SMART 2022 ESTIMATOR

SMART SCAFFOLDER

MODEL IT:
USER GUIDE

Version: 2022.0

CADS

AUTODESK. Authorised Developer

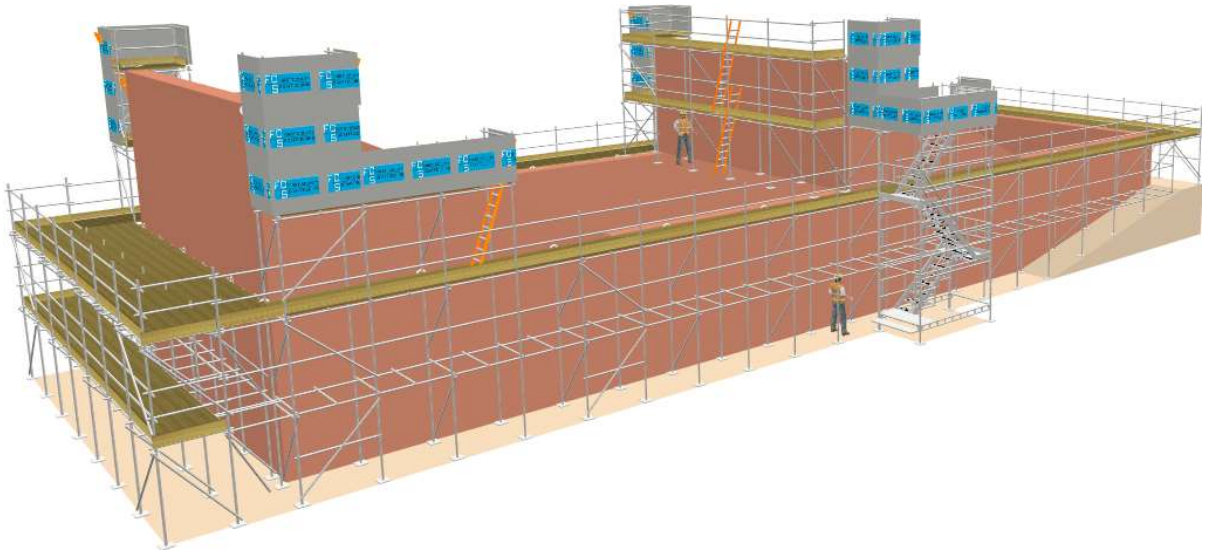
Microsoft Partner Gold Application Development

Contents

Introduction 1
Create a new project 2
Navigating the 3D model 2
Zooming the display 2
Rotating the display 4
Panning the display 5
Find the tools you want to use 6
Copy a picture of your scaffolds 7
Set up your project 8
Clear scaffolds 12
Erase all the scaffolds in an item 12
Erase one scaffold only 12
Create scaffolds 13
Select the system configuration 13
Enter the building dimensions 14
Create gable ends 16
Create a scaffold plan 17
Draw around a site plan 19
Edit the scaffold 20
Add a pavement lift 20
Modify the lift heights 21
Modifying the top lift 23
Remove the top lift 24
Removing your changes 24
Add a foot lift 25
Specify the guard rails 26
Modify the board details 27
Place inside boards 29
Add a cantilever platform (hop-ups) 31
Anchor the scaffold 33
Using the other SMART Estimator products 35
Schedule IT 35
Report IT 35
Price IT 35
Quote IT 35

Copyright 2022 © Computer and Design Services Limited

BIM Toolbox 35
Feedback 36



Copyright 2022 © Computer and Design Services Limited

Introduction

Thank you for choosing SMART Estimator.

SMART Estimator **Model IT** is a cutting-edge visualisation tool for the rapid generation of 3D photo-realistic rendered models of tube-and-fitting or system scaffolding. These models can be pasted into a report or proposal for illustration. SMART Estimator **Model IT** will also calculate overall quantities automatically, helping you to plan and price your scaffolding projects.

SMART Estimator **Model IT** now supports tube-and-fitting scaffolding and system scaffolding, with the present version supporting the Cuplok, Kwikstage, Layher Allround, HAKI Universal and Frame Scaffolding systems.

Copyright 2022 © Computer and Design Services Limited

Create a new project

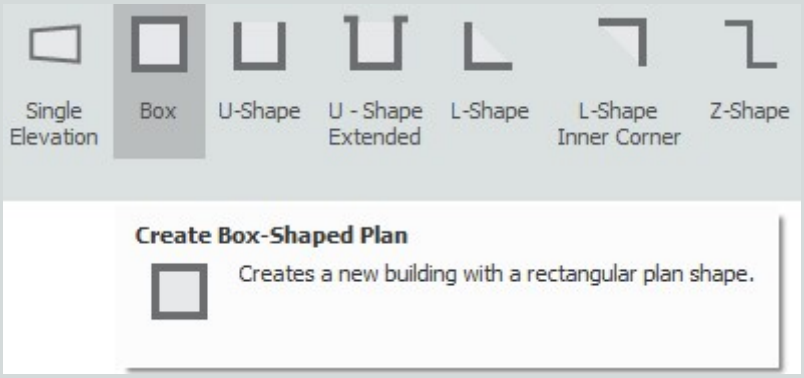
Please see the **Getting Started Guide** for instructions on how to create a new project.

Navigating the 3D model

This section will demonstrate how to use the 3D model navigation features: zooming, rotating, and panning. The 3D model is available by selecting the **Model IT** tab at the top of the window.

Try it!

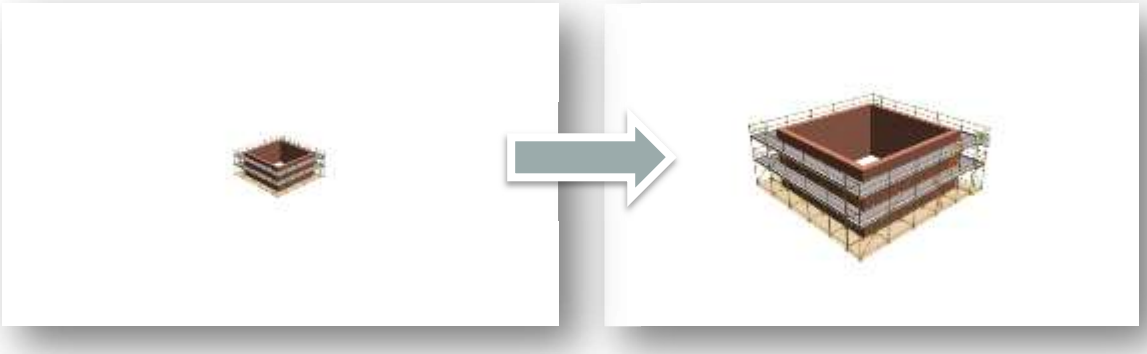
Before learning about these features, click on the **Box** icon to create a default scaffold.



Zooming the display

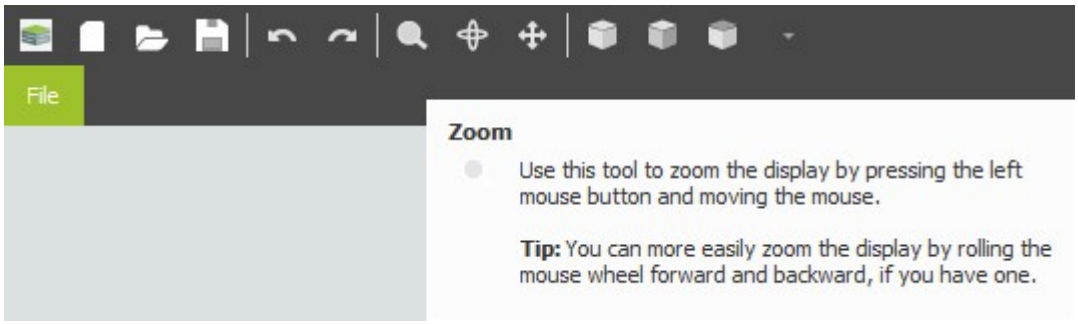
When working with **Model IT** you will often want to *zoom in* to see part of the model in more detail, or *zoom out* to see the whole model. The easiest method is to use the mouse wheel, if you have one.

Roll the mouse wheel forward to zoom in or backward to zoom out.

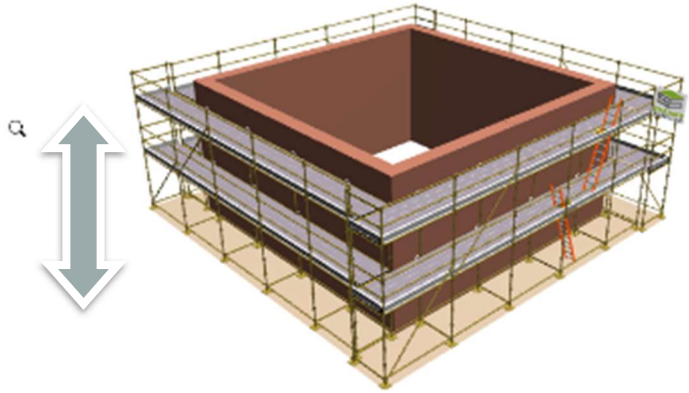


Copyright 2022 © Computer and Design Services Limited

If you do not have a mouse with a wheel you can use the **Zoom** tool:



Click on the **Zoom** tool to activate it; then zoom in and out by moving the mouse to the 3D view, pressing and holding the left mouse button, and moving the mouse up and down.



Once you have finished zooming there are three methods of exiting the zoom mode:

- Double-click the left mouse button;
- Press the **Esc** key;
- Click on the zoom tool again.

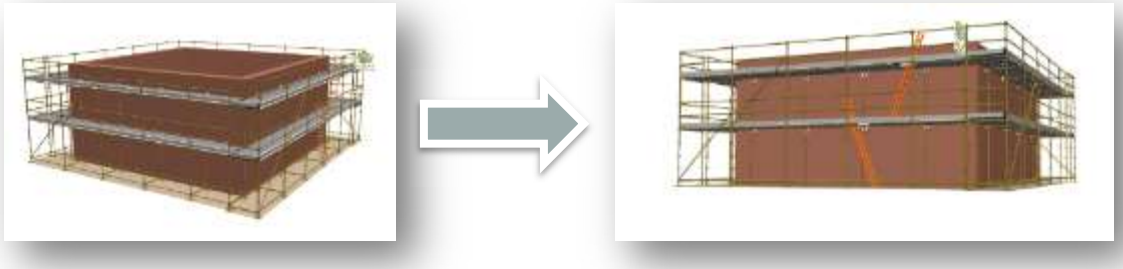
All of the tools within **Model IT** can be exited in the same way.

Copyright 2022 © Computer and Design Services Limited

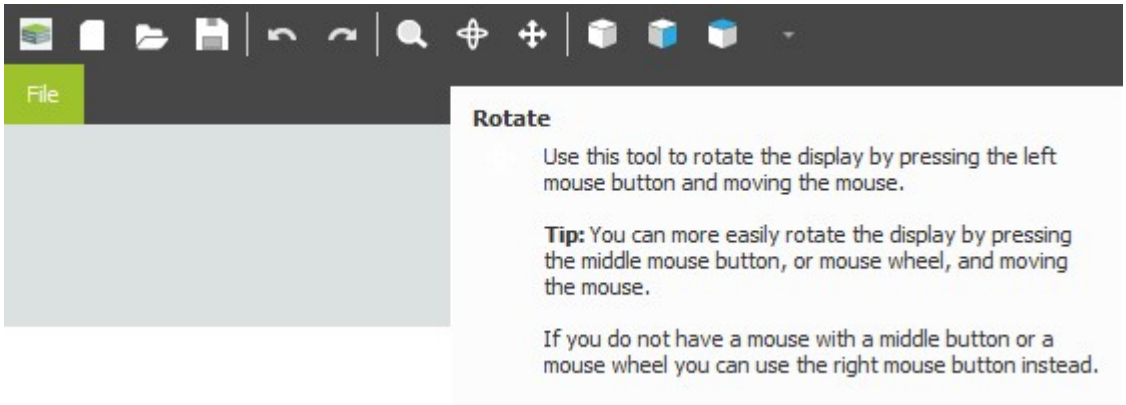
Rotating the display

The model can be rotated by pressing and holding down either the middle mouse button or the right mouse button and moving the mouse.

Press the middle or the right mouse button and move the mouse.



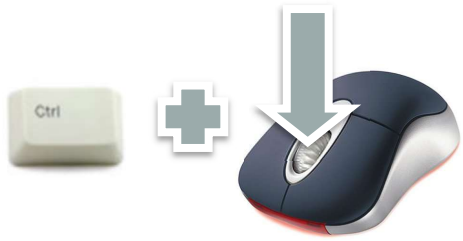
Alternatively you can use the **Rotate** tool, which works with the left mouse button, just like the **Zoom** tool.



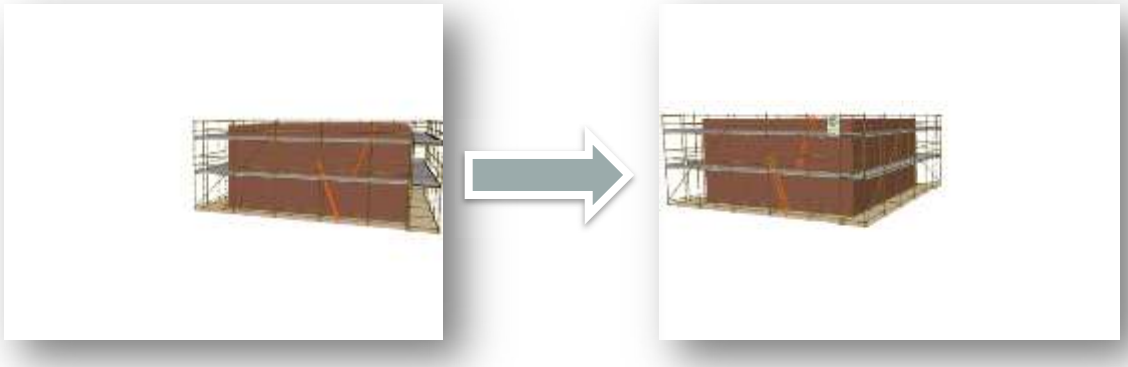
Copyright 2022 © Computer and Design Services Limited

Panning the display

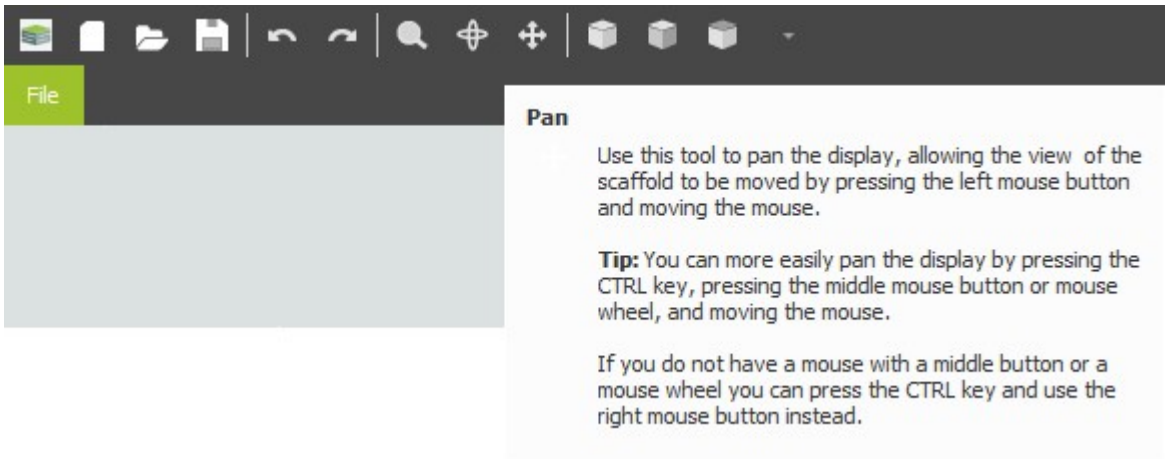
Once you have zoomed the display you may wish to move it to see other parts of the model. This is known as *panning.* To pan the display, hold the **Ctrl** key, press either the middle mouse button or the right mouse button, and move the mouse.



Hold the **Ctrl** key and press the middle or the right mouse button and move the mouse.



Alternatively you can use the **Pan** tool, which works with the left mouse button, just like the **Zoom** and **Rotate** tools.



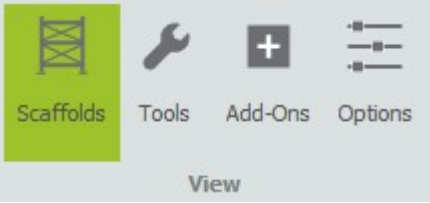
Copyright 2022 © Computer and Design Services Limited

Find the tools you want to use

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

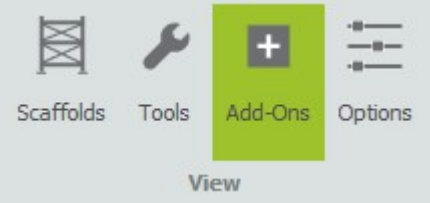
- Scaffolds
- Tools
- Add-Ons
- Options

To switch between these, select one from the toolbar.



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

For example, when the *Add-Ons* view is active, the *Bridge* tool is available and can be applied to the model:



Copyright 2022 © Computer and Design Services Limited

Copy a picture of your scaffolds

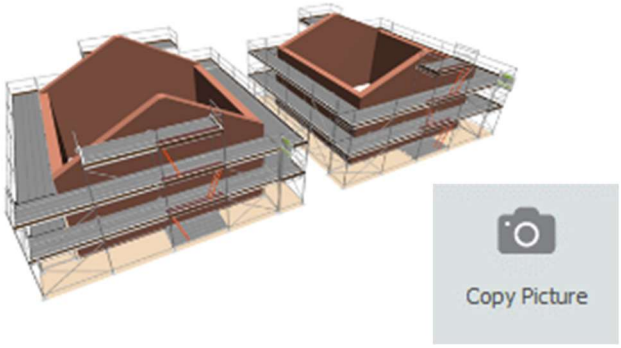
You can copy snapshots from **Model IT** and use them within your proposals, quotations, risk assessments, and site drawings. There are two methods of achieving this:

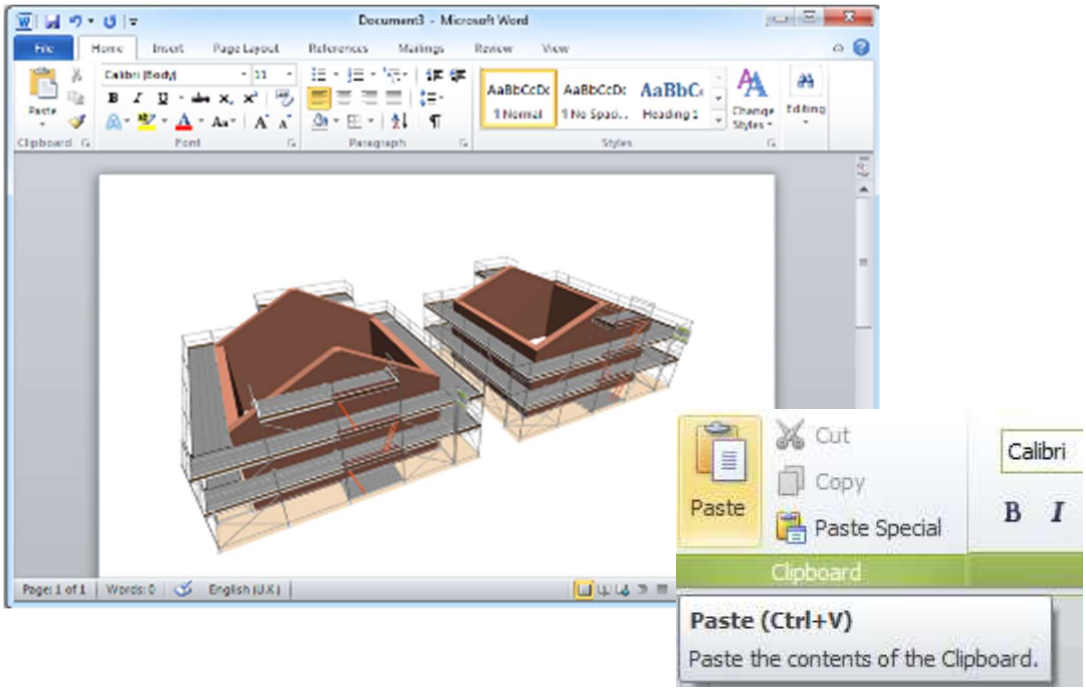
- You can copy and paste a picture into another application, for example Microsoft Word.
- You can copy and paste a picture into your quotation (if you have **Quote IT**).

When copying a picture, first use the rotation, zooming, and panning tools to set up the camera angle that you require.

To copy and paste the picture into another application, first select the **Copy Picture** button from the **Options** view. Then switch to the other application and press **Paste**.

To copy and paste the picture into your quotation, first select the **Copy Picture** button from the **Options** view. Then switch to the **Quote IT** tab and press **Paste**.





Copyright 2022 © Computer and Design Services Limited

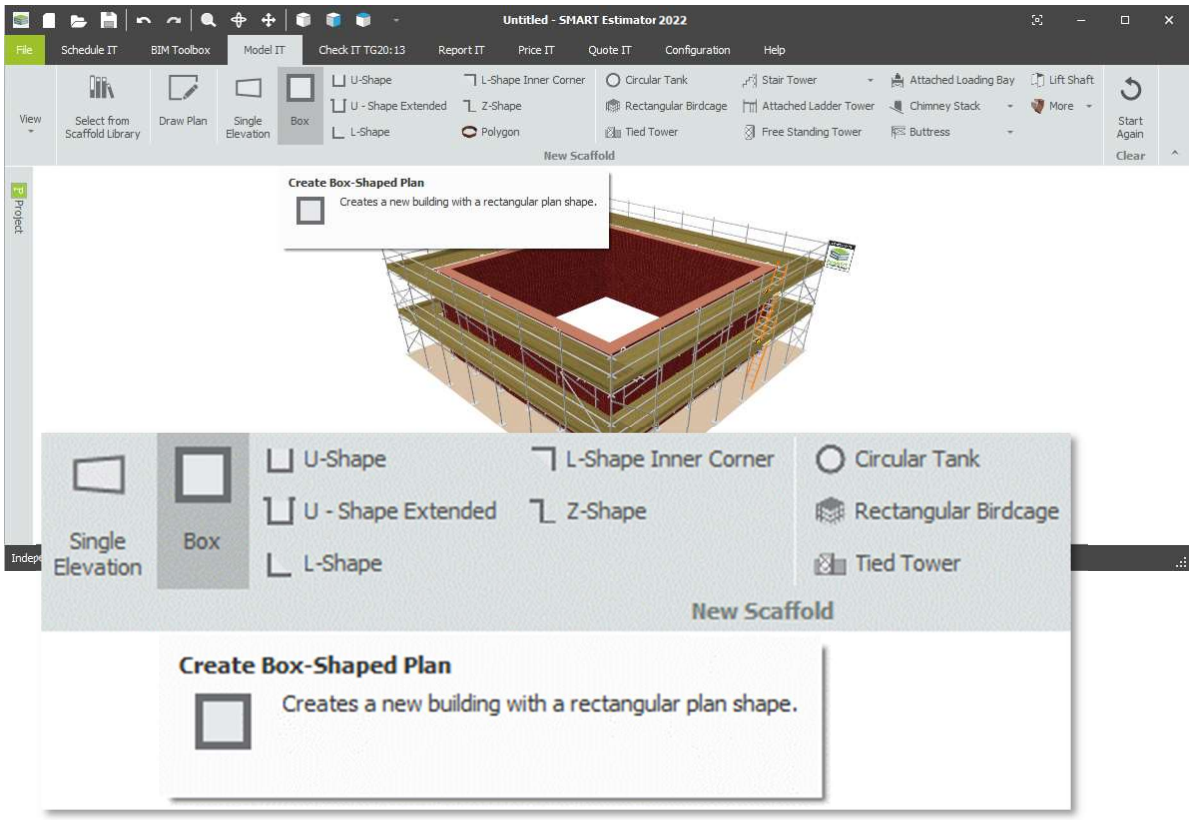
Set up your project

The **Model IT** *project browser* helps you to organise your scaffolding models into a single project, enabling you to estimate quantities and print reports for several items at one time.

The *project browser* starts with one item in the project, ready to create your first scaffold.

Try it!

Click on the **Box** button to create a new scaffold – you will see it in the main 3D screen and as a small thumbnail image in the **project browser**.

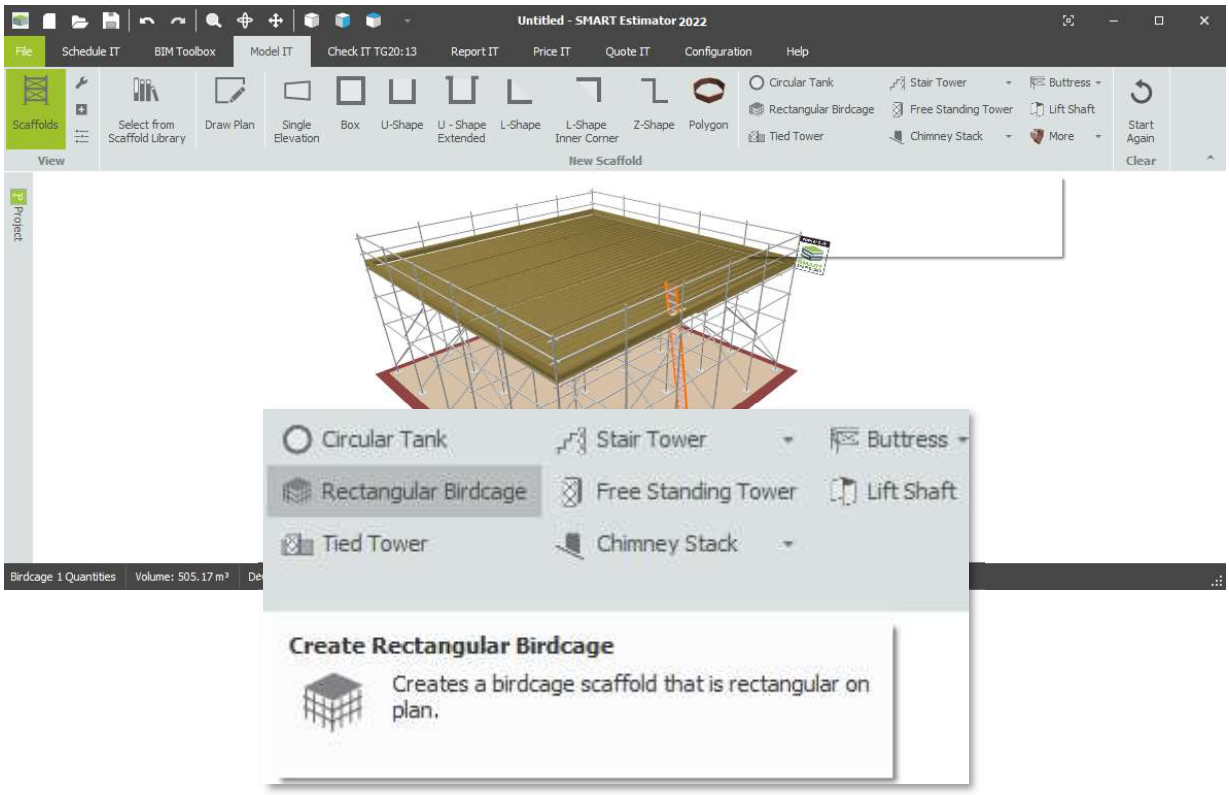


If you wish you can change the contract number and enter a description for the project, which will appear in the title areas of your printed reports. You can change the *Project status* using the drop-down menu provided. You can also change the name of the item from 'Item 1' to any name of your choosing.

If you want to add another item to the project, select the **Click to add a new item** option. Alternatively, you can press the **Ctrl** and **Insert** keys at the same time. This will add a new blank item to the project and activate it; you can tell which item is active because its border is highlighted in the **project browser**.

Copyright 2022 © Computer and Design Services Limited

You can then select the type of scaffold that you want to model, for example by clicking on the **Rectangular Birdcage** button:



You can continue to add new items, or click on one of the thumbnails to switch between items.

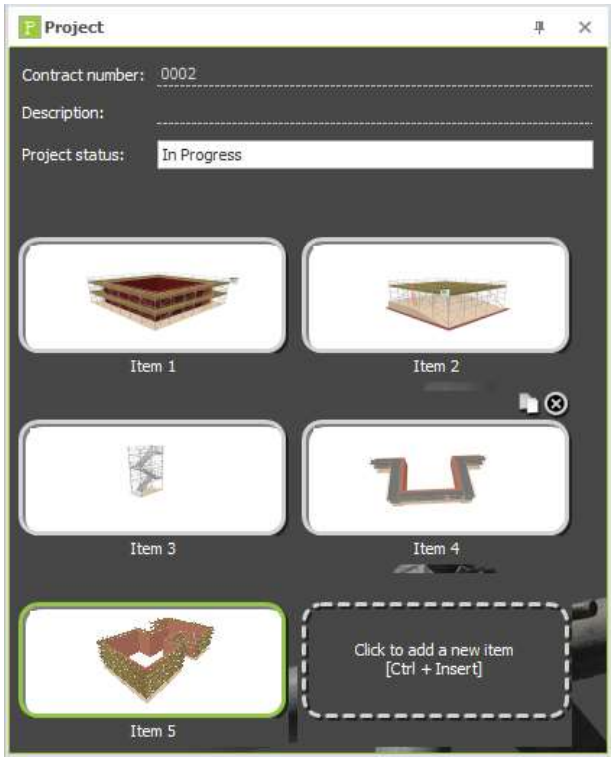
You can also add scaffolds by using **Draw Plan** (explained later) or **Schedule IT** (see the **SMART Estimator Schedule IT user guide**).

If you want to create a new scaffolding item that is similar to another one, for example to show a variation or to scaffold around a similar building, you can hover the mouse pointer over a thumbnail to display the *context-sensitive options:*

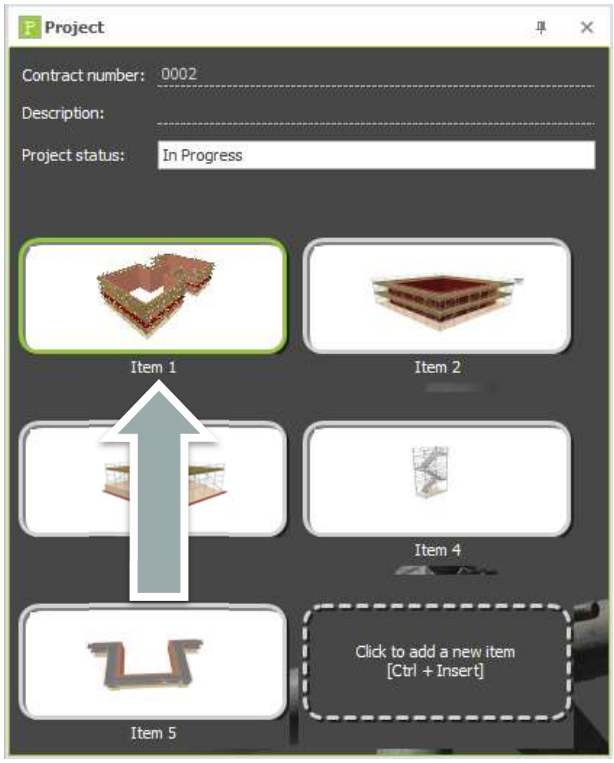
If you make a mistake while using the **project browser** you can press the **Undo** button at the top of the screen.

Copyright 2022 © Computer and Design Services Limited

If you are working with a larger project you can scroll the display to see different items, or you can resize the *project browser* to see more items at the same time:

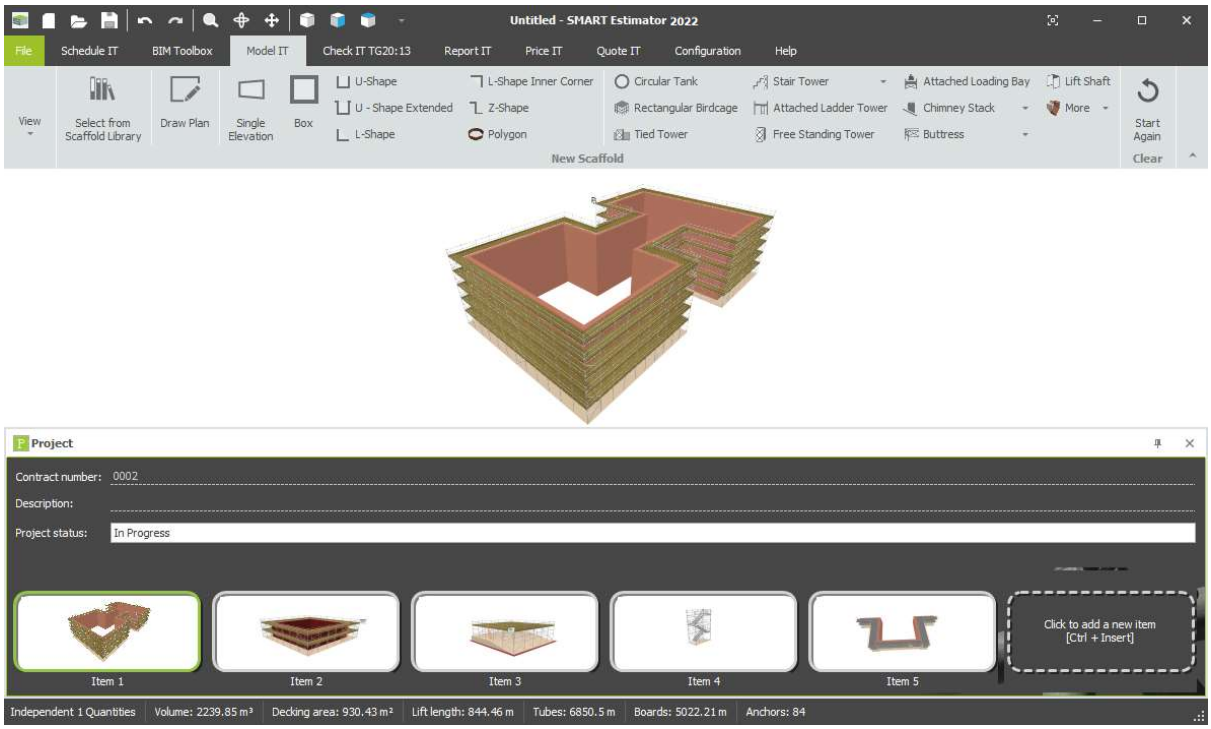


This makes it easy to reorganise your project if you want to; just click and hold the left mouse button over an item, then move the mouse to reorder the items:

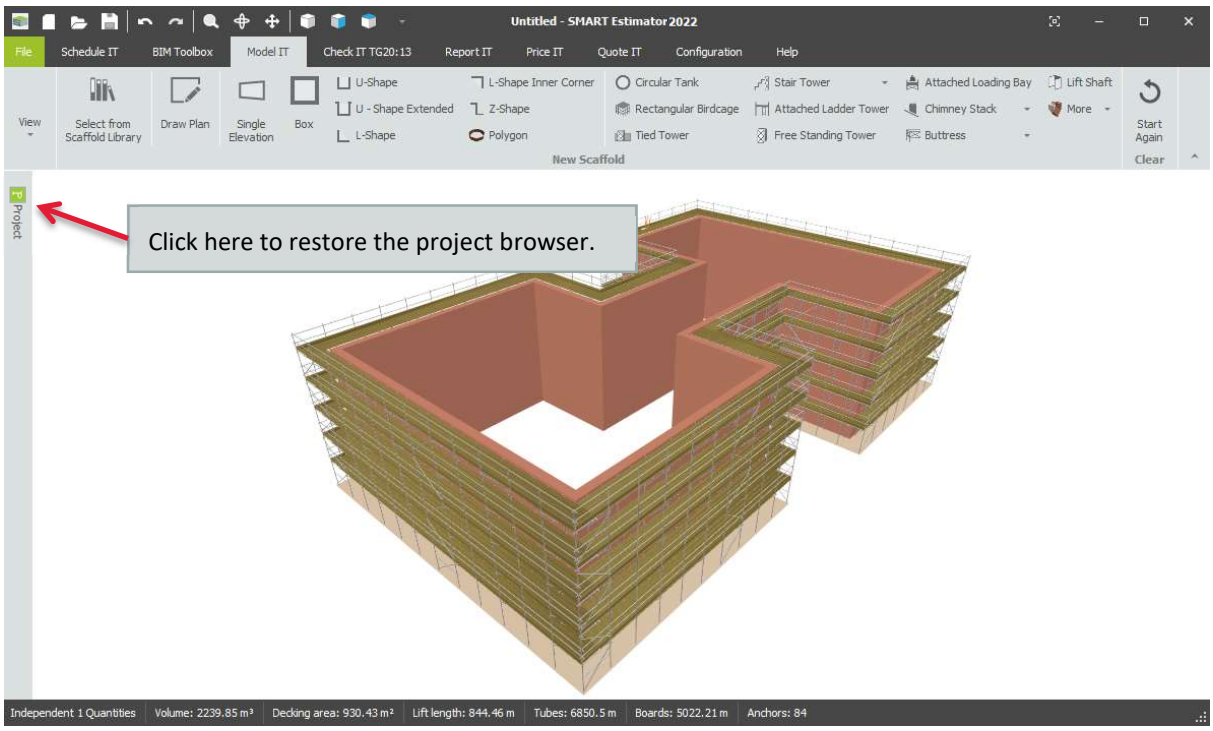


Copyright 2022 © Computer and Design Services Limited

You can move the **project browser** by dragging its title bar; for example if you prefer to see your items in a horizontal list:



You can also hide the *project browser* if you want more space for 3D modelling. Just click the **X** button at the top corner of the browser to minimise the browser and click on the **Project** button to restore it. Finally, you can click on the **Pin** button to lock the *project browser* into place.

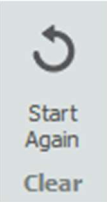


Copyright 2022 © Computer and Design Services Limited

Clear scaffolds

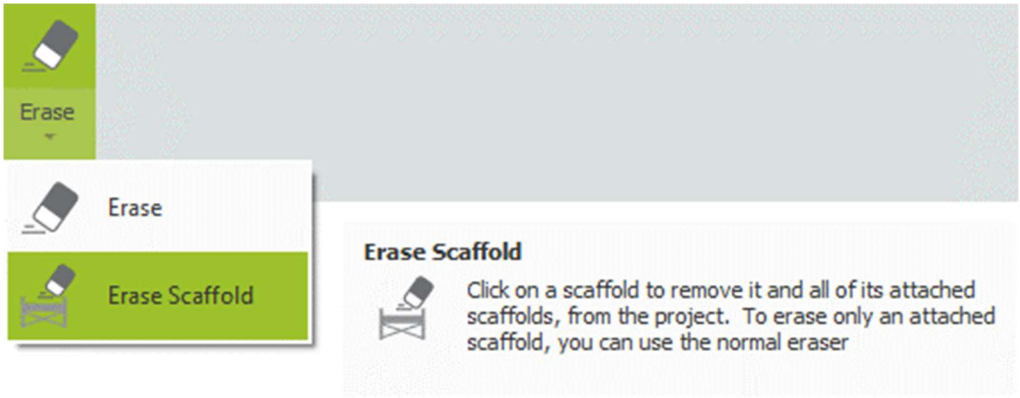
Erase all the scaffolds in an item

If you want to start again with a project item, you can erase all of the scaffolds in it. To do this, press the **Start Again** button, available from the **Scaffolds** view on the **Model IT** tab.



Erase one scaffold only

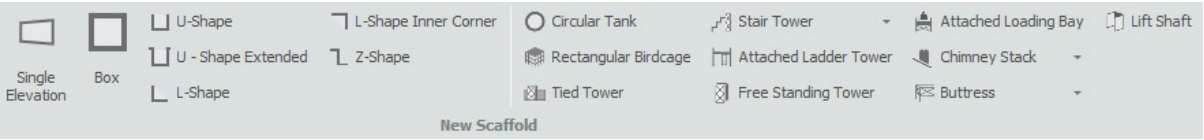
If you only want to remove one scaffold, you can do this by selecting the **Erase Scaffold** button, from the **Erase** menu available on the **Scaffolds** view in the **Model IT** tab.



Copyright 2022 © Computer and Design Services Limited

Create scaffolds

The easiest way to get started is to create a scaffold using one of the pre-set building shapes.



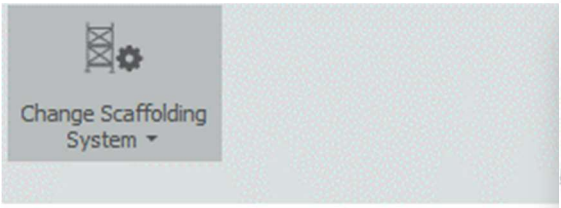
These are available from the **Scaffolds** view on the **Model IT** tab.

Depending on which scaffolding system licences you have bought, the scaffold will be created either as a tube-and-fitting scaffold or a system scaffold.

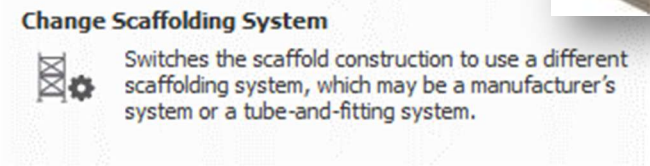
When you select a stair type as the first scaffold in an item (from the **Staircase** menu), it will be created using the first scaffolding system you have licenced which includes that stair type.

Select the system configuration

Once you have selected a pre-set shape you can choose the scaffolding system configuration you want to use. To do this, select the **Tools** view and click on the **Choose Scaffolding System** menu.



A scaffold built with the Cuplok system.



An equivalent tube-and-fitting scaffold.

Select the scaffolding system configuration that you want to use and all scaffolds in this item will change to the selected system.

All scaffolds in the project item will change to the selected system. To add scaffolds from a different scaffolding system configuration, you must create a new item. (See the **Set up your project** section above.)

Copyright 2022 © Computer and Design Services Limited

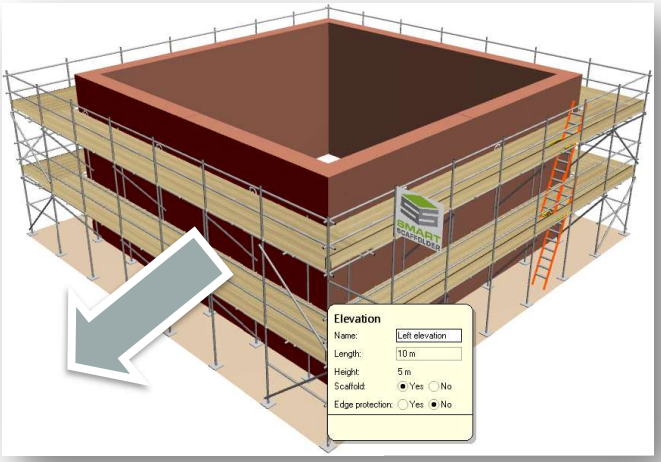
Enter the building dimensions

Once you have selected a pre-set shape you can then edit it to provide your own dimensions. You can enter the dimensions in two ways:

1. By dragging the building elevations with the mouse;

2. By hovering the mouse over an elevation and typing its new dimensions.

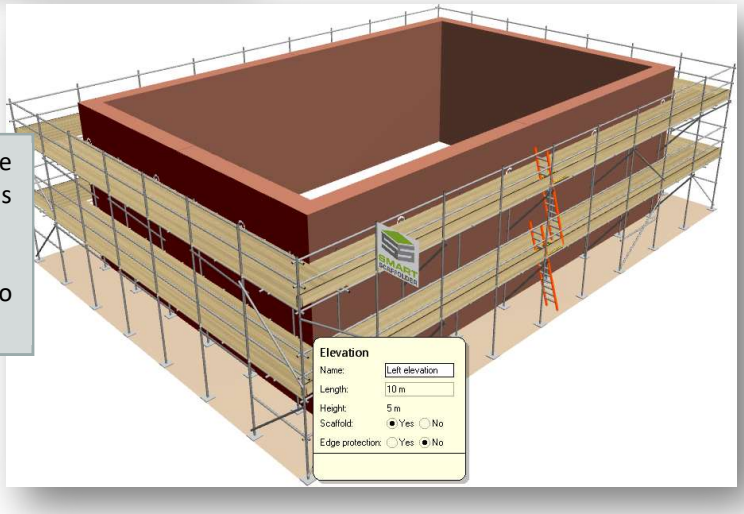
To move an elevation with the mouse, move the mouse pointer to the elevation, then press and hold the left mouse button while moving the mouse. Release the left mouse button when you have finished.



Press and hold the left mouse button to start dragging…

…Notice that the lengths of the front and rear elevations update as you move the mouse.

Release the left mouse button to finish.



Tips:

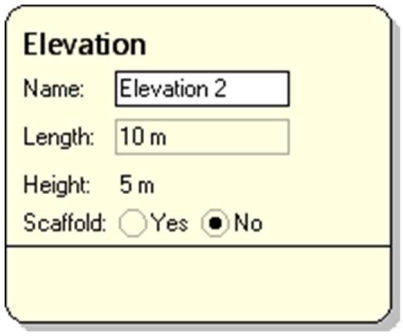
If you prefer you can drag objects by clicking the left mouse button, moving the mouse, and clicking again to finish.

If you change your mind, for example if you pick on the wrong part of the scaffold, you can press the **Esc** key to cancel.

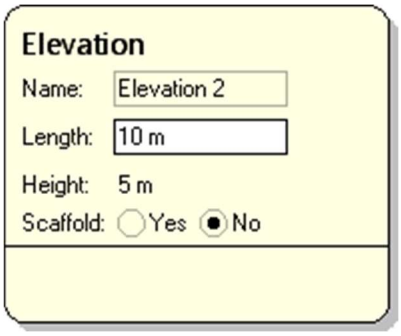
Copyright 2022 © Computer and Design Services Limited

Instead of dragging you can directly type the length of the elevation. Move the mouse pointer to the elevation that you wish to change; there is no need to click the mouse button.

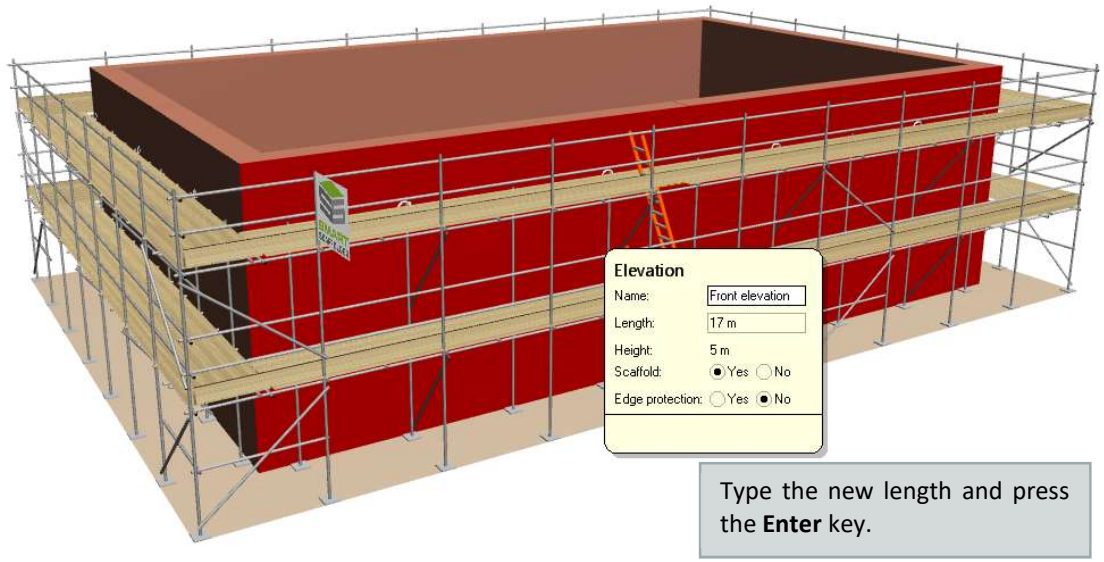
The elevation name, its length and whether it has scaffolding is shown.



Without moving the mouse, press the **Tab** key until the **Length** is selected:

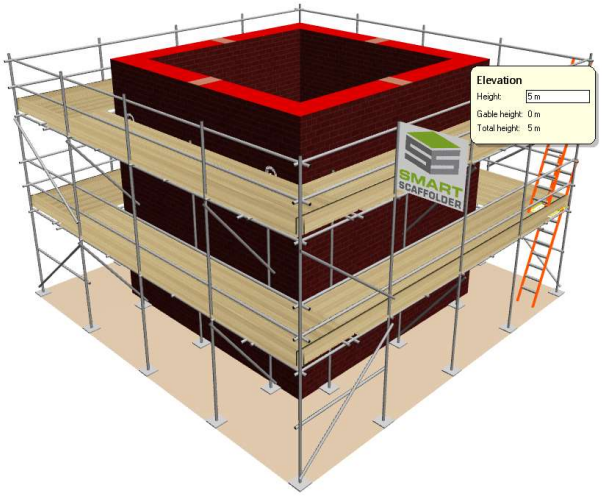


Press the **Tab** key so that **Length** is highlighted. Type in the new length and press the **Enter** key:



Type the new length and press the **Enter** key.

The height of the scaffold can be modified in the same way. Either drag the top of the building to the required height or move the mouse pointer to the top of the building and type the new height.



Lifts are added and removed as the height changes.

Copyright 2022 © Computer and Design Services Limited

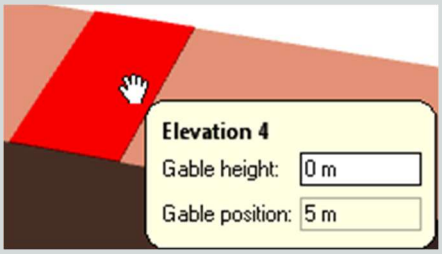
Create gable ends

Gable ends can be created by moving the mouse to the centre of the top face of the elevation, pressing the left mouse button, and dragging the mouse upward. You can also drag left or right, to make an asymmetric gable. Alternatively you can type in the gable height and press the **Enter** key. You can use the tab key to change to the Gable position.

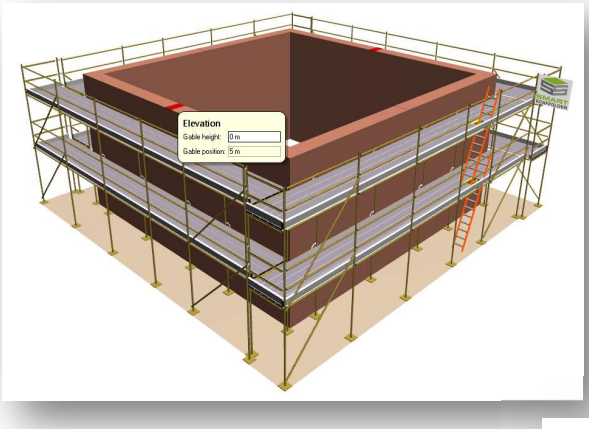
Tip:

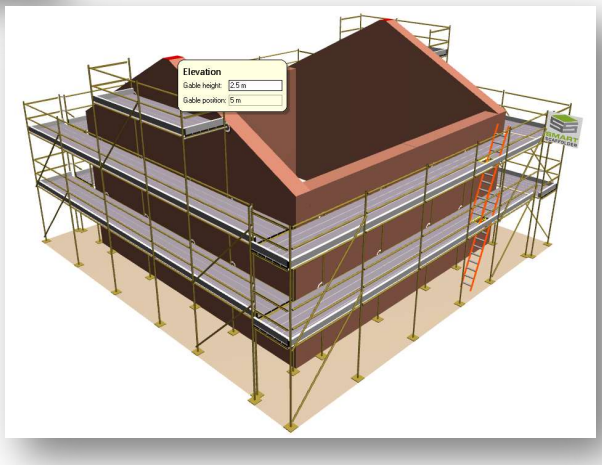
You can tell when the mouse pointer is over the correct place to create a gable because the *grip point* will be highlighted in red and the floating input will show the **Gable height**.

You can use **Gable position** to create non-symmetric gables.



As you create the gable end a symmetrical gable end is created on the opposite elevation, if present. You can prevent this from happening by holding the **Ctrl** key while dragging the mouse.





Press the **Ctrl** key while dragging to only create one gable.

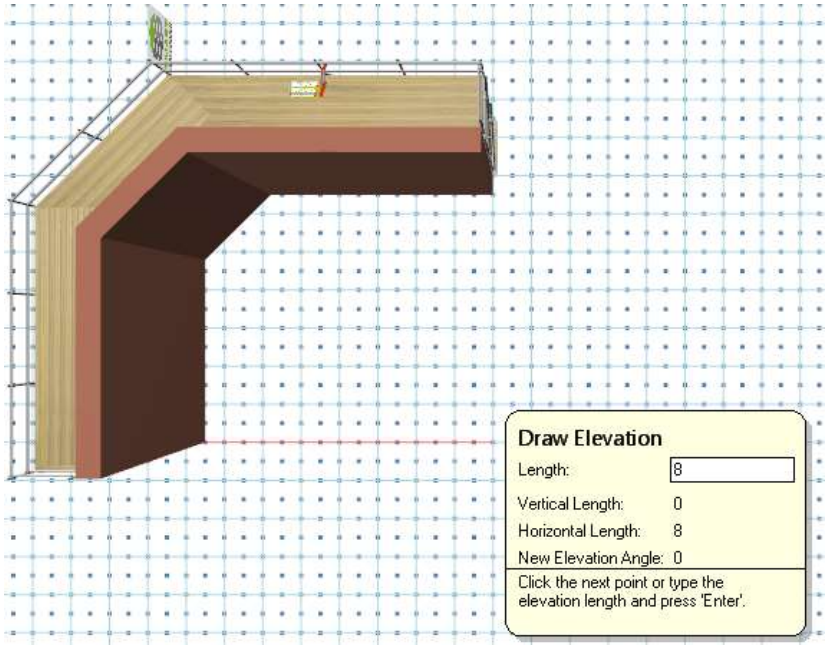
Copyright 2022 © Computer and Design Services Limited

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.

When the **Draw Plan** button is selected **Model IT** switches to a plan view and displays a grid. Elevations are created by clicking on the grid points; the grid lines are spaced one metre apart and the grid points are spaced at half metre intervals:



As the mouse is moved the **Length** field is updated so that you can measure the length of each elevation as you draw.

You can also type in the length and press **Enter**.

This allows you to enter exact dimensions, including decimal places.

You can draw outside the grid if you want to. You can even hide the grid if it is in the way.

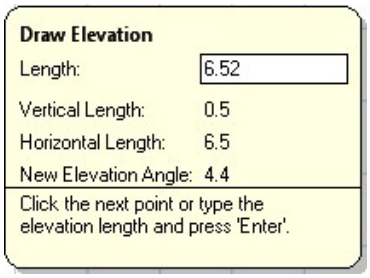
See the **Hide the grid** section later for details.

Copyright 2022 © Computer and Design Services Limited

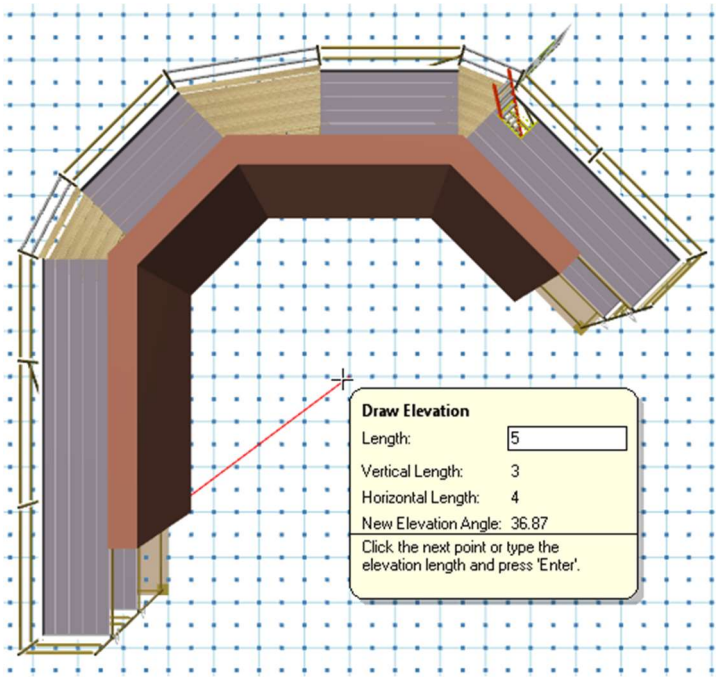
The **Vertical Length** shows the distance that you have moved upwards (north).

The **Horizontal Length** shows the distance that you have moved to the right (east).

The **New Elevation Angle** shows the angle that this elevation makes. This is always measured so that an elevation from left (west) to right (east) has an angle of 0 degrees.

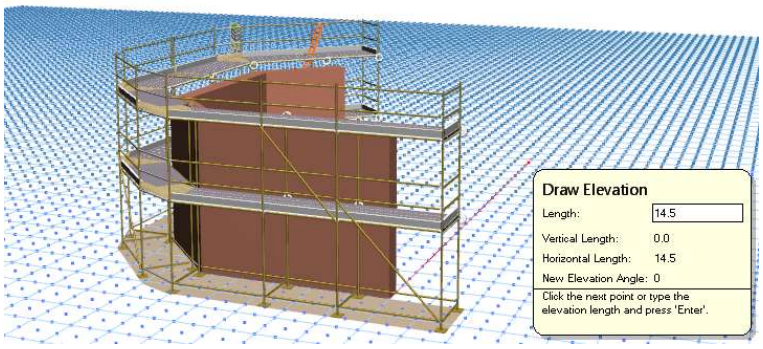


You can create irregularly-shaped buildings with non-rectangular corners; just click on the grid points.



Hold *Ctrl* to stop the lines from snapping to the grid points.

At any stage you can zoom out to get a better view, pan the display, or even rotate it to see a 3D view while you draw.



Copyright 2022 © Computer and Design Services Limited

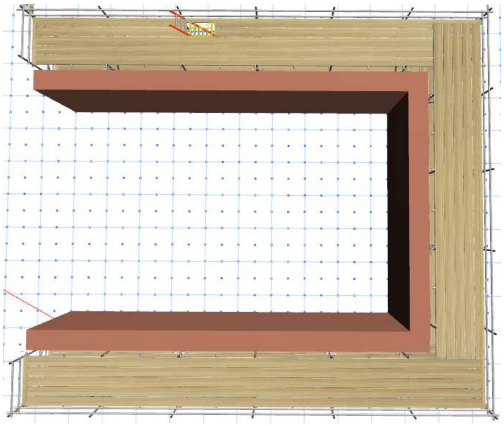
Several new options are available on the toolbar while using the **Draw Plan** mode:

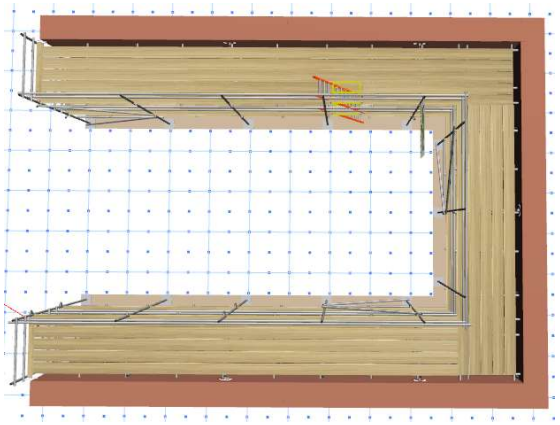
Press the **Start Again** button at any time to clear the scaffold and restart drawing.

Don't forget that you can use the **Undo** and **Redo** options at any time if you make a mistake.

Choose **Close the Building** to automatically join the first and last elevations to form a closed building. This can be easier than picking the start point of the building, especially when using exact dimensions.

Choose the **Change Scaffold Direction** option to switch the newest scaffold to the other side of the building, which allows you to build an 'inside' scaffold:





If you are not drawing an independent scaffold, this tool can be dropped on any independent.

Choose **Draw Plan** again to finish and close the view.

Draw around a site plan

If you have a plan of the site, it is possible to show the site plan and draw around it. Please see the **SMART Estimator BIM Toolbox User Guide** for details.

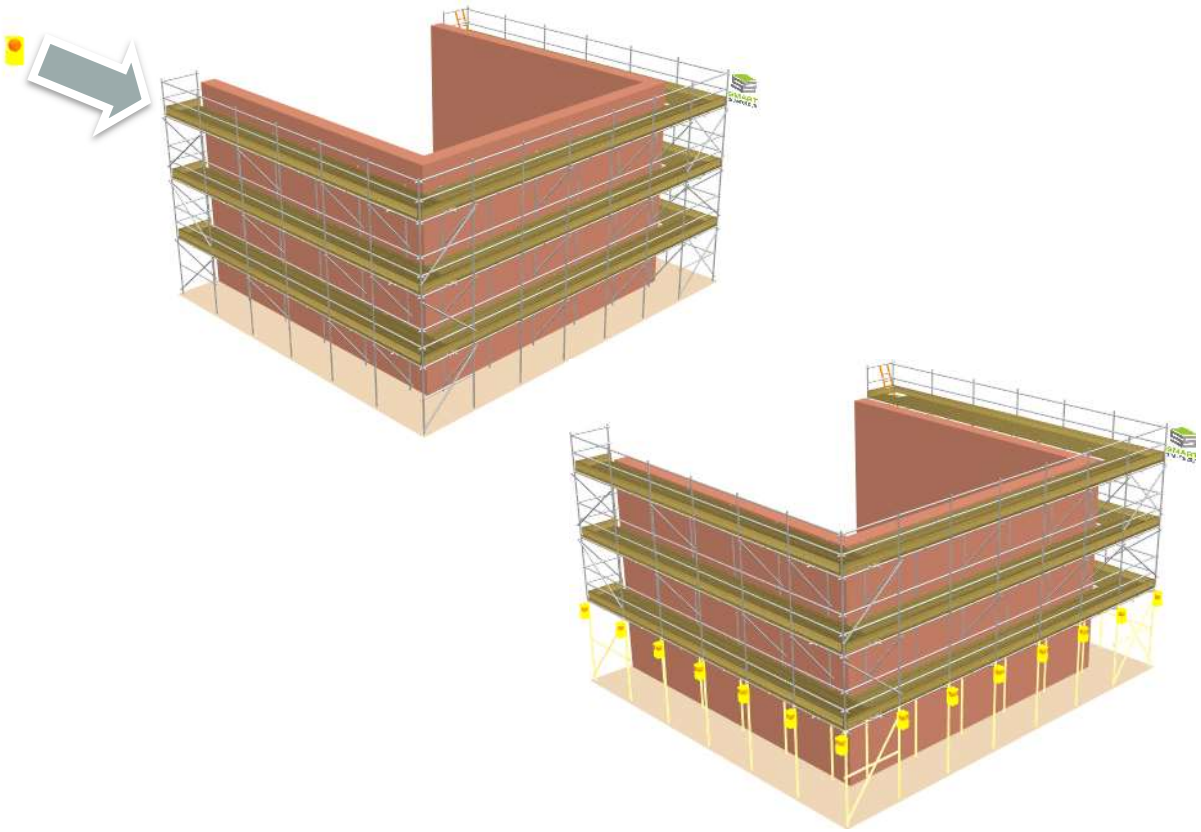
Copyright 2022 © Computer and Design Services Limited

Edit the scaffold

Add a pavement lift

You can convert the first lift into a pavement lift. To do this, switch to the **Add-Ons** view on the **Model IT** toolbar, select the **Pavement Lift** tool and apply it to an independent scaffold. Apply the tool:

- Sets the lift height to 2.70 m for Tube and Fitting, or 3.00 m for system scaffolding;
- Adds safety lamps (or safety lights);
- Adds high-visibility safety standards;
- Removes any ledger bracing from below the first lift;



Copyright 2022 © Computer and Design Services Limited

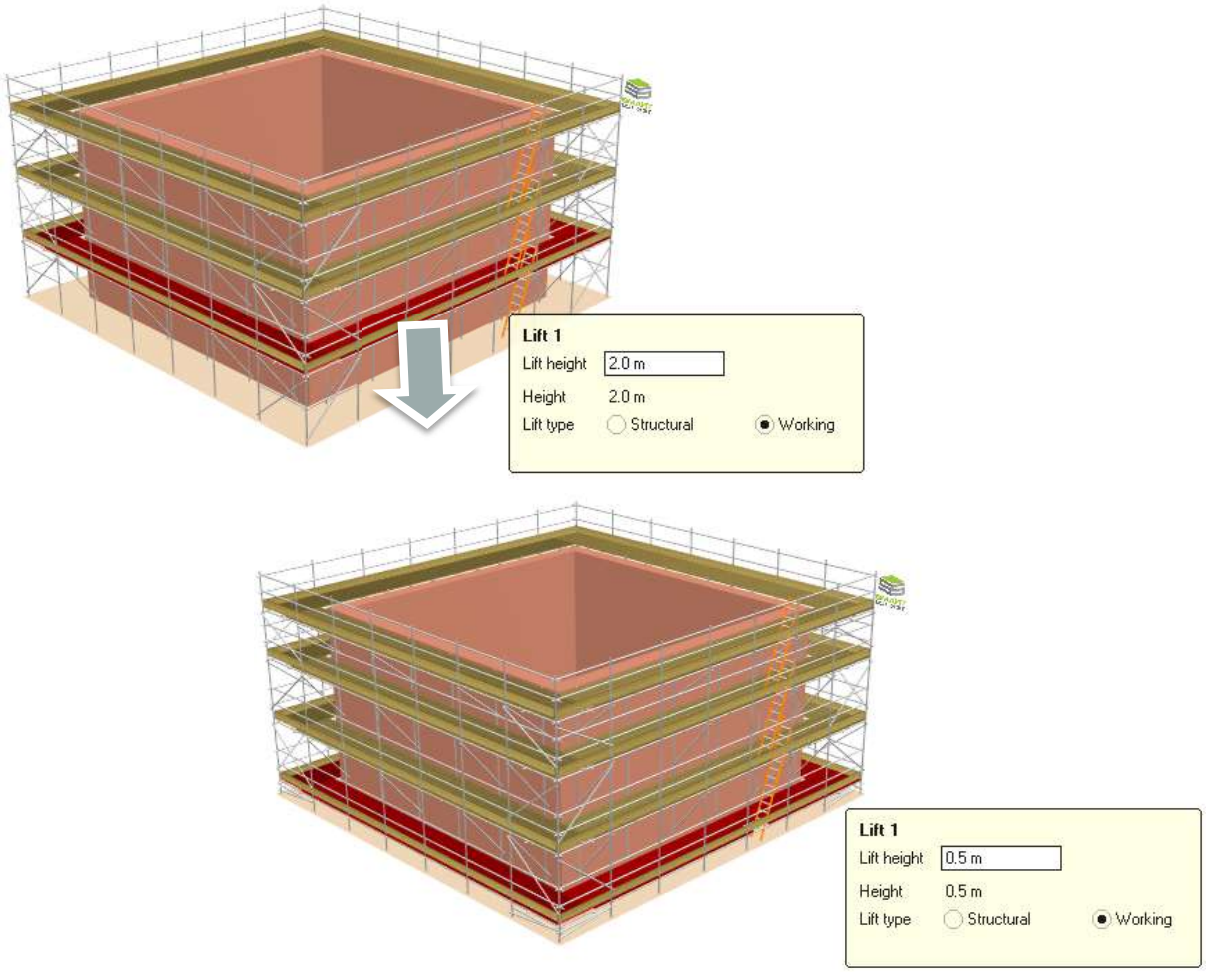
Modify the lift heights

The scaffold is created with boarded lifts at 2.00 metre intervals by default, but it is possible to modify the lifts:

- Create lifts at different heights, for example a 0.50 m first lift (to align with the structure lifts);
- Create lifts at regular heights, for example use 1.5m lifts for raising brickwork.

There are several ways to specify these options.

Starting with a short first lift, click and drag the first lift with the left mouse button, pulling it down to a height of 0.5 metres. You will see that the lifts above it also move down, so they retain their 2.00 metre spacing. The top lift height may reduce so it continues to fit in the available space:

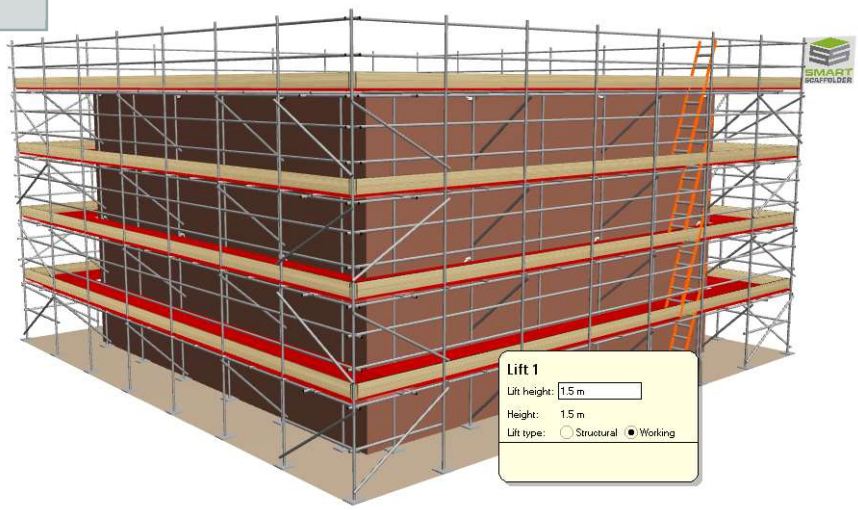


Alternatively, you can type the lift height directly in the same way as the elevation lengths. Place the mouse pointer over the bottom lift, type "**0.5**" and press **Enter**.

Copyright 2022 © Computer and Design Services Limited

It is also possible to set all lift heights to the same value. Press and hold the **Shift** key while moving the mouse over the lifts; you will see that all of the lifts above the current one are also selected. This means that any change that you make will be applied to all of the selected lifts.

Press the **Shift** key to select all of the lifts above the current one.



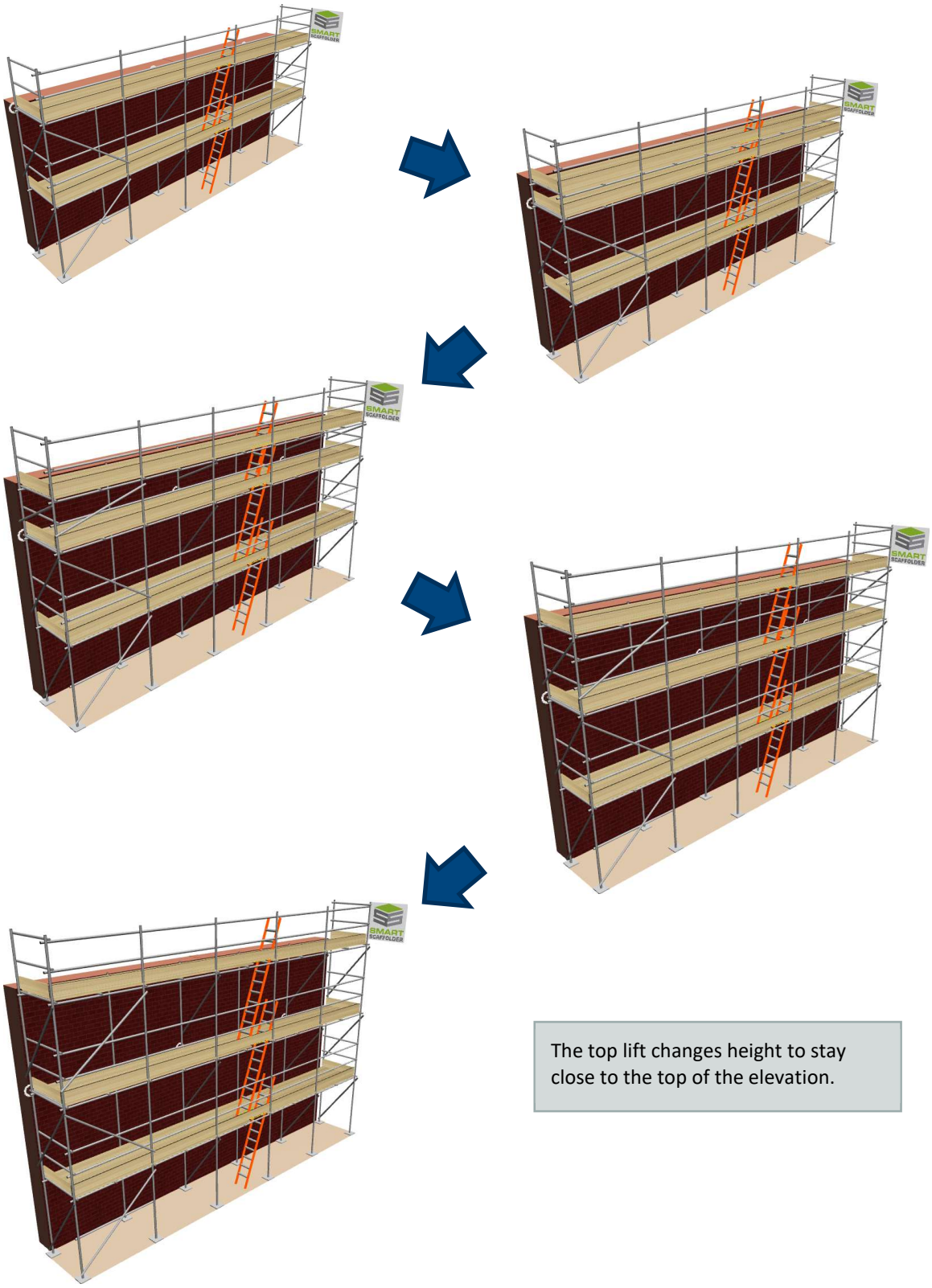
Now when you drag the bottom lift all of the lifts above it are resized to the same lift height.

You can also use the **Shift** key when typing in the lift height. You don't have to keep it pressed while typing, just type in the new value and press **Shift + Enter** to apply it to all of the lifts.

Copyright 2022 © Computer and Design Services Limited

Modifying the top lift

Unless you set a lift height, SMART Estimator will try to place a lift as close to the top of the elevation as possible. To do this, it will adjust the top lift to be 0.5m, 1m, 1.5m or 2m.

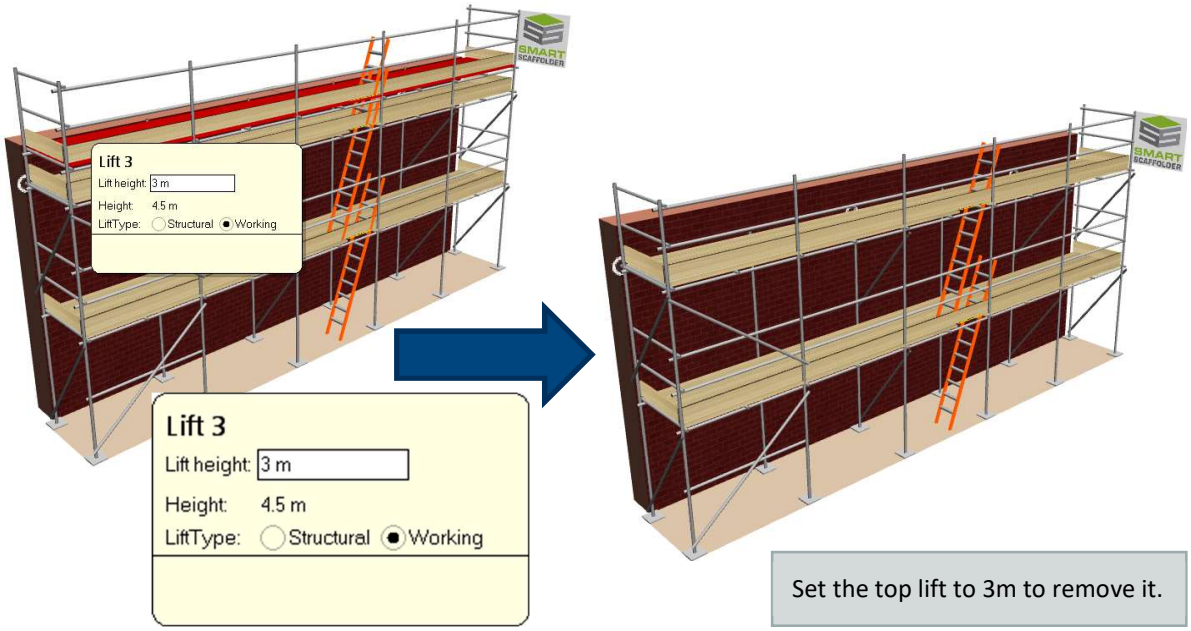


The top lift changes height to stay close to the top of the elevation.

Copyright 2022 © Computer and Design Services Limited

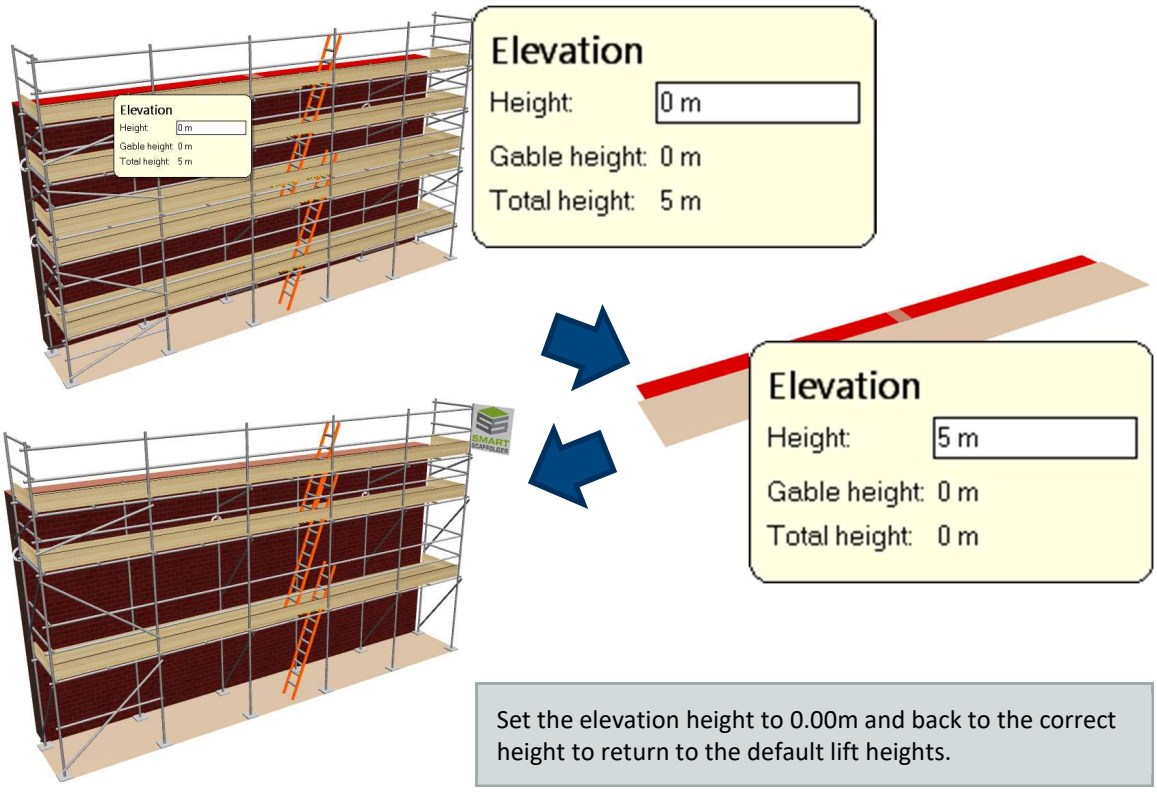
Remove the top lift

To remove this short top lift, set the height of the top lift to the maximum value: 3.00m.



Removing your changes

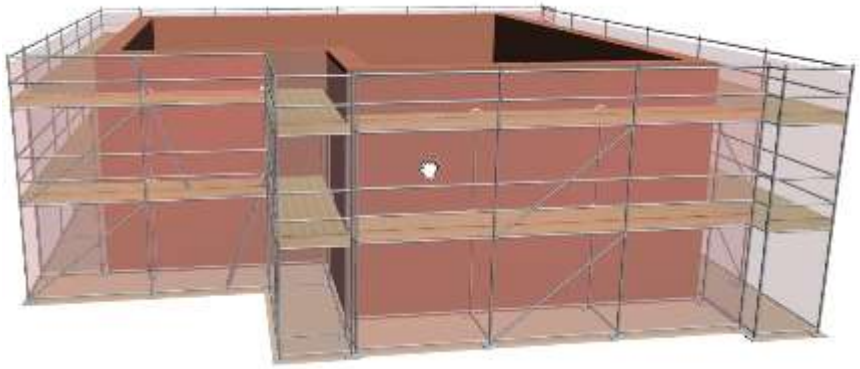
To remove all your modifications to all lift heights, set the elevation height to be 0.00m.



Copyright 2022 © Computer and Design Services Limited

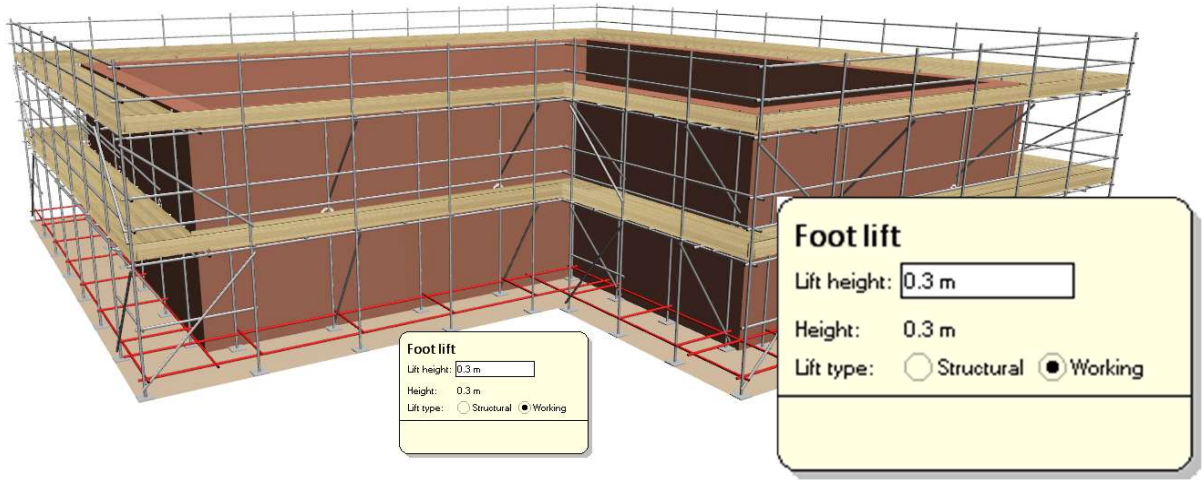
Add a foot lift

A foot lift can be added to the scaffold by selecting the **Foot Lift** button and clicking the scaffold:

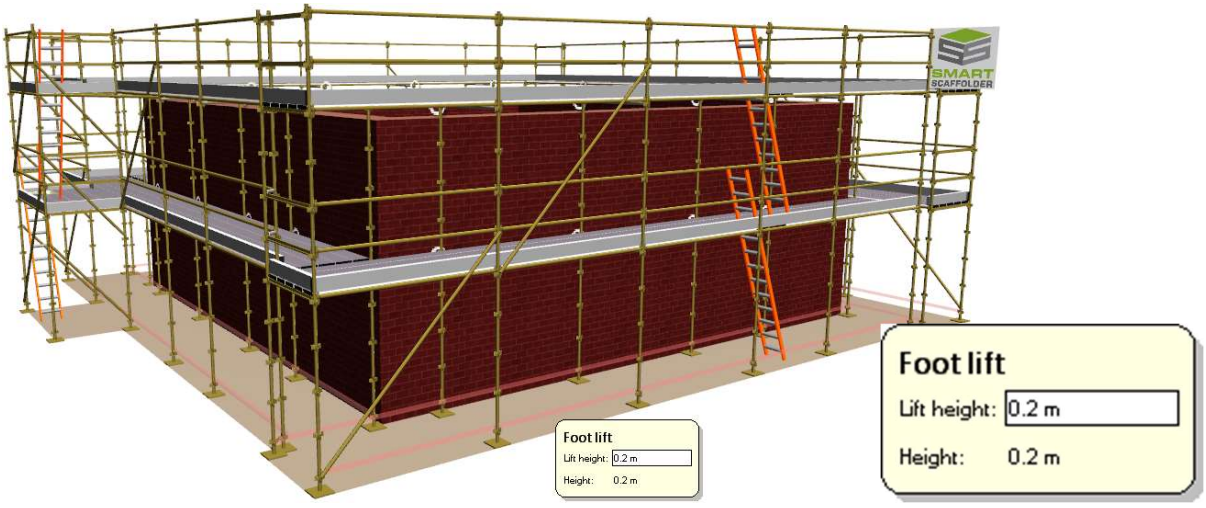


A foot lift can be applied to one elevation at a time by holding the **Ctrl** key as it is placed, and it can be removed by using the **Eraser**.

The height of the foot lift can be altered by dragging it with the mouse or by typing a new value:



For most scaffolding systems, the height of the base jacks can be set even when a foot lift is not present, by dragging the **foot lift grips**:

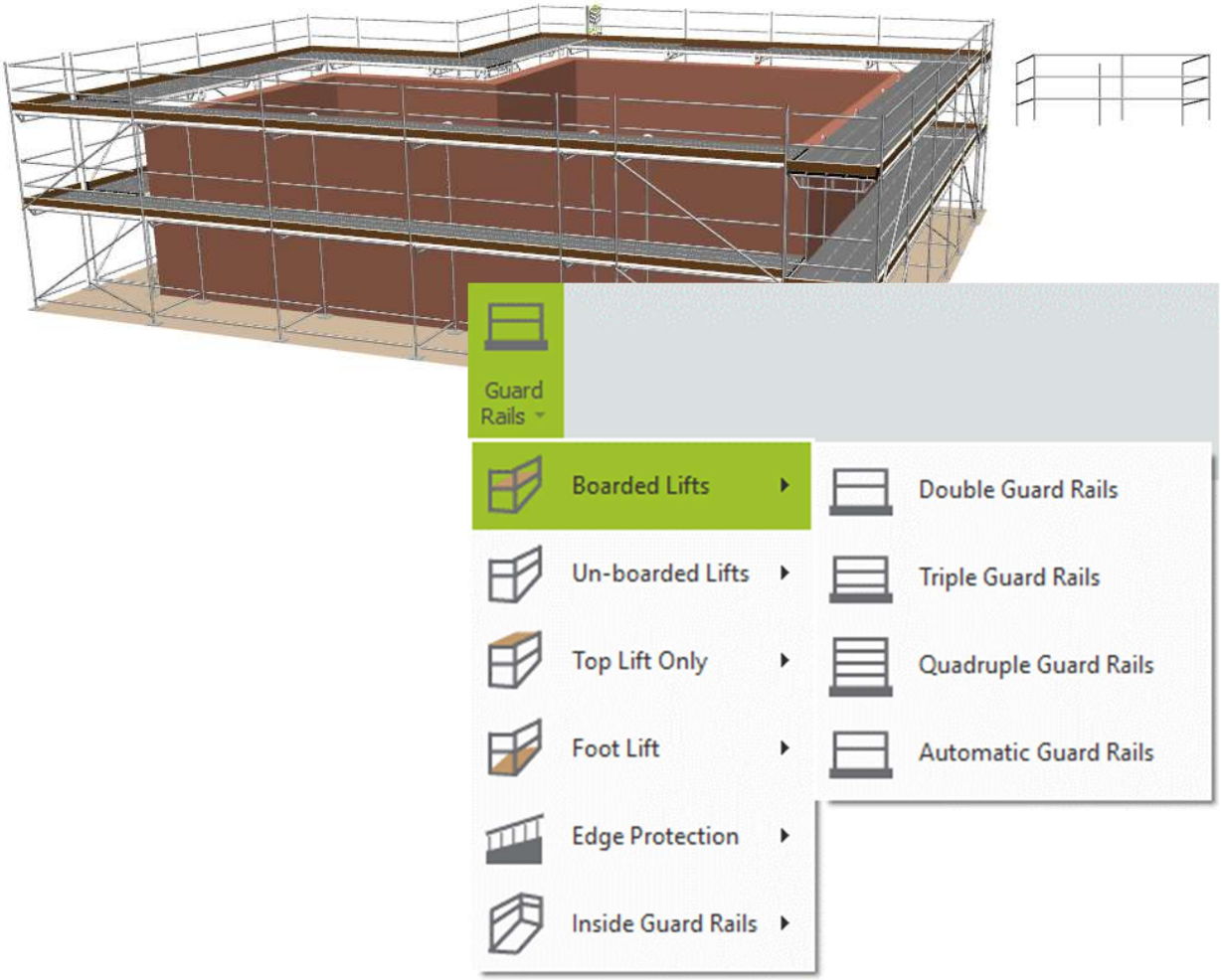


Copyright 2022 © Computer and Design Services Limited

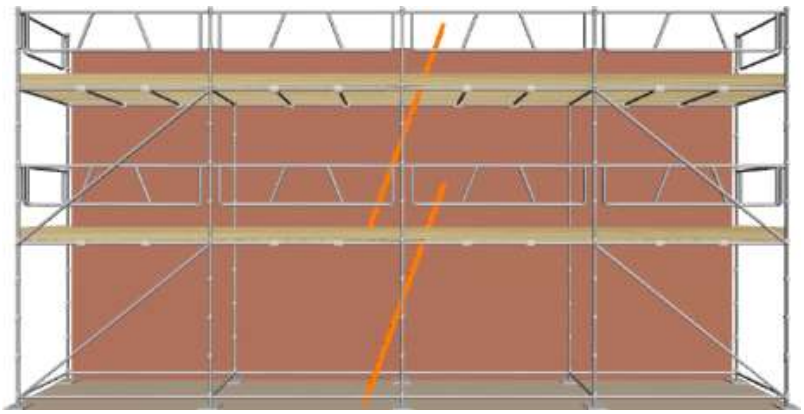
Specify the guard rails

All scaffolds are created with double guard rails at boarded lifts and single guard rails at non-boarded lifts by default, but these options can be changed to place any combination of single, double, or triple guard rails or inside guard rails.

To specify the guard rails, select the **Guard Rails** drop-down button and choose the type of guard rails that you require. Click on the scaffold to apply the guard rails, using the **Ctrl** key to apply them to one elevation of scaffolding.



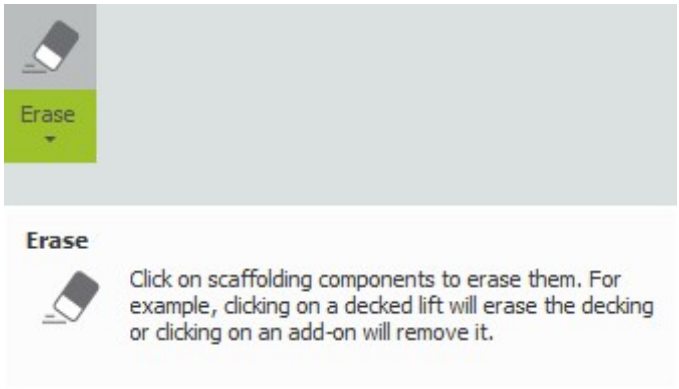
Guard rail frames are also available for some scaffolding systems:



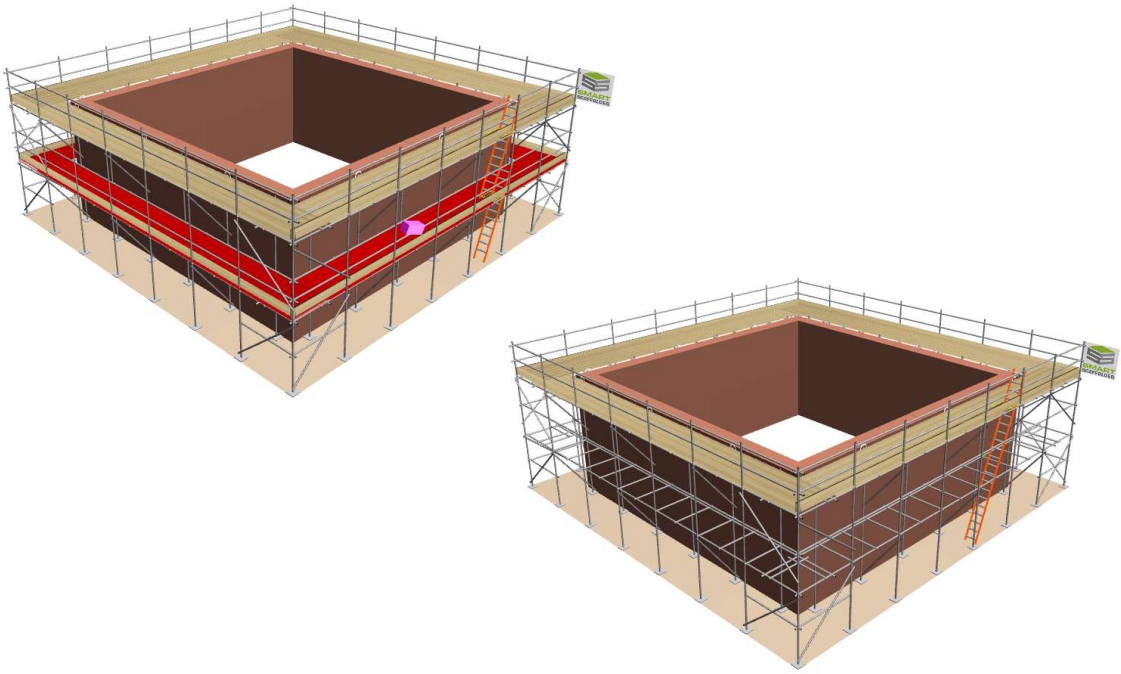
Copyright 2022 © Computer and Design Services Limited

Modify the board details

All scaffold lifts are boarded by default, but the boards can be removed by using the **eraser**. Click on the **Erase** tool to activate it:



Now click on each boarded lift to remove the boards.

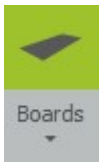


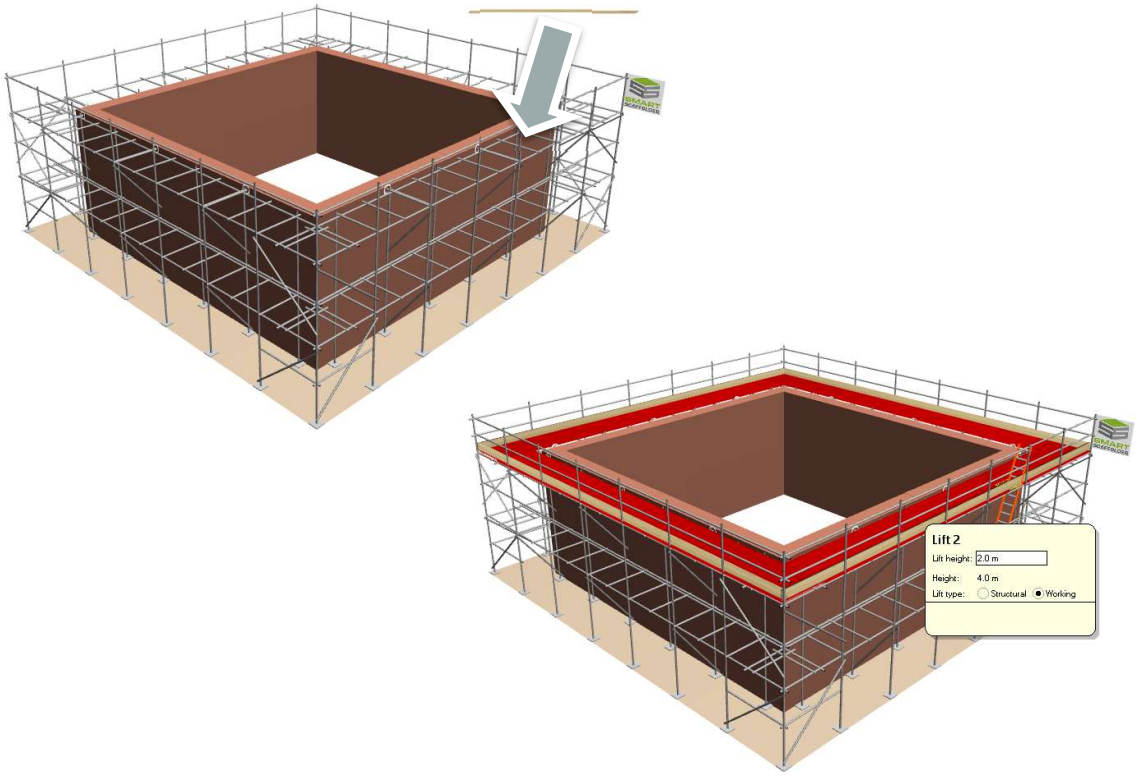
You can exit the *eraser* mode by double-clicking the left mouse button or pressing the **Esc** key.

You can also use the **Shift** key when erasing boards; the eraser will remove all of the highlighted boards.

Copyright 2022 © Computer and Design Services Limited

To place the boards back onto the lifts click on the **Boards** option. You will see that the cursor is now holding a scaffold board; click on each lift to place the boards.





You can also use the **Shift** key when placing boards; the boards will be placed on all of the highlighted lifts.

The **Shift** key allows you to select several lifts at the same time.

The **Ctrl** key allows you to select the lift at one elevation.

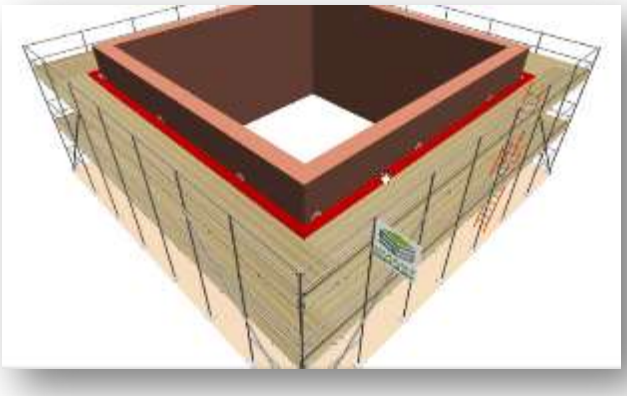
You can press **Shift** and **Ctrl** at the same time to select all of the lifts at one elevation.

Copyright 2022 © Computer and Design Services Limited

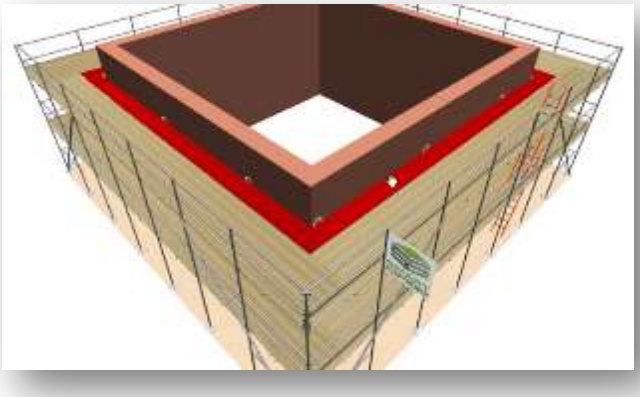
Place inside boards

You can also place boards between the building and the main scaffold to create *inside boards*.

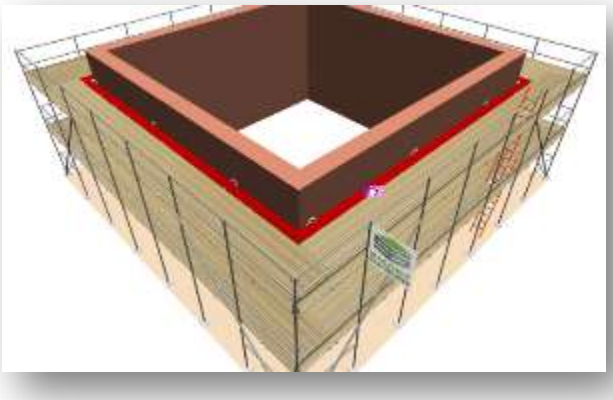
With the **Boards** tool still selected, move the mouse between the scaffold platform and the building. You might find it helpful to zoom in first:



If you click the mouse again then another inside board will be added.

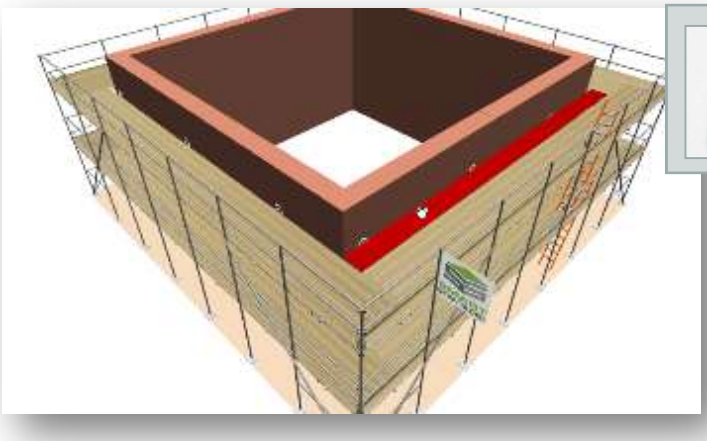


Inside boards can be removed with the **eraser**. Select the **Erase** tool and click on the inside boards. Each time you click one board is removed.



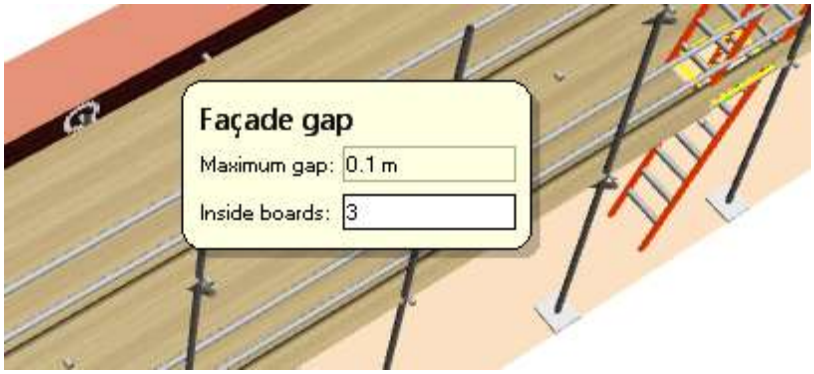
Copyright 2022 © Computer and Design Services Limited

If you want to only place inside boards on some elevations you can use the **Ctrl** key.

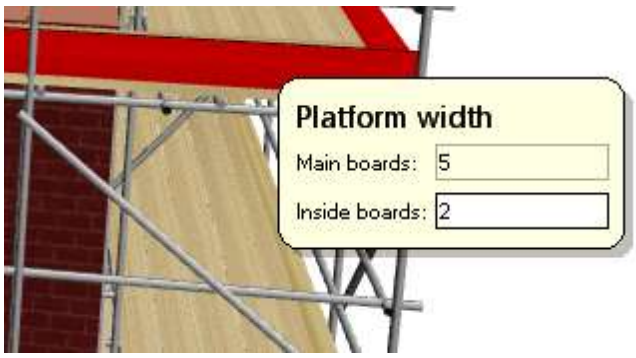


Press the **Ctrl** key to place inside boards only on one elevation.

If you prefer you can also edit the inside boards using the keyboard – move the mouse to the gap between the scaffold and the building, enter the number of inside boards, and press **Enter**:



Alternatively, moving the mouse to the toe boards allows you to enter the main platform width:



You can again use the **Ctrl** key to change the platform width of just one elevation.

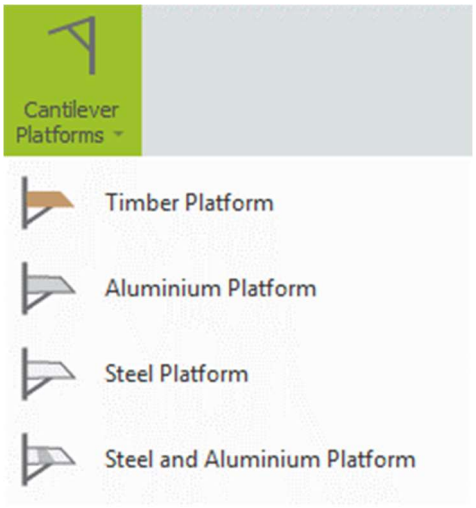
Type in the number of boards and press **Ctrl + Enter**.

Copyright 2022 © Computer and Design Services Limited

Add a cantilever platform (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.

The available deck materials for the cantilever platform depend on the scaffolding system that you are using:



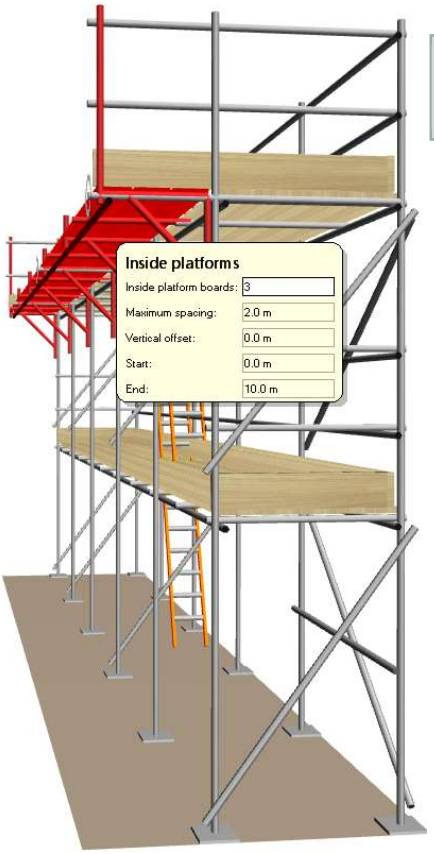
Cantilever platforms are applied to boarded lifts by selecting the required deck type and clicking on the lifts that you wish to apply the platforms to.

Press the **Shift** key to select all of the lifts above the current one.

Don't forget to use the **Shift** key if you want to place the cantilever platforms on all of the scaffold lifts.

The width of the hop-up platform can be modified by moving the mouse over it, typing the new width, and pressing **Enter**. Tube-and-fitting platforms are specified with the number of boards, whereas system scaffolding platforms are specified by selecting from one of the available bracket sizes.

Copyright 2022 © Computer and Design Services Limited



The hop-up platform width has been changed to 3 boards.

Inside platforms

Inside platform boards:	3
Maximum spacing:	2.0 m
Vertical offset:	0.0 m
Start:	0.0 m
End:	10.0 m

You can change the spacing of the brackets (on a tube-and-fitting scaffold) by moving the mouse over the platform, pressing the **Tab** key until the **Maximum spacing** field is highlighted, and entering the new maximum spacing in metres. If the spacing of the brackets is less than the spacing of the standards then new intermediate standards will be added where required.

Inside standards have been added at a spacing of 1m to support the extra brackets.

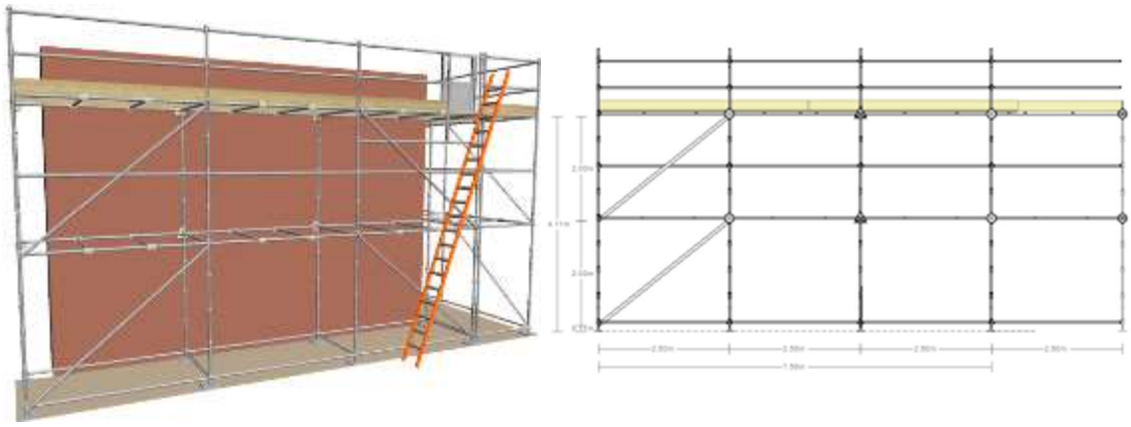
Inside platforms

Inside platform boards:	3
Maximum spacing:	1.0 m
Vertical offset:	0.0 m
Start:	0.0 m
End:	10.0 m

Copyright 2022 © Computer and Design Services Limited

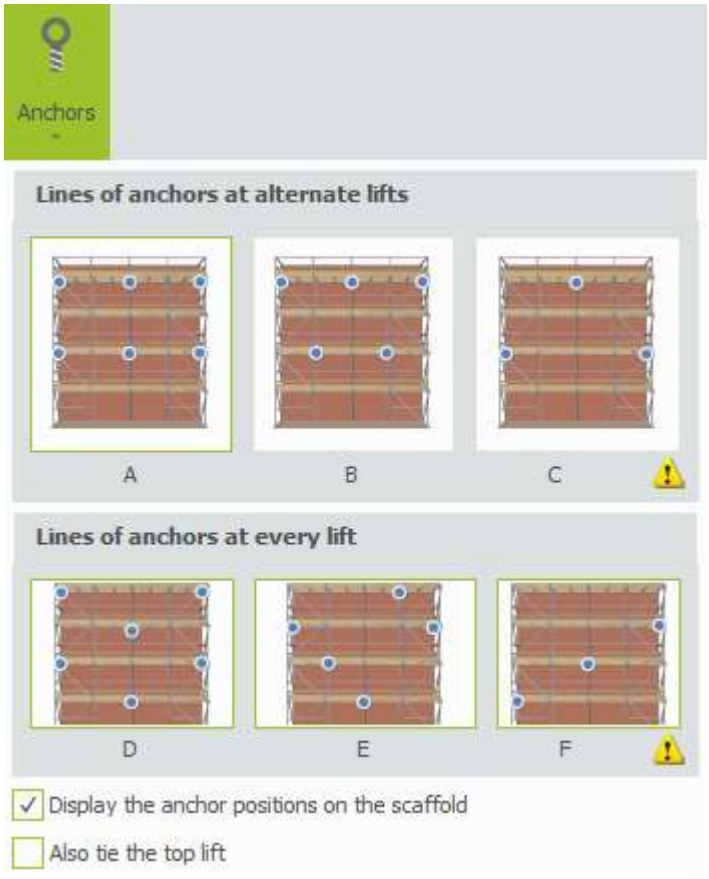
Anchor the scaffold

The positions at which the scaffold is tied to the facade can be specified by using the **Anchors** option. Standard anchors are represented with a circle, and double ('V') anchors are represented with a triangle:



The total quantity of anchors is also displayed in the **Quantities** area for use when estimating.

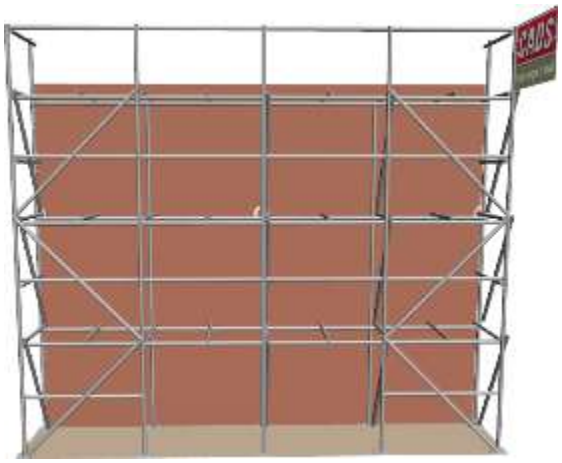
To place anchors, select the **Anchors** option and choose one of the available patterns: the six TG20 patterns are available for tube-and-fitting scaffolding and each other system has its own set of tie patterns:



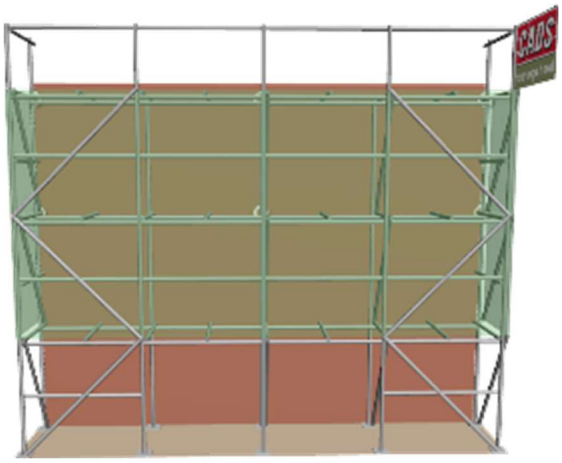
Copyright 2022 © Computer and Design Services Limited

To place the anchor pattern, drop it onto the scaffold. You can use the **Ctrl** key to place the pattern on a single elevation, if you wish, which allows you to use different patterns on different elevations, or to omit anchors from specific elevations.

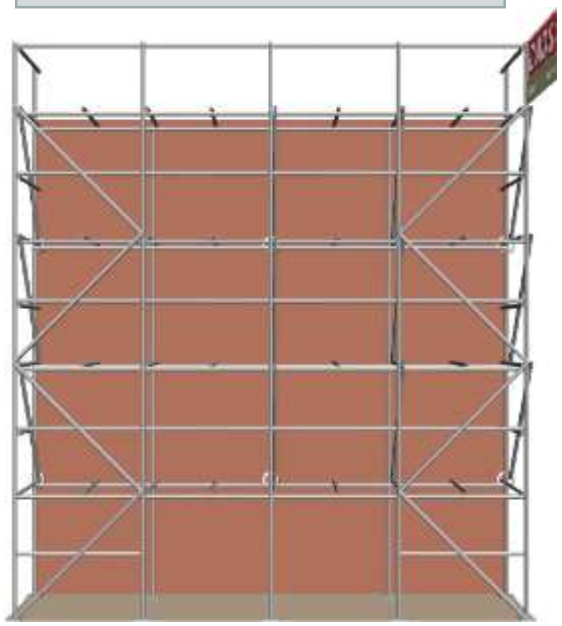
The anchor positions for tube-and-fitting scaffolding automatically account for the rules for extra tie points where a scaffold is sheeted or has a pavement lift (where ledger bracing is excluded from the ground level for access).



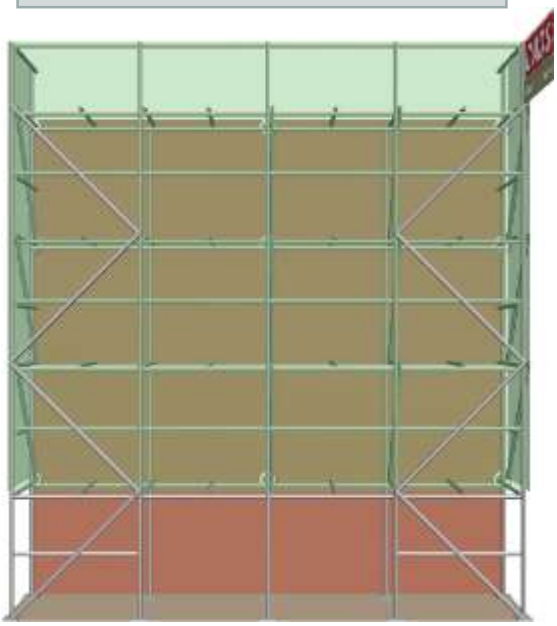
In this example of TG20 pattern A, 3 anchors are placed on the middle lift.



The top lift is automatically anchored if sheeting or debris netting is added.



The first lift is automatically anchored if the ledger bracing is removed from the pavement lift.



The top and bottom lifts are both anchored where the scaffold is clad and has a pavement lift.

The anchor patterns for system scaffolds follow the rules from the manufacturer's user manuals. Some systems include additional anchor patterns which have been requested.

Copyright 2022 © Computer and Design Services Limited

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.

Copyright 2022 © Computer and Design Services Limited

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;
- Email on support@smartscaffolder.com;
- Telephone on +44 (0)1202 603733 from Monday to Friday between 09:30 and 17:00.

Copyright 2022 © Computer and Design Services Limited