Trimble
Connect
A Trimble Product

# Trimble Connect for Browser
## 3D Viewer
# Workflow Extensions

*October 2020*

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# Before You Begin

## Building Beyond BIM

Business Premium provides access to workflow extensions and advanced BIM tools that enable you to unleash your team's collaborative potential - resulting in faster, higher-quality project delivery.

### Benefits of Workflow Extensions

The file-based approach to managing project data results in a large number of files, versions, and folders, which makes it extremely challenging for team members to find the right data at the right time to make informed decisions. Processes such as materials management, quality assurance, and project planning can truly benefit from data that is available directly in the context of 3D models. Instead of combing through rows in a spreadsheet or sorting through markups in multiple sets of drawings, simply click on an element to see the material status, QA results, or planning dates. With Trimble Connect Workflow Extensions this, and much more, becomes possible

## Licensing

### Trimble Connect Business Premium

In order to use the Workflow Extensions you will need a Connect Business Premium (or higher) level license. Business Premium licenses are available for purchase through our **sales network**, or can be purchased as part of a Bundle with another Trimble Product:

- Connect for Mixed Reality
- ProjectSight
- Quadri
- Stabicad
- SysQue
- Tekla

Learn more about Connect Business Premium **here**.

All other users of Connect (Personal and Business) have read-only access to the data included in projects through the new Organizer and Property Set functionality.

### Personal & Business Users

Users with read-only access can still consume data that has been created through the Workflow Extensions (Property Sets, Data Table, Organizer). However, to realize the full benefits of the Workflow Extensions, users must have a Business Premium license. This provides read and write capabilities and enables users to customize workflows based on their unique project needs.

# Introduction

### From Drawings, Documents and Spreadsheets to Data in BIM

Planning and collaboration in construction projects typically involve the creation and exchange of drawings, documents, and spreadsheets. This file-based approach results in a large number of files, versions, and folders with project data, which makes it extremely challenging for project team members to find the right data for informed decision making.

Trimble Connect's mission is to provide the right data to the right people at the right moment. Connect's ability to share and view constructible models today already helps hundreds of thousands of users to share, review, understand and coordinate project designs.

We are now adding data to this capability to also enable the inclusion of associated data in the constructible model context.

Processes such as materials management, quality assurance, and project planning can truly benefit from data that is available directly in the context of 3D models: instead of finding rows in a spreadsheet combined with markup in multiple drawings, simply click on an element to see the material status, QA results or planning dates. With Connect Workflow Extensions this - and much more - becomes possible.

Data-driven decision making requires a common data environment. Connect now offers this within the context of the 3D model to go beyond the world of drawings, documents, and spreadsheets - unlocking the potential of BIM for the first time.

## Workflow Extension & BIM Tools

| FEATURE | DESCRIPTION |
|---|---|
| **Property Sets** | Easily view BIM data in the design context. Create custom property sets and assign them to any model element, without having to access the original authoring tool. |
| **Data Table** | Review data and interact with model content by displaying properties in a grid view. The Data Table enables you to group objects by different properties, configure and control visibility of columns, and export data for easy reporting. |
| **Organizer** | Stay organized by defining breakdown structures and grouping objects together as you see fit. For example, you could create groups by project phase, object type, location (floors or sections), and more. |

# Property Set Libraries Updated

Use the Property Set Libraries feature to define customized property sets that you can use to link data to BIM content. Property Set Libraries can be created on the Account level (and pushed to projects) or on the project level.

## Account Level Property Set Master Libraries New

The master libraries feature enables Account Admins to create template property set libraries and apply them to multiple projects.

A master library is similar to a normal property set library. The main difference is that it's created by the Account Admin in the account context. After the Account Admin applies the master library template to a project, then the Project Admins can edit the library contents and set access control permissions in the project context. In this article, you will find descriptions of the property set master libraries features.

### Accessing Your Account's Property Set Master Libraries New

The property set master libraries are accessible by Account Admins from the Account Administration dashboard of the Connect for Browser application.

**Learn more about the Account Administration Dashboard & Master Libraries**

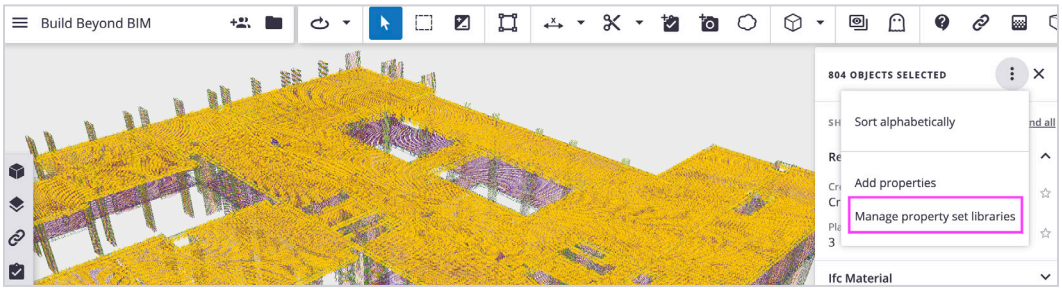
# Project Level Property Set Libraries Updated

Property set libraries are project specific. You can create and manage the project's libraries through the Project Property Set Library Manager. Note that only Project Admins can create and manage property set libraries. This feature is disabled for project users. As a Project Admin, you will also be able to edit and manage any libraries created by other Project Admins.

## Accessing the Project's Property Set Libraries

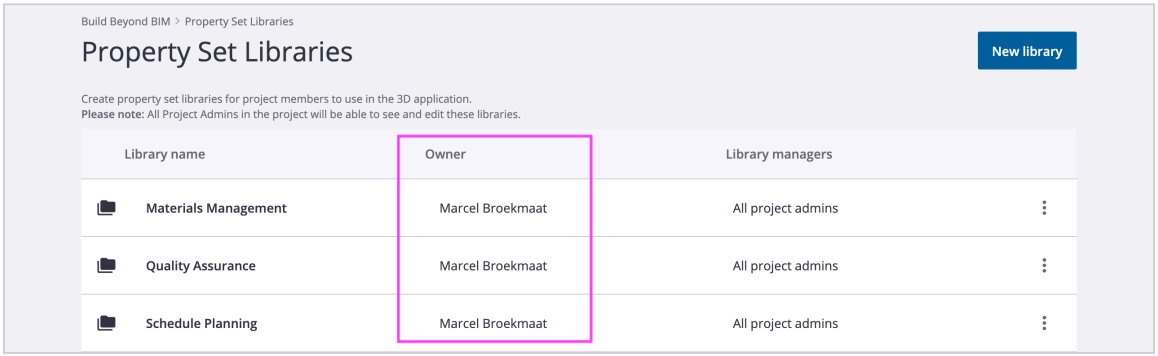
**To use the Property Set Library Manager to create, edit or delete a library:**

1. Open the Connect 3D Viewer Application
2. Select objects in 3D
3. Open the property panel
4. Click **Manage property set libraries** from the properties panel menu.




5. The Property Set Library Manager will open in a new browser tab.

**Note:** The Property Set Library Manager lists property set libraries in the Trimble Connect project that have been created by you, or by another project admin user. The person who created the library will be listed as the owner (shown in the table).



## Create a New Library Updated

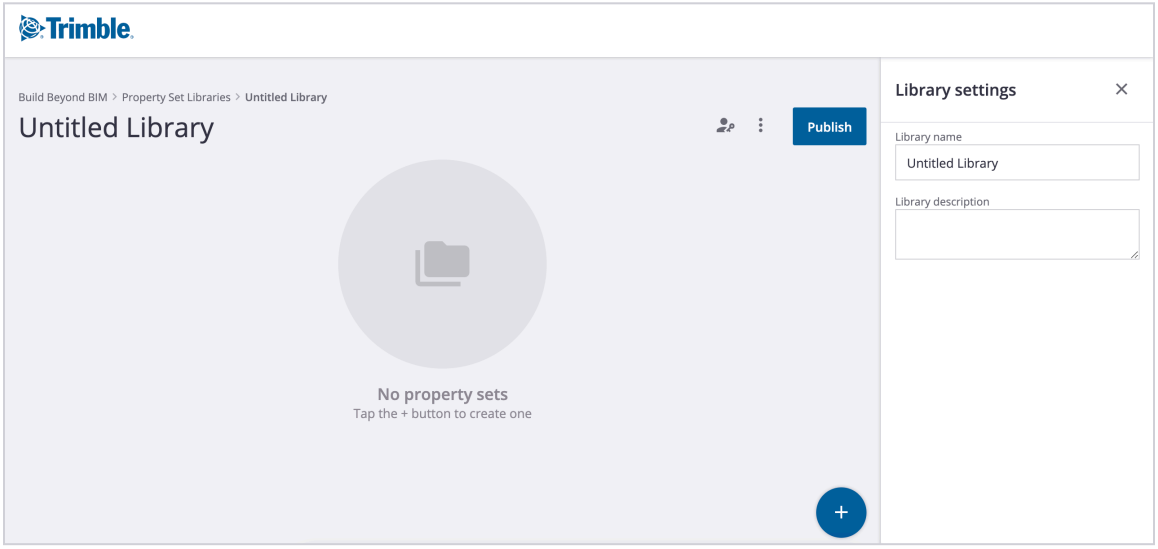
1. Open the Connect 3D Viewer Application
2. Select objects in 3D
3. Open the property panel
4. Click **Manage property set libraries** from the properties panel menu.
5. The **Property Set Library Manager** will open in a new browser tab.
6. Click **New library** to create a new library or click on an existing library to edit.

## Property Sets

Create property sets to group individual properties or data fields, that can later be applied to BIM data. To add a new property set to the library click the **Plus** button located at the bottom right of the page.

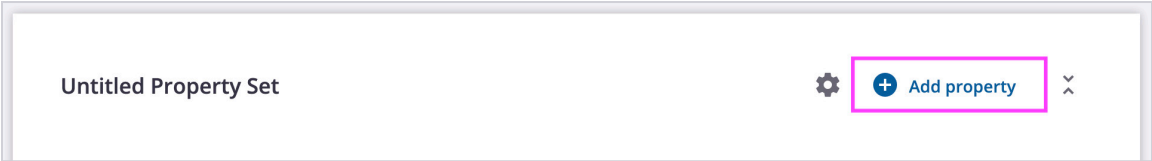
Enter a name and description for your property set. You can also apply permissions settings to the property set from the detail panel.

**Note:** Access control is covered in a later section.



## Properties

To add properties to your property set, click the **+ Add property button**. The property detail panel will be displayed where you can enter the name, a description, and define the property type.




## Property Types

Each property type has a set of options that will allow you to customize the way you want the data to be input.

| PROPERTY | DESCRIPTION |
|---|---|
| **Date** | A numeric field to store the month, day and year |
| **Dropdown choice** | Enter multiple options which can be separated with carriage return ↵<br><br>**Note:** each option must be unique. Duplicate values will be automatically removed. |
| **Number** | Define whether the input should be a whole number or decimal |
| **Measurements** | Area, Angle, Length, Mass and Volume are the available measurement types you can choose from.<br><br>The unit system and unit of measure are defined by the project settings. |
| **Text** | A descriptive text field which supports alphanumeric entries with up to 255 characters. |

| PROPERTY | DESCRIPTION |
| --- | --- |
| True/False | **Boolean vs Logical**<br><br>A boolean property type can have a TRUE or FALSE value. Examples: IsExternal, IsCombustible.<br><br>A logical property type can have a TRUE, FALSE or UNKNOWN value. |
| URL | The url field allows you or a project member to attach a link to another web page. The url must be entered in the following format: **http://www.example.com** |

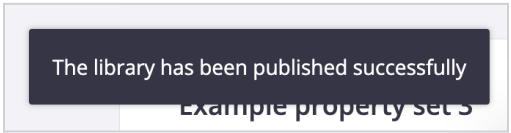
### Multi-entry inputs

Multi-entry (or List Value) defines a property that has several (numeric or descriptive) values assigned, these values are given by an order list. The order in which values appear is significant. Each value in the list is unique. i.e. no duplicate values are allowed.

A few property types do not support multiple values: Date, Dropdown choice and URL

## Publishing a Library

Once you are finished defining your property sets and properties, you can publish the library by clicking the **Publish** button. A confirmation will appear on the bottom of the screen after your library has been successfully published and is ready to be used in the 3D application.

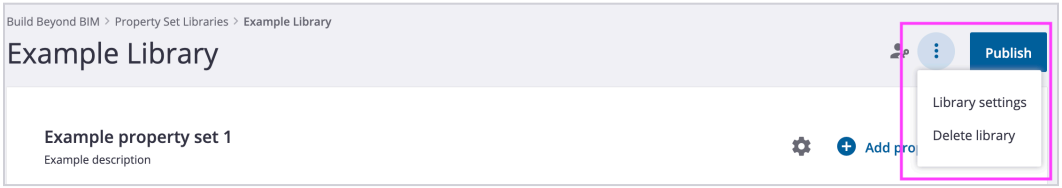



**Note:** It is not possible to save drafts of a library. To work around this, you can set the access control settings to no access, which will hide the library from users in the 3D application.

# Library Management

## Making Changes to a Library

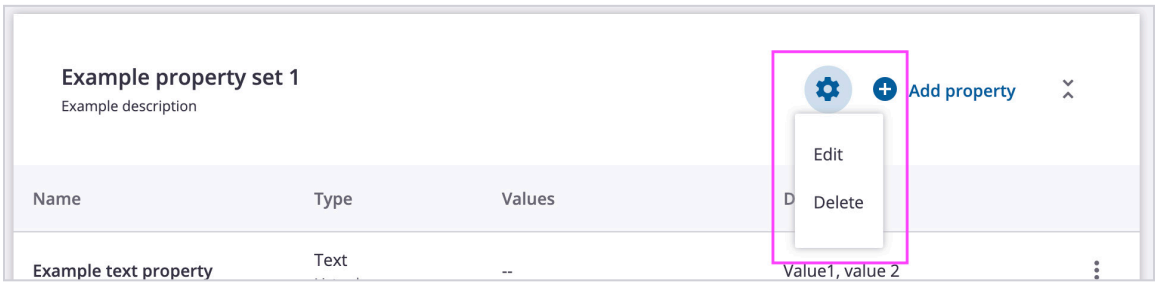
- To edit a library, click on the desired library listed on the Property Set Library Manager page.
- To change the library name, click the **Overflow Menu ( ⋮ ) › Library Settings**
- If you need to delete a library you can click on the **Overflow Menu ( ⋮ ) › Delete library**. You will be asked to confirm you really wish to delete the library since this action is permanent and cannot be undone. Any items this library or it's property sets have been applied to will be permanently removed.




## Making Changes to Property Sets or Properties

### Property Sets

You can edit the property set details or access control settings by clicking the **Settings (⚙) › Edit**, which will open the Detail Panel for the property set.

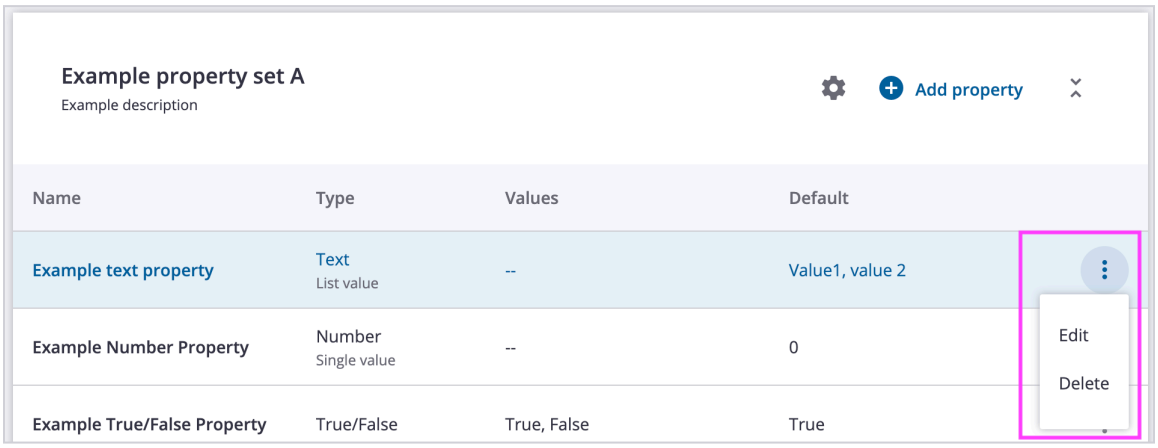



To delete a property set, click the **Settings (⚙) › Delete**, which will open a dialog asking you to confirm this action. Use caution with this action since all data associated with the property set will be permanently removed once you publish your changes.

### Properties

Click on a property listed in the table to open the Property Detail Panel. From here you can change the name, description, property type and default value.

To delete a property set, click the **Overflow Menu ( ⋮ ) › Delete**, which will open a dialog asking you to confirm this action. Use caution with this action since all data associated with the property set will be permanently removed once you publish your changes.




# Library Versioning

Certain actions done to a library will result in a new version of the library. If a property set library or it's property sets have been applied to elements in a model, the users will be required to update to the latest version of the library before they will be allowed to make edits in the 3D application.

**Actions that result in new versions:**

1. Adding a new property set
2. Deleting an existing property set
3. Adding a new property
4. Deleting an existing property
5. Changing an existing property's type
6. Add/edit/remove a property description
7. Add/edit/remove a property default value
8. Add/edit/remove a Dropdown property type value
9. Add/remove multi-entry option

## Discarding Changes

To discard any changes you made to a library, simile navigate away from the page (ex. return to the Library Manager Main page). You will be asked to confirm this action before you exit the page.

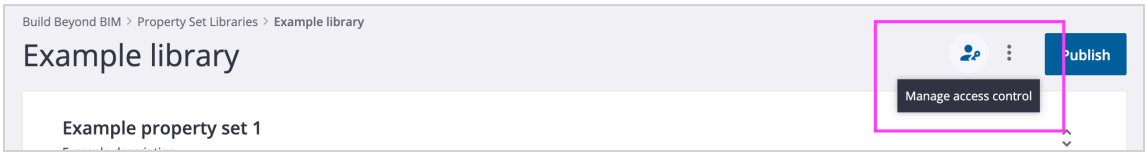
# Real-Time Updates

If two project admins happen to be editing a library at the same time, publishing your changes will override any edits the other user was making. You will be prompted to confirm you wish to override their changes before the library will be published.

# Access Control

With the property sets access control feature, project admins can define the access level for each property set in the library for each user group separately. The new access control permissions model replaces the previous one with new access levels. It is possible to choose from three different access levels: **Edit access, Read only access**, and **No access**.

To get to the **Access Control Manager Page** click the **Manage Access Control ( )** button:




## Apply the New Permission Model to an Existing Property Set Library

Action may be needed to update an existing property set library to the new access control permission model (released April 2020). Note that after the new permission model has been applied, all project admins in the project will be able to see and edit the library. Also, the previous implicit access control rules that stated that users who have the same company membership can edit property sets while other project users can only view property sets, will be replaced with access levels that are explicitly defined by the project admin for each user group.

**To update the permission model:**

1. Open the Property Set Manager panel and select a library
2. Click either the new Manage access control icon, or the text from the property set details
3. A message about the new permission model is displayed

4. Click **Use new permissions model**.
5. The Access Control Manager panel is displayed. Set the permissions as described in the **How to Manage Access Control** section.
6. Click **Save**. A draft of the permissions is saved and the Access Control Manager panel closes.
7. Click **Publish** to apply the changes.
   **Note:** If publish is not clicked, then changes will be discarded when moving away from the page and the message about the new permission model will be displayed again the next time when the Access Control Manager panel is accessed.

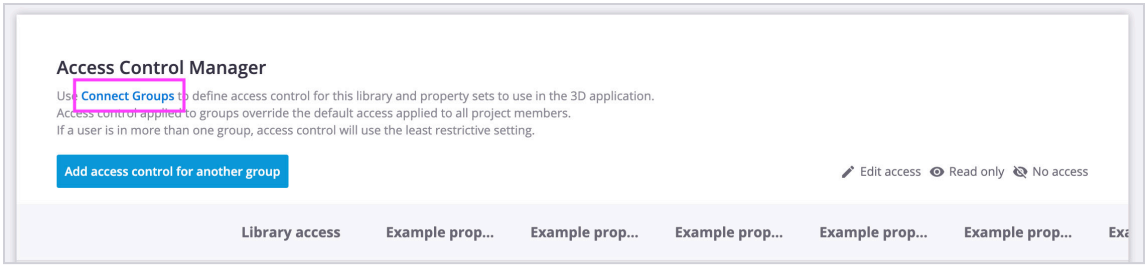
# How to Manage Access Control

The Access Control Manager panel is organized into a grid view where there is one column for each property set in the library and one row for each user group to which access has been granted. The access level granted to a property set for each user group can then be selected from three possible values: Edit access, Read only access and No access.

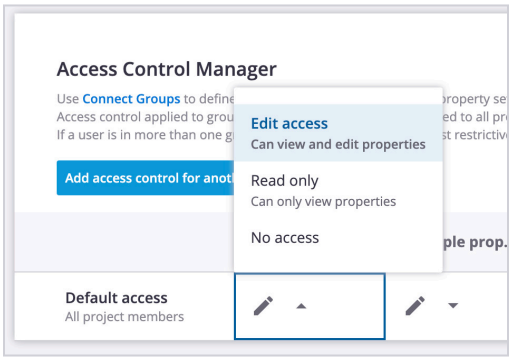
## Access Control Levels and Descriptions

| LEVEL | DESCRIPTION |
|---|---|
| **Edit Access** | Edit access means that members of the user group can add the property set to model objects and edit the property set values in the Connect 3D Viewer |
| **Read Only Access** | Read only access means that members of the user group can only see the property sets that have been added to model objects but they cannot edit the property values |
| **No Access** | No access means that the property set is hidden from the members of the user group in the Connect 3D Viewer |

Access control uses the project's Team Groups to define permissions for the library and property sets. If you haven't already set up Groups yet, click the **Connect Groups** link, where you will be taken to your project's Team page.



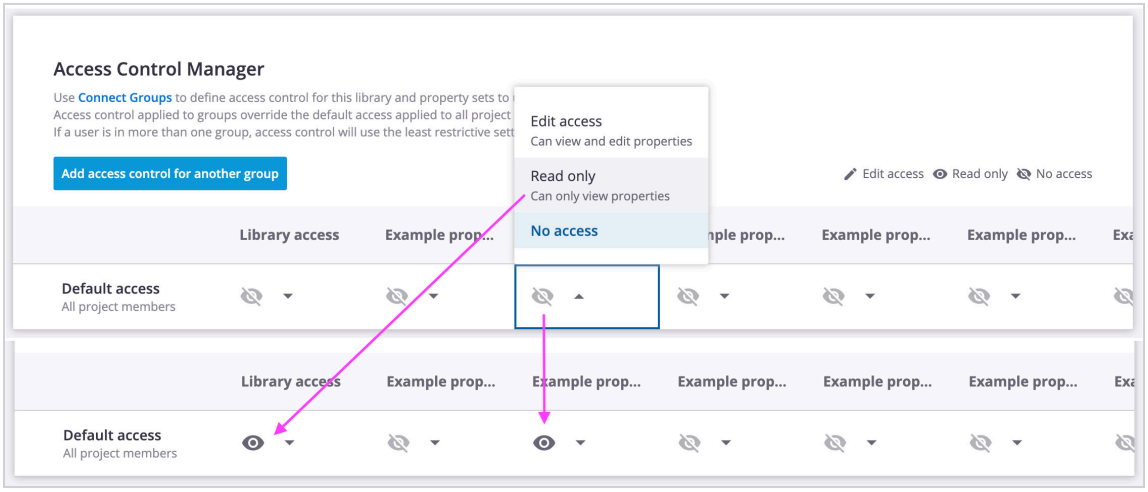

The default library access is a general rule that you can easily define access control for all the project members in your project. To change the permissions on the library or property set level click the dropdown arrow in the column.




To easily change the permissions to all property sets, change the permissions for the library access. All the property sets will inherit this rule.

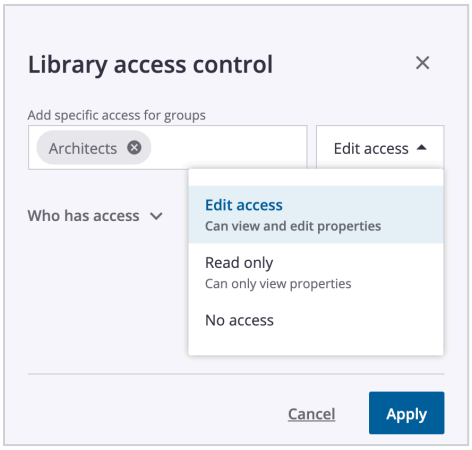
## Quick Tip

Because the property sets inherit access controls set on the library level, if you had applied No Access to the library, but then granting access to a property set, it will automatically give access to the property set library.



## Add Access Control to Groups

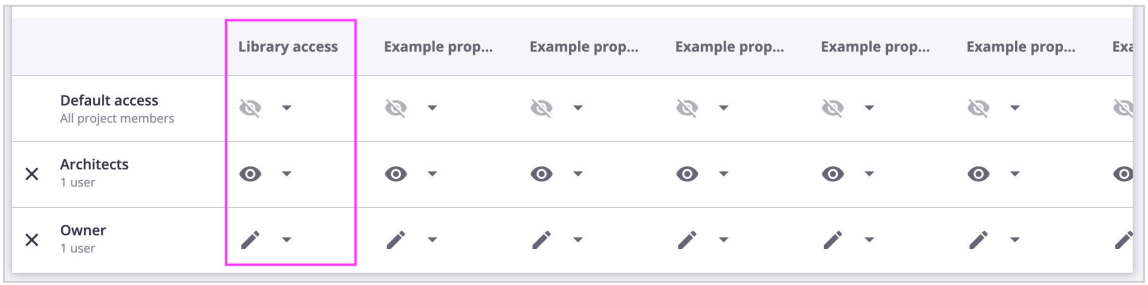
To remove or grant access to a specific Group, click the Add access control for another group button. A dialog will appear where you can enter the group name and define the permissions.




## Overrides

Access control applied to groups override the default access applied to all project members. If a user is in more than one group, access control will use the **least restrictive setting**.

**Example illustrated below:**




*If a user is in both the Architects Group and the Owner Group, they will have edit access to the library.*

# Publishing an Access Control Policy

If your library has never been published, the access control policy will be saved as a draft. It will take effect after the library has been published.

If your library has been published and you have not made any changes to it, saving the access control policy will take effect about 15 minutes after the time you saved.

If you have made edits to a library, please allow up to 15 min for this policy to take effect in the 3D application after you have published the library.

# Maximum Access Control Policy Size

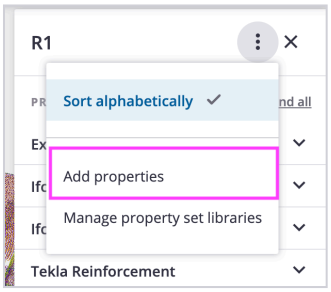
There is a maximum size for the access control policy document that is created based on the settings made in the Access Control Manager panel. The exact size of the policy document varies based on the details of the access control settings so it is impossible to give a unique amount of property sets and user groups after which the size limit is reached. However, typically adding **up to 10 property sets and up to 30 user groups per property set library** can be fitted.  If the maximum size of the policy is exceeded, then saving changes in the Access Control Manager panel will fail with an error message. If more user groups and/or property sets are needed, then a new library must be created.

# Using Property Set Libraries & Property Sets in 3D

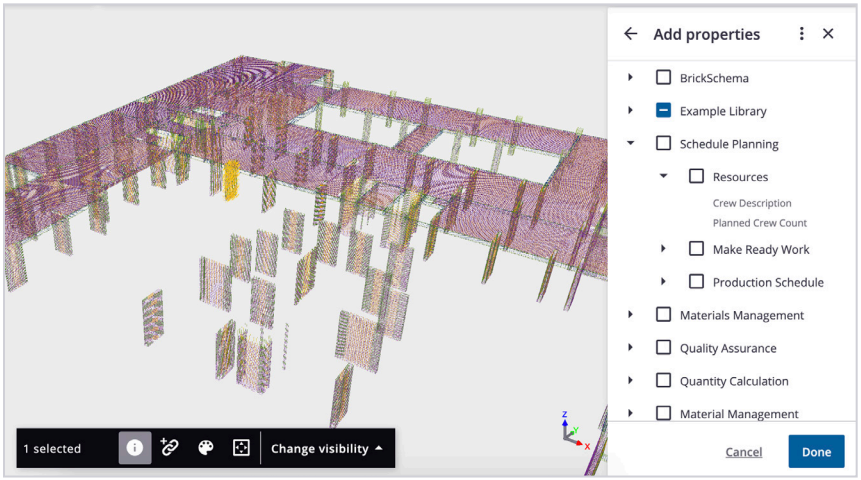
## Applying Property Sets

Any member of your project who has a Business Premium license (or higher) will be able to apply an entire library or individual property set to objects in 3D.

1. Start by select objects in 3D
2. Open the property panel and click **Add properties** from the properties panel menu

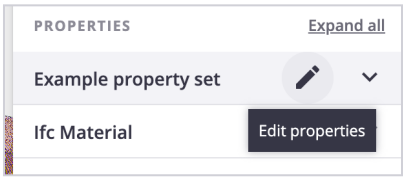



3. Select the property set(s) that you want to add and click **Done**
   **Note:** You can select an entire library or individual property sets

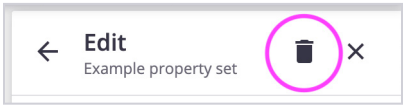


# Edit or Remove Property Sets

Property sets which can be edited will have an edit button. Click the **Edit properties** ( ) button to go into the Edit panel.

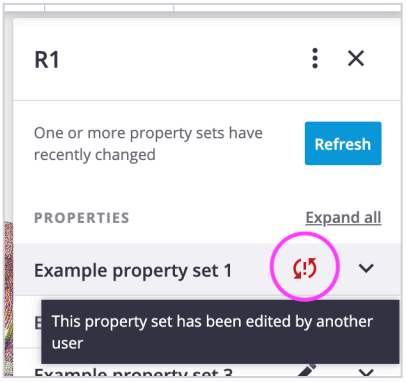


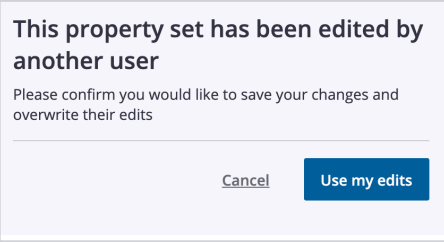

To remove a property set, click the **Trash** ( ) button from the Edit panel. A dialog will open asking you to confirm this action. Use caution, since all data associated with the property set will be permanently removed once you confirm to delete.




# Real-Time Updates

There are a few different times you will receive notifications in the application which indicate a change has been made to a property set.

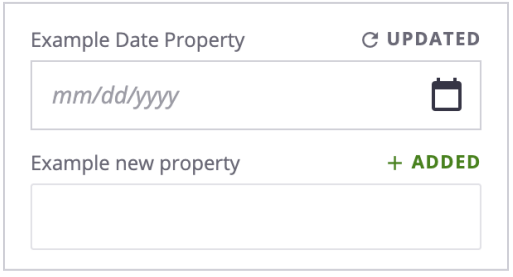
| LEVEL | DESCRIPTION |
|---|---|
| **Updates to a property value**<br><br>**Updates to a property set** | If another user has made changes to a property set you are looking at, like editing a property value, you will see a notification in the panel. Click the refresh button to see the latest data.<br>  |

| LEVEL | DESCRIPTION |
| --- | --- |
| **Addition of a property sets** | If another user adds more property sets to the objects you are looking at, you will see a notification in the panel. Click the refresh button to see the latest data. |
| **Removal of a property set** | If another user removes a property set from the objects you are looking at, you will see a notification in the panel. Click the refresh button to see the latest data. |
| **Multi-user edits** | If another user makes changes to the property set you are editing, upon saving your changes, you will be asked to confirm you would like to save your changes and overwrite their edits.<br>  |

# Versioning

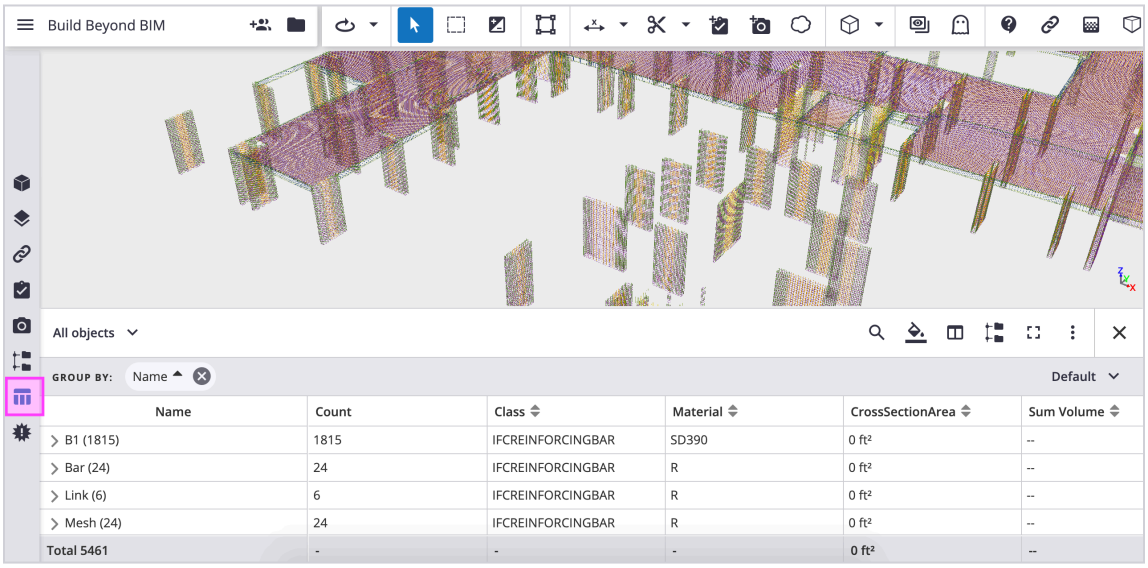
If a new version of a library has been published, you will be required to update to the latest version before you can edit a property set from that library.

Once you have updated to the latest version, you will see the new changes noted with labels next to the changed fields.



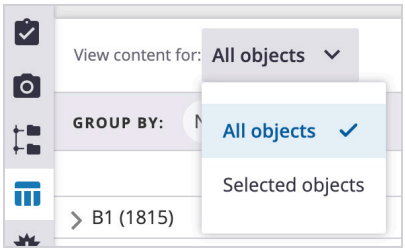
# Data Table

Use Data Table to display model properties, including the custom properties, in a grid view for reporting purposes. For example, Data Table allows grouping objects by different properties, configuring visible columns, seeing quantities and exporting to a spreadsheet in CSV format.

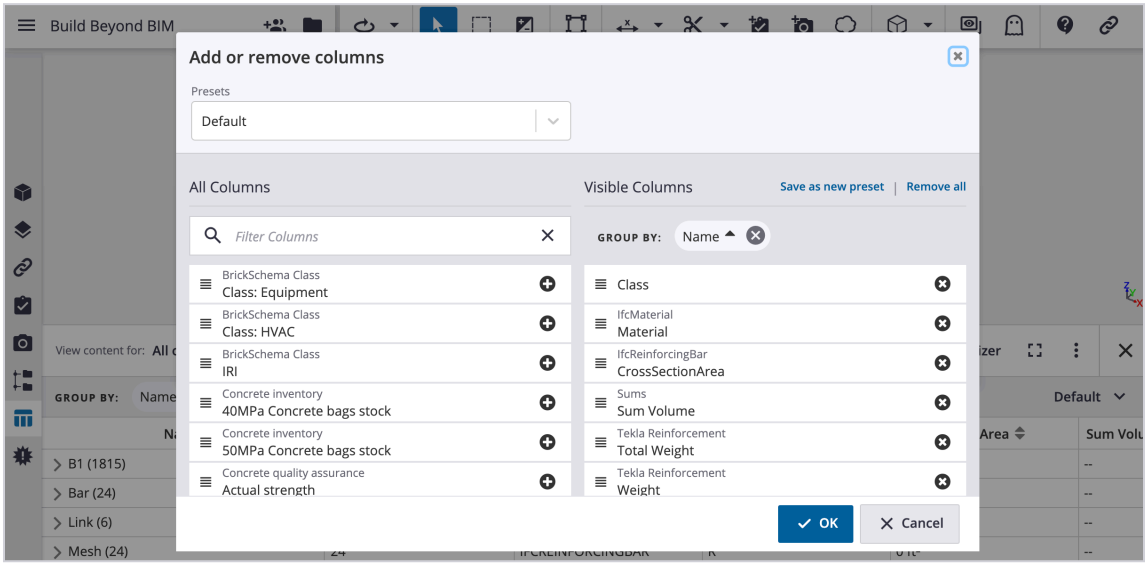



| Name | Count | Class | Material | CrossSectionArea | Sum Volume |
|---|---|---|---|---|---|
| B1 (1815) | 1815 | IFCREINFORCINGBAR | SD390 | 0 ft² | -- |
| Bar (24) | 24 | IFCREINFORCINGBAR | R | 0 ft² | -- |
| Link (6) | 6 | IFCREINFORCINGBAR | R | 0 ft² | -- |
| Mesh (24) | 24 | IFCREINFORCINGBAR | R | 0 ft² | -- |
| Total 5461 | - | - | - | 0 ft² | -- |

You can choose to view data for all objects in the model or for other the selected objects by toggling between those options in the View content for dropdown menu.

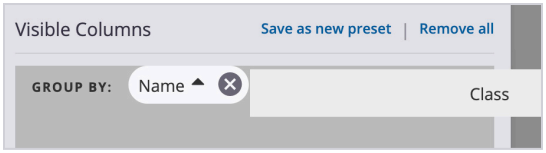


# Configuration

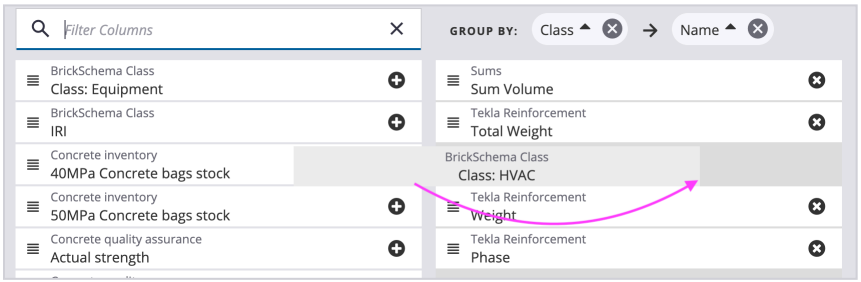



## Customize Columns

1. Open the Columns settings, click the **Columns** button.
2. You can change the order of how the properties are listed in the Data Table by clicking and dragging to a new position in the Visible Columns list.
3. Change the default grouping by dragging a list item into the **GROUP BY** section



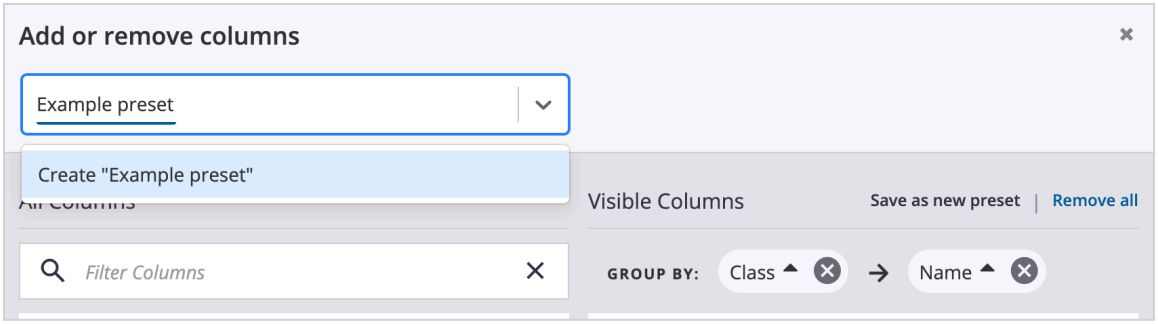

4. Remove properties by clicking the **button**
5. Add other properties to show in the Data Table by dragging a property from the All Columns section to the Visible Columns section



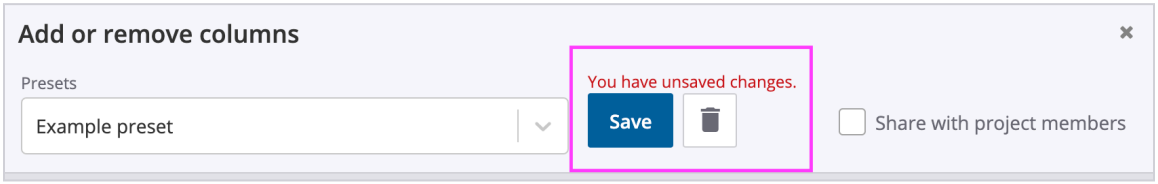
# Column Presets

If you need to frequently look at particular properties for a model, you can create a Preset from your column configuration.

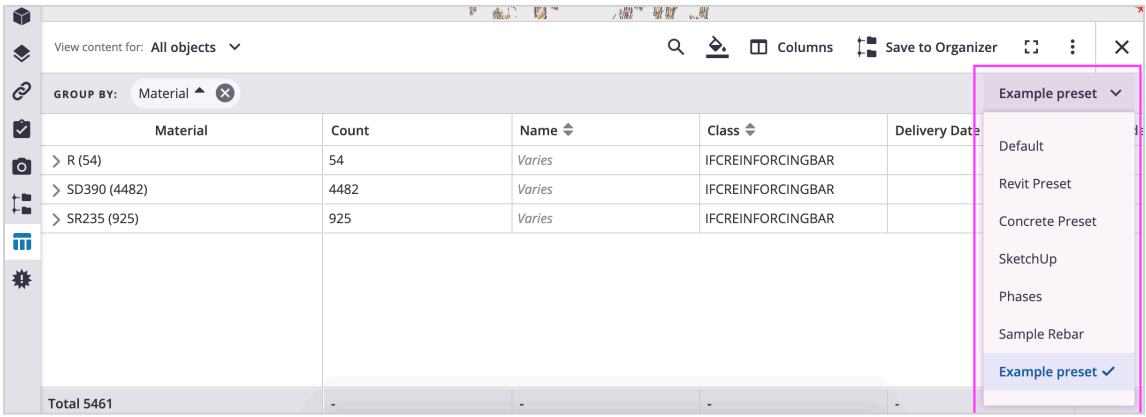
Start by creating the configuration you want. Then click **Save as new preset** where you will be required to name it. Hit the Enter key to confirm the name and save your preset.




If you need to update or make changes to one of your presets, simply make the necessary changes and then hit **Save**.

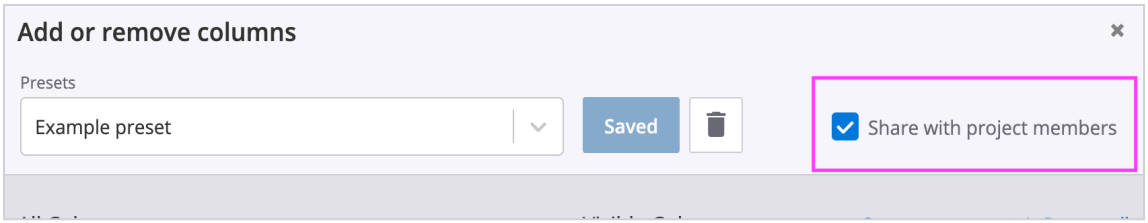



Now that you have defined presets, you can quickly change view in the data table by switching to a different preset.



### Sharing Presets

Easily create presets that can be used by others in the project by clicking the **Share with project members check-box**. The preset will now be visible to others in the project.



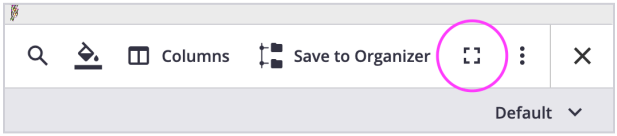

**Note**: Only the creator of the shared preset will be able to make changes to it.

# Table Functions

## Change the View Area

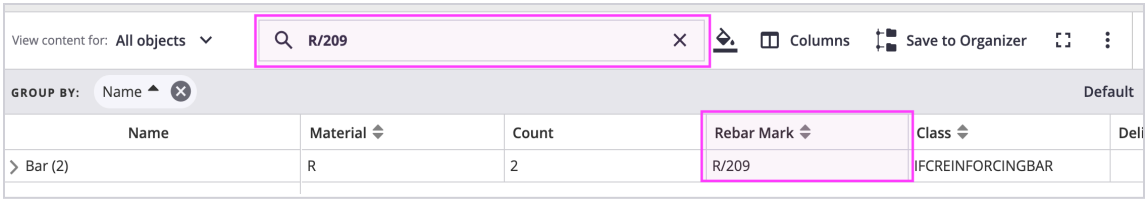
Hover over top of the Data Table where you will see the drag area indicator. Pull up or down to change the height of the table.

You can also use the full-screen mode button to extend the table to take up the entire height of the page.



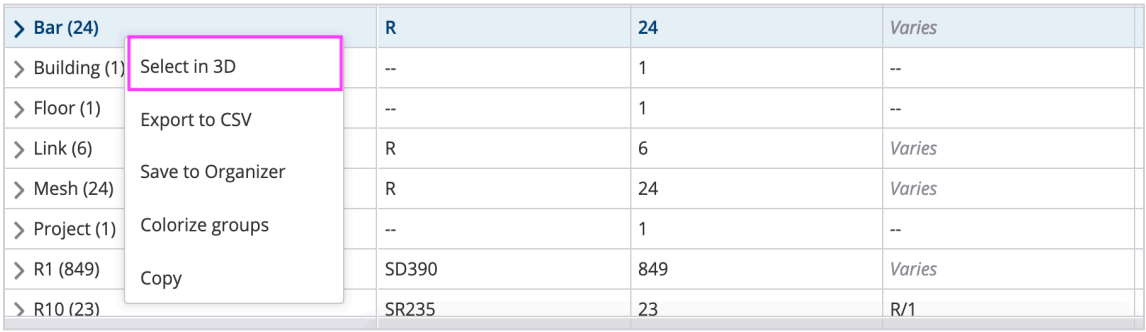

## Search for a Property Value

Use the search function to make queries against the visible data listed in the Data Table. This is a quick and easy way to search for rebar marks or any other property values that may be of interest to you.



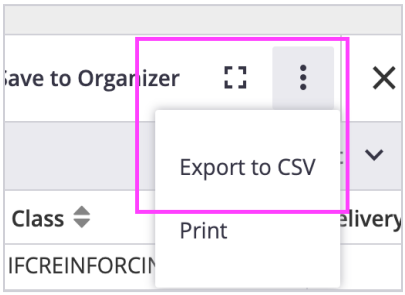

## Select in 3D

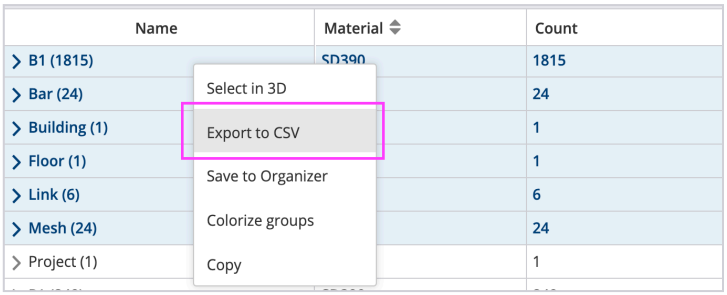
To select objects in the 3D Viewer, select a row and click with the right mouse button to open the context menu.




## Export to CSV

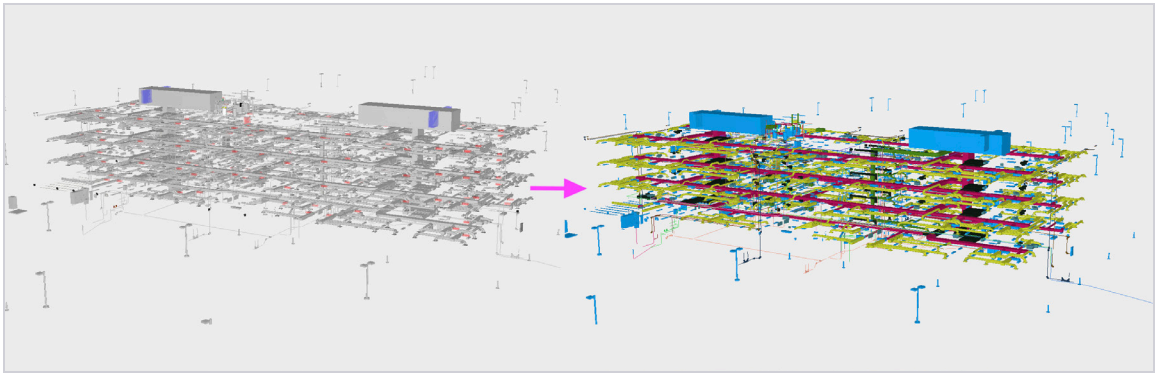
You can export the entire Data Table or just a few rows from the Data Table by clicking **Export to CSV** from the Data Table menu or by selecting the desired rows and right clicking to open the context menu.

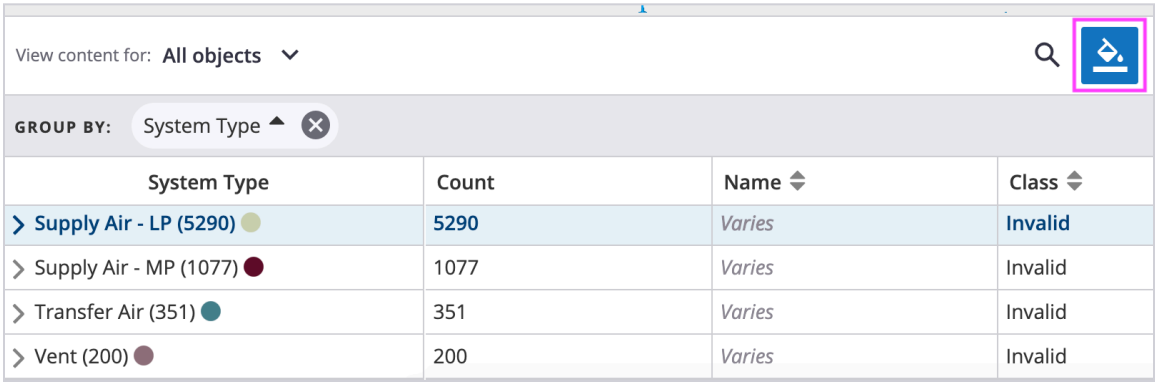



## Colorize

Click **Colorize** button to automatically colorize objects in 3D according to Data Table rows. This can be very useful for models that may have many objects that are the same color.



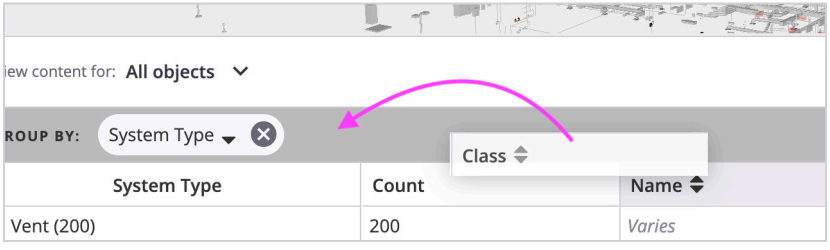



| System Type | Count | Name | Class |
|---|---|---|---|
| Supply Air - LP (5290) | 5290 | *Varies* | Invalid |
| Supply Air - MP (1077) | 1077 | *Varies* | Invalid |
| Transfer Air (351) | 351 | *Varies* | Invalid |
| Vent (200) | 200 | *Varies* | Invalid |

# Create Custom Breakdown Structures

## Grouping Elements

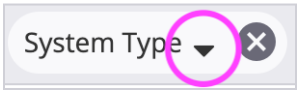
Drag & drop column names to the Group by area on top of the table to create different groupings. In the example below, objects have been first grouped by class, then by material.




| System Type | Count | Name |
|---|---|---|
| Vent (200) | 200 | *Varies* |

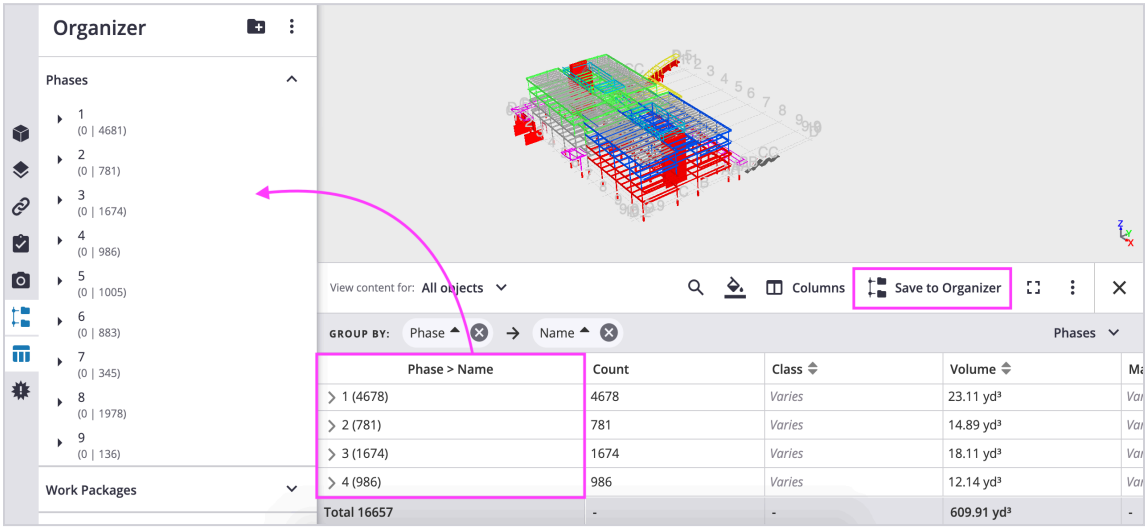
### Quick Tip

You can change the sort order of the group by clicking the arrow button.

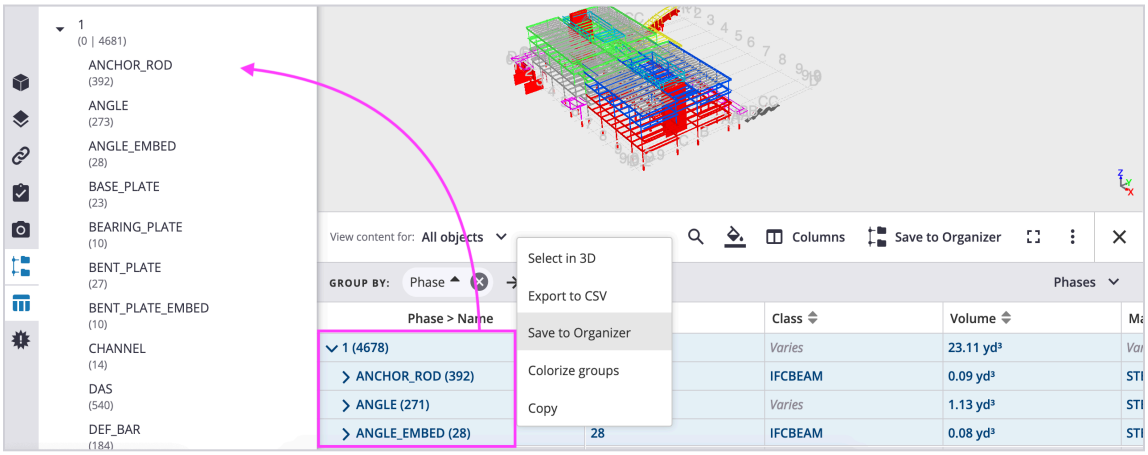


# Saving the Breakdown Structure

With the custom grouping the way you want it, you can quickly save that breakdown structure to Organizer with the click of a button. With the breakdown structure saved in Organizer, you can add custom properties to that group, make cross sections and so much more!



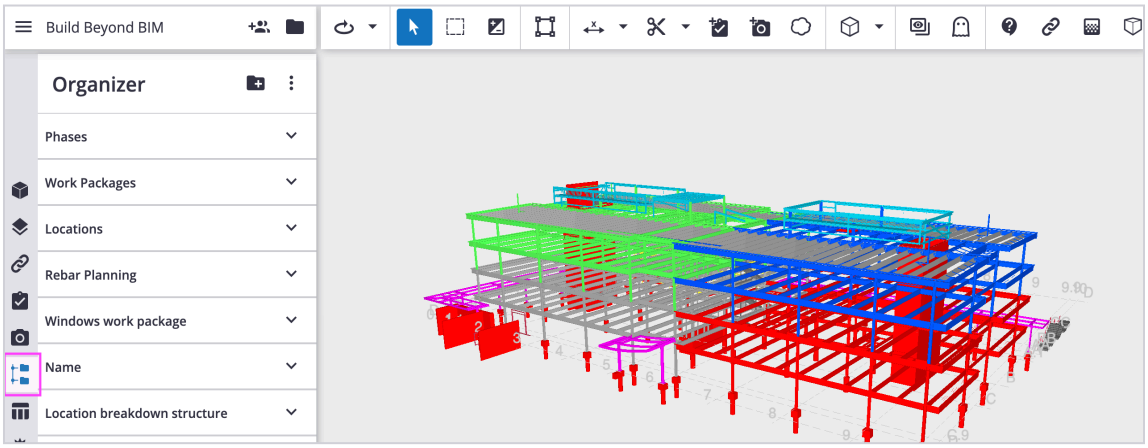

## Save a Selection to Organizer




1. Select one or more rows in the Data Table table by holding down the Ctrl button and clicking rows with the mouse.
2. Click **Save to Organizer** button or the context menu item
3. A new Organizer group will be created with the same content as in the selected rows.

# Organizer

Use Organizer to group objects together as you wish.

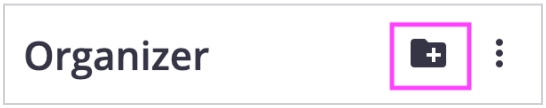



**For example, create groups by**

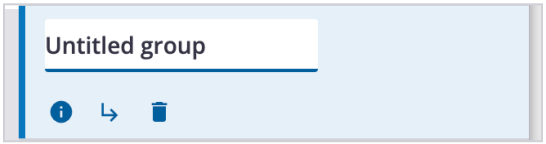
- Location (floors, sections)
- Phases
- Object type (cast in place, steel assemblies)
- Work Breakdown Structures / Work Packages
- Cost units
- Bill of Quantities

## Create Custom Groups

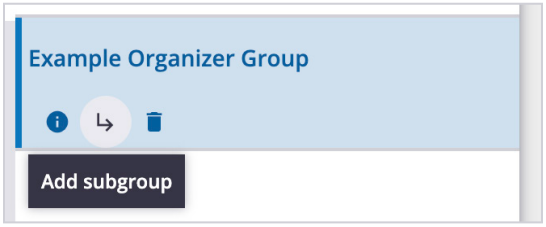
1. Start by clicking **Add new group (📁+)**




2. Click on the name to edit



3. Add subgroups by clicking Add subgroup



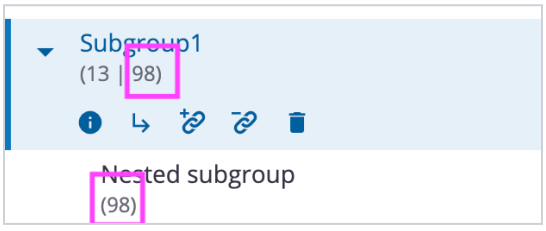

**Note**: Subgroups can be created under other subgroups too.

4. You can link the objects that are currently selected in 3D to the group by clicking **Link objects**

### Quick Tip

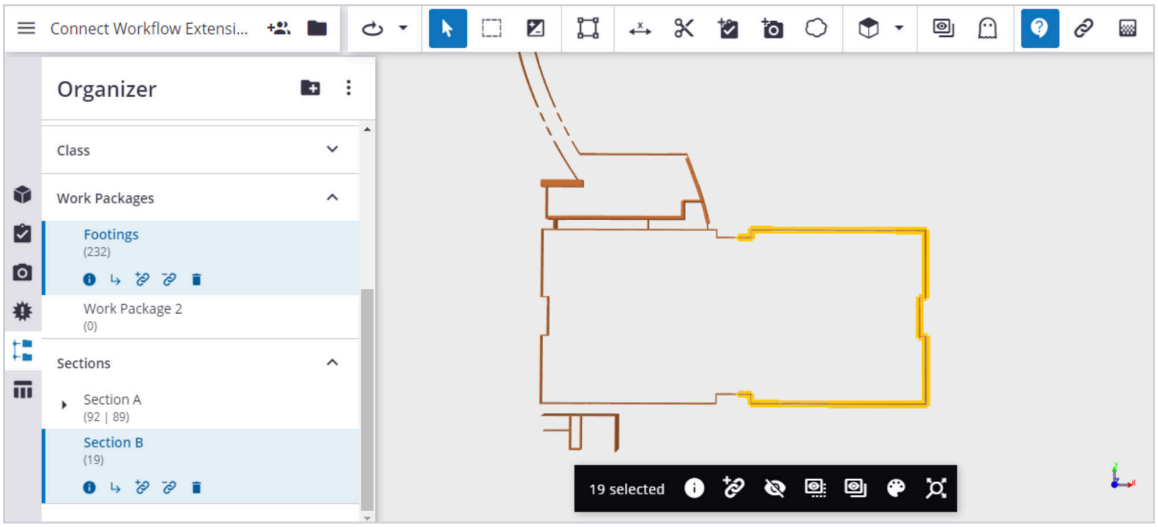
The numbers in parentheses under the group name indicate how many objects have been linked to the group and its subgroups. The first number is the total number of linked objects in the group.

The second number is the total number of linked objects in nested groups.



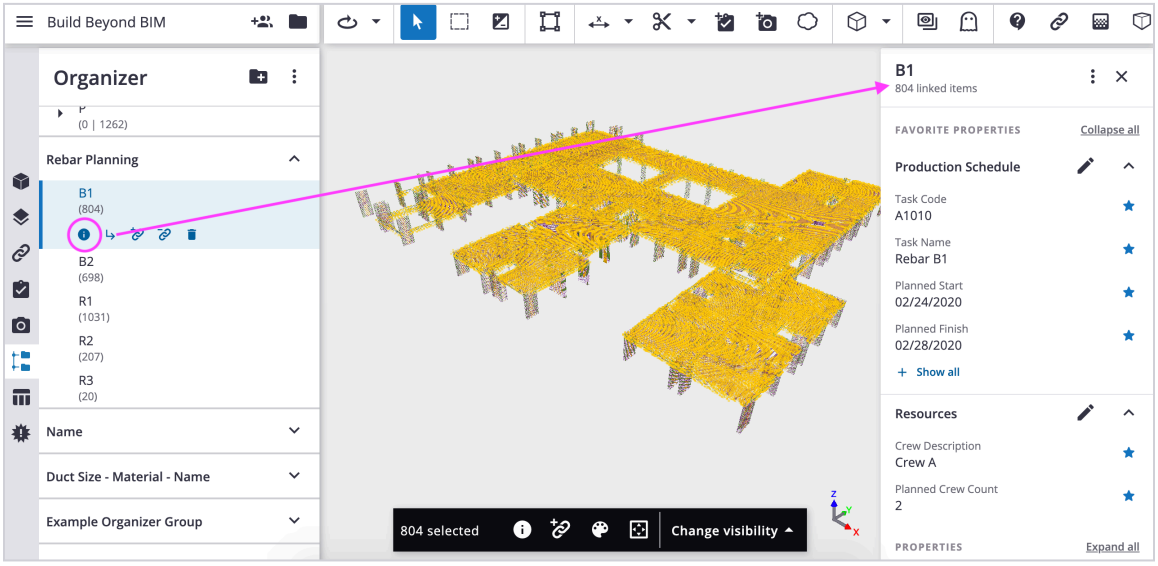
# Intersections

Create intersections of multiple groups by selecting more than one group while holding down the **CTRL** key. For example, by selecting the groups “Footings” and “Section B” the user highlighted all footings in the section B of the building.



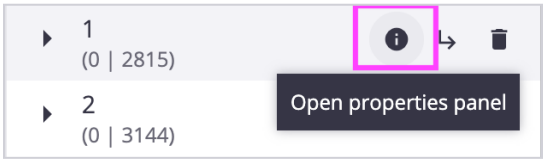

# Adding Property Sets to Organizer Groups

There may be cases where adding custom property sets make more sense to be applied to an Organizer group, rather than to the objects linked to that group. For example, adding a custom property set for a production schedule. By adding the property set to the group, it allows you to be able to link objects freely without needing to continuously change the object’s properties.

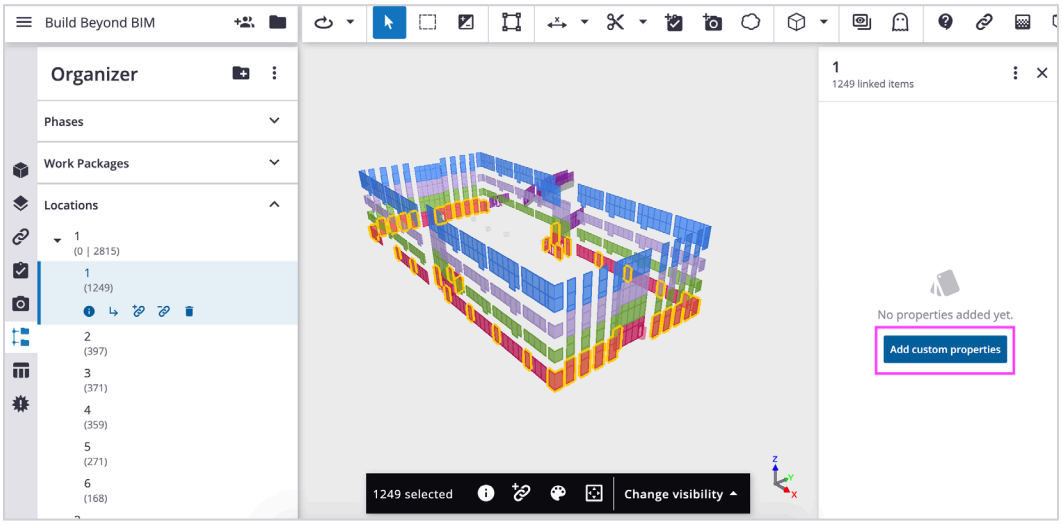


**To add properties to a group:**

1. Click the **Open properties panel** button in the Organizer group




2. In the properties panel, click **Add custom properties**




3. Select property set(s) that you want to add and click **Done**

   **Note:** The selected properties are now added to the Organizer group and not to the model objects. You can access this property set only from the Organizer group's Open properties panel icon.

# Organizer Access Control

### Who can see and edit the groups that I created?

All users in the project can see the groups that you create. The table below illustrates which users in the project can edit property sets and organizer groups.

| ACTION | PROJECT ADMIN + BP LICENSE | PROJECT USER + BP LICENSE | PROJECT USER + BUSINESS OR PERSONAL |
|---|---|---|---|
| Manage Property Set Libraries and Definitions | ✓ | ✗ | ✗ |
| Add property sets to objects in the 3D Viewer[1] | ✓ | ✓ | ✗ |
| Edit properties[2] | ✓ | ✓ | ✗ |
| View properties[3] | ✓ | ✓ | ✓ |
| Create Organizer groups | ✓ | ✓ | ✗ |
| Edit Organizer groups | ✓ | ✓[4] | ✗ |
| Link objects to Organizer group | ✓ | ✓[5] | ✗ |
| View Organizer groups | ✓ | ✓ | ✗ |

1 Depending on the library access control policy defined in the Property Set Manager
2 Depending on the library access control policy defined in the Property Set Manager
3 Depending on the library access control policy defined in the Property Set Manager
4 Users can only edit Organizer groups from other users in their organization
5 Users can only edit Organizer groups from other users in their organization

# Known Limitations

| CATEGORY | TITLE | DESCRIPTION |
|---|---|---|
| **Workflow Extensions** | Limited availability | The workflow extensions are only available and can be used in the 3D Viewer Web Application |
| **Property Sets** | Reordering property sets & properties | It is not possible at this time to change the order of the property sets or individual properties. They will be ordered in the order they were created. |
| **Property Sets** | Merging changes in the Property Set Library | It is not possible to merge changes made from two users editing a library at the same time. |
| **Data Table** | No mobile support | The Data Table is not available on mobile devices. It can be used on the web for Tablet and larger devices. |
| **Data Table** | Assembly selection | If Assembly selection mode is turned on, no data will be shown in the table |
| **Data Table** | Multi-selection limitations | SHIFT + Click is not supported for selection multiple rows in succession |
| **Organizer** | Automatic loading of models | Currently clicking on an Organizer group does not automatically load the corresponding model(s) that have objects linked to it. |

# For Developers

## Property Set API

Other applications can read / write Property Sets from / to the Trimble Connect project via API integration. See the **Trimble Connect Property Set API**.

## Organizer API

Other applications can read / write Organizer groups from / to the Connect project via API integration. See the **Trimble Connect Organizer API**.

# Resources & Training Material

For more Trimble Connect User Guides and other useful information, click on any of the links below.

## Specifications

**Applications Feature Comparison**

**Application Settings**

**Supported File Formats**

**Supported Languages**

**Support Policy**

**System Requirements**

**Understanding Connect Licensing**

**Understanding Project Types & Features**

## User Guides

**Account Administration Dashboard User Guide**

**Connect for Browser User Guide**

Connect for Browser 2D Viewer User Guide — ***Coming Soon!***

Connect for Browser 3D Viewer User Guide — ***Coming Soon!***

**Connect for Windows User Guide**

**Connect for Mobile User Guide**

**Connect Sync User Guide**