



## MODEL IT: ADVANCED USER GUIDE

Version: 2022.0



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# Introduction



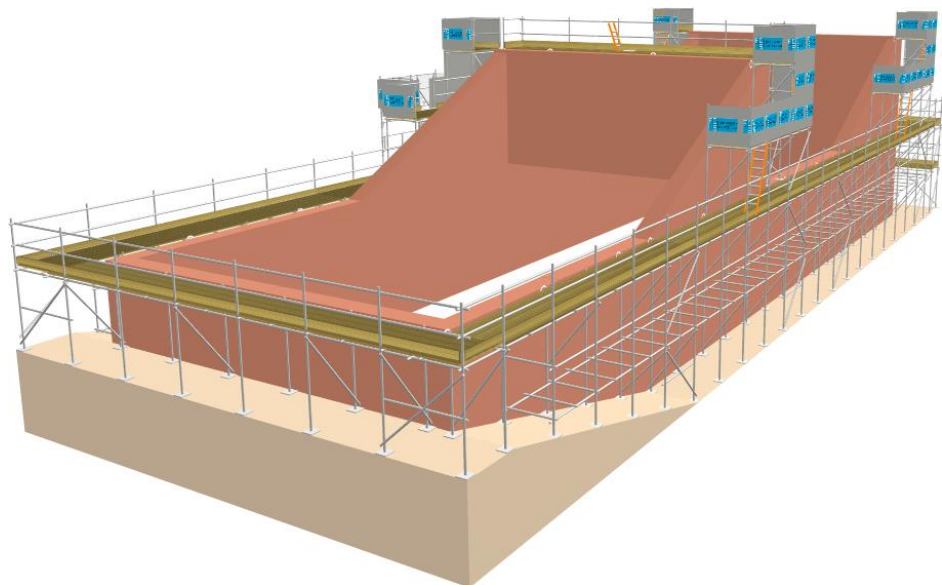
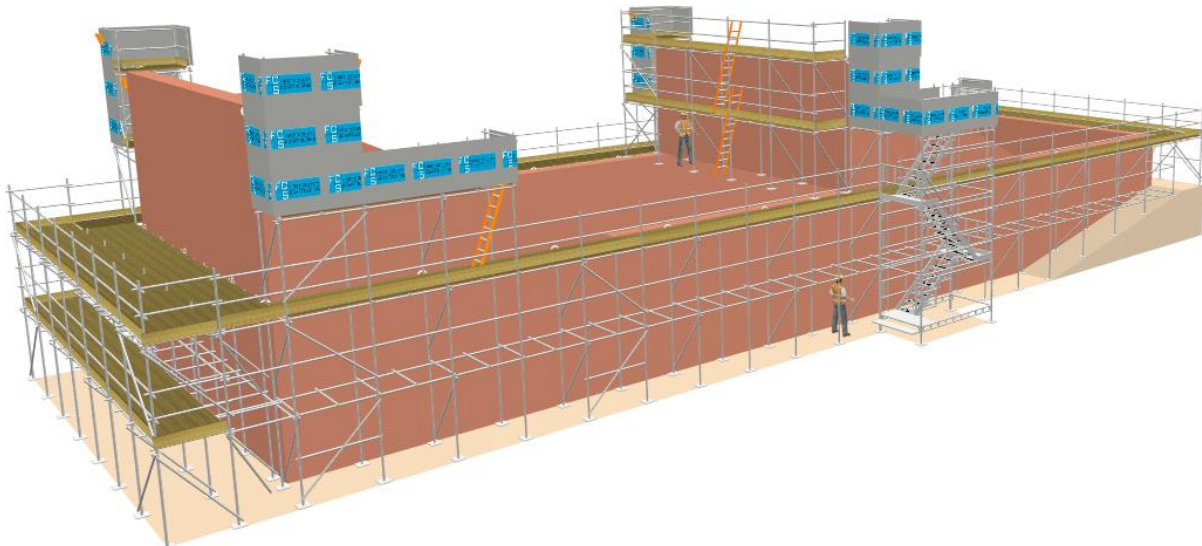
This is an **advanced** guide.

Please read the **Model IT User Guide** for help with most common tasks before reading this guide.

This guide assumes that you are familiar with navigating Model IT, creating and editing simple scaffolds.

SMART Estimator **Model IT** is a powerful 3D scaffold Model tool.

Help with common, simple types of scaffolding is included in the **Model IT User Guide**. This **Model IT Advanced User Guide** includes tips, tricks and advice for more complex types of scaffold Model.



## Applying Tools

Tools can be used to add additional features to a scaffold. To apply a tool:

- ▶ Select the tool;
- ▶ Press the **Shift** or **Ctrl** key to modify how the tool is applied.



Typically, the **SHIFT** key applies the tool to **MORE** of the scaffold.

Typically, the **CTRL** key applies the tool to **LESS** of the scaffold.

- ▶ Click on the scaffold, lift, elevation or feature to apply the tool.



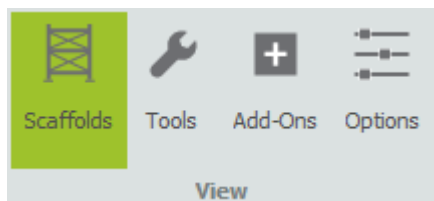
One of the most versatile tools is the **Eraser**. This can be used to remove many different features and add-ons from a scaffold.

## Find the tools you want to use

SMART Estimator **Model IT** has many tools available, each on different “Views”:

- ▶ Scaffolds
- ▶ Tools
- ▶ Add-Ons
- ▶ Options

To switch between these, select one from the toolbar.



When the view changes, the toolbar shows tools for that view.



## Available tools

The following tools can be applied to a scaffold:

### Tools view

Tool	Description	Where	Apply to
Select one scaffold / Show all scaffolds	<i>See: Editing multiple scaffolds.</i>		
Move scaffold	Move a scaffold horizontally or vertically along the ground.	Tools view	A scaffold
Erase	Erase a scaffold add-on or feature.	Tools view and Tools view: Erase menu	Various
Erase scaffold	Erase a scaffold.	Tools view: Erase menu	A scaffold
Split elevation	Split an independent into two.	Tools view	An elevation
Change scaffold direction	Flip the scaffold to the other side of the elevation.	Tools view	A scaffold
Tube-and-fitting transoms	Use traditional scaffold tubes as transoms for this scaffold.  <i>This feature only applies for Tube and Fitting scaffolds.</i>	Tools view: Transoms menu	A scaffold
System transoms	Use system transoms (e.g. Ready-lok transoms) for this scaffold.  <i>This feature only applies for Tube and Fitting scaffolds.</i>	Tools view: Transoms menu	A scaffold
Single boards	Remove double boards from a lift, leaving single boards.  Does not board an un-boarded lift.	Tools view: Boards menu: Double boards menu	A lift; <b>SHIFT</b> : This elevation only. <b>CTRL</b> : All lifts above.

<b>Double boards</b>	Add double boards to a boarded lift. Does not board an un-boarded lift.	Tools view: Boards menu: Double boards menu	A lift; <b>SHIFT</b> : This elevation only. <b>CTRL</b> : All lifts above.
<b>Double boards with sheeting</b>	Add double boards with a layer of sheeting between (i.e. sandwich boards) to a lift. Does not board an un-boarded lift.	Tools view: Boards menu: Double boards menu	A lift; <b>SHIFT</b> : This elevation only. <b>CTRL</b> : All lifts above.
<b>Platform material</b>	Change the decking material used for the scaffold.	Tools view: Boards menu: Deck board material menu	A scaffold
<b>Ladder</b>	Add a column in ladders in the selected bay.	Tools view: Ladder menu	A bay
<b>Single-lift ladder</b>	Add a column in ladders that span a maximum of one lift in the selected bay.  <i>These ladders will span multiple lifts if the lifts are very low height or un-boarded lifts are present.</i>	Tools view: Ladder menu	A bay
<b>External ladder</b>	Add a column in ladders with an external ladder and a ladder gate at the first lift.	Tools view: Ladder menu	A bay
<b>Vertical ladder</b>	Add a vertical ladder.  <i>You need to select the vertical ladder components in the <b>Configuration</b> if you want to add a vertical ladder.</i>  <i>See the <b>SMART Estimator Configuration User Guide</b> for details of how to do this.</i>	Tools view: Ladder menu	A bay
<b>Façade bracing: Single bay / Single bay (alternating) / Double bay</b>	Set the style of façade bracing. Façade will be restored if it has been erased.  <i>Façade bracing options are determined by the scaffolding system.</i>	Tools view: Bracing	All elevations; <b>CTRL</b> : This elevation only.
<b>Ledger bracing</b>	Apply ledger bracing.  <i>Bracing options are determined by the scaffolding system.</i>	Tools view: Bracing	All elevations; <b>CTRL</b> : This elevation only.



## Add-ons view

Tool	Description	Where	Apply to
<b>Bridge</b>	<p>Apply a bridge to a bay. The selected bay will be the top left bay of the bridge.</p> <p><i>Select different bridge tools to apply different types of bridge. Available bridge options are determined by the scaffolding system.</i></p> <p><i>See <b>Edit bridge dimensions</b>.</i></p>	Add-ons view: Bridge	A bay
<b>Gin wheel</b>	<p>Apply a gin wheel and rope.</p> <p><i>Gin wheels can be re-positioned by dragging along the elevation.</i></p>	Add-ons view	A lift
<b>Double standards</b>	<p>Add double standards.</p> <p><i>The height of double standards can be changed using the dynamic input.</i></p>	Add-ons view	All elevations; <b>CTRL</b> : This elevation only.
<b>Rubbish chute</b>	<p>Add a rubbish chute.</p> <p><i>Select different rubbish chute tools to apply different types of chute.</i></p> <p><i>Rubbish chutes can be re-positioned by dragging along the elevation.</i></p>	Add-ons view and Add-ons view: Rubbish chute	A lift
<b>Safety standards</b>	<p>Add high-visibility safety standards (foam or tape).</p> <p><i>Select different safety standard tools to apply different types.</i></p>	Add-ons view and Add-ons view: Safety standards	All elevations; <b>CTRL</b> : This elevation only.
<b>Safety lamps</b>	<p>Add safety lamps / lights to the first lift.</p> <p><i>Select different safety lamp tools to apply different types. You can use the eraser and the <b>Ctrl</b> key to delete individual lights.</i></p>	Add-ons view and Add-ons view: Safety lamps	All elevations; <b>CTRL</b> : This elevation only.
<b>Sheeting</b>	<p>Add sheeting to a lift.</p> <p><i>Select different sheeting tools to apply different sheeting colours.</i></p>	Add-ons view and Add-ons view: Sheeting	A lift; <b>SHIFT</b> : This elevation only. <b>CTRL</b> : All lifts above

<b>Debris netting</b>	<p>Add debris netting to a lift.</p> <p><i>Select different debris netting tools to apply different netting colours.</i></p>	<p>Add-ons view and Add-ons view: Debris netting</p>	<p>A lift; <b>SHIFT</b>: This elevation only. <b>CTRL</b>: All lifts above</p>
<b>Brick guards</b>	<p>Add brick guards to a lift.</p>	<p>Add-ons view and Add-ons view: Brick guards</p>	<p>A lift; <b>SHIFT</b>: This elevation only. <b>CTRL</b>: All lifts above</p>
<b>Light-duty fan</b>	<p>Add light-duty fan to a lift.</p> <p><i>Select different fan tools to apply different types of fan.</i></p> <p><i>The width, start and end of a cantilever fan can be changed using the dynamic input.</i></p>	<p>Add-ons view: Light-duty fan</p>	<p>A lift; <b>SHIFT</b>: This elevation only. <b>CTRL</b>: All lifts above</p>
<b>Banner</b>	<p>Add a banner.</p>	<p>Add-ons view and Add-ons view: Banner</p>	<p>An elevation</p>
<b>Banner logo</b>	<p>Set the logo shown on banners.</p>	<p>Add-ons view: Banner</p>	<p>N/A</p>
<b>Sheeting logo</b>	<p>Set the logo shown on sheeting.</p>	<p>Add-ons view: Sheeting logo</p>	<p>N/A</p>
<b>Clear sheeting logo</b>	<p>Set sheeting to show no logo.</p>	<p>Add-ons view: Sheeting logo</p>	<p>N/A</p>
<b>Pavement lift</b>	<p>Add a pavement lift. This has the following effects:</p> <ul style="list-style-type: none"> <li>▶ The first lift height is updated;</li> <li>▶ Safety standards are applied;</li> <li>▶ Safety lamps are applied;</li> <li>▶ Ledger bracing is removed below the first lift.</li> </ul>	<p>Add-ons view</p>	<p>All elevations; <b>CTRL</b>: This elevation only.</p>
<b>Recess</b>	<p>Add a small recess in the elevation, filled with inside boards or cantilever platforms (hop-ups).</p>	<p>Add-ons view</p>	<p>An elevation <b>SHIFT</b>: All elevations</p>

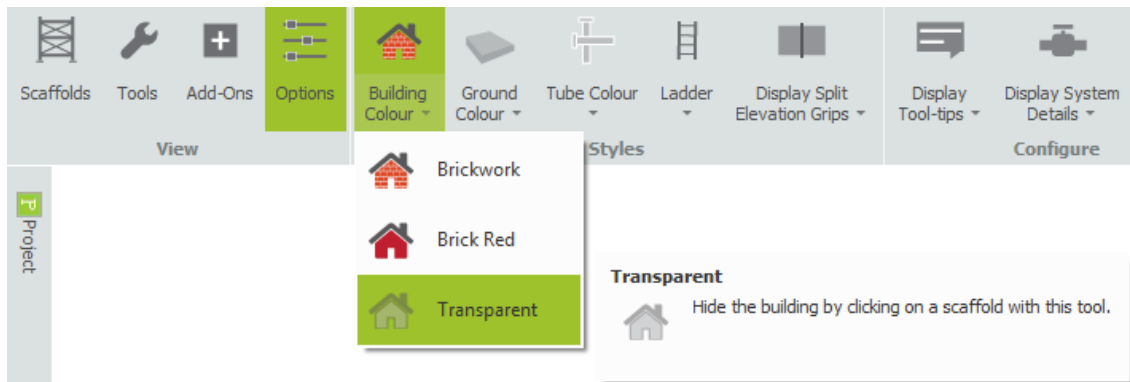
## Options view

Tool	Description	Where	Apply to
<b>Building colour</b>	Set the building colour.  <i>You can use the <b>Transparent</b> tool to hide the building.</i>	Options view: Building colour menu	N/A
<b>Ground colour</b>	Set the ground colour.  <i>You can use the <b>Transparent</b> tool to hide the ground.</i>	Options view: Ground colour menu	N/A
<b>Tube colour</b>	Set the tube colour for this scaffolding system.	Options view: Tube colour menu	N/A
<b>Ladder</b>	Set the ladder colour.	Options view: Ladder menu	N/A
<b>Display split elevation grips</b>	Show the grips that can be moved to adjust the length of split elevations.  <i>You may want to hide these grips before capturing a screenshot.</i>	Options view: Display split elevation grips menu	N/A
<b>Display tooltips</b>	Change when the dynamic inputs (tooltips) are displayed. Usually this should be set to <b>Always</b> .	Options view: Display tooltips menu	N/A
<b>Display system details</b>	Change when system details are displayed.  <i>Hiding these details improves performance, while showing them improves the look of the scaffolds.</i>	Options view: Display system details menu	N/A
<b>Display person</b>	Show a scaffolder / person near the scaffold.  <i>See the <b>Display a person</b> section in the <b>Copy a picture of your scaffolds</b> section for details.</i>	Options view: Display person menu	N/A
<b>Copy picture</b>	Capture an image of the scaffold and copy it to the clipboard.  <i>See the <b>Copy a picture of your scaffolds</b> section for details.</i>	Options view	N/A

## Hide or Display objects

### Hide unwanted buildings

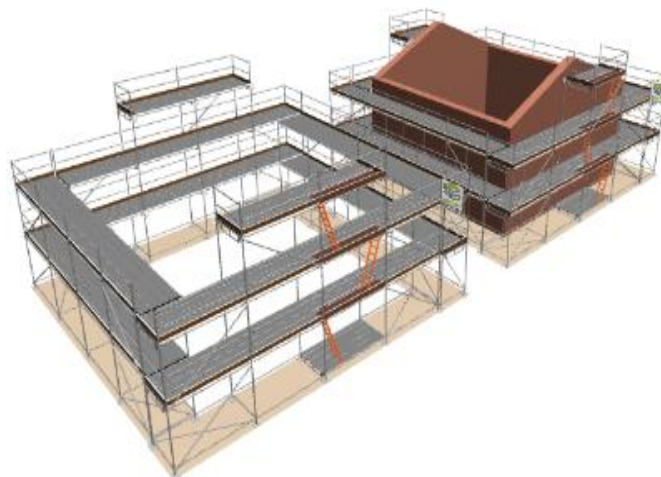
You can remove any of the buildings from the image if you wish and only show the scaffolds. To do this, switch to the **Options view** on the **Model IT** toolbar and select the **Transparent** building tool, then click on a scaffold:



Select a scaffold:

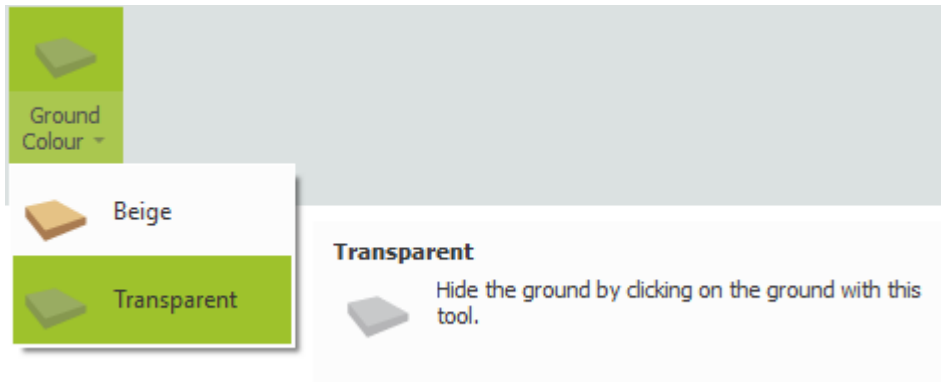


The building is then hidden from the display:

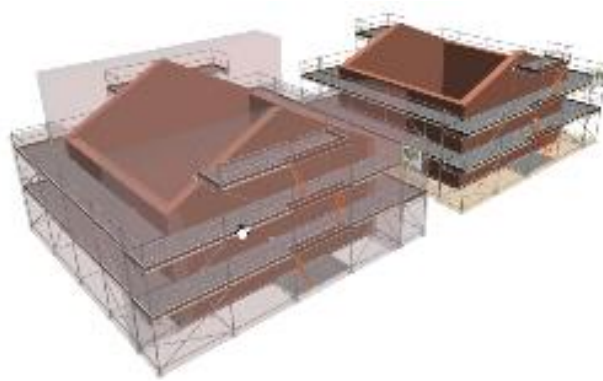


## Hide the ground

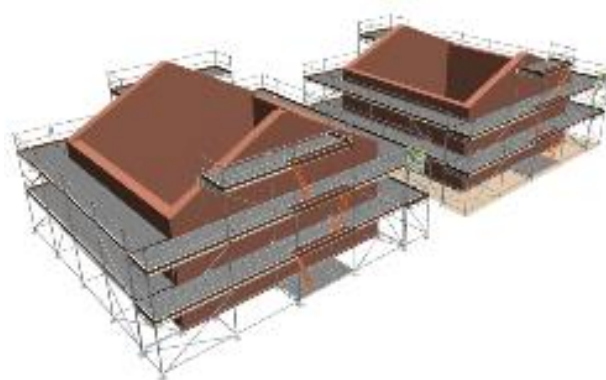
You can hide the ground in a similar way. To do this, switch to the **Options** view on the **Model IT** toolbar and select the **Transparent** ground tool, then click on a scaffold:



Select a scaffold:



The ground is then hidden from the display:



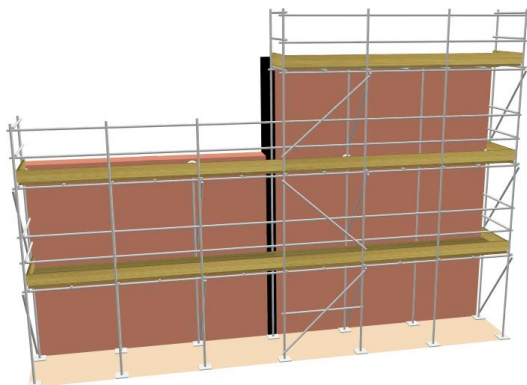
Hiding the ground might improve your 3D images, especially with sloped ground.

## Hide the split elevation grips

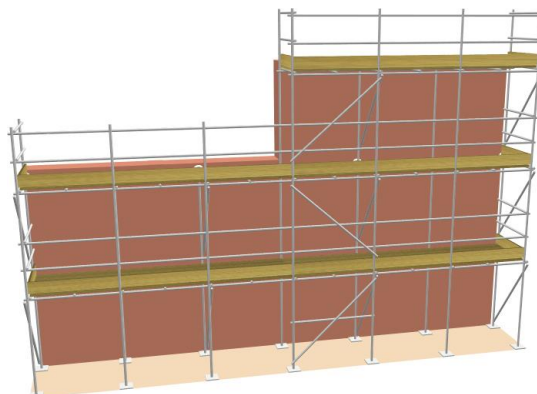
You can hide the split elevation grips. To do this, switch to the **Options** view on the **Model IT** toolbar and select the **Never** option in the **Display Split Elevation Grips** menu:



Always:



Never:

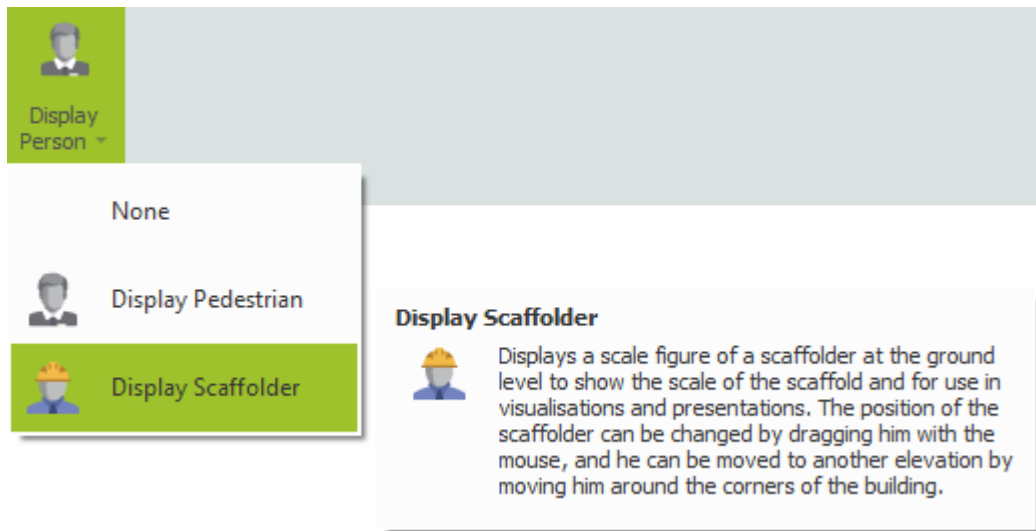


Hiding these grips might improve your 3D images.

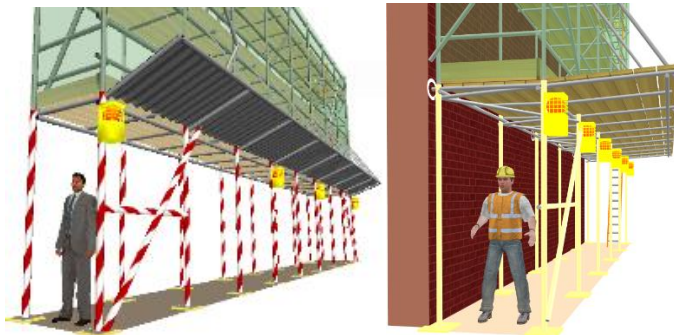


## Display a person

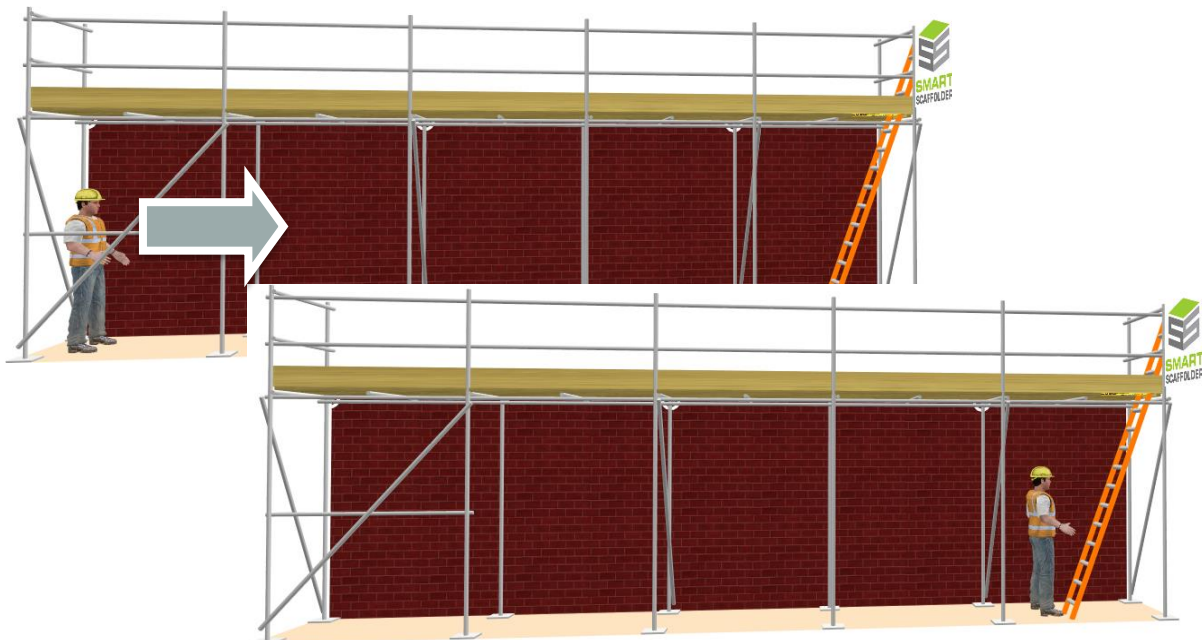
You can use the **Display Person** options to display a scale figure (person / scaffolder):



A person appears on each scaffold:



The person can be dragged into the desired position at the ground level:

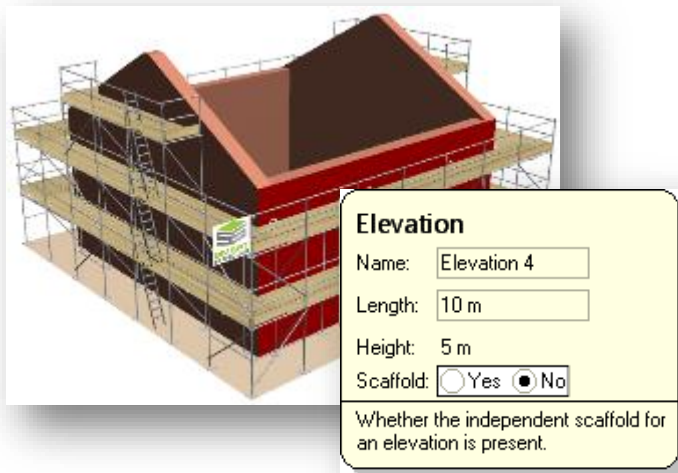




## Show non-scaffolded elevations

You may want to show a building which is partially scaffolded. There is a method of achieving this:

- ▶ Create the building in the usual way;
- ▶ Move the mouse pointer to the elevation that you wish to change. There is no need to click the mouse button;
- ▶ Some options are displayed. Tab down to the **Scaffold** option;
- ▶ Use the right arrow key to set the **Scaffold** option to **No**;
- ▶ Press the **Enter** or **Tab** key to select this option.

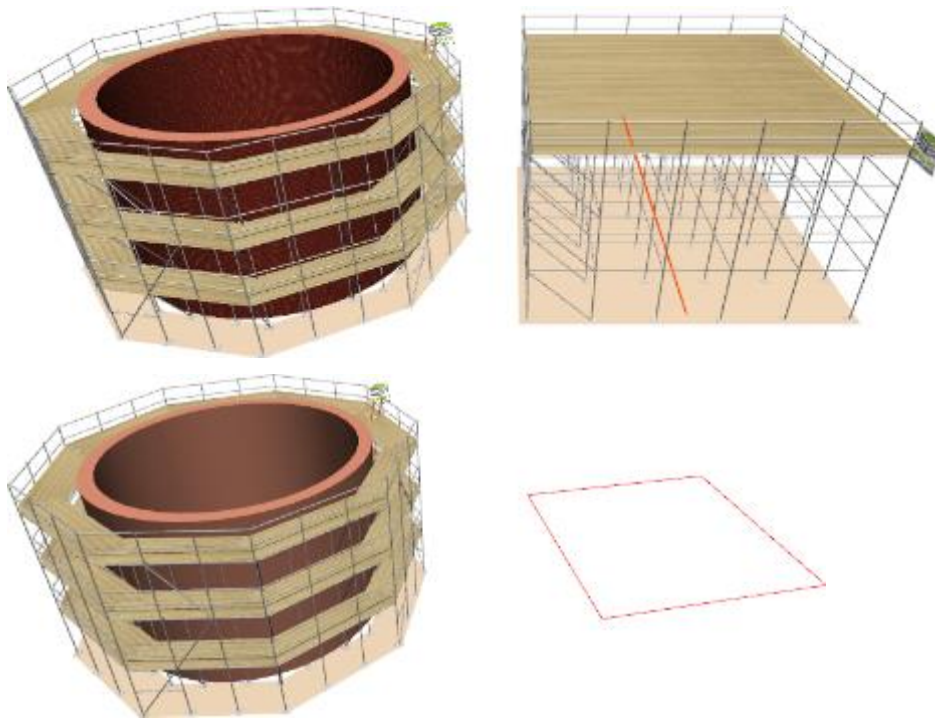


Non-scaffolded elevations are only used by the 3D picture. They don't appear in the quotation or other reports.

## Edit multiple scaffolds

When you have more than one scaffold, you can edit them with all of the usual tools. (See the **Edit the scaffold** section above). With multiple scaffolds, some extra tools are useful.

Use the **Select One Scaffold** button on the **Edit Scaffold** tab to hide all of the scaffolds except for one. This will also hide any tools that can't be used on this type of scaffold:



Hiding other scaffolds can make it easier to see what you are doing.

You can show all the hidden scaffolds by clicking the **Show All Scaffolds** button, which appears in the same place.

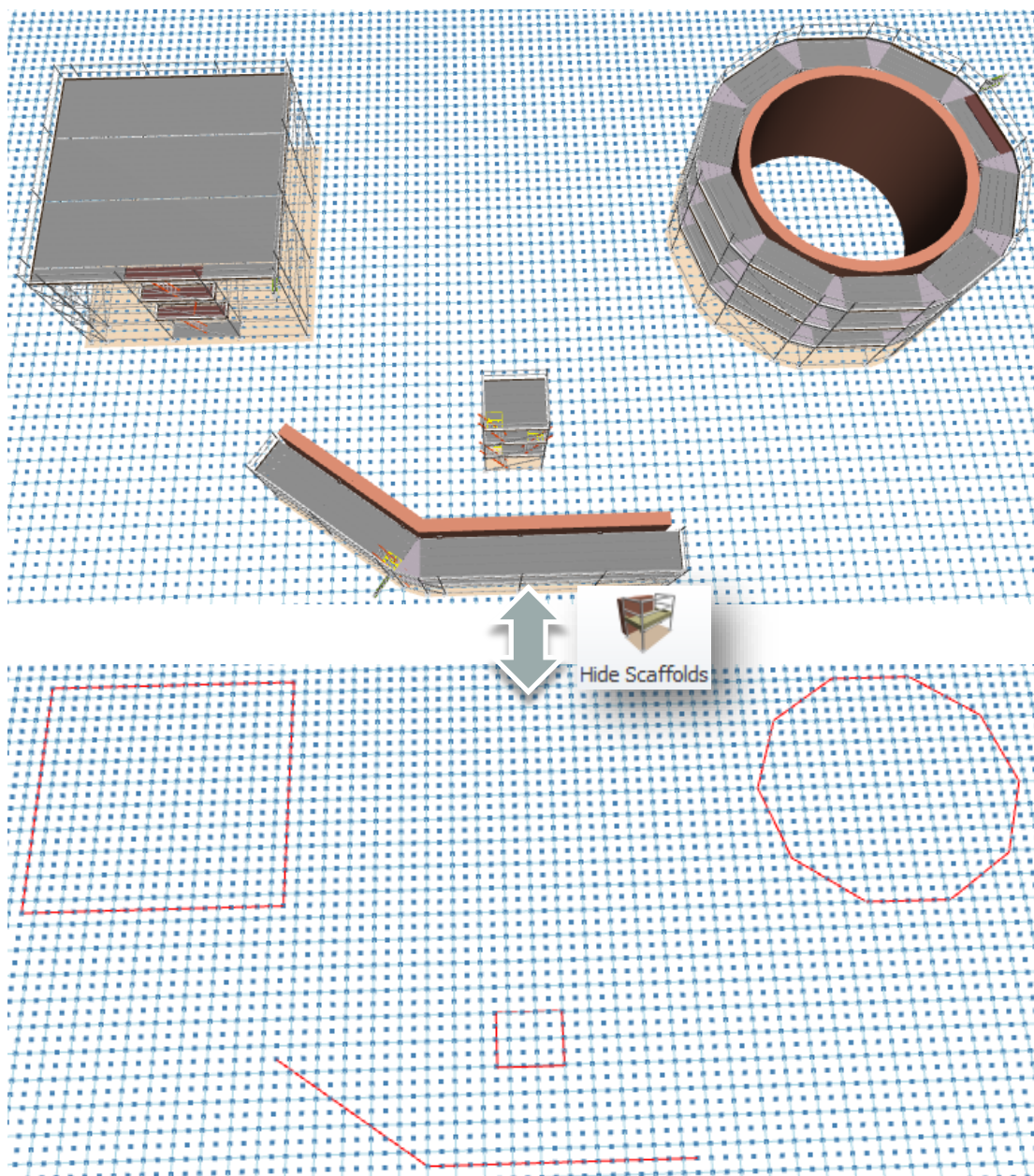
You cannot change to a different scaffolding system while any of the scaffolds are hidden.

You can also move scaffolds using the **Move Scaffolds** tool. This works just like the **Move Scaffold** tool in Draw Plan.

With this tool, you can move a scaffold in any of the four directions along the ground.

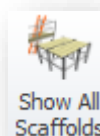
## Hide Scaffolds

You can also hide all of the scaffolds in your item, so that it is easier to see where they are in relation to each other. By choosing the **Hide Scaffolds** button, they are changed to red lines:



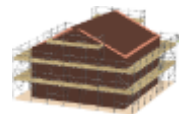
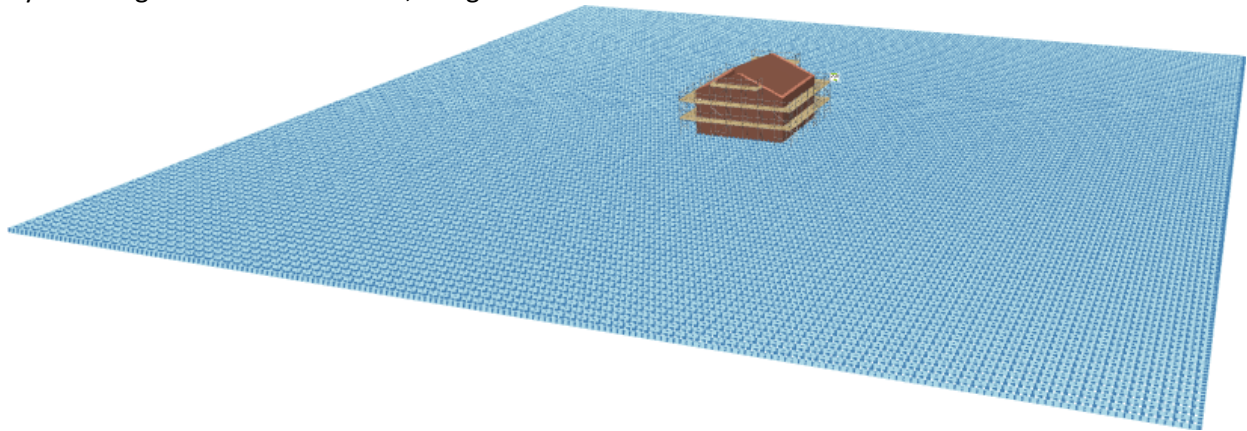
Hiding the scaffolds can make it much easier to draw elevations accurately.

You can show the scaffolds again by pressing **Show Scaffolds**.

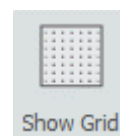


## Hide the grid

You can hide the grid of points. This is most useful if a site plan is showing and the grid is in the way. By choosing the **Hide Grid** button, the grid is hidden:



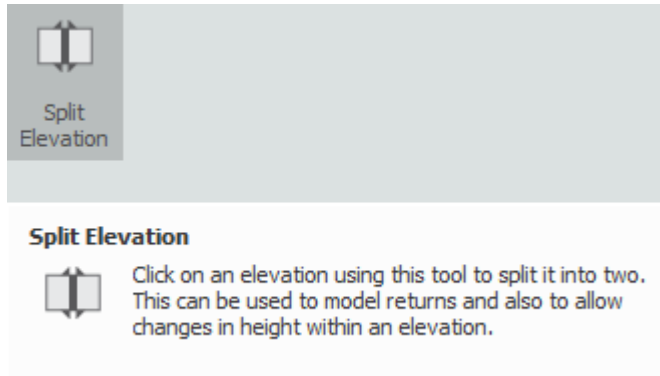
You can show the grid of points again by pressing **Show Grid**.



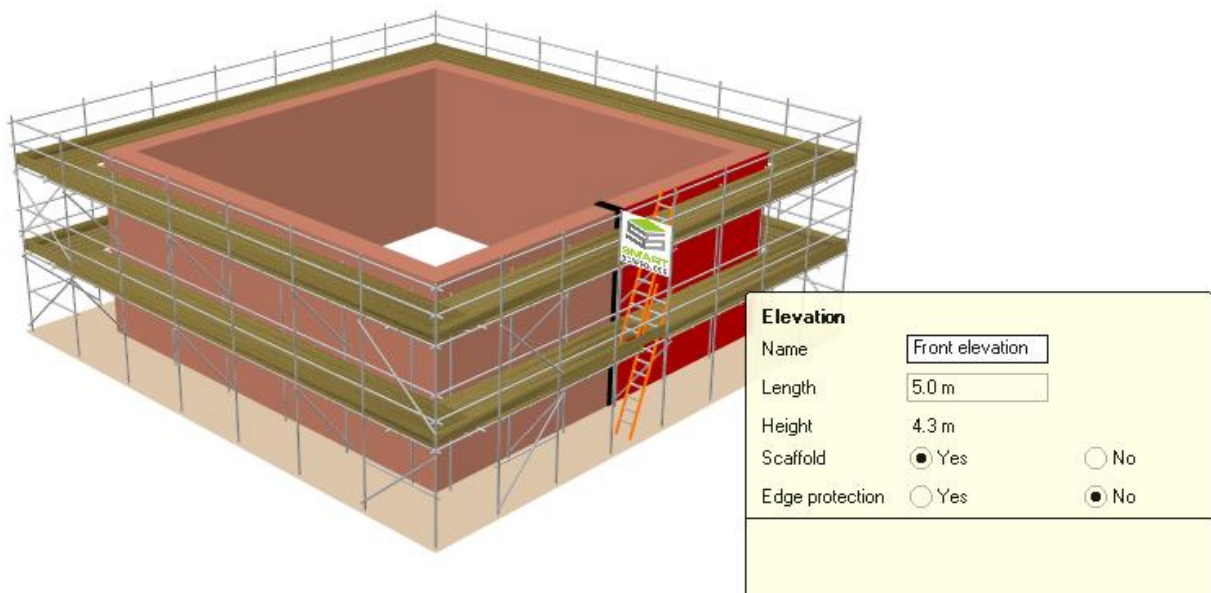


## Split elevations

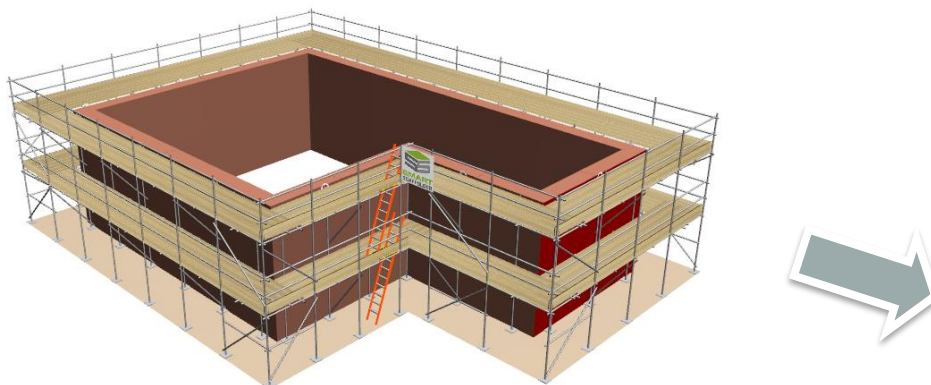
Complicated building shapes can be created by splitting elevations. This is achieved with the **Split Elevation** tool.



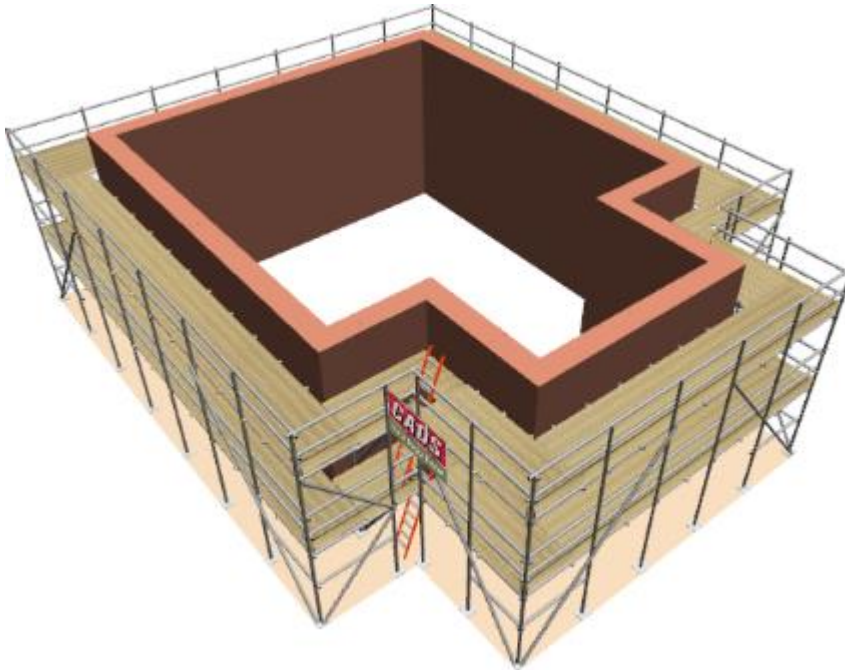
To split an elevation, click on the **Split Elevation** button and click on the elevation that you want to split. You can now see that there are two elevations by moving the mouse over them; only one side of the original elevation will be highlighted. A black grip appears at the split position.



Now that the elevation has been split you can pull or push it to make a return:



You can split an elevation as often as you wish, and any of the elevations can be pulled and pushed into the positions that you want. For example, you can split the return elevation again and push it back to create an inward return.



You can also split elevations to create several gable ends on one face of the building. To create this example, create a rectangular building and split the front elevation twice. You will now have three elevations along one face of the building.

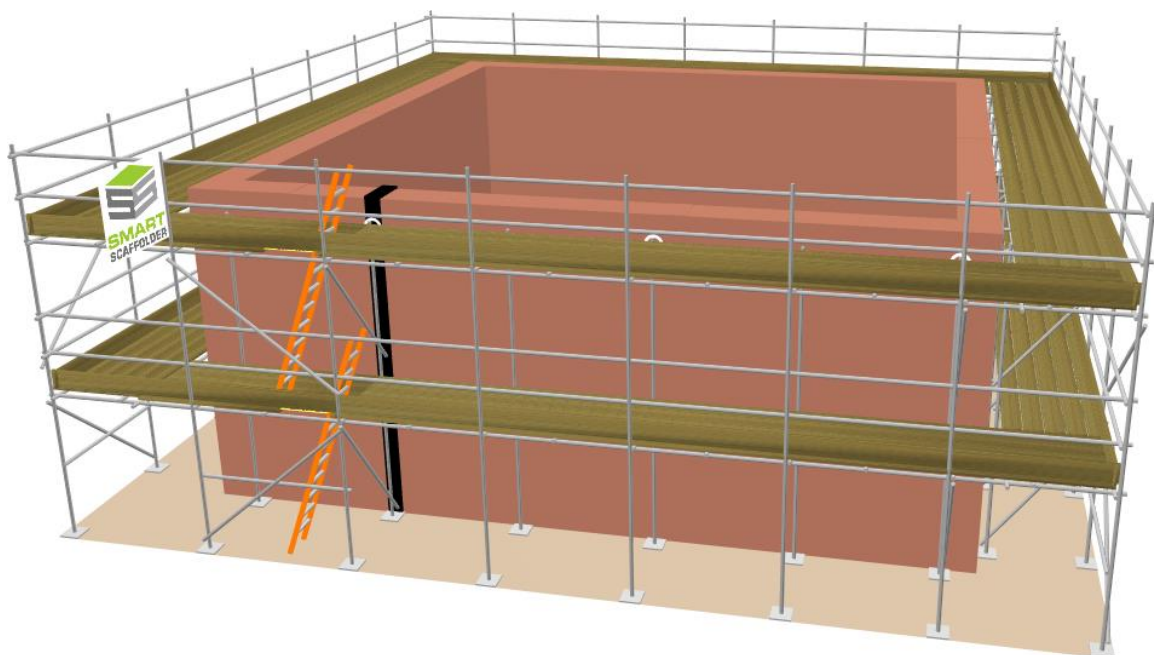
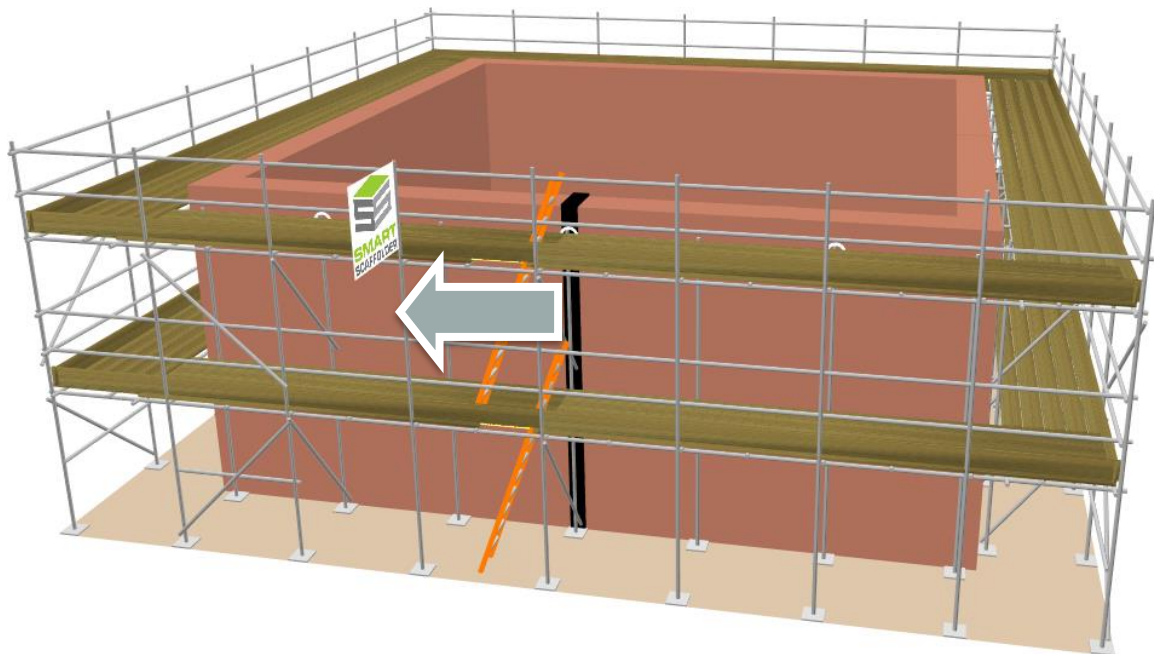
Move the mouse to each elevation, type in its length, and press **Enter**. Set the first and third elevations to 10 metres and the middle elevation to 3 metres.

Now rotate the building so that you can see the top. You will see that each section of the elevation has its own gable end grip point. Lift up these grip points to complete the scaffolding.



## Move the elevation split

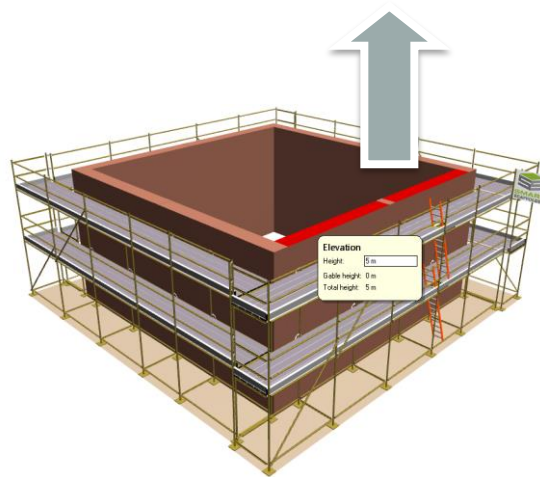
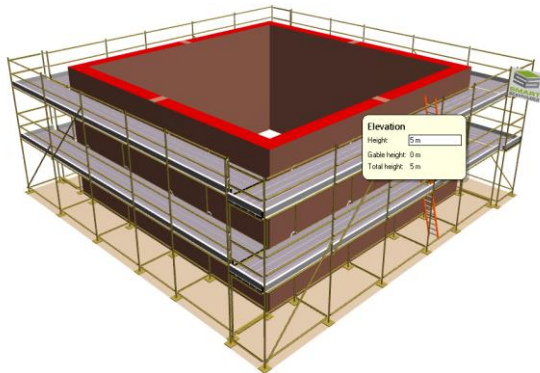
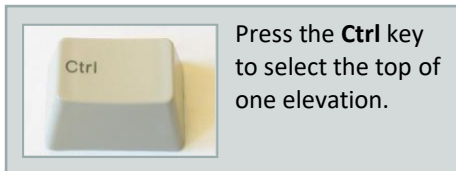
You can move the position of a split at any time by dragging the **Split Elevation Grip**.



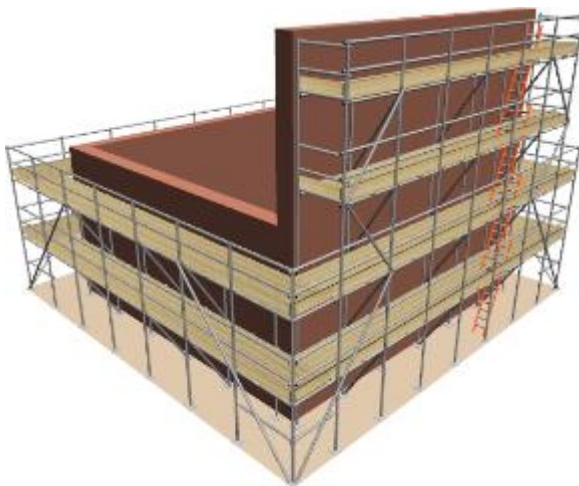
## Create stepped elevations

You can modify the height of a single elevation by holding the **Ctrl** key while dragging the top of the building.





Now pull the top of the elevation up:

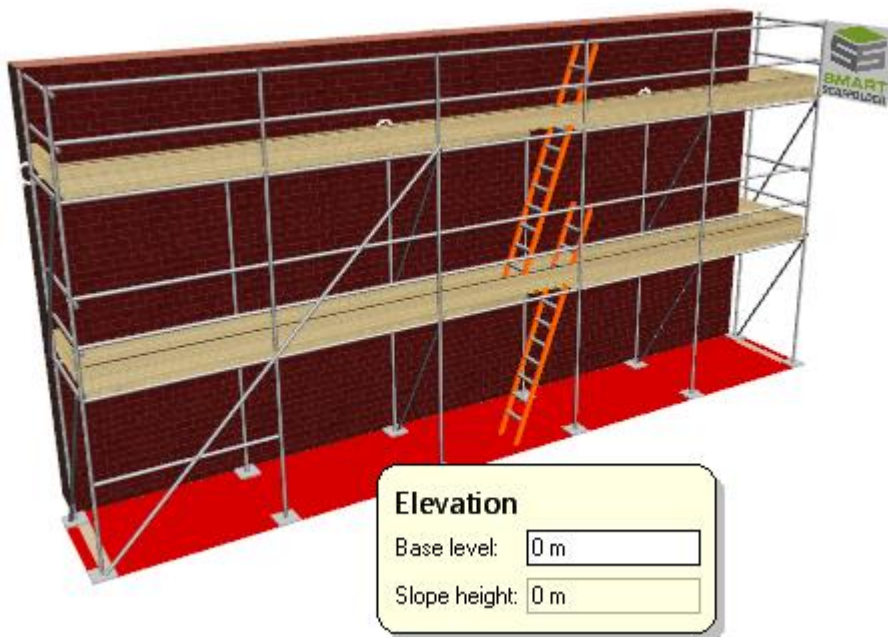


You can create hop-ups by splitting an elevation and using the **Ctrl** key to raise the height of one half.

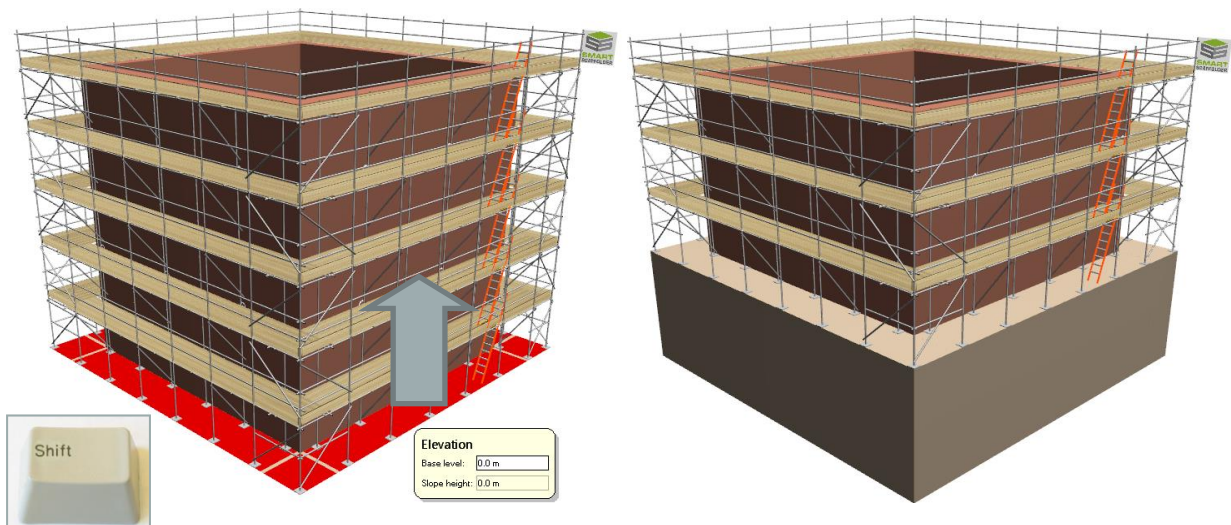


## Edit the ground conditions

To move a scaffold up and down, select the ground and drag it up or down:



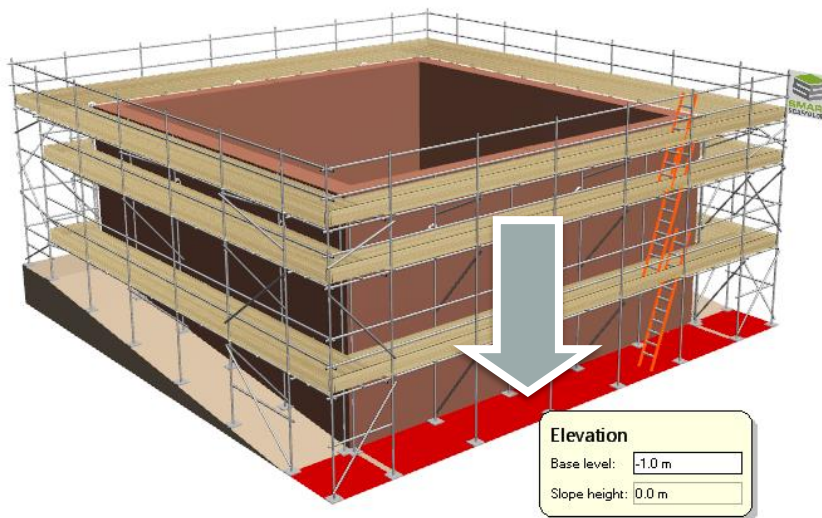
Holding the **Shift** key selects the ground for more elevations, while holding the **Ctrl** key selects only the main section (without the corners).



Remember that you can hide the ground for a scaffold using the **Ground** menu on the **Options** view.

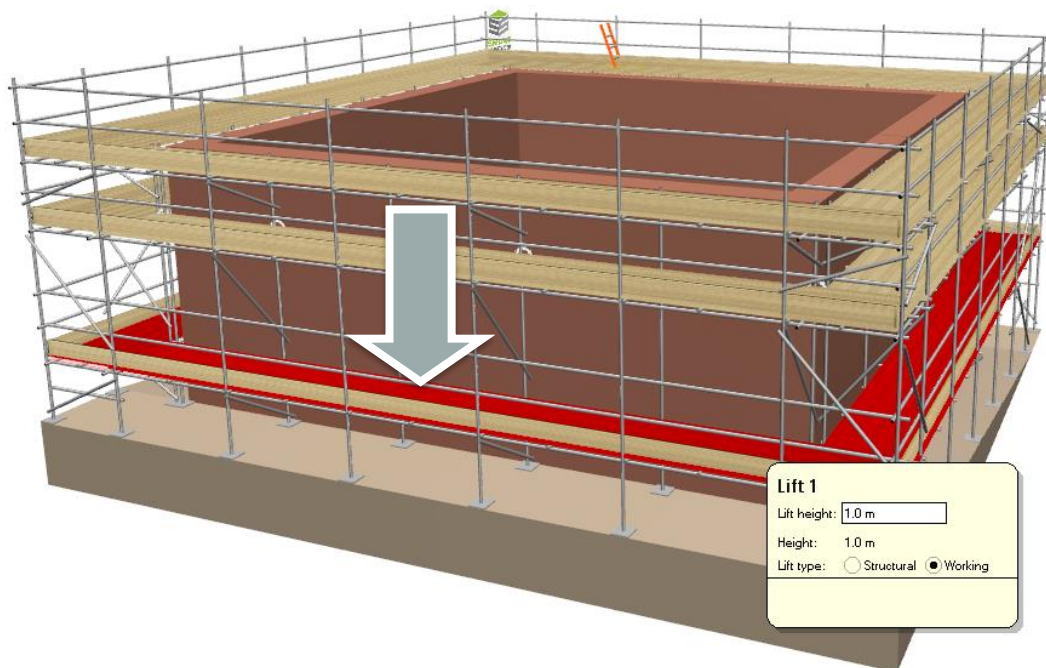
## Sloping or stepped ground

You can model stepped or sloping ground by clicking and dragging the elements of the ground model. Start by creating a rectangular scaffold; then drag one of the ground sections down by around 0.5 metres:



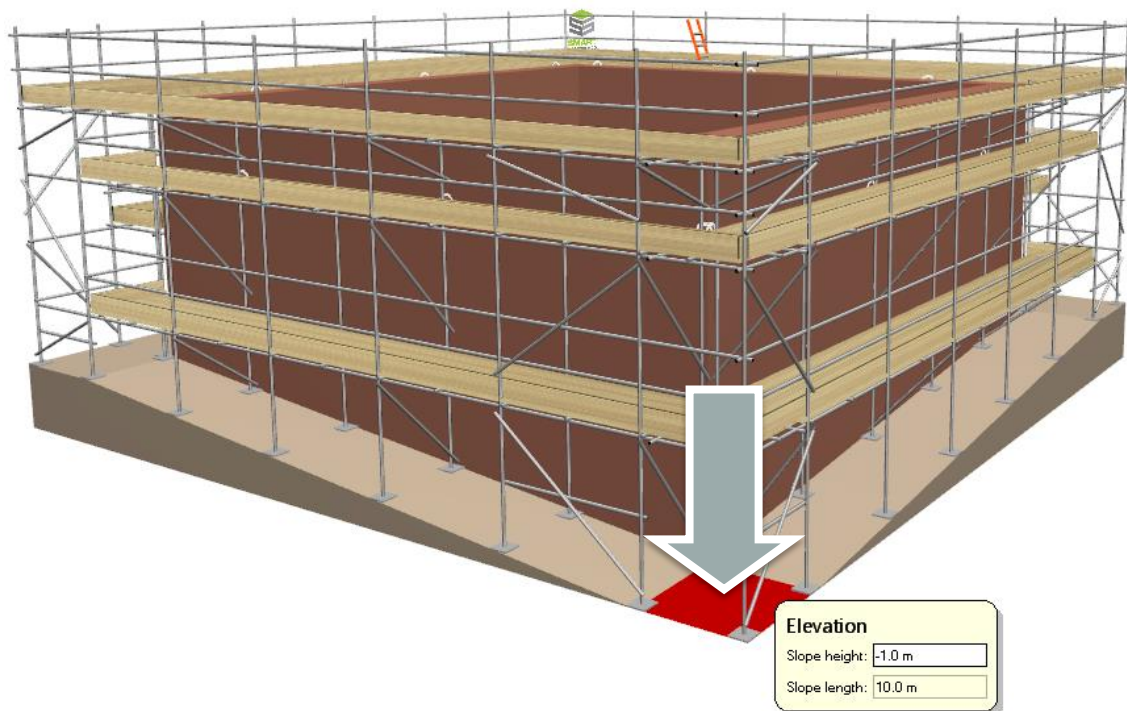
You will see that the adjacent ground sections become sloped.

When you alter the ground in this way you will see that some of the lifts may become disconnected. This happens because the lift heights are maintained; in this case most of the lifts are at a height of 2.0 metres, so the lifts at the front and at the sides are now 0.5 metres below the lifts at the back. You can correct this by either dragging the front lift upwards or by dragging the back lift downwards until the lifts become joined.

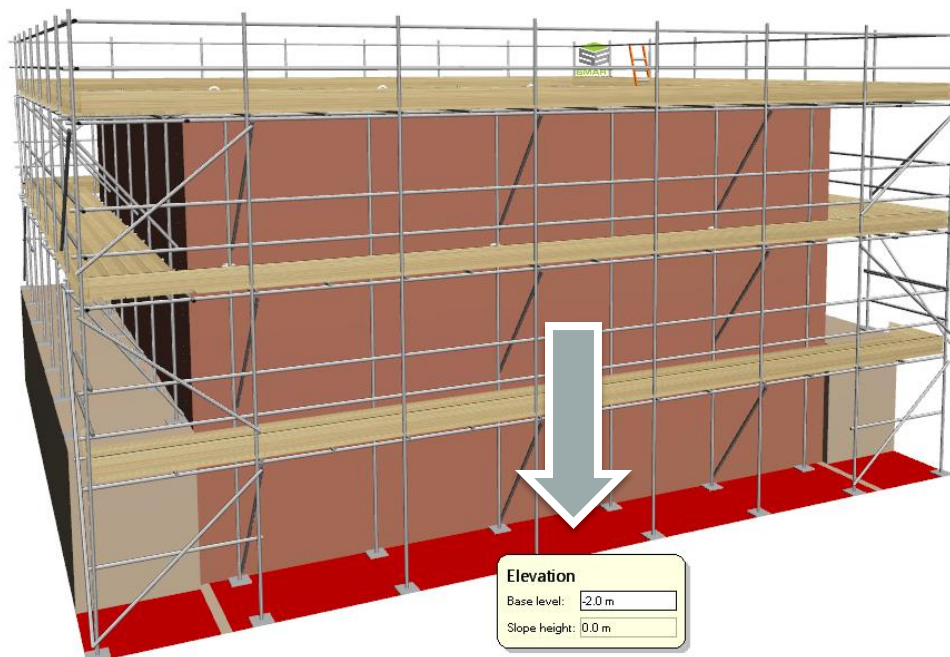




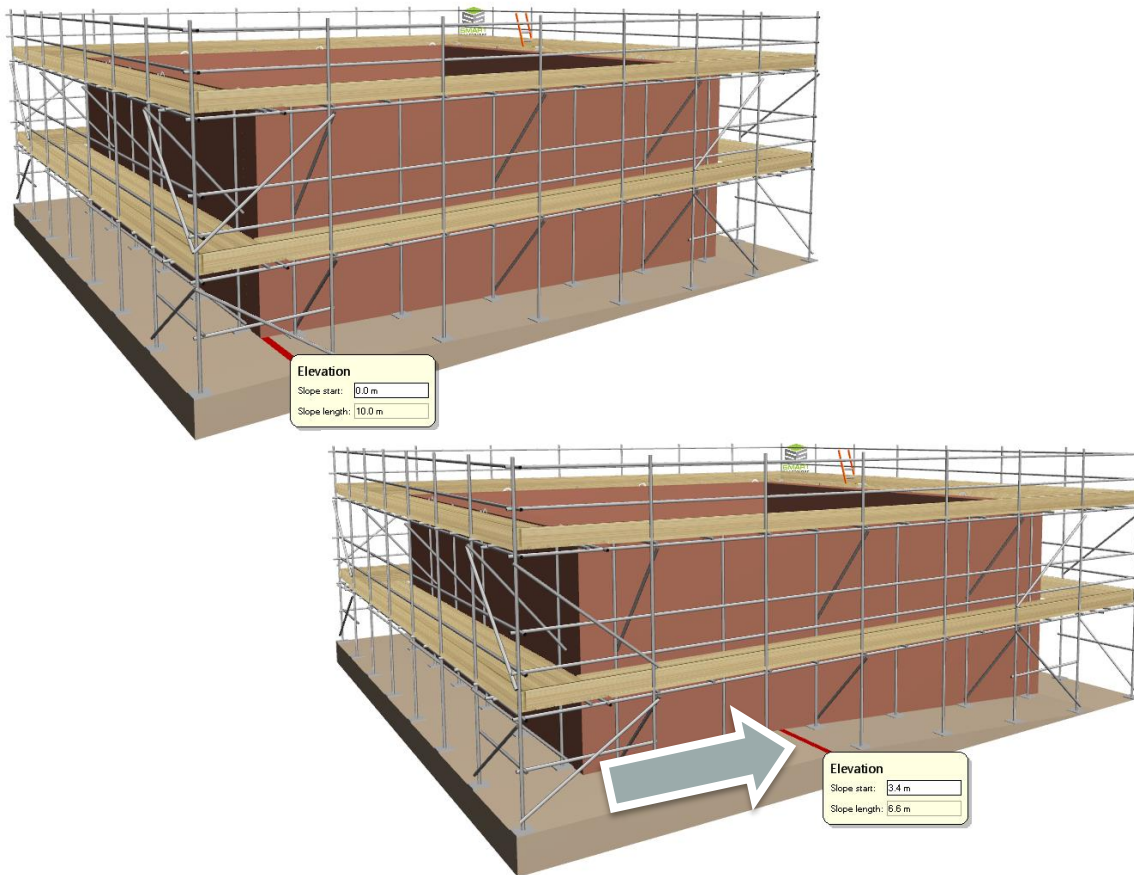
It is also possible to create slopes by dragging the corner sections of the ground:



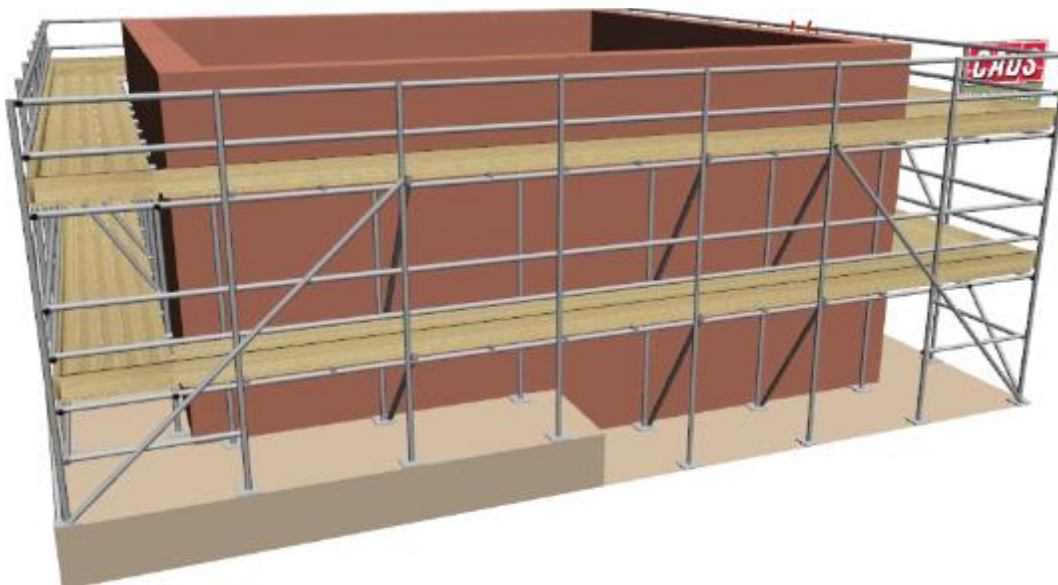
If you hold the **Ctrl** key while dragging you can create a step:



Slopes can be modified to change their start and end positions. As you move the mouse along a slope you will see the start and end locations become highlighted. Drag these highlighted sections with the left mouse button to modify the slope.



You can create a step along the length of an elevation by moving the start and end positions of the slope to the same location:





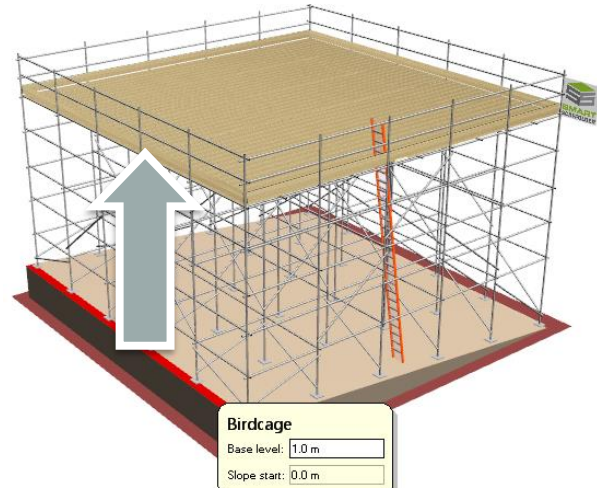
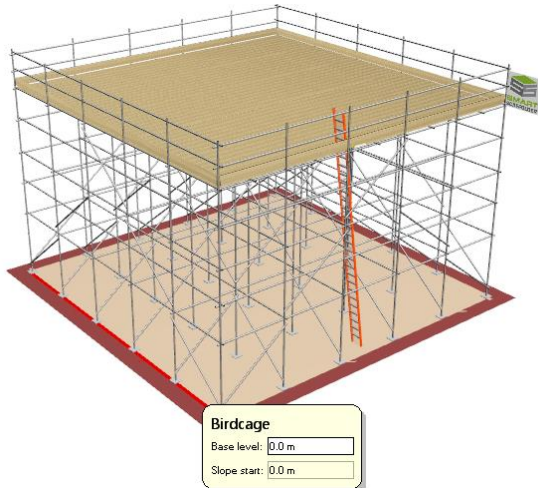
## Birdcage stepped or sloped ground

You can model a step or a slope in the ground in one direction for a birdcage.

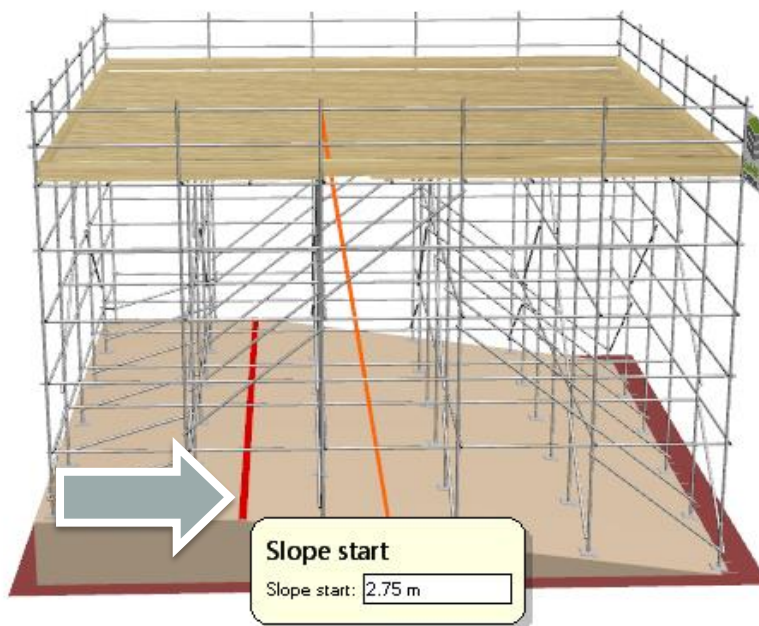


The slope always runs along the length of the birdcage, so you may need to swap the length and width dimensions to ensure that the slope direction is correct.

To change the height of the slope or step, move the mouse to the far left or right of the ground level so that a small strip of the ground is highlighted. Then, drag the mouse up or down to change the slope, or type the new slope height and press the **Enter** key.

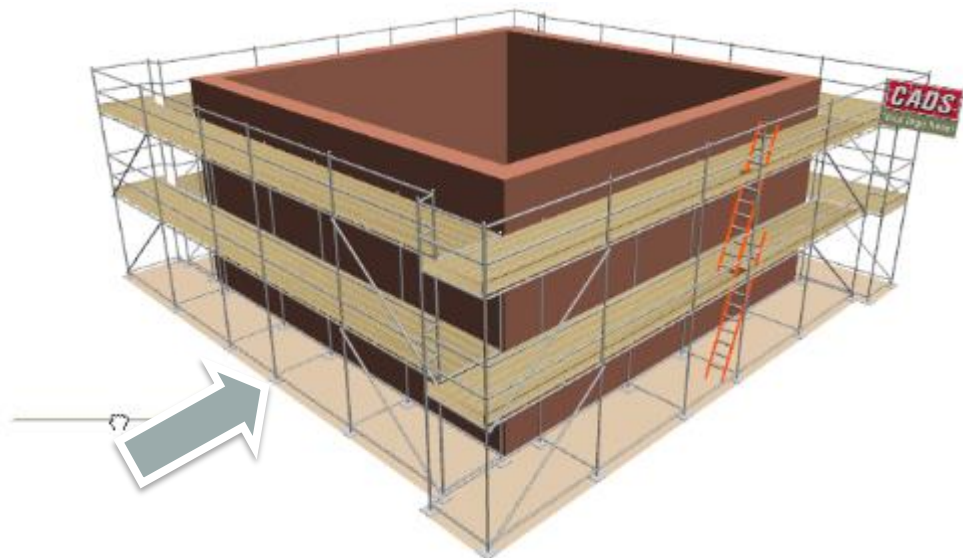


The start position of the slope can be changed by moving the mouse slightly away from the edge of the ground to highlight the **Slope start** or the **Slope end**. The start and end positions can be modified by dragging them with the mouse or by typing in a new value and pressing **Enter**.

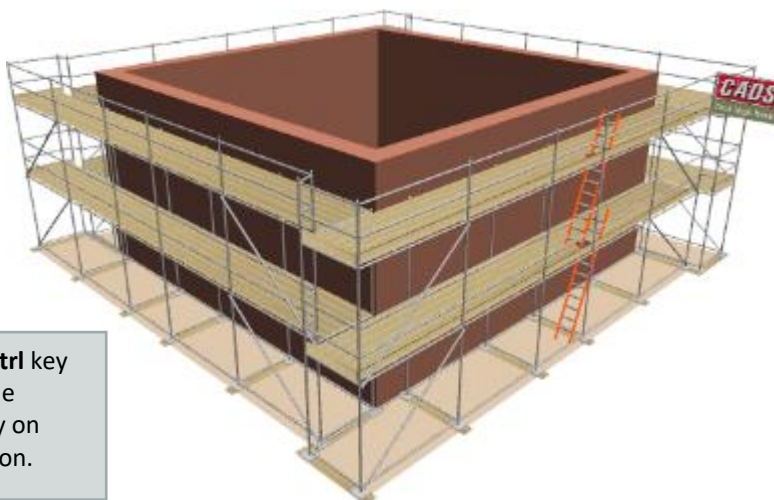


## Place sole boards

Sole boards may also be placed using the **Boards** option (in the **Tools** view on the **Model IT** tab) – just drop the boards onto the scaffold base plates:



If you hold the **Ctrl** key while placing the boards you can apply them to one elevation:



Press the **Ctrl** key to place sole boards only on one elevation.

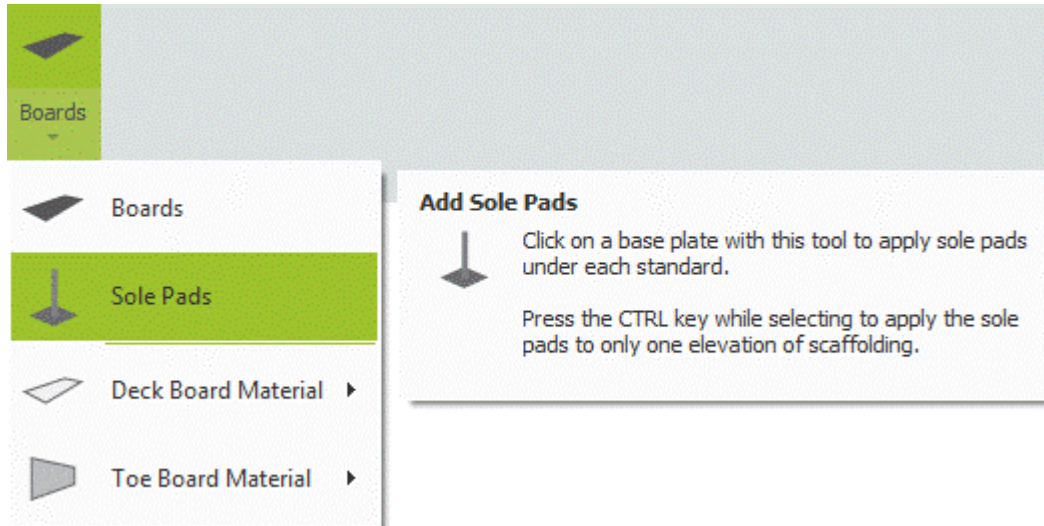


Sole boards, like most other components, can be removed with the **Eraser**.



## Place sole pads

Rather than placing sole boards, which span across pairs of standards, it is instead possible to place individual sole pads under each base plate if you prefer. To do so, click the **Boards** drop-down button and select the **Sole Pads** option:



The sole pads are then placed by clicking on the base plates, with the option to press the **Ctrl** key to apply them to one elevation at a time.

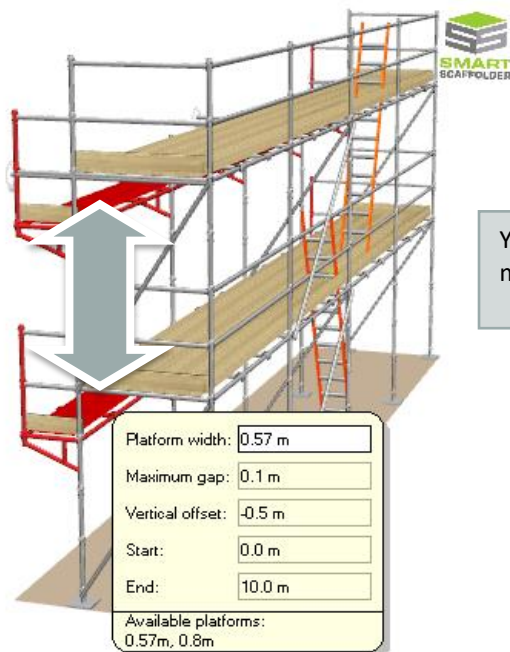


## Edit cantilever platforms (hop-ups)

In the **Tools** view on the **Model IT** tab, cantilever platforms can be created by using the **Cantilever Platforms** option. This feature can be used on tube-and-fitting scaffolding or system scaffolding. The platform will be supported by brackets or – in the case of tube-and-fitting scaffolding – a wider single-stage cantilever can be supported by tubes.

### Vertically offset cantilever platforms (hop-ups)

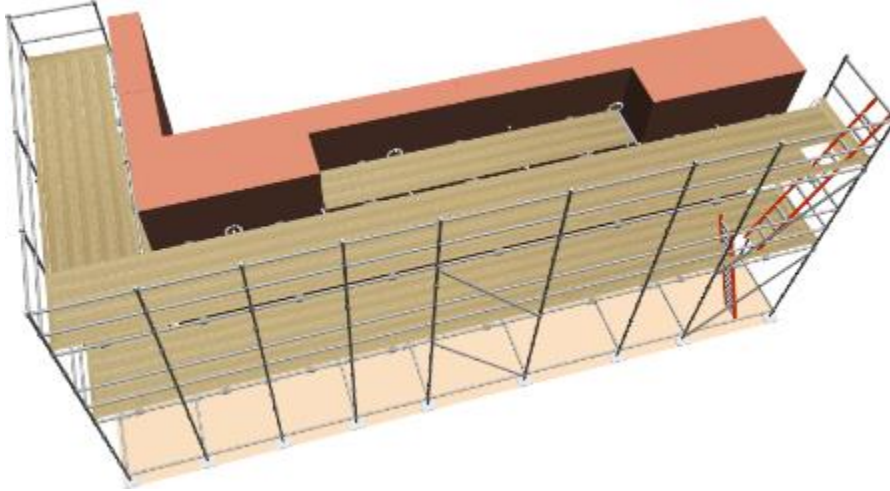
You can move the cantilever platforms up or down if you wish. To do so, move the mouse over the platform, pressing **Shift** or **Ctrl** to modify the selection as usual, and drag the platform up or down while pressing the left mouse button. Alternatively, you can enter the **Vertical offset** value directly with the keyboard by pressing the **Tab** key until it is highlighted, entering its new value, and pressing **Enter**.



You can move the cantilever platforms with the mouse or by typing a new vertical offset value.

## Edit the cantilever platform start and end

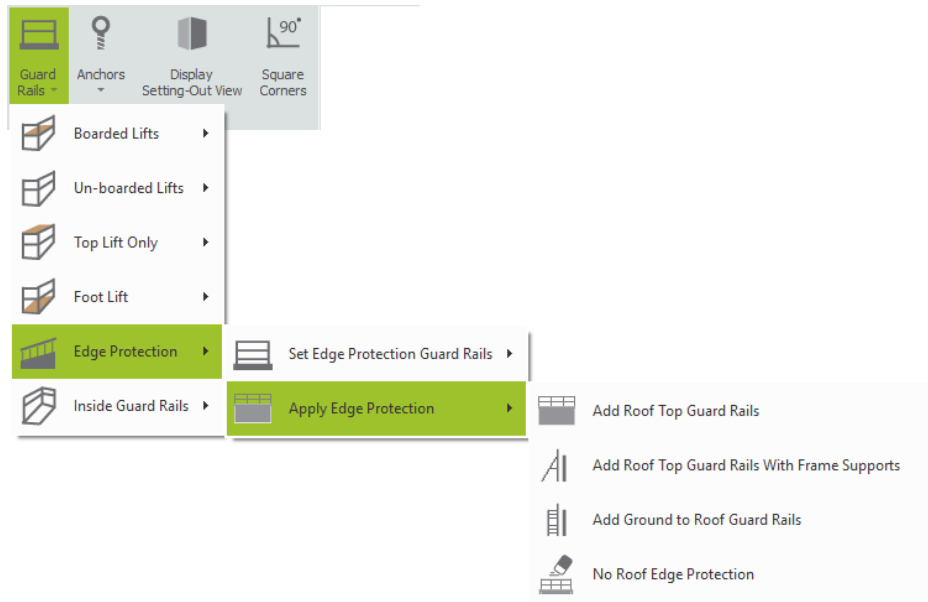
The **Start** and **End** positions of the platform can also be specified, for example to allow you to build a short platform within a recess. Press the **Tab** key to move to the **Start** or **End** field, type the new value, in metres, and press **Enter**.



Don't forget to use the **Ctrl** key to adjust the start and end of a single platform if your scaffold has more than one elevation.

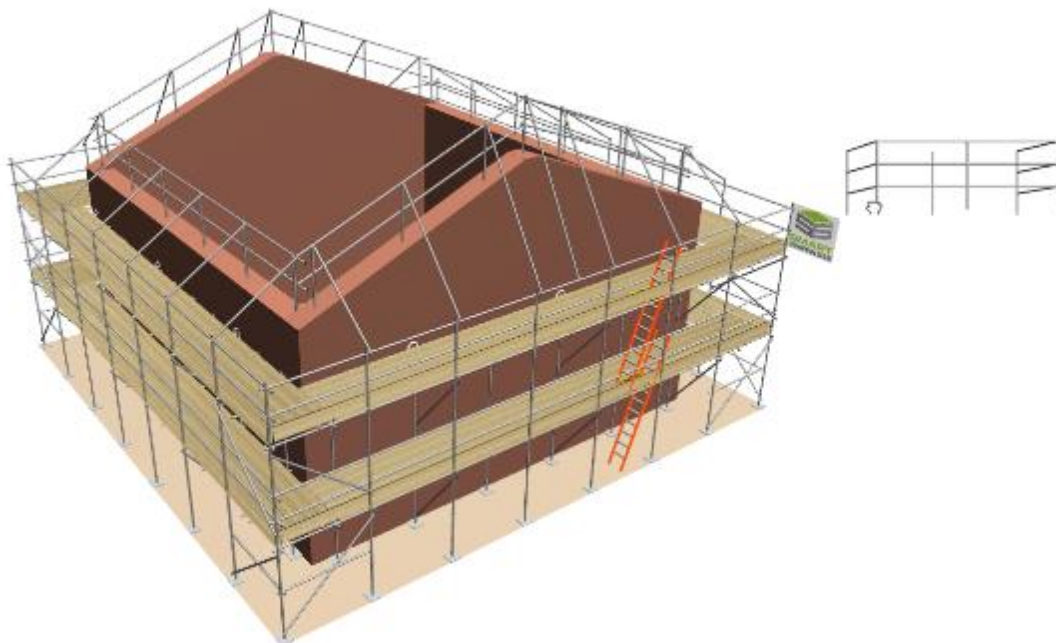
## Add edge protection guard rails

You may wish to add guard rails to protect against falling from a roof top. To specify the guard rails, select the **Guard Rails** drop-down button, then choose the type of guard rails that you require from the **Apply Edge protection** option:



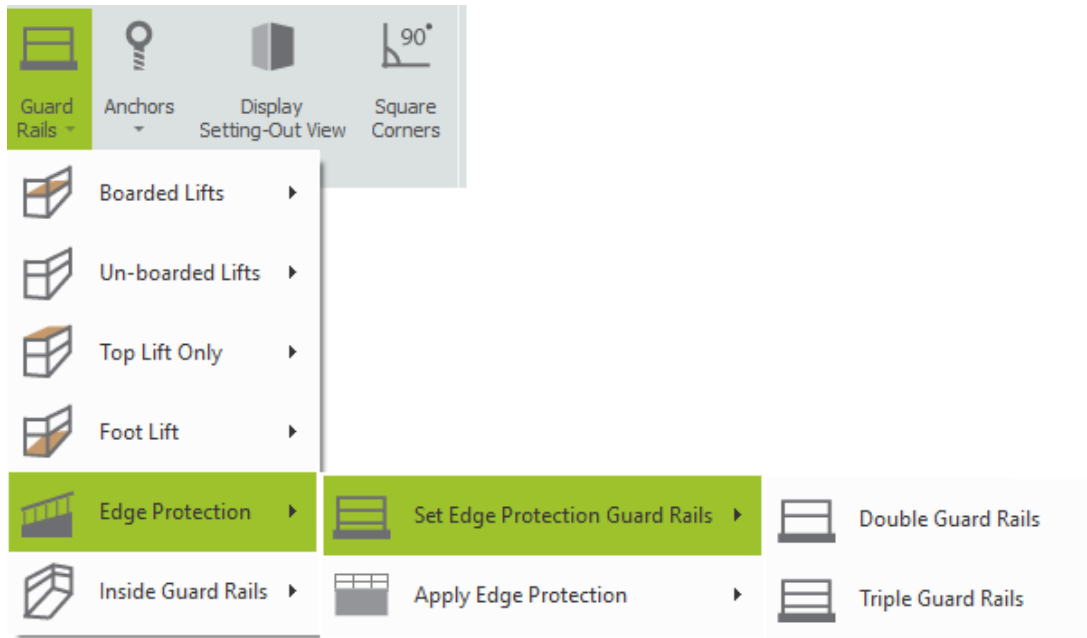
- ▶ Roof top is for guard rails which are erected on the roof top, but may be supported by diagonal supports from an independent.
- ▶ Ground is for guard rails which are a part of the independent.

Click on the scaffold to apply the guard rails, using the **Ctrl** key to apply them to one elevation of scaffolding.



## Change the number of guard rails

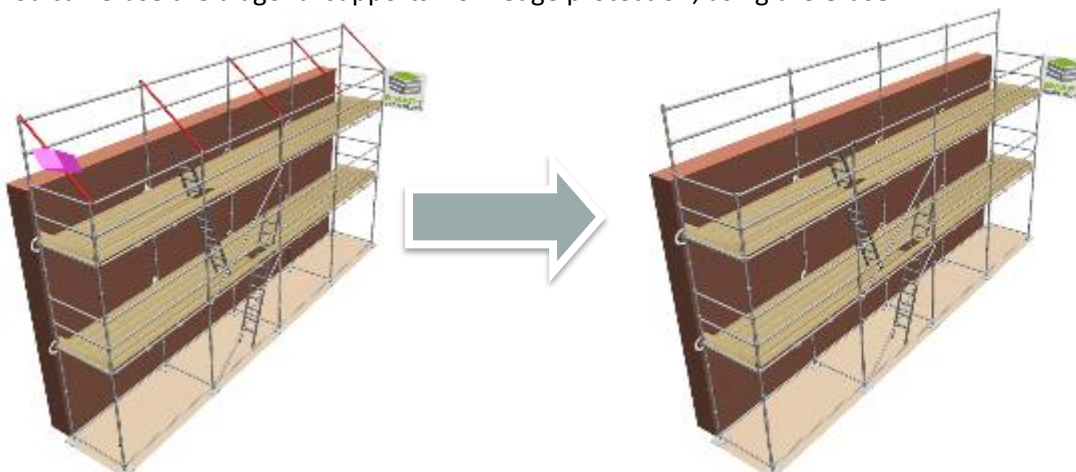
To change the number of guard rails, first add the guard rails as in the previous section, then select the **Set Edge Protection Guard Rails** option:



Click on the scaffold to apply the guard rails setting, using the **Ctrl** key to apply them to one elevation of scaffolding.

## Remove the supports from edge protection

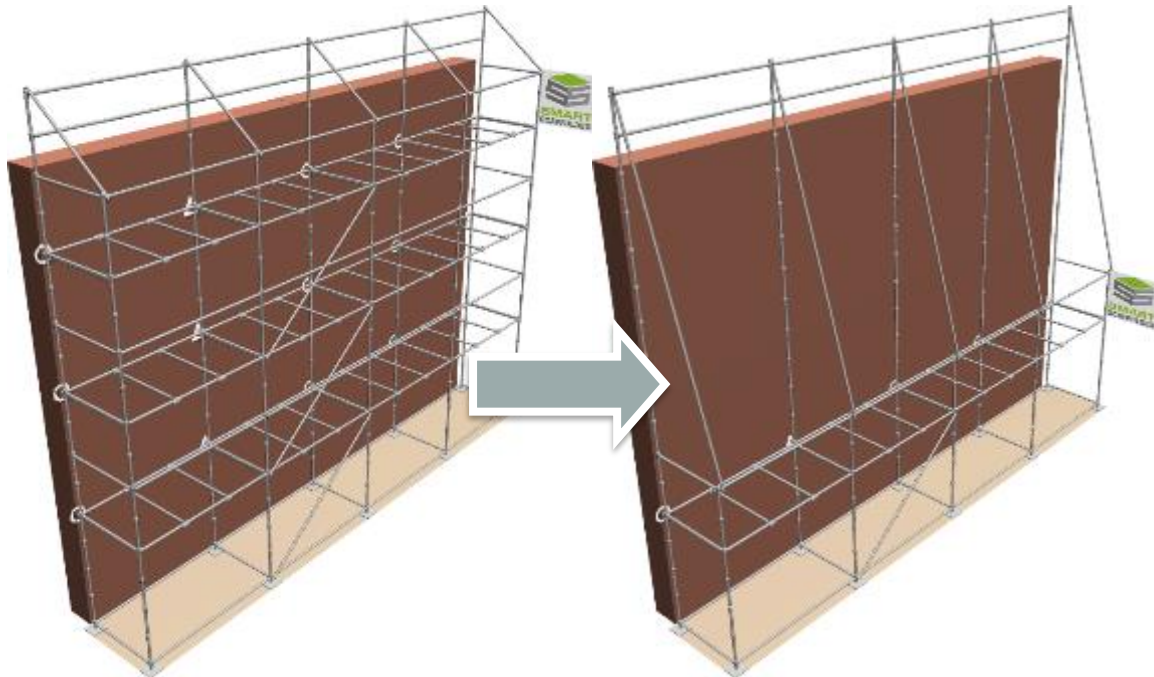
You can erase the diagonal supports from edge protection, using the **eraser**:



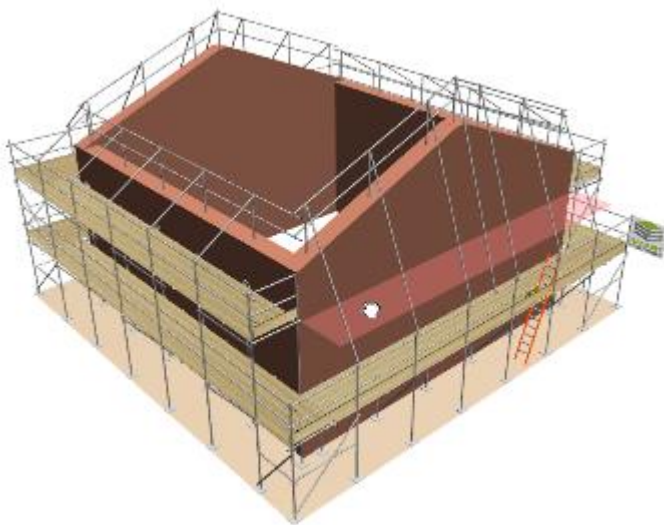


## Lower the structure supporting edge protection

When you have edge protection rails and an independent, the independent can be lowered below the roof level:



To do this, grab the transparent grip which is located just above the independent and lower it down:

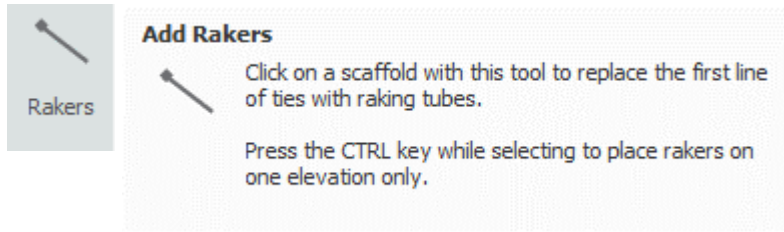


When the independent has **not** been lowered, you can raise or lower the gable lifts, using a smaller and central gable grip:

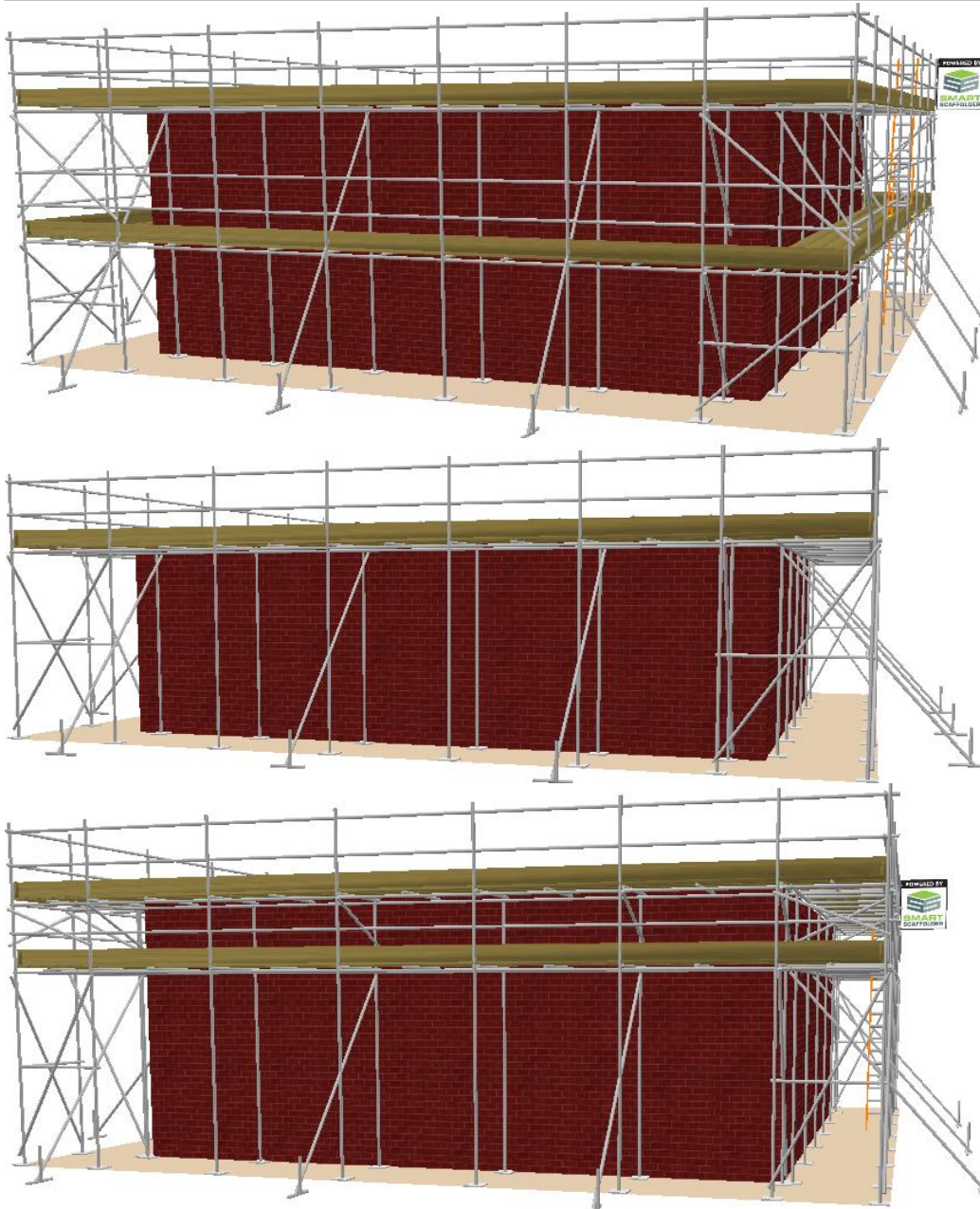


## Replace some anchors with Rakers

For Tube and Fitting scaffolds, some anchors can be replaced by Rakers. To add Rakers, select the **Rakers** tool and click on the scaffold. Use the **Ctrl** key to apply them to one elevation of scaffolding.



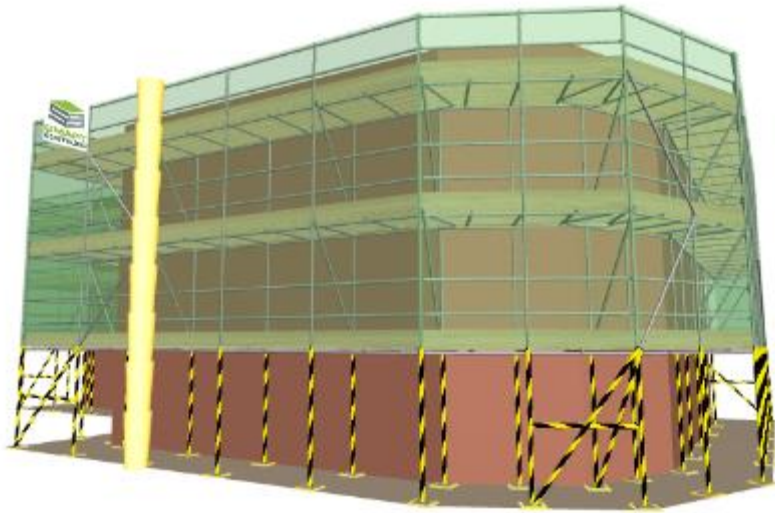
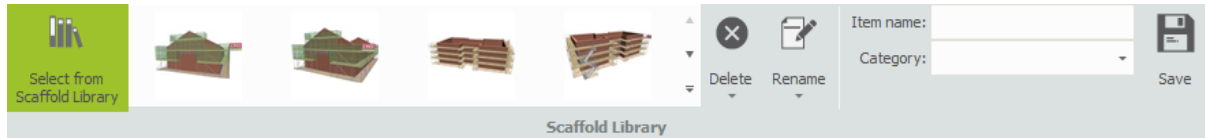
Depending on the lift heights, Rakers will either run to the first or second lift. Anchors at the positions are removed.





## Using the Scaffold Library

You can use the scaffold library to store a selection of typical items for reuse on different projects. To use the library choose the **Scaffolds** view and select the **Scaffold Library** button:



Items can be loaded from the library by clicking on their preview picture. You can use the drop-down arrow to display more preview pictures to choose from.

To save the current item to the library enter a name for the scaffold in the **Item name** field and optionally enter or select a **Category**. Press the **Save** button to store the item in the library.

You can also use the **Delete** and **Rename** buttons to erase or modify existing library items.

## Create a scaffold plan

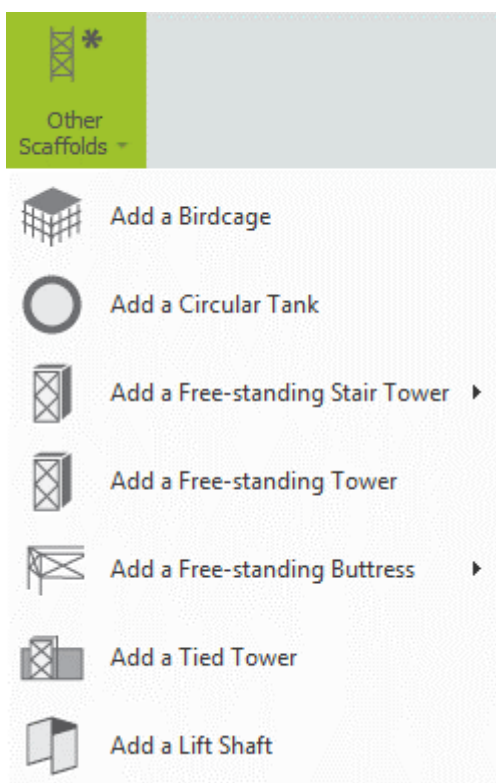
While many simple scaffolds can be built with the standard scaffold shapes, more complex or irregularly-shaped buildings are easier to create with the **Draw Plan** option from the **Scaffolds** view.



You can also open the **Draw Plan** by choosing the **Edit the Plan** button from the **Tools** view.

## Add more scaffolds

You can use these buttons to add new scaffolds next to the existing ones:



The **Draw New Independent** button will stop drawing the current scaffold so you can draw a new independent scaffold. The **Draw New Edge Protection** button works in a similar way.

Select the **Add a Birdcage**, **Add a Circular Tank**, **Add a Free-standing Tower**, **Add a Tied Tower** or **Add a Lift Shaft** button and then click any grid point to add a scaffold at that point.

Select a staircase from the **Add a Free-standing staircase** or a buttress from the **Add a Free-standing Buttress** drop-down and then click any grid point to add a scaffold at that point.

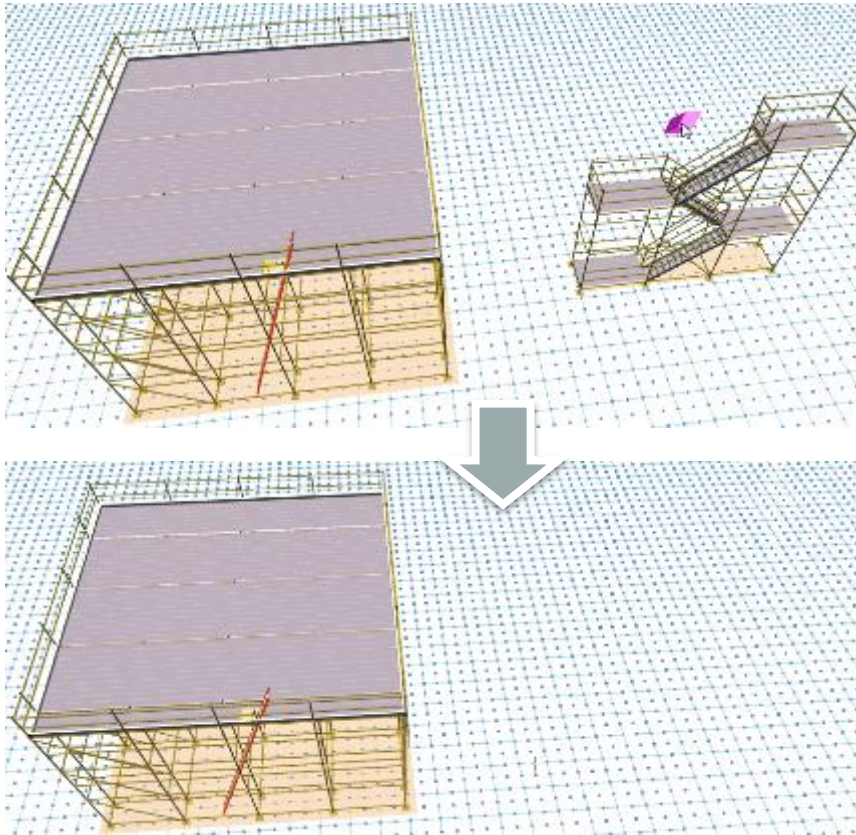


To change the size of a scaffold or to place attached scaffolds, you must leave Draw Plan by clicking **Draw Plan** again.

Don't worry, you can always return to Draw Plan by clicking **Draw Plan** or **Edit the Plan**.

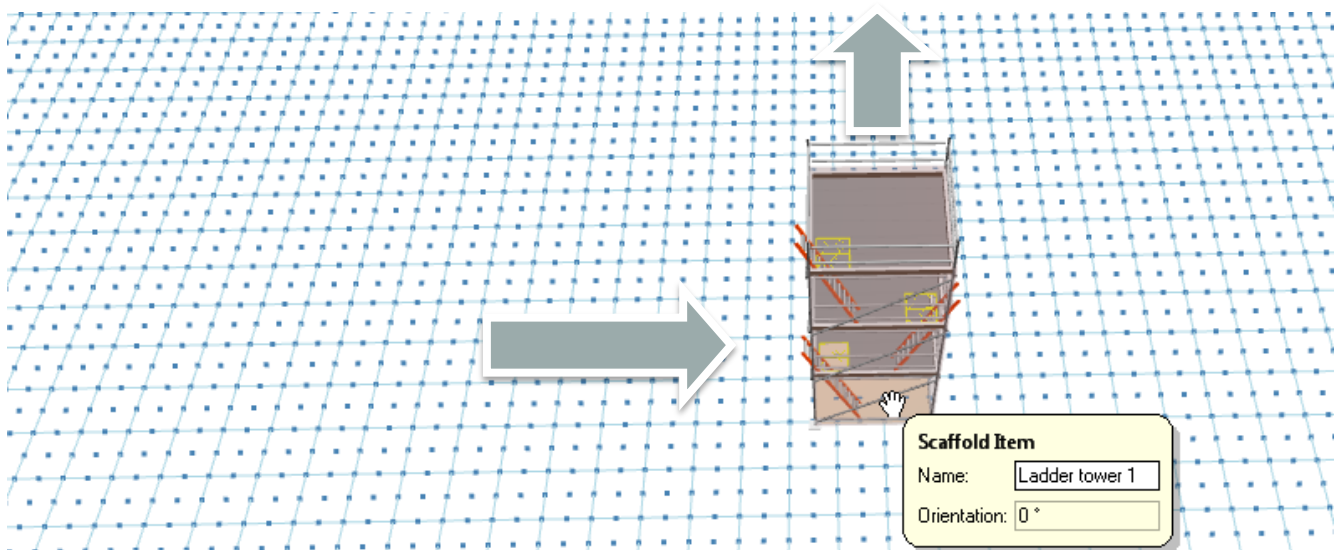
## Erase Scaffolds

Erase entire scaffolds by clicking on them with the **Erase Scaffold** tool:



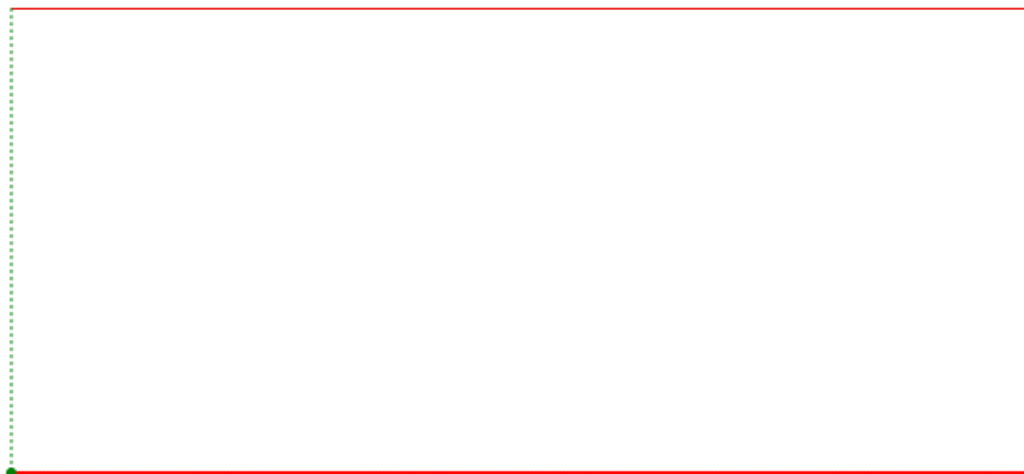
## Move Scaffolds

Select the **Move Scaffold** tool to drag scaffolds to new locations. You can only drag horizontally or vertically along the grid. To move the scaffold diagonally, you must move it in two motions:





## Snap to 90 degrees

When the grid is hidden, or when you activate it, helper snaps will assist you in drawing independent elevations so they align properly:

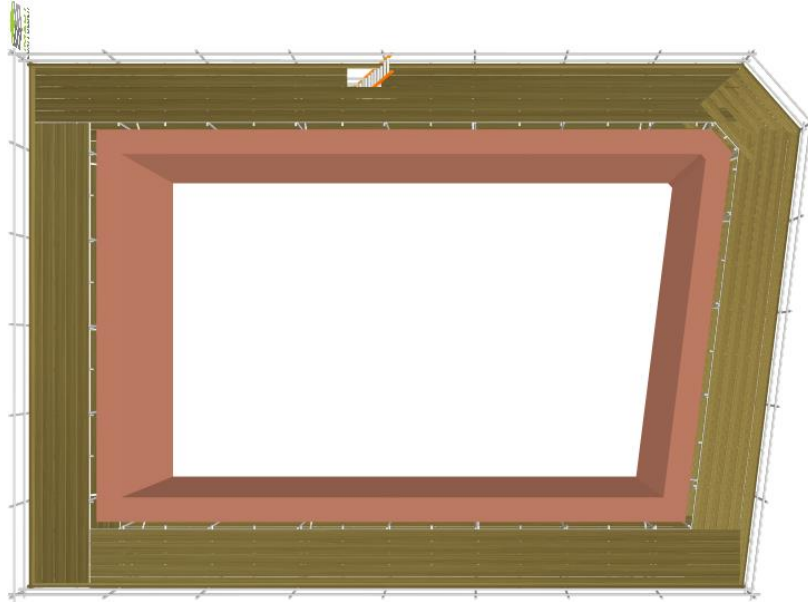


Draw Elevation	
Length	<input type="text" value="11.0"/>
Vertical Length	0.0
Horizontal Length	-11.0
New Elevation Angle	180
Click the next point or type the elevation length and press 'Enter'.	

Snapping enabled	Snapping disabled
 UnSnap 90°	 Snap 90°

## Square the corners

The independent scaffold you have drawn might have corners close to “right-angle” 90 degrees, but not quite 90 degrees. In this case, you will see SMART Estimator using extra components to build around the corner. It may even insert a “chamfer” elevation to cut the corner:



A *chamfer* elevation has been added automatically at this corner.

### Why does SMART Estimator insert *Chamfer* elevations?

The gap between the scaffold and the elevation is usually largest at corners (returns). If the corner is sharp, the gap becomes large. When this happens, a chamfer is inserted to make the corner less sharp.

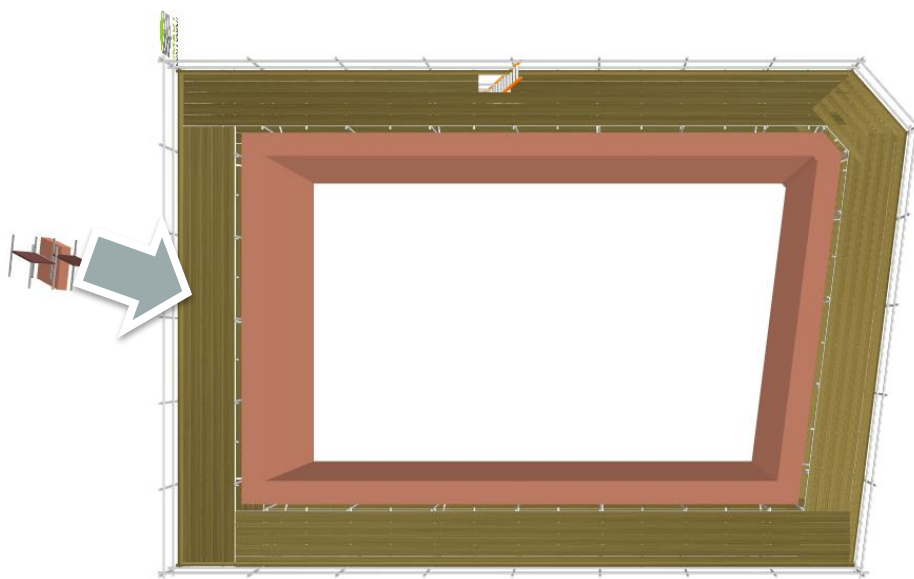


## Square the corners

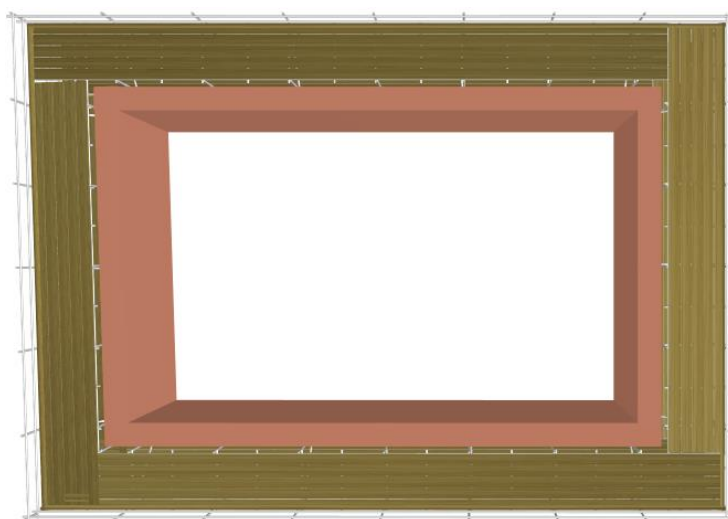
The **Square Corners** tool can be applied to “straighten” the scaffold and clear some of these corners. To do this, switch to the **Tools** view on the **Model IT** toolbar and select the **Square Corners** tool, then click on a scaffold:



Select the scaffold:



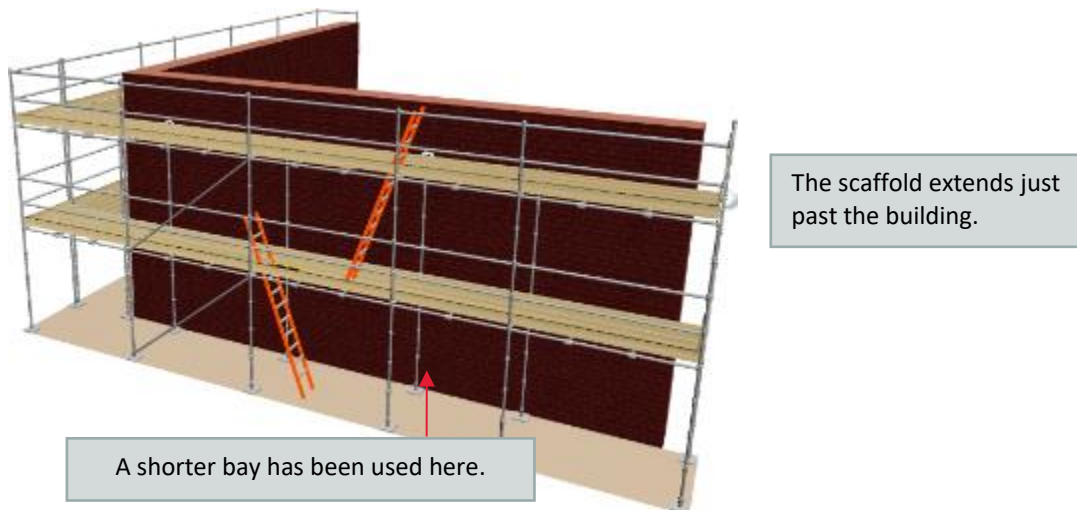
Corners close to 90 degrees (right angles) are “squared”:



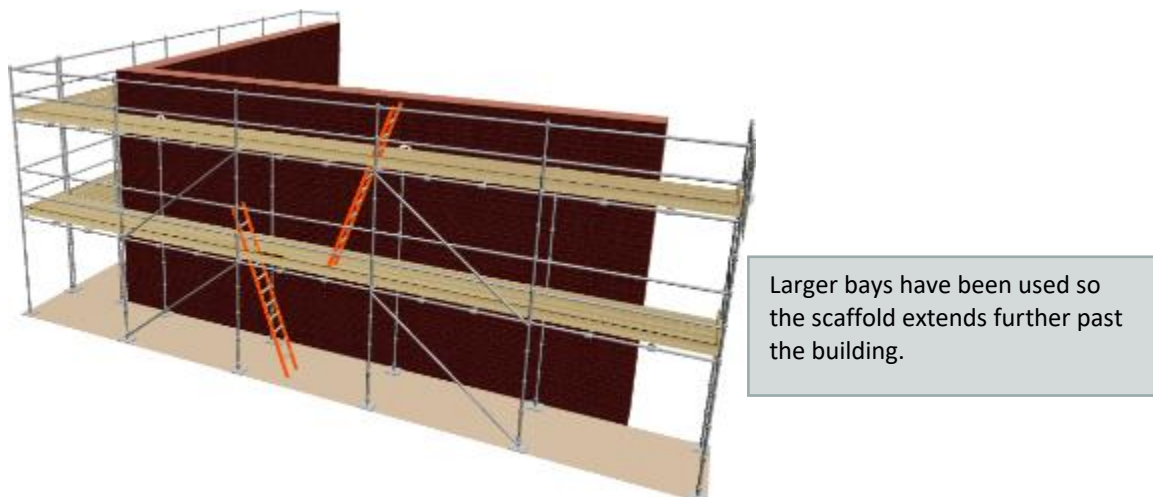
## Setting-out system scaffolding

Tube-and-fitting scaffolding can be set-out to match the dimensions of the building, but system scaffolding is comprised of bays of fixed lengths. A combination of bay lengths that best match the building dimensions are required to set-out the scaffold.

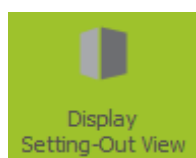
While setting-out a system scaffold around an external return, **Model IT** will allow the scaffold to extend past the return, but will shorten one of the bays by default to best match the building dimensions and minimise the length of the extension:



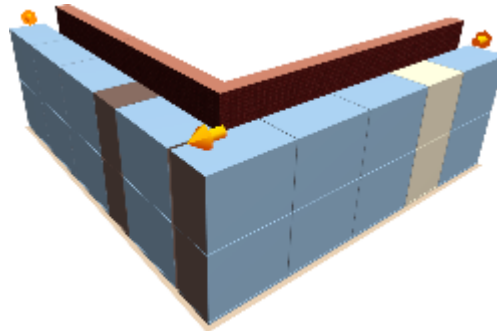
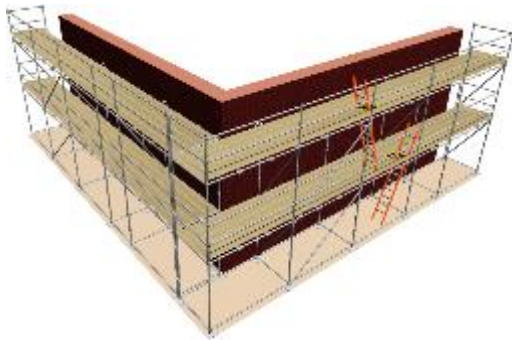
However, depending on site conditions you may prefer to match the scaffold to the building, or to avoid the shorter bay and allow the scaffold to extend further:



This fine-tuning can be performed by using the **Model IT Setting-out View**, which is accessed from the **Tools view**:



While in the **Setting-Out View** the scaffold bays are represented as blocks of colour, with each colour representing one standard bay length. This makes it easy to see which bay lengths are used in the scaffold:

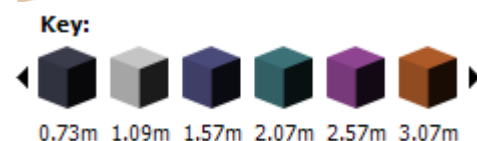
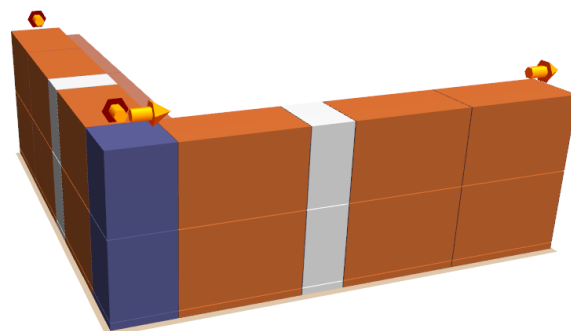
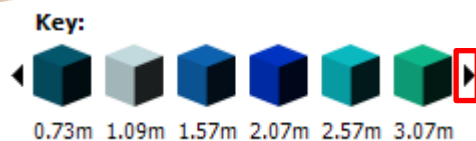
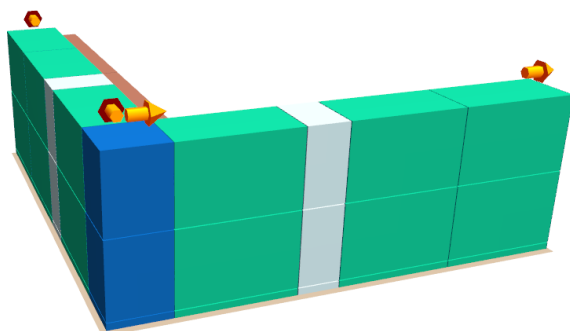


The setting-out view makes it easy to see that three different bay lengths are used to build this scaffold.

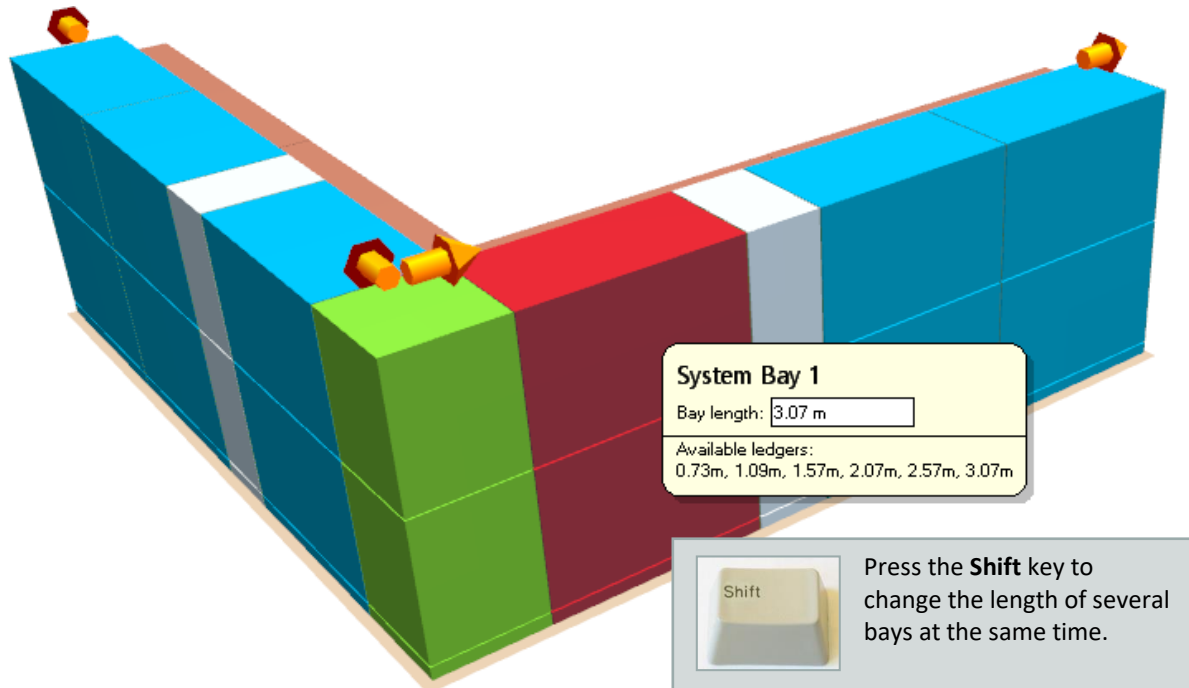


You can print the setting-out view and use it on site while building the scaffold: you may find it easier to read than a conventional technical drawing.

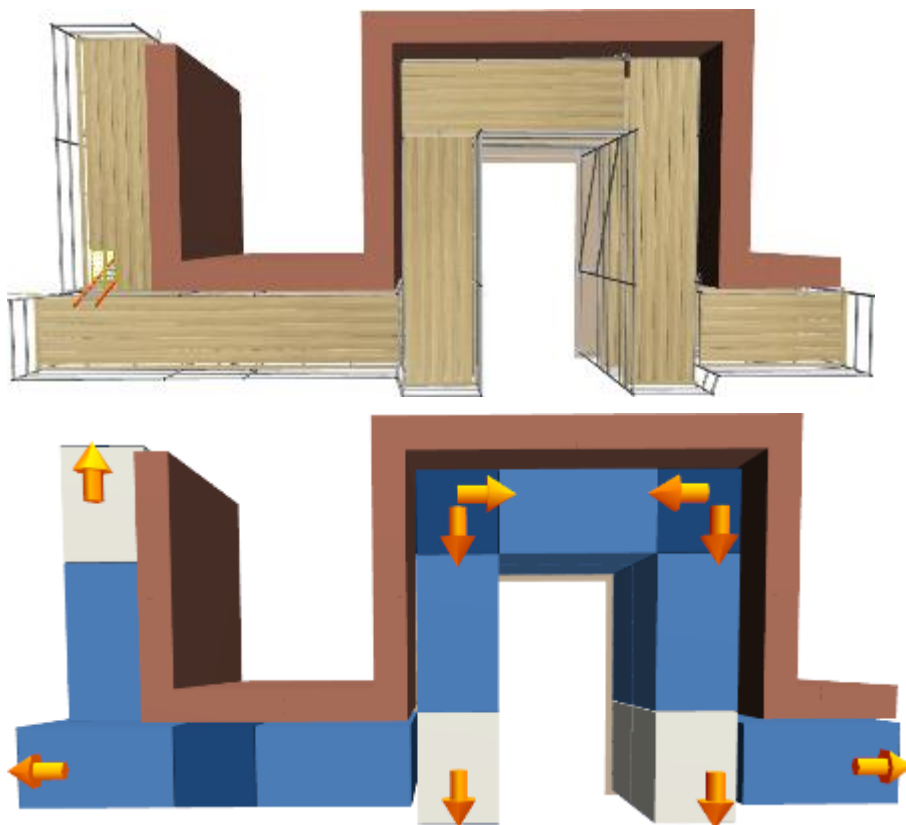
A key is displayed in the corner of the screen to relate the colours to the bay lengths. You can choose from a number of provided colour schemes by clicking on the left and right arrows. You can choose a colour scheme to match your company branding or to exaggerate the colours to make the setting-out view easier to read on site:



The bay lengths used to build the scaffold can be easily modified by hovering the mouse over the setting-out view, typing the new bay length, and pressing the **Enter** key.

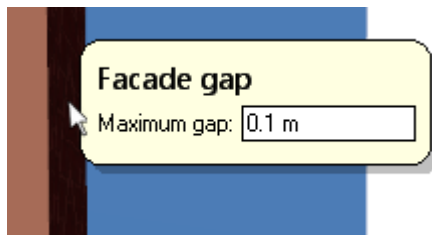


The setting-out of system scaffolding within an internal recess is more complicated than for external returns because the system bays need to fit within the available area. SMART Estimator **Model IT** automatically works out the optimum combination of bay lengths to fit within the space, allowing you to modify them if you wish.





The setting-out of the system bays depends on the allowable distance between the building and the scaffold: if it is possible to allow a large gap then it is easier to fit in the system bays, whereas if the scaffold must be closely aligned with the building the system bays may not exactly fit. This can be controlled by altering the **maximum gap** between the scaffold and the building in the setting-out view:

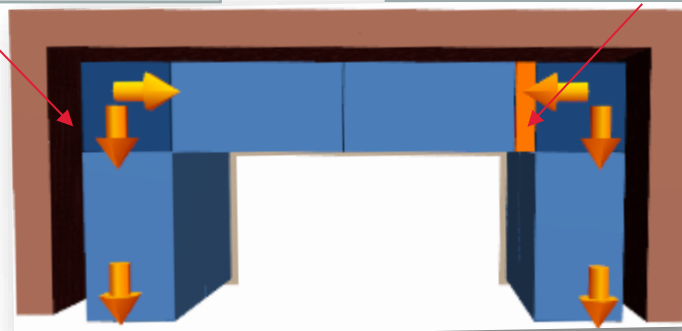


The maximum gap can be set for the whole scaffold or for each elevation, which allows you to account for protrusions from the building facade if you wish. To set the maximum gap for one elevation, type in the required gap and press **Ctrl + Enter**.

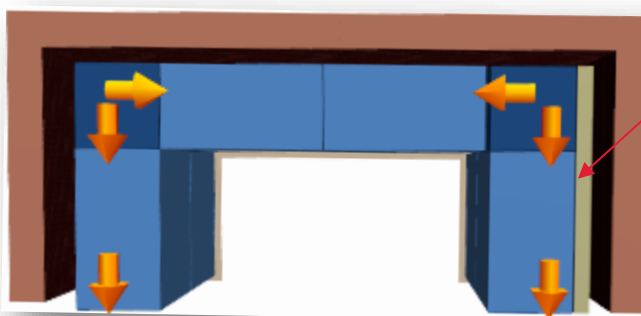
If you set a more restrictive maximum gap, for example a maximum of 0.1m from the building, you may find that the scaffold bays no longer fit exactly within the recess. In these cases a bright orange marker is used to identify the gap, which will be filled by default with tube-and-fitting scaffolding.

The maximum gap has been reduced to 0.1m around the building.

A tube-and-fitting infill is now required, which can be removed by increasing the distance to the building.

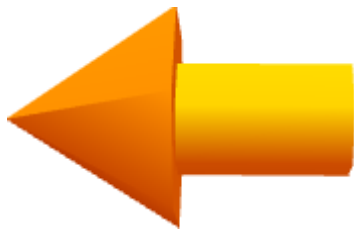


This infill can also be removed by **Add an inside board** to one or more elevations. The inside boards are illustrated in the Setting-Out View so that it is clear where they have been applied:

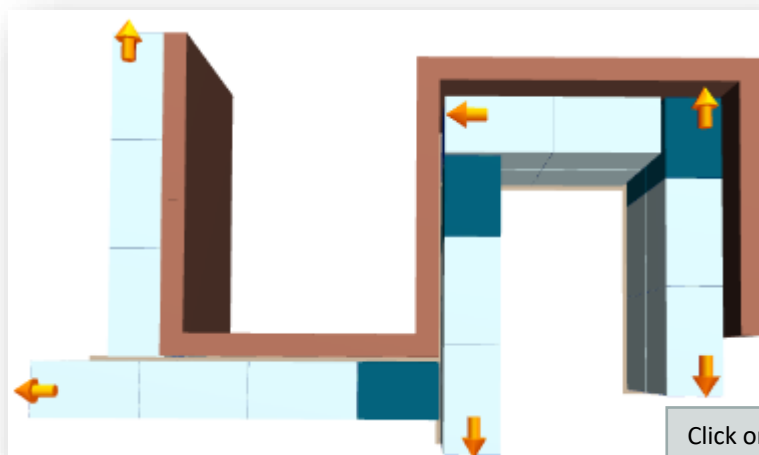


An inside board has been placed to remove the infill.

The final facility of the setting-out view allows you to change the priority of the scaffolding at a return. This decides which of the adjacent elevations should be allowed to extend past the building. This is controlled by the **Change Priority at Corner** arrows, which are only available when the setting-out view is active:



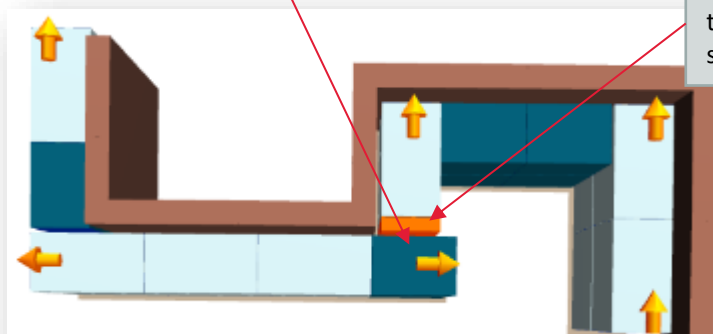
Arrows are shown above the system bays whose priority can be toggled:



Click on an arrow to change the priority; click again to change it back.

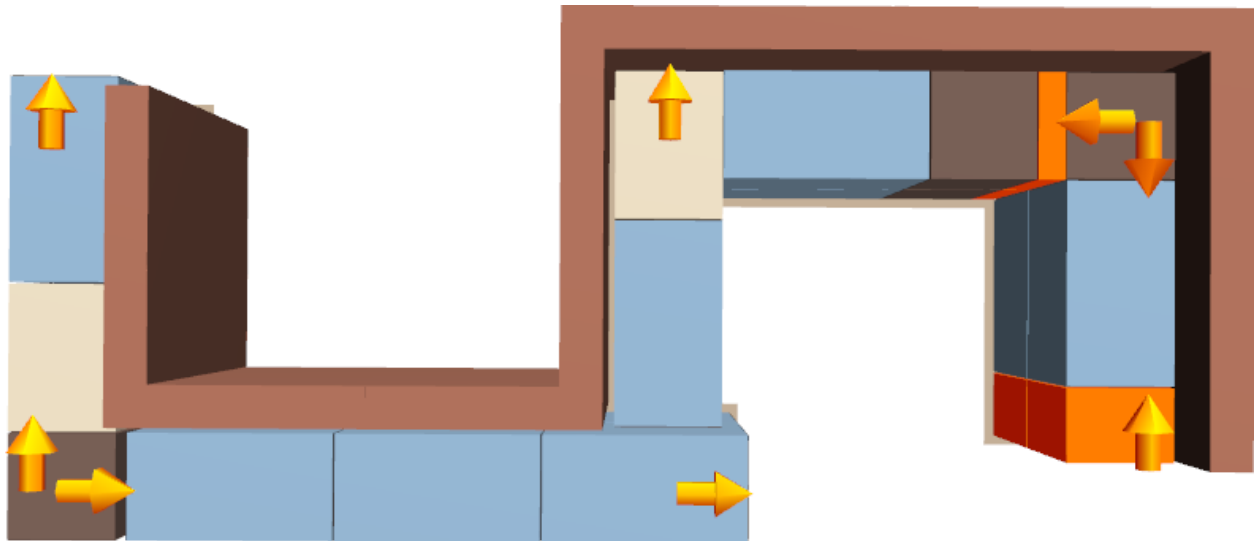
This feature is useful in cases where the scaffold bays do not exactly fit with the default priorities. For example, the extension of a scaffold elevation past the building can sometimes create an internal recess; changing the direction of the extension avoids it:

The direction of this extension has been changed...



... It is no longer possible to build this elevation with the available system bay lengths.

## Constrain in two directions



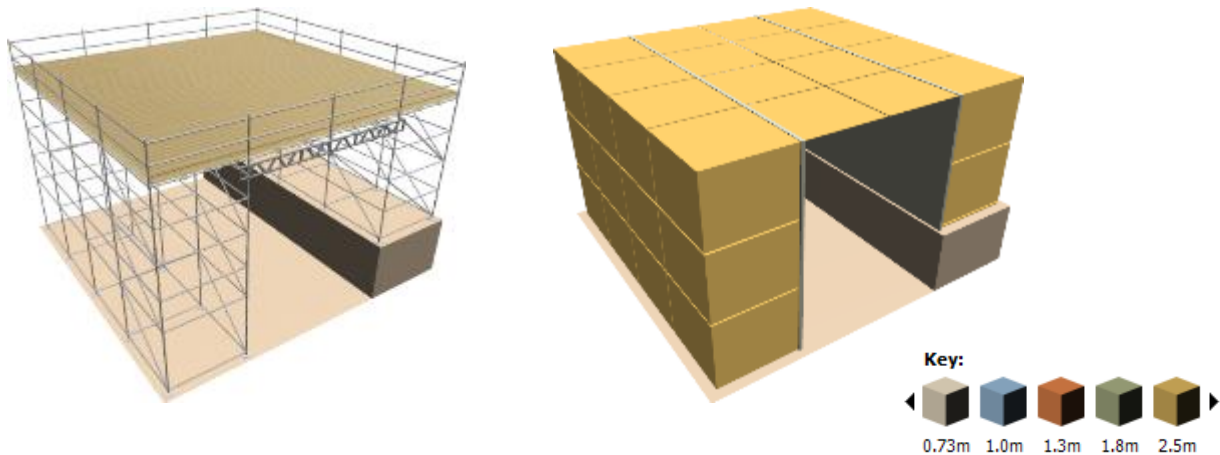
It is possible to set the corners so that the scaffold cannot extend ('fly past') in either direction. This will usually cause a square bay to be created in the corner.

## Set-out system birdcages

The *Setting-Out View*, which was previously described for independent scaffolding, is also available for birdcages.

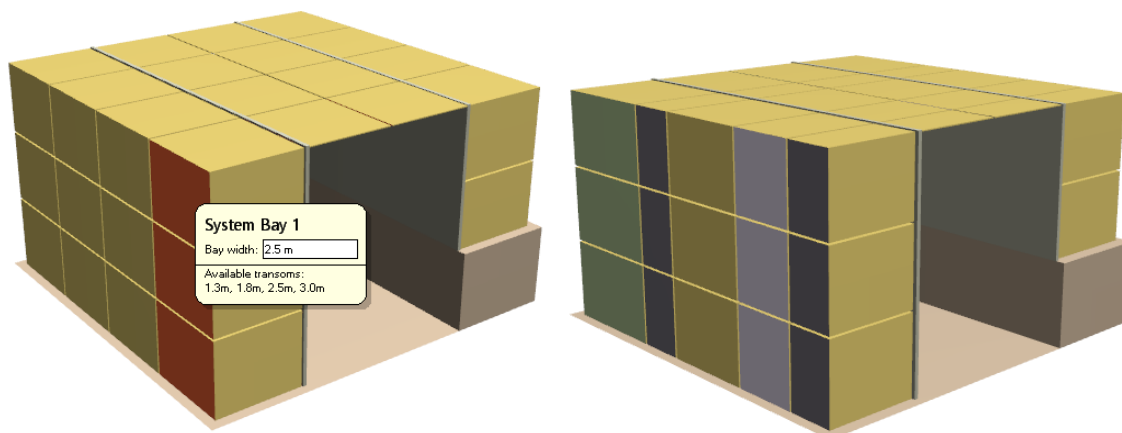
This feature only applies to system scaffolding.

Click the **Setting-Out View** button to display the birdcage as a set of coloured blocks, where the colours represent the lengths and widths of each bay:



In this example, the **Setting-Out** View makes it easier to see that the birdcage is 4 bays long and 4 bays wide, where each bay measures 2.5m in each direction.

To change the length or width of a bay, move the mouse to the bay, type in the new value, and press **Enter**. The lengths of the other bays will be automatically changed so that the birdcage still fills the same building dimensions.

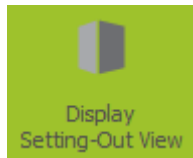


If you want to reduce the length of all of the bays, the quickest way is to change the **Maximum Bay Length**, as described earlier.



## Set-out a system circular tank

The bay sizes used for a circular tank can be changed as they are for independent scaffolds, using the **Model IT Setting-out View**, which is accessed from the **Tools view**:



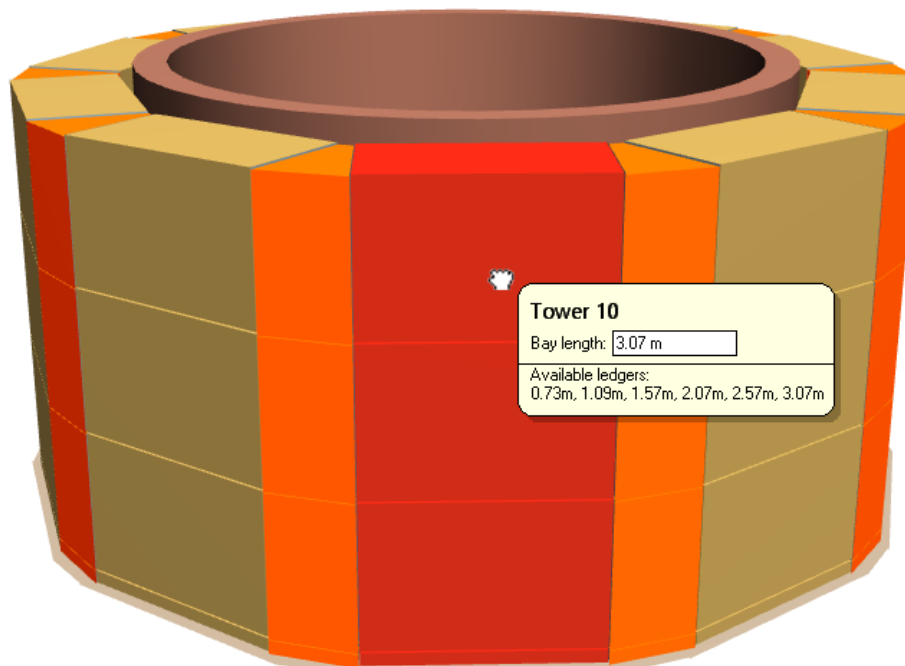
## Change the bays in a tower

When you change the bay sizes for any circular tank tower:

1. All other towers are automatically changed to match;
2. The number of towers around the tank may change, to give the best solution;
3. The size of trapezoidal bays is automatically updated, to stay as close as possible to the circular tank.

## Change the trapezoidal bay size

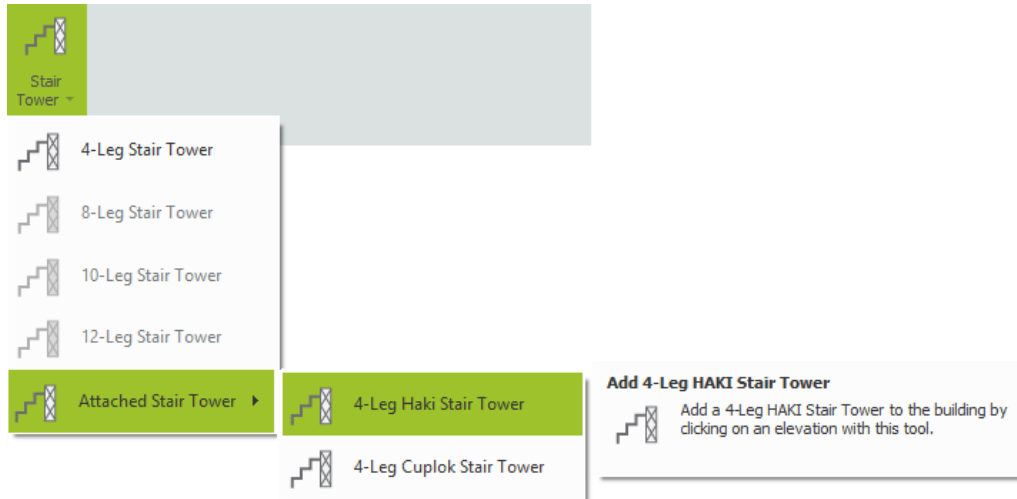
You can change the minimum size of the trapezoidal bays. To do this, set the **Minimum Size** by placing the mouse cursor over the trapezoidal bay and typing a new value.



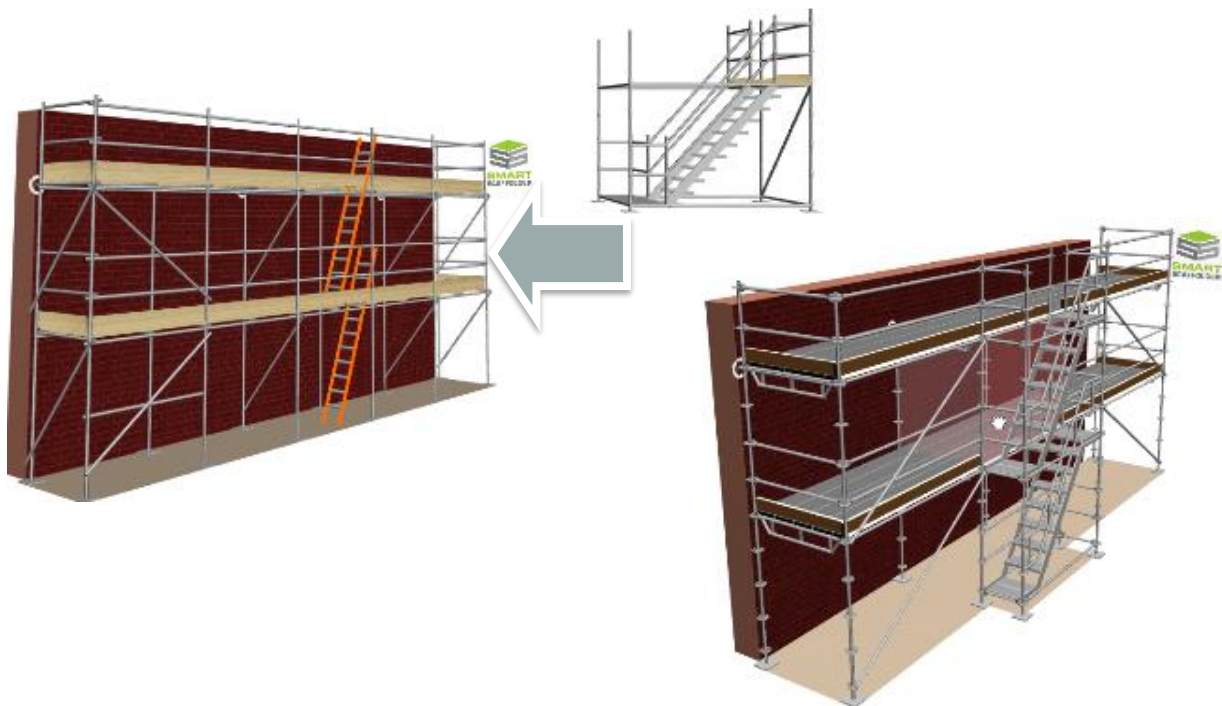
The actual size of the trapezoidal bay is calculated automatically for you. The number of towers around the circular tank may change when you change the trapezoidal bay size in some rare circumstances.

## Add an attached stair

A system staircase can be added to an independent and circular tank scaffold by selecting the **any stair** from the **Attached staircase** menu on the **Staircase** drop-down menu. This is available from the **Scaffolds** view in **Model IT**. Then click on a bay of the independent or circular tank to attach the stair:



Note that the options in this drop-down do vary depending on the system that you are using. Just choose the type of staircase that you would like to use. Select a bay and the left-most bay of the stair will be placed there.

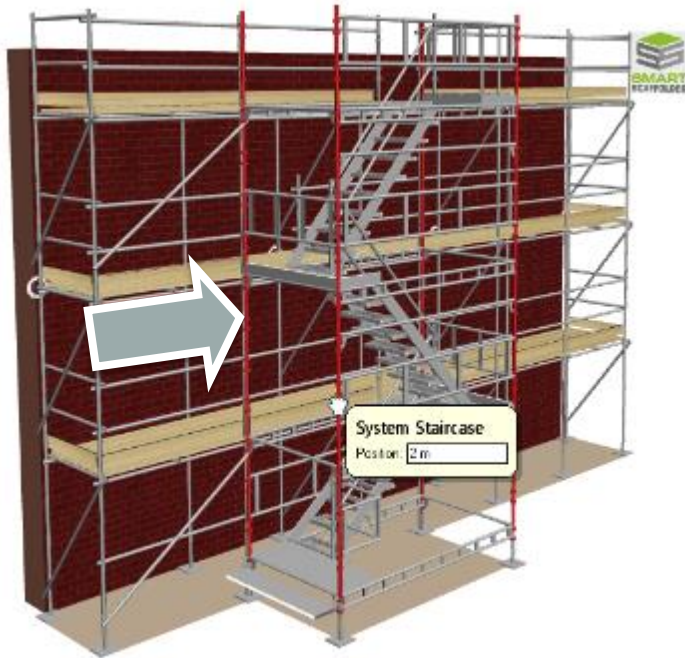


You may need to set the bay to the correct size using **Setting-Out View** first.

## Change the attached stair position

Once the staircase has been placed it can be moved by dragging the standards to the left or right.

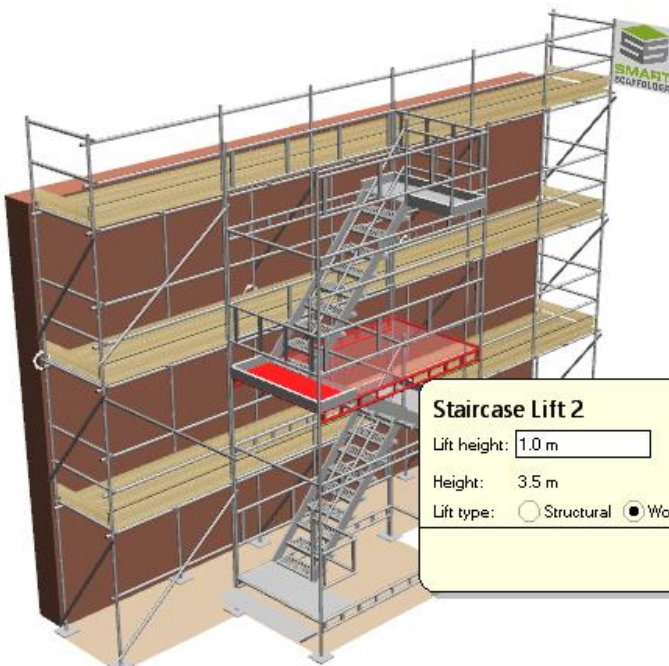
Alternatively the start position of the staircase can be entered with the keyboard:



**System Staircase**  
 Position:

## Adjust the attached stair lift heights

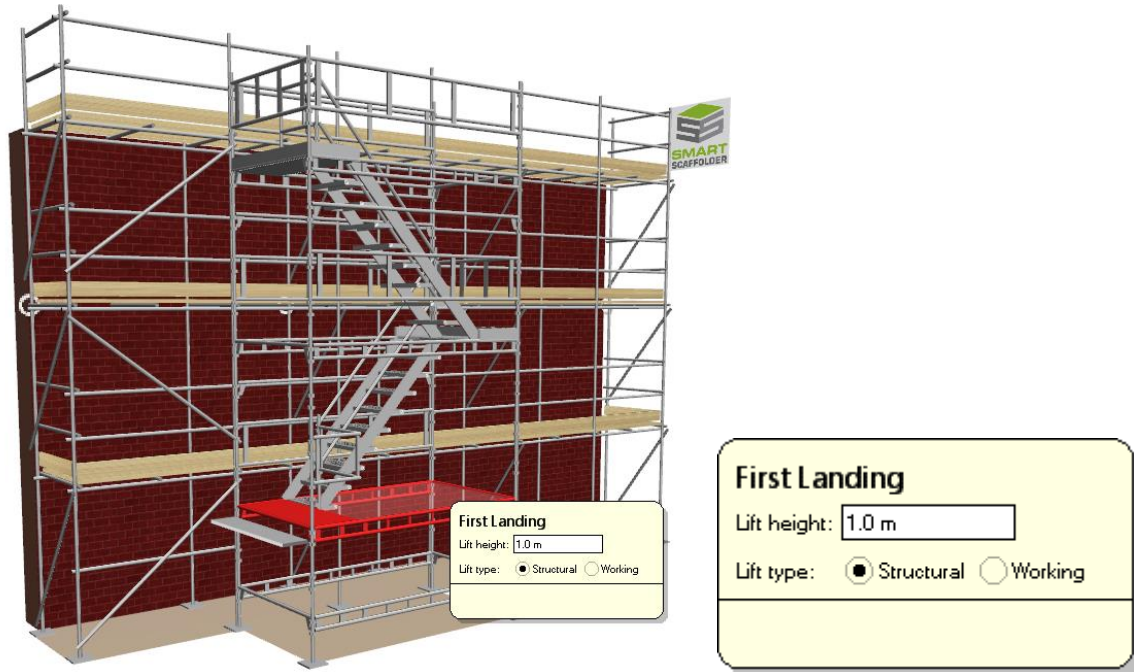
The lifts heights can also be changed by dragging with the mouse or by typing in a new value:



**Staircase Lift 2**  
 Lift height:   
 Height: 3.5 m  
 Lift type: ☐ Structural ☒ Working

## Adjust the first lift starting height

You can set the starting lift of an attached system stair so the first stair tread is at a higher connection. To do this, simply drag the foot lift up to a higher connection.



## Clad the attached stair tower

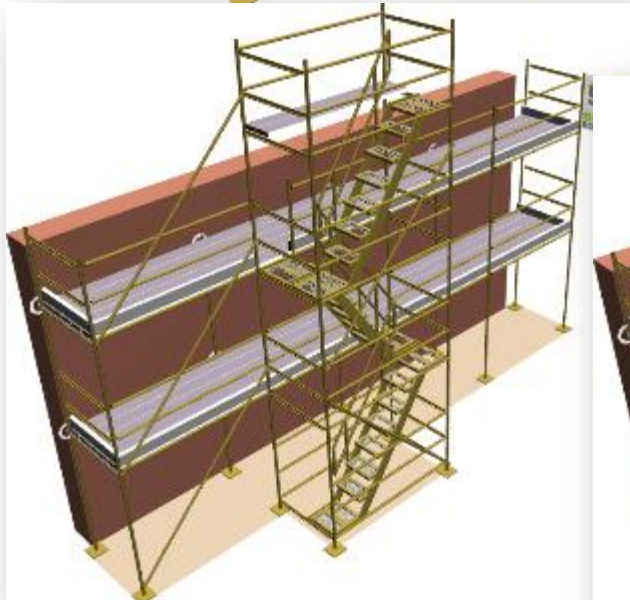
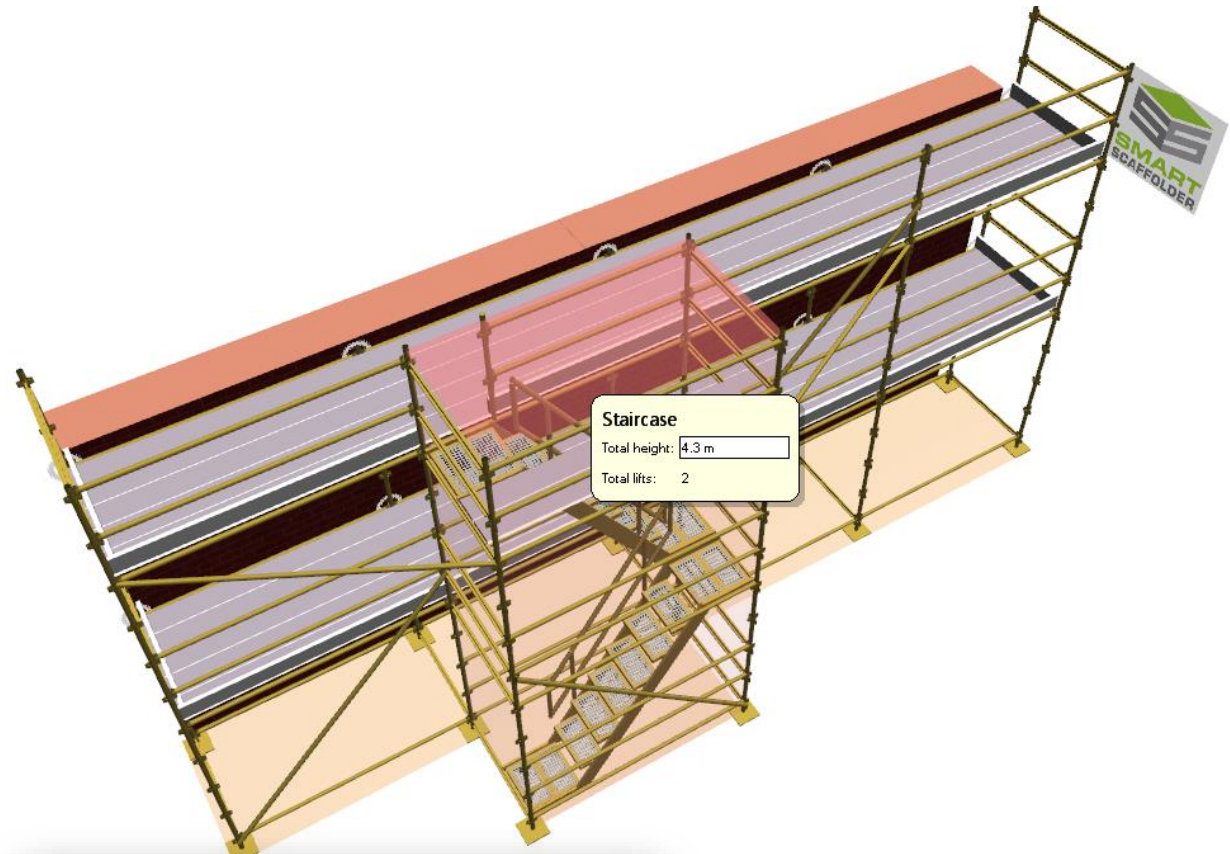
Finally, sheeting or debris netting can be wrapped around a staircase by dropping the sheeting onto the staircase lifts in the same way as for the lifts of the main scaffold.





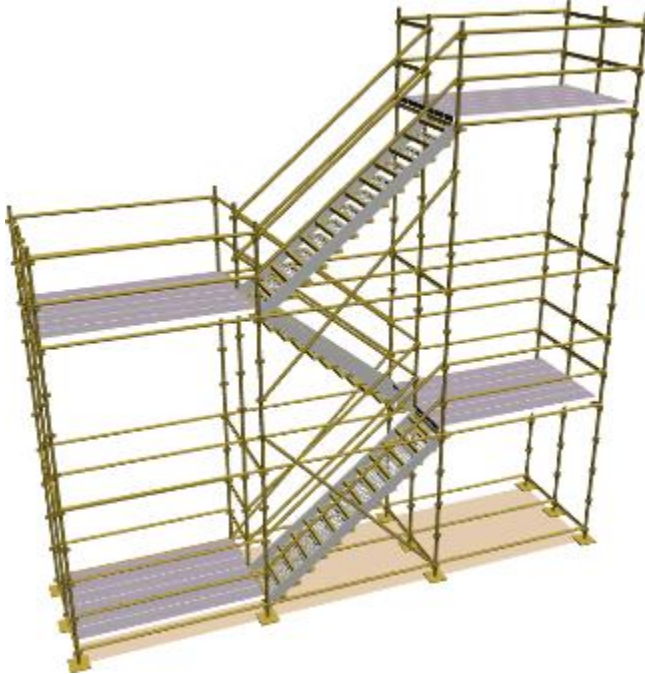
## Change the attached stair number of lifts

The number of lifts on the attached stair can be changed by dragging the top of the stair up or down. This is easiest to do when you are looking down on the attached stair.



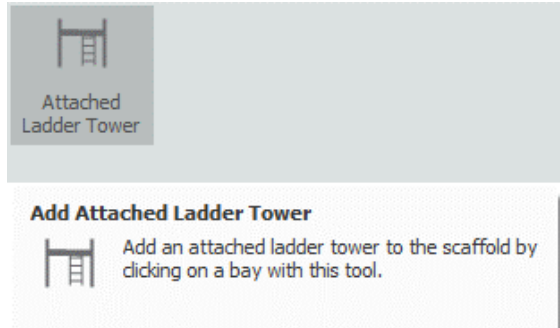
## Model a non-attached stair tower for estimating

A stair tower can be created which is not attached to an independent. This is sometimes useful for estimating purposes, as it allows the stair to be treated as a separate scaffold. For example, you can give the stair its own name.

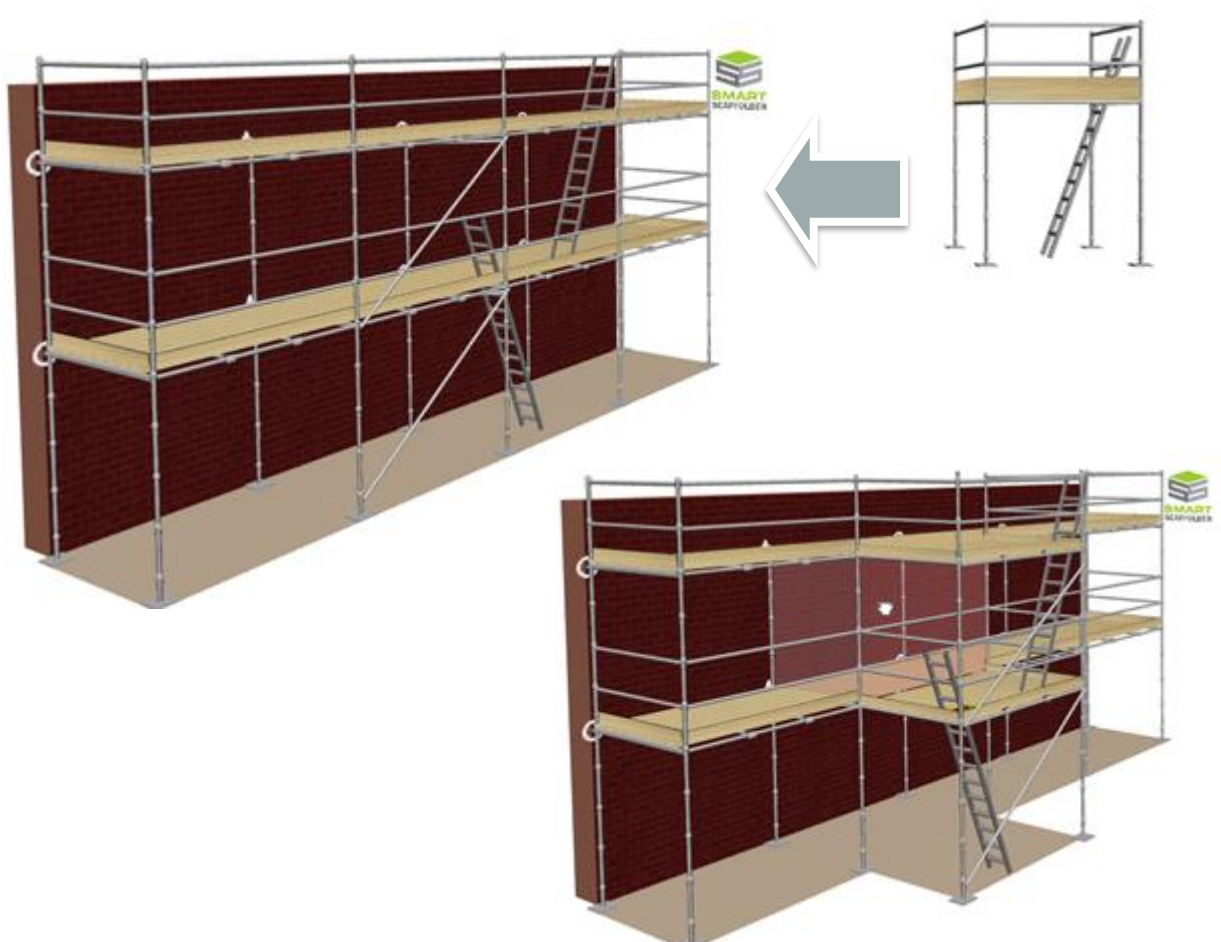


## Add an attached ladder tower

A ladder tower can be added to an independent and circular tank scaffold by selecting the **Attached Ladder Tower** tool. This is available from the **Scaffolds** view in **Model IT**. Then click on a bay of the independent or circular tank to attach the ladder tower:



Select a bay and the left-most bay of the ladder tower will be placed there:



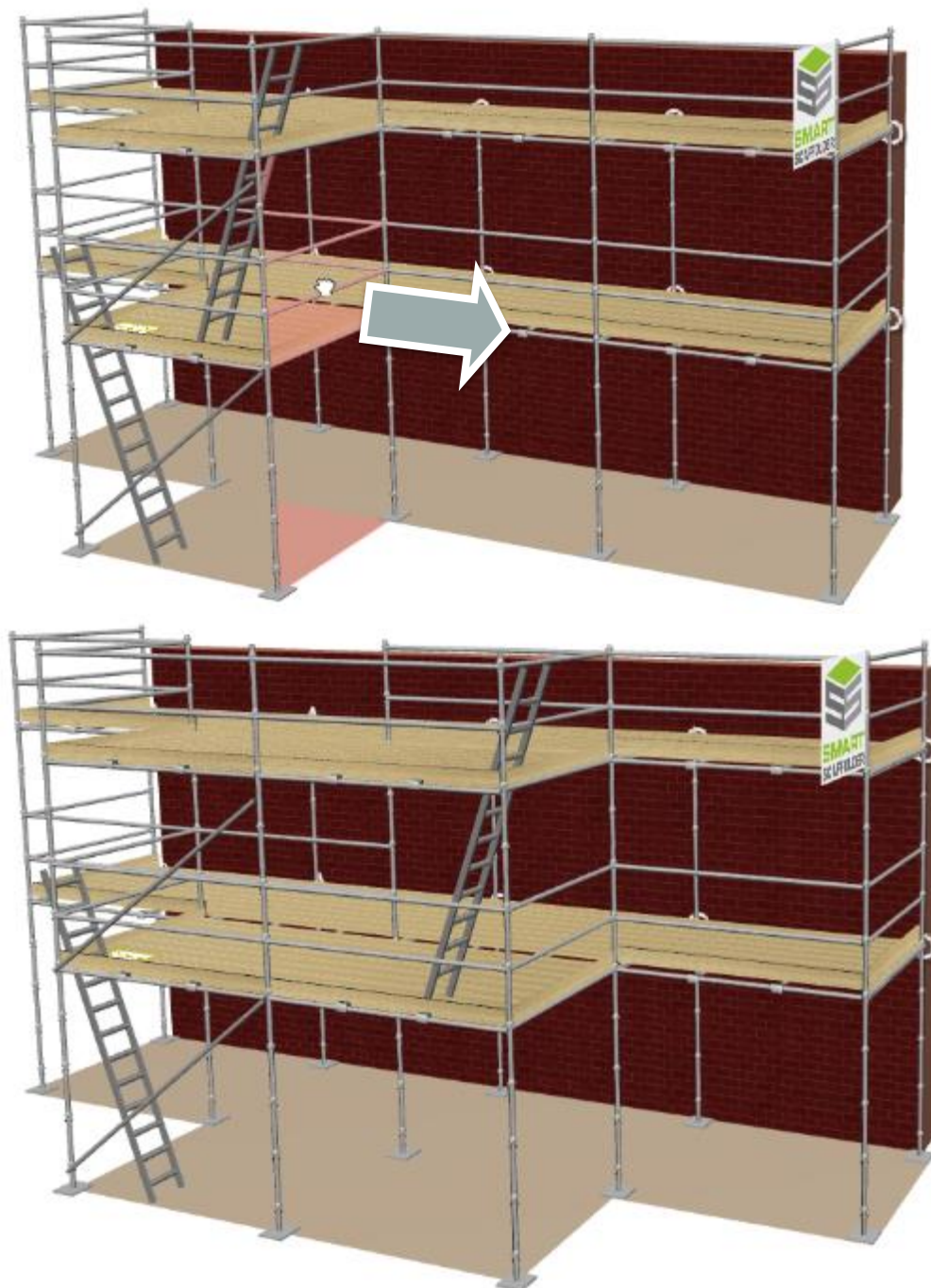
The position, lift heights and number of lifts can be changed using the same method used for the attached stair tower.



## Change the number of bays of an attached tower

Most scaffolding systems use a single bay attached ladder tower by default. Tube-and-fitting scaffolds default to two bays wide.

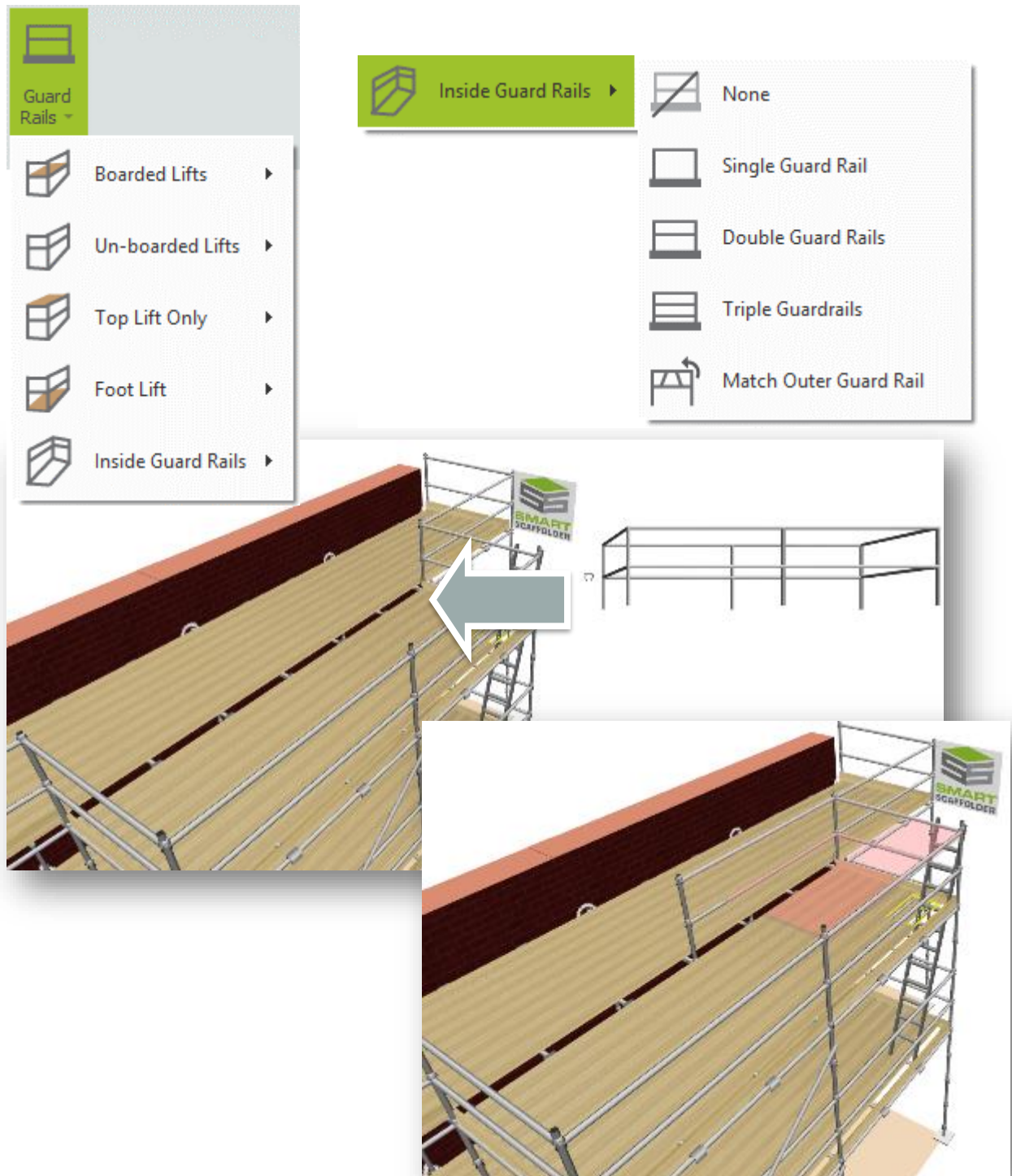
The number of bays on the attached ladder tower can be changed by dragging the ends of the tower:





## Change attached tower inside guard rails

Inside guard rails can be added to a bay of the ladder tower by selecting an **Inside Guard Rails** tool from the **Guard Rails** menu. This is available from the **Tools** view on the **Model IT** tab. Select the tool and click on a bay of the attached ladder tower to add inside guard rails:



These inside guard rails can be removed with the **Eraser**.

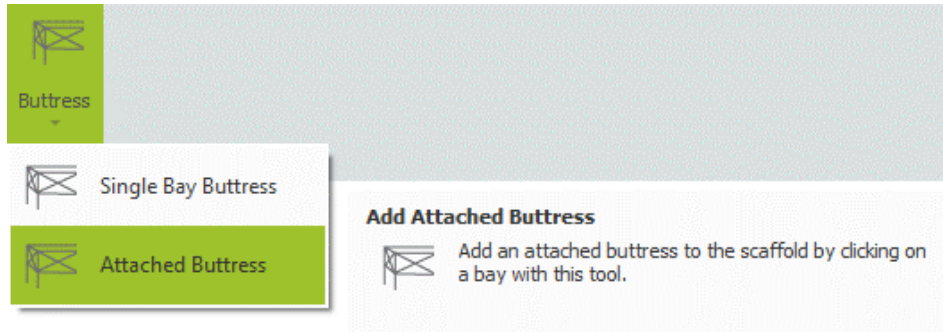
## Model a non-attached ladder tower for estimating

A ladder tower can be created which is not attached to an independent. This is sometimes useful for estimating purposes, as it allows the stair to be treated as a separate scaffold. For example, you can give the ladder tower its own name.

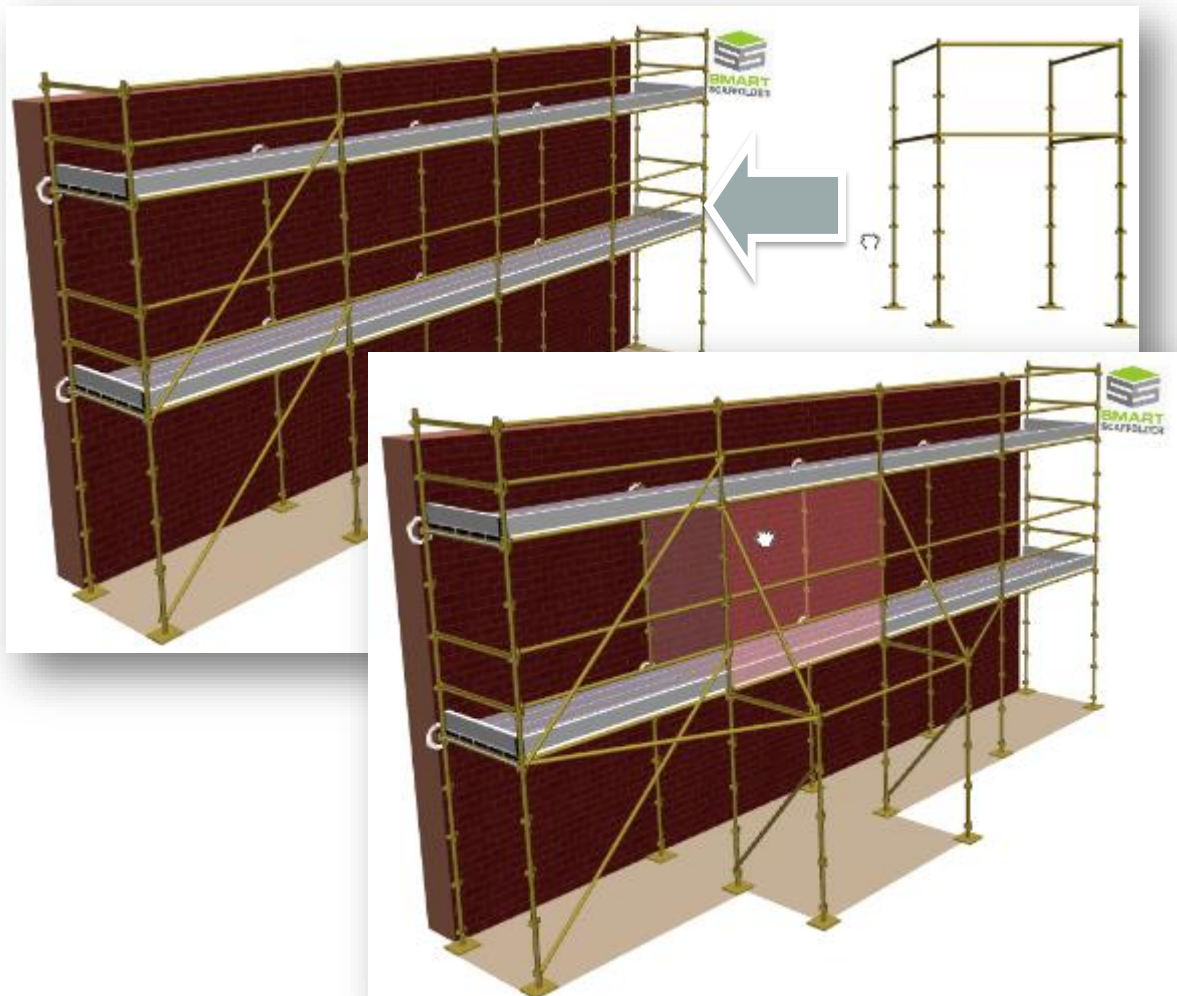


## Add an attached simple buttress

A simple buttress tower can be added to an independent and circular tank scaffold by selecting the **Attached Buttress** tool from the **Buttress** drop-down menu. This is available from the **Scaffolds** view in **Model IT**. Then click on a bay of the independent or circular tank to attach the buttress:



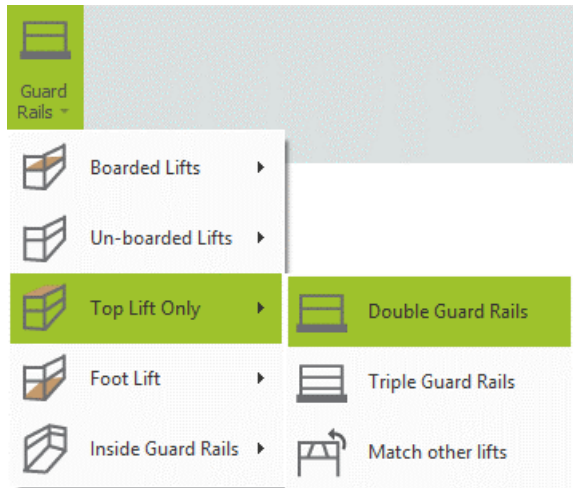
Select a bay and the buttress will be placed there:



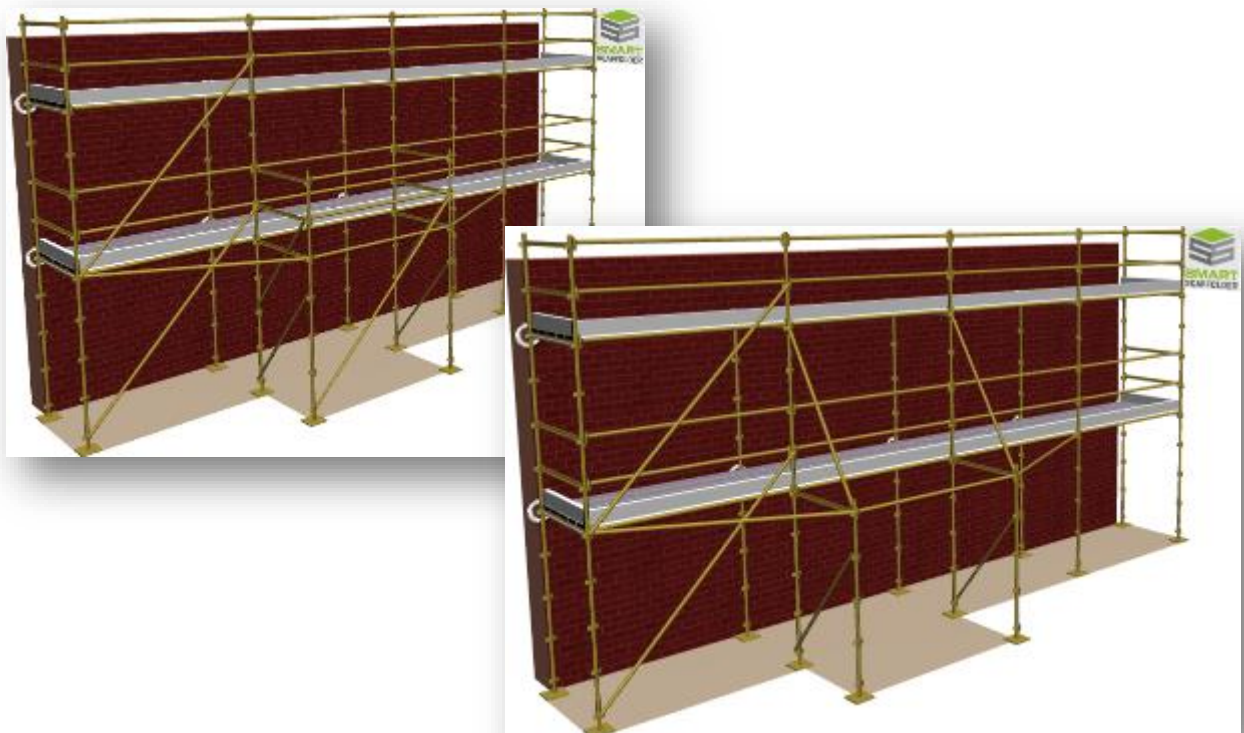
The position, lift heights and number of lifts can be changed using the same method used for the attached ladder tower. Lifts can be decked using the **Boards** tool, as for independent scaffolds.

## Change the buttress style

By default, a buttress will include diagonal tubes at the top lift. These can be swapped for guard rails by selecting any option from the **Top Lift Only** menu in the **Guard Rails** menu. This menu is available from the **Tools** view in the **Model IT** tab.



To return to a diagonal tube solution, delete the top guard rails with the **Eraser**.

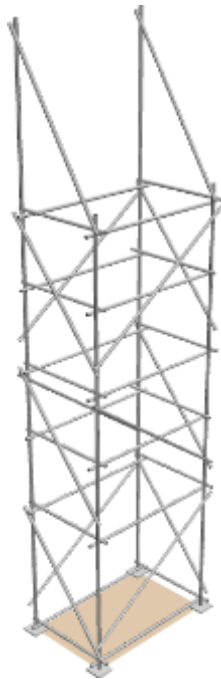




Diagonal tubes at the top lift always run to the next lift above on the main scaffold. If there is no lift above, the diagonal tubes will be excluded. If the lift above is very close in height, the diagonal tubes will be very short. To change these, change the lift heights or the number of lifts for the attached buttress.

## Model a non-attached buttress tower for estimating

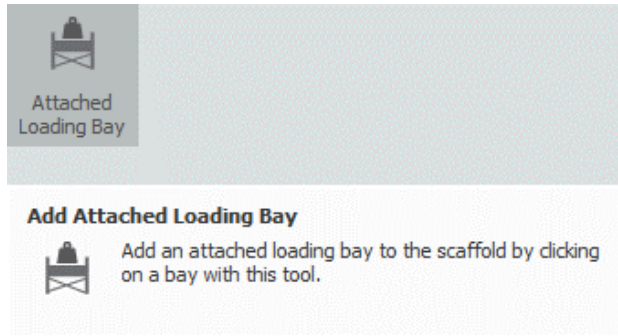
A simple buttress can be created which is not attached to an independent. This is only useful for estimating and visualisation purposes, since it is not common to create a buttress which is not supporting an independent or circular tank.



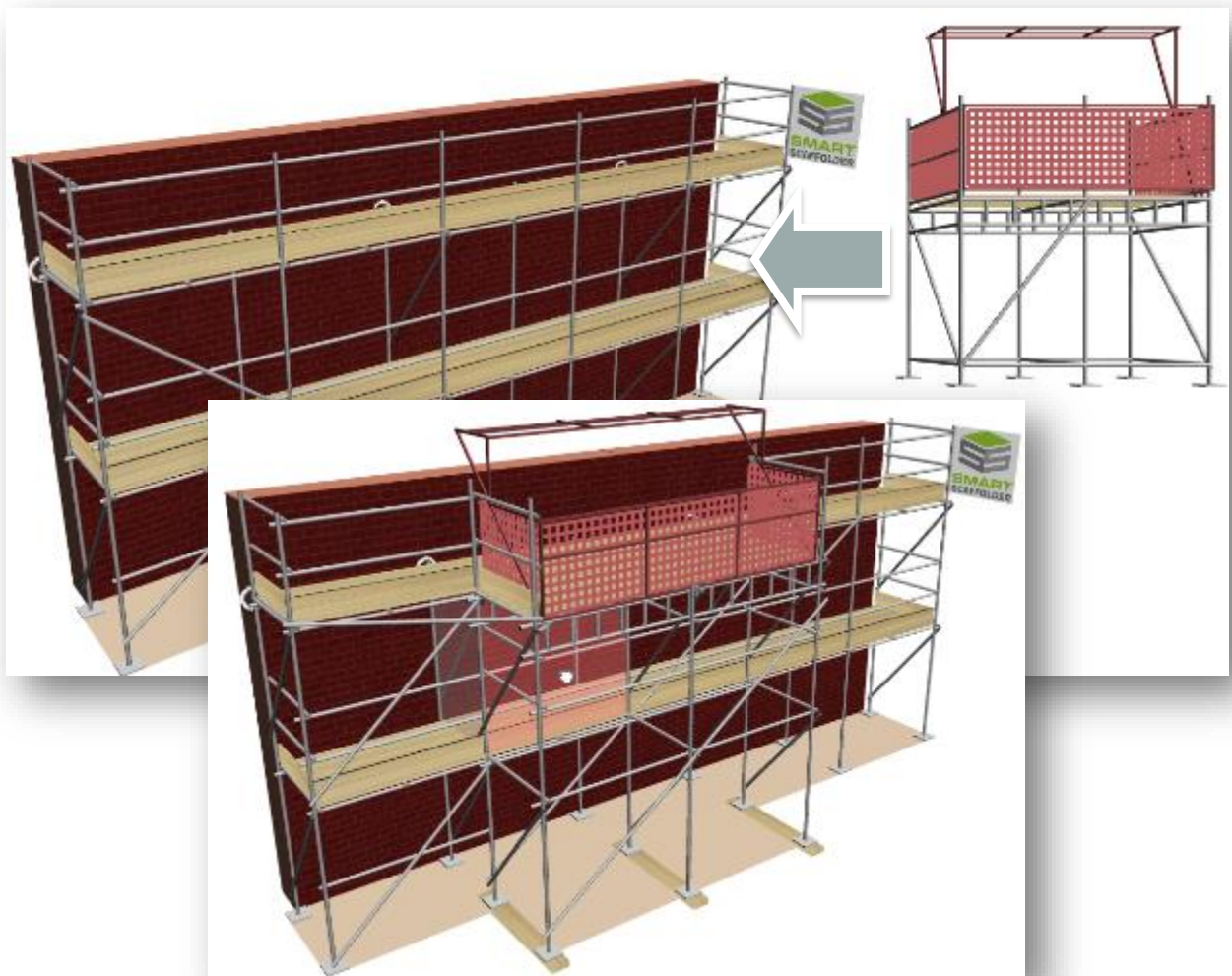


## Add an attached loading bay

A loading bay can be added to an independent and circular tank scaffold by selecting the **Attached Loading Bay** tool. This is available from the **Scaffolds** view in **Model IT**. Then click on a bay of the independent or circular tank to attach the loading bay:



Select a bay and the left-most bay of the loading tower will be placed there:



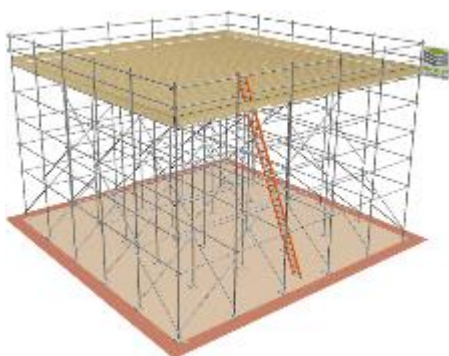
The position, lift heights and number of lifts can be changed using the same method used for the attached ladder tower. Lifts can be decked using the **Boards** tool, as for independent scaffolds.

## Model a birdcage

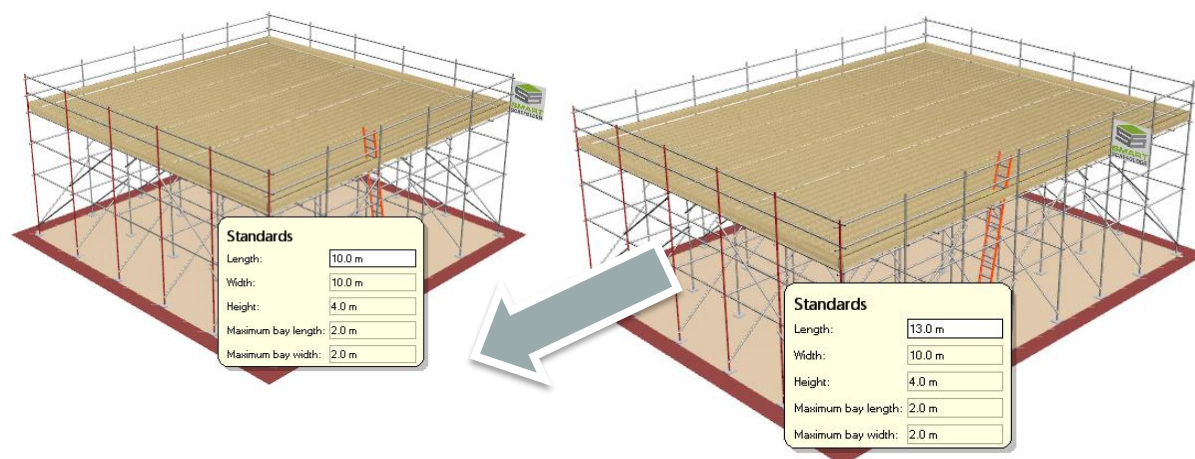
Birdcages can be created in **Model IT** by selecting the **Rectangular Birdcage** option from the **Scaffolds** view in **Model IT**.



A default birdcage is created that is 10m long, 10m wide and 3 lifts tall:



The length and width of the birdcage can be altered either by dragging the standards with the mouse or by directly typing in the dimensions. To drag the birdcage with the mouse, highlight the standards of the side of the birdcage that you want to change, press and hold the left mouse button, move the standards to the required position, and release the mouse button. The new dimensions are displayed as you drag:



Drag the standards to change the birdcage dimensions.

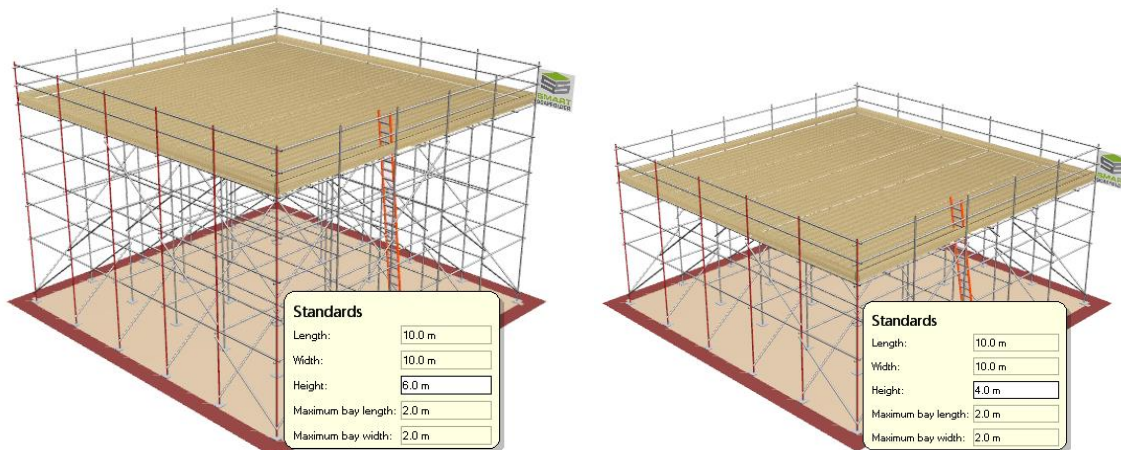
To type in the dimensions directly, hover the mouse over the standards (there is no need to click the mouse button), type in the new **Length** value, and press the **Enter** key. To change the width of the birdcage, follow the same procedure but press the **Tab** key to highlight the **Width** field before typing in the new value.

Standards	
Length:	<input type="text" value="15 m"/>
Width:	<input type="text" value="15 m"/>
Height:	<input type="text" value="6.5 m"/>
Maximum bay length:	<input type="text" value="2 m"/>
Maximum bay width:	<input type="text" value="2 m"/>

Press the **Tab** key to highlight the Width, type its new value and press the **Enter** key.

The bays along the length and the width of the birdcage are automatically set out to match the dimensions that you have specified. If you want to restrict the maximum length or width of the bays, for example because your scaffold is to be more heavily loaded, you can set the **Maximum bay length** and **Maximum bay width** accordingly.

The birdcage height is specified in the same way: press the **Tab** key until the **Height** field is highlighted, type in the new value, and press the **Enter** key. New lifts are added, or lifts are removed, to match the new height that you have specified.



The lifts are updated when the height is modified.

## Specify the deck materials

Birdcages are created with timber decks and toe boards by default, but other materials may be used if they are available in the material catalogue of the scaffolding system that you are using.

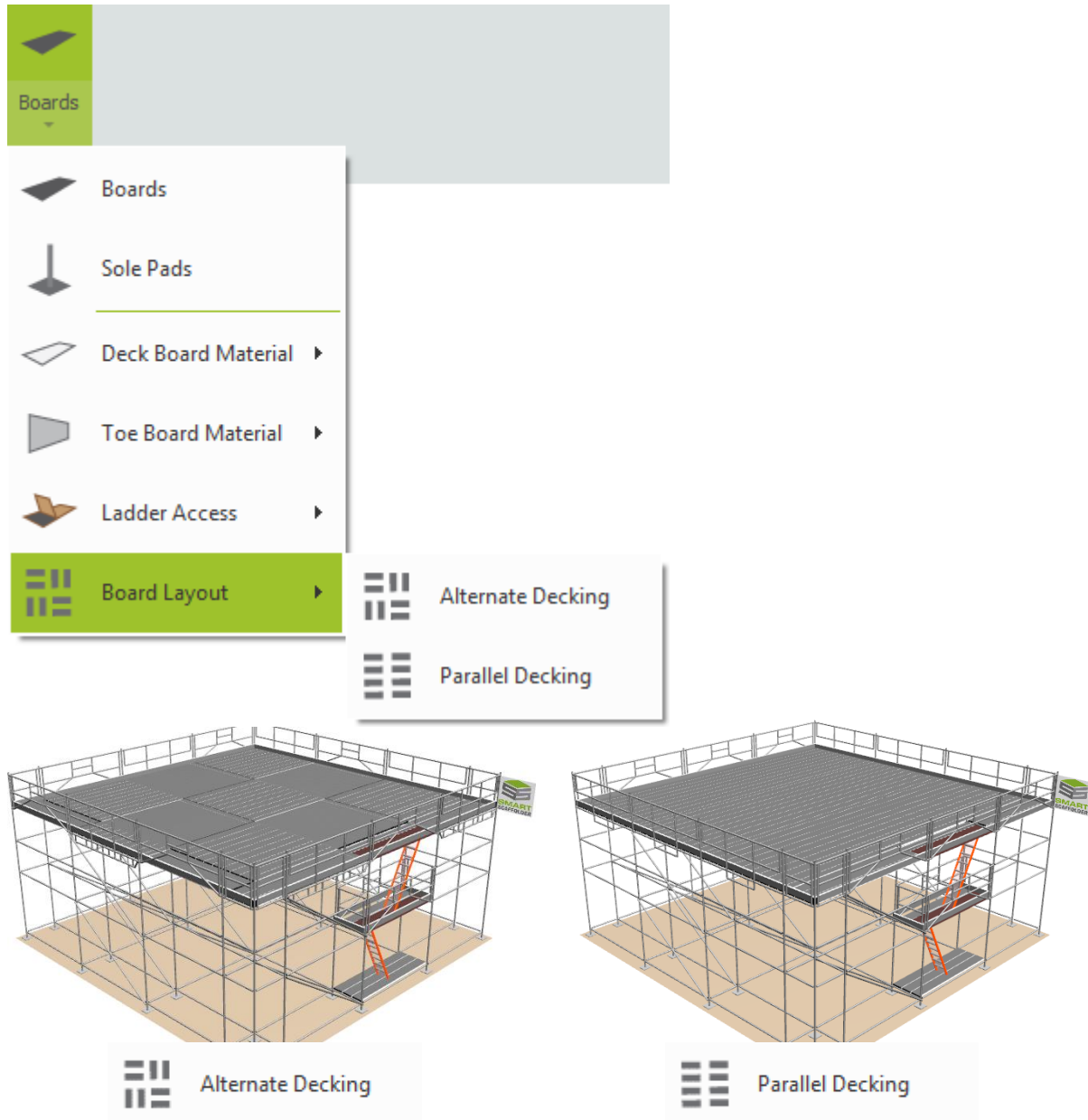
To change the deck or toe board material, click on the drop-down arrow below the **Boards** button and select the material from the menu:





## Set the decking layout

If you are using system styling decking, which clips to the transoms, then the layout of the decking can be set. To change the layout, click on the drop-down arrow below the **Boards** button and select the material from the menu:



## Add safety lamps, high visibility standards or rubbish chutes

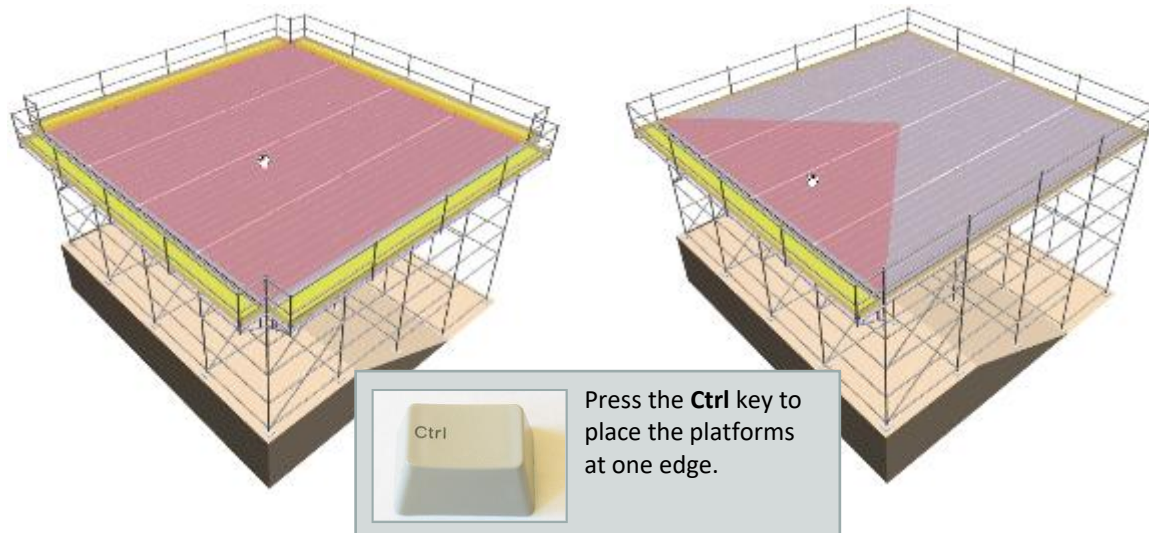
Safety lamps, high-visibility standards and rubbish chutes can all be added as for independents. See the **Edit the scaffold > Add a pavement lift** section in the basic guide for details.



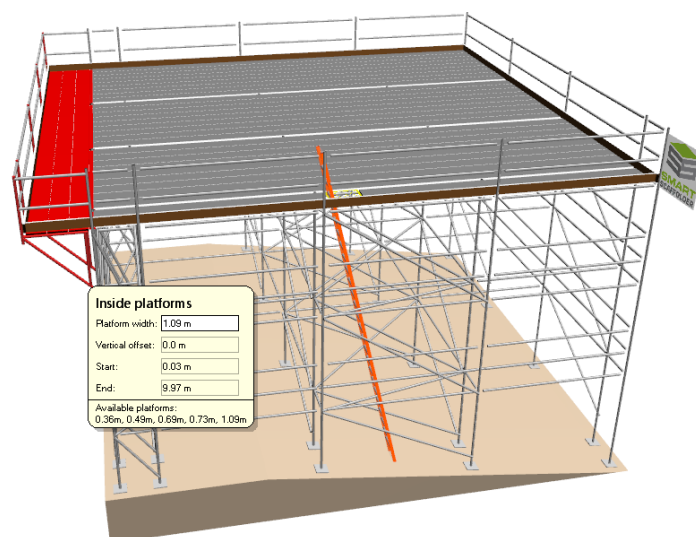
## Add Cantilever Platforms

Cantilevered platforms can be added to a birdcage by clicking on the **Cantilever Platforms** button. A platform can be built from timber, steel, or aluminium decking depending on the materials available in the catalogue for your scaffolding system, just as for the main decks.

Click on the main deck to place the platforms around the whole birdcage. Alternatively, hold the **Ctrl** key to place the platforms only on one edge:



Once the platforms have been placed they can be modified by moving the mouse over them to display their dimensions. The **Width** of the platform can be increased, depending on the available brackets in your material catalogue. The available platform widths are displayed in the input window to help you:



The width of the cantilever platform can be increased.

### Inside platforms

Platform width:

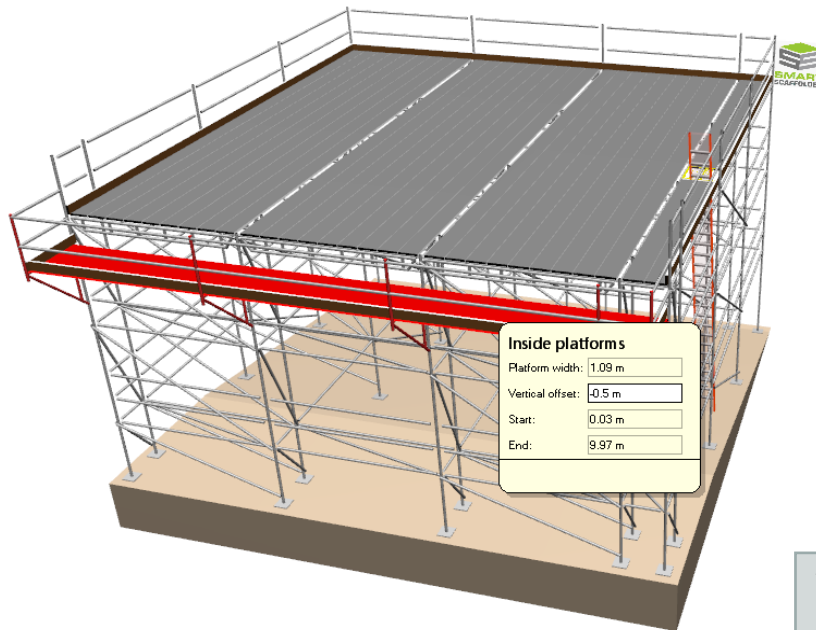
Vertical offset:

Start:

End:

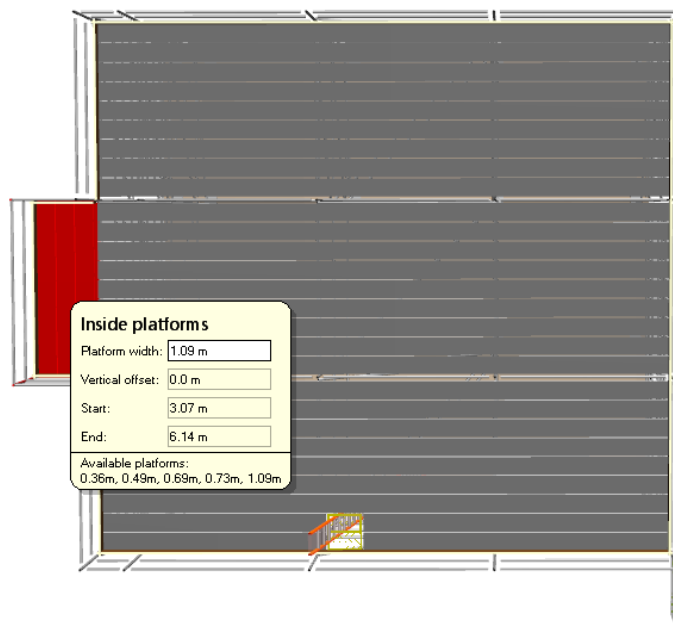
Available platforms:  
0.36m, 0.49m, 0.69m, 0.73m, 1.09m

The platform can be offset from the main deck by dragging it with the mouse or by changing the **Vertical offset** dimension:



The cantilever platform has been lowered by 0.5m.

You can also create a platform along part of the birdcage by changing the **Start** and **End** positions:



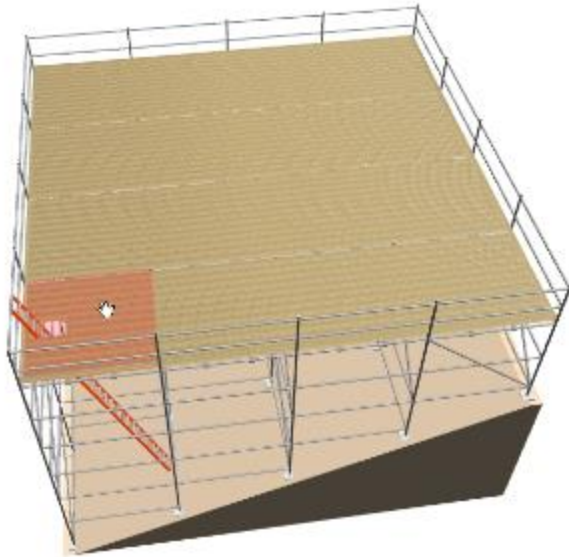
The cantilever platform has been built along part of the birdcage.



Ensure that you press the **Ctrl** key if you only want to change the dimensions of one platform, otherwise all of the selected platforms will be changed.

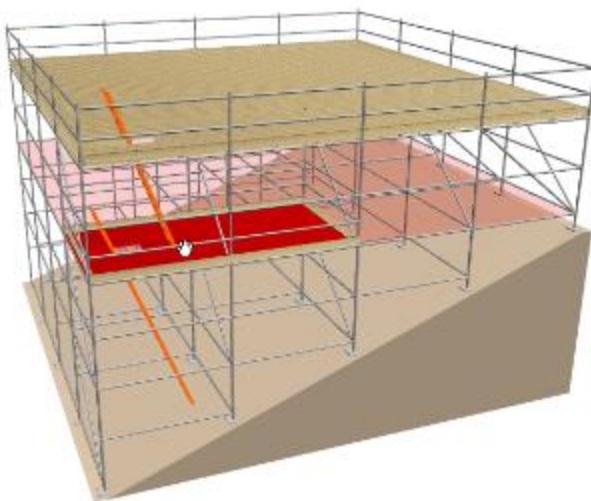
## Add Ladders and Landing Platforms

Ladders can be built either within the birdcage or externally. To build a ladder within the birdcage, click on the **Ladder** tool and click on the bay in which the ladder is to be placed:



Drop the ladder onto a birdcage bay to place it.

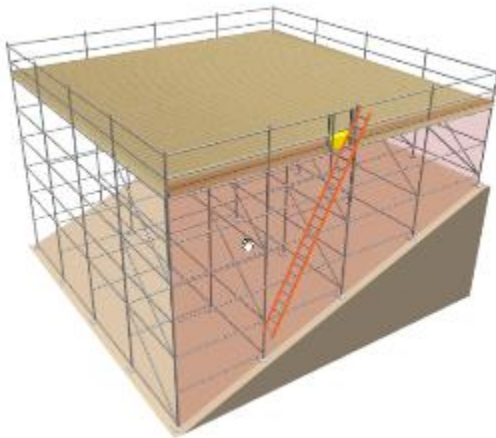
A long ladder is built from the ground to the top lift by default. To use shorter ladders, click on the **Landing** tool and click on the non-boarded lifts to create landing platforms:



Place landing platforms to use shorter ladders.

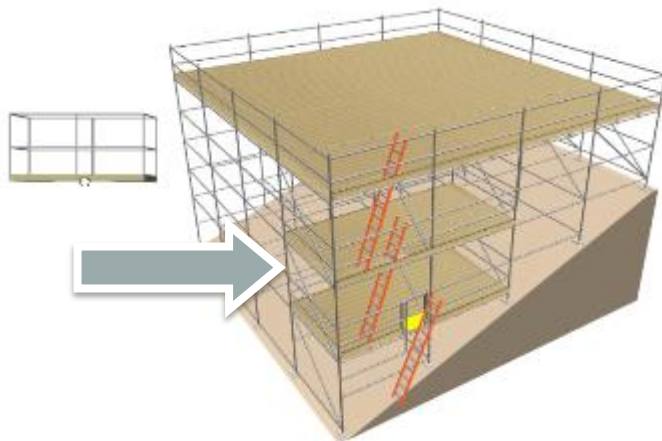
Once the ladders have been placed they can be moved by dragging them with the mouse.

It is also possible to place an external ladder with a safety gate. To place an external ladder, click on the drop-down arrow under the **Ladder** button and select the **External Ladder** menu option. The external ladder is placed by clicking on one side of the birdcage:



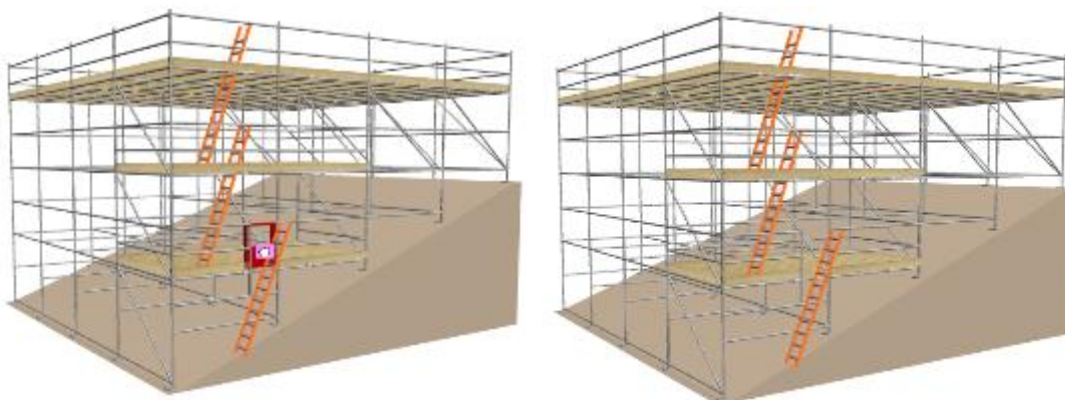
You can choose which side of the birdcage to place the external ladder.

An external ladder can also be split with landing platforms: the additional ladders are built within the birdcage and the safety gate is built at the first landing position:



Place landings to split the ladder.

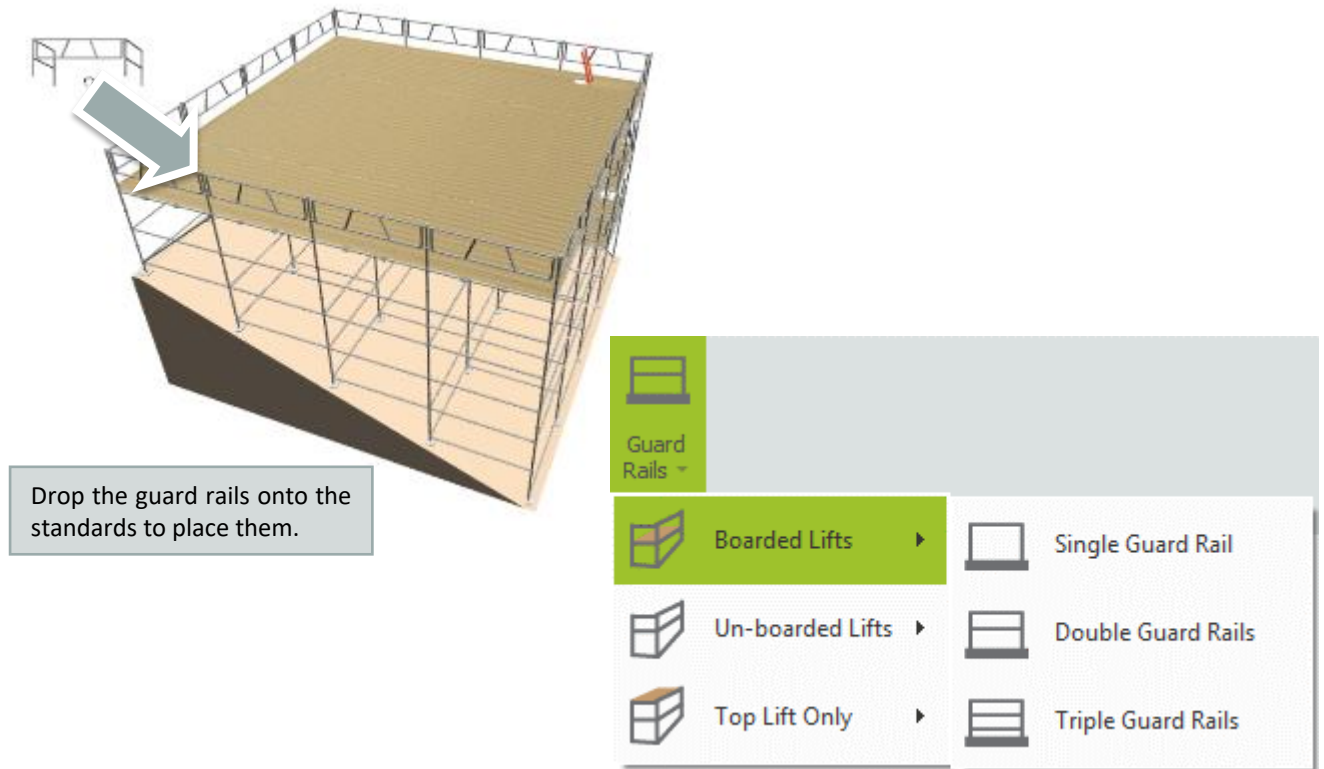
If you don't want to use a safety gate you can remove it with the **Eraser**:





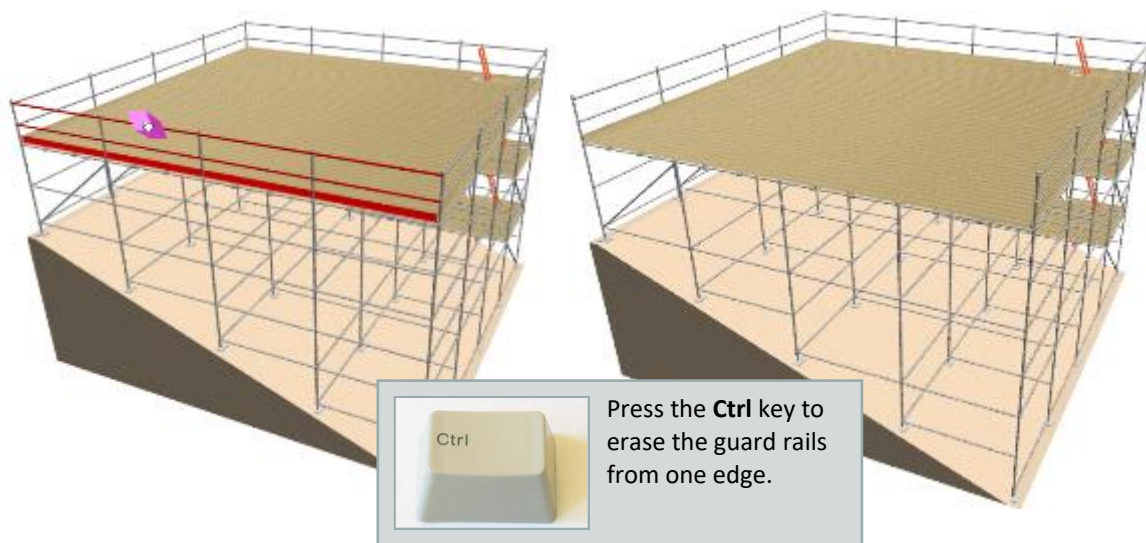
## Modify the Guard Rails

The guard rails which are placed on birdcages depend on the scaffolding system in use. For tube-and-fitting scaffolds, double guard rails are placed at all boarded lifts by default, with single guard rails at non-boarded lifts. This can be changed by clicking the **Guard Rails** button and selecting an option from the menus:



It is also possible to remove the guard rails from the perimeter of the birdcage, either from all sides or from a single side. To do this, select the **Erase** tool and click on the guard rails. Press the **Ctrl** key while erasing to remove the guard rails from one side.

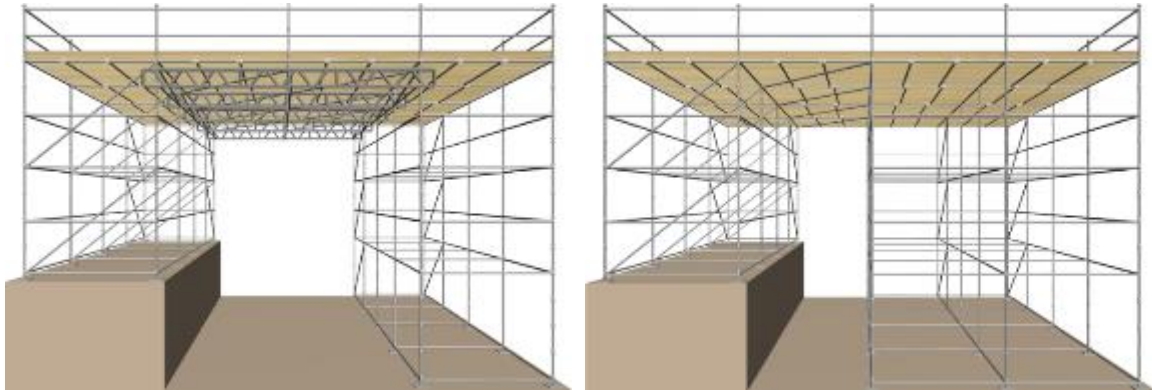
Any guard rails built around the internal sides of a ladder landing will remain, to prevent falls into the birdcage.





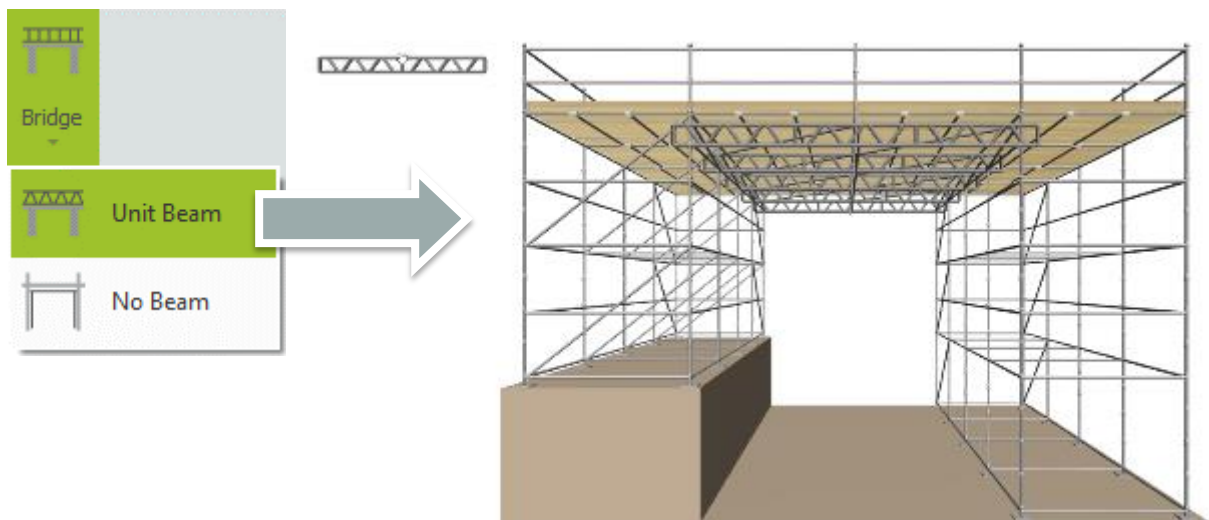
## Create a Bridge

A bridge can be created through a birdcage by using the **Bridge** tool from the **Add-ons** toolbar. A bridge can be created with or without beams by selecting from the drop-down menu:



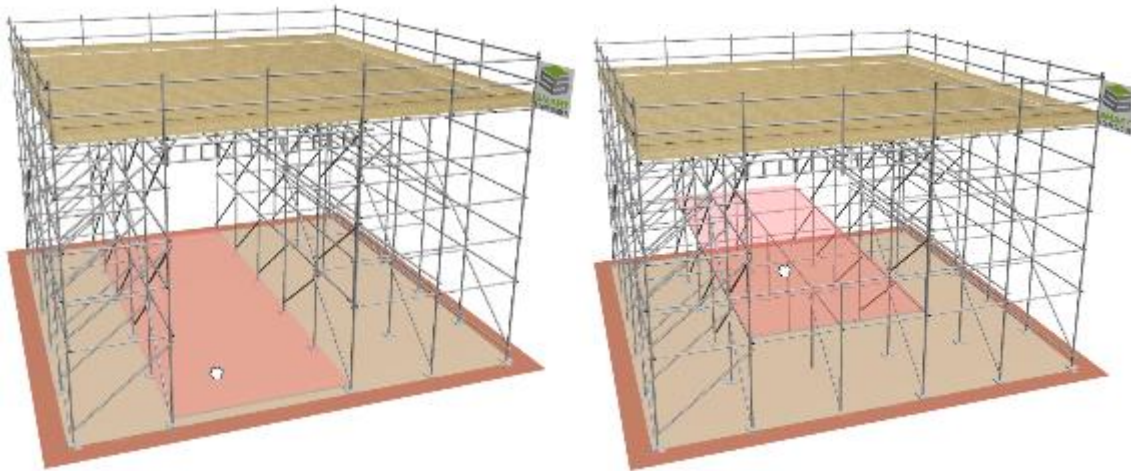
Bridges can be built with or without beams.

To create a bridge, click on the **Unit Beam**, **Ladder Beam**, or **No Beam** option and drop the bridge onto one of the birdcage lifts. The available bridge types depend on the active scaffolding system. A bridge can be created on each lift if required, up to a maximum of one bridge per lift.



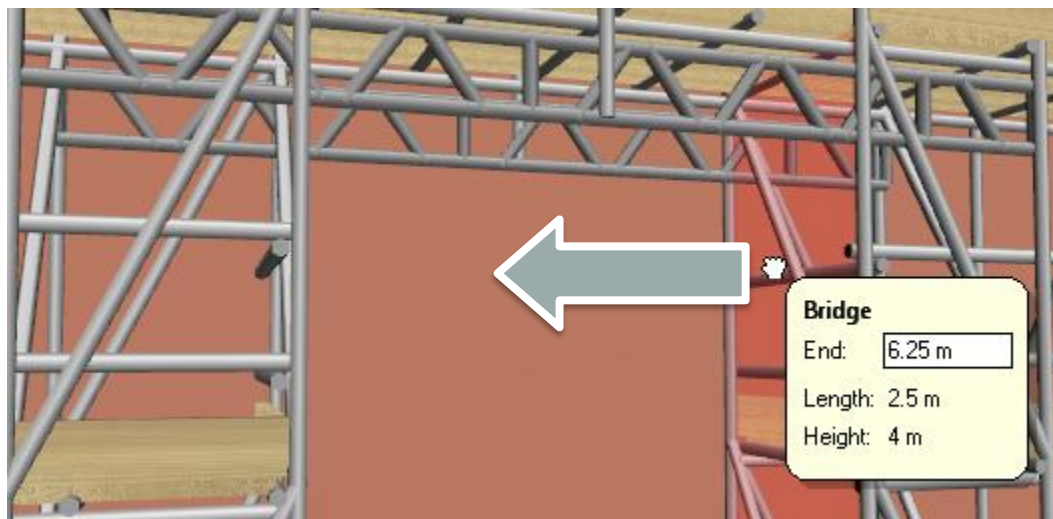
Lacing and bracing tubes are automatically applied to connect the beams.

Bridges do not have to extend all the way to ground level. To create an opening around an obstruction, such as pipework, you can raise the bottom of the bridge. To lift the bridge by as many lifts as required, simply lift the bottom of the bridge upwards:

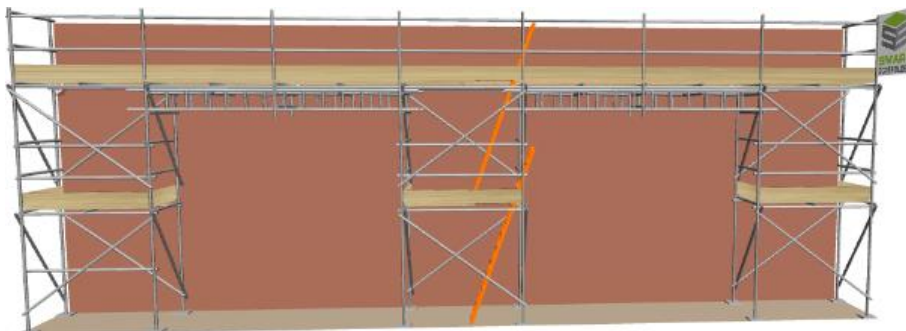


## Edit bridge dimensions

You can modify the position of a bridge by clicking and dragging the sides of the bridge with the left mouse button. You can also type in the new start and end positions and press **Enter**:

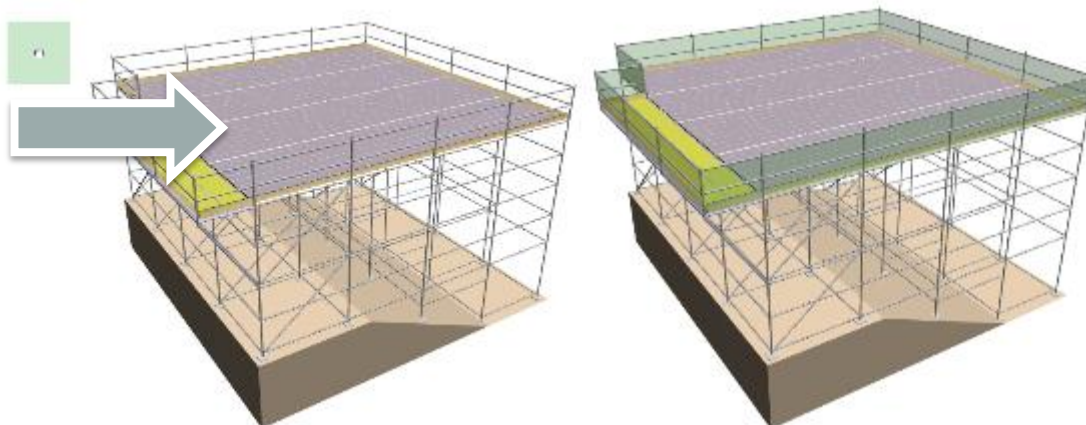


You can place several bridges per elevation:

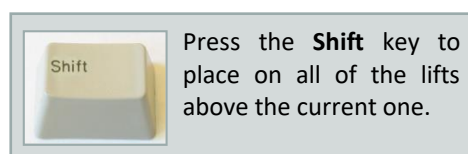
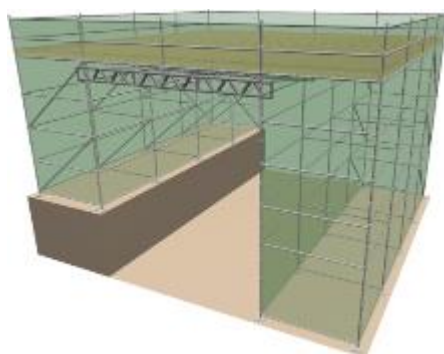


## Add Sheeting or Debris Netting

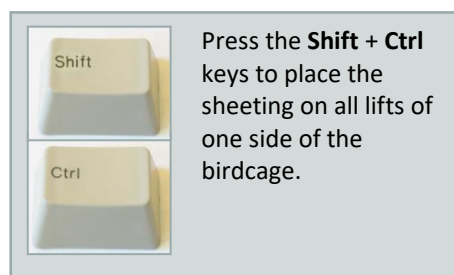
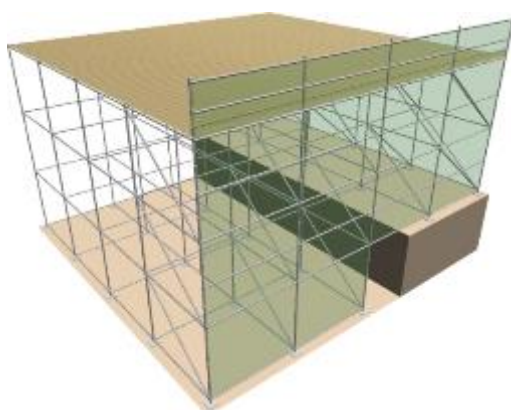
Sheeting and debris netting can be added to a birdcage by choosing the **Sheeting** option from the **Add-ons** toolbar and clicking on the birdcage lifts:



The sheeting or netting can be applied to the whole birdcage by pressing the **Shift** key while selecting a lift; all of the lifts above the selected lift will be sheeted.



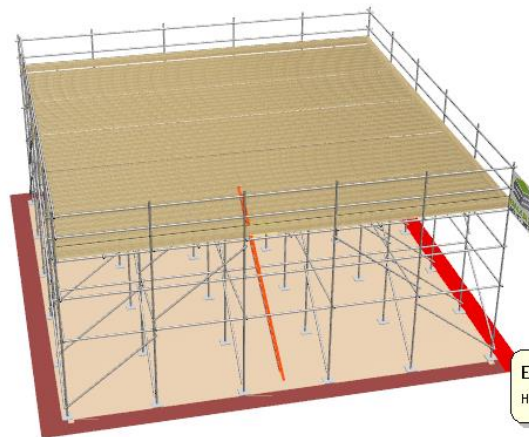
You can also place the sheeting on one side of the birdcage by pressing the **Ctrl** key while selecting the lifts:



## Show the birdcage against an elevation

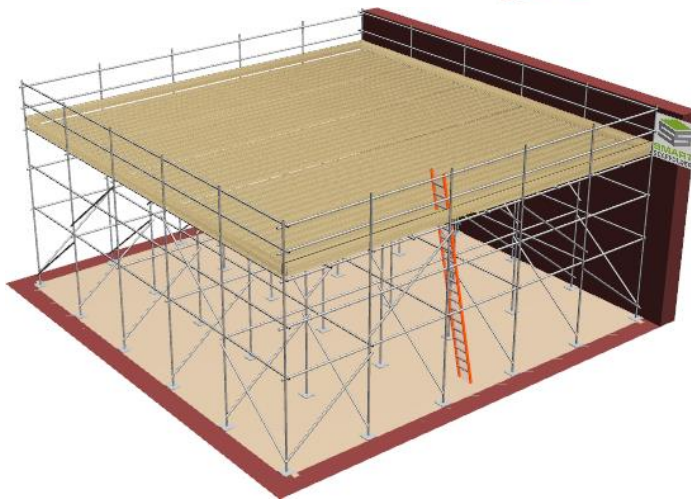
You can show the birdcage supported against an elevation on one or more sides. To do this, lift the birdcage elevations as you would for an independent:





**Elevation**

Height: 0.0 m



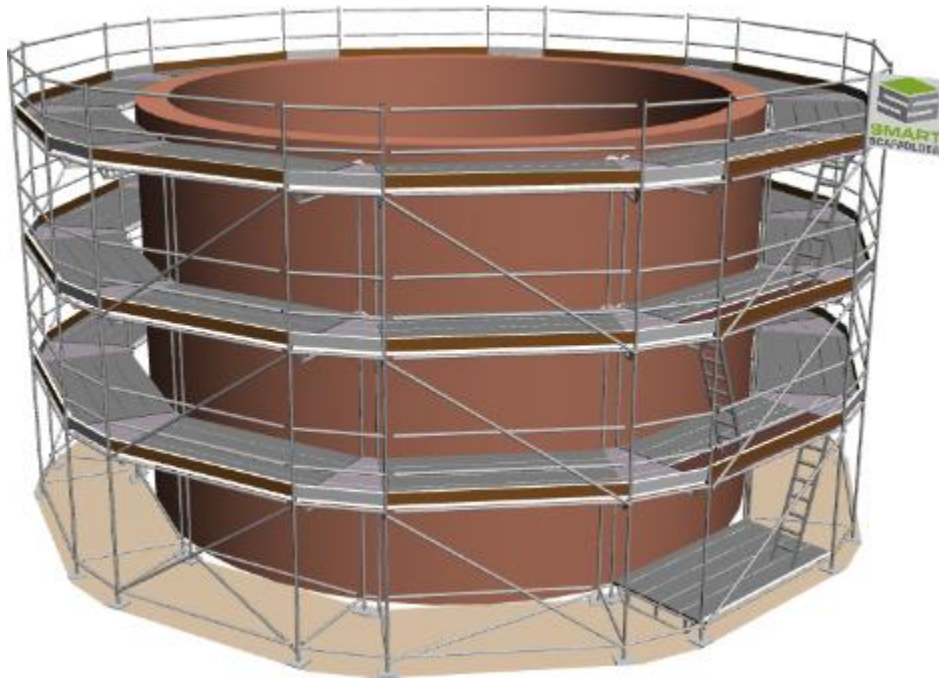
Press the **Ctrl** key while dragging to lift only one elevation.



## Model a circular tank

Circular tank scaffolds can be created in **Model IT** by selecting the **Circular Tank** option from the **Scaffolds view** in **Model IT**.

A default circular tank has a diameter of 10m and is 2 lifts tall:



The lift heights, add-ons and ground conditions can be set for a circular tank exactly as they are for an independent scaffold. Every tower of the tank behaves in the same way as an elevation for an independent scaffold.

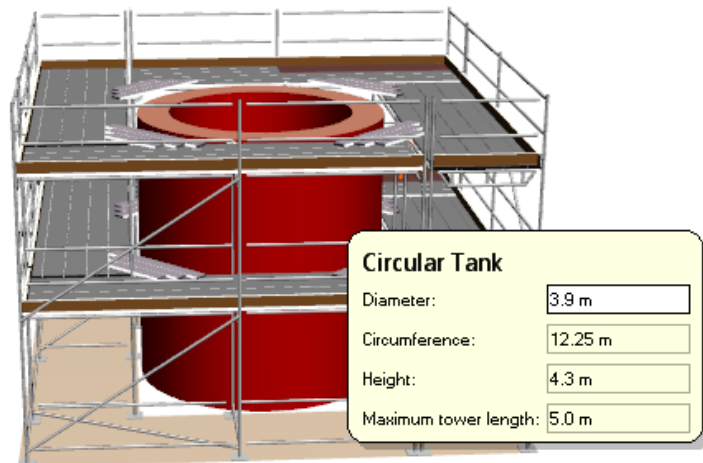
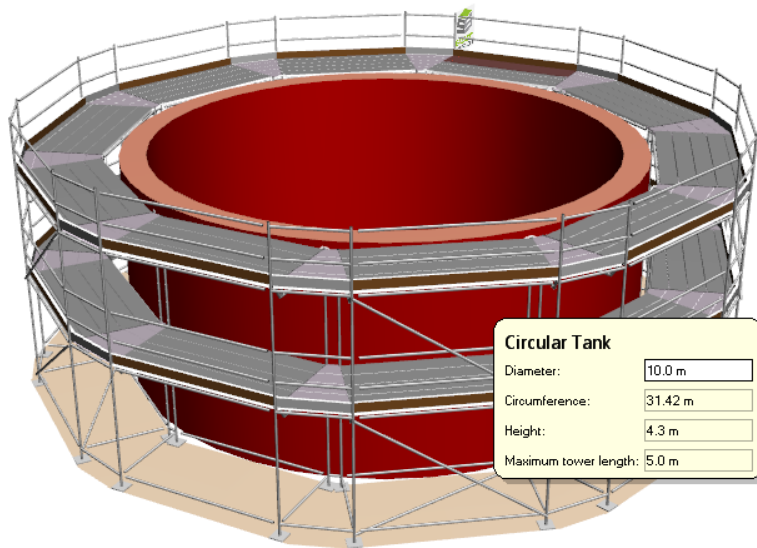
### Enter the tank dimensions

The height, diameter and circumference of the circular tank can be changed, similarly to the method used for independent scaffolds.

You can enter the dimensions in two ways:

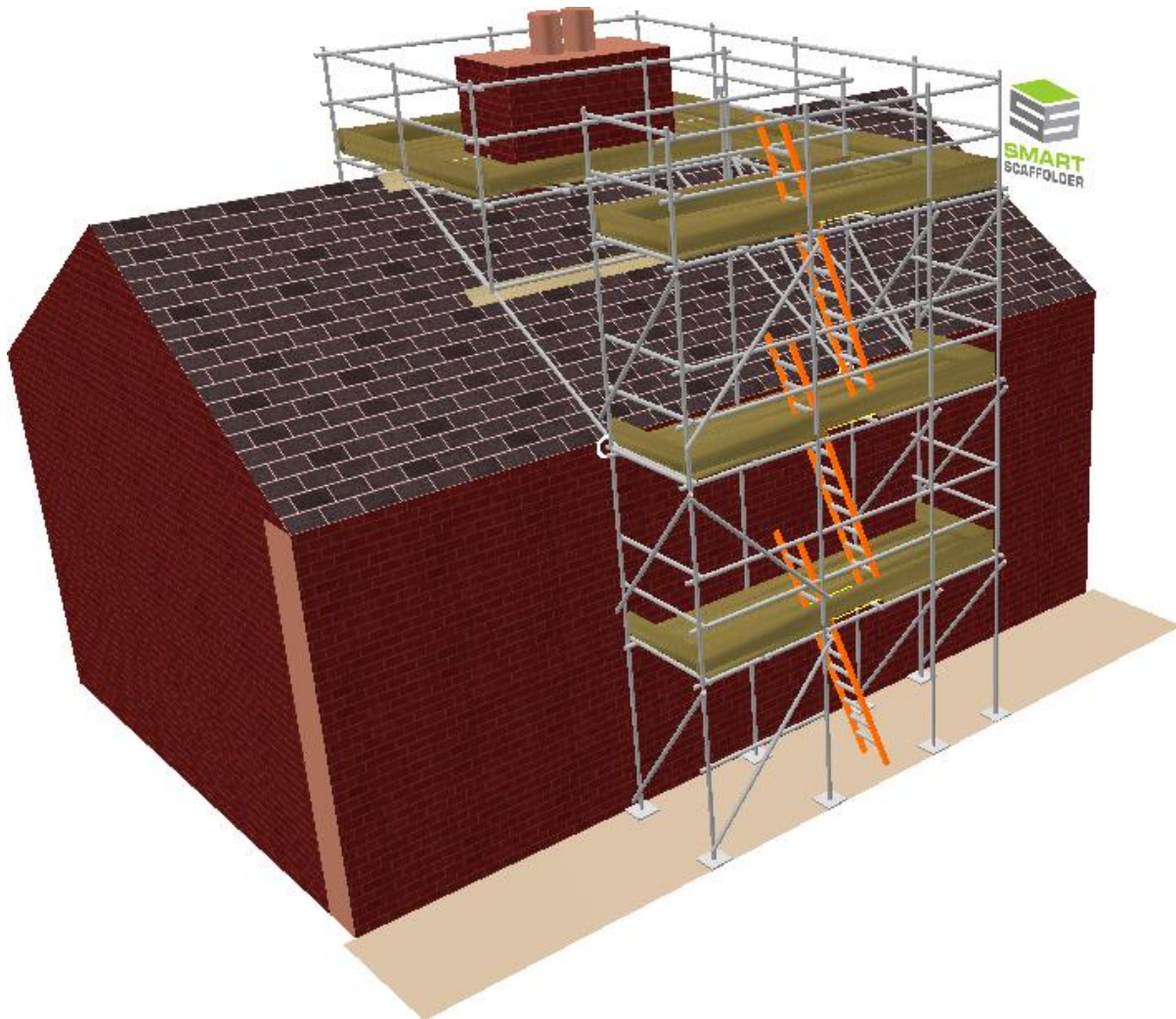
1. By dragging the tank with the mouse;
2. By hovering the mouse over the tank and typing its new dimensions.

When the size of the circular tank changes, the scaffolding will automatically change between the preferred square scaffold and a set of towers and trapezoidal bays:



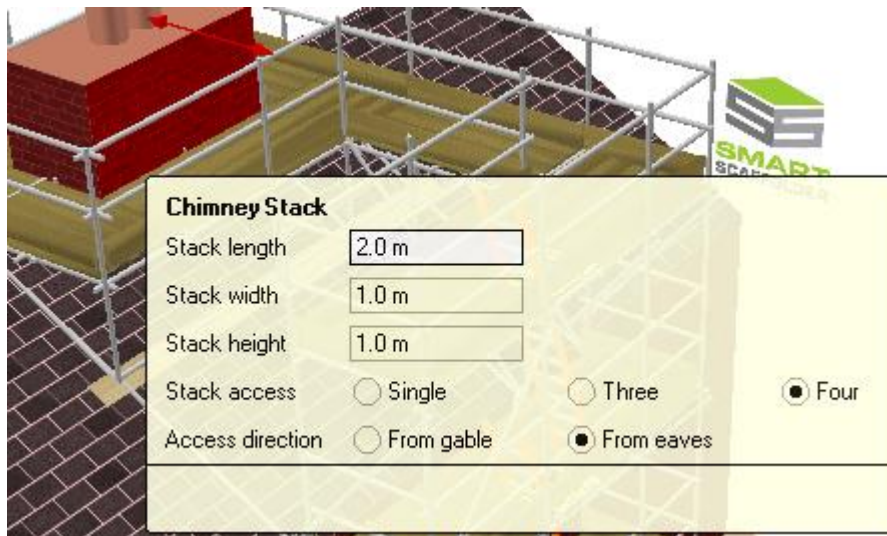
If you prefer a different solution, you can try changing the distance between the tank and the scaffold, change the bay solution in **Setting-Out View** or change the **Maximum bay spacing**. Adding inside boards or cantilever platforms (sometimes known as 'hop-ups') can also affect the type of scaffold created.

## Model a chimney stack



Chimney stacks can be 3D modelled or attached to an existing independent or tied tower.

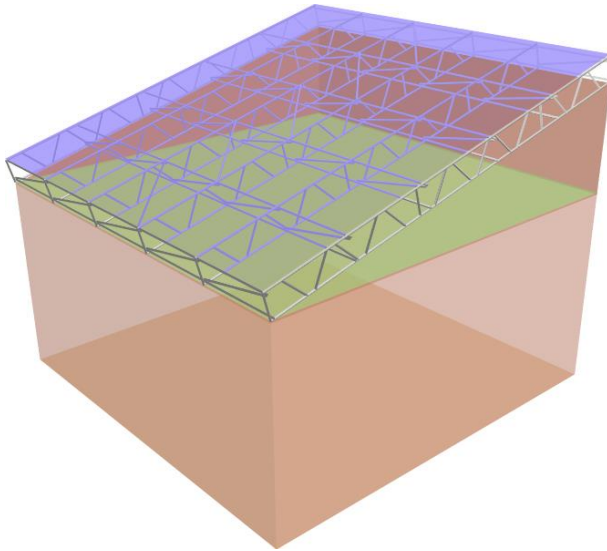
The position and size of the chimney stack, gable and elevations can be set by dragging the appropriate object. Hovering over the chimney stack provides access to some additional options:



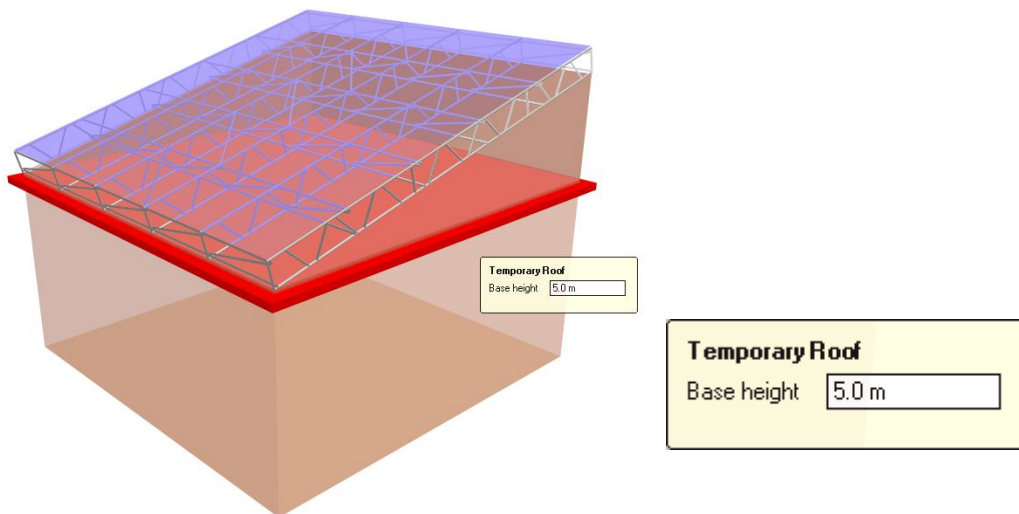


## Model a temporary roof

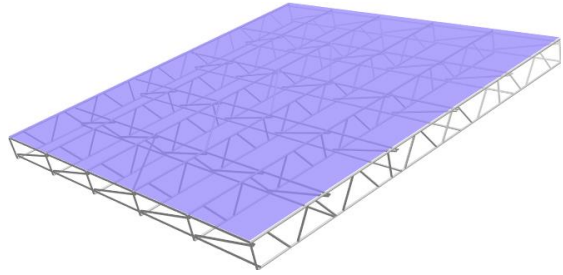
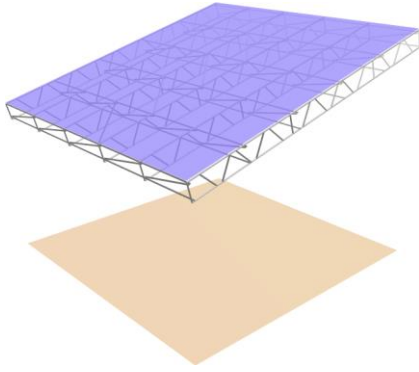
A temporary roof can be created which is not attached to an independent. The scaffold type has only been provided for estimation purposes.



The size, pitch, covering type and name can all be set using the dynamic input. The size can be adjusted by dragging. The scaffold can be raised or lowered with the base height grip:



The **Building Colour** and **Ground Colour** tools can be applied to hide the sizing grips:



## Using the other SMART Estimator products

The best way to use the SMART Estimator products is to use them together. Every product is designed to enhance the rest of the suite.

SMART Estimator **Model IT** can be used with the rest of the SMART Estimator products:

### Schedule IT

With **Schedule IT**, it is possible to rapidly create large scaffolding projects without the need to model every scaffold in 3D. It is then possible to use **Model IT** to adjust those scaffolds until they match the job.

You can also use **Schedule IT** to instantly copy a set of scaffolds, or to move scaffolds between items.

### Report IT

Create instant reports of the components used, for your modelled scaffolds. This shows the exact weight of components used. You can also produce technical drawings.

### Price IT

Price the modelled scaffolds using saved and fully customisable sets of rates, to rapidly estimate and check the pricing for the project.

### Quote IT

Generate quotations for the project which are automatically updated as you change the details of the scaffolding.

### BIM Toolbox

Create scaffolds more quickly, using information from an existing model, or export data from SMART Estimator to be used in other design software.



For more information about the other SMART Estimator products, please refer to their user guides, which are available from the Help tab.

## Feedback

Thank you for choosing SMART Estimator.

We are always striving to improve the product so please contact us with your feedback. We are always keen to hear new ideas and if you experience any problems with the software we want to hear about them so that they can be resolved.



You can contact us via:

- ▶ Our website support centre at [www.smartscaffolder.com/support.html](http://www.smartscaffolder.com/support.html);
- ▶ Email on [support@smartscaffolder.com](mailto:support@smartscaffolder.com);
- ▶ Telephone on +44 (0)1202 603733 from Monday to Friday between 09:30 and 17:00.