A GUIDE TO THE DATA MANAGER IN VECTORWORKS

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INTRODUCTION

The Data Manager is an all-encompassing management system that puts all data management capabilities in one place. With this tool you can define data mappings and create data sheets from the same dialog.

When creating advanced building information models, there is a large amount of critical data that needs to be managed throughout the design process. The Data Manager provides you better access and control of the data output of a model. It will provide a consistent way to manage data in Vectorworks and give you the flexibility to create your own workflow based on your needs, requirements, and processes.

NEW TERMINOLOGY

DATA SET

A collection of data fields. In Vectorworks, data fields come from various places that include:

- Plugin Object Parameters: These are parameters found within the tool itself, e.g. a Door object's height, width, configuration, label, etc.
- Record Format: These are user-defined and can be used for customized data, e.g. user-defined field data.
- IFC property sets (or IFC data): e.g. ifcEntities (ifcWall, ifcDoor, etc.), ifcPSets (standard and custom).

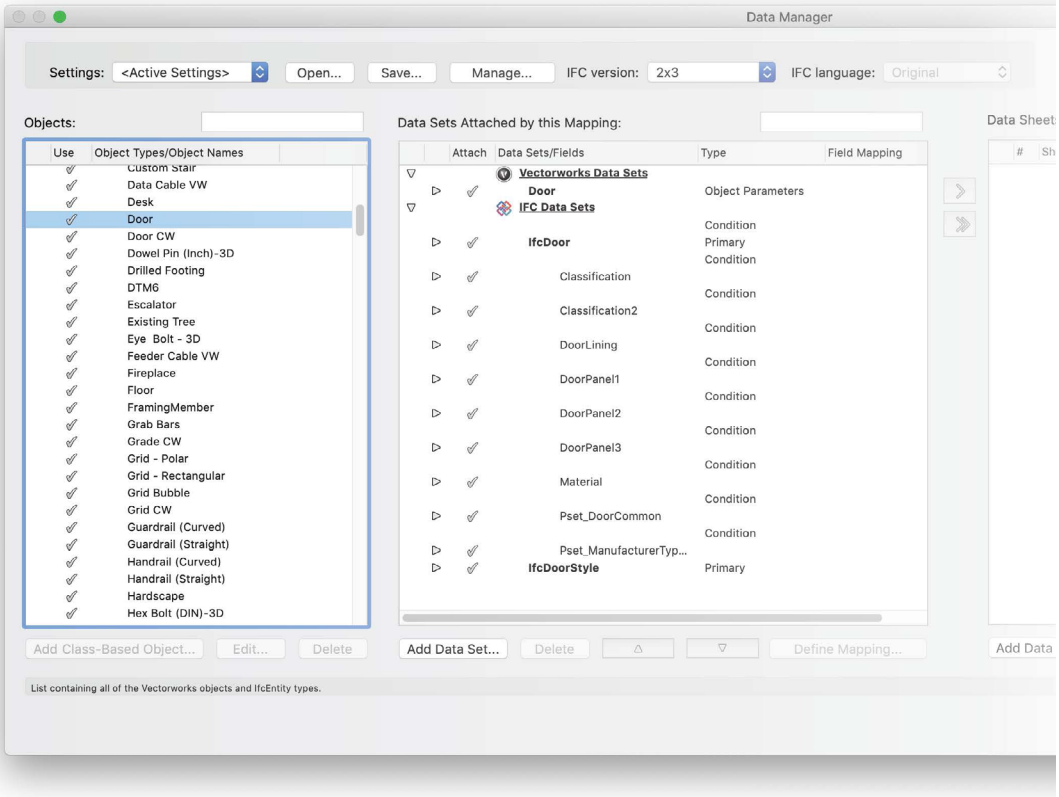

FIGURE 1: An example of a typical Door Object Data Set

NEW TERMINOLOGY (CONT'D)

DATA SHEET

A user-defined selection of data sets displayed in the Data pane of the Object Info palette (OIP). Think of this as a simplified way to see a specific set of data fields in the OIP in one place. Data Sheets can be comprised of data from any Data Set — so you can mix and match PIO parameters, IFC Data, and data from Record Formats.

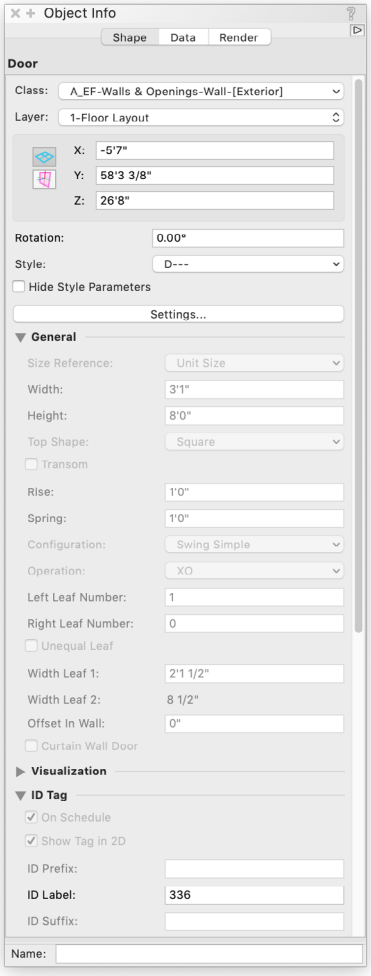

FIGURE 2: Data fields of a Door object in the Shape pane of the Object Info palette

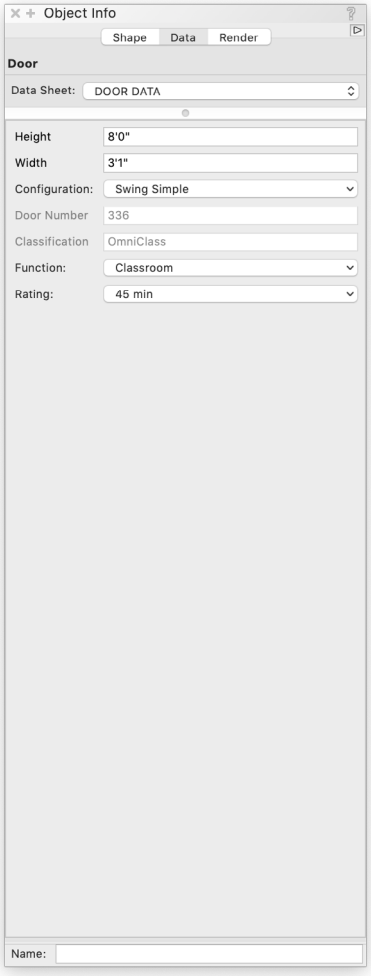

FIGURE 3: Data Sheet example of a Door object in the Data pane of the Object Info palette

WHY SHOULD YOU USE THE DATA MANAGER?

The Data Manager helps simplify the process of attaching data to an object and verifying that correct and applicable data of an object is present. This means that the Data Manager will:

- Provide a more efficient way to ensure the model's data are properly transferred to your collaborators in a BIM workflow.
- Streamline how you can assign sets of data to modeled building elements such as plugin objects and hybrid symbols.
- Streamline how you can apply custom records to objects.

  Note: in previous versions, applying custom records could be achieved manually for each individual object or by manually attaching the record to a resource within the resource manager.

- Let you automatically apply sets of data to objects pertaining to a Class.
- Allow you to rename default parameters in a Data Set to coincide with office standards in a Data Sheet (especially useful for IFC parameters).
- Provide a way for managers to ensure the data are accurate and meet the project requirements by:
  i. Querying data fields from Data Sheets into a Worksheet.
  ii. Using field validation to ensure the information is in a specified range of values or has a set default value.
  iii. Creating Data Sheets corresponding to the required information for each phase of a project (BIM LODs or traditional design phases).

This feature will benefit any office that is working with a "Big BIM" workflow. But it is expected that larger firms working on large projects will benefit the most from this feature as it gives the BIM or project managers ways to verify and control the output of data for external collaborators.

WHY SHOULD YOU USE THE DATA MANAGER? (CONT'D)

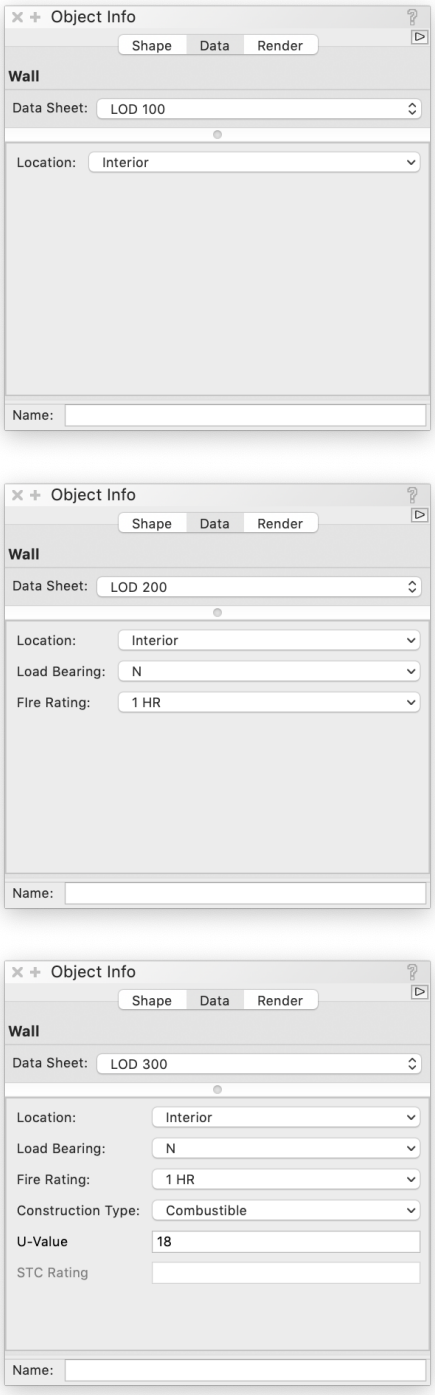

FIGURE 4: Example of Data Sheets for BIM LOD 100, 200, 300.

HOW TO USE THE DATA MANAGER

The Data Manager can be accessed from the Tools drop-down menu.

The Data Manager has the following organization:

- **Settings** (the upper part of the dialog) is for saving and managing data mapping sets.
- **Objects** (the left window pane) is where you find and select the object for the mapping you want to create: Class, Symbol or Plugin Objects.
- **Data Set** (the middle window pane) is where you can manage (change, add, delete) the data mapping of the selected object.
- **Data Sheets** (the right window pane) is where you create data sheets based on the data sets mapped to the selected object.

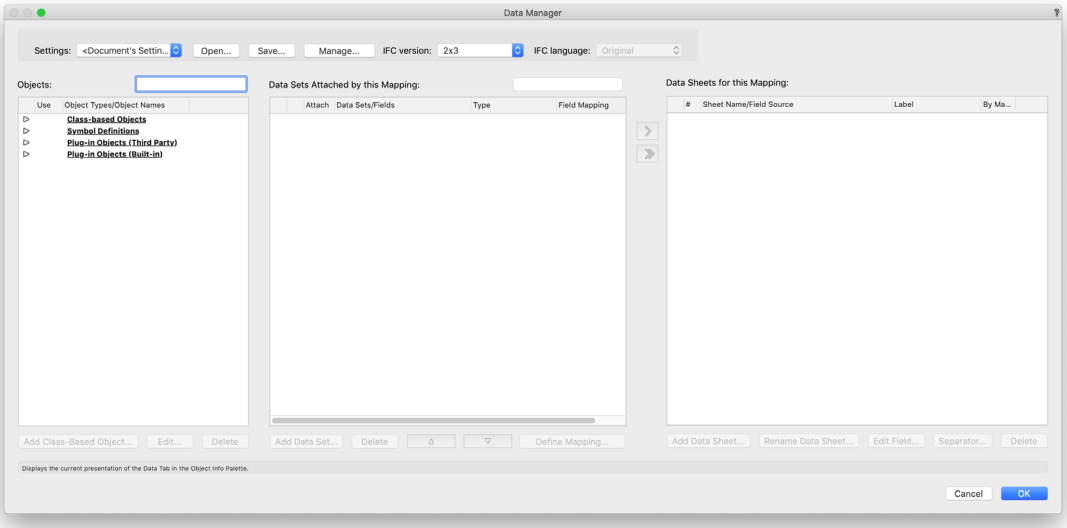

FIGURE 5: Data Manager dialog

HOW TO USE THE DATA MANAGER (CONT'D)

Each plugin object has a defined data set including object parameters and IFC property sets (ifcPSets) — see figure 1. This is called the default data mapping. The default data mapping is always active until you modify or create a new mapping.

> Vectorworks default mapping consists of the typical data necessary to successfully export a model when working in an open BIM collaboration workflow.

In addition to the default data sets described above, you can add custom data to any plugin object and any symbol resources contained in the active file.

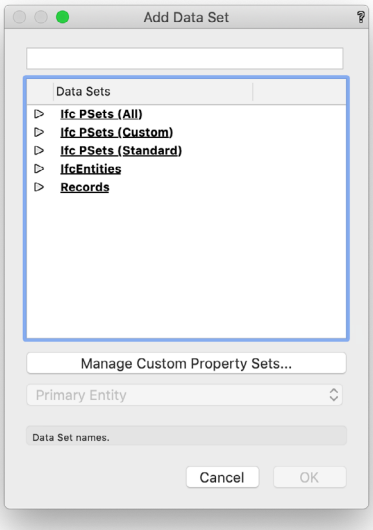

FIGURE 6: Types of Data Sets

HOW TO USE THE DATA MANAGER (CONT'D)

You can also add (or map) any of these data sets to a Vectorworks Class. This means that each time an object (line, wall, door, extrusion) is created on or moved to a class with data sets mapped to it, that data will be automatically attached to that object pertaining to that Class.

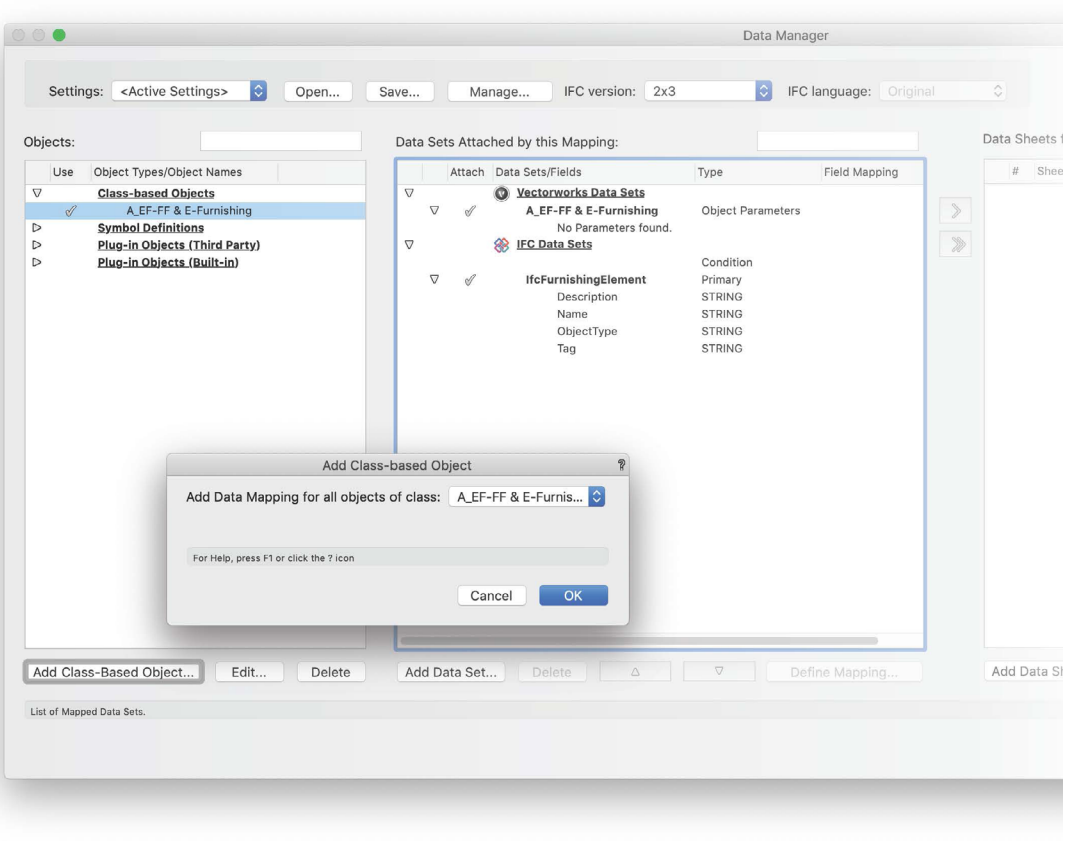

FIGURE 7: Data Mapping by Class

HOW TO USE THE DATA MANAGER (CONT'D)

If you choose to customize the data mapping, you can save and manage these specific mappings by clicking the save button in the settings section of the Data Manager dialog. By default, these mappings are saved in the Vectorworks User Libraries folder in the Application Support folder for Vectorworks. You can also save project-specific mappings in any workgroup folders you assign. For more information about User and Workgroup folders, please refer to our [BIM Managers' Guide to Managing Resources].

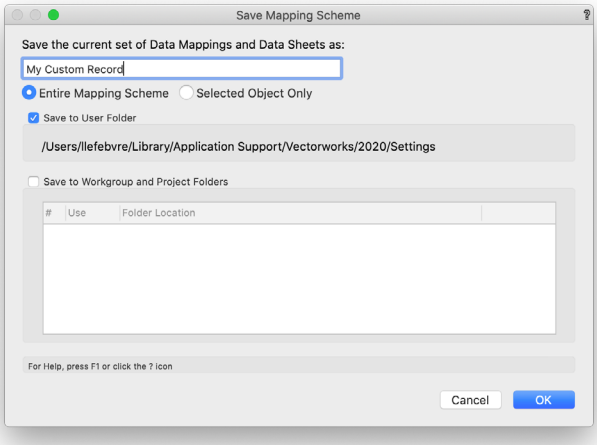

FIGURE 8: Save and manage mappings

HOW TO USE THE DATA MANAGER (CONT'D)

The right window pane of the Data Manager dialog is used to create and manage data sheets, which are user-defined selections of data sets displayed in the Data pane of the Object Info palette (OIP).

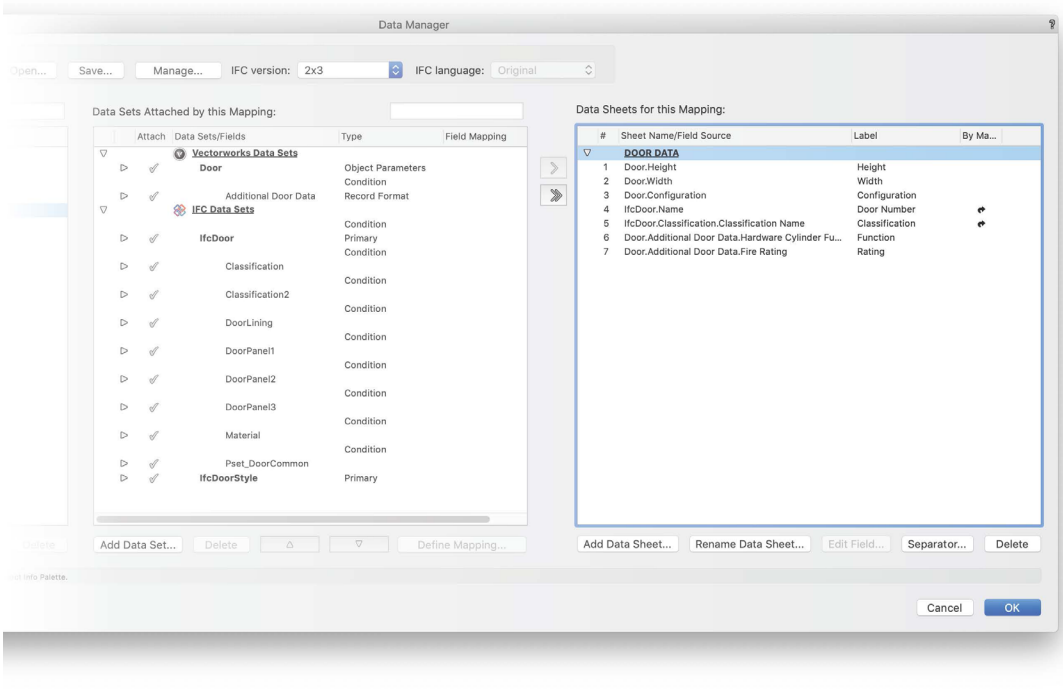

FIGURE 9: Data Sheet in the Data Manager

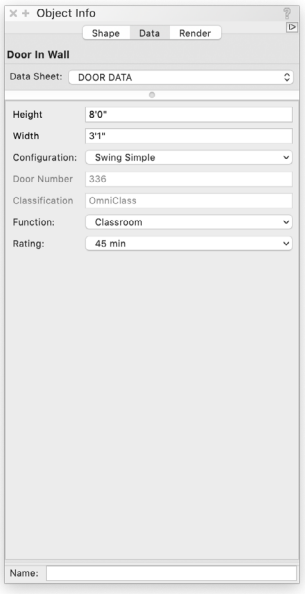

FIGURE 10: Data Sheet in the OIP Data pane

HOW TO USE THE DATA MANAGER (CONT'D)

For each data set mapped to a data sheet, you can re-order each field by moving its order # and you can customize the label of each field that will appear in the OIP. This can be done by clicking the edit field button.

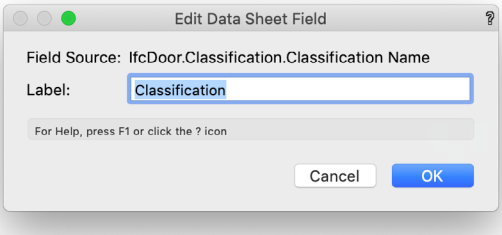

FIGURE 11: Editing field label of an IFC Pset

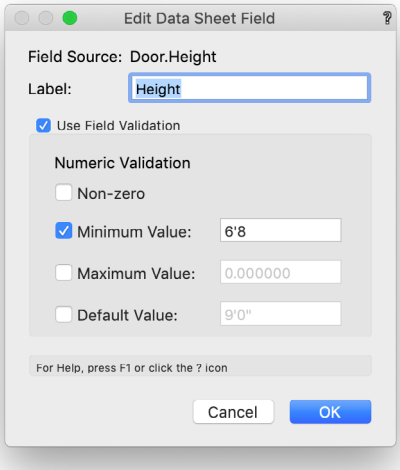

FIGURE 12: Editing field label of an Object Parameters

HOW TO USE THE DATA MANAGER (CONT'D)

When editing the data sheet field of an object's parameter value, you will find an option for enabling Field Validation. This added benefit will let you assign a minimum-maximum value, or even a default value. When enabling this function, you will receive feedback in the OIP if the values entered by the user don't meet the criteria established.

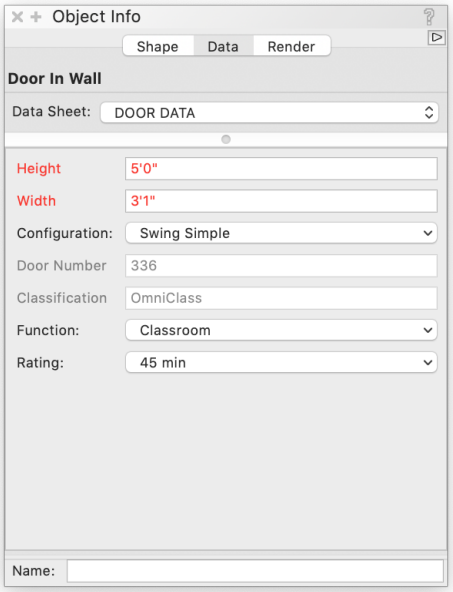

FIGURE 13: Door data not complying with the min/max values established by the mapping

HOW DOES THE DATA MANAGER WORK?

DATA MAPPING

It is important to remember that a data mapping is used to ensure proper data are exported when collaborating in an open BIM workflow. The IFC data must be attached to modeled objects to export in the IFC file format.

For example, a door in Vectorworks is exported as an IfcDoor. The IfcDoor data can come from various sources of data in Vectorworks, i.e. the door object parameters and custom records:

IFCDOOR.OVERALLHEIGHT = DOOR.HEIGHT
This formula indicates that the value of the door height from Vectorworks' door object will be exported as the OverallHeight value in the IFC file.

IFCDOOR.PSET_DOORCOMMON.FIRERATING = DOOR.ADDITIONAL DOOR DATA.FIRE RATING
This formula indicates that the value of the door fire rating coming from a custom record named "additional door data" will be exported as the fire rating in the IFC file.

The two formulas above are what we call a mapping. Use the Data Manager to create or change a mapping:

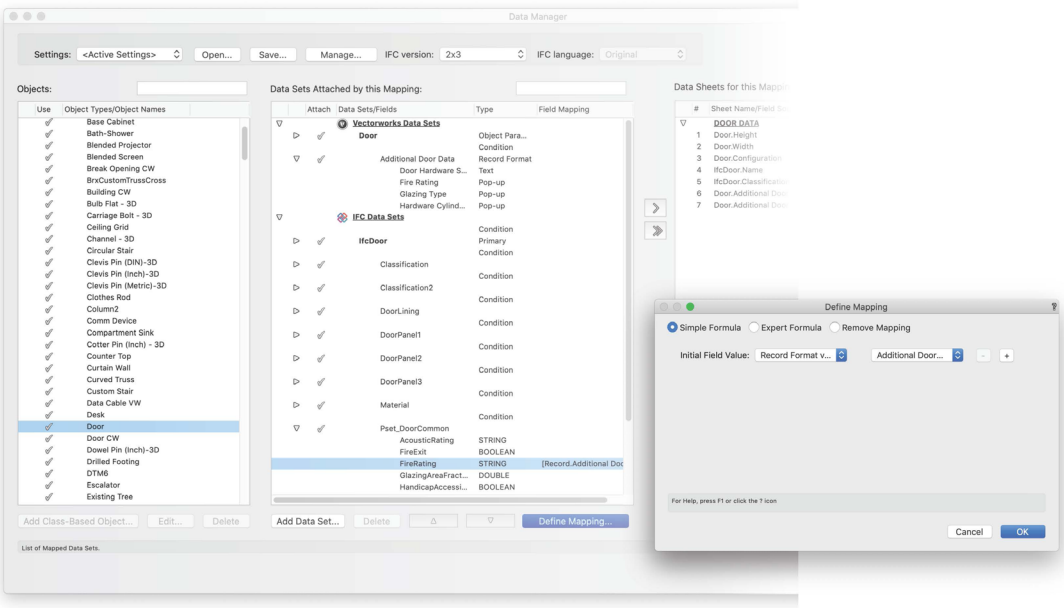

FIGURE 14: Door Fire Rating mapping from a custom record

HOW DOES THE DATA MANAGER WORK? (CONT'D)

To add a mapping for the door fire rating, find the Fire Rating field in the Pset_DoorCommon of the IfcDoor parameters. Select **Define Mapping** and choose **Simple Formula**. Set the **Initial Field Value** to **Record Format Value**. Then select the corresponding record format value for the mapping.

You can create more complex mappings when selecting **Expert Formula** from the **Define Mapping** dialog. You can add functions and operators and provide a choice in the case that values are not properly assigned to the objects. In this example, when exporting a door to an IFC file, the door number will be exported as the IFC Door Name, and if a door object does not contain a door number parameter, the IFC Door Name will default to Door.

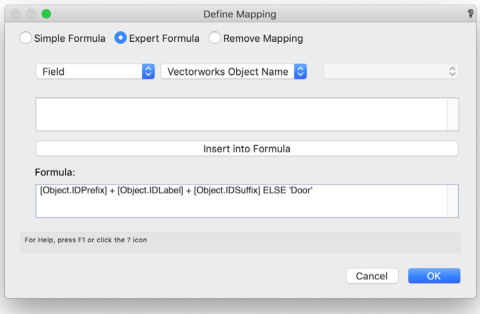

FIGURE 15: Example of an Expert Formula in the Define Mapping Dialog

HOW DOES THE DATA MANAGER WORK?

DATA SHEETS

A Data Sheet is a selection of data fields displayed in the data pane of the Object Info palette (OIP). Creating a Data Sheet is a simple process of selecting the data fields from the data sets and "move" them to the selected data sheet.

In this example we will create a Data Sheet from a custom record. The first step is to add the custom record to the wall object. Select the wall object from the left window pane and select **Add Data Set** below the Data Set window pane.

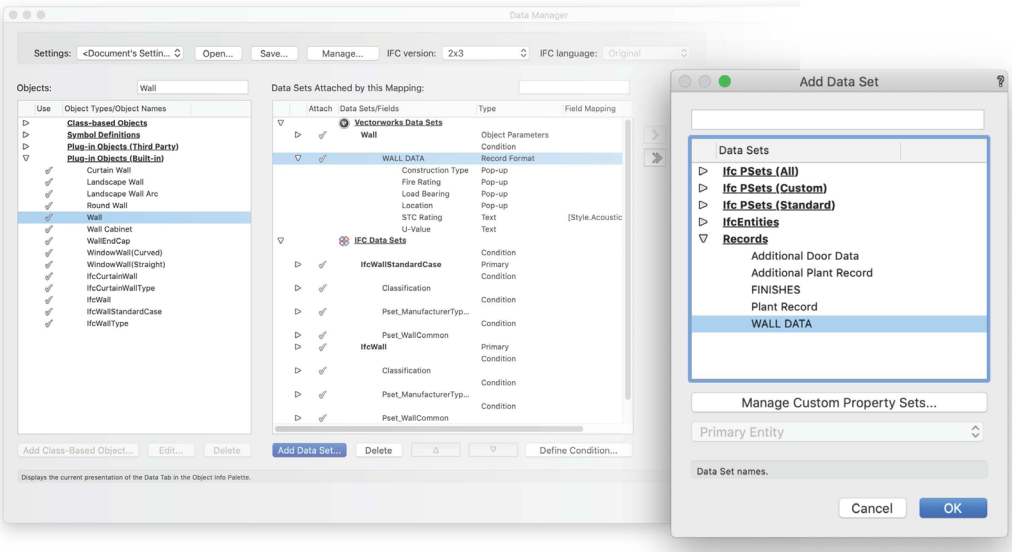

FIGURE 16: Add Custom Record to the Wall object mapping

HOW DOES THE DATA MANAGER WORK? (CONT'D)

To create a new Data Sheet, select Add Data Sheet, below the Data Sheet window pane of the dialog and give it a name.

With the Data Sheet selected, select the data fields from the Data Sets of the object and click the arrow to move the selected data field to the data sheet.

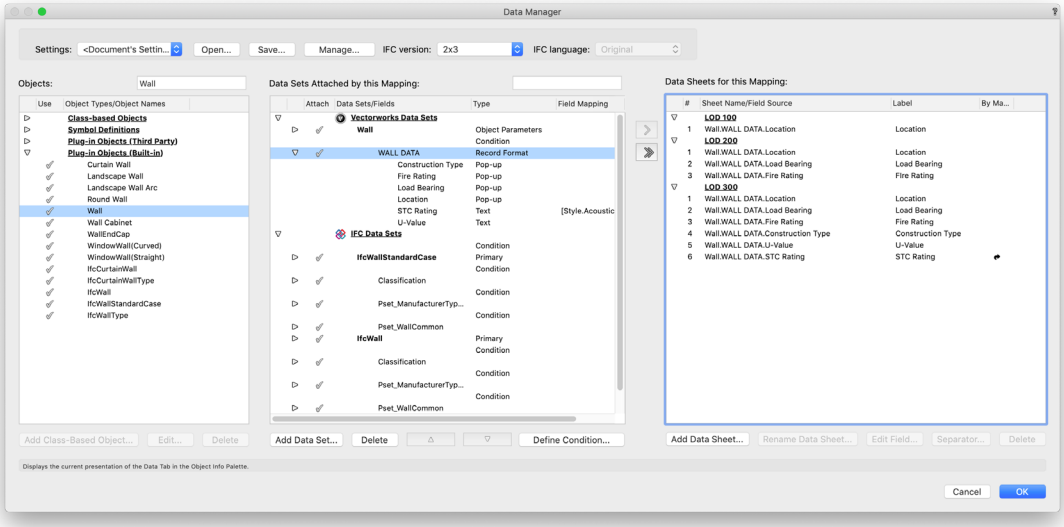

FIGURE 17: Data Sheet created from Wall Data Custom Record

HOW DOES THE DATA MANAGER WORK?

There are a few benefits to using Data Sheets. One, you can create sheets from any Data Sets and combine them so they are visible and manageable from the OIP. Two, you can rename the complex field names — such as IFC parameters — to appear in a more comprehensive way in the OIP. This is done by creating a label to the data field name. To change the name, simply select Edit Field at the bottom of the Data Sheet window pane.

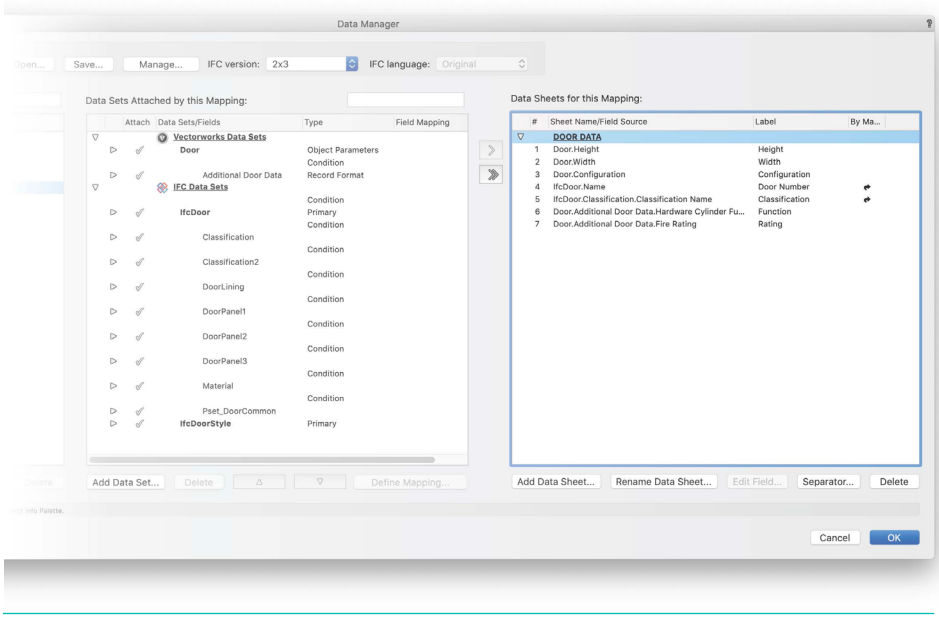

FIGURE 18: Example of a Door Data Sheet with fields from multiple Data Sets.

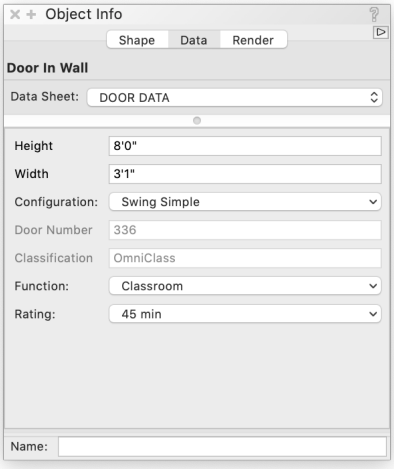

FIGURE 19: Example of Door Data Sheet in the Object Info Palette showing the data field labels.

SUMMARY

The Data Manager provides many benefits. First, by adding efficiencies in highly collaborative workflows like building information modeling. Second, by allowing managers to control the quality and quantity of the data exported in the process. And third, by providing data sheet functionality to validate/verify that the proper data are provided for each phase of a project.

Combining the power of this tool with the Data Visualization feature, the quality control of building information modeling is now more efficient with Vectorworks software products.

LEARN MORE

about how Vectorworks can help you implement and develop BIM workflows. Email us at **hello@vectorworks.net**.

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