

iTWO costX[®] 6.9 Release Notes

Over the past few years, we have rolled out many releases which concentrated on adding and enhancing functionality. In iTWO costX[®] 6.9, we are very pleased to announce that this time in addition to functionality improvements, we will also bring you a completely revamped user interface, which has been carefully redesigned to provide a contemporary look and feel while maintaining user-friendliness and familiarity.

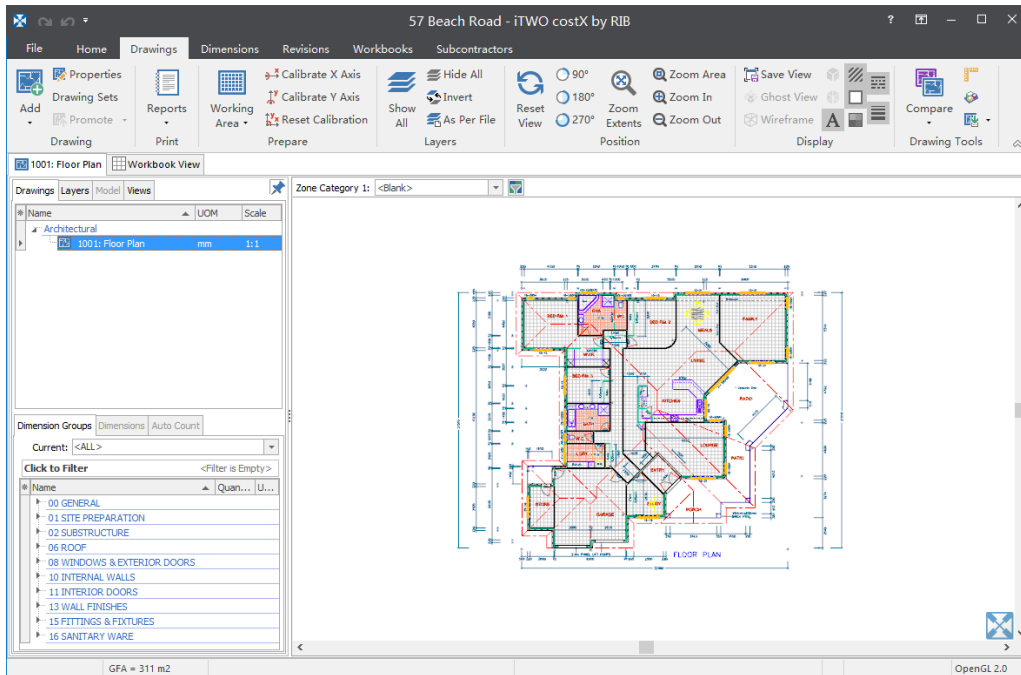
Along with a refreshed interface, this release also introduces several new features that will increase your take-off speed, including the ability to create an unlimited number of Custom Quantities on a dimension group and support for Dimension Cutouts.

Headline Features

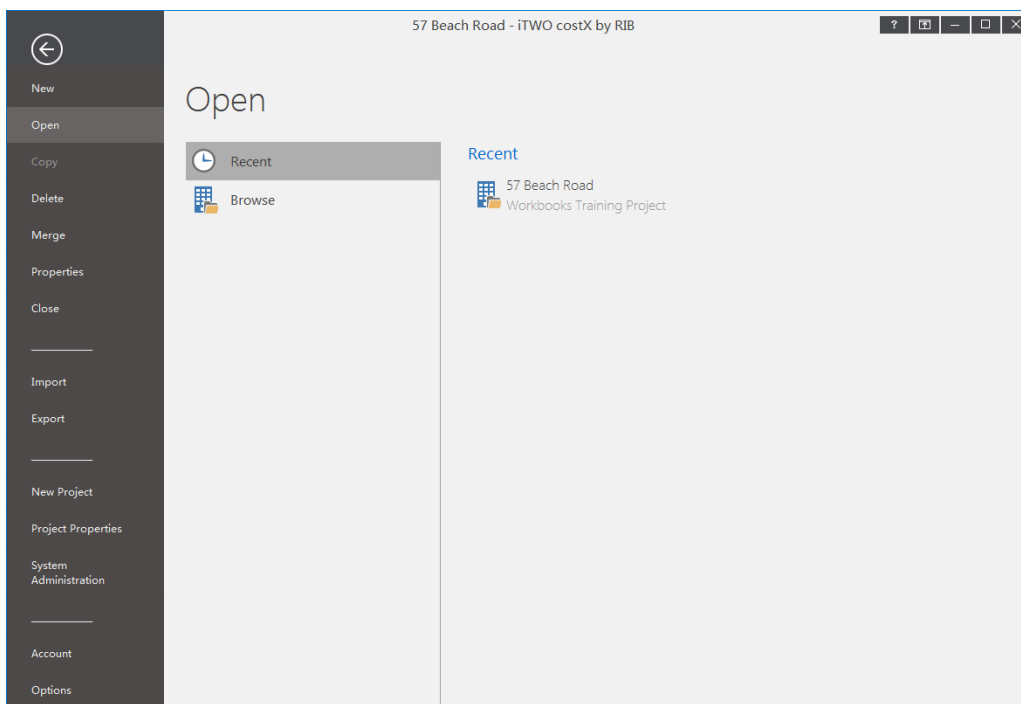
- A **brand-new modern user interface** with new ribbon, icons, style and menus for clearer and easier navigation.
- **Native support for RVT files** making it possible to load and extract quantities directly from Revit files without the need to install a copy of Revit.
- Dimension groups now support an **unlimited number of Custom Quantities**, instead of only three previously.
- Support for **Dimension Cutouts** to create holes in area dimensions for voids, openings and other deductions.
- Support for automatic unit conversion between fields for quantities referenced in dimension group expressions.
- Ability to bulk change variable answers for multiple dimensions.
- A new 'Add Project' user permission to allow a user to create projects while restricting their access to other sections of System Administration.

User Interface

The iTWO costX® 6.9 user interface has been updated to a more modern, professional look with a new colour scheme and meticulously redesigned icons and buttons. While the icons and buttons have been redesigned to provide a great looking consistent modern style throughout, and better reflect the actions being performed, careful attention was paid to ensuring that existing users will still be able to find and recognise them easily. This will maintain a consistent user experience.



A new 'Backstage View' area replaces the previous Application Menu to provide enhanced functionality and more easily accessible information. The Backstage View (shown below) appears when you click the **File** tab located in the upper-left corner of the user interface.



Custom Quantities

Support for advanced take-off was significantly enhanced in iTWO costX® 6.8 with the introduction of dimension group variables, which allowed the calculation of quantities to be based on users' responses to questions. iTWO costX® 6.9 extends this to allow each dimension group to have an unlimited number of Custom Quantities, instead of only three previously. This gives you the ability to capture far more calculated quantities derived from a single take-off.

Setting up Custom Quantities in System Administration

You can set up frequently used Custom Quantities in System Administration, and then reuse them across standard dimension groups and dimension groups in different Buildings and Projects.

Custom Quantities can be pre-filled with formulas for automatic calculation during take-off and can reference variables or other fields in the formulas. To calculate the value of the Custom Quantity using BIM dimensions, enter the formula in the **BIM Expression** field. To calculate the value of the Custom Quantity using measured or manually inserted non-BIM dimensions, enter the formula in the **Measured Expression** field.

By clicking the ellipsis (...) button to the right of these two fields, you can launch the Custom Quantity Expression Editor, which can be used to quickly build formulas in a similar way to the Dimension Group Expression Editor.

Importing Custom Quantities

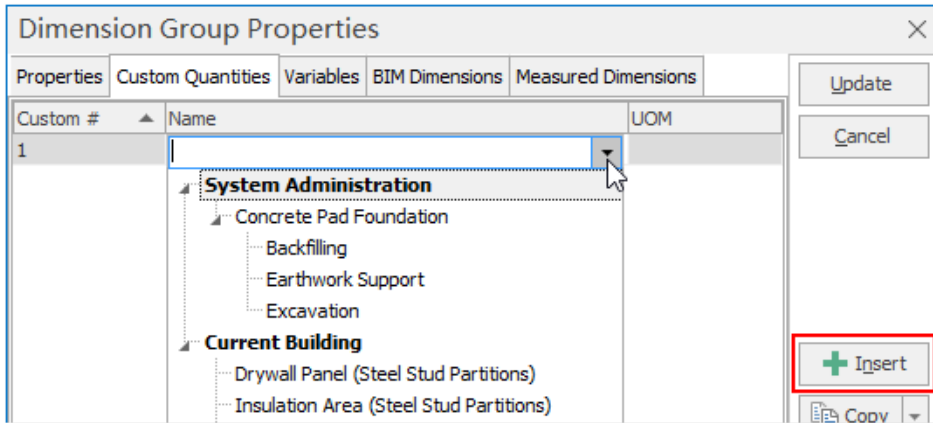
It is possible to import Custom Quantities from a CSV file into the Custom Quantities list in System Administration. In the CSV file, each Custom Quantity must be on a separate line, and each line must include the Custom Quantity data fields in the following sequence:

Folder, Name, UOM, Measured Expression, BIM Expression

The Name is the only mandatory field. For more details on the CSV file format requirements, refer to the *Importing Custom Quantities from CSV* topic in iTWO costX® Help.

Adding Custom Quantities to a dimension group

A new **Custom Quantities** tab has been added to the Dimension Group and Standard Dimension Group Properties dialogs, allowing Custom Quantities to be added using the **Insert** button outlined in red below. You can either enter a new Custom Quantity name or select it from the drop-down list, which displays both the Custom Quantities from System Administration and from other dimension groups in the same building.



Once the name of a Custom Quantity is defined on the **Custom Quantities** tab, a new field with the defined name will be added to the **BIM Dimensions** and **Measured Dimensions** tabs, where you can enter an expression to specify how the value of the Custom Quantity is to be calculated. If a previously defined Custom Quantity is selected in the **Name** field, the UOM field and the corresponding fields added to the **BIM Dimensions** and **Measured Dimensions** tabs will be automatically populated with the UOM and expression(s) defined for that Custom Quantity.

NOTES:

- You can only add or edit BIM expressions for Custom Quantities when there are no BIM dimensions in the dimension group.
- Custom Quantities that have been added to a dimension group can only be deleted when there are no dimensions in the dimension group.
- Custom Quantities created in a dimension group can be added to System Administration by using the **Copy Custom Quantity to System Administration** option in the **Copy** drop-down menu.

You can set any of the Custom Quantities defined for a dimension group as the display quantity in the dimension groups list, which also allows an alias for the unit of measure to be used if required. For example, it is easy to show a length UOM of 'sqft' instead of the default of 'ft2', or show counts as 'nr' or 'ea' instead of 'no'.

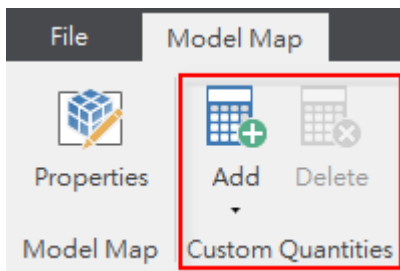
Dimension group and standard dimension group imports via CSV now support unlimited Custom Quantities. For detailed information on how to add Custom Quantities to the CSV file, refer to the following two templates, which are provided in the `C:\ProgramData\Exactal\CostX\Samples\DimensionGroups` folder.

- Import Dimension Groups from CSV Template
- Import Standard Dimension Groups from CSV Template

NOTE: The `ProgramData` folder is hidden by default in Windows Explorer. To show the folder, ensure you've enabled the "Show hidden files, folders, and drives" option in Control Panel.

Adding Custom Quantities to a Model Map

On the **Model Map** ribbon, there is a new **Custom Quantities** group which contains two buttons for adding and removing Custom Quantities from the Mapping Definition.



XGETCUSTOM function

You can use the new XGETCUSTOM function in a Workbook to live link to any Custom Quantity on a dimension group by name. The old XGETCUSTOM1, XGETCUSTOM2, and XGETCUSTOM3 functions are still supported for backward compatibility, however, they are no longer available in the **Insert Function** dialog, and it is recommended that you use the new XGETCUSTOM function to replace these old functions. For detailed information on how to use the XGETCUSTOM function, refer to the *XGETCUSTOM()* topic in iTWO costX® Help.

Excel® export

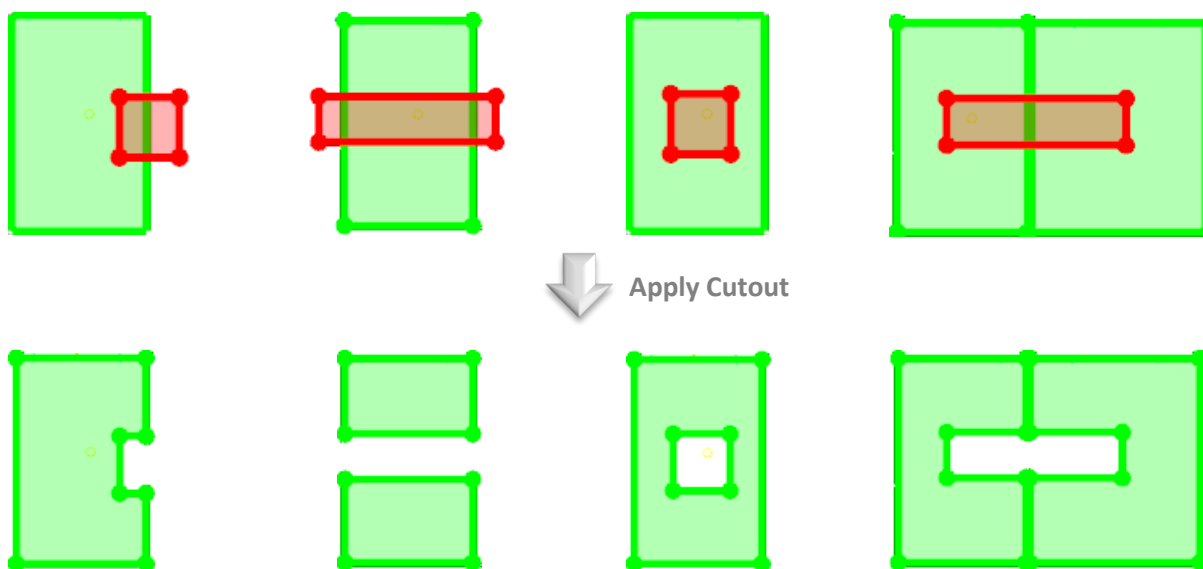
The export format for dimension groups / dimensions exported to Excel® has changed in order to support the unlimited Custom Quantities. If any external systems read data from the Excel® export, they will need to be updated to correctly read the new format.

Drawings & Take-off

Dimension Cutouts

In earlier versions of iTWO costX®, voids and openings that needed to be removed from an area dimension had to be measured as separate negative dimensions, which were then automatically subtracted from the area value of the dimension group. Although this evaluated to a correct area value overall for the dimension group, it didn't allow the areas (with cutouts) to be easily viewed for individual dimensions. In addition, if it was necessary to get a count of the area dimensions, the count would include the negative dimensions which may not always be desirable.

iTWO costX® 6.9 includes a new Cutout tool which solves these problems by allowing you to cut out or subtract smaller areas directly from a large area dimension. By using the Cutout tool, you can create one or more holes in a single dimension, or create holes that span across multiple dimensions. The following are four examples of Cutouts that are supported.



The Cutout tool can be used on both Line mode and Point mode dimensions. However, a Line mode dimension will be converted to Point mode if a Cutout is applied.

Creating Cutouts

1. Measure the large areas as positive dimensions and the smaller areas to be cut out as negative dimensions.
2. Ensure both the positive and negative dimensions are displayed on the drawing.
3. To create a single hole, select the negative dimension.

NOTE: If the selected negative dimension overlaps multiple positive dimensions that are stacked on top of each other, and you wish to apply the Cutout to one of the positive dimensions only, then select the positive dimension on which you wish to perform the Cutout as well.

To create multiple holes, select both the positive and negative dimensions.

4. Do either of the following:

- On the **Dimensions** ribbon, in the **Dimension** section, select **Change > Convert To Cutout**.
- On the drawing, right click and select **Modify Dimensions > Convert To Cutout**.

Once the selected areas are cut out, the negative dimensions will be removed from the Dimensions List and the area and length values of the positive dimensions will be recalculated to account for the holes. If a dimension is split in two after a Cutout (see example 2 above), it will become two dimensions.

For dimensions that contain Cutouts in their entirety, such as example 3 shown above, the following values will be additionally available in the hint that is displayed when hovering the mouse over a dimension.

Value	Description
Area of Cutouts	The total area of all Cutouts in the dimension.
Length of Cutouts	The total length of all Cutouts in the dimension.
Area Excluding Cutouts	The area of the dimension without subtracting the Cutout areas.
Length Excluding Cutouts	The length of the dimension without adding the lengths of the Cutouts.

The above values can be referenced in a dimension group expression as Properties. To reference them, use their names in square brackets '[]'. For example, you can use the expression *[Area of Cutouts]* for a Custom Quantity called "Slab Voids" and use the expression *[Length of Cutouts]*{Height}* for another Custom Quantity "Slab Void Formwork". For more detailed information on how to use Properties in an expression, see the *Composing Expressions* topic in iTWO costX® Help.

Removing Cutouts

Only Cutouts that lie entirely within a dimension (e.g. example 3 shown above) can be removed. Removing a Cutout does not restore the negative dimension – it only removes the hole created by the negative dimension. To remove a Cutout, select one of the lines or corner points of the Cutout, then right click and select **Remove Cutout**.

Dimension group expressions

Syntax highlighting

The Dimension Group Expression Editor now comes with built-in syntax highlighting. Syntax highlighting displays various components of an expression (such as functions, variables, brackets and dimension fields) in different colours as shown below. It is also possible to find matching brackets using CTRL-SHIFT-B, which will toggle the cursor between the matching open and close brackets. This improves readability and makes it much easier to spot errors such as misplaced and unmatched brackets in complex expressions.

```
LEFT (XTEXT (ABS ( {Length} /XVAR ("Shots & Pin Spacing")+1) ), SEARCH (".", XTEXT (ABS ( {Length} /XVAR ("Shots & Pin Spacing")+1) )))
```

Automatic unit conversion for BIM properties and variables used in expressions


Earlier versions of i TWO costX® already supported automatic unit conversion between the UOMs displayed in the second column below for BIM properties and variables used in expressions. In i TWO costX® 6.9, the UOM variants displayed in the third column are additionally supported for automatic unit conversion.

Name of UOM	UOM variants supported in V.6.8 or earlier	Additional variants supported in V.6.9
Feet	ft	lf, l.f., lnft, ln ft, feet, foot, vlf, lfr, '
Square Feet	ft2, ft ² , ft^2, sf	s.f., gsf, vgsf, sqft, sq ft, sq feet, sq foot, feet^2, foot^2
Cubic Feet	ft3, ft ³ , ft^3, cf	c.f., cuft, cu ft, cu feet, cu foot, feet^3, foot^3
Inches	in	inch, inches, "
Square Inches	in2, in ² , in^2	s.i., si, sqin, sq in, sq inch, sq inches, inch^2, inches^2
Cubic Inches	in3, in ³ , in^3	ci, c.i., cuin, cu in, cu inch, cu inches, inch^3, inches^3
Yards	yd, yard, yards, yds	
Square Yards	yd2, yd ² , yd^2, yds^2, yard^2, yards^2	s.y., sy, sqyd, sq yd, sq yard, sq yards
Cubic Yards	yd3, yd ³ , yd^3, yds^3, yard^3, yards^3, cy, cu yd, cu yds, cu yard, cu yards	c.y., cuyd
Metres	m	mtr, metre, meter, metres, meters
Square Metres	m2, m ² , m^2	metre^2, metres^2, meter^2, meters^2, mtr2, mtr2, mtr^2, sq mtr, sqmtr, sqm, sq m, sq metre, sq meter, sq metres, sq meters
Cubic Metres	m3, m ³ , m^3	metre^3, metres^3, meter^3, meters^3, mtr3, mtr3, mtr^3, cu mtr, cumtr, cum, cu m, cu metre, cu meter, cu metres, cu meters
Millimetres	mm, millimeter	millimetre, millimetres, millimeters
Square Millimetres	mm2, mm ² , mm^2, millimeter^2	millimetre^2, millimetres^2, millimeters^2, sqmm, sq mm, sq millimetre, sq millimeter, sq millimetres, sq millimeters
Cubic Millimetres	mm3, mm ³ , mm^3, millimeter^3	millimetre^3, millimetres^3, millimeters^3, cumm, cu mm, cu millimetre, cu millimeter, cu millimetres, cu millimeters


If conversion factors were used in an earlier version to convert referenced BIM properties or variables from or to the newly supported units, the conversion factors may no longer be needed in 6.9. **After upgrade, you need to review the relevant expressions and manually remove redundant conversion factors.** If redundant factors are not removed, new dimensions measured into the relevant dimension groups will have incorrect values. Existing dimensions will retain their old values after upgrading to 6.9, but if they are modified before the redundant factors are removed, they will be recalculated based on the incorrect expressions and also get incorrect values. **It is therefore very important to review your expressions before taking or modifying any dimensions.** To ensure that you fully understand when a conversion factor is needed, please read through the *Quantity Expression Unit Conversions* topic in iTWO costX® Help before reviewing your expressions.

Automatic unit conversion for fields used in expressions


In addition to BIM properties and variables, iTWO costX® now also supports automatic unit conversion between the above units for fields used in expressions. For example, to reference an Area field that is in m² in an expression for a field with units set to ft², previously you would need to enter $\{Area\} * 10.764$ as you needed to multiply the area value by 10.764 to convert it to ft². In version 6.9, you only need to enter $\{Area\}$ because iTWO costX® automatically performs the conversion for you when evaluating the expression.

 **NOTE:** To convert between units other than the units listed in the above table, you still need to use factors in your formulas. For example, to use a Custom Quantity to convert an Area value in yd² to the unit Acre, the formula $\{Area\} / 4840$ will need to be added.

If you've used conversion factors in an earlier version to convert referenced fields between the UOMs listed above, these factors are no longer needed. When upgrading to 6.9, the upgrade process will check if existing expressions in a Building contain fields that have been converted between supported units. If such fields exist, it will automatically multiply or divide the fields by an appropriate factor to cancel out the conversion factor that is automatically applied in iTWO costX® 6.9. For example, if the expression $\{Length\} / 12$ was used in a previous iTWO costX® version to convert from inches to feet, it will be automatically updated to $\{\{Length\} * 12\} / 12$ after upgrading to 6.9. The updated expression will only be applied to new dimensions measured into the relevant dimension group. Dimensions taken in earlier versions of iTWO costX will not be recalculated based on the new expression unless they are modified.

 **TIP:** It is recommended to perform a review of your template dimension group expressions after upgrading to iTWO costX® 6.9 to simplify as needed. Where expressions contain factors that cancel each other out, they can be removed to simplify them. Using the above example, the formula $\{\{Length\} * 12\} / 12$ could be simplified to $\{Length\}$ since the multiplication and division by 12 cancel each other out.

Note that performing this simplification review is optional and the recommendation mainly applies in the case of standard dimension groups or dimension groups in Building templates that will continue to be copied to new projects in future. It is not necessary to review completed projects (unless they will be used as a template for future projects).

 **NOTE:** During the upgrade, iTWO costX® will compare the units of the referenced fields with the unit of the expression to determine if the expression needs to be updated. To avoid spurious differences when comparing the units, the upgrade process will remove the leading and trailing spaces from the units.

For fields referenced in Standard Dimension Group and Model Map expressions, the upgrade process will not make any adjustments. **If you have used conversion factors in Standard Dimension Group or Model Map expressions to convert referenced fields to other units, after upgrading to 6.9, you need to review these expressions and manually remove redundant factors.**

Dimension group expression functions

The following functions can now be used in dimension group expressions:

- XGETSPACEDLENGTH
- XGETSPACEDCOUNT
- XGETSPACEDCOUNTRND
- XGETSPACEDLENGTHRND
- CEILING
- FLOOR
- ROUNDUP
- ROUNDDOWN

For detailed information on how to use these functions, refer to the *Dimension Group Expression Functions* topic in iTWO costX® Help.

Variables

Organizing variables

Standard Variables are now organised in folders. If a folder is not specified for a Standard Variable, it will be displayed under the folder <UNCLASSIFIED>.

Variables displayed in the Dimension Group Expression Editor are now first grouped into **Standard Variables** and **Dimension Group Variables**. Standard Variables are then further categorised according to the folder structure defined in System Administration.

Dimension Fields	Dimension Group Fields	Custom Quantities	Constants	Functions	Properties	Variables
Name	Unit	Type				
Dimension Group Variables						
Slab Thickness	in	Number				
Standard Variables						
Concrete Slab						
Reinforced?		Boolean				
Concrete Strength		Selection				
Insulation						
Insulation Level		Selection				
Insulation Type		Selection				

You can now also change the order of referenced variables in a dimension group by using the new **Move Up** and **Move Down** buttons. This ensures that when taking off Dimensions, the variables that have dependencies based on the choice of other variable values are shown in the correct order depending on the values chosen by the user.

Dimension Group Properties ✕

Properties Custom Quantities Variables BIM Dimensions Measured Dimensions

Define the default values for the dimension variables.

Referenced Variables

Insulation Type	Batt	▼	🔑	
Insulation Level	R.30	▼	🔑	
Reinforced?	True	▼	🔑	
Slab Thickness	4		🔑	in

Update

Cancel

Move Up

Move Down

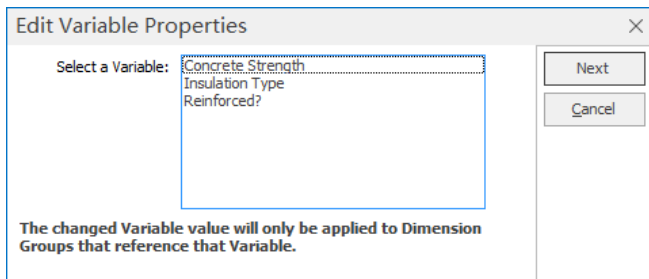
Importing Standard Variables from CSV

Due to the added support for folders, the CSV import format for Standard Variables has been updated. You now need to specify the folder name for each variable in the first column. In other words, each line must include the data fields of a variable in the following sequence:

Folder, Name, UOM, Hint, Default Value, Type, Option 1, Option 2, Option 3...

Editing variable properties for multiple dimension groups

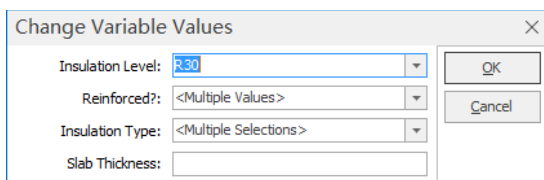
The right-click menu on dimension groups now includes an **Edit Variable Properties** option which can be used to edit the properties of a variable for multiple dimension groups. For example, if you needed to add a new option in a selection list for a particular variable. This option launches the following dialog, which lists all the variables referenced by the dimension groups that are selected. Simply choose the required variable, click **Next** to edit its properties, and then click **Update** to apply your changes to all the selected dimension groups that reference the variable. The changes will not cascade to existing dimensions in the dimension groups – they will only be applied to new dimensions.



Bulk changing variable values for multiple dimensions

You can now mass update variable values for multiple dimensions in the same dimension group. To make a mass update, select the required dimensions, and then choose the **Change Variable Values** option from the dimensions right-click menu or from the **Change** drop-down menu on the **Dimensions** ribbon.


A list of all variables that are referenced by the selected dimensions will be displayed. If a variable has the same value in all of the selected dimensions, its value will be displayed in the value field. For variables that have different values in the selected dimensions, their value field will display “<Multiple Selections>” for **Selection** type variables, “<Multiple Values>” for **Boolean** type variables, and a blank value for **Number** type variables, as shown below.



It is possible to specify a new value for a variable even if it has different values in the selected dimensions. The new value will be applied to all the selected dimensions that reference the variable.

Other new features and improvements

- Native support for loading and automatically extracting quantities from Revit (RVT) files.

 **NOTE:** iTWO costX® will load RVT files from Revit versions 2011 to 2020. However, if your RVT file version is older than 2020, it is highly recommended to upgrade the file to the 2020 version for the best results. See iTWO costX® System Requirements for more details.


- Languages that are read from right to left, such as Arabic, now display correctly in the drawing window and published drawings.
- Support for Sketchup 2019.3 and 2020 file formats.
- When changing the Height of a dimension group or dimension via the right-click menu, you can now use 4 decimal places, instead of only 2 previously.

Workbooks

Importing workbook data from Excel®

You can now transfer Excel® data (such as an Excel® BOQ) to a workbook without going through a laborious copy/paste routine, as iTWO costX® now allows you to import data from a single Excel® file directly to multiple levels of a workbook.

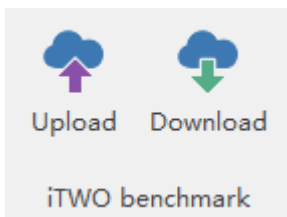
For detailed information on how to optimise an Excel® file for import and step-by-step instructions for importing Excel® data, refer to the *Importing Workbook Data from Excel* topic in iTWO costX® Help.

 **NOTE:** This item was released under iTWO costX® 6.8 R1. iTWO costX® 6.9 further enhances this feature by allowing you to import more than 64 worksheets in a single import operation.

Integration with iTWO benchmark

- iTWO costX® now provides seamless integration with RIB's cloud-based iTWO benchmark system, which allows you to create conceptual estimates based on historical data from similar projects or benchmark an estimate against historical estimates.

Workbook data in iTWO costX® can be uploaded to iTWO benchmark, and cost analysis data in iTWO benchmark can also be downloaded directly into iTWO costX® by using the **Upload** and **Download** options on the **Workbooks** ribbon.



For detailed upload and download procedures, refer to the following two topics in iTWO costX® Help.

- Exporting Workbook Data to iTWO benchmark
- Importing Workbook Data from iTWO benchmark

 **NOTE:** This item was released under iTWO costX® 6.8 R1.

- iTWO benchmark cloud configuration settings now provide additional flexibility in the supported URL formats.

 **NOTE:** This item was released under iTWO costX® 6.8 R2.

Other new features and improvements

- Workbook data can now be uploaded as line items directly to RIB's iTWO 4.0 platform, a cloud-based collaborative platform for managing enterprise-wide projects throughout the construction lifecycle based on 5D BIM.
- Workbook recalculation performance improvements.

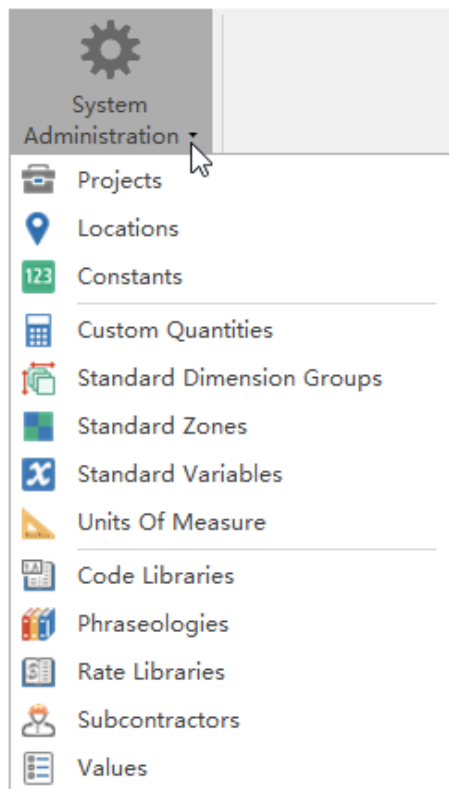
 **NOTE:** This item was released under iTWO costX® 6.8 R1.

- A new **Maintain Live Links** option is now available when copying a workbook rate breakdown to a Rate Library, allowing you to choose whether to maintain the live links in the Rate sub-sheet or convert the live links to static values.

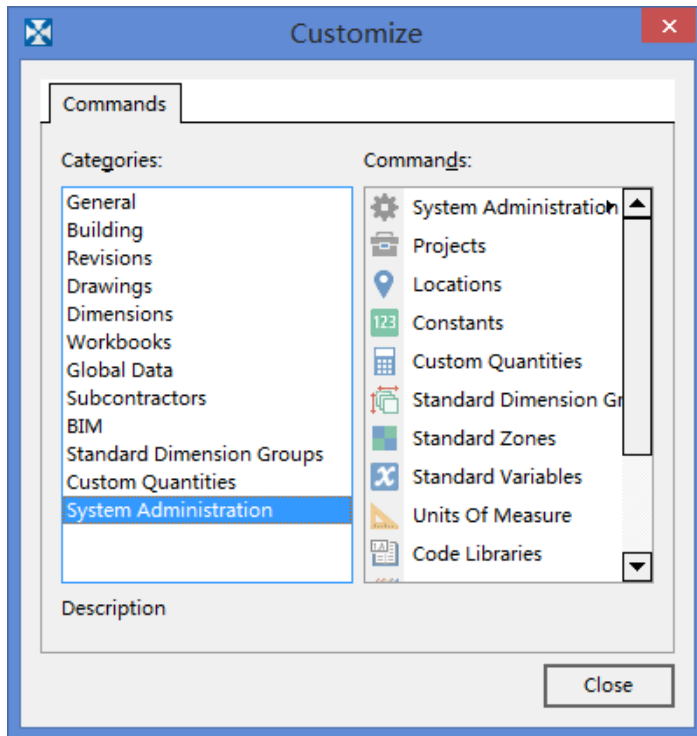
 **NOTE:** This item was released under iTWO costX® 6.8 R2.

System Administration

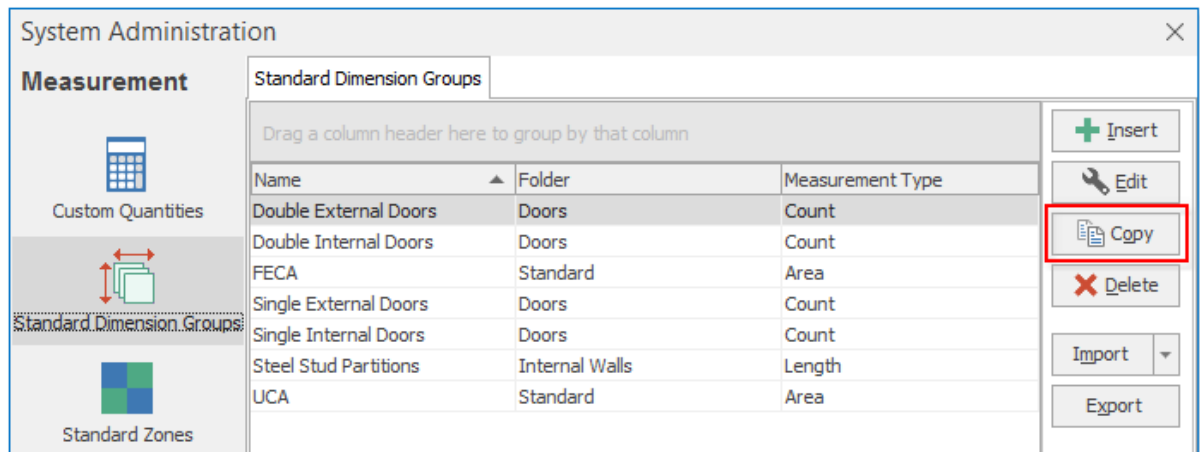
- A new **System Administration** button has been added to the **Home** ribbon for quick access to various sections of System Administration.



- The **Customize** dialog for the Quick Access Toolbar now has a new category of commands for System Administration. You can quickly access various sections of System Administration by adding the required commands to the Quick Access Toolbar.

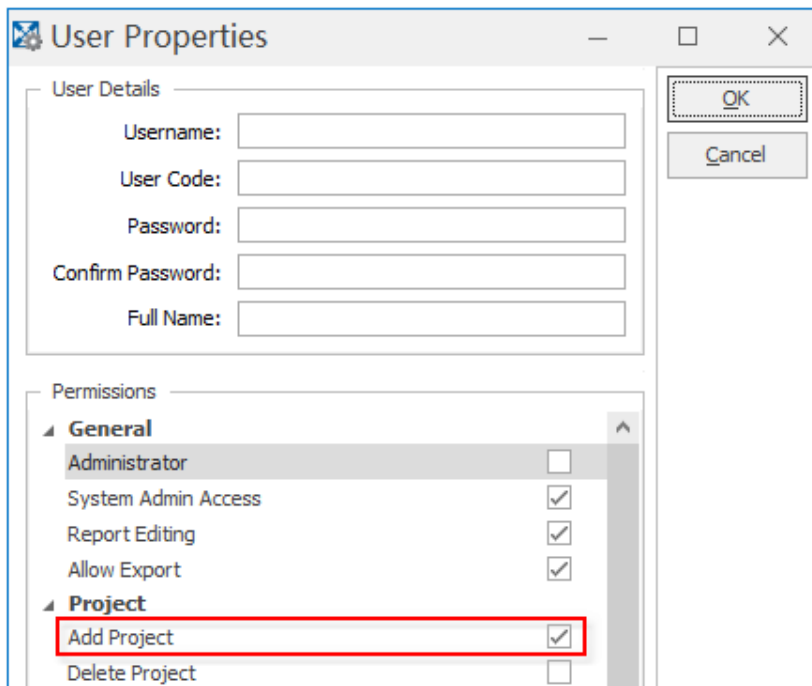


- Copying standard dimension groups is now supported.

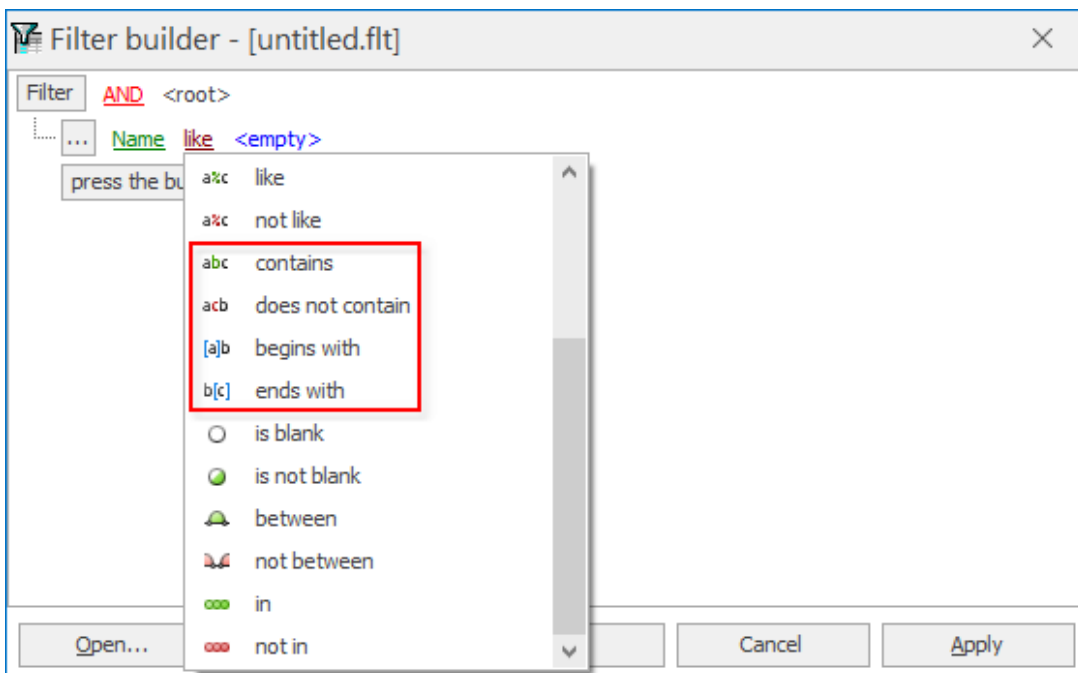


Other

- A new 'Add Project' permission is now available in the user permissions list in iTWO costX server admin. This means it is now possible to allow a user to create projects while restricting their access to other sections of System Administration.

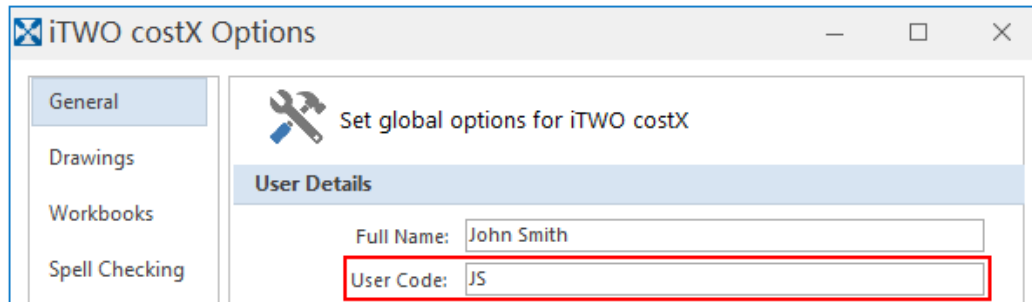


- The following new operators are now available for custom filters: 'contains', 'does not contain', 'begins with', and 'ends with'.




- Support for the latest XLSX file format for User Properties files.
- The character limit for Units of Measure has been increased from 12 to 20.


- The Standalone version of iTWO costX® now supports recording the user's initials against each dimension in the same way the Network version does. You can modify your initials by using the **User Code** field in the **General** category of **iTWO costX Options**. When taking measurements, your initials will be appended to the front of the automatically generated dimension names.




- Support for file paths longer than 260 characters for drawings, imports, exports, and various other places where Windows file paths are referenced. Long file path support can only be enabled on Windows 10 version 1607 and later. For instructions on how to enable this feature, refer to the *File Path Length Limit* topic in iTWO costX® Help.

 **NOTE:** This item was released under iTWO costX® 6.8 R2.


- iTWO costX® Database upgraded to PostgreSQL 10 providing improved performance especially on modern multi-core servers, due to improved parallel processing of queries. The iTWO costX® installer automatically handles the database upgrade without the need for any manual steps to be performed.
- All executable binary files are now signed with a certificate.
- Updated underlying architecture that introduces CostX Core and CostX Auth components which run as a Windows service. iTWO costX® server also has equivalent CostX Server Core and CostX Server Auth components.

 **NOTE:** As part of the architectural changes, the option to choose Server Processing has been removed, with processing now always handled by CostX Server Core for some of the tasks previously handled by the Server Processing option.

- Better support for computer displays running with a high DPI setting.
- 4K screen resolution is now supported.
- Improved the performance and reduced memory consumption in BIM Schedule, and other grids that hold large amounts of data.
- Fixed a rare issue that could prevent backup files from being restored in some locales.

 **NOTE:** This item was released under iTWO costX® 6.8 R2.

- Message boxes containing many warnings now support many more rows before being truncated.

 **NOTE:** This item was released under iTWO costX® 6.8 R2.

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