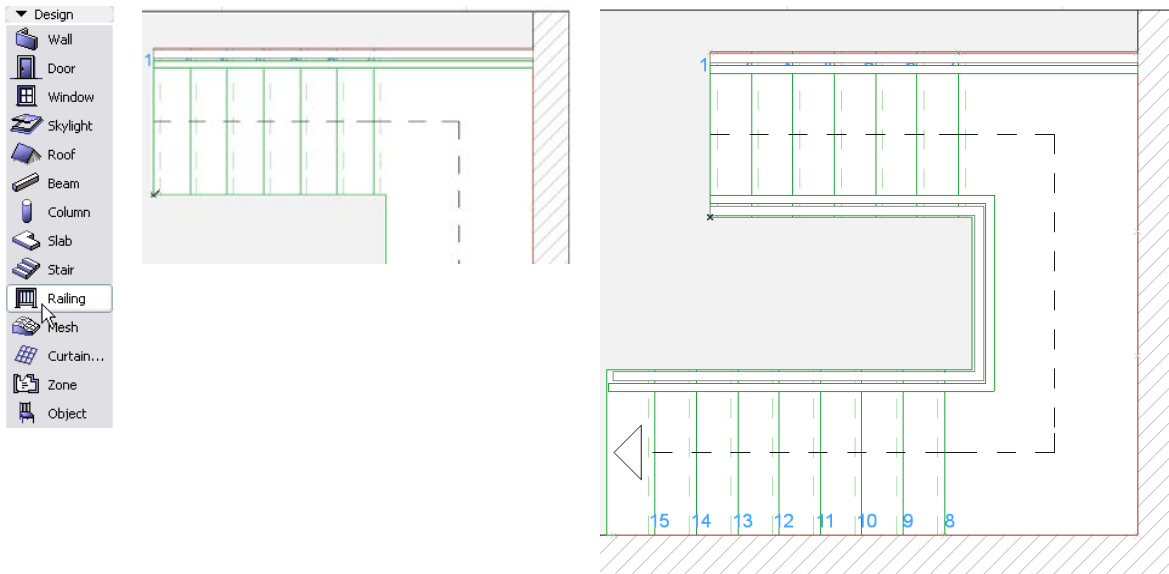


## Railings

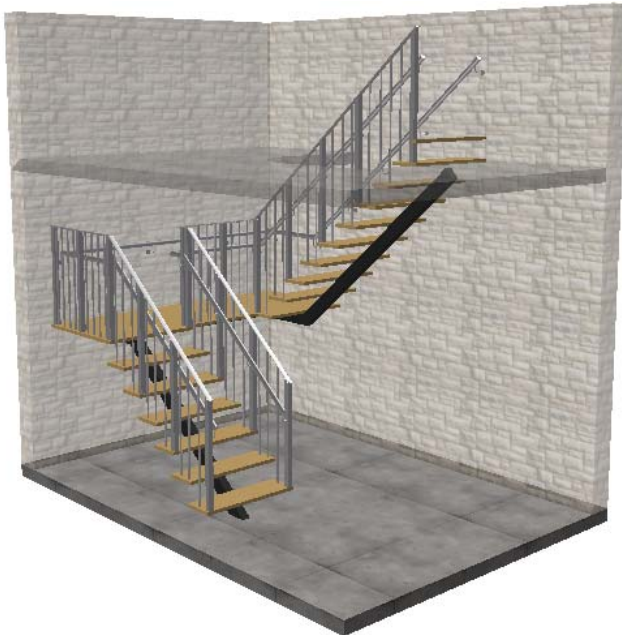
Railings can be snapped onto the edges of stairs and slabs, or placed independently like regular objects. This section describes how to place railings into your project.

Use the railing settings dialog to design the [appearance of the railing](#). This is outlined in a later section.

### Attach a Railing to a Complete Stair



To place a railing along one side of an entire stair, select the railing tool from the ArchiCAD toolbox and click on an end point rather than an edge.

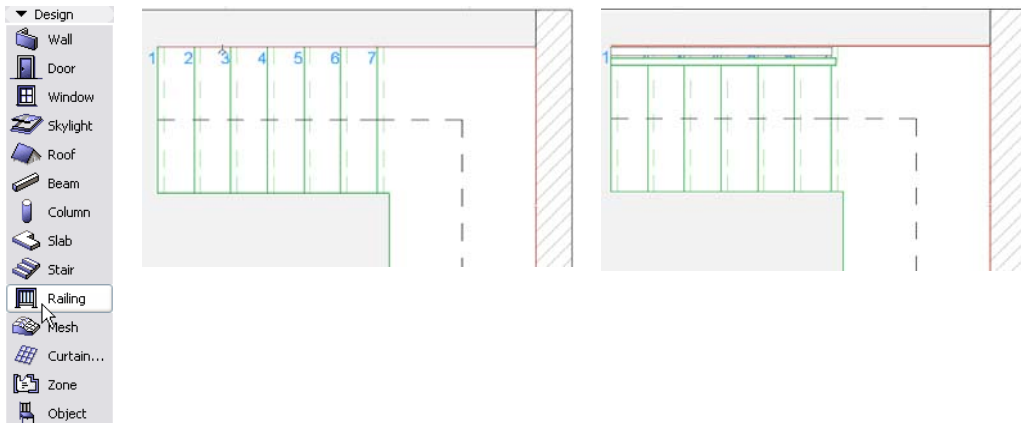


If you had previously placed railings onto [individual edges](#), these will remain intact.



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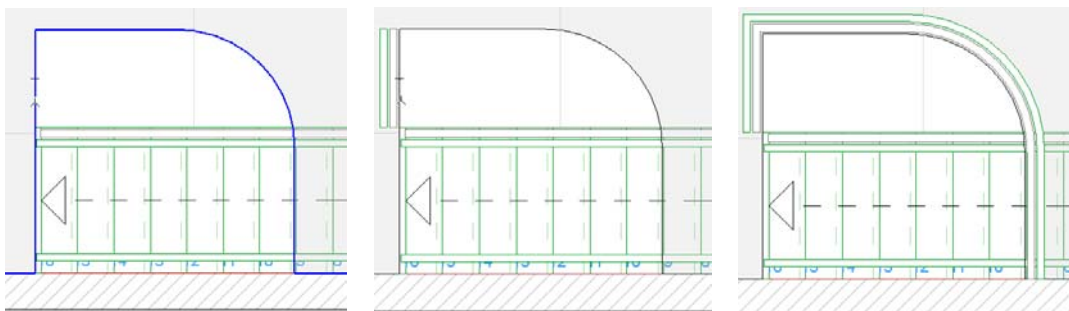
## Attach a Railing to a Single Stair Component



Select the **Railing** tool from the ArchiCAD toolbox. [Adjust the settings](#) to model the railing, then click somewhere on the edge of a stair component. A railing will be placed along that edge.

If no **Railing** tool appears in the toolbox, [use the Work Environment to add the tool](#).

## Attach a Railing to a Slab Edge



You can attach a railing to a slab edge. To do so, select the railing tool from the ArchiCAD toolbox and click on the edge.

## Place an Independent Railing

To place an independent railing that is not connected to a slab or a stair component, select the Railing tool and click to place it like a regular object.

## Adjust the Length of a Railing

All railings can be stretched via the reference line end hotspots. For independent railings, these are regular black hotspots. For railings attached to stairs or slabs, the hotspots are dynamic (diamond shaped). Select one of the hotspots, and pull it to extend or shorten the railing.

## Bend an Independent Railing

At the midpoint of each independent railing is a dynamic hotspot. Moving this hotspot will cause the railing to bend along an arc through the end points and the mid point.

## Flip a Railing

You can flip a railing to the other side of the reference line, provided it is not attached to a stair component. Use the [railing settings dialog](#) to do this.

## Delete a Railing

Railings can be selected and deleted like regular ArchiCAD elements.



### Link Railings



Two railings will automatically link if the ends of their reference lines meet.

- The handrail and balustrade ends will automatically adjust to fit in with linked railings.
- If you want the railings at the top of the stair to bend to the horizontal, place a short section of landing at the top.
- Railings may be linked across storeys.

### Hotlinked Modules

If you have a stair that repeats through multiple storeys, you could include it in a module then hotlink it into the project multiple times.

If you use this approach, it is recommended that you do not include the railings with the module. Place these after you link the module into the project.

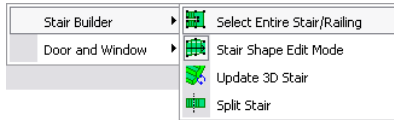
This provides the best control over the handrail end types, and allows you to make changes to the railings on different storeys without breaking the hotlink.



# Stair Builder 12

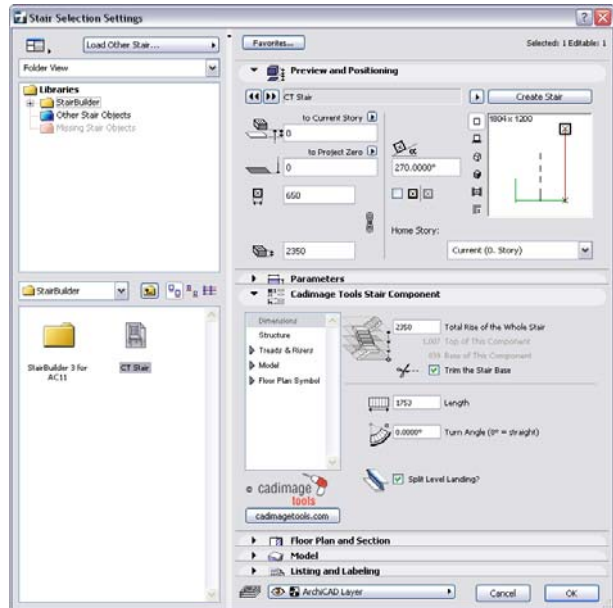
## Define a Style for the Stair

If you want to apply the settings to the whole stair, you need to select all the stair components. Select one of the components, then use the **Select Entire Stair/Railing** menu item to select the entire stair.



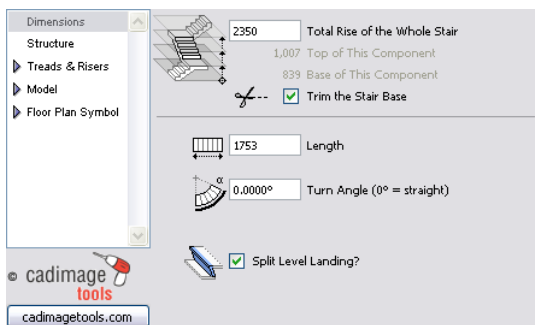
Now double-click on the **Stair** tool in the ArchiCAD toolbar to open the settings dialog.

The **CT Stair** component has a settings dialog in which you can set dimensions and choose preferences. If you don't know the exact dimensions of the stair, leave the **Shape** settings at their default values. If you like, you can set the total rise of the whole stair to match the vertical dimension the stair is intended to span. Available settings are described in this section.



Click **OK** once you have finished defining the style of the stair.

## Dimensions

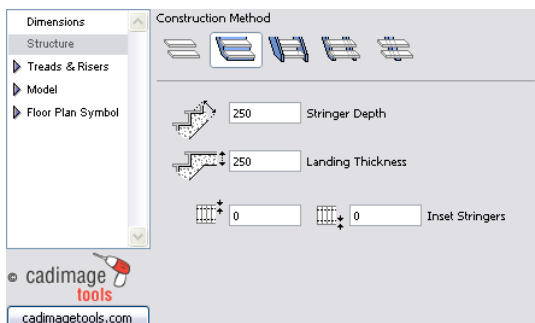


Click on the **Dimensions** item in the list to display the overall dimensions of the stair. Here you can set the total rise of the whole stair, set the length (or radius) and turn angle.

Choose to **Trim the Stair Base** if this is the first flight of a stair. This tidies up the stringers below the first tread.

If this is a landing followed by a landing, choose **Split Level Landing** to force a step in level.

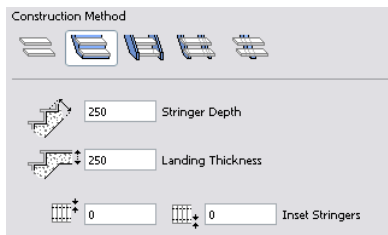
## Structure



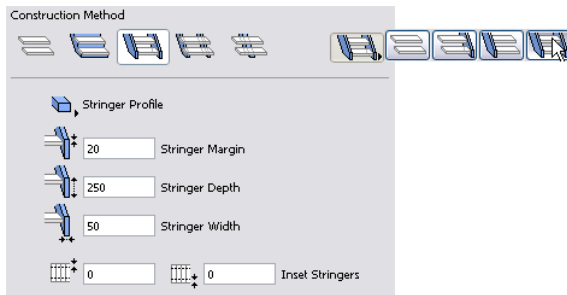
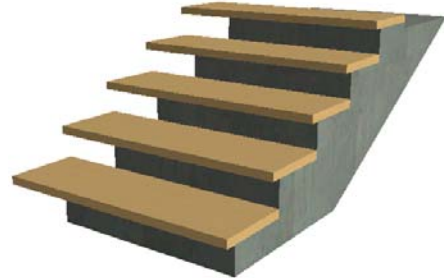
First choose a basic **Construction Method** for the stair. You can choose treads only, concrete pre-cast stair, traditional timber stringer construction, steel stringers along the edges, or a central steel stringer or pair of stringers.

Depending on your selection for the construction method, related settings will appear.



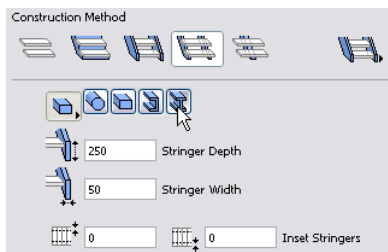


For concrete stringers, set the **Stringer Depth** and the **Landing Thickness**. You can **Inset** the concrete stringers to produce a tread overhang.

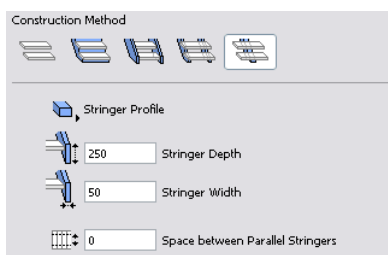


For timber stringers, choose whether a stringer is included on the left, right or both sides of the stair. Timber stringers can also be used to model steel profiles. Choose the **Stringer Profile** from the menu.

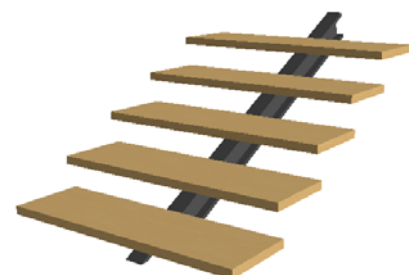
Set the **Stringer Depth** and **Thickness**, and also a **Margin** or kerb that extends above the tread fronts. If you choose to **Inset** the stringers, the treads will cut away the top part, producing an 'open' stringer on that side of the stair.



Steel edge stringers have the same settings as the timber stringers. As these stringers run below the treads, there is no setting for a margin or kerb.



The final structure type is a central steel stringer. This type of stringer runs along the walking line. As with the other stringer types, choose a **Profile** for the stringer, and set the dimensions.



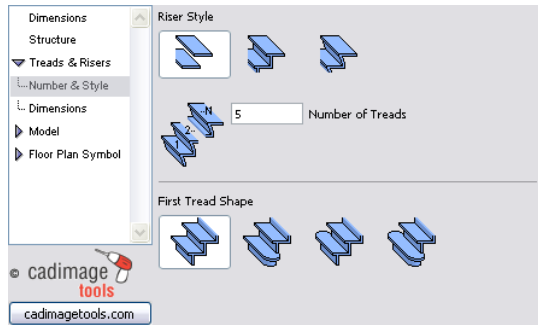
# Stair Builder 12

For a single stringer, leave the **Space between Parallel Stringers** setting at zero. To create two parallel stringers, set this value to be the separation between the stringers.

## Treads & Risers

The **Treads & Risers** page is broken into two parts. Use the first part to select the number and style of the risers and the shape of the first tread. Use the second part to define the dimensions of the tread.

### Number & Style

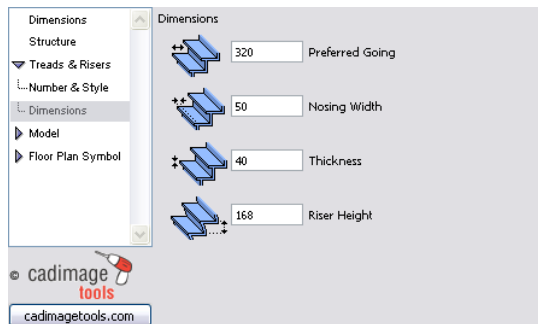


Set the **Riser Style** to open, closed or angled. Depending on the structure settings, this will have a different effect – for example concrete stairs do not include a separate riser piece.

Set the **Number of Treads** for the selected stair component.

You can choose rounded ends for the first tread.

### Dimensions



If you set the **Preferred Going**, the number of treads will be re-calculated. If you set the **Number of Treads** in the flight (see above) the going will be re-calculated.

Set the tread thickness, and the width of the front nosing.

Changing the **Riser Height** will change the [total rise of the stair](#).

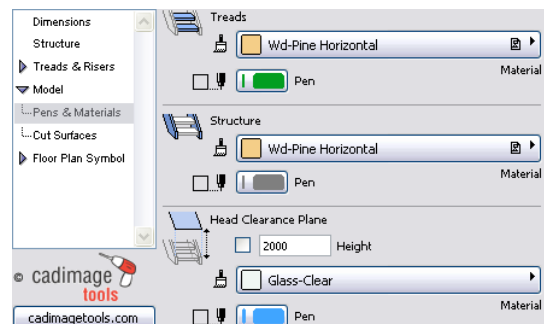
## Model

The **Model** page provides settings for pens, materials and fills used when constructing the 3D model.

### Pens & Materials

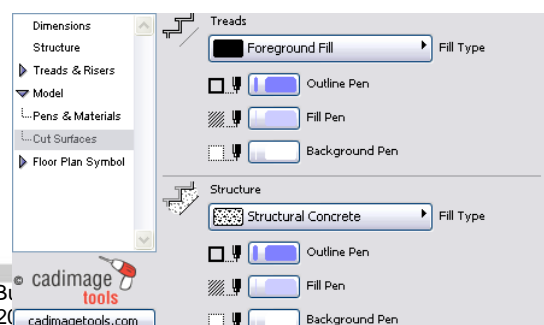
Choose separate materials and contour pens for **Treads** and **Structure** (stringers or concrete).

On this page you can also enable a **Head Clearance Plane**. This is a plane that floats above the stair at a constant height, to indicate the minimum clearance.



### Cut Surfaces

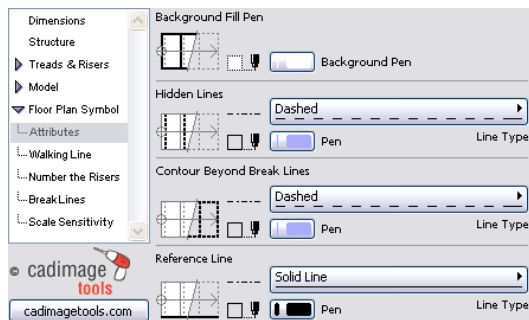
The pens and fills set on this page control how the stair will look in section when cut by the section line. Separate settings are available for the **Structure** (stringers or concrete) and for the **Treads**.



## Floor Plan Symbol

The stair's **Floor Plan Symbol** is highly configurable. Aside from the basic outline and treads, there are settings for how the walking line is displayed, how the risers are numbered, what details are shown at different drawing scales, and where break lines are placed.

### Attributes

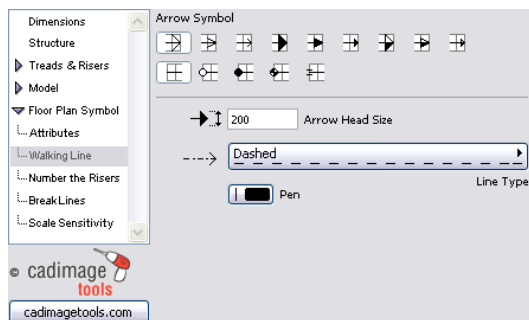


Set a pen for the stair symbol background. If you choose a zero pen, the background fill will be transparent.

Set line types and pens independently for hidden lines, the stair outline and treads beyond the break lines, and for the reference line. Set the reference line pen to zero to make this line invisible.

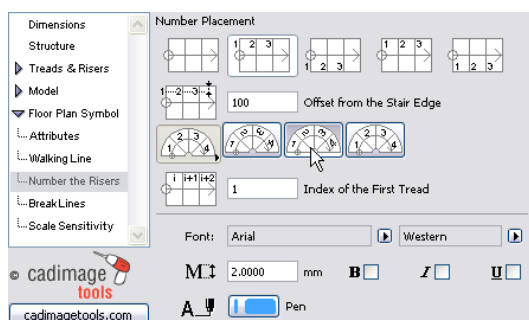
The main contour of the stair is always drawn using a solid line.

### Walking Line



Choose an arrow head and tail symbol for the walking line, set the head size, choose a pen and set the line type of the walking line.

### Number the Risers

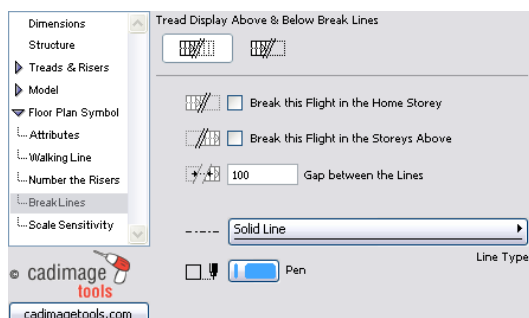


Each riser on the stair can be numbered. Choose the location for the riser numbers, including an offset from the stair edge.

Choose an orientation for the numbering. The numbers can either follow the direction of the walking line, or remain vertical.

Set the font, text size, style and pen for the numbers.

### Break Lines

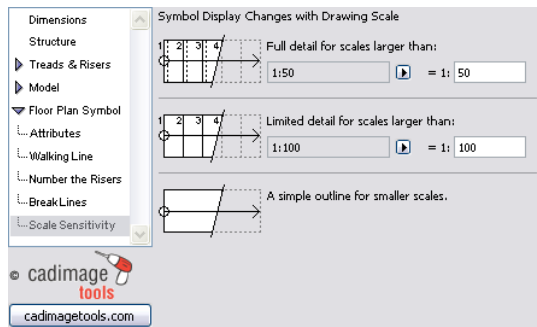


Choose how treads above and below the break line should be displayed, and set pen and line type for the break lines.

Check the options to show a break line in either the home storey (the storey in which the stair was placed) or in an upper storey.



## Scale Sensitivity



The final page of the Floor Plan Symbol settings provides control over what items are displayed at different drawing scales. For very large scale drawings, you will want to see full detail. For very small scale drawings, the stair outline is sufficient. At intermediate drawing scales you can show just the outline and the tread fronts.

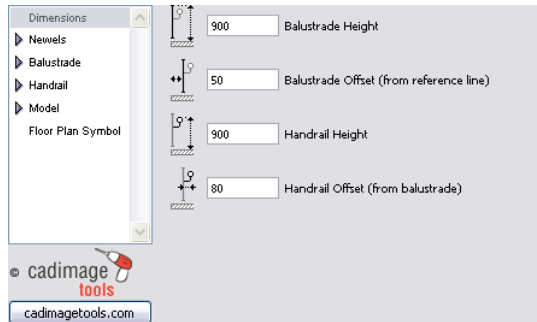
Select the drawing scales at which the symbol should transition between the three levels of detail.



## Railing

Double-click on the Railing tool in the ArchiCAD toolbar, and choose the CT Railing from the library.

### Dimensions

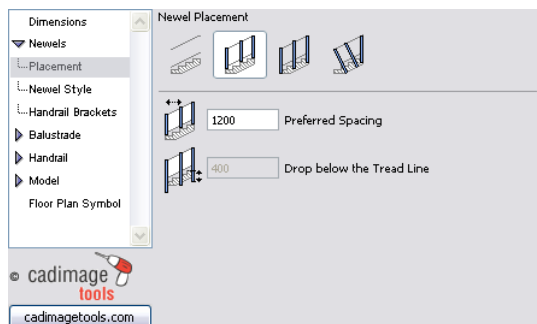


On the first page of the settings dialog, set the heights for the balustrade and handrail. If these are to be offset from the edge of the stair or slab to which they are attached, set the offset values.

### Newels

Newel posts can be included with the railing. A number of options are available to provide a high level of flexibility.

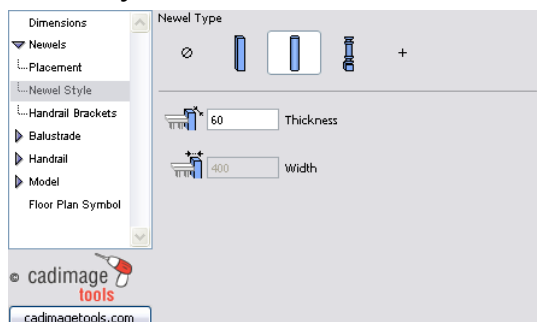
### Placement



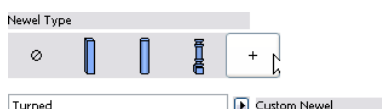
The first group of settings provides control over how the newels attach to the stairs. You can choose to attach the newels directly to the treads, to the stringers, or perpendicular to the rise angle. You can also choose to have no stringers.

Set the preferred maximum spacing between newels.

### Newel Style



Choose a newel style from the available options. Set the thickness and width of the newel.

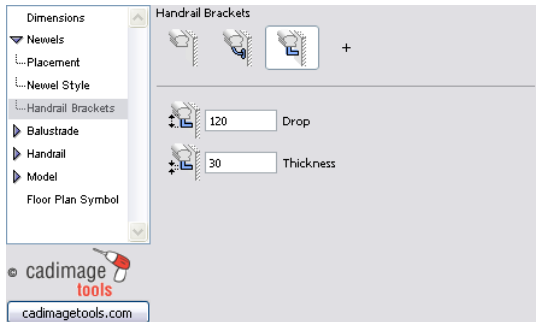


Choose the + option to type in the name of a custom newel not included with the regular library.



# Stair Builder 12

## Handrail Brackets



The handrail is attached to the newel posts or directly to the wall, by means of brackets. Choose an option for the handrail bracket. You can choose not to include the brackets.

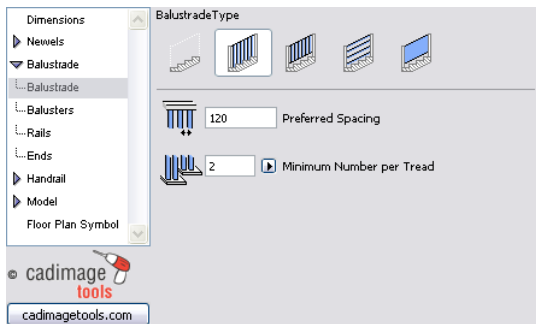
Set the bracket drop and thickness.



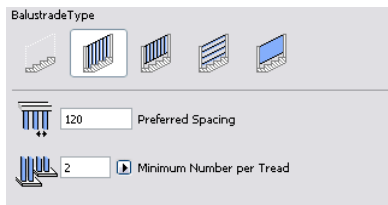
Choose the + option to type in the name of a custom bracket not included with the regular library.

## Balustrade

### Balustrade Type



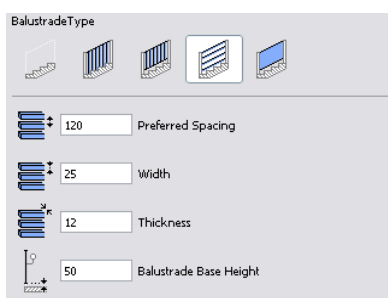
Select a balustrade type from the list at the top of the settings dialog. Depending on which type you choose, different settings will appear.



If you choose vertical balusters that attach to the treads, you can set the preferred spacing between the balusters. Also set a minimum number to attach to each tread, in case the tread depth becomes small, for example on the inside radius of a curved flight.

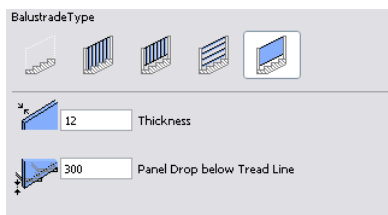


If you choose vertical balusters supported by a bottom rail, set the preferred spacing and the height of the bottom rail.



If you choose parallel rails for your balustrade, set the preferred spacing as well as the rail width and thickness, and the height of the lowest rail.

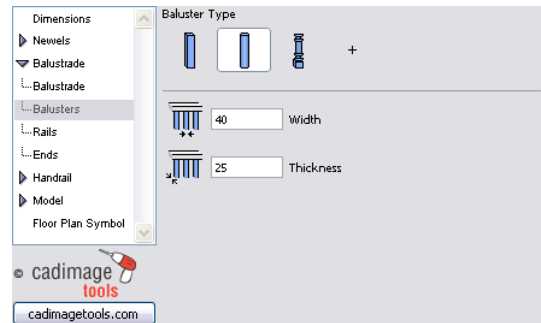




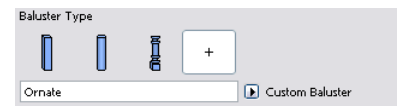
If you choose a panel type balustrade, set the thickness and the distance the panel drops below the tread line.

### Balusters

If you chose vertical balusters, this page provides settings for their appearance. Choose the baluster style, width and thickness.



Select the + option to type in the name of a custom bracket not included with the regular library.

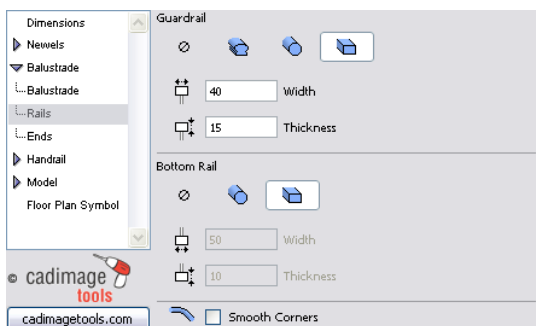


### Rails

You can include a guardrail at the top of the balustrade. Choose the profile and dimensions of the rail.

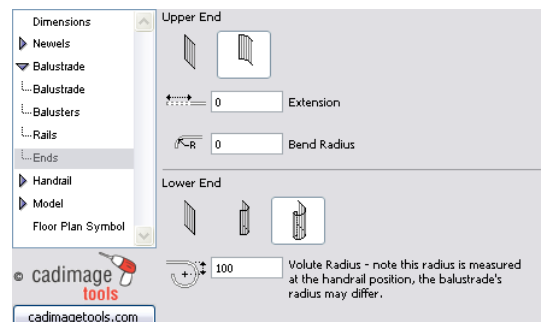
If you selected vertical balusters or a panel type balustrade, you can also choose a bottom rail.

Two railings may join together, in which case the ends of the balustrade will automatically mitre to join the linked railing. If you would prefer a smooth curve instead of a mitre, choose the **Smooth Corners** option.



### Ends

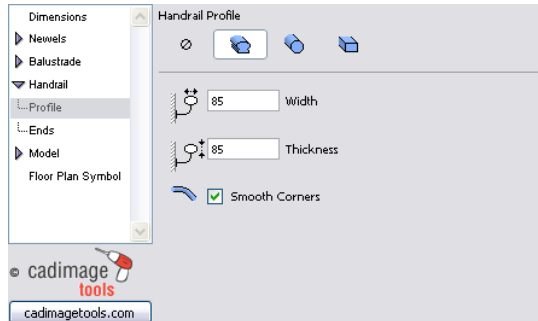
Free ends can be given a different style. You can choose a square cut end or bend the balustrade back to the edge of the stair. You can also create a volute end.



# Stair Builder 12

## Handrail

### Balustrade Type



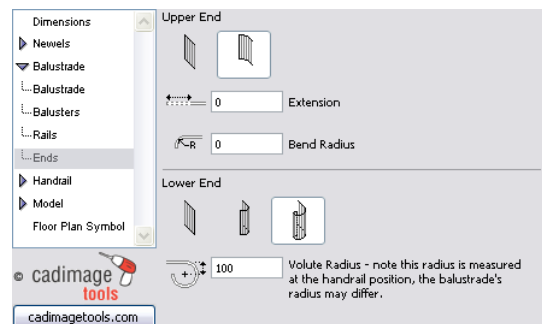
Select a handrail profile from the list at the top of the settings dialog.

Two railings may join together, in which case the ends of the handrail will automatically mitre to join to the linked railing. If you would prefer a smooth curve instead of a mitre, choose the **Smooth Corners** option.

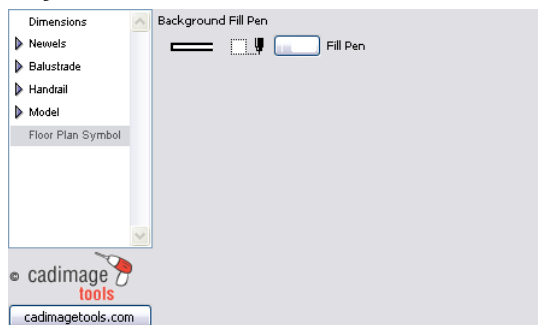
Handrails will only mitre or bend if they intersect with a handrail on a linked railing. If the handrail heights on the two railings are different, the handrails will not link.

### Ends

Choose how the upper and lower ends of the handrail should behave, in cases where they do not link to an adjacent railing. You can choose a square cut end or bend the handrail back to the edge of the stair. You can also create a volute end.



## 2D Symbol



The railing's **Floor Plan Symbol** has few options. Choose a background fill pen. The 2D Symbol displayed for each newel type is scripted into the newel objects.

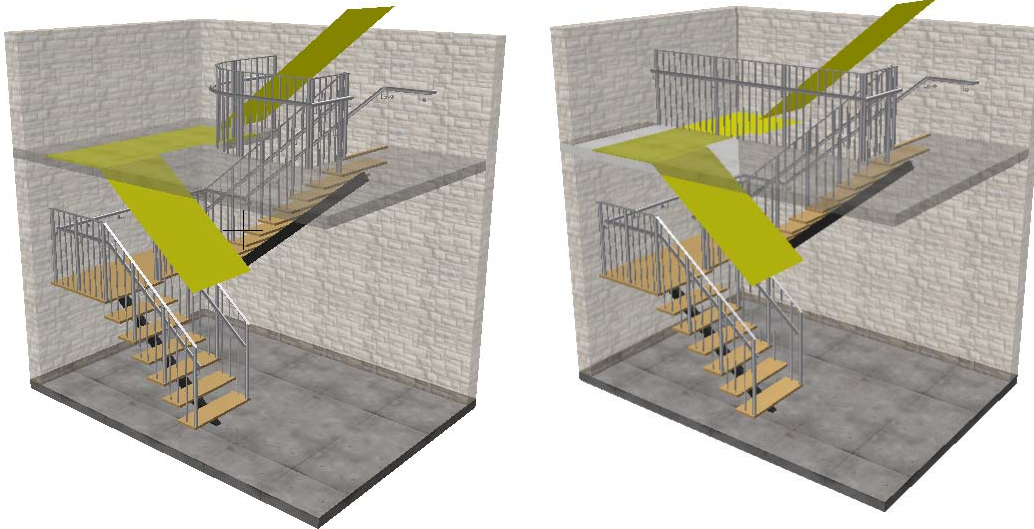
Break lines are automatically inserted to match those of the stair components to which the railings are attached.



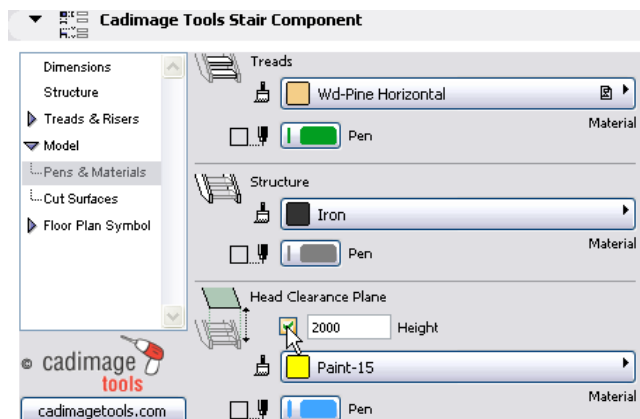
## Integrity Checking

Stair Builder includes some tools to help you check the integrity of the stairs you model. This includes the stairs themselves, and how they fit into the building.

### Head Height Plane



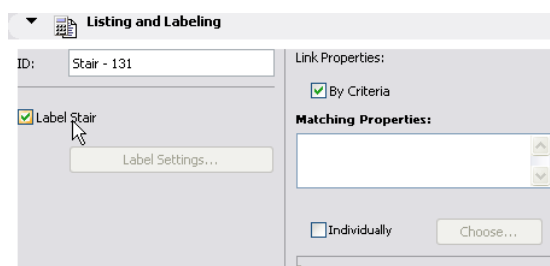
The *head height plane* provides a visual check that enough clearance has been left above the stairs. Displaying the head height line can serve to highlight design issues that might otherwise go un-noticed.



To show the head height plane in 3D, Section and Elevation views, select the stair components and open the Stair Settings dialog.

In the **Model > Pens & Materials** page, turn the checkbox **On** and set the minimum head clearance height.

### Label the Stair

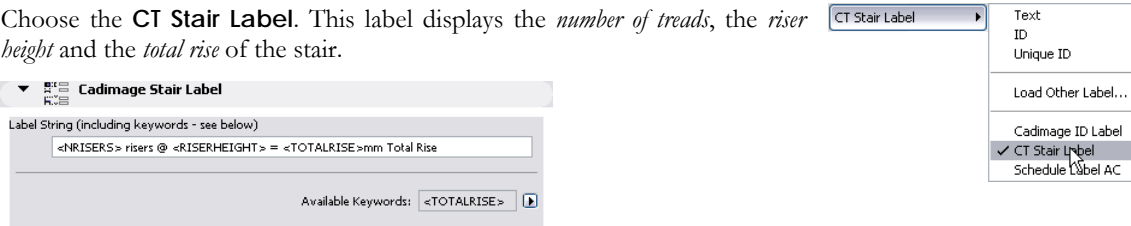


Select one of the stair components, and open the **Listing and Labelling** tab. Click on the Label Stair checkbox.



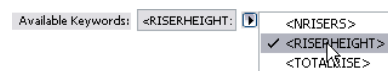
## Stair Builder 12

Choose the **CT Stair Label**. This label displays the *number of treads*, the *riser height* and the *total rise* of the stair.



Type a label string into the label settings dialog. The string can contain *keywords*, such as <RISERHEIGHT>, which are converted into numeric data when the label is placed into the project.

A full list of available keywords is provided. Copy and paste these keywords into the label string. You can include any other text that you might like.



## Custom Components

Stair Builder comes with a limited number of newels, balusters and handrail brackets. If you have a GDL development resource you can extend the available range by creating your own components. **If you like, you can share these with other Stair Builder users by uploading them to the CadimageTools web site.**

Example objects are included in the library. To create a new custom component, open one of these example objects and save it under a new name then edit the scripts to create your own component.

## Sharing your Projects

When you design a stair using Stair Builder, you might want to share the project with a colleague. You should ensure that your colleague has installed Stair Builder before he opens the project. Your colleague does not have to purchase or register the product. Unregistered products will work OK – your colleague will not be able to edit the stairs or create new stairs.

If the project is accidentally opened and saved by someone who does not use Stair Builder, it is possible that the stairs may become unlinked. This is not a problem until you try to edit a stair. To reconstruct the stair, including all the links, select it and cut/copy the stair components and railings. Delete the original stair, then paste the clipboard contents back into the original location. The stair will be pasted back exactly as it was, and all links will be re-instated.

If the stair includes custom newels, balusters or handrail bracketes, you will have to provide these library parts.

