



# usBIM.checker

## User Manual




Ed.	1
Rev.	1
Date	12/07/2022

## INDEX

1	usBIM.checker .....	3
1.1	CREATING A NEW USBIM.CLASH DOCUMENT .....	3
1.2	CREATING A GROUP .....	5
1.3	READING RESULTS .....	8
1.4	REPORT EXPORT.....	10

## TABLE OF FIGURES

Figure 1.	New Document .....	3
Figure 2.	Creating a new usBIM.checker document.....	4
Figure 3.	Forms for model federation .....	4
Figure 4.	Creating a group.....	5
Figure 5.	Manage Filters and Controls .....	6
Figure 6.	Object selection filters.....	7
Figure 7.	Property Checks .....	8
Figure 8.	Reading the verification .....	9
Figure 9.	Verification results .....	10
Figure 10.	Report Export .....	10

	<b>usBIM.checker – User Manual</b>	Ed. <b>1</b>
		Rev. <b>1</b>
	Date <b>12/07/2022</b>	

# 1 usBIM.checker

It is a service for checking files in openBIM IFC format and serves to check and validate all the data of the BIM model with respect to the project or tender requirements. Verifying an IFC model implies having to analyse the properties of the various entities and ensure that they meet certain technical requirements in a timely manner.

The verification operations, thanks to usBIM.checker, are simpler and less complex than the same operations carried out with BIM authoring software. Special filter functions and conditions allow you to better define the properties of an IFC file, properties that can be enriched by importing into usBIM.checker also data from different BIM Authoring and Tools programs: the result will therefore be an IFC model complete with all the information and quality.

The result can be replicated thanks to the template that usBIM.checker allows you to export in order to make it reusable on other projects using the same selection and control filters on the various IFC models.

## 1.1 Creating a new usBIM.clash document

A new usBIM.clash document can be created by all users who have Edit permission on the folder.

To create a Checker document, you need to click the “New Document” button (arrow 1 Figure 1)

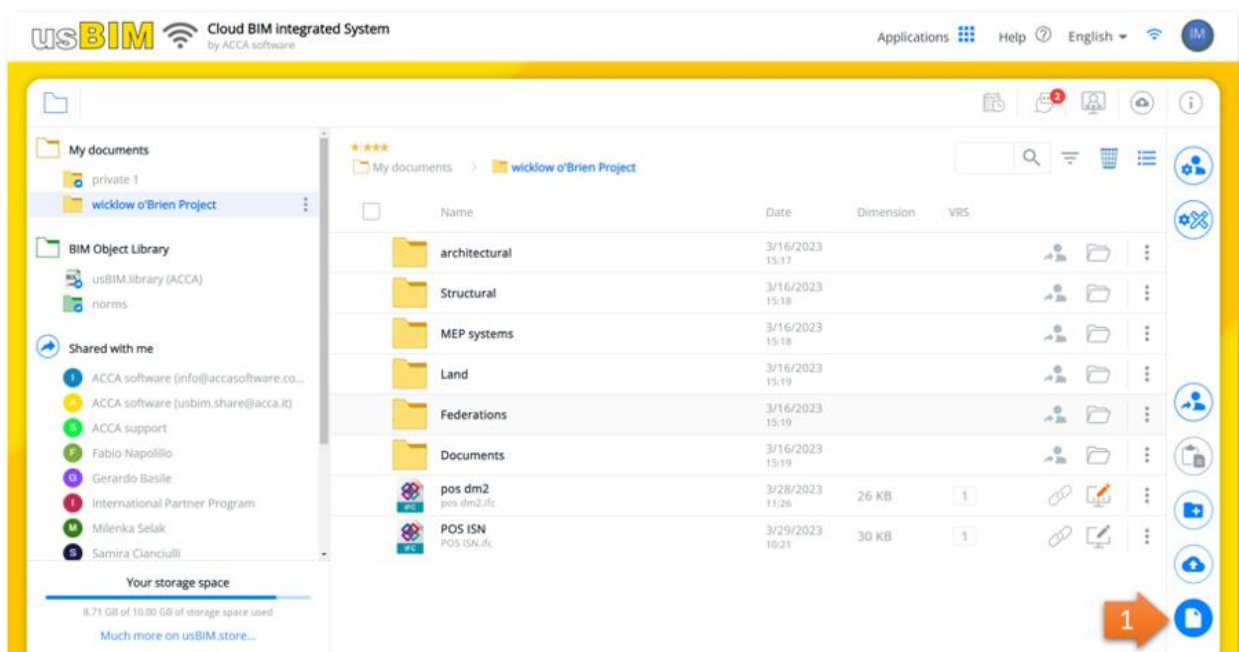



Figure 1. New Document

	<b>usBIM.checker – User Manual</b>	Ed. <b>1</b>
		Rev. <b>1</b>
	Date <b>12/07/2022</b>	

After clicking on the button, the modal window shown in will open Figure 2, in which you can select the Clash Detection item of usBIM.clash (arrow 1 Figure 2); it is mandatory to indicate the Name of the file and it is possible to differentiate the Title (Arrow 2 and Arrow 3 Figure 2) as described in the paragraph.

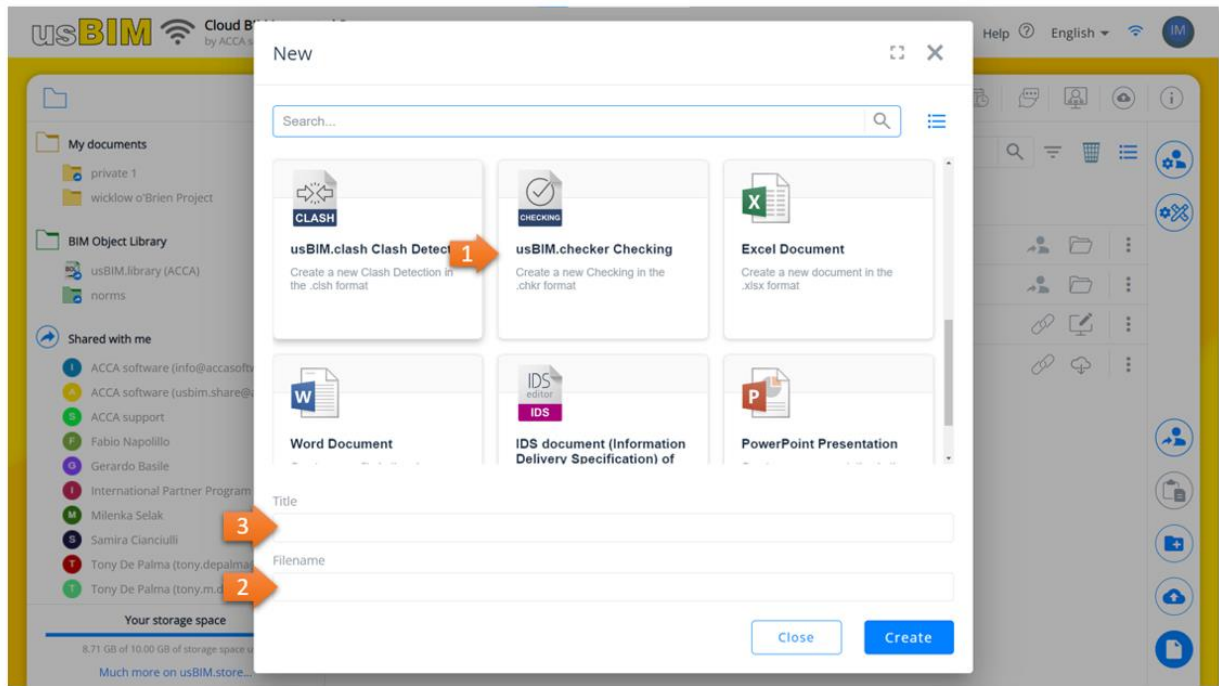


Figure 2. Creating a new usBIM.checker document

To confirm the operation, simply click on the "Create" button.

In the new modal that opens (Figure 3), you can enter a Model or a federation of models.

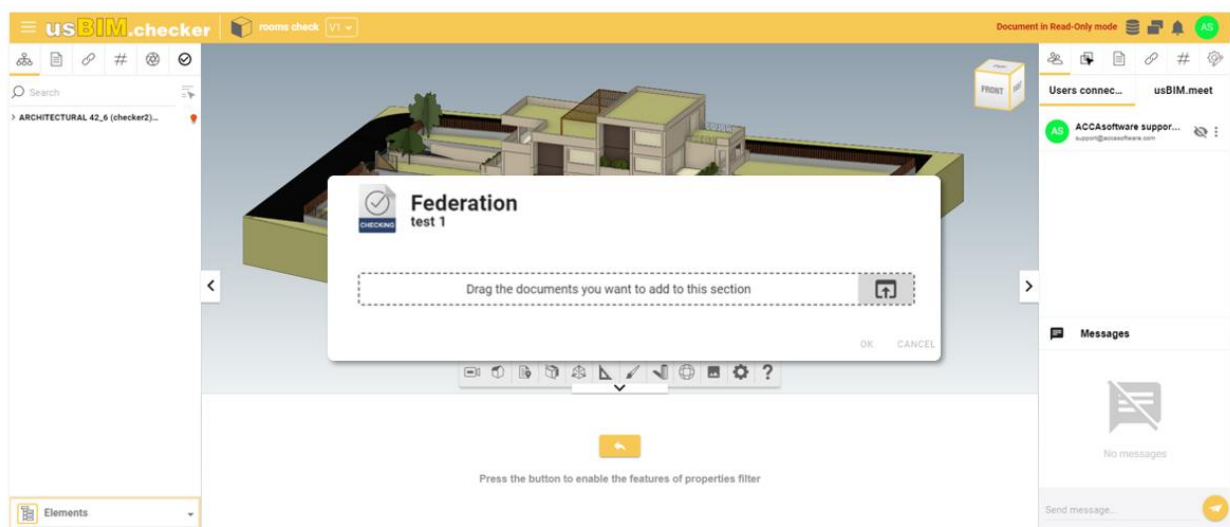


Figure 3. Forms for model federation

## 1.2 Creating a group

After having federated the various models, to create a group it is necessary to click on the "Check Filter" icon (arrow 1 Figure 4), select the "+" button (arrow 2 Figure 4) and, as required in the new modal, enter the "Group Name" (arrow 3 Figure 4).

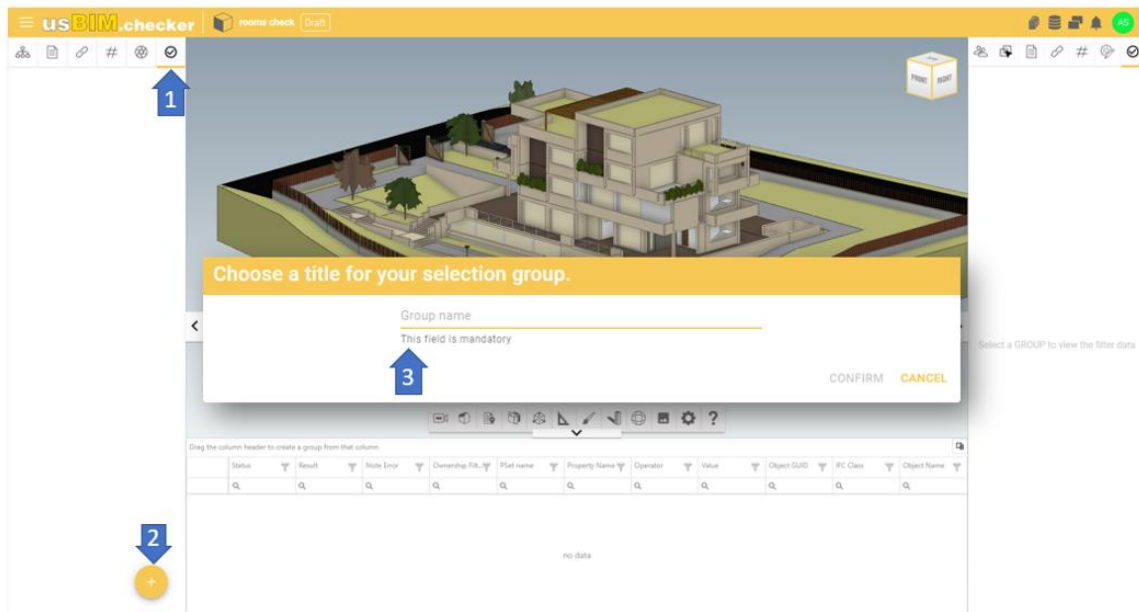


Figure 4. Creating a group

The new modal is divided into four sections:

- Requirements List: allows you to set the number of actions to be taken on the models to be verified. You can add more checks to the list of requirements by clicking the "+" button (arrow 2 Figure 5). You can import/export models lists (arrow 3 Figure 5). The checks can be selected/deselected so as to leave the user free to choose in the different scenarios. The checks can be selected/deselected so as to leave freedom of choice to the user in the different scenarios, in the case in which multiple checks are selected, the logical operator AND comes into play (implies the satisfaction of both propositions)
- Object Selection Filters: Allows the user to set the filter criteria for the objects of the models to be tested. The selection criterion within usBIM.clash allows you to create capillary selection logics.

You can characterize selection filters by using the OR logical operator (satisfying at least one of the two operations) - (arrow 4 Figure 5)

- Property Controls: Defines the list of Pset and expected properties in terms of presence, compared to the object selection set.
- Templates included in selections: (arrow 5 Figure 5) You can indicate which templates to apply the configured filtering to.

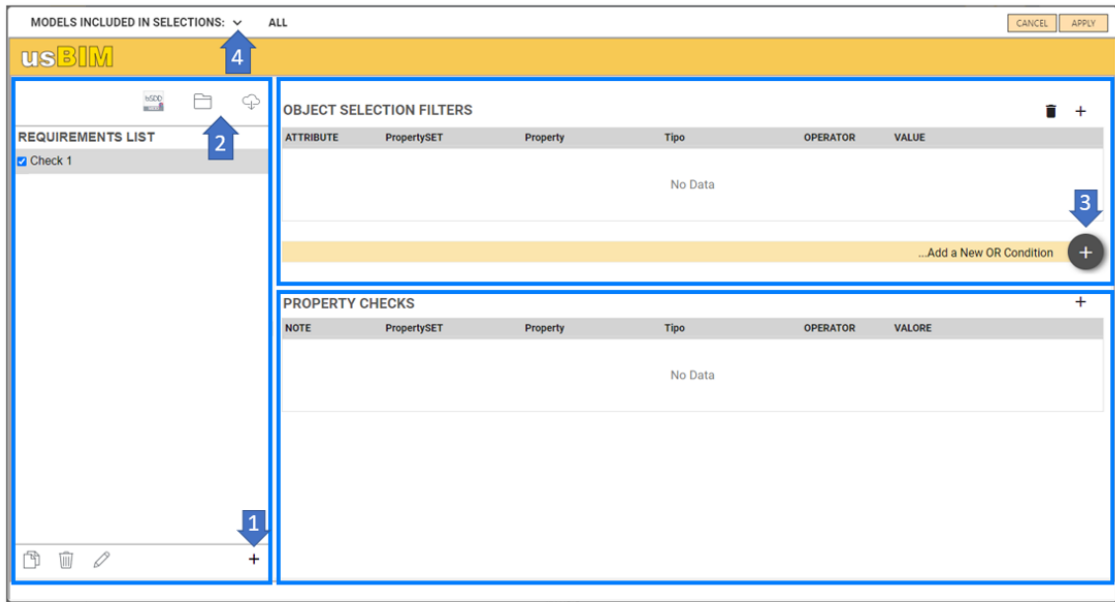



Figure 5. Manage Filters and Controls

Clicking on the "Add row" icon (arrow 1 Figure 6) will open a new window, in which you can detail the selection filter. In particular, you can filter by using the attributes (arrow 2 Figure 6):

- IfcProperty: is an IFC data schema entity that generalizes the concept of properties that can be associated with a model object.
- IfcClass: Defines the class of homogeneous products within an IFC model, such as IfcWall, IfcWindow, etc.
- IfcGlobalID: consists of a 22-character alphanumeric string, used to uniquely identify an object within an IFC model;
- IfcClassification: is used to qualify entities within a specific category based on a specific purpose or common characteristics;
- IfcEntityName: attribute associated with each object that shows the name used by the software that creates the object or set by the user;
- IfcEntityDescription: attribute associated with each object that reports the description provided to exchange additional information;
- IfcObjectType: This attribute finds a particular type that specifies the object in detail. The use of this attribute is expected for the object;
- IfcTypeName: attribute associated with each IfcTypeObject that shows the name used by the software that creates the type or characterized by the user;

	<b>usBIM.checker – User Manual</b>	Ed. <b>1</b>
		Rev. <b>1</b>
	Date <b>12/07/2022</b>	

- IfcPredefinedType: This attribute finds a particular type that specifies the object in detail. The use of this attribute is expected for the IfcTypeObject entity and is defined from a list of values provided by different standards for each IfcClass;
- IfcBuildingStorey: corresponds to the floor/level concept of a building. It is usually related in a hierarchical way to all objects belonging to the specific plan;
- IfcGroup: Corresponds to a logical, non-hierarchical collection of objects. A group is an aggregation of objects of a non-geometric/topological nature. It can include construction products, processes, controls, resources or even other groups;
- IfcZone: represents a non-hierarchical aggregation of spaces/compartments or other zones. It is intended as a subtype of the IfcGroup entity;
- IfcSystem: represents a non-hierarchical collection of construction products functional to offer a service within a work.

You must also fill in the fields:

- Operator: allows you to choose between different operators both mathematical and textual that allow you to structure the selection in an appropriate way;
- Value: is the field within which the expected value must be indicated.

Now click on confirmation (arrow 3 Figure 6Figure 6)

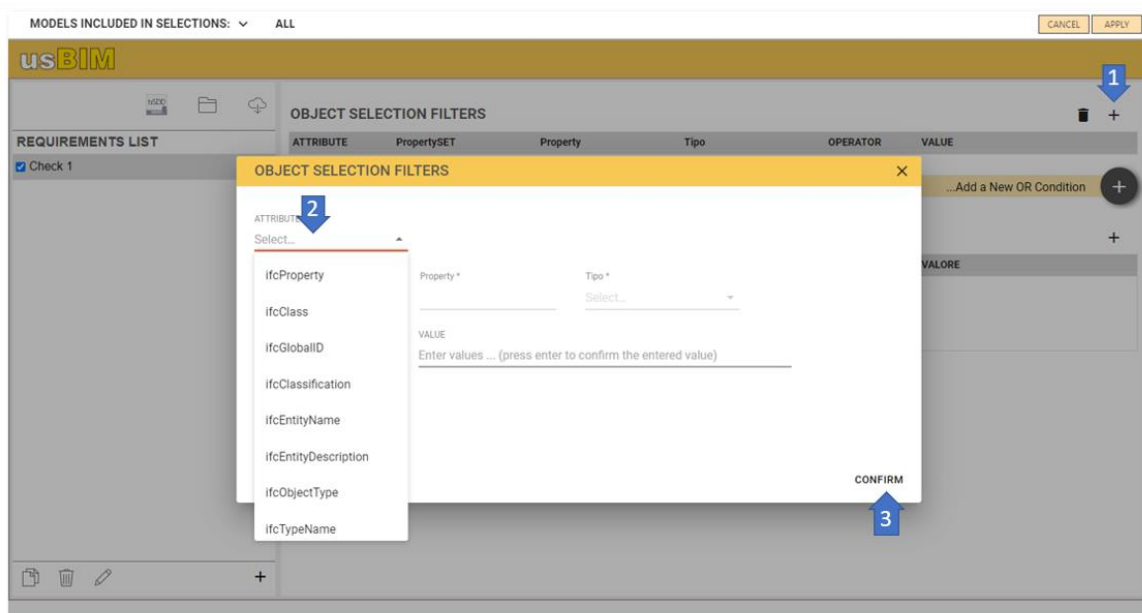



Figure 6. Object selection filters

Clicking on the "Add row" icon (arrow 1 Figure 7) will open a new window useful for setting the property controls. In particular, it is mandatory to enter:

- **Note:** describes the verification to be carried out.

	<b>usBIM.checker – User Manual</b>	Ed. <b>1</b>
		Rev. <b>1</b>
	Date <b>12/07/2022</b>	

- **PropertySET:** requires the insertion of the group to which the property on which you want to verify should belong
- **Property:** requires you to enter the expected name for the property you want to verify
- **Type:** Indicates the type of data expected for that specific property:
  - IfcText: alphanumeric string of characters
  - IfcLabel: alphanumeric label that refers to a specific object. Value field is limited to 255 characters
  - IfcIdentifier: Identifier field for a specific object. Value field is limited to 255 characters
  - IfcInteger: Matches the integer domain
  - IfcReal: corresponds to all rational, irrational and scientific numbers
  - IfcBoolean: Can be True or False
  - IfcLogical: Can be True, False, or Unknown
- **Operator:** allows you to choose between different operators both mathematical and textual that allow you to articulate the verification rule.
- **Value:** Expected value based on the rule you set.

After having completed all the fields, click on "Confirm" (arrow 2 Figure 7).

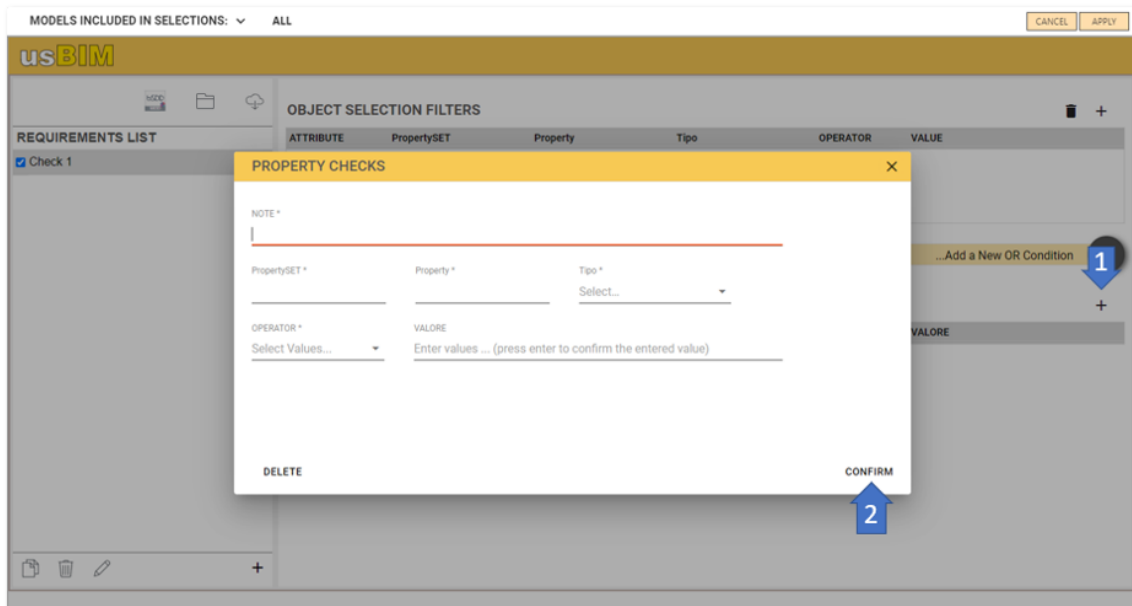


Figure 7. PROPERTY CHECKS

To start the verification, click on "Apply".

### 1.3 Reading results

In the tab on the right (arrow 1 Figure 8) you can view a report of the test results, specifically:



- scanned objects (indicates the number of objects that have been scanned)
- total objects (indicates the number of objects in the model)
- unverified checks (indicates the number of properties of objects that have not been verified)
- verified checks (indicates the number of properties of the objects that have been verified)
- properties not found (indicates the number of properties that were not found in the objects)

*Example: If the results of the verification of the checks (not verified, verified and properties not found) are all equal to 0, it means that the selection of filters has not been successful, in particular there are no objects that meet those conditions.*

In addition, in the "Selection" section (arrow 2 Figure 8) you can read the same information mentioned above regarding only the selected objects. In the central panel (arrow 3 Figure 8) there is a list of all the checks carried out with the relative results. Using the "Filter Columns" (arrow 4 Figure 8) you can rearrange the report table by dragging a column into the pane to hide it.

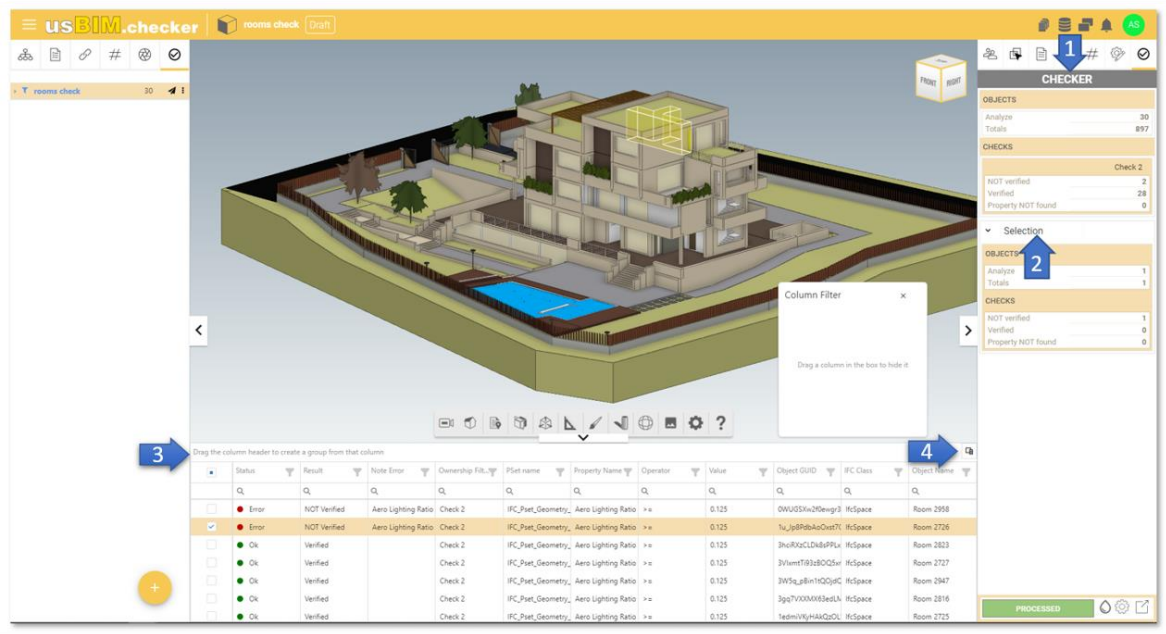


Figure 8. Reading the verification

By clicking on the "Colours" icon (arrow 1 Figure 9) you can select and display the objects in different colors, depending on the status of the verification carried out.



Figure 9. Verification results

## 1.4 Report Export

After completing the Checker verification, you can export the result. By clicking on the "Export Data" icon (arrow 1 Figure 10) you have the possibility to export it in three formats: CSV, BCF and EXCEL.

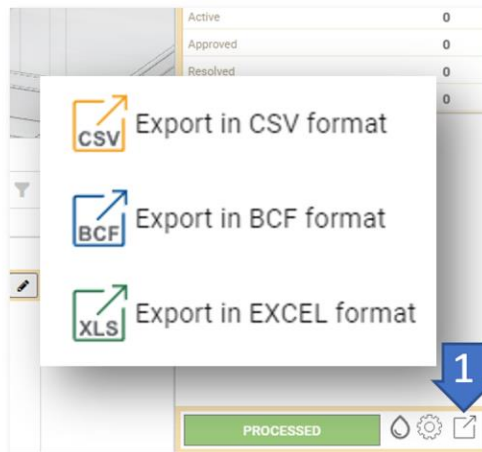


Figure 10. Report Export